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ACCELERATOR CONTROL SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NBS000J8

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NBS000J9

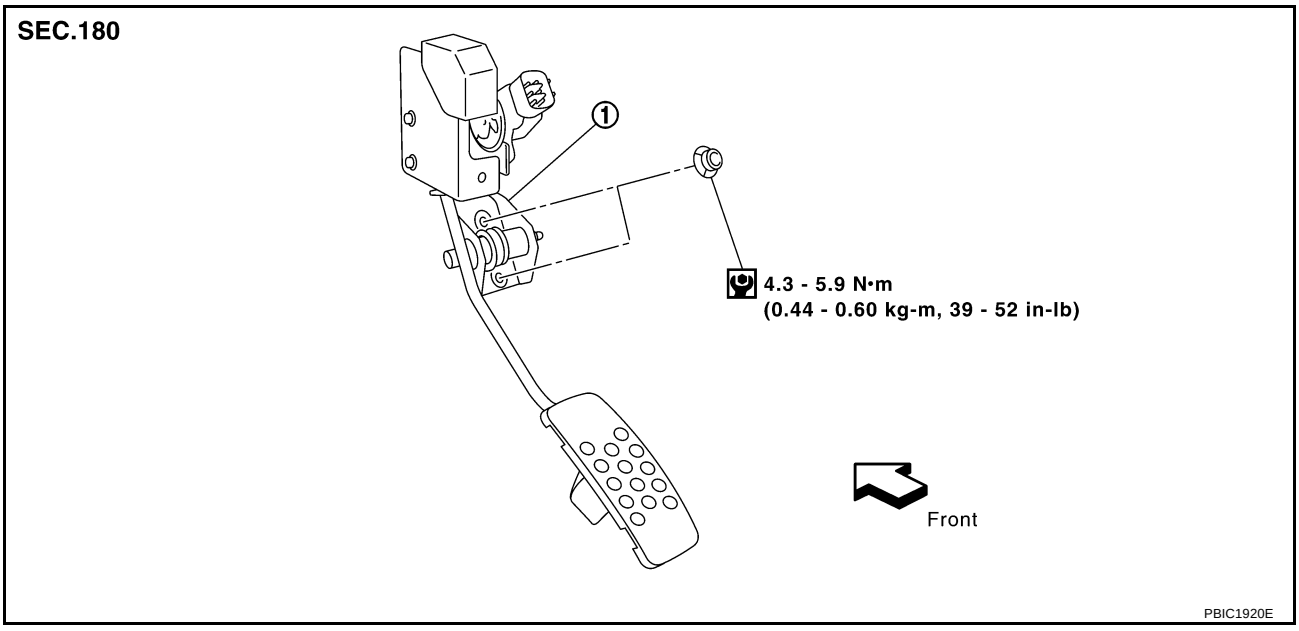
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

ACCELERATOR CONTROL SYSTEM

PFP:18005

Removal and Installation

NBS000JA



1. Accelerator pedal assembly

REMOVAL

1. Disconnect accelerator pedal position sensor harness connector.
2. Loosen nuts, and remove accelerator pedal assembly.

CAUTION:

- **Do not disassemble accelerator pedal assembly. Do not remove accelerator pedal position sensor from accelerator pedal assembly.**
- **Avoid impact from dropping etc. during handling.**
- **Be careful to keep accelerator pedal assembly away from water.**

INSTALLATION

Installation is the reverse order of removal.

INSPECTION AFTER INSTALLATION

- Make sure that accelerator pedal moves smoothly within the whole operation range.
- Make sure that accelerator pedal securely returns to the original position.
- For the electrical inspection of accelerator pedal assembly, refer to EC-633, "DTC P2122, P2123 APP SENSOR" , EC-641, "DTC P2127, P2128 APP SENSOR" and EC-650, "DTC P2138 APP SENSOR" .

CAUTION:

When harness connector of accelerator pedal position sensor is disconnected, perform "Accelerator Pedal Released Position Learning". Refer to EC-77, "Accelerator Pedal Released Position Learning" .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Tightening Torque

NBS000JB

Unit: N·m (kg-m, in-lb)

Accelerator pedal assembly	4.3 - 5.9 (0.44 - 0.60, 39 - 52)

SECTION ACS
AUTO CRUISE CONTROL SYSTEM

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AUTOMATIC SPEED CONTROL DEVICE (ASCD)

PFP:18930

Description

NKS000DY

Regarding the information for ASCD system, refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" .

SECTION AT
AUTOMATIC TRANSMISSION

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INDEX FOR DTC

PFP:00024

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NCS00017

NOTE:
If DTC "U1000 CAN COMM CIRCUIT" is displayed with other DTCs, first perform the trouble diagnosis for "DTC U1000 CAN COMMUNICATION LINE". Refer to AT-94 .

Items (CONSULT-III screen terms)	DTC		Reference page
	OBD-II	Except OBD-II	
	CONSULT-III GST*1	CONSULT-III only "TRANSMISSION"	
A/T 1ST E/BRAKING	—	P1731	AT-143
A/T 1ST GR FNCTN	P0731	P0731	AT-115
A/T 2ND GR FNCTN	P0732	P0732	AT-117
A/T 3RD GR FNCTN	P0733	P0733	AT-119
A/T 4TH GR FNCTN	P0734	P0734	AT-121
A/T 5TH GR FNCTN	P0735	P0735	AT-123
A/T INTERLOCK	P1730	P1730	AT-141
A/T TCC S/V FNCTN	P0744*2	P0744	AT-127
ATF TEMP SEN/CIRC	P0710	P1710	AT-134
CAN COMM CIRCUIT	U1000	U1000	AT-94
D/C SOLENOID/CIRC	P1762	P1762	AT-149
ENGINE SPEED SIG	P0725	P0725	AT-113
FR/B SOLENOID/CIRC	P1757	P1757	AT-147
HLR/C SOL/CIRC	P1767	P1767	AT-151
I/C SOLENOID/CIRC	P1752	P1752	AT-145
L/PRESS SOL/CIRC	P0745	P0745	AT-129
LC/B SOLENOID/CIRC	P1772	P1772	AT-153
LC/B SOLENOID FNCT	P1774*2	P1774	AT-155
MANU MODE SW/CIRC	—	P1815	AT-157
PNP SW/CIRC	P0705	P0705	AT-102
STARTER RELAY/CIRC	—	P0615	AT-97
TCC SOLENOID/CIRC	P0740	P0740	AT-125
TCM	P0700	P0700	AT-101
TP SEN/CIRC A/T	P1705	P1705	AT-131
TURBINE REV S/CIRC	P0717	P0717	AT-106
VEH SPD SE/CIR-MTR	—	P1721	AT-139
VEH SPD SEN/CIR AT	P0720	P0720	AT-108

- *1: These numbers are precribed by SAE J2012.
- *2: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

DTC No. Index

NCS00018

NOTE:
If DTC "U1000 CAN COMM CIRCUIT" is displayed with other DTCs, first perform the trouble diagnosis for "DTC U1000 CAN COMMUNICATION LINE". Refer to AT-94 .

DTC		Items (CONSULT-III screen terms)	Reference page
OBD-II	Except OBD-II		
CONSULT-III GST*1	CONSULT-III only "TRANSMISSION"		
—	P0615	STARTER RELAY/CIRC	AT-97
P0700	P0700	TCM	AT-101
P0705	P0705	PNP SW/CIRC	AT-102
P0710	P1710	ATF TEMP SEN/CIRC	AT-134
P0717	P0717	TURBINE REV S/CIRC	AT-106
P0720	P0720	VEH SPD SEN/CIR AT	AT-108
P0725	P0725	ENGINE SPEED SIG	AT-113
P0731	P0731	A/T 1ST GR FNCTN	AT-115
P0732	P0732	A/T 2ND GR FNCTN	AT-117
P0733	P0733	A/T 3RD GR FNCTN	AT-119
P0734	P0734	A/T 4TH GR FNCTN	AT-121
P0735	P0735	A/T 5TH GR FNCTN	AT-123
P0740	P0740	TCC SOLENOID/CIRC	AT-125
P0744*2	P0744	A/T TCC S/V FNCTN	AT-127
P0745	P0745	L/PRESS SOL/CIRC	AT-129
P1705	P1705	TP SEN/CIRC A/T	AT-131
—	P1721	VEH SPD SE/CIR-MTR	AT-139
P1730	P1730	A/T INTERLOCK	AT-141
—	P1731	A/T 1ST E/BRAKING	AT-143
P1752	P1752	I/C SOLENOID/CIRC	AT-145
P1757	P1757	FR/B SOLENOID/CIRC	AT-147
P1762	P1762	D/C SOLENOID/CIRC	AT-149
P1767	P1767	HLR/C SOL/CIRC	AT-151
P1772	P1772	LC/B SOLENOID/CIRC	AT-153
P1774*2	P1774	LC/B SOLENOID FNCT	AT-155
—	P1815	MANU MODE SW/CIRC	AT-157
U1000	U1000	CAN COMM CIRCUIT	AT-94

- *1: These numbers are precribed by SAE J2012.
- *2: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NCS00019

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NCS0001A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for On Board Diagnostic (OBD) System of A/T and Engine

NCS0001B

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

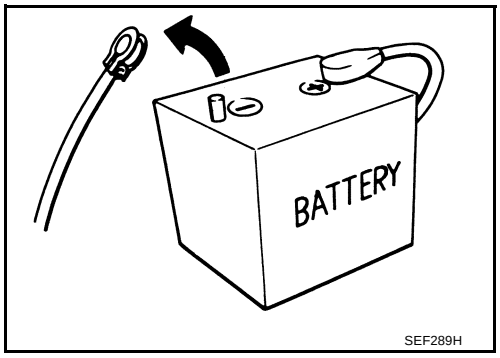
CAUTION:

- **Be sure to turn the ignition switch OFF and disconnect the battery cable from the negative terminal before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. Will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to an open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Be sure to route and secure the harnesses properly after work. Interference of the harness with a bracket, etc. May cause the MIL to light up due to a short circuit.**
- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to a malfunction of the EGR system or fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the TCM and ECM before returning the vehicle to the customer.**

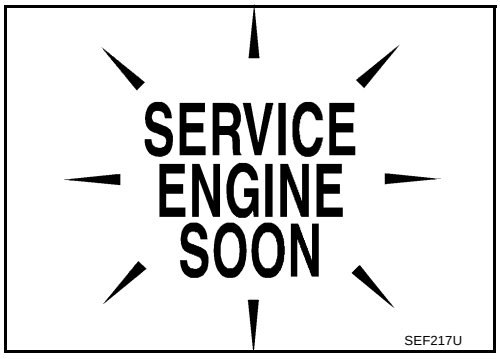
Precautions

NCS0001C

- **Before connecting or disconnecting the A/T assembly harness connector, turn ignition switch OFF and disconnect the battery cable from the negative terminal. Because battery voltage is applied to TCM even if ignition switch is turned OFF.**



- **After performing each TROUBLE DIAGNOSIS, perform "DTC Confirmation Procedure".**
  If the repair is completed the DTC should not be displayed in the "DTC Confirmation Procedure".



- Always use the specified brand of ATF. Refer to MA-11, "Fluids and Lubricants" .
- Use lint-free paper not cloth rags during work.
- After replacing the ATF, dispose of the waste oil using the methods prescribed by law, ordinance, etc.
- Before proceeding with disassembly, thoroughly clean the outside of the A/T. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free paper or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the A/T.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the A/T is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Clean or replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to AT-9, "ATF COOLER SERVICE" .
- After overhaul, refill the A/T with new ATF.
- When the A/T drain plug is removed, only some of the ATF is drained. Old ATF will remain in torque converter and ATF cooling system.
  Always follow the procedures under "Changing A/T Fluid" in the AT section when changing A/T fluid. Refer to AT-12, "Changing A/T Fluid" , AT-12, "Checking A/T Fluid" .

Service Notice or Precautions

NCS0001D

ATF COOLER SERVICE

If ATF contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T fluid cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. For A/T fluid cooler cleaning procedure, refer to AT-14, "A/T Fluid Cooler Cleaning" . For radiator replacement, refer to CO-13, "RADIATOR" .

OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the TCM in combination with the ECM. The results can be read through the blinking pattern of the A/T CHECK indicator or the malfunction indicator lamp (MIL). Refer to the table on AT-86, "SELF-DIAGNOSTIC RESULT MODE" for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and TCM memories.
  Always perform the procedure on AT-38, "HOW TO ERASE DTC" to complete the repair and avoid unnecessary blinking of the MIL.

For details of OBD-II, refer to EC-47, "ON BOARD DIAGNOSTIC (OBD) SYSTEM" .

- **Certain systems and components, especially those related to OBD, may use the new style slide-locking type harness connector. For description and how to disconnect, refer to PG-76, "HARNESS CONNECTOR" .**

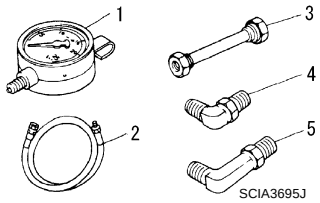
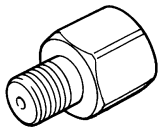
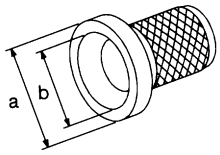
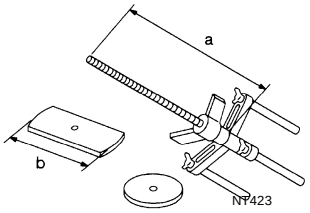
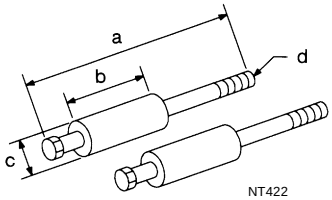
PREPARATION

PFP:00002

Special Service Tools

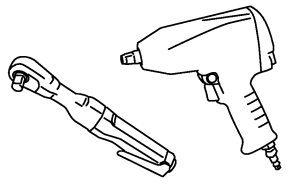
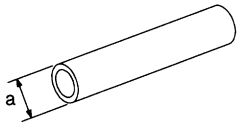
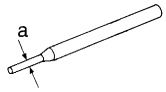
NCS0001F

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST2505S001 (J-34301-C) Oil pressure gauge set 1. ST25051001 (—) Oil pressure gauge 2. ST25052000 (—) Hose 3. ST25053000 (—) Joint pipe 4. ST25054000 (—) Adapter 5. ST25055000 (—) Adapter  SCIA3695J	Measuring line pressure
KV31103600 (J-45674) Joint pipe adapter (With ST25054000)  ZZA1227D	Measuring line pressure
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.  NT086	● Installing rear oil seal ● Installing oil pump housing oil seal
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor a: 320 mm (12.60 in) b: 174 mm (6.85 in)  NT423	Installing reverse brake return spring retainer
ST25850000 (J-25721-A) Sliding hammer a: 179 mm (7.05 in) b: 70 mm (2.76 in) c: 40 mm (1.57 in) d: M12X1.75P  NT422	Remove oil pump assembly

Commercial Service Tools

NCS0001G

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
Drift a: 22 mm (0.87 in) dia.  NT083	Installing manual shaft oil seals
Pin punch a: 4 mm (0.16 in) dia.  NT410	Removing retaining pin

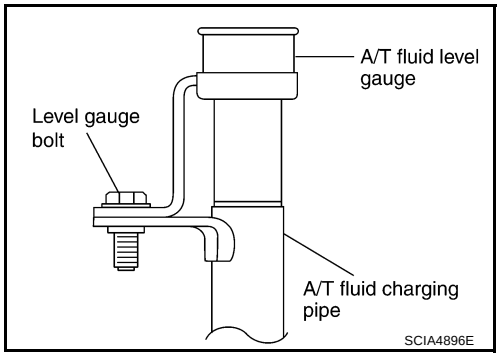
A/T FLUID

PFP:KLE40

Changing A/T Fluid

NCS0001H

1. Warm up ATF.
2. Stop engine.
3. Loosen the level gauge bolt.
4. Drain ATF from drain plug and refill with new ATF. Always refill same volume with drained ATF.
   - To replace the ATF, pour in new ATF at the A/T fluid charging pipe with the engine idling and at the same time drain the old ATF from the radiator cooler hose return side.
   - When the color of the ATF coming out is about the same as the color of the new ATF, the replacement is complete. The amount of new ATF to use should be 30 to 50% increase of the stipulated amount.



ATF: **Genuine NISSAN Matic J ATF**

Fluid capacity: **10.3 ℓ (10-7/8 US qt, 9-1/8 Imp qt)**

CAUTION:

- **Use only Genuine NISSAN Matic J ATF. Do not mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the NISSAN new vehicle limited warranty.**
- **When filling ATF, take care not to splash heat generating parts such as exhaust with ATF.**
- **Do not reuse drain plug gasket.**

Drain plug:

: 34 N·m (3.5 kg-m, 25 ft-lb)

5. Run engine at idle speed for 5 minutes.
6. Check A/T fluid level and condition. Refer to AT-12, "Checking A/T Fluid" . If ATF is still dirty, repeat step 2. through 5.
7. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
8. Tighten the level gauge bolt.

Level gauge bolt:

: 5.1 N·m (0.52 kg-m, 45 in-lb)

Checking A/T Fluid

NCS0001I

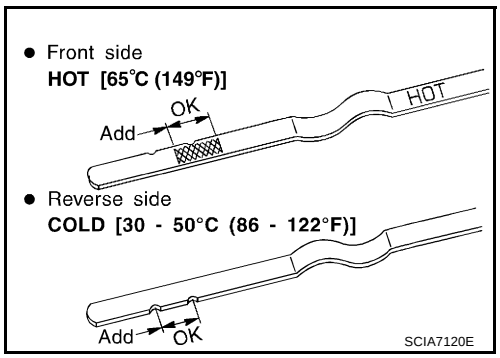
1. Warm up engine.
2. Check for A/T fluid leakage.
3. Loosen the level gauge bolt.
4. Before driving, A/T fluid level can be checked at A/T fluid temperatures of 30 to 50°C (86 to 122°F) using “COLD” range on A/T fluid level gauge as follows.

a. Park vehicle on level surface and set parking brake.

b. Start engine and move selector lever through each gear position. Leave selector lever in “P” position.

c. Check A/T fluid level with engine idling.

d. Remove A/T fluid level gauge and wipe clean with lint-free paper.



CAUTION:

When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.

e. Re-insert A/T fluid level gauge into A/T fluid charging pipe as far as it will go.

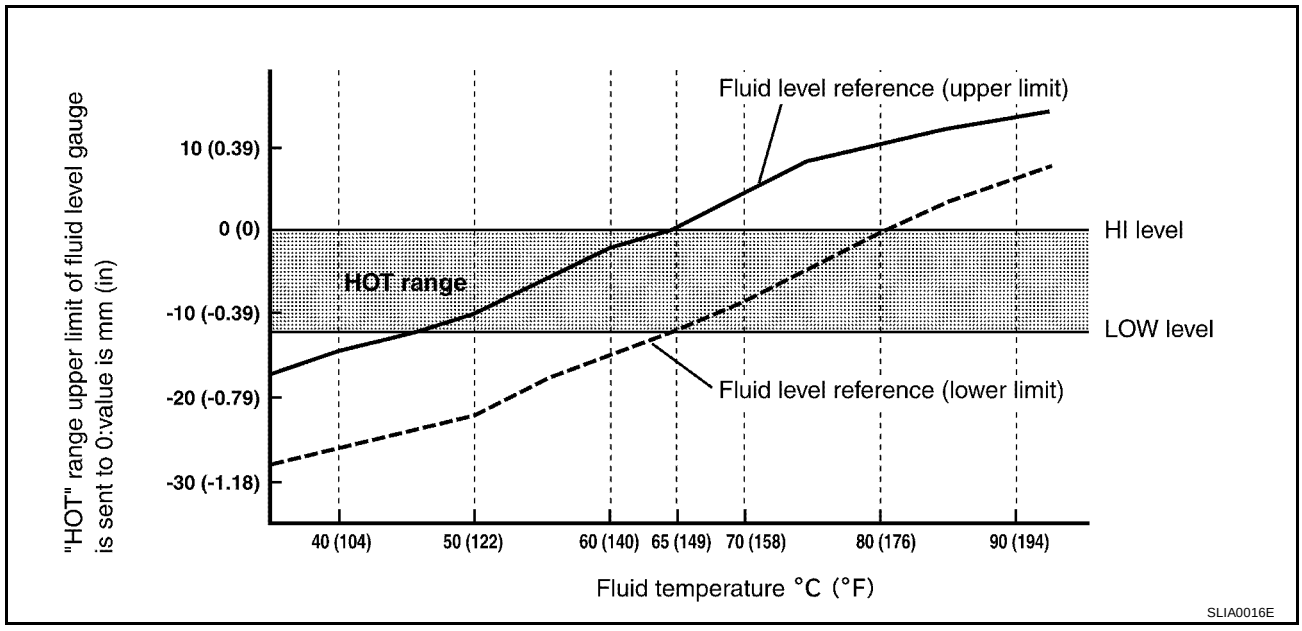
CAUTION:
To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions.

f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add ATF to the A/T fluid charging pipe.

CAUTION:
Do not overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.
6. Make the A/T fluid temperature approximately 65°C (149°F).

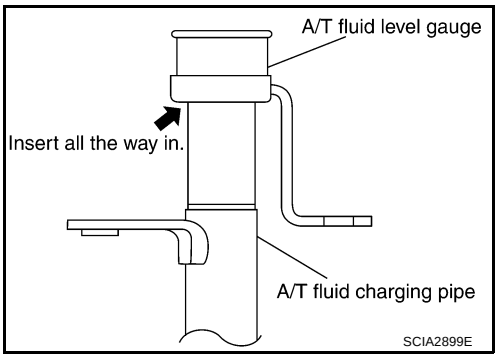
NOTE:
A/T fluid level will be greatly affected by temperature as shown in the figure. Therefore, be certain to perform operation while checking data with CONSULT-III.



a. Select “DATA MONITOR”.
b. Read out the value of “ATF TEMP 1”.

7. Re-check A/T fluid level at A/T fluid temperatures of approximately 65°C (149°F) using “HOT” range on A/T fluid level gauge.

CAUTION:
- **When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.**
- **To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge rotated from the normal attachment conditions as shown.**

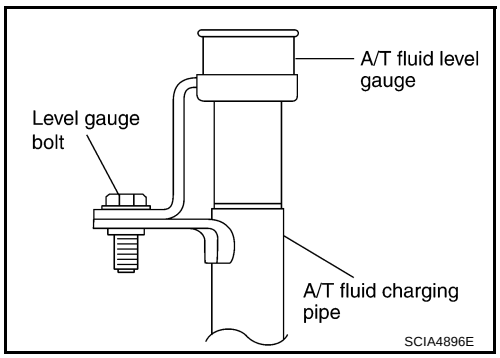


8. Check A/T fluid condition.
   - If ATF is very dark or smells burned, check operation of A/T. Flush cooling system after repair of A/T.
   - If ATF contains frictional material (clutches, bands, etc.), replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to CO-13, "RADIATOR" and AT-14, "A/T Fluid Cooler Cleaning" .
9. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.

10. Tighten level gauge bolt.

Level gauge bolt:

: 5.1 N·m (0.52 kg-m, 45 in-lb)



A/T Fluid Cooler Cleaning

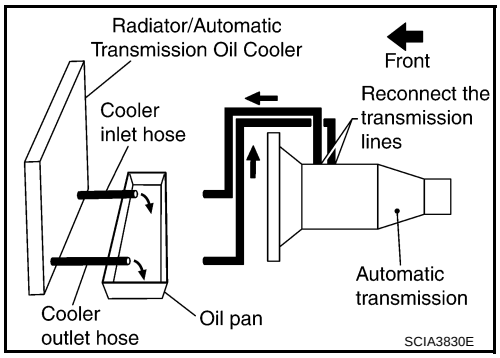
NCS0001J

Whenever an A/T is replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned. Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of ATF. In either case, malfunction of the newly serviced A/T may result.
Debris, if present, may build up as ATF enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

A/T FLUID COOLER CLEANING PROCEDURE

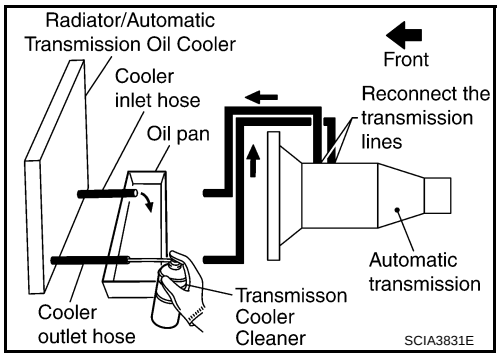
1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Identify the inlet and outlet A/T fluid cooler hoses.
3. Disconnect the A/T fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.

   NOTE:
   Replace the cooler hoses if rubber material from the hose remains on the tube fitting.
4. Allow any ATF that remains in the cooler hoses to drain into the oil pan.



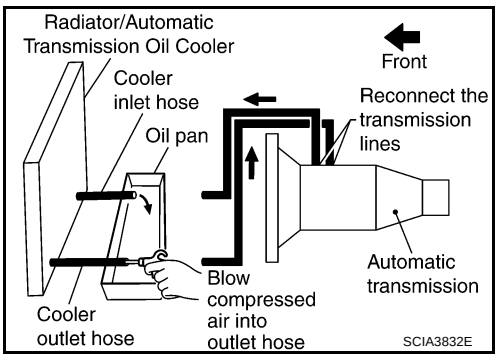
5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Do not breath vapors or spray mist.**



6. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.

7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the air gun tip and of the cooler outlet hose.
9. Blow compressed air regulated to 5 to 9 kg/cm^2 (70 to 130 psi) through the cooler outlet hose for 10 seconds to force out any remaining ATF.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the A/T fluid cooler steel lines to the A/T.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the A/T by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.



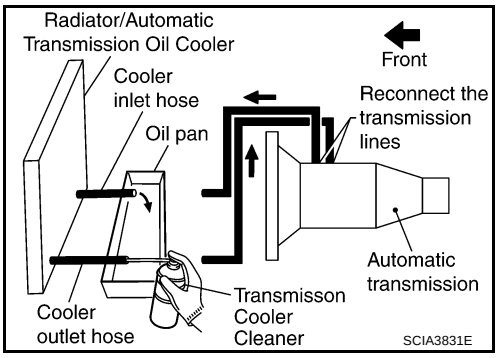
14. Blow compressed air regulated to 5 to 9 kg/cm^2 (70 to 130 psi) through each steel line from the cooler side back toward the A/T for 10 seconds to force out any remaining ATF.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform AT-15, "A/T FLUID COOLER DIAGNOSIS PROCEDURE" .

A/T FLUID COOLER DIAGNOSIS PROCEDURE

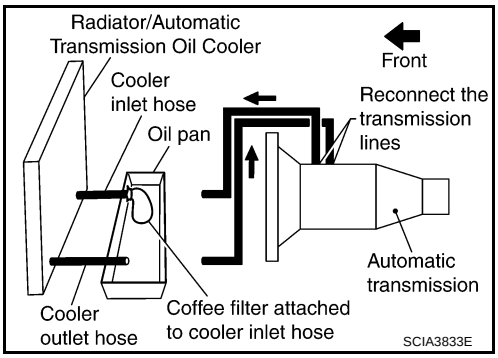
NOTE:
Insufficient cleaning of the cooler inlet hose exterior may lead to inaccurate debris identification.

1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Clean the exterior and tip of the cooler inlet hose.
3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

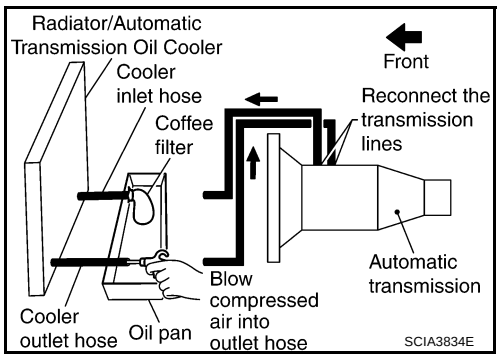
   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Do not breath vapors or spray mist.**



4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.
5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



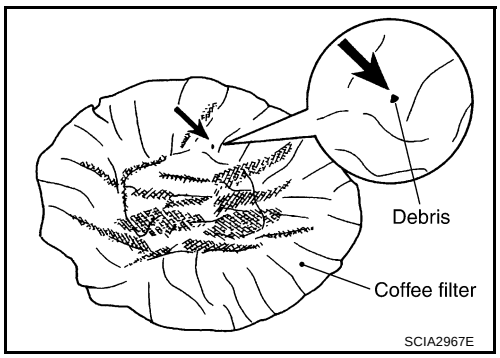
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 to 9 kg/cm^2 (70 to 130 psi) through the cooler outlet hose to force any remaining ATF into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform AT-16, "A/T FLUID COOLER INSPECTION PROCEDURE" .



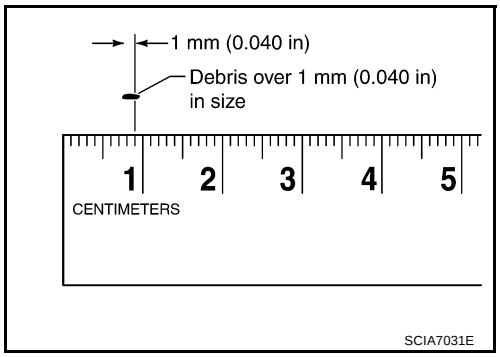
A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

a. If small metal debris less than 1 mm (0.04 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.



b. If one or more pieces of debris are found that are over 1 mm (0.04 in) in size and/or peeled clutch facing material is found in the coffee filter, the A/T fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to CO-13, "RADIATOR" and CO-17, "RADIATOR (ALUMINUM TYPE)" .



A/T FLUID COOLER FINAL INSPECTION

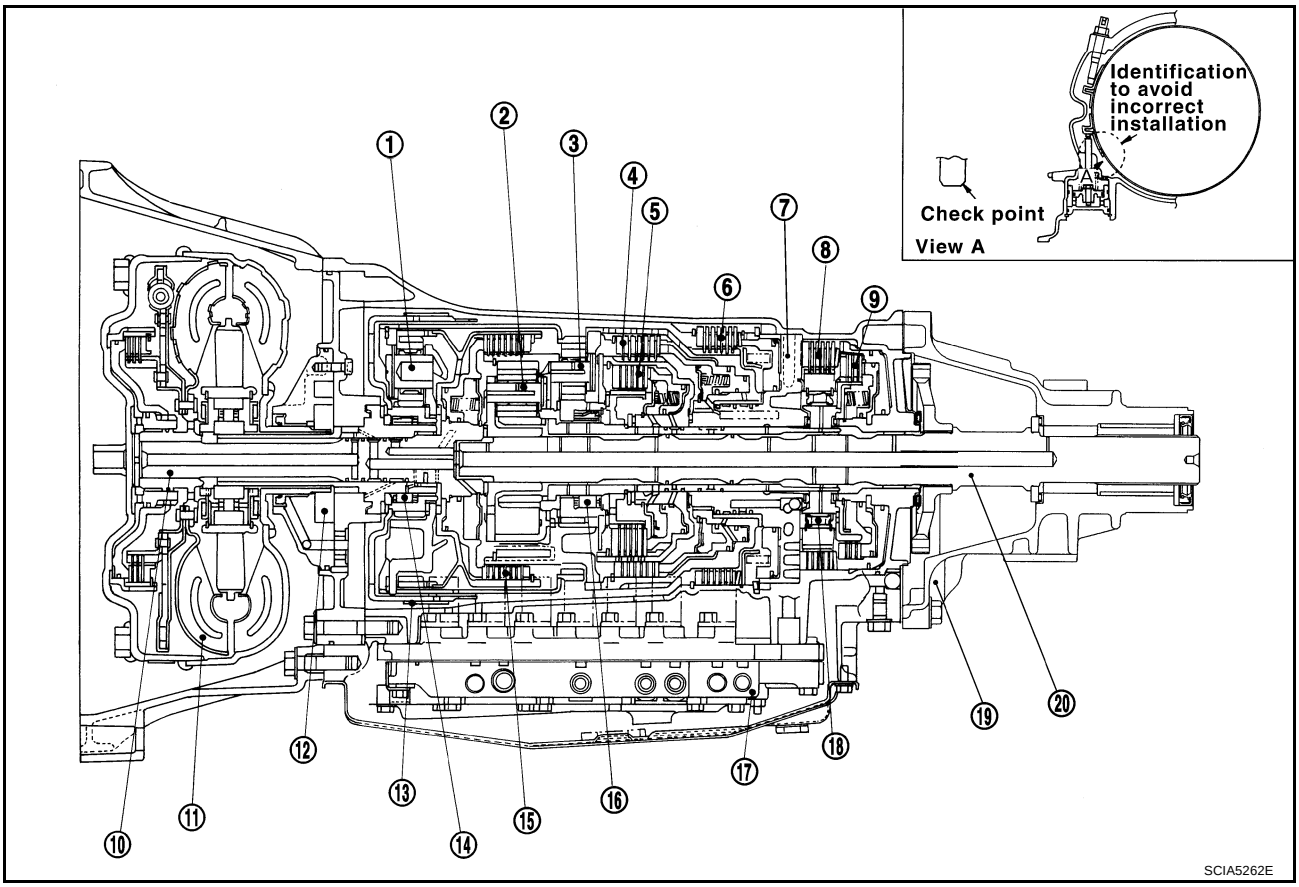
After performing all procedures, ensure that all remaining oil is cleaned from all components.

A/T CONTROL SYSTEM

PFP:31036

Cross-sectional View

NCS0001K



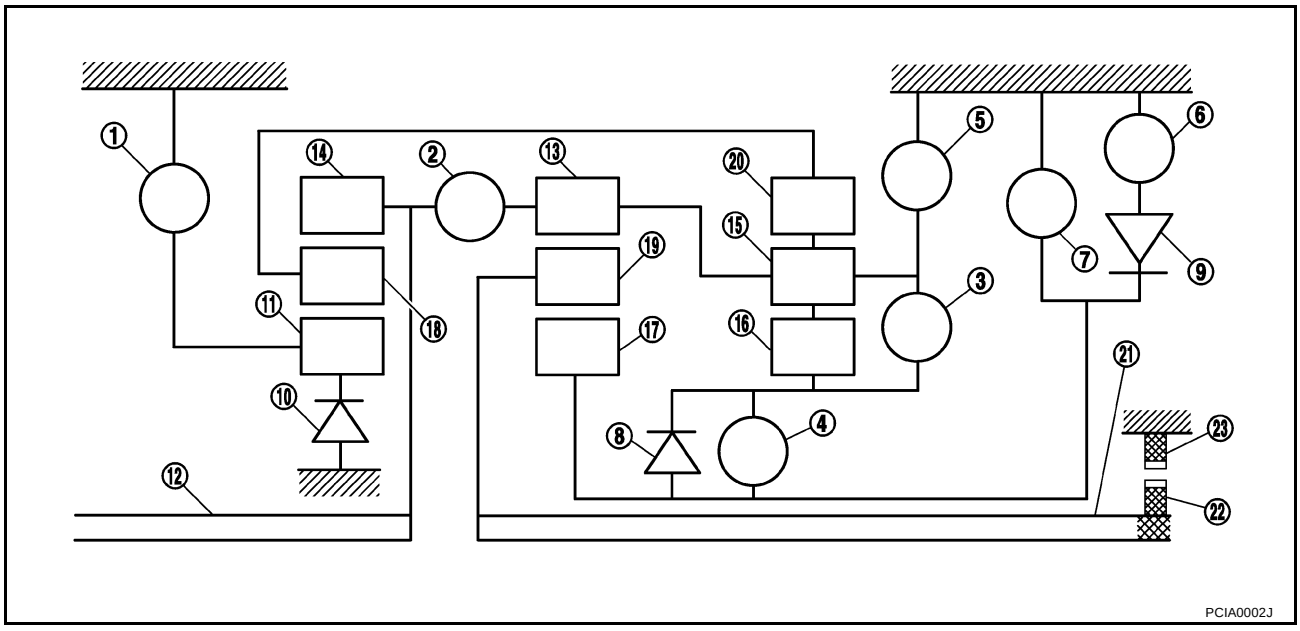
1. Front planetary gear	2. Mid planetary gear	3. Rear planetary gear
4. Direct clutch	5. High and low reverse clutch	6. Reverse brake
7. Drum support	8. Forward brake	9. Low coast brake
10. Input shaft	11. Torque converter	12. Oil pump
13. Front brake	14. 3rd one-way clutch	15. Input clutch
16. 1st one-way clutch	17. Control valve with TCM	18. Forward one-way clutch
19. Rear extension	20. Output shaft	

Shift Mechanism

NCS0001L

The A/T uses compact triple planetary gear systems to improve power transmission efficiency, simplify construction and reduce weight.
It also employs an optimum shift control and super wide gear ratios. They improve starting performance and acceleration during medium and high-speed operation.

CONSTRUCTION



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

FUNCTION OF CLUTCH AND BRAKE

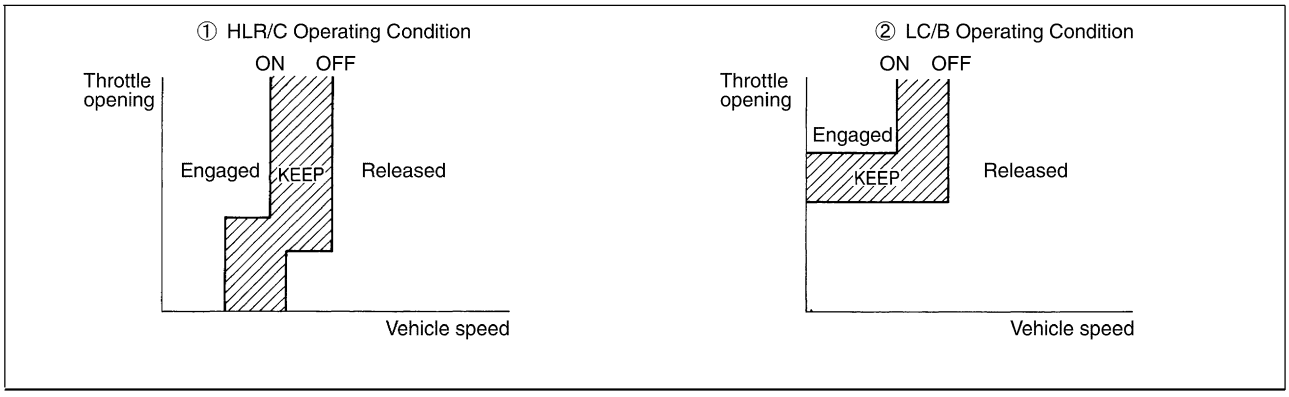
Name of the Part	Abbreviation	Function
Front brake (1)	FR/B	Fastens the front sun gear (11).
Input clutch (2)	I/C	Connects the input shaft (12), the front internal gear (14) and the mid internal gear (13).
Direct clutch (3)	D/C	Connects the rear carrier (15) and the rear sun gear (16).
High and low reverse clutch (4)	HLR/C	Connects the mid sun gear (17) and the rear sun gear (16).
Reverse brake (5)	R/B	Fastens the rear carrier (15).
Forward brake (6)	Fwd/B	Fastens the mid sun gear (17).
Low coast brake (7)	LC/B	Fastens the mid sun gear (17).
1st one-way clutch (8)	1st OWC	Allows the rear sun gear (16) to turn freely forward relative to the mid sun gear (17) but fastens it for reverse rotation.
Forward one-way clutch (9)	Fwd OWC	Allows the mid sun gear (17) to turn freely in the forward direction but fastens it for reverse rotation.
3rd one-way clutch (10)	3rd OWC	Allows the front sun gear (11) to turn freely in the forward direction but fastens it for reverse rotation.

CLUTCH AND BAND CHART

Shift position		I/C	HLR/C	D/C	R/B	FR/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC	Remarks
P			△			△						PARK POSITION
R			○		○	○			◎		◎	REVERSE POSITION
N			△			△						NEUTRAL POSITION
D	1st		△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2↔3↔4↔5
	2nd			○		△		○		◎	◎	
	3rd		○	○		○		△	◇		◎	
	4th	○	○	○				△	◇			
	5th	○	○			○		△	◇		◇	
M5	5th	○	○			○		△	◇		◇	Locks* (held stationary) in 5th gear
M4	4th	○	○	○				△	◇			Locks* (held stationary) in 4th gear
M3	3rd		○	○		○		△	◇		◎	Locks* (held stationary) in 3rd gear
M2	2nd			○		○	○	○		◎	◎	Locks* (held stationary) in 2nd gear
M1	1st		○			○	○	○	◎	◎	◎	Locks* (held stationary) in 1st gear

*: Down shift automatically according to the vehicle speed.

○ — Operates
◎ — Operates during "progressive" acceleration.
◇ — Operates and affects power transmission while coasting.
△ — Line pressure is applied but does not affect power transmission.
△ * — Operates under conditions shown in illustration ①.
△ ** — Operates under conditions shown in illustration ②. Delay control is applied during D (4,3,2,1) → N shift.



SCIA6962E

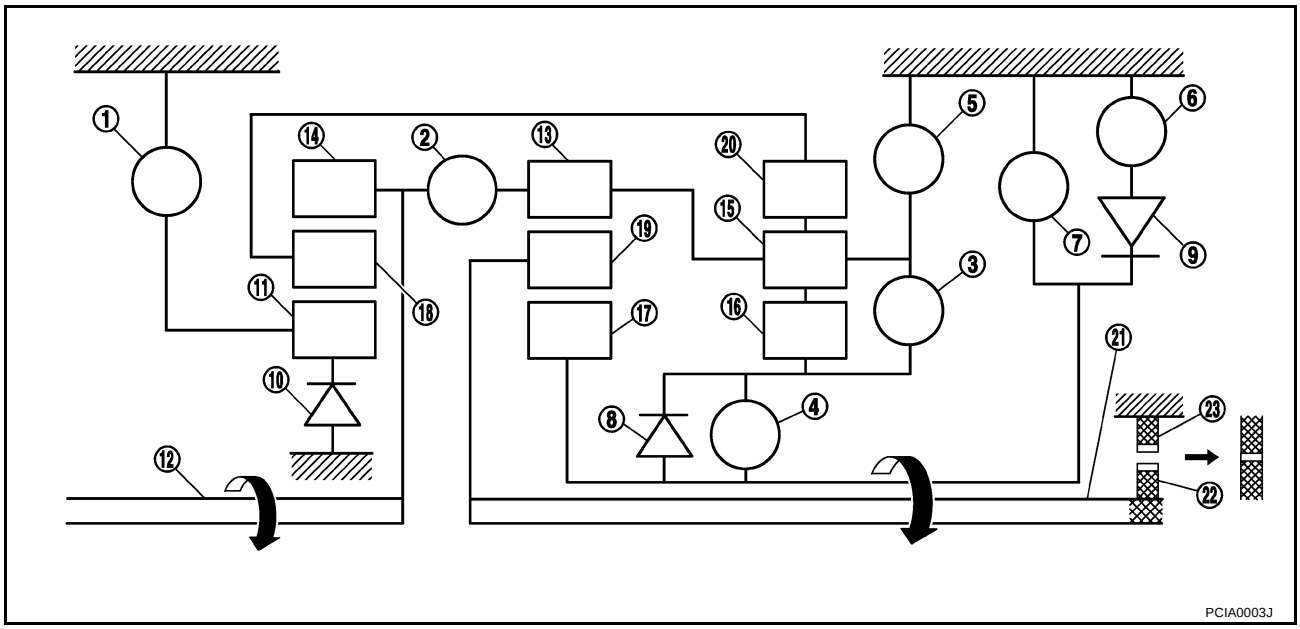
POWER TRANSMISSION

“N” Position

Since both the forward brake and the reverse brake are released, torque from the input shaft drive is not transmitted to the output shaft.

“P” Position

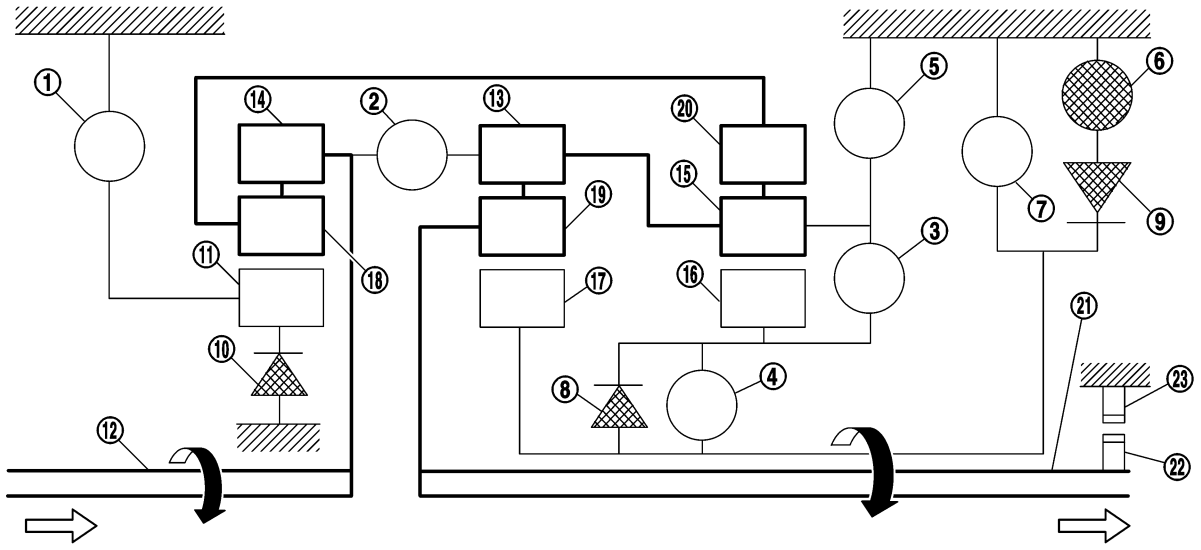
- The same as for the “N” position, both the forward brake and the reverse brake are released, so torque from the input shaft drive is not transmitted to the output shaft.
- The parking pawl linked with the selector lever meshes with the parking gear and fastens the output shaft mechanically.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“D1 ” Position

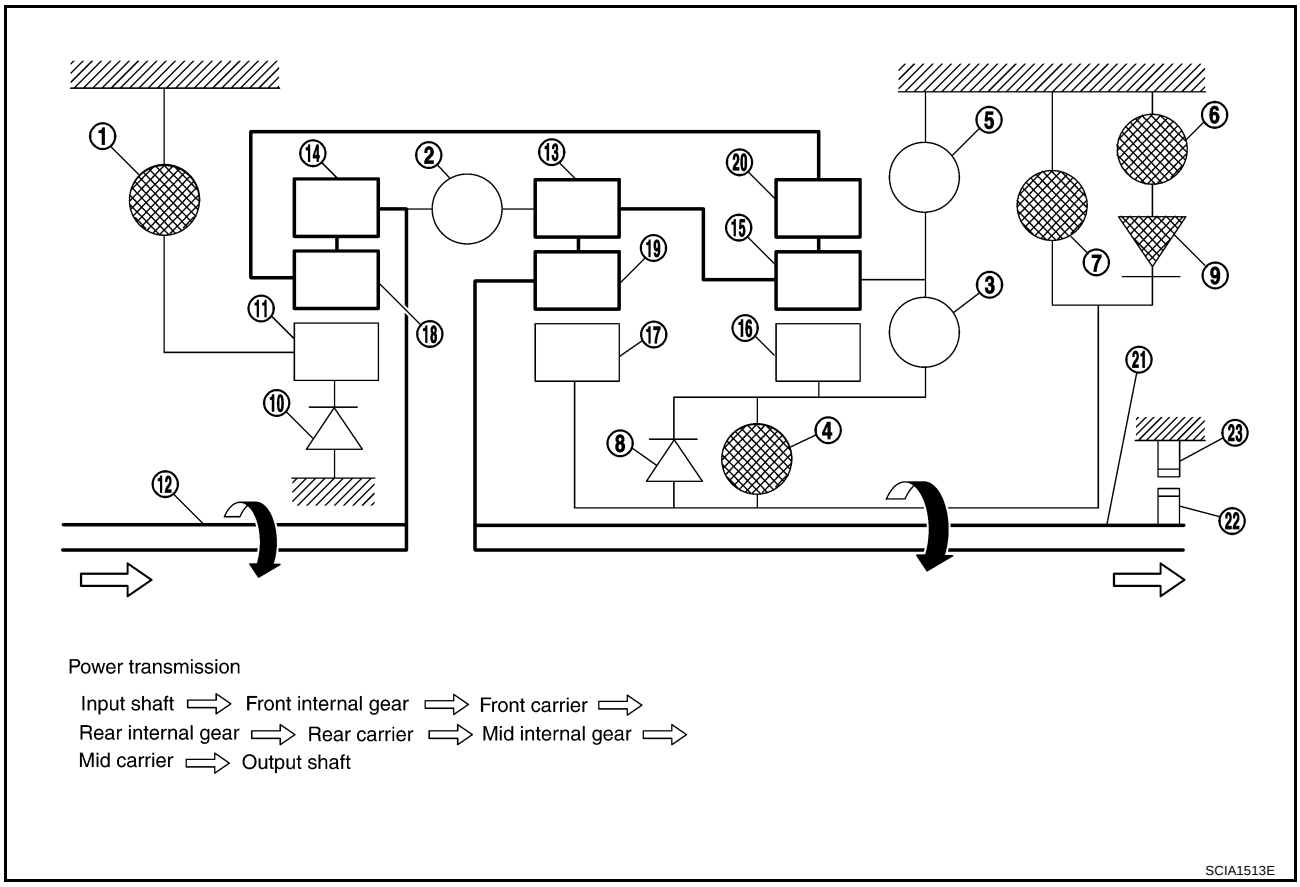
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 1st one-way clutch regulates reverse rotation of the rear sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and the engine brake is not activated.



1. Front brake	2. Input clutch	3. Direct clutch
4. High and low reverse clutch	5. Reverse brake	6. Forward brake
7. Low coast brake	8. 1st one-way clutch	9. Forward one-way clutch
10. 3rd one-way clutch	11. Front sun gear	12. Input shaft
13. Mid internal gear	14. Front internal gear	15. Rear carrier
16. Rear sun gear	17. Mid sun gear	18. Front carrier
19. Mid carrier	20. Rear internal gear	21. Output shaft
22. Parking gear	23. Parking pawl	

"M1 " Position

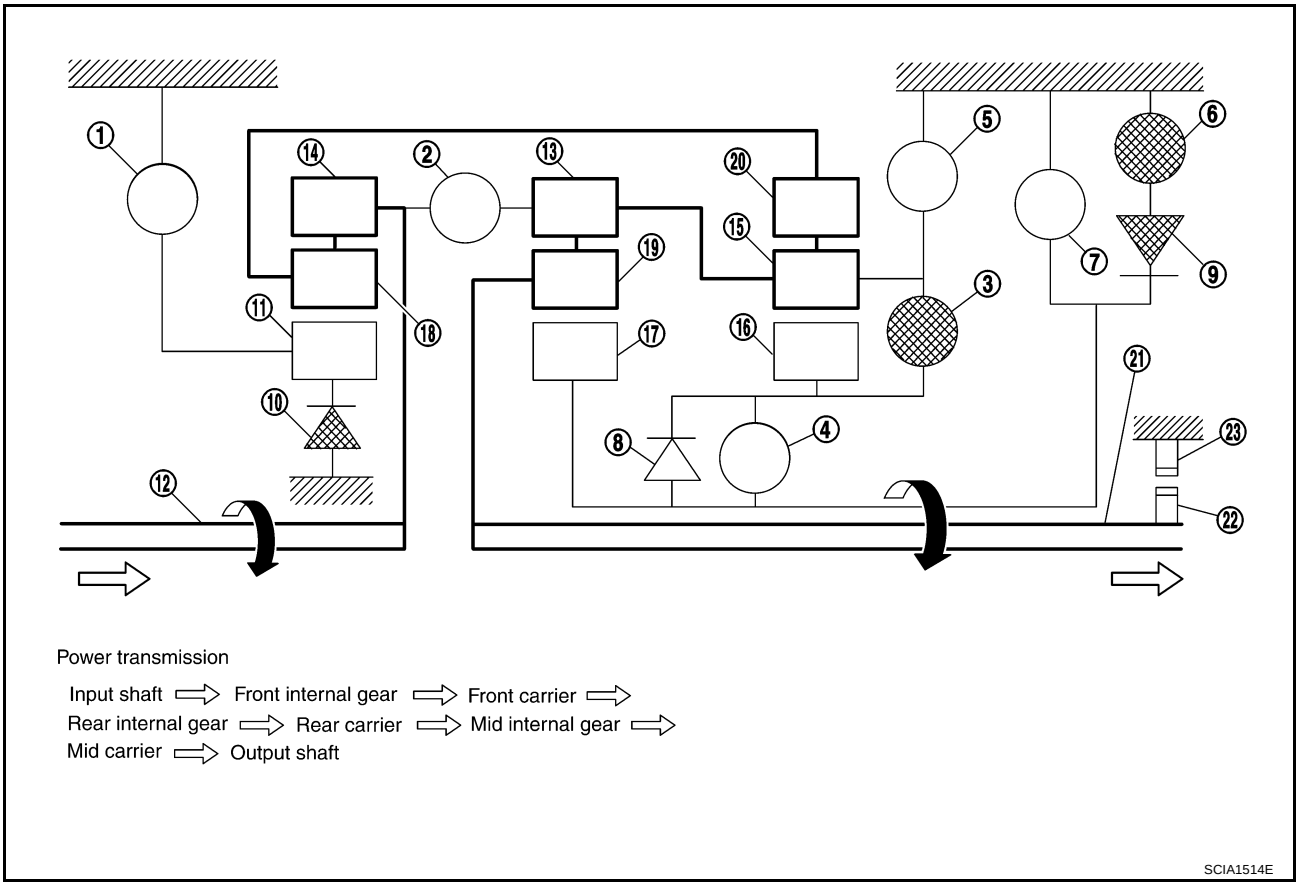
- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- High and low reverse clutch connects the rear sun gear and the mid sun gear.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

"D2 " Position

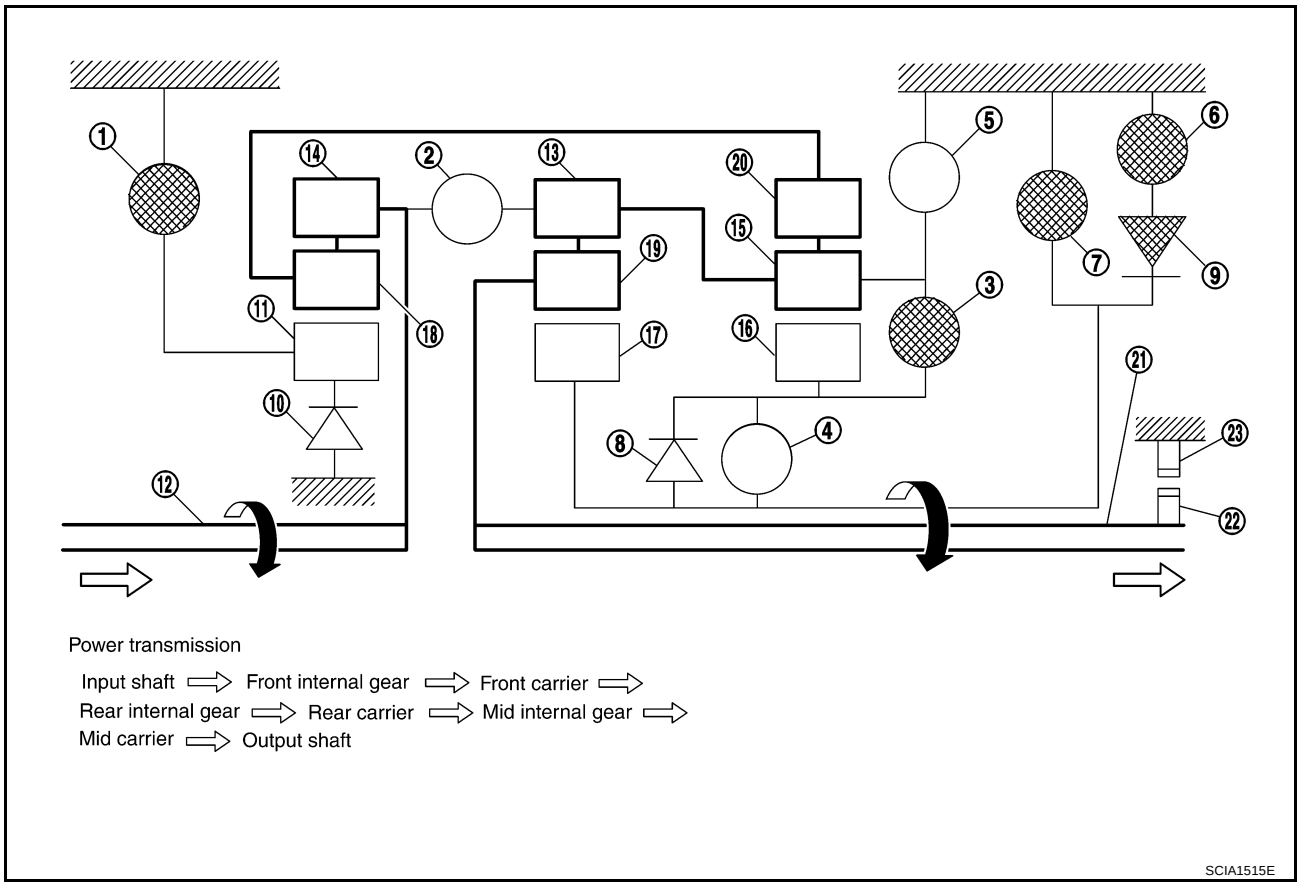
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and engine brake is not activated.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

"M2 " Position

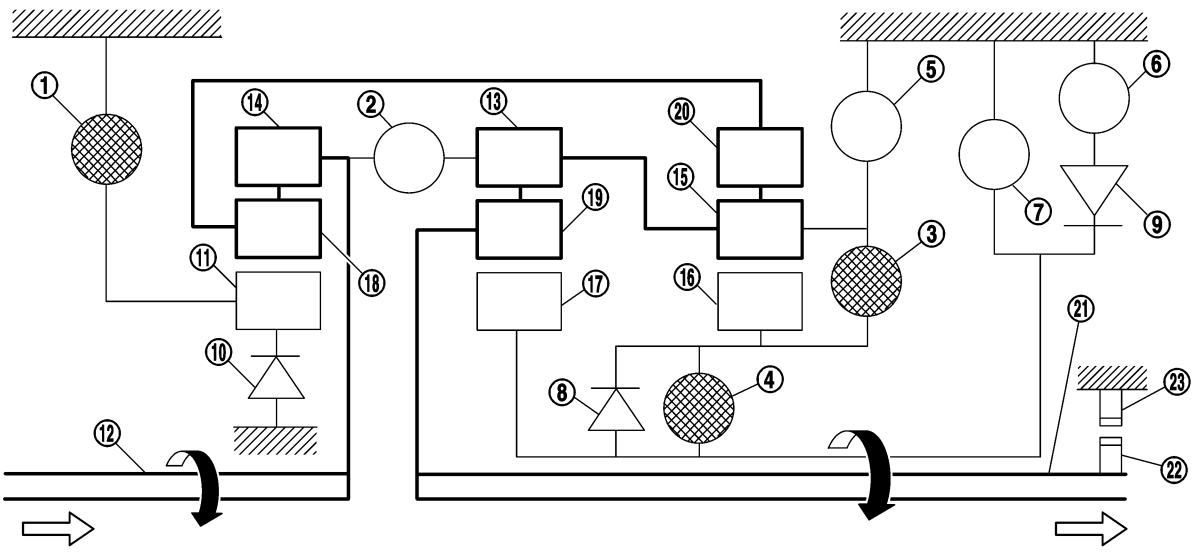
- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

"D3 " and "M3 " Positions

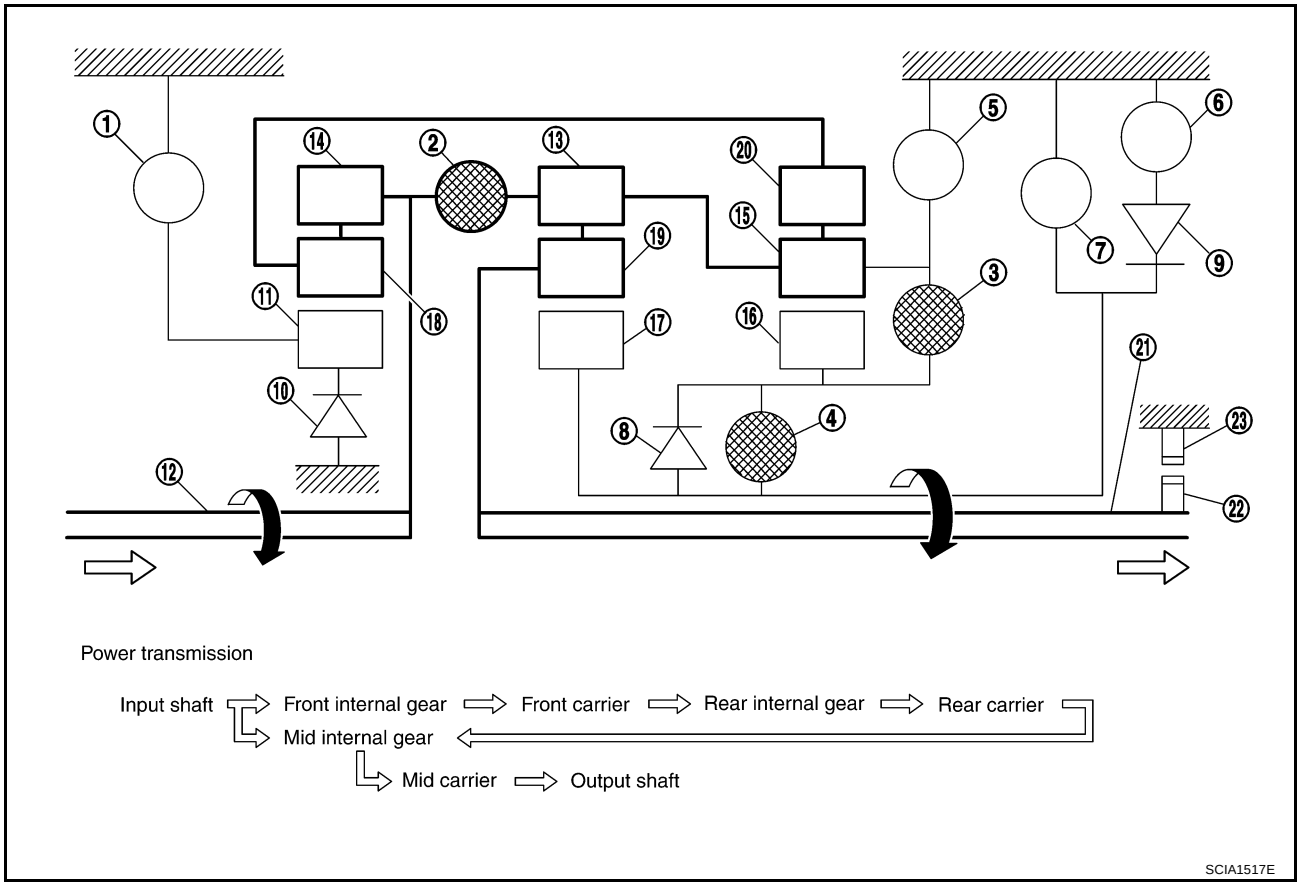
- The front brake fastens the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



1. Front brake	2. Input clutch	3. Direct clutch
4. High and low reverse clutch	5. Reverse brake	6. Forward brake
7. Low coast brake	8. 1st one-way clutch	9. Forward one-way clutch
10. 3rd one-way clutch	11. Front sun gear	12. Input shaft
13. Mid internal gear	14. Front internal gear	15. Rear carrier
16. Rear sun gear	17. Mid sun gear	18. Front carrier
19. Mid carrier	20. Rear internal gear	21. Output shaft
22. Parking gear	23. Parking pawl	

"D4 " and "M4 " Positions

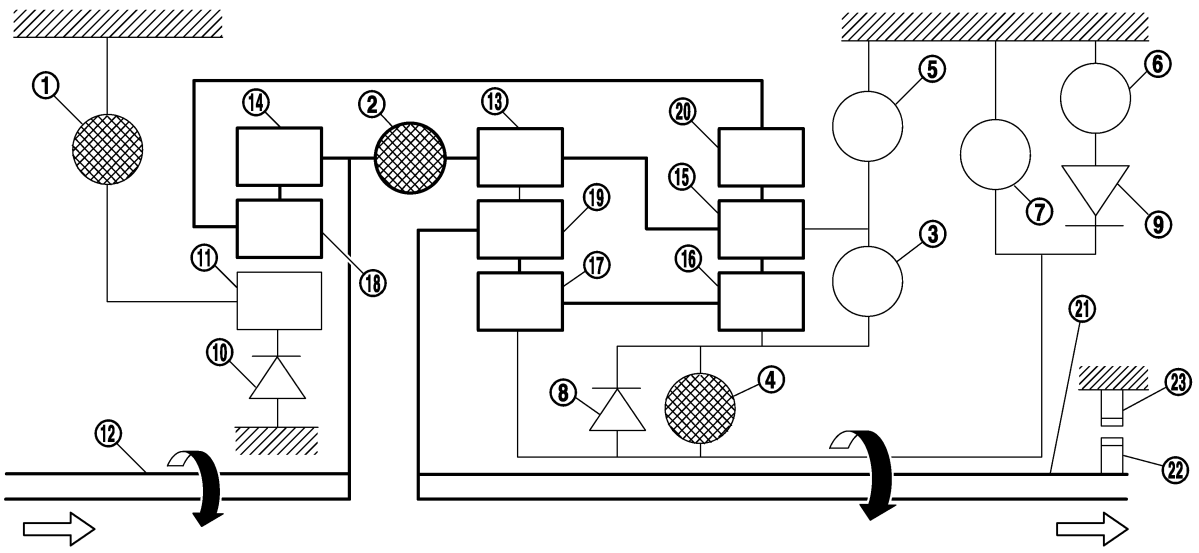
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The drive power is conveyed to the front internal gear, mid internal gear, and rear carrier and the three planetary gears rotate forward as one unit.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“D5 ” and “M5 ” Positions

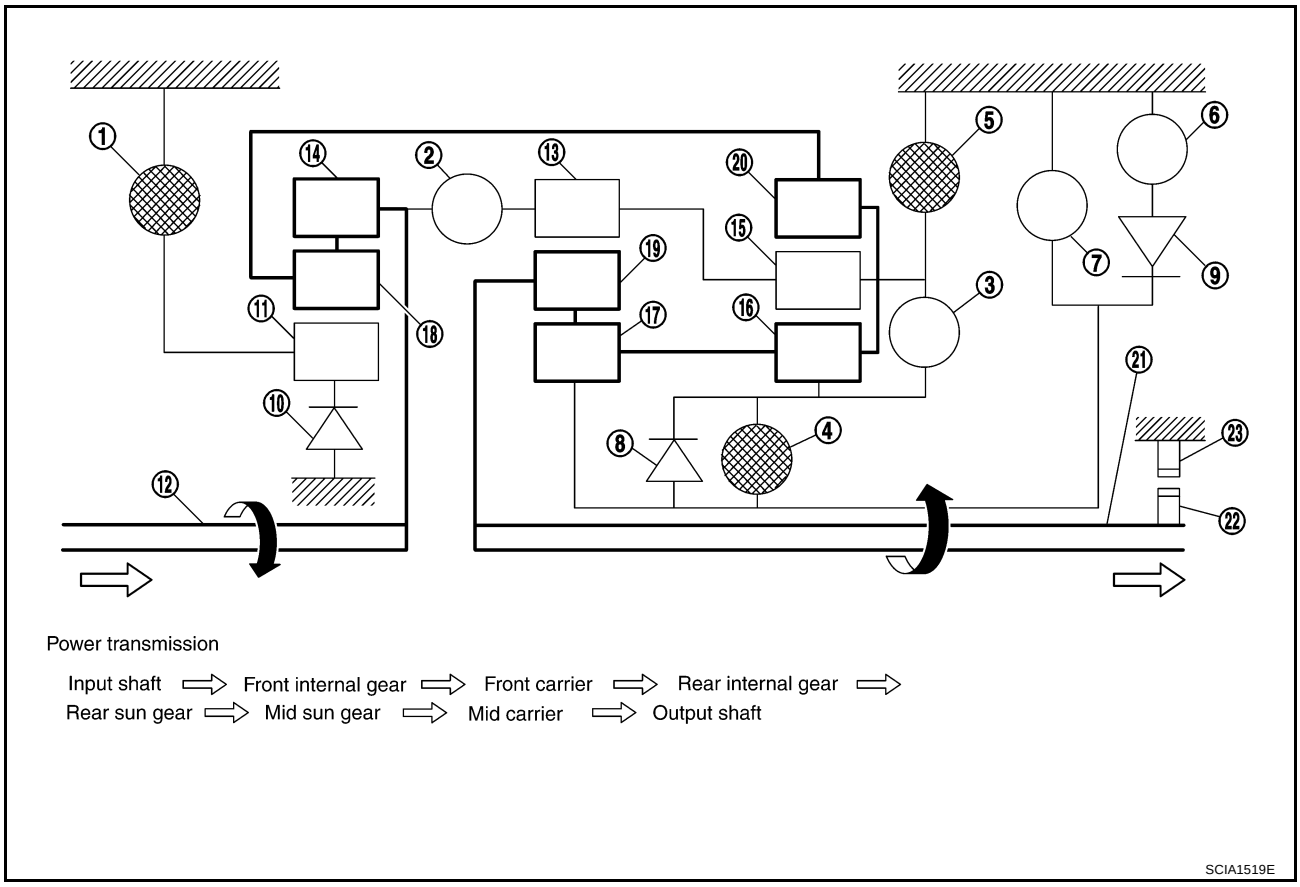
- The front brake fastens the front sun gear.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“R” Position

- The front brake fastens the front sun gear.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The reverse brake fastens the rear carrier.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

TCM Function

NCS0001M

The function of the TCM is to:

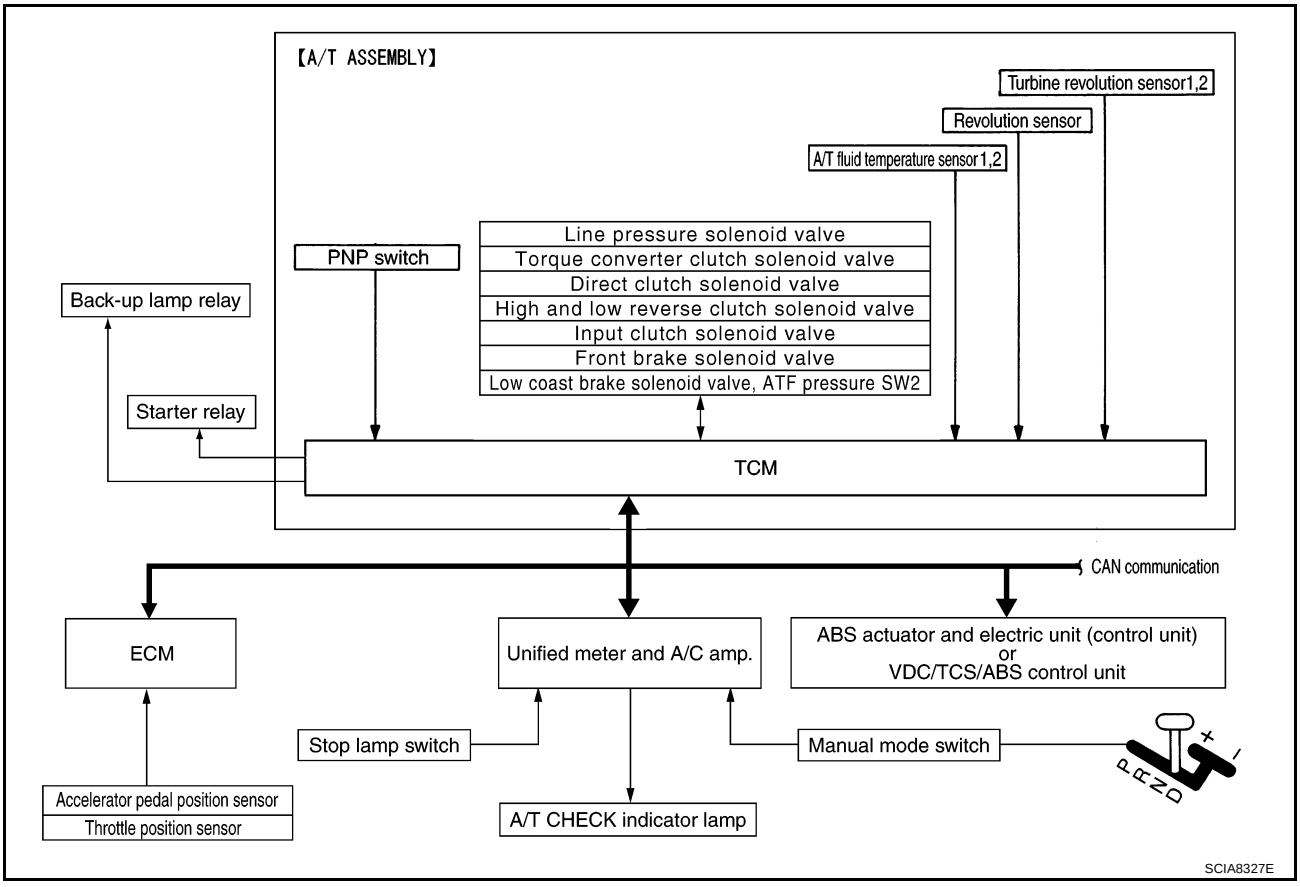
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

CONTROL SYSTEM OUTLINE

The A/T senses vehicle operating conditions through various sensors or signals. It always controls the optimum shift position and reduces shifting and lock-up shocks.

SENSORS (or SIGNALS)		TCM		ACTUATORS
PNP switch Accelerator pedal position signal Closed throttle position signal Wide open throttle position signal Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed signal Manual mode switch signal Stop lamp switch signal Turbine revolution sensor ATF pressure switch	⇒	Shift control Line pressure control Lock-up control Engine brake control Timing control Fail-safe control Self-diagnosis CONSULT-III communication line Duet-EA control CAN system	⇒	Input clutch solenoid valve Direct clutch solenoid valve Front brake solenoid valve High and low reverse clutch solenoid valve Low coast brake solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve A/T CHECK indicator lamp Starter relay Back-up lamp relay

CONTROL SYSTEM DIAGRAM



CAN Communication

NCS0001N

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-48, "CAN System Specification Chart" .

Input/Output Signal of TCM

NCS0001O

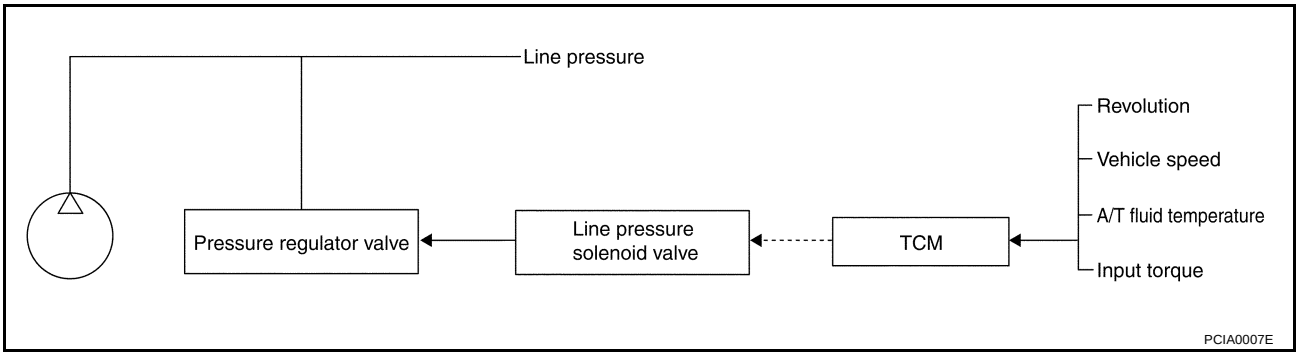
Control item			Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function(*3)	Self-diagnostics function
Input	Accelerator pedal position signal(*5)		X	X	X	X	X	X	X
	Vehicle speed sensor A/T (revolution sensor)		X	X	X	X	X	X	X
	Vehicle speed sensor MTR(*1)(*5)							X	
	Closed throttle position signal(*5)			X(*2)	X	X		X	X(*4)
	Wide open throttle position signal(*5)							X	X(*4)
	Turbine revolution sensor 1			X		X	X	X	X
	Turbine revolution sensor 2 (for 4th speed only)			X		X	X	X	X
	Engine speed signals(*5)		X	X	X	X	X	X	X
	Stop lamp switch signal(*5)			X	X	X			X(*4)
	A/T fluid temperature sensors 1, 2		X	X	X	X		X	X
	ASCD	Operation signal(*5)		X	X	X			
		Overdrive cancel signal(*5)		X					
Output	Direct clutch solenoid			X	X			X	X
	Input clutch solenoid			X	X			X	X
	High and low reverse clutch solenoid			X	X			X	X
	Front brake solenoid			X	X			X	X
	Low coast brake solenoid (ATF pressure switch 2)			X	X		X	X	X
	Line pressure solenoid		X	X	X	X	X	X	X
	TCC solenoid					X		X	X
	Self-diagnostics table(*6)								X
	Starter relay							X	X

- *1: Spare for vehicle speed sensor A/T (revolution sensor)
- *2: Spare for accelerator pedal position signal
- *3: If these input and output signals are different, the TCM triggers the fail-safe function.
- *4: Used as a condition for starting self-diagnostics; if self-diagnostics are not started, it is judged that there is some kind of error.
- *5: Input by CAN communications
- *6: Output by CAN communications

Line Pressure Control

NCS0001P

- When an input torque signal equivalent to the engine drive force is sent from the ECM to the TCM, the TCM controls the line pressure solenoid.
- This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the oil pump to the line pressure most appropriate to the driving state.

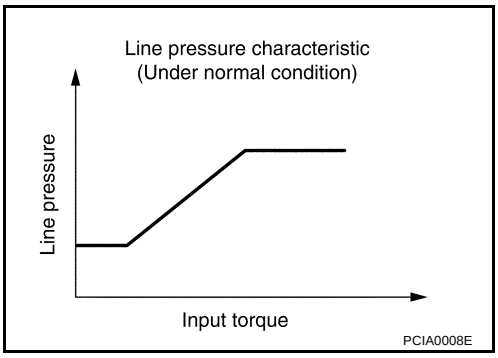


LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

- The TCM has stored in memory a number of patterns for the optimum line pressure characteristic for the driving state.
- In order to obtain the most appropriate line pressure characteristic to meet the current driving state, the TCM controls the line pressure solenoid current valve and thus controls the line pressure.

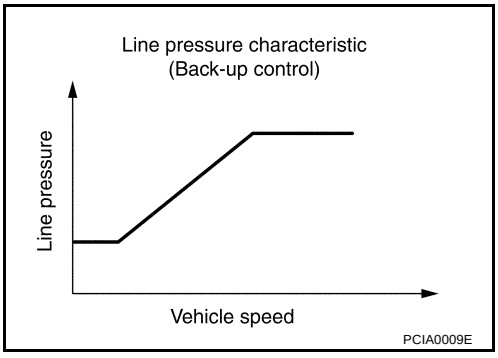
Normal Control

Each clutch is adjusted to the necessary pressure to match the engine drive force.



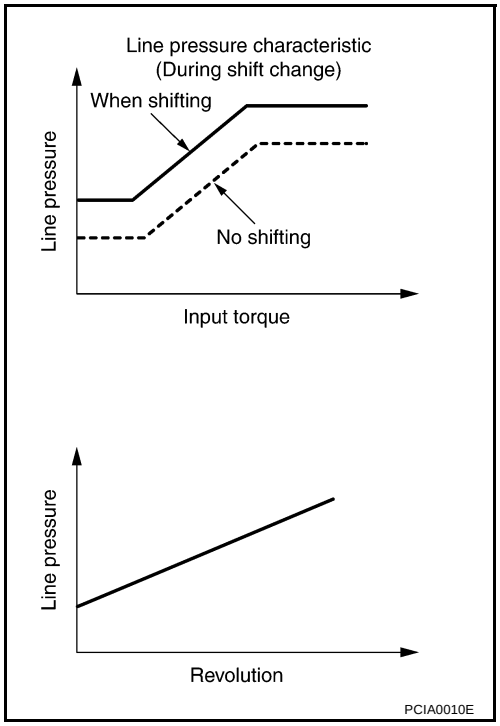
Back-up Control (Engine Brake)

When the select operation is performed during driving and the A/T is shifted down, the line pressure is set according to the vehicle speed.



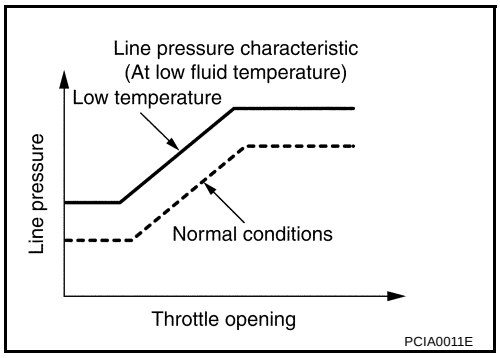
During Shift Change

The necessary and adequate line pressure for shift change is set. For this reason, line pressure pattern setting corresponds to input torque and gearshift selection. Also, line pressure characteristic is set according to engine speed, during engine brake operation.



At Low Fluid Temperature

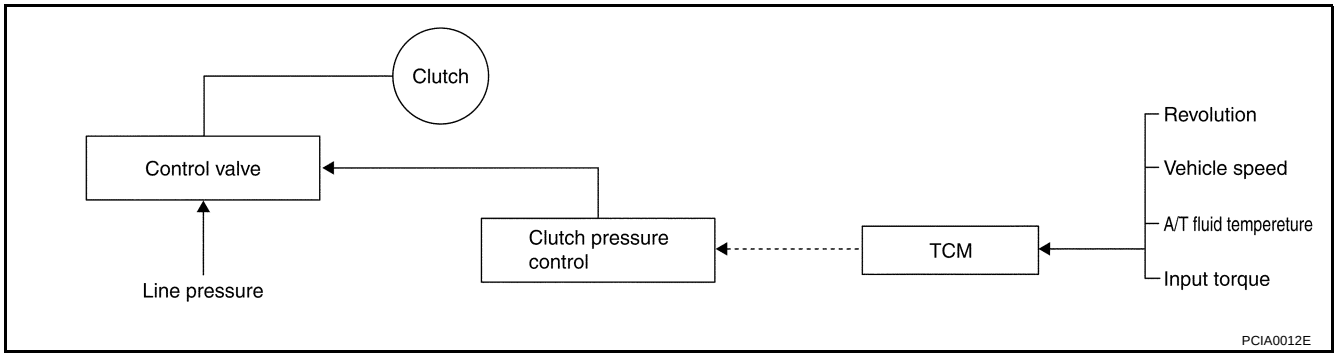
When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



Shift Control

NCS0001Q

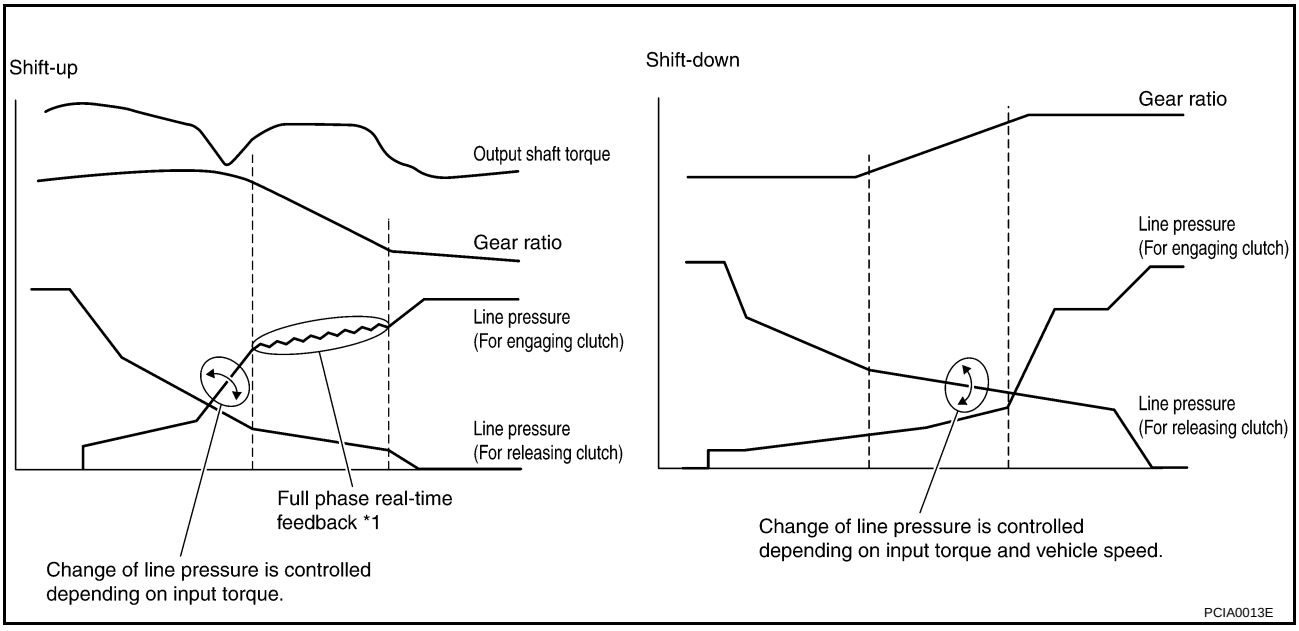
The clutch pressure control solenoid is controlled by the signals from the switches and sensors. Thus, the clutch pressure is adjusted to be appropriate to the engine load state and vehicle driving state. It becomes possible to finely control the clutch hydraulic pressure with high precision and a smoother shift change characteristic is attained.



NORMAL SHIFT CONTROL

The clutch is controlled with the optimum timing and oil pressure by the engine speed, engine torque information, etc.

Shift Change System Diagram



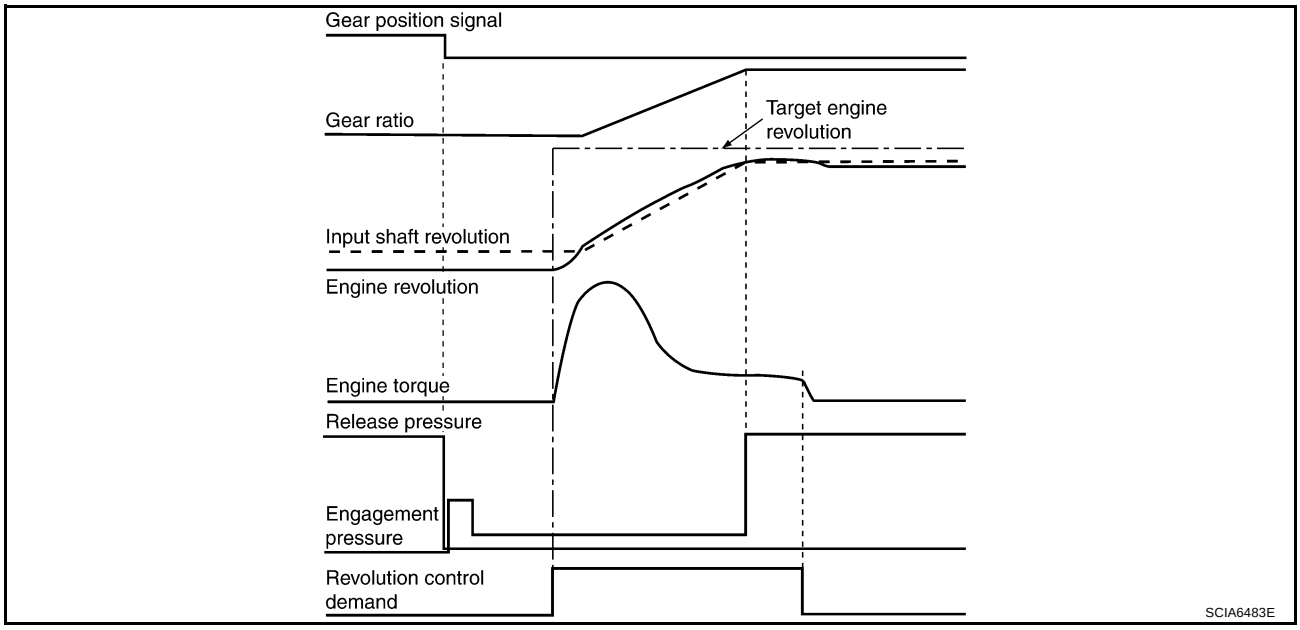
*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure at real-time to achieve the best gear ratio.

BLIPPING CONTROL

This system makes transmission clutch engage readily by controlling (synchronizing) engine revolution according to the (calculation of) engine revolution after shifting down.

- "BLIPPING CONTROL" functions.
  - When downshifting by accelerator pedal depression at "D" position.
  - When downshifting under the manual mode.
- TCM selects "BLIPPING CONTROL" or "NORMAL SHIFT CONTROL" according to the gear position, the select lever position, the engine torque and the speed when accelerating by pedal depression.
- Revolution control demand signal is transmitted from TCM to ECM under "BLIPPING CONTROL".
- TCM synchronizes engine revolution according to the revolution control demand signal.

Shift Change System Diagram



Lock-up Control

NCS0001R

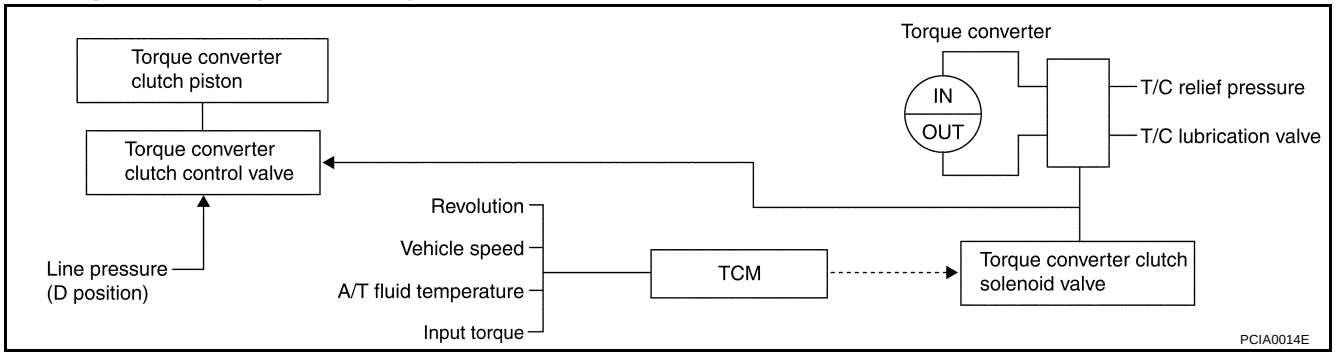
The torque converter clutch piston in the torque converter is engaged to eliminate torque converter slip to increase power transmission efficiency.
The torque converter clutch control valve operation is controlled by the torque converter clutch solenoid valve, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

Lock-up operation condition table

selector lever	"D" position		"M" position			
Gear position	5	4	5	4	3	2
Lock-up	×	–	×	×	×	×
Slip lock-up	×	×	–	–	–	–

TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

Lock-up Control System Diagram



Lock-up Released

In the lock-up released state, the torque converter clutch control valve is set into the unlocked state by the torque converter clutch solenoid and the lock-up apply pressure is drained.
In this way, the torque converter clutch piston is not coupled.

Lock-up Applied

In the lock-up applied state, the torque converter clutch control valve is set into the locked state by the torque converter clutch solenoid and lock-up apply pressure is generated.
In this way, the torque converter clutch piston is pressed and coupled.

SMOOTH LOCK-UP CONTROL

When shifting from the lock-up released state to the lock-up applied state, the current output to the torque converter clutch solenoid is controlled with the TCM. In this way, when shifting to the lock-up applied state, the torque converter clutch is temporarily set to the half-clutched state to reduce the shock.

Half-clutched State

The current output from the TCM to the torque converter clutch solenoid is varied to gradually increase the torque converter clutch solenoid pressure.
In this way, the lock-up apply pressure gradually rises and while the torque converter clutch piston is put into half-clutched status, the torque converter clutch piston operating pressure is increased and the coupling is completed smoothly.

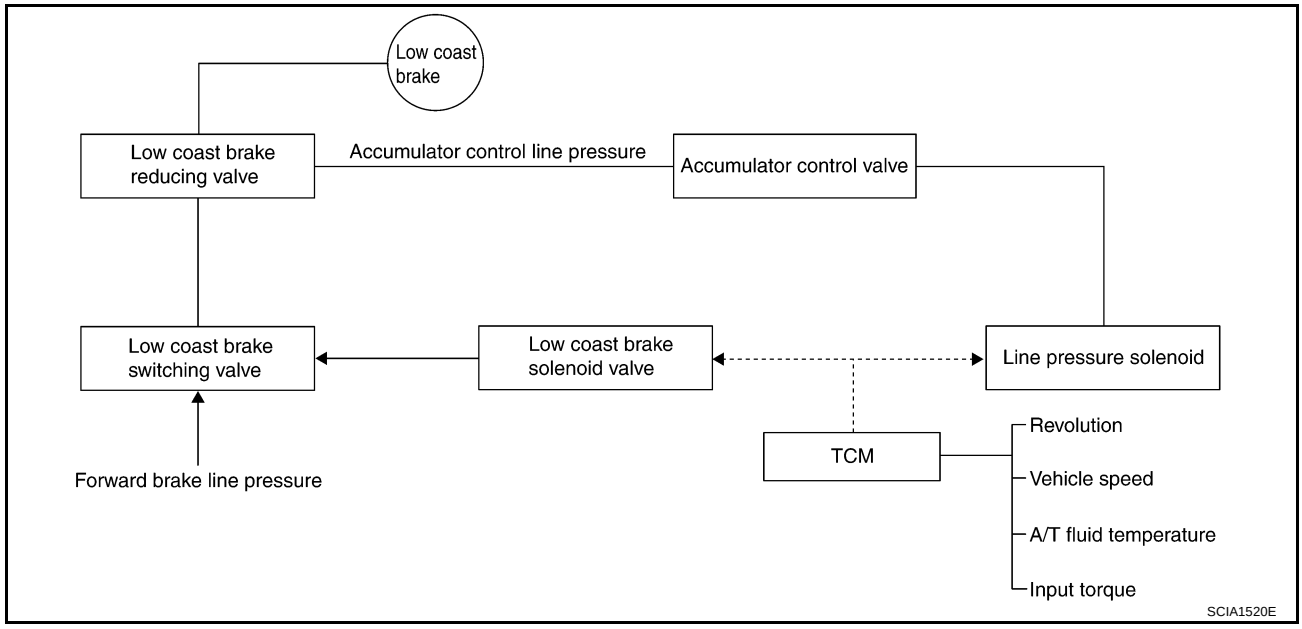
Slip Lock-up Control

In the slip region, the torque converter clutch solenoid current is controlled with the TCM to put it into the half-clutched state. This absorbs the engine torque fluctuation and lock-up operates from low speed.
This raises the fuel efficiency for 4th and 5th gears at both low speed and when the accelerator has a low degree of opening.

Engine Brake Control

NCS0001S

- The forward one-way clutch transmits the drive force from the engine to the rear wheels. But the reverse drive from the rear wheels is not transmitted to the engine because the one-way clutch is idling.
  Therefore, the low coast brake solenoid is operated to prevent the forward one-way clutch from idling and the engine brake is operated in the same manner as conventionally.



- The operation of the low coast brake solenoid switches the low coast brake switching valve and controls the coupling and releasing of the low coast brake.
  The low coast brake reducing valve controls the low coast brake coupling force.

Control Valve

NCS0001T

FUNCTION OF CONTROL VALVE

Name	Function
Torque converter regulator valve	In order to prevent the pressure supplied to the torque converter from being excessive, the line pressure is adjusted to the optimum pressure (torque converter operating pressure).
Pressure regulator valve Pressure regulator plug Pressure regulator sleeve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.
Front brake control valve	When the front brake is coupled, adjusts the line pressure to the optimum pressure (front brake pressure) and supplies it to the front brake. (In 1st, 2nd, 3rd, and 5th gears, adjusts the clutch pressure.)

Name	Function
Accumulator control valve	Adjusts the pressure (accumulator control pressure) acting on the accumulator piston and low coast reducing valve to the pressure appropriate to the driving state.
Pilot valve A	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for line pressure control, shift change control, and lock-up control.
Pilot valve B	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for shift change control.
Low coast brake switching valve	During engine braking, supplies the line pressure to the low coast brake reducing valve.
Low coast brake reducing valve	When the low coast brake is coupled, adjusts the line pressure to the optimum pressure (low coast brake pressure) and supplies it to the low coast brake.
N-R accumulator	Produces the stabilizing pressure for when N-R is selected.
Direct clutch piston switching valve	Operates in 4th gear and switches the direct clutch coupling capacity.
High and low reverse clutch control valve	When the high and low reverse clutch is coupled, adjusts the line pressure to the optimum pressure (high and low reverse clutch pressure) and supplies it to the high and low reverse clutch. (In 1st, 3rd, 4th and 5th gears, adjusts the clutch pressure.)
Input clutch control valve	When the input clutch is coupled, adjusts the line pressure to the optimum pressure (input clutch pressure) and supplies it to the input clutch. (In 4th and 5th gears, adjusts the clutch pressure.)
Direct clutch control valve	When the direct clutch is coupled, adjusts the line pressure to the optimum pressure (direct clutch pressure) and supplies it to the direct clutch. (In 2nd, 3rd, and 4th gears, adjusts the clutch pressure.)
TCC control valve TCC control plug TCC control sleeve	Switches the lock-up to operating or released. Also, by performing the lock-up operation transiently, lock-up smoothly.
Torque converter lubrication valve	Operates during lock-up to switch the torque converter, cooling, and lubrication system oil passage.
Cool bypass valve	Allows excess oil to bypass cooler circuit without being fed into it.
Line pressure relief valve	Discharges excess oil from line pressure circuit.
N-D accumulator	Produces the stabilizing pressure for when N-D is selected.
Manual valve	Sends line pressure to each circuit according to the select position. The circuits to which the line pressure is not sent drain.

FUNCTION OF ATF PRESSURE SWITCH

Name	Function
ATF pressure switch 2 (LC/B)	Detects any malfunction in the low coast brake hydraulic pressure. When it detects any malfunction, it puts the system into fail-safe mode.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

NCS0001U

The A/T system has two self-diagnostic systems.
The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.
The second is the TCM original self-diagnosis indicated by the A/T CHECK indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For detail, refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

OBD-II Function for A/T System

NCS0001V

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system. One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.
The MIL automatically illuminates in “One or Two Trip Detection Logic” when a malfunction is sensed in relation to A/T system parts.

One or Two Trip Detection Logic of OBD-II

NCS0001W

ONE TRIP DETECTION LOGIC

If a malfunction is sensed during the first test drive, the MIL will illuminate and the malfunction will be stored in the ECM memory as a DTC. The TCM is not provided with such a memory function.

TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — 1st trip
If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — 2nd trip
The “Trip” in the “One or Two Trip Detection Logic” means a driving mode in which self-diagnosis is performed during vehicle operation.

OBD-II Diagnostic Trouble Code (DTC)

NCS0001X

HOW TO READ DTC AND 1ST TRIP DTC

DTC and 1st trip DTC can be read by the following methods.
(with CONSULT-III or GST GST) CONSULT-III or GST (Generic Scan Tool) Examples: P0705, P0720 etc.
These DTC are prescribed by SAE J2012.
(CONSULT-III also displays the malfunctioning component or system.)

- **1st trip DTC No. is the same as DTC No.**
- **Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST, they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal.**
  CONSULT-III can identify them as shown below, therefore, CONSULT-III (if available) is recommended.

Freeze Frame Data and 1st Trip Freeze Frame Data

The ECM has a memory function, which stores the driving condition such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed and vehicle speed at the moment the ECM detects a malfunction.
Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST. For detail, refer to EC-116, "CONSULT-III Function (ENGINE)" .
Only one set of freeze frame data (either 1st trip freeze frame data of freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175
2		Except the above items (Includes A/T related items)
3	1st trip freeze frame data	

Both 1st trip freeze frame data and freeze frame data (along with the DTC) are cleared when the ECM memory is erased.

HOW TO ERASE DTC

The diagnostic trouble code can be erased by CONSULT-III, GST or ECM DIAGNOSTIC TEST MODE as described following.

- **If the battery cable is disconnected, the diagnostic trouble code will be lost within 24 hours.**
- **When you erase the DTC, using CONSULT-III or GST is easier and quicker than switching the mode selector on the ECM.**

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to EC-48, "Emission-related Diagnostic Information" .

- **Diagnostic trouble codes (DTC)**
- **1st trip diagnostic trouble codes (1st trip DTC)**
- **Freeze frame data**
- **1st trip freeze frame data**
- **System readiness test (SRT) codes**
- **Test values**

HOW TO ERASE DTC (WITH CONSULT-III)

1. The emission related diagnostic information in the TCM and ECM can be erased by selecting “ALL Erase” in the “Description” of “FINAL CHECK” mode with CONSULT-III.

HOW TO ERASE DTC (WITH GST)

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-92, "OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Select Mode 4 with GST (Generic Scan Tool). For details, refer to EC-125, "Generic Scan Tool (GST) Function" .

HOW TO ERASE DTC (NO TOOLS)

The A/T CHECK indicator lamp is located on the instrument panel.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Perform “OBD-II SELF-DIAGNOSTIC PROCEDURE (No tools)”. Refer to EC-61, "How to Erase DTC" .

Malfunction Indicator Lamp (MIL)

NCS0001Y

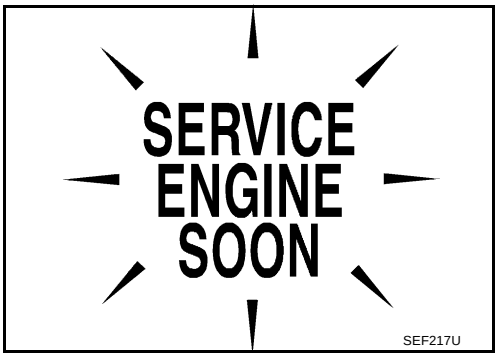
DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check.

- If the MIL does not light up, refer to DI-56, "WARNING LAMPS" , or see EC-716, "MIL AND DATA LINK CONNECTOR" .

2. When the engine is started, the MIL should go off.
   If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



SEF217U

TROUBLE DIAGNOSIS

PFP:00004

DTC Inspection Priority Chart

NCS0001Z

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:
If DTC "U1000 CAN COMM CIRCUIT" is displayed with other DTCs, first perform the trouble diagnosis for "DTC U1000 CAN COMMUNICATION LINE". Refer to AT-94 .

Priority	Detected items (DTC)
1	U1000 CAN communication line
2	Except above

Fail-safe

NCS00020

The TCM has an electrical fail-safe mode. This mode makes it possible to operate even if there is a an error in a main electronic control input/output signal circuit.
In fail-safe mode, even if the selector lever is "D" or "M" mode, the A/T is fixed in 2nd, 4th or 5th (depending on the breakdown position), so the customer should feel "slipping" or "poor acceleration".
Even when the electronic circuits are normal, under special conditions (for example, when slamming on the brake with the wheels spinning drastically and stopping the tire rotation), the A/T can go into fail-safe mode. If this happens, switch OFF the ignition switch for 10 seconds, then switch it ON again to return to the normal shift pattern. Therefore, the customer's vehicle has returned to normal, so handle according to the AT-43, "WORK FLOW" .

FAIL-SAFE FUNCTION

If any malfunction occurs in a sensor or solenoid, this function controls the A/T to mark driving possible.

Vehicle Speed Sensor A/T

Signals are input from two systems - from vehicle speed sensor A/T (revolution sensor) installed on the A/T and from combination meter so normal driving is possible even if there is a malfunction in one of the systems. And if vehicle speed sensor A/T (revolution sensor) has unusual cases, 5th gear and manual mode are prohibited.

Accelerator Pedal Position Sensor

If there is a malfunction in one of the systems, the accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. And if there are malfunctions in tow systems, the engine speed is fixed by ECM to a pre-determined engine speed to make driving possible.

Throttle Position Sensor

If there is a malfunction in one of the systems, the accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. And if there are malfunctions in tow systems, the accelerator opening angle is controlled by the idle signal sent from the ECM which is based on input indicating either idle condition or off-idle condition (pre-determined accelerator opening) in order to make driving possible.

PNP Switch

In the unlikely event that a malfunction signal enters the TCM, the position indicator is switched OFF, the starter relay is switched OFF (starter starting is disabled), the back-up lamp relay switched OFF (back-up lamp is OFF) and the position is fixed to the "D" position to make driving possible.

Starter Relay

The starter relay is switched OFF. (Starter starting is disabled.)

A/T Interlock

- If there is an A/T interlock judgment malfunction, the transmission is fixed in 2nd gear to make driving possible.

  NOTE:
  When the vehicle is driven fixed in 2nd gear a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.

- When interlock is detected at the 3rd gear or more, it is locked at the 2nd gear.

A/T 1st Engine Braking

When there is an A/T first gear engine brake judgment malfunction, the low coast brake solenoid is switched OFF to avoid the engine brake operation.

Line Pressure Solenoid

The solenoid is switched OFF and the line pressure is set to the maximum hydraulic pressure to make driving possible.

Torque Converter Clutch Solenoid

The solenoid is switched OFF to release the lock-up.

Low Coast Brake Solenoid

When a malfunction (electrical or functional) occurs, in order to make driving possible, if the solenoid is ON, the A/T is held in 2nd gear; if the solenoid is OFF, the A/T is held in 4th gear. (Engine brake is not applied in 1st and 2nd gear.)

Input Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

Direct Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

Front Brake Solenoid

If a malfunction (electrical or functional) occurs with the solenoid ON, in order to make driving possible, the A/T is held in 5th gear; if the solenoid is OFF, 4th gear.

High and Low Reverse Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

Turbine Revolution Sensor 1 or 2

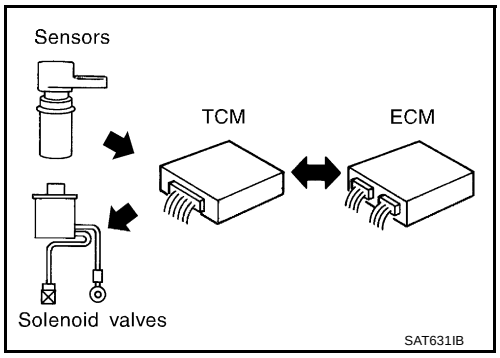
The control is the same as if there were no turbine revolution sensors, 5th gear and manual mode are prohibited.

How to Perform Trouble Diagnosis for Quick and Accurate Repair

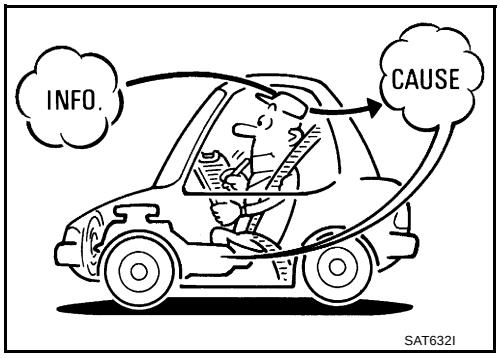
NCS00021

INTRODUCTION

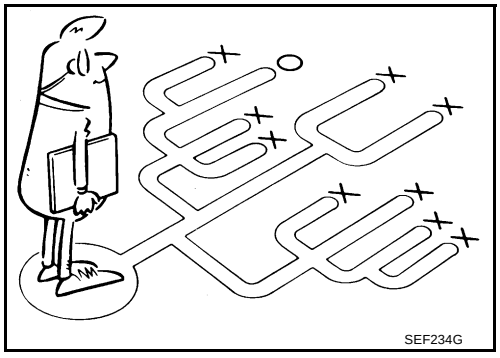
The TCM receives a signal from the vehicle speed sensor, accelerator pedal position sensor (throttle position sensor) or PNP switch and provides shift control or lock-up control via A/T solenoid valves.
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.
Input and output signals must always be correct and stable in the operation of the A/T system. The A/T system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.



It is much more difficult to diagnose a error that occurs intermittently rather than continuously. Most intermittent errors are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.
A visual check only may not find the cause of the errors. A road test with CONSULT-III (or GST) or a circuit tester connected should be performed. Follow the AT-43, "WORK FLOW" .



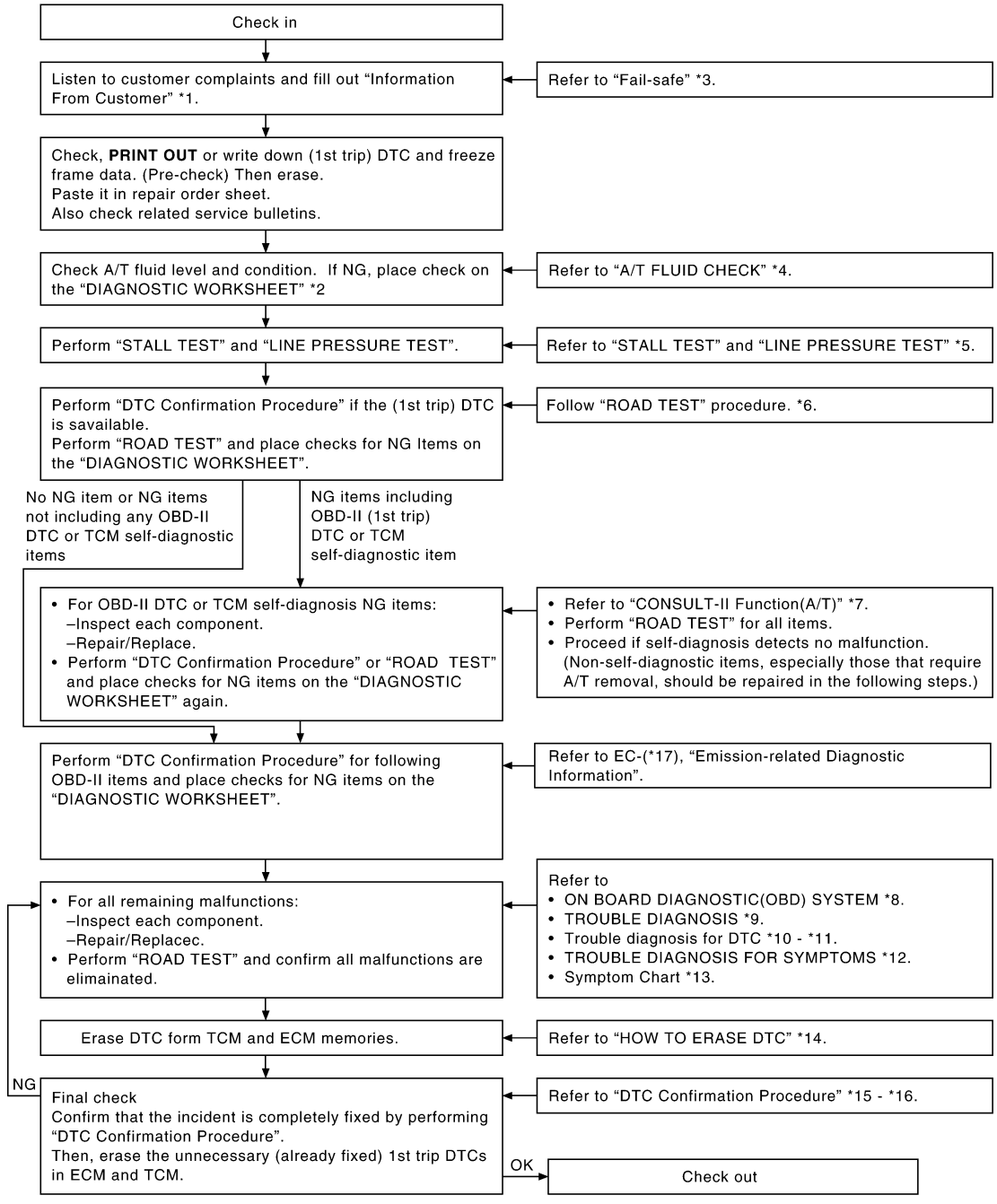
Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such errors, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A “DIAGNOSTIC WORKSHEET” as shown on the example (Refer to AT-44) should be used.
Start your diagnosis by looking for “conventional” errors first. This will help troubleshoot driveability errors on an electronically controlled engine vehicle.
Also check related Service bulletins.



WORK FLOW

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a malfunction. It is important to fully understand the symptoms or conditions for a customer complaint.
Make good use of the two sheets provided, AT-44, "Information from Customer" and AT-44, "Diagnostic Worksheet Chart" , to perform the best troubleshooting possible.

Work Flow Chart



SCIA7037E

*1. AT-44 *2. AT-44 *3. AT-40
*4. AT-49 *5. AT-49, AT-50 *6. AT-52
*7. AT-84 *8. AT-37 *9. AT-40
*10. AT-94 *11. AT-157 *12. AT-169
*13. AT-59 *14. AT-38 *15. AT-94
*16. AT-157 *17. EC-48

DIAGNOSTIC WORKSHEET

Information from Customer

KEY POINTS

- **WHAT**..... Vehicle & A/T model
- **WHEN**..... Date, Frequencies
- **WHERE**..... Road conditions
- **HOW**..... Operating conditions, Symptoms

Customer name MR/MS	Model & Year	VIN
Trans. Model	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	❑ Continuous ❑ Intermittent (times a day)	
Symptoms	❑ Vehicle does not move. (❑ Any position ❑ Particular position)	
	❑ No up-shift (❑ 1st → 2nd ❑ 2nd → 3rd ❑ 3rd → 4th ❑ 4th → 5th)	
	❑ No down-shift (❑ 5th → 4th ❑ 4th → 3rd ❑ 3rd → 2nd ❑ 2nd → 1st)	
	❑ Lock-up malfunction	
	❑ Shift point too high or too low.	
	❑ Shift shock or slip (❑ N → D ❑ Lock-up ❑ Any drive position)	
	❑ Noise or vibration	
	❑ No kick down	
	❑ No pattern select	
	❑ Others ( )	
A/T CHECK indicator lamp	❑ Continuously lit	❑ Not lit
Malfunction indicator lamp (MIL)	❑ Continuously lit	❑ Not lit

Diagnostic Worksheet Chart

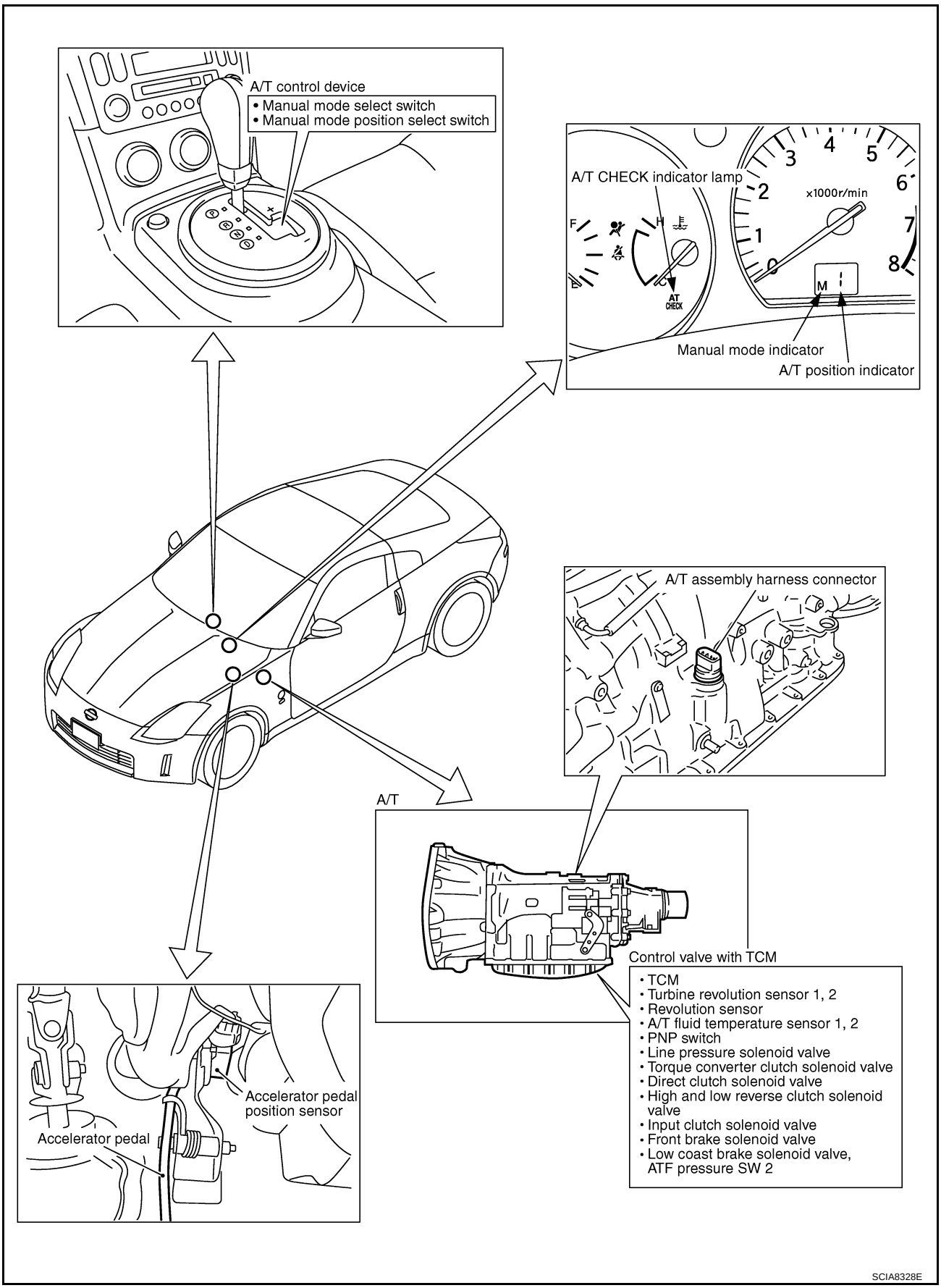
1	❑ Read the item on cautions concerning fail-safe and understand the customer's complaint.			AT-40
2	❑ A/T fluid inspection			AT-49
		❑ Leak (Repair leak location.) ❑ State ❑ Amount		
3	❑ Stall test and line pressure test			AT-49, AT-50
		❑ Stall test		
			❑ Torque converter one-way clutch ❑ Front brake ❑ High and low reverse clutch ❑ Low coast brake ❑ Forward brake ❑ Reverse brake ❑ Forward one-way clutch	❑ 1st one-way clutch ❑ 3rd one-way clutch ❑ Engine ❑ Line pressure low ❑ Except for input clutch and direct clutch, clutches and brakes OK
		❑ Line pressure inspection - Suspected part:		

4	❑ Perform all road tests and enter checks in required inspection items.			AT-52
	4-1.	Check before engine is started		AT-53
		❑ AT-172, "A/T Check Indicator Lamp Does Not Come On" ❑ Perform self-diagnostics. Enter checks for detected items. AT-86 , AT-92		
			❑ AT-94, "DTC U1000 CAN COMMUNICATION LINE" ❑ AT-97, "DTC P0615 START SIGNAL CIRCUIT" ❑ AT-101, "DTC P0700 TCM" ❑ AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" ❑ AT-106, "DTC P0717 TURBINE REVOLUTION SENSOR" ❑ AT-108, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" ❑ AT-113, "DTC P0725 ENGINE SPEED SIGNAL" ❑ AT-115, "DTC P0731 A/T 1ST GEAR FUNCTION" ❑ AT-117, "DTC P0732 A/T 2ND GEAR FUNCTION" ❑ AT-119, "DTC P0733 A/T 3RD GEAR FUNCTION" ❑ AT-121, "DTC P0734 A/T 4TH GEAR FUNCTION" ❑ AT-123, "DTC P0735 A/T 5TH GEAR FUNCTION" ❑ AT-125, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" ❑ AT-127, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)" ❑ AT-129, "DTC P0745 LINE PRESSURE SOLENOID VALVE" ❑ AT-131, "DTC P1705 THROTTLE POSITION SENSOR" ❑ AT-134, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" ❑ AT-139, "DTC P1721 VEHICLE SPEED SENSOR MTR" ❑ AT-141, "DTC P1730 A/T INTERLOCK" ❑ AT-143, "DTC P1731 A/T 1ST ENGINE BRAKING" ❑ AT-145, "DTC P1752 INPUT CLUTCH SOLENOID VALVE" ❑ AT-147, "DTC P1757 FRONT BRAKE SOLENOID VALVE" ❑ AT-149, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" ❑ AT-151, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" ❑ AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" ❑ AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" ❑ AT-157, "DTC P1815 MANUAL MODE SWITCH"	
	4-2.	Check at Idle		AT-53
		❑ AT-173, "Engine Cannot Be Started in “P” or “N” Position" ❑ AT-173, "In “P” Position, Vehicle Moves When Pushed" ❑ AT-174, "In “N” Position, Vehicle Moves" ❑ AT-175, "Large Shock (“N” to “D” Position)" ❑ AT-177, "Vehicle Does Not Creep Backward in “R” Position" ❑ AT-179, "Vehicle Does Not Creep Forward in “D” Position"		
	4-3.	Cruise test		AT-55
		Part 1		
		❑ AT-181, "Vehicle Cannot Be Started from D_1" ❑ AT-183, "A/T Does Not Shift: $D_1 \rightarrow D_2$" ❑ AT-185, "A/T Does Not Shift: $D_2 \rightarrow D_3$" ❑ AT-187, "A/T Does Not Shift: $D_3 \rightarrow D_4$" ❑ AT-189, "A/T Does Not Shift: $D_4 \rightarrow D_5$" ❑ AT-191, "A/T Does Not Lock-up" ❑ AT-193, "A/T Does Not Hold Lock-up Condition" ❑ AT-194, "Lock-up Is Not Released" ❑ AT-195, "Engine Speed Does Not Return to Idle"		

		Part 2		AT-57
		❏ AT-181, "Vehicle Cannot Be Started from D1" ❏ AT-183, "A/T Does Not Shift: D1 → D2" ❏ AT-185, "A/T Does Not Shift: D2 → D3" ❏ AT-187, "A/T Does Not Shift: D3 → D4"		
		Part 3		AT-58
		❏ AT-196, "Cannot Be Changed to Manual Mode" ❏ AT-196, "A/T Does Not Shift: 5th Gear → 4th Gear" ❏ AT-198, "A/T Does Not Shift: 4th Gear → 3rd Gear" ❏ AT-199, "A/T Does Not Shift: 3rd Gear → 2nd Gear" ❏ AT-201, "A/T Does Not Shift: 2nd Gear → 1st Gear" ❏ AT-202, "Vehicle Does Not Decelerate by Engine Brake" ❏ Perform self-diagnostics. Enter checks for detected items. AT-86 , AT-92		
4	4-3.		❏ AT-94, "DTC U1000 CAN COMMUNICATION LINE" ❏ AT-97, "DTC P0615 START SIGNAL CIRCUIT" ❏ AT-101, "DTC P0700 TCM" ❏ AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" ❏ AT-106, "DTC P0717 TURBINE REVOLUTION SENSOR" ❏ AT-108, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" ❏ AT-113, "DTC P0725 ENGINE SPEED SIGNAL" ❏ AT-115, "DTC P0731 A/T 1ST GEAR FUNCTION" ❏ AT-117, "DTC P0732 A/T 2ND GEAR FUNCTION" ❏ AT-119, "DTC P0733 A/T 3RD GEAR FUNCTION" ❏ AT-121, "DTC P0734 A/T 4TH GEAR FUNCTION" ❏ AT-123, "DTC P0735 A/T 5TH GEAR FUNCTION" ❏ AT-125, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" ❏ AT-127, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)" ❏ AT-129, "DTC P0745 LINE PRESSURE SOLENOID VALVE" ❏ AT-131, "DTC P1705 THROTTLE POSITION SENSOR" ❏ AT-134, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" ❏ AT-139, "DTC P1721 VEHICLE SPEED SENSOR MTR" ❏ AT-141, "DTC P1730 A/T INTERLOCK" ❏ AT-143, "DTC P1731 A/T 1ST ENGINE BRAKING" ❏ AT-145, "DTC P1752 INPUT CLUTCH SOLENOID VALVE" ❏ AT-147, "DTC P1757 FRONT BRAKE SOLENOID VALVE" ❏ AT-149, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" ❏ AT-151, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" ❏ AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" ❏ AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" ❏ AT-157, "DTC P1815 MANUAL MODE SWITCH"	
5	❏ Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunctioning parts.			
6	❏ Perform all road tests and enter the checks again for the required items.			AT-52
7	❏ For any remaining NG items, perform the “diagnostics procedure” and repair or replace the malfunctioning parts. See the chart for diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)			AT-59
8	❏ Erase the results of the self-diagnostics from TCM and ECM.			AT-93, AT-38

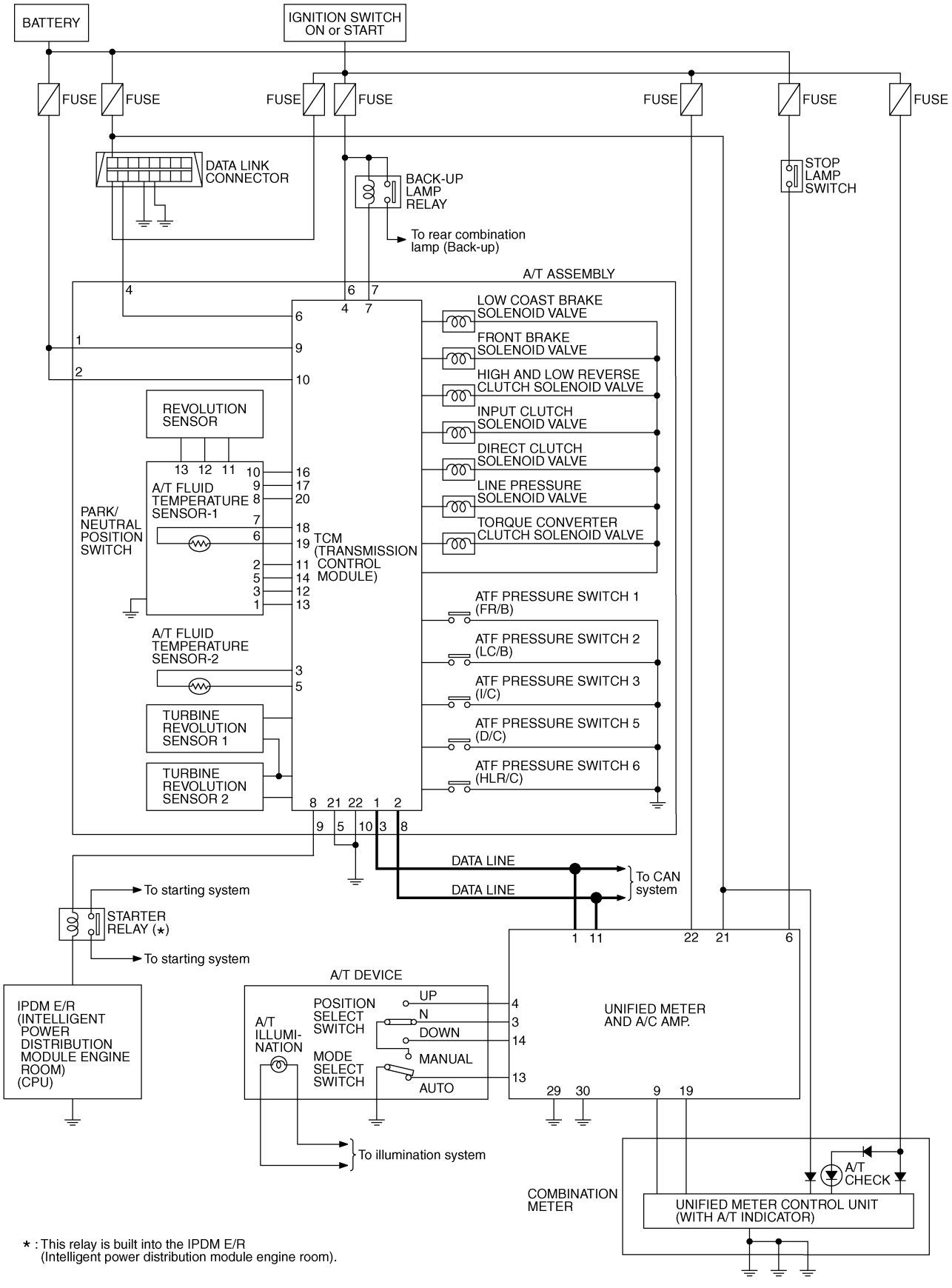
A/T Electrical Parts Location

NCS00022



Circuit Diagram

NCS00023



Inspections Before Trouble Diagnosis

NCS00024

A/T FLUID CHECK

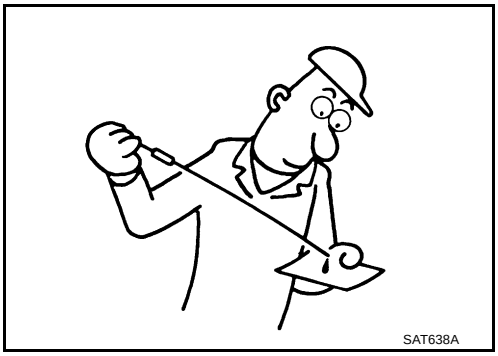
A/T Fluid Leakage and A/T Fluid Level Check

Inspect for A/T fluid leakage and check the A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

A/T Fluid Condition Check

Inspect the A/T fluid condition.

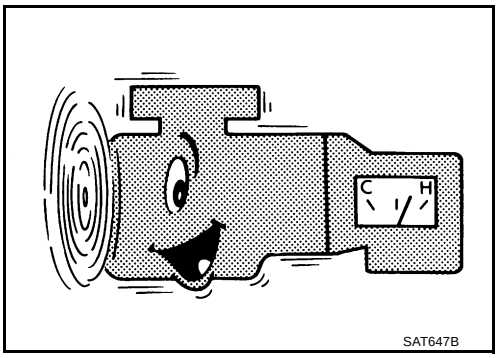
Fluid condition	Conceivable Cause	Required Operation
Varnished (viscous varnish state)	Clutch, brake scorched	Replace the ATF and check the A/T main unit and the vehicle for malfunctions (wire harnesses, cooler pipes, etc.)
Milky white or cloudy	Water in the fluid	Replace the ATF and check for places where water is getting in.
Large amount of metal powder mixed in	Unusual wear of sliding parts within A/T	Replace the ATF and check for improper operation of the A/T.


SAT638A

STALL TEST

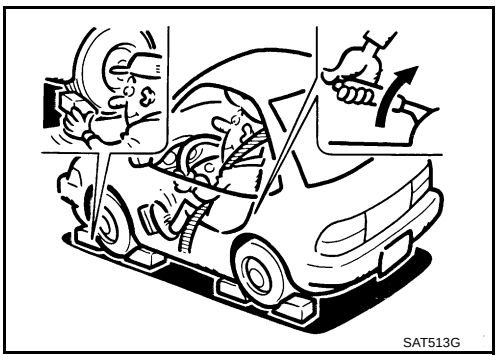
Stall Test Procedure

1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Inspect the amount of ATF. Replenish if necessary.



SAT647B

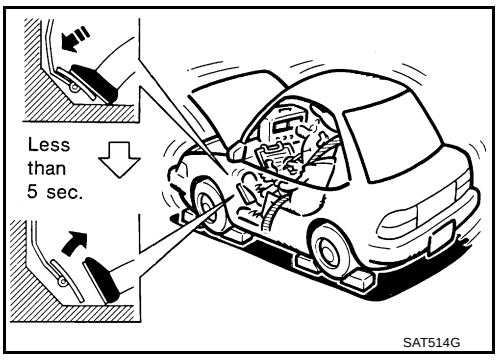
3. Securely engage the parking brake so that the tires do not turn.
4. Engine start, apply foot brake, and place selector lever in “D” position.


SAT513G

5. While holding down the foot brake, gradually press down accelerator pedal.
6. Quickly read off the stall speed, then quickly remove your foot from accelerator pedal.

CAUTION:
Do not hold down accelerator pedal for more than 5 seconds during this test.

Stall speed: 2,700 – 3,000 rpm



SAT514G

7. Move selector lever to “N” position.

8. Cool down the ATF.

CAUTION:
Run the engine at idle for at least one minute.

9. Repeat steps 5 through 8 with selector lever in “R” position.

Judgment Stall Test

	Selector lever position		Expected problem location
	“D” and “M”	“R”	
Stall speed	H	O	● Forward brake ● Forward one-way clutch ● 1st one-way clutch ● 3rd one-way clutch
	O	H	● Reverse brake
	L	L	● Engine and torque converter one-way clutch
	H	H	● Line pressure low

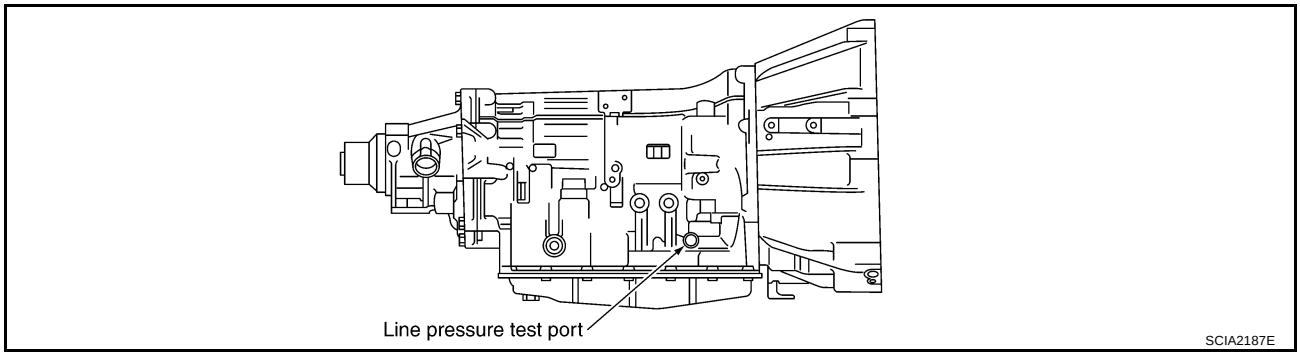
O: Stall speed within standard value position
H: Stall speed higher than standard value
L: Stall speed lower than standard value

Stall Test Standard Value Position

Does not shift-up “D” or “M” position 1 → 2	Slipping in 2nd, 3rd or 4th gear	Direct clutch slippage
Does not shift-up “D” or “M” position 2 → 3	Slipping in 3rd, 4th or 5th gear	High and low reverse clutch slippage
Does not shift-up “D” or “M” position 3 → 4	Slipping in 4th or 5th gear	Input clutch slippage
Does not shift-up “D” or “M” position 4 → 5	Slipping in 5th gear	Front brake slippage

LINE PRESSURE TEST

Line Pressure Test Port



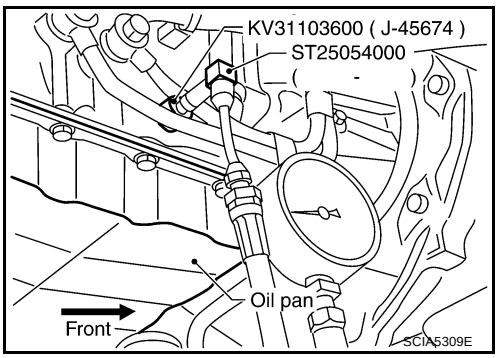
Line Pressure Test Procedure

1. Inspect the amount of engine oil and replenish if necessary.
2. Drive the car for about 10 minutes to warm it up so that the ATF reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of ATF and replenish if necessary.

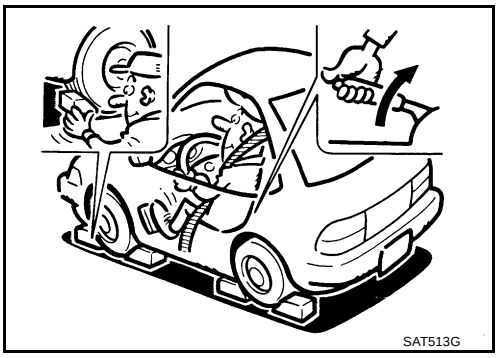
NOTE:
The A/T fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.

3. After warming up remove the oil pressure detection plug and install the oil pressure gauge [ST2505S001(J-34301-C)].

CAUTION:
When using the oil pressure gauge, be sure to use O- ring attached to the oil pressure detection plug.



4. Securely engage the parking brake so that the tires do not turn.

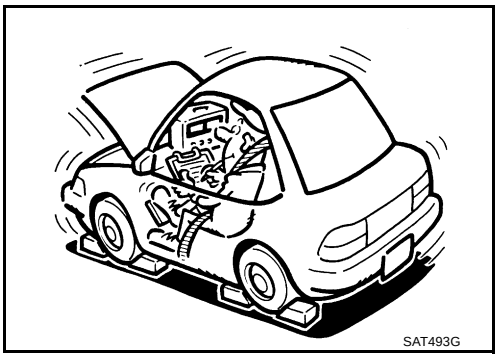


5. Start the engine, then measure the line pressure at both idle and the stall speed.

CAUTION:
- **Keep brake pedal pressed all the way down during measurement.**
- **When measuring the line pressure at the stall speed, refer to AT-49, "STALL TEST" .**

6. After the measurements are complete, install the oil pressure detection plug and tighten to the specified torque. Refer to AT-246, "Components" .

CAUTION:
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



Line Pressure

Engine speed	Line pressure kPa (kg/cm^2 , psi)	
	"R" position	"D" and "M" positions
At idle speed	425 – 465 (4.3 – 4.7, 62 – 67)	379 – 428 (3.9 – 4.4, 55 – 62)
At stall speed	1,605 – 1,950 (16.4 – 19.9, 233 – 283)	1,310 – 1,500 (13.4 – 15.3, 190 – 218)

Judgment of Line Pressure Test

Judgment		Possible cause
Idle speed	Low for all positions (“P”, “R”, “N”, “D”, “M”)	Possible causes include malfunctions in the pressure supply system and low oil pump output. For example ● Oil pump wear ● Pressure regulator valve or plug sticking or spring fatigue ● Oil strainer ⇒ oil pump ⇒ pressure regulator valve passage oil leak ● Engine idle speed too low
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.
	High	Possible causes include a sensor malfunction or malfunction in the line pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● A/T fluid temperature sensor malfunction ● Line pressure solenoid malfunction (sticking in OFF state, filter clog, cut line) ● Pressure regulator valve or plug sticking
Stall speed	Line pressure does not rise higher than the line pressure for idle.	Possible causes include a sensor malfunction or malfunction in the pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● TCM breakdown ● Line pressure solenoid malfunction (shorting, sticking in ON state) ● Pressure regulator valve or plug sticking ● Pilot valve sticking or pilot filter clogged
	The pressure rises, but does not enter the standard position.	Possible causes include malfunctions in the pressure supply system and malfunction in the pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● Line pressure solenoid malfunction (sticking, filter clog) ● Pressure regulator valve or plug sticking ● Pilot valve sticking or pilot filter clogged
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.

ROAD TEST

Description

- The road test inspects overall performance of A/T and analyzes possible malfunction causes.
- The road test is performed in the following three stages.

1. Check before engine is started. Refer to AT-53, "Check Before Engine is Started" .
2. Check at idle. Refer to AT-53, "Check at Idle" .
3. Cruise test

- Inspect all the items from Part 1 to Part 3. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" and AT-58, "Cruise Test — Part 3" .

- Before beginning the road test, check the test procedure and inspection items.
- Test all inspection items until the symptom is uncovered. Diagnose NG items when all road tests are complete.

Check Before Engine is Started

NCS00025

1. CHECK A/T CHECK INDICATOR LAMP

1. Park vehicle on level surface.
2. Move selector lever to “P” position.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON. (Do not start engine.)

Does A/T CHECK indicator lamp light up for about 2 seconds?

YES >> 1. Turn ignition switch OFF.
2. Perform self-diagnostics and record all NG items on the AT-44, "DIAGNOSTIC WORKSHEET" . Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .
3. Go to AT-53, "Check at Idle" .

NO >> Stop the road test and go to AT-172, "A/T Check Indicator Lamp Does Not Come On" .

Check at Idle

NCS00026

1. CHECK STARTING THE ENGINE

1. Park vehicle on level surface.
2. Move selector lever to “P” or “N” position.
3. Turn ignition switch OFF.
4. Start engine.

Does the engine start?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-173, "Engine Cannot Be Started in “P” or “N” Position" .

2. CHECK STARTING THE ENGINE

1. Turn ignition switch ON. (Do not start engine.)
2. Move selector lever in “D”, “M” or “R” position.
3. Start engine.

Does the engine start in each position?

YES >> Stop the road test and go to AT-173, "Engine Cannot Be Started in “P” or “N” Position" .
NO >> GO TO 3.

3. CHECK “P” POSITION FUNCTIONS

1. Move selector lever to “P” position.
2. Turn ignition switch OFF.
3. Release the parking brake.
4. Push the vehicle forward or backward.
5. Engage the parking brake.

When you push the vehicle with disengaging the parking brake, does it move?

YES >> Enter a check mark at AT-173, "In “P” Position, Vehicle Moves When Pushed" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.
NO >> GO TO 4.

4. CHECK “N” POSITION FUNCTIONS

1. Start engine.
2. Move selector lever to “N” position.
3. Release the parking brake.

Does vehicle move forward or backward?

YES >> Enter a check mark at AT-174, "In “N” Position, Vehicle Moves" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.
NO >> GO TO 5.

5. CHECK SHIFT SHOCK

1. Engage the brake.
2. Move selector lever to “D” position.

When the A/T is shifted from “N” to “D”, is there an excessive shock?

YES >> Enter a check mark at AT-175, "Large Shock (“N” to “D” Position)" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.
NO >> GO TO 6.

6. CHECK “R” POSITION FUNCTIONS

1. Engage the brake.
2. Move selector lever to “R” position.
3. Release the brake for 4 to 5 seconds.

Does the vehicle creep backward?

YES >> GO TO 7.
NO >> Enter a check mark at AT-177, "Vehicle Does Not Creep Backward in “R” Position" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

7. CHECK “D” POSITION FUNCTIONS

Inspect whether the vehicle creep forward when the A/T is put into the “D” position.

Does the vehicle creep forward in the “D” position?

YES >> Go to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" and AT-58, "Cruise Test — Part 3" .
NO >> Enter a check mark at AT-179, "Vehicle Does Not Creep Forward in “D” Position" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test. Go to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" and AT-58, "Cruise Test — Part 3" .

Cruise Test — Part 1

NCS00027

1. CHECK STARTING OUT FROM D_1

1. Drive the vehicle for about 10 minutes to warm up the engine oil and ATF.
   Appropriate temperature for the ATF: 50 to 80°C (122 to 176°F)
2. Park the vehicle on a level surface.
3. Move selector lever to “P” position.
4. Start engine.
5. Move selector lever to “D” position.
6. Press the accelerator pedal about half-way down to accelerate the vehicle.

With CONSULT-III

Read the gear position. Refer to AT-88, "DATA MONITOR MODE" .

Starts from D_1 ?

YES >> GO TO 2.
NO >> Enter a check mark at AT-181, "Vehicle Cannot Be Started from D1" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

2. CHECK SHIFT-UP $D_1 \rightarrow D_2$

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up ($D_1 \rightarrow D_2$) at the appropriate speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position, and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up $D_1 \rightarrow D_2$ at the correct speed?

YES >> GO TO 3.
NO >> Enter a check mark at AT-183, "A/T Does Not Shift: D1 → D2" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

3. CHECK SHIFT-UP $D_2 \rightarrow D_3$

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up ($D_2 \rightarrow D_3$) at the appropriate speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position, and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up $D_2 \rightarrow D_3$ at the correct speed?

YES >> GO TO 4.
NO >> Enter a check mark at AT-185, "A/T Does Not Shift: D2 → D3" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

4. CHECK SHIFT-UP $D_3 \rightarrow D_4$

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up ($D_3 \rightarrow D_4$) at the appropriate speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position, and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up $D_3 \rightarrow D_4$ at the correct speed?

YES >> GO TO 5.
NO >> Enter a check mark at AT-187, "A/T Does Not Shift: D3 → D4" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

5. CHECK SHIFT-UP $D_4 \rightarrow D_5$

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up ($D_4 \rightarrow D_5$) at the appropriate speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position, and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up $D_4 \rightarrow D_5$ at the correct speed?

YES >> GO TO 6.

NO >> Enter a check mark at AT-189, "A/T Does Not Shift: $D_4 \rightarrow D_5$" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

6. CHECK LOCK-UP

When releasing accelerator pedal (closed throttle position signal: OFF) from D_5 , check lock-up from D_5 to L/U. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Select “TCC SOLENOID” with the “MAIN SIGNALS” mode for “A/T”. Refer to AT-84, "CONSULT-III REFERENCE VALUE" .

Does it lock-up?

YES >> GO TO 7.

NO >> Enter a check mark at AT-191, "A/T Does Not Lock-up" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

7. CHECK LOCK-UP HOLD

Check hold lock-up.

With CONSULT-III

Select “TCC SOLENOID” with the “MAIN SIGNALS” mode for “A/T”. Refer to AT-84, "CONSULT-III REFERENCE VALUE" .

Does it maintain lock-up status?

YES >> GO TO 8.

NO >> Enter a check mark at AT-193, "A/T Does Not Hold Lock-up Condition" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

8. CHECK LOCK-UP RELEASE

Check lock-up cancellation by depressing brake pedal lightly to decelerate.

With CONSULT-III

Select “TCC SOLENOID” with the “MAIN SIGNALS” mode for “A/T”. Refer to AT-84, "CONSULT-III REFERENCE VALUE" .

Does lock-up cancel?

YES >> GO TO 9.

NO >> Enter a check mark at AT-194, "Lock-up Is Not Released" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

9. CHECK SHIFT-DOWN $D_5 \rightarrow D_4$

Decelerate by pressing lightly on the brake pedal.

With CONSULT-III

Read the gear position and engine speed. AT-88, "DATA MONITOR MODE" .

When the A/T shift-down $D_5 \rightarrow D_4$, does the engine speed drop smoothly back to idle?

YES >> 1. Stop the vehicle.
2. Go to AT-57, "Cruise Test — Part 2" .

NO >> Enter a check mark at AT-195, "Engine Speed Does Not Return to Idle" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test. Go to AT-57, "Cruise Test — Part 2" .

Cruise Test — Part 2

NCS00028

1. CHECK STARTING FROM D1

1. Move selector lever into “D” position.
2. Accelerate at half throttle.

With CONSULT-III

Read the gear position. Refer to AT-88, "DATA MONITOR MODE" .

Does it start from D1?

YES >> GO TO 2.

NO >> Enter a check mark at AT-181, "Vehicle Cannot Be Started from D1" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

2. CHECK SHIFT-UP D1 → D2

Press the accelerator pedal down all the way and inspect whether or not the A/T shifts up (D1 → D2) at the correct speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up D1 → D2 at the correct speed?

YES >> GO TO 3.

NO >> Enter a check mark at AT-183, "A/T Does Not Shift: D1 → D2" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

3. CHECK SHIFT UP D2 → D3

Press the accelerator pedal down all the way and inspect whether or not the A/T shifts up (D2 → D3) at the correct speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up D2 → D3 at the correct speed?

YES >> GO TO 4.

NO >> Enter a check mark at AT-185, "A/T Does Not Shift: D2 → D3" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

4. CHECK SHIFT-UP D3 → D4 AND ENGINE BRAKE

When the A/T changes speed D3 → D4 , return the accelerator pedal.

With CONSULT-III

Read the gear position. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up D3 → D4 and apply the engine brake?

YES >> 1. Stop the vehicle.
2. Go to AT-58, "Cruise Test — Part 3" .

NO >> Enter a check mark at AT-187, "A/T Does Not Shift: D3 → D4" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test. Go to AT-58, "Cruise Test — Part 3" .

Cruise Test — Part 3

NCS00029

1. MANUAL MODE FUNCTION

Move to manual mode from “D” position.

Does it switch to manual mode?

YES >> GO TO 2.

NO >> Continue road test and add check mark to AT-196, "Cannot Be Changed to Manual Mode" on the AT-44, "DIAGNOSTIC WORKSHEET" .

2. CHECK SHIFT-DOWN

During manual mode driving, is downshift from $M_5 \rightarrow M_4 \rightarrow M_3 \rightarrow M_2 \rightarrow M_1$ performed?

With CONSULT-III

Read the gear position. Refer to AT-88, "DATA MONITOR MODE" .

Is downshifting correctly performed?

YES >> GO TO 2.

NO >> Enter a check mark at “A/T Does Not Shift” at the corresponding position (5th → 4th, 4th → 3rd, 3rd → 2nd, 2nd → 1st) on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

3. CHECK ENGINE BRAKE

Check engine brake.

Does engine braking effectively reduce speed in M_1 position?

YES >> 1. Stop the vehicle.
2. Perform self-diagnostics. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

NO >> Enter a check mark at AT-202, "Vehicle Does Not Decelerate by Engine Brake" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue trouble diagnosis.

Vehicle Speed at When Gears Shifting Occurs

NCS0002A

Throttle position	Vehicle speed km/h (MPH)							
	$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_5 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	50 – 54 (31 – 34)	97 – 105 (60 – 65)	154 – 164 (96 – 102)	224 – 234 (139 – 145)	220 – 230 (137 – 143)	145 – 155 (90 – 96)	86 – 94 (53 – 58)	39 – 43 (24 – 27)
Half throttle	29 – 33 (18 – 21)	63 – 69 (39 – 43)	100 – 108 (62 – 67)	136 – 144 (85 – 89)	88 – 96 (55 – 60)	64 – 72 (40 – 45)	28 – 34 (17 – 21)	9 – 13 (6 – 8)

- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed at Which Lock-up Occurs/Releases

NCS0002B

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	62 – 70 (39 – 44)	59 – 67 (37 – 42)
Half throttle	136 – 144 (85 – 89)	88 – 96 (55 – 60)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 4/8 of the full opening.

Symptom Chart

NCS0002C

- **The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.**
- **Overhaul and inspect inside the A/T only if A/T fluid condition is NG. Refer to** AT-49, "A/T Fluid Condition Check".

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
1	Shift Shock	Large shock. (“N” → “D” position) Refer to AT-175, "Large Shock (“N” to “D” Position)" .	ON vehicle	1. Engine idle speed	EC-76
				2. Engine speed signal	AT-113
				3. Accelerator pedal position sensor	AT-131
				4. A/T position	AT-206
				5. A/T fluid temperature sensor	AT-134
				6. Front brake solenoid valve	AT-147
				7. CAN communication line	AT-94
				8. A/T fluid level and state	AT-49
				9. Line pressure test	AT-50
				10. Control valve with TCM	AT-215
			OFF vehicle	11. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
2		Shock is too large when changing D_1 → D_2 or M_1 → M_2 .	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Direct clutch solenoid valve	AT-149
				4. CAN communication line	AT-94
				5. Engine speed signal	AT-113
				6. Turbine revolution sensor	AT-106
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. Direct clutch	AT-288
3		Shock is too large when changing D_2 → D_3 or M_2 → M_3 .	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. High and low reverse clutch solenoid valve	AT-151
				4. CAN communication line	AT-94
				5. Engine speed signal	AT-113
				6. Turbine revolution sensor	AT-106
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. High and low reverse clutch	AT-286

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
4	Shift Shock	Shock is too large when changing D3 → D4 or M3 → M4 .	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Input clutch solenoid valve	AT-145
				4. CAN communication line	AT-94
				5. Engine speed signal	AT-113
				6. Turbine revolution sensor	AT-106
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. Input clutch	AT-276
5		Shock is too large when changing D4 → D5 or M4 → M5 .	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Front brake solenoid valve	AT-147
				4. CAN communication line	AT-94
				5. Engine speed signal	AT-113
				6. Turbine revolution sensor	AT-106
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. Front brake (brake band)	AT-255
				11. Input clutch	AT-276
6		Shock is too large for downshift when accelerator pedal is pressed.	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. CAN communication line	AT-94
				4. Engine speed signal	AT-113
				5. Turbine revolution sensor	AT-106
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				7. A/T fluid level and state	AT-49
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Front brake (brake band)	AT-255
				10. Input clutch	AT-276
				11. High and low reverse clutch	AT-286
				12. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
7	Shift Shock	Shock is too large for upshift when accelerator pedal is released.	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Engine speed signal	AT-113
				4. CAN communication line	AT-94
				5. Turbine revolution sensor	AT-106
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				7. A/T fluid level and state	AT-49
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Front brake (brake band)	AT-255
				10. Input clutch	AT-276
				11. High and low reverse clutch	AT-286
				12. Direct clutch	AT-288
8		Shock is too large for lock-up.	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Engine speed signal	AT-113
				4. CAN communication line	AT-94
				5. Turbine revolution sensor	AT-106
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				7. Torque converter clutch solenoid valve	AT-125
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. Torque converter	AT-255
9		Shock is too large during engine brake.	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. CAN communication line	AT-94
				4. A/T fluid level and state	AT-49
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Front brake (brake band)	AT-255
				7. Input clutch	AT-276
				8. High and low reverse clutch	AT-286
				9. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
10	No Up Shift	Gear does not change from $D_1 \rightarrow D_2$ or from $M_1 \rightarrow M_2$. Refer to AT-183, "A/T Does Not Shift: $D_1 \rightarrow D_2$".	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Direct clutch	AT-288
11		Gear does not change from $D_2 \rightarrow D_3$ or from $M_2 \rightarrow M_3$. Refer to AT-185, "A/T Does Not Shift: $D_2 \rightarrow D_3$".	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. High and low reverse clutch solenoid valve	AT-151
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. High and low reverse clutch	AT-286
12		Gear does not change from $D_3 \rightarrow D_4$ or from $M_3 \rightarrow M_4$. Refer to AT-187, "A/T Does Not Shift: $D_3 \rightarrow D_4$".	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Front brake solenoid valve	AT-147
				5. Line pressure test	AT-50
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Input clutch	AT-276
13		Gear does not change from $D_4 \rightarrow D_5$ or from $M_4 \rightarrow M_5$. Refer to AT-189, "A/T Does Not Shift: $D_4 \rightarrow D_5$".	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Direct clutch solenoid valve	AT-149
				5. Turbine revolution sensor	AT-106
				6. Line pressure test	AT-50
				7. CAN communication line	AT-94
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Front brake (brake band)	AT-255
				10. Input clutch	AT-276

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
14	No Down Shift	In “D” or “M” position, does not downshift to 4th gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Direct clutch solenoid valve	AT-149
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Front brake (brake band)	AT-255
				9. Input clutch	AT-276
15		In “D” or “M” position, does not downshift to 3rd gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Front brake solenoid valve	AT-147
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Input clutch	AT-276
16		In “D” or “M” position, does not downshift to 2nd gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. High and low reverse clutch solenoid valve	AT-151
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. High and low reverse clutch	AT-286
17		In “D” or “M” position, does not downshift to 1st gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
18	Slips/Will Not Engage	When “D” or “M” position, remains in 1st gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. 3rd one-way clutch	AT-274
				8. 1st one-way clutch	AT-281
				9. Gear system	AT-246
				10. Reverse brake	AT-255
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
19		When “D” or “M” position, remains in 2nd gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108 , AT-139
				3. Low coast brake solenoid valve	AT-153
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. 3rd one-way clutch	AT-274
				8. Gear system	AT-246
				9. Direct clutch	AT-288
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
20		When “D” or “M” position, remains in 3rd gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Line pressure test	AT-50
				4. CAN communication line	AT-94
				5. Control valve with TCM	AT-215
			OFF vehicle	6. 3rd one-way clutch	AT-274
				7. Gear system	AT-246
				8. High and low reverse clutch	AT-286
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
21	Slips/Will Not Engage	When “D” or “M” position, remains in 4th gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Direct clutch solenoid valve	AT-149
				5. High and low reverse clutch solenoid valve	AT-151
				6. Low coast brake solenoid valve	AT-153
				7. Front brake solenoid valve	AT-147
				8. Line pressure test	AT-50
				9. CAN communication line	AT-94
				10. Control valve with TCM	AT-215
			OFF vehicle	11. Input clutch	AT-276
				12. Gear system	AT-246
				13. High and low reverse clutch	AT-286
				14. Direct clutch	AT-288
22		When “D” or “M” position, remains in 5th gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276
				9. Gear system	AT-246
				10. High and low reverse clutch	AT-286

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
23	Slips/Will Not Engage	Vehicle cannot be started from D_1 . Refer to AT-181, "Vehicle Cannot Be Started from D_1" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Accelerator pedal position sensor	AT-131
				3. Line pressure test	AT-50
				4. CAN communication line	AT-94
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Torque converter	AT-255
				7. Oil pump assembly	AT-271
				8. 3rd one-way clutch	AT-274
				9. 1st one-way clutch	AT-281
				10. Gear system	AT-246
				11. Reverse brake	AT-255
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
24		Does not lock-up. Refer to AT-191, "A/T Does Not Lock-up" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Engine speed signal	AT-113
				4. Turbine revolution sensor	AT-106
				5. Torque converter clutch solenoid valve	AT-125
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
25		Does not hold lock-up condition. Refer to AT-193, "A/T Does Not Hold Lock-up Condition" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Engine speed signal	AT-113
				4. Turbine revolution sensor	AT-106
				5. Torque converter clutch solenoid valve	AT-125
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
26	Slips/Will Not Engage	Lock-up is not released. Refer to AT-194, "Lock-up Is Not Released" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Engine speed signal	AT-113
				4. Turbine revolution sensor	AT-106
				5. Torque converter clutch solenoid valve	AT-125
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
27		No shock at all or the clutch slips when vehicle changes speed $D_1 \rightarrow D_2$ or $M_1 \rightarrow M_2$.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. Gear system	AT-246
				11. Direct clutch	AT-288
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
28	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed $D_2 \rightarrow D_3$ or $M_2 \rightarrow M_3$.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. High and low reverse clutch solenoid valve	AT-151
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. Gear system	AT-246
				11. High and low reverse clutch	AT-286
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
29		No shock at all or the clutch slips when vehicle changes speed $D_3 \rightarrow D_4$ or $M_3 \rightarrow M_4$.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Front brake solenoid valve	AT-147
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. Input clutch	AT-276
				11. Gear system	AT-246
				12. High and low reverse clutch	AT-286
				13. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
30	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed $D_4 \rightarrow D_5$ or $M_4 \rightarrow M_5$.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Direct clutch solenoid valve	AT-149
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. Front brake (brake band)	AT-255
				11. Input clutch	AT-276
				12. Gear system	AT-246
				13. High and low reverse clutch	AT-286
31		When you press the accelerator pedal and shift speed $D_5 \rightarrow D_4$ or $M_5 \rightarrow M_4$ the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Direct clutch solenoid valve	AT-149
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. Input clutch	AT-276
				11. Gear system	AT-246
				12. High and low reverse clutch	AT-286
				13. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
32	Slips/Will Not Engage	When you press the accelerator pedal and shift speed D4 → D3 or M4 → M3 the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Front brake solenoid valve	AT-147
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. 3rd one-way clutch	AT-274
				11. Gear system	AT-246
				12. High and low reverse clutch	AT-286
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
33		When you press the accelerator pedal and shift speed D3 → D2 or M3 → M2 the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. High and low reverse clutch solenoid valve	AT-151
				4. Direct clutch solenoid valve	AT-149
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. 3rd one-way clutch	AT-274
				11. Gear system	AT-246
				12. Direct clutch	AT-288
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
34	Slips/Will Not Engage	When you press the accelerator pedal and shift speed $D_2 \rightarrow D_1$ or $M_2 \rightarrow M_1$ the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. 1st one-way clutch	AT-281
				11. Gear system	AT-246
				12. Reverse brake	AT-255
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
35		With selector lever in “D” position, acceleration is extremely poor.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. PNP switch	AT-102
				6. A/T position	AT-206
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. 1st one-way clutch	AT-281
				11. Gear system	AT-246
				12. Reverse brake	AT-255
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
36	Slips/Will Not Engage	With selector lever in “R” position, acceleration is extremely poor.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. High and low reverse clutch solenoid valve	AT-151
				5. CAN communication line	AT-94
				6. PNP switch	AT-102
				7. A/T position	AT-206
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Gear system	AT-246
				10. Output shaft	AT-255
				11. Reverse brake	AT-255
37		While starting off by accelerating in 1st, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Torque converter	AT-255
				7. Oil pump assembly	AT-271
				8. 3rd one-way clutch	AT-274
				9. 1st one-way clutch	AT-281
				10. Gear system	AT-246
				11. Reverse brake	AT-255
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
38	Slips/Will Not Engage	While accelerating in 2nd, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Direct clutch solenoid valve	AT-149
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. Gear system	AT-246
				11. Direct clutch	AT-288
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
39		While accelerating in 3rd, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. High and low reverse clutch solenoid valve	AT-151
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. Gear system	AT-246
				11. High and low reverse clutch	AT-286
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
40	Slips/Will Not Engage	While accelerating in 4th, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Input clutch solenoid valve	AT-145
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. Input clutch	AT-276
				10. Gear system	AT-246
				11. High and low reverse clutch	AT-286
				12. Direct clutch	AT-288
41		While accelerating in 5th, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Front brake solenoid valve	AT-147
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. Front brake (brake band)	AT-255
				10. Input clutch	AT-276
				11. Gear system	AT-246
				12. High and low reverse clutch	AT-286
42		Slips at lock-up.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Engine speed signal	AT-113
				4. Turbine revolution sensor	AT-106
				5. Torque converter clutch solenoid valve	AT-125
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
43	Slips/Will Not Engage	No creep at all. Refer to AT-177, "Vehicle Does Not Creep Backward in “R” Position" , AT-179, "Vehicle Does Not Creep Forward in “D” Position" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. Direct clutch solenoid valve	AT-149
				5. PNP switch	AT-102
				6. CAN communication line	AT-94
				7. A/T position	AT-206
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Torque converter	AT-255
				10. Oil pump assembly	AT-271
				11. 1st one-way clutch	AT-281
				12. Gear system	AT-246
				13. Reverse brake	AT-255
				14. Direct clutch	AT-288
				15. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				16. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
44		Vehicle cannot run in all positions.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. PNP switch	AT-102
				4. A/T position	AT-206
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Oil pump assembly	AT-271
				7. Gear system	AT-246
				8. Output shaft	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
45	Slips/Will Not Engage	With selector lever in “D” position, driving is not possible.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. PNP switch	AT-102
				4. A/T position	AT-206
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Torque converter	AT-255
				7. Oil pump assembly	AT-271
				8. 1st one-way clutch	AT-281
				9. Gear system	AT-246
				10. Reverse brake	AT-255
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
46		With selector lever in “R” position, driving is not possible.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. PNP switch	AT-102
				4. A/T position	AT-206
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Gear system	AT-246
				7. Output shaft	AT-255
				8. Reverse brake	AT-255
47	Does Not Change	Does not change $M_5 \rightarrow M_4$. Refer to AT-196, "A/T Does Not Shift: 5th Gear → 4th Gear" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
48		Does not change $M_4 \rightarrow M_3$. Refer to AT-198, "A/T Does Not Shift: 4th Gear → 3rd Gear" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
49	Does Not Change	Does not change M_3 → M_2 . Refer to AT-199, "A/T Does Not Shift: 3rd Gear → 2nd Gear" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276
				9. High and low reverse clutch	AT-286
50		Does not change M_2 → M_1 . Refer to AT-201, "A/T Does Not Shift: 2nd Gear → 1st Gear" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Input clutch	AT-276
				8. High and low reverse clutch	AT-286
				9. Direct clutch	AT-288
51		Cannot be changed to manual mode. Refer to AT-196, "Cannot Be Changed to Manual Mode" .	ON vehicle	1. Manual mode switch	AT-157
				2. Turbine revolution sensor	AT-106
				3. CAN communication line	AT-94
52	Others	Shift point is high in “D” position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				2. Accelerator pedal position sensor	AT-131
				3. CAN communication line	AT-94
				4. A/T fluid temperature sensor	AT-134
				5. Control valve with TCM	AT-215
53		Shift point is low in “D” position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				2. Accelerator pedal position sensor	AT-131
				3. CAN communication line	AT-94
				4. Control valve with TCM	AT-215

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
54	Others	Judder occurs during lock-up.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. Turbine revolution sensor	AT-106
				4. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				5. Accelerator pedal position sensor	AT-131
				6. CAN communication line	AT-94
				7. Torque converter clutch solenoid valve	AT-125
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Torque converter	AT-255
55		Strange noise in “R” position.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. CAN communication line	AT-94
				4. Control valve with TCM	AT-215
			OFF vehicle	5. Torque converter	AT-255
				6. Oil pump assembly	AT-271
				7. Gear system	AT-246
				8. High and low reverse clutch	AT-286
				9. Reverse brake	AT-255
56		Strange noise in “N” position.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. CAN communication line	AT-94
				4. Control valve with TCM	AT-215
			OFF vehicle	5. Torque converter	AT-255
				6. Oil pump assembly	AT-271
				7. Gear system	AT-246
57		Strange noise in “D” position.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. CAN communication line	AT-94
				4. Control valve with TCM	AT-215
			OFF vehicle	5. Torque converter	AT-255
				6. Oil pump assembly	AT-271
				7. Gear system	AT-246
				8. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
58	Others	Vehicle does not decelerate by engine brake. Refer to AT-202, "Vehicle Does Not Decelerate by Engine Brake" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Input clutch	AT-276
				8. High and low reverse clutch	AT-286
				9. Direct clutch	AT-288
59		Engine brake does not work $M_5 \rightarrow M_4$.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
60		Engine brake does not work $M_4 \rightarrow M_3$.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276
61		Engine brake does not work $M_3 \rightarrow M_2$.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276
				9. High and low reverse clutch	AT-286

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
62	Others	Engine brake does not work $M_2 \rightarrow M_1$.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Input clutch	AT-276
				8. High and low reverse clutch	AT-286
				9. Direct clutch	AT-288
63		Maximum speed low.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Direct clutch solenoid valve	AT-149
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. Input clutch	AT-276
				10. Gear system	AT-246
				11. High and low reverse clutch	AT-286
				12. Direct clutch	AT-288
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				14 Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
64		Extremely large creep.	ON vehicle	1. Engine idle speed	EC-76
				2. CAN communication line	AT-94
			OFF vehicle	3. Torque converter	AT-255
65		With selector lever in “P” position, vehicle does not enter parking condition or, with selector lever in another position, parking condition is not cancelled.	ON vehicle	1. PNP switch	AT-102
				2. A/T position	AT-206
				3. Parking pawl components	AT-246
66		Vehicle runs with A/T in “P” position.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Control valve with TCM	AT-215
				5. Parking pawl components	AT-246
			OFF vehicle	6. Gear system	AT-246

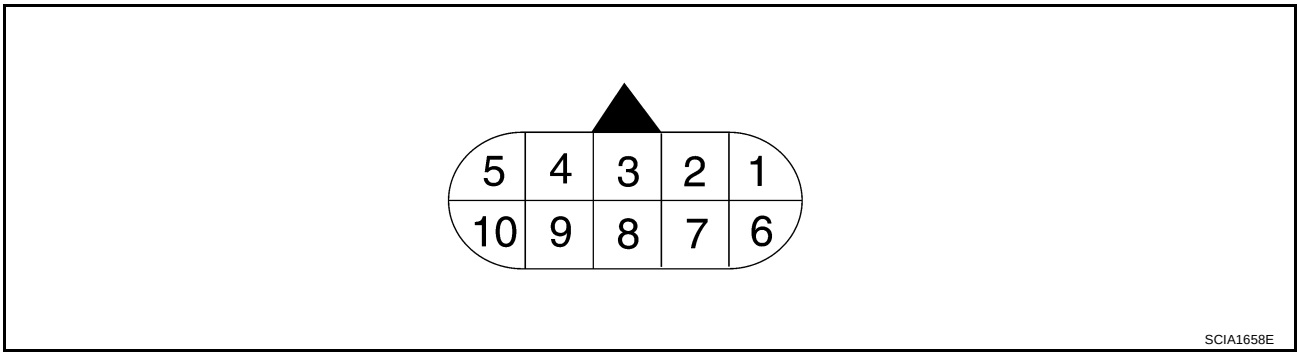
No.	Items	Symptom	Condition	Diagnostic Item	Reference page
67	Others	Vehicle runs with A/T in “N” position. Refer to AT-174, "In “N” Position, Vehicle Moves" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Control valve with TCM	AT-215
			OFF vehicle	5. Input clutch	AT-276
				6. Gear system	AT-246
				7. Direct clutch	AT-288
				8. Reverse brake	AT-255
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				10. Low coast brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
68		Engine does not start in “N” or “P” position. Refer to AT-173, "Engine Cannot Be Started in “P” or “N” Position" .	ON vehicle	1. Ignition switch and starter	PG-4, SC-8
				2. A/T position	AT-206
				3. PNP switch	AT-102
69		Engine starts in positions other than “N” or “P”.	ON vehicle	1. Ignition switch and starter	PG-4, SC-8
				2. A/T position	AT-206
				3. PNP switch	AT-102
70		Engine stall.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. Turbine revolution sensor	AT-106
				4. Torque converter clutch solenoid valve	AT-125
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
71		Engine stalls when selector lever shifted “N” → “D”, “R”.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. Turbine revolution sensor	AT-106
				4. Torque converter clutch solenoid valve	AT-125
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
72	Others	Engine speed does not return to idle. Refer to AT-195, "Engine Speed Does Not Return to Idle" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Direct clutch solenoid valve	AT-149
				3. Front brake solenoid valve	AT-147
				4. Accelerator pedal position sensor	AT-131
				5. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Front brake (brake band)	AT-255
				9. Direct clutch	AT-288

TCM Input/Output Signal Reference Values

NCS0002D

A/T ASSEMBLY HARNESS CONNECTOR TERMINAL LAYOUT



TCM INSPECTION TABLE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
1	G	Power supply (Memory back-up)	Always		Battery voltage
2	G	Power supply (Memory back-up)	Always		Battery voltage
3	L	CAN-H	—		—
4	PU/W	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.		—
5	B	Ground	Always		0 V
6	Y/R	Power supply		—	Battery voltage
				—	0 V
7	Y	Back-up lamp relay		Selector lever in “R” position.	0 V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	—		—
9	GY/R	Starter relay		Selector lever in “N” and “P” positions.	Battery voltage
				Selector lever in other positions.	0 V
10	B	Ground	Always		0 V

CONSULT-III Function (TRANSMISSION)

NCS0002E

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

FUNCTION

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.
Data monitor	Input/Output data in the ECU can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.
Function test	Performed by CONSULT-III instead of a technician to determine whether each system is “OK” or “NG”.
DTC work support	Select the operating condition to confirm Diagnosis Trouble Codes.
ECU part number	TCM part number can be read.

CONSULT-III REFERENCE VALUE

NOTICE:

1. The CONSULT-III electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid).
   Check for time difference between actual shift timing and the CONSULT-III display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
2. Shift schedule (which implies gear position) displayed on CONSULT-III and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:

- Actual shift schedule has more or less tolerance or allowance,
- Shift schedule indicated in Service Manual refers to the point where shifts start, and
- Gear position displayed on CONSULT-III indicates the point where shifts are completed.

3. Display of solenoid valves on CONSULT-III changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).

Item name	Condition	Display value (Approx.)
ATF TEMP SE 1	0°C (32° F) – 20°C (68°F) – 80°C (176°F)	3.3 – 2.7 – 0.9 V
ATF TEMP SE 2		3.3 – 2.5 – 0.7 V
ATF TEMP 1	Ignition switch ON	Measured ATF temperature is displayed.
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A
SLCT LVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.
VEHICLE SPEED	During driving	Approximately matches the speedometer reading.
ENGINE SPEED	Engine running	Closely matches the tachometer reading.
LINE PRES SOL	During driving	0.2 – 0.6 A
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 – 0.05 A
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 – 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 – 0.05 A
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 – 0.05 A
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 – 0.05 A
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF
GEAR	During driving	1, 2, 3, 4, 5

SELF-DIAGNOSTIC RESULT MODE

After performing self-diagnosis, place check marks for results on the AT-44, "DIAGNOSTIC WORKSHEET" . Reference pages are provided following the items.

Display Items List

X: Applicable, —: Not applicable

Items (CONSULT-III screen terms)	Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)	Reference page
		"TRANSMISSION" with CONSULT-III	MIL*1, "ENGINE" with CONSULT-III or GST	
CAN COMM CIRCUIT	When TCM is not transmitting or receiving CAN communication signal for 2 seconds or more.	U1000	U1000	AT-94
STARTER RELAY/ CIRC	If this signal is ON other than in "P" or "N" position, this is judged to be a malfunction. (And if it is OFF in "P" or "N" position, this too is judged to be a malfunction.)	P0615	—	AT-97
TCM	TCM is malfunctioning	P0700	P0700	AT-101
PNP SW/CIRC	● PNP switch 1–4 signals input with impossible pattern. ● "P" position is detected from "N" position without any other position being detected in between.	P0705	P0705	AT-102
TURBINE REV S/CIRC	● TCM does not receive the proper voltage signal from the sensor. ● TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.	P0717	P0717	AT-106
VEH SPD SEN/CIR AT	● Signal from vehicle speed sensor A/T (Revolution sensor) not input due to cut line or the like. ● Unexpected signal input during running. ● After ignition switch is turned ON, unexpected signal input from vehicle speed sensor MTR before the vehicle starts moving.	P0720	P0720	AT-108
ENGINE SPEED SIG	TCM does not receive the CAN communication signal from the ECM.	P0725	P0725	AT-113
A/T 1ST GR FNCTN	A/T cannot shift to 1st gear	P0731	P0731	AT-115
A/T 2ND GR FNCTN	A/T cannot shift to 2nd gear	P0732	P0732	AT-117
A/T 3RD GR FNCTN	A/T cannot shift to 3rd gear	P0733	P0733	AT-119
A/T 4TH GR FNCTN	A/T cannot shift to 4th gear	P0734	P0734	AT-121
A/T 5TH GR FNCTN	A/T cannot shift to 5th gear	P0735	P0735	AT-123
TCC SOLENOID/CIRC	Normal voltage not applied to solenoid due to cut line, short, or the like.	P0740	P0740	AT-125
A/T TCC S/V FNCTN	● A/T cannot perform lock-up even if electrical circuit is good. ● TCM detects as irregular by comparing difference value with slip rotation.	P0744	P0744*2	AT-127
L/PRESS SOL/CIRC	● Normal voltage not applied to solenoid due to cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P0745	P0745	AT-129
TP SEN/CIRC A/T	TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.	P1705	P1705	AT-131
ATF TEMP SEN/CIRC	During running, the A/T fluid temperature sensor signal voltage is excessively high or low.	P1710	P0710	AT-134

Items (CONSULT-III screen terms)	Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)	Reference page
		"TRANSMISSION" with CONSULT-III	MIL[*1], "ENGINE" with CONSULT-III or GST	
VEH SPD SE/CIR-MTR	● Signal (CAN communication) from vehicle speed sensor MTR not input due to cut line or the like. ● Unexpected signal input during running.	P1721	—	AT-139
A/T INTERLOCK	Except during shift change, the gear position and ATF pressure switch states are monitored and comparative judgment made.	P1730	P1730	AT-141
A/T 1ST E/BRAKING	Each ATF pressure switch and solenoid current is monitored and if a pattern is detected having engine braking 1st gear other than in the M_1 position, a malfunction is detected.	P1731	—	AT-143
I/C SOLENOID/CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P1752	P1752	AT-145
FR/B SOLENOID/CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P1757	P1757	AT-147
D/C SOLENOID/CIRC	● Normal voltage not applied to solenoid due to cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P1762	P1762	AT-149
HLR/C SOL/CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P1767	P1767	AT-151
LC/B SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like.	P1772	P1772	AT-153
LC/B SOLENOID FNCT	● TCM detects an improper voltage drop when it tries to operate the solenoid valve. ● Condition of ATF pressure switch 2 is different from monitor value, and relation between gear position and actual gear ratio is irregular.	P1774	P1774[*2]	AT-155
MANU MODE SW/ CIRC	When an impossible pattern of switch signals is detected, a malfunction is detected.	P1815	—	AT-157
NO DTC IS DETECTED FURTHER TESTING MAY BE REQUIRED	No NG item has been detected.	X	X	—

- [*1]: Refer to AT-39, "Malfunction Indicator Lamp (MIL)" .
- [*2]: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

DATA MONITOR MODE
Display Items List

X: Standard, —: Not applicable, ▼: Option

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/S SE-A/T (km/h)	X	X	▼	Revolution sensor
VHCL/S SE-MTR (km/h)	X	—	▼	
ACCELE POSI (0.0/8)	X	—	▼	Accelerator pedal position signal
THROTTLE POSI (0.0/8)	X	X	▼	Degree of opening for accelerator recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
CLSD THL POS (ON/OFF)	X	—	▼	Signal input with CAN communications.
W/O THL POS (ON/OFF)	X	—	▼	
BRAKE SW (ON/OFF)	X	—	▼	Stop lamp switch
GEAR	—	X	▼	Gear position recognized by the TCM updated after gear-shifting.
ENGINE SPEED (rpm)	X	X	▼	
TURBINE REV (rpm)	X	X	▼	
OUTPUT REV (rpm)	X	X	▼	
GEAR RATIO	—	X	▼	
TC SLIP SPEED (rpm)	—	X	▼	Difference between engine speed and torque converter input shaft speed.
F SUN GR REV (rpm)	—	—	▼	
F CARR GR REV (rpm)	—	—	▼	
ATF TEMP SE 1 (V)	X	—	▼	
ATF TEMP SE 2 (V)	X	—	▼	
ATF TEMP 1 (°C)	—	X	▼	
ATF TEMP 2 (°C)	—	X	▼	
BATTERY VOLT (V)	X	—	▼	
ATF PRES SW 1 (ON/OFF)	X	X	▼	(for FR/B solenoid)
ATF PRES SW 2 (ON/OFF)	X	X	▼	(for LC/B solenoid)
ATF PRES SW 3 (ON/OFF)	X	X	▼	(for I/C solenoid)
ATF PRES SW 5 (ON/OFF)	X	X	▼	(for D/C solenoid)
ATF PRES SW 6 (ON/OFF)	X	X	▼	(for HLR/C solenoid)
PNP SW 1 (ON/OFF)	X	—	▼	
PNP SW 2 (ON/OFF)	X	—	▼	
PNP SW 3 (ON/OFF)	X	—	▼	
PNP SW 4 (ON/OFF)	X	—	▼	
1 POSITION SW (ON/OFF)	X	—	▼	

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
SLCT LVR POSI	—	X	▼	Selector lever position is recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
OD CONT SW (ON/OFF)	X	—	▼	Not mounted but displayed.
POWERSHIFT SW (ON/OFF)	X	—	▼	
HOLD SW (ON/OFF)	X	—	▼	
MANU MODE SW (ON/OFF)	X	—	▼	
NON M-MODE SW (ON/OFF)	X	—	▼	
UP SW LEVER (ON/OFF)	X	—	▼	
DOWN SW LEVER (ON/OFF)	X	—	▼	
SFT UP ST SW (ON/OFF)	—	—	▼	Not mounted but displayed.
SFT DWN ST SW (ON/OFF)	—	—	▼	
ASCD-OD CUT (ON/OFF)	—	—	▼	
ASCD-CRUISE (ON/OFF)	—	—	▼	
ABS SIGNAL (ON/OFF)	—	—	▼	
ACC OD CUT (ON/OFF)	—	—	▼	Not mounted but displayed
ACC SIGNAL (ON/OFF)	—	—	▼	
TCS GR/P KEEP (ON/OFF)	—	—	▼	
TCS SIGNAL 2 (ON/OFF)	—	—	▼	
TCS SIGNAL 1 (ON/OFF)	—	—	▼	
TCC SOLENOID (A)	—	X	▼	
LINE PRES SOL (A)	—	X	▼	
I/C SOLENOID (A)	—	X	▼	
FR/B SOLENOID (A)	—	X	▼	
D/C SOLENOID (A)	—	X	▼	
HLR/C SOL (A)	—	X	▼	
ON OFF SOL (ON/OFF)	—	—	▼	LC/B solenoid
TCC SOL MON (A)	—	—	▼	
L/P SOL MON (A)	—	—	▼	
I/C SL MON (A)	—	—	▼	
FR/B SOL MON (A)	—	—	▼	
D/C SOL MON (A)	—	—	▼	
HLR/C SOL MON (A)	—	—	▼	
ON OFF SOL MON (ON/OFF)	—	—	▼	LC/B solenoid
P POSI IND (ON/OFF)	—	—	▼	
R POSI IND (ON/OFF)	—	—	▼	

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
N POSI IND (ON/OFF)	—	—	▼	
D POSI IND (ON/OFF)	—	—	▼	
4TH POSI IND (ON/OFF)	—	—	▼	
3RD POSI IND (ON/OFF)	—	—	▼	
2ND POSI IND (ON/OFF)	—	—	▼	
1ST POSI IND (ON/OFF)	—	—	▼	
MANU MODE IND (ON/OFF)	—	—	▼	
POWER M LAMP (ON/OFF)	—	—	▼	
F-SAFE IND/L (ON/OFF)	—	—	▼	
ATF WARN LAMP (ON/OFF)	—	—	▼	Not mounted but displayed.
BACK-UP LAMP (ON/OFF)	—	—	▼	
STARTER RELAY (ON/OFF)	—	—	▼	
PNP SW3 MON (ON/OFF)	—	—	▼	
C/V CLB ID1	—	—	▼	
C/V CLB ID2	—	—	▼	
C/V CLB ID3	—	—	▼	
UNIT CLB ID1	—	—	▼	
UNIT CLB ID2	—	—	▼	
UNIT CLB ID3	—	—	▼	
TRGT GR RATIO	—	—	▼	
TRGT PRES TCC (kPa)	—	—	▼	
TRGT PRES L/P (kPa)	—	—	▼	
TRGT PRES I/C (kPa)	—	—	▼	
TRGT PRE FR/B (kPa)	—	—	▼	
TRGT PRES D/C (kPa)	—	—	▼	
TRG PRE HLR/C (kPa)	—	—	▼	
SHIFT PATTERN	—	—	▼	
DRV CST JUDGE	—	—	▼	
START RLY MON	—	—	▼	
NEXT GR POSI	—	—	▼	
SHIFT MODE	—	—	▼	
MANU GR POSI	—	—	▼	
VEHICLE SPEED (km/h)	—	X	▼	Vehicle speed recognized by the TCM.
Voltage (V)	—	—	▼	Displays the value measured by the voltage probe.

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Frequency (Hz)	—	—	▼	The value measured by the pulse probe is displayed.
DUTY-HI (high) (%)	—	—	▼	
DUTY-LOW (low) (%)	—	—	▼	
PLS WIDTH-HI (ms)	—	—	▼	
PLS WIDTH-LOW (ms)	—	—	▼	

DTC WORK SUPPORT MODE

Display Items List

DTC work support item	Description	Check item
1ST GR FUNCTN P0731	Following items for “1st gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	● Input clutch solenoid valve ● Front brake solenoid valve ● Direct clutch solenoid valve ● High and low reverse clutch solenoid valve ● Each clutch ● Hydraulic control circuit
2ND GR FUNCTN P0732	Following items for “2nd gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	
3RD GR FUNCTN P0733	Following items for “3rd gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	
4TH GR FUNCTN P0734	Following items for “4th gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	
5TH GR FUNCTN P0735	Following items for “5th gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	

Diagnostic Procedure Without CONSULT-III

NCS0002F

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to EC-125, "Generic Scan Tool (GST) Function" .

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to EC-62, "Malfunction Indicator Lamp (MIL)" .

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Description

When the ignition switch is turned ON, the indicator lamp lights up 2 seconds. As a method for locating the suspect circuit, when the self-diagnostics start signal is input, the memory for the malfunction location is output and A/T CHECK indicator lamp flashes to display the corresponding DTC.

Diagnostic Procedure

1. CHECK A/T CHECK INDICATOR LAMP

1. Start the engine with selector lever in “P” position. Warm engine to normal operating temperature.
2. Turn ignition switch ON and OFF at least twice, then leave it in the OFF position.
3. Wait 10 seconds.
4. Turn ignition switch ON. (Do not start engine.)

Does A/T CHECK indicator lamp come on for about 2 seconds?

YES >> GO TO 2.
NO >> Go to AT-172, "A/T Check Indicator Lamp Does Not Come On" .

2. JUDGMENT PROCEDURE

1. Turn ignition switch OFF.
2. Keep pressing shift lock release button.
3. Move selector lever from “P” to “D” position.
4. Release accelerator pedal. (Set the closed throttle position signal ON.)
5. Depress brake pedal. (Stop lamp switch signal ON.)
6. Turn ignition switch ON. (Do not start engine.)
7. Wait 3 seconds.
8. Move the selector lever to the manual shift gate side. (Manual mode switch ON.)
9. Release brake pedal. (Stop lamp switch signal OFF.)
10. Move the selector lever to “D” position. (Manual mode switch OFF.)
11. Depress brake pedal. (Stop lamp switch signal ON.)
12. Release brake pedal. (Stop lamp switch signal OFF.)
13. Depress accelerator pedal fully and release it.

>> GO TO 3.

3. CHECK SELF-DIAGNOSIS CODE

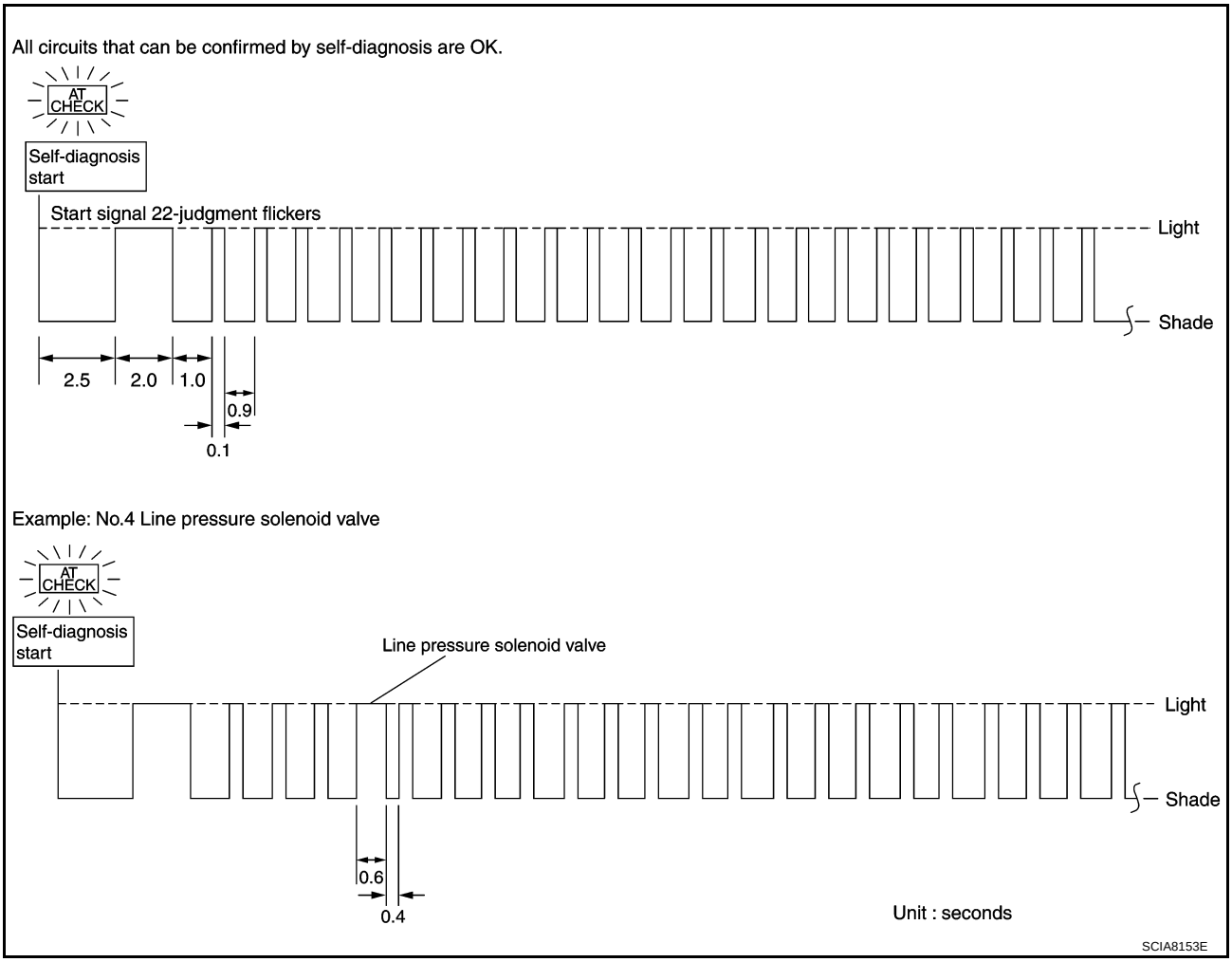
Check A/T CHECK indicator lamp. Refer to AT-93, "Judgment Self-diagnosis Code" .
If the system does not go into self-diagnostics. Refer to AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-157, "DTC P1815 MANUAL MODE SWITCH" , AT-166, "CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT" , AT-167, "BRAKE SIGNAL CIRCUIT" .

>> **DIAGNOSIS END**

Judgment Self-diagnosis Code

If there is a malfunction, the lamp lights up for the time corresponding to the suspect circuit.

No.	Malfunctioning item	No.	Malfunctioning item
1	Revolution sensor AT-108	12	A/T interlock AT-141
2	Direct clutch solenoid valve AT-149	13	A/T 1st engine braking AT-143
3	Torque converter clutch solenoid valve AT-125	14	Start signal AT-97
4	Line pressure solenoid valve AT-129	15	Accelerator pedal position sensor AT-131
5	Input clutch solenoid valve AT-145	16	Engine speed signal AT-113
6	Front brake solenoid valve AT-147	17	CAN communication line AT-94
7	Low coast brake solenoid valve AT-153 , AT-155	18	1st gear function AT-115
8	High and low reverse clutch solenoid valve AT-151	19	2nd gear function AT-117
9	PNP switch AT-102	20	3rd gear function AT-119
10	A/T fluid temperature sensor AT-134	21	4th gear function AT-121
11	Turbine revolution sensor AT-106	22	5th gear function AT-123



Erase Self-diagnosis

- In order to make it easier to find the cause of hard-to-duplicate malfunctions, malfunction information is stored into the control unit as necessary during use by the user. This memory is not erased no matter how many times the ignition switch is turned ON and OFF.
- However, this information is erased by turning ignition switch OFF after performing self-diagnostics or by erasing the memory using the CONSULT-III.

DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

NCS0002G

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent malfunction detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

NCS0002H

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “U1000 CAN COMM CIRCUIT” with CONSULT-III or 17th judgment flicker without CONSULT-III is detected when TCM cannot communicate to other control units.

Possible Cause

NCS0002I

Harness or connectors
(CAN communication line is open or shorted.)

DTC Confirmation Procedure

NCS0002J

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine and wait for at least 6 seconds.
4. If DTC is detected, go to AT-96, "Diagnostic Procedure" .

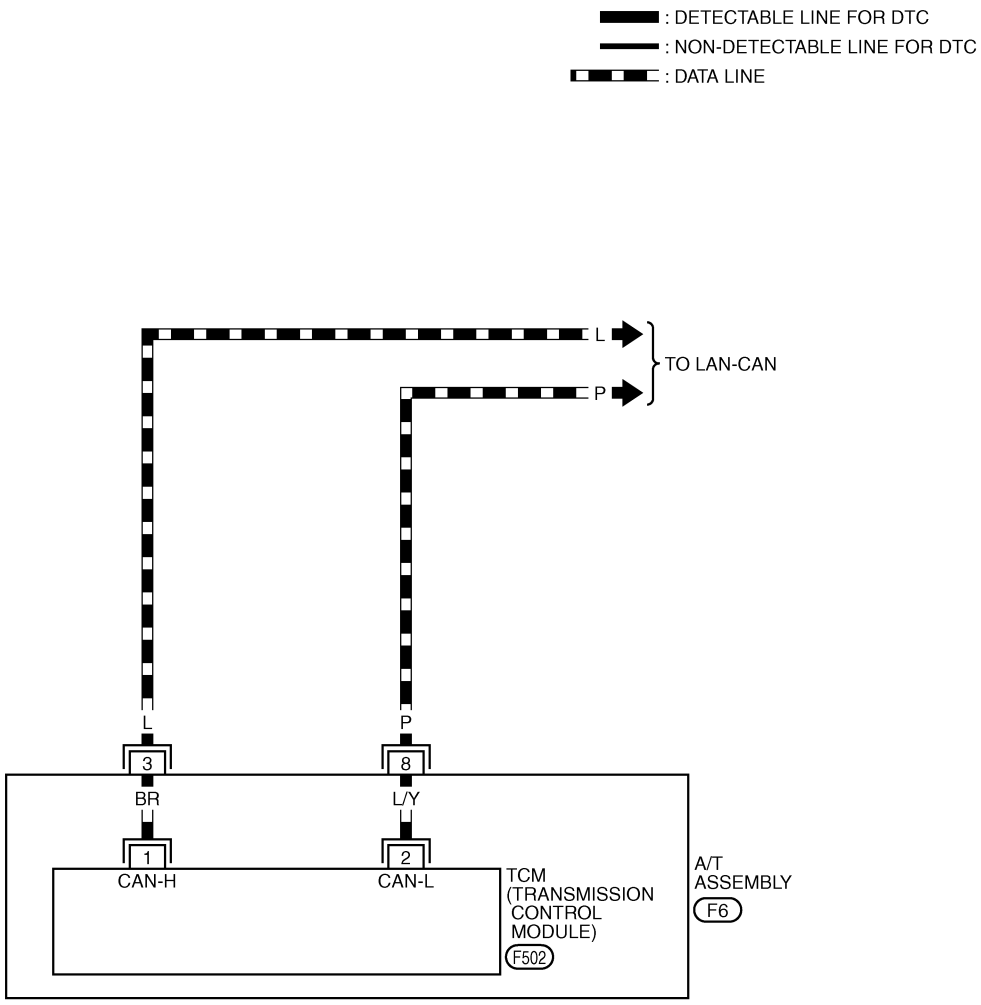
WITH GST

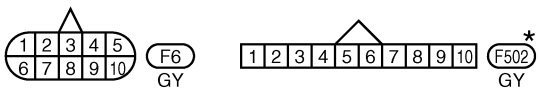
Follow the procedure “WITH CONSULT-III”.

Wiring Diagram — AT — CAN

NCS0002K

AT-CAN-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0259E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	—	—
8	P	CAN-L	—	—

Diagnostic Procedure

NCS0002L

1. CHECK CAN COMMUNICATION CIRCUIT

With CONSULT-III

1. Turn ignition switch ON and start engine.
2. Select “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.

Is any malfunction of the “CAN COMM CIRCUIT” indicated?

YES >> Print out CONSULT-III screen, GO TO LAN section. Refer to LAN-48, "CAN System Specification Chart" .

NO >> **INSPECTION END**

DTC P0615 START SIGNAL CIRCUIT

PFP:25230

Description

NCS0002M

Prohibits cranking other at “P” or “N” position.

CONSULT-III Reference Value

NCS0002N

Item name	Condition	Display value
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF

On Board Diagnosis Logic

NCS0002O

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0615 STARTER RELAY/CIRC” with CONSULT-III or 14th judgment flicker without CONSULT-III is detected when starter relay is switched ON other than at “P” or “N” position. (Or when switched OFF at “P” or “N” position.)

Possible Cause

NCS0002P

- Harness or connectors
  (Starter relay and TCM circuit is open or shorted.)
- Starter relay circuit

DTC Confirmation Procedure

NCS0002Q

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

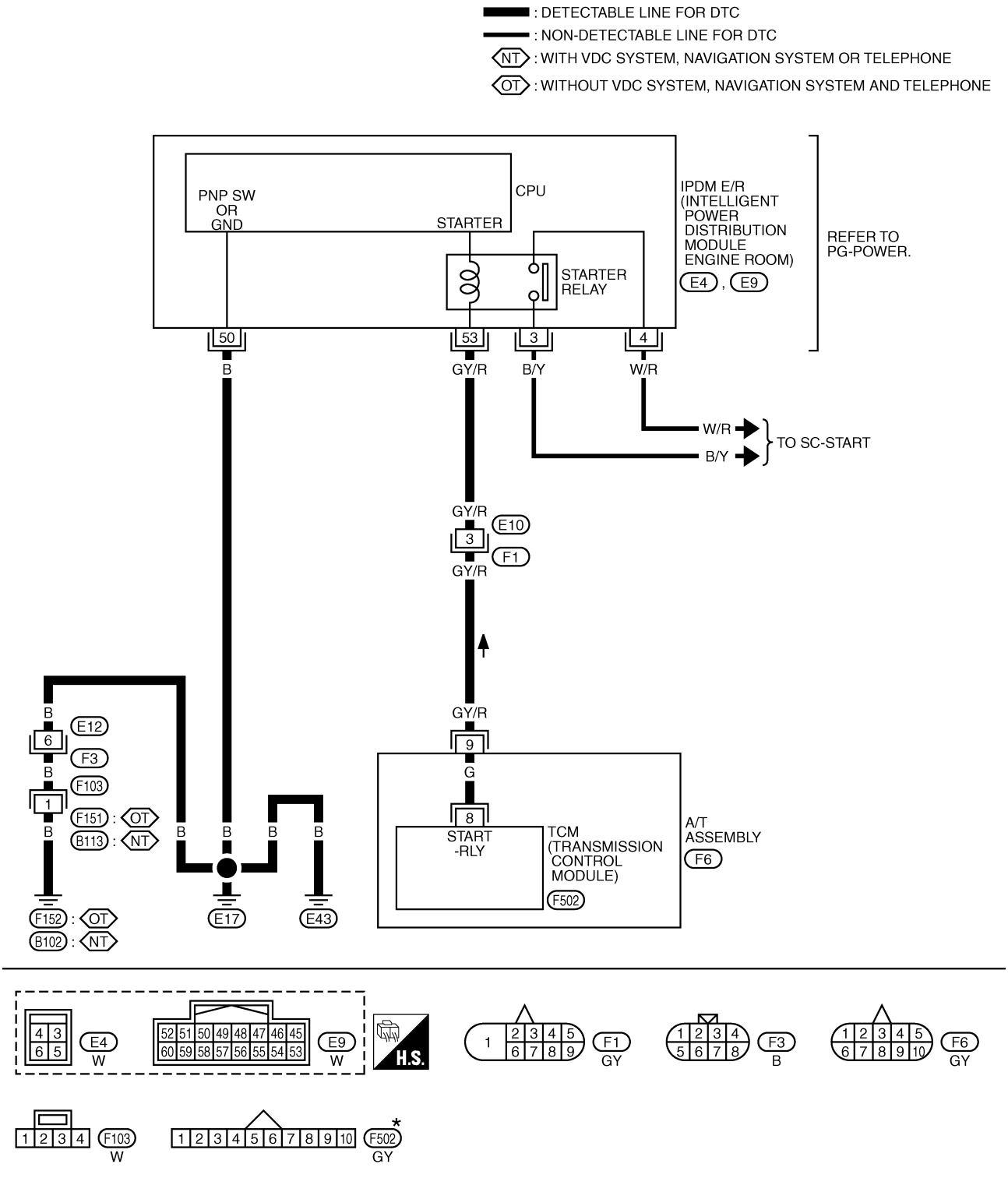
WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine.
5. Vehicle start for at least 2 consecutive seconds.
6. If DTC is detected, go to AT-99, "Diagnostic Procedure" .

Wiring Diagram — AT — STSIG

NCS0002R

AT-STSIG-01



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWT0438E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
9	GY/R	Starter relay		Selector lever in “N” and “P” positions.	Battery voltage
				Selector lever in other positions.	0 V

Diagnostic Procedure

NCS0002S

1. CHECK STARTER RELAY

With CONSULT-III

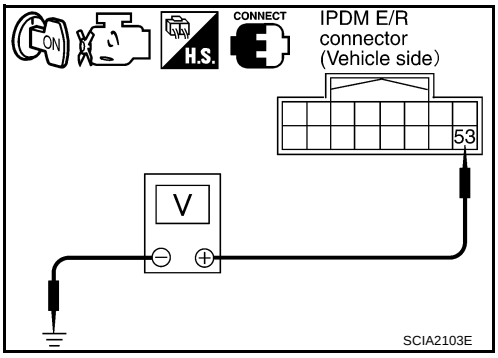
1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “STARTER RELAY” ON/OFF.

Item name	Condition	Display value
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between the IPDM E/R connector and ground.

Item	Connector	Terminal	Shift position	Voltage (Approx.)
Starter relay	E9	53 – Ground	“N”, “P”	Battery voltage
			Other positions	0 V



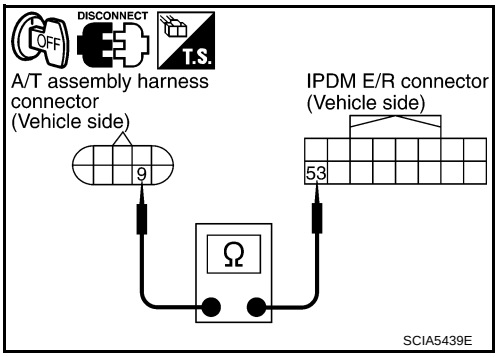
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK HARNESS BETWEEN A/T ASSEMBLY HARNESS CONNECTOR AND IPDM E/R CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector and IPDM E/R connector.
3. Check continuity between A/T assembly harness connector and IPDM E/R connector.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	9	Yes
IPDM E/R connector	E9	53	



4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

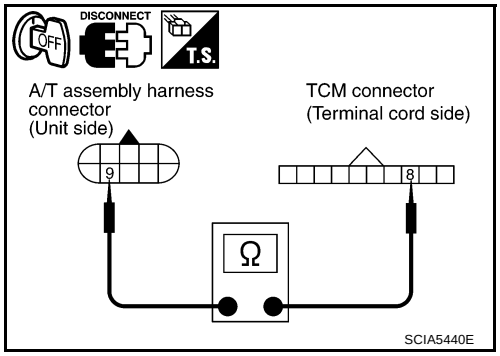
OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK TERMINAL CORD ASSEMBLY

1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminal and TCM connector terminal.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	9	Yes
TCM connector	F502	8	



4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

4. DETECT MALFUNCTIONING ITEM

Check the following.

- Starter relay, Refer to SC-8, "STARTING SYSTEM" .
- IPDM E/R, Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

5. CHECK DTC

Perform AT-97, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0700 TCM

PFP:31036

Description

NCS0002T

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls A/T.

On Board Diagnosis Logic

NCS0002U

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0700 TCM” with CONSULT-III is detected when TCM is malfunctioning.

Possible Cause

NCS0002V

TCM.

DTC Confirmation Procedure

NCS0002W

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine.
5. Run engine for at least 2 consecutive seconds at idle speed.
6. If DTC is detected, go to AT-101, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0002X

1. CHECK DTC

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “ERASE”.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Perform AT-101, "DTC Confirmation Procedure" .

Is the “TCM” displayed again?

YES >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NO >> **INSPECTION END**

DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

Description

NCS0002Y

- PNP switch includes a transmission range switch.
- The transmission range switch detects the selector lever position and sends a signal to the TCM.

CONSULT-III Reference Value

NCS0002Z

Item name	Condition	Display value
SLCT LVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D

On Board Diagnosis Logic

NCS00030

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0705 PNP SW/CIRC” with CONSULT-III or 9th judgment flicker without CONSULT-III is detected under the following conditions.

– When TCM does not receive the correct voltage signal from PNP switch 1, 2, 3 and 4 based on the gear position.

– When no other position but “P” position is detected from “N” position.

Possible Cause

NCS00031

- Harness or connectors
  PNP switch 1, 2, 3, 4 and TCM circuit is open or shorted.
- PNP switch 1, 2, 3 and 4

DTC Confirmation Procedure

NCS00032

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   ACCELE POSI: More than 1.0/8
6. If DTC is detected, go to AT-104, "Diagnostic Procedure" .

WITH GST

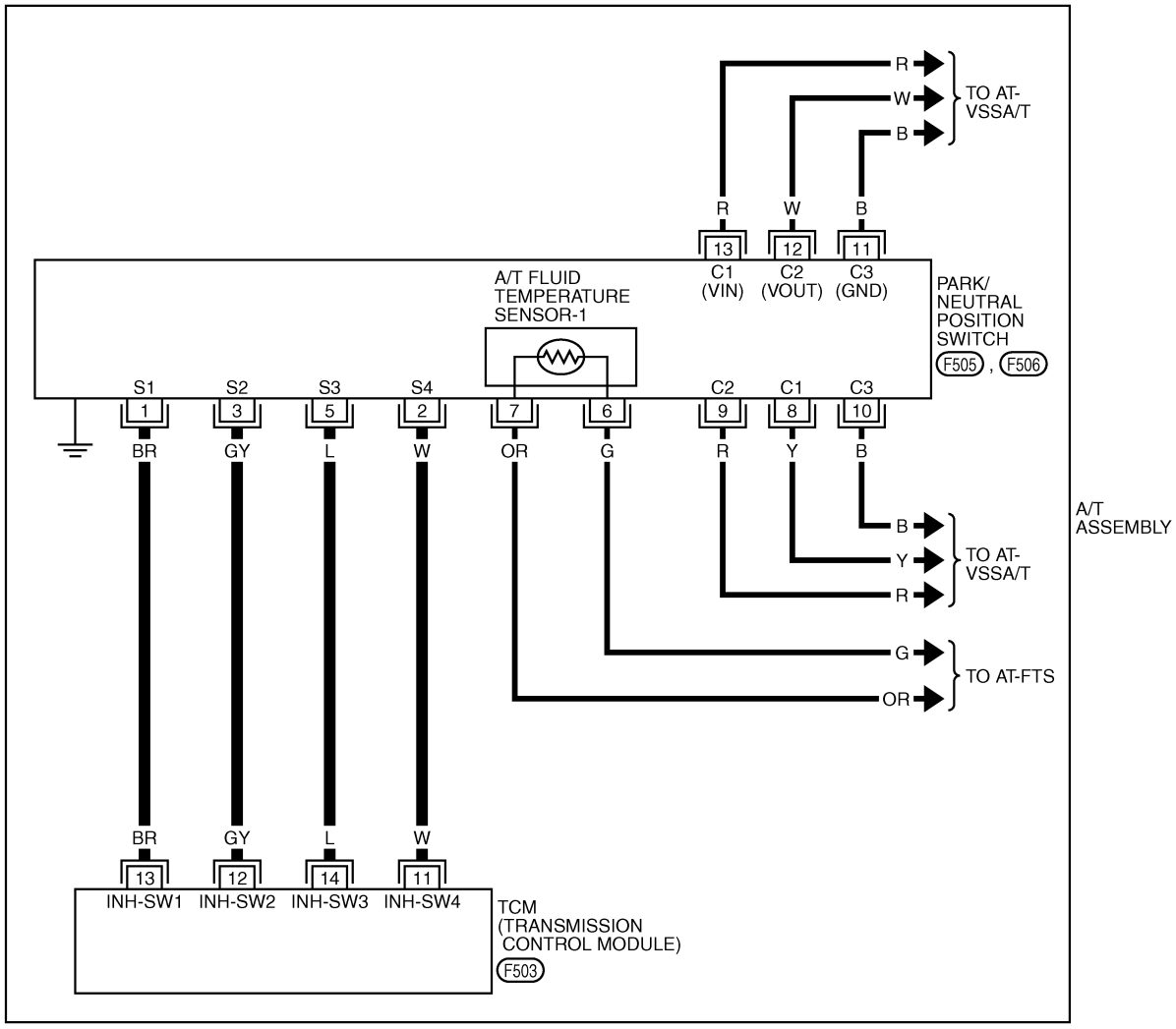
Follow the procedure “WITH CONSULT-III”.

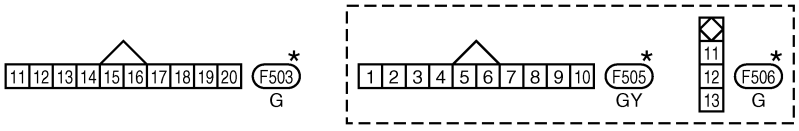
Wiring Diagram — AT — PNP/SW

NCS00033

AT-PNP/SW-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0248E

Diagnostic Procedure

NCS00034

1. CHECK PNP SW CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Check if correct selector lever position (N/P, R or D) is displayed as selector lever is moved into each position.

Item name	Condition	Display value
SLCT LVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D

OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

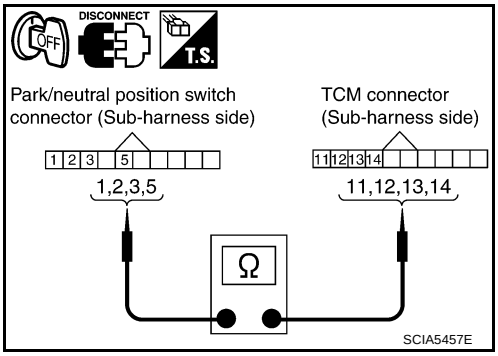
Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.



Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	1	Yes
TCM connector	F503	13	
Park/neutral position switch connector	F505	2	Yes
TCM connector	F503	11	
Park/neutral position switch connector	F505	3	Yes
TCM connector	F503	12	
Park/neutral position switch connector	F505	5	Yes
TCM connector	F503	14	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. CHECK DTC

Perform AT-102, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

DTC P0717 TURBINE REVOLUTION SENSOR

PFP:31935

Description

NCS0019V

The turbine revolution sensor detects input shaft rpm (revolutions per minute). It is located on the input side of the A/T. Monitors revolution of sensor 1 and sensor 2 for non-standard conditions.

CONSULT-III Reference Value

NCS0019W

Item name	Condition	Display value
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.

On Board Diagnosis Logic

NCS0019X

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0717 TURBINE REV S/CIRC” with CONSULT-III or 11th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - When TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.

Possible Cause

NCS0019Y

- Harness or connectors
  (Sensor circuit is open or shorted.)
- Turbine revolution sensor 1 and/or 2

DTC Confirmation Procedure

NCS0019Z

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI”, “ENGINE SPEED”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-A/T: 40 km/h (25 MPH) or more
   ACCELE POSI: More than 0.5/8
   ENGINE SPEED: 1,500 rpm or more
   SLCT LVR POSI: “D” position
   GEAR (Turbine revolution sensor 1): “4” or “5” position
   GEAR (Turbine revolution sensor 2): All positions
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected, go to AT-107, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS001A0

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Vehicle start and read out the value of “TURBINE REV”.

Item name	Condition	Display value
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-106, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)

PFP:32702

Description

NCS00035

The revolution sensor detects the revolution of the parking gear and emits a pulse signal. The pulse signal is sent to the TCM which converts it into vehicle speed.

CONSULT-III Reference Value

NCS00036

Item name	Condition	Display value
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.

On Board Diagnosis Logic

NCS00037

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0720 VEH SPD SEN/CIR AT” with CONSULT-III or 1st judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - After ignition switch is turned ON, irregular signal input from vehicle speed sensor MTR before the vehicle starts moving.

Possible Cause

NCS00038

- Harness or connectors
  (Sensor circuit is open or shorted.)
- Revolution sensor
- Vehicle speed sensor MTR

DTC Confirmation Procedure

NCS00039

CAUTION:

- **Always drive vehicle at a safe speed.**
- **Be careful not to rev engine into the red zone on the tachometer.**

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Drive vehicle and check for an increase of “VHCL/S SE-A/T” value in response to “VHCL/S SE-MTR” value.
   If the check result is NG, go to AT-111, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
5. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI”, “ENGINE SPEED” and “SLCT LVR POSI”.
6. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-A/T: 30 km/h (19 MPH) or more
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
   If the check result is NG, go to AT-111, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
7. Maintain the following conditions for at least 5 consecutive seconds.
   ENGINE SPEED: 3,500 rpm or more
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position

Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

8. If DTC is detected, go to AT-111, "Diagnostic Procedure" .

WITH GST

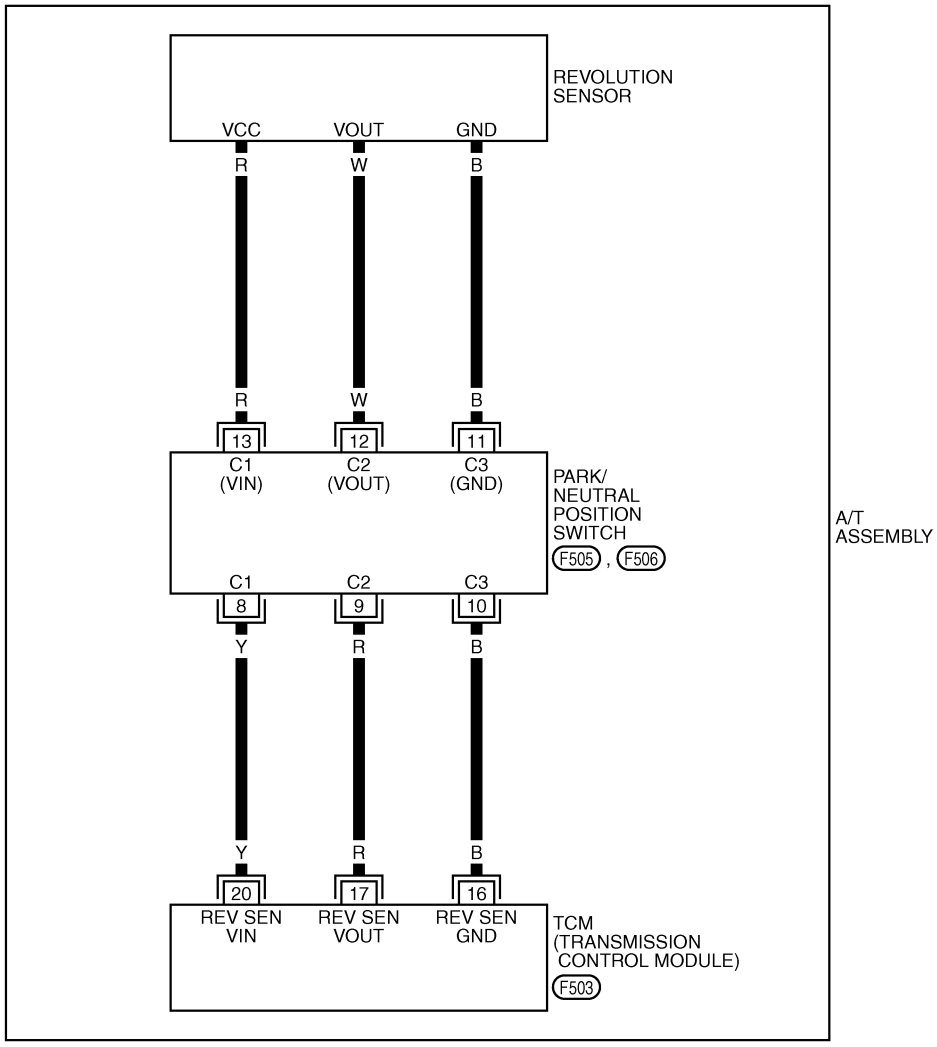
Follow the procedure “WITH CONSULT-III”.

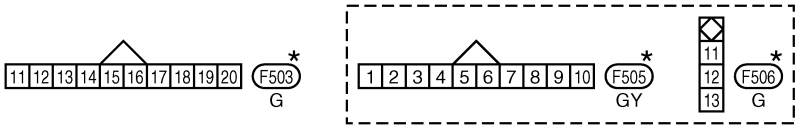
Wiring Diagram — AT — VSSA/T

NCS0003A

AT-VSSA/T-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0249E

Diagnostic Procedure

NCS0003B

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “VHCL/S SE-A/T” while driving. Check the value changes according to driving speed.

Item name	Condition	Display value
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.

OK or NG

OK >> GO TO 6.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

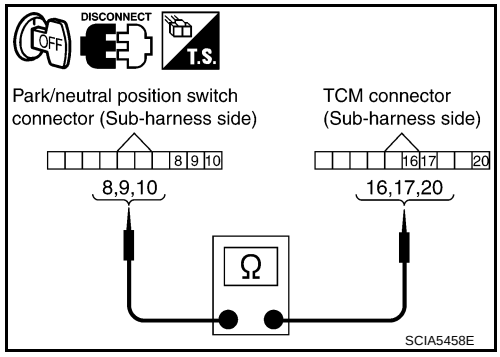
Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.



Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	8	Yes
TCM connector	F503	20	
Park/neutral position switch connector	F505	9	Yes
TCM connector	F503	17	
Park/neutral position switch connector	F505	10	Yes
TCM connector	F503	16	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> GO TO 5.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. REPLACE THE REVOLUTION SENSOR AND CHECK DTC

1. Replace revolution sensor. Refer to AT-235, "Revolution Sensor" .
2. Perform AT-108, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

6. CHECK DTC

Perform AT-108, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0725 ENGINE SPEED SIGNAL

PFP:24825

Description

NCS0003C

The engine speed signal is sent from the ECM to the TCM.

CONSULT-III Reference Value

NCS0003D

Item name	Condition	Display value
ENGINE SPEED	Engine running	Closely matches the tachometer reading.

On Board Diagnosis Logic

NCS0003E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0725 ENGINE SPEED SIG” with CONSULT-III or 16th judgment flicker without CONSULT-III is detected when TCM does not receive the ignition signal from ECM during engine cranking or running.

Possible Cause

NCS0003F

Harness or connectors
(ECM to TCM circuit is open or shorted.)

DTC Confirmation Procedure

NCS0003G

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI” and “SLCT LVR POSI”.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 10 consecutive seconds.
   VHCL/S SE-A/T: 10 km/h (6 MPH) or more
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position
5. If DTC is detected, go to AT-114, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0003H

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK DTC WITH TCM

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. While monitoring engine speed, check for engine speed change corresponding to wide-open throttle position signal.

Item name	Condition	Display value
ENGINE SPEED	Engine running	Closely matches the tachometer reading.

OK or NG

OK >> GO TO 3.
NG >> Check the ignition signal circuit. Refer to EC-698, "IGNITION SIGNAL" .

3. CHECK DTC

Perform AT-113, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 4.

4. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P0731 A/T 1ST GEAR FUNCTION

PFP:31940

Description

NCS001SB

This malfunction is detected when the A/T does not shift into 1st gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SC

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0731 A/T 1ST GR FNCTN” with CONSULT-III or 18th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SD

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001SE

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “1ST GR FNCTN P0731” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “1” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0731 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go to AT-116, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

– Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001SF

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-115, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

Description

NCS001SG

This malfunction is detected when the A/T does not shift into 2nd gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SH

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0732 A/T 2ND GR FNCTN” with CONSULT-III or 19th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SI

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001SJ

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “2ND GR FNCTN P0732” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “2” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0732 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go to AT-118, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

– Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001T0

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-117, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

Description

NCS001SL

This malfunction is detected when the A/T does not shift into 3rd gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SM

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0733 A/T 3RD GR FNCTN” with CONSULT-III or 20th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SN

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001SO

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “3RD GR FNCTN P0733” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “3” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0732 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go to AT-120, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

– Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001T1

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-119, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

Description

NCS001SQ

This malfunction is detected when the A/T does not shift into 4th gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SR

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0734 A/T 4TH GR FNCTN” with CONSULT-III or 21th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SS

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001ST

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “4TH GR FNCTN P0734” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “4” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0734 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go toAT-122, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

- Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001T2

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-121, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0735 A/T 5TH GEAR FUNCTION

PFP:31940

Description

NCS001SV

This malfunction is detected when the A/T does not shift into 5th gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SW

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0735 A/T 5TH GR FNCTN” with CONSULT-III or 22th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SX

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001SY

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “5TH GR FNCTN P0735” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “5” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0735 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go to AT-124, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

– Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001T3

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-123, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

Description

NCS0003I

- Torque converter clutch solenoid valve is activated, with the gear in D_4 , D_5 , M_2 , M_3 , M_4 and M_5 by the TCM in response to signals sent from the vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Torque converter clutch piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1.0/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

CONSULT-III Reference Value

NCS0003J

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

On Board Diagnosis Logic

NCS0003K

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0740 TCC SOLENOID/CIRC” with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0003L

- Torque converter clutch solenoid valve
- Harness or connectors
  (Solenoid circuit is open or shorted.)

DTC Confirmation Procedure

NCS0003M

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI” and “SLCT LVR POSI”.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-A/T: 80 km/h (50 MPH) or more
   ACCELE POSI: 0.5/8 – 1.0/8
   SLCT LVR POSI: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected go to AT-126, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0003N

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “TCC SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-125, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)

PFP:31940

Description

NCS0003O

This malfunction is detected when the A/T does not shift into 5th gear position or the torque converter clutch does not lock-up as instructed by the TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

CONSULT-III Reference Value

NCS0003P

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

On Board Diagnosis Logic

NCS0003Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0744 A/T TCC S/V FNCTN” with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.
  - When A/T cannot perform lock-up even if electrical circuit is good.
  - When TCM detects as irregular by comparing difference value with slip rotation.

Possible Cause

NCS0003R

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Torque converter clutch solenoid valve
- Hydraulic control circuit

DTC Confirmation Procedure

NCS0003S

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start engine.
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle and maintain the following conditions for at least 30 consecutive seconds.
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position
   TCC SOLENOID: 0.4 – 0.6 A
   VEHICLE SPEED: 80 km/h (50 MPH) or more
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected, go to AT-128, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0003T

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “TCC SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-127, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0745 LINE PRESSURE SOLENOID VALVE

PFP:31940

Description

NCS0003U

The line pressure solenoid valve regulates oil pump discharge pressure to suit the driving condition in response to a signal sent from the TCM.

CONSULT-III Reference Value

NCS0003V

Item name	Condition	Display value (Approx.)
LINE PRES SOL	During driving	0.2 – 0.6 A

On Board Diagnosis Logic

NCS0003W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0745 L/PRESS SOL/CIRC” with CONSULT-III or 4th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0003X

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Line pressure solenoid valve

DTC Confirmation Procedure

NCS0003Y

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine and wait at least 5 seconds.
5. If DTC is detected, go to “AT-130, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0003Z

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “LINE PRES SOL” while driving.

Item name	Condition	Display value (Approx.)
LINE PRES SOL	During driving	0.2 – 0.6 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-129, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1705 THROTTLE POSITION SENSOR

PFP:22620

Description

NCS0004A

Electric throttle control actuator consists of throttle control motor, accelerator pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the ECM, and ECM sends signals to TCM with CAN communication.

CONSULT-III Reference Value

NCS0004B

Item name	Condition	Display value (Approx.)
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8

On Board Diagnosis Logic

NCS0004C

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1705 TP SEN/CIRC A/T” with CONSULT-III or 15th judgment flicker without CONSULT-III is detected when TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.

Possible Cause

NCS0004D

Harness or connectors
(Sensor circuit is open or shorted.)

DTC Confirmation Procedure

NCS0004E

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine and let it idle for 1 second.
5. If DTC is detected, go to AT-132, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0004F

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK DTC WITH TCM

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Depress accelerator pedal and read out the value of “ACCELE POSI”.

Item name	Condition	Display value (Approx.)
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8

4. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-III. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE"

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK DTC WITH ECM

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” mode for “ENGINE” with CONSULT-III. Refer to EC-116, "CONSULT-III Function (ENGINE)" .

OK or NG

OK >> GO TO 4.
NG >> Check the DTC detected item. Refer to EC-116, "CONSULT-III Function (ENGINE)" .
- If CAN communication line is detected, go to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .

4. CHECK DTC

Perform AT-131, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Repair or replace damaged parts.

DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31940

Description

NCS0004G

The A/T fluid temperature sensor detects the A/T fluid temperature and sends a signal to the TCM.

CONSULT-III Reference Value

NCS0004H

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 1	0 (32) – 20 (68) – 80 (176)	3.3 – 2.7 – 0.9 V
ATF TEMP SE 2		3.3 – 2.5 – 0.7 V

On Board Diagnosis Logic

NCS0004I

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1710 (A/T), P0710 (ENGINE) ATF TEMP SEN/CIRC” with CONSULT-III or 10th judgment flicker without CONSULT-III is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

NCS0004J

- Harness or connectors
  (Sensor circuit is open or shorted.)
- A/T fluid temperature sensors 1 and/or 2

DTC Confirmation Procedure

NCS0004K

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI” and “SLCT LVR POSI”.
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)
   VHCL/S SE-A/T: 10 km/h (6 MPH) or more
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position
4. If DTC is detected, go to AT-136, "Diagnostic Procedure" .

WITH GST

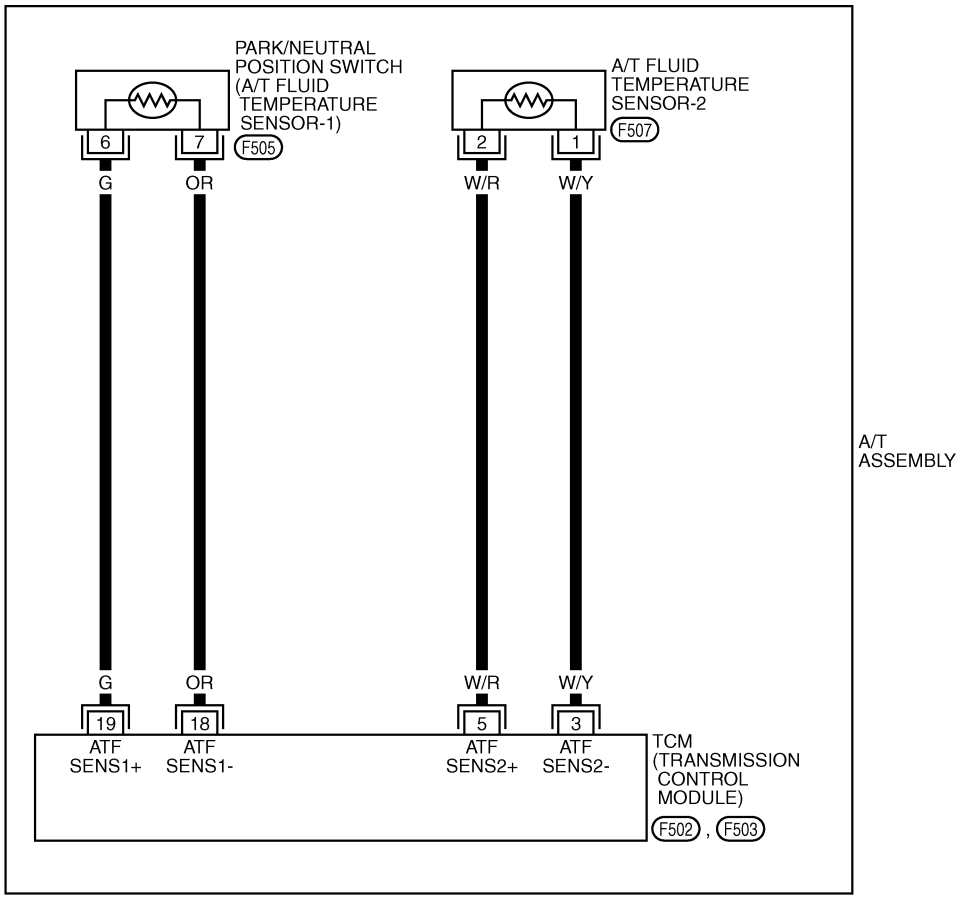
Follow the procedure “WITH CONSULT-III”.

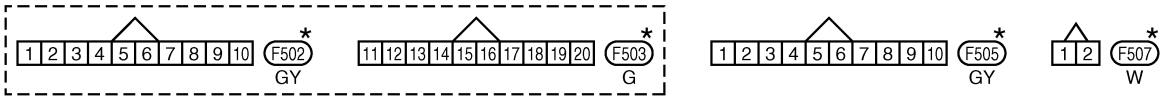
Wiring Diagram — AT — FTS

NCS0004L

AT-FTS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWT0374E

Diagnostic Procedure

NCS0004M

1. CHECK A/T FLUID TEMPERATURE SENSOR 1 SIGNAL

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out the value of “ATF TEMP SE 1”.

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 1	0 (32) – 20 (68) – 80 (176)	3.3 – 2.7 – 0.9 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK A/T FLUID TEMPERATURE SENSOR 2 SIGNAL

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out the value of “ATF TEMP SE 2”.

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 2	0 (32) – 20 (68) – 80 (176)	3.3 – 2.5 – 0.7 V

OK or NG

OK >> GO TO 8.
NG >> GO TO 5.

3. CHECK A/T FLUID TEMPERATURE SENSOR 1

Check A/T fluid temperature sensor 1. Refer to AT-138, "A/T FLUID TEMPERATURE SENSOR 1" .

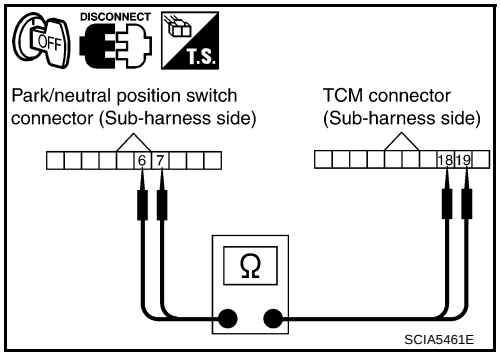
OK or NG

OK >> GO TO 4.
NG >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

4. CHECK SUB-HARNESS

1. Disconnect park/neutral position switch connector and TCM connector.
2. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	6	Yes
TCM connector	F503	19	
Park/neutral position switch connector	F505	7	Yes
TCM connector	F503	18	



3. If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. CHECK A/T FLUID TEMPERATURE SENSOR 2

Check A/T fluid temperature sensor 2. Refer to AT-138, "A/T FLUID TEMPERATURE SENSOR 2" .

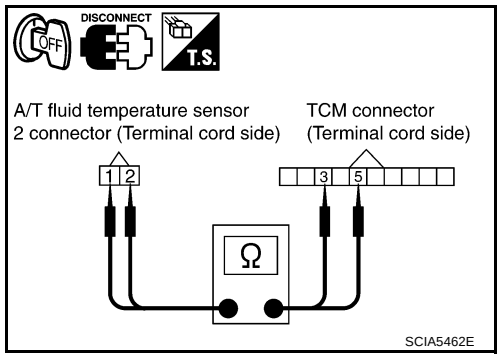
OK or NG

OK >> GO TO 6.
NG >> Replace A/T fluid temperature sensor 2. Refer to AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .

6. CHECK TERMINAL CORD ASSEMBLY

1. Disconnect A/T fluid temperature sensor 2 connector and TCM connector.
2. Check continuity between A/T fluid temperature sensor 2 connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T fluid temperature sensor 2 connector	F507	1	Yes
TCM connector	F502	3	
A/T fluid temperature sensor 2 connector	F507	2	Yes
TCM connector	F502	5	



3. If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

7. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

1. Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .
2. Reinstall any part removed.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

8. CHECK DTC

Perform AT-134, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 1.

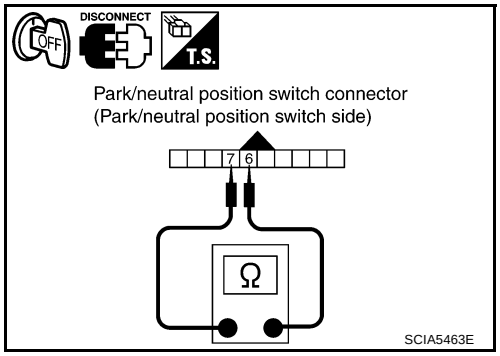
Component Inspection

NCS0004N

A/T FLUID TEMPERATURE SENSOR 1

1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check resistance between terminals.

Name	Connector	Terminal	Temperature °C (°F)	Resistance (Approx.)
A/T fluid temperature sensor 1	F505	6 – 7	0 (32)	15 kΩ
			20 (68)	6.5 kΩ
			80 (176)	0.9 kΩ

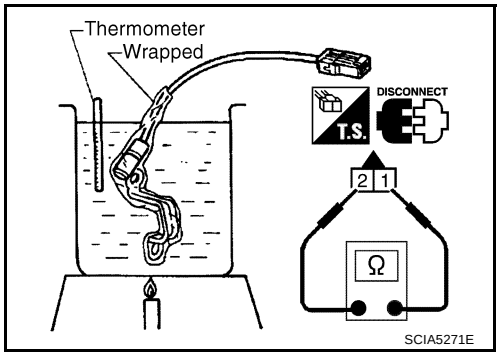


3. If NG, replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

A/T FLUID TEMPERATURE SENSOR 2

1. Remove A/T fluid temperature sensor 2. Refer to AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .
2. Check resistance between terminals.

Name	Connector	Terminal	Temperature °C (°F)	Resistance (Approx.)
A/T fluid temperature sensor 2	F507	1 – 2	0 (32)	10 kΩ
			20 (68)	4 kΩ
			80 (176)	0.5 kΩ



3. If NG, replace A/T fluid temperature sensor 2. Refer to AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .

DTC P1721 VEHICLE SPEED SENSOR MTR

PFP:24814

Description

NCS0004U

The vehicle speed sensor·MTR signal is transmitted from combination meter to TCM by CAN communication line. The signal functions as an auxiliary device to revolution sensor when it is malfunctioning. The TCM will then use the vehicle speed sensor·MTR signal.

CONSULT-III Reference Value

NCS0004V

Item name	Condition	Display value
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.

On Board Diagnosis Logic

NCS0004W

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1721 VEH SPD SE/CIR-MTR” with CONSULT-III is detected when TCM does not receive the proper vehicle speed sensor MTR signal (input by CAN communication) from unified meter and A/C amp.

Possible Cause

NCS0004X

Harness or connectors
(Sensor circuit is open or shorted.)

DTC Confirmation Procedure

NCS0004Y

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-MTR: 30 km/h (19 MPH) or more
   ACCELE POSI: 1.0/8 or less
5. If DTC is detected, go to AT-140, "Diagnostic Procedure" .

Diagnostic Procedure

NCS0004Z

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is malfunction in the CAN communication indicated in the result?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK INPUT SIGNAL

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle and read out the value of “VHCL/S SE-MTR”.

Item name	Condition	Display value
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK UNIFIED METER AND A/C AMP.

Check unified meter and A/C amp. Refer to DI-44, "UNIFIED METER AND A/C AMP" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-139, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P1730 A/T INTERLOCK

PFP:00000

Description

NCS00050

Fail-safe function to detect interlock conditions.

On Board Diagnosis Logic

NCS00051

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1730 A/T INTERLOCK” with CONSULT-III or 12th judgment flicker without CONSULT-III is detected when TCM does not receive the proper voltage signal from the sensor and switch.
- TCM monitors and compares gear position and conditions of each ATF pressure switch when gear is steady.

Possible Cause

NCS00052

- Harness or connectors
  (Solenoid and switch circuit is open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

DTC Confirmation Procedure

NCS00053

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   SLCT LVR POSI: “D” position
6. If DTC is detected, go to AT-142, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Judgment of A/T Interlock

NCS00054

- When A/T Interlock is judged to be malfunctioning, the vehicle should be fixed in 2nd gear, and should be set in a condition in which it can travel.

  NOTE:
  When the vehicle is driven fixed in 2nd gear, a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.
- When interlock is detected at the 3rd gear or more, it is locked at the 2nd gear.

Diagnostic Procedure

NCS00055

1. SELF-DIAGNOSIS

With CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Select “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.

Without CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Perform self-diagnosis. Refer to AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG

OK >> GO TO 2.
NG >> Check low coast brake solenoid valve circuit and function. Refer to AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" , AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" .

2. CHECK DTC

Perform AT-141, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P1731 A/T 1ST ENGINE BRAKING

PFP:00000

Description

NCS00056

Fail-safe function to prevent sudden decrease in speed by engine brake other than at M1 position.

CONSULT-III Reference Value

NCS00057

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

NCS00058

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1731 A/T 1ST E/BRAKING” with CONSULT-III or 13th judgment flicker without CONSULT-III is detected under the following conditions.

– When TCM does not receive the proper voltage signal from the sensor.

– When TCM monitors each ATF pressure switch and solenoid monitor value, and detects as irregular when engine brake of 1st gear acts other than at M1 position.

Possible Cause

NCS00059

- Harness or connectors
  (The sensor circuit is open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

DTC Confirmation Procedure

NCS0005A

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously preformed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ENGINE SPEED”, “MANU MODE SW” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   ENGINE SPEED: 1,200 rpm
   MANU MODE SW: ON
   GEAR: “1” position
6. If DTC is detected, go to AT-144, "Diagnostic Procedure" .

Diagnostic Procedure

NCS0005B

1. CHECK INPUT SIGNALS

With CONSULT-III

1. Start engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle in the “M” position (1st gear), and confirm the ON/OFF actuation of “ATF PRES SW 2” and “ON OFF SOL”.

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-143, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1752 INPUT CLUTCH SOLENOID VALVE

PFP:31940

Description

NCS0005C

Input clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS0005D

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 – 0.05 A

On Board Diagnosis Logic

NCS0005E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1752 I/C SOLENOID/CIRC” with CONSULT-III or 5th judgment flicker CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0005F

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Input clutch solenoid valve

DTC Confirmation Procedure

NCS0005G

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 – 2.0/8
   SLCT LVR POSI: “D” position
   GEAR: “3” ⇒ “4” (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
6. If DTC is detected go to “AT-146, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0005H

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “I/C SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 – 0.05 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-145, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1757 FRONT BRAKE SOLENOID VALVE

PFP:31940

Description

NCS0005O

Front brake solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS0005P

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 – 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 – 0.05 A

On Board Diagnosis Logic

NCS0005Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1757 FR/B SOLENOID/CIRC” with CONSULT-III or 6th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0005R

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Front brake solenoid valve

DTC Confirmation Procedure

NCS0005S

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before preforming the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 – 2.0/8
   SLCT LVR POSI: “D” position
   GEAR: “3” ⇒ “4” (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
6. If DTC is detected go to AT-148, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0005T

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “FR/B SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 – 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 – 0.05 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-147, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1762 DIRECT CLUTCH SOLENOID VALVE

PFP:31940

Description

NCS00060

Direct clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS00061

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 – 0.05 A

On Board Diagnosis Logic

NCS00062

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1762 D/C SOLENOID/CIRC” with CONSULT-III or 2nd judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS00063

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Direct clutch solenoid valve

DTC Confirmation Procedure

NCS00064

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 – 2.0/8
   SLCT LVR POSI: “D” position
   GEAR: “1” ⇒ “2” (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
6. If DTC is detected, go to AT-150, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS00065

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “D/C SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 – 0.05 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-149, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

PFP:31940

Description

NCS0006C

High and low reverse clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS0006D

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 – 0.05 A

On Board Diagnosis Logic

NCS0006E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1767 HLR/C SOL/CIRC” with CONSULT-III or 8th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0006F

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- High and low reverse clutch solenoid valve

DTC Confirmation Procedure

NCS0006G

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 – 2.0/8
   SLCT LVR POSI: “D” position
   GEAR: “2” ⇒ “3” (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
6. If DTC is detected, go to AT-152, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0006H

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “HLR/C SOL” while driving.

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 – 0.05 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK TCM

Perform AT-151, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1772 LOW COAST BRAKE SOLENOID VALVE

PFP:31940

Description

NCS0006O

Low coast brake solenoid valve is turned ON or OFF by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS0006P

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

NCS0006Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1772 LC/B SOLENOID/CIRC” with CONSULT-III or 7th judgment flicker without CONSULT-III is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

NCS0006R

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Low coast brake solenoid valve

DTC Confirmation Procedure

NCS0006S

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “MANU MODE SW” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   MANU MODE SW: ON
   GEAR: “1” or “2” (LC/B ON/OFF)
6. If DTC is detected, go to AT-154, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0006T

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “ON OFF SOL” while driving.

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-153, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

PFP:31940

Description

NCS0006U

- Low coast brake solenoid valve is turned ON or OFF by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-III Reference Value

NCS0006V

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

NCS0006W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1774 LC/B SOLENOID FNCT” with CONSULT-III or 7th judgment flicker without CONSULT-III is detected under the following conditions.

– When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 2 is irregular during depressing accelerator pedal (Other than during shift change)

– When TCM detects that relation between gear position and condition of ATF pressure switch 2 is irregular during releasing accelerator pedal (Other than during shift change)

Possible Cause

NCS0006X

- Harness or connectors
  (The solenoid and switch circuits are open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

DTC Confirmation Procedure

NCS0006Y

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   MANU MODE SW: ON
   GEAR: “1” or “2” (LC/B ON/OFF)
3. Perform step 2 again.
4. Turn ignition switch OFF, then perform step 1 to 3 again.
5. Check “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.
   If DTC (P1774) is detected, refer to AT-156, "Diagnostic Procedure" .
   If DTC (P1772) is detected, go to AT-154, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0006Z

1. CHECK INPUT SIGNALS

With CONSULT-III

1. Start engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle in the manual mode (“1” or “2” gear), and confirm the ON/OFF actuation of the “ATF PRES SW 2” and “ON OFF SOL”.

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-155, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1815 MANUAL MODE SWITCH

PFP:34901

Description

NCS00070

Manual mode switch is installed in A/T device. It sends manual mode switch, shift up and shift down switch signals to TCM.
TCM sends the switch signals to unified meter and A/C amp. By CAN communication line. Then manual mode switch position is indicated on the A/T position indicator. For inspection, refer to AT-168, "A/T INDICATOR CIRCUIT" .

CONSULT-III Reference Value in Data Monitor Mode

NCS00071

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF

On Board Diagnosis Logic

NCS00072

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1815 MANU MODE SW/CIRC” with CONSULT-III is detected when TCM monitors Manual mode, Non manual mode, Up or Down switch signal, and detects as irregular when impossible input pattern occurs 1 second or more.

Possible Cause

NCS00073

- Harness or connectors
  (These switches circuit is open or shorted.)
- Manual mode select switch (Into control device)
- Manual mode position select switch (Into control device)

DTC Confirmation Procedure

NCS00074

CAUTION:
Always drive vehicle at a safe speed.

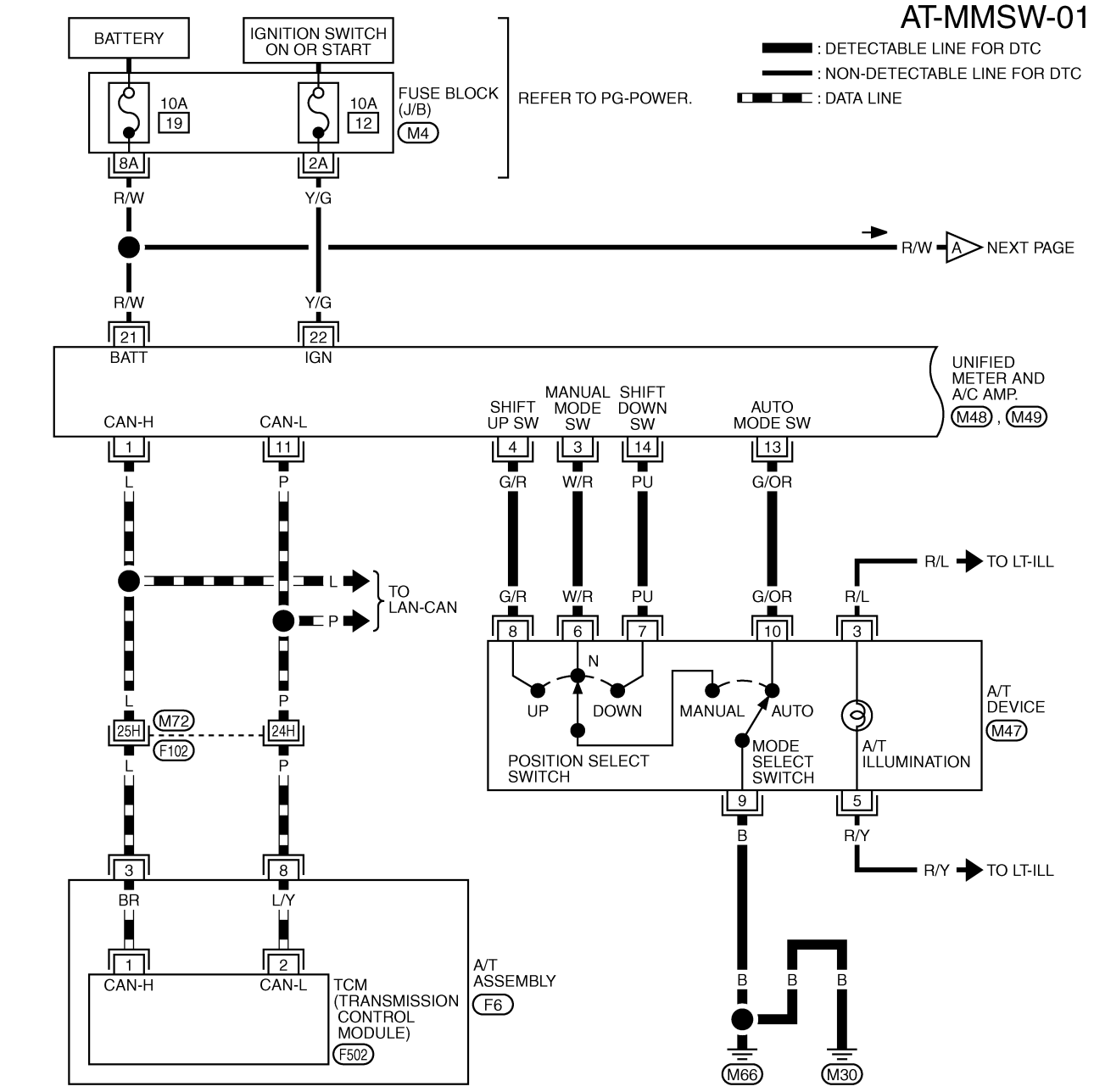
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

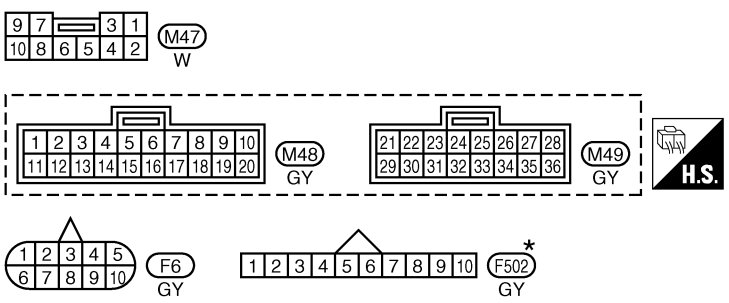
WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Move selector lever to “M” position.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   MANU MODE SW: ON
6. If DTC is detected, go to AT-160, "Diagnostic Procedure" .

Wiring Diagram — AT — MMSW

NCS00075





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

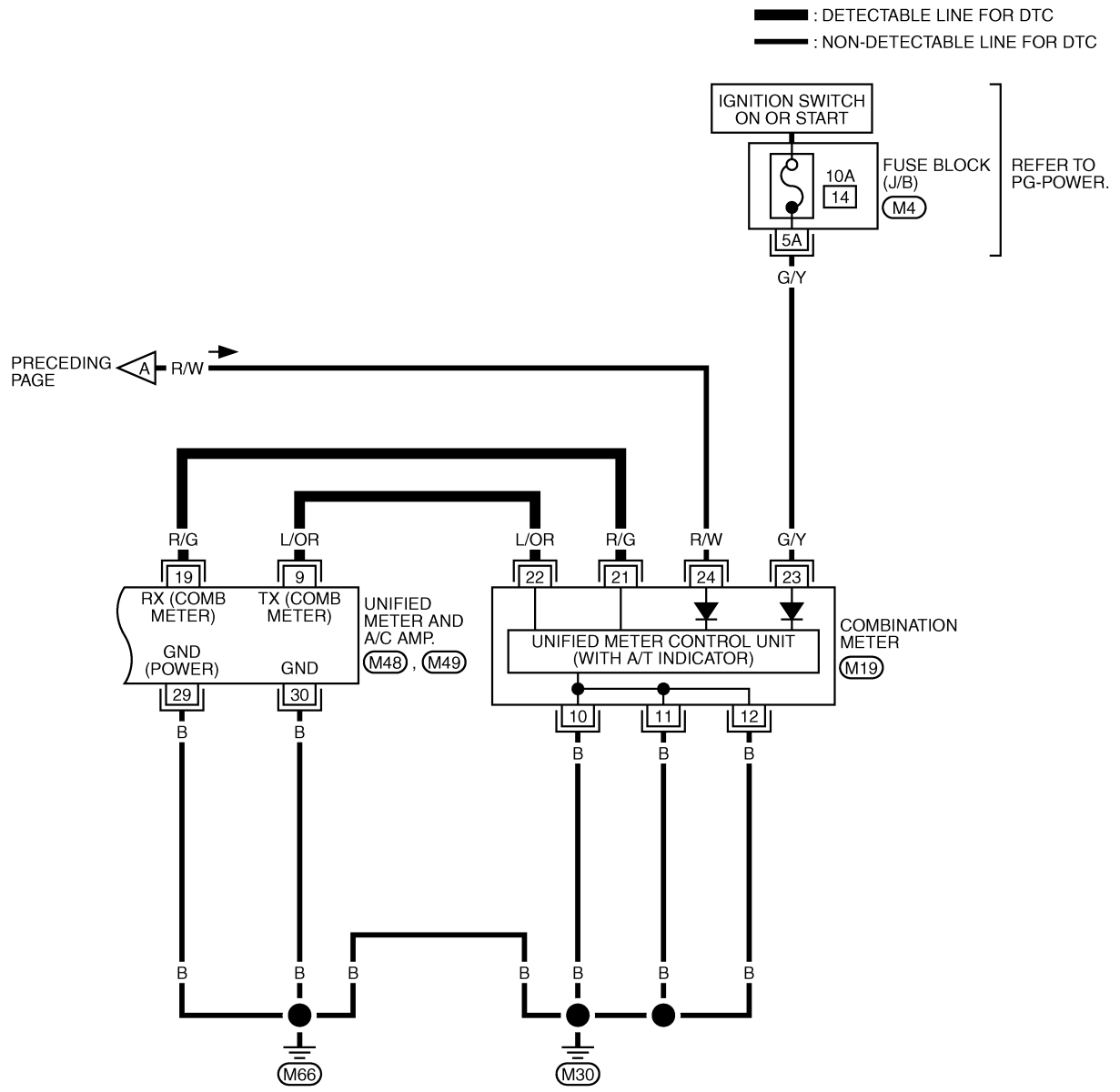
REFER TO THE FOLLOWING.

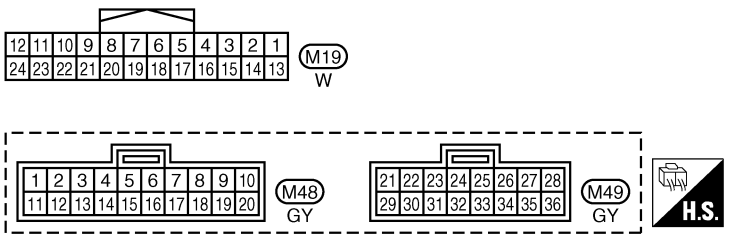
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0439E

AT-MMSW-02





REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWM0263E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	—	—
8	P	CAN-L	—	—

Diagnostic Procedure

NCS00076

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK MANUAL MODE SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out ON/OFF switching action of “MANU MODE SW”, “NON M-MODE SW”, “UP SW LEVER”, “DOWN SW LEVER”.

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	selector lever: +side	ON
	Other than the above	OFF
DOWN SW LEVER	selector lever: -side	ON
	Other than the above	OFF

Without CONSULT-III

Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1st ⇔ 5th gear).

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following.

- Manual mode switch. Refer to AT-161, "Component Inspection" .
- Pin terminals for damage or loose connection with harness connector.
- Open circuit or short to ground or short to power in harness or connector for A/T device (manual mode switch).
- Unified meter and A/C amp. Refer to DI-44, "UNIFIED METER AND A/C AMP" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-157, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

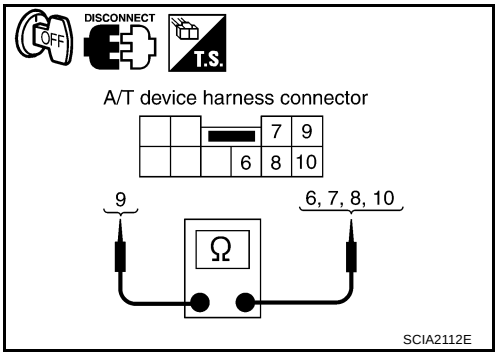
Component Inspection

NCS00077

MANUAL MODE SWITCH

Check continuity between terminals.

Item	Position	Connector	Terminal	Continuity
Manual mode select switch	Auto	M47	9 – 10	Yes
	Manual		6 – 9	
Manual mode position select switch	UP		8 – 9	
	DOWN		7 – 9	



MAIN POWER SUPPLY AND GROUND CIRCUIT

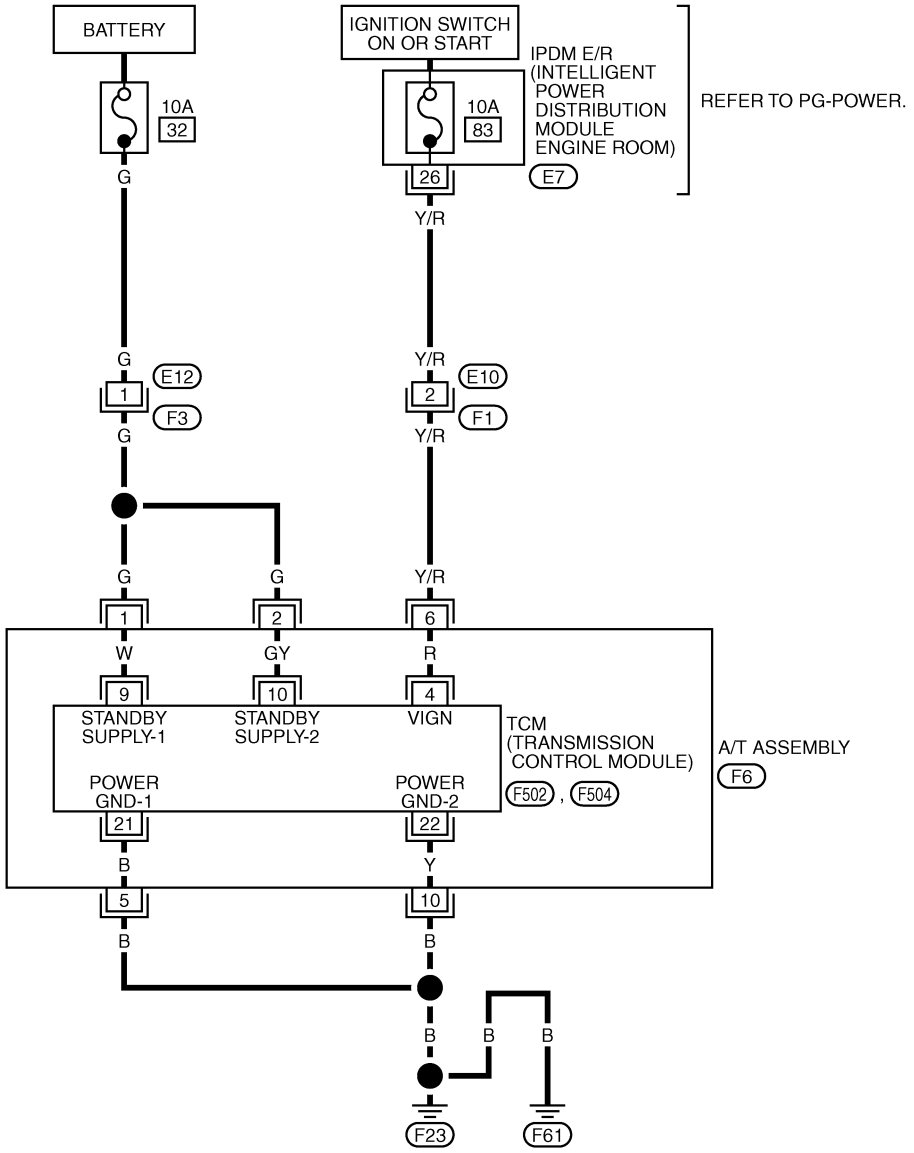
PFP:00100

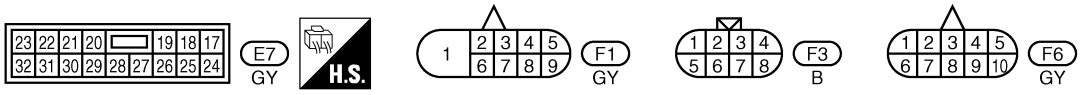
Wiring Diagram — AT — MAIN

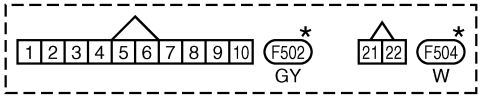
NCS0007W

AT-MAIN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC







*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWT0440E

TCM terminals and data are reference value. Measured between each terminal and ground.

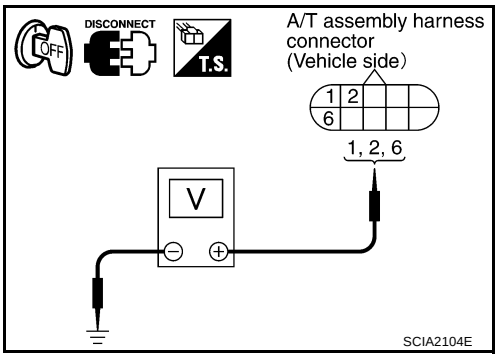
Terminal	Wire color	Item	Condition		Data (Approx.)
1	G	Power supply (Memory back-up)	Always		Battery voltage
2	G	Power supply (Memory back-up)	Always		Battery voltage
5	B	Ground	Always		0 V
6	Y/R	Power supply		—	Battery voltage
				—	0 V
10	B	Ground	Always		0 V

Diagnostic Procedure

NCS0007X

1. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check voltage between A/T assembly harness connector and ground.



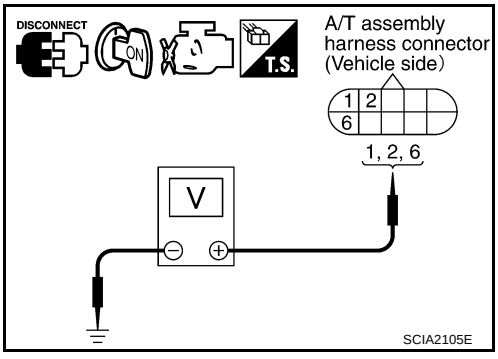
Item	Connector	Terminal	Voltage (Approx.)
TCM	F6	1 – Ground	Battery voltage
		2 – Ground	
		6 – Ground	0 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK TCM POWER SOURCE STEP 2

1. Disconnect A/T assembly harness connector.
2. Turn ignition switch ON.
3. Check voltage between A/T assembly harness connector and ground.



Item	Connector	Terminal	Voltage (Approx.)
TCM	F6	1 – Ground	Battery voltage
		2 – Ground	
		6 – Ground	

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between battery and A/T assembly harness connector terminals 1, 2
- Harness for short or open between ignition switch and A/T assembly harness connector terminal 6
- 10 A fuse (No. 32, located in the fuse and fusible link block) and 10 A fuse (No. 83, located in the IPDM E/R)
- Ignition switch, Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

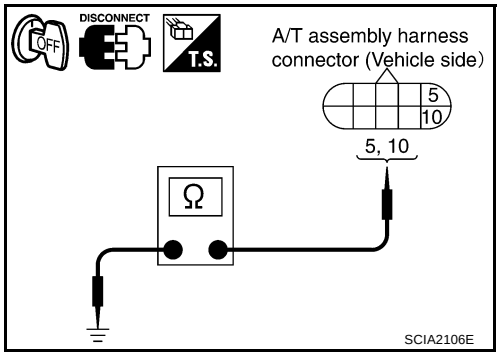
OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check continuity between A/T assembly harness connector terminals and ground.

Item	Connector	Terminal	Continuity
TCM	F6	5, 10 – Ground	Yes



If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

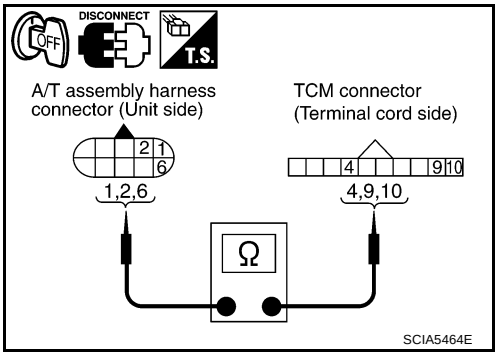
OK or NG

OK >> **INSPECTION END**
NG-1 >> Self-diagnosis does not activate: GO TO 7.
NG-2 >> DTC is displayed: Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

7. CHECK TERMINAL CORD ASSEMBLY

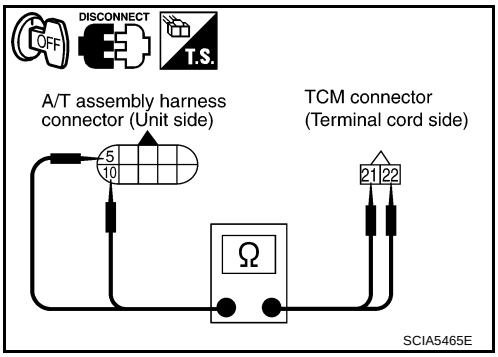
1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	1	Yes
TCM connector	F502	9	
A/T assembly harness connector	F6	2	Yes
TCM connector	F502	10	
A/T assembly harness connector	F6	6	Yes
TCM connector	F502	4	



4. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	5	Yes
TCM connector	F504	21	
A/T assembly harness connector	F6	10	Yes
TCM connector	F504	22	



5. If OK, check harness for short to ground and short to power.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Replace open circuit or short to ground and short to power in harness or connectors.

CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT

PFP:18002

CONSULT-III Reference Value

NCS0007Y

Item name	Condition	Display value
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF

Diagnostic Procedure

NCS0007Z

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK THROTTLE POSITION SIGNAL CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Depress accelerator pedal and read out the value of “CLSD THL POS” and “W/O THL POS”.

Accelerator Pedal Operation	Monitor Item	
	CLSD THL POS	W/O THL POS
Released	ON	OFF
Fully depressed	OFF	ON

OK or NG

OK >> **INSPECTION END**
NG >> Check the following. If NG, repair or replace damaged parts.

- Perform self-diagnosis for “ENGINE” with CONSULT-III. Refer to EC-116, "CONSULT-III Function (ENGINE)" .
- Open circuit or short to ground or short to power in harness or connectors.
- Pin terminals for damage or loose connection with harness connector.

BRAKE SIGNAL CIRCUIT

PFP:25320

CONSULT-III Reference Value

NCS00080

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

Diagnostic Procedure

NCS00081

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK STOP LAMP SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out ON/OFF switching action of the “BRAKE SW”.

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

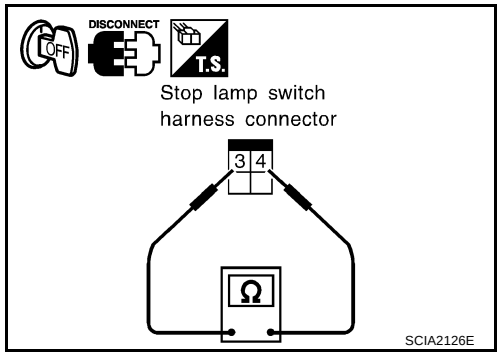
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK STOP LAMP SWITCH

Check continuity between stop lamp switch harness connector E111 terminals 3 and 4. Refer to AT-169, "Wiring Diagram — AT — NON-DTC" .

Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No



Check stop lamp switch after adjusting brake pedal — refer to BR-7, "BRAKE PEDAL" .

OK or NG

OK >> Check the following. If NG, repair or replace damaged parts.
- Harness for short or open between battery and stop lamp switch.
- Harness for short or open between stop lamp switch and unified meter and A/C amp.
- 10 A fuse (No. 20, located in fuse block).

NG >> Repair or replace the stop lamp switch.

A/T INDICATOR CIRCUIT

PFP:24810

Description

NCS00082

The TCM sends the switch signals to unified meter and A/C amp. By CAN communication line. Then manual mode switch position is indicated on the A/T position indicator.

CONSULT-III Reference Value

NCS00083

Item name	Condition	Display value
GEAR	During driving	1, 2, 3, 4, 5

Diagnostic Procedure

NCS00084

1. CHECK INPUT SIGNALS

With CONSULT-III

1. Start engine.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and read out the value of “GEAR”.
3. Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1st ⇔ 5th gear).

OK or NG

OK >> **INSPECTION END**
NG >> Check the following.

A/T INDICATOR SYMPTOM CHART

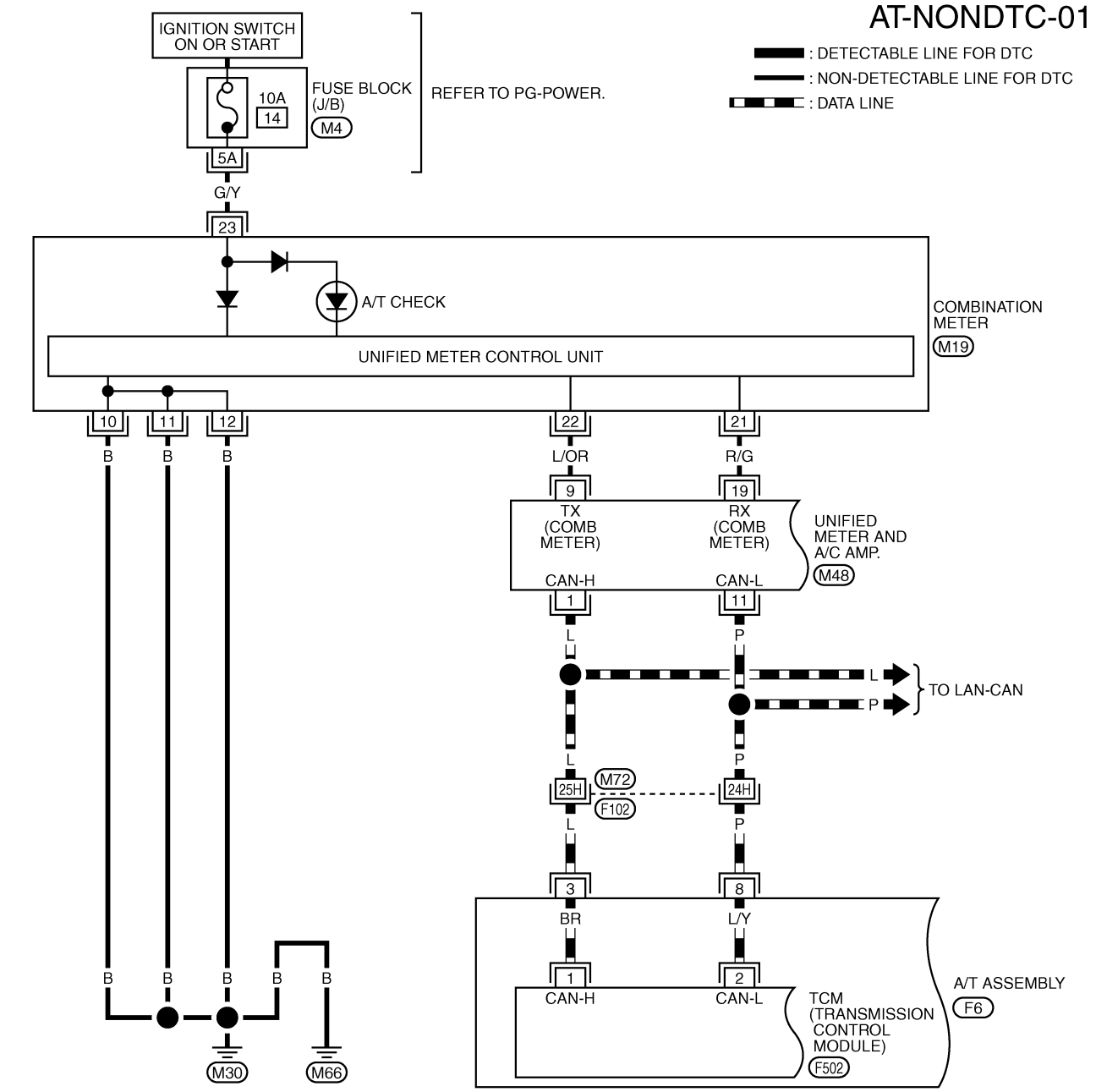
Items	Presumed Location of Trouble
The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). The A/T position indicator is not indicated.	Manual mode switch Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" . A/T main system (Fail-safe function actuated) ● Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .
The actual gear position changes, but the A/T position indicator is not indicated.	Perform the self-diagnosis function. ● Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .
The actual gear position and the indication on the A/T position indicator do not coincide.	Perform the self-diagnosis function. ● Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .
Only a specific position or positions is/are not indicated on the A/T position indicator.	Check the unified meter and A/C amp. ● Refer to DI-4, "COMBINATION METERS" .

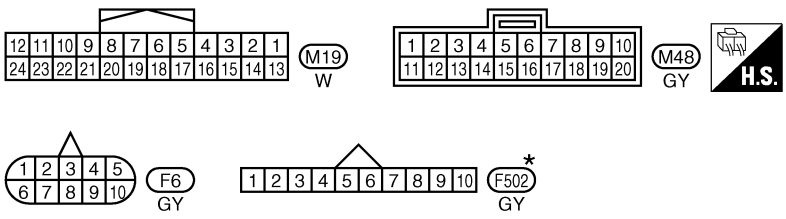
TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Wiring Diagram — AT — NONDTC

NCS00085





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

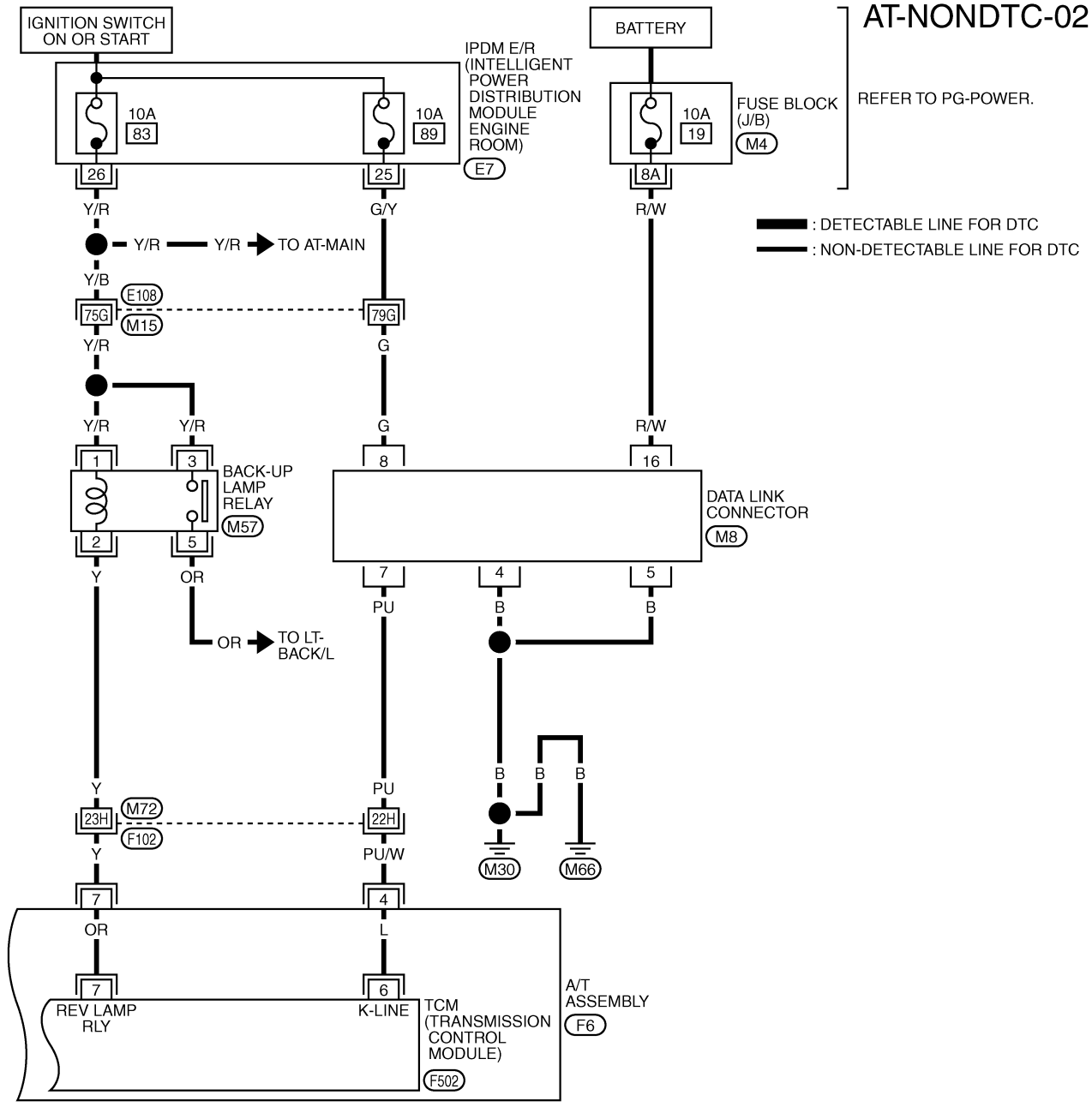
REFER TO THE FOLLOWING.

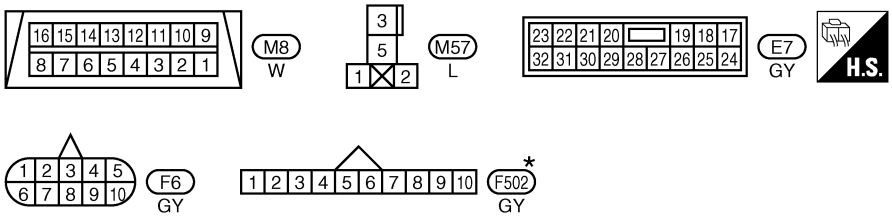
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0441E

AT-NONDTC-02





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

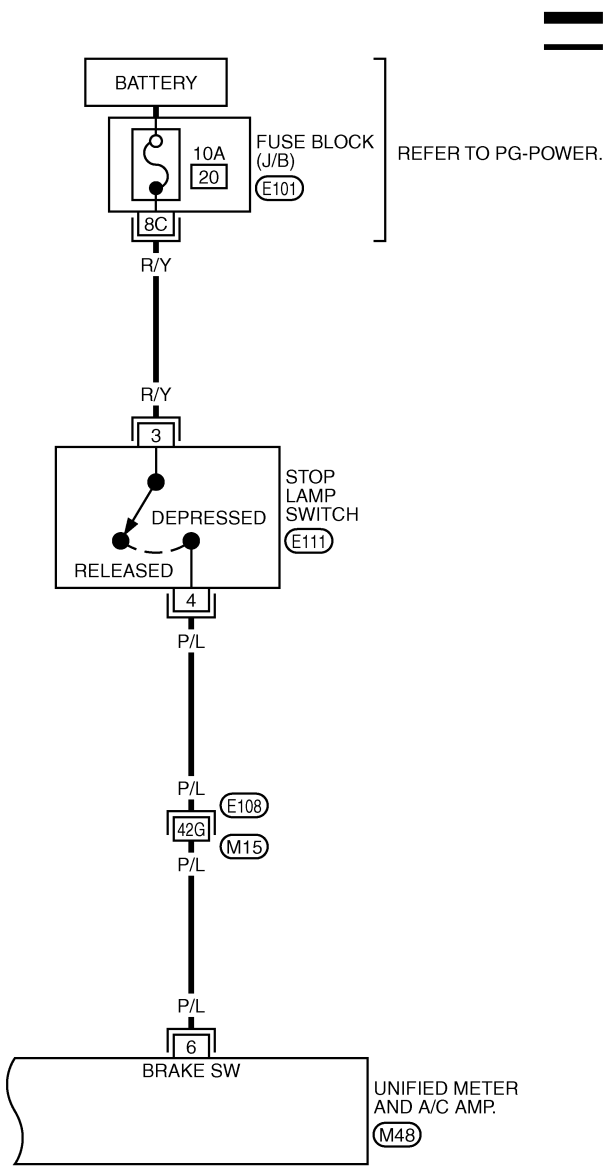
REFER TO THE FOLLOWING.

E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0442E

AT-NONDTC-03





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0378E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
3	L	CAN-H	—		—
4	PU/W	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.		—
7	Y	Back-up lamp relay		Selector lever in “R” position.	0 V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	—		—

A/T Check Indicator Lamp Does Not Come On

NCS00086

SYMPTOM:

A/T CHECK indicator lamp does not come on for about 2 seconds when turning ignition switch to ON.

DIAGNOSTIC PROCEDURE

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK A/T CHECK INDICATOR LAMP CIRCUIT

Check combination meter. Refer to DI-4, "COMBINATION METERS" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Engine Cannot Be Started in “P” or “N” Position

NCS00087

SYMPTOM:

- **Engine cannot be started with selector lever in “P” or “N” position.**
- **Engine can be started with selector lever in “D” or “R” position.**

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

3. CHECK STARTING SYSTEM

Check starting system. Refer to SC-8, "STARTING SYSTEM" .

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

In “P” Position, Vehicle Moves When Pushed

NCS00088

SYMPTOM:

Even though the selector lever is set in the “P” position, the parking mechanism is not actuated, allowing the vehicle to be moved when it is pushed.

DIAGNOSTIC PROCEDURE

1. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 2.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

2. CHECK PARKING COMPONENTS

Check parking components. Refer to AT-227, "Parking Components" .

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

In “N” Position, Vehicle Moves

NCS00089

SYMPTOM:

Vehicle moves forward or backward when selecting “N” position.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

4. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 5.

NG >> Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 67).

5. CHECK SYMPTOM

Check again. Refer to AT-53, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

Large Shock (“N” to “D” Position)

NCS0008A

SYMPTOM:

A noticeable shock occurs when the selector lever is shifted from the “N” to “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. ENGINE IDLE SPEED

Check engine idle speed. Refer to EC-76, "Idle Speed and Ignition Timing Check" .

OK or NG

OK >> GO TO 3.

NG >> Adjust engine idle speed. Refer to EC-76, "Idle Speed and Ignition Timing Check" .

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 5.

NG >> Refill ATF.

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 8.

NG - 1 >> Line pressure high: GO TO 6.

NG - 2 >> Line pressure low: GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

– Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 1).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-53, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Vehicle Does Not Creep Backward in “R” Position

NCS0008B

SYMPTOM:

The vehicle does not creep in the “R” position. Or an extreme lack of acceleration is observed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

4. CHECK STALL TEST

Check stall revolution with selector lever in “M” and “R” positions.
Refer to AT-49, "STALL TEST" .

OK or NG

OK >> GO TO 6.

OK in “M” position, NG in “R” position>>GO TO 5.

NG in both “M” and “R” positions>>GO TO 8.

5. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
2. Check the following.

- Reverse brake. Refer to AT-255, "Disassembly" .

OK or NG

OK >> GO TO 9.

NG >> Repair or replace damaged parts.

6. CHECK LINE PRESSURE

Check line pressure with the engine idling. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 9.

NG - 1 >> Line pressure high. GO TO 7.

NG - 2 >> Line pressure low. GO TO 8.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

8. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 13.

10. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

11. CHECK SYMPTOM

Check again. Refer to AT-53, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 12.

12. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

13. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

Vehicle Does Not Creep Forward in “D” Position

NCS0008C

SYMPTOM:

Vehicle does not creep forward when selecting “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.
NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK STALL TEST

Check stall revolution with selector lever in “D” position. Refer to AT-49, "STALL TEST" .

OK or NG

OK >> GO TO 5.
NG >> GO TO 7.

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high. GO TO 6.
NG - 2 >> Line pressure low. GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 43).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-53, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

12. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 43).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

Vehicle Cannot Be Started from D1

NCS0008D

SYMPTOM:

Vehicle cannot be started from D1 on cruise test - Part 1.

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps in “R” position.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-177, "Vehicle Does Not Creep Backward in “R” Position" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III"

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK ACCELERATOR POSITION SENSOR

Check accelerator pedal position sensor. Refer to AT-131, "DTC P1705 THROTTLE POSITION SENSOR"

OK or NG

OK >> GO TO 4.
NG >> Repair or replace accelerator pedal position sensor.

4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 5.
NG >> Refill ATF.

5. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high. GO TO 6.
NG - 2 >> Line pressure low. GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 23).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

12. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 23).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_1 \rightarrow D_2$

NCS0008E

SYMPTOM:

The vehicle does not shift-up from the D_1 to D_2 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-179, "Vehicle Does Not Creep Forward in “D” Position" , AT-181, "Vehicle Cannot Be Started from D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following items:

– Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 10).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 10).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_2 \rightarrow D_3$

NCS0008F

SYMPTOM:

The vehicle does not shift-up from D_2 to D_3 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-179, "Vehicle Does Not Creep Forward in “D” Position" , AT-181, "Vehicle Cannot Be Started from D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 11).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 11).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_3 \rightarrow D_4$

NCS0008G

SYMPTOM:

The vehicle does not shift-up from the D_3 to D_4 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-179, "Vehicle Does Not Creep Forward in “D” Position" , AT-181, "Vehicle Cannot Be Started from D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 12).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 12).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_4 \rightarrow D_5$

NCS0008H

SYMPTOM:

- **The vehicle does not shift-up from the D_4 to D_5 gear at the specified speed.**
- **The vehicle does not shift-up from the D_4 to D_5 gear unless A/T is warmed up.**

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-179, "Vehicle Does Not Creep Forward in “D” Position" , AT-181, "Vehicle Cannot Be Started from D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

– Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 13).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 13).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Lock-up

NCS0008I

SYMPTOM:

A/T does not lock-up at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 6.

NG - 1 >> Line pressure high. GO TO 4.

NG - 2 >> Line pressure low. GO TO 5.

4. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 7.
NG >> GO TO 10.

7. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 24).

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

10. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 24).

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

A/T Does Not Hold Lock-up Condition

NCS0008J

SYMPTOM:

The lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 4.

NG >> GO TO 7.

4. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 25).

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 25).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

Lock-up Is Not Released

NCS0008K

SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Engine Speed Does Not Return to Idle

NCS0008L

SYMPTOM:

When a shift-down is performed, the engine speed does not smoothly return to the idling speed.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III"

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 7.

4. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 72).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 72).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

Cannot Be Changed to Manual Mode

NCS0008M

SYMPTOM:

Does not change to manual mode when manual shift gate is used.

DIAGNOSTIC PROCEDURE

1. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> **INSPECTION END**

A/T Does Not Shift: 5th Gear → 4th Gear

NCS0008N

SYMPTOM:

When shifted from M_5 to M_4 position in manual mode, does not downshift from 5th to 4th gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 47).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 47).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 4th Gear → 3rd Gear

NCS0008O

SYMPTOM:

When shifted from M4 to M3 position in manual mode, does not downshift from 4th to 3rd gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.

NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 48).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 48).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 3rd Gear → 2nd Gear

NCS0008P

SYMPTOM:

When shifted from M_3 to M_2 position in manual mode, does not downshift from 3rd to 2nd gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 49).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 49).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 2nd Gear → 1st Gear

NCS0008Q

SYMPTOM:

When shifted from M_2 to M_1 position in manual mode, does not downshift from 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.

NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 50).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 50).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

Vehicle Does Not Decelerate by Engine Brake

NCS0008R

SYMPTOM:

No engine brake is applied when the gear is shifted from the 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 58).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 58).

OK or NG

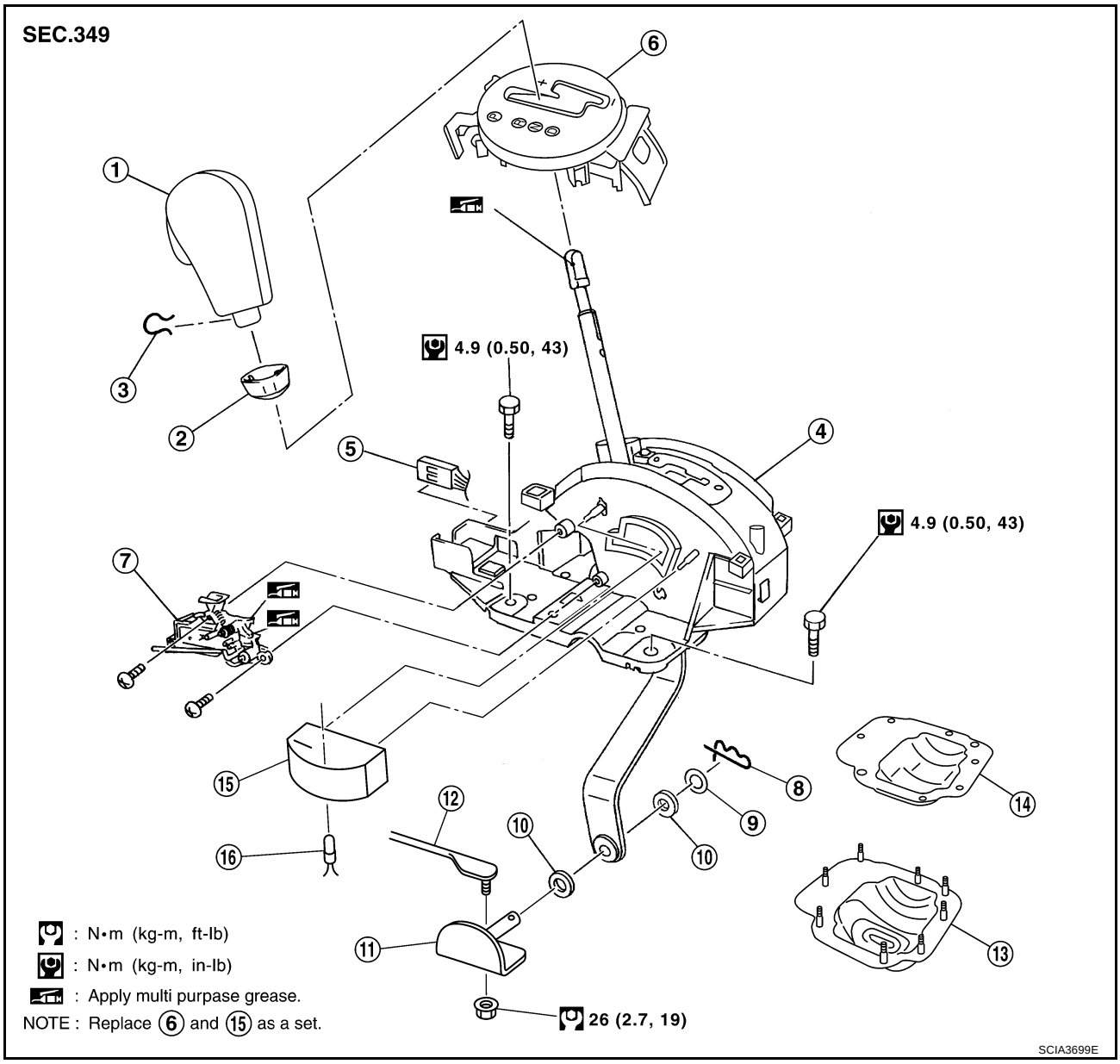
OK >> GO TO 7.
NG >> Repair or replace damaged parts.

SHIFT CONTROL SYSTEM

PFP:34901

Control Device Removal and Installation

NCS0008S



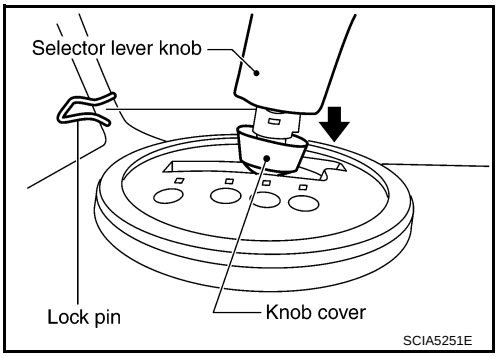
1. Selector lever knob	2. Knob cover	3. Lock pin
4. Control device assembly	5. A/T device harness connector	6. Position indicator plate
7. Shift lock solenoid and park position switch assembly	8. Snap pin	9. Conical washer
10. Plain washer	11. Bracket	12. Control rod
13. Dust cover	14. Dust cover plate	15. Bulb case
16. Position lamp		

REMOVAL

CAUTION:

Make sure that parking brake is applied before removal/installation.

1. Disconnect lower lever of control device and control rod.
2. Remove knob cover below selector lever downward.
3. Pull lock pin out of selector lever knob.
4. Remove selector lever knob.
5. Remove console finisher (A/T ring) and console finisher (A/T). Refer to IP-10, "Component Parts Drawing" .
6. Remove center console. Refer to IP-10, "Component Parts Drawing" .
7. Remove key interlock cable from control device. Refer to AT-213, "Removal and Installation" .
8. Disconnect A/T device harness connector.
9. Remove control device assembly.



CAUTION:

Do not impact, or damage propeller shaft tube.

INSTALLATION

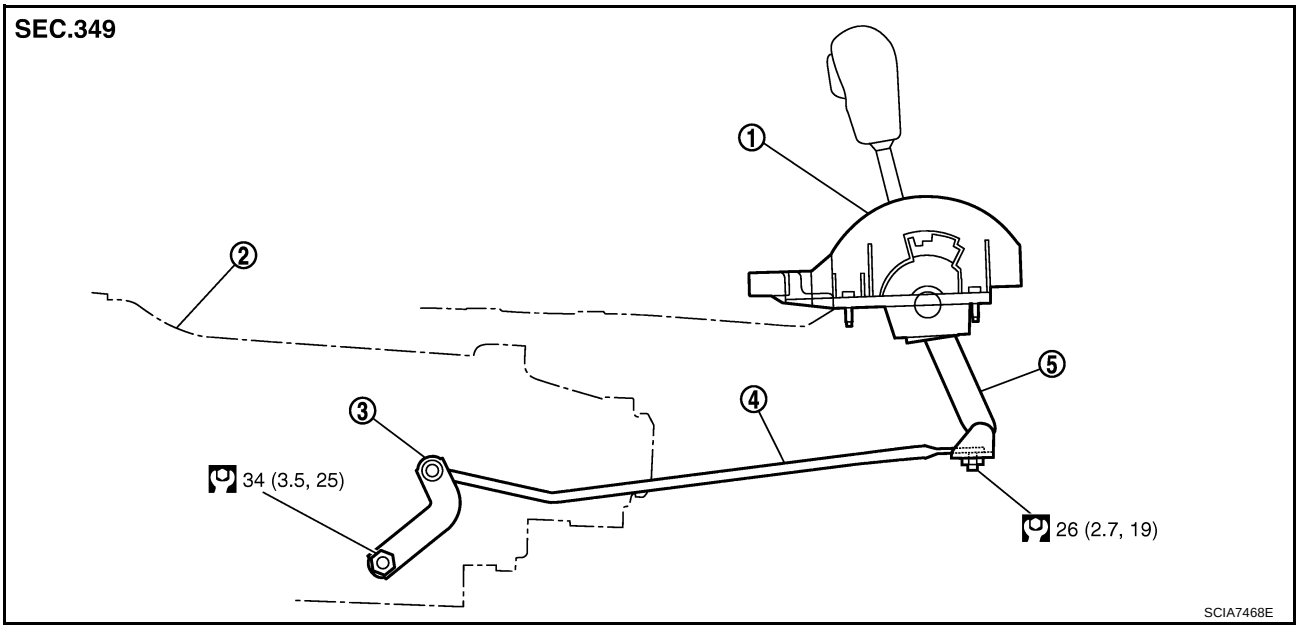
Note the following, and install in the reverse order of removal.

- After installation is completed, adjust and check A/T position. Refer to AT-206, "Adjustment of A/T Position" , AT-206, "Checking of A/T Position" .

Control Rod Removal and Installation

NCS0008T

CONTROL ROD COMPONENTS

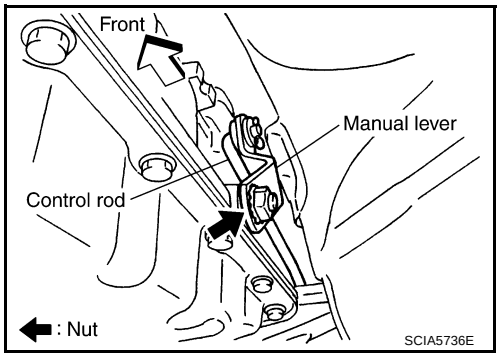


1. Control device assembly
2. A/T
3. Manual lever
4. Control rod
5. Lower lever

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

REMOVAL

1. Disconnect lower lever of control device and control rod.
2. Remove manual lever from A/T.
3. Remove control rod from vehicle.



INSTALLATION

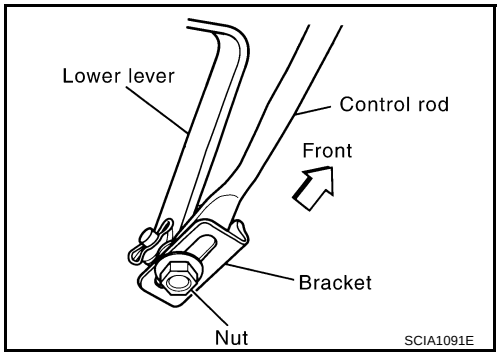
Note the following, and install in the reverse order of removal.

- After installation is completed, adjust and check A/T position. Refer to AT-206, "Adjustment of A/T Position" and AT-206, "Checking of A/T Position" .

Adjustment of A/T Position

NCS0008U

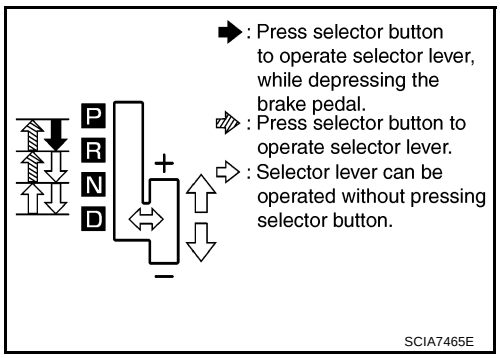
1. Loosen nut of control rod.
2. Place PNP switch and selector lever in “P” position.
3. While pressing lower lever toward rear of vehicle (in “P” position direction), tighten nut to the specified torque. Refer toAT-205, "CONTROL ROD COMPONENTS"



Checking of A/T Position

NCS0008V

1. Place selector lever in “P” position, and turn ignition switch ON.
2. Make sure that selector lever can be shifted to other than “P” position when brake pedal is depressed. Also make sure that selector lever can be shifted from “P” position only when brake pedal is depressed.
3. Move the selector lever and check for excessive effort, sticking, noise or rattle.
4. Confirm the selector lever stops at each position with the feel of engagement when it is moved through all the positions. Check whether or not the actual position the selector lever is in matches the position shown by the shift position indicator and the transmission body.
5. The method of operating the lever to individual positions correctly should be as shown in the figure.
6. When selector button is pressed in “P”, “R”, or “N” position without applying forward/backward force to selector lever, check button operation for sticking.
7. Confirm the back-up lamps illuminate only when lever is placed in the “R” position. Confirm the back-up lamps does not illuminate when selector lever is pushed against “R” position in the “P” or “N” position.
8. Confirm the engine can only be started with the selector lever in the “P” and “N” positions. (With selector lever in the “P” position, engine can be started even when selector lever is moved forward and backward.)
9. Make sure that transmission is locked completely in “P” position.
10. When selector lever is set to manual shift gate, make sure that manual mode is displayed on combination meter.
    Shift selector lever to “+” and “-” sides, and check that set shift position changes.



A/T SHIFT LOCK SYSTEM

PFP:34950

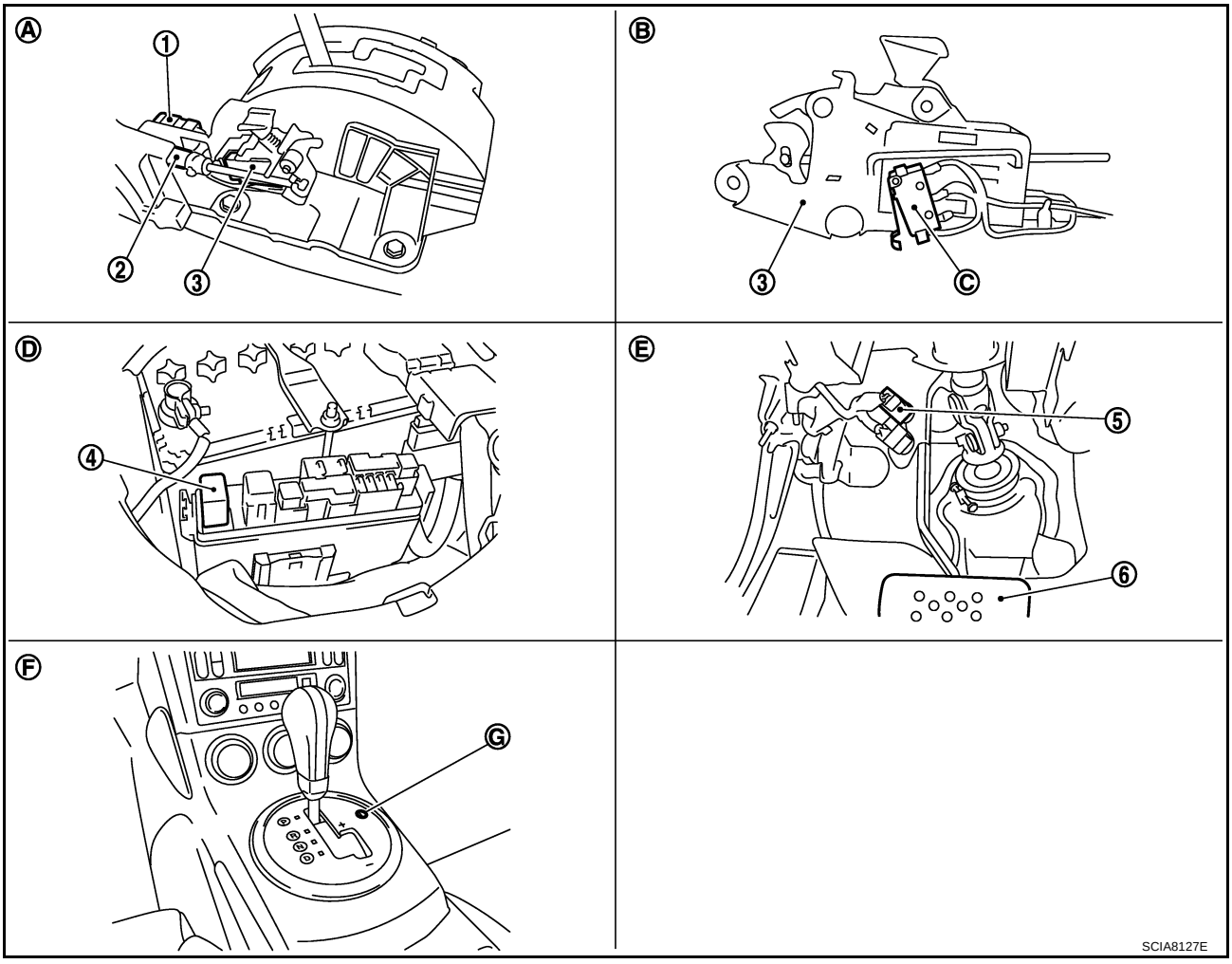
Description

NCS0008W

- The mechanical key interlock mechanism also operates as a shift lock:
  With the ignition switch turned to ON, the selector lever cannot be shifted from “P” position to any other position unless the brake pedal is depressed.
  With the key removed, the selector lever cannot be shifted from “P” position to any other position.
  The key cannot be removed unless the selector lever is placed in “P” position.
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder.

Shift Lock System Electrical Parts Location

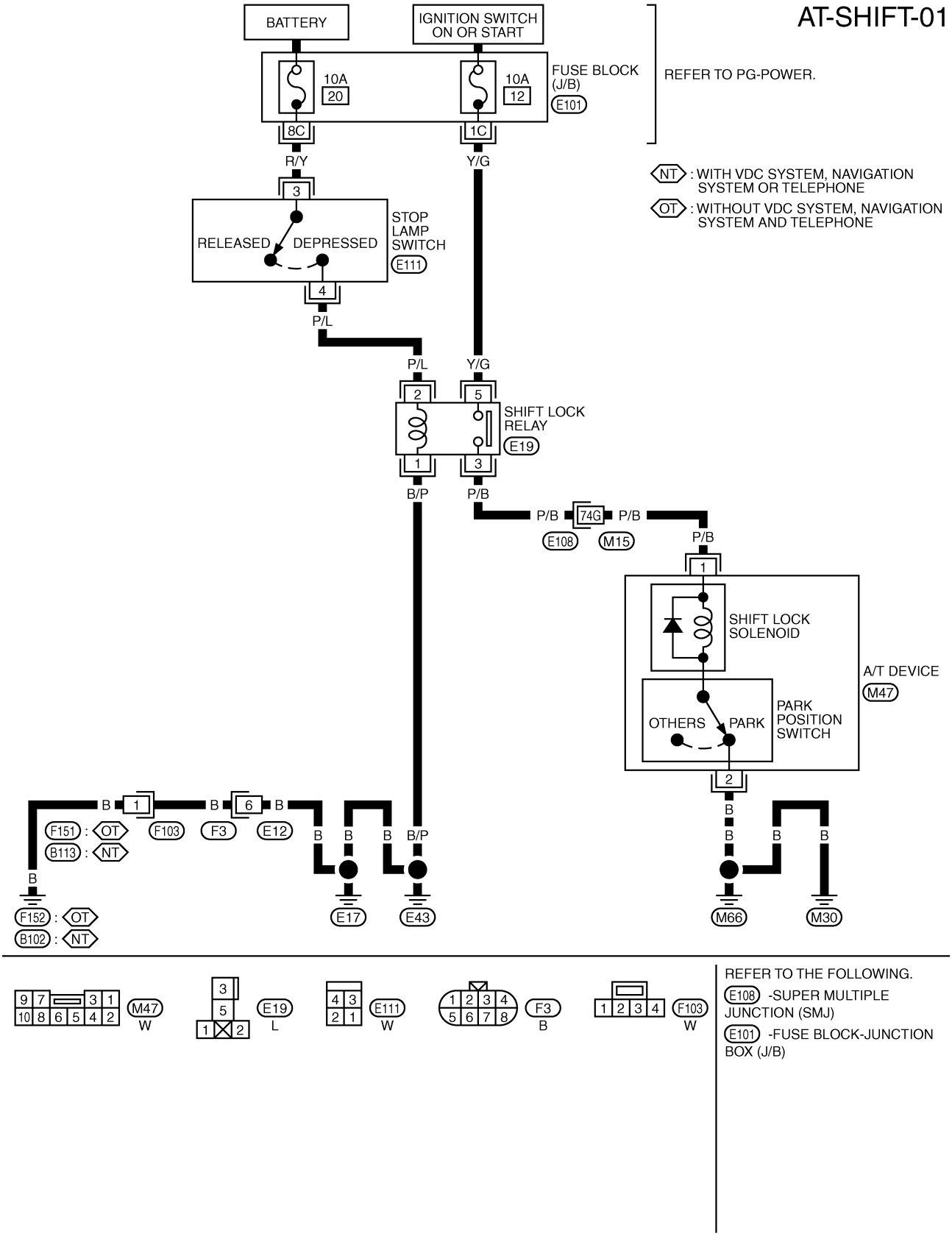
NCS001RP



1. A/T device harness connector
2. Key inter lock cable
3. Shift lock solenoid
4. Shift lock relay
5. Stop lamp switch
6. Brake pedal
A. Control device assembly
B. Shift lock solenoid, revers side
C. Park position switch
D. Fuse, fusible link and relay box
E. Brake pedal, upper
F. A/T console finisher
G. Shift lock release button

Wiring Diagram — AT — SHIFT

NCS0008Y



TCWT0443E

Diagnostic Procedure

NCS0008Z

SYMPTOM 1:

- **Selector lever cannot be moved from “P” position with key in ON position and brake pedal applied.**
- **Selector lever can be moved from “P” position with key in ON position and brake pedal released.**
- **Selector lever can be moved from “P” position when key is removed from key cylinder.**

SYMPTOM 2:

- **Ignition key cannot be removed when selector lever is set to “P” position.**
- **Ignition key can be removed when selector lever is set to any position except “P” position.**

1. CHECK KEY INTERLOCK CABLE

Check the key interlock cable for damage.

OK or NG

OK >> GO TO 2.
NG >> Replace key interlock cable. Refer to AT-212, "KEY INTERLOCK CABLE" .

2. CHECK SELECTOR LEVER POSITION

Check the selector lever position for damage. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.
NG >> Check selector lever. Refer to AT-206, "Adjustment of A/T Position" .

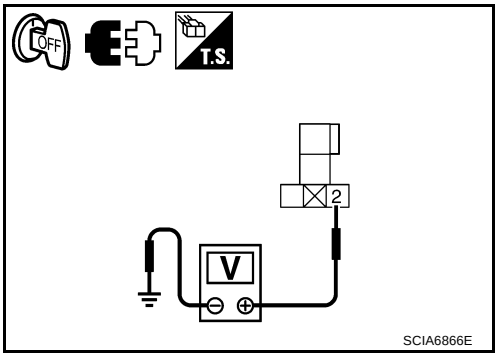
3. CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check voltage between shift lock relay E19 terminal 2 and ground.

Voltage

Brake pedal depressed: Battery voltage

Brake pedal released: 0 V



OK or NG

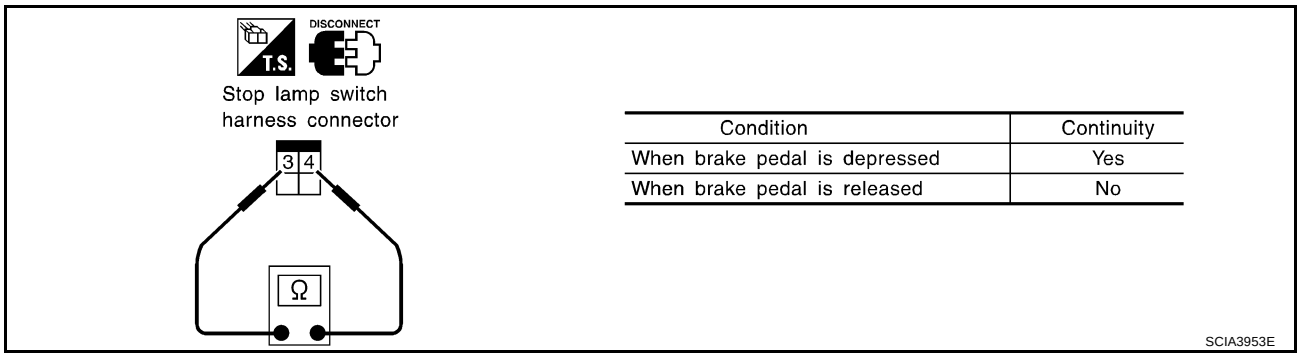
OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between battery and stop lamp switch harness connector E111 terminal 3.
- Harness for short or open between stop lamp switch harness connector E111 terminal 4 and shift lock relay E19 terminal 2.
- 10 A fuse [No. 20, located in the fuse block (J/B)].
- Stop lamp switch.

– Check continuity between stop lamp switch harness connector E111 terminals 3 and 4.



Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal — refer to BR-7, "BRAKE PEDAL".

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

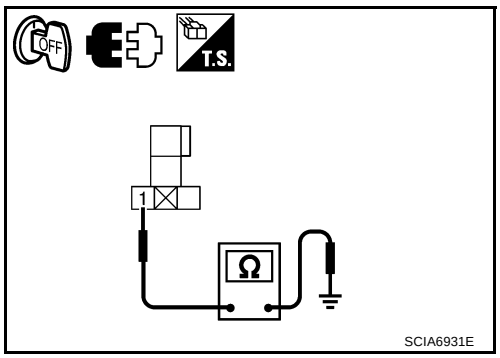
5. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check continuity between shift lock relay E19 terminal 1 and ground.

CAUTION:
Connect test probe (BLACK) to shift lock relay, and test probe (RED) to ground.

Continuity should exist.

If OK, check harness for short to ground and short to power.



OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

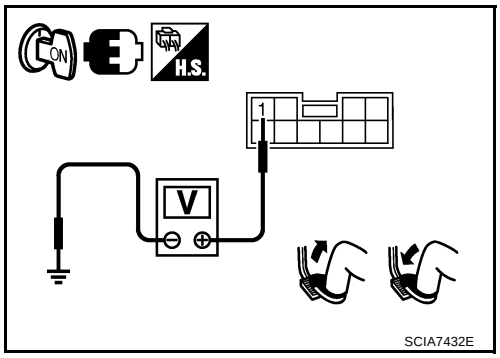
6. CHECK INPUT SIGNAL A/T DEVICE

1. Turn ignition switch ON.
2. Selector lever is set in “P” position.
3. Check voltage between A/T device harness connector M47 terminal 1 and ground.

Voltage

Brake pedal depressed: Battery voltage

Brake pedal released: 0 V



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

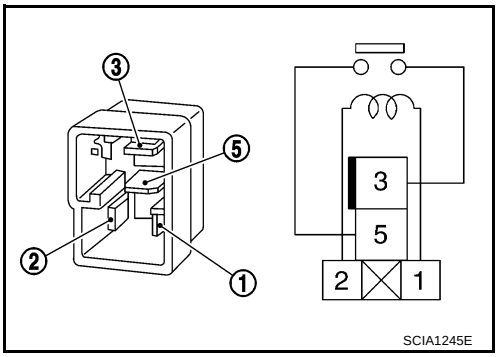
7. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between ignition switch and shift lock relay E19 terminal 5.
- Harness for short or open between shift lock relay E19 terminal 3 and A/T device harness connector M47 terminal 1.
- 10 A fuse [No. 12, located in the fuse block (J/B)].
- Ignition switch (Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT").
- Shift lock relay.

– Check continuity between shift lock relay E19 terminal 3 and 5.

Condition	Continuity
12V direct current supply between terminal 1 and 2	Yes
OFF	No



OK or NG

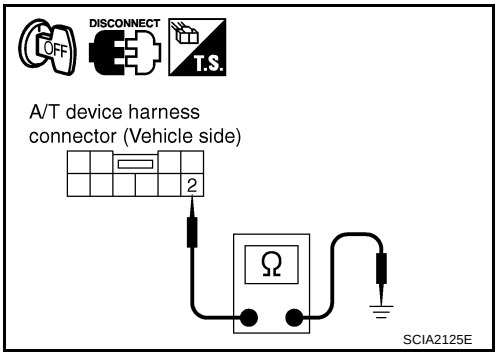
OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T device harness connector.
3. Check continuity between A/T device harness connector M47 terminal 2 and ground.

Continuity should exist.

If OK, check harness for short to ground and short to power.



OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK SHIFT LOCK SOLENOID AND PARK POSITION SWITCH

1. Connect A/T device harness connector.
2. Turn ignition switch ON.
3. Selector lever is set in “P” position.
4. Check operation.

Condition	Brake pedal	Operation
When ignition switch is turned to “ON” position and selector lever is set in “P” position.	Depressed	Yes
	Released	No

OK or NG

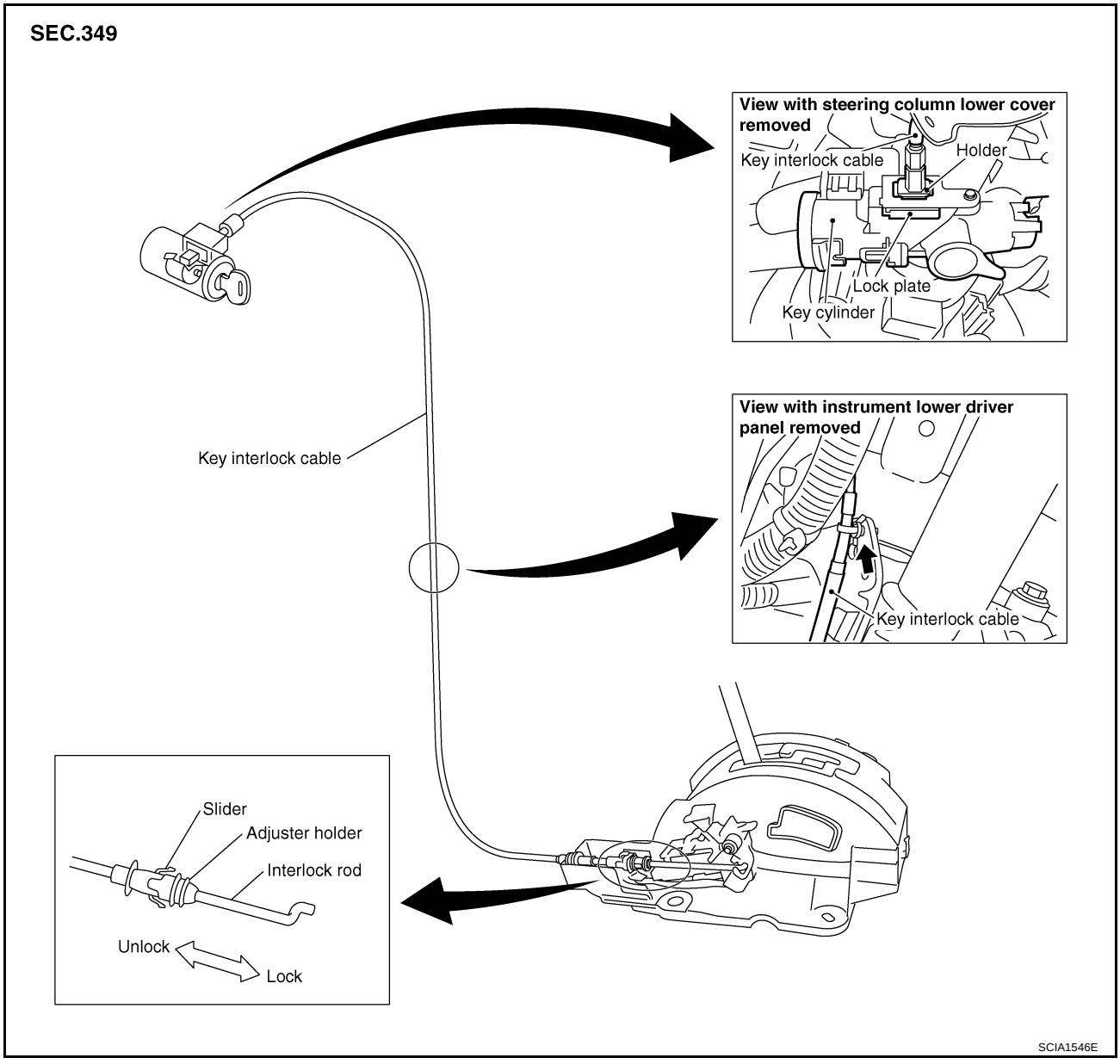
OK >> **INSPECTION END**.
NG >> Repair or replace damaged parts.

KEY INTERLOCK CABLE

PFP:34908

Components

NCS00090



CAUTION:

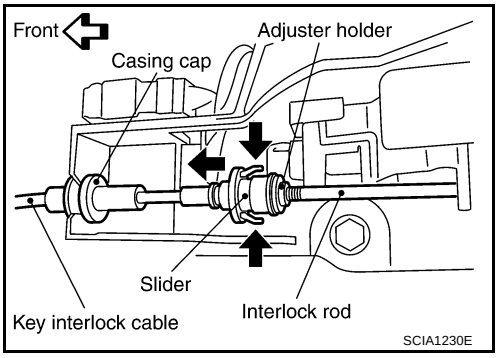
- **Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.**
- **After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions. If casing cap be removed with an external load of less than 39.2 N (4.0 kg, 8.8 lb), replace key interlock cable with new one.**

Removal and Installation

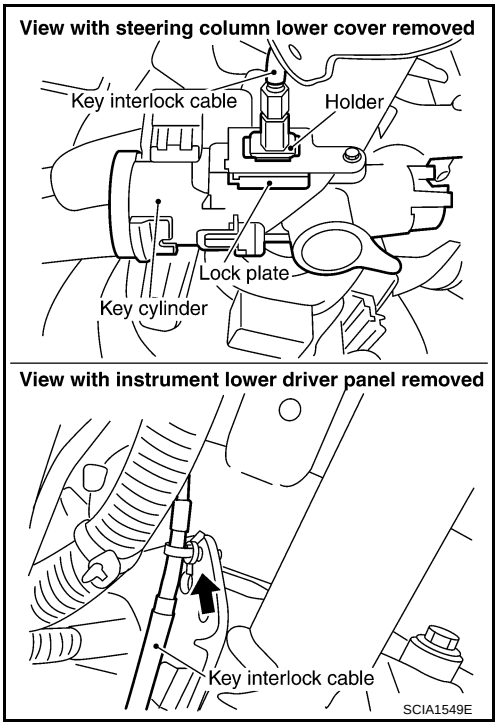
NCS00091

REMOVAL

1. Unlock slider by squeezing lock tabs on slider from adjuster holder.
2. Remove casing cap from bracket of control device assembly and remove interlock rod from adjuster holder.



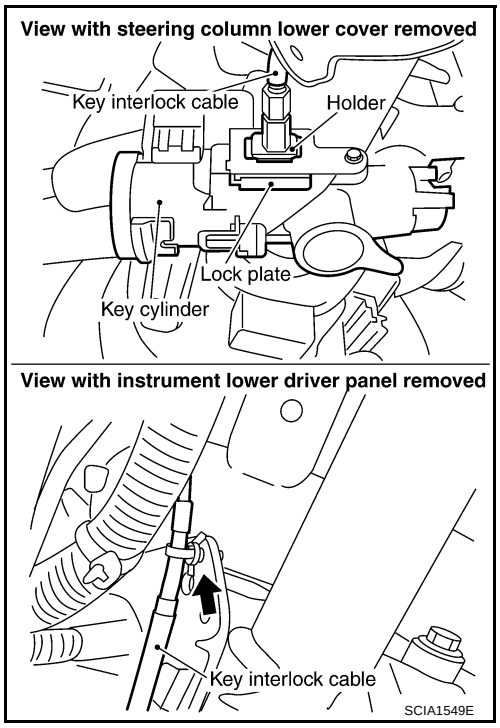
3. Remove lock plate from key cylinder.
4. Remove holder from key cylinder and remove key interlock cable.



INSTALLATION

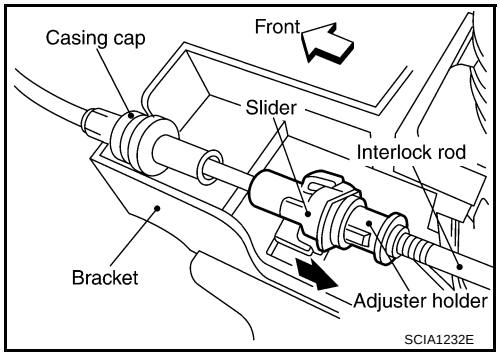
1. Set holder of key interlock cable to key cylinder and install lock plate.

   CAUTION:
   Do not reuse the lock plate
2. Clamp key interlock cable and fix to key interlock cable with band.
3. Turn ignition key to lock position.
4. Set selector lever to “P” position.



5. Insert interlock rod into adjuster holder.
6. Install casing cap to bracket.
7. Move slider in order to fix adjuster holder to interlock rod.

   CAUTION:
   Do not touch any parts except slider. Do not add any force to slider except force toward slider.



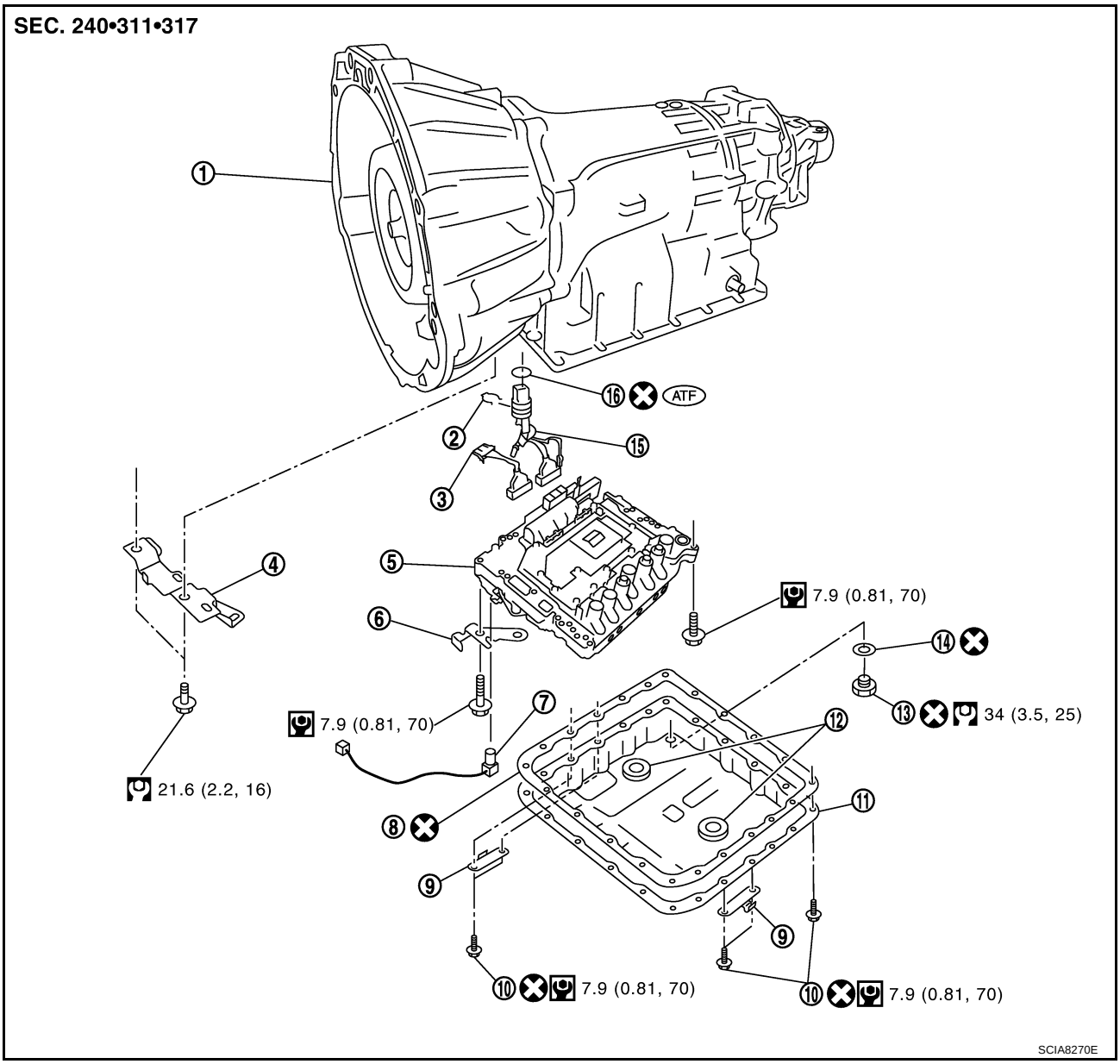
ON-VEHICLE SERVICE

PFP:00000

Control Valve with TCM and A/T Fluid Temperature Sensor 2

NCS00092

COMPONENTS



1. A/T	2. Snap ring	3. Sub-harness
4. Bracket	5. Control valve with TCM	6. Bracket
7. A/T fluid temperature sensor 2	8. Oil pan gasket	9. Clip
10. Oil pan mounting bolt	11. Oil pan	12. Magnet
13. Drain plug	14. Drain plug gasket	15. Terminal cord assembly
16. O-ring		

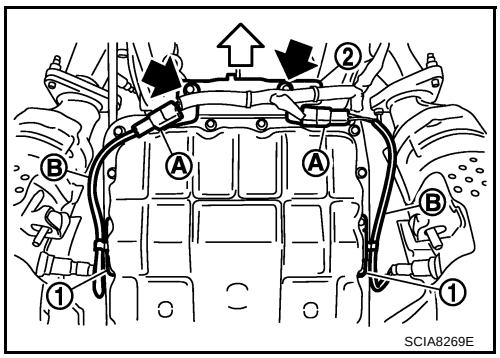
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

CONTROL VALVE WITH TCM ASSEMBLY REMOVAL AND INSTALLATION

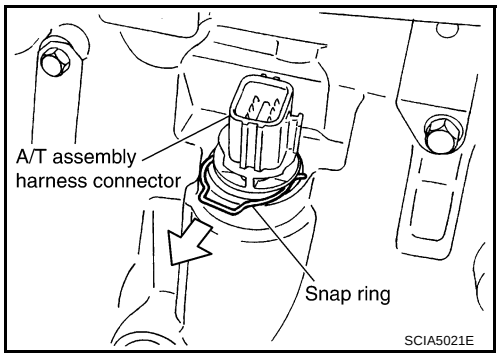
Removal

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .

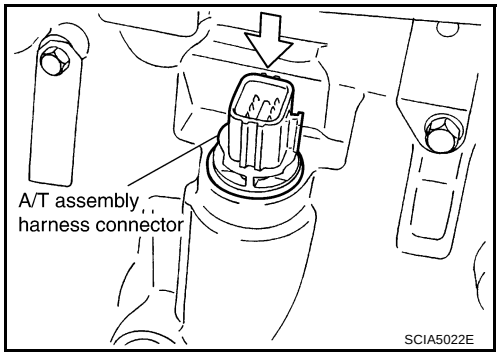
4. Disconnect heated oxygen sensor 2 harness connectors (A).
   - ⇦: Vehicle front
   - ⬅: Bolt
5. Remove heated oxygen sensor 2 harness (B) from clips (1).
6. Remove bracket (2) from transmission assembly.
7. Disconnect A/T assembly harness connector.



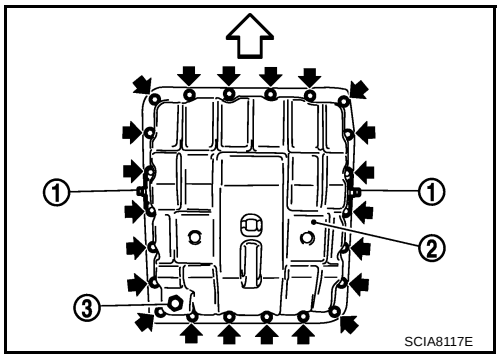
8. Remove snap ring from A/T assembly harness connector.



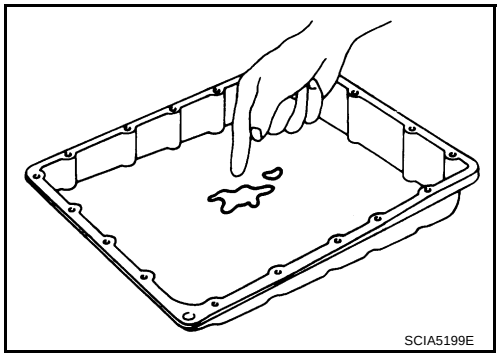
9. Push A/T assembly harness connector.
   CAUTION:
   Be careful not to damage connector.



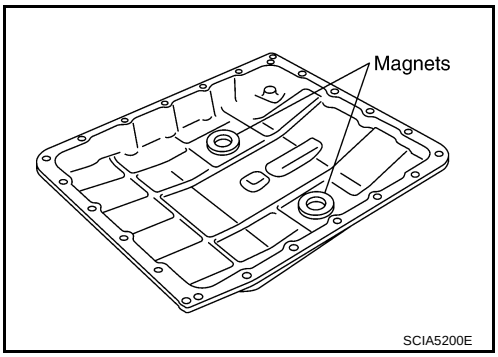
10. Remove clips (1), oil pan (2) and oil pan gasket.
    - ⇦: Vehicle front
    - ⬅: Oil pan mounting bolt
    - Drain bolt (3)



11. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
    - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**



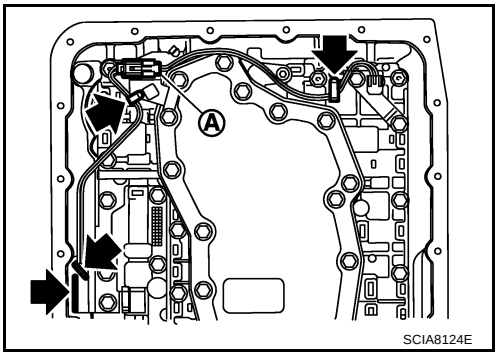
12. Remove magnets from oil pan.



13. Disconnect A/T fluid temperature sensor 2 connector (A).

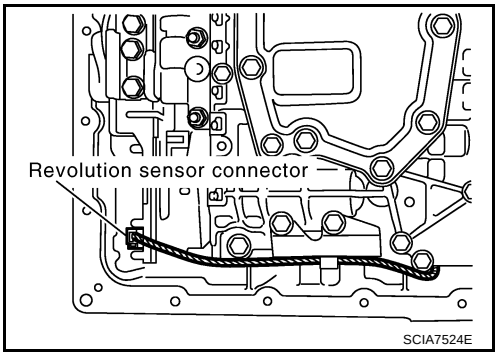
CAUTION:
Be careful not to damage connector.

14. Straighten terminal clips (⬅) to free terminal cord assembly and A/T fluid temperature sensor 2 harness.

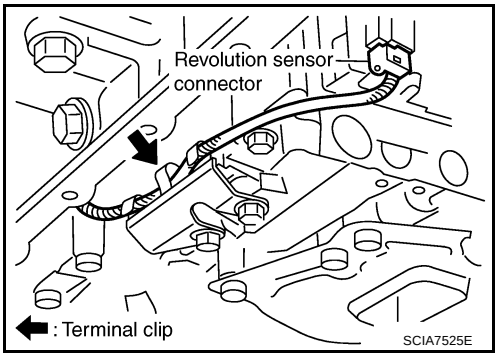


15. Disconnect revolution sensor connector.

CAUTION:
Be careful not to damage connector.

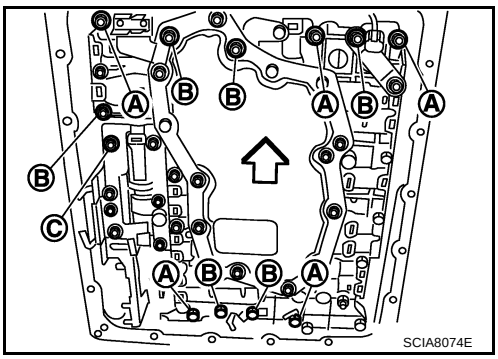


16. Straighten terminal clip to free revolution sensor harness.



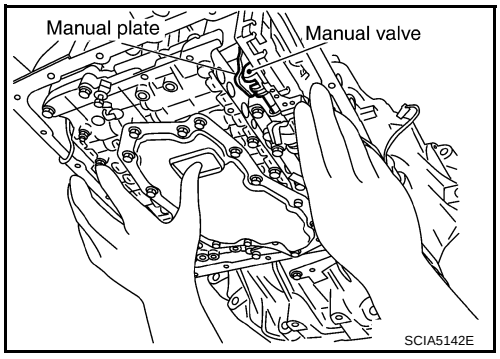
17. Remove bolts (A), (B) and (C) from control valve with TCM.
    - ⇦: Vehicle front

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1

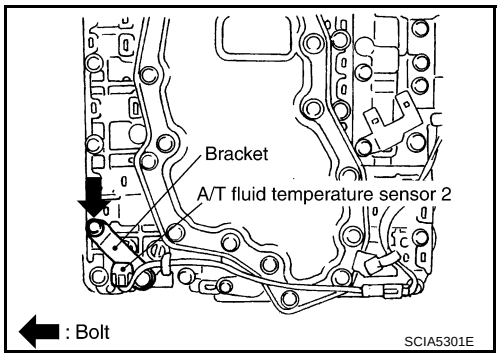


18. Remove control valve with TCM from transmission case.

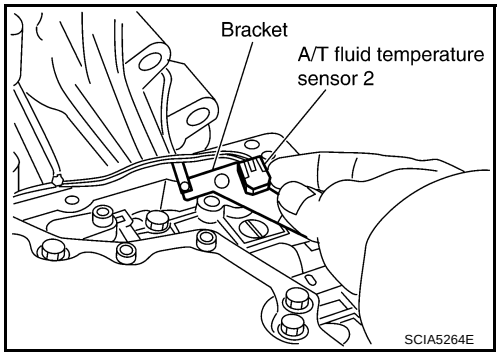
CAUTION:
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



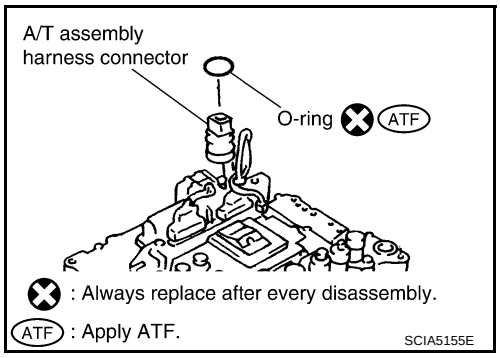
19. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



20. Remove bracket from A/T fluid temperature sensor 2.

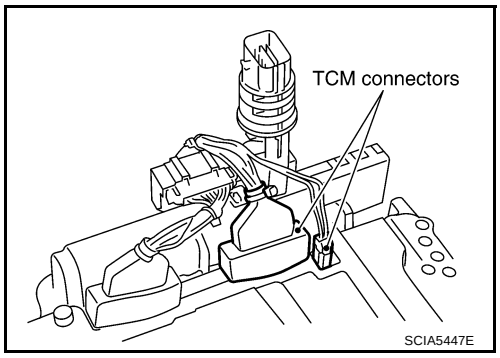


21. Remove O-ring from A/T assembly harness connector.

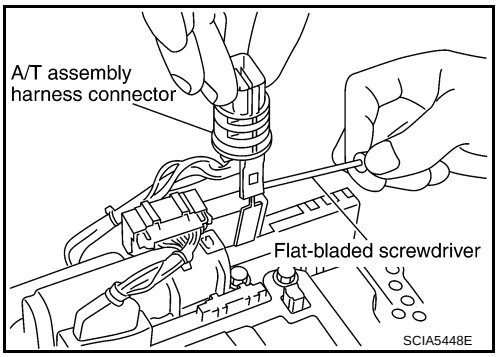


22. Disconnect TCM connectors.

CAUTION:
Be careful not to damage connectors.

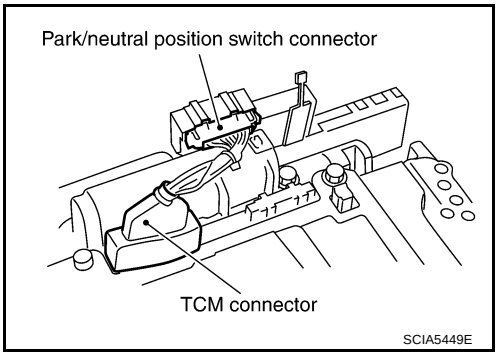


23. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.



24. Disconnect TCM connector and park/neutral position switch connector.

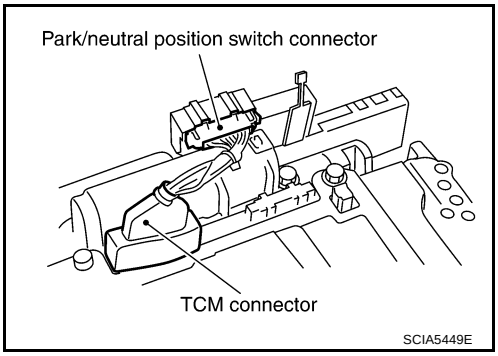
CAUTION:
Be careful not to damage connectors.



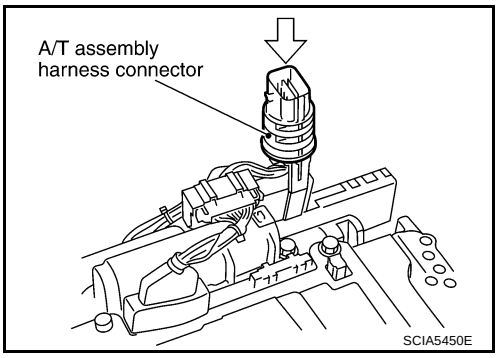
Installation

CAUTION:
After completing installation, check A/T fluid leakage and A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

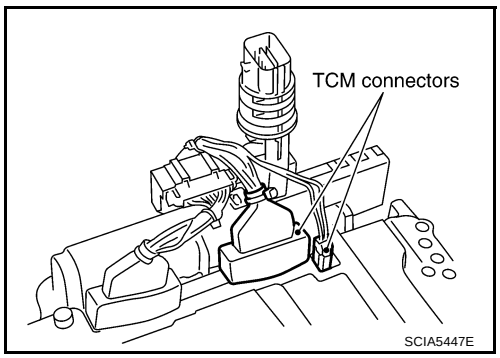
1. Connect TCM connector and park/neutral position switch connector.



2. Install A/T assembly harness connector from control valve with TCM.



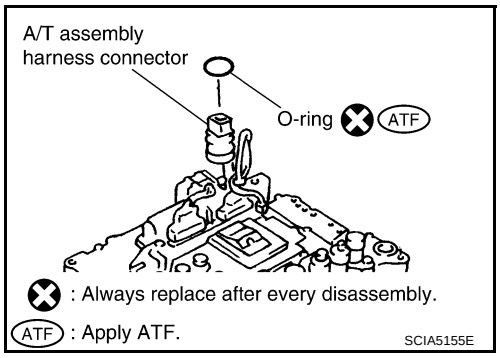
3. Connect TCM connectors.



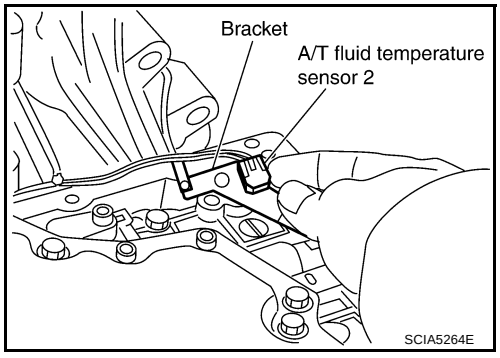
4. Install O-ring in A/T assembly harness connector.

CAUTION:

- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



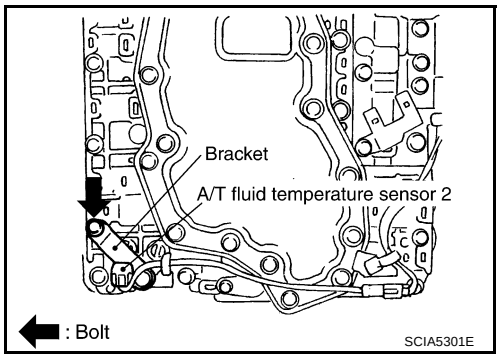
5. Install A/T fluid temperature sensor 2 to bracket.



6. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to AT-215, "COMPONENTS" .

CAUTION:

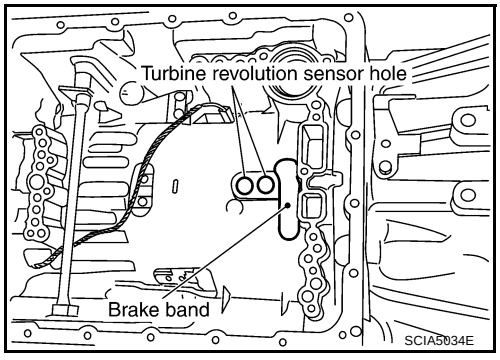
Adjust bolt hole of bracket to bolt hole of control valve with TCM.



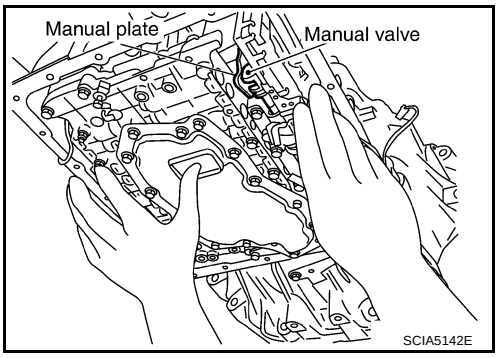
7. Install control valve with TCM in transmission case.

CAUTION:

- **Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.**
- **Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.**
- **Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.**

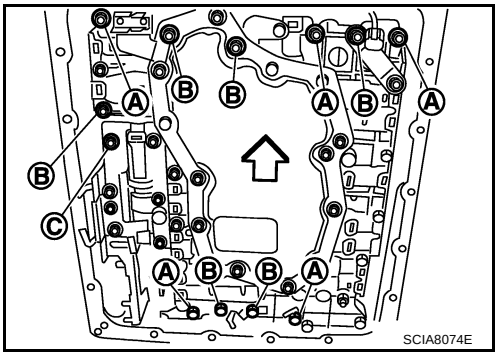


- **Assemble it so that manual valve cutout is engaged with manual plate projection.**

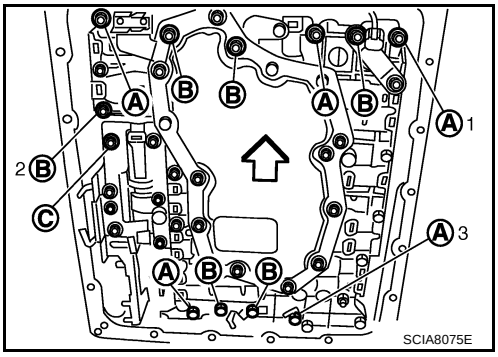


8. Install bolts (A), (B) and (C) in control valve with TCM.
   - ⇦: Vehicle front

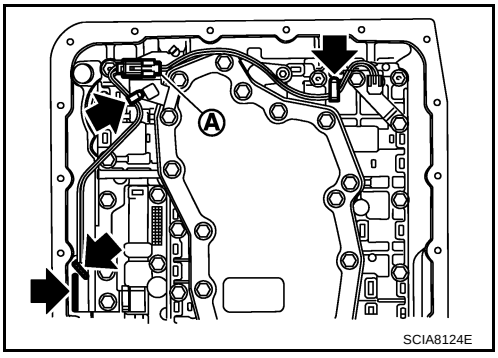
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



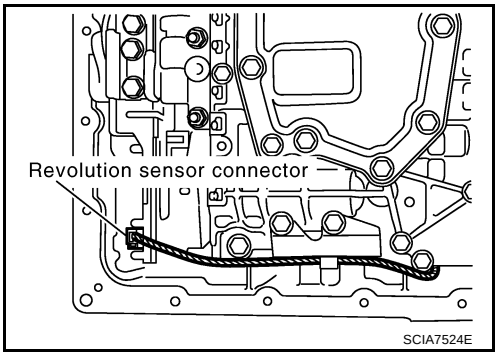
9. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts, and then tighten control valve with TCM mounting bolts to the specified torque. Refer to AT-215, "COMPONENTS" .
   - ⇦: Vehicle front



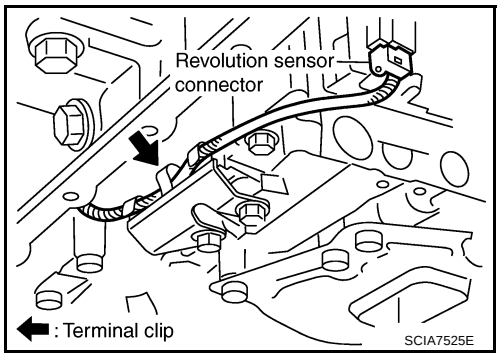
10. Connect A/T fluid temperature sensor 2 connector (A).
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips (⬅).



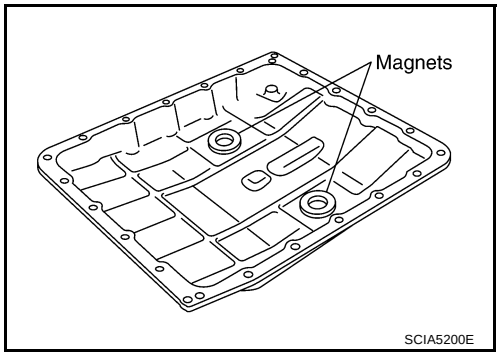
12. Connect revolution sensor connector.



13. Securely fasten revolution sensor harness with terminal clip.



14. Install magnets in oil pan.



15. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

CAUTION:

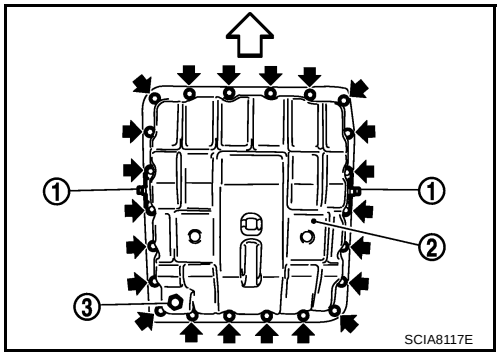
- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

- ⇦: Vehicle front
- ⬅: Oil pan mounting bolt

CAUTION:

- **Install it so that drain plug (3) comes to the position as shown in the figure.**
- **Be careful not to pinch harness.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**



c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-215, "COMPONENTS" .

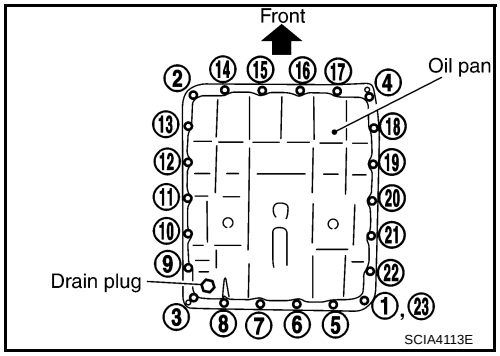
CAUTION:

Do not reuse oil pan mounting bolts.

16. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-215, "COMPONENTS" .

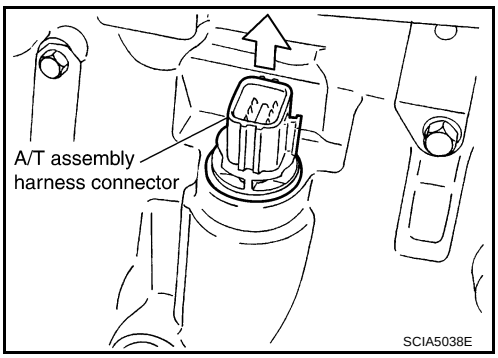
CAUTION:

Do not reuse drain plug gasket.

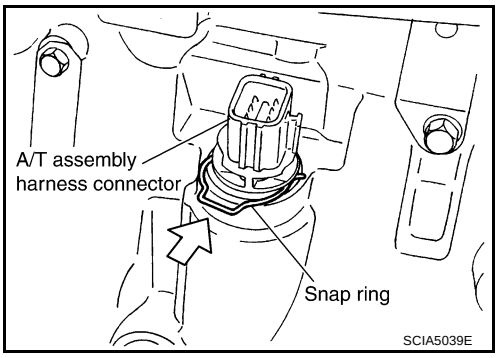


17. Pull up A/T assembly harness connector.

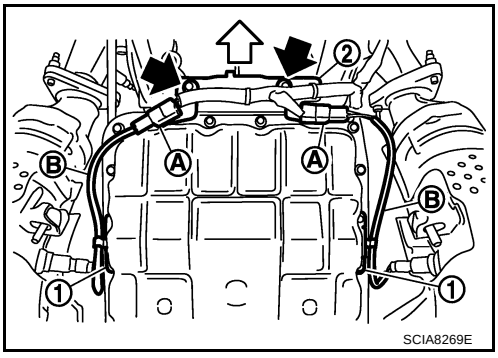
CAUTION:
Be careful not to damage connector.



18. Install snap ring to A/T assembly harness connector.
19. Connect A/T assembly harness connector.



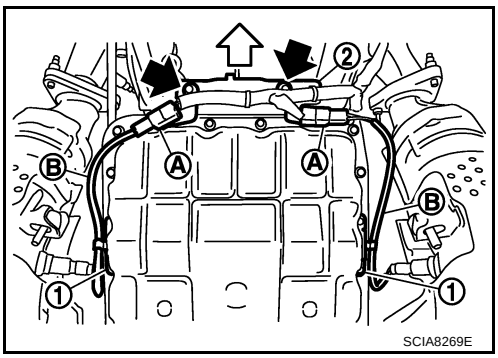
20. Install bracket (2) from transmission assembly. Refer to AT-215, "COMPONENTS" .
    - ⇦: Vehicle front
    - ⬅: Bolt
21. Install heated oxygen sensor 2 harness (B) from clips (1).
22. Connect heated oxygen sensor 2 harness connectors (A).
23. Install exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .
24. Pour ATF into A/T assembly. Refer to AT-12, "Changing A/T Fluid" .
25. Connect the battery cable to the negative terminal.



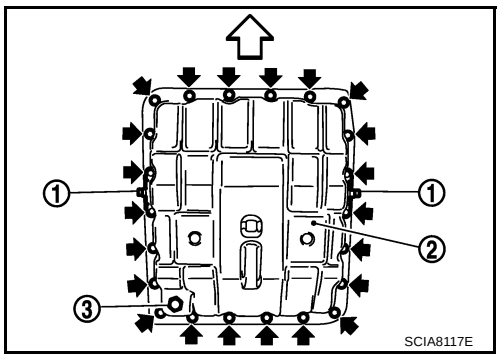
A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION

Removal

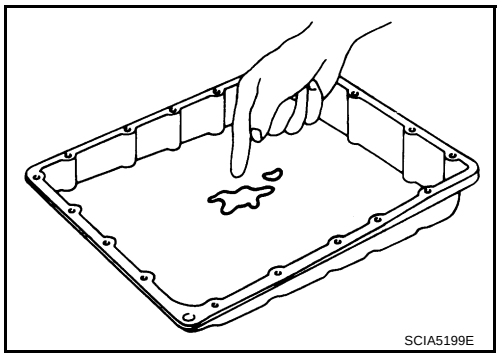
1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .
4. Disconnect heated oxygen sensor 2 harness connectors (A).
    - ⇦: Vehicle front
    - ⬅: Bolt
5. Remove heated oxygen sensor 2 harness (B) from clips (1).
6. Remove bracket (2) from transmission assembly.



7. Remove clips (1), oil pan (2) and oil pan gasket.
   - ⇦: Vehicle front
   - ⬅: Oil pan mounting bolt
   - Drain plug (3)



8. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**

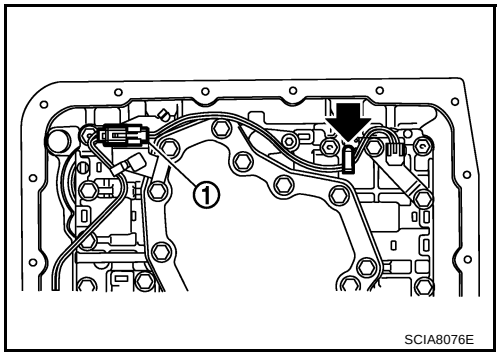


9. Disconnect A/T fluid temperature sensor 2 connector (1).

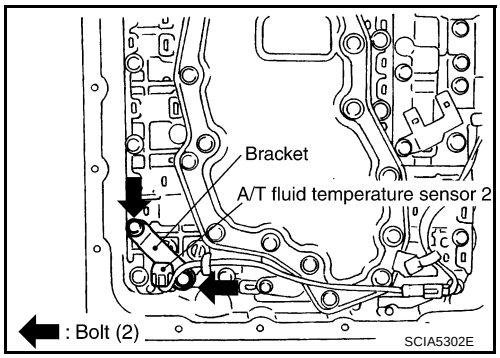
   CAUTION:

   Be careful not to damage connector.

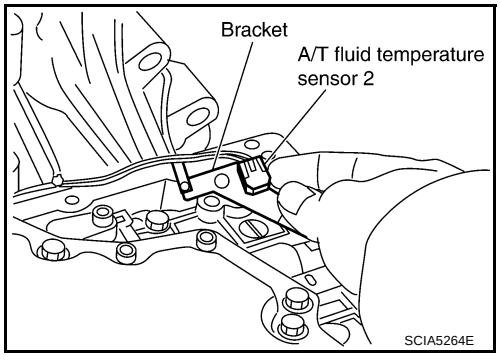
10. Straighten terminal clip (⬅) to free A/T fluid temperature sensor 2 harness.



11. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



12. Remove bracket from A/T fluid temperature sensor 2.

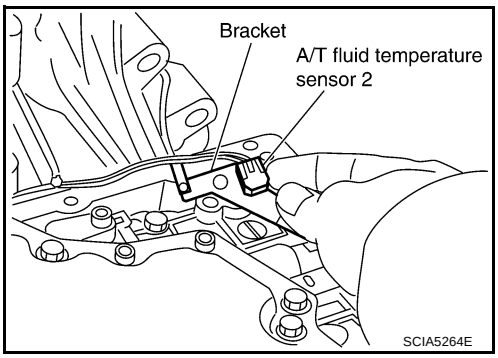


Installation

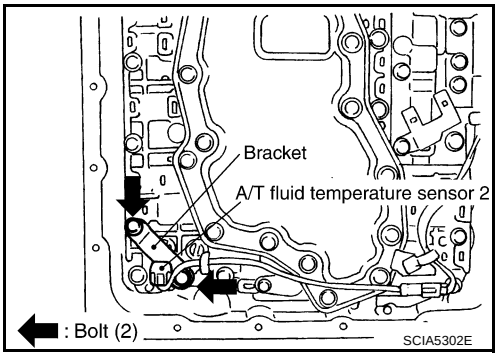
CAUTION:

After completing installation, check A/T fluid leakage and A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

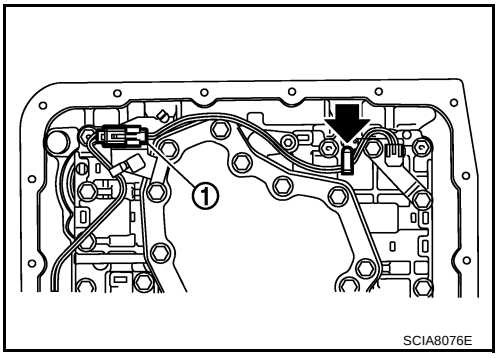
1. Install A/T fluid temperature sensor 2 to bracket.



2. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to AT-215, "COMPONENTS" .



3. Connect A/T fluid temperature sensor 2 connector (1).
4. Securely fasten A/T fluid temperature sensor 2 harness with terminal clip (⬅).



5. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

CAUTION:

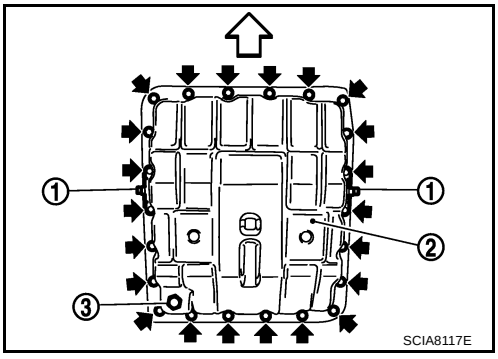
- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

- ⇦: Vehicle front
- ⬅: Oil pan mounting bolt

CAUTION:

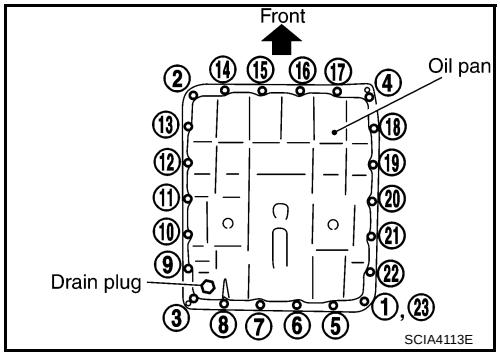
- **Install it so that drain plug (3) comes to the position as shown in the figure.**
- **Be careful not to pinch harness.**



- **Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-215, "COMPONENTS" .

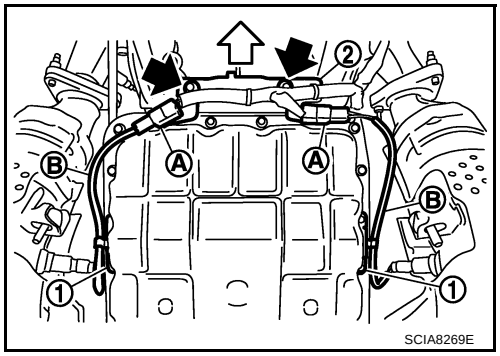
CAUTION:
Do not reuse oil pan mounting bolts.



6. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-215, "COMPONENTS" .

CAUTION:
Do not reuse drain plug gasket.

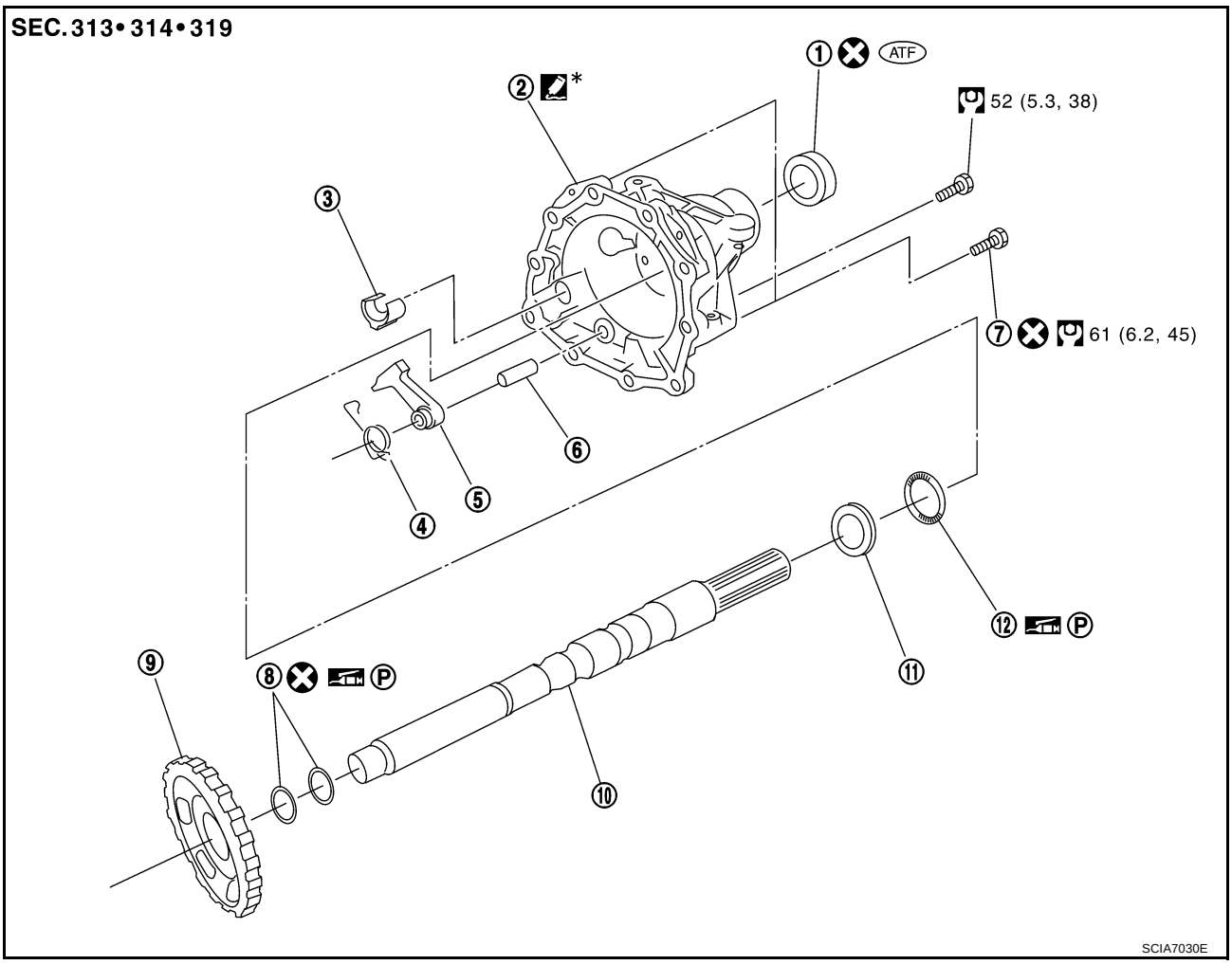
7. Install bracket (2) from transmission assembly. Refer to AT-215, "COMPONENTS" .
   - ⇦: Vehicle front
   - ⬅: Bolt
8. Install heated oxygen sensor 2 harness (B) from clips (1).
9. Connect heated oxygen sensor 2 harness connectors (A).
10. Install exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .
11. Pour ATF into A/T assembly. Refer to AT-12, "Changing A/T Fluid" .
12. Connect the battery cable to the negative terminal.



Parking Components

NCS00093

COMPONENTS



1.	Rear oil seal	2.	Rear extension	3.	Parking actuator support
4.	Return spring	5.	Parking pawl	6.	Pawl shaft
7.	Self-sealing bolt	8.	Seal ring	9.	Parking gear
10.	Output shaft	11.	Bearing race	12.	Needle bearing

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

However, refer to the following for others.

: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

REMOVAL

1. Drain ATF through drain hole.
2. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
3. Remove rear propeller shaft. Refer to PR-6, "Removal and Installation" .

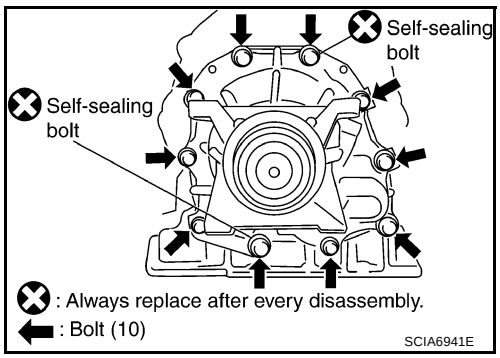
   CAUTION:

   Do not impact or damage propeller shaft tube.
4. Remove control rod. Refer to AT-205, "Control Rod Removal and Installation" .
5. Support A/T assembly with a transmission jack.

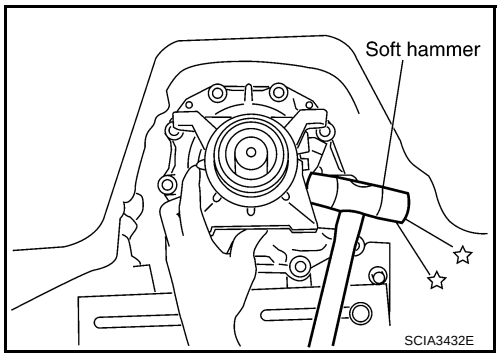
   CAUTION:

   When setting transmission jack, be careful not to allow it to collide against drain plug.
6. Remove rear engine mounting member with power tool. Refer to AT-242, "Removal and Installation" .

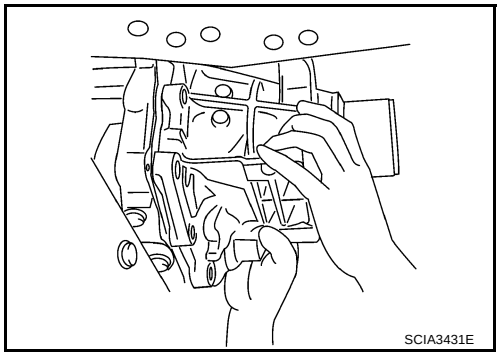
7. Remove tightening bolts for rear extension assembly and transmission case.



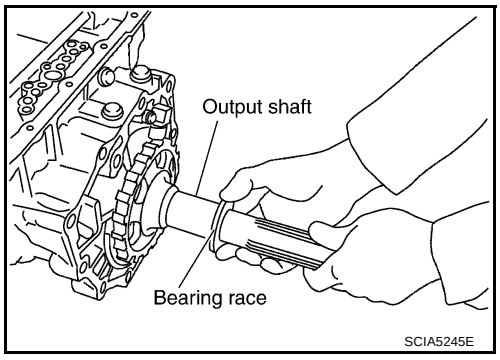
8. Tap rear extension assembly with soft hammer.



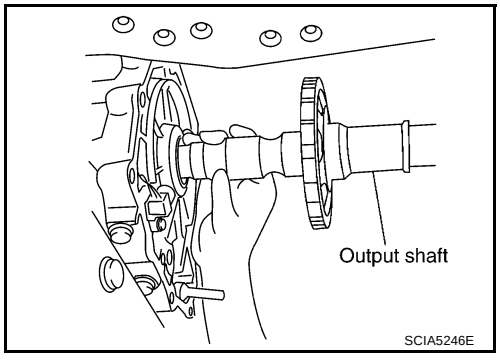
9. Remove rear extension assembly from transmission case. (With needle bearing.)



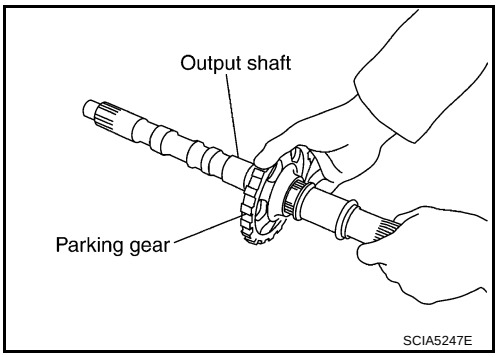
10. Remove bearing race from output shaft.



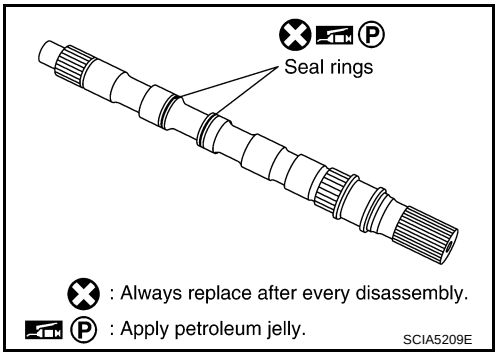
11. Remove output shaft from transmission case by rotating left/right.



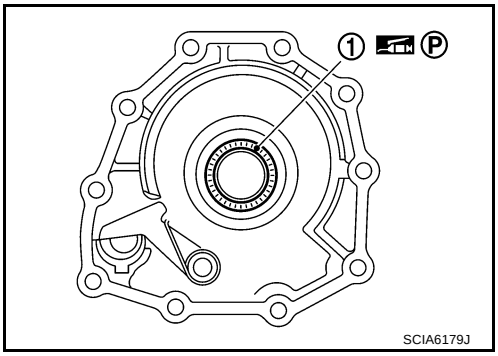
12. Remove parking gear from output shaft.



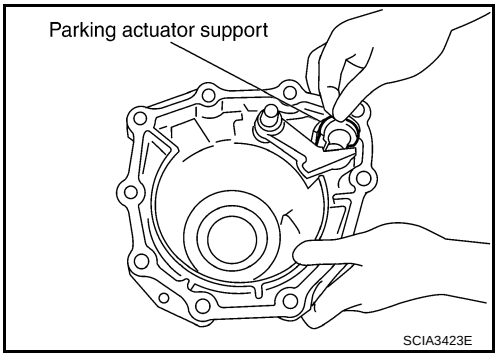
13. Remove seal rings from output shaft.



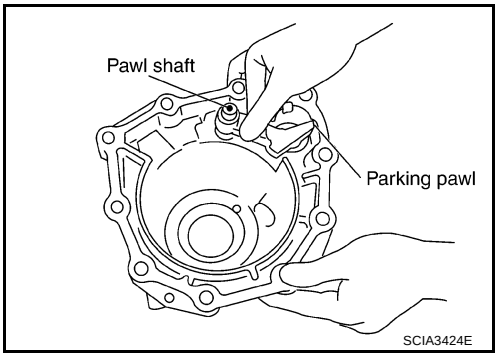
14. Remove needle bearing (1) from rear extension.



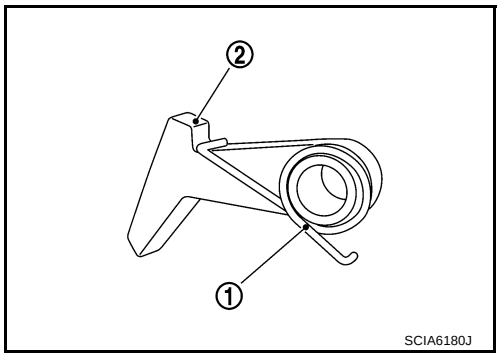
15. Remove parking actuator support from rear extension.



16. Remove parking pawl (with return spring) and pawl shaft from rear extension.



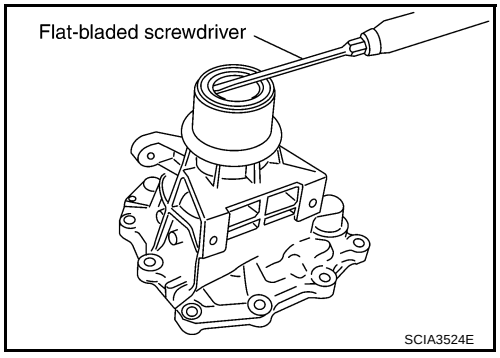
17. Remove return spring (1) from parking pawl (2).



18. Remove rear oil seal from rear extension.

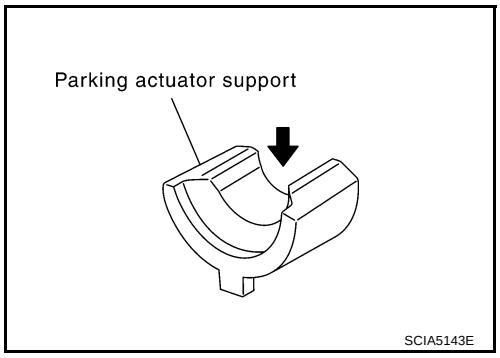
CAUTION:

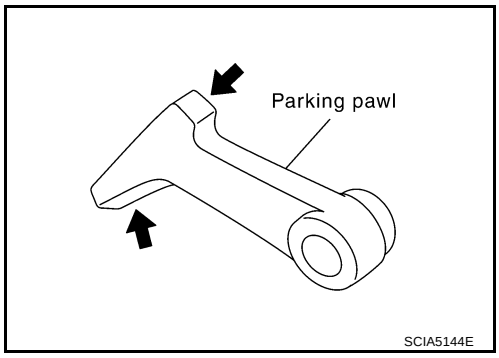
Be careful not to scratch rear extension.



INSPECTION

- If the contact surface on parking actuator support, parking pawl, etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



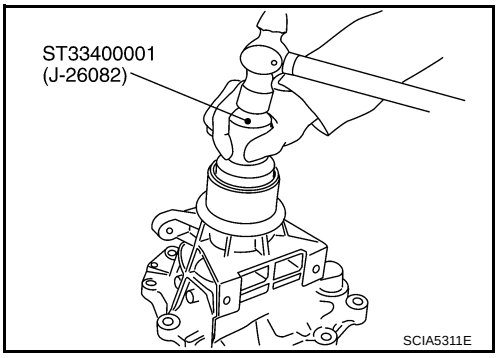


INSTALLATION

CAUTION:

After completing installation, check A/T position, A/T fluid leakage and A/T fluid level. Refer to AT-206, "Checking of A/T Position" , AT-12, "Checking A/T Fluid" .

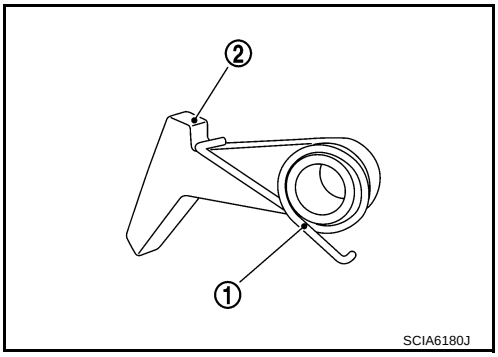
1. As shown in the figure, use a drift to drive rear oil seal into the rear extension until it is flush.



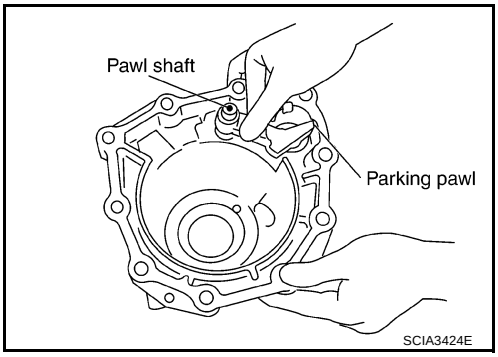
CAUTION:

- **Do not reuse rear oil seal.**
- **Apply ATF to rear oil seal.**

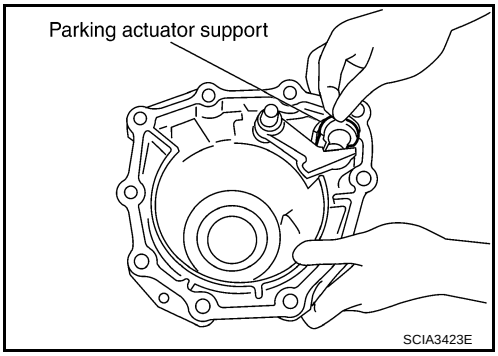
2. Install return spring (1) to parking pawl (2).



3. Install parking pawl (with return spring) and pawl shaft to rear extension.



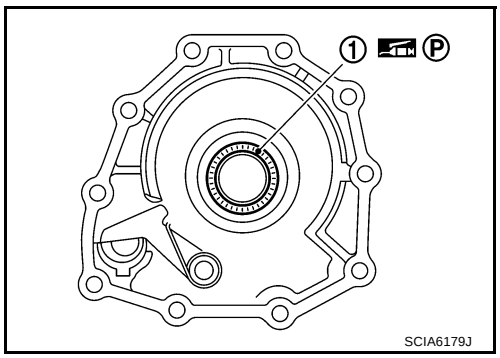
4. Install parking actuator support to rear extension.



5. Install needle bearing (1) to rear extension.

CAUTION:

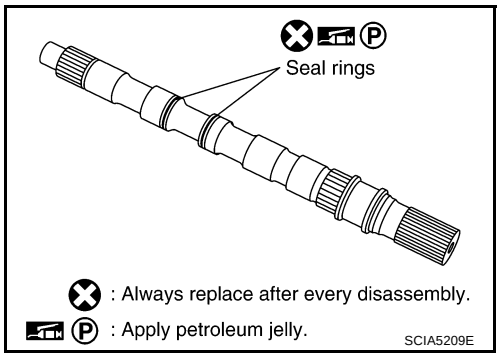
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



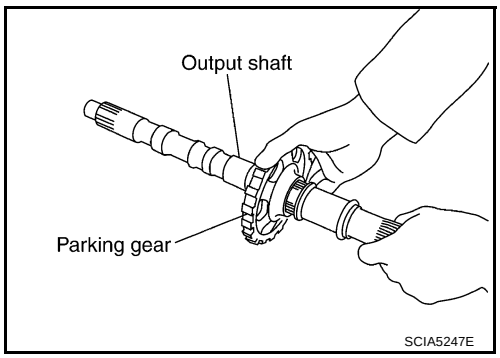
6. Install seal rings in output shaft.

CAUTION:

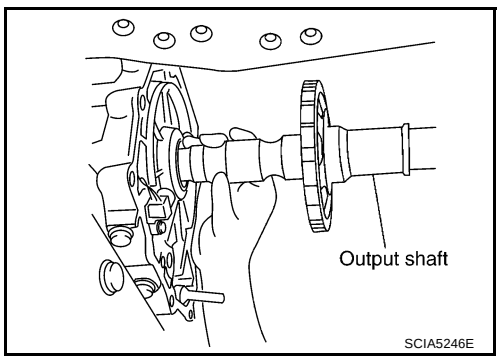
- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



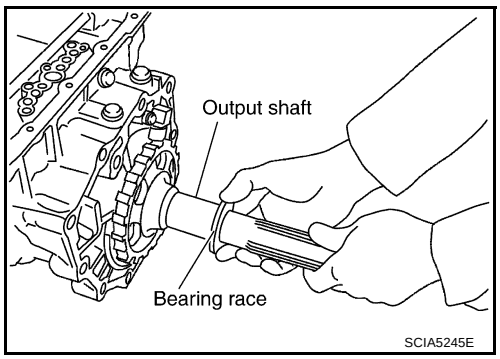
7. Install parking gear to output shaft.



8. Install output shaft to transmission case.

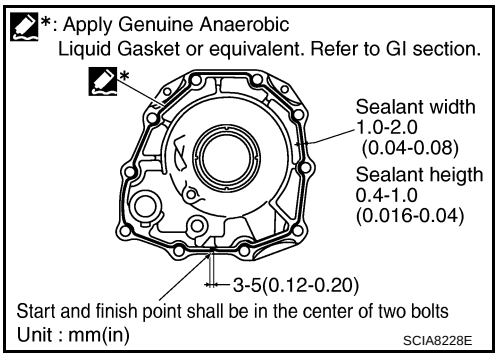


9. Install bearing race to output shaft.



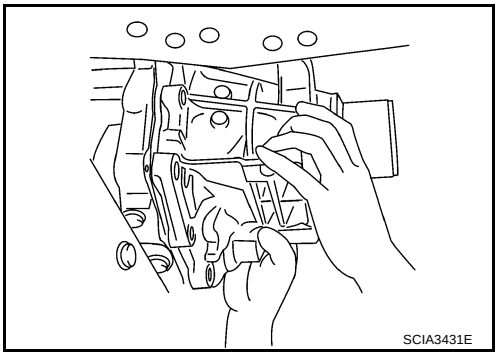
10. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in the figure.

CAUTION:
Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



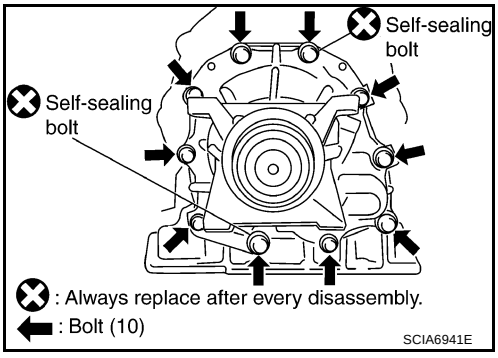
11. Install rear extension assembly to transmission case. (With needle bearing.)

CAUTION:
Insert the tip of parking rod between parking pawl and parking actuator support when assembling rear extension assembly.



12. Tighten rear extension assembly mounting bolts to the specified torque. Refer to AT-227, "COMPONENTS" .

CAUTION:
Do not reuse self-sealing bolts.



13. Install rear engine mounting member. Refer to AT-242, "Removal and Installation" .
14. Install control rod. Refer to AT-205, "Control Rod Removal and Installation" .
15. Install rear propeller shaft. Refer to PR-6, "Removal and Installation" .

CAUTION:
Do not impact or damage propeller shaft tube.

16. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .
17. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-215, "COMPONENTS" .

CAUTION:
Do not reuse drain plug gasket.

18. Pour ATF into A/T assembly. Refer to AT-12, "Changing A/T Fluid" .

Rear Oil Seal

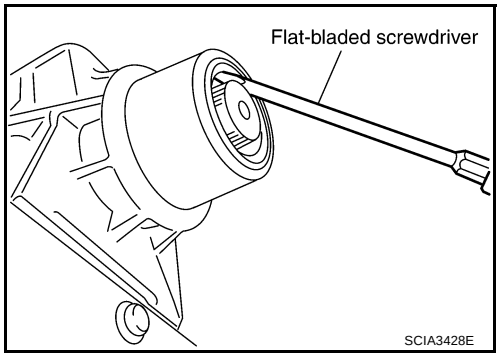
NCS00094

REMOVAL

1. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
2. Remove rear propeller shaft. Refer to PR-6, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
3. Remove rear oil seal using a flat-bladed screwdriver.

   CAUTION:
   Be careful not to scratch rear extension assembly.



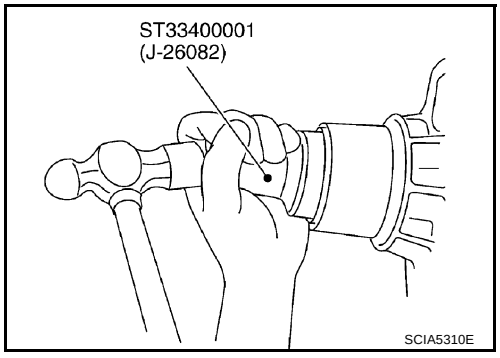
INSTALLATION

CAUTION:
After completing installation, check A/T fluid leakage and A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

1. As shown in the figure, use the drift to drive rear oil seal into rear extension assembly until it is flush.

   CAUTION:
   - **Do not reuse rear oil seal.**
   - **Apply ATF to rear oil seal.**
2. Install rear propeller shaft. Refer to PR-6, "Removal and Installation" .

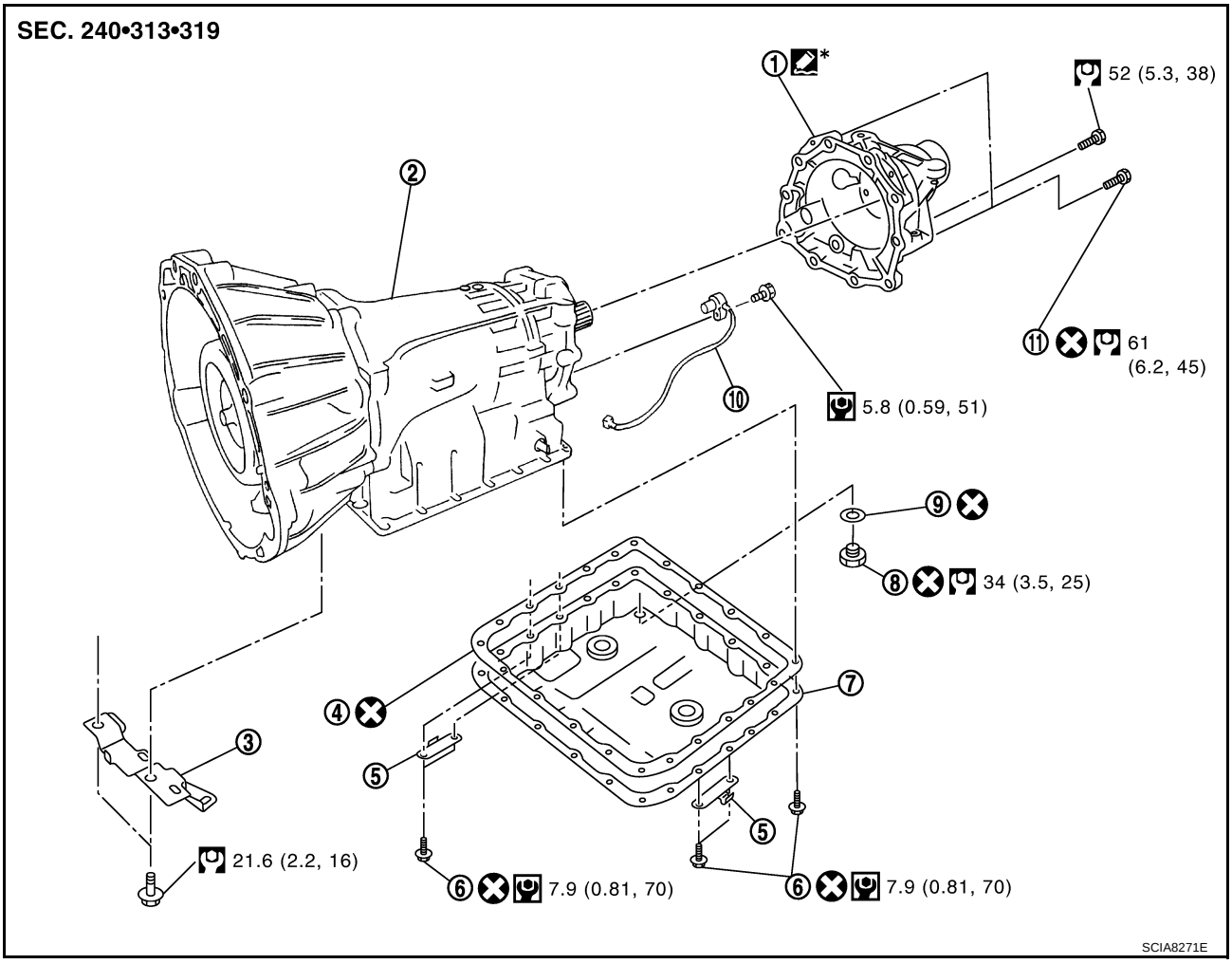
   CAUTION:
   Do not impact or damage propeller shaft tube.
3. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .



Revolution Sensor

NCS00095

COMPONENTS



1. Rear extension	2. A/T	3. Bracket
4. Oil pan gasket	5. Clip	6. Oil pan mounting bolt
7. Oil pan	8. Drain plug	9. Drain plug gasket
10. Revolution sensor	11. Self-sealing bolt	

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

However, refer to the following for others.

: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

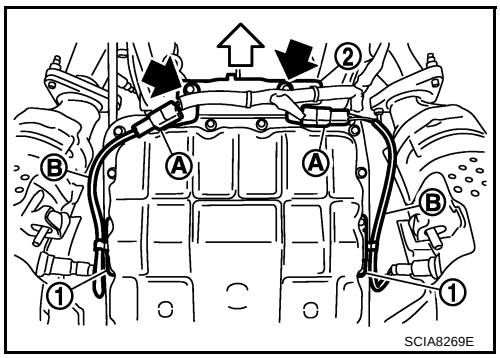
REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
4. Remove rear propeller shaft. Refer to PR-6, "Removal and Installation" .

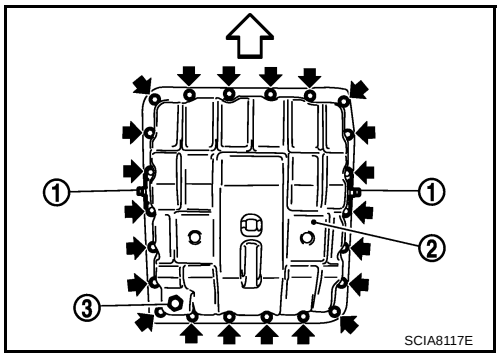
   CAUTION:

   Do not impact or damage propeller shaft tube.
5. Remove control rod. Refer to AT-205, "Control Rod Removal and Installation" .
6. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .

7. Disconnect heated oxygen sensor 2 harness connectors (A).
   - ⇦: Vehicle front
   - ⬅: Bolt
8. Remove heated oxygen sensor 2 harness (B) from clips (1).
9. Remove bracket (2) from transmission assembly.

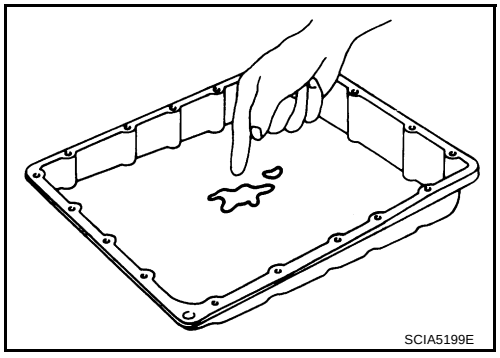


10. Remove clip (1), oil pan (2) and oil pan gasket.
    - ⇦: Vehicle front
    - ⬅: Oil pan mounting bolt
    - Drain plug (3)

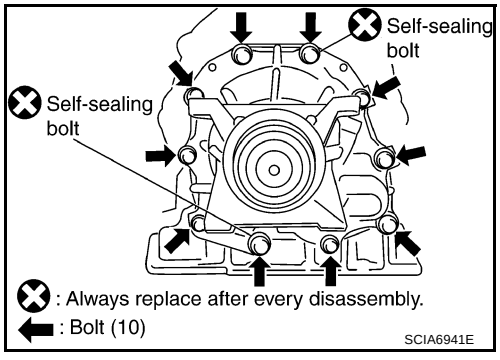


11. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
    - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**
12. Support transmission assembly with a transmission jack.

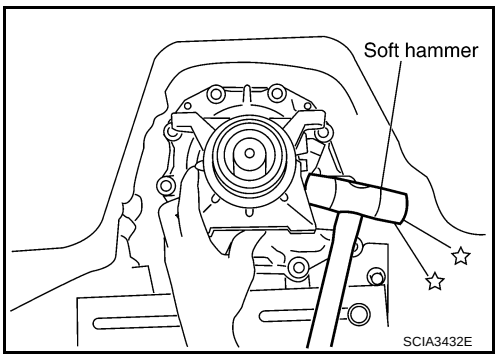
    CAUTION:
    When setting transmission jack, place wooden blocks to prevent from damaging control valve with TCM and transmission case.



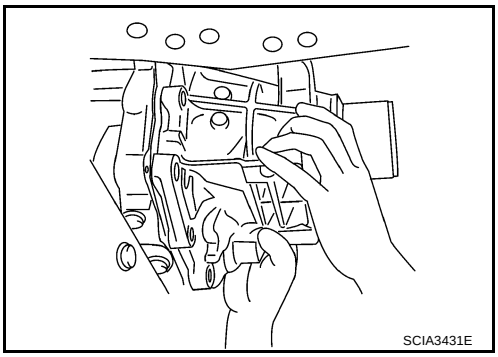
13. Remove rear engine mounting member with power tool. Refer to AT-242, "Removal and Installation" .
14. Remove tightening bolts for rear extension assembly and transmission case.



15. Tap rear extension assembly with soft hammer.



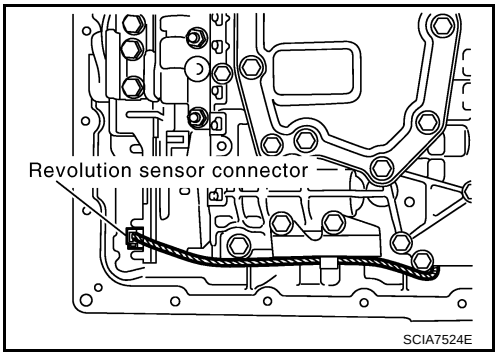
16. Remove rear extension assembly from transmission case. (With needle bearing.)



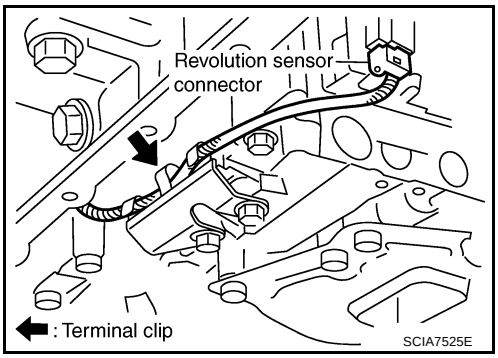
17. Disconnect revolution sensor connector.

CAUTION:

Be careful not to damage connector.



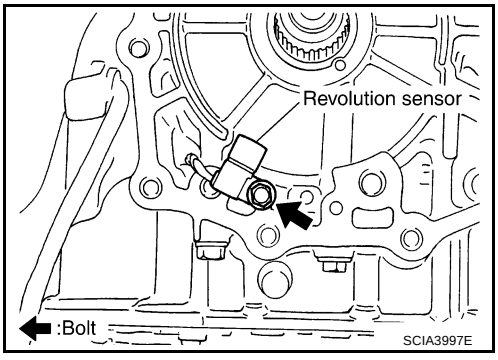
18. Straighten terminal clip to free revolution sensor harness.



19. Remove revolution sensor from transmission case.

CAUTION:

- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

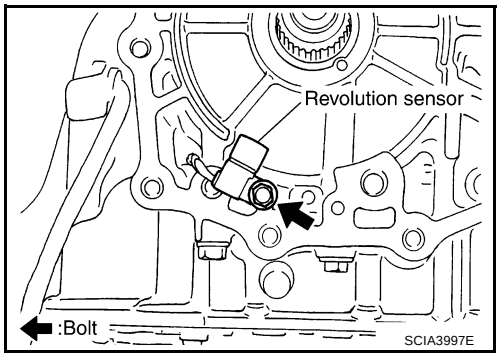


INSTALLATION

CAUTION:

After completing installation, check A/T position, A/T fluid leakage and A/T fluid level. Refer to AT-206, "Checking of A/T Position" , AT-12, "Checking A/T Fluid" .

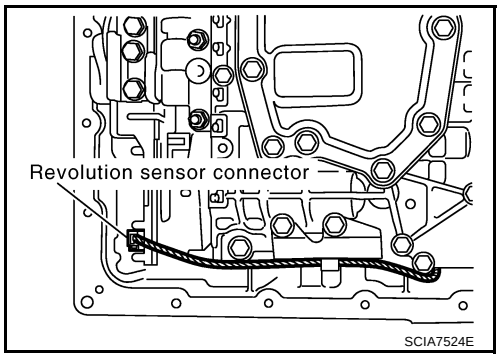
1. Install revolution sensor in transmission case, and then tighten a revolution sensor mounting blot to the specified torque. Refer to AT-235, "COMPONENTS" .



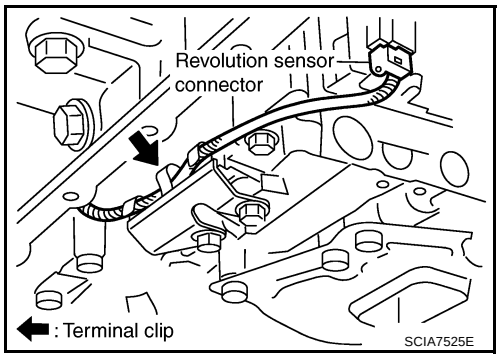
CAUTION:

- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

2. Connect revolution sensor connector.



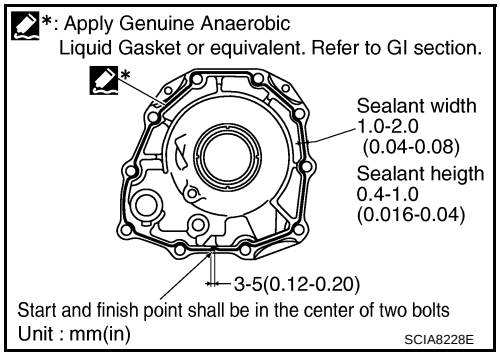
3. Securely fasten revolution sensor harness with clip.



4. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in illustration.

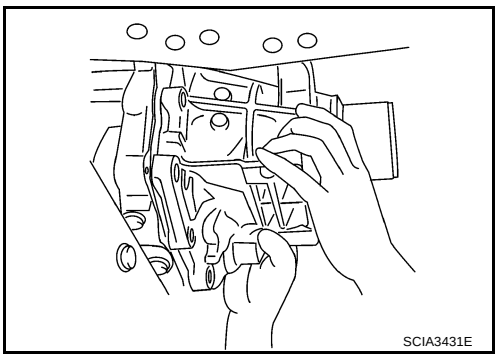
CAUTION:

Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



5. Install rear extension assembly to transmission case. (With needle bearing.)

CAUTION:
Insert the tip of parking rod between parking pawl and parking actuator support when assembling rear extension assembly.



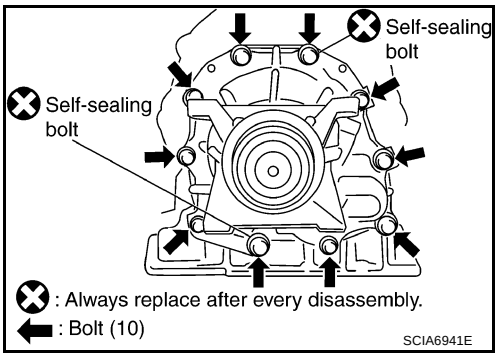
6. Tighten rear extension assembly mounting bolts to the specified torque. Refer to AT-235, "COMPONENTS" .

CAUTION:
Do not reuse self-sealing bolts.

7. Install rear engine mounting member. Refer to AT-242, "Removal and Installation" .
8. Install oil pan to transmission case.

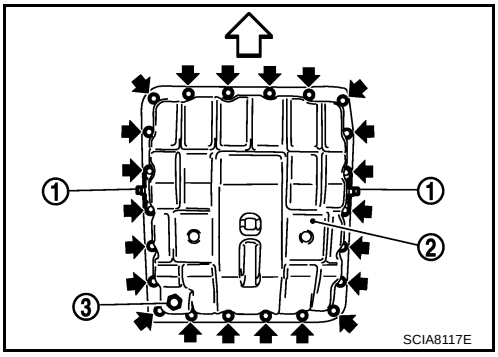
a. Install oil pan gasket to oil pan.

CAUTION:
- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**



b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.
- ⇦: Vehicle front
- ⬅: Oil pan mounting bolt

CAUTION:
- **Install it so that drain plug (3) comes to the position as shown in the figure.**
- **Be careful not to pinch harness.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

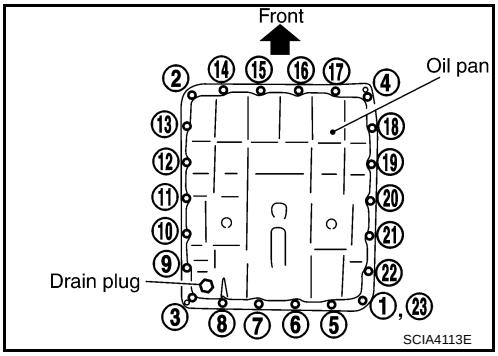


c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-235, "COMPONENTS" .

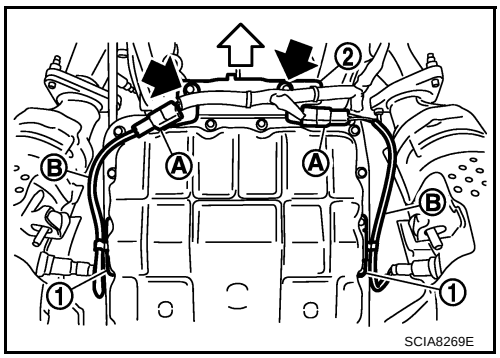
CAUTION:
Do not reuse oil pan mounting bolts.

9. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-235, "COMPONENTS" .

CAUTION:
Do not reuse drain plug gasket.



10. Install bracket (2) from transmission assembly. Refer to AT-215, "COMPONENTS" .
    - ⇦: Vehicle front
    - ⬅: Bolt
11. Install heated oxygen sensor 2 harness (B) from clips (1).
12. Connect heated oxygen sensor 2 harness connectors (A).
13. Install exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .
14. Install control rod. Refer to AT-205, "Control Rod Removal and Installation" .



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15. Install rear propeller shaft. Refer to PR-6, "Removal and Installation" .

    CAUTION:
    Do not impact or damage propeller shaft tube.
16. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .
17. Pour ATF into A/T assembly. Refer to AT-12, "Changing A/T Fluid" .
18. Connect the battery cable to the negative terminal.

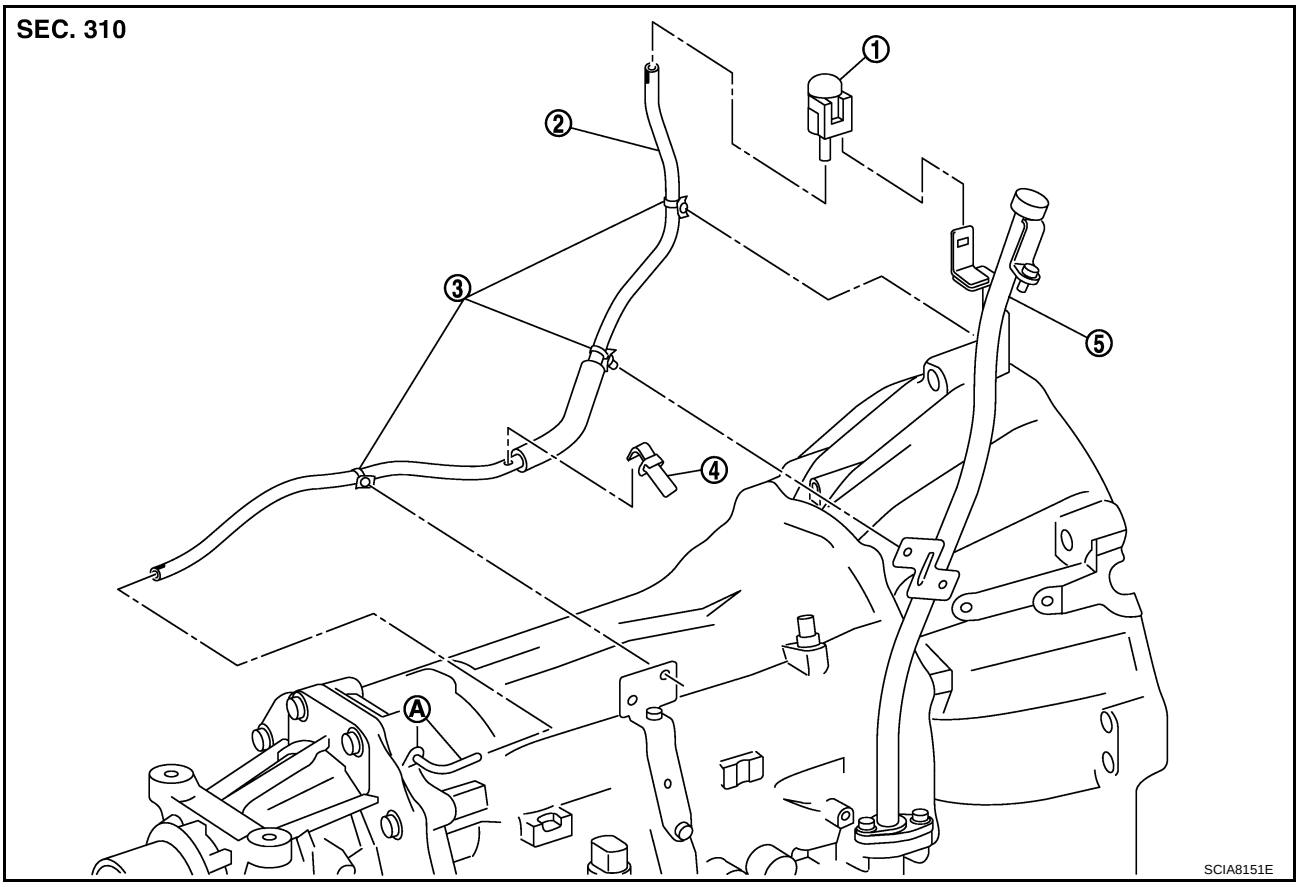
AIR BREATHER HOSE

PFP:31098

Removal and Installation

NCS00096

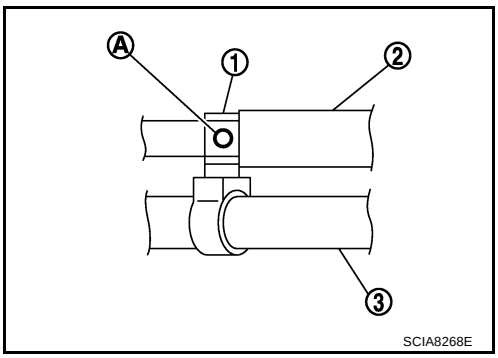
Refer to the figure below for air breather hose removal and installation procedure.



1. Air breather box
2. Air breather hose
3. Clip
4. Clip
5. A/T fluid charging pipe
A. Air breather tube

CAUTION:

- **When installing an air breather hose, do not to crush or block by folding or bending the hose.**
- **When inserting air breather hose to air breather tube, be sure to insert it fully until its end reaches the tube bend R portion.**
- **Install A/T air breather hose to air breather tube so that the paint mark is facing upward.**
- **Ensure clips are securely installed to brackets when installing A/T breather hose to brackets.**
- **When inserting air breather hose to air breather box, be sure to insert it fully until its end reaches the stop.**
- **Install A/T air breather hose to air breather box so that the paint mark is facing backward.**
- **Install clip (1) at the paint mark (A).**
  - **Air breather hose (2)**
  - **Harness (3)**

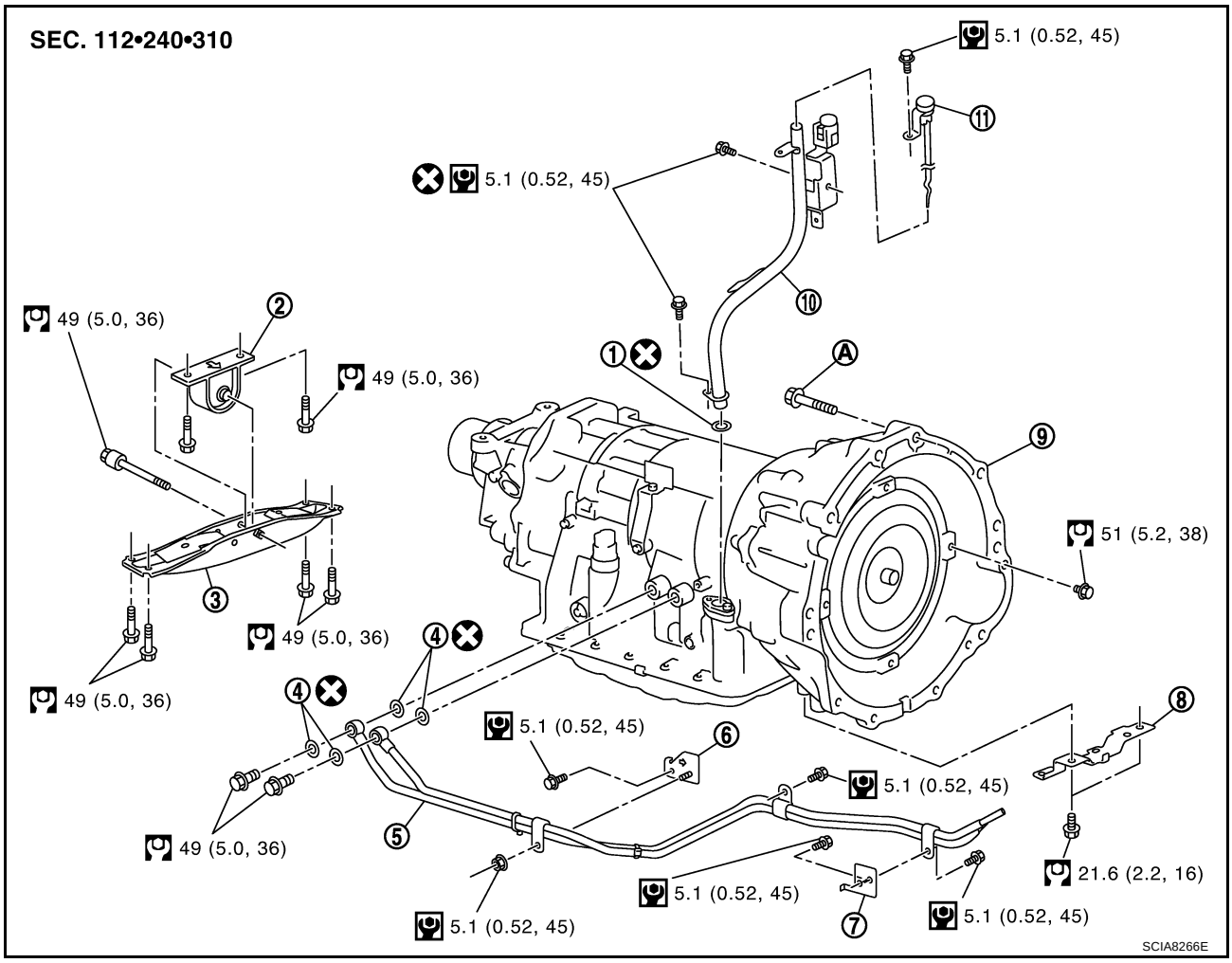


TRANSMISSION ASSEMBLY

PFP:31020

Removal and Installation

NCS00097



1. O-ring	2. Engine mounting insulator (rear)	3. Rear engine mounting member
4. Copper washer	5. Fluid cooler tube	6. Bracket
7. Bracket	8. Bracket	9. A/T assembly
10. A/T fluid charging pipe	11. A/T fluid level gauge	

A. For tightening torque, refer to AT-244, "INSTALLATION" .

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

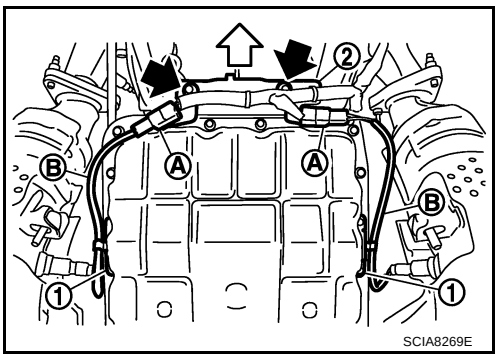
REMOVAL

CAUTION:

- **When removing A/T assembly from engine assembly, first remove crankshaft position sensor (POS) from A/T assembly.**
- **Be careful not to damage sensor edge.**

1. Disconnect the battery cable from the negative terminal.
2. Remove tower bar with power tool. Refer to FSU-20, "Removal and Installation" .
3. Remove engine under covers with power tool.
4. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .

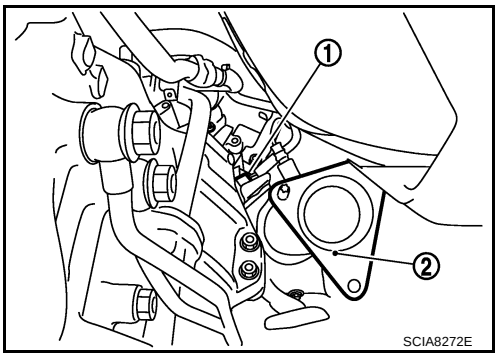
5. Disconnect heated oxygen sensor 2 harness connectors (A).
   - ⇦: Vehicle front
   - ⬅: Bolt
6. Remove heated oxygen sensor 2 harness (B) from clips (1).
7. Remove bracket (2) from transmission assembly.
8. Remove front cross bar with power tool. Refer to FSU-8, "Components" .
9. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
10. Remove three way catalyst (right bank) and three way catalyst (left bank). Refer to EM-22, "Removal and Installation" .



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11. Remove crankshaft position sensor (POS) (1). Refer to EM-26, "Removal and Installation" .
    - Three way catalyst (right bank) (2)

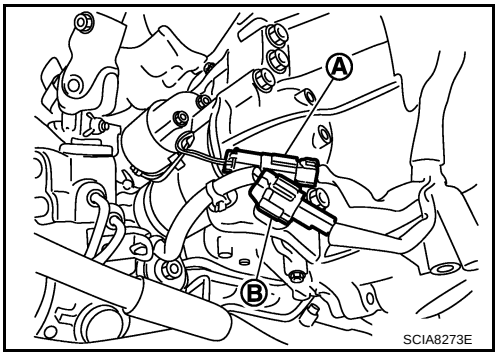
    CAUTION:
    - **Do not subject it to impact by dropping or hitting it.**
    - **Do not disassemble.**
    - **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
    - **Do not place in an area affected by magnetism.**



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12. Remove rear propeller shaft. Refer to PR-6, "Removal and Installation" .

    CAUTION:
    Do not impact, or damage propeller shaft tube.
13. Remove control rod. Refer to AT-205, "Control Rod Removal and Installation" .
14. Disconnect the following:
    - A/T assembly harness connector
    - S terminal connector (A)
    - EPS solenoid valve harness connector (B)
15. Remove starter motor with power tool. Refer to SC-17, "Removal and Installation" .
16. Remove A/T fluid level gauge.
17. Remove A/T fluid charging pipe
18. Remove O-ring from A/T fluid charging pipe.
19. Remove fluid cooler tube according to the following procedure.



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a. Remove mounting nuts of the engine mounting insulator (LH) and engine mounting insulator (RH) on the undersurface of the vehicle. Refer to EM-101, "Removal and Installation" .
b. Push engine assembly upward from the vehicle with transmission jack to create clearance for removing fluid cooler tube.

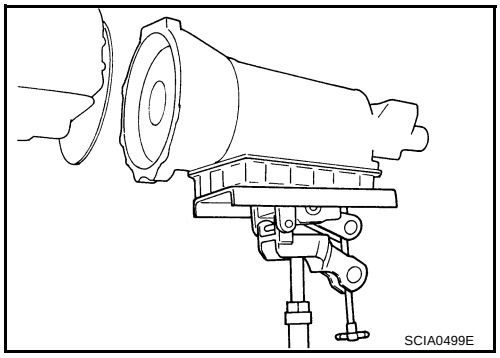
   CAUTION:
   Be careful with hoses and harness when pushing up the engine assembly.
c. Remove fluid cooler tube.

20. Plug up openings such as A/T fluid charging pipe hole, etc.
21. Remove rear plate cover from converter housing. Refer to EM-26, "Removal and Installation" .
22. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.

    CAUTION:
    When turning crankshaft, turn it clockwise as viewed from the front of the engine.
23. Support A/T assembly with a transmission jack.

    CAUTION:
    When setting the transmission jack, be careful not to allow it to collide against the drain plug.
24. Remove rear engine mounting member with power tool. Refer to AT-242, "Removal and Installation" .

25. Remove engine mounting insulator (rear) with power tool. Refer to AT-242, "Removal and Installation" .
26. Remove bolts fixing A/T assembly to engine assembly with power tool.
27. Remove A/T assembly from vehicle with a transmission jack.
    - **Secure torque converter to prevent it from dropping.**
    - **Secure A/T assembly to a transmission jack.**
28. Remove air breather hose. Refer to AT-241, "Removal and Installation" .

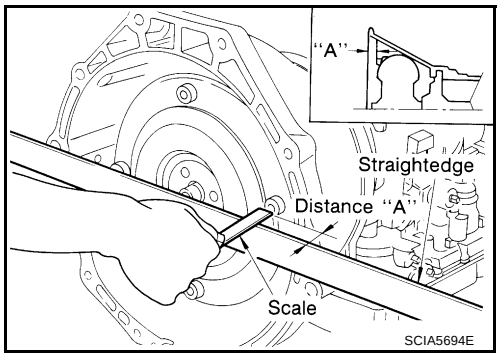


INSPECTION

Installation and Inspection of Torque Converter

- After inserting a torque converter to a A/T, be sure to check distance “A” to ensure it is within the reference value limit.

Distance “A”: 25.0 mm (0.98 in) or more

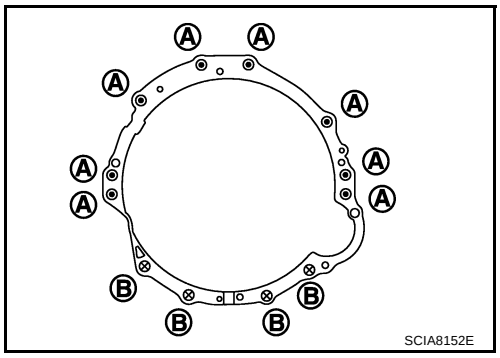


INSTALLATION

Install the removed parts in the reverse order of the removal, while paying attention to the following work.

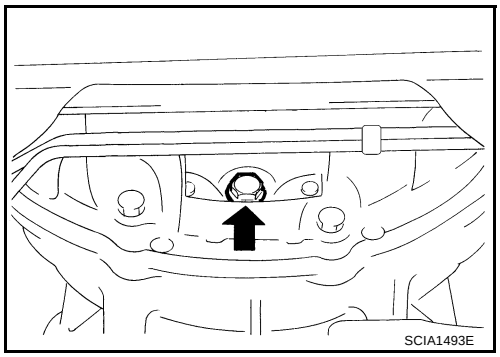
- When installing A/T assembly to the engine assembly, attach the fixing bolts in accordance with the following standard.
  - ⊗: Engine to transmission
  - ⦿: Transmission to engine

Bolt symbol	A	B
Number of bolts	8	4
Bolt length mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)	46.6 (4.8, 34)



- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then tighten the bolts with the specified torque.

: 51 N·m (5.2 kg-m, 38 ft-lb)



CAUTION:

- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for torque converter after fixing crankshaft pulley bolts, be sure to confirm the tightening torque of crankshaft pulley mounting bolts. Refer to EM-53, "TIMING CHAIN" .**
- **After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.**
- Install crankshaft position sensor (POS). Refer to EM-26, "Removal and Installation" .

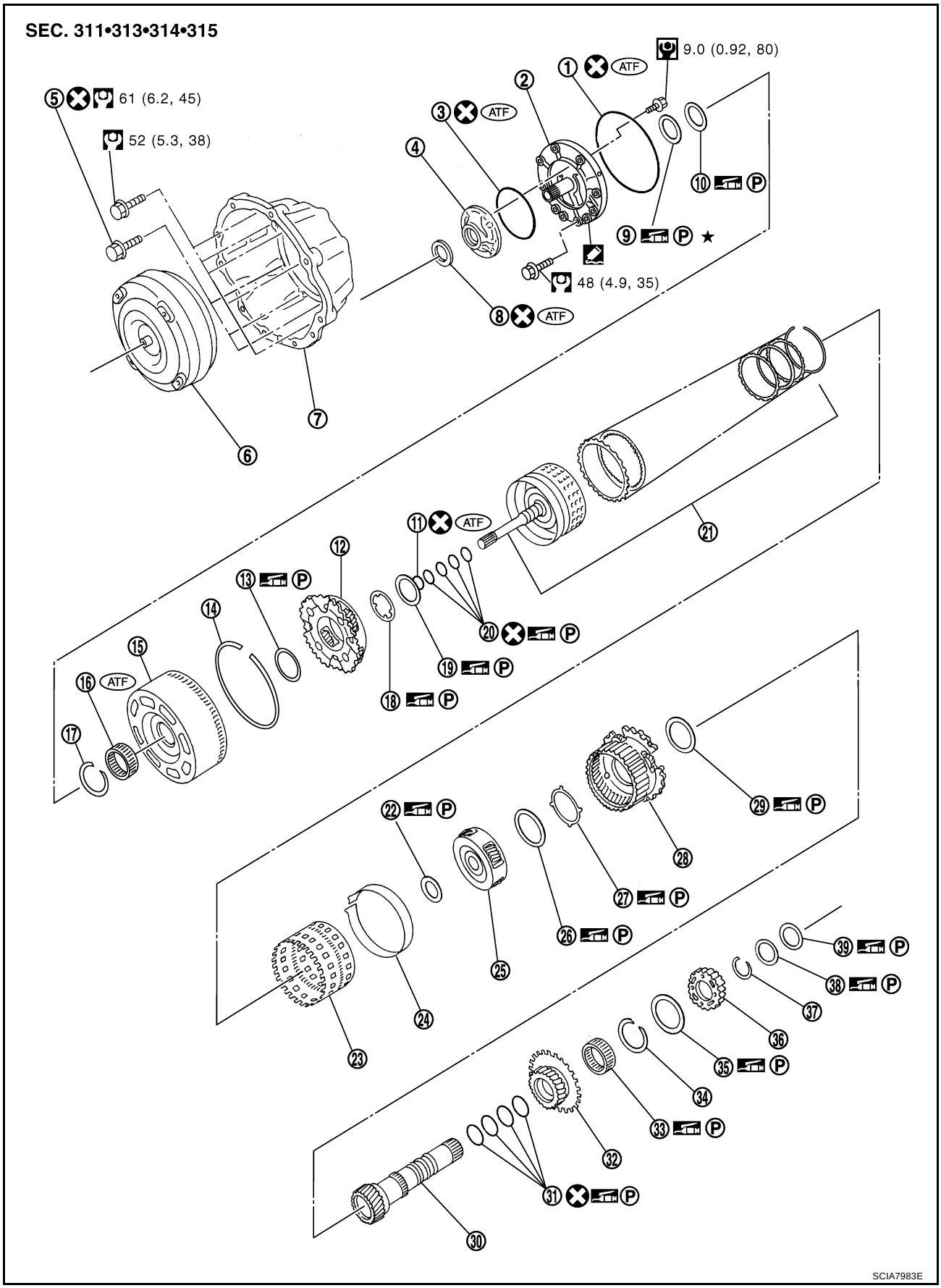
- After completing installation, check A/T fluid leakage, A/T fluid level and A/T position. Refer to AT-12, "Checking A/T Fluid" , AT-206, "Checking of A/T Position" .

OVERHAUL

PFP:00000

Components

NCS00098



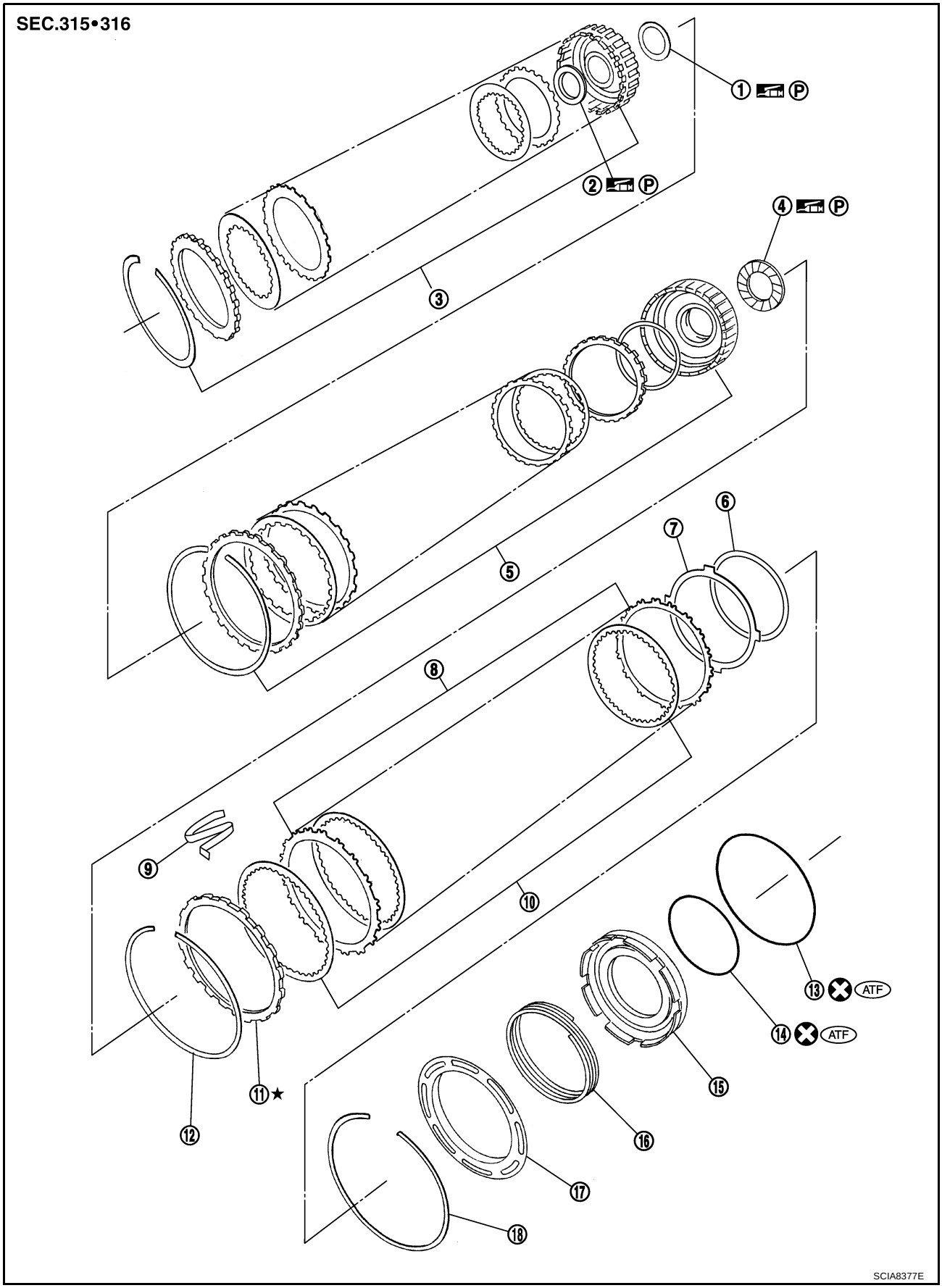
1. O-ring	2. Oil pump cover	3. O-ring
4. Oil pump housing	5. Self-sealing bolt	6. Torque converter
7. Converter housing	8. Oil pump housing oil seal	9. Bearing race
10. Needle bearing	11. O-ring	12. Front carrier assembly
13. Needle bearing	14. Snap ring	15. Front sun gear
16. 3rd one-way clutch	17. Snap ring	18. Bearing race
19. Needle bearing	20. Seal ring	21. Input clutch assembly
22. Needle bearing	23. Rear internal gear	24. Brake band
25. Mid carrier assembly	26. Needle bearing	27. Bearing race
28. Rear carrier assembly	29. Needle bearing	30. Mid sun gear
31. Seal ring	32. Rear sun gear	33. 1st one-way clutch
34. Snap ring	35. Needle bearing	36. High and low reverse clutch hub
37. Snap ring	38. Bearing race	39. Needle bearing

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

However, refer to the following for others.

: Apply Genuine RTV silicone sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

SEC.315•316

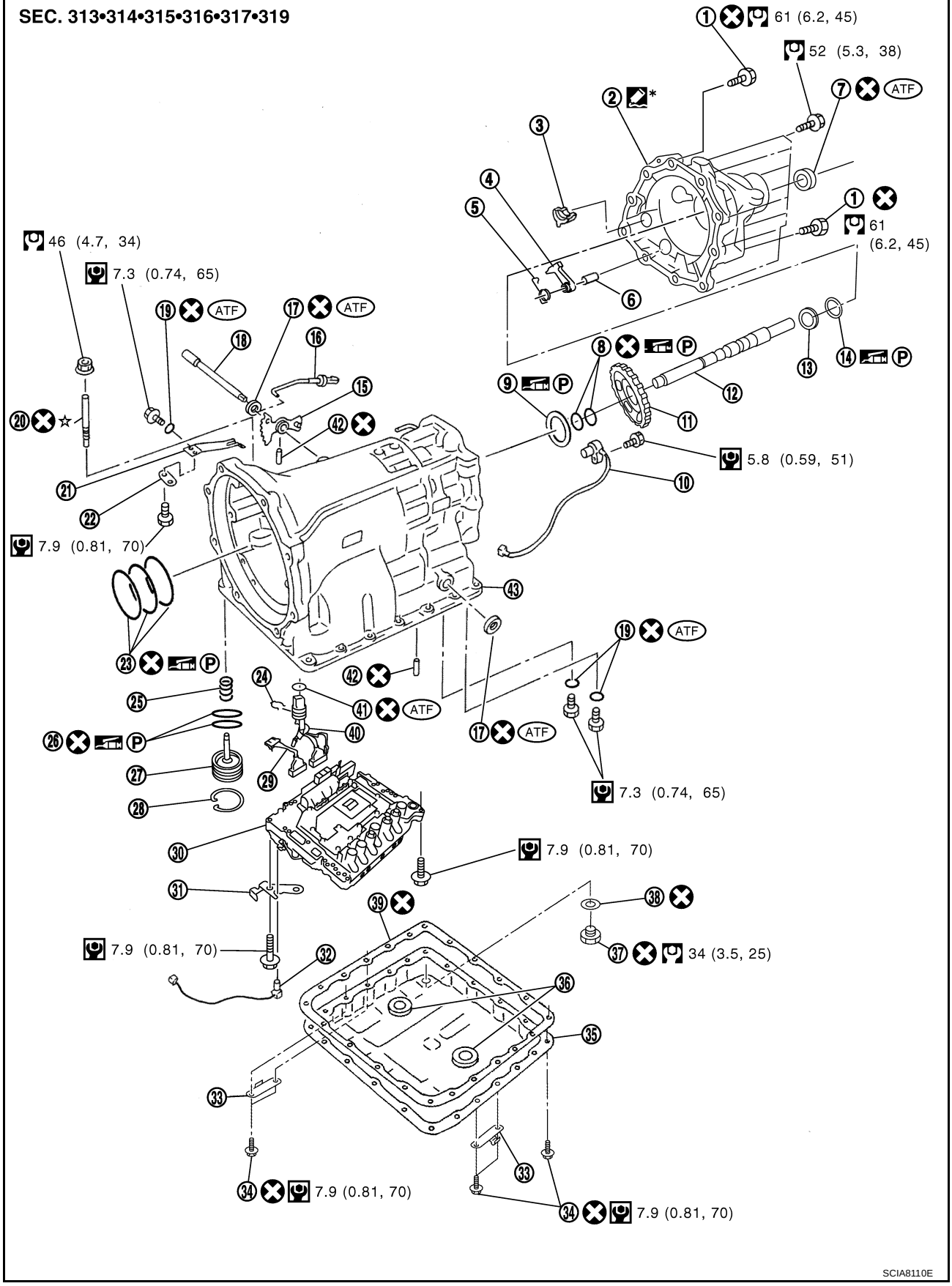


1. Needle bearing
2. Bearing race
3. High and low reverse clutch assembly
4. Needle bearing
5. Direct clutch assembly
6. Reverse brake dish plate
7. Reverse brake dish plate
8. Reverse brake driven plate
9. N-spring

10. Reverse brake drive plate	11. Reverse brake retaining plate	12. Snap ring
13. D-ring	14. D-ring	15. Reverse brake piston
16. Return spring	17. Spring retainer	18. Snap ring

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

SEC. 313•314•315•316•317•319



1. Self-sealing bolt
2. Rear extension
3. Parking actuator support
4. Parking pawl
5. Return spring
6. Pawl shaft
7. Rear oil seal
8. Seal ring
9. Needle bearing

10. Revolution sensor	11. Parking gear	12. Output shaft
13. Bearing race	14. Needle bearing	15. Manual plate
16. Parking rod	17. Manual shaft oil seal	18. Manual shaft
19. O-ring	20. Band servo anchor end pin	21. Detent spring
22. Spacer	23. Seal ring	24. Snap ring
25. Return spring	26. O-ring	27. Servo assembly
28. Snap ring	29. Sub-harness	30. Control valve with TCM
31. Bracket	32. A/T fluid temperature sensor 2	33. Clip
34. Oil pan mounting bolt	35. Oil pan	36. Magnet
37. Drain plug	38. Drain plug gasket	39. Oil pan gasket
40. Terminal cord assembly	41. O-ring	42. Retaining pin
43. Transmission case		

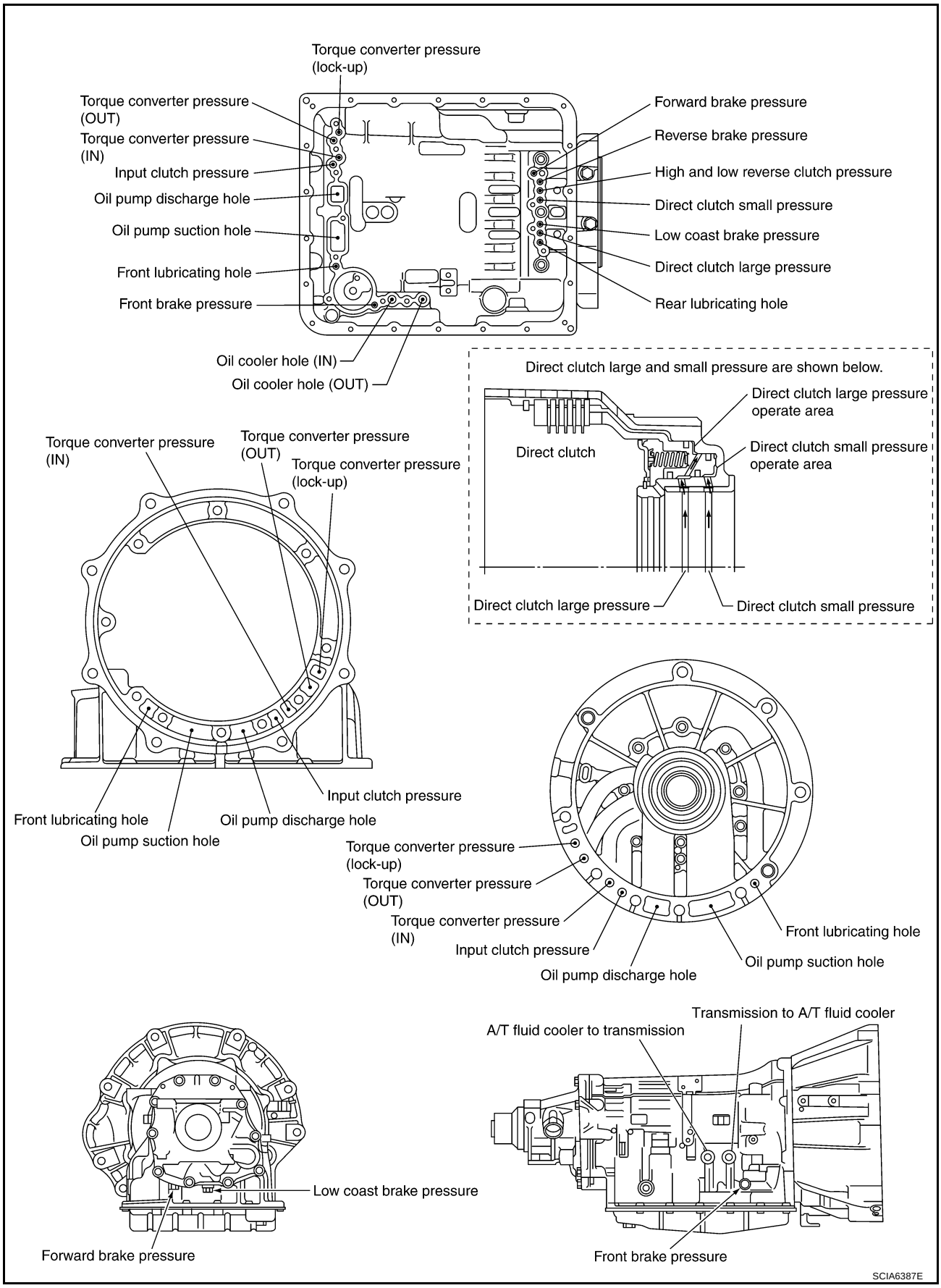
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

However, refer to the following for others.

* : Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

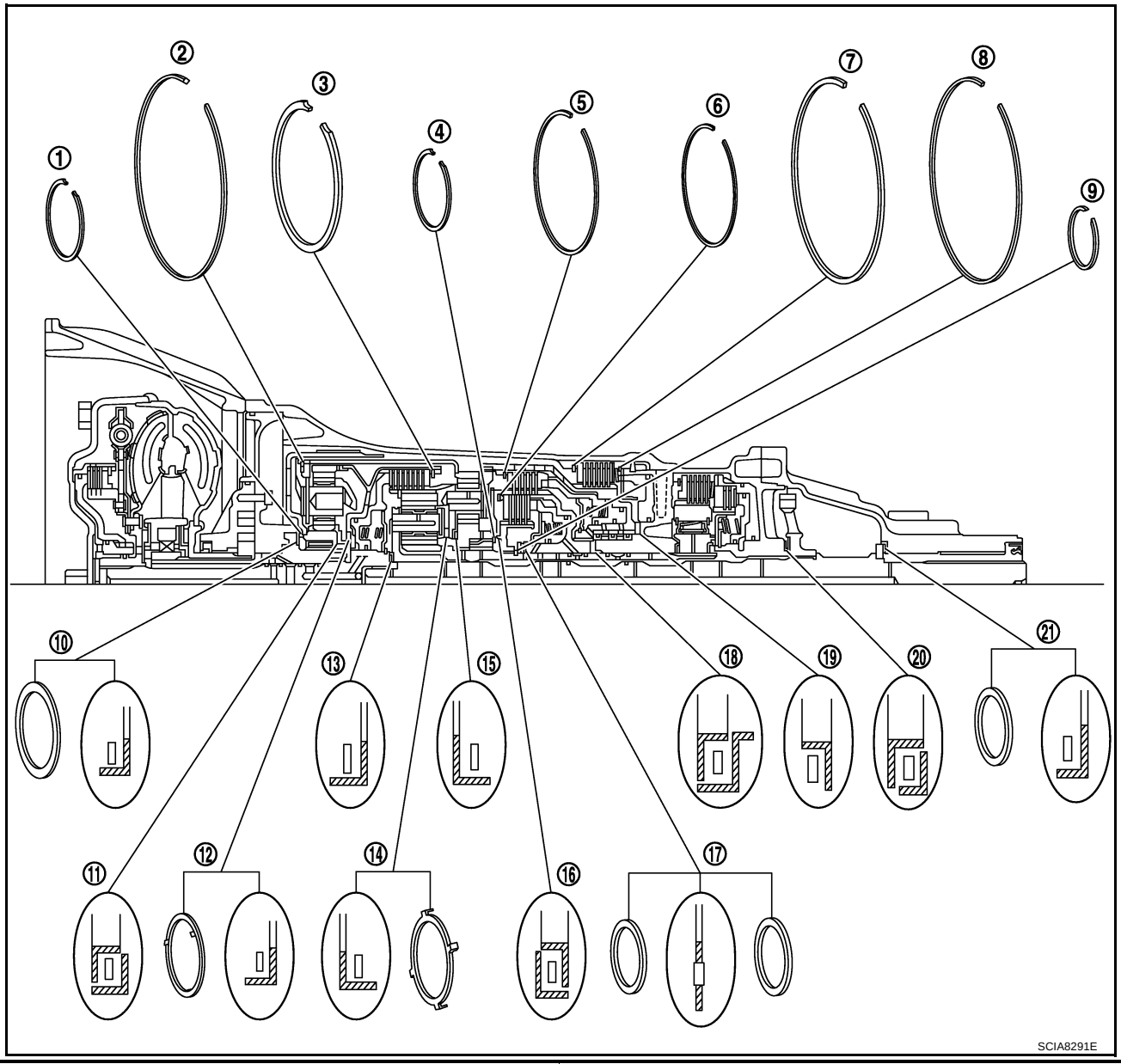
Oil Channel

NCS00099



Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

NCS0009A



Snap ring		Needle bearing	
Item number	Outer diameter mm (in)	Item number	Outer diameter mm (in)
1	67.5 (2.657)	10	80 (3.15)
2	182.4 (7.181)	11	77 (3.03)
3	171.5 (6.751)	12	77 (3.03)
4	70.5 (2.775)	13	47 (1.85)
5	169 (6.653)	14	84 (3.31)
6	134.3 (5.287)	15	84 (3.31)
7	180.5 (7.106)	16	92 (3.62)
8	181 (7.125)	17	60 (2.36)
9	48.4 (1.905)	18	63 (2.48)
—	—	19	92 (3.62)

Snap ring		Needle bearing	
Item number	Outer diameter mm (in)	Item number	Outer diameter mm (in)
—	—	20	65 (2.56)
—	—	21	60 (2.36)

DISASSEMBLY

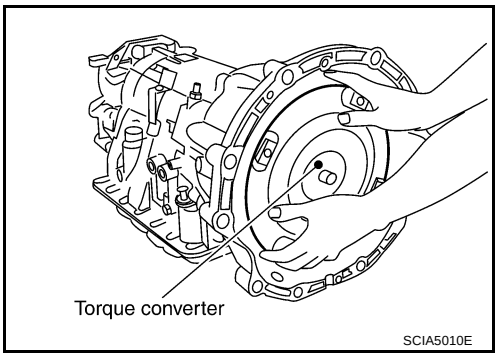
PFP:31020

Disassembly

NCS0009B

CAUTION:
Do not disassemble parts behind Drum Support. Refer to AT-17, "Cross-sectional View" .

1. Drain ATF through drain hole.
2. Remove torque converter by holding it firmly and turing while pulling straight out.

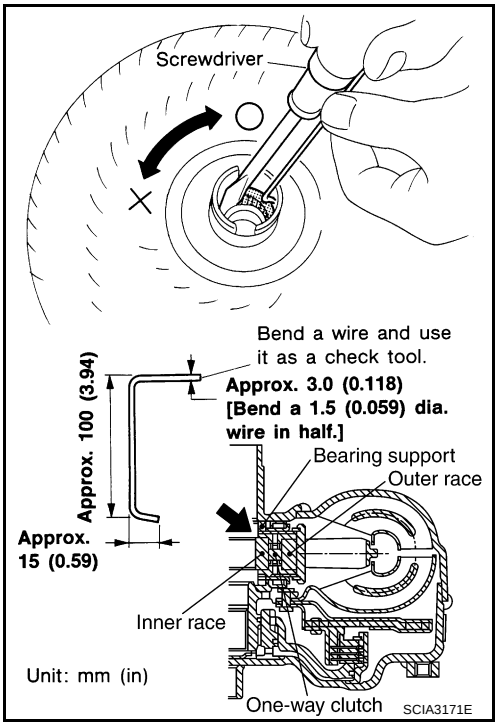


3. Check torque converter one-way clutch using check tool as shown at figure.

a. Insert check tool into the groove of bearing support built into one-way clutch outer race.

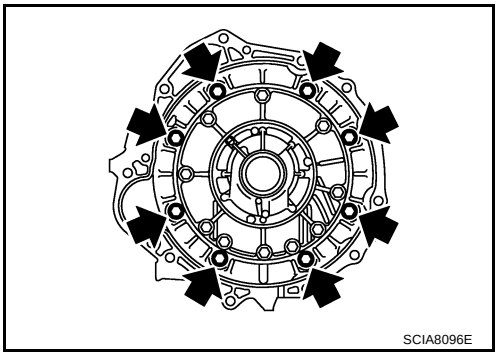
b. When fixing bearing support with check tool, rotate one- way clutch spline using screwdriver.

c. Check that inner race rotates clockwise only. If not, replace torque converter assembly.

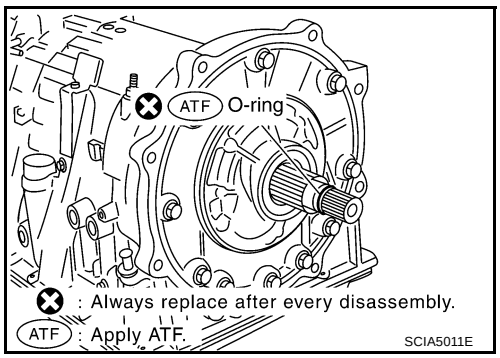


4. Remove tightening bolts (⬅) for converter housing and transmission case.
5. Remove converter housing from transmission case.

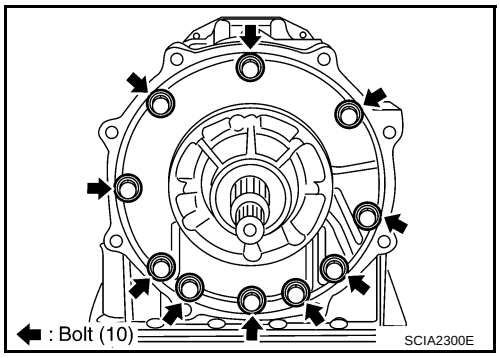
CAUTION:
Be careful not to scratch converter housing.



6. Remove O-ring from input clutch assembly.



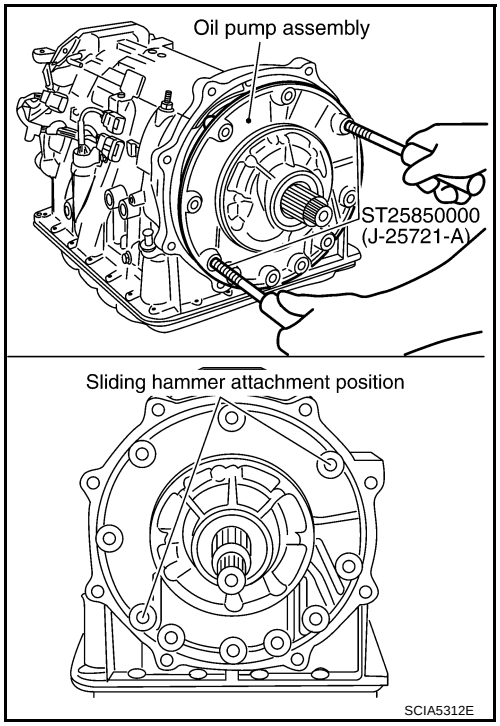
7. Remove tightening bolts for oil pump assembly and transmission case.



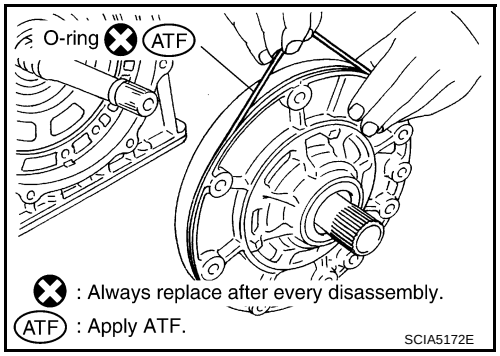
8. Attach the sliding hammers to oil pump assembly and extract it evenly from transmission case.

CAUTION:

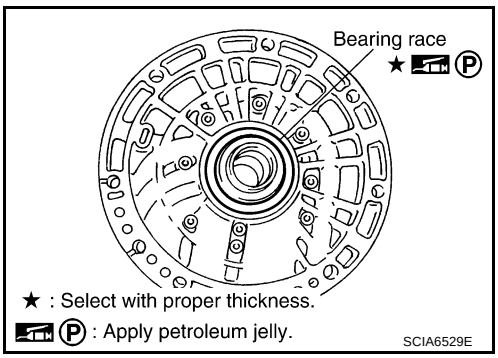
- **Fully tighten sliding hammer screw.**
- **Make sure that bearing race is installed to the oil pump assembly edge surface.**



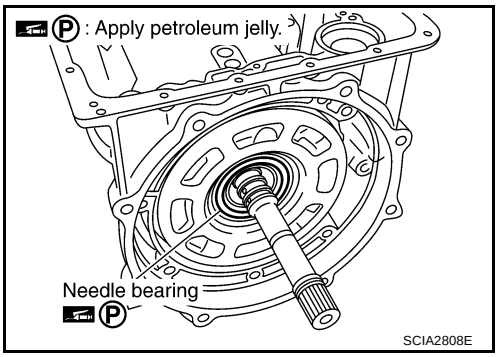
9. Remove O-ring from oil pump assembly.



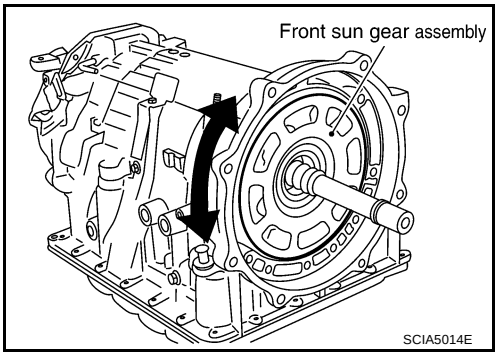
10. Remove bearing race from oil pump assembly.



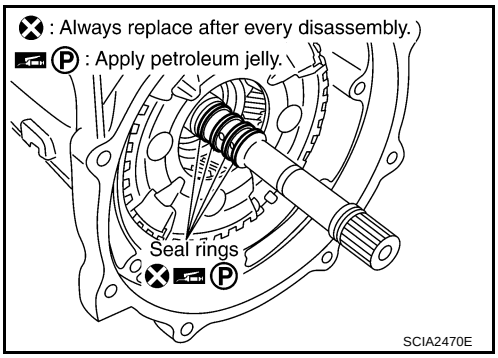
11. Remove needle bearing from front sun gear.



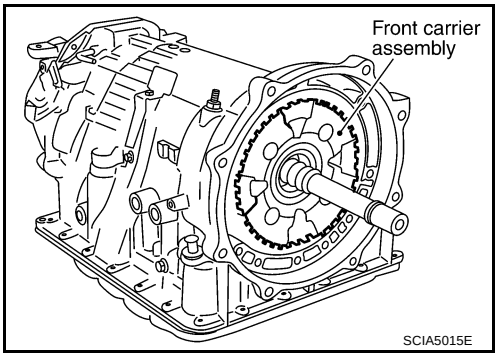
12. Remove front sun gear assembly from front carrier assembly.
NOTE:
Remove front sun gear by rotating left/right.



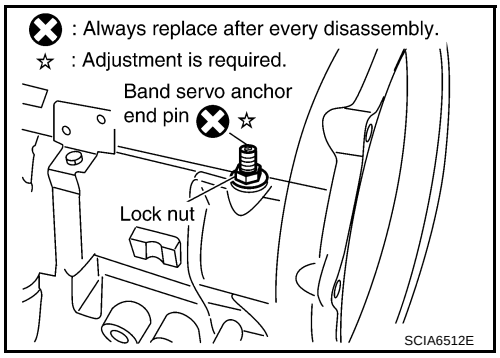
13. Remove seal rings from input clutch assembly.



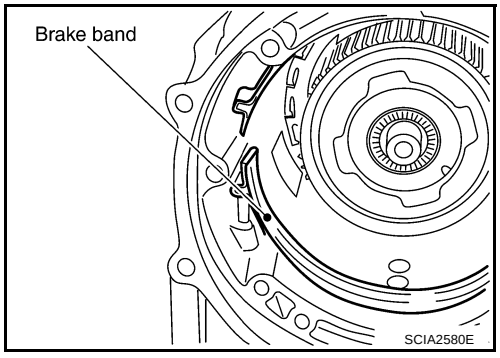
14. Remove front carrier assembly from rear carrier assembly. (With input clutch assembly and rear internal gear.)
CAUTION:
Be careful to remove it with needle bearing.



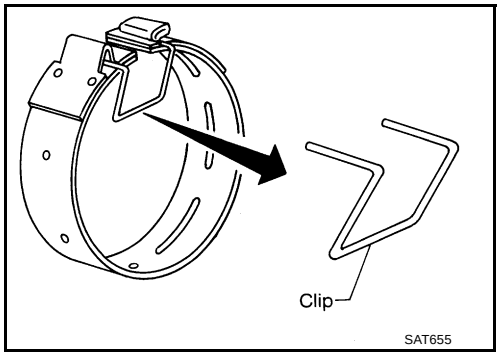
15. Loosen lock nut and remove band servo anchor end pin from transmission case.



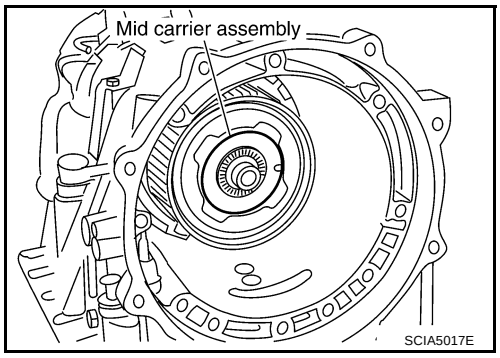
16. Remove brake band from transmission case.



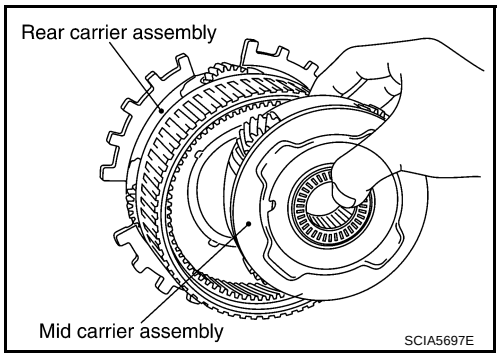
- **To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at right.**
  Leave the clip in position after removing the brake band.
- **Check brake band facing for damage, cracks, wear or burns.**



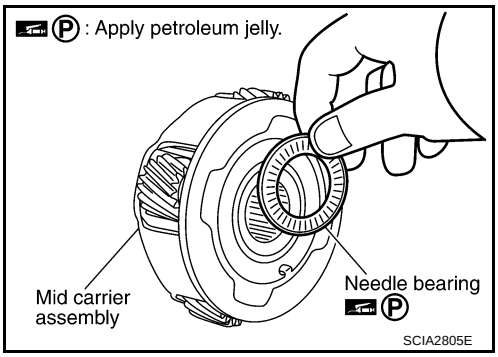
17. Remove mid carrier assembly and rear carrier assembly as a unit.



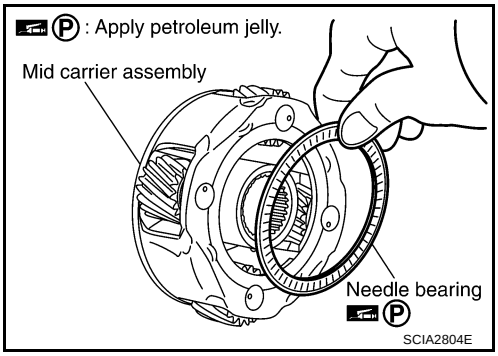
18. Remove mid carrier assembly from rear carrier assembly.



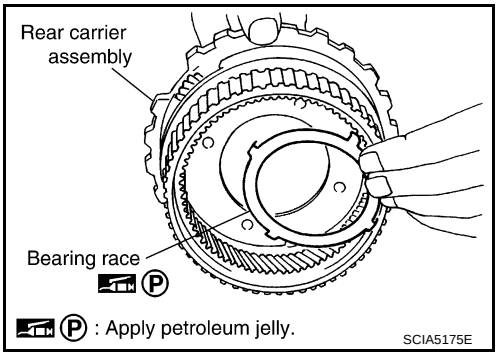
19. Remove needle bearing (front side) from mid carrier assembly.



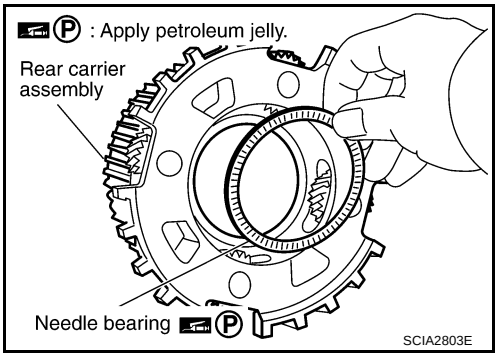
20. Remove needle bearing (rear side) from mid carrier assembly.



21. Remove bearing race from rear carrier assembly.



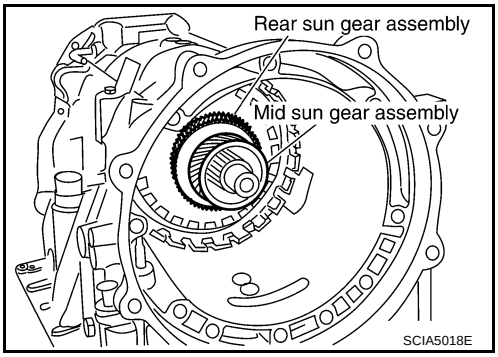
22. Remove needle bearing from rear carrier assembly.



23. Remove mid sun gear assembly, rear sun gear assembly and high and low reverse clutch hub as a unit.

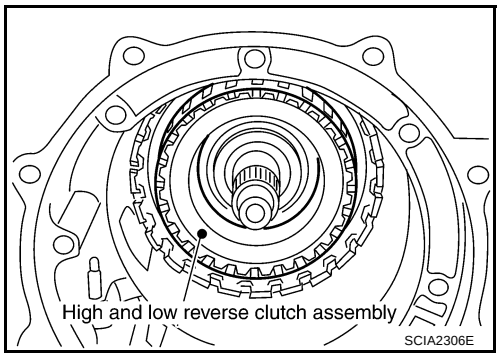
CAUTION:

Be careful to remove then with bearing race and needle bearing.

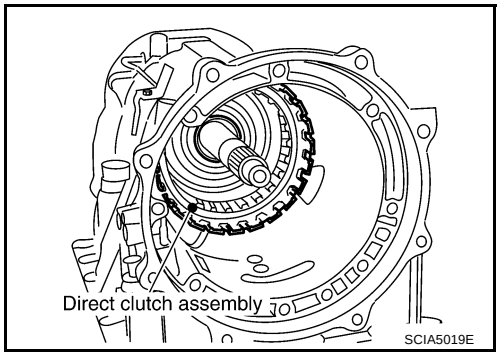


24. Remove high and low reverse clutch assembly from direct clutch assembly.

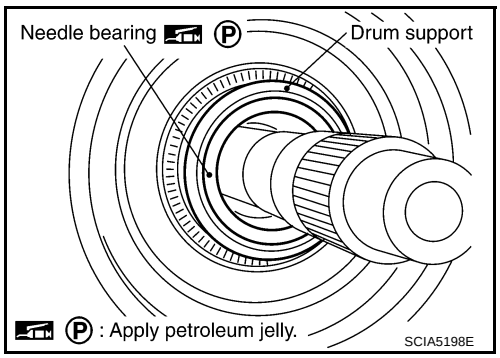
CAUTION:
Make sure that needle bearing is installed to high and low reverse clutch assembly edge surface.



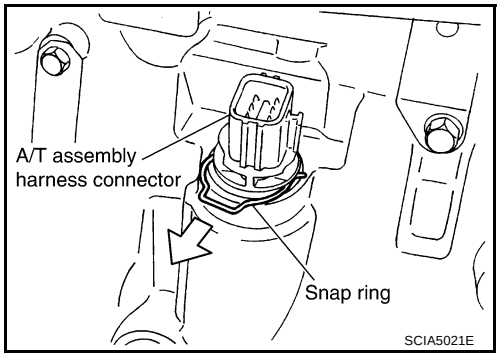
25. Remove direct clutch assembly from reverse brake.



26. Remove needle bearing from drum support.

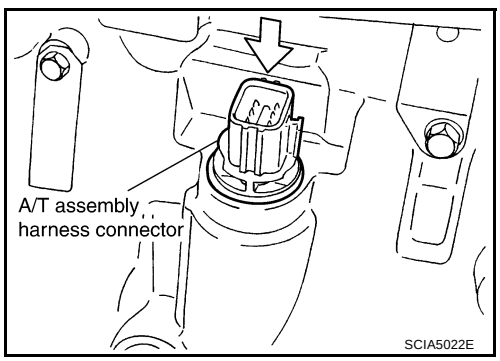


27. Remove snap ring from A/T assembly harness connector.

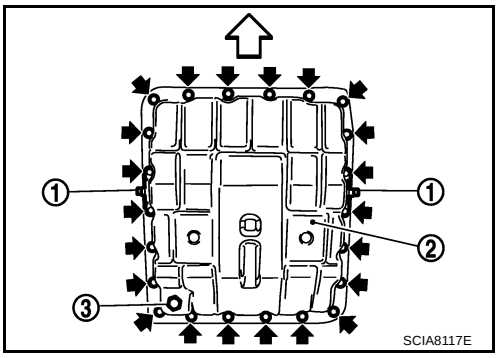


28. Push A/T assembly harness connector.

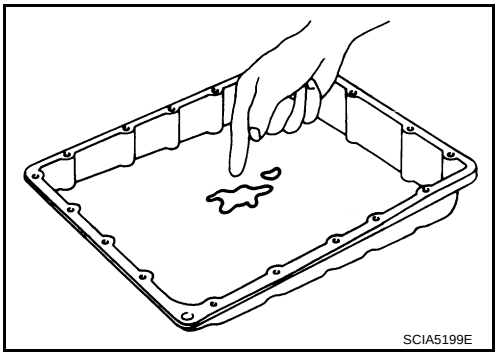
CAUTION:
Be careful not to damage connector.



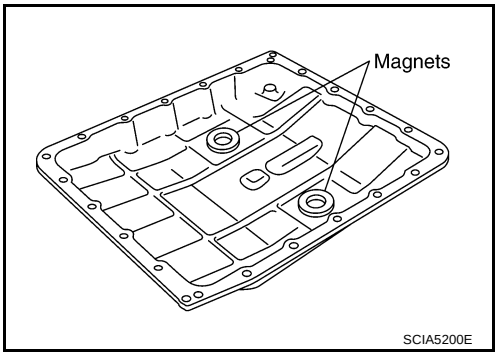
29. Remove clips (1), oil pan (2) and oil pan gasket.
    - ⇦: Front
    - ⬅: Oil pan mounting bolt
    - Drain bolt (3)



30. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
    - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**



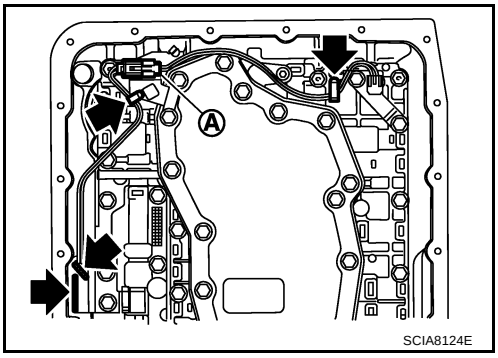
31. Remove magnets from oil pan.



32. Disconnect A/T fluid temperature sensor 2 connector (A).

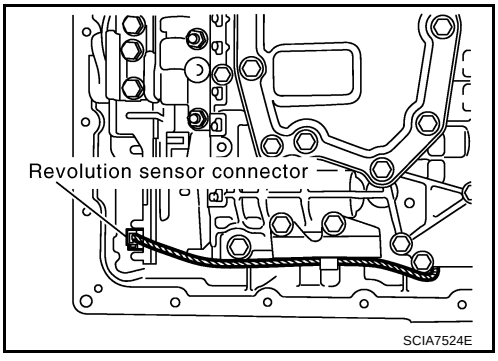
    CAUTION:
    Be careful not to damage connector.

33. Straighten terminal clips (⬅) to free terminal cord assembly and A/T fluid temperature sensor 2 harness.

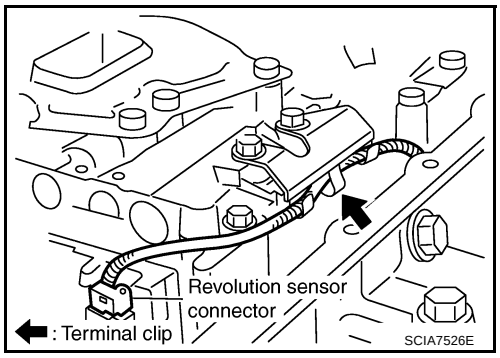


34. Disconnect revolution sensor connector.

    CAUTION:
    Be careful not to damage connector.

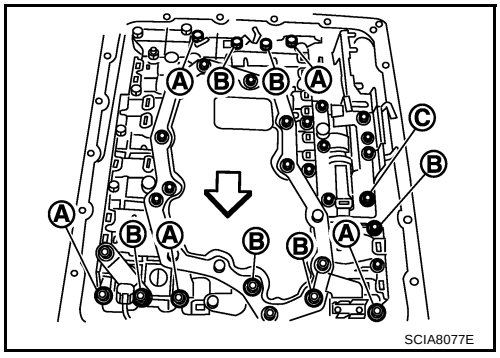


35. Straighten terminal clip to free revolution sensor harness.



36. Remove bolts (A), (B) and (C) from control valve with TCM.
    - ⇦: Front

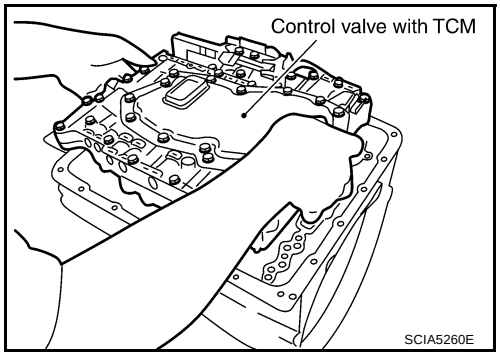
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



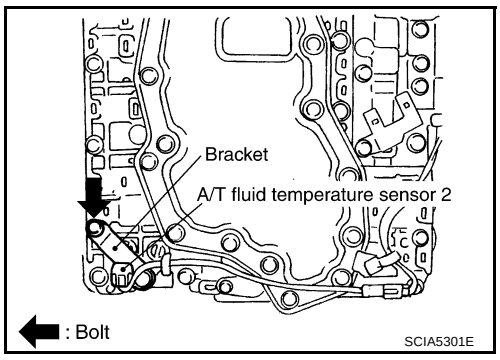
37. Remove control valve with TCM from transmission case.

    CAUTION:

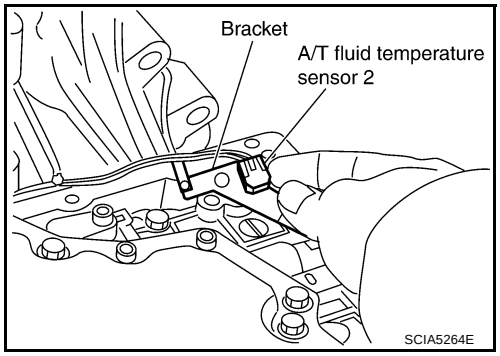
    When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



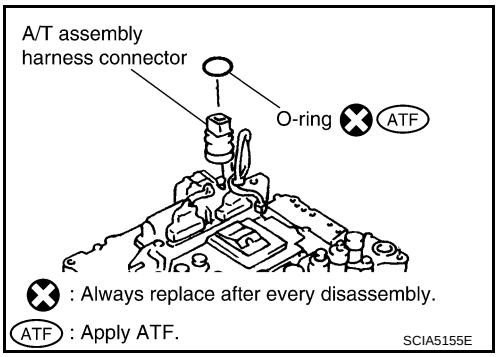
38. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



39. Remove bracket from A/T fluid temperature sensor 2.

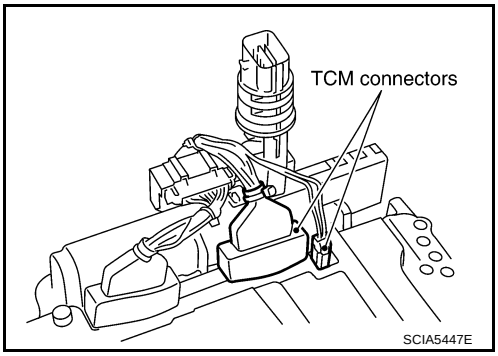


40. Remove O-ring from A/T assembly harness connector.

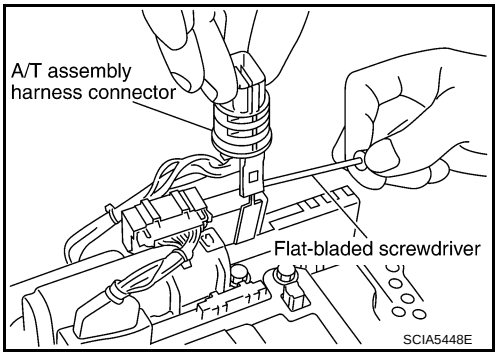


41. Disconnect TCM connectors.

CAUTION:
Be careful not to damage connectors.

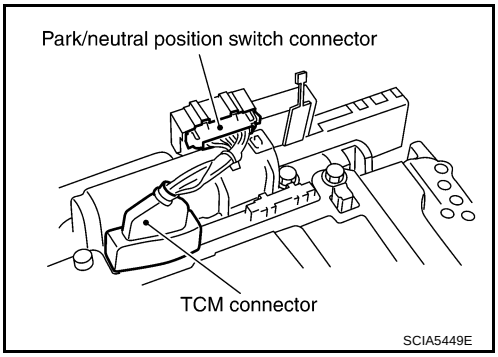


42. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.

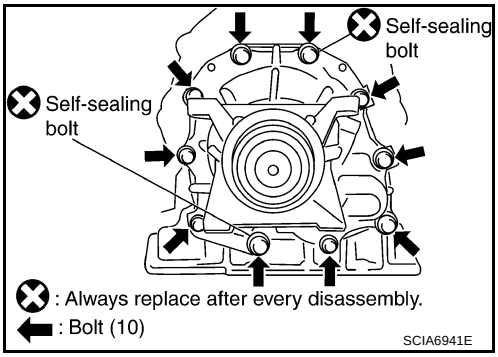


43. Disconnect TCM connector and park/neutral position switch connector.

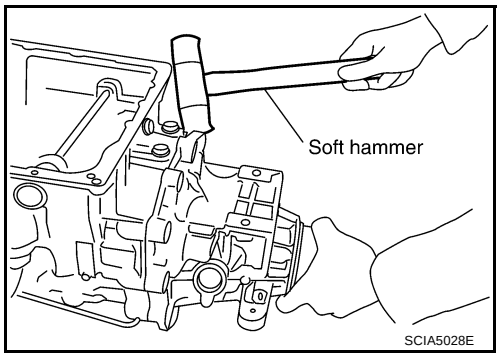
CAUTION:
Be careful not to damage connectors.



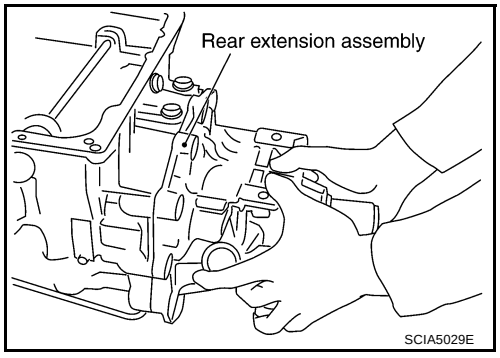
44. Remove tightening bolts for rear extension assembly and transmission case.



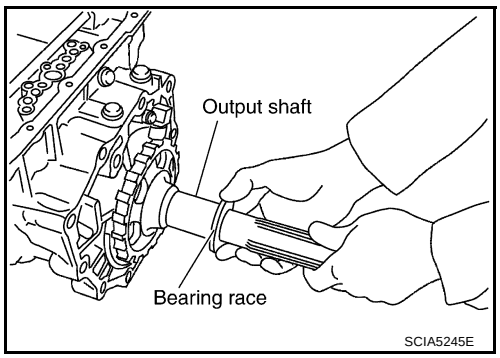
45. Tap rear extension assembly with soft hammer.



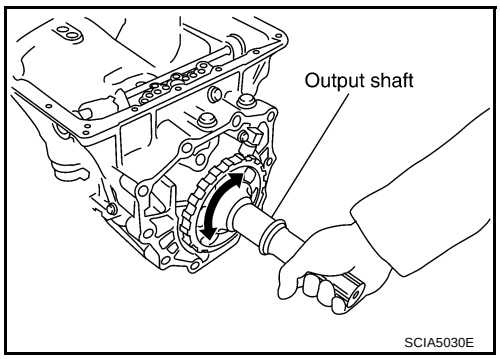
46. Remove rear extension assembly from transmission case. (With needle bearing)



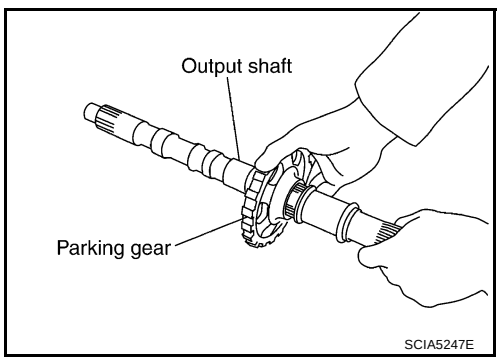
47. Remove bearing race from output shaft.



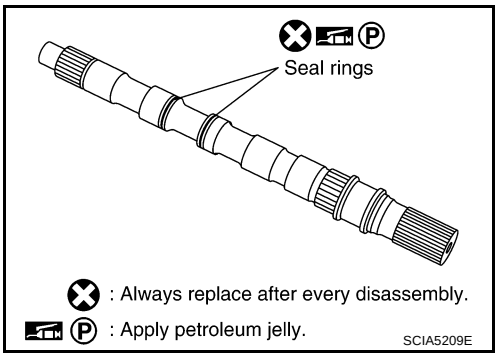
48. Remove output shaft from transmission case by rotating left/right.



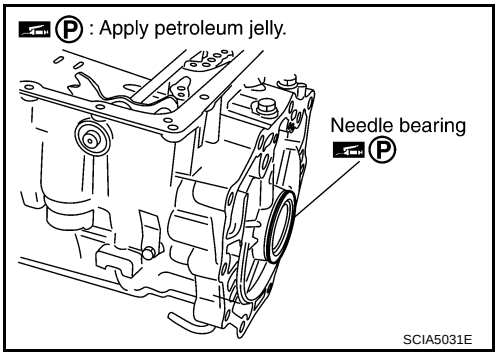
49. Remove parking gear from output shaft.



50. Remove seal rings from output shaft.



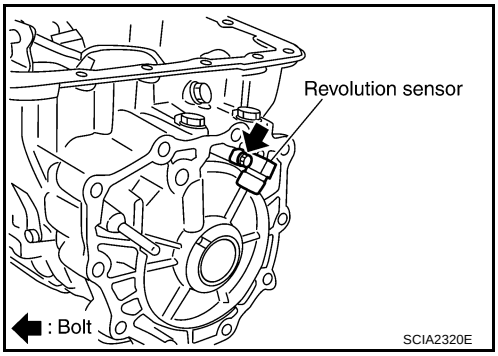
51. Remove needle bearing from transmission case.



52. Remove revolution sensor from transmission case.

CAUTION:

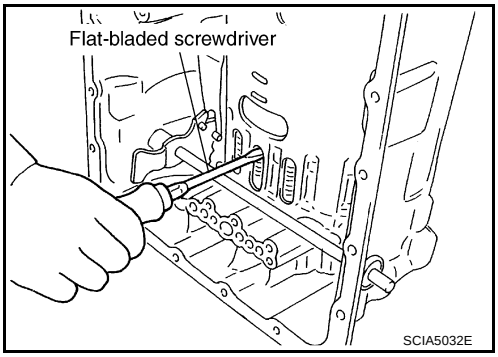
- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**



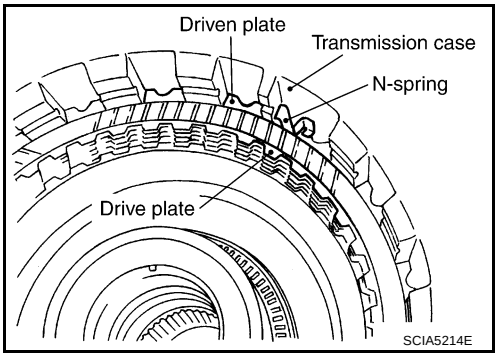
53. Remove reverse brake snap ring (fixing plate) using 2 flat-bladed screwdrivers.

NOTE:
Press out snap ring from transmission case oil pan side gap using a flat-bladed screwdriver, and remove it using another screwdriver.

54. Remove reverse brake retaining plate from transmission case.
    - Check facing for burns, cracks or damage. If necessary, replace the plate.



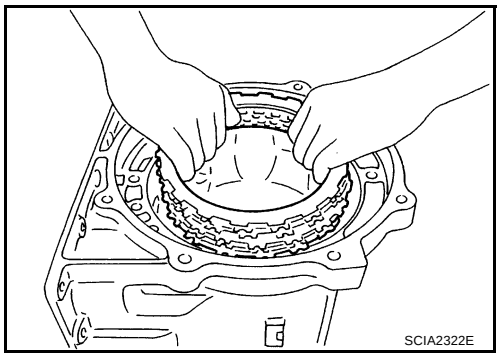
55. Remove N-spring from transmission case.



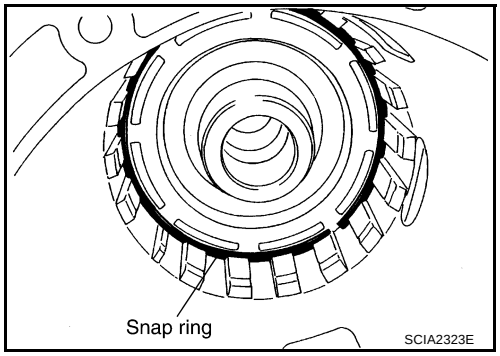
56. Remove reverse brake drive plates, driven plates and dish plates from transmission case.

CAUTION:

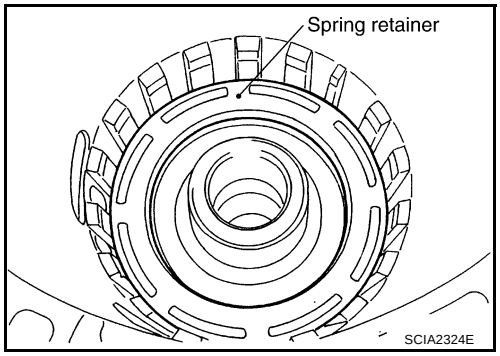
Be careful to remove it with N-spring.



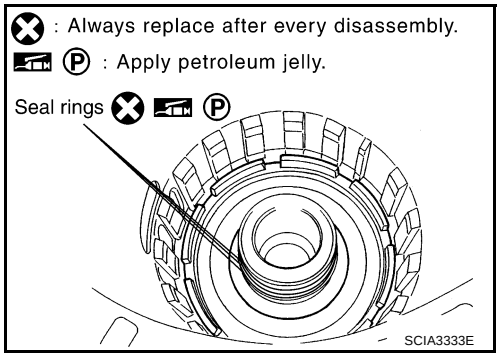
57. Remove snap ring (fixing spring retainer) using a flat-bladed screwdriver.



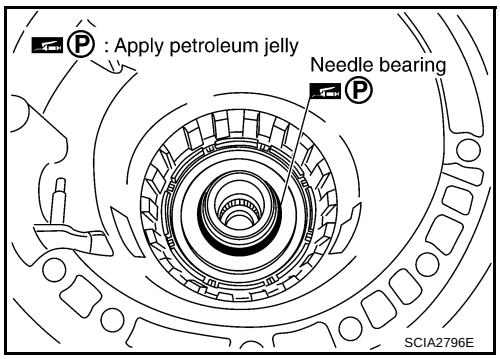
58. Remove spring retainer and return spring from transmission case.



59. Remove seal rings from drum support.



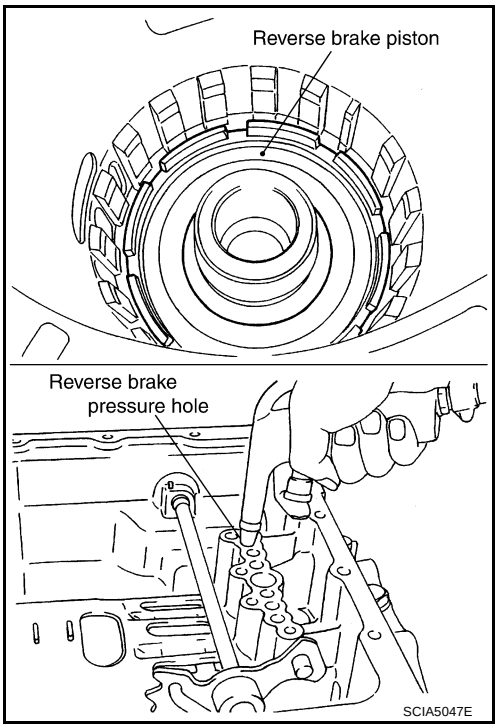
60. Remove needle bearing from drum support edge surface.



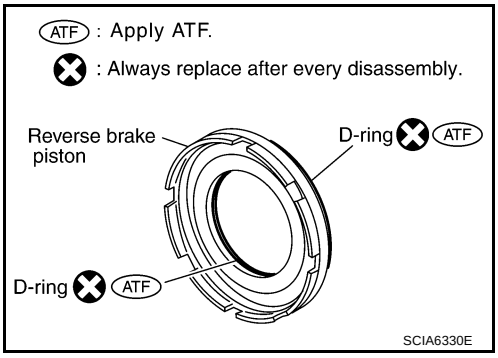
61. Remove reverse brake piston from transmission case with compressed air. Refer to AT-252, "Oil Channel" .

CAUTION:

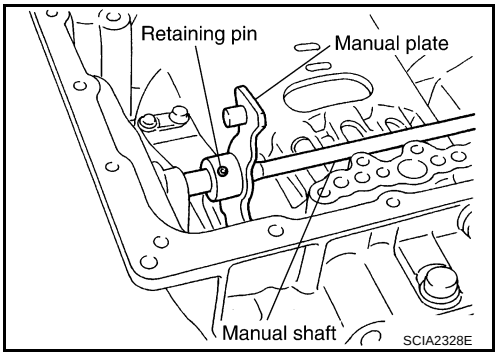
Care should be taken not to abruptly blow air. It makes pistons incline, as the result, it becomes hard to disassemble the pistons.



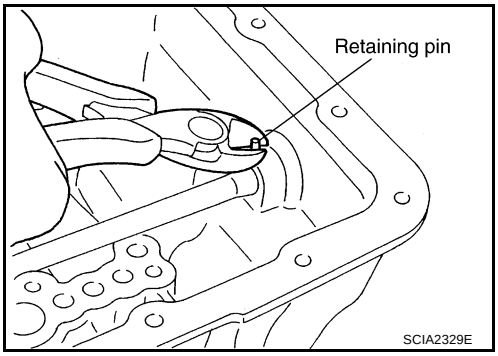
62. Remove D-rings from reverse brake piston.



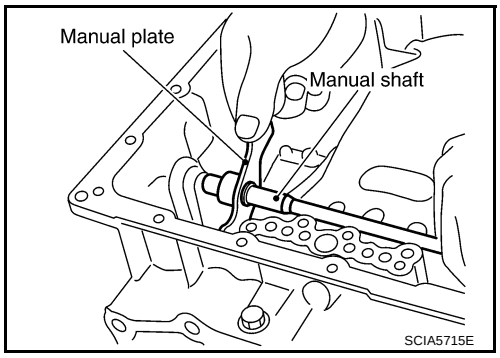
63. Use a pin punch [4 mm (0.16 in) dia. commercial service tool] to knock out retaining pin.



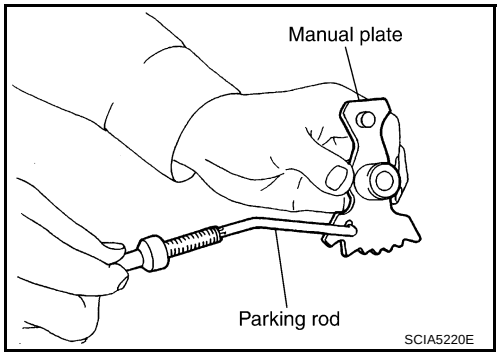
64. Remove manual shaft retaining pin using pair of nippers.



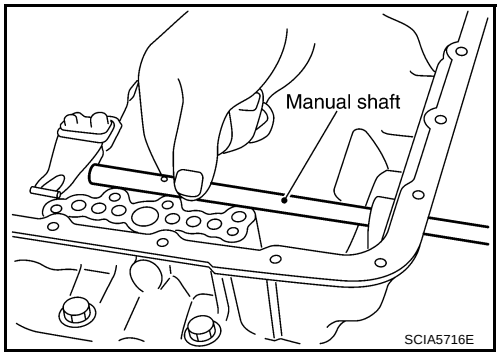
65. Remove manual plate (with parking rod) from manual shaft.



66. Remove parking rod from manual plate.



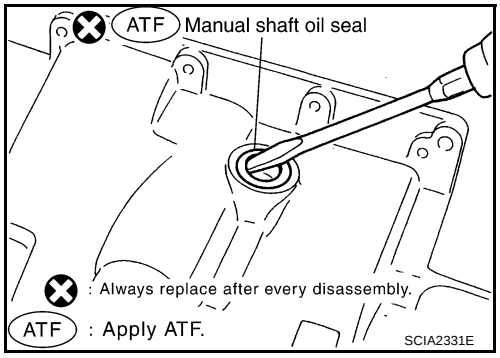
67. Remove manual shaft from transmission case.



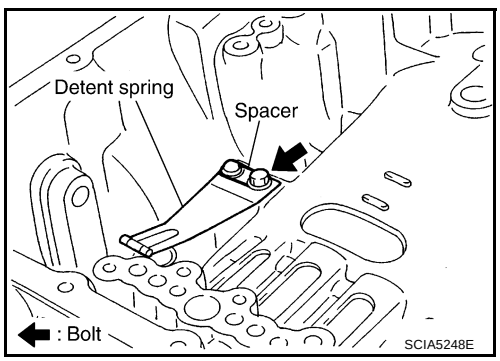
68. Remove manual shaft oil seals using a flat-bladed screwdriver.

CAUTION:

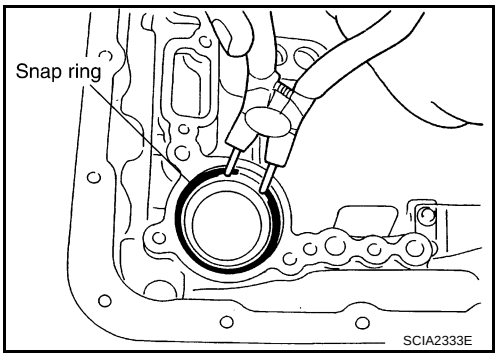
Be careful not to scratch transmission case.



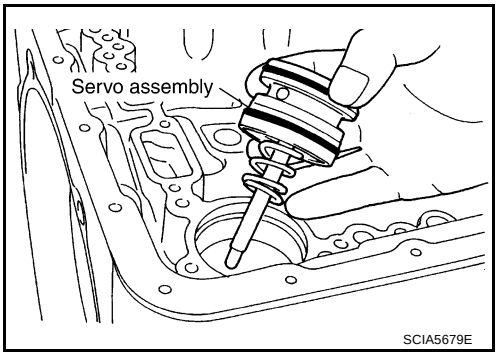
69. Remove detent spring and spacer from transmission case.



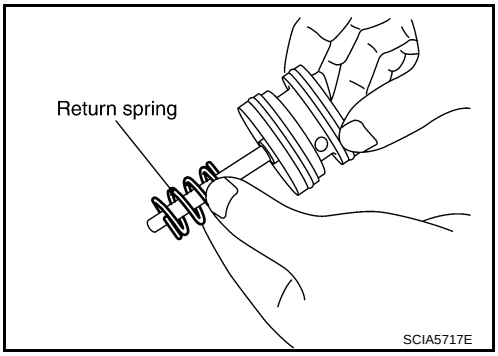
70. Remove snap ring from transmission case using pair of snap ring pliers.



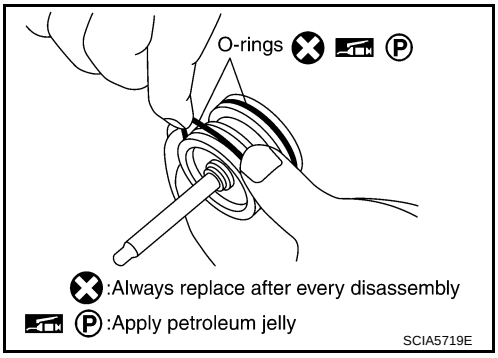
71. Remove servo assembly (with return spring) from transmission case.



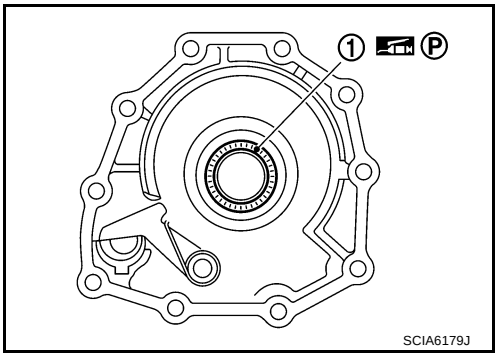
72. Remove return spring from servo assembly.



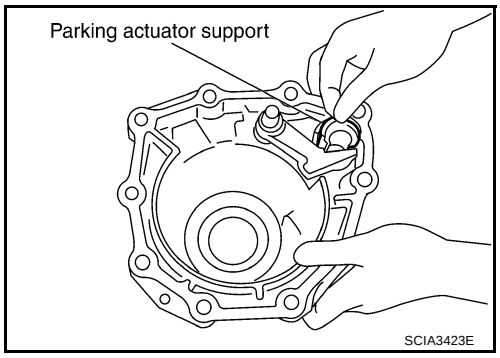
73. Remove O-rings from servo assembly.



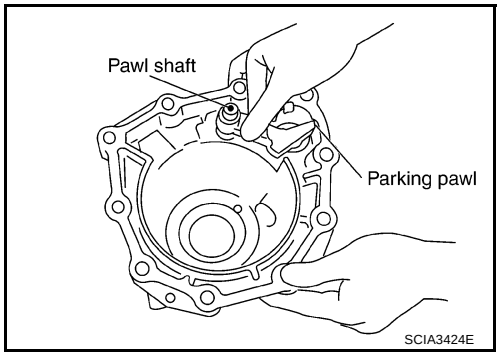
74. Remove needle bearing (1) from rear extension.



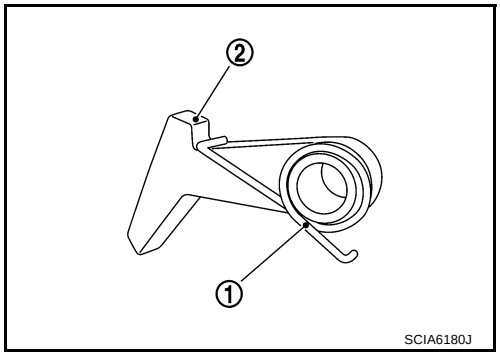
75. Remove parking actuator support from rear extension.



76. Remove parking pawl (with return spring) and pawl shaft from rear extension.



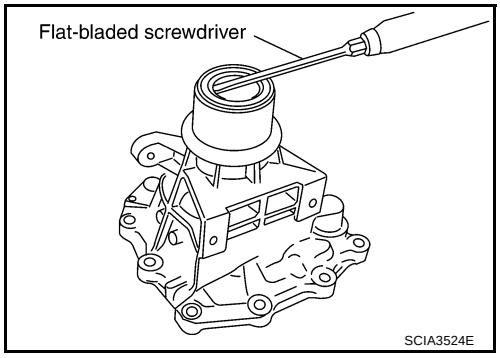
77. Remove return spring (1) from parking pawl (2).



78. Remove rear oil seal from rear extension.

CAUTION:

Be careful not to scratch rear extension.



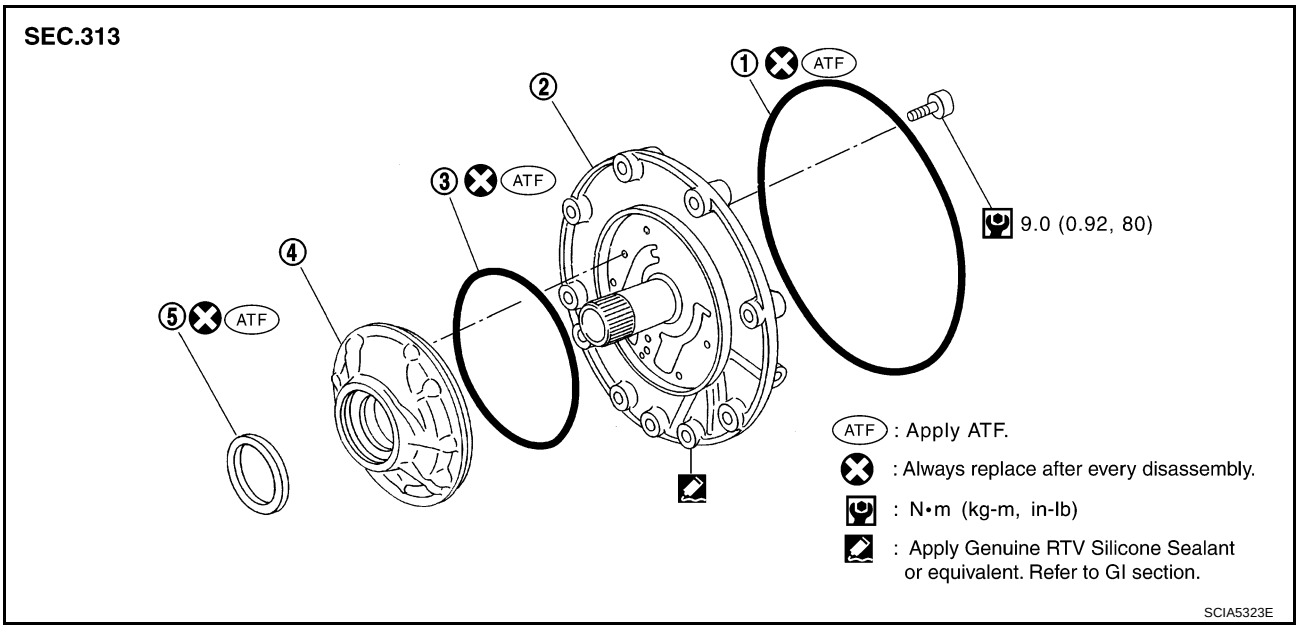
REPAIR FOR COMPONENT PARTS

PFP:00000

Oil Pump

NCS0009C

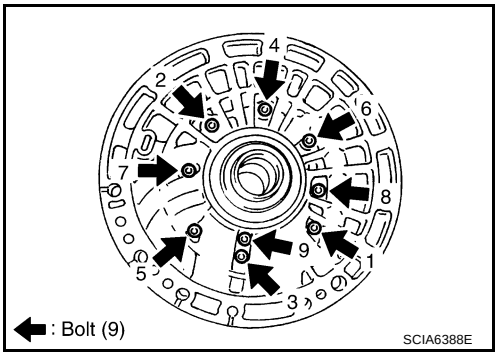
COMPONENTS



1. O-ring
2. Oil pump cover
3. O-ring
4. Oil pump housing
5. Oil pump housing oil seal

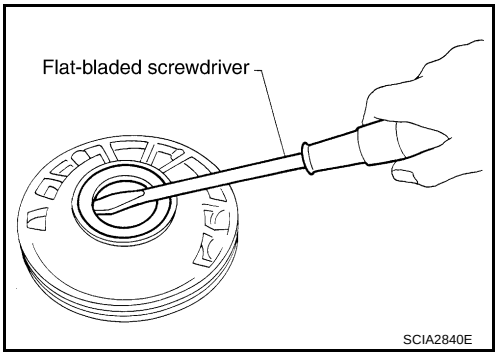
DISASSEMBLY

1. Remove oil pump housing from oil pump cover.

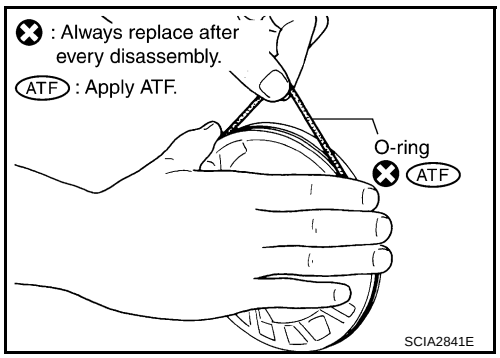


2. Remove oil pump housing oil seal using a flat-bladed screwdriver.

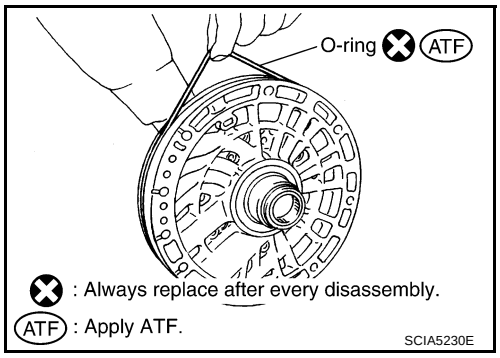
CAUTION:
Be careful not to scratch oil pump housing.



3. Remove O-ring from oil pump housing.



4. Remove O-ring from oil pump cover.

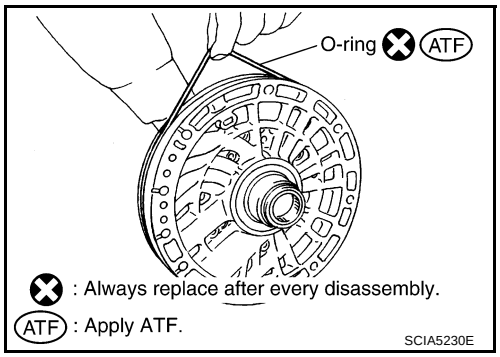


ASSEMBLY

1. Install O-ring to oil pump cover.

CAUTION:

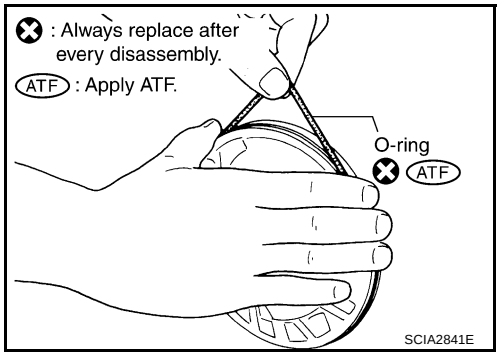
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



2. Install O-ring to oil pump housing.

CAUTION:

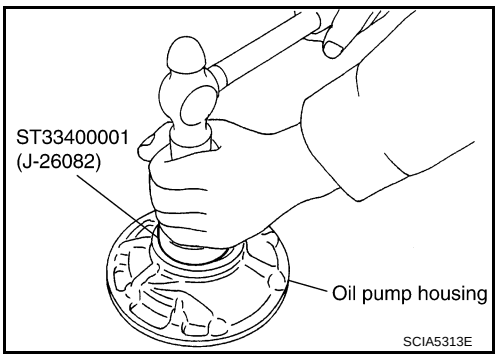
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



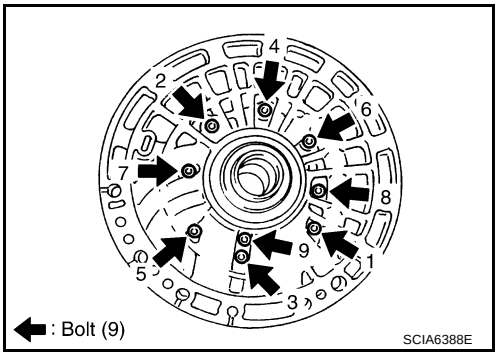
3. Install oil pump housing oil seal to the oil pump housing until it is flush using the drift.

CAUTION:

- **Do not reuse oil seal.**
- **Apply ATF to oil seal.**



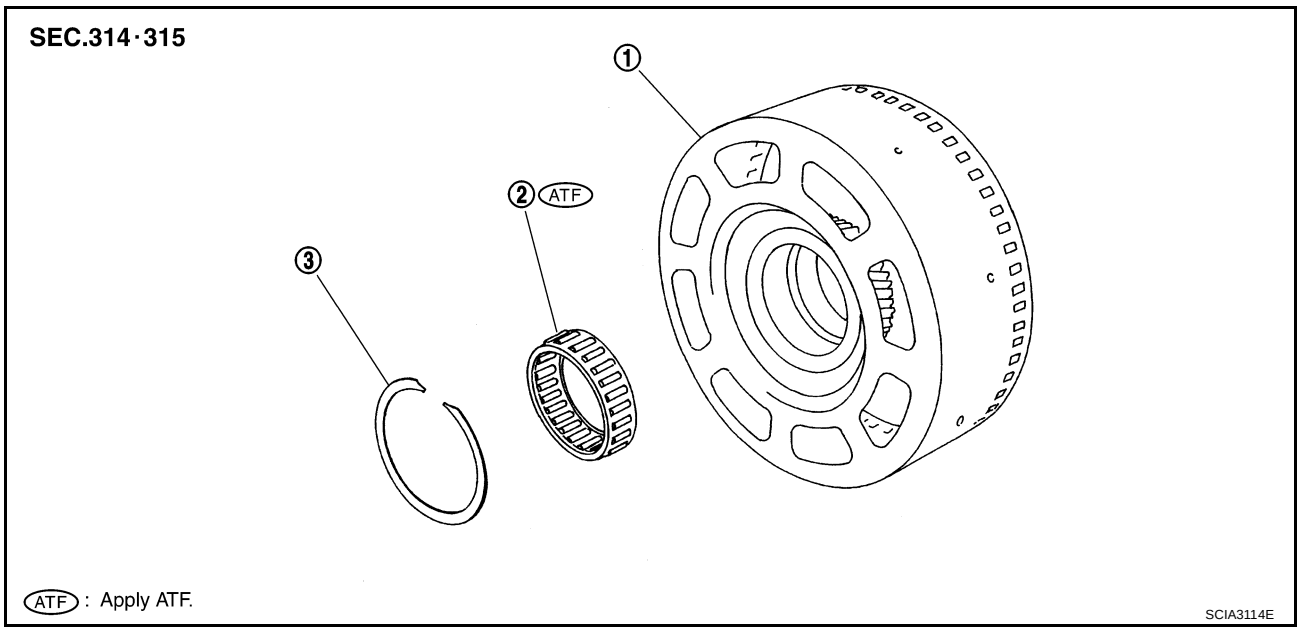
4. Install oil pump housing to oil pump cover.
5. Tighten bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-271, "COMPONENTS" .



Front Sun Gear, 3rd One-way Clutch

NCS0009D

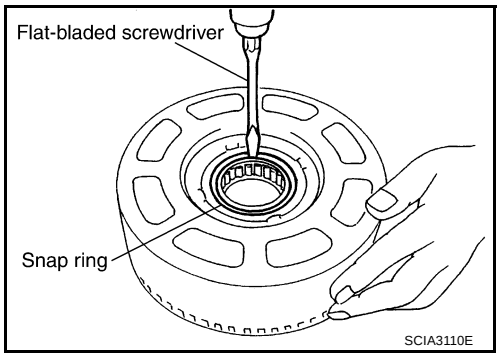
COMPONENTS



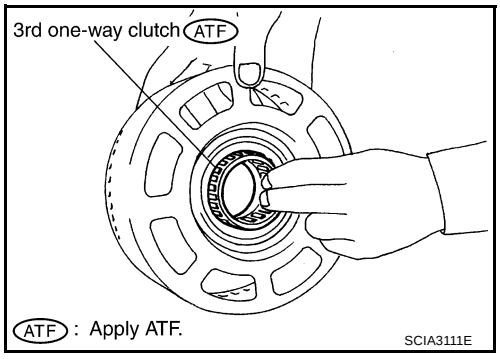
1. Front sun gear
2. 3rd one-way clutch
3. Snap ring

DISASSEMBLY

1. Remove snap ring from front sun gear using a flat-bladed screwdriver.



2. Remove 3rd one-way clutch from front sun gear.



INSPECTION

3rd One-way Clutch

- Check frictional surface for wear or damage.

CAUTION:
If necessary, replace 3rd one-way clutch.

Front Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace snap ring.

Front Sun Gear

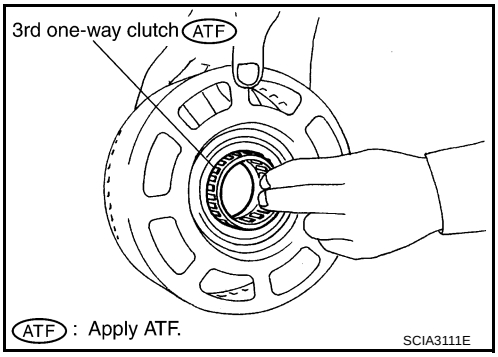
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace front sun gear.

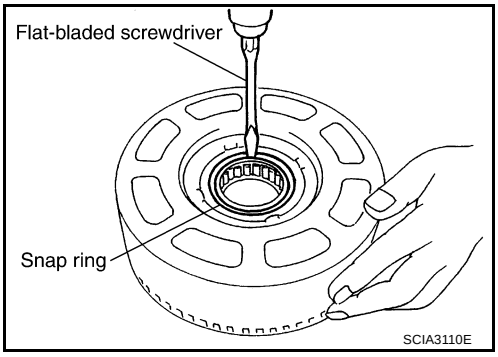
ASSEMBLY

1. Install 3rd one-way clutch in front sun gear.

CAUTION:
Apply ATF to 3rd one-way clutch.



2. Install snap ring in front sun gear using a flat-bladed screwdriver.

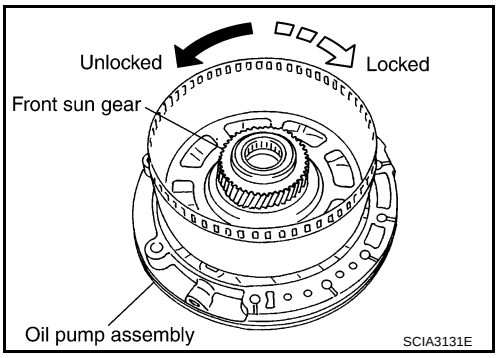


3. Check operation of 3rd one-way clutch.

a. Hold oil pump assembly and turn front sun gear.

b. Check 3rd one-way clutch for correct locking and unlocking directions.

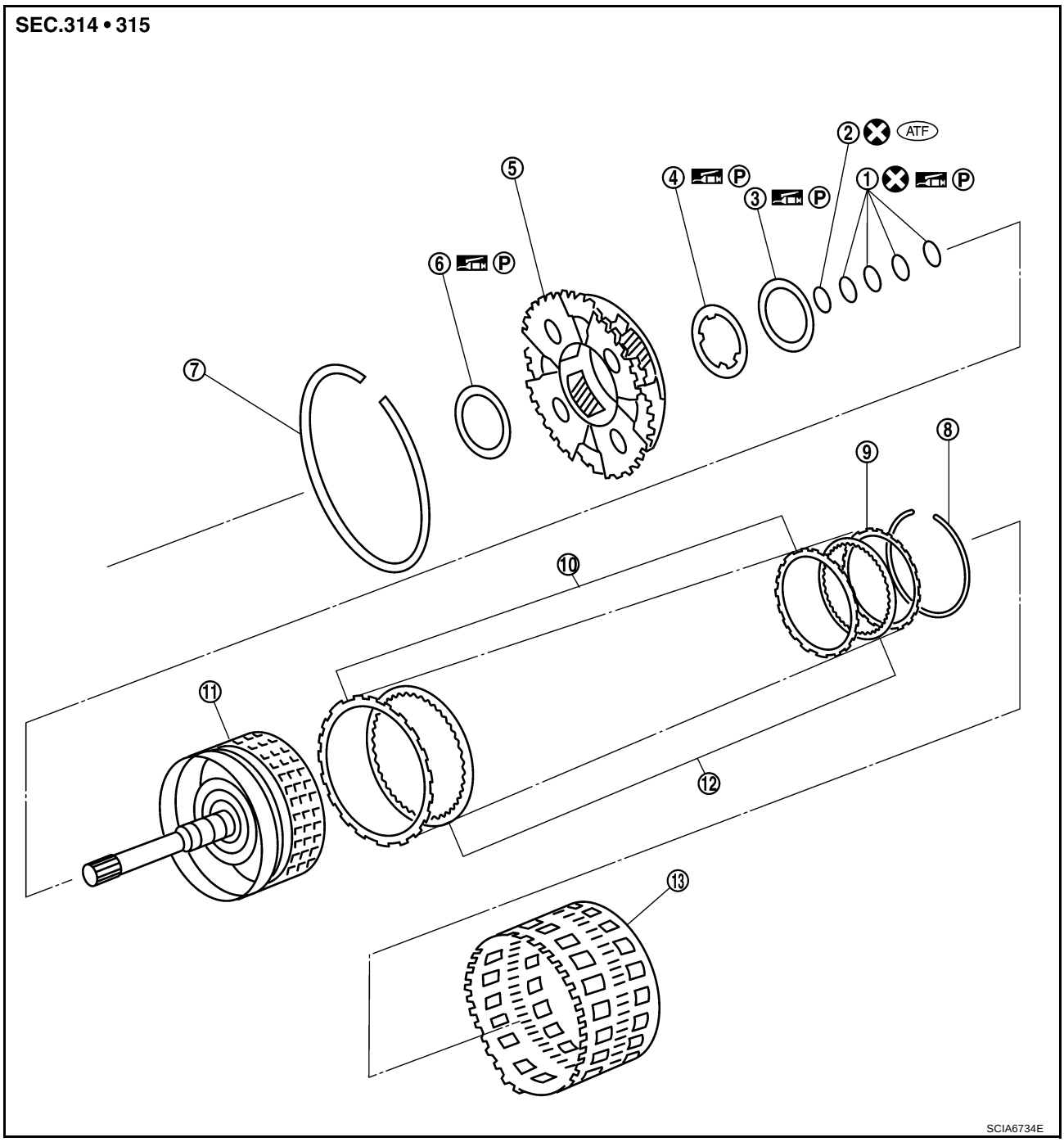
CAUTION:
If not as shown in the figure, check installation direction of 3rd one-way clutch.



Front Carrier, Input Clutch, Rear Internal Gear

NCS0009E

COMPONENTS

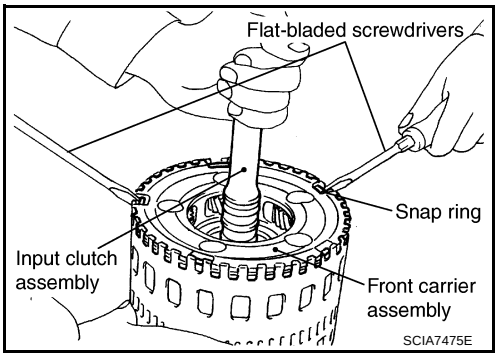


1. Seal ring
2. O-ring
3. Needle bearing
4. Bearing race
5. Front carrier assembly
6. Needle bearing
7. Snap ring
8. Snap ring
9. Retaining plate
10. Driven plate
11. Input clutch drum
12. Drive plate
13. Rear internal gear

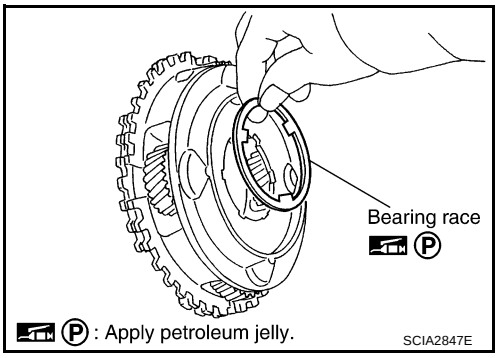
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

DISASSEMBLY

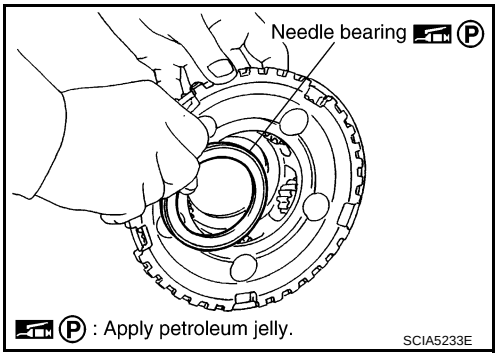
1. Compress snap ring using 2 flat-bladed screwdrivers.
2. Remove front carrier assembly and input clutch assembly from rear internal gear.
3. Remove front carrier assembly from input clutch assembly.



a. Remove bearing race from front carrier assembly.

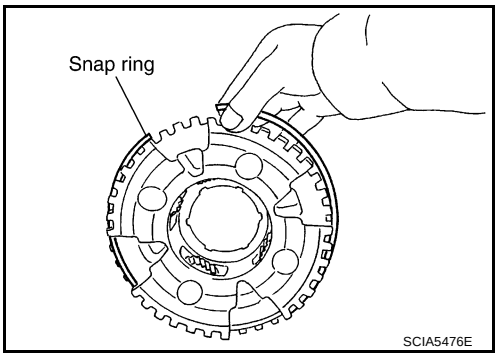


b. Remove needle bearing from front carrier assembly.



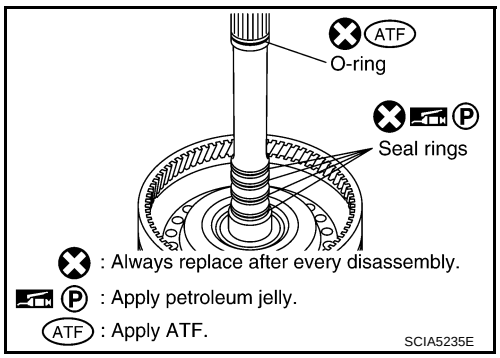
c. Remove snap ring from front carrier assembly.

CAUTION:
Do not expand snap ring excessively.

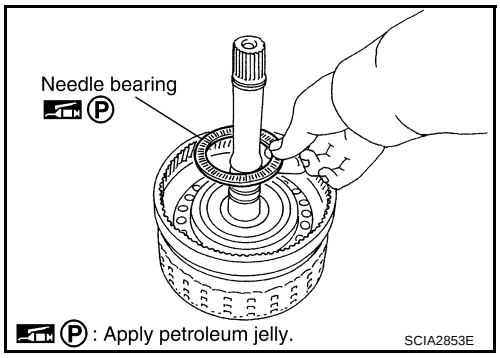


4. Disassemble input clutch assembly.

a. Remove O-ring and seal rings from input clutch assembly.

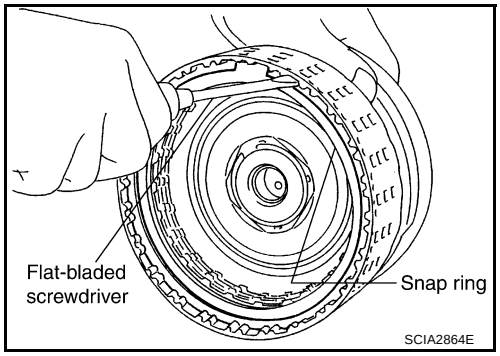


b. Remove needle bearing from input clutch assembly.



c. Remove snap ring from input clutch drum using a flat-bladed screwdriver.

d. Remove retaining plate, drive plates and driven plates from input clutch drum.



INSPECTION

Front Carrier Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace snap ring.

Input Clutch Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace input clutch assembly.

Input Clutch Drum

- Check for deformation, fatigue or damage or burns.

CAUTION:
If necessary, replace input clutch assembly.

Input Clutch Drive Plates

- Check facing for burns, cracks or damage.

CAUTION:
If necessary, replace input clutch assembly.

Input Clutch Retaining Plate and Driven Plates

- Check facing for burns, cracks or damage.

CAUTION:
If necessary, replace input clutch assembly.

Front Carrier

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace front carrier assembly.

Rear Internal Gear

- Check for deformation, fatigue or damage.

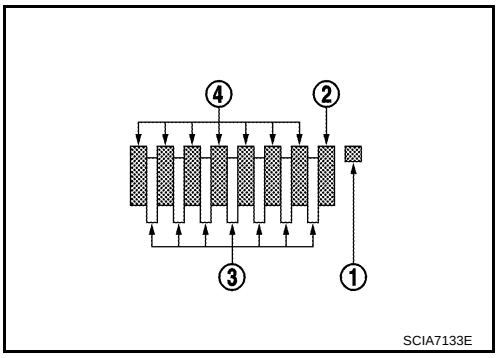
CAUTION:
If necessary, replace rear internal gear.

ASSEMBLY

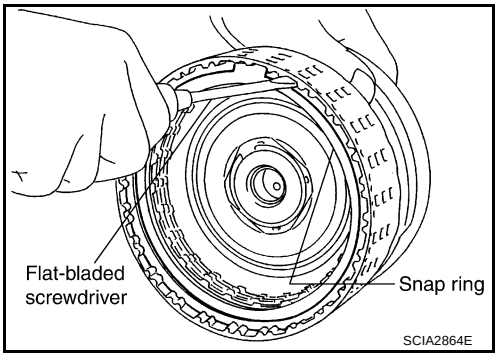
1. Install input clutch.

a. Install driven plates, drive plates and retaining plate in input clutch drum.
   - Snap ring (1)
   - Retaining plate (2)
   - Drive plate (3)
   - Driven plate (4)
   - Drive plate/Driven plate: 7/7

   CAUTION:
   Take care with order of plates.

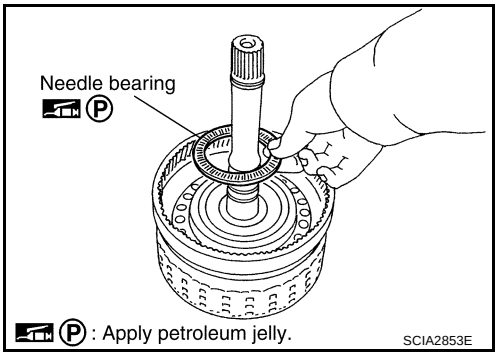


b. Install snap ring in input clutch drum using a flat-bladed screwdriver.



c. Install needle bearing in input clutch assembly.

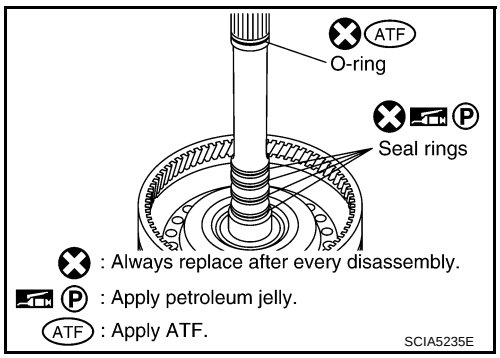
   CAUTION:
   - **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
   - **Apply petroleum jelly to needle bearing.**



d. Install O-ring and seal rings in input clutch assembly.

CAUTION:

- **Do not reuse O-ring and seal rings.**
- **Apply ATF to O-ring.**
- **Apply petroleum jelly to seal rings.**

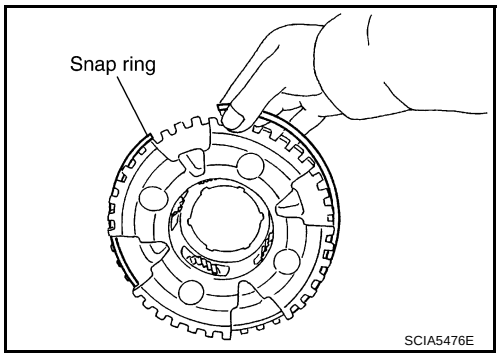


2. Install front carrier assembly.

a. Install snap ring to front carrier assembly.

CAUTION:

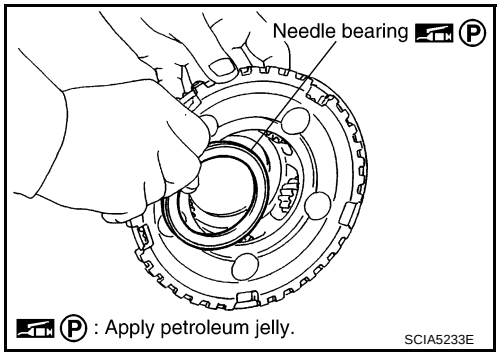
Do not expand snap ring excessively.



b. Install needle bearing in front carrier assembly.

CAUTION:

- **Take care with the direction of needle bearing. Refer to** **AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"** .
- **Apply petroleum jelly to needle bearing.**

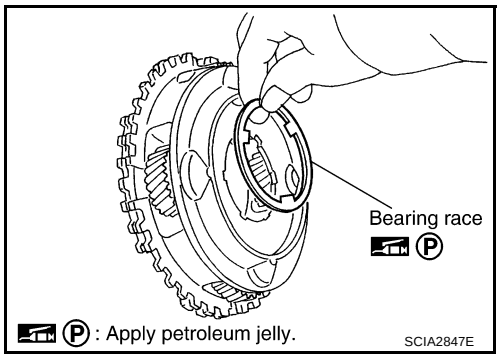


c. Install bearing race in front carrier assembly.

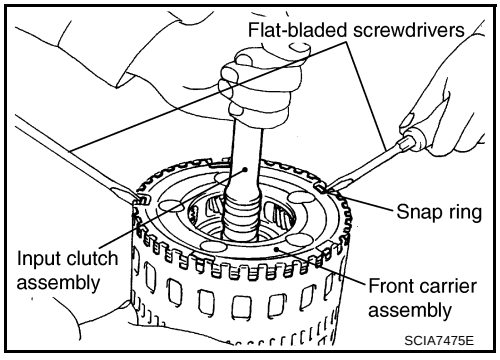
CAUTION:

Apply petroleum jelly to bearing race.

d. Install front carrier assembly to input clutch assembly.



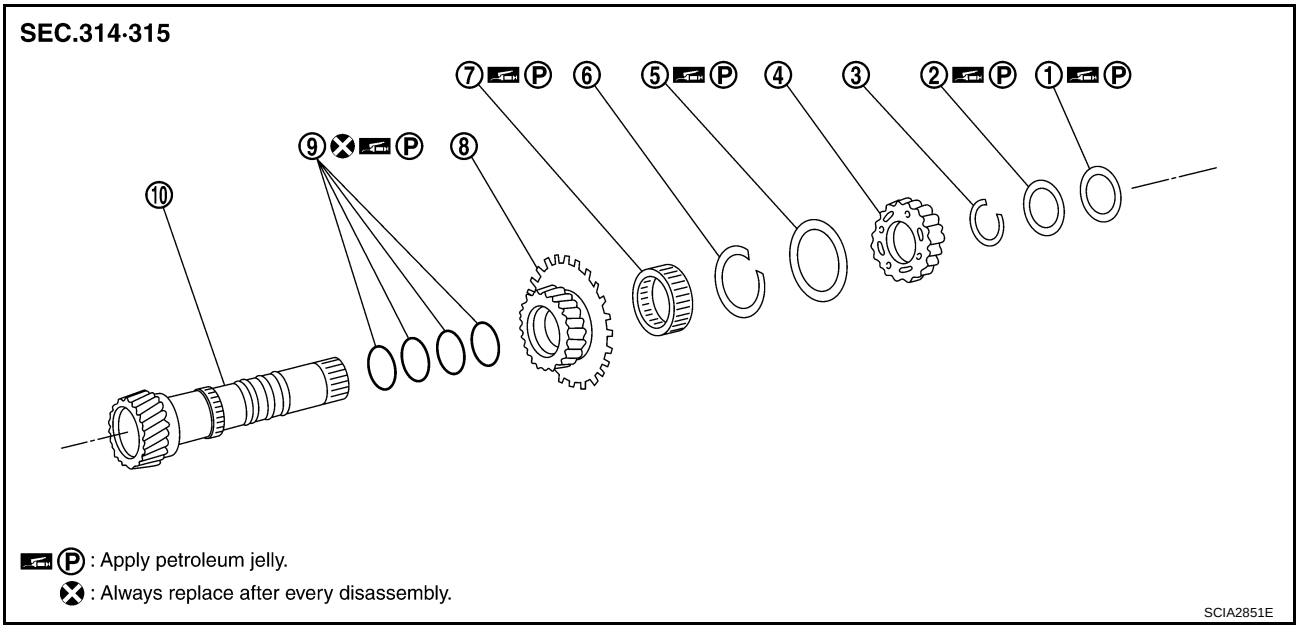
3. Compress snap ring using 2 flat-bladed screwdrivers.
4. Install front carrier assembly and input clutch assembly to rear internal gear.



Mid Sun Gear, Rear Sun Gear, High and Low Reverse Clutch Hub

NCS0009F

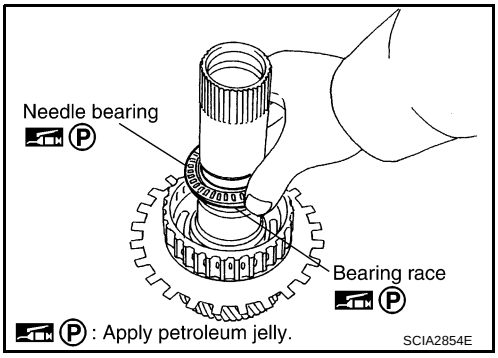
COMPONENTS



1. Needle bearing
2. Bearing race
3. Snap ring
4. High and low reverse clutch hub
5. Needle bearing
6. Snap ring
7. 1st one-way clutch
8. Rear sun gear
9. Seal ring
10. Mid sun gear

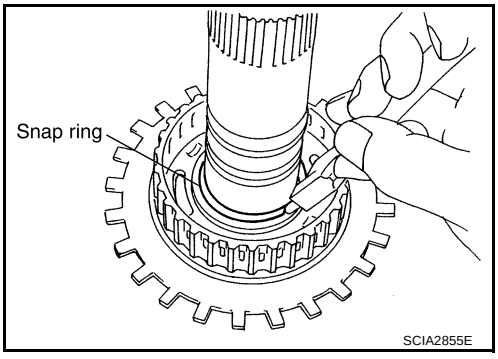
DISASSEMBLY

1. Remove needle bearing and bearing race from high and low reverse clutch hub.

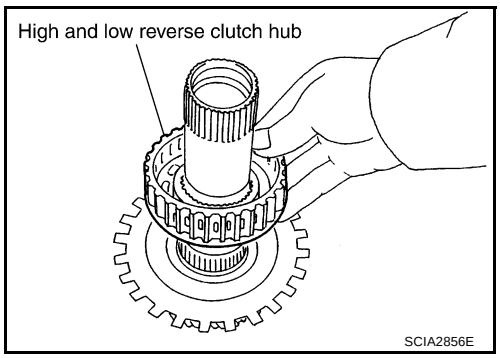


2. Remove snap ring from mid sun gear assembly using pair of snap ring pliers.

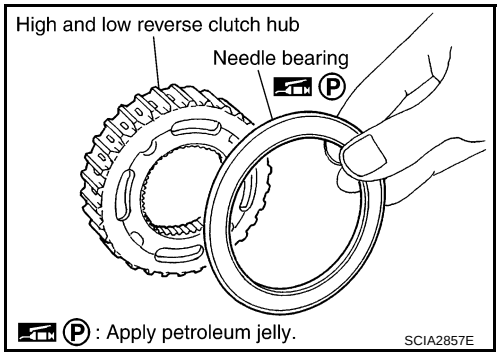
CAUTION:
Do not expand snap ring excessively.



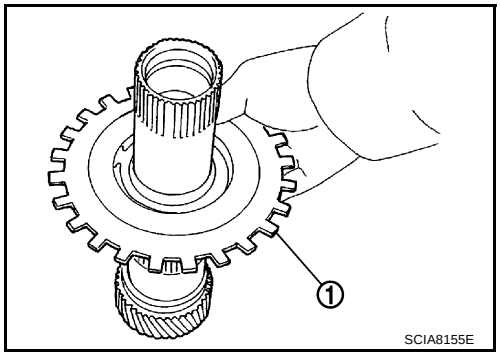
3. Remove high and low reverse clutch hub from mid sun gear assembly.



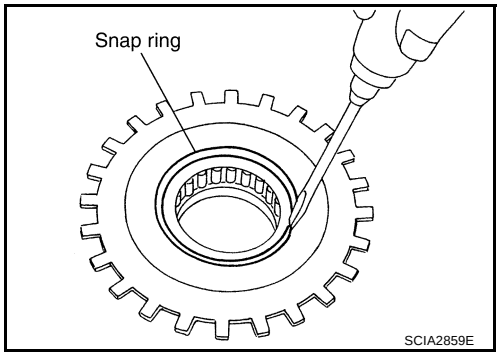
a. Remove needle bearing from high and low reverse clutch hub.



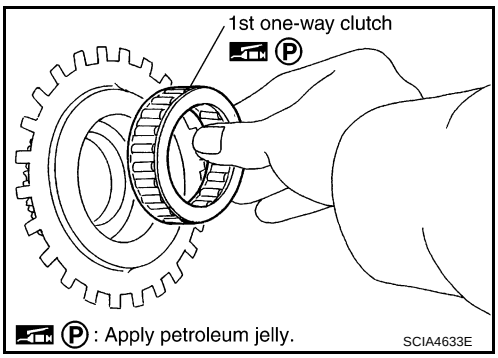
4. Remove rear sun gear assembly (1) from mid sun gear assembly.



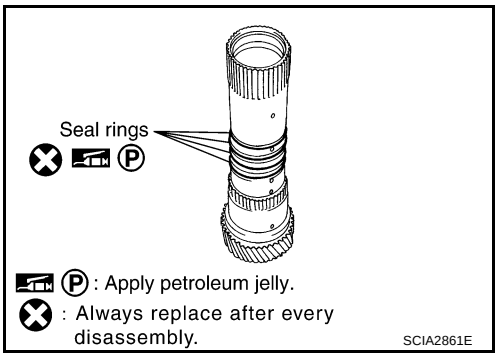
a. Remove snap ring from rear sun gear using a flat-bladed screwdriver.



b. Remove 1st one-way clutch from rear sun gear.



5. Remove seal rings from mid sun gear.



INSPECTION

High and Low Reverse Clutch Hub Snap Ring, Rear Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace snap ring.

1st One-way Clutch

- Check frictional surface for wear or damage.

CAUTION:
If necessary, replace 1st one-way clutch.

Mid Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace mid sun gear.

Rear Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace rear sun gear.

High and Low Reverse Clutch Hub

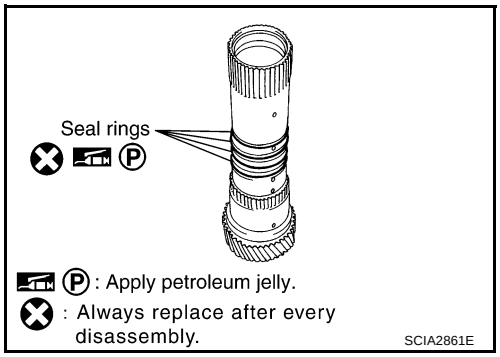
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace high and low reverse clutch hub.

ASSEMBLY

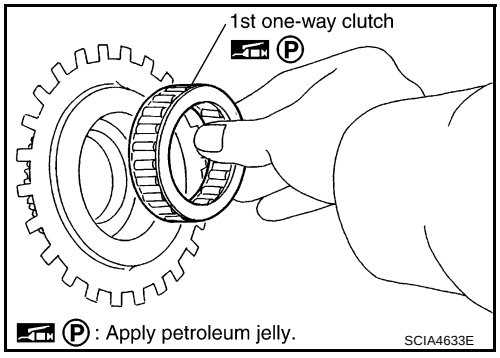
1. Install seal rings to mid sun gear.

CAUTION:
- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**

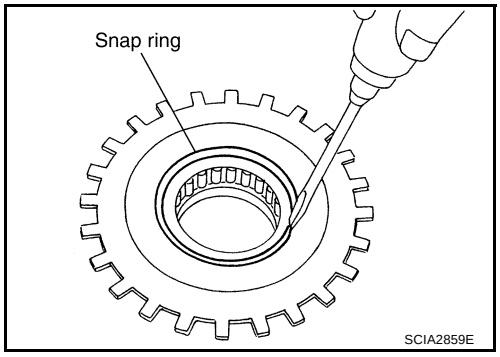


2. Install 1st one-way clutch to rear sun gear.

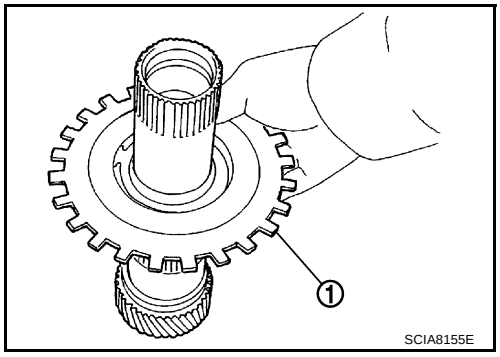
CAUTION:
Apply petroleum jelly to 1st one-way clutch.



3. Install snap ring to rear sun gear using a flat-bladed screwdriver.



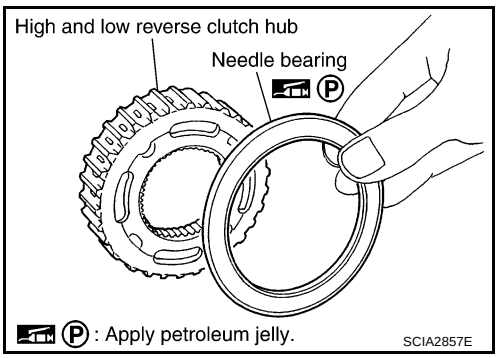
4. Install rear sun gear assembly (1) to mid sun gear assembly.



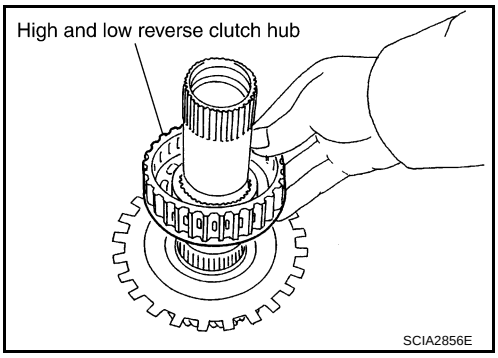
5. Install needle bearing to high and low reverse clutch hub.

CAUTION:

- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



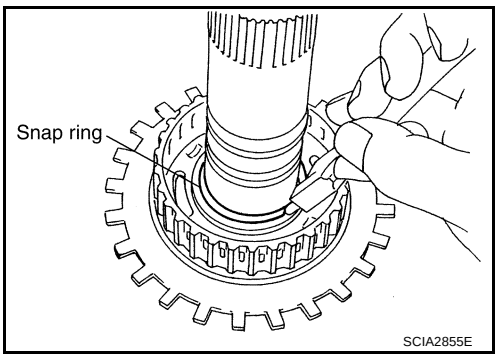
6. Install high and low reverse clutch hub to mid sun gear assembly.



7. Install snap ring to mid sun gear assembly using pair of snap ring pliers.

CAUTION:

Do not expand snap ring excessively.



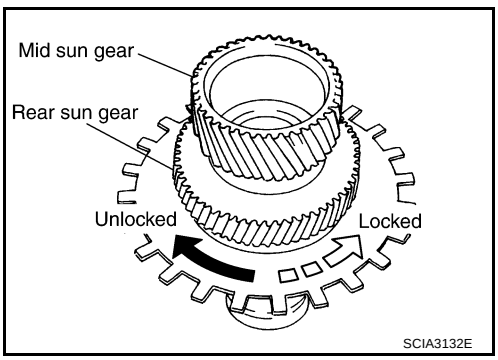
8. Check operation of 1st one-way clutch.

a. Hold mid sun gear and turn rear sun gear.

b. Check 1st one-way clutch for correct locking and unlocking directions.

CAUTION:

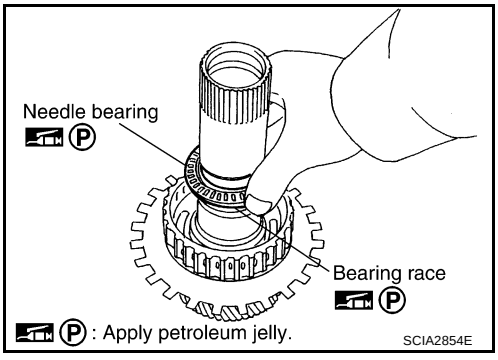
If not as shown in illustration, check installation direction of 1st one-way clutch.



9. Install bearing race and needle bearing to high and low reverse clutch hub.

CAUTION:

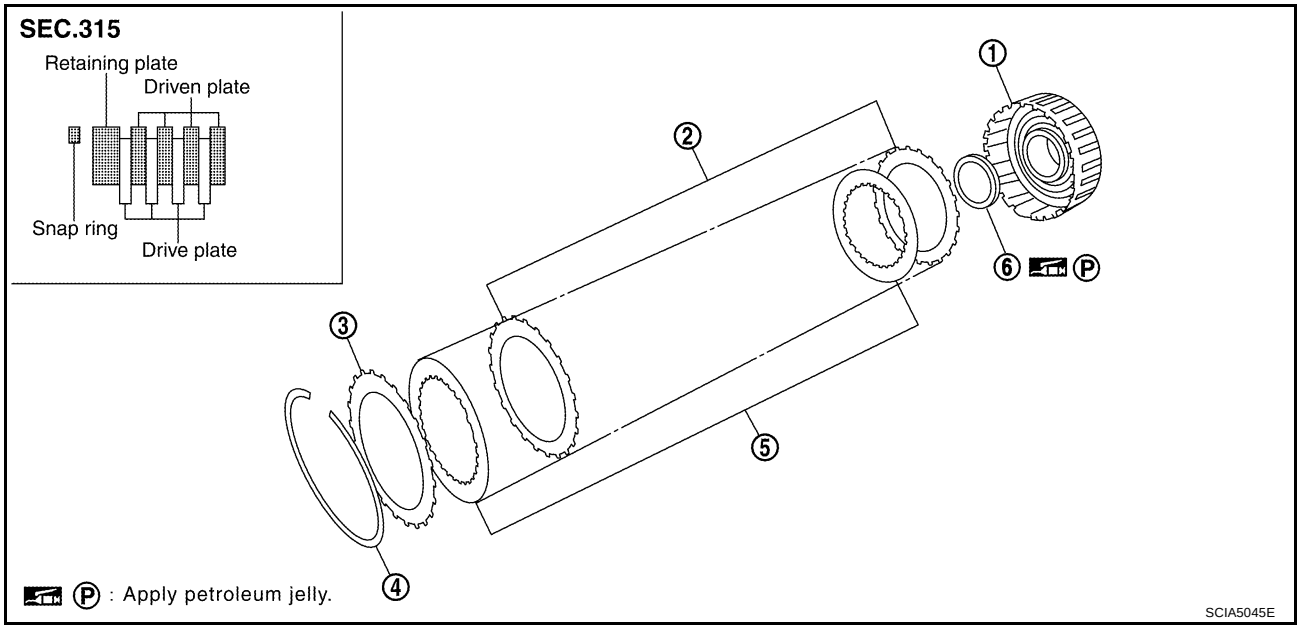
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



High and Low Reverse Clutch

NCS0009G

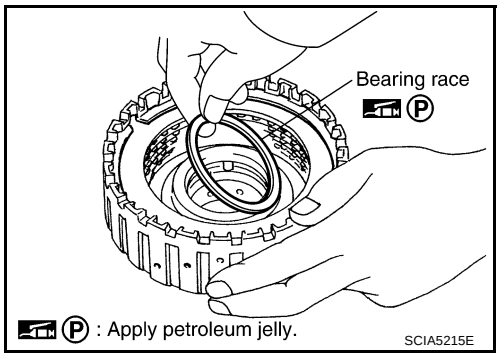
COMPONENTS



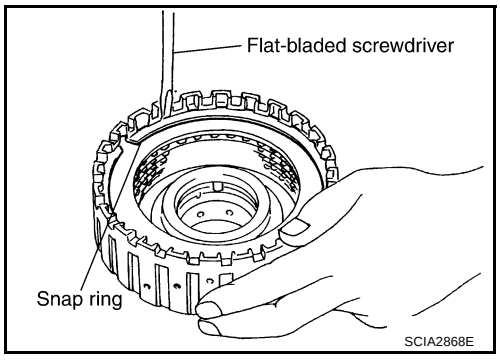
1. High and low reverse clutch drum
2. Driven plate
3. Retaining plate
4. Snap ring
5. Drive plate
6. Bearing race

DISASSEMBLY

1. Remove bearing race from high and low reverse clutch drum.



2. Remove snap ring from high and low reverse clutch drum using a flat-bladed screwdriver.
3. Remove retaining plate, drive plates and driven plates from high and low reverse clutch drum.



INSPECTION

Check the following, and replace high and low reverse clutch assembly if necessary.

High and Low Reverse Clutch Snap Ring

- Check for deformation, fatigue or damage.

High and Low Reverse Clutch Drive Plates

- Check facing for burns, cracks or damage.

High and Low Reverse Clutch Retaining Plate and Driven Plates

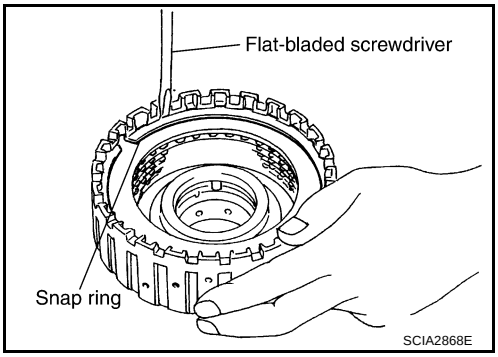
- Check facing for burns, cracks or damage.

ASSEMBLY

1. Install driven plates, drive plates and retaining plate in high and low reverse clutch drum.

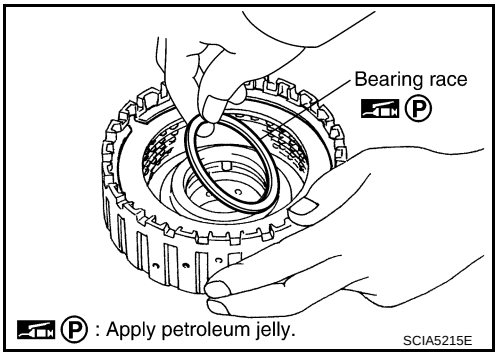
   CAUTION:
   Take care with order of plates.

2. Install snap ring in high and low reverse clutch drum using a flat-bladed screwdriver.



3. Install bearing race to high and low reverse clutch drum.

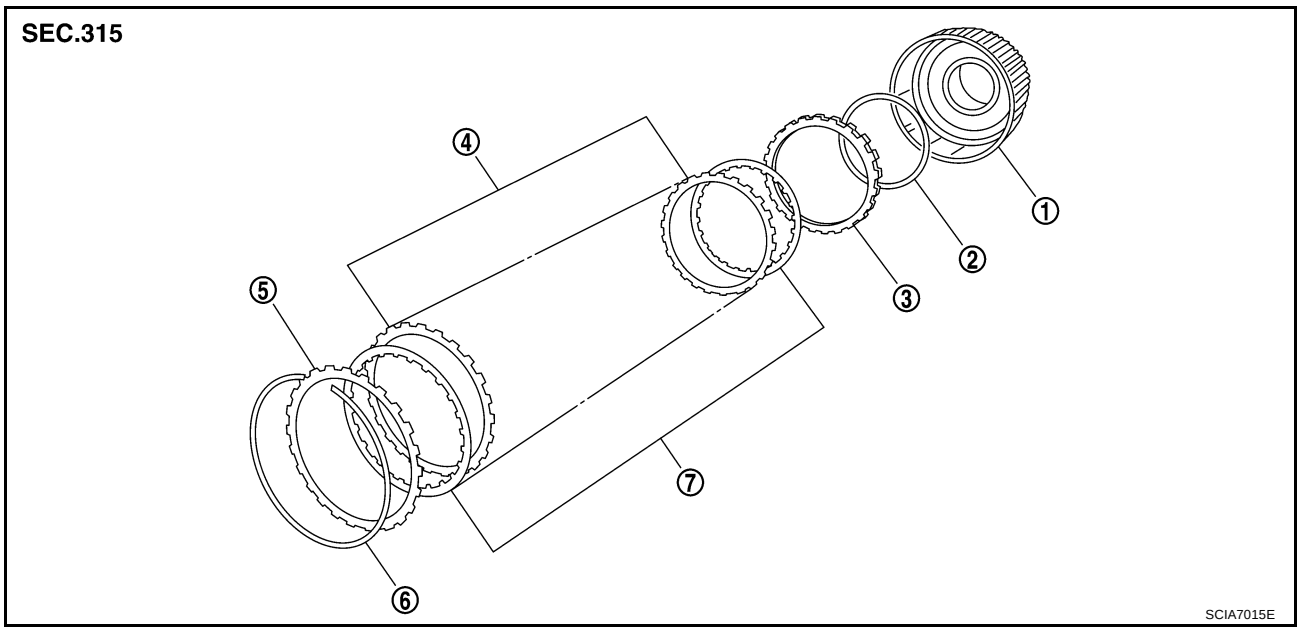
   CAUTION:
   Apply petroleum jelly to bearing race.



Direct Clutch

NCS0009H

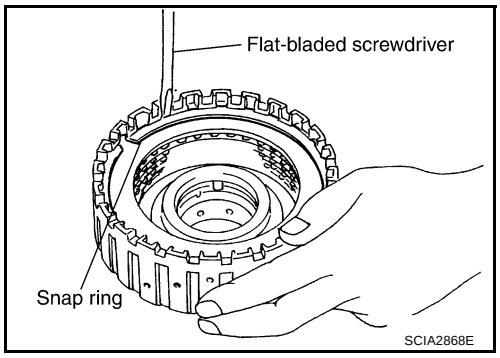
COMPONENTS



1. Direct clutch drum
2. Dish plate
3. Retaining plate
4. Driven plate
5. Retaining plate
6. Snap ring
7. Drive plate

DISASSEMBLY

1. Remove snap ring from direct clutch drum using a flat-bladed screwdriver.
2. Remove retaining plates, drive plates, driven plates and dish plate from direct clutch drum.



INSPECTION

Check the following, and replace direct clutch assembly if necessary.

Direct Clutch Snap Ring

- Check for deformation, fatigue or damage.

Direct Clutch Drive Plates

- Check facing for burns, cracks or damage.

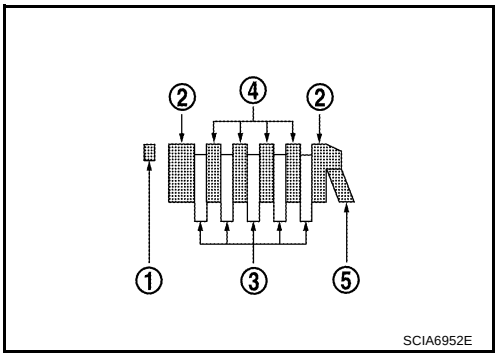
Direct Clutch Retaining Plate, Driven Plates and Dish Plate

- Check facing for burns, cracks or damage.

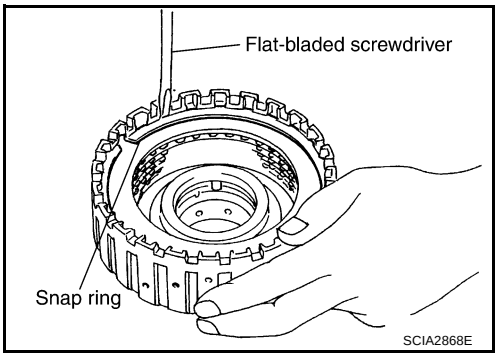
ASSEMBLY

1. Install dish plate, retaining paltes, driven plates and drive plates in direct clutch drum.
   - Snap ring (1)
   - Retaining plate (2)
   - Drive plate (3)
   - Driven plate (4)
   - Dish plate (5)
   - Drive plate/Driven plate: 5/4

   CAUTION:
   Take care with order of plates.



2. Install snap ring in direct clutch drum using a flat-bladed screwdriver.



ASSEMBLY

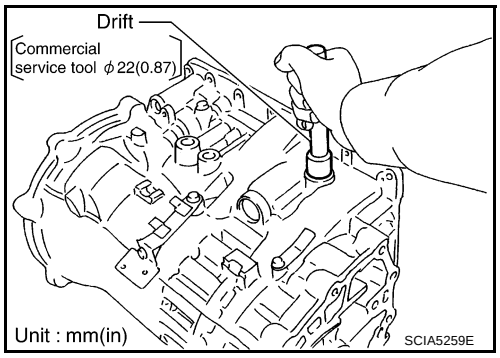
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Assembly (1)

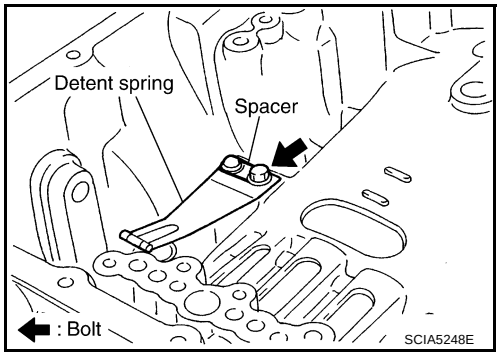
NCS0009I

1. As shown in the right figure, use a drift [commercial service tool: 22 mm (0.87 in) dia.] to drive manual shaft oil seals into transmission case until it is flush.

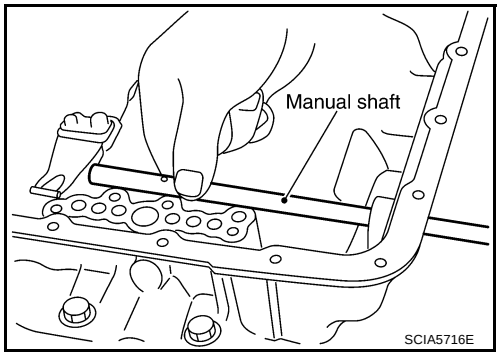
   CAUTION:
   - **Do not reuse manual shaft oil seals.**
   - **Apply ATF to manual shaft oil seals.**



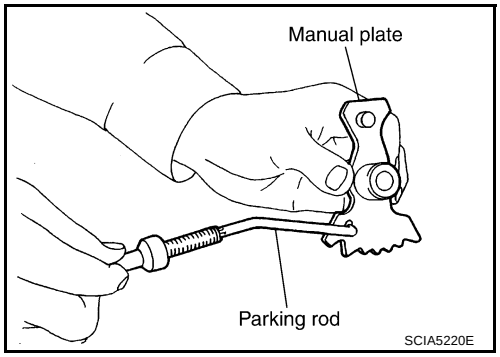
2. Install detent spring and spacer to transmission case, and then tighten mounting bolt to the specified torque. Refer to AT-246, "Components" .



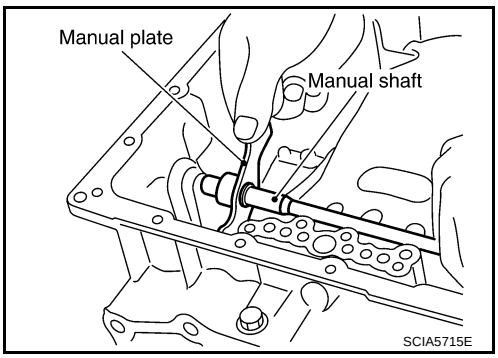
3. Install manual shaft to transmission case.



4. Install parking rod to manual plate.



5. Install manual plate (with parking rod) to manual shaft.



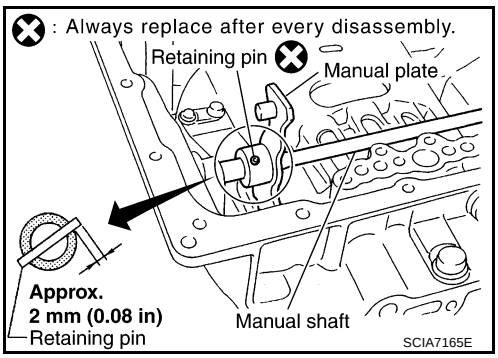
6. Install retaining pin into manual plate and manual shaft.

a. Fit pinhole of manual plate to pinhole of manual shaft with a pin punch.

b. Tap retaining pin into manual plate using a hammer.

CAUTION:

- **Do not reuse retaining pin.**
- **Drive retaining pin to 2±0.5 mm (0.08±0.020 in) over manual plate.**



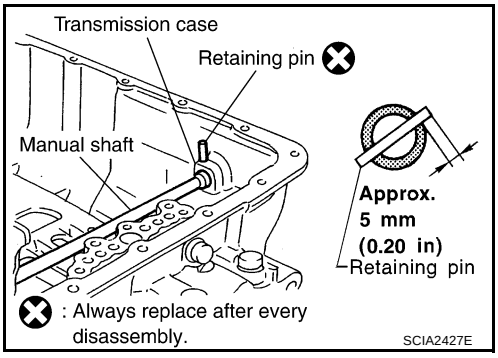
7. Install retaining pin into transmission case and manual shaft.

a. Fit pinhole of transmission case to pinhole of manual shaft with a pin punch.

b. Tap the retaining pin into transmission case using a hammer.

CAUTION:

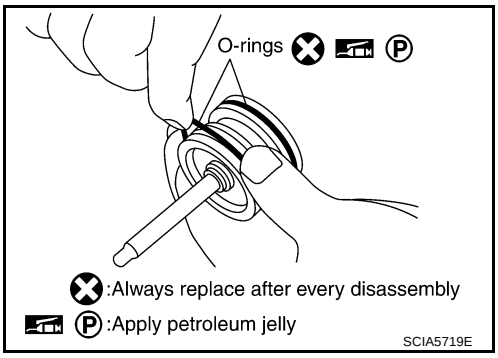
- **Do not reuse retaining pin.**
- **Drive retaining pin to 5±1 mm (0.20±0.04 in) over transmission case.**



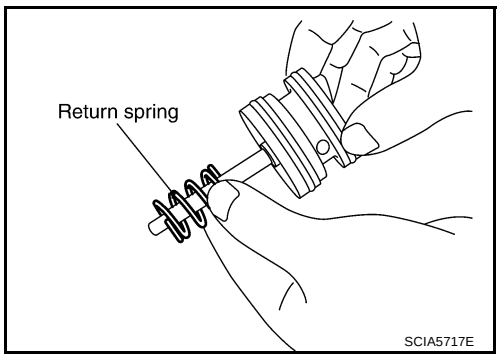
8. Install O-rings to servo assembly.

CAUTION:

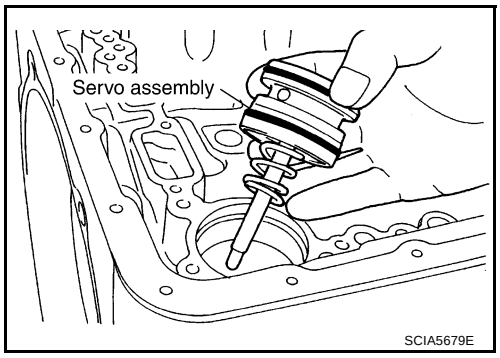
- **Do not reuse O-rings.**
- **Apply petroleum jelly to O-rings.**



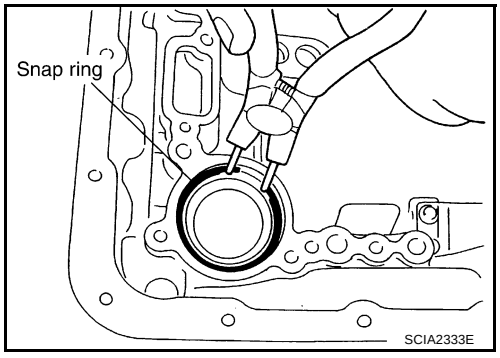
9. Install return spring to servo assembly.



10. Install servo assembly in transmission case.



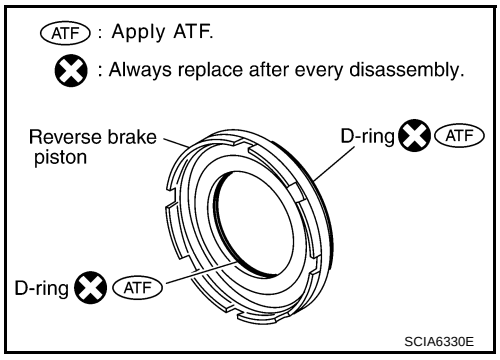
11. Install snap ring to transmission case using pair of snap ring pliers.



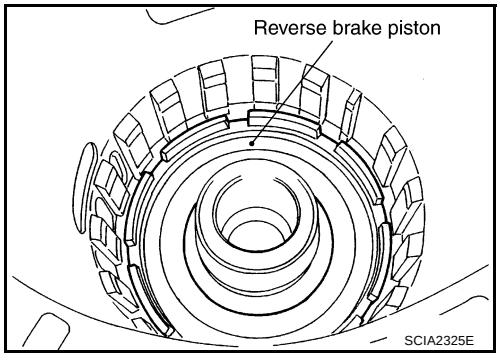
12. Install D-rings in reverse brake piston.

CAUTION:

- **Do not reuse D-rings.**
- **Apply ATF to D-rings.**



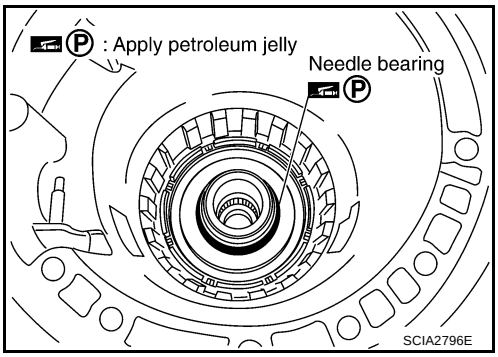
13. Install reverse brake piston in transmission case.



14. Install needle bearing to drum support edge surface.

CAUTION:

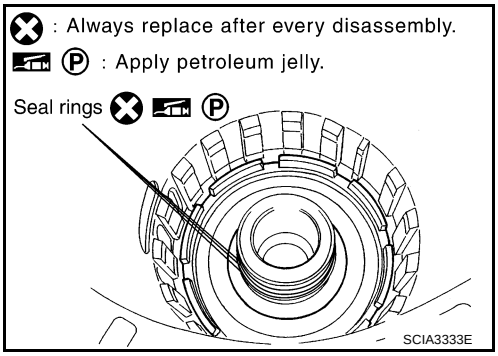
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



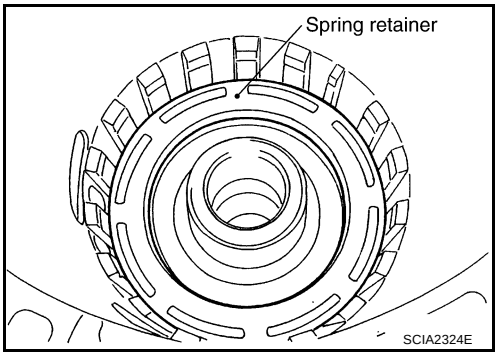
15. Install seal rings to drum support.

CAUTION:

- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



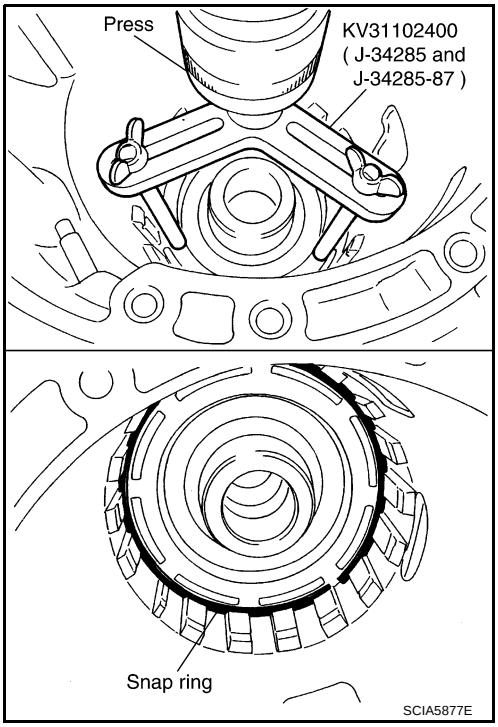
16. Install return spring and spring retainer in transmission case.



17. Set the SST on spring retainer and install snap ring (fixing spring retainer) in transmission case while compressing return spring.

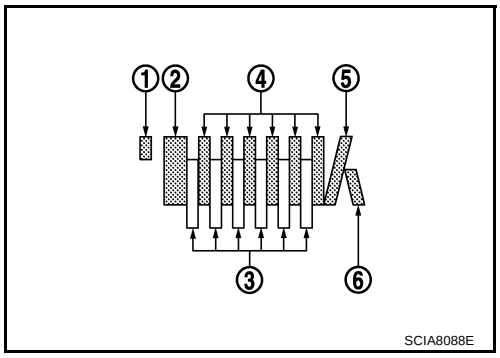
CAUTION:

Securely assemble them using a flat-bladed screwdriver so that snap ring tension is slightly weak.

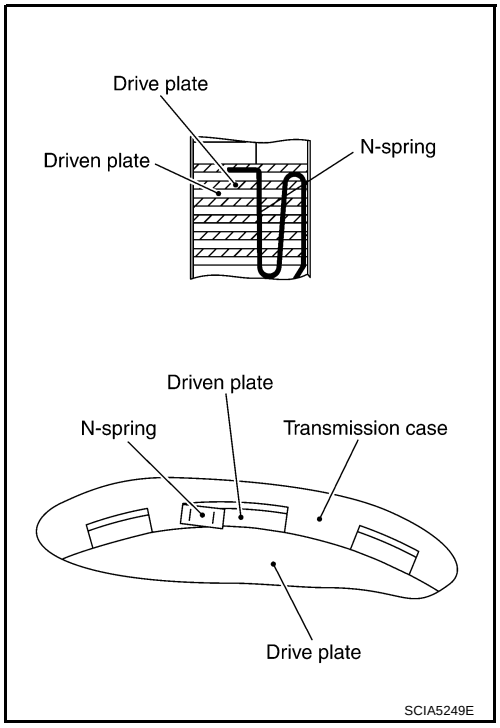


18. Install reverse brake retaining plate, drive plates, driven plates and dish plates in transmission case.
    - Snap ring (1)
    - Retaining plate (2)
    - Drive plate (3)
    - Driven plate (4)
    - Dish plate (5)
    - Dish plate (6)
    - Driveplate/Driven plate: 6/6

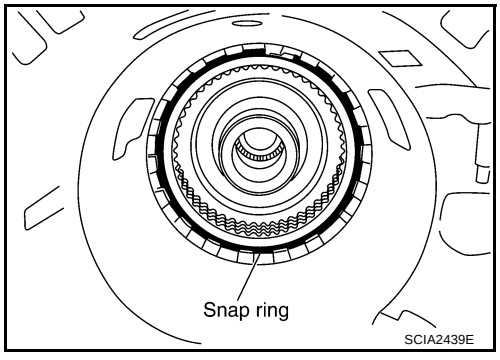
    CAUTION:
    Take care with order of plates.



19. Assemble N-spring.
20. Install reverse brake retaining plate in transmission case.



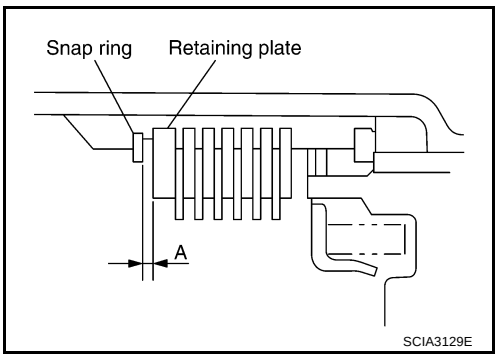
21. Install snap ring in transmission case.



22. Measure clearance between retaining plate and snap ring. If not within specified clearance, select proper retaining plate. Refer to “Parts Information” for retaining plate selection.

Specified clearance “A”:

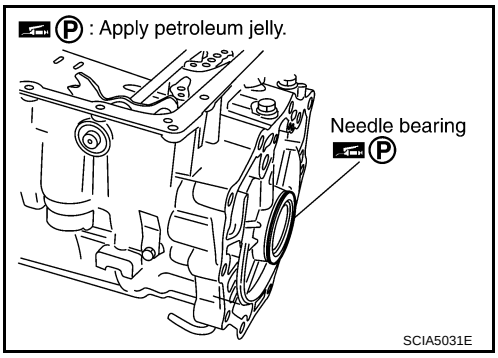
Refer to AT-312, "Reverse Brake" .



23. Install needle bearing to transmission case.

CAUTION:

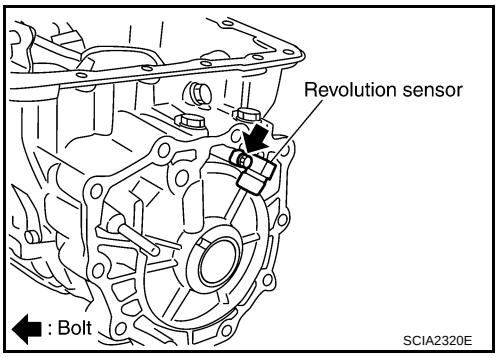
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



24. Install revolution sensor to transmission case, and then tighten mounting bolt to the specified torque. Refer to AT-246, "Components" .

CAUTION:

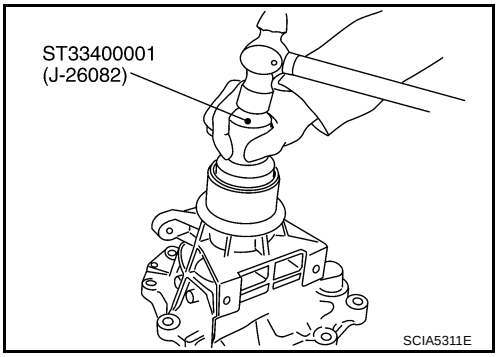
- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**



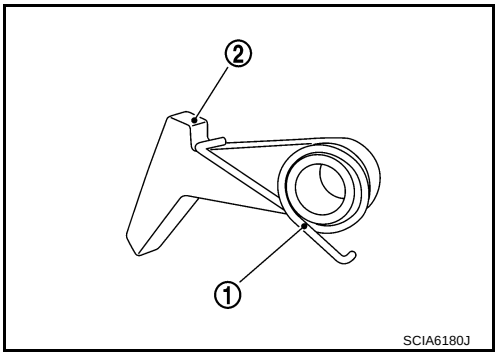
25. As shown in the figure, drive rear oil seal into rear extension until it is flush using a drift.

CAUTION:

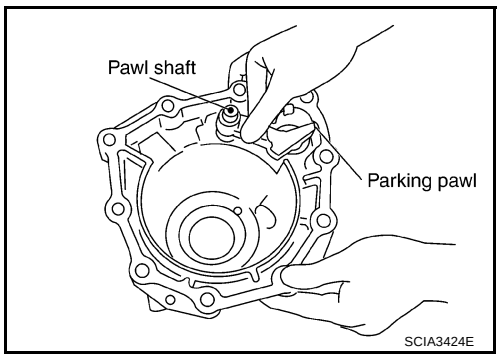
- **Do not reuse rear oil seal.**
- **Apply ATF to rear oil seal.**



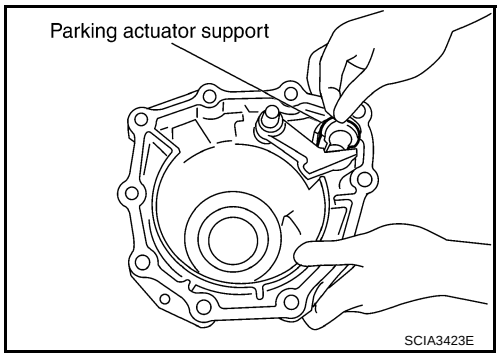
26. Install return spring (1) to parking pawl (2).



27. Install parking pawl (with return spring) and pawl shaft to rear extension.



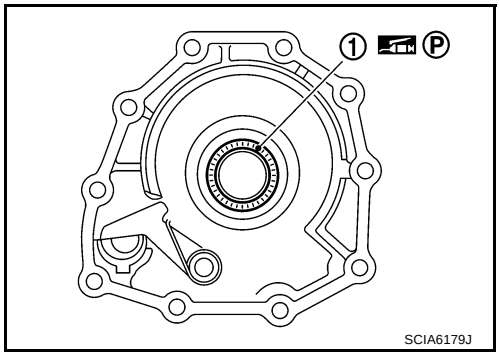
28. Install parking actuator support to rear extension.



29. Install needle bearing (1) to rear extension.

CAUTION:

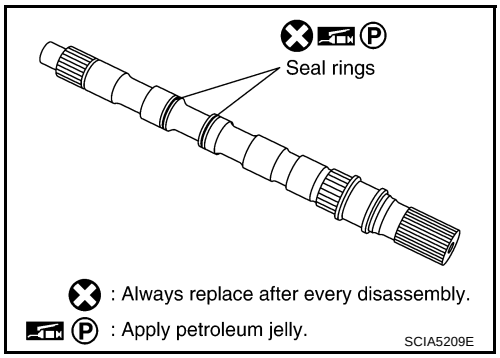
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



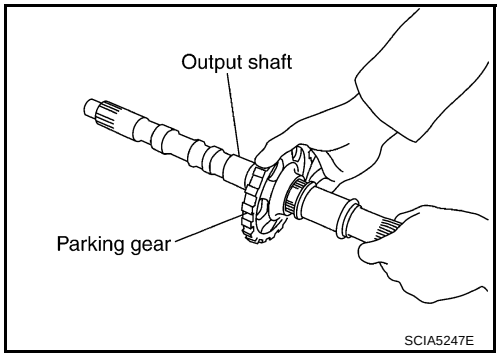
30. Install seal rings to output shaft.

CAUTION:

- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**

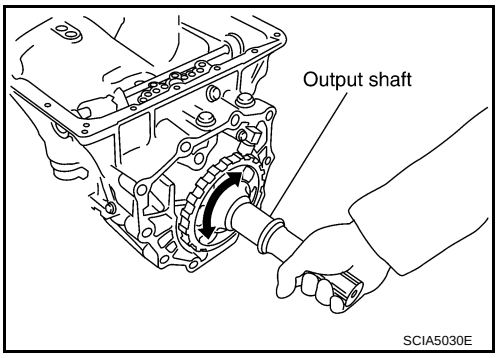


31. Install parking gear to output shaft.

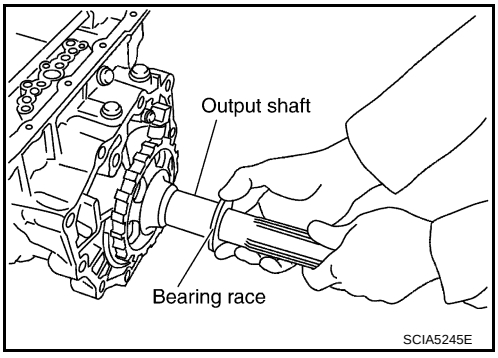


32. Install output shaft in transmission case.

CAUTION:
Be careful not to mistake front for rear because both sides looks similar. (Thinner end is front side.)

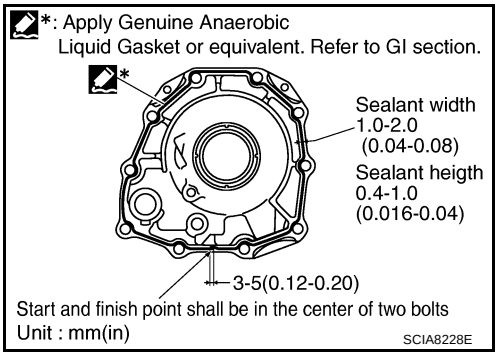


33. Install bearing race to output shaft.



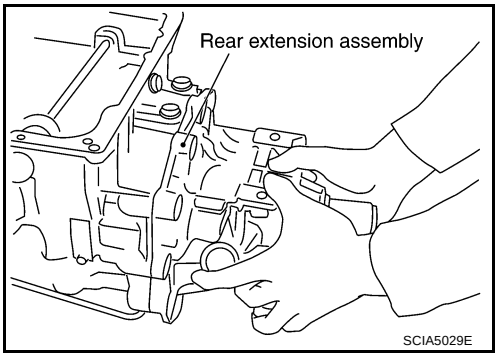
34. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in the figure.

CAUTION:
Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



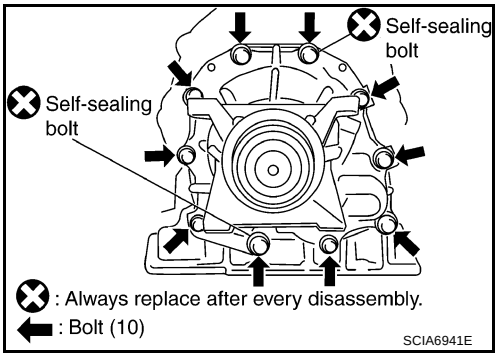
35. Install rear extension assembly to transmission case.

CAUTION:
Insert the tip of parking rod between parking pawl and the parking actuator support when assembling rear extension assembly.



36. Tighten rear extension assembly mounting bolts to the specified torque. Refer to AT-246, "Components" .

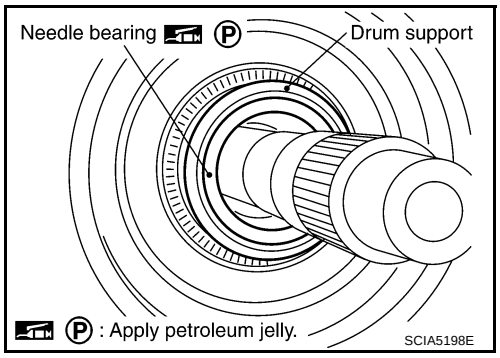
CAUTION:
Do not reuse self-sealing bolts.



37. Install needle bearing in drum support.

CAUTION:

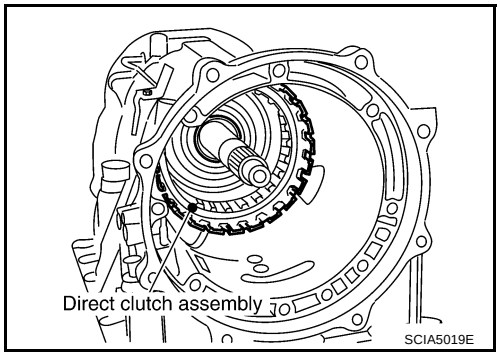
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



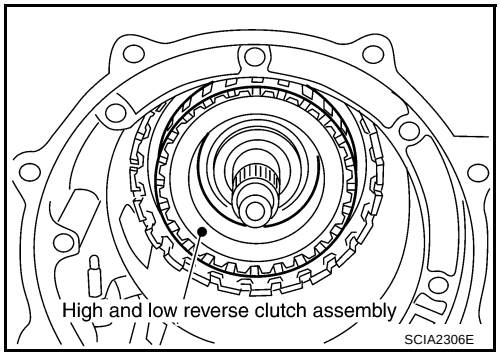
38. Install direct clutch assembly in reverse brake.

CAUTION:

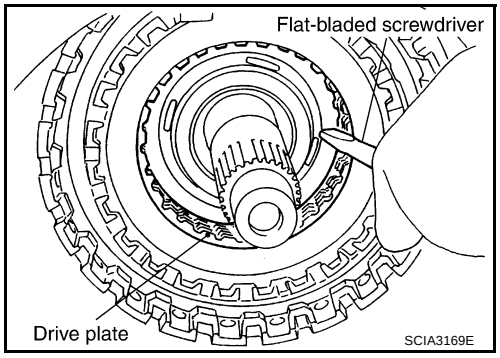
Make sure that drum support edge surface and direct clutch inner boss edge surface come to almost same place.



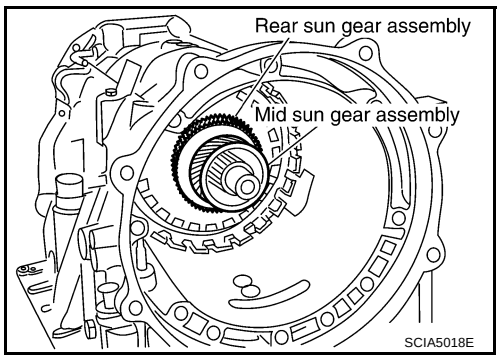
39. Install high and low reverse clutch assembly in direct clutch.



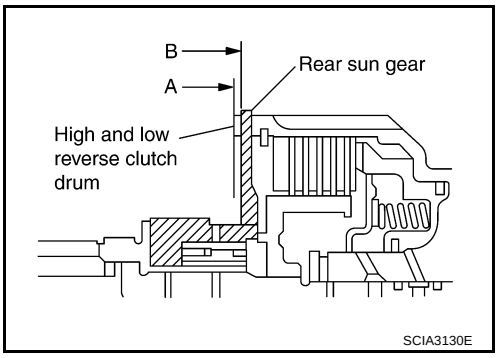
40. Align drive plate using a flat-bladed screwdriver.



41. Install high and low reverse clutch hub, mid sun gear assembly and rear sun gear assembly as a unit.

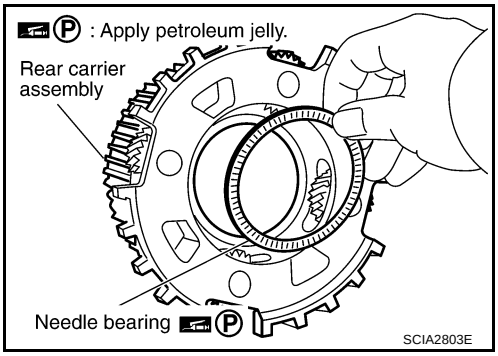


CAUTION:
Make sure that portion “A” of high and low reverse clutch drum protrudes approximately 2 mm (0.08 in) beyond portion “B” of rear sun gear.



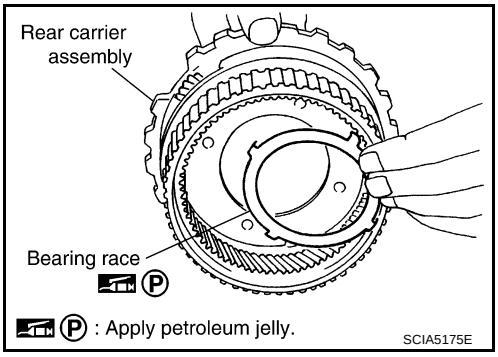
42. Install needle bearing in rear carrier assembly.

CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**

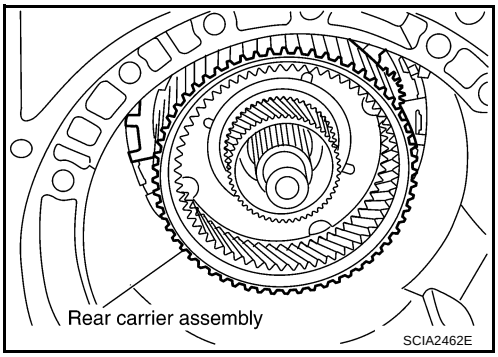


43. Install bearing race in rear carrier assembly.

CAUTION:
Apply petroleum jelly to bearing race.



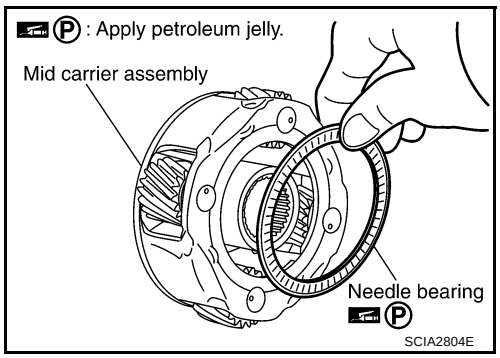
44. Install rear carrier assembly in direct clutch drum.



45. Install needle bearing (rear side) to mid carrier assembly.

CAUTION:

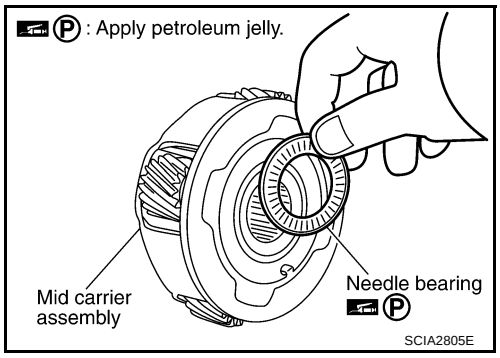
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



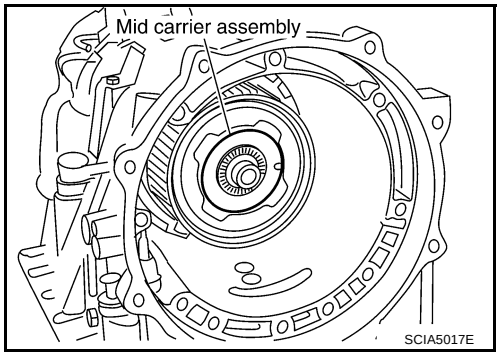
46. Install needle bearing (front side) to mid carrier assembly.

CAUTION:

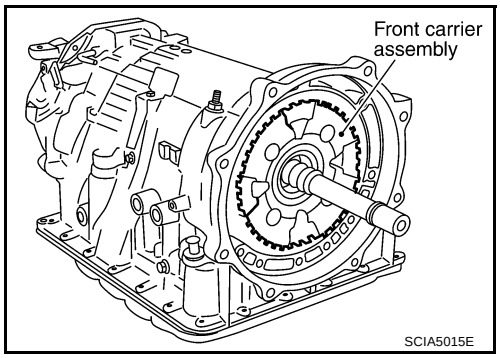
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



47. Install mid carrier assembly in rear carrier assembly.



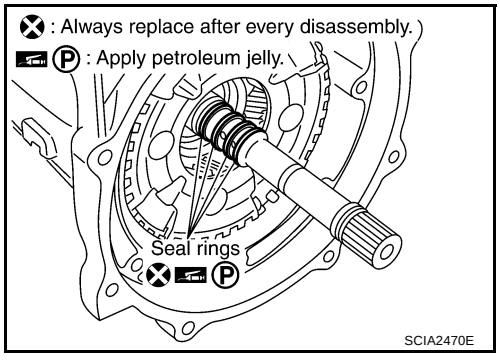
48. Install front carrier assembly, input clutch assembly and rear internal gear as a unit.



49. Install seal rings in input clutch assembly.

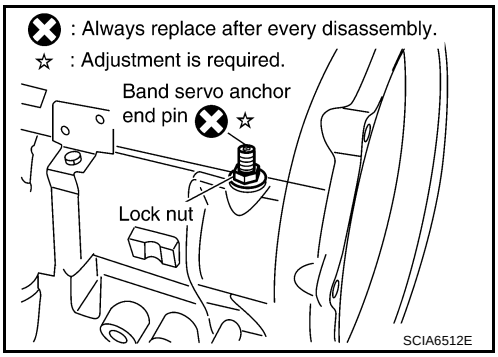
CAUTION:

- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



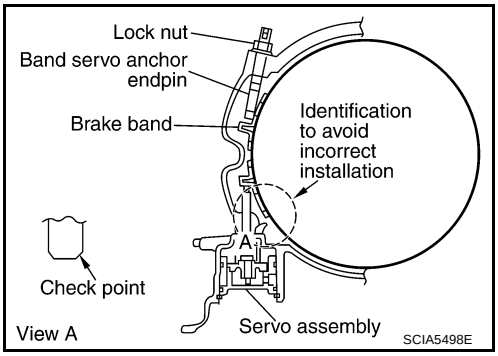
50. Install band servo anchor end pin and lock nut in transmission case.

CAUTION:
Do not reuse band servo anchor end pin.



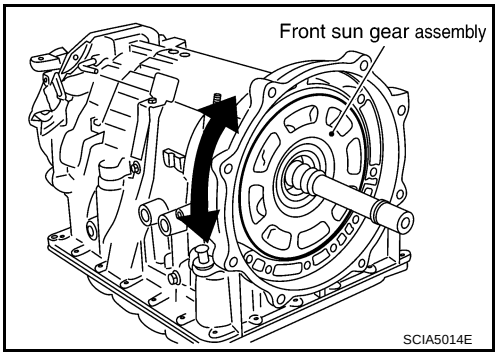
51. Install brake band in transmission case.

CAUTION:
Assemble it so that identification to avoid incorrect installation faces servo side.



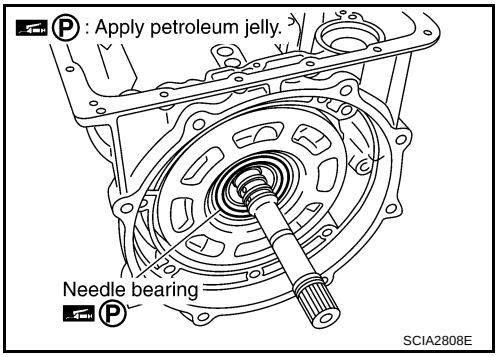
52. Install front sun gear to front carrier assembly.

CAUTION:
Apply ATF to front sun gear bearing and 3rd one-way clutch end bearing.

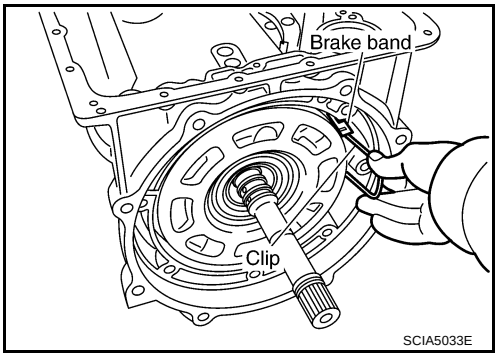


53. Install needle bearing to front sun gear.

CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



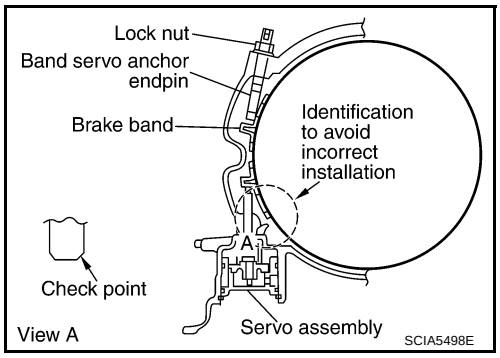
54. Adjust brake band tilting using a clip so that brake band contacts front sun gear drum evenly.



55. Adjust brake band.
a. Loosen lock nut.
b. Tighten band servo anchor end pin to the specified torque.

: 5.0 N·m (0.51 kg-m, 44 in-lb)

c. Back of band servo anchor end pin three turns.
d. Holding band servo anchor end pin, tighten lock nut to the specified torque. Refer to AT-246, "Components" .

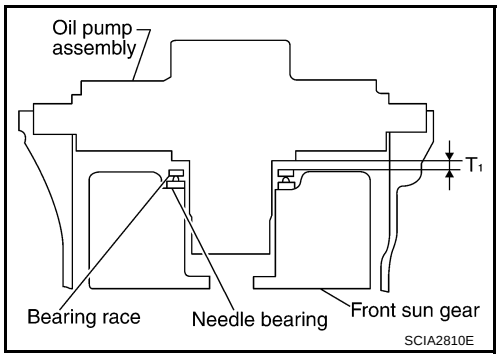


NCS0009J

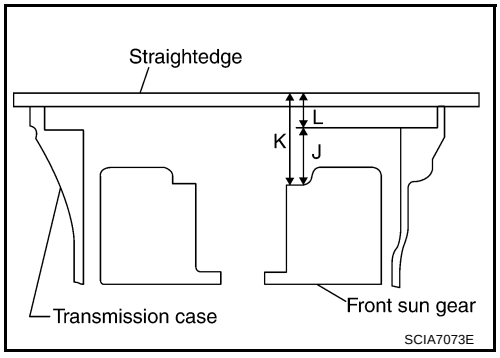
Adjustment

TOTAL END PLAY

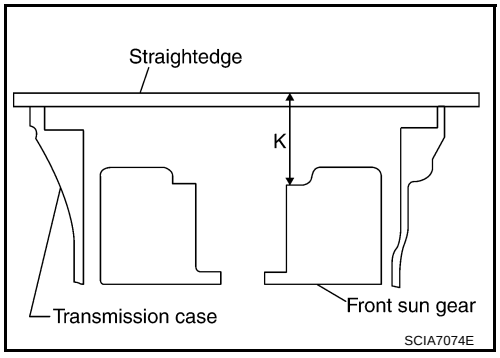
- Measure clearance between front sun gear and bearing race for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.



1. Measure dimensions “K” and “L” and then calculate dimension “J”.



a. Measure dimension “K”.

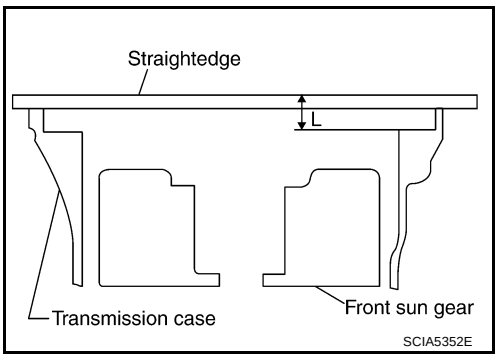


b. Measure dimension “L”.

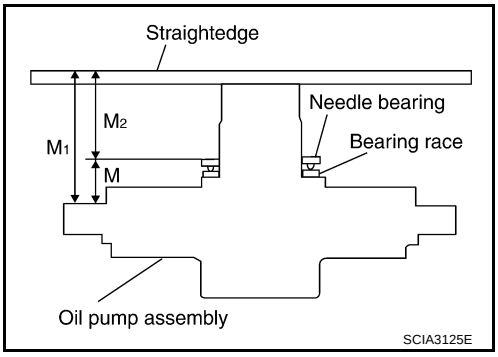
c. Calculate dimension “J”.

“J”: Distance between oil pump fitting surface of transmission case and needle bearing mating surface of front sun gear.

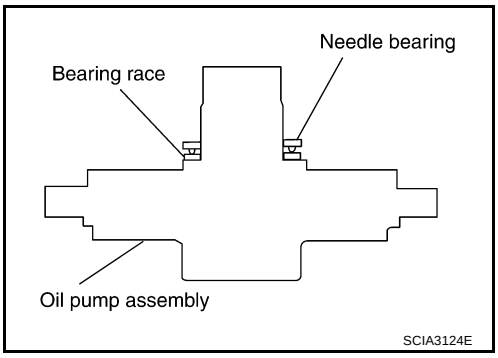
J = K – L



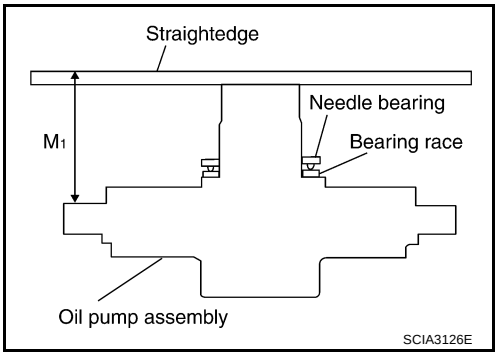
2. Measure dimensions “M_1 ” and “M_2 ” and then calculate dimension “M”.



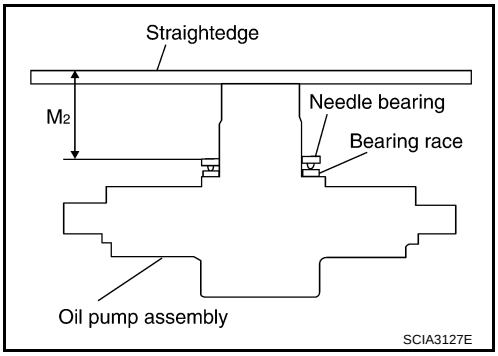
a. Place bearing race and needle bearing on oil pump assembly.



b. Measure dimension “M_1 ”.



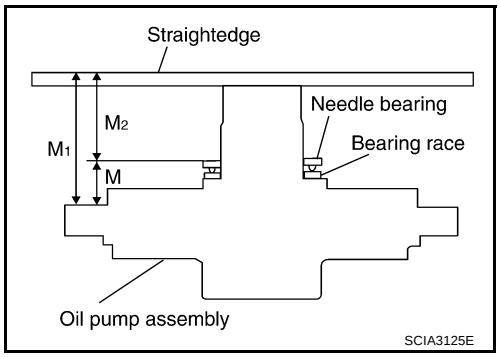
c. Measure dimension “M_2 ”.



d. Calculate dimension “M”.

“M”: Distance between transmission case fitting surface of oil pump and needle bearing on oil pump.

$M = M_1 - M_2$



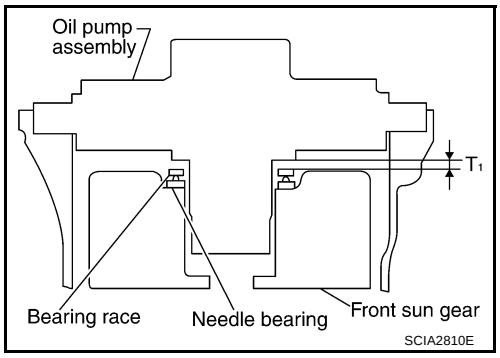
3. Adjust total end play “T_1”.

$T_1 = J - M$

Total end play “T_1”:

Refer to AT-312, "Total End Play" .

- Select proper thickness of bearing race so that total end play is within specifications. Refer to “Parts Information” for bearing race selection.



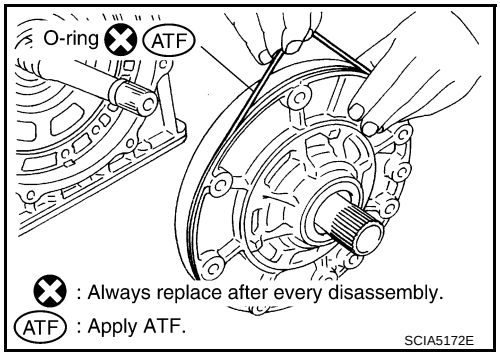
Assembly (2)

NCS0009K

1. Install O-ring to oil pump assembly.

CAUTION:

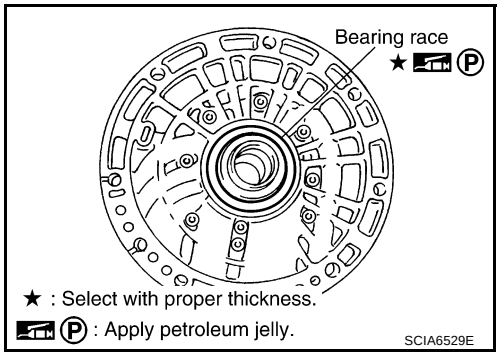
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



2. Install bearing race to oil pump assembly.

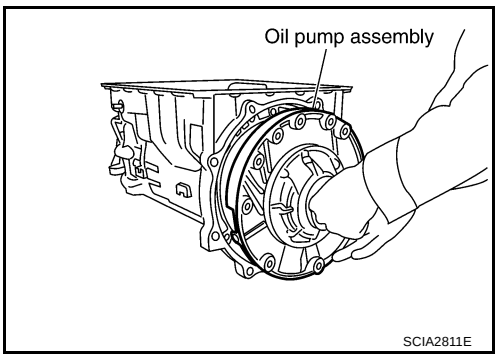
CAUTION:

Apply petroleum jelly to bearing race.



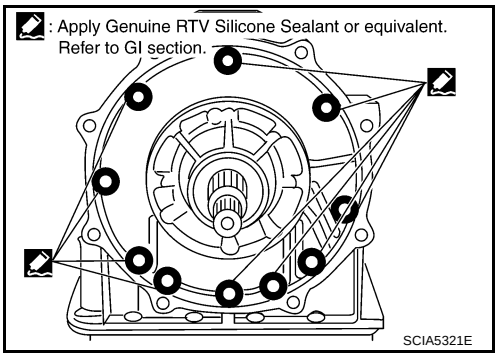
3. Install oil pump assembly in transmission case.

CAUTION:
Apply ATF to oil pump bearing.



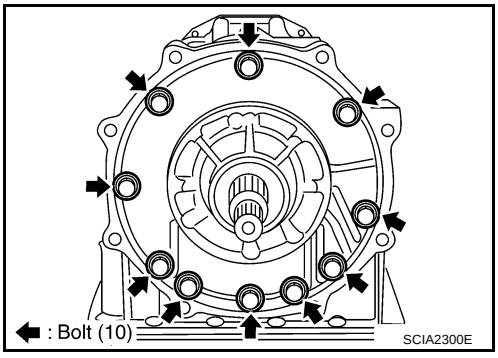
4. Apply recommended sealant (Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .) to oil pump assembly as shown in the figure.

CAUTION:
Completely remove all moisture, oil and old sealant, etc. from the oil pump mounting bolts and oil pump mounting bolt mounting surfaces.



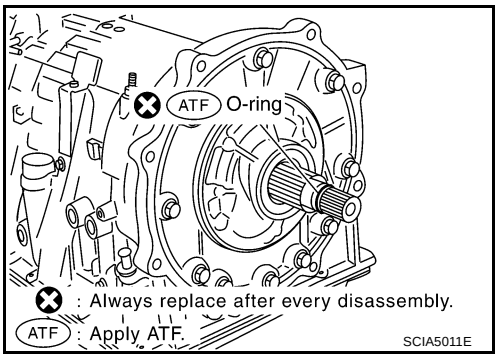
5. Tighten oil pump mounting bolts to the specified torque. Refer to AT-246, "Components" .

CAUTION:
Apply ATF to oil pump bushing.



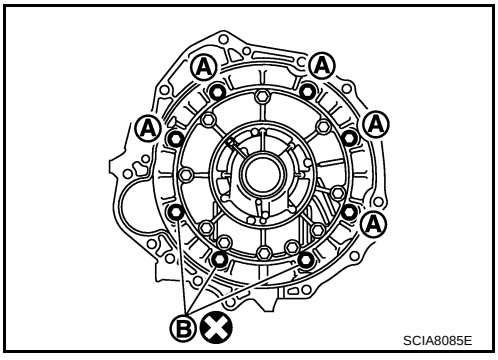
6. Install O-ring to input clutch assembly.

CAUTION:
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**

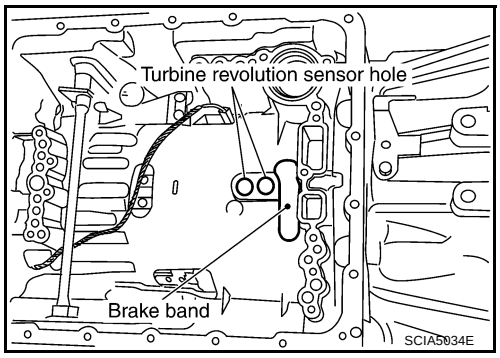


7. Install converter housing to transmission case, and then tighten converter housing bolts (A) and self-sealing bolts (B) to the specified torque. Refer to AT-246, "Components" .

CAUTION:
Do not reuse self-sealing bolts (B).

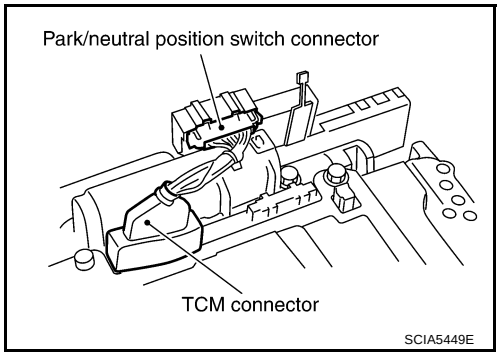


8. Make sure that brake band does not close turbine revolution sensor hole.

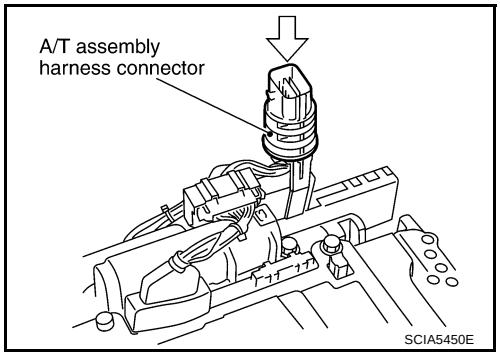


9. Install control valve with TCM.

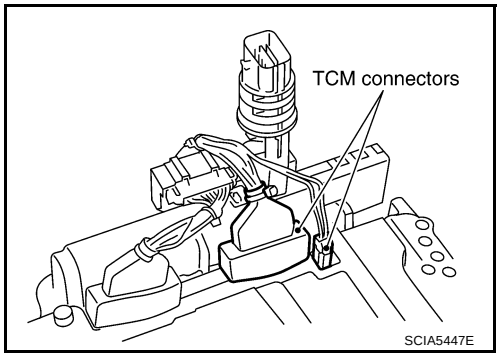
a. Connect TCM connector and park/neutral position switch connector.



b. Install A/T assembly harness connector from control valve with TCM.



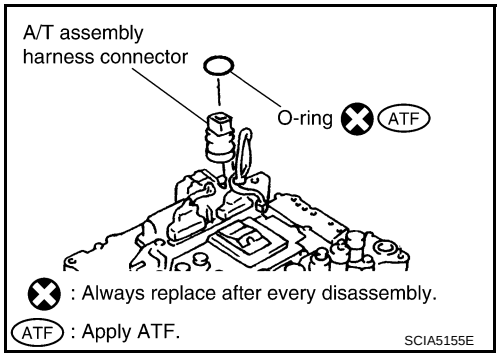
c. Connect TCM connectors.



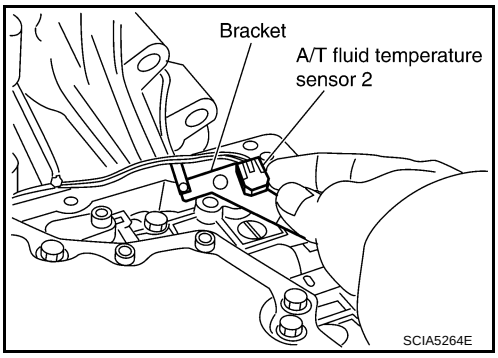
d. Install O-ring to A/T assembly harness connector.

CAUTION:

- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**

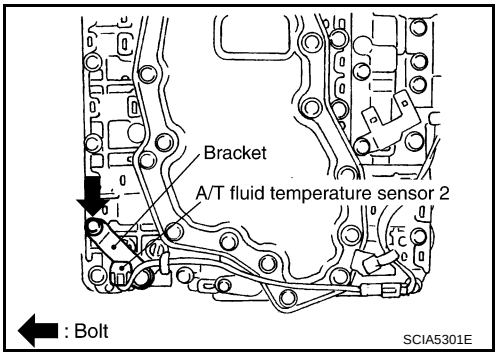


e. Install A/T fluid temperature sensor 2 to bracket.



f. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten mounting bolt to the specified torque. Refer to AT-246, "Components" .

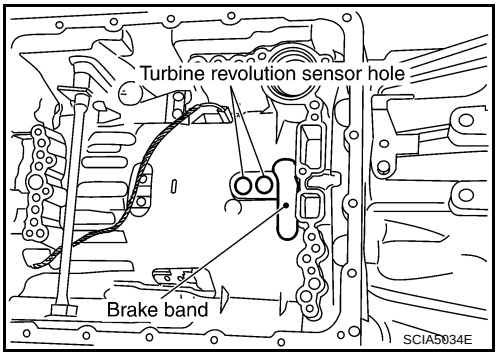
CAUTION:
Adjust bolt hole of bracket to bolt hole of control valve with TCM.



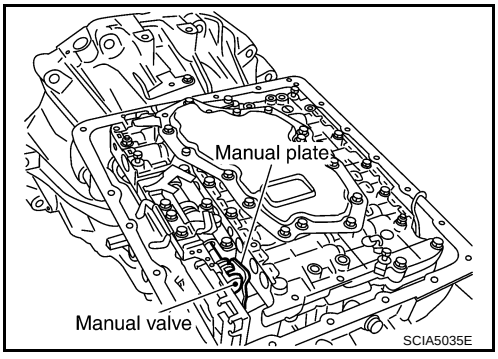
g. Install control valve with TCM in transmission case.

CAUTION:

- **Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.**
- **Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.**
- **Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.**

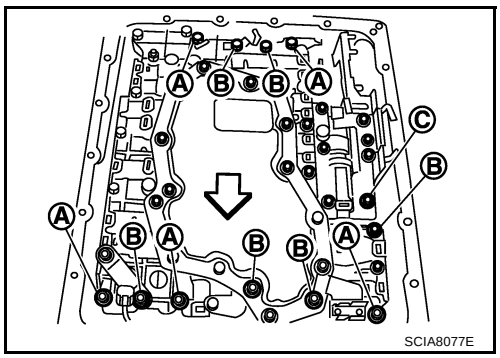


- **Assemble it so that manual valve cutout is engaged with manual plate projection.**

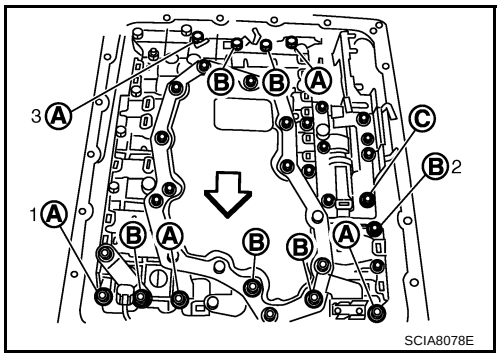


h. Install bolts (A), (B) and (C) to control valve with TCM.
- ⇦: Front

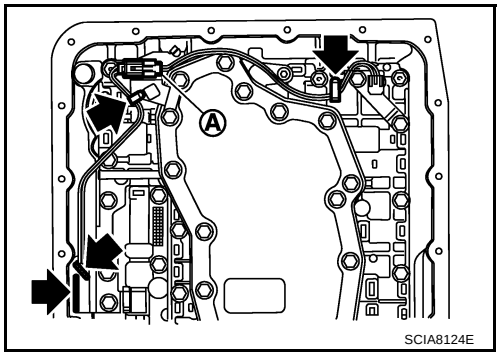
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



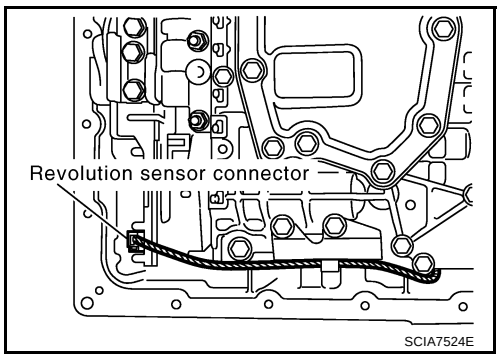
i. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts to the specified torque. Refer to AT-246, "Components" .
- ⇦: Front



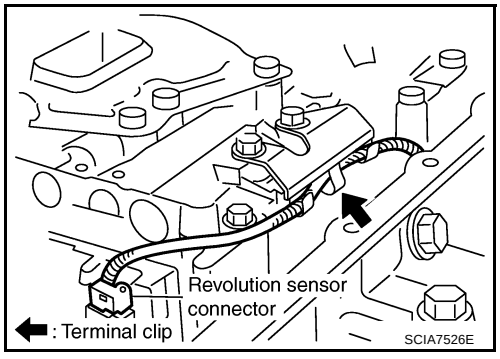
10. Connect A/T fluid temperature sensor 2 connector (A).
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips (⬅).



12. Connect revolution sensor connector.

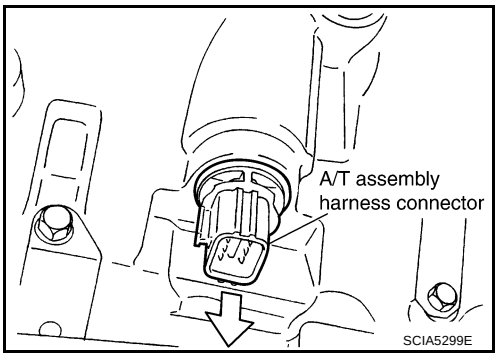


13. Securely fasten revolution sensor harness with terminal clip.

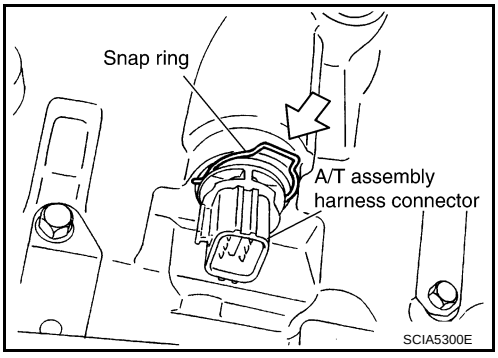


14. Pull down A/T assembly harness connector.

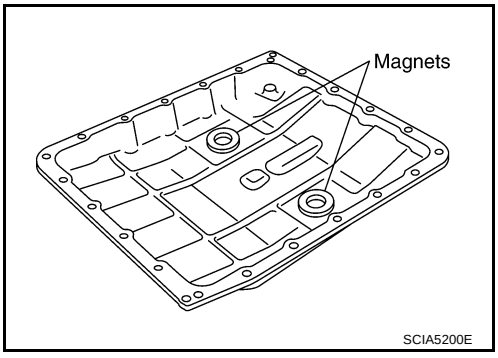
CAUTION:
Be careful not to damage connector.



15. Install snap ring to A/T assembly harness connector.



16. Install magnets in oil pan.



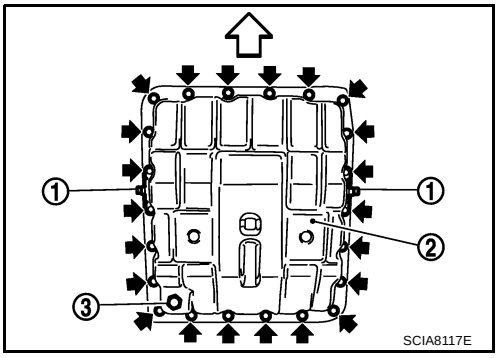
17. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

CAUTION:
- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.
- ⇦: Front
- ⬅: Oil pan mounting bolt

CAUTION:
- **Install it so that drain plug (3) comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

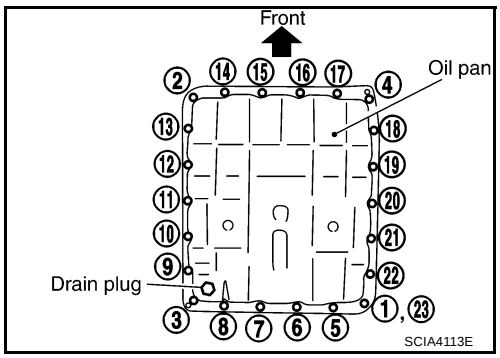


c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-246, "Components" .

CAUTION:
Do not reuse oil pan mounting bolts.

18. Install drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-246, "Components" .

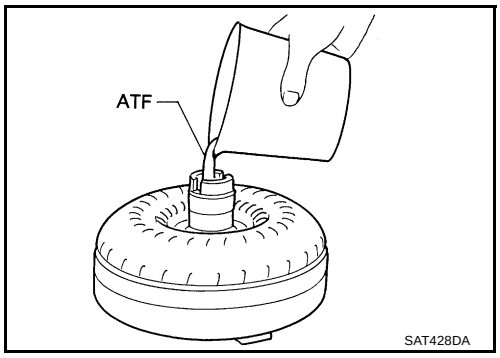
CAUTION:
Do not reuse drain plug gasket.



19. Install torque converter.

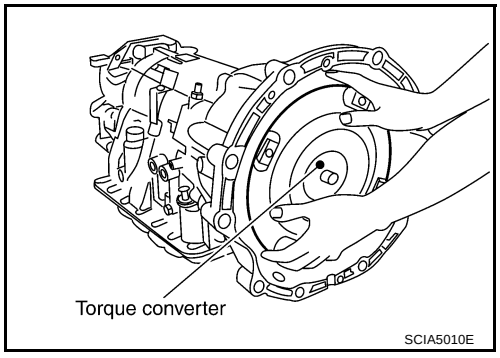
a. Pour ATF into torque converter.

- **Approximately 2 liter (2-1/8 US qt, 1-3/4 Imp qt) of ATF is required for a new torque converter.**
- **When reusing old torque converter, add the same amount of ATF as was drained.**



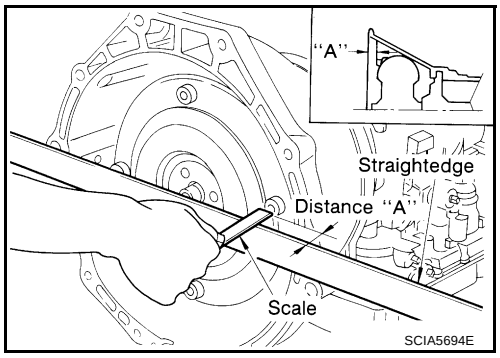
b. Install torque converter while aligning notches of torque converter with notches of oil pump.

CAUTION:
Install torque converter while rotating it.



c. Measure distance “A” to check that torque converter is in proper position.

Distance “A”: 25.0 mm (0.98 in) or more



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NCS0009L

Applied model		VQ35HR engine
Automatic transmission model		RE5R05A
Transmission model code number		98X5B
Stall torque ratio		1.74 : 1
Transmission gear ratio	1st	3.842
	2nd	2.353
	3rd	1.529
	4th	1.000
	5th	0.839
	Reverse	2.765
Recommended fluid		Genuine NISSAN Matic J ATF*1
Fluid capacity		10.3 liter (10-7/8 US qt, 9-1/8 Imp qt)*2

CAUTION:

- **Use only Genuine NISSAN Matic J ATF. Do not mix with other fluid.**
- **Using A/T fluid other than Genuine NISSAN Matic J ATF will cause deterioration driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.**

- *1: Refer to MA-11, "Fluids and Lubricants" .
- *2: The fluid capacity is the reference value. Check the fluid level with A/T fluid level gauge.

Vehicle Speed at Which Gear Shifting Occurs

NCS0009M

Throttle position	Vehicle speed km/h (MPH)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
Full throttle	50 – 54 (31 – 34)	97 – 105 (60 – 65)	154 – 164 (96 – 102)	224 – 234 (139 – 145)	220 – 230 (137 – 143)	145 – 155 (90 – 96)	86 – 94 (53 – 58)	39 – 43 (24 – 27)
Half throttle	29 – 33 (18 – 21)	63 – 69 (39 – 43)	100 – 108 (62 – 67)	136 – 144 (85 – 89)	88 – 96 (55 – 60)	64 – 72 (40 – 45)	28 – 34 (17 – 21)	9 – 13 (6 – 8)

- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed at Which Lock-up Occurs/Releases

NCS0009N

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	62 – 70 (39 – 44)	59 – 67 (37 – 42)
Half throttle	136 – 144 (85 – 89)	88 – 96 (55 – 60)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 4/8 of the full opening.

Stall Speed

NCS0009O

Stall speed	2,700 – 3,000 rpm

Line Pressure

NCS0009P

Engine speed	Line pressure kPa (kg/cm^2 , psi)	
	“R” position	“D” and “M” positions
At idle speed	425 – 465 (4.3 – 4.7, 62 – 67)	379 – 428 (3.9 – 4.4, 55 – 62)
At stall speed	1,605 – 1,950 (16.4 – 19.9, 233 – 283)	1,310 – 1,500 (13.4 – 15.3, 190 – 218)

A/T Fluid Temperature Sensor

NCS0009Q

Name	Condition	CONSULT-III "DATA MONITOR" (Approx.)	Resistance (Approx.)
A/T fluid temperature sensor 1	0°C (32°F)	3.3 V	15 kΩ
	20°C (68°F)	2.7 V	6.5 kΩ
	80°C (176°F)	0.9 V	0.9 kΩ
A/T fluid temperature sensor 2	0°C (32°F)	3.3 V	10 kΩ
	20°C (68°F)	2.5 V	4 kΩ
	80°C (176°F)	0.7 V	0.5 kΩ

Turbine Revolution Sensor

NCS0009R

Name	Condition	Data (Approx.)
Turbine revolution sensor 1	When running at 50 km/h (31 MPH) in 4th speed with the closed throttle position signal OFF.	1.3 kHz
Turbine revolution sensor 2	When moving at 20 km/h (12 MPH) in 1st speed with the closed throttle position signal OFF.	

Vehicle Speed Sensor A/T (Revolution Sensor)

NCS0009S

Name	Condition	Data (Approx.)
Revolution sensor	When moving at 20 km/h (12 MPH).	185 Hz

Reverse Brake

NCS0009T

Model code number		98X5B
Number of drive plates		6
Number of driven plates		6
Clearance mm (in)	Standard	0.7 – 1.1 (0.028 – 0.043)

Total End Play

NCS0009U

Total end play mm (in)	0.25 – 0.55 (0.0098 – 0.0217)

SECTION ATC
AUTOMATIC AIR CONDITIONER

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NJS000D2

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

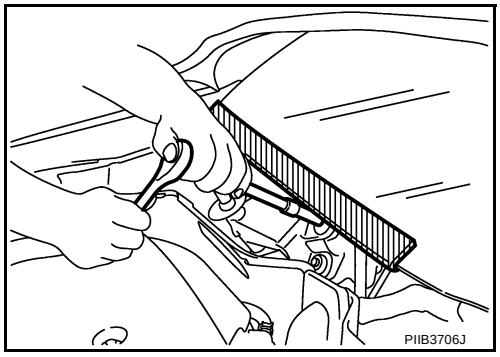
NJS000D3

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NJS000CP

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Working with HFC-134a (R-134a)

NJS00003

CAUTION:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor malfunction is likely to occur, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
  - **When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
  - **When installing refrigerant components to a vehicle, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
  - **Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.**
  - **Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.**

CONTAMINATED REFRIGERANT

If a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle, take appropriate steps shown below:

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- In case of repairing, recover the refrigerant using only **dedicated equipment and containers. Never recover contaminated refrigerant into the existing service equipment.** If the facility does not have dedicated recovery equipment, contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact Nissan Customer Affairs for further assistance.

General Refrigerant Precautions

NJS00004

WARNING:

- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment], or J-2209 [HFC-134a (R-134a) recovery equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Never store or heat refrigerant containers above 52°C (126°F).**
- **Never heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Never intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Never pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

Precautions for Refrigerant Connection

NJS00006

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

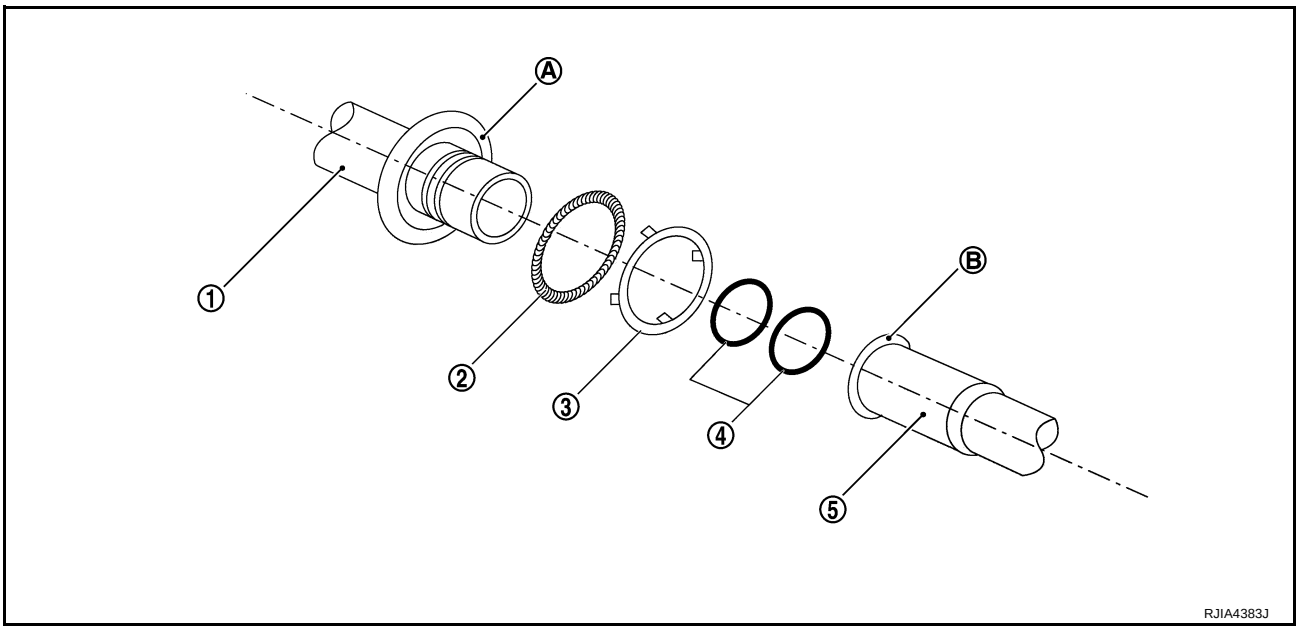
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

ABOUT ONE-TOUCH JOINT

Description

- One-touch joints are pipe joints which do not require tools during piping connection.
- Unlike conventional connection methods using union nuts and flanges, controlling tightening torque at connection point is not necessary.
- When removing a pipe joint, use a disconnector.

COMPONENT PARTS



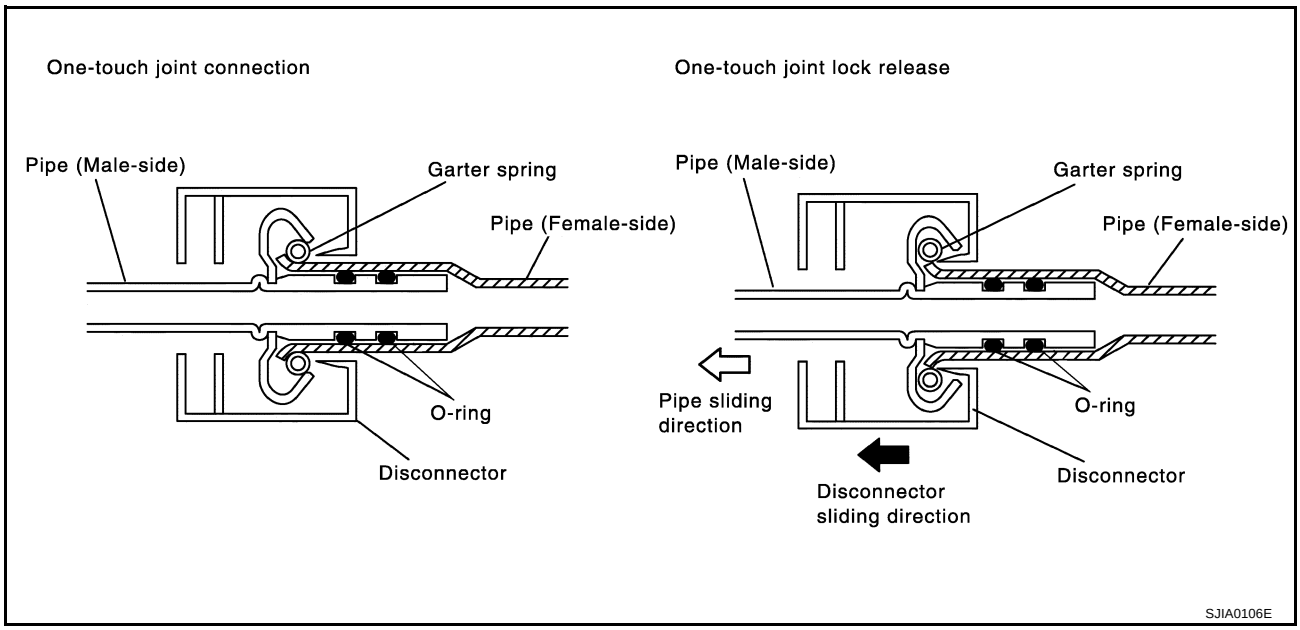
FUNCTIONS OF COMPONENT PARTS

1	Pipe (Male-side)	● Retains O-rings (4). ● Retains garter spring (2) in cage (A).
2	Garter spring	Anchors female-side piping (5).
3	Indicator ring	When connection is made properly, this is ejected from male-side piping (1). (This part is no longer necessary after connection.)
4	O-ring	Seals connection point. (Not reusable)
5	Pipe (Female-side)	● Seals connection by compressing O-rings (4). ● Anchors piping connection using flare (B) and garter spring (2).

NOTE:

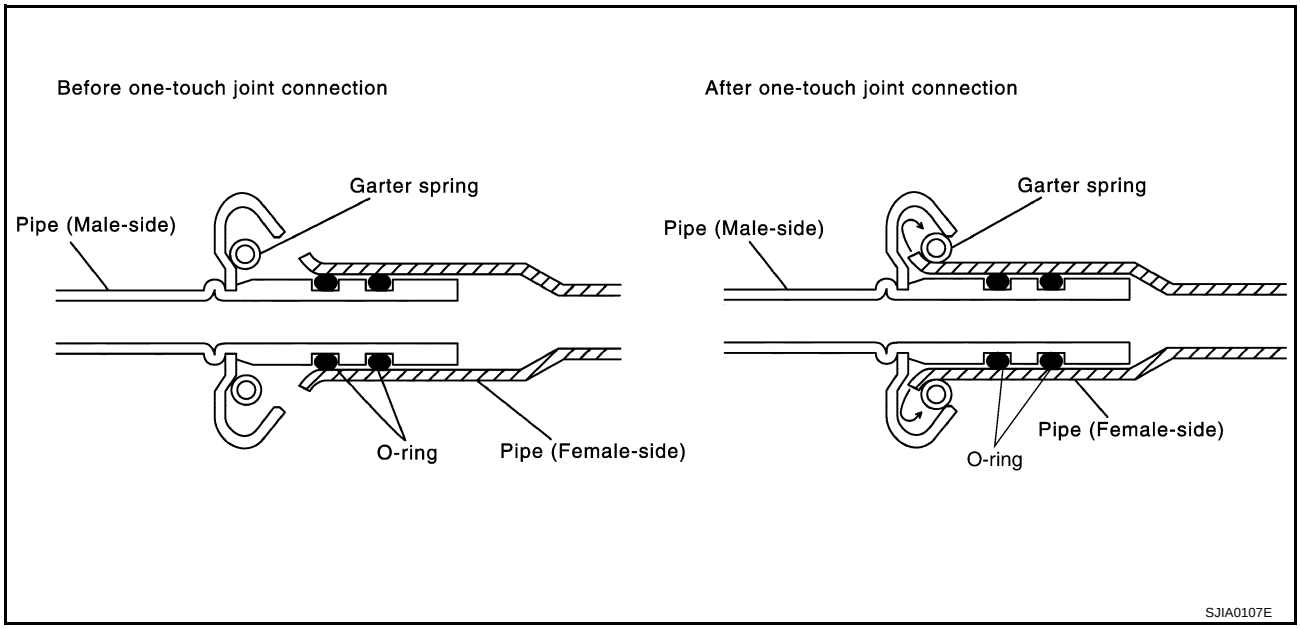
- Garter spring (2) cannot be removed from cage (A) of male-side piping.
- Indicator ring (3) remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

REMOVAL



1. Clean piping connection point, and set a disconnector.
2. Slide disconnector in axial direction of piping, and stretch garter spring with tapered point of disconnector.
3. Slide disconnector farther so that inside diameter of garter spring becomes larger than outside diameter of female-side piping flare. Then male-side piping can be disconnected.

INSTALLATION



1. Clean piping connection points, and insert male-side piping into female-side piping.
2. Push inserted male-side piping harder so that female-side piping flare stretches garter spring.
3. If inside diameter of garter spring becomes larger than outside diameter of female-side piping flare, garter spring seats on flare. Then, it fits in between male-side piping cage and female-side piping flare to anchor piping connection point.

   NOTE:
   When garter spring seats on flare, and fits in between male-side piping cage and female-side piping flare, it clicks.

   CAUTION:
   - **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
   - **Insert piping securely until a click is heard.**

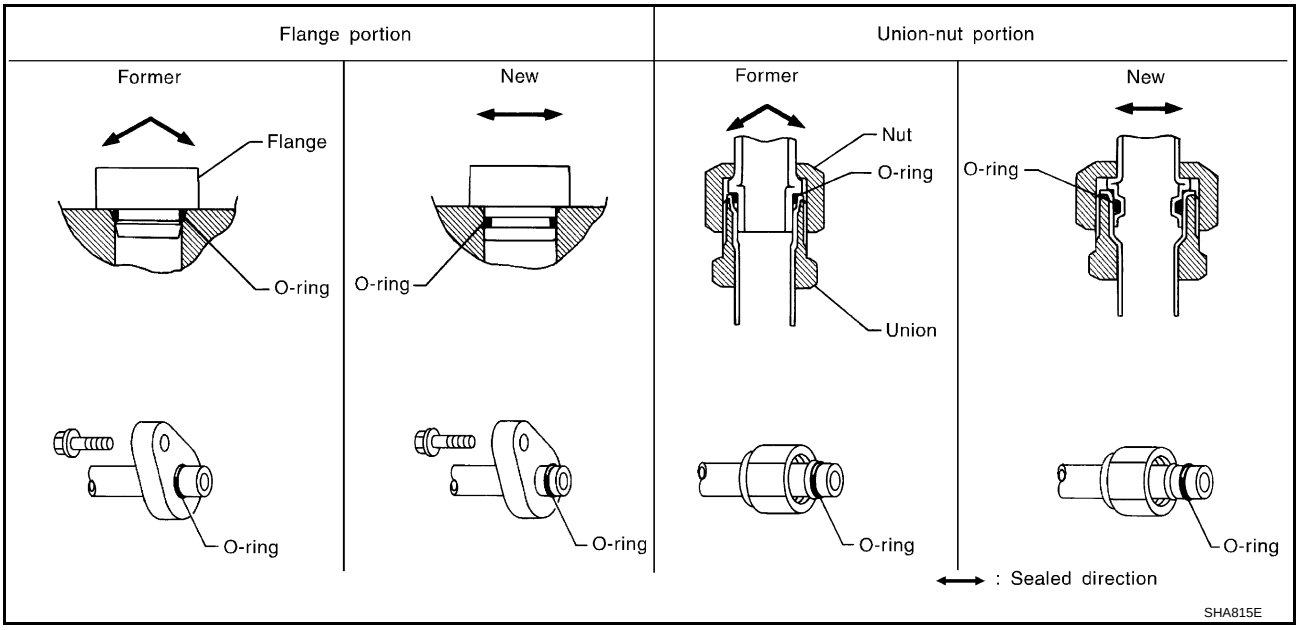
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**

NOTE:
One-touch joint connection is used in points below.

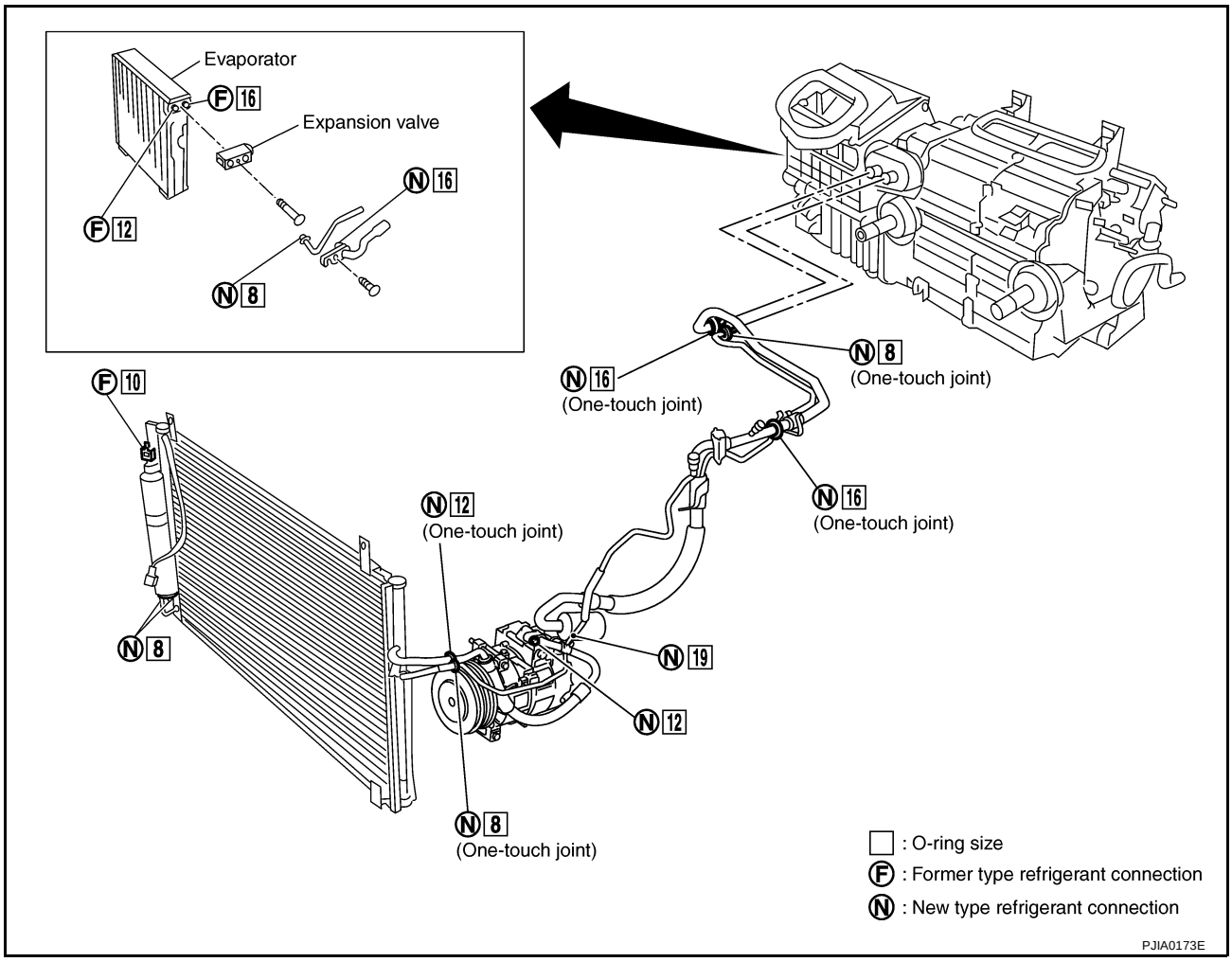
- Low-pressure pipe 2 to low-pressure pipe 1 (O-ring size: 16)
- Low-pressure pipe 2 to low-pressure flexible hose (O-ring size: 16)
- High-pressure flexible hose to condenser (O-ring size: 12)
- High-pressure pipe 1 to high-pressure pipe 2 (O-ring size: 8)
- High-pressure pipe 1 to condenser (O-ring size: 8)

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the possibility of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.
- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.



O-RING AND REFRIGERANT CONNECTION



CAUTION:

The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant may leak at the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low-pressure pipe 2 to low-pressure pipe 1 (One-touch joint)		92473 N8221	2	16
	Low-pressure pipe 2 to low-pressure flexible hose (One-touch joint)		92473 N8221	2	16
	High-pressure pipe 1 to high-pressure pipe 2 (One-touch joint)		92471 N8221	2	8
	Condenser to high-pressure flexible hose (One-touch joint)		92472 N8221	2	12
	Condenser to high-pressure pipe 1 (One-touch joint)		92471 N8221	2	8
	Low-pressure pipe 1 to expansion valve		92473 N8210	1	16
	High-pressure pipe 2 to expansion valve		92471 N8210	1	8
	Compressor to low-pressure flexible hose		92474 N8210	1	19
	Compressor to high-pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser pipe	Inlet	92471 N8210	1	8
		Outlet		1	

Connection type	Piping connection point		Part number	QTY	O-ring size
Former	Refrigerant pressure sensor to liquid tank		J2476 89956	1	10
	Expansion valve to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16

WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

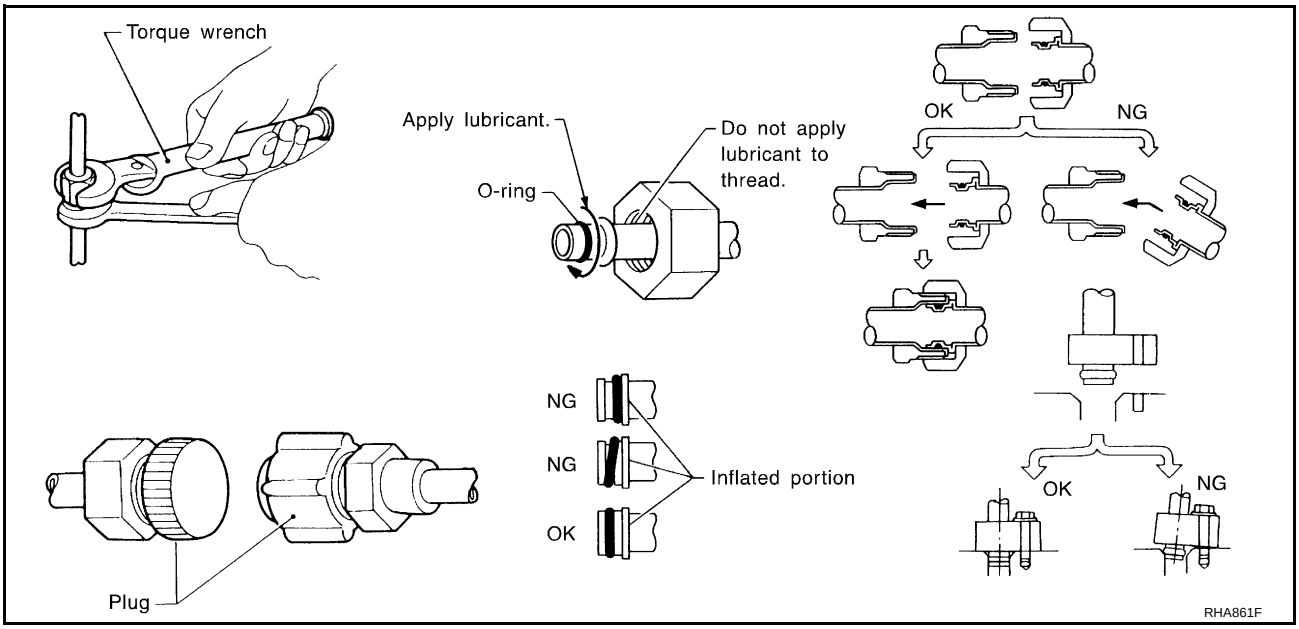
CAUTION:

When replacing or cleaning refrigerant cycle components, observe the following.

- **When the compressor is removed, store it in the same way at it is when mounted on the car. Failure to do so will cause lubricant to enter the low-pressure chamber.**
- **When connecting tubes, always use a torque wrench and a back-up wrench.**
- **After disconnecting tubes, immediately plug all openings to prevent entry of dust and moisture.**
- **When installing an air conditioner in the vehicle, connect the pipes at the final stage of the operation. Never remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Always replace used O-rings.**
- **When connecting tubes, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.**

Name : Nissan A/C system Oil Type S

- **O-ring must be closely attached to the groove of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until a click can be heard, then tighten the nut or bolt by hand. Make sure that the O-ring is installed to tube correctly.**
- **After connecting line, perform leak test and make sure that there is no leakage from connections. When the refrigerant leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.**



Precautions for Servicing Compressor

NJS00007

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same way at it is when mounted on the car.**
- **When replacing or repairing compressor, follow “Maintenance of Lubricant Quantity in Compressor” exactly. Refer to ATC-21, "Maintenance of Lubricant Quantity in Compressor" .**
- **Keep friction surfaces between clutch and pulley clean. If the surface is contaminated with lubricant, wipe it off by using a clean waste cloth moistened with thinner.**
- **After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.**
- **After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.**

Precautions for Service Equipment

NJS00008

RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer’s instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRICAL LEAK DETECTOR

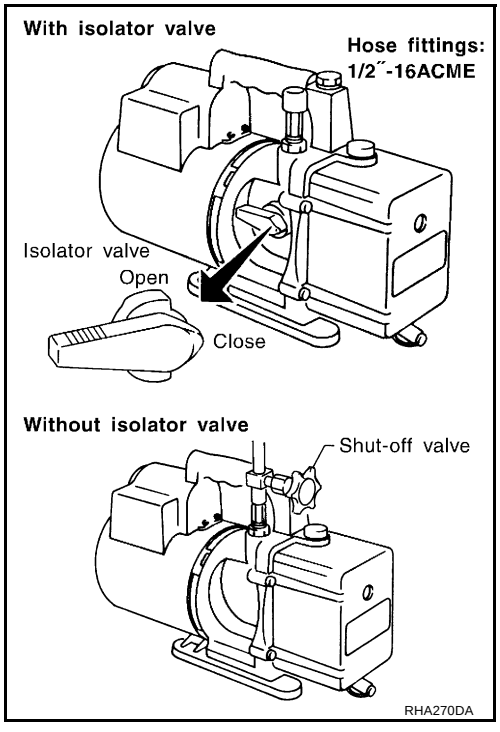
Be certain to follow the manufacturer’s instructions for tester operation and tester maintenance.

VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as follows.

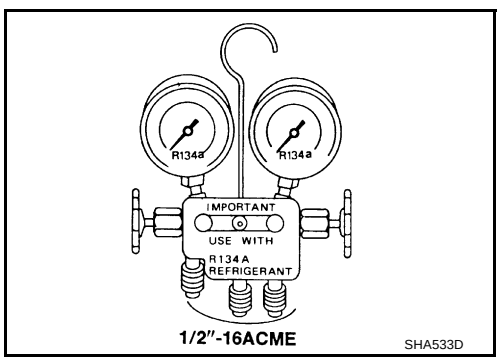
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has an automatic shut-off valve, disconnect the hose from the pump. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under no vacuum condition. Such valves may restrict the pump’s ability to pull a deep vacuum and are not recommended.



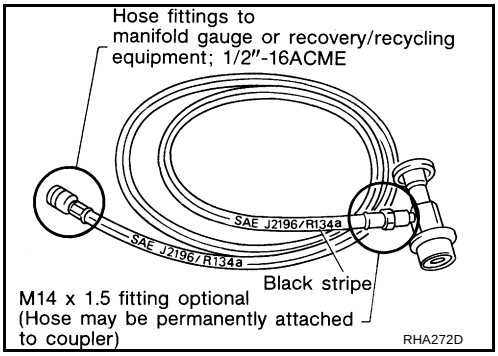
MANIFOLD GAUGE SET

Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.



SERVICE HOSES

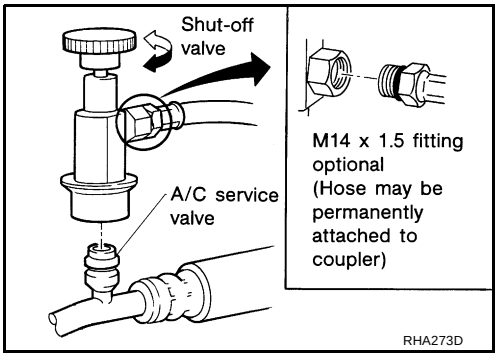
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut -off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

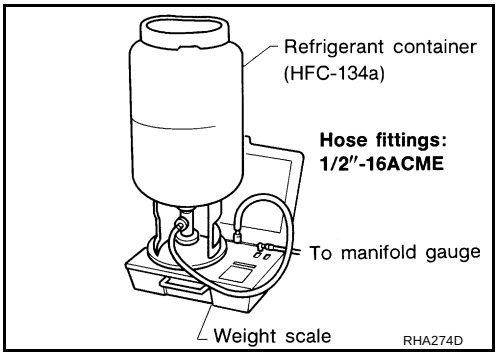
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2″-16 ACME.



CHARGING CYLINDER

Using a charging cylinder is not recommended. Refrigerant may be vented into air from cylinder's top valve when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electrical scale or of quality recycle/recharge equipment.

Precautions for Leak Detection Dye

NJS00009

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leaks.
- For the purpose of safety and customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.
- Never allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- Never spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Never use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Never use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C system, or A/C system damage may result.
- The fluorescent properties of the dye will remain for three years or a little over unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:
Vehicles with factory installed fluorescent dye have a green label.
Vehicles without factory installed fluorescent dye have a blue label.

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have the identification label on the front side of hood.

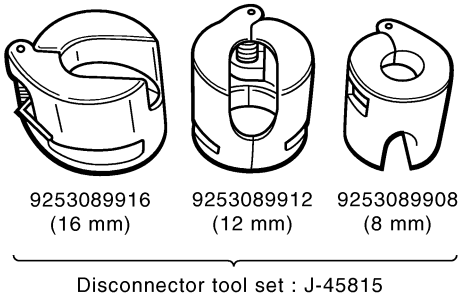
PREPARATION

PFP:00002

Special Service Tools

NJS0000B

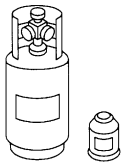
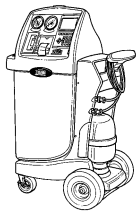
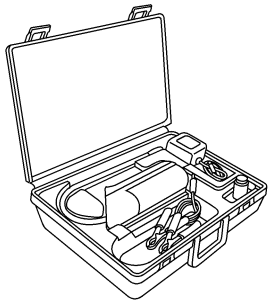
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

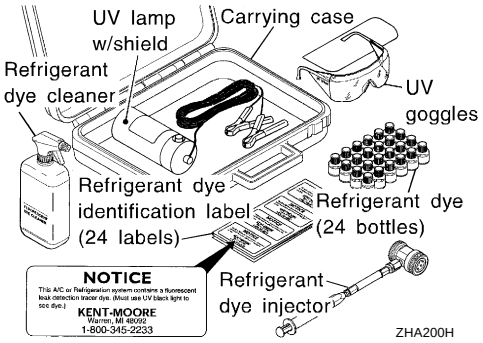
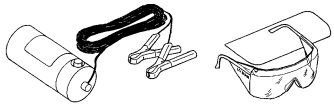
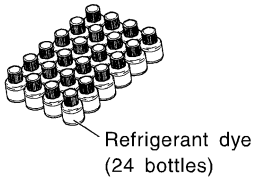
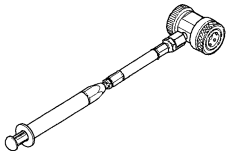
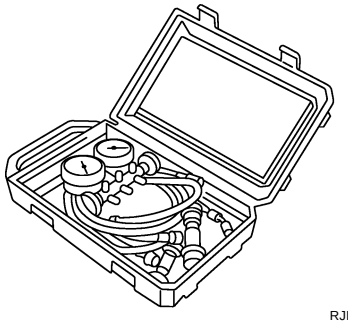
Tool number (Kent-Moore No.) Tool name		Description
9253089908 (for high-pressure pipe 1) (-) 9253089912 (for high-pressure flexible hose) (-) 9253089916 (for low-pressure pipe 1 and low-pressure flexible hose) (-) Disconnector tool set (J-45815)		Disconnect one-touch joint connection

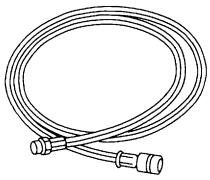
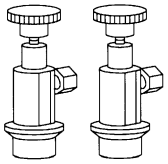
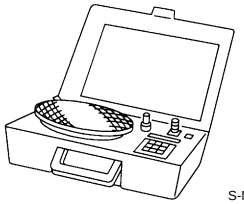
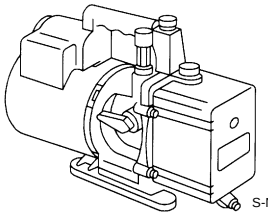
HFC-134a (R-134a) Service Tools and Equipment

NJS0000C

Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
Never use adapters that convert one size fitting to another: refrigerant/lubricant contamination occurs and compressor malfunction may result.

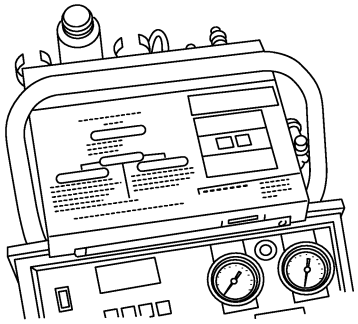
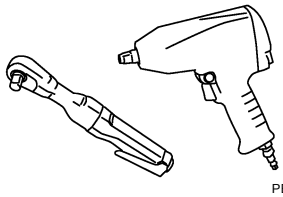
Tool number (Kent-Moore No.) Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2″-16 ACME
Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz)
(ACR2005-NI) ACR5 A/C Service Center	 WJIA0293E	Function: Refrigerant recovery, recycling and recharging
(J-41995) Electrical A/C leak detector	 AHA281A	Power supply: DC 12 V (Battery terminal)

Tool number (Kent-Moore No.) Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner	 ZHA200H	Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles	 SHA438F	Power supply: DC 12 V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)	 SHA439F	Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle	 SHA440F	For injecting 1/4 ounce of fluorescent leak detection dye into A/C system
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: ● The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size ● 1/2″-16 ACME

Tool number (Kent-Moore No.) Tool name		Description
Service hoses ● High-pressure side hose (J-39501-72) ● Low-pressure side hose (J-39502-72) ● Utility hose (J-39476-72)	 S-NT201	Hose color: ● Low hose: Blue with black stripe ● High hose: Red with black stripe ● Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: ● 1/2″-16 ACME
Service couplers ● High-pressure side coupler (J-39500-20) ● Low-pressure side coupler (J-39500-24)	 S-NT202	Hose fitting to service hose: M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale	 S-NT200	For measuring of refrigerant Fitting size: Thread size 1/2″-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)	 S-NT203	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size ● 1/2″-16 ACME

Commercial Service Tools

NJS0000D

Tool name		Description
Refrigerant identifier equipment	 RJIA0197E	Checking for refrigerant purity and system contamination
Power tool	 PBIC0190E	For loosening bolts and nuts

REFRIGERATION SYSTEM

PFP:KA990

Refrigerant Cycle

NJS0000E

REFRIGERANT FLOW

The refrigerant flows from the compressor, through the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation in the evaporator is controlled by an externally equalized expansion valve, located inside the evaporator case.

FREEZE PROTECTION

To prevent evaporator frozen up, the evaporator air temperature is monitored, and the voltage signal to the unified meter and A/C amp. will make the A/C relay go OFF and stop the compressor.

Refrigerant System Protection

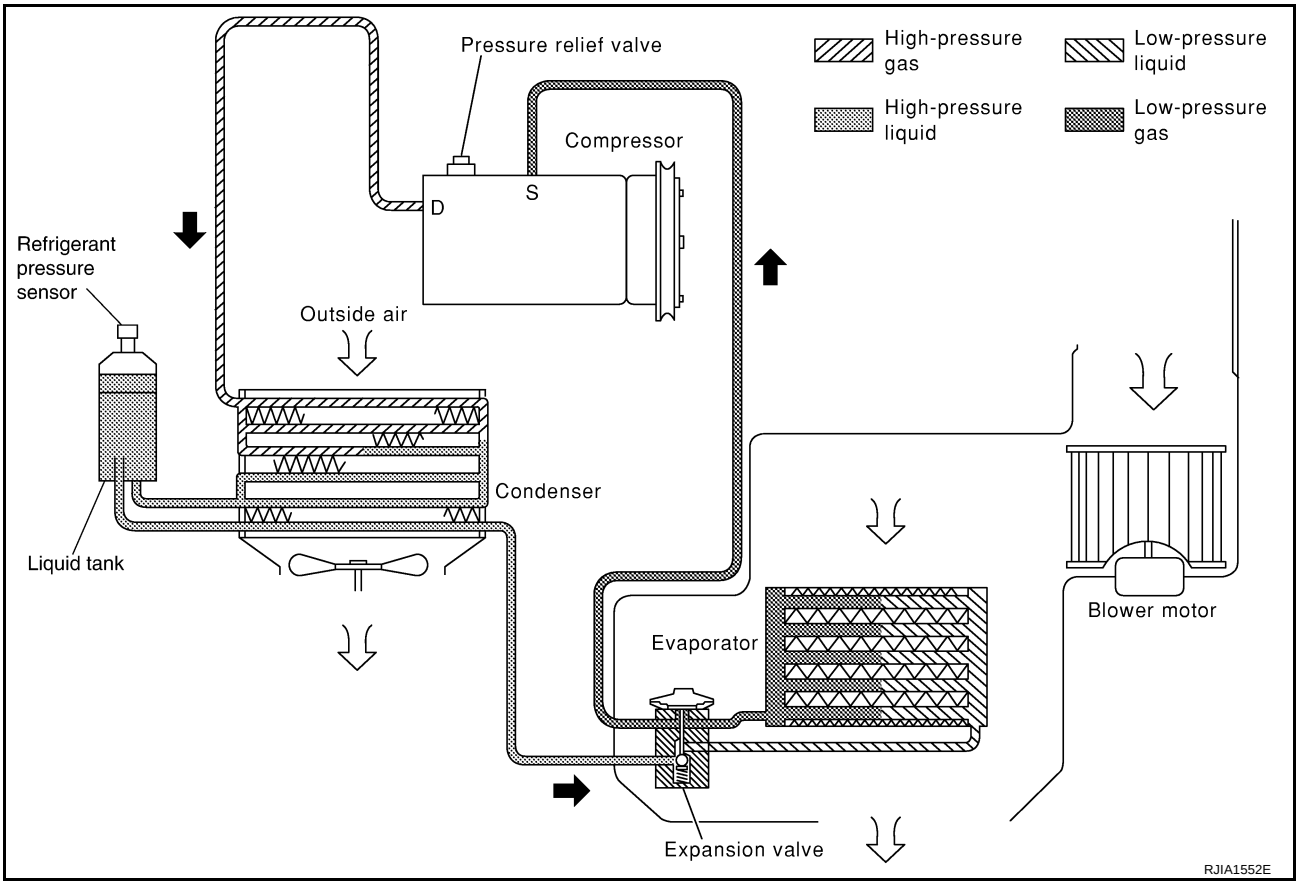
NJS0000F

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the liquid tank. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm^2 , 398 psi), or below about 134 kPa (1.4 kg/cm^2 , 19 psi).

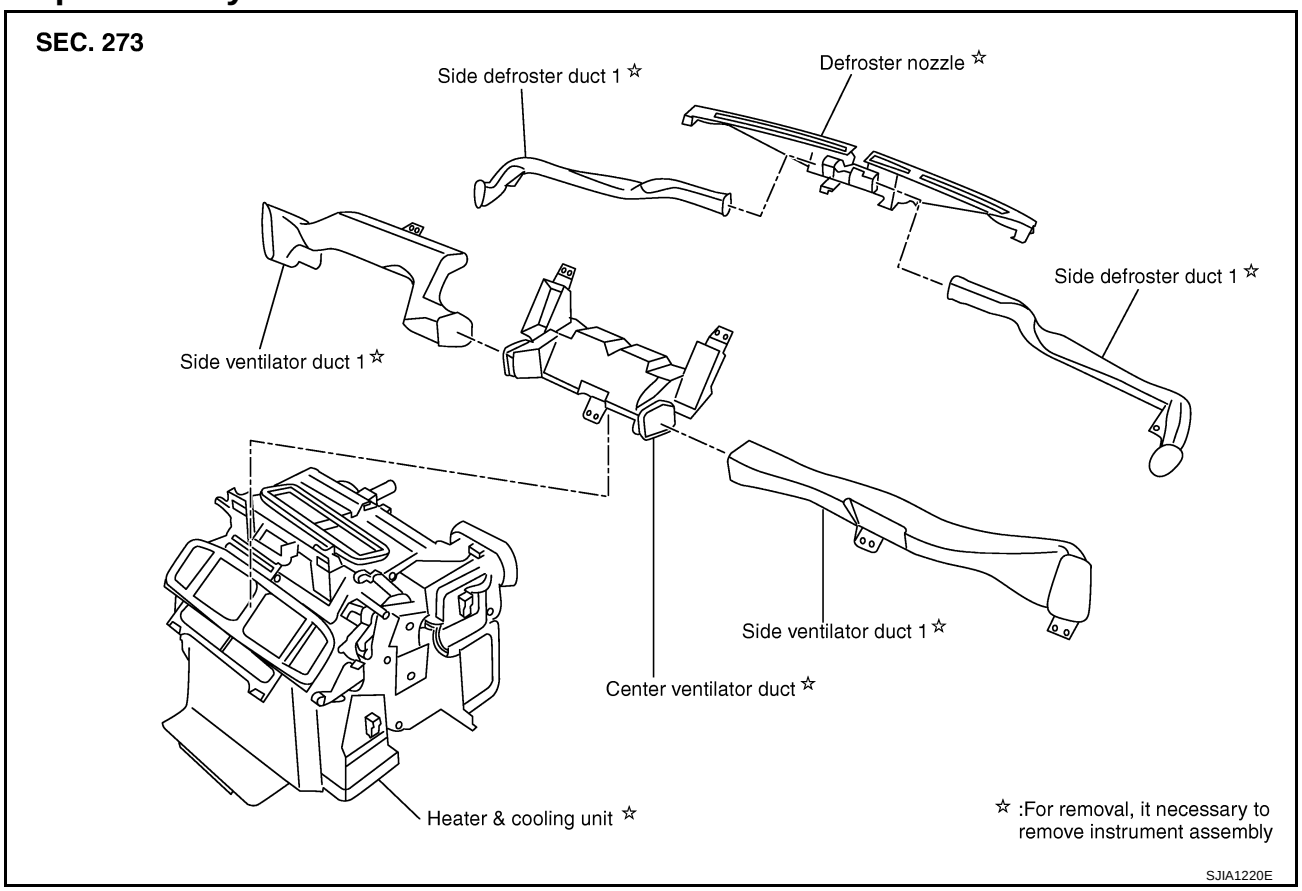
PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3,600 kPa (36.7 kg/cm^2 , 522 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



Component Layout

NJS0000H



LUBRICANT

PFP:KLG00

Maintenance of Lubricant Quantity in Compressor

NJS0000I

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.
If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

Name : Nissan A/C System Oil Type S

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1. CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:
If excessive lubricant leakage is noted, never perform the lubricant return operation.

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

1. Start the engine, and set to the following conditions:
   - Engine speed: Idling to 1,200 rpm
   - A/C switch: ON
   - Blower speed: Max. position
   - Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
   - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop the engine.

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> GO TO ATC-23, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT" .
NO >> GO TO ATC-22, "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR" .

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.
Amount of lubricant to be added:

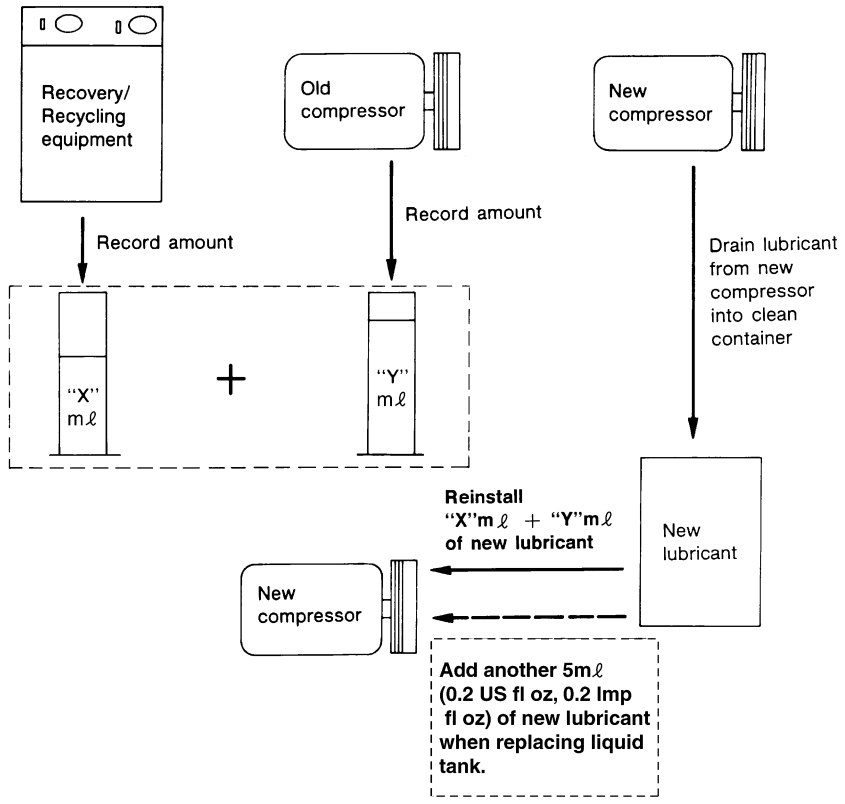
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*1: If the refrigerant leak is small, no addition of lubricant is needed.

LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

1. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-5, "CONTAMINATED REFRIGERANT" .
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-5, "CONTAMINATED REFRIGERANT" .
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.
   Do not add this 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement



RJIA3578E

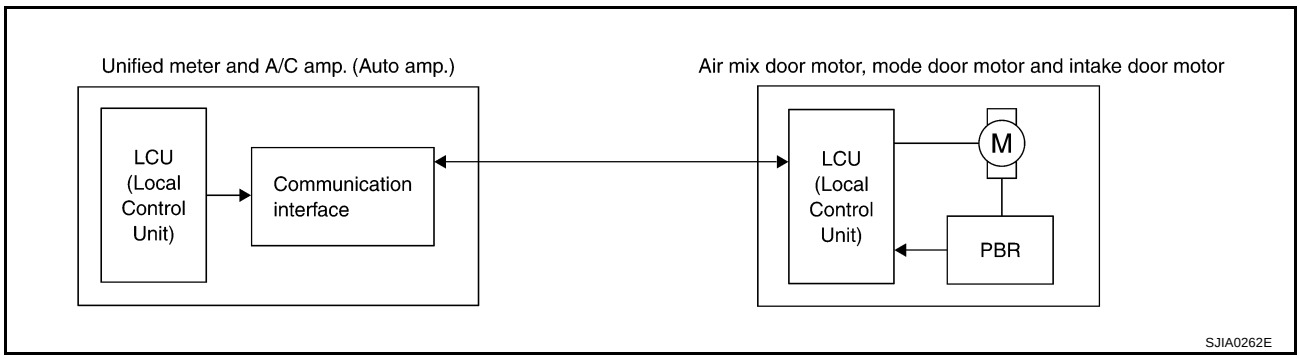
AIR CONDITIONER CONTROL

PFP:27500

Description of Air Conditioner LAN Control System

NJS0000J

The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motor and intake door motor.
A configuration of these components is shown in the figure below.

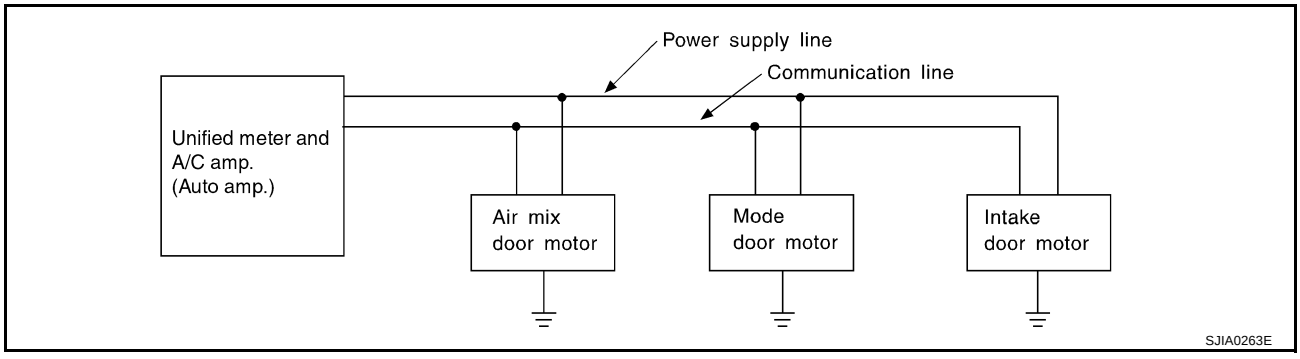


System Construction

NJS0000K

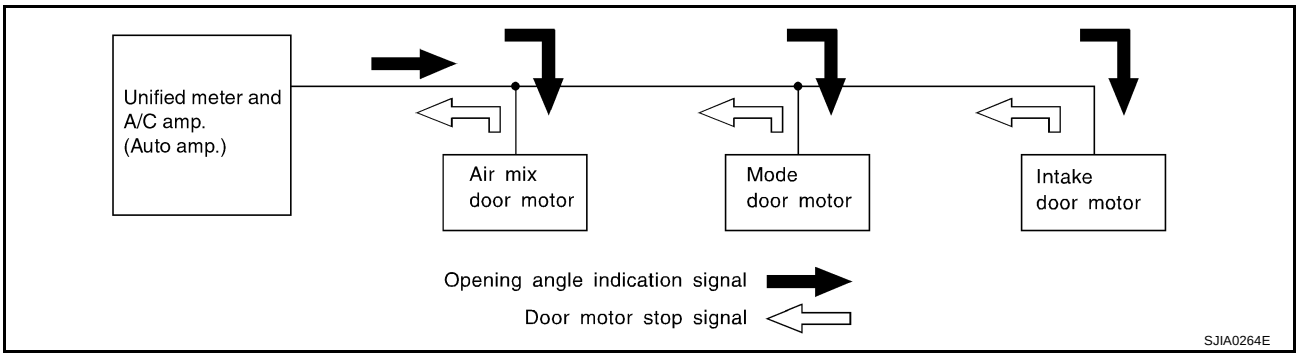
A small network is constructed between unified meter and A/C amp., air mix door motor, mode door motor and intake door motor. The unified meter and A/C amp. and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of each door motor.
Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the unified meter and A/C amp. and each door motor.
The following functions are contained in LCUs built into the air mix door motor, the mode door motor and the intake door motor.

- Address
- Motor opening angle signal
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



OPERATION

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends mode door, air mix door and intake door opening angle data to the mode door motor LCU, air mix door motor LCU and intake door motor LCU.
The mode door motor, air mix door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors is compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the unified meter and A/C amp.



TRANSMISSION DATA AND TRANSMISSION ORDER

Unified meter and A/C amp. data is transmitted consecutively to each of the door motors following the form shown in figure below.

Start:

Initial compulsory signal sent to each of the door motors.

Address:

Data sent from the unified meter and A/C amp. are selected according to data-based decisions made by the air mix door motor, mode door motor and intake door motor.
If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data have no error, door control begins.
If an error exists, the received data are rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.

Opening Angle:

Data that shows the indicated door opening angle of each door motor.

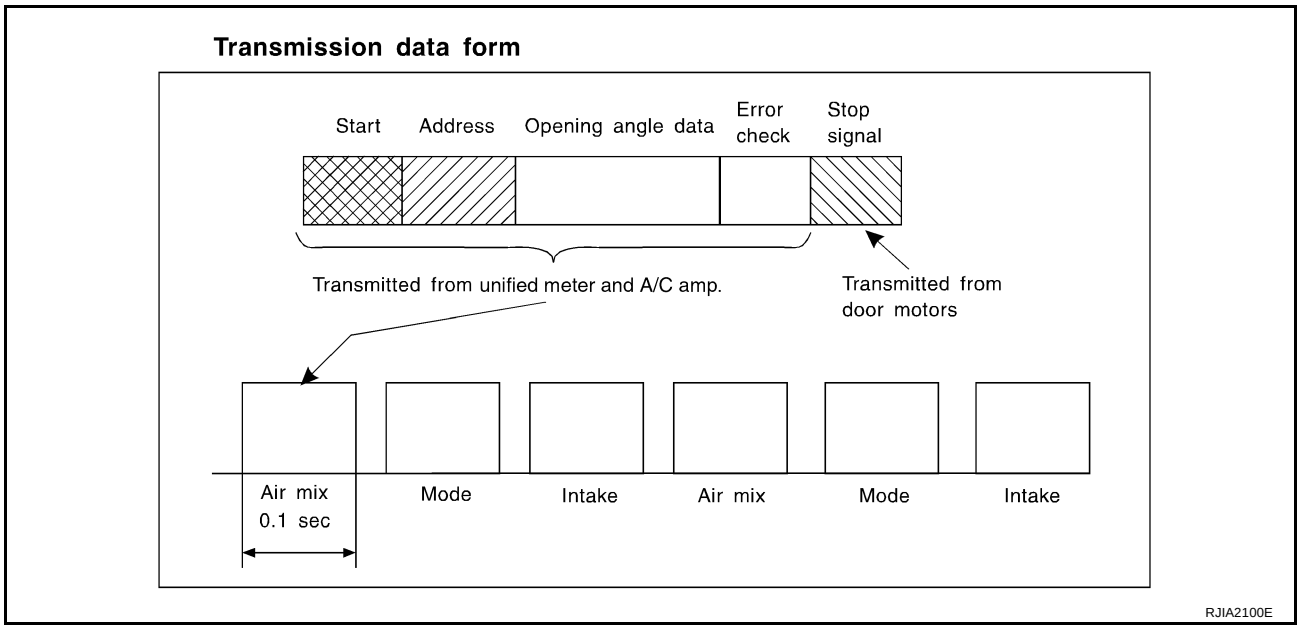
Error Check:

In this procedure, transmitted and received data are checked for errors. Error data are then compiled. The error check prevents corrupted data from being used by the air mix door motor, the mode door motor and the intake door motor. Error data can be related to the following symptoms.

- Malfunction of electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

Stop Signal:

At the end of each transmission, a stop operation, in-operation, or internal malfunction message is delivered to the unified meter and A/C amp. This completes one data transmission and control cycle.



AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

The air mix door is automatically controlled so that in-vehicle temperature is maintained at a predetermined value by the temperature setting, ambient temperature, in-vehicle temperature and amount of sunload.

FAN SPEED CONTROL

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
With FAN control dial set to AUTO, the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

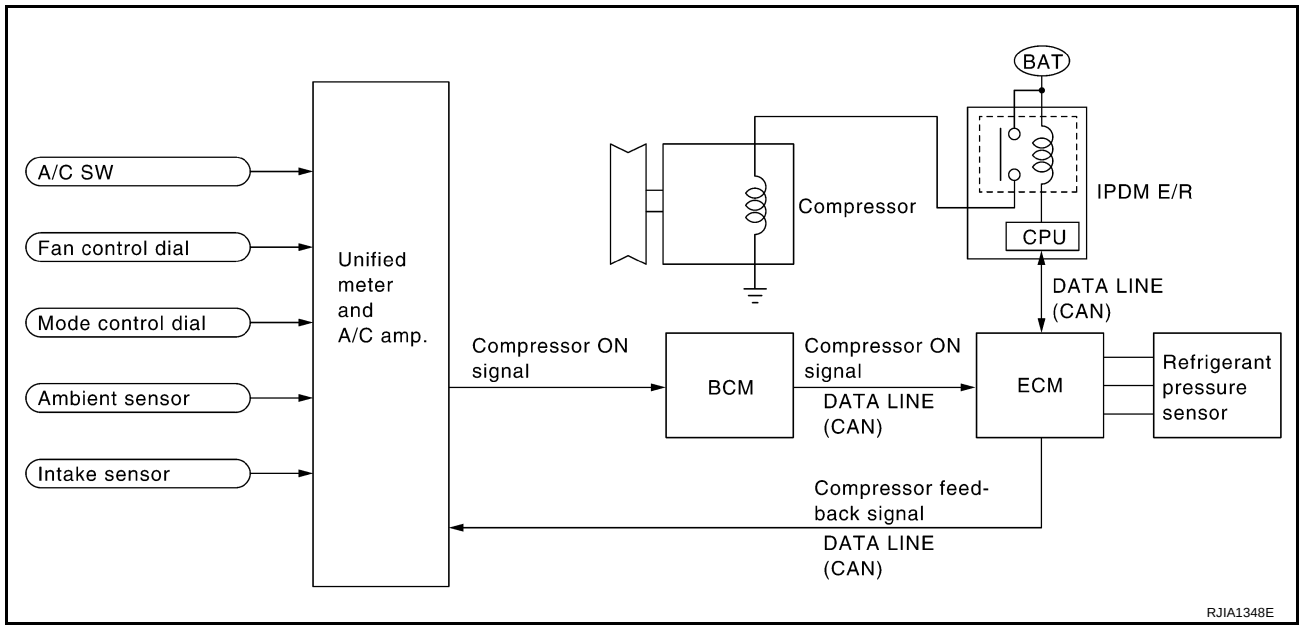
INTAKE DOOR CONTROL

The intake doors are automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON/OFF operation of the compressor.

MODE DOOR CONTROL

The mode door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

MAGNET CLUTCH CONTROL



When A/C switch is pressed, turn fan control dial to ON or set mode control dial to D/F, D/F2 or DEF position, unified meter and A/C amp. transmits compressor ON signal to BCM.
BCM sends compressor ON signal to ECM, via CAN communication.
ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant-pressure sensor signal, throttle angle, etc.). If it judges compressor can be turned ON, it sends compressor ON signal to IPDM E/R, via CAN communication.
Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.
When sending compressor ON signal to IPDM E/R via CAN communication line, ECM simultaneously sends compressor feedback signal to unified meter and A/C amp. via CAN communication line.
Unified meter and A/C amp., then, uses input compressor feedback signal to control air inlet.

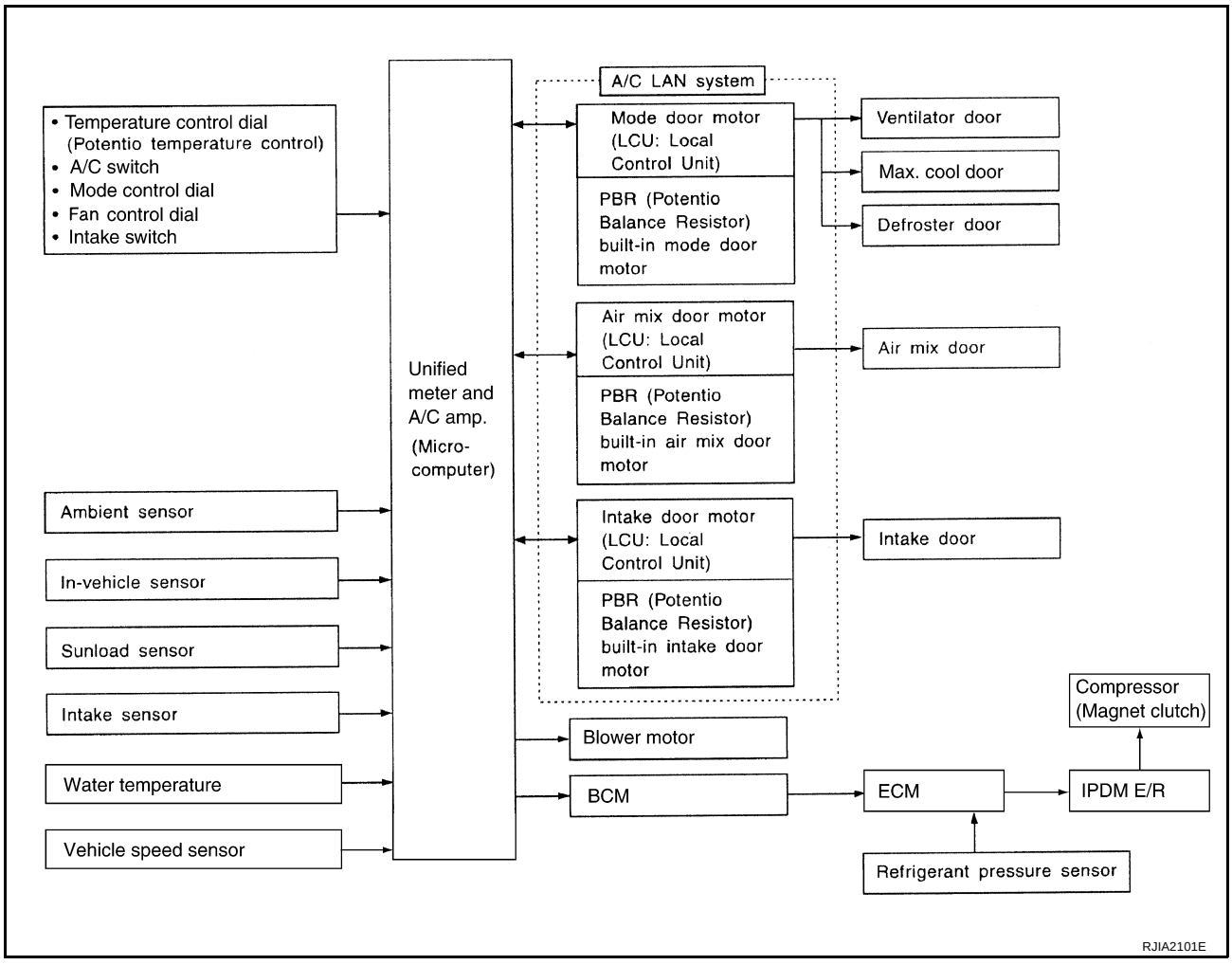
SELF-DIAGNOSIS SYSTEM

The self-diagnosis system is built into the unified meter and A/C amp. to quickly locate the cause of malfunctions.

Description of Control System

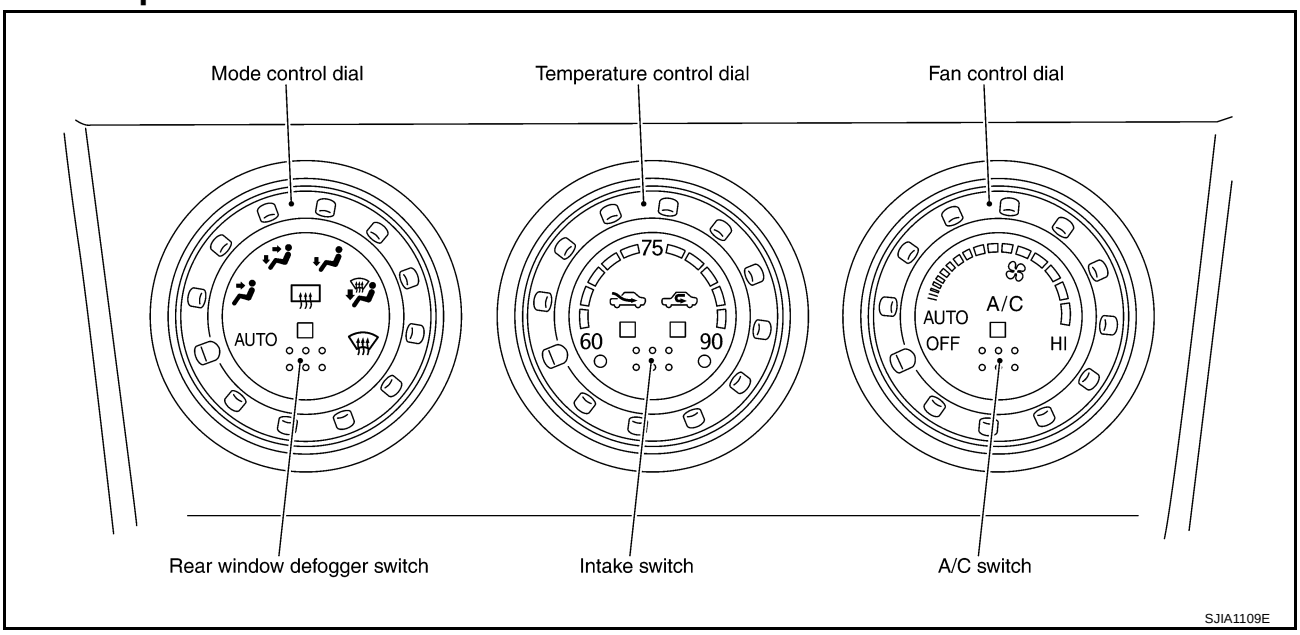
NJS0000L

The control system consists of input sensors, switches, unified meter and A/C amp. (microcomputer) and outputs. The relationship of these components is shown in the figure below:



Control Operation

NJS0000M



MODE CONTROL DIAL

The air discharge outlets are controlled with this dial.
Mode doors are set to the defrost position with this dial. Also, intake doors are set to the outside air position.
When shifting mode control dial to D/F, D/F2 or DEF position under the following conditions, compressor is turned ON. (A/C LED ON)

- FAN: ON
- A/C: OFF

TEMPERATURE CONTROL DIAL (POTENTIO TEMPERATURE CONTROL)

The set temperature is increased or decreased with this dial.

FAN CONTROL DIAL

The blower speed is automatically or manually controlled with this dial. Twenty-five speeds are available for manual control.
Shifting fan control dial to AUTO, compressor is turned ON automatically.

REAR WINDOW DEFOGGER SWITCH

When illumination is ON, rear window is defogged.

INTAKE SWITCH

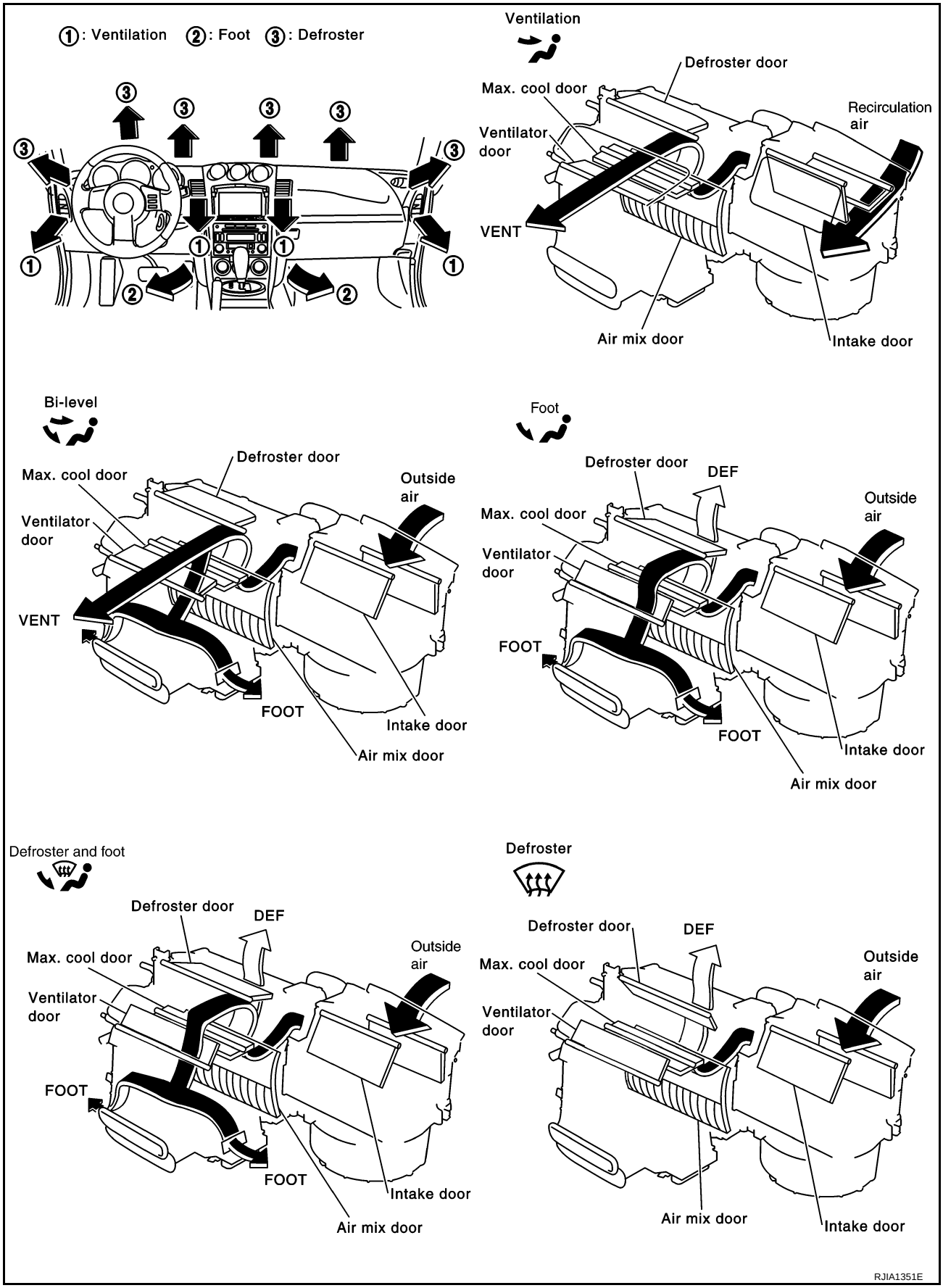
- When intake switch is ON, REC LED turns ON, and air inlet is fixed to REC.
- When press intake switch again, FRE LED turns ON, and air inlet is fixed to FRE.
- When intake switch is pressed for approximately 1.5 seconds or longer, REC and FRE LEDs blink twice. Then, automatic control mode is entered. Inlet status is displayed even during automatic control.
- When FRE LED is turned ON, shifting mode control dial to D/F, D/F2 or DEF, or when compressor is turned from ON to OFF, intake switch is automatically turned OFF (fixed to FRE mode). REC mode can be re-entered by pressing intake switch again, and then compressor is turned ON. (Except D/F, D/F2 or DEF position)

A/C SWITCH

Compressor is ON or OFF with this switch.
(Pressing the A/C switch when the fan control dial is ON, will turn OFF the A/C switch and compressor.)

Discharge Air Flow

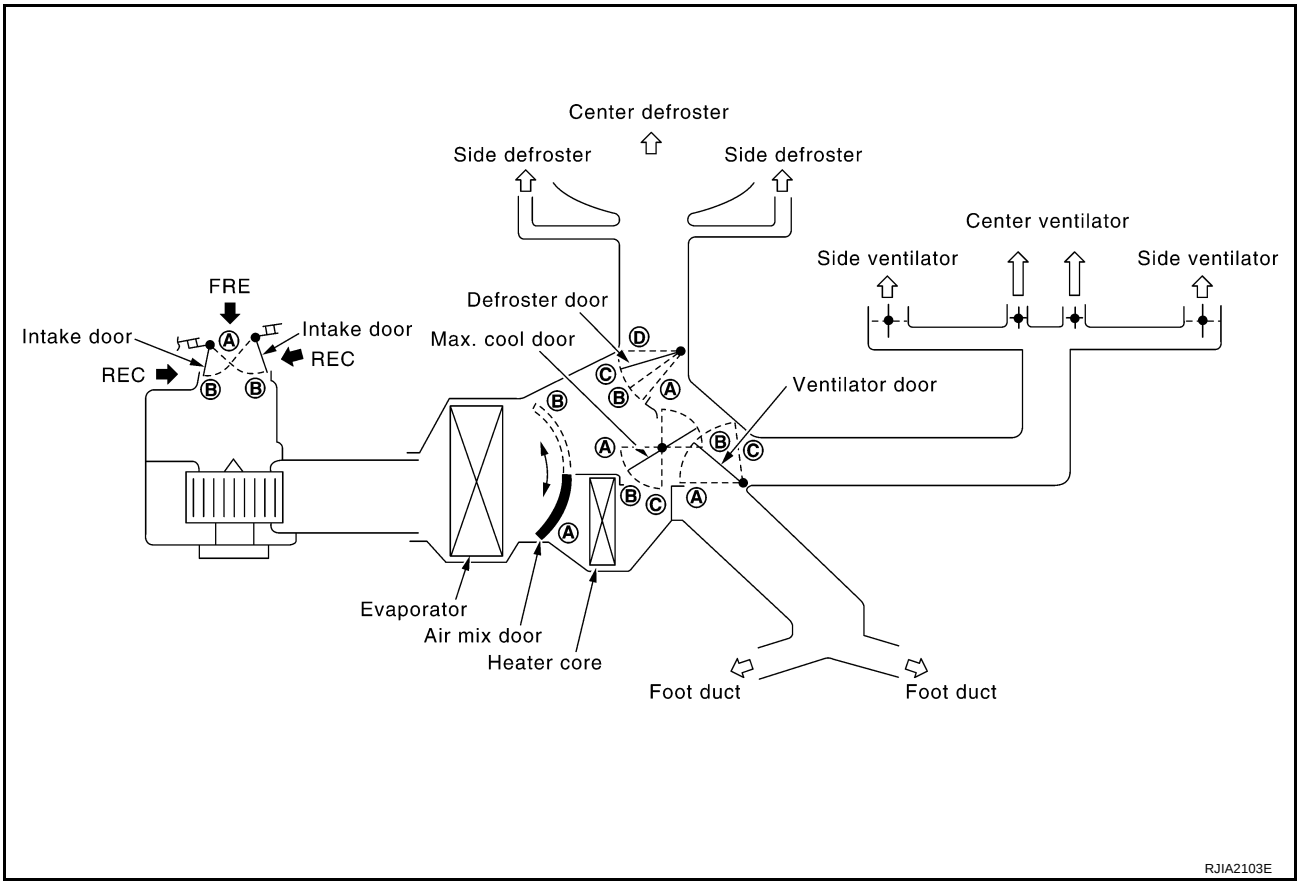
NJS0000N



System Description

NJS0000O

SWITCHES AND THEIR CONTROL FUNCTION



Door \ Position or switch	MODE control dial						Intake SW		Temperature control dial		
	VENT	B/L	FOOT	D/F	DEF	AUTO					
						—			18°C (60°F)	⇔	32°C (90°F)
Ventilator door	Ⓐ	Ⓑ	Ⓒ	Ⓒ	Ⓒ	AUTO	—		—		
Max. cool door	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓒ		—		—		
Defroster door	Ⓓ	Ⓓ	Ⓓ or Ⓒ *1	Ⓑ	Ⓐ		—		—		
Intake door	—			Ⓑ	Ⓑ	—	Ⓐ *2	Ⓑ *2	—		
Air mix door	—			—	—	—	—		Ⓐ	AUTO	Ⓑ

*1: This position is selected only when the mode door is automatically controlled.
*2: Inlet status is displayed during automatic control.

SJIA1884E

CAN Communication System Description

NJS0000P

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

CONSULT-III Function (BCM)

NJS0000Q

CONSULT-III can display each diagnosis item using the diagnosis test modes shown following.

System part	Check item, diagnosis mode	Description
BCM	Data monitor	Displays BCM input data in real time.

DATA MONITOR

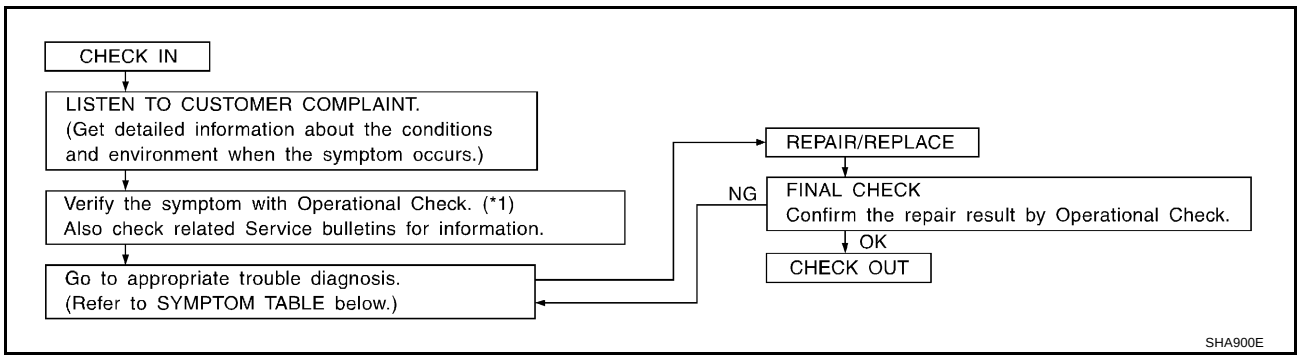
Display Item List

Monitor Item	Condition		Value/Status
IGNITION SW	Ignition switch OFF → ON		OFF → ON
HEATER FAN SW	Ignition switch ON	Blower fan motor switch ON	ON
		Blower fan motor switch OFF	OFF
AIR COND SIG	Ignition switch ON	Compressor ON	ON
		Compressor ON	OFF
AC PRESS SEN	● Engine is running ● Warm-up condition ● Both A/C switch and blower fan motor switch: ON (Compressor operates)		1.0 - 4.0 V

How to Perform Trouble Diagnosis for Quick and Accurate Repair

NJS0000R

WORK FLOW



*1 ATC-53, "Operational Check"

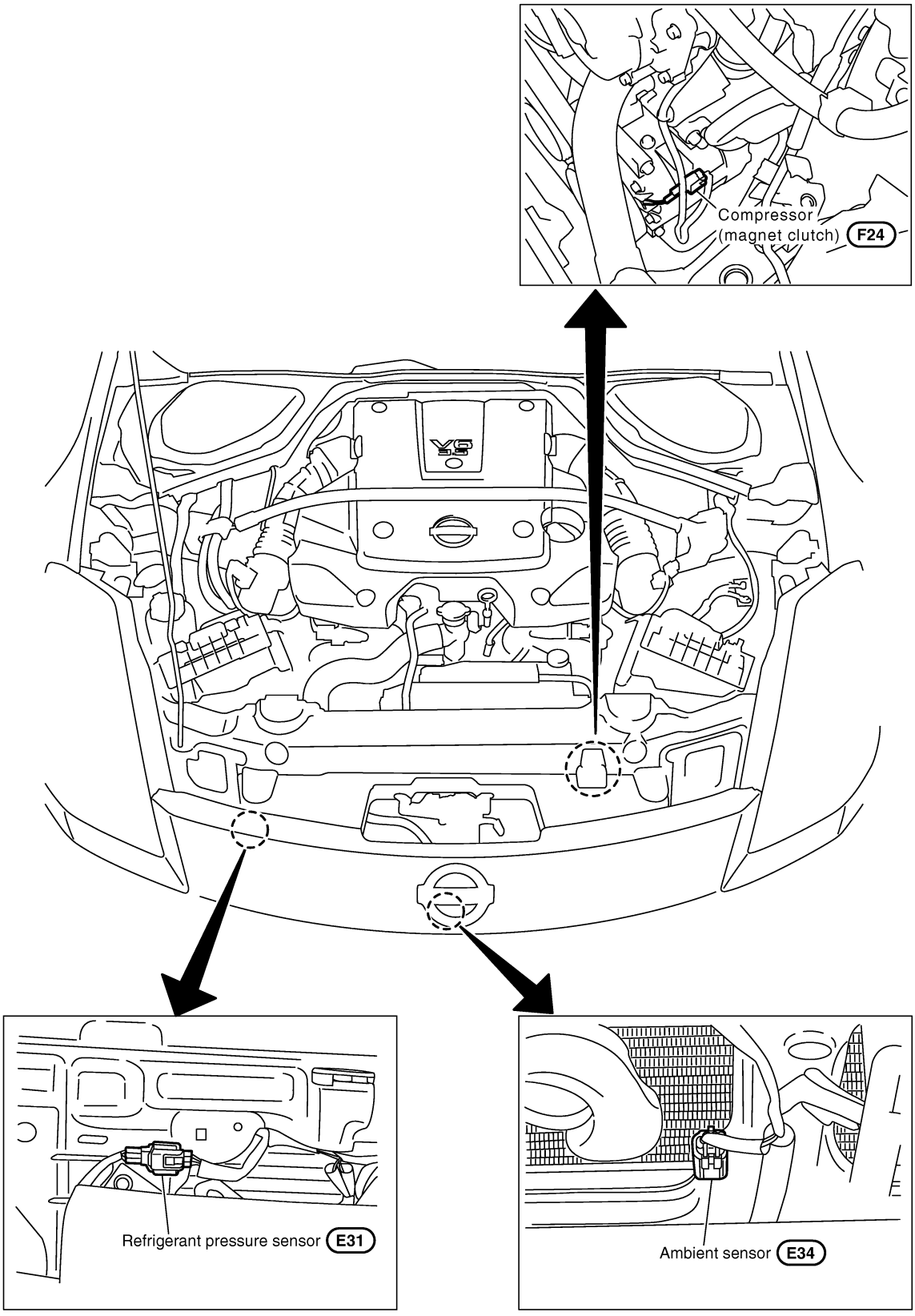
SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C system.	ATC-54, "Power Supply and Ground Circuit for Auto Amp."
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	ATC-60, "Mode Door Motor Circuit"
Mode door motor does not operate normally.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	ATC-63, "Air Mix Door Motor Circuit"
Air mix door motor does not operate normally.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	ATC-66, "Intake Door Motor Circuit"
Intake door motor does not operate normally.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	ATC-69, "Blower Motor Circuit"
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	ATC-74, "Magnet Clutch Circuit"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	ATC-81, "Insufficient Cooling"
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	ATC-89, "Insufficient Heating"
Noise	Go to Trouble Diagnosis Procedure for Noise.	ATC-90, "Noise"
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	ATC-91, "Self-diagnosis"

Component Parts and Harness Connector Location

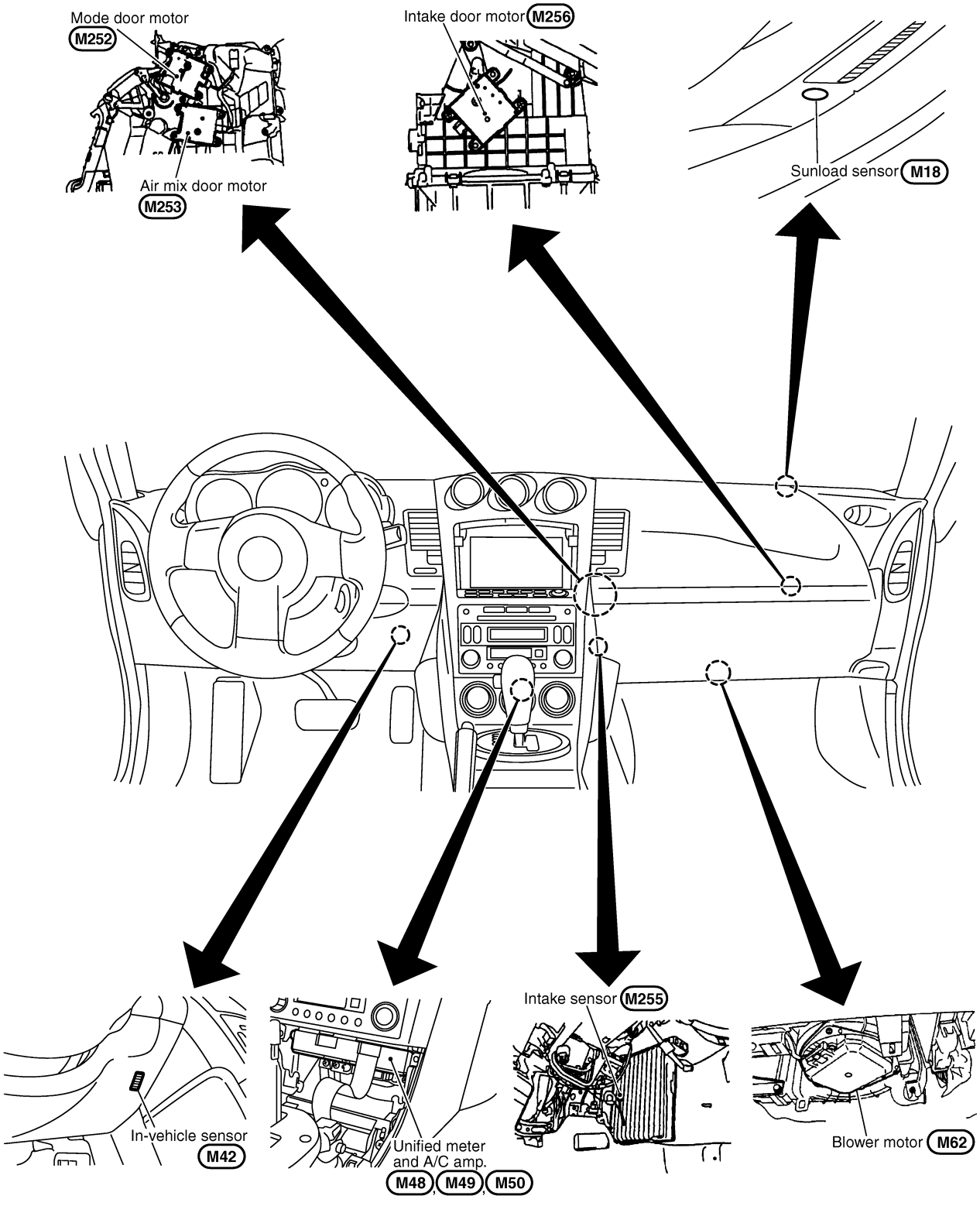
NJS0000S

ENGINE COMPARTMENT



PJIA0175E

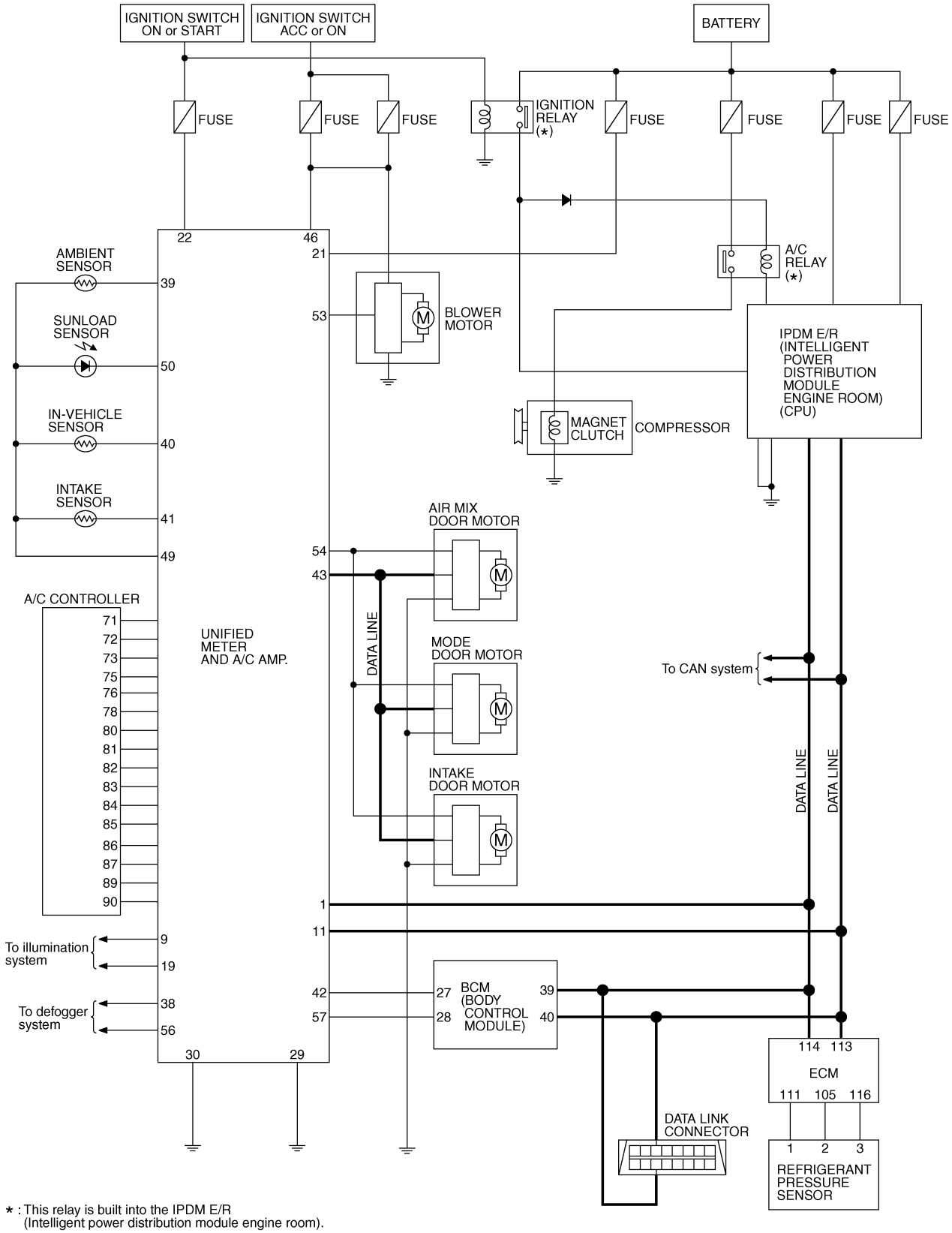
PASSENGER COMPARTMENT



PJIA0167E

Schematic

NJS0000T

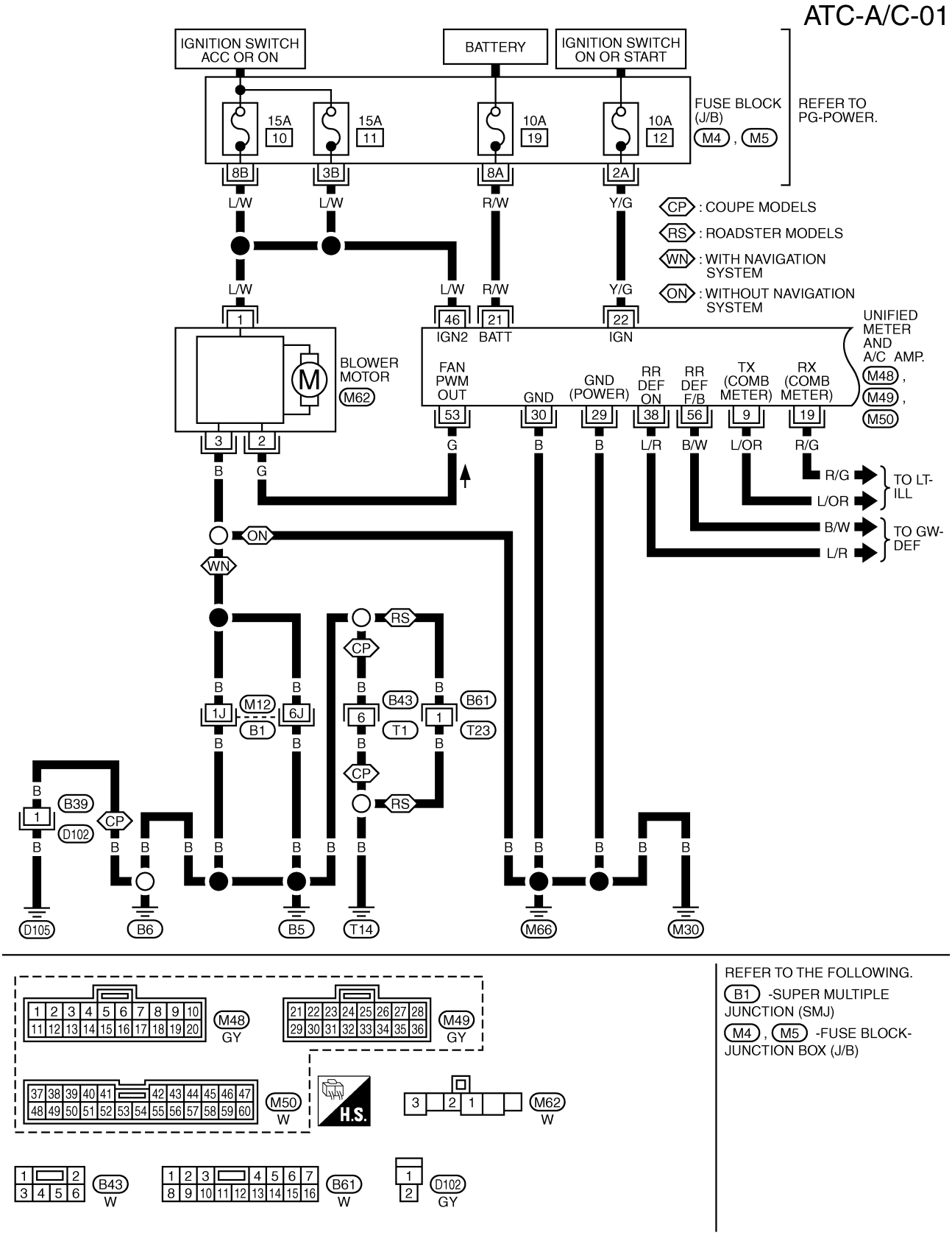


* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

TJWT0259E

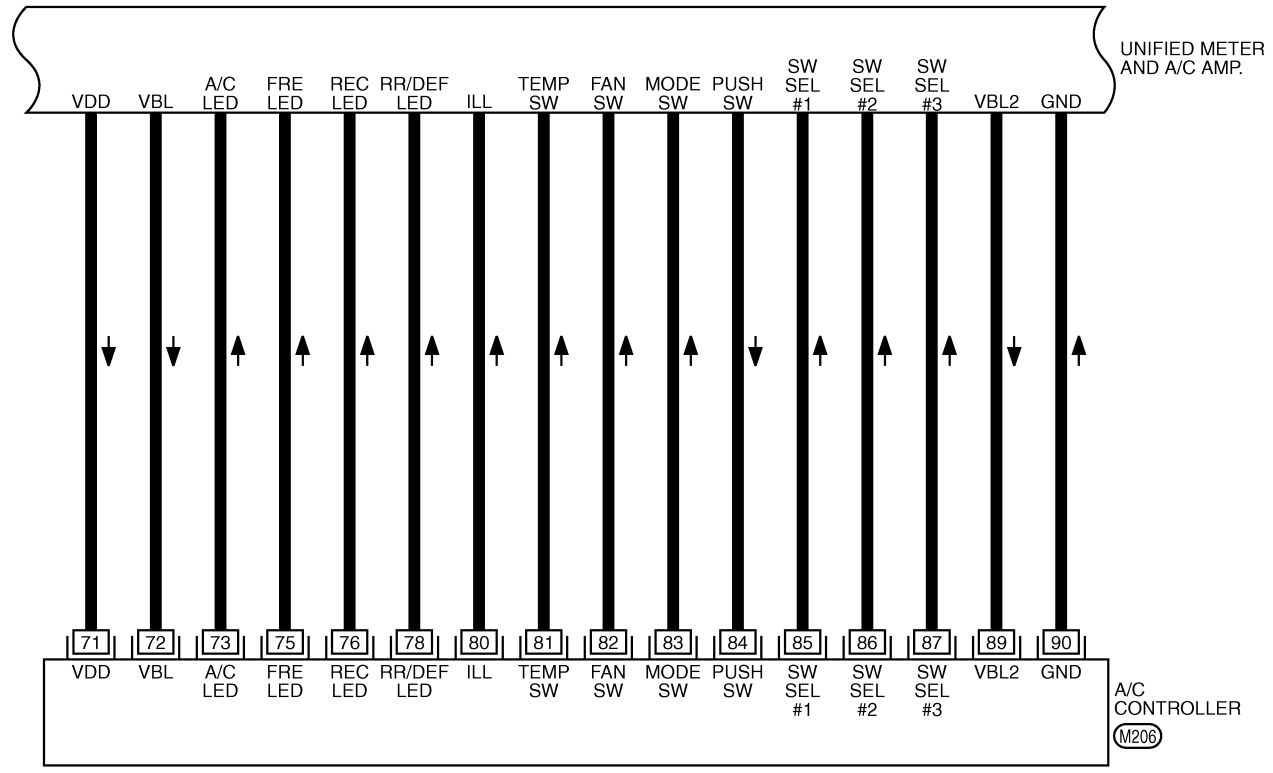
Wiring Diagram — A/C —

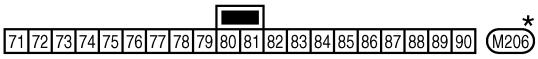
NJS0000U



TJWT0092E

ATC-A/C-02

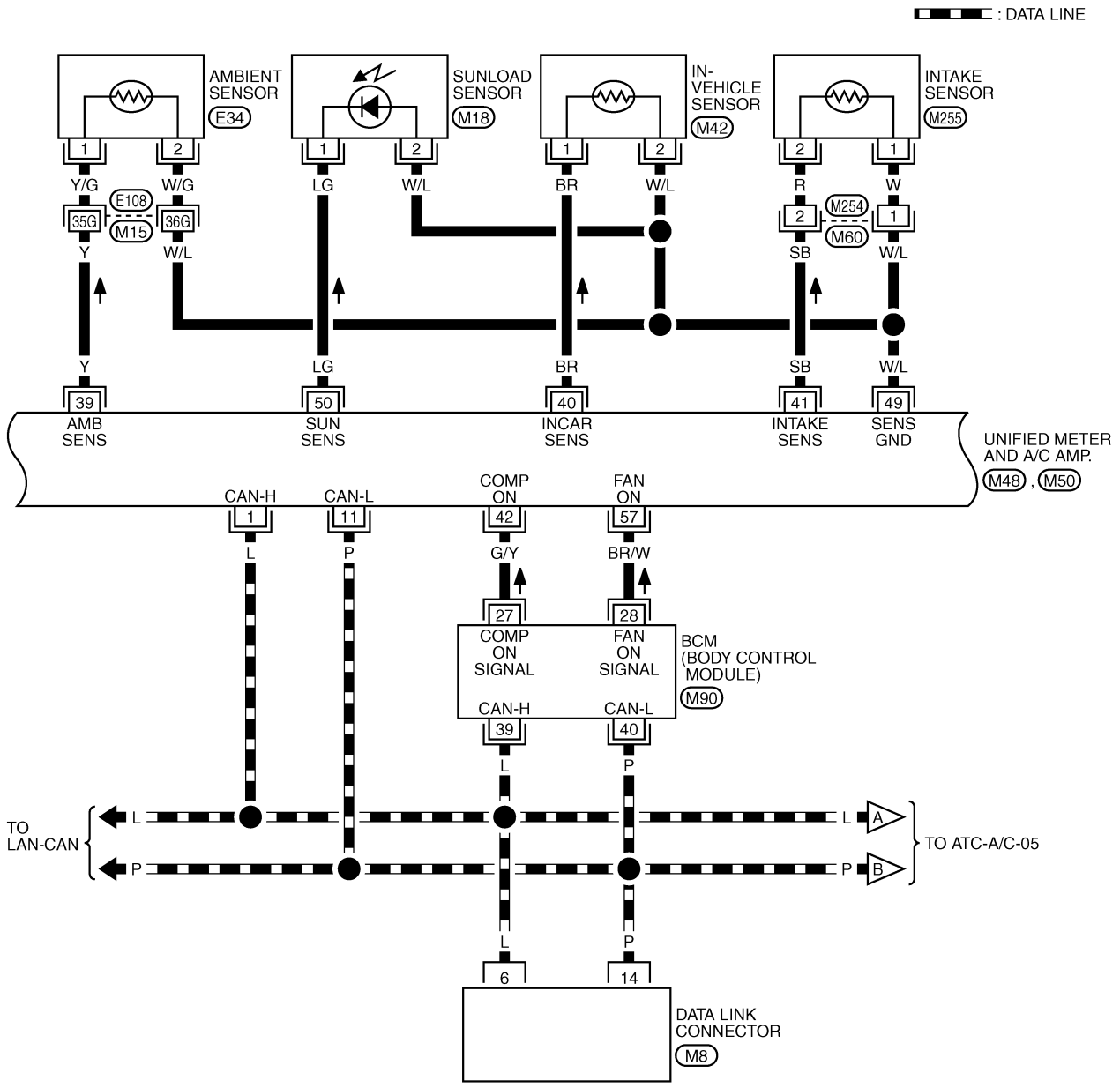


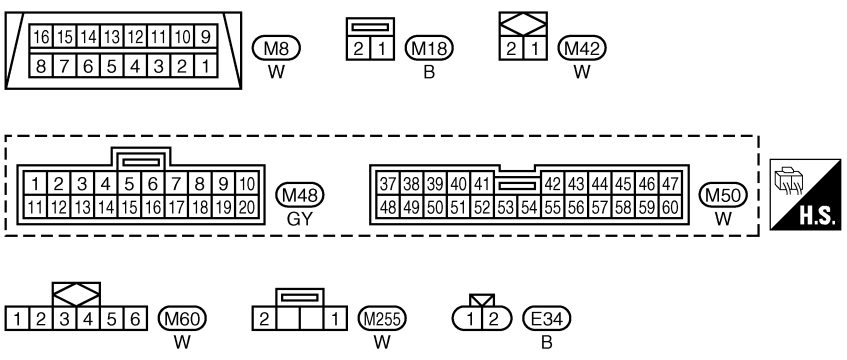


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TJWT0169E

ATC-A/C-03





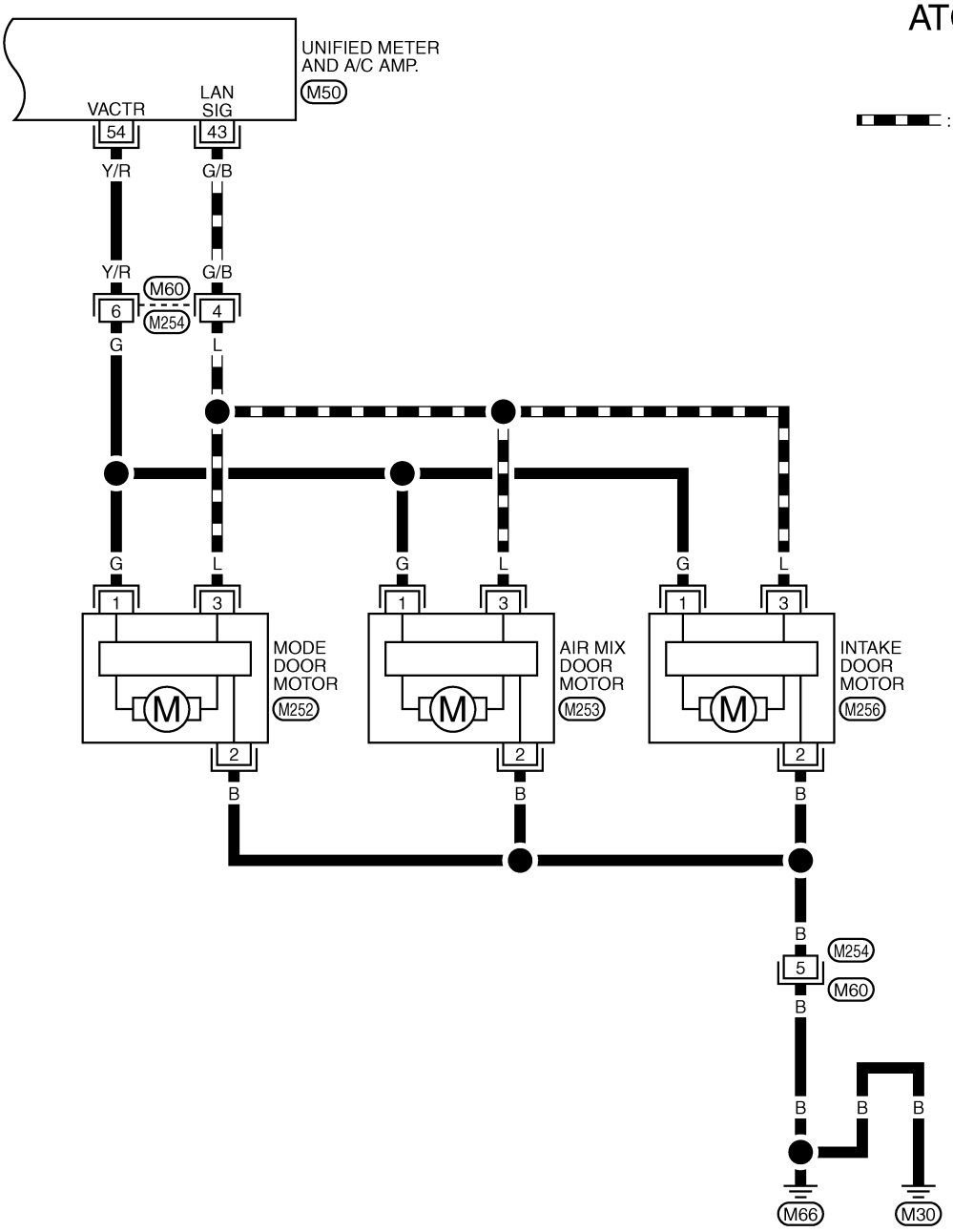
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M90 -ELECTRICAL UNITS

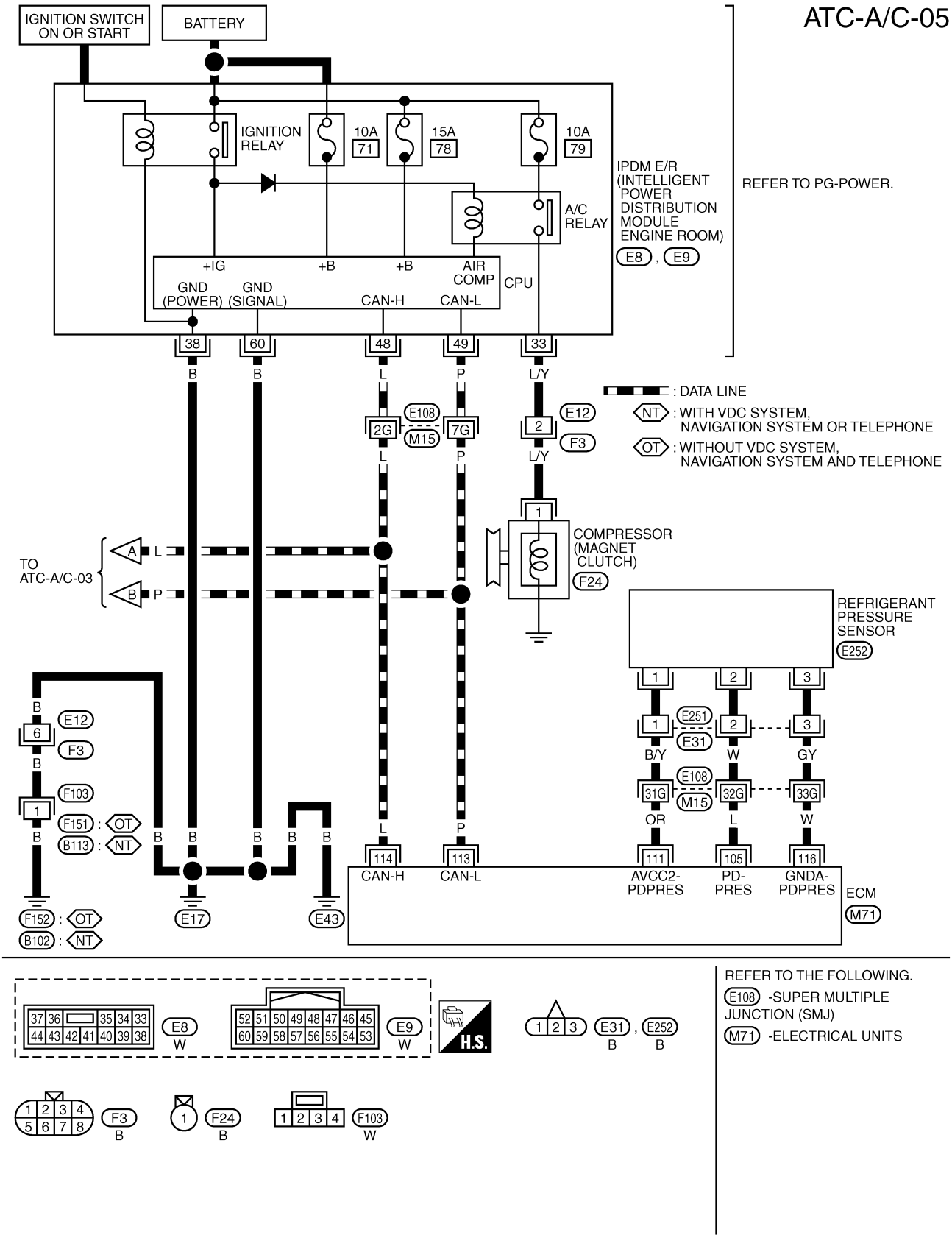
TJWT0260E

ATC-A/C-04





TJWT0171E

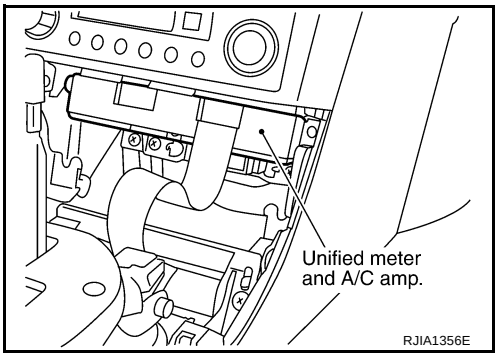

ATC-A/C-05
IGNITION SWITCH ON OR START
BATTERY
IGNITION RELAY
10A 71
15A 78
10A 79
A/C RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E8 , E9
REFER TO PG-POWER.
+IG
+B
+B
AIR COMP
CPU
GND (POWER)
GND (SIGNAL)
CAN-H
CAN-L
38
60
48
49
33
B
B
L
P
L/Y
: DATA LINE
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
E108
2G
M15
7G
E12
2
F3
TO ATC-A/C-03
A
B
L
P
COMPRESSOR (MAGNET CLUTCH)
F24
REFRIGERANT PRESSURE SENSOR
E252
E251
E31
B/Y
W
GY
31G
32G
33G
OR
L
W
E12
6
F3
F103
F151 : OT
B113 : NT
F152 : OT
B102 : NT
E17
E43
114
113
111
105
116
CAN-H
CAN-L
AVCC2-PDPRES
PD-PRES
GNDA-PDPRES
ECM
M71
E8
W
E9
W
H.S.
E31 , E252
B
B
F3
B
F24
B
F103
W
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M71 -ELECTRICAL UNITS

TJWT0261E

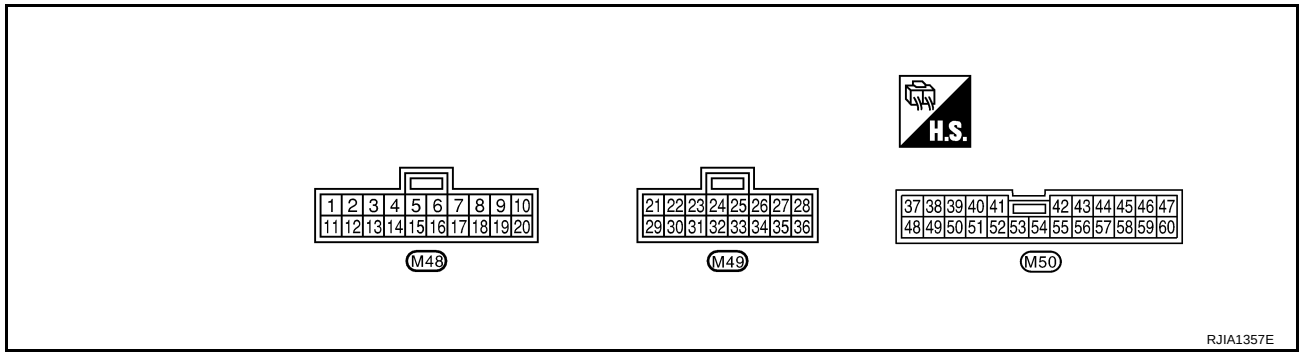
Auto Amp. Terminals and Reference Value

NJS0000V

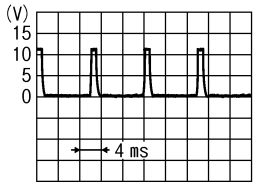
Measure voltage between each terminal and ground by referring terminals and reference value for unified meter and A/C amp.

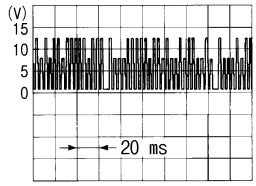
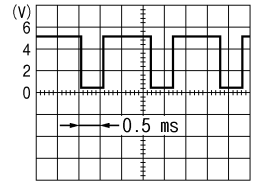


PIN CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUE FOR UNIFIED METER AND A/C AMP.

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
1	L	CAN-H	—	—	—
9	L/OR	Multiplex communication signal (TX)	—	—	—
11	P	CAN-L	—	—	—
19	R/G	Multiplex communication signal (RX)	—	—	—
21	R/W	Power supply from BATT	OFF	—	Battery voltage
22	Y/G	Power supply from IGN	ON	—	Battery voltage
29	B	Ground (Power)	ON	—	Approx. 0
30	B	Ground	ON	—	Approx. 0
38	L/R	Rear window defogger ON signal	ON	Rear window defogger switch is depressed.	Approx. 0
				Rear window defogger switch is released.	Approx. 12
39	Y	Ambient sensor	—	—	—
40	BR	In-vehicle sensor	—	—	—
41	SB	Intake sensor	—	—	—
42	G/Y	Compressor ON signal	ON	A/C switch: ON (Blower motor operates.)	Approx. 0
				A/C switch: OFF	

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
43	G/B	A/C LAN signal	ON	—	 SJIA1453J
46	L/W	Power supply from IGN2	ACC or ON	—	Battery voltage
49	W/L	Sensor ground	ON	—	Approx. 0
50	LG	Sunload sensor	—	—	—
53	G	Blower motor control signal	ON	Blower speed: 1st speed (manual)	 SJIA1454J
54	Y/R	Power supply for each door motor	ON	—	Battery voltage
56	B/W	Rear window defogger feedback signal	ON	Rear window defogger switch: ON	Approx. 12
				Rear window defogger switch: OFF	Approx. 0
57	BR/W	Blower motor ON signal	ON	Fan control dial: ON (A/C system operates)	Approx. 0
				Fan control dial: OFF	Approx. 5

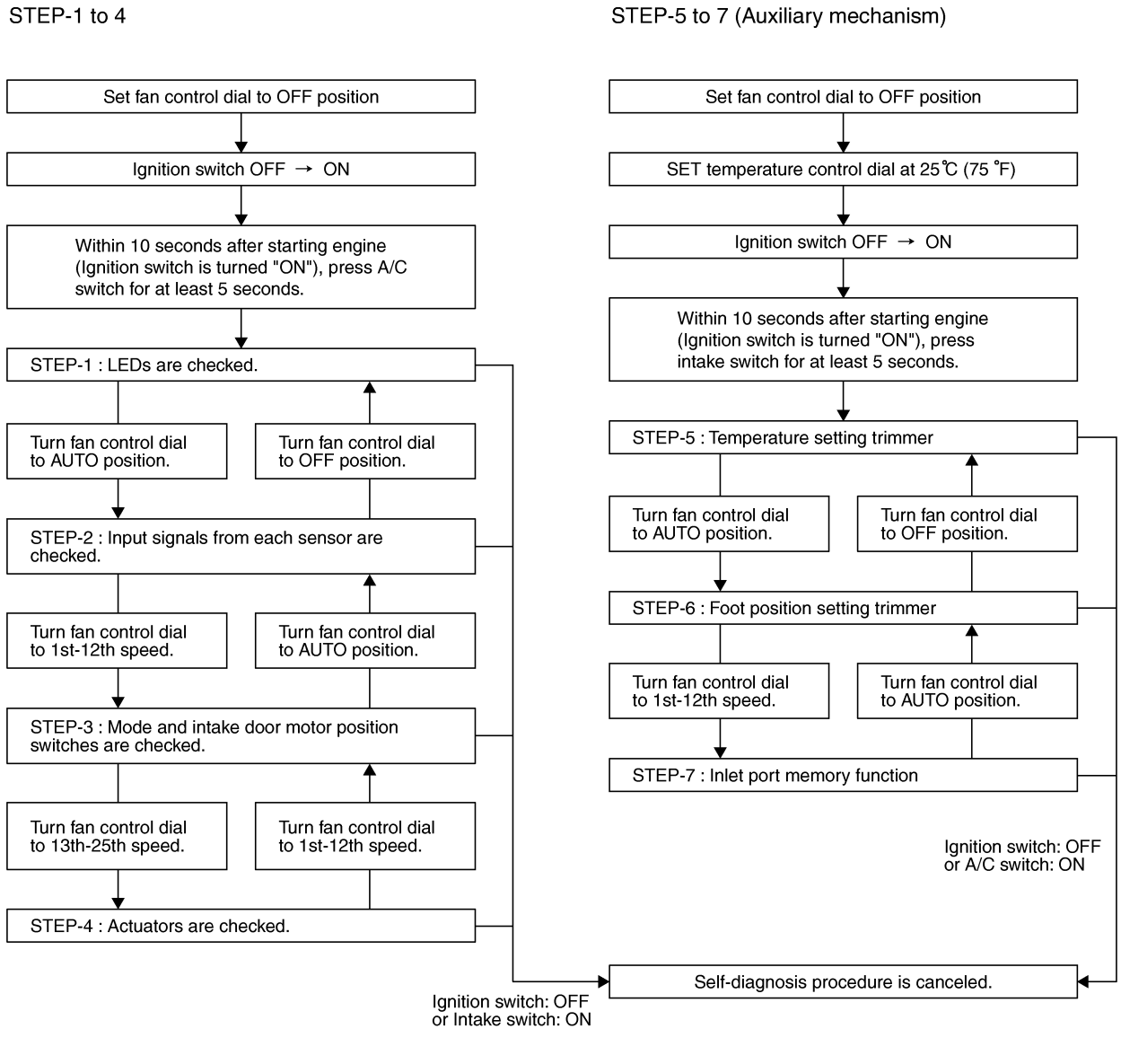
Self-diagnosis Function

NJS0000W

DESCRIPTION

The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line.
Self-diagnosis is STEP-1 to 7. There are two ways of changing method during self-diagnosis.

- Switching to self-diagnosis STEP-1 to 4.
  Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch from OFF to ON) and pressing A/C switch for at least 5 seconds. The A/C switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing intake switch or turning the ignition switch OFF. Shifting to the next step is accomplished by means of turning fan control dial, as required.
- Switching to self-diagnosis STEP-5 to 7 (Auxiliary mechanism).
  Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch from OFF to ON) and pressing intake switch for at least 5 seconds. The intake switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing A/C switch or turning the ignition switch OFF. Shifting to the next step is accomplished by means of turning fan control dial, as required.



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FUNCTION CONFIRMATION PROCEDURE

1. SET IN SELF-DIAGNOSIS MODE (STEP-1 TO 4)

1. Set the fan control dial to OFF position.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press A/C switch for at least 5 seconds.

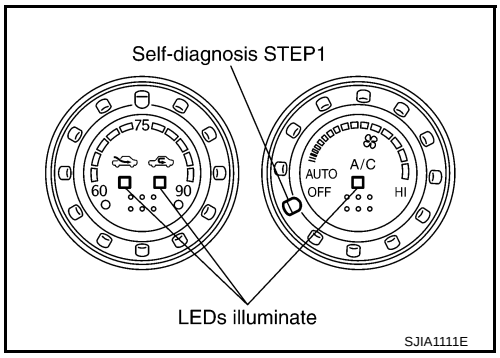
NOTE:
If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. To avoid this, start engine before performing this diagnosis.

>> GO TO 2.

2. STEP-1: LEDS ARE CHECKED

Check intake and A/C switch LEDs illumination.

OK >> GO TO 3.
NG >> Refer to ATC-91, "Self-diagnosis" .

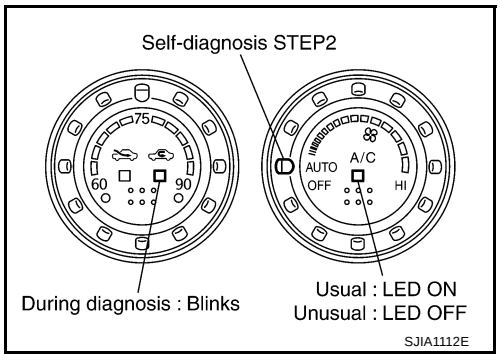


3. CHECK TO ADVANCE SELF-DIAGNOSIS STEP-2

1. Turn fan control dial to AUTO position.
   NOTE:
   When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.
2. Check A/C switch LED illumination.

Advance to self-diagnosis STEP-2?

YES >> GO TO 4.
NO >> Replace A/C controller. (Fan control dial is malfunctioning.)



4. CHECK TO RETURN SELF-DIAGNOSIS STEP-1

Turn fan control dial to OFF position.

Return to self-diagnosis STEP-1?

YES >> GO TO 5.
NO >> Replace A/C controller. (Fan control dial is malfunctioning.)

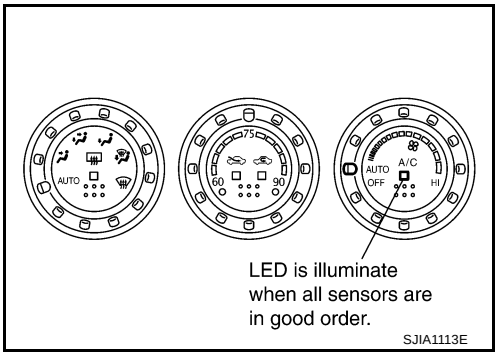
5. STEP-2: SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT

1. Turn fan control dial to AUTO position.
2. Turn mode control dial to AUTO position.

   NOTE:
   When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.
3. Check A/C switch LED is illuminate.

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.



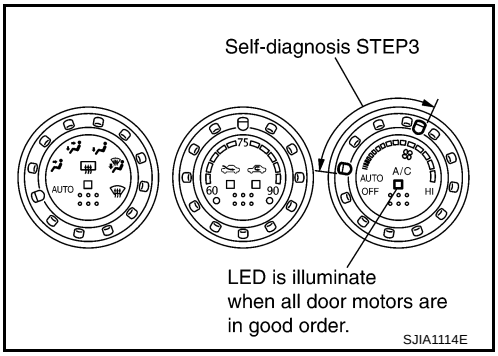
6. STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

1. Turn fan control dial to 1st - 12th speed.

   NOTE:
   When switched to STEP-3, LED of REC position blinks for approximately 50 seconds.
2. Check A/C switch LED is illuminate.

OK or NG

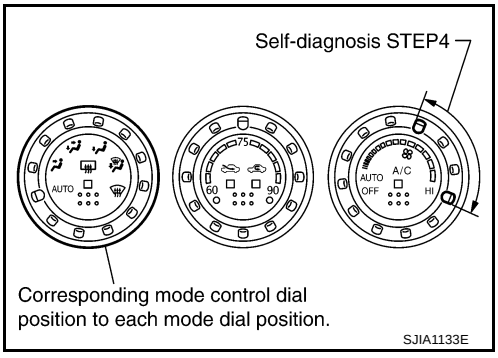
OK >> GO TO 7.
NG >> GO TO 10.



7. STEP-4: OPERATION OF EACH ACTUATOR IS CHECKED

1. Turn fan control dial to 13th - 25th speed.
2. Change operation status of air conditioner by changing mode control dial position.

>> GO TO 8.



8. CHECK ACTUATORS

Refer to the following chart and confirm discharge air flow, air temperature, blower motor duty ratio and compressor operation.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

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STEP-No. *1	STEP-41	STEP-42	STEP-43	STEP-44	STEP-45	STEP-46
Mode control dial position	AUTO	VENT	B/L	FOOT or FOOT2	D/F or D/F2	DEF
Mode door position	VENT	VENT2	B/L	FOOT *2	D/F	DEF
Intake door position	REC	REC	REC	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT
Blower motor duty ratio	25%	25%	41%	57%	75%	91%
Compressor	ON	ON	OFF	OFF	ON	ON

Checks must be made visually, by listening the sound, or by touching air outlets with hand, etc. for improper operation.

*1: STEP-No. 41 to 46 are for differentiation and will not be displayed.

*2: FOOT position during automatic control. Refer to ATC-51, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER" .

OK or NG

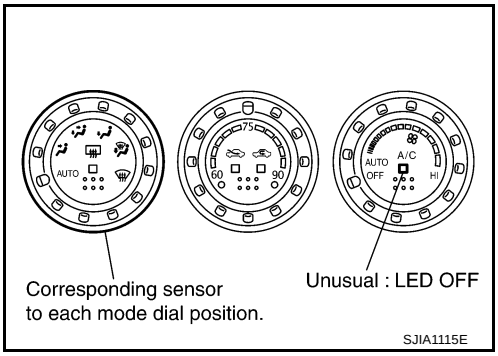
OK >> 1. Turn ignition switch OFF or intake switch ON.
2. INSPECTION END

NG >>
- Air outlet does not change.
  Go to Mode Door Motor Circuit. Refer to ATC-60, "Mode Door Motor Circuit" .
- Intake door does not change.
  Go to Intake Door Motor Circuit. Refer to ATC-66, "Intake Door Motor Circuit" .
- Discharge air temperature does not change.
  Go to Air Mix Door Motor Circuit. Refer to ATC-63, "Air Mix Door Motor Circuit" .
- Blower motor operation is malfunctioning.
  Go to Blower Motor Circuit. Refer to ATC-69, "Blower Motor Circuit" .
- Magnet clutch does not engage.
  Go to Magnet Clutch Circuit. Refer to ATC-74, "Magnet Clutch Circuit" .

9. CHECK MALFUNCTIONING SENSOR AND DOOR MOTOR

Refer to the following chart.
*1: Perform self-diagnosis STEP-2 under sunshine.
When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise LED of A/C switch will not indicate despite that sunload sensor is functioning properly.

NOTE:
When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.



Mode control dial position	Unusual	Malfunctioning sensor and door motor (Including circuits)	Reference page
VENT	A/C LED: OFF	Ambient sensor	*2
B/L		In-vehicle sensor	*3
FOOT or FOOT2		Sunload sensor *1	*4
D/F or D/F2		Intake sensor	*5
DEF		Air mix door motor (LCU) PBR	*6

*2: ATC-92, "DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR" .
*3: ATC-95, "DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR" .
*4: ATC-97, "DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR" .
*5: ATC-100, "DIAGNOSIS PROCEDURE FOR INTAKE SENSOR" .
*6: ATC-65, "DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR PBR" .

>> INSPECTION END

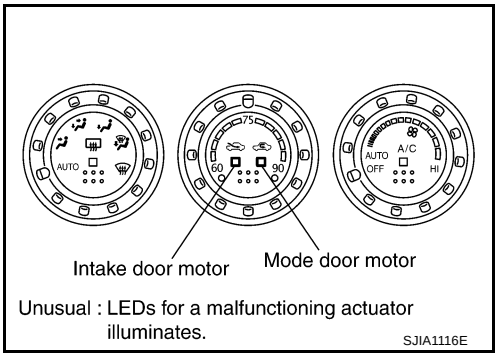
10. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode and/or intake door motor PBR(s) is/are malfunctioning.

NOTE:
When switched to STEP-3, LED of REC position blinks for approximately 50 seconds.

Unusual	Mode or intake door position	Reference page
REC LED: ON	Mode door motor	*1
FRE LED: ON	Intake door motor	*2

*1: ATC-62, "DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR" .
*2: ATC-68, "DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR" .



>> INSPECTION END

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

The trimmer compensates for differences in range of ±3°C (±6°F) between temperature setting (temperature control dial position) and temperature felt by customer.

Operating procedures for this trimmer are as follows:

1. Set fan control dial to OFF.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
4. When intake switch is pressed, temperature shifts in following order: 0°C (0°F)→ 1°C (2°F)→ 2°C (4°F)→ 3°C (6°F)→ –3°C (–6°F)→ –2°C (–4°F)→ –1°C (–2°F)→ return to 0°C (0°F).

Setting temperature	LED status of each switch		
	FRE	REC	A/C
–3°C (–6°F)	ON	ON	ON
–2°C (–4°F)	ON	ON	OFF
–1°C (–2°F)	ON	OFF	ON
0°C (0°F) (Initial setting)	OFF	OFF	OFF
1°C (2°F)	OFF	OFF	ON
2°C (4°F)	OFF	ON	OFF
3°C (6°F)	OFF	ON	ON

When battery cable is disconnected or battery voltage is below 9 V, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e. 0°C (0°F).

AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER

Wind distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as follows:

1. Set fan control dial to AUTO.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
4. Press intake switch as desired.

Type	Discharge air flow			
	Automatically controls the mode door		Manually controls the mode door	
	FOOT	DEF	FOOT	DEF
Type-A (initial setting)	76%	24%	100%	—
Type-B	76%	24%	100%	—
Type-C	100%	—	100%	—
Type-D	100%	—	100%	—

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Type	LED status of each switch		
	FRE	REC	A/C
Type-A (Initial setting)	OFF	OFF	ON
Type-B	OFF	ON	OFF
Type-C	OFF	ON	ON
Type-D	ON	OFF	OFF

When battery cable is disconnected or battery voltage is below 9 V, trimmer operation is canceled. Wind distribution ratio set becomes that of initial condition.

AUXILIARY MECHANISM: INLET PORT MEMORY FUNCTION

When ignition switch is turned from OFF to ON, inlet port memory function at manual mode can be set.

Operating procedures for this trimmer are as follows:

1. Set fan control dial to 1st - 12th speed.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
4. Press intake switch as desired.

LED status of FRE position	LED status of REC position	Setting status		Setting changeover method
		FRE	REC	
OFF	OFF	AUTO control	AUTO control	Intake SW: ON
OFF	ON	AUTO control (Initial setting)	Manual REC status is memorized. (Initial setting)	
ON	ON	Manual FRE status is memorized.	AUTO control	
ON	OFF	Manual FRE status is memorized.	Manual REC status is memorized.	

When battery cable is disconnected or battery voltage is below 9 V, memory function is canceled. Memory function set becomes that of initial condition.

Operational Check

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The purpose of the operational check is to check if the individual system operates properly.

Conditions : Engine running at normal operating temperature

CHECKING BLOWER

1. Turn fan control dial to 1st speed. Blower should operate on low speed.
2. Turn fan control dial to 2nd speed, and continue checking blower speed until all speeds are checked.
3. Leave blower on max. speed.

If NG, go to trouble diagnosis procedure for ATC-69, "Blower Motor Circuit" .
If OK, continue the check.

CHECKING DISCHARGE AIR

1. Turn mode control dial to each position.
2. Confirm that discharge air comes out according to the air distribution table. Refer to ATC-30, "Discharge Air Flow" .

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

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Intake door position is checked in the next step.
If NG, go to trouble diagnosis procedure for ATC-60, "Mode Door Motor Circuit" .
If OK, continue the check.

NOTE:
Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when the D/F, D/F2 or DEF position are selected.

CHECKING INTAKE DOOR

1. Press intake switch. Recirculation LED should illuminate.
2. Press intake switch again. Fresh LED should illuminate.
3. Listen for intake door position change. (Slight change of blower sound can be heard.)

If NG, go to trouble diagnosis procedure for ATC-66, "Intake Door Motor Circuit" .
If OK, continue the check.

CHECKING TEMPERATURE DECREASE

1. Turn temperature control dial until 18°C (60°F).
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-81, "Insufficient Cooling" .
If OK, continue the check.

CHECKING TEMPERATURE INCREASE

1. Turn temperature control dial until 32°C (90°F).
2. Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-89, "Insufficient Heating" .
If OK, continue the check.

CHECKING A/C SWITCH

Turn fan control dial to AUTO position. (Compressor is turned ON automatically.)

- Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)

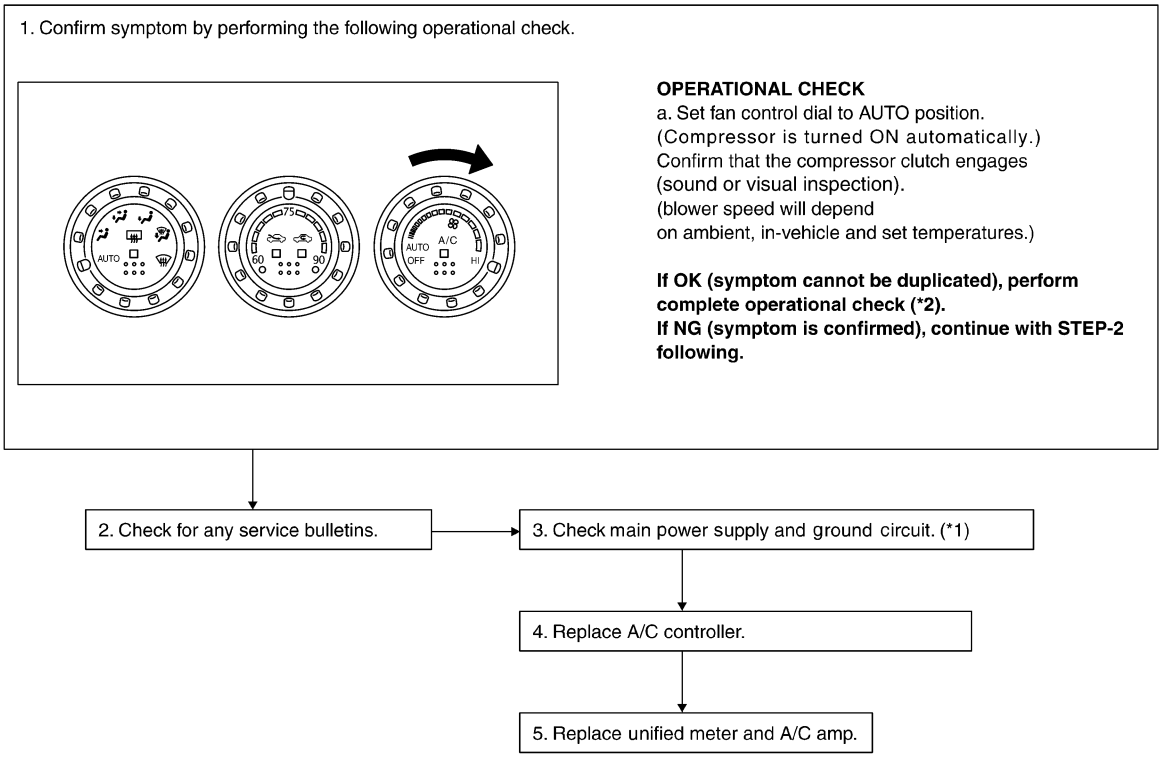
If NG, go to trouble diagnosis procedure for ATC-54, "Power Supply and Ground Circuit for Auto Amp." , then if necessary, trouble diagnosis procedure for ATC-74, "Magnet Clutch Circuit" .
If all operational checks are OK (symptom cannot be duplicated), go to Incident Simulation Tests in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to ATC-34, "SYMPTOM TABLE" and perform applicable trouble diagnosis procedures.

Power Supply and Ground Circuit for Auto Amp.

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SYMPTOM: A/C system does not come on.

INSPECTION FLOW



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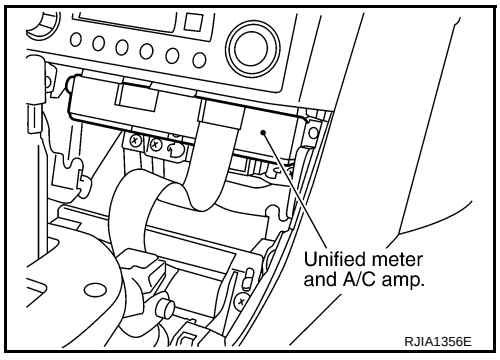
*1 ATC-55, "DIAGNOSIS PROCEDURE FOR A/C SYSTEM"

*2 ATC-53, "Operational Check"

COMPONENT DESCRIPTION

Unified Meter and A/C amp. (Automatic Amplifier)

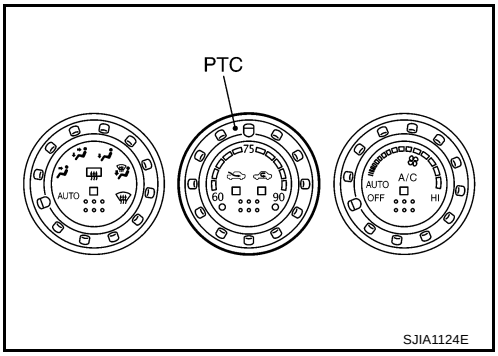
The unified meter and A/C amp. has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, blower motor and compressor are then controlled.
When the various switches and temperature control dial are operated, data is input to the unified meter and A/C amp. from the A/C controller using multiplex communication.
Self-diagnosis functions are also built into unified meter and A/C amp. to provide quick check of malfunctions in the auto air conditioner system.



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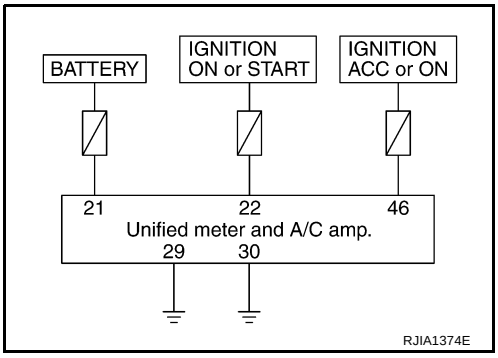
Potentio Temperature Control (PTC)

The PTC is built into the A/C controller. It can be set at an interval of 1°C (2.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by turning the temperature control dial.



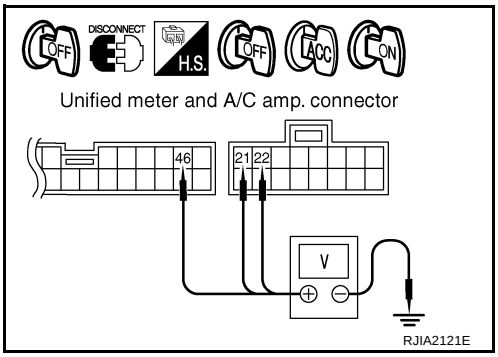
DIAGNOSIS PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Disconnect unified meter connector and A/C amp. connector.
2. Check voltage between unified meter and A/C amp. harness connector M49 terminal 21 and 22, unified meter and A/C amp. harness connector M50 terminal 46 and ground.



Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Unified meter and A/C amp. connector	Terminal No.				
M49	21	Ground	Battery voltage	Battery voltage	Battery voltage
M49	22		Approx. 0 V	Approx. 0 V	Battery voltage
M50	46		Approx. 0 V	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check 10A and 15A fuses [Nos. 10, 11, 12 and 19, located in the fuse block (J/B)]. Refer to PG-85, "FUSE BLOCK - JUNCTION BOX (J/B)" .

- If fuses are OK, check harness for open circuit. Repair or replace if necessary.
- If fuses are NG, check harness for short circuit and replace fuse.

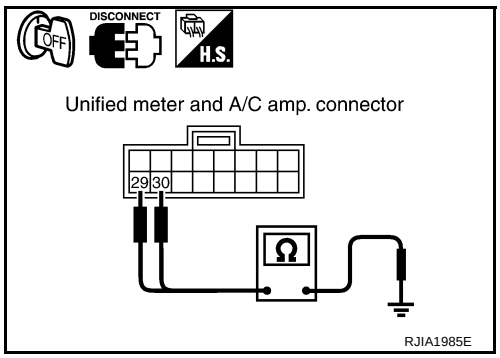
2. CHECK GROUND CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Check continuity between unified meter and A/C amp. harness connector M49 terminal 29, 30 and ground.

29, 30 – Ground : Continuity should exist.

OK or NG

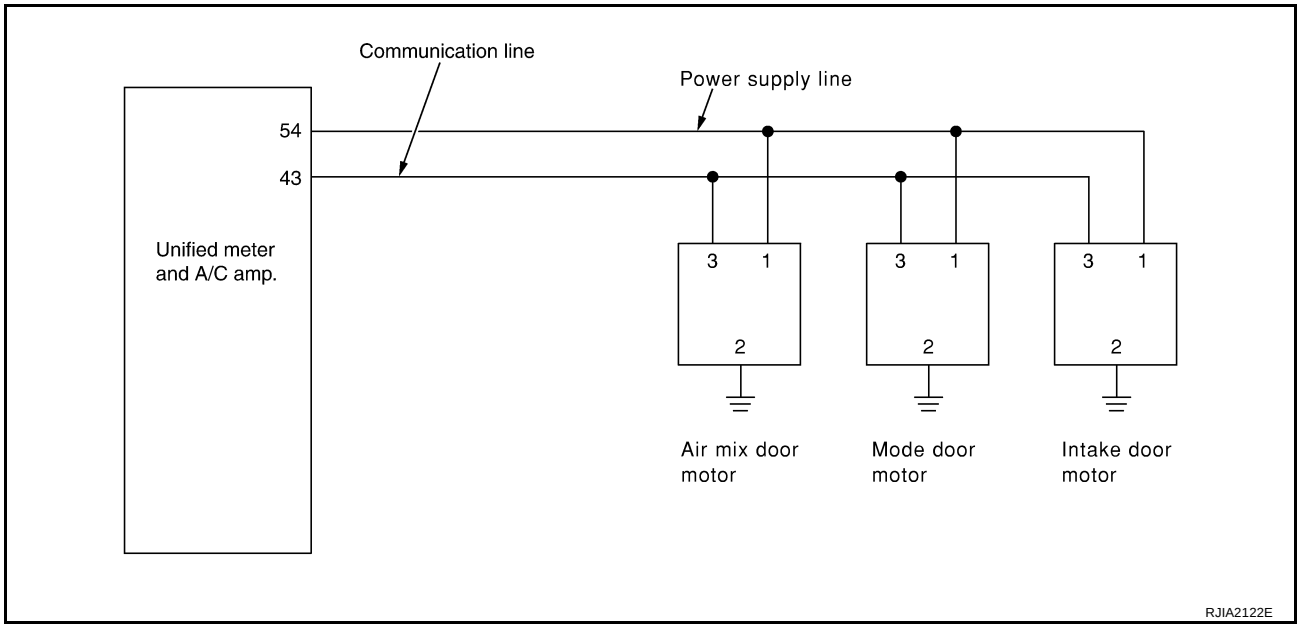
OK >> Replace unified meter and A/C amp.
NG >> Repair harness or connector.



LAN System Circuit

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SYMPTOM: Mode door motor, intake door motor and/or air mix door motor does not operate normally.



DIAGNOSIS PROCEDURE FOR LAN CIRCUIT

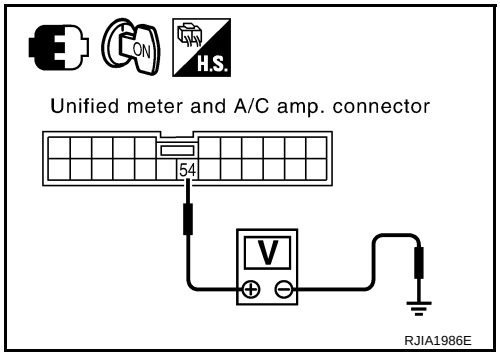
1. CHECK POWER SUPPLY FOR UNIFIED METER AND A/C AMP.

1. Turn ignition switch ON.
2. Check voltage between unified meter and A/C amp. harness connector M50 terminal 54 and ground.

54 – Ground : Battery voltage

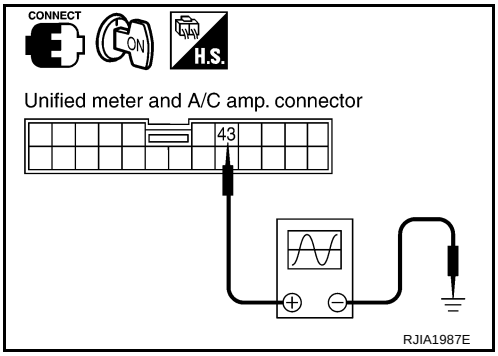
OK or NG

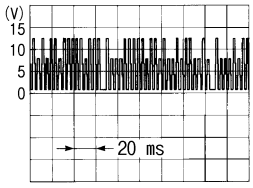
OK >> GO TO 2.
NG >> Replace unified meter and A/C amp.



2. CHECK SIGNAL FOR UNIFIED METER AND A/C AMP.

Confirm A/C LAN signal between unified meter and A/C amp. harness connector M50 terminal 43 and ground using an oscilloscope.



Terminals			Voltage
(+)		(–)	
Unified meter and A/C amp. connector	Terminal No.		
M50	43	Ground	

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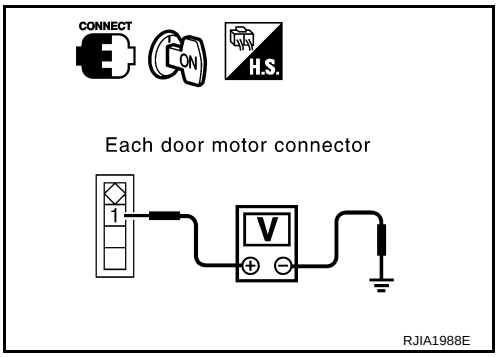
OK or NG

OK >> GO TO 3.
NG >> Replace unified meter and A/C amp.

3. CHECK POWER SUPPLY FOR EACH DOOR MOTOR

Check voltage between each door motor harness connector terminal 1 and ground.

1 – Ground : Battery voltage

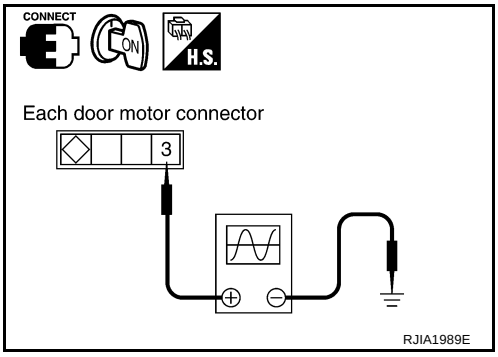


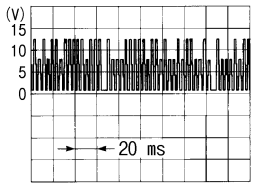
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK SIGNAL FOR EACH DOOR MOTOR

Confirm A/C LAN signal between each door motor harness connector terminal 3 and ground using an oscilloscope.



Door motor	Terminals			Voltage
	(+)		(–)	
	Connector	Terminal No.		
Mode	M252	3	Ground	
Air mix	M253	3		
Intake	M256	3		

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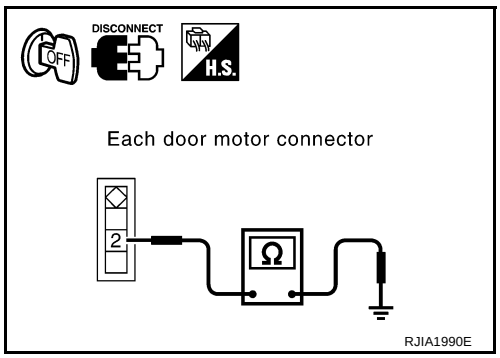
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect each door motor connector.
3. Check continuity between each door motor harness connector terminal 2 and ground.

2 – Ground : Continuity should exist.



OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK MOTOR OPERATION

1. Reconnect each door motor connector.
2. Turn ignition switch ON.
3. Confirm operation of each door motor.

OK or NG

OK >> Return to operate normally.
- Poor contact in motor connector

NG >> Does not operate normally.
- GO TO 7.

7. CHECK AIR MIX DOOR MOTOR AND INTAKE DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect mode door motor, air mix door motor and intake door motor connector.
3. Reconnect air mix door motor and intake door motor connector.
4. Turn ignition switch ON.
5. Confirm operation of air mix door motor and intake door motor.

OK or NG

OK >> Air mix door motor and intake door motor operate normally.
- Replace mode door motor.

NG >> Air mix door motor and intake door motor does not operate normally.
- GO TO 8.

8. CHECK MODE DOOR MOTOR AND INTAKE DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect air mix door motor connector.
3. Reconnect mode door motor connector.
4. Turn ignition switch ON.
5. Confirm operation of mode door motor and intake door motor.

OK or NG

OK >> Mode door motor and intake door motor operate normally.
- Replace air mix door motor.

NG >> Mode door motor and intake door motor does not operate normally.
- GO TO 9.

9. CHECK MODE DOOR MOTOR AND AIR MIX DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector.
3. Reconnect air mix door motor connector.
4. Turn ignition switch ON.
5. Confirm operation of mode door motor and air mix door motor.

OK or NG

OK >> Mode door motor and air mix door motor operate normally.
- Replace intake door motor.

NG >> Mode door motor and air mix door motor does not operate normally.
- Replace unified meter and A/C amp.

Mode Door Motor Circuit

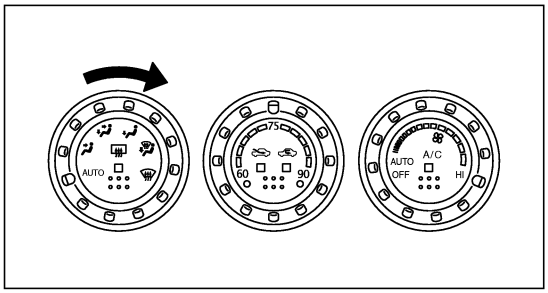
NJS00010

SYMPTOM

- Air outlet does not change.
- Mode door motor does not operate normally.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air

a.Turn mode control dial to each position.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

b. Confirm that discharge air comes out according to the air distribution table at left.
Refer to “Discharge Air Flow” (*1).

- **If OK (symptom cannot be duplicated), perform complete operational check (*2).**
  If NG (symptom is confirmed), continue with STEP-2 following.
- **Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when D/F, D/F2 or DEF is selected.**

2. Check for any service bulletins.

4. Perform self-diagnosis STEP-2. (*4)
- OK → 3. Perform self-diagnosis STEP-1. (*3)
- NG → Go to appropriate malfunctioning sensor circuit. (*9)

OK

5. Perform self-diagnosis STEP-3. (*4)
- NG → Go to DIAGNOSIS PROCEDURE FOR LAN SYSTEM CIRCUIT. (*10)

OK

6. Perform self-diagnosis STEP-4. (*4)
- NG → Check mode door control linkage. (*11)
  - NG → Repair or adjust control linkage.

OK **[Cause cannot be confirmed by self-diagnosis.]**

7. Check ambient sensor circuit. (*5)

OK

8. Check in-vehicle sensor circuit. (*6)

OK

9. Check sunload sensor circuit. (*7)

OK

10. Check intake sensor circuit. (*13)

OK

11. Check air mix door motor PBR circuit. (*8)

OK → If the symptom still exists, perform a complete operational check (*2) and check for other symptoms.
[Refer to symptom table, (*12).]
Dose another symptom exist?
- YES → Go to Trouble Diagnosis for related symptoms. **[Another symptom exists.]**
- NO → Replace unified meter and A/C amp.

INSPECTION END

SJIA1850E

*1 ATC-30, "Discharge Air Flow"
*2 ATC-53, "Operational Check"
*3 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*4 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*5 ATC-92, "Ambient Sensor Circuit"
*6 ATC-94, "In-vehicle Sensor Circuit"
*7 ATC-97, "Sunload Sensor Circuit"
*8 ATC-65, "Air Mix Door Motor PBR Circuit"
*9 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.

*10 ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT"
*11 ATC-116, "MODE DOOR MOTOR"
*12 ATC-34, "SYMPTOM TABLE"
*13 ATC-100, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

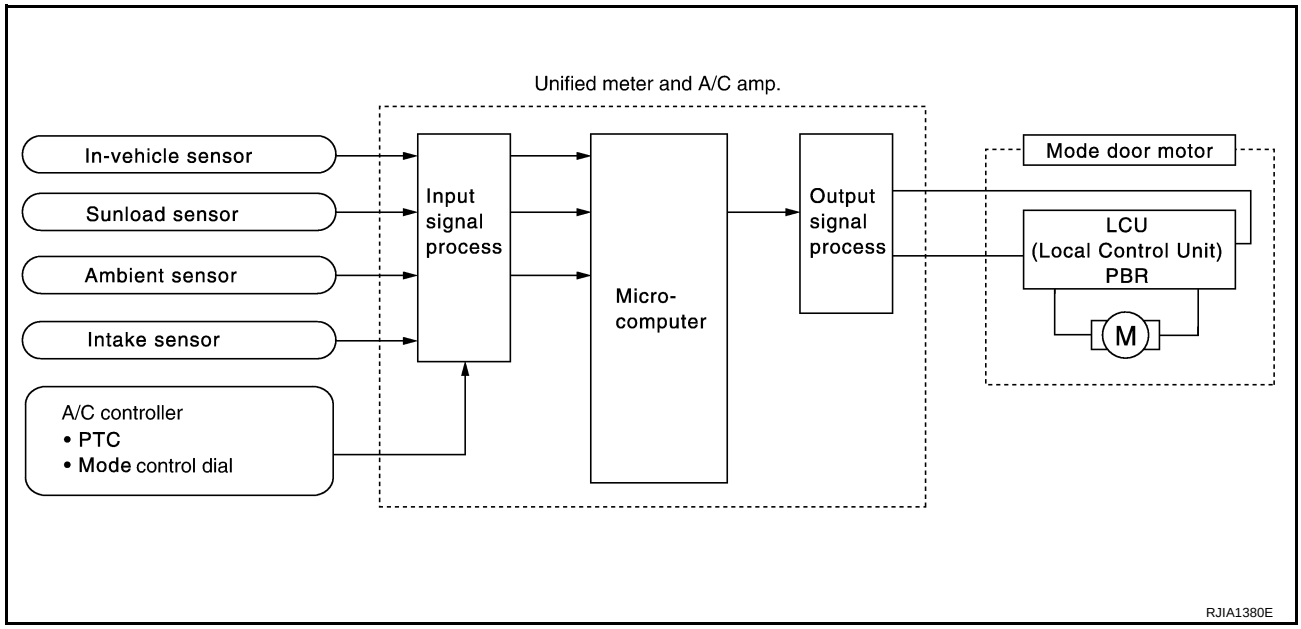
Component Parts

Mode door control system components are:

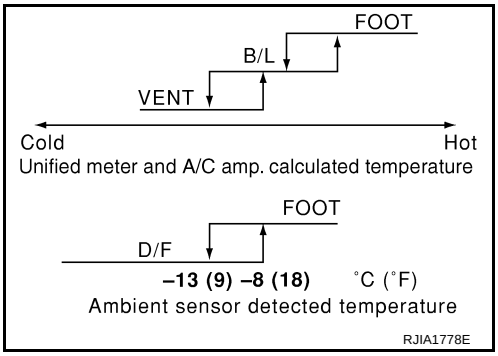
- Unified meter and A/C amp.
- Mode door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.
The air mix door motor, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the unified meter and A/C amp.



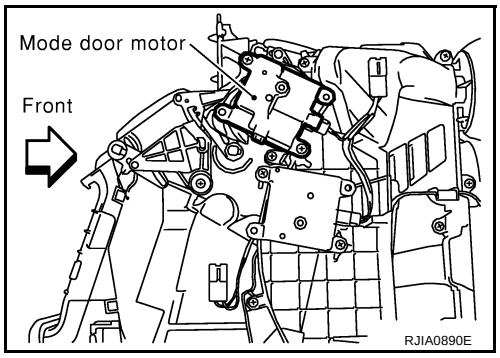
Mode Door Control Specification



COMPONENT DESCRIPTION

Mode Door Motor

The mode door motor is attached to the heater & cooling unit assembly. It rotates so that air is discharged from the outlet set by the unified meter and A/C amp. Motor rotation is conveyed to a link which activates the mode door.



DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR

SYMPTOM: Mode door motor does not operate normally.
Perform diagnosis procedure. Refer to ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Air Mix Door Motor Circuit

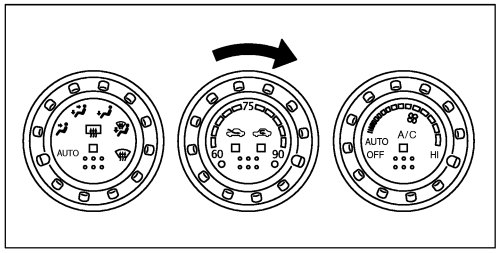
NJS00011

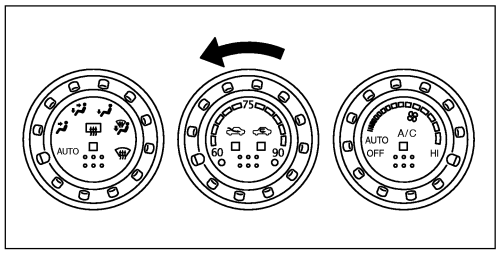
SYMPTOM

- Discharge air temperature does not change.
- Air mix door motor does not operate normally.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.





OPERATIONAL CHECK

Temperature increase

a. Turn temperature control dial clockwise until 32°C (90°F).
b. Check for hot air at discharge air outlets.

Temperature decrease

a. Turn temperature control dial counterclockwise until 18°C (60°F).
b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*9).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*1)
OK
4. Perform self-diagnosis STEP-2. (*12)
NG → Go to appropriate malfunctioning sensor circuit. (*6)
OK
5. Perform self-diagnosis STEP-4. (*12)
OK **[Cause cannot be confirmed by self-diagnosis.]**
6. Check ambient sensor circuit. (*2)
OK
7. Check in-vehicle sensor circuit. (*3)
OK
8. Check sunload sensor circuit. (*4)
OK
9. Check intake sensor circuit. (*11)
OK
10. Check air mix door motor PBR circuit. (*5)
OK
If the symptom still exists, perform a complete operational check (*9) and check for other symptoms. [Refer to symptom table, (*10).] Does another symptom exist?
YES → Go to Trouble Diagnosis for related symptom.
Another symptom exists.
NO
Replace unified meter and A/C amp. → INSPECTION END

NG → Go to LAN system circuit. (*7)
OK
Check air mix door motor. (*8)
NG
Replace air mix door motor.

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*1 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-92, "Ambient Sensor Circuit"
*3 ATC-94, "In-vehicle Sensor Circuit"
*4 ATC-97, "Sunload Sensor Circuit"
*5 ATC-65, "Air Mix Door Motor PBR Circuit"
*6 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*7 ATC-56, "LAN System Circuit"
*8 ATC-65, "Air Mix Door Motor"
*9 ATC-53, "Operational Check"
*10 ATC-34, "SYMPTOM TABLE"
*11 ATC-100, "Intake Sensor Circuit"
*12 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.

SYSTEM DESCRIPTION

Component Parts

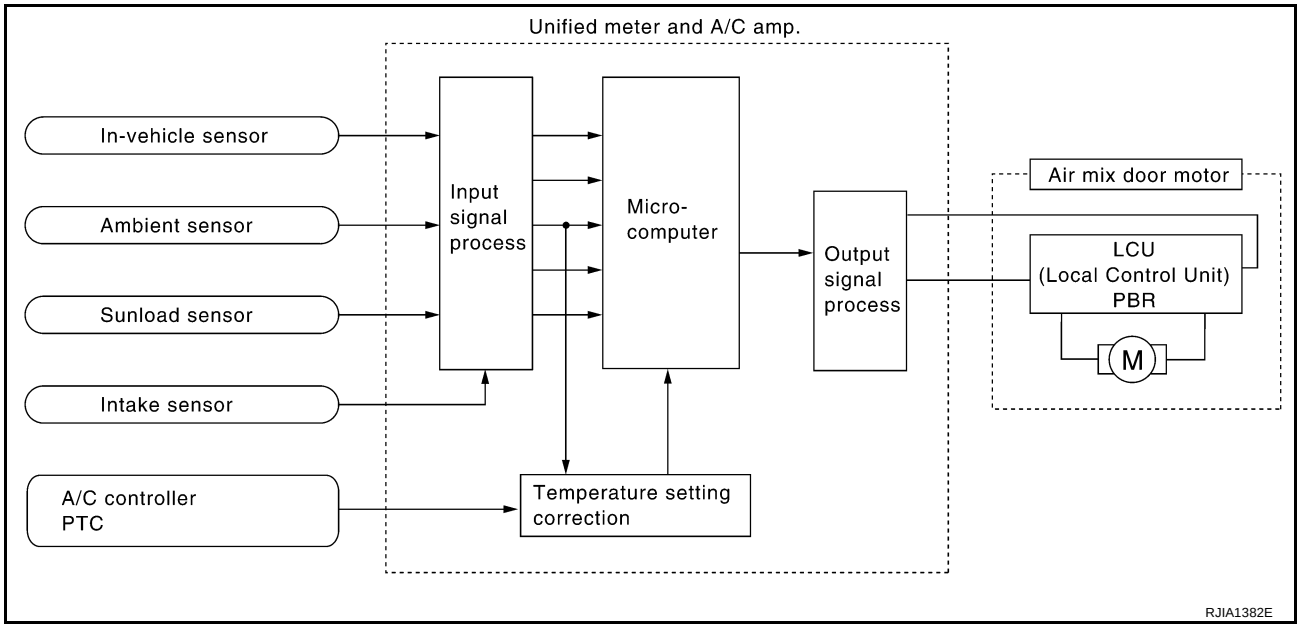
Air mix door control system components are:

- Unified meter and A/C amp.
- Air mix door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

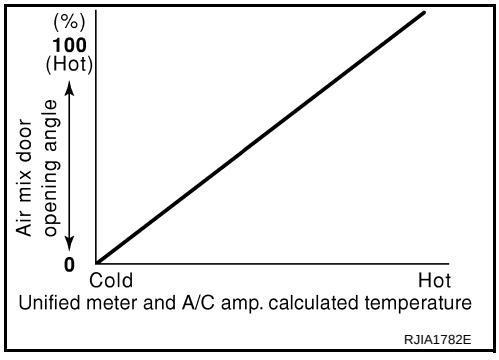
System Operation

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.

The air mix door motor, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the unified meter and A/C amp.



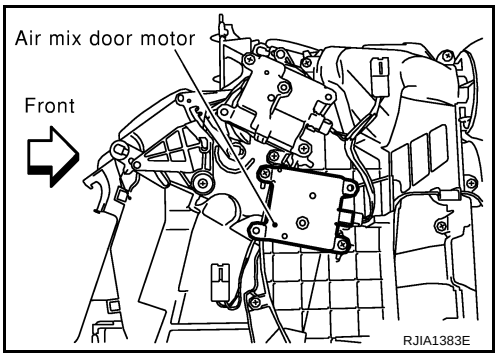
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motor is attached to the heater & cooling unit assembly. It rotates so that the air mix door is opened or closed to a position set by the unified meter and A/C amp. Motor rotation is then sent conveyed through a shaft and the air mix door position feedback is then sent to the unified meter and A/C amp. by PBR built-in air mix door motor.



DIAGNOSIS PROCEDURE FOR AIR MIX DOOR

SYMPTOM: Discharge air temperature does not change.
Perform diagnosis procedure. Refer to ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Air Mix Door Motor PBR Circuit

NJS00012

SYMPTOM

- Discharge air temperature does not change.
- PBR circuit is open or shorted.

DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR PBR

Perform diagnosis procedure. Refer to ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

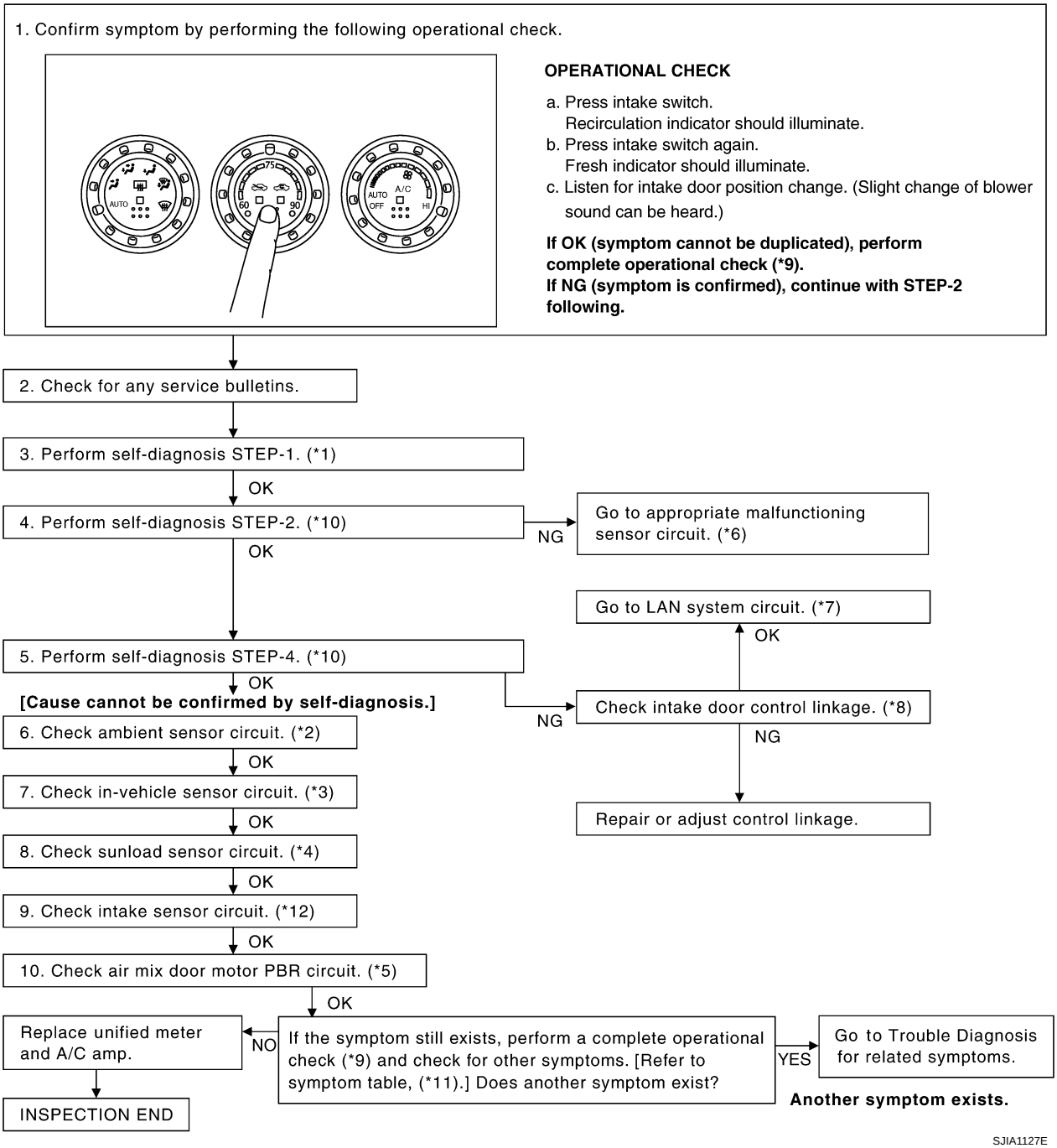
Intake Door Motor Circuit

NJS00013

SYMPTOM

- Intake door does not change.
- Intake door motor does not operate normally.

INSPECTION FLOW



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*1	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2	ATC-92, "Ambient Sensor Circuit"	*3	ATC-94, "In-vehicle Sensor Circuit"
*4	ATC-97, "Sunload Sensor Circuit"	*5	ATC-65, "Air Mix Door Motor PBR Circuit"	*6	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*7	ATC-56, "LAN System Circuit"	*8	ATC-111, "INTAKE DOOR MOTOR"	*9	ATC-53, "Operational Check"
*10	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*11	ATC-34, "SYMPTOM TABLE"	*12	ATC-100, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

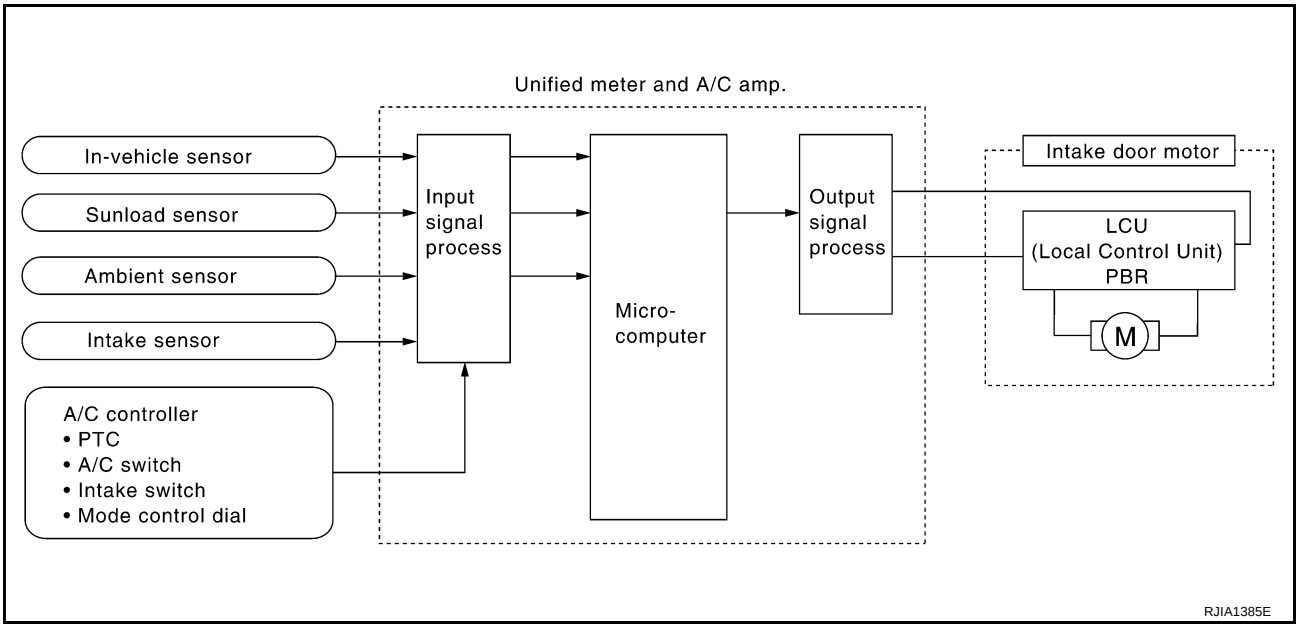
Component Parts

Intake door control system components are:

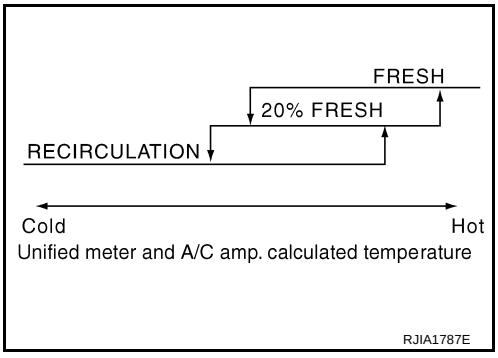
- Unified meter and A/C amp.
- Intake door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The intake door control determines intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When setting mode control dial to D/F, D/F2 or DEF position, fan control dial OFF position, the unified meter and A/C amp. sets the intake door at the FRE position.



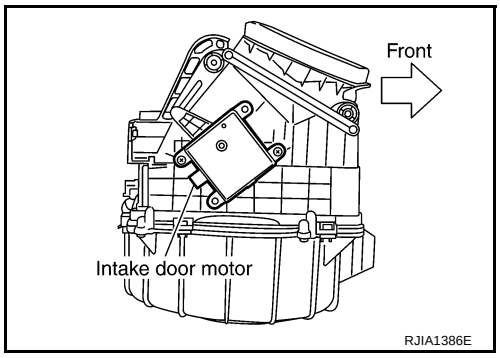
Intake Door Control Specification



COMPONENT DESCRIPTION

Intake Door Motor

The intake door motor is attached to the blower unit. It rotates so that air is drawn from inlets set by the unified meter and A/C amp. Motor rotation is conveyed to a lever which activates the intake door.



DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR

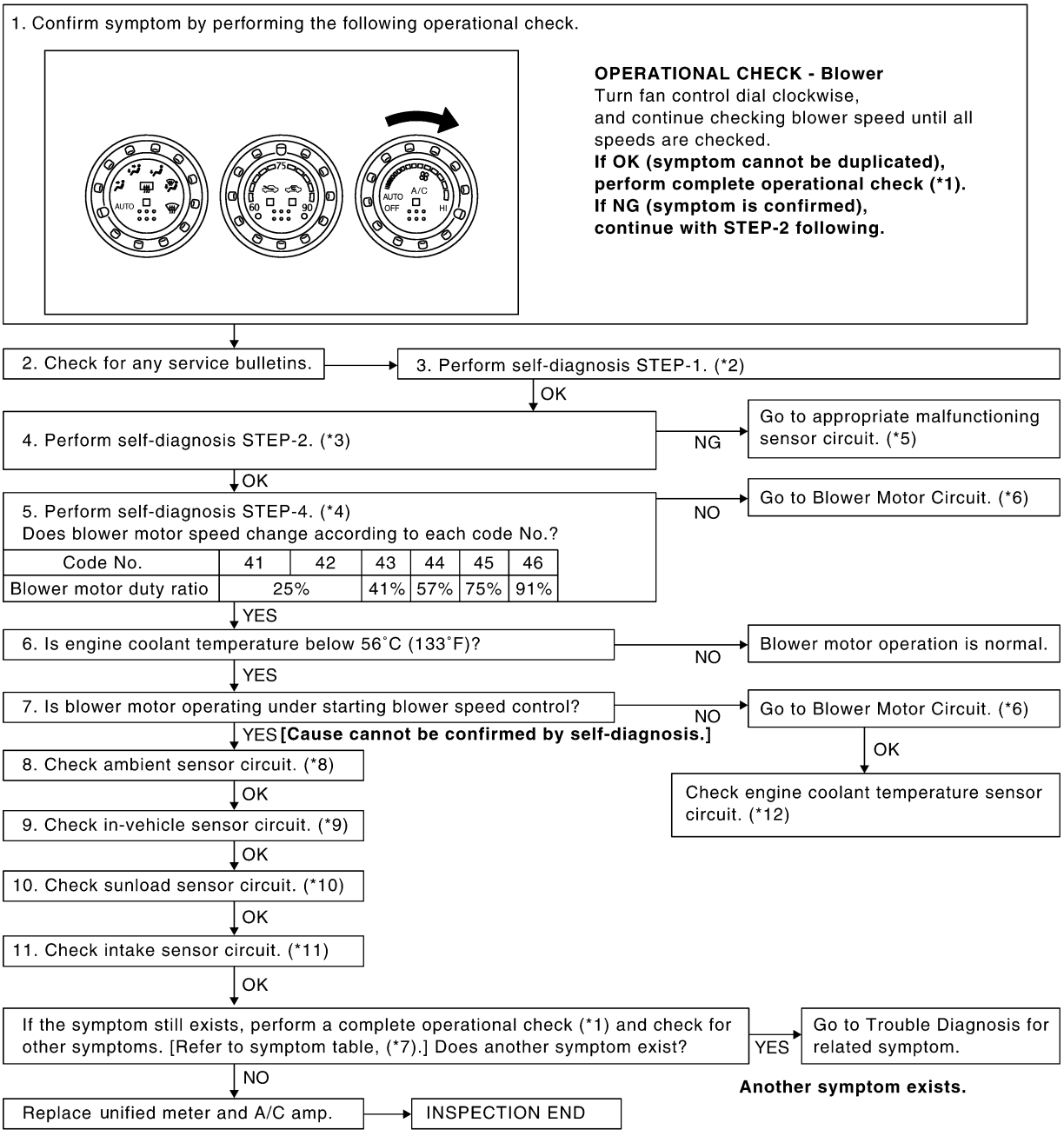
SYMPTOM: Intake door motor does not operate normally.
Perform diagnosis procedure. Refer to ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Blower Motor Circuit

NJS00014

SYMPTOM: Blower motor operation is malfunctioning.

INSPECTION FLOW



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*1	ATC-53, "Operational Check"	*2	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*3	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5.
*4	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 7.	*5	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.	*6	ATC-71, "DIAGNOSIS PROCEDURE FOR BLOWER MOTOR"
*7	ATC-34, "SYMPTOM TABLE"	*8	ATC-92, "Ambient Sensor Circuit"	*9	ATC-94, "In-vehicle Sensor Circuit"
*10	ATC-97, "Sunload Sensor Circuit"	*11	ATC-100, "Intake Sensor Circuit"	*12	EC-223, "DTC P0117, P0118 ECT SENSOR"

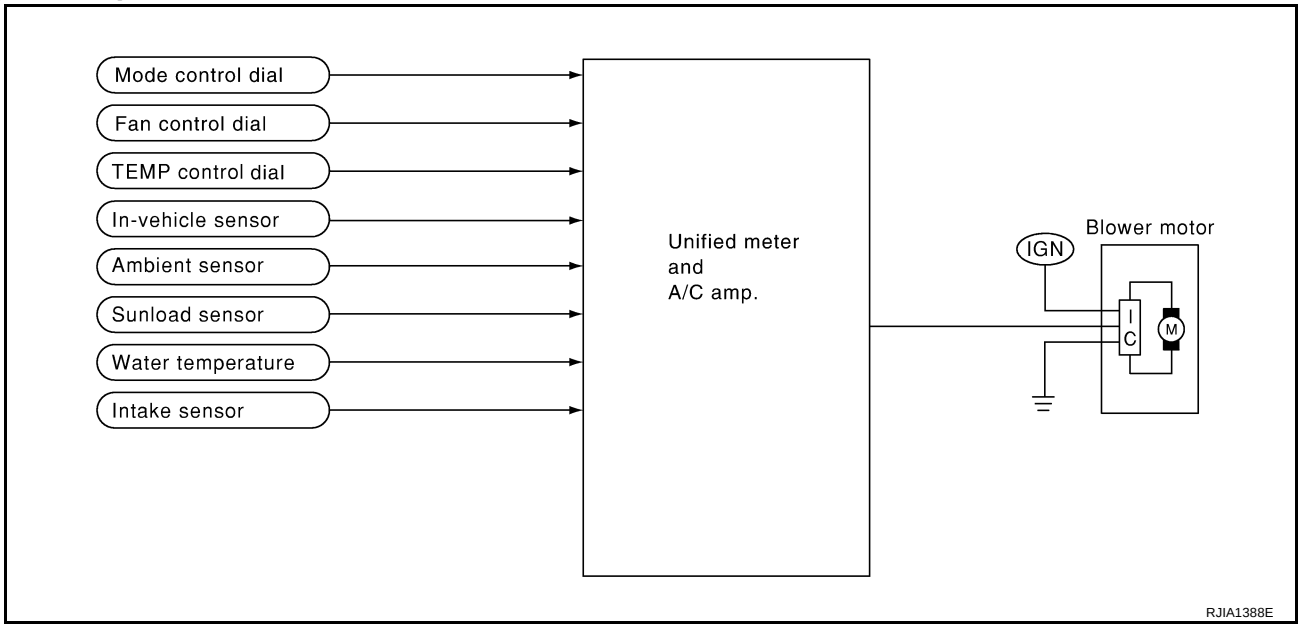
SYSTEM DESCRIPTION

Component Parts

Fan speed control system components are:

- Unified meter and A/C amp.
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation



Automatic Mode

In the automatic mode, the blower motor speed is calculated by the unified meter and A/C amp. based on the input from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor.
When the air flow is increased, the duty ratio of the blower motor's drive signal is changed at 8%/sec. to prevent a sudden increase in air flow.
In addition to manual air flow control and the usual automatic air flow control, starting air flow control, low water temperature starting control and high passenger compartment temperature starting control are available.

Starting Fan Speed Control

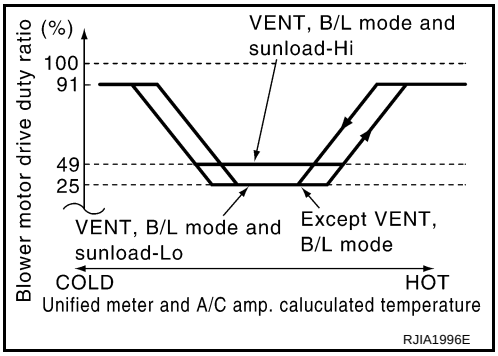
Start up from COLD SOAK Condition (Automatic mode)
In a cold start up condition where the engine coolant temperature is below 56°C (133°F), the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.
In the most extreme case (very low ambient) the blower starting delay will be 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 56°C (133°F), and then the blower speed will increase to the objective speed.
Start up from usual or HOT SOAK Condition (Automatic mode)
The blower will begin operation momentarily after the fan control dial to AUTO position. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

Blower Speed Compensation

Sunload

When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of low or no sunload, the blower speed is at duty ratio 25%. During high sunload conditions, the unified meter and A/C amp. raise the blower speed.(duty ratio 49%).

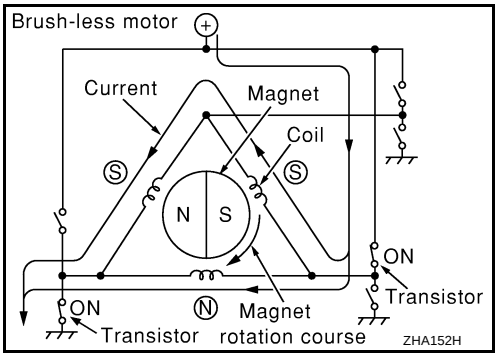
Fan Speed Control Specification



COMPONENT DESCRIPTION

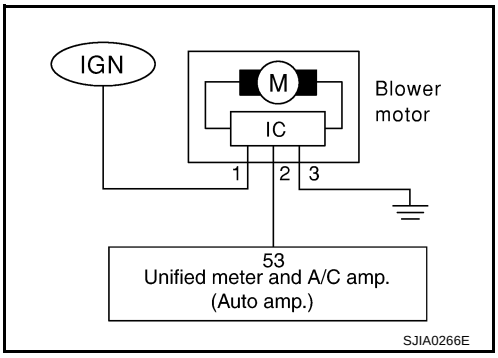
Brush-less Motor

The blower motor utilizes a brush-less motor with a rotating magnet. Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.



DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

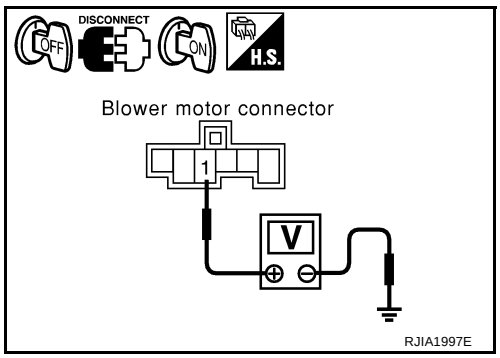
SYMPTOM: Blower motor operation is malfunctioning.



1. CHECK POWER SUPPLY FOR BLOWER MOTOR

1. Disconnect blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between blower motor harness connector M62 terminal 1 and ground.

1 – Ground : Battery voltage



OK or NG

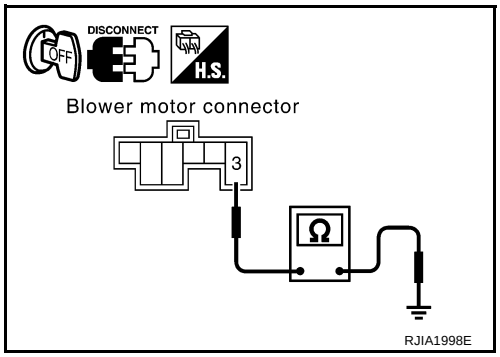
OK >> GO TO 2.
NG >> Check power supply circuit and 15A fuses [Nos. 10 and 11, located in the fuse block (J/B)]. Refer to PG-85, "FUSE BLOCK - JUNCTION BOX (J/B)" .

- If fuse are OK, check harness for open circuit. Repair or replace if necessary.
- If fuse are NG, check harness for short circuit and replace fuse.

2. CHECK GROUND CIRCUIT FOR BLOWER MOTOR

1. Turn ignition switch OFF.
2. Check continuity between blower motor harness connector M62 terminal 3 and ground.

3 – Ground : Continuity should exist.



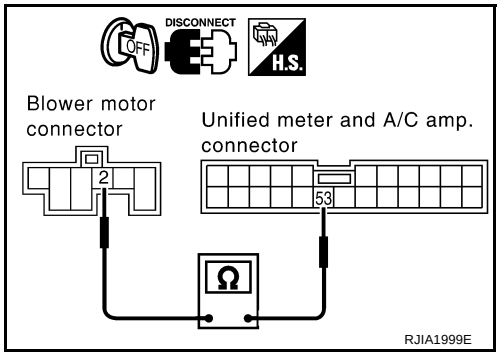
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND UNIFIED METER AND A/C AMP.

1. Disconnect unified meter connector and A/C amp. connector.
2. Check continuity between blower motor harness connector M62 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 53.

2 – 53 : Continuity should exist.

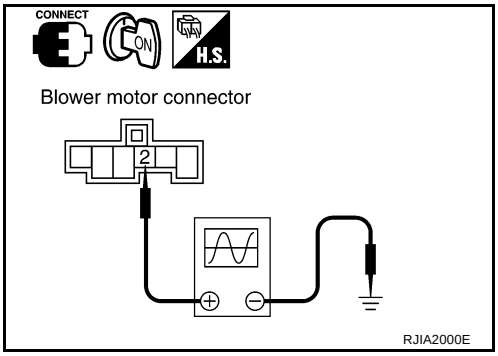


OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Reconnect blower motor connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Change the fan speed from Lo to Hi, and check the duty ratios between blower motor harness connector M62 terminal 2 and ground by using an oscilloscope. Normal terminal 2 drive signal duty ratios are shown in the table below.



Blower fan speed	1st	5th	10th	15th	20th	25th
Blower motor connector M62 Terminal No. 2 (Oscilloscope)	T1 Approx. 1.6 ms	T2 Approx. 1.6 ms	T3 Approx. 1.6 ms	T4 Approx. 1.6 ms	T5 Approx. 1.6 ms	T6 Approx. 1.6 ms
Duty ratio	Approx. 25%	Approx. 37%	Approx. 47%	Approx. 57%	Approx. 71%	Approx. 91%

NOTE: Duty ratio = $\frac{Tx}{\text{Approx. 1.6 ms}}$ x 100 (%)

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OK or NG

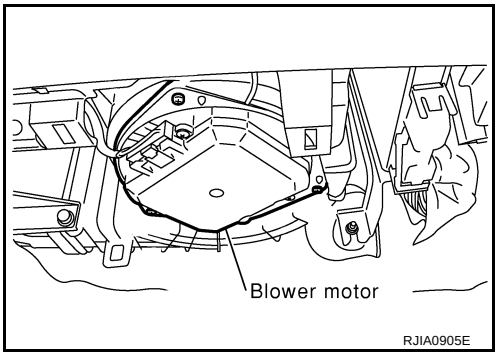
OK >> Replace blower motor after confirming the fan air flow does not change.
NG >> Replace unified meter and A/C amp.

COMPONENT INSPECTION

Blower Motor

Confirm smooth rotation of the blower motor.

- Ensure that there are no foreign particles inside the blower unit.

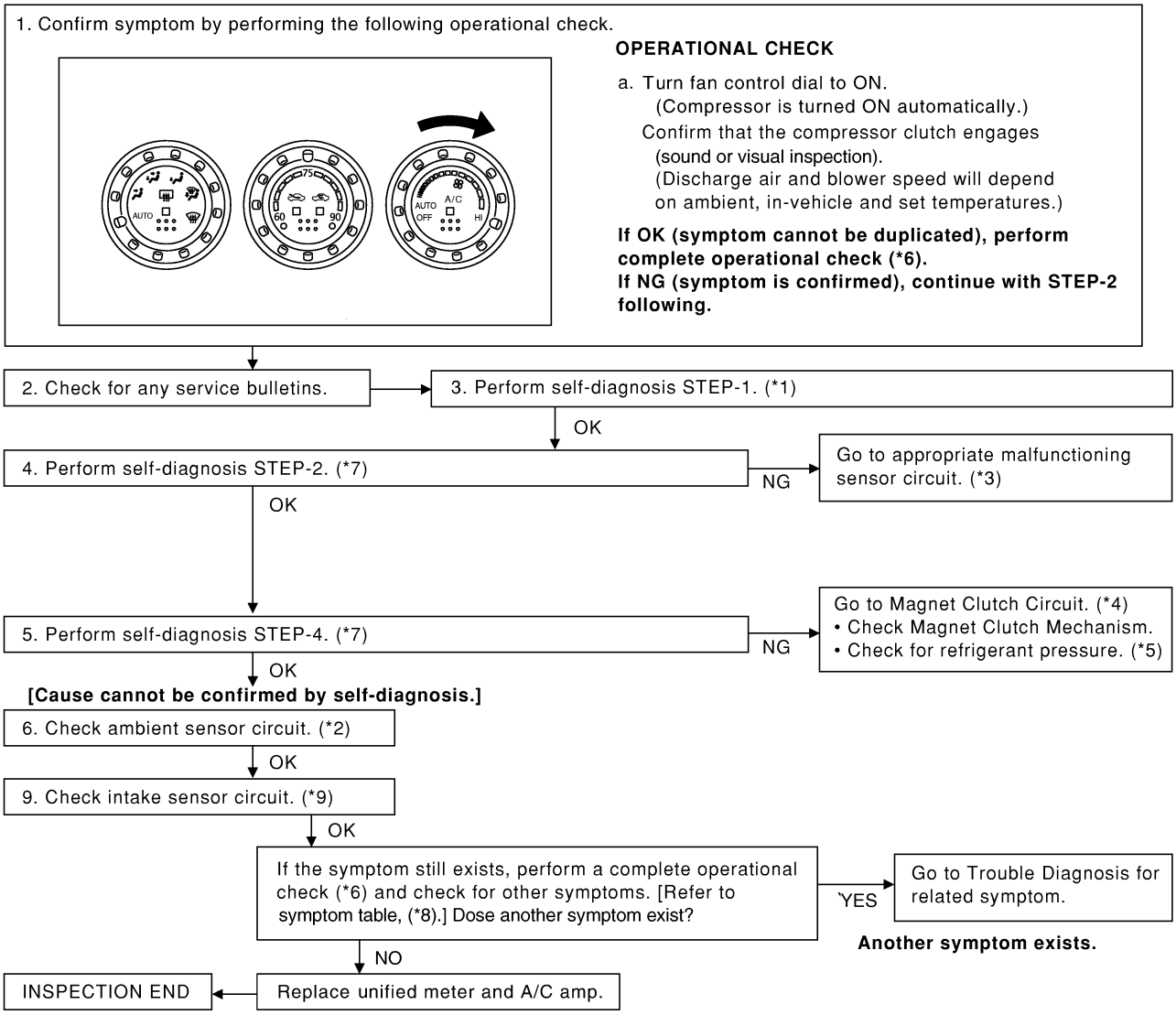


Magnet Clutch Circuit

NJS00015

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW



SJIA1129E

*1 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2 ATC-92, "Ambient Sensor Circuit"	*3 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*4 ATC-75, "DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH"	*5 ATC-86, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"	*6 ATC-53, "Operational Check"
*7 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*8 ATC-34, "SYMPTOM TABLE"	*9 ATC-100, "Intake Sensor Circuit"

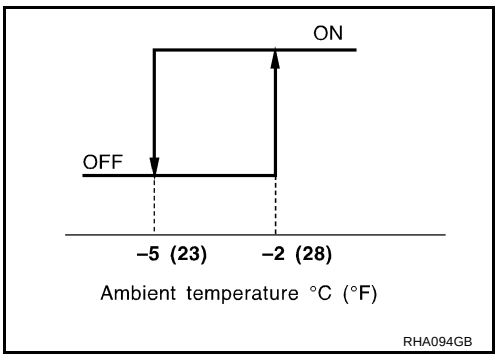
SYSTEM DESCRIPTION

Unified meter and A/C amp. controls compressor operation by ambient temperature, intake air temperature and signal from ECM.

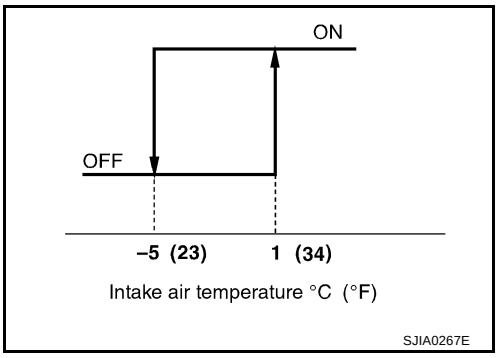
Low Temperature Protection Control

Unified meter and A/C amp. will turn compressor ON or OFF as determined by a signal detected by ambient sensor and intake sensor.

When ambient temperature is higher than –2°C (28°F), the compressor turns ON. The compressor turns OFF when ambient temperature is lower than –5°C (23°F).

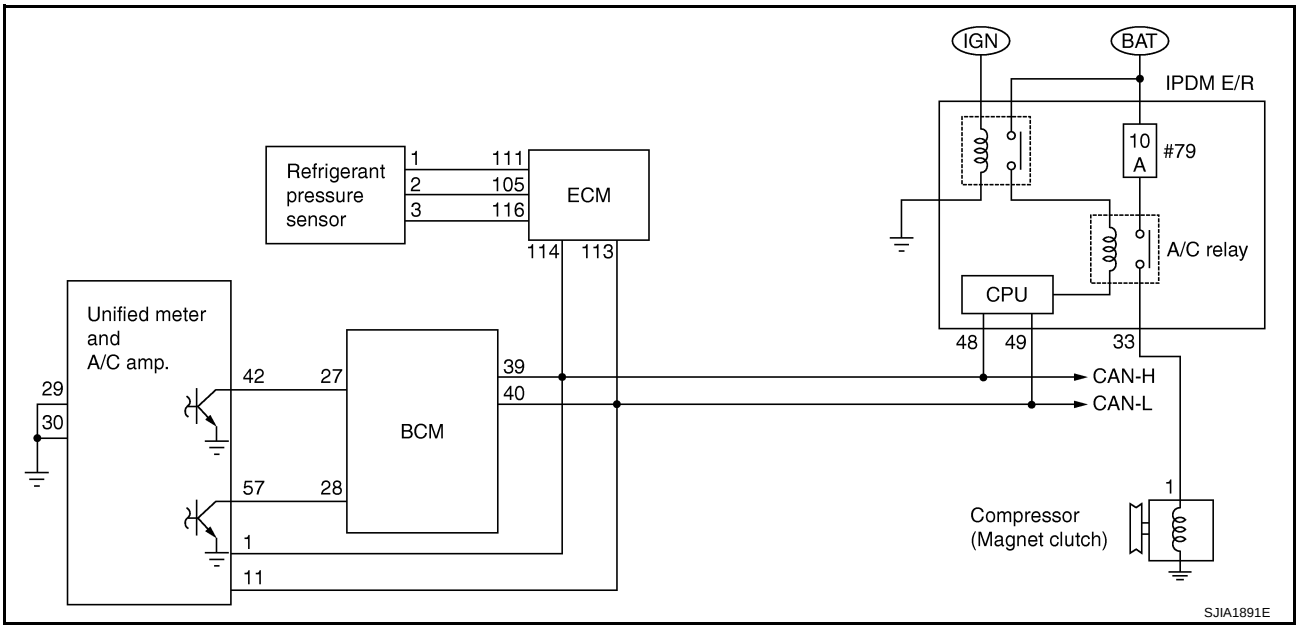


When intake air temperature is higher than 1°C (34°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than –5°C (23°F).



DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. CHECK AMBIENT SENSOR CIRCUIT AND INTAKE SENSOR CIRCUIT

Check ambient sensor and intake sensor. Refer to ATC-46, "FUNCTION CONFIRMATION PROCEDURE" , see No. 9.

OK or NG

OK >> GO TO 2.

NG >>
- Malfunctioning ambient sensor: Refer to ATC-92, "Ambient Sensor Circuit" .
- Malfunctioning intake sensor: Refer to ATC-100, "Intake Sensor Circuit" .

2. PERFORM AUTO ACTIVE TEST

Refer to PG-20, "Auto Active Test" .

Dose the magnet clutch operate?

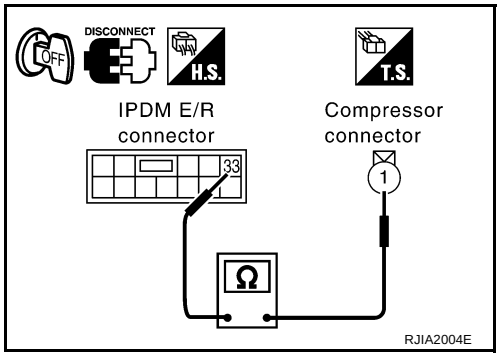
YES >>
- WITH CONSULT-III: GO TO 5.
- WITHOUT CONSULT-III: GO TO 6.

NO >> Check 10A fuse (No. 79, located in IPDM E/R), and GO TO 3. Refer to PG-23, "IPDM E/R Terminal Arrangement" .

3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor connector.
3. Check continuity between IPDM E/R harness connector E8 terminal 33 and compressor harness connector F24 terminal 1.

33 – 1 : Continuity should exist.



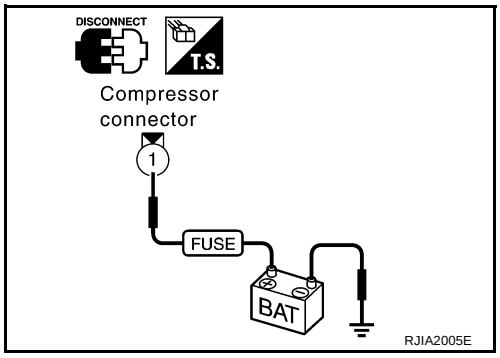
OK or NG

OK >> GO TO 4.

NG >> Repair harness or connector.

4. CHECK MAGNET CLUTCH CIRCUIT

Check for operation sound when applying battery voltage direct current to terminal.



OK or NG

OK >> 1. Replace IPDM E/R.
2. Go to self-diagnosis procedure ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and preform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.

NG >> 1. Replace magnet clutch.
2. Go to self-diagnosis procedure ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and preform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.

5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to ATC-33, "CONSULT-III Function (BCM)" .

A/C SW ON : AIR COND SIG ON

A/C SW OFF : AIR COND SIG OFF

OK or NG

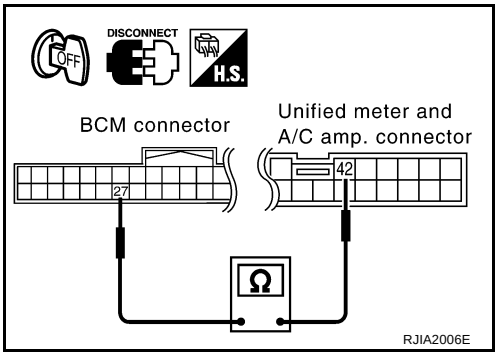
OK >> GO TO 8.

NG >> GO TO 6.

6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M90 terminal 27 and unified meter and A/C amp. harness connector M50 terminal 42.

27 – 42 : Continuity should exist.

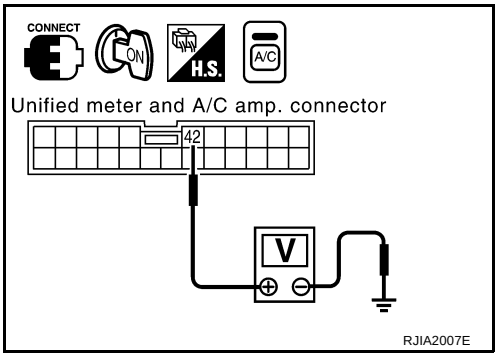


OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M50 terminal 42 and ground.



Terminals			Condition	Voltage
(+)		(–)		
Unified meter and A/C amp. connector	Terminal No.			
M50	42	Ground	A/C switch: ON (Blower motor operates.)	Approx. 0 V
			A/C switch: OFF	Approx. 5 V

OK or NG

OK >> GO TO 8.
NG-1 >> If the voltage is approx. 5 V when A/C switch is ON: Replace unified meter and A/C amp.
NG-2 >> If the voltage is approx. 0 V when A/C switch is OFF: Replace BCM.

8. CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-III

1. Start the engine.
2. Check voltage of refrigerant pressure sensor. Refer to EC-127, "CONSULT-III Reference Value in Data Monitor" .

WITHOUT CONSULT-III

1. Start the engine.
2. Check voltage between ECM harness connector M71 terminal 105 and ground.

Terminals			Condition	Voltage
(+)		(–)		
ECM connector	Terminal No.			
M71	105	Ground	A/C switch: ON (Blower motor operates.)	Approx. 1.0 - 4.0 V

OK or NG

OK >> ● WITH CONSULT-III: GO TO 9.
● WITHOUT CONSULT-III: GO TO 10.

NG >> Refer to EC-710, "REFRIGERANT PRESSURE SENSOR" .

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to ATC-33, "CONSULT-III Function (BCM)" .

FAN SW ON : HEATER FAN SW ON
FAN SW OFF : HEATER FAN SW OFF

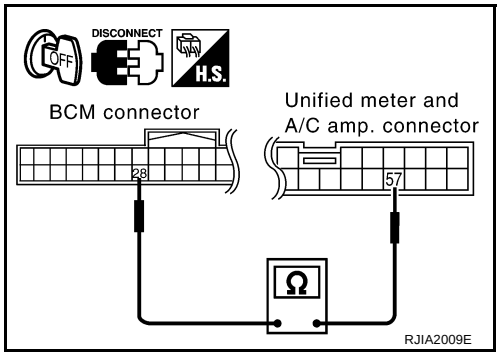
OK or NG

OK >> GO TO 12.
NG >> GO TO 10.

10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M90 terminal 28 and unified meter and A/C amp. harness connector M50 terminal 57.

28 – 57 : Continuity should exist.

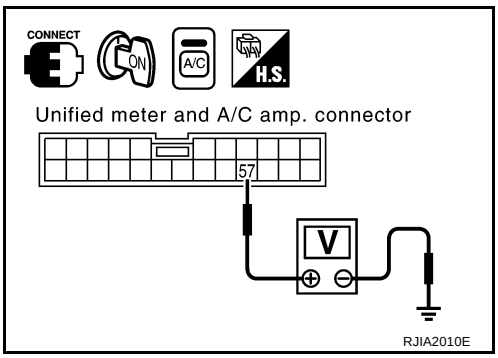


OK or NG

OK >> GO TO 11.
NG >> Repair harness or connector.

11. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (FAN ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M50 terminal 57 and ground.



Terminals			Condition	Voltage
(+)		(–)		
Unified meter and A/C amp. connector	Terminal No.			
M50	57	Ground	Fan control dial: ON (Blower motor operates.)	Approx. 0 V
			Fan control dial: OFF	Approx. 5 V

OK or NG

OK >> GO TO 12.
NG-1 >> If the voltage is approx. 5 V when blower motor is ON: Replace unified meter and A/C amp.
NG-2 >> If the voltage is approx. 0 V when blower motor is OFF: Replace BCM.

12. CHECK CAN COMMUNICATION

Check CAN communication. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

- BCM – ECM
- ECM – IPDM E/R
- ECM – Unified meter and A/C amp.

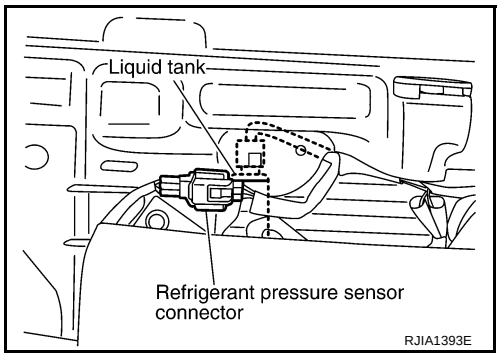
OK or NG

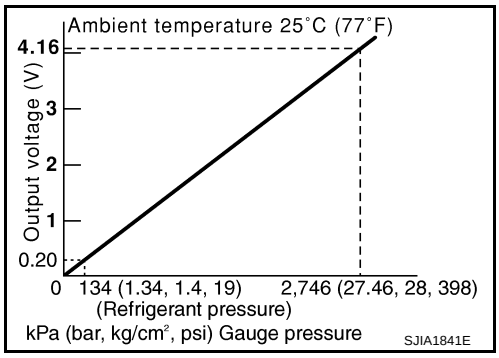
OK >> Replace ECM.
NG >> Repair or replace malfunctioning part(s).

COMPONENT INSPECTION

Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the liquid tank.
Make sure that the A/C refrigerant pressure and the sensor output voltage are within the specified range as shown in the A/C operating condition figure. Refer to EC-710, "REFRIGERANT PRESSURE SENSOR" .





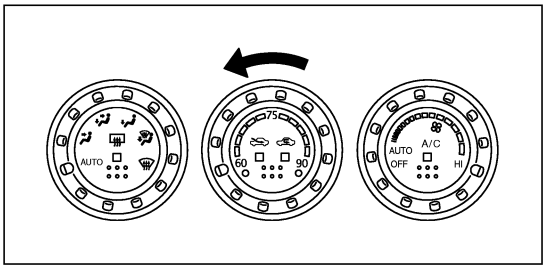
Insufficient Cooling

NJS00016

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature decrease

a. Turn temperature control dial counterclockwise until 18°C (60°F).

b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)

OK

4. Perform self-diagnosis STEP-2. (*11)

NG → Go to appropriate malfunctioning sensor circuit. (*5)

OK

5. Perform self-diagnosis STEP-4. (*11)

NG → **Go to appropriate malfunctioning items.**
- Check LAN system circuit. (*6)
- Check blower motor circuit. (*7)
- Check magnet clutch circuit. (*8)

OK

6. Check compressor belt tension. Refer to (*13), “Checking Drive Belts”.

NG → Adjust or replace compressor belt.

OK

7. Check air mix door operation. (*2)

NG → Replace air mix door motor.

OK

8. Check cooling fan motor operation.

NG → Refer to (*14), “System Description”.

OK

9. Before connectiong Recovery / Recycling Recharging equipment to vehicle, check Recovery / Recycling Recharging equipment gauges.
No refrigerant pressure should be displayed.
If NG, recover refrigerant from equipment lines.

OK

10. Confirm refrigerant purity in supply tank using Recovery / Recycling Recharging equipment with refrigerant identifire.

NG → Refer to Contaminated refrigerant. (*12)

OK

11. Connect Recovery / Recycling Recharging equipment to vehicle. Confirm refrigerant purity in vehicle A/C system using Recovery / Recycling Recharging equipment with refrigerant identifire.

NG

OK

12. Check for evaporator core freeze up.

NG (Freeze up.) → Perform performance test diagnosis. Refer to (*9)

(Does not freeze up.)

OK

13. Check refrigeration cycle pressure with manifold gauge connected. Refer to (*3).

NG

OK

14. Check ducts for air leaks.

NG → Replair air leaks.

OK

15. Perform temperature setting trimmer. (*4)
(1) Set up AUXILIARY MECHANISM mode in self-diagnosis.
(2) Turn temperature dial counterclockwise as desired.

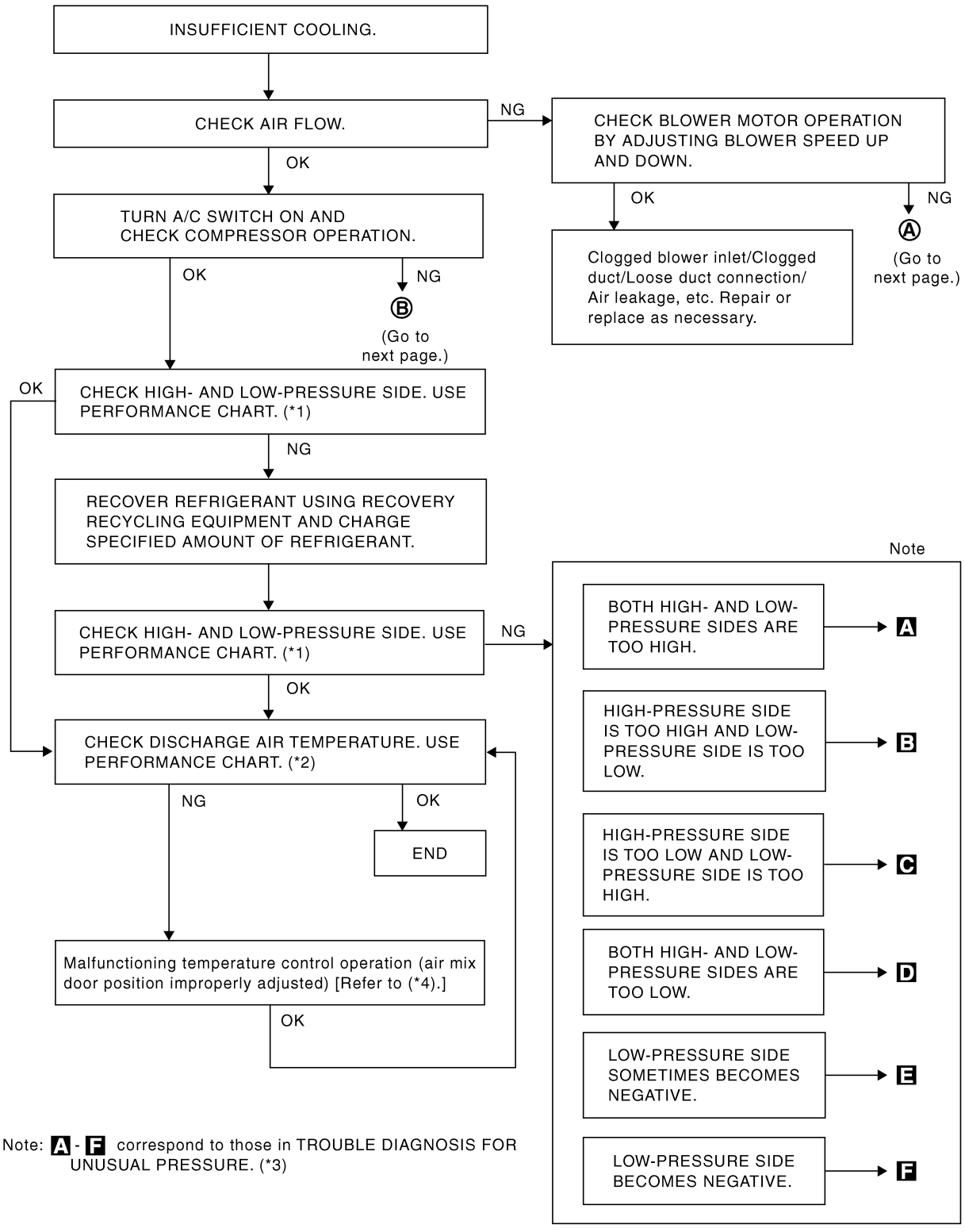
OK

INSPECTION END

SJIA1130E

*1	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2	ATC-63, "Air Mix Door Motor Circuit"	*3	ATC-85, "Test Reading"
*4	ATC-50, "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"	*5	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.	*6	ATC-56, "LAN System Circuit"
*7	ATC-69, "Blower Motor Circuit"	*8	ATC-74, "Magnet Clutch Circuit"	*9	ATC-83, "PERFORMANCE TEST DIAGNOSIS"
*10	ATC-53, "Operational Check"	*11	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*12	ATC-5, "CONTAMINATED REFRIGERANT"
*13	EM-12, "Checking Drive Belts"	*14	EC-543, "SYSTEM DESCRIPTION"		

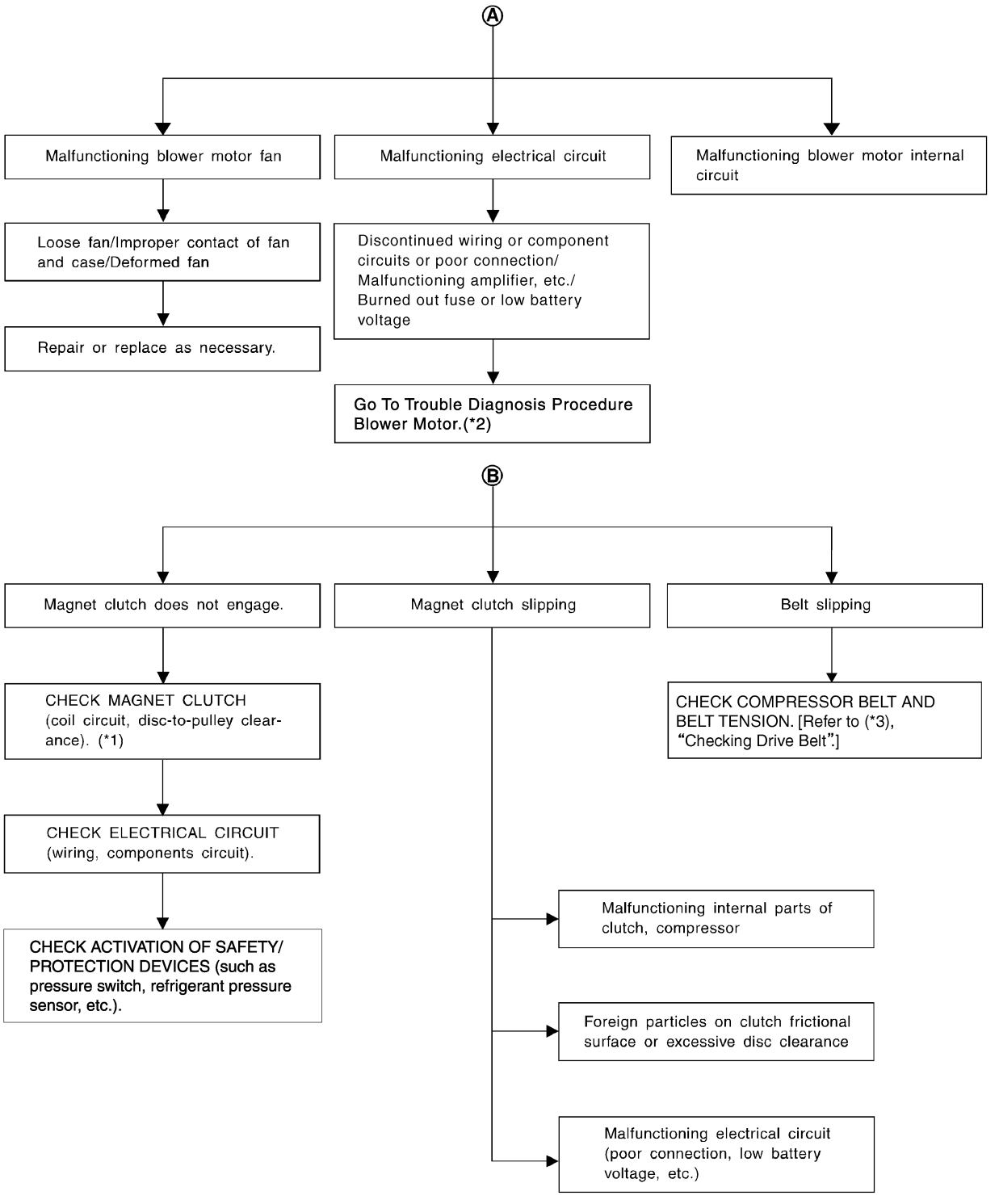
PERFORMANCE TEST DIAGNOSIS



SJIA1226E

*1 ATC-85, "PERFORMANCE CHART" *2 ATC-85, "PERFORMANCE CHART" *3 ATC-86, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"

*4 ATC-63, "Air Mix Door Motor Circuit"



SJIA1642E

*1 ATC-125, "Removal and Installation of Compressor" *2 ATC-69, "Blower Motor Circuit" *3 EM-12, "Checking Drive Belts"

PERFORMANCE CHART

Test Condition

Testing must be performed as follows:

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door windows	Open
Hood	Open
TEMP.	Max. COLD
Mode control dial	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

Test Reading

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	6.1 - 8.7 (43 - 48)
	25 (77)	8.5 - 11.5 (47 - 53)
60 - 70	20 (68)	8.7 - 11.1 (48 - 52)
	25 (77)	11.5 - 14.5 (53 - 58)

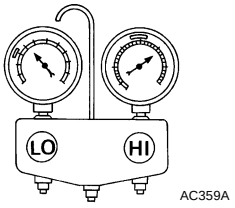
Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm^2 , psi)	Low-pressure (Suction side) kPa (kg/cm^2 , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	850 - 1,050 (8.67 - 10.71, 123.3 - 152.3)	180 - 230 (1.84 - 2.35, 26.1 - 33.4)
	25 (77)	1,020 - 1,260 (10.40 - 12.85, 147.9 - 182.7)	190 - 240 (1.94 - 2.45, 27.6 - 34.8)
	30 (86)	1,150 - 1,410 (11.73 - 14.38, 166.8 - 204.5)	210 - 250 (2.14 - 2.55, 30.5 - 36.3)
	35 (95)	1,240 - 1,510 (12.65 - 15.40, 179.8 - 219.0)	220 - 270 (2.24 - 2.75, 31.9 - 39.2)

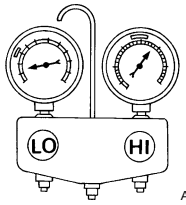
TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

Whenever system's high and/or low side pressure(s) is/are unusual, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table).

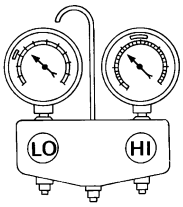
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	● Clean condenser. ● Check and repair cooling fan as necessary.
	● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2 , 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	● An area of the low-pressure pipe is colder than areas near the evaporator outlet. ● Low-pressure pipe is sometimes covered with frost.	● Excessive liquid refrigerant on low-pressure side. ● Excessive refrigerant discharge flow. ● Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment.	Replace expansion valve.

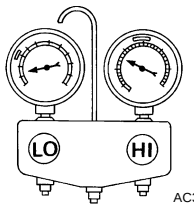
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	● Check and repair or replace malfunctioning parts. ● Check lubricant for contamination.

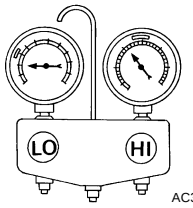
High-pressure Side is Too Low and Low-pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC356A	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

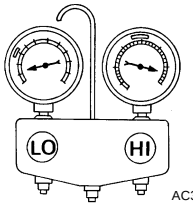
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	● There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. ● Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	● Replace liquid tank. ● Check lubricant for contamination.
	● Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. ● Expansion valve inlet is frosted. ● Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Expansion valve and liquid tank are warm or slightly cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant for leaks. Refer to ATC-138, "Checking for Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	● Remove foreign particles by using compressed air. ● Replace expansion valve. ● Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	● Check intake sensor circuit. Refer to ATC-100, "Intake Sensor Circuit" . ● Replace compressor. ● Repair evaporator fins. ● Replace evaporator. ● Refer to ATC-69, "Blower Motor Circuit" .

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	● Air conditioning system does not function and does not cyclically cool the compartment air. ● The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative.  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or wet with dew.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles. ● If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. ● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). ● If either of the above methods cannot correct the malfunction, replace expansion valve. ● Replace liquid tank. ● Check lubricant for contamination.

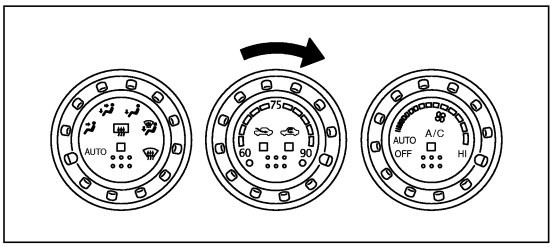
Insufficient Heating

NJS00017

SYMPTOM: Insufficient heating

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature increase

a. Turn temperature control dial clockwise until 32˚C (90˚F) .

b. Check for hot air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*1).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*2)

OK

4. Perform self-diagnosis STEP-2. (*3)

NG: Go to appropriate malfunctioning sensor circuit. (*5)

OK

5. Perform self-diagnosis STEP-4. (*3)

NG: **Go to appropriate malfunctioning items.**
- Check LAN system circuit. (*6)
- Check blower motor circuit. (*7)

OK

6. Check the following:
- Engine coolant level [Refer to (*10), “Changing Engine Coolant”.]
- Hoses for leaks or kinks.
- Radiator cap. [Refer to (*11), “Checking Radiator cap”.]
- Air in cooling system.

NG: Repair/replace as necessary.

OK

7. Check air mix door operation. Refer to (*4).

NG: Go to Air Mix Door Motor Circuit. (*8)

OK

8. Check ducts for air leaks.

NG: Repair leaks.

OK

9. Check the heater inlet and outlet hose temperatures by touching.

Hot inlet
Warm outlet

Check engine coolant temperature sensor (*9).

NG

Check heater hoses for proper installation.

NG: Repair or replace as necessary. Retest.

OK

Both hoses warm

OK

Back flush heater core, drain and refill coolant.
[Refer to (*10), “Changing Engine Coolant”.] Retest.

Hot inlet
Warm outlet

System OK

Both hoses warm

Replace heater core. Refill engine coolant.
[Refer to (*10), “Changing Engine Coolant”.] Retest.

Hot inlet
Warm outlet

SJIA1131E

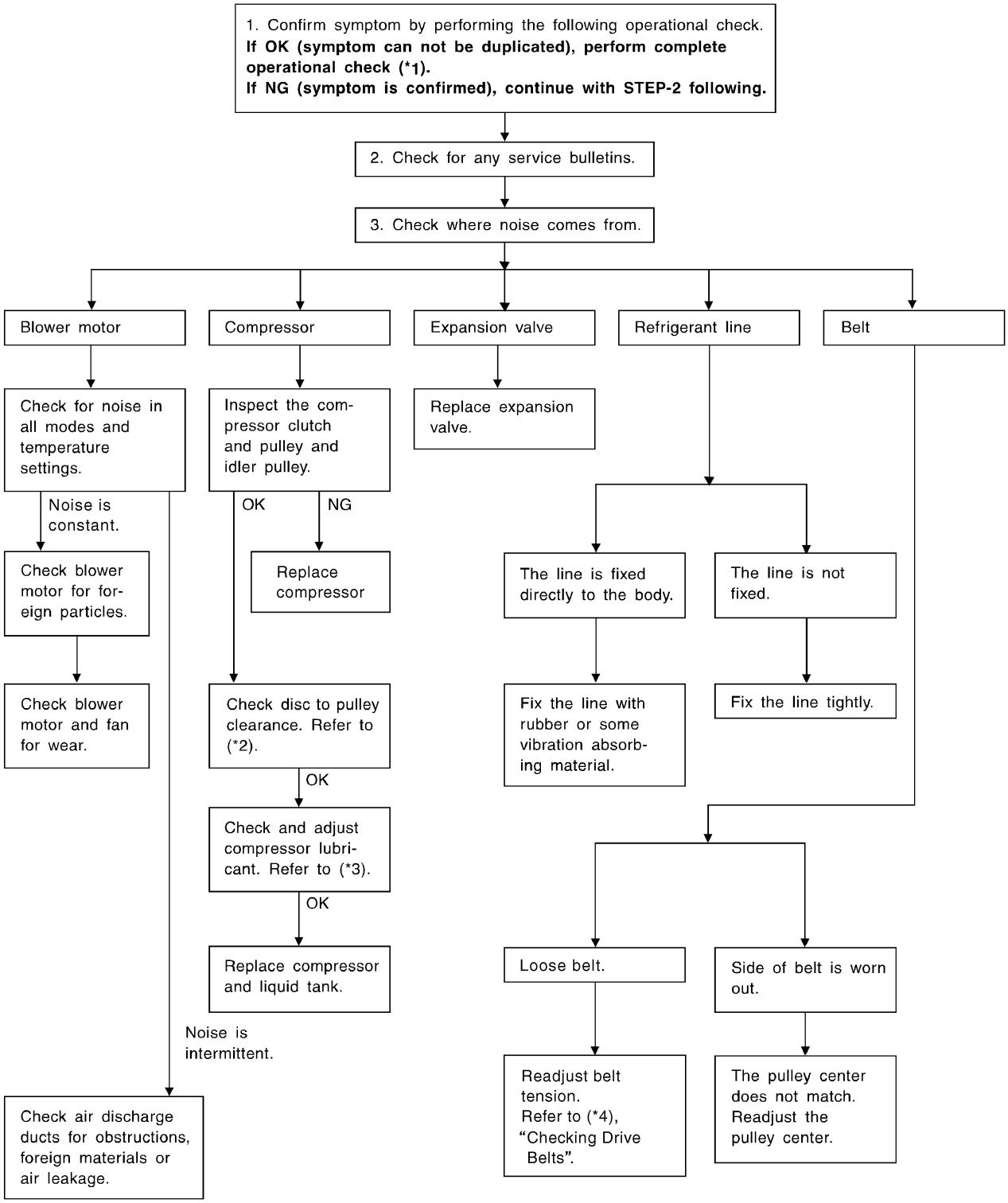
*1 ATC-53, "Operational Check"
*2 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*3 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*4 ATC-63, "Air Mix Door Motor Circuit"
*5 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*6 ATC-56, "LAN System Circuit"
*7 ATC-69, "Blower Motor Circuit"
*8 ATC-63, "Air Mix Door Motor Circuit"
*9 EC-223, "DTC P0117, P0118 ECT SENSOR"
*10 CO-10, "Changing Engine Coolant"
*11 CO-15, "Checking Radiator Cap"

Noise

NJS00018

SYMPTOM: Noise

INSPECTION FLOW



SJIA0843E

*1 ATC-53, "Operational Check"

*2 ATC-126, "Check Disc to Pulley Clearance"

*3 ATC-21, "Maintenance of Lubricant Quantity in Compressor"

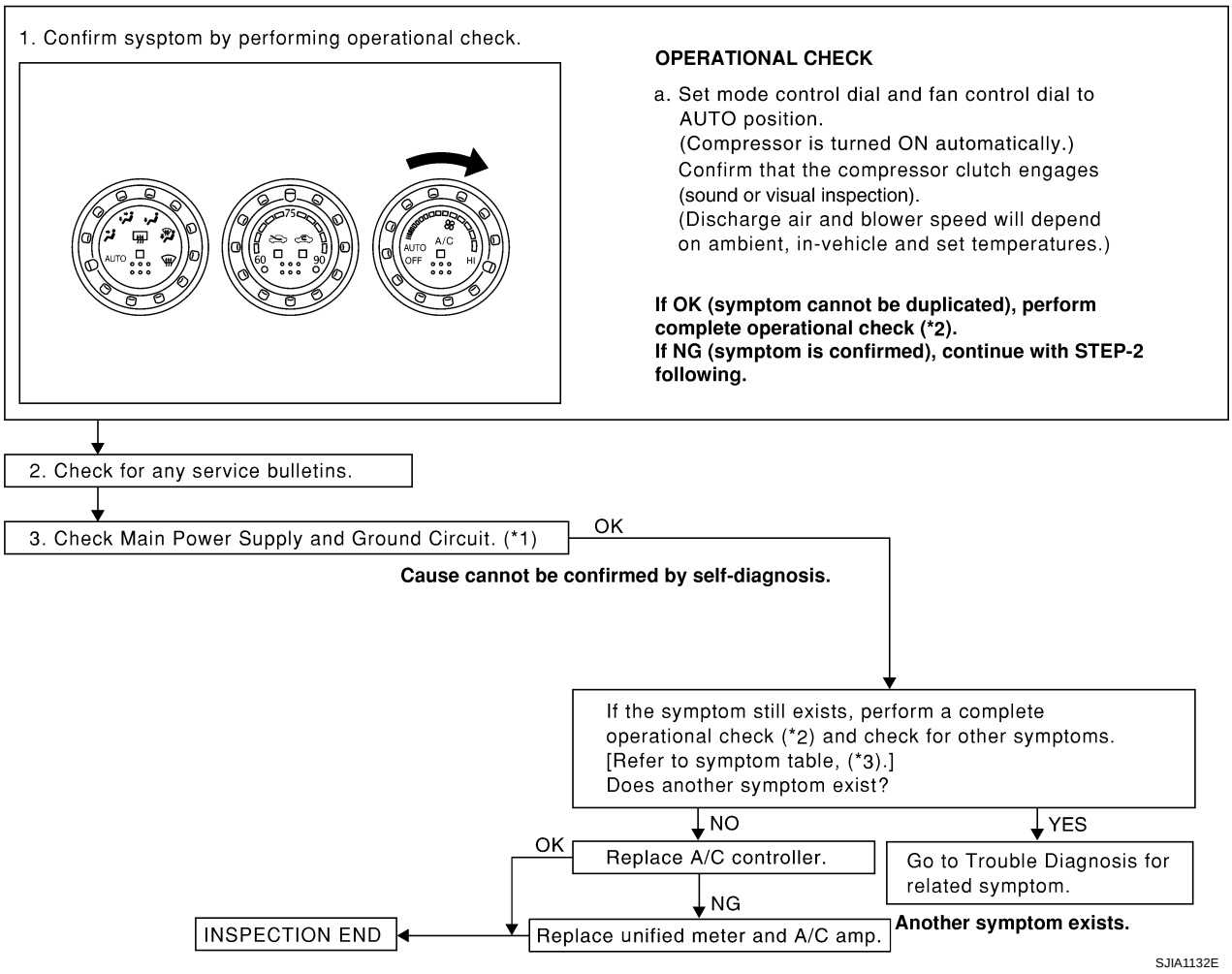
*4 EM-12, "Checking Drive Belts"

Self-diagnosis

NJS00019

SYMPTOM: Self-diagnosis cannot be performed.

INSPECTION FLOW



*1 ATC-54, "Power Supply and Ground Circuit for Auto Amp." *2 ATC-53, "Operational Check" *3 ATC-34, "SYMPTOM TABLE"

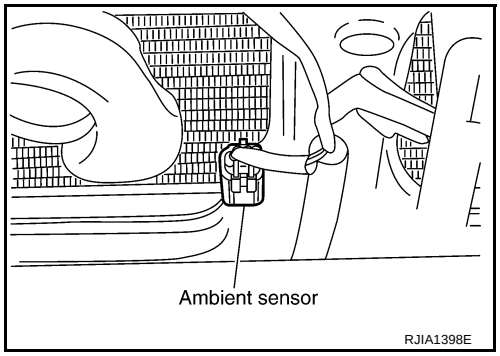
Ambient Sensor Circuit

NJS0001A

COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor is attached on the hood lock stay. It detects ambient temperature and converts it into a resistance value which is then input into the unified meter and A/C amp.



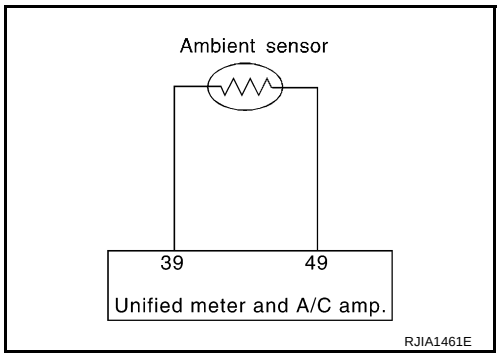
AMBIENT TEMPERATURE INPUT PROCESS

The unified meter and A/C amp. includes a processing circuit for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the unified meter and A/C amp. function. It only allows the unified meter and A/C amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds.

As an example, consider stopping for a few minutes after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front bumper area, location of the ambient sensor.

DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR

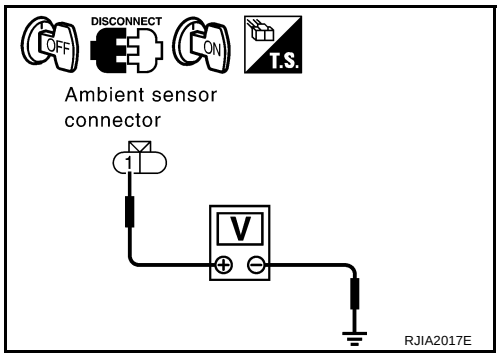
SYMPTOM: Ambient sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E34 terminal 1 and ground.

1 – Ground : Approx. 5 V



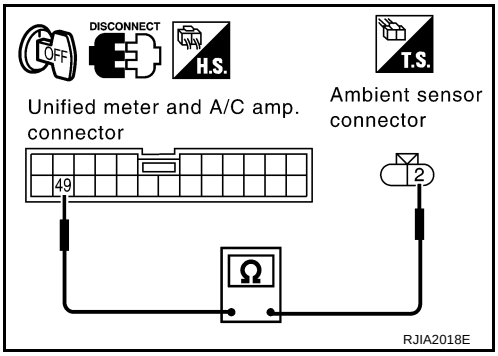
OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 49.

2 – 49 : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK AMBIENT SENSOR

Refer to ATC-94, "Ambient Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace ambient sensor.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

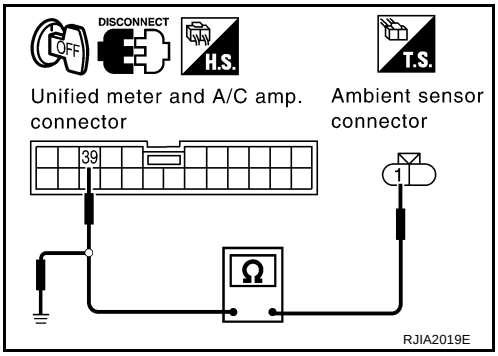
4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 39.

1 – 39 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E34 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

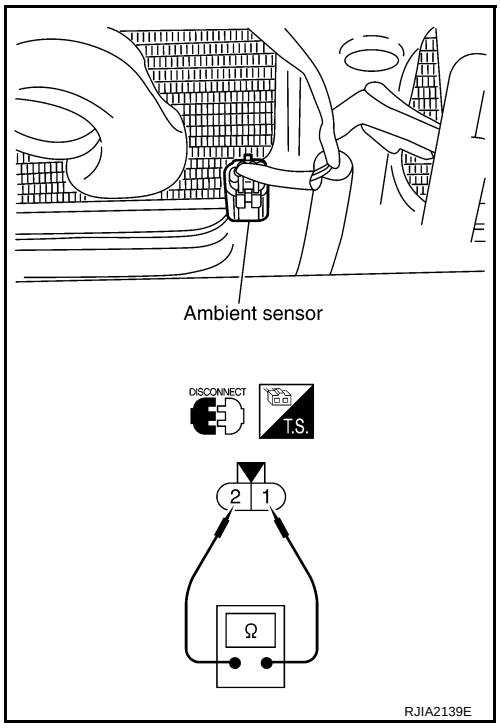
NG >> Repair harness or connector.

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor connector E34, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



If NG, replace ambient sensor.

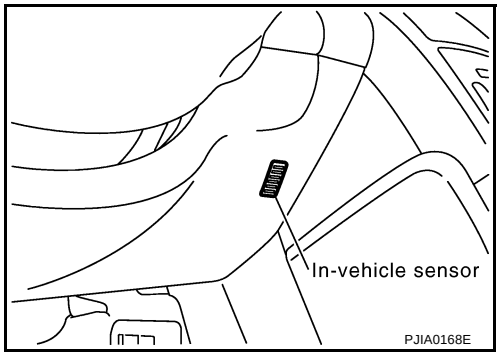
In-vehicle Sensor Circuit

NJS0001B

COMPONENT DESCRIPTION

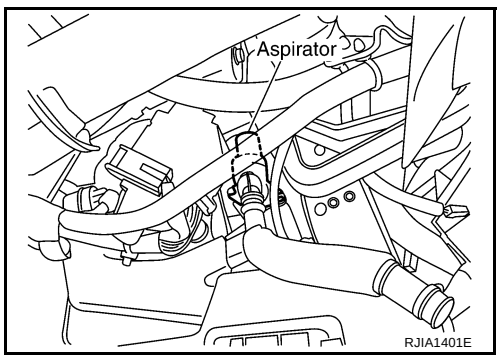
In-vehicle Sensor

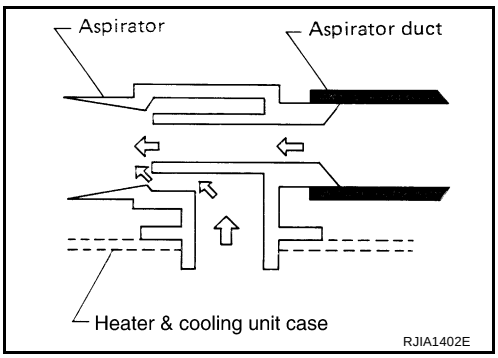
The in-vehicle sensor is located on instrument driver panel lower. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the unified meter and A/C amp.



Aspirator

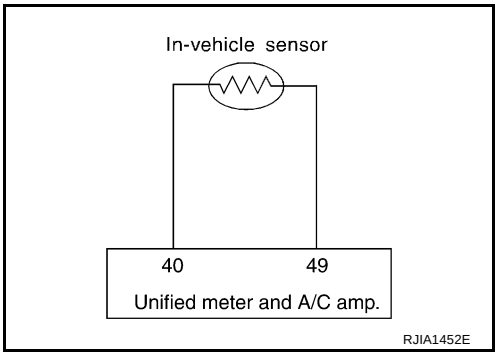
The aspirator is located on driver's side of heater & cooling unit assembly. It produces vacuum pressure due to air discharged from the heater & cooling unit assembly, continuously taking compartment air in the aspirator.





DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



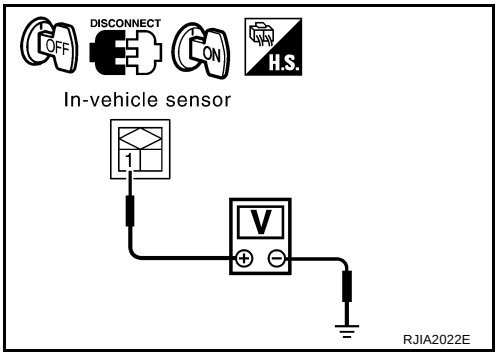
1. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector M42 terminal 1 and ground.

1 – Ground : Approx. 5 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.



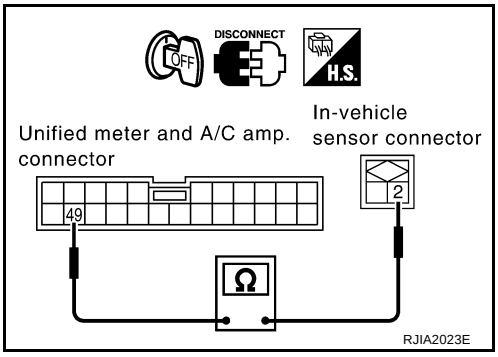
2. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 49.

2 – 49 : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. CHECK IN-VEHICLE SENSOR

Refer to ATC-96, "In-vehicle Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace in-vehicle sensor.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

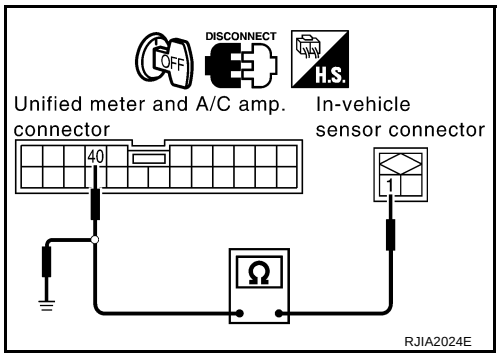
4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 40.

1 – 40 : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M42 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

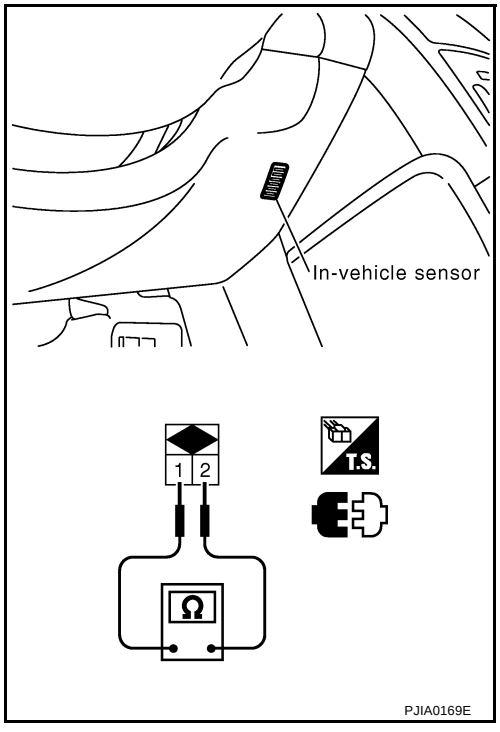
NG >> Repair harness or connector.

COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M42, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



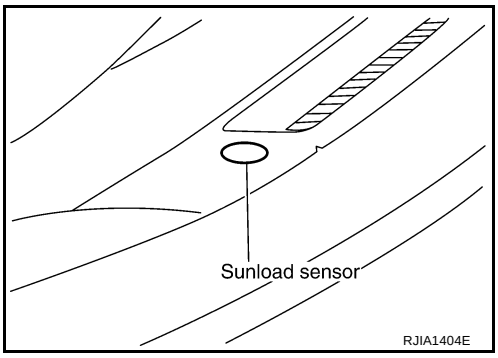
If NG, replace in-vehicle sensor.

Sunload Sensor Circuit

NJS0001C

COMPONENT DESCRIPTION

The sunload sensor is located on the passenger's side defroster grille. It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the unified meter and A/C amp.



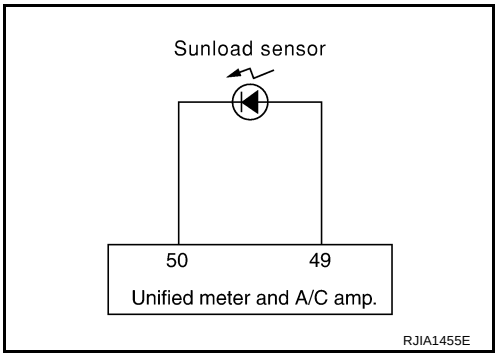
SUNLOAD INPUT PROCESS

The unified meter and A/C amp. also includes a processing circuit which averages the variations in detected sunload over a period of time. This prevents drastic swings in the ATC system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the ATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.

DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR

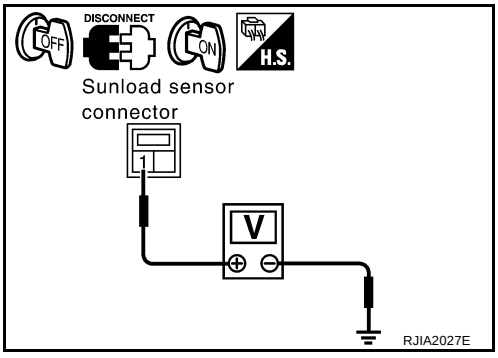
SYMPTOM: Sunload sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector M18 terminal 1 and ground.

1 – Ground : Approx. 5 V



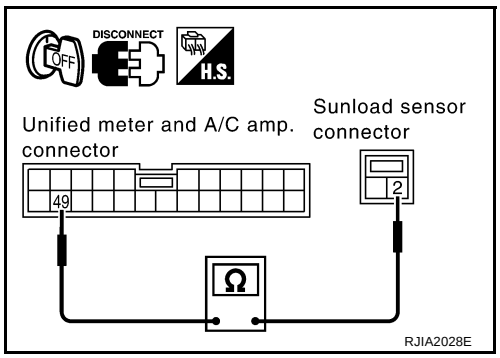
OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 49.

2 – 49 : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and unified meter and A/C amp. connector.
2. Refer to ATC-99, "Sunload Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace sunload sensor.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

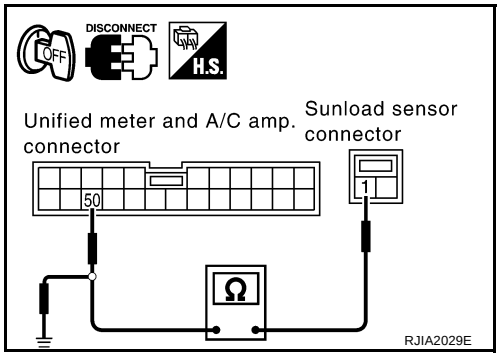
4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 50.

1 – 50 : Continuity should exist.

4. Check continuity between sunload sensor harness connector M18 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

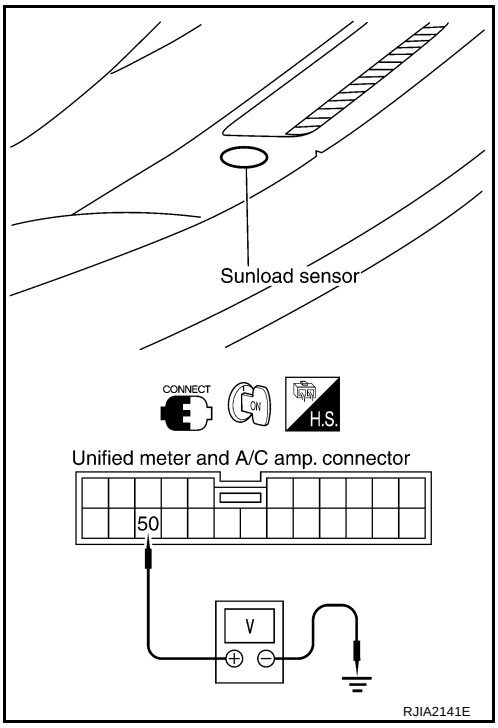
OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> Repair harness or connector.

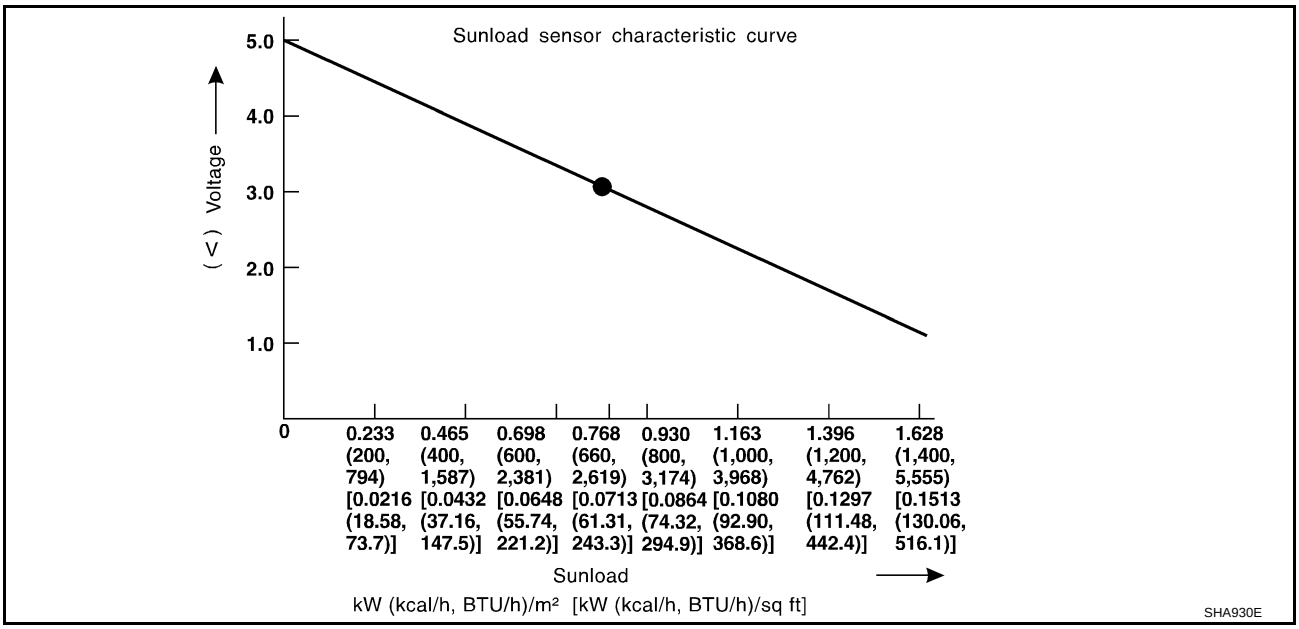
COMPONENT INSPECTION

Sunload Sensor

Measure voltage between unified meter and A/C amp. harness connector M50 terminal 50 and ground.



- When checking sunload sensor, select a place where sunshine directly on it.



If NG, replace sunload sensor.

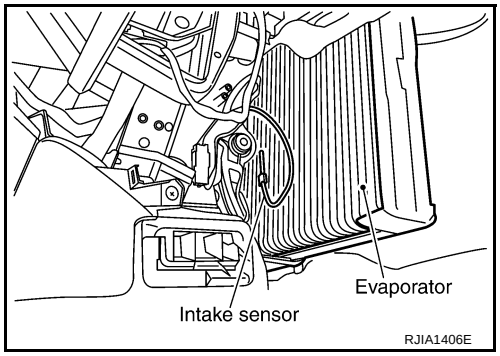
Intake Sensor Circuit

NJS0001D

COMPONENT DESCRIPTION

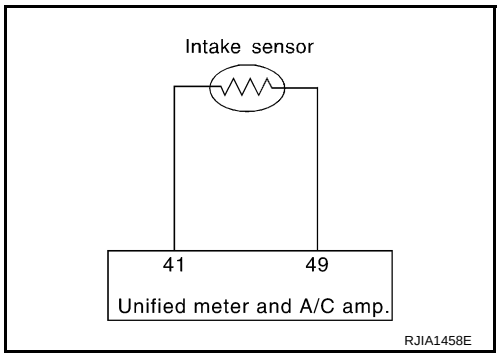
Intake Sensor

The intake sensor is located on the heater & cooling unit assembly. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the unified meter and A/C amp.



DIAGNOSIS PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



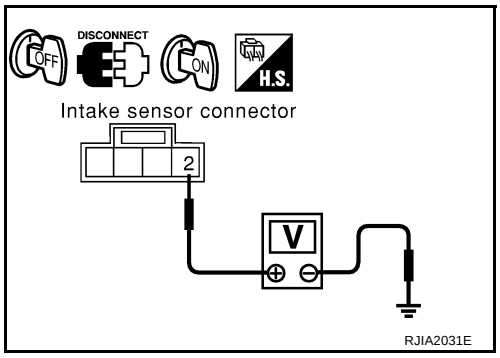
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M255 terminal 2 and ground.

2 – Ground : Approx. 5 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.



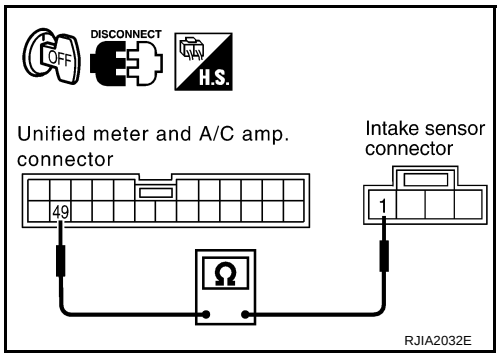
2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M255 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 49.

1 – 49 : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. CHECK INTAKE SENSOR

Refer to ATC-101, "Intake Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace intake sensor.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

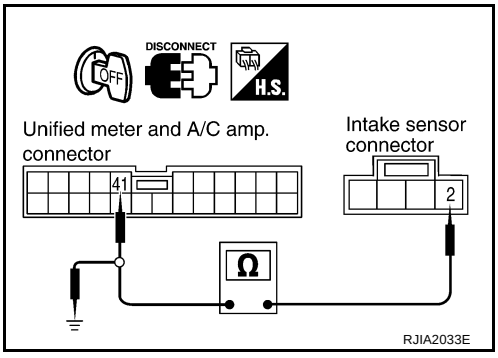
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M255 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 41.

2 – 41 : Continuity should exist.

4. Check continuity between intake sensor harness connector M255 terminal 2 and ground.

2 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> Repair harness or connector.

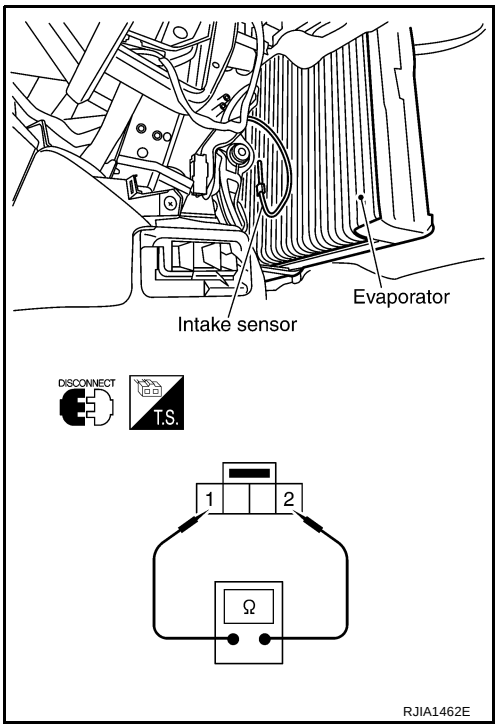
COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector M255, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.34
–10 (14)	9.62
–5 (23)	7.56
0 (32)	6.00
5 (41)	4.80
10 (50)	3.87
15 (59)	3.15
20 (68)	2.57
25 (77)	2.12
30 (86)	1.76
35 (95)	1.47
40 (104)	1.23
45 (113)	1.04

If NG, replace intake sensor.



A/C CONTROLLER

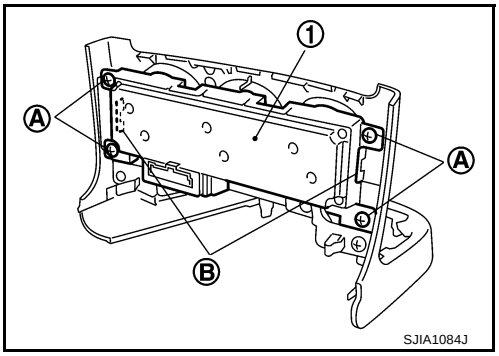
PFP:27500

Removal and Installation

NJS0001E

REMOVAL

1. Remove console finisher (A/T) or console boot (M/T). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws (A) and clips (B), and then remove A/C controller (1) from console finisher (A/T) or console boot (M/T).

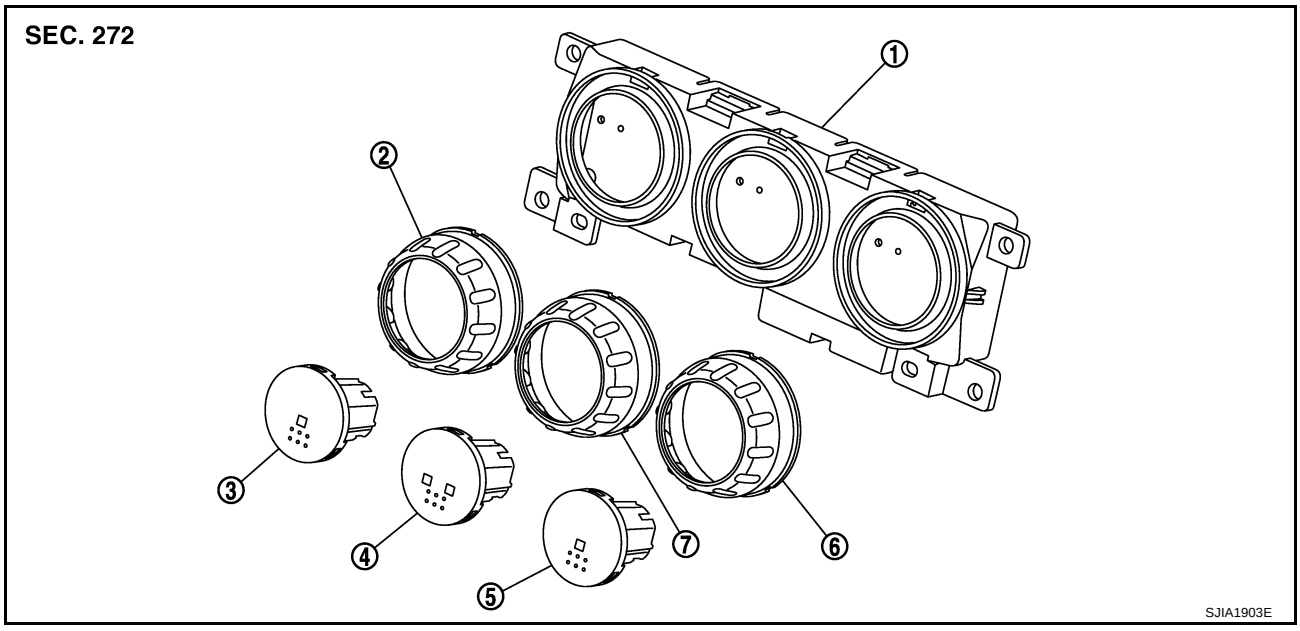


INSTALLATION

Installation is basically the reverse order of removal.

Disassembly and Assembly

NJS000CT



1. A/C controller assembly
2. Mode control dial
3. Rear window defogger switch
4. Intake switch
5. A/C switch
6. Fan control dial
7. Temperature control dial

NOTE:

When disassembling controller, wind gummed tape around each dial assembly and pull out the dial assembly together with switch from the A/C controller assembly.

AUTO AMP

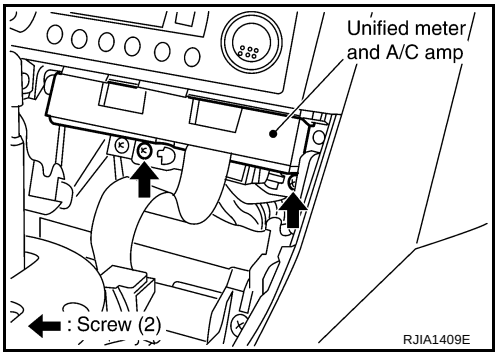
PFP:27760

Removal and Installation of Unified Meter and A/C Amp.

NJS0001F

REMOVAL

1. Remove console finisher (A/T) or console boot (M/T). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws, and then remove unified meter and A/C amp.



INSTALLATION

Installation is basically the reverse order of removal.

AMBIENT SENSOR

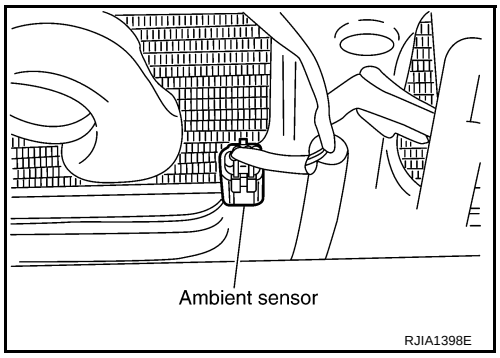
PFP:27722

Removal and Installation

NJS0001G

REMOVAL

1. Disconnect ambient sensor connector.
2. Remove ambient sensor.



INSTALLATION

Installation is basically the reverse order of removal.

IN-VEHICLE SENSOR

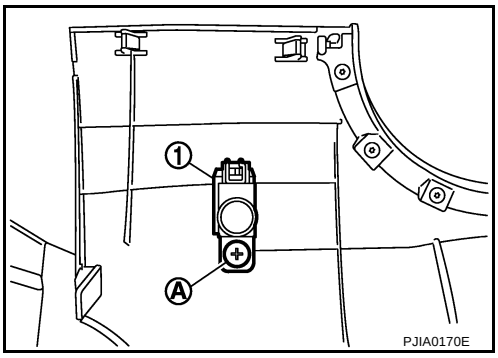
PFP:27720

Removal and Installation

NJS0001H

REMOVAL

1. Remove instrument driver panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screw (A), and then remove in-vehicle sensor (1).



INSTALLATION

Installation is basically the reverse order of removal.

SUNLOAD SENSOR

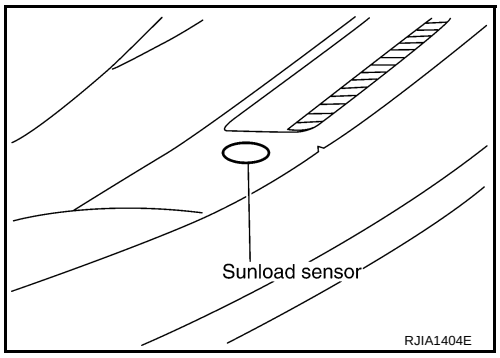
PFP:27721

Removal and Installation

NJS0001I

REMOVAL

1. Pull out sunload sensor from instrument panel.
2. Disconnect sunload sensor connector, and then remove sunload sensor.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE SENSOR

PFP:27723

Removal and Installation

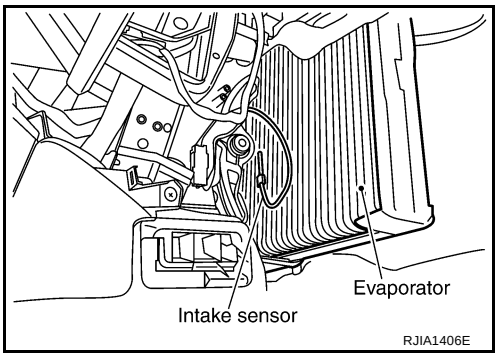
NJS0001J

REMOVAL

1. Remove low-pressure pipe 1 and high-pressure pipe 2. Refer to ATC-131, "Removal and Installation of Low-pressure Pipe 1 and High-pressure Pipe 2" .

   CAUTION:
   Cap or wrap the joint of evaporator, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with suitable material such as vinyl tape to avoid the entry of air.

2. Slide evaporator to passenger side, and then remove intake sensor.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

BLOWER UNIT

PFP:27200

Removal and Installation

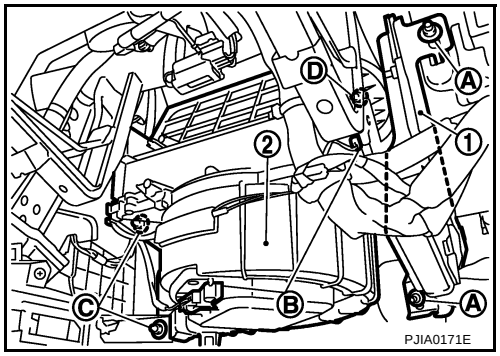
NJS0001K

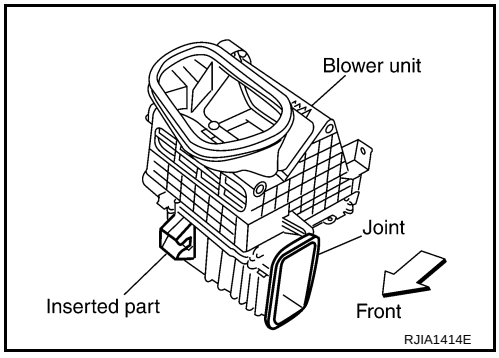
REMOVAL

1. Remove remote keyless entry receiver. Refer to BL-92, "Removal and Installation of Remote Keyless Entry Receiver" .
2. Remove mounting nuts (A), and then remove ECM (1) with bracket attached.
3. Disconnect intake door motor and blower motor connector (B).
4. Remove mounting screws (C) and bolt (D), and then remove blower unit (2).

CAUTION:

Move blower unit rightward, and remove location pin (1 part) and joint. Then remove blower unit downward.





INSTALLATION

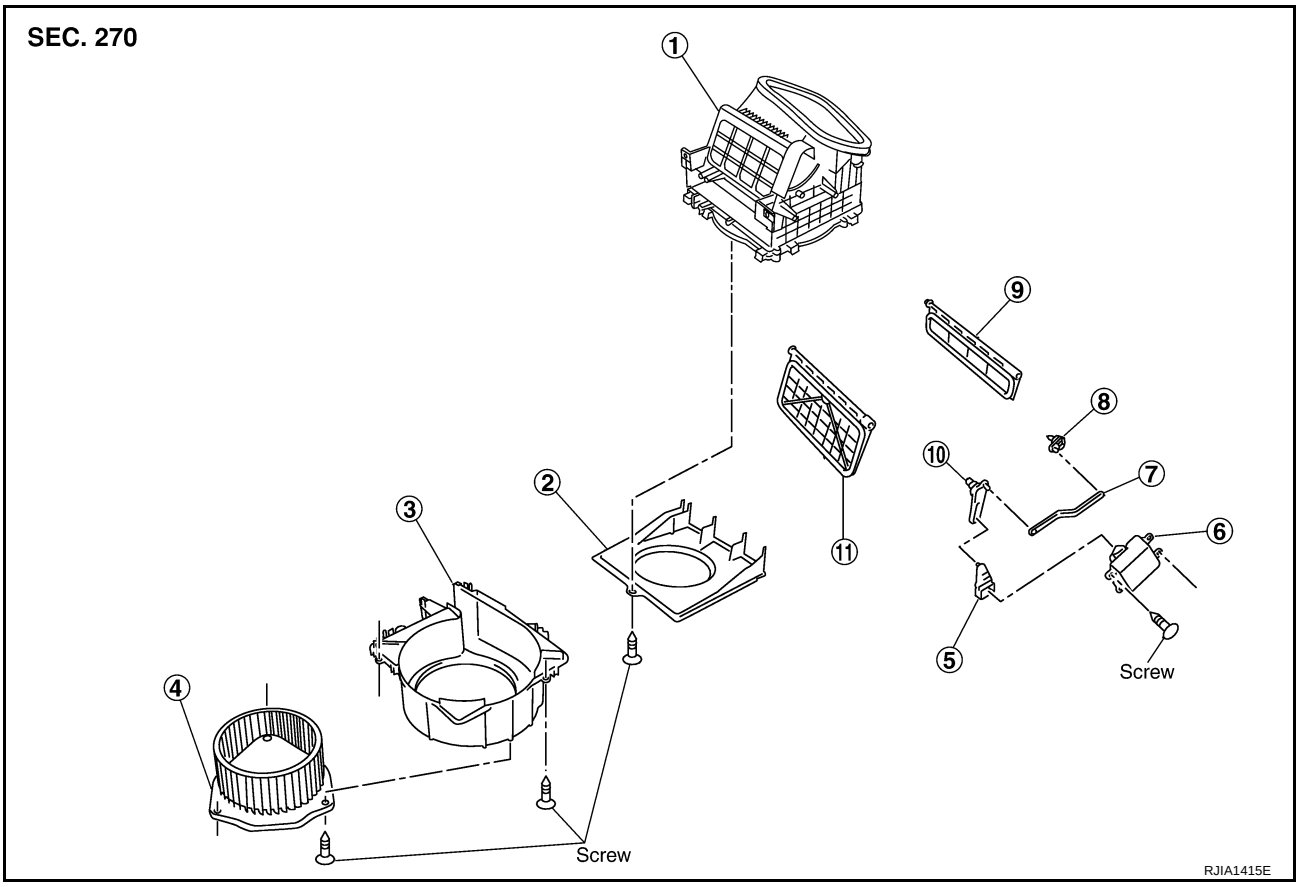
Installation is basically the reverse order of removal.

CAUTION:

Make sure location pin (1 part) and joint are securely inserted.

Disassembly and Assembly

NJS0001L



1. Intake upper case
2. Intake bell mouth
3. Intake lower case
4. Blower motor assembly
5. Intake door lever 2
6. Intake door motor
7. Intake door link
8. Intake door lever 3
9. Intake door 2
10. Intake door lever 1
11. Intake door 1

BLOWER MOTOR

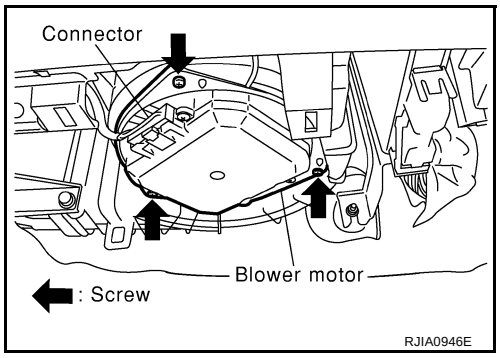
PFP:27226

Removal and Installation

NJS0001M

REMOVAL

1. Remove instrument passenger panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect blower motor connector.
3. Remove mounting screws, and then remove blower motor.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE DOOR MOTOR

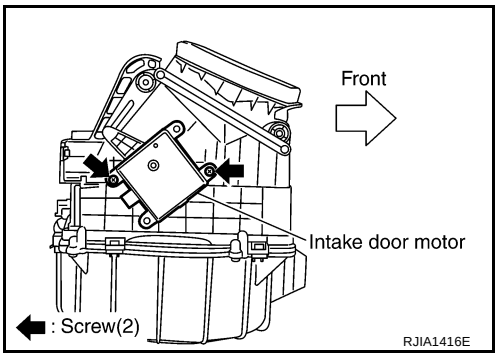
PFP:27730

Removal and Installation

NJS0001N

REMOVAL

1. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
2. Remove mounting screws, and then remove intake door motor from blower unit.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER & COOLING UNIT ASSEMBLY

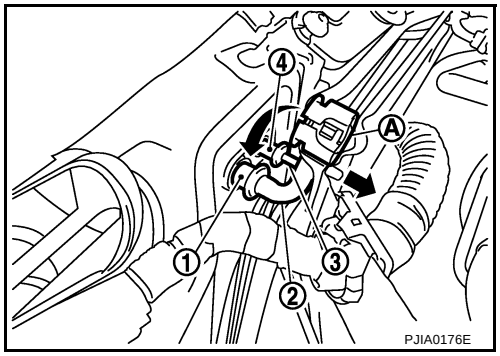
PFP:27110

Removal and Installation

NJS0001O

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Drain coolant from cooling system. Refer to CO-10, "Changing Engine Coolant" .
3. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
4. Disconnect one-touch joint between low-pressure pipe 1 (1) and low-pressure pipe 2 (2) with disconnector (SST: 9253089916) (A).

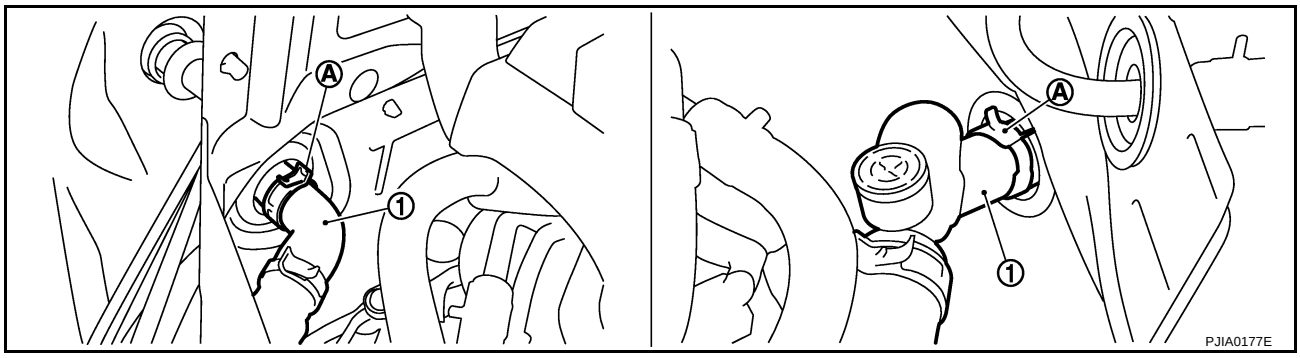


CAUTION:
Cap or wrap the joint of low-pressure pipe 1 and low-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.

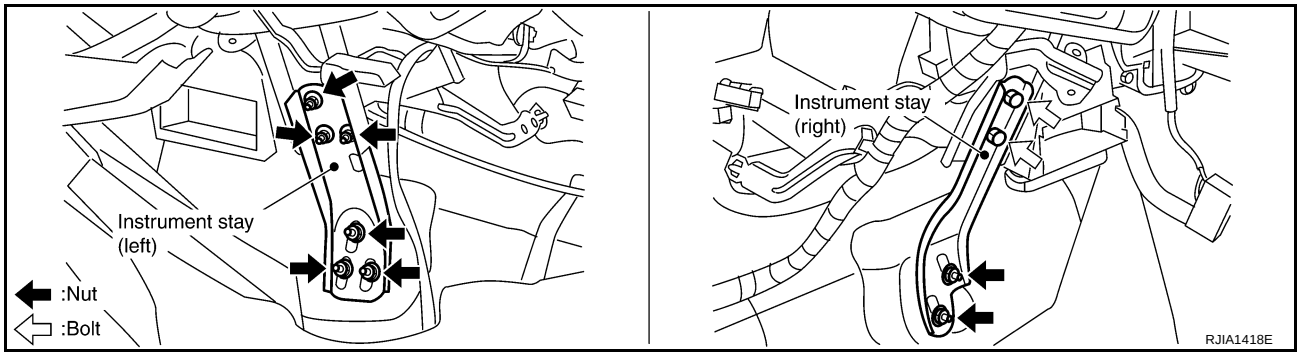
5. Disconnect one-touch-joint between high-pressure pipe 1 (3) and high-pressure pipe 2 (4) with disconnector (SST: 9253089908) (A).

CAUTION:
Cap or wrap the joint of high-pressure pipe 1 and high-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.

6. Remove clamps (A), and then disconnect two heater hoses (1) from heater core.

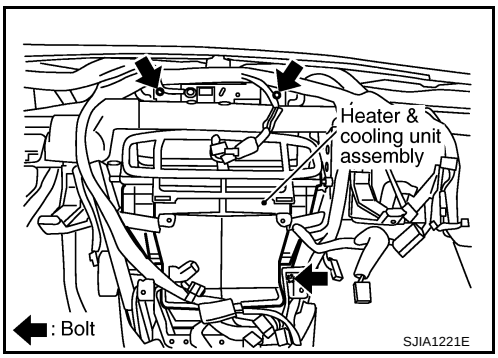


7. Remove instrument panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
8. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
9. Remove clips of vehicle harness from steering member.
10. Remove mounting nuts and bolts, and then remove instrument stays (left and right).

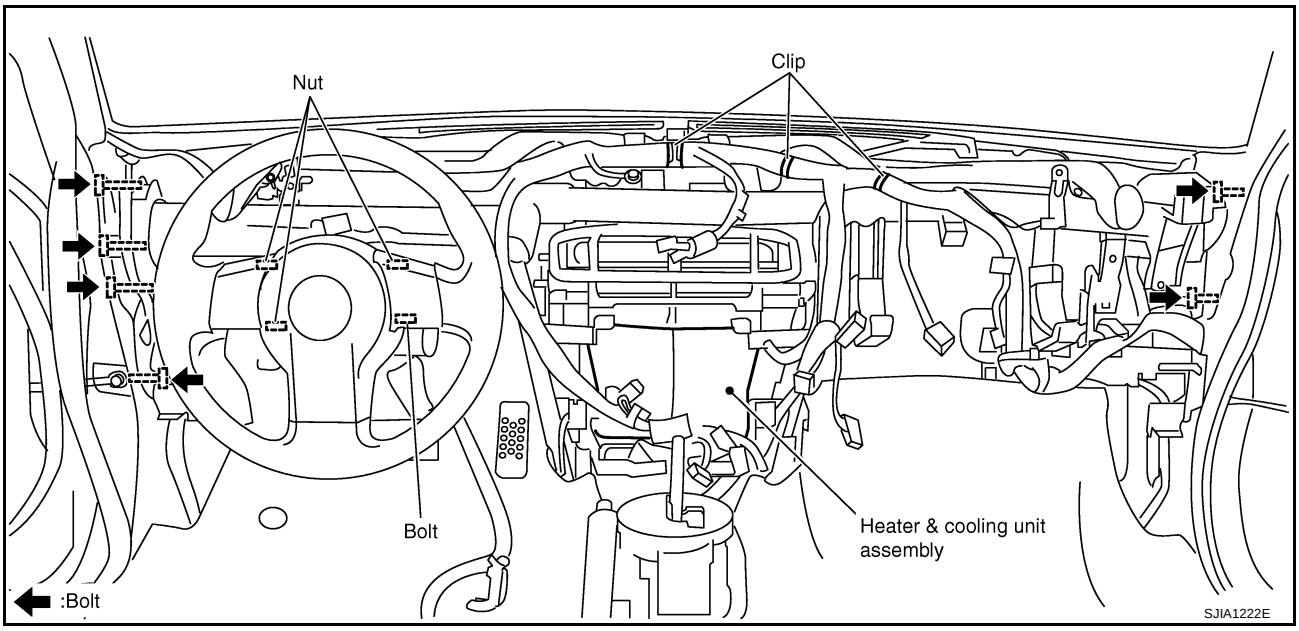


11. Remove defroster nozzle and ventilator ducts. Refer to ATC-121, "Removal of Defroster Nozzle, Ducts and Ventilator Ducts" .

12. Remove mounting bolts from heater & cooling unit assembly.



13. Remove steering column assembly mounting nuts and bolt.
14. Remove steering member mounting bolts, and then remove steering member.



15. Remove heater & cooling unit assembly.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 2 and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

NOTE:

- When filling radiator with coolant, refer to CO-10, "Changing Engine Coolant" .
- Recharge the refrigerant.

Heater & cooling unit assembly mounting bolts

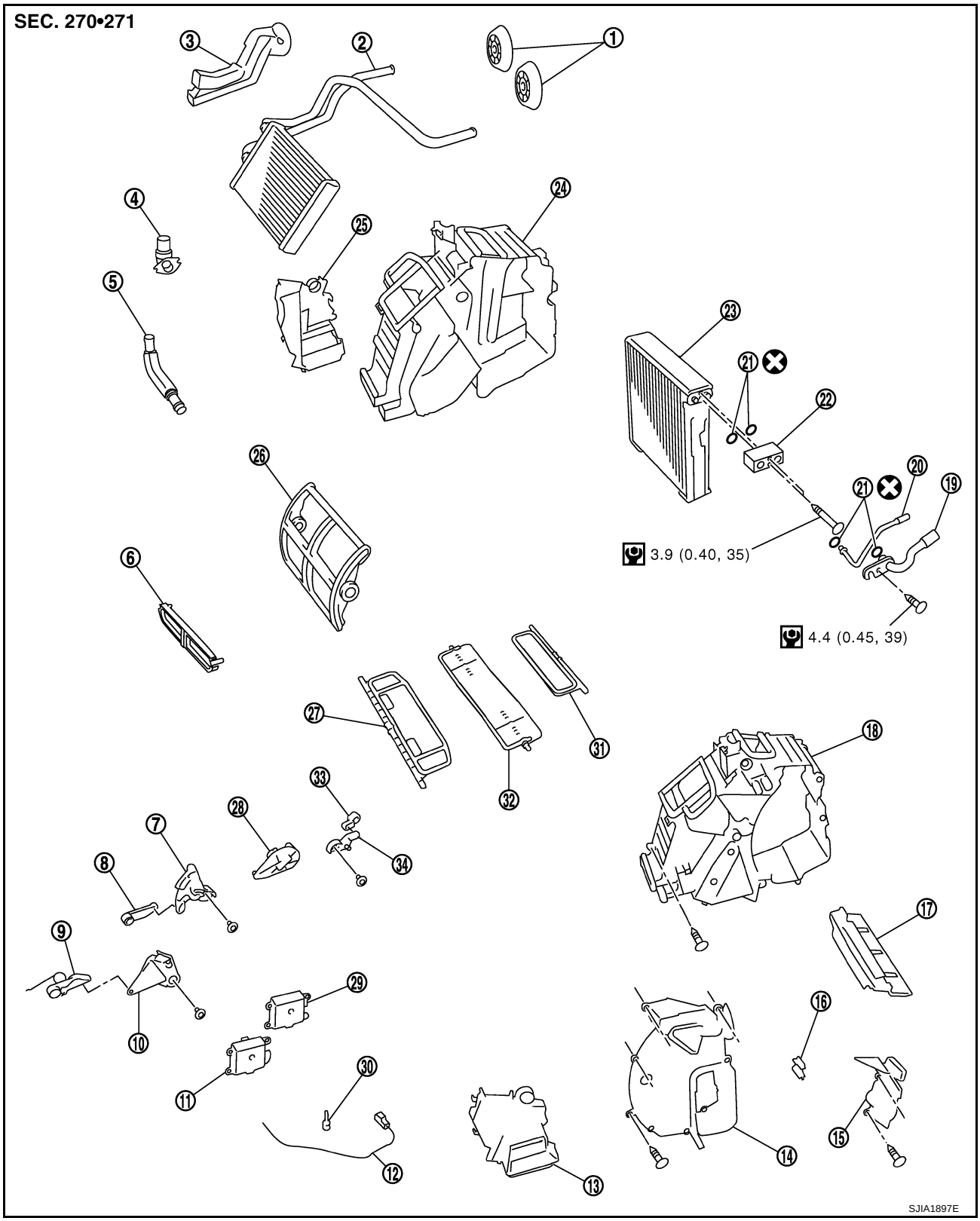
: 6.9 N·m (0.7 kg-m, 61 in-lb)

Steering member and steering column assembly mounting nuts and bolt

: 12 N·m (1.2 kg-m, 9 ft-lb)

Disassembly and Assembly

NJS0001P



1. Heater pipe grommet
2. Heater core
3. Heater pipe cover
4. Aspirator
5. Aspirator duct
6. Rear foot cover
7. Max. cool door link
8. Max. cool door lever
9. Ventilator door lever
10. Ventilator door link
11. Air mix door motor
12. Intake sensor
13. Foot duct (right)
14. Evaporator cover
15. Evaporator cover adapter
16. Heater pipe bracket
17. Insulator
18. Heater case (right)

19. Low-pressure pipe 1
20. High-pressure pipe 2
21. O-ring
22. Expansion valve
23. Evaporator
24. Heater case (left)
25. Foot duct (left)
26. Air mix door (slide door)
27. Ventilator door
28. Side link
29. Mode door motor
30. Intake sensor bracket
31. Defroster door
32. Max. cool door
33. Defroster door lever
34. Defroster door link

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

MODE DOOR MOTOR

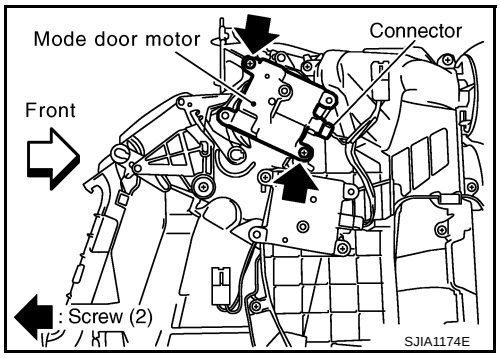
PFP:27731

Removal and Installation

NJS0001Q

REMOVAL

1. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
2. Remove mounting screws from mode door motor.
3. Disconnect connector, and then remove mode door motor.



INSTALLATION

Installation is basically the reverse order of removal.

AIR MIX DOOR MOTOR

PFP:27732

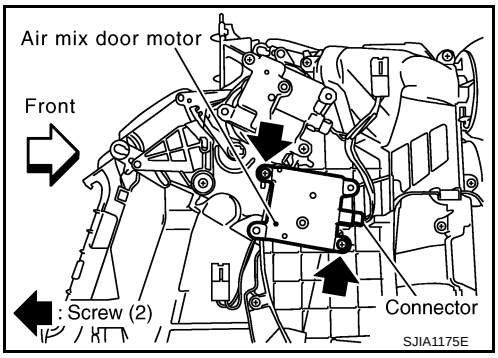
Removal and Installation

NJS0001R

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.

   CAUTION:
   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
4. Disconnect air mix door motor connector.
5. Remove mounting screws, and then remove air mix door motor.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER CORE

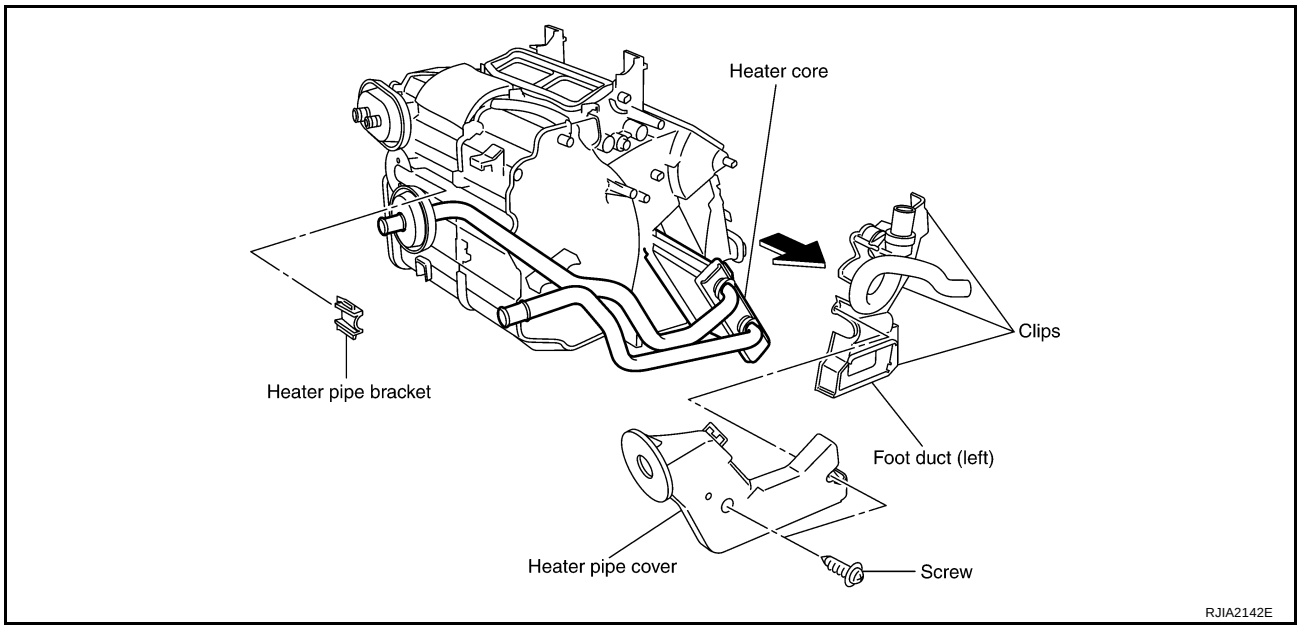
PFP:27140

Removal and Installation

NJS0001S

REMOVAL

1. Remove heater & cooling unit assembly. Refer to ATC-112, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove foot duct (left). Refer to ATC-122, "Removal of Foot Ducts" .



3. Remove mounting screws, and then remove heater pipe cover.
4. Remove heater pipe bracket and heater pipe grommet.
5. Slide heater core to leftward.

INSTALLATION

Installation is basically the reverse order of removal.

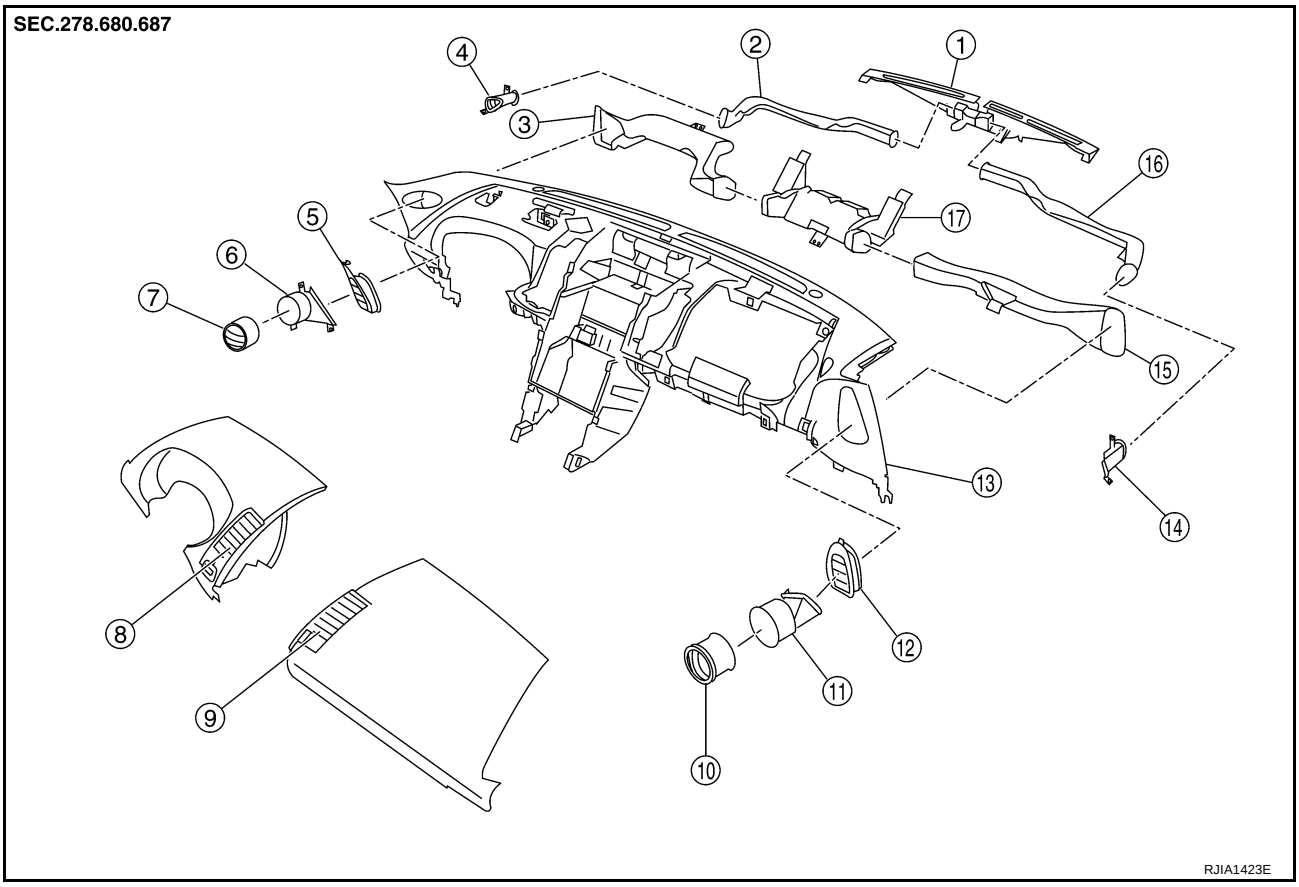
DUCTS AND GRILLES

PFP:27860

Removal and Installation

NJS0001T

COMPONENT LAYOUT

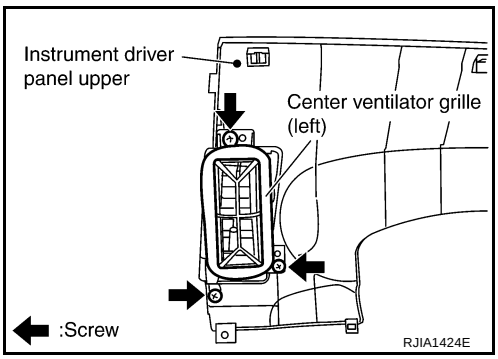


1. Defroster nozzle
2. Side defroster duct 1 (left)
3. Side ventilator duct 1 (left)
4. Side defroster duct 2 (left)
5. Instrument side finisher (left)
6. Side ventilator duct 2 (left)
7. Side ventilator grille (left)
8. Center ventilator grille (left)
9. Center ventilator grille (right)
10. Side ventilator grille (right)
11. Side ventilator duct 2 (right)
12. Instrument side finisher (right)
13. Instrument panel
14. Side defroster duct 2 (right)
15. Side ventilator duct 1 (right)
16. Side defroster duct 1 (right)
17. Center ventilator duct

REMOVAL

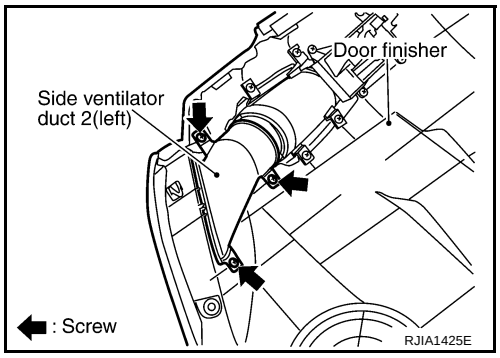
Removal of Center Ventilator Grilles

1. Remove instrument driver and passenger panel upper. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws, and then remove center ventilator grilles.

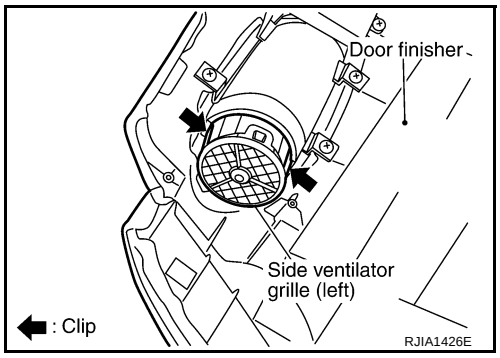


Removal of Side Ventilator Duct 2 and Grilles

1. Remove door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Remove mounting screws, and then remove side ventilator duct 2 (left and right).

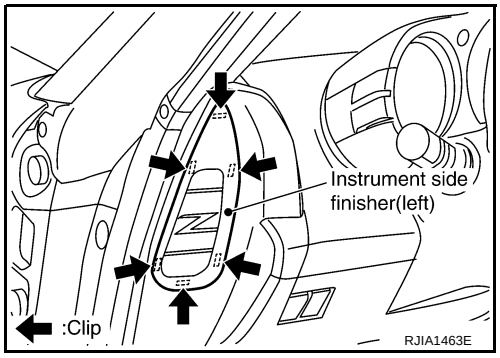


3. Remove mounting clips, and then remove side ventilator grilles (left and right).



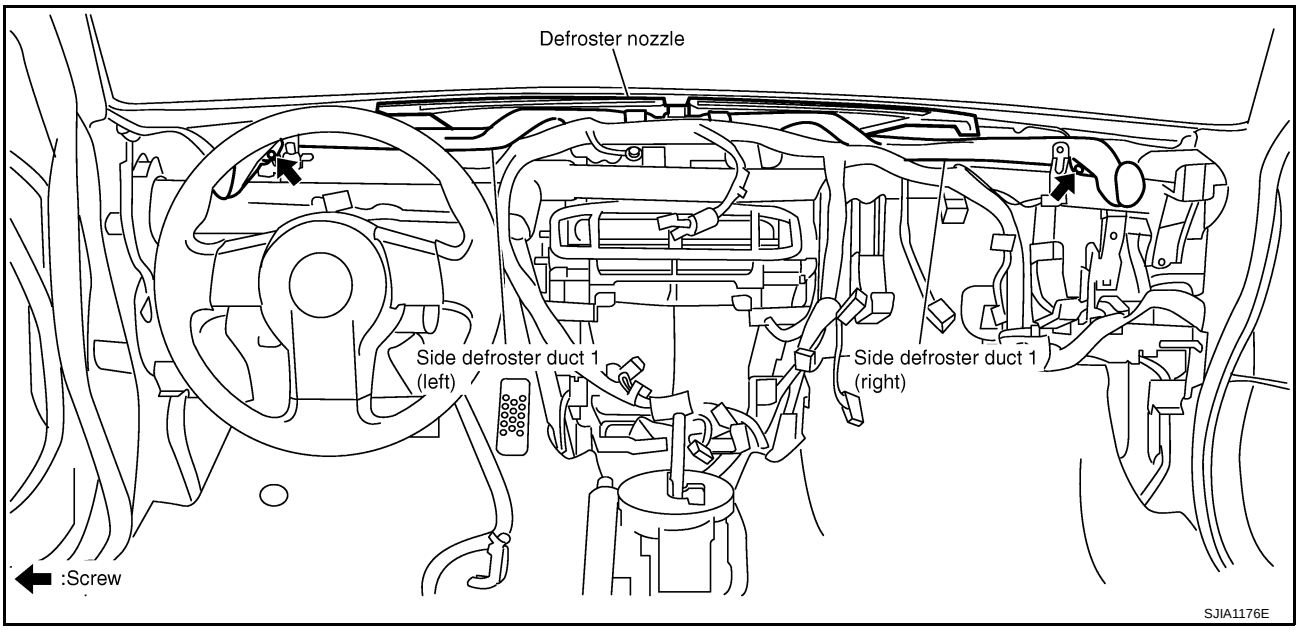
Removal of Instrument Side Finishers

Remove mounting clips, and then remove instrument side finishers (left and right).

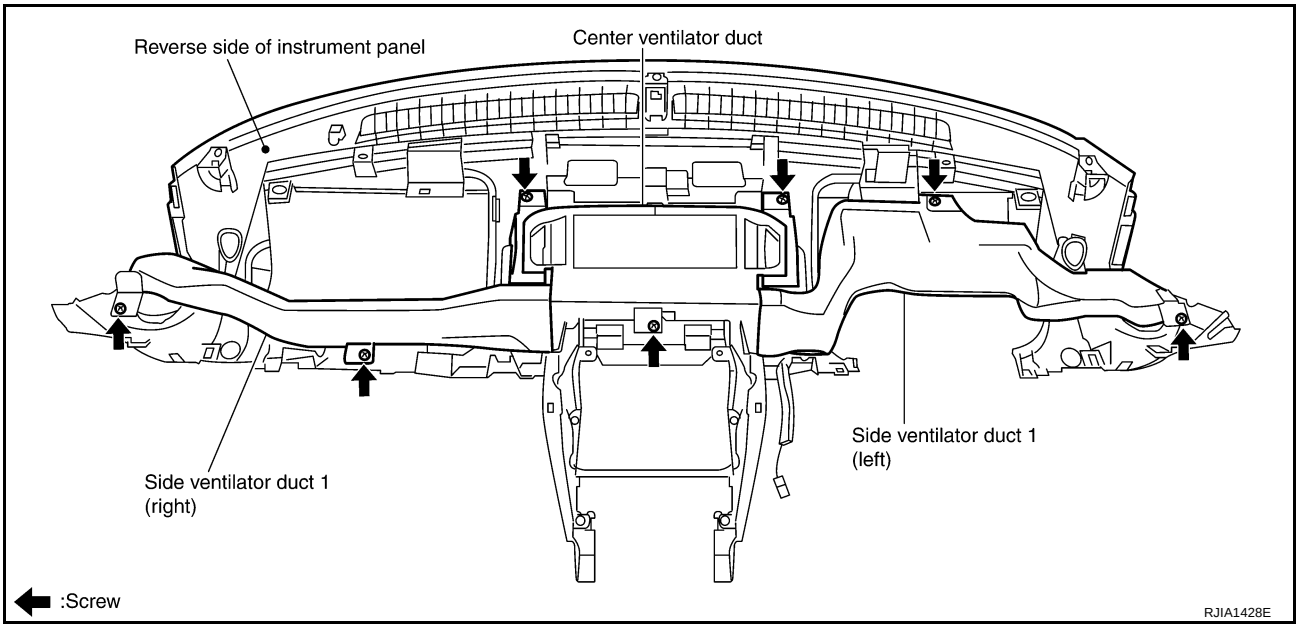


Removal of Defroster Nozzle, Ducts and Ventilator Ducts

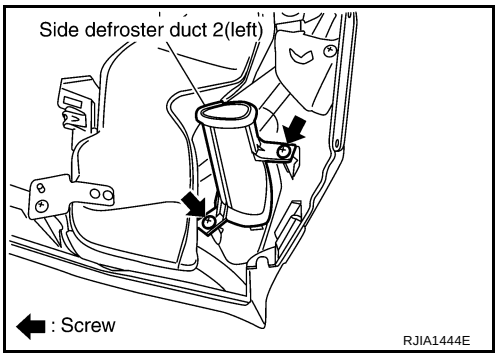
1. Remove instrument panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws, and then remove side defroster duct 1 (left and right).
3. Remove steering member, and then remove defroster nozzle.



4. Remove mounting screws, and then remove side ventilator duct 1 (left and right) and center ventilator duct from instrument panel.

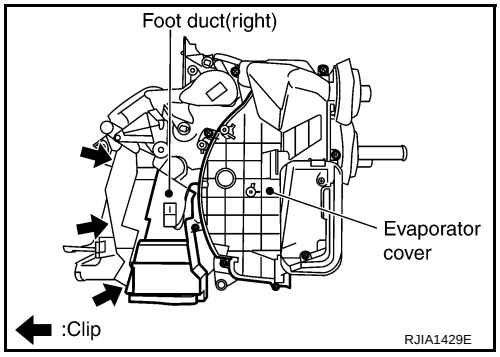


5. Remove mounting screws, and then remove side defroster duct 2 (left and right).



Removal of Foot Ducts

1. Remove heater & cooling unit assembly. Refer to ATC-112, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove evaporator cover, and then remove foot duct (right).
3. Remove aspirator and heater pipe cover.
4. Remove mounting clips, and then remove foot duct (left).



INSTALLATION

Installation is basically the reverse order of removal.

REFRIGERANT LINES

PFP:92600

HFC-134a (R-134a) Service Procedure

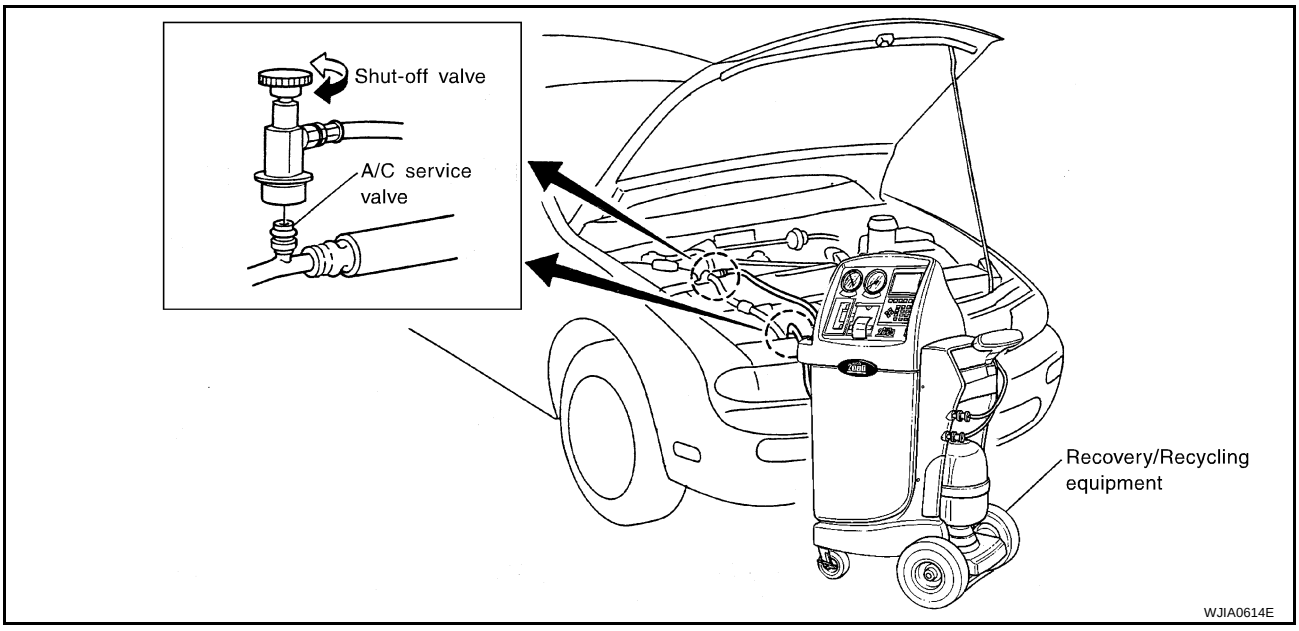
NJS0001U

SETTING OF SERVICE TOOLS AND EQUIPMENT

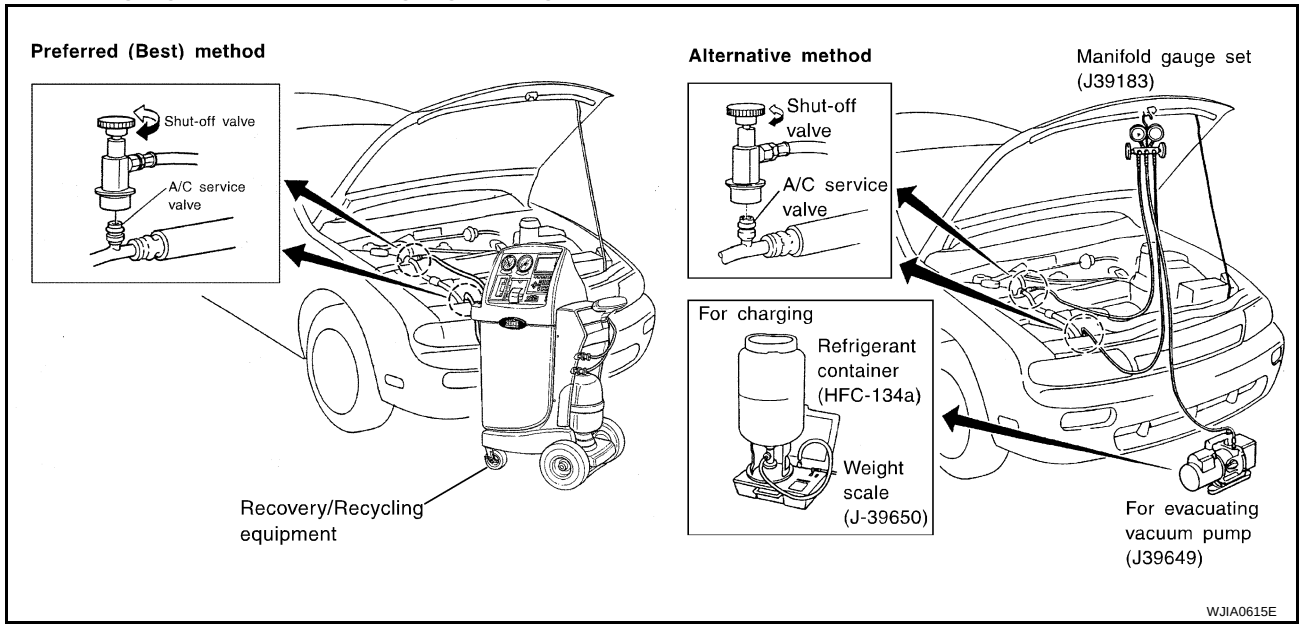
Discharging Refrigerant

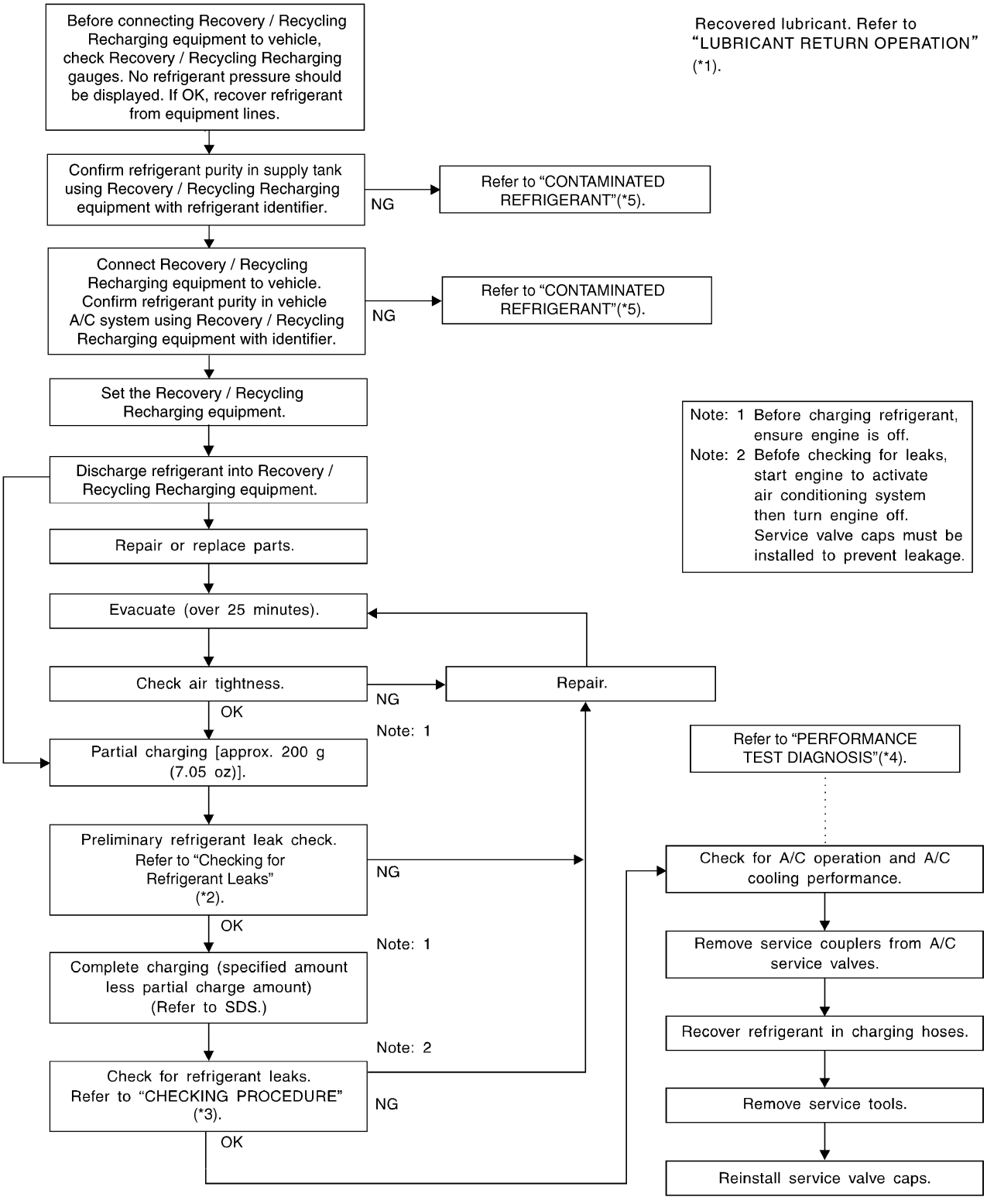
WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment] or J-2209 [HFC-134a (R-134a) recovery equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.



Evacuating System and Charging Refrigerant





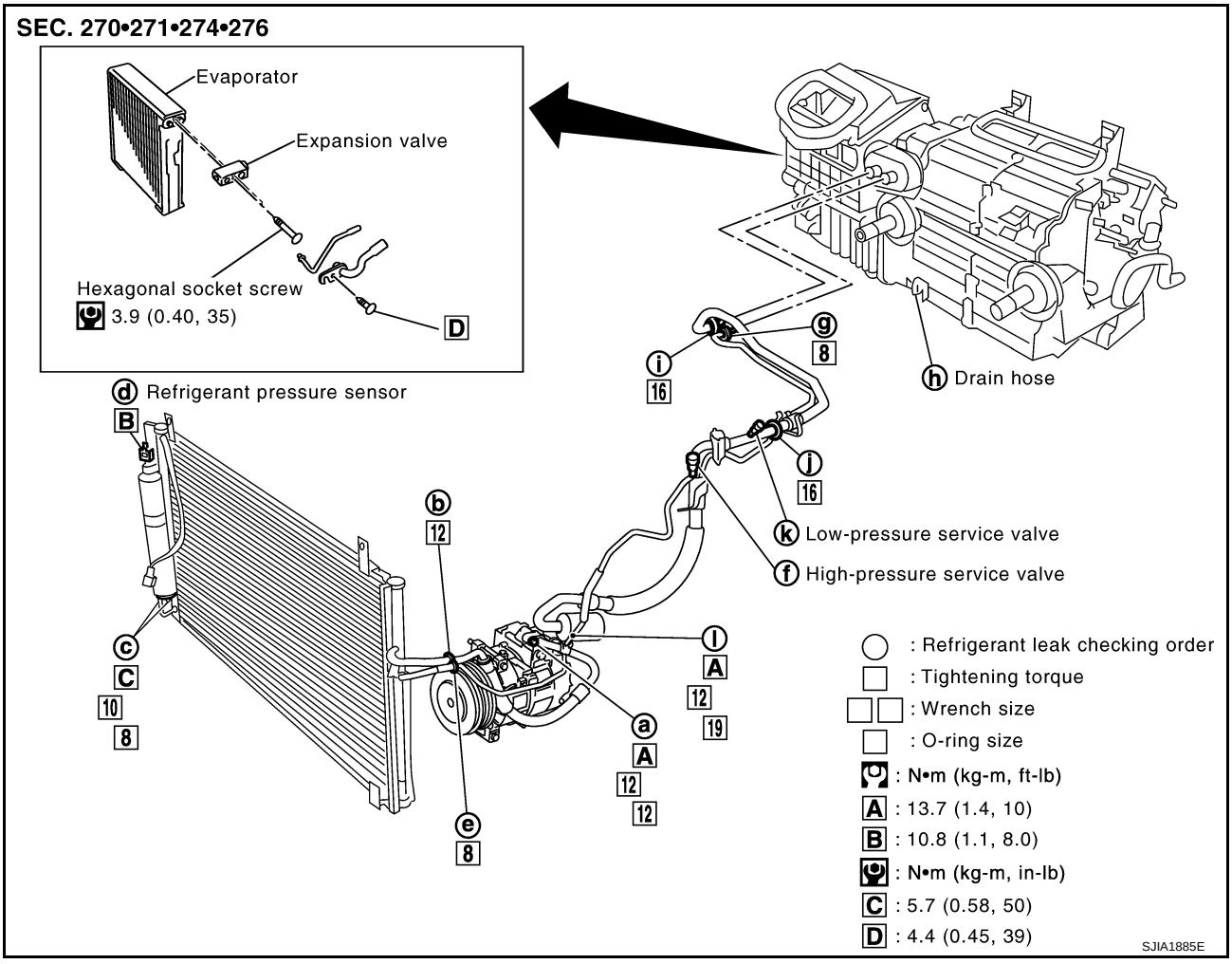
SJIA1275E

*1 ATC-21, "LUBRICANT RETURN OPERATION"
*2 ATC-138, "Checking for Refrigerant Leaks"
*3 ATC-140, "CHECKING PROCEDURE"
*4 ATC-83, "PERFORMANCE TEST DIAGNOSIS"
*5 ATC-5, "CONTAMINATED REFRIGERANT"

Components

NJS0001V

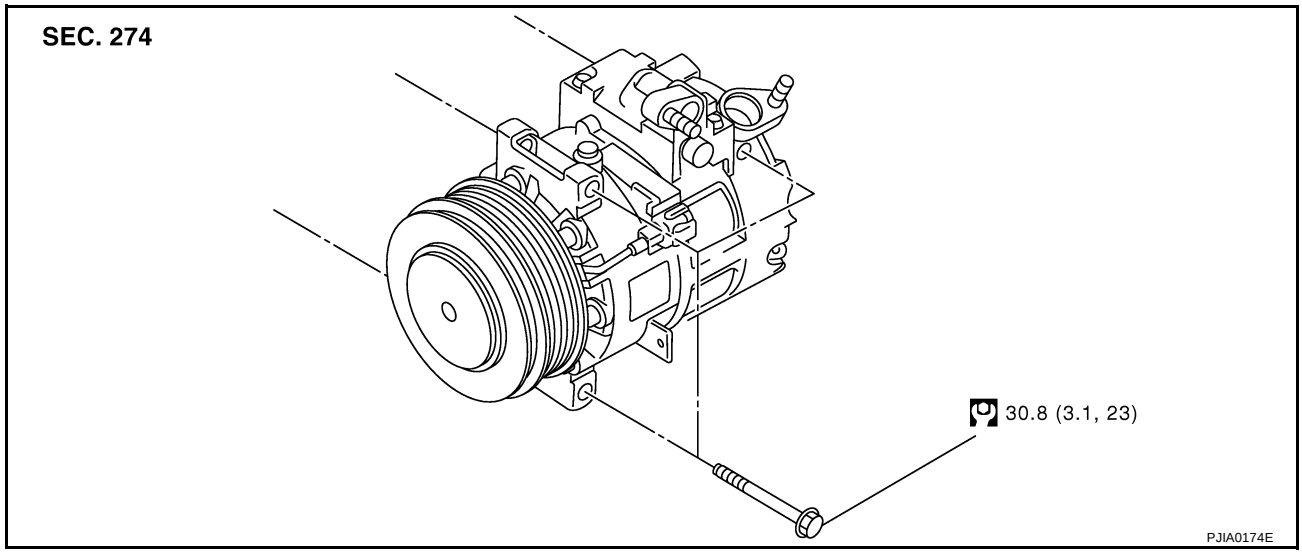
Refer to ATC-7, "Precautions for Refrigerant Connection" .



Removal and Installation of Compressor

NJS0001W

REMOVAL



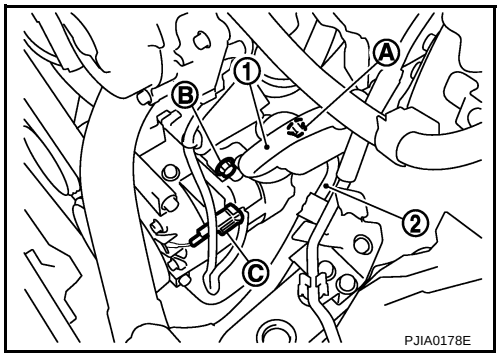
: N·m (kg-m, ft-lb)

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove tower bar. Refer to FSU-20, "TOWER BAR" .

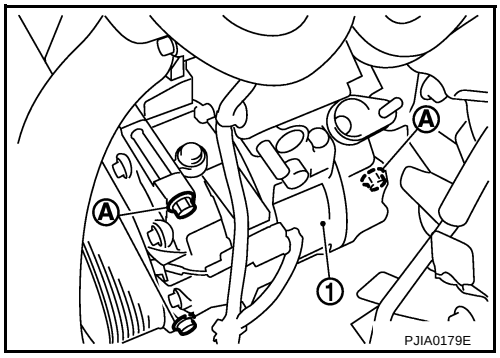
3. Remove engine cover (1), (2). Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
4. Remove air cleaner case (LH) and air duct (LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
5. Remove mounting nuts (A) from low-pressure flexible hose (1).
6. Remove mounting nuts (B) from high-pressure flexible hose (2).

CAUTION:
Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

7. Disconnect compressor connector (C).
8. Remove drive belt. Refer to EM-12, "DRIVE BELTS" .



9. Remove mounting bolts (A) from compressor, using power tools.
10. Remove compressor (1) upward of vehicle.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

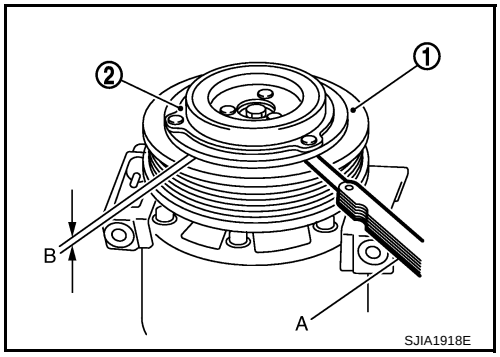
Check Disc to Pulley Clearance

NJS000IE

Check the clearance (B) between pulley assembly (1) and clutch disc (2) around the entire periphery with feeler gauge (A).

Disc to pulley clearance : 0.30 - 0.60 mm (0.012 - 0.024 in)

If specified clearance is not obtained, replace compressor.

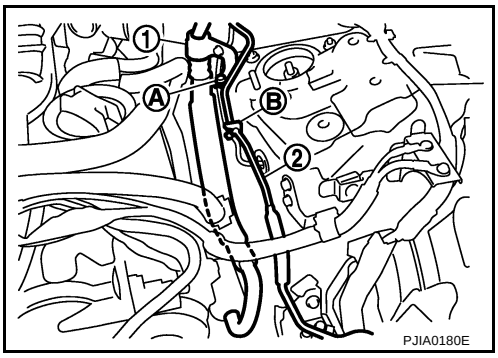


Removal and Installation of Low-pressure Flexible Hose and Pipe 2

NJS0001Y

REMOVAL

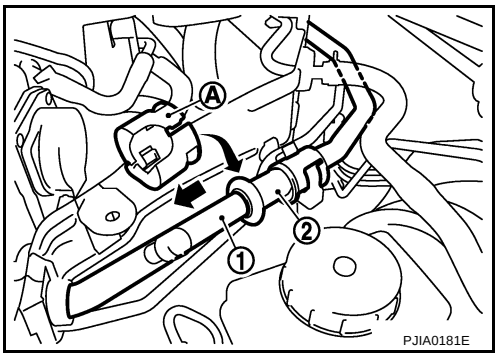
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
3. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
4. Remove engine cover (1), (2). Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
5. Remove air cleaner case (LH) and air duct (LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
6. Remove mounting bolt (A) from low-pressure flexible hose bracket (1).
7. Remove high-pressure pipe 1 (2) from vehicle clip (B).



8. Disconnect one-touch joint between low-pressure flexible hose (1) and low-pressure pipe 2 (2) with disconnector (SST: 9253089916) (A).

CAUTION:

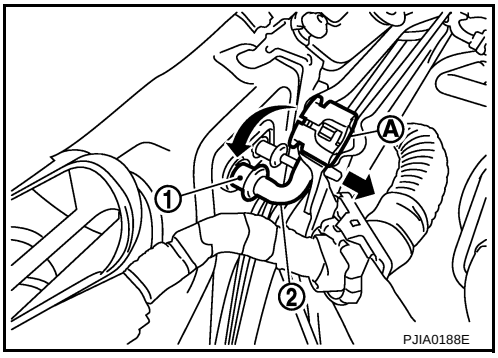
Cap or wrap the joint of low-pressure flexible hose and low-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.



9. Disconnect one-touch joint between low-pressure pipe 1 (1) and low-pressure pipe 2 (2) with disconnector (SST: 9253089916) (A).

CAUTION:

Cap or wrap the joint of low-pressure pipe 1 and low-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.

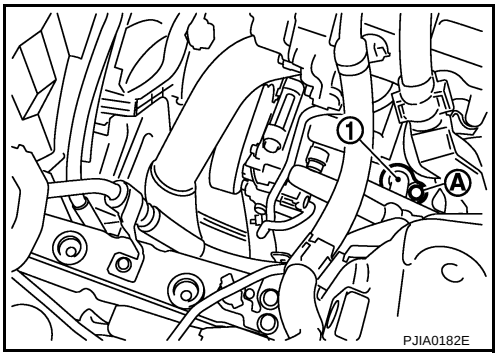


10. Remove mounting nut (A) from low-pressure flexible hose (1). (Compressor side)

CAUTION:

Cap or wrap the joint of compressor and low-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

11. Remove low-pressure flexible hose.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

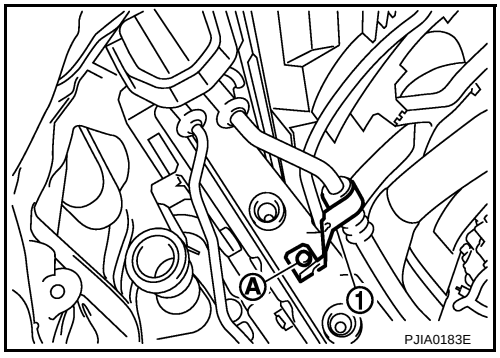
: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of High-pressure Flexible Hose

NJS0001Z

REMOVAL

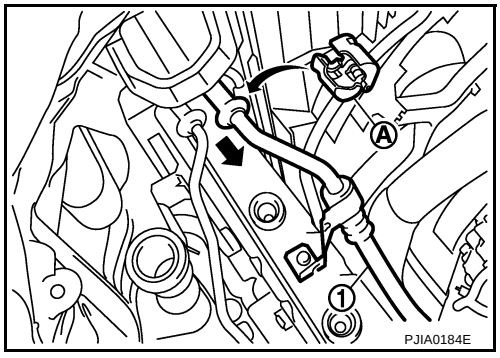
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
3. Remove engine cover (1), (2). Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
4. Remove air cleaner case (LH) and air duct (LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
5. Remove mounting bolt (A) from high-pressure flexible hose bracket (1).



6. Disconnect one-touch joint between high-pressure flexible hose (1) and condenser with disconnector (SST: 9253089912) (A).

   CAUTION:

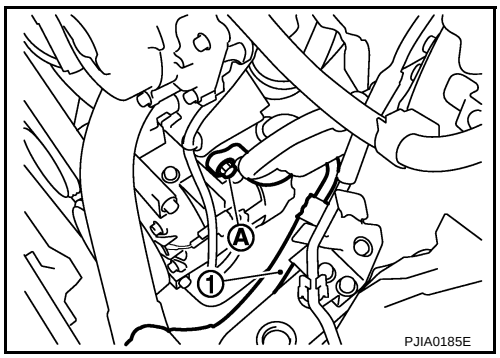
   Cap or wrap the joint of high-pressure flexible hose and condenser with suitable material such as vinyl tape to avoid the entry of air.



7. Remove mounting nut (A) from high-pressure flexible hose (1), and then remove high-pressure flexible hose.

   CAUTION:

   Cap or wrap the joint of high-pressure flexible hose and compressor with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

High-pressure flexible hose bracket mounting bolt

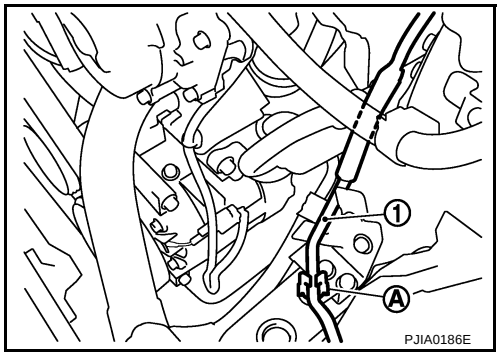
: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of High-pressure Pipe 1 (Engine Compartment)

NJS00020

REMOVAL

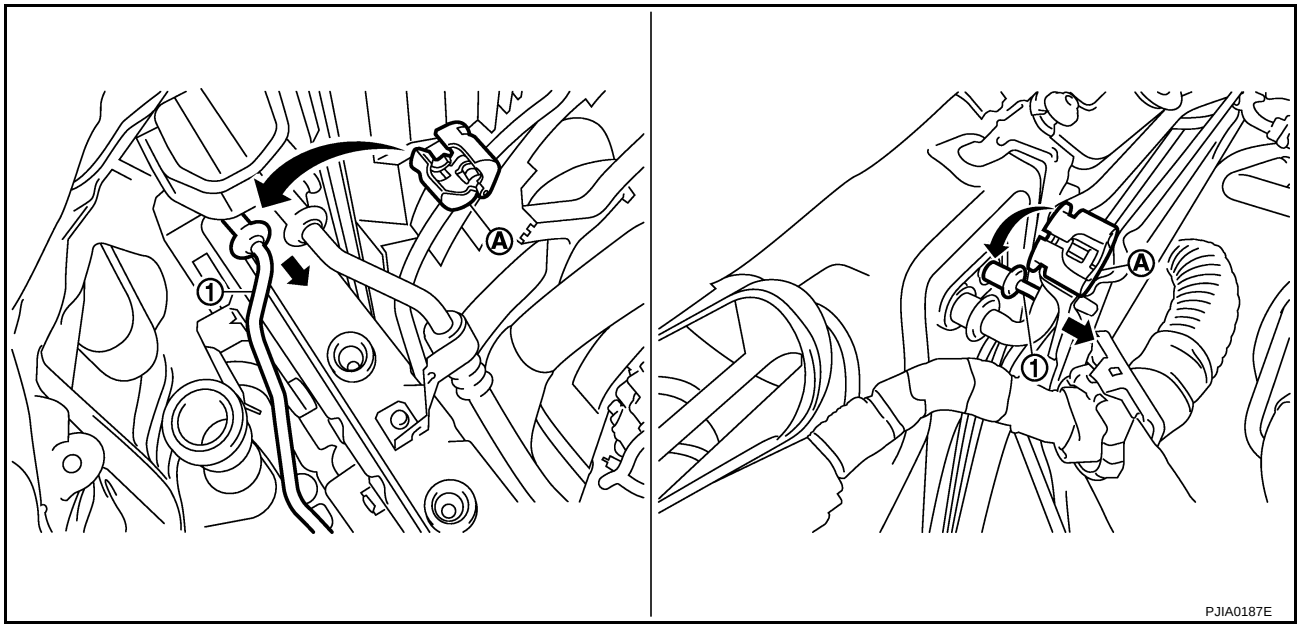
1. Remove low-pressure flexible hose and pipe 2. Refer to ATC-127, "Removal and Installation of Low-pressure Flexible Hose and Pipe 2" .
2. Remove high-pressure pipe 1 (1) from vehicle clip (A).



3. Disconnect one-touch joint between high-pressure pipe 1 (1) and condenser with disconnector (SST: 9253089908) (A).

CAUTION:

Cap or wrap the joint of condenser and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



4. Disconnect one-touch joint between high-pressure pipe 1 (1) and high-pressure pipe 2 with disconnector (SST: 9253089908) (A).

CAUTION:

Cap or wrap the joint of high-pressure pipe 1 and 2 with suitable material such as vinyl tape to avoid the entry of air.

5. Remove high-pressure pipe 1.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**

- **When recharging refrigerant, check for leaks.**

High-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

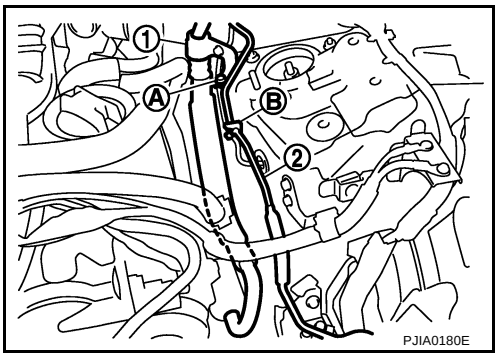
Removal and Installation of Low-pressure Pipe 1 and High-pressure Pipe 2

NJS00021

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and passenger window, and then disconnect the battery cable from the negative terminal.

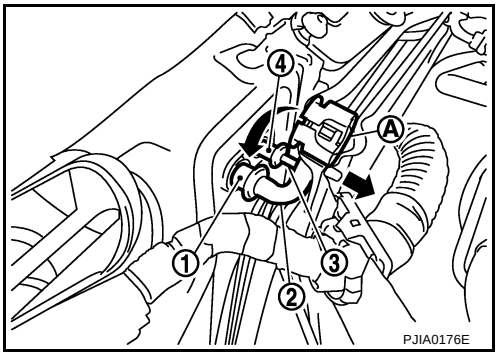
   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
4. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
5. Remove mounting bolt (A) from low-pressure flexible hose bracket (1).
6. Remove high-pressure pipe 1 (2) from vehicle clip (B).



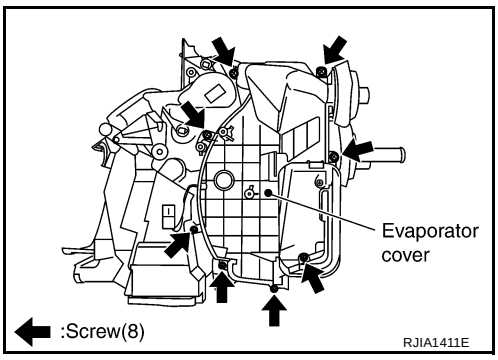
7. Disconnect one-touch joint between low-pressure pipe 1 (1) and low-pressure pipe 2 (2) with disconnector (SST: 9253089916) (A).

   CAUTION:
   Cap or wrap the joint of low-pressure pipe 1 and low-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.
8. Disconnect one-touch joint between high-pressure pipe 1 (3) and high-pressure pipe 2 (4) with disconnector (SST: 9253089908) (A).

   CAUTION:
   Cap or wrap the joint of high-pressure pipe 1 and high-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.

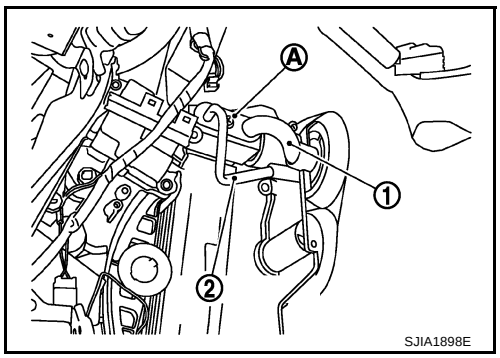


9. Remove instrument passenger panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
10. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
11. Remove air mix door motor and mode door motor. Refer to ATC-117, "AIR MIX DOOR MOTOR" and ATC-116, "MODE DOOR MOTOR" .
12. Remove mounting screws, and then remove evaporator cover.



13. Remove mounting bolt (A), and then remove low-pressure pipe 1 (1) and high-pressure pipe 2 (2).

CAUTION:
Cap or wrap the joint of evaporator, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of Liquid Tank

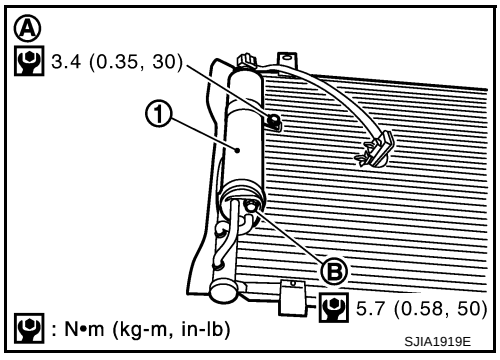
NJS00022

REMOVAL

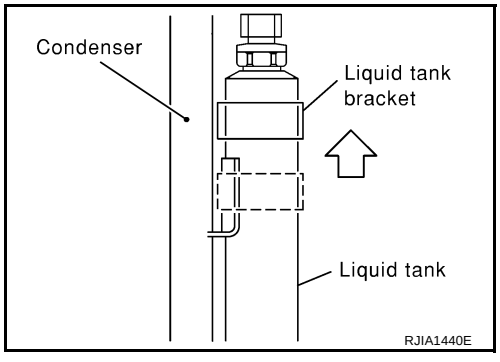
1. Remove condenser. Refer to ATC-133, "Removal and Installation of Condenser" .
2. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.

CAUTION:
Be sure to clean carefully.

3. Remove mounting bolts (A), (B) from liquid tank (1).



4. Lift liquid tank bracket upward. Remove liquid tank bracket from protruding part of condenser.
5. Slide liquid tank upward, and then remove liquid tank.

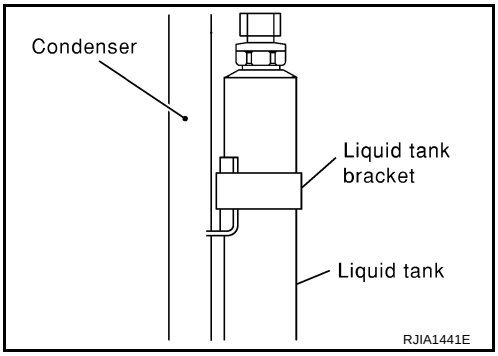


INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Make sure liquid tank bracket is securely installed at protrusion of condenser.**
- **Make sure liquid tank bracket does not move to a position below center of liquid tank.**
- **Replace O-rings of condenser pipe with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

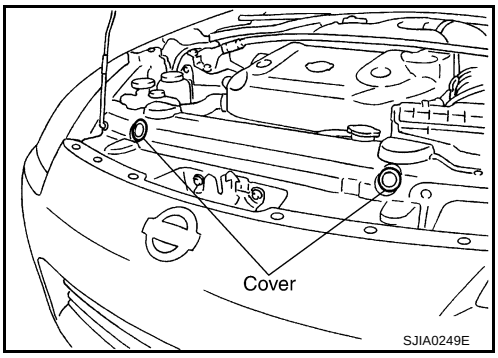


Removal and Installation of Condenser

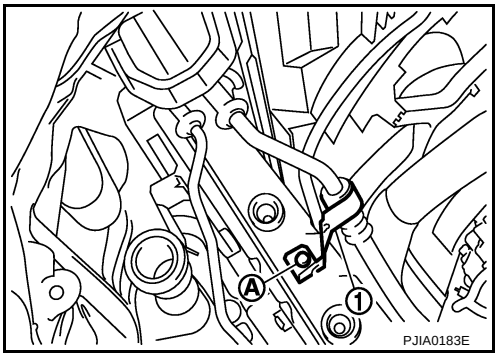
NJS00023

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Drain engine coolant. Refer to CO-10, "Changing Engine Coolant" .
3. Remove cover for condenser mounting bolt.



4. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
5. Remove engine cover (1), (2). Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
6. Remove air cleaner case (LH) and air duct (LH). Refer to and EM-15, "AIR CLEANER AND AIR DUCT" .
7. Remove radiator fan shroud after removing radiator upper hose.
8. Remove mounting bolt for condenser.
9. Remove mounting bolt (A) from high-pressure flexible hose bracket (1).



10. Disconnect one-touch joint between high-pressure flexible hose (1) and condenser with disconnector (SST: 9253089912).

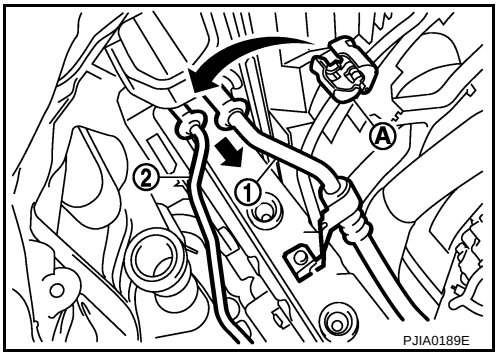
    CAUTION:

    Cap or wrap the high-pressure flexible hose and condenser with suitable material such as vinyl tape to avoid the entry of air.

    Disconnect one-touch joint between high-pressure pipe 1 (2) and condenser with disconnector (SST: 9253089908).

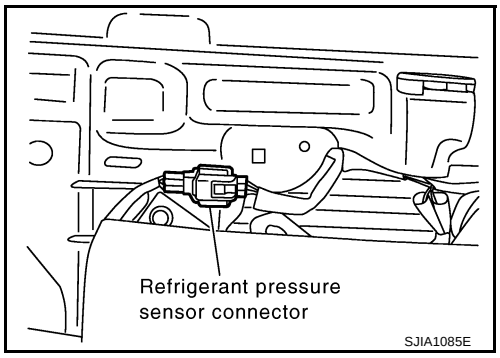
    CAUTION:

    Cap or wrap the joint of high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.

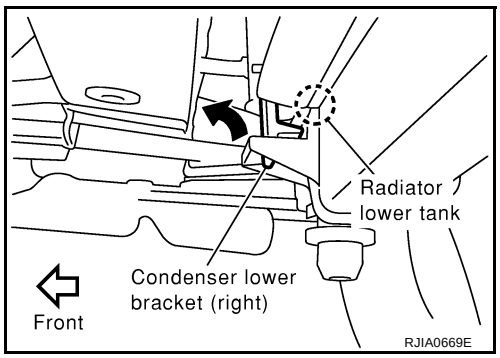


11. Remove radiator upper mount, move radiator and condenser to the engine side.

12. Disconnect refrigerant pressure sensor connector.



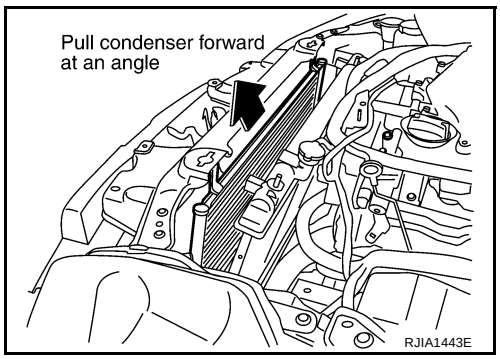
13. Lift condenser up slightly and tilt it toward front of vehicle. (This is because condenser lower bracket is on bottom of radiator tank.)



14. Pull condenser forward at an angle. Remove condenser from radiator.

CAUTION:

Be careful not to damage core surface of the condenser and the radiator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure flexible hose and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Condenser mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

High-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

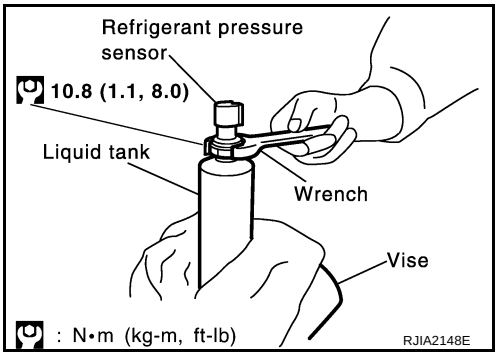
Removal and Installation of Refrigerant Pressure Sensor

NJS00024

REMOVAL

1. Remove liquid tank. Refer to ATC-132, "Removal and Installation of Liquid Tank" .
2. Using a vise, secure liquid tank, and then remove refrigerant pressure sensor.

CAUTION:
When working, be careful not to damage condenser.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Apply compressor oil to the O-ring of the refrigerant pressure sensor when installing it.**
- **When recharging refrigerant, check for leaks.**

Removal and Installation of Evaporator

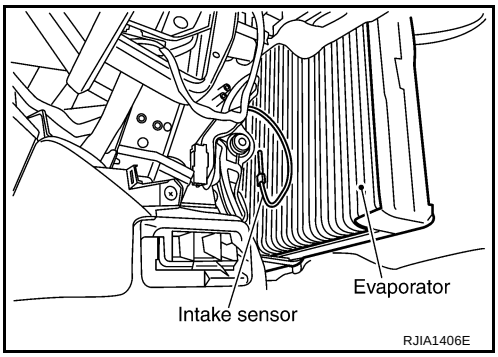
NJS00025

REMOVAL

1. Remove low-pressure pipe 1 and high-pressure pipe 2. Refer to ATC-131, "Removal and Installation of Low-pressure Pipe 1 and High-pressure Pipe 2" .

CAUTION:
Cap or wrap the joint of evaporator, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with suitable material such as vinyl tape to avoid the entry of air.

2. Slide evaporator, and then remove it from heater & cooling unit assembly.
3. Remove intake sensor from evaporator, and then remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

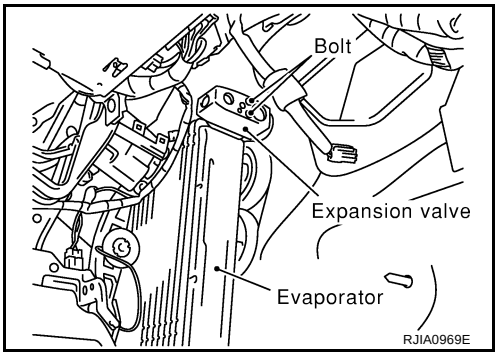
Removal and Installation of Expansion Valve

NJS00026

REMOVAL

1. Remove low-pressure pipe 1 and high-pressure pipe 2. Refer to ATC-131, "Removal and Installation of Low-pressure Pipe 1 and High-pressure Pipe 2" .
2. Remove mounting bolts, and then remove expansion valve.

CAUTION:
Cap or wrap the joint of evaporator with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of evaporator, expansion valve, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to them when installing them.**
- **O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).**
- **When recharging refrigerant, check for leaks.**

Checking for Refrigerant Leaks

NJS00027

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electrical leak detector or fluorescent dye leak detector (SST: J-42220).
If dye is observed, confirm the leak with an electrical leak detector. It is possible a prior leak was repaired and not properly cleaned.
When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.
When searching for refrigerant leaks using an electrical leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:
Moving the electrical leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

Checking System for Leaks Using the Fluorescent Leak Detector

NJS00028

1. Check A/C system for leaks using the UV lamp and safety goggles (SST: J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner (SST: J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electrical leak detector.

NOTE:
Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.
Clean with a dry cloth or blow off with shop air.
Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

Dye Injection

NJS00029

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm^2 , 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (SST: J-41459).
3. Connect the injector tool to the A/C low-pressure side service valve.
4. Start the engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool (SST: J-41459) (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service valve.

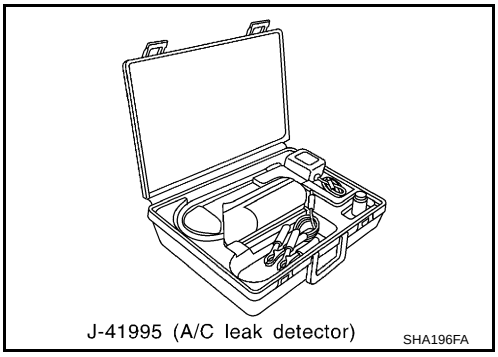
   CAUTION:
   Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.
7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.
8. Attach a blue label as necessary.

Electrical Leak Detector

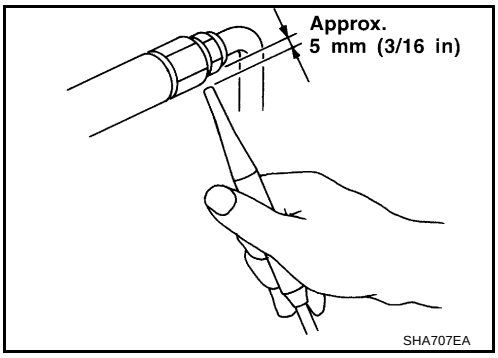
NJS0002A

PRECAUTIONS FOR HANDLING LEAK DETECTOR

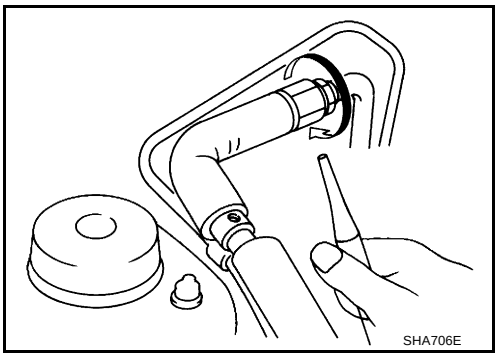
When performing a refrigerant leak check, use an A/C electrical leak detector (SST) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



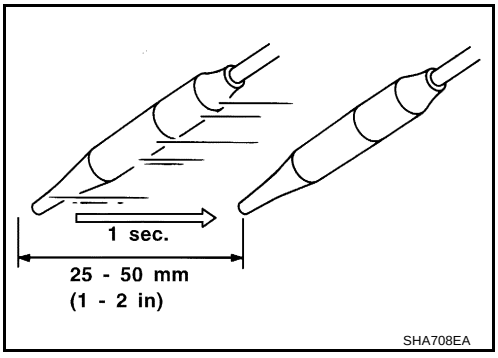
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Stop the engine.
2. Connect a suitable A/C manifold gauge set (SST:J-39183) to the A/C service valves.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm^2 , 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

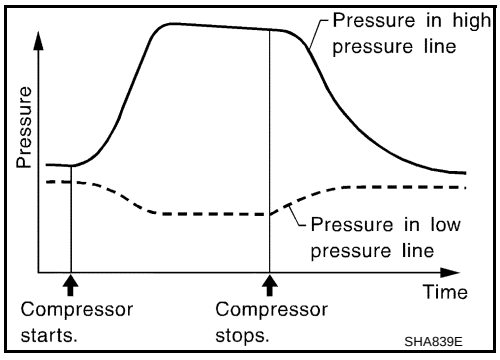
   NOTE:
   At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm^2 , 50 psi).
4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet g) to the low-pressure side (evaporator drain hose h to shaft seal l). Refer to ATC-125, "Components" . Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.

   Compressor
   Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.
   Condenser
   Check the fitting of high-pressure flexible hose and pipe.
   Liquid tank
   Check the fitting of refrigerant connection.
   Service valves
   Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

   NOTE:
   After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.
   Cooling unit (Evaporator)
   With engine OFF, turn blower fan on “High” for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer’s recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.
   Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.
5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
   If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;

a. A/C switch: ON
b. MODE door position: VENT (Ventilation)
c. Intake door position: Recirculation
d. Temperature setting: Max. cold
e. Fan speed: High

9. Run engine at 1,500 rpm for at least 2 minutes.
10. Stop the engine and perform leak check again following steps 4 through 6 above.
    Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.



11. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery/recycling recharging equipment. Repair the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Perform A/C performance test to ensure system works properly.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Compressor

NJS0002B

Model		VALEO THERMAL SYSTEMS JAPAN make DCS-17IC
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Max.	171 (10.4)
Cylinder bore × stroke mm (in)		32 (1.26) × 30.5 (1.20)
Direction of rotation		Clockwise (viewed from drive end)
Drive belt		Poly V

Lubricant

NJS0002C

Model		VALEO THERMAL SYSTEMS JAPAN make DCS-17IC
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity m ℓ (US fl oz, lmp fl oz)	Total in system	150 (5.07, 5.3)
	Compressor (Service part) charging amount	150 (5.07, 5.3)

Refrigerant

NJS0002D

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.55 (1.21)

Engine Idling Speed

NJS0002E

Refer to EC-718, "Idle Speed and Ignition Timing" .

Belt Tension

NJS0002F

Refer to EM-12, "DRIVE BELTS" .

SECTION AV

AUDIO VISUAL, NAVIGATION & TELEPHONE SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS000C3

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS000C4

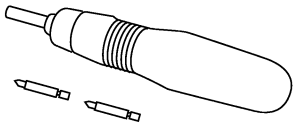
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

PREPARATION

PFP:00002

Commercial Service Tools

NKS000C6

Tool name	Description
Power tool  PBIC0191E	Loosening bolts and nuts

AUDIO

PFP:28111

System Description

NKS000C7

BASE SYSTEM

For Audio System operation information, refer to Owner's Manual.
Power is supplied at all times

- through 15 A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6.

With the ignition switch in the ACC or ON position, power is supplied

- through 10 A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10.

Ground is supplied through the case of the audio unit.
When audio switch is pressed, audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to terminals 1 and 2 of driver door speaker and passenger door speaker
- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side).

When one of steering switch is pressed to volume up, seek up, or mode ON, resistance in steering switch circuit changes depending on which button is pressed.
When one of steering switch is pressed to volume down, seek down, or power ON, resistance in steering switch circuit changes depending on which button is pressed.

BOSE SYSTEM (COUPE MODELS)

CD auto changer (built into audio unit) operation is controlled by audio unit.
Refer to owner's manual for the system operation.
Power is supplied at all times

- through 15 A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6
- to BOSE speaker amp. terminal 11
- to satellite radio tuner terminal 32,
- through 15 A fuse [No. 17, located in the fuse block (J/B)]
- to woofer amp. terminal 8.

With the ignition switch in the ACC or ON position, power is supplied

- through 10 A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10
- to satellite radio tuner terminal 36,
- through audio unit terminal 12
- to BOSE speaker amp. terminal 41,
- through BOSE speaker amp. terminal 32
- to woofer amp. terminal 6.

Ground is supplied through the case of the audio unit.
Ground is also supplied

- to BOSE speaker amp. terminal 27
- to woofer amp. terminal 7
- through body grounds B5, B6, D105 and T14.

When audio switch is pressed, audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to BOSE speaker amp. terminals 33, 34, 35, 36, 37, 38, 39 and 40.

Audio signals are amplified by the BOSE speaker amp.
The amplified audio signals are supplied

- through BOSE speaker amp. terminals 12, 19, 20, 21, 22, 23, 24, 25, 26 and 28
- to terminals 1 and 2 of driver door speaker and passenger door speaker

- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side)
- to terminals 1 and 2 of woofer amp.

Audio signals are amplified by the woofer amp.
The amplified audio signals are supplied

- through woofer amp. terminals 3 and 4
- to terminals 1 and 2 of woofer.

When one of steering switch is pressed to volume up, seek up, or mode ON, resistance in steering switch circuit changes depending on which button is pressed.
When one of steering switch is pressed to volume down, seek down, or power ON, resistance in steering switch circuit changes depending on which button is pressed.

BOSE SYSTEM (ROADSTER MODELS)

CD auto changer (built into audio unit) operation is controlled by audio unit.
Refer to owner's manual for the system operation.
Power is supplied at all times

- through 15 A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6
- to BOSE speaker amp. terminal 11,
- through 15 A fuse [No. 17, located in the fuse block (J/B)]
- to woofer amp. terminal 8.

With the ignition switch in the ACC or ON position, power is supplied

- through 10 A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10,
- through audio unit terminal 12
- to BOSE speaker amp. terminal 41,
- through BOSE speaker amp. terminal 32
- to woofer amp. terminal 6.

Ground is supplied through the case of the audio unit.
Ground is also supplied

- to BOSE speaker amp. terminal 27
- to woofer amp. terminal 7
- through body grounds B5, B6 and T14.

When audio switch is pressed, audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to BOSE speaker amp. terminals 33, 34, 35, 36, 37, 38, 39 and 40.

Audio signals are amplified by the BOSE speaker amp.
The amplified audio signals are supplied

- through BOSE speaker amp. terminals 12, 19, 20, 21, 22, 23, 24, 25, 26 and 28
- to terminals 1 and 2 of driver door speaker and passenger door speaker
- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side)
- to terminals 1 and 2 of woofer amp.

Audio signals are amplified by the woofer amp.
The amplified audio signals are supplied

- through woofer amp. terminals 3 and 4
- to terminals 1 and 2 of woofer.

When one of steering switch is pressed to volume up, seek up, or mode ON, resistance in steering switch circuit changes depending on which button is pressed.
When one of steering switch is pressed to volume down, seek down, or power ON, resistance in steering switch circuit changes depending on which button is pressed.

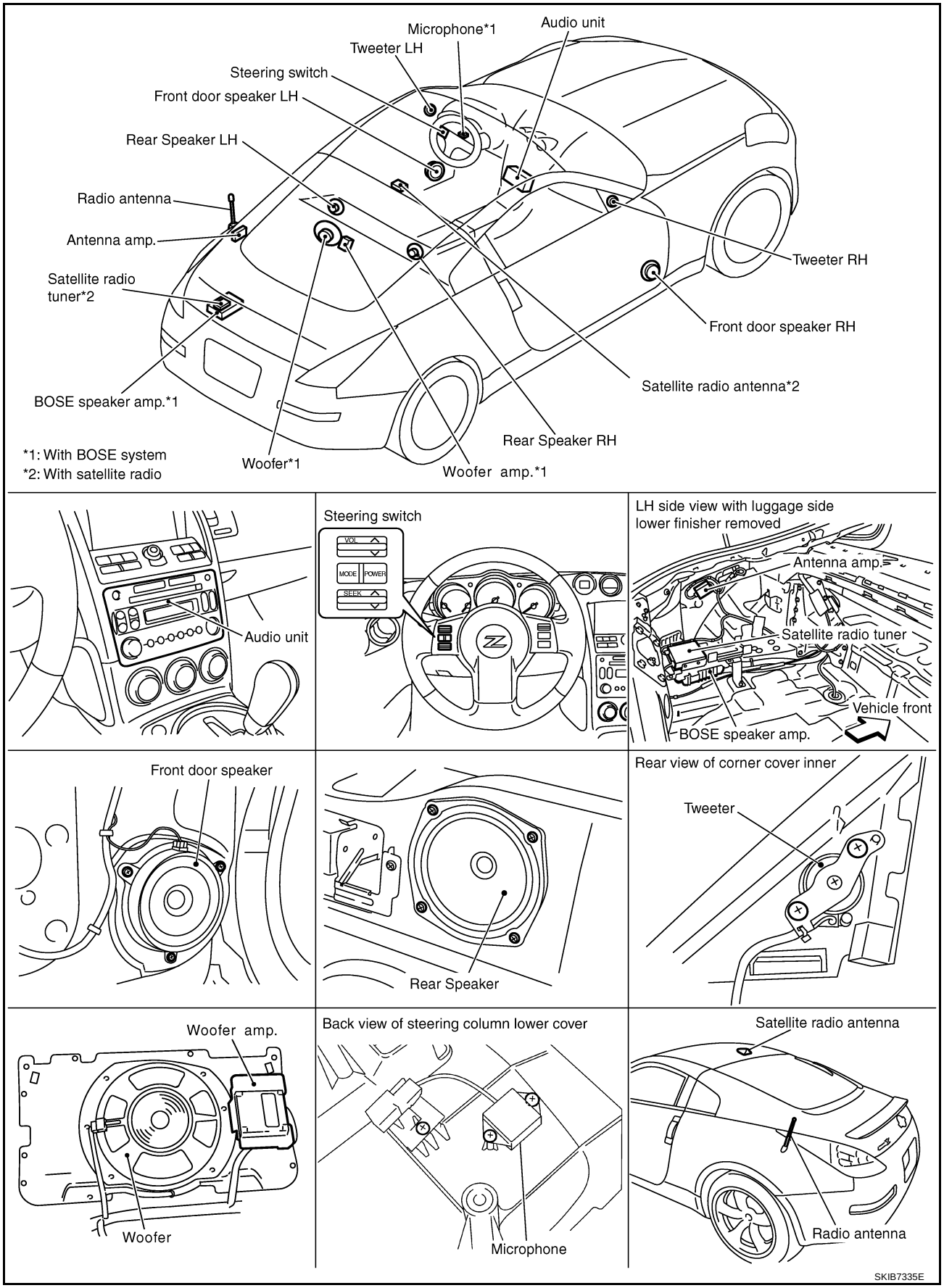
AudioPilot® System

AudioPilot® is the sound improving system that picks up by a microphone under the steering any noises or the sound of music coming into the vehicle, and that uses the BOSE speaker amp. to revise the frequency feature of music in real time in response to the frequency feature of the noise while driving and listening to music.

- If low frequency area noise from vehicle is loud, it adjusts low frequency element of music to be bigger than vehicle noise.
- If high frequency area noise from vehicle is loud, it adjusts high frequency element of music to be bigger than vehicle noise.
- If vehicle noise is smaller than the setting volume, correction is not performed.

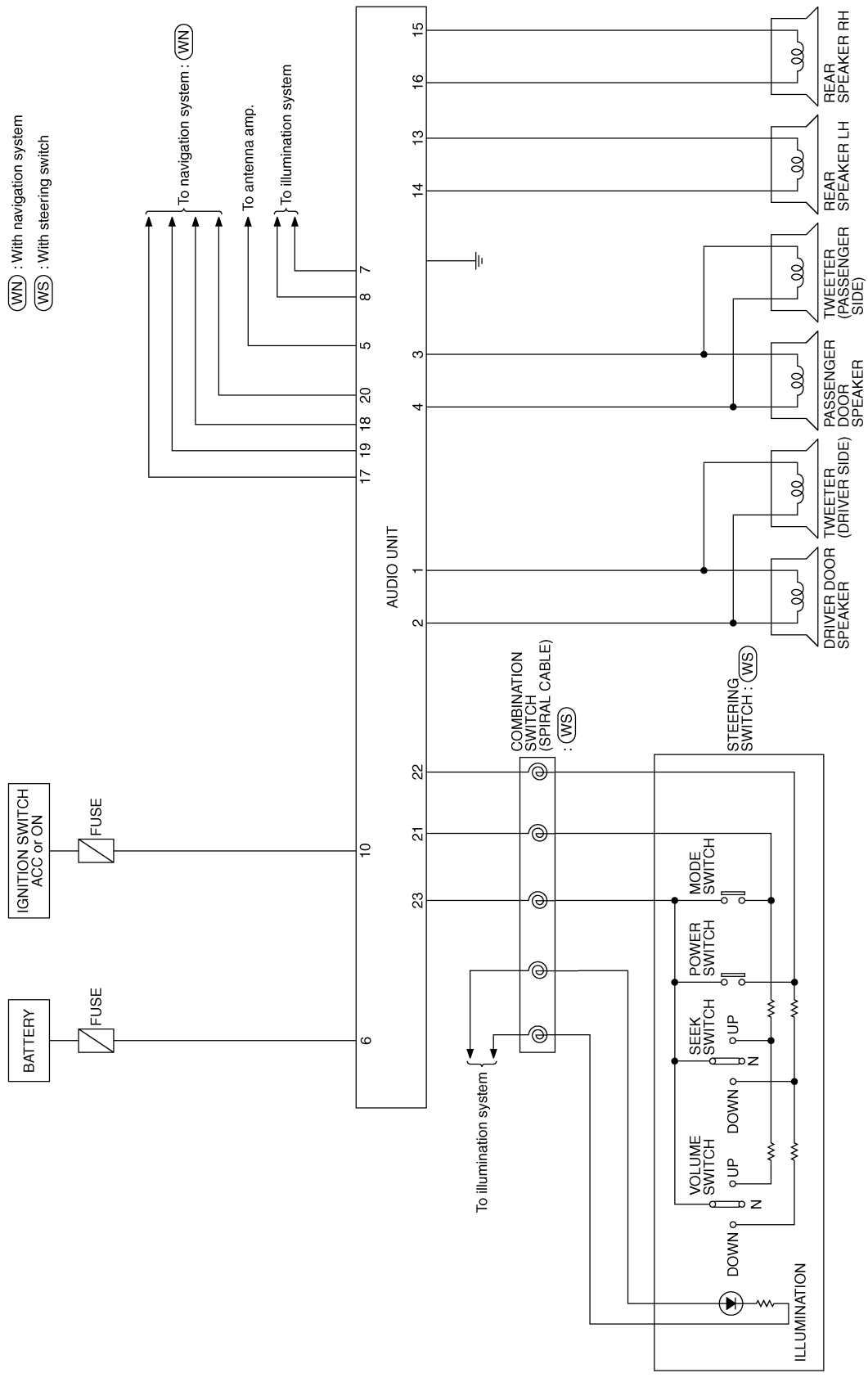
Component Parts Location

NKS000C8



Schematic / Base System

NKS000C9

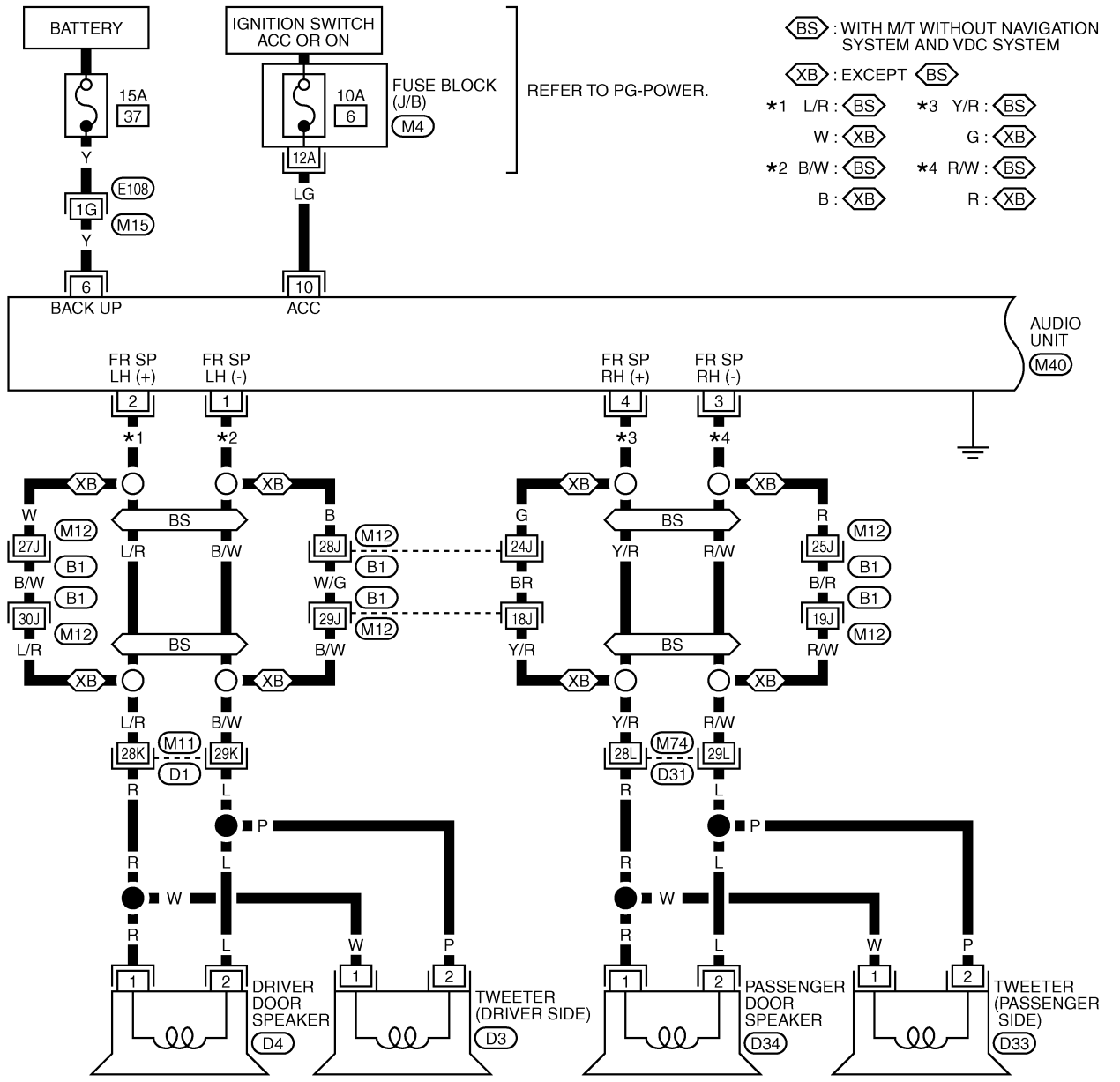


TKWT4061E

Wiring Diagram — AUDIO — / Base System

NKS000CA

AV-AUDIO-01



BS : WITH M/T WITHOUT NAVIGATION SYSTEM AND VDC SYSTEM

XB : EXCEPT BS

*1 L/R : BS, W : XB

*2 B/W : BS, B : XB

*3 Y/R : BS, G : XB

*4 R/W : BS, R : XB

M40 W

D3 BR, D33 BR

D4 W, D34 W

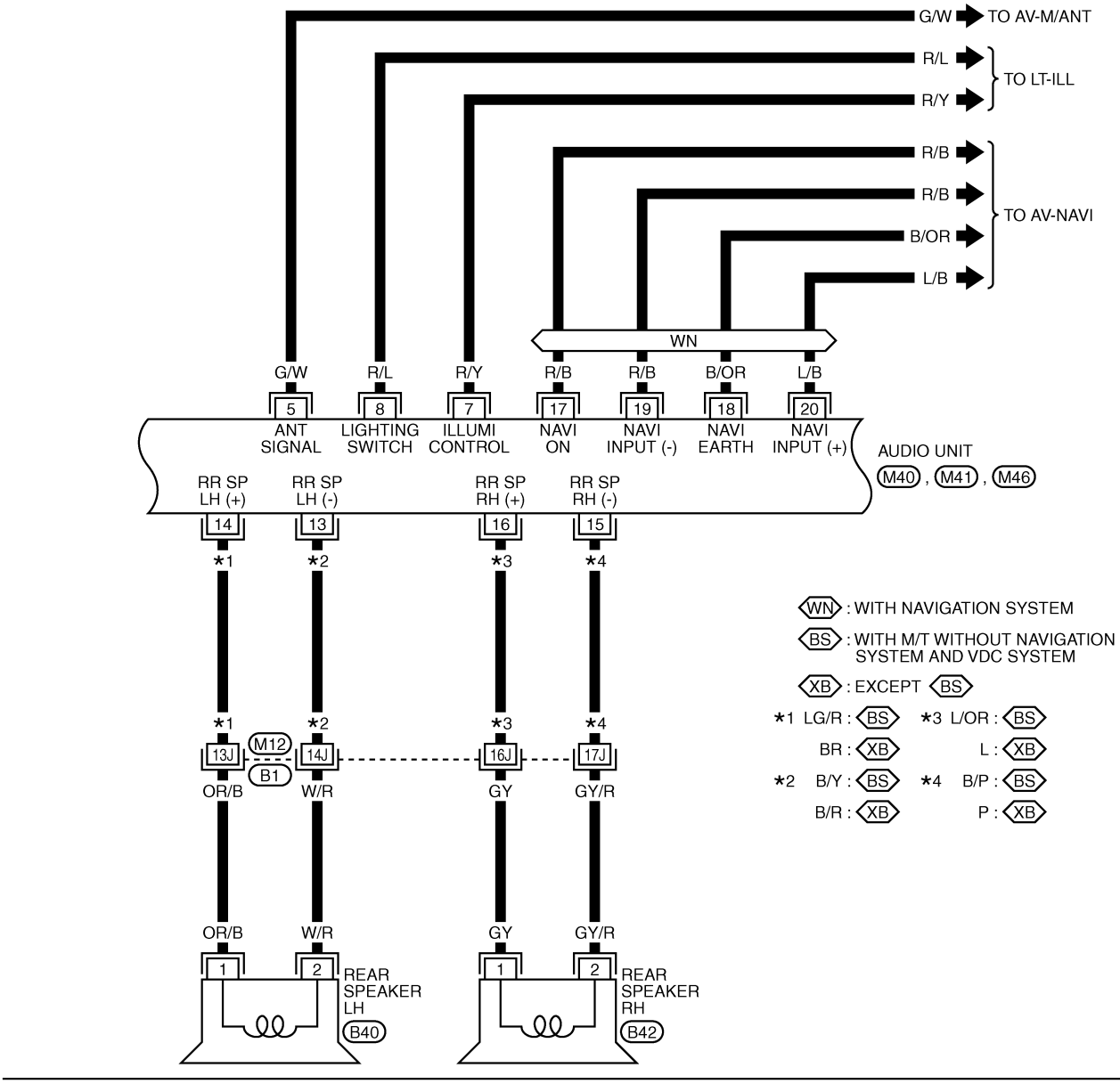
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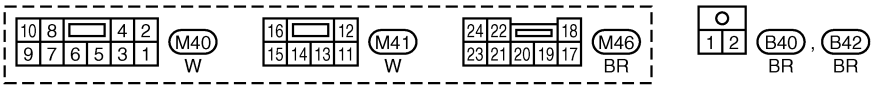
E108, B1, D1, D31 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5785E

AV-AUDIO-02



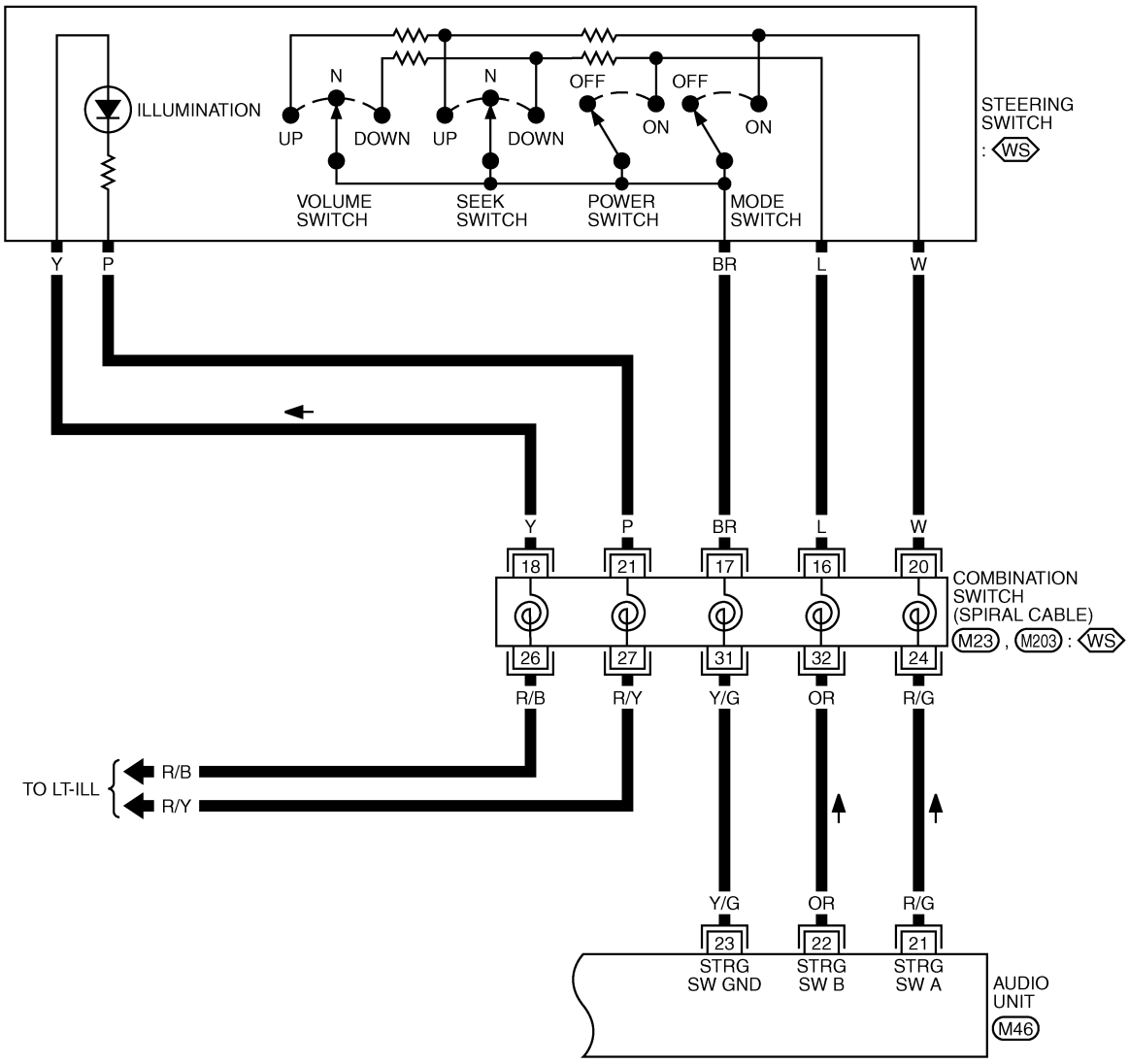


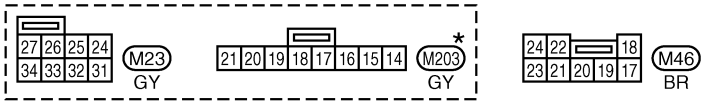
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5648E

AV-AUDIO-03

WS : WITH STEERING SWITCH



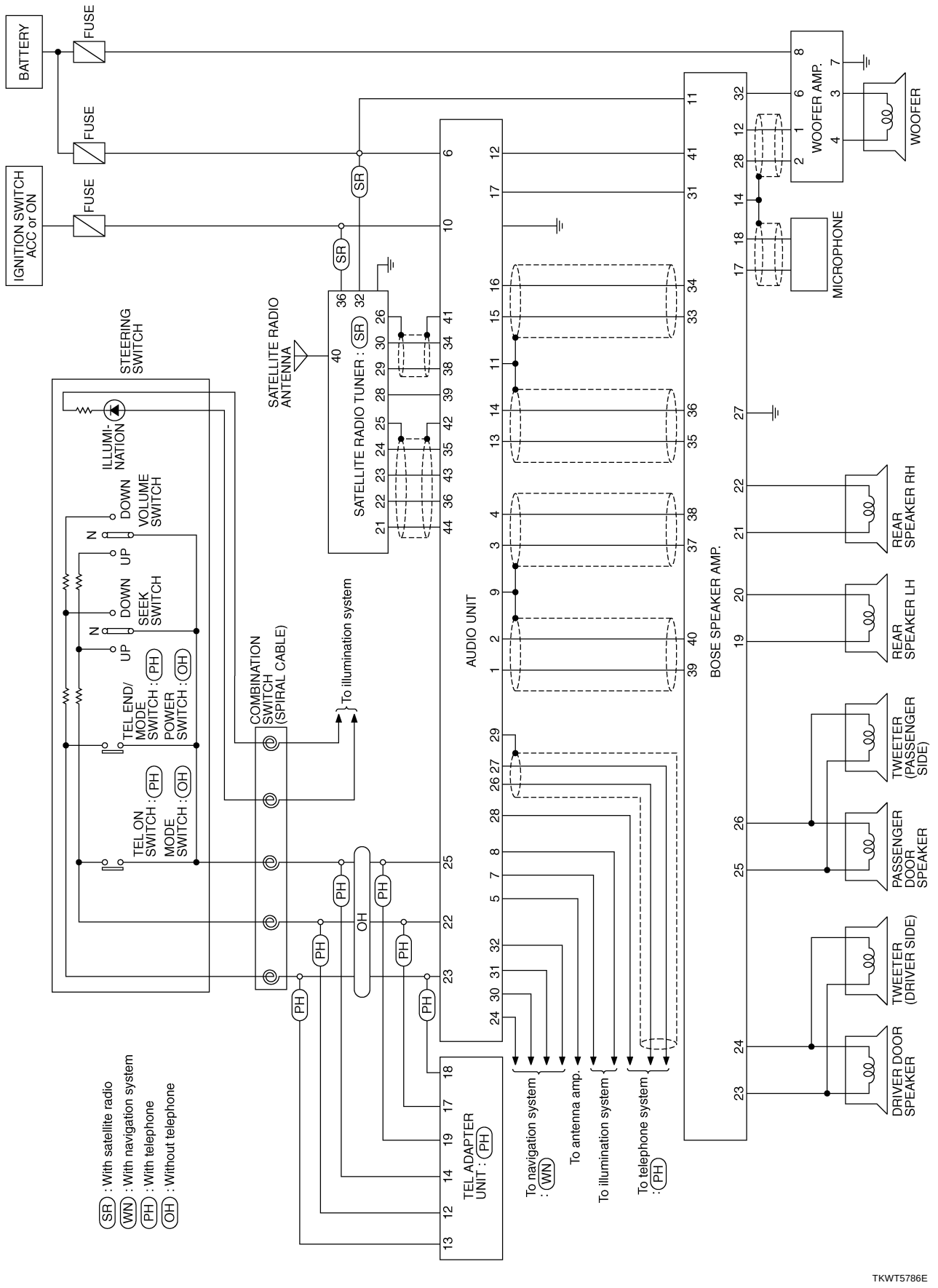


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5649E

Schematic / BOSE System

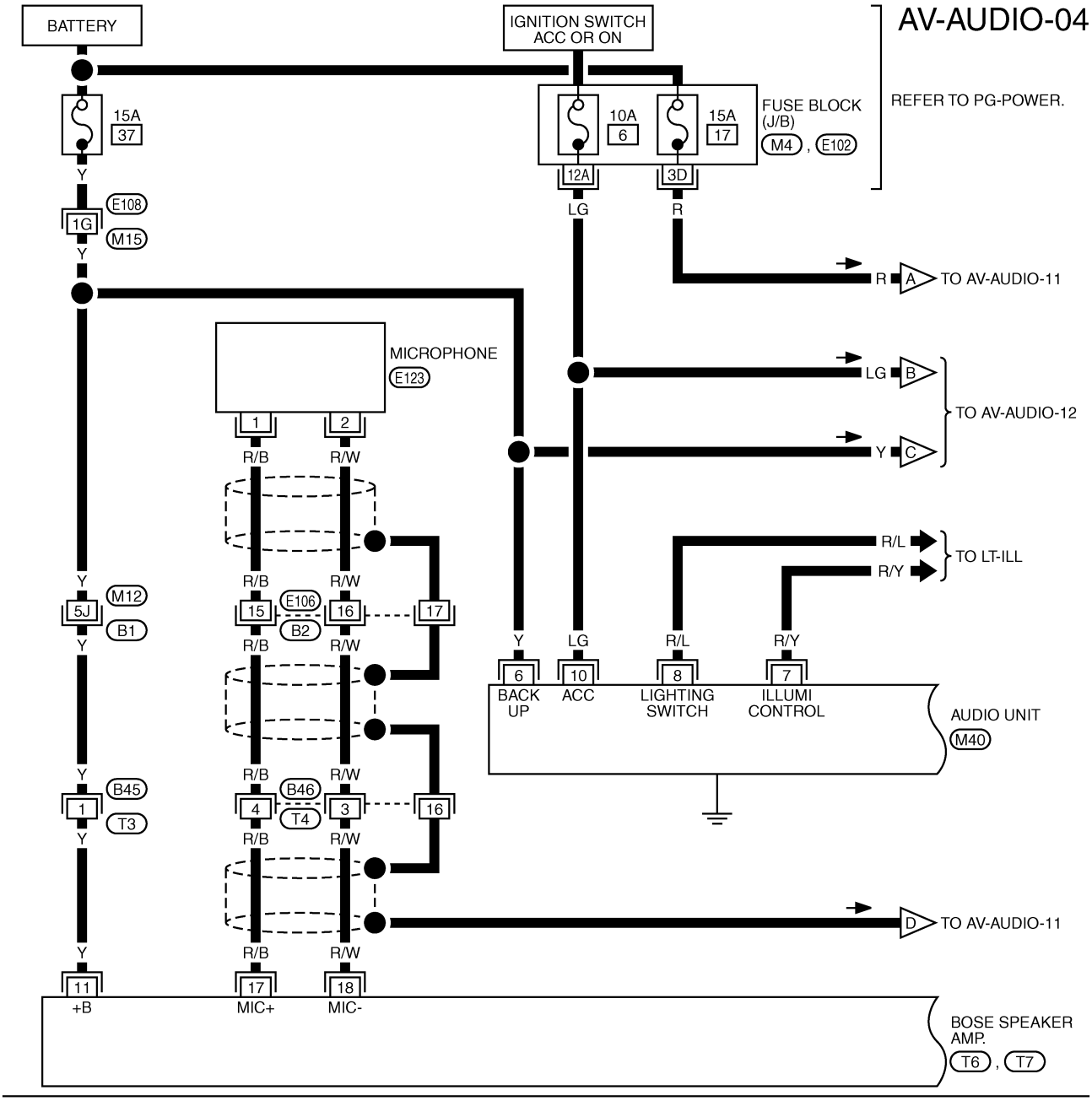
NKS002B6

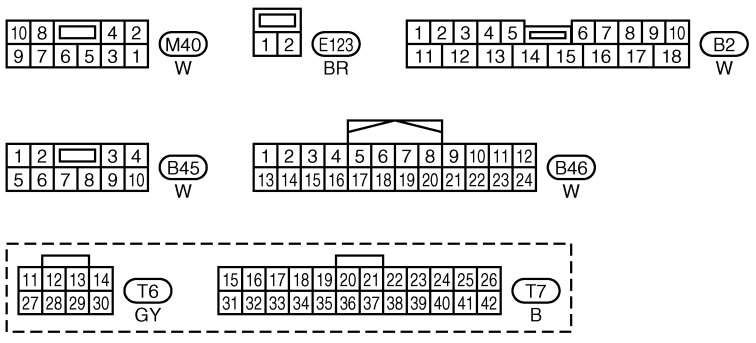


TKWT5786E

Wiring Diagram — AUDIO — / BOSE System (Coupe Models)

NKS004SV





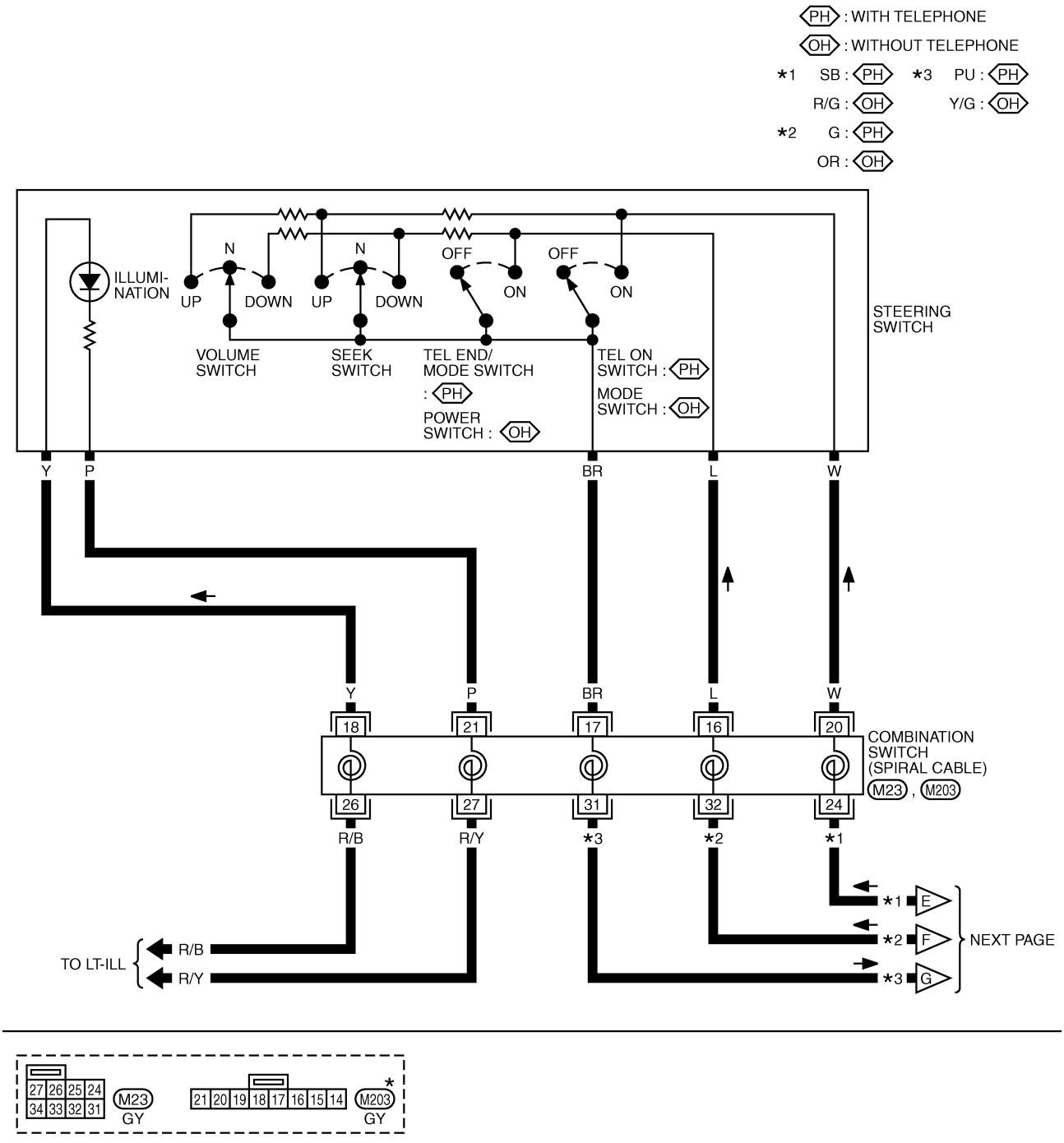
REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5787E

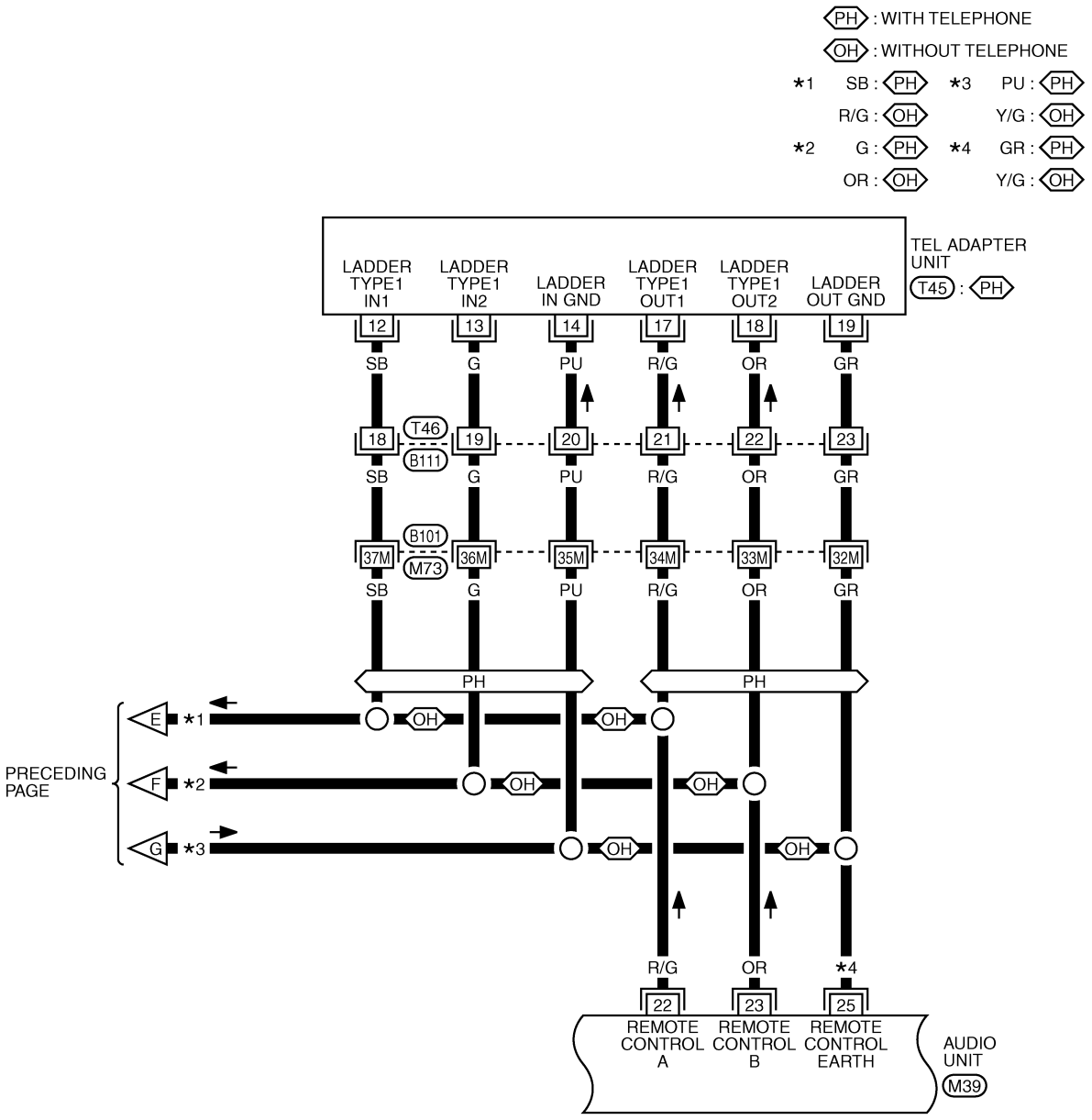
AV-AUDIO-05

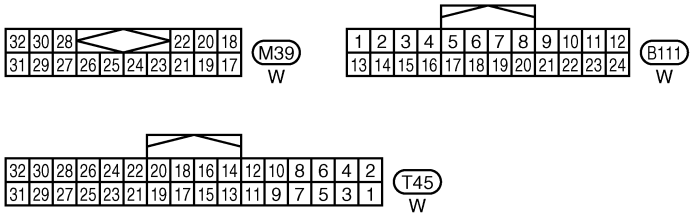


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5788E

AV-AUDIO-06



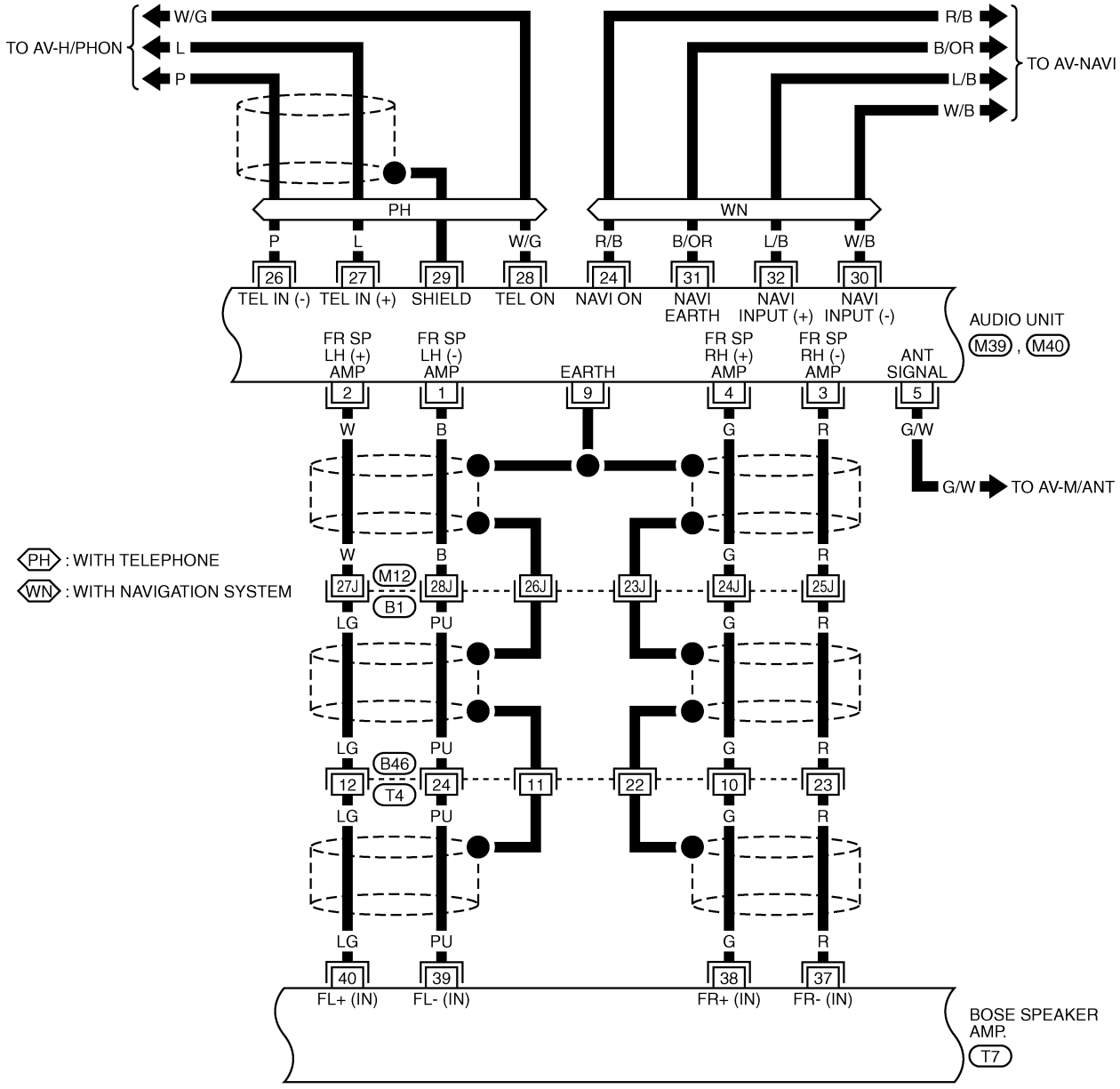


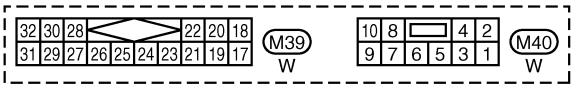
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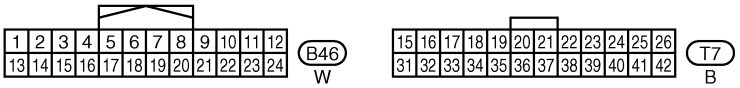
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5789E

AV-AUDIO-07





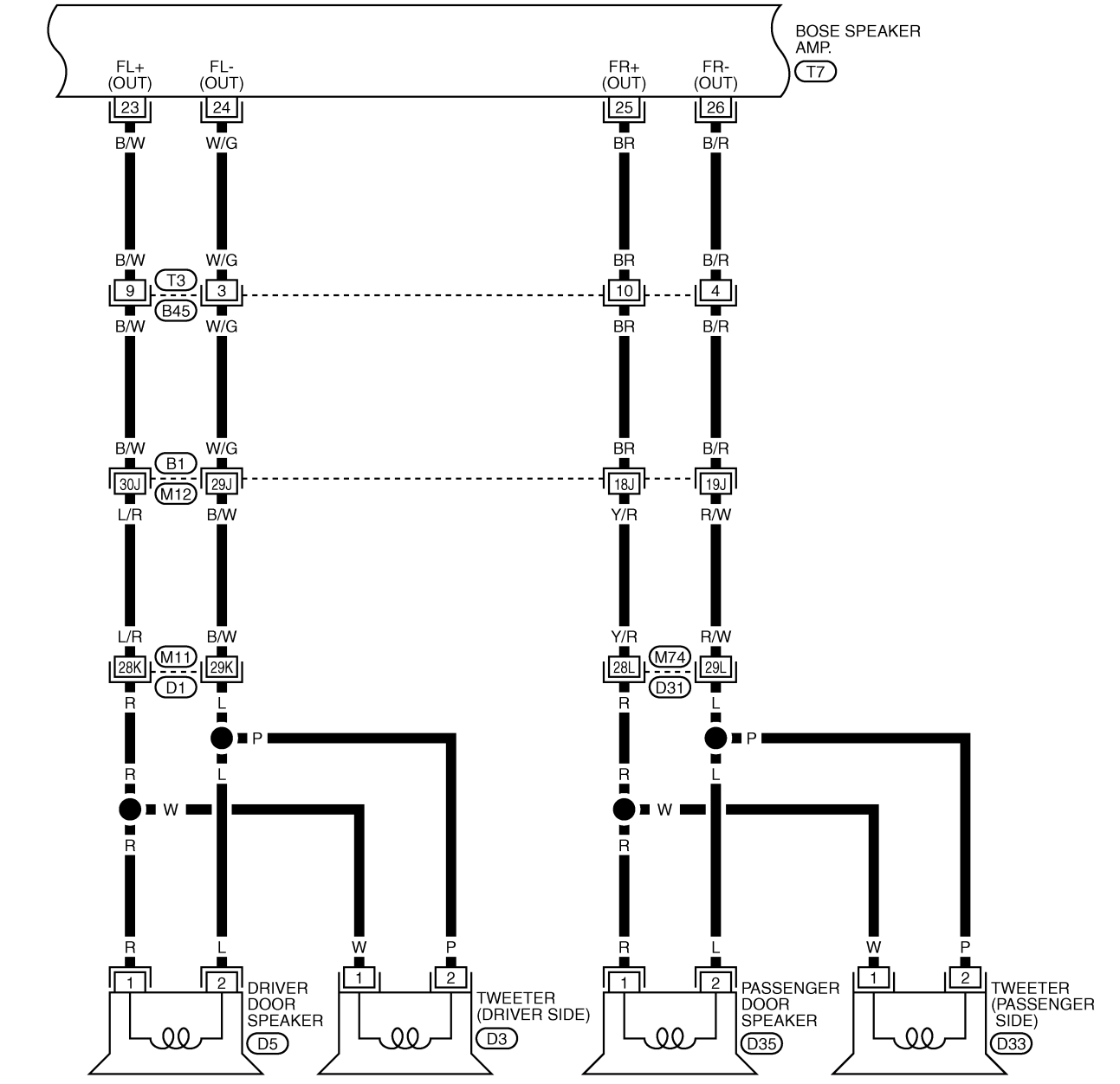


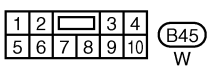
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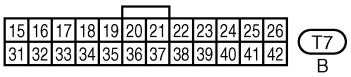
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5790E

AV-AUDIO-08







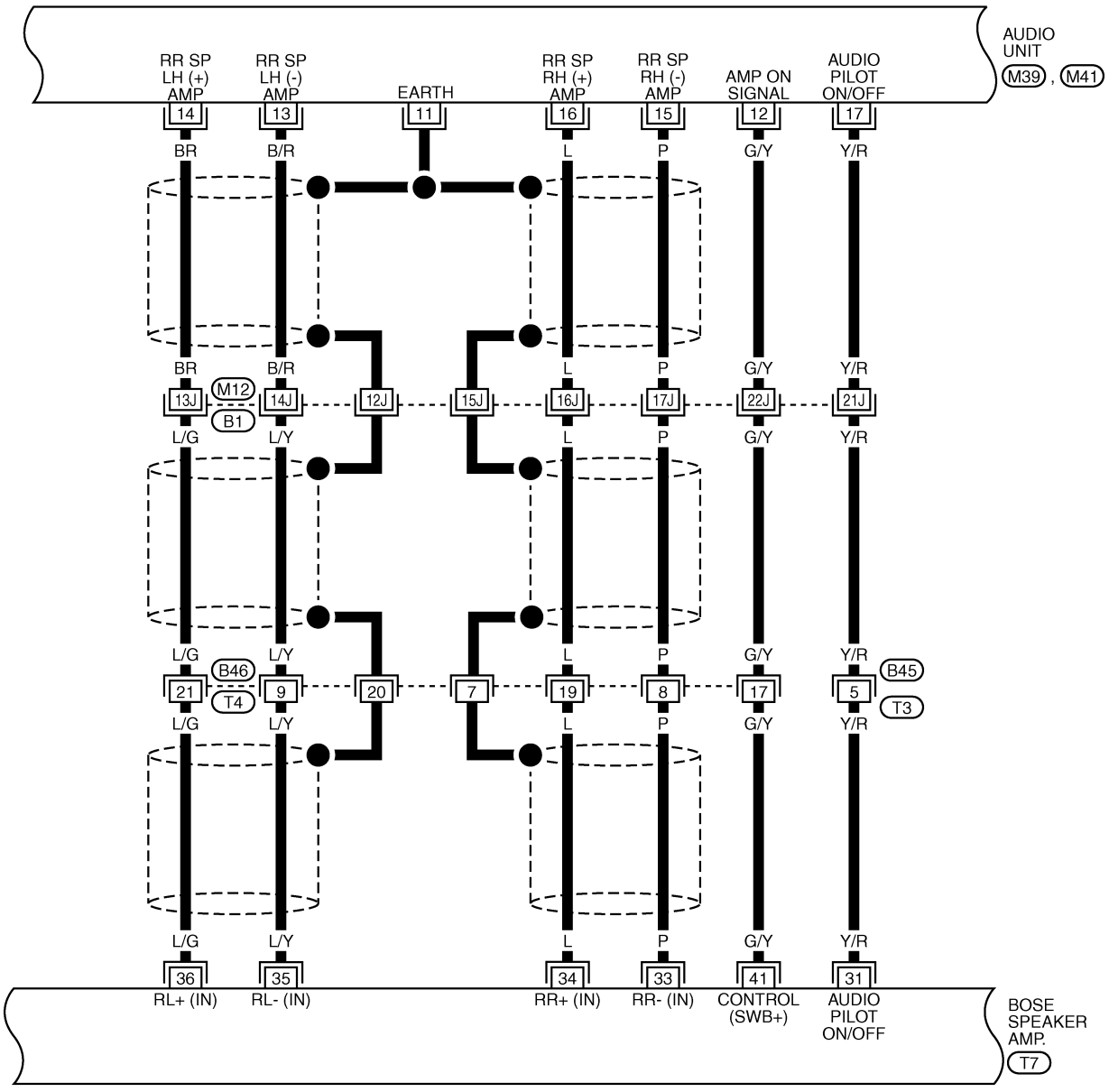


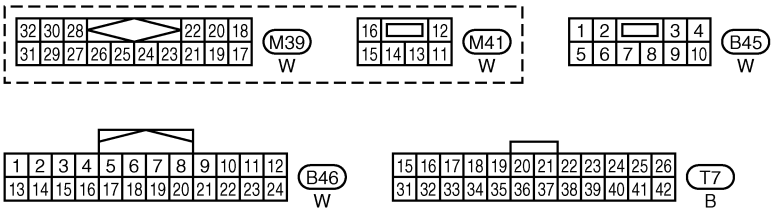


REFER TO THE FOLLOWING.
B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5791E

AV-AUDIO-09



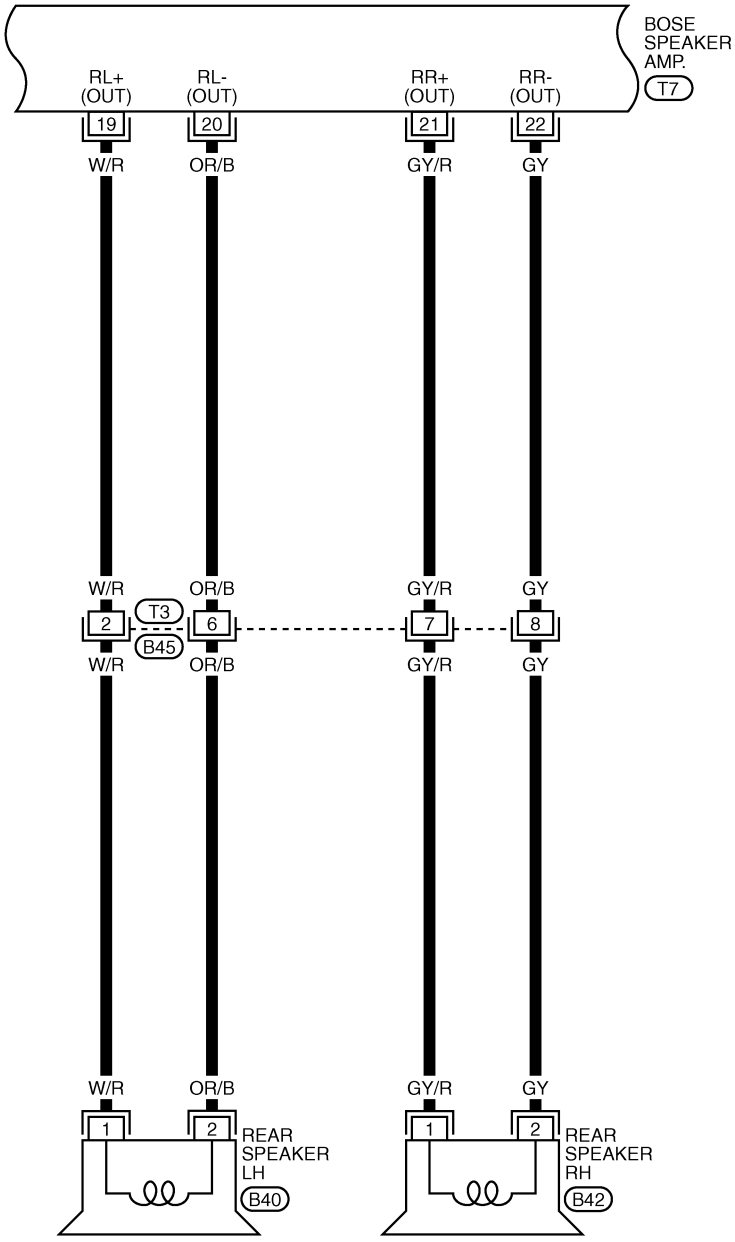


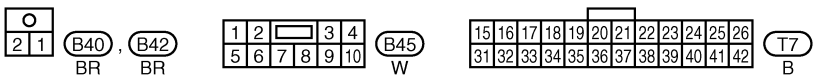
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5792E

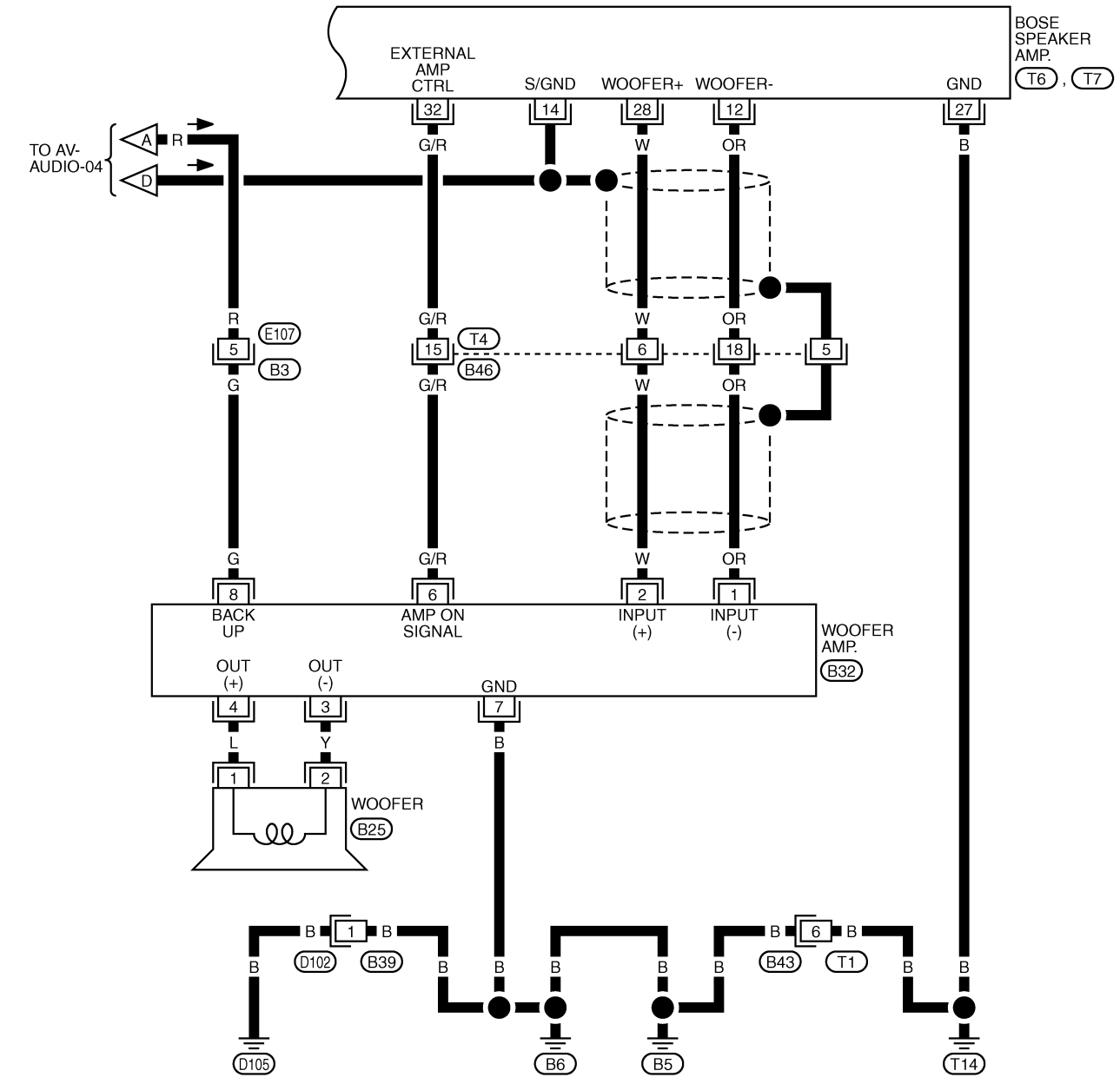
AV-AUDIO-10

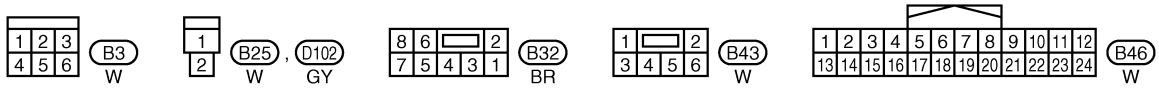


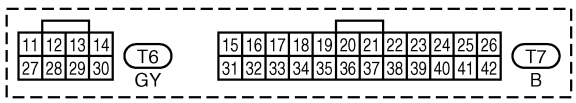


TKWT5793E

AV-AUDIO-11



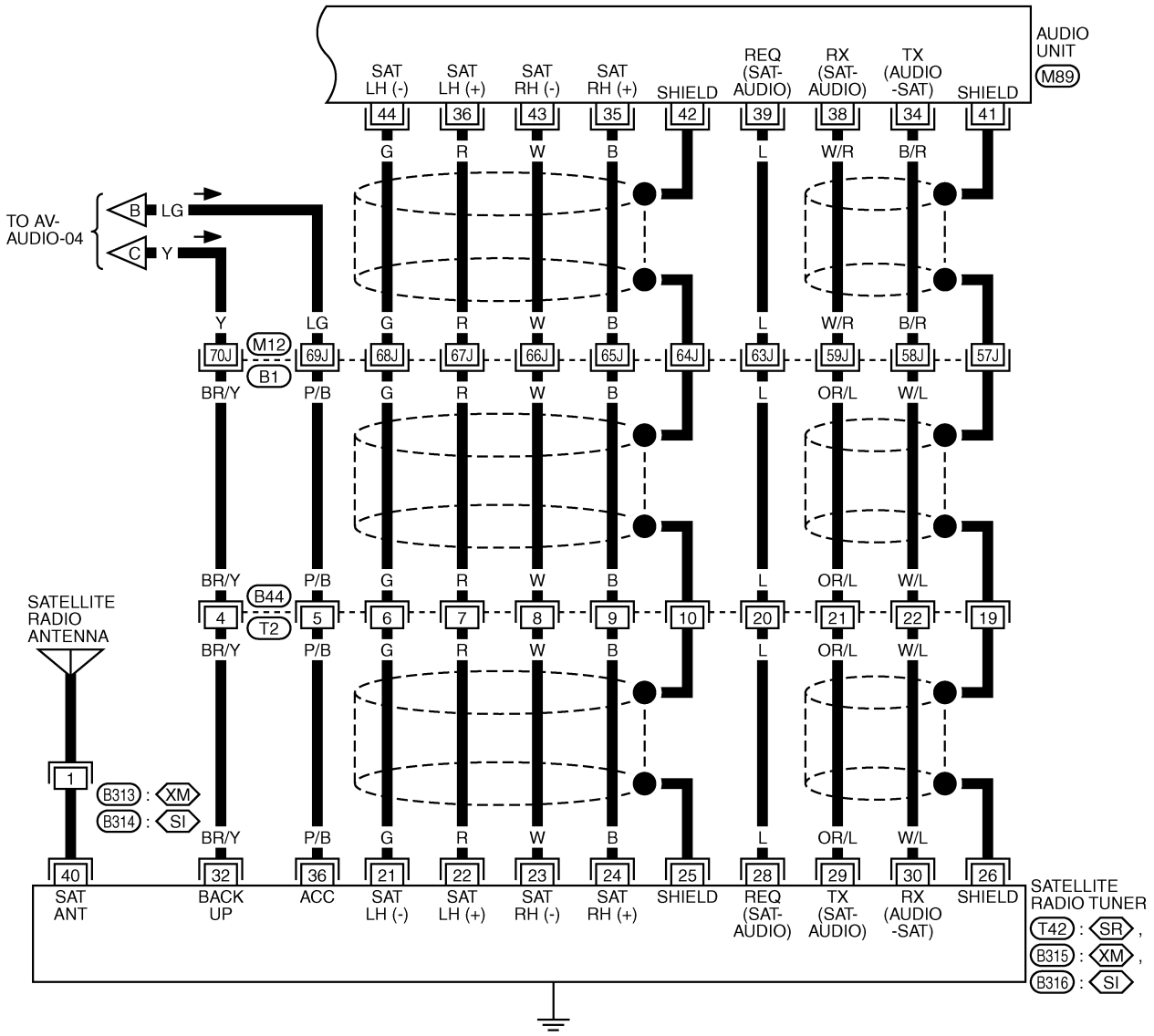


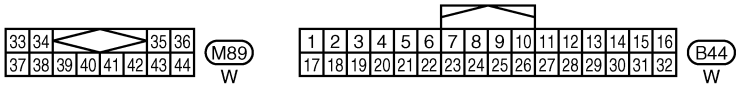


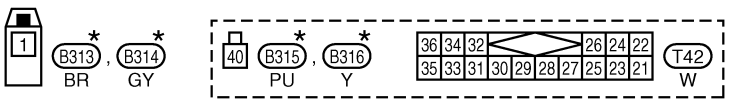
TKWT5794E

AV-AUDIO-12

SR : WITH SATELLITE RADIO
XM : WITH SATELLITE RADIO (XM)
SI : WITH SATELLITE RADIO (SIRIUS)







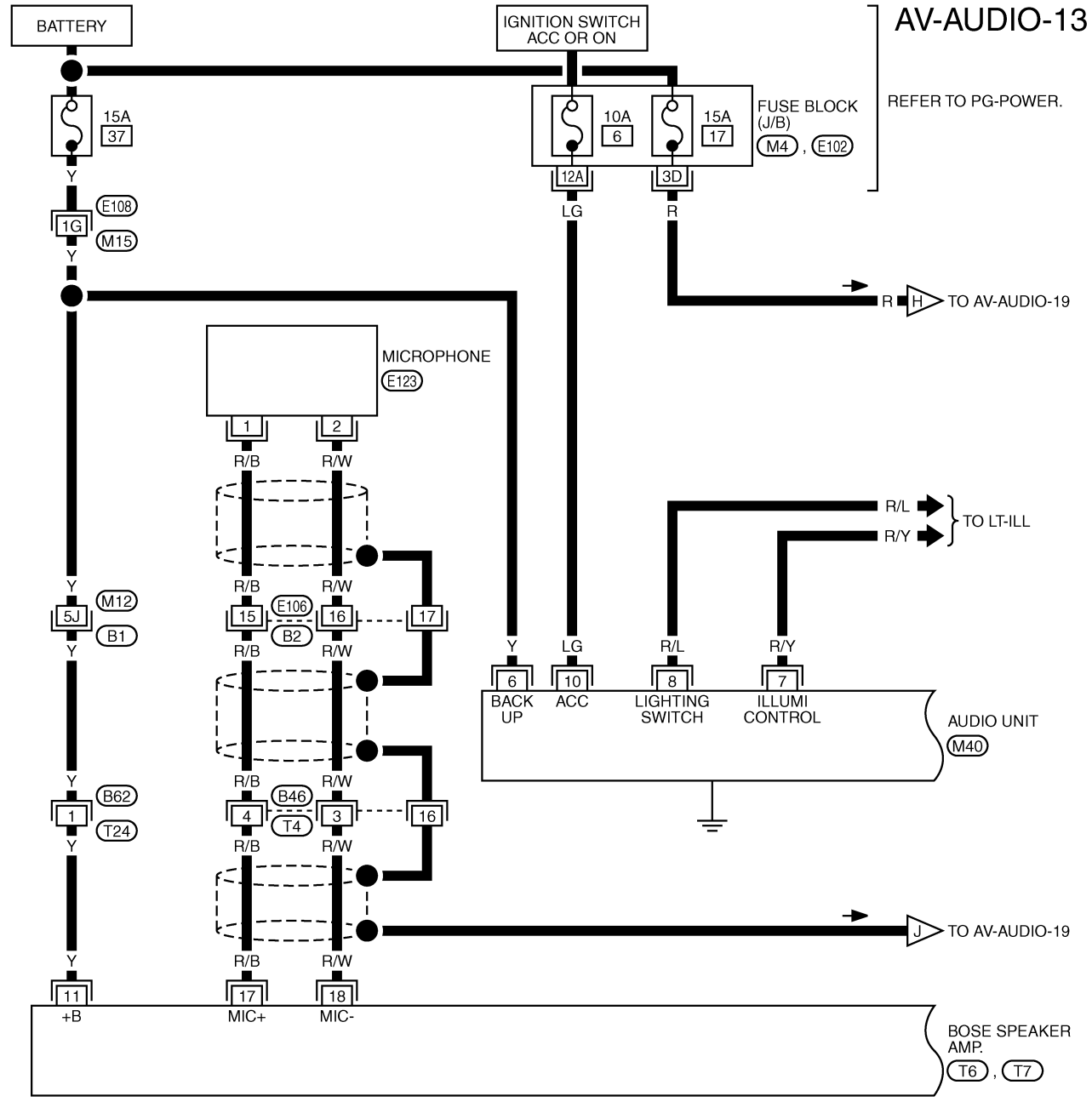
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

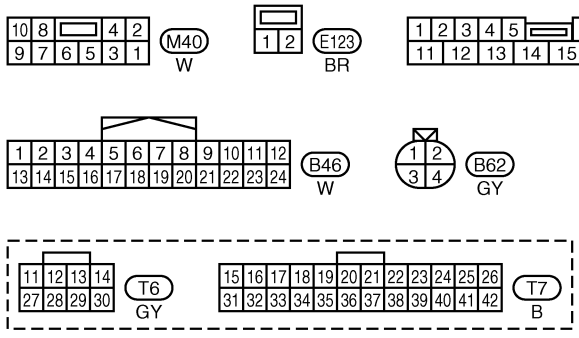
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5795E

Wiring Diagram — AUDIO — / BOSE System (Roadster Models)

NKS004SW



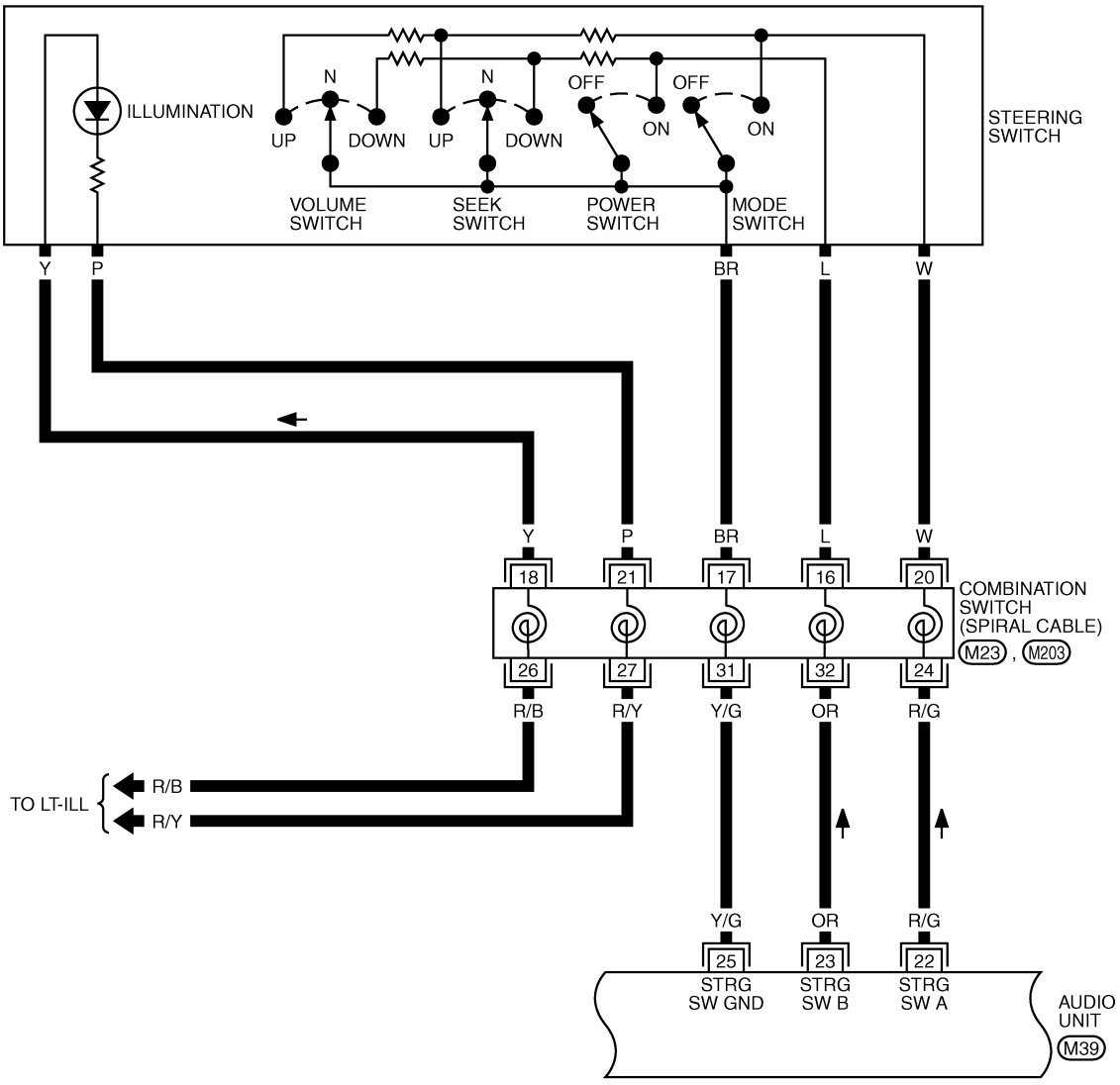


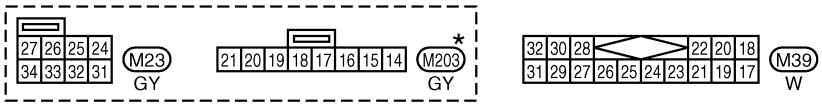
REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5796E



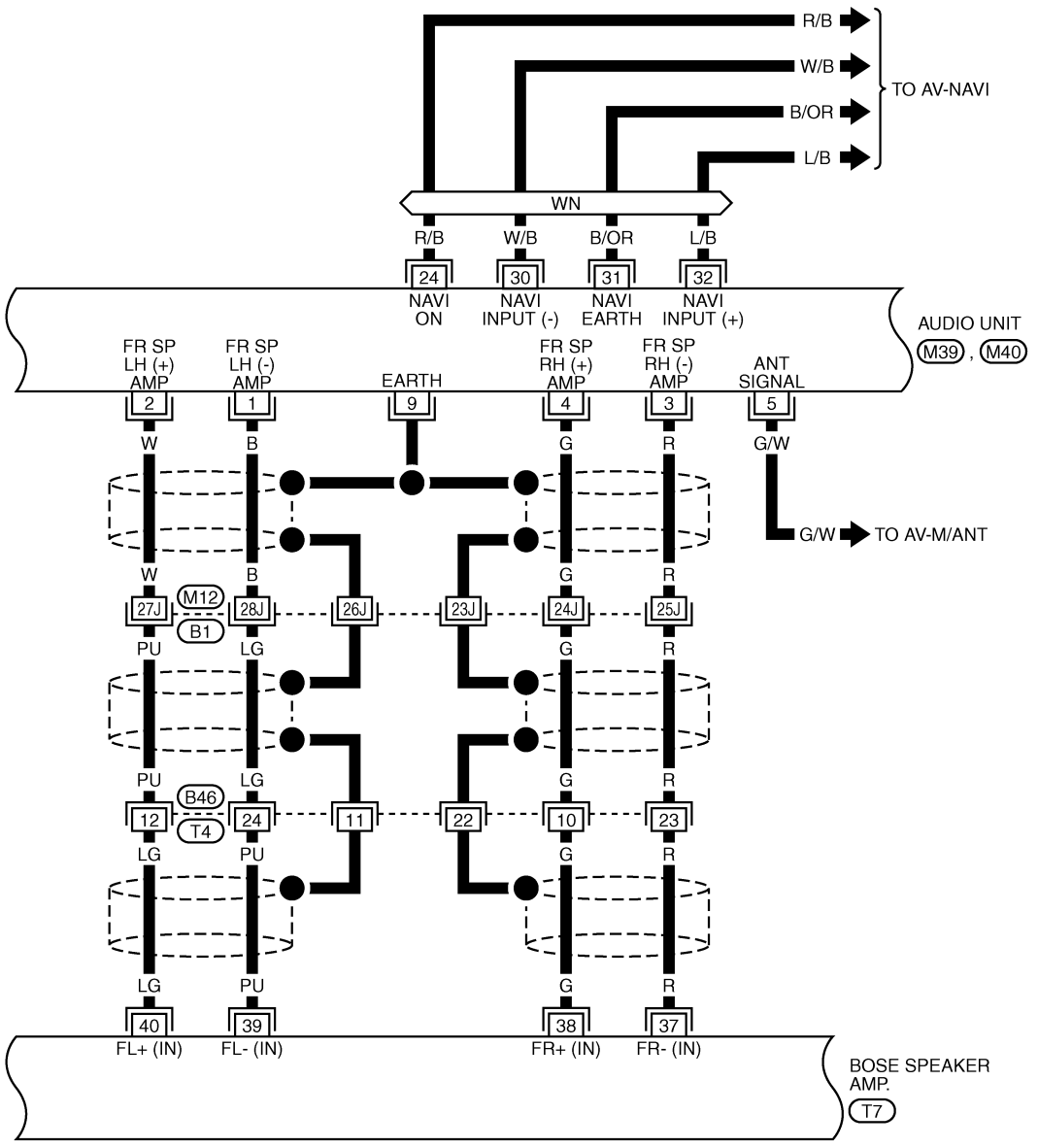


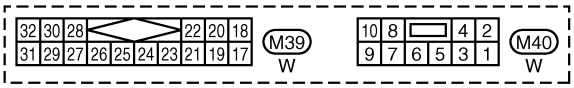
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

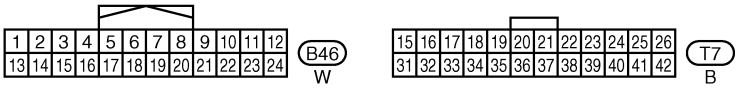
TKWT5797E

AV-AUDIO-15

WN : WITH NAVIGATION SYSTEM



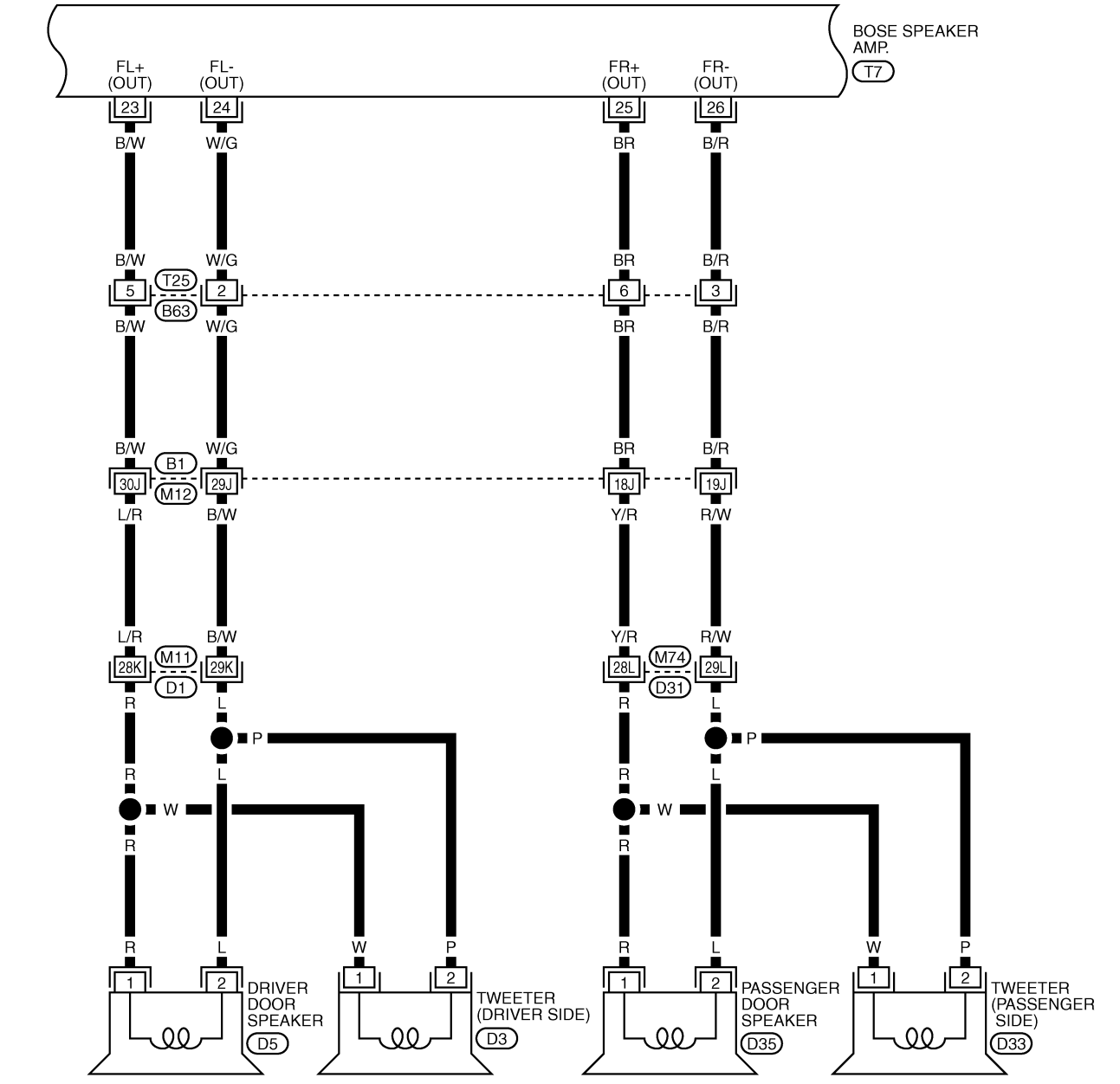


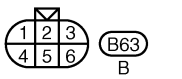


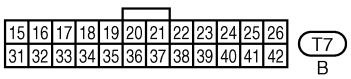
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

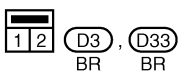
TKWT5798E

AV-AUDIO-16







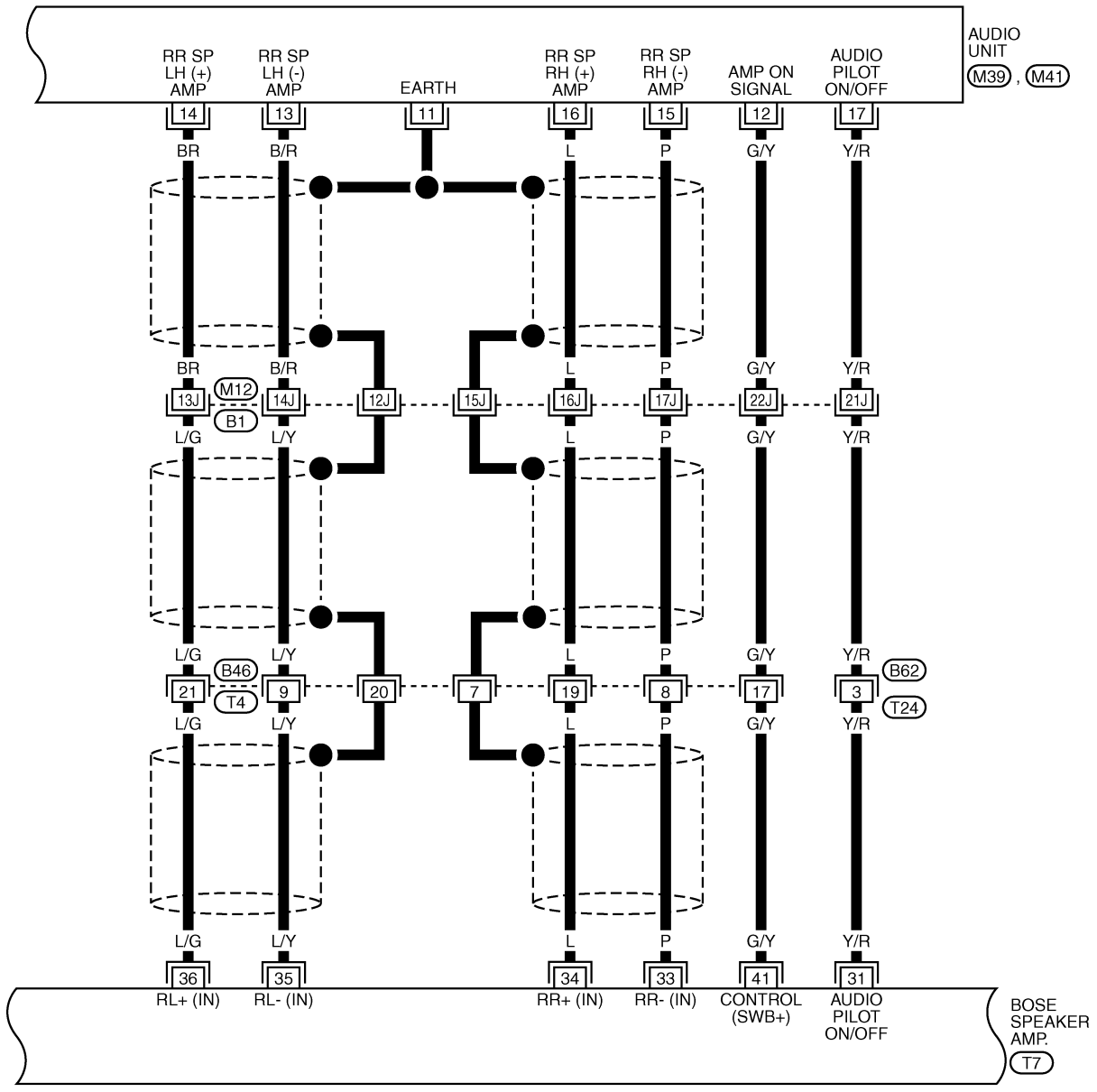


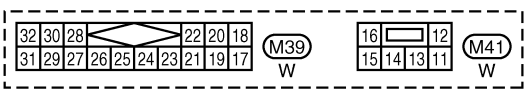


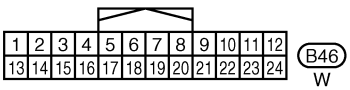
REFER TO THE FOLLOWING.
B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

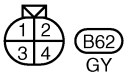
TKWT5799E

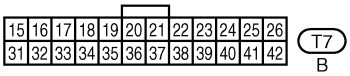
AV-AUDIO-17







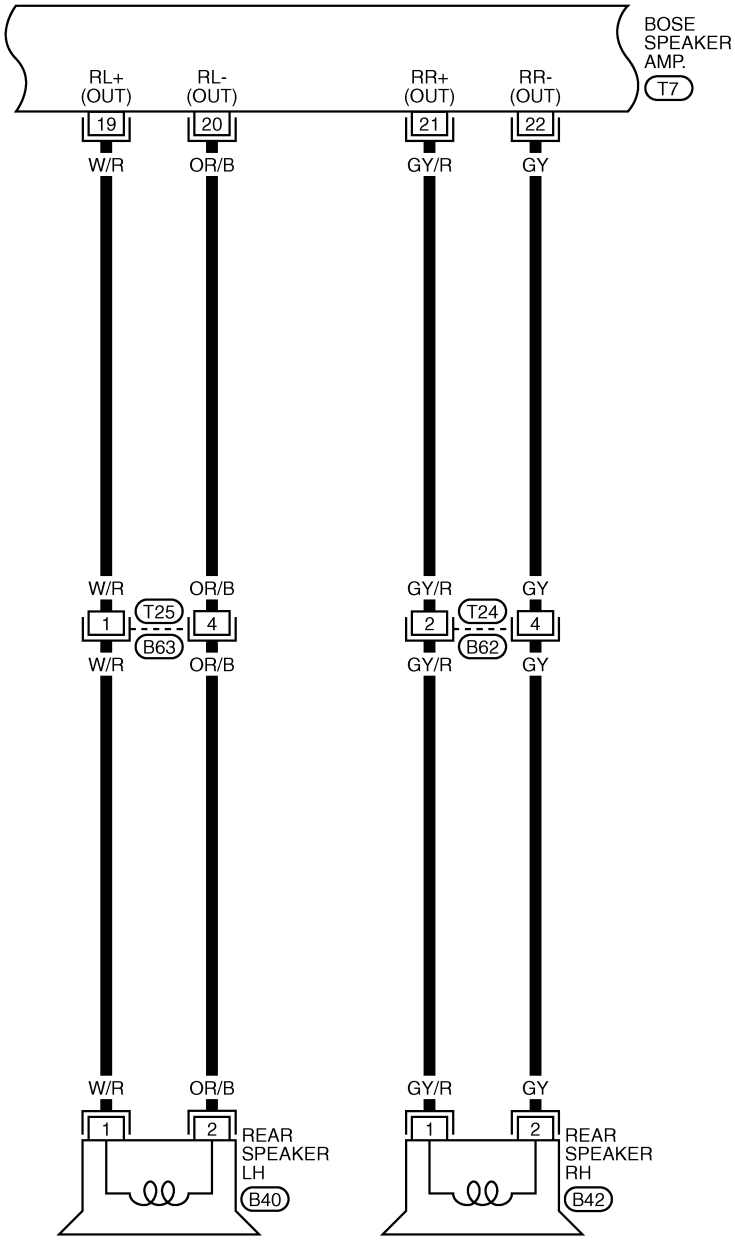


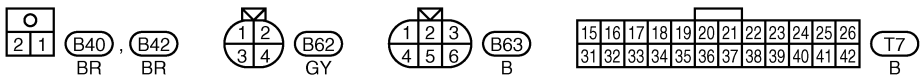


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5800E

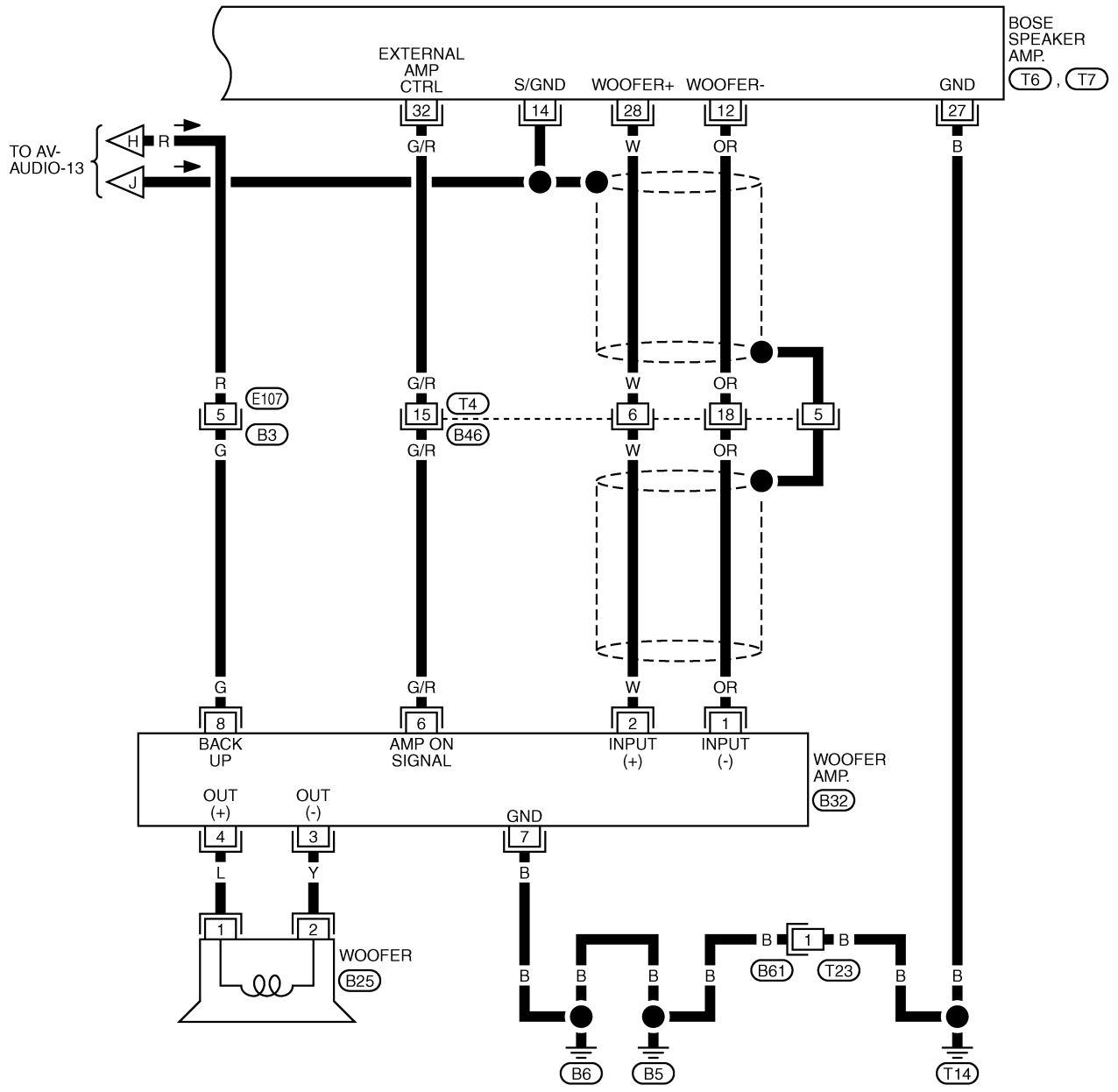
AV-AUDIO-18

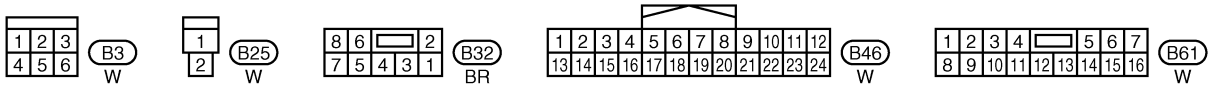


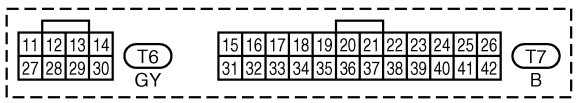


TKWT5801E

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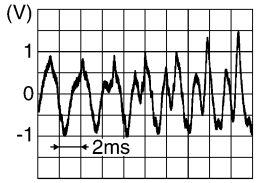
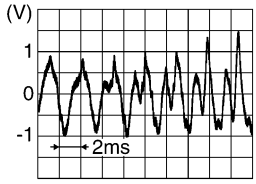
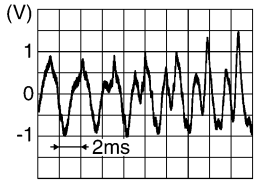
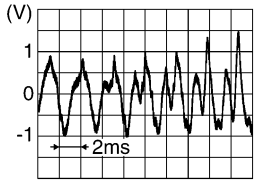
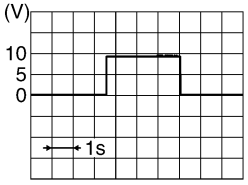


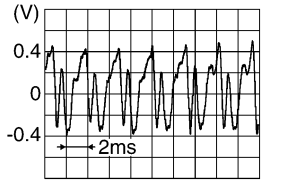


TKWT5802E

Terminals and Reference Value for Audio Unit / Base System

NKS002B9

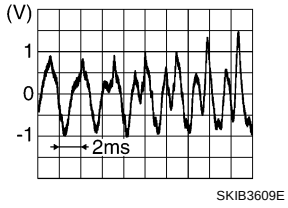
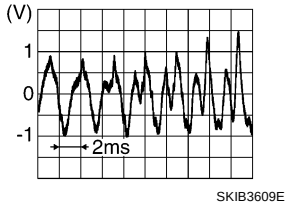
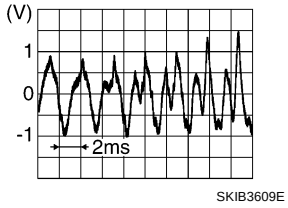
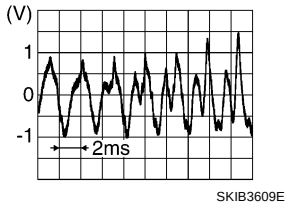
Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value
2 (L/R)*1 (W)*2	1 (B/W)*1 (B)*2	Audio signal front LH	Output	ON	Receive audio signal	 SKIB3609E
4 (Y/R)*1 (G)*2	3 (R/W)*1 (R)*2	Audio signal front RH	Output	ON	Receive audio signal	 SKIB3609E
5 (G/W)	Ground	Antenna amp. ON signal	Output	ON	—	Approx. 12 V
6 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
7 (R/Y)	Ground	Illumination control signal	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12 V
8 (R/L)	Ground	Lighting switch signal	Input	ON	Lighting switch ON	Approx. 12 V
					Lighting switch OFF	Approx. 0 V
10 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
14 (LG/R)*1 (BR)*2	13 (B/Y)*1 (B/R)*2	Audio signal rear LH	Output	ON	Receive audio signal	 SKIB3609E
16 (L/OR)*1 (L)*2	15 (B/P)*1 (P)*2	Audio signal rear RH	Output	ON	Receive audio signal	 SKIB3609E
17 (R/B)	18 (B/OR)	Voice guidance ON signal*3	Input	ON	Press “VOICE” button	 SKIB0232E

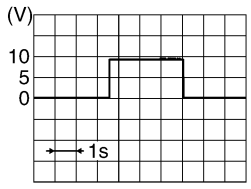
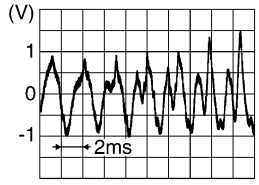
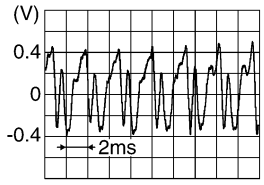
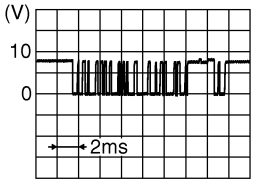
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
20 (L/B)	19 (R/B)	Voice guidance signal*3	Input	ON	Press “VOICE” button	 SKIB3597E
21 (R/G)	23 (Y/G)	Remote control signal A	Input	ON	Press and hold MODE switch	Approx. 0 V
					Press and hold SEEK UP switch	Approx. 1.7 V
					Press and hold VOLUME UP switch	Approx. 3.3 V
					Except for above	Approx. 5 V
22 (OR)	23 (Y/G)	Remote control signal B	Input	ON	Press and hold POWER switch	Approx. 0 V
					Press and hold SEEK DOWN switch	Approx. 1.7 V
					Press and hold VOLUME DOWN switch	Approx. 3.3 V
					Except for above	Approx. 5 V
23 (Y/G)	Ground	Remote control ground	—	ON	—	Approx. 0 V

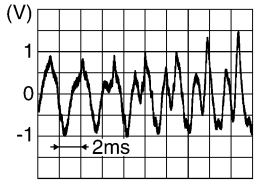
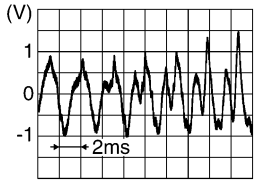
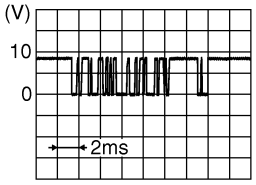
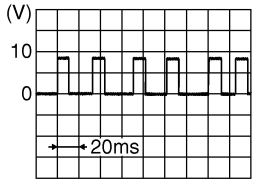
- *1: With M/T without navigation system and VDC system
- *2: Except *1
- *3: With navigation system

Terminals and Reference Value for Audio Unit / BOSE System

NKS002BA

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
2 (W)	1 (B)	Audio signal front LH	Output	ON	Receive audio signal	 SKIB3609E
4 (G)	3 (R)	Audio signal front RH	Output	ON	Receive audio signal	 SKIB3609E
5 (G/W)	Ground	Antenna amp. ON signal	Output	ON	—	Approx. 12 V
6 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
7 (R/Y)	Ground	Illumination control signal	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12 V
8 (R/L)	Ground	Lighting switch signal	Input	ON	Lighting switch ON	Approx. 12 V
					Lighting switch OFF	Approx. 0 V
9	—	Shield	—	—	—	—
10 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
11	—	Shield	—	—	—	—
12 (G/Y)	Ground	BOSE speaker amp. ON signal	Output	ON	—	Approx. 12 V
14 (BR)	13 (B/R)	Audio signal rear LH	Output	ON	Receive audio signal	 SKIB3609E
16 (L)	15 (P)	Audio signal rear RH	Output	ON	Receive audio signal	 SKIB3609E
17 (Y/R)	Ground	AudioPilot® ON/OFF signal	Output	ON	AudioPilot® OFF	Approx. 7.5 V
					AudioPilot® ON	Approx. 0 V

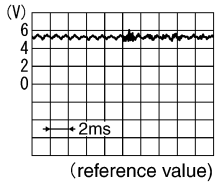
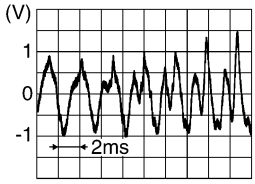
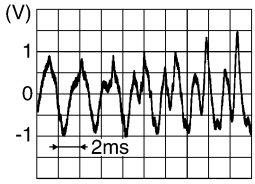
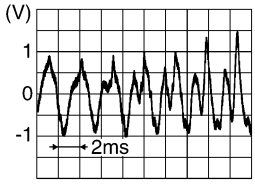
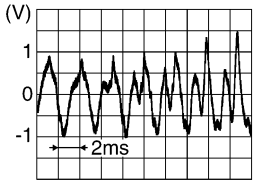
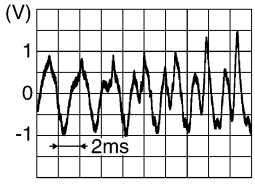
Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value
22 (R/G)	25 (GR)*1 (Y/G)*2	Remote control signal A	Input	ON	Press and hold MODE switch	Approx. 0 V
					Press and hold SEEK UP switch	Approx. 1.7 V
					Press and hold VOLUME UP switch	Approx. 3.3 V
					Except for above	Approx. 5 V
23 (OR)	25 (GR)*1 (Y/G)*2	Remote control signal B	Input	ON	Press and hold POWER switch	Approx. 0 V
					Press and hold SEEK DOWN switch	Approx. 1.7 V
					Press and hold VOLUME DOWN switch	Approx. 3.3 V
					Except for above	Approx. 5 V
24 (R/B)	31 (B/OR)	Voice guidance ON signal*3	Input	ON	Press “VOICE” button	 SKIB0232E
25 (GR)*1 (Y/G)*2	Ground	Remote control ground	—	ON	—	Approx. 0 V
27 (L)	26 (P)	TEL voice signal*1	Input	ON	Receiving the party's voice while using the hands-free phone system.	 SKIB3609E
28 (W/G)	Ground	TEL ON signal*1	Input	ON	When using hands-free phone system	Approx. 0 V
					Except while using hands-free phone system	Approx. 5 V
29	—	Shield*1	—	—	—	—
32 (L/B)	30 (W/B)	Voice guidance signal*3	Input	ON	Press “VOICE” button	 SKIB3597E
34 (B/R)	Ground	Communication signal Tx (AUDIO-SAT)*4	Output	ON	When setting to satellite radio mode	 SKIB7336E

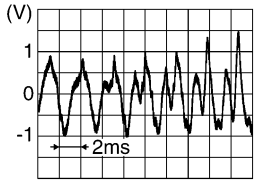
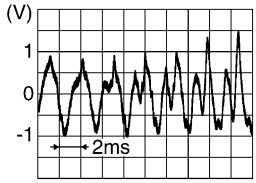
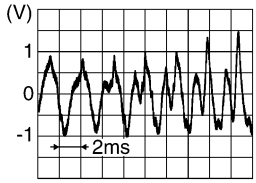
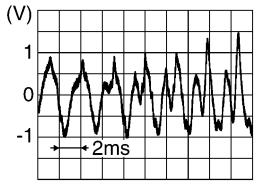
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
35 (B)	43 (W)	Satellite radio audio signal RH*4	Input	ON	Receive satellite radio audio signal	 SKIB3609E
36 (R)	44 (G)	Satellite radio audio signal LH*4	Input	ON	Receive satellite radio audio signal	 SKIB3609E
38 (W/R)	Ground	Communication signal Rx (SAT-AUDIO)*4	Input	ON	When setting to satellite radio mode	 SKIB7337E
39 (L)	Ground	Communication signal REQ (SAT-AUDIO)*4	Input	ON	When setting to satellite radio mode	 SKIB7338E
41	—	Shield*4	—	—	—	—
42	—	Shield*4	—	—	—	—

- *1: With telephone system
- *2: Without telephone system
- *3: With navigation system
- *4: With satellite radio

Terminals and Reference Value for BOSE Speaker Amp.

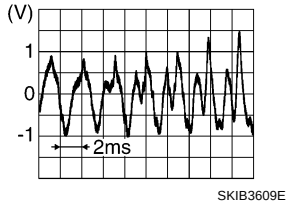
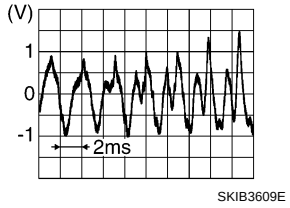
NKS002BB

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
11 (Y)	Ground	Battery power supply	Input	ON	—	Battery voltage
14	—	Shield	—	—	—	—
17 (R/B)	18 (R/W)	Microphone signal	Input	ON	When inputting some sounds (voice, etc.) toward the microphone	 (reference value) PKIA2104E
19 (W/R)	20 (OR/B)	Audio signal rear LH	Output	ON	Receive audio signal	 SKIB3609E
21 (GY/R)	22 (GY)	Audio signal rear RH	Output	ON	Receive audio signal	 SKIB3609E
23 (B/W)	24 (W/G)	Audio signal front LH	Output	ON	Receive audio signal	 SKIB3609E
25 (BR)	26 (B/R)	Audio signal front RH	Output	ON	Receive audio signal	 SKIB3609E
27 (B)	Ground	Ground	—	ON	—	Approx. 0 V
28 (W)	12 (OR)	Audio signal woofer	Output	ON	Receive audio signal	 SKIB3609E
31 (Y/R)	Ground	AudioPilot® ON/OFF signal	Input	ON	AudioPilot® OFF	Approx. 7.5 V
					AudioPilot® ON	Approx. 0 V
32 (G/R)	Ground	Woofer amp. ON signal	Output	ON	—	Approx. 12 V

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
34 (L)	33 (P)	Audio signal rear RH	Input	ON	Receive audio signal	 SKIB3609E
36 (L/G)	35 (L/Y)	Audio signal rear LH	Input	ON	Receive audio signal	 SKIB3609E
38 (G)	37 (R)	Audio signal front RH	Input	ON	Receive audio signal	 SKIB3609E
40 (LG)	39 (PU)	Audio signal front LH	Input	ON	Receive audio signal	 SKIB3609E
41 (G/Y)	Ground	BOSE speaker amp. ON signal	Input	ON	—	Approx. 12 V

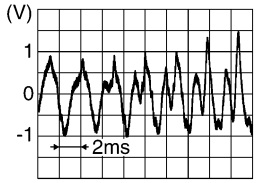
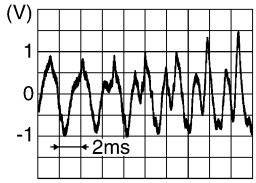
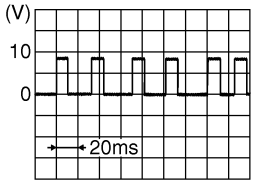
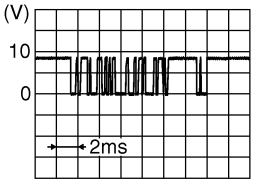
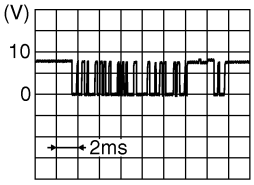
Terminals and Reference Value for Woofer Amp.

NKS002BC

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
2 (W)	1 (OR)	Audio signal woofer	Input	ON	Receive audio signal	 SKIB3609E
4 (L)	3 (Y)	Audio signal woofer	Output	ON	Receive audio signal	 SKIB3609E
6 (G/R)	Ground	Woofer amp. ON signal	Input	ON	—	Approx. 12 V
7 (B)	Ground	Ground	—	ON	—	Approx. 0 V
8 (G)	Ground	Battery power supply	Input	OFF	—	Battery voltage

Terminals and Reference Value for Satellite Radio Tuner

NKS002EC

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
22 (R)	21 (G)	Satellite radio audio signal LH	Output	ON	Receive satellite radio audio signal	 SKIB3609E
24 (B)	23 (W)	Satellite radio audio signal RH	Output	ON	Receive satellite radio audio signal	 SKIB3609E
25	—	Shield	—	—	—	—
26	—	Shield	—	—	—	—
28 (L)	Ground	Communication signal REQ (SAT-AUDIO)	Output	ON	When setting to satellite radio mode	 SKIB7338E
29 (OR/L)	Ground	Communication signal Tx (SAT-AUDIO)	Output	ON	When setting to satellite radio mode	 SKIB7337E
30 (W/L)	Ground	Communication signal Rx (AUDIO-SAT)	Input	ON	When setting to satellite radio mode	 SKIB7336E
32 (BR/Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
36 (P/B)	Ground	ACC power supply	Input	ACC	—	Battery voltage
40	—	Satellite radio antenna	—	—	—	—

Trouble Diagnosis

NKS002ED

- The majority of the audio malfunctions are the result of outside causes (bad CD, electromagnetic interference, etc.). Check the symptoms below to diagnose the malfunction.
- The vehicle itself can be a source of noise if noise prevention parts or electrical equipment is malfunctioning. Check if noise is caused and/or changed by engine speed, ignition switch turned to each position, and operation of each piece of electrical equipment, and then determine the cause.
- Refer to "SERVICE BULLETIN NTB04-119" for the diagnosis of satellite radio.

Symptom	Possible malfunction location
Audio system does not work properly.	● Audio unit power supply circuit ● Audio unit
No sound can be heard from all speakers.	**Base system** ● Audio unit
	BOSE system ● BOSE speaker amp. power supply and ground circuit ● BOSE speaker amp. ON signal circuit ● Audio unit ● BOSE speaker amp.
No sound can be heard from one or several speakers.	**Base system** ● Audio signal circuit between audio unit and speaker ● Speaker ● Tweeter ● Audio unit
	BOSE system ● Audio signal circuit between audio unit and BOSE speaker amp. ● Audio signal circuit between BOSE speaker amp. and speaker ● Speaker ● Tweeter ● Audio unit ● BOSE speaker amp.
No sound can be heard from woofer.	● Woofer amp. power supply and ground circuit ● Woofer amp. ON signal circuit ● Audio signal circuit between BOSE speaker amp. and woofer ● Audio signal circuit between woofer amp. and woofer ● Woofer ● Woofer amp. ● BOSE speaker amp.
No sound can be heard from radio or noise is caught.	● Antenna amp. ON signal circuit ● Antenna feeder ● Antenna ● Antenna amp. ● Audio unit
None of the steering switch operations work	● TEL adapter unit control signal 1 circuit ● Steering switch signal ground circuit

NOTE:
Noise resulting from variations in field strength, such as fading noise and multi-path noise, or external noise from trains and other sources. It is not a malfunction.

- Fading noise: This noise occurs because of variations in the field strength in a narrow range due to mountains or buildings blocking the signal.

- Multi-path noise: This noise results from a time difference between the broadcast waves directly from the station arriving at the antenna and the waves reflected by mountains or buildings.

Power Supply Circuit Inspection

NKS002BF

1. CHECK FUSE

Make sure that the following fuses of the audio unit, BOSE speaker amp. and woofer amp. are not blown.

Unit	Signal	Fuse No.
Audio unit	Battery power supply	37
	Ignition switch ACC or ON	6
BOSE speaker amp.	Battery power supply	37
Woofer amp.	Battery power supply	17

OK or NG

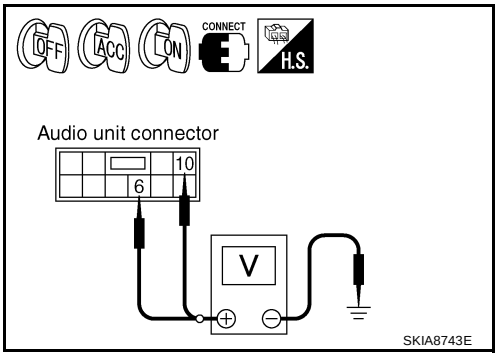
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

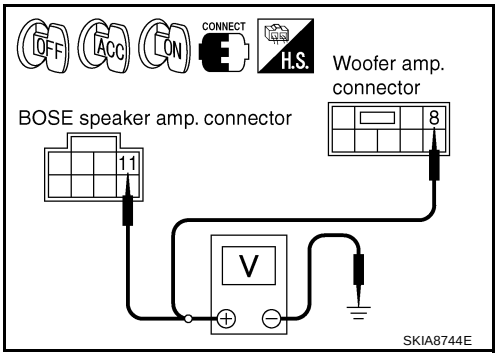
1. Check voltage between audio unit harness connector terminals and ground.

Unit	Terminals (+) Connector	Terminals (+) Terminal	Terminals (–)	OFF	ACC	ON
Audio unit	M40	6	Ground	Battery voltage	Battery voltage	Battery voltage
		10	Ground	0 V	Battery voltage	Battery voltage



2. Check voltage between BOSE speaker amp., woofer amp. harness connector terminals and ground (BOSE system).

Unit	Terminals (+) Connector	Terminals (+) Terminal	Terminals (–)	OFF	ACC	ON
BOSE speaker amp.	T6	11	Ground	Battery voltage	Battery voltage	Battery voltage
Woofer amp.	B32	8				



OK or NG

OK >> ● INSPECTION END (Base system)
● GO TO 3 (BOSE system).

NG >> Repair harness or connector.

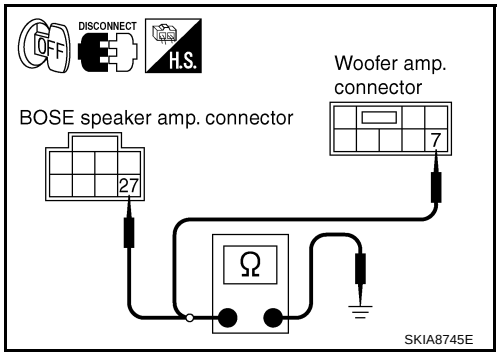
3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BOSE speaker amp. and woofer amp. connectors.
3. Check continuity between BOSE speaker amp. harness connector T6 terminal 27 and ground.

27 – Ground : Continuity should exist.

4. Check continuity between woofer amp. harness connector B32 terminal 7 and ground.

7 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

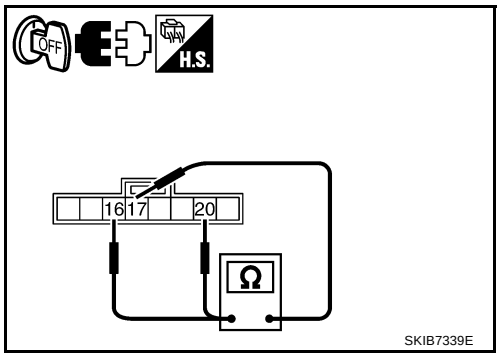
Steering Switch Does Not Operate

NKS002EE

1. CHECK STEERING SWITCH RESISTANCE

1. Turn ignition switch OFF.
2. Disconnect combination switch (spiral cable) connector.
3. Check resistance between steering switch harness connector M203 terminals.

Terminal		Signal name	Condition	Resistance (Ω)
16	17	Power	Press and hold POWER switch.	Approx. 0
		Seek down	Press and hold SEEK DOWN switch.	Approx. 165
		Volume down	Press and hold VOLUME DOWN switch.	Approx. 652
20		Mode	Press and hold MODE switch.	Approx. 0
		Seek up	Press and hold SEEK UP switch.	Approx. 165
		Volume up	Press and hold VOLUME UP switch.	Approx. 652



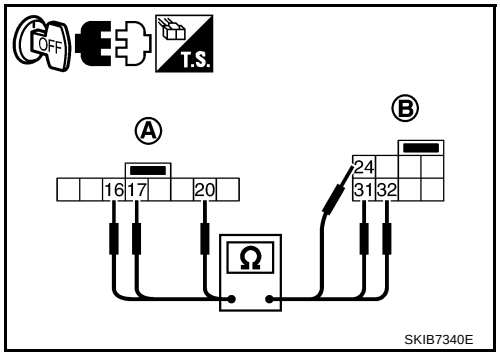
OK or NG

OK >> GO TO 2.
NG >> Replace steering switch.

2. CHECK SPIRAL CABLE

1. Disconnect combination switch (spiral cable) connector.
2. Check continuity between combination switch (spiral cable) connector (A) terminals 16, 17, 20 and connector (B) terminals 32, 31, 24.

16 – 32 : Continuity should exist.
17 – 31 : Continuity should exist.
20 – 24 : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Replace spiral cable.

3. CHECK HARNESS

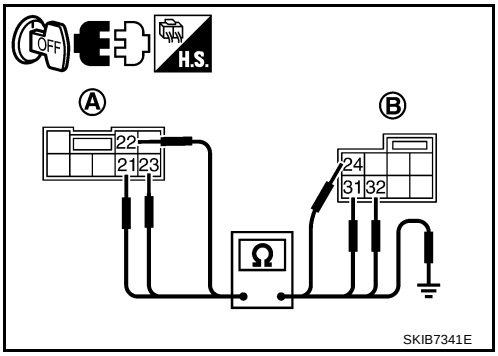
Base system

1. Disconnect audio unit connector.
2. Check continuity between audio unit harness connector (A) M46 terminals 21, 22, 23 and combination switch (spiral cable) harness connector (B) M23 terminals 24, 32, 31.

   21 – 24 : Continuity should exist.
   22 – 32 : Continuity should exist.
   23 – 31 : Continuity should exist.

3. Check continuity between audio unit harness connector (A) M46 terminals 21, 22 and ground.

   21, 22 – Ground : Continuity should not exist.



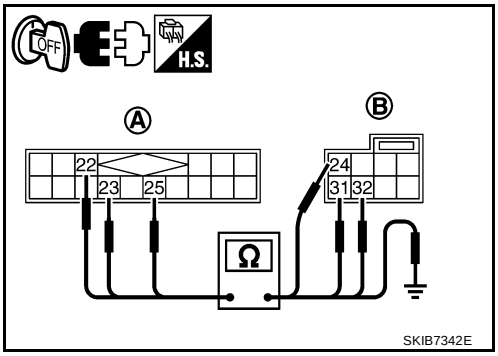
BOSE system

1. Disconnect audio unit connector.
2. Check continuity between audio unit harness connector (A) M39 terminals 22, 23, 25 and combination switch (spiral cable) harness connector (B) M23 terminals 24, 32, 31.

   22 – 24 : Continuity should exist.
   23 – 32 : Continuity should exist.
   25 – 31 : Continuity should exist.

3. Check continuity between audio unit harness connector (A) M39 terminals 22, 23 and ground.

   22, 23 – Ground : Continuity should not exist.



OK or NG

OK >> Replace audio unit.
NG >> Repair harness or connector.

AudioPilot® Does Not Work

NKS002BG

1. CHECK AUDIO UNIT

Check AudioPilot® turns ON.

OK or NG

OK >> GO TO 2.
NG >> Turn AudioPilot® ON.

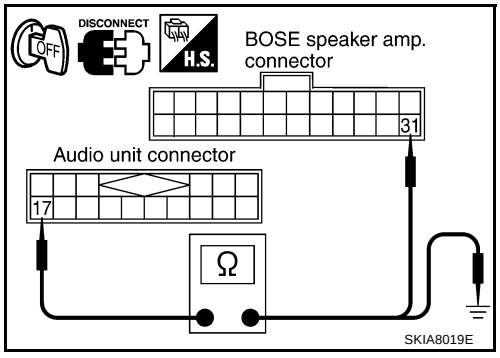
2. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect audio unit and BOSE speaker amp. connectors.
3. Check continuity between audio unit harness connector M39 terminal 17 and BOSE speaker amp. harness connector T7 terminal 31.

17 – 31 : Continuity should exist.

4. Check continuity between audio unit harness connector M39 terminal 17 and ground.

17 – Ground : Continuity should not exist.



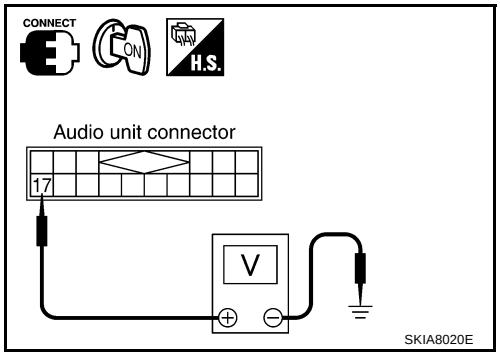
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK AUDIOPILOT® SIGNAL

1. Connect audio unit and BOSE speaker amp. connectors.
2. Turn ignition switch ON.
3. Check voltage between audio unit harness connector terminals and ground.

Terminals			Condition	Voltage
(+)		(–)		
Connector	Terminal			
M39	17	Ground	AudioPilot® OFF	Approx. 7.5 V
			AudioPilot® ON	Approx. 0 V



OK or NG

OK >> GO TO 4.
NG >> Replace audio unit.

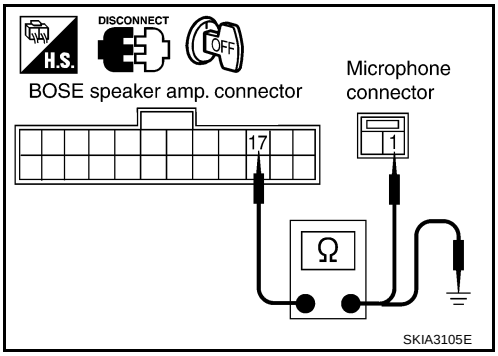
4. CHECK HARNESS

1. Turn ignition switch OFF
2. Disconnect BOSE speaker amp. and microphone connectors.
3. Check continuity between BOSE speaker amp. harness connector T7 terminal 17 and microphone harness connector E123 terminal 1.

17 – 1 : Continuity should exist.

4. Check continuity between BOSE speaker amp. harness connector T7 terminal 17 and ground.

17 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

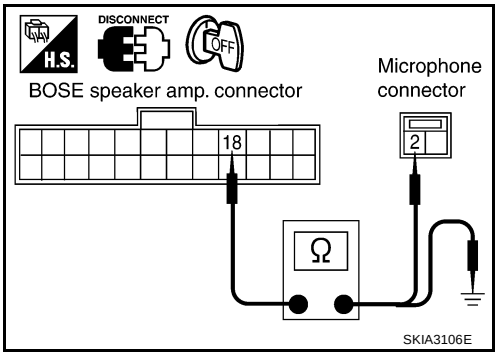
5. CHECK HARNESS

1. Check continuity between BOSE speaker amp. harness connector T7 terminal 18 and microphone harness connector E123 terminal 2.

18 – 2 : Continuity should exist.

2. Check continuity between BOSE speaker amp. harness connector T7 terminal 18 and ground.

18 – Ground : Continuity should not exist.



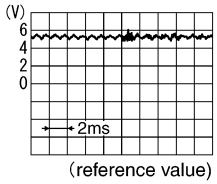
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

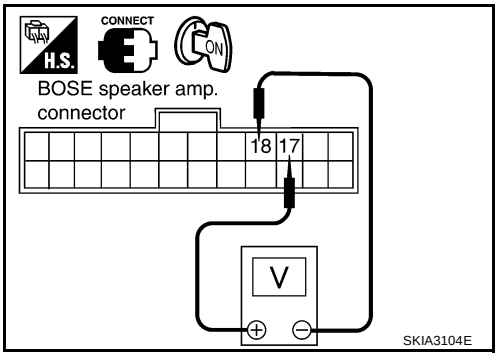
6. CHECK MICROPHONE SIGNAL

1. Connect BOSE speaker amp. and microphone connectors.
2. Turn ignition switch ON.
3. Check voltage waveform between BOSE speaker amp. harness connector T7 terminal 17 and 18 using oscilloscope, when inputting some sounds (voice, etc.) toward the microphone.

17 – 18:



PKIA2104E



Does the voltage waveform change with sounds?

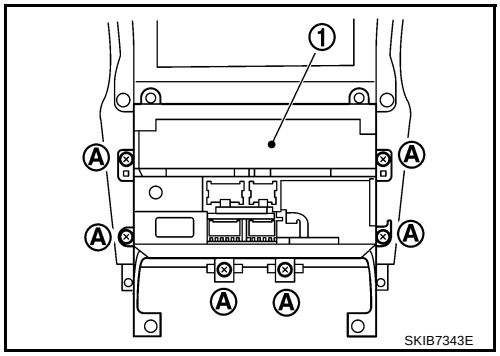
YES >> Replace BOSE speaker amp.
NO >> Replace microphone.

Removal and Installation of Audio Unit (Base system)

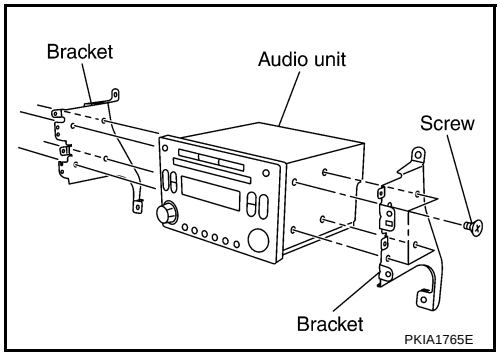
NKS002BH

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (A), and remove audio unit (1).



3. Remove screws (8), and remove bracket.



INSTALLATION

Installation is the reverse order of removal.

Locking CD Auto Changer Mechanism (Audio unit of BOSE system)

NKS002BI

CAUTION:

- **Prior to removing a malfunctioning CD auto changer unit (Audio unit of BOSE system) that will be shipped for repair, the changer mechanism MUST BE LOCKED to prevent the mechanism from being damaged during shipping.**
- **If a CD is jammed or unable to be removed from the unit, do NOT lock the changer mechanism. If the unit is to be shipped for repair, carefully package the unit to prevent vibration and shock.**

DAMPER LOCK PROCEDURE

1. Eject and remove any CDs from the audio unit (BOSE system).
2. Turn ignition switch OFF. Wait until audio unit (BOSE system) display is off and mechanism stops moving (mechanism sound stops).
3. Press any one of the disc selection buttons once. When a display shows on the audio unit (BOSE system), press the same disc selection button again within 5 seconds.
   - The changer mechanism will lock itself within 10 seconds.
4. After mechanism stops moving (mechanism sound stops), open the driver and passenger window, and then disconnect negative battery cable.

CAUTION:

After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

NOTE:

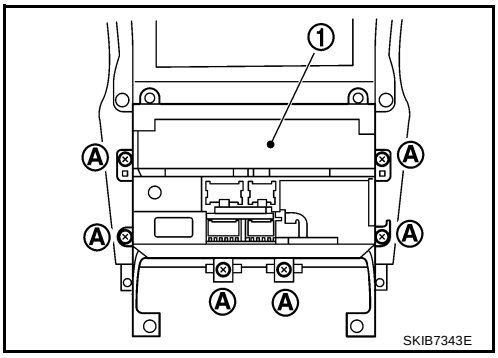
After installing a new or remanufactured audio unit (BOSE system), switching the audio unit (BOSE system) ON will automatically unlock the mechanism. A special unlocking procedure is not required.

Removal and Installation of Audio Unit (BOSE system)

NKS002BJ

REMOVAL

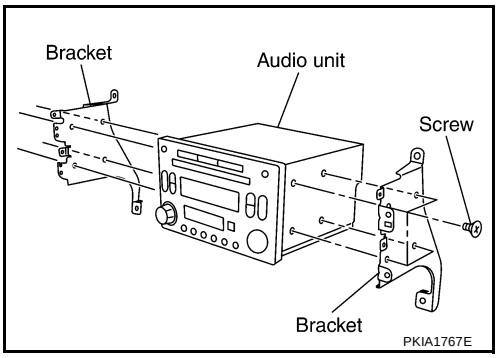
1. Perform damper lock operation. Refer to AV-46, "Locking CD Auto Changer Mechanism (Audio unit of BOSE system)" .
2. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. Remove screws (A), and remove audio unit (1).



4. Remove screws (8), and remove bracket.

CAUTION:

- **When carrying audio unit body, do not touch internal mechanism access from cassette tape slot.**
- **Be careful not to allow foreign matter from cassette tape slot.**



INSTALLATION

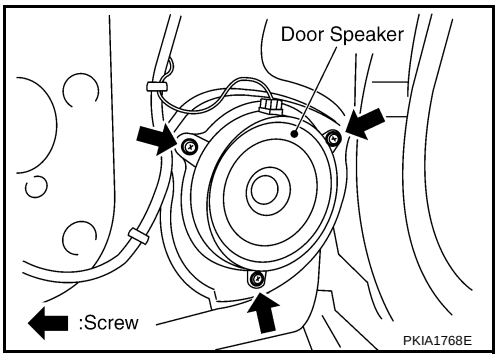
Installation is the reverse order of removal.

Removal and Installation of Door Speaker

NKS002BK

REMOVAL

1. Remove door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove screws (3), and remove door speaker.



INSTALLATION

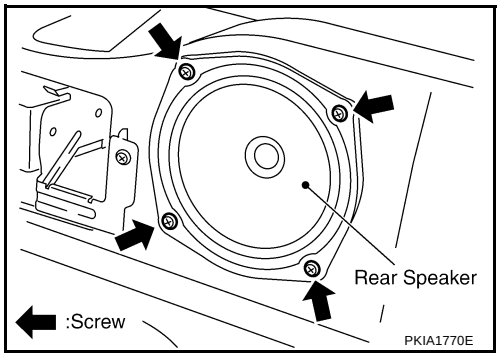
Installation is the reverse order of removal.

Removal and Installation of Rear Speaker

NKS002BL

REMOVAL

1. Remove luggage floor finisher upper (front) (Coupe models), or luggage floor finisher upper (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove screws (4), and remove rear speaker.



INSTALLATION

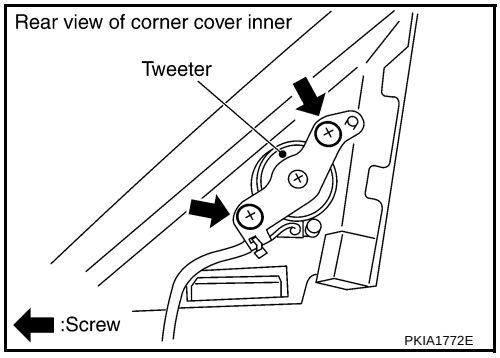
Installation is the reverse order of removal.

Removal and Installation of Tweeter

NKS002BM

REMOVAL

1. Remove corner cover inner. Refer to GW-81, "Removal and Installation" .
2. Remove screws (2), and remove tweeter from corner cover inner.



INSTALLATION

Installation is the reverse order of removal.

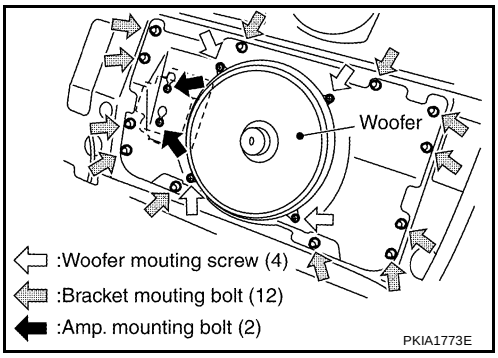
Removal and Installation of Woofer and Woofer Amp. (BOSE System)

NKS002BN

REMOVAL

Woofer Assembly

1. Remove luggage floor finisher lower. Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove woofer mounting screws (4), and remove woofer.
3. Remove bracket mounting bolts (12), and remove bracket.
4. Remove woofer amp. mounting bolts (2), and remove woofer amp. from bracket.



Woofer or Woofer Amp. Only

1. Remove luggage floor finisher mask. Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove woofer mounting screws (4), and remove woofer.
3. Remove woofer amp. mounting bolts (2), and remove woofer amp. from bracket.

INSTALLATION

Installation is the reverse order of removal, taking care of the following point.

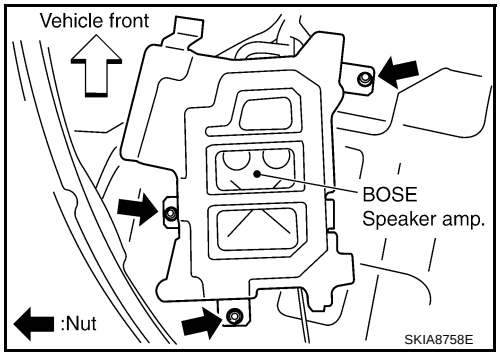
Bracket mounting bolt : **9 N·m (0.92 kg-m, 80 in-lb)**

Removal and Installation of BOSE Speaker Amp.

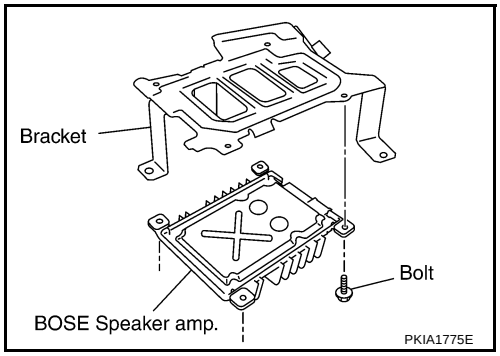
NKS002BO

REMOVAL

1. Remove trunk side box. Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
2. Remove luggage floor carpet and spare tire cover (Coupe models), or trunk floor carpet and spare tire cover (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
3. Remove nuts (3), and remove BOSE speaker amp. from trunk room floor.



4. Remove bolts (4), and remove bracket.



INSTALLATION

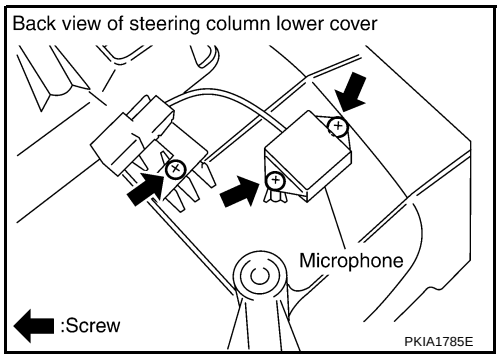
Installation is the reverse order of removal.

Removal and Installation of Microphone

NKS002BP

REMOVAL

1. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (3), and remove microphone.



INSTALLATION

Installation is the reverse order of removal.

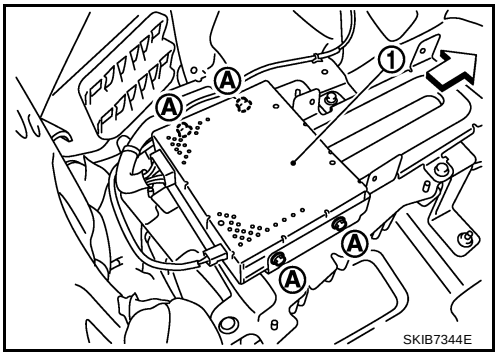
Removal and Installation of Satellite Radio Tuner

NKS002EF

REMOVAL

⇦: Vehicle front

1. Remove trunk side box. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
2. Remove luggage floor carpet and spare tire cover. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Remove screws (A), and remove satellite radio tuner (1).



INSTALLATION

Installation is the reverse order of removal.

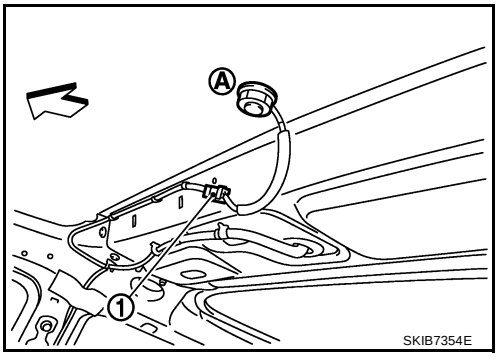
Removal and Installation of Satellite Radio Antenna

NKS002EL

REMOVAL

⇦: Vehicle front

1. Remove headlining. Refer to EI-44, "Removal and Installation (for Coupe Models)" .
2. Remove nut (A), and then disconnect connector (1).
3. Remove satellite radio antenna.



INSTALLATION

Installation is the reverse order of removal.

Roof antenna mounting nut : 6.0 N·m (0.61 kg-m, 53 in-lb)

ANTENNA

PFP:28200

System Description

NKS002EG

With the ignition switch in ACC or ON, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10.

Ground is supplied through the case of the antenna amp.
When the radio switch is turned ON, antenna signal is supplied

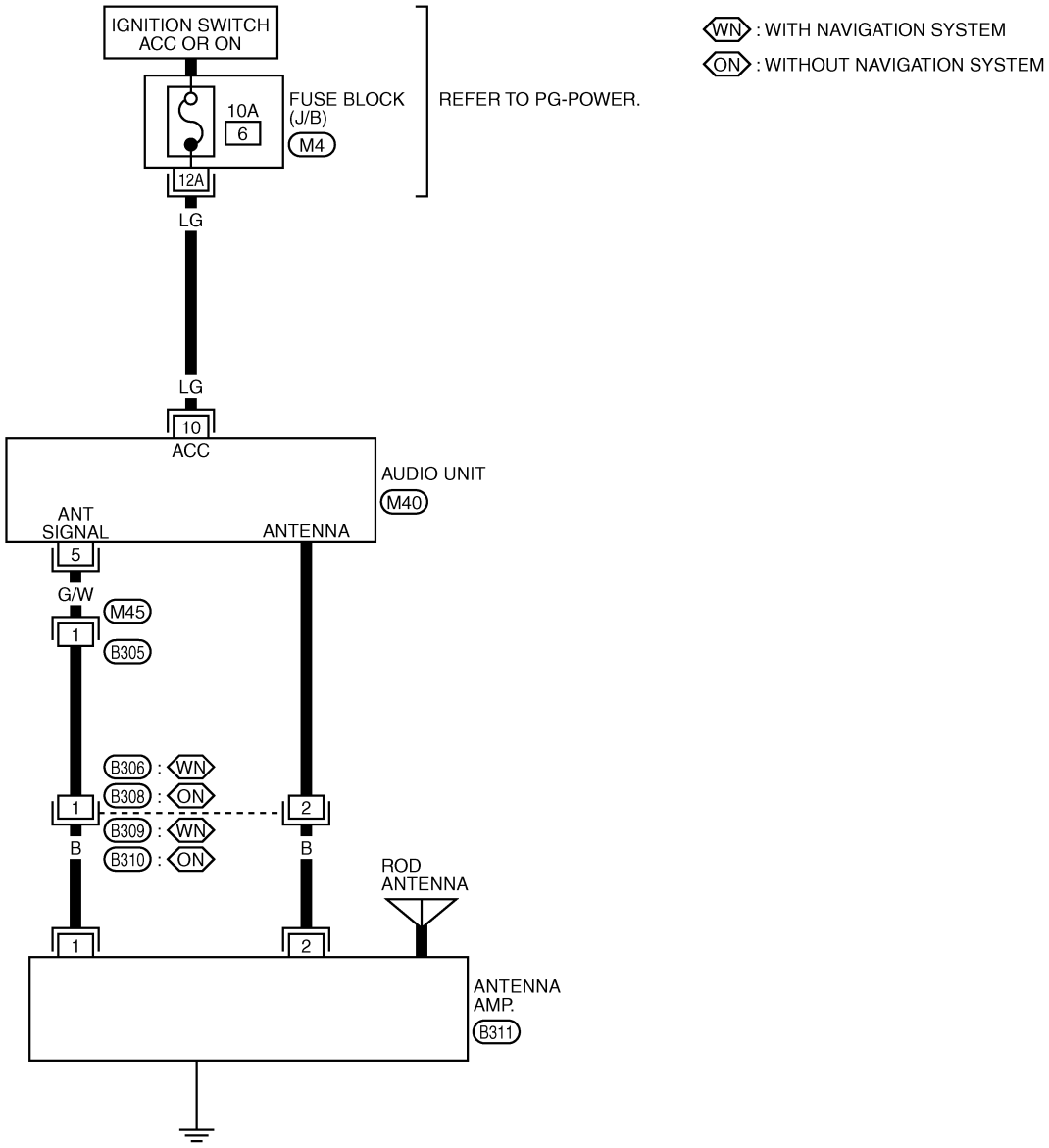
- through audio unit terminal 5
- to antenna amp. terminal 1.

Then the antenna amp. is activated.
Antenna signals amplified by the antenna amp. are supplied to the audio unit.

Wiring Diagram — M/ANT —

NKS002EH

AV-M/ANT-01





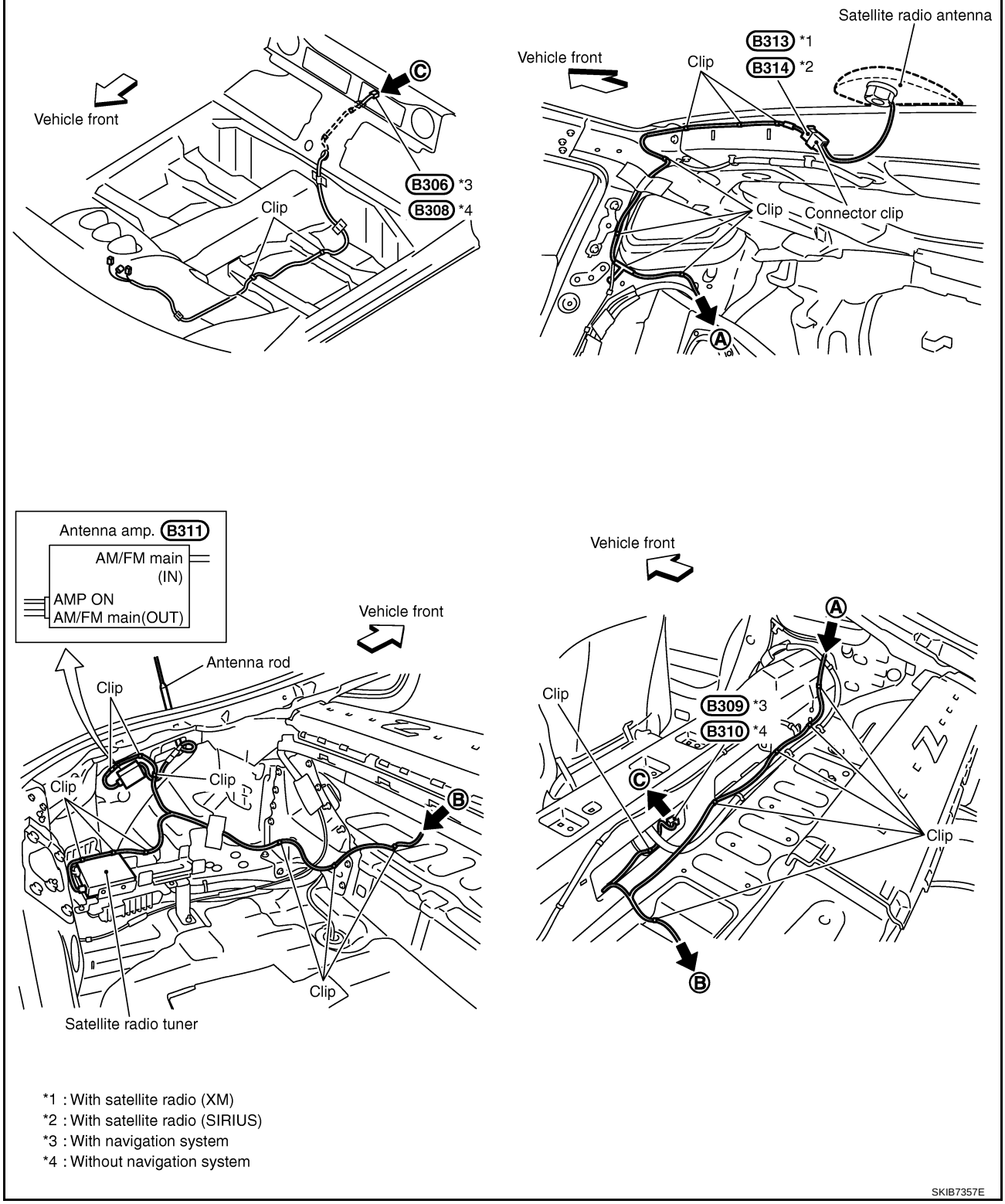
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT0509E

Location of Antenna

NKS002EI

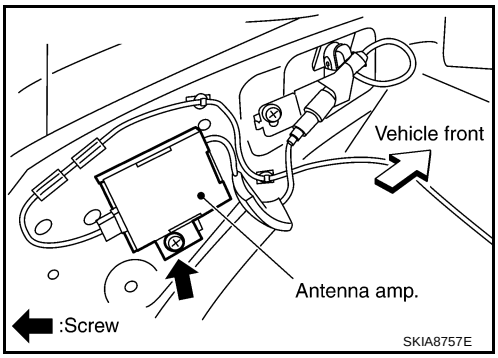


Removal and Installation of Antenna Amp.

NKS002EJ

REMOVAL

1. Remove luggage side finisher lower (LH) (Coupe models), or trunk front finisher (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
2. Remove luggage floor carpet and spare tire cover (Coupe models), or trunk floor carpet and spare tire cover (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
3. Remove screw (1), and remove antenna amp.

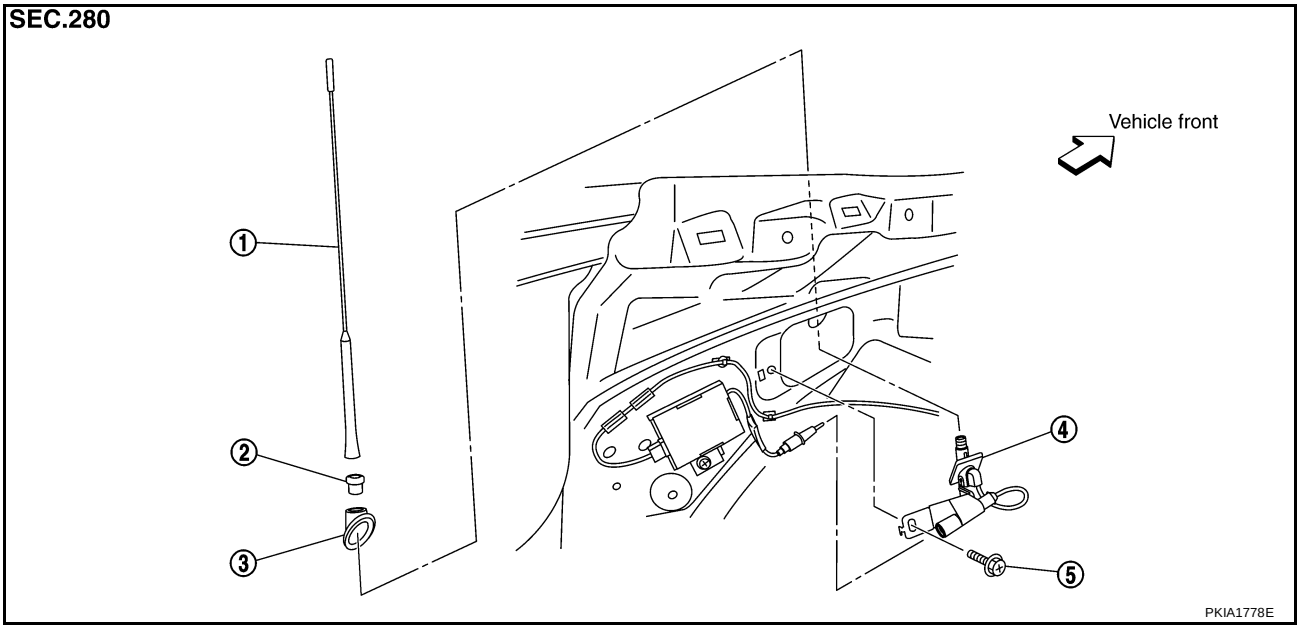


INSTALLATION

Installation is the reverse order of removal.

Removal and Installation of Antenna

NKS002EK



1. Antenna rod
2. Antenna nut
3. Antenna base
4. Antenna assembly
5. Screw

REMOVAL

1. Remove luggage side finisher lower (LH) (Coupe models), or trunk front finisher (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
2. Remove antenna rod and remove antenna nut.
3. Disconnect antenna amp. plug.
4. Remove screw and remove antenna assembly.
5. Remove antenna base.

INSTALLATION

Installation is the reverse order of removal.

Removal and Installation of Satellite Radio Antenna

NKS002KG

Refer to AV-51, "Removal and Installation of Satellite Radio Antenna" .

NAVIGATION SYSTEM

PFP:25915

System Description

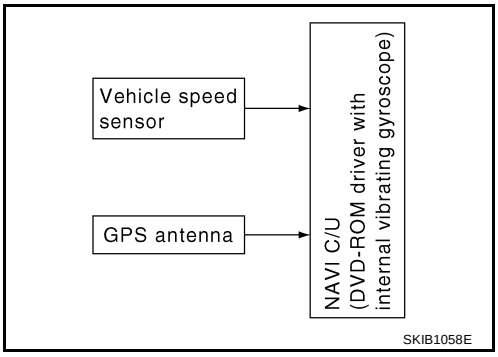
NKS000CX

For Navigation System operation information, refer to Navigation System Owner's Manual.

LOCATION DETECTION PRINCIPLE

The navigation system periodically calculates the vehicle's current position according to the following three signals:

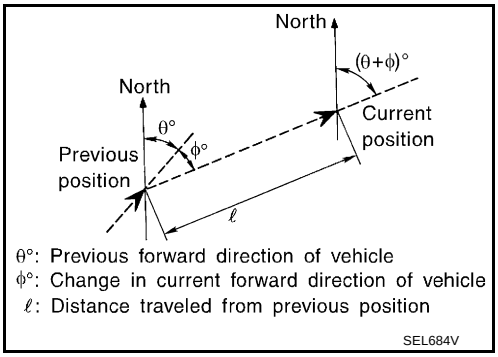
- Travel distance of the vehicle as determined by the vehicle speed sensor
- Turning angle of the vehicle as determined by the gyroscope (angular velocity sensor)
- Direction of vehicle travel as determined by the GPS antenna (GPS information)



The current position of the vehicle is then identified by comparing the calculated vehicle position with map data read from the DVD-ROM, which is stored in the DVD-ROM drive (map-matching), and indicated on the screen as a current-location mark. More accurate data is judged and used by comparing vehicle position detection results found by the GPS with the result by map-matching.

The current vehicle position will be calculated by detecting the distance the vehicle moved from the previous calculation point and its direction.

- Travel distance
  Travel distance calculations are based on the vehicle speed sensor input signal. Therefore, the calculation may become incorrect as the tires wear down. To prevent this, an automatic distance correction function has been adopted.
- Travel direction
  Change in the travel direction of the vehicle is calculated by a gyroscope (angular velocity sensor) and a GPS antenna (GPS information). They have both advantages and disadvantages.



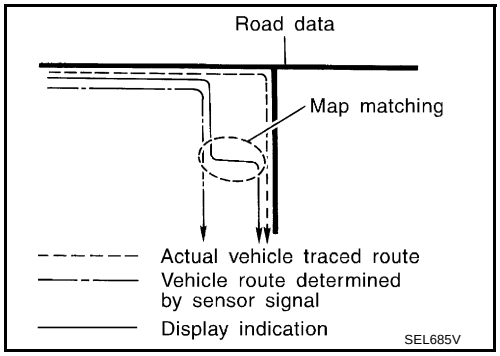
Type	Advantage	Disadvantage
Gyroscope (angular velocity sensor)	Can detect the vehicle's turning angle quite accurately.	Direction errors may accumulate when vehicle is driven for long distances without stopping.
GPS antenna (GPS information)	Can detect the vehicle's travel direction (North/South/East/West).	Correct direction cannot be detected when vehicle speed is low.

More accurate traveling direction is detected because priorities are set for the signals from these two devices according to the situation.

MAP-MATCHING

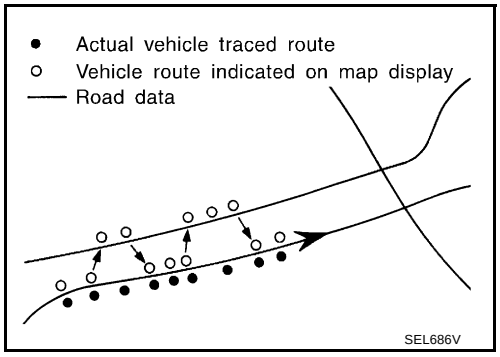
Map-matching compares a current location detected by the method in the “Location Detection Principle” with a road map data from DVD-ROM stored in DVD-ROM drive.

NOTE:
The road map data is based on data stored in the DVD-ROM.

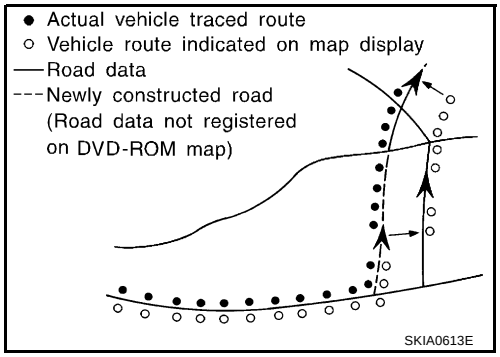


The vehicle position may not be corrected under the following circumstances and after driving for a certain time when GPS information is difficult to receive. In this case, the current-location mark on the display must be corrected manually.

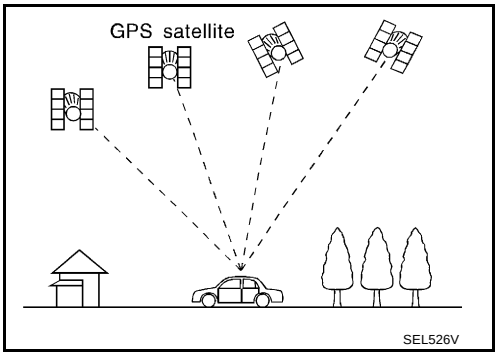
- In map-matching, alternative routes to reach the destination will be shown and prioritized, after the road on which the vehicle is currently driven has been judged and the current-location mark has been repositioned.
  If there is an error in distance and/or direction, alternative routes will be shown in different order of priority, and the incorrect road can be avoided.
  If two roads are running in parallel, they are of the same priority. Therefore, the current-location mark may appear on either of them alternately, depending on maneuvering of the steering wheel and configuration of the road.



- Map-matching does not function correctly when a road on which the vehicle is driving is new and not recorded in the DVD-ROM, or when road pattern stored in the map data and the actual road pattern are different due to repair.
  When driving on a road not present in the map, the map-matching function may find another road and position the current-location mark on it. Then, when the correct road is detected, the current-location mark may change to it.
- Effective range for comparing the vehicle position and travel direction calculated by the distance and direction with the road data read from the DVD-ROM is limited. Therefore, when there is an excessive gap between current vehicle position and the position on the map, correction by map-matching is not possible.



GPS (GLOBAL POSITIONING SYSTEM)



GPS (Global Positioning System) was developed for and is controlled by the US Department of Defense. The system utilizes GPS satellites (NAVSTAR), sending out radio waves while flying on an orbit around the earth at an altitude of approximately 21,000 km (13,100 miles).

The GPS receiver calculates the vehicle's position in three dimensions (latitude/longitude/altitude) according to the time lag of the radio waves received from four or more GPS satellites (three-dimensional positioning). If radio waves were received only from three GPS satellites, the GPS receiver calculates the vehicle's position in two dimensions (latitude/longitude), and utilize the altitude data calculated previously with radio waves from four or more GPS satellites (two-dimensional positioning).

Position correction by GPS is not available while the vehicle is stopped.

Accuracy of GPS will deteriorate under the following conditions:

- In two-dimensional positioning, GPS accuracy will deteriorate when altitude of the vehicle position changes.
- The accuracy can be even lower depending on the arrangement of the GPS satellites utilized for the positioning.
- Position detection is not possible when vehicle is in an area where radio waves from the GPS satellite do not reach, such as in a tunnel, parking lot in a building, and under an elevated highway. Radio waves from the GPS satellites may not be received when some object is located over the GPS antenna.

NOTE:

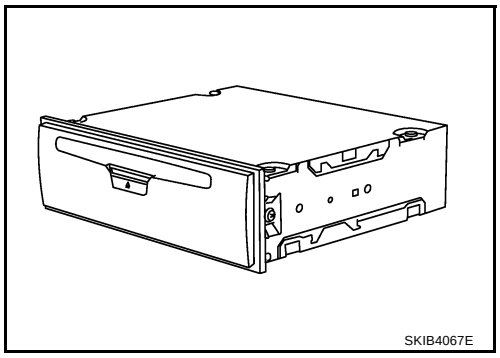
- Even a high-precision three dimensional positioning, the detection result has an error about 10 m (30ft).
- Because the signals of GPS satellite is controlled by the Tracking and Control Center in the United States, the accuracy may be degraded lower intentionally or the radio waves may stop.

Component Description

NKS002QA

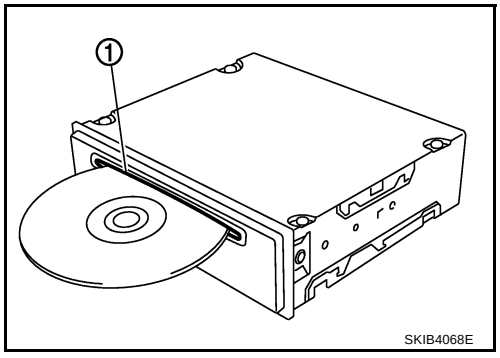
NAVI CONTROL UNIT

- NAVI control unit connects to the display unit and NAVI switch with communication lines.
- The gyro (angular speed sensor) and the DVD-ROM drive are built-in units that control the navigation functions.
- Signals are received from the gyro, the vehicle speed sensor, and the GPS antenna. Vehicle location is determined by combining these data with the data contained in the DVD-ROM map. Locations information is shown on display unit.
- NAVI control unit outputs ON signal and voice guidance signal to audio unit.


SKIB4067E

DVD-ROM Drive

Maps, traffic control regulations, and other pertinent information can be easily read from the DVD-ROM (1).



SKIB4068E

DVD-ROM

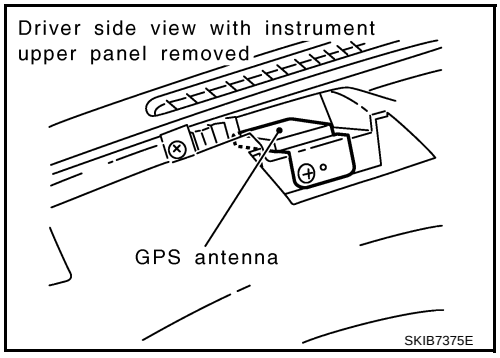
- The DVD-ROM has maps, traffic control regulations, and other pertinent information.
- To improve DVD-ROM map matching and route determination functions, the DVD-ROM uses an exclusive Nissan format. Therefore, the use of a DVD-ROM provided by other manufacturers cannot be used.

Gyro (Angular Speed Sensor)

- The oscillator gyro sensor is used to detect changes in vehicle steering angle.
- The gyro is built into the NAVI control unit.

GPS ANTENNA

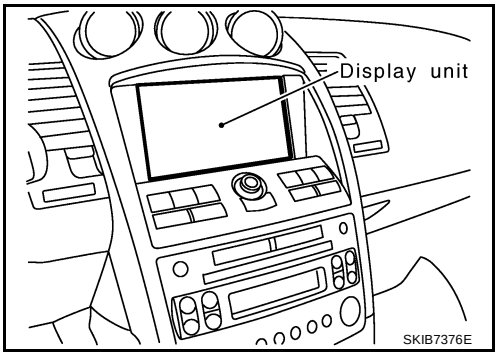
The GPS antenna receives and amplifies the radio waves from the GPS satellites, and then transmits the GPS signal to NAVI control unit.



SKIB7375E

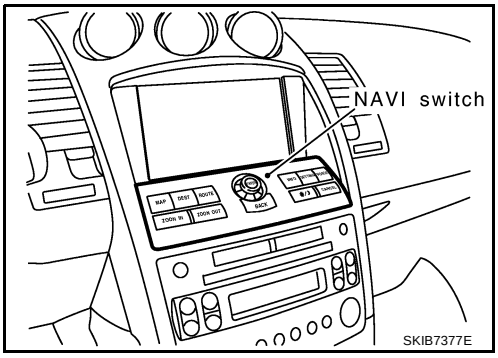
DISPLAY UNIT

- Display unit connects to the NAVI control unit and NAVI switch with communication lines.
- Display unit receives RGB image signal from NAVI control unit, and RGB image is displayed.



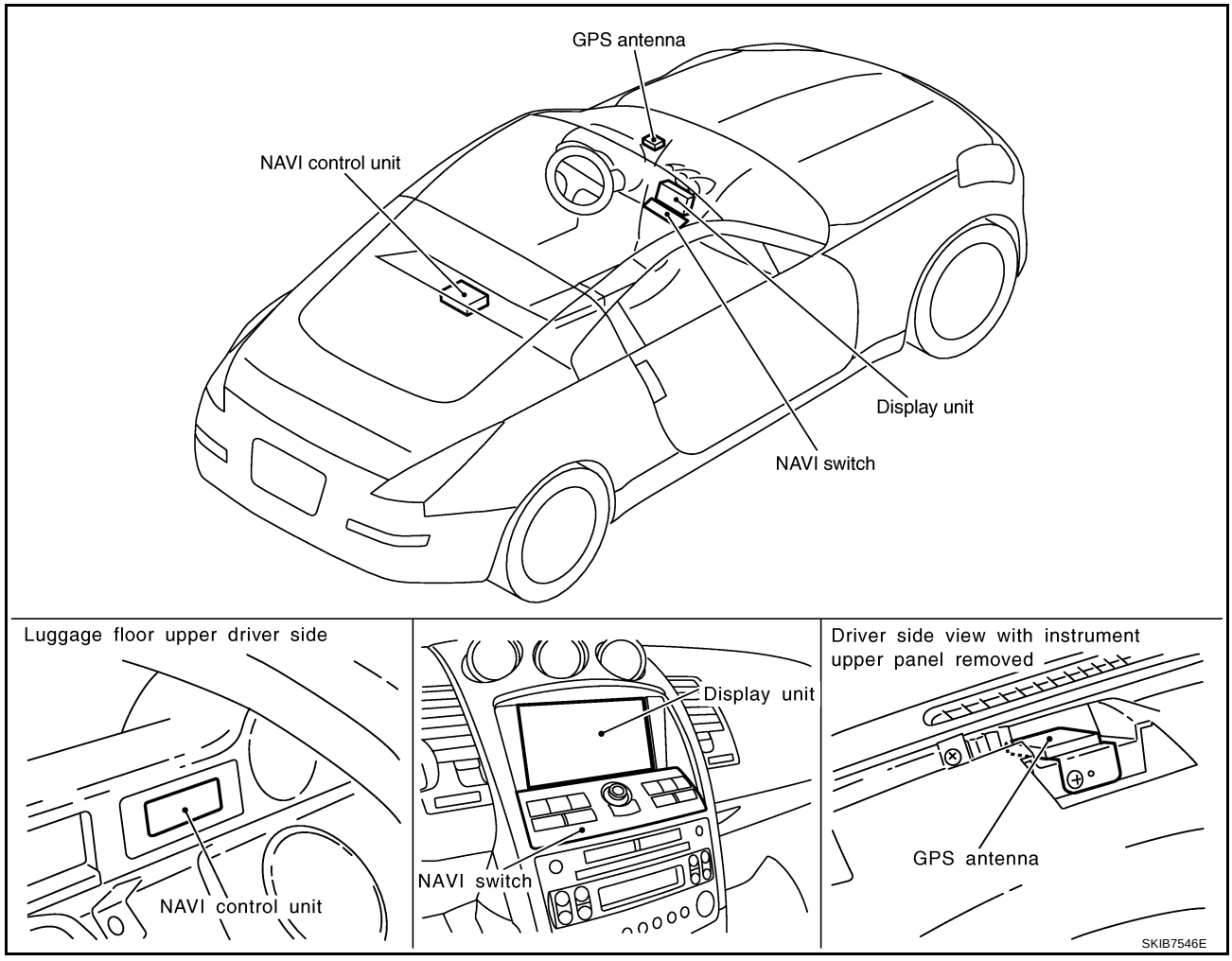
NAVI SWITCH

- NAVI switch connects to the display unit and NAVI control unit with communication lines.
- Operation signal from NAVI switch is transmitted to NAVI control unit through display unit.



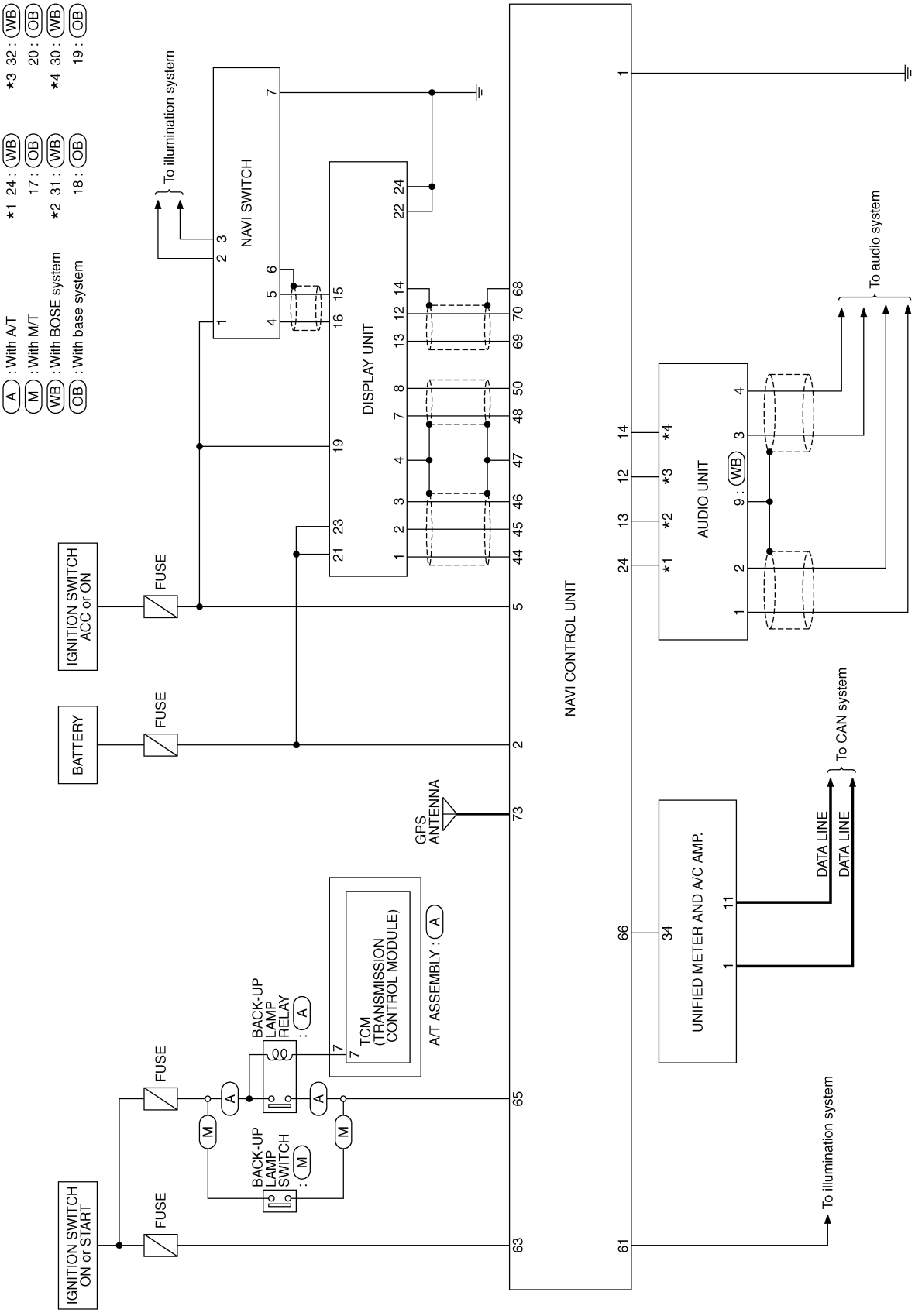
Component Parts Location

NKS000CZ



Schematic

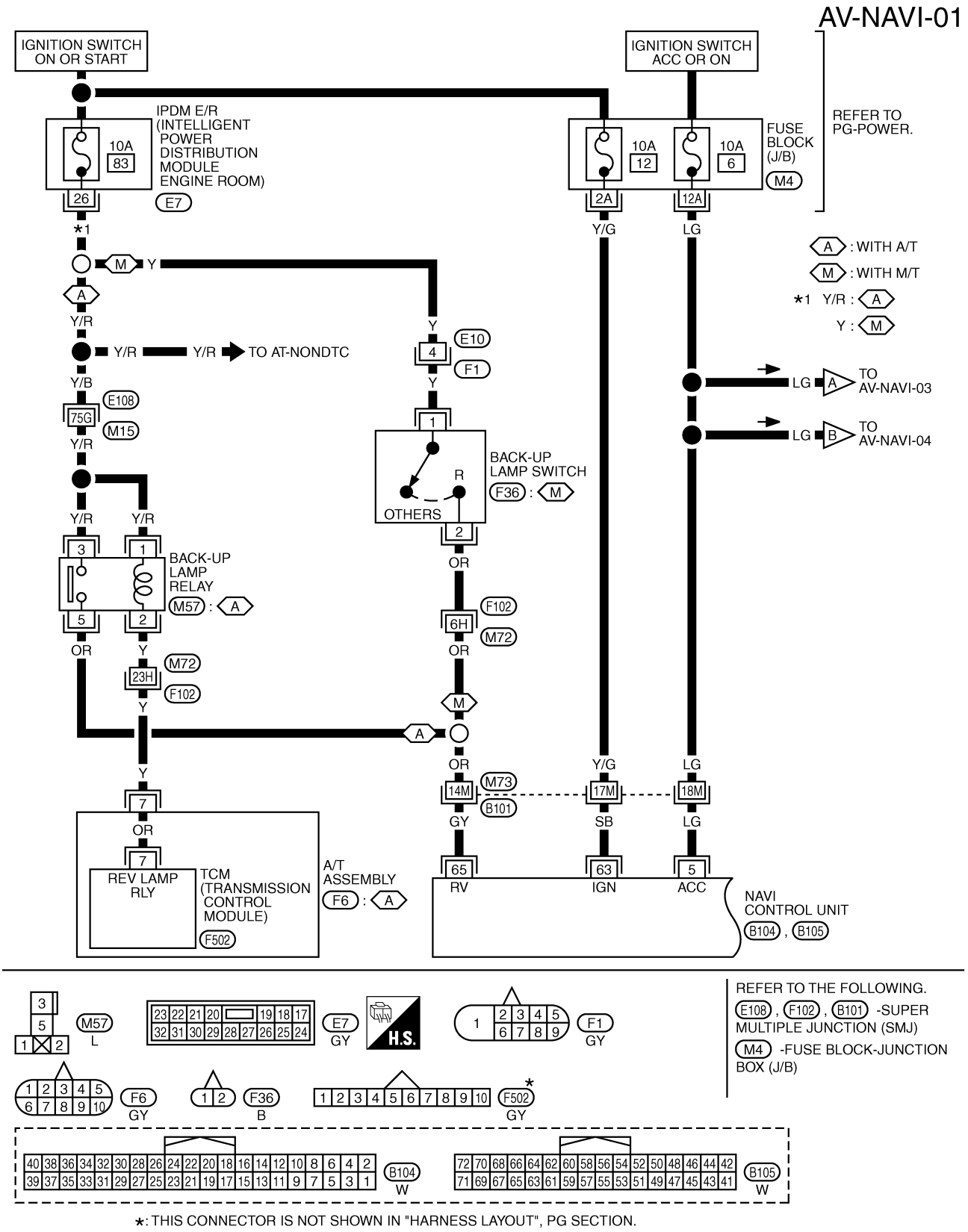
NKS000D0



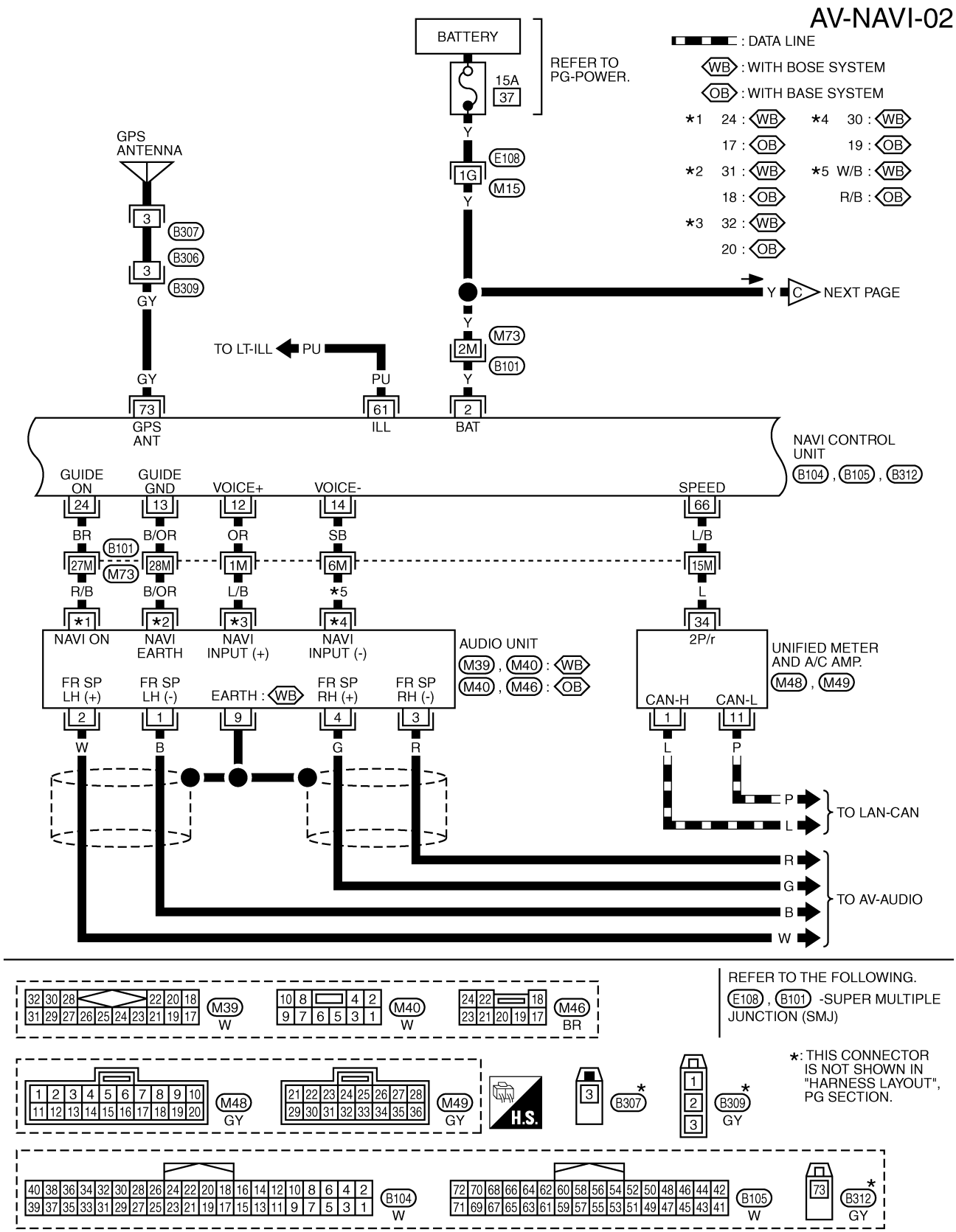
TKWT4081E

Wiring Diagram — NAVI —

NKS004RZ

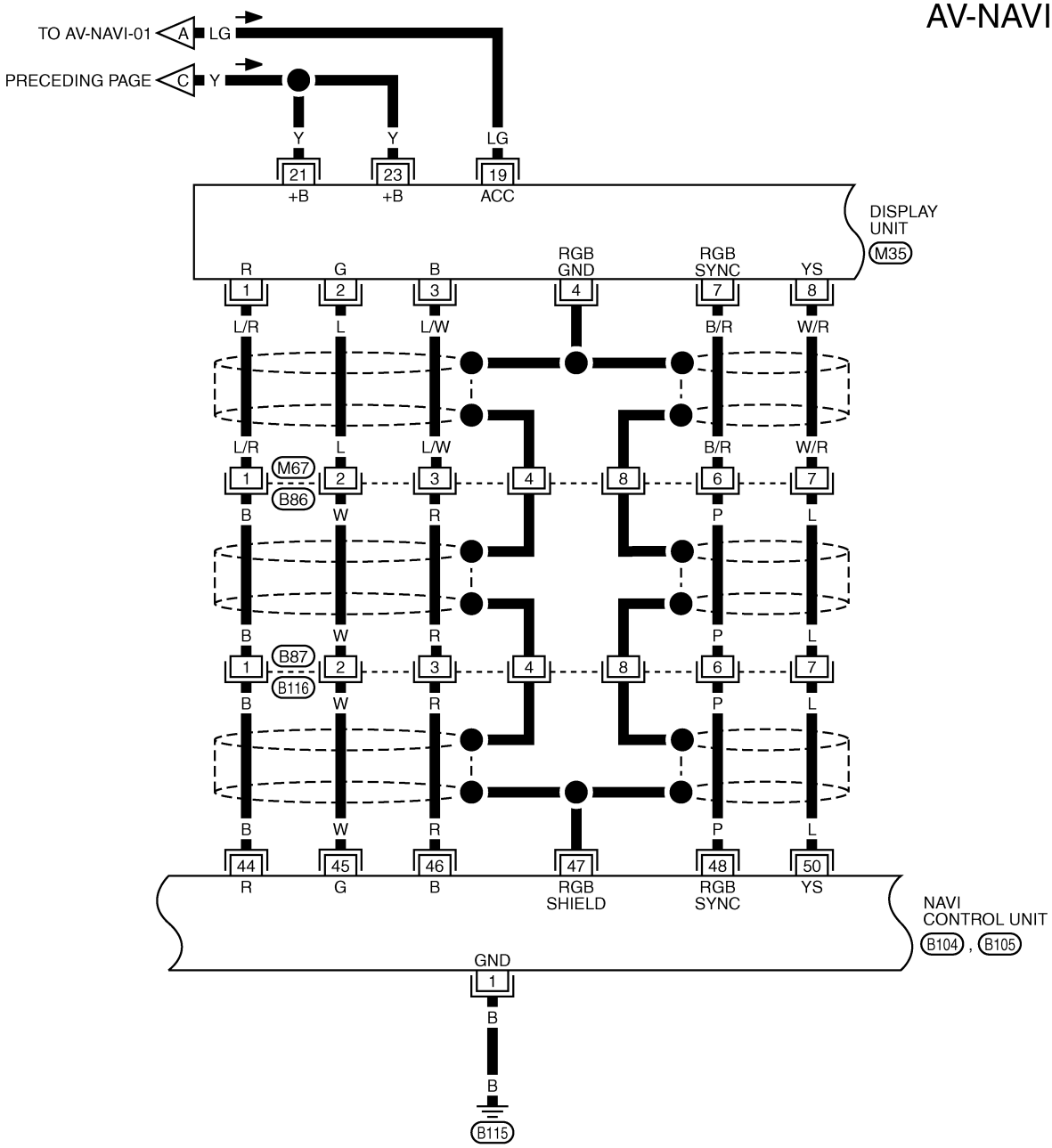


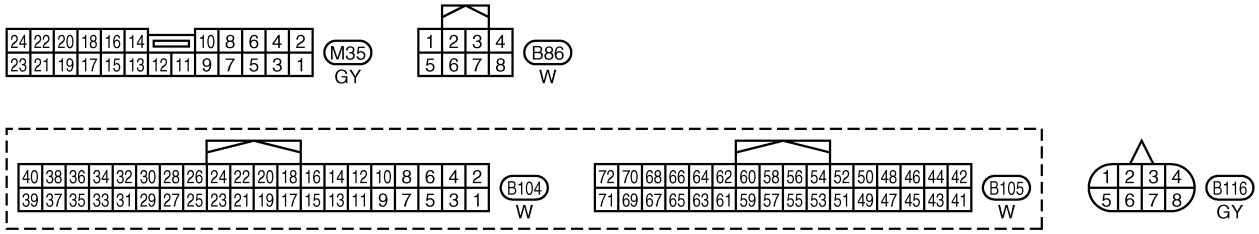
TKWT5803E


AV-NAVI-02
: DATA LINE
WB : WITH BOSE SYSTEM
OB : WITH BASE SYSTEM
*1 24 : WB 17 : OB
*2 31 : WB 18 : OB
*3 32 : WB 20 : OB
*4 30 : WB 19 : OB
*5 W/B : WB R/B : OB
BATTERY
15A 37
REFER TO PG-POWER.
GPS ANTENNA
E108
1G
M15
B307
B306
B309
NEXT PAGE
TO LT-ILL
PU
M73
2M
B101
GPS ANT
ILL
BAT
NAVI CONTROL UNIT
B104 , B105 , B312
GUIDE ON
GUIDE GND
VOICE+
VOICE-
SPEED
B101
M73
NAVI ON
NAVI EARTH
NAVI INPUT (+)
NAVI INPUT (-)
AUDIO UNIT
M39 , M40 : WB
M40 , M46 : OB
FR SP LH (+)
FR SP LH (-)
EARTH : WB
FR SP RH (+)
FR SP RH (-)
2P/r
UNIFIED METER AND A/C AMP.
M48 , M49
CAN-H
CAN-L
TO LAN-CAN
TO AV-AUDIO
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.
M39 W
M40 W
M46 BR
M48 GY
M49 GY
H.S.
B307
B309 GY
B104 W
B105 W
B312 GY

TKWT5629E

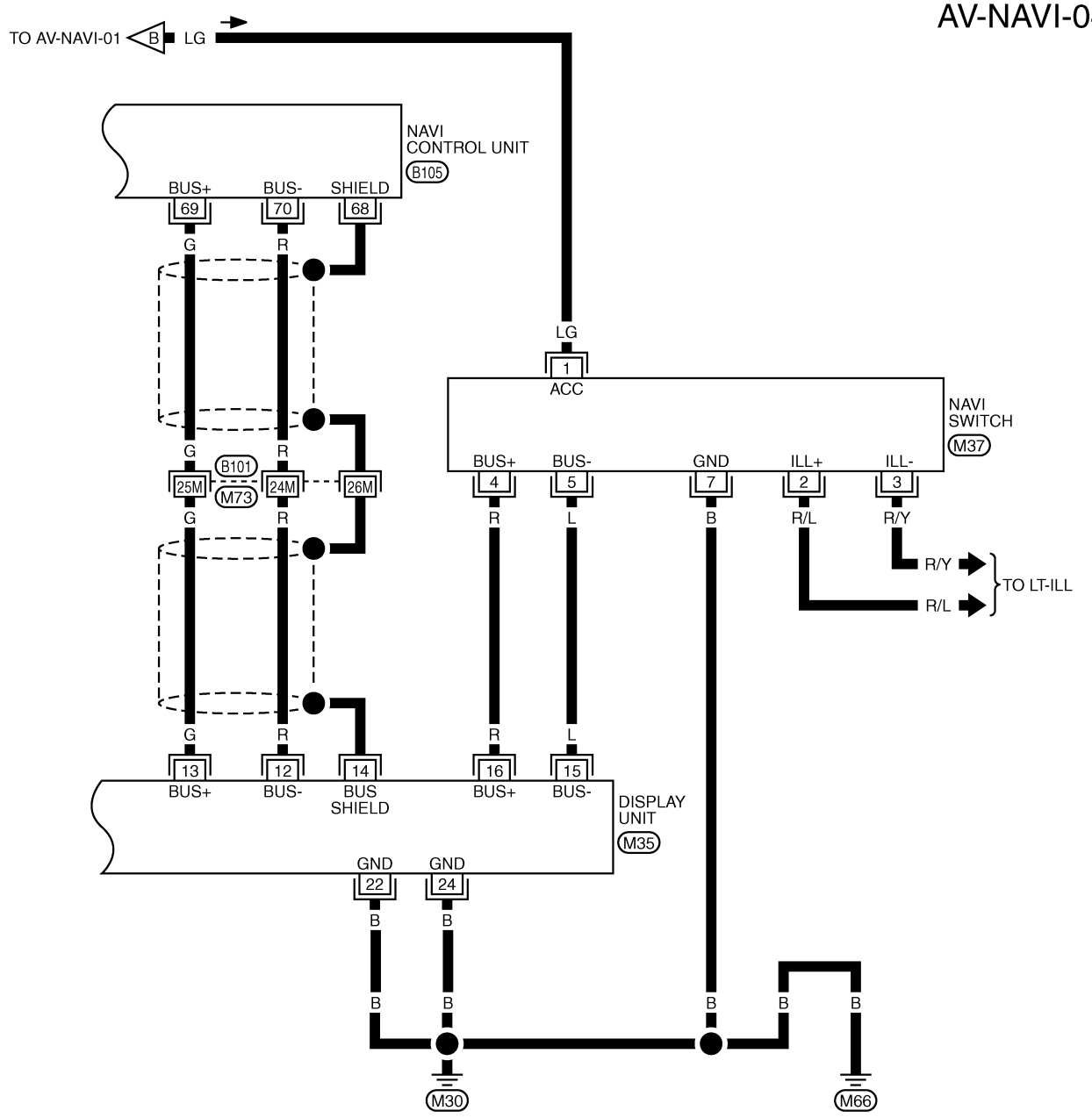
AV-NAVI-03

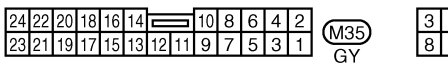


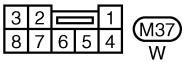


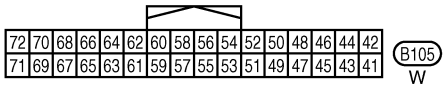
TKWT5804E

AV-NAVI-04







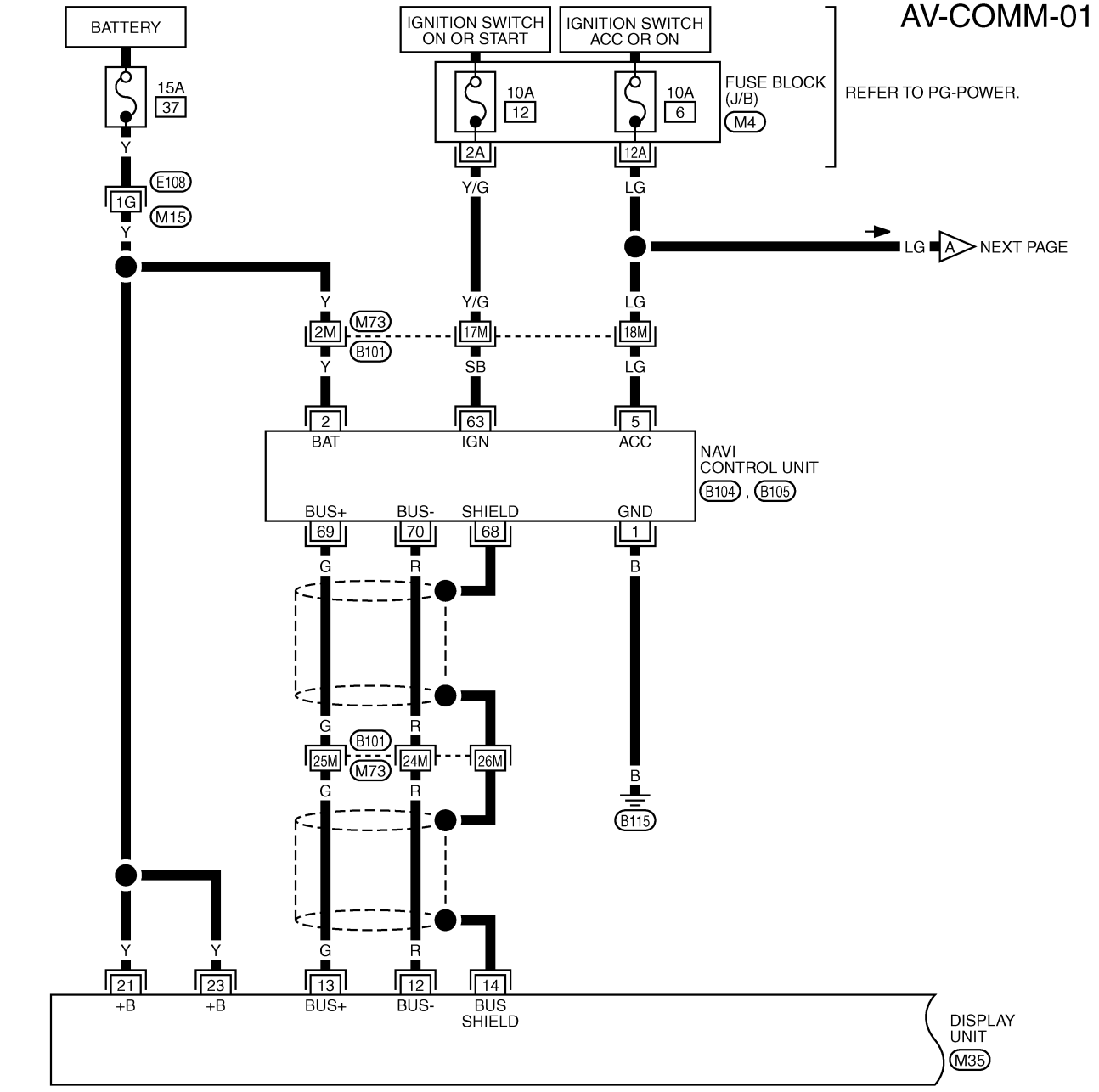


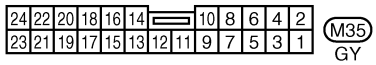
REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5631E

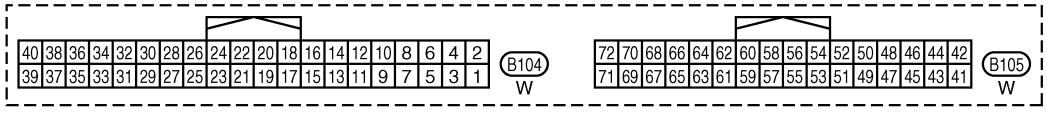
Wiring Diagram — COMM —

NKS004S0



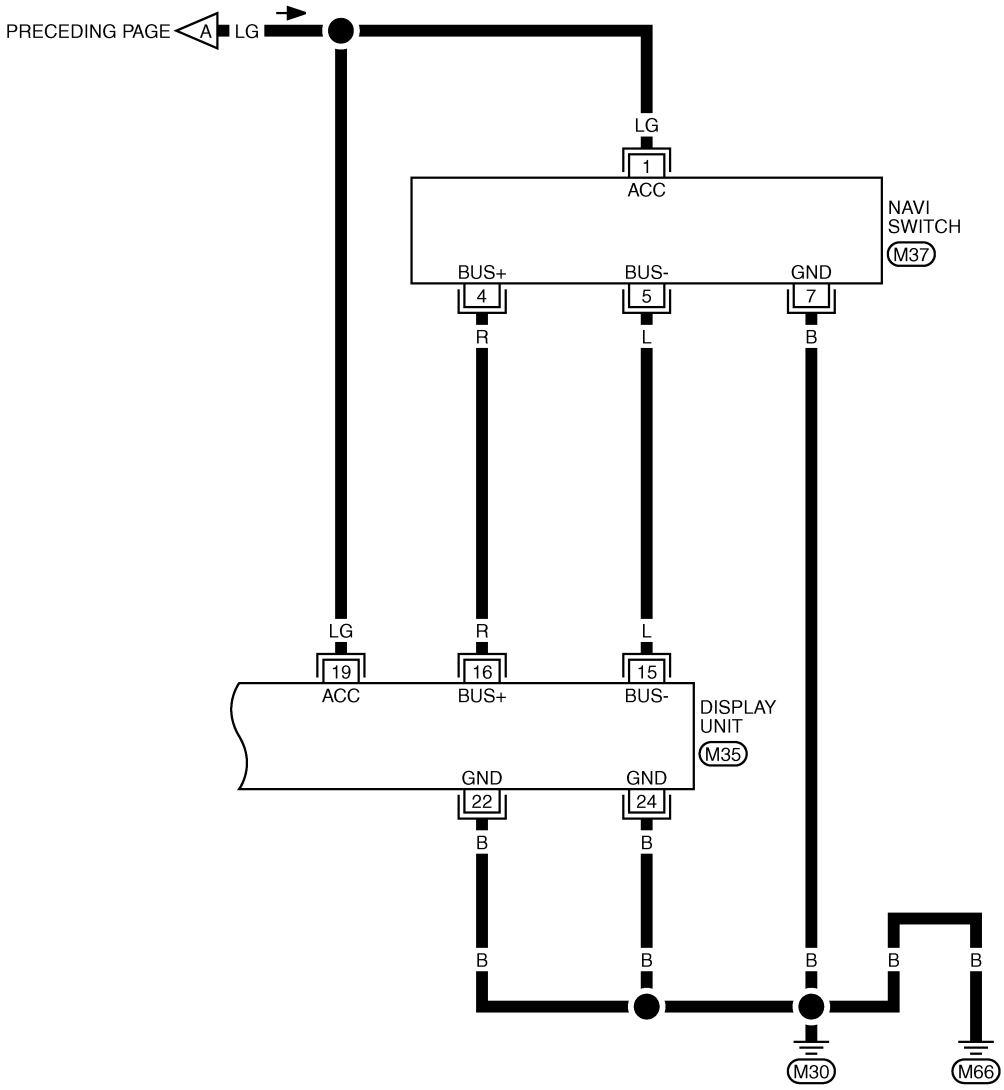


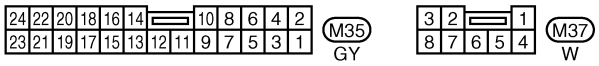
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



TKWT5632E

AV-COMM-02

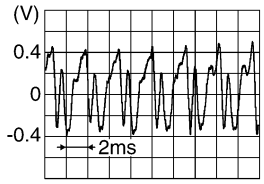
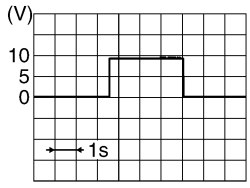
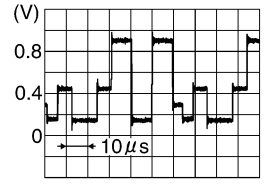
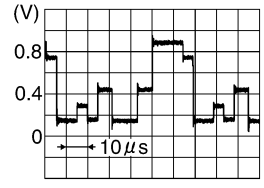
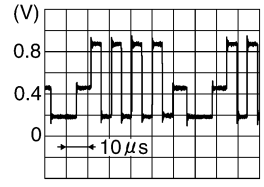
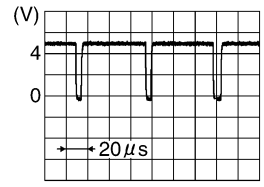


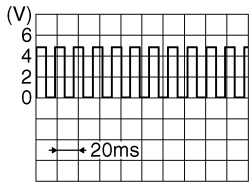
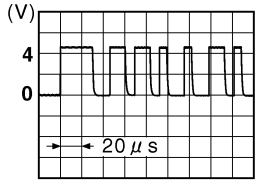
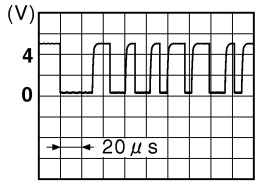


TKWT5633E

Terminals and Reference Value for NAVI Control Unit

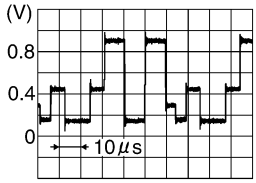
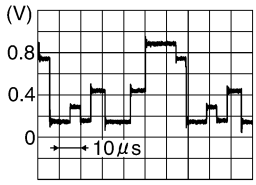
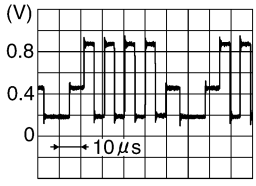
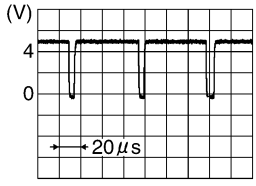
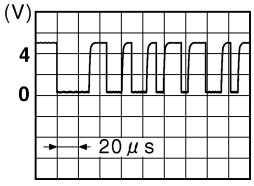
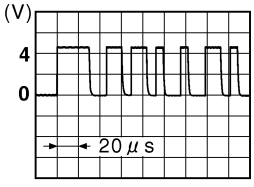
NKS000D3

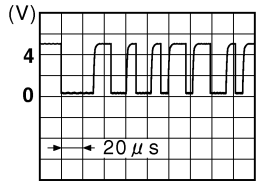
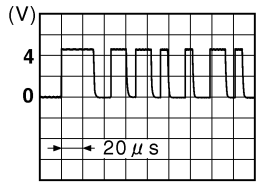
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
1 (B)	Ground	Ground	—	ON	—	Approx. 0 V
2 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
5 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
12 (OR)	14 (SB)	Voice guidance signal	Output	ON	Press “VOICE” button	 SKIB3597E
24 (BR)	13 (B/OR)	Voice guidance ON signal	Output	ON	Press “VOICE” button	 SKIB0232E
44 (B)	Ground	RGB signal (R: red)	Output	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7360E
45 (W)	Ground	RGB signal (G: green)	Output	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7361E
46 (R)	Ground	RGB signal (B: blue)	Output	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7362E
47	—	Shield	—	—	—	—
48 (P)	Ground	RGB synchronizing signal	Output	ON	—	 SKIB3603E
50 (L)	Ground	RGB area (YS) signal	Output	ON	—	Approx. 5 V

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
61 (PU)	Ground	Illumination signal	Input	ON	Lighting switch ON	Approx. 12 V
					Lighting switch OFF	Approx. 0 V
63 (SB)	Ground	Ignition signal	Input	ON	—	Battery voltage
65 (GY)	Ground	Reverse signal	Input	ON	Select R position	Approx. 12 V
					Other position	Approx. 0 V
66 (L/B)	Ground	Vehicle speed signal (2-pulse)	Input	ON	When vehicle speed is approx. 40 km/h (25 MPH)	 SKIA6649J
68	—	Shield	—	—	—	—
69 (G)	Ground	Communication signal (+)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7378E
70 (R)	Ground	Communication signal (–)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7379E
73 (GY)	Ground	GPS signal	Input	ON	Connector is not connected	Approx. 5 V

Terminals and Reference Value for Display Unit

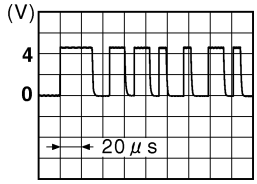
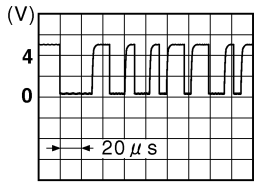
NKS000D4

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
1 (L/R)	Ground	RGB signal (R: red)	Input	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7360E
2 (L)	Ground	RGB signal (G: green)	Input	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7361E
3 (L/W)	Ground	RGB signal (B: blue)	Input	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7362E
4	—	Shield	—	—	—	—
7 (B/R)	Ground	RGB synchronizing signal	Input	ON	—	 SKIB3603E
8 (W/R)	Ground	RGB area (YS) signal	Input	ON	—	Approx. 5 V
12 (R)	Ground	Communication signal (–)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7379E
13 (G)	Ground	Communication signal (+)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7378E
14	—	Shield	—	—	—	—

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
15 (L)	Ground	Communication signal (–)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7379E
16 (R)	Ground	Communication signal (+)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7378E
19 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
21 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
22 (B)	Ground	Ground	—	ON	—	Approx. 0 V
23 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
24 (B)	Ground	Ground	—	ON	—	Approx. 0 V

Terminals and Reference Value for NAVI Switch

NKS000D5

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
1 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
2 (R/L)	Ground	Illumination signal	Input	ON	Lighting switch ON	Approx. 12 V
					Lighting switch OFF	Approx. 0 V
3 (R/Y)	Ground	Illumination control signal	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12 V
4 (R)	Ground	Communication signal (+)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7378E
5 (L)	Ground	Communication signal (–)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7379E
7 (B)	Ground	Ground	—	ON	—	Approx. 0 V

Special Note for Trouble Diagnosis

NKS002JP

Prior to perform trouble diagnosis, make sure there are no corresponding description in the “Example of Symptoms Possible No Malfunction”. Refer to AV-95, "Example of Symptoms Possible No Malfunction" .

On Board Self-Diagnosis Function

NKS000D6

DESCRIPTION

- Trouble diagnosis function of navigation system has a Self Diagnosis mode by automatic operation and a Confirmation/Adjustment mode by manual operation.
- Self Diagnosis mode checks for connections between the units constituting this system, analyzes each individual unit at the same time, and displays the results on the display unit.
- Confirmation/Adjustment mode displays trouble diagnosis that require an operation and a judgment by a human (auto-decision can not be performed by the system), confirmation of preset value, and an error history.

DIAGNOSIS ITEM

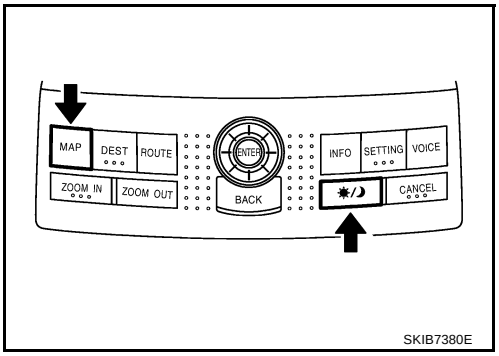
Mode			Description
Self Diagnosis			● NAVI control unit diagnosis (DVD-ROM drive will not be diagnosed when no DVD-ROM is in it.). ● Analyzes connection between the NAVI control unit and the GPS antenna, connection between the NAVI control unit and each unit, and operation of each unit.
Confirmation/ Adjustment	Display Diagnosis		Color tone and shading of the screen can be checked by the display of a color bar and a gray scale.
	Vehicle Signals		Diagnosis of signals that are input to NAVI control unit can be performed for Vehicle speed, Lights, Ignition and Reverse.
	Navigation	Steering Angle Adjustment	This mode is used to correct difference between actual turning angle of a vehicle and turning angle of the vehicle mark on the display.
		Speed Calibration	Under ordinary conditions, the navigation system distance measuring function will automatically compensate for minute decreases in wheel and tire diameter caused by tire wear or low-pressure. Speed Calibration can immediately restore system accuracy in cases such as when distance calibration is needed because of the use of tire chains.
	Error History		Malfunctions that occurred in the past are displayed, along with the number of times each has occurred. Time and location when/where the errors occurred are also displayed.
	Delete Unit Connection Log		Erase the connection history of unit and error history.

Self Diagnosis Mode

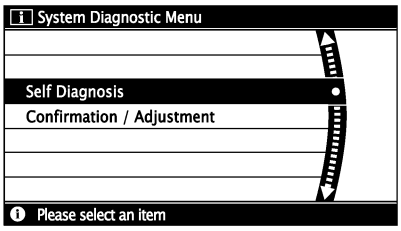
NKS000D7

OPERATION PROCEDURE

1. Start the engine.
2. Press and hold “MAP” and “☀/☽” buttons simultaneously for 5 seconds or more.
   - Shifting from current screen to previous screen is performed by pressing “BACK” button.

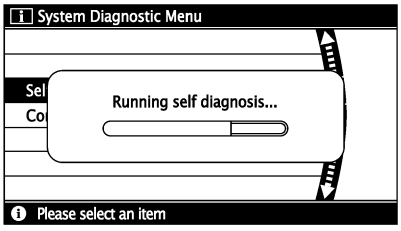


3. The initial trouble diagnosis screen will be shown, and items “Self Diagnosis” and “Confirmation/Adjustment” will become selective.



SKIB6971E

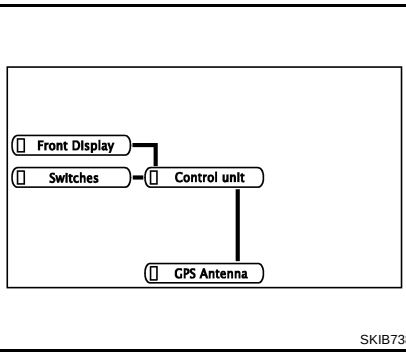
4. Perform self-diagnosis by selecting the “Self Diagnosis”.
   - Self-diagnosis screen is displayed, and then self-diagnosis starts.
   - The bar graph visible below self-diagnosis screen displays progress of the diagnosis.



SKIB6972E

5. On the diagnosis results screen, each unit name and connection line will be colored according to the diagnosis result, as follows.

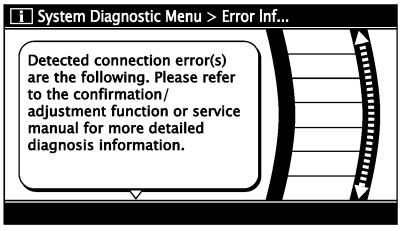
Diagnosis results	Unit	Connection line
Normal	Green	Green
Connection malfunction	Gray	Yellow
DVD-ROM drive undiagnosed	Gray	Green
DVD-ROM and DVD-ROM drive malfunction	Yellow	Green
Unit returned an error	Red	Green



SKIB7381E

NOTE:
- Control unit = NAVI control unit
- Switches = NAVI switch
- Only Control unit (NAVI control unit) is displayed in red.
- If multiple malfunctions occur at the same time for a single unit, the screen switch colors are determined according to the following order of priority: red > yellow > gray.

6. Select a switch on the diagnosis results screen, and comments for the diagnosis results will be shown.

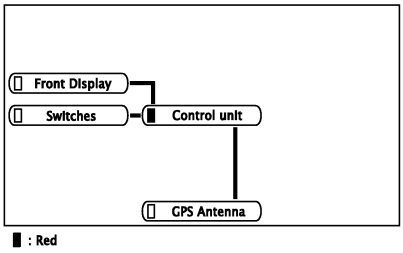
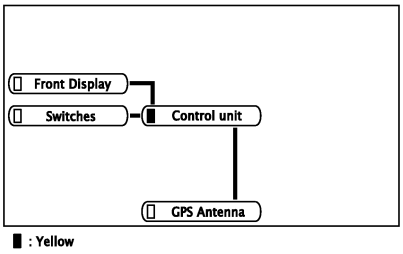
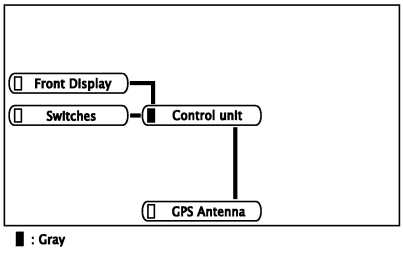
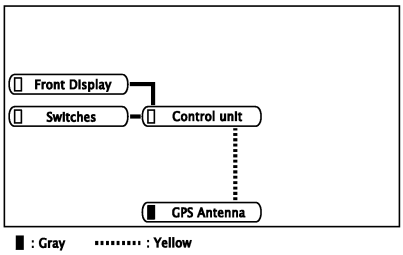


SKIB3659E

SELF-DIAGNOSIS RESULT

Check the applicable display in the following table, and then repair the malfunctioning parts.

Quick Reference Table

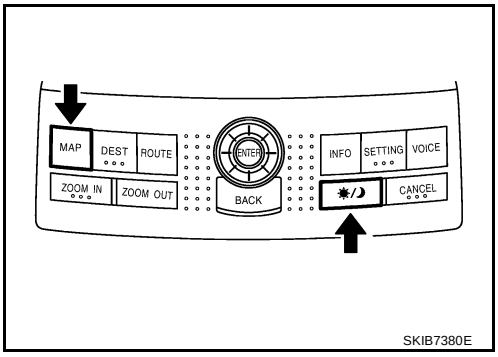
Self-diagnosis result screen	Possible cause	Action to take
 SKIB7382E	NAVI control unit malfunction is detected	Replace NAVI control unit Refer to AV-98, "Removal and Installation of NAVI Control Unit"
 SKIB7383E	● Malfunction is detected on DVD-ROM drive pickup lens in NAVI control unit ● There is dirt and damage on the DVD-ROM	1. Check if the inserted DVD-ROM is specified for this navigation system, and the DVD-ROM is dirty, scratched or warped. 2. If the results from the above checkup show no malfunction, insert the same DVD-ROM, and then restart self-diagnosis. 3. If self-diagnosis results still show any malfunction, replace NAVI control unit.
 SKIB7384E	DVD-ROM not inserted is detected	Insert DVD-ROM
 SKIB7385E	GPS antenna connection malfunction is detected	1. Check if GPS antenna feeder line is snapped or pinched. 2. If the results from the above checkup show no malfunction, replace GPS antenna, and then restart self-diagnosis. 3. If self-diagnosis results still show any malfunction, replace NAVI control unit.

Confirmation/Adjustment Mode

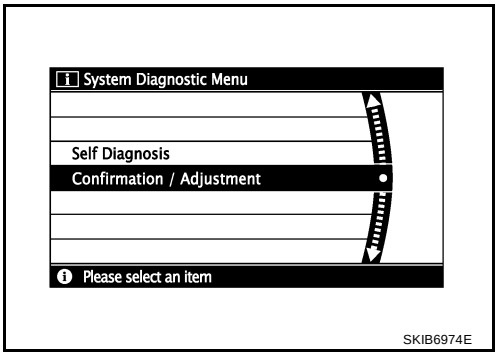
NKS000D8

OPERATION PROCEDURE

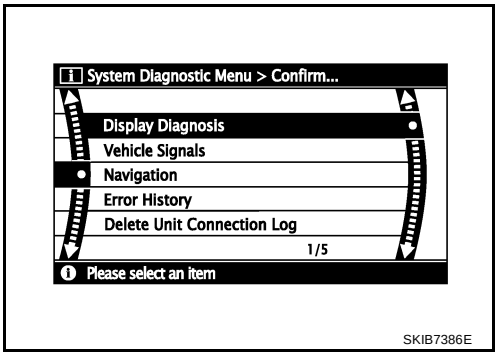
1. Start the engine.
2. Press and hold “MAP” and “☀/☽” buttons simultaneously for 5 seconds or more.
   - Shifting from current screen to previous screen is performed by pressing “BACK” button.



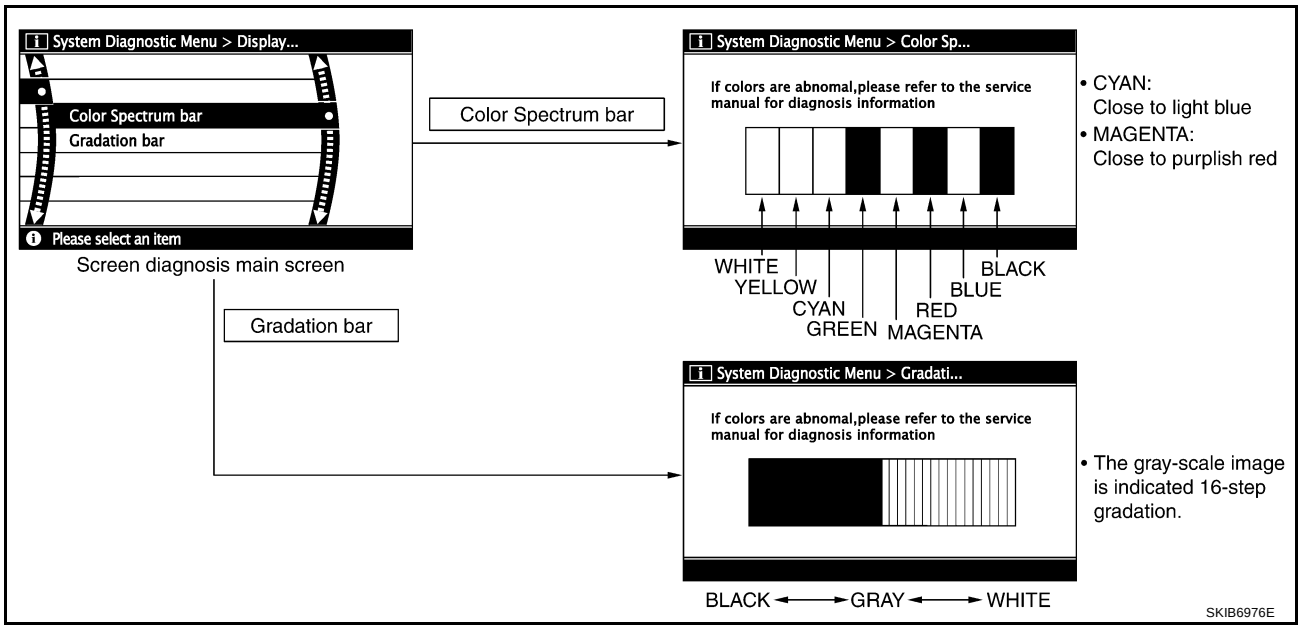
3. The initial trouble diagnosis screen will be shown, and items “Self Diagnosis” and “Confirmation/Adjustment” will become selective.
4. Select “Confirmation/Adjustment”.



5. Each diagnosis is shown by selecting each screen switch on Confirmation/Adjustment screen.



DISPLAY DIAGNOSIS

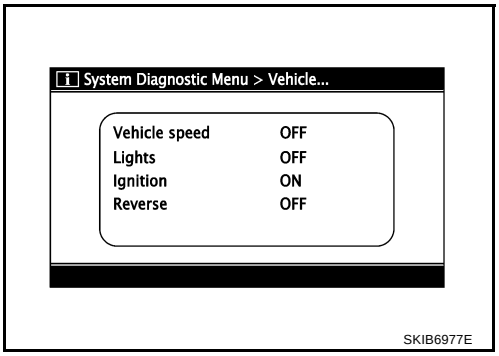


- If RGB signal is malfunctioning, the tint of the color bar display is as follows.

R (red) signal error : Light blue (Cyan) tint
G (green) signal error : Purple (Magenta) tint
B (blue) signal error : Yellow tint

VEHICLE SIGNALS

A comparison check can be made of each actual vehicle signal and the signals recognized by the NAVI control unit.



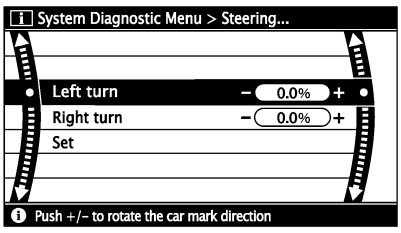
Diagnosis item	Display	Condition	Remarks
Vehicle speed	ON	When vehicle speed is more than 0 km/h (0 MPH)	Changes in indication may be delayed. This is normal.
	OFF	When vehicle speed is 0 km/h (0 MPH)	
	—	Ignition switch in ACC position	
Lights	ON	Lighting switch ON	—
	OFF	Lighting switch OFF	
Ignition	ON	Ignition switch ON	—
	OFF	Ignition switch ACC position	
Reverse	ON	Selector lever in R position	Changes in indication may be delayed. This is normal.
	OFF	Selector lever in any position other than R position	
	—	Ignition switch in ACC position	

NOTE:
If ignition signal is NG, each vehicle signal of vehicle speed and reverse is not displayed.

NAVIGATION

Steering Angle Adjustment

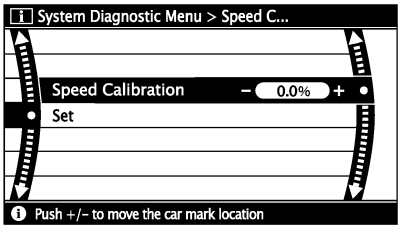
The steering angle output value detected by the gyroscope can be adjusted.



SKIB3684E

Speed Calibration

Usually the automatic distance correction function adjusts the malfunction in distance caused by the tires wearing down or the tire pressure change. If prompt adjustment is necessary when the tire chains are installed etc., perform this procedure.

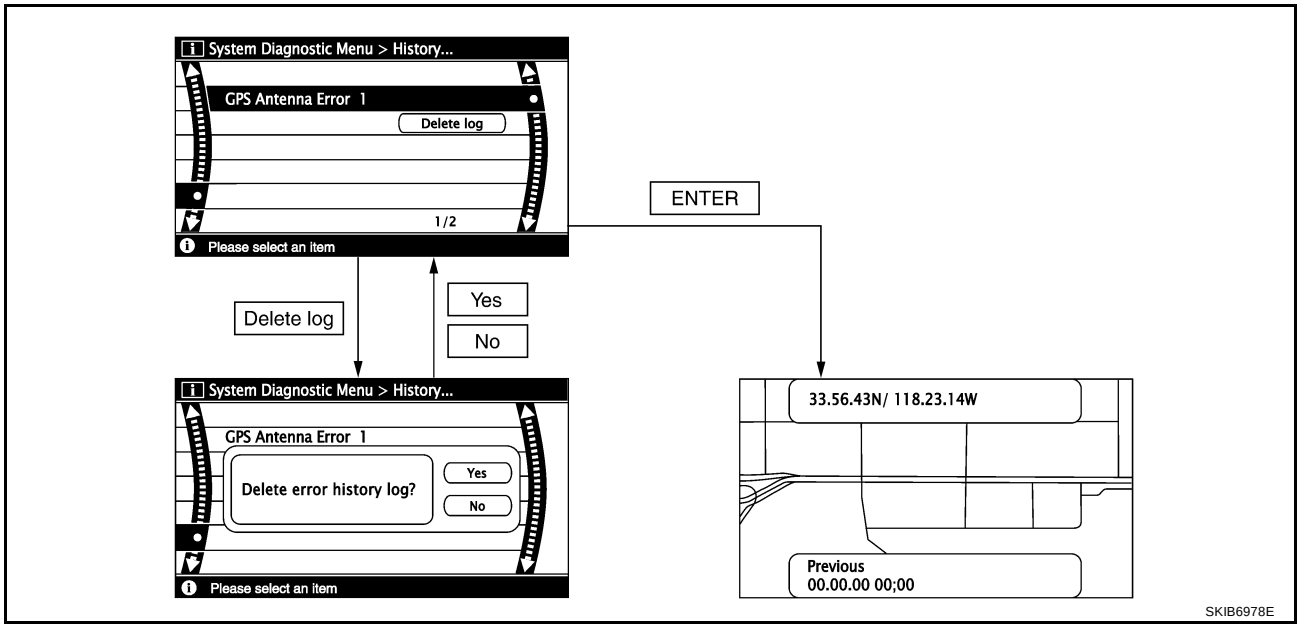


SKIB3685E

ERROR HISTORY

Diagnosis results of self-diagnosis depend on if any error occurred during the time after selecting “Self Diagnosis” until self-diagnosis results is displayed.
Meanwhile, when an error occurs before selecting “Self Diagnosis”, and if an error does not occur until self-diagnosis results is displayed, a diagnosis result is judged as normal.
Consequently, a diagnosis needs to be performed with “Error History” for the past error that is not available with self-diagnosis.
“Error History” displays the time and place of the most recent occurrence of that error. However, take note of the following points.

- Correct time of the error occurrence may not be displayed when the GPS antenna substrate within the NAVI control unit has malfunctioned.
- Place of the error occurrence is represented by the position of the vehicle mark at the time when the error occurred. If the vehicle mark has deviated from the correct position, then the place of the error occurrence may not be located correctly.
- When the ignition switch is turned ON if the error is detected, the counter increases 1. Even if it is normal when the ignition switch is turned ON the next time, the counter does not decrease.
- The upper limit of the counter is 50. 51 or more is displayed as 50. It can be reset to 0 by “Delete log” switch.



Diagnosis by Error History

- When having a difficulty on the investigation of cause due to multiple errors with a reproducible malfunction, turn ON the ignition switch from OFF mode after making a memo of the item and number of time (or delete “Error History”). Check “Error History” again after the malfunction was reproduced, and then perform diagnosis focusing on the item of which number of time increased.
- DVD-ROM error history may be restored because DVD-ROM cannot be temporarily read. (Driving on rough road etc.) Then, erase the error history. (This is not a malfunction.) Perform service in “Action to take” if error history are repeatedly indicated again.

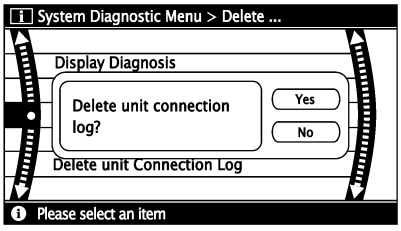
Error item	Possible cause	Action to take
GPS Antenna Error	GPS antenna connection malfunction is detected	1. Start self-diagnosis, and make sure of the result. 2. If any error is found, GO TO 3. If any error is not found, delete the error history and end the diagnosis. (This is not a malfunction.) 3. Check if GPS antenna feeder line is snapped or pinched. 4. If the results from the above checkup show no malfunction, replace GPS antenna, and then restart self-diagnosis. 5. If self-diagnosis results still show any malfunction, replace NAVI control unit.
FLASH-ROM Error Of Control Unit	NAVI control unit malfunction is detected	1. Start self-diagnosis, and make sure of the result. 2. If any error is found, replace NAVI control unit. Refer to AV-98, "Removal and Installation of NAVI Control Unit" . If any error is not found, delete the error history and end the diagnosis. (This is not a malfunction.)
Connection Of Gyro		
GPS Communication Error	GPS malfunction is detected	If the symptoms such as the GPS receipt malfunction occur, intermittent malfunction caused by strong radio interference may be detected. If the malfunction always occurs, replace NAVI control unit.
GPS ROM Error		
GPS RAM Error		
GPS RTC Error		
DVD-ROM Mechanism not Detected	● Malfunction is detected on DVD-ROM drive pickup lens in NAVI control unit ● There is dirt and damage on the DVD-ROM	1. Check if the inserted DVD-ROM is specified for this navigation system, and the DVD-ROM is dirty, scratched or warped. 2. If the results from the above checkup show no malfunction, insert the same DVD-ROM, and then restart self-diagnosis. 3. If self-diagnosis results still show any malfunction, replace NAVI control unit.
DVD-ROM Communication Error		
DVD-ROM Mechanism Error		
DVD-ROM Focus Error		
DVD-ROM TOC Error		
DVD-ROM Disc Error		
DVD-ROM Seek Error		
DVD-ROM Error Correction Error		
DVD-ROM Read Error		
DVD-ROM Data Transfer Error		
DVD-ROM Data Error		
DVD-ROM Loading / Eject Error		
DVD-ROM Time-out		

Error item	Possible cause	Action to take
Front Display Connection Error	Display unit power supply and ground circuit malfunction is detected	1. Delete the error history, and turn OFF ignition switch. 2. Turn ON ignition switch, and make sure of the error history. 3. If the error item listed left is displayed again, GO TO 4. If the error item is not displayed, end the diagnosis. (This is not a malfunction.) 4. Check display unit power supply and ground circuit. 5. If the results from the above checkup show no malfunction, replace display unit.

Error item	Possible cause	Action to take
Switches Connection Error	● NAVI switch power supply and ground circuit malfunction is detected ● Malfunction is detected on communication signal between display unit and NAVI switch ● Malfunction is detected on communication signal between NAVI control unit and display unit	1. Delete the error history, and turn OFF ignition switch. 2. Turn ON ignition switch, and make sure of the error history. 3. If the error item listed left is displayed again, GO TO 4. If the error item is not displayed, end the diagnosis. (This is not a malfunction.) 4. Check NAVI switch power supply and ground circuit. 5. Check communication circuit between display unit and NAVI switch. 6. Check communication circuit between NAVI control unit and display unit. 7. If the results from the above checkup show no malfunction, replace NAVI switch, display unit, or NAVI control unit, and then start self-diagnosis. 8. If self-diagnosis results still show any malfunction, replace one of the two units that is not replaced yet. 9. If self-diagnosis results still show any malfunction, replace the other unit.
● Front Display Connection Error ● Switches Connection Error	● Malfunction is detected on communication signal between NAVI control unit and display unit ● Malfunction is detected on communication signal between display unit and NAVI switch	1. Delete the error history, and turn OFF ignition switch. 2. Turn ON ignition switch, and make sure of the error history. 3. If the error item listed left is displayed again, GO TO 4. If the error item is not displayed, end the diagnosis. (This is not a malfunction.) 4. Check communication circuit between NAVI control unit and display unit. 5. Check communication circuit between display unit and NAVI switch. 6. If the results from the above checkup show no malfunction, replace NAVI switch, display unit, or NAVI control unit, and then start self-diagnosis. 7. If self-diagnosis results still show any malfunction, replace one of the two units that is not replaced yet. 8. If self-diagnosis results still show any malfunction, replace the other unit.

DELETE UNIT CONNECTION LOG

Erase the connection history of unit and error history that is recorded in NAVI control unit (clear the connection history of the removed unit).



SKIB6979E

All Images Are Not Displayed

NKS000DI

Symptom: RGB image such as a map screen is not displayed.

1. CHECK CONDITION

Check if brightness of screen changes when ☀/☽ button on NAVI switch is turned on after turning on ignition switch.

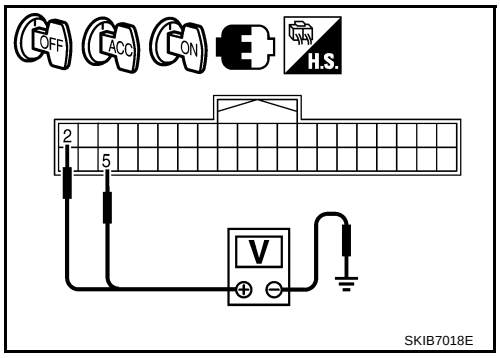
Does brightness of screen change?

YES >> GO TO 5.
NO >> GO TO 2.

2. CHECK NAVI CONTROL UNIT POWER SUPPLY AND GROUND CIRCUIT

1. Check voltage between NAVI control unit harness connector terminals and ground.

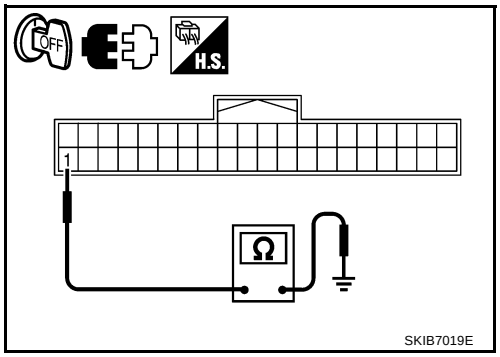
Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal				
B104	2	Ground	Battery voltage	Battery voltage	Battery voltage
	5		0 V	Battery voltage	Battery voltage



SKIB7018E

2. Turn ignition switch OFF.
3. Disconnect NAVI control unit connector.
4. Check continuity between NAVI control unit harness connector B104 terminal 1 and ground.

1 – Ground : Continuity should exist.



SKIB7019E

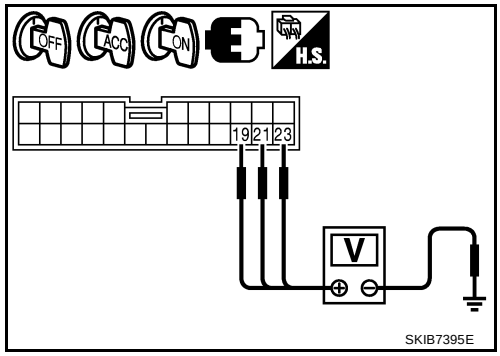
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK DISPLAY UNIT POWER SUPPLY AND GROUND CIRCUIT

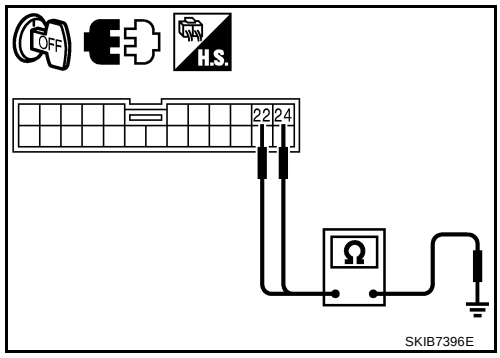
1. Check voltage between display unit harness connector terminals and ground.

Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal				
M35	21, 23	Ground	Battery voltage	Battery voltage	Battery voltage
	19		0 V	Battery voltage	Battery voltage



2. Turn ignition switch OFF.
3. Disconnect display unit connector.
4. Check continuity between display unit harness connector M35 terminals 22, 24 and ground.

22, 24 – Ground : Continuity should exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK NAVI CONTROL UNIT AND DISPLAY UNIT

1. Replace NAVI control unit or display unit.
2. Turn ignition switch ON.
3. Check if an image is displayed on the screen.

Is an image displayed on the screen?

YES >> INSPECTION END
NO >> Replace the other unit.

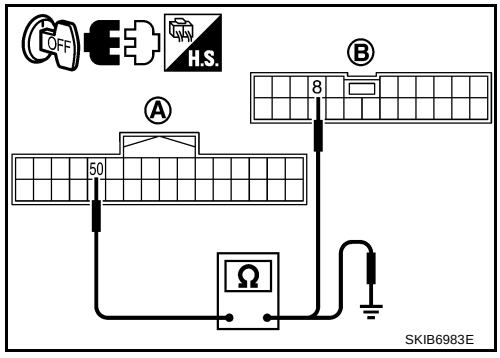
5. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and display unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B105 terminal 50 and display unit harness connector (B) M35 terminal 8.

50 – 8 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B105 terminal 50 and ground.

50 – Ground : Continuity should not exist.



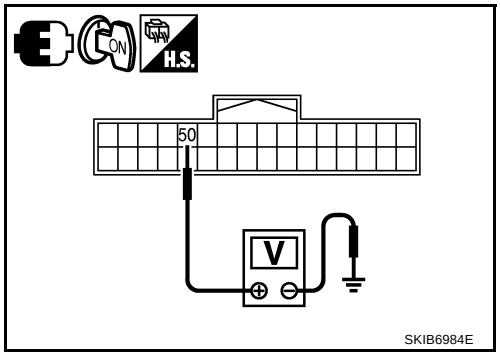
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK RGB AREA (YS) SIGNAL

1. Connect NAVI control unit and display unit connectors.
2. Turn ignition switch ON.
3. Check voltage between NAVI control unit harness connector B105 terminal 50 and ground.

50 – Ground : Approx. 5 V



OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

Navigation System Is Not Operated by NAVI Switch

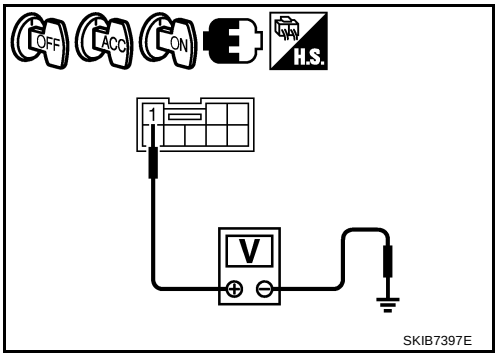
NKS000DJ

Symptom: Initial screen (NISSAN screen) or warning screen is displayed after ignition switch turns ON. But NAVI switch does not work.

1. CHECK NAVI SWITCH POWER SUPPLY AND GROUND CIRCUIT

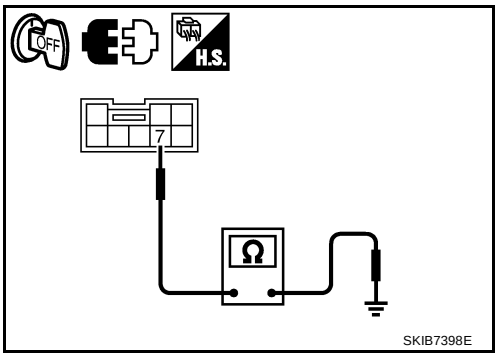
1. Check voltage between NAVI switch harness connector terminal and ground.

Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal				
M37	1	Ground	0 V	Battery voltage	Battery voltage



2. Turn ignition switch OFF.
3. Disconnect NAVI switch connector.
4. Check continuity between NAVI switch harness connector M37 terminal 7 and ground.

7 – Ground : Continuity should exist.



OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

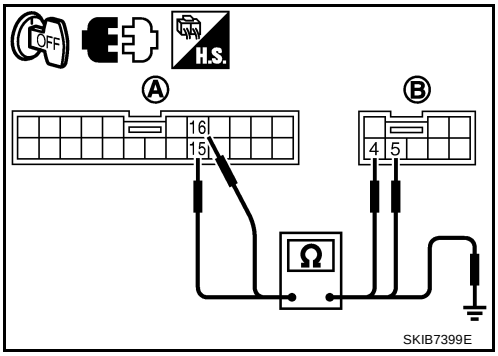
2. CHECK HARNESS

1. Disconnect display unit connector.
2. Check continuity between display unit harness connector (A) M35 terminals 15, 16 and NAVI switch harness connector (B) M37 terminals 5, 4.

15 – 5 : Continuity should exist.
16 – 4 : Continuity should exist.

3. Check continuity between display unit harness connector (A) M35 terminals 15, 16 and ground.

15, 16 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

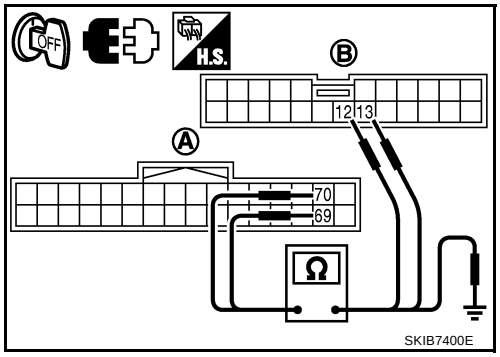
3. CHECK HARNESS

1. Disconnect NAVI control unit connector.
2. Check continuity between NAVI control unit harness connector (A) B105 terminals 69, 70 and display unit harness connector (B) M35 terminals 13, 12.

69 – 13 : Continuity should exist.
70 – 12 : Continuity should exist.

3. Check continuity between NAVI control unit harness connector (A) B105 terminals 69, 70 and ground.

69, 70 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK NAVI SWITCH, DISPLAY UNIT AND NAVI CONTROL UNIT

1. Replace NAVI switch, display unit, or NAVI control unit.
2. Make sure that navigation system can be operated by NAVI switch.

OK or NG

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK NAVI SWITCH, DISPLAY UNIT AND NAVI CONTROL UNIT

1. Replace one of the two units that is not replaced yet.
2. Make sure that navigation system can be operated by NAVI switch.

OK or NG

OK >> INSPECTION END
NG >> Replace the other unit.

Tint Is Strange for The RGB Image

NKS000DL

Symptom: Tint of RGB image is strange.

1. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and display unit connectors.
3. Check the malfunctioning circuit according to the symptoms.

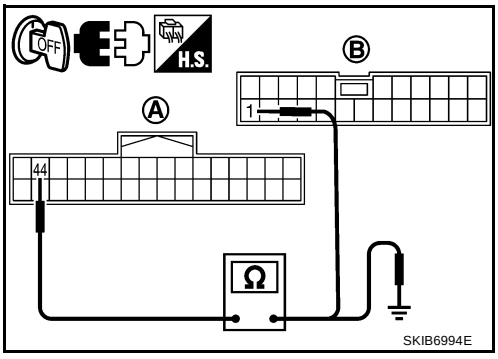
- **Light blue (Cyan) tinged screen**

Check continuity between NAVI control unit harness connector (A) B105 terminal 44 and display unit harness connector (B) M35 terminal 1.

44 – 1 : Continuity should exist.

Check continuity between NAVI control unit harness connector (A) B105 terminal 44 and ground.

44 – Ground : Continuity should not exist.



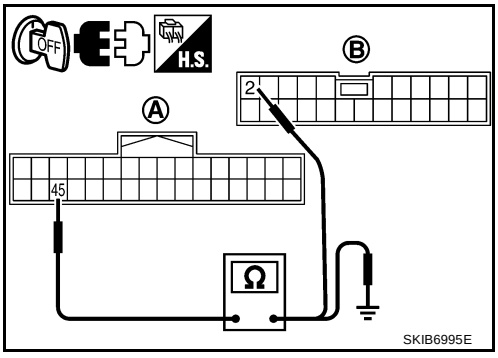
- **Purple (Magenta) tinged screen**

Check continuity between NAVI control unit harness connector (A) B105 terminal 45 and display unit harness connector (B) M35 terminal 2.

45 – 2 : Continuity should exist.

Check continuity between NAVI control unit harness connector (A) B105 terminal 45 and ground.

45 – Ground : Continuity should not exist.



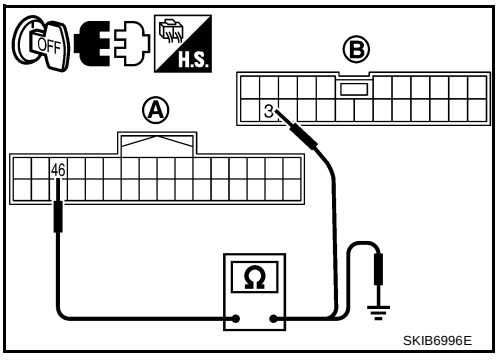
- **Yellow tinged screen**

Check continuity between NAVI control unit harness connector (A) B105 terminal 46 and display unit harness connector (B) M35 terminal 3.

46 – 3 : Continuity should exist.

Check continuity between NAVI control unit harness connector (A) B105 terminal 46 and ground.

46 – Ground : Continuity should not exist.



OK or NG

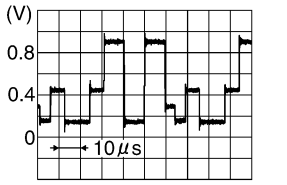
OK >> GO TO 2.
NG >> Repair harness or connector.

2. CHECK RGB SIGNAL

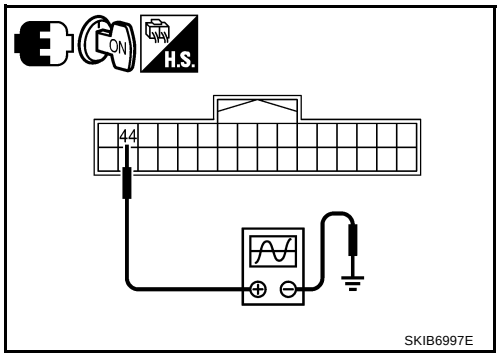
1. Connect NAVI control unit and display unit connectors.
2. Turn ignition switch ON.
3. Start Confirmation/Adjustment mode. Refer to AV-77, "Confirmation/Adjustment Mode" .
4. Display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen. Refer to AV-78, "DISPLAY DIAGNOSIS" .
5. Check the malfunctioning circuit according to the symptoms.

- **Light blue (Cyan) tinged screen**
  Check voltage waveform between NAVI control unit harness connector B105 terminal 44 and ground using oscilloscope.

44 – Ground:



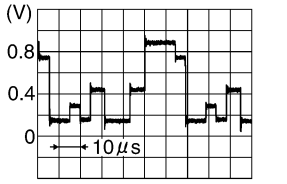
SKIB7360E



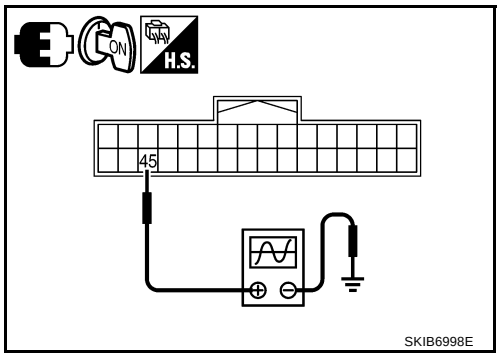
SKIB6997E

- **Purple (Magenta) tinged screen**
  Check voltage waveform between NAVI control unit harness connector B105 terminal 45 and ground using or oscilloscope.

45 – Ground:



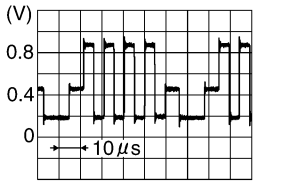
SKIB7361E



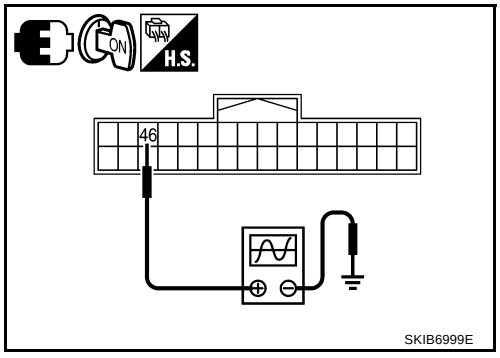
SKIB6998E

- **Yellow tinged screen**
  Check voltage waveform between NAVI control unit harness connector B105 terminal 46 and ground using oscilloscope.

46 – Ground:



SKIB7362E



SKIB6999E

OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

RGB Image Is Rolling

NKS000DM

Symptom: RGB image such as a map screen is rolling.

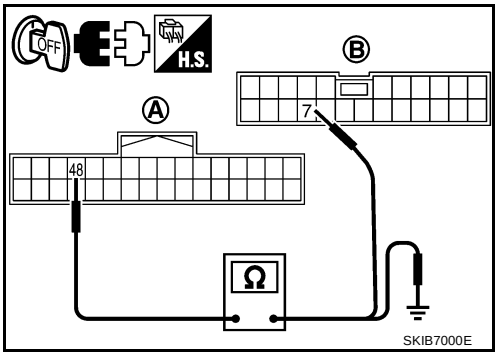
1. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and display unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B105 terminal 48 and display unit harness connector (B) M35 terminal 7.

48 – 7 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B105 terminal 48 and ground.

48 – Ground : Continuity should not exist.



SKIB7000E

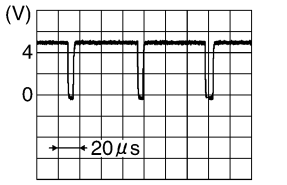
OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

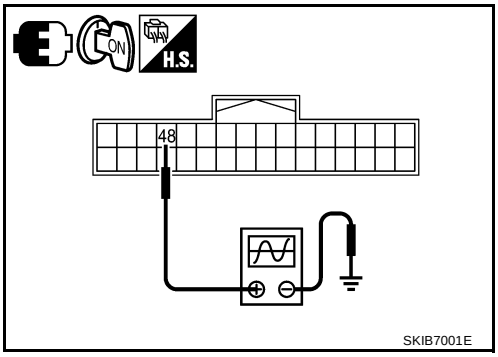
2. CHECK RGB SYNCHRONIZING SIGNAL

1. Connect NAVI control unit and display unit connectors.
2. Turn ignition switch ON.
3. Check voltage waveform between NAVI control unit harness connector B105 terminal 48 and ground using oscilloscope.

48 – Ground:



SKIB3603E



SKIB7001E

OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

Voice Guidance Is Not Heard

NKS000DN

Symptom: Voice guidance does not sound at route guidance.

1. CHECK CONDITION

Turn audio system ON, and check if any sound can be heard from front door speaker.

OK or NG

OK >> GO TO 2.
NG >> Refer to AV-39, "Trouble Diagnosis" and repair malfunctioning part.

2. CHECK CONDITION

Turn audio system ON, and check if front door speaker is muted when pressing “VOICE” button during sounding from front door speaker.

Is front door speaker muted?

YES >> GO TO 3.
NO >> GO TO 5.

3. CHECK HARNESS

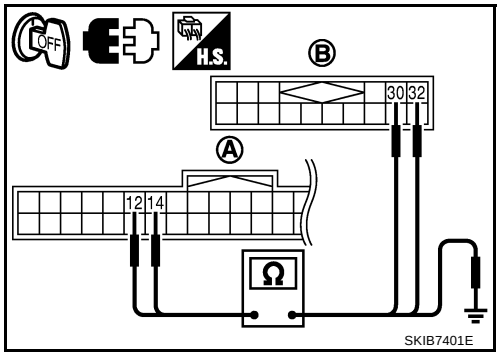
With BOSE system

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and audio unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B104 terminals 12, 14 and audio unit harness connector (B) M39 terminals 32, 30.

   12 – 32 : Continuity should exist.
   14 – 30 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B104 terminals 12, 14 and ground.

   12, 14 – Ground : Continuity should not exist.



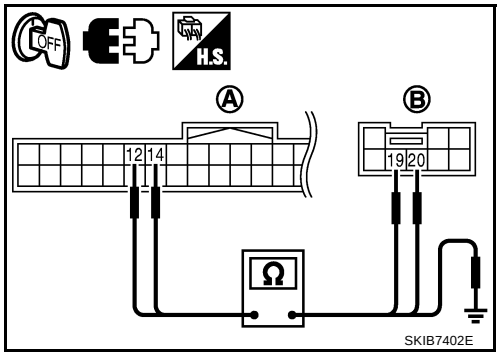
With base system

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and audio unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B104 terminals 12, 14 and audio unit harness connector (B) M46 terminals 20, 19.

   12 – 20 : Continuity should exist.
   14 – 19 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B104 terminals 12, 14 and ground.

   12, 14 – Ground : Continuity should not exist.

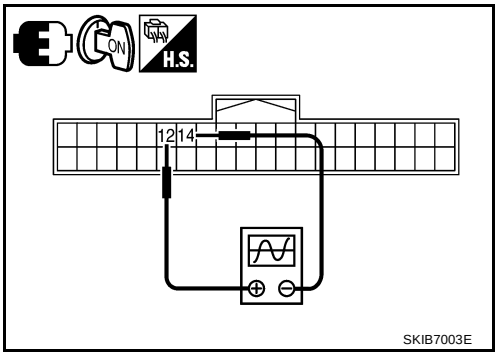


OK or NG

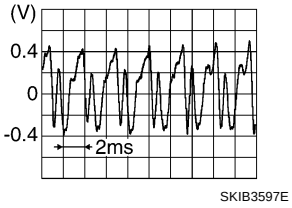
OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK VOICE GUIDANCE SIGNAL

1. Connect NAVI control unit and audio unit connectors.
2. Turn ignition switch ON.
3. When pressing “VOICE” button, check voltage waveform between NAVI control unit harness connector B104 terminals 12 and 14 using or oscilloscope.



12 – 14:



OK or NG

OK >> Replace audio unit.
NG >> Replace NAVI control unit.

5. CHECK HARNESS

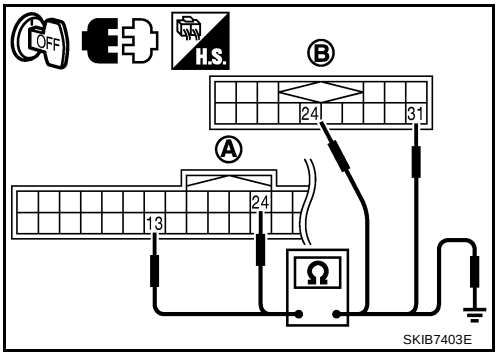
With BOSE system

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and audio unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B104 terminals 13, 24 and audio unit harness connector (B) M39 terminals 31, 24.

13 – 31 : Continuity should exist.
24 – 24 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B104 terminal 24 and ground.

24 – Ground : Continuity should not exist.



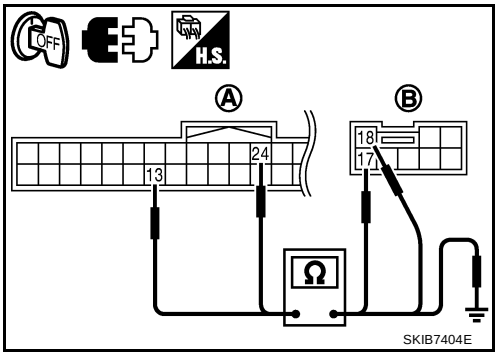
With base system

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and audio unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B104 terminals 13, 24 and audio unit harness connector (B) M46 terminals 18, 17.

13 – 18 : Continuity should exist.
24 – 17 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B104 terminal 24 and ground.

24 – Ground : Continuity should not exist.



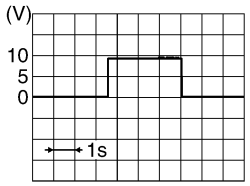
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

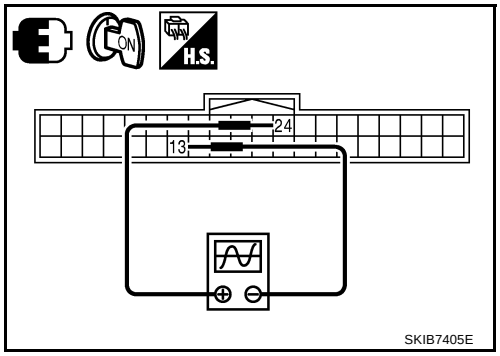
6. CHECK VOICE GUIDANCE ON SIGNAL

1. Connect NAVI control unit and audio unit connectors.
2. Turn ignition switch ON.
3. When pressing “VOICE” button, check voltage waveform between NAVI control unit harness connector B104 terminals 24 and 13 using oscilloscope.

24 – 13:



SKIB0232E



SKIB7405E

OK or NG

OK >> Replace audio unit.
NG >> Replace NAVI control unit.

Vehicle Mark Is Not Displayed Properly

NKS000DO

Symptom: Vehicle mark is not displayed at the vehicle driving position properly.

1. NAVIGATION SYSTEM ADJUSTMENT

1. Select “Navigation” in Confirmation/Adjustment mode, and adjust items, “Steering Angle Adjustment” and “Speed Calibration”. Refer to AV-79, "NAVIGATION" .
2. Check symptom with driving.

Is any malfunction observed?

YES >> GO TO 2.
NO >> INSPECTION END

2. SELF-DIAGNOSIS

Start self-diagnosis, and check any malfunction related to GPS. Refer to AV-74, "Self Diagnosis Mode" .

Is any malfunction related to GPS observed?

YES >> Repair malfunctioning part by diagnosis results.
NO >> GO TO 3.

3. CHECK VEHICLE SIGNAL

Select “Vehicle Signals” in Confirmation/Adjustment mode, and check the vehicle speed signal and reverse signal inputting to NAVI control unit. Refer to AV-78, "VEHICLE SIGNALS" .

OK or NG

OK >> Limit of position detection capacity.
NG >>
- Check NAVI control unit vehicle speed signal circuit, and repair malfunctioning part.
- Check NAVI control unit reverse signal circuit, and repair malfunctioning part.

Example of Symptoms Possible No Malfunction

NKS002JQ

For Navigation System operation information, refer to Navigation System Owner's Manual.

BASIC OPERATIONS

Symptom	Possible cause	Possible solution
No image is displayed.	The brightness is at the lowest setting.	Adjust the brightness of the display.
	The display is turned off.	Press and hold the ☀/☽ button to turn on the display.
No voice guidance is available. or The volume is too high or too low.	The volume is not set correctly, or it is turned off.	Adjust the volume of voice guidance.
No map is displayed on the screen.	The DVD-ROM is not inserted, or it is inserted upside down.	Insert the DVD-ROM correctly.
	A screen other than map screen is displayed.	Press the “MAP” button.
	The pickup lens of the DVD unit is dirty.	The pickup lens can become dirty depending on how you use the vehicle. Contact a NISSAN dealer or qualified workshop for pickup lens cleaning.
The screen is too dim. The movement is slow.	The temperature in the interior of the vehicle is low.	Wait until the interior of the vehicle has warmed up.
Some pixels in the display are darker or brighter than others.	This condition is an inherent characteristic of liquid crystal displays.	This is not a malfunction.
Some menu items cannot be selected.	Some menu items become unavailable while the vehicle is driven.	Park the vehicle in a safe location, then operate the navigation system.

NOTE:

Locations stored in the Address Book and other memory functions may be lost if the vehicle's battery is disconnected or is discharged. If this occurs, service the vehicle's battery as necessary and re-enter the information in the Address Book.

VEHICLE MARKS

Symptom	Possible cause	Possible solution
Names of roads and locations differ between plan view and BIRD-VIEW™ .	This is because the quantity of the displayed information is reduced so that the screen does not become difficult to read. There is also a chance that names of the roads or locations may be displayed several times, and the names appearing on the screen may be different because of a processing procedure.	This is not a malfunction.
The vehicle mark is not displayed in the correct position.	The vehicle was transported after the ignition switch was turned off, for example, by a ferry or car transporter.	Drive the vehicle for a while on a road where GPS signals can be received.
	The position and direction of the vehicle mark may be incorrect depending on the driving environments and the levels of positioning accuracy of the navigation system.	This is not a malfunction. Drive the vehicle for a while to automatically correct the position and direction of the vehicle mark.
When the vehicle is travelling on a new road, the vehicle mark is located on another road nearby.	The system automatically places the vehicle mark on the nearest available road, because the new road is not stored in the map data.	Updated road information will be included in the next version of the DVD-ROM.
The screen does not switch to the night screen even after turning on the headlights.	The daytime screen was set the last time the headlights were turned on.	Set the screen to the night screen mode using ☀/☽ button when you turn on the headlights.
The map does not scroll even when the vehicle is moving.	The current location map screen is not displayed.	Press the “MAP” button.
The vehicle mark is not displayed.	The current location map screen is not displayed.	Press the “MAP” button.

Symptom	Possible cause	Possible solution
The GPS indicator on the screen remains gray.	GPS signals cannot be received depending on the vehicle location, such as in a parking garage, on a road that has numerous tall buildings, etc.	Drive on an open, straight road for a while.
	A sufficient amount of GPS satellites is not available.	Please wait for the satellites to move to locations available for your navigation system.
The location of the vehicle mark is misaligned from the actual position.	When using tire chains or replacing the tires, speed calculations based on the speed sensor may be incorrect.	Drive the vehicle for a while [at approximately 30 km/h (19 MPH) for about 30 minutes] to automatically correct the vehicle's mark position. If this does not correct the vehicle mark position, contact a NISSAN dealer or qualified workshop.
	The map data has a mistake or is incomplete (the vehicle mark position is always misaligned in the same area).	Updated road information will be included in the next version of the DVD-ROM.

DVD-ROM

Symptom	Possible cause	Possible solution
The message “Error” appears.	The DVD-ROM is dirty or partially damaged.	Check the DVD-ROM and wipe it clean with a soft cloth.
		In you see any damage, replace the DVD-ROM.

ROUTE CALCULATION AND VISUAL GUIDANCE

Symptom	Possible cause	Possible solution
In the auto re-route calculation, waypoints are not included.	Waypoints that you have already passed are not included in the auto re-route calculation.	If you want to go to that waypoint again, you need to edit the route.
Route information is not displayed.	Route calculation has not yet been performed.	Set the destination and perform route calculation.
	You are not driving on the suggested route.	Drive on the suggested route.
	Route guidance is set to off.	Turn on the route guidance.
The auto re-route calculation (or detour calculation) suggests the same route as the one previously suggested.	Route calculations took priority conditions into consideration, but the same route was calculated.	This is not a malfunction.
A waypoint cannot be added.	Five waypoints are already set on the route, including the ones that you have already passed.	A maximum of 5 waypoints can be set on the route. If you want to go to 6 or more waypoints, perform route calculations several times, as necessary.
The suggested route is not displayed.	Roads near the destination cannot be calculated.	Reset the destination to a main or ordinary road, and recalculate the route.
	The starting point and destination are too close.	Set a more distant destination.
	The starting point and destination are too far away.	Divide your trip by selecting one or two intermediate destinations, and perform a global route calculation based on multiple route calculations.
	There are time restricted roads (day of week, time) near the current vehicle location or destination.	Set [Use Time Restricted Roads] to off.
The part of the route that you have already passed is deleted.	A route is managed by sections between waypoints. If you passed the first waypoint, the section between the starting point and the waypoint is deleted. (It may not be deleted depending on the area.)	This is not a malfunction.

Symptom	Possible cause	Possible solution
An indirect route is suggested.	If there are restrictions (such as one-way streets) on roads close to the starting point or destination, the system may suggest an indirect route.	Adjust the location of the starting point or destination.
	The system may suggest an indirect route because route calculation does not take into consideration some areas such as narrow streets (grey roads).	Reset the destination to a main or ordinary road, and recalculate the route.
The landmark information does not correspond to the actual information.	This may be caused by insufficient or incorrect data on the DVD-ROM.	Updated information will be included in the next version of the DVD-ROM.
The suggested route does not exactly connect with the starting point, waypoints, or destination.	There is no data for route calculation closer to these locations.	Set the starting point, waypoints and destination on a main road, and perform route calculation.

VOICE GUIDANCE

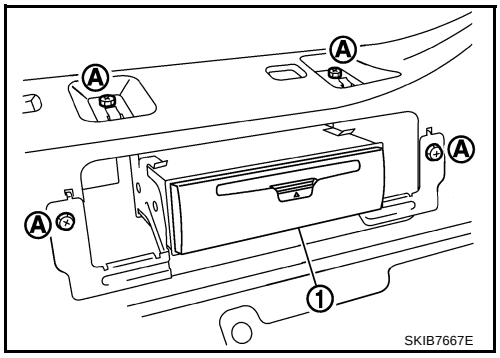
Symptom	Possible cause	Possible solution
Voice guidance is not available.	Voice guidance is only available at certain intersections marked with . In some cases, voice guidance is not available even when the vehicle should make a turn.	This is not malfunction.
	The vehicle has deviated from the suggested route.	Go back to the suggested route or request route calculation again.
	Voice guidance is set to off.	Turn on the voice guidance.
	Route guidance is set to off.	Turn on the route guidance.
The guidance content does not correspond to the actual condition.	The content of voice guidance may vary, depending on the types of intersections where turns are made.	Follow all traffic rules and regulations.

Removal and Installation of NAVI Control Unit

NKS000DT

REMOVAL

1. Remove luggage floor finisher upper (front) (Coupe models), or luggage floor finisher upper (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove screws (A), and remove NAVI control unit (1).
3. Remove NAVI control unit from bracket.



INSTALLATION

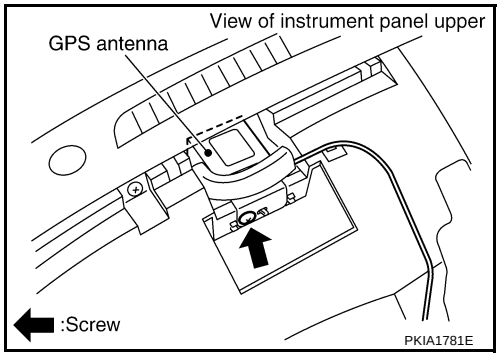
Installation is the reverse order of removal.

Removal and Installation of GPS Antenna

NKS000DU

REMOVAL

1. Remove instrument driver panel upper. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screw (1), and remove GPS antenna.



INSTALLATION

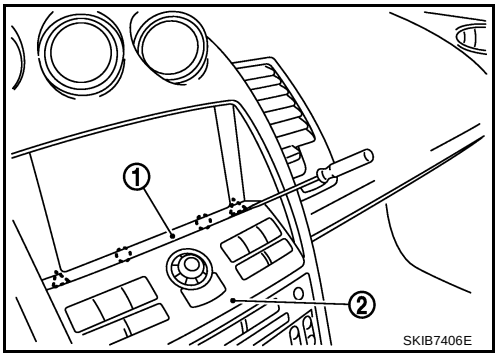
Installation is the reverse order of removal.

Removal and Installation of NAVI Switch

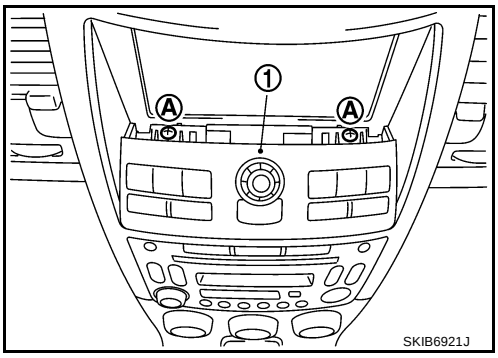
NKS000DV

REMOVAL

1. Insert cloth-covered driver into gaps between mask (1) and NAVI switch (2), and remove mask (1).



2. Remove screws (A), and remove NAVI switch (1).



INSTALLATION

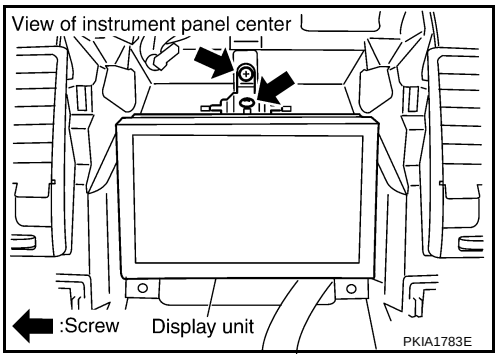
Installation is the reverse order of removal.

Removal and Installation of Display Unit

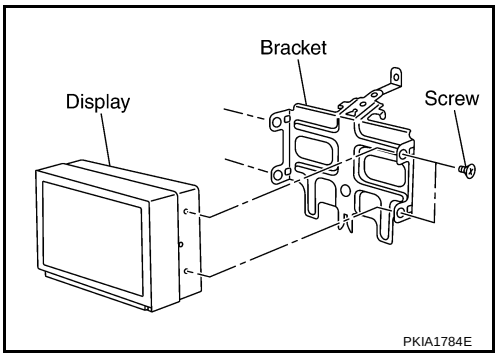
NKS000DW

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (2), and remove display unit.



3. Remove screws (4), and remove bracket.



INSTALLATION

Installation is the reverse order of removal.

TELEPHONE

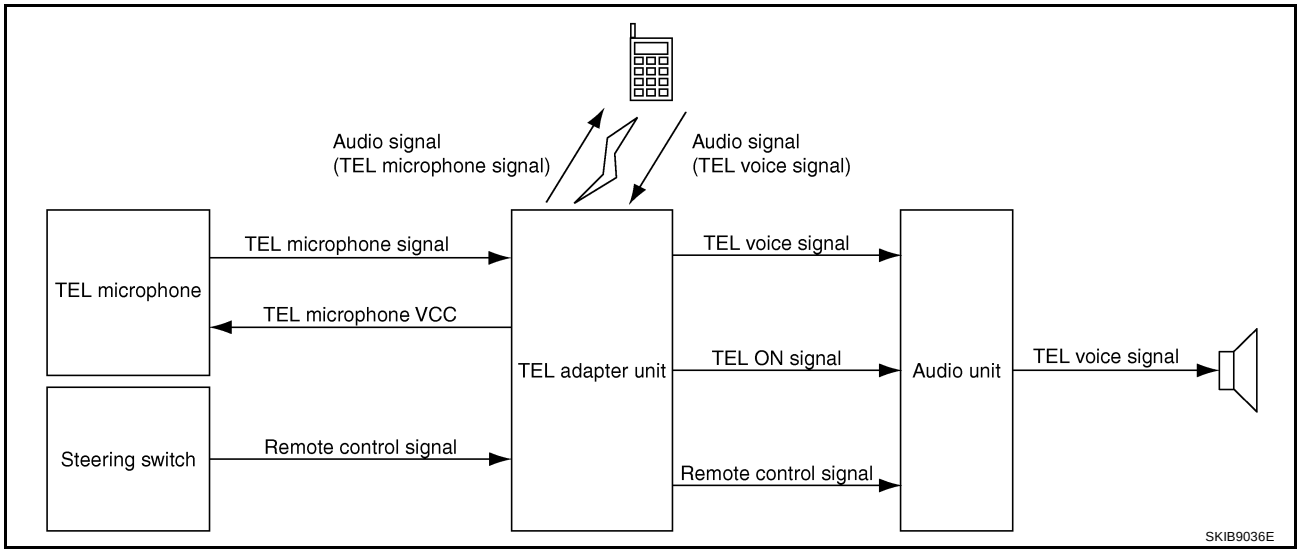
PFP:28342

System Description

NKS0056C

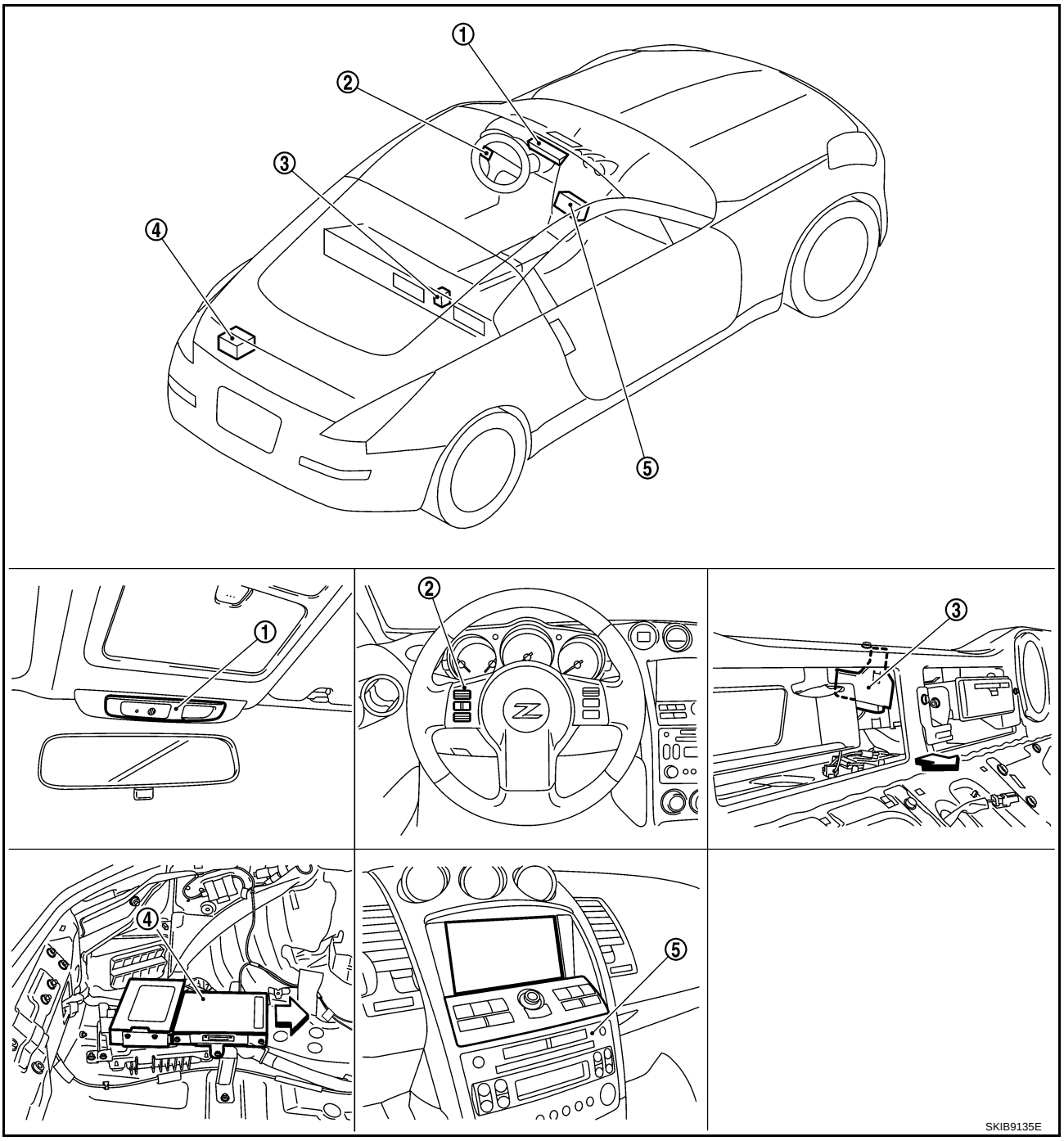
HANDS-FREE PHONE SYSTEM

- For Hands-free phone system operation information, refer to Owner's Manual.
- TEL adapter unit has Bluetooth® module. It can perform wireless hands-free telephone calls using a cellular phone in vehicle compartment.
- 5 or less cellular phones can be registered into the TEL adapter unit.
- Hands-free phone mode starts by transmitting steering switch signal to TEL adapter unit when pressing button.
- Hands-free phone mode ends by transmitting steering switch signal to TEL adapter unit when pressing MODE button.
- When uttering to the TEL microphone, TEL microphone signal (audio signal) is transmitted from the TEL microphone to the TEL adapter unit and transmitted to the cellular phone with the Bluetooth® communication.
- Audio signals from a party at the other end are transmitted from the cellular phone to the TEL adapter unit with the Bluetooth® communication, and transmitted from the TEL adapter unit to the audio unit, then the party's voice is output from the front door speaker.
- Audio unit switches the voice from front speaker RH to TEL voice when receiving TEL ON signal from TEL adapter unit.



Component Parts Location

NKS0056D

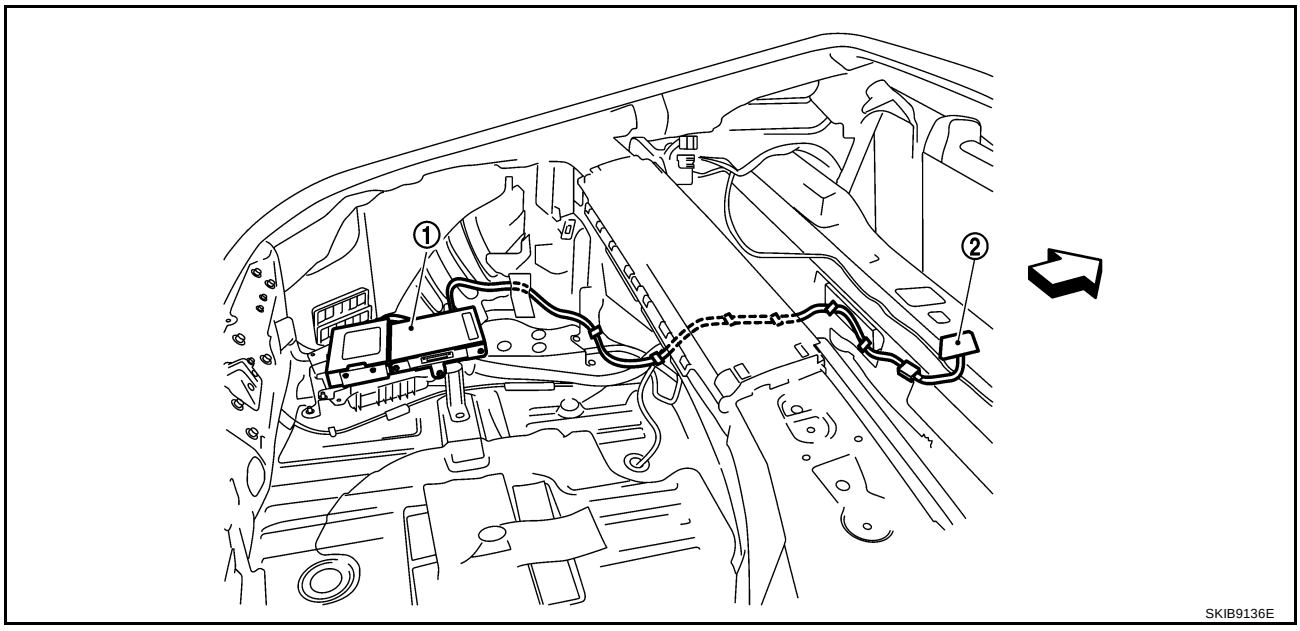


1. TEL microphone
2. Steering switch
3. TEL antenna
4. TEL adapter unit
5. Audio unit

⇦ : Vehicle front

Location of TEL Antenna

NKS0056E

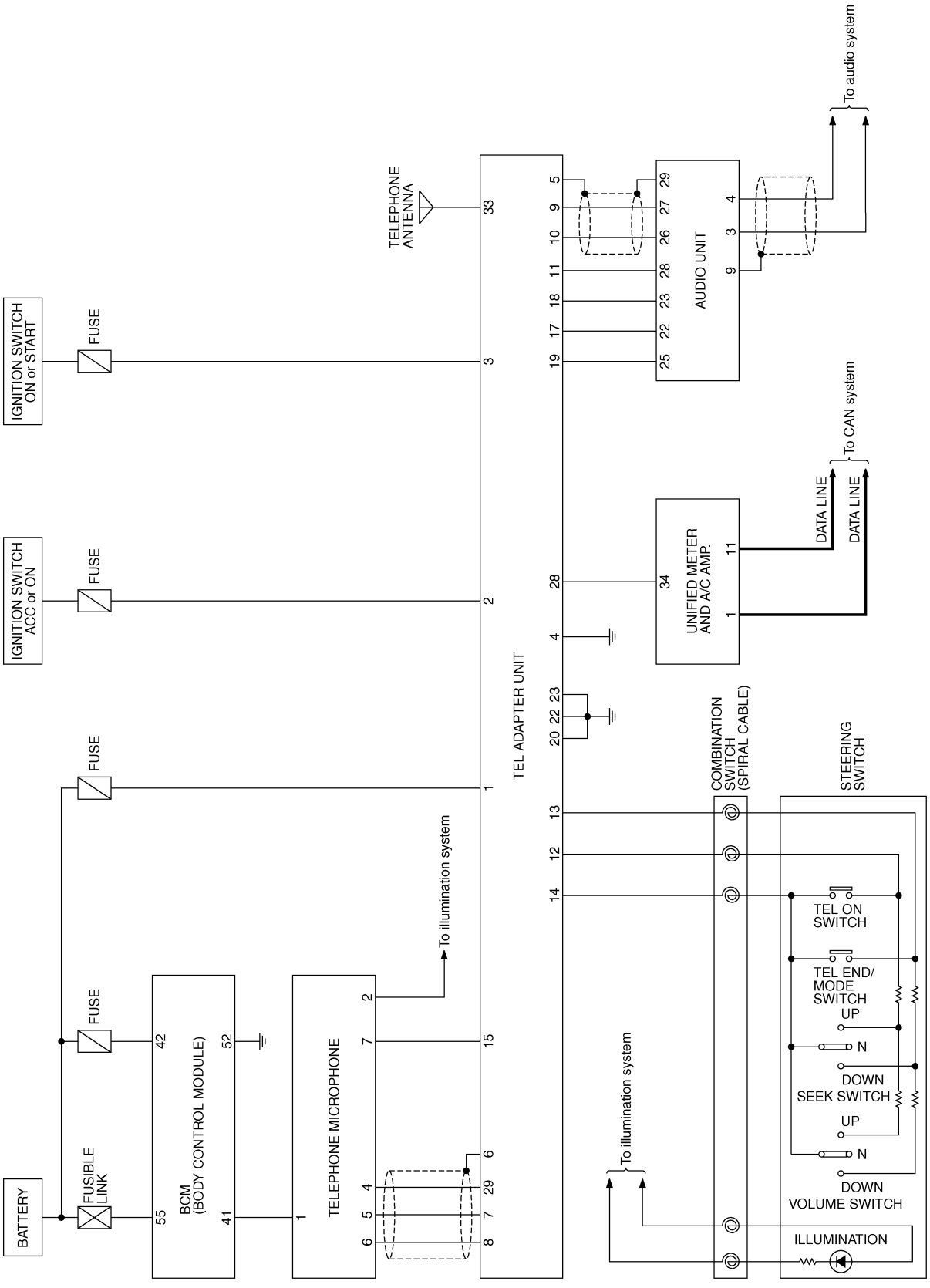


1. TEL adapter unit
2. TEL antenna

⇦ : Vehicle front

Schematic

NKS0056F

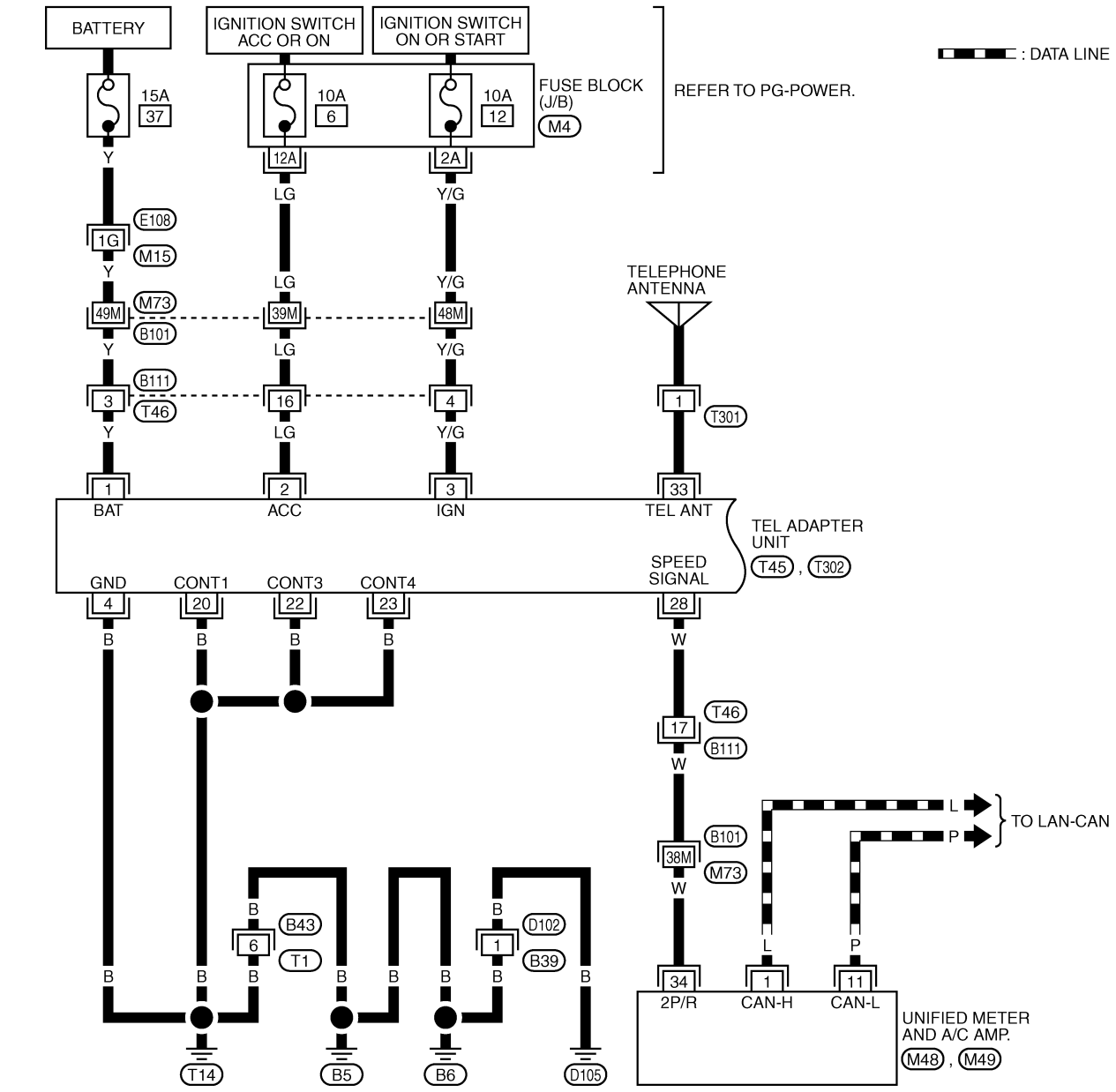


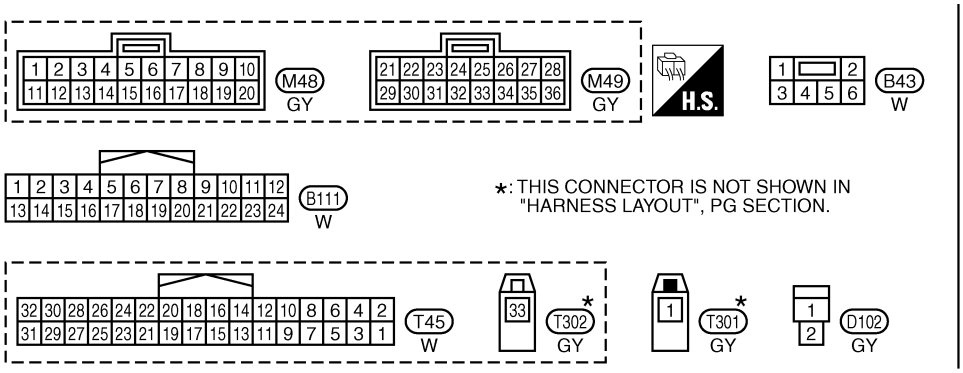
TKWT5806E

Wiring Diagram — H/PHONE —

NKS0056G

AV-H/PHON-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

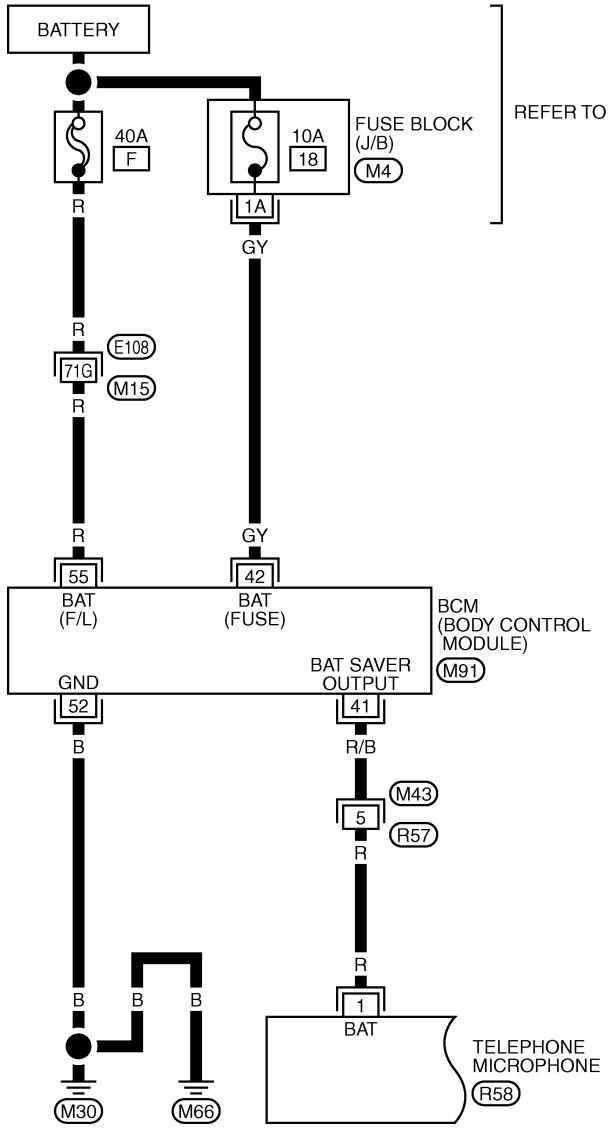
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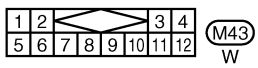
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

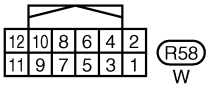
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5807E

AV-H/PHON-02



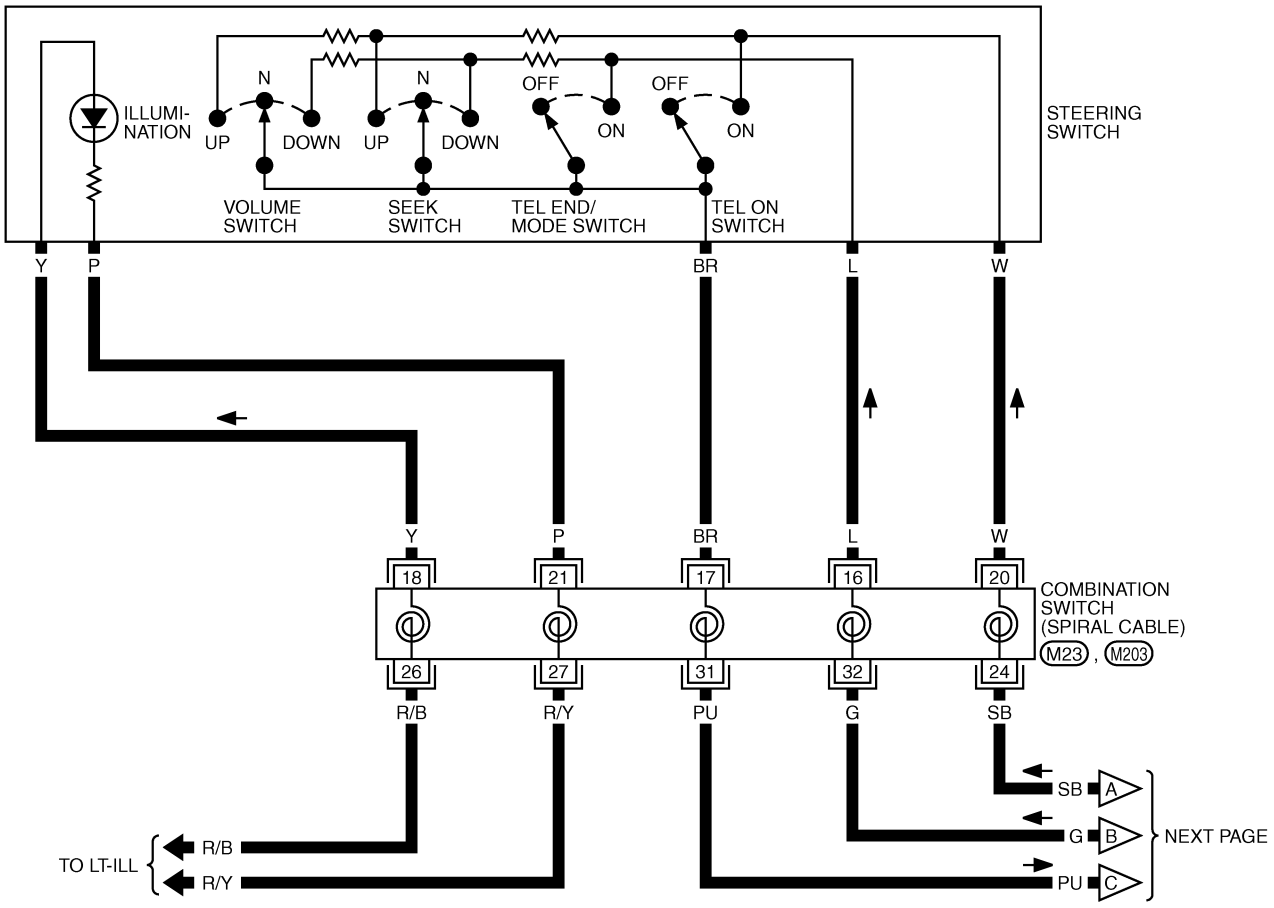


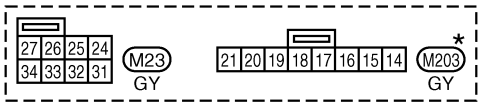


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M91 -ELECTRICAL UNITS

TKWT5551E

AV-H/PHON-03

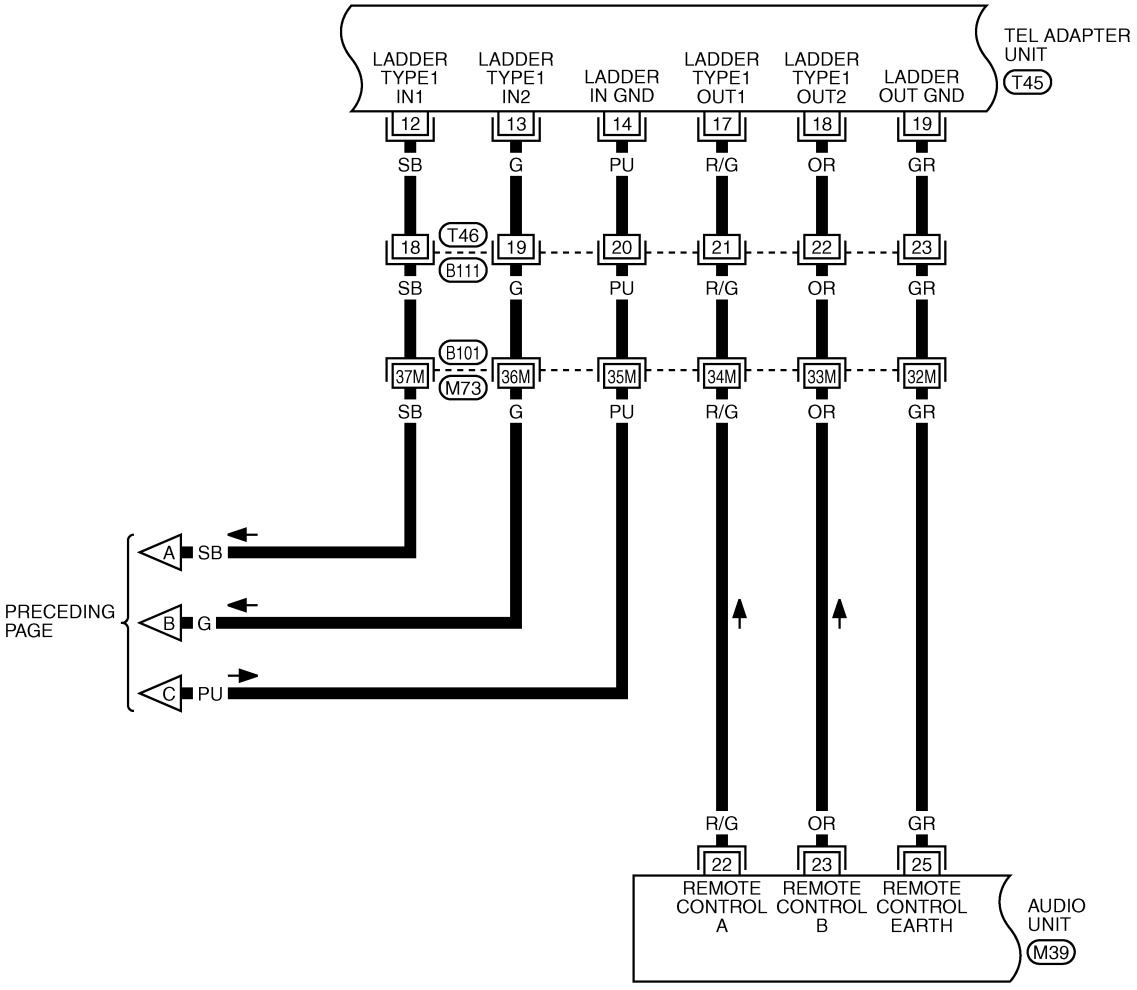


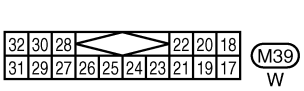


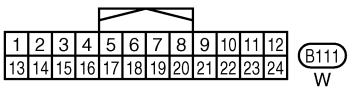
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

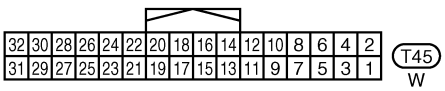
TKWT5808E

AV-H/PHON-04





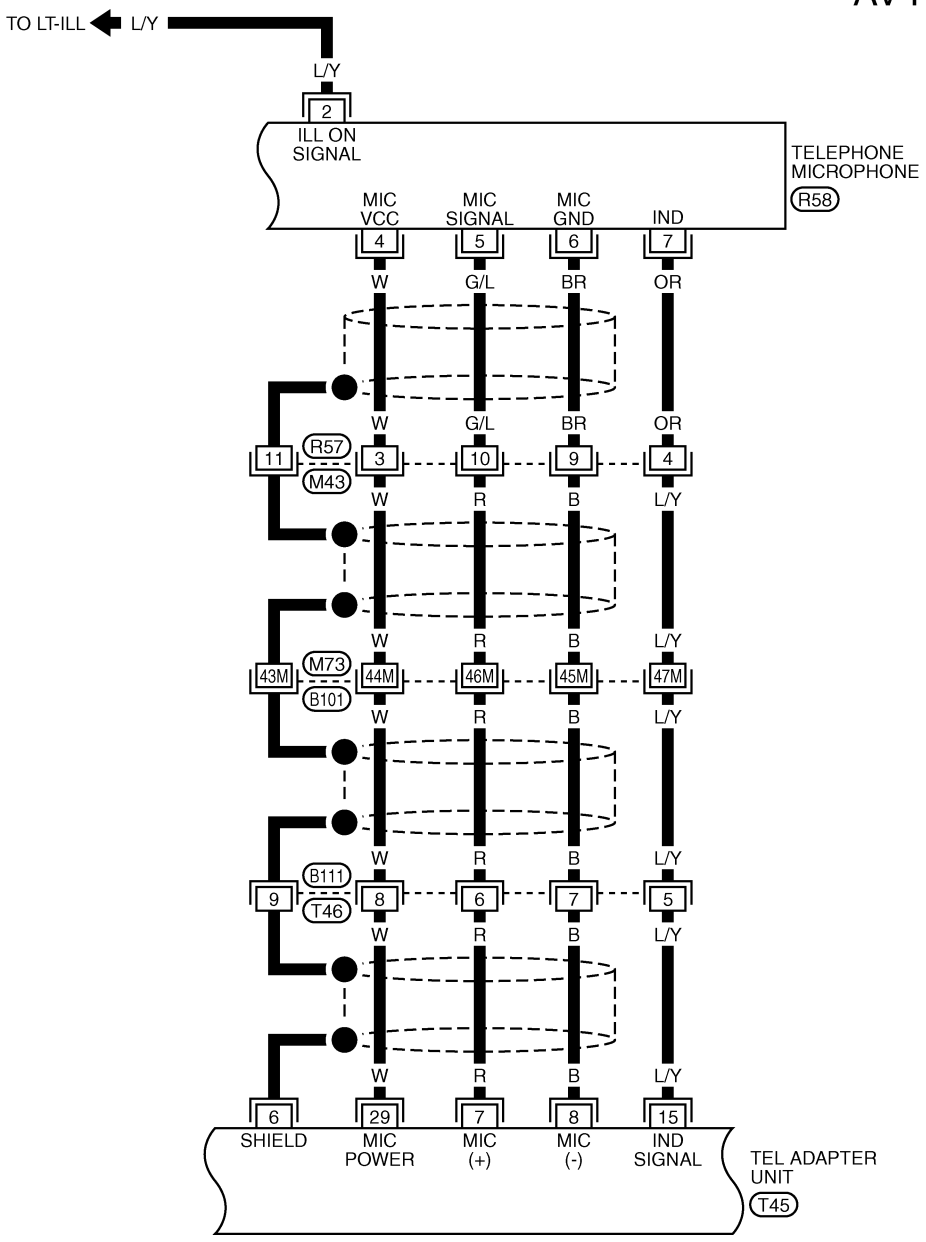


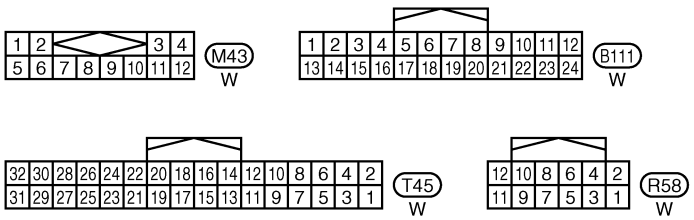


REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5553E

AV-H/PHON-05



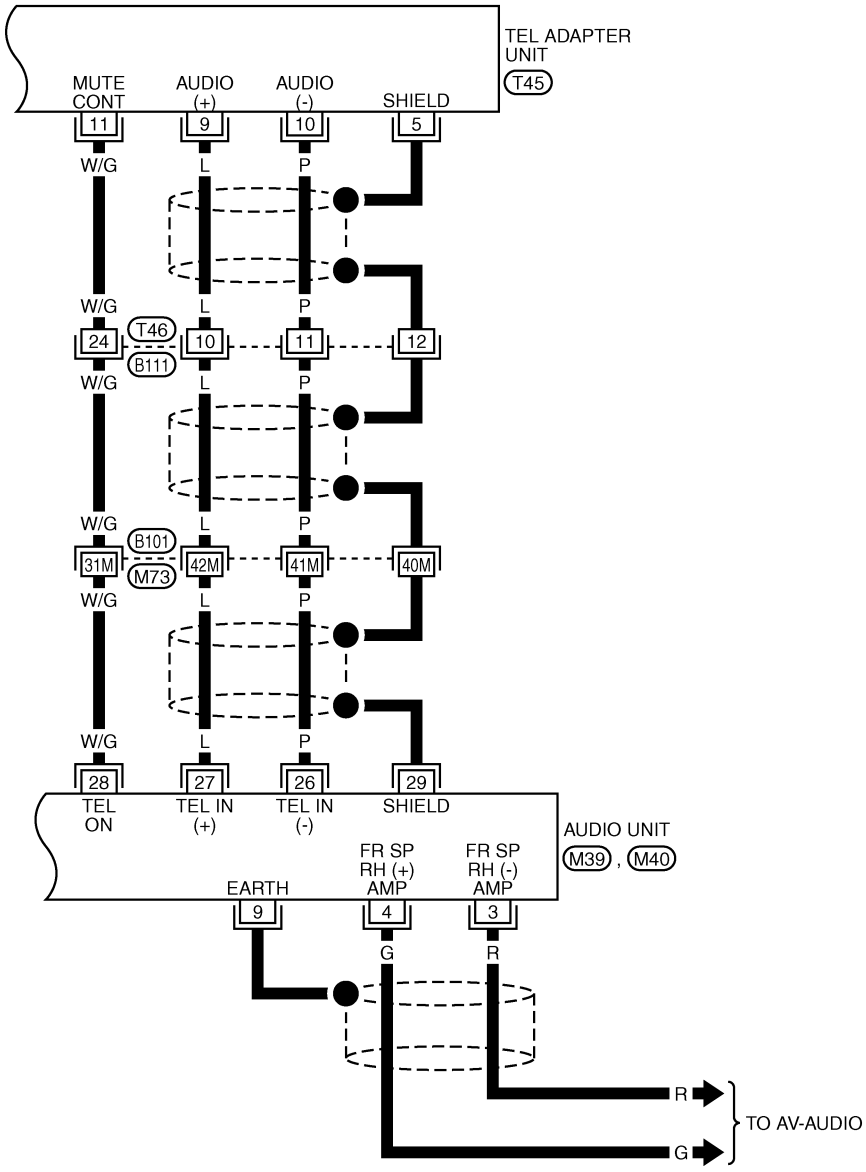


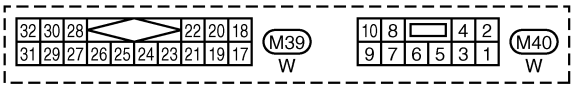
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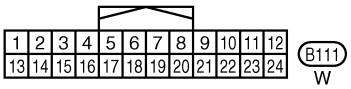
B101 -SUPER MULTIPLE JUNCTION (SMJ)

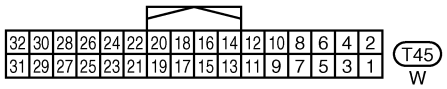
TKWT5554E

AV-H/PHON-06







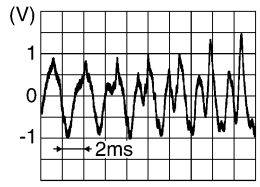
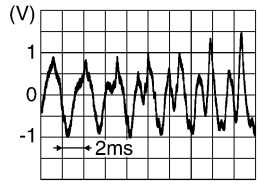


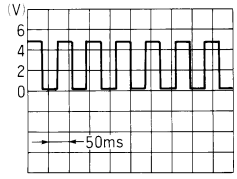
REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5809E

Terminals and Reference Value for TEL Adapter Unit

NKS0056H

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
1 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
2 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
3 (Y/G)	Ground	Ignition signal	Input	ON	—	Battery voltage
4 (B)	Ground	Ground	—	ON	—	Approx. 0 V
5	—	Shield	—	—	—	—
6	—	Shield	—	—	—	—
7 (R)	8 (B)	TEL microphone signal	Input	ON	Uttering in front of the microphone while using the hands-free phone system.	 SKIB3609E
9 (L)	10 (P)	TEL voice signal	Output	ON	Receiving the party's voice while using the hands-free phone system.	 SKIB3609E
11 (W/G)	Ground	TEL ON signal	Output	ON	While using hands-free phone system	Approx. 0 V
					Except while using hands-free phone system	Approx. 5 V
12 (SB)	14 (PU)	Remote control signal A	Input	ON	Press and hold switch	Approx. 0 V
					Press and hold SEEK UP switch	Approx. 1.7 V
					Press and hold VOLUME UP switch	Approx. 3.3 V
					Except for above	Approx. 5 V
13 (G)	14 (PU)	Remote control signal B	Input	ON	Press and hold MODE switch	Approx. 0 V
					Press and hold SEEK DOWN switch	Approx. 1.7 V
					Press and hold VOLUME DOWN switch	Approx. 3.3 V
					Except for above	Approx. 5 V
14 (PU)	Ground	Remote cntrol signal ground	—	ON	—	Approx. 0 V
15 (L/Y)	Ground	Indicator signal	Output	ON	Microphone indicator ON	Approx. 1 V
					Microphone indicator OFF	Approx. 10 V
17 (R/G)	19 (GR)	Remote control signal A	Output	ON	Press and hold SEEK UP switch	Approx. 1.7 V
					Press and hold VOLUME UP switch	Approx. 3.3 V
					Except for above	Approx. 5 V

Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value
18 (OR)	19 (GR)	Remote control signal B	Output	ON	Press and hold MODE switch	Approx. 0 V (Audio mode)
						Approx. 5 V (TEL mode)
					Press and hold SEEK DOWN switch	Approx. 1.7 V
					Press and hold VOLUME DOWN switch	Approx. 3.3 V
					Except for above	Approx. 5 V
19 (GR)	Ground	Remote control signal ground	—	ON	—	Approx. 0 V
20 (B)	Ground	Control signal 1	—	ON	—	Approx. 0 V
22 (B)	Ground	Control signal 3	—	ON	—	Approx. 0 V
23 (B)	Ground	Control signal 4	—	ON	—	Approx. 0 V
28 (W)	Ground	Vehicle speed signal (2-pulse)	Input	ON	When vehicle speed is approx. 40 km/h (25 MPH)	**NOTE:** Maximum voltage may be 12 V due to specifications (connected units).  ELF1080D
29 (W)	Ground	TEL Microphone VCC	Output	ON	—	Approx. 5 V
33	—	TEL antenna signal	Input	ON	Not connected to Bluetooth® antenna connector	Approx. 3 V

Self-Diagnosis Function

NKS0056J

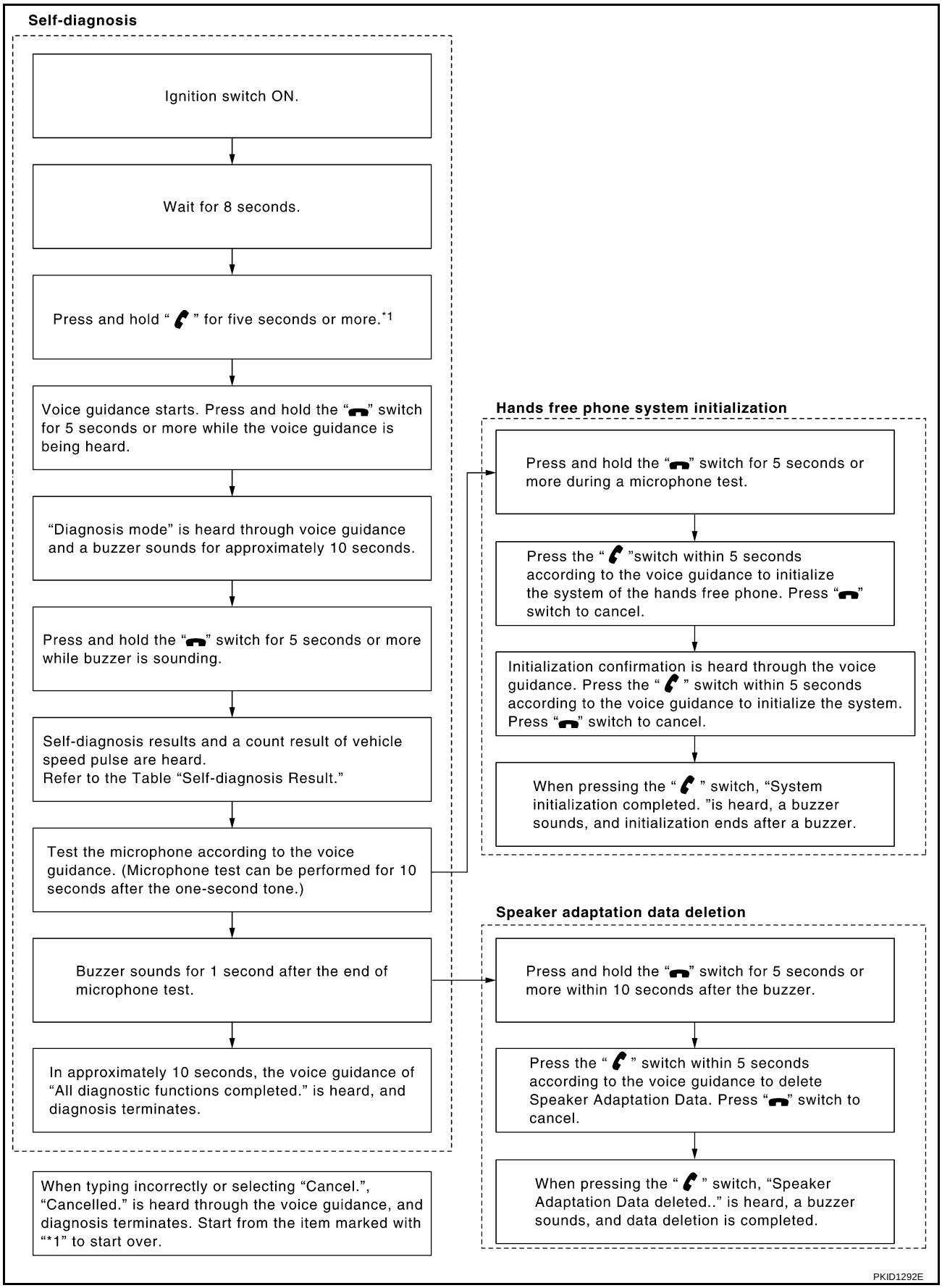
- During on board diagnosis the diagnosis function of TEL adapter unit starts with the operation of the steering switch and performs the diagnosis when ignition switch ACC.
- The on board diagnosis has 3 modes: the self-diagnosis mode that performs the trouble diagnosis, the speaker adaptation data deleting mode and the hands free phone system initialization mode.

NOTE:

- Perform the diagnosis with the vehicle stopped.
- Perform STEP 2 if necessary.

STEP	Mode	Contents
STEP 1	Self-diagnosis	The self-diagnosis mode perform the following. ● Diagnosis of TEL adapter unit, Bluetooth antenna and steering switch. ● Vehicle speed pulse count. ● Microphone test. Then reads out the results with the sound.
STEP 2	Speaker adaptation data deleting	The speaker adaptation data deleting mode can delete the speaker adaptation data.
	Hands free phone system initialization	Hands free phone system initialization mode can perform the initialization of hands free phone system.

DIAGNOSIS FUNCTION OPERATION PROCEDURE



ERROR ITEM (ERROR NAME)

Error name	Detection condition	Trouble-shooting method
There are no failure records to report	System is normal	—
Internal error	Error inside TEL adapter unit	Replace TEL adapter unit.
Bluetooth® antenna open	Open in the Bluetooth® antenna is detected	Check the Bluetooth® antenna feeder for open.
Bluetooth® antenna short	Short in the Bluetooth® antenna is detected	Check the Bluetooth® antenna feeder for short.
Bluetooth® antenna unplugged	Disconnected Bluetooth® antenna	Check the connection Bluetooth® antenna.
Phone button stuck	Stuck switch	Check the steering switch. Refer to AV-115, "Component Inspection" .
Phone end button stuck	Stuck MODE switch	

Error Count

- Error count is read out simultaneously when reading out the error name.
- The errors are read out continuously when some errors occur at the same time.
- The error count guides “0” when the error occurs. The next time it counts up “1” if it is normal with the ignition switch ON.
- It continues the count up unless the initialization of hands free phone system is performed.

VEHICLE SPEED SIGNAL

- Check the input status of the vehicle speed pulse count after ignition switch turns ON.
- The guidance announces the type of error name and then the vehicle speed pulse count.

MICROPHONE TEST

Input the voice spoken into the microphone to the speaker, and checks the microphone function.

Symptom Chart

NKS0056K

Indicator status	Symptom	Check item	Diagnosis procedure
ON (Normal)	Voice is not heard on the other end.	—	● Check the TEL microphone signal circuit between TEL adapter unit to the TEL microphone. ● Check the TEL microphone power supply circuit between TEL adapter unit to the microphone.
	Voice guidance does not activate, or the volume of voice guidance is too low when pressing switch. (“PHONE” is indicated on LCD screen of the audio unit)	—	Check TEL voice signal circuit between TEL adapter unit to the audio unit.
	Voice guidance does not activate, when pressing switch. (“PHONE” is not indicated on LCD screen of the audio unit)	Dial the cellular phone. The front speaker RH outputs a dial tone.	1. Check “VOLUME UP” and “SEEK UP” switches function. 2. Replace steering switch, if “VOLUME UP” and “SEEK UP” switches function is normal. If not, go to 3. 3. Check if remote control signal A circuit between steering switch and TEL adapter unit is not open or short. 4. Check voltage of remote control signal A between steering switch and TEL adapter unit when operating steering switch.
		Dial the cellular phone. The front speaker RH does not outputs a dial tone.	1. Check TEL ON signal circuit. Go to the next step if normal. 2. Disconnect TEL adapter unit connector. Measure audio unit #28 terminal voltage. Replace TEL adapter unit if the voltage approx. 5 V. Replace audio unit if the voltage approx. 0 V.
	None of the steering switch operations work.	—	● Check control signal 1circuit. ● Check steering switch signal ground circuit.
OFF	Bluetooth® communication does not perform.	The indicator blinks for approx. 5 sec. when pressing switch.	Perform the error history mode with self-diagnosis. Refer to AV-111, "Self-Diagnosis Function" .
		The indicator continue turning OFF when pressing switch.	Check TEL adapter unit power supply, and ground circuit.

Component Inspection

NKS0056L

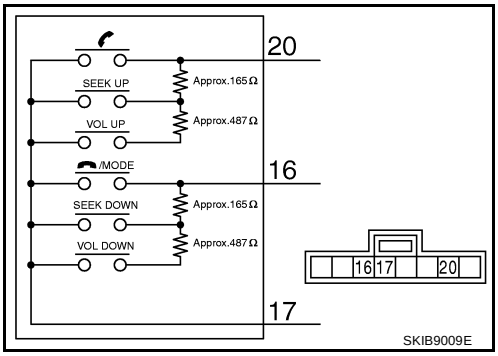
STEERING SWITCH

20 – 17

switch ON	: Approx. 0 Ω
“SEEK UP” switch ON	: Approx. 165 Ω
“VOLUME UP” switch ON	: Approx. 652 Ω

16 – 17

MODE switch ON	: Approx. 0 Ω
“SEEK DOWN” switch ON	: Approx. 165 Ω
“VOLUME DOWN” switch ON	: Approx. 652 Ω

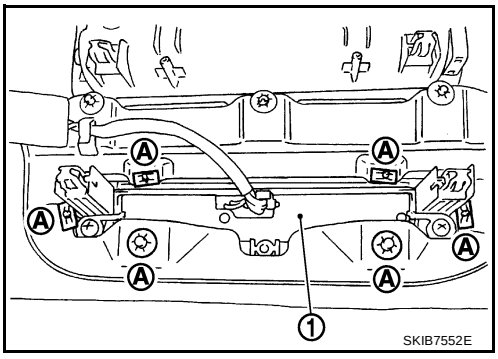


Removal and Installation of Telephone Microphone

NKS0056M

REMOVAL

1. Remove headlining. Refer toEI-44, "Removal and Installation (for Coupe Models)" .
2. Remove mount pin (A), and remove telephone microphone(1).



INSTALLATION

Installation is the reverse order of removal.

SECTION BCS
BODY CONTROL SYSTEM

CONTENTS

PRECAUTIONS 2
Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER” 2
Precautions for Battery Service 2
BCM (BODY CONTROL MODULE) 3
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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS0009L

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS0009M

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

BCM (BODY CONTROL MODULE)

PFP:284B2

System Description

NKS0009N

BCM (Body Control Module) controls the operation of various electrical units installed in the vehicle.

BCM FUNCTION

BCM has combination switch reading function for reading the operation of combination switches (light, wiper, washer and turn signal) in addition to a function for controlling the operation of various electrical components. Also it has an interface function allowing it to receive signals from the unified meter and A/C amp., and send signals to ECM using CAN communication.

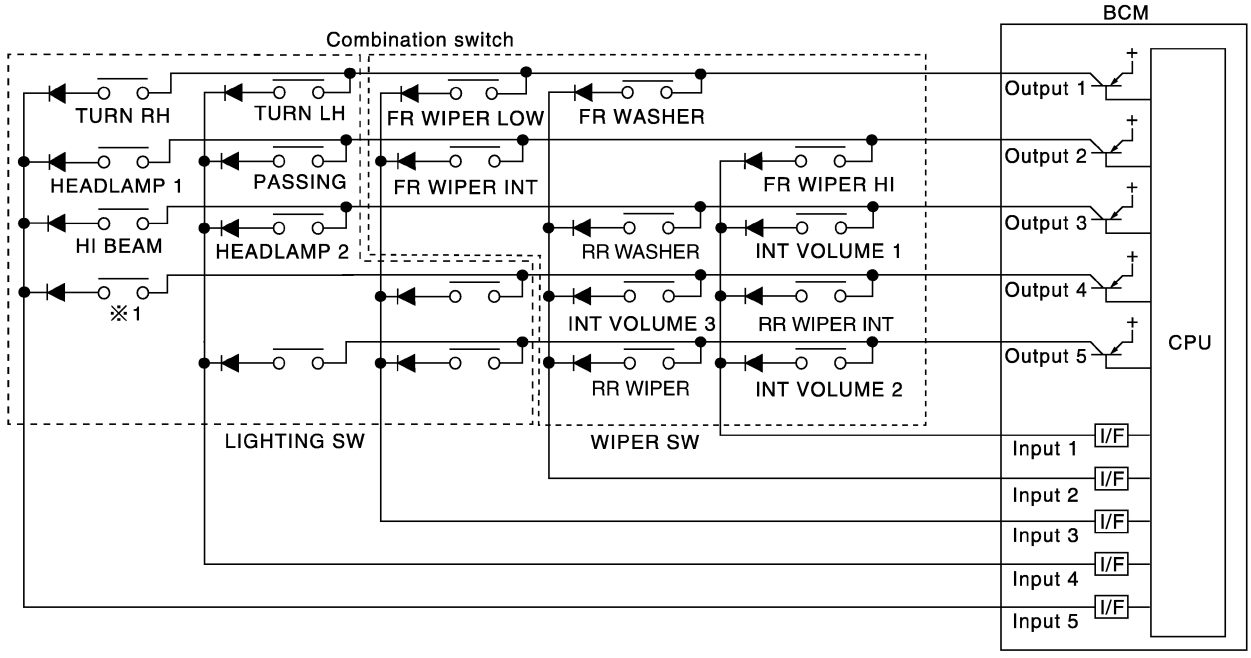
COMBINATION SWITCH READING FUNCTION

Description

- BCM reads combination switch (lighting switch, wiper switch) status, and controls various electrical component, according to the results.
- BCM reads information of a maximum of 20 switches by combining five output terminals (OUTPUT 1 - 5) and five input terminals (INPUT 1 - 5).

Operation Description

- BCM activates transistors of output terminals (OUTPUT 1 - 5) periodically and, allows current to flow in turn.
- If any (1 or more) switches are turned ON, circuit of output terminals (OUTPUT 1 - 5) and input terminals (INPUT 1 - 5) becomes active.
- At this time, transistors of output terminals (OUTPUT 1 - 5) are activated to allow current to flow. When voltage of input terminals (INPUT 1 - 5) corresponding to that switch changes, interface in BCM detects voltage change, and BCM determines that switch is ON.



※1 : LIGHTING SWITCH 1ST POSITION

PKIC4861E

Operation Table of BCM and Combination Switches

BCM reads operation status of combination switch using combinations shown in table below.

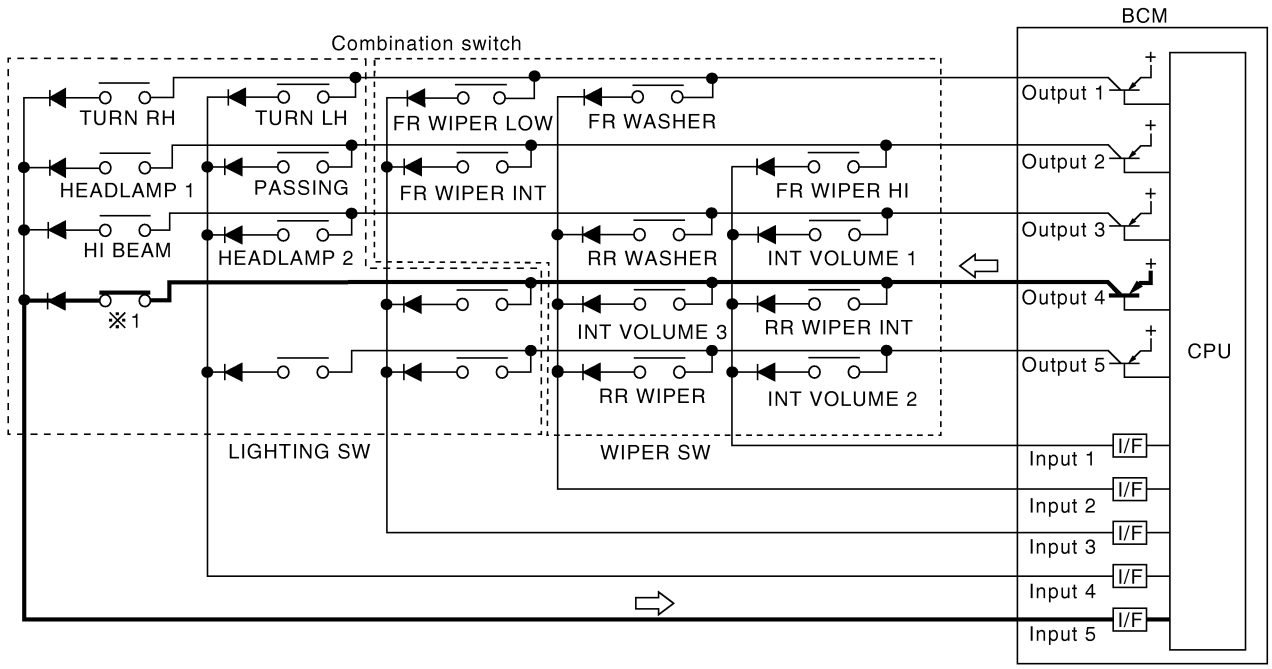
	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	—	—	FR WIPER HI ON	FR WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	RR WIPER INT ON	RR WIPER INT OFF	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	—	—	RR WASHER ON	RR WASHER OFF	INT VOLUME 3 ON	INT VOLUME 3 OFF	RR WIPER ON	RR WIPER OFF
COMB SW INPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	—	—	—	—	—	—
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	—	—	—	—
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1st) ON	LIGHTING SW (1st) OFF	—	—

PKIC4963E

NOTE:
Headlamp system has a dual circuit.

Sample Operation (When lighting switch 1ST position is turned ON)

- When lighting switch 1ST position is turned ON, contact in combination switch turns ON. At this time if OUTPUT 4 transistor is activated, BCM detects that voltage changes in INPUT 5.
- When OUTPUT 4 transistor is ON, BCM detects that voltage changes in INPUT 5, and judges that lighting switch 1ST position is ON. Then BCM sends lighting switch (1ST position) ON signal to IPDM E/R using CAN communication.
- When OUTPUT 4 transistor is activated again, BCM detects that voltage changes in INPUT 5, and recognizes that lighting switch 1ST position is continuously ON.



※1 : LIGHTING SWITCH 1ST POSITION

SKIB7456E

NOTE:
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore after switch is turned ON, electrical loads are activated with time delay. But this time delay is so short that it cannot be detected by human senses.

Operation Mode

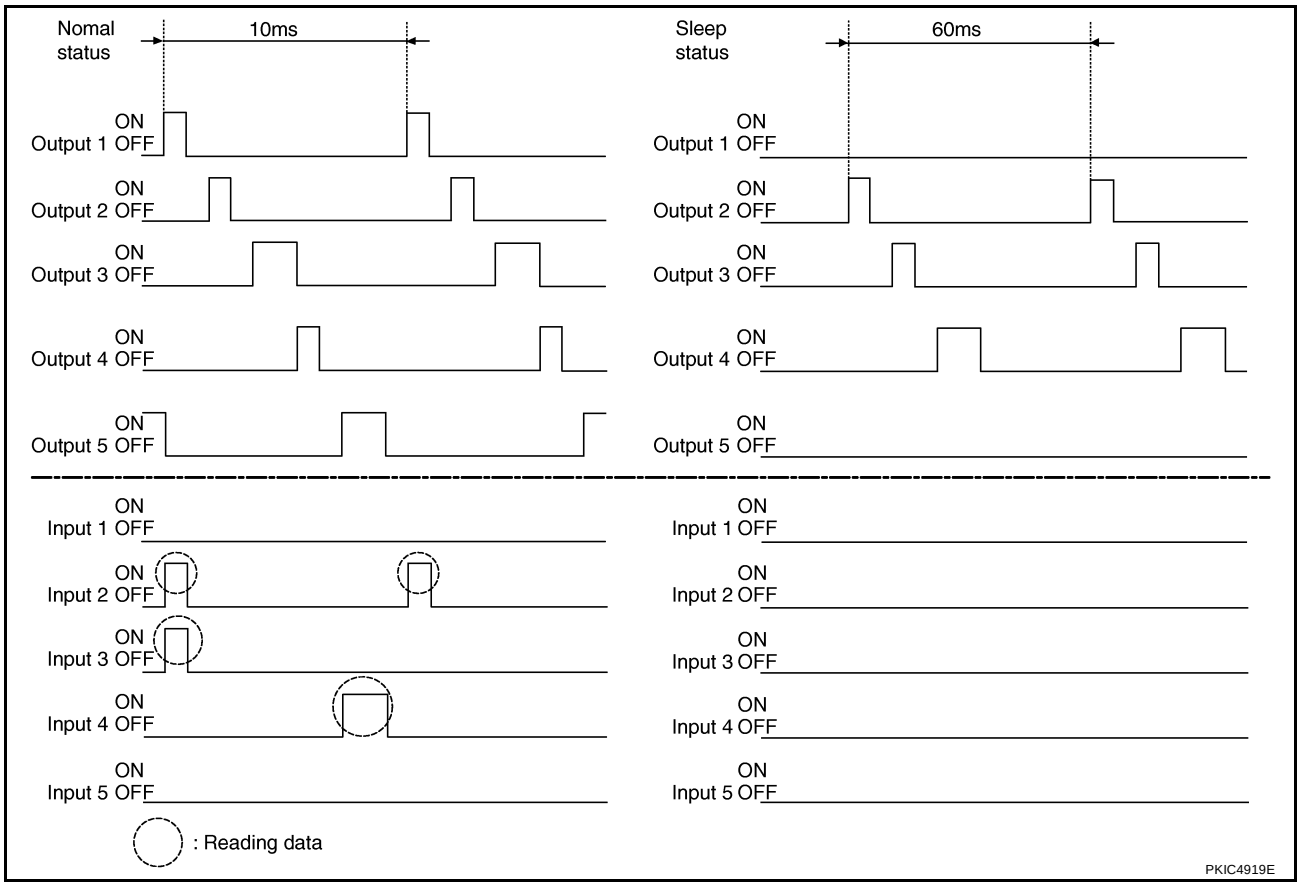
The combination switch reading function has the operation modes shown below.

1. Normal mode

– When BCM is not in sleep mode, OUTPUT terminals (1 - 5) each turn ON-OFF every 10 ms.

2. Sleep mode

– When BCM is in sleep mode BCM enters low power mode. OUTPUT (1 - 5) turn ON-OFF every 60 ms, and only input from light switch system is accepted.



CAN COMMUNICATION CONTROL

CAN communication allows a high rate of information transmission through the two communication lines (CAN L line, CAN H line) connecting the various control units in the system. Each control unit transmits/receives data but selectively reads required data only. For details of signals that are transmitted/received by BCM via CAN communication, refer to LAN-48, "CAN System Specification Chart" .

BCM STATUS CONTROL

BCM changes its status depending on the operation status in order to save power consumption.

1. CAN communication status
   - With ignition switch ON, CAN communicates with other control units normally.
   - Control by BCM is being operated properly.
   - When ignition switch is OFF, switching to sleep mode is possible.
   - Even when ignition switch is OFF, if CAN communication with IPDM E/R and combination meter is active, CAN communication status is active.
2. Sleep transient status
   - This status shuts down CAN communication when ignition switch is turned OFF.
   - It transmits sleep request signal to IPDM E/R and combination meter.
   - Two seconds after CAN communication of all control units stops, sleep transient status switches to CAN communication inactive status.
3. CAN communication inactive status
   - With ignition switch OFF, CAN communication is not active.
   - With ignition switch OFF, control performed only by BCM is active.
   - Three seconds after CAN communication of all control units stops, CAN communication inactive status switches to sleep status.
4. Sleep status
   - BCM is activated with low power mode.
   - CAN communication is not active.
   - When CAN communication operation is detected, it switches to CAN communication status.
   - When a state of the following switches changes, it switches to CAN communication state.
   - Key switch (ACC, ON)
   - Hazard switch
   - Door lock/unlock switch
   - Front door switch (driver side, passenger side)
   - Back door opener switch (coupe models)
   - Trunk lid opener switch (roadster models)
   - Combination switch (passing, lighting switch 1ST position)
   - Key fob (lock/unlock signal)
   - Key cylinder switch
   - When control performed only by BCM is required by switch, it shifts to CAN communication inactive mode.
   - Status of combination switch reading function is changed.

SYSTEMS CONTROLLED BY BCM DIRECTLY

System	Reference
Power door lock system	BL-21, "POWER DOOR LOCK SYSTEM"
Remote keyless entry system	BL-59, "REMOTE KEYLESS ENTRY SYSTEM"
Power window system NOTE 1	GW-18, "POWER WINDOW SYSTEM"
Power seat NOTE 1	SE-12, "POWER SEAT/FOR COUPE" or SE-15, "POWER SEAT/FOR ROADSTER"
Interior room lamp	LT-128, "INTERIOR ROOM LAMP"
Rear wiper and washer system NOTE 2	WW-36, "REAR WIPER AND WASHER SYSTEM"

NOTE:

1. Power supply only. No system control.
2. Coupe models

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

System	Reference
Panic alarm	BL-59, "REMOTE KEYLESS ENTRY SYSTEM"
Theft warning	BL-125, "VEHICLE SECURITY (THEFT WARNING) SYSTEM"
NVIS (NATS)	BL-150, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)"
Headlamp (For USA)	LT-5, "HEADLAMP (FOR USA)"
● Headlamp (For Canada) ● Daytime light system	LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -"
● Parking, license plate and tail lamps ● Battery saver control	LT-103, "PARKING, LICENSE PLATE AND TAIL LAMPS"
Front wiper and washer system	WW-4, "FRONT WIPER AND WASHER SYSTEM"
Rear window defogger	GW-56, "REAR WINDOW DEFOGGER"

SYSTEMS CONTROLLED BY BCM AND COMBINATION METER

System	Reference
Warning chime	DI-71, "WARNING CHIME"
Turn signal and hazard warning lamps	LT-65, "TURN SIGNAL AND HAZARD WARNING LAMPS"
Low tire pressure warning system	WT-10, "TIRE PRESSURE MONITORING SYSTEM"

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote control entry system	● Remote keyless entry receiver ● Key switch ● All-door switch	● All-door locking actuator ● Turn signal lamp (LH, RH)
Power door lock system	● Power window main switch (door lock and unlock switch) ● Power window sub switch (passenger side) (door lock and unlock switch)	All-door locking actuator
Power supply (IGN) to power window	Ignition power supply	Power window system
Power supply (BAT) to power window and power seat	Battery power supply	Power window system and power seat
Panic alarm	● Key switch ● Remote keyless entry receiver	IPDM E/R
Theft warning system	● All-door switch ● Remote keyless entry receiver ● Power window main switch (door lock and unlock switch)	● IPDM E/R ● Security indicator lamp
Exterior lamp battery saver control	● Ignition switch ● Combination switch	IPDM E/R
Headlamp	Combination switch	IPDM E/R
Daytime light system	● Engine status signal ● Ignition switch ● Combination switch ● Parking brake signal	IPDM E/R
Tail lamp	Combination switch	IPDM E/R
Turn signal lamp	● Combination switch ● Ignition switch	● Turn signal lamp ● Combination meter
Hazard lamp	Hazard switch	● Turn signal lamp ● Combination meter
Room lamp timer	● Key switch ● Remote keyless entry receiver ● Power window main switch (door lock and unlock switch) ● All-door switch	● Interior room lamp ● Map lamp ● Key hole illumination
Interior lamp battery saver control	● Ignition switch ● Remote keyless entry receiver ● All-door switch	BCM
Key warning chime	● Key switch ● Front door switch driver side	Combination meter (warning buzzer)
Light warning chime	● Combination switch ● Ignition switch ● Front door switch driver side	Combination meter (warning buzzer)
Seat belt warning chime	● Combination meter [Seat belt buckle (driver side) switch] ● Ignition switch	Combination meter (warning buzzer)
Front wiper and washer system	● Combination switch ● Combination meter ● Ignition switch	IPDM E/R

System	Input	Output
Rear wiper and washer system NOTE	● Combination switch ● Ignition switch	Rear wiper motor
Rear window defogger	● Rear window defogger switch ● Ignition switch	IPDM E/R
A/C switch signal	Unified meter and A/C amp.	ECM
Blower fan switch signal	Unified meter and A/C amp.	ECM
Low tire pressure warning system	Remote keyless entry receiver	Combination meter

NOTE:
Coupe models

CAN Communication System Description

NKS0009O

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicles are equipped with many electronic control units and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

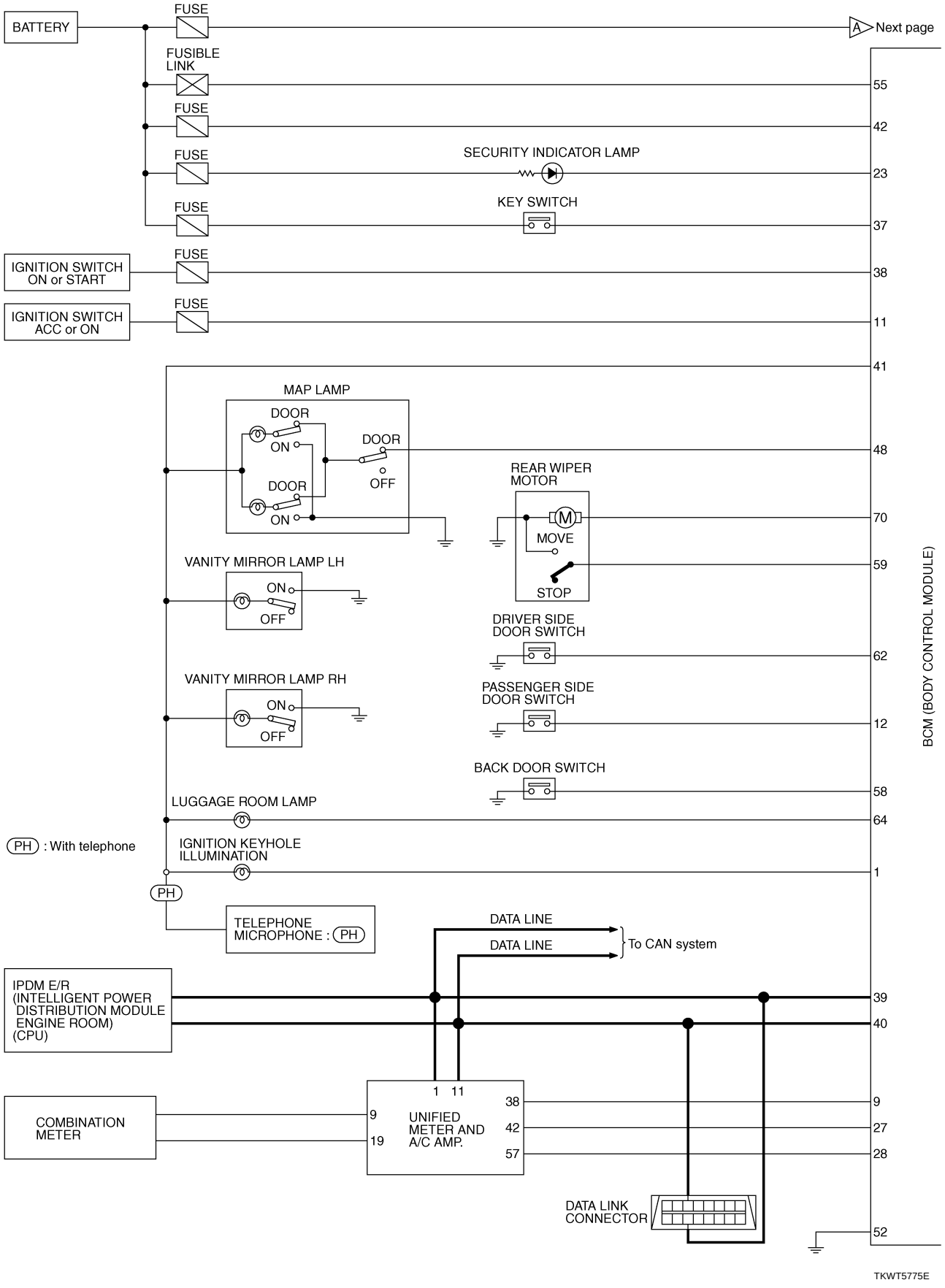
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Refer to LAN-48, "CAN System Specification Chart" .

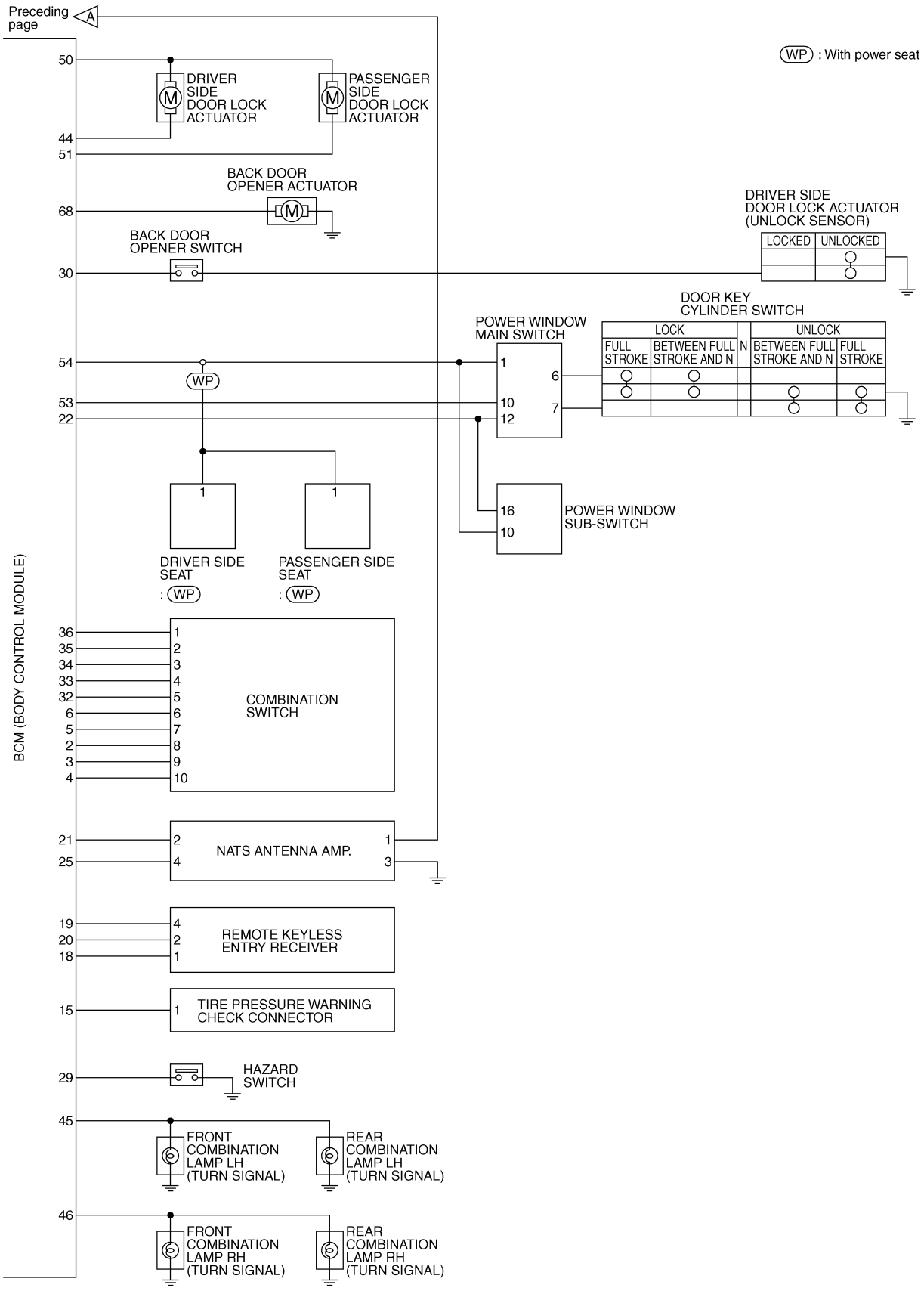
Schematic

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COUPE MODELS

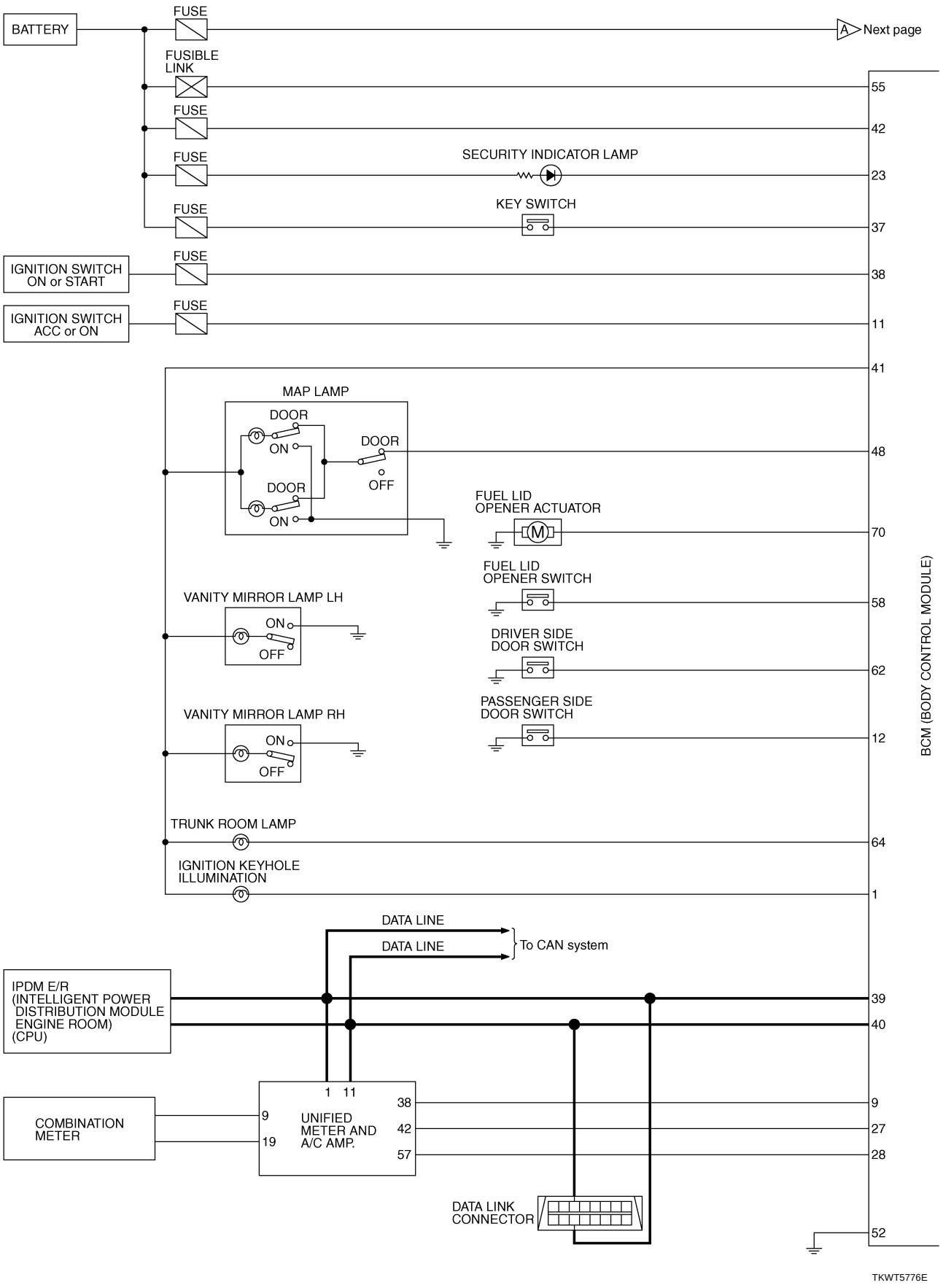


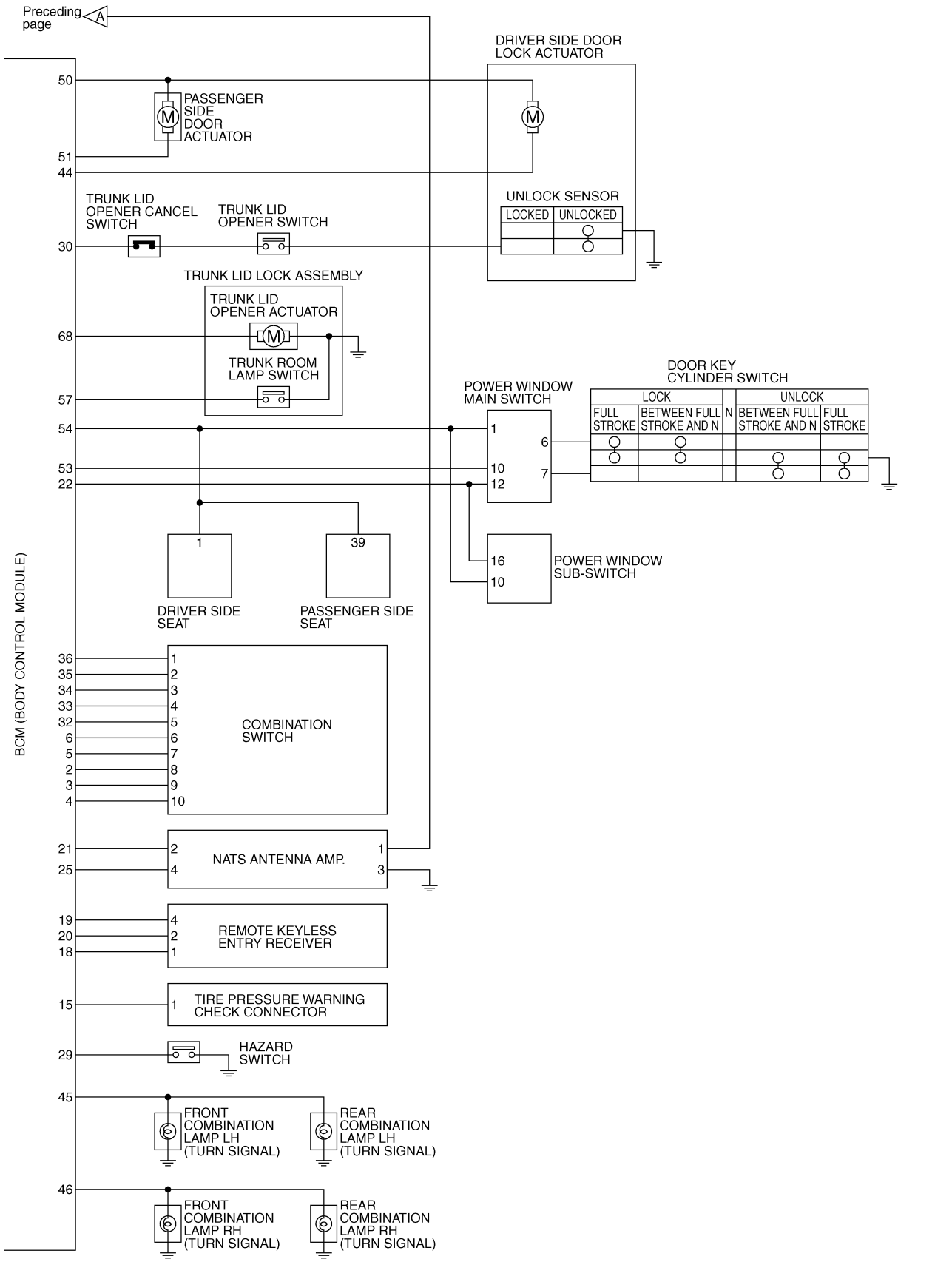
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A
WP : With power seat
50
DRIVER SIDE DOOR LOCK ACTUATOR
PASSENGER SIDE DOOR LOCK ACTUATOR
44
51
BACK DOOR OPENER ACTUATOR
68
BACK DOOR OPENER SWITCH
30
DRIVER SIDE DOOR LOCK ACTUATOR (UNLOCK SENSOR)
LOCKED
UNLOCKED
DOOR KEY CYLINDER SWITCH
LOCK
UNLOCK
FULL STROKE
BETWEEN FULL STROKE AND N
N
BETWEEN FULL STROKE AND N
FULL STROKE
POWER WINDOW MAIN SWITCH
54
WP
53
22
1
6
10
7
12
16
10
POWER WINDOW SUB-SWITCH
DRIVER SIDE SEAT : WP
PASSENGER SIDE SEAT : WP
BCM (BODY CONTROL MODULE)
36
35
34
33
32
6
5
2
3
4
COMBINATION SWITCH
21
25
NATS ANTENNA AMP.
19
20
18
REMOTE KEYLESS ENTRY RECEIVER
15
TIRE PRESSURE WARNING CHECK CONNECTOR
29
HAZARD SWITCH
45
FRONT COMBINATION LAMP LH (TURN SIGNAL)
REAR COMBINATION LAMP LH (TURN SIGNAL)
46
FRONT COMBINATION LAMP RH (TURN SIGNAL)
REAR COMBINATION LAMP RH (TURN SIGNAL)

TKWT4014E

ROADSTER MODELS




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A
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TKWT5777E

CONSULT-III Function (BCM)

NKS0009R

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnostic test item	Check item, diagnostic test mode	Content
Inspection by part	WORK SUPPORT	Changes setting of each function.
	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	DATA MONITOR	Displays the input data of BCM in real time.
	ACTIVE TEST	Gives a drive signal to a load to check the operation.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
	ECU PART NUMBER	BCM part number can be read.

ITEMS OF EACH PART

NOTE:
CONSULT-III displays systems equipped in the vehicle.

×: Applicable

System and item	CONSULT-III display	Diagnostic test mode (Inspection by part)						
		WORK SUPPORT	SELF–DIAG RESULTS	DATA MONITOR	CAN DIAG SUPPORT MNTR	ACTIVE TEST	ECU PART NUMBER	CONFIGURATION
BCM	BCM	×	×		×		×	× NOTE
Power door lock system	DOOR LOCK	×		×		×		
Rear window defogger	REAR DEFOGGER			×		×		
Warning chime	BUZZER			×		×		
Room lamp timer	INT LAMP	×		×		×		
Remotecontrol entry system	MULTI REMOTE ENT	×		×		×		
Headlamp	HEAD LAMP	×		×		×		
Wiper	WIPER	×		×		×		
Turn signal lamp Hazard lamp	FLASHER			×		×		
Blower fan switch signal A/C switch signal	AIR CONDITONER			×				
Combination switch	COMB SW			×				
NVIS	IMMU			×		×		
Interior lamp battery saver	BATTERY SAVER	×		×		×		
Trunk lid	TRUNK			×		×		
Vehicle security system	THEFT ALM	×		×		×		
Retained power control	RETAINED PWR	×		×		×		
Oil pressure switch	SIGNAL BUFFER			× NOTE		×		
Low tire pressure warning system	AIR PRESSURE MONITOR	×	×	×		×		
Panic alarm system	PANIC ALARM					×		

NOTE:
This item is displayed, but should not be used.

WORK SUPPORT

Display Item List

Item	Description
RESET SETTING VALUE	Return a value set with WORK SUPPORT of each system to a default value in factory shipment.

CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)

NKS0009S

1. SELF-DIAGNOSIS RESULT CHECK

CONSULT-III display code	Diagnosis item
U1000	INITIAL DIAG
	TRANSMIT DIAG
	ECM
	IPDM E/R
	METER / M&A

Contents displayed

No malfunction>>INSPECTION END

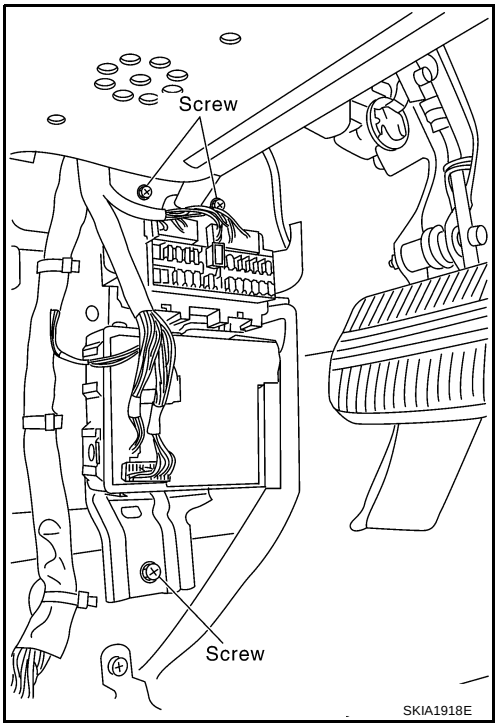
Malfunction in CAN communication system>>After printing the monitor items, go to “CAN System”. Refer to LAN-48, "CAN System Specification Chart" .

Removal and Installation of BCM

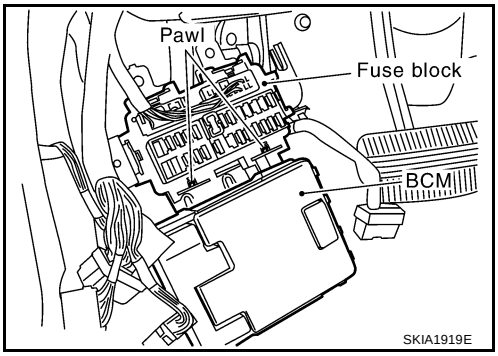
NKS0009T

REMOVAL

1. Remove the dash side finisher (LH). Refer to EI-35, "BODY SIDE TRIM" .
2. Disconnect BCM connector.
3. Remove bracket mounting screws to remove BCM and fuse block with bracket.



4. Raise the pawl of fuse block and remove bracket from fuse block to remove BCM.



INSTALLATION

Installation is the reverse order of removal.

NOTE:

When replacing BCM perform initialization of NATS system and registration of all NATS ignition key IDs.

SECTION BL

BODY, LOCK & SECURITY SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00001

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NIS00002

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Work

NIS00003

- After removing and installing the opening/closing parts, be sure to carry out fitting adjustments to check their operation.
- Check the lubrication level, damage, and wear of each part. If necessary, grease or replace it.

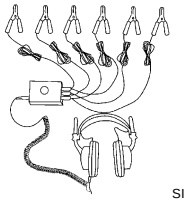
PREPARATION

PFP:00002

Special Service Tools

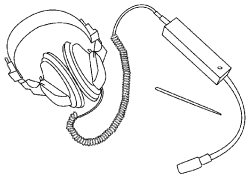
NIS00005

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J-39570) Chassis ear  SIIA0993E	Locating the noise
(J-43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS00006

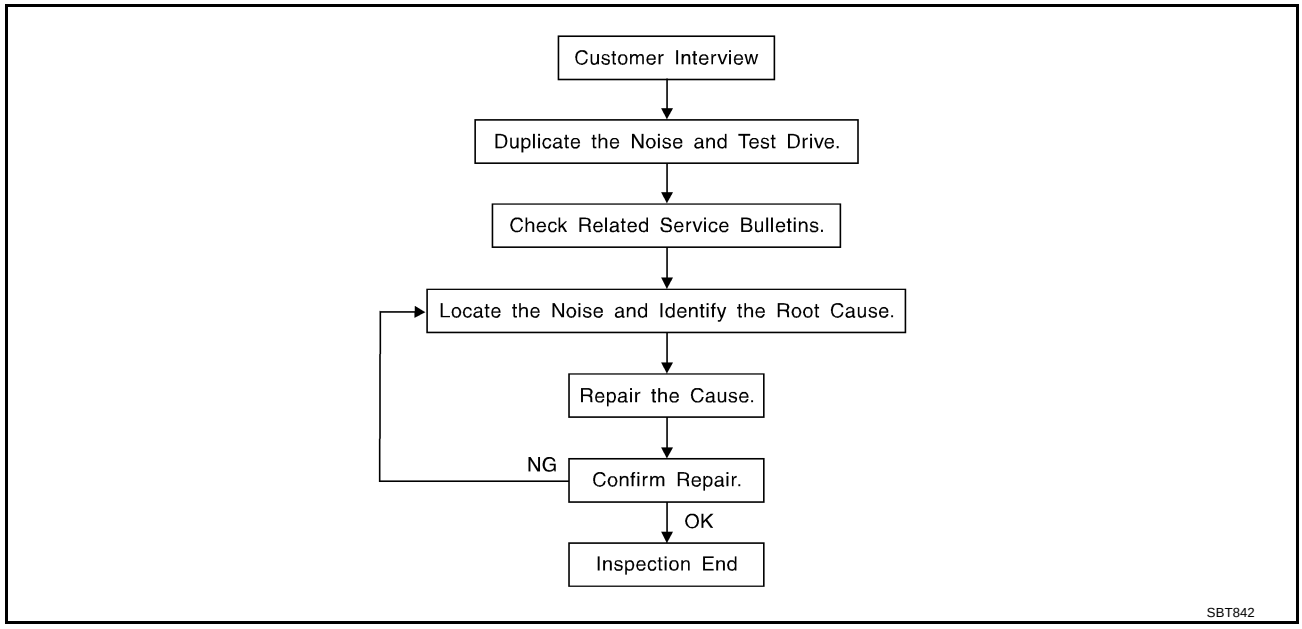
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS00007



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to BL-11, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to BL-9, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS00008

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

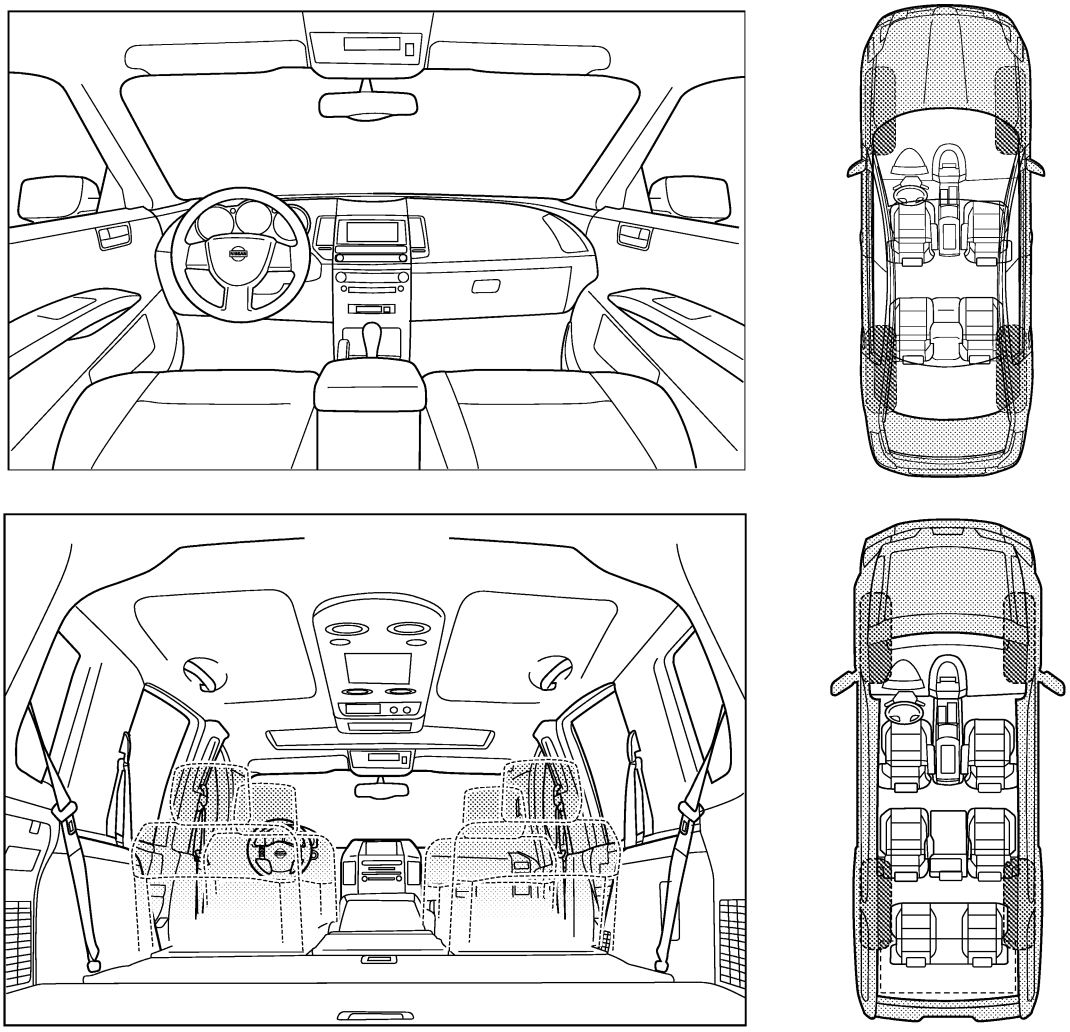
Diagnostic Worksheet

NIS00009

SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

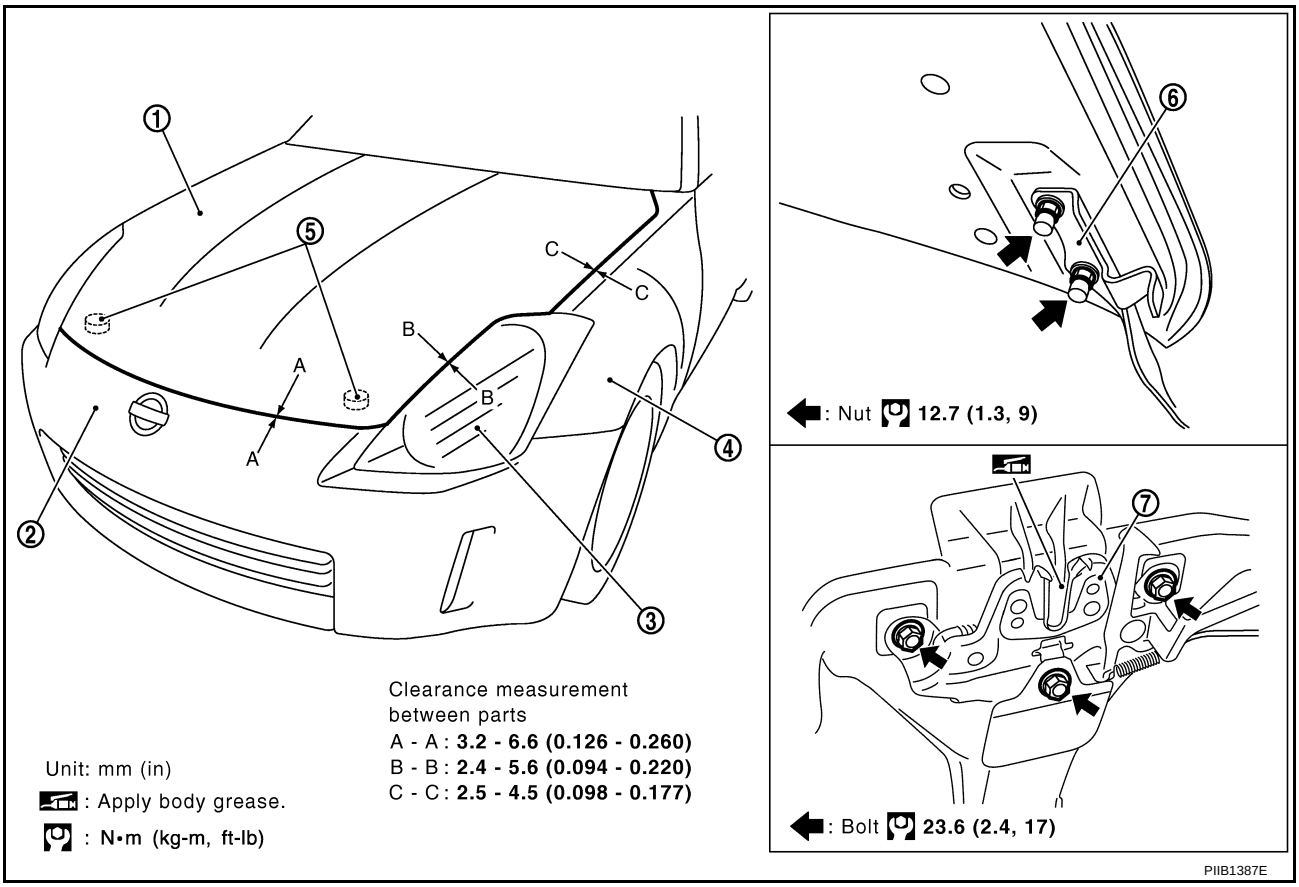
PIIB8742E

HOOD

PFP:F5100

Fitting Adjustment

NIS0000A



1. Hood assembly
2. Front bumper
3. Head lamp
4. Front fender
5. Bumper rubber
6. Hood hinge
7. Hood lock assembly

LONGITUDINAL AND LATERAL CLEARANCE ADJUSTMENT

1. Remove hood lock assembly, loosen the hood hinge nuts and close the hood.
2. Adjust the lateral and longitudinal clearance, and open the hood to tighten the hood hinge mounting bolts to the specified torque.
3. Install the hood lock temporarily, and align the hood striker and hood lock so that the centers of hood striker and hood lock become vertical viewed from the front, by moving the hood lock laterally.
4. Tighten hood lock assembly mounting bolts to the specified torque.

CAUTION:

Adjust right/left clearance between hood and each part to the following specification.

Hood and head lamp (B–B) : Less than 2.0 mm (0.08 in)

Hood and fender (C–C) : Less than 1.0 mm (0.04 in)

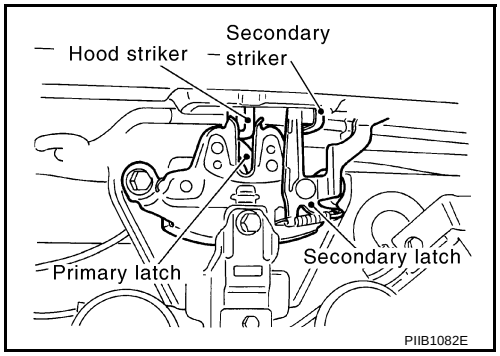
FRONT END HEIGHT ADJUSTMENT

1. Remove the hood lock and adjust the height by rotating the bumper rubber until the hood becomes 1 to1.5 mm (0.04 to 0.059 in) lower than the fender.
2. Temporarily tighten the hood lock assembly, and position it by engaging it with the hood striker. Check the hood lock and hood striker for looseness, and tighten the hood lock assembly mounting bolts to the specified torque.

SURFACE HEIGHT ADJUSTMENT

1. Remove hood lock assembly, and adjust the surface height difference of hood and fender according to the fitting standard dimension, by rotating RH and LH bumper rubbers.
2. Install hood lock temporarily, and move hood lock laterally until the centers of striker and lock become vertical when viewed from the front.
3. Make sure that the hood lock secondary latch is properly engaged with the secondary striker with hood's own weight.
4. Make sure that the hood lock primary latch is securely engaged with the hood striker with hood's own weight by dropping hood from approx. 200 mm (7.87 in) height.

   CAUTION:
   Do not drop hood from a height of 300 mm (11.81 in) or more.
5. Move hood lockup and down until striker smoothly engages the lock when the hood is closed.
6. When pulling the hood opener lever gently, make sure that front end of the hood rises by approximately 20 mm (0.79 in) and that hood striker and hood lock primary latch is disengaged. Also make sure that hood opener returns to the original position.
7. After adjustment, tighten lock bolts to the specified torque.

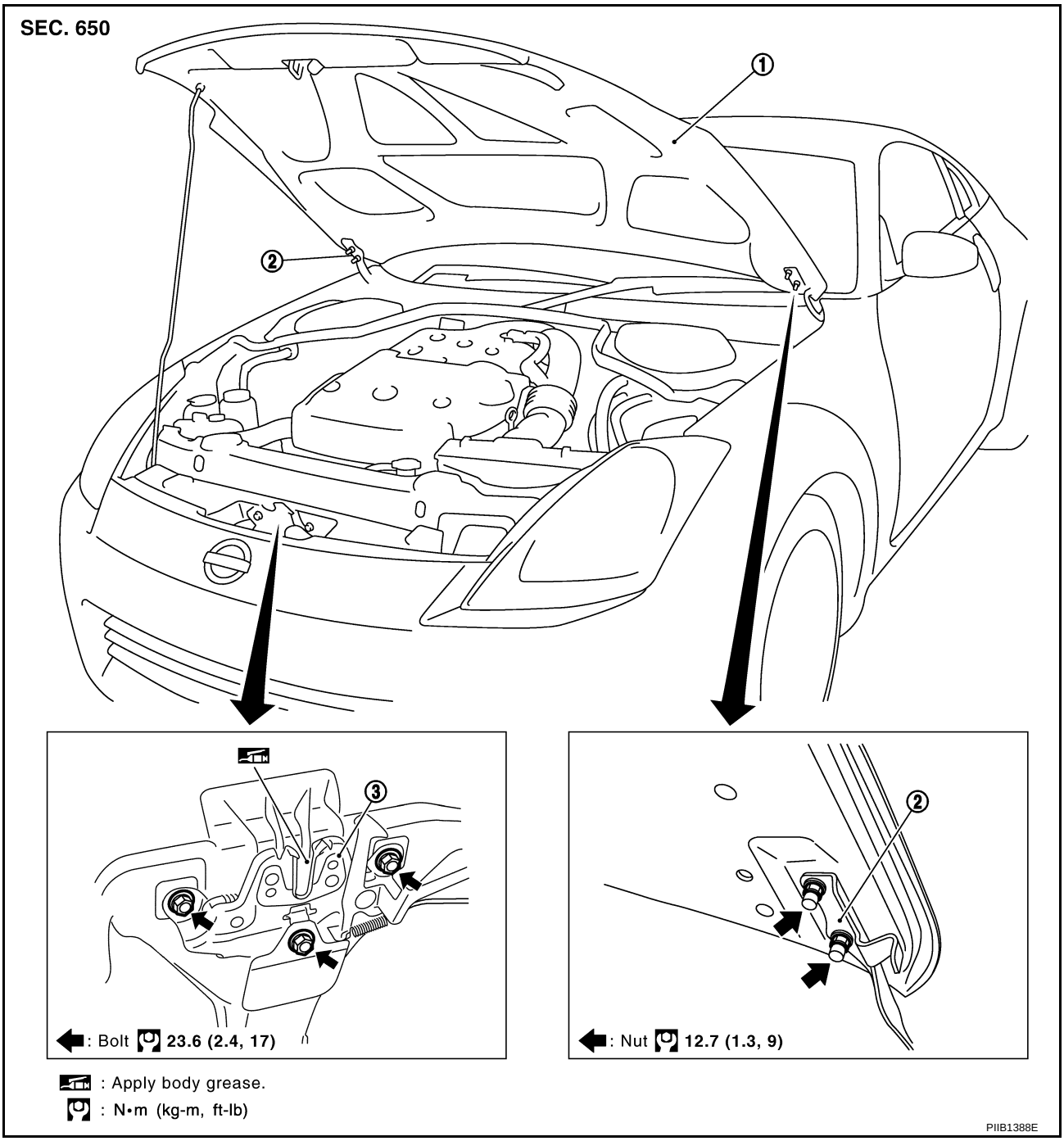


CAUTION:
Adjust evenness between hood and fender to the following specification.

Hood and fender (C–C) : 0 ± 1.0 mm (0 ± 0.04 in)

Removal and Installation of Hood Assembly

NIS0000B



1. Hood assembly
2. Hood hinge
3. Hood lock assembly

REMOVAL

Remove the hinge mounting nuts on the hood to remove the hood assembly.

CAUTION:

Operate with two workers, because of its heavy weight.

INSTALLATION

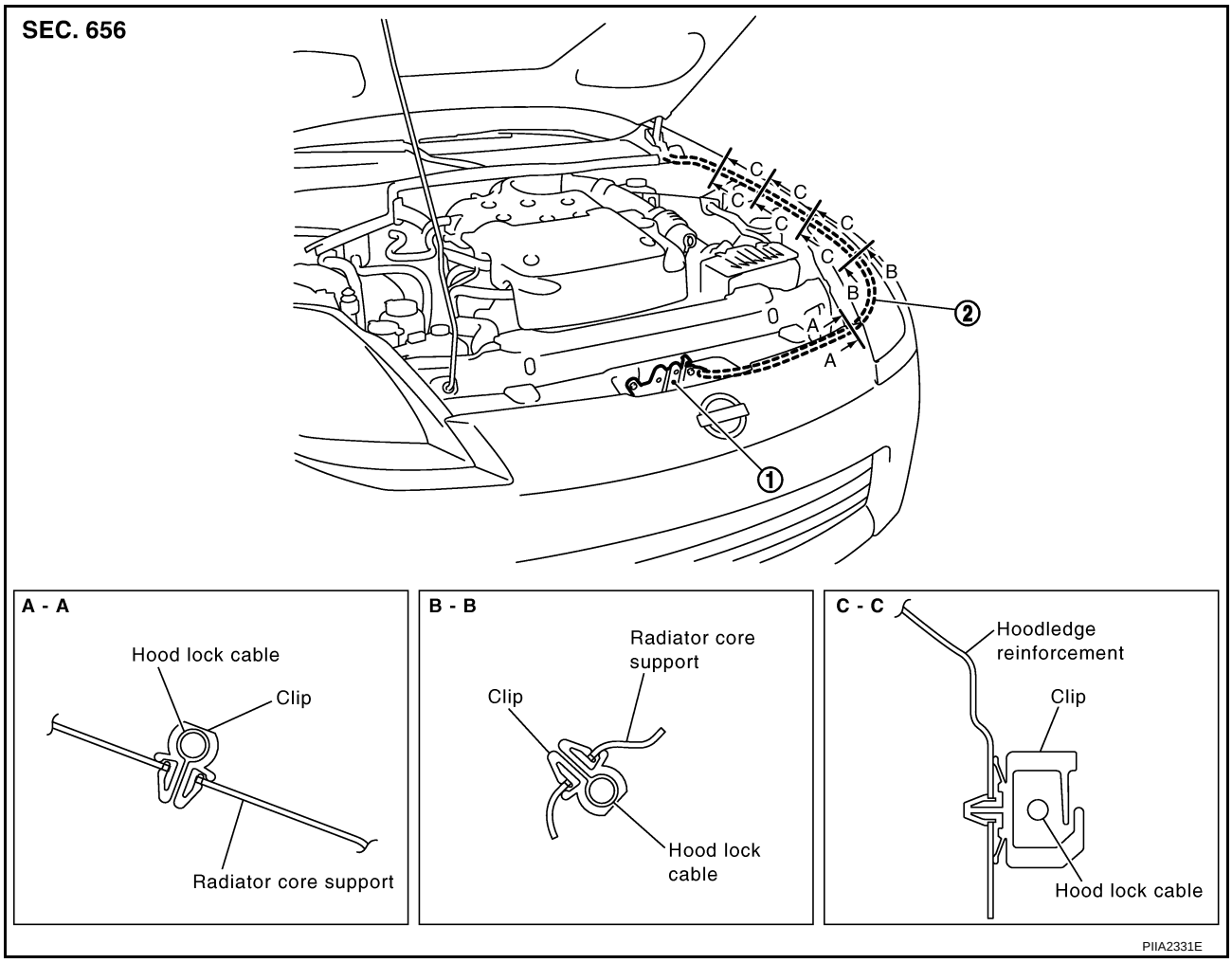
Install in the reverse order of removal.

CAUTION:

- **Before installing hood hinge, apply anticorrosive agent onto the mounting surface of the vehicle body.**
- **After installing, perform hood fitting adjustment. Refer to BL-13, "Fitting Adjustment" .**

Removal and Installation of Hood Lock Control

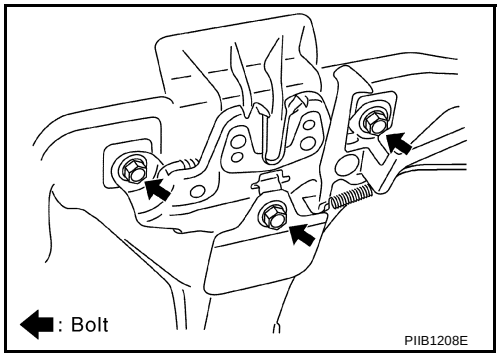
NIS0000C



1. Hood lock assembly
2. Hood lock cable

REMOVAL

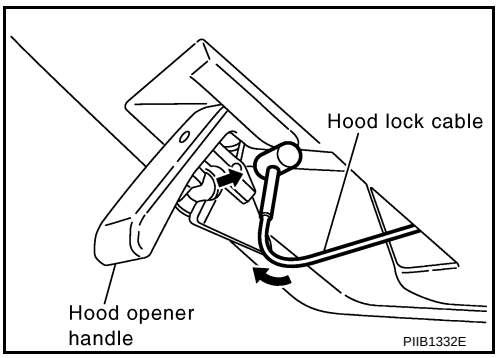
1. Remove the fender protector (LH). Refer to EI-21, "FENDER PROTECTOR" .
2. Remove the hood lock assembly.



3. Remove the dash side finisher. Refer to IP-10, "Component Parts Drawing" .
4. Remove hood lock cable and unclip it from portion of radiator core support.

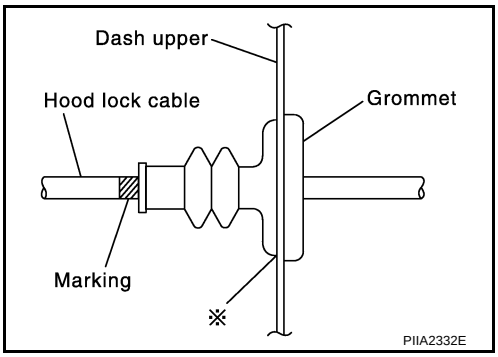
5. While pulling the hood lock cable, remove hood lock cable connected to hood opener handle.
6. Remove grommet on dash board, and pull hood lock cable toward passenger compartment.

CAUTION:
While pulling, be careful not to damage (peeling) the outside of the hood lock cable.

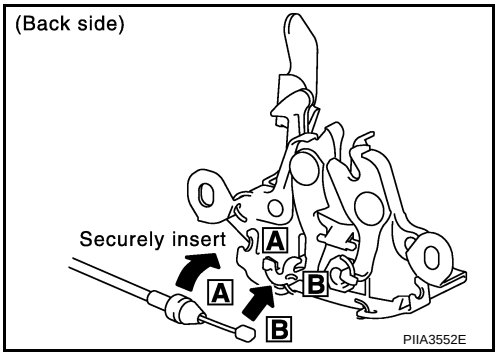


INSTALLATION

1. Pull the hood lock cable through the panel hole to the engine compartment. Be careful not to bend the cable too much, keeping the radius 100 mm (3.94 in) or more.
2. Check that the cable is not offset from the positioning grommet, and push the grommet into the panel hole securely.
3. Apply the sealant to the grommet (at * mark) properly.
4. Install while pulling hood lock cable.



5. Install the hood lock cable securely to the hood lock.
6. Install hood lock assembly.
7. After installing, check the hood lock adjustment and hood opener operation.

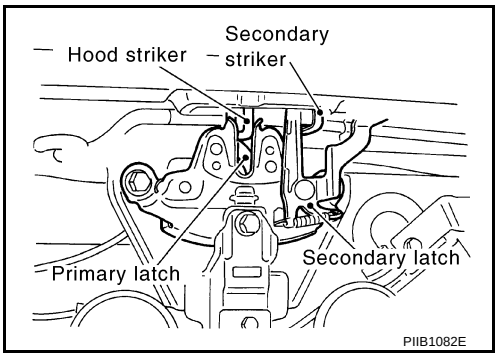


Hood Lock Control Inspection

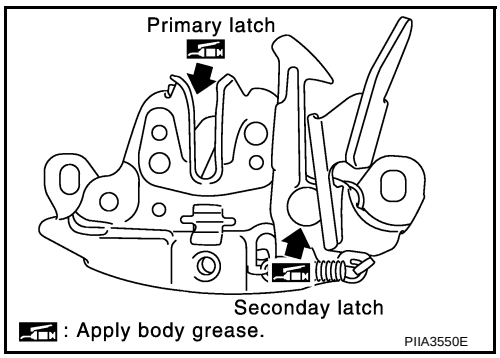
NIS0000D

CAUTION:
If the hood lock cable is bent or deformed, replace it.

1. Check that the secondary latch is properly engaged with the secondary striker with hood's own weight by dropping it from approx. 200 mm (7.87 in) height.
2. While operating the hood opener, carefully check that the front end of the hood is raised by approx. 20 mm (0.79 in). Also check that the hood opener returns to the original position.



3. Check the hood lock lubrication condition. If necessary, apply “body grease” to the points shown in the figure.

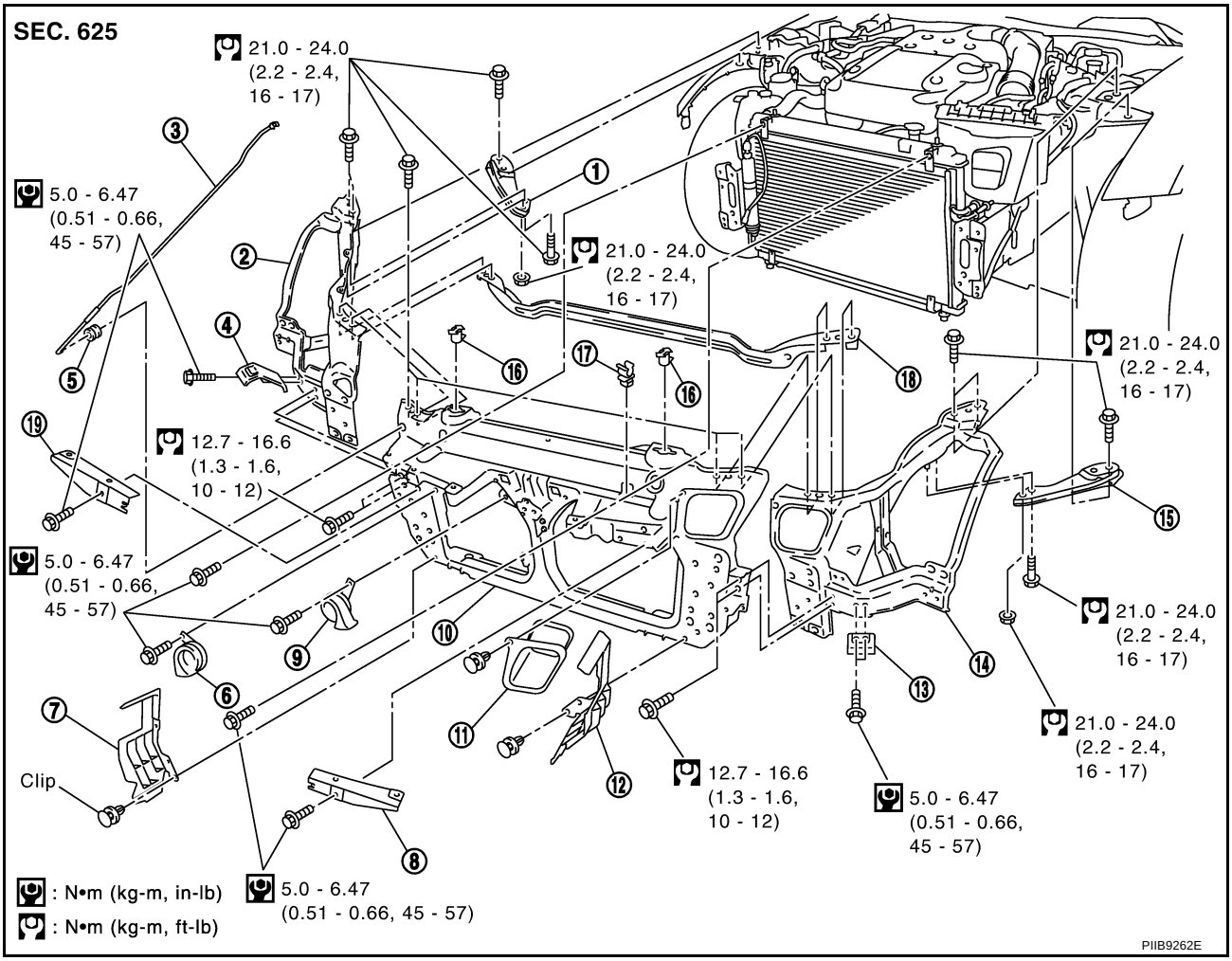


RADIATOR CORE SUPPORT

PFP:62500

Removal and Installation

NIS0000E

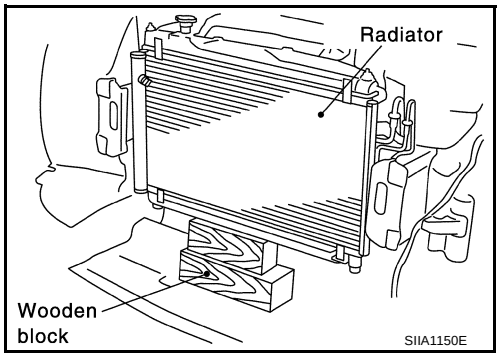


1.	Radiator core support side stay (RH)	2.	Radiator core support side (RH)	3.	Hood stay
4.	Bumper retainer (RH)	5.	Grommet	6.	Horn (High)
7.	Air guide (RH)	8.	Bumper fascia stay radiator core support center (LH)	9.	Horn (Low)
10.	Radiator core support center	11.	Air duct	12.	Air guide (LH)
13.	Bumper retainer (LH)	14.	Radiator core support side (LH)	15.	Radiator core support side stay (LH)
16.	Radiator upper bracket	17.	Hood rod clamp	18.	Radiator core support bar
19.	Bumper fascia stay radiator core support center (RH)				

REMOVAL

1. Remove hood assembly. Refer to BL-15, "Removal and Installation of Hood Assembly" .
2. Remove front bumper. Refer to EI-14, "Removal and Installation" .
3. Remove head lamp (LH/RH). Refer to LT-29, "Removal and Installation" .
4. Remove hood lock assembly, and then hood lock cable. Refer to BL-16, "Removal and Installation of Hood Lock Control" .
5. Remove washer tank. Refer to WW-34, "Removal and Installation of Washer Tank" .
6. Remove crash zone sensor. Refer to SRS-48, "Removal and Installation" .
7. Remove washer tank inlet clip. Refer to WW-34, "Removal and Installation of Washer Tank" .
8. Remove the oil cooler. Refer to PS-33, "HYDRAULIC LINE" .
9. Remove ambient sensor. Refer to ATC-104, "Removal and Installation" .

10. Remove horn connectors.
11. Remove mounting harness clip on radiator core support center and side to separate the harness.
12. Remove radiator upper bracket, and radiator core support side and radiator core support hood ledge stay bolts. Remove radiator core support center and side together. Remove bolts with power tool.



CAUTION:
Put a wooden block under the radiator assembly to prevent the radiator assembly from falling.

13. Remove radiator core support center and side together.
14. After removing radiator core support center and side together, the following parts are separated.
    - Remove the hood stay, grommet and hood rod clamp
    - Horn (High/Low)
    - Air duct
    - Air guide (LH/RH)
    - Bumper fascia stay radiator core support center (LH/RH)
    - Bumper retainer (LH/RH)
    - Radiator core support side and radiator core support side bar
    - Radiator core support side hood ledge stay (LH/RH)

INSTALLATION

Install in the reverse order of removal.

CAUTION:
After installing, check the hood lock adjustment and hood opener operation. Refer to BL-13, "Fitting Adjustment" .

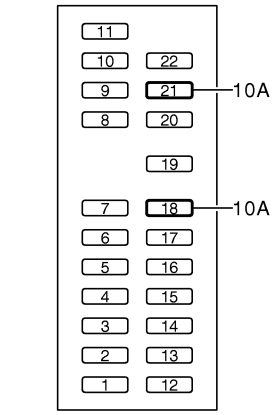
POWER DOOR LOCK SYSTEM

PFP:24814

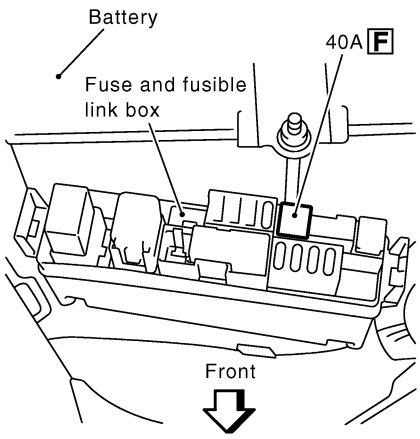
Component Parts and Harness Connector Location

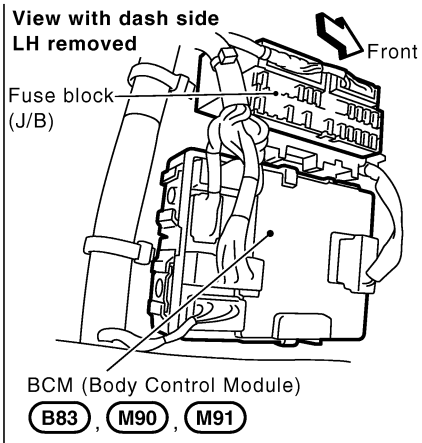
NIS0000F

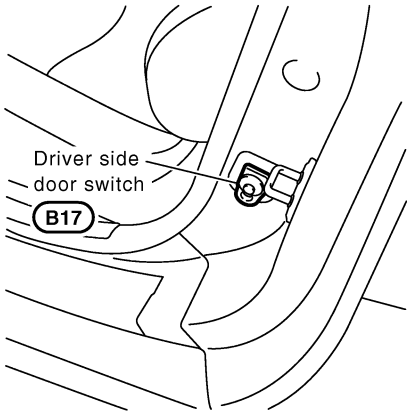
FOR COUPE

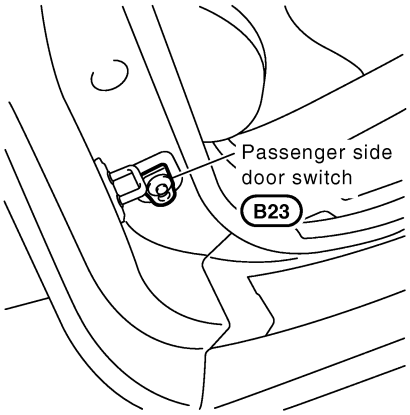


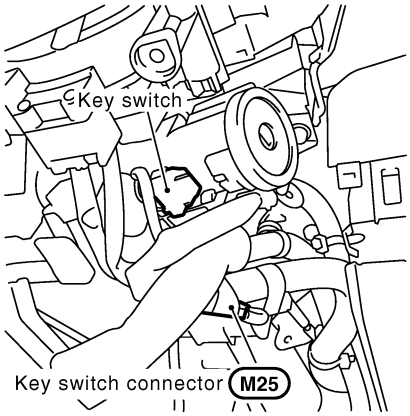
Fuse block (J/B) fuse layout

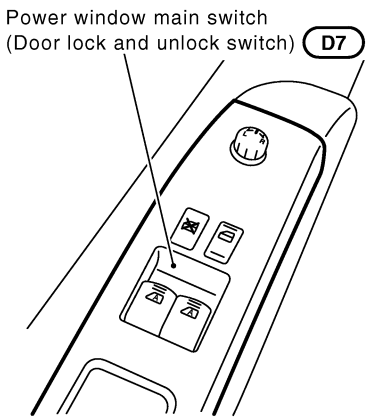


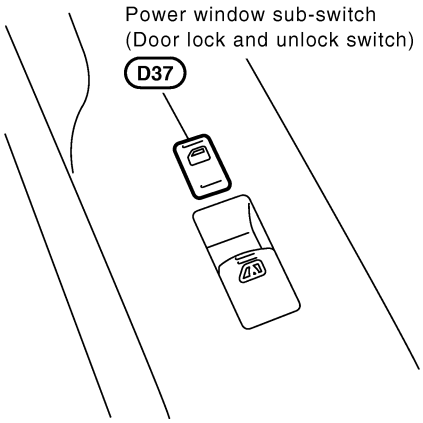


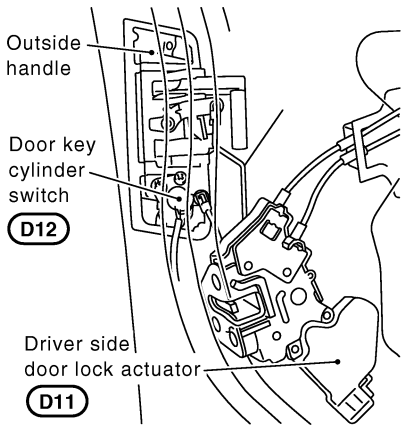


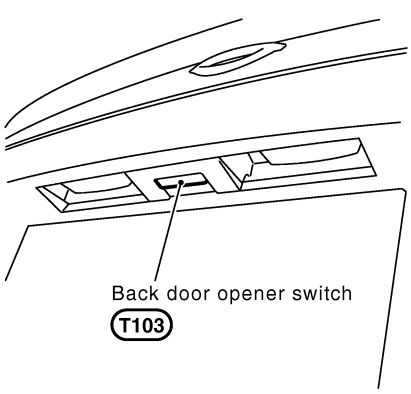


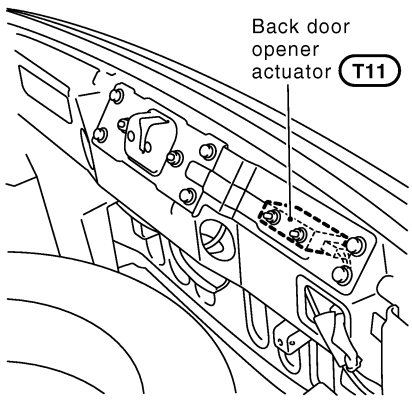


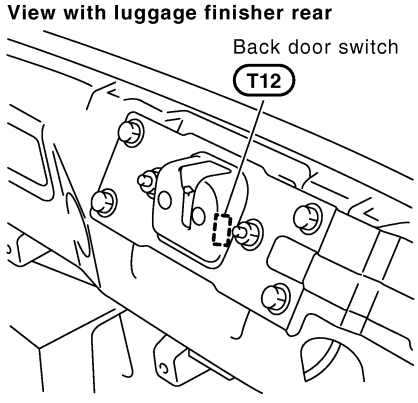






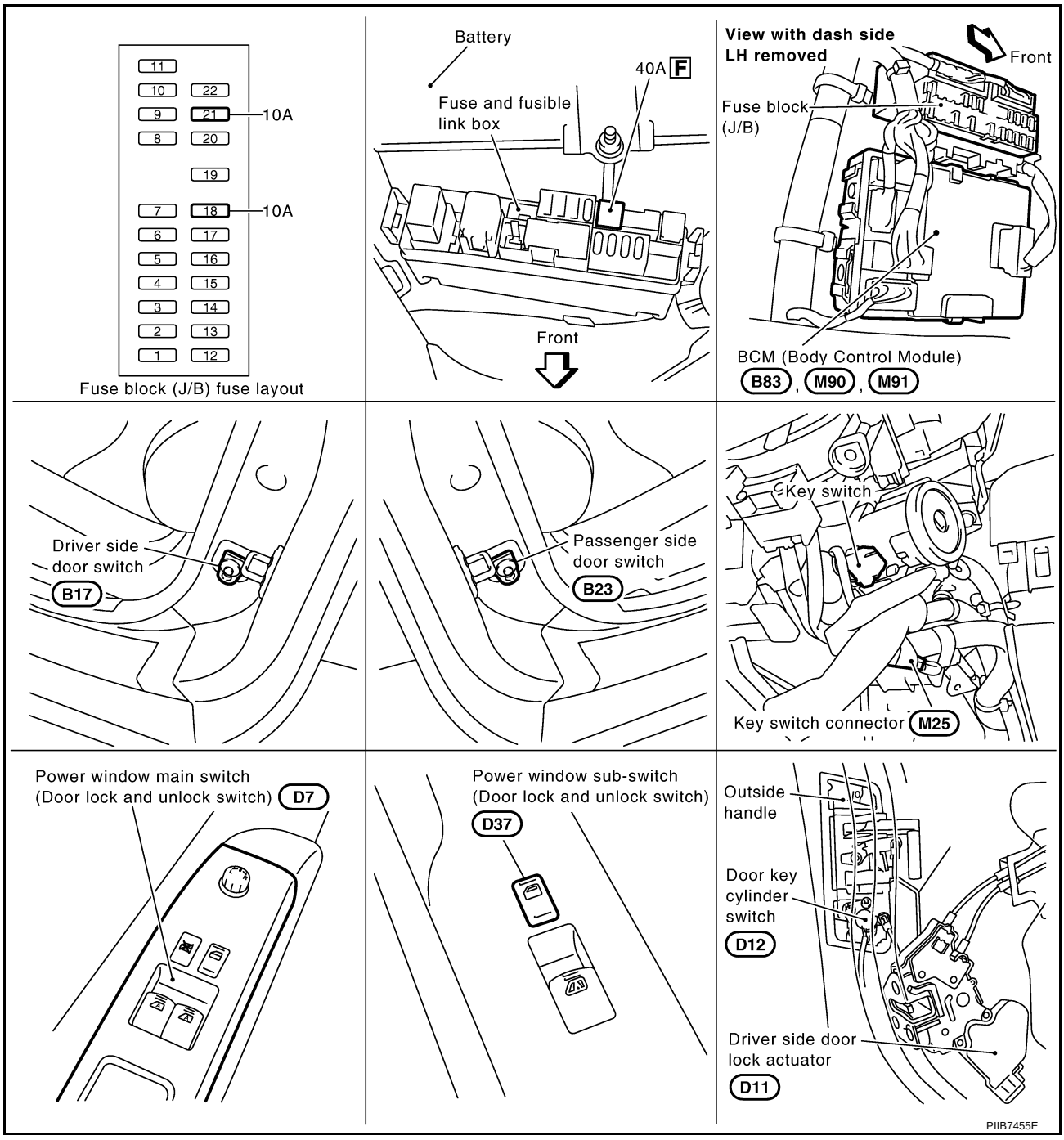






PIIB7454E

FOR ROADSTER



System Description

NIS0000G

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No.21, located in the fuse block (J/B)]
- to key switch terminal 2.

When ignition key inserted, power is supplied

- through key switch terminal 1
- to BCM terminal 37.

Ground is supplied

- to terminal 52 of BCM
- through body grounds M30 and M66.

When the door is locked or unlocked with power window main switch (door lock and unlock switch), ground is supplied

- to power window main switch (door lock and unlock switch) terminal 15
- through body grounds M30 and M66.

Power window main switch (door lock and unlock switch) operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12.
- to BCM terminal 22

When the door is locked or unlocked with power window sub-switch (door lock and unlock switch), ground is supplied

- to power window sub-switch (door lock and unlock switch) terminal 11
- through body grounds M30 and M66.

Power window sub-switch (door lock and unlock switch) operation signal is supplied

- through power window sub-switch (door lock and unlock switch) terminal 16.
- to BCM terminal 22

When the door is locked with door key cylinder switch, ground is supplied

- to power window main switch (door lock and unlock switch) terminal 6
- through door key cylinder switch terminals 3 and 2 and
- through body grounds M30 and M66.

Door key cylinder switch operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

When the door is unlocked with door key cylinder switch, ground is supplied

- to power window main switch (door lock and unlock switch) terminal 7
- through door key cylinder switch terminals 1 and 2 and
- through body grounds M30 and M66.

Door key cylinder switch operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

BCM is connected to power window main switch (door lock and unlock switch) and power window sub-switch (door lock and unlock switch) as serial link.

POWER WINDOW SERIAL LINK

Power window main switch, power window sub-switch and BCM transmit and receive the signal by power window serial link.
The under mentioned signal is transmitted from power window main switch to BCM.

- Door lock and unlock switch signal.

The under mentioned signal is transmitted from power window sub-switch to BCM.

- Door lock and unlock switch signal.

OUTLINE

Functions available by operating the door lock and unlock switches on driver's door and passenger's door

- With the locking operation of door lock and unlock switch, door lock actuators of driver's and passenger's doors are locked.
- With the unlocking operation of door lock and unlock switch, door lock actuators of driver's and passenger's doors are unlocked.

Functions available by operating the key cylinder switch

- With the locking operation of door key cylinder, door lock actuators of all doors are locked.
- When door key cylinder is unlocked, door lock actuator (driver side) is unlocked.
- When door key cylinder is unlocked for the second time within 5 seconds after the first unlock operation, door lock actuators on driver's and passenger's doors are unlocked.

Unlock mode can be changed by using CONSULT-III “WORK SUPPORT” mode in “DOOR LOCK-UNLOCK SET”.
Refer to BL-35, "WORK SUPPORT" .

Key reminder door system

When door lock and unlock switch is operated to lock doors with ignition key put in key cylinder and driver's and passenger's door open, driver and passenger door lock actuators are locked and then unlocked.

Back door opener operation/For coupe

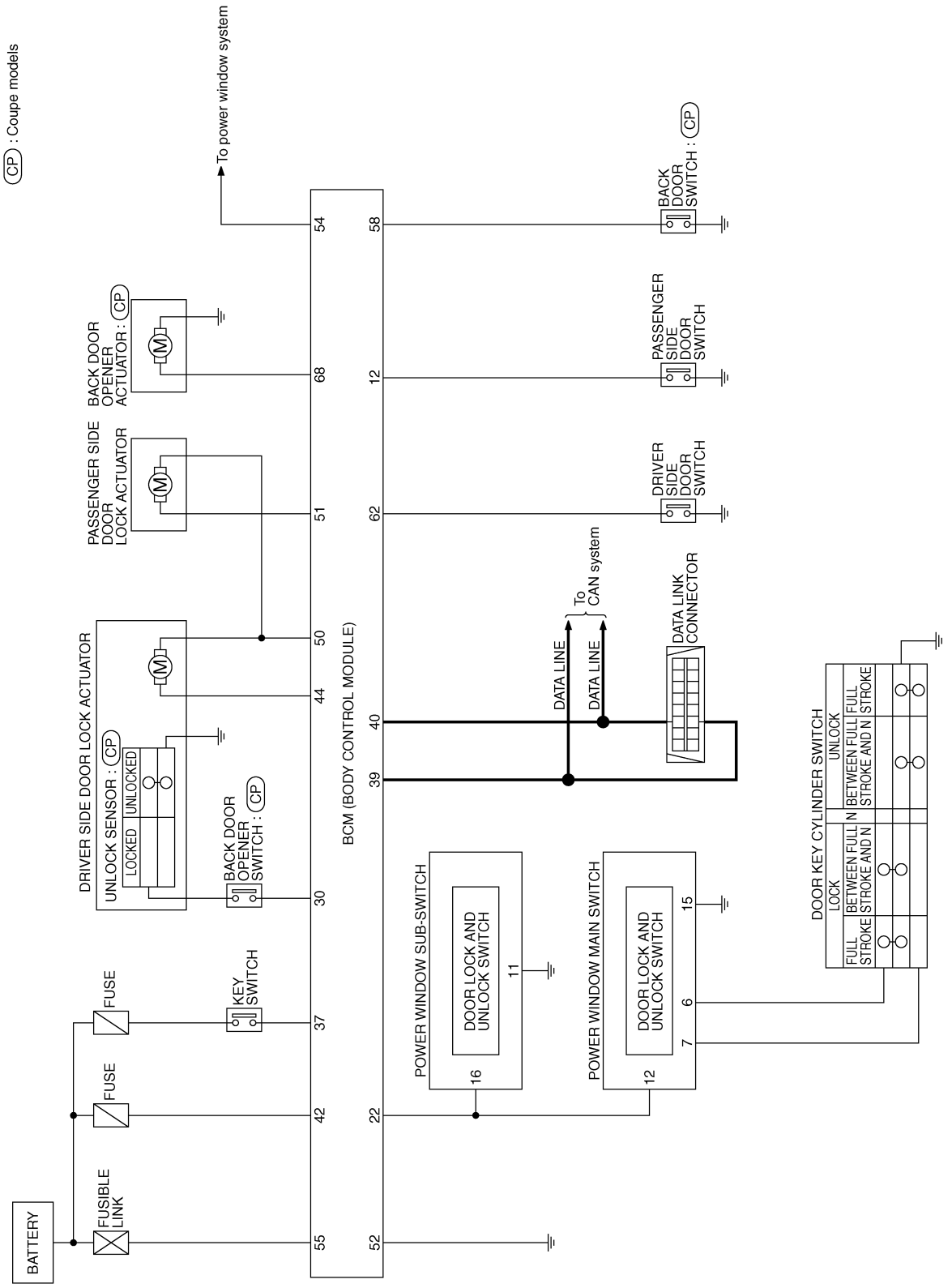
When back door opener switch is ON with driver's door unlocked,
ground is supplied

- to BCM terminal 68
- through back door opener actuator terminals 1 and 2 and
- through body grounds B5, B6, D105 and T14

Then back door opener actuator opens back door.

Schematic

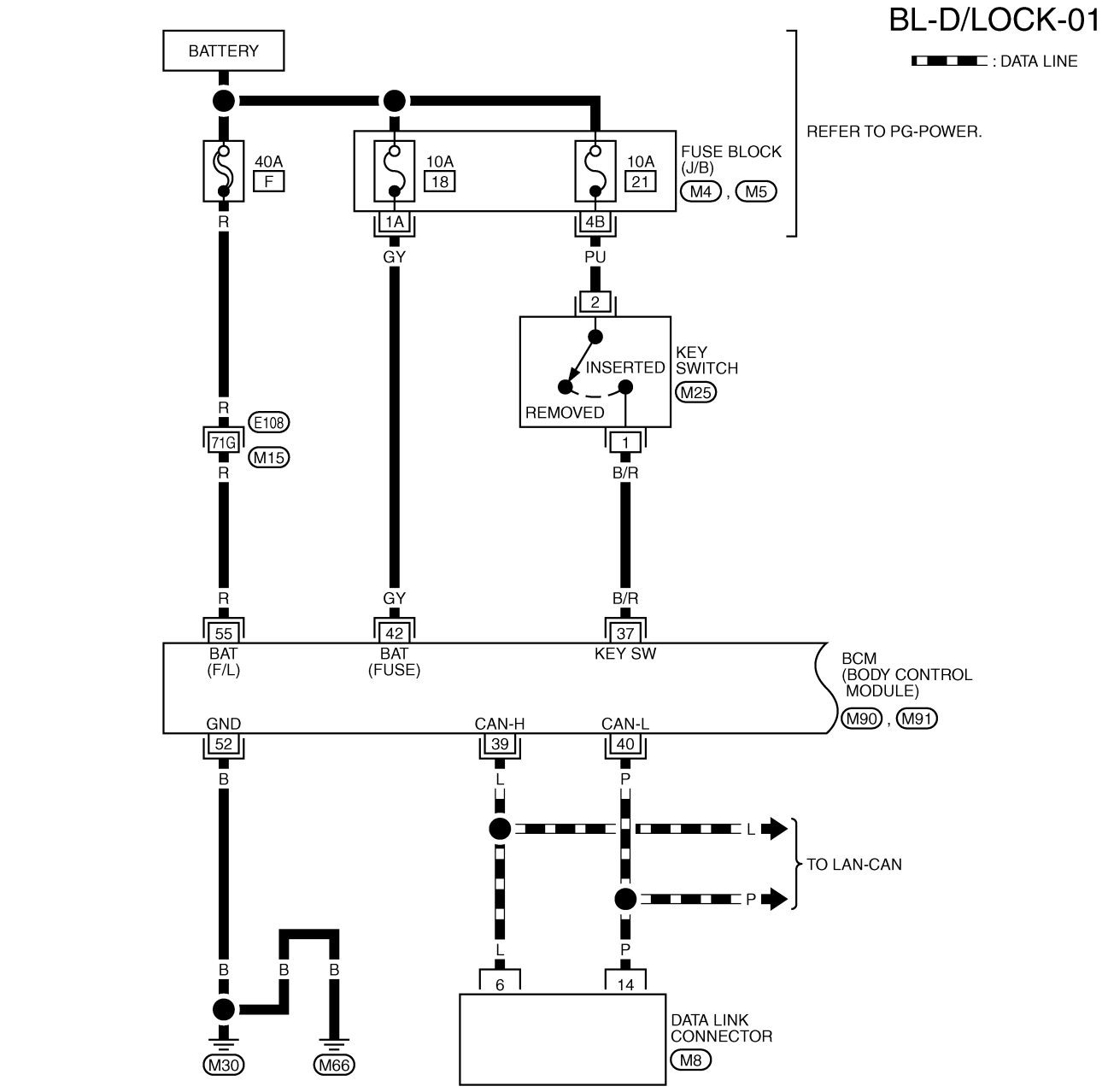
NIS0000H



TIWT0949E

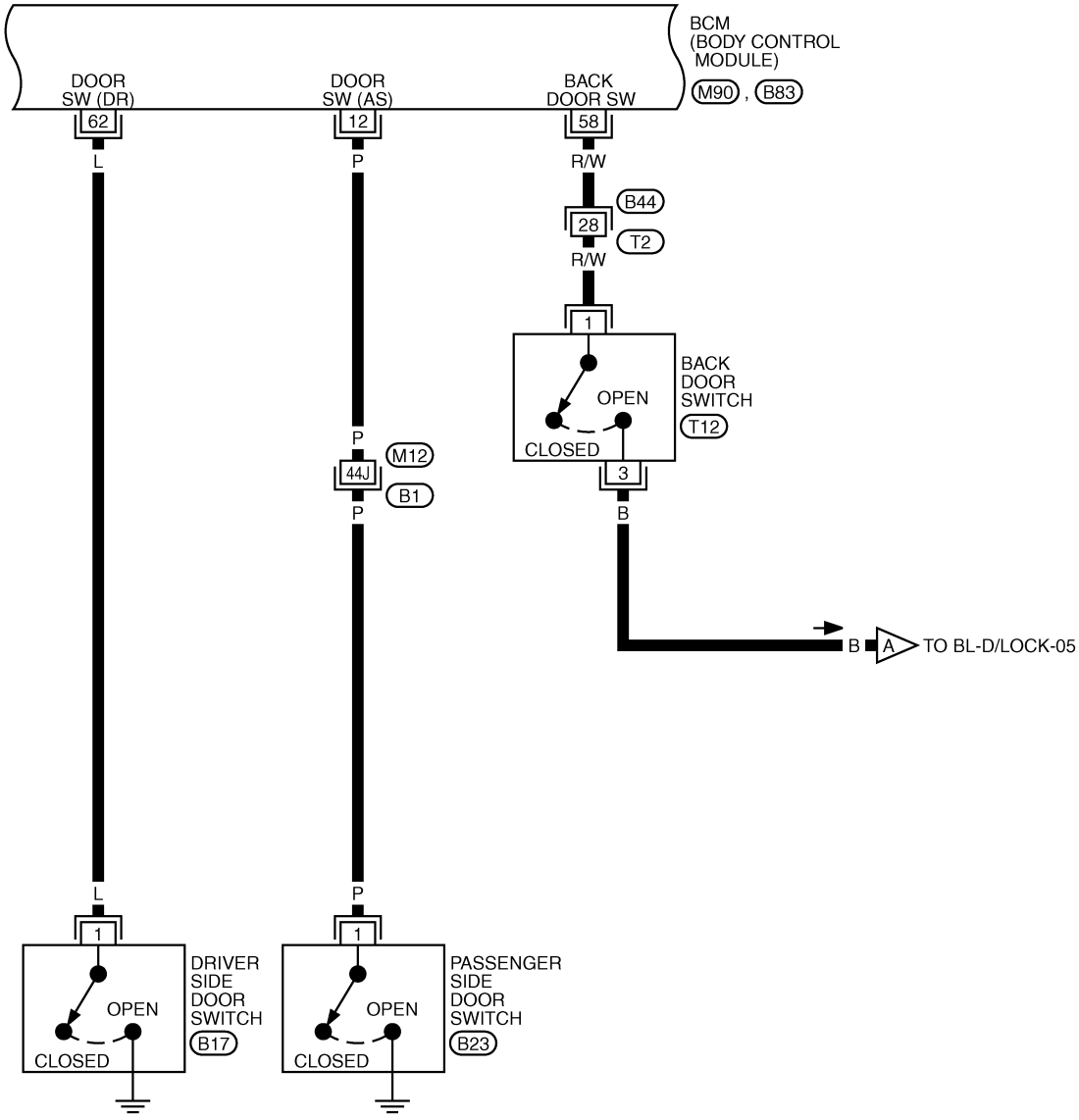
Wiring Diagram — D/LOCK — /For Coupe

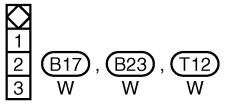
NIS0000I

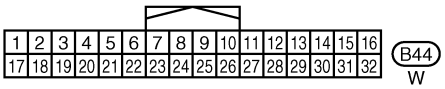


TIWT1566E

BL-D/LOCK-02



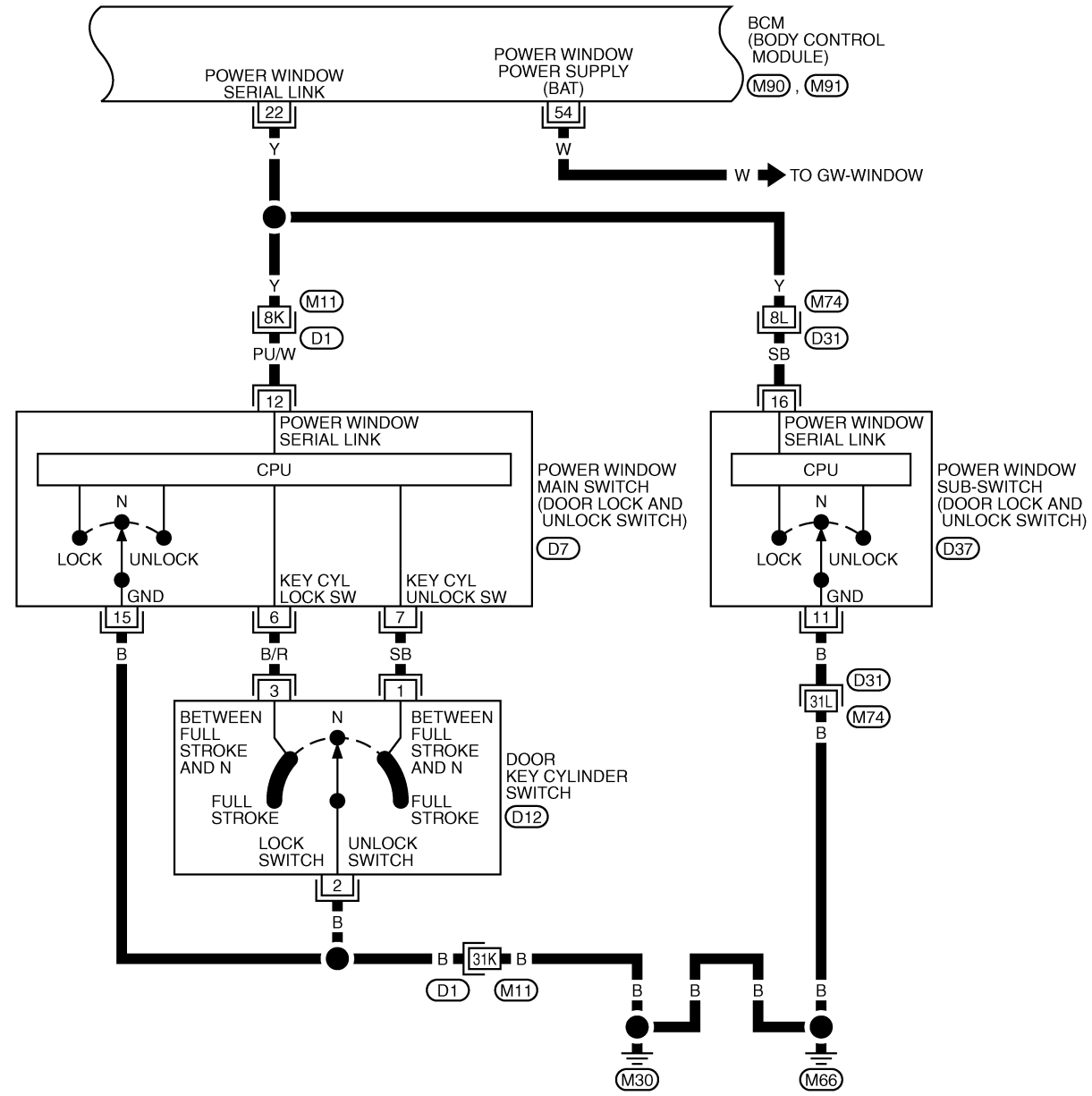


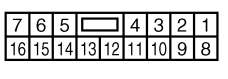


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

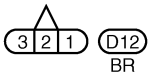
TIWT1567E

BL-D/LOCK-03





D7 , D37
W W

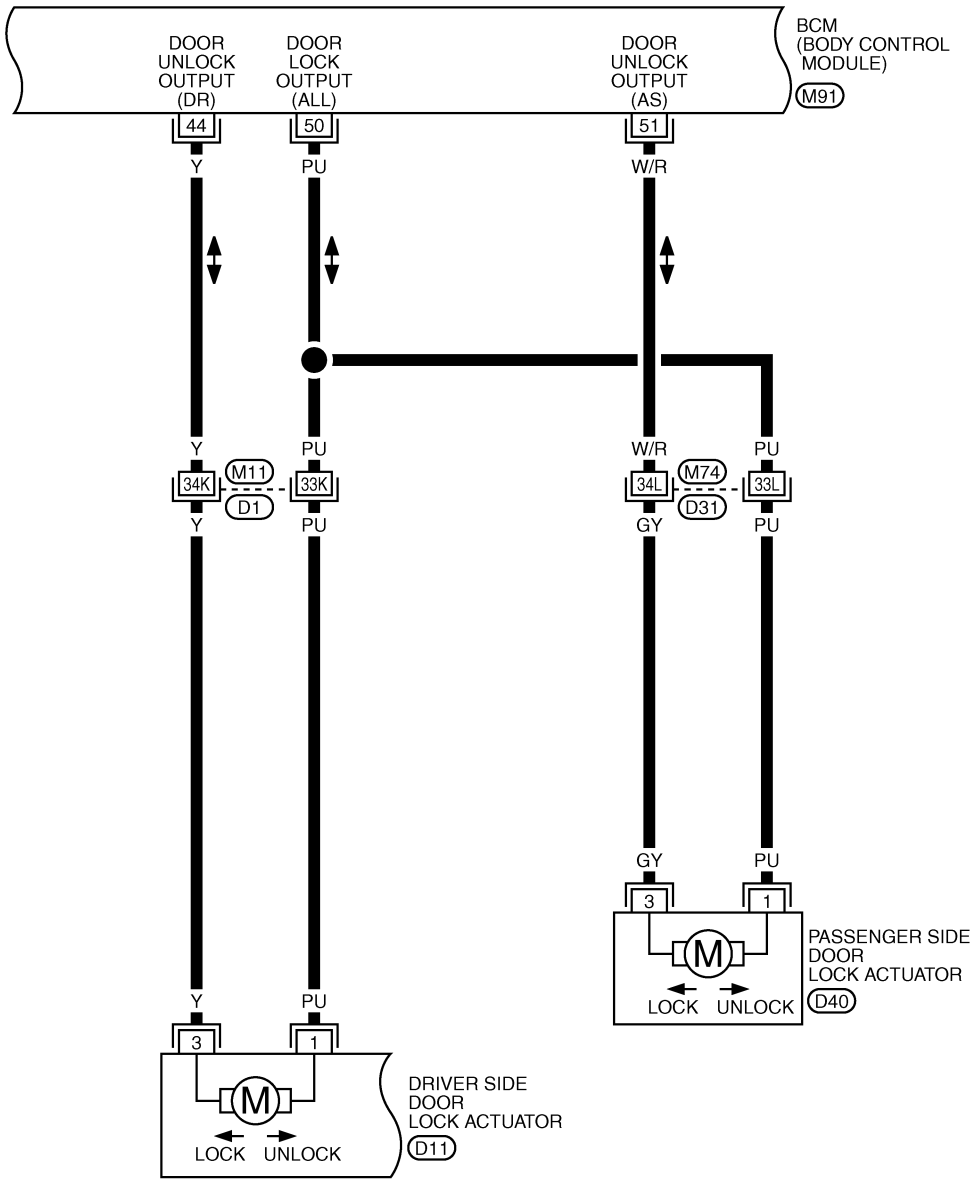


D12
BR

REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 -ELECTRICAL UNITS

TIWT1568E

BL-D/LOCK-04

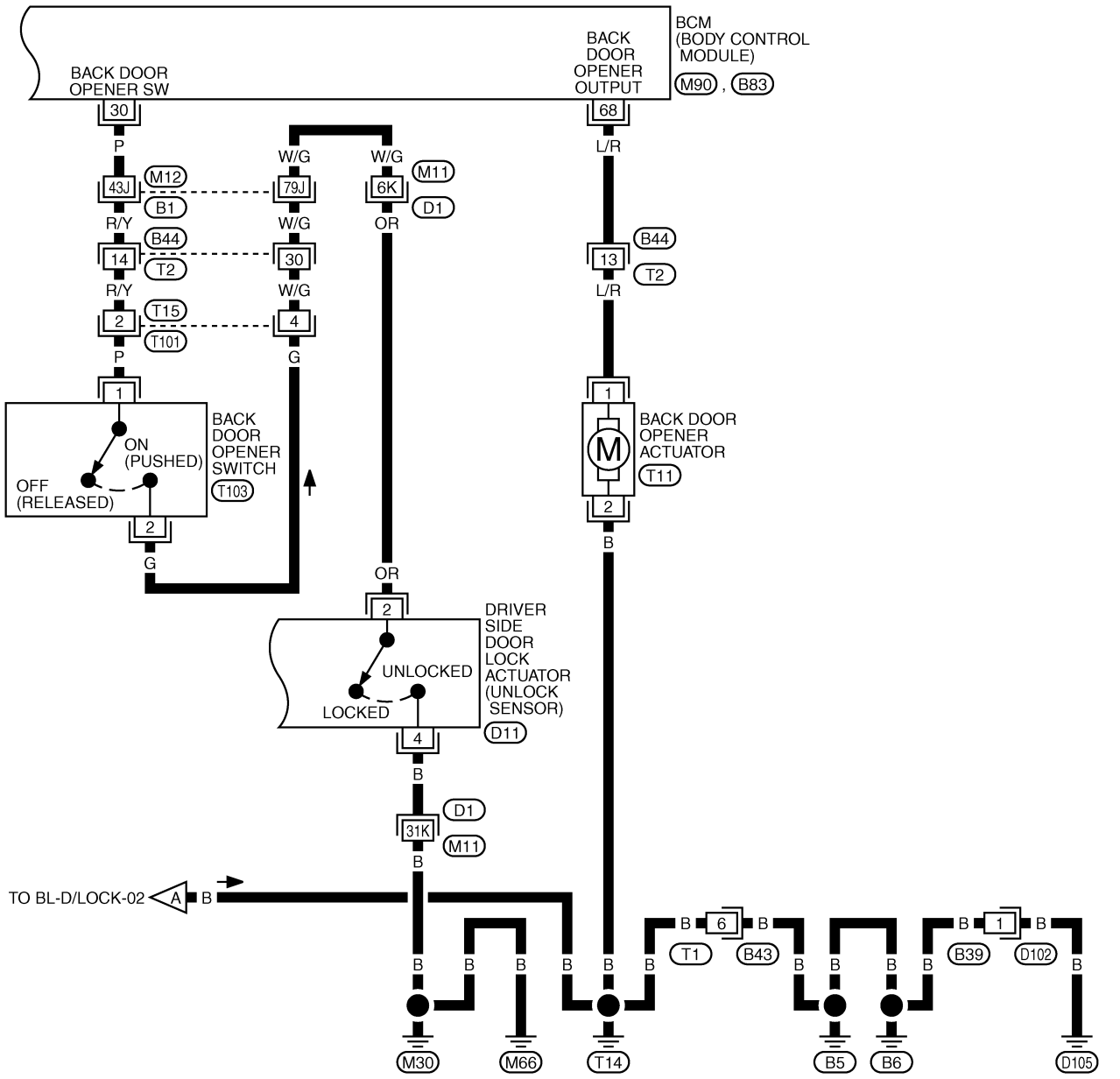


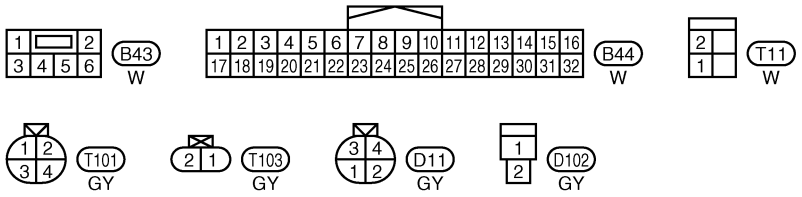


REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M91 -ELECTRICAL UNITS

TIWT1569E

BL-D/LOCK-05





REFER TO THE FOLLOWING.

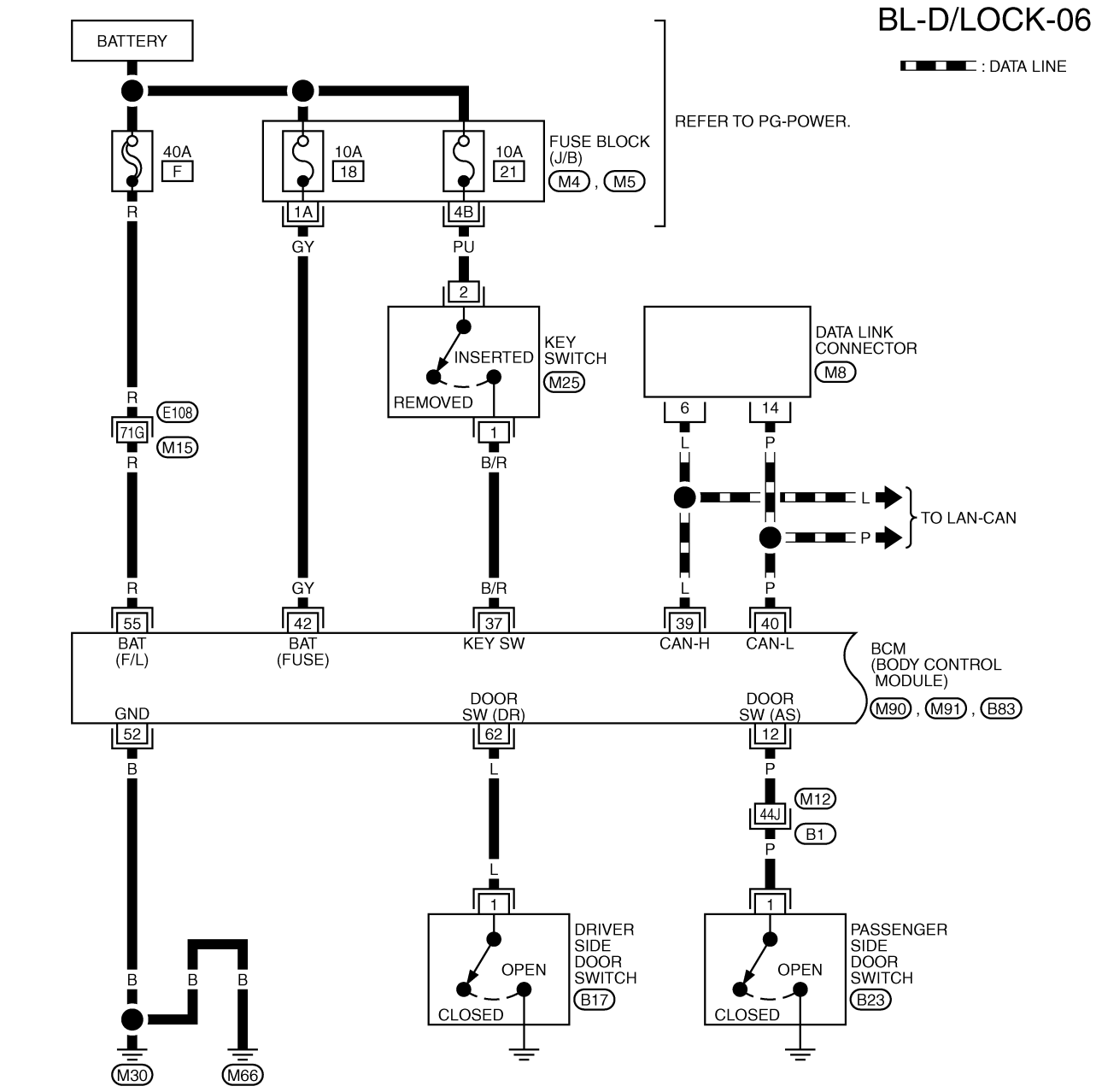
B1 , D1 -SUPER MULTIPLE JUNCTION (SMJ)

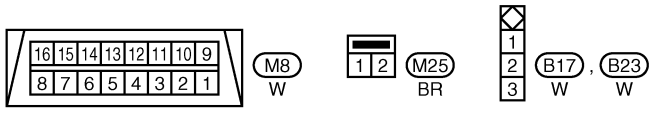
M90 , B83 -ELECTRICAL UNITS

TIWT2262E

Wiring Diagram — D/LOCK — /For Roadster

NIS0000J

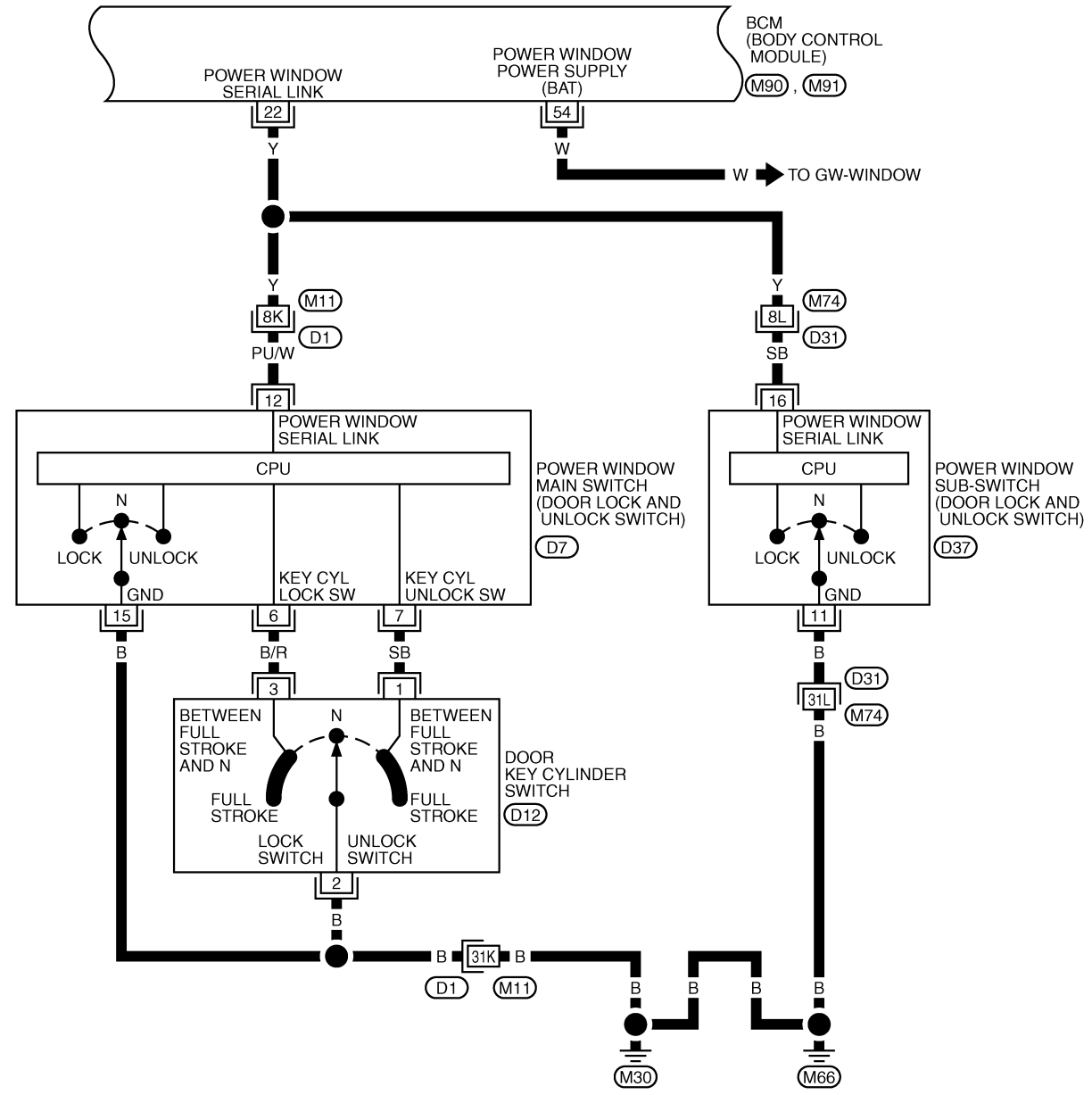


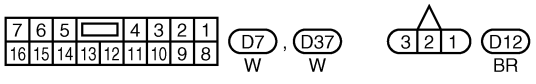


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT1571E

BL-D/LOCK-07





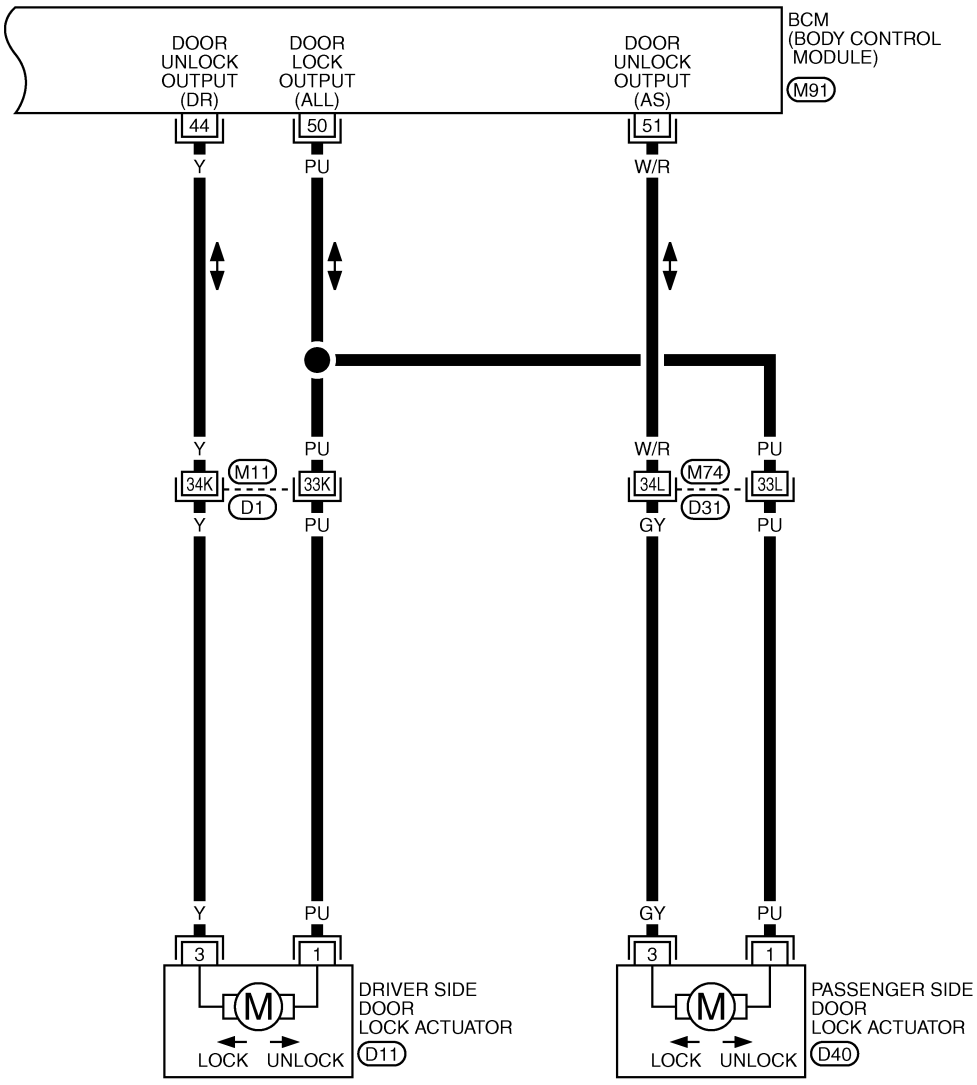
REFER TO THE FOLLOWING.

D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M90 , M91 -ELECTRICAL UNITS

TIWT1572E

BL-D/LOCK-08



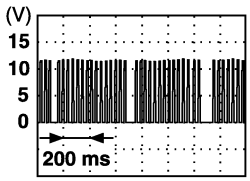


REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M91 -ELECTRICAL UNITS

TIWT1573E

Terminals and Reference Value for BCM

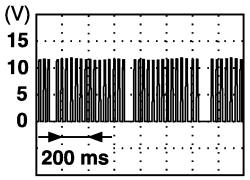
NIS0000K

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx.)
12	P	Passenger side door switch	Input	ON (Open) → OFF (Closed)	0 → 5
22	Y	Power window switch serial link	Input/ Output	—	 PIIA2344J
30	P	Back door opener switch	Input	Press the back door opener switch when driver side door is unlocked	5 → 0
37	B/R	Ignition key switch (insert)	Input	ON (Key inserted) → OFF (Key removed from IGN key cylinder)	Battery voltage → 0
39	L	CAN-H	Input/ Output	—	—
40	P	CAN-L	Input/ Output	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
44	Y	Driver side door lock actuator (unlock)	Output	Door lock / unlock switch (Free → Unlock)	0 → Battery voltage → 0
50	PU	All door lock actuator (lock)	Output	Door lock / unlock switch (Free → Lock)	0 → Battery voltage → 0
51	W/R	Passenger side door lock actuator (unlock)	Output	Door lock / unlock switch (Free → Unlock)	0 → Battery voltage → 0
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage
58	R/W	Back door switch	Input	ON (Open) → OFF (Closed)	0 → Battery voltage *
62	L	Driver side door switch	Input	ON (Open) → OFF (Closed)	0 → 5
68	L/R	Back door opener output	Output	Press the back door opener switch when driver side door is unlocked	0 → Battery voltage

*When interior lamp battery saver control is in OFF: Approx. 5V

Terminal and Reference Value for Power Window Main Switch

NIS0000L

Terminal	Wire color	Item	Condition	Voltage (V) (Approx.)
6	B/R	Key cylinder switch lock signal	Key position (Neutral → Locked)	5 → 0
7	SB	Key cylinder switch unlock signal	Key position (Neutral → Unlocked)	5 → 0
12	PU/W	Power window switch serial link	—	 PIIA2344J
15	B	Ground	—	0

Work Flow

NIS0000M

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to BL-23, "System Description" .
3. Does power door lock system operate normally? If Yes, GO TO 6, If No, GO TO 4.
4. INSPECTION END.

CONSULT-III Function (BCM)

NIS0000N

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis part	Inspection item, self-diagnosis mode	Content
Door lock	Work support	Changes the setting for each function.
	Data monitor	Displays BCM input data on real-time basis.
	Active test	Sends drive signals to door lock actuator to perform operation check.

WORK SUPPORT

Work item	Description
DOOR LOCK-UNLOCK SET	Select unlock mode can be changed in this mode. Selects ON-OFF of select unlock mode.
ANTI-LOCK OUT SET	Key reminder door mode can be changed in this mode. Selects ON-OFF of key reminder door mode.

DATA MONITOR

Monitor item “operation”		Content
KEY ON SW	“ON/OFF”	Indicates [ON/OFF] condition of key switch.
LOCK SW DR/AS	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from lock/unlock switch of driver and passenger side.
UNLK SW DR/AS	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from lock/unlock switch of driver and passenger side.
KEY CYL LK-SW	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from key cylinder.
KEY CYL UN-SW	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from key cylinder.
LK BUTTON/SIG	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from key fob.
IGN ON SW	“ON/OFF”	Indicates [ON/OFF] condition of ignition switch.
DOOR SW-DR	“ON/OFF”	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	“ON/OFF”	Indicates [ON/OFF] condition of passenger side door switch.
BACK DOOR SW*1	“ON/OFF”	Indicates [ON/OFF] condition of back door switch.
TRNK OPN MNTR*2	“ON/OFF”	Indicates [ON/OFF] condition of trunk lid opener switch.

*1: For Coupe
*2: For Roadster

ACTIVE TEST

Test item	Content
ALL D/LK MTR	This test is able to check all door lock actuators lock operation. These actuators lock when “ON” on CONSULT-III screen is touched.
DR D/UN MTR	This test is able to check driver side door lock actuator unlock operation. This actuator unlock when “ON” on CONSULT-III screen is touched.
NON DR D/UN	This test is able to check door lock actuators (except driver side door lock actuator) unlock operation. These actuator unlock when “ON” on CONSULT-III screen is touched.

Trouble Diagnoses Symptom Chart

NIS0000O

Symptom	Diagnoses service procedure	Reference to page
Key reminder door system does not operate properly.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check key switch (Insert) .	BL-40
	3. Check door switch .	BL-38
	4. Replace BCM.	BCS-17
Power door lock does not operate by door lock and unlock switch on power window main switch or power window sub-switch.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check door lock and unlock switch .	BL-42
	3. Check driver side door lock actuator .	BL-45
	4. Check passenger side door lock actuator .	BL-46
	5. Replace BCM	BCS-17
Driver side door lock actuator does not operate.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check driver side door lock actuator .	BL-45
Passenger side door lock actuator does not operate.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check passenger side door lock actuator .	BL-46
Power door lock does not operate by door key cylinder operation, but operates by door lock and unlock switch.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check door key cylinder switch .	BL-47
	3. Replace power window main switch.	—
Back door opener does not operate.	1. Check power supply and ground of BCM.	BL-37
	2. Check back door opener switch .	BL-48
	3. Check back door opener actuator .	BL-50

Check Power Supply and Ground Circuit of BCM

NIS0000P

CHECK FUSE

1. FUSE INSPECTION

1. Turn ignition switch OFF.
2. Check the following.

- 40A fusible link (letter **F** , located in the fuse and fusible link box)
- 10A fuse [No.18, located in the fuse block (J/B)]

NOTE:
Refer to BL-21, "Component Parts and Harness Connector Location" .

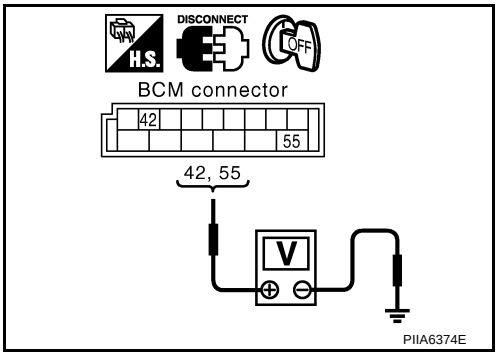
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector M91 terminal 42, 55 and ground.

42 (GY) - Ground : Battery voltage
55 (R) – Ground : Battery voltage



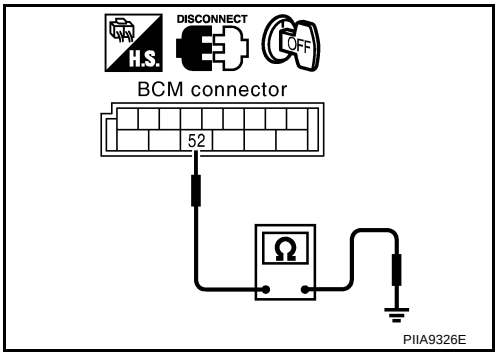
OK or NG

OK >> GO TO 3.
NG >> Check BCM power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector M91 terminal 52 and ground.

52 (B) – Ground Continuity should exist.



OK or NG

OK >> Power supply and ground circuit is OK.
NG >> Check BCM ground circuit for open or short.

Check Door Switch

NIS0000Q

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

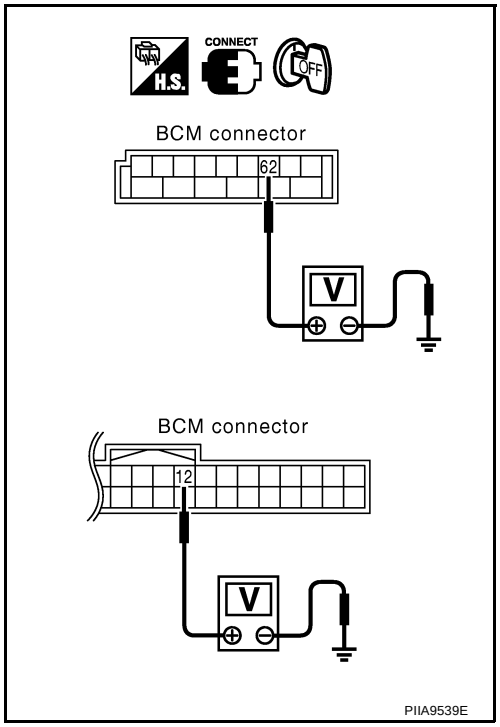
Check door switches (“DOOR SW-AS” and “DOOR SW-DR”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Item	Terminals			Condition of door switch	Voltage (V) (Approx.)
	Connector	(+) Terminal (Wire color)	(–)		
Driver side door switch	B83	62 (L)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK.
NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23, terminals 1 and BCM harness connector B83 terminals 62 (driver side) or M90 terminal 12 (passenger side).

Driver side door

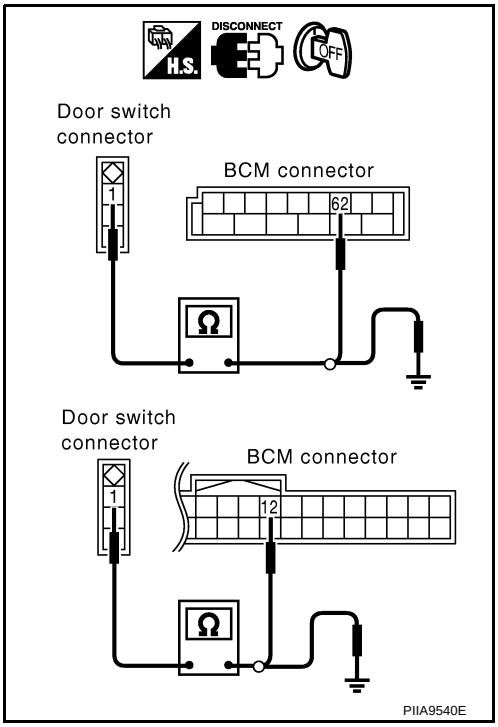
1 (L) – 62 (L) : Continuity should exist.

Passenger door

1 (P) – 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23, terminals 1 and ground.

1 (L or P) – Ground : Continuity should not exist.



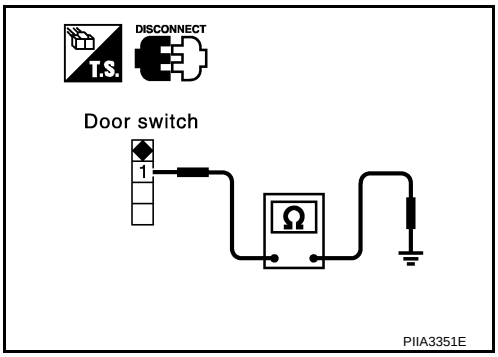
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK DOOR SWITCH

Check continuity between door switch harness connector B17 (driver side) or B23 (passenger side) terminal 1 and ground.

Terminal (Wire color)		Door switch	Continuity
1 (L or P)	Ground	Pushed	No
		Released	Yes



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace malfunction door switch.

Check Key Switch (insert)

NIS0000R

1. CHECK KEY SWITCH INPUT SIGNAL

With CONSULT-III

Check ignition key cylinder switch “KEY ON SW” in “DATE MONITOR” mode with CONSULT-II

- When key is inserted in ignition key cylinder

  KEY ON SW :ON

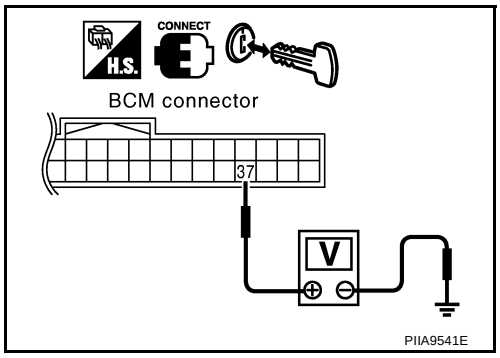
- When key is removed in ignition key cylinder

  KEY ON SW :OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
M90	37 (B/R)	Ground	Key is inserted	Battery voltage
			Key is removed	0



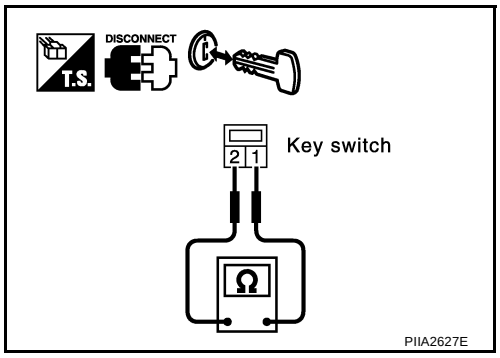
OK or NG

OK >> Key switch is OK.
NG >> GO TO 2.

2. CHECK KEY SWITCH (INSERT)

1. Turn ignition switch OFF.
2. Disconnect key switch connector.
3. Check continuity between key switch terminals 1 and 2.

Connector	Terminals		Condition	Continuity
M25	1	2	Key is inserted in ignition key cylinder	Yes
			Key is removed from ignition key cylinder	No



OK or NG

OK >> GO TO 3.
NG >> Replace key switch.

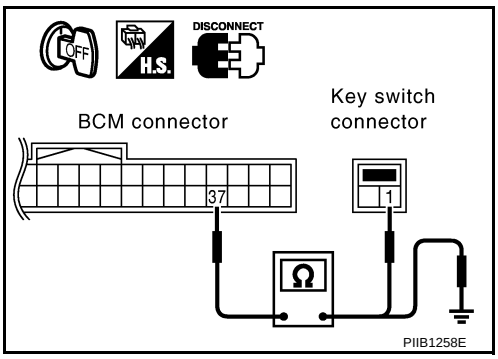
3. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 and key switch harness connector M25 terminal 1.

37 (B/R) - 1 (B/R) : Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 and ground.

37 (B/R) - Ground : Continuity should not exist.



OK or NG

OK >> Check the following.
- 10A fuse [No.21, located in the fuse block (J/B)]
- Harness for open or short between key switch and fuse

NG >> Repair harness or connector.

Check Door Lock and Unlock Switch

NIS0000S

1. CHECK POWER WINDOW OPERATION

Does power window system operate normally?

YES or NO?

YES >> GO TO 2
NO >> Refer to GW-30, "Trouble Diagnoses Symptom Chart" .

2. CHECK DOOR LOCK AND UNLOCK SWITCH OUTPUT SIGNAL

With CONSULT-III

Check door lock and unlock switch (“LOCK SW DR/AS”, “UNLK SW DR/AS”) in DATA MONITOR mode with CONSULT-II. Refer to BL-35, "DATA MONITOR" .

- When door lock and unlock switch is turned to LOCK

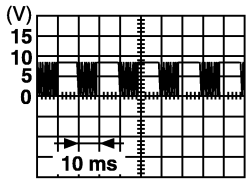
  CDL LOCK SW :ON

- When door lock and unlock switch is turned to UNLOCK

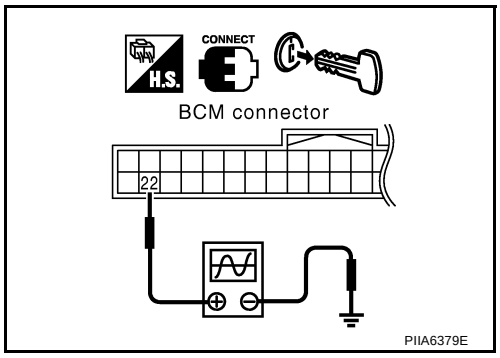
  CDL UNLOCK SW :ON

Without CONSULT-III

1. Remove key from ignition switch, and close the doors of driver side and passenger side.
2. Check the signal between BCM connector and ground with oscilloscope when door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.
3. Make sure signals which are shown in the figure below can be detected during 10 second just after door lock and unlock switch (driver side or passenger side) is turned “LOCK” or “UNLOCK”.

Connector	Terminal (Wire color)		Signal (Reference value)
	(+)	(–)	
M90	22 (Y)	Ground	

PIIA1297E



PIIA6379E

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK BCM OUTPUT SIGNAL

Check power window serial link (“POWER WINDOW DOWN”) in “ACTIVE TEST” mode with CONSULT-III. Refer to BL-74, "Active Test" .
When “ACTIVE TEST” is executed, the window of driver side and passenger side are go down.

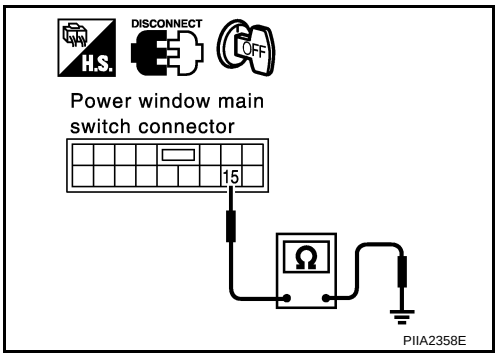
OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace BCM.

4. CHECK DOOR LOCK AND UNLOCK SWITCH GROUND CIRCUIT

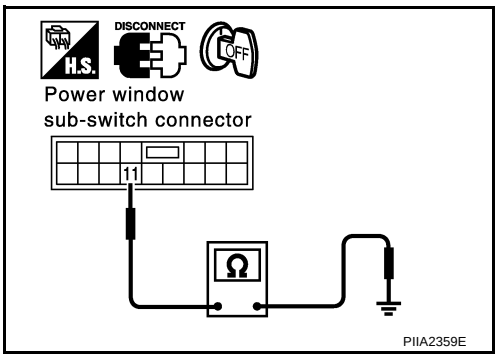
1. Turn ignition switch OFF.
2. Disconnect power window main switch (door lock and unlock switch) and power window sub-switch (door lock and unlock switch) connector.
3. Check continuity between power window main switch (door lock and unlock switch) harness connector D7 terminal 15 and ground.

15 (B) – Ground : Continuity should exist.



4. Check continuity between power window sub-switch (door lock and unlock switch) harness connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



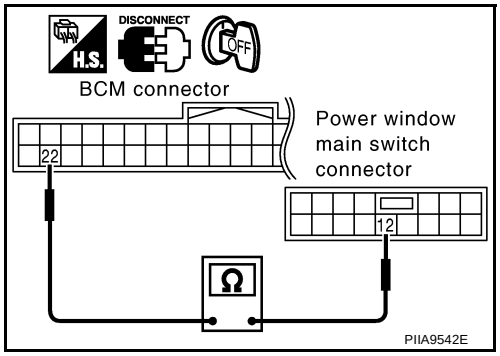
OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.

5. CHECK POWER WINDOW SERIAL LINK CIRCUIT

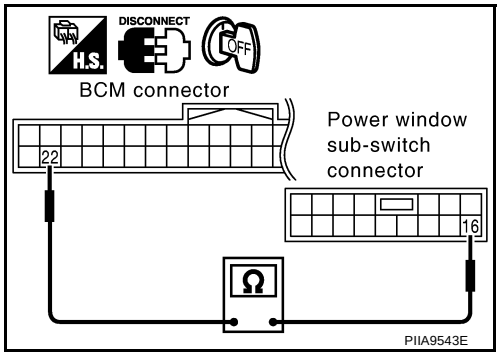
1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 22 and power window main switch (door lock and unlock switch) harness connector D7 terminal 12.

22 (Y) – 12 (PU/W) **: Continuity should exist.**



3. Check continuity between BCM harness connector M90 terminal 22 and power window sub-switch (door lock and unlock switch) harness connector D37 terminal 16.

22 (Y) – 16 (SB) **: Continuity should exist.**



OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.

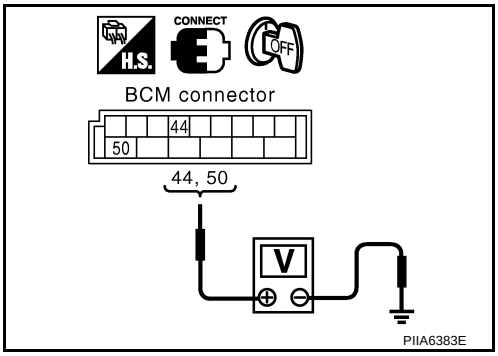
Check Driver Side Door Lock Actuator

NIS0000T

1. CHECK DOOR LOCK ACTUATOR SIGNAL

1. Turn ignition switch OFF.
2. Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M91	44 (Y)	Ground	Driver door lock/unlock switch is turned to UNLOCK.	0 → Battery voltage → 0
	50 (PU)		Driver door lock/unlock switch is turned to LOCK.	0 → Battery voltage → 0



OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

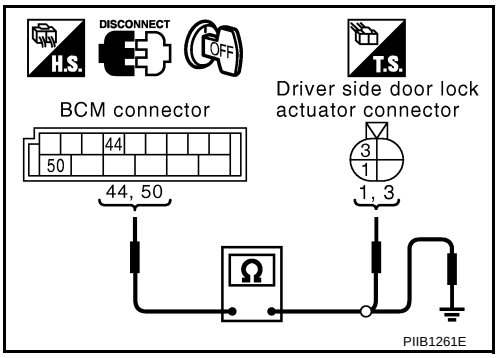
2. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M91 terminals 44, 50 and driver side door lock actuator harness connector D11 terminals 1, 3.

44 (Y) – 3 (Y) : Continuity should exist.
50 (PU) – 1 (PU) : Continuity should exist.

3. Check continuity between BCM harness connector M91 terminals 44, 50 and ground.

44 (Y) – Ground : Continuity should not exist.
50 (PU) – Ground : Continuity should not exist.



OK or NG

OK >> Replace driver side door lock actuator.
NG >> Repair or replace harness between BCM and driver side door lock actuator.

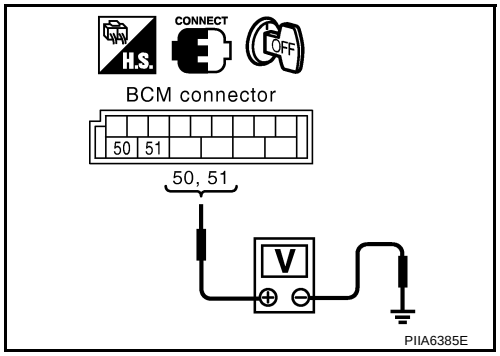
Check Passenger Side Door Lock Actuator

NIS0000U

1. CHECK DOOR LOCK ACTUATOR SIGNAL

1. Turn ignition switch OFF.
2. Check voltage between passenger side door lock actuator connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M91	50 (PU)	Ground	Door lock/unlock switch is turned to LOCK.	0 → Battery voltage → 0
	51 (W/R)		Door lock/unlock switch is turned to UNLOCK.	0 → Battery voltage → 0



OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

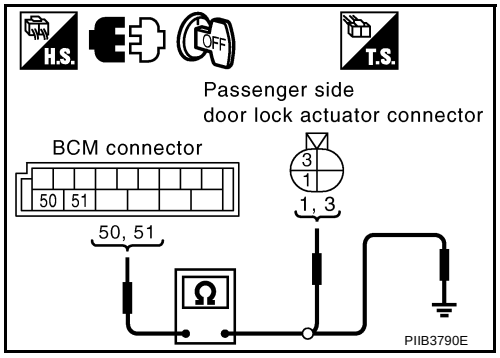
2. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M91 terminals 50, 51 and passenger side door lock actuator harness connector D40 terminals 1, 3.

50 (PU) – 1 (PU) : Continuity should exist.
51 (W/R) – 3 (GY) : Continuity should exist.

3. Check continuity between BCM harness connector M91 terminals 50, 51 and ground.

50 (PU) – Ground : Continuity should not exist.
51 (W/R) – Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger side door lock actuator.
NG >> Repair or replace harness between BCM and passenger side door lock actuator.

Check Door Key Cylinder Switch

NIS0000V

1. CHECK DOOR KEY CYLINDER SWITCH INPUT SIGNAL

With CONSULT-III

- Check door key cylinder switch (“KEY CYL LK SW”) in “DATA MONITOR” mode with CONSULT-III.

  “KEY CYL LK-SW” should be “ON” when key inserted in door key cylinder is turned to lock.

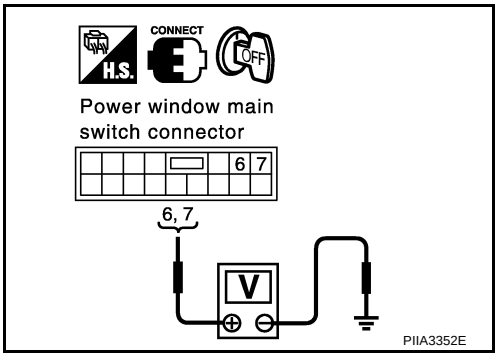
- Check door key cylinder switch (“KEY CYL UN-SW”) in “DATA MONITOR” mode with CONSULT-III.

  “KEY CYL UN-SW” should be “ON” when key inserted in door key cylinder is turned to unlock.

Without CONSULT-III

Check voltage between power window main switch (door lock and unlock switch) connector and ground.

Connector	Terminals (+)	Terminals (–)	Key position	Voltage (V) (Approx.)
D7	6 (B/R)	Ground	Neutral/Unlock	5
			Lock	0
	7 (SB)		Neutral/Lock	5
			Unlock	0



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.

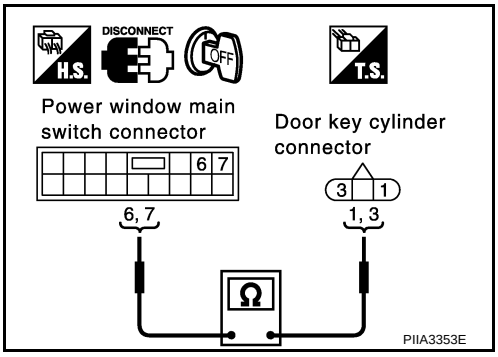
NG >> GO TO 2.

2. CHECK DOOR KEY CYLINDER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch (door lock and unlock switch) and door key cylinder switch connector.
3. Check continuity between power window main switch (door lock and unlock switch) harness connector D7 terminals 6, 7 and door key cylinder switch harness connector D12 terminals 1, 3.

6 (B/R) – 3 (B/R) : Continuity should exist.

7 (SB) – 1 (SB) : Continuity should exist.



OK or NG

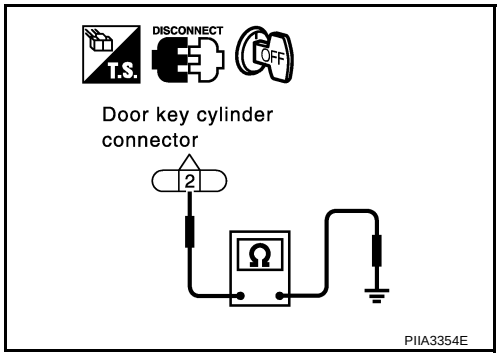
OK >> GO TO 3.

NG >> Repair or replace harness between power window main switch and door key cylinder switch.

3. CHECK DOOR KEY CYLINDER SWITCH GROUND CIRCUIT

Check continuity between door key cylinder switch harness connector D12 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



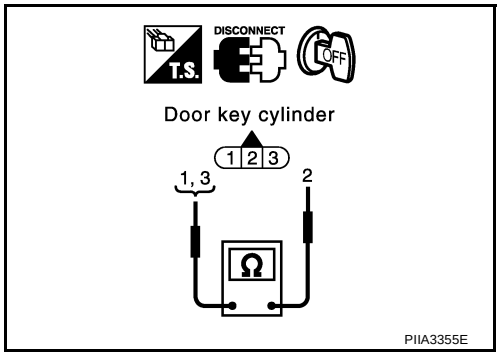
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK DOOR KEY CYLINDER SWITCH

Check continuity between door key cylinder switch terminals 1, 3 and 2.

Connector	Terminals		Key position	Continuity
D12	1	2	Neutral/Lock	No
			Unlock	Yes
	3		Neutral/Unlock	No
			Lock	Yes



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace door key cylinder switch.

Check Back Door Opener Switch

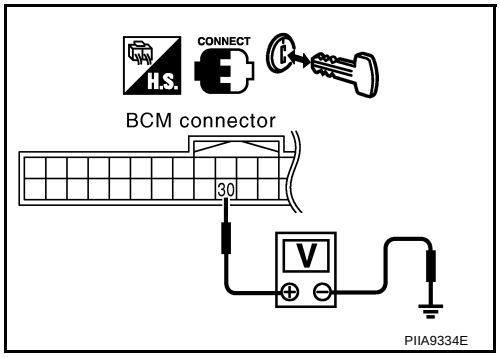
NIS0000W

1. CHECK BACK DOOR OPENER SIGNAL

Check voltage between BCM connector and ground.
Press back door opener switch when driver side door is unlocked.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Back door opener switch ON	0
			Back door opener switch OFF	Battery voltage*

*: When interior lamp battery saver control is in OFF position. →Approx.5V



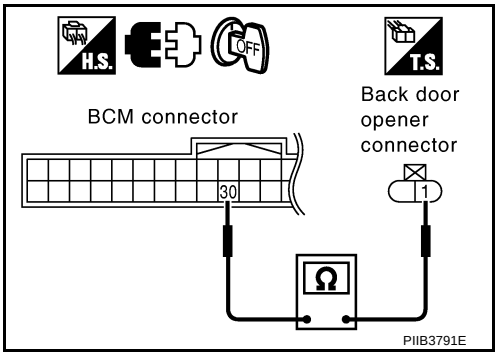
OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

2. CHECK BACK DOOR OPENER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door opener switch connector.
3. Check continuity between BCM harness connector M90 terminal 30 and back door opener switch harness connector T103 terminal 1.

30 (P) – 1 (P) **: Continuity should exist.**



OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between BCM and back door opener switch.

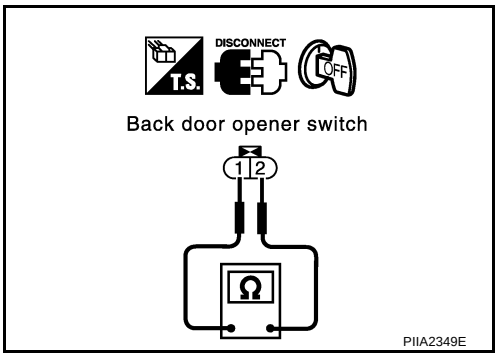
3. CHECK BACK DOOR OPENER SWITCH

Check continuity between back door opener switch terminals 1 and 2.

Connector	Terminals		Condition	Continuity
T103	1	2	Back door opener switch: ON	Yes
			Back door opener switch: OFF	No

OK or NG

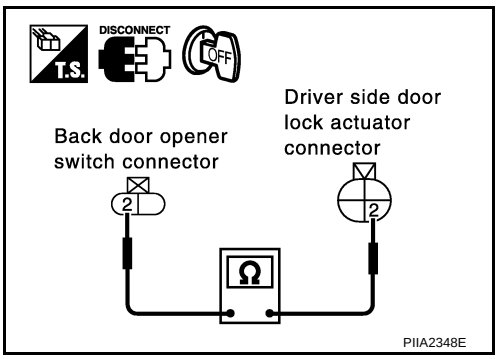
OK >> GO TO 4.
NG >> Replace back door opener switch.



4. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between back door opener switch harness connector T103 terminal 2 and driver side door lock actuator harness connector D11 terminal 2.

2 (G) – 2 (OR) **: Continuity should exist.**



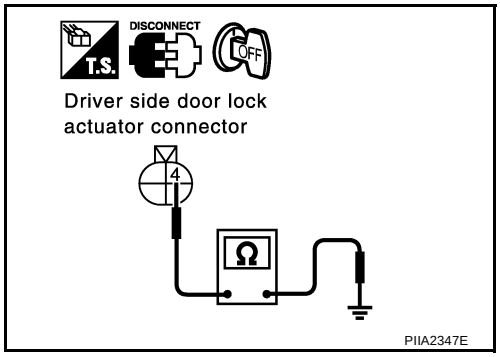
OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness between back door opener switch and driver side door lock actuator.

5. CHECK DOOR LOCK ACTUATOR GROUND CIRCUIT

Check continuity between driver side door lock actuator harness connector D11 terminal 4 and ground.

4 (B) – Ground : Continuity should exist.



OK or NG

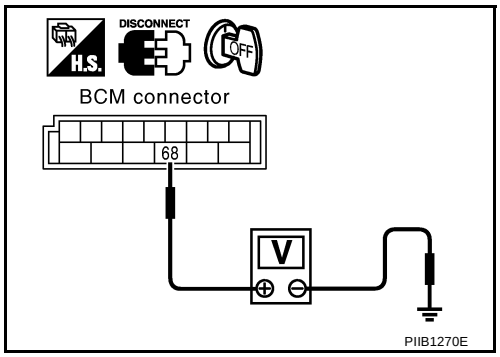
OK >> Replace driver side door lock actuator.
NG >> Repair or replace harness.

Check Back Door Opener Actuator

NIS0000X

1. CHECK BACK DOOR OPENER ACTUATOR SIGNAL

Check voltage between BCM connector and ground.
Press the back door opener switch when driver side door is unlocked.



Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
B83	68 (L/R)	Ground	Back door opener switch ON	Battery voltage
			Back door opener switch OFF	0

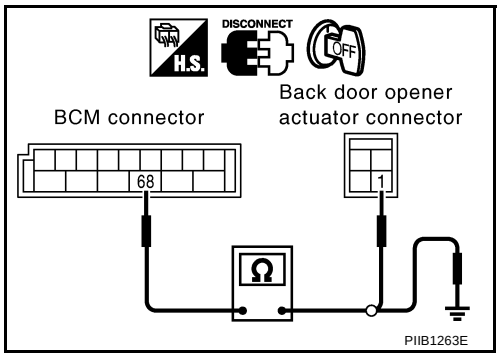
OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

2. CHECK BACK DOOR OPENER ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door opener actuator connector.
3. Check continuity between BCM harness connector B83 terminal 68 and back door opener actuator harness connector T11 terminal 1.

68 (L/R) – 1 (L/R) : Continuity should exist.



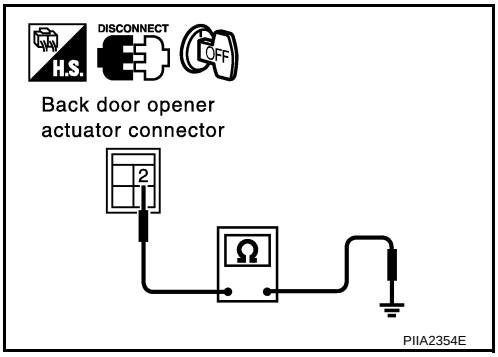
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between BCM and back door opener actuator.

3. CHECK BACK DOOR OPENER ACTUATOR GROUND CIRCUIT

Check continuity between back door opener actuator harness connector T11 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



OK or NG

OK >> Replace back door opener actuator.
NG >> Repair or replace.

FUEL FILLER LID OPENER

PFP:78820

System Description/For RoadSter

NIS0000Y

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

When ignition switch ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

FUEL LID OPEN OPERATION

When fuel lid opener switch is ON (pushed), ground is supplied

- to BCM terminal 58
- through fuel lid opener switch terminals 1 and 2, and
- through body grounds M30 and M66.

And power is supplied

- to BCM terminal 70
- through fuel lid opener actuator terminals 1 and 2, and
- through body grounds B5, B6, and T14.

Then fuel lid opener actuator opens fuel lid.

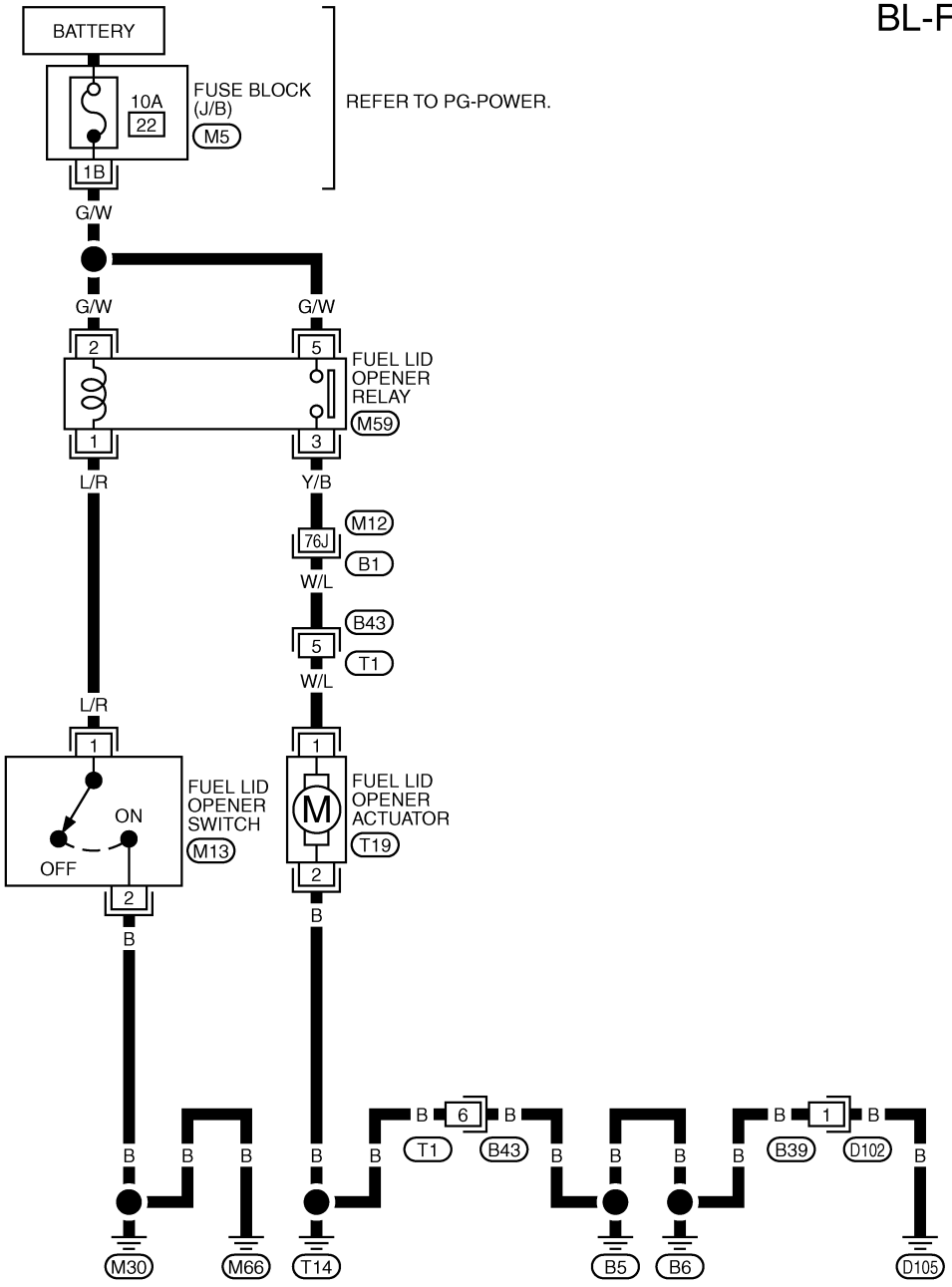
FUEL LID OPENER CANCEL OPERATION

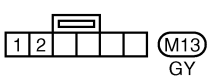
Fuel lid cannot open when vehicle condition is in arm or alarm phase.

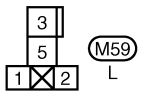
Wiring Diagram — F/LID — /For Coupe

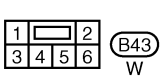
NIS0000Z

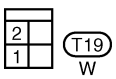
BL-F/LID-01

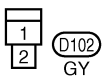












REFER TO THE FOLLOWING.

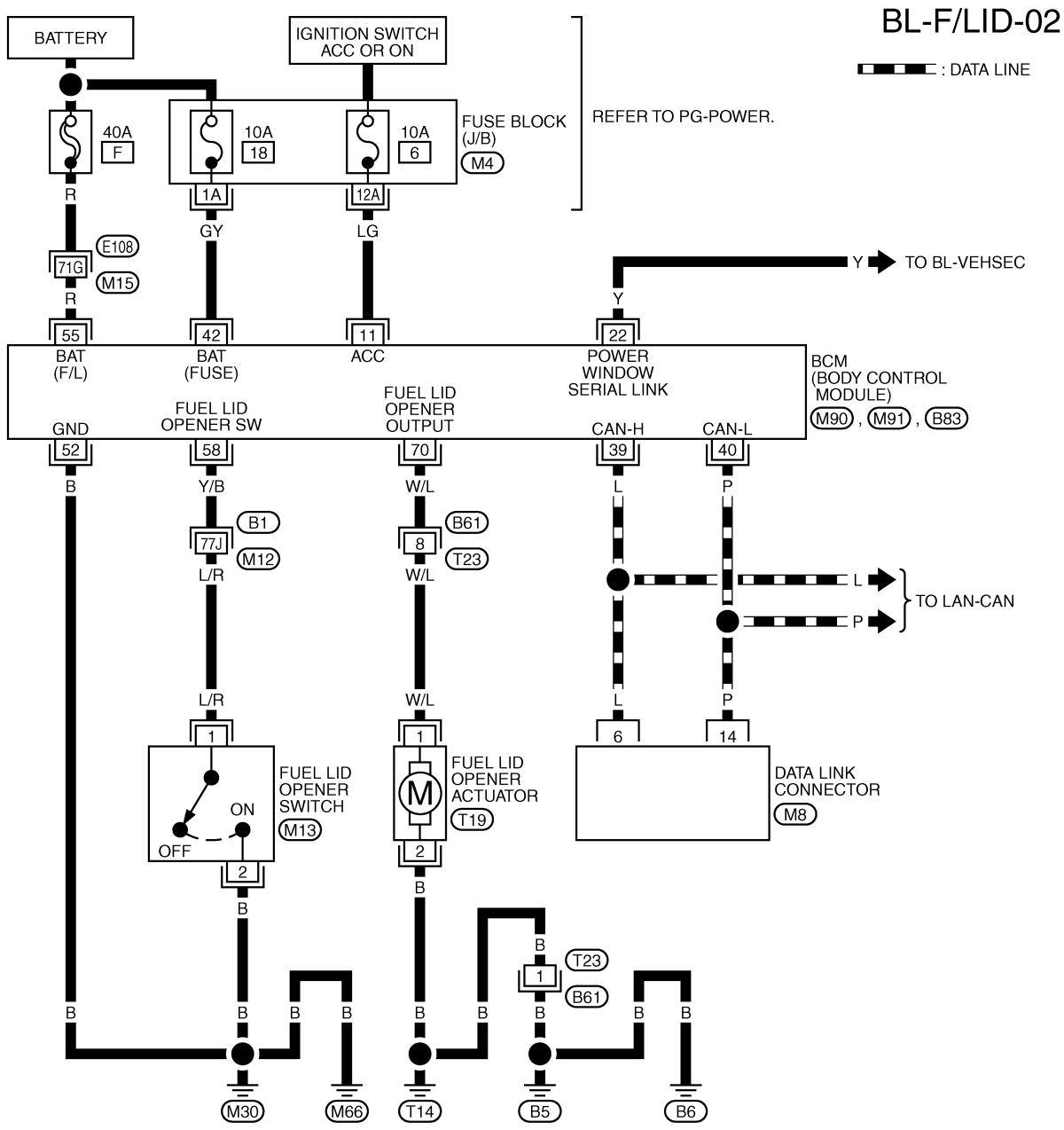
B1 -SUPER MULTIPLE JUNCTION (SMJ)

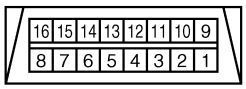
M5 -FUSE BLOCK-JUNCTION BOX (J/B)

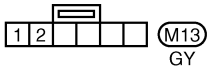
TIWT1574E

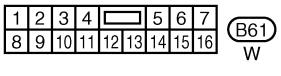
Wiring Diagram — F/LID — / For Roadster

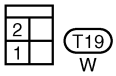
NIS00010











REFER TO THE FOLLOWING.
E108, B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91, B83 -ELECTRICAL UNIT

TIWT1575E

CONSULT-III Function (BCM)/For Roadster

NIS00011

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis part	Inspection item, self-diagnosis mode	Content
Fuel lid	Data monitor	Displays BCM input data on real-time basis.
	Active test	Sends drive signals to fuel lid opener actuator to perform operation check.

DATA MONITOR

Monitor item “operation”	Content
F/LID OPN SW	Indicates [ON/OFF] condition of fuel lid opener switch.

ACTIVE TEST

Test item	Content
FUEL LID OPEN	This test is able to check fuel lid opener actuator unlock operation. This actuator unlocks when “ON” on CONSULT-III screen is touched.

Terminals and Reference Value for BCM/For Roadster

NIS00012

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage [V] (Approx.)
11	LG	Ignition switch (ACC)	Input	Ignition switch (ACC or ON)	Battery voltage
39	L	CAN-H	Input	—	—
40	P	CAN-L	Input	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage
58	Y/B	Fuel lid opener switch	Input	Fuel lid opener switch is ON	0
				Fuel lid opener switch is OFF	Battery voltage
70	W/L	Fuel lid opener release output signal	Output	Fuel lid opener switch is ON	0
				Fuel lid opener switch is OFF	Battery voltage (For 0.5s)

Trouble Diagnosis/For Roadster

NIS00013

FUEL LID DOSE NOT OPEN WITH FUEL LID OPENER SWITCH

1. VEHICLE CONDITION

Check vehicle security system.

Arm phase or alarm phase?

Yes or No

Yes >> Cancel arm phase or alarm phase condition.
No >> GO TO 2.

2. CHECK FUEL LID OPEN INPUT SIGNAL

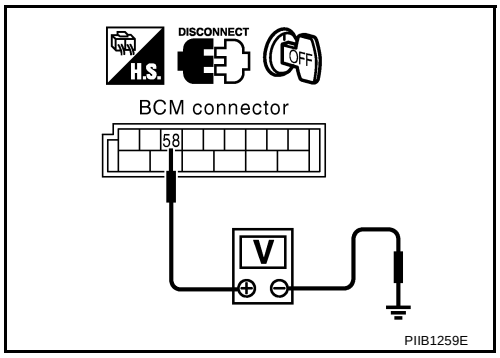
With CONSULT-III

Check door switches (“F/LID OPN SW”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
F/LID OPN SW	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

1. Turn ignition switch OFF.
2. Check voltage between BCM and ground.



Connector	Terminal (Wire color)		Condition	Voltage [V] (Approx.)
	(+)	(–)		
B83	58 (Y/B)	Ground	Fuel lid opener switch ON	0
			Fuel lid opener switch OFF	Battery voltage

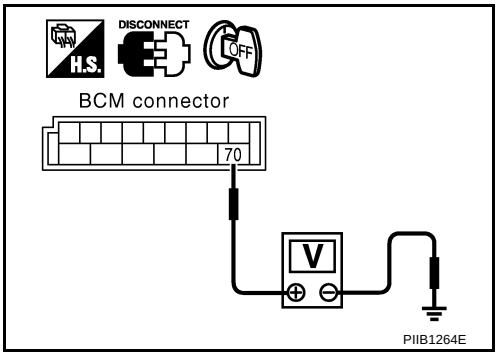
OK or NG

OK >> GO TO 3.
NG >> GO TO 6.

3. CHECK FUEL LID OPEN OUTPUT SIGNAL

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage [V] (Approx.)
	(+)	(–)		
B83	70 (W/L)	Ground	Fuel lid opener switch ON	Battery voltage (for 0.5s)
			Fuel lid opener switch OFF	0



OK or NG

OK >> GO TO 4.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

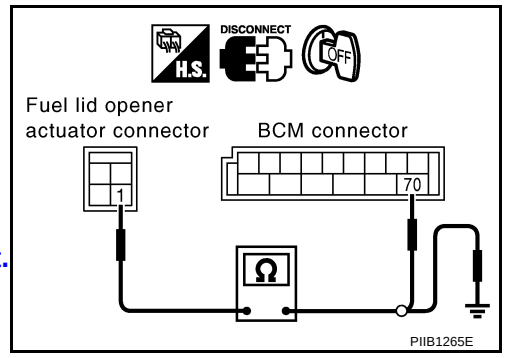
4. CHECK FUEL LID OPENER ACTUATOR CIRCUIT

1. Disconnect BCM connector and fuel lid opener actuator connector.
2. Check continuity between BCM harness connector B83 terminal 70 and fuel lid opener actuator harness connector T19 terminal 1.

70 (W/L) - 1 (W/L) : Continuity should exist.

3. Check continuity between fuel lid opener actuator harness connector T19 terminal 1 and ground.

1 (W/L) - ground : Continuity should not exist.



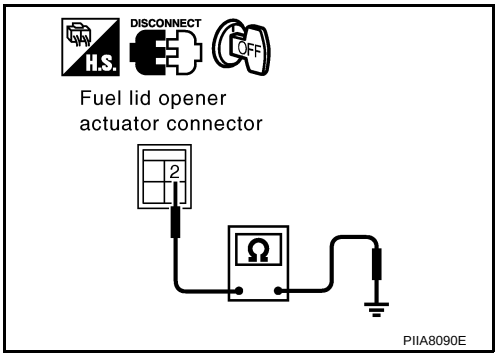
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK FUEL LID OPENER ACTUATOR GROUND CIRCUIT

Check continuity between fuel lid opener actuator harness connector T19 terminal 2 and ground.

2 (B) - ground : Continuity should exist.



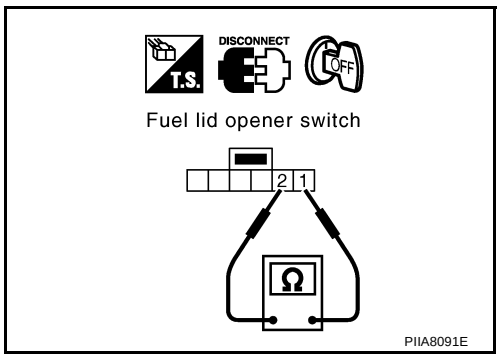
OK or NG

OK >> Replace fuel lid opener actuator.
NG >> Repair harness or connector.

6. CHECK FUEL LID OPENER SWITCH

1. Disconnect fuel lid opener switch
2. Check continuity between fuel lid opener switch harness connector M13 terminals 1 and 2.

Connector	Terminals		Fuel lid opener switch condition	Continuity
M13	1	2	ON (Pushed)	Yes
			OFF (Released)	No



OK or NG

OK >> GO TO 7.
NG >> Replace fuel lid opener switch.

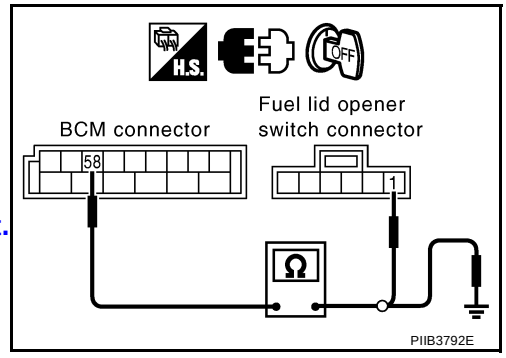
7. CHECK FUEL LID OPENER SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector B83 terminal 58 and fuel lid opener switch harness connector M13 terminal 1.

58 (Y/B) - 1 (L/R) : Continuity should exist.

3. Check continuity between BCM harness connector B83 terminal 58 (Y/B) and ground.

58 (Y/B) - ground : Continuity should not exist.



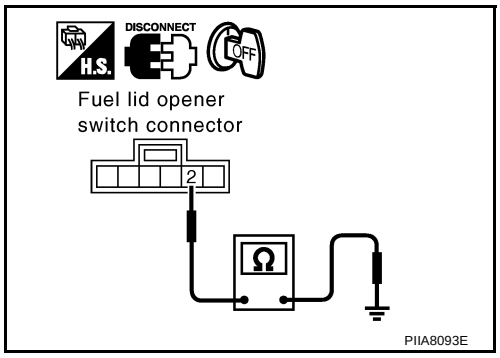
OK or NG

OK >> GO TO 8.
NG >> Repair harness or connector.

8. CHECK FUEL LID OPENERE SWITCH GROUND CIRCUIT

Check continuity between fuel lid opener switch harness connector M13 terminal 2 and ground.

2 (B) - ground : Continuity should exist.



OK or NG

OK >> Replace fuel lid opener switch.
NG >> Repair harness or connector.

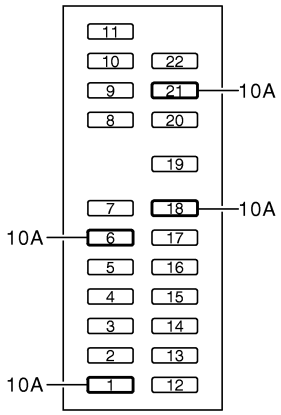
REMOTE KEYLESS ENTRY SYSTEM

PFP:28596

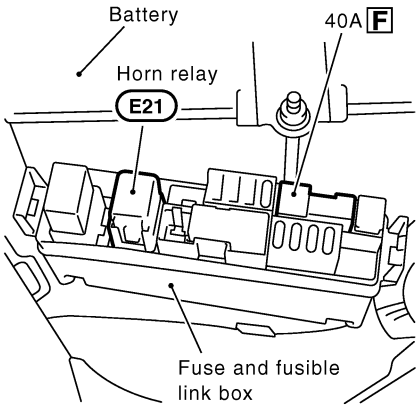
Component Parts and Harness Connector Location

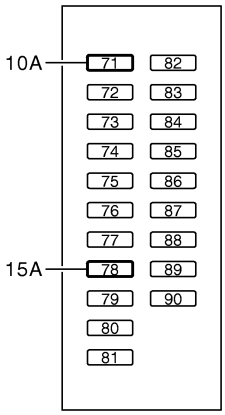
NIS00014

FOR COUPE



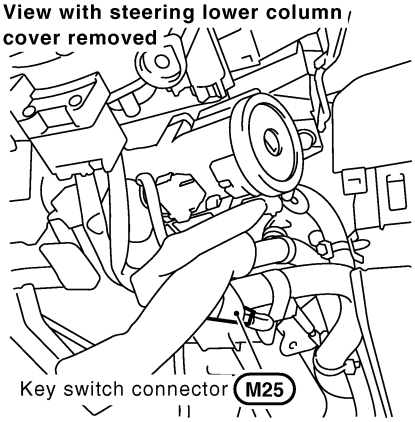
Fuse block (J/B) fuse layout



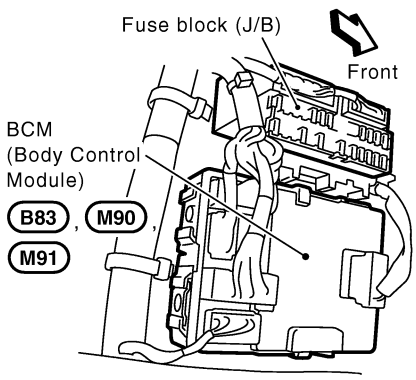


IPDM E/R fuse layout

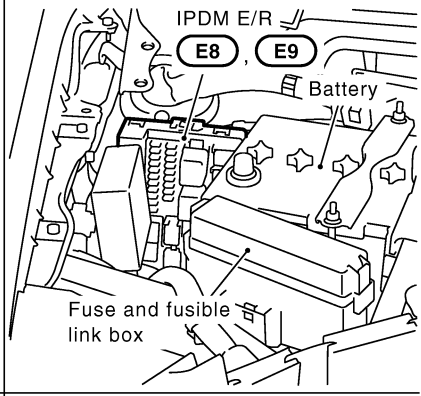
View with steering lower column cover removed

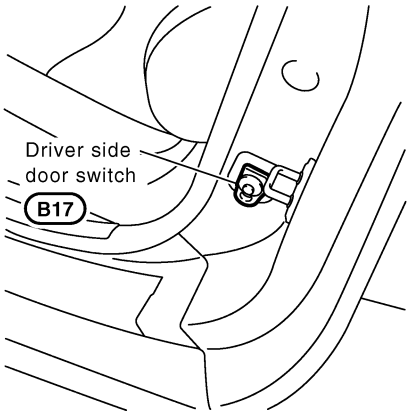


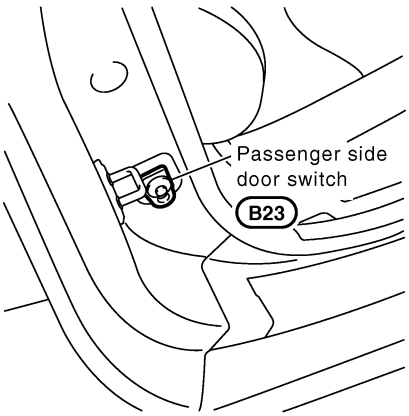
View with dash side LH removed



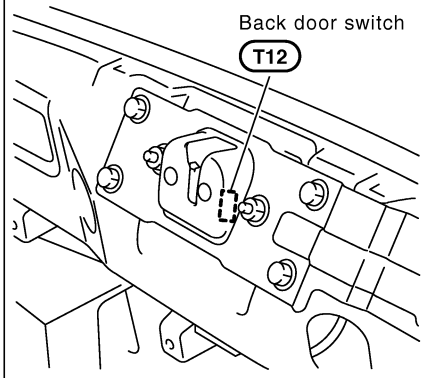
View with cowl top removed

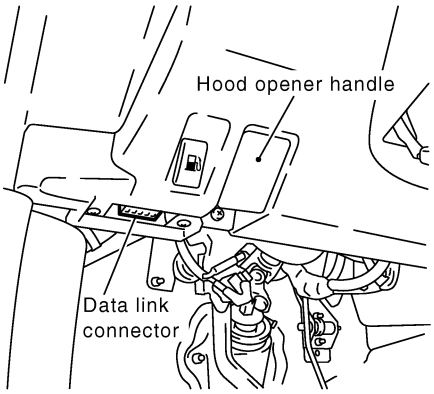




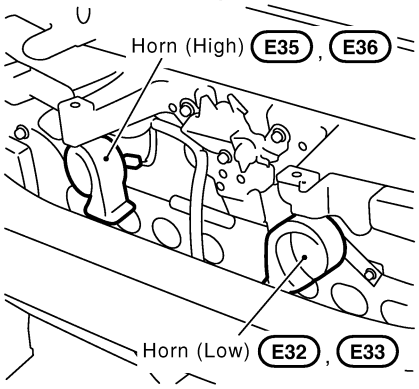


View with luggage finisher rear

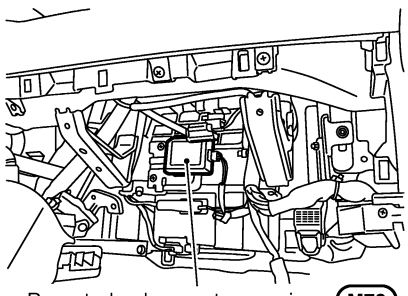




View with front bumper removed

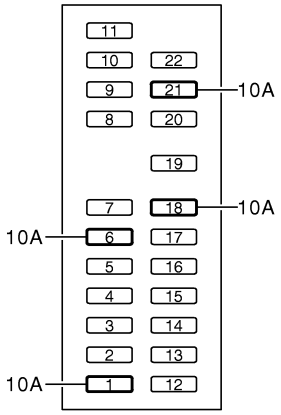


View with instrument passenger panel lower removed

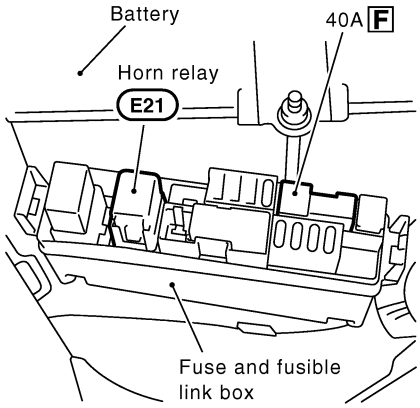


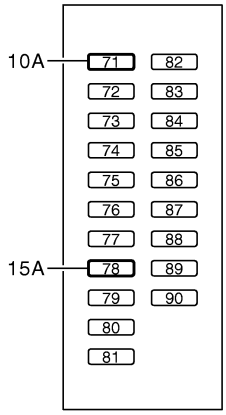
PIIB7456E

FOR ROADSTER



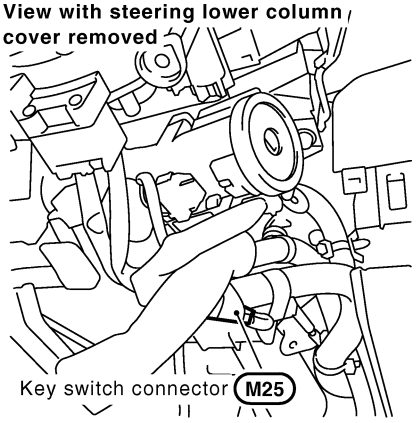
Fuse block (J/B) fuse layout



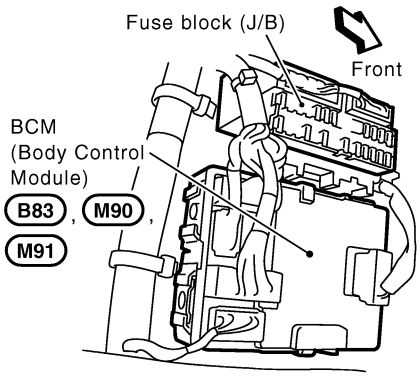


IPDM E/R fuse layout

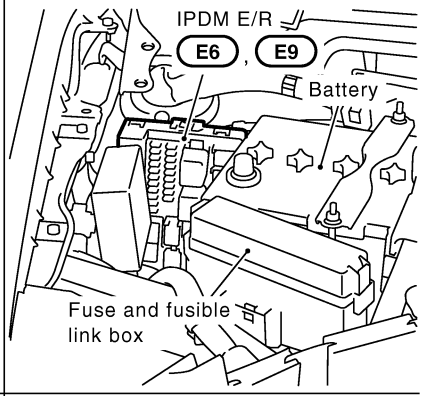
View with steering lower column cover removed

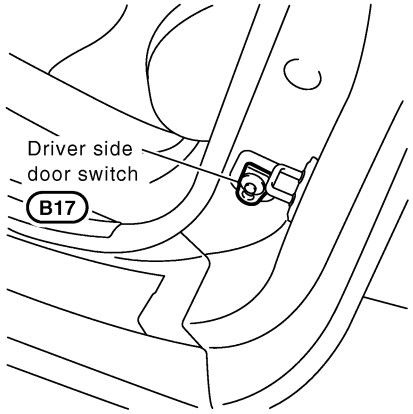


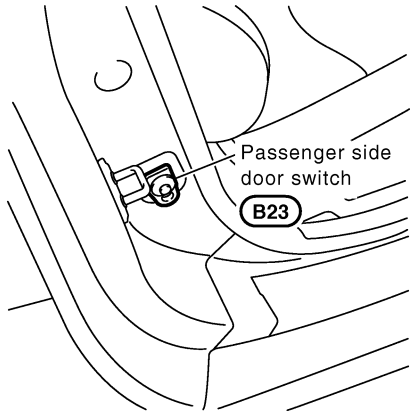
View with dash side LH removed



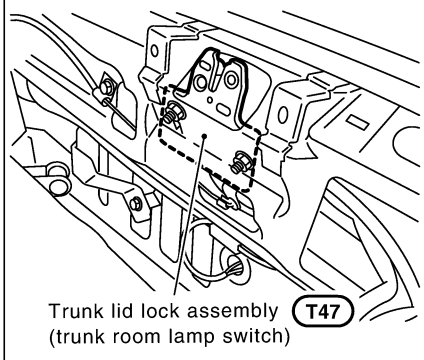
View with cowl top removed

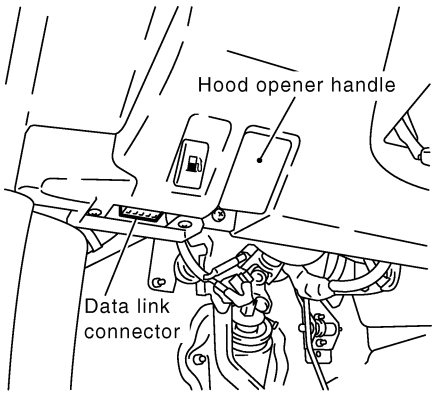




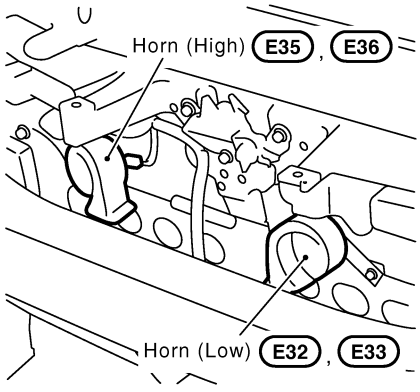


View with luggage finisher lower (center) removed

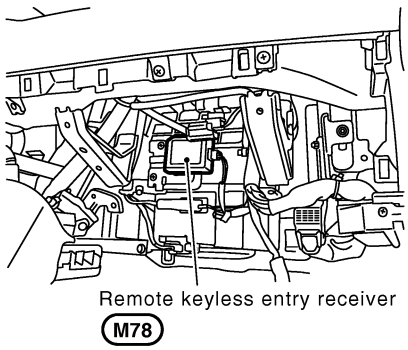




View with front bumper removed



View with instrument passenger panel lower removed



PIIB9172E

System Description

NIS00015

INPUTS

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No. 21, located in the fuse block (J/B)]
- to key switch terminal 2.

When the ignition switch is ON or START position, power is supplied

- through 10A fuse [No.1, located in the fuse block (J/B)]
- to BCM terminal 38.

When the ignition switch is ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

When the driver side door switch is ON (door is OPEN), ground is supplied

- to BCM terminal 62
- through driver side door switch terminal 1 and
- through driver door switch case ground.

When the passenger side door switch is ON (door is OPEN), ground is supplied

- to BCM terminal 12
- through passenger side door switch terminal 1 and
- through passenger side door switch case ground.

When the back door switch (For coupe models) is ON (door is OPEN), ground is supplied

- to BCM terminal 58
- through the back door switch terminals 1 and 3 and
- through body grounds B5, B6, D105 and T14.

When the trunk lid lock assembly (trunk room lamp switch) (For roadster models) is ON (trunk is OPEN), ground is supplied

- to BCM terminal 57
- through the trunk room lamp switch terminals 3 and 1 and
- through body grounds B5,B6 and T14.

When the key switch is ON (key is inserted in ignition key cylinder), power is supplied

- through key switch terminals 2 and 1
- to BCM terminal 37.

Key fob signal is inputted to remote keyless entry receiver (the antenna of the system is built in remote keyless entry receiver).
Remote keyless entry receiver sends keyfob signal

- to BCM terminal 20
- from remote keyless entry receiver terminal 2.

The remote keyless entry system controls operation of the

- power door lock
- hazard and horn reminder
- auto door lock
- interior lamp and step lamp
- panic alarm

- back door opener (For coupe)
- trunk lid opener (For roadster)
- keyless power window down (open)

OPERATION PROCEDURE

Power Door Lock Operation

BCM receives a LOCK signal from key fob. BCM locks all doors receiving of LOCK signal from key fob.
When an UNLOCK signal is sent from key fob once, driver's door will be unlocked.
Then, if an UNLOCK signal is sent from key fob again within 5 seconds, all other doors will be unlocked.

Hazard Reminder

When the doors are locked or unlocked by key fob, power is supplied to hazard warning lamp and it flashes as follows

- LOCK operation: C mode (flash twice) or S mode (flash twice)
- UNLOCK operation: C mode (flash once) or S mode (does not flash)

Horn Reminder

BCM output to IPDM E/R for horn reminder signal as DATA LINE (CAN H line and CAN L line).
The horn reminder has C mode (horn chirp mode) and S mode (non-horn chirp mode).

Operating function of hazard and horn reminder

	C mode		S mode	
Remote controller operation	Lock	Unlock	Lock	Unlock
Hazard warning lamp flash	Twice	Once	Twice	—
Horn sound	Once	—	—	—

Hazard and horn reminder does not operate if any door switch is ON (any door is OPEN).

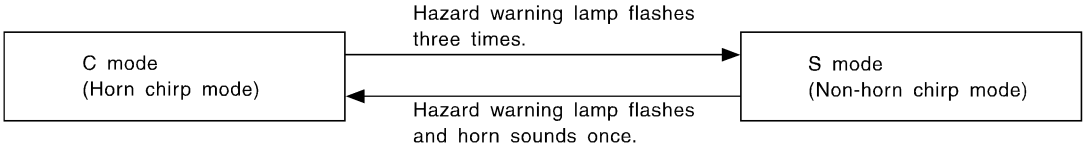
How to change hazard and horn reminder mode

With CONSULT-III

Hazard and horn reminder can be changed using “WORK SUPPORT” mode in “MULTI ANSWER BACK SET”.
Refer to BL-73, "Work Support" .

Without CONSULT-III

When LOCK and UNLOCK signals are sent from the key fob for more than 2 seconds at the same time, the hazard and horn reminder mode is changed and hazard warning lamp flashes and horn sounds as follows:



SEL153WA

Auto Door Lock Operation

Auto lock function signal is sent for operation when any of the following signals are not sent within 1 minute after the unlock signal is sent from the key fob:

- when door switch is turned ON for open.
- when the key switch is turned ON.
- when the lock signal is sent from the key fob.

Auto door lock mode can be changed using “WORK SUPPORT” mode in “AUTO LOCK SET”.
Refer to BL-73, "Work Support" .

Interior Lamp and Step Lamp Operation

When the following conditions come:

- condition of interior lamp switch is DOOR position;
- door switch OFF (when all the doors are closed);

Remote keyless entry system turns on interior lamp (for 30 seconds) with input of UNLOCK signal from key fob.
For detailed description, refer to LT-130, "MAP LAMP TIMER OPERATION" .

Panic Alarm Operation

When key switch is OFF (when ignition key is not inserted in key cylinder), BCM turns on and off horn and headlamp intermittently with input of PANIC ALARM signal from key fob.
The alarm automatically turns off after 25 seconds or when BCM receives any signal from key fob.
For detailed description, refer to BL-128, "PANIC ALARM OPERATION" .

Back Door Operation/For Coupe

When a BACK DOOR OPEN signal is sent with key OFF (ignition key removed from key cylinder) from key fob, power is supplied through BCM terminal 19.
When power and ground are supplied, back door opener actuator opens back door.

Trunk Opener Operation/For Roadster

When a TRUNK OPEN signal is sent with key OFF (ignition key removed from key cylinder) from key fob, power is supplied through BCM terminal 19.
When power and ground are supplied, trunk lid opener actuator opens trunk.

Keyless Power Window Down (open) Operation

When key fob unlock switch is turned ON with ignition switch OFF, and key fob unlock switch is detected to be on continuously for 3 seconds, the driver's door and passenger's door power windows are simultaneously opened.
Power window is operated to open and the operation continues as long as the key fob unlock switch is pressed.

CAN Communication System Description

NIS00016

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

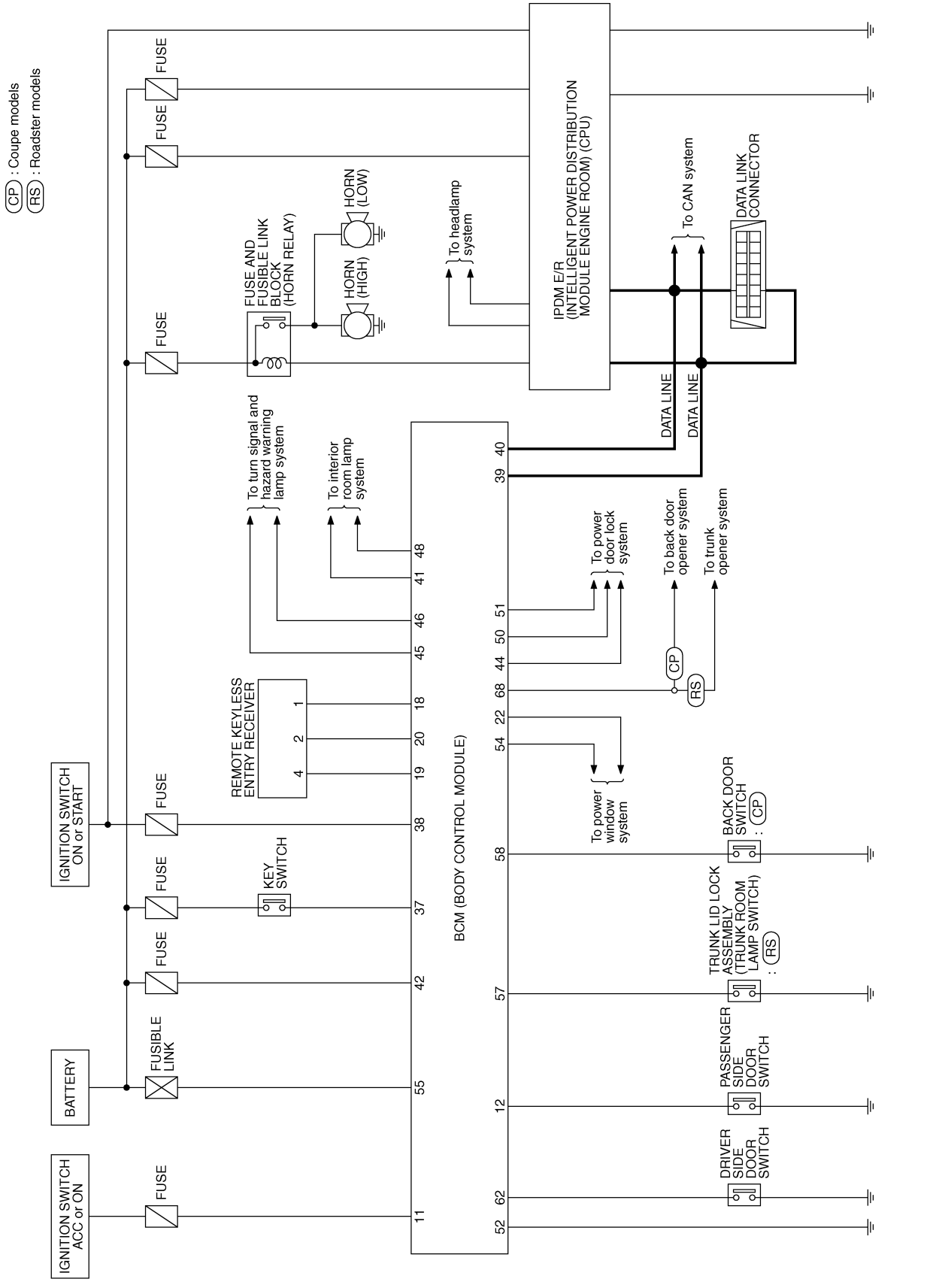
CAN Communication Unit

NIS00017

Refer to LAN-4, "CAN Communication System"

Schematic

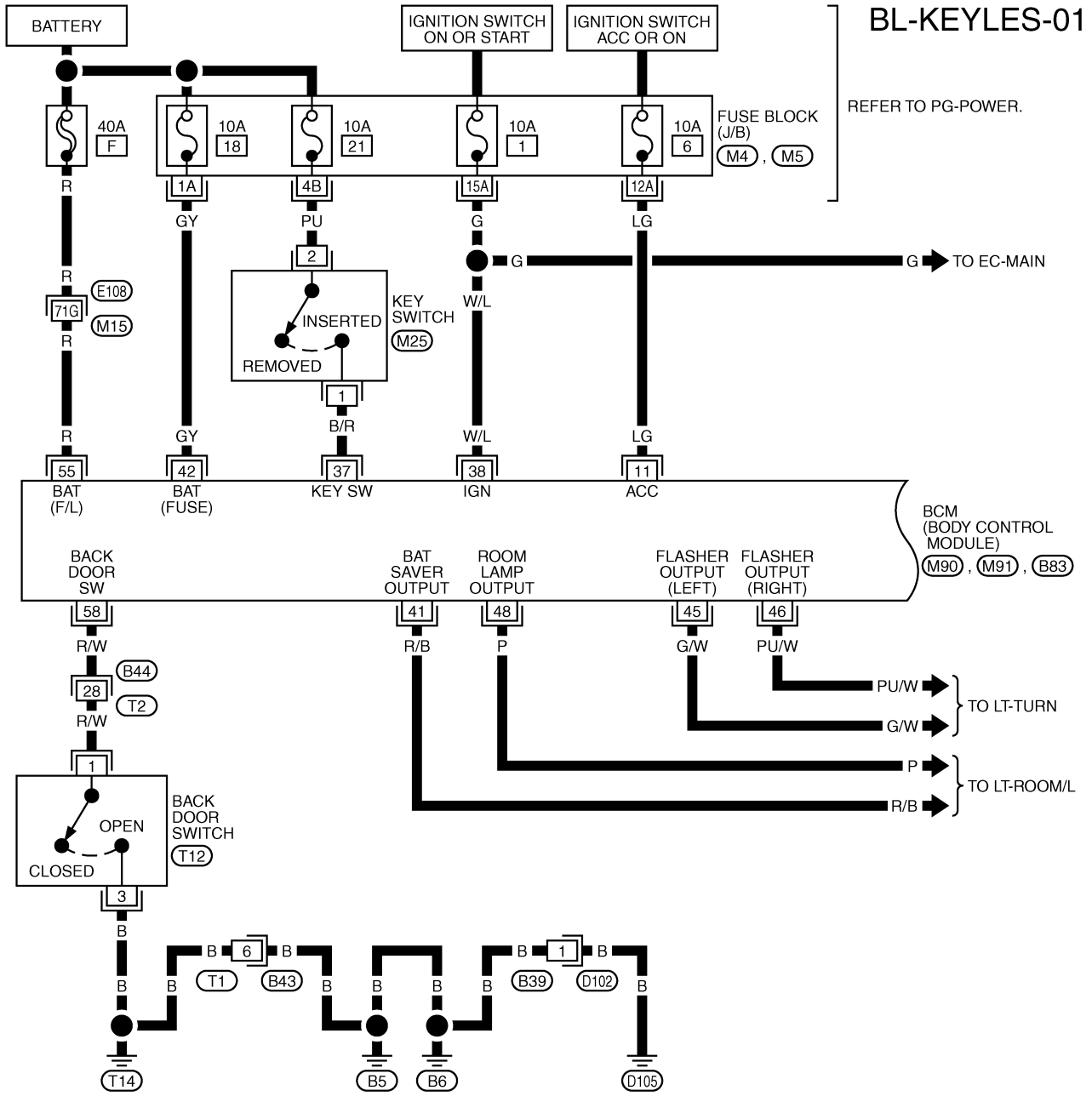
NIS00018

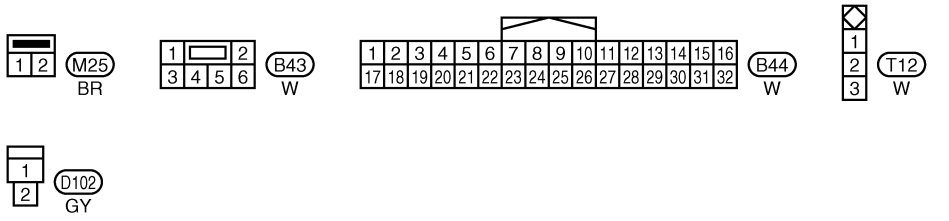


TIWT2193E

Wiring Diagram — KEYLES — /For Coupe

NIS00019

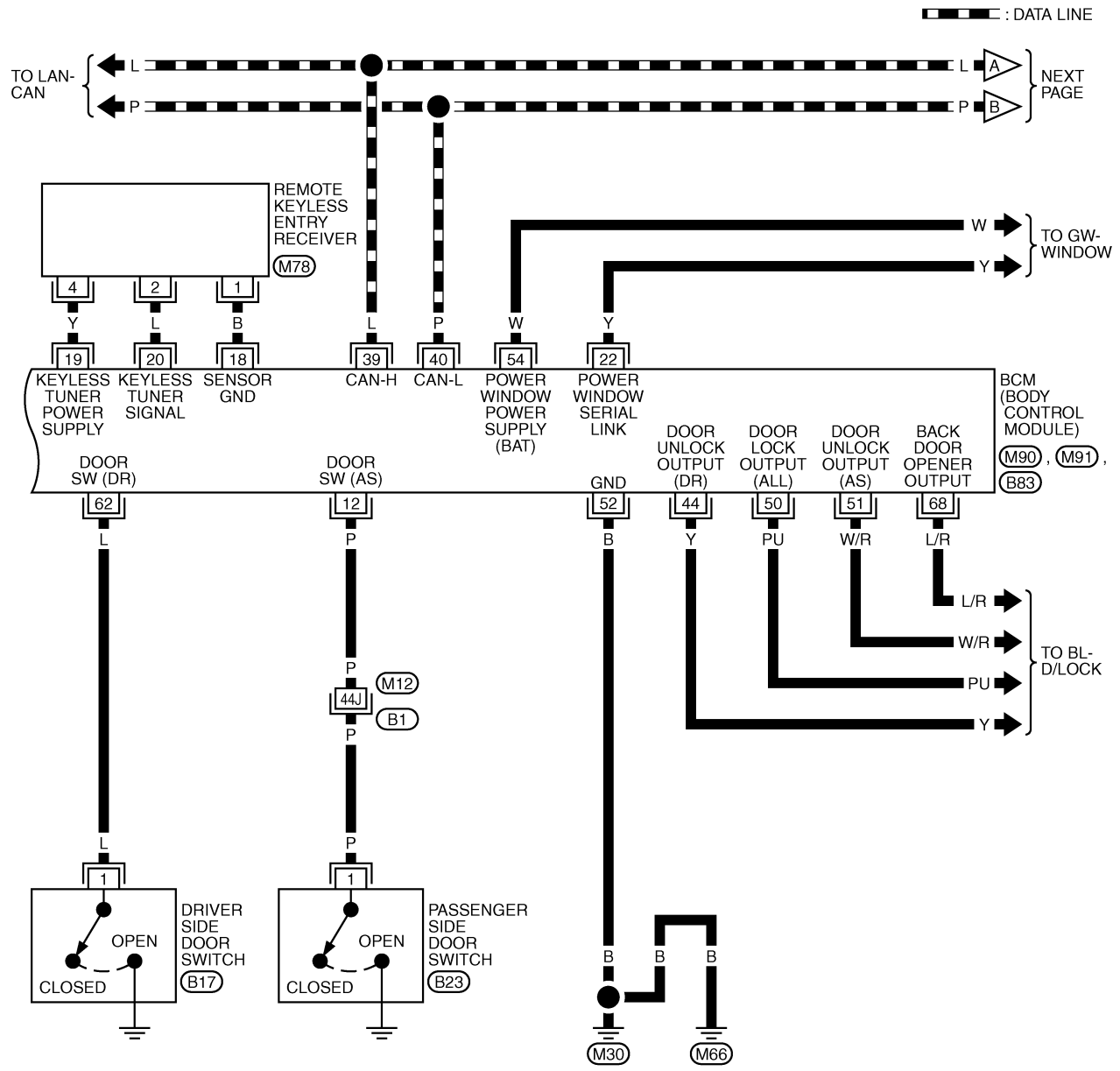


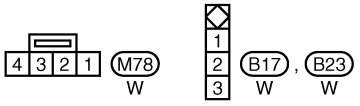


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT2263E

BL-KEYLES-02

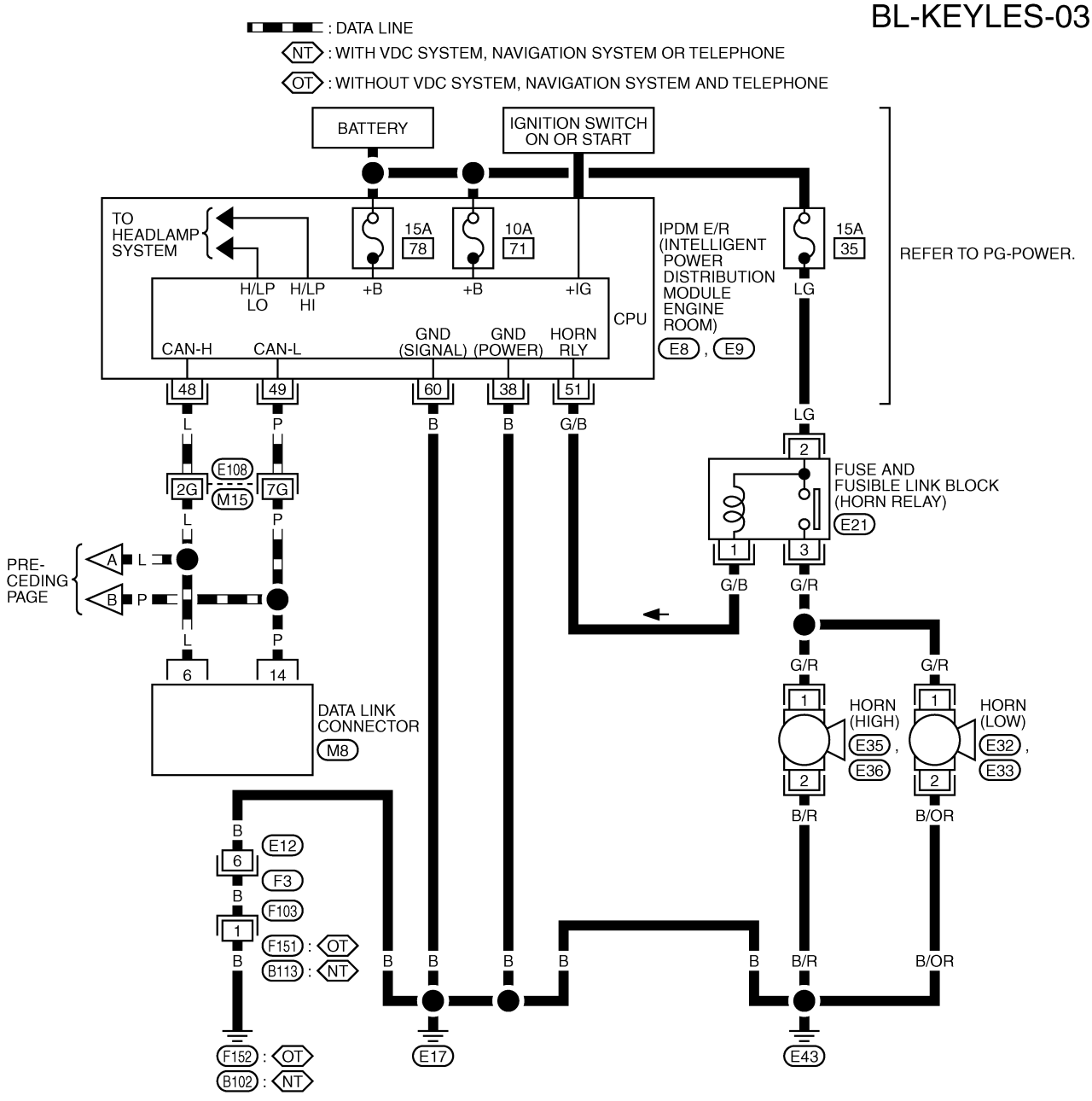


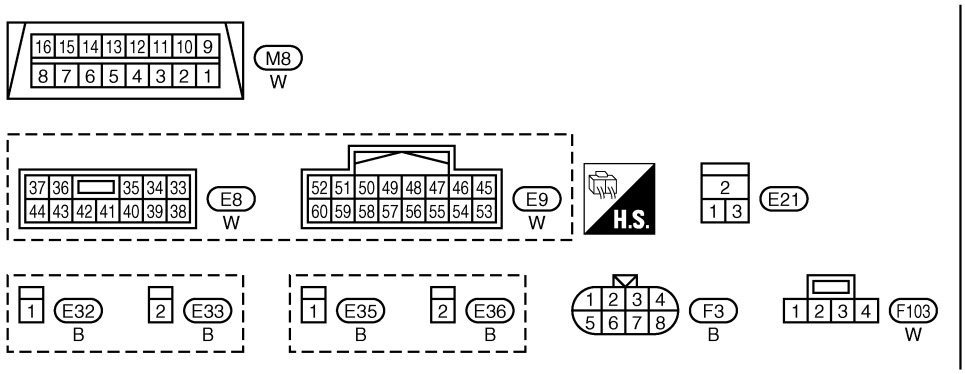


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 , B83
-ELECTRICAL UNITS

TIWT1577E

BL-KEYLES-03





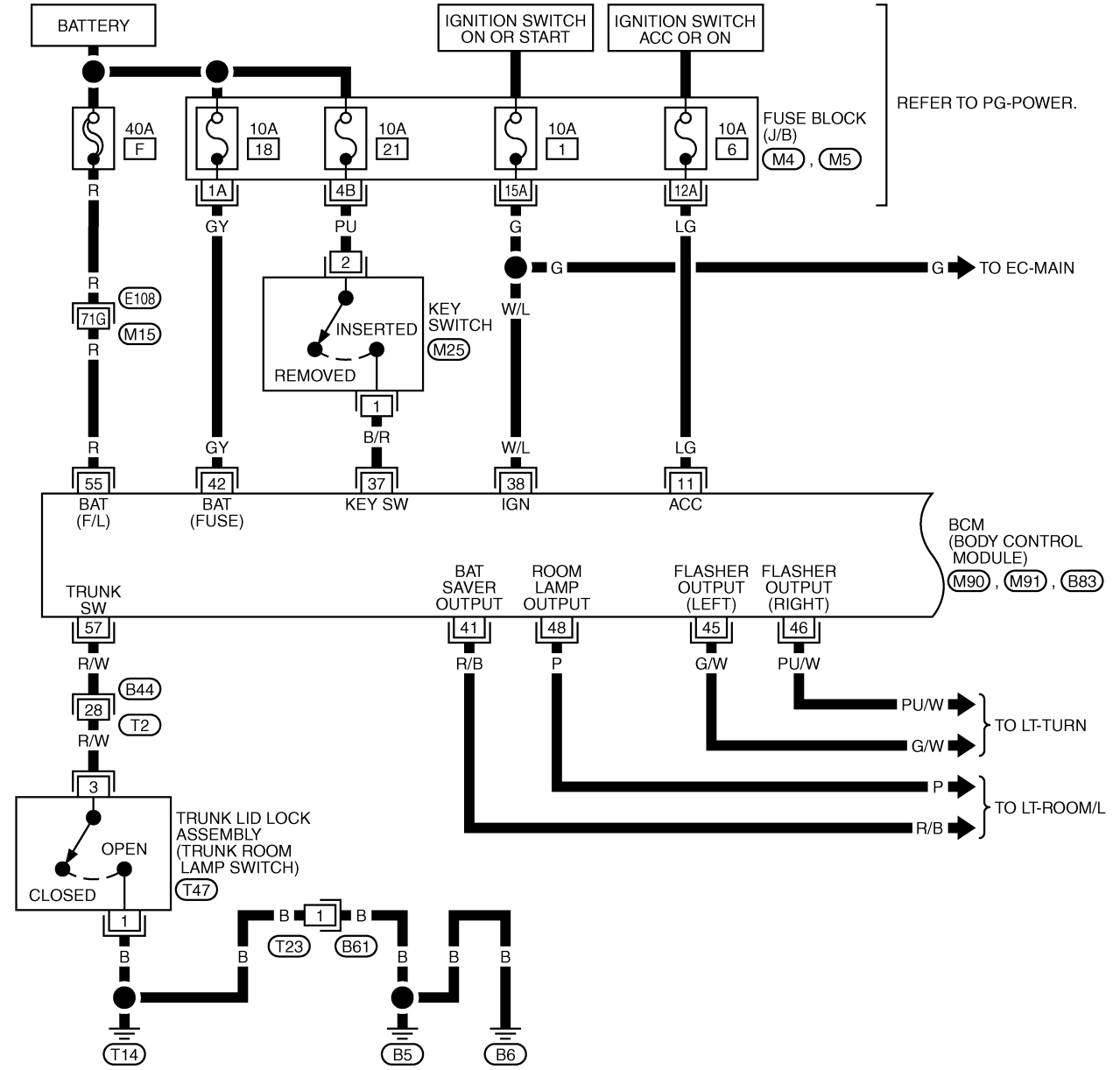
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

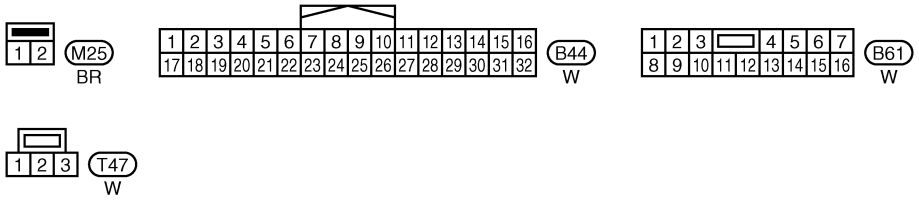
TIWT2264E

Wiring Diagram — KEYLES — /For Roadster

NIS0001A

BL-KEYLES-04





REFER TO THE FOLLOWING.

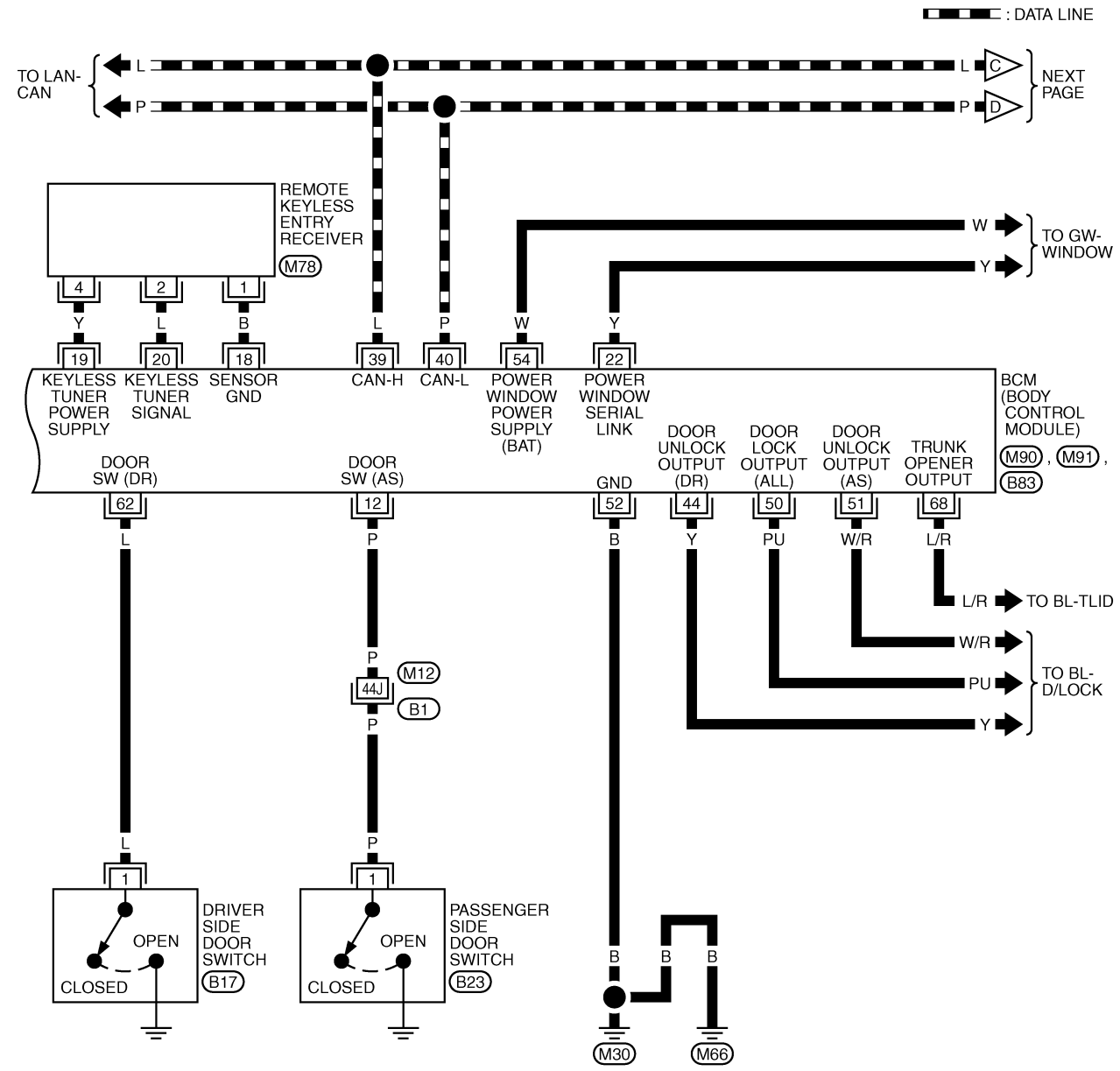
E108 -SUPER MULTIPLE JUNCTION (SMJ)

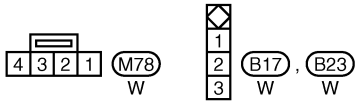
M4, M5 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91, B83 -ELECTRICAL UNITS

TIWT2265E

BL-KEYLES-05

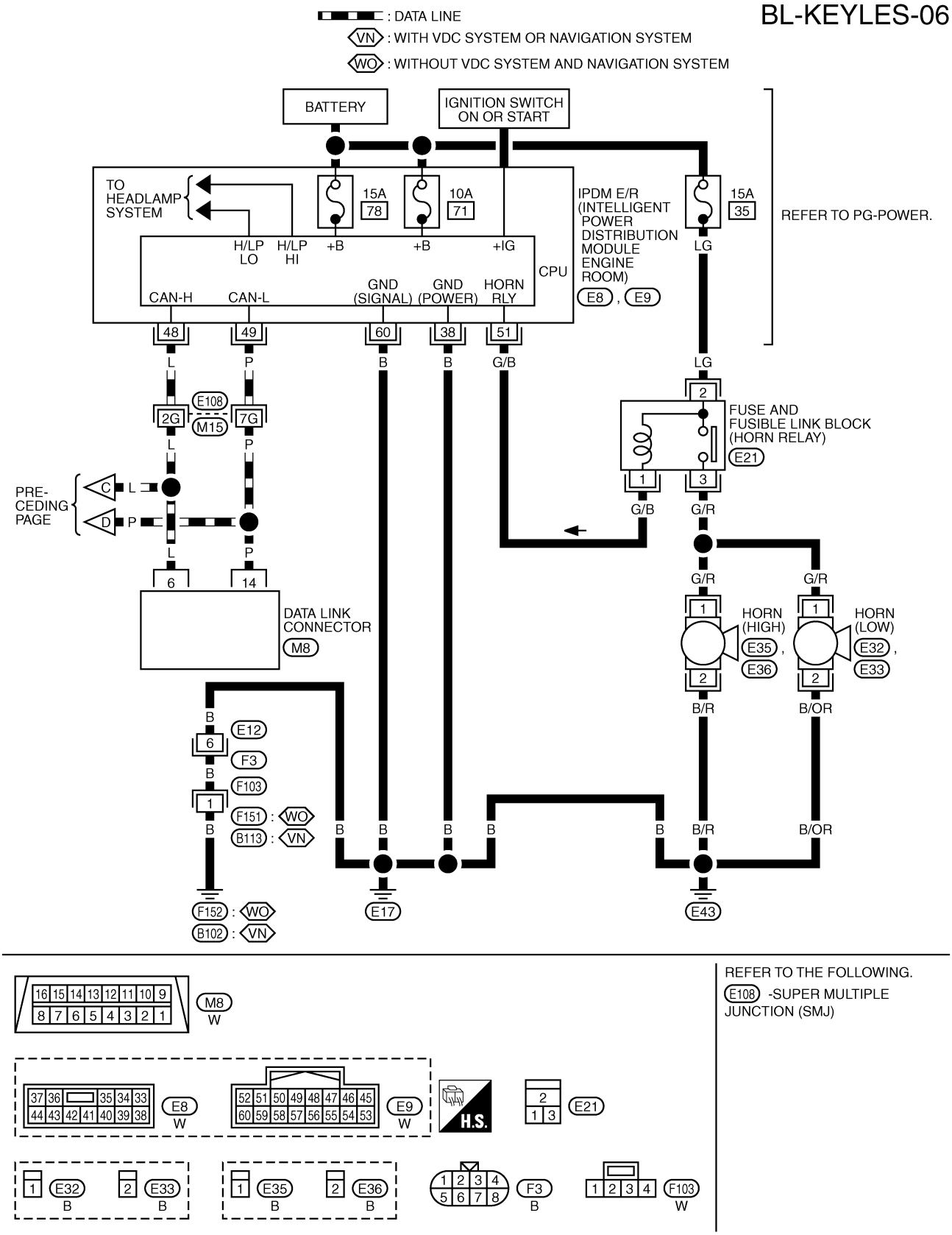




REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90, M91, B83
-ELECTRICAL UNITS

TIWT1580E

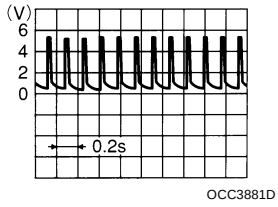
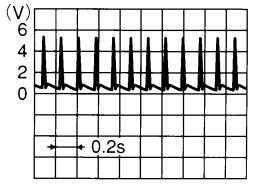
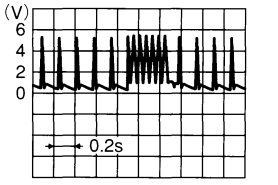
BL-KEYLES-06



TIWT2266E

Terminals and Reference Value for BCM

NIS0001B

Terminal	Wire color	Item	Signal input/ output	Condition	Voltage (V) (Approx.)
11	LG	Ignition switch (ACC)	Input	Ignition switch (ACC or ON position)	Battery voltage
12	P	Passenger side door switch	Input	ON (Open) → OFF (Closed)	0 → 5
18	B	Remote keyless entry receiver (Ground)	—	—	0
19	Y	Remote keyless entry receiver (Power supply)	Output	Key is inserted in IGN key cylinder	0
				All door closed	 OCC3881D
20	L	Remote keyless entry receiver (Signal)	Input	Key is inserted in IGN key cylinder	0
				Waiting (All door closed)	 OCC3879D
				When signal is received (All door closed)	 OCC3880D
37	B/R	Key switch (Insert)	Input	ON (Key inserted) → OFF (Key removed from IGN key cylinder)	Battery voltage → 0
38	W/L	Ignition switch (ON)	Input	Ignition switch (ON or START position)	Battery voltage
39	L	CAN – H	Input/ Output	—	—
40	P	CAN – L	Input/ Output	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage
57	R/W	Trunk lid lock assembly (trunk room lamp switch)*2	Input	ON (Open) → OFF (Closed)	0 → Battery voltage*1
58	R/W	Back door switch	Input		
62	L	Driver side door switch	Input	ON (Open) → OFF (Closed)	0 → 5

*1: When interior lamp battery saver control is in OFF: Approx 5V.
*2: For roadster.

Terminals and Reference Value for IPDM E/R

NIS0001C

Terminal	Wire color	Item	Signal input/output	Condition	Voltage (V) (Approx.)
38	B	Ground	—	—	0
48	L	CAN – H	Input/ Output	—	0
49	P	CAN – L	Input/ Output	—	0
51	G/B	Horn relay	Input	When door lock is operated using key fob* (ON → OFF)	Battery voltage → 0
60	B	Ground	—	—	0

*: In the state that horn reminder operates.

CONSULT-III Function (BCM)

NIS0001D

- CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis position	Inspection items and diagnosis mode	Description
MULTI REMOTE ENT	Data monitor	Displays the input remote keyless entry system data to BCM on real–time basis.
	Active test	Sends a drive signal to check the operation.
	Work support	Changes the setting for each function.

*:Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

CONSULT-III Application Items for BCM

NIS0001F

"MULTI REMOTE CONTENT"

Work Support

Test Item	Description
REMO CONT ID CONFIR	It can be checked whether key fob ID code is registered or not in this mode.
REMO CONT ID REGIST	Key fob ID code can be registered.
REMO CONT ID ERASUR	Key fob ID code can be erased.
MULTI ANSWER BACK SET	Hazard and horn reminder mode can be changed in this mode. The reminder mode will be changed when "MODE SET" on CONSULT-III screen is touched.
AUTO LOCK SET	Auto locking function mode can be changed in this mode. The function mode will be changed when "MODE SET" on CONSULT-III screen is touched.
PANIC ALRM SET	Panic alarm operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-III screen is touched.
TRUNK OPEN SET	Back door opener operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-III screen is touched.
	Trunk lid opener operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-III screen is touched.
PW DOWN SET	Keyless power window down (open) operation mode can be changed in this mode. The operation mode will be changed when"MODE SET" on CONSULT-III screen is touched.

Hazard and horn reminder mode

	ON (C mode)		OFF (S mode)		MODE 3		MODE 4		MODE 5		MODE 6	
Key fob operation	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock
Hazard warning lamp flash	Twice	Once	Twice	—	—	—	Twice	Once	Twice	—	—	Once
Horn sound	Once	—	—	—	—	—	—	—	Once	—	Once	—

Auto door lock operation mode

	MODE 1	MODE 2	MODE 3
Auto locking function	1 minutes	Nothing	5 minutes

Panic alarm operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Back door open operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Trunk lid open operation mode (Roadster models)

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Power window down (open) operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	3 seconds	Nothing	5 seconds

Data Monitor

Monitored Item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch in ON position.
ACC ON SW	Indicates [ON/OFF] condition of ignition switch in ACC position.

Monitored Item	Description
KEY ON SW	Indicates [ON/OFF] condition of key switch.
DOOR SW-DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	Indicates [ON/OFF] condition of passenger side door switch.
BACK DOOR SW	Indicates [ON/OFF] condition of back door switch (For Coupe).
LOCK SW DR/AS	Indicates [ON/OFF] condition of lock signal from lock/unlock switch.
UNLK SW DR/AS	Indicates [ON/OFF] condition of unlock signal from lock/unlock switch.
KEY CYL LK SW	Indicates [ON/OFF] condition of lock signal from door key cylinder switch.
LK BUTTON/SIG	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	Indicates [ON/OFF] condition of unlock signal from key fob.
PANIC BTN	Indicates [ON/OFF] condition of panic signal from key fob.
TRUNK OPNR SW	Indicates [ON/OFF] condition of trunk room lamp switch (For Roadster).
TRUNK BTN/SIG	Indicates [ON/OFF] condition of back door open signal from key fob.
	Indicates [ON/OFF] condition of trunk open signal from key fob. (For Roadster)
TRUNK OPN MNTR	Indicates [ON/OFF] condition of trunk lid opener switch. (For Roadster)
UN BUTTON ON	Indicates [ON/OFF] condition of unlock signal from key fob.
LK/UN BTN ON	Indicates [ON/OFF] condition of lock/unlock signal at the same time from key fob.
DOOR SW-RR	This is displayed even when it is not equipped.

Active Test

Test Item	Description
INT LAMP	This test is able to check interior lamp operation. The interior lamp is turned on when “ON” on CONSULT-III screen is touched.
IGN ILLUM	This is displayed even when it is not equipped.
TRUNK/BACK DOOR	This test is able to check back door (For Coupe) or trunk lid (For Roadster) opener actuator operation. The back door (For Coupe) or trunk (For Roadster) is unlocked when “ON” on CONSULT-III screen is touched.
HORN	This test is able to check panic alarm and horn reminder operations. The horn activate for 0.02 seconds after “ON” on CONSULT-III screen is touched.
HEAD LAMP(HI)	This test is able to check headlamps panic alarm operation. The headlamp illuminates for 0.5 seconds after “ON” on CONSULT-III screen is touched.
POWER WINDOW DOWN	This test is able to check power window open operation. The front power windows activate for 10 seconds after “ON” or CONSULT-III screen is touched.
FLASHER RIGHT	This test is able to check hazard reminder operation. The right hazard lamp turns on when “ON” on CONSULT-III screen is touched.
FLASHER LEFT	This test is able to check hazard reminder operation. The left hazard lamp turns on when “ON” on CONSULT-III screen is touched.
FLASHER RIGHT (CAN)	This test is able to check hazard reminder operation. The right hazard indicator lamp turns on when “ON” on CONSULT-III screen is touched.
FLASHER LEFT (CAN)	This test is able to check hazard reminder operation. The left hazard indicator lamp turns on when “ON” on CONSULT-III screen is touched.

CONSULT-III Application Items for IPDM E/R

NIS0001H

DATA MONITOR

Monitored Item	Description
HORN CHIRP	Indicates [ON/OFF] condition of horn function by IPDM E/R.

ACTIVE TEST

Test Item	Description
HORN	This test is able to check horn operation. Horn activates when “ON” on CONSULT-III screen is touched.

Work Flow

NIS0001I

1. Check the trouble symptom and customer's requests.
2. Understand outline of system. Refer to BL-61, "System Description" .
3. Confirm that power door lock system operates normally. Refer to BL-21, "POWER DOOR LOCK SYSTEM" .
4. Refer to trouble diagnosis chart by symptom, repair or replace any malfunctioning parts. Refer to BL-75, "Trouble Diagnosis Chart by Symptom" .
5. Inspection end.

Trouble Diagnosis Chart by Symptom

NIS0001J

NOTE:

- Always check the “Work Flow” before troubleshooting. Refer to BL-75, "Work Flow" .
- Always check key fob battery before replacing key fob.
- The panic alarm operation, back door or trunk lid (Roadster models) opener operation and keyless power window down operation of remote keyless entry system do not activate with the ignition key inserted in the ignition key cylinder.

Symptom	Diagnoses/service procedure	Reference page
All functions of remote keyless entry system do not operate.	1. Check key fob battery and function	BL-77
	2. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-III is OK, key fob is not malfunctioning.	BL-89
	3. Check remote keyless entry receiver	BL-85
	4. Replace BCM	BCS-17
The new ID of key fob cannot be entered without CONSULT-III.	1. Check key fob battery and function	BL-77
	2. Check key switch	BL-84
	3. Check door switch	BL-79
	4. Check ACC switch	BL-78
	5. Check door lock and unlock switch	BL-42
	6. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-III is OK, key fob is not malfunctioning.	BL-89
	7. Replace BCM	BCS-17
Door lock or unlock does not work.	1. Check door lock operation	BL-23
	2. Check key fob battery and function	BL-77
	3. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-III is OK, key fob is not malfunctioning.	BL-89
	4. Replace BCM	BCS-17
Back door does not open when back door opener button is continuously pressed.	1. Check back door opener operation	BL-23
	2. Check back door open operation mode	BL-73
	3. Check key fob battery and function	BL-77
	4. Check key switch	BL-84
	5. Replace BCM	BCS-17

Symptom	Diagnoses/service procedure	Reference page
Trunk does not open when trunk opener button is continuously pressed. (Roadster models)	1. Check trunk opener operation	BL-114
	2. Check trunk open operation mode	BL-73
	3. Check key fob battery and function	BL-77
	4. Check key switch	BL-84
	5. Replace BCM	BCS-17
Hazard reminder does not activate properly when pressing lock or unlock button of key fob.	1. Check hazard reminder mode * *: Hazard reminder can be activated or deactivated. First check the hazard reminder setting.	BL-73
	2. Check hazard warning lamp function with hazard switch.	LT-66
	3. Check door switch	BL-79
	4. Replace BCM	BCS-17
Horn reminder does not activate properly when pressing lock button of key fob.	1. Check horn reminder mode * *: Horn reminder can be activated or deactivated. First check the horn chirp setting.	BL-73
	2. Check horn chirp function with horn switch.	BL-88
	3. Check door switch	BL-79
	4. Check IPDM E/R operation	BL-85
	5. Replace BCM	BCS-17
Interior lamp and step lamp operation do not activate properly.	1. Check interior lamp and step lamp operation	BL-88
	2. Check door switch	BL-79
	3. Replace BCM	BCS-17
Panic alarm (horn and headlamp) does not activate when panic alarm button is continuously pressed.	1. Check panic alarm mode * *: Panic alarm can be activated or deactivated. First check the Panic alarm setting.	BL-73
	2. Check key fob battery and function	BL-77
	3. Check headlamp alarm	BL-88
	4. Check horn chirp function with horn switch.	BL-88
	5. Check IPDM E/R operation	BL-85
	6. Check key switch	BL-84
	7. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-III is OK, key fob is not malfunctioning.	BL-89
	8. Replace BCM	BCS-17
Auto door lock operation does not activate properly. (All other remote keyless entry system function is OK.)	1. Check auto door lock operation mode * *: Auto door lock operation can be activated or deactivated. First check the auto door lock operation setting.	BL-73
	2. Replace BCM	BCS-17
Keyless power window down (open) operation does not activate properly. (All other remote keyless entry system function is OK.)	1. Check power window down operation mode * *: Power window down operation can be activated or deactivated. First check the power window down setting.	BL-73
	2. Check power window function	GW-19
	3. Replace BCM	BCS-17

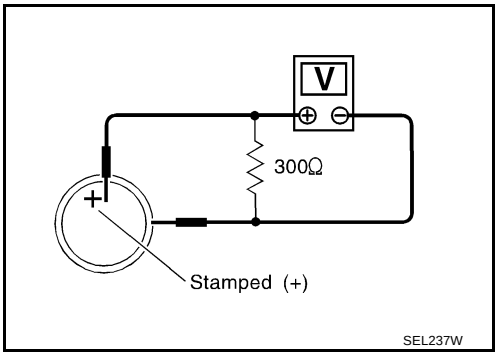
Check Key Fob Battery and Function

NIS0001K

1. CHECK KEY FOB BATTERY

1. Remove key fob battery. Refer to BL-91, "Key Fob Battery Replacement" .
2. Measure voltage between battery positive and negative terminals.

Voltage : 2.5 - 3.0V



NOTE:
Key fob does not function if battery is not set correctly.

OK or NG

OK >> GO TO 2
NG >> Replace battery.

2. CHECK KEY FOB FUNCTION

With CONSULT-III

Check key fob function in “DATA MONITOR” mode with CONSULT-III.
When pushing each button of key fob, the corresponding monitor item should be turned as follows.

Condition	Monitor item	
Pushing LOCK	KEYLESS LOCK	: ON
Pushing UNLOCK	KEYLESS UNLOCK	: ON
Keep pushing UNLOCK	RKE KEEP UNLK	: ON*
	*: “RKE KEEP UNLK” turns to ON 3 seconds after UNLOCK button keeps pushing.	
Pushing TRUNK	KEYLESS TRUNK	: ON
Pushing PANIC	KEYLESS PANIC	: ON
Pushing LOCK and UNLOCK at the same time	RKE LCK - UNLCK	: ON

OK or NG

OK >> Key fob is OK.
NG >> Replace key fob.

Check ACC Switch

NIS0001L

1. CHECK ACC SWITCH

With CONSULT-III

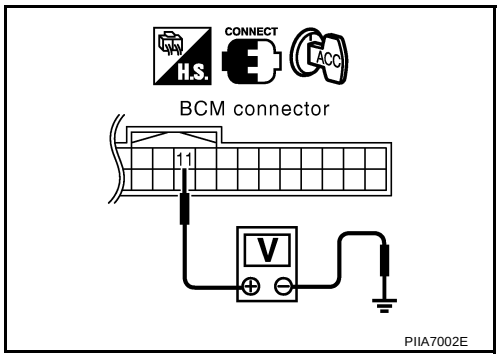
Check ACC switch (“ACC ON SW”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
ACC ON SW	Ignition switch position is ACC or ON	: ON
	Ignition switch position is OFF	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Item	Con-nector	Terminals (Wire color)		Condition	Voltage [V] (Approx.)
		(+)	(–)		
Ignition switch	M90	11 (LG)	Ground	ACC or ON	Battery voltage
				OFF	0



OK or NG

OK >> ACC switch is OK.

NG >> Check the following.

- 10A fuse [No. 6, located in fuse block (J/B)]
- Harness for open or short between BCM and fuse

Check Door Switch

NIS0001M

DRIVER SIDE DOOR SWITCH AND PASSENGER SIDE DOOR SWITCH CHECK

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

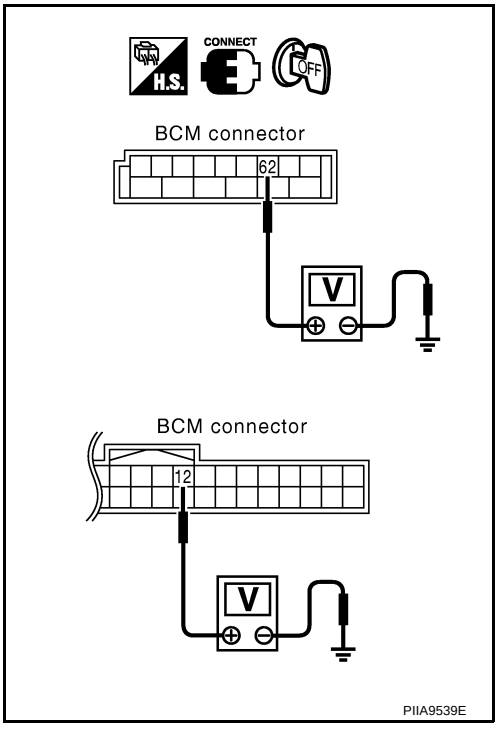
Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Item	Con-nector	Terminals (Wire color)		Condition	Voltage [V] (Approx.)
		(+)	(–)		
Driver side door switch	B83	62 (L)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK.

NG >> GO TO 2.

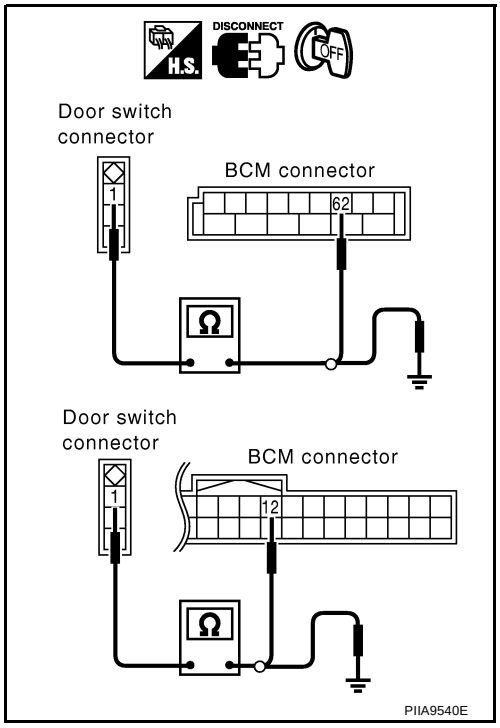
2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23 terminal 1 and BCM harness connector B83 terminal 62 (driver side) or M90 terminal 12 (passenger side).

Driver side door
1 (L) - 62 (L) : Continuity should exist.
Passenger side door
1 (P) - 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23 terminal 1and ground.

Driver side door switch
1 (L) - Ground : Continuity should not exist.
Passenger side door switch
1(P) - Ground : Continuity should not exist.



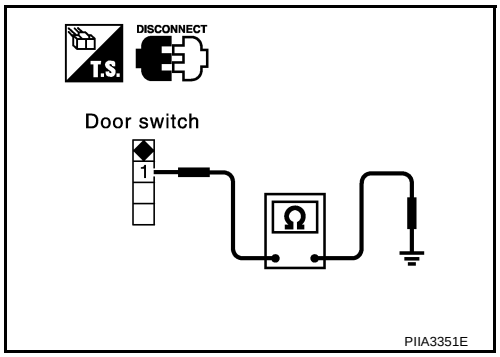
OK or NG
OK >> GO TO 3.
NG >> Repair or replace door switch harness.

3. CHECK DOOR SWITCH

Check continuity between door switch B17 (driver side) or B23 (passenger side) terminal 1 and ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Ground part of door switch	Pushed (close)	No
		Released (open)	Yes

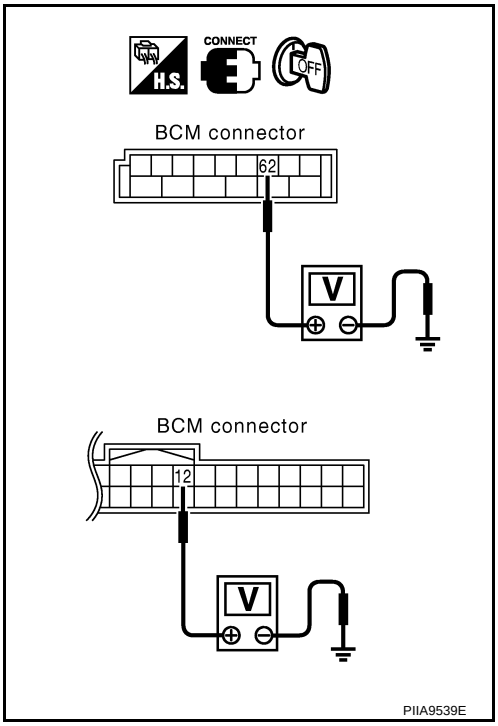
OK or NG
OK >> GO TO 4.
NG >> Replace door switch.



4. CHECK DOOR SWITCH INPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM harness connectors B83 (driver side), M90 (passenger side) terminals 62, 12 and ground.

62 (L) – Ground : Approx. 5V
12 (P) – Ground : Approx. 5V



OK or NG

OK >> Check harness connection.
NG >> Replace BCM.

CHECK BACK DOOR SWITCH /FOR COUPE

1. CHECK BACK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

Check back door switch (“BACK DOOR SW”) in “DATA MONITOR” mode with CONSULT-III.

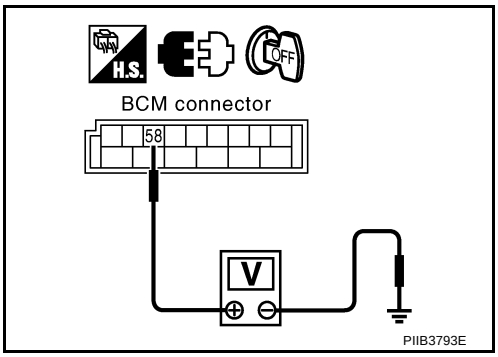
Monitor item	Condition	
BACK DOOR SW	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

1. Turn ignition switch OFF.
2. Check voltage between BCM connector and ground.

Connector	Terminals (Wire color)		Condition of back door switch	Voltage [V] (Approx.)
	(+)	(–)		
B83	58 (R/W)	Ground	Open	0
			Close	Battery voltage*

* : When interior lamp battery saver control is in OFF. → Approx. 5V



OK or NG

OK >> Back door switch circuit is OK.
NG >> GO TO 2.

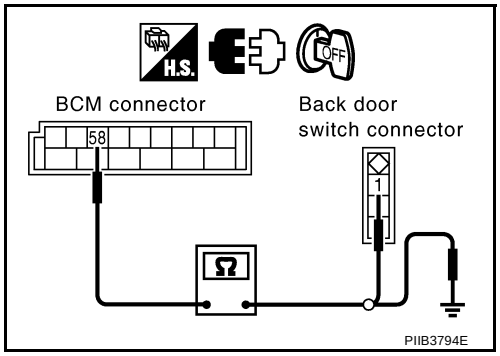
2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect back door switch and BCM connector.
3. Check continuity between BCM harness connector B83 terminal 58 and back door switch harness connector T12 terminal 1.

58 (R/W) - 1 (R/W) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 58 and ground.

58 (R/W) - Ground : Continuity should not exist.



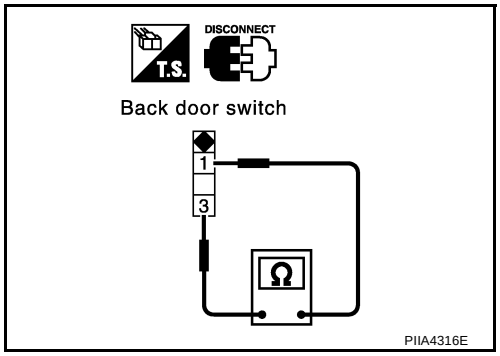
OK or NG

OK >> GO TO 3.
NG >> Repair or replace back door switch harness.

3. CHECK BACK DOOR SWITCH

Check continuity between back door switch terminals 1 and 3.

Connector	Terminal		Condition of back door switch	Continuity
T12	1	3	Open position	Yes
			Closed position	No



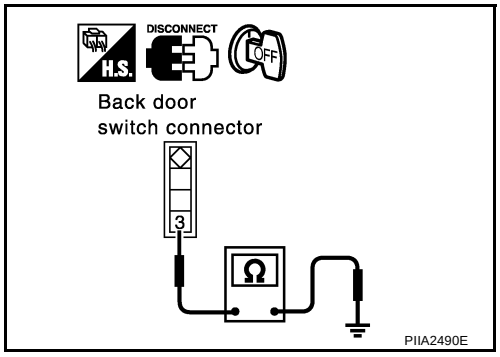
OK or NG

OK >> GO TO 4.
NG >> Replace back door switch.

4. CHECK BACK DOOR SWITCH GROUND CIRCUIT

Check continuity between door switch harness connector T12 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check harness connection.
NG >> Repair or replace back door switch harness.

Check Trunk Lid Lock Assembly (Trunk Room Lamp Switch) / For Roadster

NIS0001N

1. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) INPUT SIGNAL

With CONSULT-III

Check trunk lid opener switch (“TRUNK OPN MNTR”) in “DATA MONITOR” mode with CONSULT-III.

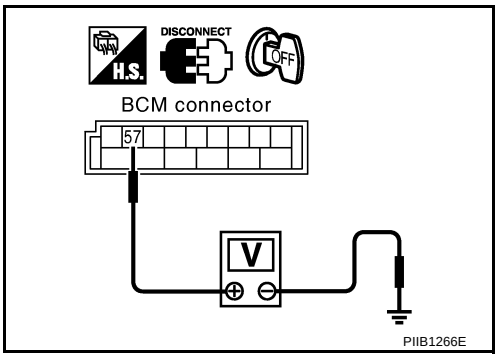
Monitor item	Condition	
TRNK OPN MNTR	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Con-nector	Terminals (Wire color)		Condition of trunk lid lock assembly (trunk room lamp switch)	Voltage [V] (Approx.)
	(+)	(–)		
B83	57 (R/W)	Ground	Open	0
			Close	Battery voltage*

*: When interior lamp battery saver control is in OFF. → Approx. 5V.



OK or NG

OK >> Trunk room lamp switch is OK.
NG >> GO TO 2.

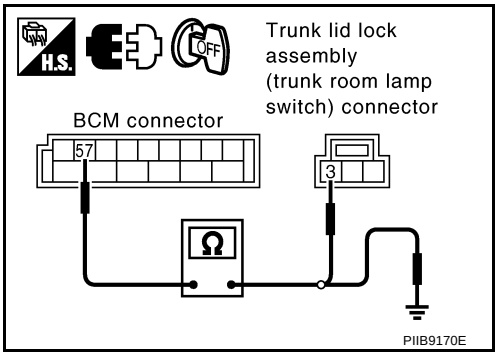
2. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect trunk lid lock assembly (trunk room lamp switch) and BCM connector.
3. Check continuity between BCM harness connector B83 terminal 57 and trunk lid lock assembly (trunk room lamp switch) harness connector T47 terminal 3.

   57 (R/W) - 3 (R/W) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 57 and ground.

   57 (R/W) - Ground : Continuity should not exist.



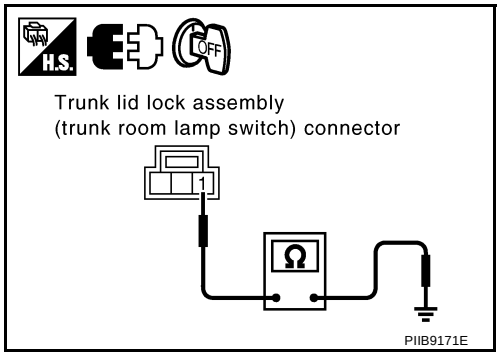
OK or NG

OK >> GO TO 3.
NG >> Repair or replace trunk lid lock assembly (trunk room lamp switch) harness.

3. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect trunk lid lock assembly (trunk room lamp switch) connector.
3. Check continuity between trunk lid lock assembly (trunk room lamp switch) connector T47 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check trunk lid lock assembly (trunk room lamp switch).
NG >> Repair or replace trunk lid lock assembly (trunk room lamp switch) harness.

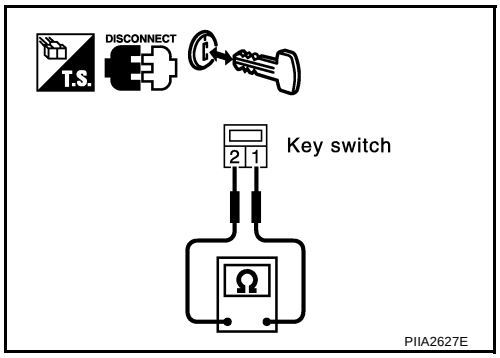
Check Key Switch

NIS0001O

1. CHECK KEY SWITCH

Check continuity key switch terminals 1 and 2.

Connector	Terminals		Condition of key switch	Continuity
M25	1	2	Inserted	Yes
			Removed	No



OK or NG

OK >> GO TO 3.
NG >> Replace key switch.

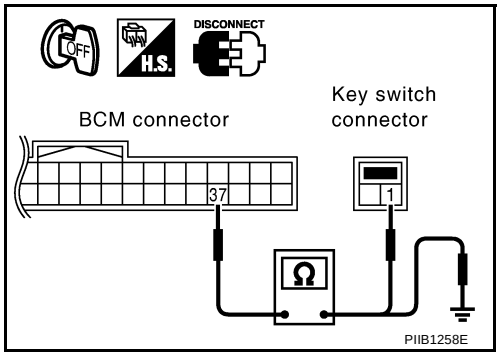
2. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 and key switch harness connector M25 terminal 1.

37 (B/R) - 1 (B/R) : Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 and ground.

37 (B/R) - Ground : Continuity should not exist.



OK or NG

OK >> Check the following.
- 10A fuse [No.21, located in the fuse block (J/B)]
- Harness for open or short between key switch and fuse

NG >> Repair or replace harness.

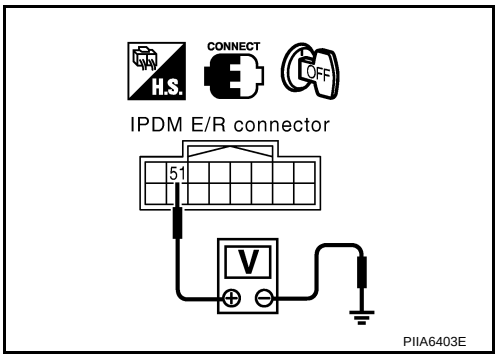
Check IPDM E/R Operation

NIS0001P

1. CHECK IPDM E/R INPUT SIGNAL

Check voltage between IPDM E/R connector E9 terminal 51 and ground.

51 (G/B) – Ground : Battery voltage



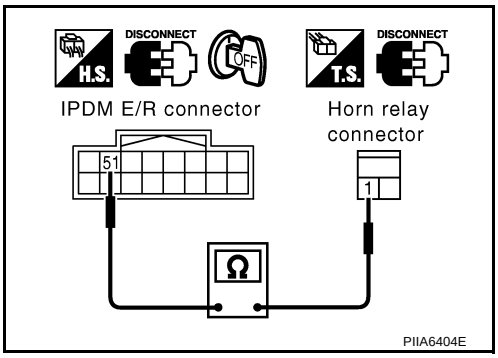
OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 2.

2. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R and horn relay connector.
3. Check continuity between IPDM E/R harness connector E9 terminal 51 and horn relay harness connector E21 terminal 1.

1 (G/B) - 51(G/B) : Continuity should exist.



OK or NG

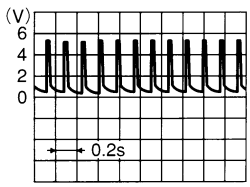
OK >> Check harness connection.
NG >> Repair or replace harness.

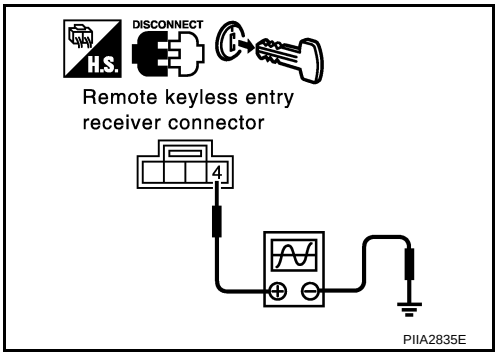
Check Remote Keyless Entry Receiver

NIS0001Q

1. CHECK MULTI-REMOTE CONTROL RECEIVER INPUT VOLTAGE

1. Remove key from ignition key cylinder.
2. Check signal between remote keyless entry receiver connector and ground with oscilloscope.

Con-nector	Terminal (Wire color) (+)	Terminal (Wire color) (–)	Condition	Signal (Reference value)
M78	4 (Y)	Ground	Key is inserted in IGN key cylinder	0
			All door closed	



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

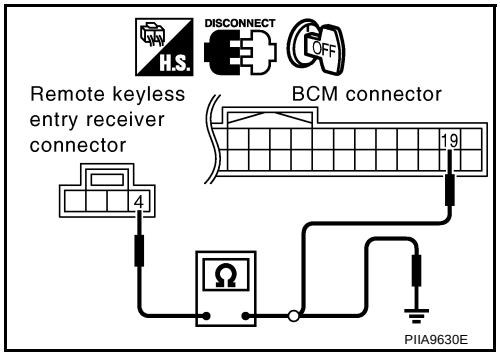
2. CHECK REMOTE KEYLESS ENTRY RECEIVER HARNESS

1. Turn ignition switch OFF.
2. Disconnect remote keyless entry receiver and BCM connector.
3. Check continuity between remote keyless entry receiver connector M78 terminal 4 and BCM connector M90 terminal 19.

4 (Y) - 19 (Y) : Continuity should exist.

4. Check continuity between remote keyless entry receiver connector M78 terminal 4 and ground.

4 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Check harness connection.
NG >> Repair or replace the harness.

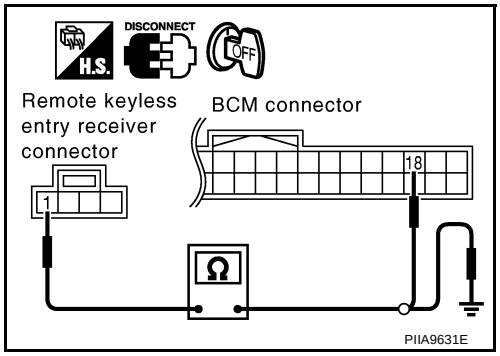
3. CHECK REMOTE KEYLESS ENTRY RECEIVER

1. Turn ignition switch OFF.
2. Check continuity between remote keyless entry receiver connector M78 terminal 1 and BCM connector M90 terminal 18.

1 (B) - 18 (B) : Continuity should exist.

3. Check continuity between remote keyless entry receiver connector M78 terminal 1 and ground.

1 (B) - Ground : Continuity should not exist.

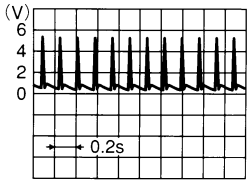
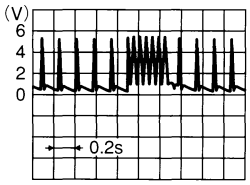


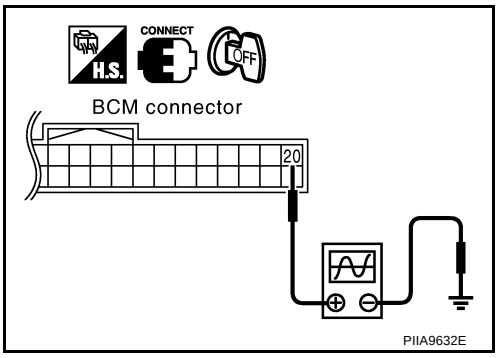
OK or NG

OK >> GO TO 4.
NG >> Repair or replace the harness.

4. CHECK REMOTE KEYLESS ENTRY RECEIVER OUTPUT SIGNAL

1. Connect remote keyless entry receiver connector.
2. Check signal BCM connector and ground with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (–)	Condition	Signal (Reference value)
M90	20 (L)	Ground	Key is inserted in IGN key cylinder	0
			Waiting (All door closed)	 OCC3879D
			When signal is received (All door closed)	 OCC3880D



OK or NG

OK >> Replace BCM.
NG >> GO TO 5.

5. CHECK REMOTE KEYLESS ENTRY RECEIVER HARNESS

1. Disconnect remote keyless receiver and BCM connector.
2. Check continuity between remote keyless entry receiver connector M78 terminal 2 and BCM connector M90 terminal 20.

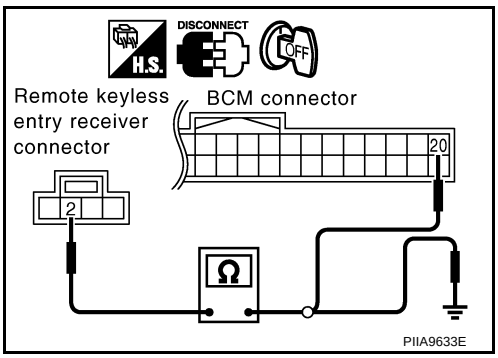
2 (L) - 20 (L) : Continuity should exist.

3. Check continuity between remote keyless entry receiver connector M78 terminal 2 and ground.

2 (L) - Ground : Continuity should not exist.

OK or NG

OK >> Replace remote keyless entry receiver.
NG >> Repair or replace the harness.



Check Horn Function

NIS0001R

First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-III, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

1. CHECK HORN OPERATION

Check if horn sounds with horn switch.

Does horn operate?

Yes >> Horn circuit is OK.
No >> Check horn circuit. Refer to WW-53, "Wiring Diagram — HORN —" .

Check Headlamp Alarm

NIS0001S

First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-III, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

1. CHECK HEADLAMP OPERATION

Does headlamp come on when turning lighting switch “ON”.

YES or NO

Yes >> Headlamp alarm circuit is OK.
No >> Check headlamp system. Refer to LT-5, "HEADLAMP (FOR USA)" , LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -" ,.

Check Interior Lamp Operation

NIS0001T

1. CHECK ILLUMINATION OPERATION

When interior lamp switch is in “DOOR” position, open the door (driver side or passenger side).

Interior lamp should illuminate.

OK or NG

OK >> Interior lamp circuit is OK.
NG >> Check interior lamp circuit. Refer to LT-128, "INTERIOR ROOM LAMP" .

ID Code Entry Procedure

NIS0001U

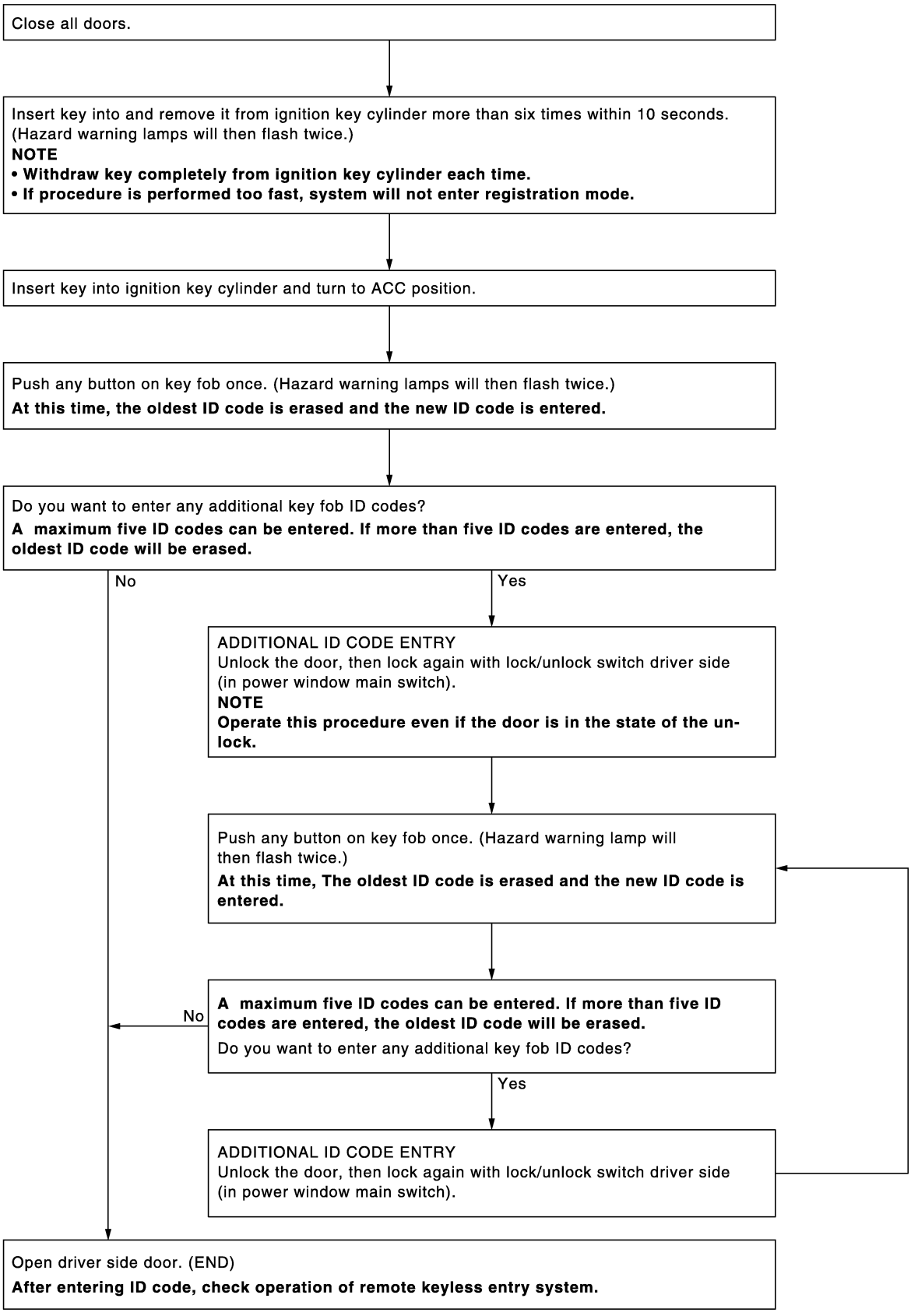
KEY FOB ID SETUP WITH CONSULT-III

NOTE:
If a key fob is lost, the ID code of the lost key fob must be erased to prevent unauthorized use. When the ID code of a lost key fob is not known, all controller ID codes should be erased. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.

1. Touch “WORK SUPPORT”.

2. The items shown on the figure can be set up.
   - “REMO CONT ID REGIST”
     Use this mode to register a key fob ID code.
     NOTE:
     Register the ID code when key fob or BCM is replaced, or when additional key fob is required.
   - “REMO CONT ID ERASUR”
     Use this mode to erase a key fob ID code.
   - “REMO CONT ID CONFIR”
     Use this mode to confirm if a key fob ID code is registered or not.

KEY FOB ID SETUP WITHOUT CONSULT-III



PIIA2839E

NOTE:

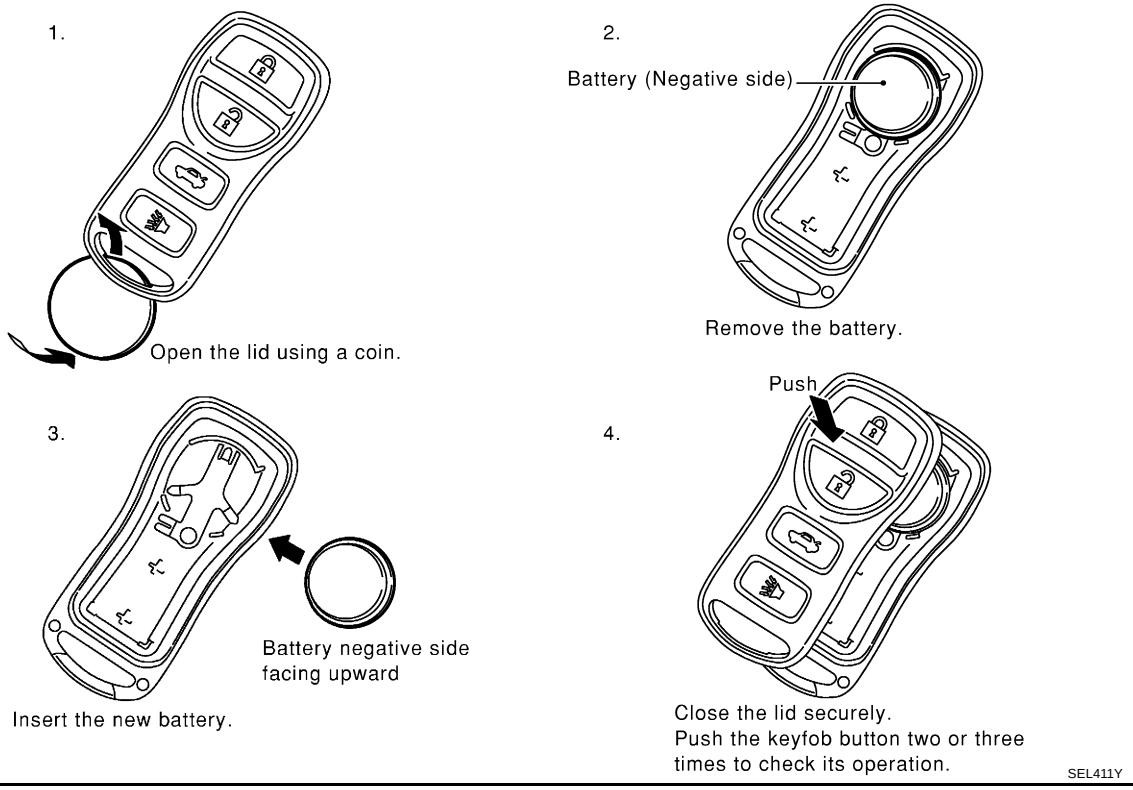
- If a key fob is lost, the ID code of the lost key fob must be erased to prevent unauthorized use. A specific ID code can be erased with CONSULT-III. However, when the ID code of a lost key fob is not known, all controller ID codes should be erased. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.
  To erase all ID codes in memory, register one ID code (key fob) five times. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.
- When registering an additional key fob, the existing ID codes in memory may or may not be erased. If five ID codes are stored in memory, when an additional code is registered, only the oldest code is erased. If less than five ID codes are stored in memory, when an additional ID code is registered, the new ID code is added and no ID codes are erased.
- If you need to activate more than two additional new key fobs, repeat the procedure “Additional ID code entry” for each new key fob.
- Entry of maximum five ID codes is allowed. When more than five ID codes are entered, the oldest ID code will be erased.
- Even if same ID code that is already in the memory is input, the same ID code can be entered. The code is counted as an additional code.

Key Fob Battery Replacement

NIS0001V

NOTE:

- Be careful not to touch the circuit board or battery terminal.
- The keyfob is water-resistant. However, if it does get wet, immediately wipe it dry.

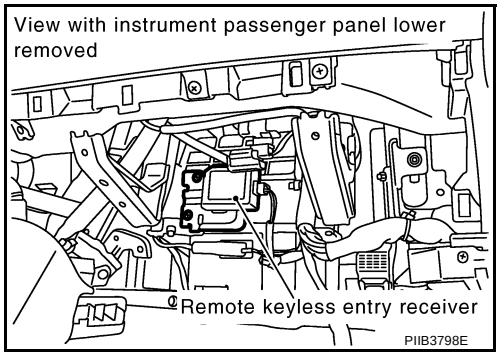


Removal and Installation of Remote Keyless Entry Receiver

NIS0001W

REMOVAL

1. Remove the instrument passenger panel lower. Refer to IP-13, "(L) Instrument Passenger Panel Lower" .
2. Remove the screw and remote keyless entry receiver connector.
3. Remove the remote keyless entry receiver.



INSTALLATION

Install in the reverse order of removal.

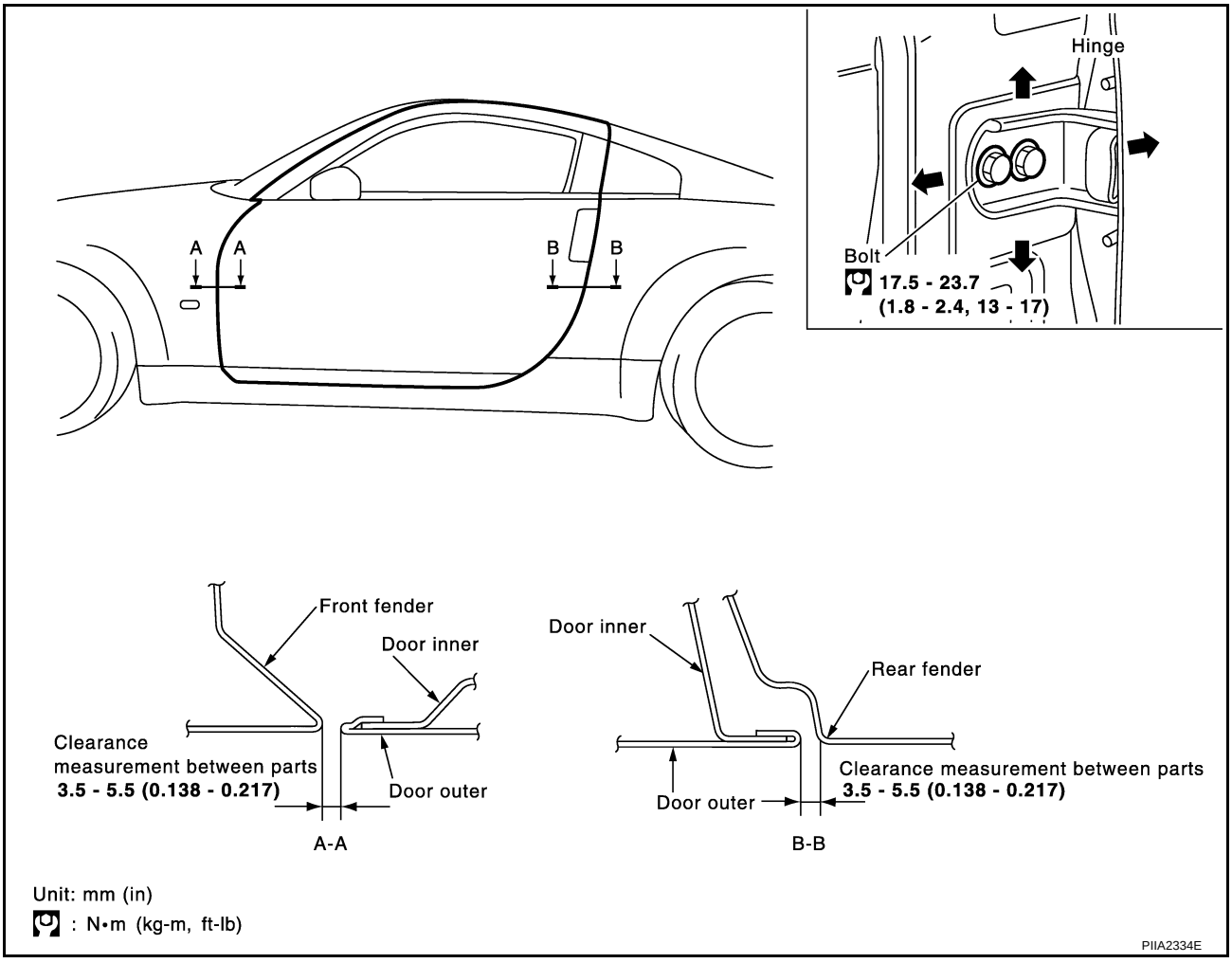
DOOR

PFP:80100

Fitting Adjustment

NIS0001X

COUPE



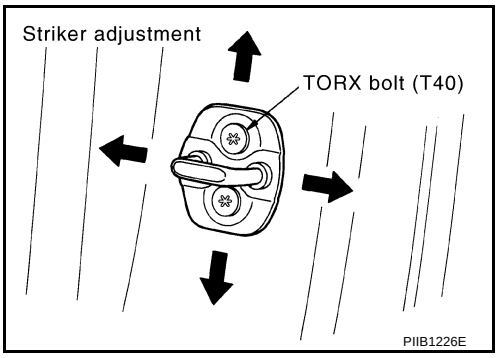
DOOR

Longitudinal clearance and surface height adjustment at front end

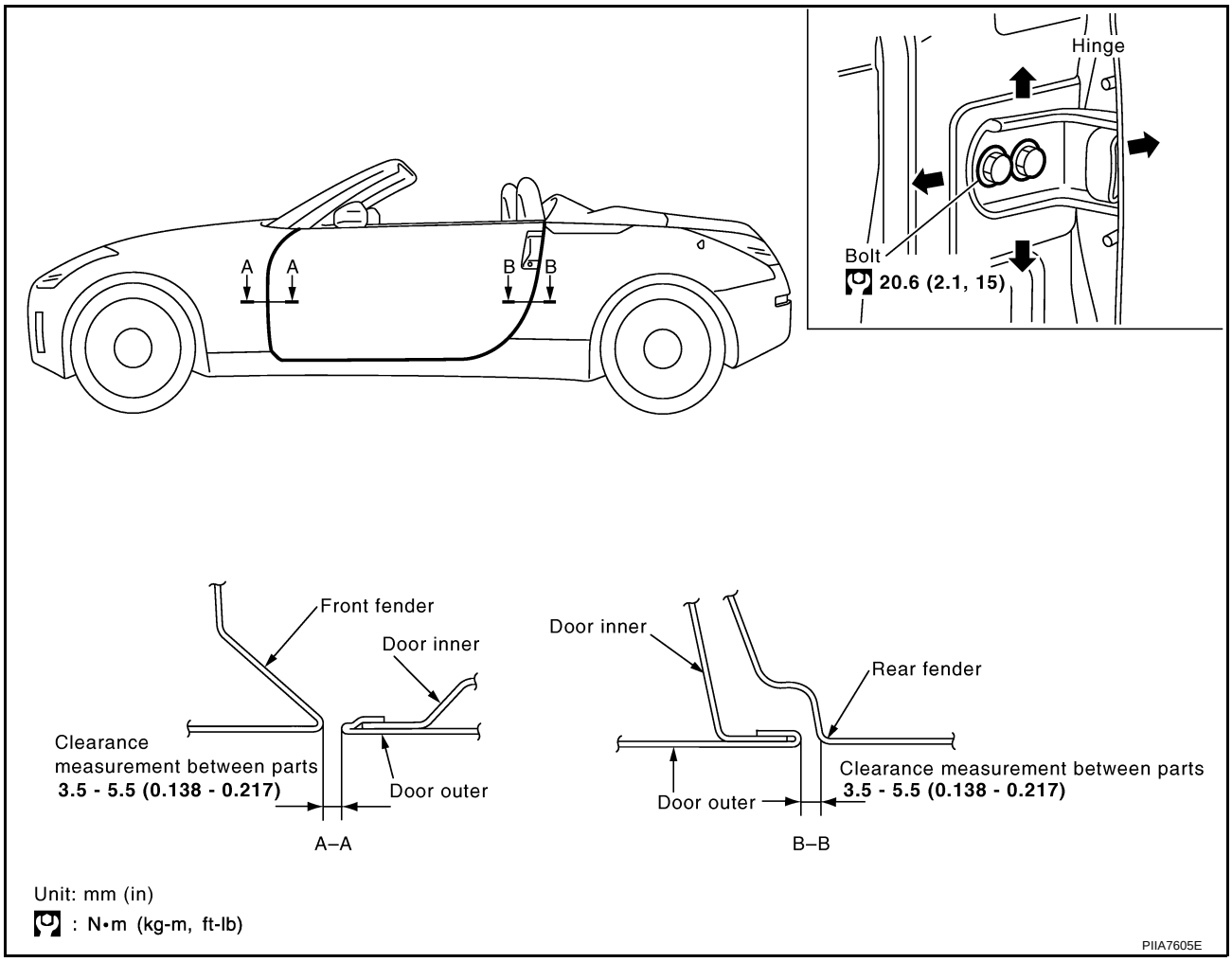
1. Remove the fender protector. Refer to EI-21, "FENDER PROTECTOR" .
2. Loosen the hinge mounting bolts. Raise the door at rear end to adjust.

STRIKER ADJUSTMENT

Adjust the striker so that it becomes parallel with the lock insertion direction.



ROADSTER



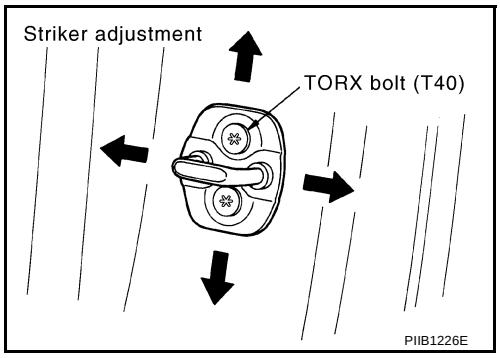
DOOR

Longitudinal clearance and surface height adjustment at front end

1. Remove the fender protector. Refer to EI-21, "FENDER PROTECTOR" .
2. Loosen the hinge mounting bolts. Raise the door at rear end to adjust.

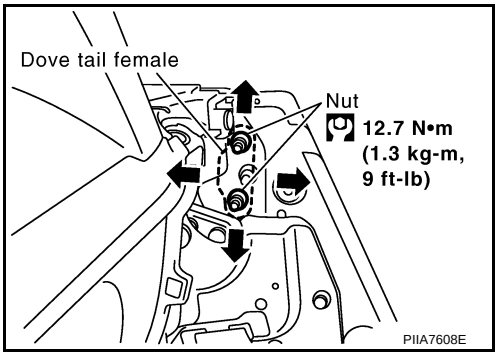
STRIKER ADJUSTMENT

Adjust the striker so that it becomes parallel with the lock insertion direction.



DOVE TAIL FEMALE ADJUSTMENT (ROADSTER)

Adjust the dove tail female so that it becomes parallel with the lock insertion direction.



Removal and Installation

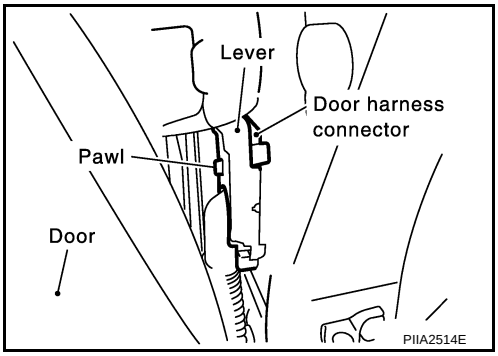
NIS0001Y

CAUTION:

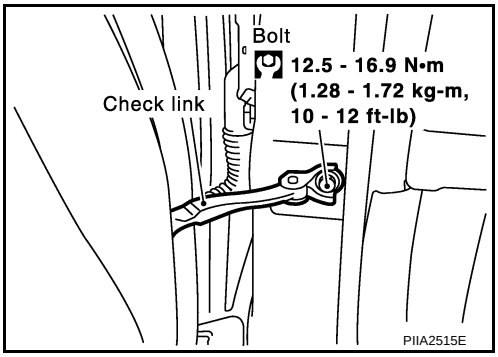
- **When removing and installing the door assembly, support the door with a jack and cloth to protect the door and body.**
- **When removing and installing door assembly, be sure to perform the fitting adjustment Refer to BL-93, "Fitting Adjustment" .**
- **Operate with two workers, because of its heavy weight.**
- **Check the hinge rotating part for poor lubrication. If necessary, apply “body grease”.**
- **After installing, check operation.**
- **Apply sealant and coat with the same body color paint to door hinge installation part and mounting nuts.**

REMOVAL

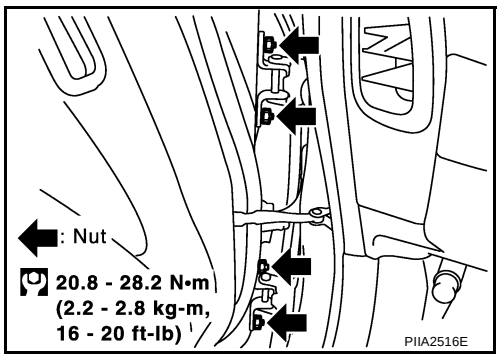
1. Pull the lever and remove the door harness connector while removing tabs of door harness connector.



2. Remove the mounting bolts of the check link on the vehicle.



3. Remove the door-side hinge mounting nuts, and remove the door assembly.



INSTALLATION

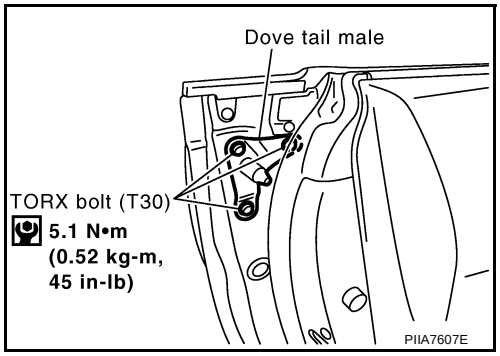
Install in the reverse order of removal.

Removal and Installation of Dove Tail Male & Female (Roadster)

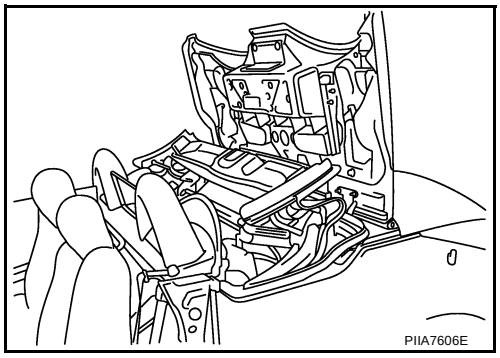
NIS0001Z

REMOVAL

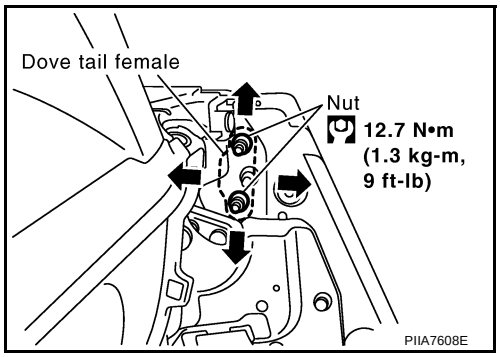
1. Remove the TORX bolts (T30) of dove tail male.



2. Soft top assembly locate like a figure.
3. Remove the body side welt. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Remove the body side weatherstrip. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
5. Remove the rear side finisher and kicking plate inner. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
6. Remove the shoulder anchor. Refer to SB-6, "Removal and Installation of Seat Belt (Roadster)" .
7. Remove the rear side trim. Refer to EI-37, "Removal and Installation (for Roadster Models)" .



8. Remove the dove tail female mounting nuts. Remove the dove tail female.

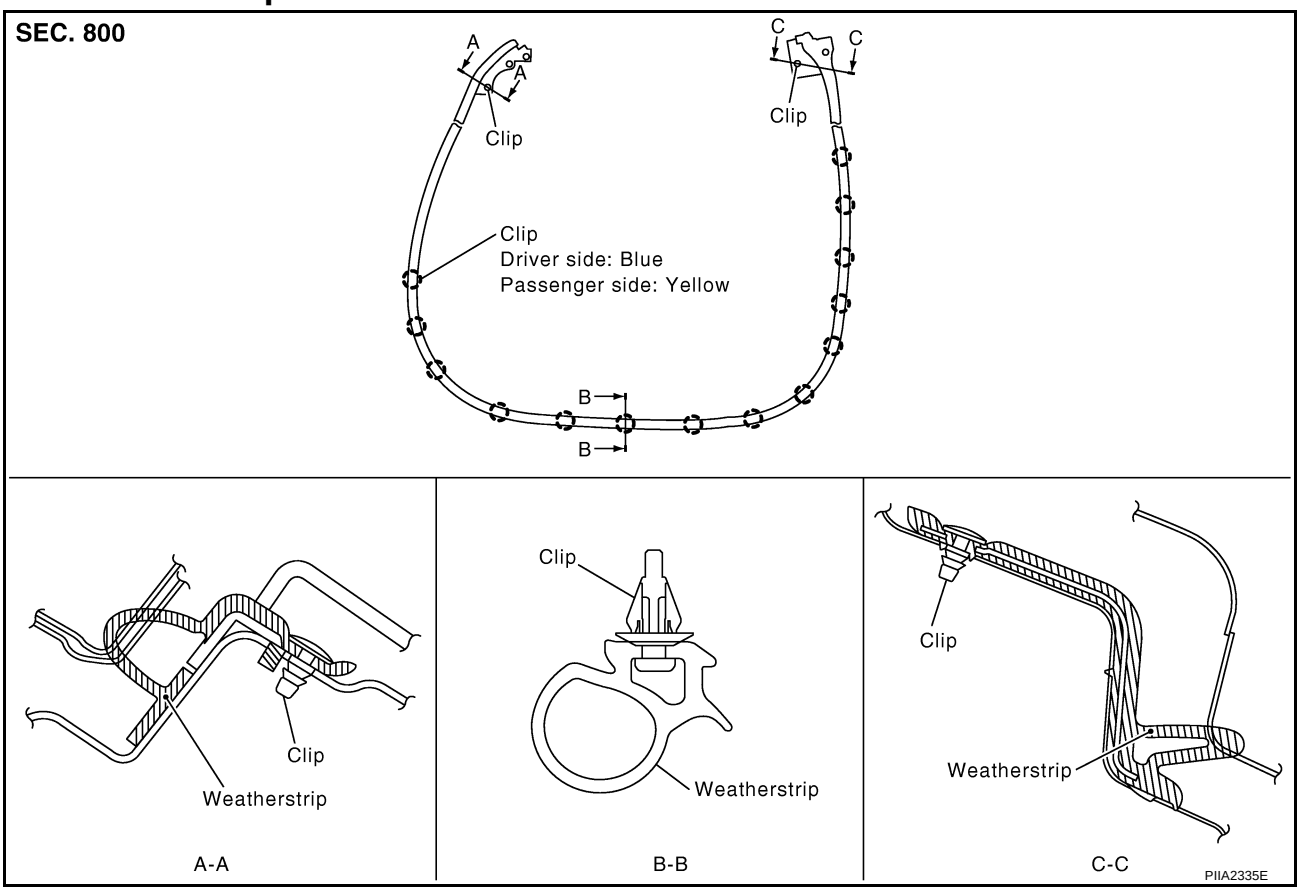


INSTALLATION

Install in the reverse order of removal.

Door Weatherstrip

NIS00020



REMOVAL

Remove the weatherstrip clips and remove weatherstrip.

INSTALLATION

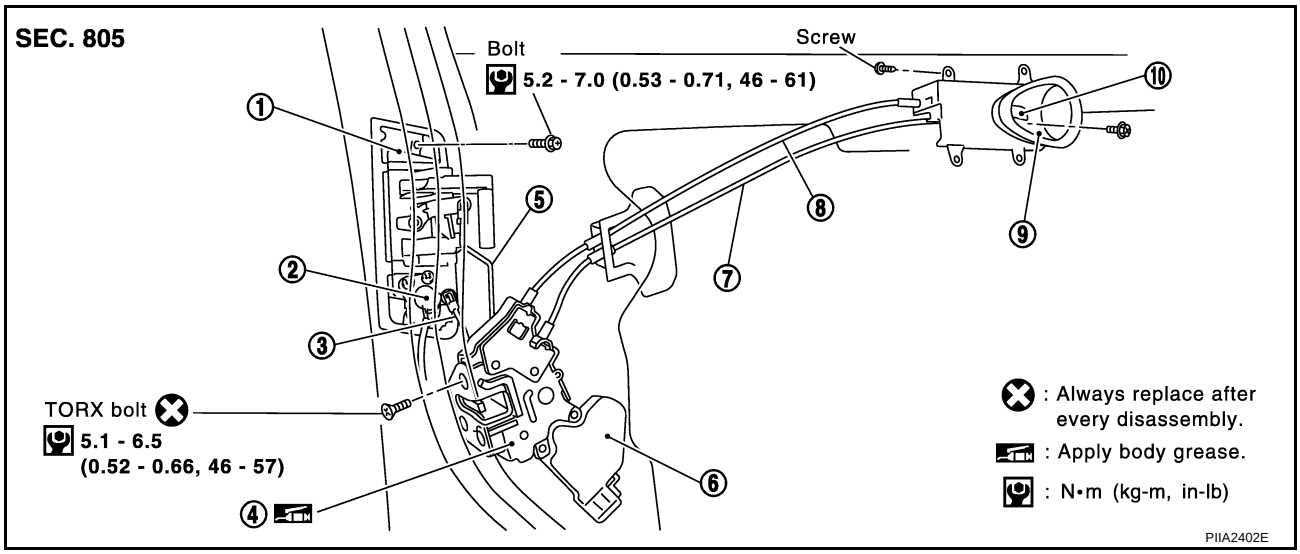
Install in the reverse order of removal.

DOOR LOCK

PFP:80502

Component Structure

NIS00021



1. Outside handle
2. Key cylinder (driver side only)
3. Key lock rod (driver side only)
4. Door lock assembly
5. Outside handle rod
6. Door lock actuator
7. Lock knob cable
8. Inside handle cable
9. Inside handle
10. Lock knob

Inspection and Adjustment

NIS00022

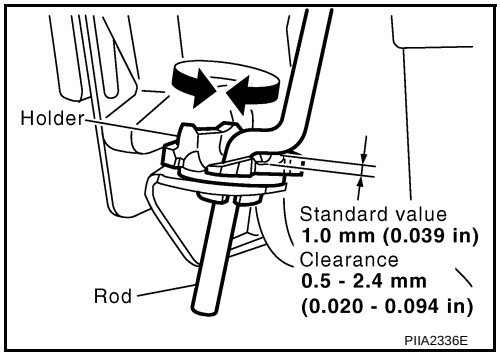
1. Remove the door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove the door window and door module assembly. Refer to GW-51, "Removal and Installation" .

EXTERIOR HANDLE ROD ADJUSTMENT

Rotate the bushing to adjust so that the clearance between the bushing and rod becomes as shown in the figure.

CAUTION:

Be careful not to make the clearance 0 mm (0 in) or the rod will be pressed continuously.

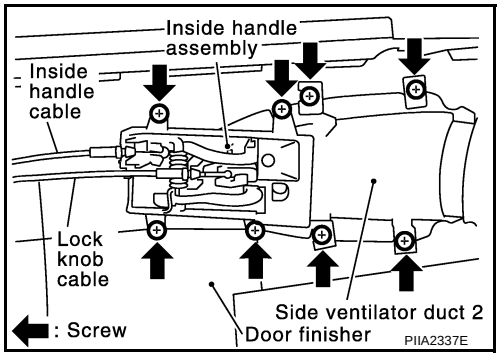


Removal and Installation

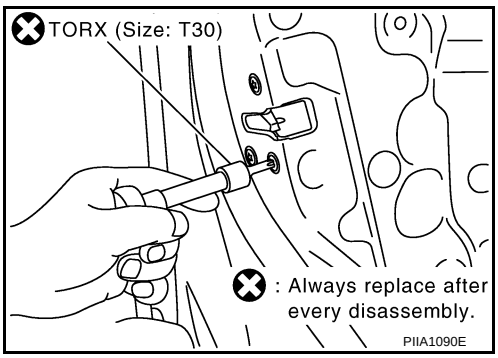
NIS00023

REMOVAL

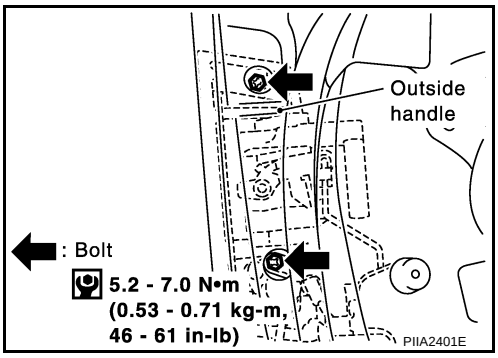
1. Remove the door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove the door window and door module assembly. Refer to GW-51, "Removal and Installation" .
3. Disconnect the inside handle cable and locking knob cable from the back side of the door finisher.



4. Reach to separate the key cylinder (driver side only) rod and outside handle rod connection (on the handle).
5. Disconnect the door lock actuator connector.
6. Remove the mounting screws (TORX T30), remove the door lock assembly.



7. Remove the outside handle mounting bolts, remove the outside handle.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **To install each rod, be sure to rotate the rod holder until a click is felt.**
- **After installing, check operation.**
- **After installing, perform fitting adjustment. Refer to BL-93, "Fitting Adjustment" .**

Disassembly and Assembly

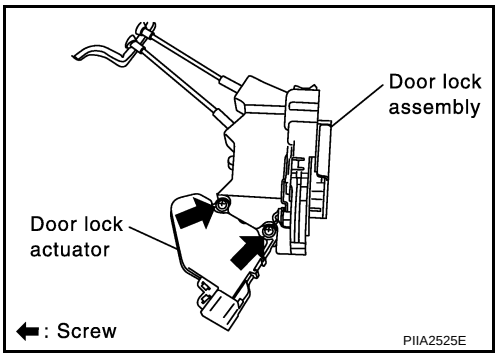
NIS00024

DISASSEMBLY

CAUTION:

Be sure to remove or install the actuator with the door lock assembly removed.

1. Remove the mounting screws, and remove the actuator from the door lock assembly.
2. Pull the actuator straight downward to separate it from the door lock assembly.



ASSEMBLY

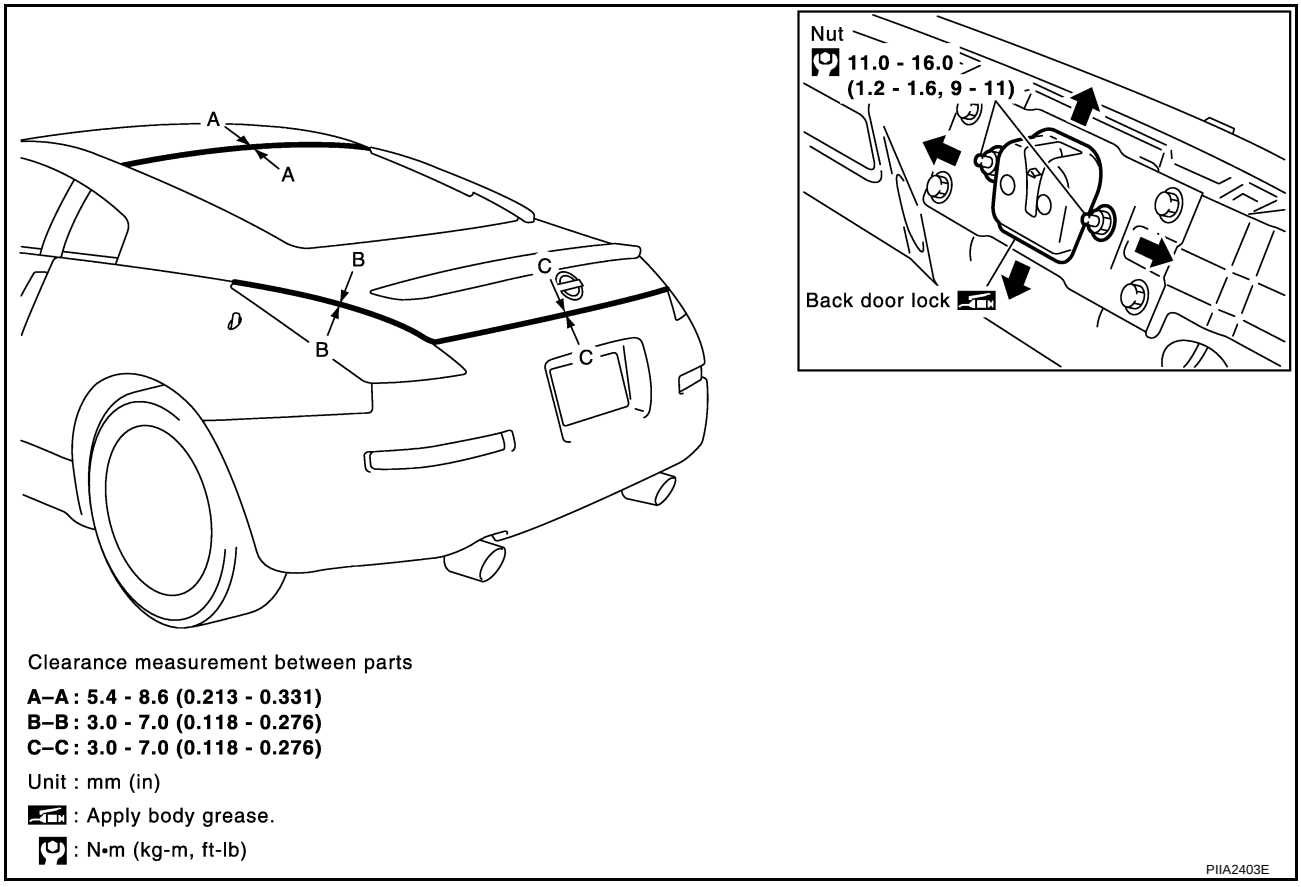
1. Align the actuator pivot with the cutout on the knob lever of the door lock assembly, then assemble the actuator.
2. Move the knob lever and the actuator pivot toward the lock-on direction, and check that it engages securely.

BACK DOOR

PFP:90100

Fitting Adjustment

NIS00025



Clearance measurement between parts

A–A : 5.4 - 8.6 (0.213 - 0.331)
B–B : 3.0 - 7.0 (0.118 - 0.276)
C–C : 3.0 - 7.0 (0.118 - 0.276)

Unit : mm (in)

: Apply body grease.

: N•m (kg-m, ft-lb)

PIIA2403E

VERTICAL/LATERAL CLEARANCE ADJUSTMENT

1. Remove back door weatherstrip. Refer to BL-103, "Removal and Installation of Back Door Weatherstrip" .
2. Remove the luggage finisher lower (center). Refer to EI-40, "LUGGAGE FLOOR TRIM" .
3. Loosen the back door lock mounting bolts. Raise the back door lock to the top position, and temporarily tighten the back door lock mounting bolt at the position.
4. Close the back door lightly and adjust the surface height, then open the back door to finally tighten the back door lock mounting bolts to the specified torque.

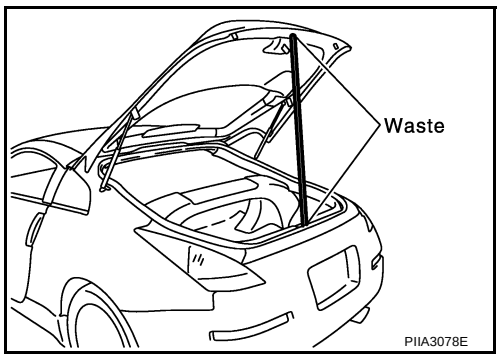
Back Door Assembly

NIS00026

REMOVAL

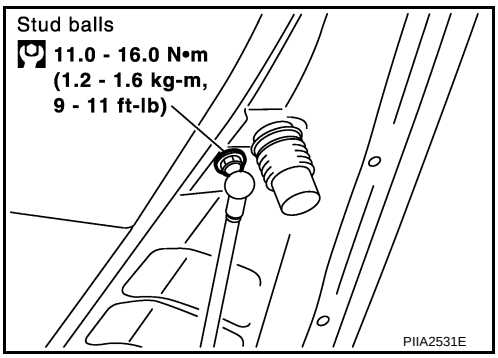
1. Remove the headlining. Refer to EI-44, "Removal and Installation (for Coupe Models)" .
2. Disconnect each harness connector, which is out to body from back door.
3. Support the back door striker with a proper material to prevent it from falling.

   WARNING:
   Body injury may occur if no supporting rod is holding the back door open when removing the damper stay.

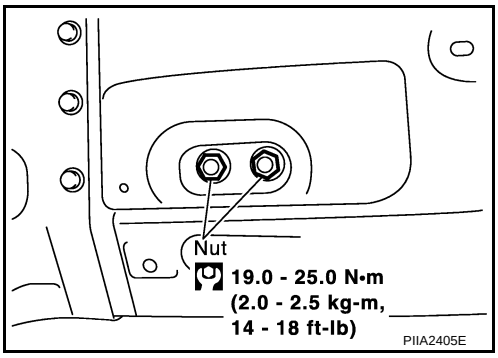


PIIA3078E

4. Remove stud balls on back door.



5. Remove hinge mount nuts of the body and remove back door assembly.



INSTALLATION

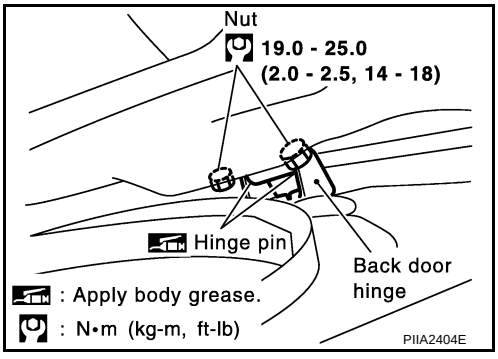
Install in the reverse order of removal.

CAUTION:

- **After installing, check operation.**
- **After installing, perform fitting adjustment.**

INSPECTION

1. Check hinges for the following items.
   - Malfunction noise or door closing and opening effort
   - Component wear or damage
2. Apply body grease to the rotating part of the hinge.

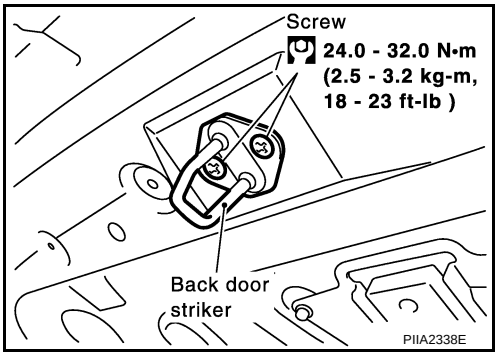


Removal and Installation of Back Door Striker

NIS00027

REMOVAL

1. Remove back door finisher lower. Refer to EI-48, "BACK DOOR FINISHER" .
2. Remove mounting screws, and remove striker from the vehicle.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

After installing, perform fitting adjustment.

Removal and Installation of Back Door Stay

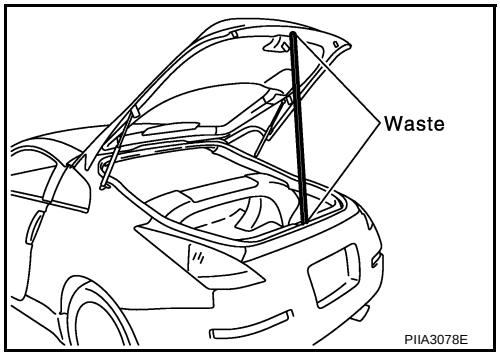
NIS00028

REMOVAL

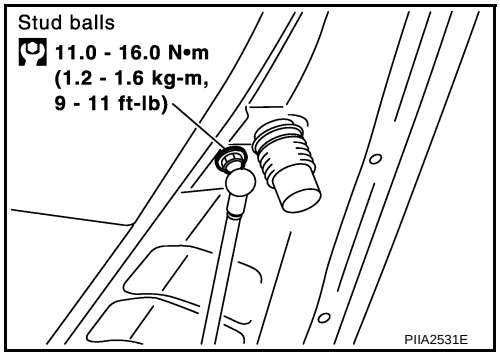
1. Support the back door striker with a proper material to prevent it from falling.

   WARNING:

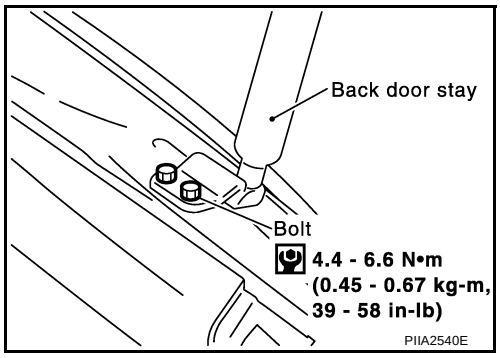
   Body injury may occur if no supporting rod is holding the back door open when removing the damper stay.



2. Remove stud balls on back door.



3. Remove back door stay assembly (gas stay) bracket adjusting nuts and remove back door stay assembly.



INSTALLATION

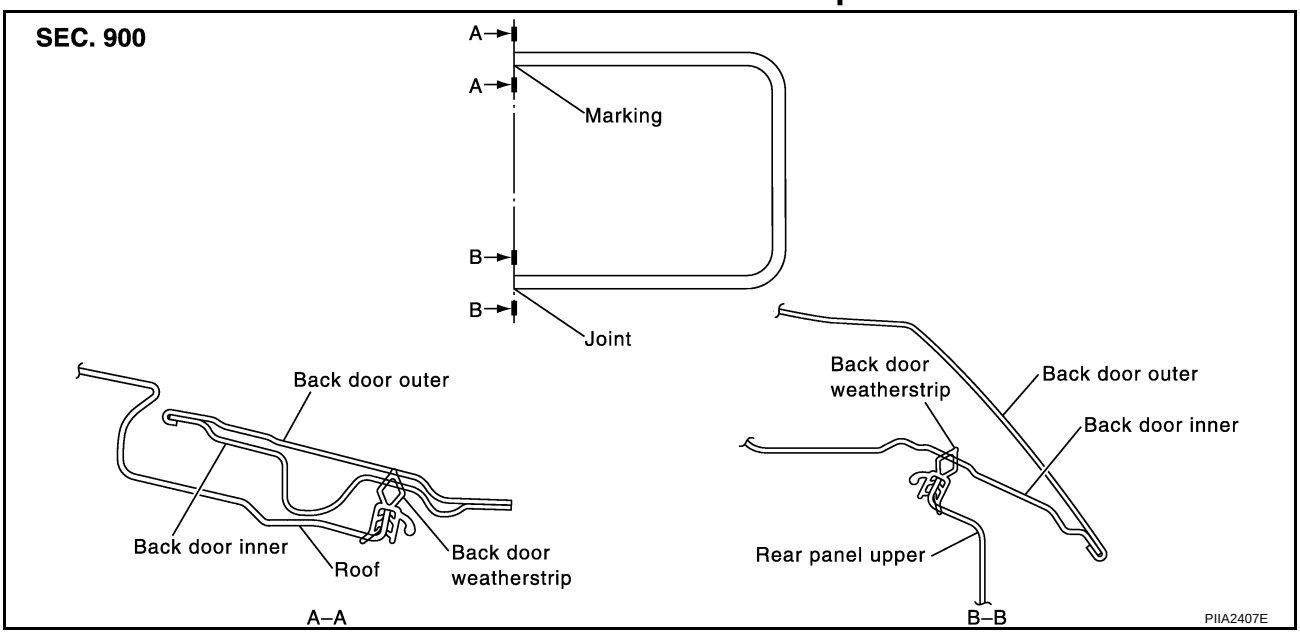
Install in the reverse order of removal.

CAUTION:

After installing, check operation.

Removal and Installation of Back Door Weatherstrip

NIS00029



REMOVAL

Pull up and remove engagement with body from weatherstrip joint.

CAUTION:

After removal, do not pull strongly on the weatherstrip.

INSTALLATION

Install in the reverse order of removal.

1. Working from the upper section, align weatherstrip mark with vehicle center position mark and install weatherstrip onto the vehicle.
2. For the lower section, align the weatherstrip seam with center of the striker.
3. After installation, pull the weatherstrip gently to ensure that there is no loose section.

   NOTE:
   Make sure the weatherstrip is fit tightly at each corner and back door rear plate.

BACK DOOR LOCK

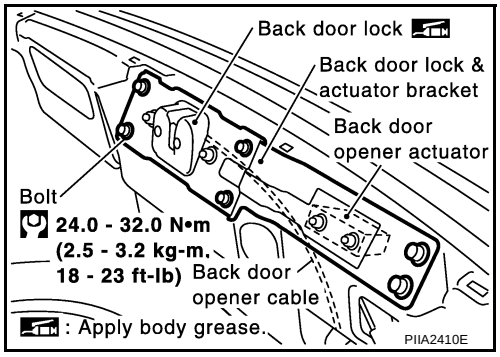
PFP:90504

Removal and Installation of Back Door Lock & Back Door Opener Actuator

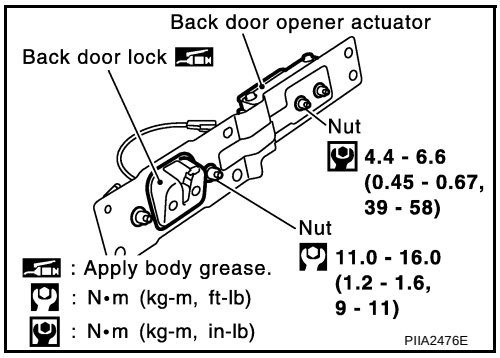
NIS0002A

REMOVAL

1. Remove back door weatherstrip. Refer to BL-103, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower (center). Refer to EI-40, "LUGGAGE FLOOR TRIM" .
3. Disconnect the connector and the clip of the back door opener.
4. Remove the mounting bolts.



5. Disconnect the connector of the back door opener actuator and back door opener cable, remove the bracket.
6. Remove the mounting nuts, remove back door lock and back door opener actuator.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **After installing, check operation.**
- **After installing, perform fitting adjustment. Refer to BL-100, "Fitting Adjustment" .**

INSPECTION

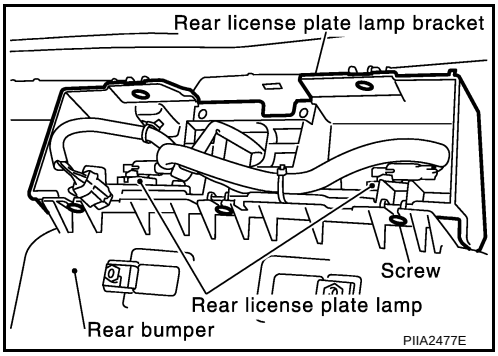
1. Check back door lock for the following items.
   - Malfunction noise or door closing and opening effort
   - Component wear or damage
2. Apply body grease to the rotating part of the back door lock.

Removal and Installation of Back Door Opener Switch (External)

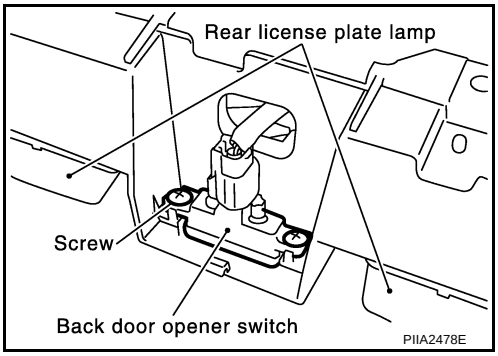
NIS0002B

REMOVAL

1. Remove rear bumper fascia assembly. Refer to EI-17, "Removal and Installation" .
2. Remove the mounting screws of the license plate bracket.



3. Remove the mounting screws and connector of the back door opener switch.

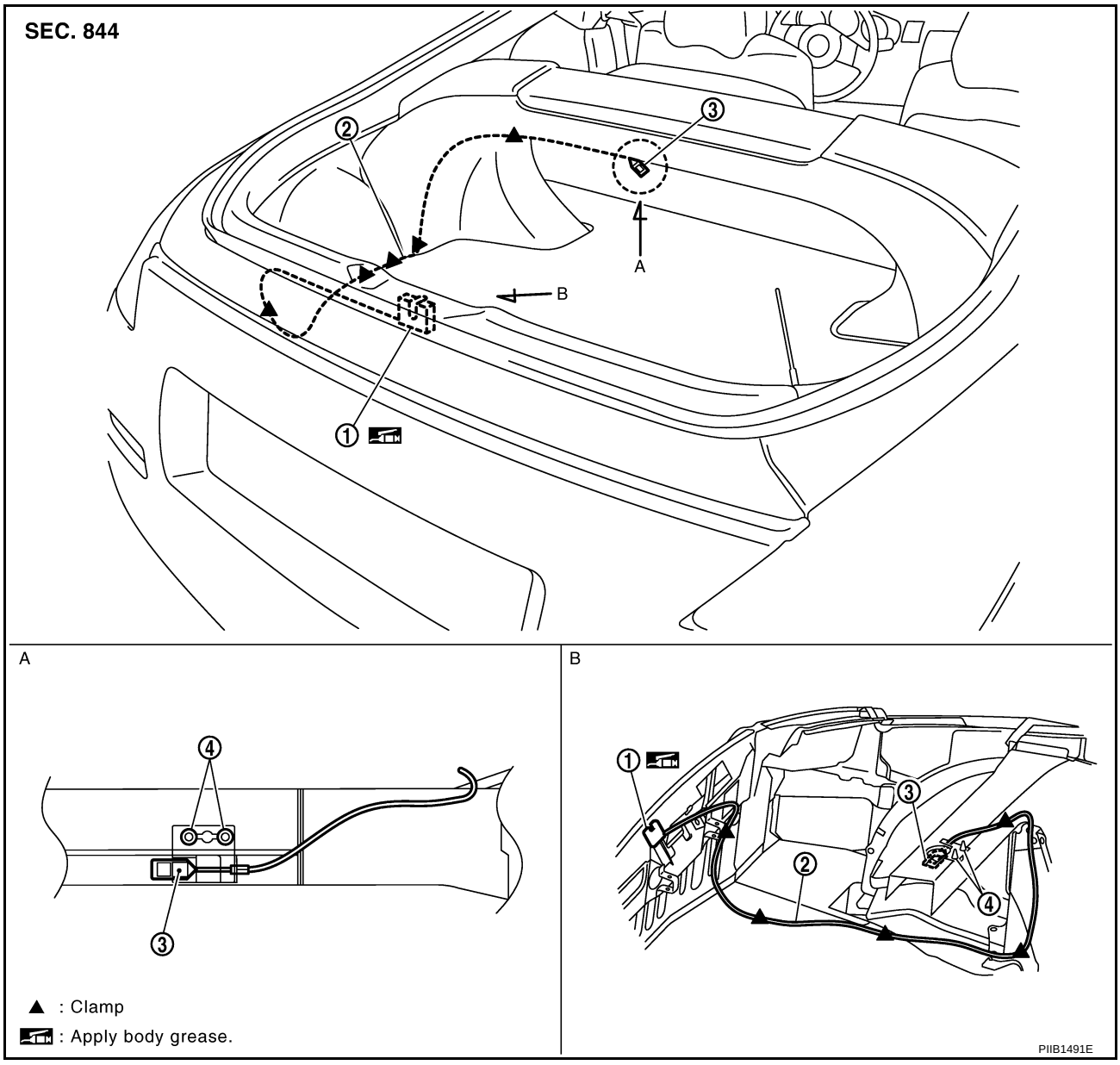


INSTALLATION

1. Install in the reverse order of removal.
2. After installing, check the operation.

Removal and Installation of Back Door Emergency Opener Cable

NIS0002C



1. Back door lock assembly
2. Back door emergency opener cable
3. hook
4. Clip

REMOVAL

1. Remove back door weather strip. Refer to BL-103, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower (center), luggage side finisher lower (LH), luggage side finisher upper (LH), trunk side box, luggage floor carpet, strut cover rear, strut cover lower (center), and strut cover lower (LH). Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Disconnect back door emergency opener cable from back door lock.
4. Disconnect back door emergency opener cable from back door emergency opener cable clamp, and then remove back door emergency opener cable.

INSTALLATION

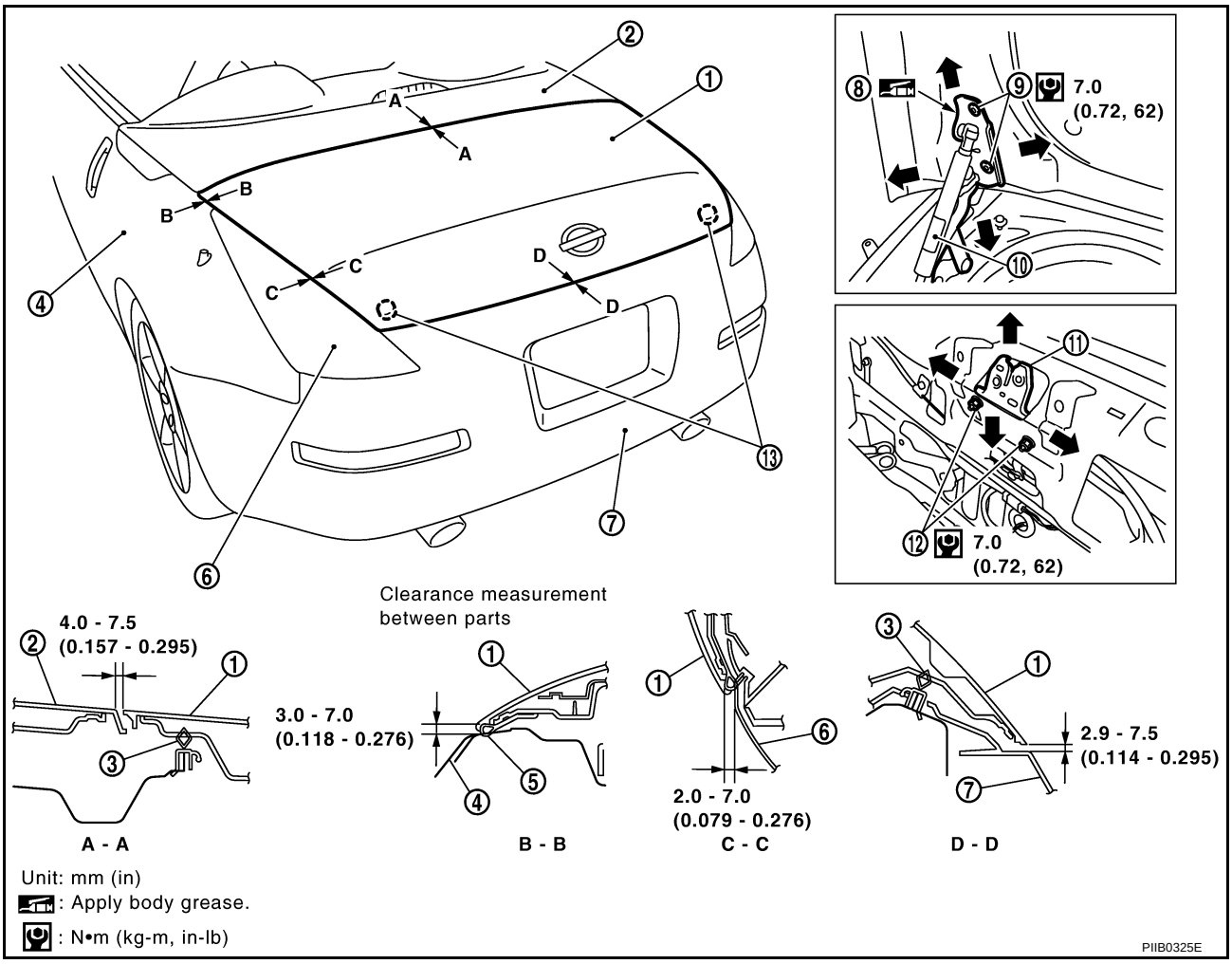
1. Install in the reverse order of removal.
2. After installing, check the operation.

TRUNK LID

PFP:H4300

Fitting Adjustment

NIS0002D



1. Trunk lid assembly
2. Storage lid
3. Trunk lid weatherstrip
4. Rear fender
5. Trunk lid moulding
6. Rear combination lamp
7. Rear bumper fascia
8. Trunk lid hinge
9. TORX bolt (T30)
10. Trunk lid stay
11. Trunk lid lock assembly
12. Nut
13. Bumper rubber

LONGITUDINAL AND LATERAL CLEARANCE ADJUSTMENT

1. Remove trunk rear finisher. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
2. Loosen trunk lid hinge mounting bolts, and remove trunk lid lock. And then, close trunk lid.
3. Tighten trunk lid hinge mounting bolts to the specified torque after adjusting lateral clearance and clearance to storage lid and rear bumper fascia.
4. Position trunk lid lock and engage trunk lid striker. Check trunk lid striker and trunk lid lock for looseness.
5. Tighten trunk lid mounting bolts to the specified torque.

SURFACE HEIGHT ADJUSTMENT

1. Remove trunk rear finisher. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER"
2. Remove trunk lid lock. Rotate bumper rubber to adjust height between trunk lid and bumper fascia.
3. Position trunk lid lock and engage trunk lid striker. Check trunk lid striker and trunk lid lock for looseness. Tighten trunk lid mounting bolts to the specified torque.
4. Adjust lateral clearance and surface height between trunk lid and other parts so that they are within the following dimensional difference.

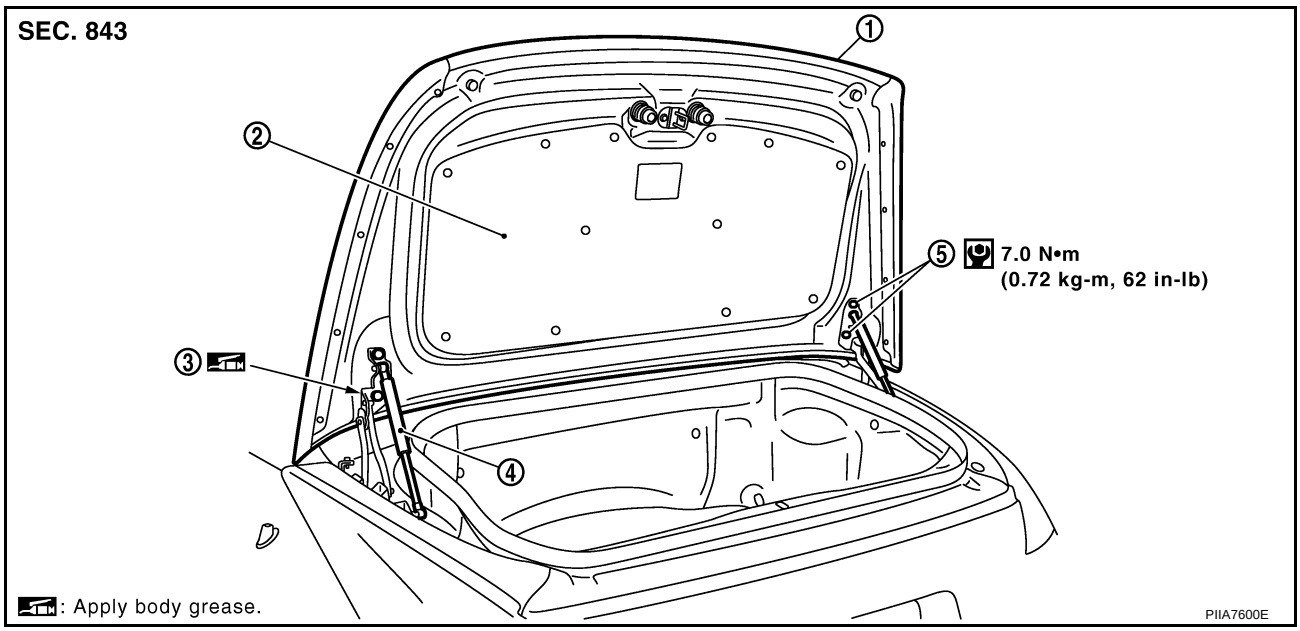
CAUTION:

Adjust evenness between trunk lid and each part to the following specification.

Trunk lid and storage lid (A–A) : 0 ± 1.0 mm (0 ± 0.04 in)
Trunk lid and rear bumper fascia (D–D) : 0.85 ± 2.1 mm (0.0335 ± 0.083 in)

Removal and Installation of Trunk Lid Assembly

NIS0002E

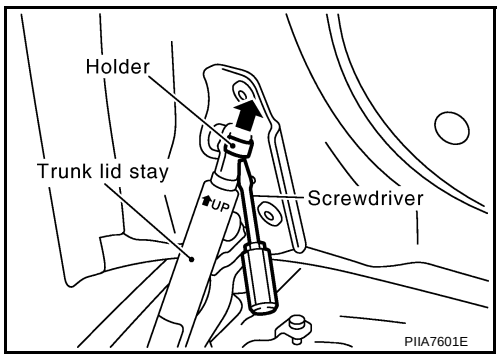


1. Trunk lid assembly
2. Trunk lid insulator
3. Trunk lid hinge
4. Trunk lid stay
5. TORX bolt (T30)

CAUTION:
Operate with two workers, because of its heavy weight.

REMOVAL

1. Screwdriver into the gap and remove holder.
2. Remove trunk lid stay (gas stay).
3. Remove the trunk lid hinge bolts, trunk lid assembly side and remove the trunk lid assembly.



INSTALLATION

Note the following, and install in the reverse order of removal.
Install holder to trunk lid stay, and then push it into trunk lid hinge (stud ball) when installing trunk lid stay.

CAUTION:

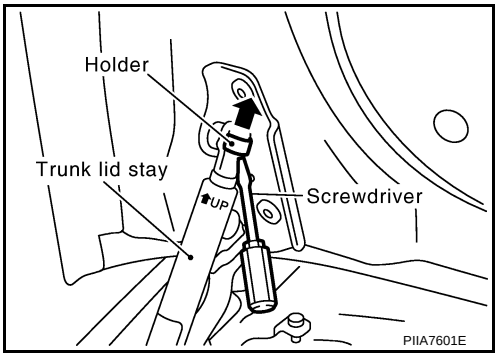
- **Check trunk lid open/close operation after installation**
- **Apply sealant and coat with the same body color paint to trunk lid hinge installation part and mounting bolts.**

Removal and Installation of Trunk Lid Stay

NIS0002F

REMOVAL

1. Screwdriver into the gap and remove holder.
2. Remove trunk lid stay.



INSTALLATION

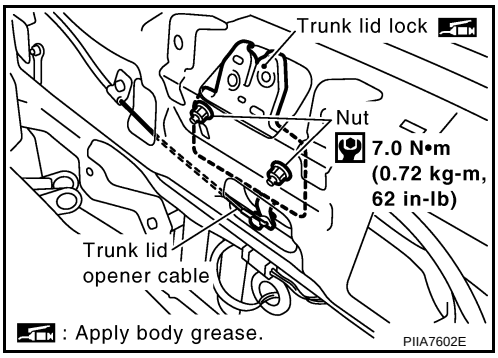
1. Note the following, and install in the reverse order of removal.
   Install holder to trunk lid stay, and then push it into trunk lid hinge (stud ball) when installing trunk lid stay.
2. After installation, check the operation.

Removal and Installation of Trunk Lid Lock Assembly

NIS0002G

REMOVAL

1. Remove the trunk lid weatherstrip. Refer to BL-113, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk lid release lever. Refer to EI-49, "Removal and Installation (for Roadstar Models)" .
3. Remove the trunk lid finisher. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
4. Disconnect the release lever cable and trunk lid opener cable from the clip.
5. After removing the harness connector, remove the mounting bolts, and remove the trunk lid lock.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

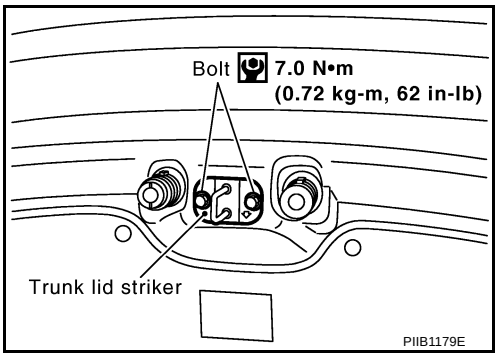
- **After installing, close the trunk lid height. Perform the lock and surface height adjustment. Refer to BL-107, "Fitting Adjustment" .**
- **After installing, check the operation.**

Removal and Installation of Trunk Lid Striker

NIS0002H

REMOVAL

Remove the mounting bolts, then remove the striker from the trunk lock support.

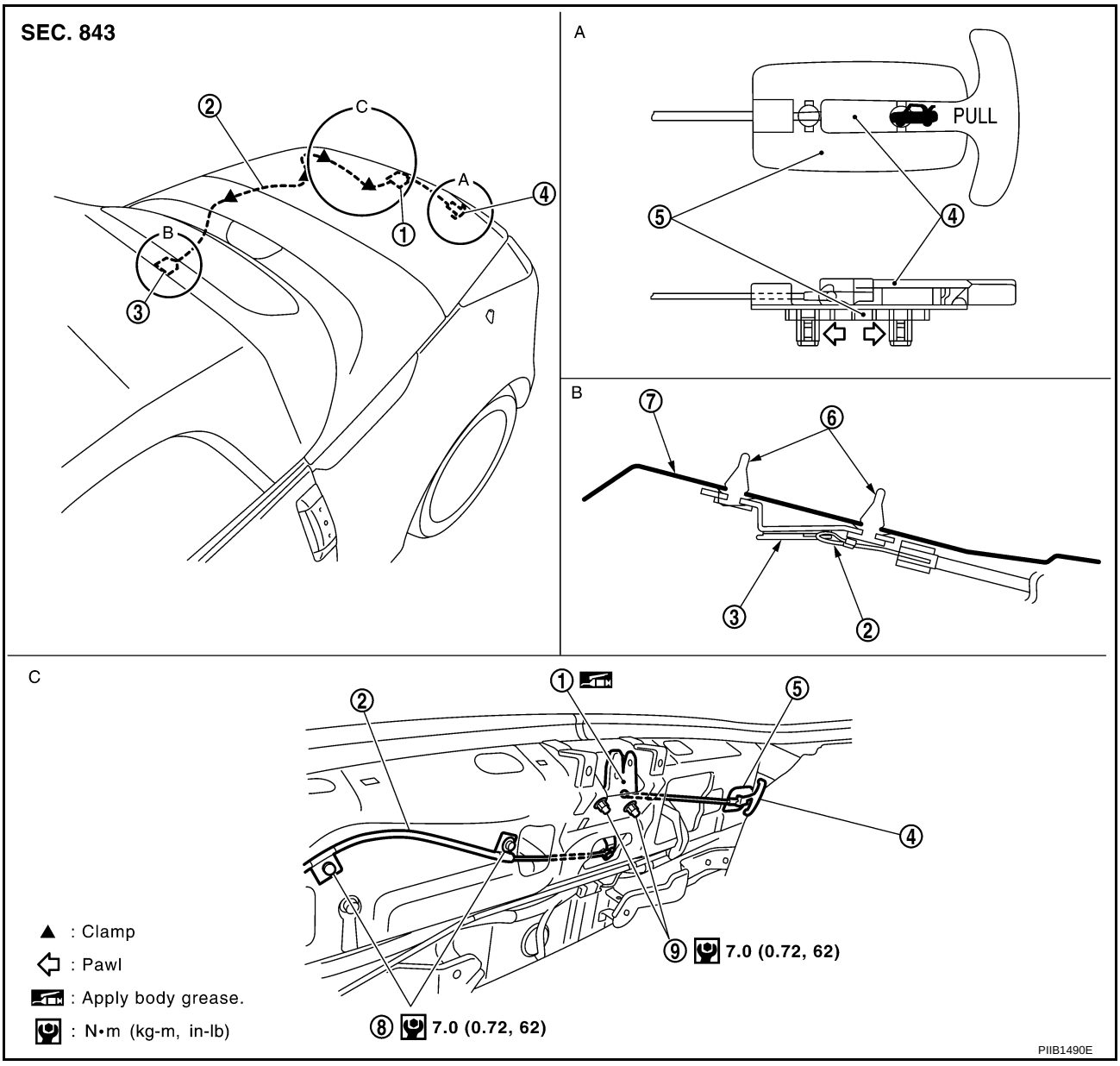


INSTALLATION

1. Install in the reverse order of removal.
2. After installing, close the trunk lid height. Perform the lock and surface height adjustment. Refer to BL-107, "Fitting Adjustment" .
3. After installation, check the operation.

Removal and Installation of Trunk Lid Emergency Opener Cable

NIS0002I



1. Trunk lid lock assembly	2. Trunk lid emergency opener cable	3. Trunk lid emergency opener cable hook
4. Trunk lid emergency opener lever (secondary)	5. Trunk lid emergency opener lever holder	6. Clip
7. Panel	8. Bolt	9. Nut

REMOVAL

1. Remove trunk lid weatherstrip. Refer to BL-113, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk floor carpet, spare tire cover, trunk rear finisher, trunk front finisher, and trunk side box. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
3. Remove floor box lid. Refer to EI-41, "Removal and Installation (for Roadster Models)" .
4. Disconnect trunk lid emergency opener cable from trunk lid lock.
5. Disconnect each clamp of trunk lid emergency opener cable.

INSTALLATION

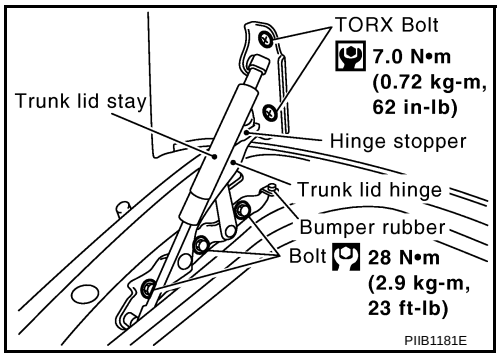
Install in the reverse order of removal.

Removal and Installation of Trunk Lid Hinge

NIS0002J

REMOVAL

1. Remove trunk lid stay. Refer to BL-109, "Removal and Installation of Trunk Lid Stay" .
2. Remove trunk lid assembly. Refer to BL-108, "Removal and Installation of Trunk Lid Assembly" .
3. Remove trunk lid hinge mounting bolts, and then remove trunk lid hinge.



INSTALLATION

1. Position trunk lid hinge to body side. Temporarily tighten front side bolt and rear side bolt in this order, and then tighten them to the specified torque.
2. Install trunk lid to trunk lid hinge.
3. Install trunk lid stay.

CAUTION:

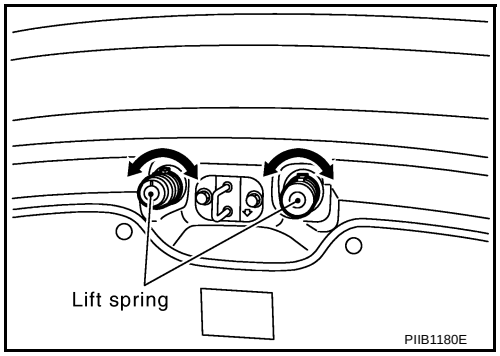
- **Before installing trunk lid hinge, apply anticorrosive agent onto the mounting surface of the vehicle body.**
- **After installation, perform trunk lid fitting adjustment. Refer to BL-107, "Fitting Adjustment" .**
- **Check trunk lid open/close operation after installation.**
- **Apply sealant and the same body color paint to trunk lid hinge and mounting bolts to cover broken seal area.**

Removal and Installation of Lift Spring

NIS0002K

REMOVAL

Rotate lift spring bottom clockwise/counterclockwise by approximately 90 deg, and then remove lift spring.

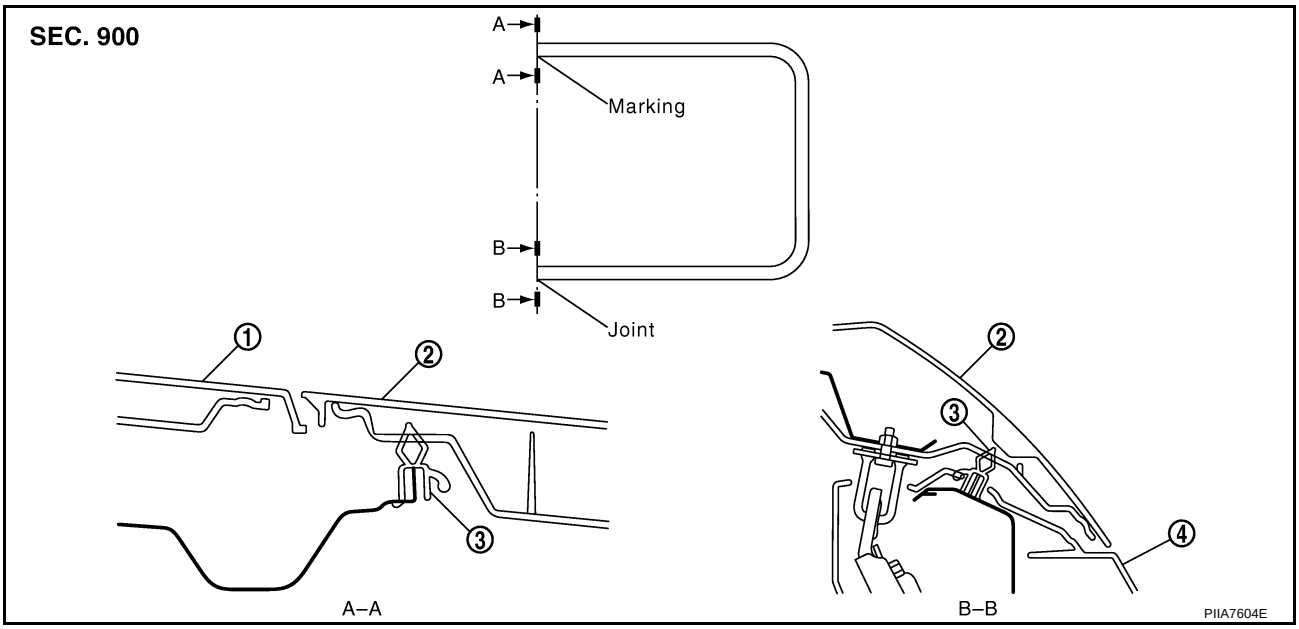


INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Trunk Lid Weatherstrip

NIS0002L



1. Storage lid
2. Trunk lid assembly
3. Trunk lid weatherstrip
4. Rear bumper fascia

REMOVAL

Pull up and remove engagement with body from weatherstrip joint.

CAUTION:

After removal, do not pull strongly on the weatherstrip.

INSTALLATION

Install in the reverse order of removal.

1. Install the weatherstrip from the front with the vehicle center mark aligned to the weatherstrip mark.
2. At rear side, align the weatherstrip seam to the center of the striker.
3. After installing, pull the weatherstrip lightly to check for looseness.

   CAUTION:

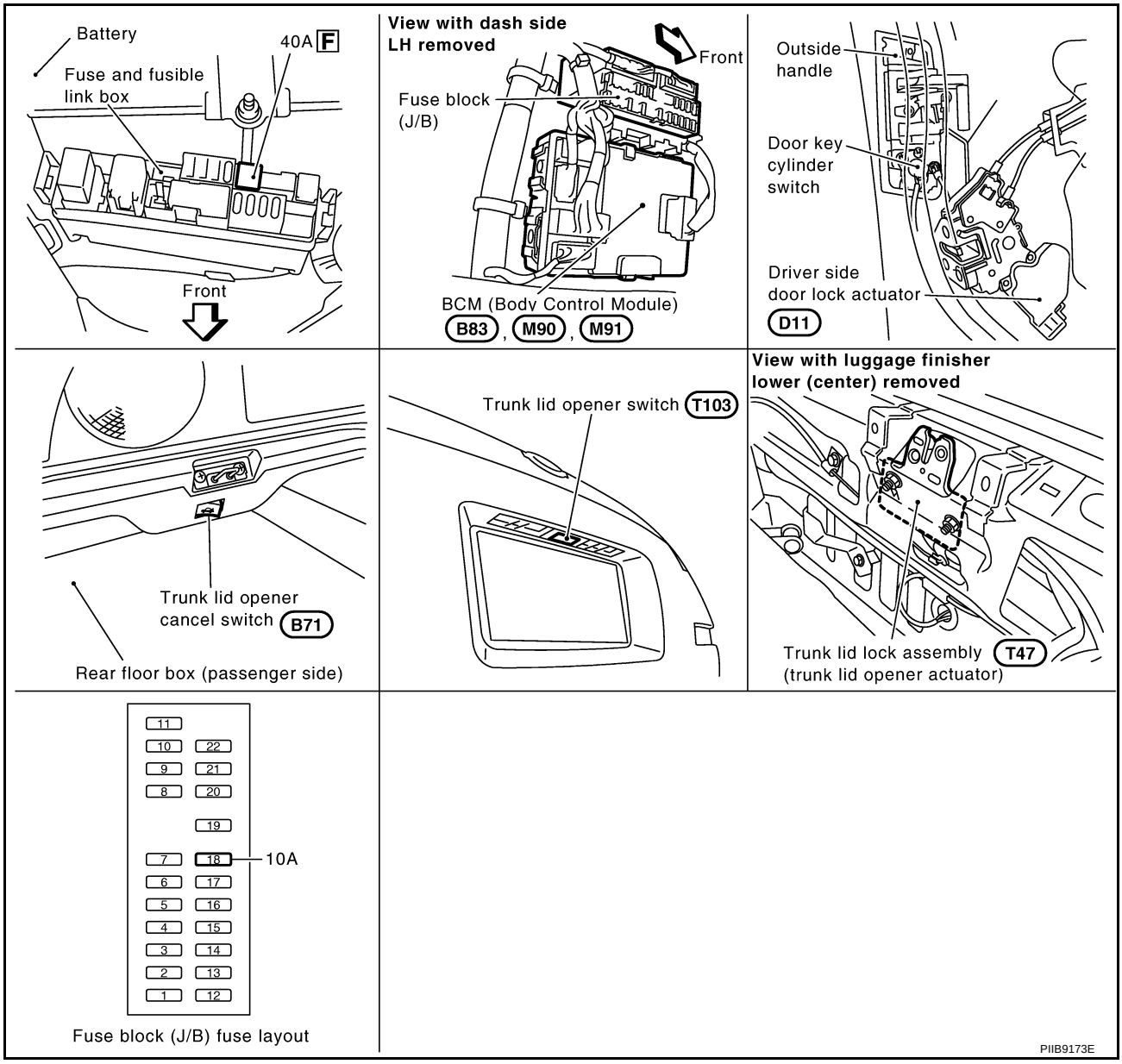
   The weatherstrip should fit tightly onto the corners and trunk lid rear plate.

TRUNK LID OPENER

PFP:84640

Component Parts and Harness Connector Location

NIS0002M



System Description

NIS0002N

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

When trunk lid opener switch is ON (pushed) with trunk lid opener cancel switch is ON and driver's door unlocked, ground is supplied

- to BCM terminal 30
- through trunk lid opener cancel switch terminals 1 and 2,
- through trunk lid opener switch terminals 1 and 2,

- through driver side door lock actuator (unlock sensor) terminals 2 and 4,
- through grounds M30 and M66.

And power is supplied

- to BCM terminal 68
- through trunk lid lock assembly (trunk lid opener actuator) terminals 2 and 1
- through grounds B5, B6 and T14.

Then trunk lid lock assembly (trunk lid opener actuator) opens trunk.

TRUNK LID OPENER CANCEL OPERATION

When trunk lid opener cancel switch is OFF (CANCEL), it cannot open trunk with trunk lid opener switch.

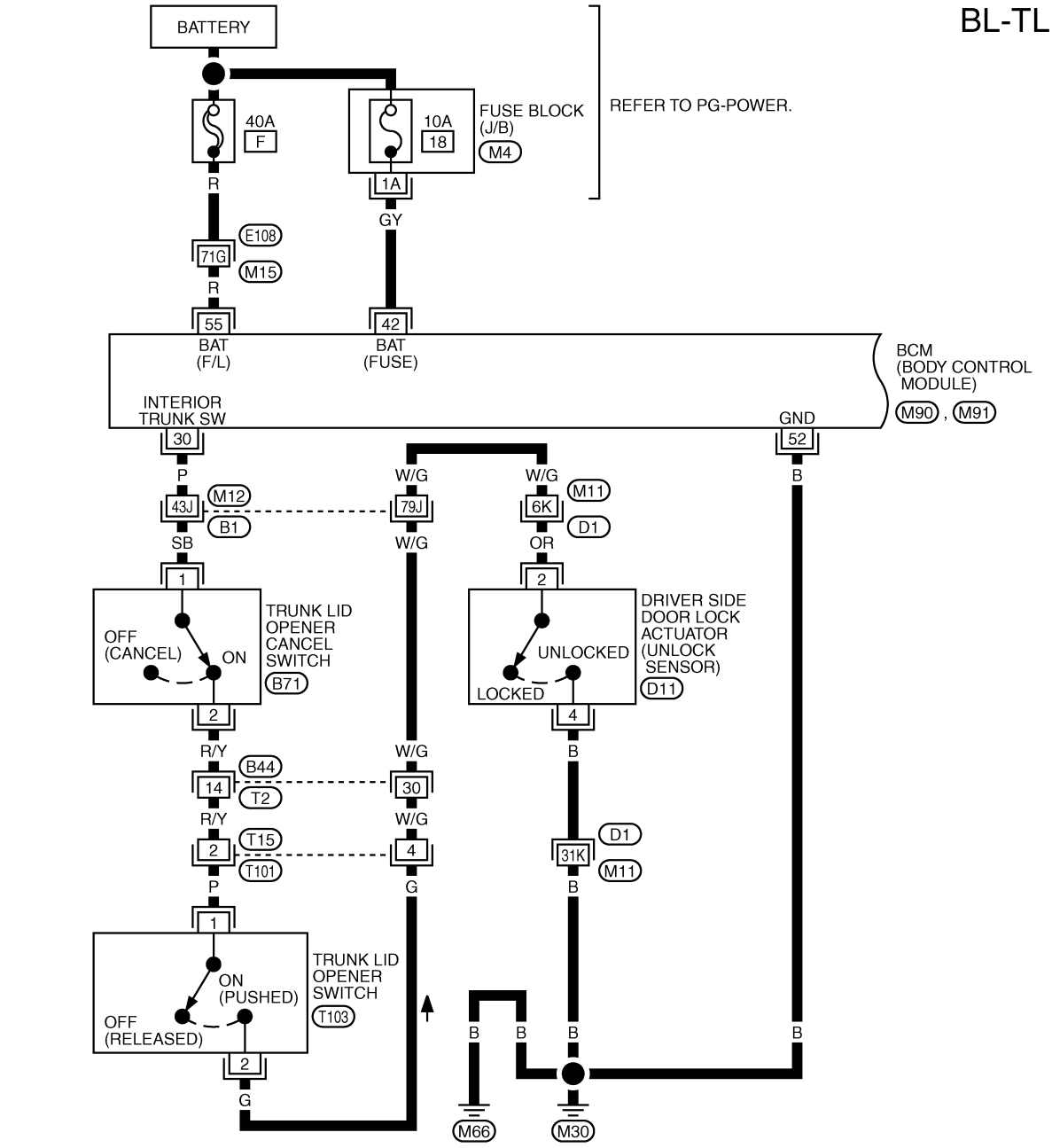
TRUNK OPENER OPERATION WITH KEY FOB

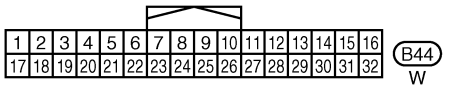
Open the trunk with key fob. Refer to BL-63, "Trunk Opener Operation/For Roadster" .

Wiring Diagram—T/LID—

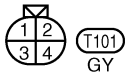
NIS0002O

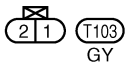
BL-TLID-01









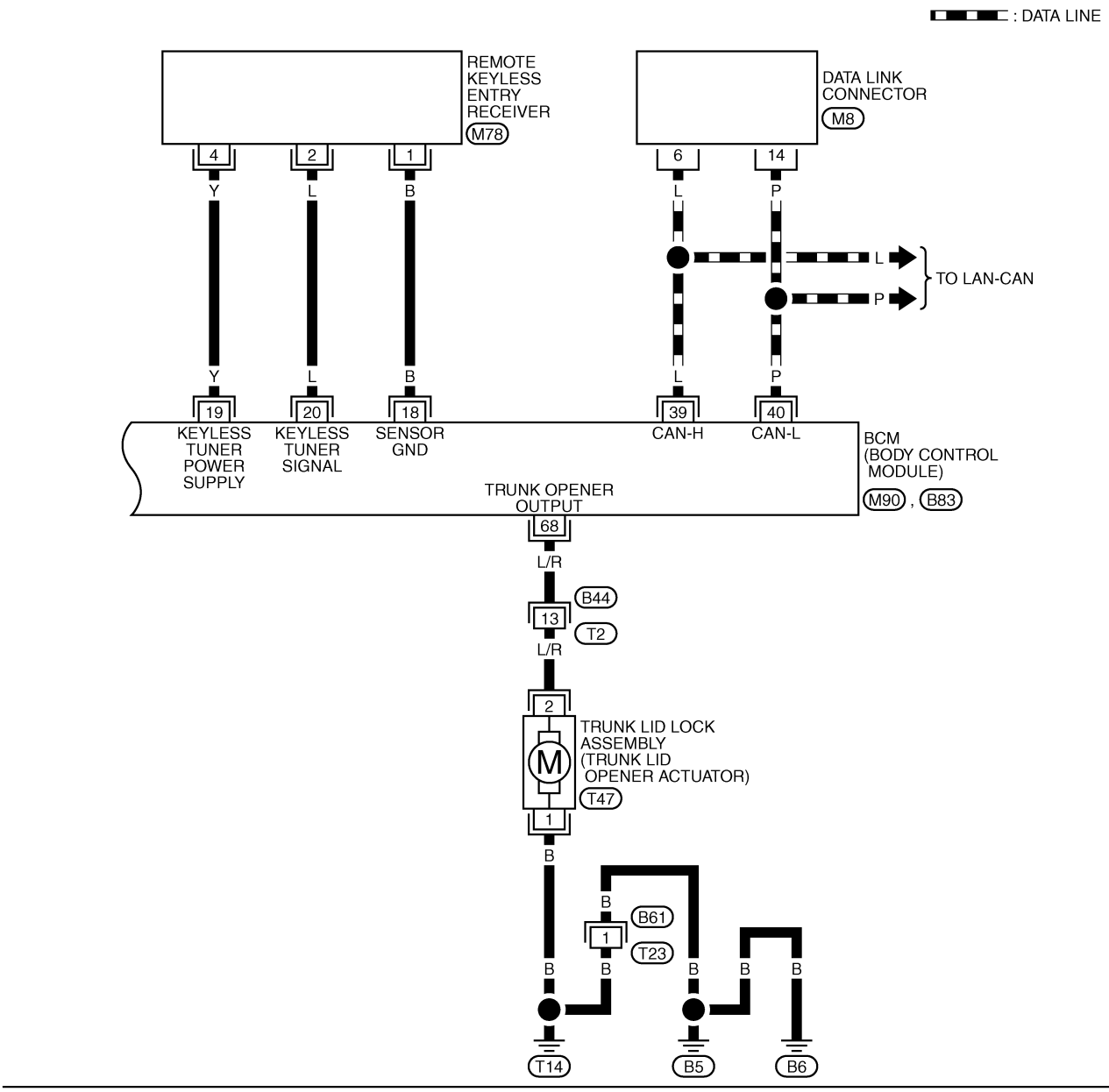


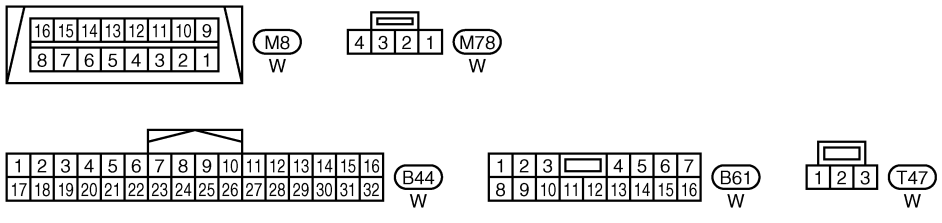


REFER TO THE FOLLOWING.
E108 , B1 , D1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 -ELECTRICAL UNITS

TIWT2267E

BL-TLID-02



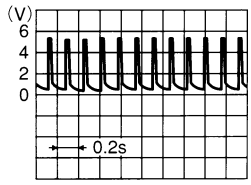
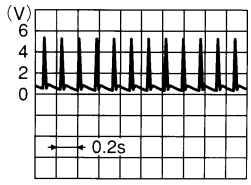
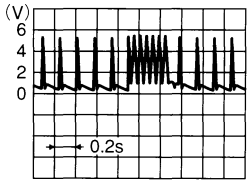


REFER TO THE FOLLOWING.
M90 , B83 -ELECTRICAL UNITS

TIWT2198E

Terminals and Reference Value for BCM

NIS0002P

Terminal	Wire color	Item	Signal input/output	Condition		Voltage (V) (Approx.)
18	B	Remote keyless entry receiver (Ground)	—	—		0
19	Y	Remote keyless entry receiver (Power supply)	Output	Key is inserted in IGN key cylinder		0
				All door closed		 OCC3881D
20	L	Remote keyless entry receiver (Signal)	Input	Key is inserted in IGN key cylinder		0
				Waiting (All door closed)		 OCC3879D
				When signal is received (All door closed)		 OCC3880D
30	P	Trunk lid opener switch	Input	Trunk lid opener cancel switch is ON	Trunk lid opener switch is ON	0
					Trunk lid opener switch is OFF	5
				Driver side door is locked	Trunk lid opener cancel switch is OFF	5
39	L	CAN – H	Input/Output	—		—
40	P	CAN – L	Input/Output	—		—
42	GY	Ignition switch (ON)	Input	Ignition switch ON or START position		Battery voltage
52	B	Ground	—	—		0
55	R	Power source (Fusible link)	Input	—		Battery voltage
68	L/R	Trunk lid opener release output signal	Output	Closed (OFF) → Opened (ON)		0 → Battery voltage

CONSULT-III Function (BCM)

NIS0002Q

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis part	Inspection item, self-diagnosis mode	Content
Trunk	DATA MONITOR	Displays the input data of BCM in real time basis.
	ACTIVE TEST	Give a drive signals to load to check the operation check.

ACTIVE TEST

Test item	Content
TRUNK/BACK DOOR	This test is able to check trunk lid opener actuator unlock operation. This actuator unlocks when “ON” on CONSULT-III screen is touched.

Trouble Diagnosis

NIS0002R

TRUNK DOSE NOT OPEN WITH TRUNK LID OPENER SWITCH

1. CHECK TRUNK LID OPENER CANCEL SWITCH

Check trunk lid opener cancel switch position.

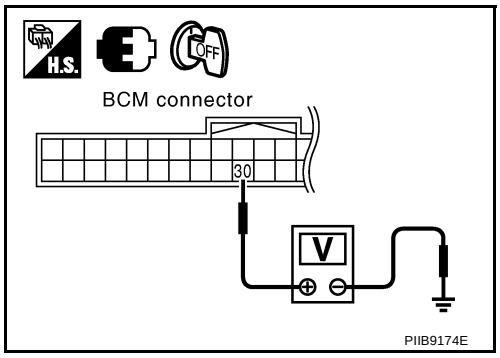
Is trunk lid opener cancel switch in ON position?

Yes or No

Yes >> GO TO 2.
No >> Turn on trunk lid opener cancel switch.

2. CHECK TRUNK LID OPEN INPUT SIGNAL

1. Remove Key from ignition key cylinder.
2. Unlock driver side door.
3. Check voltage between BCM and ground.



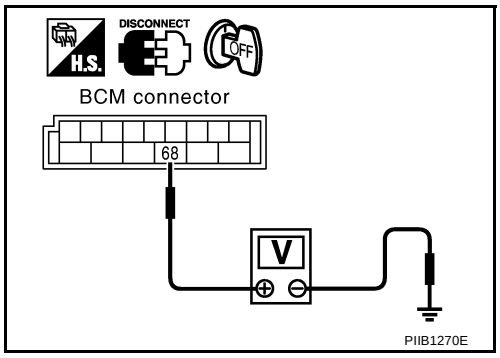
Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Trunk lid opener switch ON	0
			Trunk lid opener switch OFF	5

OK or NG

OK >> GO TO 3.
NG >> GO TO 6.

3. CHECK TRUNK LID OPEN OUTPUT SIGNAL

Check voltage between BCM and ground.



Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
B83	68 (L/R)	Ground	Trunk lid opener switch ON	Battery voltage
			Trunk lid opener switch OFF	0

OK or NG

OK >> GO TO 4.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

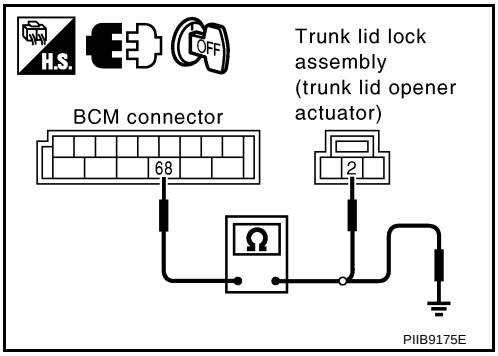
4. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK LID OPENER ACTUATOR) CIRCUIT

1. Disconnect BCM connector and trunk lid lock assembly (trunk lid opener actuator) connector.
2. Check continuity between BCM harness connector B83 terminal 68 and trunk lid lock assembly (trunk lid opener actuator) harness connector T47 terminal 2.

68 (L/R) - 2 (L/R) : Continuity should exist.

3. Check continuity between BCM harness connector B83 terminal 68 and ground.

68 (L/R) - ground : Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

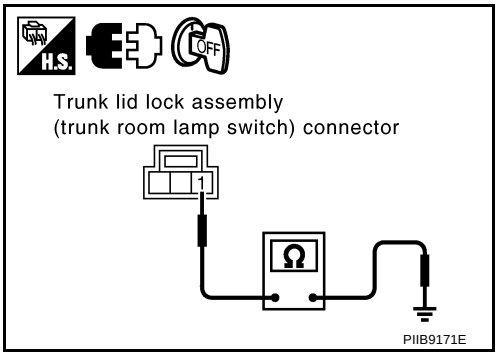
5. CHECKTRUNK LID LOCK ASSEMBLY (TRUNK LID OPENER ACTUATOR) GROUND CIRCUIT

Check continuity between trunk lid lock assembly (trunk lid opener actuator) harness connector T47 terminal 1 and ground.

1 (B) - ground : Continuity should exist.

OK or NG

OK >> Replace trunk lid lock assembly (trunk lid opener actuator).
NG >> Repair harness or connector.



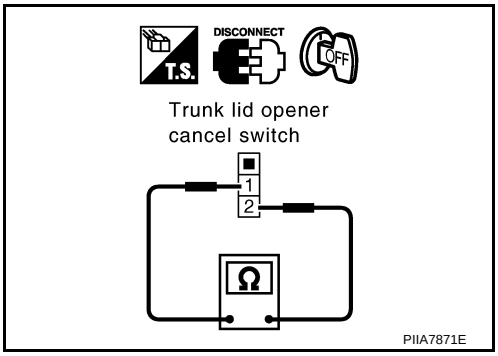
6. CHECK TRUNK LID OPENER CANCEL SWITCH

1. Disconnect trunk lid opener cancel switch.
2. Check continuity between trunk lid opener cancel switch harness connector B71 terminals 1 and 2.

Terminals		Trunk lid opener cancel switch condition	Continuity
1	2	ON	Yes
		OFF	No

OK or NG

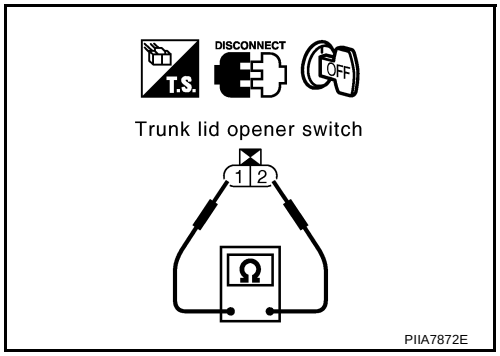
OK >> GO TO 7.
NG >> Replace trunk lid opener cancel switch.



7. CHECK TRUNK LID OPENER SWITCH

1. Disconnect trunk lid opener switch
2. Check continuity between trunk lid opener switch harness connector T103 terminals 1 and 2.

Terminals		Trunk lid opener switch condition	Continuity
1	2	ON (Pushed)	Yes
		OFF (Released)	No



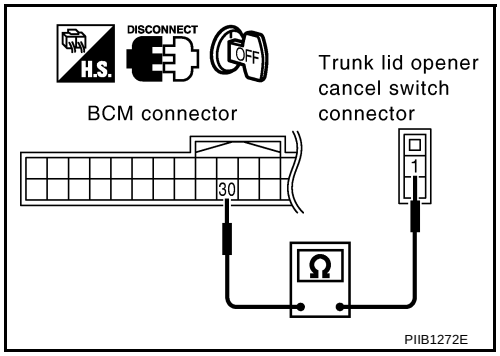
OK or NG

OK >> GO TO 8.
NG >> Replace trunk lid opener switch.

8. CHECK TRUNK LID OPENER CANCEL SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 30 and trunk lid opener cancel switch harness connector B71 terminal 1.

30 (P) - 1 (SB) : Continuity should exist.



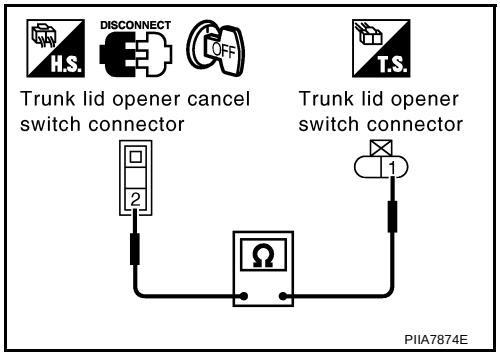
OK or NG

OK >> GO TO 9.
NG >> Repair harness or connector.

9. CHECK TRUNK LID OPENER SWITCH CIRCUIT

Check continuity between trunk lid opener cancel switch harness connector B71 terminal 2 and trunk lid opener switch harness connector T103 terminal 1.

2 (R/Y) - 1 (P) : Continuity should exist.



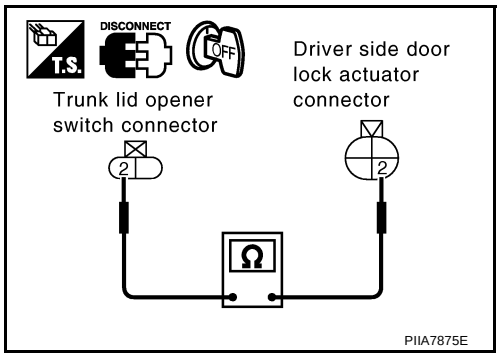
OK or NG

OK >> GO TO 10.
NG >> Repair harness or connector.

10. CHECK DRIVER SIDE DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between trunk lid opener switch harness connector T103 terminal 2 and driver side door lock actuator switch harness connector D11 terminal 2.

2 (G) - 2 (OR) : Continuity should exist.



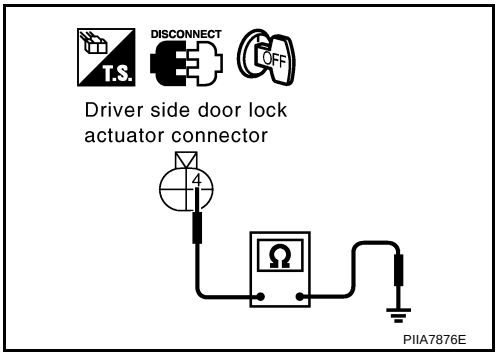
OK or NG

OK >> GO TO 11.
NG >> Repair harness or connector.

11. CHECK DRIVER SIDE DOOR LOCK ACTUATOR GROUND CIRCUIT

Check continuity between driver side door lock actuator switch harness connector D11 terminal 4 and ground.

4 (B) - ground : Continuity should exist.



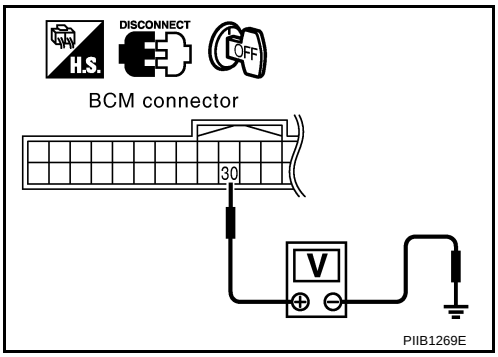
OK or NG

OK >> Replace driver side door lock actuator.
NG >> Repair harness or connector.

TRUNK DOSE NOT CLOSE

1. CHECK TRUNK LID OPEN INPUT SIGNAL

1. Remove Key from ignition key cylinder.
2. Turn on trunk lid opener cancel switch.
3. Unlock driver side door.
4. Check voltage between BCM and ground.



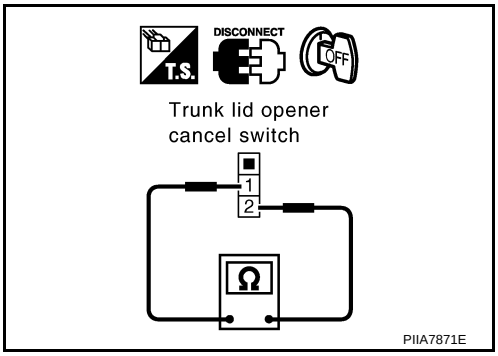
Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Trunk lid opener switch ON	0
			Trunk lid opener switch OFF	5

OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

2. CHECK TRUNK LID OPENER CANCEL SWITCH

1. Disconnect trunk lid opener cancel switch.
2. Check continuity between trunk lid opener cancel switch harness connector B71 terminals 1 and 2.



Terminals		Trunk lid opener cancel switch condition	Continuity
1	2	ON	Yes
		OFF	No

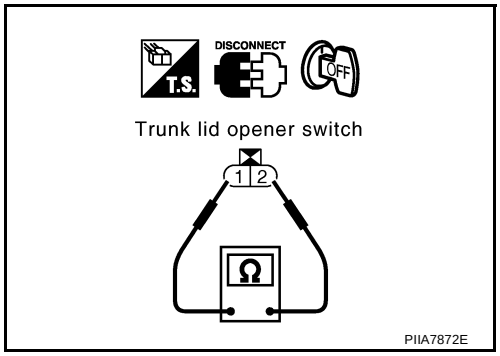
OK or NG

OK >> GO TO 3.
NG >> Replace trunk lid opener cancel switch.

3. CHECK TRUNK LID OPENER SWITCH

1. Disconnect trunk lid opener switch
2. Check continuity between trunk lid opener switch harness connector T103 terminals 1 and 2.

Terminals		Trunk lid opener switch condition	Continuity
1	2	ON (Pushed)	Yes
		OFF (Released)	No



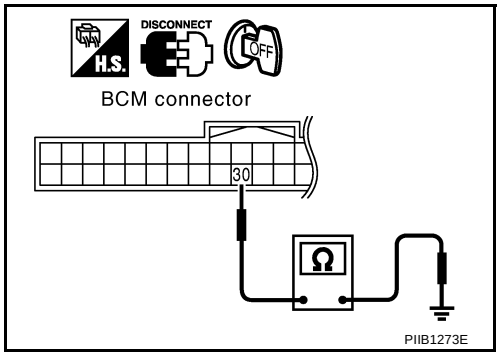
OK or NG

OK >> GO TO 4.
NG >> Replace trunk lid opener switch.

4. CHECK TRUNK LID OPENER CANCEL SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 30 and ground.

30 (P) - ground : Continuity should not exist.



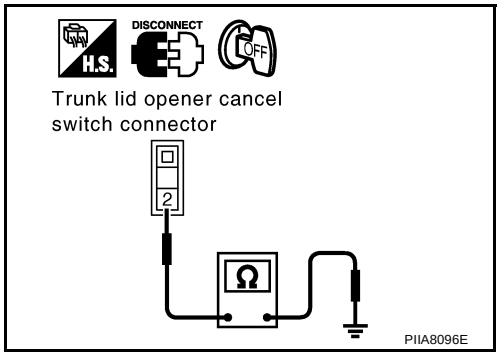
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK TRUNK LID OPENER SWITCH CIRCUIT

Check continuity between trunk lid opener cancel switch harness connector B71 terminal 2 and ground.

2 (R/Y) - ground : Continuity should not exist.



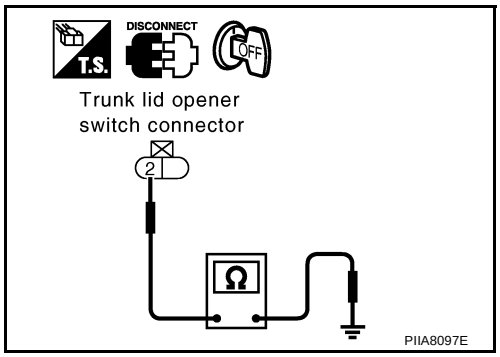
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK DRIVER SIDE DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between trunk lid opener switch harness connector T103 terminal 2 and ground.

2 (G) - ground : Continuity should not exist.



OK or NG

OK >> Replace BCM.
NG >> Repair harness or connector.

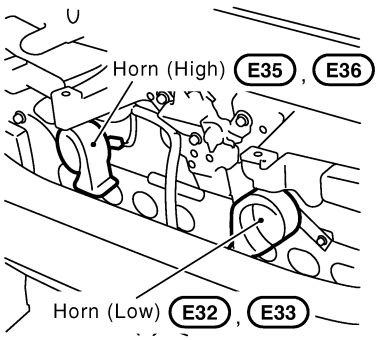
VEHICLE SECURITY (THEFT WARNING) SYSTEM

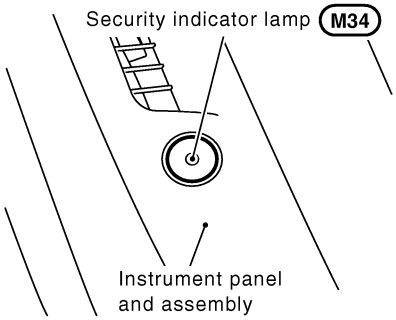
PFP:28491

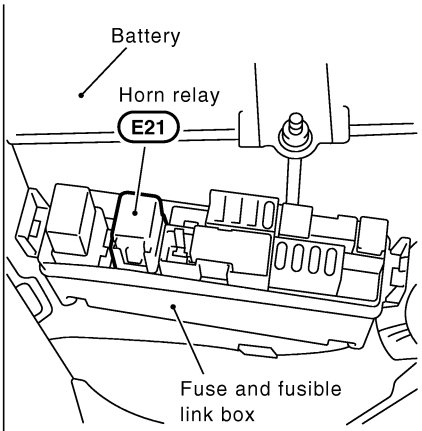
Component Parts and Harness Connector Location

NIS0002S

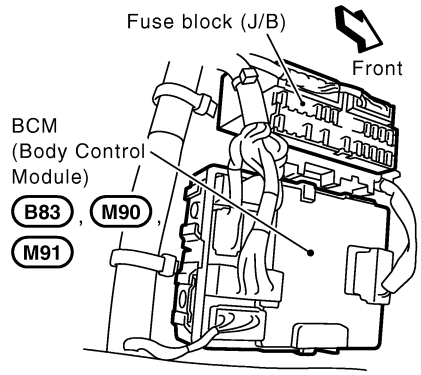
View with front bumper removed



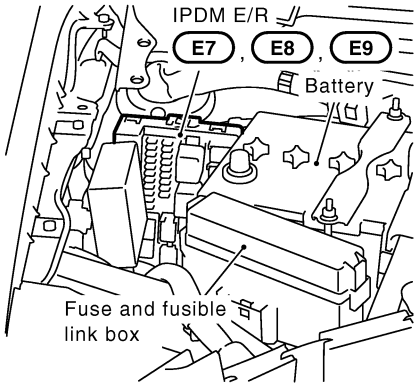


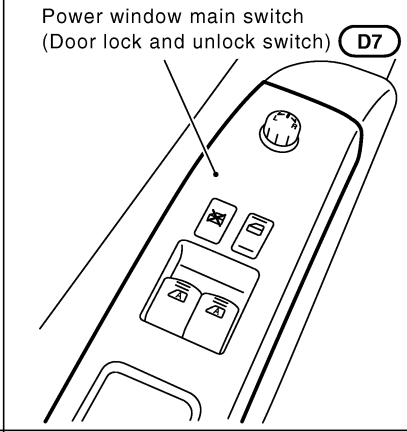


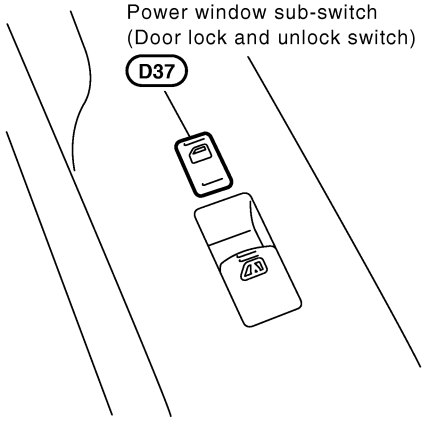
View with dash side LH removed



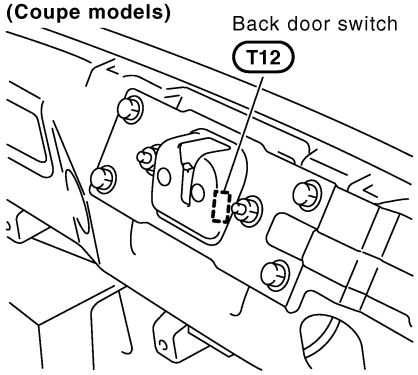
View with cowl top removed

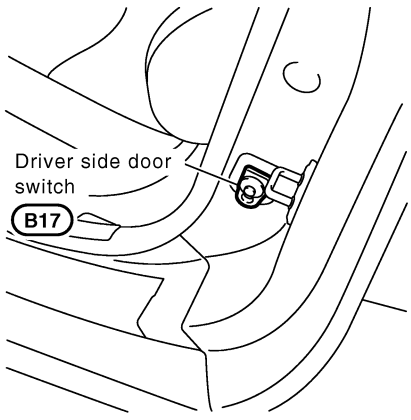


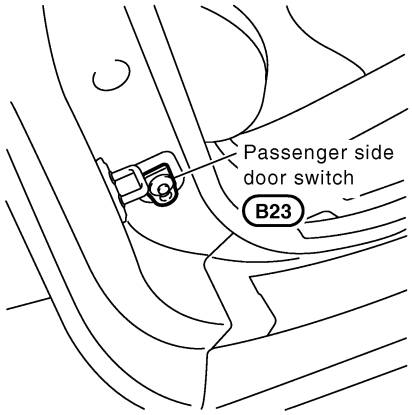




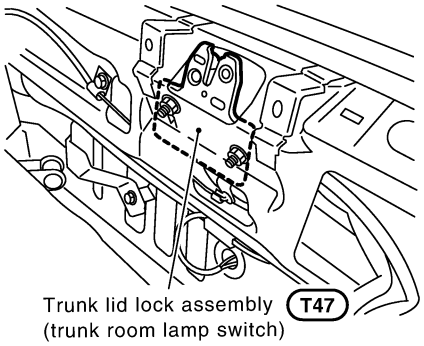
View with luggage finisher rear (Coupe models)







View with luggage finisher lower (center) removed



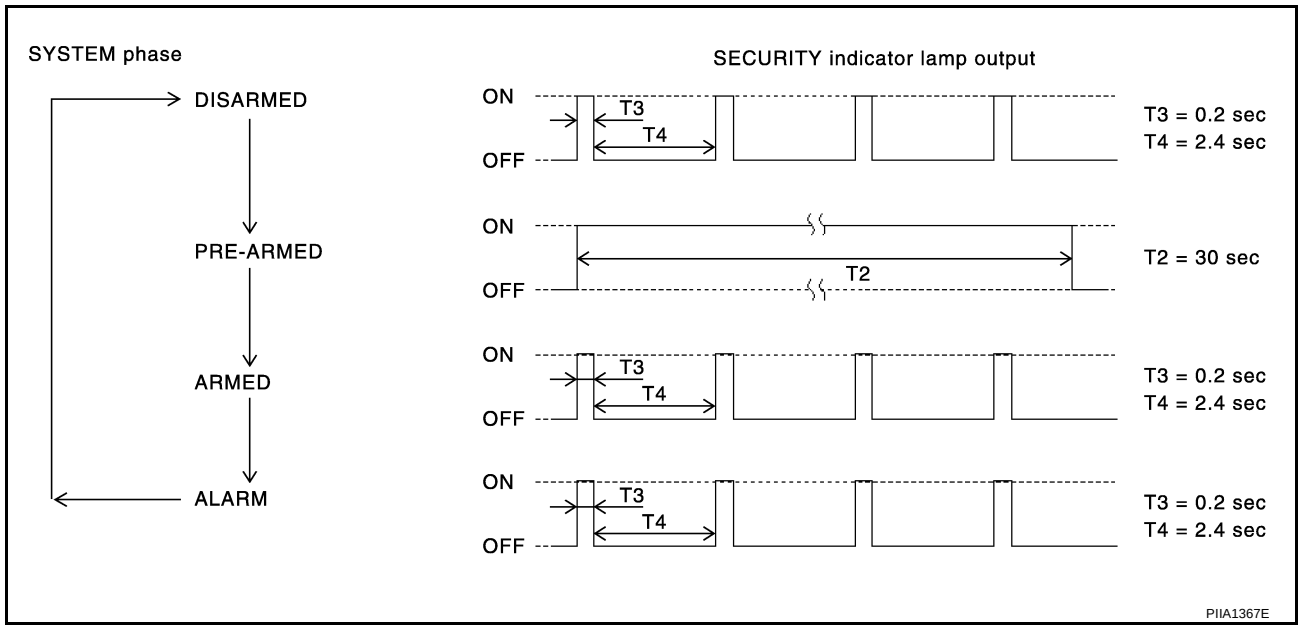
PIIB9256E

System Description

NIS0002T

DESCRIPTION

Operation Flow



Setting the vehicle security system

Initial condition

- Ignition switch is in OFF position.

Disarmed phase

- When hood, doors, back door (for Coupe) or trunk (for Roadster) is open, the vehicle security system is set in the disarmed phase on the assumption that the owner is inside or near the vehicle.
- When the vehicle security system is in the disarmed phase, the security indicator lamp blinks every 2.4 seconds.

Pre-armed phase and armed phase

When the following operation 1 or 2 is performed, the vehicle security system turns into the “pre-armed” phase. (The security indicator lamp illuminates.)

1. BCM receives LOCK signal from door key cylinder switch or key fob after all doors and back door (for Coupe) or trunk (for Roadster) are closed.
2. All doors and back door (for Coupe) or trunk (for Roadster) are closed after doors are locked by key or door lock and unlock switch.
   The security indicator lamp illuminates for 30 seconds. Then, the system automatically shifts into the “armed” phase.

Canceling the set vehicle security system

When one of the following operations is performed, the armed phase is canceled.

1. Unlock the doors with the key or the key fob.
2. Open the back door (for Coupe) or trunk (for Roadster) with the key fob.
3. Turn ignition switch to “ON” or “ACC” position.

Canceling the alarm operation of the vehicle security system

When one of the following operations is performed, the alarm operation is canceled.

- Unlock the door with the key or key fob.
- Open the trunk (for Roadster) with the key fob.

Activating the alarm operation of the vehicle security system

Make sure the system is in the armed phase. (The security indicator lamp blinks every 2.4 seconds.)
When the following operation 1 or 2 is performed, the system sounds the horns and flashes the headlamps for about 50 seconds.

1. Any door or trunk (for Roadster) is opened during armed phase.

2. Disconnecting and connecting the battery connector before canceling armed phase.

POWER SUPPLY AND GROUND

Power is supplied at all times

- through 10A fuse [No.19, located in the fuse block (J/B)]
- to security indicator lamp terminal 1.

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

With the ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied.

- to BCM terminal 52
- through body grounds M30 and M66.

INITIAL CONDITION TO ACTIVATE THE SYSTEM

The operation of the vehicle security system is controlled by the doors and trunk (for Roadster).
To activate the vehicle security system, BCM must receive signals indicating the doors and trunk (for Roadster) are closed and the doors are locked by key or key fob.
When a door is open, BCM terminals 12, 65 receives a ground signal from each door switch.
When driver side door is unlocked by power window main switch (door lock and unlock switch), BCM terminal 22 receives a signal from terminal 12 of power window main switch.
When passenger side door is unlocked by power window sub-switch (door lock and unlock switch), BCM terminal 22 receives a signal from terminal 16 of power window sub-switch.
The IPDM E/R then sends a signal to the BCM via CAN communication line.
When the back door (for Coupe) or trunk (for Roadster) is open, BCM terminal 57 (for Roadster) or 58 (for Coupe) receives a ground signal

- from terminal 1 of the back door switch (for Coupe) or terminal 3 of trunk lid lock assembly (trunk room lamp switch) (for Roadster)
- through body grounds B5, B6,T14, D105 (for Coupe) or B5, B6, T14 (for Roadster).

VEHICLE SECURITY SYSTEM ALARM OPERATION

The vehicle security system is triggered by

- opening a driver or passenger side door
- opening the back door (for Coupe)
- opening the trunk (for Roadster)
- detection of battery disconnect and connect.

The vehicle security system will be triggered once the system is in armed phase,
When BCM receives a ground signal at terminals 12, 62 (door switch), 57 (trunk room lamp switch) or 58 (back door switch).
Power is supplied at all times

- to horn relay terminal 2
- through 15A fuse (No. 35, located in the fuse and fusible link box).

When the vehicle security system is triggered, ground is supplied intermittently to both headlamp relay and horn relay.
When both headlamp relay (with built-in IPDM E/R) and horn relay are energized and then power is supplied to headlamps (high beam and low beam) and horns (HIGH and LOW).
The headlamps flash and the horn sounds intermittently.
The alarm automatically turns off after 50 seconds, but will reactivate if the vehicle is tampered with again.

VEHICLE SECURITY SYSTEM DEACTIVATION

To deactivate the vehicle security system, a door must be unlocked or back door (for Coupe) or trunk (for Roadster) must be opened with the key or key fob.

When the key is used to unlock a door, BCM terminal 22 receives signal

- from terminal 12 of the power window main switch (door lock and unlock switch).

When the BCM receives either above signal or unlock signal from key fob, the vehicle security system is deactivated. (Disarmed phase)

PANIC ALARM OPERATION

Remote keyless entry system may or may not operate vehicle security system (horn and headlamps) as required.
When the panic alarm button on the keyfob is triggered, ground is supplied intermittently to both headlamp relay and horn relay.
When both headlamp relay (with built-in IPDM E/R) and horn relay are energized and then power is supplied to headlamps (high beam and low beam) and horns (HIGH and LOW).
The headlamp flashes and the horn sounds intermittently.
The alarm automatically turns off after 25 seconds or when BCM receives any signal from key fob.

CAN Communication System Description

NIS0002U

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

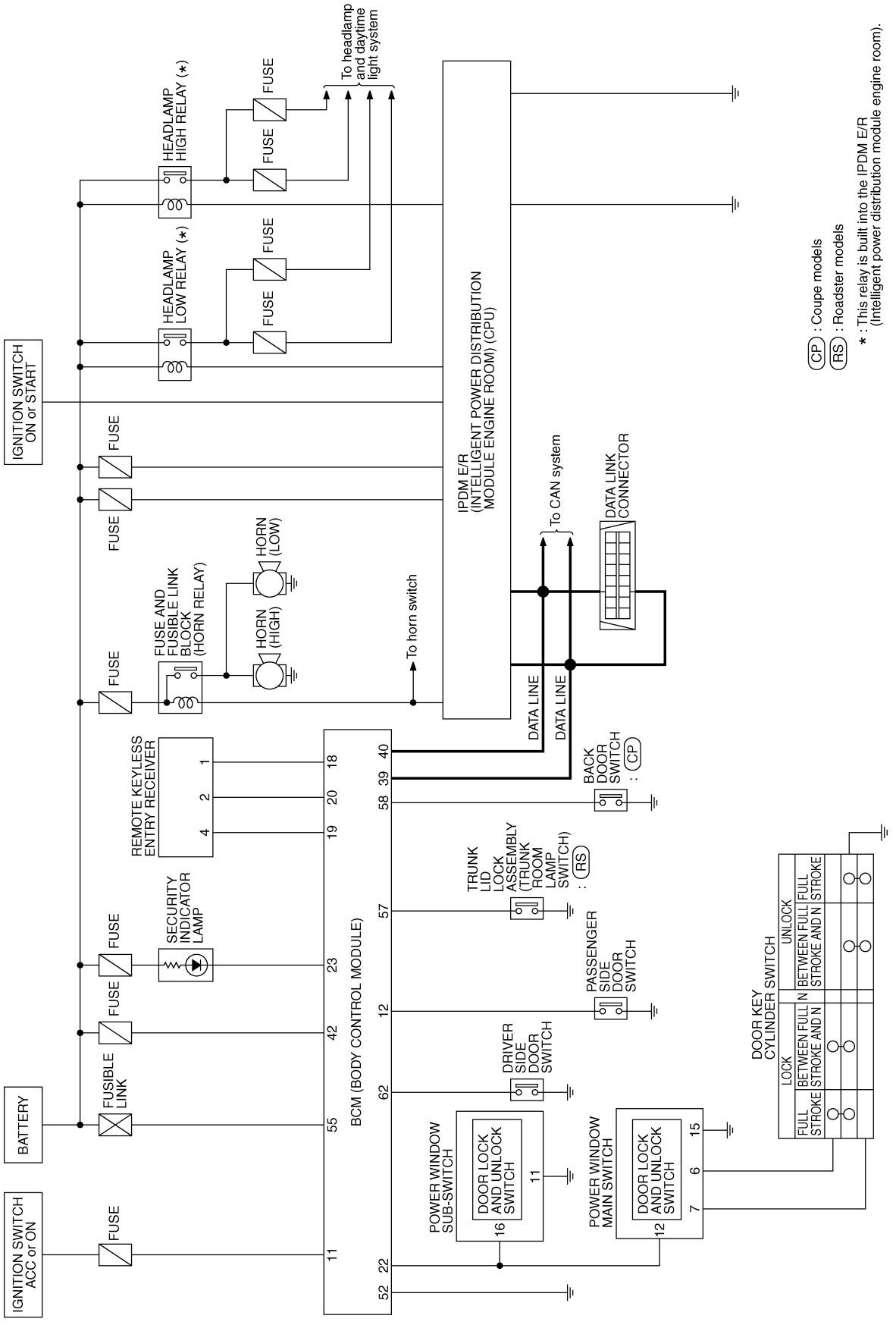
CAN Communication Unit

NIS0002V

Refer to LAN-4, "CAN Communication System" .

Schematic

NIS0002W

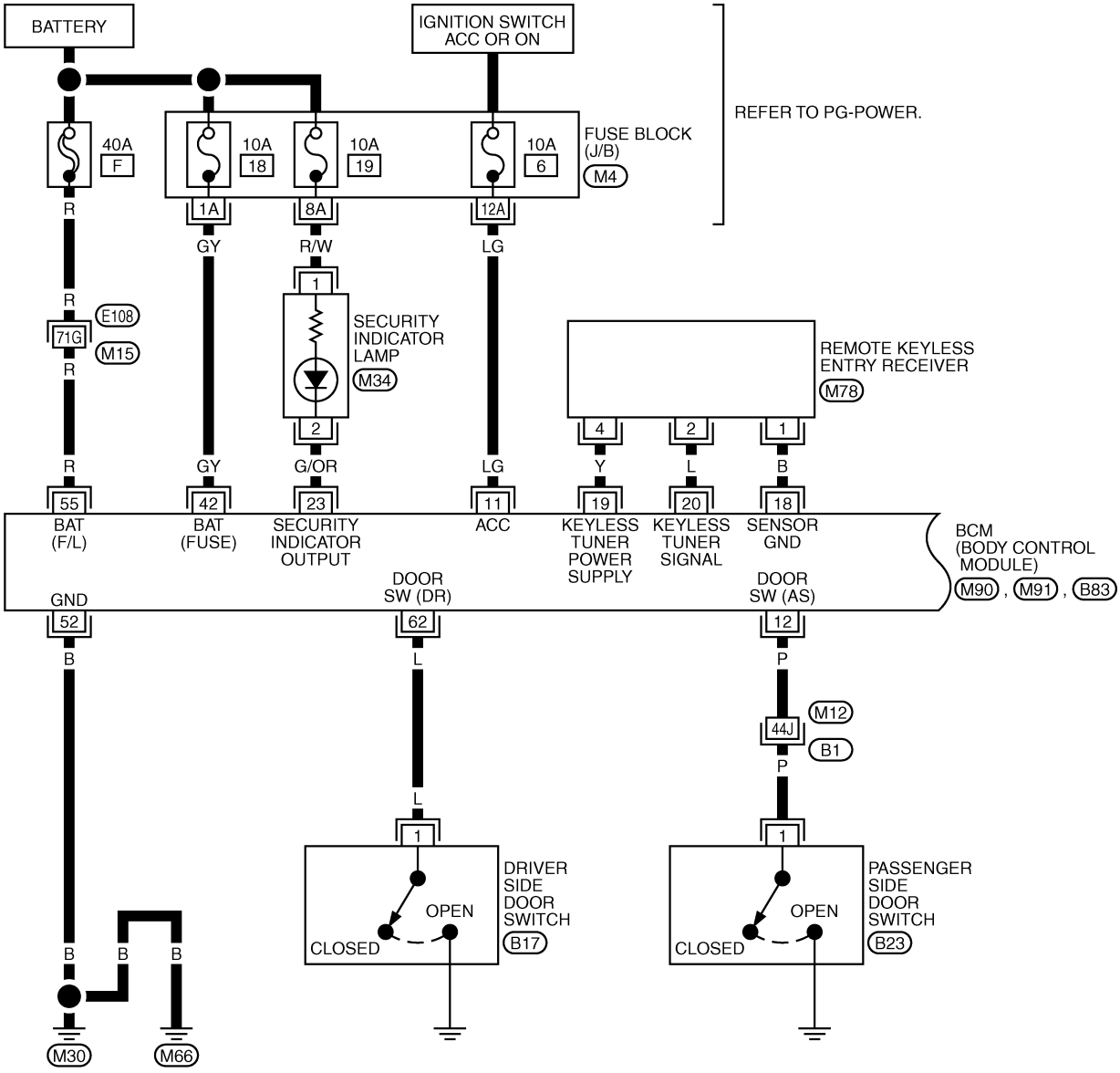


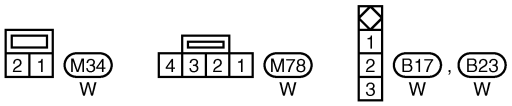
TIWT2268E

Wiring Diagram — VEHSEC —

NIS0002X

BL-VEHSEC-01





REFER TO THE FOLLOWING.

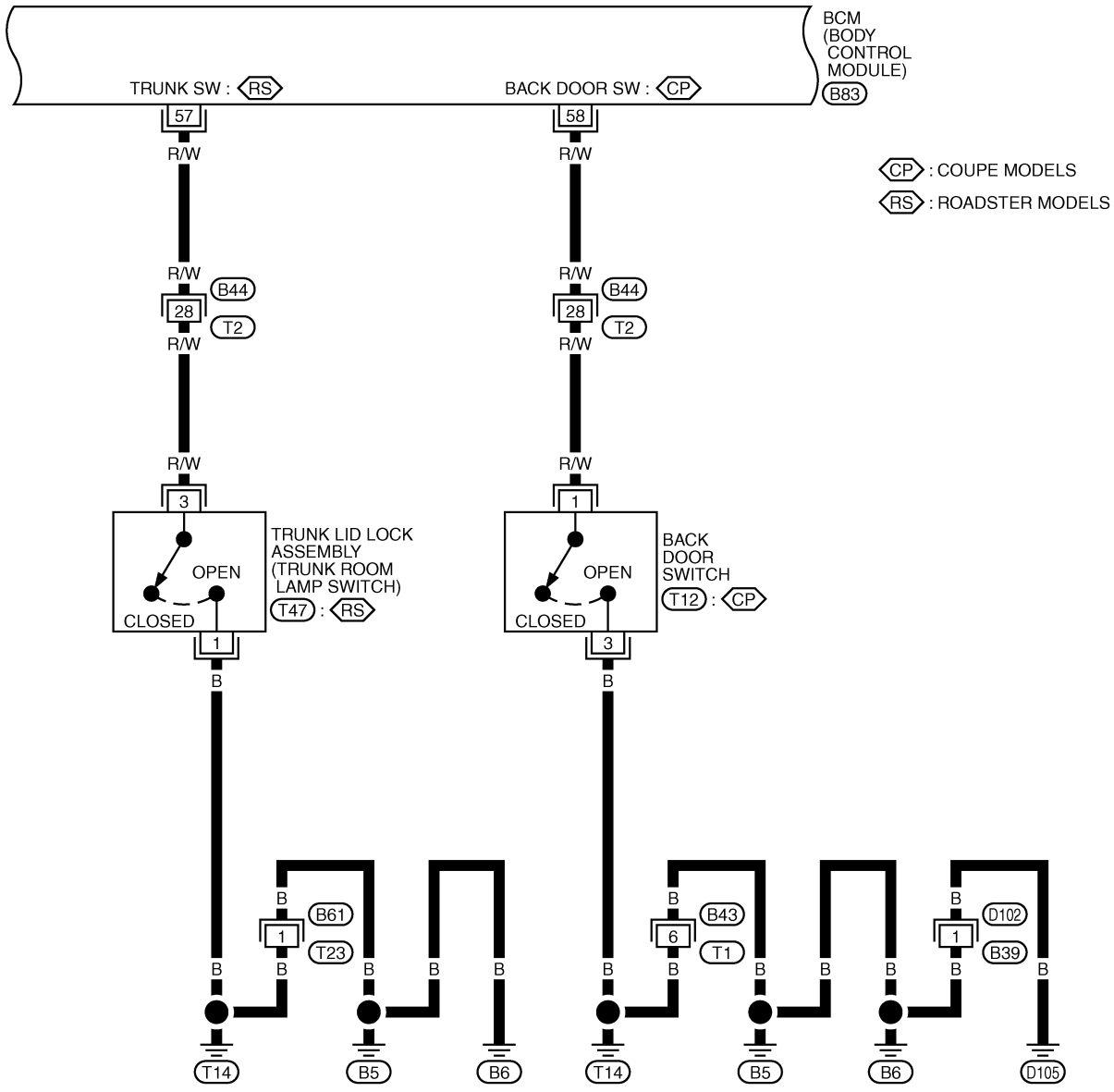
E108, B1 -SUPER MULTIPLE JUNCTION (SMJ)

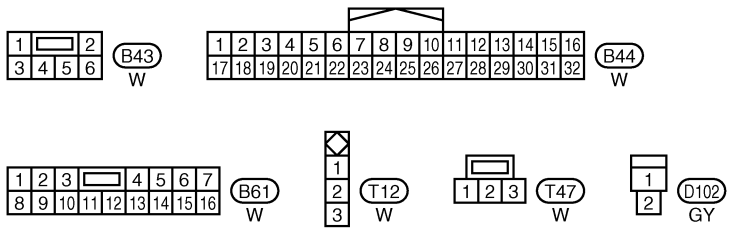
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91, B83 -ELECTRICAL UNITS

TIWT1584E

BL-VEHSEC-02

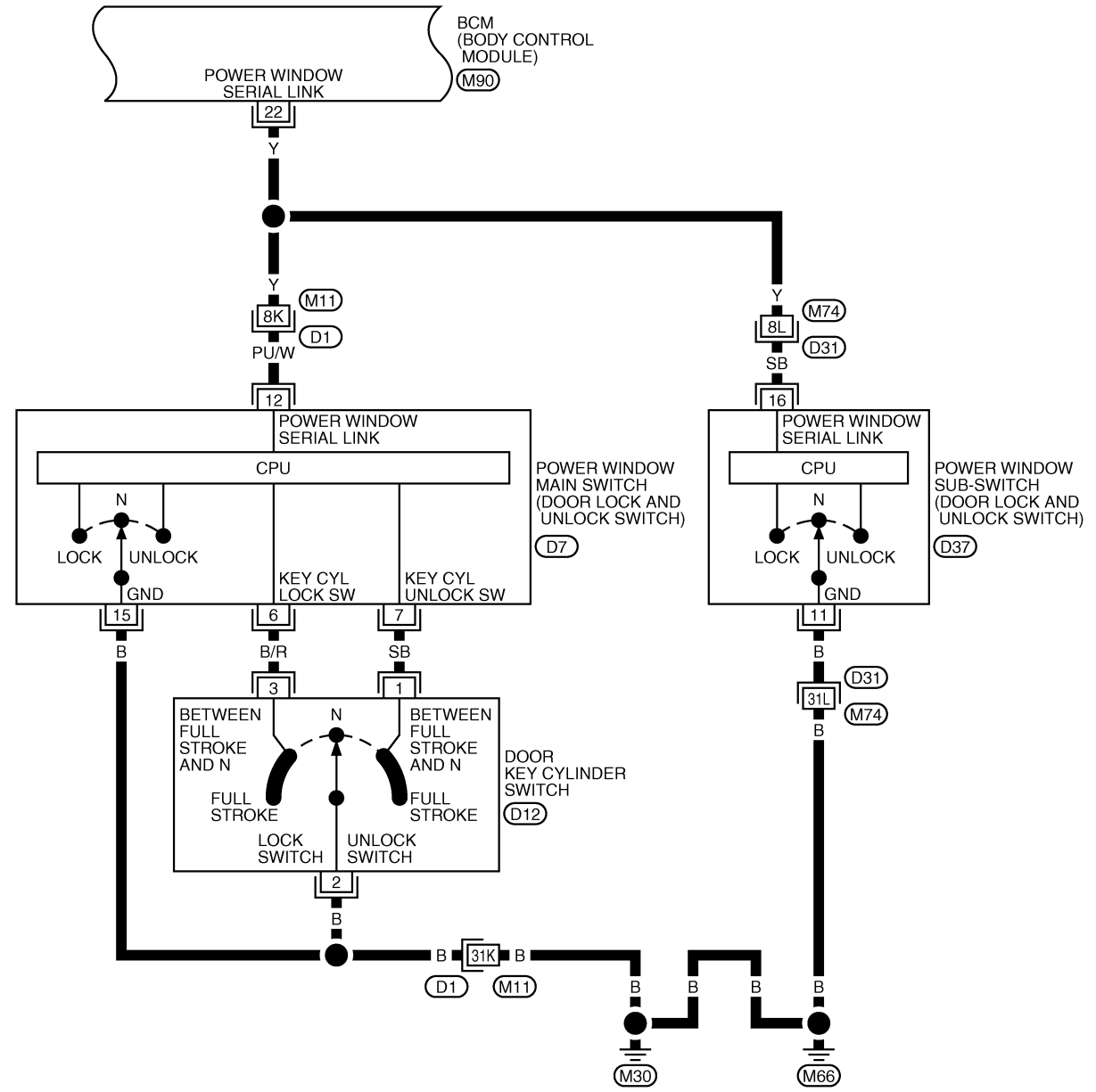


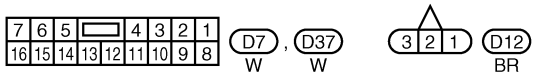


REFER TO THE FOLLOWING.
B83 -ELECTRICAL UNITS

TIWT2200E

BL-VEHSEC-03





REFER TO THE FOLLOWING.

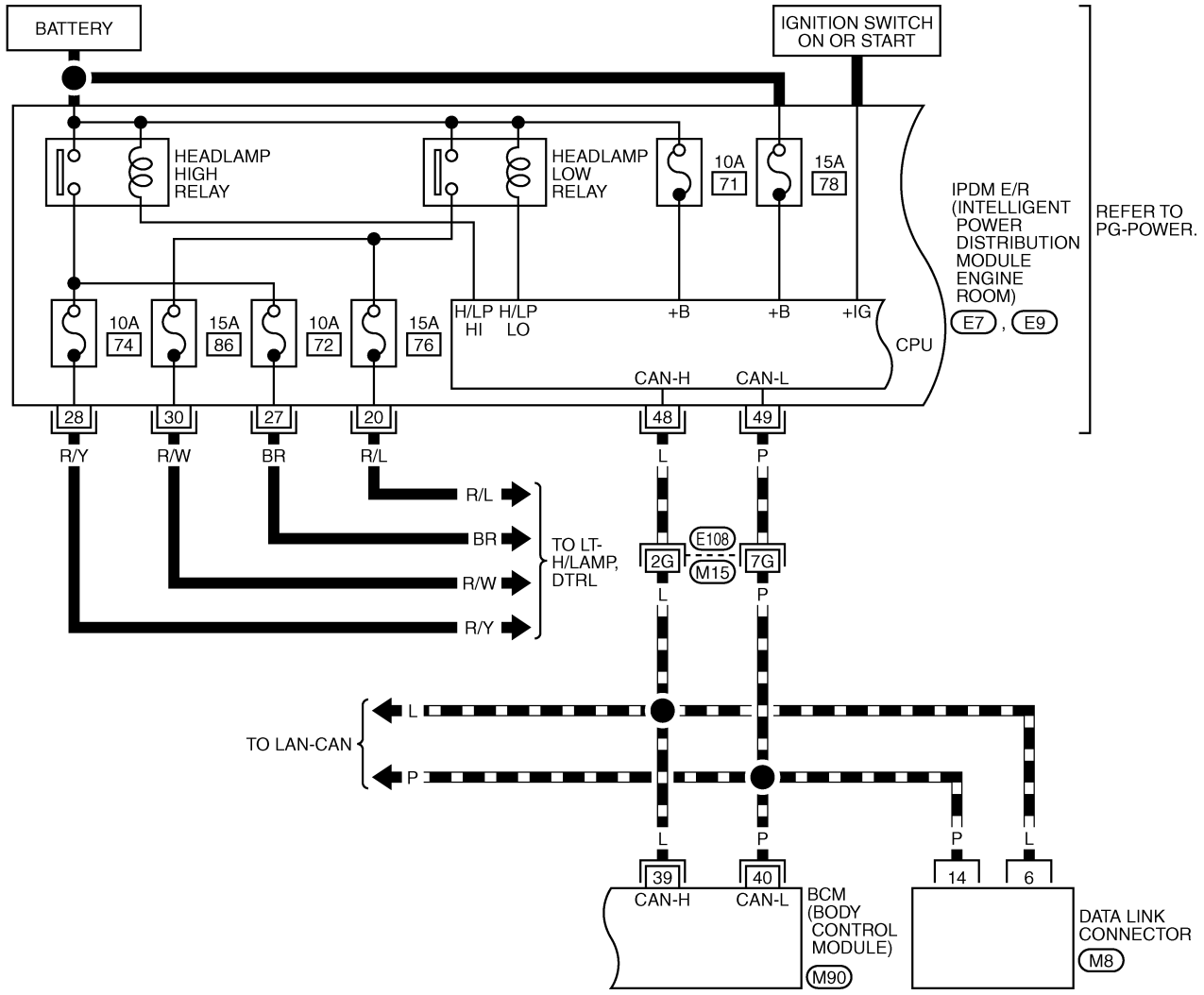
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

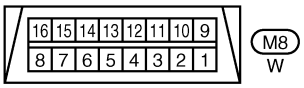
M90 -ELECTRICAL UNITS

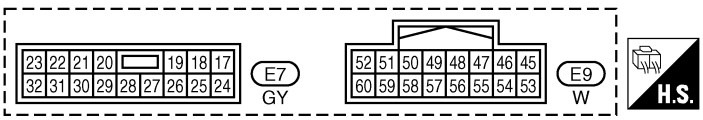
TIWT1586E

BL-VEHSEC-04

: DATA LINE







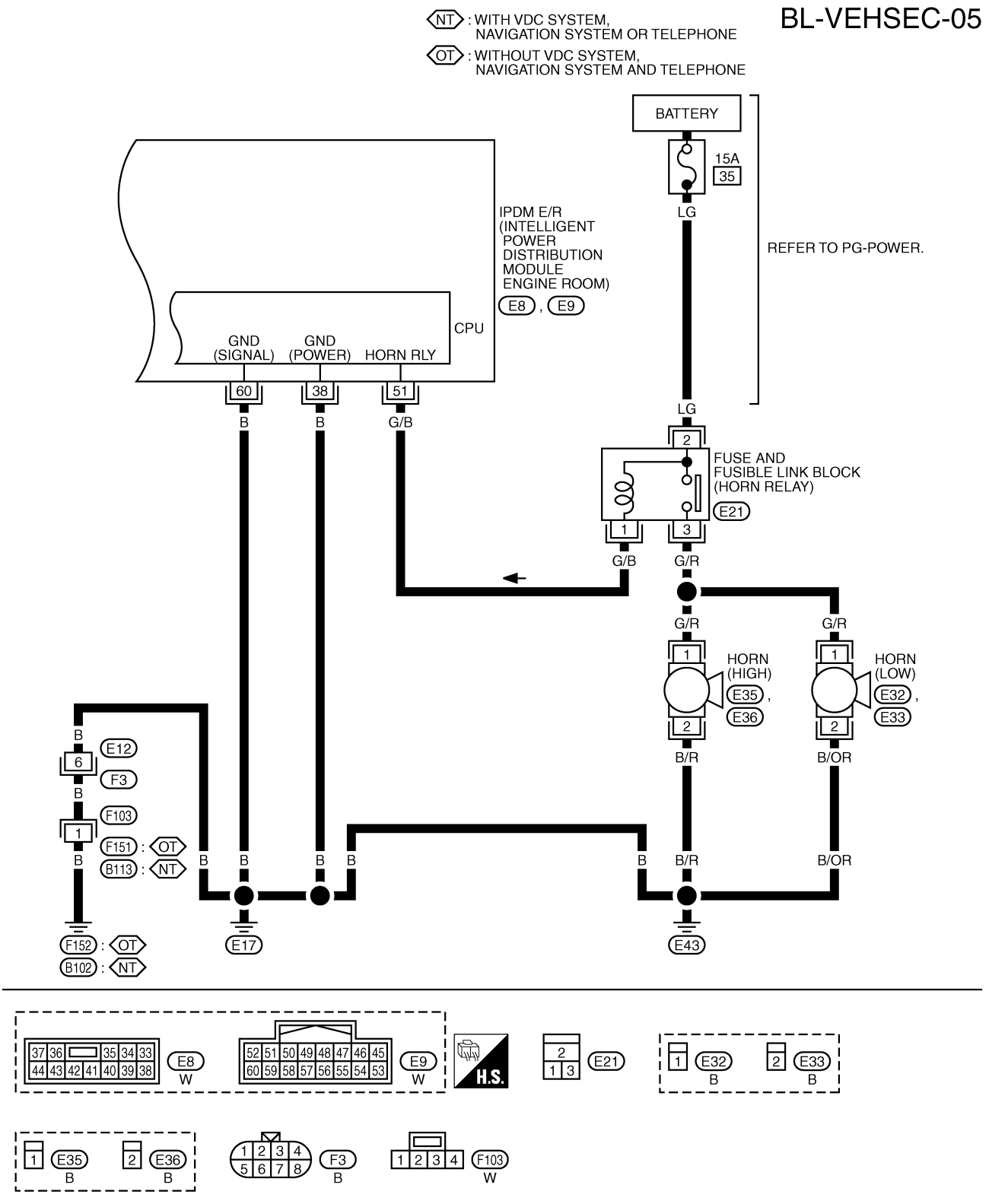
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M90 -ELECTRICAL UNITS

TIWT2269E

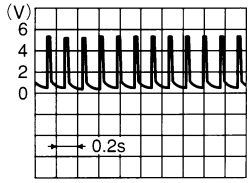
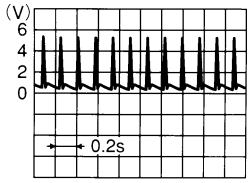
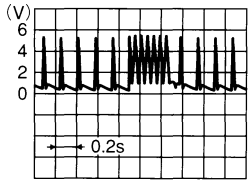
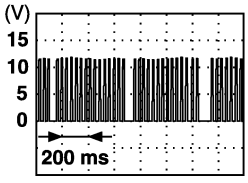
BL-VEHSEC-05



TIWT2270E

Terminals and Reference Value for BCM

NIS0002Y

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx.)
11	LG	Ignition switch (ACC)	Input	Ignition switch (ACC or ON)	Battery voltage
12	P	Passenger side door switch	Input	ON (Open) → OFF (Closed)	0 → 5
18	B	Remote keyless entry receiver (Ground)	—	—	0
19	Y	Remote keyless entry receiver (Power supply)	Output	Key is inserted is IGN key cylinder	0
				All door closed	 OCC3881D
20	L	Remote keyless entry receiver (Signal)	Input	Key is inserted is IGN key cylinder	0
				Stand-by	 OCC3879D
				When remote keyless entry receiver receives signal from keyfob	 OCC3880D
22	Y	Power window switch (Serial link)	Input/ Output	Driver side door and passenger side door are closed. (Each door switch is OFF)	 PIIA2344J
23	G/OR	Security indicator lamp	Output	Goes off → Illuminates (Every 2.4 seconds)	Battery voltage → 0
39	L	CAN-H	Input/ Output	—	—
40	P	CAN-L	Input/ Output	—	—
42	GY	Ignition switch (ON)	Input	Ignition switch (ON or START)	Battery voltage
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage
57	R	Trunk room lamp switch (For Roadster)	Input	ON (Open) → OFF (Closed)	0 → Battery voltage*1
58	R/W	Back door switch (For Coupe)	Input		
62	L	Driver side door switch	Input	ON (Open) → OFF (Closed)	0 → 5

*1: When interior lamp battery saver control is in OFF: Approx.5V.

Terminals and Reference Value for IPDM E/R

NIS0002Z

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage [V] (Approx.)
38	B	Ground	—	—	0
48	L	CAN-H	Input/ Output	—	—
49	P	CAN-L	Input/ Output	—	—
51	G/B	Horn relay	Output	ON → OFF	0 → Battery voltage
60	B	Ground	—	—	0

CONSULT-III Function (BCM)

NIS00030

CONSULT-III APPLICATION ITEM

Work Support

Test Item	Description
SECURITY ALARM SET	This mode is able to confirm and change security alarm ON-OFF setting.
THEFT ALM TRG	The switch which triggered vehicle security alarm is recorded. This mode is able to confirm and erase the record of vehicle security alarm. The trigger data can be erased by touching “CLEAR” on CONSULT-III screen.

Data Monitor

Monitored Item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
ACC ON SW	Indicates [ON/OFF] condition of ignition switch in ACC position.
KEY CYL LK SW	Indicates [ON/OFF] condition of lock signal from key cylinder switch.
KEY CYL UN SW	Indicates [ON/OFF] condition of unlock signal from key cylinder switch.
DOOR SW-DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	Indicates [ON/OFF] condition of passenger side door switch.
BACK DOOR SW	Indicates [ON/OFF] condition of back door switch.
TRUNK OPNR SW	Indicates [ON/OFF] condition of trunk room lamp switch. (Roadster models)
TRUNK OPN MNTR	This is displayed even when it is not equipped. Indicates [ON/OFF] condition of trunk lid opener switch. (Roadster models)
TRUNK KEY SW	This is displayed even when it is not equipped.
DOOR SW-RR	This is displayed even when it is not equipped.
HOOD SW	Indicates [ON/OFF] condition of hood switch.
LOCK SW DR/AS	Indicates [ON/OFF] condition of lock signal from driver and passenger side door lock/unlock switch.
UNLK SW DR/AS	Indicates [ON/OFF] condition of unlock signal from driver and passenger side door lock/unlock switch.
LK BUTTON/SIG	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	Indicates [ON/OFF] condition of unlock signal from key fob.
TRUNK BTN/SIG	Indicate [ON/OFF] condition of back door open signal from key fob (for Coupe). Indicates [ON/OFF] condition of trunk open signal from key fob (for Roadster).

Active Test

Test Item	Description
THEFT IND	This test is able to check security indicator lamp operation. The lamp will be turned on when “ON” on CONSULT-III screen is touched.

Test Item	Description
HORN	This test is able to check vehicle security horn (horn alarm) operation. The horns will be activated for 0.5 seconds after “ON” on CONSULT-III screen is touched.
HEAD LAMP	This test is able to check vehicle security lamp (headlamp alarm) operation. The headlamps will be activated for 0.5 seconds after “ON” on CONSULT-III screen is touched.

CONSULT-III Function (IPDM E/R)

NIS00031

CONSULT-III APPLICATION ITEM

Data Monitor

Monitored Item	Description
HL LO REQ	Indicates [ON/OFF] condition of headlamp low beam.
HL HI REQ	Indicates [ON/OFF] condition of headlamp high beam.
HOOD SW	Indicates [ON/OFF] condition of hood switch.
THFT HRN REQ	Indicates [ON/OFF] condition of horn relay.

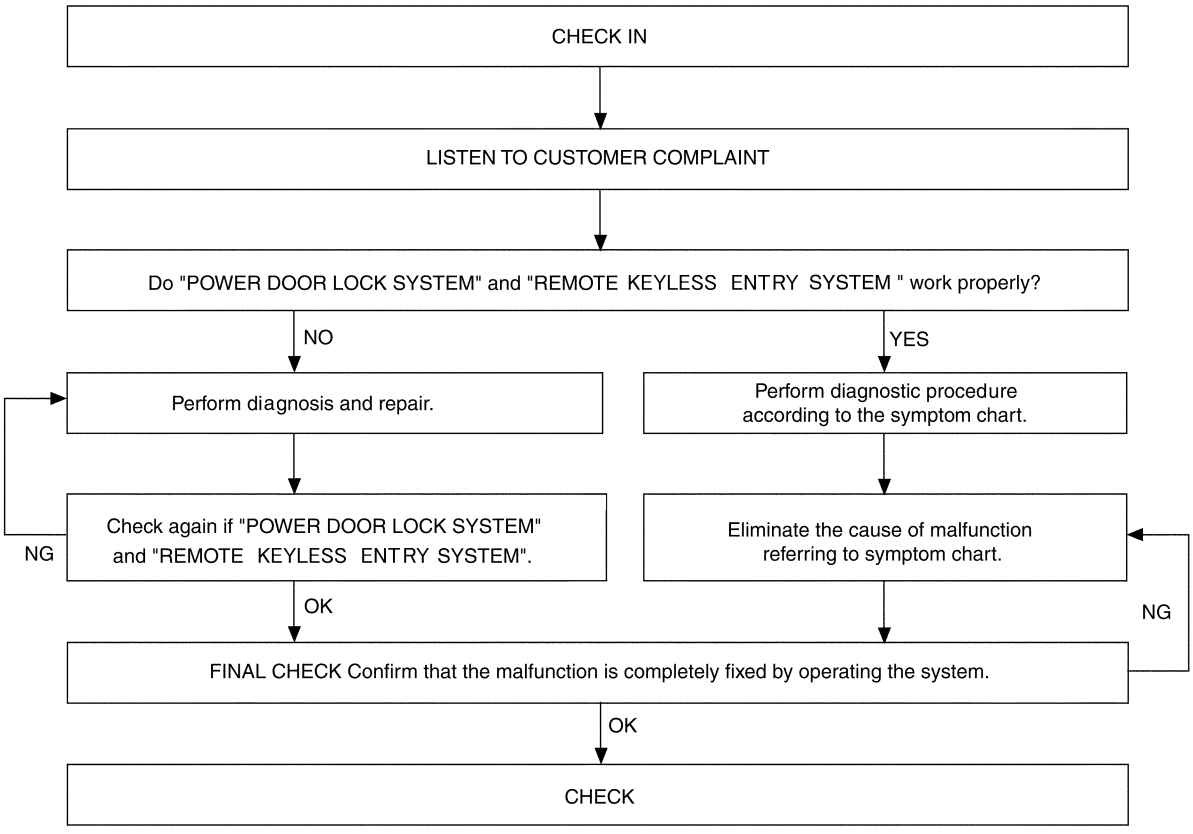
Active Test

Test Item	Description
LAMPS	This test is able to check theft warning lamp (headlamp alarm) operation. The headlamps will be activated for 0.5 seconds after “ON” on CONSULT-III screen is touched.
HORN	This test is able to check theft warning horn (horn alarm) operation. The horns will be activated for 0.5 seconds after “ON” on CONSULT-III screen is touched.

Trouble Diagnosis

NIS00032

WORK FLOW



LIIA0123E

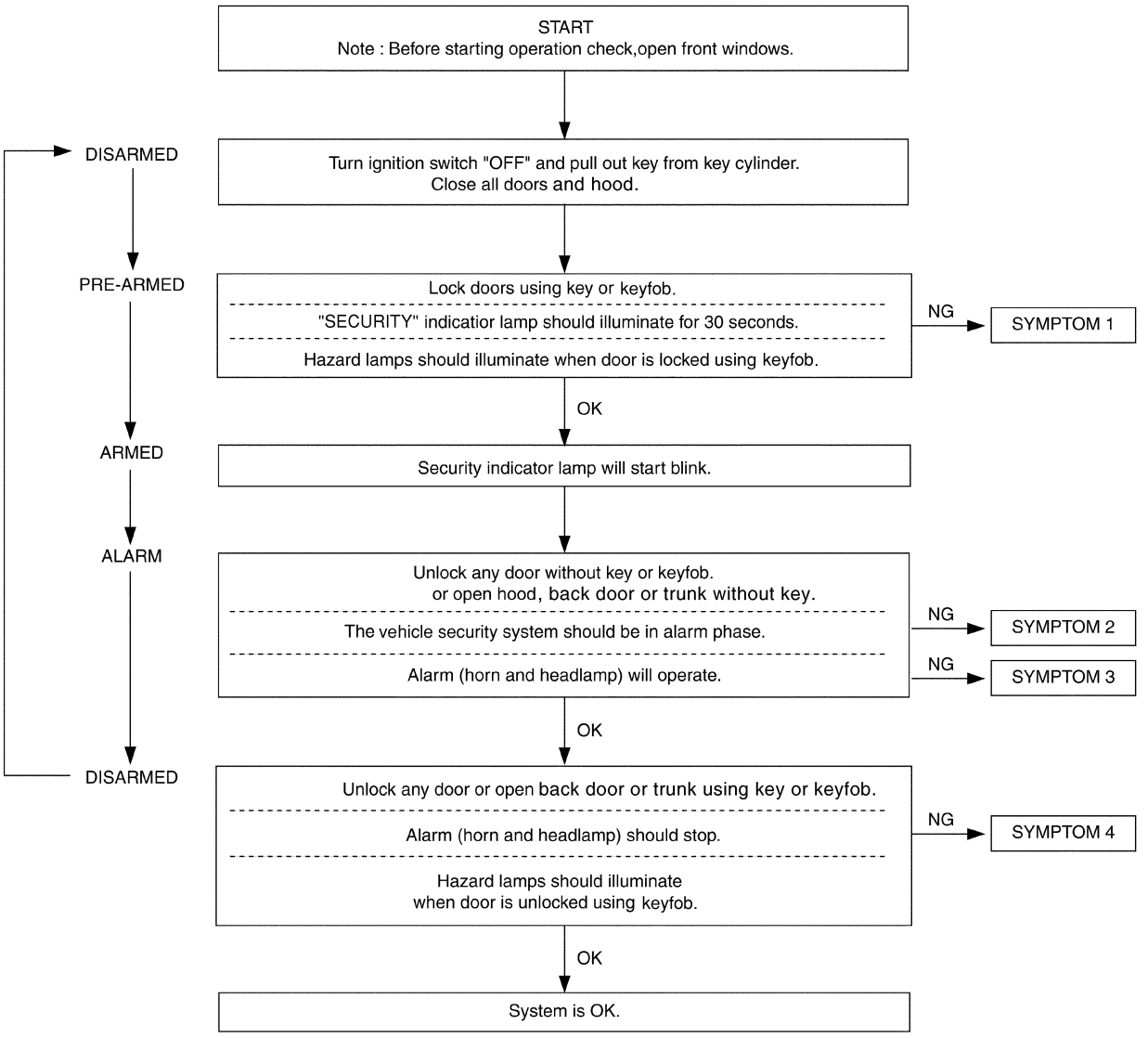
- “POWER DOOR LOCK SYSTEM” Diagnosis; refer to BL-35, "Work Flow" .

- “REMOTE KEYLESS ENTRY” Diagnosis; refer to BL-75, "Work Flow" .

Preliminary Check

NIS00033

The system operation is canceled by turning ignition switch to “ACC” at any step between START and ARMED in the following flow chart.



PIIA8954E

After performing preliminary check, go to symptom chart. Refer to BL-140, "Symptom Chart" .

Symptom Chart

NIS00034

PROCEDURE / SYMPTOM			Diagnostic procedure	Reference page
1	Vehicle security system cannot be set by ….	Door switch	Diagnostic Procedure 1 (Check door, hood, back door switch or trunk room lamp switch)	BL-141
		Lock/unlock switch	Diagnostic Procedure 6 (Check door lock/unlock switch)	BL-149
		Door outside key	Diagnostic Procedure 3 (Check door key cylinder switch)	BL-147
		Key fob	Check remote keyless entry system function.	BL-61
		BCM	If the above systems are “OK”, replace BCM.	BCS-17
	Security indicator does not turn “ON”.		Diagnostic Procedure 2 (Check security indicator lamp)	BL-146
			If the above systems are “OK”, replace BCM.	BCS-17
2	*1 Vehicle security system does not alarm when ….	Any door is opened.	Diagnostic Procedure 1 (Check door, hood and trunk room lamp switch)	BL-141
			If the above systems are “OK”, replace BCM.	BCS-17
3	Vehicle security alarm does not activate.	Horn alarm	Diagnostic Procedure 4 (Check vehicle security horn alarm)	BL-148
			If the above systems are “OK”, replace BCM.	BCS-17
		Headlamp alarm	Diagnostic Procedure 5 (Check vehicle security headlamp alarm)	BL-148
			If the above systems are “OK”, replace BCM.	BCS-17
4	Vehicle security system cannot be canceled by ….	Door outside key	Diagnostic Procedure 3 (Check door key cylinder switch)	BL-147
		Key fob	Check remote keyless entry system function.	BL-61
			If the above systems are “OK”, replace BCM.	BCS-17

*1: Make sure the system is in the armed phase.

Diagnostic Procedure 1

NIS00035

1 – 1 CHECK DOOR SWITCH

Check driver side door switch and passenger side door switch

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

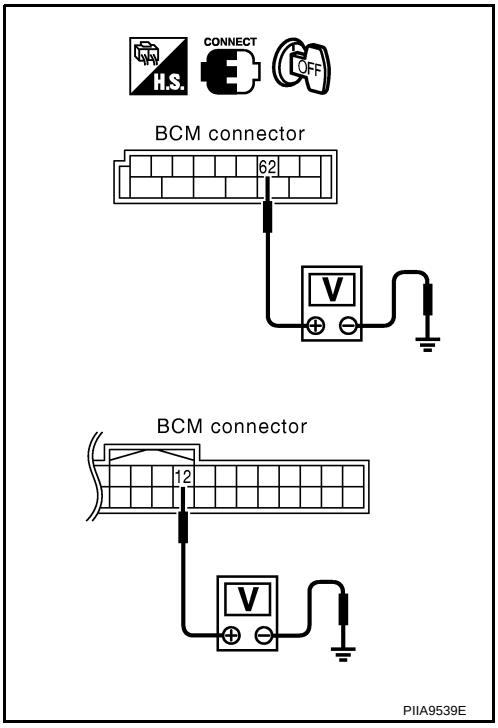
Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Item	Con-nector	Terminal (Wire color)		Condi-tion of door switch	Voltage [V] (Approx.)
		(+)	(–)		
Driver side door switch	B83	62 (L)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK, and go to the following

- BL-143, "1 – 2 CHECK BACK DOOR SWITCH (COUPE)"
- BL-145, "1 – 3 CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) (ROADSTER)"

NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23 terminal 1 and BCM harness connector B83 terminal 62 (driver side) or M90 terminal 12 (passenger side).

Driver side door

1 (L) - 62 (L) : Continuity should exist.

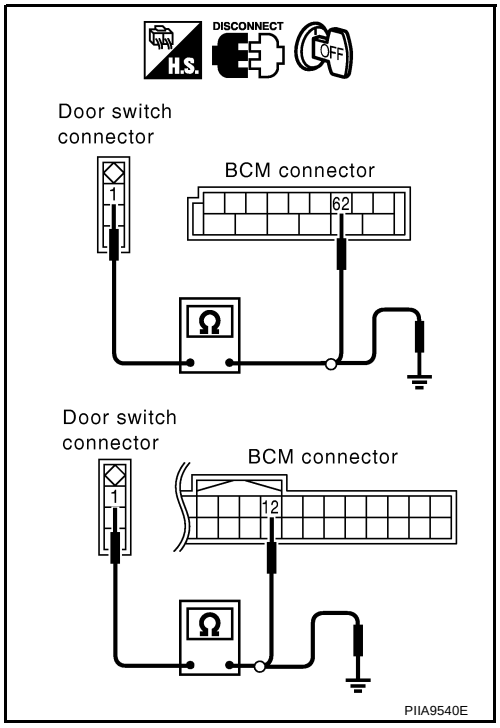
Passenger side door

1 (P) - 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23 terminal 1 and ground.

Each door switch

1 (W or P) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace door switch harness.

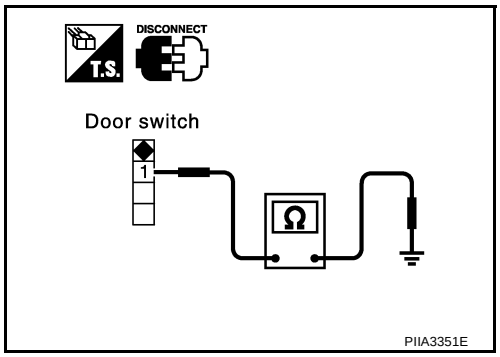
3. CHECK DOOR SWITCH

Check continuity between door switch B17 (driver side) or B23 (passenger side) terminal 1 and ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Ground part of door switch	Pushed	No
		Released	Yes

OK or NG

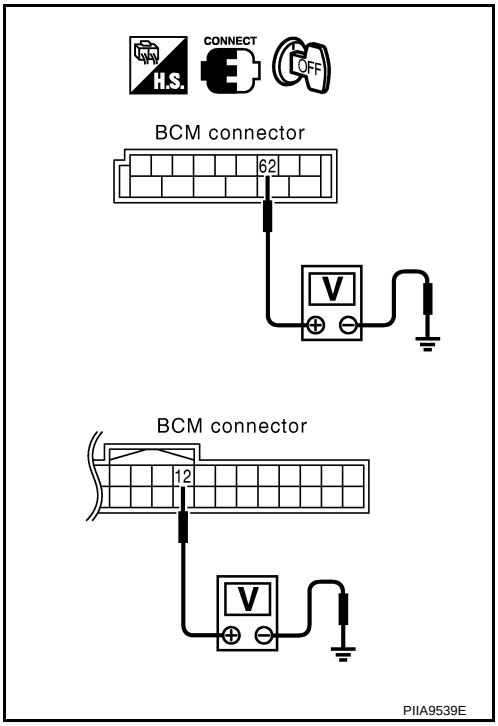
OK >> GO TO 4.
NG >> Replace door switch.



4. CHECK DOOR SWITCH INPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM harness connectors B83 (driver side), M90 (passenger side) terminals 62, 12 and ground.

62 (L) – Ground : Approx. 5V
12 (P) – Ground : Approx. 5V



OK or NG

OK >> Check harness connection.
NG >> Replace BCM.

1 – 2 CHECK BACK DOOR SWITCH (COUPE)

1. CHECK BACK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

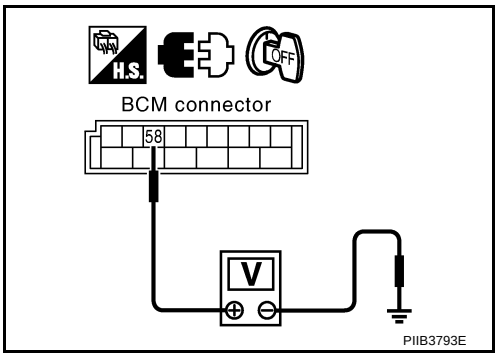
Check back door switch (“BACK DOOR SW”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
BACK DOOR SW	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition of back door switch	Voltage [V] (Approx.)
	(+)	(–)		
M83	58 (R/W)	Ground	Open	0
			Close	Buttery voltage



OK or NG

OK >> Back door switch is OK.
NG >> GO TO 2.

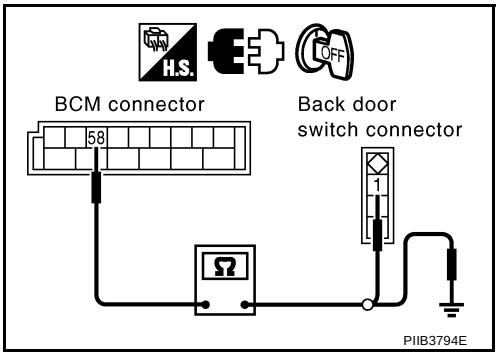
2. CHECK BACK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door switch connectors.
3. Check continuity between BCM harness connector B83 terminal 58 and back door switch harness connector T12 terminal 1.

58 (R/W) - 1 (R/W) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 58 and ground.

58 (R/W) - Ground : Continuity should not exist.



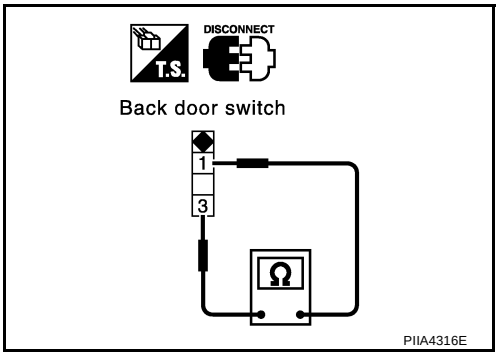
OK or NG

OK >> GO TO 3.
NG >> Repair or replace back door switch harness.

3. CHECK BACK DOOR SWITCH

Check continuity between door switch terminals 1 and 3.

Terminal		Condition of back door switch	Continuity
1	3	Open position	Yes
		Closed position	No



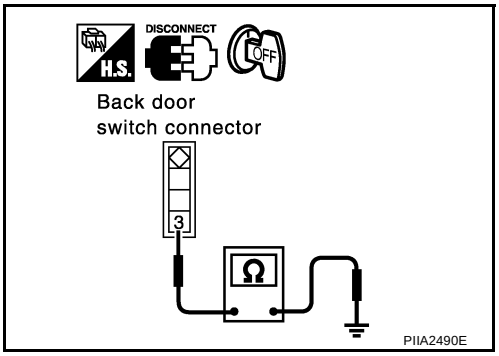
OK or NG

OK >> GO TO 4.
NG >> Replace back door switch.

4. CHECK BACK DOOR SWITCH GROUND CIRCUIT

Check continuity between back door switch harness connector T12 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



OK or NG

OK >> Back door switch circuit is OK.
NG >> Repair or replace harness.

1 – 3 CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) (ROADSTER)

1. CHECK TRUNK ROOM LAMP SWITCH INPUT SIGNAL

With CONSULT-III

Check trunk lid opener switch (“TRUNK OPN MNTR”) in “DATA MONITOR” mode with CONSULT-III.

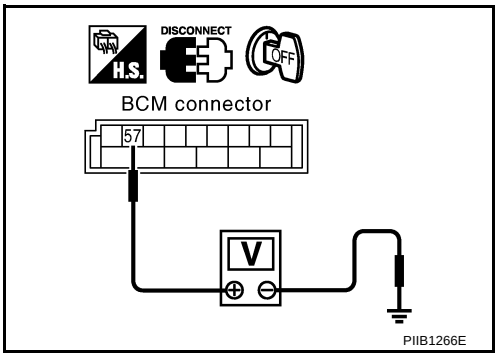
Monitor item	Condition	
TRNK OPN MNTR	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition of trunk room lamp switch	Voltage [V] (Approx.)
	(+)	(–)		
B83	57 (R/W)	Ground	Open	0
			Close	Battery voltage*

*: When interior lamp battery saver control is in OFF. → Approx 5V.



OK or NG

OK >> Trunk room lamp switch is OK .
NG >> GO TO 2.

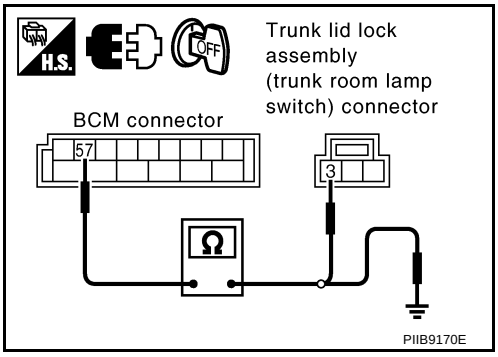
2. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect trunk lid lock assembly (trunk room lamp switch) and BCM connector.
3. Check continuity between trunk lid lock assembly (trunk room lamp switch) harness connector T47 terminal 3 and BCM harness connector B83 terminal 57.

   57 (R/W) - 3 (R/W) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 57 and ground.

   57 (R/W) - Ground : Continuity should not exist.



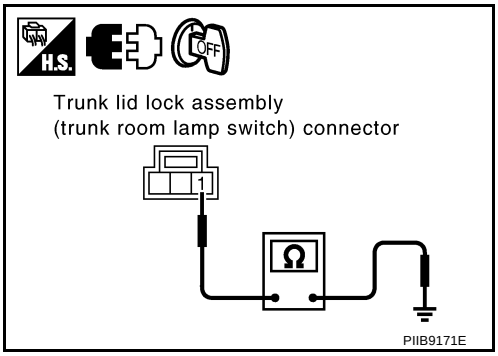
OK or NG

OK >> GO TO 3.
NG >> Replace trunk lid lock assembly (trunk room lamp switch) harness.

3. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between trunk lid lock assembly (trunk room lamp switch) harness connector T47 terminal 1 and ground.

   1 (B) - Ground : Continuity should exist.



OK or NG

OK >> Trunk lid lock assembly (trunk room lamp switch) is OK.
NG >> Repair or replace trunk lid lock assembly (trunk room lamp switch) harness.

Diagnostic Procedure 2

NIS00036

CHECK SECURITY INDICATOR LAMP

1. SECURITY INDICATOR LAMP ACTIVE TEST

With CONSULT-III

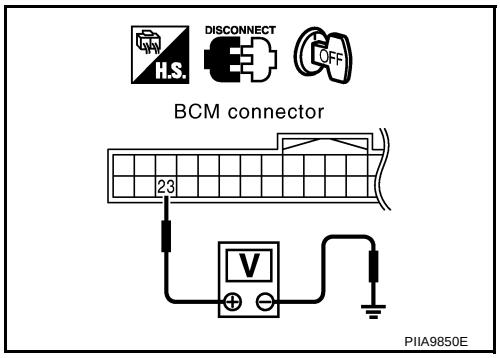
Check “THEFT IND” in “ACTIVE TEST” mode with CONSULT-III.

Perform operation shown on display.
Indicator lamp should illuminate.

Without CONSULT-III

1. Disconnect BCM connector.
2. Check voltage between BCM connector M90 terminal 23 and ground.

23 (G/OR) - Ground : Battery voltage



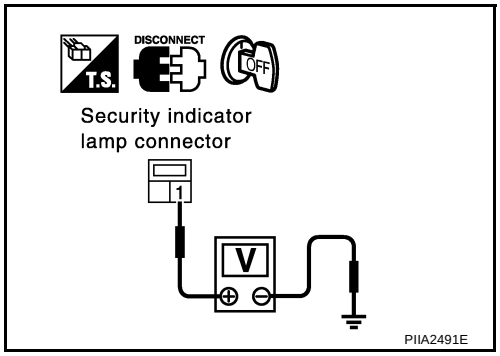
OK or NG

OK >> Security indicator lamp is OK.
NG >> GO TO 2.

2. CHECK POWER SUPPLY CIRCUIT FOR SECURITY INDICATOR LAMP

1. Disconnect security indicator lamp connector.
2. Check voltage between security indicator lamp connector M34 terminal 1 and ground.

1 (R/W) - Ground : Battery voltage



OK or NG

OK >> GO TO 3.
NG >> Check the following.

- 10A fuse [No. 19, located in fuse block (J/B)]
- Harness for open or short between security indicator lamp and fuse

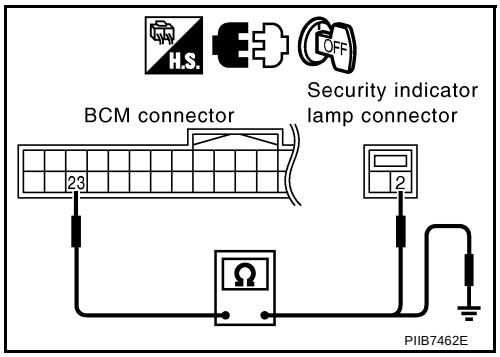
3. CHECK SECURITY INDICATOR LAMP CIRCUIT

1. Check continuity between BCM harness connector M90 terminal 23 and security indicator lamp harness connector M34 terminal 2.

23 (G/OR) - 2 (G/OR) : Continuity should exist.

2. Check continuity between BCM harness connector M90 terminal 23 and ground.

23 (G/OR) - Ground : Continuity should not exist.



OK or NG

OK >> Check indicator lamp condition.
NG >> Repair harness or connector.

Diagnostic Procedure 3

NIS00037

CHECK DOOR KEY CYLINDER SWITCH

1. CHECK DOOR KEY CYLINDER SWITCH DRIVER SIDE OPERATION

Do doors lock/unlock when using the key?

YES or NO

YES >> Door key cylinder switch operation is OK.
NO >> Check door key cylinder switch circuit. Refer to BL-47, "Check Door Key Cylinder Switch" .

Diagnostic Procedure 4

NIS00038

CHECK VEHICLE SECURITY HORN ALARM

First perform the “SELF-DIAG RESULTS” of “BCM” with CONSULT-III, then perform the trouble diagnosis of malfunction system indicated in “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

1. CHECK HORN OPERATION

Check if horn sounds with horn switch.

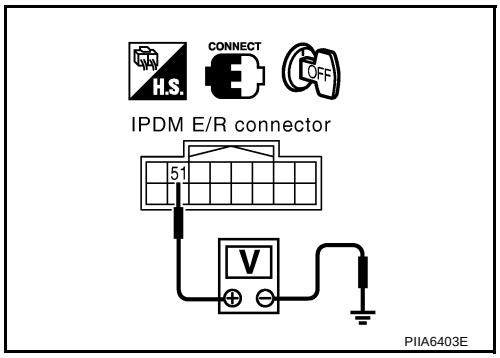
Does horn operate?

YES >> GO TO 2.
NO >> Check horn circuit. Refer to WW-53, "HORN" .

2. CHECK IPDM E/R INPUT SIGNAL

Check voltage between IPDM E/R connector E9 terminal 51 and ground.

51 (G/B) – Ground : Battery voltage.



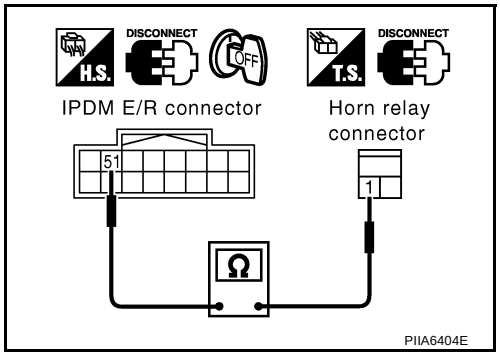
OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 3.

3. CHECK HORN RERAY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R and horn relay connector.
3. Check continuity between IPDM E/R harness connector E9 terminal 51 and horn relay harness connector E21 terminal 1.

1 (G/B) - 51(G/B) : Continuity should exist.



OK or NG

OK >> Horn circuit is OK.
NG >> Repair or replace harness.

Diagnostic Procedure 5

NIS00039

CHECK VEHICLE SECURITY HEADLAMP ALARM

1. CHECK HEAD LAMP OPERATION

Does headlamp come on when turning lighting switch “ON”?

YES or NO

YES >> Headlamp alarm circuit is OK.
NO >> Check headlamp system. Refer to,,, LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -"LT-5, "HEADLAMP (FOR USA)" .

Diagnostic Procedure 6

NIS0003A

CHECK DOOR LOCK AND UNLOCK SWITCH

1. CHECK DOOR LOCK AND UNLOCK SWITCH INPUT SIGNAL

Does doors lock/unlock when using power window main switch (door lock and unlock switch) or power window sub-switch (door lock and unlock switch)?

YES or NO?

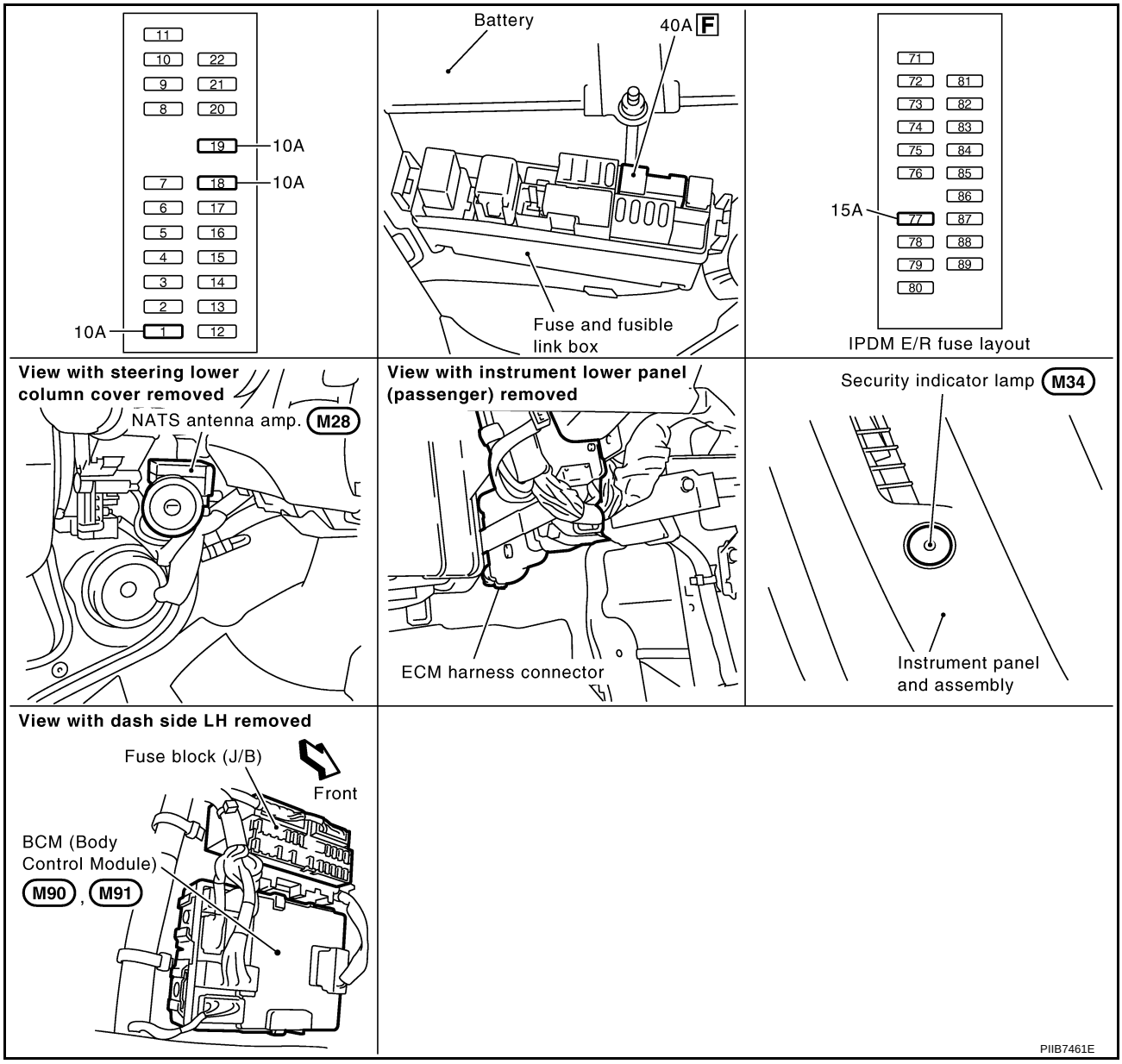
YES >> Door lock and unlock switch is OK.
NO >> Refer to BL-42, "Check Door Lock and Unlock Switch" .

NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)

PFP:25386

Component Parts and Harness Connector Location

NIS0003B



NOTE:

If customer reports a “No start” condition, request ALL KEYS to be brought to an NISSAN dealer in case of a NVIS (NATS) malfunction.

System Description

NIS0003C

NVIS (Nissan Vehicle Immobilizer System-NATS) has the following immobilizer functions:

- Since only NVIS (NATS) ignition keys, whose ID Nos. have been registered into the ECM and BCM, allow the engine to run, a vehicle operation without a key registered in NVIS (NATS) is prevented by NVIS (NATS).
  That is to say, NVIS (NATS) will immobilize the engine if someone tries to start it without the registered key of NVIS (NATS).
- All of the originally supplied ignition key IDs (except for card plate key) have been registered in NVIS (NATS).
  If requested by the vehicle owner, a maximum of five key IDs can be registered into the NVIS (NATS) components.
- The security indicator blinks when the ignition switch is in “OFF” or “ACC” position. Therefore, NVIS (NATS) warns outsiders that the vehicle is equipped with the anti-theft system.
- When NVIS (NATS) detects trouble, the security indicator lamp lights up while ignition key is in the “ON” position.
- NVIS (NATS) trouble diagnoses, system initialization and additional registration of other NVIS (NATS) ignition key IDs must be carried out using CONSULT-III hardware and CONSULT-III NVIS (NATS) software.
  When NVIS (NATS) initialization has been completed, the ID of the inserted ignition key is automatically registered in NVIS (NATS). Then, if necessary, additional registration of other NVIS (NATS) ignition key IDs can be carried out.
  Regarding the procedures of NVIS (NATS) initialization and NVIS (NATS) ignition key ID registration, refer to CONSULT-III Operation Manual NATS-IVIS/NVIS.
- **When servicing a malfunction of the NVIS (NATS) (indicated by lighting up of Security Indicator Lamp) or registering another NVIS (NATS) ignition key ID No., it may be necessary to re-register original key identification. Therefore, be sure to receive ALL KEYS from vehicle owner.**

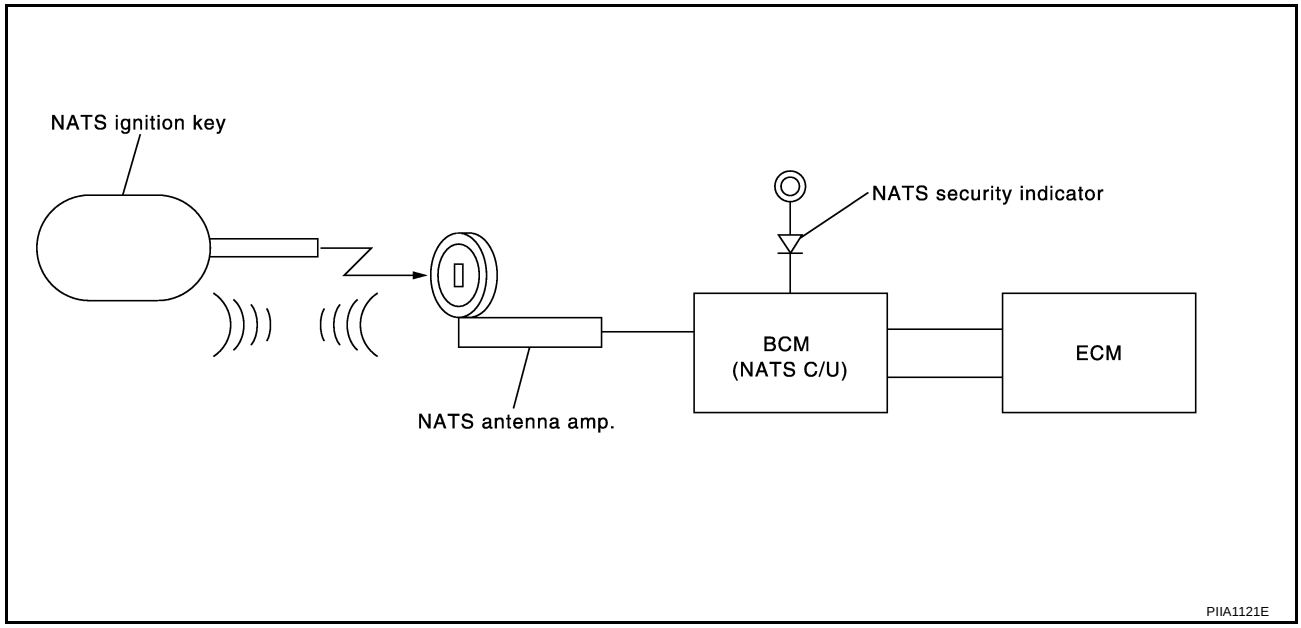
System Composition

NIS0003D

The immobilizer function of the NVIS (NATS) consists of the following:

- NATS ignition key
- NATS antenna amp. located in the ignition key cylinder
- BCM
- Engine control module (ECM)
- Security indicator

NOTE:
The communication between ECM and BCM uses the CAN communication system.



ECM Re-communicating Function

NIS0003E

Performing following procedure can automatically perform re-communication of ECM and BCM, but only when the ECM has been replaced with a new one (*1).
*1: New one means a virgin ECM which has never been energized on-board.
(In this step, initialization procedure by CONSULT-III is not necessary)

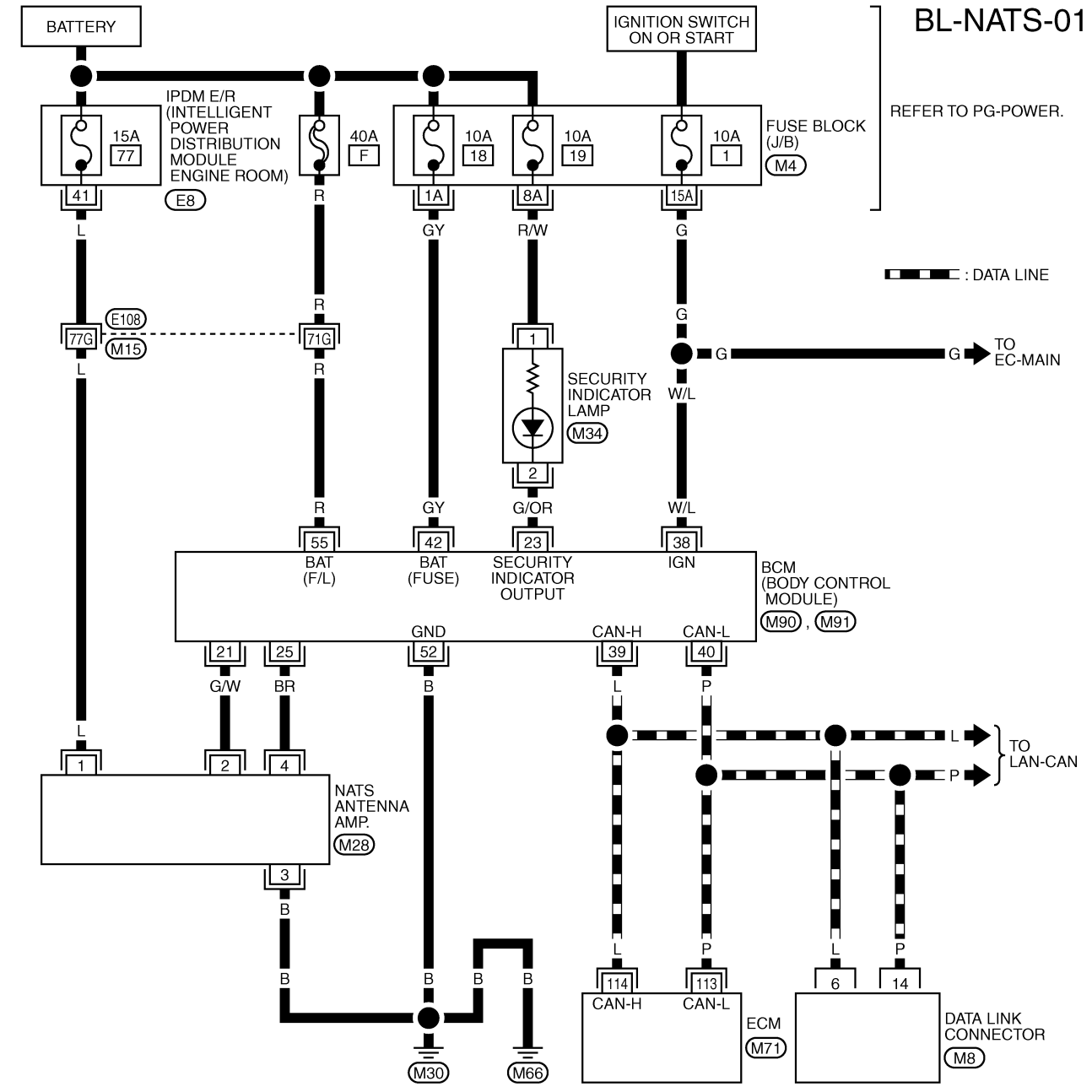
NOTE:

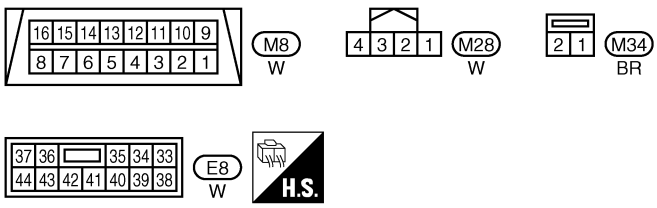
- **When registering new Key IDs or replacing the ECM other than brand new, refer to CONSULT-III Operation Manual NATS-IVIS/NVIS.**
- **If multiple keys are attached to the key holder, separate them before work.**
- **Distinguish keys with unregistered key ID from those with registered ID.**

1. Install ECM.
2. Using a registered key (*2), turn ignition switch to “ON”.
   *2: To perform this step, use the key (except for card plate key) that has been used before performing ECM replacement.
3. Maintain ignition switch in “ON” position for at least 5 seconds.
4. Turn ignition switch to “OFF”.
5. Start engine.
   If engine can be started, procedure is completed.
   If engine cannot be started, refer to CONSULT-III Operation Manual NATS-IVIS/NVIS and initialize control unit.

Wiring Diagram — NATS —

NIS0003F





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M71 , M90 , M91 -ELECTRICAL UNITS

TIWT2271E

Terminals and Reference Value for BCM

NIS0003G

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx.)
21	G/W	NATS antenna amp.	Input/ Output	Ignition switch (OFF → ON)	Just after turning ignition switch “ON”: Pointer of tester should move.
23	G/OR	Security indicator lamp	Output	Goes OFF → illuminates (Every 2.4 seconds)	Battery voltage → 0
25	BR	NATS antenna amp.	Input/ Output	Ignition switch (OFF → ON)	Just after turning ignition switch “ON”: Pointer of tester should move.
38	W/L	Ignition switch (ON)	Input	Ignition switch (ON or START)	Battery voltage
39	L	CAN-H	Input/ Output	—	—
40	P	CAN-L	Input/ Output	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage

CONSULT-III

NIS0003H

CONSULT-III INSPECTION PROCEDURE

Refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

CONSULT-III DIAGNOSTIC TEST MODE FUNCTION

CONSULT-III DIAGNOSTIC TEST MODE	Description
C/U INITIALIZATION	When replacing any of the following components, C/U initialization and re-registration of all NATS ignition keys are necessary. [(NATS ignition key BCM/ ECM)

NOTE:

- When any initialization is performed, all ID previously registered will be erased and all NATS ignition keys must be registered again.

NVIS (NATS) SELF-DIAGNOSTIC RESULTS ITEM CHART

Detected items [NVIS (NATS) program card screen terms]	P No. Code (Self-diagnostic result of “ENGINE”)	Malfunction is detected when.....	Reference page
CHAIN OF ECM-IMMU [P1612]	NATS MALFUNCTION P1612	Communication impossible between ECM and BCM In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.	Refer to BL-158, "Diagnostic Procedure 1" .
DIFFERENCE OF KEY [P1615]	NATS MALFUNCTION P1615	BCM can receive the key ID signal but the result of ID verification between key ID and BCM is NG.	Refer to BL-159, "Diagnostic Procedure 2" .
CHAIN OF IMMU-KEY [P1614]	NATS MALFUNCTION P1614	BCM cannot receive the key ID signal.	Refer to BL-160, "Diagnostic Procedure 3" .

Detected items [NVIS (NATS) program card screen terms]	P No. Code (Self-diagnostic result of “ENGINE”)	Malfunction is detected when.....	Reference page
ID DISCORD, IMM-ECM [P1611]	NATS MALFUNCTION P1611	The result of ID verification between BCM and ECM is NG. System initialization is required.	Refer to BL-161, "Diagnostic Procedure 4" .
LOCK MODE [P1610]	NATS MALFUNCTION P1610	When the starting operation is carried out five or more times consecutively under the following conditions, NVIS (NATS) will shift the mode to one which prevents the engine from being started. ● Unregistered ignition key is used. ● BCM or ECM’s malfunctioning.	Refer to BL-165, "Diagnostic Procedure 6" .
DON'T ERASE BEFORE CHECKING ENG DIAG	—	All engine trouble codes except NVIS (NATS) trouble code has been detected in ECM.	Refer to BL-155, "Work Flow" .

Work Flow

NIS002B3

1. LISTEN TO CUSTOMER COMPLAINT OR REQUEST

Get symptoms or listen to customer complaints or request.

NOTE:
In case of request for NVIS (NATS) system repair, the key ID re-registration might be necessary. Keep all the ignition keys before work for the re-registration.

Key ID registration request>>Register ignition key by referring to CONSULT-III Operation Manual NATS-IVIS/NVIS.
Request for malfunction repair.>>GO TO 2.

2. CONFIRM SELF DIAGNOSIS 1

Start CONSULT-III with ignition switch in ON position and confirm “SELF DIAG RESULT” with “ENGINE”.

Is DTC detected?

No malfunction>>GO TO 3.
If the codes detected are between the interval P1610 to P1615.>> Refer to BL-154, "NVIS (NATS) SELF-DIAGNOSTIC RESULTS ITEM CHART" .
If the codes detected are between the interval P1610 to P1615 and others.>> GO TO 4.

3. CHECK SECURITY INDICATOR FUNCTION

Check that security indicator for lighting up fulfill the two conditions below.

- Security indicator lights off when ignition switch is ON position.
- Security indicator blinks when ignition switch is in any position except ON.

Lighting up condition is normal.>>Inspection END.
Lighting up condition is malfunctioning.>>Perform security indicator Inspection. Refer to BL-163, "Diagnostic Procedure 5" .

4. TROUBLE DIAGNOSIS

Perform by priority the trouble diagnosis for the codes which are not included in the interval P1610 to P1615.

Is DTC detected?

No malfunction>>Inspection END.
If the codes detected are between the interval P1610 to P1615.>>BL-154, "NVIS (NATS) SELF-DIAGNOSTIC RESULTS ITEM CHART".

Trouble Diagnoses

NIS0003J

SYMPTOM MATRIX CHART 1

Self-diagnosis related item

SYMPTOM	Displayed “SELF-DIAG RESULTS” on CONSULT-III screen.	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
● Security indicator lighting up* ● Engine cannot be started	CHAIN OF ECM-IMMU [P1612]	PROCEDURE 1 (BL-158)	In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.	—
			Open circuit in battery voltage line of BCM circuit	C1
			Open circuit in ignition line of BCM circuit	C2
			Open circuit in ground line of BCM circuit	C3
			Open or short circuit between BCM and ECM communication line	C4
			ECM	B
			BCM	A
	DIFFERENCE OF KEY [P1615]	PROCEDURE 2 (BL-159)	Unregistered key	D
			BCM	A
	CHAIN OF IMMU-KEY [P1614]	PROCEDURE 3 (BL-160)	Malfunction of key ID chip	E5
			Communication line between ANT/ AMP and BCM: Open circuit or short circuit of battery voltage line or ground line	E1
				E2
			Open circuit in power source line of ANT/ AMP circuit	E3
			Open circuit in ground line of ANT/ AMP circuit	E4
			NATS antenna amp.	E6
			BCM	A
	ID DISCORD, IMM-ECM [P1611]	PROCEDURE 4 (BL-161)	System initialization has not yet been completed.	F
			ECM	B

SYMPTOM	Displayed “SELF-DIAG RESULTS” on CONSULT-III screen.	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
● Security indicator lighting up* ● Engine cannot be started	LOCK MODE [P1610]	PROCEDURE 6 (BL-165)	LOCK MODE	When the starting operation is carried out five or more times consecutively under the following conditions, NVIS (NATS) will shift the mode to one which prevents the engine from being started. ● Unregistered ignition key is used. ● BCM or ECM’s malfunctioning.
Security indicator lighting up*	DON'T ERASE BEFORE CHECKING ENG DIAG	WORK FLOW (BL-155)	Engine trouble data and NVIS (NATS) trouble data have been detected in ECM	—

*: When NVIS (NATS) detects trouble, the security indicator lights up while ignition key is in the “ON” position.

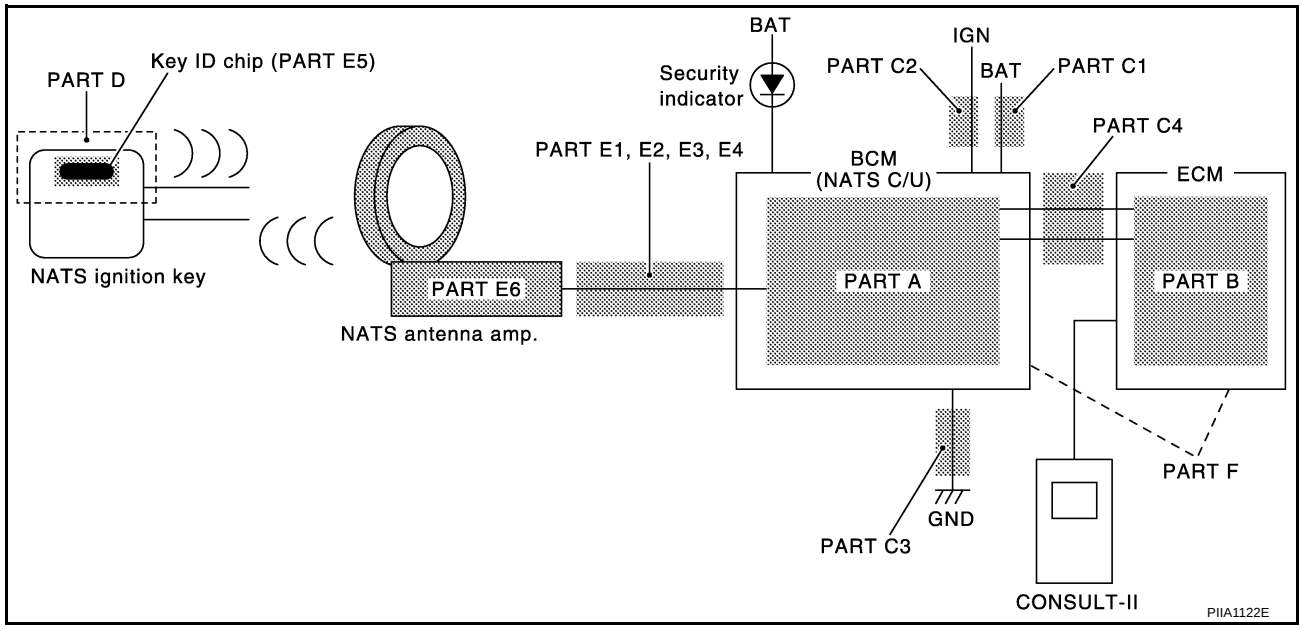
SYMPTOM MATRIX CHART 2

Non self-diagnosis related item

SYMPTOM	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
Security indicator does not light up*.	PROCEDURE 5 (BL-163)	Security indictor.	—
		Open circuit between Fuse and BCM	—
		BCM	A

*: CONSULT-III self-diagnostic results display screen “no malfunction is detected”.

DIAGNOSTIC SYSTEM DIAGRAM



Diagnostic Procedure 1

NIS0003K

Self-diagnostic results:
“CHAIN OF ECM-IMMU” displayed on CONSULT-III screen
First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-III, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “CHAIN OF ECM-IMMU” displayed on CONSULT-III screen.

NOTE:
In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.

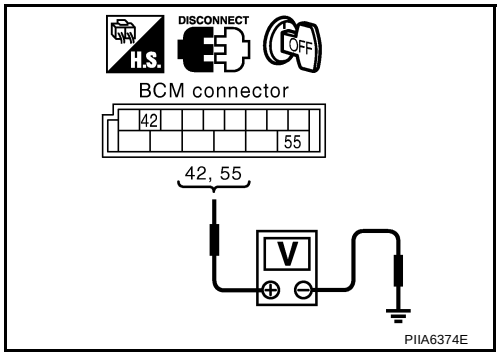
Is CONSULT-III screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. CHECK POWER SUPPLY CIRCUIT FOR BCM

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector M91 terminal 42, 55 and ground with CONSULT-III or tester.

42 (GY) - Ground : Battery voltage
55 (R) - Ground : Battery voltage



OK or NG

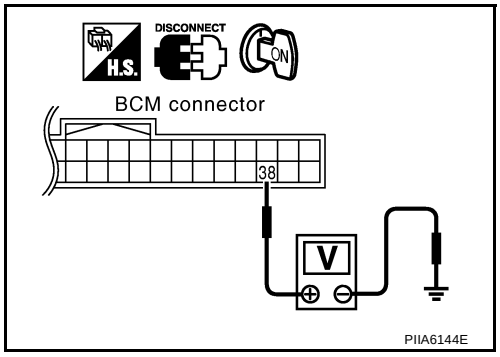
OK >> GO TO 3.
NG >> Check the following.

- 40A fusible link (letter **F** , located in fuse and fusible link box)
- 10A fuse [No.18, located in the fuse block (J/B)]
- Harness for open or short between fusible link and BCM. **Ref. Part No. C1**
- Harness for open or short between fuse and BCM. **Ref. Part No. C1**

3. CHECK IGN SW. ON SIGNAL

1. Turn ignition switch ON.
2. Check voltage between BCM harness connector M90 terminal 38 and ground with CONSULT-III or tester.

38 (W/L) - Ground : Battery voltage



OK or NG

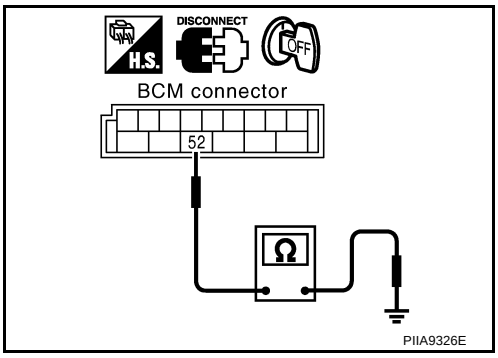
OK >> GO TO 4.
NG >> Check the following.

- 10A fuse [No. 1, located in the fuse block (J/B)]
- Harness for open or short between fuse and BCM. **Ref. part No. C2**

4. CHECK GROUND CIRCUIT FOR BCM

1. Turn ignition OFF.
2. Check continuity between BCM harness connector M91 terminal 52 and ground.

52 (B) - Ground : Continuity should exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness. **Ref. part No. C3**

5. REPLACE BCM

1. Replace BCM **Ref. part No. A**
2. Perform initialization with CONSULT-III.
   For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

Does the engine start?

Yes >> BCM is malfunctioning.
- Replace BCM. **Ref. part No. A**
- Perform initialization with CONSULT-III.
- For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

No >> ECM is malfunctioning.
- Replace ECM. **Ref. part No. B**
- Perform initialization or re-communicating function.
- For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.
- For re-communicating function, refer to BL-152, "ECM Re-communicating Function" .

Diagnostic Procedure 2

NIS0003L

Self-diagnostic results:
“DIFFERENCE OF KEY” displayed on CONSULT-III screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “DIFFERENCE OF KEY” displayed on CONSULT-III screen.

Is CONSULT-III screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. PERFORM INITIALIZATION WITH CONSULT-III

Perform initialization with CONSULT-III. Re-register all NATS ignition key IDs.
For initialization and registration of NATS ignition key IDs, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-III shows message on the screen.

Can the system be initialized and can the engine be started with re-registered NATS ignition key?

Yes >> Ignition key ID was unregistered. **Ref. part No. D**
No >> BCM is malfunctioning.
- Replace BCM. **Ref. part No. A**
- Perform initialization with CONSULT-III.
- For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

Diagnostic Procedure 3

NIS0003M

Self-diagnostic results:
“CHAIN OF IMMU-KEY” displayed on CONSULT-III screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “CHAIN OF IMMU-KEY” displayed on CONSULT-III screen.

Is CONSULT-III screen displayed as shown in figure?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. CHECK NATS ANTENNA AMP. INSTALLATION

Check NATS antenna amp. installation. Refer to BL-166, "How to Replace NATS Antenna Amp." .

OK or NG

OK >> GO TO 3.
NG >> Reinstall NATS antenna amp. correctly.

3. CHECK NVIS (NATS) IGNITION KEY ID CHIP

Start engine with another registered NATS ignition key.

Does the engine start?

Yes >> Ignition key ID chip is malfunctioning.
- Replace the ignition key. **Ref. part No, E5**
- Perform initialization with CONSULT-III.
  For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

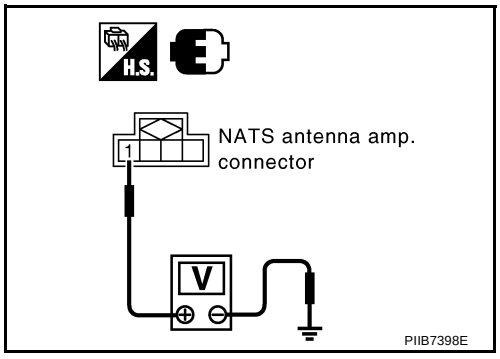
No >> GO TO 4.

4. CHECK POWER SUPPLY FOR NATS ANTENNA AMP.

1. Turn ignition switch “ON”.
2. Check voltage between NATS antenna amp. harness connector M28 terminal 1 and ground with CONSULT-III or tester.

Just after turning ignition switch “ON”

Voltage: Approx. 5V (For 3 seconds)



OK or NG

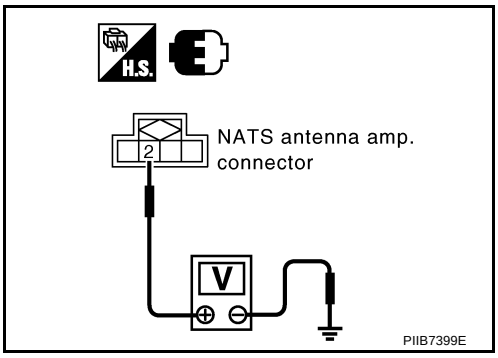
OK >> GO TO 5.
NG >>
- Check harness for open or short between NATS antenna amp. and BCM.

NOTE:
If harness is OK, replace BCM, perform initialization with CONSULT-III. For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

5. CHECK NATS ANTENNA AMP. SIGNAL LINE- 1

Check voltage between NATS antenna amp. harness connector M28 terminal 2 and ground with analogue tester.

Before turning ignition switch "ON"
Voltage: 0V
Just after turning ignition switch "ON"
: Pointer of tester should move.



OK or NG

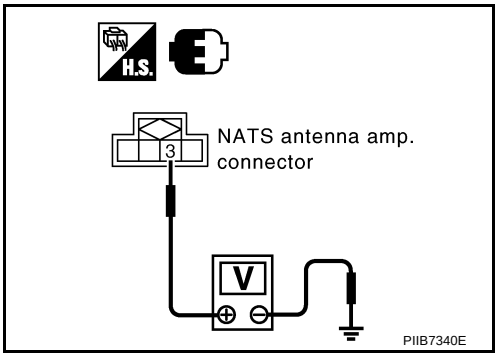
OK >> GO TO 6.
NG >> ● Check harness for open or short between NATS antenna amp. and BCM.

NOTE:
If harness is OK, replace BCM, perform initialization with CONSULT-III. For initialization, refer to "CONSULT-III Operation Manual NATS-IVIS/NVIS".

6. CHECK NATS ANTENNA AMP. SIGNAL LINE- 2

Check voltage between NATS antenna amp. harness connector M28 terminal 3 and ground with analogue tester.

Before turning ignition switch "ON"
Voltage: 0V
Just after turning ignition switch "ON"
: Pointer of tester should move.



OK or NG

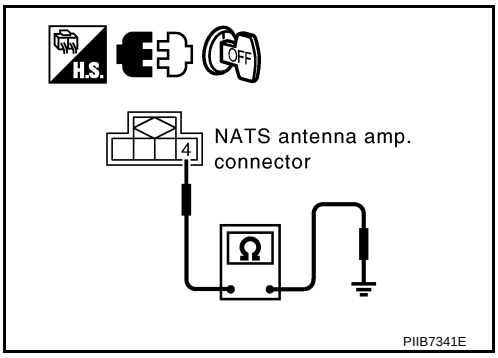
OK >> GO TO 7.
NG >> ● Check harness for open or short between NATS antenna amp. and BCM.

NOTE:
If harness is OK, replace BCM, perform initialization with CONSULT-III. For initialization, refer to "CONSULT-III Operation Manual NATS-IVIS/NVIS".

7. CHECK NATS ANTENNA AMP. GROUND LINE CIRCUIT

1. Turn ignition switch "OFF".
2. Check continuity between NATS antenna amp. connector harness M28 terminal 4 and ground.

4 (BR) – Ground : Continuity should exist.



OK or NG

OK >> NATS antenna amp. is malfunctioning. **Ref. part No. E6**
NG >> Replace NATS antenna amp.

● Check harness for open or short between NATS antenna amp. and BCM.

NOTE:
If harness is OK, replace BCM, perform initialization with CONSULT-III. For initialization, refer to "CONSULT-III Operation Manual NATS-IVIS/NVIS".

Diagnostic Procedure 4

NIS0003N

Self-diagnostic results:
"ID DISCORD, IMM-ECM" displayed on CONSULT-III screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “ID DISCORD, IMM-ECM” displayed on CONSULT-III screen.

NOTE:
“ID DISCORD IMM-ECM”:
Registered ID of BCM is in discord with that of ECM.

Is CONSULT-III screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. PERFORM INITIALIZATION WITH CONSULT-III

Perform initialization with CONSULT-III. Re-register all NATS ignition key IDs.
For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-III shows message on the screen.

Can the system be initialized?

Yes >> Start engine. (END)
- (System initialization had not been completed. **Ref. part No. F**)

No >> ECM is malfunctioning.
- Replace ECM. **Ref. part No. B**
- Perform initialization with CONSULT-III.
  For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

Diagnostic Procedure 5

NIS0003O

“SECURITY INDICATOR LAMP DOES NOT LIGHT UP”

1. CHECK FUSE

- Check 10A fuse [No.19, located in the fuse block (J/B)]

  NOTE:
  Refer to BL-150, "Component Parts and Harness Connector Location" .

OK or NG

OK >> GO TO 2.
NG >> Replace fuse.

2. CHECK SECURITY INDICATOR LAMP

1. Install 10A fuse.
2. Start engine and turn ignition switch OFF.
3. Check the security indicator lamp lights up.

Security indicator lamp should light up.

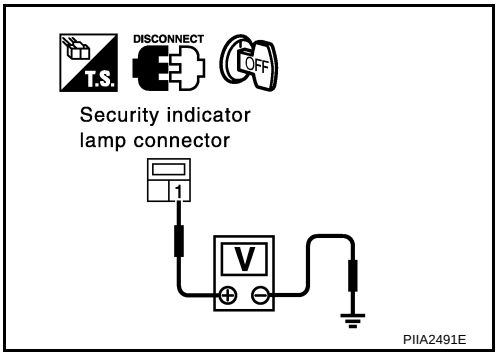
OK or NG

OK >> Inspection END.
NG >> GO TO 3.

3. CHECK SECURITY INDICATOR LAMP POWER SUPPLY CIRCUIT

1. Disconnect security indicator lamp connector.
2. Check voltage between security indicator lamp harness connector M34 terminal 1 and ground.

1 (R/W) – Ground : Battery voltage should exist.



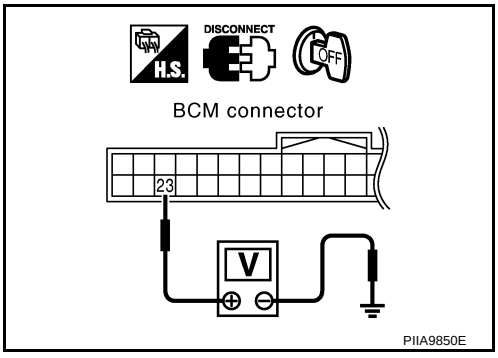
OK or NG

OK >> GO TO 4.
NG >> Check harness for open or short between fuse and security indicator lamp.

4. CHECK BCM FUNCTION

1. Connect security indicator lamp connector.
2. Disconnect BCM (NATS connector.
3. Check voltage between BCM harness connector M90 terminal 23 and ground.

23 (G/OR) – Ground : Battery voltage



OK or NG

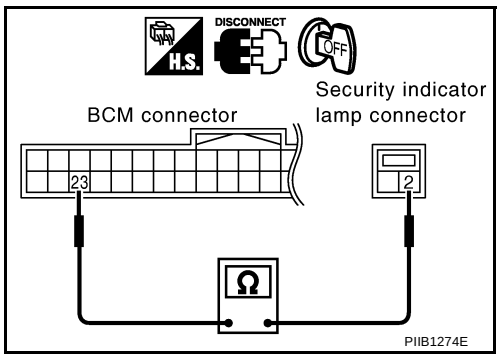
OK >> BCM is malfunctioning.
- Replace BCM.
  Ref. part No. A
- Perform initialization with CONSULT-III.
- For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NG >> GO TO 5.

5. CHECK SECURITY INDICATOR LAMP CIRCUIT

1. Check continuity between BCM harness connector M90 terminal 23 and security indicator lamp harness connector M34 terminal 2.

23 (G/OR) - 2 (G/OR) : Continuity should exist.



OK or NG

OK >> Check indicator lamp condition.
NG >> Repair harness or connector.

Diagnostic Procedure 6

NIS0003P

Self-diagnostic results:
“LOCK MODE” displayed on CONSULT-III screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “LOCK MODE” is displayed on CONSULT-III screen.

Is CONSULT-III screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. ESCAPE FROM LOCK MODE

1. Turn ignition switch OFF.
2. Turn ignition switch ON with registered key. (Do not start engine.) Wait 5 seconds.
3. Return the key to OFF position. Wait 5 seconds.
4. Repeat steps 2 and 3 twice (total of three cycles).
5. Start the engine.

Does engine start?

Yes >> System is OK (Now system is escaped from “LOCK MODE”).
No >> GO TO 3.

3. PERFORM INITIALIZATION WITH CONSULT-III

Perform initialization with CONSULT-III.
For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-III shows the message on the screen.

Can the system be initialized?

Yes >> System is OK.
No >> GO TO 4.

4. PERFORM INITIALIZATION WITH CONSULT-III AGAIN

1. Replace BCM.
2. Perform initialization with CONSULT-III.
   For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-III shows the message on the screen.

Can the system be initialized?

Yes >> System is OK. (BCM is malfunctioning. **Ref. part No. A**)
No >> ECM is malfunctioning.

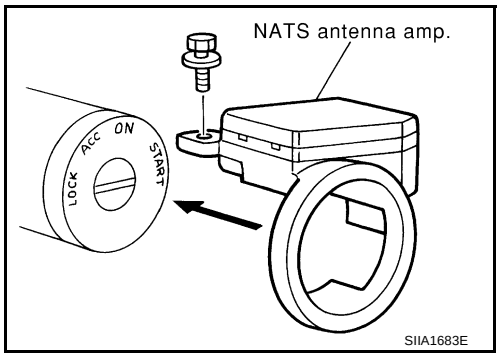
- Replace ECM. **Ref. part No. B**
- Perform initialization with CONSULT-III.
  For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

How to Replace NATS Antenna Amp.

NIS0003Q

NOTE:

- **If NATS antenna amp. is not installed correctly, NVIS (NATS) system will not operate properly and SELF-DIAG RESULTS on CONSULT-III screen will show “LOCK MODE” or “CHAIN OF IMMU-KEY”.**
- **Initialization is not necessary only when NATS antenna amp. is replaced with a new one.**



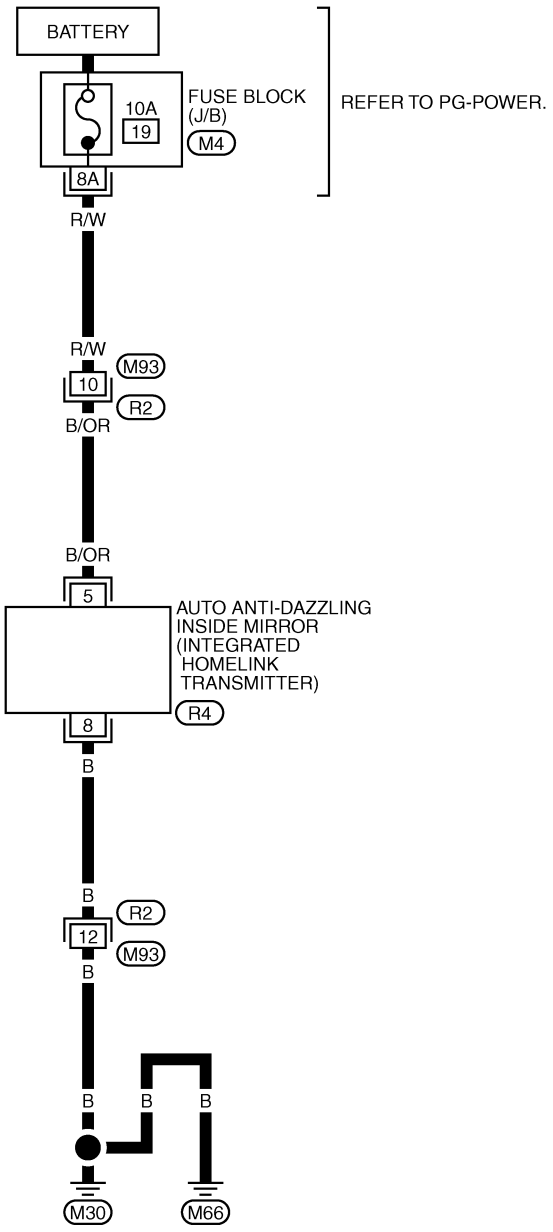
INTEGRATED HOMELINK TRANSMITTER

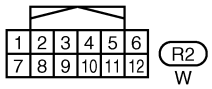
PFP:96401

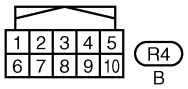
Wiring Diagram — TRNSCV —

NIS0003R

BL-TRNSCV-01







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT2272E

Trouble Diagnoses

NIS0003S

DIAGNOSTIC PROCEDURE

SYMPTOM: Transmitter does not activate receiver.

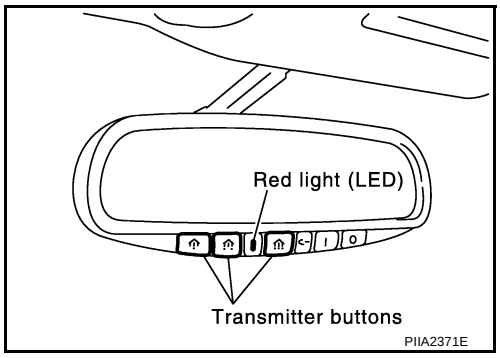
Before conducting the procedure given below, make sure that system receiver (garage door opener, etc.) operates with original, hand-held transmitter. If NG, receiver or hand-held transmitter is malfunctioning, not vehicle related.

1. CHECK ILLUMINATION

1. Turn ignition switch “OFF”.
2. Does red light (LED) of transmitter illuminate when any transmitter button is pressed?

YES or NO

YES >> GO TO 2.
NO >> GO TO 3.



2. CHECK TRANSMITTER

Check transmitter with Tool*.
*:For details, refer to Technical Service Bulletin.

OK or NG

OK >> Receiver or hand-held transmitter malfunction, not vehicle related.
NG >> Replace inside mirror assembly.

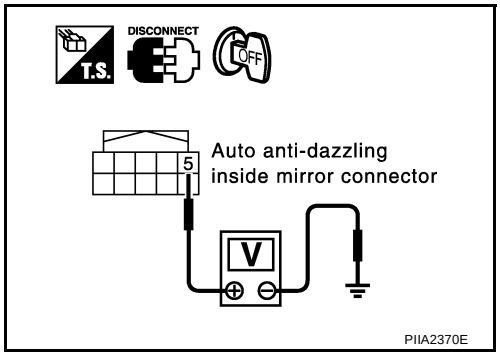
3. CHECK POWER SUPPLY

1. Disconnect transmitter connector.
2. Turn ignition switch “OFF”.
3. Check voltage between auto anti-dazzling inside mirror (integrated homelink transmitter) connector R4 terminal 5 and ground.

5 (B/OR) – Ground : Battery voltage

OK or NG

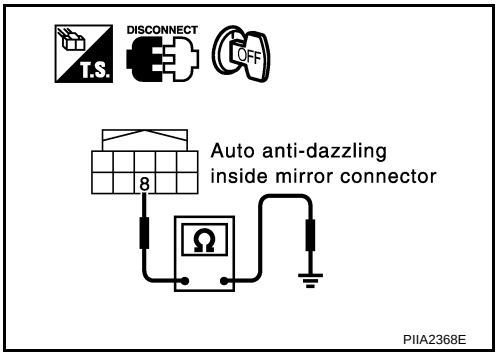
OK >> GO TO 4.
NG >>
- Check 10A fuse. [No. 19 located in the fuse block (J/B)]
- Harness for open or short between fuse and anti-dazzling inside mirror (integrated homelink transmitter).



4. CHECK GROUND CIRCUIT

Check continuity between anti-dazzling inside mirror (integrated homelink transmitter) connector R4 terminal 8 and ground.

8 (B) – Ground : Continuity should exist.



OK or NG

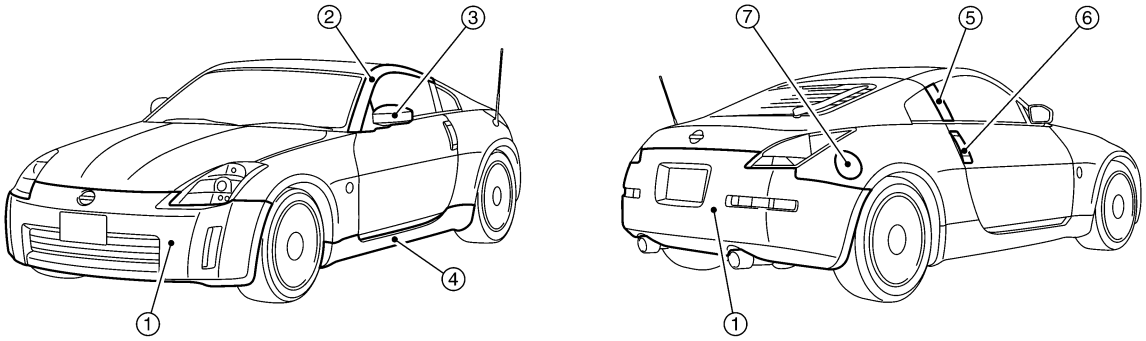
OK >> Replace inside mirror assembly.
NG >> Harness for open or short between anti-dazzling inside mirror (integrated homelink transmitter) body ground.

BODY REPAIR

PFP:60100

Body Exterior Paint Color (Coupe)

NIS0003T



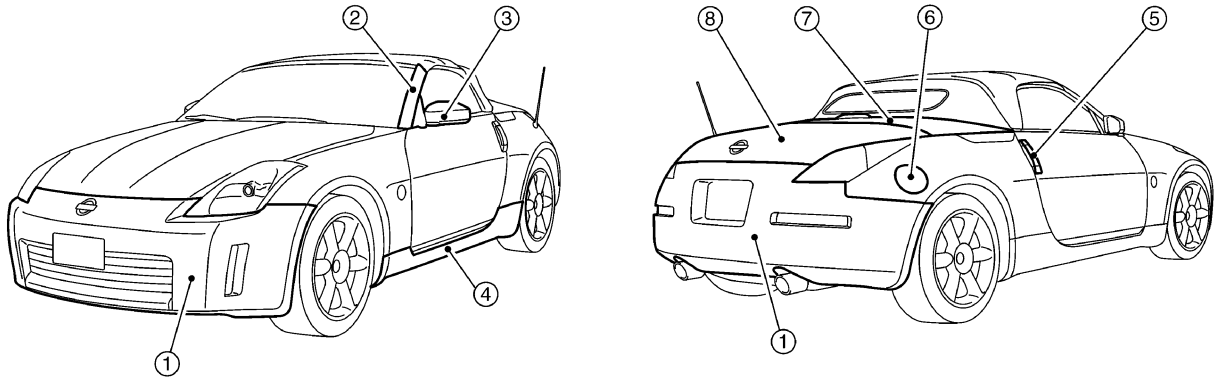
SIIA1975E

Component			Color code	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
			Description	Orange	Red	Blue	Black	Silver	Red Purple	White	Silver
			Paint type	2P	2S	CPM	2P	M	RP	3P	M
			Hard clear coat	-	X	X	X	-	X	-	-
1	Bumper fascia		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
2	Front pillar finisher		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
3	Door outside mirror	Case	Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
		Base	Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
4	Center mud-guard		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
5	Door sash		Black	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88
6	Door outside handle and escutcheon		Velour chromium-plate	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p
7	Fuel filler lid		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2

2S: Solid + Clear, M: Metallic, 2P: 2-Coat pearl, 3P: 3-Coat pearl, CPM: Clear pearl metallic, RP: Multi flex color

Body Exterior Paint Color (Roadster)

NIS0003U



SIIA2295E

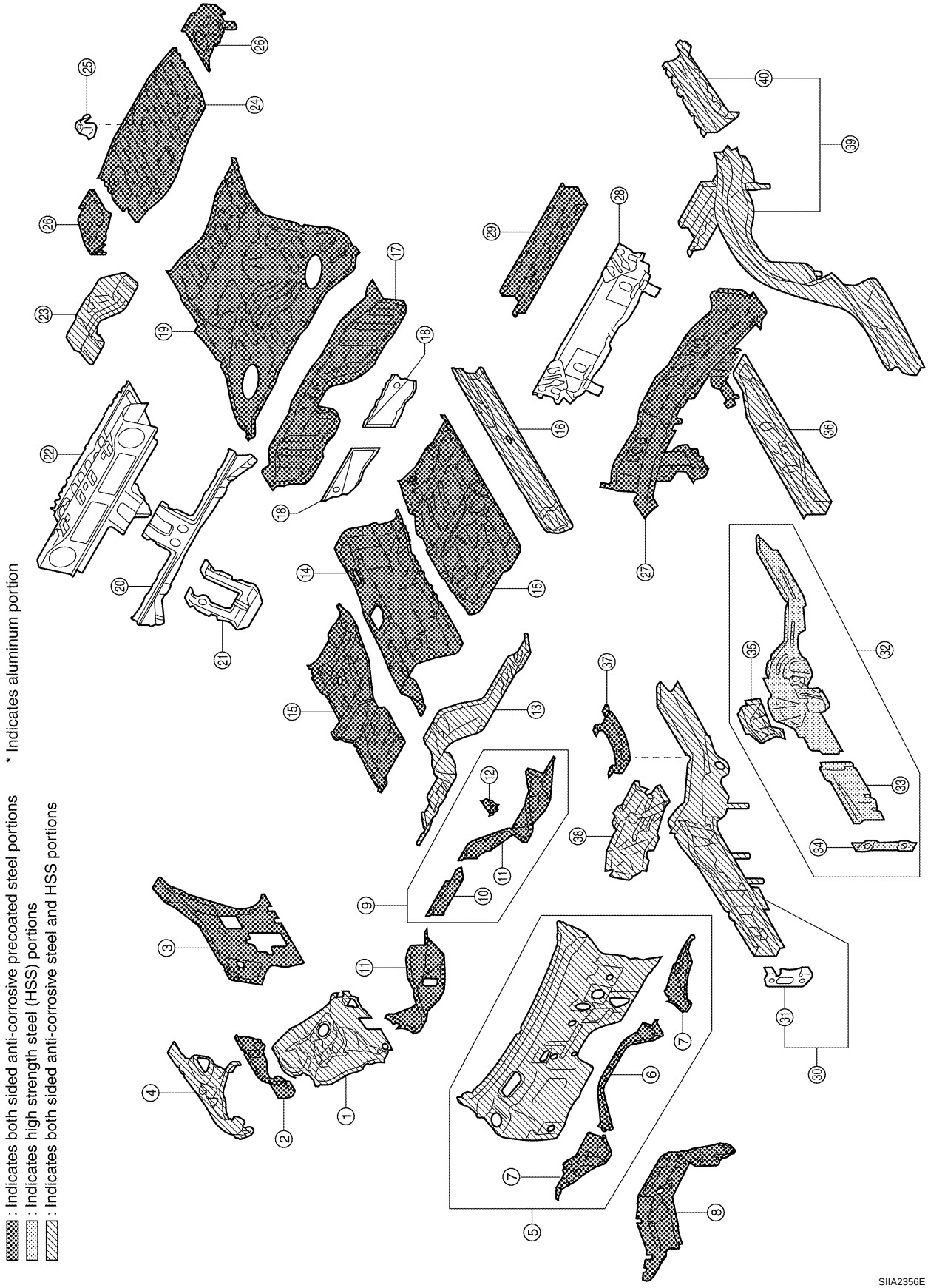
Component			Color code	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
			Description	Orange	Red	Blue	Black	Silver	Red Purple	White	Silver
			Paint type	2P	2S	CPM	2P	M	RP	3P	M
			Hard clear coat	-	X	X	X	-	X	-	-
1	Bumper fascia		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
2	Front pillar finisher		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
3	Door outside mirror	Case	Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
		Base	Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
4	Center mud-guard		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
5	Door outside handle and escutcheon		Velour chro-mium-plate	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p
6	Fuel filler lid		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
7	Storage lid		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
8	Trunk lid		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2

2S: Solid + Clear, M: Metallic, 2P: 2-Coat pearl, 3P: 3-Coat pearl, CPM: Clear pearl metallic, RP: Multi flex color

Body Component Parts (Coupe)

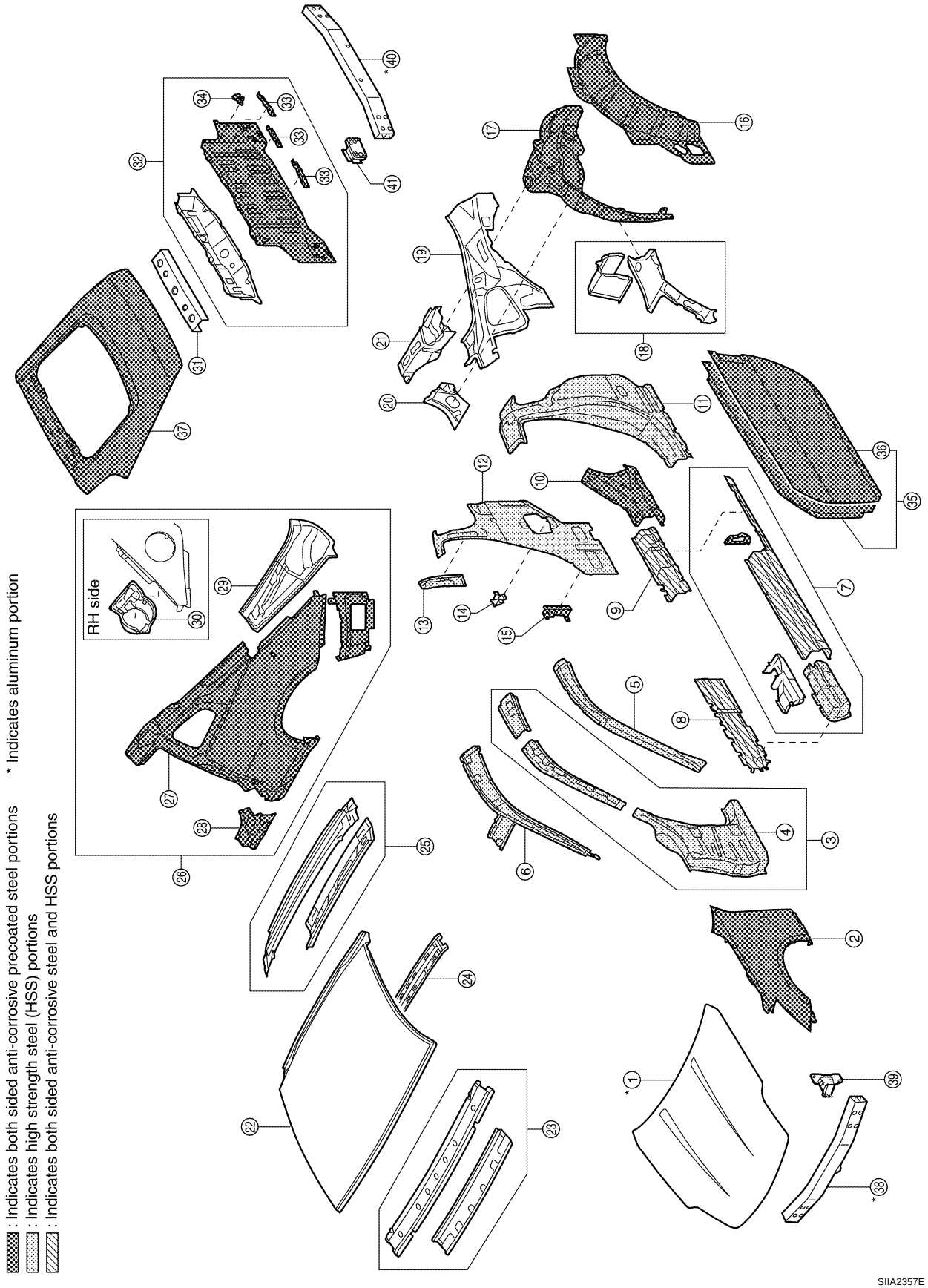
NIS0003V

UNDERBODY COMPONENT PARTS



1. Front strut housing (RH&LH)
2. Upper front hoodledge (RH&LH)
3. Upper rear hoodledge (RH&LH)
4. Hoodledge reinforcement (RH&LH)
5. Upper dash assembly
6. Lower dash crossmember center reinforcement
7. Lower dash crossmember reinforcement
8. Cowl top
9. Lower dash crossmember assembly
10. Front crossmember center
11. Lower dash crossmember
12. Steering column mounting reinforcement
13. Lower dash
14. Front floor center
15. Front floor
16. Inner sill (RH&LH)
17. Rear seat crossmember reinforcement assembly
18. Rear floor gusset
19. Rear floor front
20. Rear step upper panel assembly
21. Rear step lower panel assembly
22. Inside step panel
23. Rear floor seat belt anchor reinforcement
24. Rear floor rear
25. Spare tire clamp bracket
26. Rear floor side
27. Rear seat crossmember
28. 2ND rear crossmember
29. Rear center crossmember assembly
30. Front side member assembly (RH&LH)
31. Inner front towing hook bracket (RH&LH)
32. Front side member closing plate assembly (RH&LH)
33. Front side member front closing plate (RH&LH)
34. Outer front towing hook bracket (RH&LH)
35. Front side member center closing plate (RH&LH)
36. Front side member rear extension (RH&LH)
37. Front side member rear reinforcement (RH&LH)
38. Front side member outrigger assembly (RH&LH)
39. Rear side member assembly (RH&LH)
40. Rear side member extension (RH&LH)

BODY COMPONENT PARTS



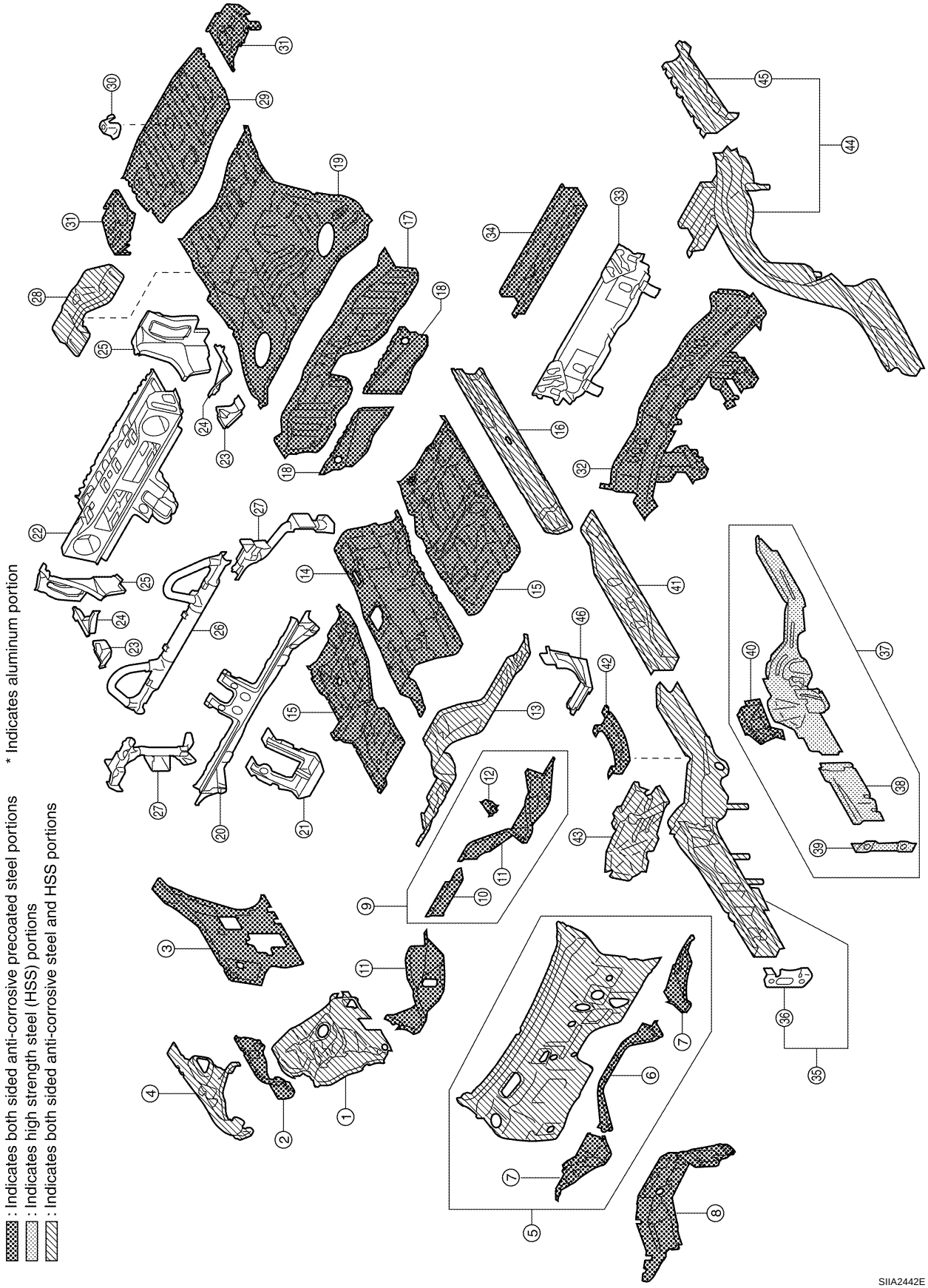
1. Hood
2. Front fender (RH&LH)

3. Front pillar reinforcement assembly (RH&LH)
4. Front pillar hinge brace (RH&LH)
5. Outer front pillar (RH&LH)
6. Inner side roof rail (RH&LH)
7. Outer sill reinforcement assembly (RH&LH)
8. Lower front pillar reinforcement (RH&LH)
9. Lower center pillar bulkhead assembly (RH&LH)
10. Outer rear wheel house extension (RH&LH)
11. Outer lock pillar reinforcement (RH&LH)
12. Inner lock pillar assembly (RH&LH)
13. Inner lock pillar reinforcement (RH&LH)
14. Seat belt anchor assembly (RH&LH)
15. Outer sill brace (RH&LH)
16. Outer rear wheel house (RH&LH)
17. Inner rear wheel house (RH&LH)
18. Inner rear pillar joint (RH&LH)
19. Inner rear pillar (RH&LH)
20. Seat back support (RH&LH)
21. Side parcel shelf (RH&LH)
22. Roof
23. Front roof rail assembly
24. Roof bow No.1
25. Rear roof rail assembly
26. Rear fender assembly (RH&LH)
27. Rear fender (RH&LH)
28. Outer sill extension (RH&LH)
29. Rear fender corner (RH&LH)
30. Fuel filler lid base
31. Parcel shelf
32. Rear panel assembly
33. Rear bumper fascia bracket
34. Rear bumper fascia center bracket (RH&LH)
35. Front door assembly (RH&LH)
36. Outer front door panel (RH&LH)
37. Back door
38. Front bumper reinforcement
39. Front bumper stay (RH&LH)
40. Rear bumper reinforcement
41. Rear bumper stay (RH&LH)

Body Component Parts (Roadster)

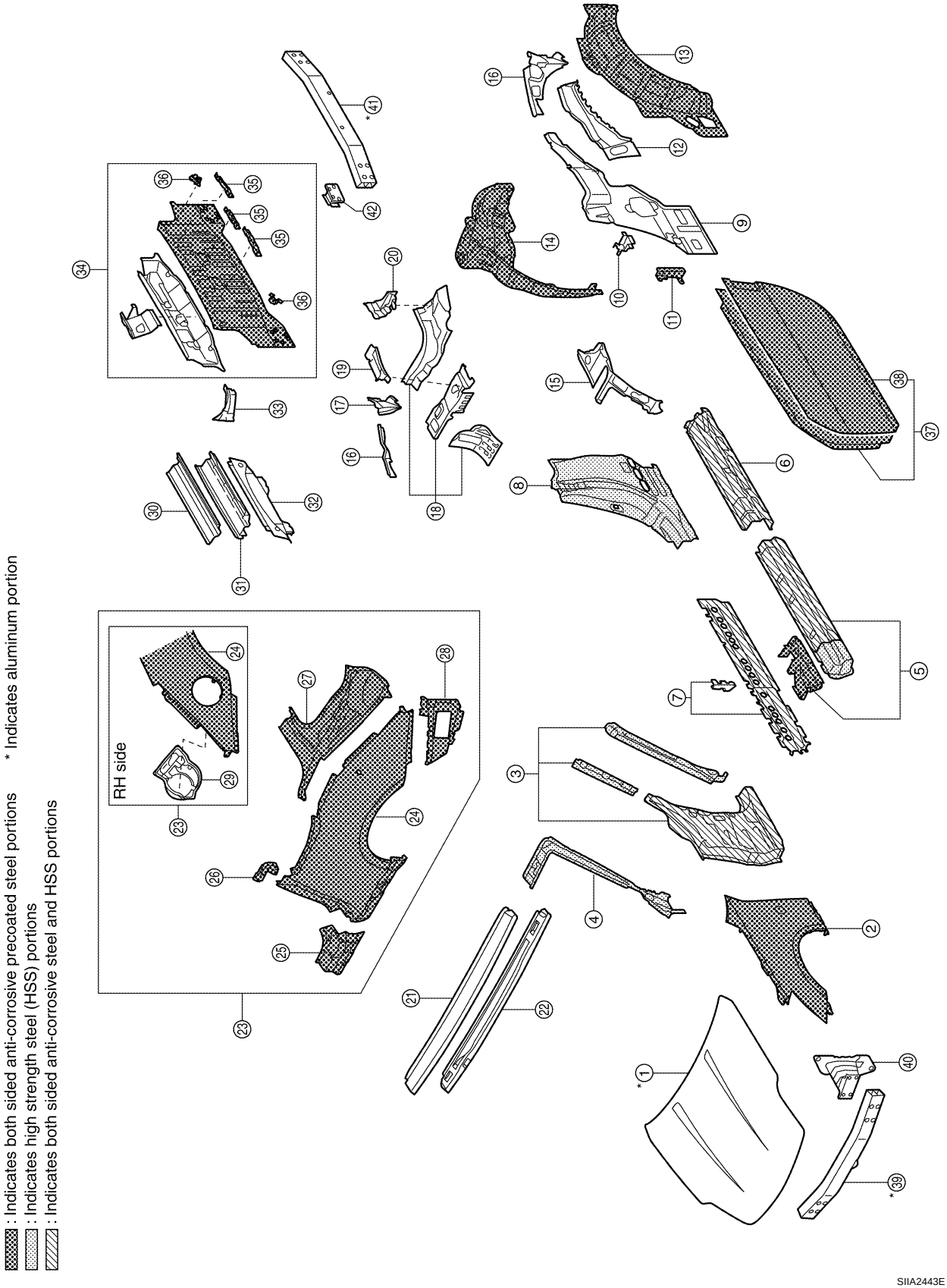
NIS0003W

UNDERBODY COMPONENT PARTS



1. Front strut housing (RH&LH)
2. Upper front hoodledge (RH&LH)
3. Upper rear hoodledge (RH&LH)
4. Hoodledge reinforcement (RH&LH)
5. Upper dash assembly
6. Lower dash crossmember center reinforcement
7. Lower dash crossmember reinforcement
8. Cowl top
9. Lower dash crossmember assembly
10. Front crossmember center
11. Lower dash crossmember A
12. Steering column mounting reinforcement
13. Lower dash
14. Front floor center
15. Front floor
16. Inner sill (RH&LH)
17. Rear seat crossmember reinforcement assembly
18. Rear floor gusset
19. Rear floor front
20. Rear step upper panel assembly
21. Rear step lower panel assembly
22. Inside step panel
23. Guard frame gusset
24. Rear side member connector
25. Inner rear wheelhouse connector
26. Guard frame assembly
27. Inside guard frame post
28. Rear floor seat belt anchor reinforcement
29. Rear floor rear
30. Spare tire clamp bracket
31. Rear floor side
32. Rear seat crossmember
33. 2ND rear crossmember
34. Rear center crossmember assembly
35. Front side member assembly (RH&LH)
36. Inner front towing hook bracket (RH&LH)
37. Front side member closing plate assembly (RH&LH)
38. Front side member front closing plate (RH&LH)
39. Outer front towing hook bracket (RH&LH)
40. Front side member center closing plate (RH&LH)
41. Front side member rear extension (RH&LH)
42. Front side member rear reinforcement (RH&LH)
43. Front side member outrigger assembly (RH&LH)
44. Rear side member assembly (RH&LH)
45. Rear side member extension (RH&LH)
46. Lower dash crossmember B

BODY COMPONENT PARTS



1. Hood
2. Front fender (RH&LH)
3. Outer front pillar assembly (RH&LH)
4. Inner side roof rail (RH&LH)
5. Outer front sill reinforcement assembly (RH&LH)
6. Outer rear sill reinforcement assembly (RH&LH)
7. Lower front pillar reinforcement assembly (RH&LH)
8. Outer lock pillar reinforcement (RH&LH)
9. Inner rear pillar (RH&LH)
10. Seat belt anchor assembly (RH&LH)
11. Outer sill brace (RH&LH)
12. Rear side waist reinforcement (RH&LH)
13. Outer rear wheel house (RH&LH)
14. Inner rear wheel house (RH&LH)
15. Rear pillar joint (RH&LH)
16. Lower inner rear pillar
17. Lower rear pillar rear (RH)
18. Side parcel shelf assembly (RH&LH)
19. Side parcel shelf (RH&LH)
20. Rear pillar gusset (RH&LH)
21. Outer front roof rail
22. Inner front roof rail
23. Rear fender assembly
24. Rear fender
25. Outer sill extension (RH&LH)
26. Rear fender extension A (RH&LH)
27. Rear fender extension B (RH&LH)
28. Rear fender extension C (RH&LH)
29. Fuel filler lid base
30. Rear waist
31. Parcel shelf
32. Seat back support
33. Rear panel bracket reinforcement (RH&LH)
34. Rear panel assembly
35. Center rear bumper fascia bracket
36. Rear bumper fascia bracket
37. Front door assembly (RH&LH)
38. Outer front door panel (RH&LH)
39. Front bumper reinforcement
40. Front bumper stay (RH&LH)
41. Rear bumper reinforcement
42. Rear bumper stay (RH&LH)

Corrosion Protection

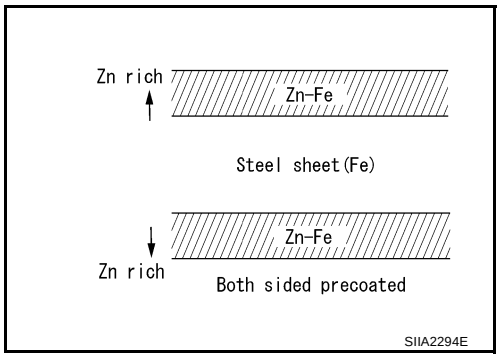
NIS0003X

DESCRIPTION

To provide improved corrosion prevention, the following anti-corrosive measures have been implemented in NISSAN production plants. When repairing or replacing body panels, it is necessary to use the same anti-corrosive measures.

Anti-corrosive precoated steel (Galvannealed steel)

To improve repairability and corrosion resistance, a new type of anti-corrosive precoated steel sheet has been adopted replacing conventional zinc-coated steel sheet.
Galvannealed steel is electroplated and heated to form Zinc-iron alloy, which provides excellent and long term corrosion resistance with cationic electrodeposition primer.



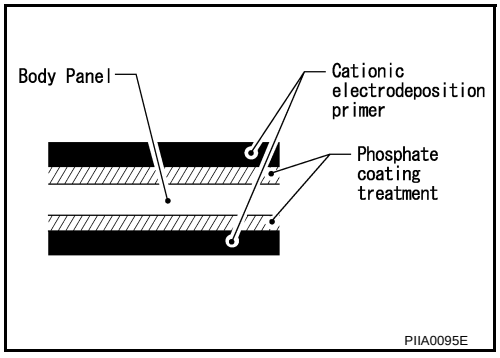
Nissan Genuine Service Parts are fabricated from galvannealed steel. Therefore, it is recommended that GENUINE NISSAN PARTS or equivalent be used for panel replacement to maintain the anti-corrosive performance built into the vehicle at the factory.

Phosphate coating treatment and cationic electrodeposition primer

A phosphate coating treatment and a cationic electrodeposition primer, which provide excellent corrosion protection, are employed on all body components.

CAUTION:

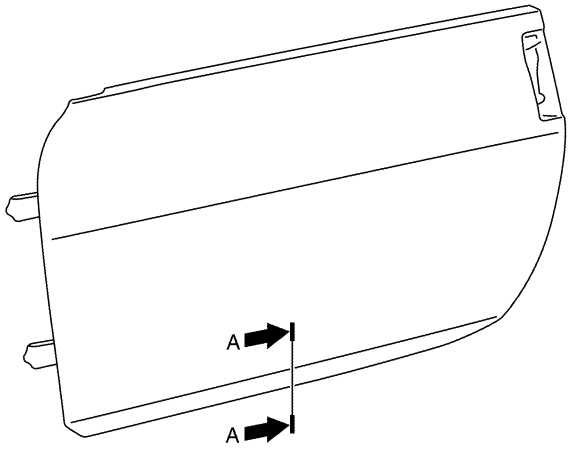
Confine paint removal during welding operations to an absolute minimum.



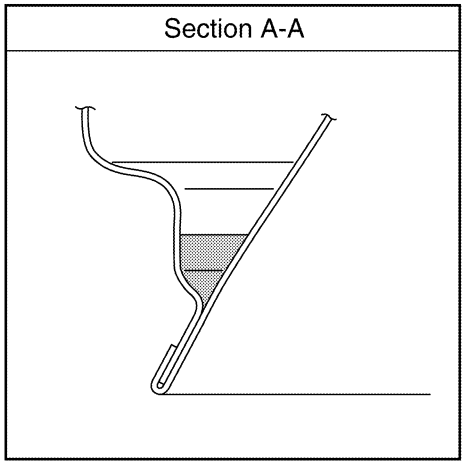
Nissan Genuine Service Parts are also treated in the same manner. Therefore, it is recommended that GENUINE NISSAN PARTS or equivalent be used for panel replacement to maintain anti-corrosive performance built into the vehicle at the factory.

ANTI-CORROSIVE WAX

To improve corrosion resistance, anti-corrosive wax is applied inside the body sill and inside other closed sections. Accordingly, when replacing these parts, be sure to apply anti-corrosive wax to the appropriate areas of the new parts. Select an excellent anti-corrosive wax which will penetrate after application and has a long shelf life.



: Indicates anti-corrosive wax coated portions.



SIIA1979E

UNDERCOATING

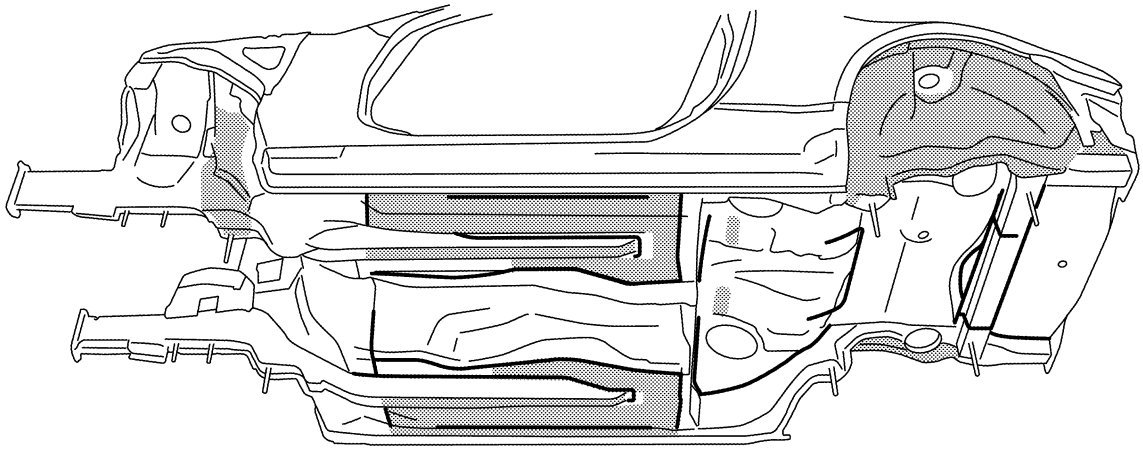
The underside of the floor and wheelhouse are undercoated to prevent rust, vibration, noise and stone chipping. Therefore, when such a panel is replaced or repaired, apply undercoating to that part. Use an undercoating which is rust preventive, soundproof, vibration-proof, shock-resistant, adhesive, and durable.

Precautions in undercoating

1. Do not apply undercoating to any place unless specified (such as the areas above the muffler and three way catalyst which are subjected to heat).
2. Do not undercoat the exhaust pipe or other parts which become hot.
3. Do not undercoat rotating parts.
4. Apply bitumen wax after applying undercoating.
5. After putting seal on the vehicle, put undercoating on it.

: Indicates undercoated portions.

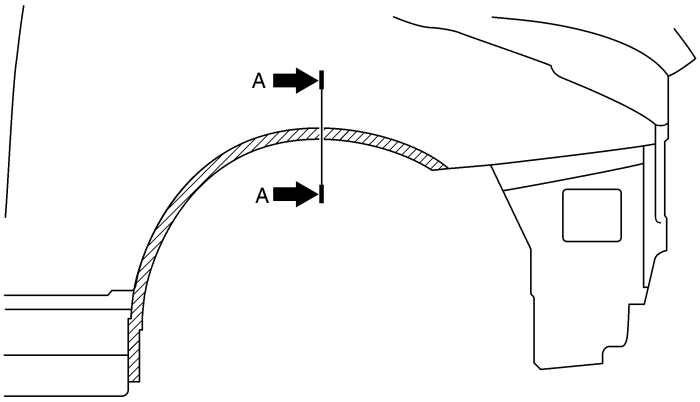
: Indicates sealed portions.



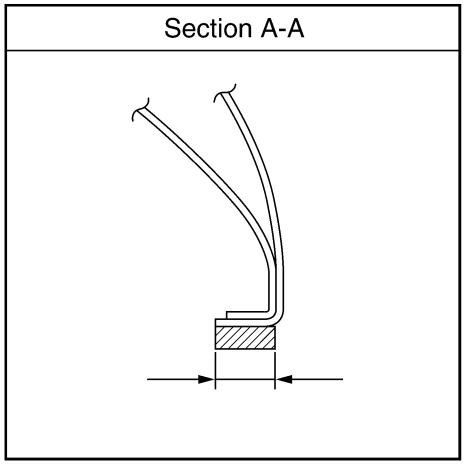
SIIA2298E

STONE GUARD COAT

To prevent damage caused by stones, the lower outer body panel (fender, door, etc.) have an additional layer of Stone Guard Coating over the ED primer coating. When replacing or repairing these panels, apply Stone Guard coating to the same portions as before. Use a coating which is rust preventive, durable, shock-resistant and has a long shelf life.



: Indicates stone guard coated portions.



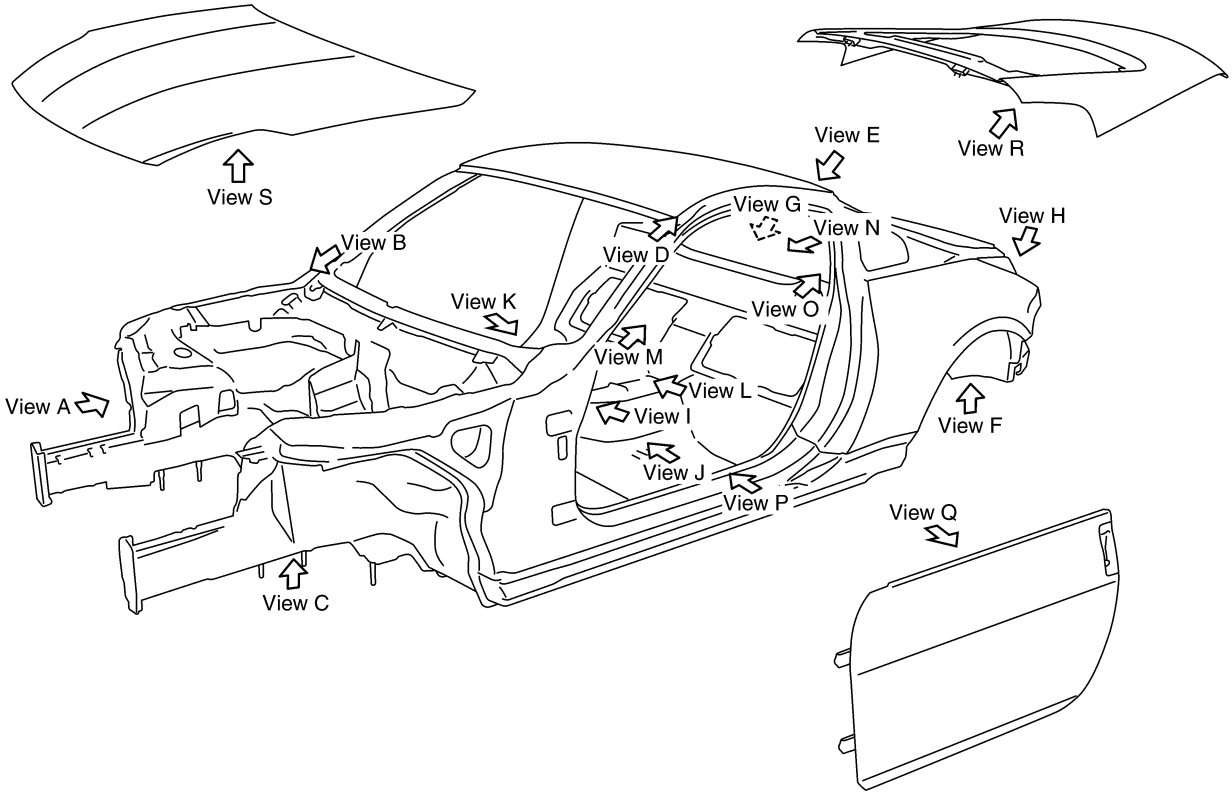
SIIA2299E

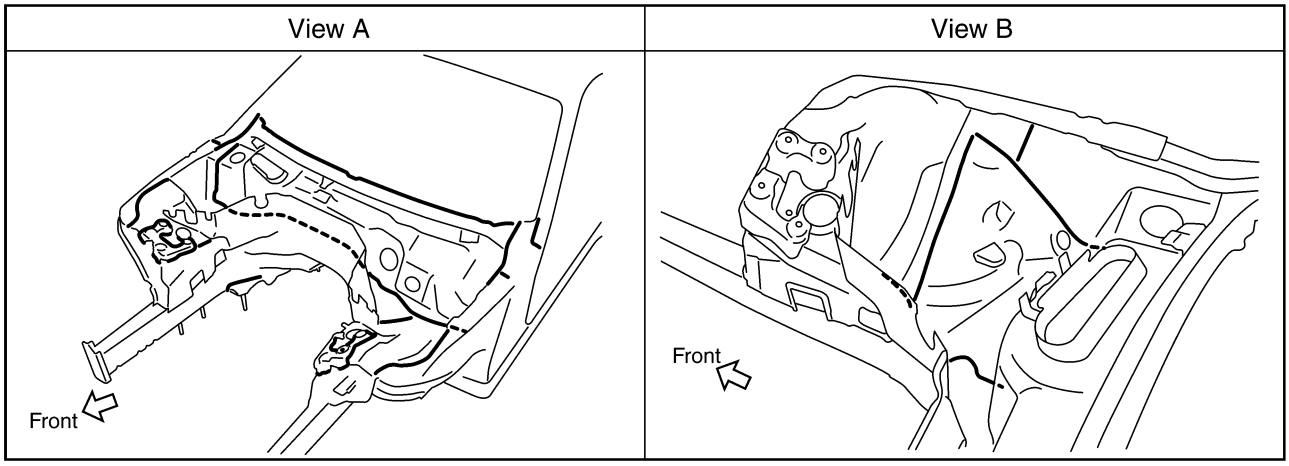
Body Sealing (Coupe)

NIS0003Y

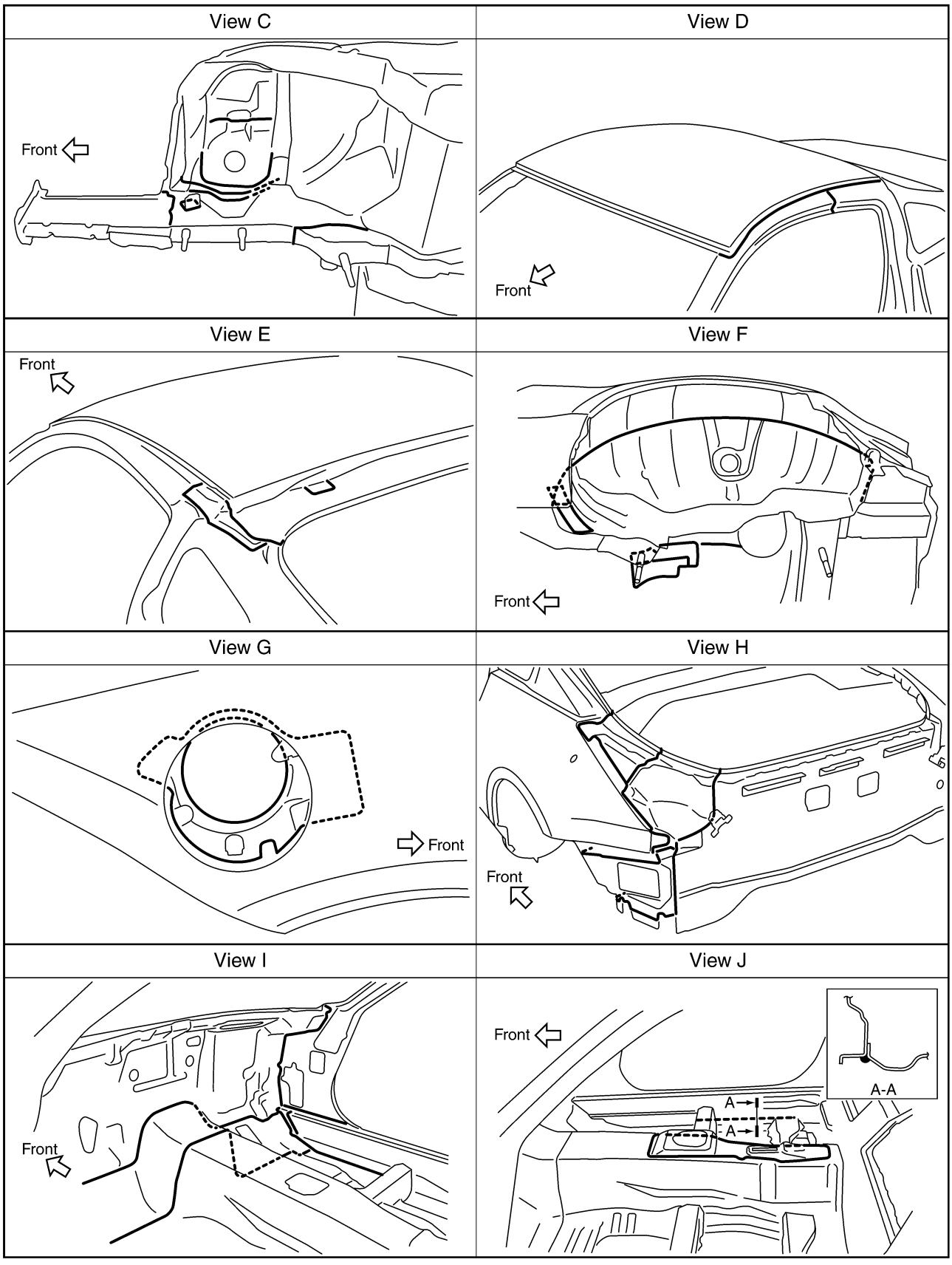
DESCRIPTION

The following figure shows the areas which are sealed at the factory. Sealant which has been applied to these areas should be smooth and free from cuts or gaps. Care should be taken not to apply an excess amount of sealant and not to allow other unaffected parts to come into contact with the sealant.



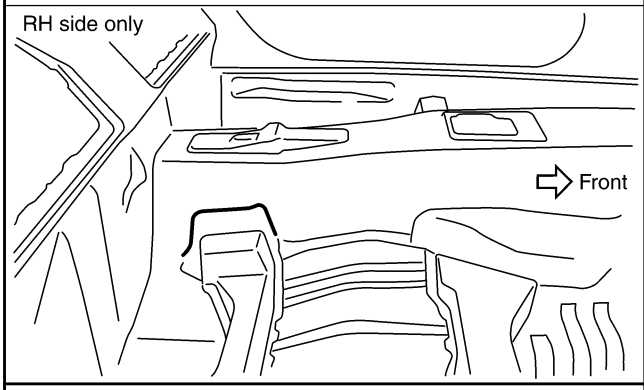


SIIA1976E

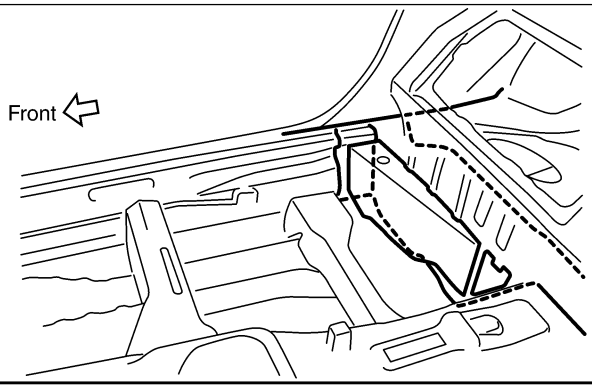

View C
Front
View D
Front
View E
Front
View F
Front
View G
Front
View H
Front
View I
Front
View J
Front
A-A
A
A

SIIA1977E

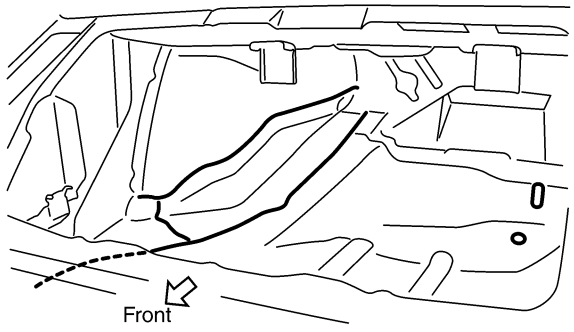
View K



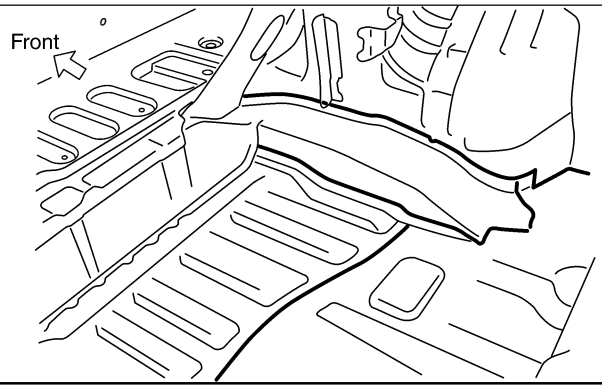
View L



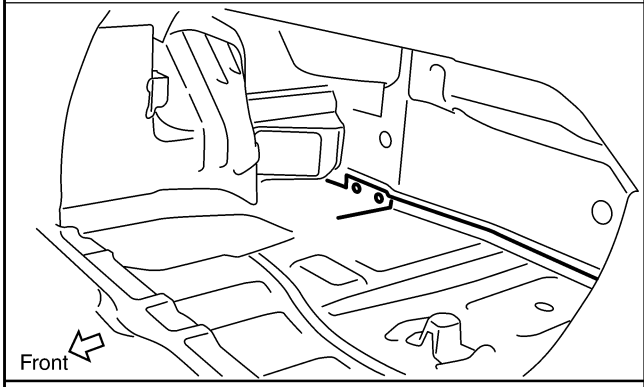
View M



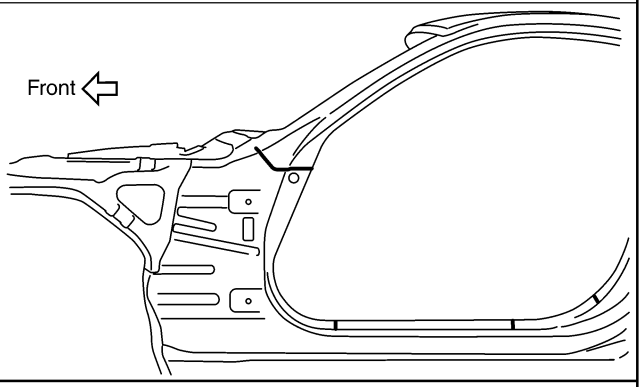
View N



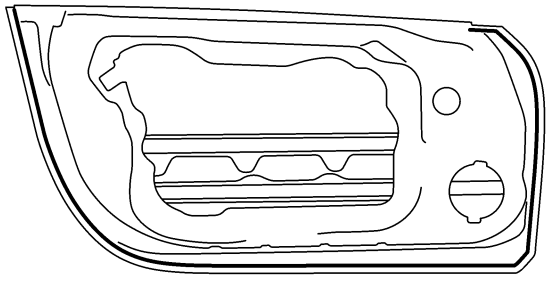
View O



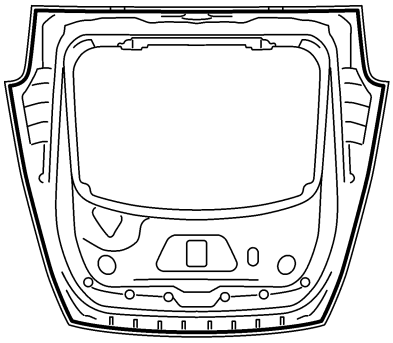
View P



View Q

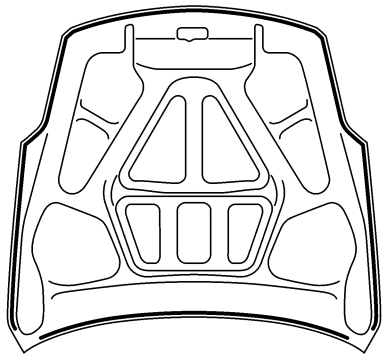


View R



SIIA1978E

View S



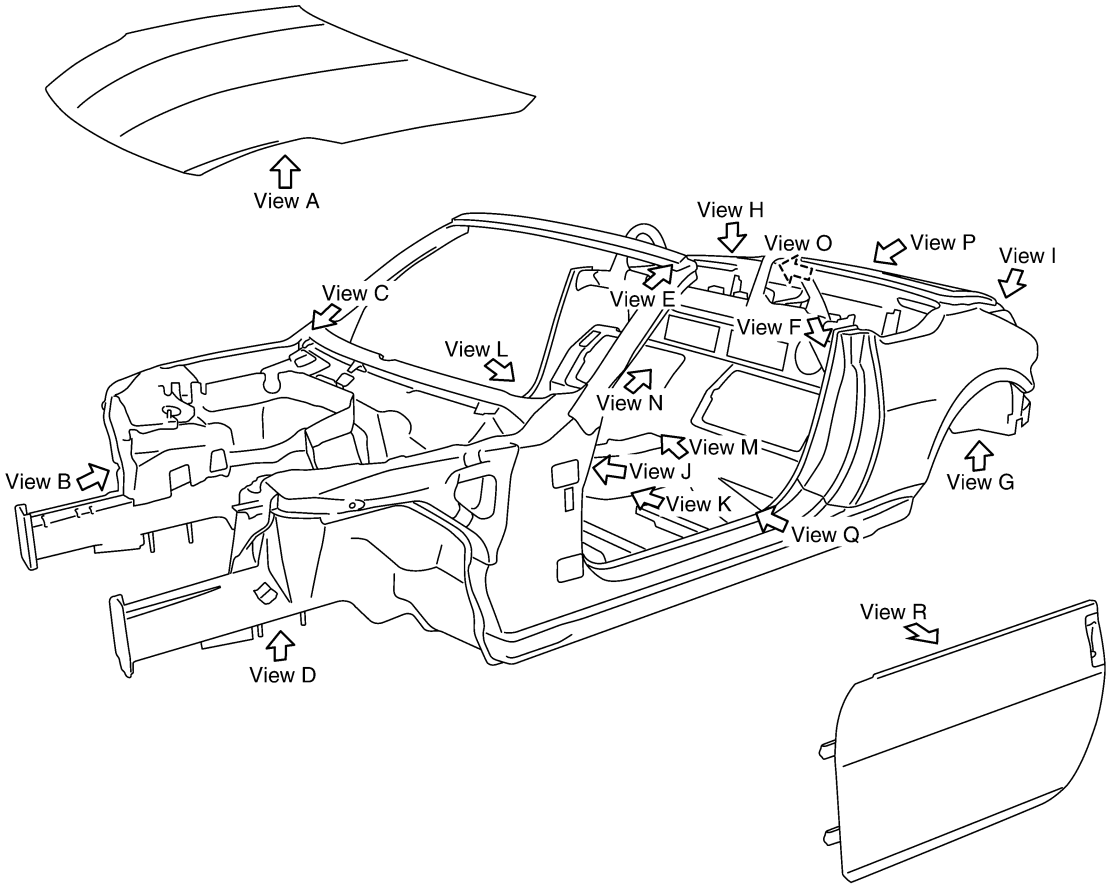
SIIA2335E

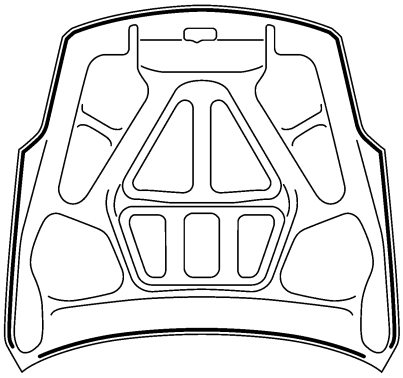
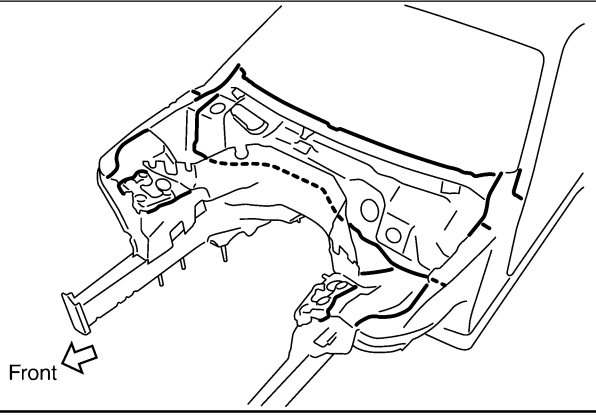
Body Sealing (Roadster)

NIS0003Z

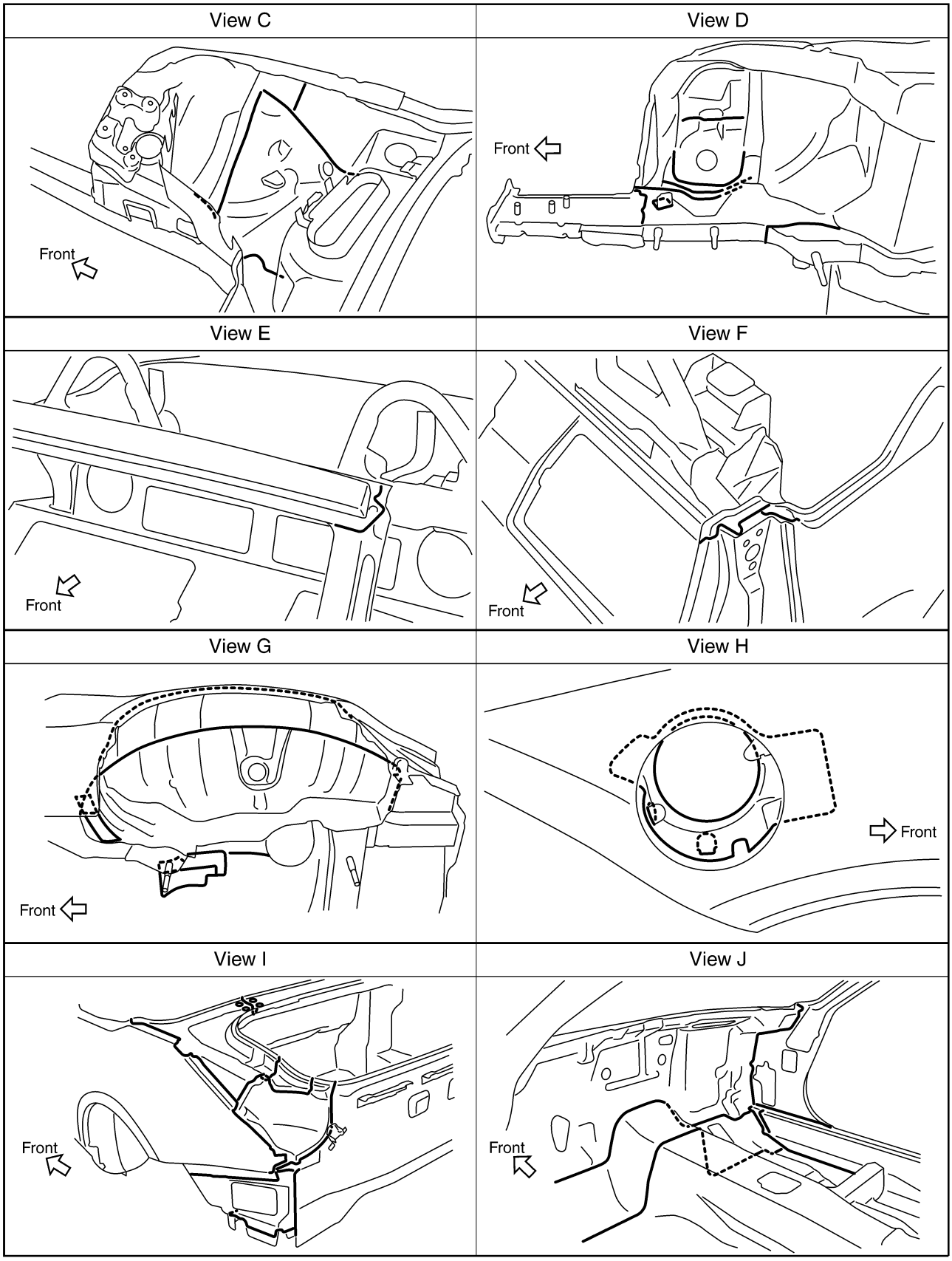
DESCRIPTION

The following figure shows the areas which are sealed at the factory. Sealant which has been applied to these areas should be smooth and free from cuts or gaps. Care should be taken not to apply an excess amount of sealant and not to allow other unaffected parts to come into contact with the sealant.

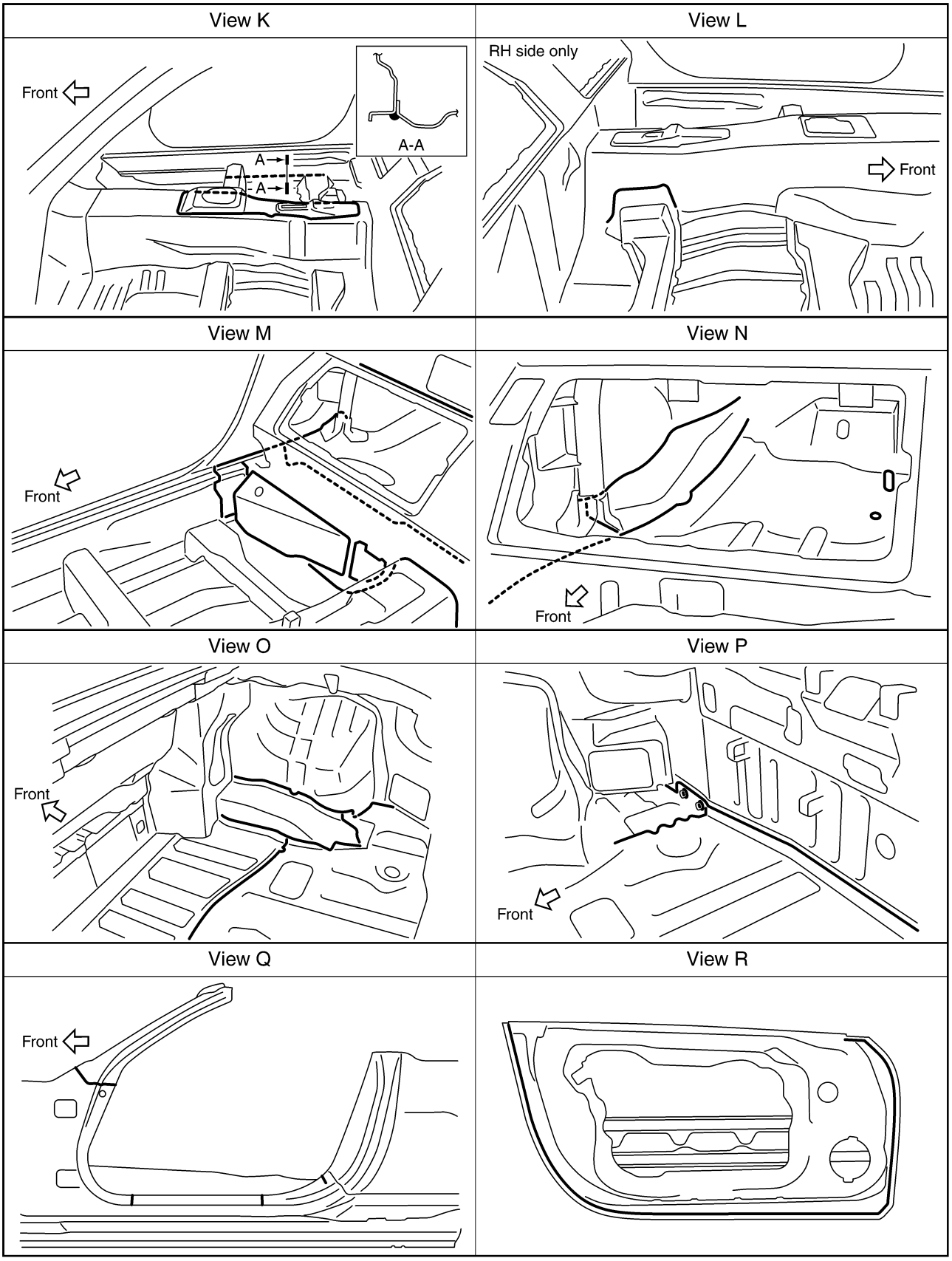


View A	View B
	

SIIA2300E


View C
Front
View D
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View E
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View F
Front
View G
Front
View H
Front
View I
Front
View J
Front

SIIA2301E

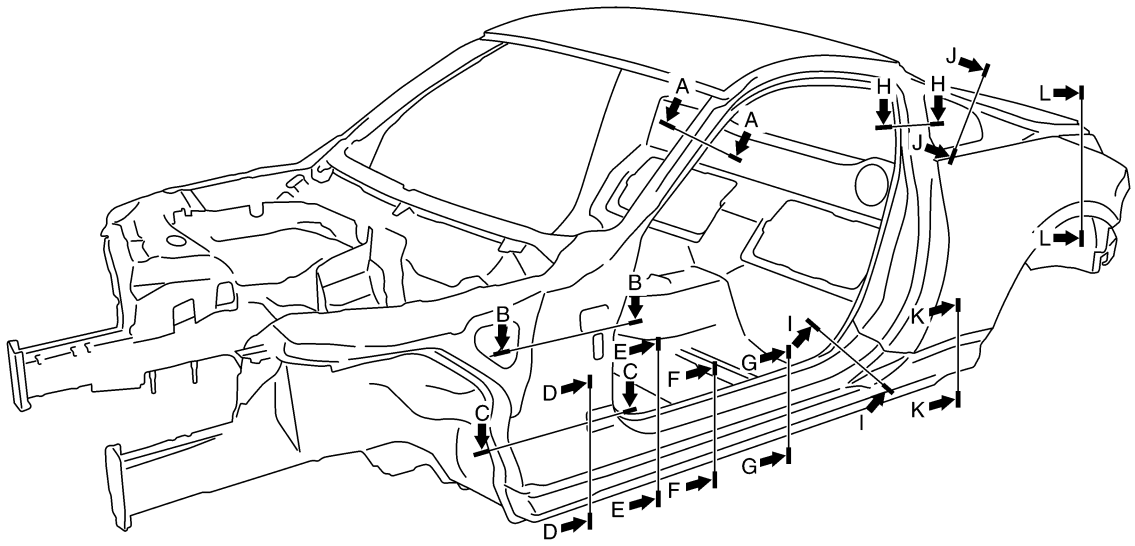

View K
Front
A-A
A
A
View L
RH side only
Front
View M
Front
View N
Front
View O
Front
View P
Front
View Q
Front
View R

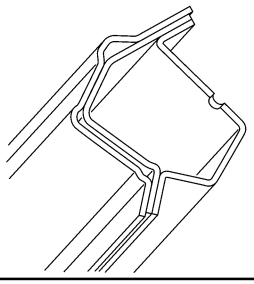
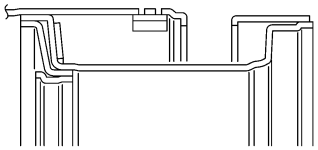
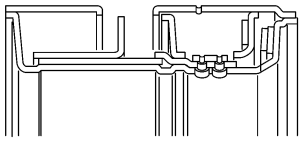
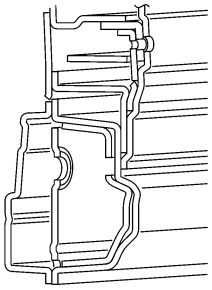
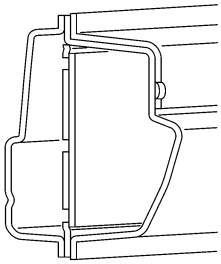
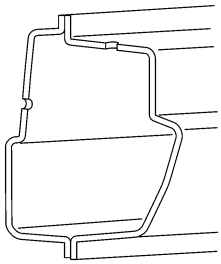
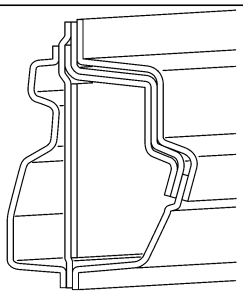
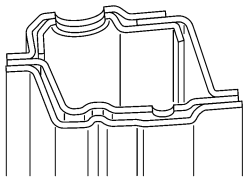
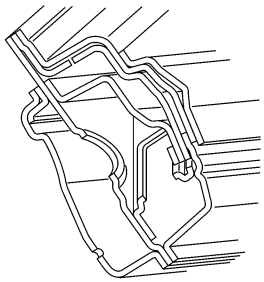
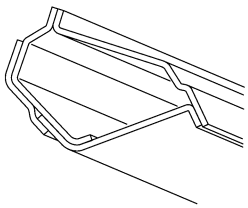
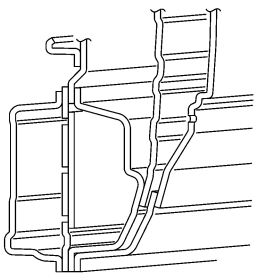
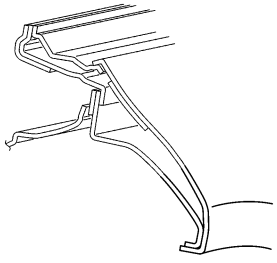
SIIA2302E

Body Construction (Coupe)

NIS00040

BODY CONSTRUCTION



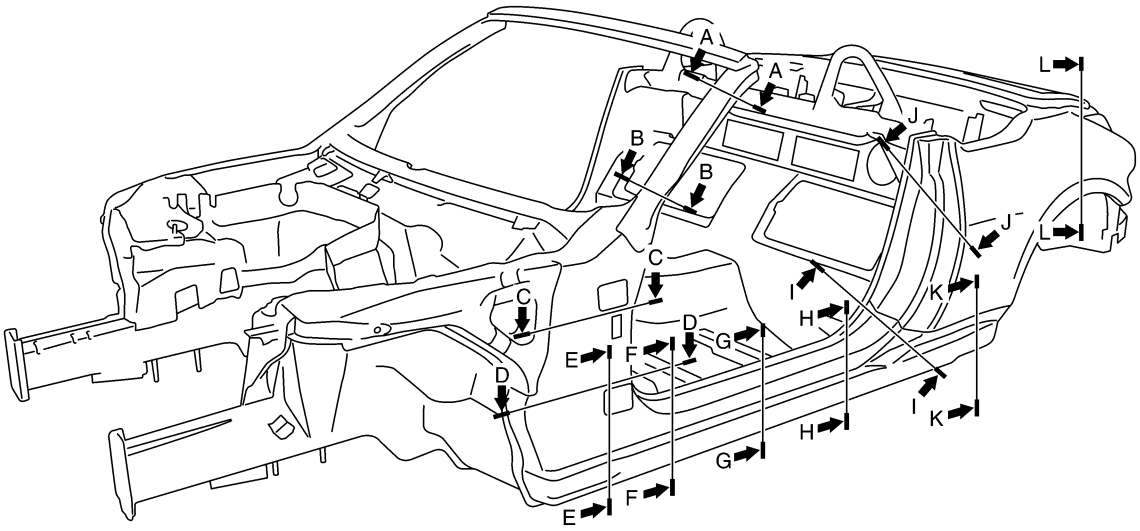
Section A-A	Section B-B	Section C-C	Section D-D
			
Section E-E	**Section F-F**	**Section G-G**	**Section H-H**
			
Section I-I	**Section J-J**	**Section K-K**	**Section L-L**
			

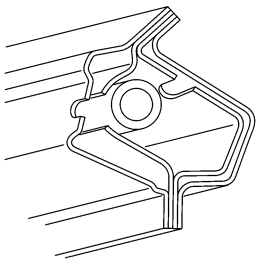
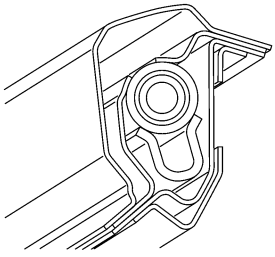
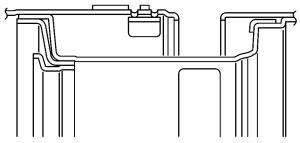
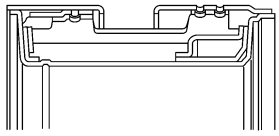
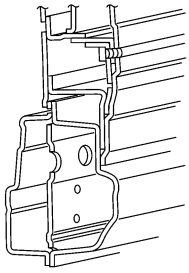
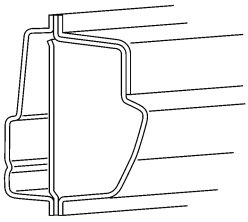
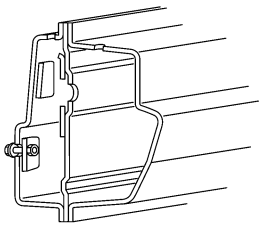
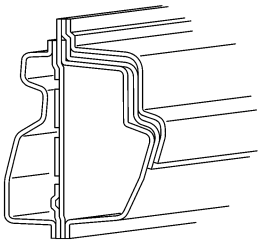
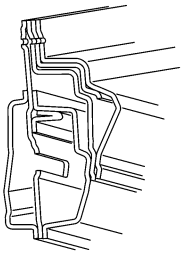
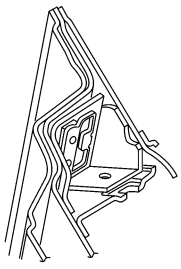
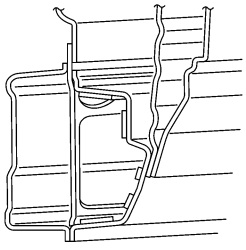
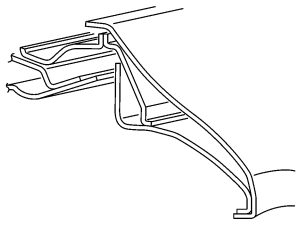
SIIA2362E

Body Construction (Roadster)

NIS00041

BODY CONSTRUCTION



Section A-A	Section B-B	Section C-C	Section D-D
			
Section E-E	**Section F-F**	**Section G-G**	**Section H-H**
			
Section I-I	**Section J-J**	**Section K-K**	**Section L-L**
			

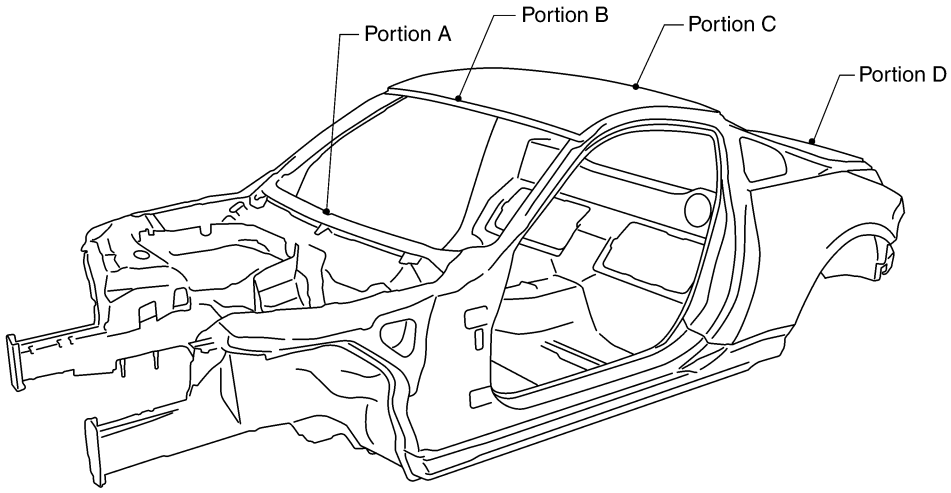
SIIA2303E

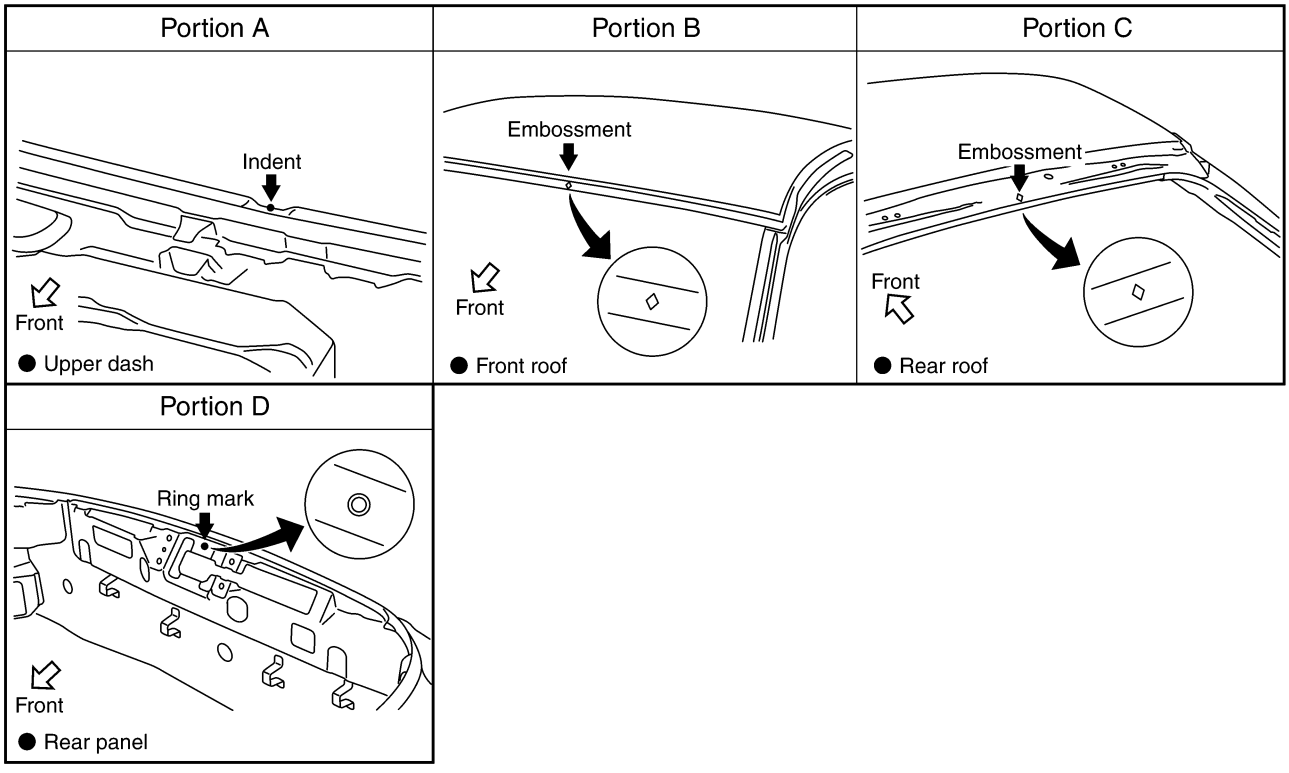
Body Alignment (Coupe)

NIS00042

BODY CENTER MARKS (COUPE)

A mark has been placed on each part of the body to indicate the vehicle center. When repairing parts damaged by an accident which might affect the vehicle frame (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

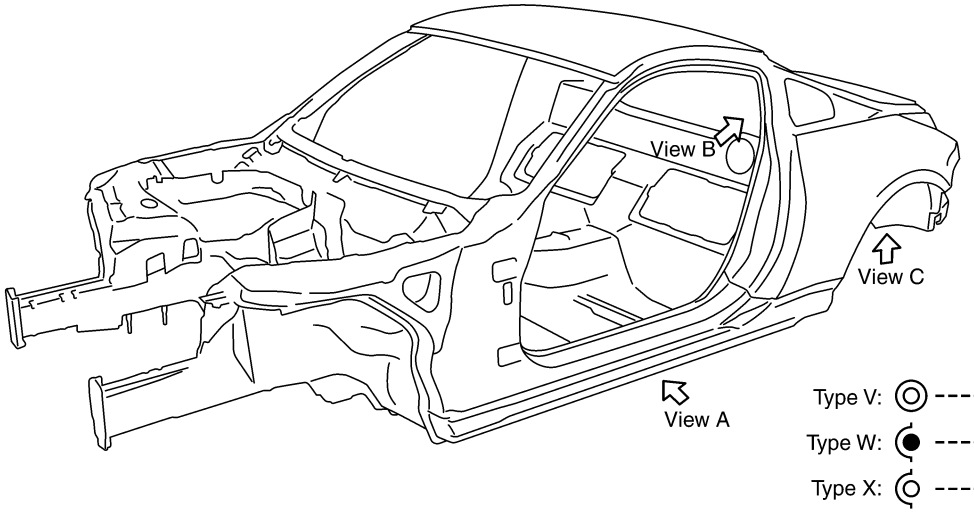


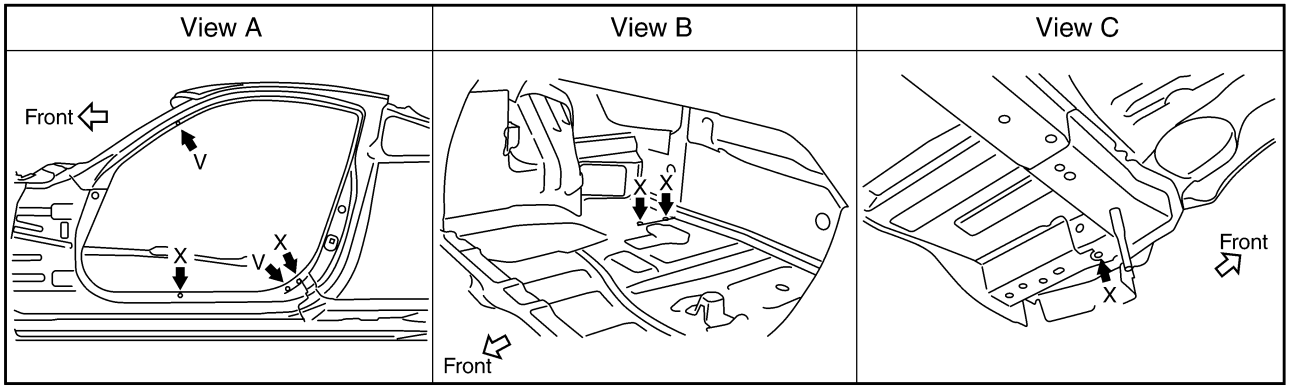


SIIA1974E

PANEL PARTS MATCHING MARKS (COUPE)

A mark has been placed on each body panel to indicate the parts matching positions. When repairing parts damaged by an accident which might affect the vehicle structure (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

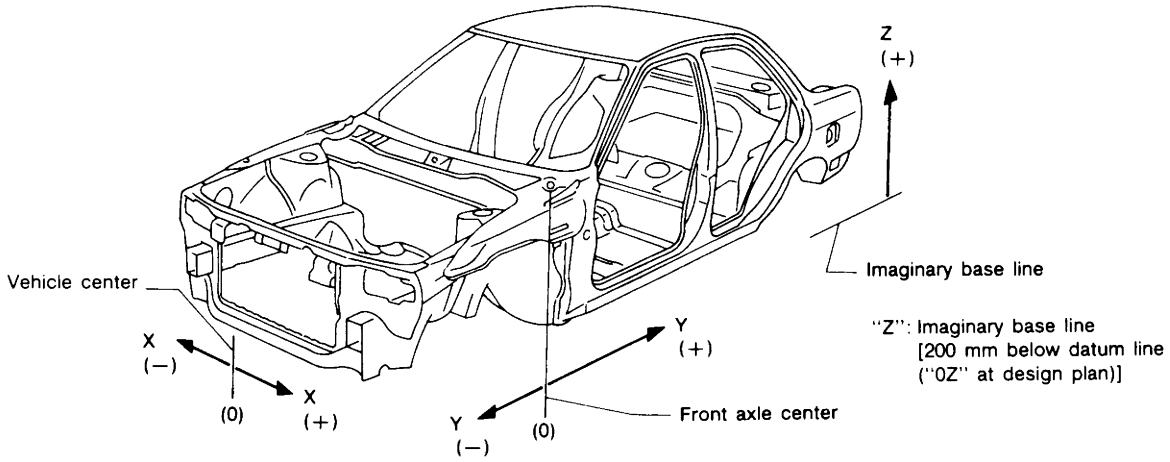




SIIA1981E

DESCRIPTION

- All dimensions indicated in the figures are actual.
- When using a tracking gauge, adjust both pointers to equal length. Then check the pointers and gauge itself to make sure there is no free play.
- When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
- Measurements should be taken at the center of the mounting holes.
- An asterisk (*) following the value at the measuring point indicates that the measuring point on the other side is symmetrically the same value.
- The coordinates of the measurement points are the distances measured from the standard line of ″X″, ″Y″ and ″Z″.

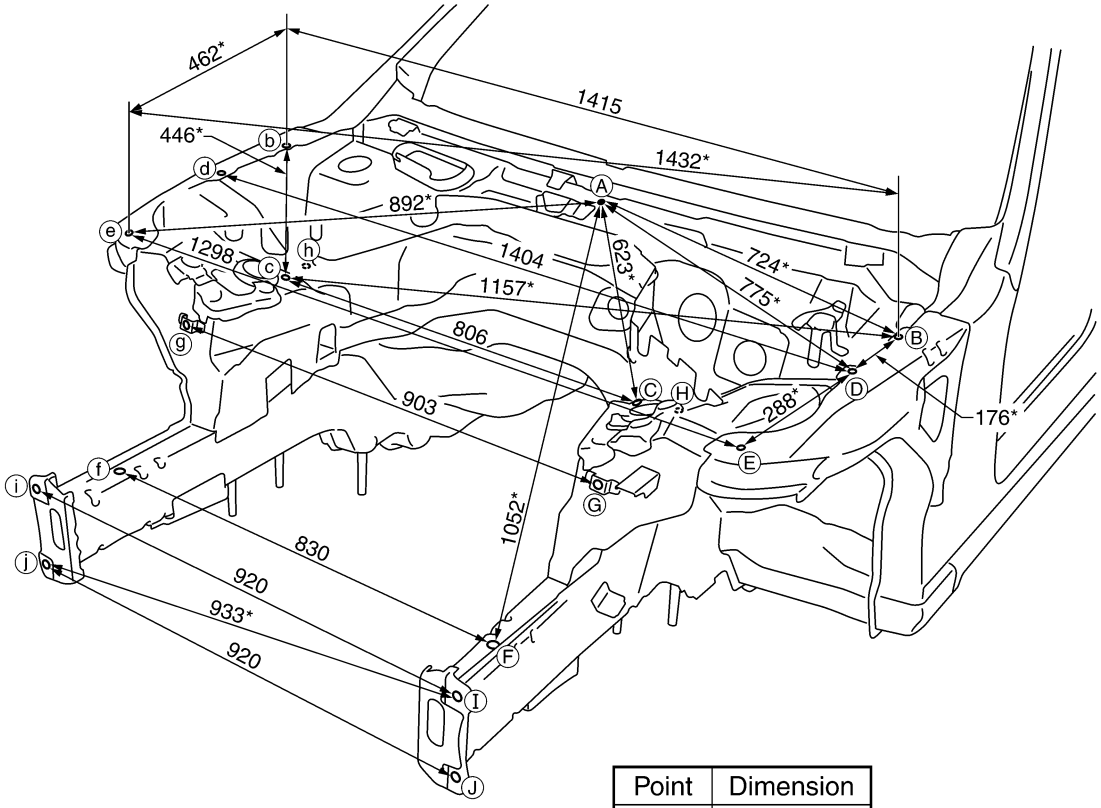


ENGINE COMPARTMENT

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm

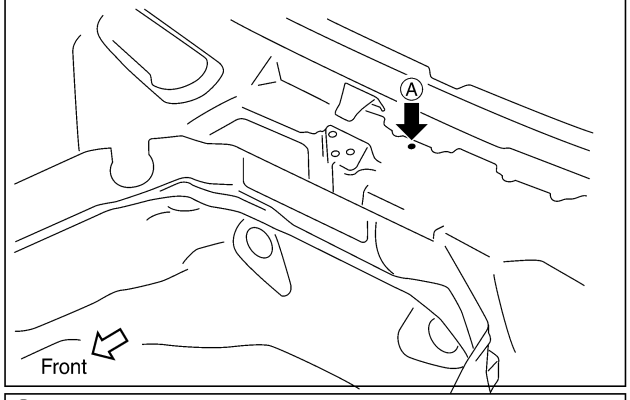


Point	Dimension
Ⓒ~ⓖ	883*
Ⓗ~ⓗ	903

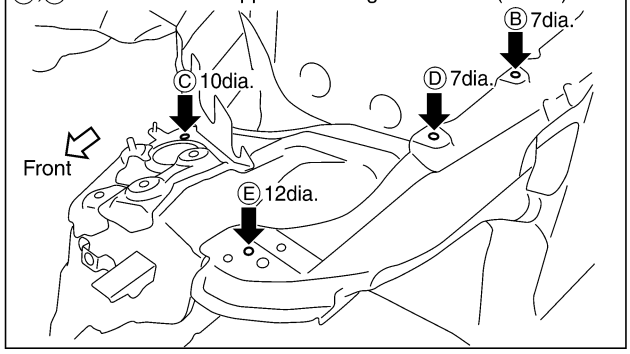
SIIA2306E

Measurement points

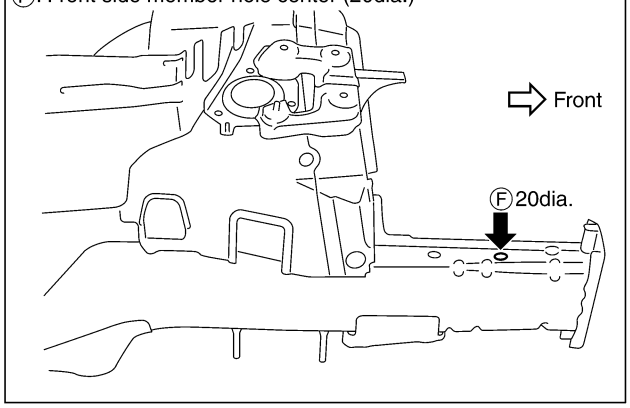
Ⓐ : Upper dash positioning mark center of center positioning mark



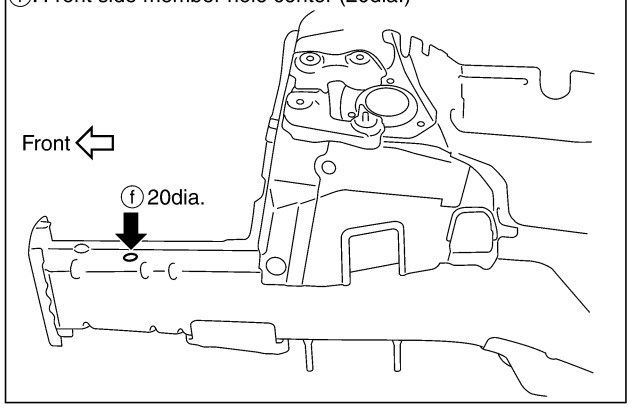
Ⓑ,ⓑ,Ⓓ,ⓓ : Front fender installing hole center (7dia.)
Ⓒ,ⓒ : Front strut installing hole center (10dia.)
Ⓔ,ⓔ : Radiator core support installing hole center (12dia.)



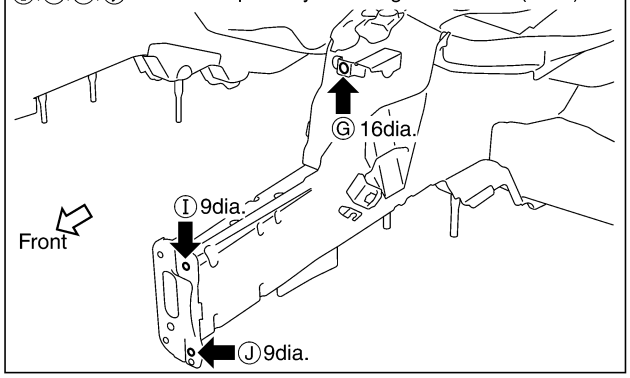
Ⓕ: Front side member hole center (20dia.)



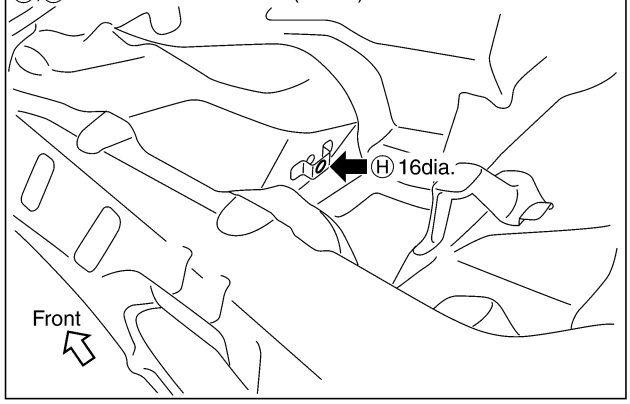
ⓕ: Front side member hole center (20dia.)



Ⓖ,ⓖ : Nut holder hole center (16dia.)
Ⓘ,ⓘ,Ⓙ,ⓙ : Front bumper stay installing hole center (9dia.)



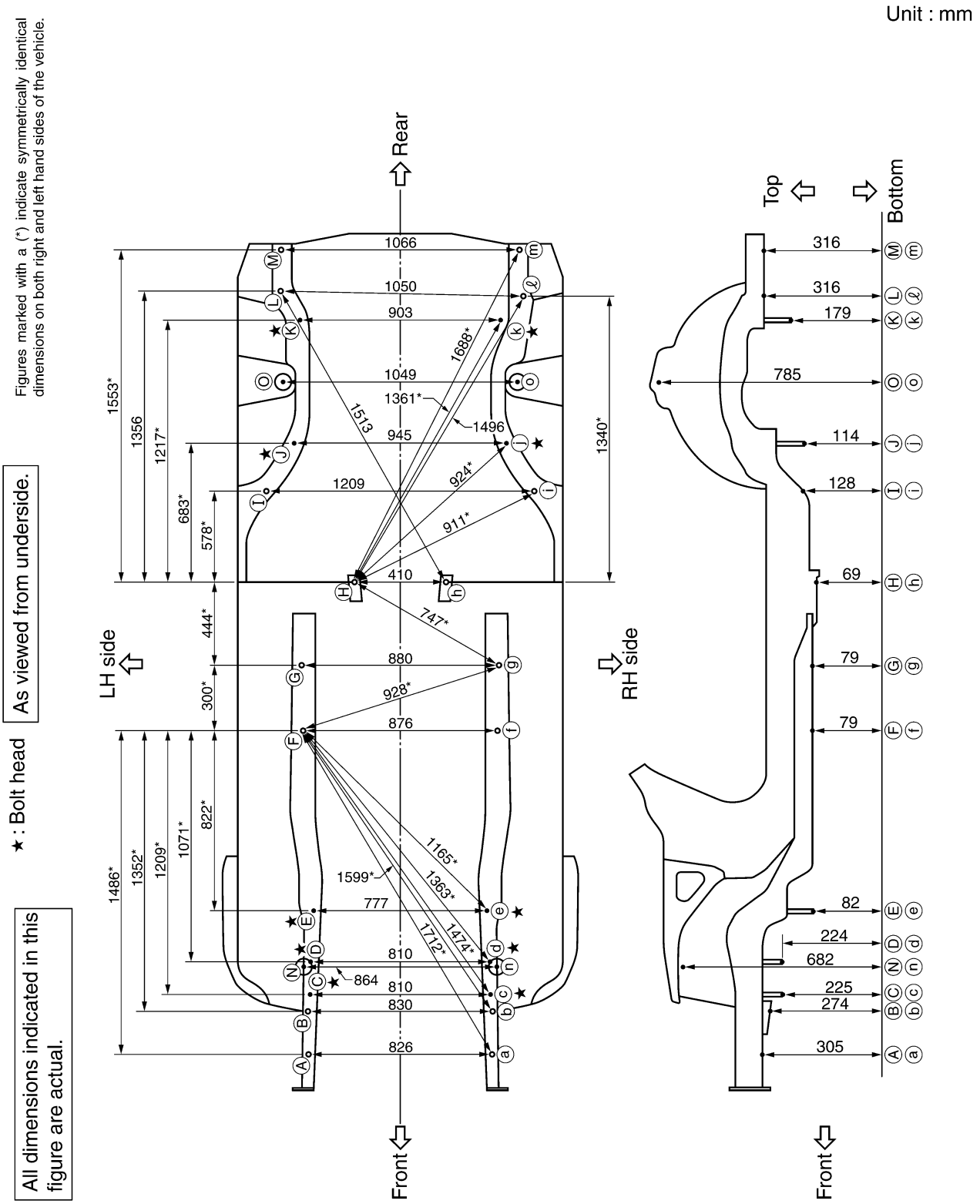
Ⓗ,ⓗ: Nut holder hole center (16dia.)



SIIA2307E

UNDERBODY
Measurement

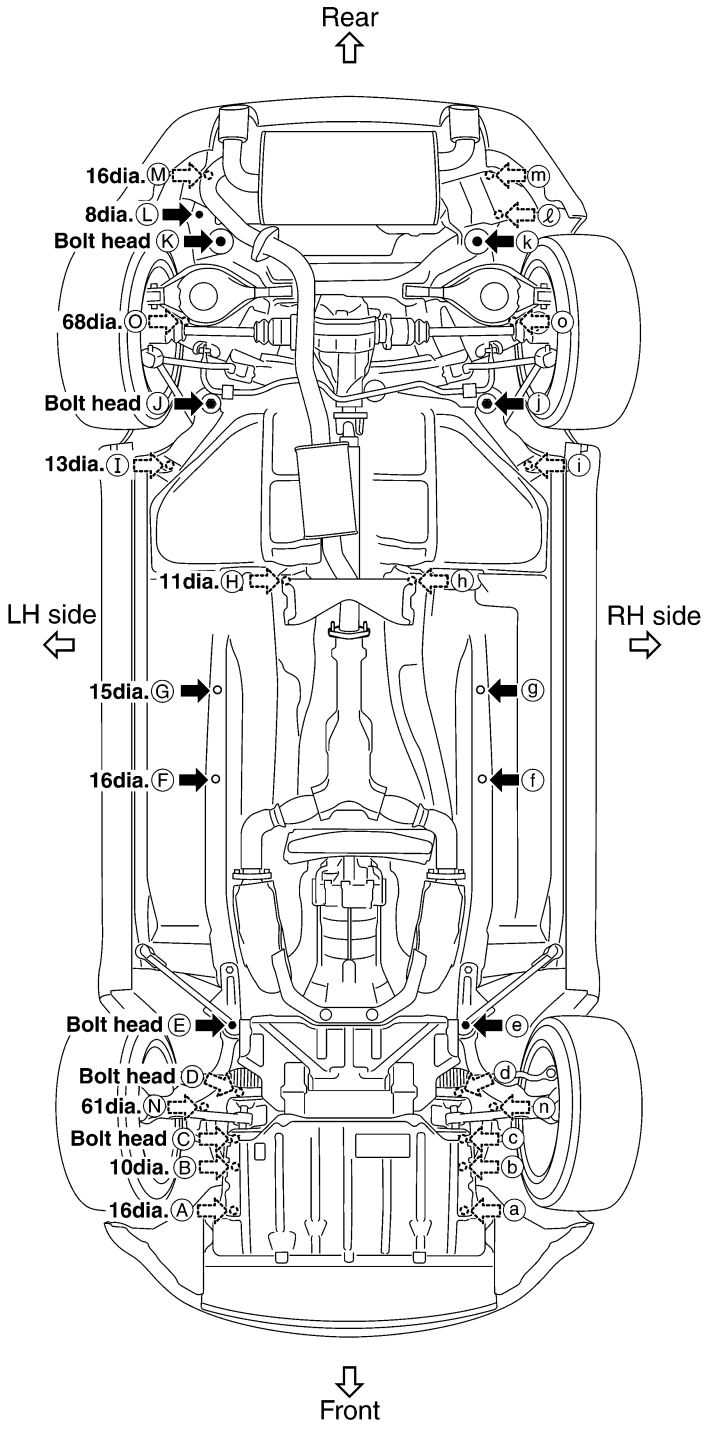
Unit : mm



Measurement points

Unit : mm

As viewed from underside.



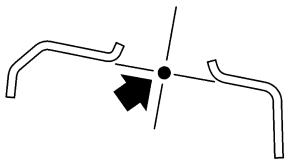
Coordinates:

Ⓐ,ⓐ	Ⓘ,ⓘ
X:413	**X:605**
Y:-368	**Y:2191**
Z:305	**Z:128**
Ⓑ,ⓑ	Ⓙ,ⓙ
X:415	**X:473**
Y:-238	**Y:2404**
Z:274	**Z:114**
Ⓒ,ⓒ	Ⓚ,ⓚ
X:405	**X:452**
Y:-100	**Y:2964**
Z:225	**Z:179**
Ⓓ,ⓓ	Ⓛ
X:405	**X:550**
Y:39	**Y:3065**
Z:224	**Z:316**
Ⓔ,ⓔ	ⓛ
X:388	**X:-500**
Y:279	**Y:3073**
Z:82	**Z:316**
Ⓕ,ⓕ	Ⓜ,ⓜ
X:438	**X:533**
Y:1100	**Y:3275**
Z:79	**Z:316**
Ⓖ,ⓖ	
X:440	
Y:1400	
Z:79	
Ⓗ,ⓗ	
X:205	
Y:1777	
Z:69	

Front and rear strut tower centers

Coordinates:

Ⓝ,ⓝ
X:432
Y:28
Z:682



Ⓞ,ⓞ
X:524
Y:2682
Z:785

Front: Ⓝ,ⓝ **61dia.**
Rear: Ⓞ,ⓞ **68dia.**

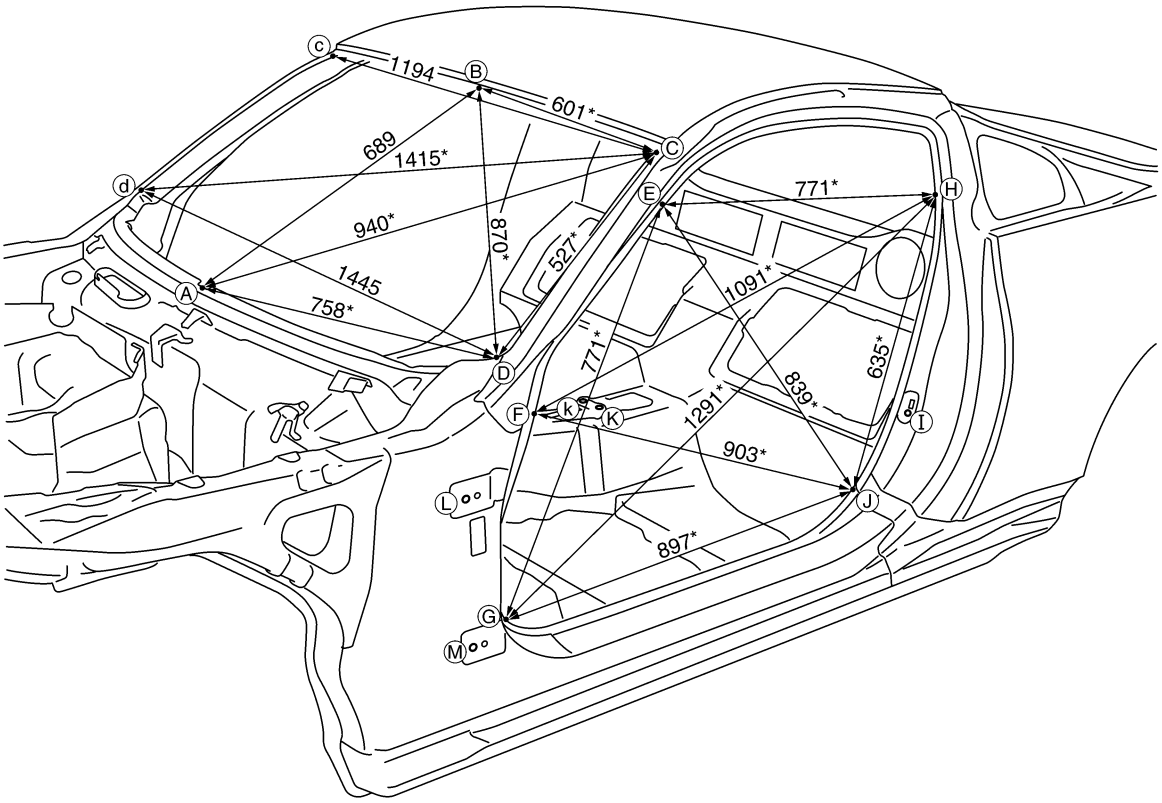
SIIA2348E

PASSENGER COMPARTMENT (COUPE)

Measurement

Unit : mm

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

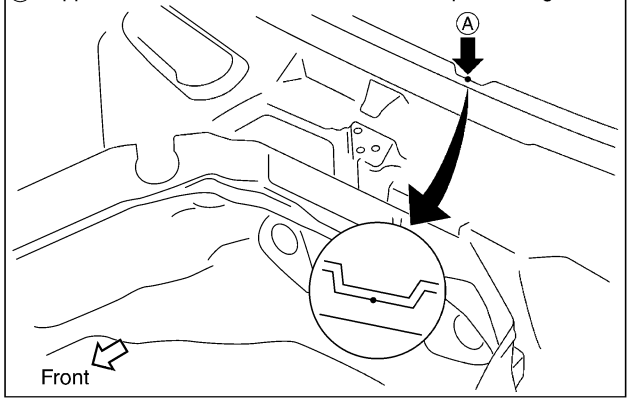


Point	Dimension	Point	Dimension	Point	Dimension
Ⓔ~ⓔ	1,317	Ⓖ~ⓗ	1,909*	Ⓚ~Ⓕ	1,052*
Ⓔ~ⓖ	1,583*	Ⓖ~ⓙ	1,707*	Ⓚ~Ⓖ	1,043*
Ⓔ~ⓗ	1,546*	Ⓗ~ⓗ	1,363	Ⓚ~Ⓗ	956*
Ⓔ~ⓙ	1,618*	Ⓗ~ⓙ	1,543*	Ⓚ~Ⓙ	715*
Ⓕ~ⓕ	1,440	Ⓙ~ⓙ	1,452	Ⓛ~Ⓘ	1,178*
Ⓖ~ⓖ	1,452	Ⓚ~Ⓔ	993*	Ⓜ~Ⓘ	1,181*

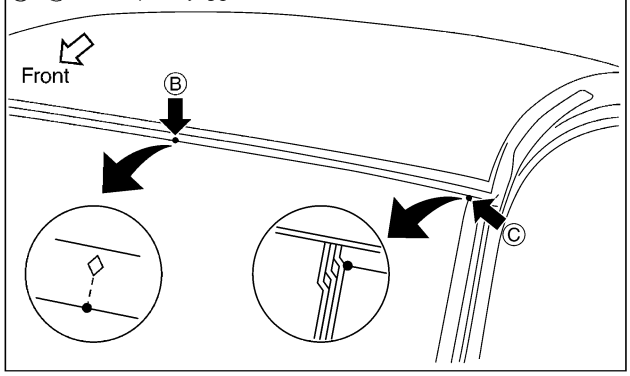
SIIA1988E

Measurement points

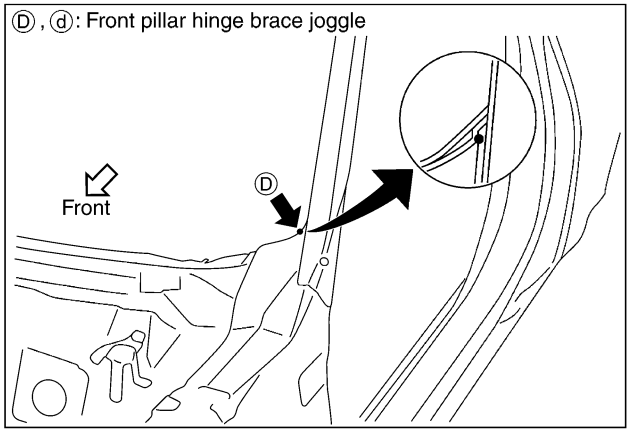
Ⓐ : Upper dash crossmember indent of center positioning mark



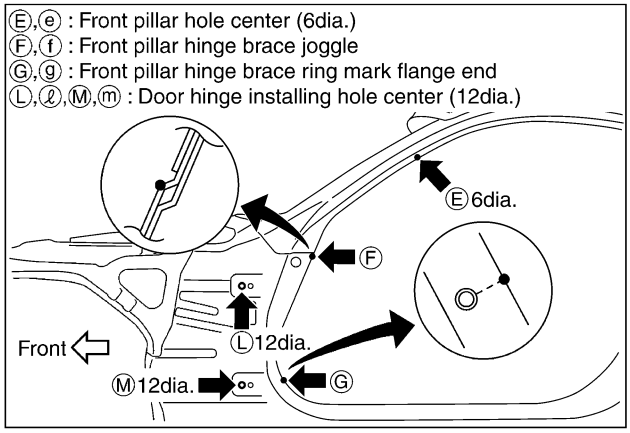
Ⓑ : Front roof flange end of center positioning mark
Ⓒ , ⓒ : Front pillar joggle



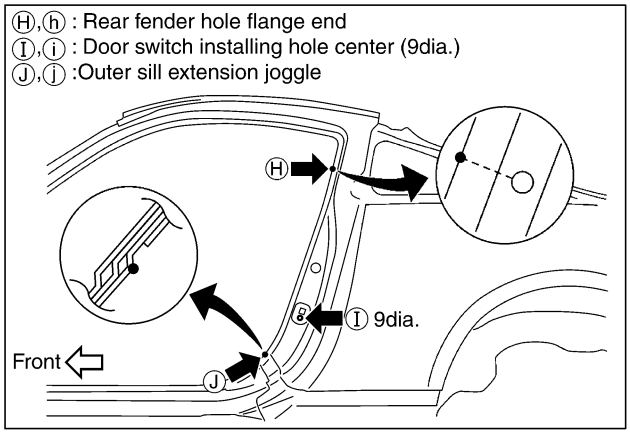
Ⓓ , ⓓ : Front pillar hinge brace joggle



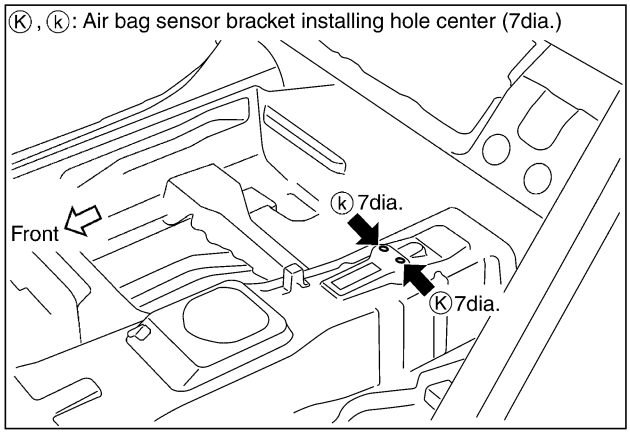
Ⓔ,ⓔ : Front pillar hole center (6dia.)
Ⓕ,ⓕ : Front pillar hinge brace joggle
Ⓖ,ⓖ : Front pillar hinge brace ring mark flange end
Ⓛ,ⓛ,Ⓜ,ⓜ : Door hinge installing hole center (12dia.)



Ⓗ,ⓗ : Rear fender hole flange end
Ⓘ,ⓘ : Door switch installing hole center (9dia.)
Ⓙ,ⓙ :Outer sill extension joggle



Ⓚ , ⓚ : Air bag sensor bracket installing hole center (7dia.)



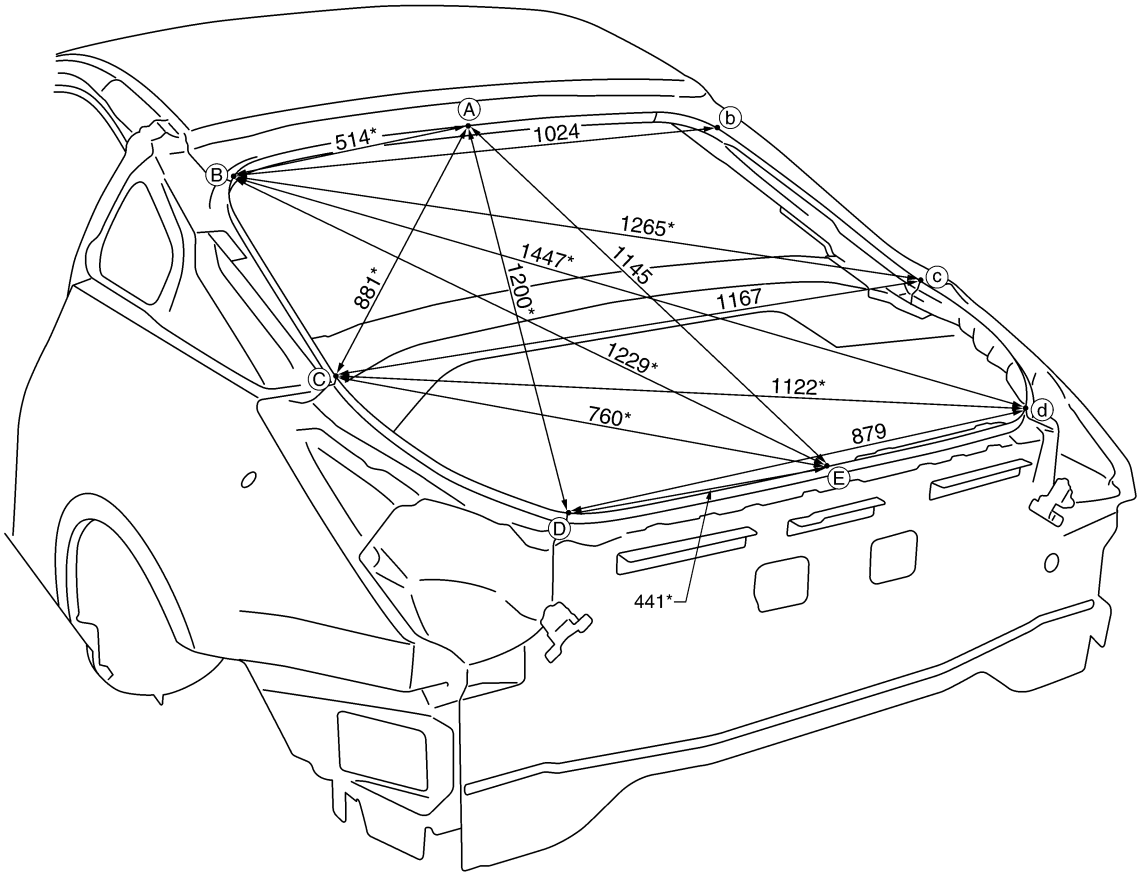
SIIA2351E

REAR BODY (COUPE)

Measurement

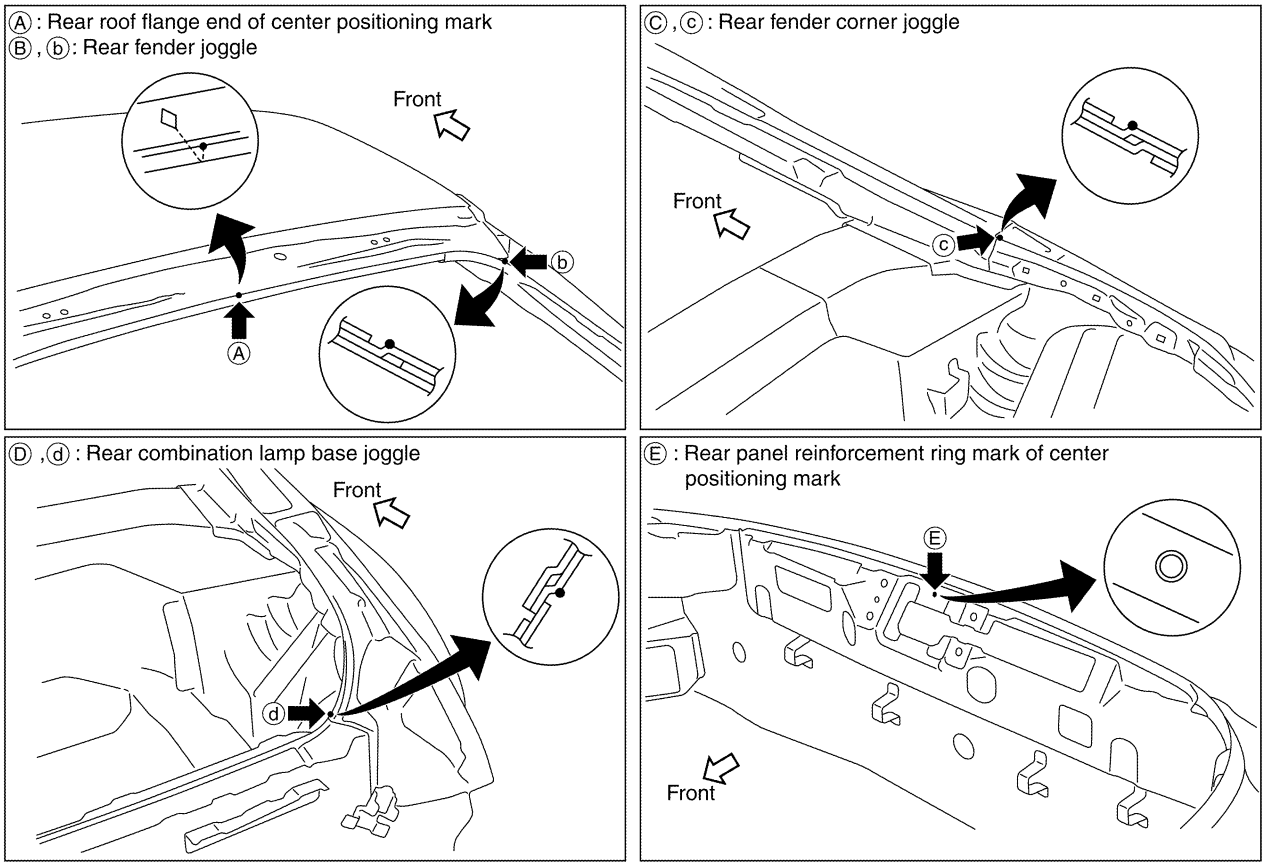
Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm



SIIA1990E

Measurement points



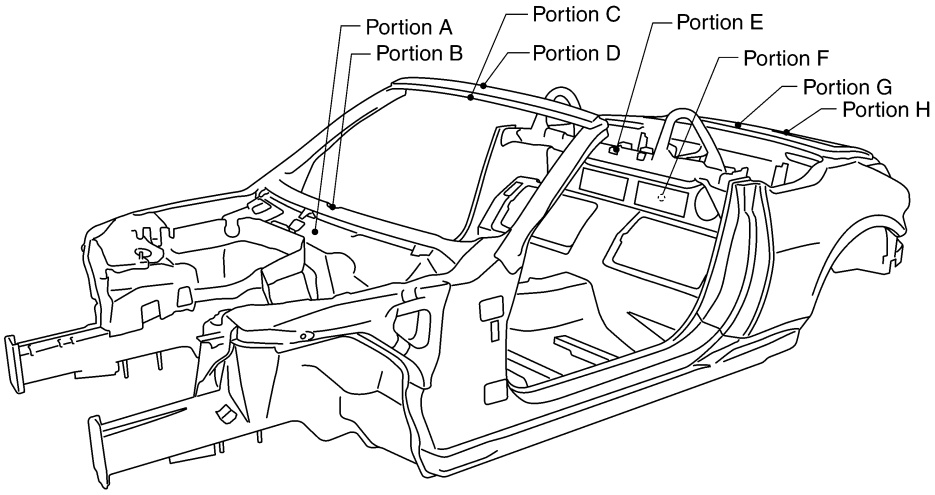
SIIA1991E

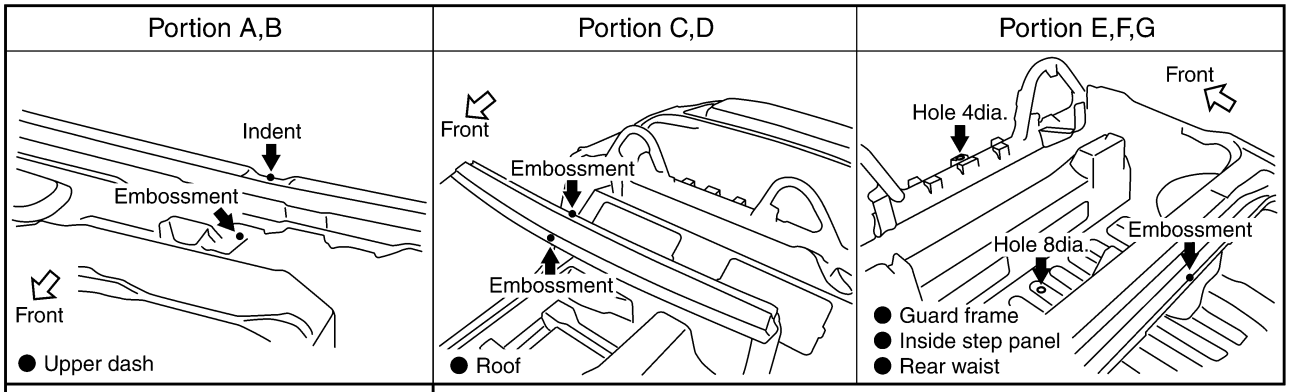
Body Alignment (Roadster)

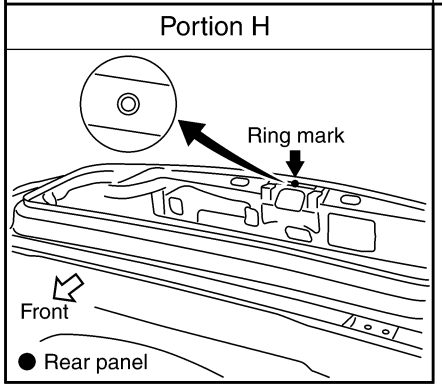
NIS00043

BODY CENTER MARKS (ROADSTER)

A mark has been placed on each part of the body to indicate the vehicle center. When repairing parts damaged by an accident which might affect the vehicle frame (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.



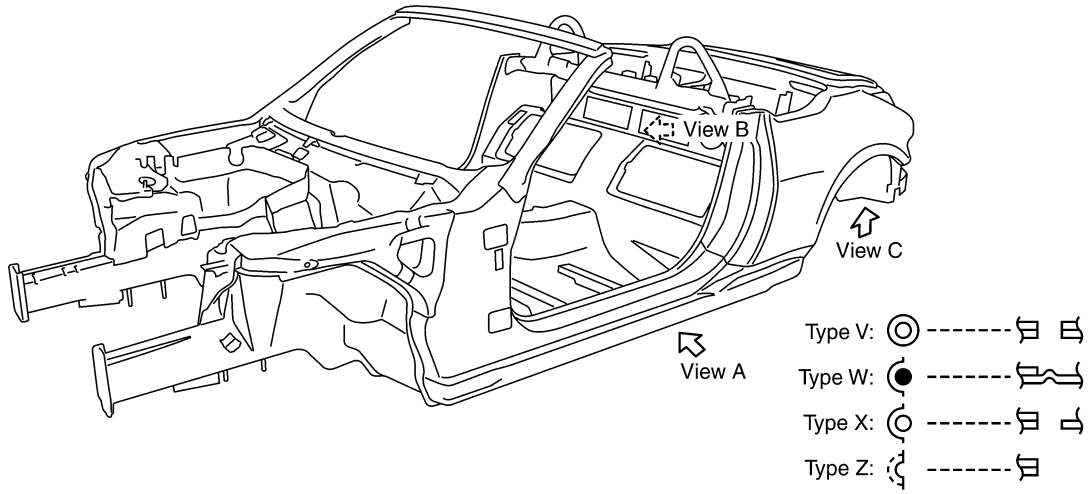


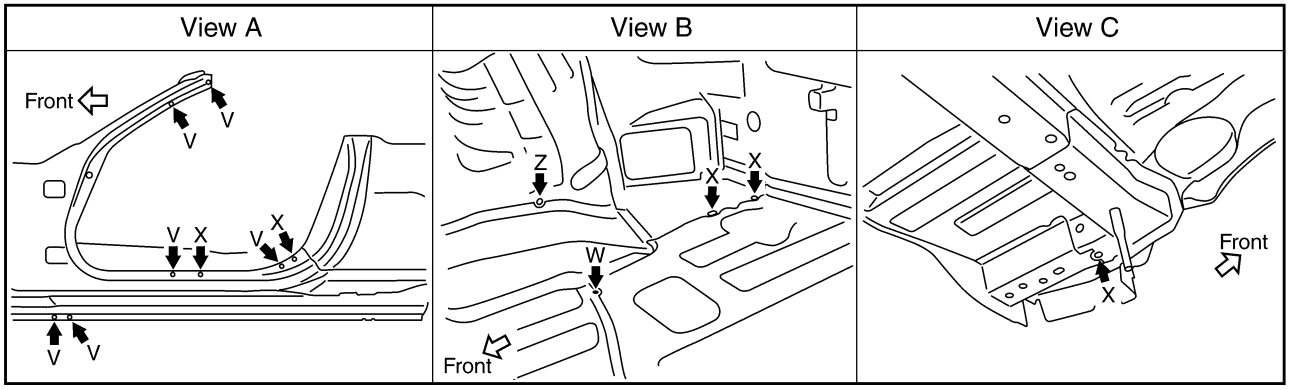


SIIA2304E

PANEL PARTS MATCHING MARKS (ROADSTER)

A mark has been placed on each body panel to indicate the parts matching positions. When repairing parts damaged by an accident which might affect the vehicle structure (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

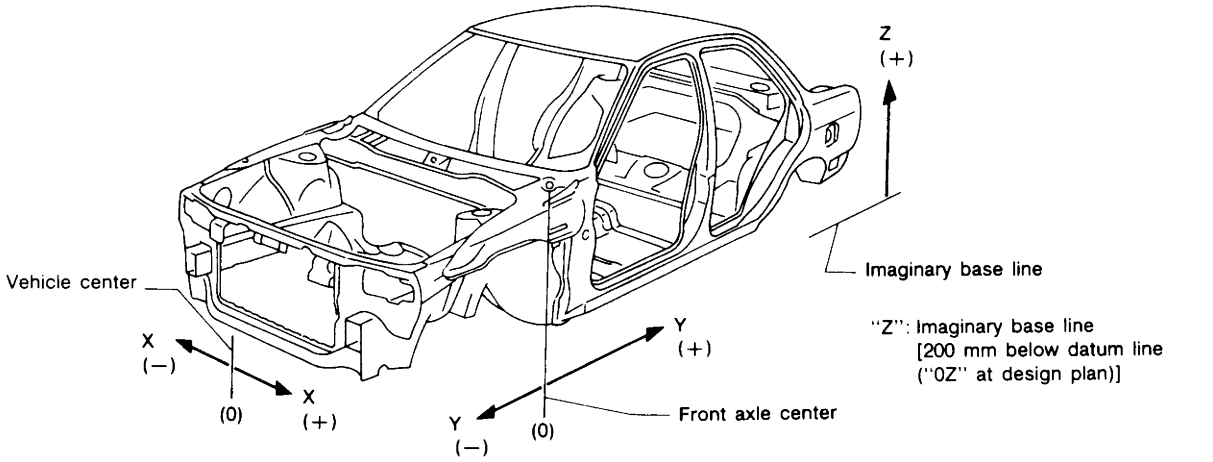




SIIA2305E

DESCRIPTION

- All dimensions indicated in the figures are actual.
- When using a tracking gauge, adjust both pointers to equal length. Then check the pointers and gauge itself to make sure there is no free play.
- When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
- Measurements should be taken at the center of the mounting holes.
- An asterisk (*) following the value at the measuring point indicates that the measuring point on the other side is symmetrically the same value.
- The coordinates of the measurement points are the distances measured from the standard line of ″X″, ″Y″ and ″Z″.

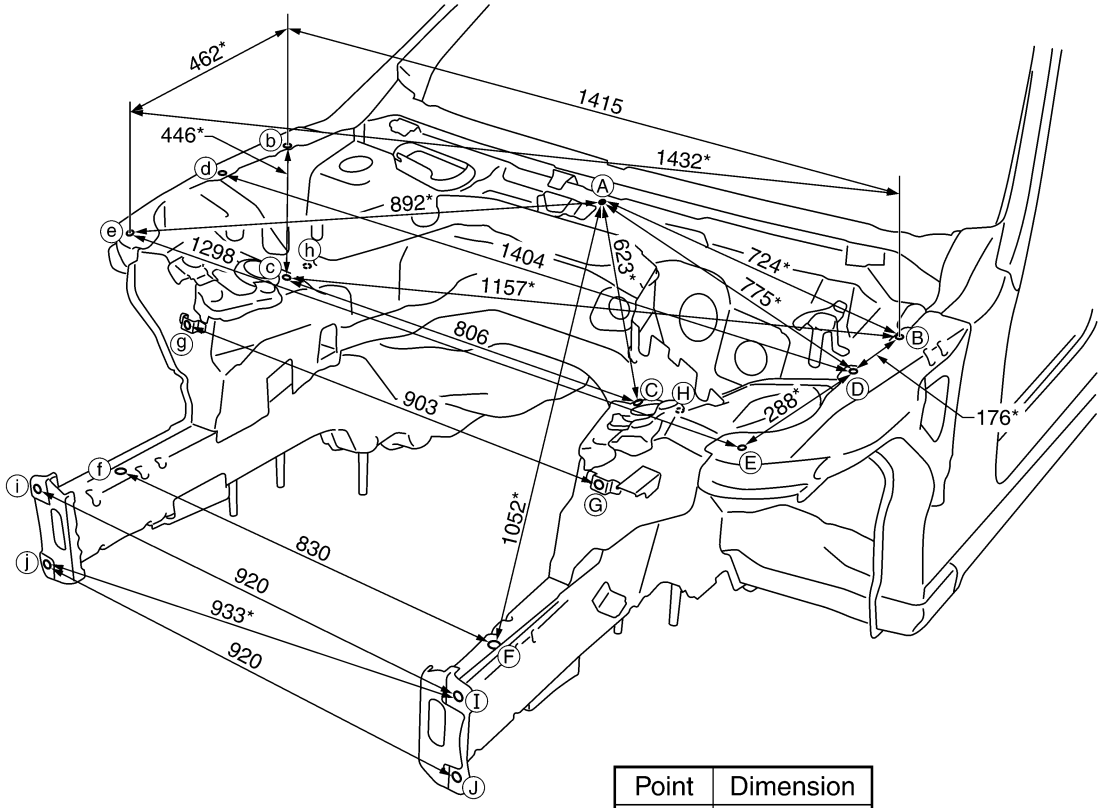


ENGINE COMPARTMENT

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm

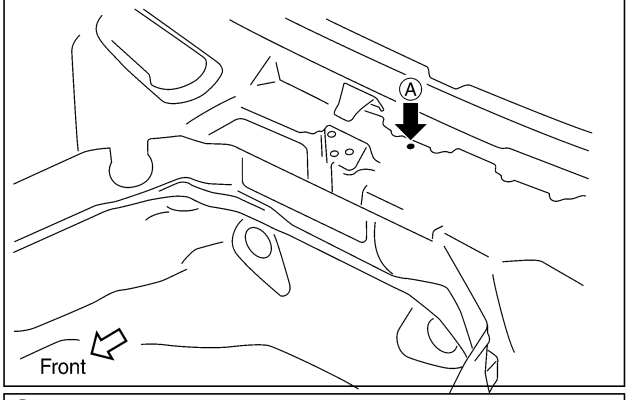


Point	Dimension
Ⓒ~ⓖ	883*
Ⓗ~ⓗ	903

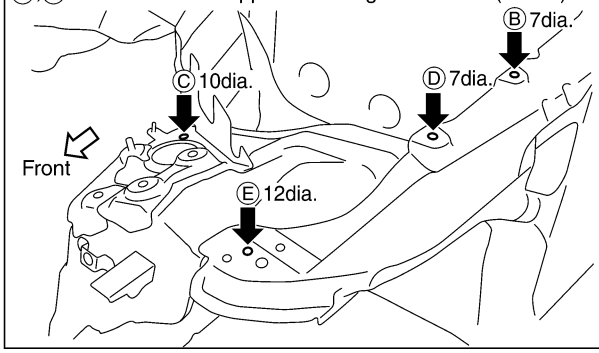
SIIA2306E

Measurement Points

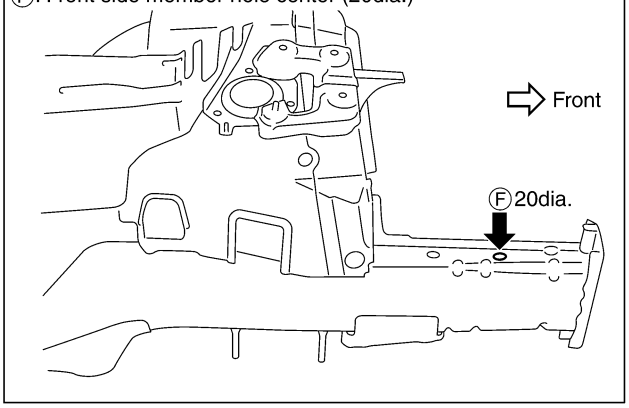
Ⓐ : Upper dash positioning mark center of center positioning mark



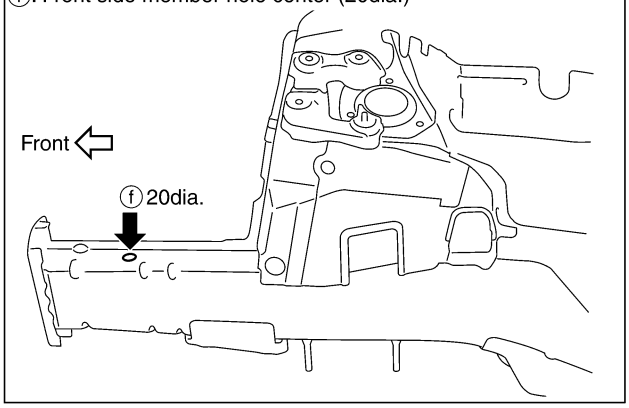
Ⓑ,ⓑ,Ⓓ,ⓓ : Front fender installing hole center (7dia.)
Ⓒ,ⓒ : Front strut installing hole center (10dia.)
Ⓔ,ⓔ : Radiator core support installing hole center (12dia.)



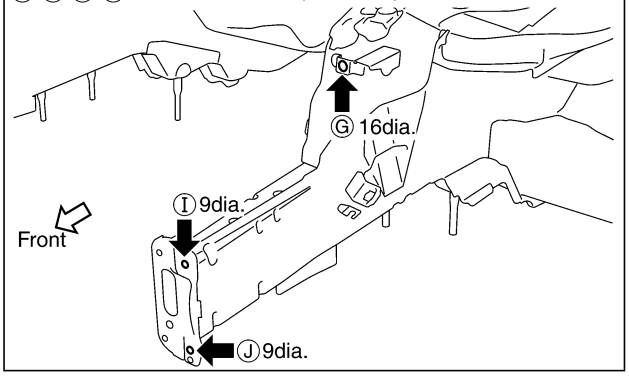
Ⓕ: Front side member hole center (20dia.)



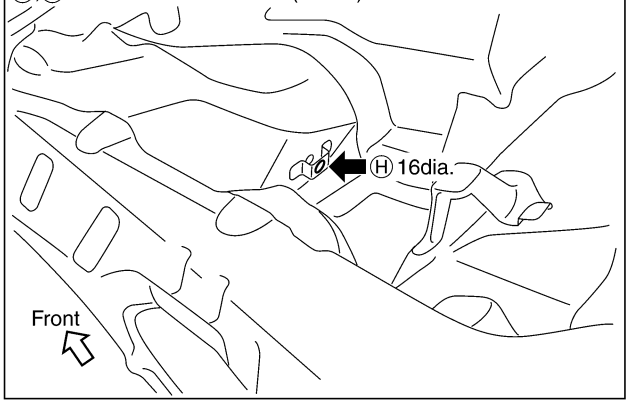
ⓕ: Front side member hole center (20dia.)



Ⓖ,ⓖ : Nut holder hole center (16dia.)
Ⓘ,ⓘ,Ⓙ,ⓙ : Front bumper stay installing hole center (9dia.)



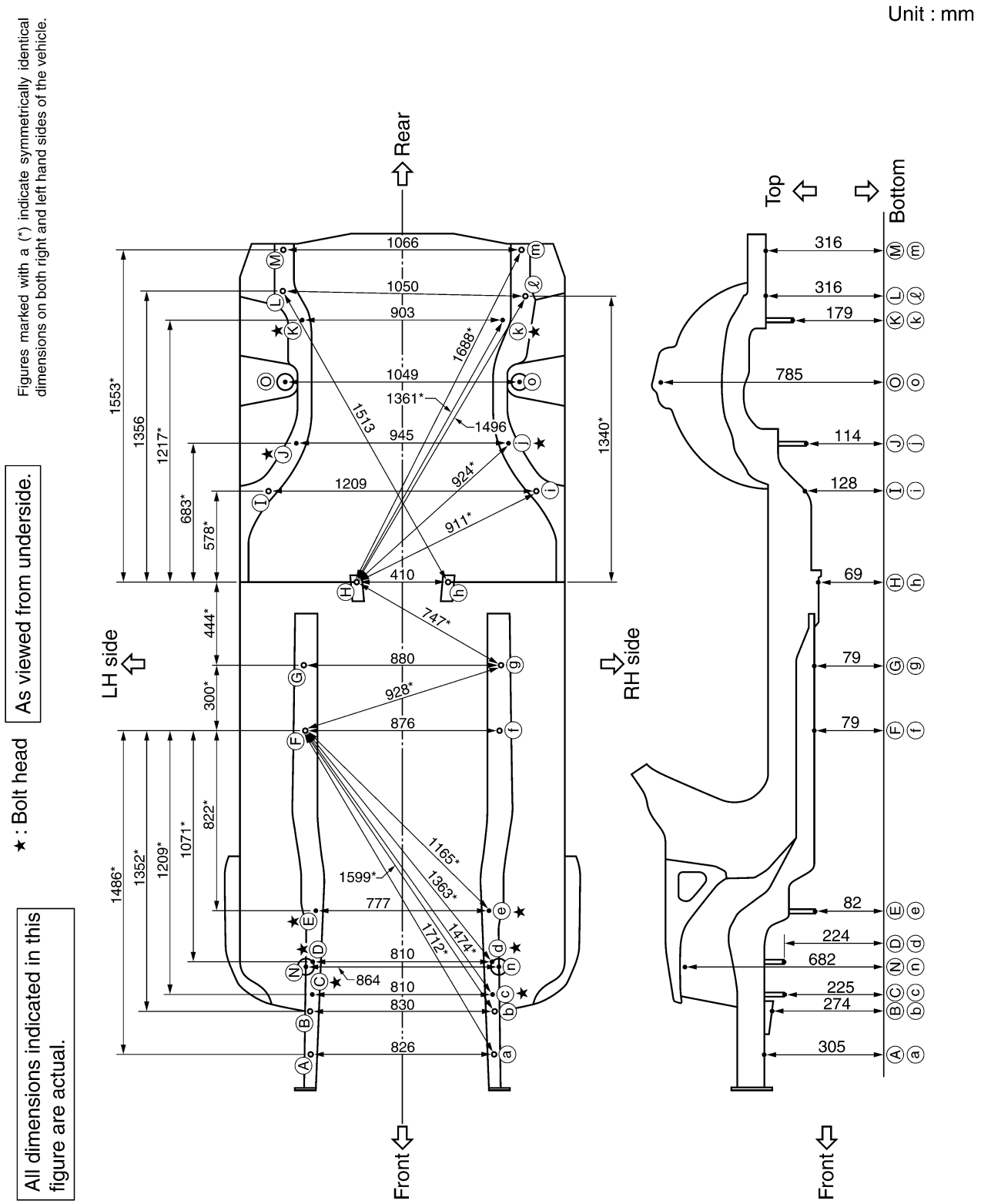
Ⓗ,ⓗ: Nut holder hole center (16dia.)



SIIA2307E

UNDERBODY
Measurement

Unit : mm

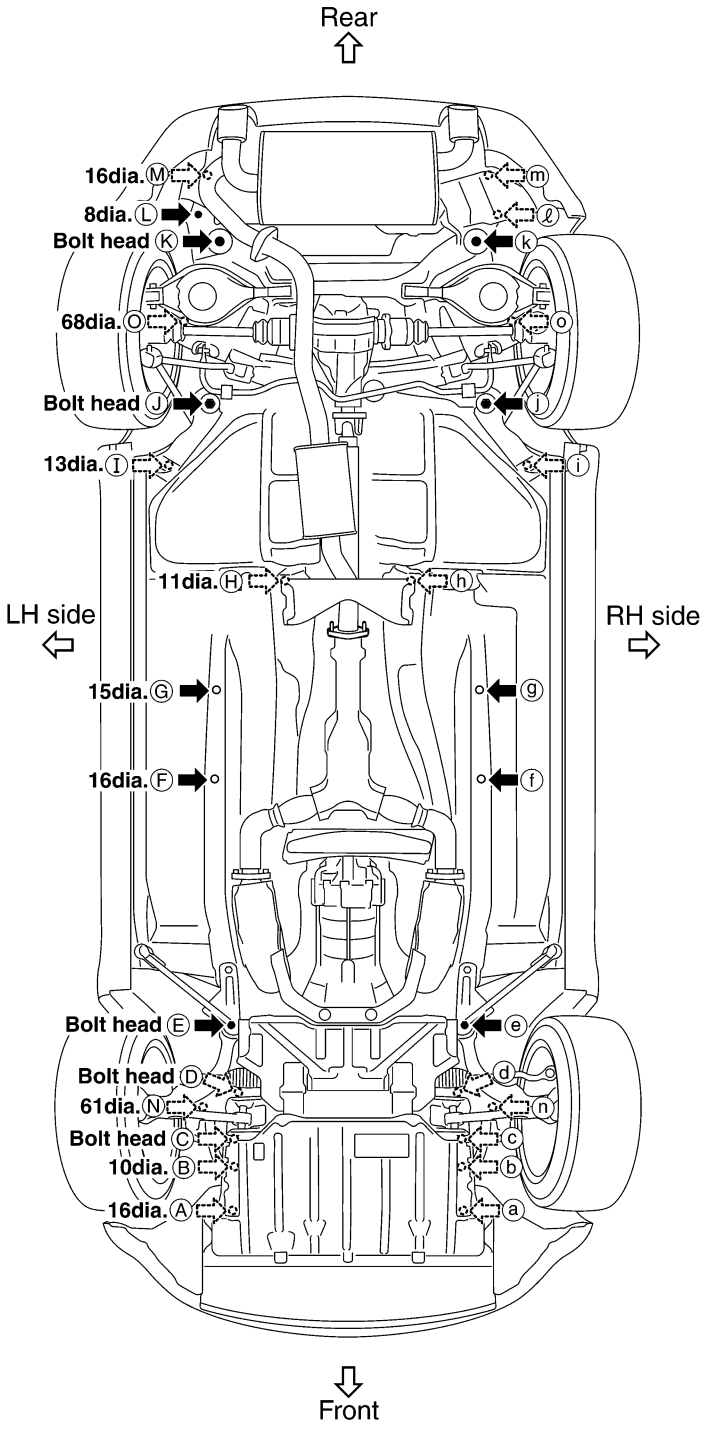


SIIA2347E

Measurement Points

Unit : mm

As viewed from underside.



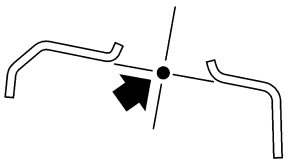
Coordinates:

Ⓐ,ⓐ	Ⓘ,ⓘ
X:413	**X:605**
Y:-368	**Y:2191**
Z:305	**Z:128**
Ⓑ,ⓑ	Ⓙ,ⓙ
X:415	**X:473**
Y:-238	**Y:2404**
Z:274	**Z:114**
Ⓒ,ⓒ	Ⓚ,ⓚ
X:405	**X:452**
Y:-100	**Y:2964**
Z:225	**Z:179**
Ⓓ,ⓓ	Ⓛ
X:405	**X:550**
Y:39	**Y:3065**
Z:224	**Z:316**
Ⓔ,ⓔ	ⓛ
X:388	**X:-500**
Y:279	**Y:3073**
Z:82	**Z:316**
Ⓕ,ⓕ	Ⓜ,ⓜ
X:438	**X:533**
Y:1100	**Y:3275**
Z:79	**Z:316**
Ⓖ,ⓖ	
X:440	
Y:1400	
Z:79	
Ⓗ,ⓗ	
X:205	
Y:1777	
Z:69	

Front and rear strut tower centers

Coordinates:

Ⓝ,ⓝ
X:432
Y:28
Z:682



Ⓞ,ⓞ
X:524
Y:2682
Z:785

Front: Ⓝ,ⓝ **61dia.**
Rear: Ⓞ,ⓞ **68dia.**

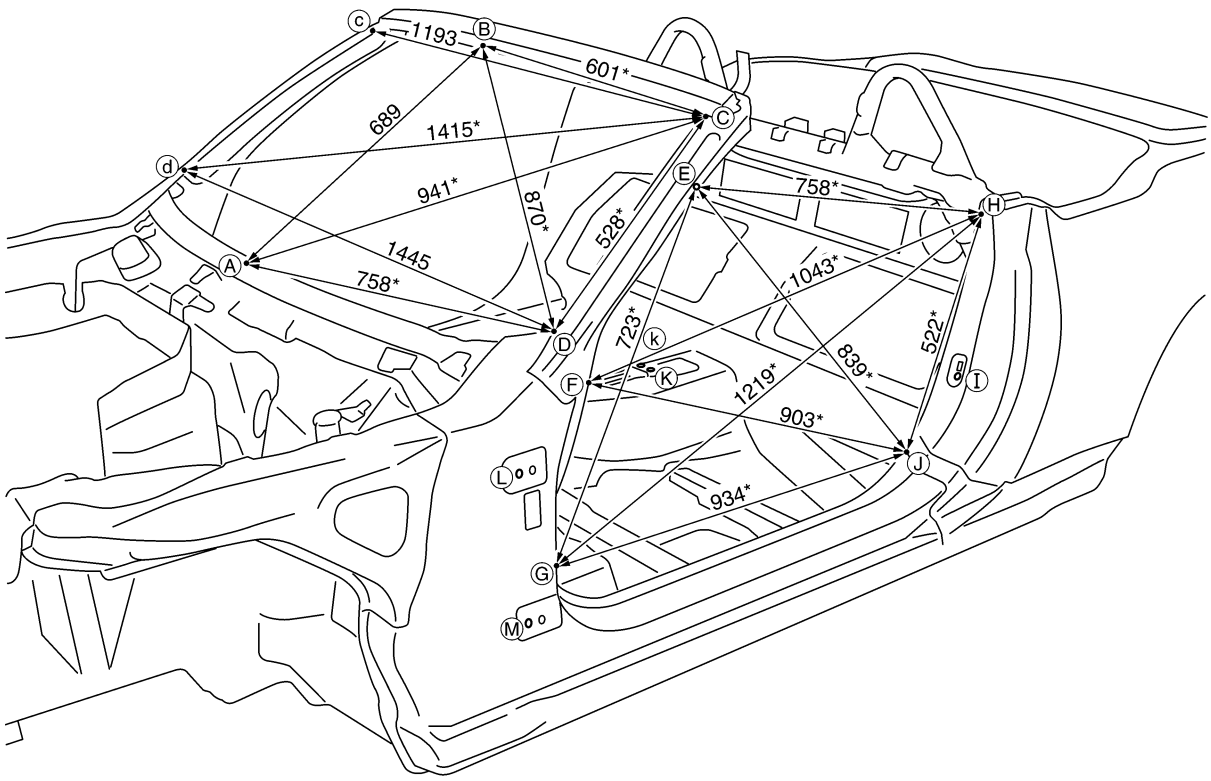
SIIA2348E

PASSENGER COMPARTMENT (ROADSTER)

Measurement

Unit : mm

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

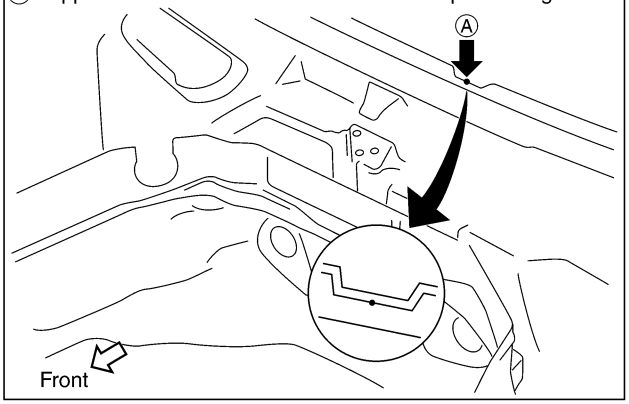


Point	Dimension	Point	Dimension	Point	Dimension
Ⓔ~ⓔ	1,317	Ⓖ~ⓗ	1,882*	Ⓚ~Ⓕ	1,052*
Ⓔ~ⓖ	1,561*	Ⓖ~ⓙ	1,727*	Ⓚ~Ⓖ	1,071*
Ⓔ~ⓗ	1,563*	Ⓗ~ⓗ	1,417	Ⓚ~Ⓗ	902*
Ⓔ~ⓙ	1,618*	Ⓗ~ⓙ	1,527*	Ⓚ~Ⓙ	715*
Ⓕ~ⓕ	1,440	Ⓙ~ⓙ	1,452	Ⓛ~Ⓘ	1,178*
Ⓖ~ⓖ	1,452	Ⓚ~Ⓔ	993*	Ⓜ~Ⓘ	1,181*

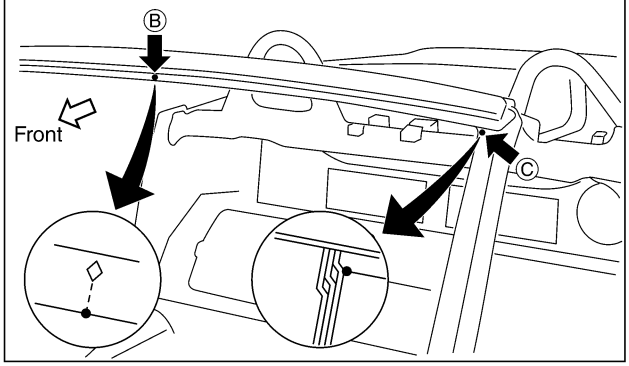
SIIA2308E

Measurement Points

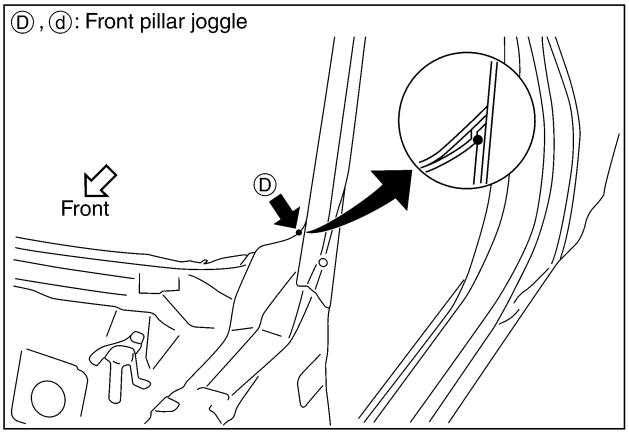
Ⓐ : Upper dash crossmember indent of center positioning mark



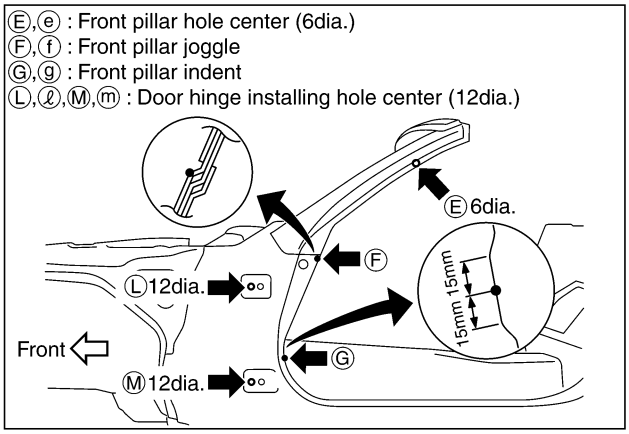
Ⓑ : Outer front roof rail flange end of center positioning mark
Ⓒ , ⓒ : Front pillar joggle



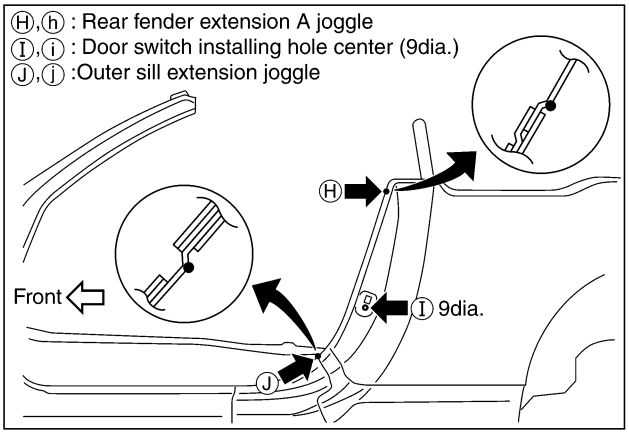
Ⓓ , ⓓ : Front pillar joggle



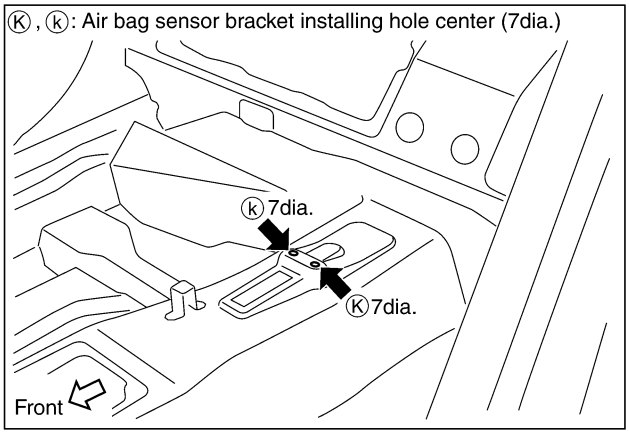
Ⓔ,ⓔ : Front pillar hole center (6dia.)
Ⓕ,ⓕ : Front pillar joggle
Ⓖ,ⓖ : Front pillar indent
Ⓛ,ⓛ,Ⓜ,ⓜ : Door hinge installing hole center (12dia.)



Ⓗ,ⓗ : Rear fender extension A joggle
Ⓘ,ⓘ : Door switch installing hole center (9dia.)
Ⓙ,ⓙ :Outer sill extension joggle



Ⓚ , ⓚ : Air bag sensor bracket installing hole center (7dia.)

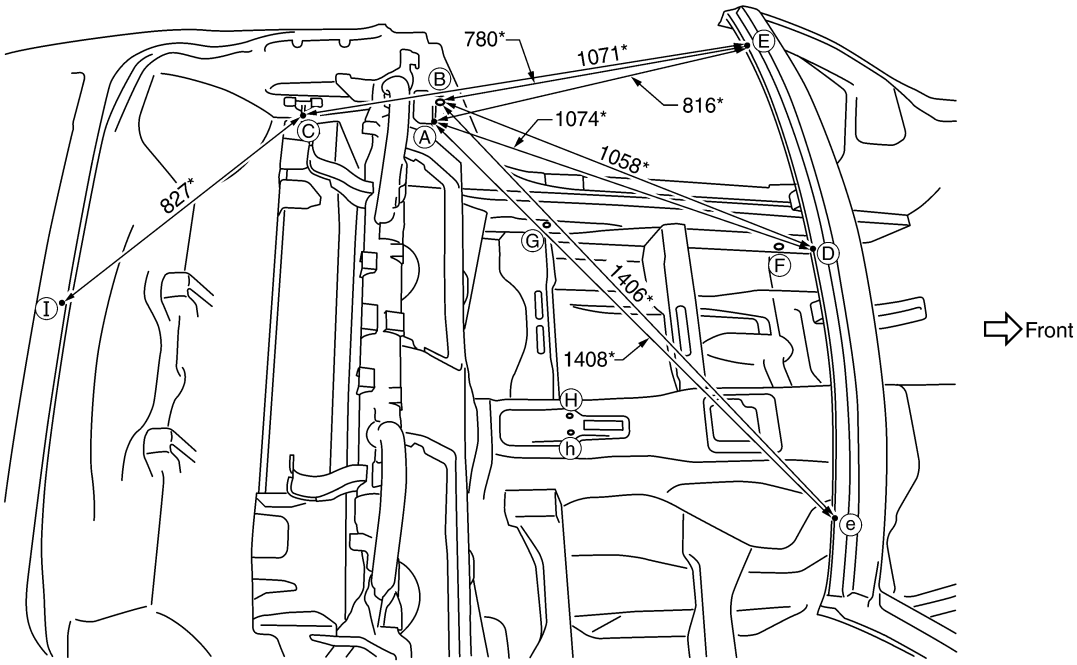


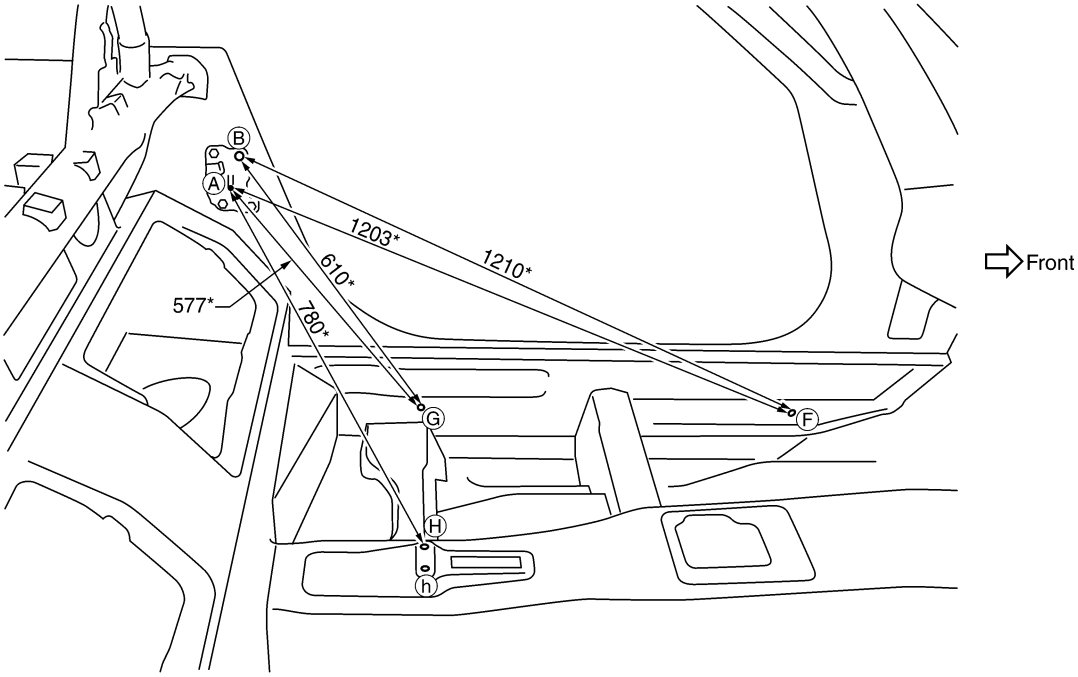
SIIA2444E

SOFT TOP MOUNTING BRACKET (ROADSTER)

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.



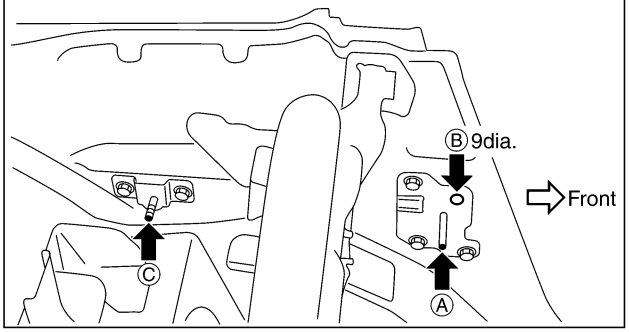


Point	Dimension
Ⓐ~ⓐ	1,344

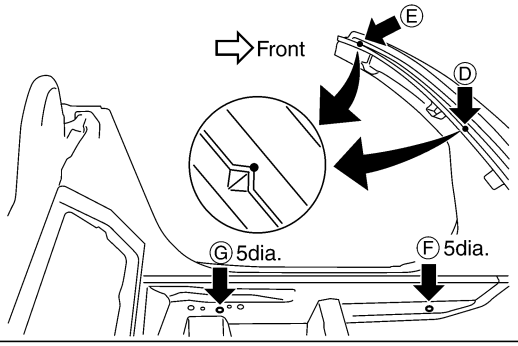
SIIA2325E

Measurement Points

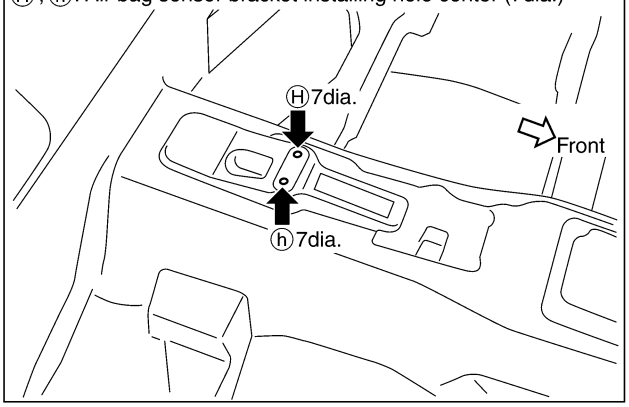
Ⓐ, ⓐ: Soft top unit installing pin top
Ⓑ, ⓑ: Soft top unit installing hole center (9dia.)
Ⓒ, ⓒ: Soft top unit installing bolt top



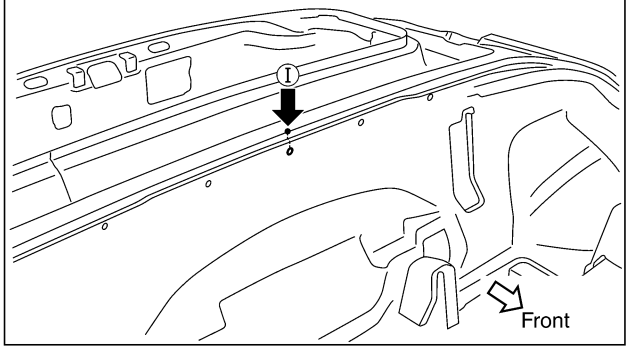
Ⓓ: Outer front roof rail embossment of center positioning mark
Ⓔ, ⓔ: Outer front roof rail embossment
Ⓕ, ⓕ, Ⓖ, ⓖ: Inner sill hole center (5dia.)



Ⓗ, ⓗ: Air bag sensor bracket installing hole center (7dia.)



Ⓘ: Rear waist & parcel shelf panel flange end of center positioning mark



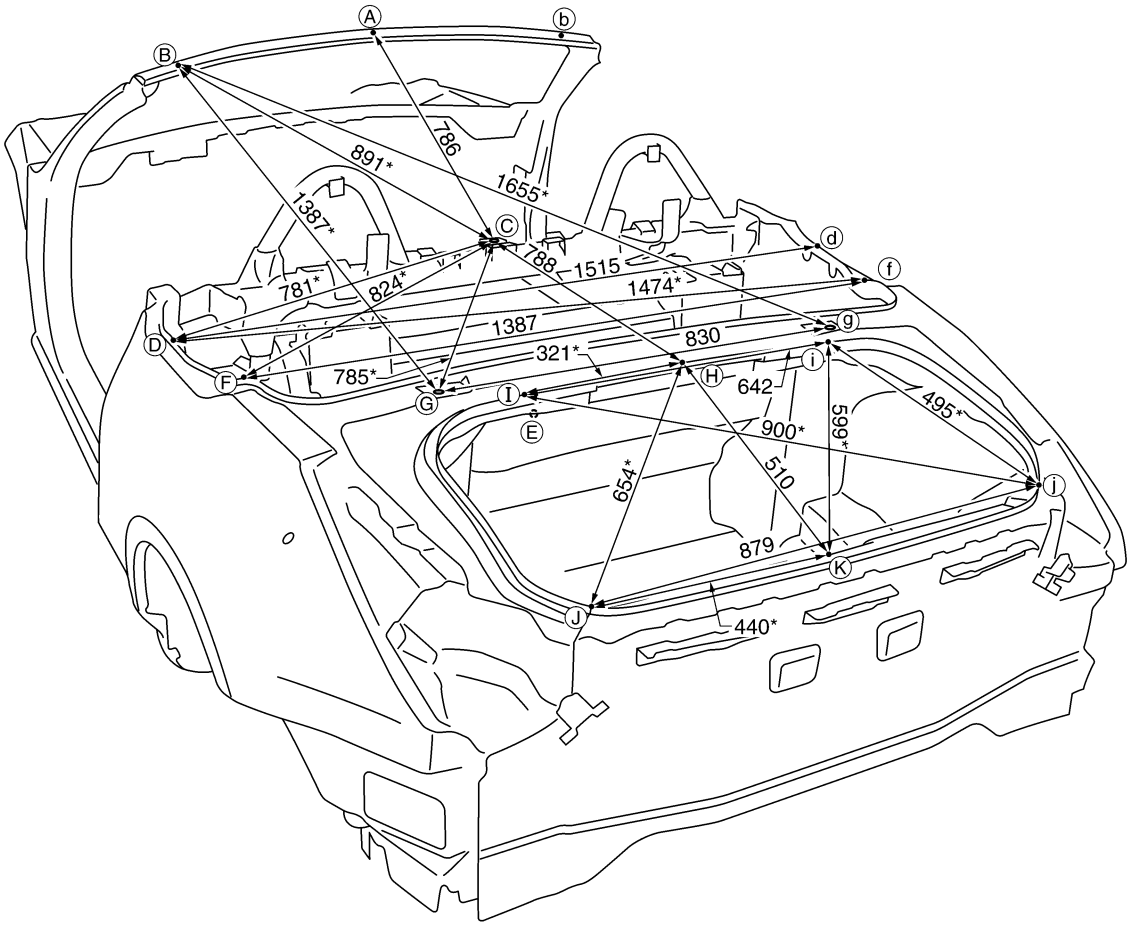
SIIA2445E

REAR BODY (ROADSTER)

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

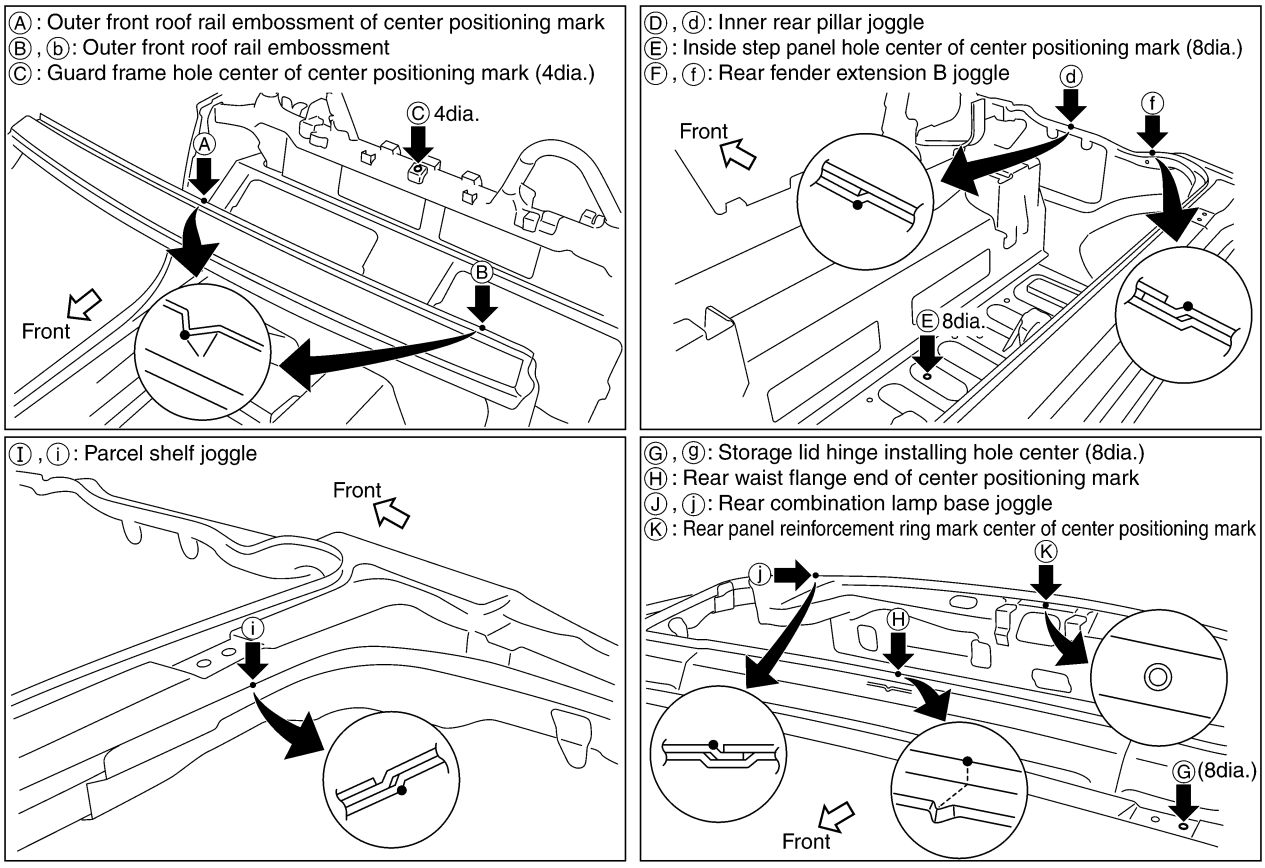
Unit : mm



Point	Dimension
Ⓔ~Ⓓ	821*
Ⓔ~Ⓕ	767*
Ⓔ~Ⓖ	622*
Ⓔ~Ⓗ	580

SIIA2310E

Measurement Points



SIIA2446E

Handling Precautions For Plastics (Coupe)

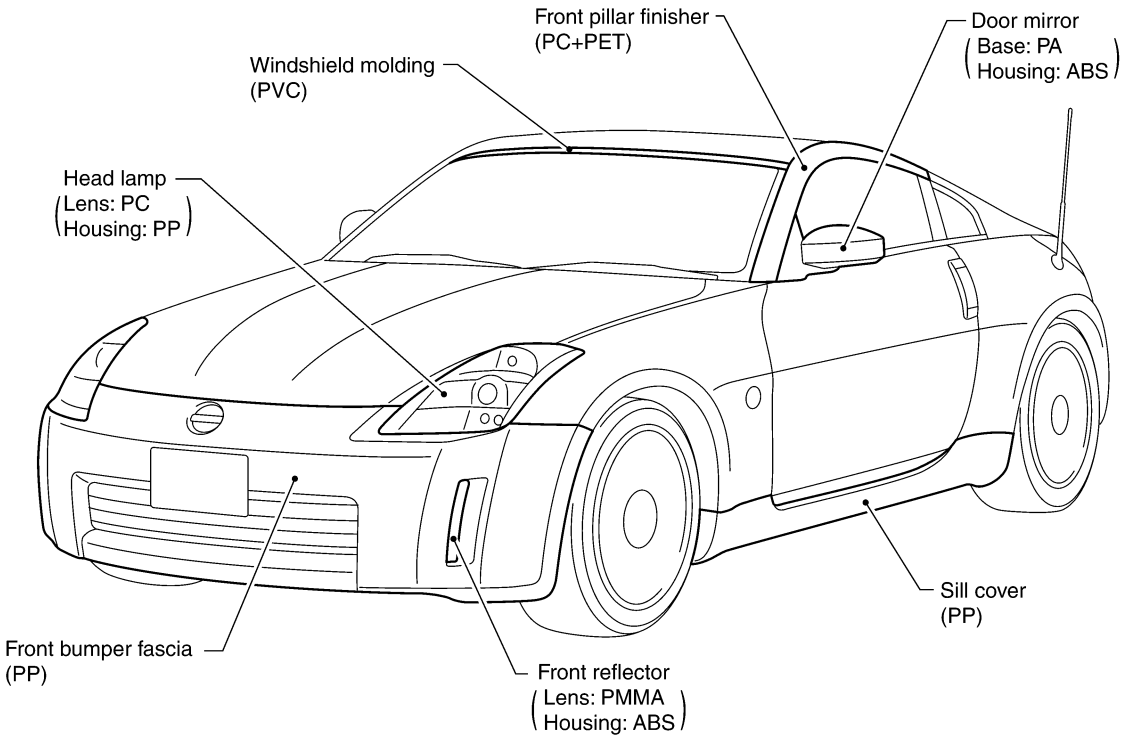
NIS00044

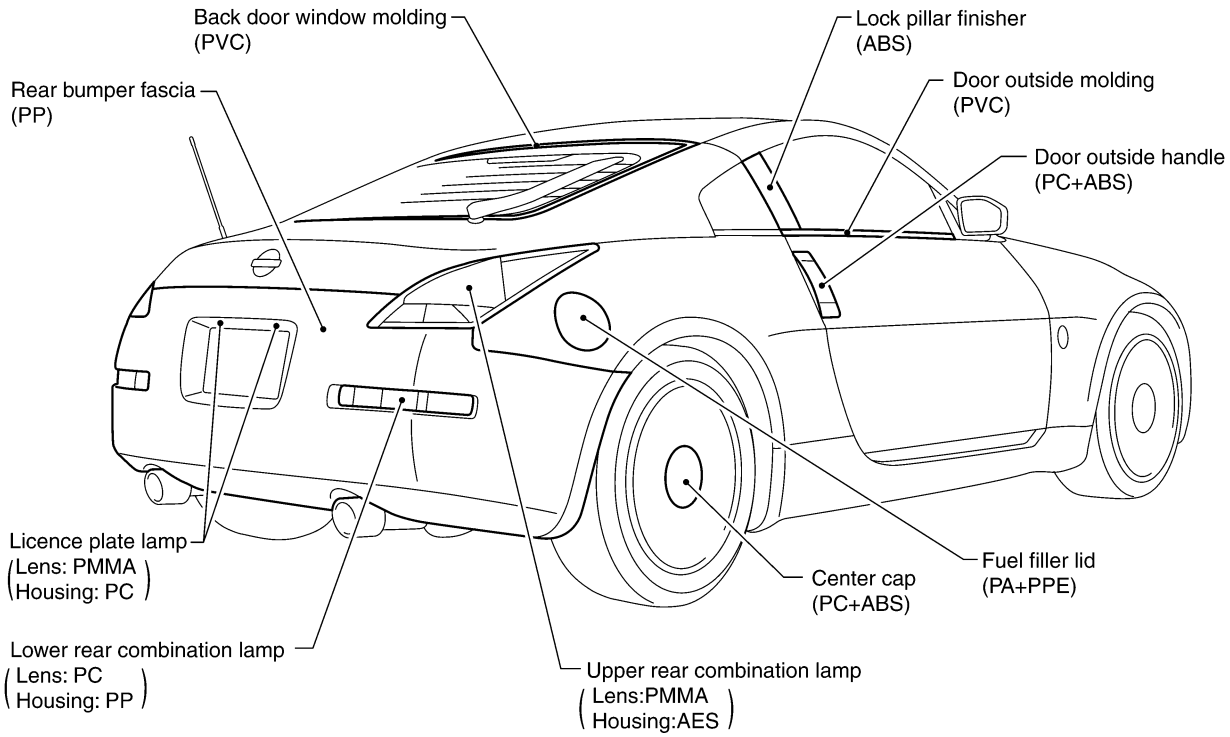
HANDLING PRECAUTIONS FOR PLASTICS

Abbre-viation	Material name	Heat resisting temperature °C(°F)	Resistance to gasoline and solvents	Other cautions
PE	Polyethylene	60(140)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PVC	Poly Vinyl Chloride	80(176)	Same as above.	Poison gas is emitted when burned.
EPM/ EPDM	Ethylene Propylene (Diene) copolymer	80(176)	Same as above.	Flammable
PP	Polypropylene	90(194)	Same as above.	Flammable, avoid battery acid.
UP	Unsaturated Polyester	90(194)	Same as above.	Flammable
PS	Polystyrene	80(176)	Avoid solvents.	Flammable
ABS	Acrylonitrile Butadiene Styrene	80(176)	Avoid gasoline and solvents.	
AES	Acrylonitrile Ethylene Styrene	80(176)	Same as above.	
PMMA	Poly Methyl Methacrylate	85(185)	Same as above.	
EVAC	Ethylene Vinyl Acetate	90(194)	Same as above.	
ASA	Acrylonitrile Styrene Acrylate	100(222)	Same as above.	Flammable
PPE	Poly Phenylene Ether	110(230)	Same as above.	
PC	Polycarbonate	120(248)	Same as above.	
PAR	Polyarylate	180(356)	Same as above.	
PUR	Polyurethane	90(194)	Same as above.	
POM	Poly Oxymethylene	120(248)	Same as above.	Avoid battery acid.
PBT+ PC	Poly Butylene Terephthalate + Polycarbonate	120(248)	Same as above.	Flammable
PA	Polyamide	140(284)	Same as above.	Avoid immersing in water.
PBT	Poly Butylene Terephthalate	140(284)	Same as above.	
PET	Polyester	180(356)	Same as above.	
PEI	Polyetherimide	200(392)	Same as above.	

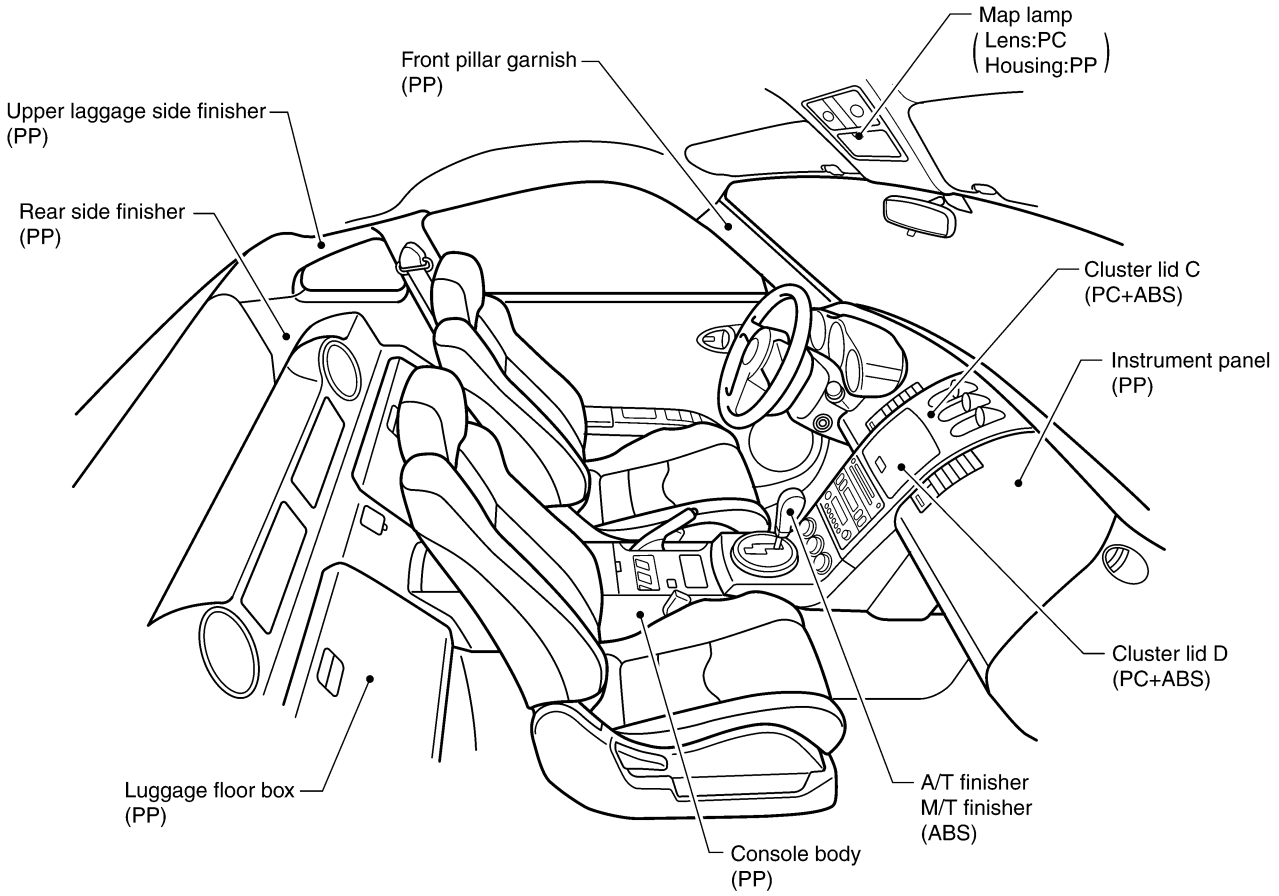
1. When repairing and painting a portion of the body adjacent to plastic parts, consider their characteristics (influence of heat and solvent) and remove them if necessary or take suitable measures to protect them.
2. Plastic parts should be repaired and painted using methods suiting the materials' characteristics.

LOCATION OF PLASTIC PARTS (COUPE)





SIIA2360E


Map lamp
Lens:PC
Housing:PP
Front pillar garnish
(PP)
Upper laggage side finisher
(PP)
Rear side finisher
(PP)
Cluster lid C
(PC+ABS)
Instrument panel
(PP)
Cluster lid D
(PC+ABS)
A/T finisher
M/T finisher
(ABS)
Luggage floor box
(PP)
Console body
(PP)

SIIA1983E

Handling Precautions For Plastics (Roadster)

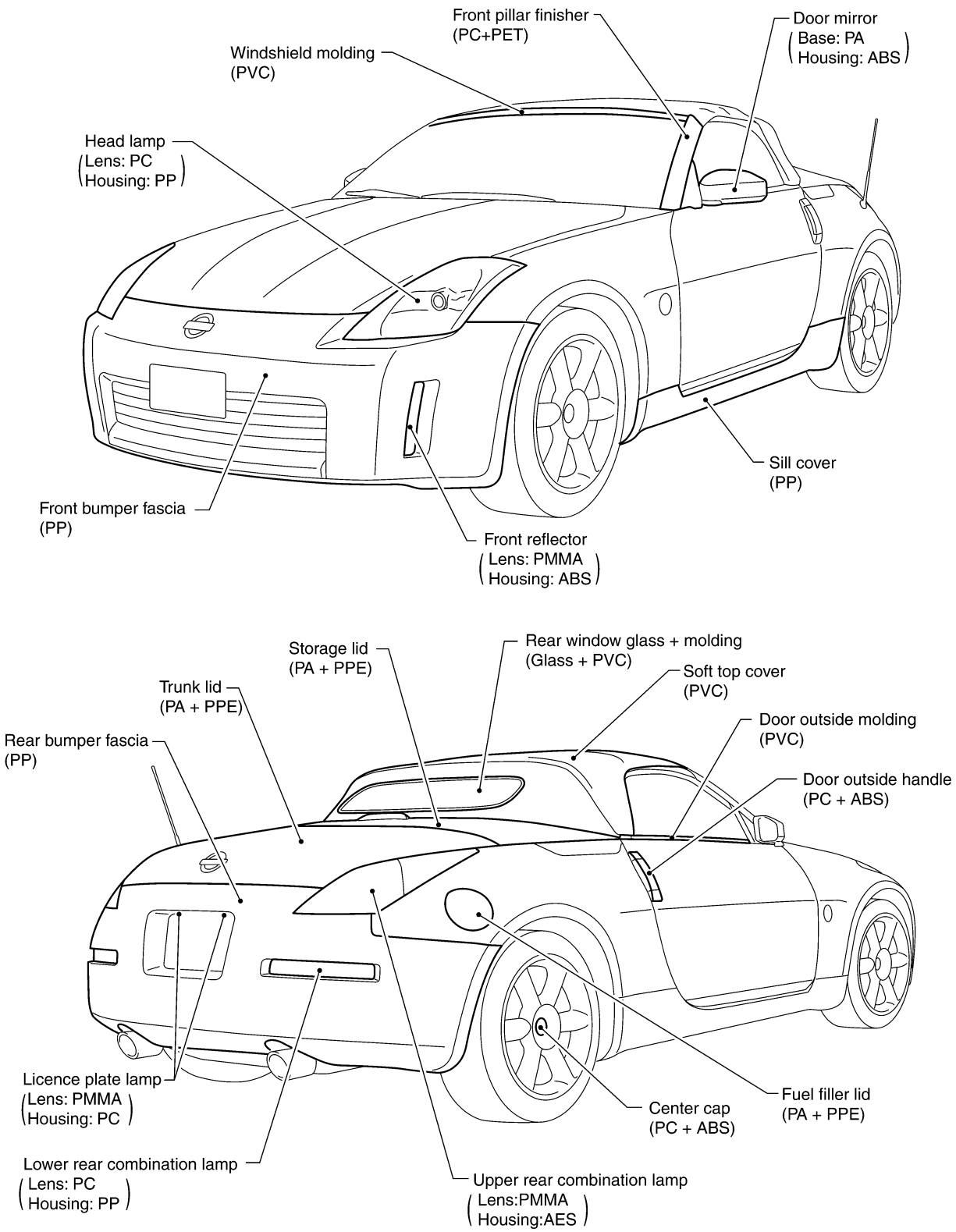
NIS00045

HANDLING PRECAUTIONS FOR PLASTICS

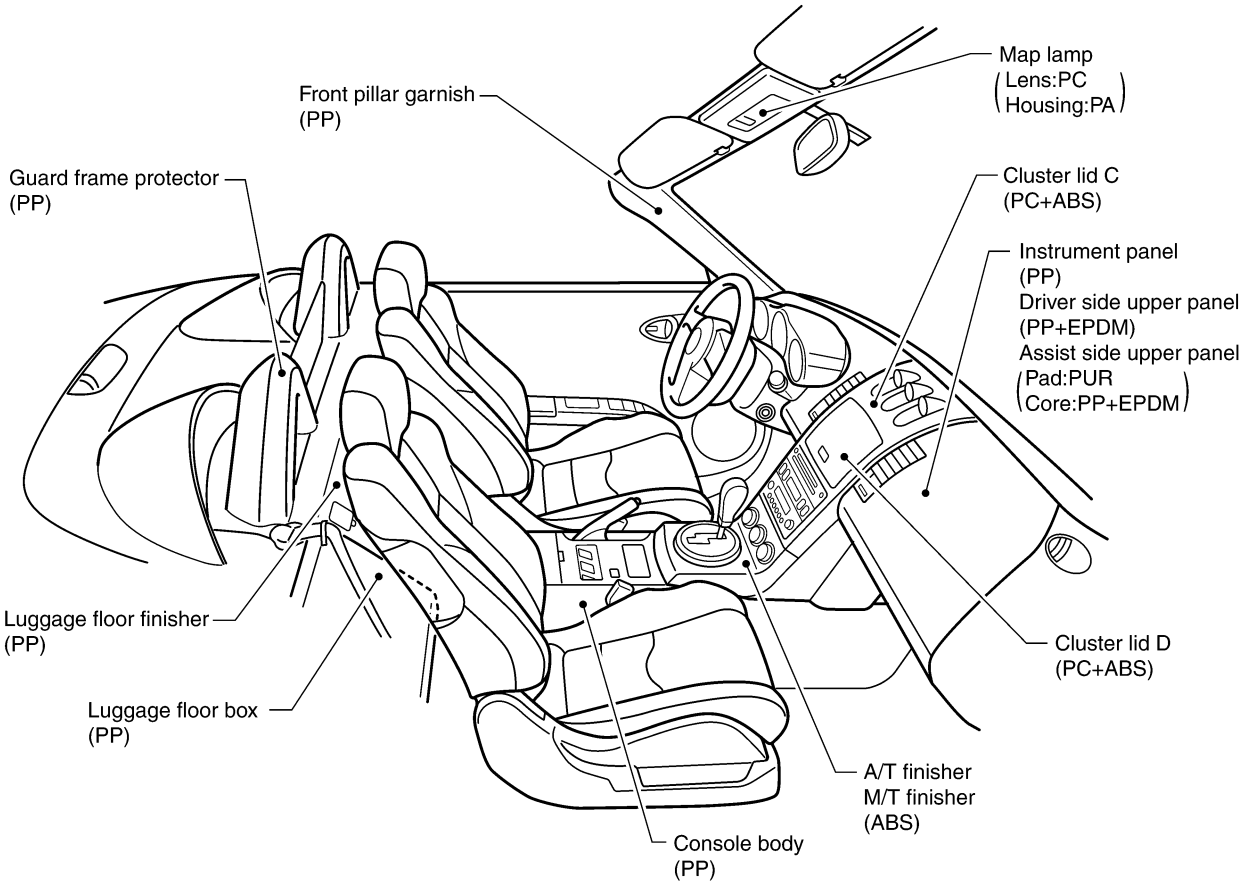
Abbre-viation	Material name	Heat resisting temperature °C(°F)	Resistance to gasoline and solvents	Other cautions
PE	Polyethylene	60(140)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PVC	Poly Vinyl Chloride	80(176)	Same as above.	Poison gas is emitted when burned.
EPM/ EPDM	Ethylene Propylene (Diene) copolymer	80(176)	Same as above.	Flammable
PP	Polypropylene	90(194)	Same as above.	Flammable, avoid battery acid.
UP	Unsaturated Polyester	90(194)	Same as above.	Flammable
PS	Polystyrene	80(176)	Avoid solvents.	Flammable
ABS	Acrylonitrile Butadiene Styrene	80(176)	Avoid gasoline and solvents.	
AES	Acrylonitrile Ethylene Styrene	80(176)	Same as above.	
PMMA	Poly Methyl Methacrylate	85(185)	Same as above.	
EVAC	Ethylene Vinyl Acetate	90(194)	Same as above.	
ASA	Acrylonitrile Styrene Acrylate	100(222)	Same as above.	Flammable
PPE	Poly Phenylene Ether	110(230)	Same as above.	
PC	Polycarbonate	120(248)	Same as above.	
PAR	Polyarylate	180(356)	Same as above.	
PUR	Polyurethane	90(194)	Same as above.	
POM	Poly Oxymethylene	120(248)	Same as above.	Avoid battery acid.
PBT+ PC	Poly Butylene Terephthalate + Polycarbonate	120(248)	Same as above.	Flammable
PA	Polyamide	140(284)	Same as above.	Avoid immersing in water.
PBT	Poly Butylene Terephthalate	140(284)	Same as above.	
PET	Polyester	180(356)	Same as above.	
PEI	Polyetherimide	200(392)	Same as above.	

1. When repairing and painting a portion of the body adjacent to plastic parts, consider their characteristics (influence of heat and solvent) and remove them if necessary or take suitable measures to protect them.
2. Plastic parts should be repaired and painted using methods suiting the materials' characteristics.

LOCATION OF PLASTIC PARTS (ROADSTER)



SIIA2361E


Map lamp
(Lens:PC
Housing:PA)
Front pillar garnish
(PP)
Guard frame protector
(PP)
Cluster lid C
(PC+ABS)
Instrument panel
(PP)
Driver side upper panel
(PP+EPDM)
Assist side upper panel
(Pad:PUR
Core:PP+EPDM)
Luggage floor finisher
(PP)
Cluster lid D
(PC+ABS)
Luggage floor box
(PP)
A/T finisher
M/T finisher
(ABS)
Console body
(PP)
SIIA2447E

Precautions In Repairing High Strength Steel

NIS00046

High strength steel is used for body panels in order to reduce vehicle weight.
Accordingly, precautions in repairing automotive bodies made of high strength steel are described below:

HIGH STRENGTH STEEL (HSS) USED IN NISSAN VEHICLES

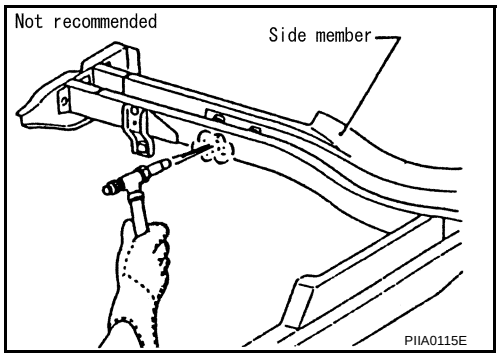
Tensile strength	Nissan/Infiniti designation	Major applicable parts
373 N/mm^2 (38kg/mm^2 ,54klb/sq in)	SP130	● Front & rear side member assembly ● Hoodledge assembly ● Upper dash ● Body side ● Other reinforcements
785-981 N/mm^2 (80-100kg/mm^2 ,114-142klb/sq in)	SP150	● Front door guard beam

SP130 is the most commonly used HSS.

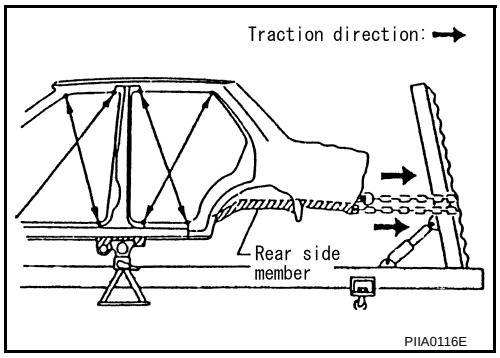
Read the following precautions when repairing HSS:

1. Additional points to consider

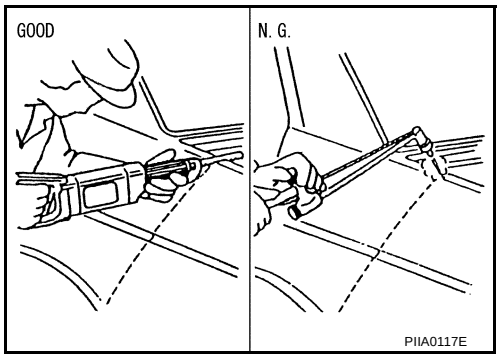
- The repair of reinforcements (such as side members) by heating is not recommended since it may weaken the component. When heating is unavoidable, do not heat HSS parts above 550°C (1,022°F).
  Verify heating temperature with a thermometer.
  (Crayon-type and other similar type thermometer are appropriate.)



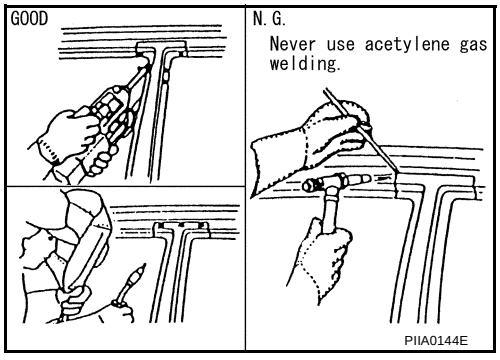
- When straightening body panels, use caution in pulling any HSS panel. Because HSS is very strong, pulling may cause deformation in adjacent portions of the body. In this case, increase the number of measuring points, and carefully pull the HSS panel.



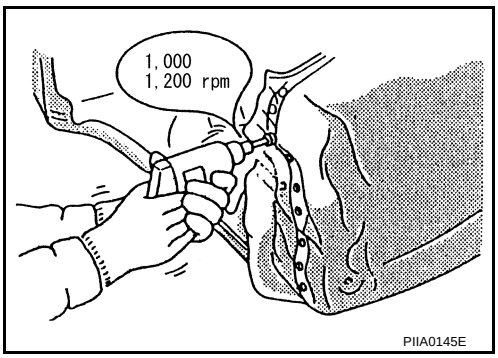
- When cutting HSS panels, avoid gas (torch) cutting if possible. Instead, use a saw to avoid weakening surrounding areas due to heat. If gas (torch) cutting is unavoidable, allow a minimum margin of 50 mm (1.97in).



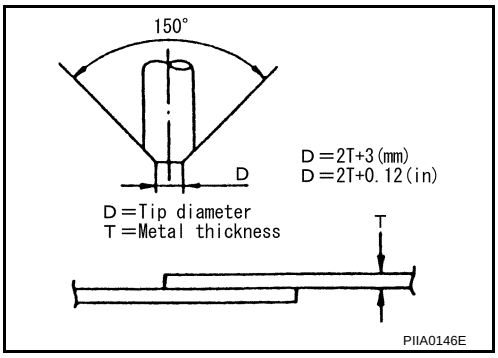
- When welding HSS panels, use spot welding whenever possible in order to minimize weakening surrounding areas due to heat.
  If spot welding is impossible, use M.I.G. welding. Do not use gas (torch) welding because it is inferior in welding strength.



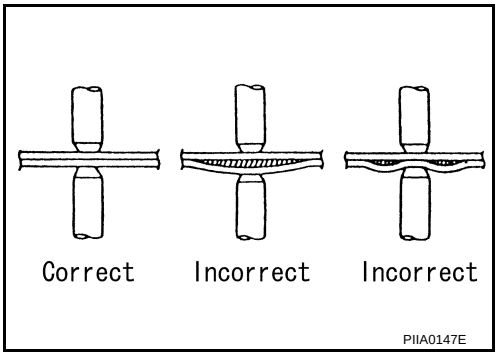
- The spot weld on HSS panels is harder than that of an ordinary steel panel.
  Therefore, when cutting spot welds on a HSS panel, use a low speed high torque drill (1,000 to 1,200 rpm) to increase drill bit durability and facilitate the operation.



2. Precautions in spot welding HSS
   This work should be performed under standard working conditions. Always note the following when spot welding HSS:
   - The electrode tip diameter must be sized properly according to the metal thickness.



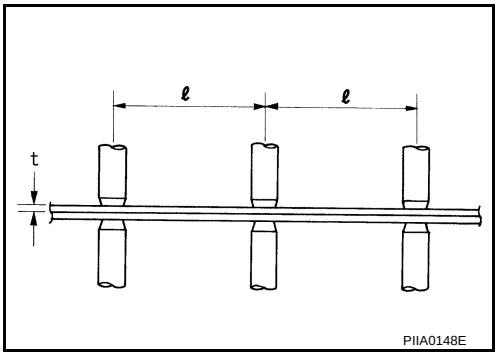
   - The panel surfaces must fit flush to each other, leaving no gaps.



   - Follow the specifications for the proper welding pitch.

Unit:mm

Thickness (t)	Minimum pitch (l)
0.6 (0.024)	10 (0.39) or over
0.8 (0.031)	12 (0.47) or over
1.0 (0.039)	18 (0.71) or over
1.2 (0.047)	20 (0.79) or over
1.6 (0.063)	27 (1.06) or over
1.8 (0.071)	31 (1.22) or over



Replacement Operations (Coupe)

NIS00047

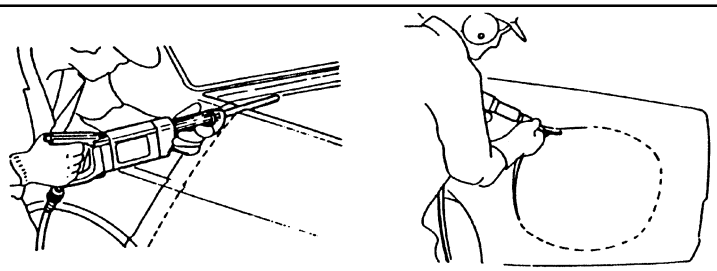
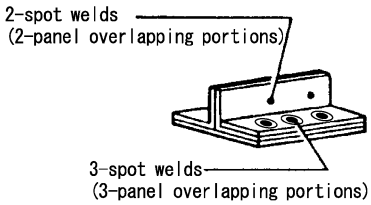
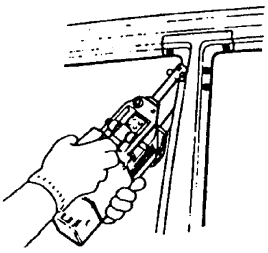
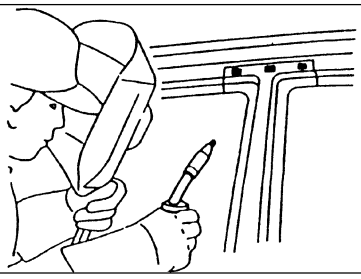
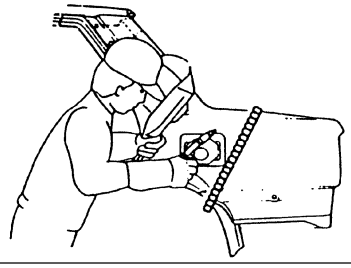
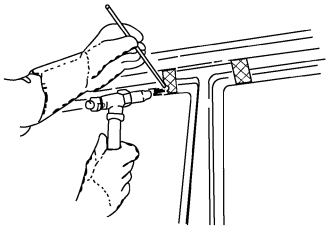
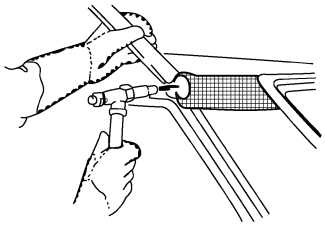
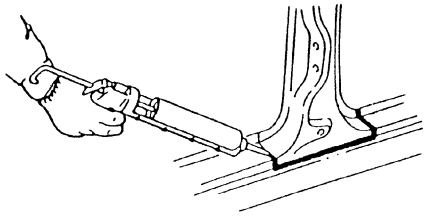
DESCRIPTION

This section is prepared for technicians who have attained a high level of skill and experience in repairing collision-damaged vehicles and also use modern service tools and equipment. Persons unfamiliar with body repair techniques should not attempt to repair collision-damaged vehicles by using this section.

Technicians are also encouraged to read Body Repair Manual (Fundamentals) in order to ensure that the original functions and quality of the vehicle can be maintained. The Body Repair Manual (Fundamentals) contains additional information, including cautions and warning, that are not including in this manual. Technicians should refer to both manuals to ensure proper repairs.

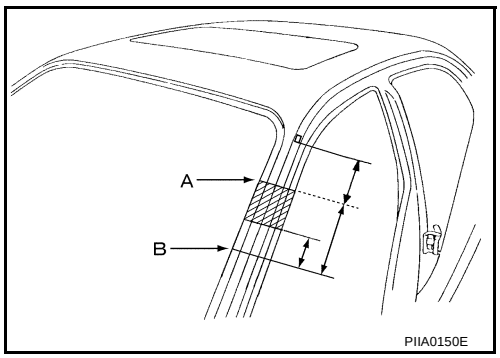
Please note that these information are prepared for worldwide usage, and as such, certain procedures might not apply in some regions or countries.

The symbols used in this section for cutting and welding / brazing operations are shown below.

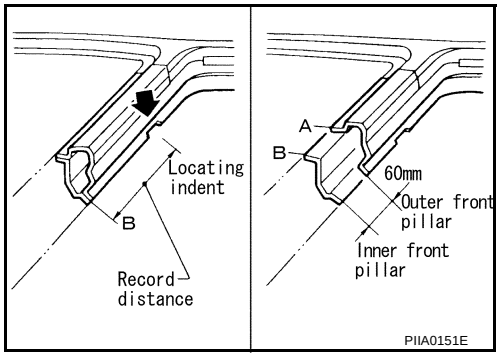
Saw cut or air chisel cut	
Spot weld 2-spot welds	 
Spot weld 3-spot welds	
MIG plug weld	 
MIG seam weld/ Point weld	
Brazing	
Soldering	
Sealing	

PIIA0149E

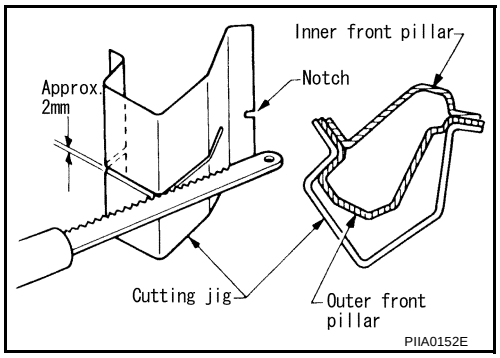
- Front pillar butt joint can be determined anywhere within shaded area as shown in the figure. The best location for the butt joint is at position A due to the construction of the vehicle. Refer to the front pillar section.



- Determine cutting position and record distance from the locating indent. Use this distance when cutting the service part. Cut outer front pillar over 60 mm above inner front pillar cut position.

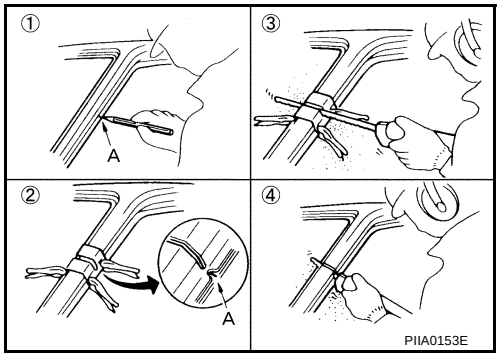


- Prepare a cutting jig to make outer pillar easier to cut. Also, this will permit service part to be accurately cut at joint position.



- An example of cutting operation using a cutting jig is as follows.

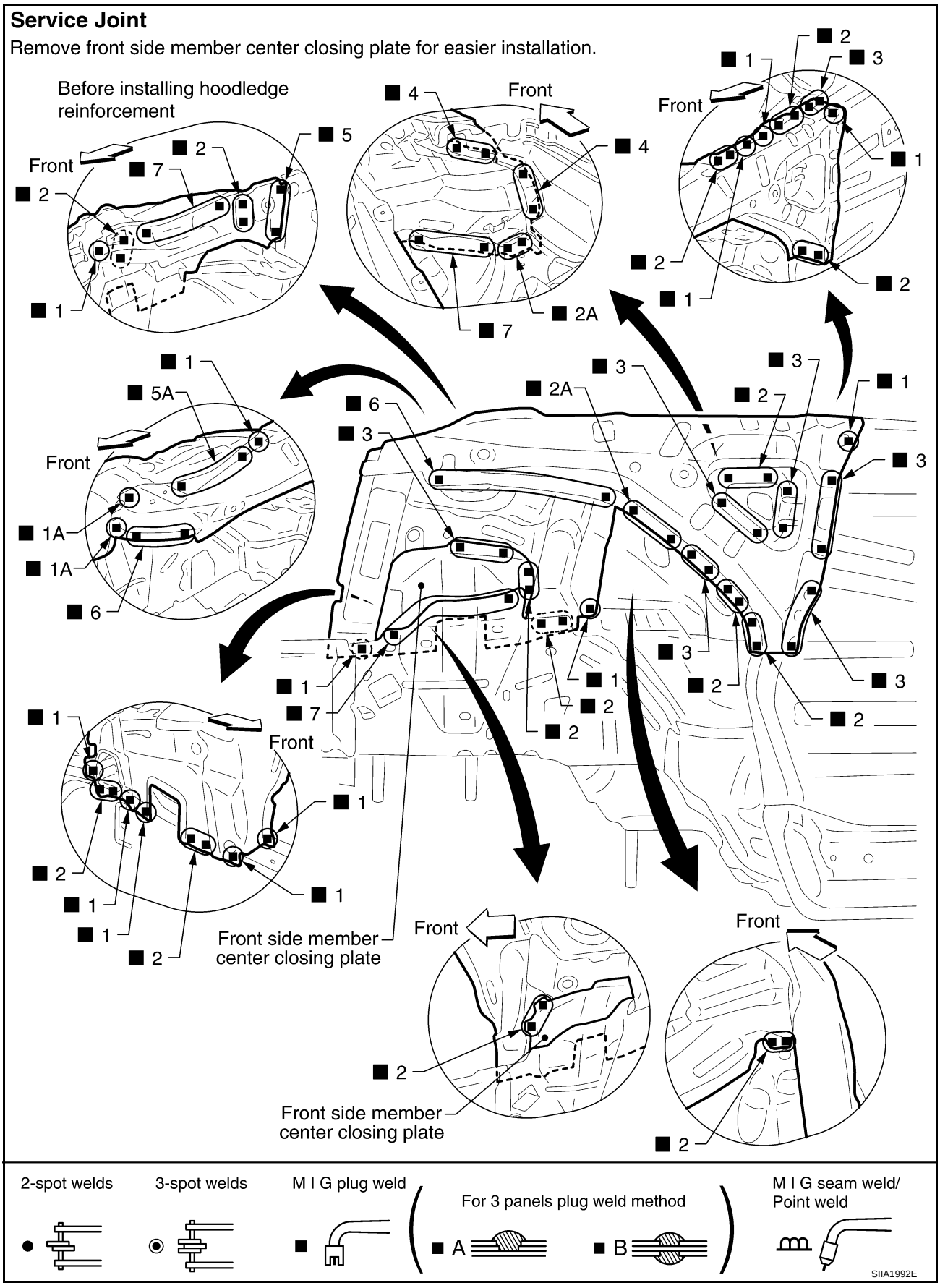
1. Mark cutting lines.
   A: Cut position of outer pillar
   B: Cut position of inner pillar
2. Align cutting line with notch on jig. Clamp jig to pillar.
3. Cut outer pillar along groove of jig. (At position A)
4. Remove jig and cut remaining portions.
5. Cut inner pillar at position B in same manner.



HOODLEDGE (COUPE)

Service Joint

Remove front side member center closing plate for easier installation.

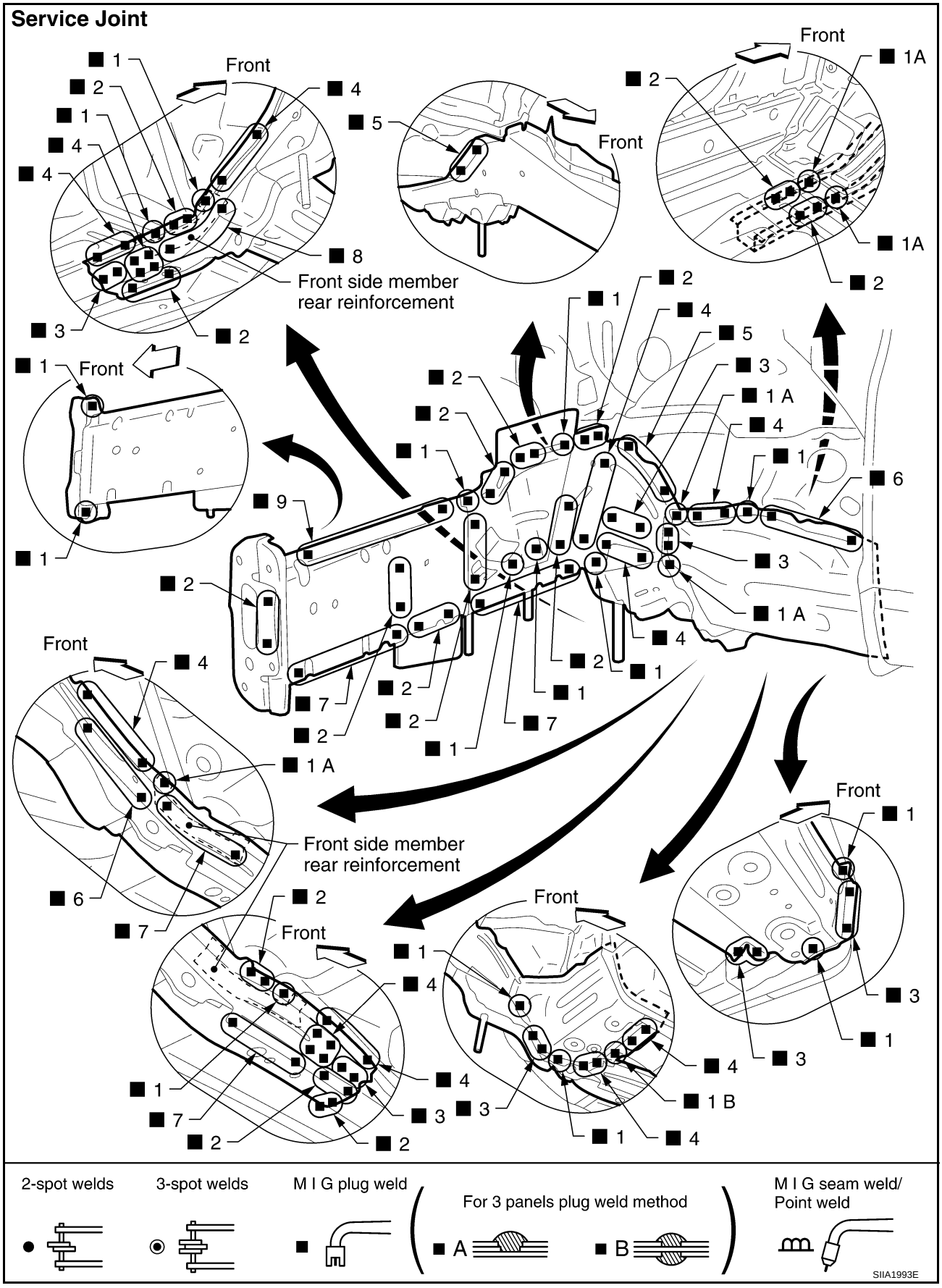


Change parts

- Front strut housing (LH)
- Upper front hoodledge (LH)
- Hoodledge reinforcement (LH)

FRONT SIDE MEMBER (COUPE)

- Work after hoodledge has been removed.



Change parts

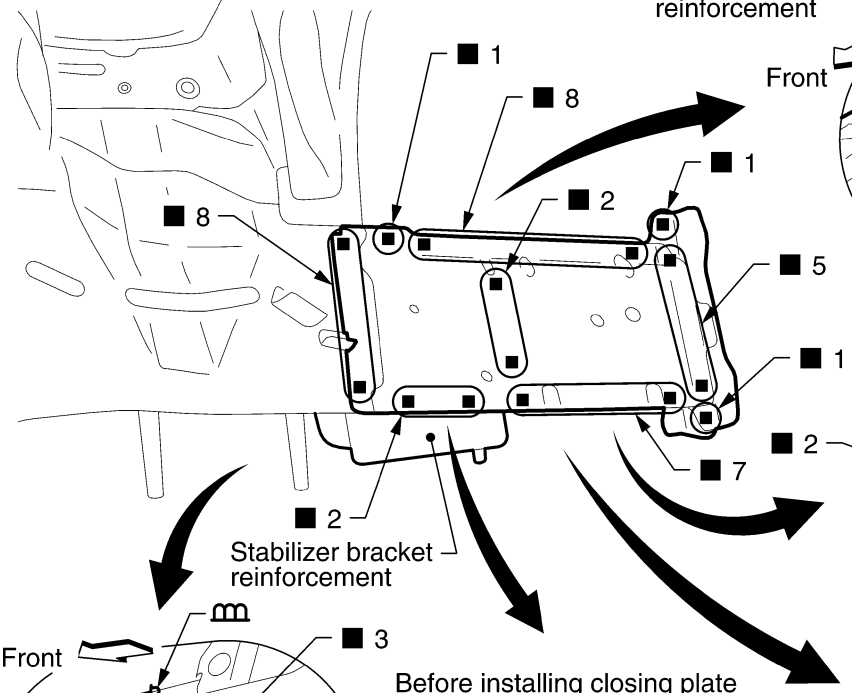
- Front side member assembly (LH)
- Front side member outrigger assembly (LH)
- Front side member closing plate assembly (LH)
- Front side member rear reinforcement (LH)

FRONT SIDE MEMBER (PARTIAL REPLACEMENT) (COUPE)

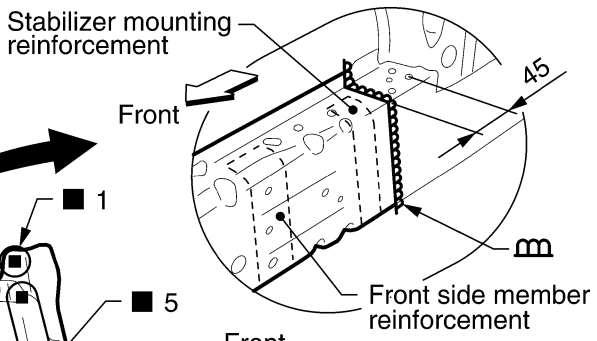
Service Joint

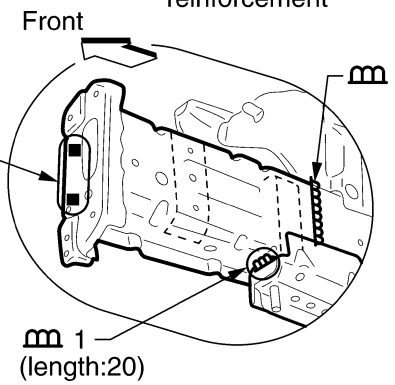
(This figure shows right front side member)

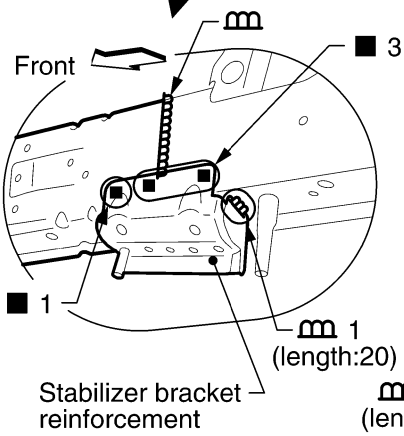
Remove stabilizer bracket reinforcement for easier installation.



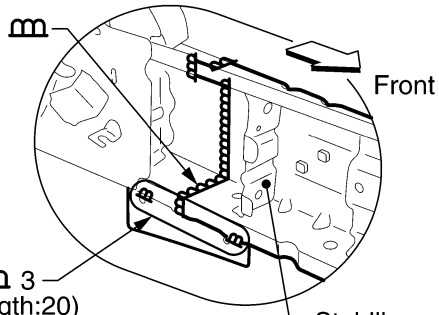
Before installing stabilizer bracket reinforcement



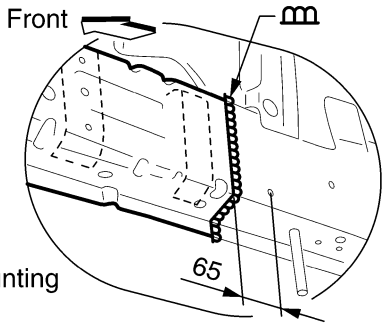




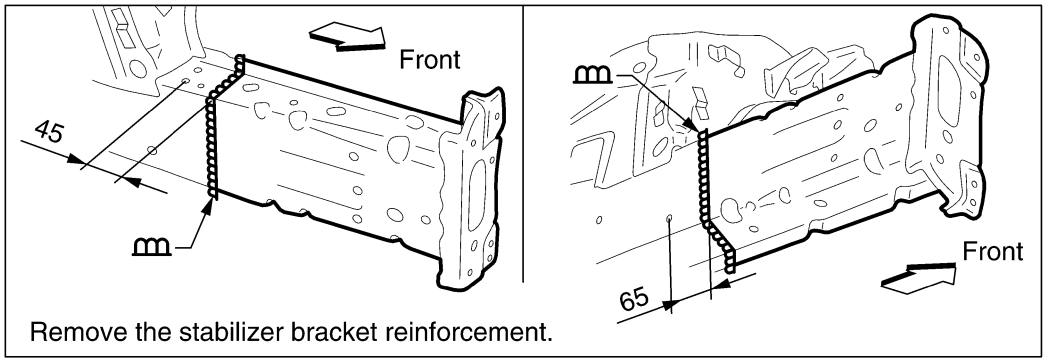
Before installing closing plate



Before installing stabilizer bracket reinforcement



・Left front side member cut portion.



Remove the stabilizer bracket reinforcement.

Unit:mm

2-spot welds ● 3-spot welds ◉ M I G plug weld ■ For 3 panels plug weld method ■ A ■ B M I G seam weld/ Point weld

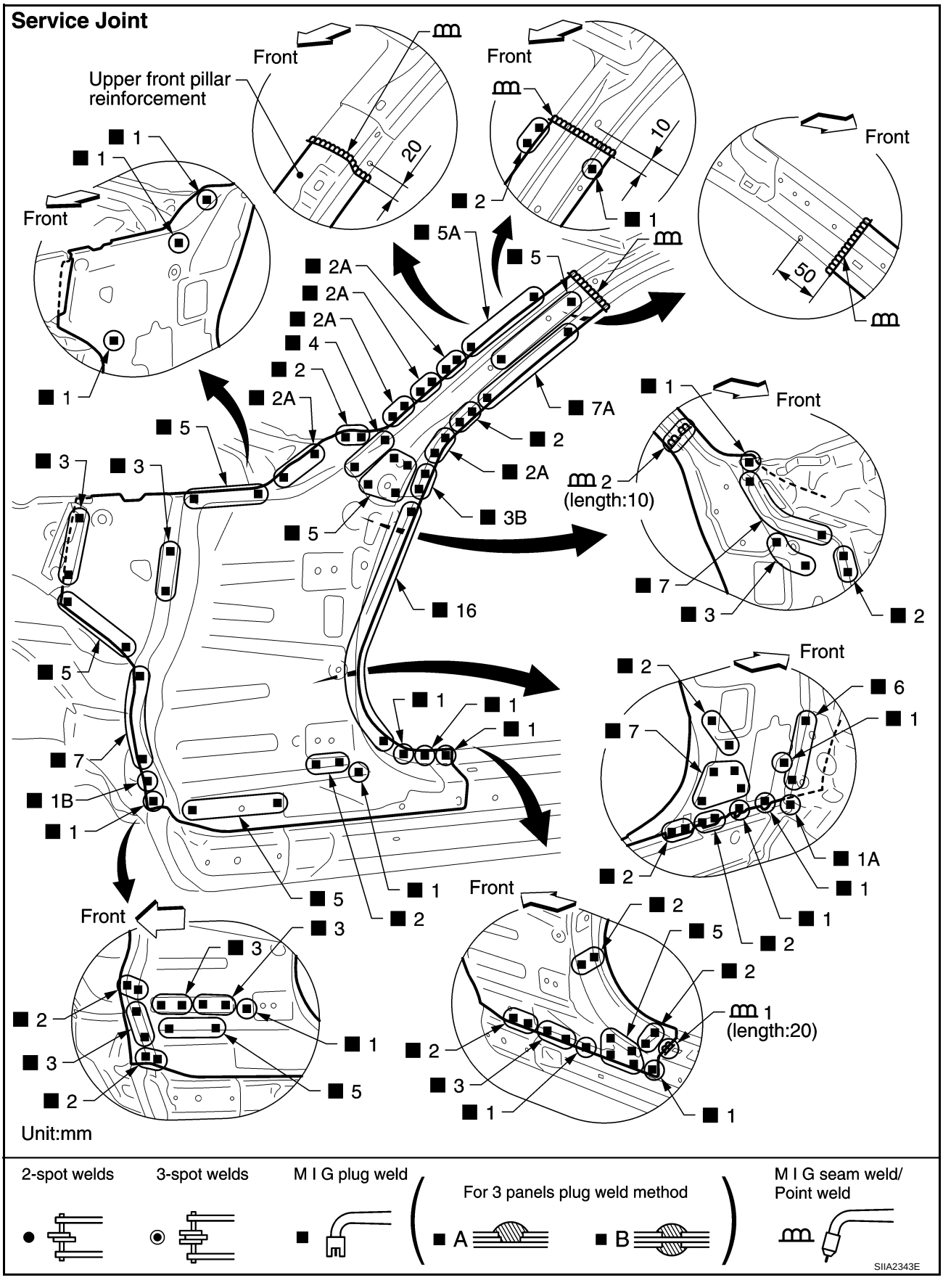
SIIA1994E

Change parts

- Front side member assembly (RH)
- Front side member front closing plate (RH)
- Outer front towing hook bracket (RH)

FRONT PILLAR (COUPE)

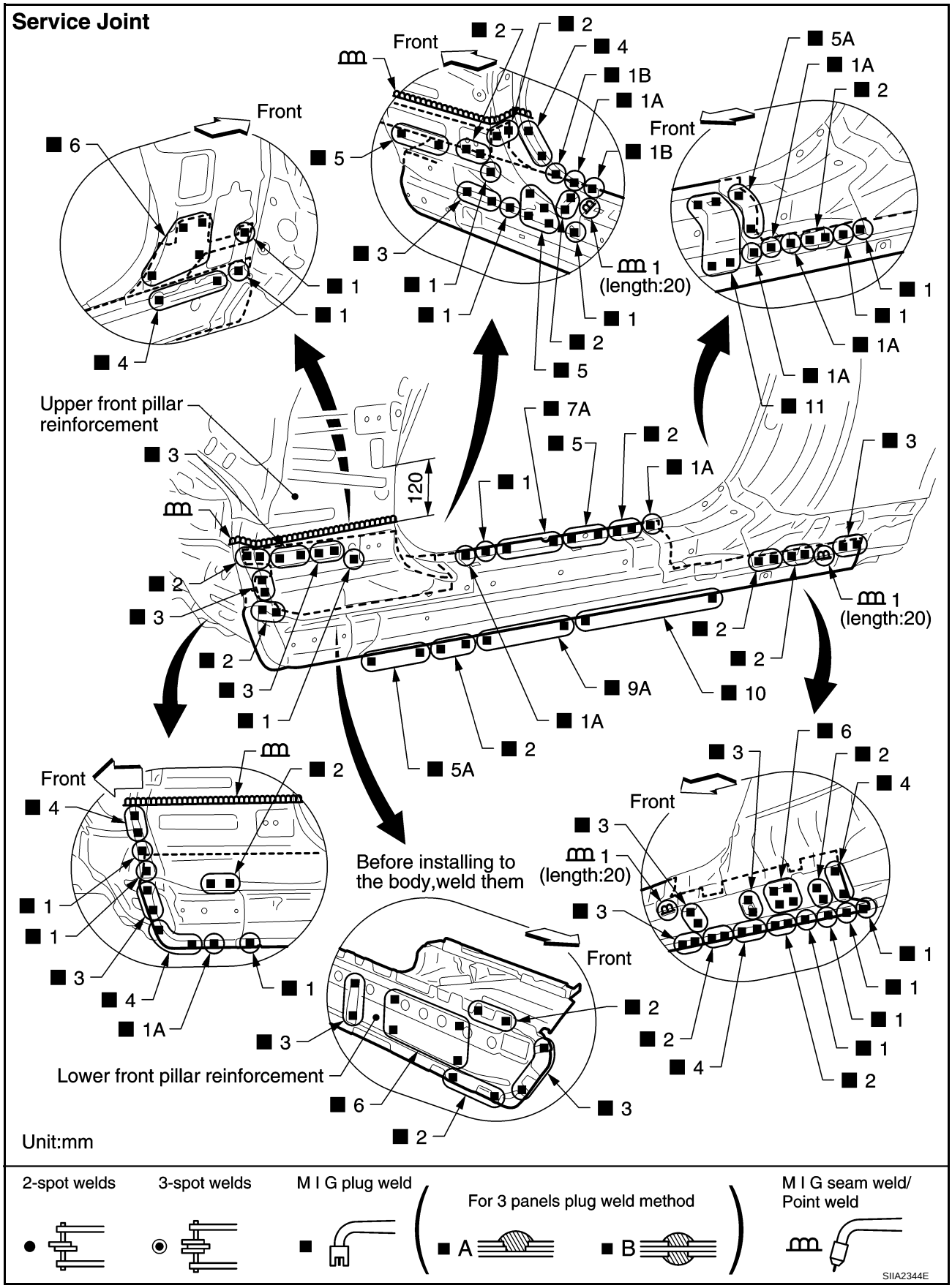
- Work after hoodledge reinforcement has been removed.



Change parts

- Front pillar reinforcement assembly (LH)
- Outer front pillar (LH)
- Inner side roof rail (LH)
- Upper rear hoodledge (LH)

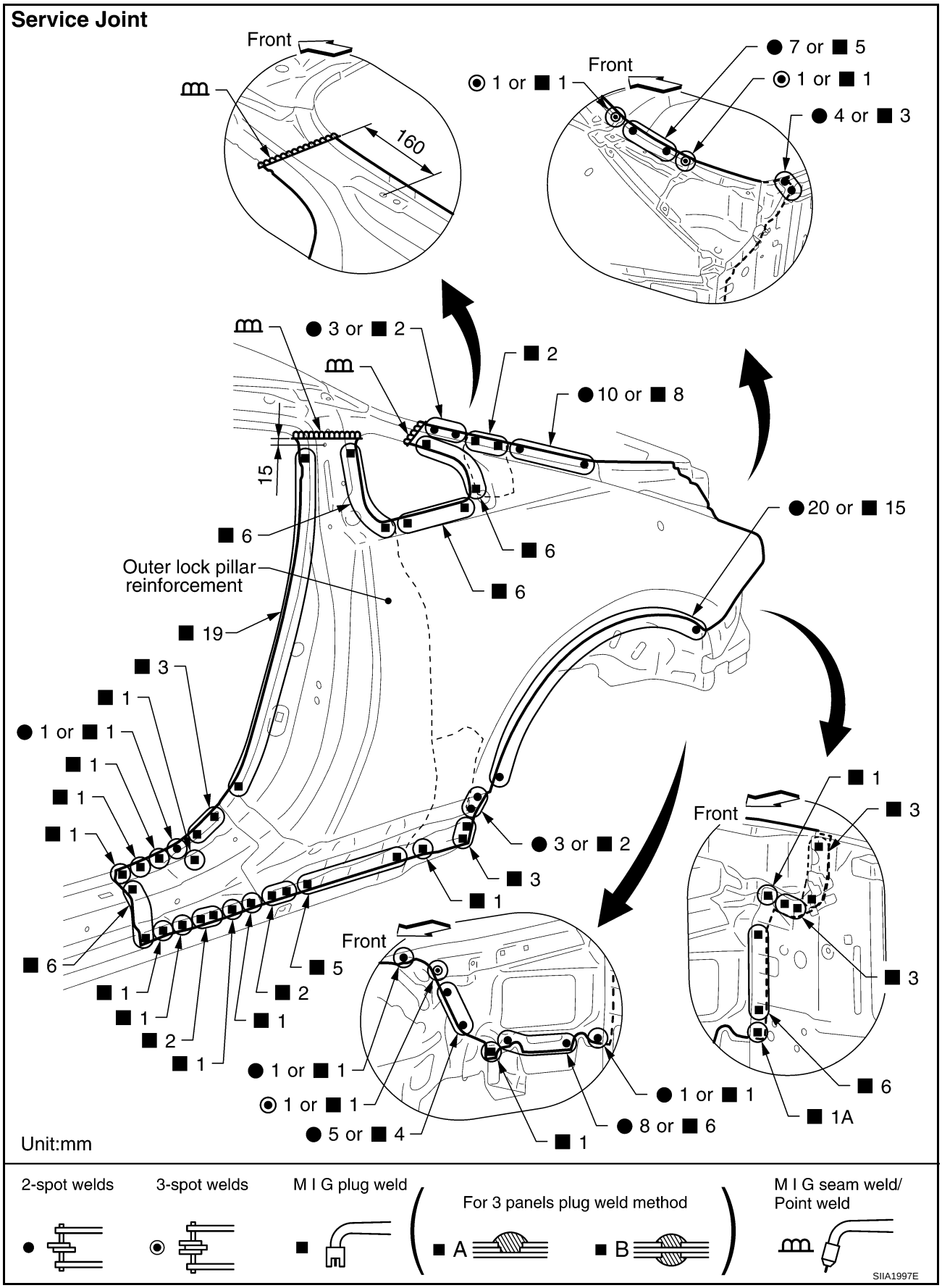
OUTER SILL (COUPE)



Change parts

- Outer sill reinforcement assembly (LH)
- Lower front pillar reinforcement (LH)

REAR FENDER (COUPE)



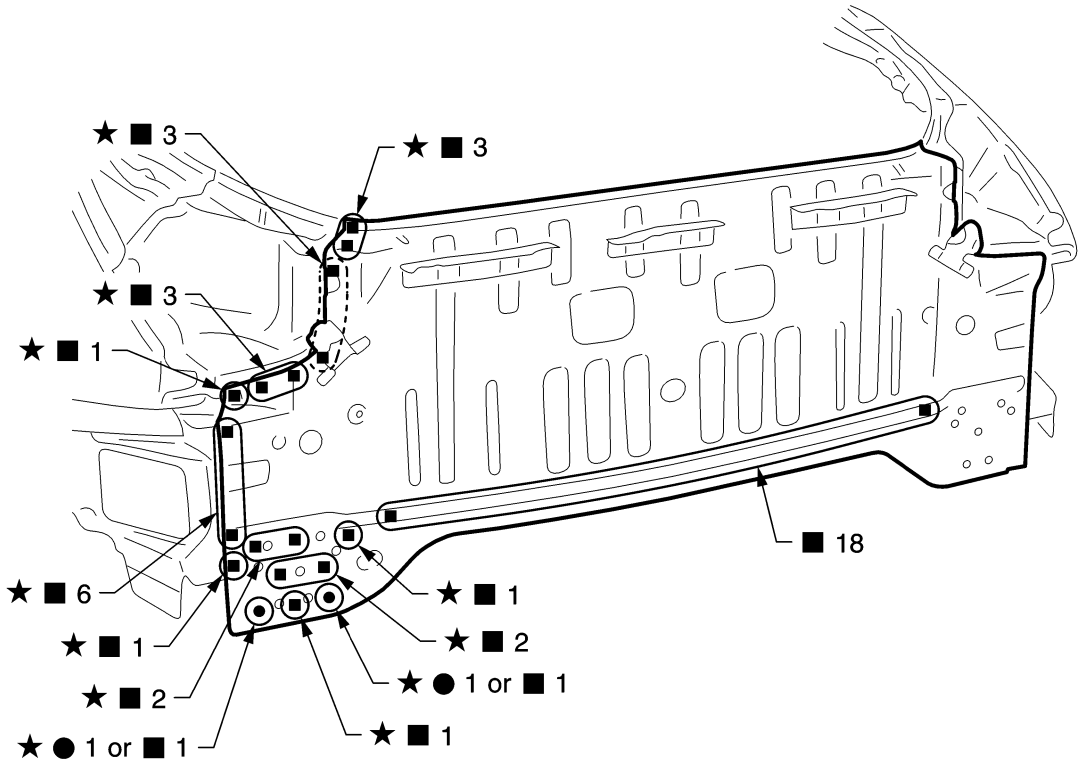
Change parts

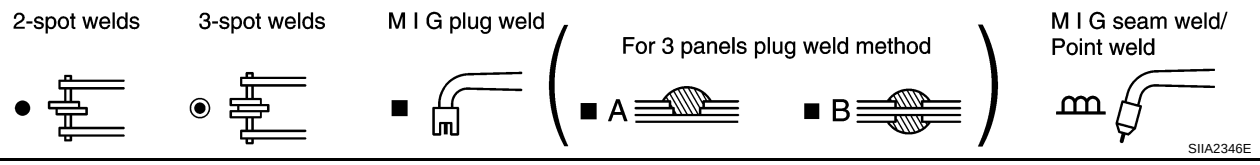
- Rear fender assembly (LH)

REAR PANEL (COUPE)

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.





Change parts

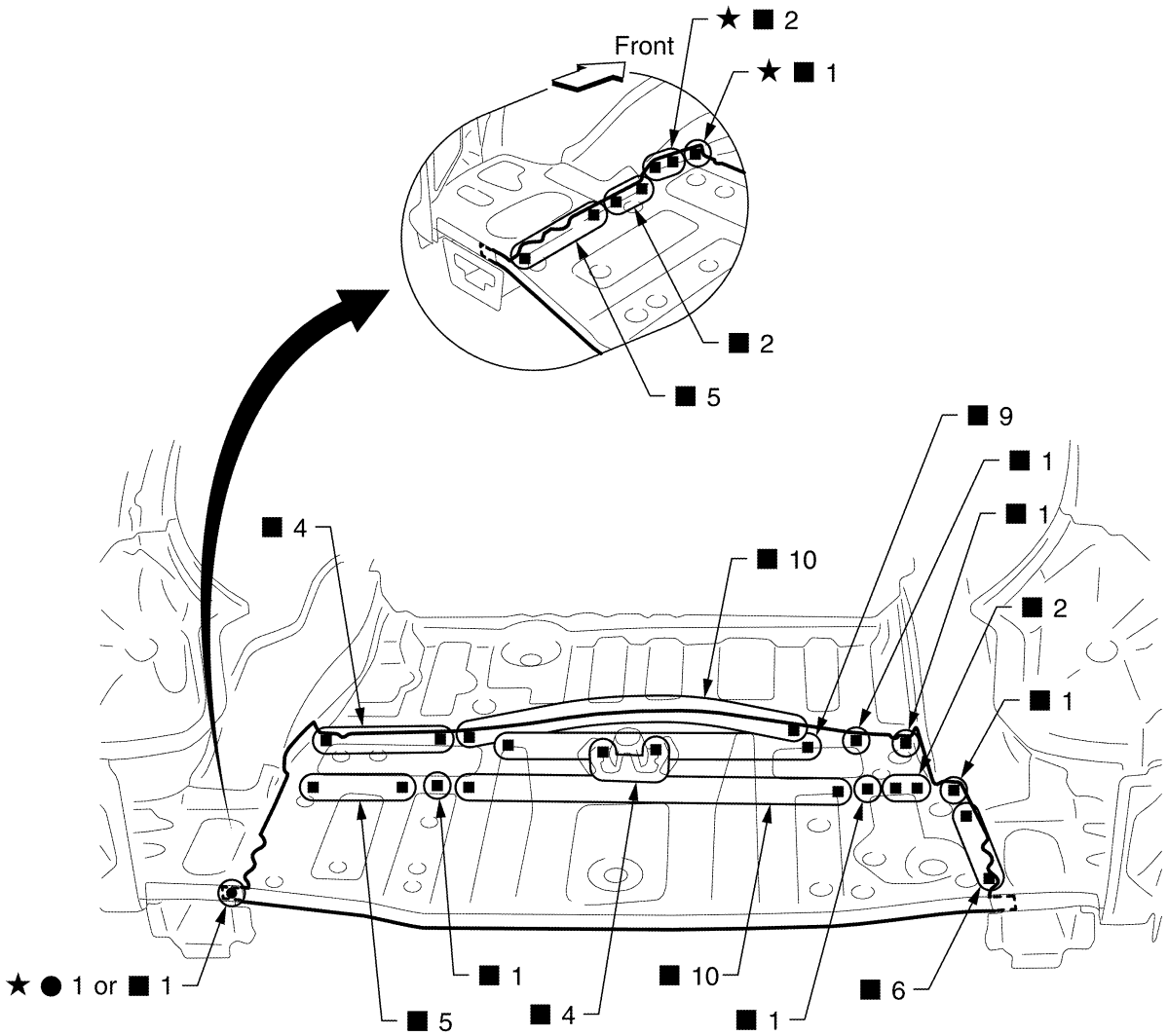
- ● Rear panel assembly

REAR FLOOR REAR (COUPE)

- Work after rear panel assembly has been removed.

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.



2-spot welds ● | 3-spot welds ◉ | M I G plug weld ■ | For 3 panels plug weld method ■ A ■ B | M I G seam weld/ Point weld

SIIA1999E

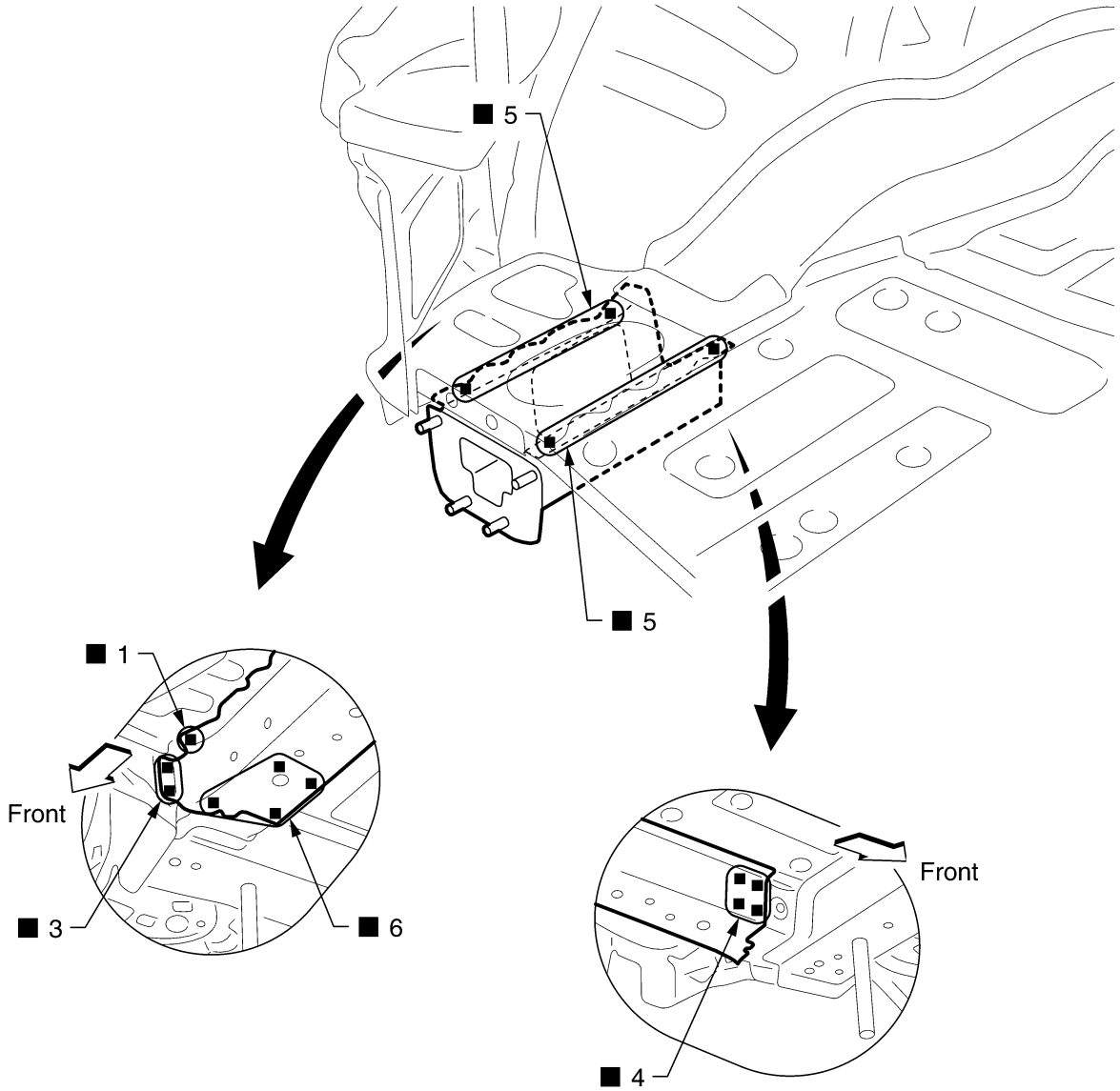
Change parts

- Rear floor rear
- Spare tire clamp bracket

REAR SIDE MEMBER EXTENSION (COUPE)

- Work after rear panel assembly has been removed.

Service Joint



2-spot welds ● 3-spot welds ◉ M I G plug weld ■ (For 3 panels plug weld method ■ A ■ B) M I G seam weld/ Point weld

SIIA2000E

Change parts

- Rear side member extension (LH)

Replacement Operations (Roadster)

NIS00048

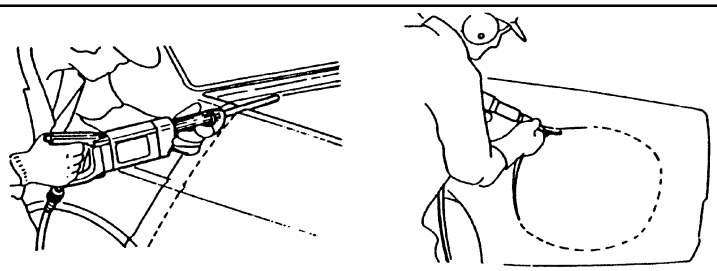
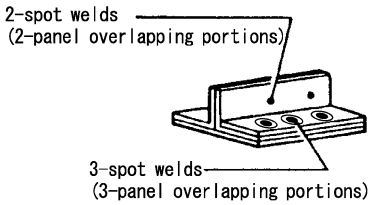
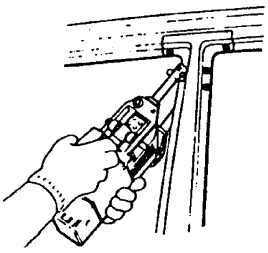
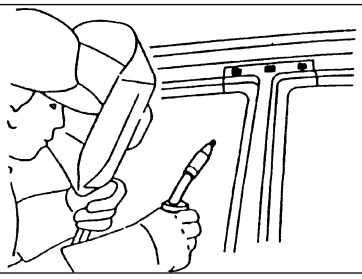
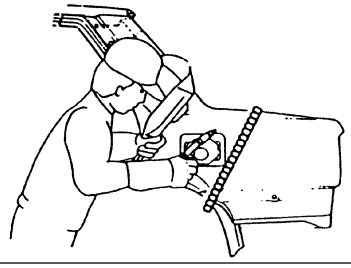
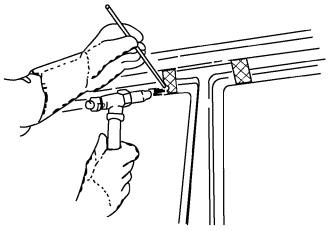
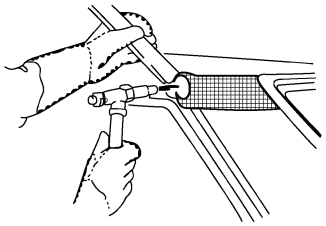
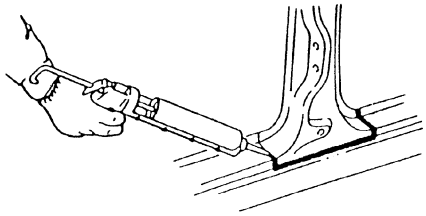
DESCRIPTION

This section is prepared for technicians who have attained a high level of skill and experience in repairing collision-damaged vehicles and also use modern service tools and equipment. Persons unfamiliar with body repair techniques should not attempt to repair collision-damaged vehicles by using this section.

Technicians are also encouraged to read Body Repair Manual (Fundamentals) in order to ensure that the original functions and quality of the vehicle can be maintained. The Body Repair Manual (Fundamentals) contains additional information, including cautions and warning, that are not including in this manual. Technicians should refer to both manuals to ensure proper repairs.

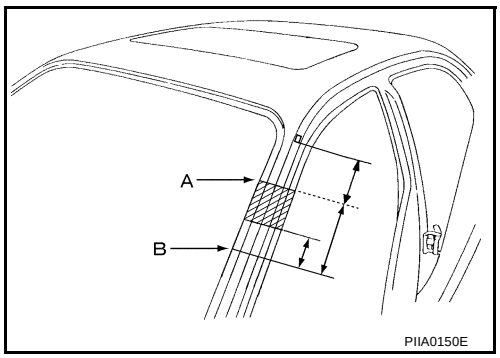
Please note that these information are prepared for worldwide usage, and as such, certain procedures might not apply in some regions or countries.

The symbols used in this section for cutting and welding / brazing operations are shown below.

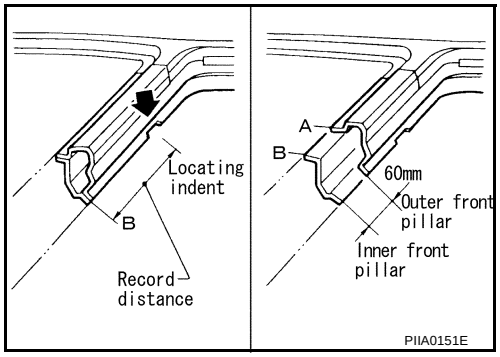
Saw cut or air chisel cut	
Spot weld 2-spot welds	 
Spot weld 3-spot welds	
MIG plug weld	 
MIG seam weld/ Point weld	
Brazing	
Soldering	
Sealing	

PIIA0149E

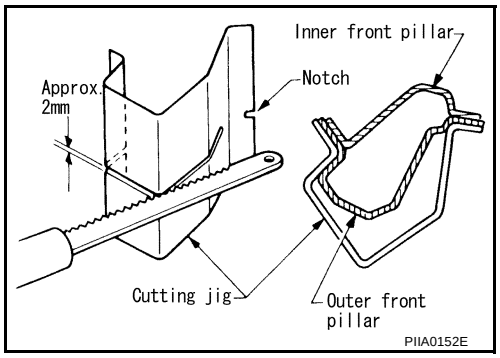
- Front pillar butt joint can be determined anywhere within shaded area as shown in the figure. The best location for the butt joint is at position A due to the construction of the vehicle. Refer to the front pillar section.



- Determine cutting position and record distance from the locating indent. Use this distance when cutting the service part. Cut outer front pillar over 60 mm above inner front pillar cut position.

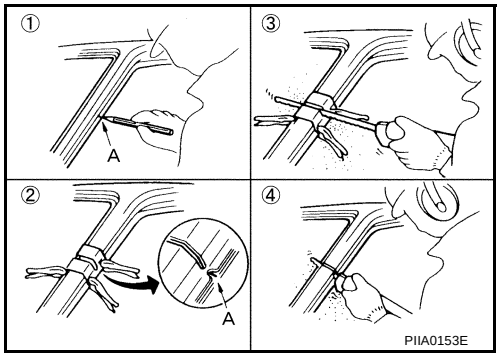


- Prepare a cutting jig to make outer pillar easier to cut. Also, this will permit service part to be accurately cut at joint position.

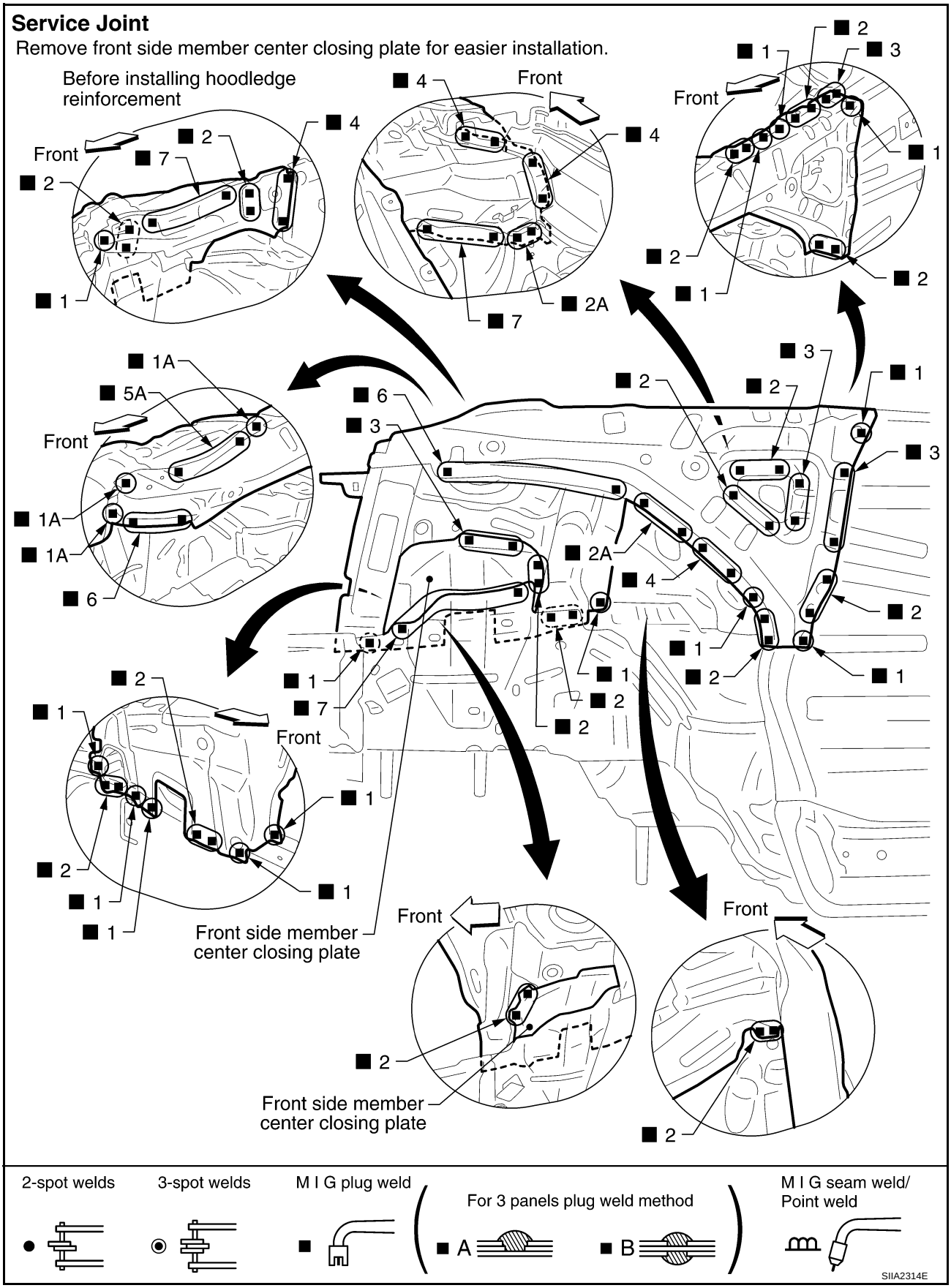


- An example of cutting operation using a cutting jig is as follows.

1. Mark cutting lines.
   A: Cut position of outer pillar
   B: Cut position of inner pillar
2. Align cutting line with notch on jig. Clamp jig to pillar.
3. Cut outer pillar along groove of jig. (At position A)
4. Remove jig and cut remaining portions.
5. Cut inner pillar at position B in same manner.



HOODLEDGE (ROADSTER)

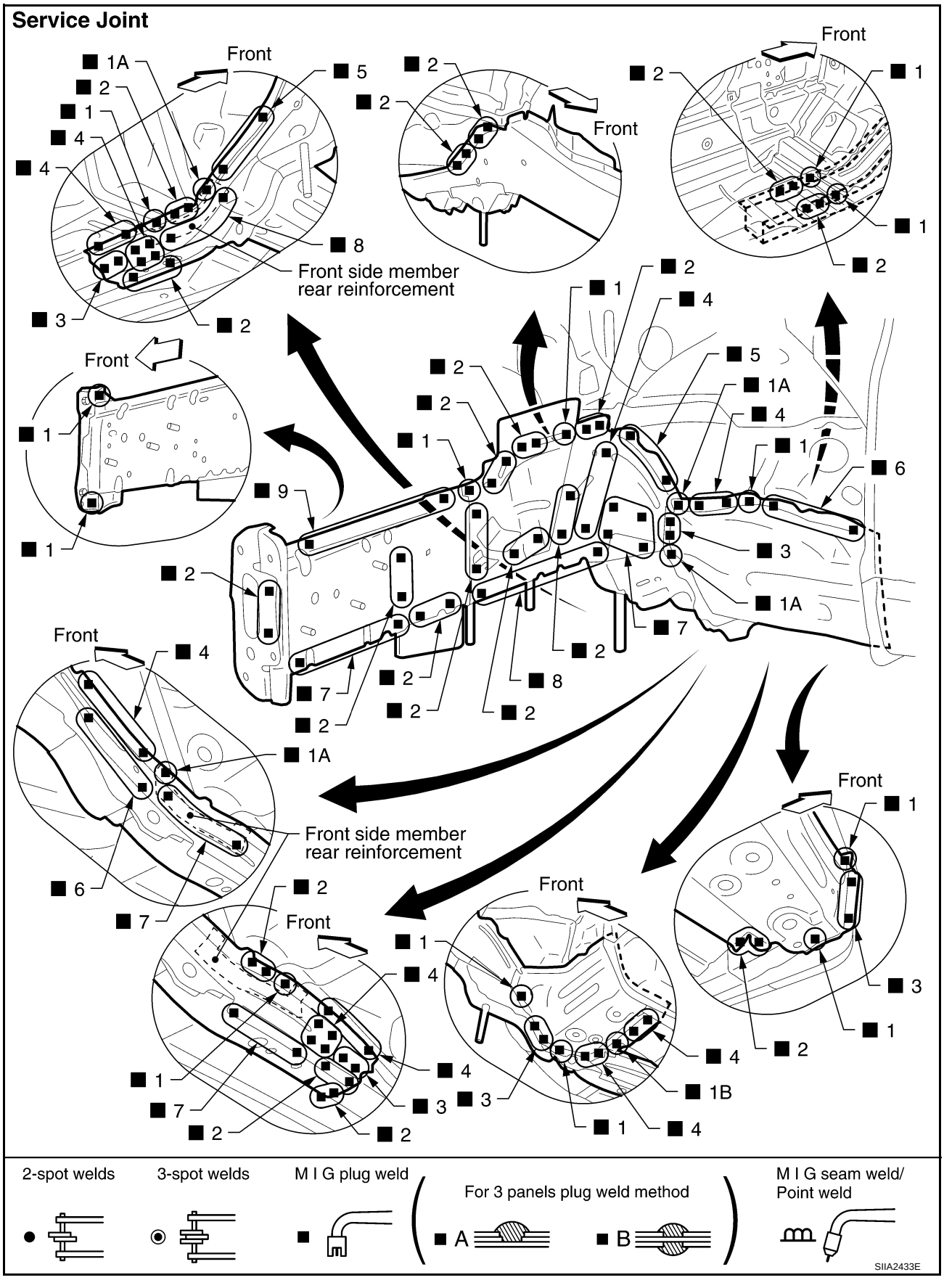


Change parts

- Front strut housing (LH)
- Upper front hoodledge (LH)
- Hoodledge reinforcement (LH)

FRONT SIDE MEMBER (ROADSTER)

- Work after hoodledge has been removed.



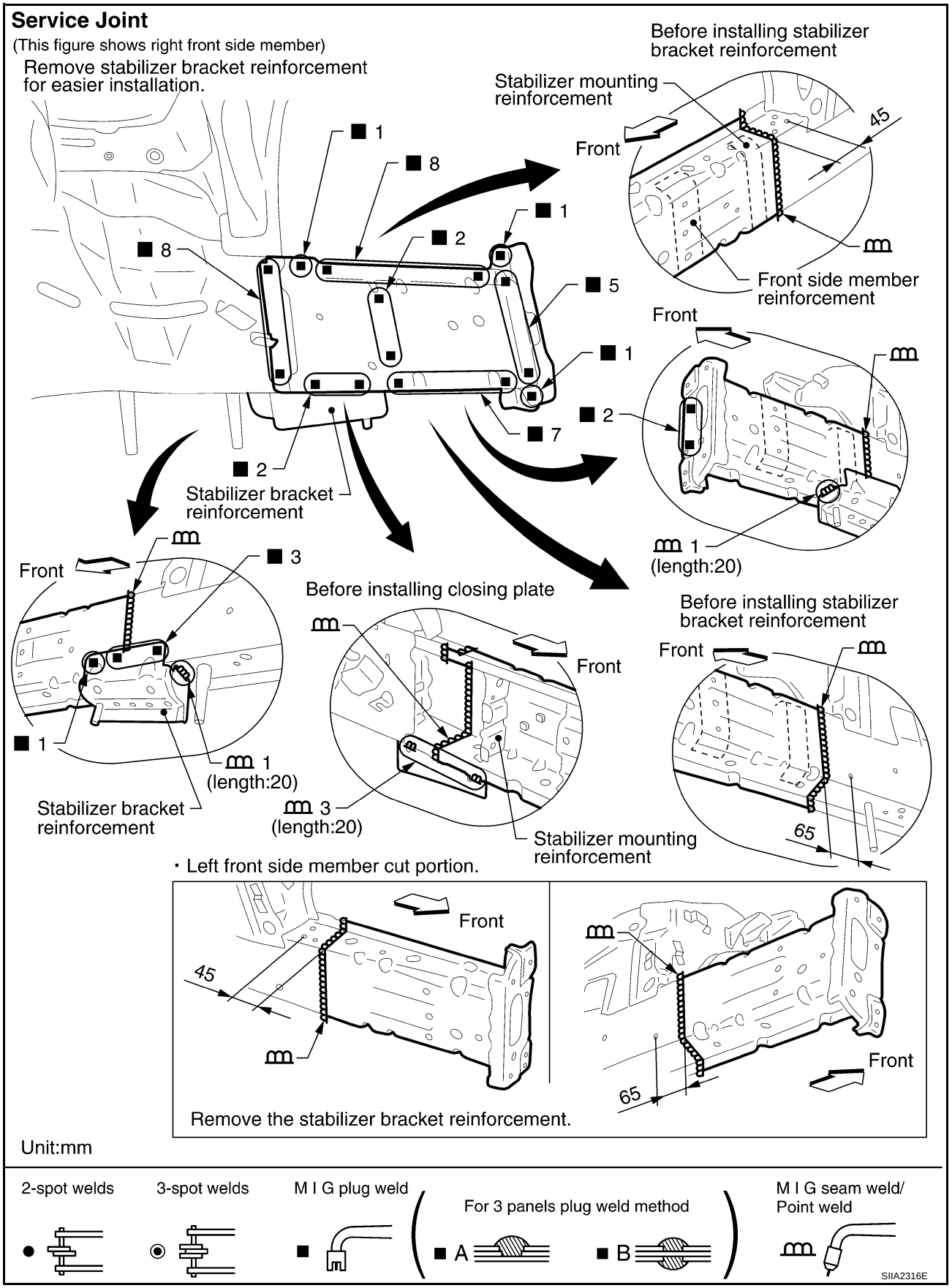
Change parts

- Front side member assembly (LH)
- Front side member outrigger assembly (LH)
- Front side member closing plate assembly (LH)
- Front side member rear reinforcement (LH)

FRONT SIDE MEMBER (PARTIAL REPLACEMENT) (ROADSTER)

Service Joint

(This figure shows right front side member)

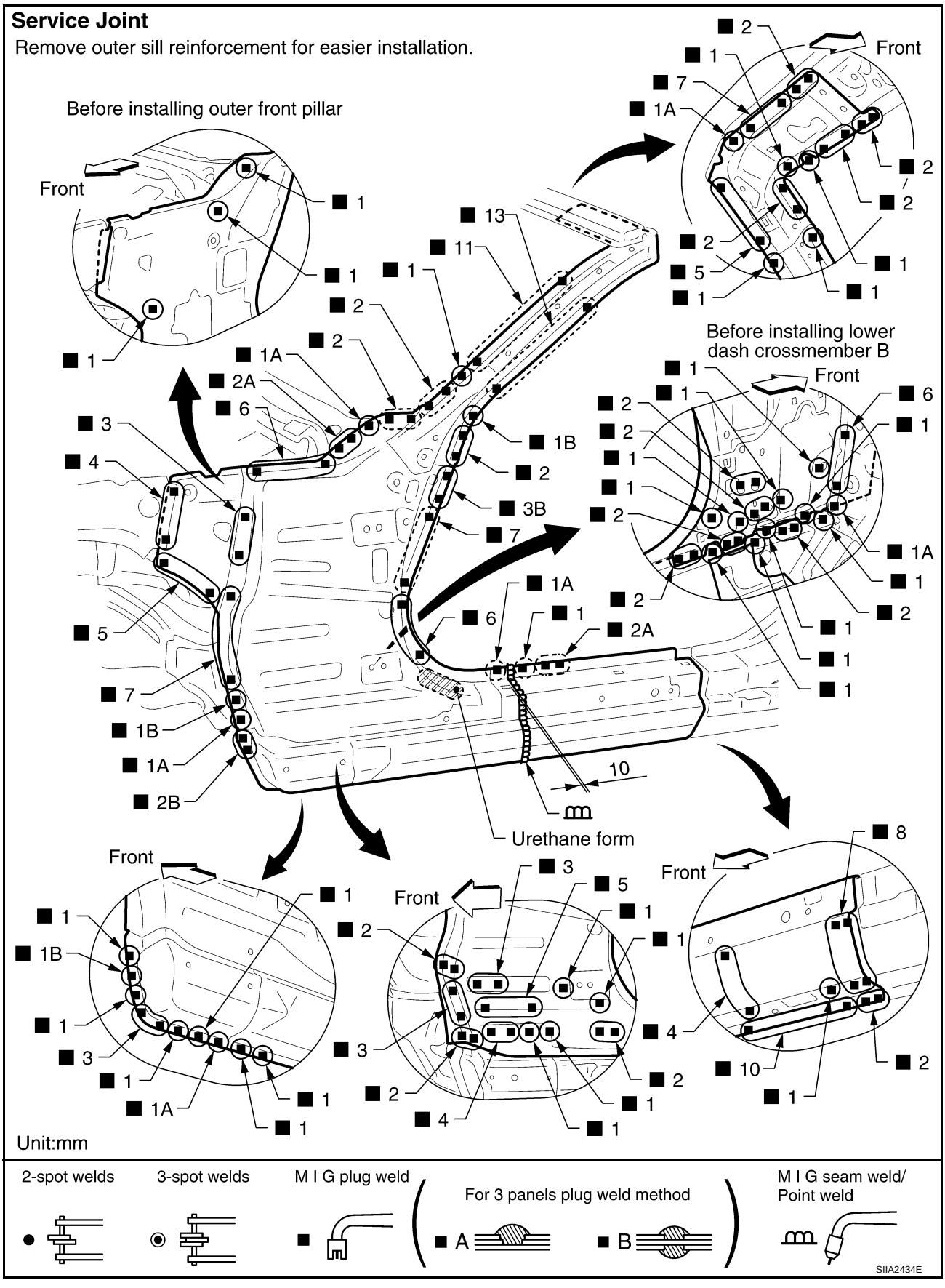


Change parts

- Front side member assembly (RH)
- Front side member front closing plate (RH)
- Outer front towing hook bracket (RH)

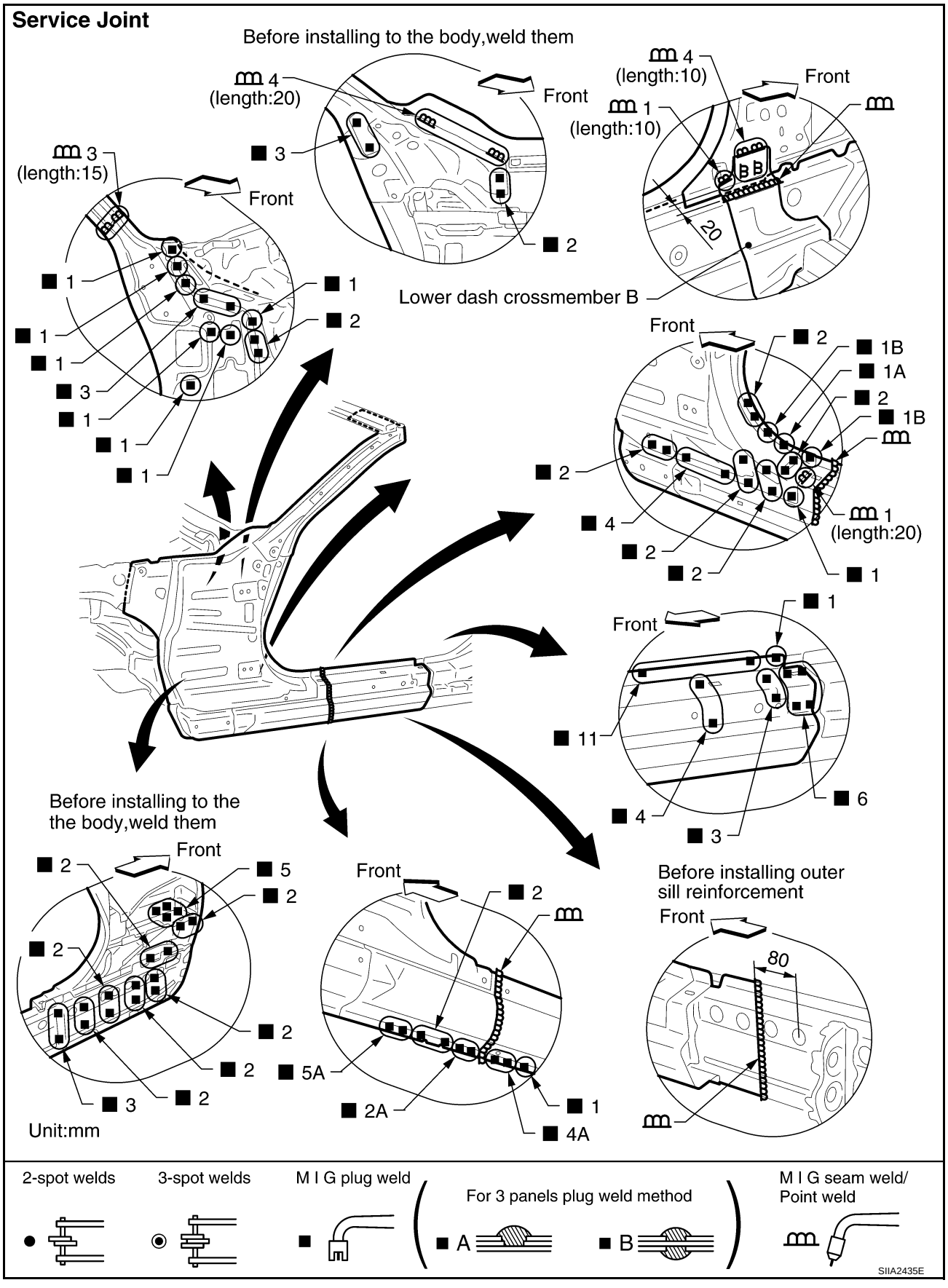
FRONT PILLAR (ROADSTER)

- Work after hoodledge reinforcement has been removed.



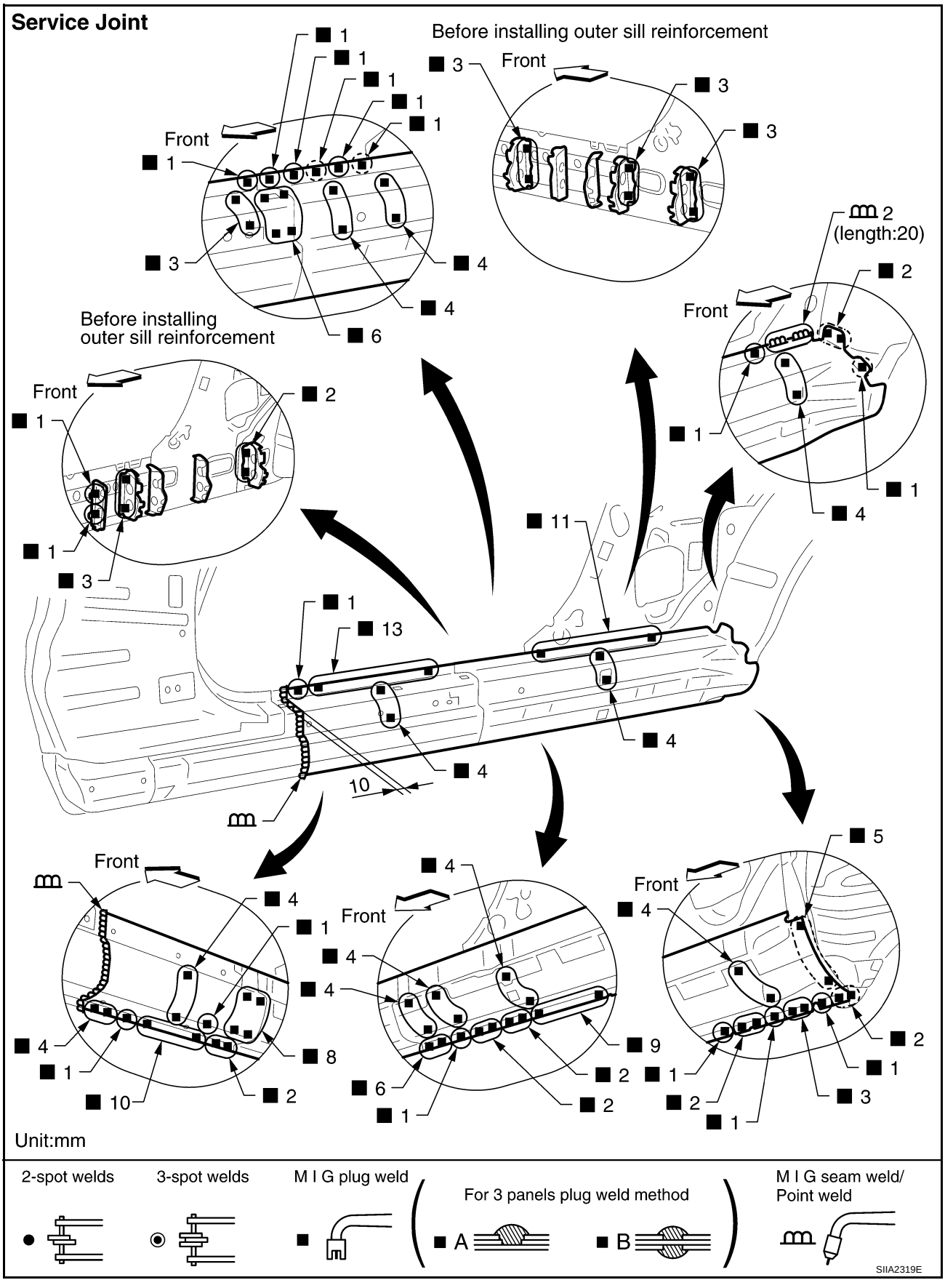
Change parts

- Outer front pillar assembly (LH)
- Outer front sill reinforcement assembly (LH)
- Inner side roof rail (LH)
- Upper rear hoodledge (LH)
- Lower front pillar reinforcement assembly (LH)



OUTER SILL (ROADSTER)

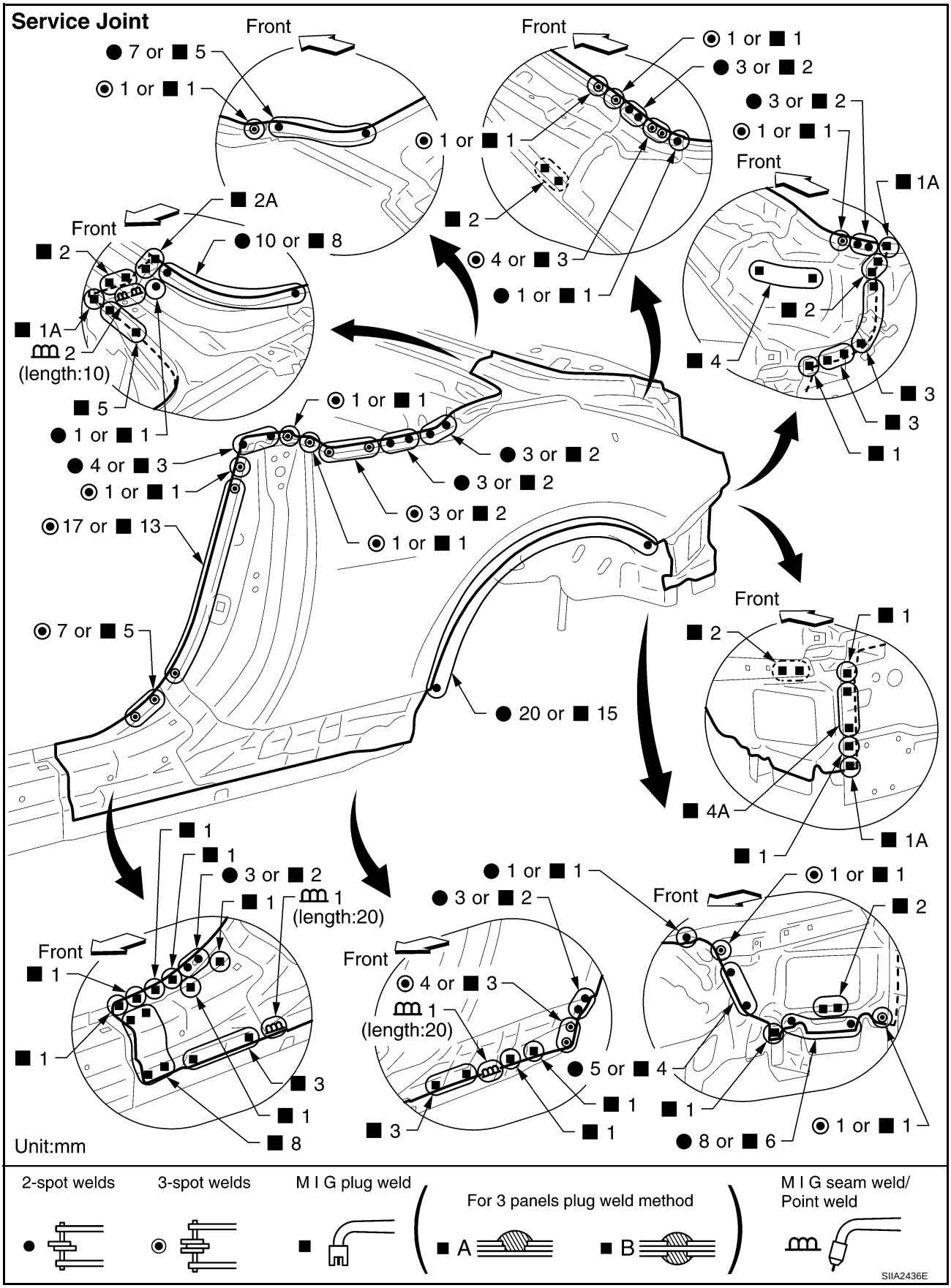
- Work after rear fender, lock pillar reinforcement and rear side waist reinforcement have been removed.



Change parts

- Outer front sill reinforcement assembly (LH)
- Outer rear sill reinforcement assembly (LH)

REAR FENDER (ROADSTER)



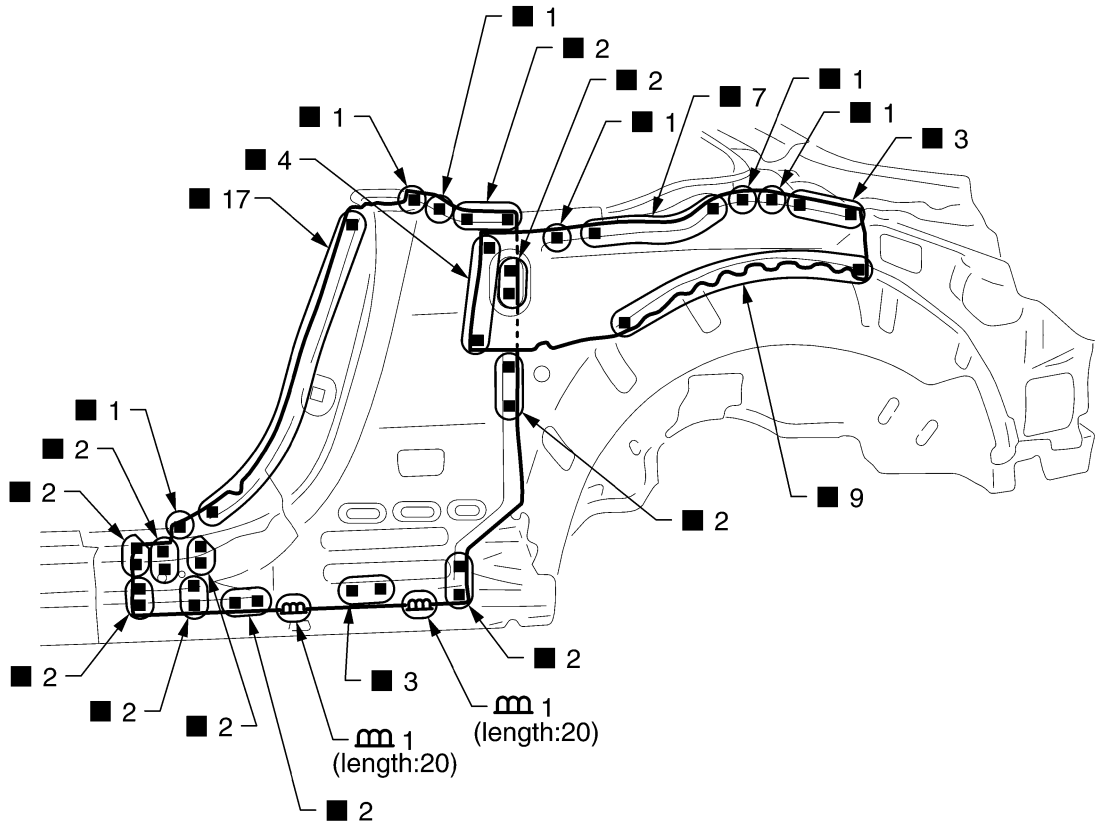
Change parts

- Rear fender assembly (LH)

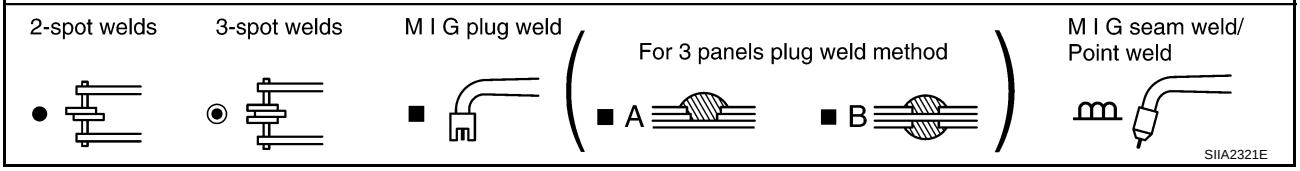
LOCK PILLAR REINFORCEMENT (ROADSTER)

- Work after rear fender has been removed.

Service Joint



Unit:mm



Change parts

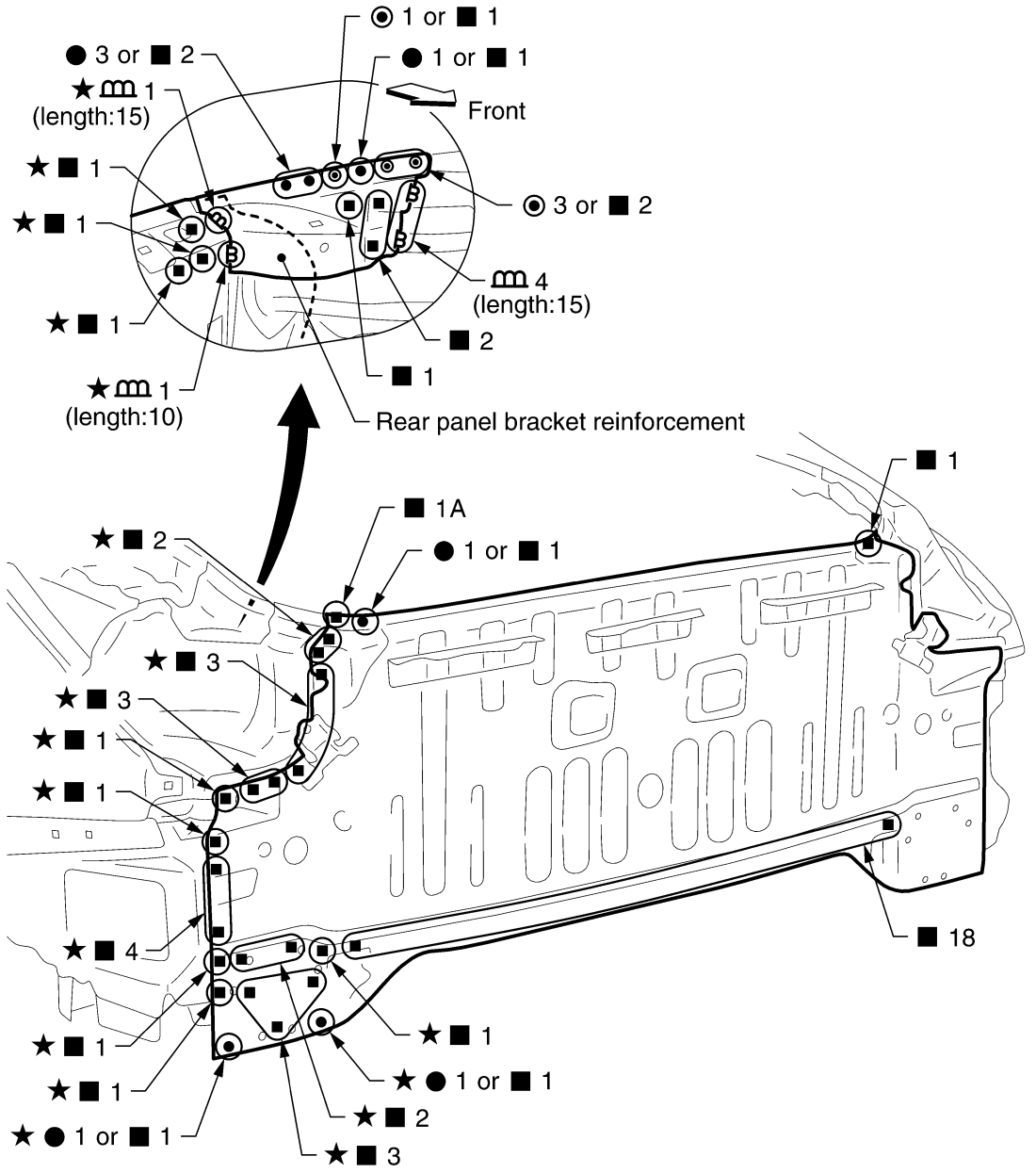
- Outer lock pillar reinforcement (LH)
- Rear side waist reinforcement (LH)

REAR PANEL (ROADSTER)

Service Joint

Remove rear panel bracket reinforcement for easier installation.

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.



Unit:mm

2-spot welds ● | 3-spot welds ◉ | M I G plug weld ■ | For 3 panels plug weld method ■ A ■ B | M I G seam weld/ Point weld

SIIA2322E

Change parts

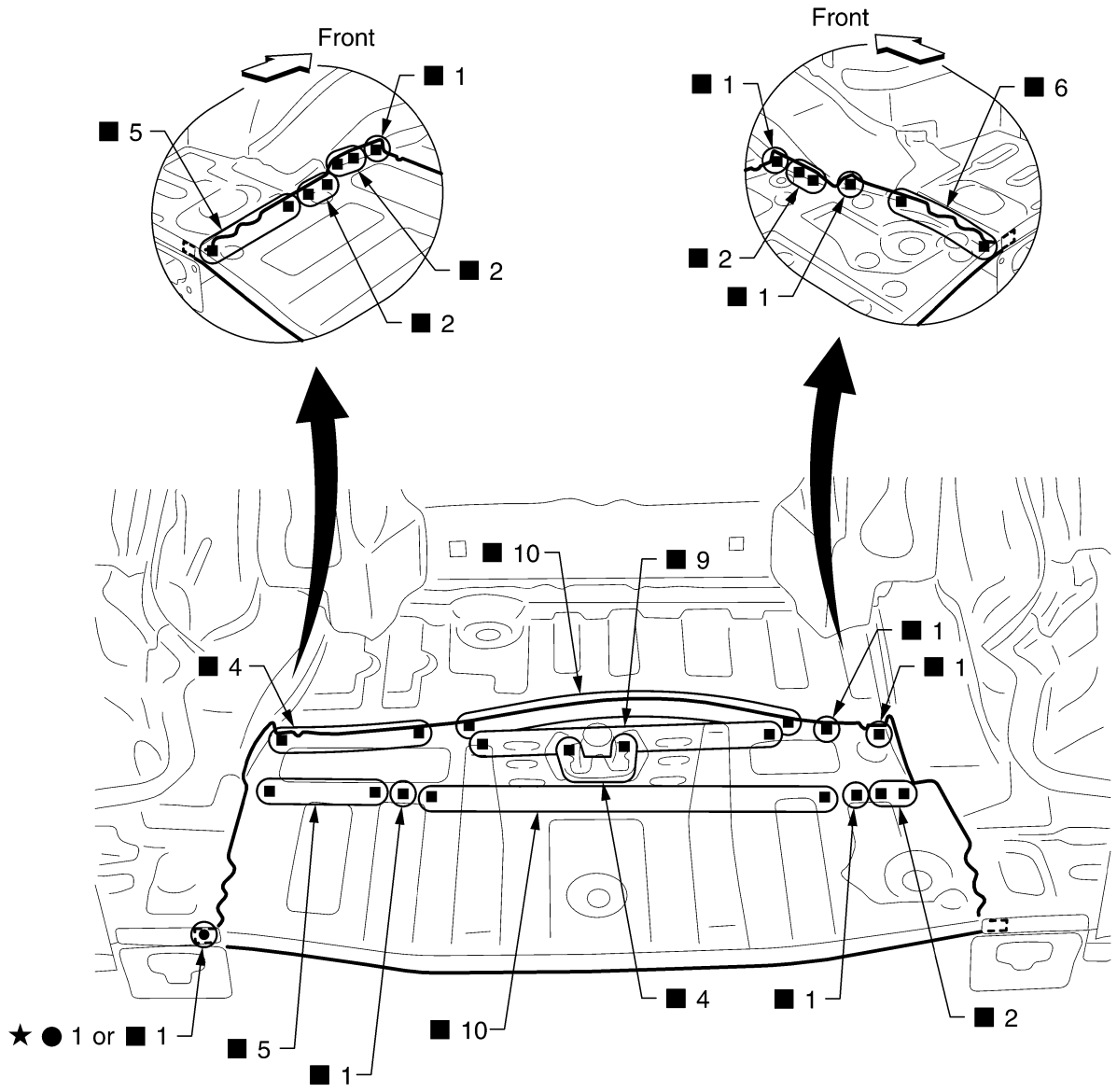
- Rear panel assembly

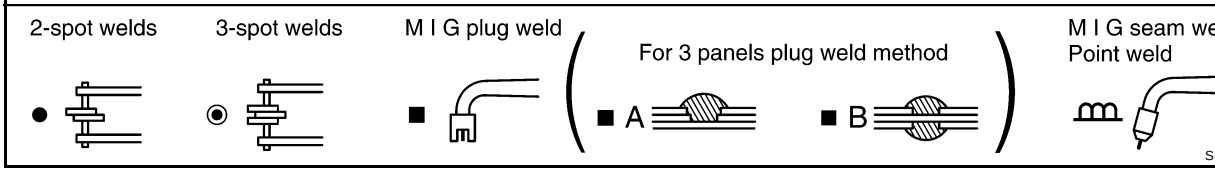
REAR FLOOR REAR (ROADSTER)

- Work after rear panel assembly has been removed.

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.





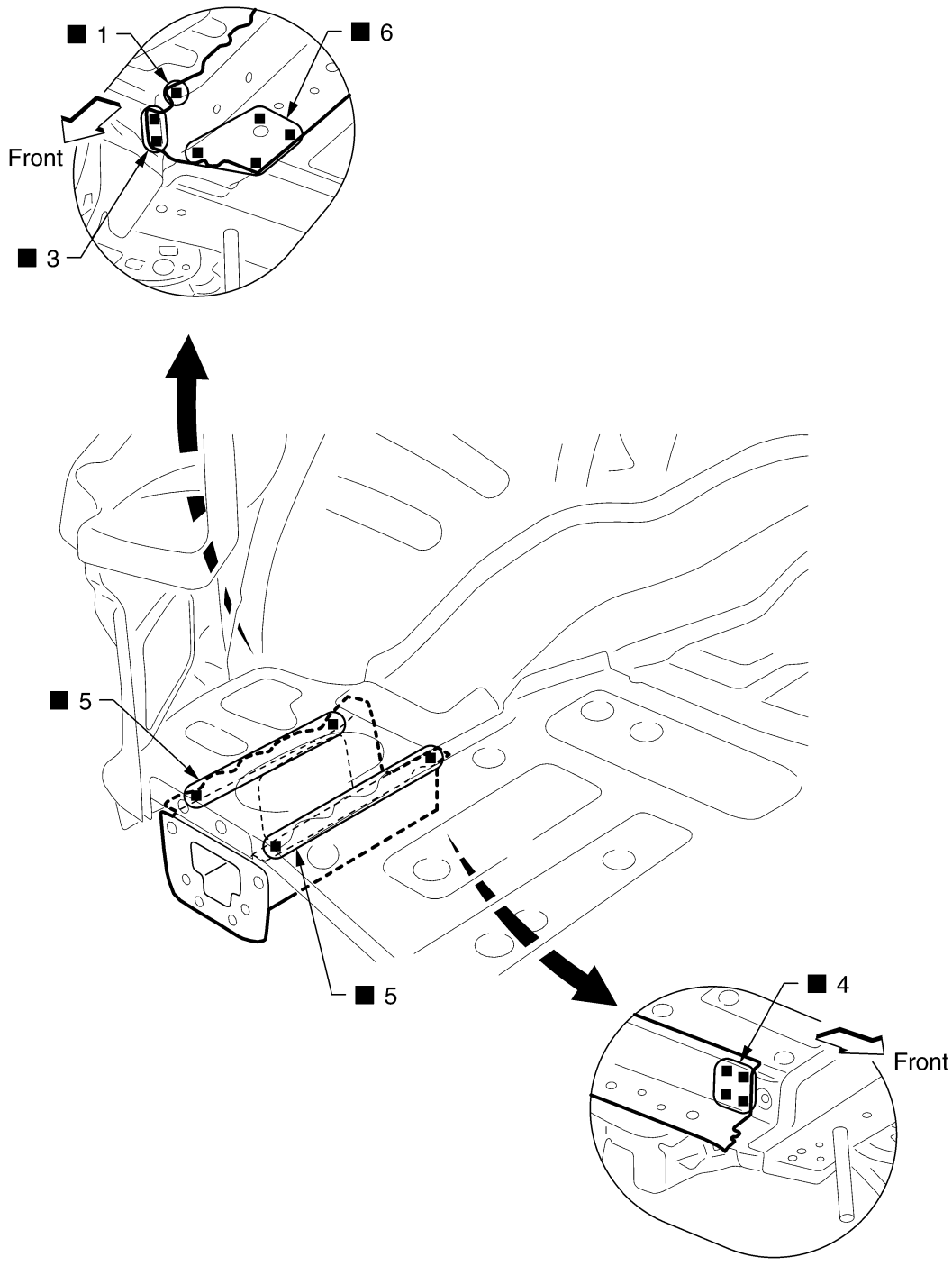
Change parts

- Rear floor rear
- Spare tire clamp bracket

REAR SIDE MEMBER EXTENSION (ROADSTER)

- Work after rear panel assembly has been removed.

Service Joint



Change parts

- Rear side member extension (LH)

SECTION BR
BRAKE SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NFS00001

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

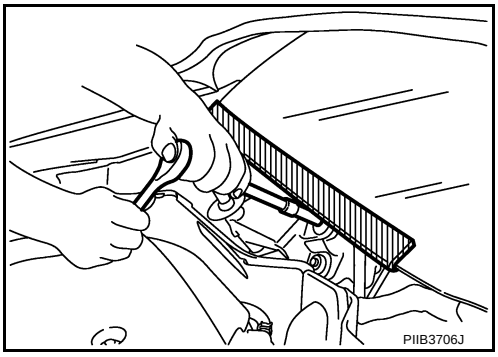
NFS00002

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NFS000HT

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.

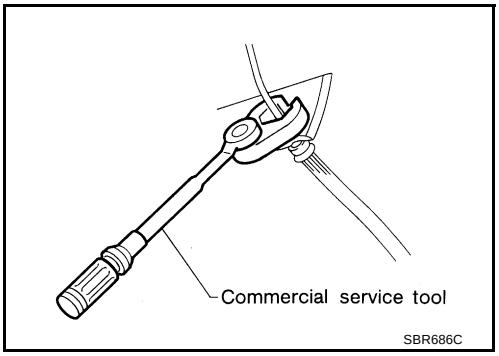


Precautions for Brake System

NFS00003

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-11, "Fluids and Lubricants" .
- Do not reuse drained brake fluid.
- Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Do not use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.

- Use flare nut crowfoot and torque wrench when removing and installing brake tube.
- When installing brake piping, be sure to check torque.
- Before working, turn the ignition switch OFF and disconnect the connectors of ABS actuator and control unit or the battery negative terminal.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage.
  Refer to BR-38, "Brake Burnishing Procedure" .



WARNING:

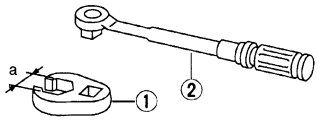
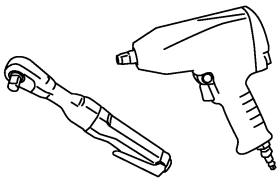
Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

PREPARATION

PFP:00002

Commercial Service Tools

NFS00004

Tool name		Description
1. Flare nut crowfoot a:10 mm (0.39 in)/12mm(0.47 in) 2. Torque wrench	 S-NT360	Installing each brake piping
Power tool	 PBIC0190E	Loosening bolts and nuts
Pin punch Tip diameter: 4 mm (0.16 in) dia	 ZZA0515D	Removing and installing reservoir tank pin

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NFS00005

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			BR-29, BR-31, BR-42, BR-45	BR-26, BR-39	BR-27, BR-40	—	—	BR-35, BR-37, BR-48, BR-50	—	—	—	BR-35, BR-37, BR-48, BR-50	—	NVH in PR section	NHV in RFD section	NVH in FAX, RAX and FSU, RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in PS section
Possible cause and SUSPECTED PARTS			Pads - damaged	Pads - uneven wear	Shims damaged	Rotor imbalance	Rotor damage	Rotor runout	Rotor deformation	Rotor deflection	Rotor rust	Rotor thickness variation	Drum out of round	PROPELLER SHAFT	DIFFERENTIAL	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	STEERING
Symptom	BRAKE	Noise	×	×	×									×	×	×	×	×	×	×
		Shake				×								×		×	×	×	×	×
		Shimmy, Judder				×	×	×	×	×	×	×	×			×	×	×		×

×: Applicable

BRAKE PEDAL

PFP:46501

Inspection and Adjustment

NFS00006

PLAY AND CLEARANCE BETWEEN THE BRAKE PEDAL AND FLOOR PANEL WITH PEDAL DEPRESSED

1. Check the brake pedal free height from the dash lower panel (1).
2. Adjust the height referring to the following specifications.

Brake pedal height "H_1 " (from dash lower panel top surface)

M/T models : 153.2 – 163.2 mm (6.03 – 6.43 in)

A/T models : 161.5 – 171.5 mm (6.36 – 6.75 in)

Depressed pedal height "H_2 " [under a force of 490 N (50 kg, 110 lb) with the engine running]

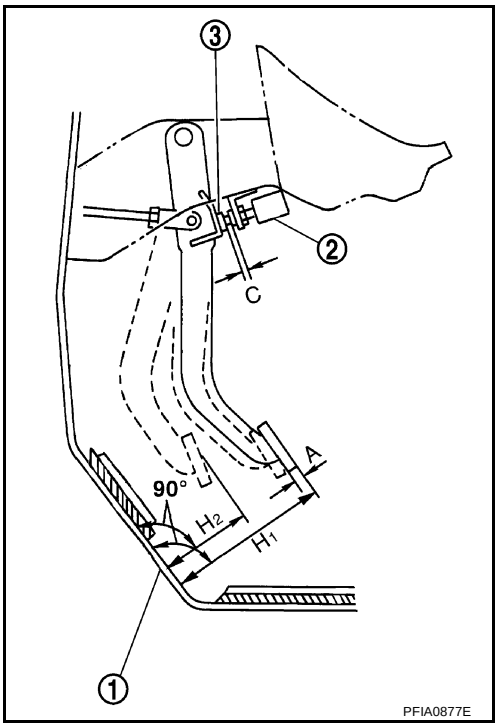
M/T models : More than 90 mm (3.54 in)

A/T models : More than 95 mm (3.74 in)

Clearance "C " between threaded end of the stop lamp switch/ASCD cancel switch (2) and stopper rubber (3).

: 0.74 – 1.96 mm (0.0291 – 0.0772 in)

Pedal play "A" : 3 – 11 mm (0.12 – 0.43 in)



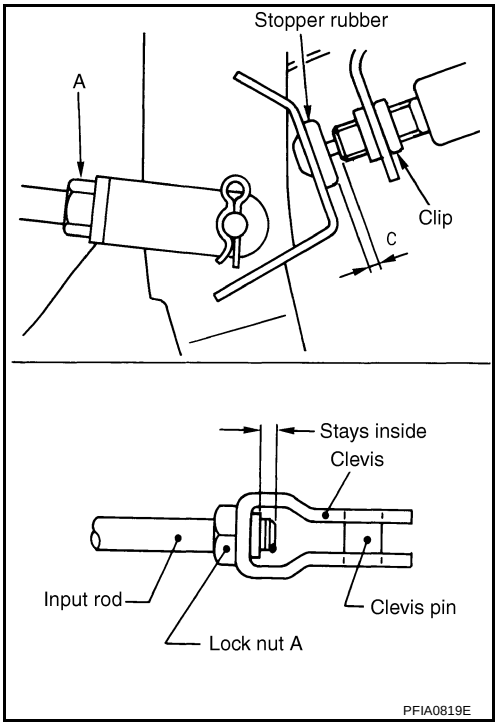
ADJUSTMENT

1. Loosen the stop lamp switch and ASCD cancel switch by rotating it counterclockwise by 45°.
2. Loosen the lock nut (A) on the input rod, then rotate the input rod to set the pedal to the specified height, and tighten the lock nut (A) to the specified torque. Refer to BR-23, "Components" .

   CAUTION:
   Check that the threaded end of the input rod stays inside the clevis.
3. With the pedal pulled and held by hand, press the stop lamp switch and ASCD cancel switch until its threaded end contacts the stopper rubber.
4. With the threaded end of the stop lamp switch contacting the stopper rubber and ASCD cancel switch, rotate the switch clockwise by 45° to secure.

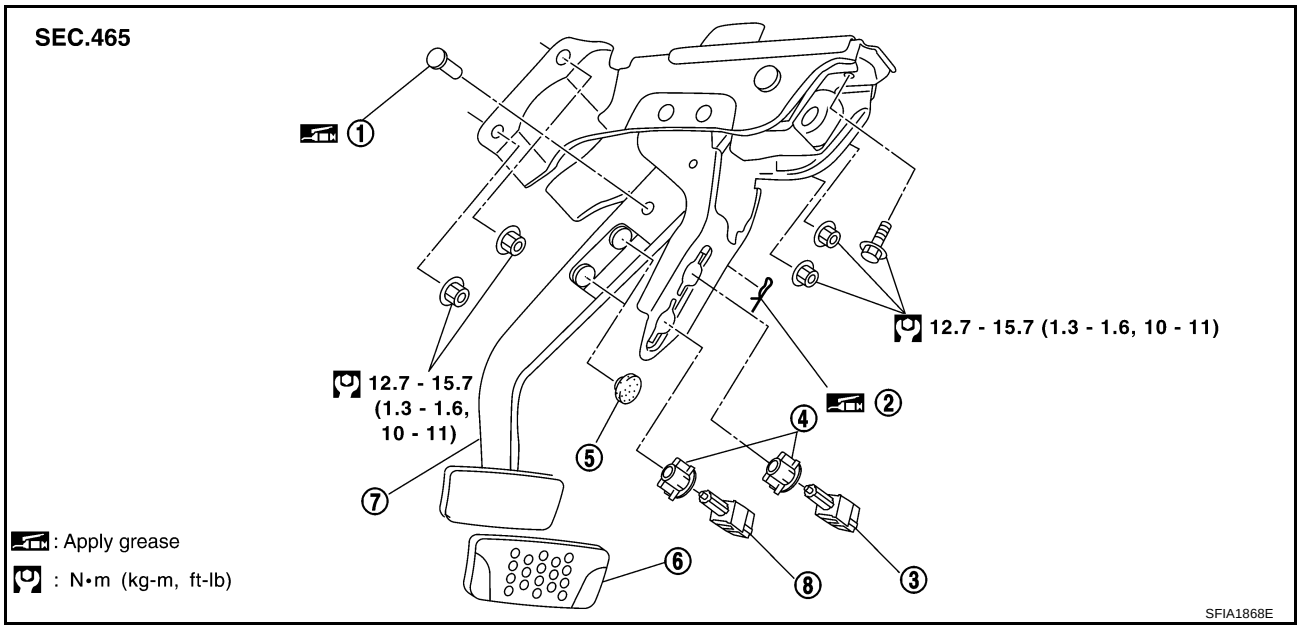
   CAUTION:
   Make sure that the clearance "C" between the stopper rubber and threaded end of the stop lamp switch and ASCD cancel switch is within the standard.
5. Check the pedal play.

   CAUTION:
   Make sure that the stop lamps go off when the pedal is released.
6. Start the engine to check the brake pedal's depressed height.



Components

NFS000IF



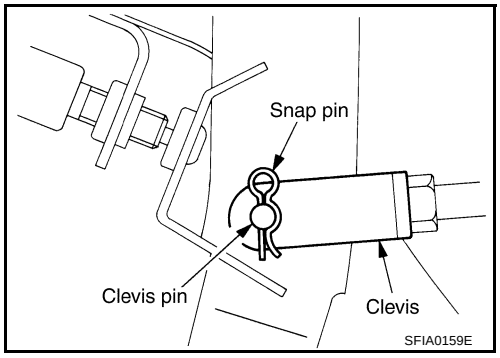
1. Clevis pin
2. Snap pin
3. Stop lamp switch
4. Clip
5. Stopper rubber
6. Pedal pad
7. Brake pedal assembly
8. ASCD cancel switch

Removal and Installation

NFS00007

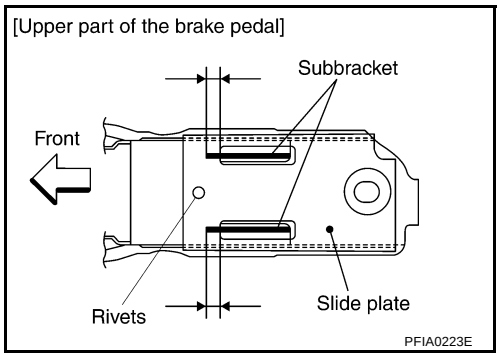
REMOVAL

1. Remove instrument driver lower panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove the steering column. Refer to PS-10, "STEERING COLUMN" .
3. Remove the stop lamp switch and ASCD cancel switch from the pedal assembly.
4. Remove the snap pin and clevis pin from the brake booster clevis.
5. Remove the mounting nuts and bolt from the bracket, and remove the pedal assembly from the vehicle.

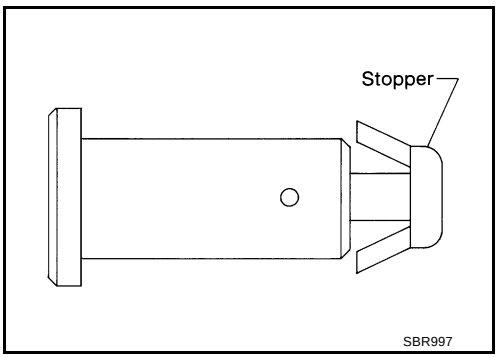


INSPECTION AFTER REMOVAL

- Check that the rivets in the upper part of the brake pedal are not deformed.
- Make sure the sub bracket and the slide plate are at least 5.0 – 6.0 mm (0.197 – 0.236 in) apart.



- Check the brake pedal for bend, damage, and cracks on the welded parts. Replace the applicable part if a failure is detected.
- Check the clevis pin and resin stopper for damage and deformation. If a failure is detected, replace the clevis pin.



INSTALLATION

Paying attention to the following items, install in the reverse order of removal.

- After installing the brake pedal assembly to the vehicle, adjust the brake pedal.

BRAKE FLUID

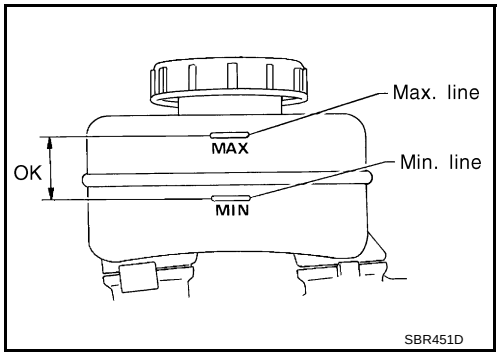
PFP:KN100

On-Vehicle Inspection

NFS00008

LEVEL CHECK

- Check that the fluid level in the reservoir tank is within the standard (between MAX and MIN lines).
- Visually check around the reservoir tank for fluid leaks.
- If fluid level is excessively low, check brake system for leaks.
- If warning lamp remains illuminated after parking lever is released, check brake system for fluid leakage.



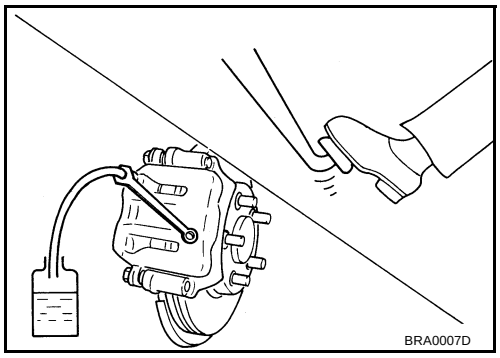
Drain and Refill

NFS00009

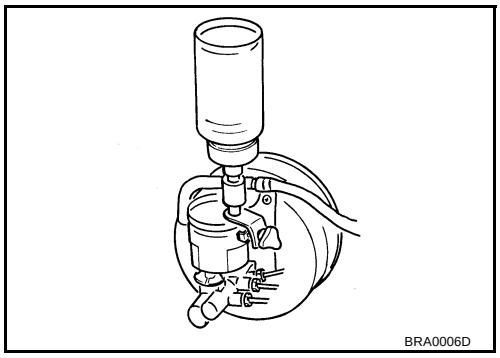
CAUTION:

- **Refill with new brake fluid “DOT3”.**
- **Do not reuse drained brake fluid.**
- **Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.**

1. Connect a vinyl tube to bleed valve.
2. Depress the brake pedal, loosen the bleed valve, and gradually remove the brake fluid.
3. Before working, turn the ignition switch OFF and disconnect the connectors of ABS actuator and control unit or battery negative terminal.



4. Make sure there is no foreign material in the reservoir tank, and refill with new brake fluid.
5. Rest foot on brake pedal. Loosen bleed valve. Slowly depress pedal until it stops. Tighten bleed valve. Release brake pedal. Repeat this process a few times, then pause to add new brake fluid to master cylinder. Continue until new brake fluid flows out. Bleed Air. Refer to BR-11, "Bleeding Brake System" .



Bleeding Brake System

NFS0000A

CAUTION:

While bleeding, pay attention to master cylinder fluid level.

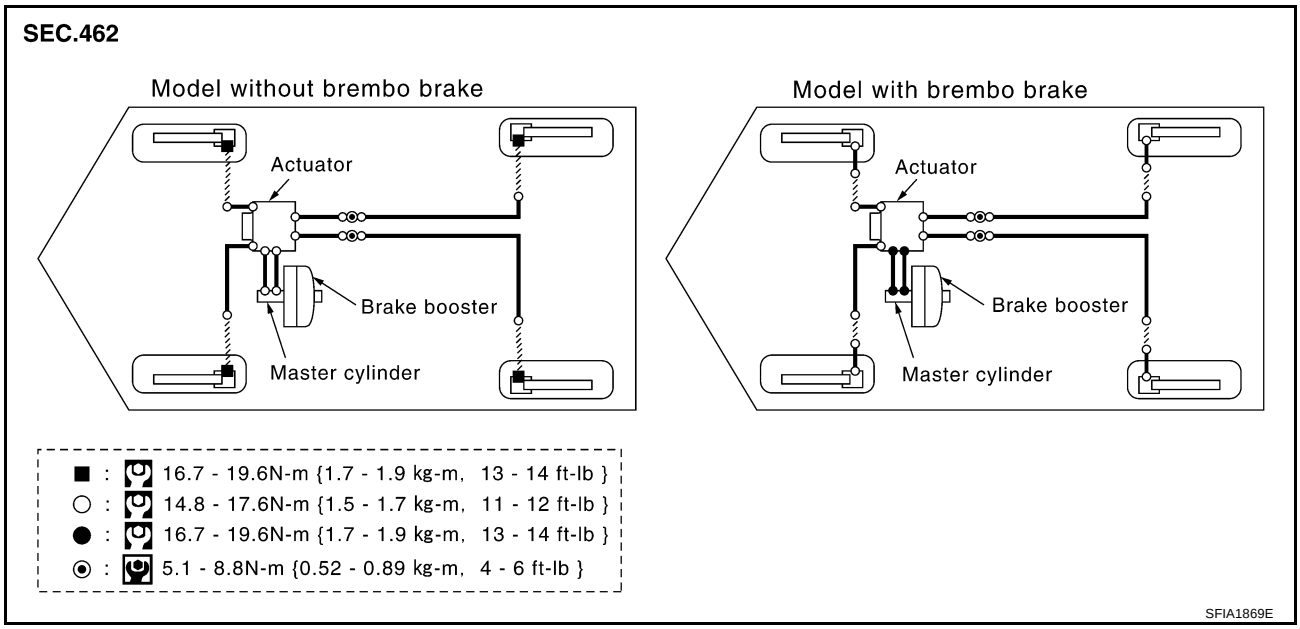
1. Before working, turn the ignition switch OFF and disconnect the connectors of ABS actuator and control unit or battery negative terminal.
2. Connect a vinyl tube to the rear right bleed valve.
3. Fully depress brake pedal 4 to 5 times.
4. With the brake pedal depressed, loosen the bleed valve to let the air out, and then tighten it immediately.
5. Repeat steps 3, 4 until no more air comes out.
6. Tighten the bleed valve to the specified torque. Refer to BR-27, "Components" (Front) and BR-40, "Components" (Rear).
7. In steps 2 to 6 below, with the master cylinder reservoir tank filled at least half way, bleed air from the front left, rear left, and front right tires, in that order.

BRAKE TUBE AND HOSE

PFP:46300

Hydraulic Circuit

NFS0000B



CAUTION:

- **Make sure it does not twist or break when being attached.**
- **Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.**
- **The brake tube is an important safety part. If a brake fluid leak is detected, always disassemble the parts. Replace applicable part with a new one, if necessary.**
- **Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.**
- **Do not bend or twist brake hose sharply, or strongly pull it.**
- **When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.**
- **Refill with new brake fluid " DOT 3 ".**
- **Do not reuse drained brake fluid.**

Removal and Installation of the Front Brake Tube and Brake Hose (Other than Brembo Calipers)

NFS0000C

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove union bolt and remove the brake hose from the caliper assembly.
4. Remove the lock plate and nut, and remove the brake hose from the vehicle.

INSTALLATION

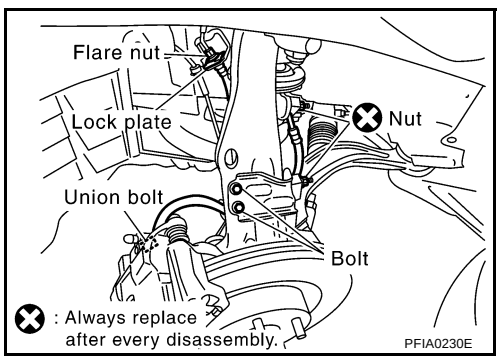
1. Attach the brake hose to the vehicle and tighten the nut to the specified torque.

   : 19.6 – 23.5 N·m (2.0 – 2.3 kg-m, 15 – 17 ft-lb)

   NOTE:
   When removed bracket attaching the bolt is tightened with provisions torque.

   : 10.8 – 15.6 N·m (1.1 – 1.5 kg-m, 8 – 11 ft-lb)

2. Install brake hose by aligning with the protrusion on caliper assembly, and tighten union bolts to the specified torque.



: 16.7 – 19.6 N·m (1.7 – 1.9 kg-m, 13 – 14 ft-lb)

CAUTION:
Do not reuse the copper washer.

3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure it to the bracket with the lock plate.
4. Using a flare nut crowfoot and torque wrench, tighten the flare nut to the specified torque.

: 14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)

5. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Removal and Installation of the Front Brake Tube and Brake Hose (With Brembo Calipers)

NFS0000D

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Using a flare nut wrench, remove the brake tube from the brake hose.
3. Using a flare nut wrench, remove the caliper-side brake tube from the brake hose.
4. Remove the lock plate and nut, and remove the brake hose from the vehicle.

INSTALLATION

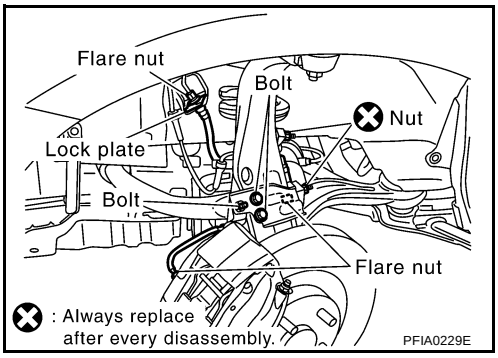
1. Attach the brake hose to the vehicle and tighten the nut to the specified torque.

Nut : 19.6 – 23.5 N·m (2.0 – 2.3 kg-m, 15 – 17 ft-lb)

Bolt : 10.8 – 15.6 N·m (1.1 – 1.5 kg-m, 8 – 11 ft-lb)

2. Attach the caliper-side brake tube to the brake hose, partially tighten the flare nut as far as possible by hand, then tighten it to the specified torque with flare nut crowfoot and torque wrench.

: 14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)



3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure to the bracket with the lock plate.
4. Using a flare nut crowfoot and torque wrench, tighten the flare nut to the specified torque with flare nut torque.

: 14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)

5. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Removal and Installation of the Rear Brake Tube and Brake Hose (Other than Brembo Calipers)

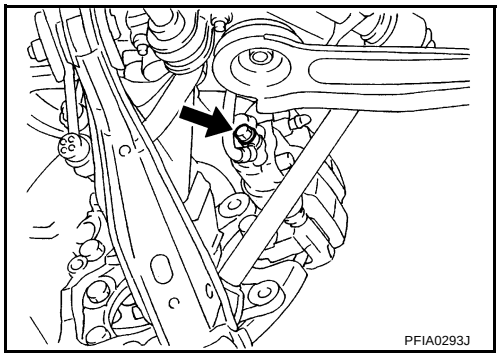
NFS0000E

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove union bolts, and then remove brake hose from the caliper assembly.
4. Remove the lock plate and then remove the brake hose from the vehicle.

INSTALLATION

1. Attach the brake hose L-pin to the caliper assembly positioning hole and tighten the union bolt to the specified torque.



: **16.7 – 19.6 N·m (1.7 – 1.9 kg-m, 13 – 14 ft-lb)**

CAUTION:
Do not reuse the copper washer.

2. After securing the brake hose to the vehicle with the lock plate, partially tighten the brake tube flare nut as far as possible by hand and then tighten to the specified torque with flare nut crow-foot and torque wrench.

: **14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)**

3. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Removal and Installation of the Rear Brake Tube and Brake Hose (With Brembo Calipers)

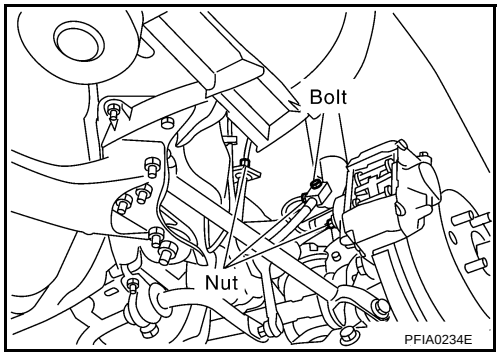
NFS0000F

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Using a flare nut wrench, remove the brake tube from the brake hose.
3. Using a flare nut wrench, remove the caliper-side brake tube from the brake hose.
4. Remove the lock plate and bolt, and remove the brake hose from the vehicle.

INSTALLATION

1. Attach the brake hose to the vehicle and tighten the bolt to the specified torque.



: **19.6 – 22.5 N·m (2.0 – 2.2 kg-m, 15 – 16 ft-lb)**

2. Attach the caliper-side brake tube to brake hose, partially tighten the flare nut as far as possible by hand, then tighten it to the specified torque with flare nut crowfoot and torque wrench.

: **14.8 – 17.6 N·m (1.5 – 1.7kg-m, 11 – 12 ft-lb)**

3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure to the bracket with the lock plate.
4. Using a flare nut crowfoot and torque wrench, tighten the flare nut to the specified torque.

: **14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)**

5. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Inspection after Installation

NFS0000G

CAUTION:
If a leak is detected at the connections, retighten it or, if necessary, replace the damaged part.

1. Check hose, tube, and connections for fluid leaks, damage, twist, deformation, contact with other parts, and loose connections.
2. While depressing pedal under a force of 785 N (80 kg, 177 lb) with engine running for approximately 5 seconds, check for fluid leakage from each part.

BRAKE MASTER CYLINDER

PFP:46010

On-Vehicle Inspection

NFS0000H

LEAK INSPECTION

- Check for leaking in the master cylinder installation surface, the reservoir tank installation surface, and the brake tube connections.

Removal and Installation

NFS0000I

CAUTION:

Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Remove the fluid surface sensor harness connector.
3. Using a flare nut wrench, disconnect master cylinder assembly and brake tube.
4. Remove the master cylinder assembly nut and remove the master cylinder assembly from the vehicle. Refer to BR-24, "Removal and Installation" .

INSTALLATION

CAUTION:

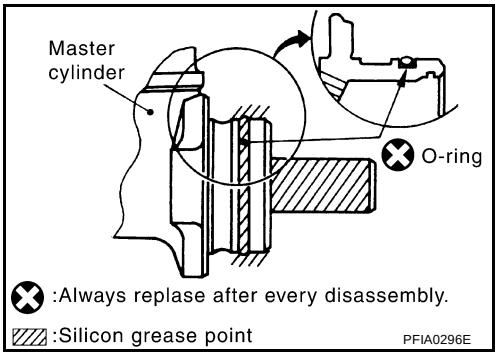
- **Refill with new brake fluid “DOT3”.**
- **Do not reuse drained brake fluid.**

1. Attach the master cylinder assembly to the brake booster assembly and tighten the nut to the specified torque. BR-23, "Components" .

   CAUTION:

   Vehicles equipped with VDC require particular attention when conducting the following installation.

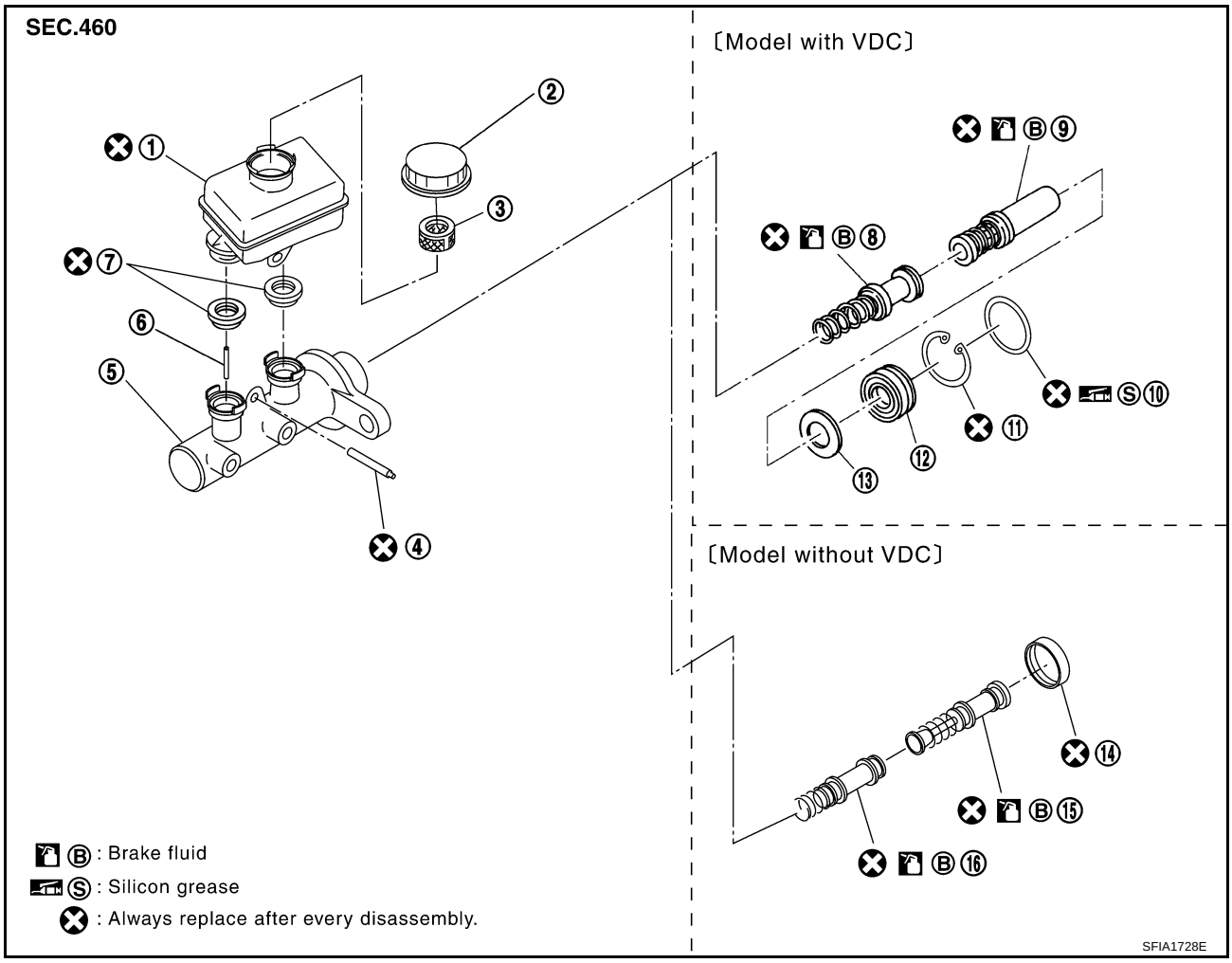
   - **Make sure the sliding surface of the primary piston rod is not damaged, and that no foreign matter become attached.**
   - **Do not reuse the O-ring on the rear end of the master cylinder as it is a non-reusable part.**
   - **Apply the silicon grease in the inner kit to and around the O-ring at the rear end of the master cylinder and to the inside of the booster.**



2. Install brake tube to master cylinder assembly and temporarily tighten flare nuts by hand.
3. Tighten the brake tube flare nut to the specified torque with flare nut crowfoot and torque wrench. Refer to BR-12, "Hydraulic Circuit" .
4. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Components

NFS0000J



1. Reservoir tank
2. Reservoir cap
3. Oil strainer
4. Pin
5. Cylinder body
6. Piston stopper
7. Grommet
8. Secondary piston assembly
9. Primary piston assembly
10. O-ring
11. Snap ring
12. Guide assembly
13. Plate
14. Stopper cap
15. Primary piston assembly
16. Secondary piston assembly

Disassembly and Assembly

NFS0000K

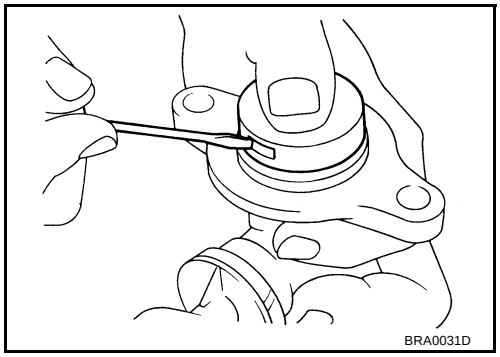
MODELS WITHOUT VDC

Disassembly

CAUTION:

Only remove the reservoir tank when absolutely necessary.

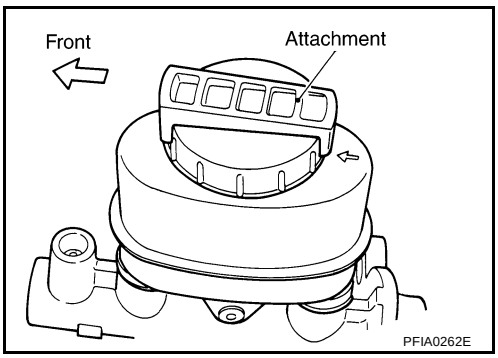
1. Using a flat-bladed screwdriver as shown in the figure, lift up the tabs on the stopper cap and remove it from the master cylinder. The piston inside the master cylinder might pop out when this is done, so hold the stopper cap down at the same time.



2. Attach the attachment in the inner kit to the reservoir cap as shown in the figure.

CAUTION:

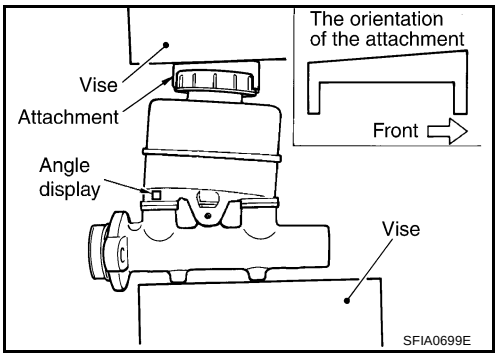
When attaching the attachment to the reservoir cap, make sure it is pointing in the right direction.



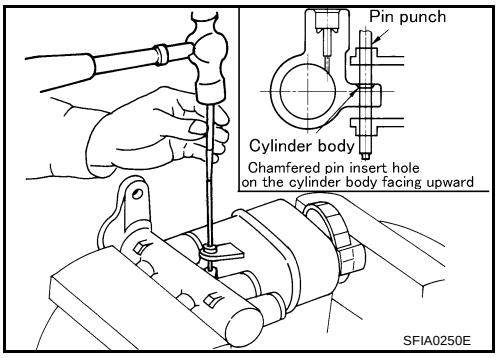
3. Place the side of the cylinder body with chamfering around the pin insertion hole facing up, and secure the master cylinder assembly with a vise.

CAUTION:

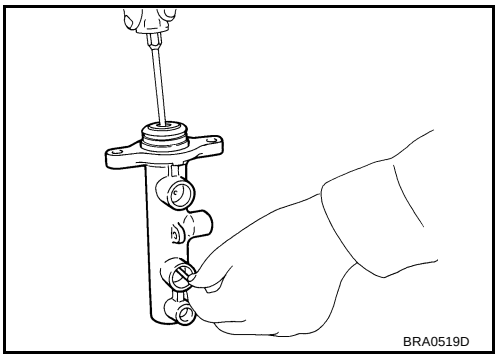
- **Tighten without letting the pin securing the reservoir tank and cylinder body come in contact with the pin insertion hole of the reservoir tank.**
- **When securing the master cylinder assembly with the vise, be sure not to over-tighten.**
- **When securing in a vise, use copper plates or cloth to protect the flange.**



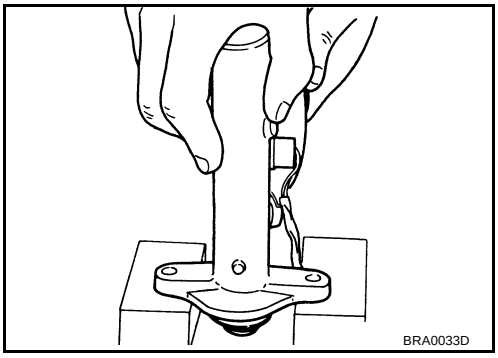
4. Using a pin punch [commercial service tool: diameter approx. 4 mm (0.16 in)], remove mounting pin on the reservoir tank.
5. Remove master cylinder assembly from the vise.
6. Remove reservoir tank and grommet from cylinder body.



7. Using a Phillips flat-bladed screwdriver, push in the primary piston and remove the piston stopper from the cylinder body secondary-side tank boss hole.
8. Carefully pull the primary piston assembly straight out to prevent cylinder inner wall from being damaged.



9. Tap flange using a soft block such as wood, and carefully pull the secondary piston assembly straight out to prevent cylinder inner wall from being damaged.



Inspection after Disassembly

Master cylinder

- Check that there is no damage, friction, rusting, or pinholes on the cylinder inner wall, and replace if there are any non-standard conditions.

Assembly

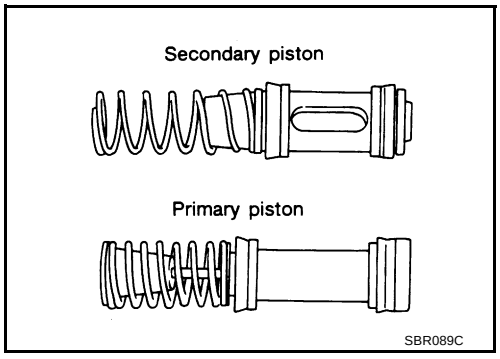
CAUTION:

- **Do not use mineral oils such as kerosene, gasoline during the cleaning and assembly process.**
- **Make sure there is no foreign matter such as dirt or dust attached to the inner cylinder walls, the piston, or the cap seal, and use care to avoid damaging parts with the assembly tools.**
- **Do not drop parts. If a part is dropped, do not use it.**

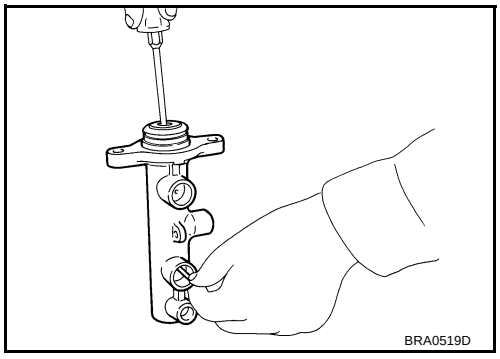
1. Apply brake fluid to cylinder inner wall body and contact surface of the piston assembly.
2. Insert the secondary piston assembly and primary piston assembly into cylinder body in this order.

   CAUTION:

   - **Do not reuse the primary and secondary piston assemblies.**
   - **Be sure to replace the assembly without disassembling the new inner kit.**
   - **Pay attention to the orientation of the piston cup, and insert straight to prevent the cup from being caught by cylinder inner wall.**



3. Perform a visual inspection of the secondary piston slit through the tank boss hole on the secondary-side of the cylinder body, and install the piston stopper.



4. Holding down the piston with the stopper cap, push the stopper cap tabs so they are firmly into the cylinder grooves, then attach the stopper cap.

   CAUTION:

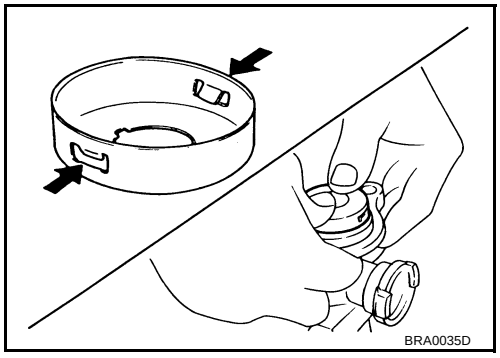
   Do not reuse the stopper cap.

5. Apply brake fluid the grommet and attach to the cylinder body.

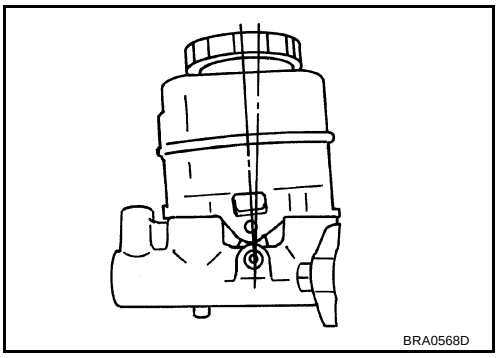
   CAUTION:

   Do not reuse the grommet.

6. Attach the attachment in the inner kit to the reservoir cap as described in disassembly step 2.
7. Master cylinder assembly is fixed in the vise as described in disassembly step 3.

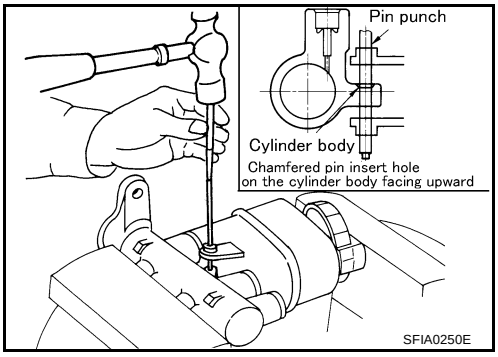


NOTE:
Attach the reservoir tank in the orientation shown in the figure.



8. Using a pin punch [commercial service tool: diameter Approx. 4 mm (0.16 in)], attach the reservoir tank mounting pin so that the attachment side and the opposite side are identical.

CAUTION:
Do not reuse reservoir tank and mounting pin.



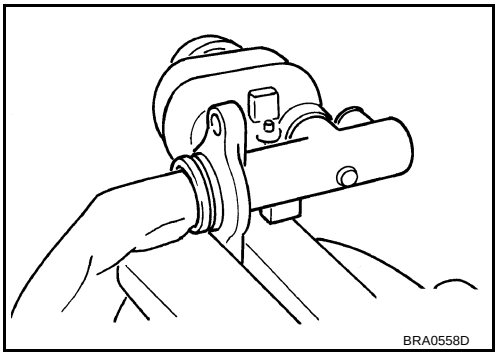
MODELS WITH VDC

Disassembly

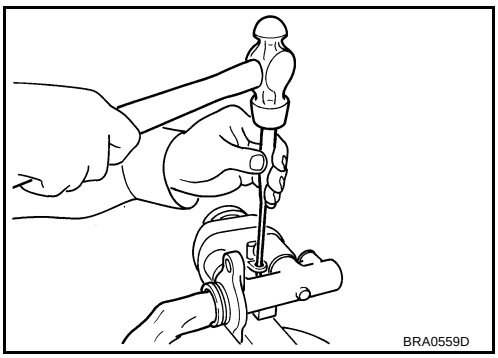
CAUTION:
- **While working, cover the primary piston rod with cloth to prevent it from being damaged.**
- **Only remove the reservoir tank when absolutely necessary.**

1. Place the side of the cylinder body with chamfering around the pin insertion hole up, and secure the cylinder body flange section with a vise as shown in the figure.

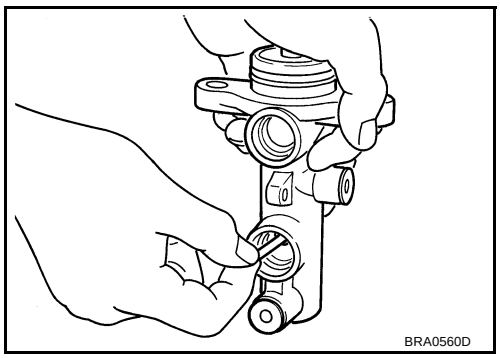
CAUTION:
When securing in a vise, use copper plates or cloth to protect the flange.



2. Using a pin punch [commercial service tool: diameter Approx 4 mm (0.16 in)], remove the reservoir tank mounting pin.
3. Remove master cylinder assembly from the vise.
4. Remove reservoir tank and grommet from cylinder body.

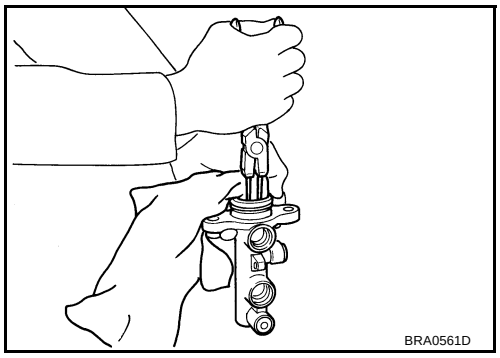


5. Push in the primary piston and remove the piston stopper from the cylinder body secondary-side tank boss hole.

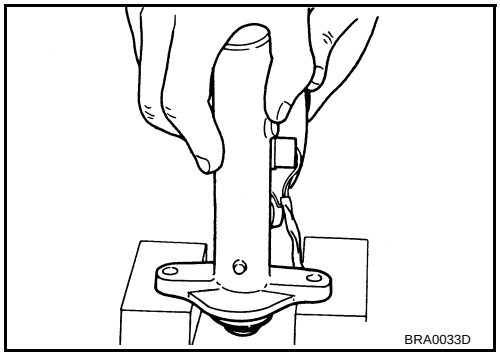


6. Remove the snap ring while pushing the primary piston in to prevent the piston from popping out.
7. Holding the primary piston rod, pull the primary piston assembly, the plate, and the guide straight out.
8. Remove the plate and guide from the primary piston.

CAUTION:
When removing the plate from the primary piston rod, make sure the inside of the plate does not damage the rod.



9. Tap flange using a soft block such as wood, and carefully pull the secondary piston assembly straight out to prevent cylinder inner wall from being damaged.



Inspection after Disassembly

Master cylinder

- Check that there is no damage, friction, rusting, or pinholes on the cylinder inner wall, and replace if there are any non-standard conditions.

Assembly

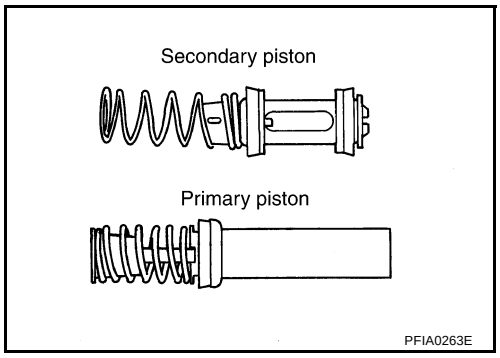
CAUTION:

- **Do not use mineral oils such as kerosene, gasoline during the cleaning and assembly process.**
- **Make sure there is no foreign matter such as dirt or dust attached to the inner cylinder walls, the piston, or the cap seal, and use care to avoid damaging parts with the assembly tools.**
- **Do not drop parts. If a part is dropped, do not use it.**

1. Apply brake fluid to cylinder inner wall body and contact surface of the piston assembly, and apply the silicon grease in the inner kit to the primary piston rod.
2. Insert the secondary piston and primary piston into cylinder body in this order.

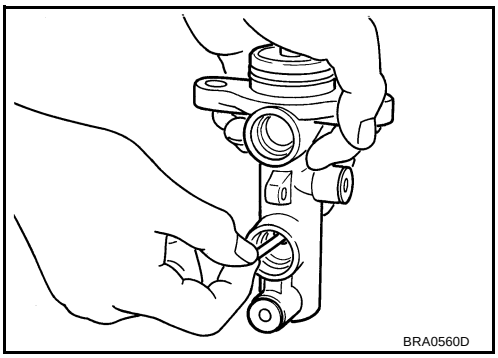
CAUTION:

- **Do not reuse the primary and secondary piston assemblies.**
- **Be sure to replace the assembly without disassembling the new inner kit.**



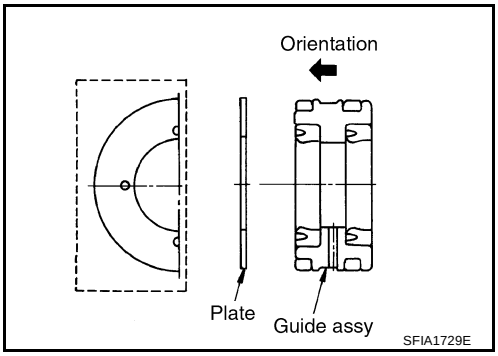
- **Pay attention to the orientation of the piston cup, and insert straight to prevent the cup from being caught by cylinder inner wall.**

3. Perform a visually inspection of the secondary piston slit through the tank boss hole on the secondary-side of the cylinder body, and install the piston stopper.



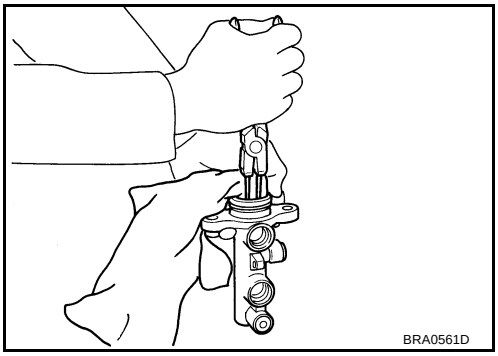
4. Insert the plate and guide into the cylinder body.

CAUTION:
- **Make sure not to damage the primary piston rod.**
- **Pay attention to the direction of the guide.**
- **Do not drop the O-ring.**
- **Make sure the guide and/or plate are not inserted at an angle.**



5. Cover the primary piston rod with cloth to prevent it getting damaged, and attach the snap ring with the primary piston pushed in.

CAUTION:
- **Make sure the area around the snap ring is snug in the cylinder body bore groove.**
- **Do not reuse the snap ring.**

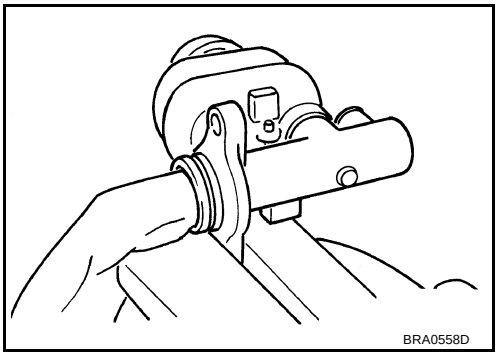


6. Place the side of the cylinder body with chamfering around the pin insertion hole up, and secure the cylinder body flange section with a vise.

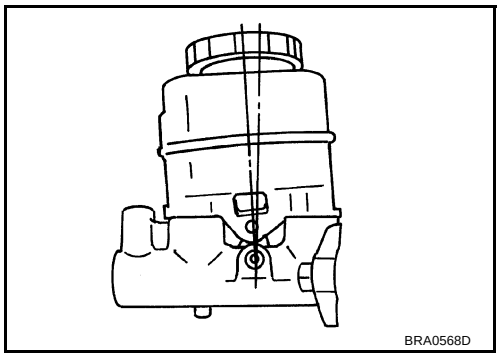
CAUTION:
When securing in a vise, use copper plates or cloth to protect the flange.

7. Apply brake fluid to the grommet and attach the reservoir tank to the master cylinder.

CAUTION:
Do not reuse the grommet.



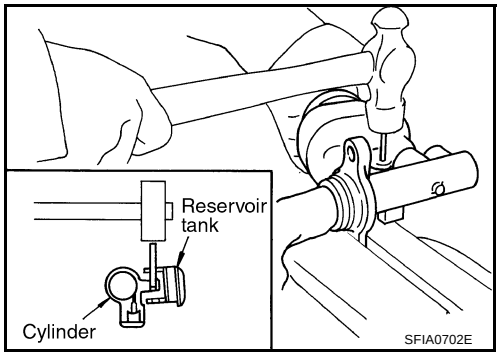
NOTE:
Attach the reservoir tank in the orientation shown in the figure.



8. Tilt the reservoir tank so that the mounting pin can be inserted as shown in the figure, and insert the mounting pin. When the mounting pin has passed the master cylinder pinhole, return the reservoir tank to a level position. Attach the mounting pin to the opposite mounting pin hole of the reservoir tank so that it is the same as the insertion side.

CAUTION:

- **Be sure to insert pin from the chamfered pinhole of cylinder body.**
- **Do not reuse reservoir tank and mounting pin.**



BRAKE BOOSTER

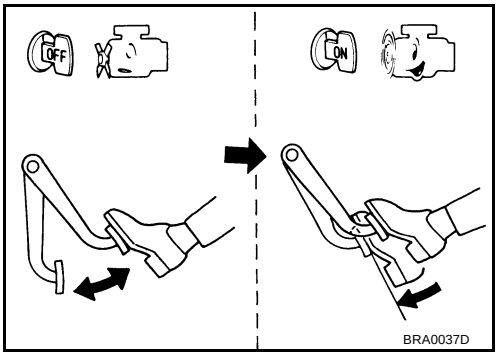
PFP:47200

On-Vehicle Inspection

NFS0000L

OPERATING CHECK

With the engine stopped, change the vacuum to the atmospheric pressure by depressing the brake pedal several times. Then with brake pedal fully depressed, start the engine and when the vacuum pressure reaches the standard, check that the clearance between the brake pedal and floor panel decreases.

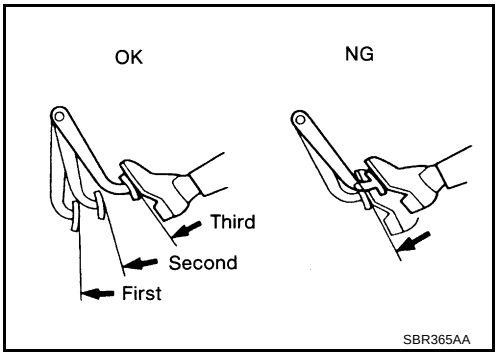


CAUTION:

Depressing pedal interval is approximately 5 seconds.

AIRTIGHT CHECK

- Run the engine at idle for approximately 1 minute, and stop it after applying vacuum to the booster. Depress the brake pedal normally to change the vacuum to the atmospheric pressure. Check that distance between the brake pedal and floor panel gradually increases.
- Depress brake pedal while engine is running, and stop engine with pedal depressed. The pedal stroke should not change after holding pedal down for 30 seconds.



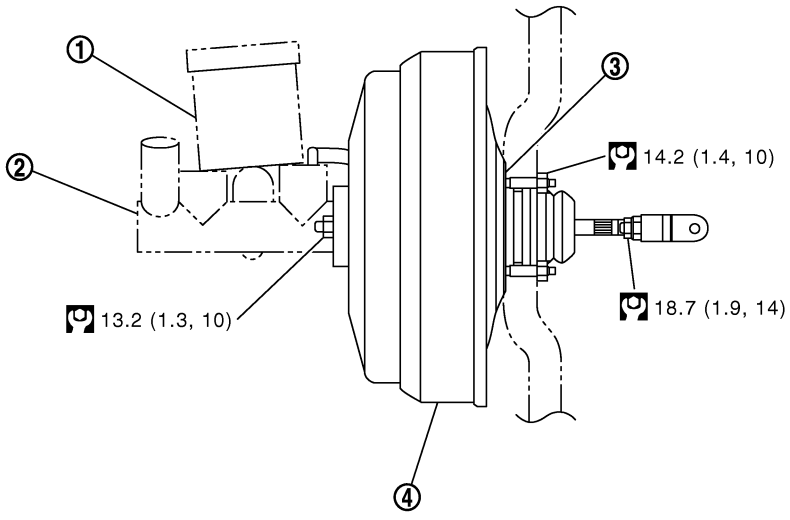
CAUTION:

Depressing pedal interval is approximately 5 seconds.

Components

NFS000IG

SEC. 460•465•470



1. Reservoir tank
2. Master cylinder
3. Gasket
4. Brake booster

Refer to GI-11, "Components" , for the symbols in the figure.

Removal and Installation

NFS0000M

REMOVAL

CAUTION:

- **Be careful not to deform or bend brake piping while removing and installing the brake booster.**
- **Replace clevis pin if it is damaged.**
- **Be careful not to damage brake booster stud bolt threads. If brake booster is tilted or inclined during installation, the dash panel may damage the threads.**
- **Attach the check valve in the correct orientation.**

1. Remove vacuum hose from the brake booster. Refer to BR-25, "VACUUM LINES" .
2. Remove the brake master cylinder. Refer to BR-24, "Removal and Installation" .
3. Remove the brake piping between brake master cylinder and ABS actuator and electric unit (control unit). Refer to BR-12, "Hydraulic Circuit" .

   CAUTION:

   For M/T vehicles with remove the brake piping after removing the clutch reservoir tank bolt.
4. Remove the brake pedal attachment snap pin and clevis pin from inside the vehicle.
5. Remove the nuts on the brake booster and brake pedal assembly.
6. Remove brake booster assembly from the engine compartment side.

INSPECTION AFTER REMOVAL

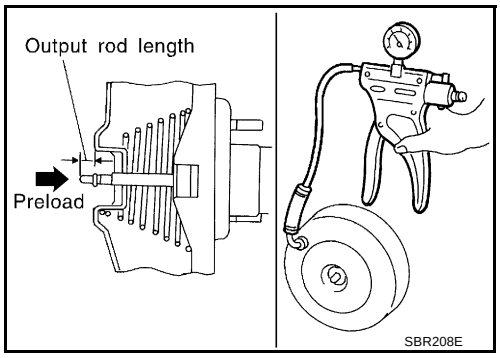
Output Rod Length Inspection

1. Using a handy vacuum pump, apply a vacuum of –66.7 kPa (–500 mmHg,–19.69 inHg) to the brake booster.
2. Check output rod length.

Standard dimension when vacuum –66.7 kPa (–500 mmHg, –19.69 inHg)

With TCS : 10.4 mm (0.409 in)

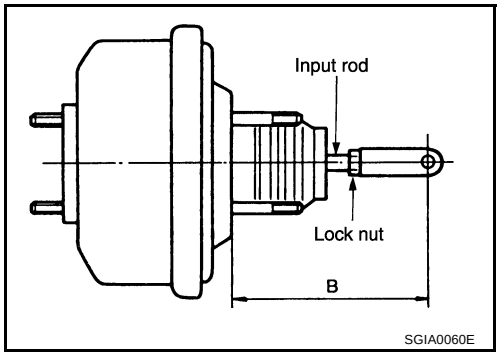
With VDC : –6.2 mm (–0.244 in)



INSTALLATION

1. Loosen the lock nut to adjust the input rod length so that the length “B” (in the figure on the right) satisfies the specified value.

   Length “B” : 125 mm (4.92 in)
2. After adjusting “B”, temporarily tighten the lock nut to install the booster assembly to the vehicle. At this time, make sure to install a gasket between the booster assembly and the vehicle.
3. Connect the brake pedal with the clevis of the input rod.
4. Install the pedal bracket mounting nuts and tighten them to the specified torque.
5. Install the brake piping between brake master cylinder and ABS actuator and electric unit (control unit). Refer to BR-12, "Hydraulic Circuit" .
6. Install the master cylinder to the booster assembly. Refer to BR-24, "Removal and Installation" .
7. Adjust the height and play of the brake pedal. Refer to BR-7, "ADJUSTMENT" .
8. Tighten the lock nut of the input rod to the specified torque. Refer to BR-23, "Components" .
9. Refill new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

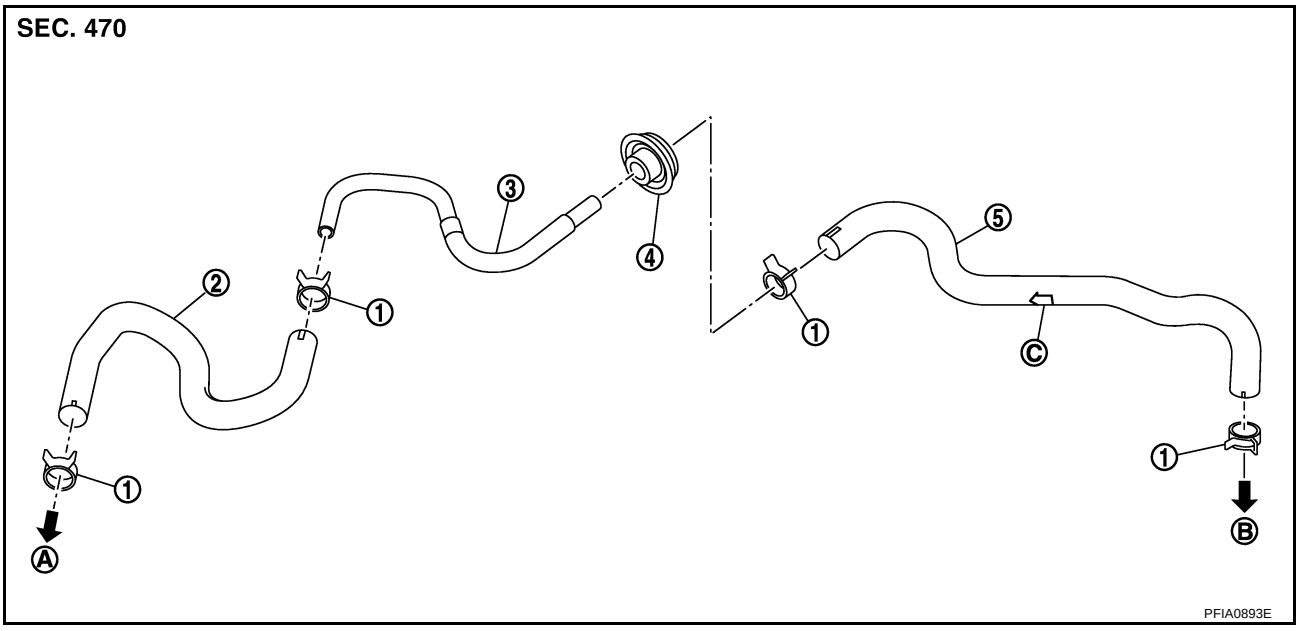


VACUUM LINES

PFP:41920

Components

NFS000IH



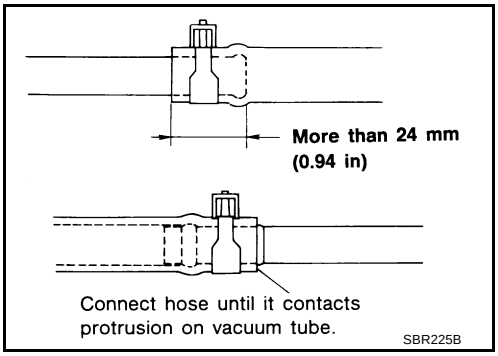
1. Clamp	2. Vacuum hose	3. Vacuum tube
4. Grommet	5. Vacuum hose (built in check valve)	
A. To intake manifold	B. To brake booster	C. Stamp indicating engine direction

Removal and Installation

NFS0000N

CAUTION:

- **Because vacuum hose contains a check valve, it must be installed in the correct orientation. Refer to the stamp or label to confirm correct installation. The brake booster will not operate normally if the hose is installed in the wrong direction.**
- **Insert the vacuum hose for at least 24 mm (0.94 in).**
- **Do not use lubricating oil during assembly.**



Inspection

NFS0000O

VISUAL INSPECTION

Check for improper assembly, damage and deteriorate.

CHECK VALVE INSPECTION

Airtightness Inspection

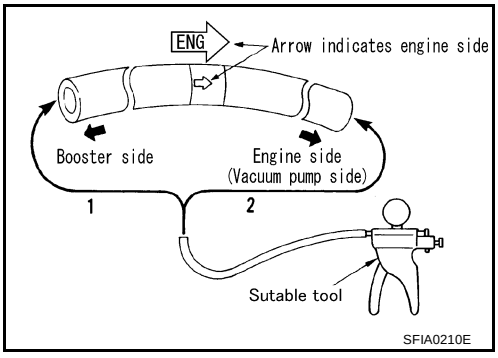
Use a hand-held vacuum pump to check.

When connected to booster side (1):

Vacuum decrease should be within 1.3 kPa (10 mmHg, 0.39 inHg) for 15 seconds under a vacuum of −66.7 kPa (−500 mmHg, −19.69 inHg)

When connected to engine side (2):

No vacuum will be applied



FRONT DISC BRAKE

PFP:41000

On-Vehicle Inspection

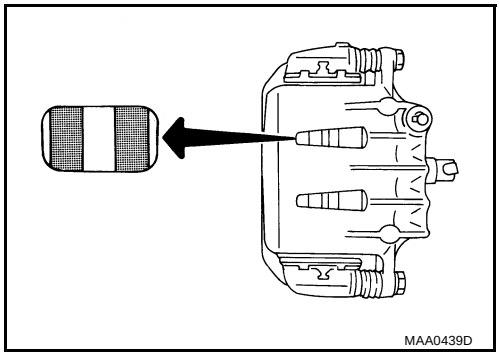
NFS000AS

PAD WEAR INSPECTION

Other than Brembo Calipers

- Check pad thickness from check hole on cylinder body. Use a scale for inspection if necessary.

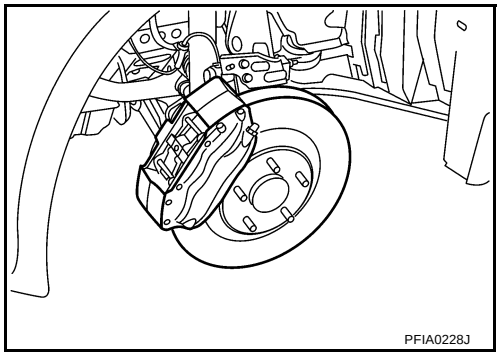
Standard thickness : 11.0 mm (0.433 in)
Repair limit thickness : 2.0 mm (0.079 in)



With Brembo Calipers

- Inspect the thickness of the pad through the caliper inspection hole. Use a scale for inspection if necessary.

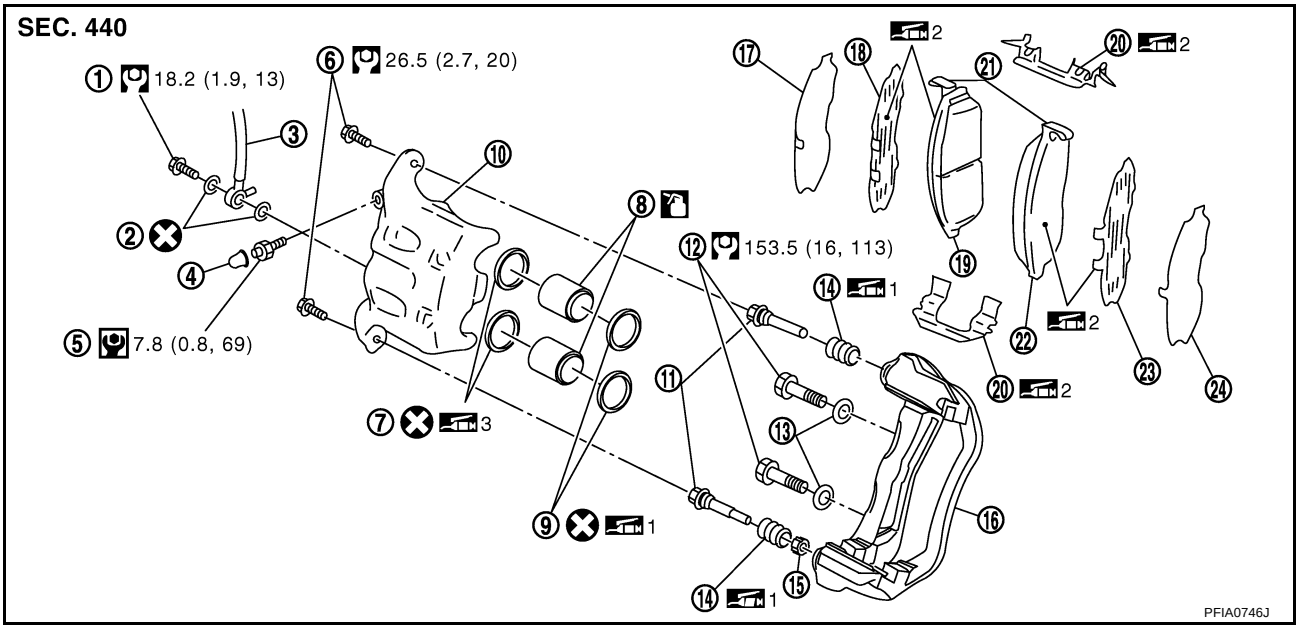
Standard thickness : 9.3 mm (0.366 in)
Repair limit thickness : 2.0 mm (0.079 in)



Components

NFS000AT

OTHER THAN BREMBO CALIPERS



1. Union bolt	2. Copper washer	3. Brake hose
4. Cap	5. Bleed valve	6. Sliding pin bolt
7. Piston seal	8. Piston	9. Piston boot
10. Cylinder body	11. Sliding pin	12. Torque member mounting bolt
13. Washer	14. Sliding pin boot	15. Bushing
16. Torque member	17. inner shim cover	18. inner shim
19. Inner pad	20. Pad retainer	21. Pad wear sensor
22. Outer pad	23. Outer shim	24. Outer shim cover

Refer to GI-11, "Components" and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease.

3: Apply polyglycol ether based lubricant.

: Apply brake fluid.

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

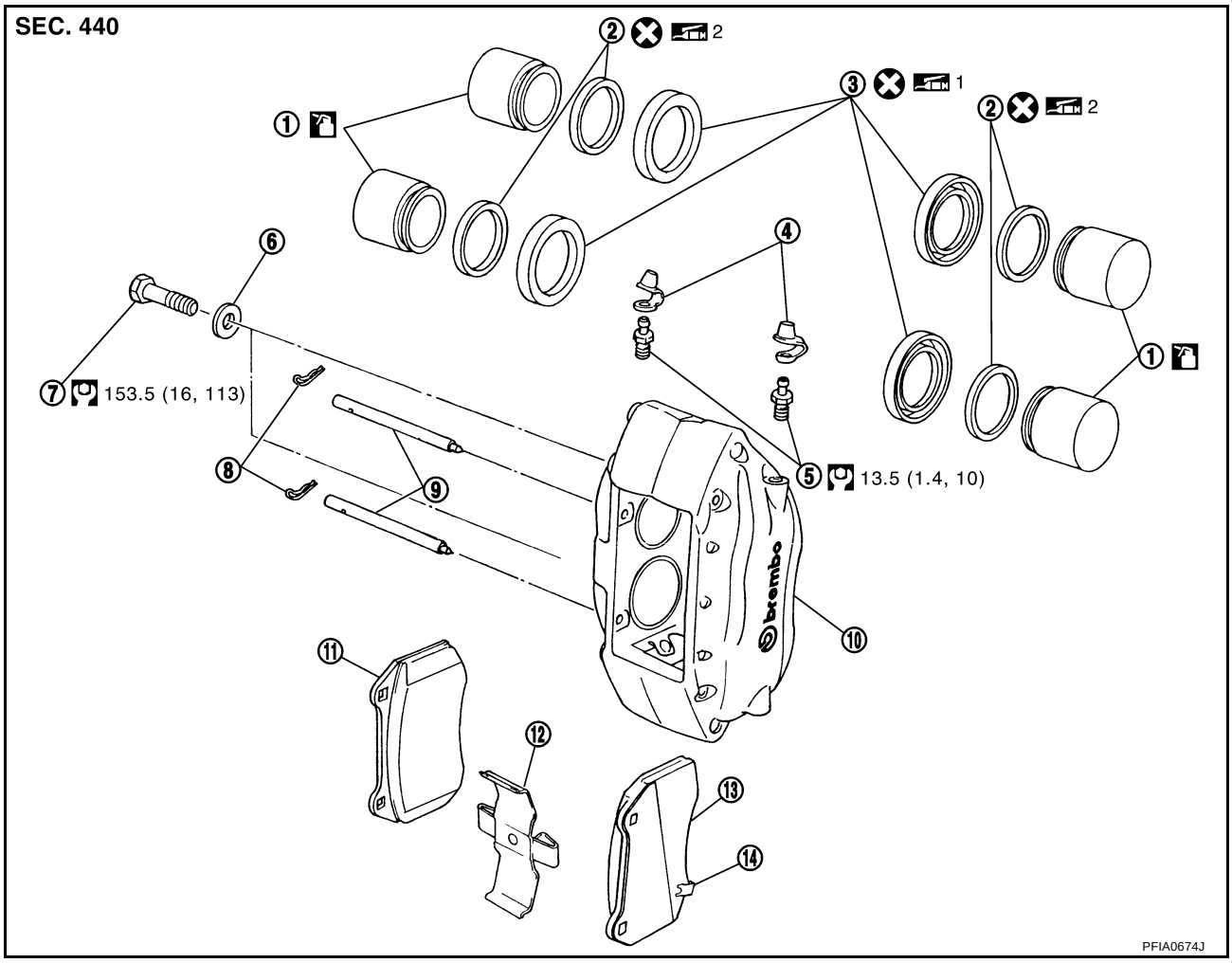
CAUTION:

- **While removing cylinder body, do not depress brake pedal because piston will pop out.**
- **It is not necessary to remove torque member mounting bolts on torque member and brake hose except for disassembly or replacement of caliper assembly. In this case, hang cylinder body with a wire so that brake hose is not under tension.**
- **Do not damage piston boot.**
- **If any shim is subject to serious corrosion, replace it with a new one.**
- **Always replace shim and shim covers as a set when replacing brake pads.**
- **Keep disc rotor clean of brake fluid.**
- **Burnish the brake pads and disc rotor mutually contacting surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to BR-38, "Brake Burnishing Procedure" .**

WITH BREMBO CALIPERS

NOTE:

Refer to BR-30, "HOW TO APPLY GREASE TO THE BRAKE PAD" for how to apply grease to brake pads.



1.	Piston	2.	Piston seal	3.	Piston boot
4.	Cap	5.	Bleed valve	6.	Washer
7.	Bolt	8.	Clips	9.	Pad pins
10.	Caliper	11.	Inner pad	12.	Cross spring
13.	Outer pad	14.	Pad wear sensor		

Refer to GI-11, "Components" and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply polyglycol ether based lubricant.

: Apply brake fluid.

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

- **While the brake pad and cylinder body are separated, the piston may suddenly jump out, so do not depress the brake pedal.**
- **Apart from caliper assembly, disassembly or replacement, there is no need to remove caliper bolts or brake hose or tube.**
- **Do not damage piston boot.**
- **Keep disc rotor clean of brake fluid.**

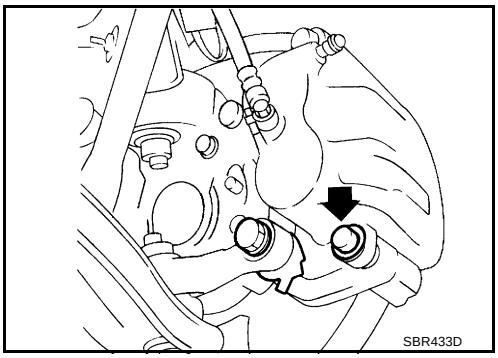
- **Burnish the brake pads and disc rotor mutually contacting surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to BR-38, "Brake Burnishing Procedure" .**

Removal and Installation of Brake Pad (Other than Brembo Calipers)

NFS000AU

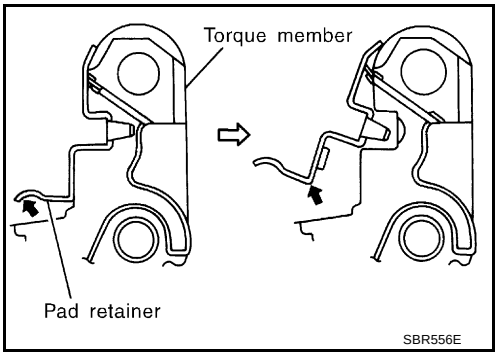
REMOVAL

1. Remove tires from vehicle with a power tool.
2. Remove lower sliding pin bolt.



3. Hang cylinder body with a wire, and remove pads, shims and pad retainers from torque member.

   CAUTION:
   - **When removing pad retainer from torque member, lift pad retainer in the direction shown by arrow (shown in the figure) so as not to deform it.**
   - **Do not damage piston boot.**
   - **Keep disc rotor clean of brake fluid.**

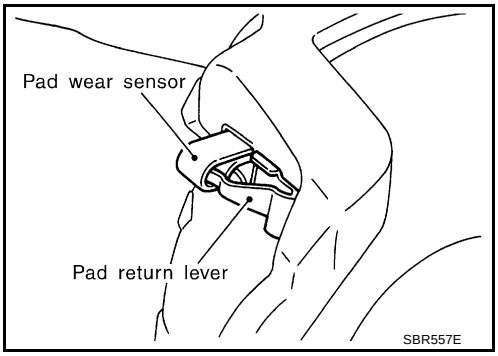


INSTALLATION

1. Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease between pad retainer and pad.
2. Install pad retainers and pad assemblies to torque member.

   CAUTION:
   Inner pad and outer pad have pad-return mechanism on upper side of pad retainer. When installing pad to torque member, be sure to install pad return lever to pad wear sensor securely.
3. Install cylinder body to torque member.

   CAUTION:
   When replacing pads with new ones, press in piston until pads can be installed. In this case, carefully monitor brake fluid level in reservoir tank because brake fluid will return to master cylinder reservoir tank.



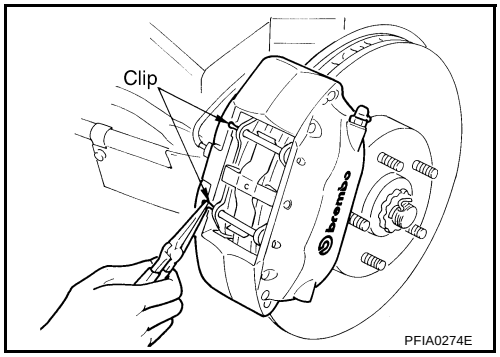
4. Install lower sliding pin bolt, and tighten it to the specified torque. Refer to BR-27, "Components" .
5. Secure disc rotor with wheel nuts. Depress brake pedal a few times until it gets a responsive touch.
6. Check front disc brake for drag.
7. Install tires to vehicle.

Removal and Installation of Brake Pad (With Brembo Calipers)

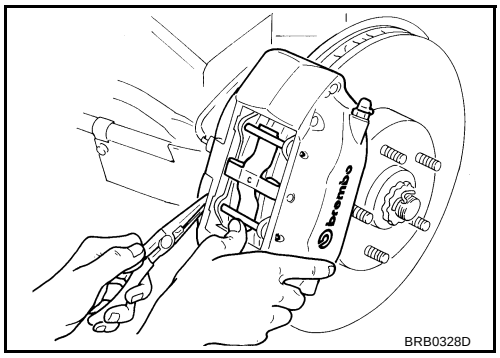
NFS0000W

REMOVAL

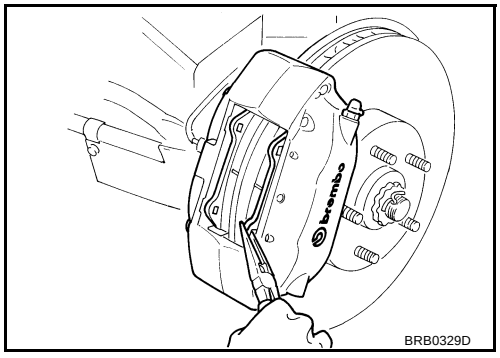
1. Remove tires from vehicle with a power tool.
2. Remove the clip from the pad pin.



3. Remove the pad pin while holding down the cross spring, then remove the cross spring from the caliper.



4. Using pliers, remove the pad from the caliper.



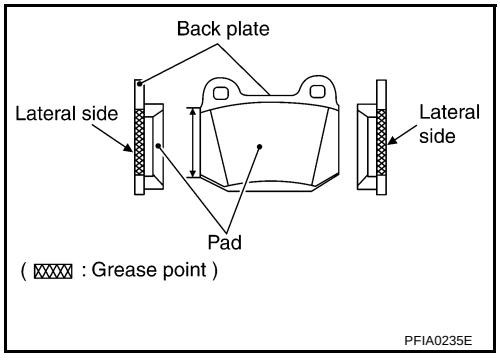
HOW TO APPLY GREASE TO THE BRAKE PAD

Pad Side

Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease about 0.5 g (0.018 oz) per surface equally to back plate side of Inner Pad and Outer Pad. (Refer to the figure.)

CAUTION:

Make sure no foreign matter attaches itself to the grease.



INSTALLATION

1. Insert the piston to the position where the pad is attached.

   NOTE:

   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

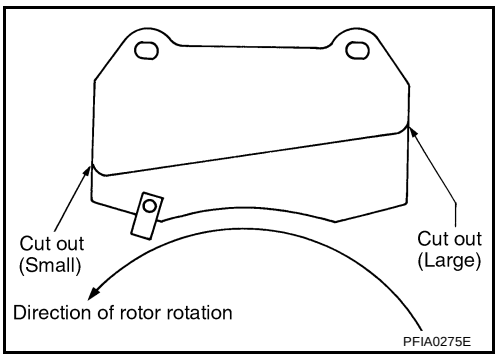
   CAUTION:

   By pushing in the piston, the brake fluid returns to the master cylinder reservoir tank. Watch the level of the surface of the reservoir tank.

2. Attach pad.

CAUTION:

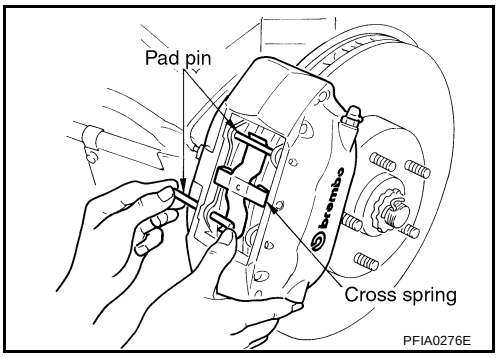
- **Attach the pad with wear sensor to the outer side.**
- **The side of the shim with the larger cutouts should be on the entry side of the disc rotor spin.**



3. Insert the upper pad pin from the inner cylinder side, then insert firmly to the outer cylinder side through the hole in the top of the pad.
4. As shown in the figure, place the top of the cross spring over the top pad pin, press in the cross spring, push the lower pad pin from the inner cylinder side to the outer cylinder side, and secure the cross spring.
5. Insert the clip in the small hole at the end of the pad pin.

CAUTION:

If the clip is not fully attached, the pad pin or the pad could fall out while the vehicle is in motion.



6. Install tires to vehicle.

Removal and Installation of Brake Caliper Assembly (Other than Brembo Calipers)

NFS000AV

REMOVAL

1. Remove tires from vehicle with a power tool.
2. Fasten disc rotor using wheel nut.
3. Drain brake fluid gradually (from bleed valve while depressing brake pedal). Refer to BR-10, "Drain and Refill" .
4. Remove union bolt, and then remove brake hose from caliper assembly.
5. Remove torque member mounting bolts (from torque member), and remove caliper assembly (from vehicle with a power tool).

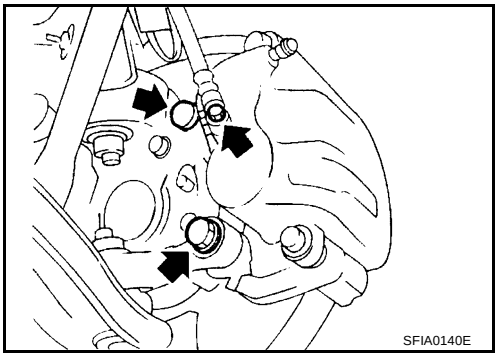
CAUTION:

Do not drop brake pad.

6. Remove disc rotor.

CAUTION:

Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove disc rotor.



INSTALLATION

CAUTION:

- **Refill with new brake fluid “DOT 3”.**
- **Do not reuse drained brake fluid.**

1. Install disc rotor.

CAUTION:

Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.

2. Install caliper assembly to vehicle, and tighten torque member mounting bolts to the specified torque. Refer to BR-27, "Components" .

CAUTION:

Before installing torque member to vehicle, wipe oil and grease on washer seats on steering knuckle and mounting surface of torque member.

3. Install a projection of brake hose metal fitting by aligning with protrusions on cylinder body, and tighten union bolt to the specified torque. Refer to BR-27, "Components" .

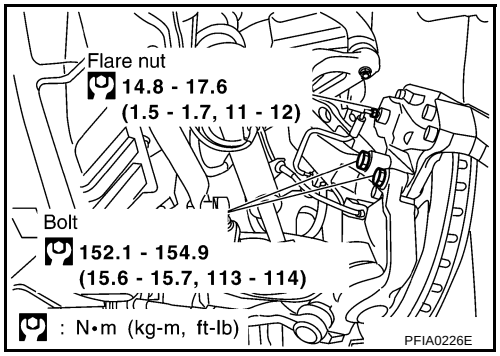
   CAUTION:
   - **Do not reuse copper washers for union bolts.**
   - **Assemble brake hose securely on caliper assembly.**
4. After installing caliper assembly, refill with new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .
5. Install tires to vehicle.

Removal and Installation of Brake Caliper Assembly (With Brembo Calipers)

NFS0000X

REMOVAL

1. Remove tires from vehicle with a power tool.
2. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
3. Remove the brake pad. Refer to BR-30, "Removal and Installation of Brake Pad (With Brembo Calipers)" .
4. Remove the brake tube flare nut using a flare wrench.
5. Remove the brake tube bracket from the knuckle spindle.



6. Remove the caliper bolt and remove the caliper assembly from the vehicle.
7. Remove disc rotor.

   CAUTION:
   Put matching marks of wheel hub assembly and disc rotor, if it is necessary to remove when removing disc rotor.

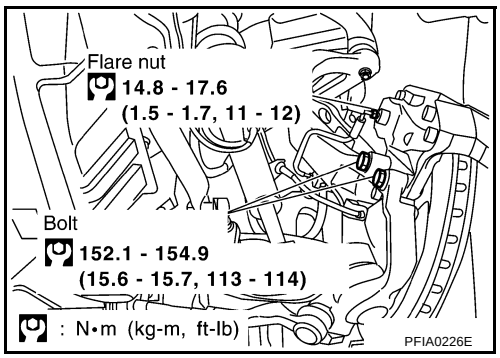
INSTALLATION

CAUTION:
- **Refill with new brake fluid “DOT 3”.**
- **Never reuse drained brake fluid.**

1. Install disc rotor.

   CAUTION:
   Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.
2. Install caliper assembly to the vehicle, and tighten bolts to the specified torque.

   CAUTION:
   When attaching the caliper assembly to the vehicle, wipe any oil off the knuckle spindle washers and caliper assembly attachment surfaces.



3. Attach the brake tube to the caliper assembly and partially tighten the flare nut.

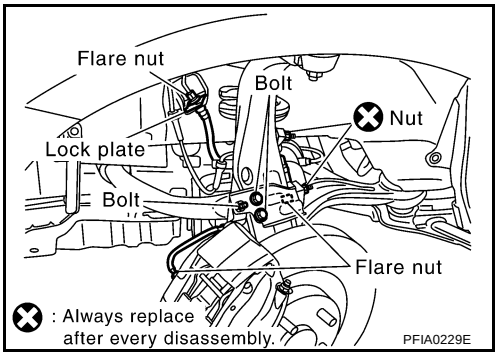
4. Attach the brake tube bracket to the knuckle spindle and tighten to the specified torque.

   : 10.8 – 15.6 N·m (1.1 – 1.5 kg-m, 8 – 11 ft-lb)

5. Using a flare nut crowfoot and torque wrench, tighten the caliper assembly and brake tube connection flare nut to the specified torque.

   : 14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)

6. Attach brake pad. Refer to BR-30, "Removal and Installation of Brake Pad (With Brembo Calipers)" .



7. Refill new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .
8. Install tires to vehicle.

Disassembly and Assembly of Brake Caliper Assembly (Other than Brembo Calipers)

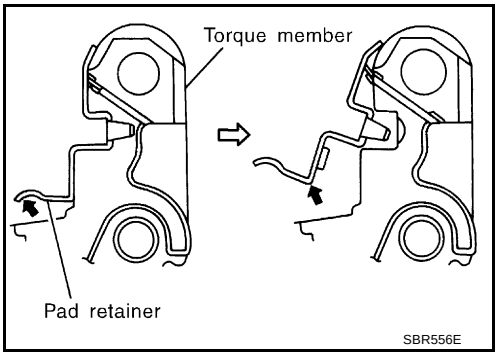
NFS000AW

NOTE:
Do not remove torque member, brake pads, shims, shim covers and pad retainers, when disassembling or assembling cylinder body.

DISASSEMBLY

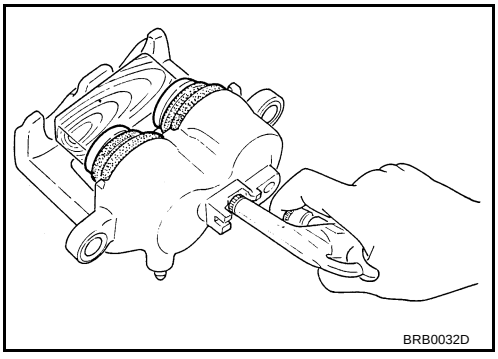
1. Remove caliper assembly from vehicle. Refer to BR-31, "Removal and Installation of Brake Caliper Assembly (Other than Brembo Calipers)" .
2. Remove sliding pin bolts from cylinder body, and remove pads, shims, shim cover and pad retainers from torque member.

   CAUTION:
   When removing pad retainer from torque member, lift the pad retainer in the direction shown by arrow (shown in the figure) so as not to deform it.



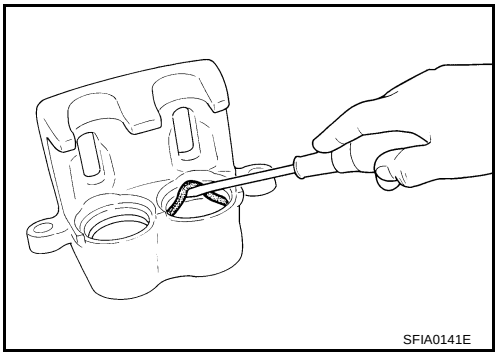
3. Remove sliding pins and sliding pin boots from torque member.
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.

   CAUTION:
   Do not get fingers caught in the pistons.



5. Using a flat-bladed screwdriver, remove piston seals from cylinder body.

   CAUTION:
   Be careful not to damage the inner wall of cylinder.



INSPECTION AFTER DISASSEMBLY

Cylinder Body

CAUTION:

Use new brake fluid to clean. Do not use mineral oils such as gasoline or kerosene.

- Check the inner wall of cylinder for corrosion, wear, and damage. If a malfunction is detected, replace cylinder body.
- Minor flaws caused by corrosion or a foreign material can be removed by polishing a surface of the inner wall with a fine sandpaper. Replace cylinder body, if a malfunction is detected.

Torque Member

Check for wear, cracks, and damage. If a malfunction is detected, replace applicable part.

Piston

CAUTION:

The piston sliding surface is plated. Do not polish with sandpaper.

Check piston surface for corrosion, wear, and damage. If a malfunction is detected, replace applicable part.

Sliding Pin, Sliding Pin Bolt, and Sliding Pin Boot

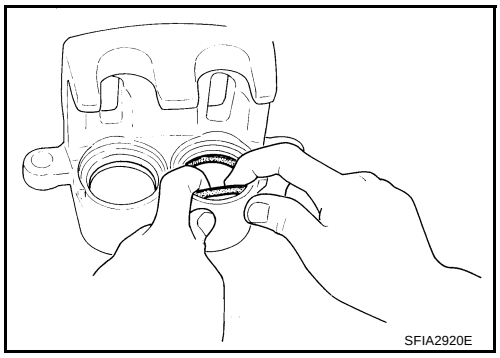
Check sliding pins and sliding pin boots for wear, damage, and cracks. If a malfunction is detected, replace applicable part.

ASSEMBLY

1. Apply polyglycol ether based lubricant to the piston seal, and install them to the cylinder body.

   CAUTION:

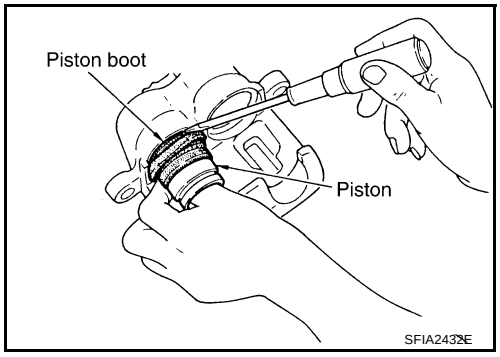
   Do not reuse piston seal.



2. Apply rubber grease to piston boots. Cover the piston end with piston boot, and install cylinder-side lip on piston boot properly into groove on cylinder body.

   CAUTION:

   Do not reuse piston boot.

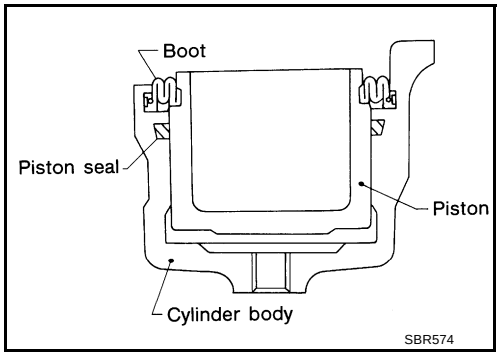


3. Apply brake fluid to piston, and press piston into cylinder body by hand to assemble piston-side lip on piston boot properly into a groove on piston.

   CAUTION:

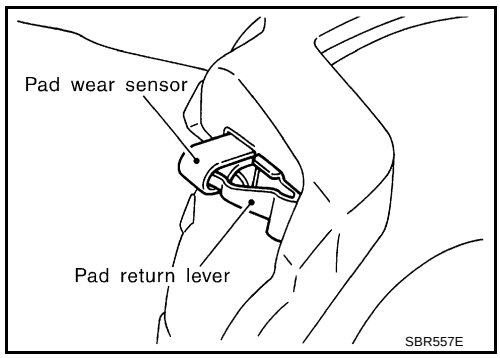
   Press piston evenly and change pressing point to prevent inner wall of cylinder from being rubbed.

4. Install sliding pins and sliding pin boots to the torque member.



5. Install the torque member to the steering knuckle and tighten the mounting bolts to the specified torque. Refer to BR-27, "Components" .

CAUTION:
Before installing torque member to vehicle, wipe off oil and grease on the washer seats on steering knuckle and the mounting surface of the torque member.



6. Install pad retainers to torque member.
7. Press in piston until pads can be installed, and then install cylinder body to torque member.
8. Install cylinder body, and tighten sliding pin bolt to the specified torque. Refer to BR-27, "Components" .
9. Position a projection of brake hose metal fitting by aligning with protrusions on cylinder body and tighten union bolt to specified torque. Refer to BR-12, "Hydraulic Circuit" .

CAUTION:
- **Assemble brake hose securely to cylinder body.**
- **Do not reuse copper washer for union bolts.**

10. After installing caliper assembly, refill with new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

DISC ROTOR INSPECTION

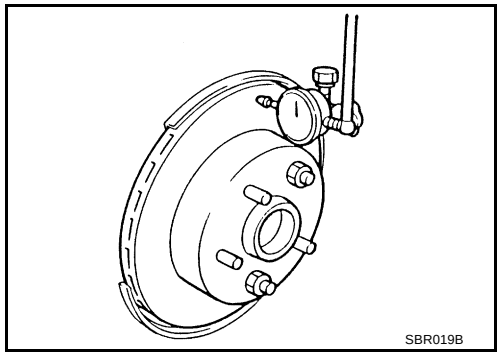
Visual Inspection

Check surfaces of disc rotor for uneven wear, cracks, and serious damage. If a malfunction is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, secure disc rotor to wheels hub. (2 or more positions)
2. Using a dial indicator, check runout.

Measurement point:
At a point 10.0 mm (0.394 in) from outer edge of disc
Runout limit (with it attached to the vehicle):
0.035 mm (0.0014 in) or less



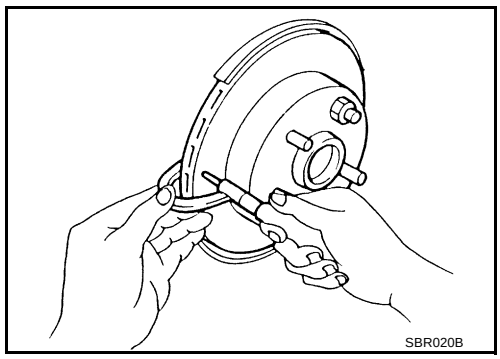
NOTE:
Make sure that wheel bearing axial end play is with in the specification before measuring runout. Refer to FAX-4, "On-Vehicle Inspection" .

3. If runout is outside limit, find the minimum runout point by shifting the mounting positions of disc rotor and wheel hub by one hole.
4. If runout is still outside the limit after performing the above operation, replace or lathe the disc rotor. [When lathing, use the Pro–Cut PFM On–Car Brake Lathe (Tool No. 38–PFM90.5) or equivalent.]

Thickness Inspection

Using a micrometer, check thickness of disc rotor. If thickness is outside standard, replace disc rotor.

Standard thickness : 28.0 mm (1.10 in)
Repair limit thickness : 26.0 mm (1.02 in)
Maximum uneven wear (measured at 8 positions)
: 0.015 mm (0,0006 in) or less



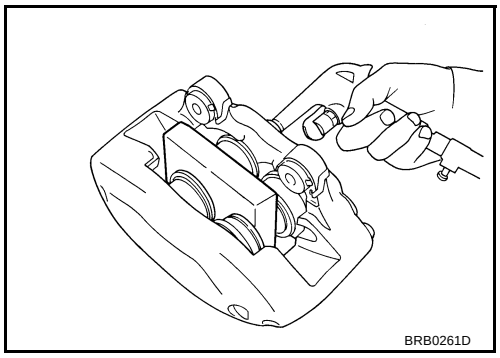
Disassembly and Assembly of Brake Caliper Assembly (With Brembo Calipers)

NFS0000Y

DISASSEMBLY

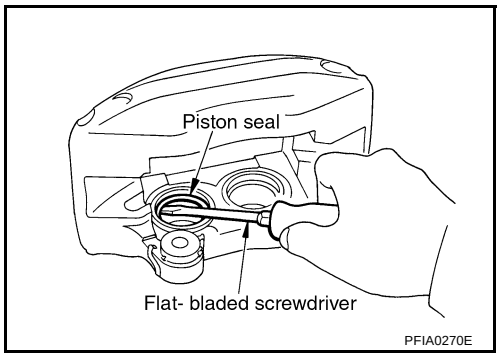
1. Insert a piece of wood as shown in the figure, blow air in through the flare nut mounting hole, and remove the piston and piston boot. If the four pistons do not all come out at the same time, press the piston(s) that have come out a ways into the cylinder body and blow air in again.

   CAUTION:
   Do not get fingers caught in the piston.
2. Remove the piston boot from the piston.



3. Using a flat-bladed screwdriver, remove the piston seal.

   CAUTION:
   - **Be careful not to damage cylinder inner wall.**
   - **Never remove the four bolts from the inner and outer sides of the caliper. Do not tighten them further, either.**



CALIPER INSPECTION

Caliper

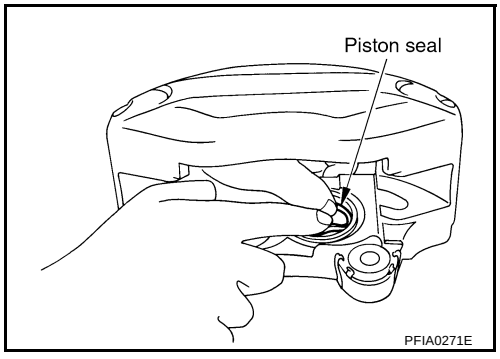
CAUTION:
- **Use new brake fluid to clean. Do not use mineral oils such as gasoline or kerosene.**
- **Check for corrosion, wear, or damage to the cylinder inner wall, and replace the caliper if there are any non-standard conditions.**

Piston

CAUTION:
- **Since the piston surface is plated, do not repair using sandpaper.**
- **Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.**

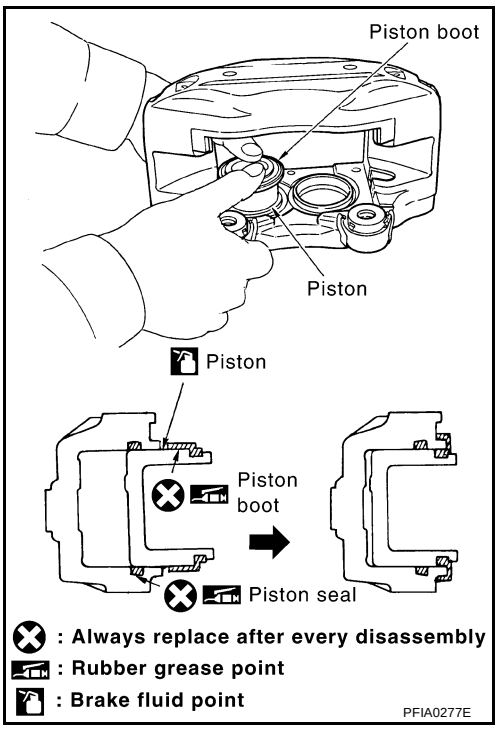
ASSEMBLY

1. Apply polyglycol ether based lubricant to the piston seal, and install them to the cylinder body.



2. Apply rubber grease to the piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.
3. Insert the piston into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

CAUTION:
Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



4. Attach the shim and shim cover to the pad and attach to the caliper.

DISC ROTOR INSPECTION

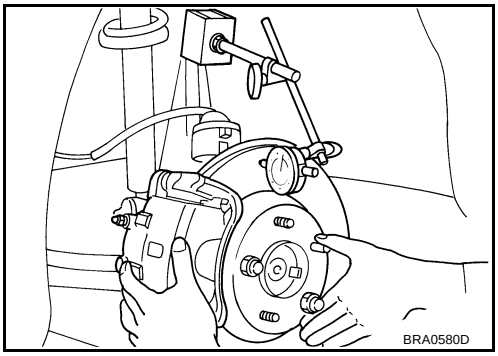
Visual Inspection

Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)
Runout limit (with it attached to the vehicle)
: 0.040 mm (0.0016 in) or less
Runout limit (just the disc rotor)
: 0.040 mm (0.0016 in) or less



NOTE:
Make sure that wheel bearing axial end play is with in the specifications before measuring runout. Refer to FAX-4, "On-Vehicle Inspection" .

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.
4. If runout is still outside the limit after performing the above operation, replace or lathe the disc rotor. [When lathing, use the Pro–Cut PFM On–Car Brake Lathe (Tool No. 38–PFM90.5) or equivalent.]

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.

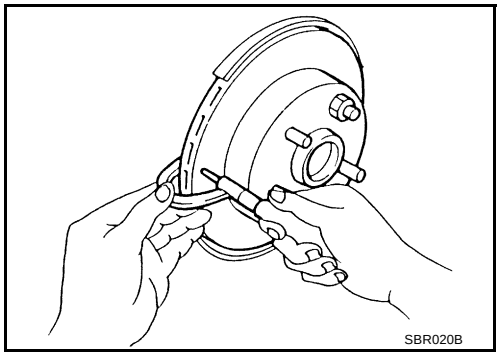
Standard

Standard thickness : 30.0 mm (1.181 in)

Wear limit : 28.4 mm (1.118 in)

Maximum uneven wear (measured at 8 positions)

: 0.015 mm (0.0006 in) or less



Brake Burnishing Procedure

NFS000AX

Burnish the brake pad and disc rotor mutually contacting surfaces of disc rotor according to following procedure after refinishing or replacing disc rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

CAUTION:

- **Be careful of vehicle speed because brake does not operate easily until pad and disc rotor are securely fitted.**
- **Only perform this procedure under safe road and traffic conditions. Use extreme caution.**

1. Drive vehicle on straight, flat road.
2. Depress brake pedal with the power to stop vehicle within 3 to 5 seconds until the vehicle stops.
3. Drive without depressing brake for a few minutes to cool brake.
4. Repeat steps 1 to 3 until pad and disc rotor are securely fitted.

REAR DISC BRAKE

PFP:44000

On-Vehicle Inspection

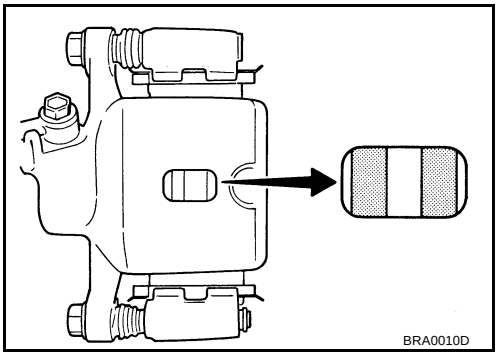
NFS0000Z

PAD WEAR INSPECTION

Other than Brembo Calipers

- Inspect the thickness of the pad through the cylinder body inspection hole. Use a scale for inspection if necessary.

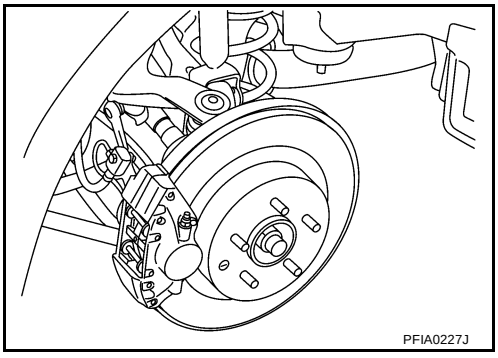
Standard thickness : 8.5 mm (0.335 in)
Repair limit thickness : 2.0 mm (0.079 in)



With Brembo Calipers

- Inspect the thickness of the pad through the caliper inspection hole. Use a scale for inspection if necessary.

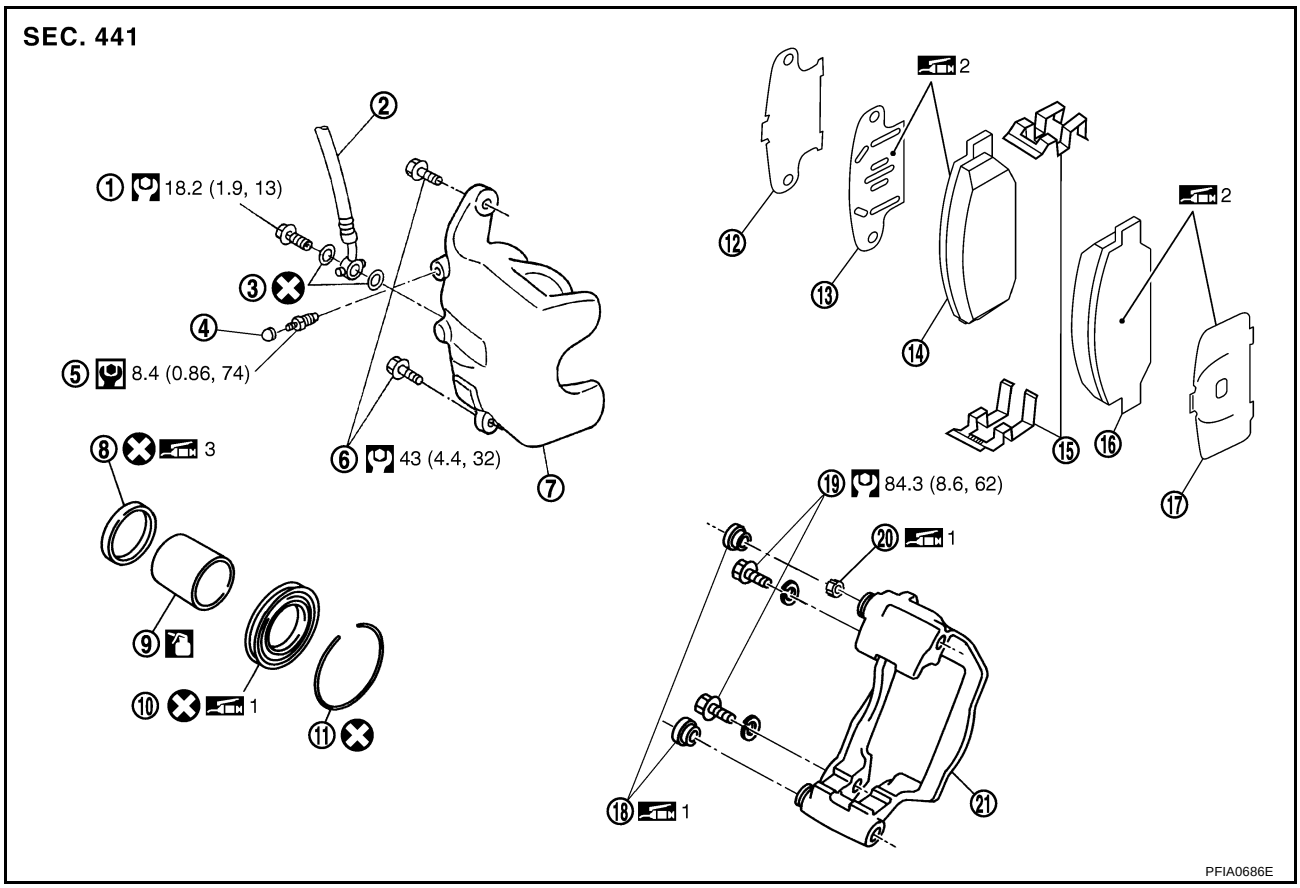
Standard thickness : 9.1 mm (0.358 in)
Repair limit thickness : 2.0 mm (0.079 in)



Components

NFS00010

OTHER THAN BREMBO CALIPERS



1.	Union bolt	2.	Brake hose	3.	Copper washer
4.	Cap	5.	Bleed valve	6.	Sliding pin bolt
7.	Cylinder body	8.	Piston seal	9.	Piston
10.	Piston boot	11.	Retaining ring	12.	Inner shim cover
13.	Inner shim	14.	Inner pad	15.	Pad retainer
16.	Outer pad	17.	Outer shim	18.	Slide pin boot
19.	Torque member bolt	20.	Bushing	21.	Torque member

Refer to GI-11, "Components" and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease.

3: Apply polyglycol ether based lubricant.

: Apply brake fluid.

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

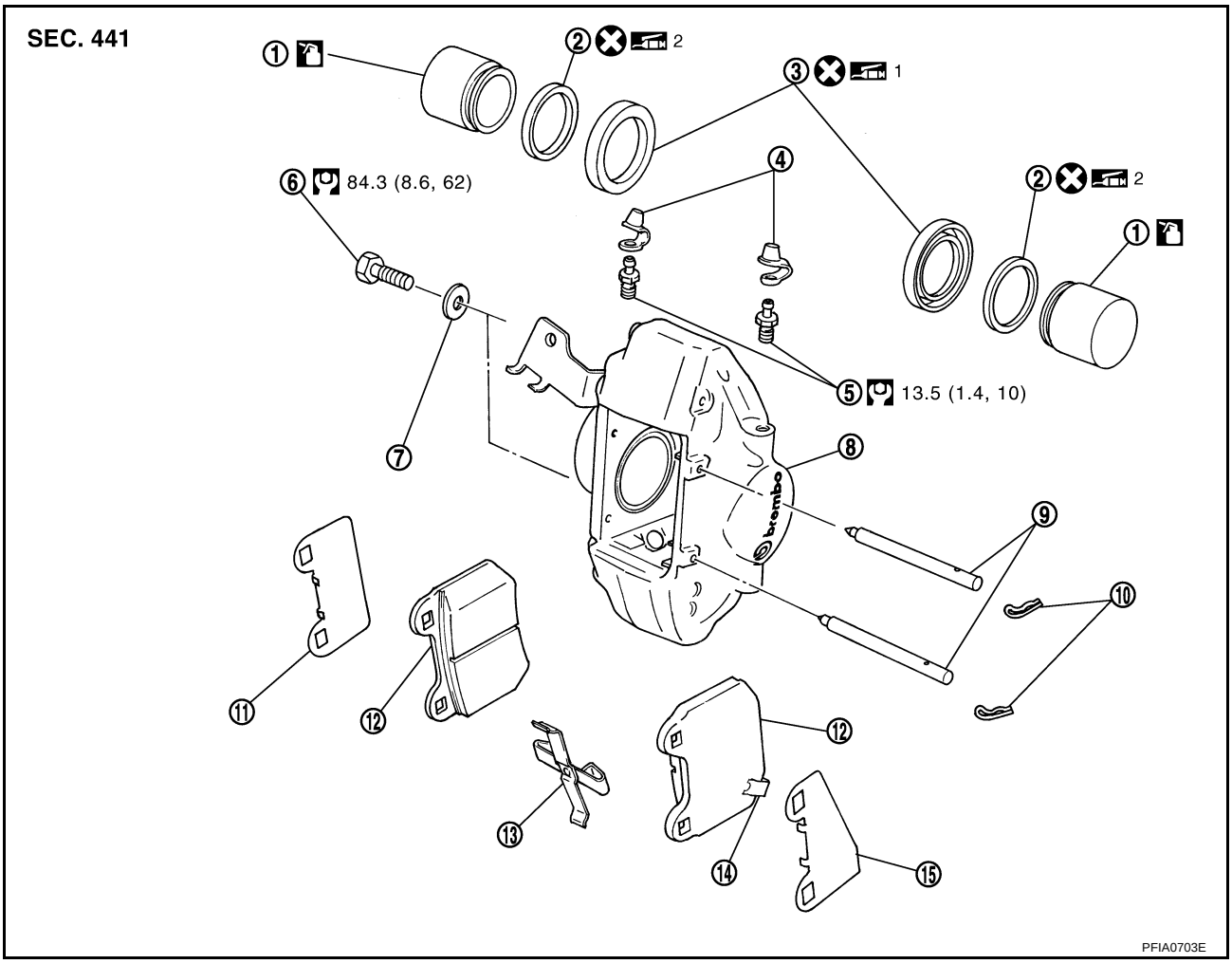
CAUTION:

- **While removing cylinder body, never depress the brake pedal because the piston will pop out.**
- **It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of the caliper assembly. In this case, hang cylinder body with a wire so as not to stretch brake hose.**
- **Do not damage piston boot.**
- **If any shim is subject to serious corrosion, replace it with a new one.**
- **Always replace shims and shim covers as a set when replacing brake pads.**
- **Keep disc rotor clean of brake fluid.**

WITH BREMBO CALIPERS

NOTE:

Refer to BR-43, "HOW TO APPLY GREASE TO THE BRAKE PAD" for how to apply grease to brake pads.



1.	Piston	2.	Piston seal	3.	Piston boot
4.	Cap	5.	Bleed valve	6.	Bolt
7.	Washer	8.	Caliper	9.	Pad pins
10.	Clips	11.	Inner shim cover	12.	Brake pad
13.	Cross spring	14.	Pad wear sensor	15.	Outer shim cover

Refer to GI-11, "Components" and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply polyglycol ether based lubricant.

: Apply brake fluid.

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

- **While removing cylinder body, never depress the brake pedal because the piston will pop out.**
- **Apart from caliper assembly, disassembly or replacement, there is no need to remove caliper bolts or brake hose or tube.**
- **Do not damage piston boot.**
- **Always replace shim covers as a set when replacing brake pads.**
- **Keep disc rotor clean of brake fluid.**

Removal and Installation of Brake Pad (Other than Brembo Calipers)

NFS00011

REMOVAL

1. Remove tires from vehicle with a power tool.
2. Remove sliding pin bold (one on top).
3. Hang cylinder body with a wire, and remove pads, pad retainers, shims and shim cover from torque member.

INSTALLATION

1. Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the rear of the pad and to both sides of the shim, and attach the inner shim and shim cover to the inner pad, and the outer shim to the outer pad.
2. Attach the pad retainer and pad to the torque member.
3. Push the piston in so that the pad is firmly attached and attach the cylinder body to the torque member.

   NOTE:
   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

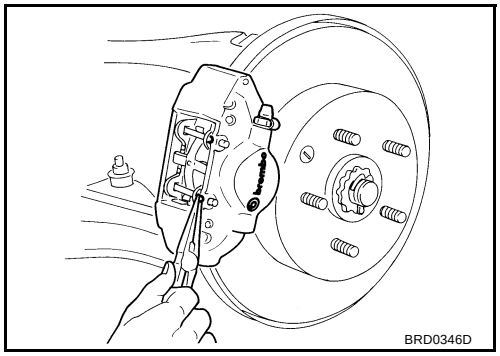
   CAUTION:
   By pushing in the piston, the brake fluid returns to the master cylinder reservoir tank. Watch the level of the surface of the reservoir tank.
4. Attach the sliding pin bolt (one on top) and tighten to the specified torque.
5. Check brake for drag.
6. Install tires to vehicle.

Removal and Installation of Brake Pad (With Brembo Calipers)

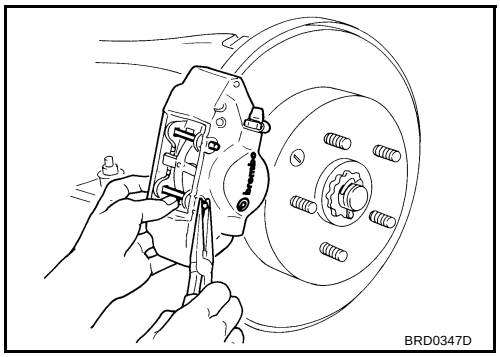
NFS00016

REMOVAL

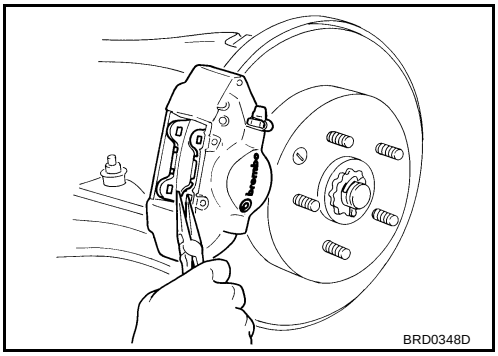
1. Remove tires from vehicle with a power tool.
2. Remove the clip from the pad pin.



3. Remove the pad pin while holding down the cross spring, then remove the cross spring from the caliper.



4. Using pliers, remove the pad from the caliper.



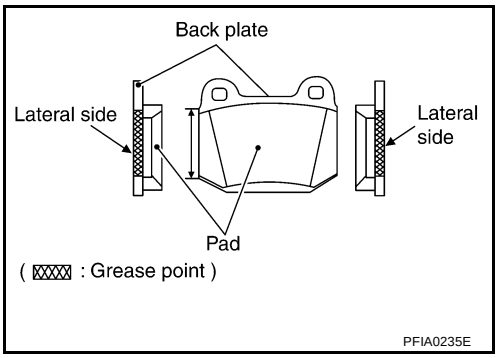
HOW TO APPLY GREASE TO THE BRAKE PAD

Pad Side

Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease about 0.5 g (0.018 oz) per surface equally to back plate side of Inner Pad and Outer Pad. (Refer to the figure)

CAUTION:

Make sure no foreign matter attaches itself to the grease.



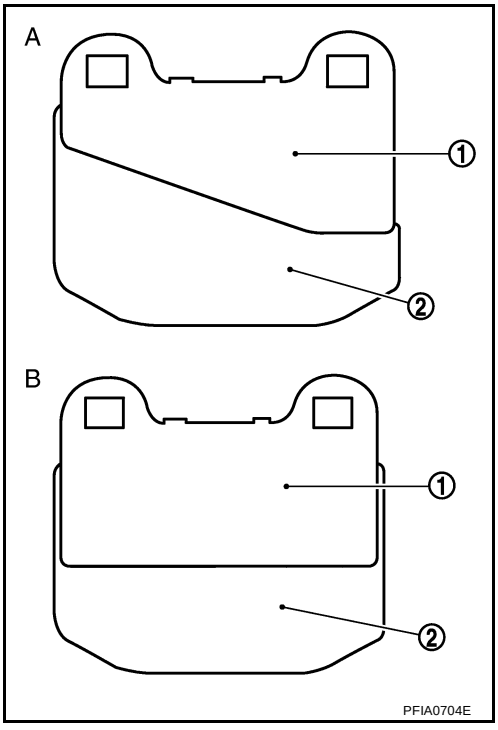
Pad Rear

Apply approximately 1.5 g (0.053 oz) of PBC (Poly Butyl Cuprysil) grease or silicone -based grease between shim cover (1) and pad (2).

- A: Outer side
- B: Inner side

CAUTION:

Make sure no foreign matter attaches itself to the grease.



INSTALLATION

1. Insert the piston to the position where the pad is attached.

   NOTE:

   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

   CAUTION:

   Pushing the piston in will make the brake fluid return to the master cylinder reservoir tank, so watch the level of the surface of the reservoir tank.

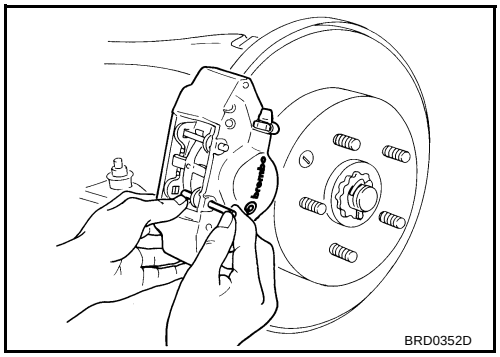
2. Attach pad and shim cover.

CAUTION:
Attach the pad with wear sensor to the outer side.

3. Insert the upper pad pin from the outer cylinder side, then insert firmly to the inner cylinder side through the hole in the top of the pad.
4. As shown in the figure, place the top of the cross spring over the top pad pin, press in the cross spring, push the lower pad pin from the outer cylinder side to the inner cylinder side, and secure the cross spring.
5. Insert the clip in the small hole at the end of the pad pin.

CAUTION:
If the clip is not fully attached, the pad pin or the pad could fall out while the vehicle is in motion.

6. Install tires to vehicle.



Removal and Installation of Brake Caliper Assembly (Other than Brembo Calipers)

NFS00012

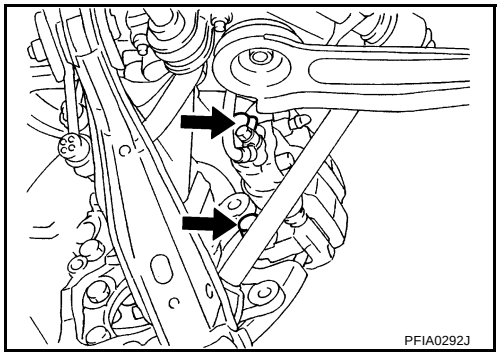
REMOVAL

1. Remove tires from vehicle with a power tool.
2. Fasten disc rotor using wheel nut.
3. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
4. Remove union bolts then disconnect brake hose from caliper assembly and torque member bolts, and remove caliper assembly.

CAUTION:
Do not drop brake pad.

5. Remove disc rotor.

CAUTION:
Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove disc rotor.



INSTALLATION

CAUTION:

- **Refill with new brake fluid “DOT 3”.**
- **Do not reuse drained brake fluid.**

1. Install disc rotor.

CAUTION:
Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.

2. Install caliper assembly to the vehicle, and tighten torque member mounting bolts to the specified torque.

CAUTION:
Before installing caliper assembly to the vehicle, wipe off oil and grease on washer seats on axle assembly and mounting surface of caliper assembly.

3. Install L-shape pin of brake hose to caliper assembly and tighten union bolts to the specified torque.

CAUTION:

- **Do not reuse the copper washer for union bolts.**
- **Securely attach brake hose to protrusion on caliper assembly.**

4. Insert new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .
5. Check rear disc brake for drag.
6. Install tires to vehicle.

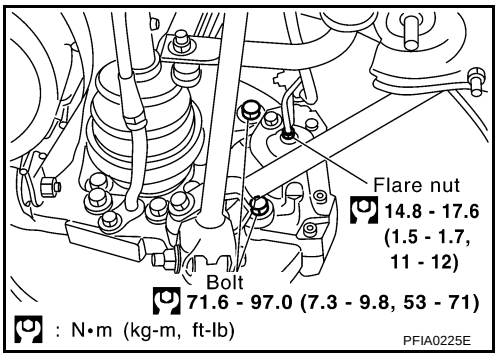
Removal and Installation of Brake Caliper Assembly (With Brembo Calipers)

NFS00017

REMOVAL

1. Remove tires from vehicle with a power tool.
2. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
3. Remove the brake pad. Refer to BR-42, "Removal and Installation of Brake Pad (With Brembo Calipers)" .
4. Remove the brake tube flare nut using a flare wrench.
5. Remove the brake hose bolt, move the brake hose, and remove the caliper assembly from the vehicle.
6. Remove disc rotor.

CAUTION:
Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove disc rotor.



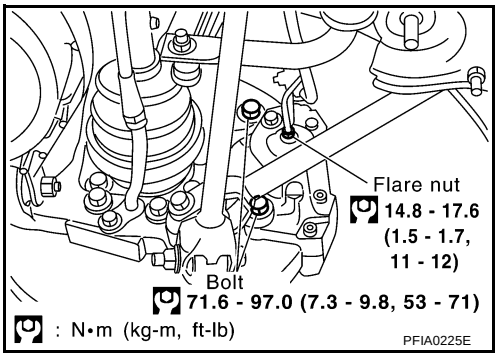
INSTALLATION

CAUTION:
- **Refill with new brake fluid “DOT 3”.**
- **Do not reuse drained brake fluid.**

1. Install disc rotor.

CAUTION:
Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.

2. Install the brake tube to the caliper assembly and partially tighten the flare nut.
3. Install the caliper assembly to the vehicle and tighten the bolt to the specified torque.
4. Tighten the flare nut to the specified torque.
5. Install brake pad and shim. Refer to BR-42, "Removal and Installation of Brake Pad (With Brembo Calipers)" .
6. Refill new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .
7. Install tires to vehicle.



Disassembly and Assembly of Brake Caliper Assembly (Other than Brembo Calipers)

NFS00013

NOTE:
Do not remove torque member, pads, shims, shim cover and pad retainers when disassembling and assembling cylinder body assembly.

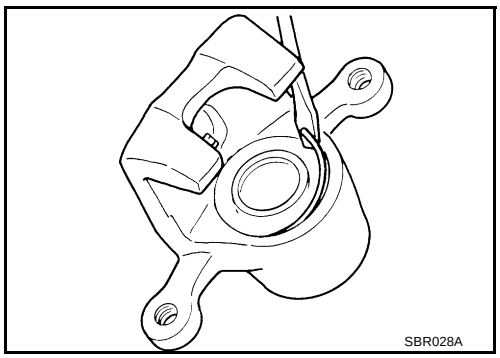
DISASSEMBLY

1. Remove the slide pin bolt, and then remove cylinder body from torque member.

CAUTION:
Do not drop pads, shims, shim covers and pad retainers from torque member.

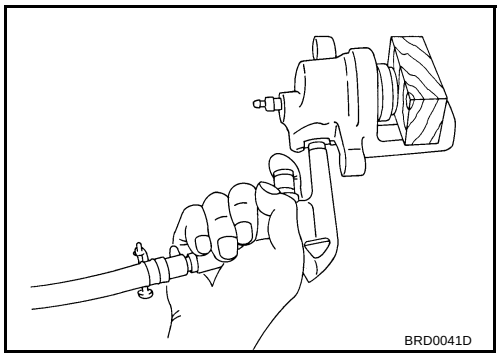
2. Remove sliding pin boot from torque member.

3. As shown in the figure, using a flat-bladed screwdriver, remove the retaining ring from the cylinder body.


SBR028A

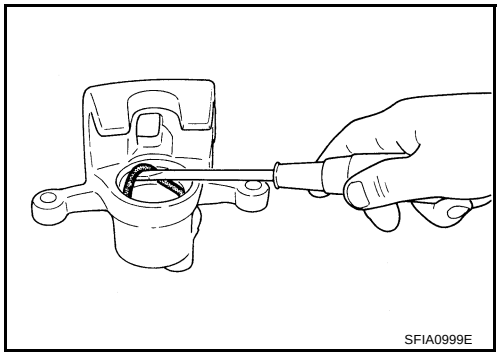
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.

CAUTION:
Do not get fingers caught in the piston.


BRD0041D

5. Using a flat-bladed screwdriver, remove piston seals from cylinder body.

CAUTION:
Be careful not to damage cylinder inner wall.


SFIA0999E

CALIPER INSPECTION

Cylinder Body

CAUTION:

- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check inner wall of cylinder for corrosion, wear, and damage. If any non-standard condition is detected, replace cylinder body.**
- **Minor flaws caused by corrosion or a foreign material can be removed by polishing the surface with a fine sandpaper. Replace the cylinder body, if necessary.**

Torque Member

Check for wear, cracks, and damage. If damage or deformation is present, replace the affected part.

Piston

CAUTION:
Since the piston surface is plated, do not repair using sandpaper.
Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.

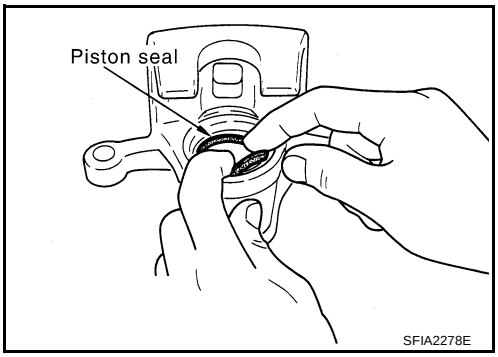
Sliding Pin Bolts and Sliding Pin Boots

Check that there is no wear, damage, or cracks in the sliding pin bolts and sliding pin boots, and if there are, replace them.

ASSEMBLY

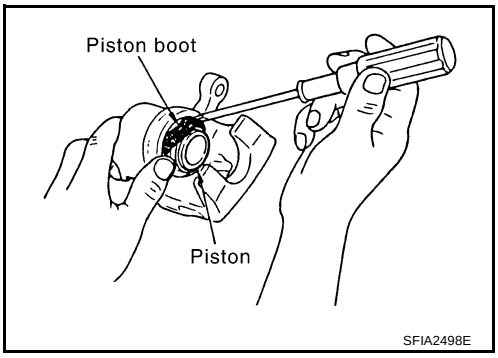
1. Apply polyglycol ether based lubricant to the piston seal, and install them to the cylinder body.

   CAUTION:
   Do not reuse piston seal.



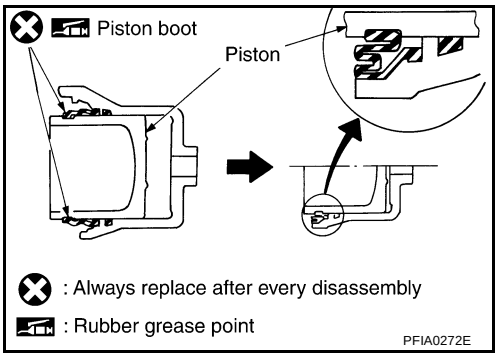
2. Apply rubber grease to piston boot. Cover the piston end with the piston boot, and then install cylinder slide lip on the piston boot securely into the groove on cylinder body.

   CAUTION:
   Do not reuse the piston boot.



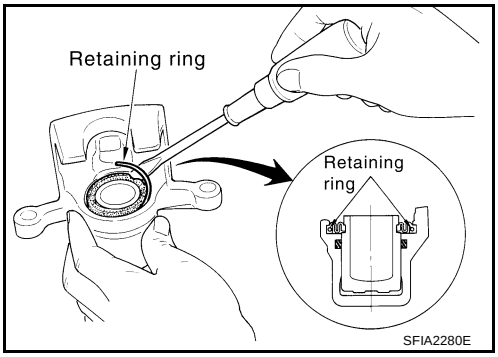
3. Apply a brake fluid to the piston, insert into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

   CAUTION:
   Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



4. Fix piston boot with retaining ring.

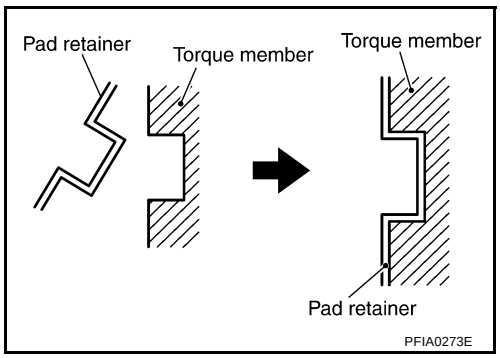
   CAUTION:
   - **Make sure the boot is firmly in the cylinder body groove.**
   - **Do not reuse the retaining ring.**



5. Install the sliding pin bolt and sliding pin boot to the torque member.
6. Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the rear of the pad and to both sides of the shim, and attach the inner shim and shim cover to the inner pad, and the outer shim to the outer pad.

7. Install the pad retainers and pads to the torque member.

CAUTION:
When attaching the pad retainer, attach it firmly so that it does not float up higher than the torque member, as shown in the figure.



8. After assembling shims and shim cover to pad, install it to the torque member.
9. Install cylinder body. Tighten sliding pin bolts to the specified torque. Refer to BR-40, "Components" .

DISC ROTOR INSPECTION

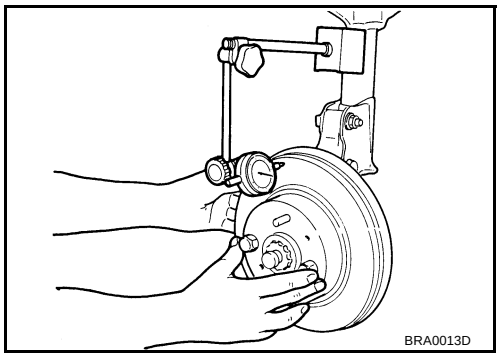
Visual Inspection

Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)
Measurement position:
At a point 10 mm (0.39 in) from outer edge of the disc
Runout limit (with it attached to the vehicle):
0.055 mm (0.0022 in) or less
Runout limit (just the disc rotor):
0.020 mm (0.008 in) or less



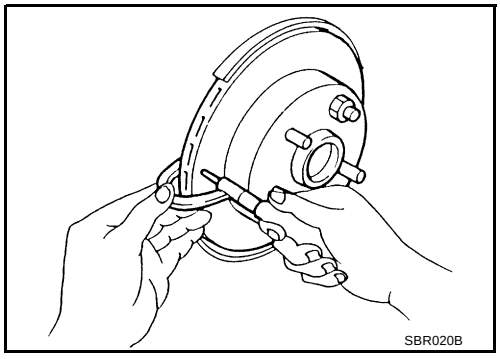
NOTE:
Make sure that wheel bearing axial end play is with in the specification before measuring runout. Refer to RAX-6, "On-Vehicle Inspection" .

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.
4. If runout is still outside the limit after performing the above operation, replace or lathe the disc rotor. [When lathing, use the Pro–Cut PFM On–Car Brake Lathe (Tool No. 38–PFM90.5) or equivalent.]

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.

Standard
Standard thickness : 16.0 mm (0.630 in)
Wear limit : 14.0 mm (0.551 in)
Maximum uneven wear (measured at 8 positions)
: 0.015 mm (0.0006 in) or less



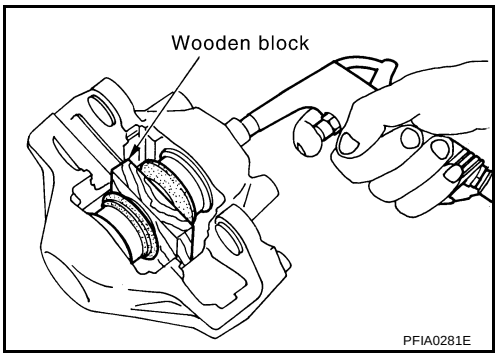
Disassembly and Assembly of Brake Caliper Assembly (With Brembo Calipers)

NFS00018

DISASSEMBLY

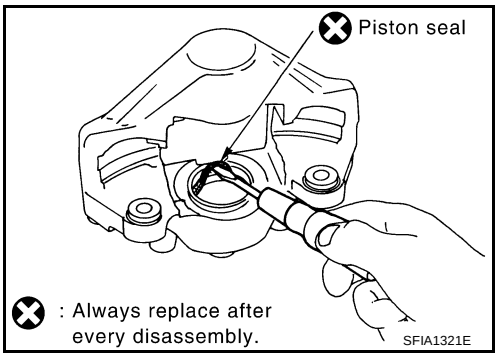
1. Insert a piece of wood as shown in the figure, blow air in through the flare nut mounting hole, and remove the piston and piston boot.

   CAUTION:
   Do not get fingers caught in the piston.
2. Remove the piston boot from the piston.



3. Using a flat-bladed screwdriver, remove the piston seal.

   CAUTION:
   - **Be careful not to damage cylinder inner wall.**
   - **Never remove the four bolts from the inner and outer sides of the caliper. Do not tighten them further, either.**



CALIPER INSPECTION

Caliper

CAUTION:
- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check for corrosion, wear, or damage to the cylinder inner wall, and replace the caliper if there are any non-standard conditions.**

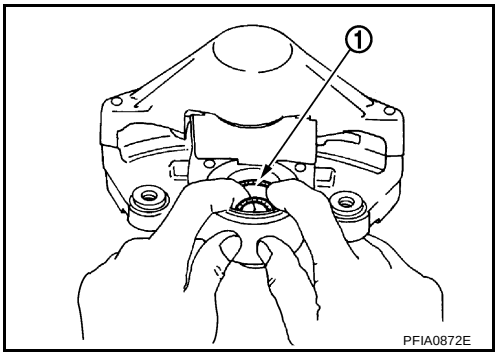
Piston

CAUTION:
- **Since the piston surface is plated, do not repair using sandpaper.**
- **Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.**

ASSEMBLY

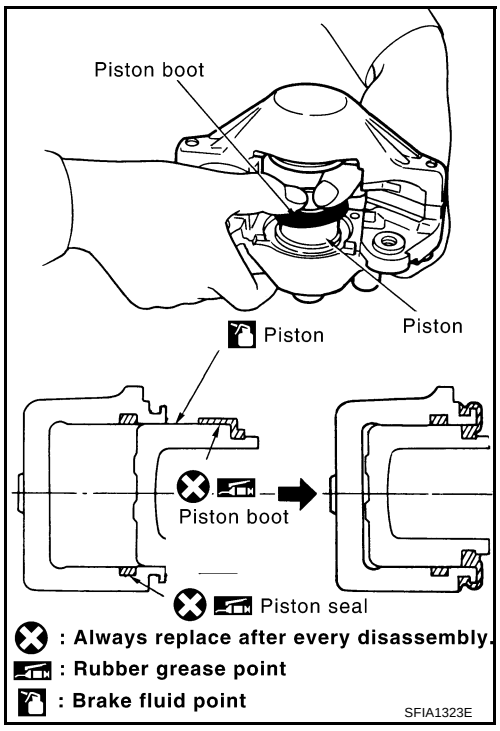
1. Apply polyglycol ether based lubricant to the piston seal (1), and install them to the cylinder body.

   CAUTION:
   Do not reuse piston seal.



2. Apply rubber grease to the piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.
3. Insert the piston into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

CAUTION:
Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



DISC ROTOR INSPECTION

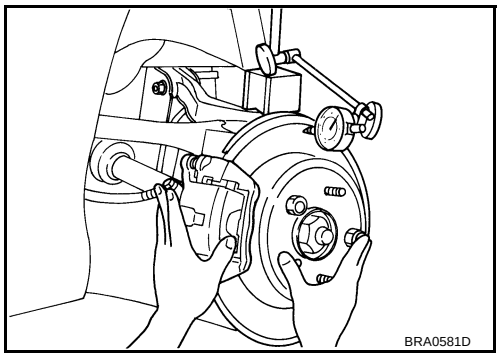
Visual Inspection

Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)
Runout limit (with it attached to the vehicle)
: 0.070 mm (0.0028 in) or less
Runout limit (just for disc rotor)
: 0.040 mm (0.0016 in) or less

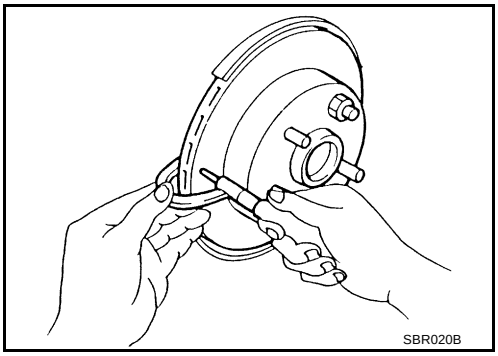


NOTE:
Make sure that wheel bearing axial end play is with in the specification before measuring runout. Refer toRAX-6, "On-Vehicle Inspection" .

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.
4. If runout is still outside the limit after performing the above operation, replace or lathe the disc rotor. [When lathing, use the Pro–Cut PFM On–Car Brake Lathe (Tool No. 38–PFM90.5) or equivalent.]

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.



Standard

Standard thickness : 22.0 mm (0.866 in)

Wear limit : 20.2 mm (0.795 in)

Maximum uneven wear (measured at 8 positions)

: 0.015 mm (0.0020 in) or less

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NFS00019

Unit: mm (in)

Brake model			Other than brembo	With brembo
Front brake	Rotor outer diameter × thickness		320 × 28.0 (12.60 × 1.102)	324 × 30.0 (12.76 × 1.181)
	Pad length × width × thickness		130.0 × 50.0 × 11.0 (5.12 × 1.97 × 0.43)	117.1 × 53.3 × 9.3 (4.61 × 2.098 × 0.366)
	Cylinder bore diameter		45.0 × 2 (1.772 × 2)	38 (1.50) × 2 + 44 (1.73) × 2
Rear brake	Rotor outer diameter × thickness		308 × 16 (12.13 × 0.63)	322 × 22 (12.68 × 0.87)
	Pad length × width × thickness		83.0 × 31.9 × 8.5 (3.27 × 1.26 × 0.335)	76.6 × 45 × 9.1 (3.016 × 1.77 × 0.358)
	Cylinder bore diameter		42.86 (1.6874)	40.0 × 2 (1.575)
Master cylinder	Cylinder bore diameter		26.99 (1.0626)	
Control valve	Valve type		Electric brake force distribution	
Brake booster	Diaphragm diameter	Coupe	255 (10.04)	Pri: 230 (9.06) Sec: 205 (8.07)
		Roadster	Pri: 230 (9.06) Sec: 205 (8.07)	Pri: 230 (9.06) Sec: 205 (8.07)
Recommended brake fluid			DOT 3	

Brake Pedal

NFS0001A

Brake pedal height (from dash lower panel top surface)	M/T models	153.2 – 163.2 mm (6.03 – 6.43 in)
	A/T models	161.5 – 171.5 mm (6.36 – 6.75 in)
Depressed pedal height [under a force of 490 N (50 kg, 110 lb) with the engine running]	M/T models	More than 90 mm (3.54 in)
	A/T models	More than 95 mm (3.74 in)
Clearance between threaded end of the stop lamp switch/ASCD cancel switch and stopper rubber		0.74 – 1.96 mm (0.0291 – 0.0772 in)
Pedal play		3 – 11 mm (0.12 – 0.43 in)

Brake Booster

NFS0001B

Vacuum leakage [at vacuum of –66.7 kPa (–500 mmHg, –19.69 inHg)]		Within 3.3 kPa (25 mmHg, 0.98 inHg) of vacuum for 15 seconds
Output rod length	With TCS	10.4 mm (0.409 in)
	With VDC	–6.2 mm (–0.244 in)
Input rod length		125 mm (4.92 in)

Check Valve

NFS0001C

Vacuum leakage [at vacuum of –66.7 kPa(–500 mmHg, –19.69 inHg)]	Within 1.3 kPa (10 mmHg, 0.39 inHg) of vacuum for 15 seconds

Front Disc Brake

NFS0001D

Brake model		Other than brembo	With brembo
Brake pad	Standard thickness (new)	11.0 mm (0.433 in)	9.3 mm (0.366 in)
	Repair limit thickness	2.0 mm (0.079 in)	2.0 mm (0.079 in)
Disc rotor	Standard thickness (new)	28.0 mm (1.102 in)	30.0mm (1.181 in)
	Repair limit thickness	26.0 mm (1.024 in)	28.4mm (1.118 in)
	Maximum uneven wear (measured at 8 positions)	0.015mm (0.0006 in) or less	0.015 mm (0.0006 in) or less
	Runout limit (with it attached to the vehicle)	0.035 mm (0.0014 in) or less	0.040 mm (0.0016 in) or less
	Runout limit (just the disc rotor)	0.020 mm (0.0008 in) or less	0.040 mm (0.0016 in) or less

Rear Disc Brake

NFS0001E

Brake model		Other than brembo	With brembo
Brake pad	Standard thickness (new)	8.5 mm (0.335 in)	9.1 mm (0.358 in)
	Repair limit thickness	2.0 mm (0.079 in)	2.0 mm (0.079 in)
Disc rotor	Standard thickness (new)	16.0 mm (0.630 in)	22.0 mm (0.866 in)
	Repair limit thickness	14.0 mm (0.551 in)	20.2 mm (0.795 in)
	Maximum uneven wear (measured at 8 positions)	0.015 mm (0.0006 in) or less	0.015 mm (0.0006 in) or less
	Runout limit (with it attached to the vehicle)	0.055 mm (0.0022 in) or less	0.070 mm (0.0028 in) or less
	Runout limit (just the disc rotor)	0.020 mm (0.008 in) or less	0.040 mm (0.0016 in) or less

SECTION BRC
BRAKE CONTROL SYSTEM

CONTENTS

ABS

PRECAUTIONS 4
Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER” 4
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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NFS0001M

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

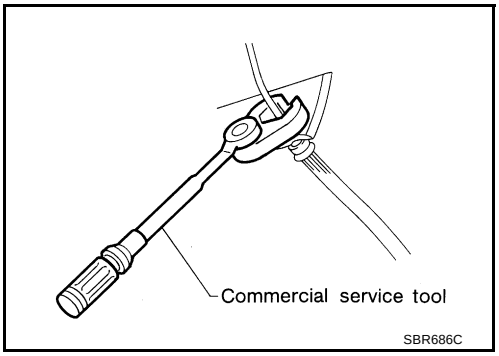
NFS0001N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0001O

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene to clean. They will ruin rubber parts and cause improper operation.
- Use a flare nut wrench when removing flare nuts, and use a flare nut crowfoot and torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of ABS actuator and electric unit (control unit) or the battery negative terminal.



WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precautions for Brake Control

NFS0001P

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

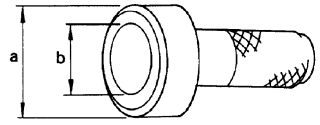
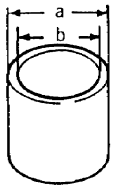
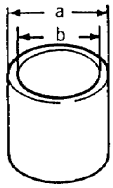
PREPARATION

PFP:00002

Special Service Tools

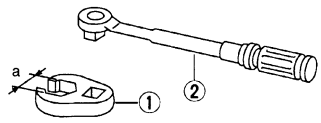
NFS0001Q

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	
KV40104710 (—) Drift a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0001R

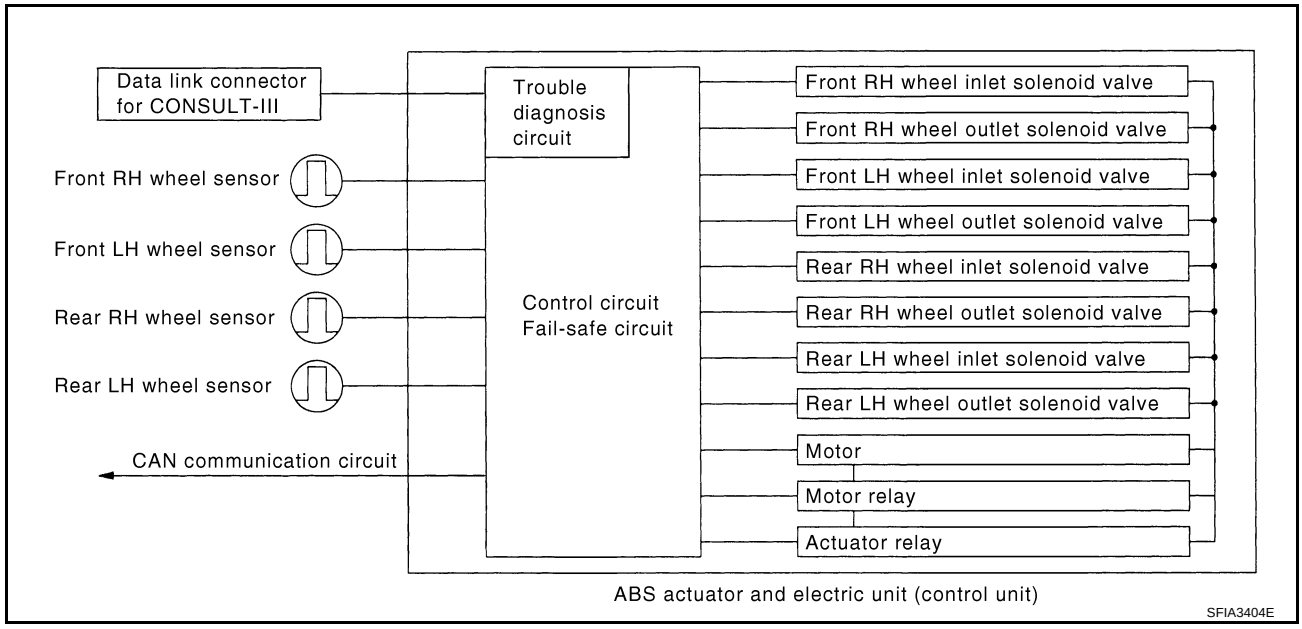
Tool name		Description
1. Flare nut crowfoot a: 10 mm (0.39 in) / 12 mm (0.47 in) 2. Torque wrench	 S-NT360	Installing brake tube

SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0001S



ABS Function

NFS0001T

- The Anti-Lock Braking System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-III is available.

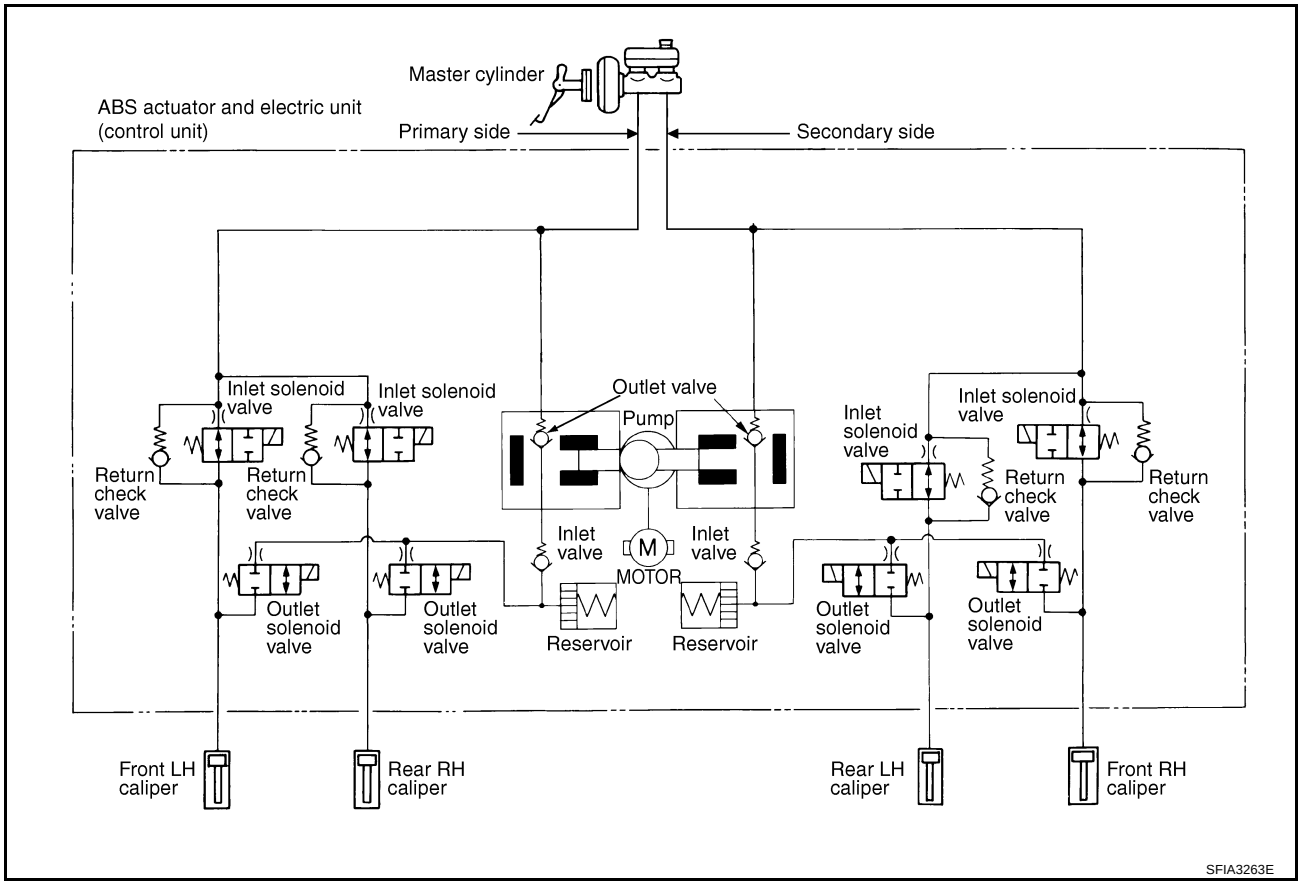
EBD Function

NFS0001U

- Electronic Brake Distribution is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-III is available.

Hydraulic Circuit Diagram

NFS0001W



CAN Communication

NFS0001X

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000II

ABS, EBD SYSTEM

In case of electrical problems with the ABS, the ABS warning lamp will turn on. In case of electrical problems with the EBD, brake warning lamp, ABS warning lamp will turn on. Simultaneously, the ABS become one of the following conditions of the Fail-Safe function.

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicle without ABS equipment.

  NOTE:
  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.
- For EBD trouble, The EBD and ABS become inoperative, are the condition of the vehicle is the same as the condition of vehicles without ABS, EBD equipment.

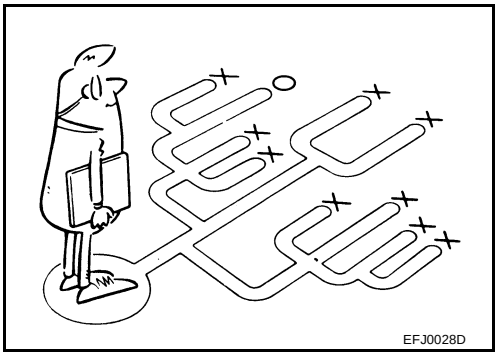
How to Proceed with Diagnosis

NFS0001Y

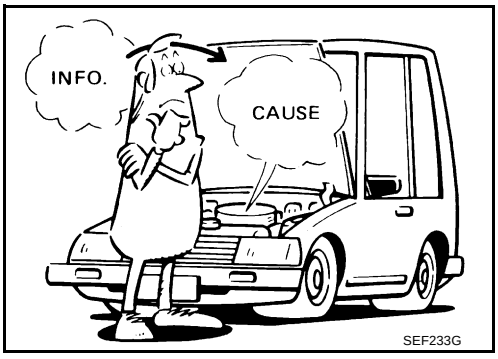
BASIC CONCEPT

- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.
- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


EFJ0028D

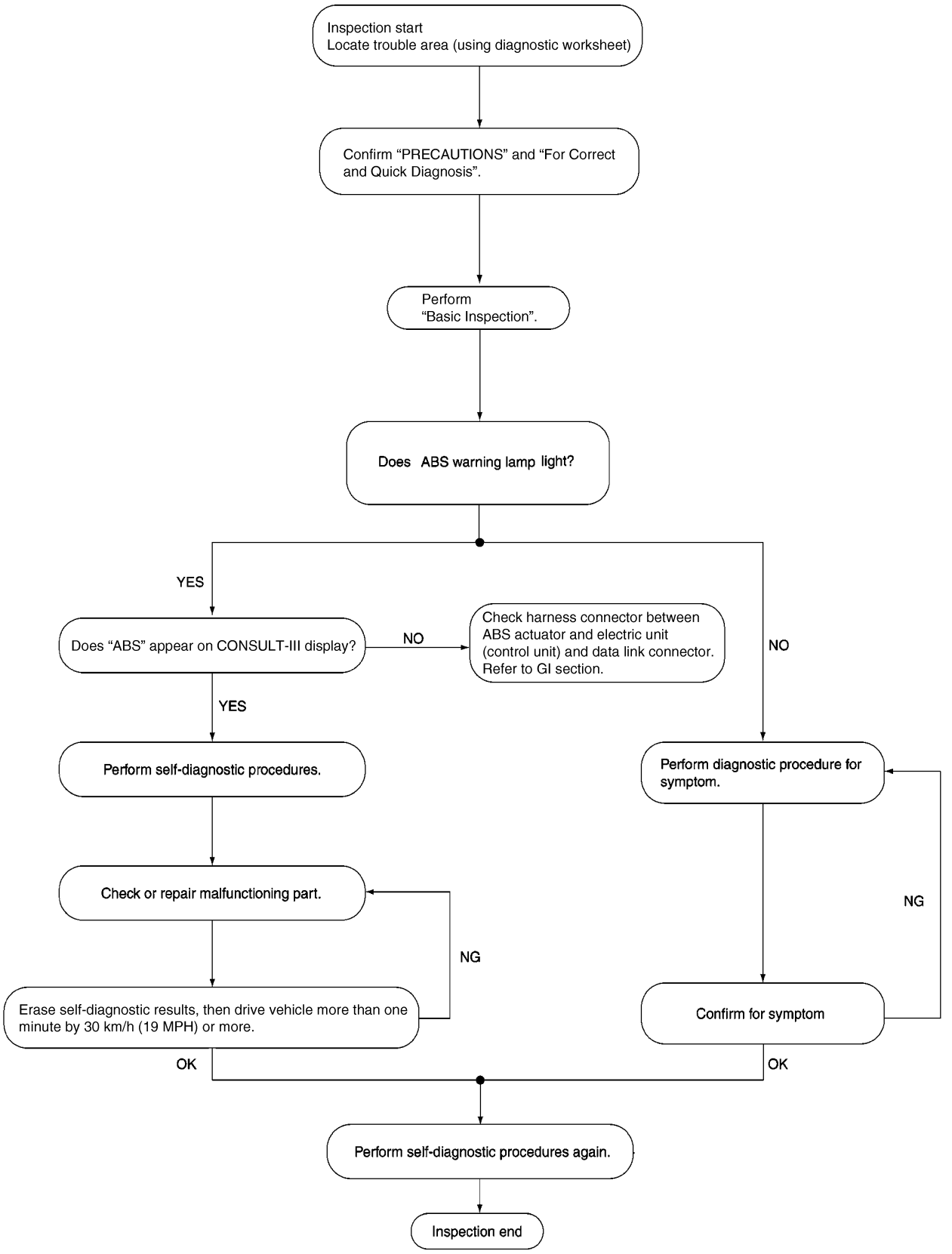
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-19, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-3, "General Precautions" .

DIAGNOSIS FLOWCHART



SFIA3405E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

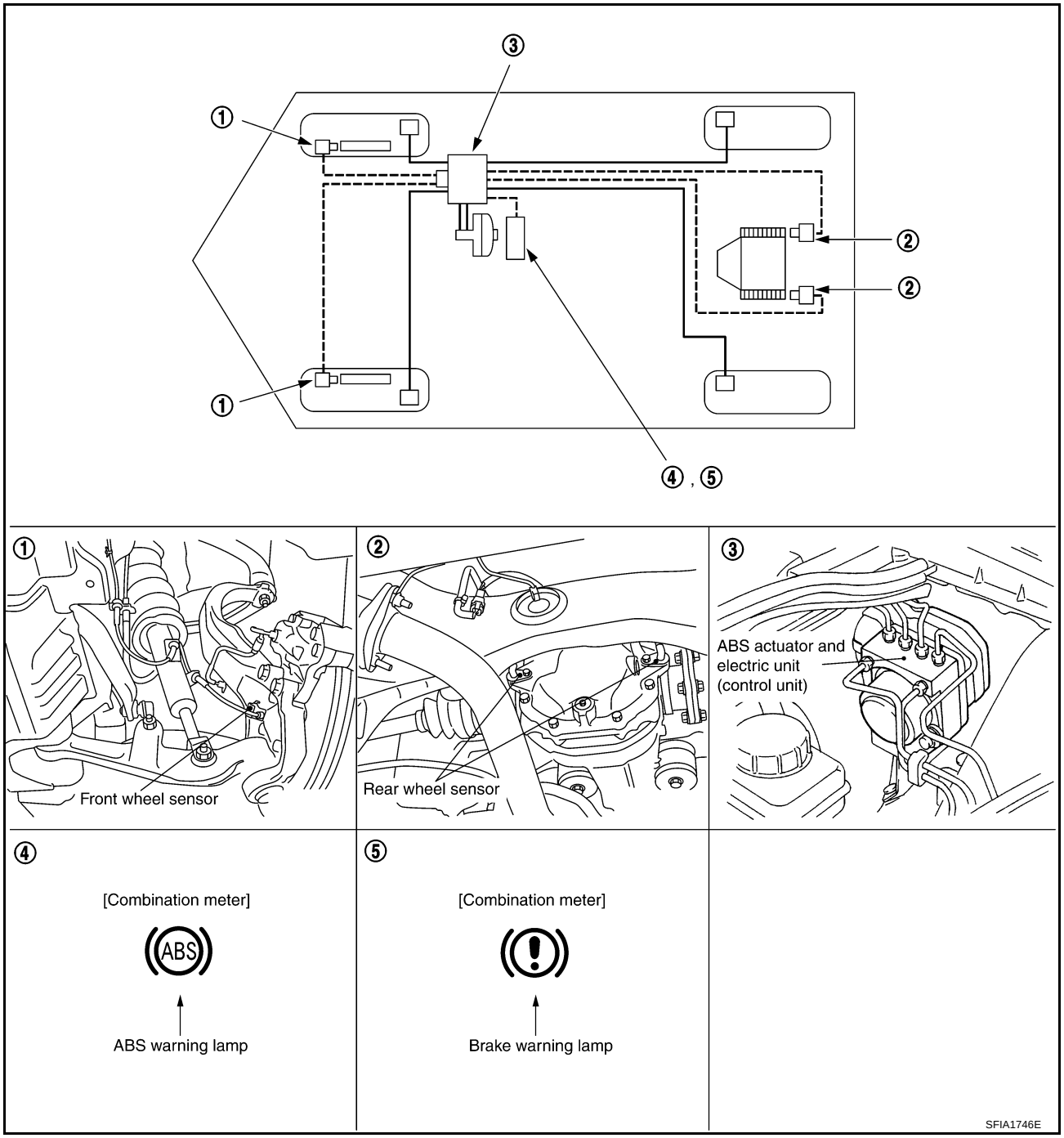
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ ABS does not work (Wheels lock when braking)	☐ Lack of sense of acceleration	
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA3264E

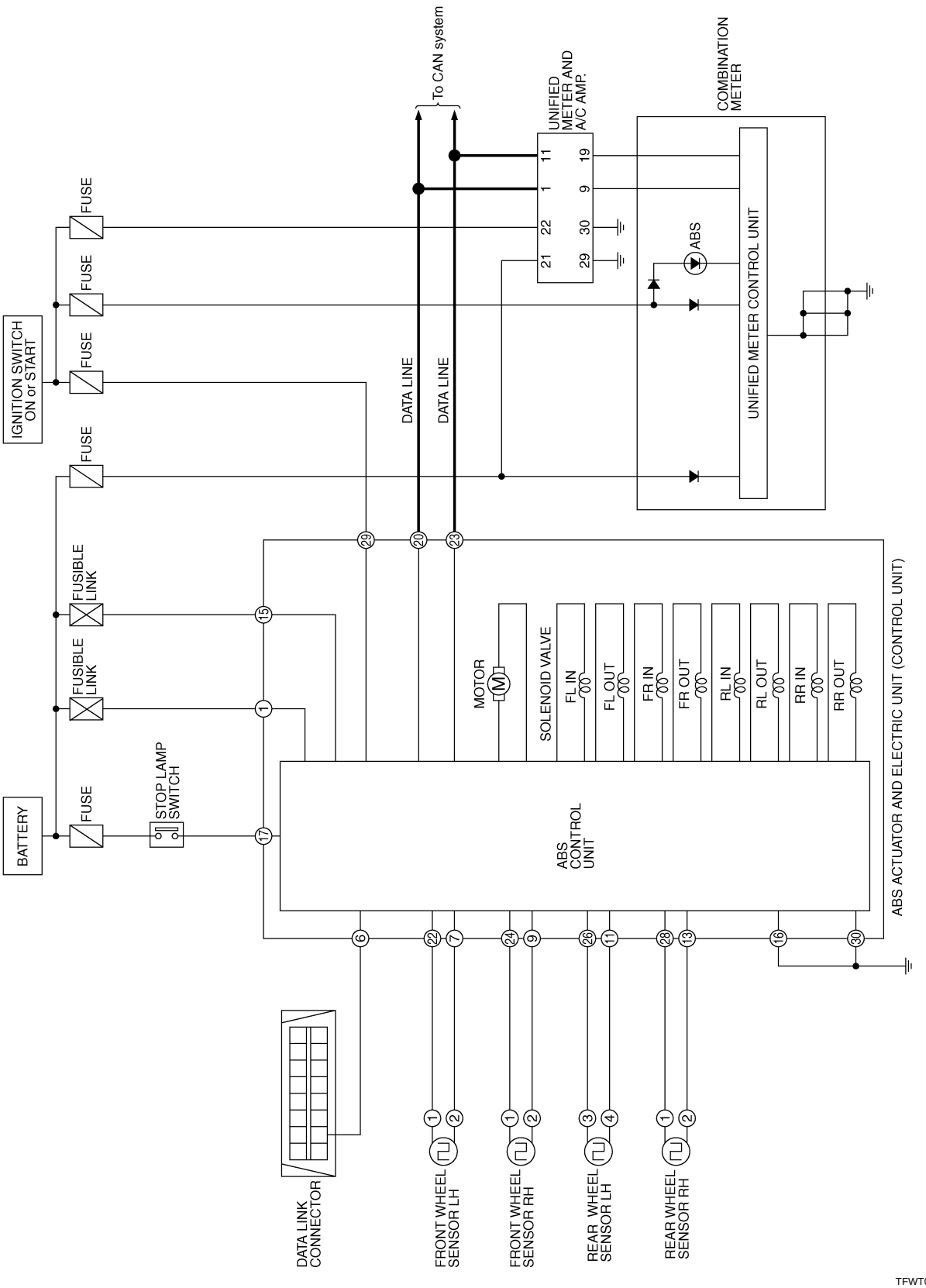
Component Parts Location

NFS0001Z



Schematic

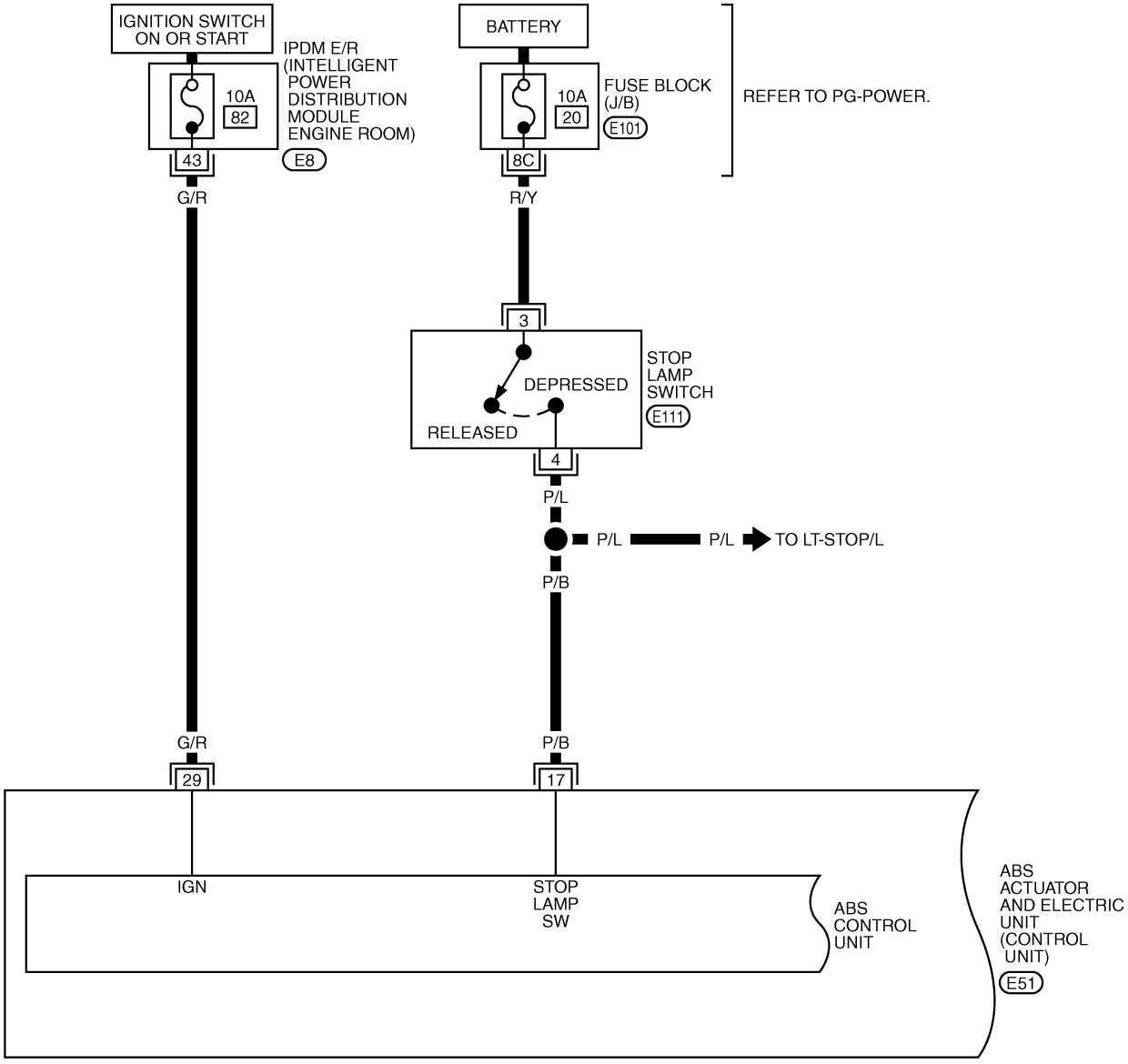
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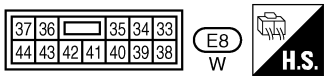


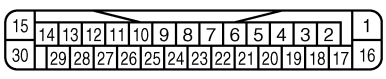
Wiring Diagram — ABS —

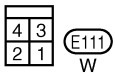
NFS00021

BRC-ABS-01







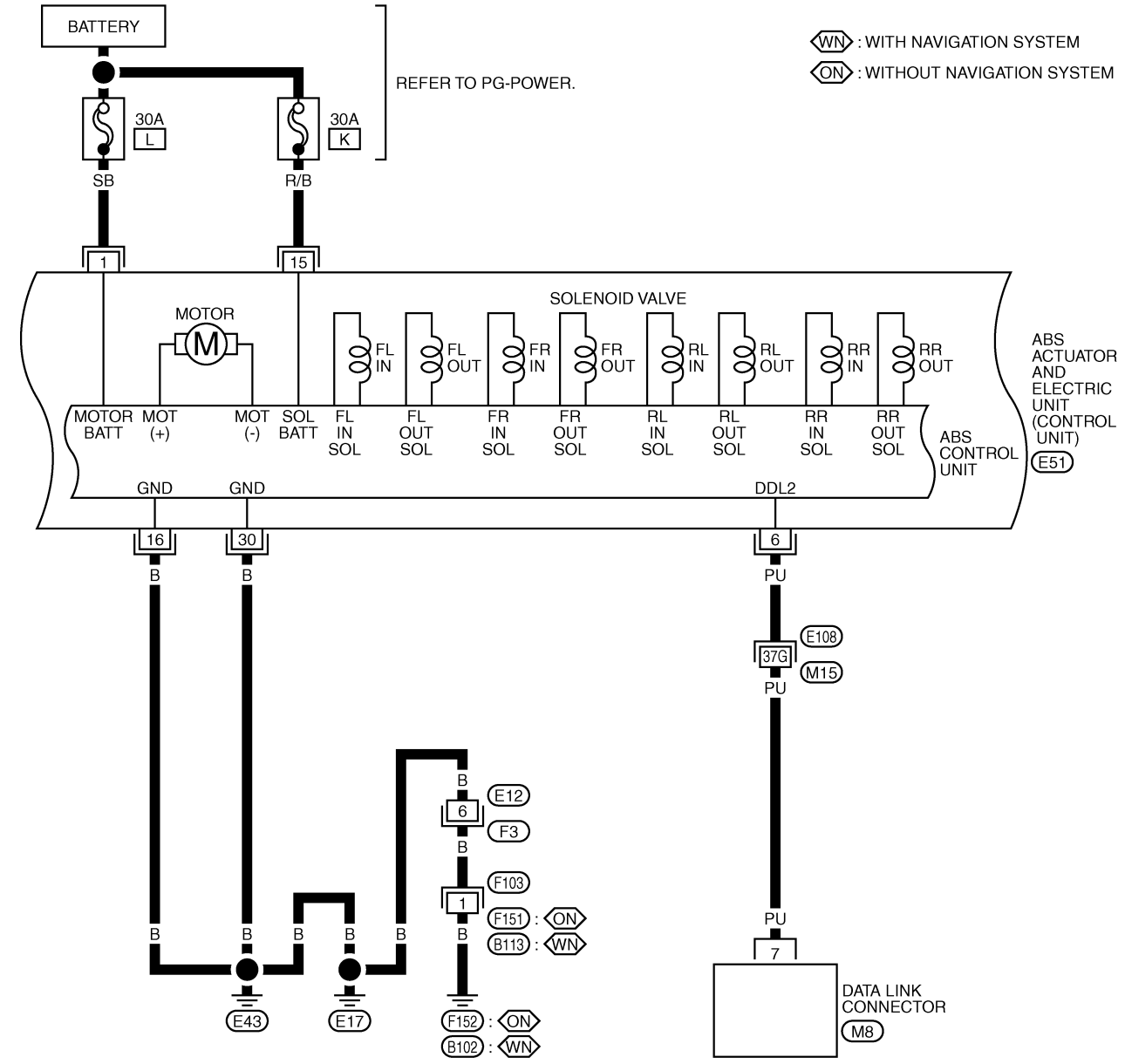


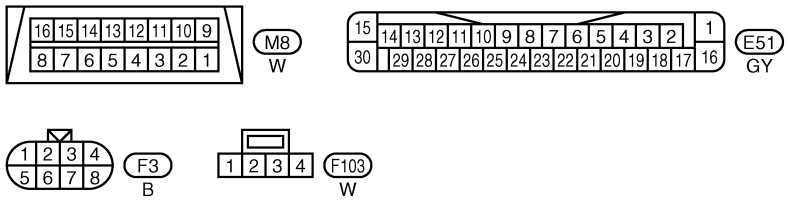
REFER TO THE FOLLOWING.

E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0376E

BRC-ABS-02

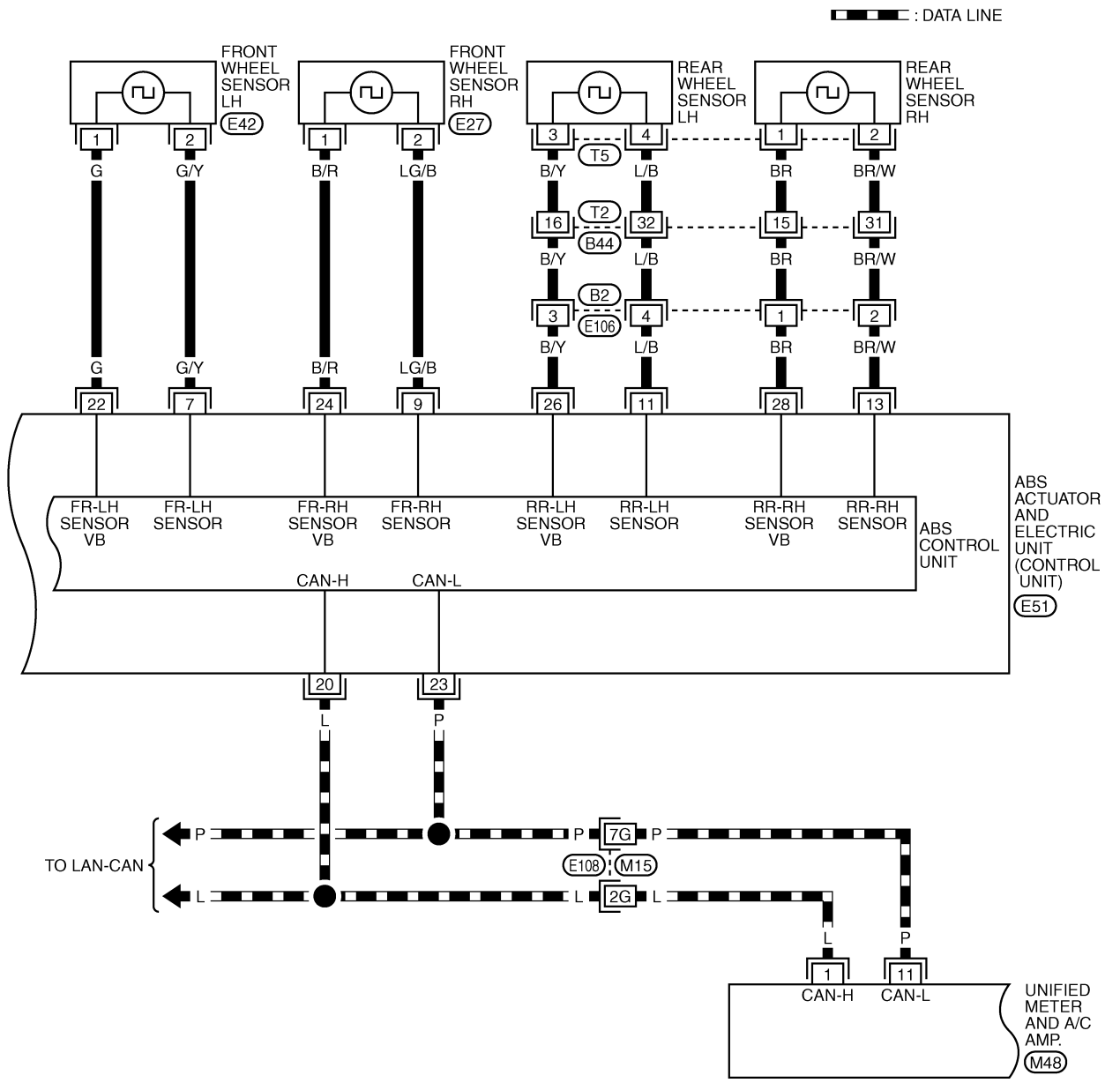


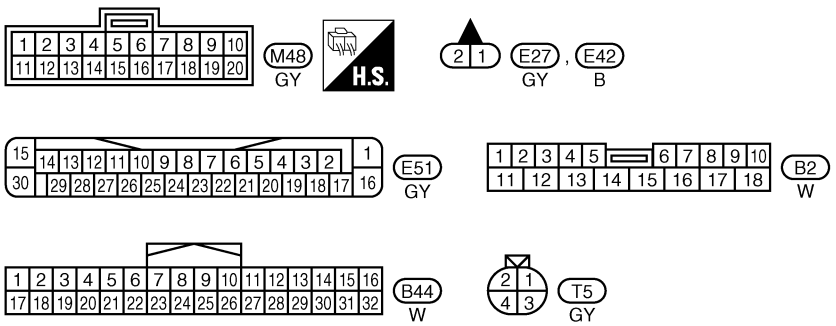


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0365E

BRC-ABS-03

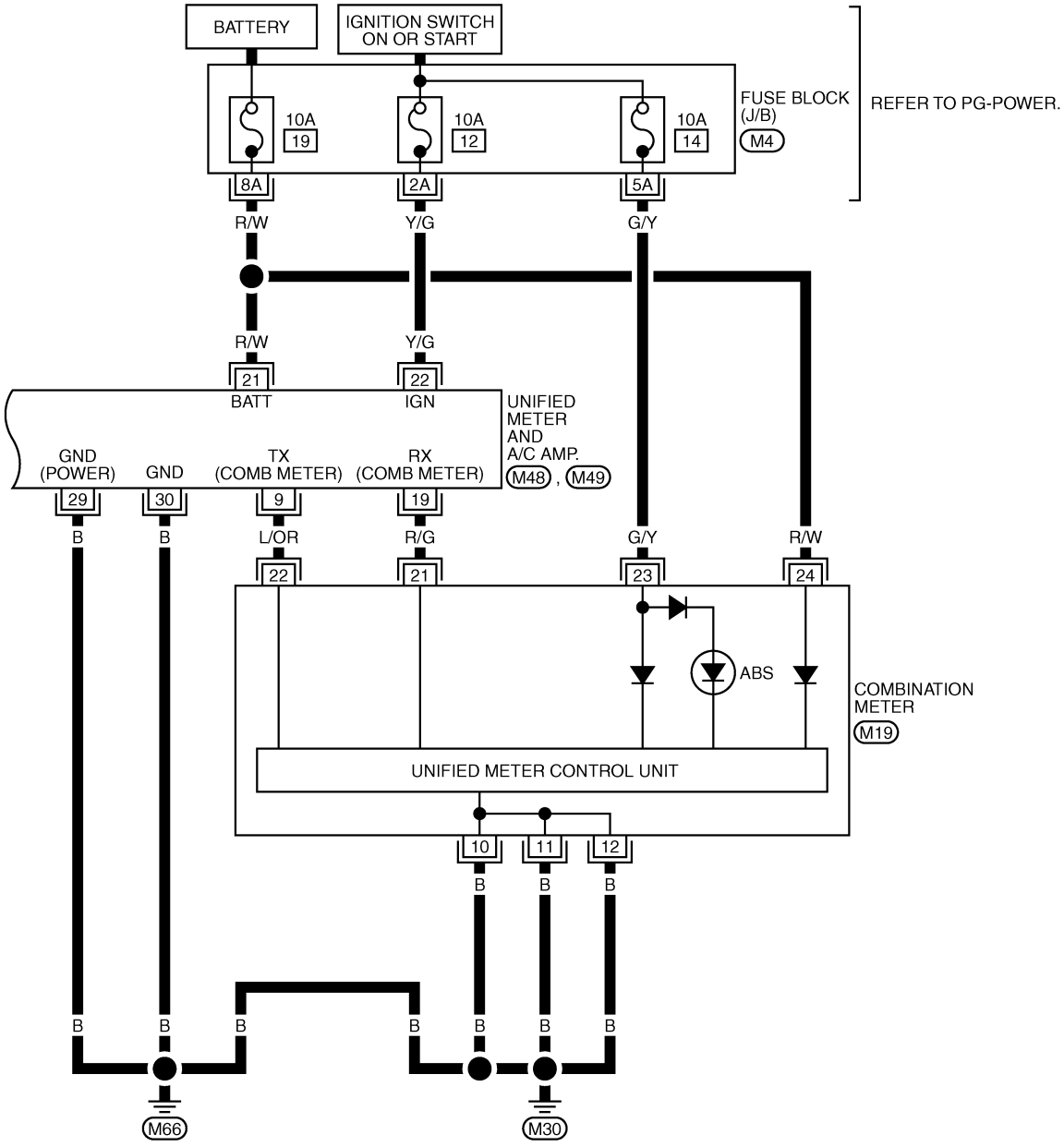


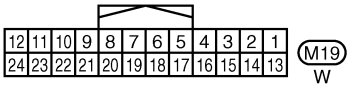


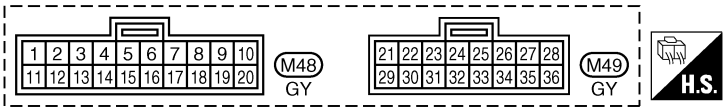
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0366E

BRC-ABS-04







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0046E

Control Unit Input/Output Signal Standard

NFS00022

REFERENCE VALUE FROM CONSULT-III

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
WHEEL SENSOR	Wheel speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)
		While driving (Note 1)	Nearly matches the speedometer display (± 10% or less)
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON
		When the actuator relay operates and the actuator solenoid does not operate	OFF
EBD WARN LAMP	Brake warning lamp on condition (Note 2)	Brake warning lamp ON	ON
		Brake warning lamp OFF	OFF
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON
		Brake pedal not depressed	OFF
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF
		When the actuator relay is not operating	ON
ABS WARN LAMP	ABS warning lamp on condition (Note 3)	ABS warning lamp ON	ON
		ABS warning lamp OFF	OFF
BATTERY VOLT	Battery voltage supplied to ABS control unit	Ignition switch ON	10 - 16V
GEAR	Determined gear shift position from the A/T PNP switch signal	Driving	M/T vehicles are always left in 1.
ENGINE RPM	Engine running	With engine stopped	0 rpm
		With engine running	Almost in accordance with tachometer display
FAIL SIGNAL	Fail signal status	During ABS fail-safe During EBD fail-safe	ON

Note 1: Confirm tire pressure is normal.
Note 2: Serves as EBD warning lamp.
Note 3: ON/OFF timing of ABS warning lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal).

CONSULT- II Functions (ABS)

NFS00023

CONSULT-III MAIN FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	Reference
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-19, "Self-Diagnosis"
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-21, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-44, "CAN Diagnostic Support Monitor"
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-22, "Active Test"
FUNCTION TEST	Conducted by CONSULT-III instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

Self-Diagnosis

NFS000HD

OPERATION PROCEDURE

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

HOW TO ERASE SELF-DIAGNOSIS RESULTS

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp and brake warning lamp turn OFF.

   CAUTION:

   If memory cannot be erased, perform applicably diagnosis.

   - When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
   - Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-1 [C1101]	When the circuit in the rear RH wheel sensor is open.	BRC-25, "Wheel Sensor System" (Note 1)
RR LH SENSOR-1 [C1102]	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR-1 [C1103]	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR-1 [C1104]	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR-2 [C1105]	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR-2 [C1108]	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-27, "ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-27, "ABS Actuator and Electric Unit (Control Unit)"
MAIN RELAY [C1114]	When the control unit detects an error in the actuator relay system.	BRC-29, "ABS Actuator Relay or ABS Motor Relay Power System"
STOP LAMP SW [C1116]	When a stop lamp switch open-circuit is detected.	BRC-30, "Stop Lamp Switch System"
FR LH IN ABS SOL [C1120]	When the control unit detects an error in the front left inlet solenoid system.	BRC-29, "ABS Actuator Relay or ABS Motor Relay Power System"
FR LH OUT ABS SOL [C1121]	When the control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL [C1122]	When the control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL [C1123]	When the control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL [C1124]	When the control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL [C1125]	When the control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL [C1126]	When the control unit detects an error in the rear right inlet solenoid system.	
RR RH OUT ABS SOL [C1127]	When the control unit detects an error in the rear right outlet solenoid system.	

Display item	Malfunction detecting condition	Check item
EMERGENCY BRAKE [C1153]	When the ABS actuator and electric unit (control unit) malfunctions (pressure increase is too much or too little).	BRC-31, "ABS Actuator and Electric Unit (Control Unit) 2"
CAN COMM CIRCUIT [U1000]	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-31, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HE

DISPLAY ITEM LIST

×: Standard –: Not applicable ▼: Option

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECM INPUT SIGNALS	MAIN SIGNALS	SELECTION MENU	
FR LH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by rear LH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by rear RH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	—	×	▼	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	—	×	▼	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	—	×	▼	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	—	×	▼	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	—	×	▼	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	—	×	▼	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	—	×	▼	Rear left wheel inside ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	—	×	▼	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	—	×	▼	Brake warning lamp (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	×	×	▼	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	—	×	▼	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR RLY (ON/OFF)	—	×	▼	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	—	×	▼	ABS warning lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	▼	The voltage supplied to the ABS control unit is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECM INPUT SIGNALS	MAIN SIGNALS	SELECTION MENU	
EBD SIGNAL (ON/OFF)	—	—	▼	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	—	—	▼	ABS operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	—	—	▼	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	—	—	▼	ABS fail-safe signal (ON/OFF) status is displayed.

Active Test

NFS000IN

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.

TEST ITEM

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

For ABS solenoid valve, touch “UP”, “KEEP”, and “DOWN”.Then use screen monitor to check that solenoid valve operates as shown in the table below.

Operation	ABS solenoid valve		
	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF

ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Correct and Quick Diagnosis

NFS00024

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-19, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	This is the sound of the motor operating inside ABS actuator, and there may be some low sounds while the ABS is operating.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal

ABS WARNING LAMP ON/OFF TIMING

×: ON –: OFF

Condition	ABS warning lamp	Remarks
Ignition switch OFF	—	—
For approximately “1” second after ignition switch ON	×	—
After approximately “1” second after ignition switch ON. (When system is normal)	—	Turns off 2 second after engine start
ABS error	×	When there is an ABS actuator and electric unit error (power or ground error)

Basic Inspection

NFS00025

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around ABS actuator for leaks. If there is leaking or oozing fluid, check following items.
   - If ABS actuator connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or ABS actuator screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than ABS actuator connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at ABS actuator, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace ABS actuator body.

     CAUTION:
     ABS actuator and electric unit (control unit) cannot be disassembled.
3. Check brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

ABS WARNING LAMP INSPECTION

1. Make sure ABS warning lamp turned on approximately 1 second when the ignition switch is turned ON. Check CAN communications. Refer to BRC-31, "CAN Communication System" .
2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. Make sure ABS warning lamp turn off 2 seconds after the engine is started. If ABS warning lamp has not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit.
4. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-19, "HOW TO ERASE SELF-DIAGNOSIS RESULTS"

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS00026

After using the CONSULT-III SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR -1, -2
FR LH SENSOR -1, -2
RR RH SENSOR -1, -2
RR LH SENSOR -1, -2

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK TIRE

Check air pressure, wear, and size.

Are the air pressure, wear, and size within the standard values?

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

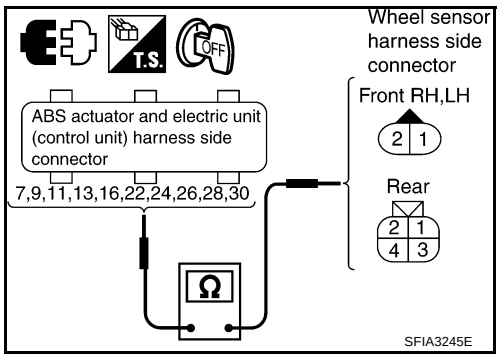
1. Disconnect ABS control unit connector and the malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connector, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect the wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS control unit (control unit) connector E51.
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit) (signal)	ABS actuator and electric unit (control unit) (ground)
Front RH	24	1	9	2	24, 9	16, 30
Front LH	22	1	7	2	22, 7	
Rear RH	28	1	13	2	28, 13	
Rear LH	26	3	11	4	26, 11	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

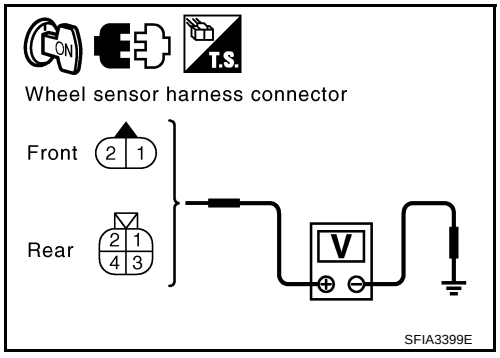
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

6. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Disconnect malfunctioning wheel sensor connector.
2. Turn ignition switch ON and check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH	1	—	8 V or more
Front LH			
Rear RH			
Rear LH	3		



OK or NG

OK >> Replace wheel sensor.
NG >> Replace ABS actuator and electric unit (control unit).

ABS Actuator and Electric Unit (Control Unit)

NFS00028

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit). Re-conduct ABS actuator and electric unit (control unit) self-diagnosis.
NO >> INSPECTION END

ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems

NFS00029

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

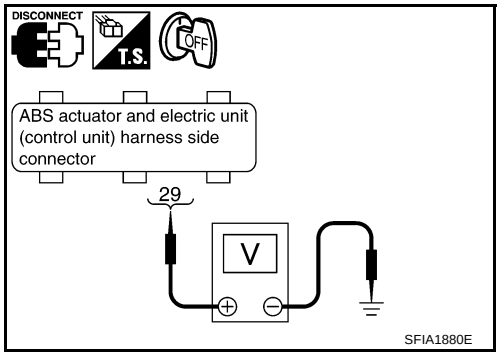
1. Disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, and so on, If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

Is the result of self-diagnosis normal?

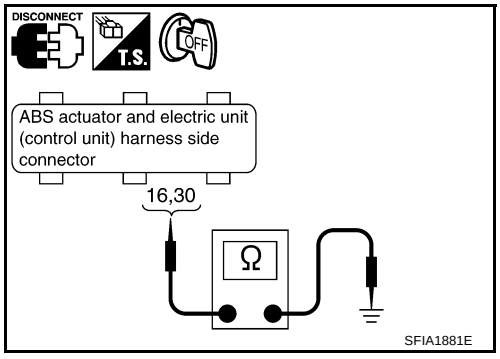
YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER AND GROUND CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check continuity and voltage between connector terminals and ground.



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Voltage
Power supply	29	Ignition switch ON	Battery voltage (Approx. 12 V)
		Ignition switch OFF	Approx. 0 V



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Continuity
Ground	16, 30	Ignition switch OFF	Yes

OK or NG

OK >> Check battery (terminal looseness, power drop, etc.) error. If there is an error, make repairs.
NG >> Corresponding harness circuit error. Repair the circuit.

ABS Actuator Relay or ABS Motor Relay Power System

NFS0002A

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
MAIN RELAY

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector E51, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

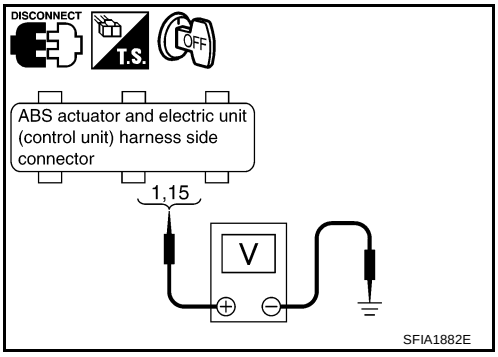
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ABS ACTUATOR RELAY OR ABS MOTOR RELAY POWER CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. For ABS actuator relay, measure the voltage between the connector terminal 1 and ground. For ABS motor relay, measure the voltage between connector terminal 15 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
1, 15	—	Battery voltage (Approx. 12 V)



OK or NG

OK >> GO TO 4
NG >> Error in the circuit between battery and ABS actuator and electric unit (control unit). Repair the circuit.

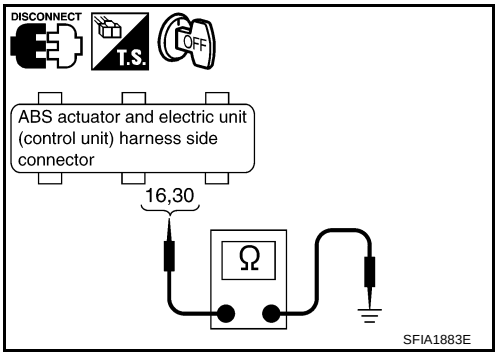
4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
16, 30	—	Yes

OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Open or short in harness. Repair or replace the harness.



Stop Lamp Switch System

NFS0002B

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector E51 and stop lamp switch connector E112, check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.
3. Start engine.
4. Repeat Pumping brake pedal carefully several times, then perform self-diagnosis again.

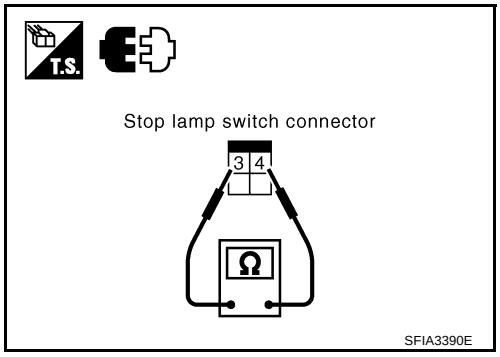
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

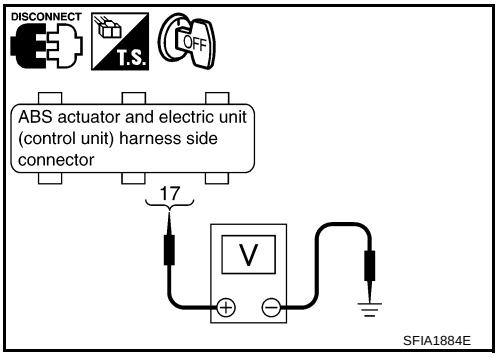


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check voltage between ABS actuator and electric unit (control unit) connector terminal and ground.



ABS actuator and electric unit (control unit)	Ground	Measurement condition	Voltage
17	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> INSPECTION END
NG >> Open or short in harness between ABS actuator and electric unit and stop lamp switch. Repair or replace the harness.

ABS Actuator and Electric Unit (Control Unit) 2

NFS0002C

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit).
NO >> INSPECTION END

CAN Communication System

NFS0002D

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-48, "CAN System Specification Chart" .
NO >> Connector terminal connector is loose, damaged, open, or shorted.

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0002E

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system.

2. CHECK FRONT AND REAR AXLE

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. CHECK WHEEL SENSOR AND SENSOR ROTOR

Wheel Sensor Inspection

- Wheel sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Wheel sensor connector connection inspection
- Wheel sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-19, "OPERATION PROCEDURE" .

Unexpected Pedal Reaction

NFS0002F

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

YES >>
- Bleed air from the brake piping.
- Check brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repairs.

NO >> GO TO 2.

2. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector, and make sure the braking force is sufficient when the ABS is not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-32, "Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

The Braking Distance is Long

NFS0002G

CAUTION:
On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-32, "Excessive ABS Function Operation Frequency" .

NG >>
- Bleed air from the brake piping.
- Check brake system.

The ABS Function Does Not Operate

NFS0002H

CAUTION:
The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-32, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-19, "OPERATION PROCEDURE" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0002I

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

Does the symptom occur?

YES >> GO TO 2.

NO >> Perform self-diagnosis. Refer to BRC-19, "OPERATION PROCEDURE" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.

NO >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-32, "Excessive ABS Function Operation Frequency" .

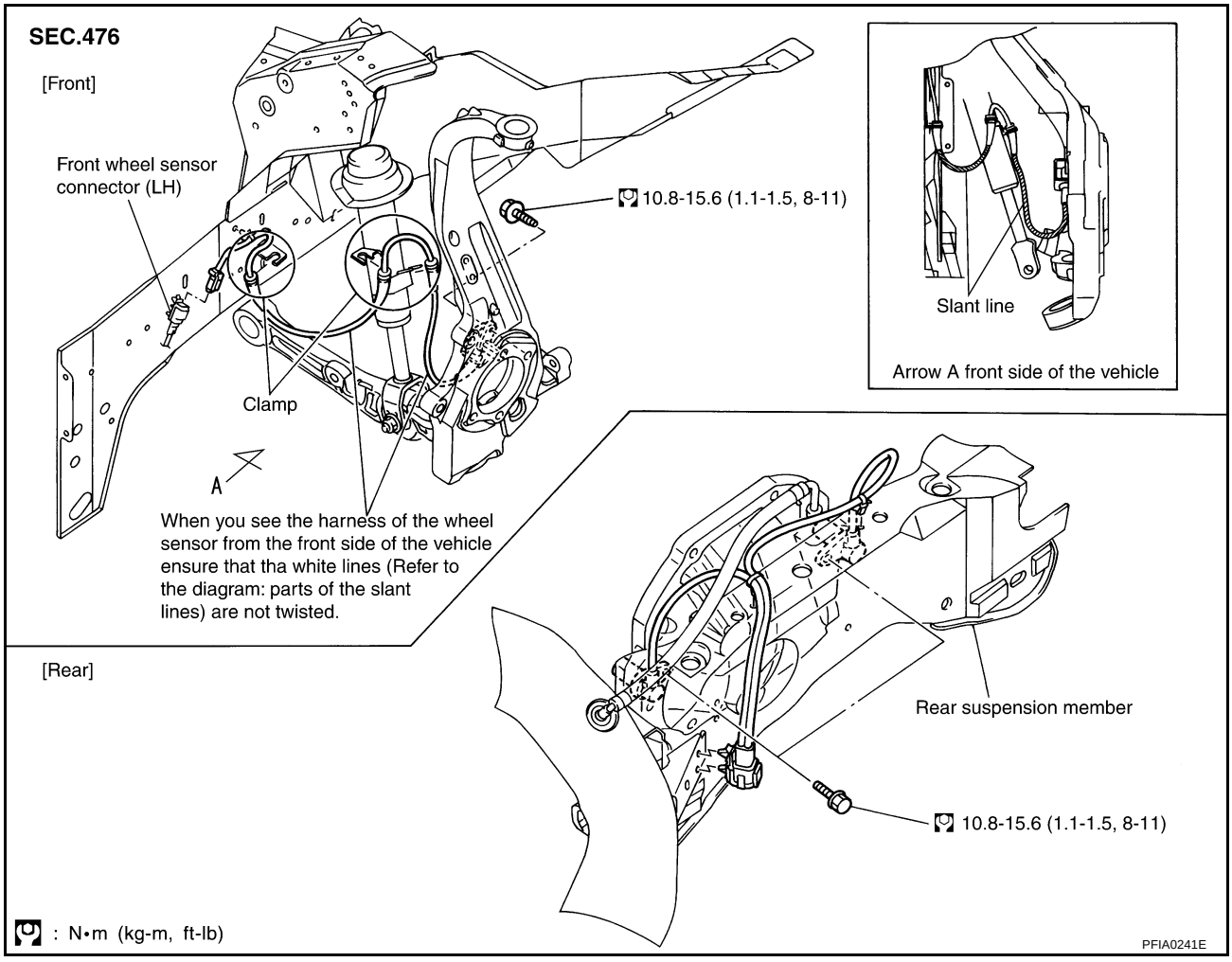
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0002J

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS0002K

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
  - Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
  - Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the companion flange.

INSTALLATION

Front

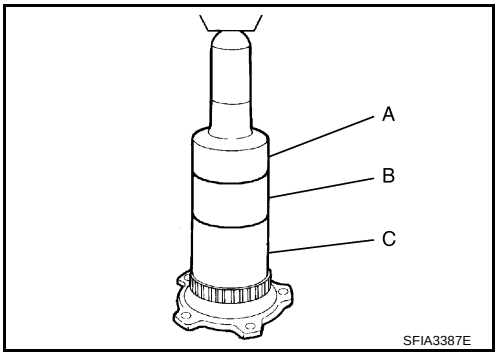
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
  - Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number	A: ST30720000 (J-25405)
	B: ST27863000 (—)
	C: KV40104710 (—)

  - Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.



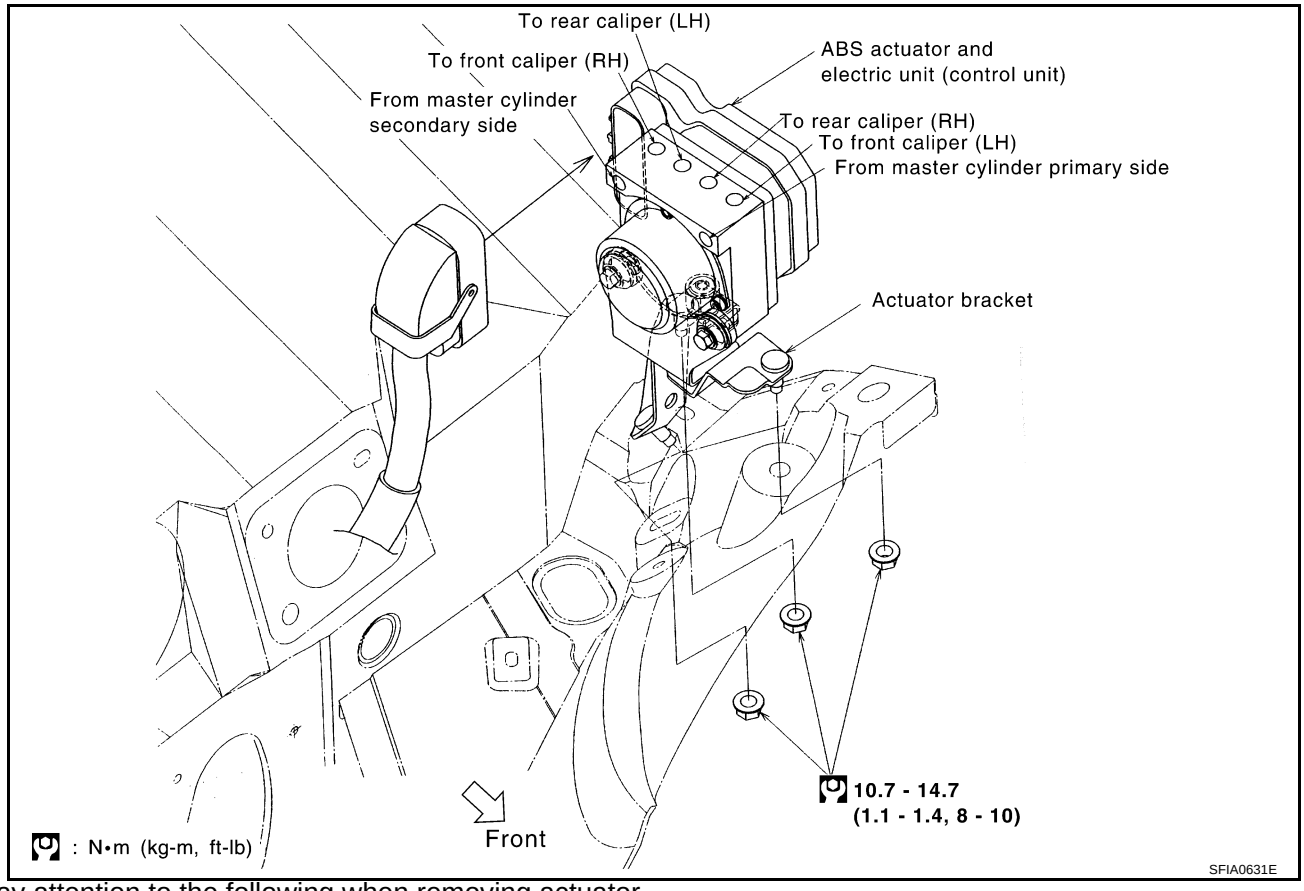
ABS ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

NFS0002L

COMPONENTS



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer to BR-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NFS0002M

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

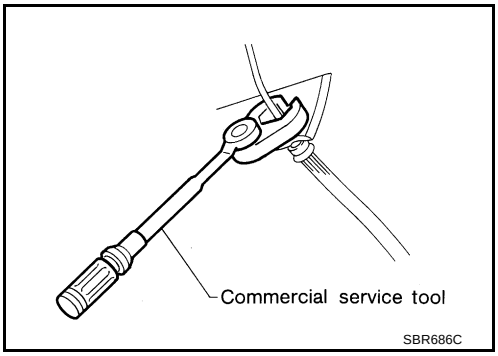
NFS0002N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0002O

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut crowfoot and torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of ABS actuator and electric unit (control unit) or the battery negative terminal.



WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precautions for Brake Control

NFS0002P

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting

diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.

- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

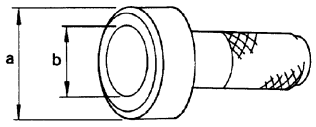
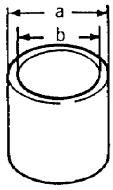
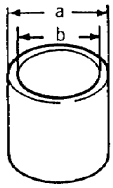
PREPARATION

PFP:00002

Special Service Tools

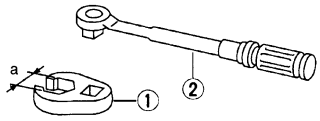
NFS0002Q

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	Installation rear sensor rotor
KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0002R

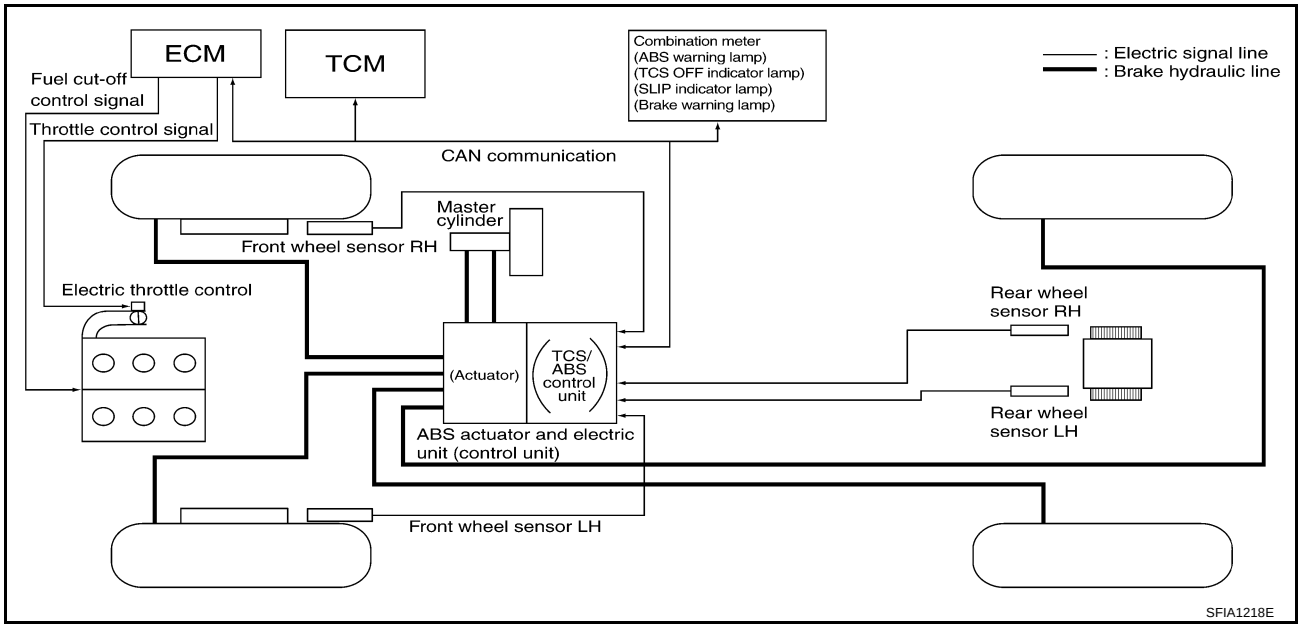
Tool name		Description
1. Flare nut crowfoot a: 10 mm (0.39 in) / 12mm (0.47 in) 2. Torque wrench	 S-NT360	Installing brake tube

SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0002S



TCS Function

NFS0002T

- The wheel spin occurrence of the drive wheels is detected by the ABS actuator and electric unit (control unit) using the wheel speed signals from all four wheels, so when wheel spin occurs, the amount of wheel spin is reduced by cutting the fuel to the engine, and partially closing the throttle valve to reduce the engine torque. The throttle opening is also controlled to obtain the optimum engine torque.
- Depending on road circumstances, the driver may have a sluggish feel. This is normal, because the optimum traction has the highest priority under TCS operation.
- TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.
- During TCS operation, it informs a driver of system operation by flashing SLIP indicator lamp.

ABS Function

NFS0002U

- The Anti-Lock Braking System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical system diagnosis by CONSULT-III is available.

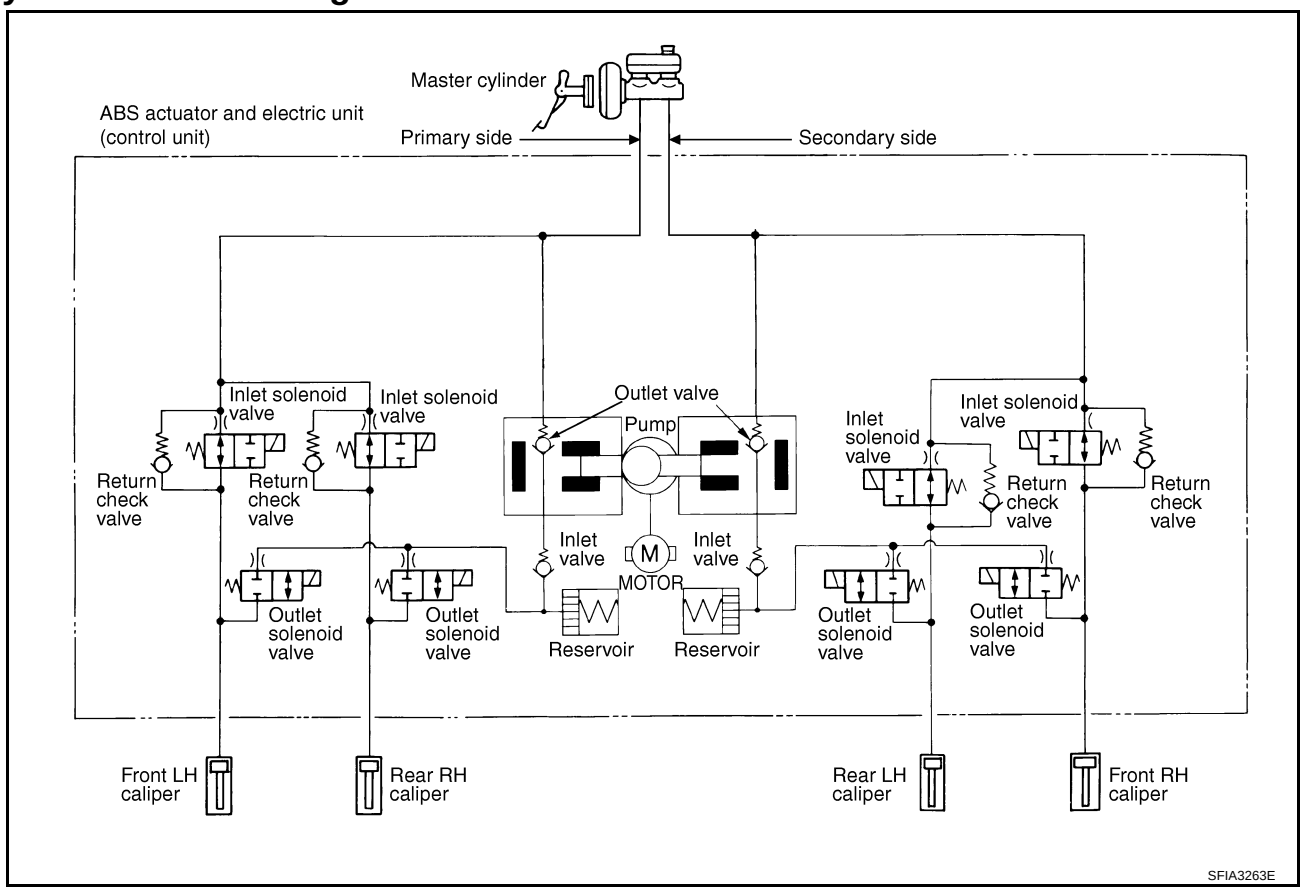
EBD Function

NFS0002V

- The Electronic Brake Distribution is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical system diagnosis by CONSULT-III is available.

Hydraulic Circuit Diagram

NFS0002X



CAN Communication

NFS0002Y

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000IJ

TCS SYSTEM

In case of Throttle Control System trouble, the TCS OFF indicator lamp and SLIP indicator lamp are turned on, and the condition of the vehicle is the same as the condition of vehicles without TCS equipment. In case of trouble to the Throttle Control System, the ABS control continues to operate normally without TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform the self-diagnosis for TCS/ABS control system.

ABS, EBD SYSTEM

In case of electrical problems with the ABS, the ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp will turn on. In case of electrical problem with the EBD, brake warning lamp, ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the TCS/ABS become one of the following conditions of the Fail-Safe function.

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicles without TCS/ABS equipment.

  NOTE:
  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.

How to Proceed with Diagnosis

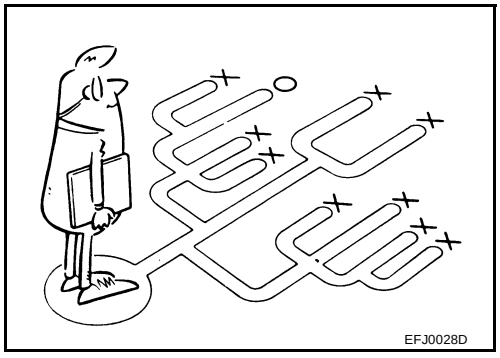
NFS0002Z

BASIC CONCEPT

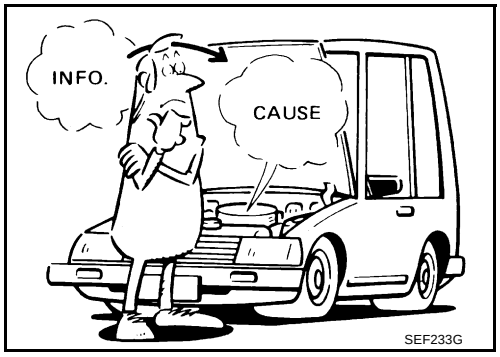
- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


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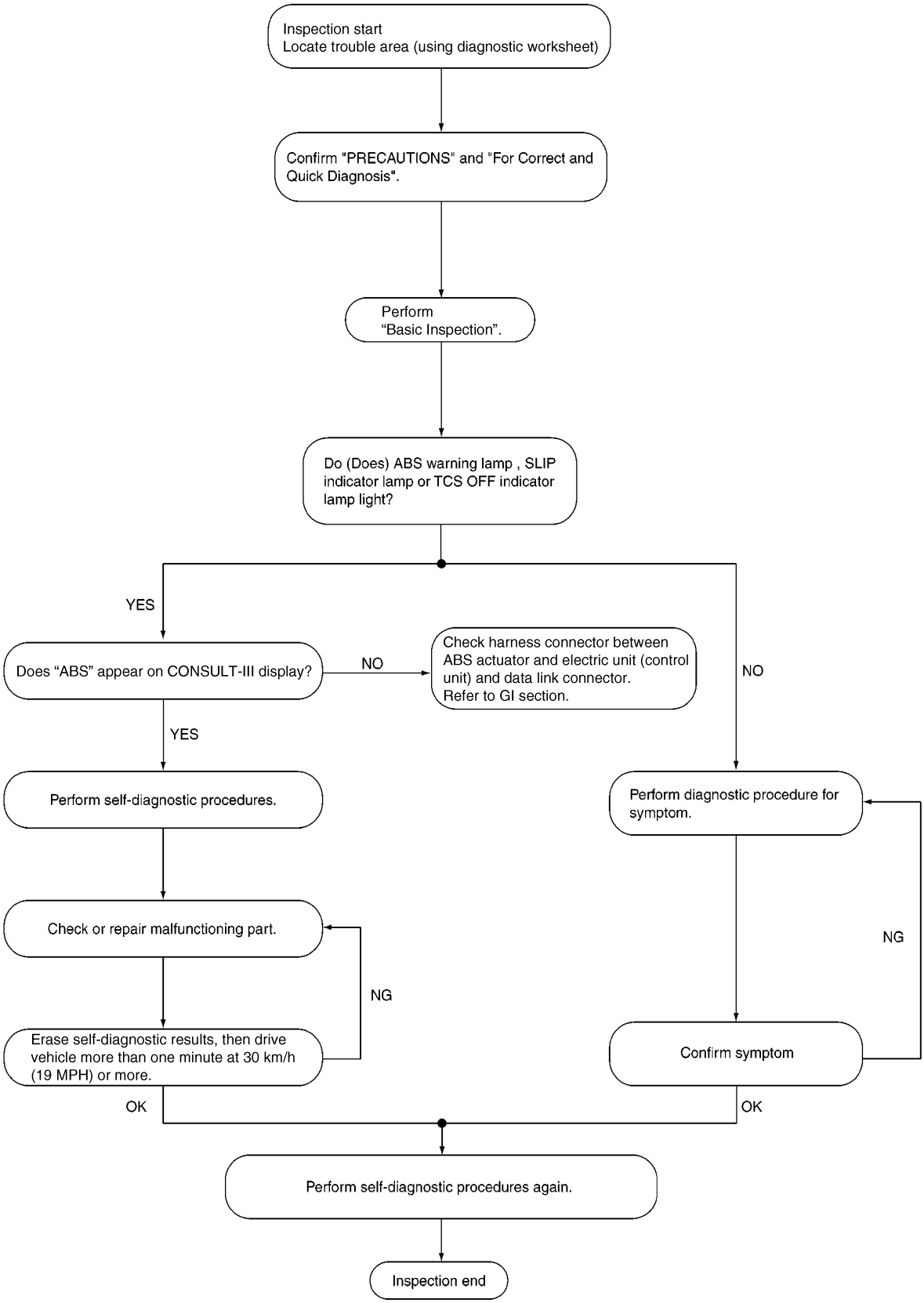
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-53, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-3, "General Precautions"

DIAGNOSIS FLOWCHART



SFIA3406E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

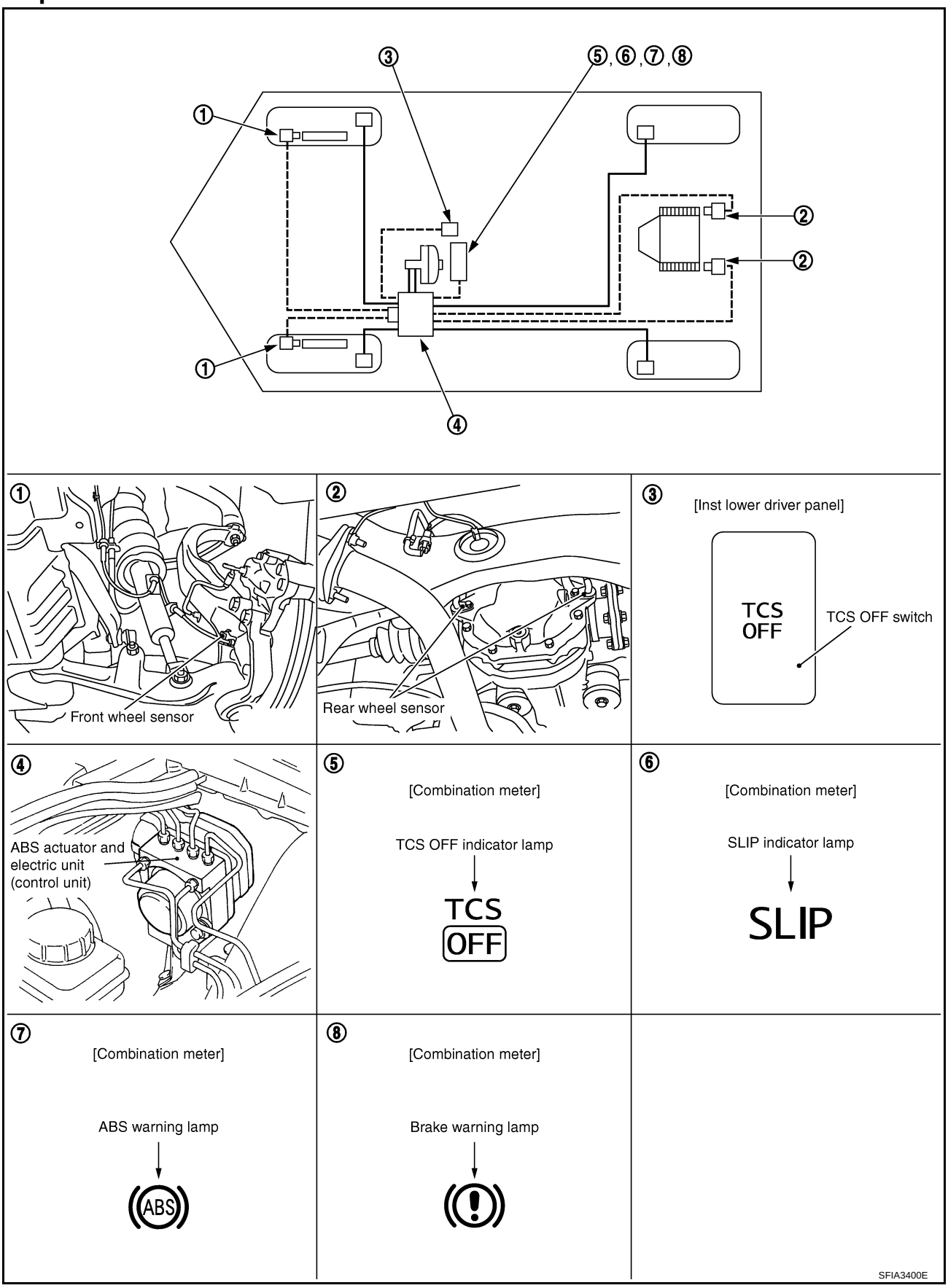
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA3265E

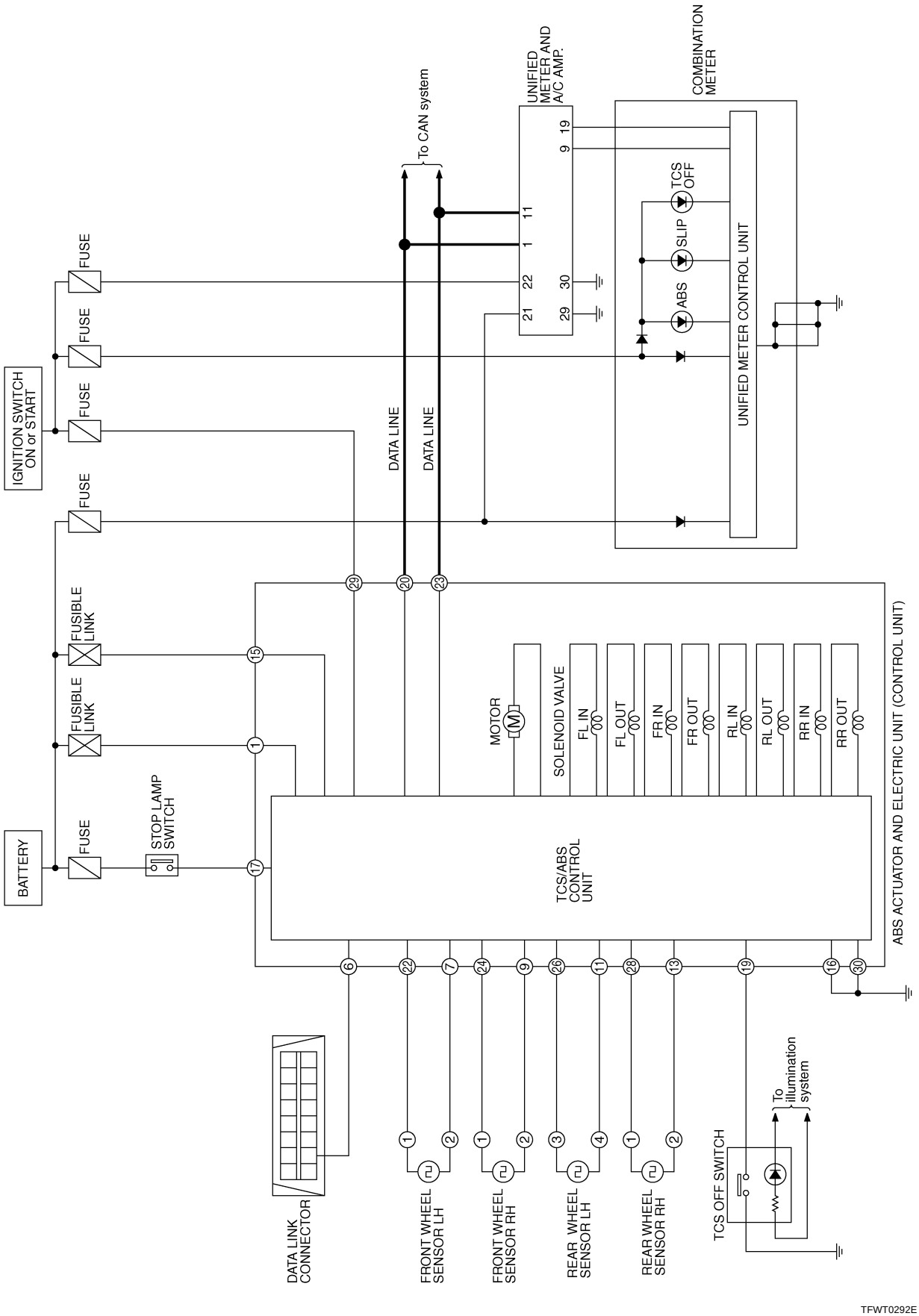
Component Parts Location

NFS00030



Schematic

NFS00031

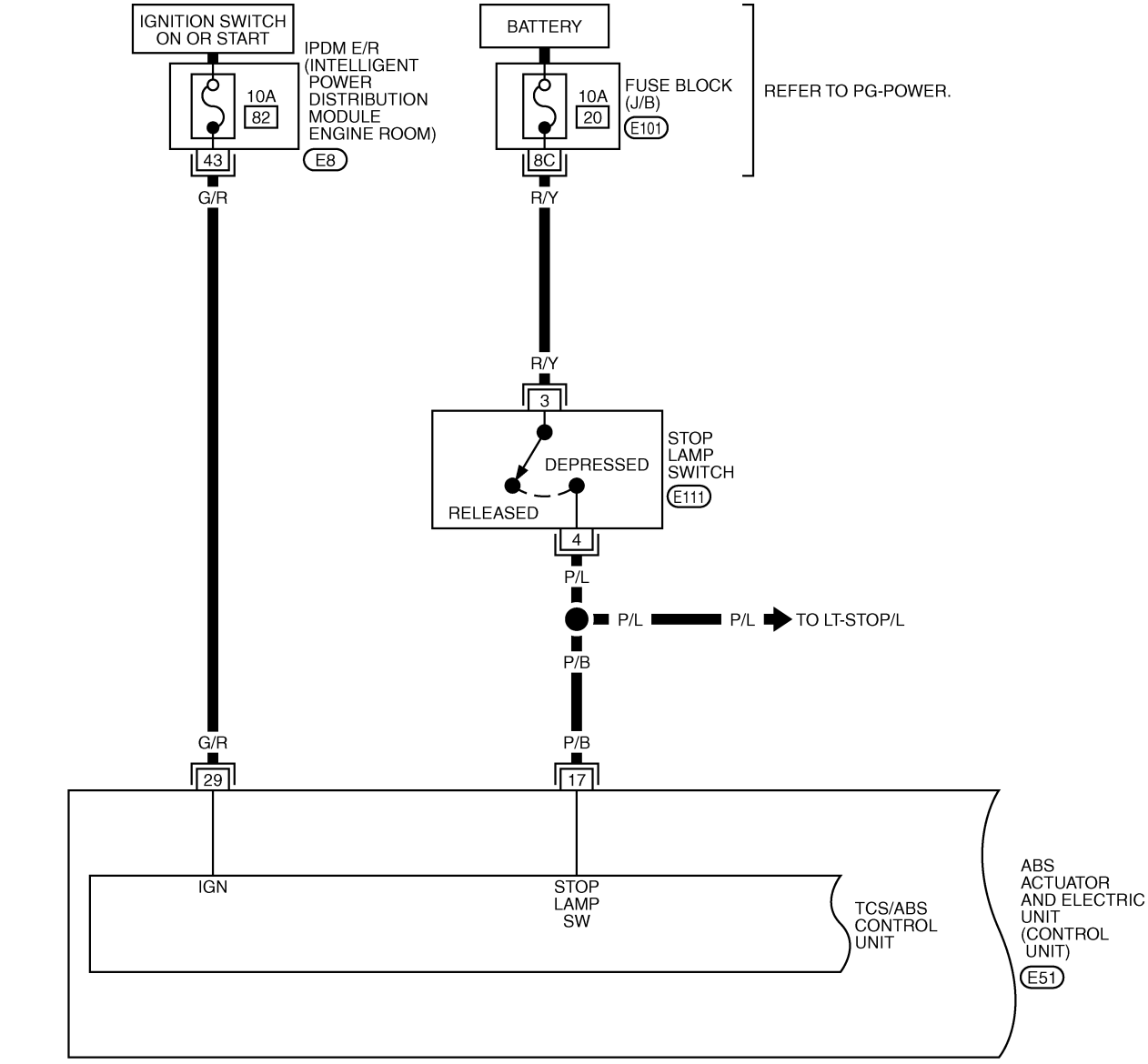


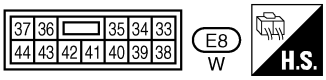
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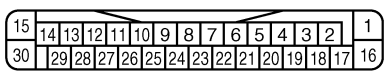
Wiring Diagram — TCS —

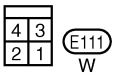
NFS00032

BRC-TCS-01





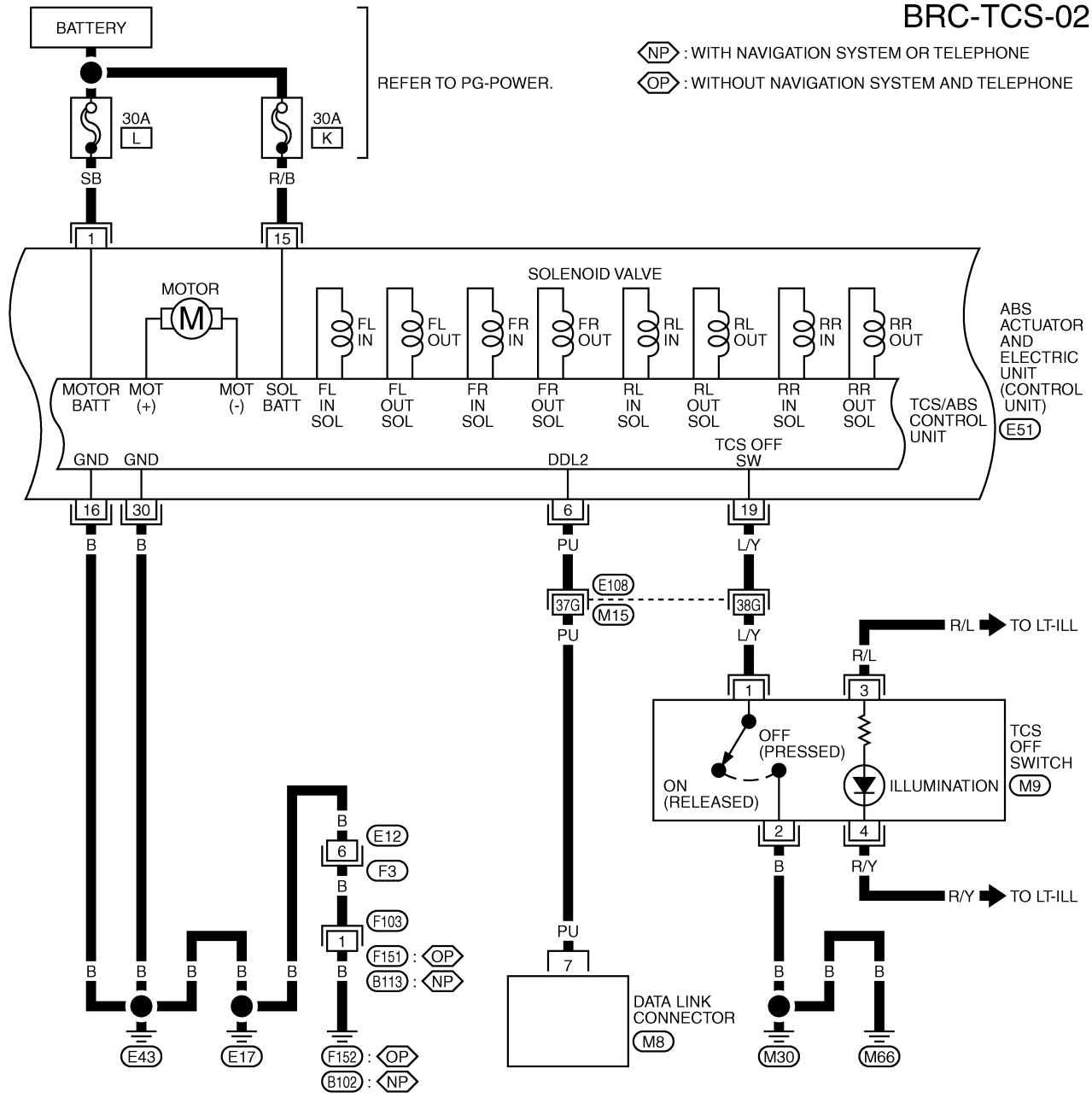


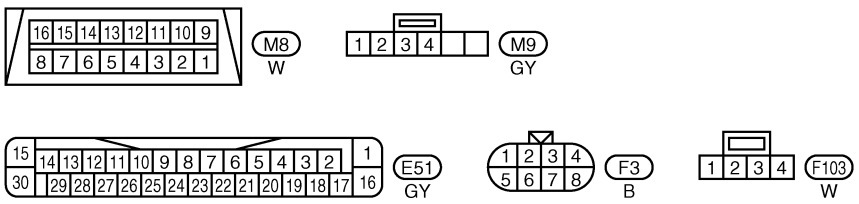


REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0377E

BRC-TCS-02

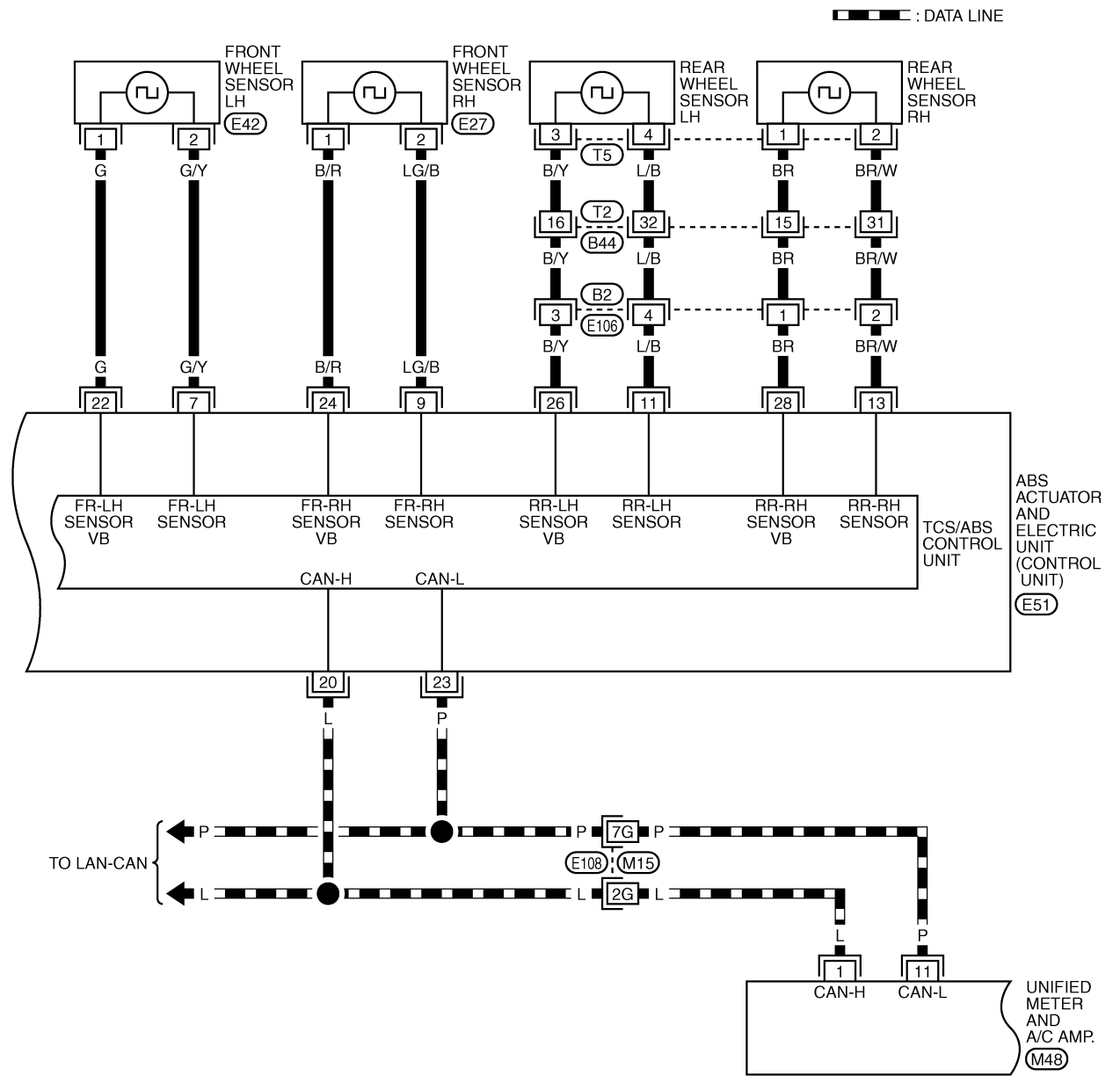


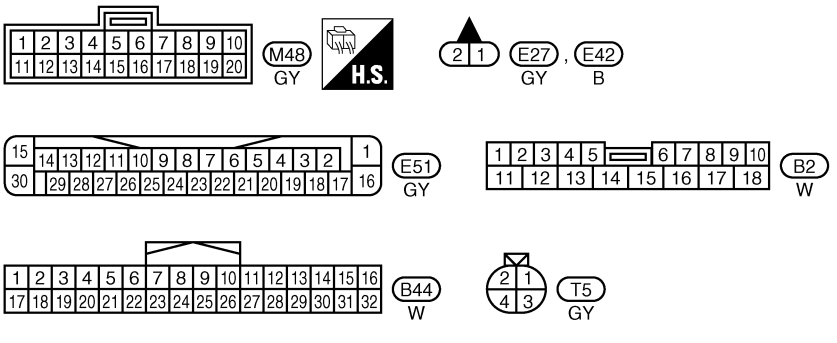


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0378E

BRC-TCS-03

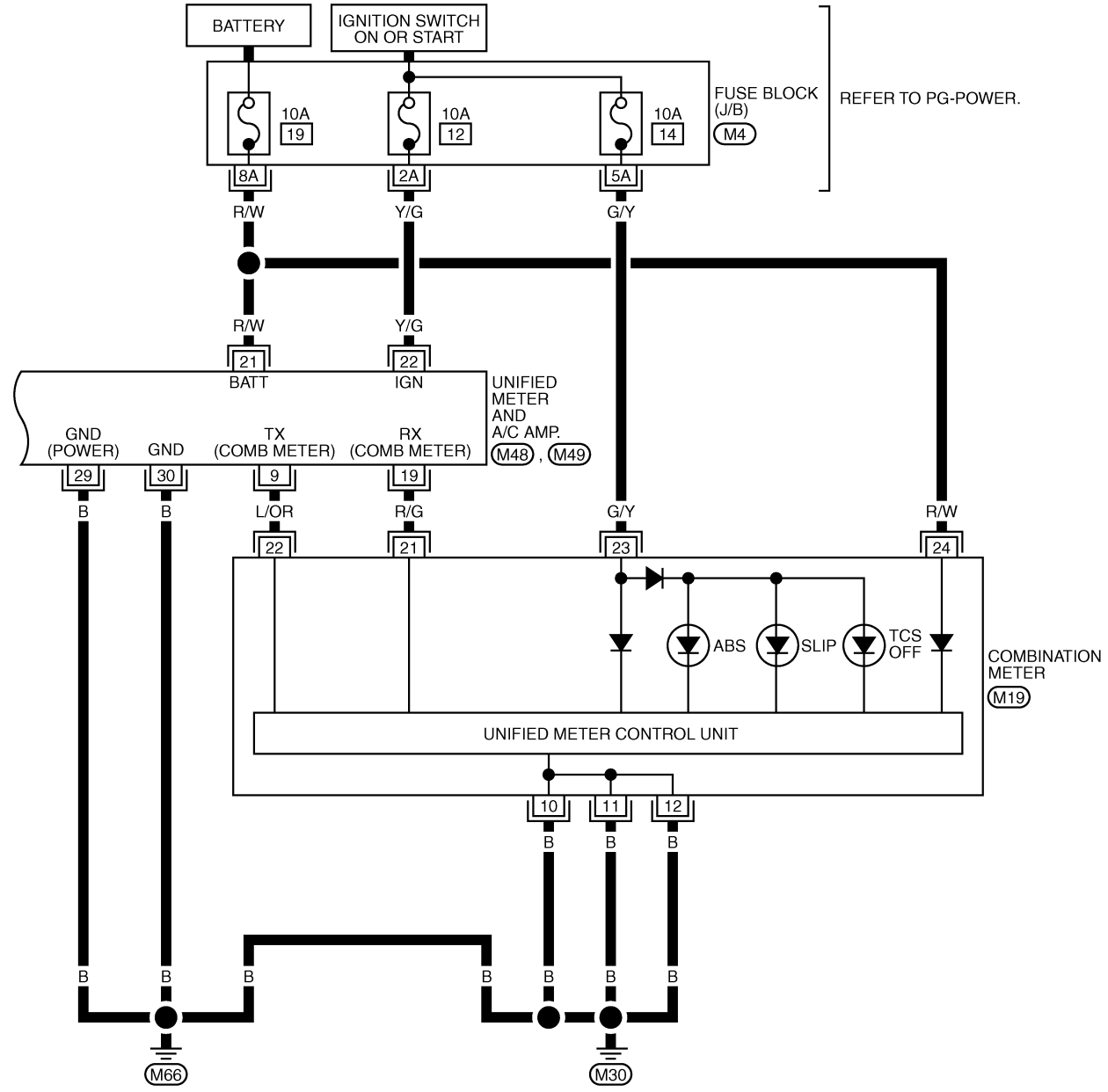


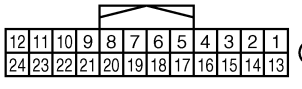


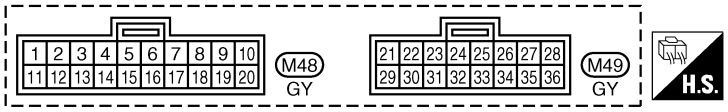
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0295E

BRC-TCS-04







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0041E

Control Unit Input/Output Signal Standard

NFS00034

REFERENCE VALUE FROM CONSULT-III

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
WHEEL SENSOR	Wheel speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)
		While driving (Note 1)	Nearly matches the speedometer display (±10% or less)
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON
		When the actuator relay operates and the actuator solenoid does not operate	OFF
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON
		Brake pedal not depressed	OFF
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF
		When the actuator relay is not operating	ON
EBD WARN LAMP	Brake warning lamp on condition (Note 2)	Brake warning lamp ON	ON
		Brake warning lamp OFF	OFF
ABS WARN LAMP	ABS warning lamp on condition (Note 3)	ABS warning lamp ON	ON
		ABS warning lamp OFF	OFF
OFF LAMP	TCS OFF indicator lamp on condition (Note 4)	TCS OFF indicator lamp ON	ON
		TCS OFF indicator lamp OFF	OFF
SLIP LAMP	SLIP indicator lamp on condition (Note 5)	SLIP indicator lamp ON	ON
		SLIP indicator lamp OFF	OFF
OFF SW	TCS switch ON-OFF status	TCS OFF switch ON (TCS OFF indicator lamp ON)	ON
		TCS OFF switch OFF (TCS OFF indicator lamp OFF)	OFF
BATTERY VOLT	Battery voltage supplied to TCS/ABS control unit	Ignition switch ON	10 - 16 V
GEAR	Determined gear shift position from the A/T PNP switch signal	Driving	1 - 5 ● Differs depending on the transmission status. (M/T vehicles are always left in 1.)
ENGINE RPM	Engine running	With engine stopped	0 rpm
		With engine running	Almost in accordance with tachometer display
N POSITION SIGNAL	Determined gear shift position from the A/T PNP switch signal (Note 5)	N position	ON
		Other than N position	OFF

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
P POSITION SIGNAL	Determined gear shift position from the A/T PNP switch signal (Note 6)	P position	ON
		Other than P position	OFF
FAIL SIGNAL	Fail signal status	During TCS fail-safe During ABS fail-safe During EBD fail-safe	ON
ACCEL POS SIG	Open/close condition of throttle valve (linked with accelerator pedal).	Accelerator pedal not depressed (ignition switch is ON)	0 %
		Depress accelerator pedal (ignition switch is ON)	0 to 100 %

Note 1: Confirm tire pressure is normal.
Note 2: Serves as EBD warning lamp.
Note 3: ON/OFF timing of ABS warning lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal).
Note 4: ON/OFF timing of TCS OFF indicator lamp
ON: For approximately 1 second after the ignition switch is turned on, when an error is detected, or when the TCS OFF switch is on.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal), when TCS OFF switch is off.
Note 5: ON/OFF timing of SLIP indicator lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal), when TCS function is not operating
Flash: When the TCS function is operating during driving.
Note 6: A/T models.

CONSULT- II Functions (ABS)

NFS00035

CONSULT-III MAIN FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	Reference
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-53, "Self-diagnosis"
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-55, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-44, "CAN Diagnostic Support Monitor"
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-57, "Active Test"
FUNCTION TEST	Conducted by CONSULT-III instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

Self-diagnosis

NFS000HG

OPERATION PROCEDURE

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

HOW TO ERASE SELF-DIAGNOSIS RESULTS

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

   CAUTION:
   If memory cannot be erased, perform applicably diagnosis.

   - When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
   - Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-1 [C1101]	When the circuit in the rear RH wheel sensor is open.	BRC-61, "Wheel Sensor System" (Note 1)
RR LH SENSOR-1 [C1102]	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR-1 [C1103]	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR-1 [C1104]	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR-2 [C1105]	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR-2 [C1108]	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-64, "ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
CONTROLLER FAILURE [C1110]	When there is an internal error in the ABS actuator and electric unit (control unit).	BRC-63, "ABS Actuator and Electric Unit (Control Unit)"
PUMP MOTOR [C1111]	When the ABS actuator and electric unit (control unit) detects an error in the motor or motor relay.	BRC-65, "ABS Actuator Relay or ABS Motor Relay Power System"
MAIN RELAY [C1114]	When the control unit detects an error in the actuator relay system	BRC-65, "ABS Actuator Relay or ABS Motor Relay Power System"

Display item	Malfunction detecting condition	Check item
STOP LAMP SW [C1116]	When a stop lamp switch open-circuit is detected.	BRC-66, "Stop Lamp Switch System"
FR LH IN ABS SOL [C1120]	When the control unit detects an error in the front left inlet solenoid system.	BRC-65, "ABS Actuator Relay or ABS Motor Relay Power System"
FR LH OUT ABS SOL [C1121]	When the control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL [C1122]	When the control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL [C1123]	When the control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL [C1124]	When the control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL [C1125]	When the control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL [C1126]	When the control unit detects an error in the rear right inlet solenoid system.	
RR RH OUT ABS SOL [C1127]	When the control unit detects an error in the rear right outlet solenoid system.	
EMERGENCY BRAKE [C1153]	When the ABS actuator and electric unit (control unit) malfunctions (pressure increase is too much or too little).	BRC-67, "ABS Actuator and Electric Unit (Control Unit) 2"
ENGINE SIGNAL 1 [C1130]	Major engine components are malfunctioning.	BRC-63, "Engine System"
ENGINE SIGNAL 2 [C1131]		
ENGINE SIGNAL 3 [C1132]		
ENGINE SIGNAL 4 [C1133]		
ENGINE SIGNAL 5 [C1134]		
ENGINE SIGNAL 6 [C1136]		
CAN COMM CIRCUIT [U1000]	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-67, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.

Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HH

DISPLAY ITEM LIST

×: Standard –: Not applicable ▼: Option

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [(km/h (MPH)]	×	×	▼	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by Rear LH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by Rear RH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	×	▼	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	×	▼	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	×	▼	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	×	▼	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	×	▼	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	×	▼	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	×	▼	Rear left rear wheel inside ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	×	▼	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	–	×	▼	Brake warning lamp (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	×	×	▼	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	×	▼	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR RLY (ON/OFF)	–	×	▼	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	×	▼	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	×	▼	TCS OFF indicator lamp (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	▼	TCS OFF switch (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	×	▼	SLIP indicator lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	▼	The voltage supplied to the ABS actuator and electric unit (control unit) is displayed.
GEAR (A/T model)	×	×	▼	The gear position determined from the A/T PNP switch signal is displayed.
ENGINE SPEED (rpm)	×	×	▼	Engine speed status determined from the CAN communication signal is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
N POSI SIG (ON/OFF) (A/T model)	–	–	▼	Shift position determined from the A/T PNP switch signal is displayed.
P POSI SIG (ON/OFF) (A/T model)	–	–	▼	Shift position determined from the A/T PNP switch signal is displayed.
ACCEL POS SIG (%)	×	–	▼	Throttle position status determined from the CAN communication signal is displayed.
EBD SIGNAL (ON/OFF)	–	–	▼	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	▼	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	–	–	▼	TCS operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	▼	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	▼	ABS fail-safe signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	–	–	▼	TCS fail-safe signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	–	–	▼	Ignition switch START position signal input status is displayed.
ASCD SIGNAL (ON/OFF)	–	–	▼	ASCD (ON/OFF) status is displayed.

Active Test

NFS000IO

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.

TEST ITEM

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

For ABS solenoid valve, touch “UP”, “KEEP”, and “DOWN”.Then use screen monitor to check that solenoid valve operates as shown in the table below.

Operation	ABS solenoid valve		
	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF

ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Correct and Quick Diagnosis

NFS00036

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-53, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- TCS/ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	This is the sound of the motor operating inside ABS actuator and electric unit (control unit), and there may be some low sounds while TCS or ABS is operating.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	

Symptom	Symptom description	Result
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
TCS operation (SLIP indicator lamp ON)	TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.	Normal When conducting the inspection on a chassis dynamometer, cancel the TCS function.
	When inspecting the speedometer, etc., press TCS OFF switch to turn off TCS function before conducting the work.	
	When accelerator pedal is depressed on a chassis dynamometer (front wheel fixing type), the vehicle speed will not increase. This is normal, because TCS is activated by the stationary front wheels. The warning lamp may also turn on to show “sensor system error” in this case. This is not a malfunction either, because the stationary front wheels are detected. Restart engine, and drive the vehicle at 30 km/h (19 MPH) or more or higher to check that the warning lamp no longer turns on.	
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal
Sluggish feel	Depending on road circumstances, the driver may have a sluggish feel. This is normal, because under TCS operation optimum traction has the highest priority (safety first). Sometimes the driver has a slight sluggish feel in response to substantial accelerator pedal operation.	Normal

ABS WARNING LAMP, TCS OFF INDICATOR LAMP AND SLIP INDICATOR LAMP ON/OFF TIMING

×: ON –: OFF

Condition	ABS warning lamp	TCS OFF indicator lamp	SLIP indicator lamp	Remarks
Ignition switch OFF	—	—		—
For approximately “1” second after ignition switch ON	×	×	×	—
After approximately “1” second after ignition switch ON (When system is normal)	—	—	—	Turns off 2 second after engine start
When the TCS OFF switch is turned on (TCS function off)	—	×	—	—
TCS/ABS error	×	×	×	—
	×	×	—	When there is an ABS actuator and electric unit (control unit) error (power or ground error)
TCS error	—	×	×	—

Basic Inspection

NFS00037

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around ABS actuator and electric unit (control unit) for leaks. If there is leaking or oozing fluid, check the following items.
   - If ABS actuator and electric unit (control unit) connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or ABS actuator and electric unit (control unit) screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than ABS actuator and electric unit (control unit) connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at ABS actuator and electric unit (control unit), if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the ABS actuator and electric unit (control unit) body.

     CAUTION:
     ABS actuator and electric unit (control unit) cannot be disassembled.
3. Check brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION

1. Make sure ABS warning lamp, TCS OFF indicator lamp (when TCS OFF switch is OFF), and SLIP indicator lamp turns ON approximately 1 second when the ignition switch is turned ON. If they do not, check the TCS OFF indicator lamp and then TCS OFF switch. Refer to BRC-68, "TCS OFF SWITCH" . Check CAN communications. Refer to “CAN Communication Inspection”. If there are no errors with TCS OFF switch and CAN communication system, check combination meter. Refer to BRC-67, "CAN Communication System" .
2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. With the engine running, make sure TCS OFF indicator lamp turns on and off when TCS OFF switch is turned on and off. If the indicator lamp status does not correspond to switch operation, check the TCS OFF switch system. Refer to BRC-68, "TCS OFF SWITCH" .
4. Make sure ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp turn off 2 seconds after the engine is started. If ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit (control unit).
5. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-53, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS00038

After using the CONSULT-III SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR -1, -2
FR LH SENSOR -1, -2
RR RH SENSOR -1, -2
RR LH SENSOR -1, -2

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK TIRE

Check air pressure, wear, and size.

Are the air pressure, wear, and size within the standard values?

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

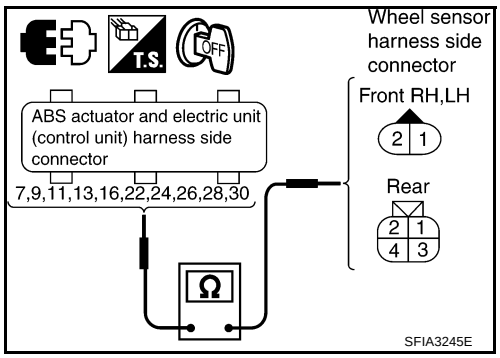
1. Disconnect ABS actuator and electric unit (control unit) connector and malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connector, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS actuator and electric unit (control unit) connector E51.
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit) (signal)	ABS actuator and electric unit (control unit) (ground)
Front RH	24	1	9	2	24, 9	16, 30
Front LH	22	1	7	2	22, 7	
Rear RH	28	1	13	2	28, 13	
Rear LH	26	3	11	4	26, 11	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

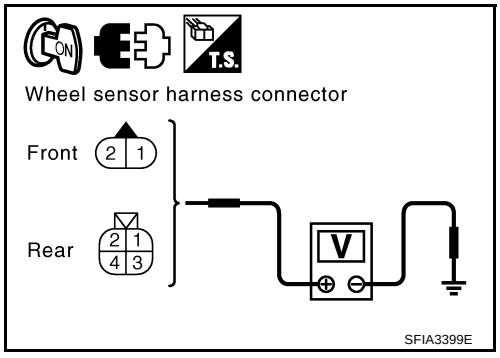
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

6. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Disconnect malfunctioning wheel sensor connector.
2. Turn ignition switch ON and check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH	1	—	8 V or more
Front LH			
Rear RH			
Rear LH	3		



OK or NG

OK >> Replace wheel sensor.
NG >> Replace ABS actuator and electric unit (control unit).

Engine System

NFS00039

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK ENGINE SYSTEM

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct ECM self-diagnosis.
2. Re-conduct ABS actuator and electric unit (control unit) self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

ABS Actuator and Electric Unit (Control Unit)

NFS0003A

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

YES >> Replace ABS actuator and electric unit (control unit). Re-conduct the self-diagnosis.
NO >> INSPECTION END

ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems

NFS0003B

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

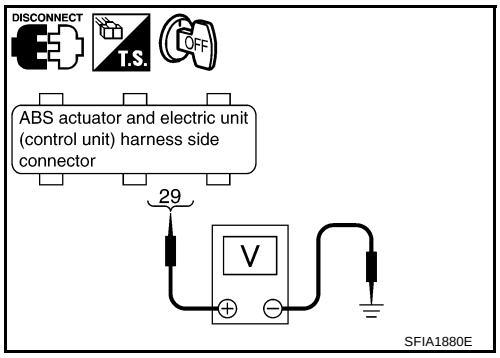
1. Disconnect ABS actuator and electric unit (control unit) connector, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

Is the result of self-diagnosis normal?

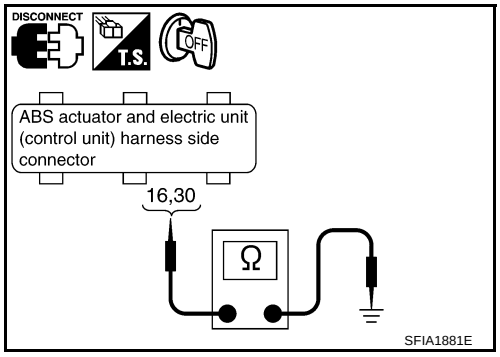
YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER AND GROUND CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check continuity and voltage between ABS actuator and electric unit (control unit) connector and ground.



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Voltage
Power supply	29	Ignition switch ON	Battery voltage (Approx. 12 V)
		Ignition switch OFF	Approx. 0 V



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Continuity
Ground	16, 30	Ignition switch OFF	Yes

OK or NG

OK >> Check battery (terminal looseness, power drop, etc.) Error. If there is an error, make repairs.
NG >> Corresponding harness circuit error. Repair the circuit.

ABS Actuator Relay or ABS Motor Relay Power System

NFS0003C

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
PUMP MOTOR
MAIN RELAY

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

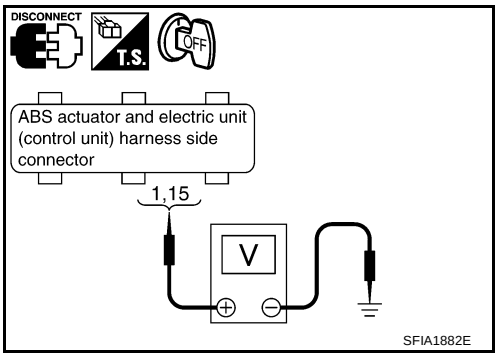
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ABS ACTUATOR RELAY OR ABS MOTOR RELAY POWER CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. For ABS actuator relay, measure the voltage between the connector terminal 1 and ground. For ABS motor relay, measure the voltage between connector terminal 15 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
1, 15	—	Battery voltage (Approx. 12 V)



OK or NG

OK >> GO TO 4
NG >> Error in the circuit between battery and ABS actuator and electric unit (control unit). Repair the circuit.

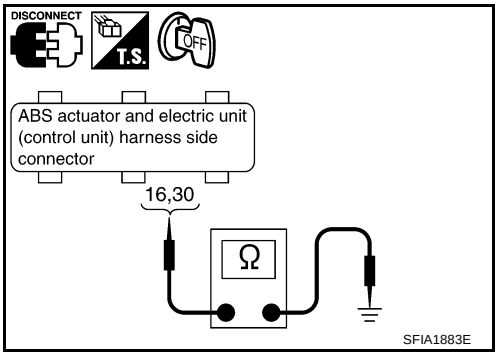
4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
16, 30	—	Yes

OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Open or short in harness. Repair or replace the harness.



Stop Lamp Switch System

NFS0003D

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector and stop lamp switch connector E111, check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.
3. Start engine
4. Repeat pumping brake pedal carefully several time, then perform self-diagnosis again

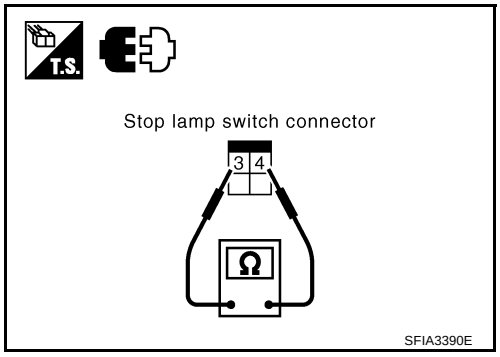
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

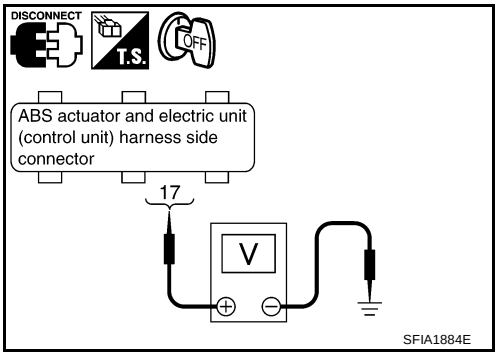


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check voltage between ABS actuator and electric unit (control unit) connector terminal and the ground.



ABS actuator and electric unit (control unit)	Ground	Measurement condition	Voltage
17	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> INSPECTION END
NG >> Open or short in harness between ABS actuator and electric unit (control unit) and stop lamp switch. Repair or replace the harness.

ABS Actuator and Electric Unit (Control Unit) 2

NFS0003E

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit).
NO >> INSPECTION END

CAN Communication System

NFS0003F

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-48, "CAN System Specification Chart" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

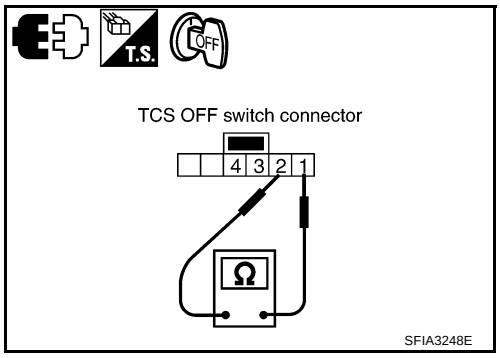
Component Inspection

NFS0003G

TCS OFF SWITCH

- Turn ignition switch OFF, disconnect the TCS OFF switch connector M9, and check continuity between terminals 1 and 2.

1 - 2 : Continuity should exist when pushing the switch.
: Continuity should not exist when releasing the switch.



TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0003H

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system.

2. CHECK FRONT AND REAR AXLE

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. CHECK WHEEL SENSOR AND SENSOR ROTOR

Wheel Sensor Inspection

- Wheel sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Wheel sensor connector connection inspection
- Wheel sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-53, "OPERATION PROCEDURE" .

Unexpected Pedal Reaction

NFS0003I

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

YES >> ● Bleed air from the brake piping.
● Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repairs.

NO >> GO TO 2.

2. CHECK FUNCTION

Disconnect the ABS actuator and electric unit (control unit) connector, and make sure the braking force is sufficient when the ABS is not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-69, "Excessive ABS Function Operation Frequency" .

NG >> Check brake system.

The Braking Distance Is Long

NFS0003J

CAUTION:

On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-69, "Excessive ABS Function Operation Frequency" .

NG >> ● Bleed air from the brake piping.
● Check brake system.

The ABS Function Does Not Operate

NFS0003K

CAUTION:

The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-69, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-53, "OPERATION PROCEDURE" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0003L

CAUTION:

Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

Does the symptom occur?

YES >> GO TO 2.
NO >> Perform self-diagnosis. Refer to BRC-53, "OPERATION PROCEDURE" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.
NO >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-69, "Excessive ABS Function Operation Frequency" .

The Vehicle Jerks Around During TCS/ABS Control

NFS0003M

1. CHECK ENGINE SPEED SIGNAL

Conduct CONSULT-III ABS actuator and electric unit (control unit) “Data Monitor”.

Is the speed during idling 400 rpm or higher?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK ECM SELF-DIAGNOSIS RESULT ITEM

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-81, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 3.

3. SYMPTOM CHECK 1

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK A/T SELF-DIAGNOSIS RESULT ITEM

Perform A/T self-diagnosis.

OK or NG

OK >> GO TO 5.
NG >> Check the corresponding items. Refer toAT-40, "TROUBLE DIAGNOSIS" in “A/T”.

5. SYMPTOM CHECK 2

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK SELF-DIAGNOSIS RESULT ITEM 1

Conduct self-diagnosis of the ABS actuator and electric unit (control unit).

Are self-diagnosis items displayed?

YES >> Check the corresponding items, make repairs, and re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.
NO >> GO TO 7.

7. CHECK CONNECTOR

1. Disconnect the ABS actuator and electric unit (control unit) connector and the ECM connectors, check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the connector.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> If the connector terminal contact is loose, damaged, open or shorted, repair or replace the connector terminal.
NG >> GO TO 8.

8. CHECK SELF-DIAGNOSIS RESULT ITEM 2

Re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any non-standard items.
NO >> GO TO 9.

9. CHECK CIRCUIT BETWEEN ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) AND THE ECM

Check CAN communication system. Refer to BRC-67, "CAN Communication System" .

OK or NG

OK >> INSPECTION END
NG >> Connect the connector and re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.

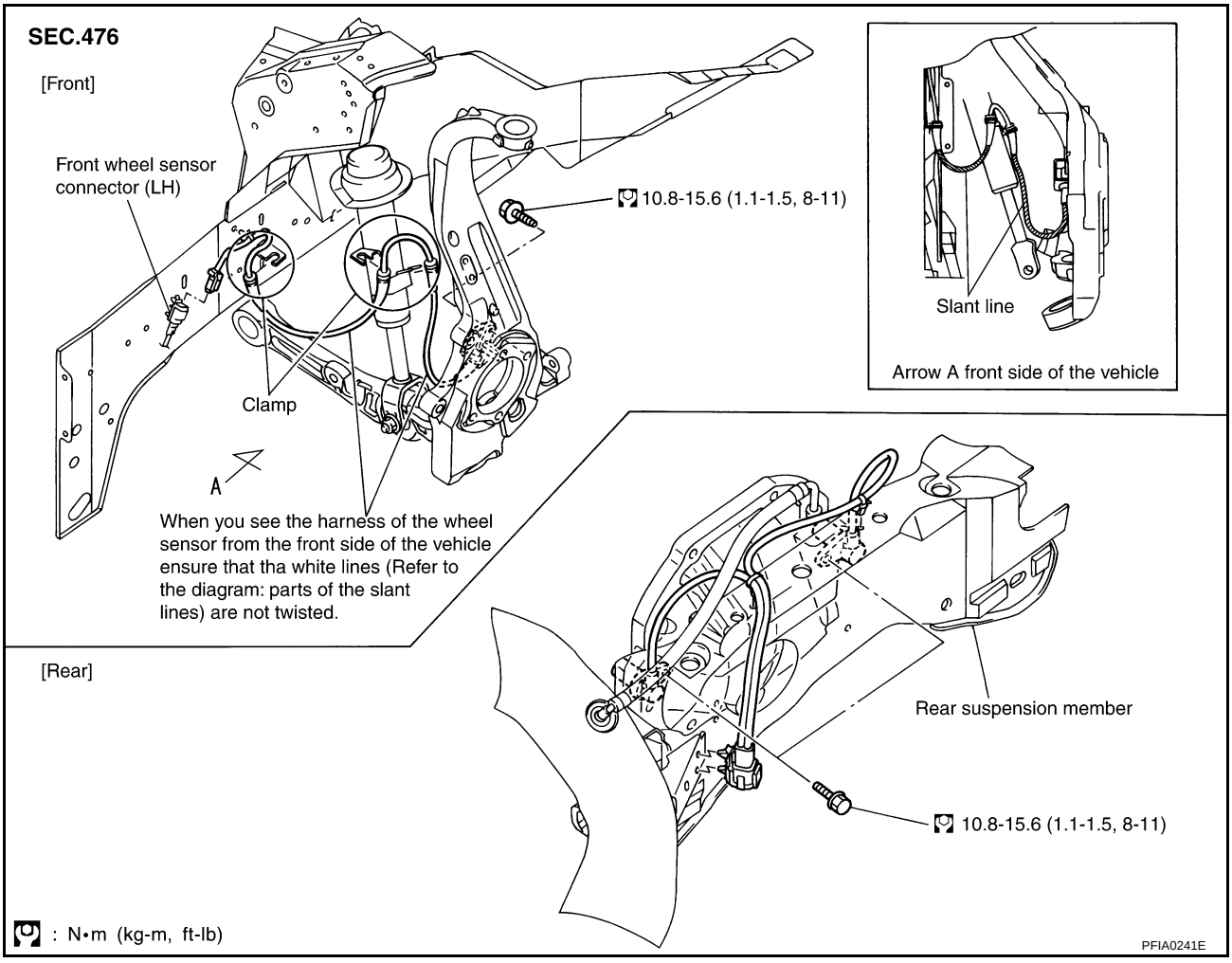
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0003N

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS0003O

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
- Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
- Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the side flange.

INSTALLATION

Front

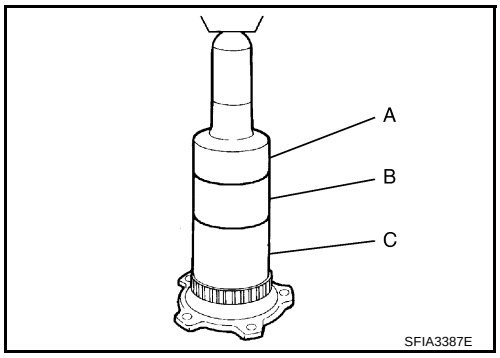
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
- Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number	A: ST30720000 (J-25405)
	B: ST27863000 (—)
	C: KV40104710 (—)

- Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.



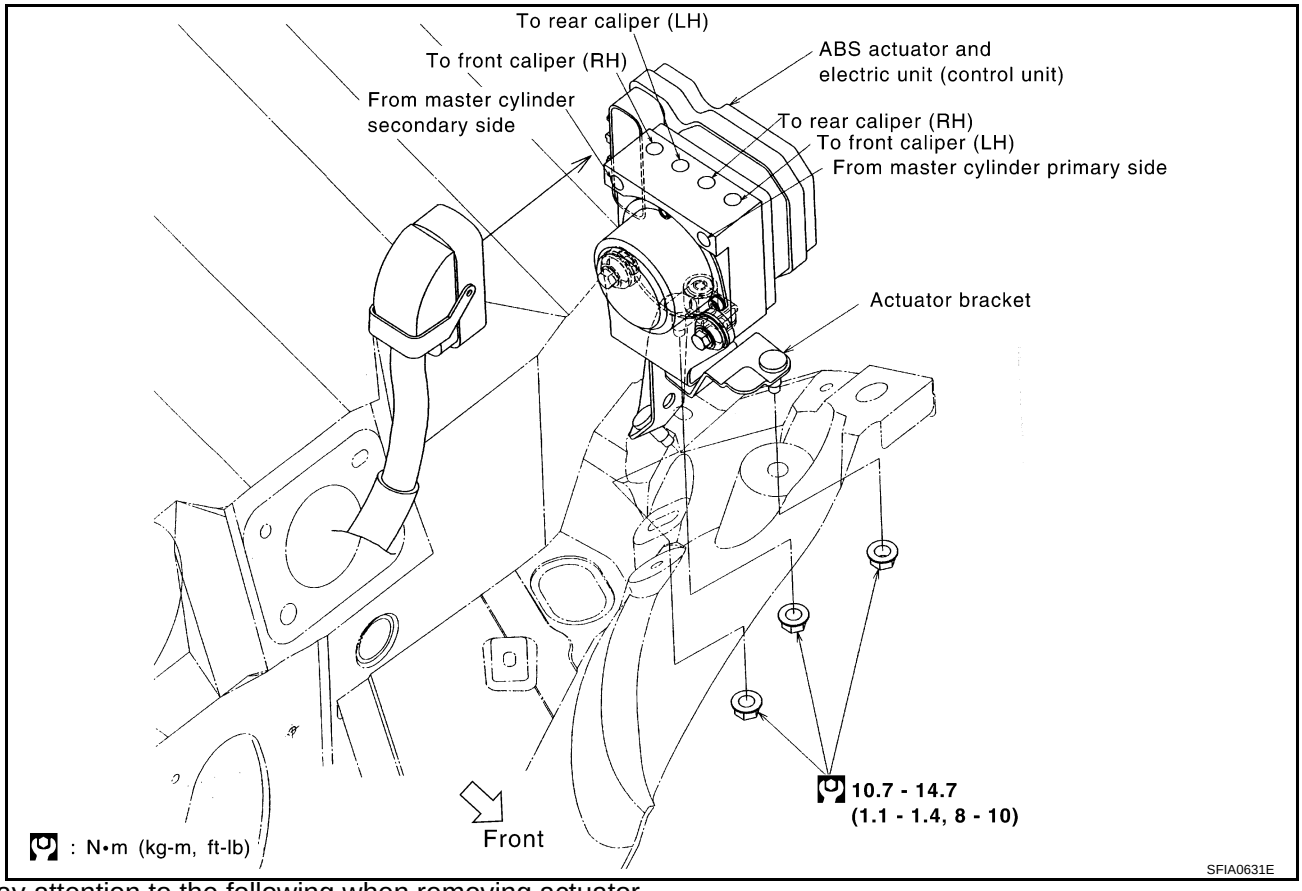
ABS ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

NFS0003P

COMPONENTS



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer toBR-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NFS000TP

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

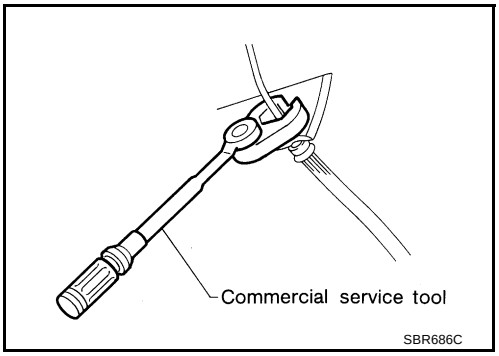
NFS0003R

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0003S

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut crowfoot and torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of VDC/TCS/ABS control unit or the battery negative terminal.



WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precautions for Brake Control

NFS0003T

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- If the following components are replaced with non-genuine components or converted, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (Shock Absorber, Strut, Spring, Bush, etc.), Tires, wheels (exclude specified size), components related to brake (Pad, Rotor, Caliper, etc.), Components related to engine (Muffler, ECM, etc.), Components related to body reinforcement (Roll bar, Tower bar, etc.).
- Driving in the condition of breakage or excessive wear of the suspension, tires or components related to the brakes may cause the VDC OFF indicator lamp and the SLIP indicator lamp to turn on, and the VDC system may not operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur if the brake pedal is used. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp carves on a freeway), the VDC may not operate normally, or the VDC warning lamp may turn on. However, this is not a problem if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. When VDC function is OFF (VDC SW ON) may cause the yaw rate/side G -sensor system indicate a problem. However this is not a problem if normal operation can be resumed after restarting the engine.

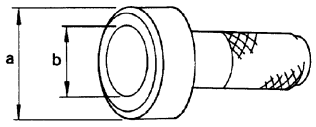
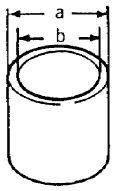
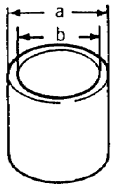
PREPARATION

PFP:00002

Special Service Tools

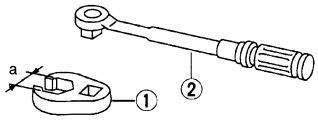
NFS0003U

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	
KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0003V

Tool name		Description
1. Flare nut crowfoot a: 10mm (0.39 in) / 12mm (0.47 in) 2. Torque wrench	 S-NT360	installing brake tube

ON-VEHICLE SERVICE

PFP:00000

Adjustment of Steering Angle Sensor Neutral Position

NFS0003W

In case of doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before running vehicle.

Situation	Adjustment of Steering Angle Sensor Neutral Position
Removing/Installing VDC/TCS/ABS control unit	–
Replacing VDC/TCS/ABS control unit	×
Removing/Installing steering angle sensor	×
Removing/Installing steering components	×
Removing/Installing suspension components	×
Change 4 tires to new ones	–
Tire rotation	–
Adjusting wheel alignment	×

×: Required
–: Not required

1. Stop vehicle with front wheels in straight-ahead position.
2. Turn ignition switch ON and in the following order touch “ABS” “WORK SUPPORT” “ANGLE SENSOR ADJUSTMENT” in CONSULT-III screen.
3. Touch “START”.

   CAUTION:
   Do not touch steering wheel while adjusting steering angle sensor.
4. After approximately 10 seconds, touch “END”. (After approximately 60 seconds, it ends automatically.)
5. Turn ignition switch OFF, then turn it ON again.

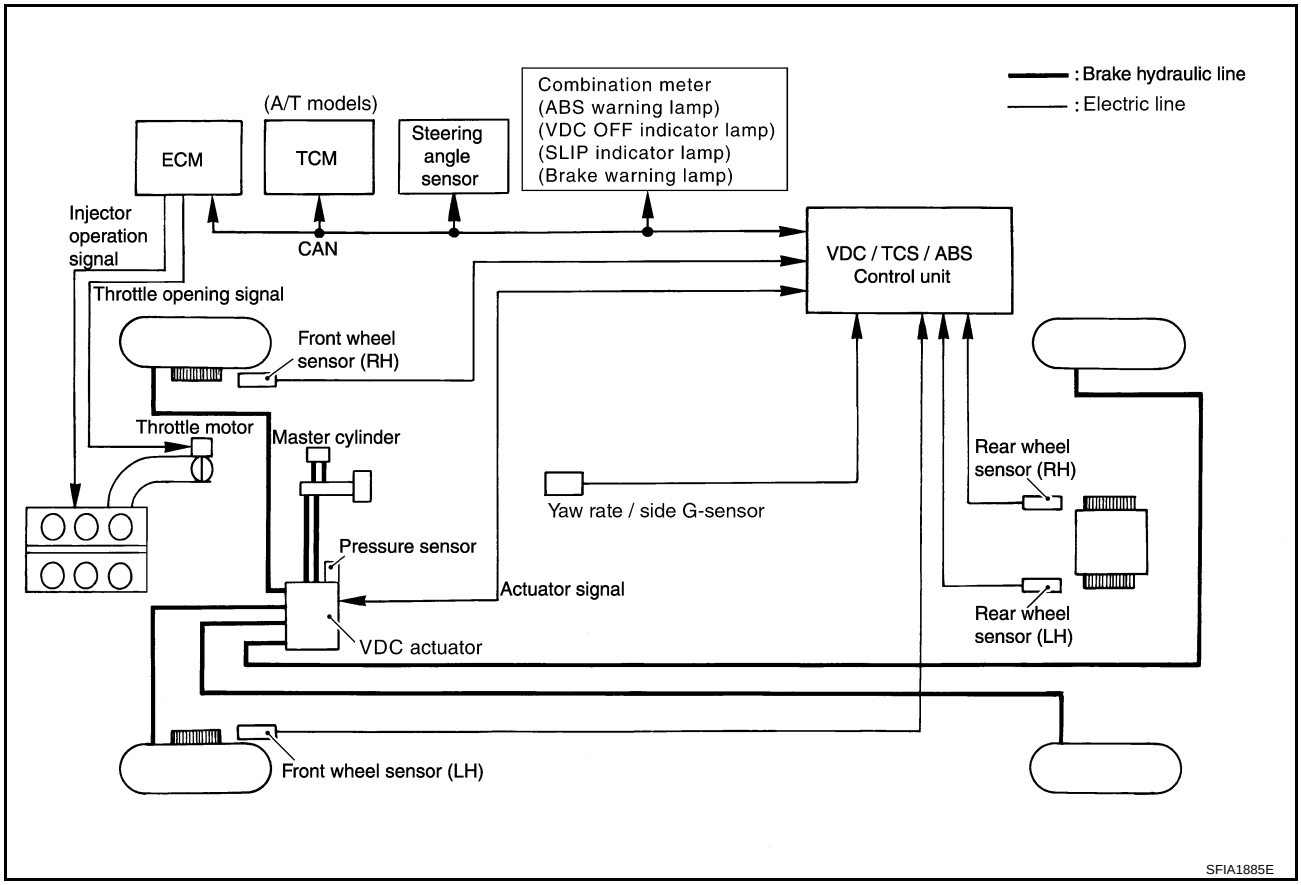
   CAUTION:
   Be sure to carry out above operation.
6. Run vehicle with front wheels in straight-ahead position, then stop.
7. Select “DATA MONITOR”, “ECU INPUT SIGNALS”, and “STEERING ANGLE SIGNAL” on CONSULT-III screen. Then check that “STEERING ANGLE SIGNAL” is within 0±2.5°. If value is more than specification, repeat steps 1 to 7.
8. Erase memory of VDC/TCS/ABS control unit and ECM.
9. Turn ignition switch to OFF.

SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0003X



VDC Function

NFS0003Y

- In addition to the TCS/ABS function, the driver steering amount and brake operation amount are detected from the steering angle sensor and pressure sensor, and the vehicle's driving status (amount of under-steering / over-steering) is determined from information from the yaw rate/side G sensor, wheel sensor, etc., and this information is used to improve vehicle stability by controlling the braking and engine power to all four wheels.
- The SLIP indicator lamp flashes to inform the driver of VDC operation.
- During VDC operation, the body and brake pedal lightly vibrate and mechanical noises may be heard. This is normal.
- The ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp might turn on when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is on a turn table or a ship while the engine is running. In this case, restart the engine on a normal road, and if the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off, there is no problem.

TCS Function

NFS0003Z

- The wheel spin of the drive wheels is detected by the VDC/TCS/ABS control unit from the wheel speed signals from the four wheels, so if wheel spin occurs, the rear wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle value is restricted to reduce the engine torque and decrease the amount of wheel spin. In addition, the degree the throttle is opened is controlled to achieve the optimum engine torque.
- Depending on road circumstances, the driver may have a sluggish feel. This is normal, because the optimum traction has the highest priority under TCS operation.
- TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.
- During TCS operation, it informs a driver of system operation by flashing SLIP indicator lamp.

ABS Function

NFS00040

- The Anti-Lock Braking System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-III is available.

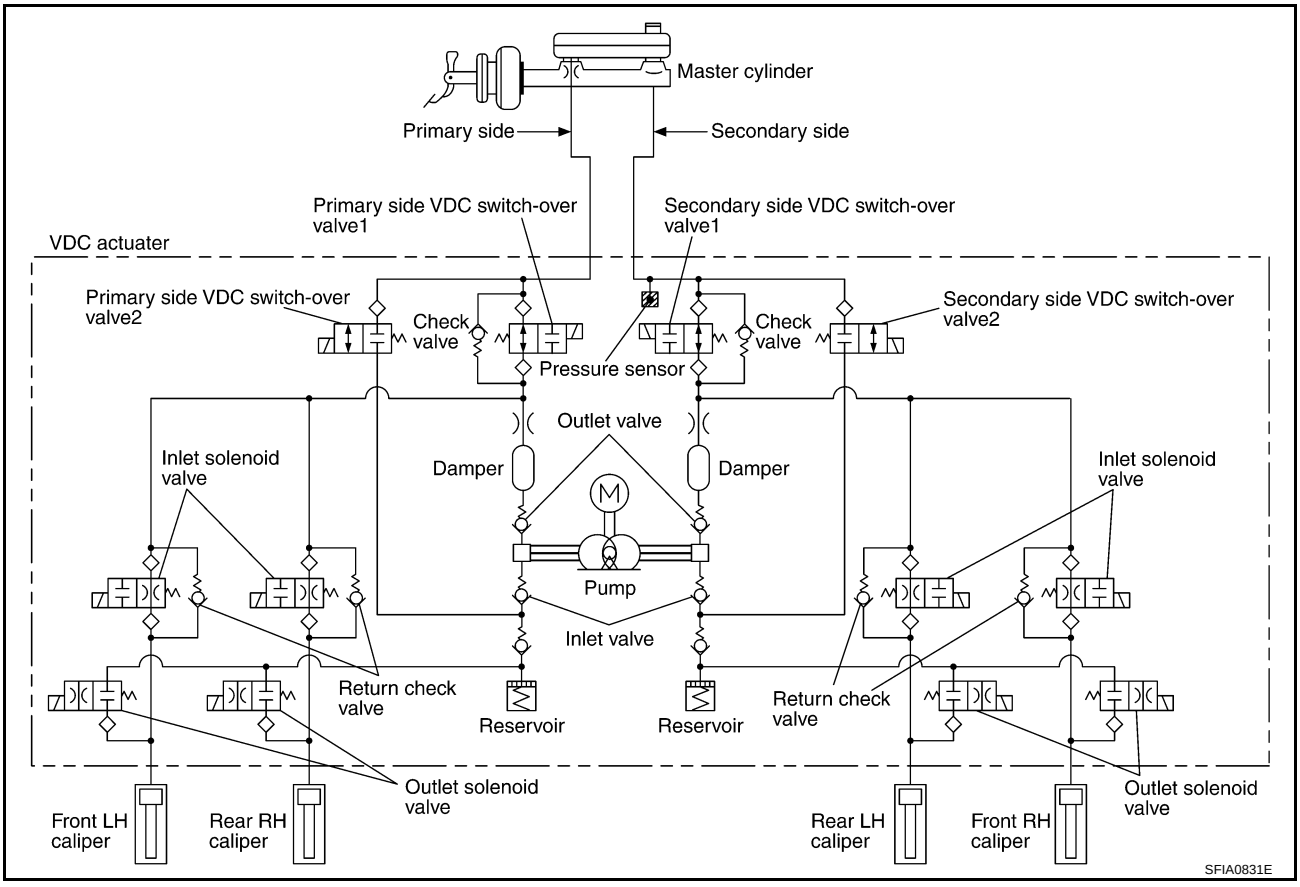
EBD Function

NFS00041

- Electronic Brake Distribution is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-III is available.

Hydraulic Circuit Diagram

NFS00043



CAN Communication

NFS00044

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000IK

VDC/TCS SYSTEM

In case of Throttle Control System trouble, the VDC OFF indicator lamp and SLIP indicator lamp are turned on, and the condition of the vehicle is the same as the condition of vehicles without VDC/TCS equipment. In case of trouble to the Throttle Control System, the ABS control continues to operate normally without VDC/TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform the self diagnosis for VDC/TCS/ABS control system.

ABS, EBD SYSTEM

In case of the electrical problems with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of the electrical problem with the EBD, brake warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the Fail-Safe function.

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicle without VDC/TCS/ABS equipment.

  NOTE:

  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.
- For EBD trouble, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without VDC/TCS/ ABS, EBD equipment.

How to Proceed With Diagnosis

NFS00045

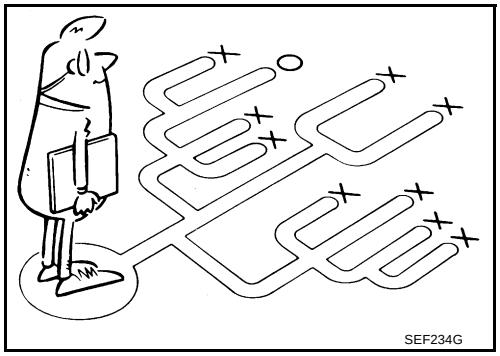
BASIC CONCEPT

- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

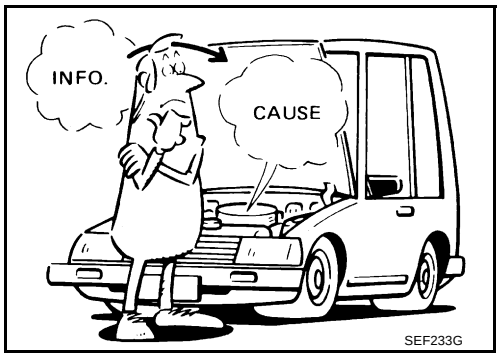
- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:

  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


SEF234G

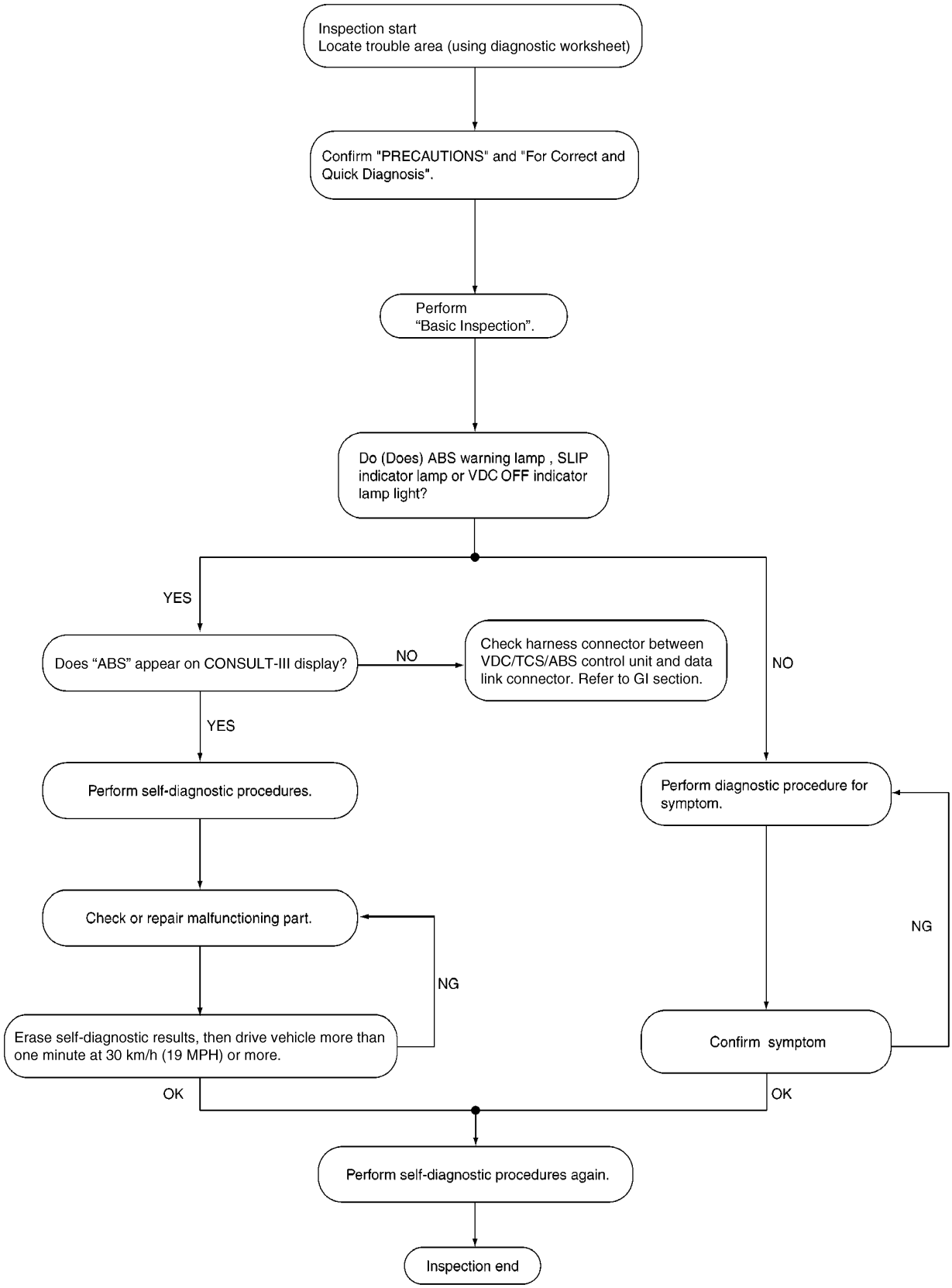
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-96, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-3, "General Precautions"

DIAGNOSIS FLOWCHART



SFIA3407E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

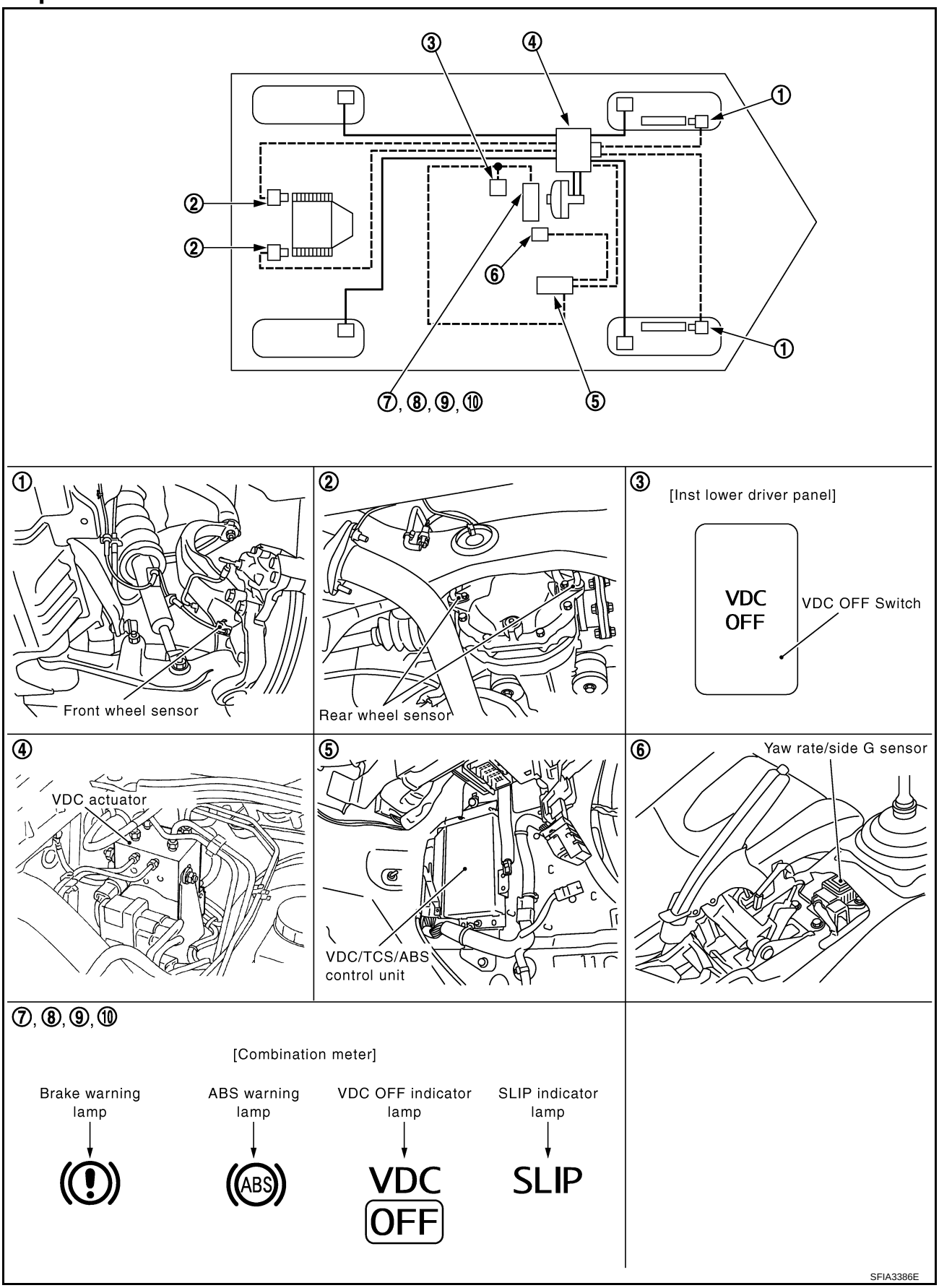
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA3265E

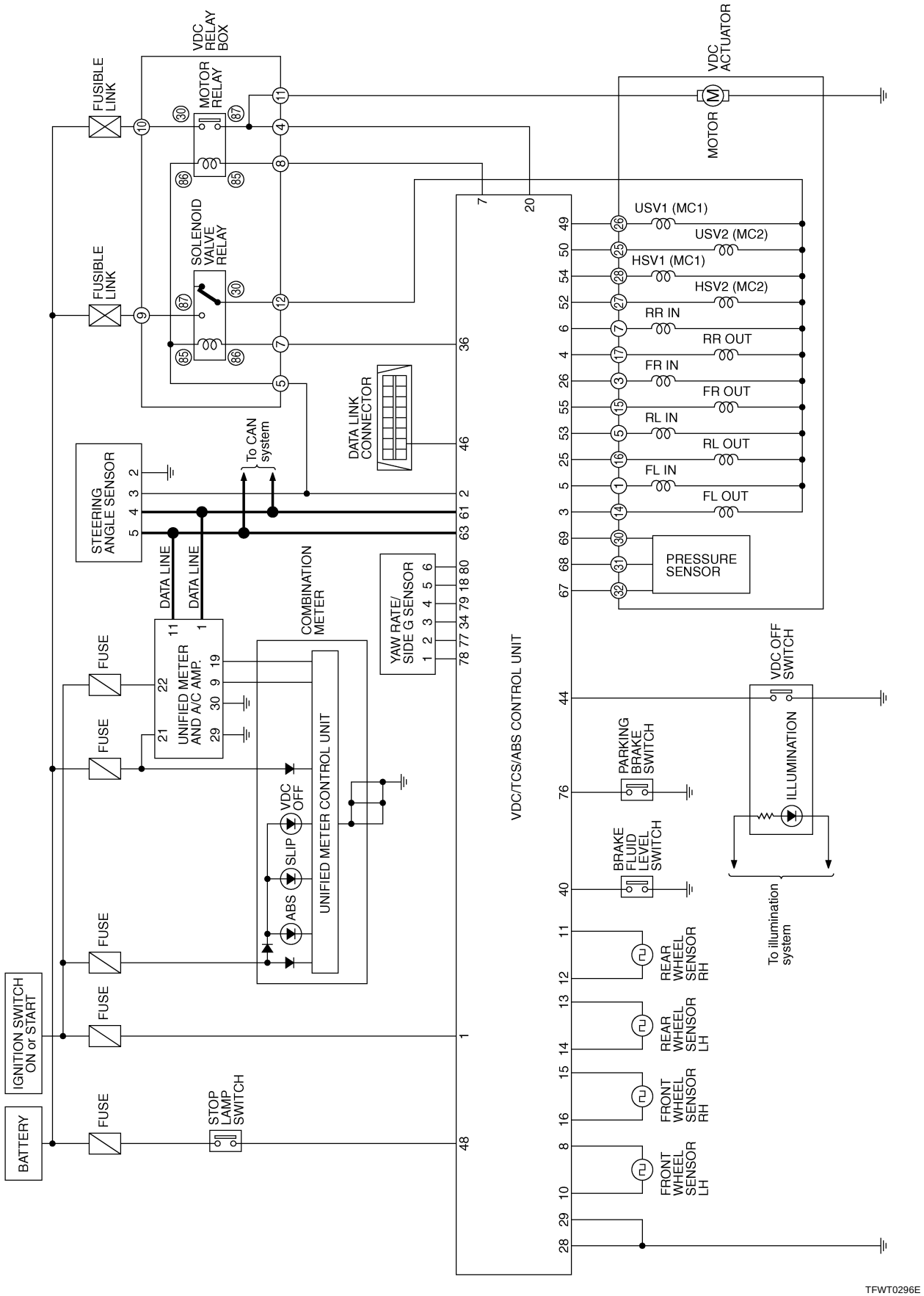
Component Parts Location

NFS000TL



Schematic

NFS00047

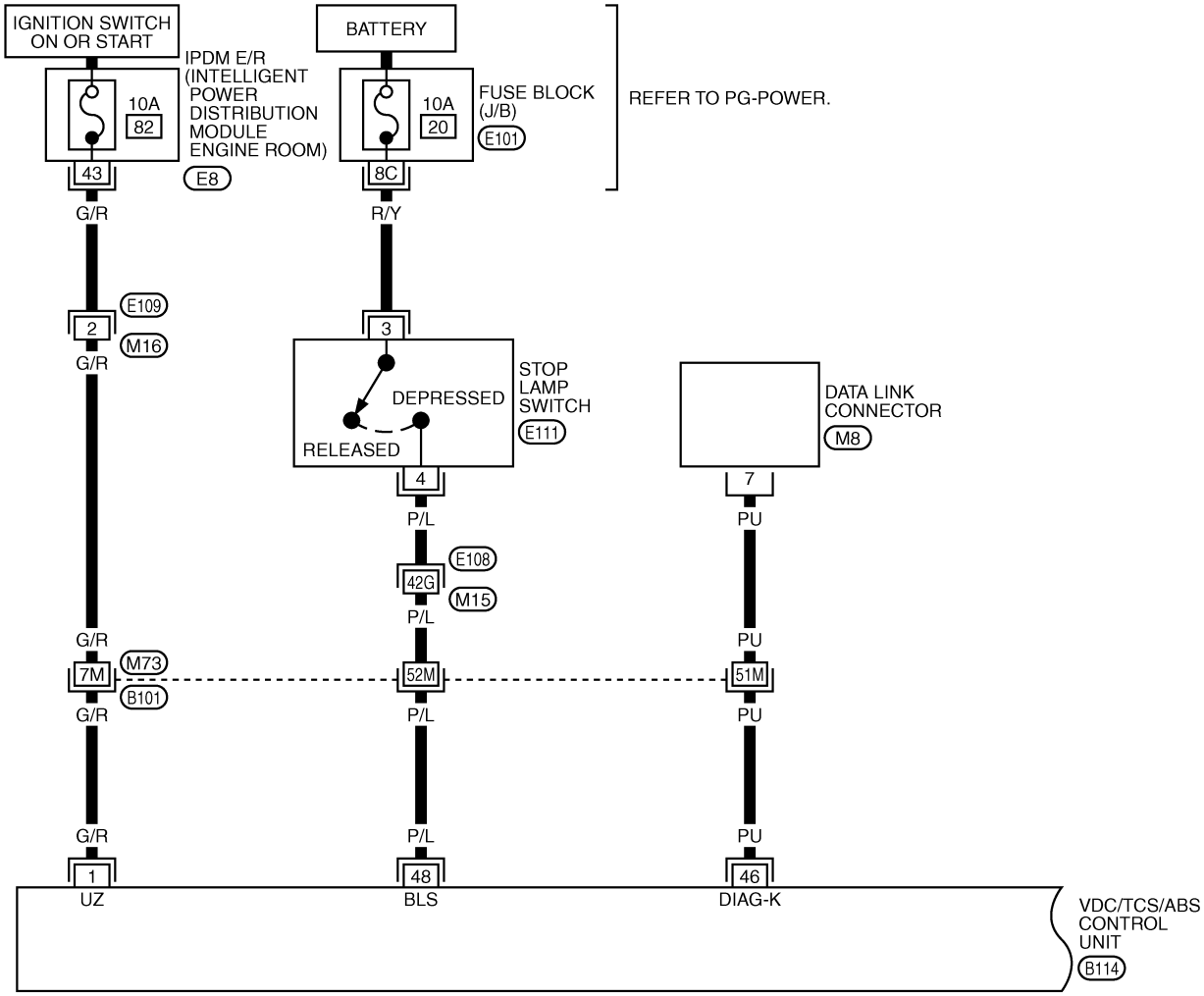


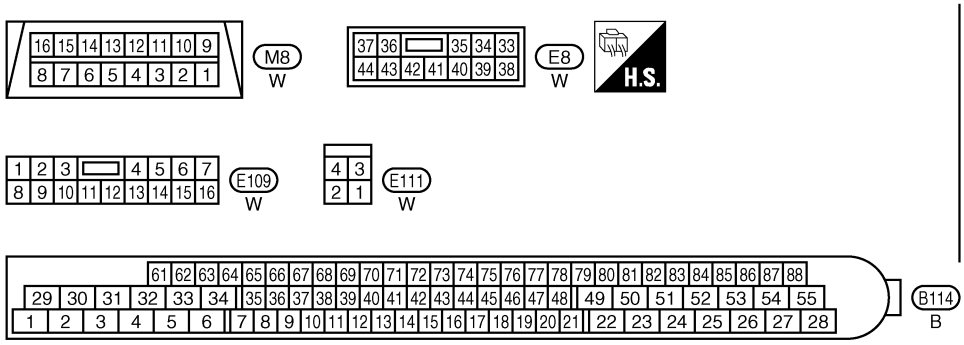
TFWT0296E

Wiring Diagram — VDC —

NFS00048

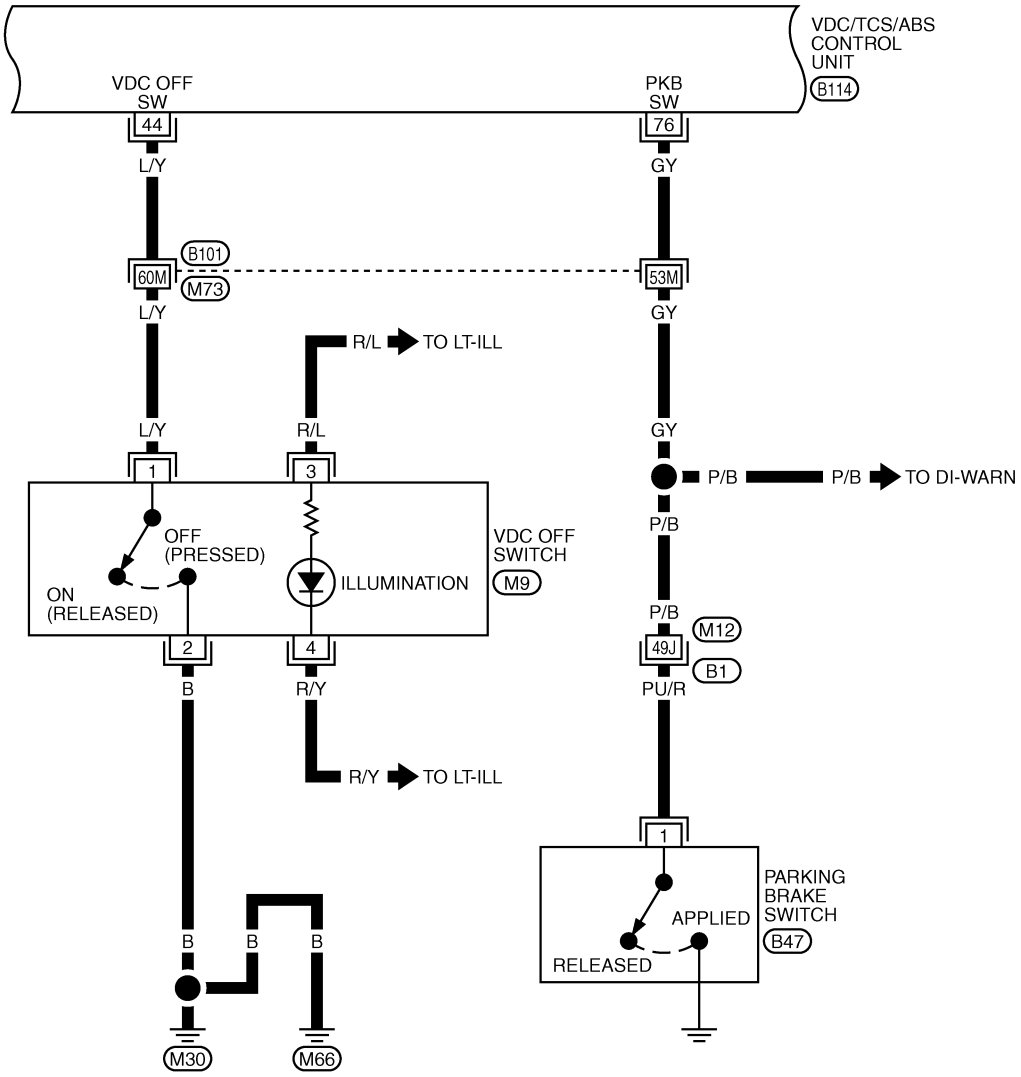
BRC-VDC-01

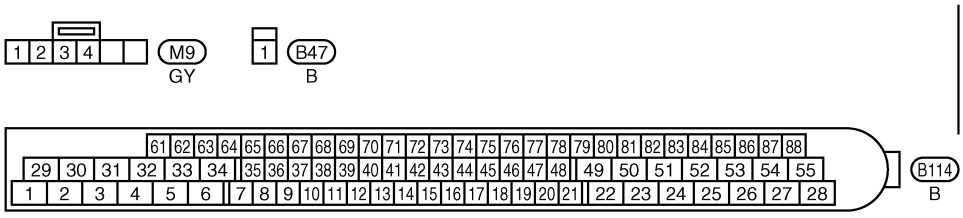




REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

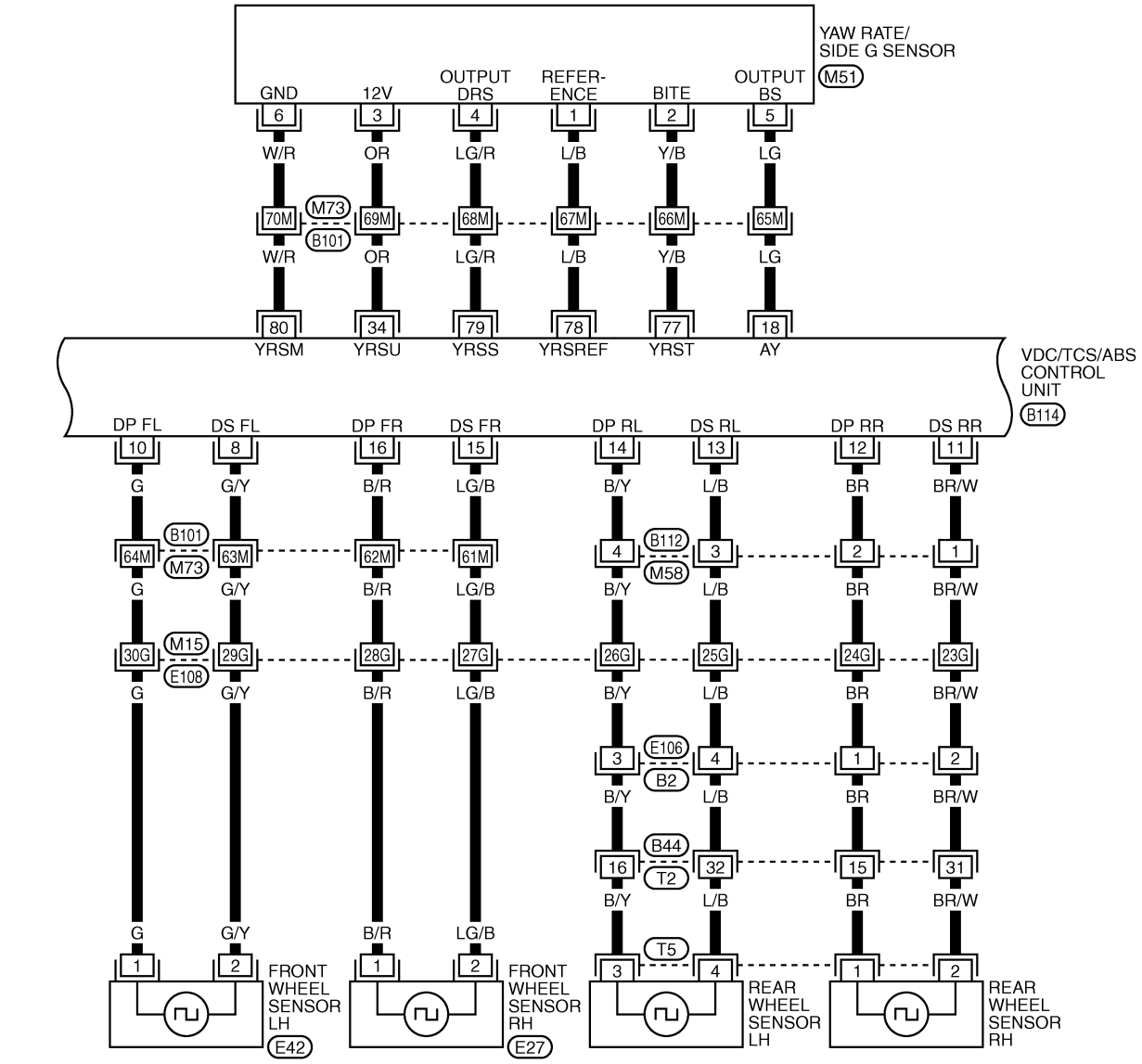
TFWT0368E

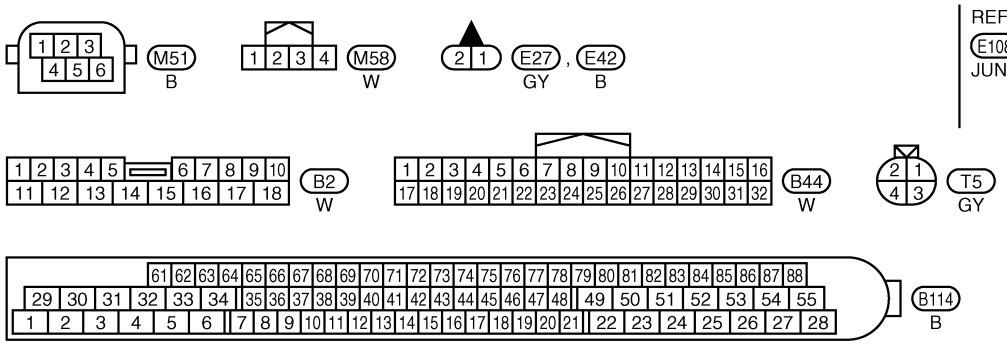

VDC/TCS/ABS CONTROL UNIT
B114
VDC OFF SW
44
L/Y
PKB SW
76
GY
B101
60M
M73
53M
L/Y
GY
R/L
TO LT-ILL
L/Y
R/L
GY
1
3
P/B
P/B
TO DI-WARN
P/B
OFF (PRESSED)
ON (RELEASED)
ILLUMINATION
VDC OFF SWITCH
M9
P/B
M12
49J
B1
2
4
B
R/Y
PU/R
R/Y
TO LT-ILL
1
PARKING BRAKE SWITCH
B47
APPLIED
RELEASED
B
B
B
M30
M66


1 2 3 4
M9
GY
1
B47
B
REFER TO THE FOLLOWING.
B1 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
B114
B

TFWT0379E

BRC-VDC-03

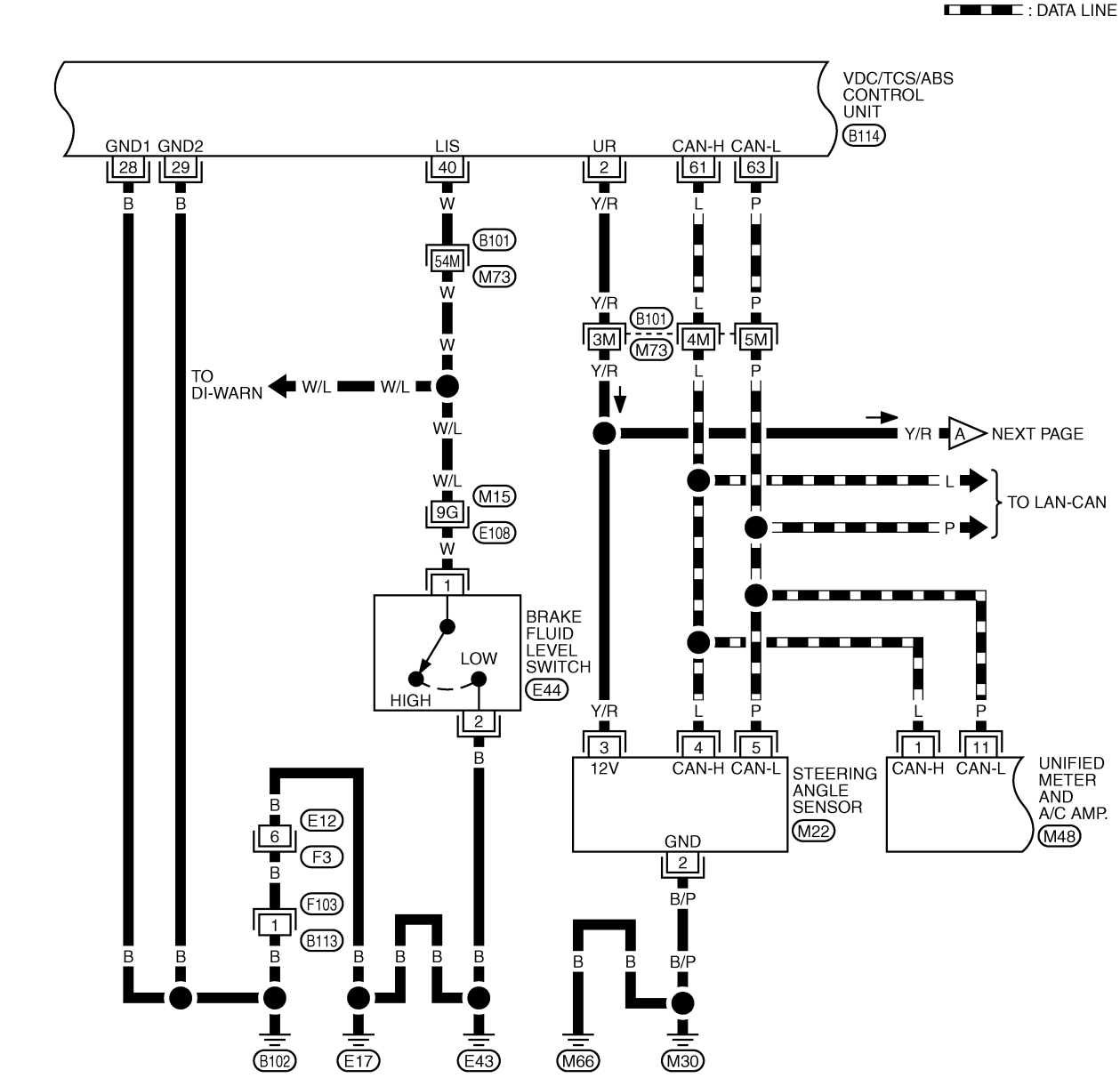


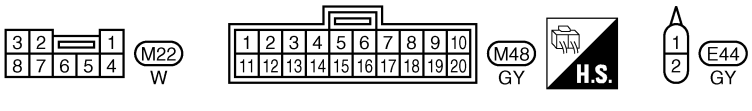


REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

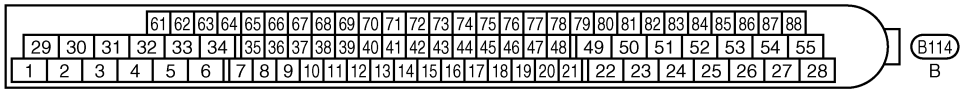
TFWT0370E

BRC-VDC-04



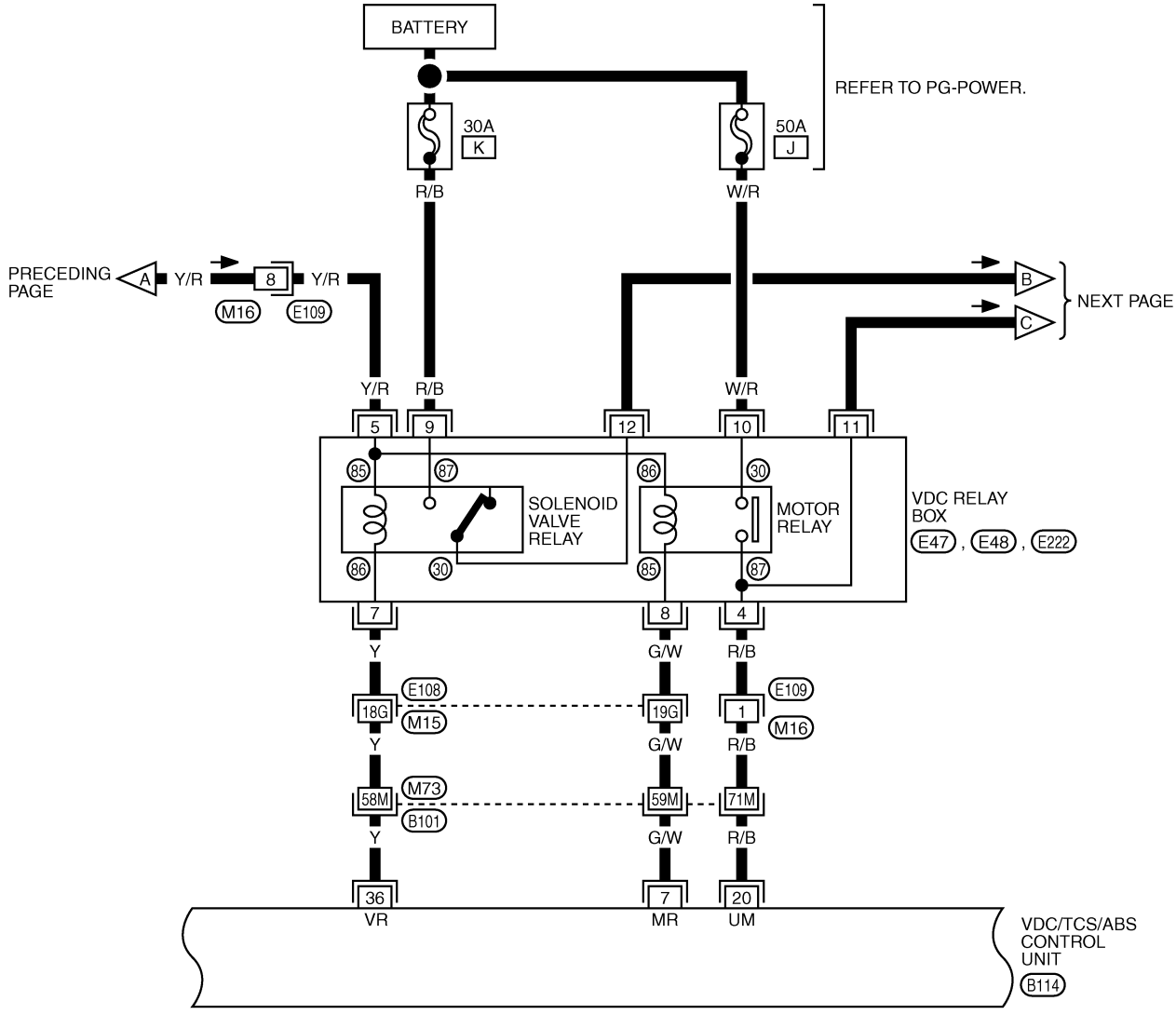


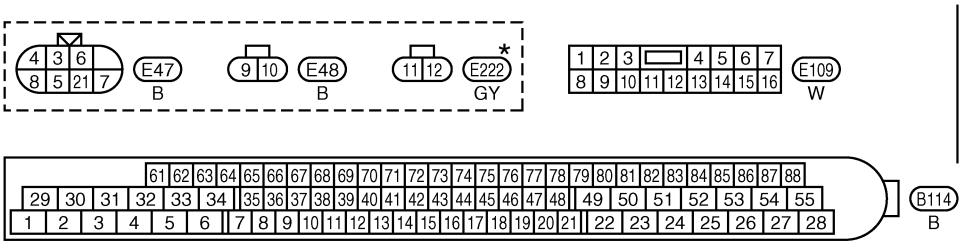
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)



TFWT0380E

BRC-VDC-05



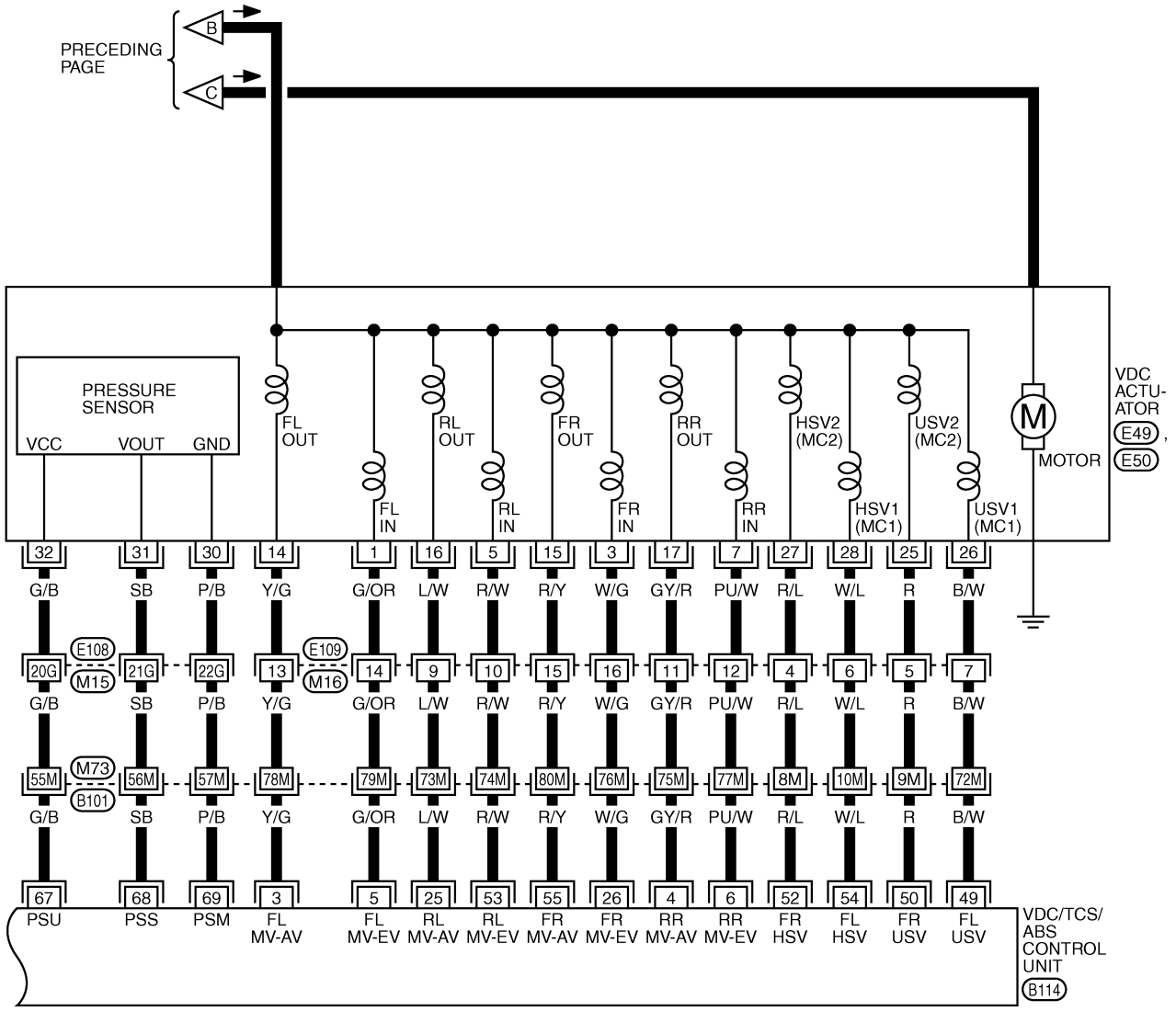


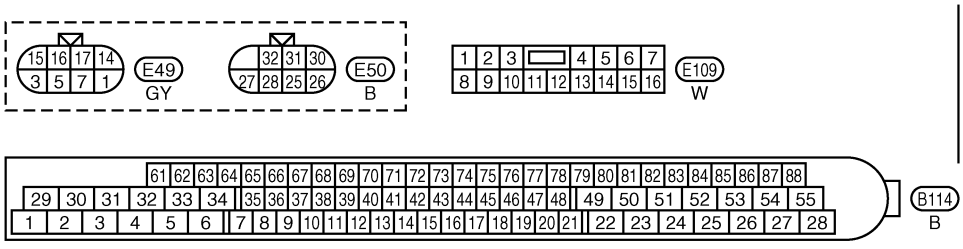
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TFWT0372E

BRC-VDC-06

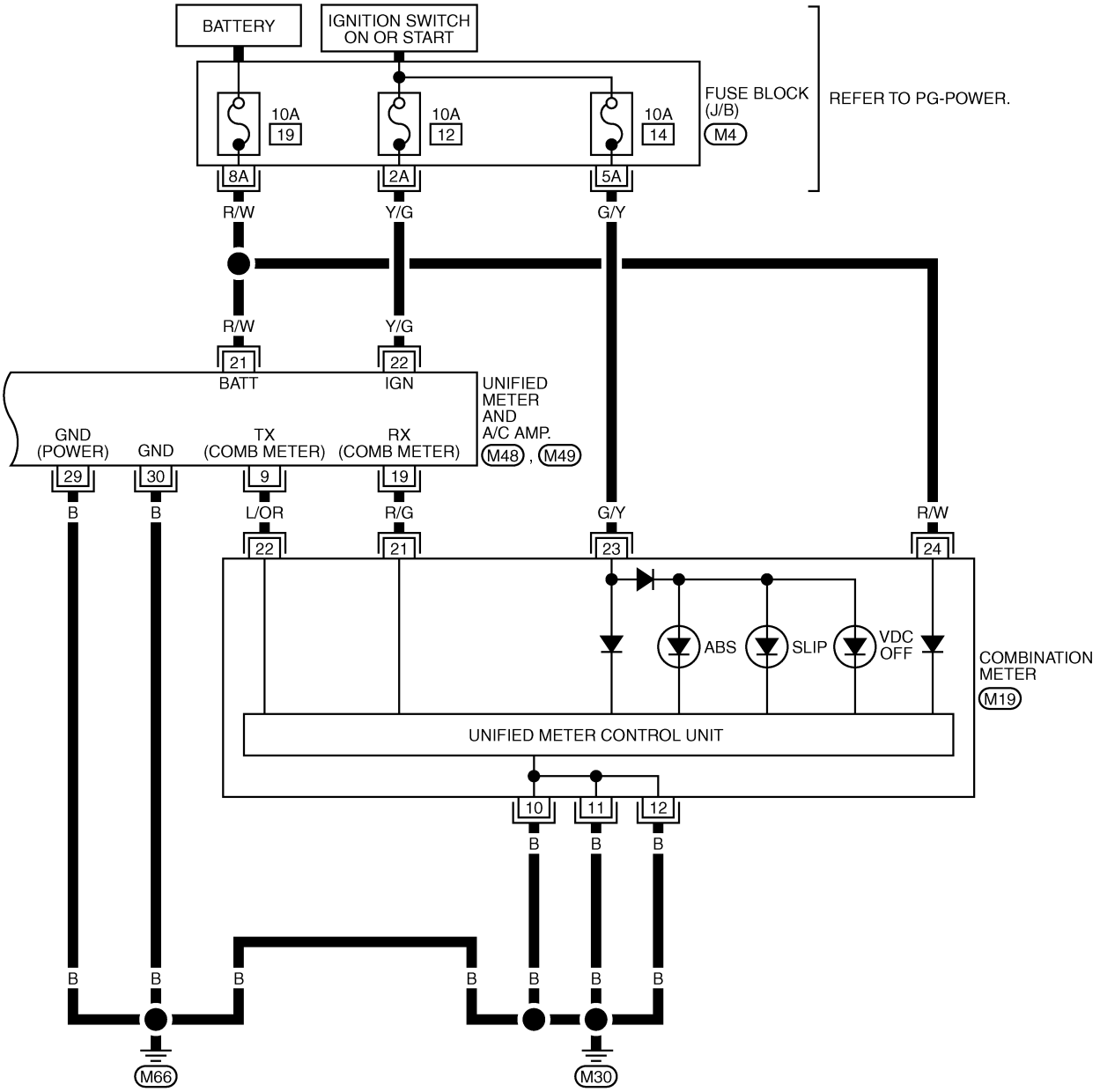


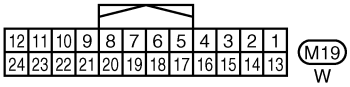


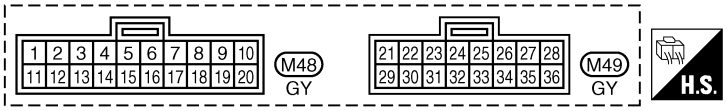
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0373E

BRC-VDC-07







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0303E

Control Unit Input/Output Signal Standard

NFS00049

REFERENCE VALUE FROM CONSULT-III

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
WHEEL SENSOR	Vehicle speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)
		While driving (Note 1)	Nearly matches the speedometer display (±10% or less)
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON
		When the actuator relay operates and the actuator solenoid does not operate	OFF
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON
		Brake pedal not depressed	OFF
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF
		When the actuator relay is not operating	ON
ABS WARN LAMP	ABS warning lamp on condition (Note 2)	ABS warning lamp ON	ON
		ABS warning lamp OFF	OFF
OFF LAMP	VDC OFF indicator lamp on condition (Note 3)	When the VDC OFF indicator lamp on	ON
		When the VDC OFF indicator lamp off	OFF
OFF SW	VDC OFF switch ON-OFF status	VDC OFF switch ON (When the VDC OFF indicator lamp on)	ON
		When VDC OFF switch OFF (When the VDC OFF indicator lamp off)	OFF
SLIP LAMP	SLIP indicator lamp on condition (Note 4)	When SLIP indicator lamp is ON	ON
		When SLIP indicator lamp is OFF	OFF
BATTERY VOLT	Battery voltage supplied to VDC/TCS/ABS control unit	Ignition switch ON	10 - 16V
GEAR	Determined gear shift position from the A/T PNP switch signal	Always	1 (M/T vehicles normally remain at 1)
POSITION	Shift position determined by the A/T PNP switch signal	Always	## (M/T vehicles normally remain at ##)
YAW RATE SEN	Yaw rate detected by yaw rate sensor	Vehicle stopped	Approx. 0 d/s
		While driving	-70 - 70d/s
ACCEL POS SIG	Throttle open/close status (linked to the accelerator pedal)	Do not step on the accelerator pedal (When ignition switch is on)	0%
		Step on the Brake pedal (When ignition switch is on)	0 to 100%
SIDE G-SENSOR	Side G detected by side G sensor	Vehicle stopped	Approx. 0 m/s^2
		While driving	-24.3 - 24.1 m/s^2
ST ANGLE SIG	Steering angle detected by steering angle sensor	Straight-ahead condition	Approx. 0°
		Steering wheel turned	-720 - 720°

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	Do not step on the Brake pedal (When ignition switch is on)	Approx. 0 bar
		Step on the accelerator pedal (When ignition switch is on)	-40 - 300 bar
ENGINE RPM	Engine running	With engine stopped	0rpm
		Engine running	Almost in accordance with tachometer display
SNOW MODE SW	Snow mode switch ON/OFF condition	Snow mode switch ON	ON
		Snow mode switch OFF	OFF
CONTROL BOOSTER	Boost control status	When control booster is operating	ON
		When control booster is not operating	OFF
M MODE	A/T manual mode status	Always	OFF (M/T vehicles normally remain OFF)
OD OFF SW	A/T OD switch status	Always	OFF (M/T vehicles normally remain OFF)
PARK BRAKE SW	Parking brake status	Parking brake depressed	ON
		Parking brake not depressed	OFF
USV HSV	VDC switch-over valve status	During actuator change-over valve operation or during a fail-safe	ON
		When the actuator relay operates and the actuator change-over valve does not operate	OFF
V/R POWER	Actuator relay activated (ON/OFF)	When actuator relay is active (engine is running).	ON
		When actuator relay is not active (before engine starts and in fail-safe mode).	OFF
M/R OUTPUT	Actuator motor and motor relay status (ON/OFF)	When actuator motor and motor relay are active (“ACTIVE TEST” with CONSULT-III).	ON
		When the actuator motor and motor relay are not operating	OFF
FLUID LEV SW	Brake fluid level sensor ON/OFF status	When brake fluid level sensor is on	ON
		When the brake fluid level sensor is off	OFF
FAIL SIGNAL	Fail signal status	During VDC fail-safe During TCS fail-safe During ABS fail-safe During EBD fail-safe	ON

Note 1: Confirm tire pressure is normal.
Note 2: ON/OFF timing of ABS warning lamp
ON: Approximately 1 sec. After turning on the ignition switch or when an error is detected.
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal).
Note 3: ON/OFF timing of VDC OFF indicator lamp
ON: Approximately 1 sec. After the ignition switch is turned on, an error is detected, or the VDC OFF switch is on
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal) and the VDC OFF switch is off
Note 4: ON/OFF timing of SLIP indicator lamp
ON: Approximately 1 sec. After turning on the ignition switch or when an error is detected.
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal) and the VDC/TCS function is not operating
Flashing: VDC/TCS function is active during driving

CONSULT-III Functions (ABS)

NFS0004A

CONSULT-III MAIN FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	Reference
WORK SUPPORT	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.	BRC-79, "Adjustment of Steering Angle Sensor Neutral Position"
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-96, "Self-Diagnosis"
DATA MONITOR	Input/Output data in the VDC/TCS/ABS control unit can be read.	BRC-99, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-44, "CAN Diagnostic Support Monitor"
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the VDC/TCS/ABS control unit and also shifts some parameters in a specified range.	BRC-101, "Active Test"
FUNCTION TEST	Conducted by CONSULT-III instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	VDC/TCS/ABS control unit part number can be read.	—

Self-Diagnosis

NFS000HK

OPERATION PROCEDURE

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

HOW TO ERASE SELF-DIAGNOSIS RESULTS

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

   CAUTION:

   If memory cannot be erased, perform applicably diagnosis.

   - When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
   - Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR -1 [C1101]	When the circuit in the rear RH wheel sensor is open.	BRC-105, "Wheel Sensor System" (Note 1)
RR LH SENSOR - 1 [C1102]	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR - 1 [C1103]	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR - 1 [C1104]	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR -2 [C1105]	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR - 2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR -2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR - 2 [C1108]	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the VDC/TCS/ABS power voltage is lower than normal.	BRC-120, "VDC/TCS/ABS Control Unit Power and Ground Systems"
CONTROLLER FAILURE [C1110]	When there is an internal error in the VDC/TCS/ABS control unit.	BRC-107, "VDC/TCS/ABS Control Unit 1"
PUMP MOTOR [C1111]	When the control unit detects an error in the motor or motor relay.	BRC-116, "ABS Motor and Motor Relay System"
MAIN RELAY [C1114]	When the control unit detects an error in the actuator relay system.	BRC-118, "Actuator Relay System"
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input is malfunction.	BRC-105, "Wheel Sensor System" (Note 1)
STOP LAMP SW [C1116]	When a stop lamp switch open-circuit is detected.	BRC-119, "Stop Lamp Switch System"
FR LH IN ABS SOL [C1120]	When the VDC/TCS/ABS control unit detects an error in the front left inlet solenoid system.	BRC-113, "Solenoid and VDC Change-Over Valve System"
FR LH OUT ABS SOL [C1121]	When the VDC/TCS/ABS control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL [C1122]	When the VDC/TCS/ABS control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL [C1123]	When the VDC/TCS/ABS control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL [C1124]	When the VDC/TCS/ABS control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL [C1125]	When the VDC/TCS/ABS control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL [C1126]	When the VDC/TCS/ABS control unit detects an error in the rear left inlet solenoid system.	
RR RH OUT ABS SOL [C1127]	When the VDC/TCS/ABS control unit detects an error in the rear right outlet solenoid system.	

Display item	Malfunction detecting condition	Check item
USV LINE [FL-RR] [C1147]	When the primary side VDC change-over valve 1 circuit is open or short-circuit.	BRC-113, "Solenoid and VDC Change-Over Valve System"
USV LINE [FR-RL] [C1148]	When the secondary side VDC change-over valve 1 circuit is open or short-circuit.	
HSV LINE [FL-RR] [C1149]	When the primary side VDC change-over valve 2 circuit is open or short-circuit.	
HSV LINE [FR-RL] [C1150]	When the secondary side VDC change-over valve 2 circuit is open or short-circuit.	
PRESS SEN CIRCUIT [C1142]	Pressure sensor open-circuit. When a short-circuit is detected. Or, when a pressure sensor error is detected.	BRC-108, "Pressure Sensor System"
ST ANG SEN CIRCUIT [C1143]	When the steering angle sensor neutral point has deviated. Or, when a steering angle sensor error is detected.	BRC-110, "Steering Angle Sensor System"
ST ANG SEN SIGNAL [C1144]	Neutral position correction of steering angle sensor is not finished.	BRC-79, "Adjustment of Steering Angle Sensor Neutral Position"
YAW RATE SENSOR [C1145]	When a yaw rate sensor error is detected. Or, when the yaw rate sensor circuit is open. When a short-circuit is detected.	BRC-111, "Yaw Rate/Side G Sensor System"
SIDE G - SEN CIRCUIT [C1146]	When there is an error in the side G sensor. Or, when the side G sensor circuit is open or short-circuited.	BRC-111, "Yaw Rate/Side G Sensor System"
ENGINE SIGNAL 1 [C1130]	Major engine components malfunctioning.	BRC-107, "Engine System"
ENGINE SIGNAL 2 [C1131]		
ENGINE SIGNAL 3 [C1132]		
ENGINE SIGNAL 4 [C1133]		
ENGINE SIGNAL 5 [C1134]		
ENGINE SIGNAL 6 [C1135]		
EMERGENCY BRAKE [C1153]	When the VDC/TCS/ABS control unit is malfunctioning (excessive pressure increase or insufficient pressure increase).	BRC-121, "VDC/TCS/ABS Control Unit 2"
BR FLUID LEVEL LOW [C1155]	The brake fluid level has dropped. Or, when there is a short to ground in the circuit between the VDC/TCS/ABS control unit and the fluid level sensor.	BRC-121, "Brake Fluid Level Switch System"
ST ANG SEN COM CIR [C1156]	CAN communication line or steering angle sensor has generated an error.	BRC-122, "CAN Communication System"
CAN COMM CIRCUIT [U1000]	When VDC/TCS/ABS control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-122, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HL

DISPLAY ITEM LIST

×: Standard –: Not applicable ▼: Option

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR [km/h (MPH)]	x	x	▼	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [km/h (MPH)]	x	x	▼	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	x	x	▼	Wheel speed calculated by rear RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	x	x	▼	Wheel speed calculated by rear LH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	x	▼	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	x	▼	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	x	▼	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	x	▼	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	x	▼	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	x	▼	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	x	▼	Rear left inlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	x	▼	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	x	x	▼	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	x	▼	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR REL (ON/OFF)	–	x	▼	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	x	▼	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	x	▼	VDC OFF indicator lamp (ON/OFF) status is displayed.
OFF SW (ON/OFF)	x	x	▼	VDC OFF switch (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	x	▼	SLIP indicator lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	x	x	▼	The voltage supplied to the VDC/TCS/ABS control unit is displayed.
GEAR	x	x	▼	The gear position determined from the A/T PNP switch signal is displayed.
SLCT LVR POSI (For A/T models)	x	x	▼	Shift position determined from the A/T PNP switch signal is displayed.
YAW RATE SEN (d/s)	x	x	▼	Yaw rate detected by the yaw rate sensor is displayed.
ACCEL POS SIG (%)	x	–	▼	Throttle position status determined from the CAN communication signal is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
SIDE G SENSOR (m/s^2)	x	–	▼	Side G detected by the side G sensor is displayed.
STR ANGLE SIG (°)	x	–	▼	Steering angle detected by the steering angle sensor is displayed.
PRESS SENSOR (bar)	x	–	▼	Brake hydraulic pressured detected by the pressure sensor is displayed.
ENGINE RPM (rpm)	x	–	▼	The engine speed status determined from the CAN communication signal is displayed.
SNOW MODE SW (ON/OFF)	–	–	▼	Snow mode switch (ON/OFF) status determined from the CAN communication signal is displayed.
BST OPER SIG (ON/OFF)	–	–	▼	Control booster operation signal (ON/OFF) status determined from the CAN communication signal is displayed.
M - MODE SIG (ON/OFF)	–	–	▼	M mode (ON/OFF) status determined from the CAN communication signal is displayed.
OD OFF SW (ON/OFF)	–	–	▼	OD cancel switch (ON/OFF) status determined from the CAN communication signal is displayed.
EBD SIGNAL (ON/OFF)	–	–	▼	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	▼	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	–	–	▼	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	–	–	▼	VDC operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	▼	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	▼	ABS fail-safe signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	–	–	▼	TCS fail-safe signal (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	–	–	▼	The VDC fail-safe signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	–	–	▼	Ignition switch START position signal input status is displayed.
ASCD SIGNAL (ON/OFF)	–	–	▼	ASCD (ON/OFF) status is displayed.
FLUID LEV (ON/OFF)	x	–	▼	Brake fluid level sensor (ON/OFF) status is displayed.
PARKING BRAKE SW (ON/OFF)	x	–	▼	Parking brake switch (ON/OFF) status is displayed.
USV FL-RR (ON/OFF)	–	–	▼	Primary side USV solenoid valve (ON/OFF) status is displayed.
USV FR-RL (ON/OFF)	–	–	▼	Secondary side USV solenoid valve (ON/OFF) status is displayed.
HSV FL-RR (ON/OFF)	–	–	▼	Primary side HSV solenoid valve (ON/OFF) status is displayed.
HSV FR-RL (ON/OFF)	–	–	▼	Secondary side HSV solenoid valve (ON/OFF) status is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
V/R OUTPUT (ON/OFF)	–	–	▼	Valve relay operation signal (ON/OFF) status is displayed.
M/R OUTPUT (ON/OFF)	–	–	▼	Monitor relay operation signal (ON/OFF) status is displayed.

Active Test

NFS000IP

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.

TEST ITEM

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

- When conducting an active test of the ABS function, select the main item for each test item. In addition, when conducting an active test of the VDC/TCS function, select the item menu for each test item.
- For the ABS solenoid valve, touch “UP”, “KEEP”, “DOWN” on the display screen. For the ABS solenoid valve (ACT), touch “UP”, “ACT UP”, “ACT KEEP” and confirm that the solenoid valves (IN, OUT, USV, HSV) operate as shown in the table below.

Operation	ABS solenoid valve			ABS solenoid valve (ACT)		
	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
USV [FR - RL]	OFF	OFF	OFF	OFF	ON	ON
HSV [FR - RR]	OFF	OFF	OFF	OFF	ON*	OFF

*: ON for 1 to 2 seconds after the touch, and then OFF

ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Correct and Quick Diagnosis

NFS0004B

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- When replacing steering angle sensor, steering system components or suspension system components, and when adjusting the alignment, be sure to adjust the steering angle sensor neutral position before driving. Refer to BRC-79, "Adjustment of Steering Angle Sensor Neutral Position" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-96, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .

- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- VDC/TCS/ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	The is a motor operation sound inside VDC/TCS/ABS actuator, and sometimes there is a slight sound when VDC, TCS, or ABS operates.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
TCS operation (SLIP indicator lamp ON)	TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.	Normal Cancel the VDC/TCS function for the inspection on a chassis dynamometer.
	When inspecting the speedometer, etc., press VDC OFF switch to turn off TCS function before conducting the work.	
	When accelerator pedal is depressed on a chassis dynamometer (front wheel fixing type), the vehicle speed will not increase. This is normal, because TCS is activated by the stationary front wheels. The warning lamp may also turn on to show “sensor system error” in this case. This is not a malfunction either, because the stationary front wheels are detected. Restart engine, and drive the vehicle at 30 km/h (19 MPH) or higher to check that the warning lamp no longer turns on.	
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal
Sluggish feel	Depending on road circumstances, the driver may have a sluggish feel. This is normal, because under TCS operation optimum traction has the highest priority (safety first). Sometimes the driver has a slight sluggish feel in response to substantial accelerator pedal operation.	Normal

ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP AND BRAKE WARNING LAMP ON/OFF TIMING

×: ON –: OFF

Condition	ABS warning lamp	VDC OFF indicator lamp	SLIP indicator lamp	Brake warning lamp (Note 1)	Remarks
Ignition switch OFF.	—	—	—	—	—
Approx. Within 1 seconds after ignition switch is turned ON.	×	×	×	× (Note 1)	—
Approx. 1 seconds after ignition switch ON.	—	—	—	× (Note 1)	Turns OFF 2 seconds after engine starts.
VDC OFF switch is turned ON. (VDC function is OFF.)	—	×	—	—	—
VDC/TCS/ABS error.	×	×	—	—	There is a malfunction in VDC/TCS/ABS control unit, SLIP indicator lamp turns off (when the power supply or ground circuits return an error).
	×	×	×	—	—
When VDC/TCS is not functioning normally.	—	×	×	—	—
EBD error.	×	×	×	×	—

Note 1:Brake warning lamp will turn on in case of operating parking brake (switch turned on) or of actuating brake fluid level switch (brake fluid is insufficient).

Basic Inspection

NFS0004C

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around VDC actuator for leaks. If there is leaking or oozing fluid, check the following items.
   - If VDC actuator connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or VDC actuator screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than VDC actuator connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at VDC actuator, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the VDC actuator body.

     CAUTION:
     VDC actuator cannot be disassembled.
3. Check the brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION

1. Make sure ABS warning lamp, VDC OFF indicator lamp (when VDC OFF switch is OFF), and SLIP indicator lamp turns ON approximately 1 second when the ignition switch is turned ON. If they do not, check the VDC OFF indicator lamp and then VDC OFF switch. Refer to BRC-122, "VDC OFF SWITCH" . Check CAN communications. Refer to “CAN Communication Inspection”. If there are no errors with VDC OFF switch and CAN communication system, check combination meter. Refer to BRC-122, "CAN Communication System" .

2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. With the engine running, make sure VDC OFF indicator lamp turns on and off when VDC OFF switch is turned on and off. If the indicator lamp status does not correspond to switch operation, check the VDC OFF switch system. Refer to BRC-122, "VDC OFF SWITCH" .
4. Make sure ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off 2 seconds after the engine is started. If ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the VDC/TCS/ABS control unit.
5. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-96, "HOW TO ERASE SELF-DIAGNOSIS RESULTS"

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS0004D

After using the CONSULT-III SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR-1,-2
FR LH SENSOR- 1,-2
RR RH SENSOR-1,-2
RR LH SENSOR-1,- 2
ABS SENSOR [ABNORMAL SIGNAL]

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK TIRE

Check air pressure, wear, and size.

Are air pressure, wear, and size within the standard values?

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

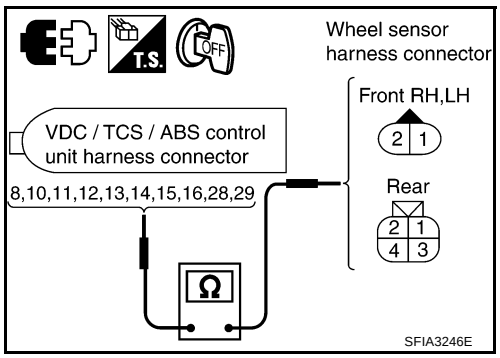
1. Disconnect VDC/TCS/ABS control unit connector and malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connectors, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect wheel sensor connector E42 (FR - LH), E27 (FR - RH), T5 (RR - RH, LH) and VDC/TCS/ABS control unit connector B114.
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	VDC/TCS/ABS control unit	Wheel sensor	VDC/TCS/ABS control unit	Wheel sensor	VDC/TCS/ABS control unit (signal)	VDC/TCS/ABS control unit (ground)
Front RH	16	1	15	2	16, 15	28, 29
Front LH	10	1	8	2	10, 8	
Rear RH	12	1	11	2	12, 11	
Rear LH	14	3	13	4	14, 13	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

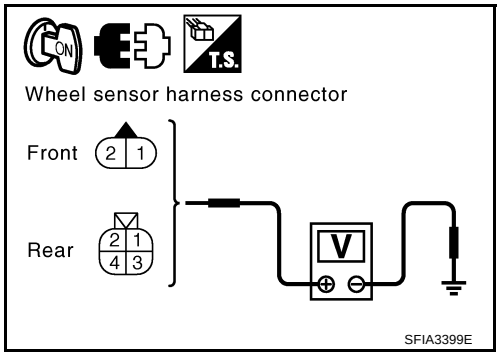
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

6. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Disconnect malfunctioning wheel sensor connector.
2. Turn ignition switch ON and check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH	1	—	8 V or more
Front LH			
Rear RH			
Rear LH	3		



OK or NG

OK >> Replace wheel sensor.
NG >> Replace ABS actuator and electric unit (control unit).

Engine System

NFS0004E

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK ENGINE SYSTEM

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct the ECM self-diagnosis.
2. Re-conduct VDC/TCS/ABS control unit self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

VDC/TCS/ABS Control Unit 1

NFS0004F

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

YES >> Replace VDC/TCS/ABS control unit. Re-conduct the self-diagnosis.
NO >> INSPECTION END

Pressure Sensor System

NFS0004G

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK STOP LAMP SWITCH CONNECTOR

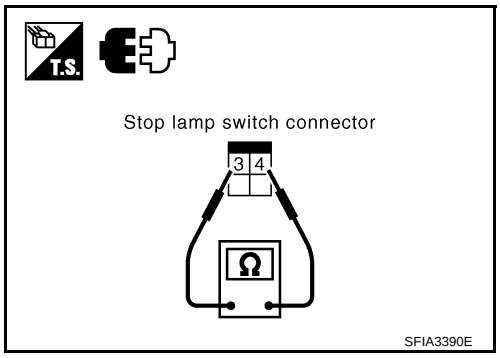
1. Disconnect stop lamp switch connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, then perform self-diagnosis again.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.



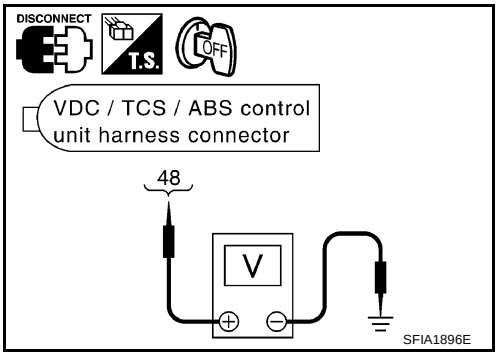
Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector B114.
2. Check voltage between VDC/TCS/ABS control unit connector B114 terminal 48 and ground.



VDC/TCS/ABS control unit	Ground	Measurement condition	Voltage
48	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> GO TO 5.
NG >> Open or short in harness. Repair or replace the harness.

5. CHECK PRESSURE SENSOR CONNECTOR

1. Disconnect VDC actuator connector E50 and VDC/TCS/ABS control unit connector, check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then perform self-diagnosis.

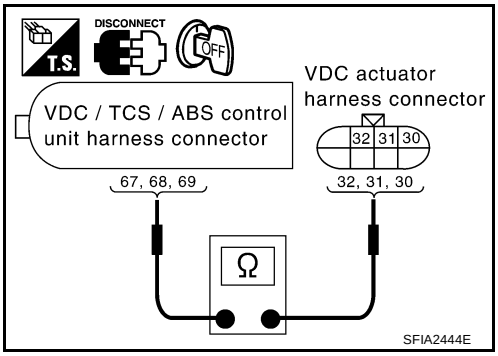
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 6.

6. CHECK PRESSURE SENSOR HARNESS

1. Turn ignition switch OFF and disconnect VDC actuator connector E50 and VDC/TCS/ABS control unit connector B114.
2. Check continuity between VDC/TCS/ABS control unit connector and VDC actuator connector.

VDC/TCS/ABS control unit	VDC actuator	Continuity
69	30	Yes
68	31	
67	32	



OK or NG

OK >> GO TO 7.
NG >> If the open or short in harness, repair or replace the harness.

7. CHECK PRESSURE SENSOR

1. Connect VDC actuator and VDC/TCS/ABS control unit connectors.
2. Conduct “DATA MONITOR” of the “PRESS SENSOR” to check if the status is normal.

Condition	Data monitor display
When brake pedal is depressed.	– 40 – 300 bar
When brake pedal is released.	Approx. 0 bar

OK or NG

OK >> INSPECTION END
NG >> If the pressure sensor is damaged or malfunctioning, replace the VDC actuator (pressure sensor it built in).

Steering Angle Sensor System

NFS0004H

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ST ANG SEN CIRCUIT

Is the above displayed in the self-diagnosis item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect steering angle sensor connector and VDC/TCS/ABS control unit connector and check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then preform self-diagnosis.

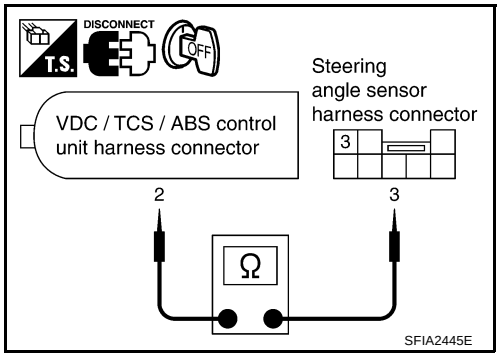
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STEERING ANGLE SENSOR HARNESS

1. Check CAN communication system. Refer to BRC-122, "CAN Communication System" .
2. Turn ignition switch OFF and disconnect steering angle sensor connector M22 and VDC/TCS/ABS control unit connector B114.
3. Check continuity between VDC/TCS/ABS control unit connector terminal 2 and steering angle sensor connector terminal 3.

VDC/TCS/ABS control unit	Steering angle sensor	Continuity
2	3	Yes



OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace the harness.

4. CHECK DATA MONITOR

1. Connect steering angle sensor and VDC/TCS/ABS control unit connectors.
2. Conduct “DATA MONITOR” of the “STR ANGLE SIG” to check if the status is normal.

Steering condition	Data monitor
Straight-ahead	Approx. 0°
Turn wheel to the right by 90 °	Approx. + 90°
Turn wheel to the left by 90 °	Approx. - 90°

OK or NG

OK >> Re-conduct VDC/TCS/ABS control unit self-diagnosis.
NG >> Replace spiral cable (steering angle sensor) and adjust neutral position of steering angle sensor. Refer to BRC-79, "Adjustment of Steering Angle Sensor Neutral Position" .

Yaw Rate/Side G Sensor System

NFS0004I

CAUTION:
Sudden turns (such as spin turns, acceleration turns), drifting, etc. When VDC function is OFF (VDC OFF switch ON) may cause the yaw rate/side G sensor system indicate a problem. However this is not a problem if normal operation can be resumed after restarting the engine.

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
YAW RATE SENSOR
SIDE G-SENSOR

CAUTION:
When on a turntable, such as at a parking structure entrance, or when on a moving object with the engine running, the VDC OFF indicator lamp might turn on and the self-diagnosis using the CONSULT-III the yaw rate sensor system might be displayed, but in this case there is no problem with the yaw rate sensor system. As soon as the vehicle leaves the turntable or moving object, restart the engine to return the system to normal.

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

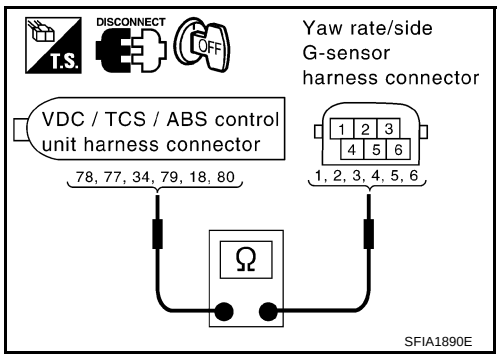
1. Disconnect yaw rate/side G sensor connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK YAW RATE/SIDE G SENSOR HARNESS

1. Turn ignition switch OFF and disconnect yaw rate/side G sensor connector M51 and VDC/TCS/ABS control unit connector B114.
2. Check continuity between VDC/TCS/ABS control unit vehicle side connector and yaw rate/side G sensor vehicle side connector.



VDC/TCS/ABS control unit	Yaw rate/side G sensor	Continuity
18	5	Yes
34	3	
77	2	
78	1	
79	4	
80	6	

OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace the harness.

4. CHECK YAW RATE/SIDE G SENSOR

1. Connect yaw rate/side G sensor and VDC/TCS/ABS control unit connectors.
2. Use “DATA MONITOR” to check if the yaw rate/side G sensor are normal.

Vehicle status	Yaw rate sensor (Data monitor standard)	Side G sensor (Data monitor standard)
When stopped	- 4 to + 4 deg/s	- 1.1 to + 1.1 m/s^2
Right turn	Negative value	Negative value
Left turn	Positive value	Positive value

OK or NG

OK >> INSPECTION END
NG >> Replace the malfunctioning yaw rate/side G sensor, and then re-conduct the VDC/TCS/ABS control unit self-diagnosis.

Solenoid and VDC Change-Over Valve System

NFS0004J

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
USV LINE [FL-RR]
USV LINE [FR-RL]
HSV LINE [FL-RR]
HSV LINE [FR-RL]

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

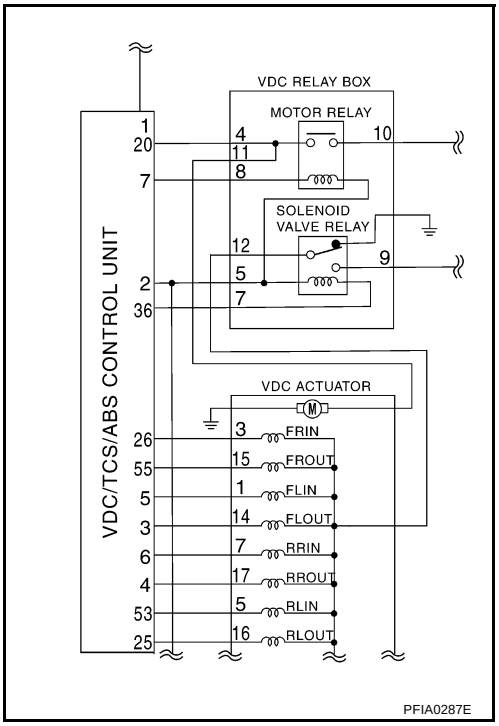
1. Disconnect VDC/TCS/ABS control unit connector and solenoid connector E49, E50 and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK SOLENOID INPUT SIGNAL

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector.
2. Check resistance between VDC/TCS/ABS control unit connector and ground.



VDC/TCS/ABS control unit	Ground	Resistance value
26	—	6.0 – 11 Ω
5		
6		
53		
55		3.0 – 5.0 Ω
3		
4		
25		
49		6.0 – 11 Ω
50		
54		3.0 – 5.0 Ω
52		

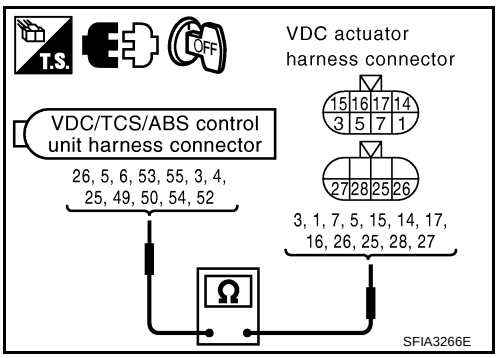
OK or NG

OK >> Check the VDC/TCS/ABS control unit power system. Refer to BRC-120, "VDC/TCS/ABS Control Unit Power and Ground Systems" .

NG >> GO TO 4.

4. CHECK SOLENOID HARNESS

1. Disconnect VDC actuator connector.
2. Check continuity between VDC/TCS/ABS control unit connector B114 and VDC actuator connector E49.



VDC/TCS/ABS control unit	VDC actuator	Continuity
26	3	Yes
5	1	
6	7	
53	5	
55	15	
3	14	
4	17	
25	16	
49	26	
50	25	
54	28	
52	27	

OK or NG

OK >> Replace VDC/TCS/ABS actuator assembly.
NG >> Open or short in harness. Repair or replace the harness.

ABS Motor and Motor Relay System

NFS0004K

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect VDC relay box connector E47, E48, E222 and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

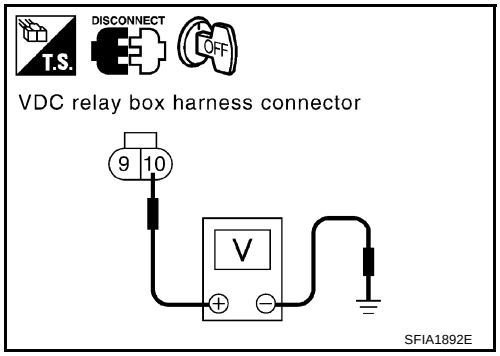
3. CHECK ABS MOTOR AND MOTOR RELAY POWER SYSTEM

1. Disconnect VDC relay box connectors E48.
2. Check voltage between VDC relay box connector and ground.

VDC relay box	Ground	Voltage
10	—	Battery voltage (Approx. 12 V)

OK or NG

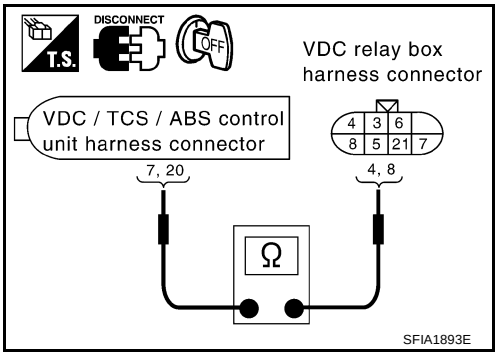
OK >> GO TO 4.
NG >> The circuit between battery and VDC relay box terminal 10 is open or shorted. Repair the circuit.



4. CHECK ABS MOTOR AND MOTOR RELAY HARNESS

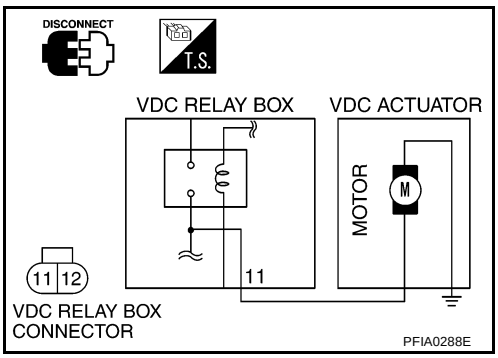
1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector B114 and VDC relay box connector E47.
2. Check continuity between VDC/TCS/ABS control unit connector and VDC relay box vehicle side connector.

VDC/TCS/ABS control unit	VDC relay box	Continuity
20	4	Yes
7	8	



3. Check if the actuator motor operates when a 12 V voltage is applied to the VDC relay box connector E222 terminal 12.

CAUTION:
Operate the actuator motor for 4 seconds or less to prevent heat generation.



OK or NG

OK >> GO TO 5.
NG >> The actuator motor or actuator motor circuit open or short in harness. Repair or replace the actuator motor or actuator motor circuit harness.

5. CHECK ABS MOTOR RELAY

ABS motor relay independent inspection. Refer toBRC-123, "ABS MOTOR RELAY AND ACTUATOR RELAY".

OK or NG

OK >> Replace VDC actuator assembly.
NG >> Replace VDC relay box.

Actuator Relay System

NFS0004L

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
MAIN RELAY

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect VDC relay box connector E47, E48, E222 and VDC/TCS/ABS control unit connector B114 and check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

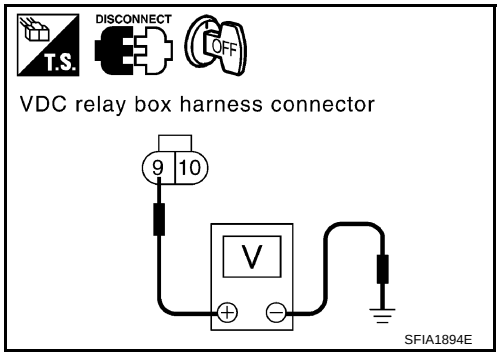
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ACTUATOR RELAY POWER SYSTEM

1. Turn ignition switch OFF and disconnect VDC relay box connector E48.
2. Check voltage between VDC relay box connector and ground.

VDC relay box	Ground	Voltage
9	—	Battery voltage (Approx. 12 V)



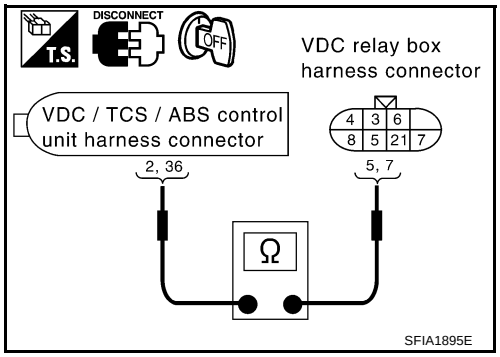
OK or NG

OK >> GO TO 4.
NG >> The circuit between battery and VDC relay box harness connector E48 terminal 9 is open or shorted. Repair the circuit.

4. CHECK ACTUATOR RELAY HARNESS

1. Disconnect VDC/TCS/ABS control unit connector B114.
2. Check continuity between VDC/TCS/ABS control unit connector and VDC relay box connector E47.

VDC/TCS/ABS control unit	VDC relay box	Continuity
2	5	Yes
36	7	



OK or NG

OK >> GO TO 5.
NG >> Open or short in harness. Repair or replace the harness.

5. CHECK ACTUATOR RELAY

Independently check VDC actuator relay. Refer to BRC-123, "ABS MOTOR RELAY AND ACTUATOR RELAY".

OK or NG

OK >> Replace VDC actuator assembly.
NG >> Replace VDC relay box.

Stop Lamp Switch System

NFS0004M

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect stop lamp switch connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, then perform self-diagnosis again.

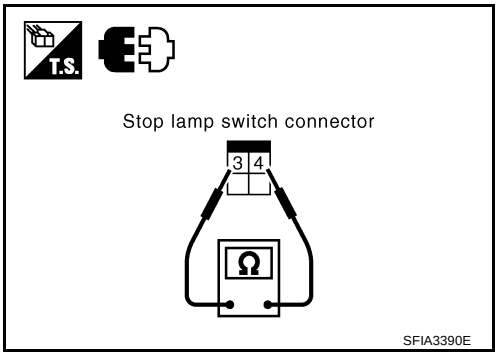
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

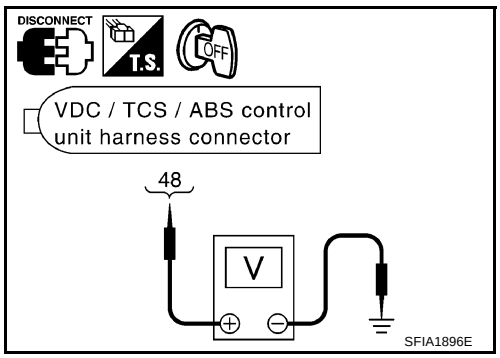


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector B114.
2. Check voltage between VDC/TCS/ABS control unit connector B114 terminal 48 and ground.



VDC/TCS/ABS control unit	Ground	Measurement condition	Voltage
48	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> Connect the connectors and conduct a VDC/TCS/ABS control unit self-diagnosis.
NG >> Open or short in harness. Repair or replace the harness.

VDC/TCS/ABS Control Unit Power and Ground Systems

NFS0004N

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect VDC/TCS/ABS control unit connector and check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

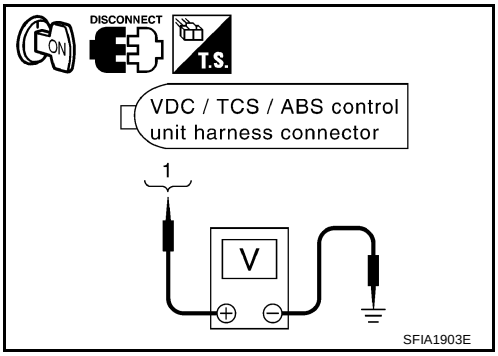
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK VDC/TCS/ABS CONTROL UNIT POWER AND GROUND CIRCUIT

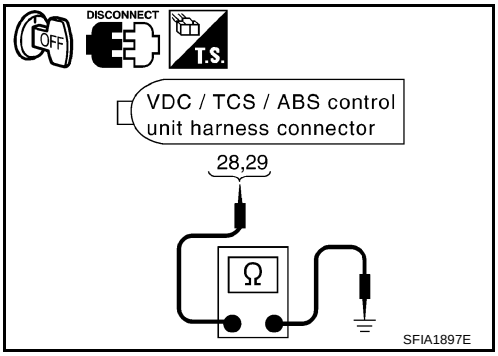
1. Disconnect VDC/TCS/ABS control unit connector B114.
2. With the ignition switch turned on and off, check voltage between VDC/TCS/ABS control unit connector and ground.

Signal name	VDC/TCS/ABS control unit	Ground	Voltage
Power supply	1	—	Battery voltage (Approx. 12 V)



3. Check continuity between VDC/TCS/ABS control unit and ground.

Signal name	VDC/TCS/ABS control unit	Ground	Continuity
Ground	28, 29	—	Yes



OK or NG

OK >> Check battery (terminal looseness, low voltage, etc.) For any non-standard condition. If any non-standard condition exists, recharge or replace battery as necessary.

NG >> The corresponding harness circuit is open or shorted. Repair the circuit.

VDC/TCS/ABS Control Unit 2

NFS0004O

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace VDC/TCS/ABS control unit and re-conduct the self-diagnosis.

NO >> INSPECTION END

Brake Fluid Level Switch System

NFS0004P

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

1. Check brake reservoir tank fluid level. If the level is low, add brake fluid.
2. Erase the self-diagnosis results and check self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.

NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect brake fluid level switch connector and VDC/TCS/ABS control unit connector and check terminal for deformation, disconnection, looseness, and so on. If there is any non-standard condition, repair or replace the terminal.
2. Securely reconnect the connectors and then perform self-diagnosis.

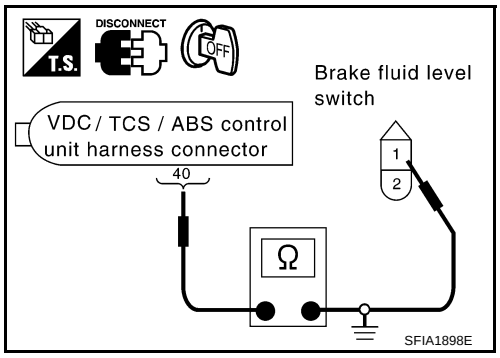
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK HARNESS BETWEEN THE BRAKE FLUID LEVEL SWITCH AND THE VDC/TCS/ABS CONTROL UNIT

1. Turn ignition switch OFF and disconnect brake fluid level switch connector, VDC/TCS/ABS control unit, connectors.
2. Check continuity between brake fluid level switch connector E44 and VDC/TCS/ABS control unit connector B114.

VDC/TCS/ABS control unit	Brake fluid level switch	Continuity
40	1	Yes
	Ground	No
Ground	2	Yes



OK or NG

OK >> Connect connectors and conduct a VDC/TCS/ABS control unit self-diagnosis.
NG >> If the open or short in harness, repair or replace the harness.

CAN Communication System

NFS0004Q

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the VDC/TCS/ABS control unit connector, and check the terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-48, "CAN System Specification Chart" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

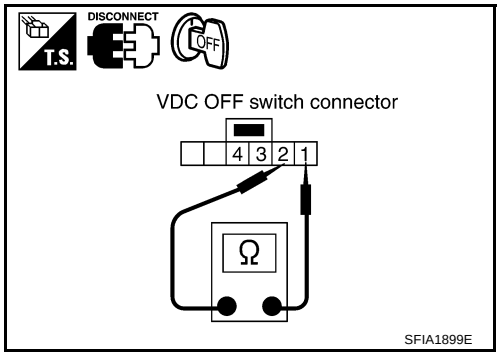
Component Inspection

NFS0004R

VDC OFF SWITCH

- Turn ignition switch OFF, and disconnect the VDC OFF switch connector M9, and check the continuity between terminals 1 and 2.

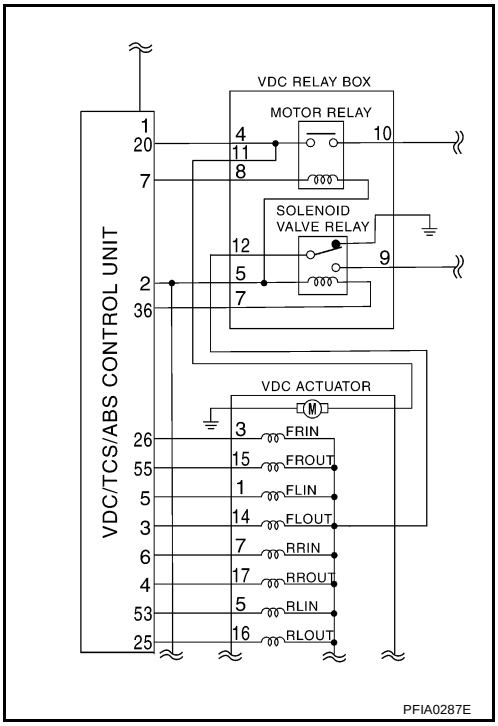
1 - 2 :Continuity should exist when pushing the switch.
continuity should not exist when releasing the switch.



ABS MOTOR RELAY AND ACTUATOR RELAY

- Turn ignition switch OFF and disconnect the VDC relay box connector E47, E48, E222.
- Apply a voltage of 12 V between the ABS motor relay terminal 8 and the actuator relay terminal 7 and then check the continuity between the following terminals.

ABS motor relay	Between terminal 4 to 10	Continuity should exist.
Actuator relay	Between terminal 9 to 12	Continuity should exist.



VDC/TCS/ABS ACTUATOR

Actuator Operation Inspection

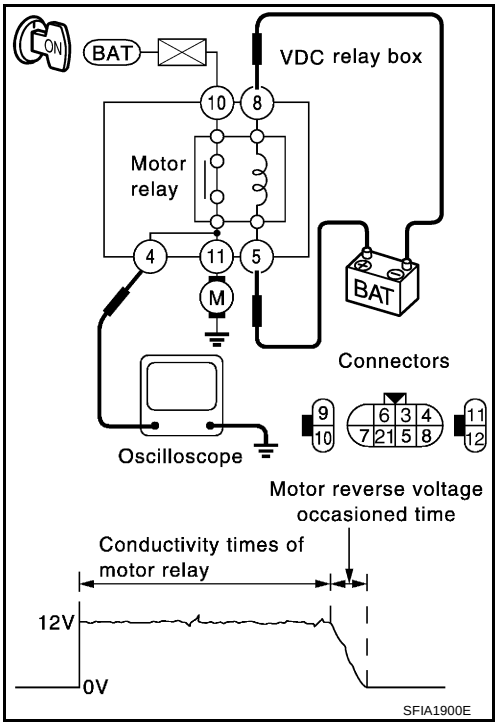
1. Turn ignition switch ON, apply a voltage of 12 V between the relay box terminal 5 and 8, use an oscilloscope to measure the motor voltage at this time (between terminal 11 and the ground), and check the motor reverse voltage occurrence time when operation is stopped.

Motor counter-electromotive force duration:

0.1 second or more

CAUTION:

- **The above check should be performed after motor relay unit inspection to make sure relay operates normally.**
- **To prevent overheating, do not drive actuator motor more than 4 seconds.**
- **The motor reverse voltage occurrence time is standard when the battery voltage is 12 V and the air temperature is 20°C (68°F), and this time is a little shorter when the battery voltage is low or the air temperature is low.**



TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0004S

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system

2. CHECK FRONT AND REAR AXLE

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. CHECK WHEEL SENSOR AND SENSOR ROTOR

Wheel Sensor Inspection

- Wheel sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Wheel sensor connector connection inspection
- Wheel sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 sec. After the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-96, "OPERATION PROCEDURE" .

Unexpected Pedal Reaction

NFS0004T

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

YES >>
- Bleed air from the brake piping.
- Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repair.

NO >> GO TO 2.

2. CHECK FUNCTION

Disconnect the VDC/TCS/ABS control unit connector and make sure the braking force is sufficient when the ABS in not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-124, "Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

The Braking Distance Is Long

NFS0004U

CAUTION:
On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Disconnect VDC/TCS/ABS control unit connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-124, "Excessive ABS Function Operation Frequency" .

NG >>
- Bleed air from the brake piping.
- Check brake system.

The ABS Function Does Not Operate

NFS0004V

CAUTION:
The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-124, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-96, "OPERATION PROCEDURE" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0004W

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine (at approximately 10 km/h (6MPH) or higher)**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

Does the symptom occur?

YES >> GO TO 2.

NO >> Perform self-diagnosis. Refer to BRC-96, "OPERATION PROCEDURE" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.

NO >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-124, "Excessive ABS Function Operation Frequency" .

Vehicle Jerks During VDC/TCS/ABS Control

NFS0004X

1. CHECK ENGINE SPEED SIGNAL

Conduct CONSULT-III VDC/TCS/ABS control unit “Data Monitor”.

Is engine speed at idle 400 rpm or higher?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK ECM SELF-DIAGNOSIS RESULT ITEM

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-81, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 3.

3. SYMPTOM CHECK 1

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK A/T SELF-DIAGNOSIS RESULTS ITEM

Perform A/T self-diagnosis.

OK or NG

OK >> GO TO 5.
NG >> Check the corresponding items. Refer to AT-40, "TROUBLE DIAGNOSIS" in “A/T”.

5. SYMPTOM CHECK 2

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK SELF-DIAGNOSIS RESULT ITEM 1

Conduct self-diagnosis of the VDC/TCS/ABS control unit.

Are self-diagnosis items displayed?

YES >> Check the corresponding items, make repairs, and re-conduct the VDC/TCS/ABS control unit self-diagnosis.
NO >> GO TO 7.

7. CHECK CONNECTOR

1. Disconnect the VDC/TCS/ABS control unit and the ECM connectors, check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the connector.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> If the connector terminal contact is loose, damaged, open or shorted, repair or replace the connector terminal.
NG >> GO TO 8.

8. CHECK SELF-DIAGNOSIS RESULT ITEM 2

Re-conduct the VDC/TCS/ABS control unit self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any non-standard items.
NO >> GO TO 9.

9. CHECK CIRCUIT BETWEEN VDC/TCS/ABS CONTROL UNIT AND THE ECM

Check CAN communication system. Refer to BRC-122, "CAN Communication System" .

OK or NG

OK >> INSPECTION END
NG >> Connect the connectors, and re-conduct the VDC/TCS/ABS control unit self-diagnosis.

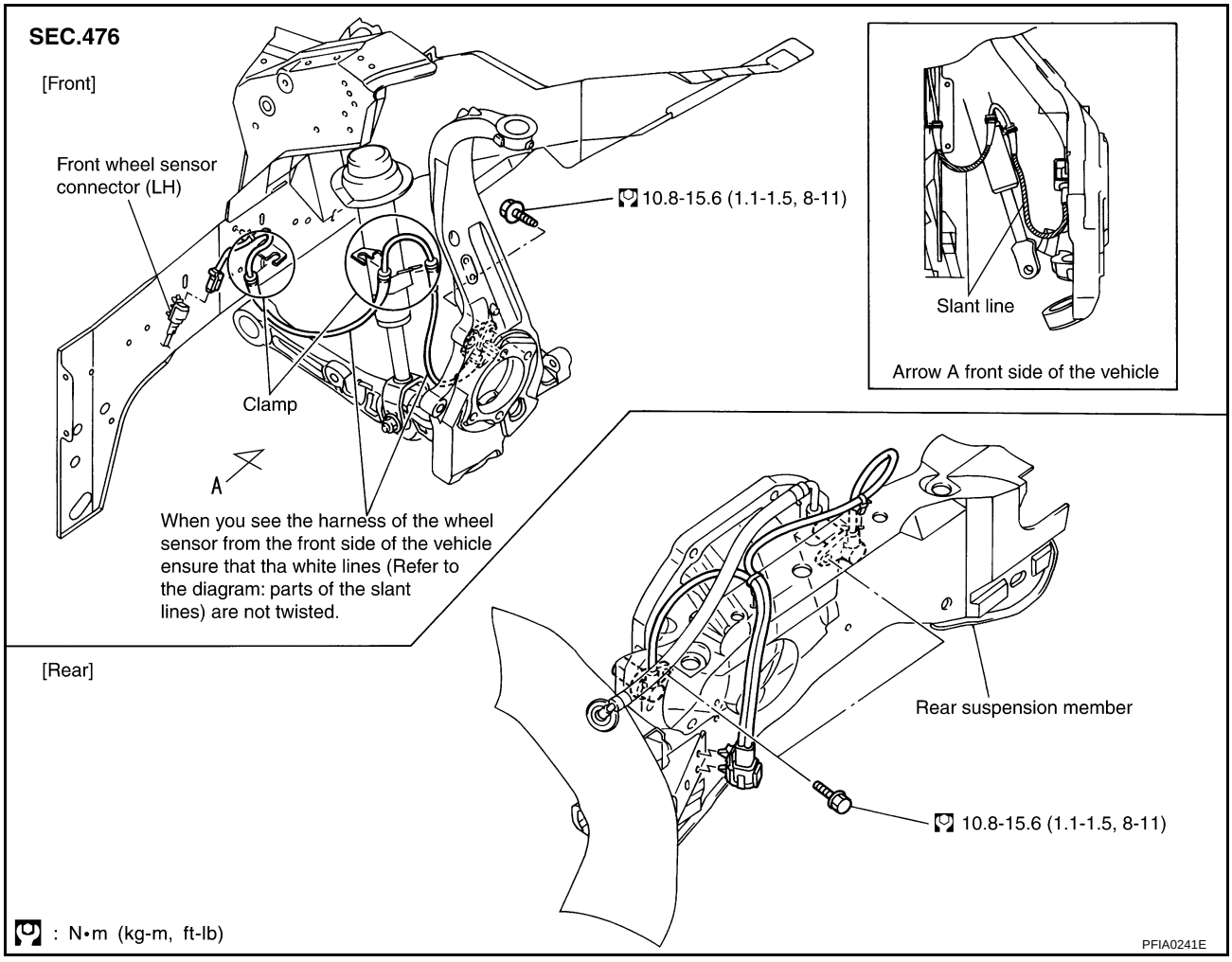
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0004Y

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

VDC/TCS/ABS CONTROL UNIT

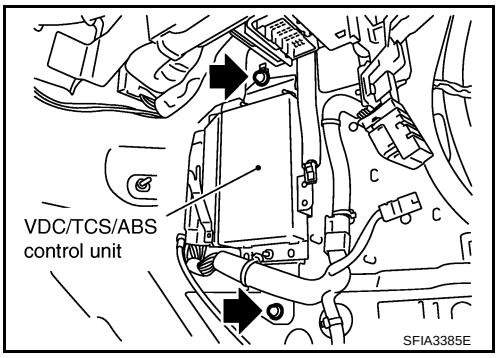
PFP:47660

Removal and Installation

NFS0004Z

REMOVAL

1. Remove dash side finisher (RH). Refer to IP-12, "(C) Dash Side Finisher (RH/LH)" .
2. Remove VDC/TCS/ABS control unit bolts.
3. Remove VDC/TCS/ABS control unit.



INSTALLATION

Installation in the reverse order of removal.

- When installing the VDC/TCS/ABS control unit, tighten bolts to the specified torque.

VDC/TCS/ABS control unit bolts : 8.3 N·m (0.85 kg–m, 73 in–lb)

CAUTION:

When replacing VDC/TCS/ABS control unit, make sure to adjust neutral position of steering angle sensor. Refer to BRC-79, "Adjustment of Steering Angle Sensor Neutral Position" .

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS00050

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
- Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
- Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the companion flange.

INSTALLATION

Front

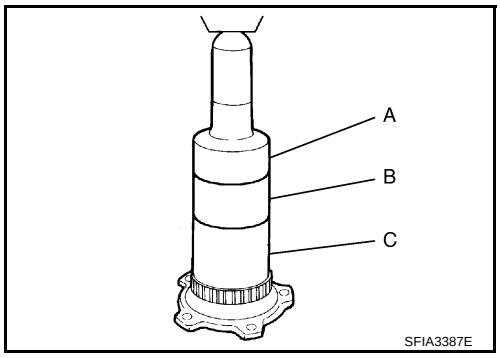
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
- Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number	A: ST30720000 (J-25405)
	B: ST27863000 (—)
	C: KV40104710 (—)

- Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.



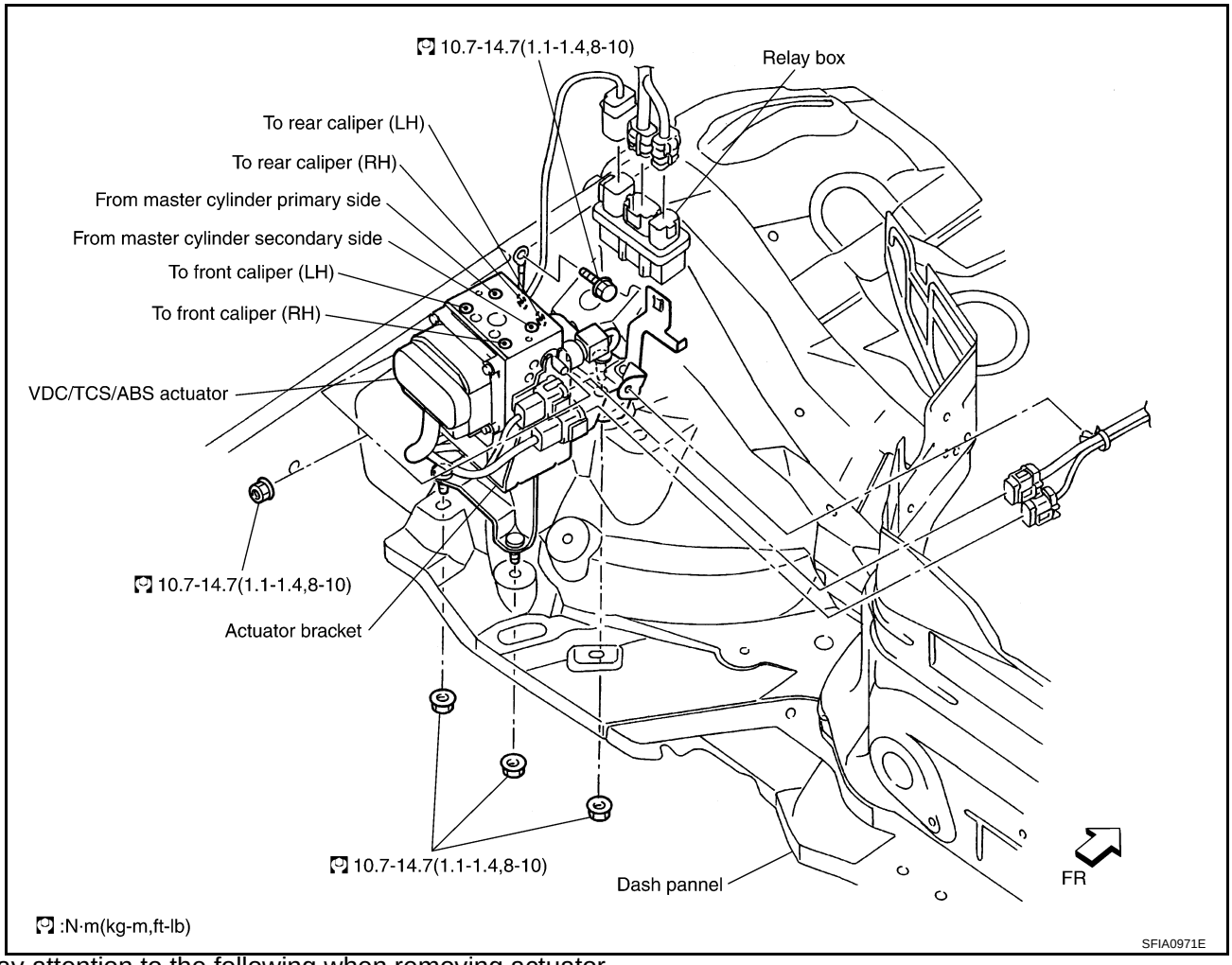
VDC/TCS/ABS ACTUATOR

PFP:47660

Removal and Installation

NFS00051

COMPONENTS



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer to BR-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

G SENSOR

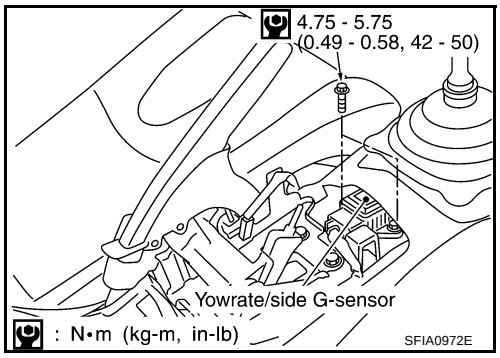
PFP:47930

Removal and Installation

NFS00052

REMOVAL

1. Remove center console. Refer to IP-16, "CENTER CONSOLE" .
2. Remove harness connector.
3. Remove installation bolts. Remove yaw rate/side G sensor.



CAUTION:

- **Do not drop or strike the yaw rate/side G sensor, because it has little endurance to impact.**
- **Do not use power tool etc., because yaw rate/side G sensor is weak for the impact.**

INSTALLATION

To install, follow procedure for removal in reverse order.

CAUTION:

- **Do not drop or strike the yaw rate/side G sensor, because it has little endurance to impact.**

STEERING ANGLE SENSOR

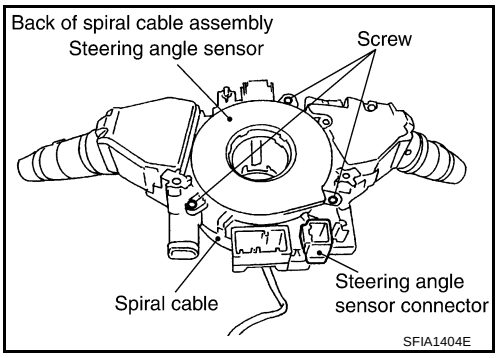
PFP:25554

Removal and Installation

NFS00053

REMOVAL

1. Remove spiral cable assembly. Refer to SRS-42, "SPIRAL CABLE" .
2. Remove steering angle sensor.



INSTALLATION

Install in the reverse order of removal.

NOTE:

After work, make sure to adjust neutral position of steering angle sensor. Refer to BRC-79, "Adjustment of Steering Angle Sensor Neutral Position" .

SECTION CL
CLUTCH

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

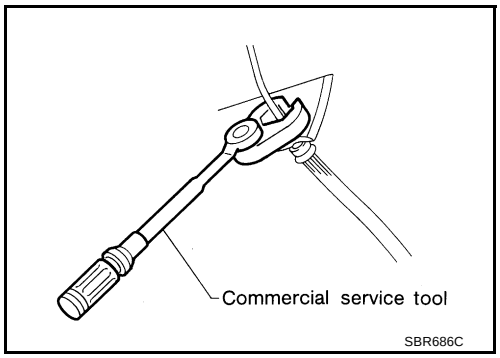
NCS00001

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Service Notice or Precautions

NCS00002

- Recommended clutch fluid is brake fluid “DOT 3”. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained clutch fluid.
- Be careful not to splash clutch fluid on painted areas.
- When removing clutch tube, use a flare nut wrench.
- When installing clutch tube, use a flare nut torque wrench.
- Use new clutch fluid to clean or wash all parts of master cylinder.
- Never use mineral oils such as gasoline or kerosene. It will ruin the rubber parts of the hydraulic system.
- If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.
- Do not disassemble CSC body.



WARNING:

After cleaning clutch disc, wipe it with a dust collector. Do not use compressed air.

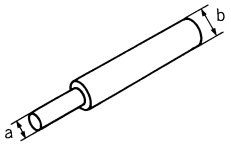
PREPARATION

PFP:00002

Special Service Tools

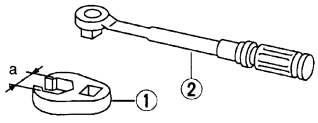
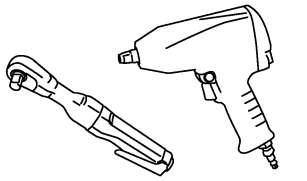
NCS00003

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST20050240 (—) Diaphragm adjusting wrench  ZZA0508D	Adjusting unevenness of diaphragm spring of clutch cover
ST20670000 (—) Clutch aligning bar a: 15 mm (0.59 in) dia. b: 23 mm (0.91 in) dia.  ZZA1178D	Installing clutch disc

Commercial Service Tools

NCS00004

Tool name	Description
Pin punch Tip diameter: 4.5 mm (0.177 in) dia.  ZZA0515D	Removing and installing master cylinder spring pin
1. Flare nut crowfoot a: 10 mm (0.39 in) 2. Torque wrench  S-NT360	Removing and installing clutch piping
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NCS00005

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

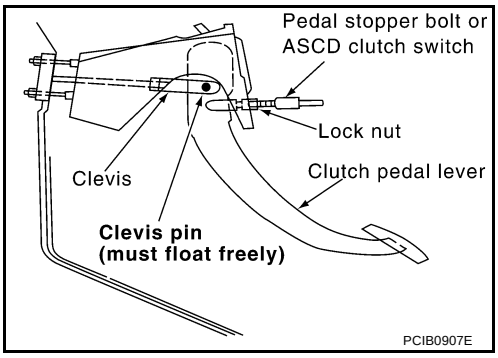
Reference page		CL-5	CL-7	CL-9	CL-11	EM-101	CL-16										EM-134
SUSPECTED PARTS (Possible cause)		CLUTCH PEDAL (Free play out of adjustment)	CLUTCH LINE (Air in line)	MASTER CYLINDER PISTON CUP (Damaged)	CSC (Concentric Slave Cylinder) (Worn, dirty or damaged)	ENGINE MOUNTING (Loose)	CLUTCH DISC (Out of true)	CLUTCH DISC (Runout is excessive)	CLUTCH DISC (Lining broken)	CLUTCH DISC (Dirty or burned)	CLUTCH DISC (Oily)	CLUTCH DISC (Worn out)	CLUTCH DISC (Hardened)	CLUTCH DISC (Lack of spline grease)	DIAPHRAGM SPRING (Damaged)	DIAPHRAGM SPRING (Out of tip alignment)	PRESSURE PLATE (Distortion)	FLYWHEEL (Distortion)
Symptom	Clutch grabs/chatters					1		2			2	2	2			2		
	Clutch pedal spongy		1	2	2													
	Clutch noisy				1													
	Clutch slips	1									2	2			3		4	5
	Clutch does not disengage	1	2	3	4		5	5	5	5	5			5	6	6	7	

CLUTCH PEDAL

PFP:46540

On-Vehicle Inspection and Adjustment

NCS00006



1. Check to see if the clevis pin floats freely in the bore of the clutch pedal. It should not be bound by the clevis or clutch pedal.

a. If the clevis pin is not free, check that the pedal stopper bolt or ASCD clutch switch is not applying pressure to the clutch pedal causing the clevis pin to bind. To adjust, loosen lock nut and turn pedal stopper bolt or ASCD clutch switch.

b. Tighten the lock nut. Refer to CL-6, "Removal and Installation" .

c. Verify that the clevis pin floats in the bore of the clutch pedal. It should not be bound by the clutch pedal.

d. If the clevis pin is still not free, remove the clevis pin and check for deformation or damage. Replace clevis pin if necessary. Leave pin removed for step 2.

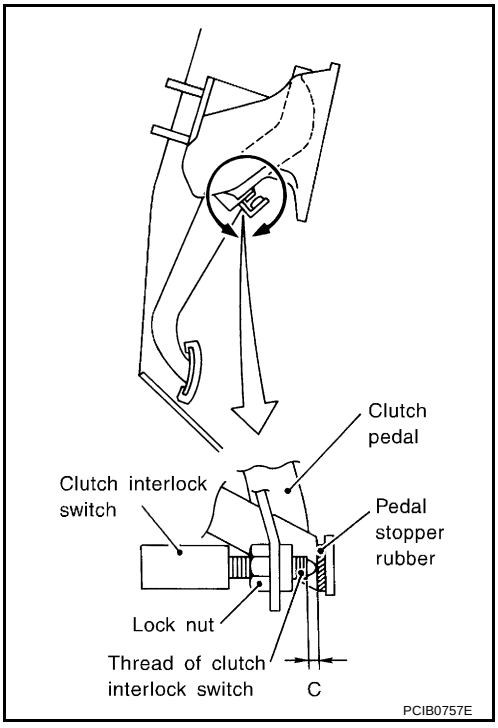
2. Check clutch pedal stroke for free range of movement.

a. With the clevis pin removed, manually move the clutch pedal up and down to determine if it moves freely.

b. If any sticking is noted, replace the related parts (clutch pedal assembly, bushing etc.). Re-assemble the clutch pedal and re-verify that the clevis pin floats freely in the bore of the clutch pedal.

3. Adjust clearance “C” while depressing clutch pedal fully. (With clutch interlock switch)

Clearance C : 0.1 - 1.0 mm (0.004 - 0.039 in)



4. Check clutch hydraulic and system components (clutch master cylinder, CSC, etc.) for sticking or binding.

a. If any sticking or binding noted, repair or replace related parts as necessary.

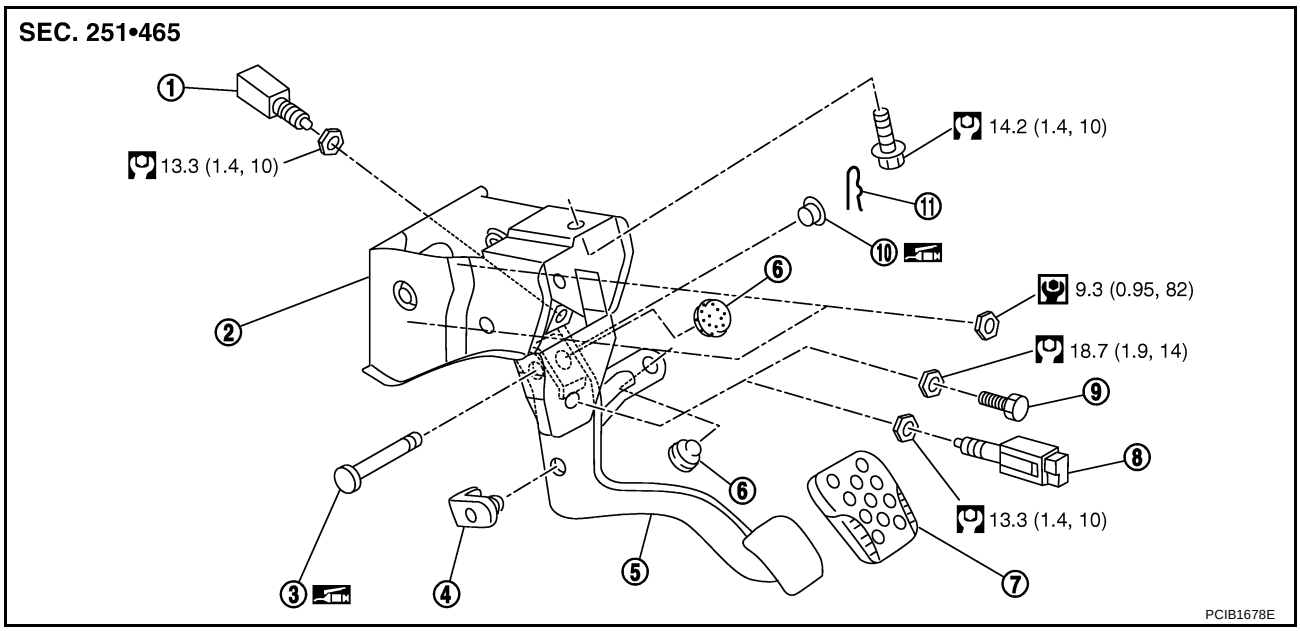
b. If hydraulic system repair was necessary, bleed the clutch hydraulic system. Refer to CL-7, "Bleeding" .

NOTE:
Do not use a vacuum assist or any other type of power bleeder on this system. Use of a vacuum assist or power bleeder will not purge all the air from the system.

Removal and Installation

NCS00007

COMPONENTS



1. Clutch interlock switch
2. Bracket
3. Clevis pin
4. Pedal stopper rubber
5. Clutch pedal
6. Stopper rubber
7. Pedal pad
8. ASCD clutch switch (With ASCD)
9. Pedal stopper bolt (Without ASCD)
10. Bushing
11. Snap pin

Refer to GI-11, "Components" , and the followings for the symbols in the figure.

: Apply lithium-based grease including molybdenum disulphide.

REMOVAL

1. Remove kicking plate. Refer to EI-35, "Removal and Installation (for Coupe Models)" or EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove footrest. Refer to EI-43, "Removal and Installation" .
3. Remove dash side finisher (LH). Refer to IP-11, "Removal and Installation" .
4. Remove instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
5. Remove the clutch interlock switch and ASCD clutch switch (with ASCD) connectors and harness.
6. Remove the snap pin and clevis pin.
7. Remove the pedal bracket mounting bolt and nuts and then remove the clutch pedal assembly.

INSPECTION AFTER REMOVAL

Check clutch pedal for bend, damage, or a cracked weld. If bend, damage, or a cracked weld is found, replace the clutch pedal assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Tighten pedal stopper bolt lock nut or ASCD clutch switch lock nut to the specified torque after installing the clutch pedal assembly in the vehicle and adjusting the pedal free play. Refer to CL-5, "On-Vehicle Inspection and Adjustment" .
- After installing the clutch interlock switch, adjust the switch position. Refer to CL-5, "On-Vehicle Inspection and Adjustment" .

CLUTCH FLUID

PFP:00017

Bleeding

NCS00008

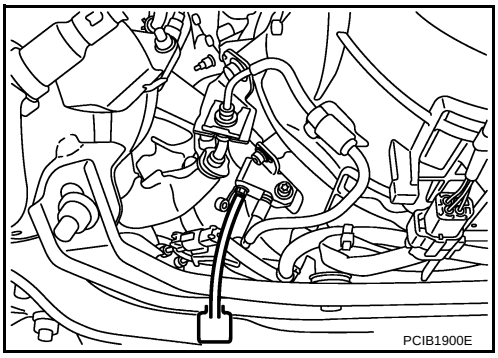
CAUTION:

- **Monitor fluid level in the reservoir tank to make sure it does not empty.**
- **Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.**

NOTE:

Do not use a vacuum assist or any other type of power bleeder on this system. Use of a vacuum assist or power bleeder will not purge all the air from the system.

1. Fill the master cylinder reservoir tank with new clutch fluid.
2. Connect a transparent vinyl hose to the air bleeder valve.
3. Depress clutch pedal slowly and fully several times at an interval of 2 to 3 seconds and hold it.
4. With clutch pedal depressed, open air bleeder valve to release air.
5. Close air bleeder valve.
6. Release clutch pedal and wait for 5 seconds.
7. Repeat steps 3 to 6 until no bubbles can be observed in the clutch fluid.
8. Tighten air bleeder valve to the specified torque. Refer to CL-11, "COMPONENTS" .

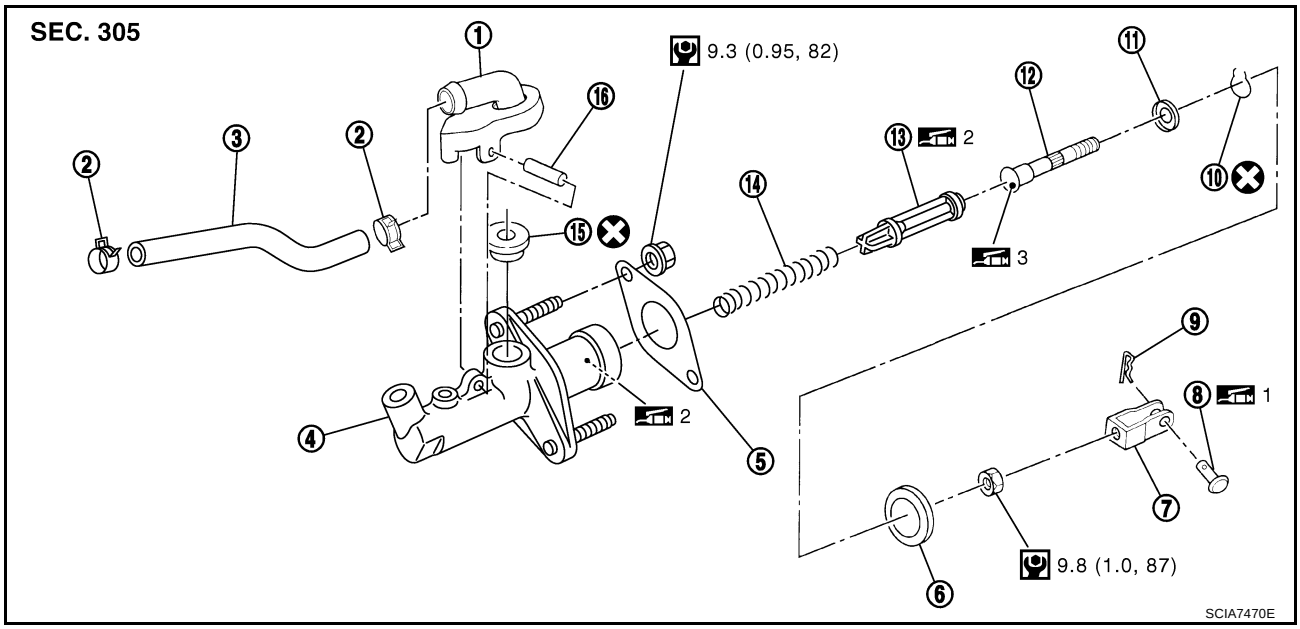

PCIB1900E

CLUTCH MASTER CYLINDER

PFP:30610

Components

NCS001A1



1. Nipple	2. Clamp	3. Reservoir hose
4. Cylinder body	5. Packing	6. Seat
7. Clevis	8. Clevis pin	9. Snap pin
10. Stopper ring	11. Stopper	12. Push rod
13. Piston assembly	14. Return spring	15. Reservoir seal
16. Spring pin		

Refer to GI-11, "Components" , and the followings for the symbols in the figure.

1: Apply lithium-based grease including molybdenum disulphide.

2: Apply rubber lubricant.

3: Apply silicone grease

Removal and Installation

NCS00009

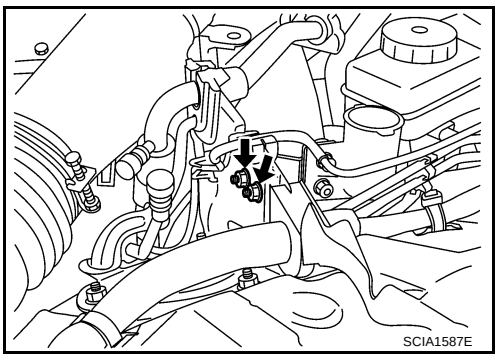
REMOVAL

1. Remove kicking plate. Refer to EI-35, "Removal and Installation (for Coupe Models)" or EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove footrest. Refer to EI-43, "Removal and Installation" .
3. Remove dash side finisher. Refer to IP-11, "Removal and Installation" .
4. Remove instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
5. Remove snap pin and clevis pin from the clevis, and separate it from clutch pedal.
6. Remove hoodledge cover. Refer to EI-20, "Removal and Installation" .
7. Drain clutch fluid in reservoir tank and then remove reservoir hose.

CAUTION:

Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.

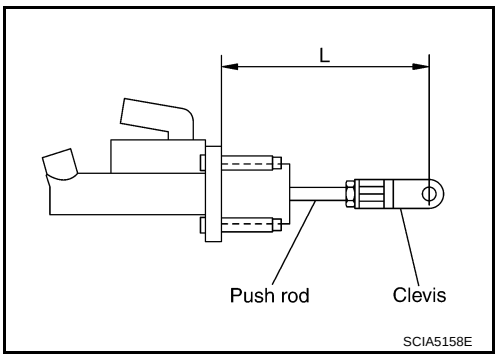
8. Remove reservoir tank mounting nut and then remove reservoir tank.
9. Remove clutch tube using a flare nut wrench.
10. Remove mounting nuts and then remove packing and master cylinder assembly.



INSTALLATION

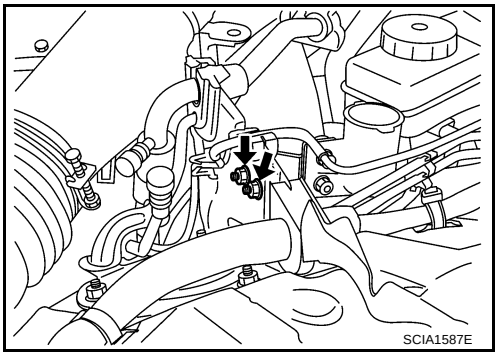
1. Check position of clevis and push rod. If measurement is outside the standard length, adjust position of clevis and push rod.

   Length "L" : 111.0 ± 0.5 mm (4.37 ± 0.02 in)



2. Install packing and master cylinder assembly and tighten mounting nuts to the specified torque. Refer to CL-8, "Components" .
3. Connect clutch tube to master cylinder assembly and temporarily tighten flare nut.
4. Tighten clutch tube flare nut to the specified torque using a flare nut torque wrench. Refer to CL-15, "Removal and Installation" .
5. Install clevis to the clutch pedal, and fix clevis with clevis pin.
6. Install snap pin to the clevis pin.
7. Install reservoir hose to the nipple. Install the reservoir tank to the vehicle, and then tighten mounting nuts to the specified torque.

   : 5.8 N·m (0.59 Kg-m, 51 in-lb)



8. After completing this procedure, inspect and adjust for clutch pedal and then bleed the clutch hydraulic system. Refer to CL-5, "On-Vehicle Inspection and Adjustment" and CL-7, "Bleeding" .
9. Install hoodledge cover.
10. Install instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
11. Install dash side finisher. Refer to IP-11, "Removal and Installation" .
12. Install footrest. Refer to EI-43, "FLOOR TRIM" .
13. Install kicking plate. Refer to EI-35, "Removal and Installation (for Coupe Models)" or EI-37, "Removal and Installation (for Roadster Models)" .

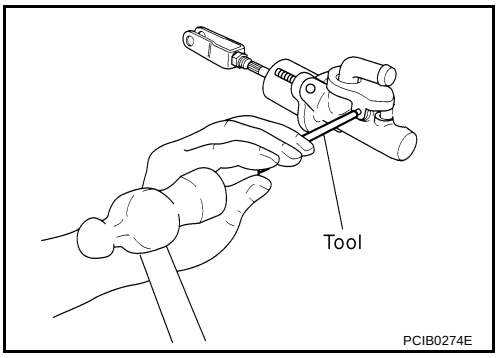
Disassembly and Assembly

NCS0000A

DISASSEMBLY

1. Remove spring pin, nipple and reservoir seal from cylinder body using a pin punch.
2. Loosen push rod lock nut. Remove clevis and lock nut.
3. Remove the seat from the cylinder body.
4. Remove the stopper ring and stopper, and then remove the push rod, piston assembly and return spring from the cylinder body.

   CAUTION:
   Restrain the push rod while doing this because there is a danger the piston assembly will fly out of the cylinder body.



INSPECTION AFTER DISASSEMBLY

Check for any of the conditions shown below. If any malfunction is found, replace the part concerned.

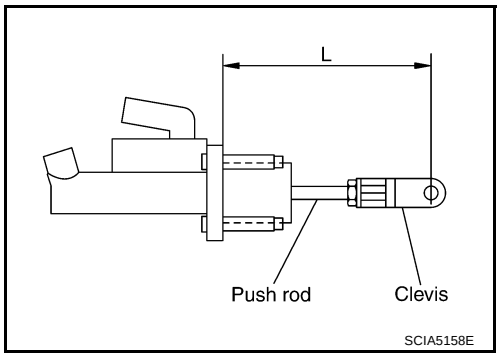
- Damaged cylinder internal wall, foreign matter, wear, corrosion, or pin hole
- Damaged or deformed nipple or reservoir tank
- Settling of the spring
- Cracked and deformed seat

ASSEMBLY

1. Apply rubber lubricant to internal surface of the cylinder body, sliding surface of piston assembly, and the piston cup. Insert return spring and piston assembly to the cylinder body.
2. Apply silicone grease to the push rod and install the stopper before installing the stopper ring.

   CAUTION:
   - **Do not reuse stopper ring.**
   - **Restrain the push rod while doing this because there is a danger the piston assembly will fly out of the master cylinder.**
3. Install seat to the cylinder body.
4. Install clevis to push rod.
5. Check and adjust the position of clevis and push rod. After adjusting “L”, tighten lock nut to the specified torque. Refer to CL-8, "Components" .

   Length “L” : 111.0 ± 0.5 mm (4.37 ± 0.02 in)



6. Install reservoir seal and nipple to cylinder body. Install spring pin using a pin punch.

   CAUTION:
   Do not reuse reservoir seal.

CSC (CONCENTRIC SLAVE CYLINDER)

PFP:30500

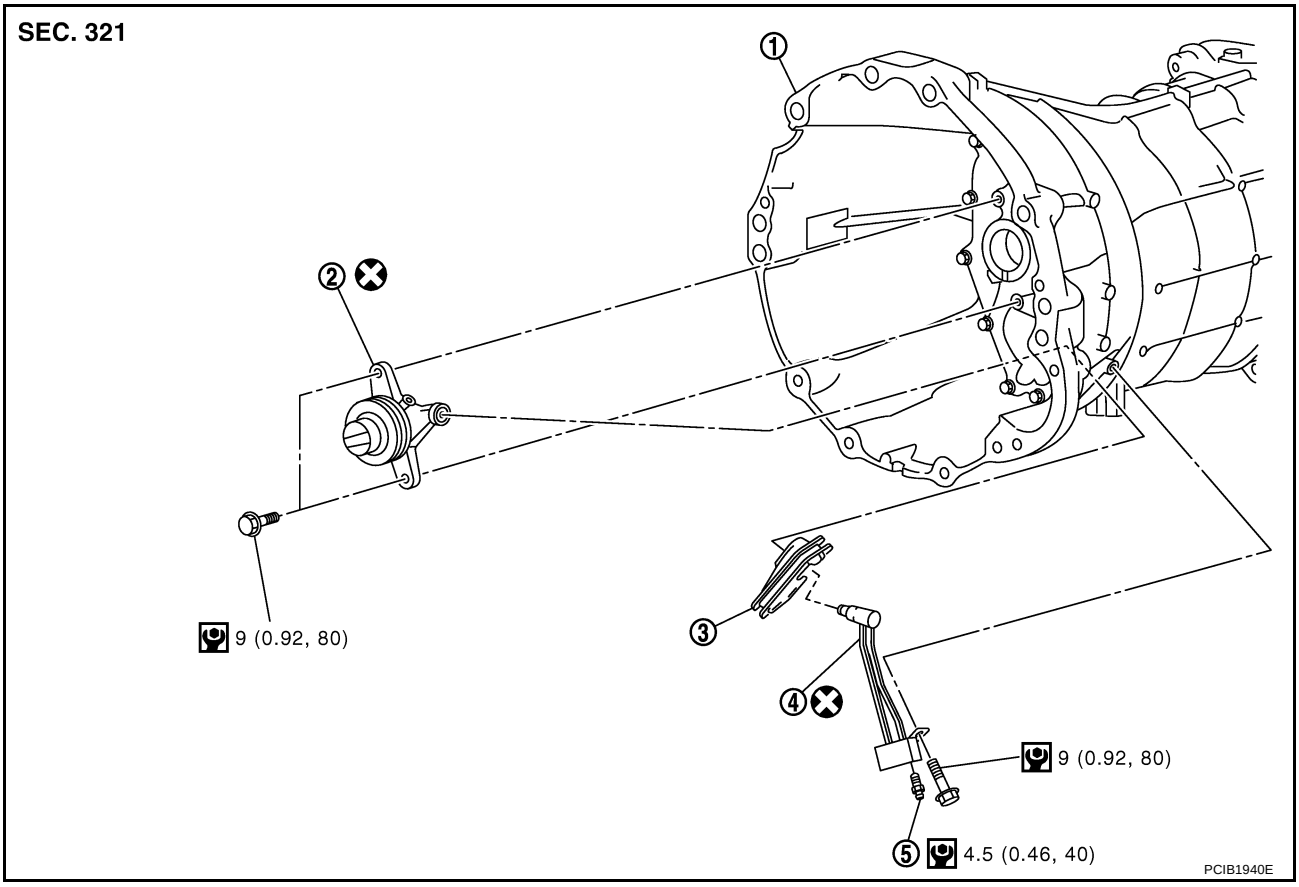
Removal and Installation

NCS0029M

CAUTION:

- **If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.**
- **Do not disassemble CSC body.**
- **Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.**

COMPONENTS



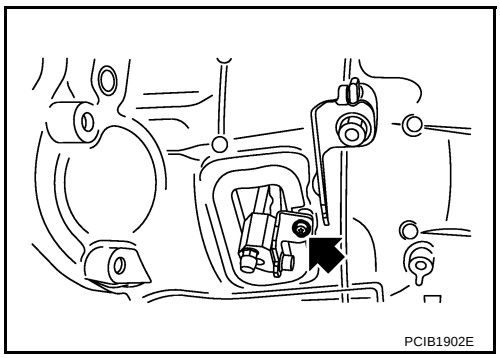
1.	Transmission assembly	2.	CSC (Concentric Slave Cylinder) body	3.	Dust cover
4.	CSC (Concentric Slave Cylinder) tube	5.	Air bleeder valve		

Refer to GI-11, "Components" for the symbols in the figure.

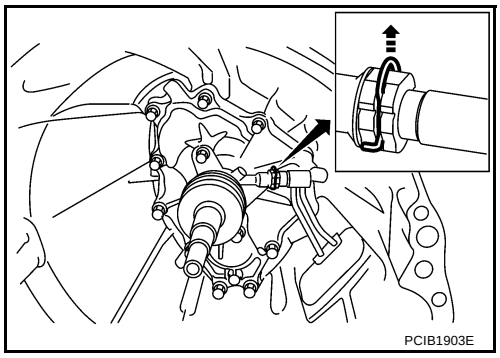
REMOVAL

1. Remove transmission assembly from the vehicle. Refer to MT-18, "Removal and Installation" .

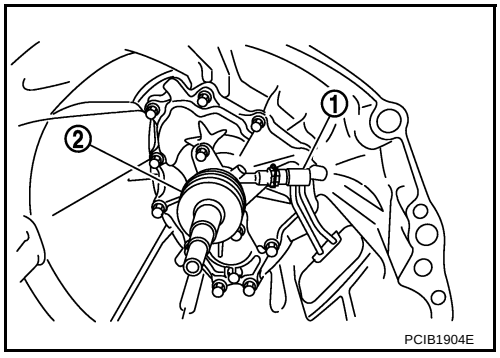
2. Remove CSC tube mounting bolt.


PCIB1902E

3. Pull up the lock pin of CSC body.

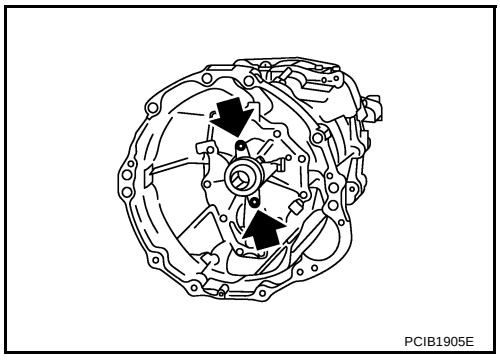

PCIB1903E

4. Pull out the CSC tube (1) from the CSC body (2).
5. Remove CSC tube and dust cover from transmission case.
6. Remove air bleeder valve from CSC tube.



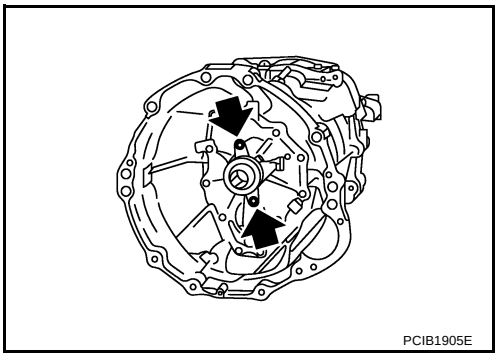
PCIB1904E

7. Remove CSC body from transmission case.


PCIB1905E

INSTALLATION

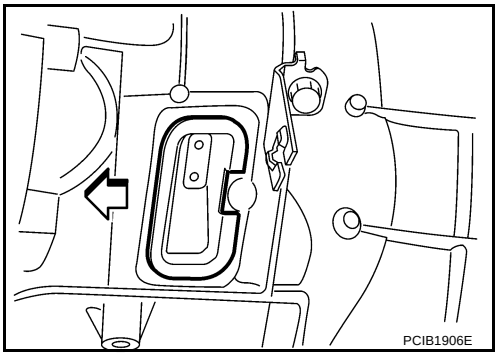
1. Install CSC body to transmission case and then tighten mounting bolts to the specified torque. Refer to CL-11, "COMPONENTS" .



CAUTION:
- **Do not reuse CSC body.**
- **Do not insert and operate CSC body because piston and stopper of CSC body components may fall off.**

2. Install dust cover to transmission case.

⇦ : Vehicle front

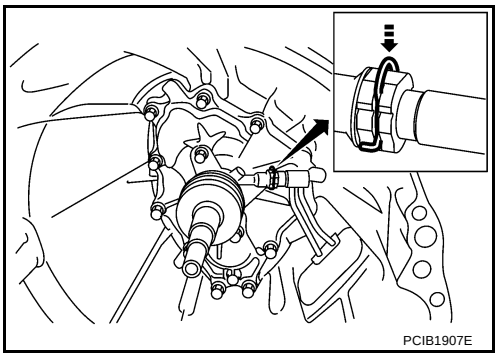


CAUTION:
Be careful with the orientation of dust cover.

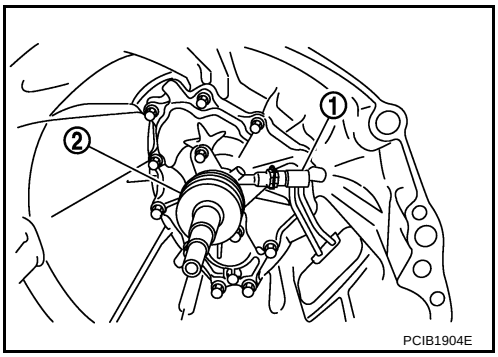
3. Insert CSC tube to dust cover.

CAUTION:
- **Do not reuse CSC tube.**
- **Be sure not to damage O-ring of CSC tube.**

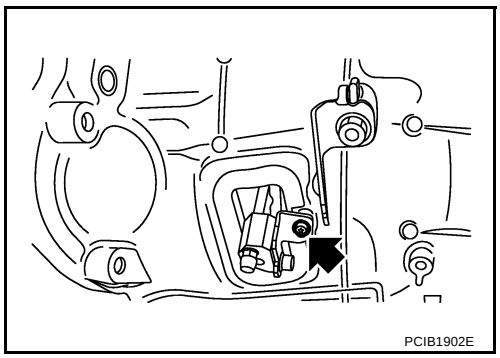
4. Press down the lock pin of the CSC body.



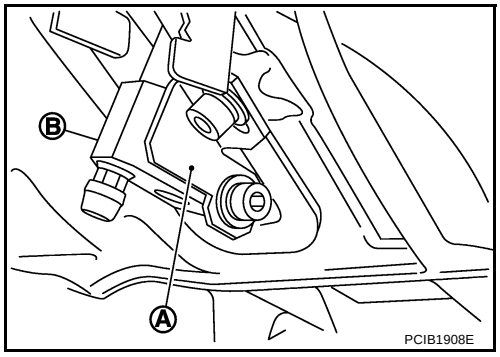
5. Insert the CSC tube (1) into the connector of the CSC body (2) until it clicks.



6. Install CSC tube mounting bolt and then tighten mounting bolt to the specified torque. Refer to CL-11, "COMPONENTS" .


PCIB1902E

CAUTION:
Assemble the components checking that the bracket (A) on the CSC body and the nozzle (B) closely contact each other before tightening the bolt. When assembled correctly, the components should not move beyond the allowable looseness of the connector on the CSC body.



PCIB1908E

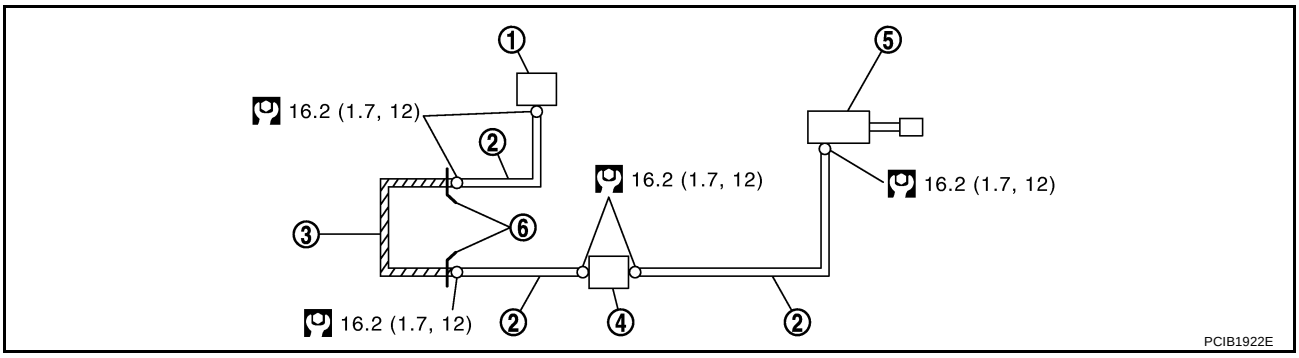
7. Install transmission assembly to the vehicle. Refer to MT-20, "INSTALLATION" .
8. Bleed the air from the clutch hydraulic system, Refer to CL-7, "Bleeding" .

CLUTCH PIPING

PFP:30650

Removal and Installation

NCS0000D



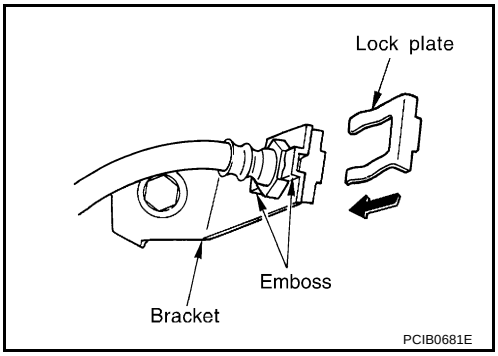
1.	CSC (Concentric Slave Cylinder) assembly	2.	Clutch tube	3.	Clutch hose
4.	Connector	5.	Master cylinder assembly	6.	Lock plate

Refer to GI-11, "Components" , for the symbol in the figure.

Carefully observe the following steps during clutch tube removal and installation.

- Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.
- When fixing clutch hose to bracket, align clutch hose metal fittings with bracket positioning emboss and lock plate to secure. At this time, prevent twisting or damage of clutch hose. In addition, be careful not to damage clutch hose.
- Tighten clutch tube flare nut to the specified torque.

  CAUTION:
  Be careful not to damage flare nut and clutch tube.
- After installation, bleed the clutch hydraulic system. Refer to CL-7, "Bleeding" .



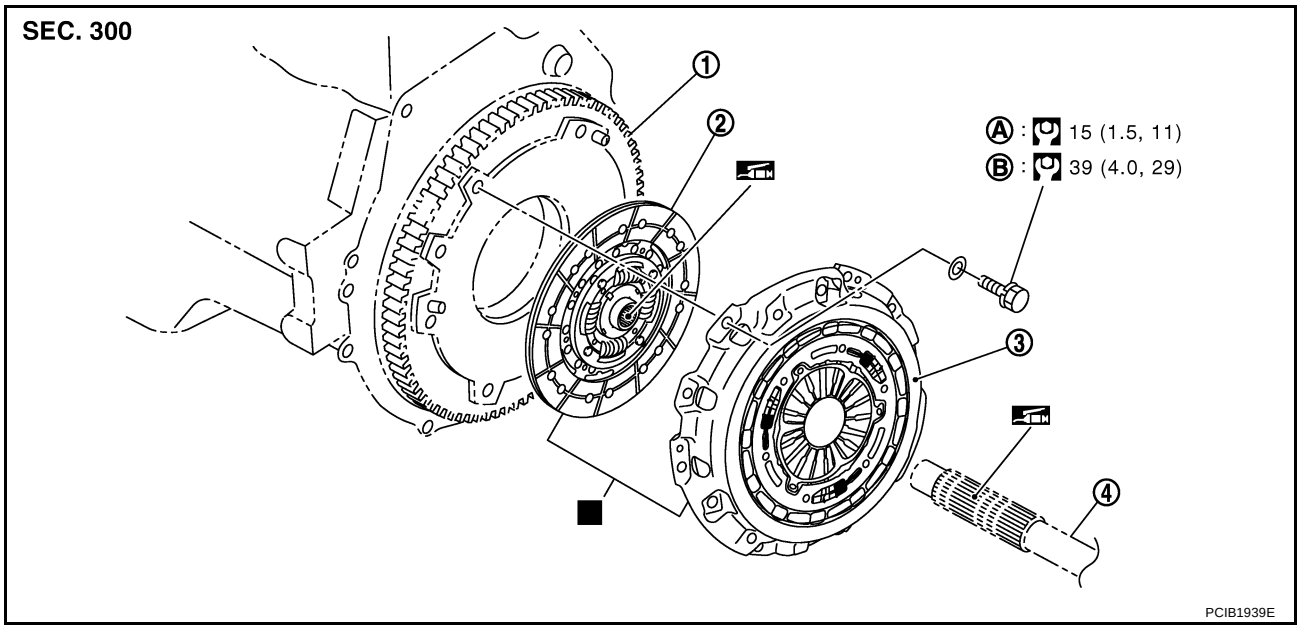
CLUTCH DISC, CLUTCH COVER

PFP:30100

Removal and Installation

NCS0000G

COMPONENTS



1. Flywheel
2. Clutch disc
3. Clutch cover
4. Main drive gear

A. First step

B. Final step

Refer to GI-11, "Components" , and the followings for the symbols in the figure.

■ : Replace the parts as a set.

: Apply lithium-based grease including molybdenum disulphide

CAUTION:

- **If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.**
- **Be careful not to bring any grease into contact with the clutch disc facing, pressure plate surface and flywheel surface.**
- **If flywheel is removed, align dowel pin with the smallest hole of flywheel. Refer to EM-111, "ASSEMBLY" .**
- **When installing, be careful that grease applied to main drive gear does not adhere to clutch disc.**
- **Do not clean in solvent on clutch disk.**

REMOVAL

1. Remove transmission assembly from the vehicle. Refer to MT-18, "Removal and Installation" .
2. Loosen clutch cover mounting bolts with power tool. Remove clutch cover and clutch disc.

   CAUTION:

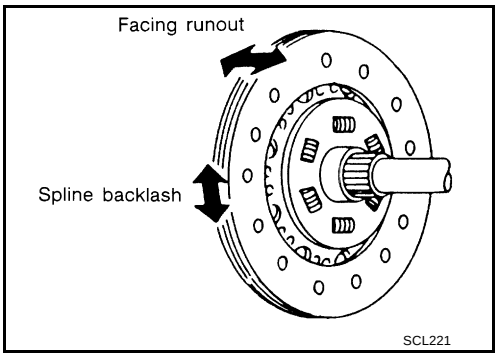
   Do not drop clutch disc.

INSPECTION AND ADJUSTMENT AFTER REMOVAL

Clutch Disc

- Measure circumference runout relative to the clutch disc center spline. If it is outside the specification, replace clutch disc and clutch cover as a set.

  Runout limit/diameter of the area to be measured
  : 1.0 mm (0.039 in)/230 mm (9.06 in) dia.

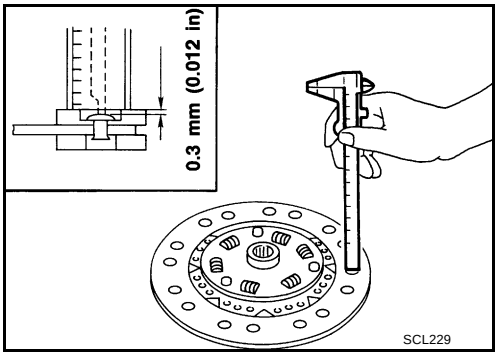


- Measure backlash for clutch disc spline and main drive shaft spline at the circumference of the clutch disc. If it is outside the specified range, replace clutch disc and clutch cover as a set.

  Maximum backlash of spline
  : 1.0 mm (0.039 in)

- Using calipers, measure the depth to the clutch disc facing rivet heads. If it exceeds the allowable wear limit, replace clutch disc and clutch cover as a set.

  Facing wear limit (depth to the rivet head)
  : 0.3 mm (0.012 in)

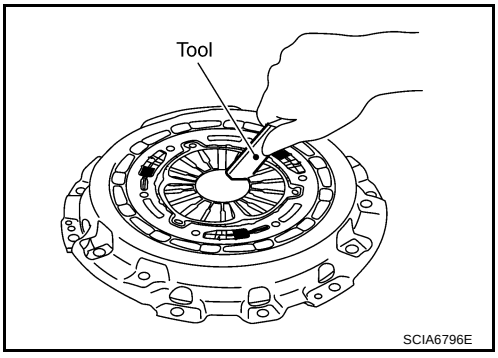


Clutch Cover

Check diaphragm spring lever claws for unevenness with the lever still on the vehicle. If they exceed the tolerance, adjust lever height using the diaphragm adjusting wrench.

Tolerance for diaphragm spring lever unevenness
: 0.8 mm (0.031 in)

Tool number : ST20050240 (—)



- Check clutch cover thrust ring for wear or breakage. If wear or breakage is found, replace clutch disc and clutch cover as a set.

  NOTE:
  - Worn thrust ring will generate a beating noise when tapped at the rivet with a hammer.
  - Broken thrust ring will make a clinking sound when cover is shaken up and down.

- If a trace of burn or discoloration is found on the clutch cover pressure plate to clutch disc contact surface, repair the surface with sandpaper. If surface is damaged or distorted, replace clutch disc and clutch cover as a set.

INSTALLATION

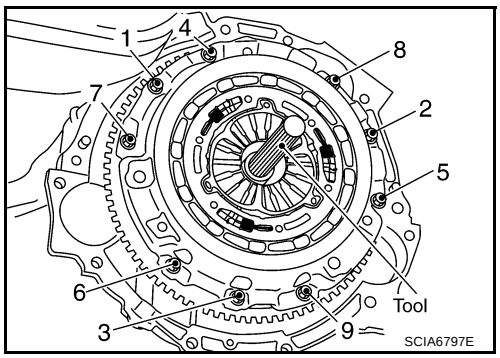
1. Apply recommended grease to clutch disc and main drive gear spline.

   CAUTION:
   Be sure to apply grease to the points specified. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip or judder. And if it adheres to seal of CSC body, it cause clutch fluid leakage. Wipe off excess grease. Wipe off any grease oozing from the parts.

2. Install clutch disc and clutch cover. Pre-tighten mounting bolts and install clutch aligning bar.

   Tool number : ST20670000 (—)

   CAUTION:
   If either clutch disk or clutch cover is needed to be replaced, replace them as a set.
3. Tighten clutch cover mounting bolts evenly in two steps in the order shown in the figure. Refer to CL-16, "Removal and Installation" .
4. Install transmission assembly. Refer to MT-18, "Removal and Installation" .



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Clutch Control System

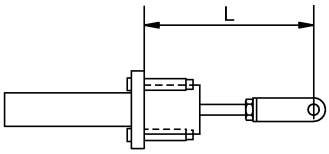
NCS0000H

Type of clutch control	Hydraulic

Clutch Master Cylinder

NCS0000I

Unit: mm (in)

Inner diameter	17.46 (11/16)
Standard length “L” between clevis and push rod  PCIB1944E	111.0 ± 0.5 (4.37 ± 0.02)

Clutch Disc

NCS0000K

Unit: mm (in)

Facing size (Outer dia. × inner dia. × thickness)	240 × 160 × 3.8 (9.45 × 6.30 × 0.150)
Wear limit (depth to the rivet head)	0.3 (0.012)
Runout limit/diameter of the area to be measured	1.0 (0.039)/230 (9.06) dia.
Maximum backlash of spline (at outer edge disc)	1.0 (0.039)

Clutch Cover

NCS0000L

Set-load	10,300 N (1,050.6 kg, 2,315.4 lb)
Diaphragm spring lever height	44.6 - 46.8 mm (1.756 - 1.843 in)
Uneven limit of diaphragm spring toe height	0.8 mm (0.031 in) or less

Clutch Pedal

NCS0000M

Unit: mm (in)

Clearance ″C″ between pedal stopper rubber and clutch interlock switch threaded while clutch pedal is fully depressed.	0.1 - 1.0 (0.004 - 0.039)

SECTION CO
ENGINE COOLING SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NBS0001M

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NBS0001N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Liquid Gasket

NBS0001O

REMOVAL OF LIQUID GASKET SEALING

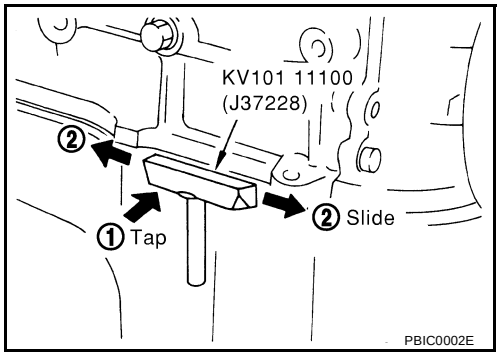
- After removing mounting bolts and nuts, separate the mating surface using seal cutter (SST) and remove old liquid gasket sealing.

  CAUTION:

  Be careful not to damage the mating surfaces.
- Tap seal cutter to insert it, and then slide it by tapping on the side as shown in the figure.
- In areas where seal cutter (SST) is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

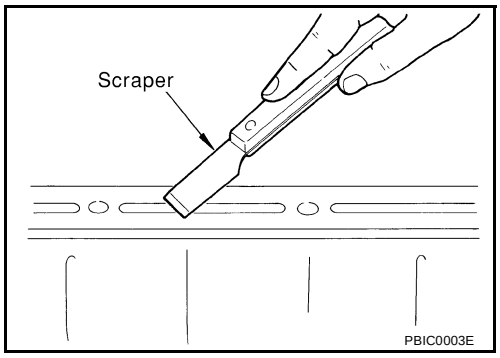
  CAUTION:

  If for some unavoidable reason tool such as screwdriver is used, be careful not to damage the mating surfaces.

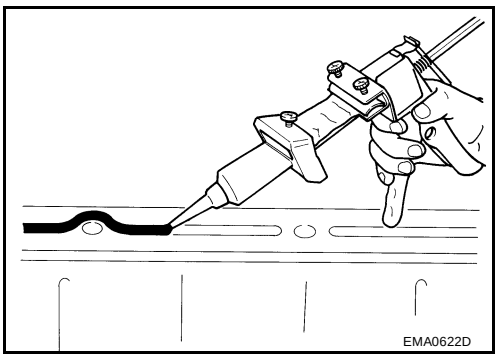


LIQUID GASKET APPLICATION PROCEDURE

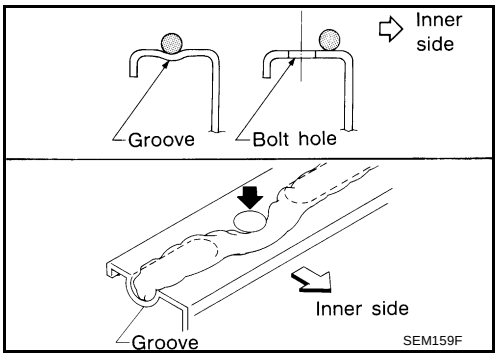
1. Using scraper, remove old liquid gasket adhering to the liquid gasket application surface and the mating surface.
   - Remove liquid gasket completely from the groove of the liquid gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.



3. Attach liquid gasket tube to tube presser [SST: WS39930000 (—)].
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for the liquid gasket application, apply liquid gasket to the groove.



   - As for the bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of service manual.
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten mounting bolts or nuts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



CAUTION:
If there are specific instructions in this manual, observe them.

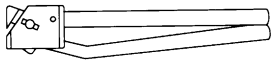
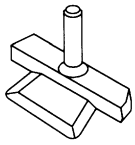
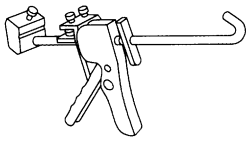
PREPARATION

PFP:00002

Special Service Tools

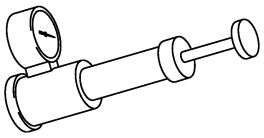
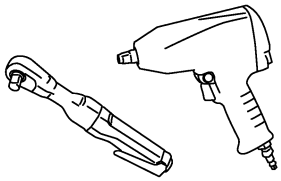
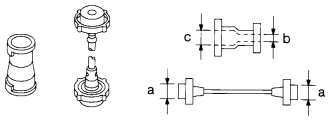
NBS0001P

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV99103510 (—) Radiator plate pliers A  S-NT224	Installing radiator upper and lower tanks
KV99103520 (—) Radiator plate pliers B  S-NT225	Removing radiator upper and lower tanks
KV10111100 (J37228) Seal cutter  NT046	Removing chain tensioner cover and water pump cover
WS39930000 (—) Tube presser  S-NT052	Pressing the tube of liquid gasket

Commercial Service Tools

NBS0001Q

Tool name	Description
Radiator cap tester  PBIC1982E	Checking radiator and radiator cap
Power tool  PBIC0190E	Loosening nuts and bolts
Radiator cap tester adapter  S-NT564	Adapting radiator cap tester to radiator cap and radiator filler neck a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)

OVERHEATING CAUSE ANALYSIS

PFP:00012

Troubleshooting Chart

NBS0001R

	Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	—	
		Damaged fins	Dust contamination or paper clogging	
			Physical damage	
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)	
	Reduced air flow	Cooling fan does not operate	Fan assembly	—
		High resistance to fan rotation		
		Damaged fan blades		
	Damaged radiator shroud	—	—	—
	Improper engine coolant mixture ratio	—	—	—
	Poor engine coolant quality	—	Engine coolant viscosity	—
	Insufficient engine coolant	Engine coolant leaks	Cooling hose	Loose clamp
				Cracked hose
			Water pump	Poor sealing
			Radiator cap	Loose
				Poor sealing
			Radiator	O-ring for damage, deterioration or improper fitting
				Cracked radiator tank
				Cracked radiator core
			Reservoir tank	Cracked reservoir tank
		Overflowing reservoir tank	Exhaust gas leaks into cooling system	Cylinder head deterioration
				Cylinder head gasket deterioration

OVERHEATING CAUSE ANALYSIS

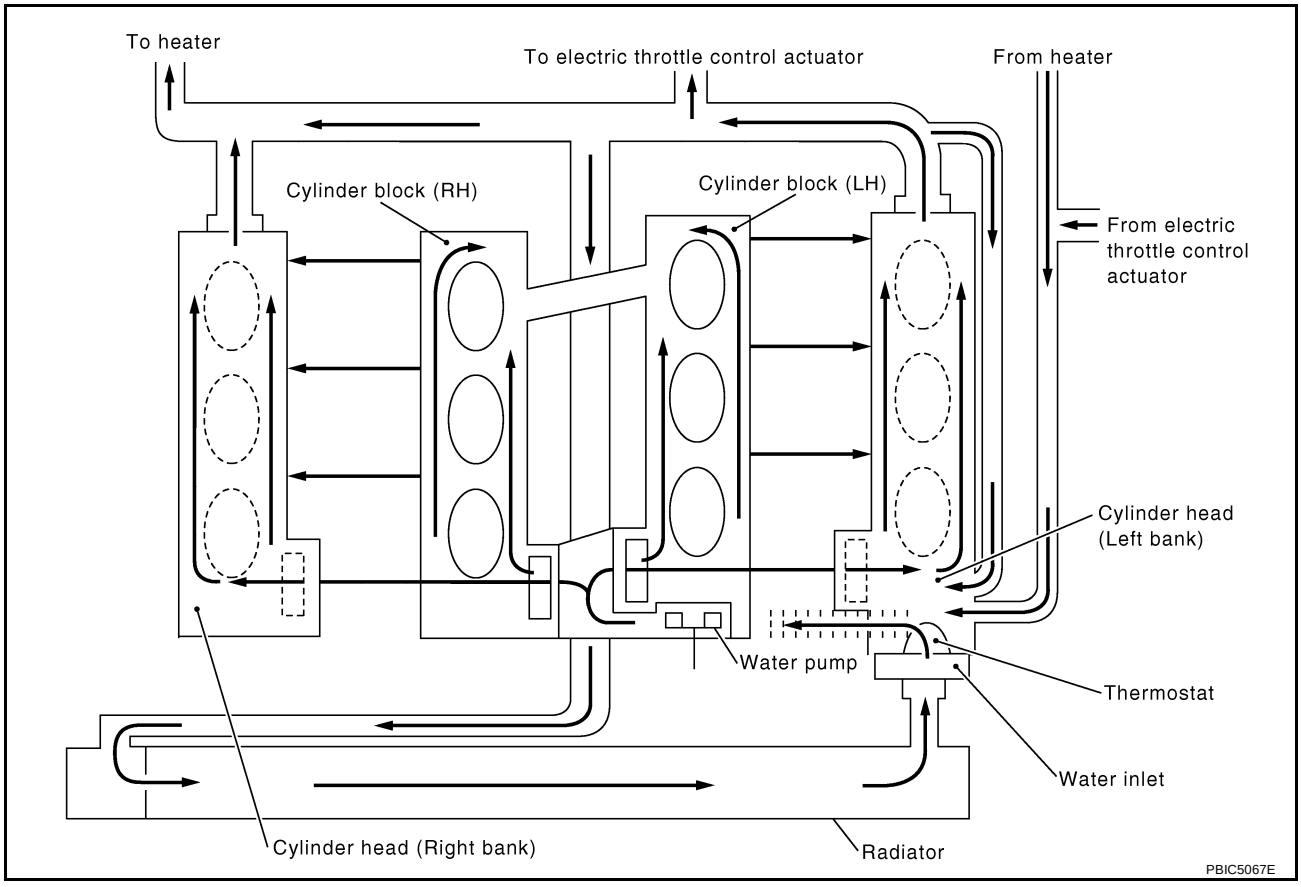
	Symptom		Check items	
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load
				Driving in low gear for extended time
				Driving at extremely high speed
			Powertrain system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes	
			Improper ignition timing	
	Blocked or restricted air flow	Blocked bumper	—	—
		Blocked radiator grille	Installed car brassiere	
			Mud contamination or paper clogging	
		Blocked radiator	—	
		Blocked condenser	Blocked air flow	
		Installed large fog lamp		

COOLING SYSTEM

PFP:21020

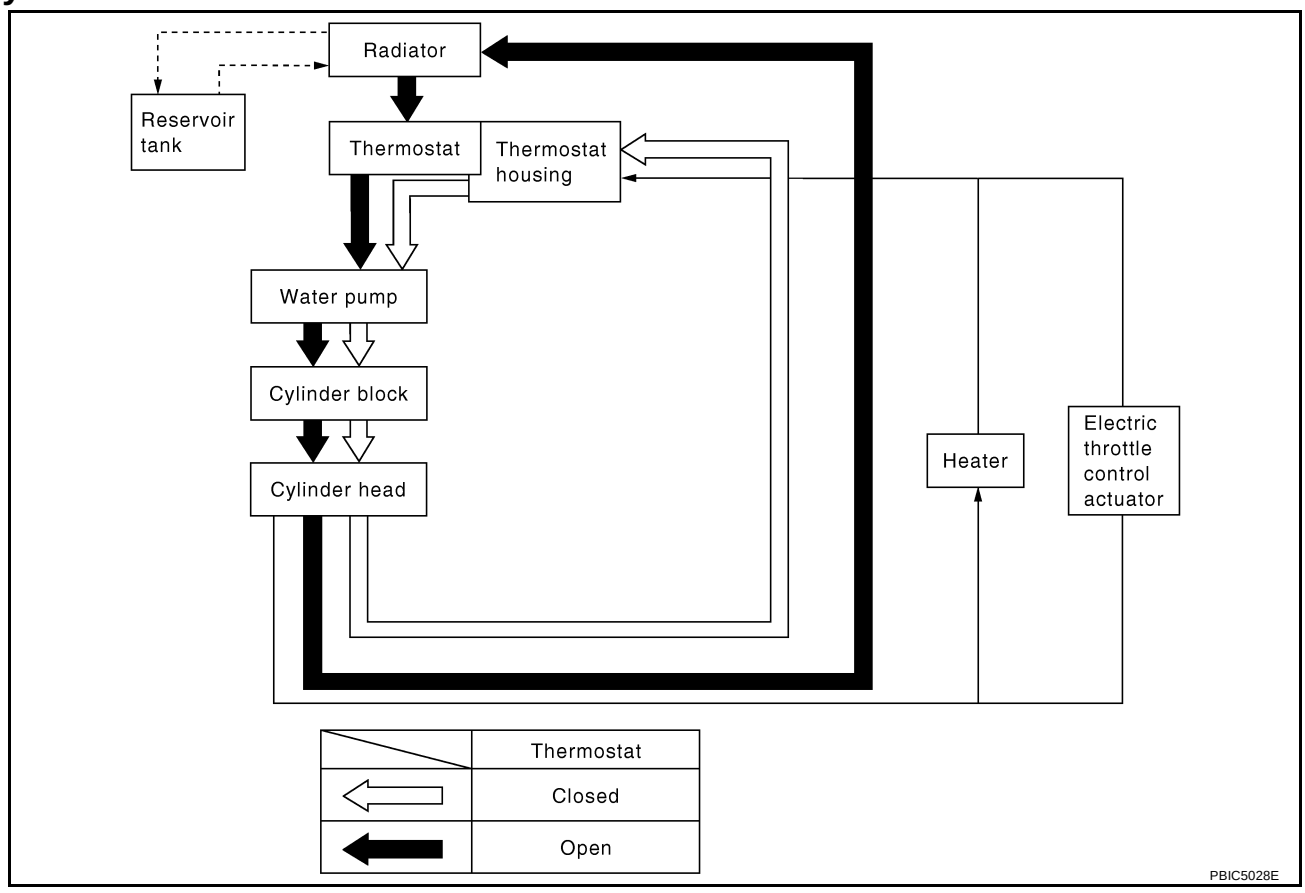
Cooling Circuit

NBS0001S



System Chart

NBS0001T



ENGINE COOLANT

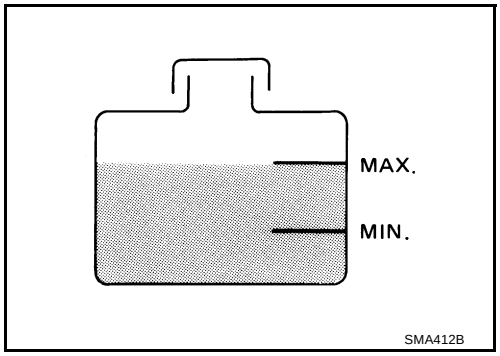
PFP:KQ100

Inspection

NBS0001U

LEVEL CHECK

- Check if the reservoir tank engine coolant level is within the “MIN” to “MAX” range when engine is cool.
- Adjust the engine coolant level as necessary.



LEAK CHECK

- To check for leaks, apply pressure to the cooling system with radiator cap tester (commercial service tool) and radiator cap tester adapter (commercial service tool) (A).

  Testing pressure

  : 157 kPa (1.6 kg/cm^2 , 23 psi)

  WARNING:

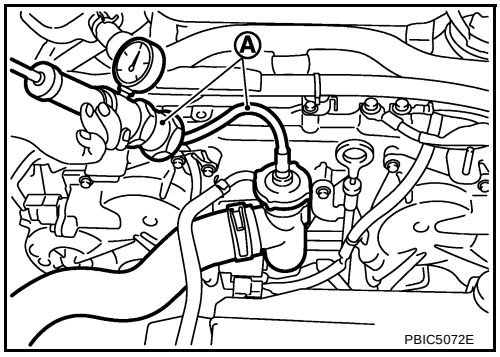
  Do not remove radiator cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator.

  CAUTION:

  Higher test pressure than specified may cause radiator damage.

  NOTE:

  In a case that engine coolant decreases, replenish radiator with engine coolant.



- If anything is found, repair or replace damaged parts.

Changing Engine Coolant

NBS0001V

WARNING:

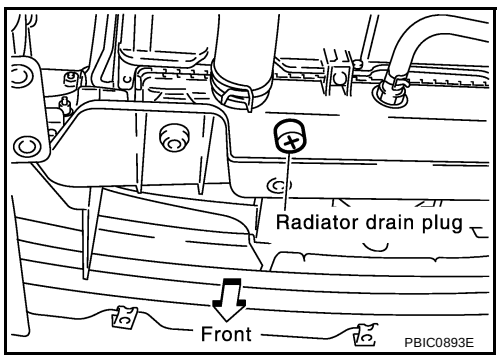
- **To avoid being scalded, do not change engine coolant when engine is hot.**
- **Wrap a thick cloth around cap and carefully remove cap. First, turn cap a quarter of a turn to release built-up pressure. Then turn cap all the way.**

CAUTION:

Be careful not to allow engine coolant to contact drive belts.

DRAINING ENGINE COOLANT

1. Remove undercover with power tool.
2. Open radiator drain plug at the bottom of radiator, and then remove radiator cap.



When drain all of engine coolant in the system, open water drain plugs on engine cylinder block. Refer to EM-108, "DISASSEMBLY" .

3. Remove reservoir tank as necessary, and drain engine coolant and clean reservoir tank before installing.
4. Check drained engine coolant for contaminants such as rust, corrosion or discoloration.
   If contaminated, flush the engine cooling system. Refer to CO-12, "FLUSHING COOLING SYSTEM" .

REFILLING ENGINE COOLANT

1. Install reservoir tank if removed, and radiator drain plug.

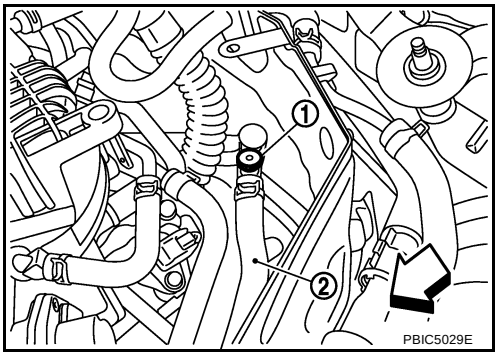
   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

   Radiator drain plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-111, "ASSEMBLY" .
2. Make sure that each hose clamp has been firmly tightened.
3. Remove air relief plug (1) on heater hose.

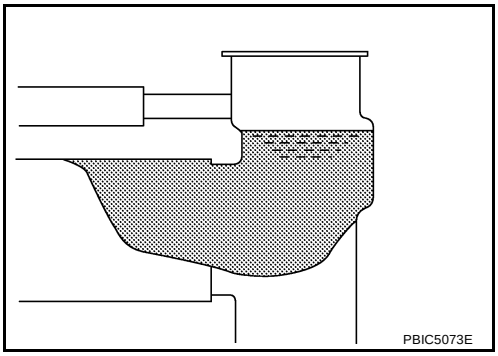
   2 : Heater hose
   ⇦ : Vehicle front



4. Fill radiator and reservoir tank to specified level.
   - **Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (2-1/8 US qt, 1-3/4 lmp qt) a minute to allow air in system to escape.**
   - **Use Genuine NISSAN Long Life Antifreeze/Coolant or equivalent mixed with water (distilled or demineralized). Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS".**

     Engine coolant capacity
     (with reservoir tank at “MAX” level)

     : Approx. 9.0 ℓ (9 - 1/2 US qt, 7- 7/8 lmp qt)



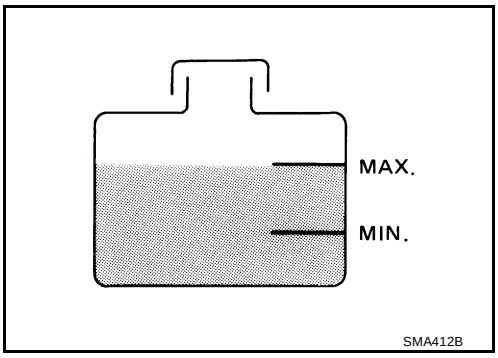
     Reservoir tank capacity (at “MAX” level)

     : 0.8 ℓ (7/8 US qt, 3/4 lmp qt)

   - When engine coolant overflows air relief hole on heater hose, install air relief plug with new O-ring.

     Air relief plug:

     : 1.2 N·m (0.12 kg-m, 11 in-lb)



5. Install radiator cap.
6. Warm up until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
   - Make sure thermostat opening condition by touching radiator hose (lower) to see a flow of warm water.

   CAUTION:
   Watch water temperature gauge so as not to overheat engine.

7. Stop engine and cool down to less than approximately 50°C (122°F).
   - Cool down using fan to reduce the time.
   - If necessary, refill radiator up to filler neck with engine coolant.
8. Refill reservoir tank to “MAX” level line with engine coolant.
9. Repeat steps 4 through 7 two or more times with radiator cap installed until engine coolant level no longer drops.
10. Check cooling system for leaks with engine running.
11. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between “COOL” and “WARM”.
    - Sound may be noticeable at heater unit.
12. Repeat step 11 three times.
13. If sound is heard, bleed air from cooling system by repeating step 4 through 7 until engine coolant level no longer drops.

FLUSHING COOLING SYSTEM

1. Install reservoir tank if removed, and radiator drain plug.

   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

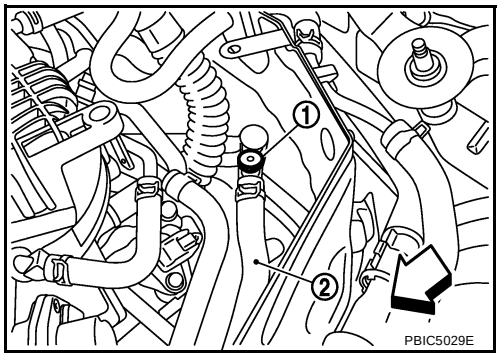
   Radiator drain plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-111, "ASSEMBLY" .

2. Remove air relief plug (1) on heater hose.

   2 : Heater hose
   ⇦ : Vehicle front



3. Fill radiator with water until water spills from the air relief hole, then close air relief plug. Fill radiator and reservoir tank with water and reinstall radiator cap.

   Air relief plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

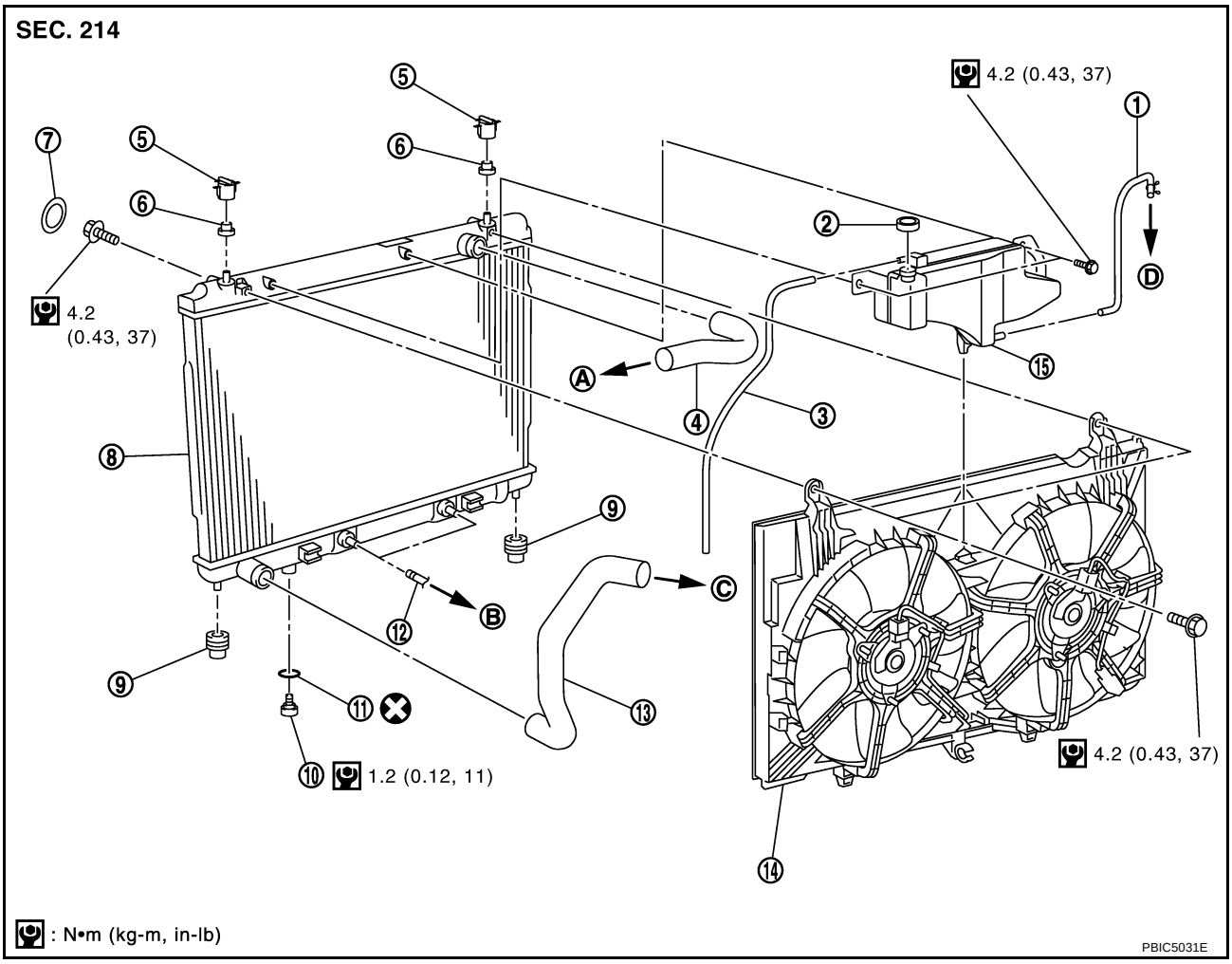
4. Run engine and warm it up to normal operating temperature.
5. Rev engine two or three times under no-load.
6. Stop engine and wait until it cools down.
7. Drain water from the system. Refer to CO-10, "DRAINING ENGINE COOLANT" .
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.

RADIATOR

PFP:21400

Removal and Installation

NBS0001W



1. Reservoir tank hose	2. Reservoir tank cap	3. Reservoir tank hose
4. Radiator hose (upper)	5. Upper mount bracket	6. Mounting rubber (upper)
7. Cover	8. Radiator	9. Mounting rubber (lower)
10. Radiator drain plug	11. O-ring	12. A/T fluid cooler hose (A/T models)
13. Radiator hose (lower)	14. Radiator cooling fan assembly	15. Reservoir tank
A. To water outlet	B. To A/T fluid cooler tube (A/T models)	C. To water inlet
D. To water outlet		

- Refer to GI-11, "Components" for symbol marks in the figure.

WARNING:

Do not remove radiator cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

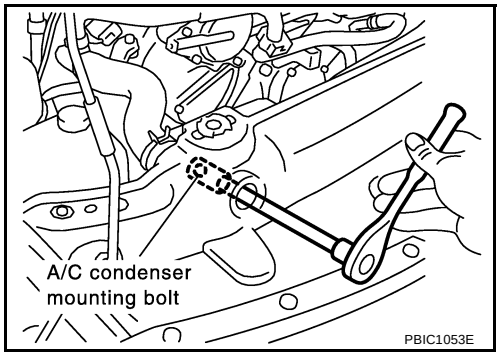
REMOVAL

1. Remove undercover with power tool.
2. Drain engine coolant from radiator. Refer to CO-10, "Changing Engine Coolant" .

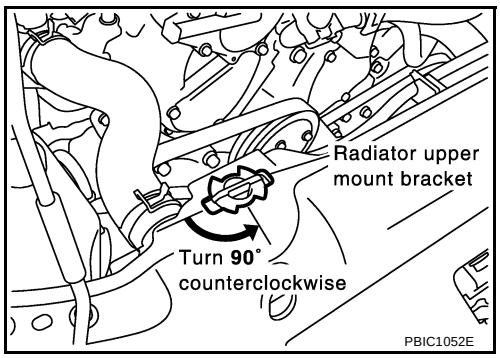
   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove air duct and air cleaner case assembly. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Remove bracket mounting bolt for anchoring A/C piping from vehicle left side, so that A/C piping can be moved.

5. Remove reservoir tank.
6. Removal radiator hoses (upper and lower) and reservoir tank hose.

   CAUTION:
   Be careful not to allow engine coolant to contact drive belts.
7. Remove radiator cooling fan assembly. Refer to CO-21, "COOLING FAN" .
8. Disconnect A/T fluid cooler hoses. (A/T models)
   - Install blind plug to avoid leakage of A/T fluid.
9. Remove cover, and then two A/C condenser mounting bolts located in upper part of radiator.



10. Rotate two radiator upper mount brackets 90 degrees in the direction as shown in the figure, and remove them.

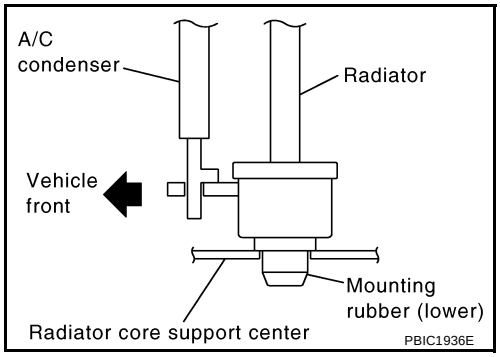


11. Remove radiator as follows:

    CAUTION:
    Do not damage or scratch A/C condenser and radiator core when removing.

a. With lifting and pulling radiator in a rear direction, disassemble lower mount from radiator core support center.

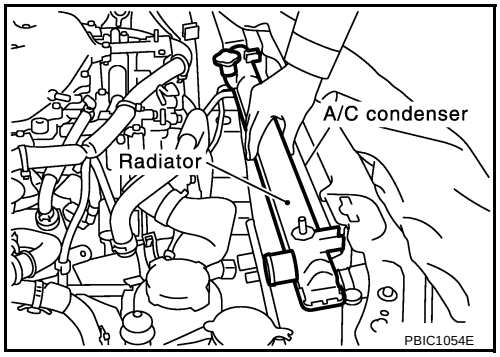
   CAUTION:
   Because A/C condenser is onto the front-lower portion of radiator, moving to rear direction should be at minimum.



b. Lift A/C condenser up and remove radiator after disengaging the fitting as front-bottom surface.

   CAUTION:
   Lifting A/C condenser should be minimum to prevent a load to A/C piping.

c. After removing radiator, put A/C condenser on radiator core support center to prevent a load to A/C piping, and temporarily fix it with rope or similar means.



INSTALLATION

Installation is the reverse order of removal.

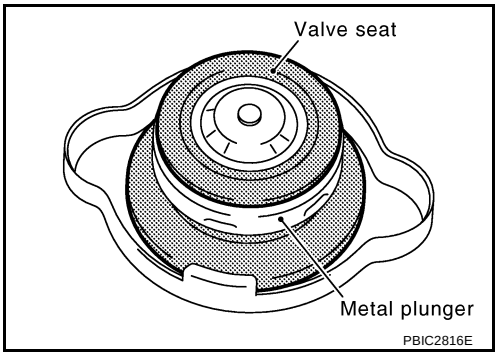
INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant using radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool). Refer to CO-10, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant and A/T fluid.

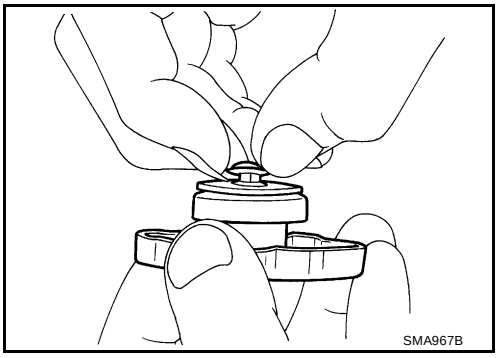
Checking Radiator Cap

NBS0001X

- Check valve seat of radiator cap.
  - Check if valve seat is swollen to the extent that the edge of the plunger cannot be seen when watching it vertically from the top.
  - Check if valve seat has no soil and damage.



- Pull negative-pressure valve to open it, and make sure that it is completely closed when released.
  - Make sure that there is no dirt or damage on the valve seat of radiator cap negative-pressure valve.
  - Make sure that there are no unusualness in the opening and closing conditions of negative-pressure valve.



- Check radiator cap relief pressure.

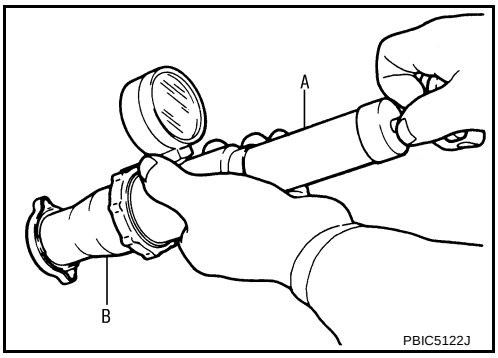
Standard:

108 - 127 kPa (1.1 - 1.3 kg/cm^2 , 16 - 18 psi)

Limit:

88 kPa (0.9 kg/cm^2 , 13 psi)

  - When connecting radiator cap to the radiator cap tester (commercial service tool) (A) and the radiator cap tester adapter (commercial service tool) (B), apply engine coolant to the cap seal surface.



- Replace radiator cap if there is an unusualness related to the above three.

CAUTION:

When installing radiator cap, thoroughly wipe out the filler neck to remove any waxy residue or foreign material.

Checking Radiator

NBS0001Y

Check radiator for mud or clogging. If necessary, clean radiator as follows.

- Be careful not to bend or damage the radiator fins.
- When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape harness and electrical connectors to prevent water from entering.

1. Apply water by hose to the back side of radiator core vertically downward.

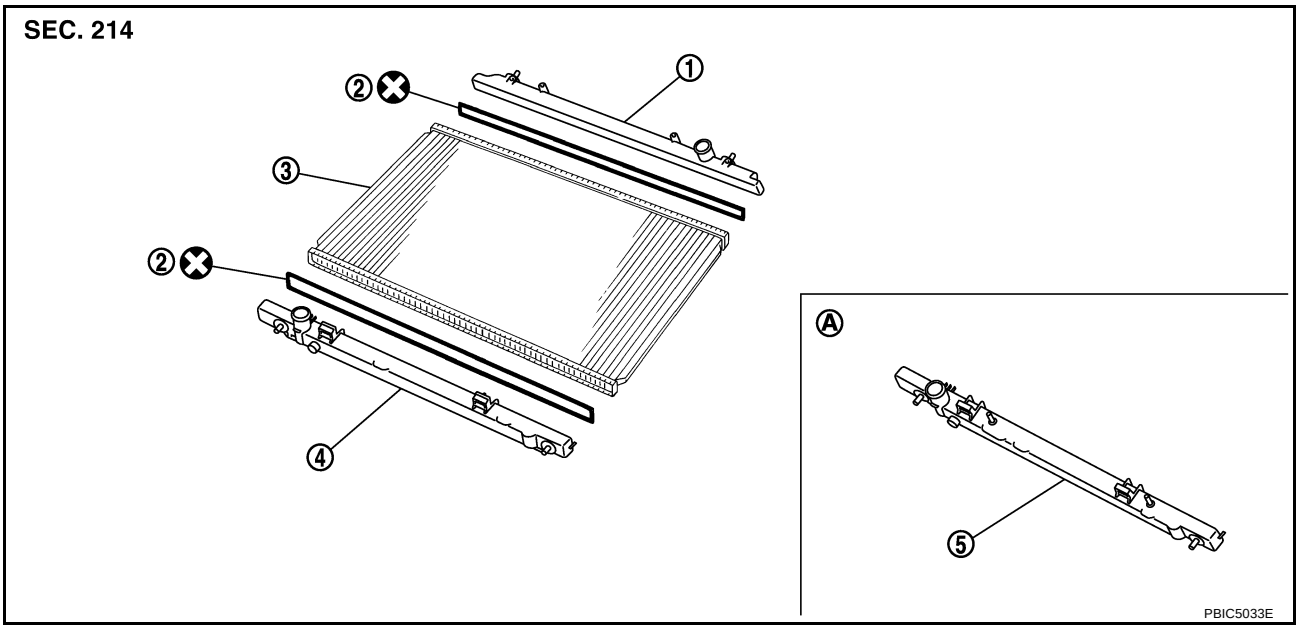
2. Apply water again to all radiator core surface once per minute.
3. Stop washing if any stains no longer flow out from radiator.
4. Blow air into the back side of radiator core vertically downward.
   - Use compressed air lower than 490 kPa (5 kg/cm^2 , 71 psi) and keep distance more than 30 cm (11.8 in).
5. Blow air again into all the radiator core surfaces once per minute until no water sprays out.

RADIATOR (ALUMINUM TYPE)

PFP:21460

Disassembly and Assembly

NBS0001Z



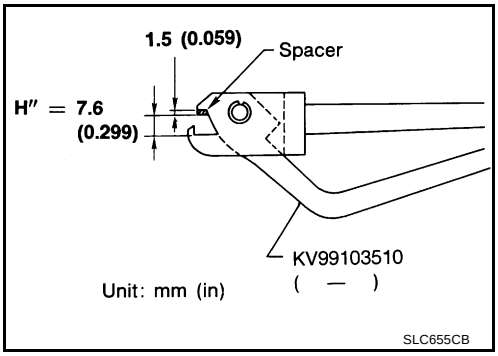
1. Upper tank
2. Sealing rubber
3. Core
4. Lower tank
5. Lower tank (with A/T fluid cooler)

A. A/T models

- Refer to GI-11, "Components" for symbol marks in the figure.

PREPARATION

1. Attach spacer to tip of radiator plate pliers A (SST).
   Spacer specification: 18 mm (0.71 in) wide × 8.5 mm (0.335 in) long × 1.5 mm (0.059 in) thick.



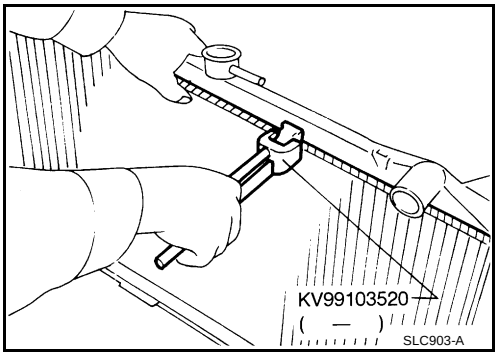
2. Make sure that when radiator plate pliers A [SST: KV99103510 (—)] are closed dimension H″ is approx. 7.6 mm (0.299 in).
3. Adjust dimension H″ with spacer, if necessary.

DISASSEMBLY

1. Remove upper and lower tanks with radiator plate pliers B (SST).

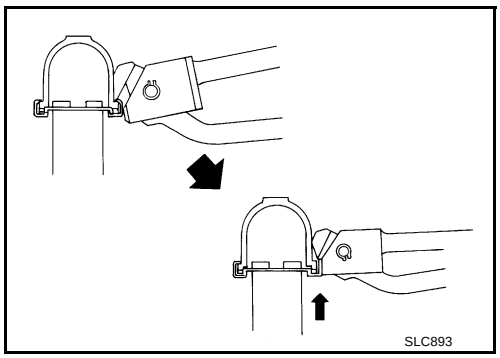
   CAUTION:
   Do not disassemble lower tank and A/T fluid cooler. (A/T models)

   NOTE:
   Regard lower tank and A/T fluid cooler as an assembly. (A/T models)



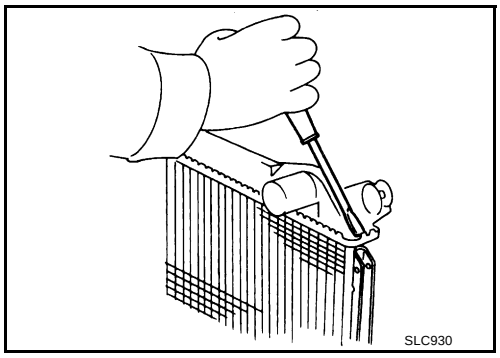
- Grip the crimped edge and bend it upwards so that radiator plate pliers B [SST: KV99103520(—)] slips off.

  CAUTION:
  Do not bend excessively.

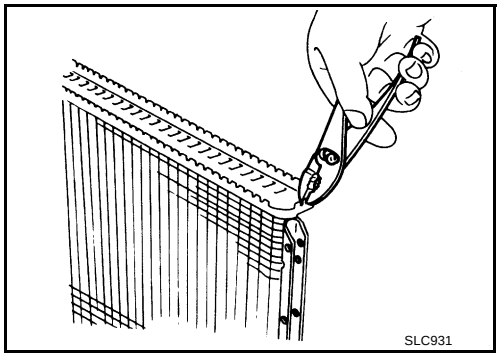


- In areas where radiator plate pliers B [SST: KV99103520(—)] cannot be used, use screwdriver to bend the edge up.

  CAUTION:
  Be careful not to damage tank.

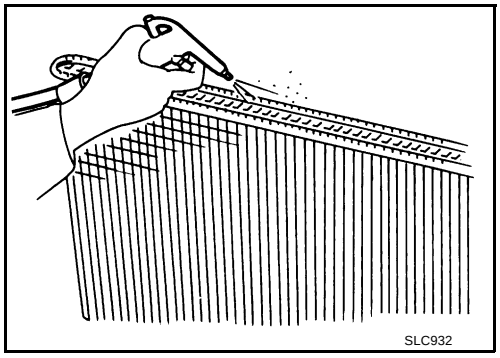


2. Remove sealing rubber.
3. Make sure the edge stands straight up.



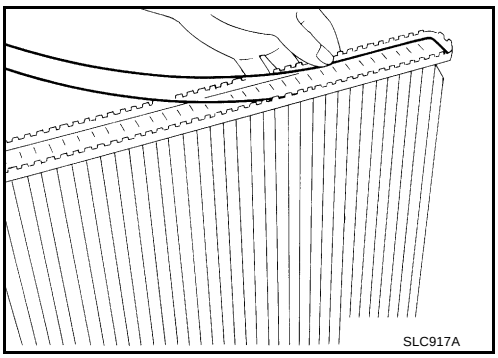
ASSEMBLY

1. Clean contact portion of tank.

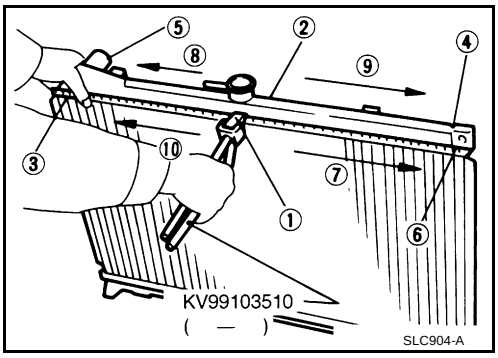


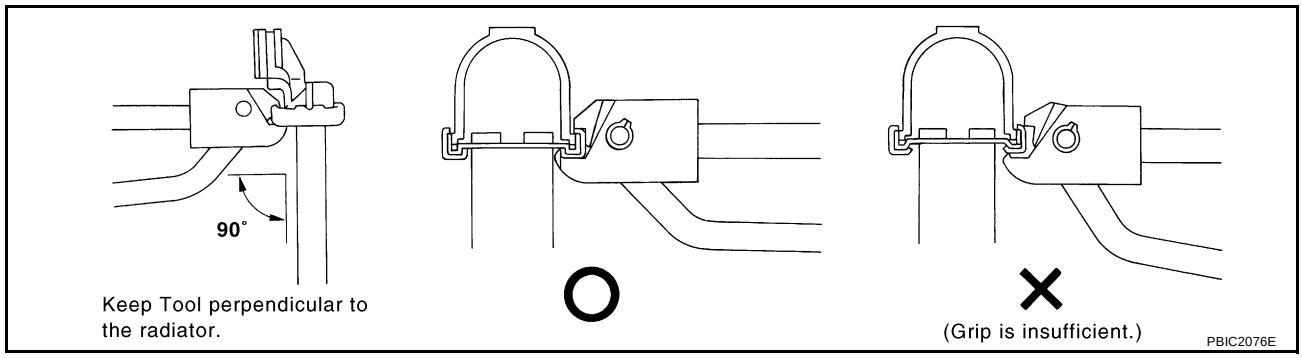
2. Install sealing rubber while pushing it with fingers.

CAUTION:
Be careful not to twist sealing rubber.

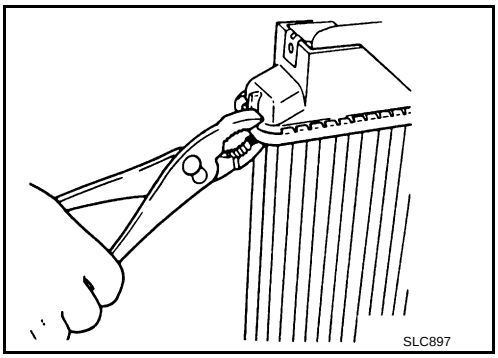


3. Caulk tank in numerical order as shown in the figure with radiator plate pliers A (SST).



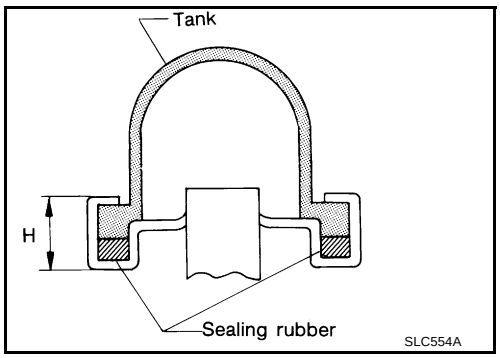


- Use pliers in the locations where radiator plate pliers A [SST: KV99103510 (—)] cannot be used.



4. Make sure that the rim is completely crimped down.

Standard height "H" : 8.0 - 8.4 mm (0.315 - 0.331 in)

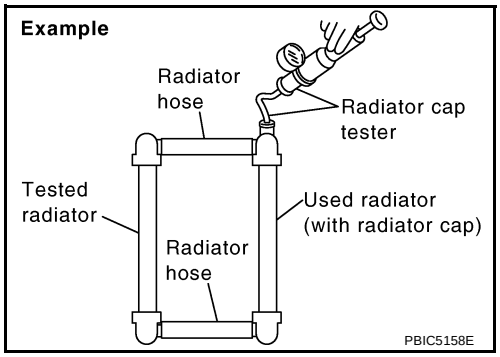


5. Make sure that there is no leakage.
Refer to CO-20, "INSPECTION" .

INSPECTION

1. Apply pressure with radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool).
   - Provide used radiator and connect it to tested radiator using radiator hoses as shown in the figure.

   NOTE:
   The used radiator should be tested beforehand to confirm it has no leakage. If used one is not available, it is possible to use new service part as a radiator testing tool.



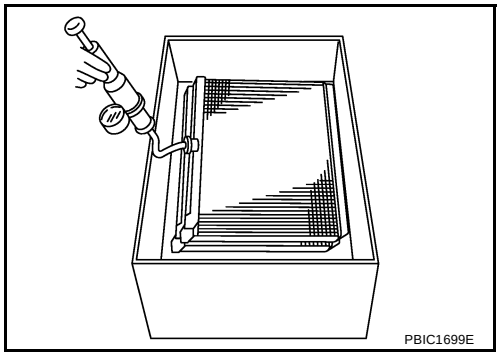
Testing pressure

: 157 kPa (1.6 kg/cm^2 , 23 psi)

WARNING:
To prevent the risk of hose coming undone while under pressure, securely fasten it down with hose clamp.

CAUTION:
Attach hose to A/T fluid cooler to seal its inlet and outlet.
(A/T models)

2. Check for leakage by soaking radiator in water container with the testing pressure applied.

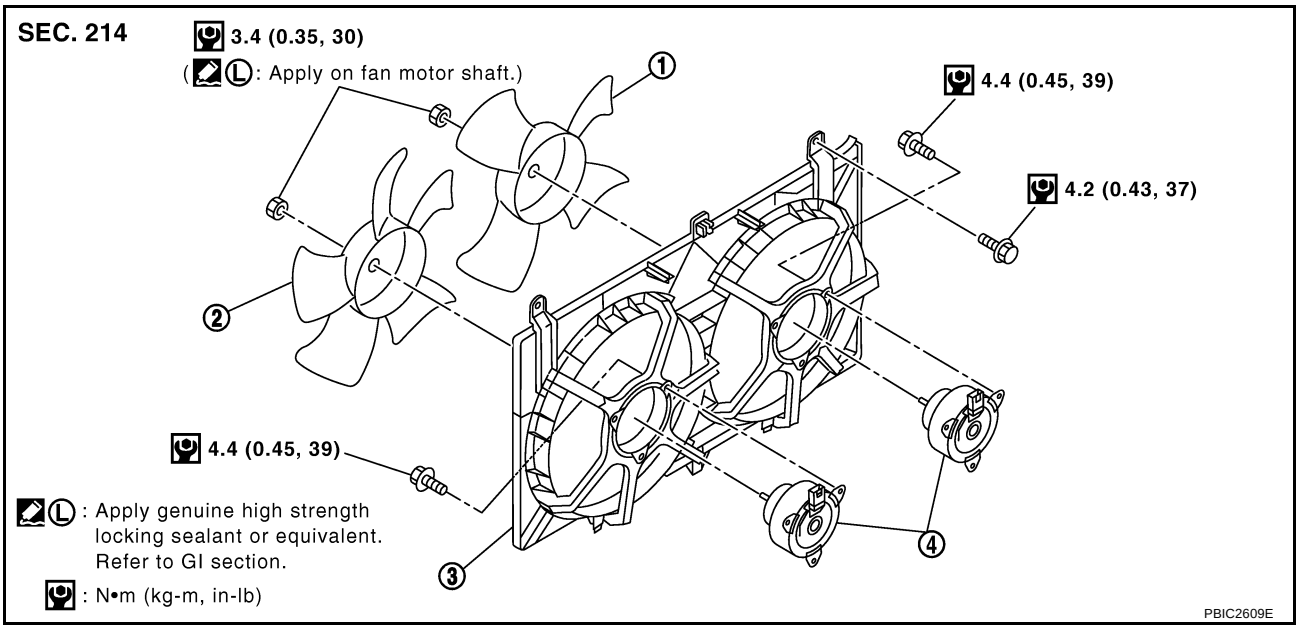


COOLING FAN

PFP:21140

Removal and Installation

NBS00020

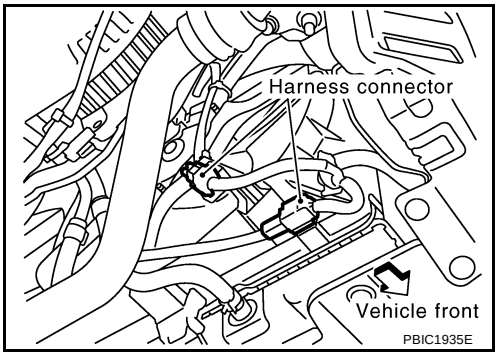


1. Cooling fan (RH)
2. Cooling fan (LH)
3. Fan shroud
4. Fan motor

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Drain engine coolant from radiator. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove air cleaner case assembly (RH, LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Remove reservoir tank. Refer to CO-13, "RADIATOR" .
5. Disconnect radiator hose (upper) at radiator side. Refer to CO-13, "RADIATOR" .
6. Disconnect fan motor harness connectors at the right-lower portion of fan shroud.



7. Remove mounting bolts to lift up and radiator cooling fan assembly.

   CAUTION:
   Be careful not to damage or scratch on radiator core.

INSTALLATION

Installation is the reverse order of removal.

NOTE:
Cooling fans are controlled by ECM. For details, refer to EC-543, "DTC P1217 ENGINE OVER TEMPERATURE" .

Disassembly and Assembly

NBS00021

DISASSEMBLY

1. Remove cooling fans (RH and LH) from fan motors.
2. Remove fan motors from fan shroud.

INSPECTION AFTER DISASSEMBLY

Cooling Fan

Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

ASSEMBLY

Assembly is the reverse order of disassembly.

CAUTION:

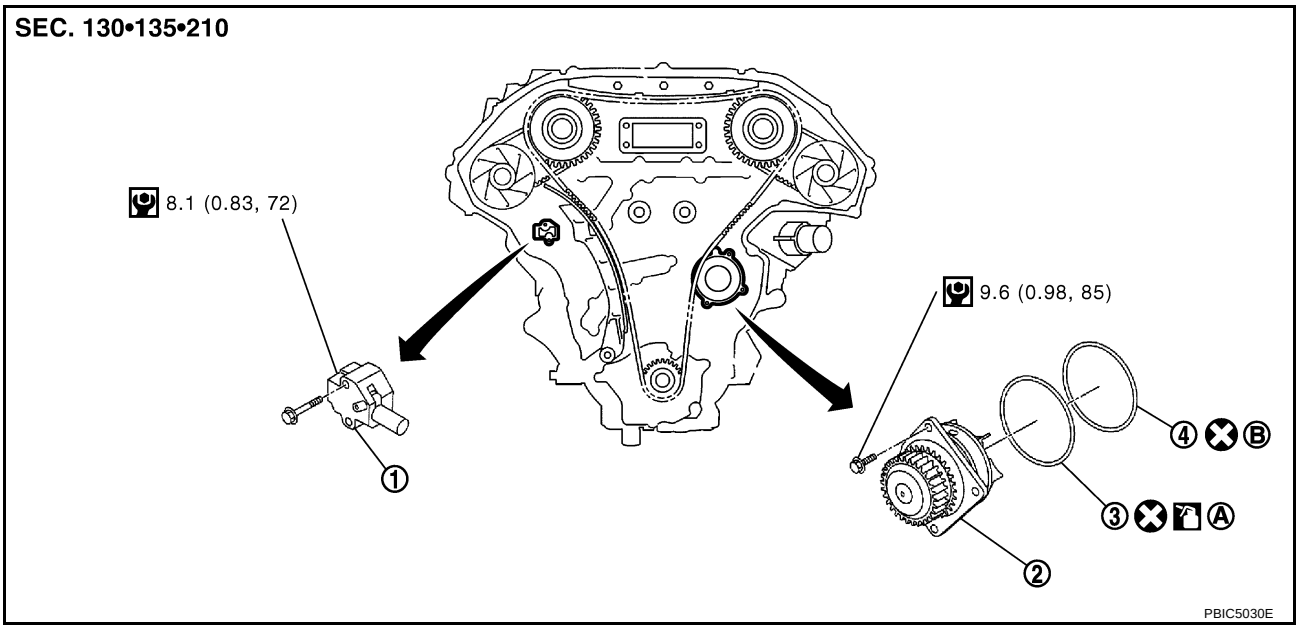
RH and LH cooling fans are different. Be careful not to misassemble them.

WATER PUMP

PFP:21020

Removal and Installation

NBS00022



1. Timing chain tensioner (primary)	2. Water pump	3. O-ring
4. O- ring		
A. Identify with yellow paint mark	B. Identify with light blue paint mark Apply engine coolant	

- Refer to GI-11, "Components" for symbol marks in the figure.

CAUTION:

- **When removing water pump assembly, be careful not to get engine coolant on drive belt.**
- **Water pump cannot be disassembled and should be replaced as a unit.**
- **After installing water pump, connect hose and clamp securely, then check for leaks using radiator cap tester (commercial service tool) and radiator cap tester adapter (commercial service tool).**

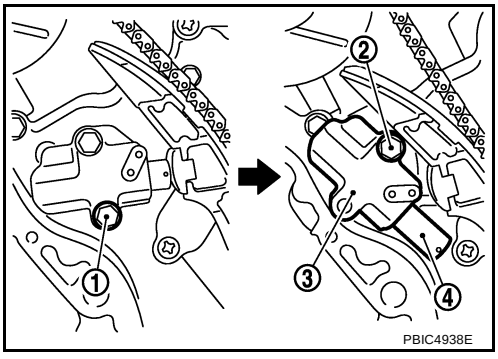
REMOVAL

1. Remove front timing chain case. Refer to EM-44, "FRONT TIMING CHAIN CASE" .
2. Remove timing chain tensioner (primary) as follows:

a. Remove lower mounting bolt (1).

b. Loosen upper mounting bolt (2) slowly, and then turn chain tensioner (primary) (3) on the upper mounting bolt so that plunger (4) is fully expanded.

NOTE:
Even if plunger is fully expanded, it is not dropped from the body of timing chain tensioner (primary).



c. Remove upper mounting bolt, and then remove timing chain tensioner (primary).

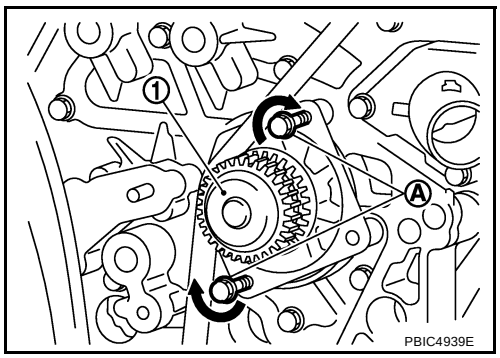
3. Remove water pump as follows:

a. Remove three water pump mounting bolts. Secure a gap between water pump gear and timing chain, by turning crankshaft counterclockwise until timing chain looseness on water pump sprocket becomes maximum.

b. Screw M8 bolts (A) [pitch: 1.25 mm (0.049 in) length: approx. 50 mm (1.97 in)] into water pumps upper and lower mounting bolt holes until they reach timing chain case. Then, alternately tighten each bolt for a half turn, and pull out water pump (1).

CAUTION:

- **Pull straight out while preventing vane from contacting socket in installation area.**
- **Remove water pump without causing sprocket to contact timing chain.**



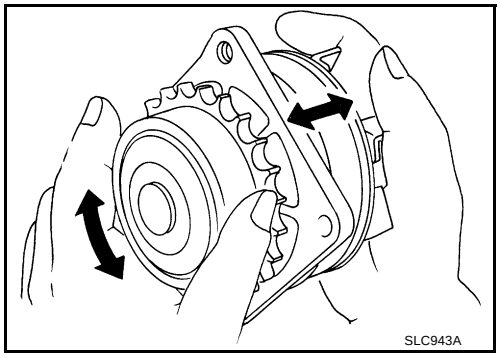
c. Remove M8 bolts and O-rings from water pump (1).

CAUTION:

Do not disassemble water pump.

INSPECTION AFTER REMOVAL

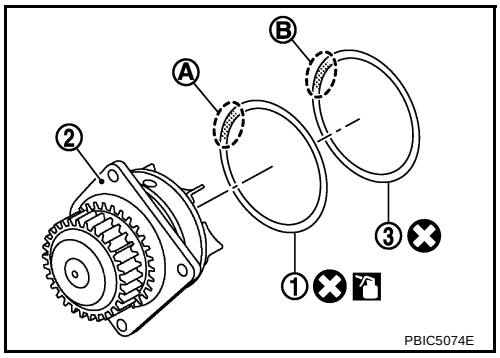
- Check for badly rusted or corroded water pump body assembly.
- Check for rough operation due to excessive end play.
- Replace water pump, if necessary.



INSTALLATION

1. Install new O-rings to water pump.
   - Apply engine oil to O-rings (1) and engine coolant to O-ring (3) as shown in the figure.
   - Locate O-ring (1) with yellow paint mark (A) to engine front side.
   - Locate O-ring (3) with light blue paint mark (B) to rear side.

   2 : Water pump



2. Install water pump.

CAUTION:

Do not allow cylinder block to nip O-rings when installing water pump.

- Make sure that timing chain and water pump sprocket are engaged.
- Insert water pump by tightening mounting bolts alternately and evenly.

3. Install timing chain tensioner (primary) as follows:

a. Turn crankshaft clockwise so that timing chain on the timing chain tensioner (primary) side is loose.

b. Pull plunger stopper tab up (or turn lever downward) so as to remove plunger stopper tab from the ratchet of plunger.

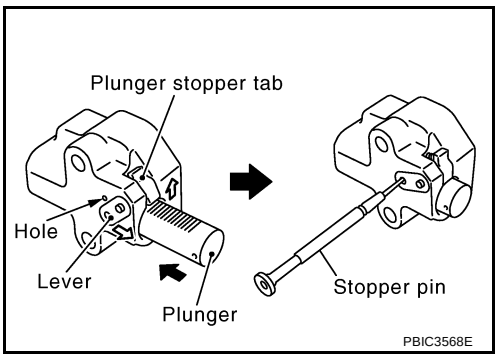
NOTE:
Plunger stopper tab and lever are synchronized.

c. Push plunger into the inside of tensioner body.

d. Hold plunger in the fully compressed position by engaging plunger stopper tab with the tip of ratchet.

e. To secure lever, insert stopper pin through hole of lever into tensioner body hole.

- The lever parts and the tab are synchronized. Therefore, the plunger will be secured under this condition.



NOTE:
Figure shows the example of 1.2 mm (0.047 in) diameter thin screwdriver being used as the stopper pin.

f. Install timing chain tensioner (primary).

- Remove dust and foreign material completely from backside of timing chain tensioner (primary) and from installation area of rear timing chain case.

g. Remove stopper pin.

h. Make sure again that timing chain and water pump sprocket are engaged.

4. Install in the reverse order of removal after this step.

- **After starting engine, let idle for three minutes, then rev engine up to 3,000 rpm under no load to purge air from the high-pressure chamber of chain tensioner. Engine may produce a rattling noise. This indicates that air still remains in the chamber and is not a matter of concern.**

INSPECTION AFTER INSTALLATION

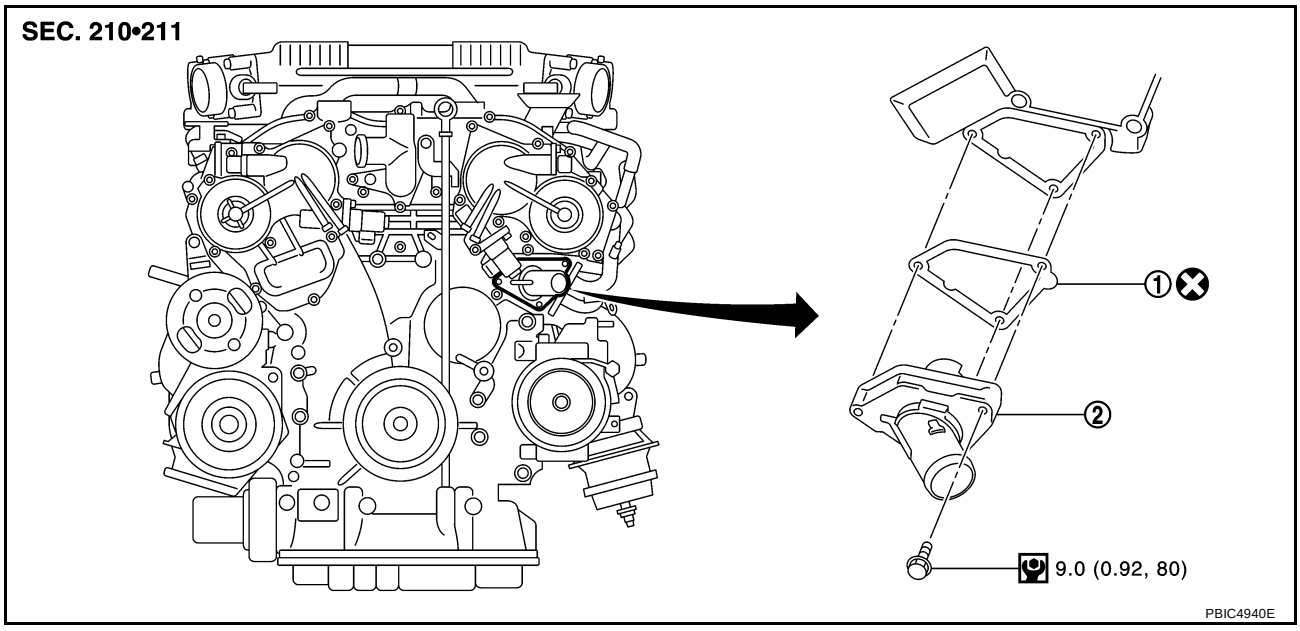
- Check for leaks of engine coolant using radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool). Refer to CO-10, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

WATER INLET AND THERMOSTAT ASSEMBLY

PFP:21200

Removal and Installation

NBS00023



1. Gasket
2. Water inlet and thermostat assembly

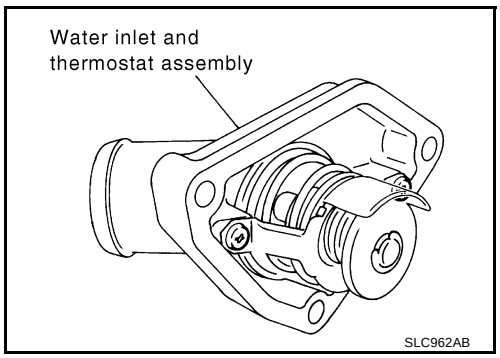
- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove undercover with power tool.
2. Drain engine coolant from radiator drain plug at the bottom of radiator. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove air duct and air cleaner case (LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Disconnect radiator hose (lower) from water inlet and thermostat assembly.
5. Remove intake valve timing control solenoid.
6. Remove water inlet and thermostat assembly.

   CAUTION:
   Do not disassemble water inlet and thermostat assembly. Replace them as a unit, if necessary.

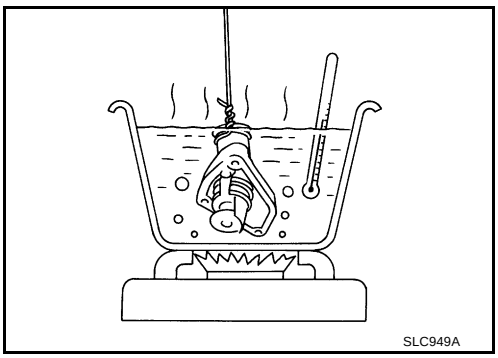


INSPECTION AFTER REMOVAL

1. Check valve seating condition at ordinary room temperatures. It should seat tightly.

2. Check valve operation.

Thermostat	Standard
Valve opening temperature	82°C (180°F)
Maximum valve lift	9.0 mm / 95°C (0.354 in / 203°F)
Valve closing temperature	77°C (171°F)



- If the malfunctioning condition, when valve seating at ordinary room temperature, or measured values are out of the standard, replace water inlet and thermostat assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

- **Be careful not to spill engine coolant over engine room. Use rag to absorb engine coolant.**

INSPECTION AFTER INSTALLATION

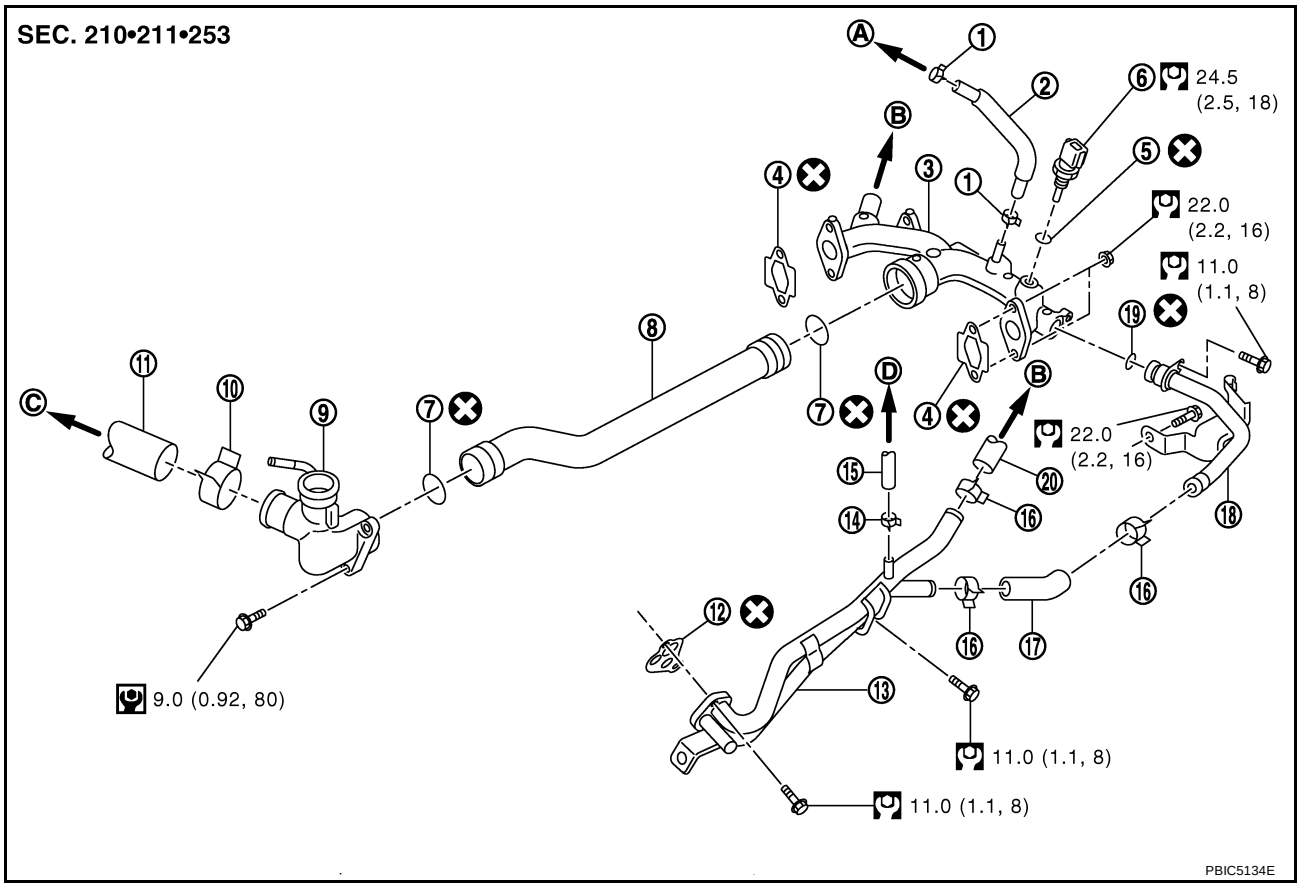
- Check for leaks of engine coolant using radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool). Refer to CO-10, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

WATER OUTLET AND WATER PIPING

PFP:11060

Removal and Installation

NBS00024



1.	Clamp	2.	Water hose	3.	Water outlet (rear)
4.	Gasket	5.	Washer	6.	Engine coolant temperature sensor
7.	O-ring	8.	Water outlet pipe	9.	Water outlet (front)
10.	Clamp	11.	Radiator hose (upper)	12.	Gasket
13.	Heater pipe	14.	Clamp	15.	Water hose
16.	Clamp	17.	Heater hose	18.	Water bypass pipe
19.	O-ring	20.	Heater hose		
A.	To EVAP piping	B.	To heater core	C.	To radiator
D.	To electric throttle control actuator				

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove undercover with power tool.
2. Drain engine coolant from radiator drain plug at the bottom of radiator, and from water drain plug at the front of cylinder block. Refer to CO-10, "Changing Engine Coolant" and CO-23, "WATER PUMP" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
4. Remove air duct and air cleaner case (RH, LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
5. Remove radiator hose (upper), heater hoses and water hoses.
6. Remove the following parts, when remove water outlet.
   - A/T fluid charging pipe (A/T models): Refer to AT-242, "TRANSMISSION ASSEMBLY" .
   - Intake manifold collector: Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
7. Remove engine coolant temperature sensor as necessary.

CAUTION:
Be careful not to damage engine coolant temperature sensor.

8. Remove oil level gauge and guide. Refer to EM-44, "FRONT TIMING CHAIN CASE" .
9. Remove water outlet, heater pipe, water bypass hoses and water pipe.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Securely insert each hose, and install clamp at a position where it does not interfere with the pipe bulge.
- When inserting water pipe into water outlet, apply neutral detergent to O-ring.

INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant using radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool). Refer to CO-10, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00100

Standard and Limit

NBS00025

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at “MAX” level)	9.0 (9-1/2, 7- 7/8)
Reservoir tank engine coolant capacity (At “MAX” level)	0.8 (7/8, 3/4)

RADIATOR

Unit: kPa (kg/cm^2 , psi)

Cap relief pressure	Standard	108 - 127 (1.1 - 1.3, 16 - 18)
	Limit	88 (0.9, 13)
Leakage test pressure		157 (1.6, 23)

THERMOSTAT

Valve opening temperature	82°C (180°F)
Maximum valve lift	9.0 mm / 95°C (0.354 in / 203°F)
Water closing temperature	77°C (171°F)

SECTION DI
DRIVER INFORMATION SYSTEM

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PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS0005P

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS0005Q

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

COMBINATION METERS

PFP:24814

System Description

NKS0005S

UNIFIED METER CONTROL UNIT

- Speedometer, odo/trip meter, tachometer, fuel gauge and water temperature gauge are controlled by the unified meter control unit, which is built into the combination meter. Unified meter control unit receives a signals from unified meter and A/C amp.
- Warning lamp and indicator lamp of combination meter are controlled by signals drawn from the unified meter and A/C amp.
- Odo/trip meter and A/T indicator segments can be checked in self-diagnosis mode.
- Meters/gauges can be checked in self-diagnosis mode.

UNIFIED METER AND A/C AMP.

Refer to DI-44, "COMBINATION METER CONTROL FUNCTION" in “UNIFIED METER AND A/C AMP”.

POWER SUPPLY AND GROUND CIRCUIT

Power is supplied at all times

- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to combination meter terminal 24.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminal 23.

With the ignition switch in the ACC or ON position, power is supplied

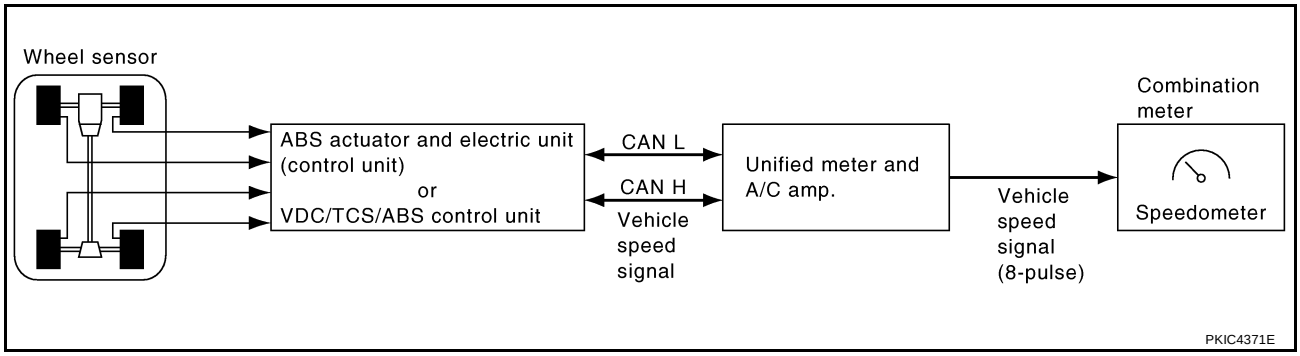
- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to combination meter terminal 14.

Ground is supplied

- to combination meter terminals 10, 11 and 12
- through body grounds M30 and M66.

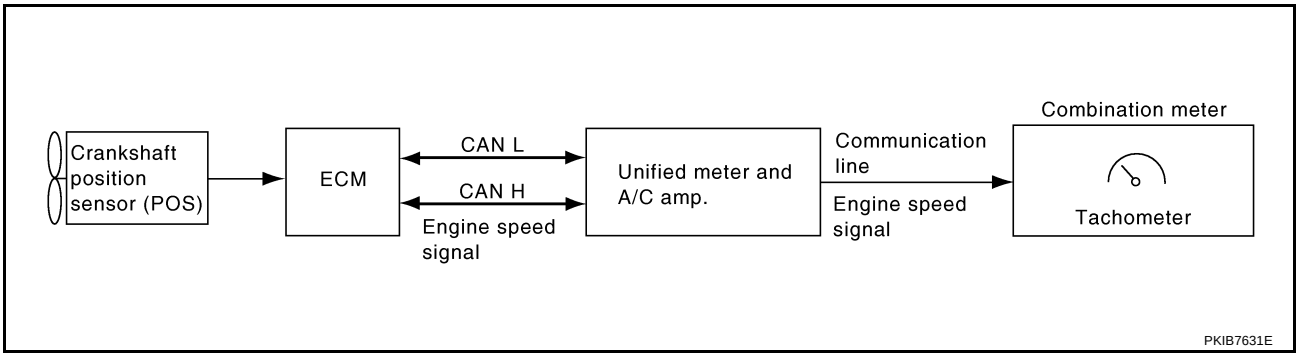
SPEEDOMETER

- VDC/TCS/ABS control unit [with VDC] or ABS actuator and electric unit (control unit) [without VDC] provides a vehicle speed signal to the unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. converts the vehicle speed signal to the 8-pulse signal, and outputs the vehicle speed signal (8-pulse) to combination meter.
- Combination meter indicates the vehicle speed according to vehicle speed signal (8-pulse).



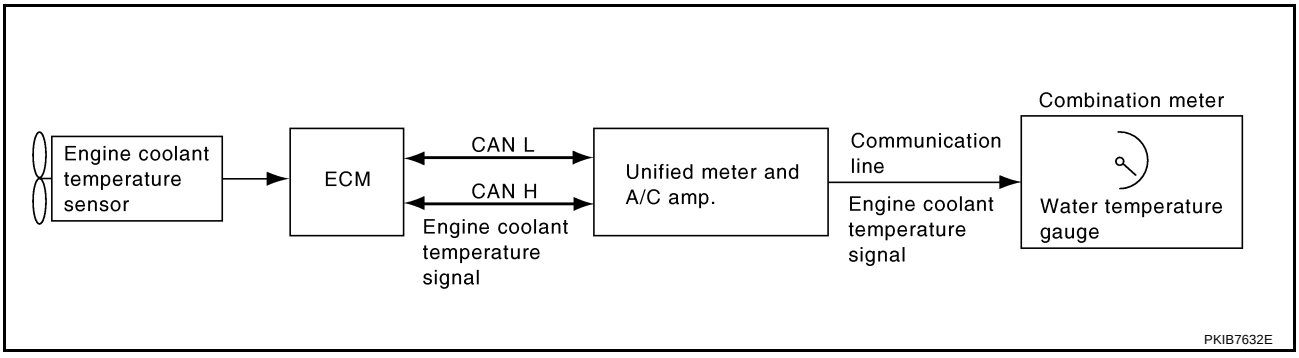
TACHOMETER

- ECM provides engine speed signal to unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. transmits engine speed signal to combination meter with communication line.
- Combination meter indicates the engine speed according to engine speed signal.



WATER TEMPERATURE GAUGE

- ECM provides engine coolant temperature signal to unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. transmits engine coolant temperature signal to combination meter with communication line.
- Combination meter indicates the engine coolant temperature according to engine coolant temperature signal.



FUEL GAUGE

- Unified meter and A/C amp. reads a resistor signal from fuel level sensor.

Signal is supplied

- from unified meter and A/C amp. terminal 36
- through fuel level sensor unit and fuel pump (main) terminals 5 and 2, and
- through fuel level sensor unit (sub) terminals 2 and 1
- to unified meter and A/C amp. terminal 28.

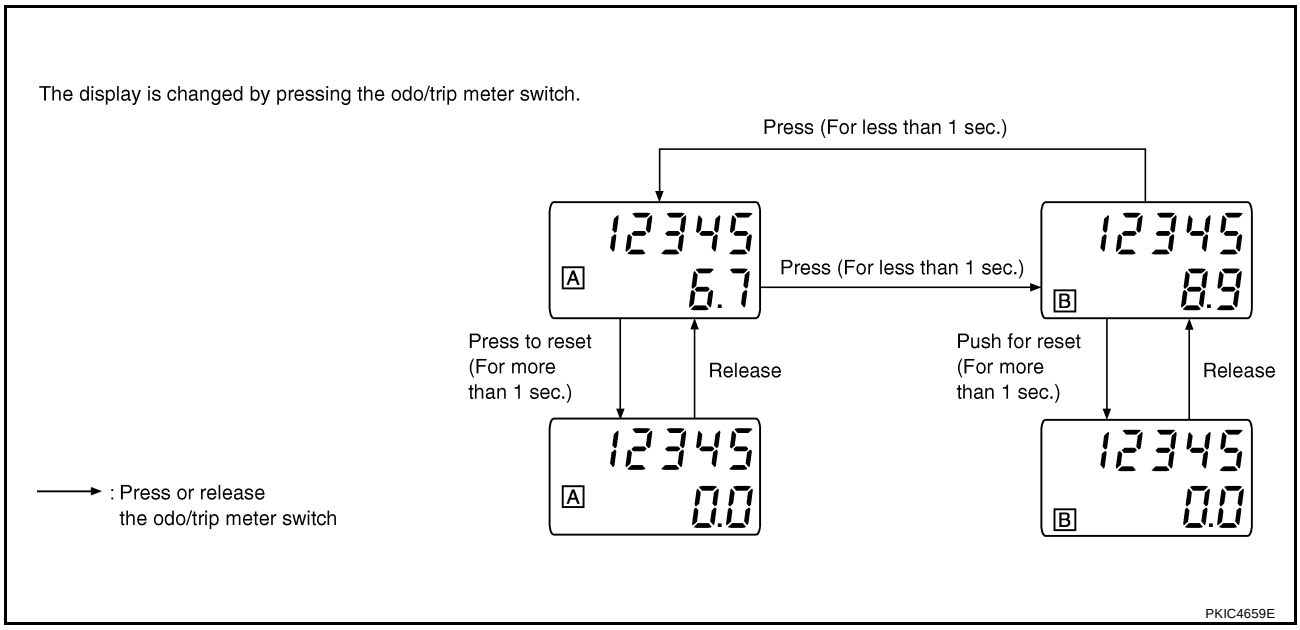
- Unified meter and A/C amp. provides a fuel level signal to combination meter with communication line.
- Combination meter indicates the approximate fuel level according to fuel level signal.

ODO/TRIP METER

- VDC/TCS/ABS control unit [with VDC] or ABS actuator and electric unit (control unit) [without VDC] provides a vehicle speed signal to the unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. converts the vehicle speed signal to the 8-pulse signal, and outputs the vehicle speed signal (8-pulse) to combination meter.
- Combination meter uses the vehicle speed signal (8-pulse) to calculate the mileage, and displays it.

How to Change The Display

Pressing the odo/trip meter switch toggles the display mode in the following order.



- The odo/trip meter display mode toggling and trip display resetting can be identified by the time elapsed from pressing the odo/trip meter switch to releasing it.
- When resetting with “trip A” displayed, only “trip A” is reset. (The “trip B” functions in the same way.)

NOTE:
The record of the odo meter is kept even if the battery cable is disconnected. The record of the trip meter is erased when the battery cable is disconnected.

ILLUMINATION CONTROL

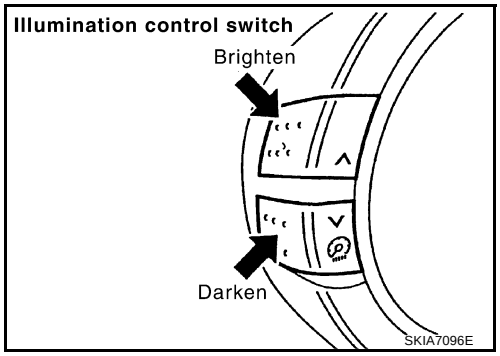
Daytime Mode

When ignition switch is turned ON, combination meter and triple meter illumination is turned ON by unified meter control unit.

Nighttime Mode

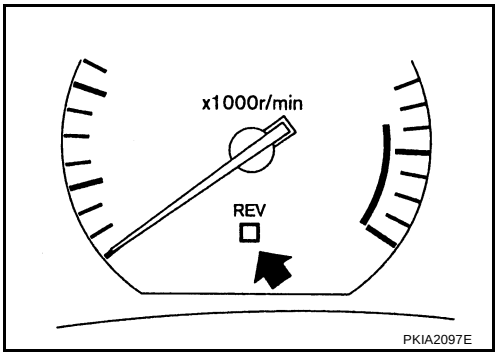
- Unified meter control unit is transferred to nighttime mode, with ignition switch turned ON and position light request signal from BCM with CAN communication.
- When in nighttime mode, trip computer switch, and illumination control switch illumination turns ON by unified meter control unit. Each illumination is controlled by unified meter control unit.
- Each illumination can be adjusted to 16 step by illumination control switch in nighttime mode.

NOTE:
For further details of illumination circuit, refer to LT-156, "ILLUMINATION" .



SHIFT-UP INDICATOR

- Shift-up indicator can be used when shifting up at a constant engine speed from any gear while driving. It becomes a guide for shift-up timing.
- Shift-up indicator flashes approximately 500 rpm before reaching the engine speed set. It illuminates when reaching the engine speed set.



Shift-up engine speed can be set by the shift-up indicator setting mode on trip computer. Refer to DI-29, "Shift-up Indicator Setting Mode" .

NOTE:

- There may be a time lag between the shift-up indicator illumination and the tachometer indication.
- If the battery cable is disconnected, the set engine speed becomes 7,000 rpm.

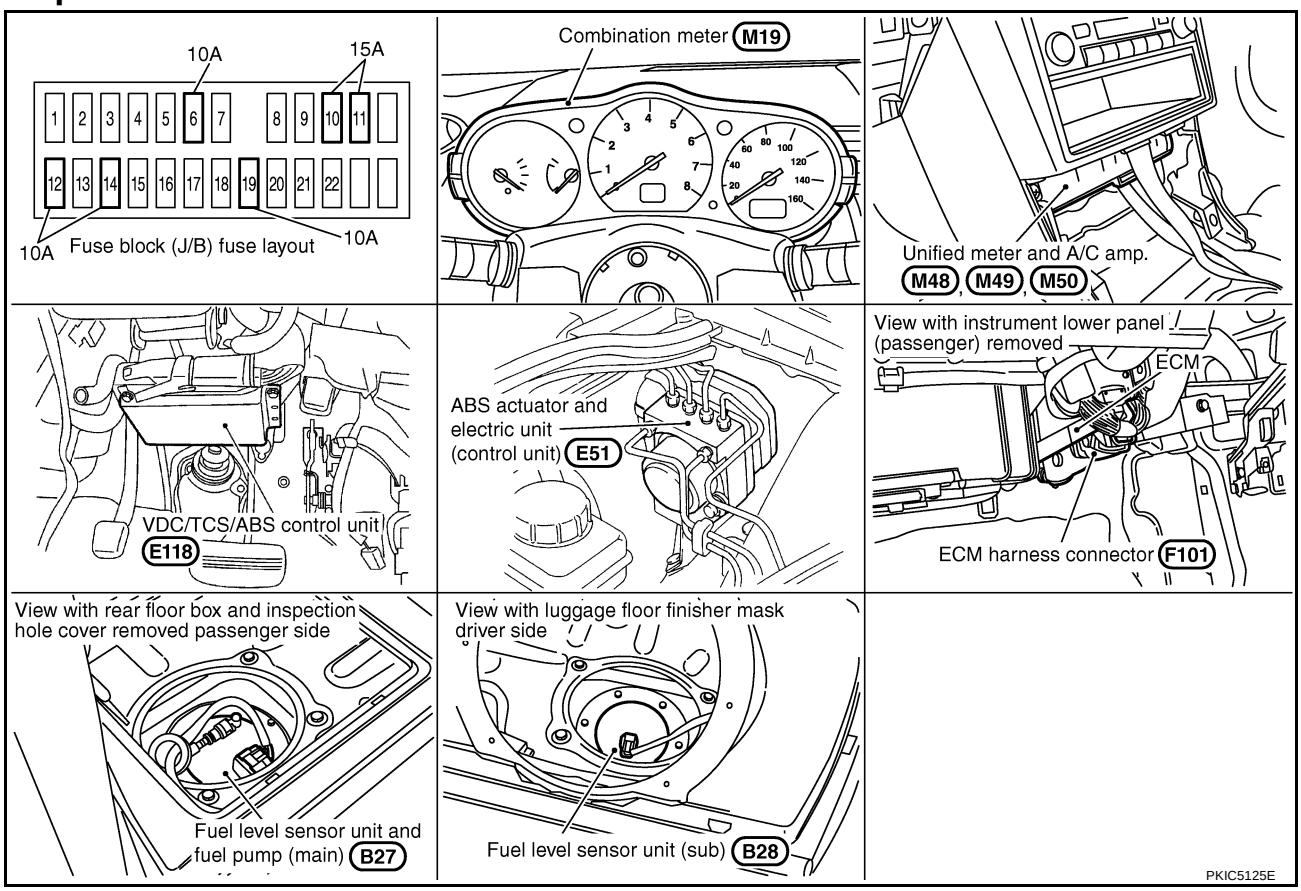
FAIL-SAFE

Combination meter performs fail-safe operation when unified meter and A/C amp. communication is malunction.

Function		Fail-safe operation
Speedometer		Return to zero
Tachometer		Reset to zero
Fuel gauge		
Water temperature gauge		
Illumination control	Combination meter illumination	Change to nighttime mode
Odo/trip meter		Integrate in response to 8-pulse input
A/T indicator		The display turns OFF
Meter buzzer		The meter buzzer turns OFF
Warning lamp/indicator lamp	ABS warning lamp	The lamp turns ON
	VDC OFF indicator lamp	
	TCS OFF indicator lamp	
	SLIP indicator lamp	
	Brake warning lamp	
	Tire pressure warning lamp	
	A/T CHECK lamp	The lamp turns OFF
	Oil pressure warning lamp	
	Door warning lamp	
	High beam indicator lamp	
	Turn signal indicator lamp	
	Malfunction indicator lamp	
	CRUISE indicator lamp	
	SET indicator lamp	

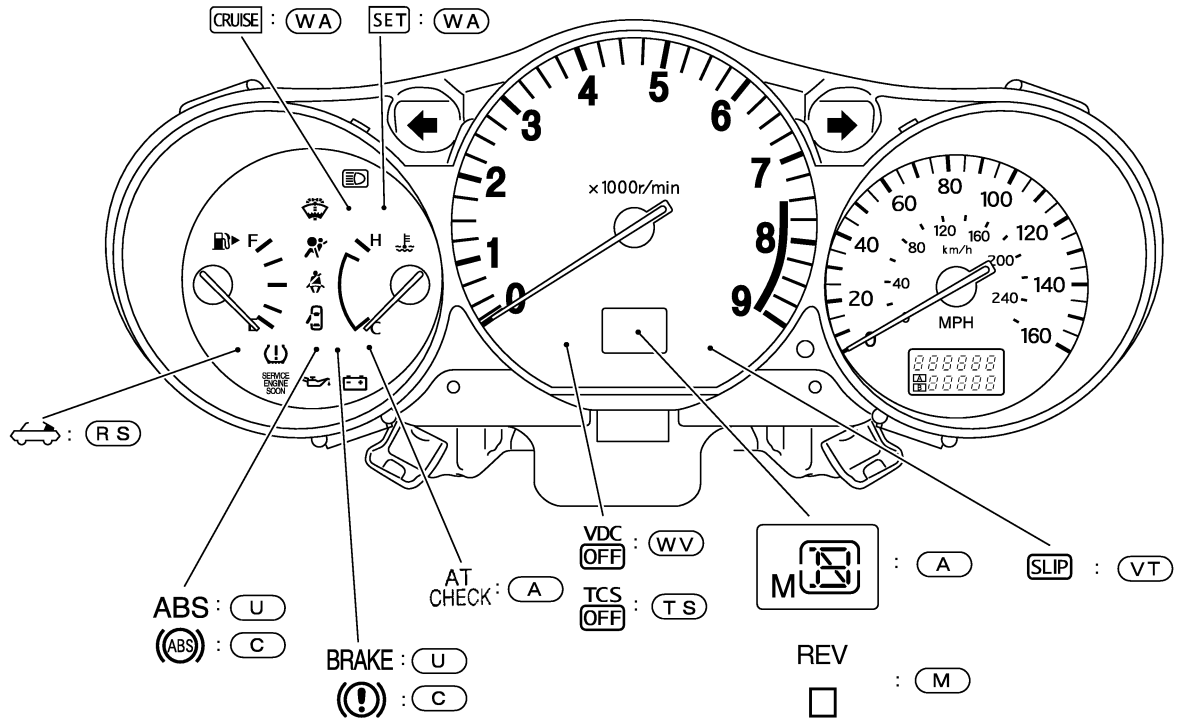
Component Parts and Harness Connector Location

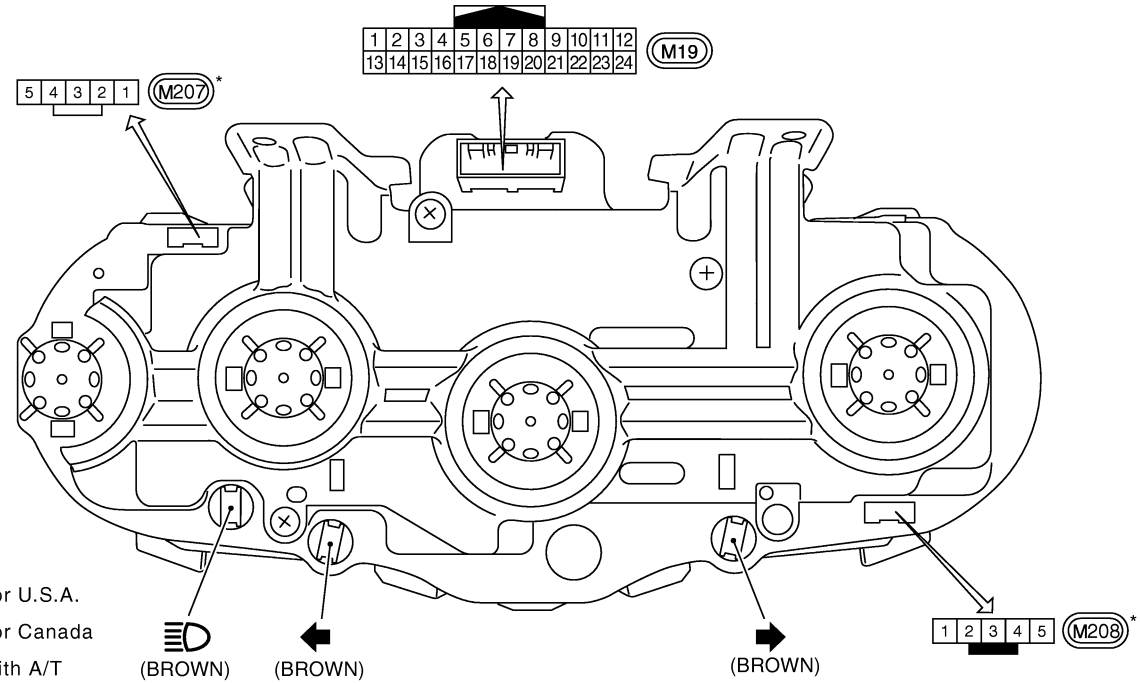
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Arrangement of Combination Meter

NKS0005U





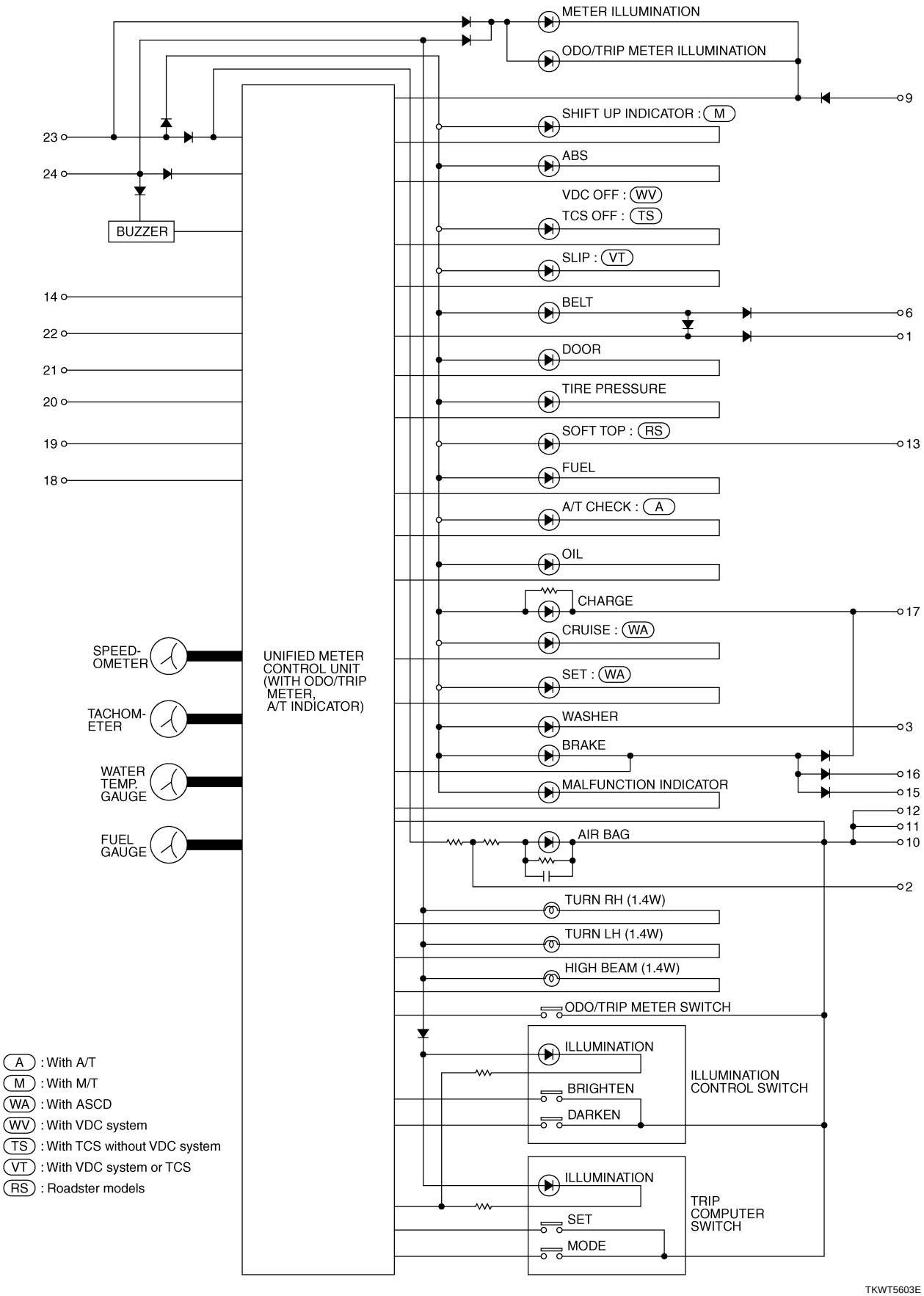
U : For U.S.A.
C : For Canada
A : With A/T
M : With M/T
RS :Roadster models
WA :With ASCD
WV : With VDC system
TS : With TCS without VDC system
VT : With VDC system or TCS
Bulb wattage : 1.4W
( ) : Bulb socket color

* THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

SKIB9134E

Schematic

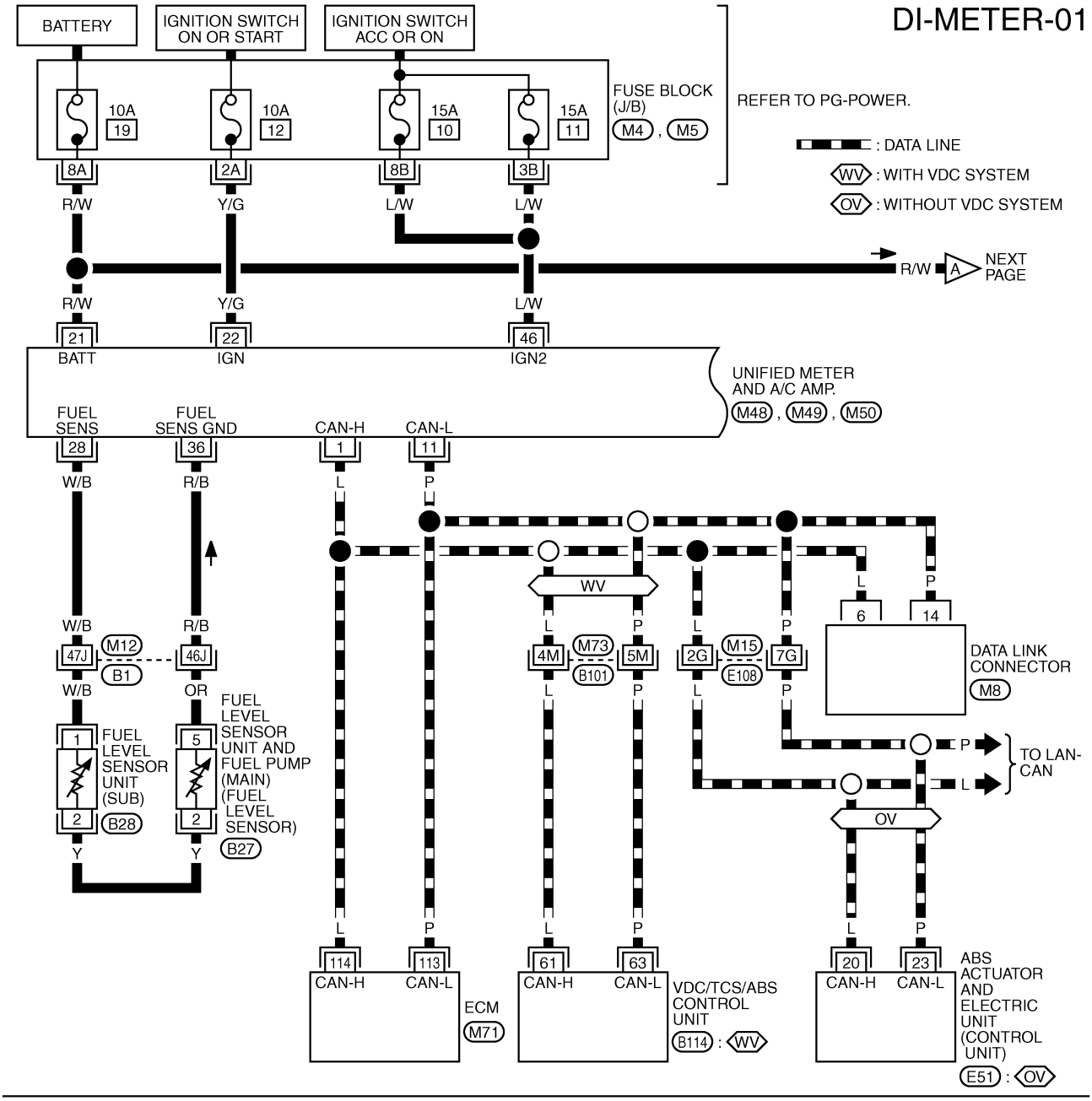
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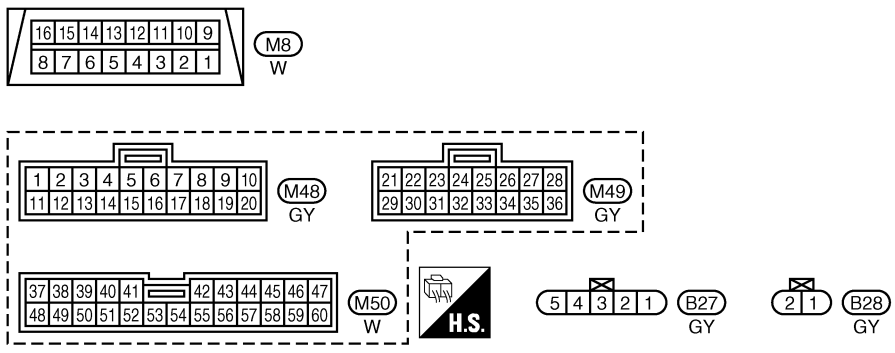


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Wiring Diagram — METER —

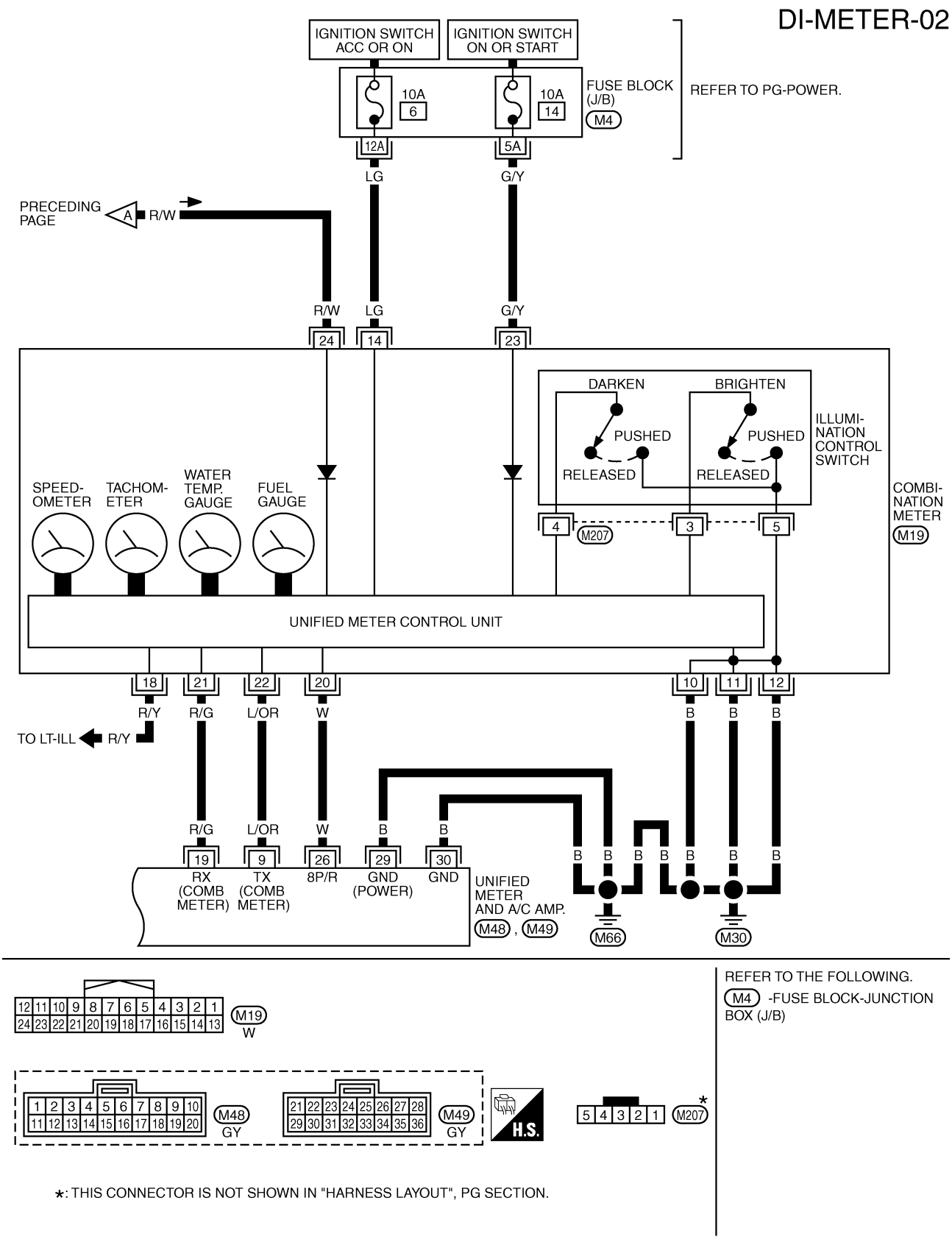
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REFER TO THE FOLLOWING.
E108 , B1 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M71 , E51 , B114 -ELECTRICAL UNITS

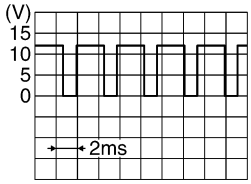
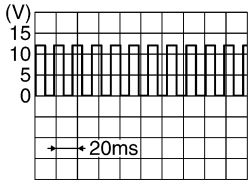
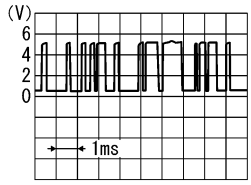
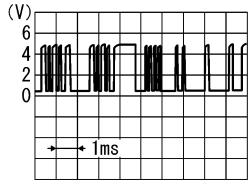
TKWT5721E


DI-METER-02
IGNITION SWITCH ACC OR ON
IGNITION SWITCH ON OR START
10A 6
10A 14
FUSE BLOCK (J/B) M4
REFER TO PG-POWER.
12A
5A
LG
G/Y
PRECEDING PAGE
A
R/W
R/W
LG
G/Y
24
14
23
DARKEN
BRIGHTEN
PUSHED
PUSHED
RELEASED
RELEASED
ILLUMI-NATION CONTROL SWITCH
SPEED-OMETER
TACHOM-ETER
WATER TEMP. GAUGE
FUEL GAUGE
COMBI-NATION METER M19
4
M207
3
5
UNIFIED METER CONTROL UNIT
18
21
22
20
10
11
12
R/Y
R/G
L/OR
W
B
B
B
TO LT-ILL
R/Y
R/G
L/OR
W
B
B
19
9
26
29
30
RX (COMB METER)
TX (COMB METER)
8P/R
GND (POWER)
GND
UNIFIED METER AND A/C AMP.
M48 , M49
M66
M30
M19
W
M48
GY
M49
GY
H.S.
M207
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5605E

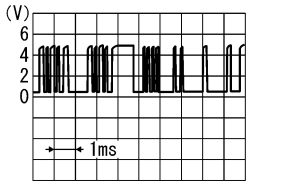
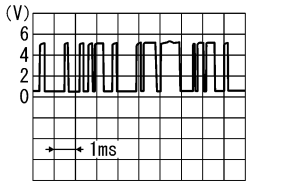
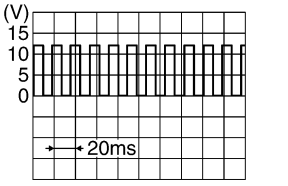
Terminals and Reference Value for Combination Meter

NKS0005X

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
10	B	Ground	ON	—	0 V
11					
12					
14	LG	ACC power supply	ACC	—	Battery voltage
18	R/Y	Illumination signal	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.>When brightness level is midway  PKIA3771E
				Lighting switch OFF	0 V
20	W	Vehicle speed signal input (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 5 V due to specifications (connected units).  PKIA1935E
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition power supply	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Value for Unified Meter and A/C Amp.

NKS0005Y

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	L	CAN-H	—	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
11	P	CAN-L	—	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition power supply	ON	—	Battery voltage
26	W	Vehicle speed signal output (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 5 V due to specifications (connected units).  PKIA1935E
28	W/B	Fuel level sensor signal	—	—	Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .
29	B	Ground (For power)	ON	—	0 V
30	B	Ground	ON	—	0 V
36	R/B	Fuel level sensor ground	ON	—	0 V
46	L/W	ACC power supply	ACC	—	Battery voltage

Self-Diagnosis Mode of Combination Meter

NKS0005Z

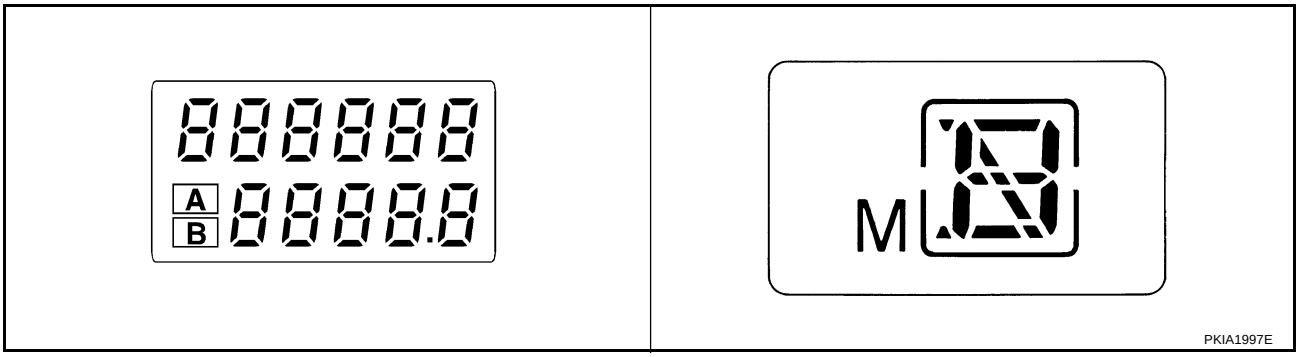
SELF-DIAGNOSIS FUNCTION

- Odo/trip meter segment and A/T indicator segment operation can be checked in self-diagnosis mode.
- Meters/gauges can be checked in self-diagnosis mode.

OPERATION PROCEDURE

1. Turn ignition switch ON, and switch the odo/trip meter to “trip A” or “trip B”.

   NOTE:
   If the diagnosis function is activated with “trip A” displayed, the mileage on “trip A” will indicate “0000.0”, but the actual trip mileage will be retained. (The “trip B” functions in the same way.)
2. Turn ignition switch OFF.
3. While pressing the odo/trip meter switch, turn ignition switch ON again.
4. Make sure that the trip meter displays “0000.0”.
5. Press the odo/trip meter switch at least 3 times (within 7 seconds after the ignition switch is turned ON).
6. All the segments on the odo/trip meter and A/T indicator illuminate, and simultaneously the low-fuel warning lamp indicator illuminates. At this time, the unified meter control unit is turned to diagnosis mode.

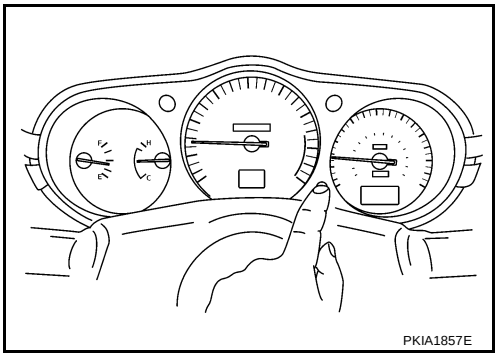


NOTE:

- Check combination meter power supply and ground circuit when self-diagnosis mode of combination meter does not start. Replace combination meter if normal.
- If any of the segments is not displayed, replace combination meter.

7. Press the odo/trip meter switch. Each meter/gauge should indicate as shown in the figure while pressing odo/trip meter switch. (At this time, the low-fuel warning lamp goes off).

   NOTE:
   If any of the meter/gauge is not activated, replace combination meter.



CONSULT-III Function (METER A/C AMP)

NKS00060

Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

Trouble Diagnosis

NKS00061

HOW TO PERFORM TROUBLE DIAGNOSIS

1. Confirm the symptom or customer complaint.
2. Perform preliminary check. Refer to DI-16, "PRELIMINARY CHECK" .
3. According to the symptom chart, make sure of the symptom cause and repair or replace applicable parts.
4. Does the meter operate normally? If so, GO TO 5. If not, GO TO 2.
5. INSPECTION END

PRELIMINARY CHECK

1. CHECK OPERATION OF SELF-DIAGNOSIS MODE (COMBINATION METER)

Perform self-diagnosis mode of combination meter. Refer to DI-15, "SELF-DIAGNOSIS FUNCTION" .

Does self-diagnosis mode operation normally?

YES >> GO TO 2.
NO >> GO TO 3.

2. CHECK UNIFIED METER AND A/C AMP. (CONSULT-III)

Perform self-diagnosis of unified meter and A/C amp. Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" .

Self-diagnostic results

No malfunction detected >> INSPECTION END
Malfunction detected >> Check applicable parts, and repair or replace corresponding parts.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT OF COMBINATION METER

Check power supply and ground circuit of combination meter. Refer to DI-17, "Power Supply and Ground Circuit Inspection" .

OK or NG

OK >> Replace combination meter.
NG >> Repair power supply and ground circuit of combination meter.

Symptom Chart

NKS00062

Symptom	Possible cause
Speedometer and odo/trip meter indication is malfunction.	Refer to DI-18, "Vehicle Speed Signal Inspection" .
Tachometer indication is malfunction.	Refer to DI-19, "Engine Speed Signal Inspection" .
Water temperature gauge indication is malfunction.	Refer to DI-19, "Engine Coolant Temperature Signal Inspection" .
Fuel gauge indication is malfunction.	Refer to DI-19, "Fuel Level Sensor Signal Inspection" .
Low-fuel warning lamp indication is irregular.	
A/T position indicator is malfunction.	Refer to DI-70, "A/T Indicator Is Malfunction" .
Illumination control does not operate.	Refer to DI-21, "Illumination Control Switch Inspection" .

Power Supply and Ground Circuit Inspection

NKS00064

1. CHECK FUSE

Check for blown combination meter fuses.

Power source	Fuse No.
Battery	19
Ignition switch ACC or ON	6
Ignition switch ON or START	14

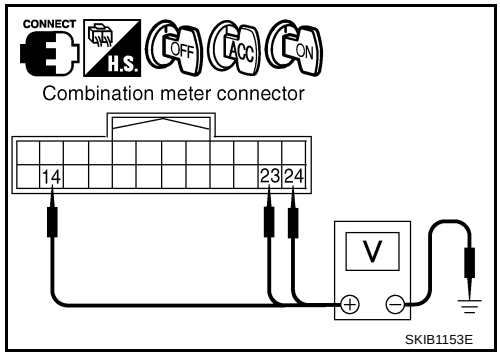
OK or NG

OK >> GO TO 2.
NG >> Be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between combination meter harness connector M19 terminals 24, 23, 14 and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M19	24	Ground	Battery voltage	Battery voltage	Battery voltage
	23		0 V	0 V	Battery voltage
	14		0 V	Battery voltage	Battery voltage



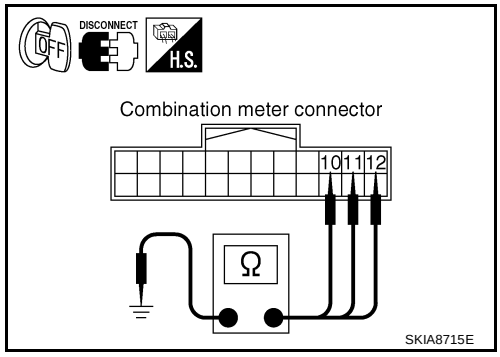
OK or NG

OK >> GO TO 3.
NG >> Repair harness between combination meter and fuse.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector.
3. Check continuity between combination meter harness connector M19 terminals 10, 11, 12 and ground.

10 – Ground
11 – Ground **: Continuity should exist.**
12 – Ground



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Vehicle Speed Signal Inspection

NKS00065

Symptom: Indication is irregular for the Speedometer and odo/trip meter.

1. CHECK VDC/TCS/ABS CONTROL UNIT OR ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform the following units self-diagnosis.

- VDC/TCS/ABS control unit [with VDC]. Refer to BRC-96, "CONSULT-III Functions (ABS)" .
- ABS actuator and electric unit (control unit) [without VDC (with TCS)]. Refer to BRC-52, "CONSULT-III MAIN FUNCTION" .
- ABS actuator and electric unit (control unit) [without VDC (without TCS)]. Refer to BRC-19, "CONSULT-III MAIN FUNCTION" .

Self-diagnostic results

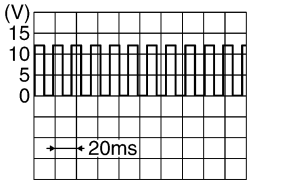
No malfunction detected >> GO TO 2.
Malfunction detected >> Check applicable parts, and repair or replace corresponding parts.

2. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

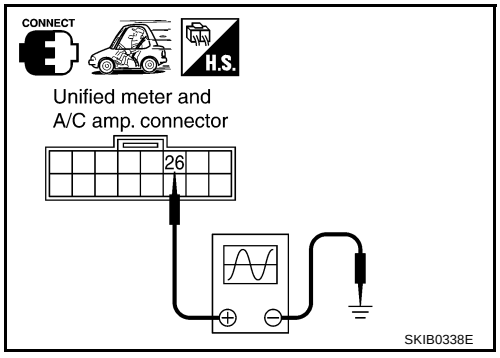
1. Start engine and drive vehicle at approximately 40 km/h (25 MPH).
2. Check voltage signal between unified meter and A/C amp. harness connector M49 terminal 26 and ground.

NOTE:
Maximum voltage may be 5 V due to specifications (connected units).

26 – Ground:



PKIA1935E



SKIB0338E

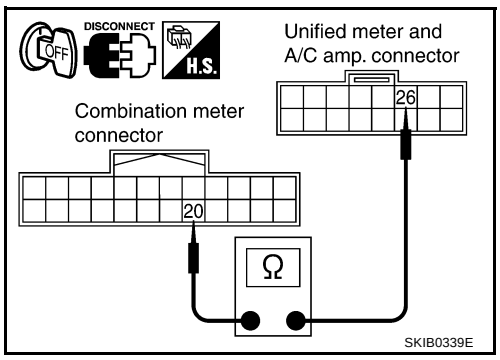
OK or NG

OK >> GO TO 3.
NG >>
- If monitor indicates “0 V” constantly, repair or replace malfunctioning parts after checking each unit inputting vehicle speed signal (8 pulse), harness and connector between each unit and unified meter and A/C amp.
- If monitor indicates “5 V” or “12 V” constantly, replace unified meter and A/C amp.

3. CHECK CONTINUITY BETWEEN COMBINATION METER AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 20 and unified meter and A/C amp. harness connector M49 terminal 26.

20 – 26 : Continuity should exist.



SKIB0339E

OK or NG

OK >> Replace combination meter.
NG >> Repair harness or connector.

Engine Speed Signal Inspection

NKS00066

Symptom: Tachometer indication is malfunction.

1. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-III.
2. Using “TACHO METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” with tachometer pointer of combination meter.

OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “ENGINE” on CONSULT-III.
2. Using “ENG SPEED” on “DATA MONITOR”, check the CONSULT-III screen when the engine is idling.
3. Select “METER A/C AMP” on CONSULT-III.
4. Using “TACHO METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” of the idling speed with that of the “ENG SPEED”.

OK or NG

OK >> Perform ECM self-diagnosis. Refer to EC-116, "CONSULT-III Function (ENGINE)" .
NG >> Replace unified meter and A/C amp.

Engine Coolant Temperature Signal Inspection

NKS00067

Symptom: Water temperature gauge indication is malfunction.

1. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-III.
2. Using “W TEMP METER” on the “DATA MONITOR”, compare the value of “DATA MONITOR” with water temperature gauge pointer of combination meter.

Water temperature gauge pointer	Reference value of data monitor [°C (°F)]
Hot	Approx. 130 (266)
Middle	Approx. 70 - 105 (158 - 221)
Cold	Approx. 50 (122)

OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “ENGINE” on CONSULT-III.
2. Using “COOLAN TEMP/S” on “DATA MONITOR”, check the CONSULT-III screen.
3. Select “METER A/C AMP” on CONSULT-III.
4. Using “W TEMP METER” on, compare the value of “DATA MONITOR” with that of the “COOLAN TEMP/S”.

OK or NG

OK >> Perform ECM self-diagnosis. Refer to EC-116, "CONSULT-III Function (ENGINE)" .
NG >> Replace unified meter and A/C amp.

Fuel Level Sensor Signal Inspection

NKS00068

Symptom:

- Fuel gauge indication is malfunction.
- Low-fuel warning lamp indication is irregular.

NOTE:
The following symptoms are not malfunction.

Fuel level sensor unit

- Depending on vehicle position or driving circumstance, the fuel level in the tank varies, and the pointer may fluctuate.
- If the vehicle is fueled with the ignition switch ON, the pointer will move slowly.

Low-fuel warning lamp

- Depending on vehicle position or driving circumstance, the fuel in the tank flows and the warning lamp ON timing may change.

1. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “METER A/C AMP” on CONSULT-III.
2. Using “FUEL METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” with fuel gauge pointer of combination meter.

Fuel gauge indication	Value on monitor [lit.]
Full	Approx. 74
Three quarters	Approx. 61
Half	Approx. 42
A quarter	Approx. 22
Empty	Approx. 8

OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK FUEL LEVEL SENSOR

1. Turn ignition switch OFF.
2. Check components. Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .

OK or NG

OK >> GO TO 3.
NG >> Replace fuel level sensor unit.

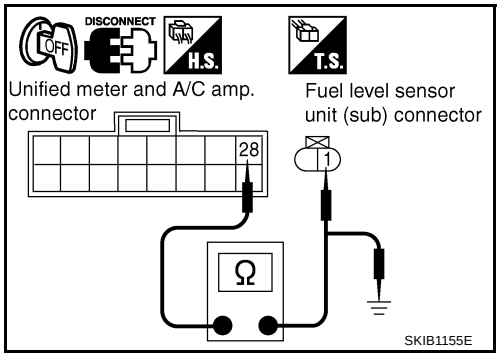
3. CHECK FUEL LEVEL SENSOR (SUB) CIRCUIT

1. Disconnect unified meter and A/C amp. connector and fuel level sensor unit (sub) connector.
2. Check continuity between unified meter and A/C amp. harness connector M49 terminal 28 and fuel level sensor unit (sub) harness connector B28 terminal 1.

28 – 1 : Continuity should exist.

3. Check continuity between unified meter and A/C amp. harness connector M49 terminal 28 and ground.

28 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

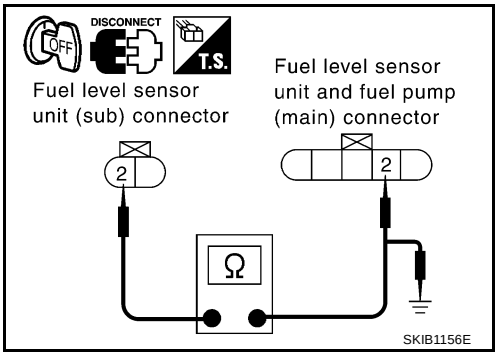
4. CHECK FUEL LEVEL SENSOR (MAIN·SUB) CIRCUIT

1. Disconnect fuel level sensor unit and fuel pump (main) connector.
2. Check continuity between fuel level sensor unit (sub) harness connector B28 terminal 2 and fuel level sensor unit and fuel pump (main) harness connector B27 terminal 2.

2 – 2 : Continuity should exist.

3. Check continuity between fuel level sensor unit (sub) harness connector B28 terminal 2 and ground.

2 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

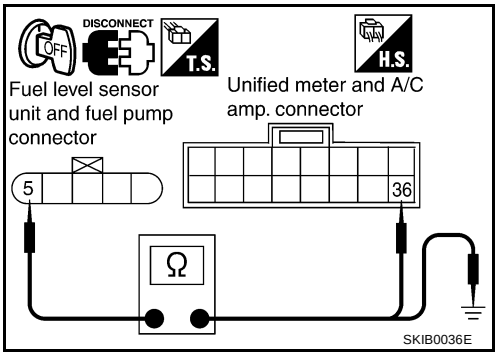
5. CHECK FUEL LEVEL SENSOR (MAIN) CIRCUIT

1. Check continuity between fuel level sensor unit and fuel pump (main) harness connector B27 terminal 5 and unified meter and A/C amp. harness connector M49 terminal 36.

5 – 36 : Continuity should exist.

2. Check continuity between fuel level sensor unit and fuel pump (main) harness connector B27 terminal 5 and ground.

5 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK INSTALLATION CONDITION

Check fuel level sensor unit installation, and check whether the float arm interferes or binds with any of the internal components in the fuel tank.

OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Install the fuel level sensor unit properly.

Illumination Control Switch Inspection

NKS00069

Symptom: Illumination control does not operate.

1. CHECK CONNECTOR

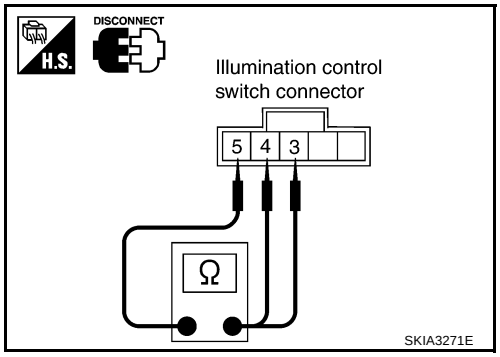
1. Turn ignition switch OFF.
2. Remove combination meter.
3. Remove rear finisher of combination meter.
4. Check illumination control switch connector for looseness.

OK or NG

OK >> GO TO 2.
NG >> Repair illumination control switch connector.

2. CHECK ILLUMINATION CONTROL SWITCH

1. Disconnect illumination control switch connector.
2. Check continuity between illumination control switch harness connector M207 terminals 3 or 4 and 5.



Terminal		Condition	Continuity
3	5	Illumination control switch upper side (BRIGHTEN) is pressed.	Yes
		Illumination control switch upper side (BRIGHTEN) is released.	No
4		Illumination control switch lower side (DARKEN) is pressed.	Yes
		Illumination control switch lower side (DARKEN) is released.	No

OK or NG

OK >> Replace combination meter.
NG >> Replace illumination control switch.

Fuel Gauge Pointer Fluctuates, Indicator Wrong Value or Varies

NKS0006A

1. CHECK FUEL GAUGE FLUCTUATION

Test drive vehicle to see if gauge fluctuates only during driving or at the instant of stopping.

Does the indication value vary only during driving or at the instant of stopping?

YES >> The pointer fluctuation may be caused by fuel level change in the fuel tank. Condition is normal.
NO >> Ask the customer about the situation when the symptom occurs in detail, and perform the trouble diagnosis.

Fuel Gauge Does Not Move to FULL Position

NKS0006B

1. QUESTION 1

Does it take a long time for the pointer to move to FULL position?

YES >> GO TO 2.
NO >> GO TO 3.

2. QUESTION 2

Was the vehicle fueled with the ignition switch ON?

YES >> Be sure to fuel the vehicle with the ignition switch OFF. Otherwise, it will take a long time to move to FULL position because of the characteristic of the fuel gauge.
NO >> GO TO 3.

3. QUESTION 3

Is the vehicle parked on an incline?

YES >> Check the fuel level indication with vehicle on a level surface.
NO >> GO TO 4.

4. QUESTION 4

During driving, does the fuel gauge pointer move gradually toward EMPTY position?

YES >> Check the fuel level sensor unit. Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .
NO >> The float arm may interfere or bind with any of the components in the fuel tank.

Electrical Components Inspection

NKS0006C

FUEL LEVEL SENSOR UNIT

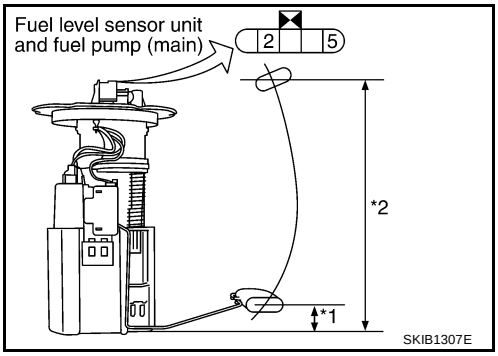
For removal, refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

Fuel Level Sensor Unit and Fuel Pump (Main)

Check the resistance between terminals 2 and 5.

Terminal		Float position [mm (in)]			Resistance value [Ω]
2	5	*1	Empty	30 (1.18)	Approx. 80
		*2	Full	210 (8.27)	Approx. 3

*1 and *2: When float rod is in contact with stopper.

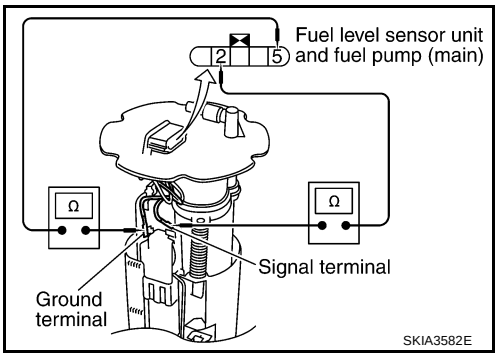


- If the results of check are NG, check the fuel level sensor unit and fuel pump (main) harness. Refer to DI-23, "Fuel Level Sensor Unit and Pump (Main) Harness" .

Fuel Level Sensor Unit and Pump (Main) Harness

Check the continuity between the following terminals.

Terminal	Continuity
2 - Signal terminal	Yes
5 - Ground terminal	



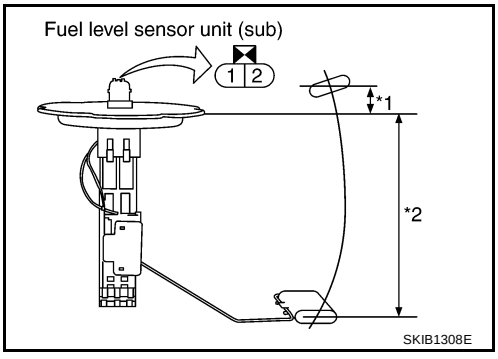
- If the results of check are NG, replace fuel pump assembly. If the results of check are OK, replace fuel level sensor unit.

Fuel Level Sensor Unit (Sub)

Check the resistance between terminals 1 and 2.

Terminal		Float position [mm (in)]			Resistance value [Ω]
1	2	*1	Full	8 (0.31)	Approx. 3
		*2	Empty	175 (6.89)	Approx. 43

*1 and *2: When float rod is in contact with stopper.

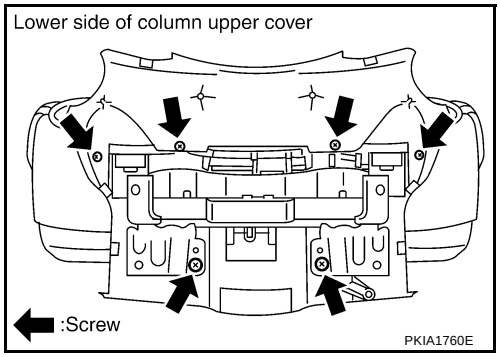


Removal and Installation for Combination Meter

NKS0006D

REMOVAL

1. Remove instrument driver panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY"
3. Remove bolts (4) and remove column upper cover and combination meter assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove screws (6) and remove combination meter.

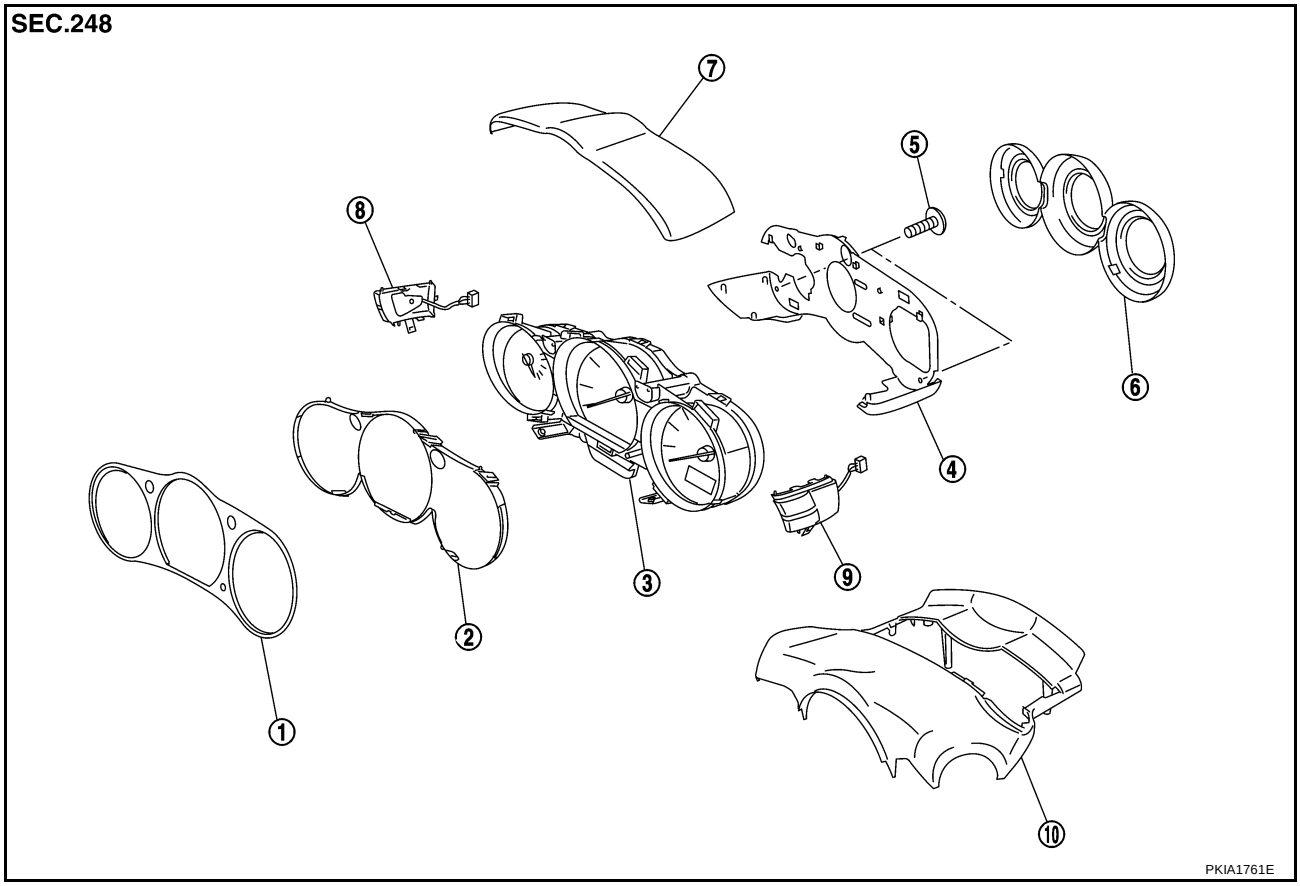


INSTALLATION

Installation is the reverse order of removal.

Disassembly and Assembly for Combination Meter

NKS0006E

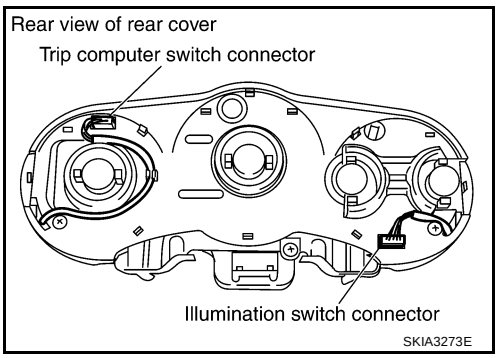


1. Front finisher
2. Front cover
3. Unified meter control unit
4. Rear cover
5. Screws
6. Rear finisher
7. Upper cover
8. Illumination control switch
9. Trip computer switch
10. Steering column upper cover

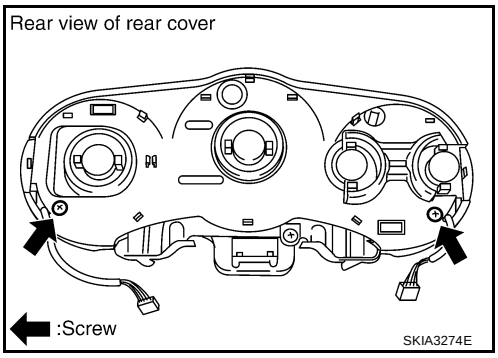
DISASSEMBLY

1. Remove screws (6) to separate steering column upper cover.
2. Disengage tabs (2) to separate front finisher.
3. Disengage tabs (8) to separate rear finisher.

4. Disconnect illumination control switch connector and trip computer switch connector.



5. Remove screws (2) and remove rear cover.



6. Disengage tabs (4) to separate upper cover from rear cover.
7. Remove illumination control switch.
8. Remove trip computer switch.
9. Disengage tabs (7) to separate front cover.

ASSEMBLY

Assembly is the reverse order of disassembly.

TRIPLE METERS

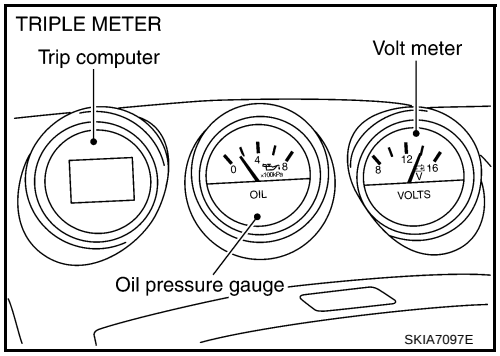
PFP:24845

System Description

NKS0006F

TRIPLE METER

- Oil pressure gauge and voltmeter are controlled by the triple meter.
- Trip computer is controlled by the signals from the unified meter and A/C amp.
- Triple meter operation can be checked with self-diagnosis mode of combination meter.



UNIFIED METER AND A/C AMP.

Refer to DI-45, "TRIPLE METER CONTROL FUNCTION" in “UNIFIED METER AND A/C AMP”.

POWER SUPPLY AND GROUND CIRCUIT

Power is supplied at all times

- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to triple meter terminal 2.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to triple meter terminal 3.

Ground is supplied

- to triple meter terminal 1
- through grounds M30 and M66.

VOLTMETER

When ignition switch is turned to the ON position, the voltmeter indicates the battery voltage.

OIL PRESSURE GAUGE

With the ignition switch in the ON or START position, power is supplied

- through triple meter terminal 9
- to oil pressure sensor terminal 1.

Ground is supplied

- to triple meter terminal 7
- through oil pressure sensor terminal 3.

And triple meter reads oil pressure signal from oil pressure sensor

- from oil pressure sensor terminal 2
- to triple meter terminal 8.

NOTE:

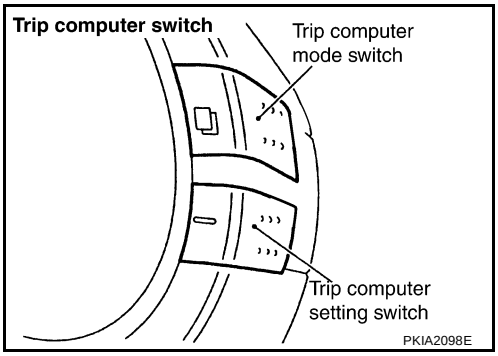
- Triple meter judges an oil pressure condition by oil pressure signal, and transmits oil pressure warning lamp signal to combination meter through unified meter and A/C amp. with communication line.
- Oil pressure gauge is not designed to indicate the low oil level. Use the oil level gauge to check the oil level.

TRIP COMPUTER

Function

When the ignition switch is turned ON, the display scrolls all the modes. And then shows the mode chosen before the ignition switch is turned OFF.

- Trip computer is operated by the trip computer switch.
- Trip computer receives a switch signal from combination meter through the unified meter and A/C amp. with communication line.



The mode of the trip computer is the following.

- Vehicle speed
- Ambient air temperature
- DTE (distance to empty)
- Average fuel consumption
- Average vehicle speed
- Trip time
- Trip distance
- Stopwatch
- Shift-up indicator setting mode

How to Change/ Reset the Displayed Mode

- The displayed mode can be selected in the following order by momentarily pressing the trip computer mode switch.
  - Vehicle speed → Ambient air temperature → DTE → Average fuel consumption and average vehicle speed → Trip time and trip distance → Stopwatch → Shift-up indicator setting
- Holding the trip computer setting switch for more than 1 second resets the displayed mode (Average fuel consumption, average vehicle speed, trip time, trip distance or stopwatch).

NOTE:
When the ambient air temperature warning, the tire pressure warning, and the DTE warning, match warning conditions at the same time, the display automatically displays the ambient air temperature warning.

Vehicle Speed

- Trip computer receives vehicle speed signal from combination meter through the unified meter and A/C amp. with communication line.
- Trip computer displays the vehicle speed according to vehicle speed signal.

Ambient Air Temperature

- Unified meter and A/C amp. reads ambient air temperature signal from ambient air temperature sensor.

Signal is supplied

- from unified meter and A/C amp. terminal 39
- through ambient sensor terminal 1 and 2
- to unified meter and A/C amp. terminal 49.

- Trip computer receives ambient air temperature signal from the unified meter and A/C amp. with communication line.
- Trip computer displays ambient air temperature according to ambient air temperature signal.

NOTE:
- Indication range is between –30 and 55 °C (–22 and 131 °F).
- When ambient air temperature is less than –30 °C (–22 °F) or more than 55 °C (131 °F), the display shows “--”.
- When ambient air temperature is less than 3 °C (37 °F) continuously, the display shows “ICY” as warning. At more than 4 °C (39 °F) the display stops showing “ICY”.

DTE (Distance to Empty)

- Unified meter and A/C amp. uses following signals to calculate the DTE signal.
  - Fuel remaining signal (from the fuel level sensor unit)
  - Fuel consumption signal (from ECM)
  - Vehicle speed signal [from VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit)]
- Trip computer receives DTE signal from the unified meter and A/C amp. with communication line.
- Trip computer displays the DTE according to DTE signal.
- The indication is refreshed every 30 seconds.

NOTE:

- When fuel remaining is less than approx. 10 ℓ (10-5/8 US qt, 8-3/4 Imp qt), the display shows “dte” blink as a warning. And the fuel remaining is less than approx. 8 ℓ (8-1/2 US qt, 7 Imp qt), the display shows “----”.
- When the battery cable is disconnected and reconnected, the display shows “----” for 30 seconds.

Average Fuel Consumption

- Unified meter and A/C amp. uses following signals to calculate the average fuel consumption signal.
  - Fuel consumption signal (from ECM)
  - Vehicle speed signal [from VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit)]
- Trip computer receives the average fuel consumption signal from the unified meter and A/C amp. with communication line.
- Trip computer displays the average fuel consumption according to the average fuel consumption signal.
- The indication is refreshed every 30 seconds.

NOTE:

If the average fuel consumption is reset, the average vehicle speed is reset at the same time. While driving about 1/3 miles (500 m) or for 80 seconds after resetting, the display shows “----”.

Average Vehicle Speed

- Unified meter and A/C amp. uses following signals to calculate the average vehicle speed signal.
  - Trip distance signal
  - Trip time signal
- Trip computer receives the average vehicle speed signal from the unified meter and A/C amp. with communication line.
- Trip computer displays the average vehicle speed according the average vehicle speed signal.
- The indication shows refreshed every 30 seconds.

NOTE:

If the average vehicle speed is reset, the average fuel consumption will be reset at the same time. After resetting, the display will show “----” for 30 seconds.

Trip Time

- Unified meter and A/C amp. calculates the time during ignition switch ON.
- Trip computer receives the trip time signal from the unified meter and A/C amp. with communication line.
- Trip computer displays trip time according to the trip time signal.

NOTE:

If trip time is reset, trip distance is reset at the same time.

Trip Distance

- Unified meter and A/C amp. uses following signals to calculate the average fuel consumption signal.
  - Trip time signal
  - Vehicle speed signal from VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit)
- Trip computer receives the trip distance signal from the unified meter and A/C amp. with communication line.
- Trip computer displays the trip distance according to the trip distance signal.

NOTE:

If trip distance is reset, trip time will be reset at the same time.

Stopwatch

Trip computer displays stopwatch.

NOTE:

- After 100 hours, the time will start from the reset display again.
- Even if the display is switched to the other mode while the time is starting, the stopwatch continues to advance until the time in the stopwatch mode is stopped.
- When the ignition switch is turned OFF, the stopwatch is reset.

Shift-up Indicator Setting Mode

Trip computer setting switch	Press and hold (for more than 1 sec.)	Press (for less than 1 sec.)
Setting engine speed	Increase setting engine speed by 500 rpm.	Increase setting engine speed by 100 rpm.

NOTE:

The range of engine speed is 2,000 - 8,000 rpm (when exceeding 8,000 rpm returns to 2,000 rpm).

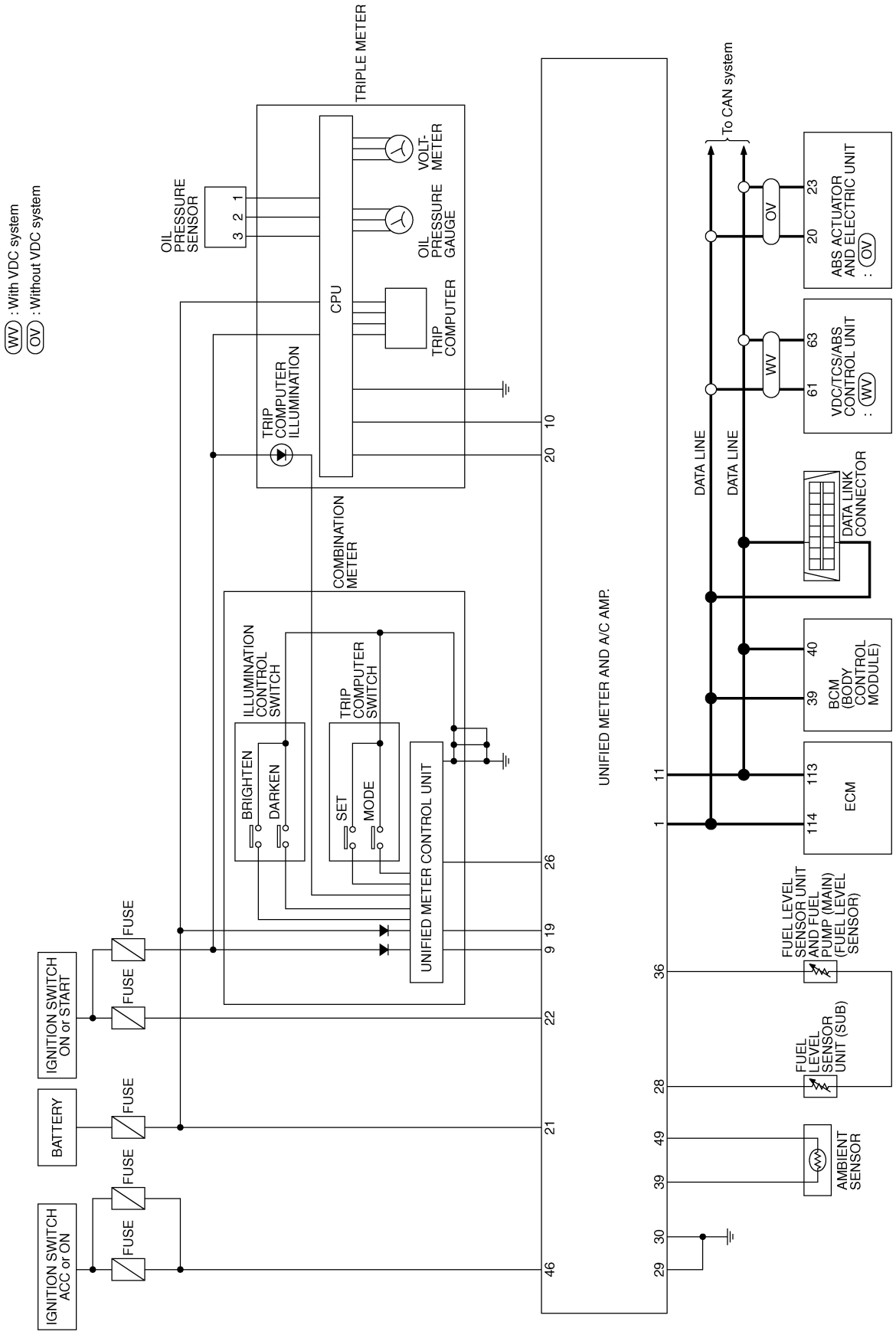
FAIL-SAFE

Triple meter performs fail-safe operation when unified meter and A/C amp. communication is malfunctioning.

Function		Fail-safe operation
Trip computer	Vehicle speed indication	Displays “---”
	Outside air temperature indication	Displays “--”
	DTE (Distance to empty) indication	Displays “----”
	Average fuel consumption indication	
	Average vehicle speed indication	
	Trip distance indication	
	Trip time indication	Displays “--:--”
Illumination control	Triple meter illumination	Change to nighttime mode.

Schematic

NKS0006G

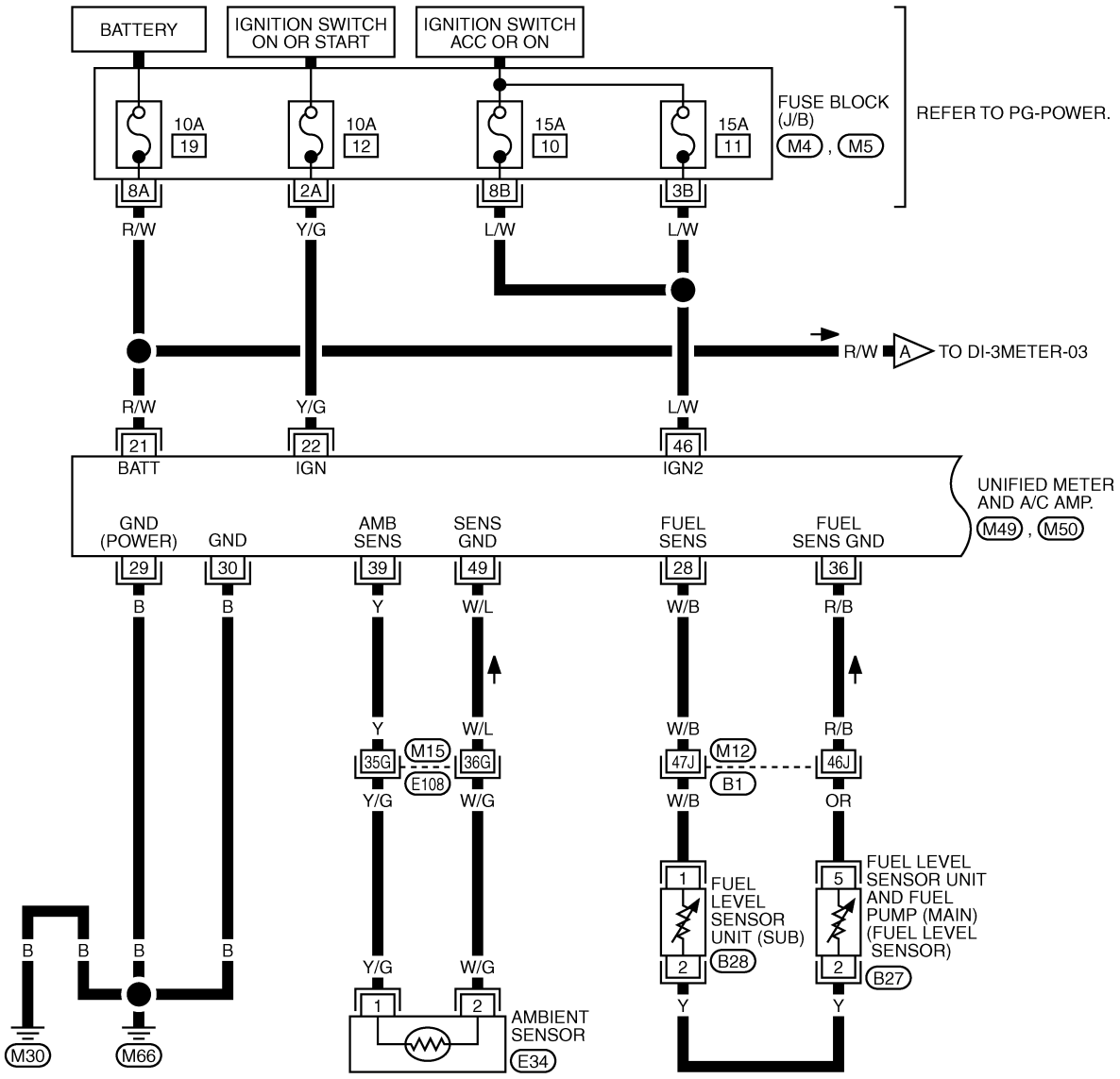


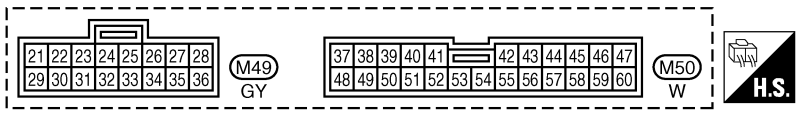
TKWT5722E

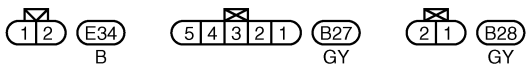
Wiring Diagram — 3METER —

NKS004RC

DI-3METER-01



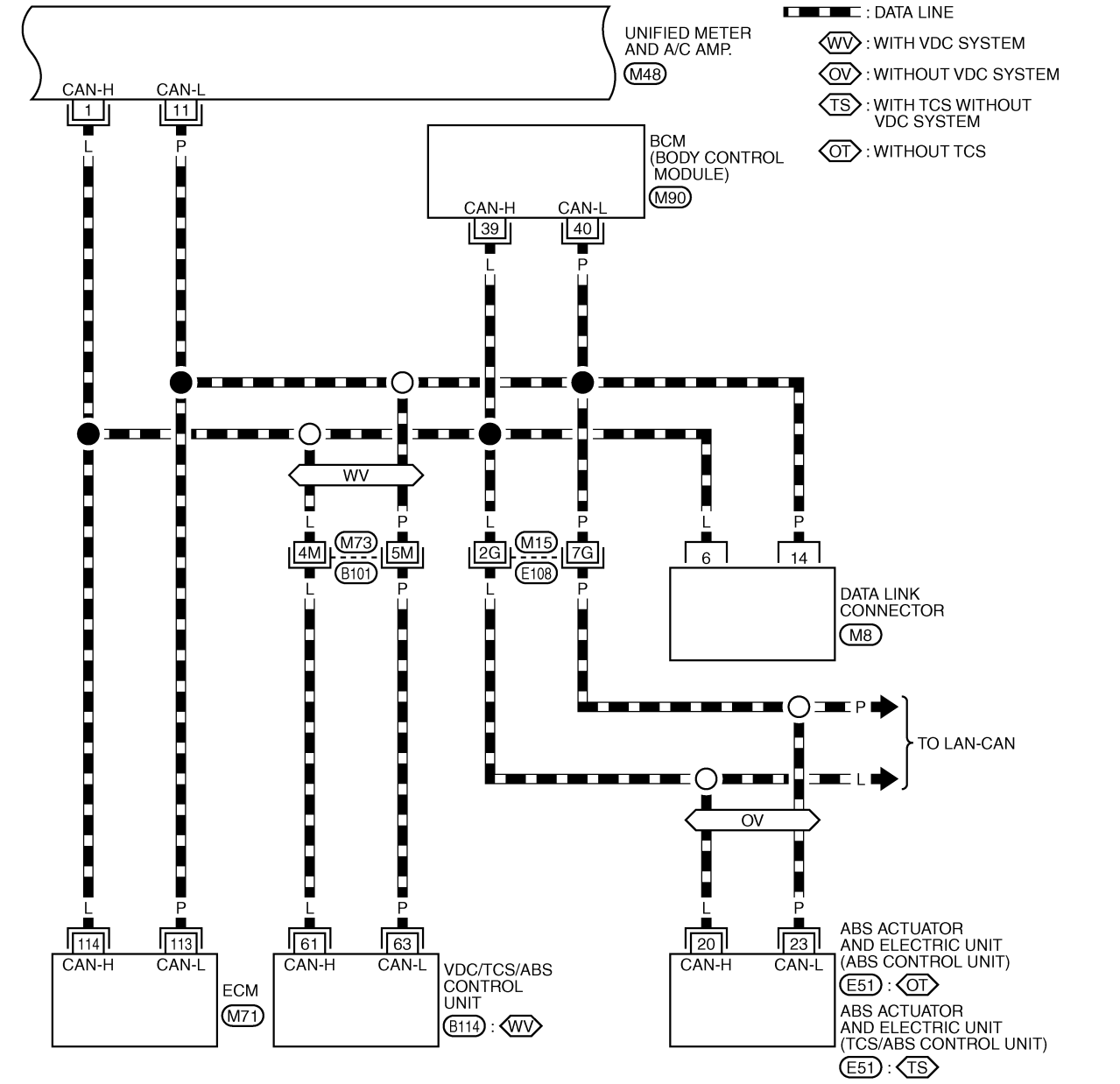


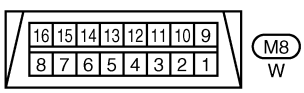


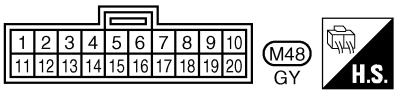
REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT3991E

DI-3METER-02

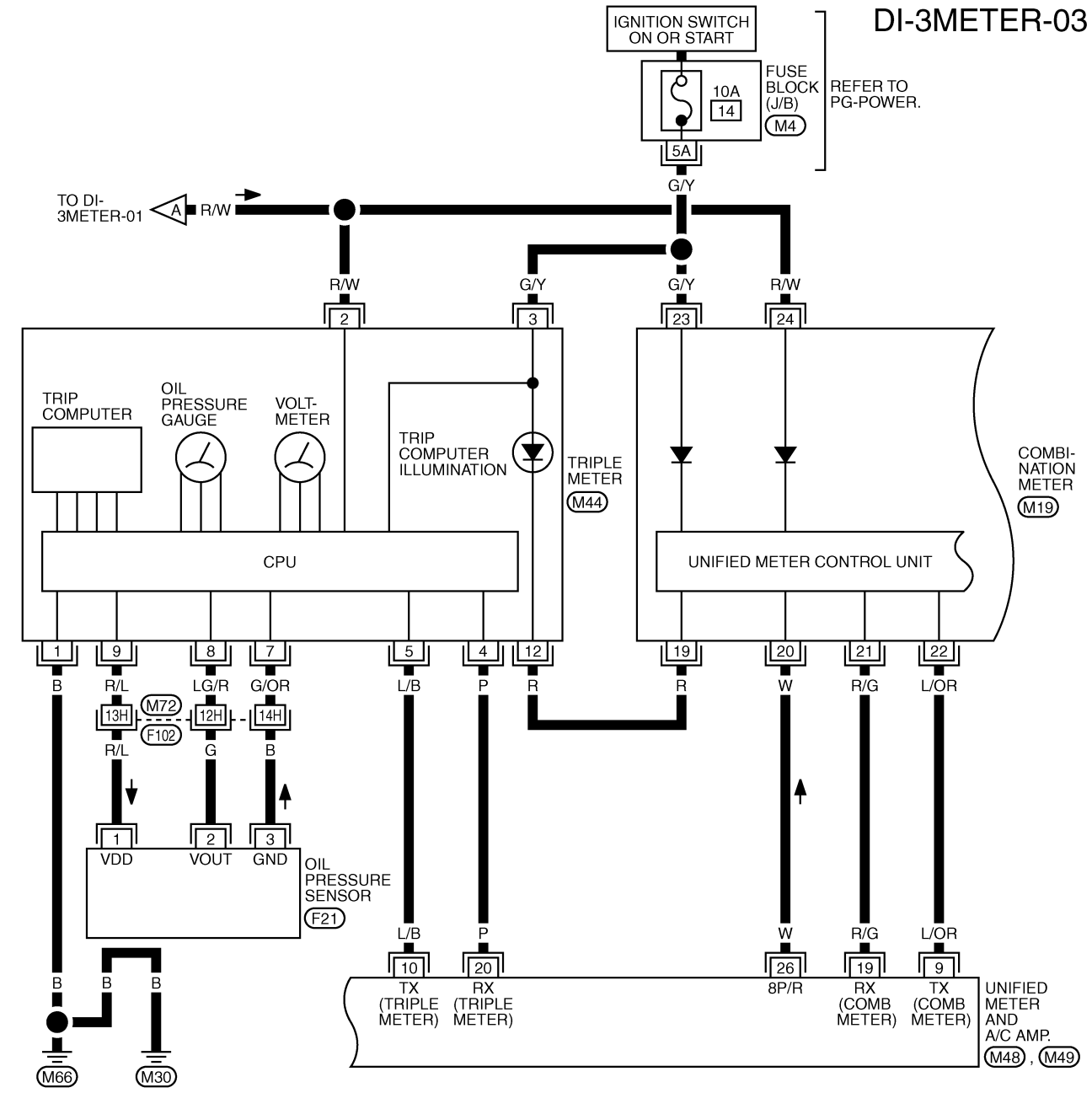






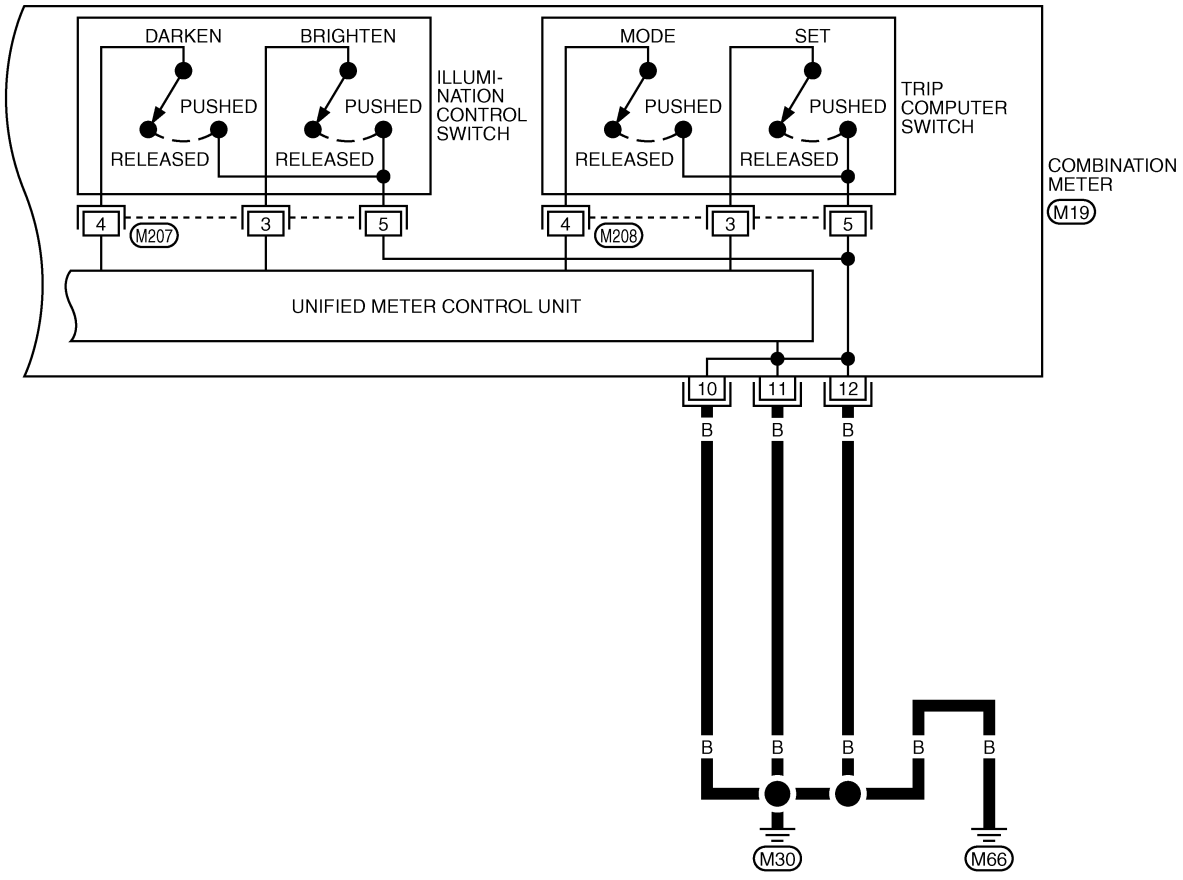
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M71 , M90 , E51 , B114 -ELECTRICAL UNITS

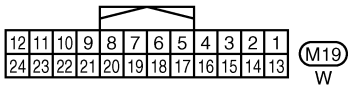
TKWT5723E

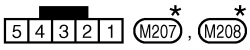

DI-3METER-03
IGNITION SWITCH ON OR START
FUSE BLOCK (J/B) M4
10A 14
5A
REFER TO PG-POWER.
G/Y
TO DI-3METER-01
A
R/W
R/W
G/Y
G/Y
R/W
2
3
23
24
TRIP COMPUTER
OIL PRESSURE GAUGE
VOLT-METER
TRIP COMPUTER ILLUMINATION
TRIPLE METER M44
COMBI-NATION METER M19
CPU
UNIFIED METER CONTROL UNIT
1
9
8
7
5
4
12
19
20
21
22
B
R/L
LG/R
G/OR
L/B
P
R
R
W
R/G
L/OR
13H
M72
F102
12H
14H
R/L
G
B
1
2
3
VDD
VOUT
GND
OIL PRESSURE SENSOR F21
L/B
P
W
R/G
L/OR
10
20
26
19
9
TX (TRIPLE METER)
RX (TRIPLE METER)
8P/R
RX (COMB METER)
TX (COMB METER)
UNIFIED METER AND A/C AMP. M48, M49
B
B
B
M66
M30
M19 W
M44 W
M48 GY
M49 GY
H.S.
F21 B
REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5724E

DI-3METER-04





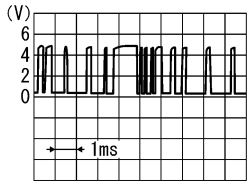
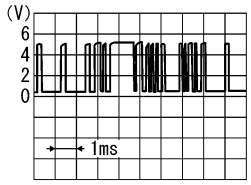
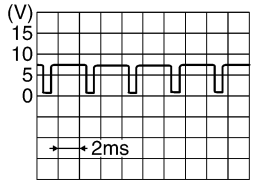


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWB1893E

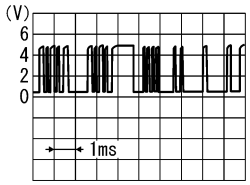
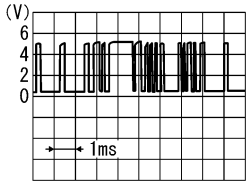
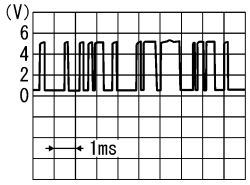
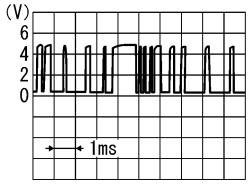
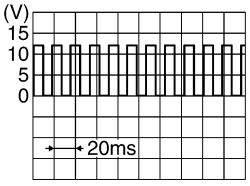
Terminals and Reference Value for Triple Meter

NKS0006I

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	B	Ground	ON	—	0 V
2	R/W	Battery power supply	OFF	—	Battery voltage
3	G/Y	Ignition power supply	ON	—	Battery voltage
4	P	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3364E
5	L/B	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3363E
7	G/OR	Oil pressure sensor ground	ON	—	0 V
8	LG/R	Oil pressure sensor signal	ON	When ignition switch is in ON position (Engine stopped.)	1 V
				Engine running [When the oil pressure is 80 psi (500 kPa)]	3 V
9	R/L	Oil pressure sensor power supply	ON	—	5 V
12	R	Illumination signal input	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.> When brightness level is midway  SKIA7256E
				Lighting switch OFF	0 V

Terminals and Reference Value for Unified Meter and A/C Amp.

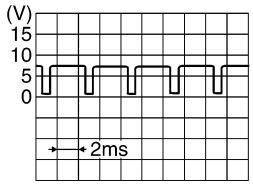
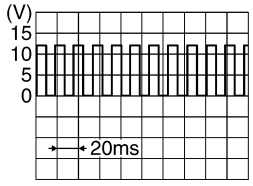
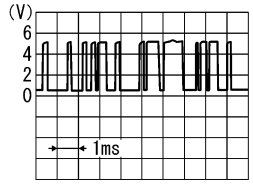
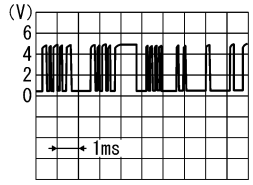
NKS0006K

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	L	CAN-H	—	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
10	L/B	TX communication line (To triple meter)	ON	—	 SKIA3363E
11	P	CAN-L	—	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
20	P	RX communication line (From triple meter)	ON	—	 SKIA3364E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition power supply	ON	—	Battery voltage
26	W	Vehicle speed signal output (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 5 V due to specifications (connected units).  PKIA1935E
28	W/B	Fuel level sensor signal	—	—	Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .
29	B	Ground (For power)	ON	—	0 V
30	B	Ground	ON	—	0 V
36	R/B	Fuel level sensor ground	ON	—	0 V
39	Y	Ambient sensor signal	—	—	Refer to ATC-92, "Ambient Sensor Circuit" .

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
46	L/W	ACC power supply	ACC	—	Battery voltage
49	W/L	Ambient sensor ground	ON	—	Approx. 0 V

Terminals and Reference Value for Combination Meter

NKS0006J

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
10 11 12	B	Ground	ON	—	0 V
19	R	Illumination signal output	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.> When brightness level is midway  SKIA7256E
				Lighting switch OFF	0 V
20	W	Vehicle speed signal input (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 5 V due to specifications (connected units).  PKIA1935E
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition power supply	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

Self-Diagnosis Mode of Triple Meter

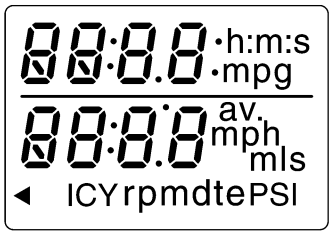
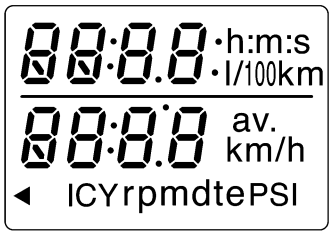
NKS0006L

SELF-DIAGNOSIS FUNCTION

Triple meter operation can be checked with self-diagnosis mode of combination meter.

OPERATION PROCEDURE

1. While pressing the odo/trip meter switch, turn ignition switch ON.
2. Make sure that the trip meter displays “0000.0”.
3. Press the odo/trip meter switch at least 3 times (within 7 seconds after the ignition switch is turned ON).
4. All the segments on the trip computer illuminate. At this time, the triple meter is turned to self-diagnosis mode.

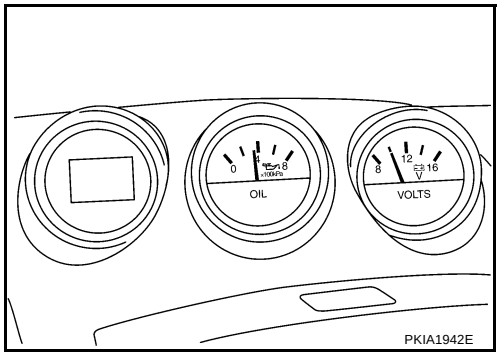
For USA	For Canada
	

SKIA8981E

NOTE:
If any of the segments is not displayed, replace triple meter.

5. Press the odo/trip meter switch. voltmeter and oil pressure gauge should indicate as shown in the figure while pressing odo/trip meter switch.

   NOTE:
   If voltmeter or oil pressure gauge is not activated, replace triple meter.



PKIA1942E

CONSULT-III Function (METER A/C AMP)

NKS0006M

Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

Trouble Diagnosis

NKS0006N

HOW TO PERFORM TROUBLE DIAGNOSIS

1. Confirm the symptom or customer complaint.
2. Perform diagnosis according to diagnosis flow. Refer to DI-39, "PRELIMINARY CHECK" .
3. According to the symptom chart, repair or replace the cause of the symptom.
4. Does the meter operate normally? If so, GO TO 5. If not, GO TO 2.
5. INSPECTION END

PRELIMINARY CHECK

1. CHECK COMMUNICATION LINE

Perform self-diagnosis of unified meter and A/C amp.

Self-diagnostic results content

No malfunction detected>>GO TO 2.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

2. CHECK OPERATION OF SELF-DIAGNOSIS MODE (COMBINATION METER)

Activate self-diagnosis mode of combination meter. Refer to DI-15, "Self-Diagnosis Mode of Combination Meter" .

Does self-diagnosis mode operate?

YES >> GO TO 3.
NO >> Check combination meter power supply and ground circuit. If normal, replace combination meter.

3. CHECK OPERATION OF SELF-DIAGNOSIS MODE (TRIPLE METER)

Check operation of triple meter in self-diagnosis mode. Refer to DI-38, "Self-Diagnosis Mode of Triple Meter" .

Does self-diagnosis mode operation namely?

YES >> INSPECTION END
NO >> GO TO 4.

4. CHECK POWER SUPPLY AND GROUND CIRCUIT OF TRIPLE METER

Check power supply and ground circuit of triple meter.

OK or NG

OK >> Replace triple meter.
NG >> Repair power supply and ground circuit of triple meter.

Symptom Chart

NKS0006O

Trouble phenomenon	Possible cause
Speed indication is not displayed properly.	Refer to DI-40, "Vehicle Speed Signal Inspection" .
Ambient air temperature indication is not displayed properly. (It may take a short time to steady the indication after ignition switch is turned ON.) **NOTE:** If the meter is powered up with the ambient sensor disconnected, ambient air temperature display will show “---” even if the sensor is reconnected. In this case, with the sensor connected, disconnect and reconnect the battery, then the correct temperature will be displayed.	Refer to ATC-92, "AMBIENT TEMPERATURE INPUT PROCESS" in “ATC”.
DTE (distance to empty) indication is not displayed properly.	Refer to DI-40, "Fuel Consumption Monitor Signal Inspection" .
Average fuel consumption indication is not displayed properly.	
Shift-up indicator setting indication is not displayed properly or shift-up indicator does not operate properly.	Refer to DI-42, "Trip Computer Switch Inspection" .

Trouble phenomenon	Possible cause
Average vehicle speed indication is not indicated properly.	Replace triple meter.
Trip distance indication is not indicated properly.	
Trip time indication is not indicated properly.	
Stopwatch indication is not displayed properly.	
Indication is malfunction of voltmeter.	
Indication is malfunction of oil pressure gauge.	Refer to DI-40, "Oil Pressure Sensor Signal Inspection" .
Trip computer switch is not operate.	Refer to DI-42, "Trip Computer Switch Inspection" .

Vehicle Speed Signal Inspection

NKS0006R

Symptom: Speed indication is not displayed properly.

1. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-III.
2. Using “SPEED METER” on the “DATA MONITOR”, compare the value of data monitor with speed indication of trip computer.

OK or NG

OK >> Refer to DI-18, "Vehicle Speed Signal Inspection" of “COMBINATION METERS”.
NG >> Replace triple meter.

Fuel Consumption Monitor Signal Inspection

NKS0006S

Symptom:

- DTE (distance to empty) indication is not displayed properly.
- Average fuel consumption indication is not displayed properly.

1. CHECK ECM (CONSULT-III)

Perform self-diagnosis of ECM. Refer to EC-116, "CONSULT-III Function (ENGINE)" .

Self-diagnostic results

No malfunction detected>>Replace unified meter and A/C amp.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

Oil Pressure Sensor Signal Inspection

NKS0006T

Symptom: Indication is malfunction of oil pressure gauge.

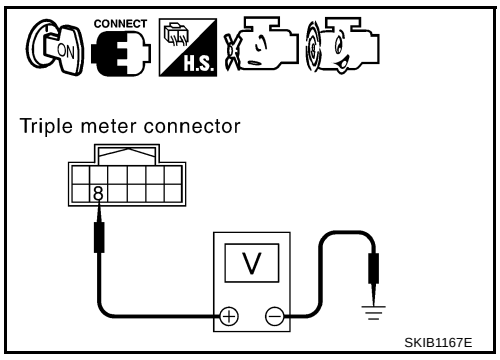
1. CHECK OIL PRESSURE SENSOR SIGNAL INPUT

1. Turn ignition switch ON.
2. Check voltage between triple meter harness connector M44 terminal 8 and ground.

8 – Ground

When ignition switch is in ON position (Engine stopped.) : Approx. 1 V

Engine running [When the oil pressure is 80 psi (500 kPa)] : Approx. 3 V



OK or NG

OK >> Replace triple meter.
NG >> GO TO 2.

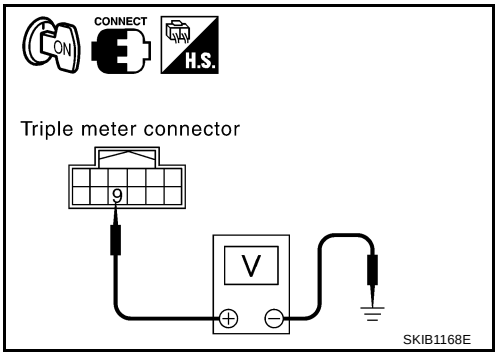
2. CHECK OIL PRESSURE SENSOR POWER SUPPLY

Check voltage between triple meter harness connector M44 terminal 9 and ground.

9 – Ground : Approx. 5 V

OK or NG

OK >> GO TO 3.
NG >> Replace triple meter.



3. CHECK OIL PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect triple meter and oil pressure switch connector.
3. Check continuity between triple meter harness connector M44 terminal 9 and oil pressure sensor harness connector F21 terminal 1.

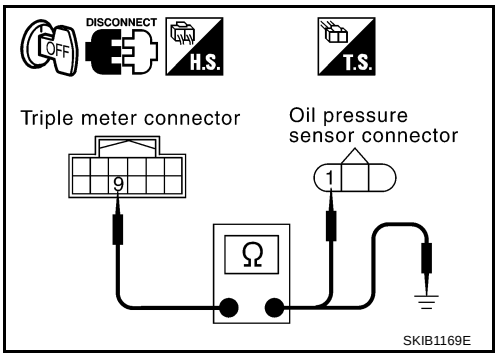
9 – 1 : Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 9 and ground.

9 – Ground : Continuity should not exist.

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.



4. CHECK OIL PRESSURE SENSOR SIGNAL CIRCUIT

1. Check continuity between triple meter harness connector M44 terminal 8 and oil pressure sensor harness connector F21 terminal 2.

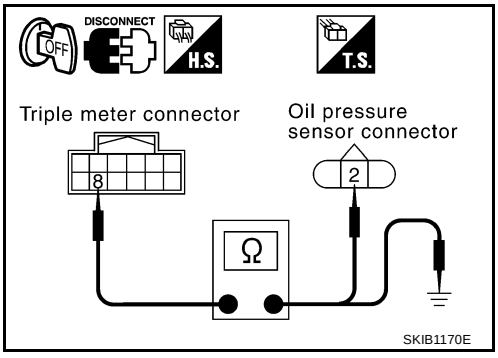
8 – 2 : Continuity should exist.

2. Check continuity between triple meter harness connector M44 terminal 8 and ground.

8 – Ground :Continuity should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.



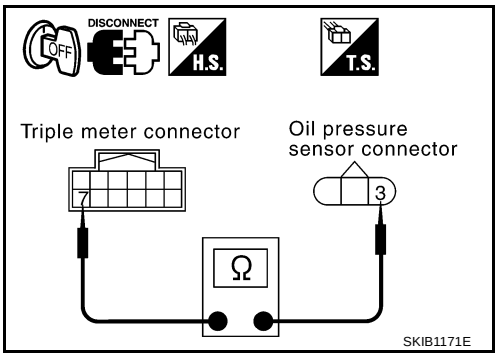
5. CHECK OIL PRESSURE SENSOR GROUND CIRCUIT

Check continuity between triple meter harness connector M44 terminal 7 and oil pressure sensor harness connector F21 terminal 3.

7 – 3 : Continuity should exist.

OK or NG

OK >> Replace oil pressure sensor.
NG >> Repair harness or connector.



Trip Computer Switch Inspection

NKS0006U

Symptom:

- Shift-up indicator setting indication is not displayed properly or shift-up indicator does not operate properly.
- Trip computer switch does not operate.

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Remove combination meter. Refer to DI-24, "Removal and Installation for Combination Meter" .
3. Remove rear finisher to combination meter. Refer to DI-24, "Disassembly and Assembly for Combination Meter" .
4. Check trip computer switch connector for looseness.

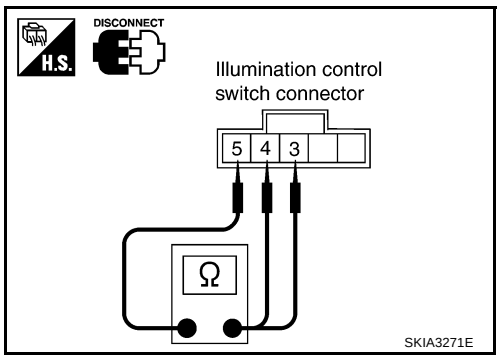
OK or NG

OK >> GO TO 2.
NG >> Repair trip computer switch connector.

2. CHECK CIRCUIT

1. Disconnect trip computer switch connector.
2. Check continuity between trip computer switch harness connector M208 terminals 3, 4 and 5.

Terminal		Condition	Continuity
3	5	Setting switch is pressed.	Yes
		Setting switch is released.	No
4		Mode switch is pressed.	Yes
		Mode switch is released.	No



OK or NG

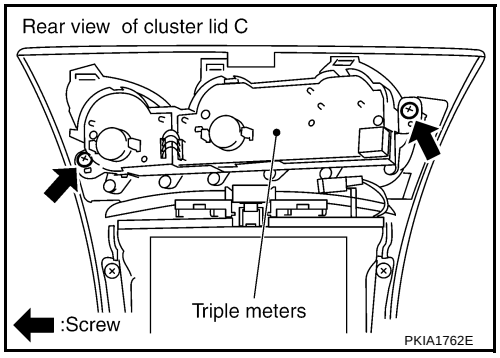
OK >> Replace combination meter.
NG >> Replace trip computer switch.

Removal and Installation of Triple Meters

NKS0006V

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (2), and remove triple meters.



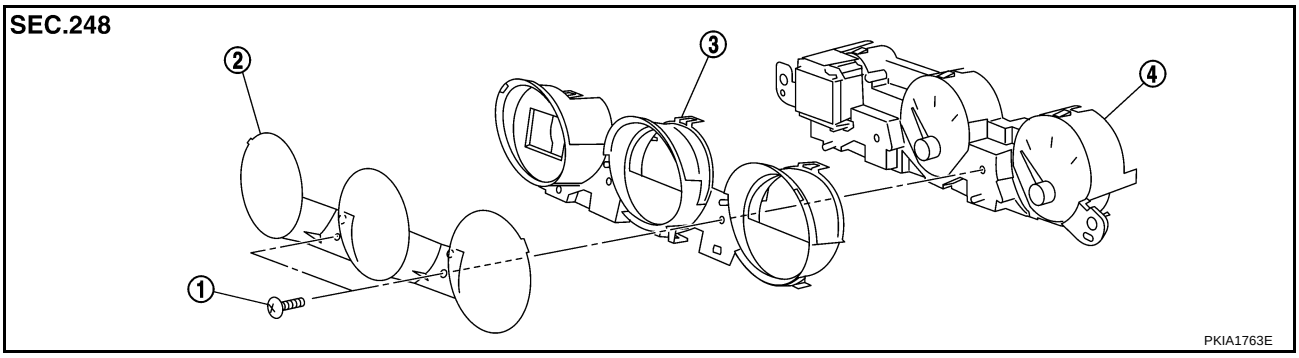
INSTALLATION

Installation is the reverse order of removal.

Disassembly and Assembly for Triple Meters

NKS0006W

SEC.248



1. Screw
2. Front cover
3. Upper housing
4. Triple meter

DISASSEMBLY

1. Remove screws (2), and remove front cover.
2. Disengage tabs (6) to separate upper housing.

ASSEMBLY

Assembly is the reverse order of disassembly.

UNIFIED METER AND A/C AMP

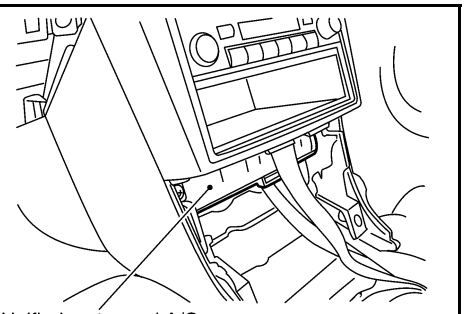
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System Description

NKS0006X

DESCRIPTION

- For the unified meter and A/C amp., the signal required for controlling the combination meter and triple meter are integrated in the A/C auto amp.
- Unified meter and A/C amp. corresponds a CONSULT-III function (self-diagnosis results, CAN diagnosis support monitor and data monitor).


Unified meter and A/C amp.
SKIB0018E

COMBINATION METER CONTROL FUNCTION

- Unified meter and A/C amp. receives necessary information for combination meter from each unit.
- Unified meter and A/C amp. converses with the combination meter transmits a signal through with communication line (TX, RX) between unified meter and A/C amp. and combination meter.

Input/output signals between unified meter and A/C amp. and combination meter.

Unit	Input	Output
Unified meter and A/C amp.	● Seat belt buckle switch signal (Driver's side) ● Trip computer mode switch signal ● Trip computer setting switch signal ● Illumination control nighttime required signal ● Refuel status signal ● Vehicle speed signal ● Low-fuel warning lamp condition signal ● Self-diagnosis condition signal ● Odo/trip switch signal ● Delivery destination data signal ● Combination meter receive error signal ● Combination meter specifications signal ● Triple meter specifications signal	● Engine speed signal ● Engine coolant temperature signal ● Fuel level sensor signal (resistance value) ● Malfunction indicator lamp signal ● ABS warning lamp signal ● Tire pressure warning lamp signal ● Brake warning lamp signal ● Oil pressure warning lamp signal ● Turn indicator signal ● High beam request signal ● VDC OFF indicator lamp signal ● TCS OFF indicator lamp signal ● SLIP indicator lamp signal ● CRUISE indicator lamp signal ● SET indicator lamp signal ● A/T CHECK indicator lamp signal ● A/T position indicator signal ● Manual mode indicator signal ● Manual mode gear position signal ● Shift-up indicator setting signal ● CAN communication condition signal of A/T ● Door switch signal ● Position lights request signal ● Buzzer output signal

NOTE:
Combination meter performs fail-safe operation when unified meter and A/C amp. communication is malfunctioning. Refer to DI-7, "FAIL-SAFE" .

TRIPLE METER CONTROL FUNCTION

- Unified meter and A/C amp. receives necessary information for triple meter from each unit.
- Unified meter and A/C amp. calculates necessary information for trip computer.
- Unified meter and A/C amp. converses with the combination meter transmits a signal with through communication line (TX, RX) between unified meter and A/C amp. and triple meter.

Input/output signals between unified meter and A/C amp. and triple meter

Unit	Input	Output
Unified meter and A/C amp.	● LCD indication condition signal ● Shift-up indicator setting signal ● Oil pressure warning lamp signal ● Triple meter receive error signal	● Ambient air temperature signal ● Ambient air temperature warning signal ● Trip distance signal ● Trip time signal ● Average vehicle speed signal ● Average fuel consumption signal ● Vehicle speed signal ● DTE (Distance to empty) signal ● DTE (Distance to empty) warning signal ● Tire pressure warning signal ● Trip computer mode switch signal ● Trip computer setting switch signal ● Self-diagnosis condition signal ● Odo/trip switch signal ● Triple meter specifications signal

NOTE:
Triple meter performs fail-safe operation when unified meter and A/C amp. communication is malfunctioning. Refer to DI-29, "FAIL-SAFE" .

A/C AUTO AMP. FUNCTION

Unified meter and A/C amp. controls each operation for A/C auto amp. Regarding A/C control, refer to ATC-24, "AIR CONDITIONER CONTROL" in ATC section.

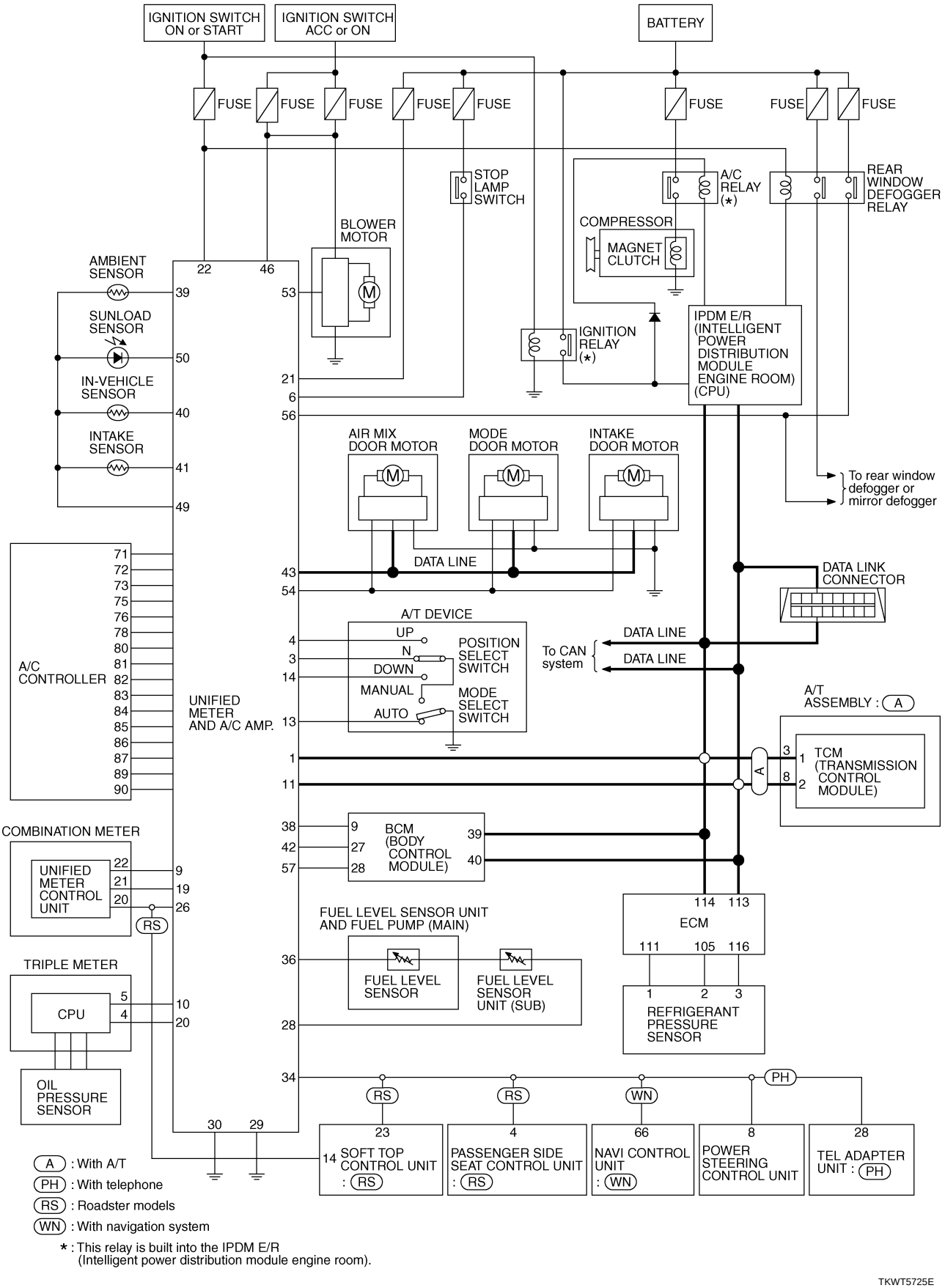
OTHER FUNCTIONS

Signal Buffer Function

Unified meter and A/C amp. transmits each signal to other units with CAN communication.

Schematic

NKS004RD



TKWT5725E

CONSULT-III Function (METER A/C AMP)

NKS00071

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

System	Diagnosis mode	Description
METER A/C AMP	SELF-DIAG RESULTS	Unified meter and A/C amp. check the conditions and displays memorized erro.
	DATA MONOTOR	Displays unified meter and A/C amp. input data in real time.

SELF-DIAGNOSTIC RESULTS

Display Item List

Display item [Code]	Malfunction is detected when...	Reference page
CAN COMM CIRC [U1000]	When unifield meter and A/C amp. is not transmitting or receiving CAN communication signal for 2 seconds or less.	DI-50
T/METER COMM CIRC [B2201]	Malfunction is detected in communication of between triple meter and unified meter and A/C amp.	DI-50
METER COMM CIRC [B2202]	Malfunction is detected in communication of between combination meter and unified meter and A/C amp.	DI-52
VEHICLE SPEED CIRC [B2205]	When an erroneous signal is input. **CAUTION:** **Even when there is no malfunction on speed signal system, malfunction may be misinterpreted when battery has low voltage (when maintaining 7 - 8 V for about 2 seconds).**	DI-55

NOTE:
"TIME" means the following.

- 0: Means detected malfunction at present.
- 1-63: Means detected malfunction in past. (Displays number of ignition switch OFF → ON after detecting malfunction. "Self-diagnosis result" is erased when exceeding "63".)

DATA MONITOR

Display Item List

Monitor item [Unit]	MAIN SIGNALS	SELECTION FROM MENU	Contents
SPEED METER [km/h] or [mph]	X	X	This is the angle correction value after the speed signal from the VDC/TCS/ABS control unit [with VDC system] or ABS actuator and electric unit (control unit) [without VDC system] is converted into the vehicle speed.
SPEED OUTPUT [km/h] or [mph]	X	X	This is the angle correction value before the speed signal from the VDC/TCS/ABS control unit [with VDC system] or ABS actuator and electric unit (control unit) [without VDC system] is converted into the vehicle speed.
TACHO METER [rpm]	X	X	This is the converted value for the engine speed signal from the ECM.
W TEMP METER [°C] or [°F]	X	X	This is the converted value for the engine coolant temperature signal from the ECM.
FUEL METER [lit.]	X	X	This is the processed value for the signal (resistance value) from the fuel gauge.
DISTANCE [km] or [mile]	X	X	This is the calculated value for the speed signal from the VDC/TCS/ABS control unit [with VDC system] or ABS actuator and electric unit (control unit) [without VDC system] and the signal (resistance signal) from the fuel gauge.
FUEL W/L [ON/OFF]	X	X	Indicates [ON/OFF] condition of low-fuel warning lamp.
MIL [ON/OFF]		X	Indicates [ON/OFF] condition of malfunction indicator lamp.

Monitor item [Unit]		MAIN SIGNALS	SELECTION FROM MENU	Contents
AIR PRES W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of low tire pressure warning lamp.
SEAT BELT W/L*1	[ON/OFF]		X	Indicates [ON/OFF] condition of seat belt warning lamp.
BUZZER	[ON/OFF]	X	X	Indicates [ON/OFF] condition of buzzer.
DOOR W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of door warning lamp.
HI-BEAM IND	[ON/OFF]		X	Indicates [ON/OFF] condition of high beam indicator.
TURN IND	[ON/OFF]		X	Indicates [ON/OFF] condition of turn indicator.
OIL W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of oil pressure warning lamp.
VDC/TCS IND	[ON/OFF]		X	Indicates [ON/OFF] condition of VDC/TCS OFF indicator lamp.
ABS W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of ABS warning lamp.
SLIP IND	[ON/OFF]		X	Indicates [ON/OFF] condition of SLIP indicator lamp.
BRAKE W/L*2	[ON/OFF]		X	Indicates [ON/OFF] condition of brake warning lamp.
M RANGE SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of manual mode range switch.
NM RANGE SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of except for manual mode range switch.
AT SFT UP SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift up switch.
AT SFT DWN SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift down switch.
AT P MODE SW	[ON/OFF]		X	Indicates [ON/OFF] condition of A/T power mode switch.
AT S MODE SW	[ON/OFF]		X	Indicates [ON/OFF] condition of A/T snow mode switch.
BRAKE SW	[ON/OFF]		X	Indicates [ON/OFF] condition of brake switch (stop lamp switch).
AT-M IND	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T manual mode indicator.
AT-M GEAR	[5/4/3/2/1]	X	X	Indicates [5/4/3/2/1] condition of A/T manual mode gear position.
P RANGE IND	ON/OFF	X	X	Indicates [ON/OFF] condition of A/T shift P range indicator.
R RANGE IND	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift R range indicator.
N RANGE IND	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift N range indicator.
D RANGE IND	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift D range indicator.
AT CHECK W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of A/T CHECK warning lamp.
CRUISE IND	[ON/OFF]		X	Indicates [ON/OFF] condition of CRUISE indicator.
SET IND	[ON/OFF]		X	Indicates [ON/OFF] condition of SET indicator.

NOTE:

Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

*1: It dose not change when fastening or unfastening the passenger seat belt.

*2: Monitor keeps indicating “OFF” when brake warning lamp is on by the parking brake operation or low brake fluid level.

Power Supply and Ground Circuit Inspection

NKS001M5

1. CHECK FUSE

Check for blown fuses.

Power source	Fuse No.
Battery	19
Ignition switch ACC or ON	10,11
Ignition switch ON or START	12

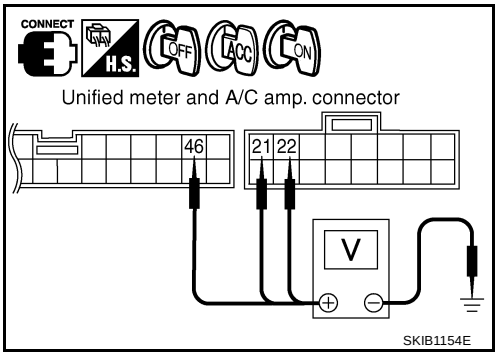
OK or NG

OK >> GO TO 2.
NG >> Be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between unified meter and A/C amp. harness connector terminals and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal				
M49	21	Ground	Battery voltage	Battery voltage	Battery voltage
M50	46		0 V	Battery voltage	Battery voltage
M49	22		0 V	0 V	Battery voltage



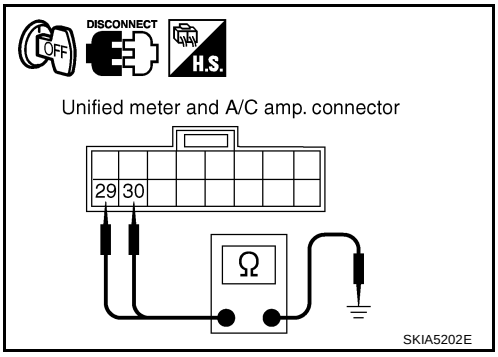
OK or NG

OK >> GO TO 3.
NG >> Check harness between unified meter and A/C amp. and fuse.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between unified meter and A/C amp. harness connector and ground.

Connector	Terminal		Continuity
M49	29	Ground	Yes
	30		



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

DTC [U1000] CAN Communication Circuit

NKS00072

Symptom: Display CAN COMM CIRC [U1000] at the result of self-diagnosis for unified meter and A/C amp.

1. CHECK CAN COMMUNICATION

1. Select “SELF-DIAG RESULTS” mode for “METER A/C AMP” with CONSULT-III.

>> Go to “LAN system”. Refer to LAN-48, "CAN System Specification Chart" .

DTC [B2201] Triple Meter Communication Circuit

NKS00073

Symptom: Display T/METER COMM CIRC [B2201] at the result of self-diagnosis for unified meter and A/C amp.

NOTE:
For the wiring diagram, refer to DI-31, "Wiring Diagram — 3METER —" .

1. CHECK CONNECTOR

Check triple meter, unified meter and A/C amp. and terminals (triple meter side, unified meter and A/C amp. side, and harness side) for looseness or bent terminals.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK METER/GAUGES VISUALLY

Does the pointer on the meter/gauges fluctuate at the engine start?

Is the fluctuation acceptable?

YES >> GO TO 3.
NO >> GO TO 6.

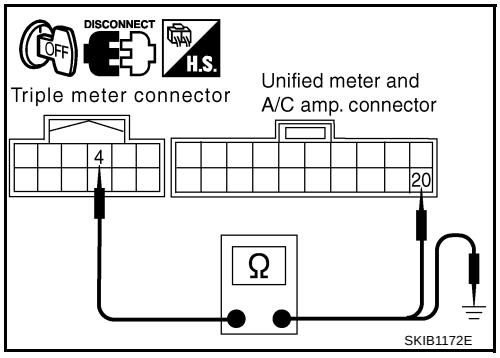
3. CHECK CONTINUITY COMMUNICATION CIRCUIT (TX: TRIPLE METER)

1. Turn ignition switch OFF.
2. Disconnect triple meter connector and unified meter and A/C amp. connector.
3. Check continuity between triple meter harness connector M44 terminal 4 and unified meter and A/C amp. harness connector M48 terminal 20.

4 – 20 : Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 4 (P) and ground.

4 – Ground : Continuity should not exist.



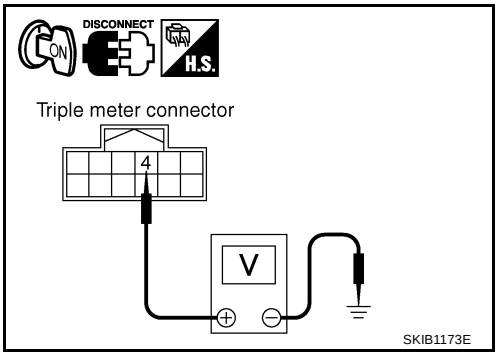
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK VOLTAGE OF UNIFIED METER AND A/C AMP.

1. Connect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between triple meter harness connector M44 terminal 4 and ground.

4 – Ground : Approx. 5 V



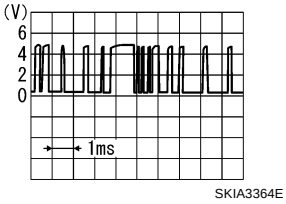
OK or NG

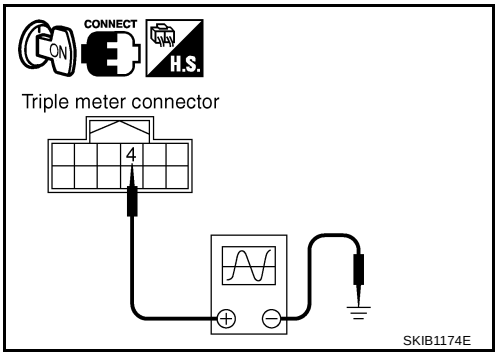
OK >> GO TO 5.
NG >> Replace unified meter and A/C amp.

5. CHECK VOLTAGE SIGNAL OF COMBINATION METER

1. Turn ignition switch OFF.
2. Connect triple meter connector.
3. Turn ignition switch ON.
4. Check voltage signal between triple meter harness connector M44 terminal 4 and ground.

4 – Ground:





OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Replace triple meter.

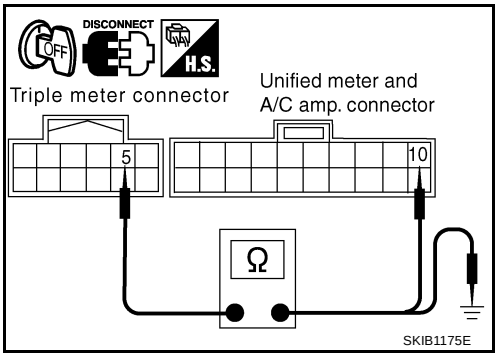
6. CHECK CONTINUITY COMMUNICATION CIRCUIT (RX: TRIPLE METER)

1. Turn ignition switch OFF.
2. Disconnect triple meter connector and unified meter and A/C amp. connector.
3. Check continuity between triple meter harness connector M44 terminal 5 and unified meter and A/C amp. harness connector M48 terminal 10.

5 – 10 : Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 5 and ground.

5 – Ground : Continuity should not exist.



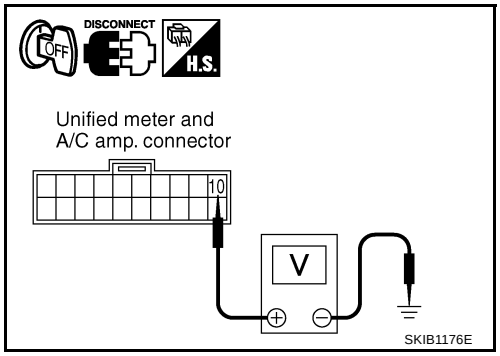
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK VOLTAGE OF COMBINATION METER

1. Connect triple meter connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M48 terminal 10 and ground.

10 – Ground : Approx. 5 V



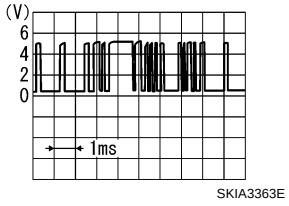
OK or NG

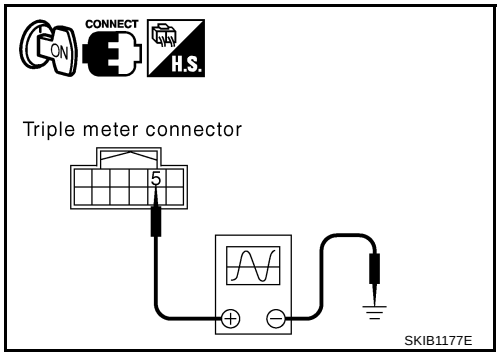
OK >> GO TO 8.
NG >> Replace triple meter.

8. CHECK VOLTAGE SIGNAL OF UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Connect triple meter connector and unified meter and A/C amp. connector.
3. Turn ignition switch ON.
4. Check voltage signal between triple meter harness connector M44 terminal 5 and ground.

5 – Ground :





OK or NG

OK >> Replace triple meter.
NG >> Replace unified meter and A/C amp.

DTC [B2202] Meter Communication Circuit

NKS00074

Symptom: Display METER COMM CIRC [B2202] at the result of self-diagnosis for unified meter and A/C amp.

NOTE:
For the wiring diagram, refer to DI-11, "Wiring Diagram — METER —" .

1. CHECK CONNECTOR

Check combination meter, unified meter and A/C amp. and terminals (combination meter side, unified meter and A/C amp. side, and harness side) for looseness or bent terminals.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK METER/GAUGES VISUALLY

Does the pointer on the meter/gauges fluctuate at the engine start?

Is the fluctuation acceptable?

YES >> GO TO 3.
NO >> GO TO 6.

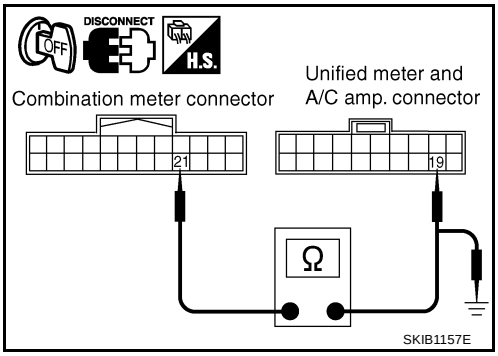
3. CHECK CONTINUITY COMMUNICATION CIRCUIT (TX: COMBINATION METER)

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 21 and unified meter and A/C amp. harness connector M48 terminal 19.

21 – 19 : Continuity should exist.

4. Check continuity between combination meter harness connector M19 terminal 21 and ground.

21 – Ground : Continuity should not exist.



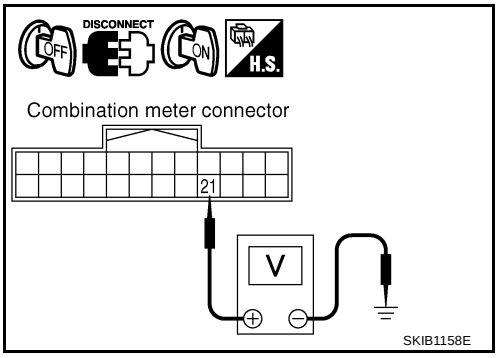
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK VOLTAGE OF UNIFIED METER AND A/C AMP.

1. Connect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between combination meter harness connector M19 terminal 21 and ground.

21 – Ground : Approx. 5 V



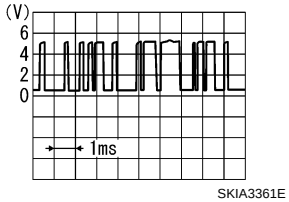
OK or NG

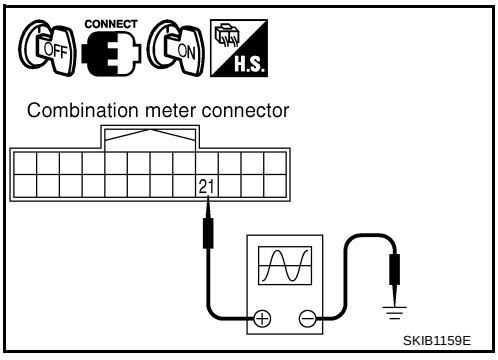
OK >> GO TO 5.
NG >> Replace unified meter and A/C amp.

5. CHECK VOLTAGE SIGNAL OF COMBINATION METER

1. Turn ignition switch OFF.
2. Connect combination meter connector.
3. Turn ignition switch ON.
4. Check voltage signal between combination meter harness connector M19 terminal 21 and ground.

21 – Ground:





OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Replace combination meter.

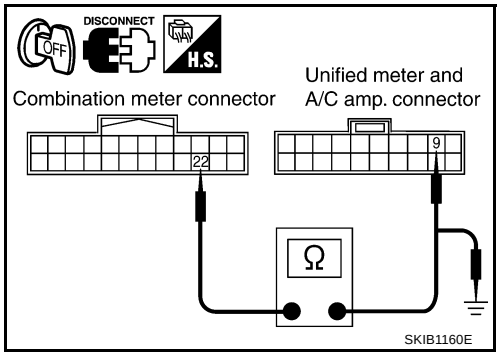
6. CHECK CONTINUITY COMMUNICATION CIRCUIT (RX: COMBINATION METER)

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 22 and unified meter and A/C amp. harness connector M48 terminal 9.

22 – 9 : Continuity should exist.

4. Check continuity between combination meter harness connector M19 terminal 22 (L/OR) and ground.

22 – Ground : Continuity should not exist.



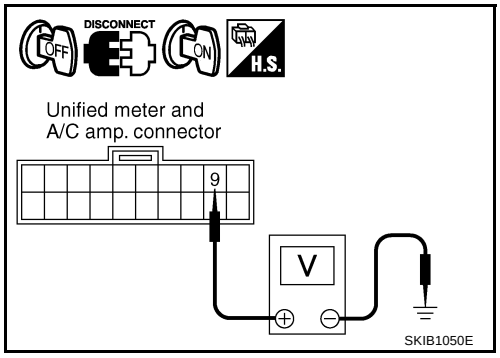
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK VOLTAGE OF COMBINATION METER

1. Connect combination meter connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M48 terminal 9 and ground.

9 – Ground : Approx. 5 V



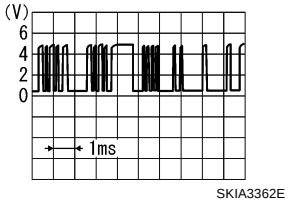
OK or NG

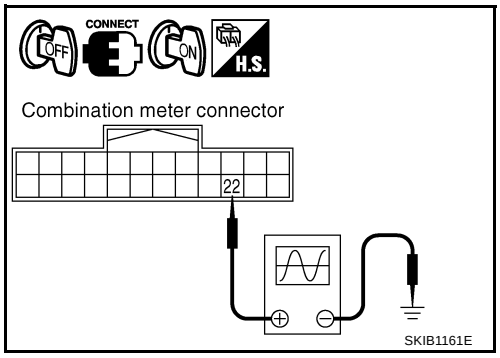
OK >> GO TO 8.
NG >> Replace combination meter.

8. CHECK VOLTAGE SIGNAL OF UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Connect unified meter and A/C amp. connector.
3. Turn ignition switch ON.
4. Check voltage signal between combination meter harness connector M19 terminal 22 and ground.

22 – Ground:





OK or NG

OK >> Replace combination meter.
NG >> Replace unified meter and A/C amp.

DTC [B2205] Vehicle Speed Circuit

NKS00075

Symptom: Display VEHICLE SPEED CIRC [B2205] at the result of self-diagnosis for unified meter and A/C amp.

1. CHECK VDC/TCS/ABS CONTROL UNIT OR ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform the following unit self-diagnosis.

- VDC/TCS/ABS control unit [with VDC]. Refer to BRC-96, "CONSULT-III Functions (ABS)" .
- ABS actuator and electric unit (control unit) [without VDC]. Refer to BRC-52, "CONSULT-III MAIN FUNCTION" (with TCS) or BRC-19, "CONSULT-III MAIN FUNCTION" (without TCS).

Self-diagnostic results content

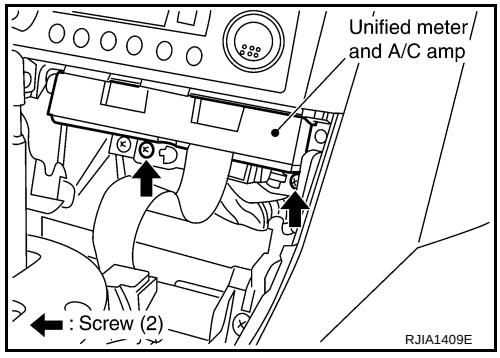
No malfunction detected>>Replace unified meter and A/C amp.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

Removal and Installation of Unified Meter and A/C Amp.

NKS00076

REMOVAL

1. Remove the console finisher (A/T) or console boot (M/T). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove the fixing screws, then remove the unified meter and A/C amp.



INSTALLATION

Installation is the reverse order of removal.

WARNING LAMPS

PFP:24814

System Description

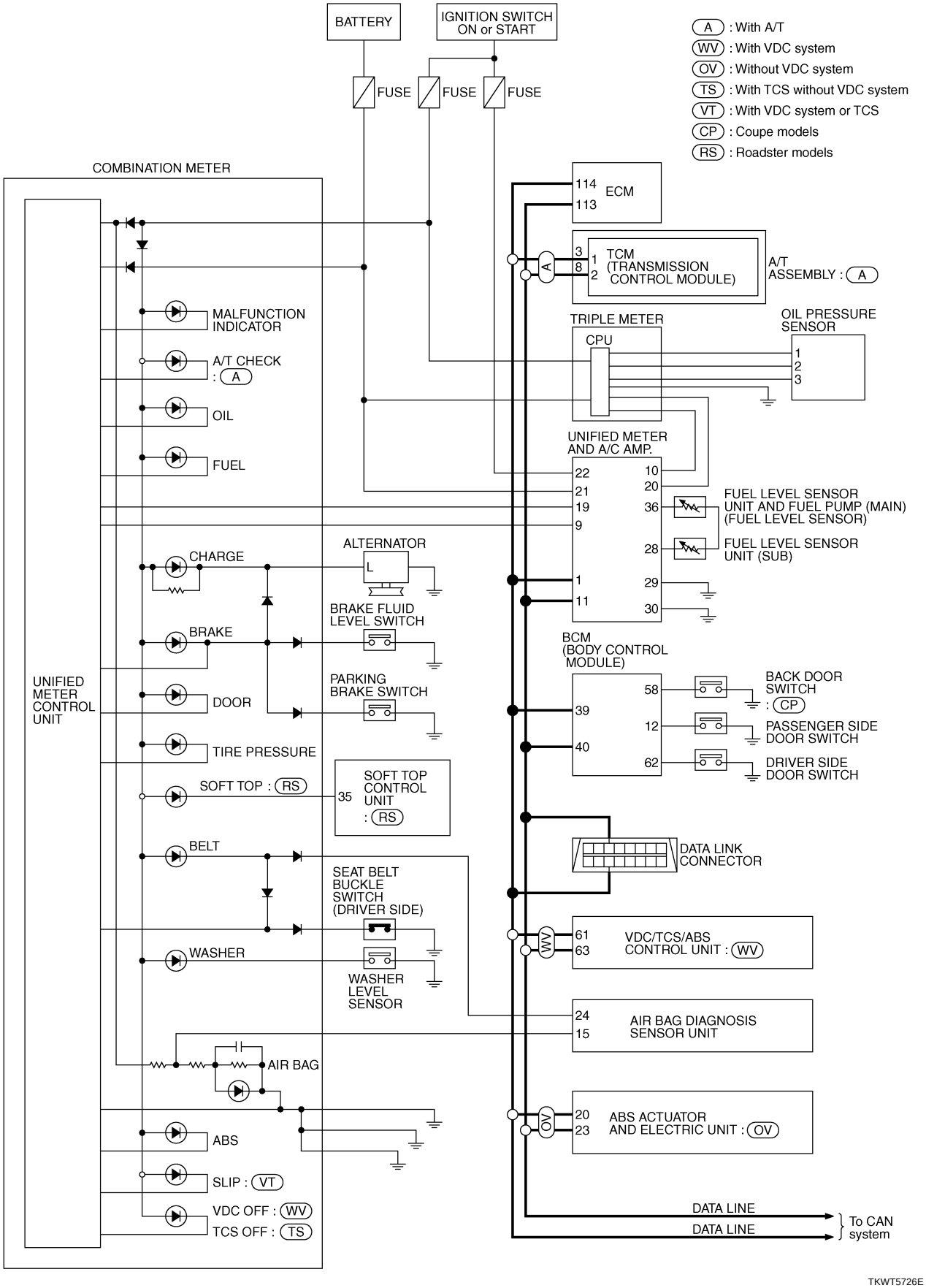
NKS00264

OIL PRESSURE WARNING LAMP

- Triple meter reads oil pressure signal from oil pressure sensor.
- Triple meter judges an oil pressure condition by oil pressure signal, and transmits oil pressure warning lamp signal to unified meter and A/C amp. with communication line.
- Unified meter and A/C amp. transmits oil pressure switch signal to combination meter with communication line.
- Combination meter turns oil pressure warning lamp according to oil pressure switch signal.

Schematic

NKS004RE



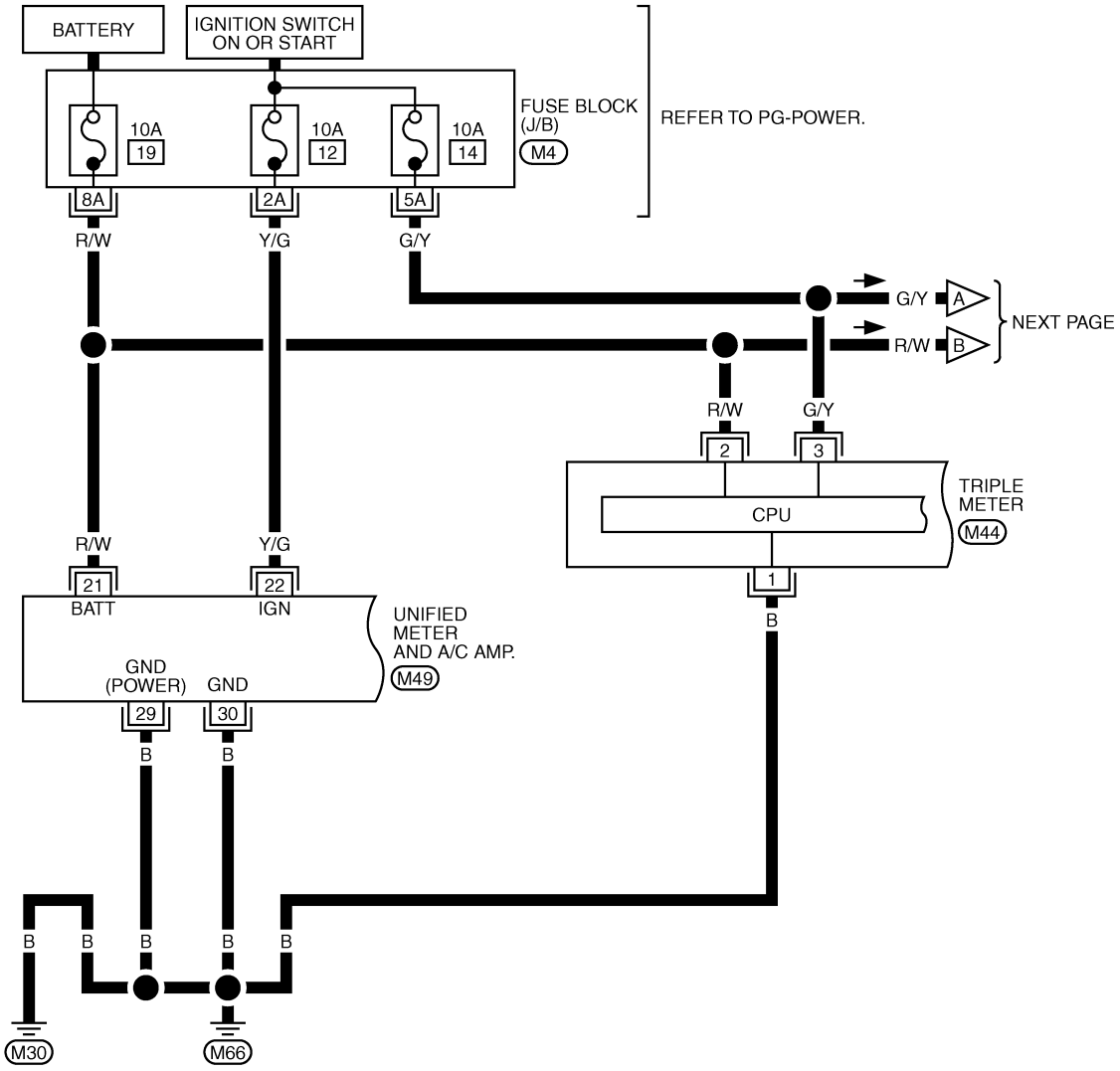
TKWT5726E

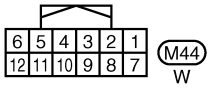
NOTE:
For the further details, refer to descriptions on each system.

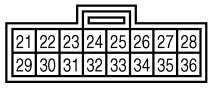
Wiring Diagram — WARN —

NKS004RF

DI-WARN-01



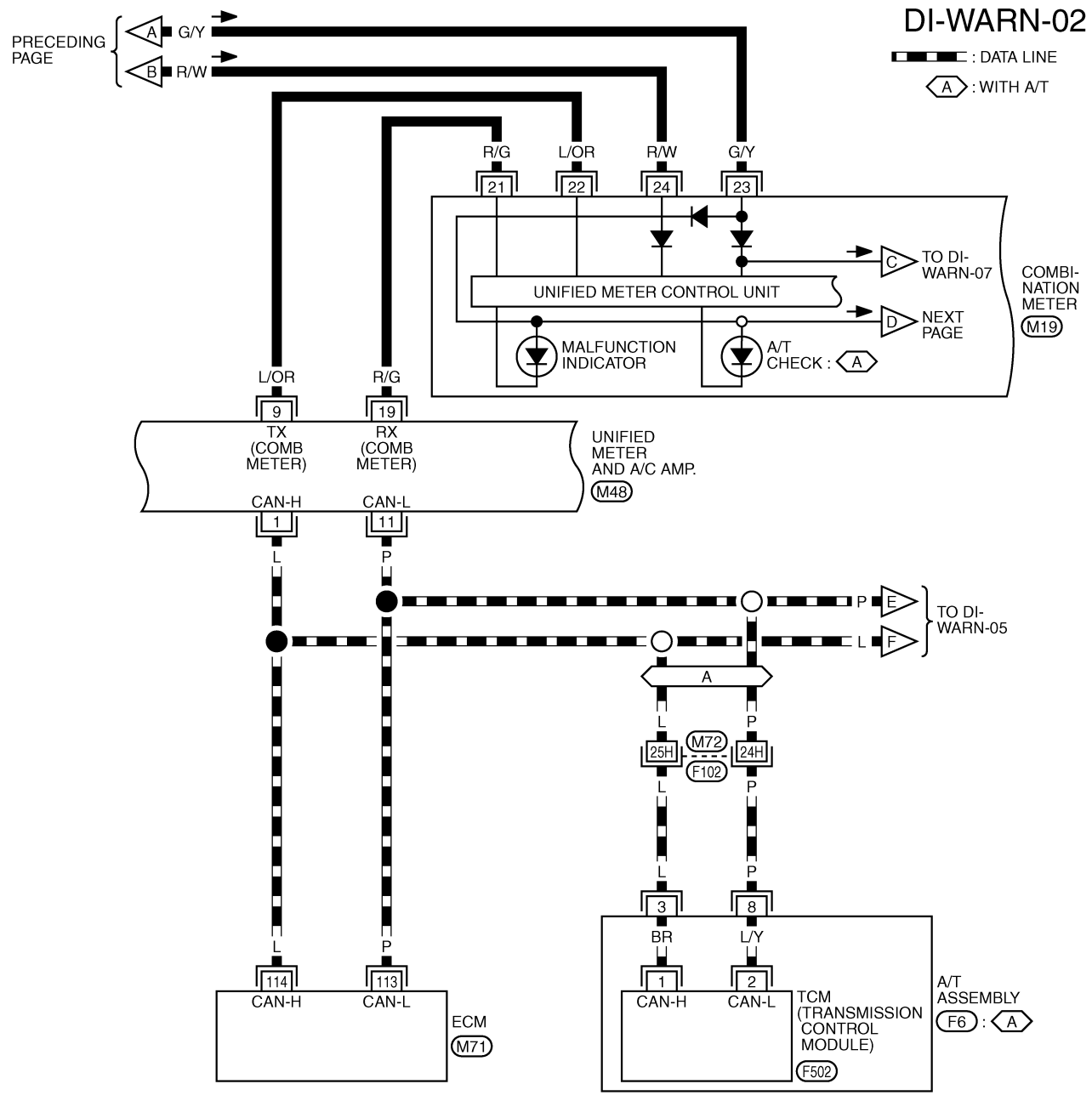


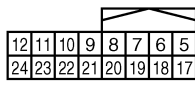


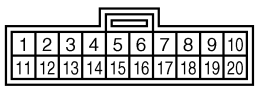


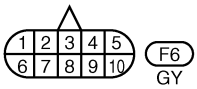
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

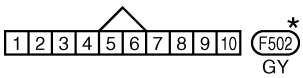
TKWT0485E









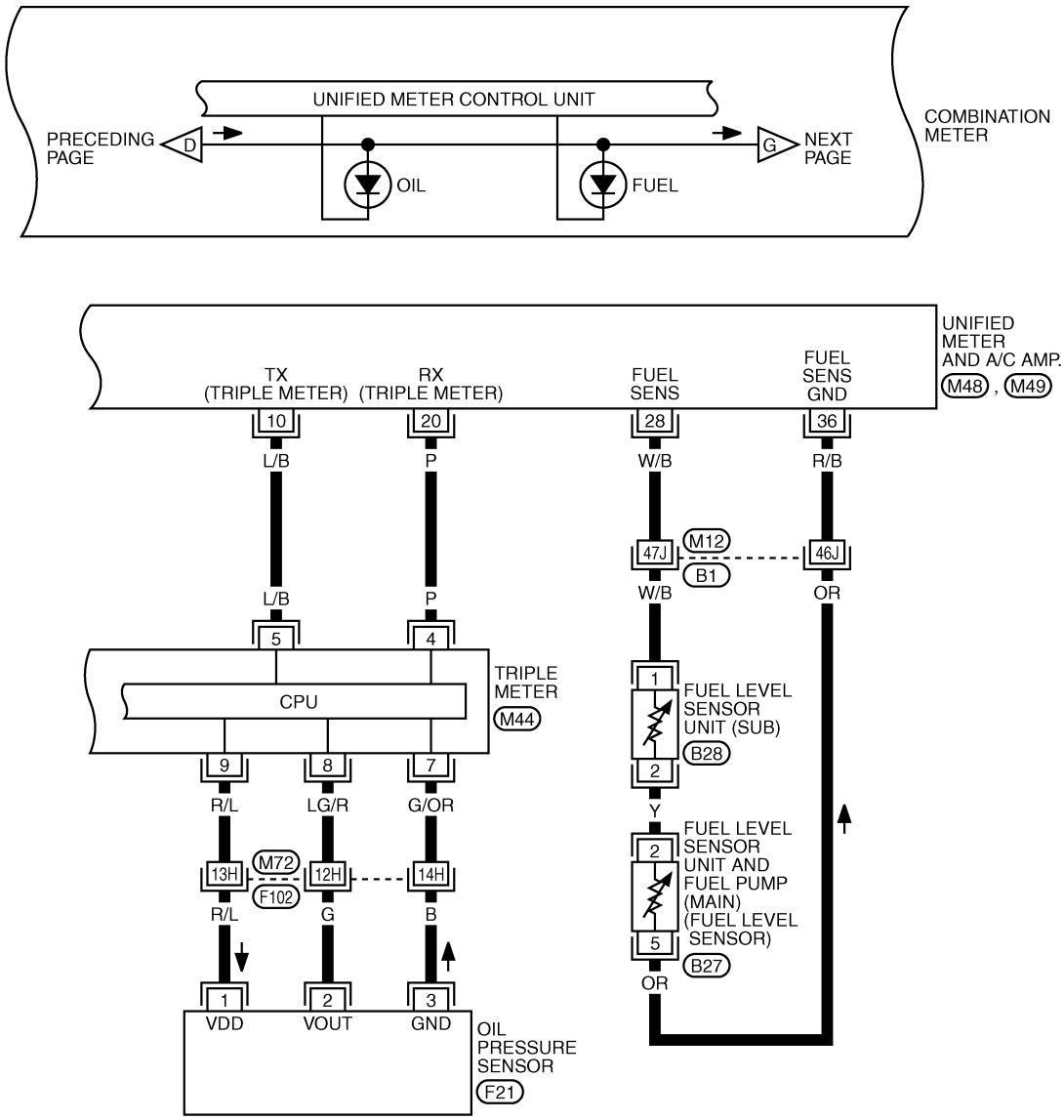


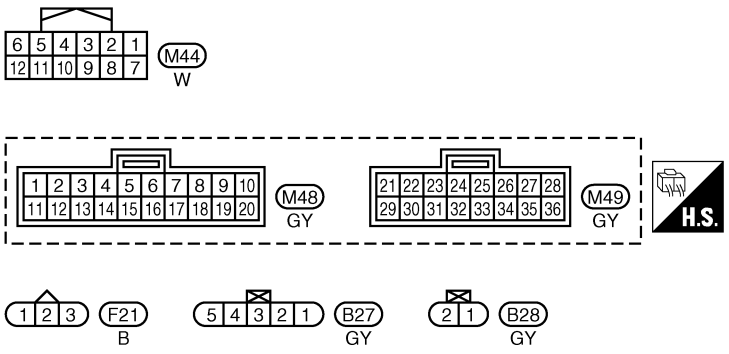
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M71 -ELECTRICAL UNITS

TKWT5727E

DI-WARN-03

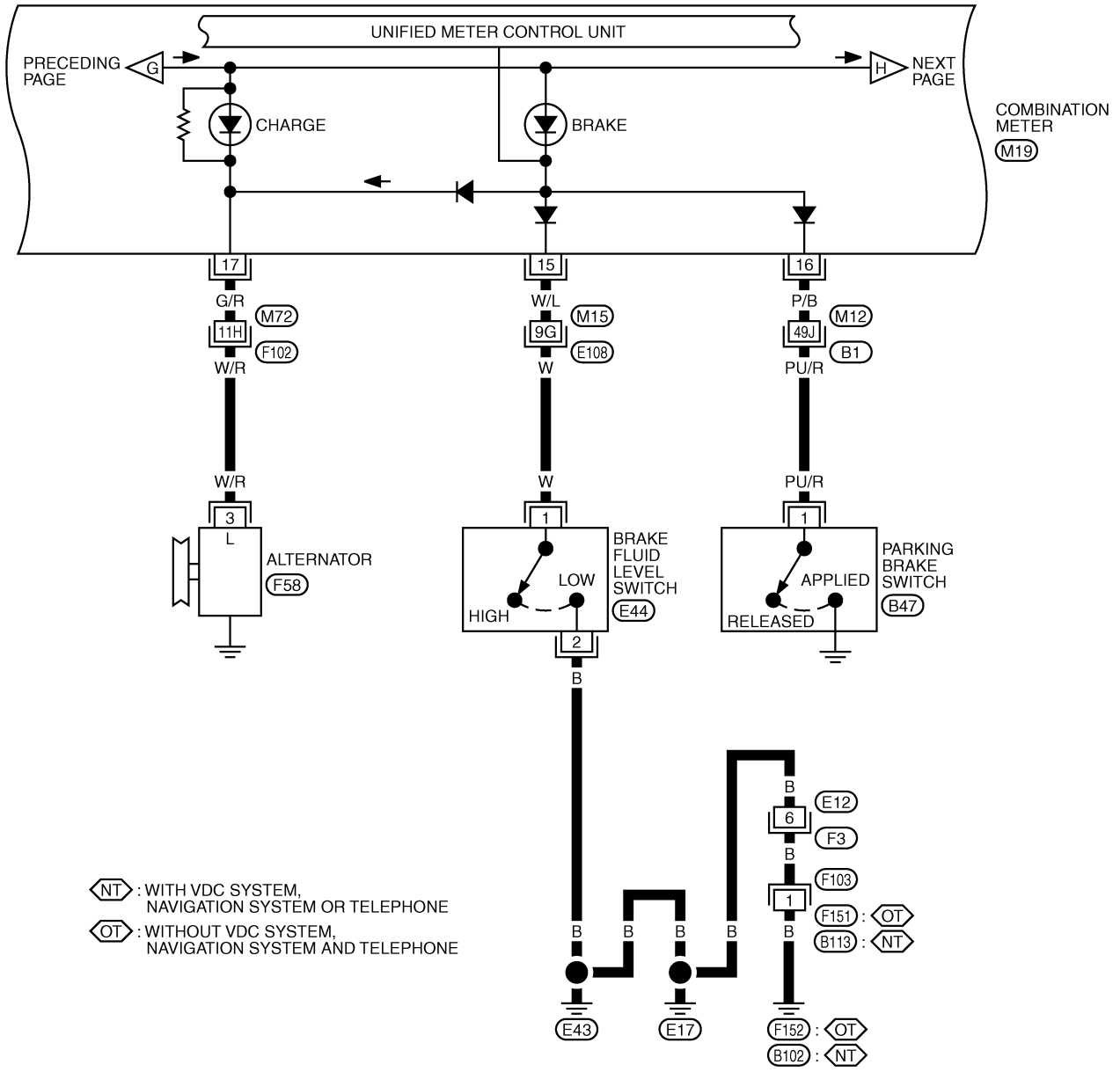


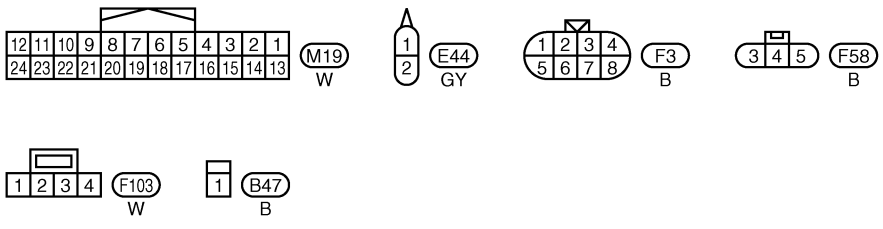


REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5728E

DI-WARN-04



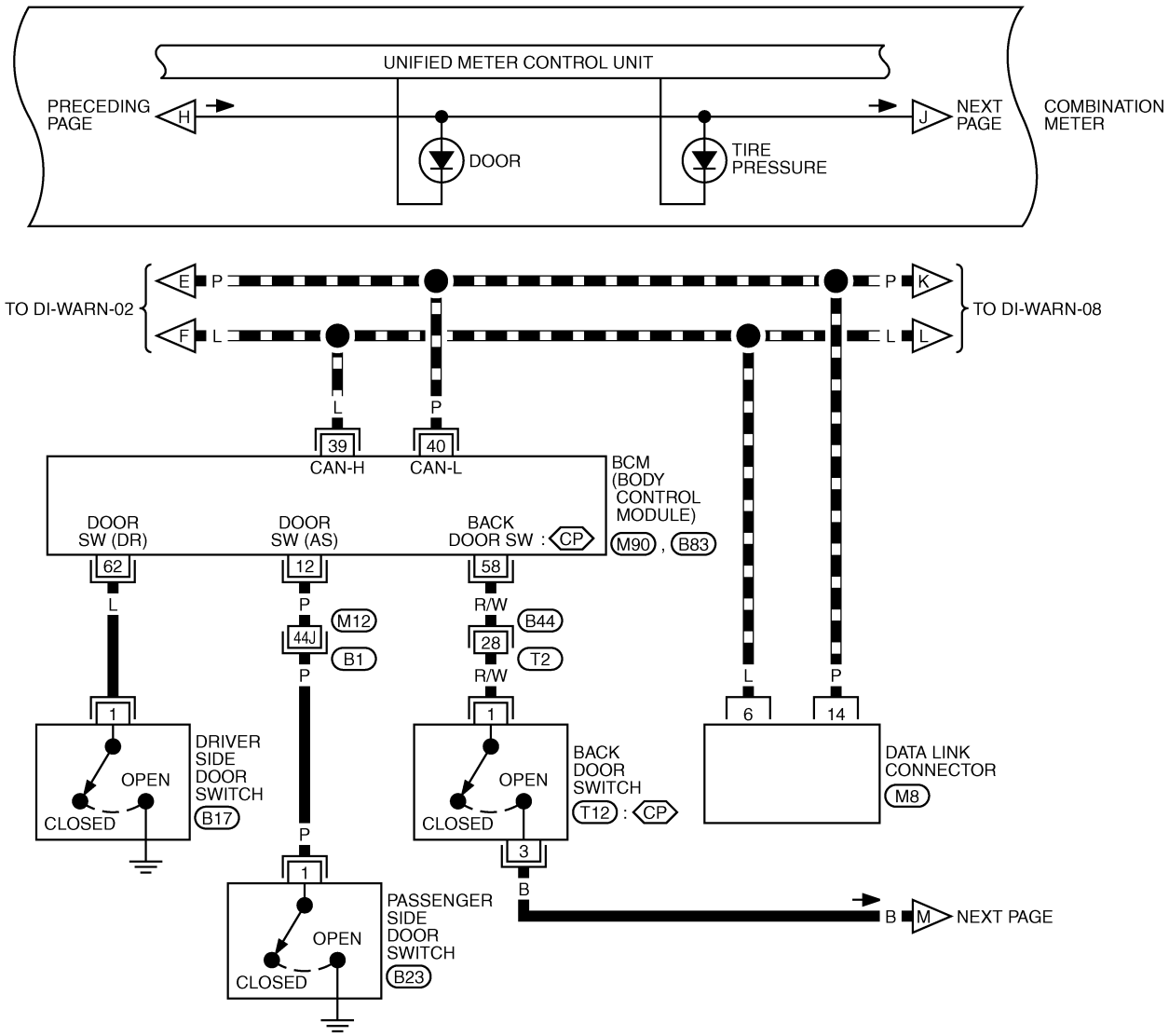


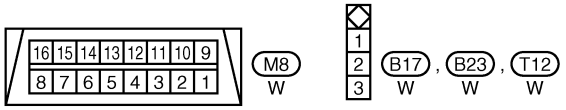
REFER TO THE FOLLOWING.
E108 , F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

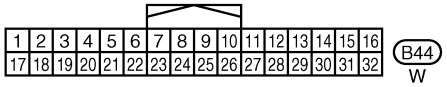
TKWT5729E

DI-WARN-05

: DATA LINE
CP : COUPE MODELS



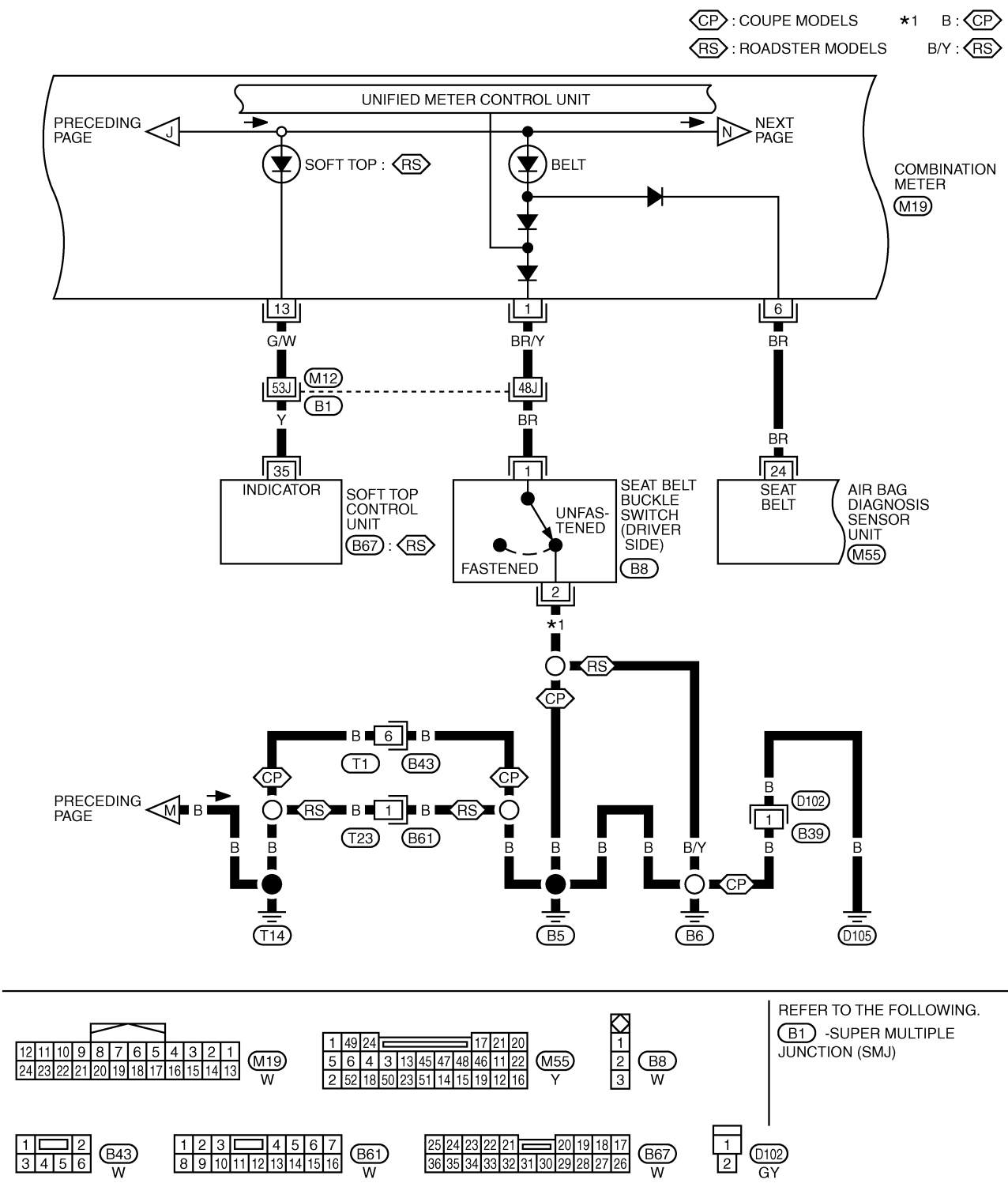




REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

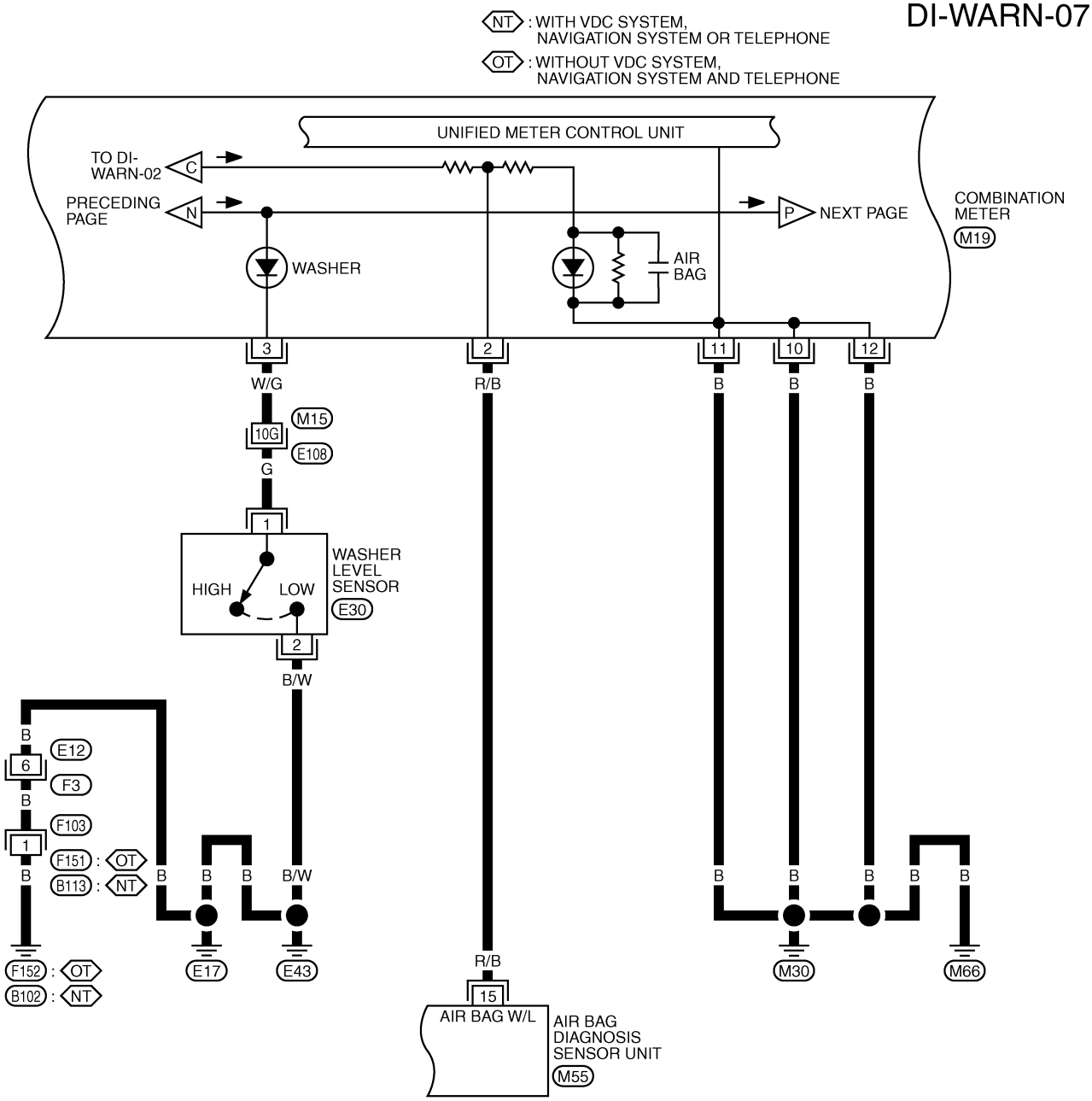
TKWT3995E

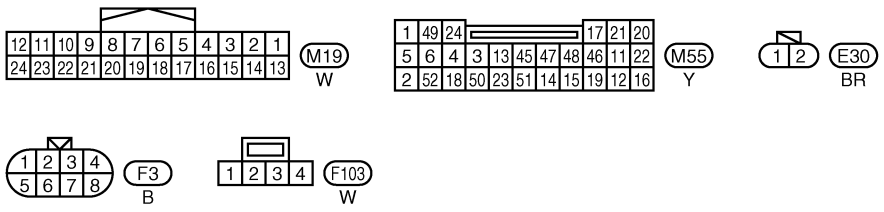
DI-WARN-06



TKWT5730E

DI-WARN-07



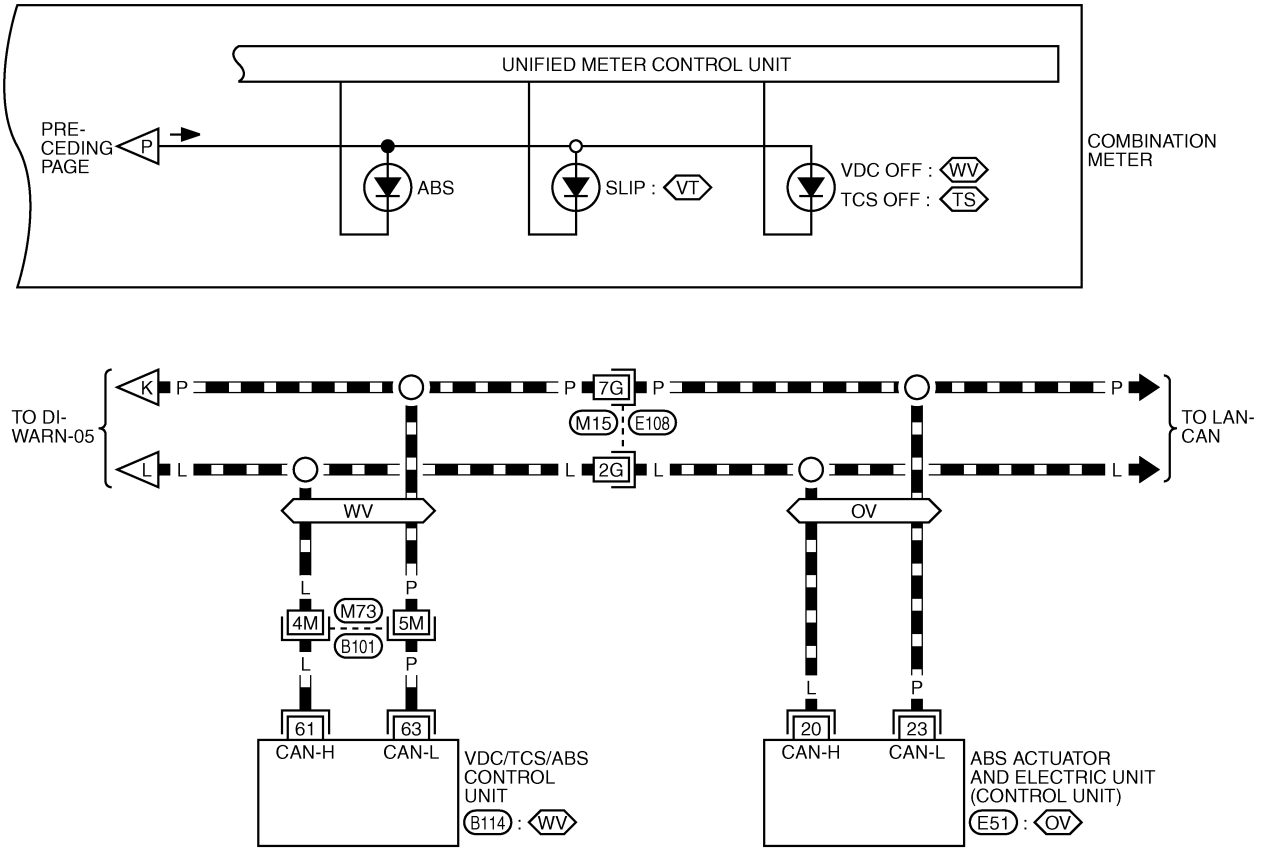


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5731E

DI-WARN-08

: DATA LINE
WV : WITH VDC SYSTEM
OV : WITHOUT VDC SYSTEM
TS : WITH TCS WITHOUT VDC SYSTEM
VT : WITH VDC SYSTEM OR TCS



REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E51 , B114 -ELECTRICAL UNITS

TKWT5612E

CONSULT-III Function (METER A/C AMP)

NKS00079

Refer to DI-15, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

Oil Pressure Warning Lamp Stays Off (Ignition Switch ON) or Stays On (Oil Pressure Is Normal)

NKS0007A

NOTE:
For oil pressure inspection, refer to LU-7, "OIL PRESSURE CHECK" .

1. CHECK OIL PRESSURE GAUGE

Start the engine.

Does oil pressure gauge operate?

YES >> GO TO 2.
NO >> Check oil pressure sensor signal.

2. CHECK COMMUNICATION LINE

Perform self-diagnosis of unified meter and A/C amp. Refer to DI-15, "CONSULT-III Function (METER A/C AMP)" .

Self-diagnostic results

No malfunction detected>>GO TO 3.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

3. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

Select “METER A/C AMP” on CONSULT-III. Operate ignition switch with “OIL W/L” of “DATA MONITOR” and check operation status.

“OIL W/L”	
When ignition switch is in ON position (Engine stopped.)	: ON
When engine running	: OFF

OK or NG

OK >> Replace combination meter.
NG >> Replace triple meter.

A/T INDICATOR

PFP:24814

System Description

NKS00265

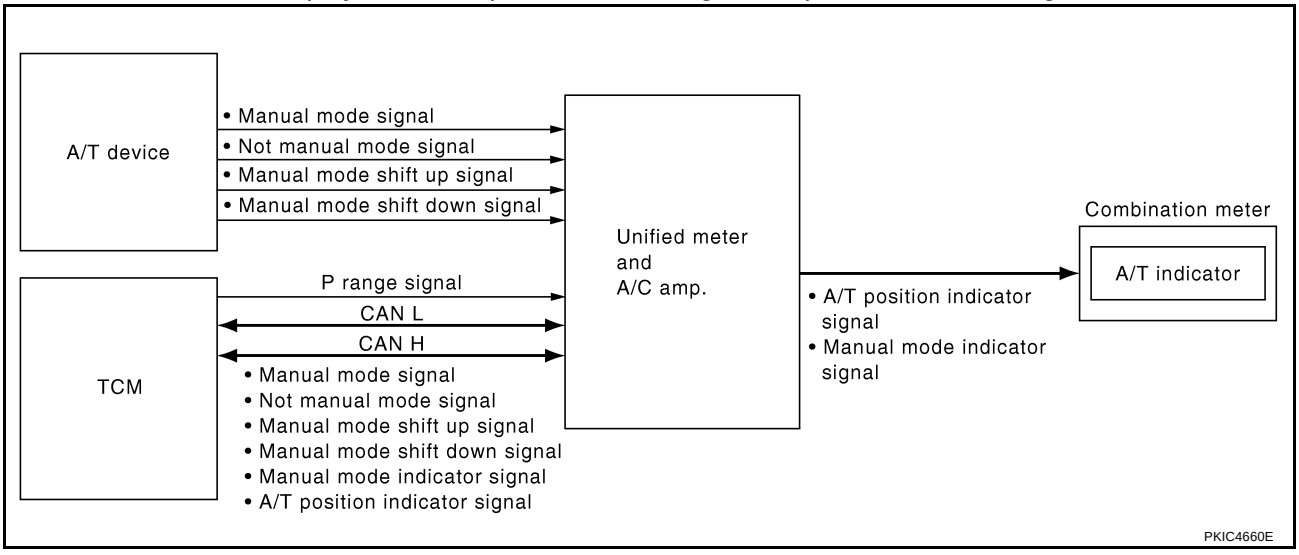
A/T position is displayed in the A/T indicator in the combination meter.

MANUAL MODE

- Unified meter and A/C amp. reads manual mode signal and shift-up/down signal from A/T device, and transmits the signals to TCM with CAN communication.
- TCM processes manual mode signal and shift-up/down signal, and transmits manual mode indicator signal and A/T position indicator signal to unified meter and A/C amp. with CAN communication.
- Unified meter and A/C amp. transmits manual mode indicator signal and A/T position indicator signal to combination meter with the communication line.
- Combination meter displays A/T gear position and manual mode indicator according to A/T position indicator signal and manual mode indication signal.

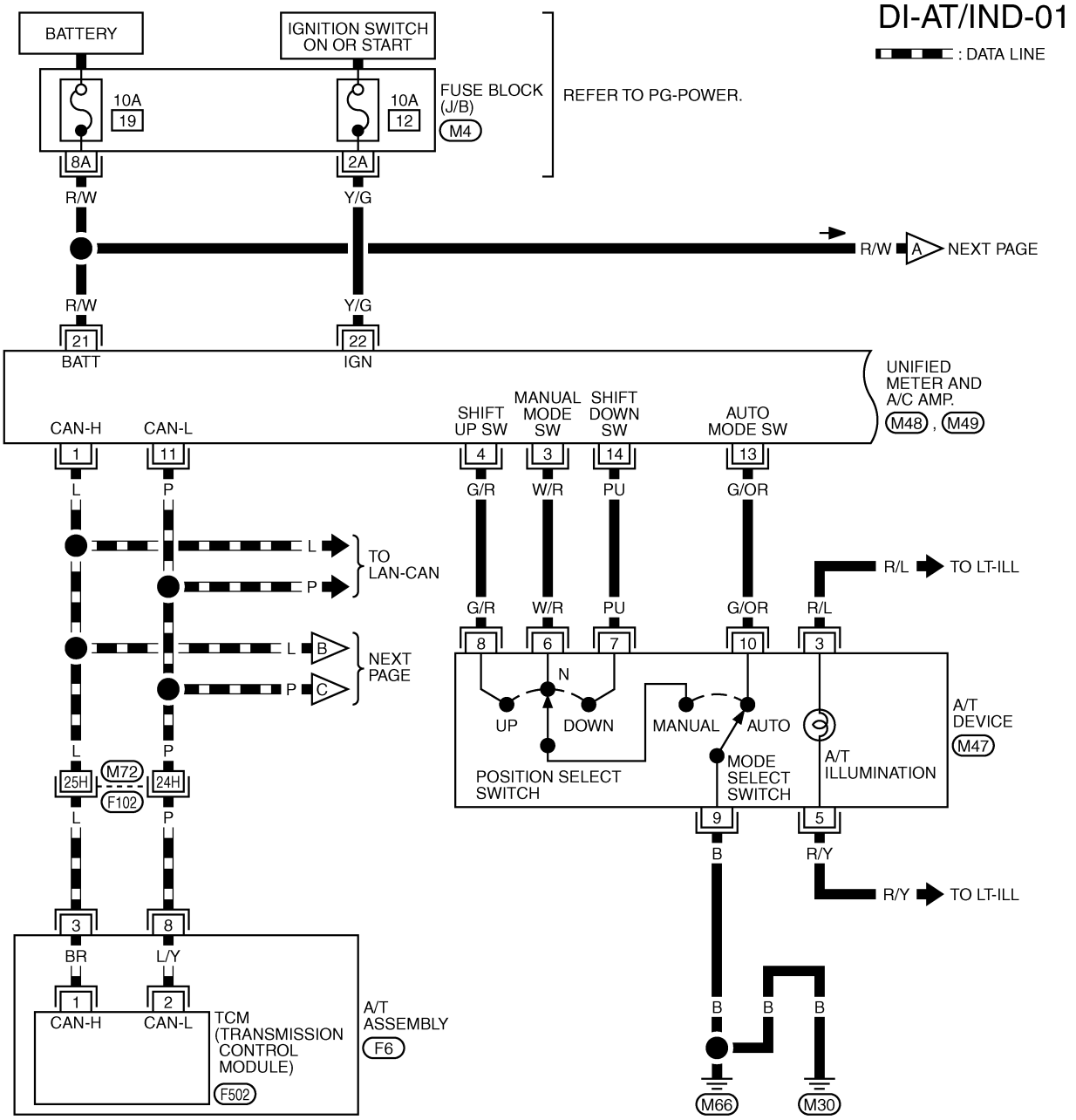
NOT MANUAL MODE

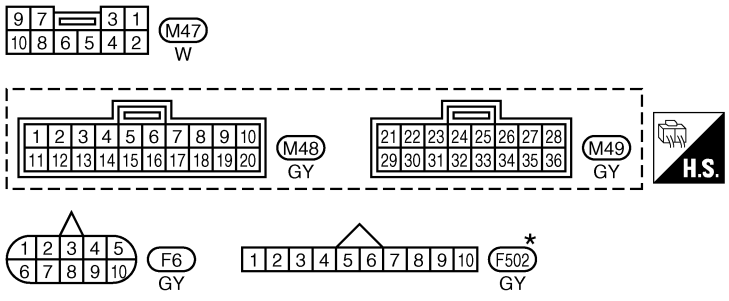
- Unified meter and A/C amp. reads not manual mode signal from A/T device, and transmits the signals to TCM with CAN communication.
- TCM transmits A/T position indicator signal to unified meter and A/C amp. with CAN communication.
- Unified meter and A/C amp. transmits A/T position indicator signal to combination meter with the communication line.
- Combination meter displays A/T shift position according to A/T position indicator signal.



Wiring Diagram — AT/IND —

NKS0007B





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

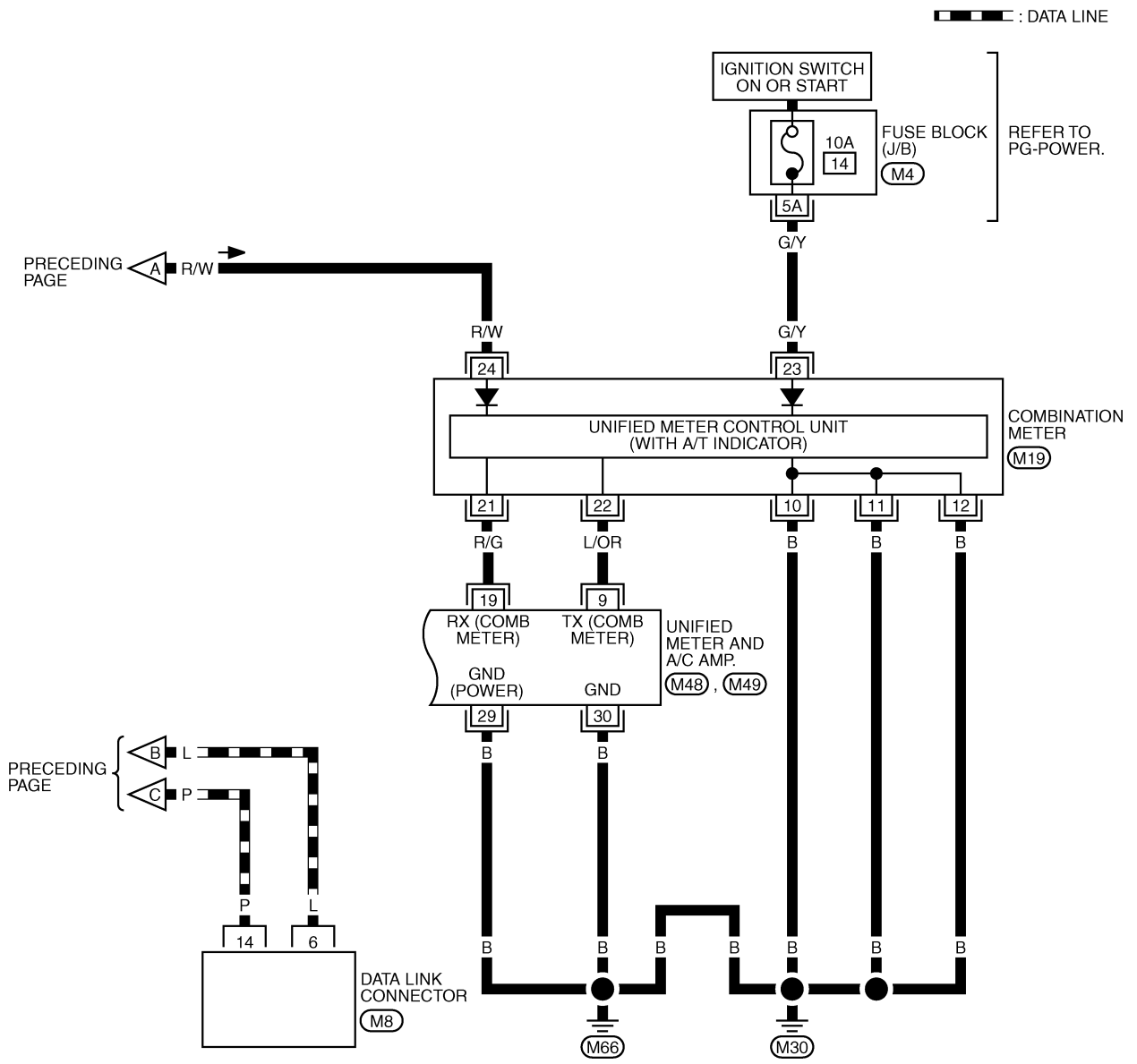
REFER TO THE FOLLOWING.

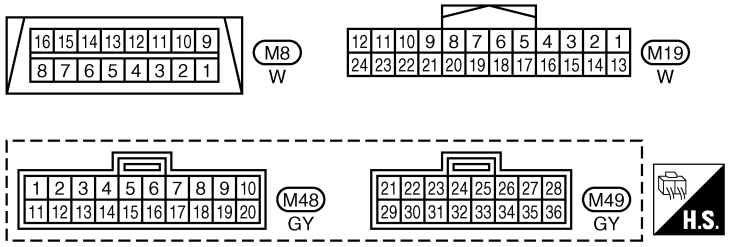
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5732E

DI-AT/IND-02





REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT2309E

CONSULT-III Function (METER A/C AMP)

NKS0007C

Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

A/T Indicator Is Malfunction

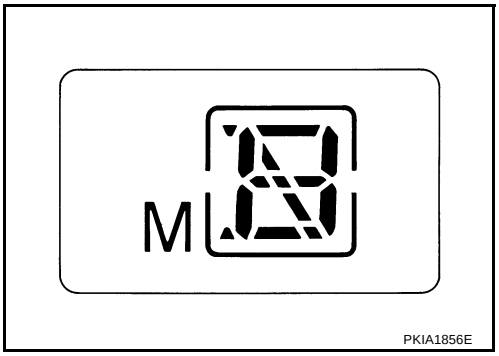
NKS0007D

1. CHECK A/T INDICATOR SEGMENTS

Perform self-diagnosis mode of combination meter. Refer to DI-15, "OPERATION PROCEDURE" .

Are all segments displayed?

YES >> GO TO 2.
NO >> Replace combination meter.



2. CHECK UNIFIED METER AND A/C AMP. (CONSULT-III)

Perform self-diagnosis of unified meter and A/C amp. Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" .

Self-diagnostic results

No malfunction detected>>GO TO 3.
Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

3. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Use “DATA MONITOR” of “METER A/C AMP” on CONSULT-III. Confirm each indication on the monitor when shifting the selector lever.

CONSULT-II display	Selector lever position	Status
AT-M IND	Manual mode range	ON
	Except for manual mode range	OFF
AT-M GEAR	Manual mode range (shift up or down)	5–1
	Except for manual mode range	1
P RANGE IND	P range	ON
	Except for P range	OFF
R RANGE IND	R range	ON
	Except for R range	OFF
N RANGE IND	N range position	ON
	Except for N range	OFF
D RANGE IND	D range position	ON
	Except for D range	OFF

OK or NG

OK >> Replace combination meter.
NG >> GO TO 4.

4. CHECK TCM (CONSULT-III)

Perform TCM self-diagnosis. Refer to AT-84, "CONSULT-III Function (TRANSMISSION)" .

Self-diagnostic results

No malfunction detected>>Replace unified meter and A/C amp.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

WARNING CHIME

PFP:24814

System Description

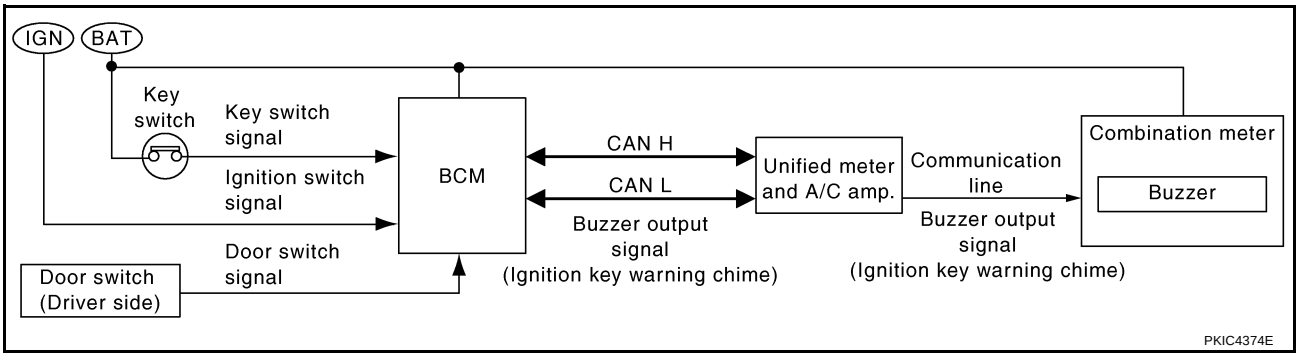
NKS00266

- The buzzer for warning chime system is installed in the combination meter.
- The buzzer sounds when the combination meter receives buzzer output signal from each unit through unified meter and A/C amp.

IGNITION KEY WARNING CHIME

With the key inserted into the key switch, and the ignition switch in OFF or ACC position, when driver's door is open, the ignition key warning chime sounds.

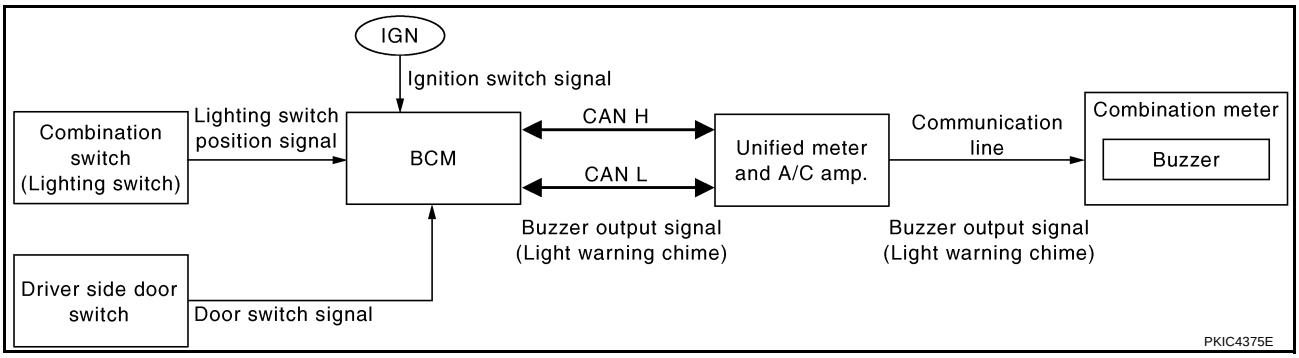
- BCM detects key inserted into the key switch, ignition switch in OFF or ACC position, and driver side door switch ON. And then, BCM transmits buzzer output signal (ignition key warning chime) to unified meter and A/C amp. with CAN communication.
- Unified meter and A/C amp. transmits buzzer output signal (ignition key warning chime) to combination meter with communication line.
- When combination meter receives buzzer output signal (ignition key warning chime), it sounds the buzzer.



LIGHT WARNING CHIME

With ignition switch in OFF or ACC position, drivers door open, and lighting switch in 1ST or 2ND position, the light warning chime will sounds.

- BCM detects ignition switch in OFF or ACC position, driver side door switch ON, and lighting switch in 1ST or 2ND position. And then, BCM transmits buzzer output signal (light warning chime) to unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. transmits buzzer output signal (light warning chime) to combination meter with communication line.
- When combination meter receives buzzer output signal (light warning chime), it sounds the buzzer.



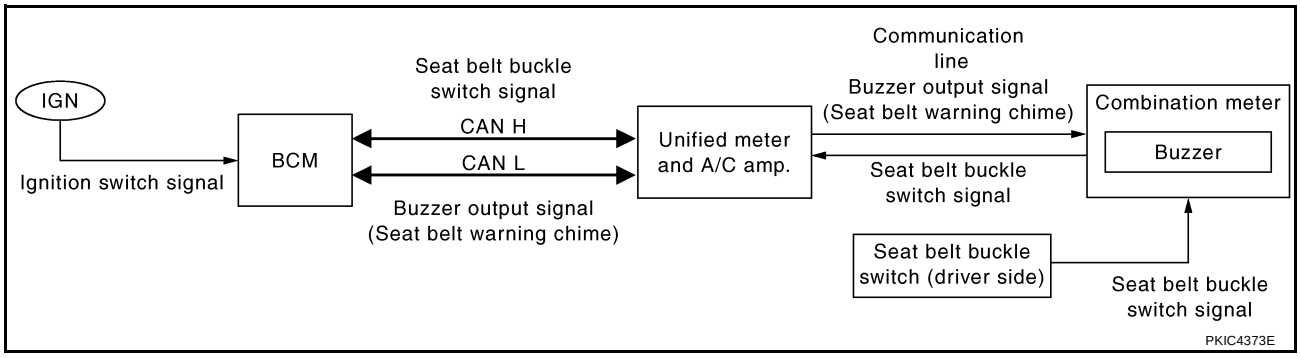
NOTE:

For further details of combination switch, refer to LT-87, "Combination Switch Reading Function" .

SEAT BELT WARNING CHIME

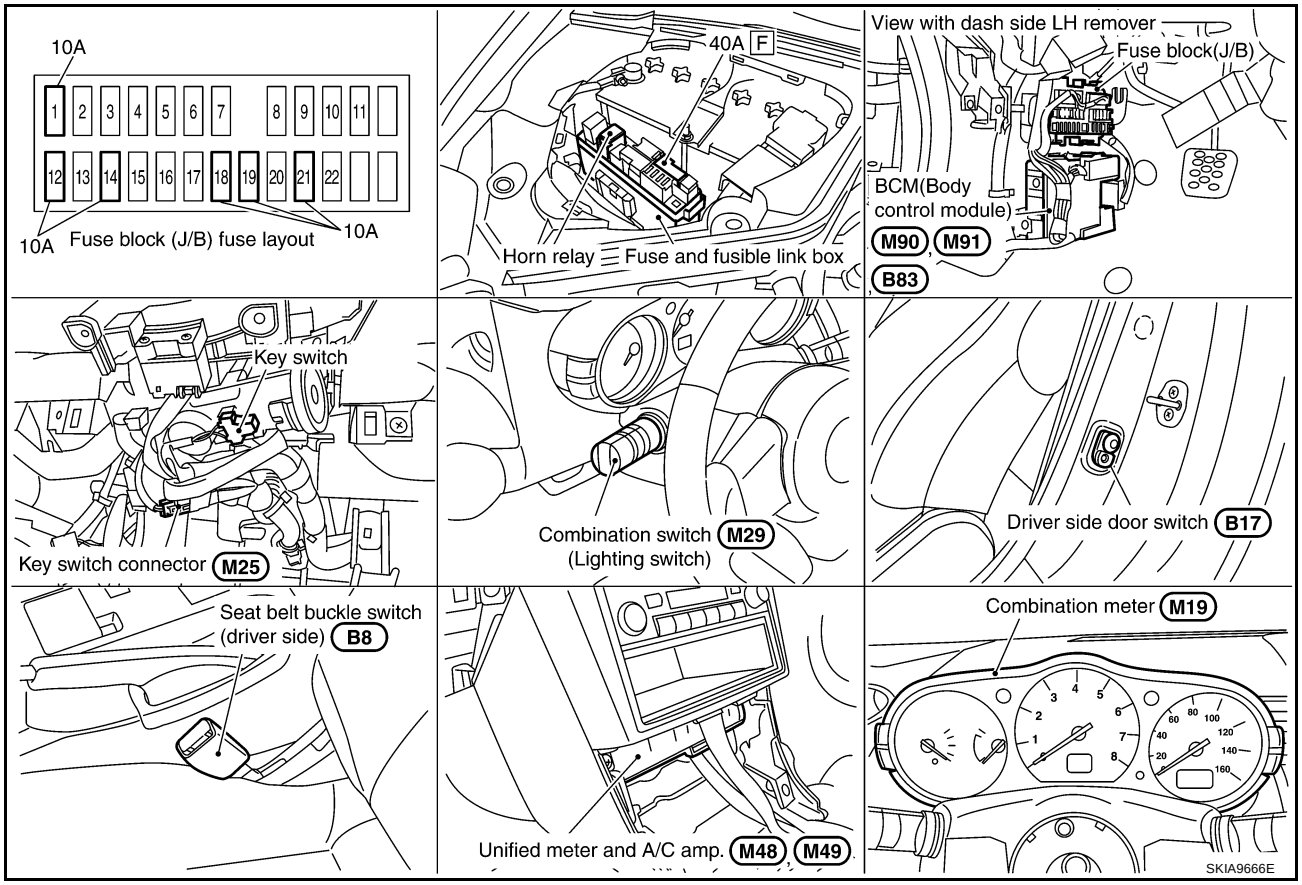
With ignition switch turned ON and driver seat belt unfastened, seat belt warning chime sounds for approximately 6 seconds.

- Combination meter reads a ON/OFF signal from seat belt buckle switch, and transmits seat belt buckle switch signal to unified meter and A/C amp. with communication line.
- BCM receives seat belt buckle switch signal (driver side) from unified meter and A/C amp. with CAN communication line.
- BCM detects ignition switch turned ON and seat belt buckle switch (driver side) ON. And then, BCM transmits buzzer output signal (seat belt warning chime) to unified meter and A/C amp. with CAN communication.
- Unified meter and A/C amp. transmits buzzer output signal (seat belt warning chime) to combination meter with communication line.
- When combination meter receives buzzer output signal (seat belt warning chime), it sounds the buzzer.



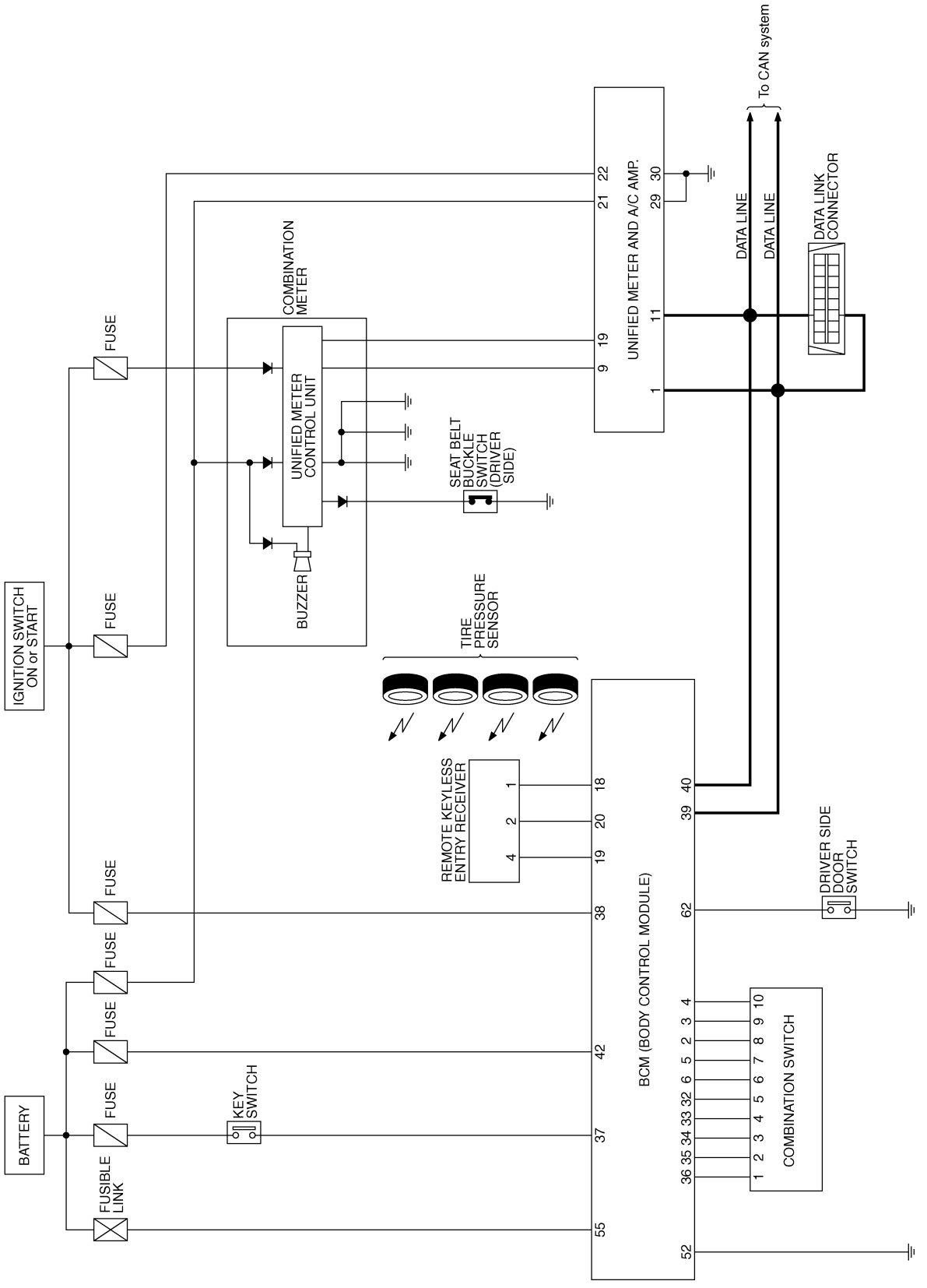
Component Parts and Harness Connector Location

NKS0007F



Schematic

NKS0007I

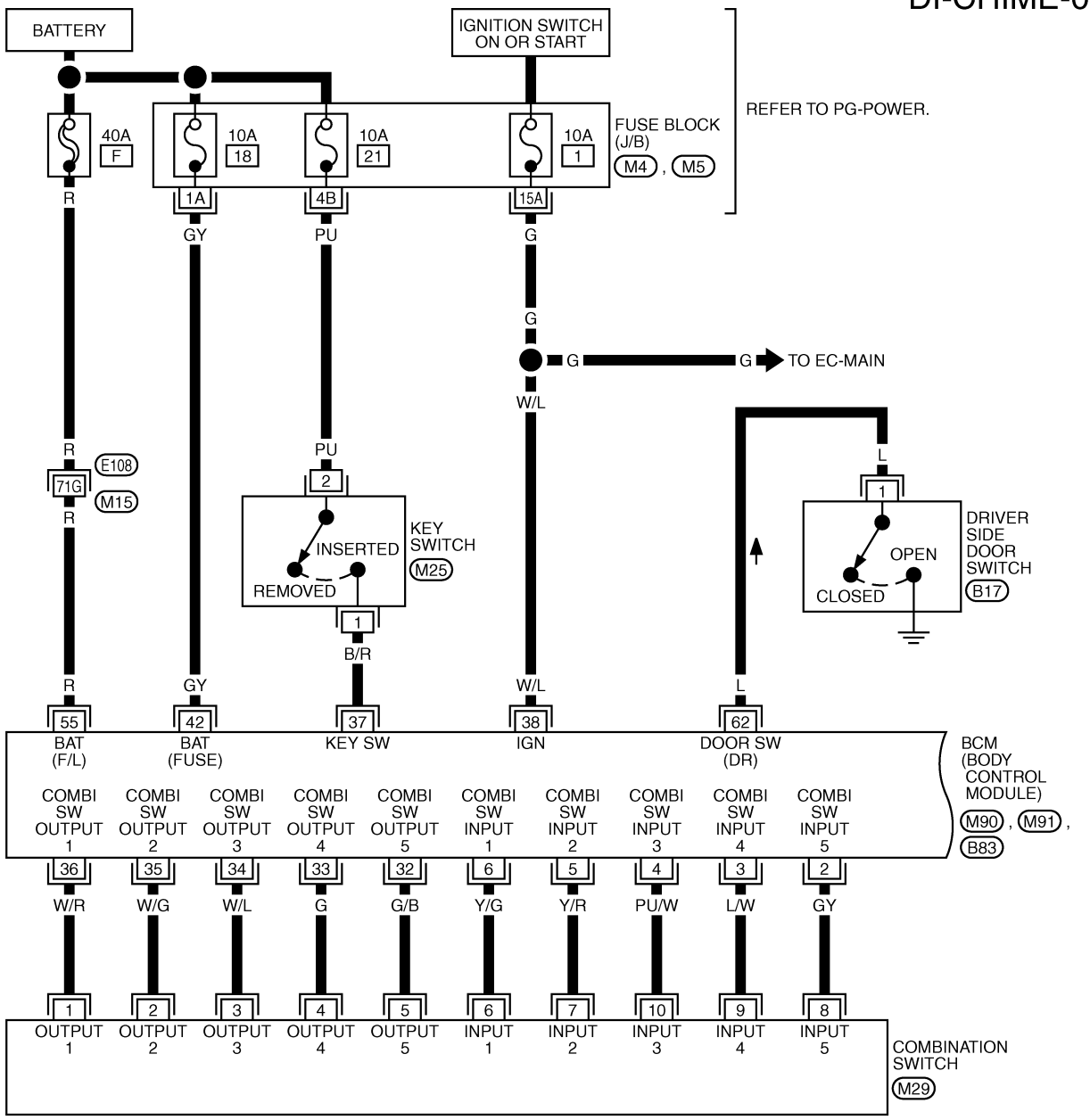


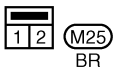
TKWT2310E

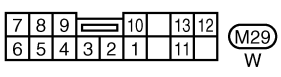
Wiring Diagram — CHIME —

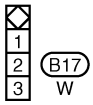
NKS004RG

DI-CHIME-01









REFER TO THE FOLLOWING.

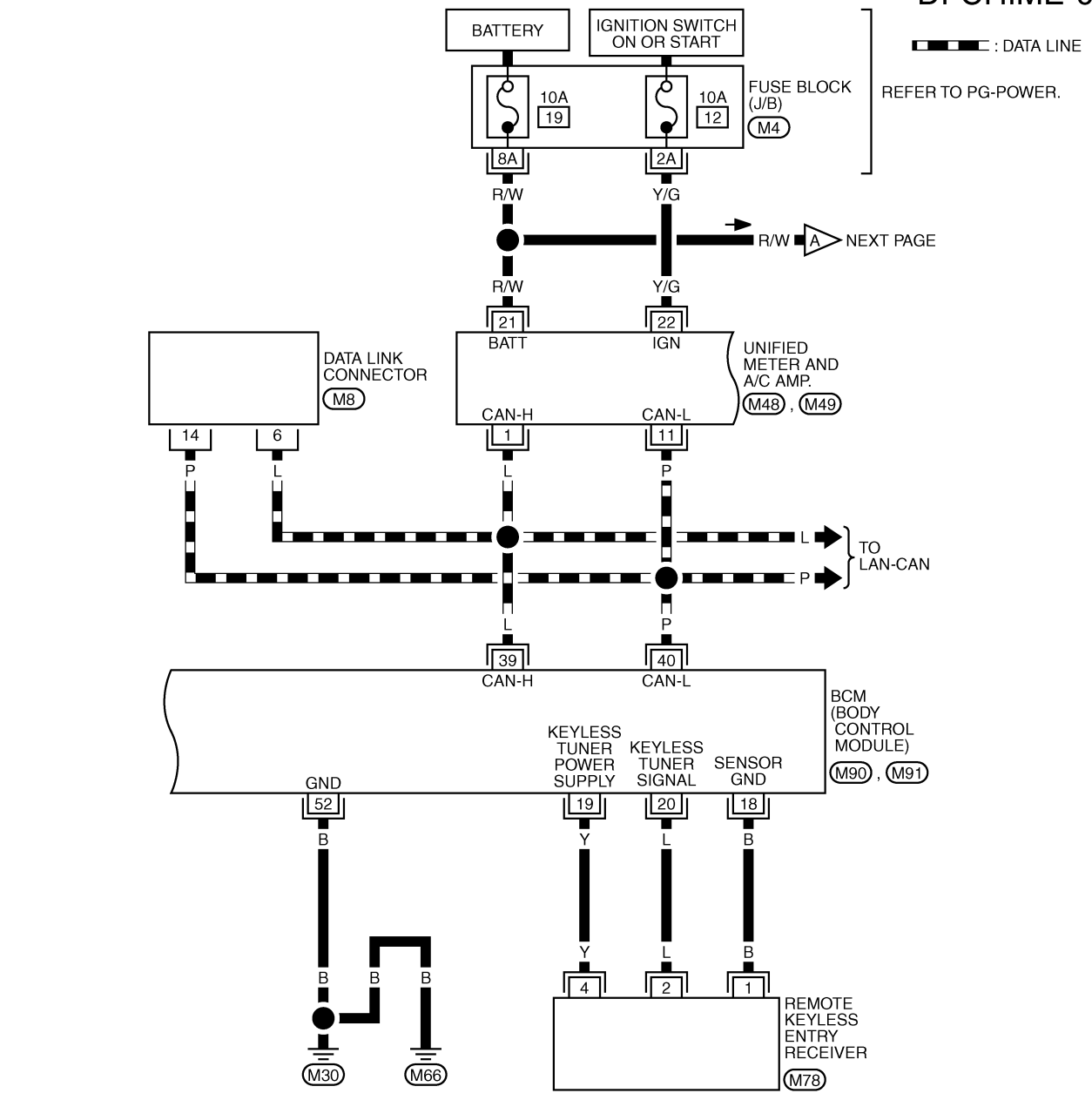
E108 -SUPER MULTIPLE JUNCTION (SMJ)

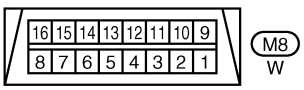
M4, M5 -FUSE BLOCK-JUNCTION BOX (J/B)

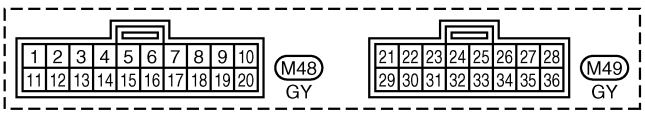
M90, M91, B83 -ELECTRICAL UNITS

TKWT5733E

DI-CHIME-02



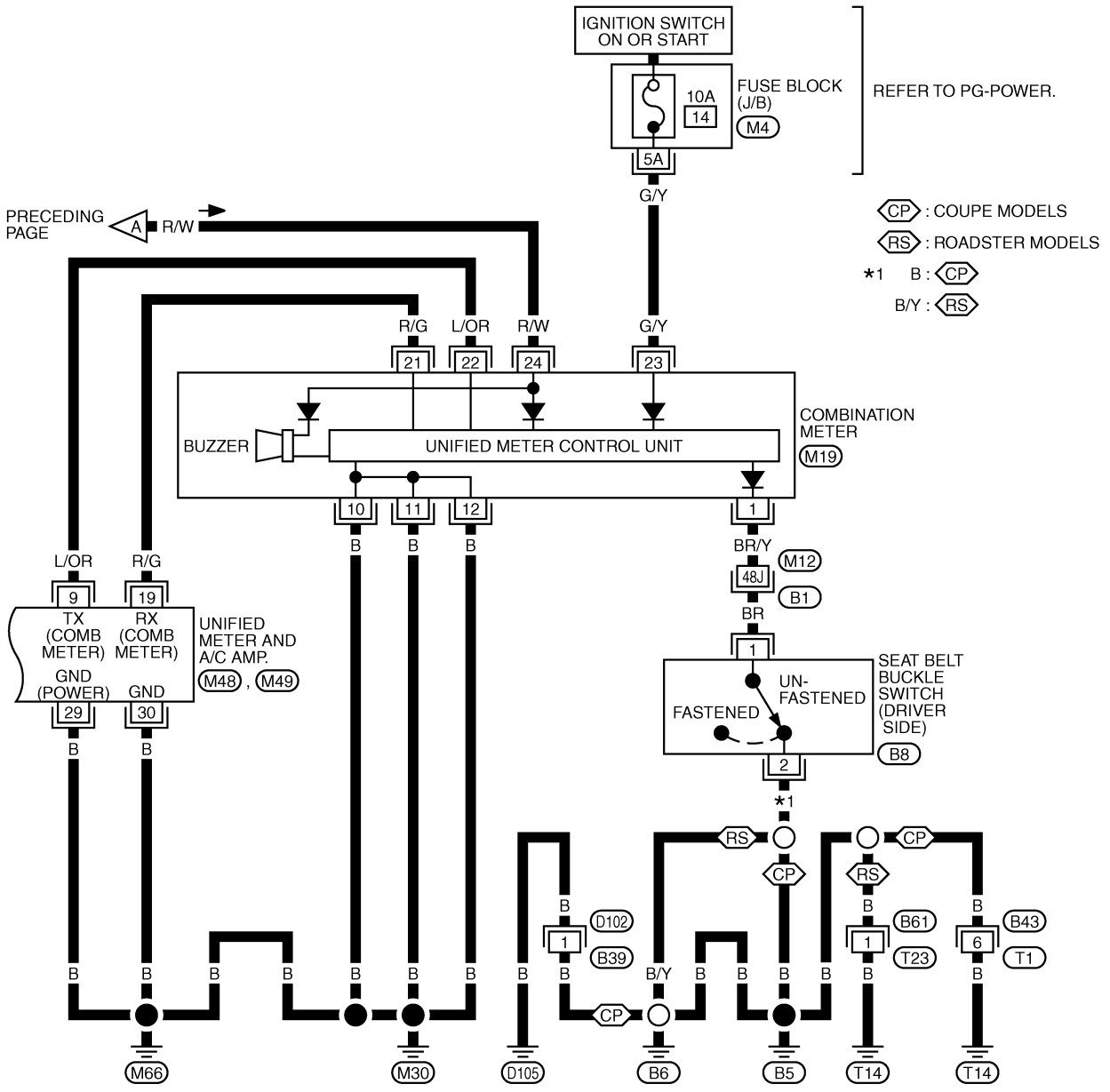


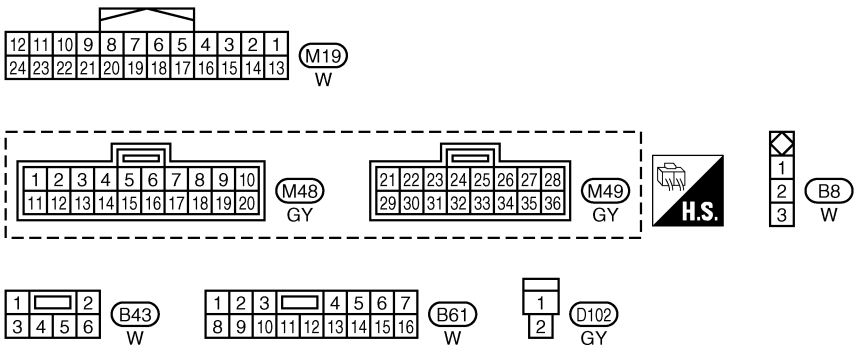


REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91 -ELECTRICAL UNITS

TKWT2312E

DI-CHIME-03





REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

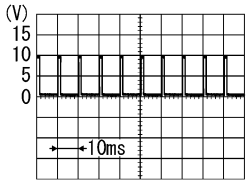
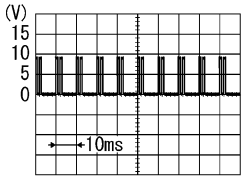
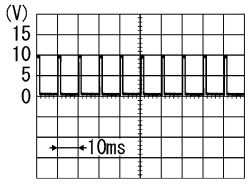
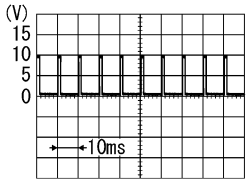
TKWT5734E

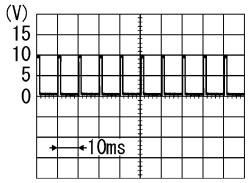
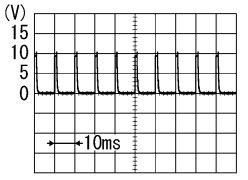
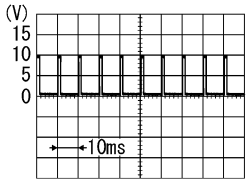
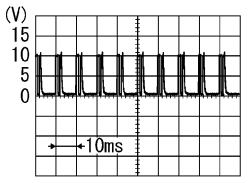
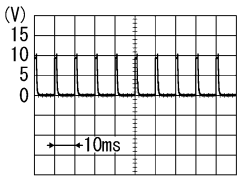
Terminals and Reference Value for BCM

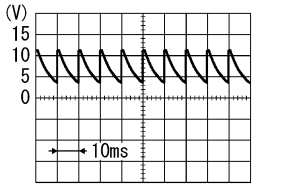
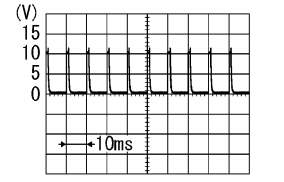
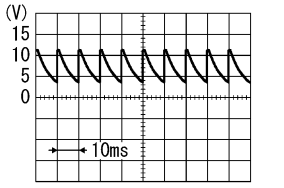
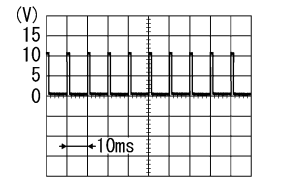
NKS0007K

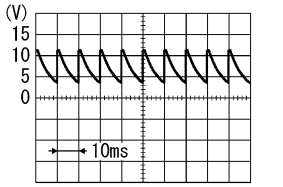
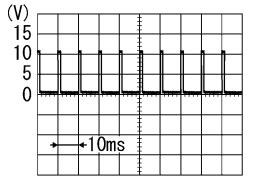
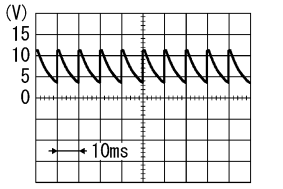
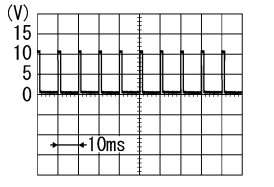
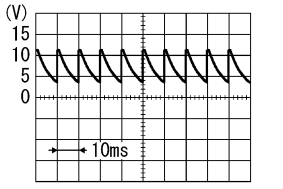
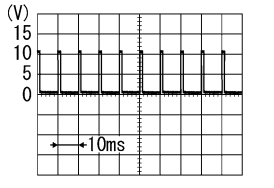
CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value (Approx.)
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch) ● Turn signal switch to right	 PKIB4959J 1.0 V
					Lighting switch 2ND	 PKIB4953J 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch) ● Turn signal switch to left	 PKIB4959J 1.0 V
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	0 V
					Any of the conditions below ● Front wiper switch MIST ● Front wiper switch INT ● Front wiper switch LO	 PKIB4959J 1.0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value (Approx.)
			Ignition switch	Operation or condition		
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	0 V
					Any of the conditions below ● Front washer switch ● Rear washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4959J 1.0 V
					Rear wiper switch ON (Wiper intermittent dial position 4)	 PKIB4955J 0.8 v
6	Y/G	Combination switch input 1	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	0 V
					Any of the conditions below ● Front wiper switch HI ● Rear wiper switch INT ● Wiper intermittent dial position 3	 PKIB4959J 1.0 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2	 PKIB4952J 1.7 V
					Any of the conditions below ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4955J 0.8 V

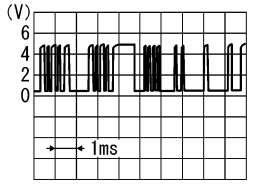
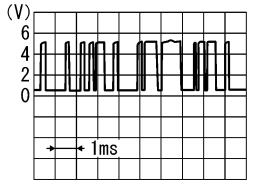
Terminal No.	Wire color	Signal name	Measuring condition			Reference value (Approx.)
			Ignition switch	Operation or condition		
18	B	Remote keyless entry receiver (Ground)	—	—		Refer to WT-20, "Control Unit Input/Output Signal Standard" .
19	Y	Remote keyless entry receiver (Power supply)				
20	L	Remote keyless entry receiver (Signal)				
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4956J 1.0 V
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J 7.2 V
					Any of the conditions below ● Lighting switch 1ST (The same result with lighting switch 2ND) ● Rear wiper switch INT ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4958J 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value (Approx.)
			Ignition switch	Operation or condition		
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch) ● Rear washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 3	 PKIB4958J 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch) ● Front wiper switch INT ● Front wiper switch HI	 PKIB4958J 1.2 V
36	W/R	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J 7.2 V
					Any of the conditions below ● Turn signal switch to right ● Turn signal switch to left ● Front wiper switch MIST ● Front wiper switch LO ● Front washer switch	 PKIB4958J 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
37	B/R	Key switch signal	OFF	Key is removed.	0 V
				Key is inserted.	12 V
38	W/L	Ignition power supply	ON	—	Battery voltage
39	L	CAN-H	—	—	—
40	P	CAN-L	—	—	—
42	GY	Battery power supply (FUSE)	OFF	—	Battery voltage
52	B	Ground	ON	—	0 V
55	R	Battery power supply (F/L)	OFF	—	Battery voltage
62	L	Driver side door switch signal	OFF	Door switch is released. (Door switch ON)	0 V
				Door switch is pressed. (Door switch OFF)	5 V

Terminals and Reference Value for Unified Meter and A/C Amp.

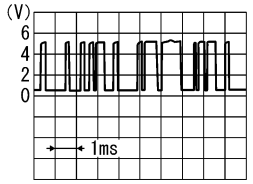
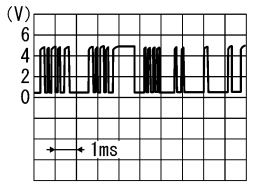
NKS0007L

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	L	CAN-H	OFF	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
11	P	CAN-L	OFF	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition power supply	ON	—	Battery voltage
29	B	Ground (POWER)	ON	—	0 V
30	B	Ground	ON	—	0 V

Terminals and Reference Value for Combination Meter

NKS0007M

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	BR/Y	Seat belt buckle switch (Driver side)	ON	Seat belt is unfastened.	0 V
				Seat belt is fastened.	5 V

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
10	B	Ground	ON	—	0 V
11					
12					
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition power supply	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

CONSULT-III Function (METER A/C AMP)

NKS0007O

Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

CONSULT-III Function (BCM)

NKS0007P

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

DIAGNOSTIC ITEMS DESCRIPTION

System	Test item	Diagnosis mode	Description
BCM	BCM	SELF-DIAG RESULT	BCM performs self-diagnosis of CAN communication.
	BUZZER	DATA MONITOR	The input data to the BCM control unit is displayed in real time.
		ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

DATA MONITOR

Display Item List

Monitor item [Unit]		ALL SIGNALS	SELECTION FROM MENU	Contents
IGN ON SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of ignition switch.
KEY ON SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of key switch.
DOOR SW-DR	[ON/OFF]	X	X	Indicates [ON/OFF] condition of driver side door switch.
LIGHT SW 1ST	[ON/OFF]	X	X	Indicates [ON/OFF] condition of lighting switch.
BUCKLE SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of seat belt switch.

ACTIVE TEST

Display Item List

Test item	Malfunction is detected when…
LIGHT WARN ALM	This test is able to check light warning chime operation.
IGN KEY WARN ALM	This test is able to check ignition key warning chime operation.
SEAT BELT WARN ALM	This test is able to check seat belt warning chime operation.

SELF-DIAGNOSTIC RESULTS

Display Item List

Display item [Code]	Malfunction is detected when…
CAN communication [U1000]	Malfunction is detected in CAN communication.

NOTE:
If “CAN communication [U1000]” is indicated, after printing the monitor item, go to “CAN system”. Refer to LAN-48, "CAN System Specification Chart" .

Trouble Diagnosis

NKS00267

HOW TO PERFORM TROUBLE DIAGNOSIS

1. Confirm the symptom and customer complaint.
2. Understand the outline of system. Refer to DI-71, "System Description" .
3. Perform the preliminary inspection. Refer to DI-84, "PRELIMINARY INSPECTION" .
4. Referring to trouble diagnosis chart, make sure the cause of the malfunction and repair or replace applicable parts. Refer to DI-84, "Symptom Chart" .
5. Does warning chime system operate normally? If yes, GO TO 6. If no, GO TO 4.
6. INSPECTION END

PRELIMINARY INSPECTION

1. CHECK BCM (CONSULT-III)

Perform self-diagnosis of BCM. Refer to BCS-15, "CONSULT-III Function (BCM)" .

Self-diagnostic results

No malfunction detected>> GO TO 2.
Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

2. CHECK UNIFIED METER AND A/C AMP. (CONSULT-III)

Perform self-diagnosis of unified meter and A/C amp. Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" .

Self-diagnostic results

No malfunction detected>> INSPECTION END
Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

Symptom Chart

NKS00268

Symptom	Diagnoses/Service procedure
All warning chimes do not activate.	Perform the following inspections. 1. DI-84, "Power Supply and Ground Circuit Inspection". 2. DI-85, "Meter Buzzer Circuit Inspection". Replace BCM, found normal function in the above inspections.
Ignition key warning chime does not activate.	Perform the following inspections. 1. DI-87, "Key Switch Signal Inspection". 2. DI-86, "Driver Side Door Switch Signal Inspection". Replace BCM, found normal function in the above inspection.
Light warning chime does not activate.	Perform the following inspections. 1. DI-88, "Lighting Switch Signal Inspection". 2. DI-86, "Driver Side Door Switch Signal Inspection". Replace BCM, found normal function in the above inspection.
Seat belt warning chime does not activate.	Perform DI-88, "Seat Belt Buckle Switch (Driver Side) Signal Inspection" . Replace BCM, found normal function in the above inspection.

Power Supply and Ground Circuit Inspection

NKS00269

1. CHECK FUSE AND FUSIBLE LINK

Check for blown BCM fuse and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START	1

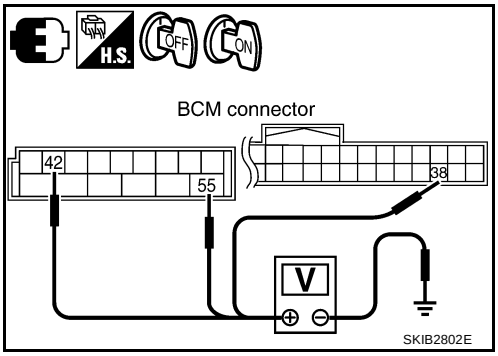
OK or NG

OK >> GO TO 2.
NG >> Be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position	
(+)		(–)	OFF	ON
Connector	Terminal (Wire color)			
M91	42	Ground	Battery voltage	Battery voltage
	55			
M90	38		0 V	Battery voltage



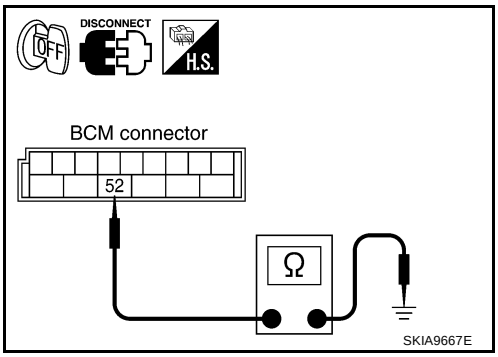
OK or NG

OK >> GO TO 3.
NG >> Repair harness between BCM and fuse.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM harness connector M91 terminal 52 and ground.

52 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Meter Buzzer Circuit Inspection

NKS0026F

1. CHECK OPERATION OF METER BUZZER

1. Select “BUZZER” of “BCM” on CONSULT-III.
2. Perform “LIGHT WARN ALM”, “IGN KEY WARN ALM” or “SEAT BELT WARN ALM” of “ACTIVE TEST”.

Does meter buzzer beep?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “METER A/C AMP” on CONSULT-III.
2. With “DATA MONITOR”, confirm “BUZZER” under the condition of buzzer input. (Seat belt warning chime, turn signal lamp operate, etc.)

“BUZZER”
Under the condition of buzzer input : ON
Except above : OFF

OK or NG

OK >> Replace combination meter.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

3. CHECK BATTERY POWER SUPPLY OF COMBINATION METER

Check battery power supply of combination meter. Refer to DI-17, "Power Supply and Ground Circuit Inspection" in combination meter.

OK or NG

OK >> GO TO 4.
NG >> Repair battery power supply circuit of combination meter.

4. CHECK BATTERY POWER SUPPLY OF UNIFIED METER AND A/C AMP.

Check battery power supply of unified meter and A/C amp. Refer to DI-49, "Power Supply and Ground Circuit Inspection" in unified meter and A/C amp.

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair battery power supply circuit of unified meter and A/C amp.

Driver Side Door Switch Signal Inspection

NKS0026A

1. CHECK BCM INPUT SIGNAL

With CONSULT-III

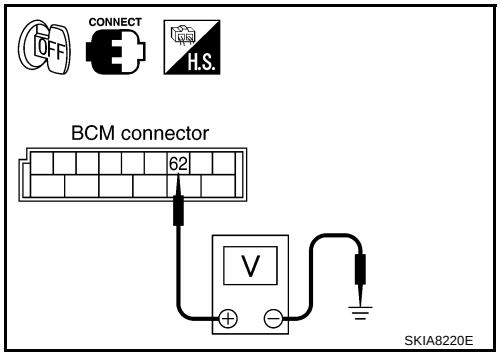
1. Select “BCM”.
2. With “DATA MONITOR” of “BUZZER”, confirm “DOOR SW-DR” when the driver side door is operated.

“DOOR SW-DR”
When driver side door is opened : ON
When driver side door is closed : OFF

Without CONSULT-III

Check voltage between BCM harness connector B83 terminal 62 and ground.

62 – Ground
When driver side door is opened : Approx. 0 V
When driver side door is closed : Approx. 5 V



OK or NG

OK >> INSPECTION END
NG >> GO TO 2.

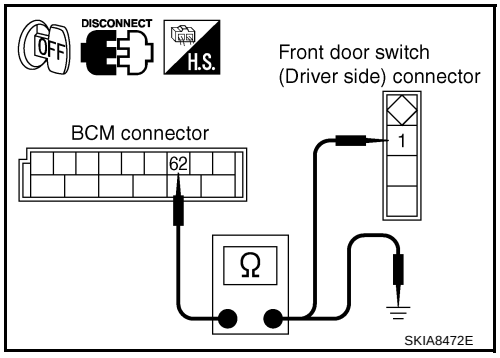
2. CHECK DRIVER SIDE DOOR SWITCH CIRCUIT

1. Disconnect BCM connector and driver side door switch connector.
2. Check continuity between BCM harness connector B83 terminal 62 and driver side door switch harness connector B17 terminal 1.

62 – 1 : Continuity should exist.

3. Check continuity between BCM harness connector B4 terminal 62 (W) and ground.

62 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK DRIVER SIDE DOOR SWITCH

Check driver side door switch. Refer to DI-90, "DRIVER SIDE DOOR SWITCH" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace driver side door switch.

Key Switch Signal Inspection

NKS0026B

1. CHECK FUSE

Check if the key switch 10A fuse [No. 21, located in the fuse block (J/B)] is blown.

OK or NG

OK >> GO TO 2.
NG >> Be sure to repair the cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK BCM INPUT SIGNAL

With CONSULT-III

1. Select “BCM”.
2. With “DATA MONITOR” of “BUZZER”, confirm “KEY ON SW” when the key switch is operated.

“KEY ON SW”

When key is inserted to ignition key cylinder : ON

When key is removed from ignition key cylinder : OFF

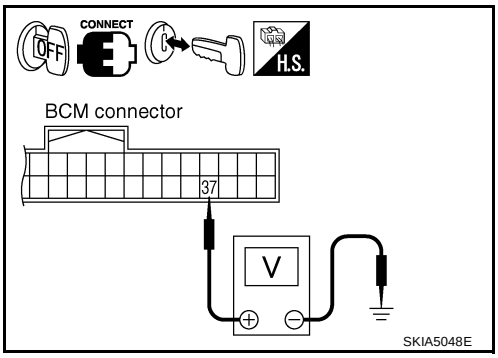
Without CONSULT-III

Check voltage between BCM harness connector M90 terminal 37 and ground.

37 – Ground

When key is inserted to ignition key cylinder : Approx. 12 V

When key is removed from ignition key cylinder : Approx. 0 V



OK or NG

OK >> INSPECTION END
NG >> GO TO 3.

3. CHECK KEY SWITCH

Check continuity between key switch. Refer to DI-90, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace key switch.

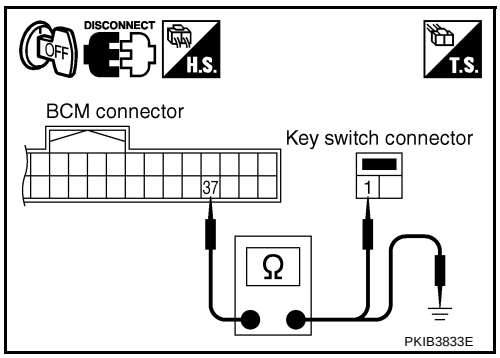
4. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 and key switch harness connector M25 terminal 1.

37 – 1 : Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 and ground.

37 – Ground : Continuity should not exist.



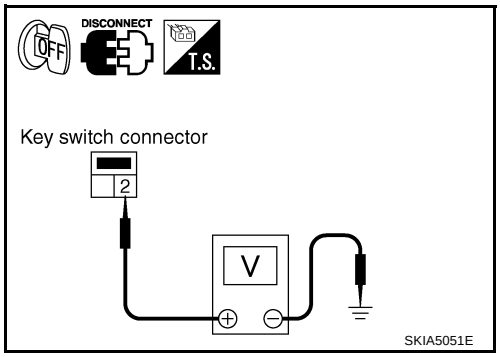
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK KEY SWITCH POWER SUPPLY CIRCUIT

Check voltage between key switch harness connector M25 terminal 2 and ground.

2 – Ground : Battery voltage



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check continuity between key switch and fuse.

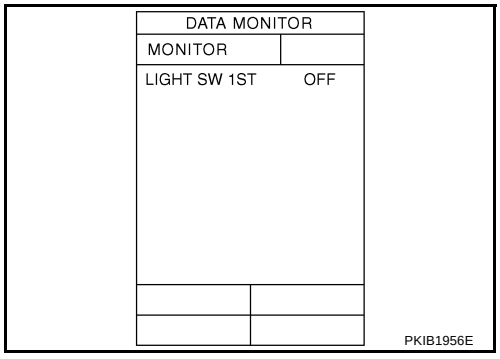
Lighting Switch Signal Inspection

NKS0026C

1. CHECK BCM INPUT SIGNAL

1. Select “BCM” on CONSULT-III.
2. With “DATA MONITOR” of “BUZZER”, confirm “LIGHT SW 1ST” when the lighting switch is operated.

“LIGHT SW 1ST”
Lighting switch (1st position) : ON
Lighting switch (OFF) : OFF



OK or NG

OK >> INSPECTION END
NG >> Check lighting switch. Refer to LT-92, "Combination Switch Inspection" .

Seat Belt Buckle Switch (Driver Side) Signal Inspection

NKS0026D

1. CHECK SEAT BELT BUCKLE SWITCH (DRIVER SIDE) SIGNAL INPUT (BCM)

1. Select “BCM” on CONSULT-III.
2. With “DATA MONITOR” of “BUZZER”, confirm “BUCKLE SW” when the seat belt buckle switch (driver side) is operated.

“BUCKLE SW”
When seat belt is fastened : OFF
When seat belt is unfastened : ON

OK or NG

OK >> INSPECTION END
NG >> GO TO 2.

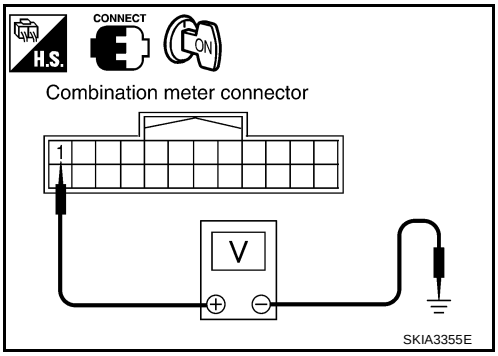
2. CHECK SEAT BELT BUCKLE SWITCH (DRIVER SIDE) SIGNAL INPUT (COMBINATION METER)

1. Turn ignition switch ON.
2. Check voltage between combination meter harness connector M19 terminal 1 and ground.

1 – Ground

When seat belt is fastened : Approx. 12 V

When seat belt is unfastened : Approx. 0 V



OK or NG

OK >> Replace combination meter.
NG >> GO TO 3.

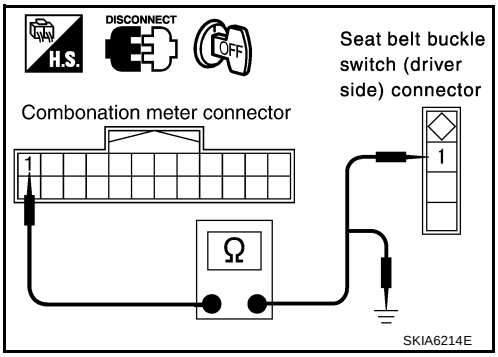
3. CHECK SEAT BELT BUCKLE SWITCH (DRIVER SIDE) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and seat belt buckle switch (driver side) connector.
3. Check continuity between combination meter harness connector M19 terminal 1 and seat belt buckle switch (driver side) harness connector B8 terminal 1.

1 – 1 : Continuity should exist.

4. Check continuity between combination meter harness connector M19 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK SEAT BELT BUCKLE SWITCH (DRIVER SIDE)

Check seat belt buckle switch (driver side). Refer to DI-90, "SEAT BELT BUCKLE SWITCH (DRIVER SIDE)" .

OK or NG

OK >> Check seat belt buckle switch (driver side) ground circuit.
NG >> Replace seat belt buckle switch (driver side).

Component Inspection

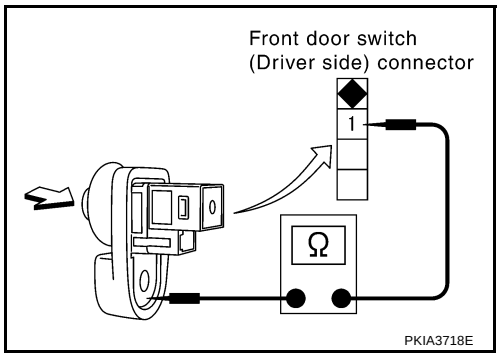
NKS0026E

DRIVER SIDE DOOR SWITCH

Check continuity between terminal 1 and door switch case ground.

1 – Door switch case ground

When driver side door switch is released	**: Continuity should exist.**
When driver side door switch is pressed	**: Continuity should not exist.**

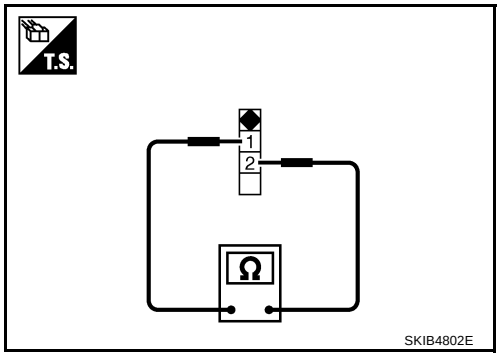


SEAT BELT BUCKLE SWITCH (DRIVER SIDE)

Check continuity between terminals 1 and 2.

1 – 2

When seat belt (driver side) is fastened	**: Continuity should not exist.**
When seat belt (driver side) is unfastened	**: Continuity should exist.**

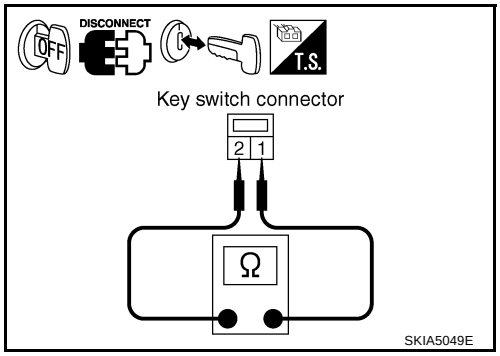


KEY SWITCH

Check continuity between key switch terminals 1 and 2.

1 – 2

When key is inserted to ignition key cylinder	**: Continuity should exist.**
When key is removed from ignition key cylinder	**: Continuity should not exist.**



CAN COMMUNICATION

PFP:23710

System Description

NKS001M6

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

NKS001M7

Refer to LAN-48, "CAN System Specification Chart" in “LAN SYSTEM”.

SECTION EC
ENGINE CONTROL SYSTEM

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NBS00027

NOTE:

- **If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC U1010 is displayed with other DTC, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

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P1572	1572	ASCD BRAKE SW	EC-610
P1574	1574	ASCD VHL SPD SEN	EC-625
P1610 - P1615	1610 - 1615	NATS MALFUNCTION	EC-46
P1715	1715	IN PULY SPEED	EC-627
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P1752	1752	I/C SOLENOID/CIRC	AT-145
P1757	1757	FR/B SOLENOID/CIRC	AT-147
P1762	1762	D/C SOLENOID/CIRC	AT-149
P1767	1767	HLR/C SOL/CIRC	AT-151
P1772	1772	LC/B SOLENOID/CIRC	AT-153
P1774	1774	LC/B SOLENOID FNCT	AT-155
P1805	1805	BRAKE SW/CIRCUIT	EC-628
P2100	2100	ETC MOT PWR-B1	EC-592
P2101	2101	ETC FUNCTION/CIRC-B1	EC-561
P2103	2103	ETC MOT PWR	EC-592
P2118	2118	ETC MOT-B1	EC-571
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P2123	2123	APP SEN 1/CIRC	EC-633
P2127	2127	APP SEN 2/CIRC	EC-641
P2128	2128	APP SEN 2/CIRC	EC-641
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P2138	2138	APP SENSOR	EC-650

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P2A03	2A03	A/F SENSOR1 (B2)	EC-659

*1: 1st trip DTC No. is the same as DTC No.
*2: This number is prescribed by SAE J2012.
*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.
*4: The troubleshooting for this DTC needs CONSULT-III.

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NOTE:

- **If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC U1010 is displayed with other DTC, first perform the diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

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A/F SEN1 HTR (B2)	P0052	0052	EC-165
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A/T 3RD GR FNCTN	P0733	0733	AT-119
A/T 4TH GR FNCTN	P0734	0734	AT-121
A/T 5TH GR FNCTN	P0735	0735	AT-123
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A/T TCC S/V FNCTN	P0744	0744	AT-127
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APP SEN 1/CIRC	P2123	2123	EC-633
APP SEN 2/CIRC	P2127	2127	EC-641
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ETC FUNCTION/CIRC-B2	P1233	1233	EC-561
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ETC MOT PWR-B1	P2100	2100	EC-592
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EVAP SMALL LEAK	P0442	0442	EC-416
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MAF SEN/CIRCUIT-B2	P010B	010B	EC-197
MAF SEN/CIRCUIT-B2	P010C	010C	EC-208
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NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	**P0000**	**0000**	**—**
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PNP SW/CIRC	P0705	0705	AT-102
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TCS C/U FUNCTN	P1211	1211	EC-541
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TP SEN 1/CIRC-B1	P0223	0223	EC-361
TP SEN 1/CIRC-B2	P2132	2132	EC-361
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*1: 1st trip DTC No. is the same as DTC No.

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*4: The troubleshooting for this DTC needs CONSULT-III.

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NBS00029

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

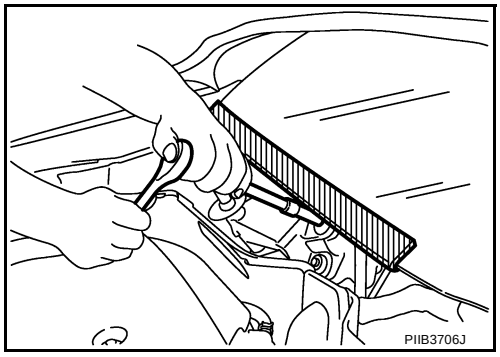
NBS0002A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NBS006TI

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



On Board Diagnostic (OBD) System of Engine and A/T

NBS0002B

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

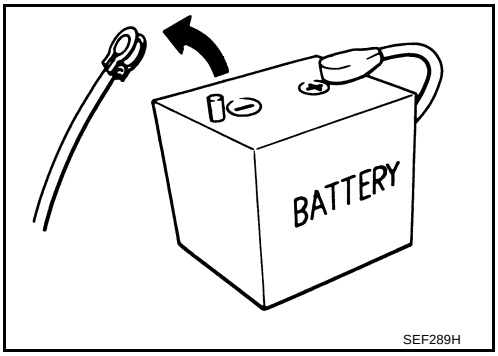
- **Be sure to turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to PG-76, "HARNESS CONNECTOR" .**
- **Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to light up due to the short circuit.**

- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to the malfunction of the EVAP system or fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.**

Precaution

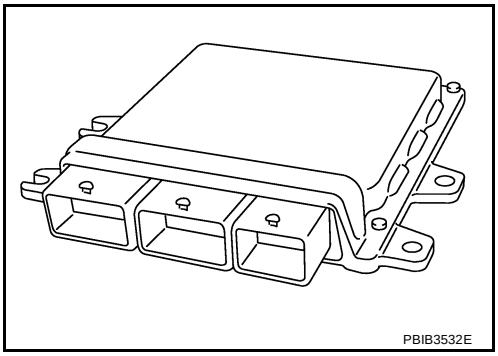
NBS0002C

- **Always use a 12 volt battery as power source.**
- **Do not attempt to disconnect battery cables while engine is running.**
- **Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect battery ground cable. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned OFF.**
- **Before removing parts, turn ignition switch OFF and then disconnect battery ground cable.**



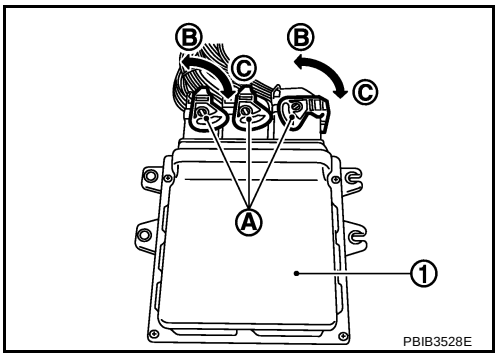
SEF289H

- **Do not disassemble ECM.**
- **If a battery cable is disconnected, the memory will return to the ECM value.**
  The ECM will now start to self-control at its initial value. Engine operation can vary slightly when the terminal is disconnected. However, this is not an indication of a malfunction. Do not replace parts because of a slight variation.
- **If the battery is disconnected, the following emission related diagnostic information will be lost within 24 hours.**
  - **Diagnostic trouble codes**
  - **1st trip diagnostic trouble codes**
  - **Freeze frame data**
  - **1st freeze frame data**
  - **System readiness test (SRT) codes**
  - **Test values**


PBIB3532E

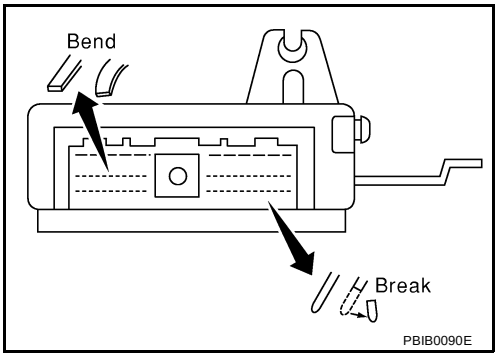
- **When connecting ECM harness connector (A), fasten (B) it securely with a lever as far as it will go as shown in the figure.**

  1 : ECM
  C : Loosen



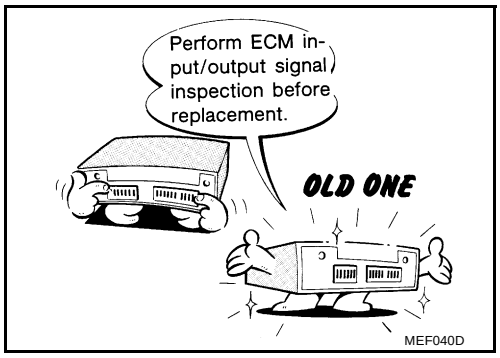
PBIB3528E

- **When connecting or disconnecting pin connectors into or from ECM, take care not to damage pin terminals (bend or break).**
  Make sure that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.
- **Securely connect ECM harness connectors.**
  A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to ICs.

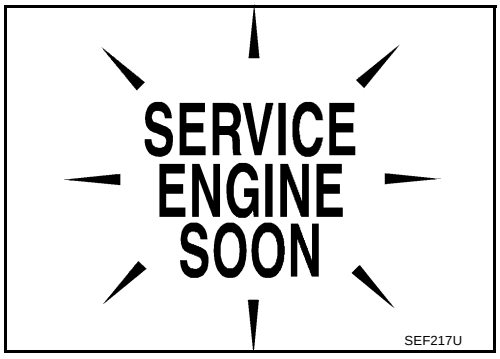


PBIB0090E

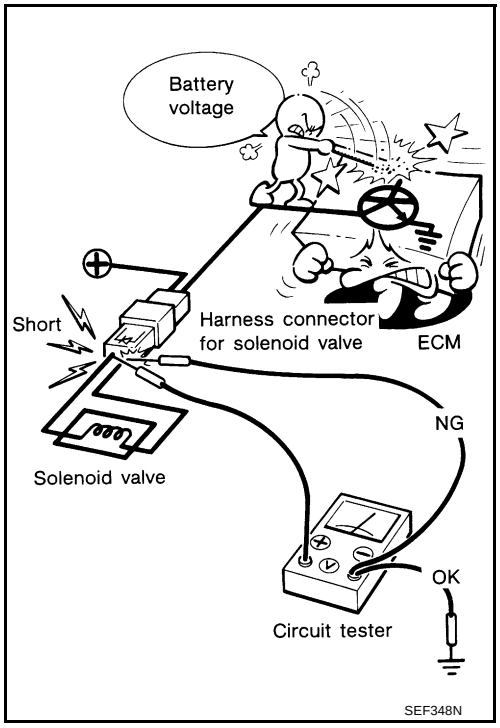
- Keep engine control system harness at least 10 cm (4 in) away from adjacent harness, to prevent engine control system malfunctions due to receiving external noise, degraded operation of ICs, etc.
- Keep engine control system parts and harness dry.
- Before replacing ECM, perform ECM Terminals and Reference Value inspection and make sure ECM functions properly. Refer to EC-103, "ECM Terminals and Reference Value".
- Handle mass air flow sensor carefully to avoid damage.
- Do not clean mass air flow sensor with any type of detergent.
- Do not disassemble electric throttle control actuator.
- Even a slight leak in the air intake system can cause serious incidents.
- Do not shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).



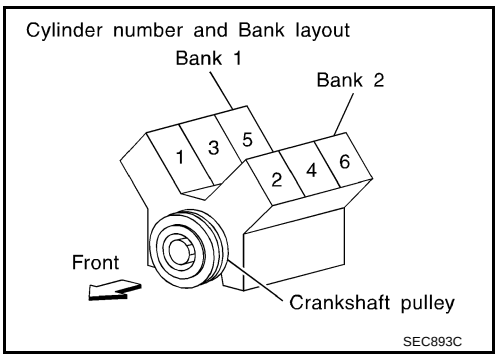
- After performing each TROUBLE DIAGNOSIS, perform DTC Confirmation Procedure or Overall Function Check.
  The DTC should not be displayed in the DTC Confirmation Procedure if the repair is completed. The Overall Function Check should be a good result if the repair is completed.



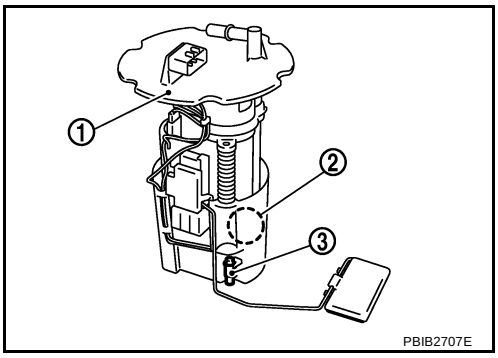
- When measuring ECM signals with a circuit tester, never allow the two tester probes to contact.
  Accidental contact of probes will cause a short circuit and damage the ECM power transistor.
- Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.



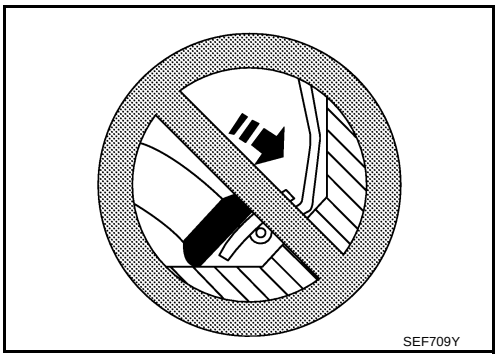
- **B1 indicates the bank 1, B2 indicates the bank 2 as shown in the figure.**



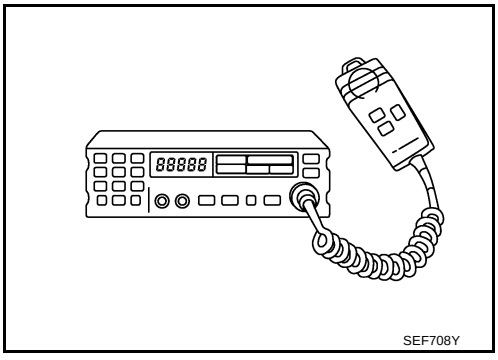
- **Do not operate fuel pump when there is no fuel in lines.**
  - 1 : Fuel level sensor unit and fuel pump
  - 2 : Fuel pressure regulator
  - 3 : Fuel tank temperature sensor
- **Tighten fuel hose clamps to the specified torque.**



- **Do not depress accelerator pedal when starting.**
- **Immediately after starting, do not rev up engine unnecessarily.**
- **Do not rev up engine just prior to shutdown.**



- **When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.**
  - **Keep the antenna as far as possible from the electronic control units.**
  - **Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls. Do not let them run parallel for a long distance.**
  - **Adjust the antenna and feeder line so that the standing-wave radio can be kept smaller.**
  - **Be sure to ground the radio to vehicle body.**



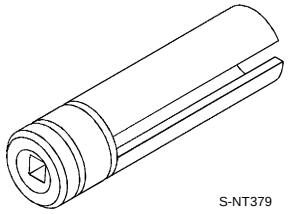
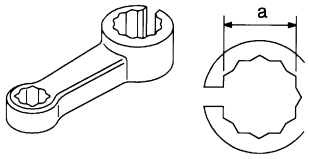
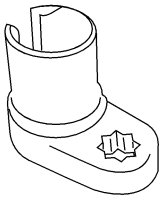
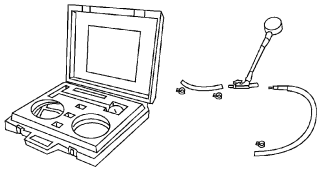
PREPARATION

PFP:00002

Special Service Tools

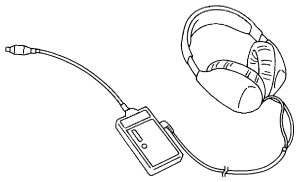
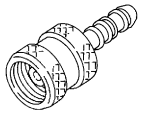
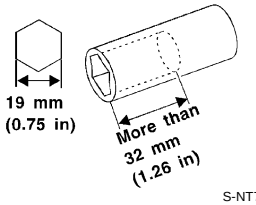
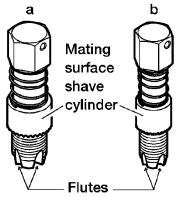
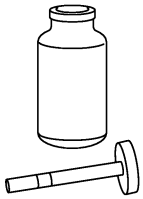
NBS0002E

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
KV10117100 (J-36471-A) Heated oxygen sensor wrench	 S-NT379	Loosening or tightening heated oxygen sensor with 22 mm (0.87 in) hexagon nut
KV10114400 (J-38365) Heated oxygen sensor wrench	 S-NT636	Loosening or tightening heated oxygen sensor **a: 22 mm (0.87 in)**
(J-44626) Air fuel ratio (A/F) sensor wrench	 LEM054	Loosening or tightening air fuel ratio (A/F) sensor 1
(J-44321) Fuel pressure gauge kit	 LEC642	Checking fuel pressure

Commercial Service Tools

NBS0002F

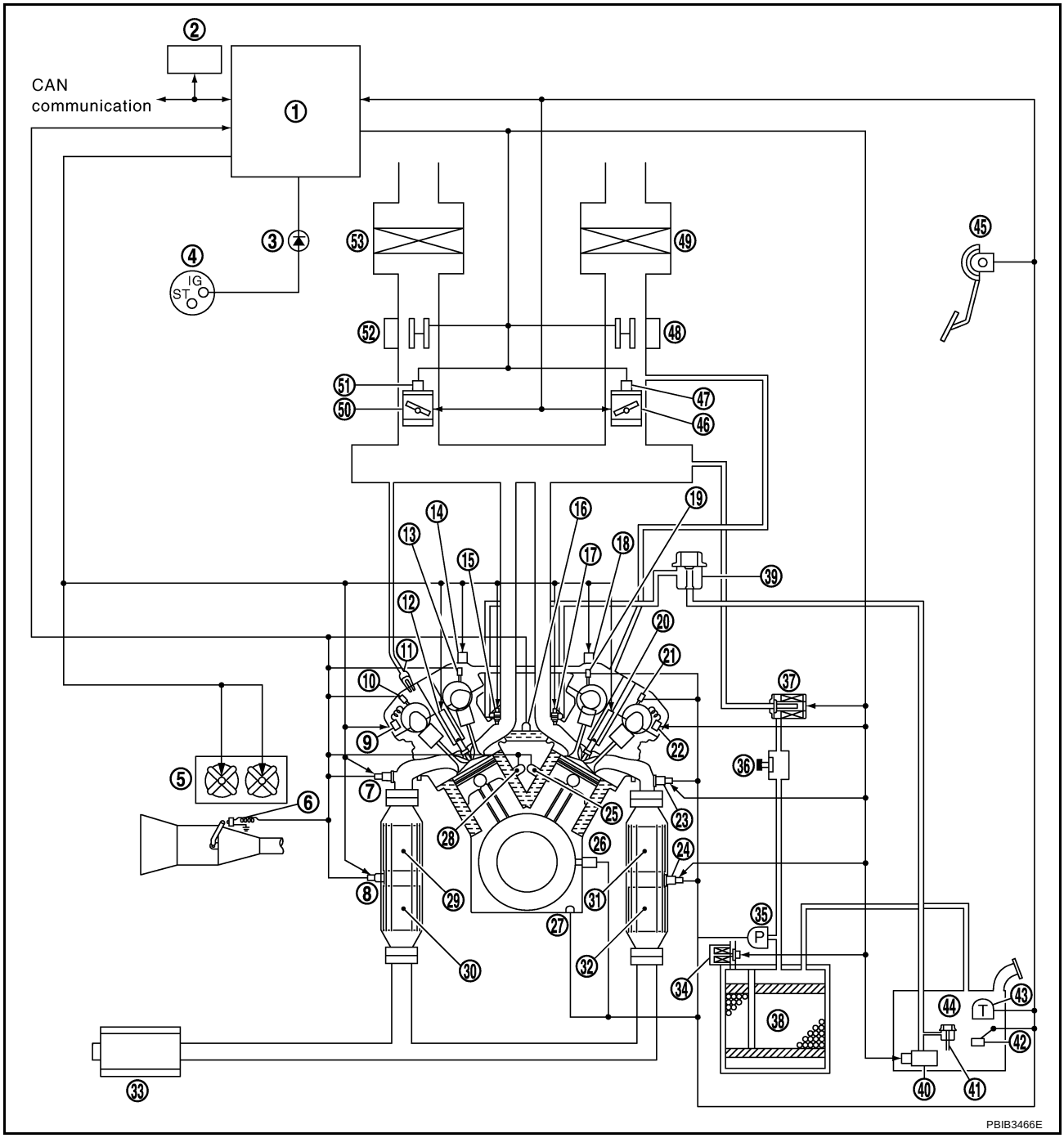
Tool name (Kent-Moore No.)		Description
Leak detector i.e.: (J-41416)	 S-NT703	Locating the EVAP leak
EVAP service port adapter i.e.: (J-41413-OBD)	 S-NT704	Applying positive pressure through EVAP service port
Fuel filler cap adapter i.e.: (MLR-8382)	 S-NT815	Checking fuel tank vacuum relief valve opening pressure
Socket wrench	 S-NT705	Removing and installing engine coolant temperature sensor
Oxygen sensor thread cleaner i.e.: (J-43897-18) (J-43897-12)	 AEM488	Reconditioning the exhaust system threads before installing a new oxygen sensor. Use with anti-seize lubricant shown below. **a: 18 mm diameter with pitch 1.5 mm for Zirconia Oxygen Sensor** **b: 12 mm diameter with pitch 1.25 mm for Titania Oxygen Sensor**
Anti-seize lubricant i.e.: (Permatex™ 133AR or equivalent meeting MIL specification MIL-A-907)	 S-NT779	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads.

ENGINE CONTROL SYSTEM

PFP:23710

System Diagram

NBS0002H



1.	ECM	2.	Data link connector	3.	MIL
4.	Ignition switch	5.	Cooling fan	6.	PNP switch
7.	A/F sensor 1	8.	Heated oxygen sensor 2	9.	Exhaust valve timing control magnet retarder
10.	Exhaust valve timing control position sensor	11.	PCV valve	12.	Spark plug
13.	Camshaft position sensor (PHASE)	14.	Intake valve timing control solenoid valve	15.	Fuel injector
16.	Engine coolant temperature sensor	17.	Fuel injector	18.	Intake valve timing control solenoid valve
19.	Camshaft position sensor (PHASE)	20.	Spark plug	21.	Exhaust valve timing control position sensor

22.	Exhaust valve timing control magnet retarder	23.	A/F sensor 1	24.	Heated oxygen sensor 2
25.	Knock sensor	26.	Crankshaft position sensor (POS)	27.	Engine oil temperature sensor
28.	Knock sensor	29.	Three way catalyst 1	30.	Three way catalyst 2
31.	Three way catalyst 1	32.	Three way catalyst 2	33.	Muffler
34.	EVAP canister vent control valve	35.	EVAP control system pressure sensor	36.	EVAP service port
37.	EVAP canister purge volume control solenoid valve	38.	EVAP canister	39.	Fuel camper
40.	Fuel pump	41.	Fuel pressure regulator	42.	Fuel level sensor
43.	Fuel tank temperature sensor	44.	Fuel tank	45.	Accelerator pedal position sensor
46.	Electric throttle control actuator	47.	Throttle position sensor	48.	Mass air flow sensor (with intake air temperature sensor)
49.	Air cleaner	50.	Electric throttle control actuator	51.	Throttle position sensor
52.	Mass air flow sensor (with intake air temperature sensor)	53.	Air cleaner		

Multiport Fuel Injection (MFI) System

NBS0002I

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed*3 Piston position	Fuel injection & mixture ratio control	Fuel injector
Camshaft position sensor (PHASE)			
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Park/neutral position (PNP) switch	Gear position		
Knock sensor	Engine knocking condition		
Battery	Battery voltage*3		
Power steering pressure sensor	Power steering operation		
Heated oxygen sensor 2*1	Density of oxygen in exhaust gas		
Air conditioner switch	Air conditioner operation*2		
Wheel sensor	Vehicle speed*2		

*1: This sensor is not used to control the engine system under normal conditions.
*2: This signal is sent to the ECM through CAN communication line.
*3: ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

The amount of fuel injected from the fuel injector is determined by the ECM. The ECM controls the length of time the valve remains open (injection pulse duration). The amount of fuel injected is a program value in the ECM memory. The program value is preset by engine operating conditions. These conditions are determined by input signals (for engine speed and intake air) from both the crankshaft position sensor and the mass air flow sensor.

VARIOUS FUEL INJECTION INCREASE/DECREASE COMPENSATION

In addition, the amount of fuel injected is compensated to improve engine performance under various operating conditions as listed below.

<Fuel increase>

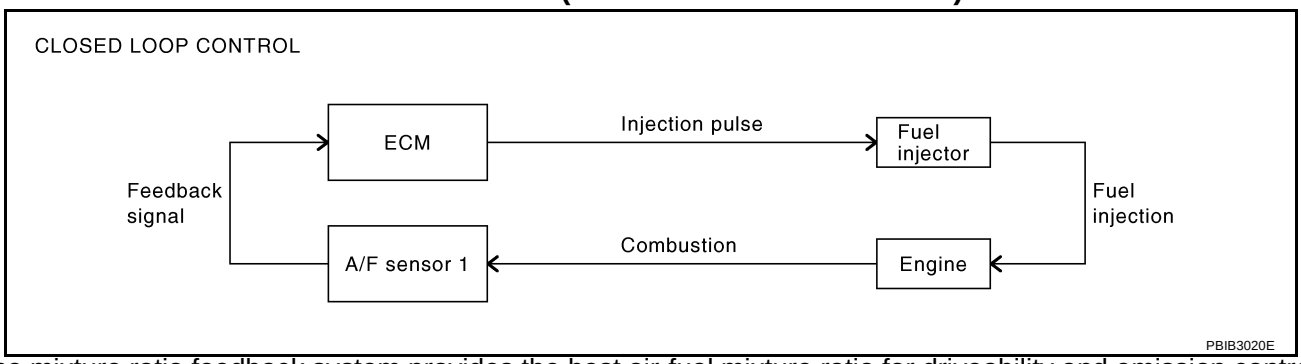
- During warm-up
- When starting the engine
- During acceleration
- Hot-engine operation

- When selector lever is changed from N to D (A/T models)
- High-load, high-speed operation

<Fuel decrease>

- During deceleration
- During high engine speed operation

MIXTURE RATIO FEEDBACK CONTROL (CLOSED LOOP CONTROL)



The mixture ratio feedback system provides the best air-fuel mixture ratio for driveability and emission control. The three way catalyst 1 can then better reduce CO, HC and NOx emissions. This system uses air fuel ratio (A/F) sensor 1 in the exhaust manifold to monitor whether the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about air fuel ratio (A/F) sensor 1, refer to EC-257, "DTC P0131, P0151 A/F SENSOR 1" . This maintains the mixture ratio within the range of stoichiometric (ideal air-fuel mixture).
This stage is referred to as the closed loop control condition.
Heated oxygen sensor 2 is located downstream of the three way catalyst 1. Even if the switching characteristics of air fuel ratio (A/F) sensor 1 shift, the air-fuel ratio is controlled to stoichiometric by the signal from heated oxygen sensor 2.

Open Loop Control

The open loop system condition refers to when the ECM detects any of the following conditions. Feedback control stops in order to maintain stabilized fuel combustion.

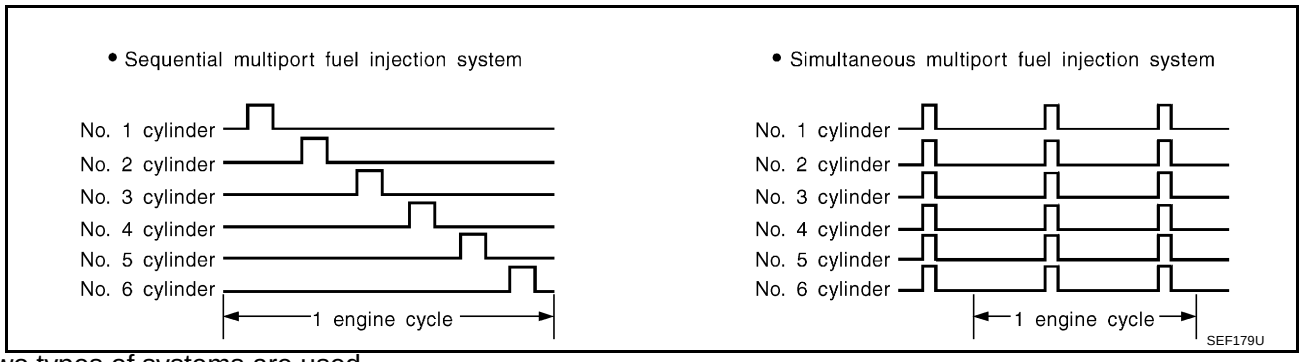
- Deceleration and acceleration
- High-load, high-speed operation
- Malfunction of air fuel ratio (A/F) sensor 1 or its circuit
- Insufficient activation of air fuel ratio (A/F) sensor 1 at low engine coolant temperature
- High engine coolant temperature
- During warm-up
- After shifting from N to D (A/T models)
- When starting the engine

MIXTURE RATIO SELF-LEARNING CONTROL

The mixture ratio feedback control system monitors the mixture ratio signal transmitted from air fuel ratio (A/F) sensor 1. This feedback signal is then sent to the ECM. The ECM controls the basic mixture ratio as close to the theoretical mixture ratio as possible. However, the basic mixture ratio is not necessarily controlled as originally designed. Both manufacturing differences (i.e., mass air flow sensor hot wire) and characteristic changes during operation (i.e., fuel injector clogging) directly affect mixture ratio.
Accordingly, the difference between the basic and theoretical mixture ratios is monitored in this system. This is then computed in terms of “injection pulse duration” to automatically compensate for the difference between the two ratios.
“Fuel trim” refers to the feedback compensation value compared against the basic injection duration. Fuel trim includes short term fuel trim and long term fuel trim.
“Short term fuel trim” is the short-term fuel compensation used to maintain the mixture ratio at its theoretical value. The signal from air fuel ratio (A/F) sensor 1 indicates whether the mixture ratio is RICH or LEAN compared to the theoretical value. The signal then triggers a reduction in fuel volume if the mixture ratio is rich, and an increase in fuel volume if it is lean.

"Long term fuel trim" is overall fuel compensation carried out long-term to compensate for continual deviation of the short term fuel trim from the central value. Such deviation will occur due to individual engine differences, wear over time and changes in the usage environment.

FUEL INJECTION TIMING



Two types of systems are used.

Sequential Multiport Fuel Injection System

Fuel is injected into each cylinder during each engine cycle according to the firing order. This system is used when the engine is running.

Simultaneous Multiport Fuel Injection System

Fuel is injected simultaneously into all six cylinders twice each engine cycle. In other words, pulse signals of the same width are simultaneously transmitted from the ECM.
The six fuel injectors will then receive the signals two times for each engine cycle.
This system is used when the engine is being started and/or if the fail-safe system (CPU) is operating.

FUEL SHUT-OFF

Fuel to each cylinder is cut off during deceleration, operation of the engine at excessively high speeds or operation of the vehicle at excessively high speeds.

Electronic Ignition (EI) System

NBS0002J

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed*2 Piston position	Ignition timing control	Power transistor
Camshaft position sensor (PHASE)			
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Knock sensor	Engine knocking		
Park/neutral position (PNP) switch	Gear position		
Battery	Battery voltage*2		
Wheel sensor	Vehicle speed*1		

*1: This signal is sent to the ECM through CAN communication line.
*2: ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

Firing order: 1-2-3-4-5-6
The ignition timing is controlled by the ECM to maintain the best air-fuel ratio for every running condition of the engine. The ignition timing data is stored in the ECM.
The ECM receives information such as the injection pulse width and camshaft position sensor (PHASE) signal. Computing this information, ignition signals are transmitted to the power transistor.
During the following conditions, the ignition timing is revised by the ECM according to the other data stored in the ECM.

- At starting

- During warm-up
- At idle
- At low battery voltage
- During acceleration

The knock sensor retard system is designed only for emergencies. The basic ignition timing is programmed within the anti-knocking zone, if recommended fuel is used under dry conditions. The retard system does not operate under normal driving conditions. If engine knocking occurs, the knock sensor monitors the condition. The signal is transmitted to the ECM. The ECM retards the ignition timing to eliminate the knocking condition.

Fuel Cut Control (at No Load and High Engine Speed)

NBS0002K

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Park/neutral position (PNP) switch	Neutral position	Fuel cut control	Fuel injector
Accelerator pedal position sensor	Accelerator pedal position		
Engine coolant temperature sensor	Engine coolant temperature		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed		
Wheel sensor	Vehicle speed*		

*: This signal is sent to the ECM through CAN communication line.

SYSTEM DESCRIPTION

If the engine speed is above 1,800 rpm under no load (for example, the shift position is neutral and engine speed is over 1,800 rpm) fuel will be cut off after some time. The exact time when the fuel is cut off varies based on engine speed.
Fuel cut will be operated until the engine speed reaches 1,500 rpm, then fuel cut will be cancelled.

NOTE:
This function is different from deceleration control listed under EC-25, "Multiport Fuel Injection (MFI) System" .

AIR CONDITIONING CUT CONTROL

PFP:23710

Input/Output Signal Chart

NBS0002L

Sensor	Input Signal to ECM	ECM function	Actuator
Air conditioner switch	Air conditioner ON signal*1	Air conditioner cut control	Air conditioner relay
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*2		
Engine coolant temperature sensor	Engine coolant temperature		
Refrigerant pressure sensor	Refrigerant pressure		
Power steering pressure sensor	Power steering operation		
Wheel sensor	Vehicle speed*1		
Battery	Battery voltage*2		

*1: This signal is sent to the ECM through CAN communication line.
*2: ECM determines the start signal status by the signal of engine speed and battery voltage.

SYSTEM DESCRIPTION

This system improves engine operation when the air conditioner is used.
Under the following conditions, the air conditioner is turned OFF.

- When the accelerator pedal is fully depressed.
- When cranking the engine.
- At high engine speeds.
- When the engine coolant temperature becomes excessively high.
- When operating power steering during low engine speed or low vehicle speed.
- When engine speed is excessively low.
- When refrigerant pressure is excessively low or high.

System Description

NBS006TJ

This system improves engine operation when the air conditioner is used.
Under the following conditions, the air conditioner is turned off.

- When the accelerator pedal is fully depressed.
- When cranking the engine.
- At high engine speeds.
- When the engine coolant temperature becomes excessively high.
- When operating power steering during low engine speed or low vehicle speed.
- When engine speed is excessively low.
- When refrigerant pressure is excessively low or high.

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

PFP:18930

System Description

NBS0002M

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
ASCD brake switch	Brake pedal operation	ASCD vehicle speed control	Electric throttle control actuator
Stop lamp switch	Brake pedal operation		
ASCD clutch switch (M/T models)	Clutch pedal operation		
ASCD steering switch	ASCD steering switch operation		
Park/neutral position (PNP) switch	Gear position		
Wheel sensor.	Vehicle speed*		
TCM (A/T models)	Powertrain revolution*		

*: This signal is sent to the ECM through CAN communication line.

BASIC ASCD SYSTEM

Refer to Owner's Manual for ASCD operating instructions.
Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal. Driver can set vehicle speed in advance between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH).
ECM controls throttle angle of electric throttle control actuator to regulate engine speed.
Operation status of ASCD is indicated by CRUISE indicator and SET indicator in combination meter. If any malfunction occurs in ASCD system, it automatically deactivates control.

NOTE:
Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws.

SET OPERATION

Press MAIN switch. (The CRUISE indicator in combination meter illuminates.)
When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press SET/COAST switch. (Then SET indicator in combination meter illuminates.)

ACCELERATE OPERATION

If the RESUME/ACCELERATE switch is pressed during cruise control driving, increase the vehicle speed until the switch is released or vehicle speed reaches maximum speed controlled by the system.
And then ASCD will keep the new set speed.

CANCEL OPERATION

When any of following conditions exist, cruise operation will be canceled.

- CANCEL switch is pressed
- More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared)
- Brake pedal is depressed
- Clutch pedal is depressed or gear position is changed to the neutral position (M/T models)
- Selector lever is changed to N, P, R position (A/T models)
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- VDC/TCS system is operated

When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking indicator lamp.

- Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE lamp may blink slowly.
  When the engine coolant temperature decreases to the normal operating temperature, CRUISE lamp will stop blinking and the cruise operation will be able to work by pressing SET/COAST switch or RESUME/ACCELERATE switch.
- Malfunction for some self-diagnoses regarding ASCD control: SET lamp will blink quickly.

If MAIN switch is turned to OFF during ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

COAST OPERATION

When the SET/COAST switch is pressed during cruise control driving, decrease vehicle set speed until the switch is released. And then ASCD will keep the new set speed.

RESUME OPERATION

When the RESUME/ACCELERATE switch is pressed after cancel operation other than pressing MAIN switch is performed, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- Brake pedal is released
- Clutch pedal is released (M/T models)
- A/T selector lever is in other than P and N positions (A/T models)
- Vehicle speed is greater than 40 km/h (25 MPH) and less than 144 km/h (89 MPH)

Component Description

NBS0002N

ASCD STEERING SWITCH

Refer to EC-602

ASCD BRAKE SWITCH

Refer to EC-610 and EC-671 .

ASCD CLUTCH SWITCH

Refer to EC-610 and EC-671 .

STOP LAMP SWITCH

Refer to EC-610 , EC-628 and EC-671 .

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EC-561 , EC-571 , EC-580 and EC-592 .

ASCD INDICATOR

Refer to EC-681 .

CAN COMMUNICATION

PFP:23710

System Description

NBS0002O

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
Refer to LAN-48, "CAN System Specification Chart" , about CAN communication for detail.

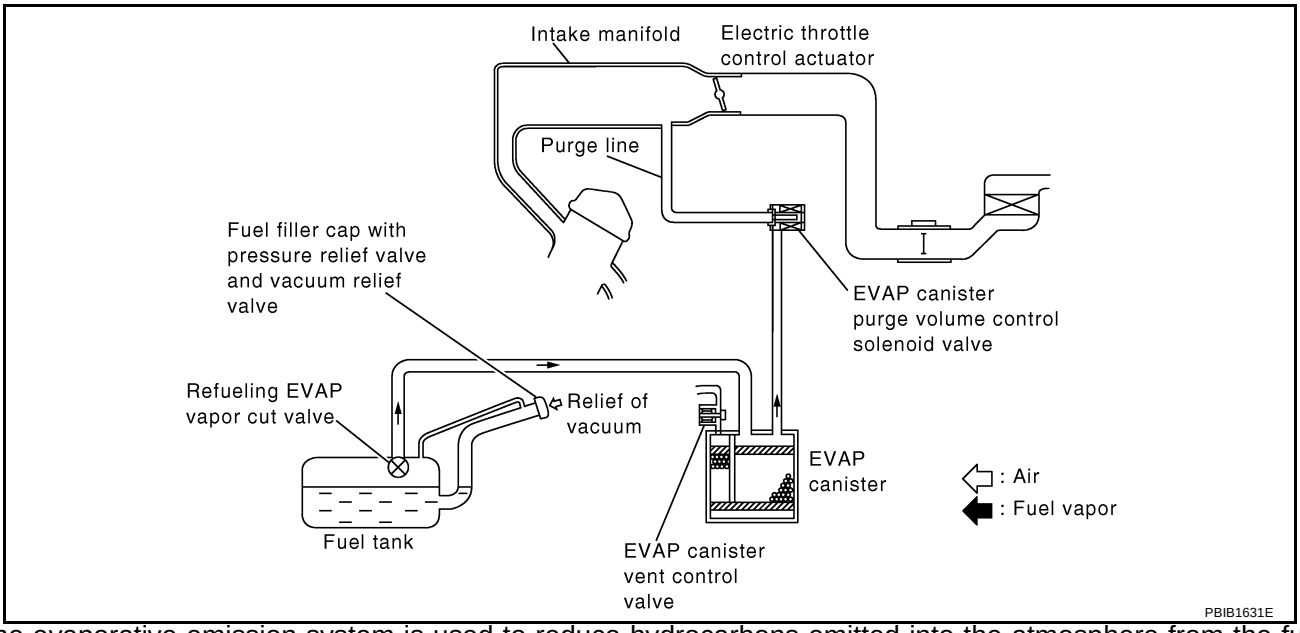
EVAPORATIVE EMISSION SYSTEM

PFP:14950

Description

NBS0002P

SYSTEM DESCRIPTION



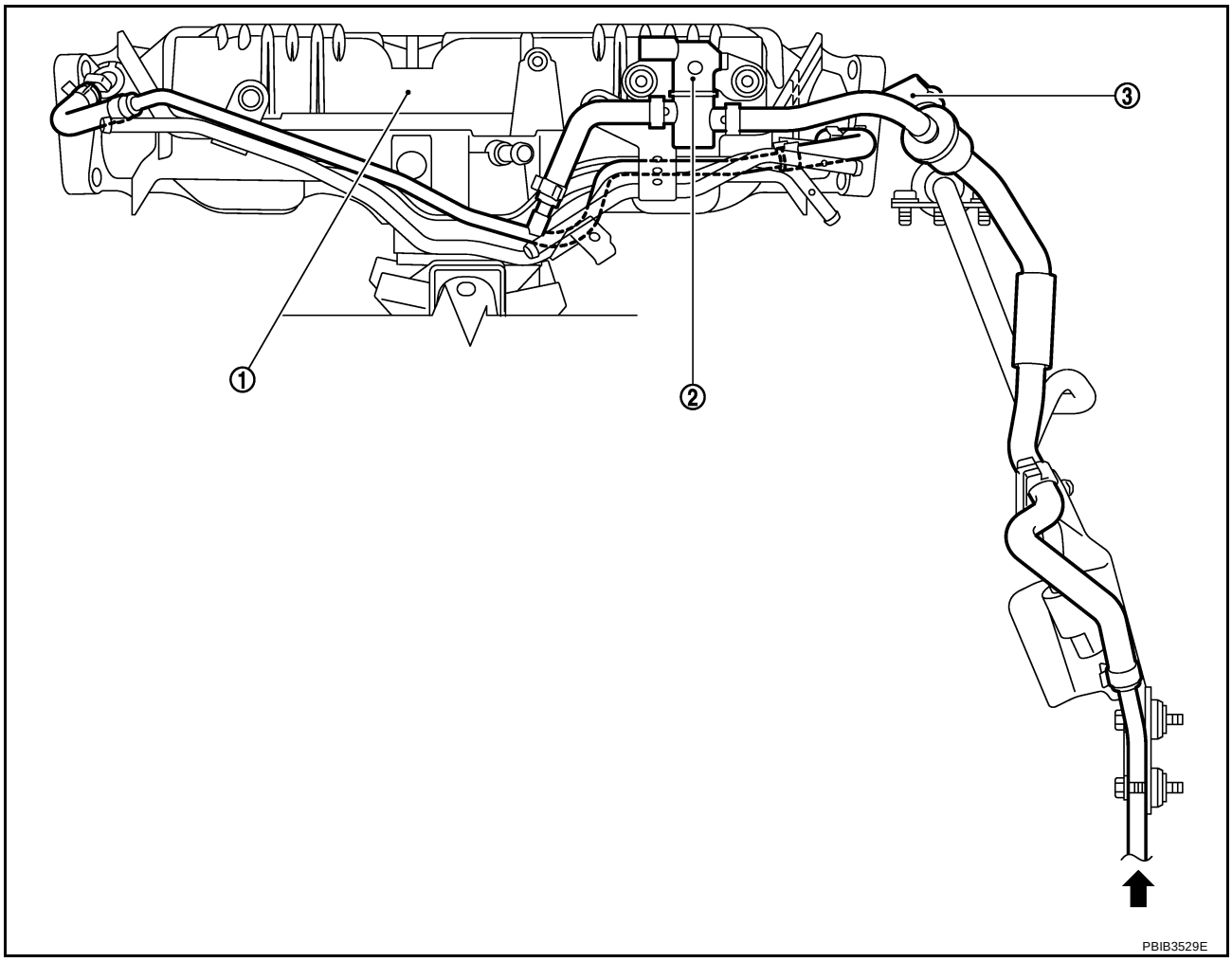
The evaporative emission system is used to reduce hydrocarbons emitted into the atmosphere from the fuel system. This reduction of hydrocarbons is accomplished by activated charcoals in the EVAP canister.

The fuel vapor in the sealed fuel tank is led into the EVAP canister which contains activated carbon and the vapor is stored there when the engine is not operating or when refueling to the fuel tank.

The vapor in the EVAP canister is purged by the air through the purge line to the intake manifold when the engine is operating. EVAP canister purge volume control solenoid valve is controlled by ECM. When the engine operates, the flow rate of vapor controlled by EVAP canister purge volume control solenoid valve is proportionally regulated as the air flow increases.

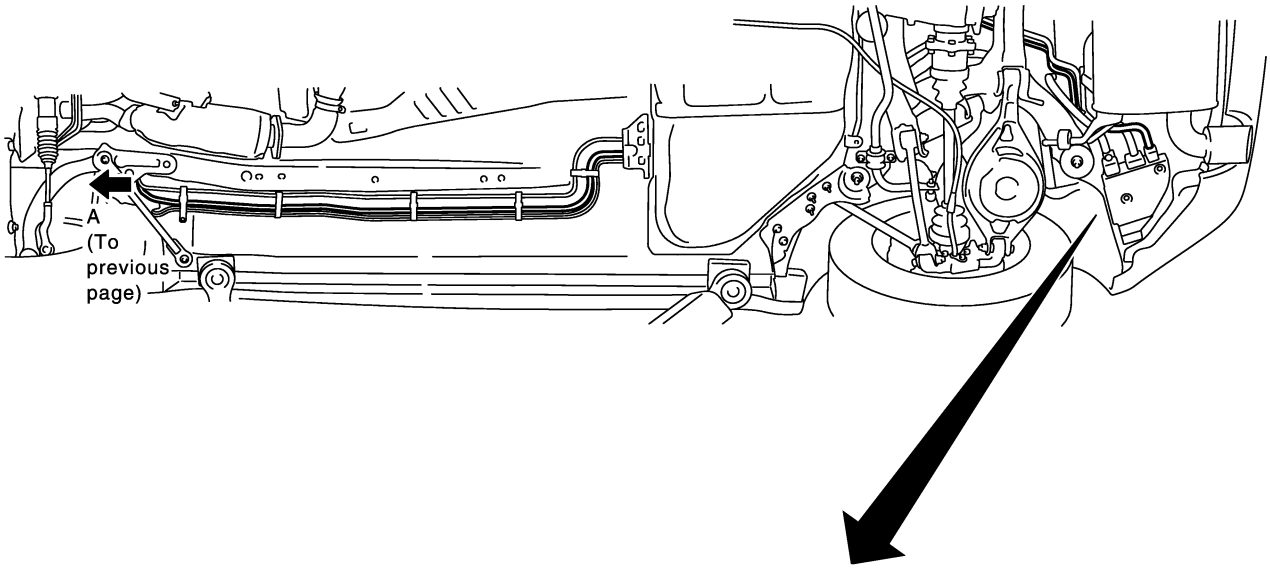
EVAP canister purge volume control solenoid valve also shuts off the vapor purge line during decelerating and idling.

EVAPORATIVE EMISSION LINE DRAWING

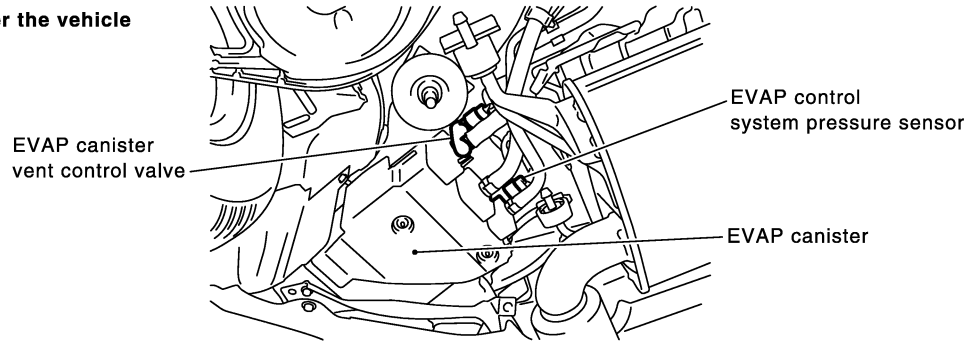


1. Intake manifold collector
2. EVAP canister purge volume control solenoid valve
3. EVAP service port

⬅: From next page



View from under the vehicle



PBIB1066E

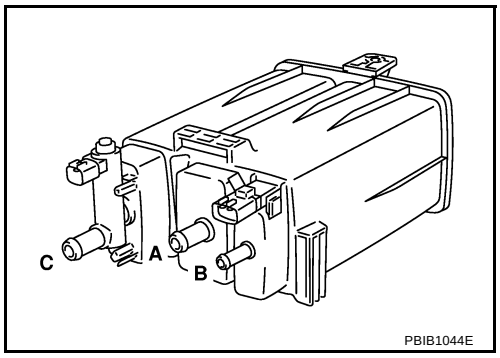
Component Inspection

NBS0002Q

EVAP CANISTER

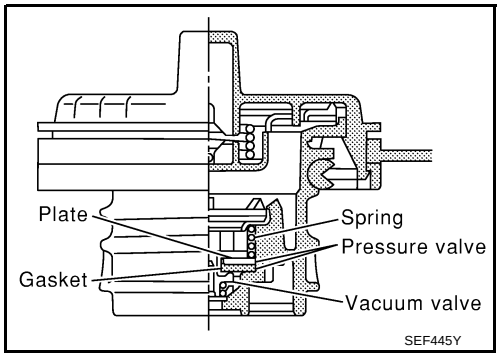
Check EVAP canister as follows:

1. Block port **B** .
2. Blow air into port **A** and check that it flows freely out of port **C** .
3. Release blocked port **B** .
4. Apply vacuum pressure to port **B** and check that vacuum pressure exists at the ports **A** and **C** .
5. Block port **A** and **B** .
6. Apply pressure to port **C** and check that there is no leakage.



FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)

1. Wipe clean valve housing.

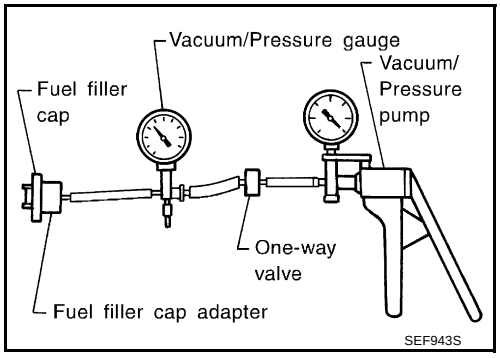


2. Check valve opening pressure and vacuum.

Pressure: **15.3 - 20.0 kPa (0.156 - 0.204 kg/cm^2 , 2.22 - 2.90 psi)**

Vacuum: **–6.0 to –3.3 kPa (–0.061 to –0.034 kg/cm^2 , –0.87 to –0.48 psi)**

3. If out of specification, replace fuel filler cap as an assembly.



CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436 .

FUEL TANK TEMPERATURE SENSOR

Refer to EC-347 .

EVAP CANISTER VENT CONTROL VALVE

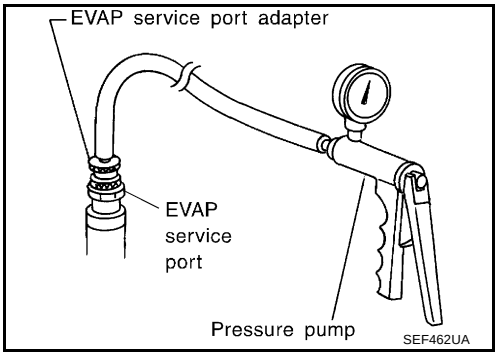
Refer to EC-442 .

EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455 .

EVAP SERVICE PORT

Positive pressure is delivered to the EVAP system through the EVAP service port. If fuel vapor leakage in the EVAP system occurs, use a leak detector to locate the leak.

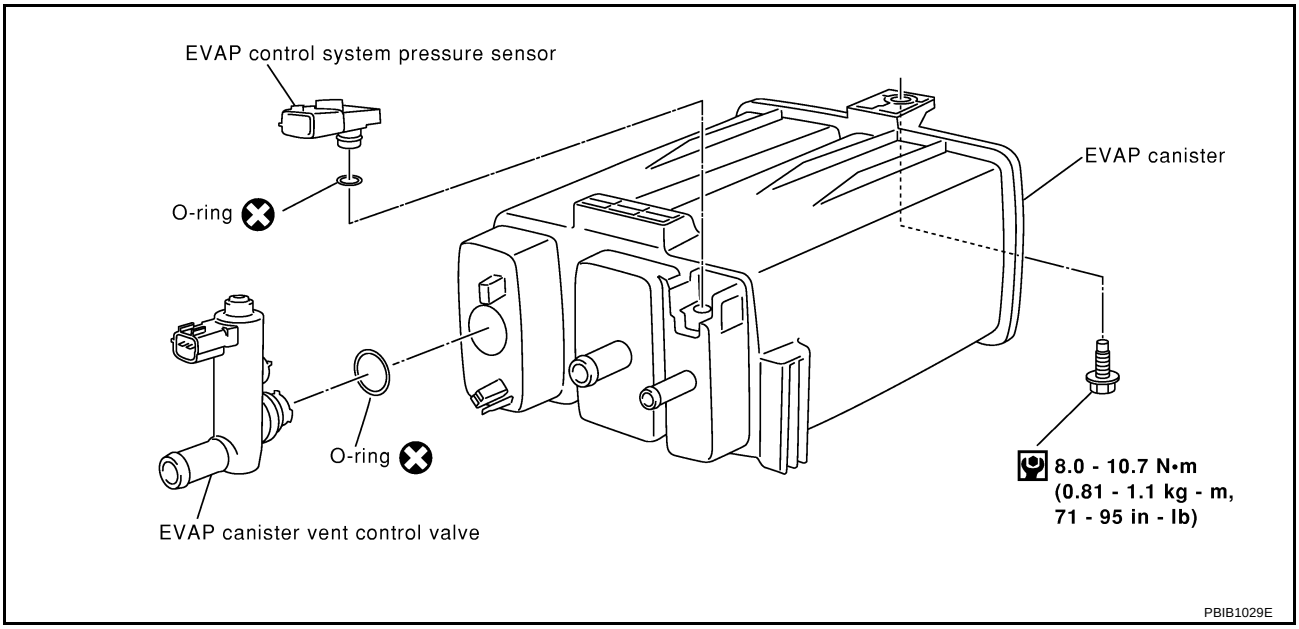


Removal and Installation

NBS0002R

EVAP CANISTER

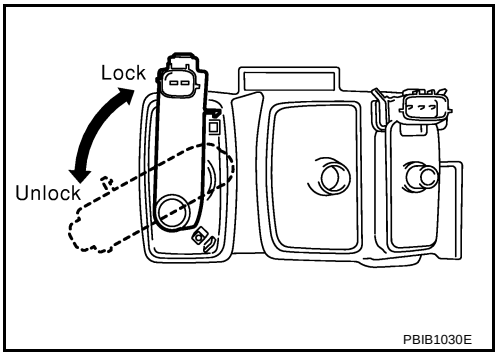
Tighten EVAP canister as shown in the figure.



EVAP CANISTER VENT CONTROL VALVE

1. Turn EVAP canister vent control valve counterclockwise.
2. Remove the EVAP canister vent control valve.

Always replace O-ring with a new one.



How to Detect Fuel Vapor Leakage

NBS0002S

CAUTION:

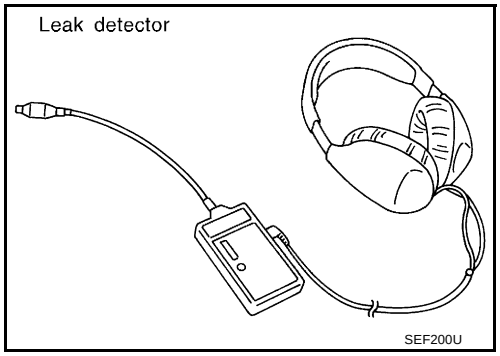
- **Never use compressed air or a high pressure pump.**
- **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in EVAP system.**

NOTE:

- Do not start engine.
- Improper installation of EVAP service port adapter to the EVAP service port may cause a leak.

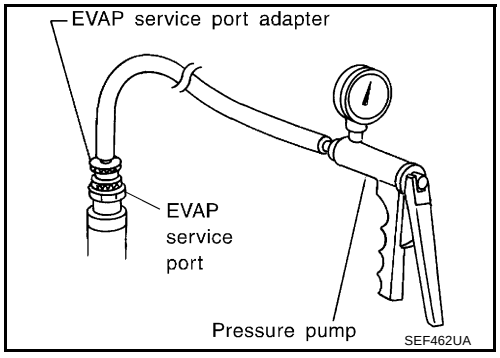
WITH CONSULT-III

1. Attach the EVAP service port adapter securely to the EVAP service port.
2. Also attach the pressure pump and hose to the EVAP service port adapter.
3. Turn ignition switch ON.
4. Select the “EVAP SYSTEM CLOSE” of “WORK SUPPORT MODE” with CONSULT-III.
5. Touch “START”. A bar graph (Pressure indicating display) will appear on the screen.
6. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.
7. Remove EVAP service port adapter and hose with pressure pump.
8. Locate the leak using a leak detector. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

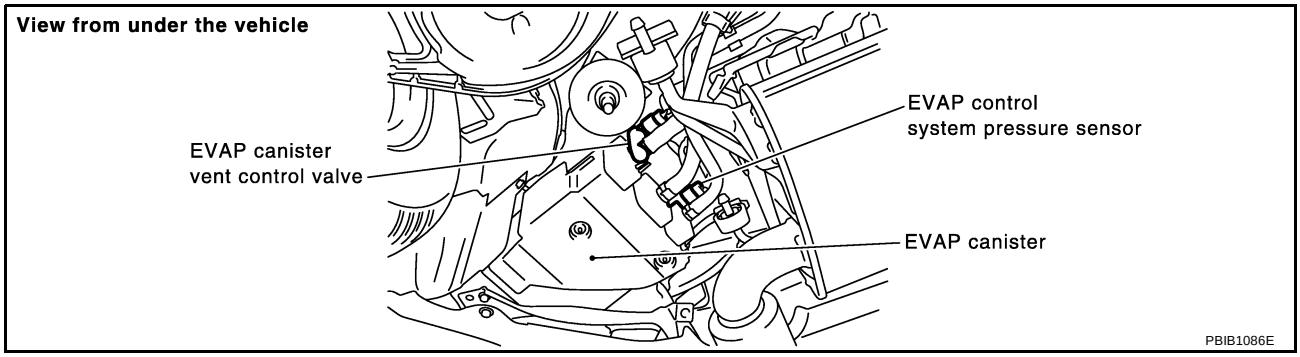


WITHOUT CONSULT-III

1. Attach the EVAP service port adapter securely to the EVAP service port.
2. Also attach the pressure pump with pressure gauge to the EVAP service port adapter.



3. Apply battery voltage between the terminals of EVAP canister vent control valve to make a closed EVAP system.



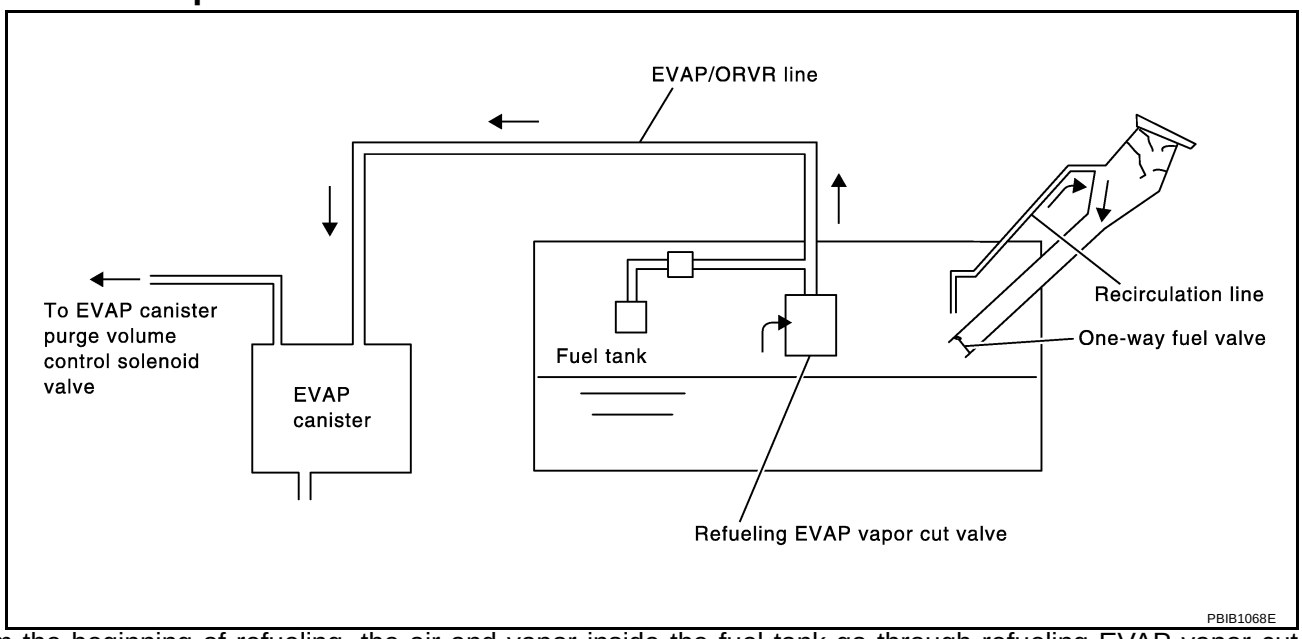
4. To locate the leak, deliver positive pressure to the EVAP system until pressure gauge points reach 1.38 to 2.76 kPa (0.014 to 0.028 kg/cm^2 , 0.2 to 0.4 psi).
5. Remove EVAP service port adapter and hose with pressure pump.
6. Locate the leak using a leak detector. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

PFP:00032

System Description

NBS0002T



From the beginning of refueling, the air and vapor inside the fuel tank go through refueling EVAP vapor cut valve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the EVAP canister and the air is released to the atmosphere.

When the refueling has reached the full level of the fuel tank, the refueling EVAP vapor cut valve is closed and refueling is stopped because of auto shut-off. The vapor which was absorbed by the EVAP canister is purged during driving.

WARNING:

When conducting inspections below, be sure to observe the following:

- **Put a “CAUTION: FLAMMABLE” sign in workshop.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.**
- **Be sure to furnish the workshop with a CO_2 fire extinguisher.**

CAUTION:

- **Before removing fuel line parts, carry out the following procedures:**
  - **Put drained fuel in an explosion-proof container and put lid on securely.**
  - **Release fuel pressure from fuel line. Refer to EC-79, "FUEL PRESSURE RELEASE" .**
  - **Disconnect battery ground cable.**
- **Always replace O-ring when the fuel gauge retainer is removed.**
- **Do not kink or twist hose and tube when they are installed.**
- **Do not tighten hose and clamps excessively to avoid damaging hoses.**
- **After installation, run engine and check for fuel leaks at connection.**
- **Do not attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically. Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.**

Diagnostic Procedure

NBS0002U

SYMPTOM: FUEL ODOR FROM EVAP CANISTER IS STRONG.

1. CHECK EVAP CANISTER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
   The weight should be less than 2.2 kg (4.9 lb).

OK or NG

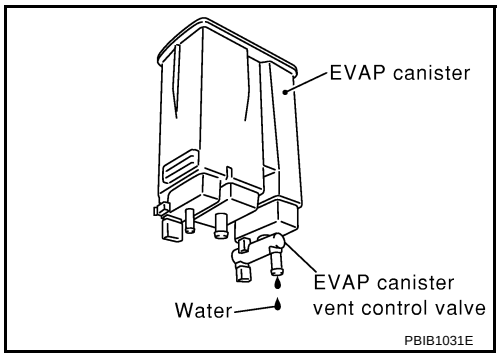
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK IF EVAP CANISTER SATURATED WITH WATER

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3.
No >> GO TO 5.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

5. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "Component Inspection" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

SYMPTOM: CANNOT REFUEL/FUEL ODOR FROM THE FUEL FILLER OPENING IS STRONG WHILE REFUELING.

1. CHECK EVAP CANISTER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
   The weight should be less than 2.2 kg (4.9 lb).

OK or NG

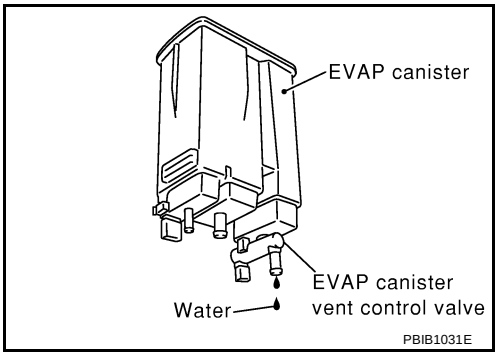
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK IF EVAP CANISTER SATURATED WITH WATER

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3.
No >> GO TO 5.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

5. CHECK VENT HOSES AND VENT TUBES

Check hoses and tubes between EVAP canister and refueling EVAP vapor cut valve for clogging, kink, looseness and improper connection.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace hoses and tubes.

6. CHECK FILLER NECK TUBE

Check recirculation line for clogging, dents and cracks.

OK or NG

OK >> GO TO 7.
NG >> Replace filler neck tube.

7. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

8. CHECK FUEL FILLER TUBE

Check filler neck tube and hose connected to the fuel tank for clogging, dents and cracks.

OK or NG

OK >> GO TO 9.
NG >> Replace fuel filler tube.

9. CHECK ONE-WAY FUEL VALVE-I

Check one-way valve for clogging.

OK or NG

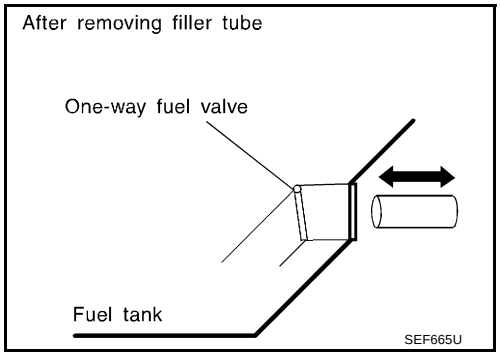
OK >> GO TO 10.
NG >> Repair or replace one-way fuel valve with fuel tank.

10. CHECK ONE-WAY FUEL VALVE-II

1. Make sure that fuel is drained from the tank.
2. Remove fuel filler tube and hose.
3. Check one-way fuel valve for operation as follows.
   When a stick is inserted, the valve should open, when removing stick it should close.
   Do not drop any material into the tank.

OK or NG

OK >> **INSPECTION END**
NG >> Replace fuel filler tube or replace one-way fuel valve with fuel tank.



Component Inspection

NBS0002V

REFUELING EVAP VAPOR CUT VALVE

With CONSULT-III

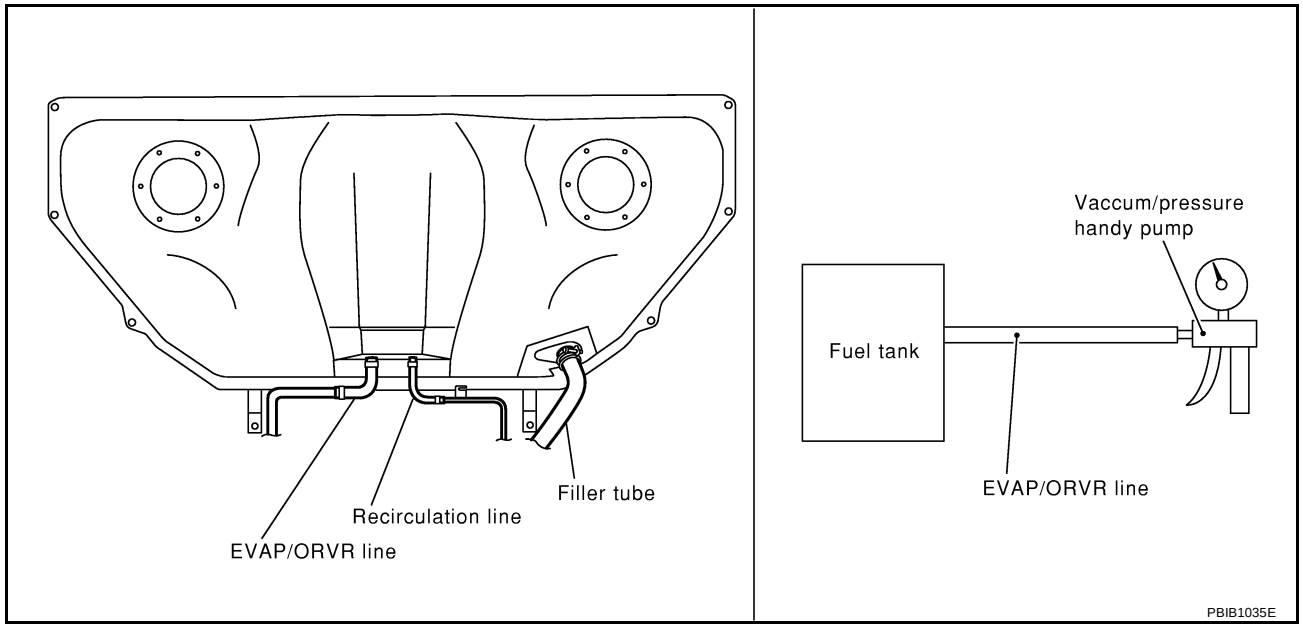
1. Remove fuel tank. Refer to FL-10, "FUEL TANK" .
2. Drain fuel from the tank as follows:

a. Remove fuel feed hose located on the fuel gauge retainer.
b. Connect a spare fuel hose, one side to fuel gauge retainer where the hose was removed and the other side to a fuel container.
c. Drain fuel using “FUEL PUMP RELAY” in “ACTIVE TEST” mode with CONSULT-III.

3. Check refueling EVAP vapor cut valve for being stuck to close as follows.
   Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
4. Check refueling EVAP vapor cut valve for being stuck to open as follows.

a. Connect vacuum pump to hose end.
b. Remove fuel gauge retainer with fuel gauge unit.
   Always replace O-ring with new one.
c. Put fuel tank upside down.

d. Apply vacuum pressure to hose end [–13.3 kPa (–100 mmHg, –3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



Without CONSULT-III

1. Remove fuel tank. Refer to FL-10, "FUEL TANK" .
2. Drain fuel from the tank as follows:

a. Remove fuel gauge retainer.

b. Drain fuel from the tank using a handy pump into a fuel container.

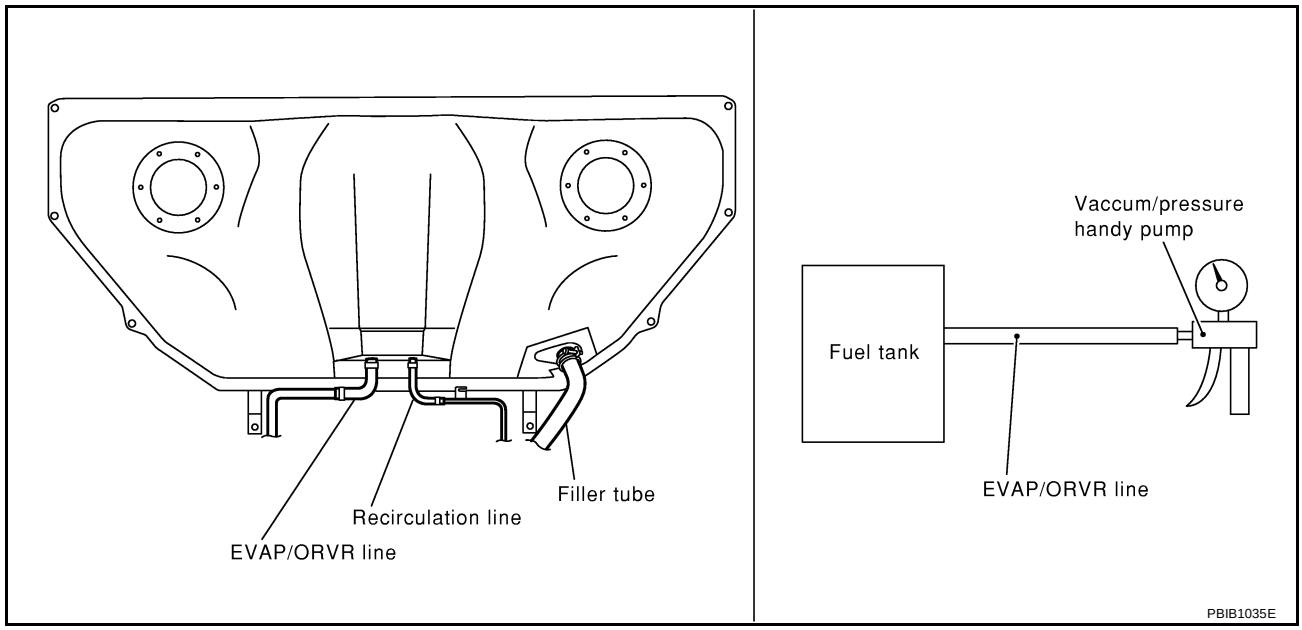
3. Check refueling EVAP vapor cut valve for being stuck to close as follows.
   Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
4. Check refueling EVAP vapor cut valve for being stuck to open as follows.

a. Connect vacuum pump to hose end.

b. Remove fuel gauge retainer with fuel gauge unit.
   Always replace O-ring with new one.

c. Put fuel tank upside down.

d. Apply vacuum pressure to hose end [–13.3 kPa (–100 mmHg, –3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



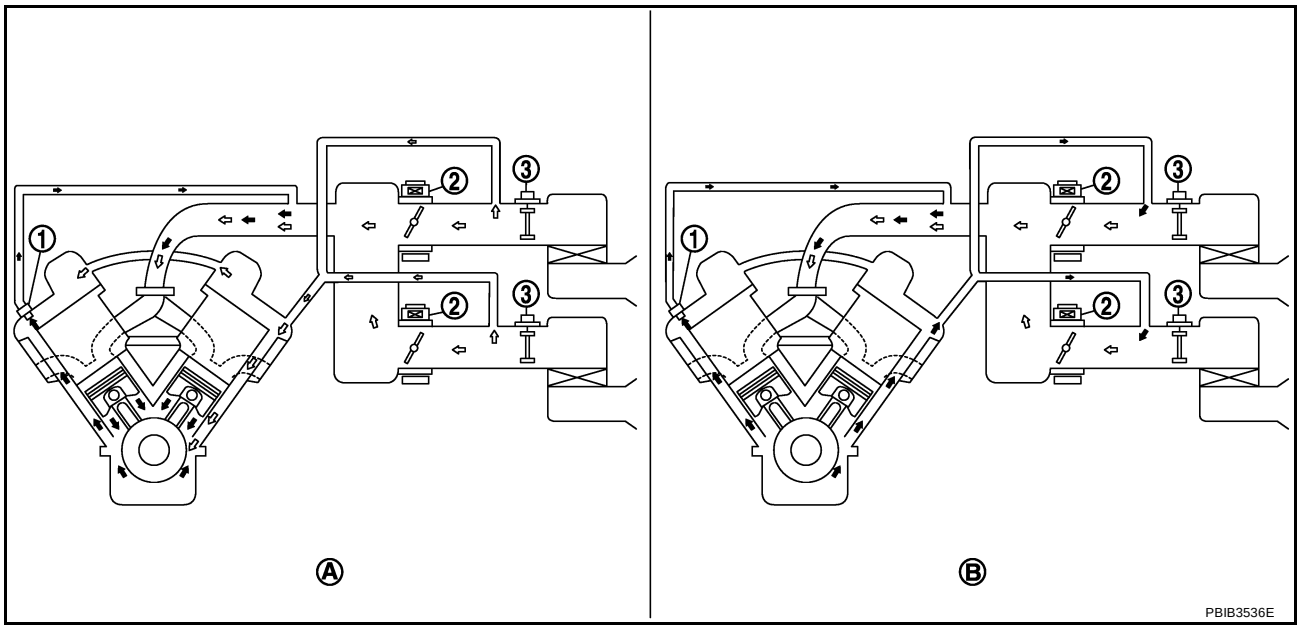
POSITIVE CRANKCASE VENTILATION

PFP:11810

Description

NBS0002W

SYSTEM DESCRIPTION



1. PCV valve
2. Electric throttle control actuator
3. Mass air flow sensor

A. Normal condition
B. Hi-load condition

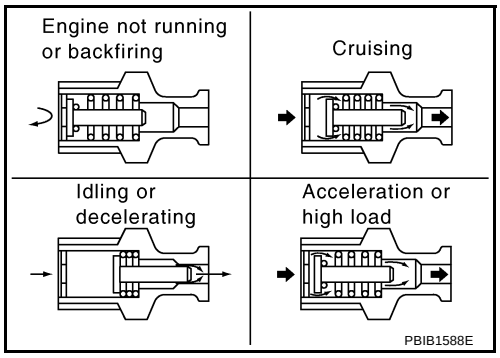
⇦: Fresh air

⬅: Blow-by air

This system returns blow-by gas to the intake manifold.

The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold. During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve. Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air. The ventilating air is then drawn from the air inlet tubes into the crankcase. In this process the air passes through the hose connecting air inlet tubes to rocker cover. Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve. The flow goes through the hose connection in the reverse direction.

On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.

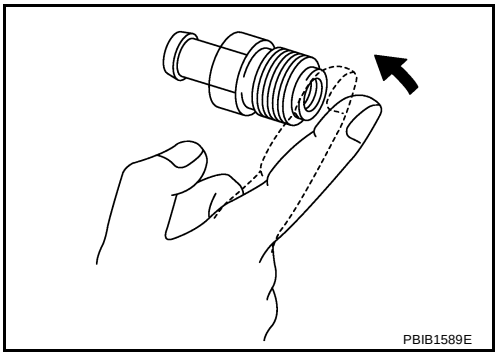


Component Inspection

NBS0002X

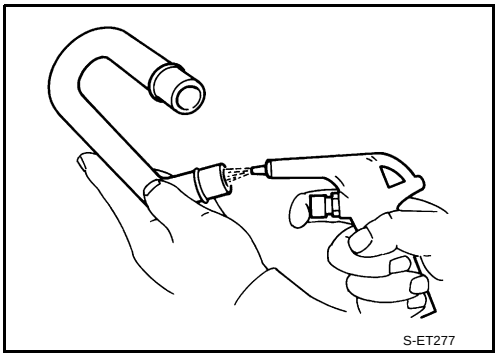
PCV (POSITIVE CRANKCASE VENTILATION) VALVE

With engine running at idle, remove PCV valve from rocker cover. A properly working valve makes a hissing noise as air passes through it. A strong vacuum should be felt immediately when a finger is placed over valve inlet.



PCV VALVE VENTILATION HOSE

1. Check hoses and hose connections for leaks.
2. Disconnect all hoses and clean with compressed air. If any hose cannot be freed of obstructions, replace.



NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)

PFP:25386

Description

NBS0002Y

- **If the security indicator lights up with the ignition switch in the ON position or “NATS MALFUNCTION” is displayed on “SELF-DIAG RESULTS” screen, perform self-diagnostic results mode with CONSULT-III using NATS program card. Refer to BL-150, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)" .**
- **Confirm no self-diagnostic results of NVIS (NATS) is displayed before touching “ERASE” in “SELF-DIAG RESULTS” mode with CONSULT-III.**
- **When replacing ECM, initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs must be carried out with CONSULT-III using NATS program card.**
  Therefore, be sure to receive all keys from vehicle owner. Regarding the procedures of NVIS (NATS) initialization and all NVIS (NATS) ignition key ID registration, refer to CONSULT-III Operation Manual, IVIS/NVIS.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

NBS0002Z

The ECM has an on board diagnostic system, which detects malfunctions related to engine sensors or actuators. The ECM also records various emission-related diagnostic information including:

Emission-related diagnostic information	Diagnostic service
Diagnostic Trouble Code (DTC)	Service $03 of SAE J1979
Freeze Frame data	Service $02 of SAE J1979
System Readiness Test (SRT) code	Service $01 of SAE J1979
1st Trip Diagnostic Trouble Code (1st Trip DTC)	Service $07 of SAE J1979
1st Trip Freeze Frame data	
Test values and Test limits	Service $06 of SAE J1979
Calibration ID	Service $09 of SAE J1979

The above information can be checked using procedures listed in the table below.

×: Applicable —: Not applicable

	DTC	1st trip DTC	Freeze Frame data	1st trip Freeze Frame data	SRT status	SRT code	Test value
CONSULT-III	×	×	×	×	×	×	—
GST	×	×	×	—	×	×	×
ECM	×	×*	—	—	×	—	—

*: When DTC and 1st trip DTC simultaneously appear on the display, they cannot be clearly distinguished from each other.

The malfunction indicator lamp (MIL) on the instrument panel lights up when the same malfunction is detected in two consecutive trips (Two trip detection logic), or when the ECM enters fail-safe mode.
(Refer to EC-89, "Fail-safe Chart" .)

Two Trip Detection Logic

NBS00030

When a malfunction is detected for the 1st time, 1st trip DTC and 1st trip Freeze Frame data are stored in the ECM memory. The MIL will not light up at this stage. <1st trip>
If the same malfunction is detected again during the next drive, the DTC and Freeze Frame data are stored in the ECM memory, and the MIL lights up. The MIL lights up at the same time when the DTC is stored. <2nd trip> The “trip” in the “Two Trip Detection Logic” means a driving mode in which self-diagnosis is performed during vehicle operation. Specific on board diagnostic items will cause the ECM to light up or blink the MIL, and store DTC and Freeze Frame data, even in the 1st trip, as shown below.

×: Applicable —: Not applicable

Items	MIL				DTC		1st trip DTC	
	1st trip		2nd trip		1st trip displaying	2nd trip displaying	1st trip displaying	2nd trip displaying
	Blinking	Lighting up	Blinking	Lighting up				
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0306 is being detected	×	—	—	—	—	—	×	—
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0306 is being detected	—	—	×	—	—	×	—	—
One trip detection diagnoses (Refer to EC-48, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS" .)	—	×	—	—	×	—	—	—
Except above	—	—	—	×	—	×	×	—

When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.

Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

Emission-related Diagnostic Information

NBS00031

EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS

×: Applicable —: Not applicable

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
CAN COMM CIRCUIT	U1000	1000*5	—	—	1	×	EC-151
CAN COMM CIRCUIT	U1001	1001*5	—	—	2	—	EC-151
CONTROL UNIT(CAN)	U1010	1010	—	—	1 (A/T) 2 (M/T)	× (A/T) — (M/T)	EC-154
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	**P0000**	**0000**	—	—	—	**Flashing*7**	EC-63
INT/V TIM CONT-B1	P0011	0011	—	—	2	×	EC-156
EXH/V TIM CONT-B1	P0014	0014	—	—	2	×	EC-160
INT/V TIM CONT-B2	P0021	0021	—	—	2	×	EC-156
EXH/V TIM CONT-B2	P0024	0024	—	—	2	×	EC-160
A/F SEN1 HTR (B1)	P0031	0031	—	×	2	×	EC-165
A/F SEN1 HTR (B1)	P0032	0032	—	×	2	×	EC-165
HO2S2 HTR (B1)	P0037	0037	—	×	2	×	EC-173
HO2S2 HTR (B1)	P0038	0038	—	×	2	×	EC-173
A/F SEN1 HTR (B2)	P0051	0051	—	×	2	×	EC-165
A/F SEN1 HTR (B2)	P0052	0052	—	×	2	×	EC-165
HO2S2 HTR (B2)	P0057	0057	—	×	2	×	EC-173
HO2S2 HTR (B2)	P0058	0058	—	×	2	×	EC-173
INT/V TIM V/CIR-B1	P0075	0075	—	—	2	×	EC-183
EX V/T MGT/RTDR-B1	P0078	0078	—	—	2	×	EC-190
INT/V TIM V/CIR-B2	P0081	0081	—	—	2	×	EC-183
EX V/T MGT/RTDR-B2	P0084	0084	—	—	2	×	EC-190
MAF SEN/CIRCUIT-B1	P0101	0101	—	—	2	×	EC-197
MAF SEN/CIRCUIT-B1	P0102	0102	—	—	1	×	EC-208
MAF SEN/CIRCUIT-B1	P0103	0103	—	—	1	×	EC-208
MAF SEN/CIRCUIT-B2	P010B	010B	—	—	2	×	EC-197
MAF SEN/CIRCUIT-B2	P010C	010C	—	—	1	×	EC-208
MAF SEN/CIRCUIT-B2	P010D	010D	—	—	1	×	EC-208
IAT SEN/CIRCUIT-B1	P0112	0112	—	—	2	×	EC-218
IAT SEN/CIRCUIT-B1	P0113	0113	—	—	2	×	EC-218
ECT SEN/CIRC	P0117	0117	—	—	1	×	EC-223
ECT SEN/CIRC	P0118	0118	—	—	1	×	EC-223
TP SEN 2/CIRC-B1	P0122	0122	—	—	1	×	EC-229
TP SEN 2/CIRC-B1	P0123	0123	—	—	1	×	EC-229

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
ECT SENSOR	P0125	0125	—	—	2	×	EC-239
IAT SENSOR-B1	P0127	0127	—	—	2	×	EC-243
THERMSTAT FNCTN	P0128	0128	—	—	2	×	EC-246
A/F SENSOR1 (B1)	P0130	0130	—	×	2	×	EC-248
A/F SENSOR1 (B1)	P0131	0131	—	×	2	×	EC-257
A/F SENSOR1 (B1)	P0132	0132	—	×	2	×	EC-266
A/F SENSOR1 (B1)	P0133	0133	×	×	2	×	EC-275
HO2S2 (B1)	P0137	0137	×	×	2	×	EC-287
HO2S2 (B1)	P0138	0138	×	×	2	×	EC-298
HO2S2 (B1)	P0139	0139	×	×	2	×	EC-313
A/F SENSOR1 (B2)	P0150	0150	—	×	2	×	EC-248
A/F SENSOR1 (B2)	P0151	0151	—	×	2	×	EC-257
A/F SENSOR1 (B2)	P0152	0152	—	×	2	×	EC-266
A/F SENSOR1 (B2)	P0153	0153	×	×	2	×	EC-275
HO2S2 (B2)	P0157	0157	×	×	2	×	EC-287
HO2S2 (B2)	P0158	0158	×	×	2	×	EC-298
HO2S2 (B2)	P0159	0159	×	×	2	×	EC-313
FUEL SYS-LEAN-B1	P0171	0171	—	—	2	×	EC-324
FUEL SYS-RICH-B1	P0172	0172	—	—	2	×	EC-334
FUEL SYS-LEAN-B2	P0174	0174	—	—	2	×	EC-324
FUEL SYS-RICH-B2	P0175	0175	—	—	2	×	EC-334
FTT SENSOR	P0181	0181	—	—	2	×	EC-344
FTT SEN/CIRCUIT	P0182	0182	—	—	2	×	EC-348
FTT SEN/CIRCUIT	P0183	0183	—	—	2	×	EC-348
EOT SENSOR	P0196	0196	—	—	2	×	EC-352
EOT SEN/CIRCUIT	P0197	0197	—	—	2	×	EC-239
EOT SEN/CIRCUIT	P0198	0198	—	—	2	×	EC-239
TP SEN 1/CIRC-B1	P0222	0222	—	—	1	×	EC-361
TP SEN 1/CIRC-B1	P0223	0223	—	—	1	×	EC-361
TP SEN 2/CIRC-B2	P0227	0227	—	—	1	×	EC-229
TP SEN 2/CIRC-B2	P0228	0228	—	—	1	×	EC-229
MULTI CYL MISFIRE	P0300	0300	—	—	2	×	EC-371
CYL 1 MISFIRE	P0301	0301	—	—	2	×	EC-371
CYL 2 MISFIRE	P0302	0302	—	—	2	×	EC-371
CYL 3 MISFIRE	P0303	0303	—	—	2	×	EC-371
CYL 4 MISFIRE	P0304	0304	—	—	2	×	EC-371
CYL 5 MISFIRE	P0305	0305	—	—	2	×	EC-371
CYL 6 MISFIRE	P0306	0306	—	—	2	×	EC-371
KNOCK SEN/CIRC-B1	P0327	0327	—	—	2	—	EC-379
KNOCK SEN/CIRC-B1	P0328	0328	—	—	2	—	EC-379
KNOCK SEN/CIRC-B2	P0332	0332	—	—	2	—	EC-379
KNOCK SEN/CIRC-B2	P0333	0333	—	—	2	—	EC-379

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
CKP SEN/CIRCUIT	P0335	0335	—	—	2	×	EC-386
CMP SEN/CIRC-B1	P0340	0340	—	—	2	×	EC-394
CMP SEN/CIRC-B2	P0345	0345	—	—	2	×	EC-394
TW CATALYST SYS-B1	P0420	0420	×	×	2	×	EC-406
TW CATALYST SYS-B2	P0430	0430	×	×	2	×	EC-406
EVAP PURG FLOW/MON	P0441	0441	×	×	2	×	EC-411
EVAP SMALL LEAK	P0442	0442	×	×	2	×	EC-416
PURG VOLUME CONT/V	P0443	0443	—	—	2	×	EC-423
PURG VOLUME CONT/V	P0444	0444	—	—	2	×	EC-431
PURG VOLUME CONT/V	P0445	0445	—	—	2	×	EC-431
VENT CONTROL VALVE	P0447	0447	—	—	2	×	EC-437
VENT CONTROL VALVE	P0448	0448	—	—	2	×	EC-444
EVAP SYS PRES SEN	P0451	0451	—	—	2	×	EC-450
EVAP SYS PRES SEN	P0452	0452	—	—	2	×	EC-456
EVAP SYS PRES SEN	P0453	0453	—	—	2	×	EC-465
EVAP GROSS LEAK	P0455	0455	—	—	2	×	EC-475
EVAP VERY SML LEAK	P0456	0456	×*4	×	2	×	EC-482
FUEL LEV SEN SLOSH	P0460	0460	—	—	2	×	EC-490
FUEL LEVEL SENSOR	P0461	0461	—	—	2	×	EC-492
FUEL LEVL SEN/CIRC	P0462	0462	—	—	2	×	EC-494
FUEL LEVL SEN/CIRC	P0463	0463	—	—	2	×	EC-494
VEH SPEED SEN/CIRC*6	P0500	0500	—	—	2	×	EC-496
ISC SYSTEM	P0506	0506	—	—	2	×	EC-498
ISC SYSTEM	P0507	0507	—	—	2	×	EC-500
PW ST P SEN/CIRC	P0550	0550	—	—	2	—	EC-502
ECM BACK UP/CIRCUIT	P0603	0603	—	—	2	×	EC-508
ECM	P0605	0605	—	—	1 or 2	× or —	EC-512
SENSOR POWER/CIRC	P0643	0643	—	—	1	×	EC-514
TCM	P0700	0700	—	—	1	×	AT-101
PNP SW/CIRC	P0705	0705	—	—	2	×	AT-102
ATF TEMP SEN/CIRC	P0710	0710	—	—	2	×	AT-134
TURBINE SENSOR	P0717	0717	—	—	2	×	AT-113
VEH SPD SEN/CIR AT*6	P0720	0720	—	—	2	×	AT-108
A/T 1ST GR FNCTN	P0731	0731	—	—	2	×	AT-115
A/T 2ND GR FNCTN	P0732	0732	—	—	2	×	AT-117
A/T 3RD GR FNCTN	P0733	0733	—	—	2	×	AT-119
A/T 4TH GR FNCTN	P0734	0734	—	—	2	×	AT-121
A/T 5TH GR FNCTN	P0735	0735	—	—	2	×	AT-123
TCC SOLENOID/CIRC	P0740	0740	—	—	2	×	AT-125
A/T TCC S/V FNCTN	P0744	0744	—	—	2	×	AT-127
L/PRESS SOL/CIRC	P0745	0745	—	—	2	×	AT-129
P-N POS SW/CIRCUIT	P0850	0850	—	—	2	×	EC-520

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
EXH TIM SEN/CIR-B1	P1078	1078	—	—	2	×	EC-528
EXH TIM SEN/CIR-B2	P1084	1084	—	—	2	×	EC-528
CLOSED LOOP-B1	P1148	1148	—	—	1	×	EC-540
CLOSED LOOP-B2	P1168	1168	—	—	1	×	EC-540
TCS C/U FUNCTN	P1211	1211	—	—	2	—	EC-541
TCS/CIRC	P1212	1212	—	—	2	—	EC-542
ENG OVER TEMP	P1217	1217	—	—	1	×	EC-543
CTP LEARNING-B1	P1225	1225	—	—	2	—	EC-557
CTP LEARNING-B1	P1226	1226	—	—	2	—	EC-559
ETC FUNCTION/CIRC-B2	P1233	1233	—	—	1	×	EC-561
CTP LEARNING-B2	P1234	1234	—	—	2	—	EC-557
CTP LEARNING-B2	P1235	1235	—	—	2	—	EC-559
ETC MOT-B2	P1236	1236	—	—	1	×	EC-571
ETC ACTR-B2	P1238	1238	—	—	1	×	EC-580
TP SENSOR-B2	P1239	1239	—	—	1	×	EC-582
ETC MOT PWR-B2	P1290	1290	—	—	1	×	EC-592
COLD START CONTROL	P1421	1421	—	—	2	×	EC-600
ASCD SW	P1564	1564	—	—	1	—	EC-602
ASCD BRAKE SW	P1572	1572	—	—	1	—	EC-610
ASCD VHL SPD SEN	P1574	1574	—	—	1	—	EC-625
NATS MALFUNCTION	P1610 - P1615	1610 - 1615	—	—	2	—	EC-46
IN PULY SPEED	P1715	1715	—	—	2	—	EC-627
A/T INTERLOCK	P1730	1730	—	—	1	×	AT-141
I/C SOLENOID/CIRC	P1752	1752	—	—	1	×	AT-145
FR/B SOLENOID/CIRC	P1757	1757	—	—	1	×	AT-147
D/C SOLENOID/CIRC	P1762	1762	—	—	1	×	AT-149
HLR/C SOL/CIRC	P1767	1767	—	—	1	×	AT-151
LC/B SOLENOID/CIRC	P1772	1772	—	—	1	×	AT-153
LC/B SOLENOID FNCT	P1774	1774	—	—	1	×	AT-155
BRAKE SW/CIRCUIT	P1805	1805	—	—	2	—	EC-628
ETC MOT PWR-B1	P2100	2100	—	—	1	×	EC-592
ETC FUNCTION/CIRC-B1	P2101	2101	—	—	1	×	EC-561
ETC MOT PWR	P2103	2103	—	—	1	×	EC-592
ETC MOT-B1	P2118	2118	—	—	1	×	EC-571
ETC ACTR-B1	P2119	2119	—	—	1	×	EC-580
APP SEN 1/CIRC	P2122	2122	—	—	1	×	EC-633
APP SEN 1/CIRC	P2123	2123	—	—	1	×	EC-633
APP SEN 2/CIRC	P2127	2127	—	—	1	×	EC-641
APP SEN 2/CIRC	P2128	2128	—	—	1	×	EC-641
TP SENSOR2/CIRC-B2	P2132	2132	—	—	1	×	EC-361
TP SENSOR2/CIRC-B2	P2133	2133	—	—	1	×	EC-361
TP SENSOR-B1	P2135	2135	—	—	1	×	EC-582

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
APP SENSOR	P2138	2138	—	—	1	×	EC-650
A/F SENSOR1 (B1)	P2A00	2A00	—	×	2	×	EC-659
A/F SENSOR1 (B2)	P2A03	2A03	—	×	2	×	EC-659

*1: 1st trip DTC No. is the same as DTC No.
*2: This number is prescribed by SAE J2012.
*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.
*4: SRT code will not be set if the self-diagnostic result is NG.
*5: The troubleshooting for this DTC needs CONSULT-III.
*6: When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.
*7: When the ECM is in the mode of displaying SRT status, MIL may flash. For the details, refer to EC-56, "How to Display SRT Status" .

DTC AND 1ST TRIP DTC

The 1st trip DTC (whose number is the same as the DTC number) is displayed for the latest self-diagnostic results obtained. If the ECM memory was cleared previously, and the 1st trip DTC did not reoccur, the 1st trip DTC will not be displayed.
If a malfunction is detected during the 1st trip, the 1st trip DTC is stored in the ECM memory. The MIL will not light up (two trip detection logic). If the same malfunction is not detected in the 2nd trip (meeting the required driving pattern), the 1st trip DTC is cleared from the ECM memory. If the same malfunction is detected in the 2nd trip, both the 1st trip DTC and DTC are stored in the ECM memory and the MIL lights up. In other words, the DTC is stored in the ECM memory and the MIL lights up when the same malfunction occurs in two consecutive trips. If a 1st trip DTC is stored and a non-diagnostic operation is performed between the 1st and 2nd trips, only the 1st trip DTC will continue to be stored. For malfunctions that blink or light up the MIL during the 1st trip, the DTC and 1st trip DTC are stored in the ECM memory.
Procedures for clearing the DTC and the 1st trip DTC from the ECM memory are described in EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
For malfunctions in which 1st trip DTCs are displayed, refer to EC-48, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS" . These items are required by legal regulations to continuously monitor the system/component. In addition, the items monitored non-continuously are also displayed on CONSULT-III.
1st trip DTC is specified in Service $07 of SAE J1979. 1st trip DTC detection occurs without lighting up the MIL and therefore does not warn the driver of a malfunction. However, 1st trip DTC detection will not prevent the vehicle from being tested, for example during Inspection/Maintenance (I/M) tests.
When a 1st trip DTC is detected, check, print out or write down and erase (1st trip) DTC and Freeze Frame data as specified in Work Flow procedure Step 2, refer to EC-82, "WORK FLOW" . Then perform DTC Confirmation Procedure or Overall Function Check to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair.

How to Read DTC and 1st Trip DTC

DTC and 1st trip DTC can be read by the following methods.

With CONSULT-III

With GST

CONSULT-III or GST (Generic Scan Tool) Examples: P0340, P0850, P1148, etc.
These DTCs are prescribed by SAE J2012.
(CONSULT-III also displays the malfunctioning component or system.)

No Tools

The number of blinks of the MIL in the Diagnostic Test Mode II (Self-Diagnostic Results) indicates the DTC. Example: 0340, 0850, 1148, etc.
These DTCs are controlled by NISSAN.

- **1st trip DTC No. is the same as DTC No.**
- **Output of a DTC indicates a malfunction. However, GST or the Diagnostic Test Mode II do not indicate whether the malfunction is still occurring or has occurred in the past and has returned to normal. CONSULT-III can identify malfunction status as shown below. Therefore, using CONSULT-III (if available) is recommended.**

A sample of CONSULT-III display for DTC and 1st trip DTC is shown below. DTC or 1st trip DTC of a malfunction is displayed in “SELF-DIAGNOSTIC RESULTS” mode of CONSULT-III. Time data indicates how many times the vehicle was driven after the last detection of a DTC.

If the DTC is being detected currently, the time data will be [0].
If a 1st trip DTC is stored in the ECM, the time data will be [1t].

FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA

The ECM records the driving conditions such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed, vehicle speed, absolute throttle position, base fuel schedule and intake air temperature at the moment a malfunction is detected.
Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data. The data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST. For details, see EC-119, "Freeze Frame Data and 1st Trip Freeze Frame Data" .
Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175
2		Except the above items (Includes A/T related items)
3	1st trip freeze frame data	

For example, the EGR malfunction (Priority: 2) was detected and the freeze frame data was stored in the 2nd trip. After that when the misfire (Priority: 1) is detected in another trip, the freeze frame data will be updated from the EGR malfunction to the misfire. The 1st trip freeze frame data is updated each time a different malfunction is detected. There is no priority for 1st trip freeze frame data. However, once freeze frame data is stored in the ECM memory, 1st trip freeze data is no longer stored (because only one freeze frame data or 1st trip freeze frame data can be stored in the ECM). If freeze frame data is stored in the ECM memory and freeze frame data with the same priority occurs later, the first (original) freeze frame data remains unchanged in the ECM memory.
Both 1st trip freeze frame data and freeze frame data (along with the DTCs) are cleared when the ECM memory is erased. Procedures for clearing the ECM memory are described in EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

SYSTEM READINESS TEST (SRT) CODE

System Readiness Test (SRT) code is specified in Service $01 of SAE J1979.
As part of an enhanced emissions test for Inspection & Maintenance (I/M), certain states require the status of SRT be used to indicate whether the ECM has completed self-diagnosis of major emission systems and components. Completion must be verified in order for the emissions inspection to proceed.
If a vehicle is rejected for a State emissions inspection due to one or more SRT items indicating “INCMP”, use the information in this Service Manual to set the SRT to “CMPLT”.
In most cases the ECM will automatically complete its self-diagnosis cycle during normal usage, and the SRT status will indicate “CMPLT” for each application system. Once set as “CMPLT”, the SRT status remains “CMPLT” until the self-diagnosis memory is erased.
Occasionally, certain portions of the self-diagnostic test may not be completed as a result of the customer's normal driving pattern; the SRT will indicate “INCMP” for these items.

NOTE:
The SRT will also indicate “INCMP” if the self-diagnosis memory is erased for any reason or if the ECM memory power supply is interrupted for several hours.
If, during the state emissions inspection, the SRT indicates “CMPLT” for all test items, the inspector will continue with the emissions test. However, if the SRT indicates “INCMP” for one or more of the SRT items the vehicle is returned to the customer untested.

NOTE:
If MIL is ON during the state emissions inspection, the vehicle is also returned to the customer untested even though the SRT indicates “CMPLT” for all test items. Therefore, it is important to check SRT (“CMPLT”) and DTC (No DTCs) before the inspection.

SRT Item

The table below shows required self-diagnostic items to set the SRT to “CMPLT”.

SRT item (CONSULT-III indication)	Performance Priority*	Required self-diagnostic items to set the SRT to "CMPLT"	Corresponding DTC No.
CATALYST	2	Three way catalyst function	P0420, P0430
EVAP SYSTEM	1	EVAP control system	P0442
	2	EVAP control system	P0456
	2	EVAP control system purge flow monitoring	P0441
HO2S	2	Air fuel ratio (A/F) sensor 1	P0133, P0153
		Heated oxygen sensor 2	P0139, P0159
		Heated oxygen sensor 2	P0137, P0157
		Heated oxygen sensor 2	P0138, P0158

*: If completion of several SRTs is required, perform driving patterns (DTC confirmation procedure), one by one based on the priority for models with CONSULT-III.

SRT Set Timing

SRT is set as "CMPLT" after self-diagnosis has been performed one or more times. Completion of SRT is done regardless of whether the result is OK or NG. The set timing is different between OK and NG results and is shown in the table below.

Self-diagnosis result		Example				
		Diagnosis	Ignition cycle ← ON →	OFF	← ON →	OFF ← ON →	OFF ← ON →
All OK	Case 1	P0400	OK (1)	— (1)	OK (2)	— (2)
		P0402	OK (1)	— (1)	— (1)	OK (2)
		P1402	OK (1)	OK (2)	— (2)	— (2)
		SRT of EGR	"CMPLT"	"CMPLT"	"CMPLT"	"CMPLT"
	Case 2	P0400	OK (1)	— (1)	— (1)	— (1)
		P0402	— (0)	— (0)	OK (1)	— (1)
		P1402	OK (1)	OK (2)	— (2)	— (2)
		SRT of EGR	"INCMP"	"INCMP"	"CMPLT"	"CMPLT"
NG exists	Case 3	P0400	OK	OK	—	—
		P0402	—	—	—	—
		P1402	NG	—	NG	NG (Consecutive NG)
		(1st trip) DTC	1st trip DTC	—	1st trip DTC	DTC (= MIL "ON")
		SRT of EGR	"INCMP"	"INCMP"	"INCMP"	"CMPLT"

OK: Self-diagnosis is carried out and the result is OK.
NG: Self-diagnosis is carried out and the result is NG.
—: Self-diagnosis is not carried out.

When all SRT related self-diagnoses showed OK results in a single cycle (Ignition OFF-ON-OFF), the SRT will indicate "CMPLT". → Case 1 above
When all SRT related self-diagnoses showed OK results through several different cycles, the SRT will indicate "CMPLT" at the time the respective self-diagnoses have at least one OK result. → Case 2 above
If one or more SRT related self-diagnoses showed NG results in 2 consecutive cycles, the SRT will also indicate "CMPLT". → Case 3 above
The table above shows that the minimum number of cycles for setting SRT as "INCMP" is one (1) for each self-diagnosis (Case 1 & 2) or two (2) for one of self-diagnoses (Case 3). However, in preparation for the state emissions inspection, it is unnecessary for each self-diagnosis to be executed twice (Case 3) for the following reasons:

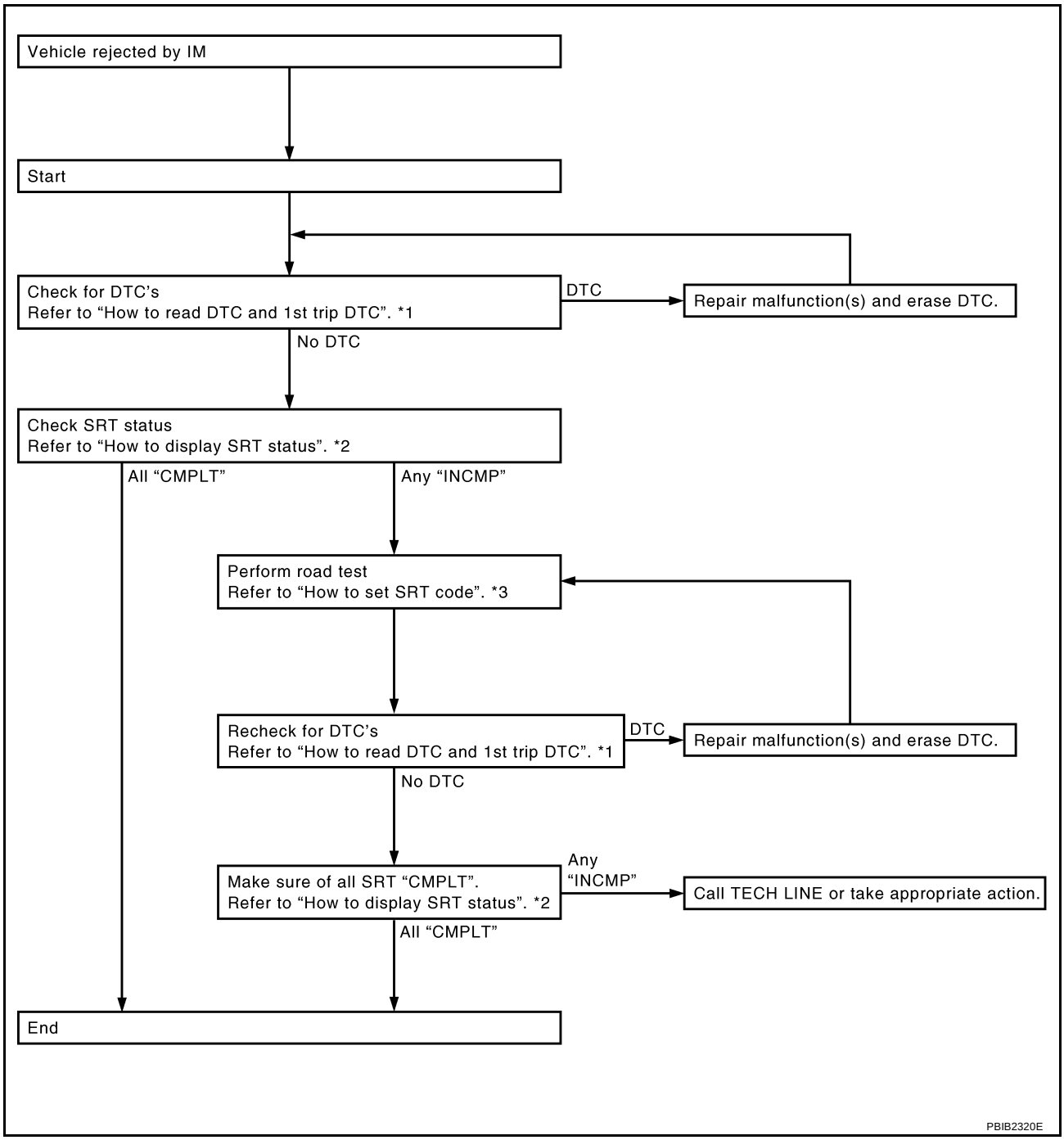
- The SRT will indicate "CMPLT" at the time the respective self-diagnoses have one (1) OK result.
- The emissions inspection requires "CMPLT" of the SRT only with OK self-diagnosis results.

- When, during SRT driving pattern, 1st trip DTC (NG) is detected prior to “CMPLT” of SRT, the self-diagnosis memory must be erased from ECM after repair.
- If the 1st trip DTC is erased, all the SRT will indicate “INCMP”.

NOTE:
SRT can be set as “CMPLT” together with the DTC(s). Therefore, DTC check must always be carried out prior to the state emission inspection even though the SRT indicates “CMPLT”.

SRT Service Procedure

If a vehicle has failed the state emissions inspection due to one or more SRT items indicating “INCMP”, review the flowchart diagnostic sequence on the next page.



*1 EC-52 *2 EC-56 *3 EC-57

How to Display SRT Status

WITH CONSULT-III

Selecting “SRT STATUS” in “DTC & SRT CONFIRMATION” mode with CONSULT-III.
For items whose SRT codes are set, a “CMPLT” is displayed on the CONSULT-III screen; for items whose SRT codes are not set, “INCMP” is displayed.
A sample of CONSULT-III display for SRT code is shown in the figure.
“INCMP” means the self-diagnosis is incomplete and SRT is not set. “CMPLT” means the self-diagnosis is complete and SRT is set.

NOTE:

Though displayed on the CONSULT-III screen, “HO2S HTR” is not SRT item.

WITH GST

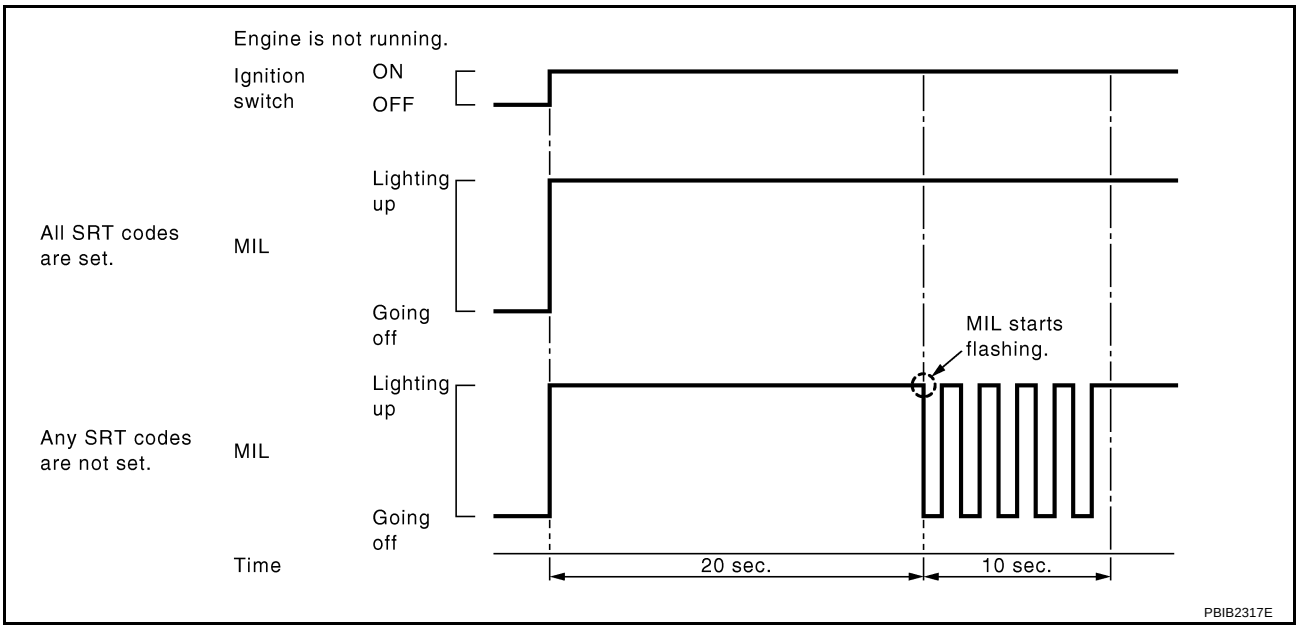
Selecting Service $01 with GST (Generic Scan Tool)

NO TOOLS

A SRT code itself can not be displayed while only SRT status can be.

1. Turn ignition switch ON and wait 20 seconds.
2. SRT status is indicated as shown below.

- When all SRT codes are set, MIL lights up continuously.
- When any SRT codes are not set, MIL will flash periodically for 10 seconds.



How to Set SRT Code

To set all SRT codes, self-diagnosis for the items indicated above must be performed one or more times. Each diagnosis may require a long period of actual driving under various conditions.

WITH CONSULT-III

Perform corresponding DTC Confirmation Procedure one by one based on Performance Priority in the table on EC-53, "SRT Item" .

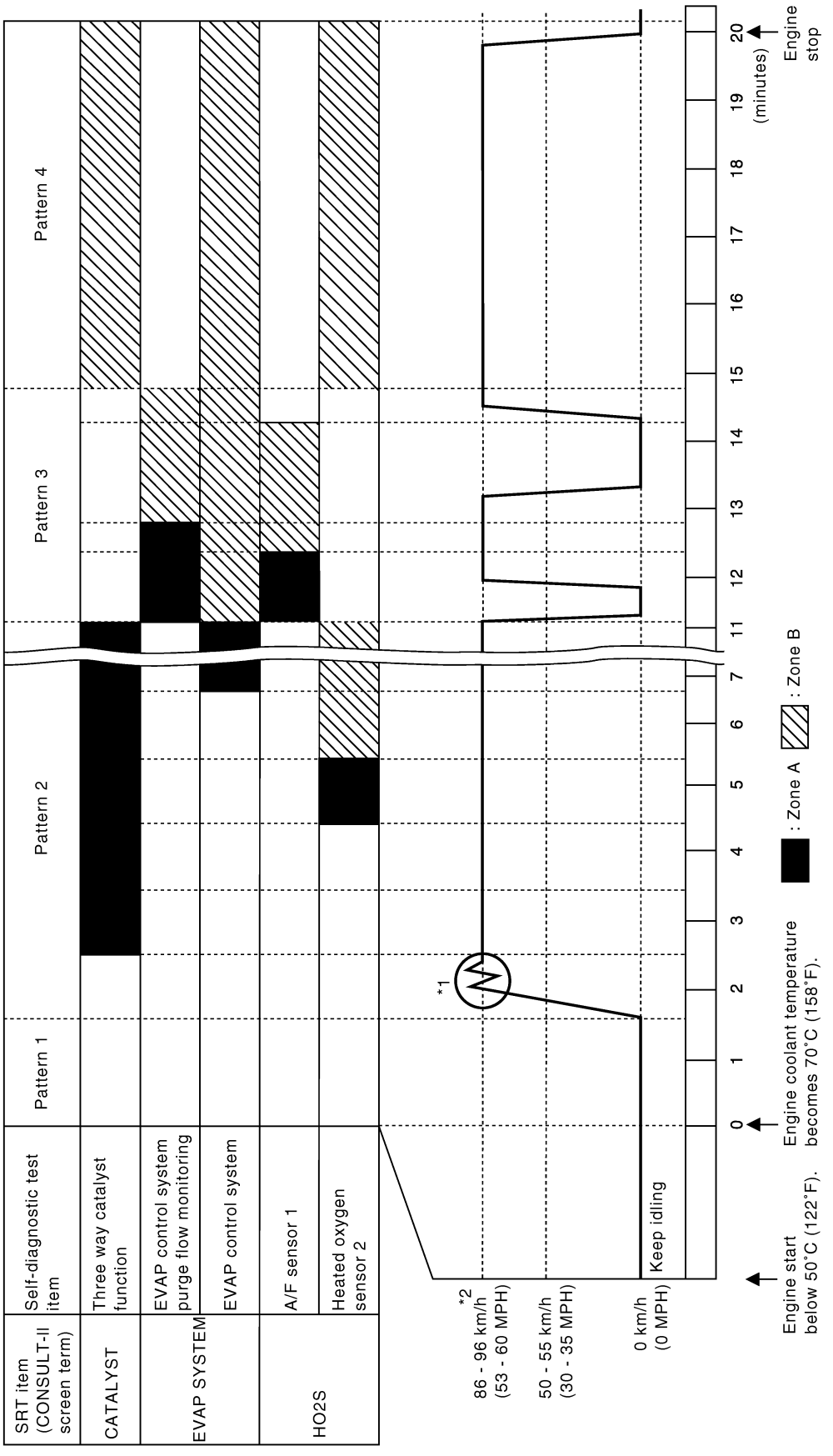
WITHOUT CONSULT-III

The most efficient driving pattern in which SRT codes can be properly set is explained on the next page. The driving pattern should be performed one or more times to set all SRT codes.

Driving Pattern

Note: Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws.
Refer to next page for more information and explanation of chart.

Driving pattern



PBIB2906E

- The time required for each diagnosis varies with road surface conditions, weather, altitude, individual driving habits, etc.
  Zone A refers to the range where the time, required for the diagnosis under normal conditions*, is the shortest.
  Zone B refers to the range where the diagnosis can still be performed if the diagnosis is not completed within zone A.

*: Normal conditions refer to the following:

- Sea level
- Flat road
- Ambient air temperature: 20 - 30°C (68 - 86°F)
- Diagnosis is performed as quickly as possible under normal conditions.
  Under different conditions [For example: ambient air temperature other than 20 - 30°C (68 - 86°F)], diagnosis may also be performed.

Pattern 1:

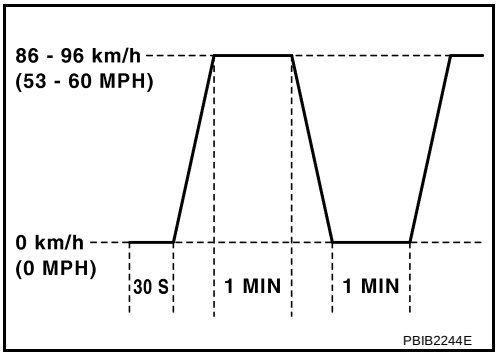
- **The engine is started at the engine coolant temperature of −10 to 35°C (14 to 95°F) (where the voltage between the ECM terminal 71 and ground is 3.0 - 4.3V).**
- **The engine must be operated at idle speed until the engine coolant temperature is greater than 70°C (158°F) (where the voltage between the ECM terminal 71 and ground is lower than 1.4V).**
- **The engine is started at the fuel tank temperature of warmer than 0°C (32°F) (where the voltage between the ECM terminal 106 and ground is less than 4.1V).**

Pattern 2:

- When steady-state driving is performed again even after it is interrupted, each diagnosis can be conducted. In this case, the time required for diagnosis may be extended.

Pattern 3:

- Operate vehicle following the driving pattern shown in the figure.
- Release the accelerator pedal during decelerating vehicle speed from 90 km/h (56 MPH) to 0 km/h (0 MPH).



Pattern 4:

- The accelerator pedal must be held very steady during steady-state driving.
- If the accelerator pedal is moved, the test must be conducted all over again.

*1: Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH), then release the accelerator pedal and keep it released for more than 10 seconds. Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH) again.
*2: Checking the vehicle speed with GST is advised.

Suggested Transmission Gear Position for A/T Models

Set the selector lever in the D position.

Suggested Upshift Speeds for M/T Models

Shown below are suggested vehicle speeds for shifting into a higher gear. These suggestions relate to fuel economy and vehicle performance. Actual upshift speeds will vary according to road conditions, the weather and individual driving habits.

	For normal acceleration in low altitude areas [less than 1,219 m (4,000 ft)]:		For quick acceleration in low altitude areas and high altitude areas [over 1,219 m (4,000 ft)]:
Gear change	ACCEL shift point km/h (MPH)	CRUISE shift point km/h (MPH)	km/h (MPH)
1st to 2nd	21 (13)	13 (8)	24 (15)
2nd to 3rd	37 (23)	26 (16)	40 (25)
3rd to 4th	48 (30)	40 (25)	64 (40)
4th to 5th	60 (37)	45 (28)	72 (45)
6th	68 (42)	53 (33)	80 (50)

Suggested Maximum Speed in Each Gear

Downshift to a lower gear if the engine is not running smoothly, or if you need to accelerate.
Do not exceed the maximum suggested speed (shown below) in any gear. For level road driving, use the highest gear suggested for that speed. Always observe posted speed limits and drive according to the road conditions to ensure sage operation. Do not over-rev the engine when shifting to a lower gear as it may cause engine damage or loss of vehicle control.

Gear	km/h (MPH)
1st	65 (40)
2nd	106 (66)
3rd	152 (95)
4th	—
5th	—
6th	—

TEST VALUE AND TEST LIMIT (GST ONLY — NOT APPLICABLE TO CONSULT-III)

The following is the information specified in Service $06 of SAE J1979.
The test value is a parameter used to determine whether a system/circuit diagnostic test is OK or NG while being monitored by the ECM during self-diagnosis. The test limit is a reference value which is specified as the maximum or minimum value and is compared with the test value being monitored.
These data (test value and test limit) are specified by Test ID (TID) and Component ID (CID) and can be displayed on the GST screen.

Item	Self-diagnostic test item	DTC	Test value (GST display)		Test limit	Conversion
			TID	CID		
CATALYST	Three way catalyst function (Bank 1)	P0420	01H	01H	Max.	1/128
		P0420	02H	81H	Min.	1
	Three way catalyst function (Bank 2)	P0430	03H	02H	Max.	1/128
		P0430	04H	82H	Min.	1
EVAP SYSTEM	EVAP control system (Small leak)	P0442	05H	03H	Max.	1/128 mm^2
	EVAP control system purge flow monitoring	P0441	06H	83H	Min.	20 mV
	EVAP control system (Very small leak)	P0456	07H	03H	Max.	1/128 mm^2

Item	Self-diagnostic test item	DTC	Test value (GST display)		Test limit	Conversion
			TID	CID		
HO2S	Air fuel ratio (A/F) sensor 1 (Bank 1)	P0131	41H	8EH	Min.	5mV
		P0132	42H	0EH	Max.	5mV
		P2A00	43H	0EH	Max.	0.002
		P2A00	44H	8EH	Min.	0.002
		P0133	45H	8EH	Min.	0.004
		P0130	46H	0EH	Max.	5mV
		P0130	47H	8EH	Min.	5mV
		P0133	48H	8EH	Min.	0.004
	Air fuel ratio (A/F) sensor 1 (Bank 2)	P0151	4CH	8FH	Min.	5mV
		P0152	4DH	0FH	Max	5mV
		P2A03	4EH	0FH	Max.	0.002
		P2A03	4FH	8FH	Min.	0.002
		P0153	50H	8FH	Min.	0.004
		P0150	51H	0FH	Max.	5mV
		P0150	52H	8FH	Min.	5mV
		P0153	53H	8FH	Min.	0.004
	Heated oxygen sensor 2 (Bank 1)	P0138	1CH	06H	Max.	10mV
		P0139	19H	86H	Min.	10mV/500 ms
		P0137	1AH	86H	Min.	10 mV
		P0138	1BH	06H	Max.	10 mV
	Heated oxygen sensor 2 (Bank 2)	P0158	24H	07H	Max	10mV
		P0159	21H	87H	Min.	10 mV/500 ms
		P0157	22H	87H	Min.	10 mV
		P0158	23H	07H	Max.	10 mV
HO2S HTR	Air fuel ratio (A/F) sensor 1 heater (Bank 1)	P0032	57H	10H	Max.	5 mV
		P0031	58H	90H	Max.	5 mV
	Air fuel ratio (A/F) sensor 1 heater (Bank 2)	P0052	59H	11H	Max.	5 mV
		P0051	5AH	91H	Max.	5 mV
	Heated oxygen sensor 2 heater (Bank 1)	P0038	2DH	0AH	Max.	20 mV
		P0037	2EH	8AH	Min.	20 mV
	Heated oxygen sensor 2 heater (Bank 2)	P0058	2FH	0BH	Max.	20 mV
		P0057	30H	8BH	Min.	20 mV

HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION

How to Erase DTC

WITH CONSULT-III

The emission related diagnostic information in the ECM can be erased by selecting “ERASE” in the “SELF-DIAG RESULTS” mode with CONSULT-III.

If DTCs are displayed for both ECM and TCM (Transmission control module), they need to be erased individually from the ECM and TCM (Transmission control module).

NOTE:

If the DTC is not for A/T related items (see EC-8, "INDEX FOR DTC"), skip steps 2 through 4.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Turn CONSULT-III ON and touch “A/T”.
3. Touch “SELF-DIAG RESULTS”.

4. Touch “ERASE”. [The DTC in the TCM (Transmission control module) will be erased.] Then touch “BACK” twice.
5. Touch “ENGINE”.
6. Touch “SELF-DIAG RESULTS”.
7. Touch “ERASE”. (The DTC in the ECM will be erased.)

WITH GST

The emission related diagnostic information in the ECM can be erased by selecting Service $04 with GST.

NOTE:
If the DTC is not for A/T related items (see EC-8, "INDEX FOR DTC"), skip step 2.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-38, "HOW TO ERASE DTC (WITH GST)" . (The DTC in the TCM will be erased.)
3. Select Service $04 with GST (Generic Scan Tool).

NO TOOLS

NOTE:
If the DTC is not for A/T related items (see EC-8, "INDEX FOR DTC"), skip step 2.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-38, "HOW TO ERASE DTC (NO TOOLS)" . (The DTC in the TCM will be erased.)
3. Change the diagnostic test mode from Mode II to Mode I by depressing the accelerator pedal. Refer to EC-63, "HOW TO SWITCH DIAGNOSTIC TEST MODE" .

- **If the battery is disconnected, the emission-related diagnostic information will be lost within 24 hours.**
- **The following data are cleared when the ECM memory is erased.**
  - Diagnostic trouble codes
  - 1st trip diagnostic trouble codes
  - Freeze frame data
  - 1st trip freeze frame data
  - System readiness test (SRT) codes
  - Test values

Actual work procedures are explained using a DTC as an example. Be careful so that not only the DTC, but all of the data listed above, are cleared from the ECM memory during work procedures.

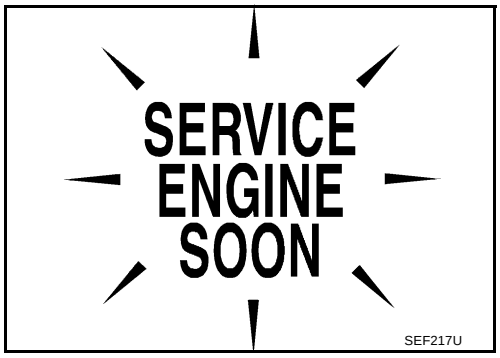
Malfunction Indicator Lamp (MIL)

NBS00032

DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check. If the MIL does not light up, refer to DI-56, "WARNING LAMPS" , or see EC-716, "MIL AND DATA LINK CONNECTOR" .
2. When the engine is started, the MIL should go off. If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



ON BOARD DIAGNOSTIC SYSTEM FUNCTION

The on board diagnostic system has the following three functions.

Diagnostic Test Mode	KEY and ENG. Status	Function	Explanation of Function
Mode I	Ignition switch in ON position  Engine stopped 	BULB CHECK	This function checks the MIL bulb for damage (blown, open circuit, etc.). If the MIL does not come on, check MIL circuit.
	Engine running 	MALFUNCTION WARNING	This is a usual driving condition. When a malfunction is detected twice in two consecutive driving cycles (two trip detection logic), the MIL will light up to inform the driver that a malfunction has been detected. The following malfunctions will light up or blink the MIL in the 1st trip. ● Misfire (Possible three way catalyst damage) ● One trip detection diagnoses
Mode II	Ignition switch in ON position  Engine stopped 	SELF-DIAGNOSTIC RESULTS	This function allows DTCs and 1st trip DTCs to be read.

When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.
Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

MIL Flashing Without DTC

When any SRT codes are not set, MIL may flash without DTC. For the details, refer to EC-56, "How to Display SRT Status" .

HOW TO SWITCH DIAGNOSTIC TEST MODE

NOTE:

- **It is better to count the time accurately with a clock.**
- **It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.**
- **Always ECM returns to Diagnostic Test Mode I after ignition switch is turned OFF.**

How to Set Diagnostic Test Mode II (Self-diagnostic Results)

1. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
2. Repeat the following procedure quickly 5 times within 5 seconds.

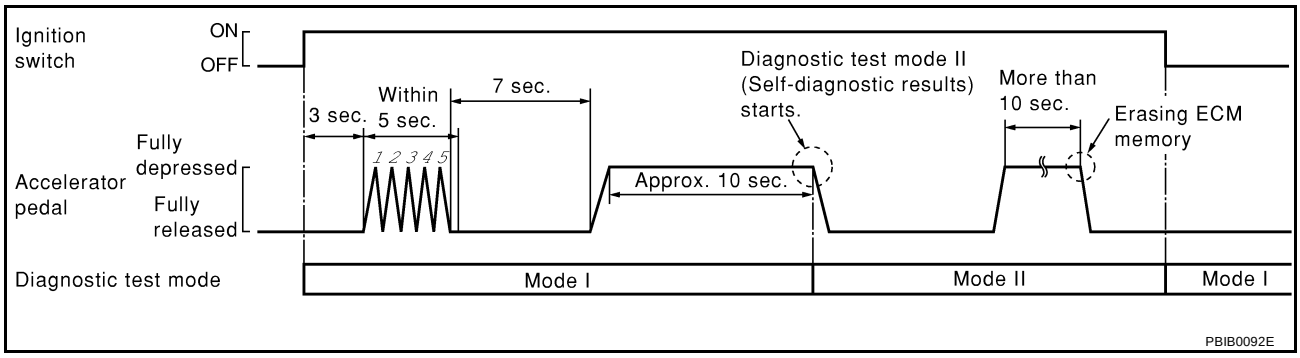
a. Fully depress the accelerator pedal.
b. Fully release the accelerator pedal.

3. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 10 seconds until the MIL starts blinking.

NOTE:
Do not release the accelerator pedal for 10 seconds if MIL may start blinking on the halfway of this 10 seconds. This blinking is displaying SRT status and is continued for another 10 seconds. For the details, refer to EC-56, "How to Display SRT Status" .

4. Fully release the accelerator pedal.
   ECM has entered to Diagnostic Test Mode II (Self-diagnostic results).

NOTE:
Wait until the same DTC (or 1st trip DTC) appears to confirm all DTCs certainly.



How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

1. Set ECM in Diagnostic Test Mode II (Self-diagnostic results).
   Refer to EC-63, "How to Set Diagnostic Test Mode II (Self-diagnostic Results)" .
2. Fully depress the accelerator pedal and keep it for more than 10 seconds.
   The emission-related diagnostic information has been erased from the backup memory in the ECM.
3. Fully release the accelerator pedal, and confirm the DTC 0000 is displayed.

DIAGNOSTIC TEST MODE I — BULB CHECK

In this mode, the MIL on the instrument panel should stay ON. If it remains OFF, check the bulb.
Refer to DI-56, "WARNING LAMPS" or see EC-716, "MIL AND DATA LINK CONNECTOR" .

DIAGNOSTIC TEST MODE I — MALFUNCTION WARNING

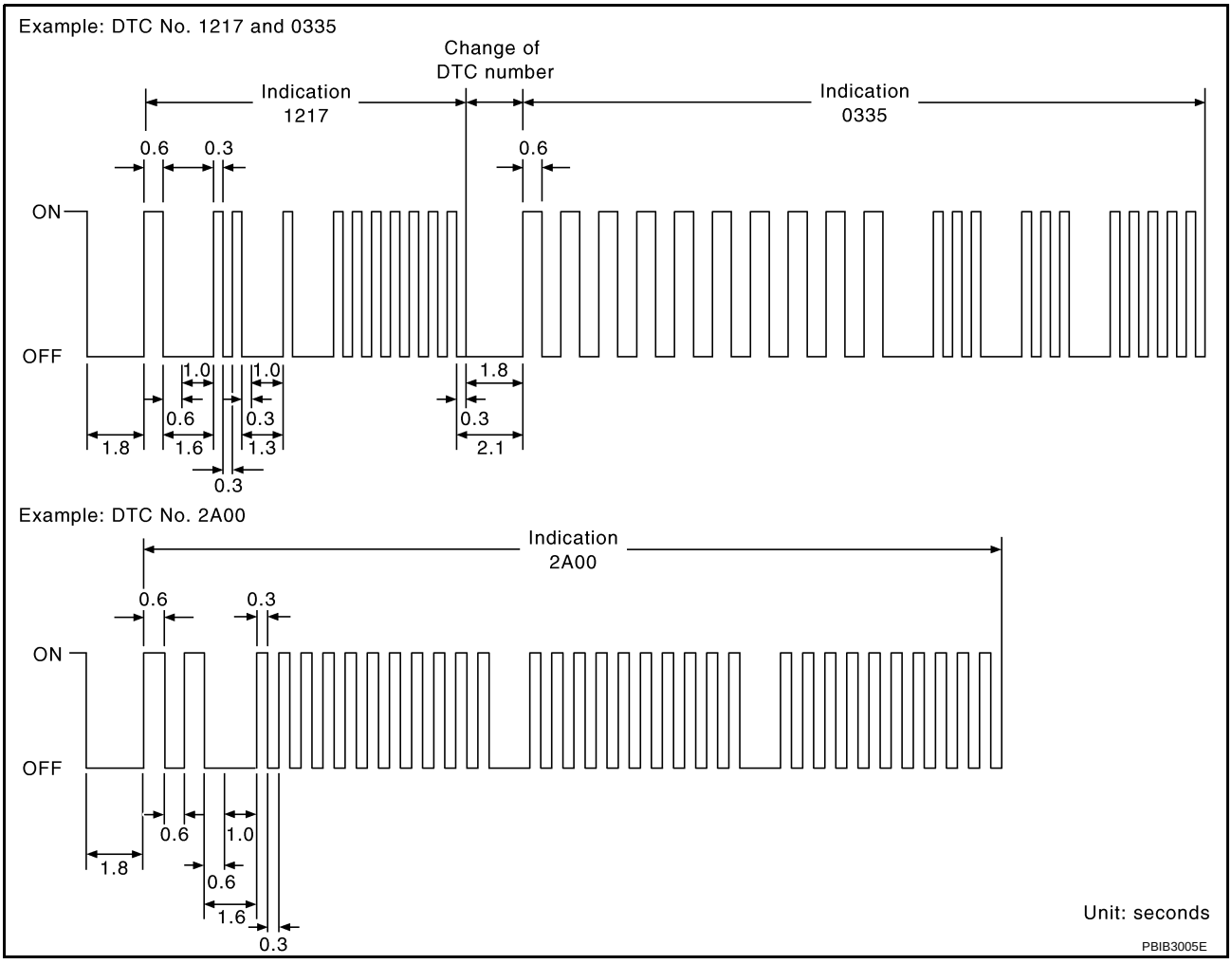
MIL	Condition
ON	When the malfunction is detected.
OFF	No malfunction.

These DTC numbers are clarified in Diagnostic Test Mode II (SELF-DIAGNOSTIC RESULTS)

DIAGNOSTIC TEST MODE II — SELF-DIAGNOSTIC RESULTS

In this mode, the DTC and 1st trip DTC are indicated by the number of blinks of the MIL as shown below. The DTC and 1st trip DTC are displayed at the same time. If the MIL does not illuminate in diagnostic test mode I (Malfunction warning), all displayed items are 1st trip DTCs. If only one code is displayed when the MIL illuminates in diagnostic test mode II (SELF-DIAGNOSTIC RESULTS), it is a DTC; if two or more codes are displayed, they may be either DTCs or 1st trip DTCs. DTC No. is same as that of 1st trip DTC. These uniden-

tified codes can be identified by using the CONSULT-III or GST. A DTC will be used as an example for how to read a code.



A particular trouble code can be identified by the number of four-digit numeral flashes as follows. The length of time the 1,000th-digit numeral flashes on and off is 1.2 seconds consisting of an ON (0.6-second) - OFF (0.6-second) cycle. The 100th-digit numeral and lower digit numerals consist of a 0.3-second ON and 0.3-second OFF cycle. A change from one digit numeral to another occurs at an interval of 1.0-second OFF. In other words, the later numeral appears on the display 1.3 seconds after the former numeral has disappeared.

Number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Flashes	10	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16

A change from one trouble code to another occurs at an interval of 1.8-second OFF.
In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. (See EC-8, "INDEX FOR DTC")

How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

The DTC can be erased from the back up memory in the ECM by depressing accelerator pedal.
Refer to EC-64, "How to Erase Diagnostic Test Mode II (Self-diagnostic Results)" .

- **If the battery is disconnected, the DTC will be lost from the backup memory within 24 hours.**
- **Be careful not to erase the stored memory before starting trouble diagnoses.**

OBD System Operation Chart

NBS00033

RELATIONSHIP BETWEEN MIL, 1ST TRIP DTC, DTC, AND DETECTABLE ITEMS

- When a malfunction is detected for the 1st time, the 1st trip DTC and the 1st trip freeze frame data are stored in the ECM memory.

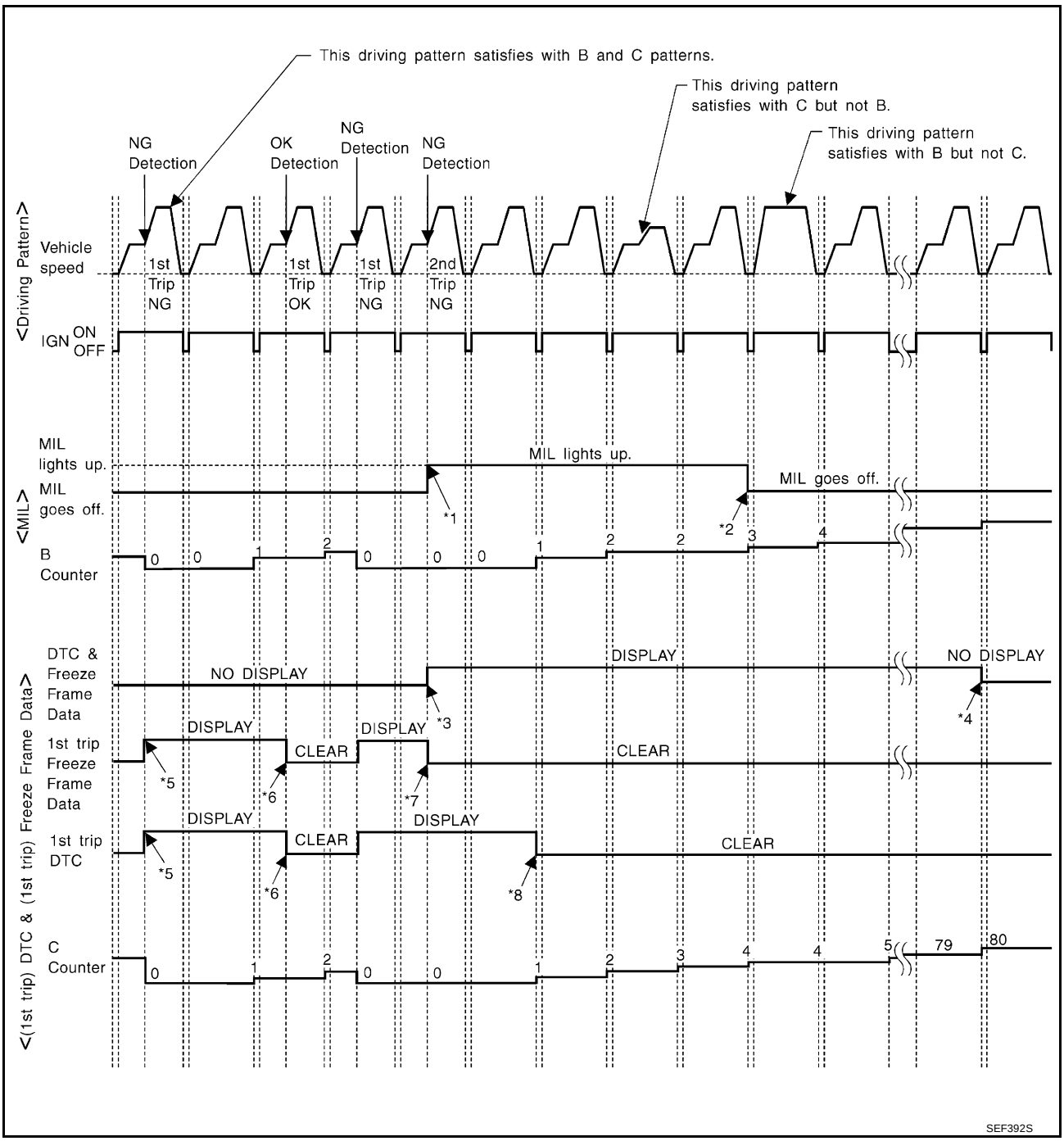
- When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data are stored in the ECM memory, and the MIL will come on. For details, refer to EC-47, "Two Trip Detection Logic" .
- The MIL will go off after the vehicle is driven 3 times (driving pattern B) with no malfunction. The drive is counted only when the recorded driving pattern is met (as stored in the ECM). If another malfunction occurs while counting, the counter will reset.
- The DTC and the freeze frame data will be stored until the vehicle is driven 40 times (driving pattern A) without the same malfunction recurring (except for Misfire and Fuel Injection System). For Misfire and Fuel Injection System, the DTC and freeze frame data will be stored until the vehicle is driven 80 times (driving pattern C) without the same malfunction recurring. The “TIME” in “SELF-DIAGNOSTIC RESULTS” mode of CONSULT-III will count the number of times the vehicle is driven.
- The 1st trip DTC is not displayed when the self-diagnosis results in OK for the 2nd trip.

SUMMARY CHART

Items	Fuel Injection System	Misfire	Other
MIL (goes off)	3 (pattern B)	3 (pattern B)	3 (pattern B)
DTC, Freeze Frame Data (no display)	80 (pattern C)	80 (pattern C)	40 (pattern A)
1st Trip DTC (clear)	1 (pattern C), *1	1 (pattern C), *1	1 (pattern B)
1st Trip Freeze Frame Data (clear)	*1, *2	*1, *2	1 (pattern B)

For details about patterns B and C under “Fuel Injection System” and “Misfire”, see EC-68 .
For details about patterns A and B under “Other”, see EC-70 .
*1: Clear timing is at the moment OK is detected.
*2: Clear timing is when the same malfunction is detected in the 2nd trip.

RELATIONSHIP BETWEEN MIL, DTC, 1ST TRIP DTC AND DRIVING PATTERNS FOR “MISFIRE ” <EXHAUST QUALITY DETERIORATION>, “FUEL INJECTION SYSTEM”



*1: When the same malfunction is detected in two consecutive trips, MIL will light up.

*2: MIL will go off after vehicle is driven 3 times (pattern B) without any malfunctions.

*3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

*4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 80 times (pattern C) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)

*5: When a malfunction is detected for the 1st time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.

*6: The 1st trip DTC and the 1st trip freeze frame data will be cleared at the moment OK is detected.

*7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

*8: 1st trip DTC will be cleared when vehicle is driven once (pattern C) without the same malfunction after DTC is stored in ECM.

EXPLANATION FOR DRIVING PATTERNS FOR “MISFIRE <EXHAUST QUALITY DETERIORATION>”, “FUEL INJECTION SYSTEM”

<Driving Pattern B>

Driving pattern B means the vehicle operation as follows:
All components and systems should be monitored at least once by the OBD system.

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunction.
- The MIL will go off when the B counter reaches 3. (*2 in OBD SYSTEM OPERATION CHART)

<Driving Pattern C>

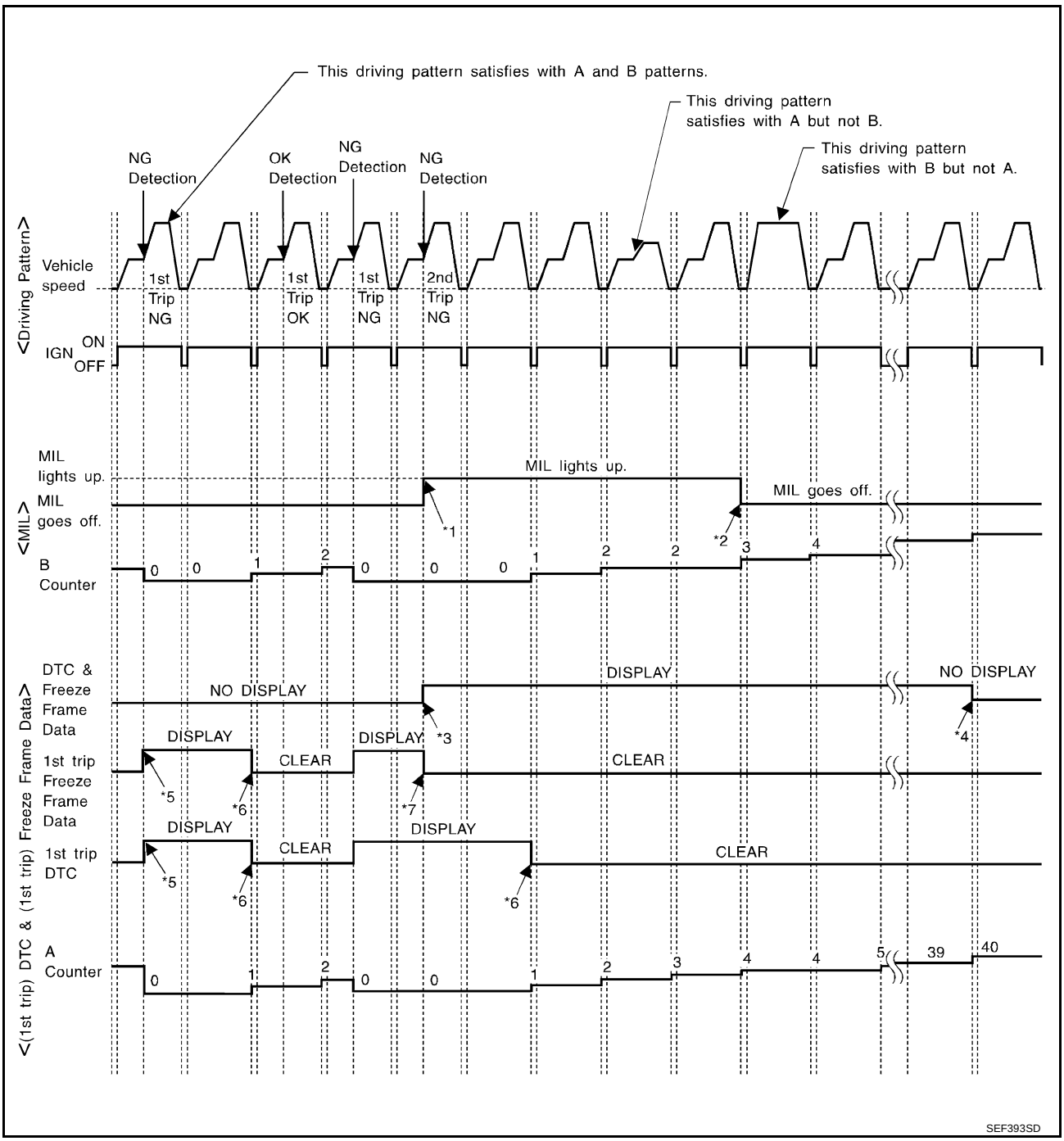
Driving pattern C means the vehicle operation as follows:
The following conditions should be satisfied at the same time:
Engine speed: (Engine speed in the freeze frame data) ±375 rpm
Calculated load value: (Calculated load value in the freeze frame data) x (1±0.1) [%]
Engine coolant temperature (T) condition:

- When the freeze frame data shows lower than 70°C (158°F), T should be lower than 70°C (158°F).
- When the freeze frame data shows higher than or equal to 70°C (158°F), T should be higher than or equal to 70°C (158°F).

Example:
If the stored freeze frame data is as follows:
Engine speed: 850 rpm, Calculated load value: 30%, Engine coolant temperature: 80°C (176°F)
To be satisfied with driving pattern C, the vehicle should run under the following conditions:
Engine speed: 475 - 1,225 rpm, Calculated load value: 27 - 33%, Engine coolant temperature: more than 70°C (158°F)

- The C counter will be cleared when the malfunction is detected regardless of vehicle conditions above.
- The C counter will be counted up when vehicle conditions above is satisfied without the same malfunction.
- The DTC will not be displayed after C counter reaches 80.(*2 in OBD SYSTEM OPERATION CHART)
- The 1st trip DTC will be cleared when C counter is counted once without the same malfunction after DTC is stored in ECM.

RELATIONSHIP BETWEEN MIL, DTC, 1ST TRIP DTC AND DRIVING PATTERNS EXCEPT FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"



*1: When the same malfunction is detected in two consecutive trips, MIL will light up.

*2: MIL will go off after vehicle is driven 3 times (pattern B) without any malfunctions.

*3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

*4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 40 times (pattern A) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)

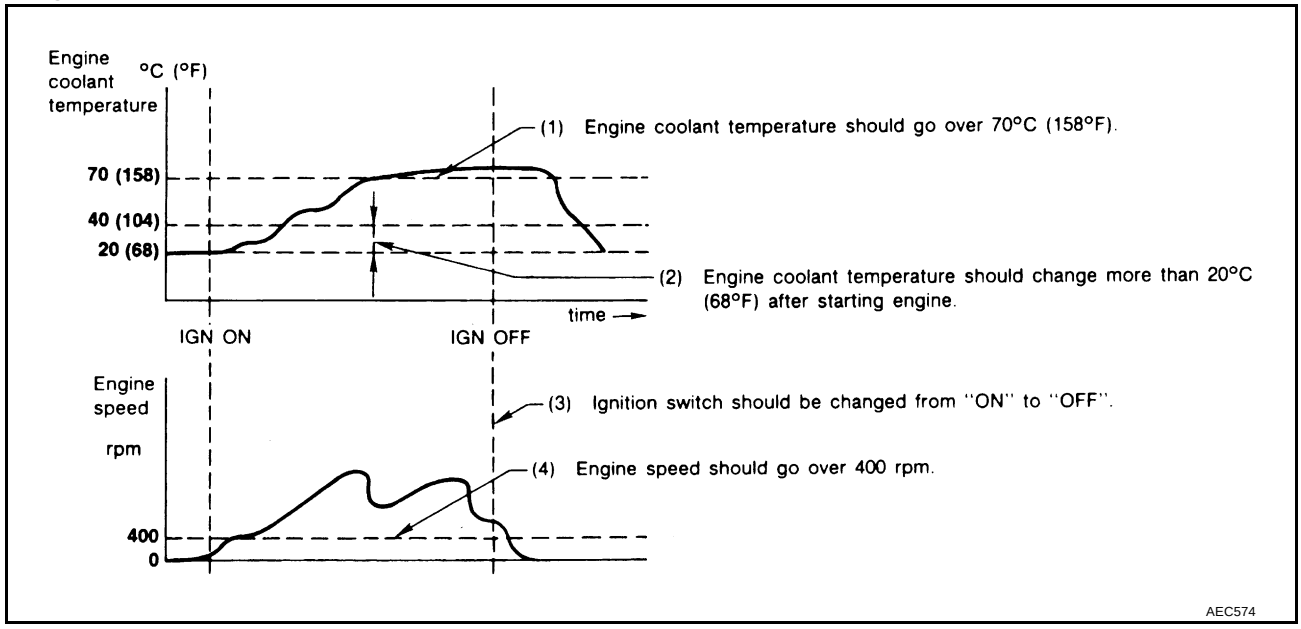
*5: When a malfunction is detected for the 1st time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.

*6: 1st trip DTC will be cleared after vehicle is driven once (pattern B) without the same malfunction.

*7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

EXPLANATION FOR DRIVING PATTERNS EXCEPT FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"

<Driving Pattern A>



- The A counter will be cleared when the malfunction is detected regardless of (1) - (4).
- The A counter will be counted up when (1) - (4) are satisfied without the same malfunction.
- The DTC will not be displayed after the A counter reaches 40.(*2 in OBD SYSTEM OPERATION CHART)

<Driving Pattern B>

Driving pattern B means the vehicle operation as follows:
All components and systems should be monitored at least once by the OBD system.

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunctions.
- The MIL will go off when the B counter reaches 3 (*2 in OBD SYSTEM OPERATION CHART).

BASIC SERVICE PROCEDURE

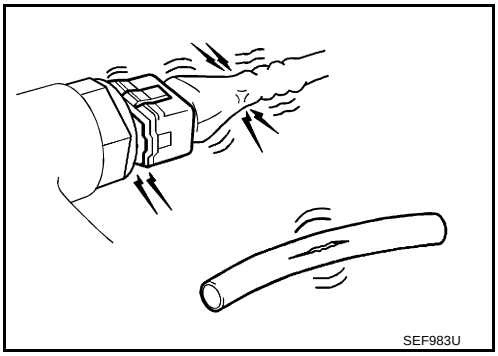
PFP:00018

Basic Inspection

NBS00034

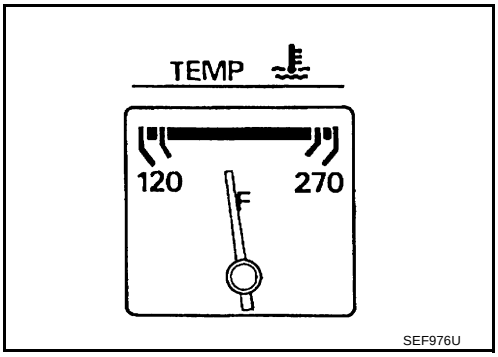
1. INSPECTION START

1. Check service records for any recent repairs that may indicate a related malfunction, or a current need for scheduled maintenance.
2. Open engine hood and check the following:
- Harness connectors for improper connections
- Wiring harness for improper connections, pinches and cut
- Vacuum hoses for splits, kinks and improper connections
- Hoses and ducts for leaks
- Air cleaner clogging
- Gasket


SEF983U

3. Confirm that electrical or mechanical loads are not applied.
- Headlamp switch is OFF.
- Air conditioner switch is OFF.
- Rear window defogger switch is OFF.
- Steering wheel is in the straight-ahead position, etc.

4. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
Ensure engine stays below 1,000 rpm.

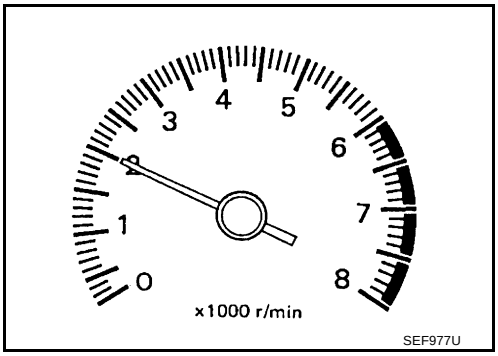


SEF976U

5. Run engine at about 2,000 rpm for about 2 minutes under no-load.
6. Make sure that no DTC is displayed with CONSULT-III or GST.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.



SEF977U

2. REPAIR OR REPLACE

Repair or replace components as necessary according to corresponding Diagnostic Procedure.

>> GO TO 3.

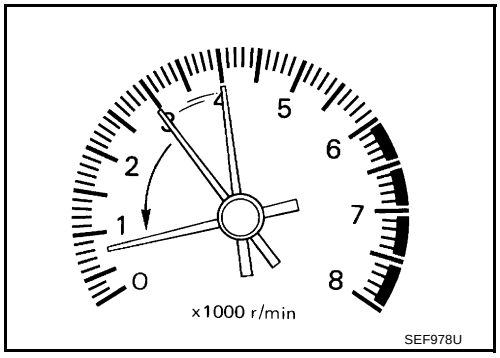
3. CHECK TARGET IDLE SPEED

With CONSULT-III

1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
3. Read idle speed in “DATA MONITOR” mode with CONSULT-III. Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm (in Neutral position)



Without CONSULT-III

1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
3. Check idle speed. Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm (in Neutral position)

OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-77, "Throttle Valve Closed Position Learning" .

>> GO TO 6.

6. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-77, "Idle Air Volume Learning" .

Is Idle Air Volume Learning carried out successfully?

Yes or No

Yes >> GO TO 7.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

7. CHECK TARGET IDLE SPEED AGAIN

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Read idle speed in “DATA MONITOR” mode with CONSULT-III.
   Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm (in Neutral position)

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed. Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm (in Neutral position)

OK or NG

OK >> GO TO 10.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit.
  Refer to EC-394, "DTC P0340, P0345 CMP SENSOR (PHASE)" .
- Check crankshaft position sensor (POS) and circuit.
  Refer to EC-386, "DTC P0335 CKP SENSOR (POS)" .

OK or NG

OK >> GO TO 9.
NG >> 1. Repair or replace.
2. GO TO 4.

9. CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-150, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)" .

>> GO TO 4.

10. CHECK IGNITION TIMING

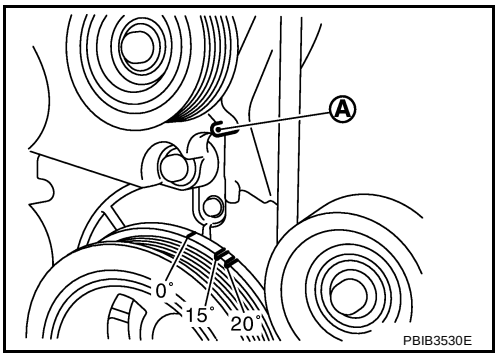
1. Run engine at idle.
2. Check ignition timing with a timing light.

   A : Timing indicator

   Refer to EC-76, "IGNITION TIMING" .

A/T: 15 ± 5° BTDC (in P or N position)

M/T: 15 ± 5° BTDC (in Neutral position)



OK or NG

OK >> GO TO 19.
NG >> GO TO 11.

11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-77, "Throttle Valve Closed Position Learning" .

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-77, "Idle Air Volume Learning" .
Is Idle Air Volume Learning carried out successfully?

Yes or No

Yes >> GO TO 14.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

14. CHECK TARGET IDLE SPEED AGAIN

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Read idle speed in “DATA MONITOR” mode with CONSULT-III.
Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm (in Neutral position)

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed. Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm (in Neutral position)

OK or NG

OK >> GO TO 15.
NG >> GO TO 17.

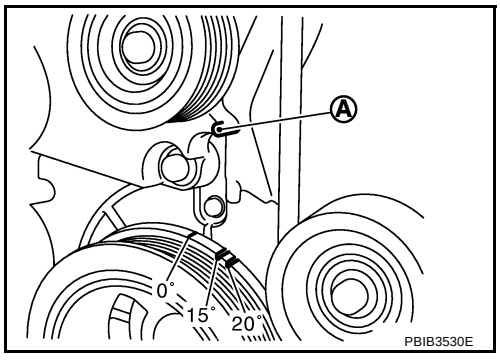
15. CHECK IGNITION TIMING AGAIN

1. Run engine at idle.
2. Check ignition timing with a timing light.

A : Timing indicator

Refer to EC-76, "IGNITION TIMING" .

A/T: 15 ± 5° BTDC (in P or N position)
M/T: 15 ± 5° BTDC (in Neutral position)



OK or NG

OK >> GO TO 19.
NG >> GO TO 16.

16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-53, "TIMING CHAIN" .

OK or NG

OK >> GO TO 17.
NG >> 1. Repair the timing chain installation.
2. GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit.
  Refer to EC-394, "DTC P0340, P0345 CMP SENSOR (PHASE)" .
- Check crankshaft position sensor (POS) and circuit.
  Refer to EC-386, "DTC P0335 CKP SENSOR (POS)" .

OK or NG

OK >> GO TO 18.
NG >> 1. Repair or replace.
2. GO TO 4.

18. CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-150, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)" .

>> GO TO 4.

19. INSPECTION END

Did you replace the ECM, referring this Basic Inspection procedure?

Yes or No

Yes >> 1. Perform EC-76, "VIN Registration"
2. Perform EC-76, "Exhaust Valve Timing Control Learning" .
3. **INSPECTION END**

No >> **INSPECTION END**

Idle Speed and Ignition Timing Check

NBS00035

IDLE SPEED

With CONSULT-III

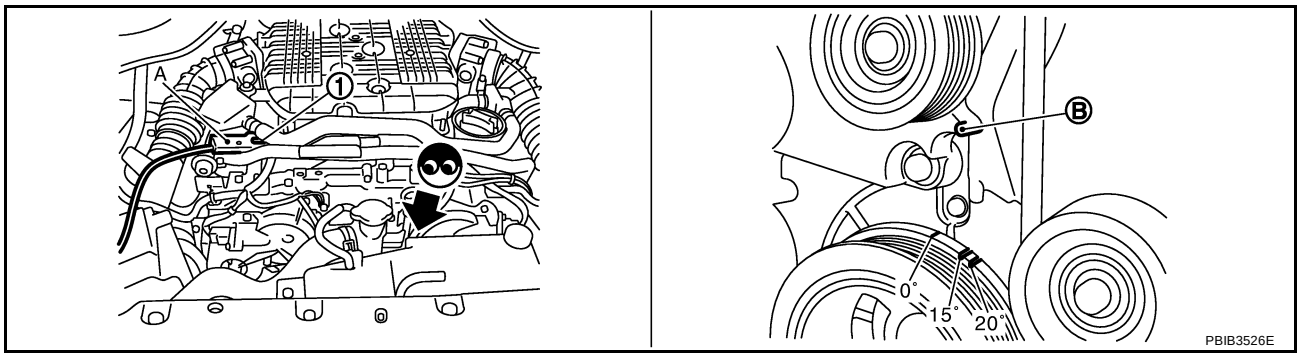
Check idle speed in “DATA MONITOR” mode with CONSULT-III.

With GST

Check idle speed in Service $01 with GST.

IGNITION TIMING

1. Attach timing light to loop wire as shown.



1. Loop wire
A. Timing light
B. Timing indicator

2. Check ignition timing.

Procedure After Replacing ECM

NBS006SZ

When replacing ECM, the following procedure must be performed.

1. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-152, "ECM Re-communicating Function" .
2. Perform EC-76, "VIN Registration" .
3. Perform EC-76, "Exhaust Valve Timing Control Learning" .
4. Perform EC-77, "Accelerator Pedal Released Position Learning" .
5. Perform EC-77, "Throttle Valve Closed Position Learning" .
6. Perform EC-77, "Idle Air Volume Learning" .

VIN Registration

NBS00037

DESCRIPTION

VIN Registration is an operation to registering VIN in ECM. It must be performed each time ECM is replaced.

NOTE:

Accurate VIN which is registered in ECM may be required for Inspection & Maintenance (I/M).

OPERATION PROCEDURE

With CONSULT-III

1. Check the VIN of the vehicle and note it. Refer to GI-46, "IDENTIFICATION INFORMATION" .
2. Turn ignition switch ON and engine stopped.
3. Select “VIN REGISTRATION” in “WORK SUPPORT” mode.
4. Follow the instruction of CONSULT-III display.

Exhaust Valve Timing Control Learning

NBS00038

DESCRIPTION

Exhaust Valve Timing Control Learning is an operation to learn the characteristic of exhaust valve timing control magnet retarder by comparing the target angle of exhaust camshaft with the actual retarded angle of exhaust camshaft. It must be performed each time exhaust valve timing control magnet retarder is disconnected or replaced, or ECM is replaced.

OPERATION PROCEDURE

With CONSULT-III

1. Start engine and warm it up to normal operation temperature.
2. Set shift lever in neutral position and confirm that following electrical or mechanical loads are not applied.
   - Headlamp switch is OFF
   - Air conditioner switch is OFF
   - Rear defogger switch is OFF
   - Steering wheel is in the straight-ahead position, etc
3. Keep the engine speed between 1,800 and 2,000 rpm.
4. Select “EXH V/T CONTROL LEARN” in “WORK SUPPORT” mode with CONSULT-III.
5. Touch “START” and wait 20 seconds.
6. Make sure that “CMPLT” is displayed on CONSULT-III screen.

Learning completed : CMPLT
Learning not yet : YET

Without CONSULT-III

1. Start engine and warm it up to normal operation temperature.
2. Set shift lever in neutral position and confirm that following electrical or mechanical loads are not applied.
   - Headlamp switch is OFF
   - Air conditioner switch is OFF
   - Rear defogger switch is OFF
   - Steering wheel is in the straight-ahead position, etc
3. Keep the engine speed between 1,800 and 2,000 rpm at 20 seconds.

Accelerator Pedal Released Position Learning

NBS00039

DESCRIPTION

Accelerator Pedal Released Position Learning is an operation to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. It must be performed each time harness connector of accelerator pedal position sensor or ECM is disconnected.

OPERATION PROCEDURE

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON and wait at least 2 seconds.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON and wait at least 2 seconds.
5. Turn ignition switch OFF and wait at least 10 seconds.

Throttle Valve Closed Position Learning

NBS0003A

DESCRIPTION

Throttle Valve Closed Position Learning is an operation to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time harness connector of electric throttle control actuator or ECM is disconnected.

OPERATION PROCEDURE

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.
   Make sure that throttle valve moves during above 10 seconds by confirming the operating sound.

Idle Air Volume Learning

NBS0003B

DESCRIPTION

Idle Air Volume Learning is an operation to learn the idle air volume that keeps each engine within the specific range. It must be performed under any of the following conditions:

- Each time electric throttle control actuator or ECM is replaced.

- Idle speed or ignition timing is out of specification.

PREPARATION

Before performing Idle Air Volume Learning, make sure that all of the following conditions are satisfied. Learning will be cancelled if any of the following conditions are missed for even a moment.

- Battery voltage: More than 12.9V (At idle)
- Engine coolant temperature: 70 - 100°C (158 - 212°F)
- Park/neutral position (PNP) switch: ON
- Electric load switch: OFF
  (Air conditioner, headlamp, rear window defogger)
  On vehicles equipped with daytime light systems, if the parking brake is applied before the engine is started, the headlamp will not be illuminated.
- Steering wheel: Neutral (Straight-ahead position)
- Vehicle speed: Stopped
- Transmission: Warmed-up

– For A/T models with CONSULT-III

• Drive vehicle until “ATF TEMP SE 1” in “DATA MONITOR” mode of “A/T” system indicates less than 0.9V.

– For A/T models without CONSULT-III and M/T models

• Drive vehicle for 10 minutes.

OPERATION PROCEDURE

With CONSULT-III

1. Perform EC-77, "Accelerator Pedal Released Position Learning" .
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Start engine and warm it up to normal operating temperature.
4. Check that all items listed under the topic PREPARATION (previously mentioned) are in good order.
5. Select “IDLE AIR VOL LEARN” in “WORK SUPPORT” mode.
6. Touch “START” and wait 20 seconds.
7. Make sure that “CMPLT” is displayed on CONSULT-III screen. If “CMPLT” is not displayed, Idle Air Volume Learning will not be carried out successfully. In this case, find the cause of the incident by referring to the DIAGNOSIS PROCEDURE below.
8. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in Neutral position)
Ignition timing	A/T: 15 ± 5° BTDC (in P or N position) M/T: 15 ± 5° BTDC (in Neutral position)

Without CONSULT-III

NOTE:

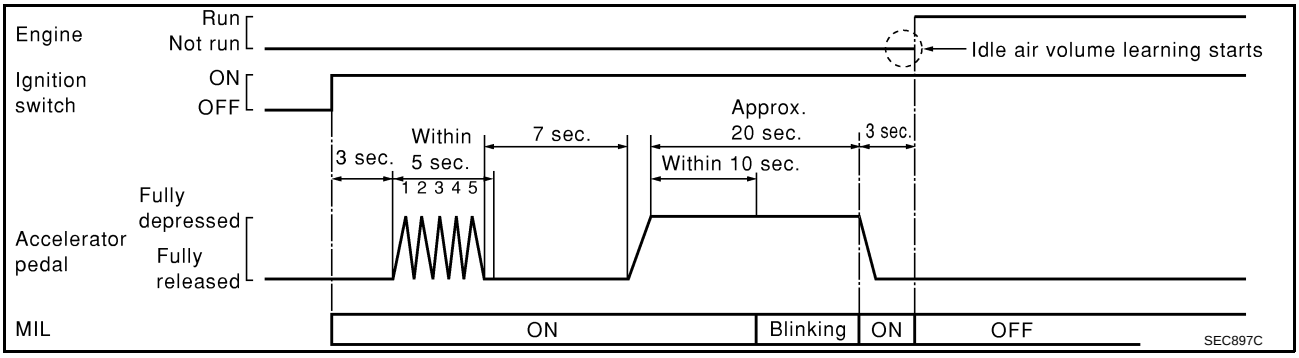
- **It is better to count the time accurately with a clock.**
- **It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.**

1. Perform EC-77, "Accelerator Pedal Released Position Learning" .
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Start engine and warm it up to normal operating temperature.
4. Check that all items listed under the topic PREPARATION (previously mentioned) are in good order.
5. Turn ignition switch OFF and wait at least 10 seconds.
6. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
7. Repeat the following procedure quickly five times within 5 seconds.

a. Fully depress the accelerator pedal.

b. Fully release the accelerator pedal.

8. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 20 seconds until the MIL stops blinking and turned ON.
9. Fully release the accelerator pedal within 3 seconds after the MIL turned ON.
10. Start engine and let it idle.
11. Wait 20 seconds.



12. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in Neutral position)
Ignition timing	A/T: 15 ± 5° BTDC (in P or N position) M/T: 15 ± 5° BTDC (in Neutral position)

13. If idle speed and ignition timing are not within the specification, Idle Air Volume Learning will not be carried out successfully. In this case, find the cause of the incident by referring to the DIAGNOSTIC PROCEDURE below.

DIAGNOSTIC PROCEDURE

If Idle Air Volume Learning cannot be performed successfully, proceed as follows:

1. **Check that throttle valve is fully closed.**
2. **Check PCV valve operation.**
3. **Check that downstream of throttle valve is free from air leakage.**
4. **When the above three items check out OK, engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident.**
   It is useful to perform EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .
5. **If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform Idle Air Volume Learning all over again:**
   - **Engine stalls.**
   - **Erroneous idle.**

Fuel Pressure Check

NBS0003C

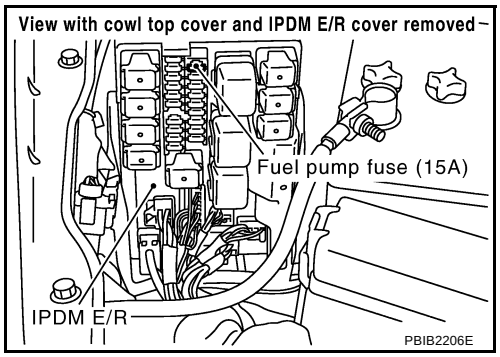
FUEL PRESSURE RELEASE

With CONSULT-III

1. Turn ignition switch ON.
2. Perform “FUEL PRESSURE RELEASE” in “WORK SUPPORT” mode with CONSULT-III.
3. Start engine.
4. After engine stalls, crank it two or three times to release all fuel pressure.
5. Turn ignition switch OFF.

Without CONSULT-III

1. Remove fuel pump fuse (1) located in IPDM E/R (2).
2. Start engine.
3. After engine stalls, crank it two or three times to release all fuel pressure.
4. Turn ignition switch OFF.
5. Reinstall fuel pump fuse after servicing fuel system.



FUEL PRESSURE CHECK

CAUTION:

Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger.

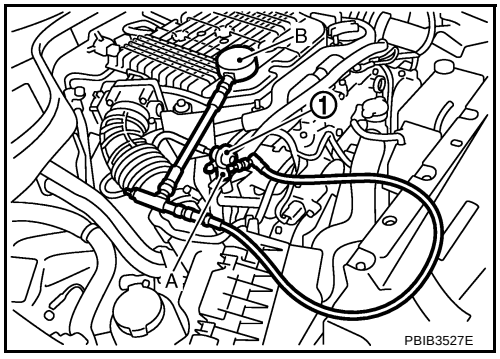
NOTE:

Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel pressure cannot be completely released because Z33 models do not have fuel return system.
Use Fuel Pressure Gauge Kit (J-44321) to check fuel pressure.

1. Release fuel pressure to zero. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Install the inline fuel quick disconnected fitting (A) between fuel damper (1) and fuel injector tube.
3. Connect the fuel pressure gauge (quick connector adapter hose) (B) to the inline fuel quick disconnected fitting.
4. Turn ignition switch ON and check for fuel leakage.
5. Start engine and check for fuel leakage.
6. Read the indication of fuel pressure gauge.

At idling: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

7. If result is unsatisfactory, go to next step.
8. Check fuel hoses and fuel tubes for clogging.
   If OK, replace “fuel filter and fuel pump assembly”.
   If NG, repair or replace.



TROUBLE DIAGNOSIS

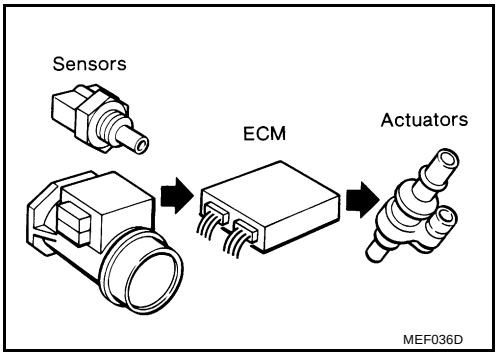
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Trouble Diagnosis Introduction

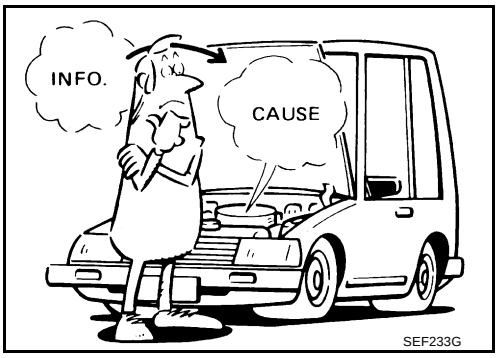
NBS0003D

INTRODUCTION

The engine has an ECM to control major systems such as fuel control, ignition control, idle air control system, etc. The ECM accepts input signals from sensors and instantly drives actuators. It is essential that both input and output signals are proper and stable. At the same time, it is important that there are no malfunctions such as vacuum leaks, fouled spark plugs, or other malfunctions with the engine.



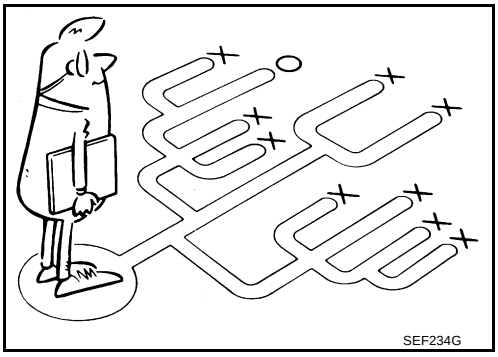
It is much more difficult to diagnose an incident that occurs intermittently rather than continuously. Most intermittent incidents are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.



A visual check only may not find the cause of the incidents. A road test with CONSULT-III (or GST) or a circuit tester connected should be performed. Follow the WORK FLOW on EC-82 .

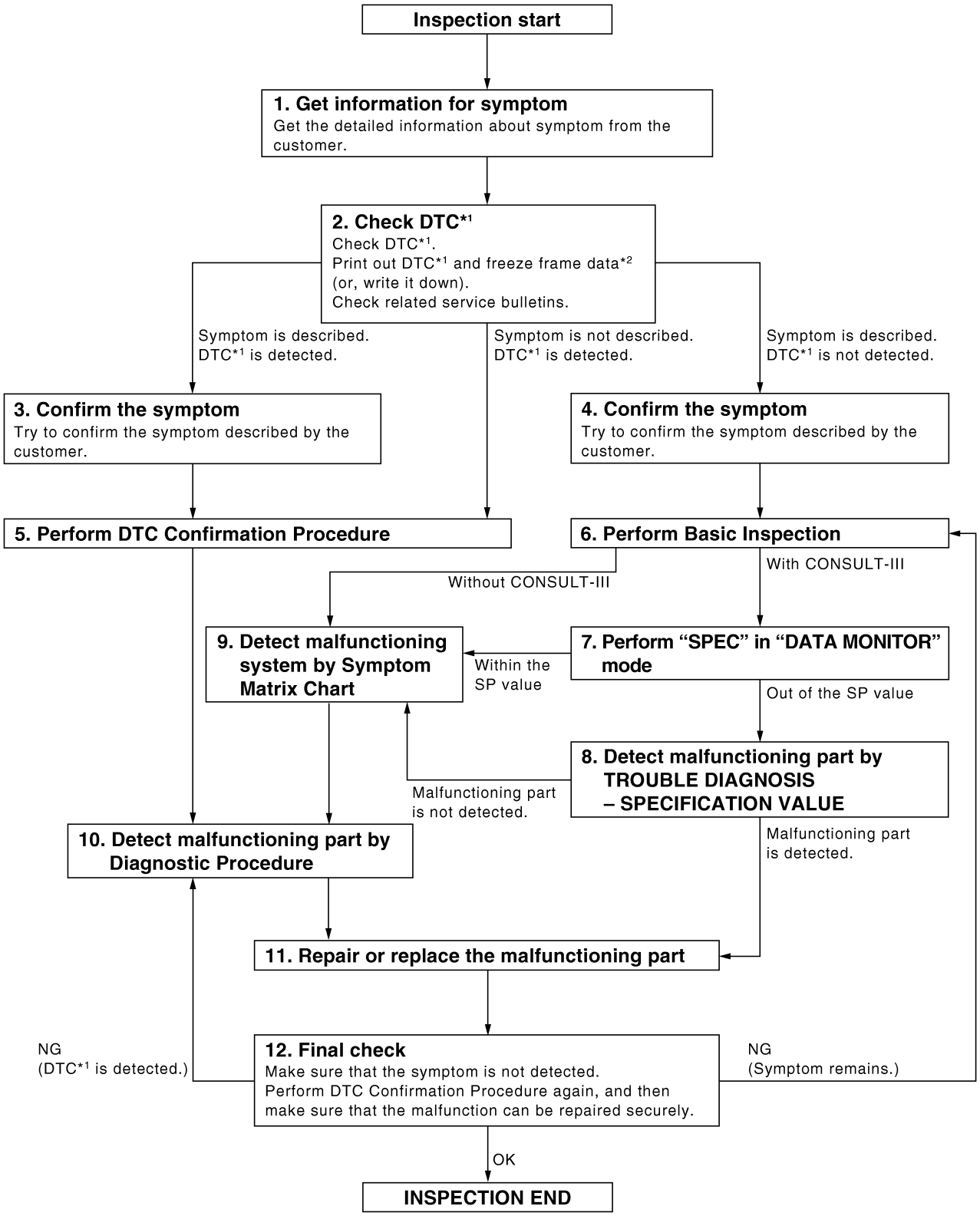
Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such incidents, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A DIAGNOSTIC WORKSHEET like the example on EC-86 should be used.

Start your diagnosis by looking for conventional malfunctions first. This will help troubleshoot driveability malfunctions on an electronically controlled engine vehicle.



WORK FLOW

Overall Sequence



*1: Include 1st trip DTC.
*2: Include 1st trip freeze frame data.

PBIB3456E

Detailed Flow

1. GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the EC-85, "DIAGNOSTIC WORKSHEET" .

>> GO TO 2.

2. CHECK DTC*1

1. Check DTC*1 .
2. Perform the following procedure if DTC*1 is displayed.

- Record DTC*1 and freeze frame data*2 . (Print them out with CONSULT-III or GST.)
- Erase DTC*1 . (Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .)
- Study the relationship between the cause detected by DTC*1 and the symptom described by the customer. (Symptom Matrix Chart is useful. Refer to EC-90, "Symptom Matrix Chart" .)

3. Check related service bulletins for information.

Is any symptom described and any DTC detected?

Symptom is described, DTC*1 is displayed>>GO TO 3.
Symptom is described, DTC*1 is not displayed>>GO TO 4.
Symptom is not described, DTC*1 is displayed>>GO TO 5.

3. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer (except MIL ON).
DIAGNOSIS WORK SHEET is useful to verify the incident.
Connect CONSULT-III to the vehicle and check diagnosis results.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
DIAGNOSIS WORK SHEET is useful to verify the incident.
Connect CONSULT-III to the vehicle and check diagnosis results.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5. PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC Confirmation Procedure for the displayed DTC*1 , and then make sure that DTC*1 is detected again.

If two or more DTCs*1 are detected, refer to EC-87, "DTC Inspection Priority Chart" and determine trouble diagnosis order.

NOTE:

- Freeze frame data*2 is useful if the DTC*1 is not detected.
- Perform Overall Function Check if DTC Confirmation Procedure is not included on Service Manual. This simplified check procedure is an effective alternative though DTC*1 cannot be detected during this check. If the result of Overall Function Check is NG, it is the same as the detection of DTC*1 by DTC Confirmation Procedure.

Is DTC*1 detected?

Yes >> GO TO 10.
No >> Check according to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

6. PERFORM BASIC INSPECTION

Perform EC-71, "Basic Inspection" .

With CONSULT-III>>GO TO 7.
Without CONSULT-III>>GO TO 9.

7. PERFORM SPEC IN DATA MONITOR MODE

With CONSULT-III
Make sure that “MAS A/F SE-B1”, “MAS A/F SE-B2”, “B/FUEL SCHDL”, and “A/F ALPHA-B1”, “A/F ALPHA-B2” are within the SP value using CONSULT-III “SPEC” in "DATA MONITOR" mode.
Refer to EC-133, "Diagnostic Procedure" .

Are they within the SP value?

Yes >> GO TO 9.
No >> GO TO 8.

8. DETECT MALFUNCTIONING PART BY TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Detect malfunctioning part according to EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .

Is malfunctioning part detected?

Yes >> GO TO 11.
No >> GO TO 9.

9. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM MATRIX CHART

Detect malfunctioning system according to EC-90, "Symptom Matrix Chart" based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

>> GO TO 10.

10. DETECT MALFUNCTIONING PART BY DIAGNOSTIC PROCEDURE

Inspect according to Diagnostic Procedure of the system.

NOTE:
The Diagnostic Procedure in EC section described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnostic Procedure. For details, refer to Circuit Inspection in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" .

Is malfunctioning part detected?

Yes >> GO TO 11.
No >> Monitor input data from related sensors or check voltage of related ECM terminals using CONSULT-III. Refer to EC-127, "CONSULT-III Reference Value in Data Monitor" , EC-103, "ECM Terminals and Reference Value" .

11. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnostic Procedure again after repair and replacement.
3. Check DTC. If DTC is displayed, erase it, refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 12.

12. FINAL CHECK

When DTC was detected in step 2, perform DTC Confirmation Procedure or Overall Function Check again, and then make sure that the malfunction have been repaired securely.
When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and make sure that the symptom is not detected.

OK or NG

NG (DTC*1 is detected)>>GO TO 10.
NG (Symptom remains)>>GO TO 6.
OK >> 1. Before returning the vehicle to the customer, make sure to erase unnecessary DTC*1 in ECM and TCM (Transmission Control Module). (Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" and AT-38, "HOW TO ERASE DTC" .)
2. If the completion of SRT is needed, drive vehicle under the specific driving pattern. Refer to EC-58, "Driving Pattern" .
3. **INSPECTION END**

*1: Include 1st trip DTC.
*2: Include 1st trip freeze frame data.

DIAGNOSTIC WORKSHEET

Description

There are many operating conditions that lead to the malfunction of engine components. A good grasp of such conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a incident. It is important to fully understand the symptoms or conditions for a customer complaint.
Utilize a diagnostic worksheet like the one on the next page in order to organize all the information for troubleshooting.
Some conditions may cause the MIL to come on steady or blink and DTC to be detected. Examples:

- Vehicle ran out of fuel, which caused the engine to misfire.
- Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

KEY POINTS

WHAT ..... Vehicle & engine model
WHEN ..... Date, Frequencies
WHERE..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SEF907L

Worksheet Sample

Customer name MR/MS		Model & Year	VIN
Engine #		Trans.	Mileage
Incident Date		Manuf. Date	In Service Date
Fuel and fuel filler cap		☐ Vehicle ran out of fuel causing misfire ☐ Fuel filler cap was left off or incorrectly screwed on.	
Symptoms	☐ Startability	☐ Impossible to start ☐ No combustion ☐ Partial combustion ☐ Partial combustion affected by throttle position ☐ Partial combustion NOT affected by throttle position ☐ Possible but hard to start ☐ Others [ ]	
	☐ Idling	☐ No fast idle ☐ Unstable ☐ High idle ☐ Low idle ☐ Others [ ]	
	☐ Driveability	☐ Stumble ☐ Surge ☐ Knock ☐ Lack of power ☐ Intake backfire ☐ Exhaust backfire ☐ Others [ ]	
	☐ Engine stall	☐ At the time of start ☐ While idling ☐ While accelerating ☐ While decelerating ☐ Just after stopping ☐ While loading	
Incident occurrence		☐ Just after delivery ☐ Recently ☐ In the morning ☐ At night ☐ In the daytime	
Frequency		☐ All the time ☐ Under certain conditions ☐ Sometimes	
Weather conditions		☐ Not affected	
	Weather	☐ Fine ☐ Raining ☐ Snowing ☐ Others [ ]	
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold ☐ Humid °F	
Engine conditions		☐ Cold ☐ During warm-up ☐ After warm-up Engine speed 0 2,000 4,000 6,000 8,000 rpm	
Road conditions		☐ In town ☐ In suburbs ☐ Highway ☐ Off road (up/down)	
Driving conditions		☐ Not affected ☐ At starting ☐ While idling ☐ At racing ☐ While accelerating ☐ While cruising ☐ While decelerating ☐ While turning (RH/LH) Vehicle speed 0 10 20 30 40 50 60 MPH	
Malfunction indicator lamp		☐ Turned on ☐ Not turned on	

MTBL0017

DTC Inspection Priority Chart

NBS0003E

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:

- **If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC U1010 is displayed with other DTC, first perform the diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION".**

Priority	Detected items (DTC)
1	● U1000 U1001 CAN communication line ● U1010 CAN communication ● P0101 P0102 P0103 P010B P010C P010D Mass air flow sensor ● P0112 P0113 P0127 Intake air temperature sensor ● P0117 P0118 P0125 Engine coolant temperature sensor ● P0122 P0123 P0222 P0223 P0227 P0228 P1225 P1226 P1234 P1235 P1239 P2132 P2133 P2135 Throttle position sensor ● P0128 Thermostat function ● P0181 P0182 P0183 Fuel tank temperature sensor ● P0196 P0197 P0198 Engine oil temperature sensor ● P0327 P0328 P0332 P0333 Knock sensor ● P0335 Crankshaft position sensor (POS) ● P0340 P0345 Camshaft position sensor (PHASE) ● P0460 P0461 P0462 P0463 Fuel level sensor ● P0500 Vehicle speed sensor ● P0605 ECM ● P0643 Sensor power supply ● P0700 TCM ● P0705 P0850 Park/neutral position (PNP) switch ● P1610 - P1615 NATS ● P2122 P2123 P2127 P2128 P2138 Accelerator pedal position sensor

Priority	Detected items (DTC)
2	● P0031 P0032 P0051 P0052 Air fuel ratio (A/F) sensor 1 heater ● P0037 P0038 P0057 P0058 Heated oxygen sensor 2 heater ● P0075 P0081 Intake valve timing control solenoid valve ● P0078 P0084 Exhaust valve timing control magnet retarder* ● P0130 P0131 P0132 P0133 P0150 P0151 P0152 P0153 P2A00 P2A03 Air fuel ratio (A/F) sensor 1 ● P0137 P0138 P0139 P0158 P0159 Heated oxygen sensor 2 ● P0441 EVAP control system purge flow monitoring ● P0443 P0444 P0445 EVAP canister purge volume control solenoid valve ● P0447 P0448 EVAP canister vent control valve ● P0451 P0452 P0453 EVAP control system pressure sensor ● P0550 Power steering pressure sensor ● P0603 ECM power supply ● P0710 P0717 P0720 P0731 P0732 P0733 P0734 P0735 P0740 P0744 P0745 P1730 P1752 P1757 P1762 P1767 P1772 P1774 A/T related sensors, solenoid valves and switches ● P1078 P1084 Exhaust valve timing control position sensor ● P1217 Engine over temperature (OVERHEAT) ● P1233 P2101 Electric throttle control function ● P1236 P2118 Throttle control motor ● P1290 P2103 P2103 Throttle control motor relay ● P1805 Brake switch
3	● P0011 P0021 Intake valve timing control ● P0014 P0024 Exhaust valve timing control* ● P0171 P0172 P0174 P0175 Fuel injection system function ● P0300 - P0306 Misfire ● P0420 P0430 Three way catalyst function ● P0442 EVAP control system (SMALL LEAK) ● P0455 EVAP control system (GROSS LEAK) ● P0456 EVAP control system (VERY SMALL LEAK) ● P0506 P0507 Idle speed control system ● P1148 P1168 Closed loop control ● P1211 TCS control unit ● P1212 TCS communication line ● P1238 P2119 Electric throttle control actuator ● P1421 Cold start control ● P1564 ASCD steering switch ● P1572 ASCD brake switch ● P1574 ASCD vehicle speed sensor ● P1715 Turbine revolution sensor

Fail-safe Chart

NBS0003F

When the DTC listed below is detected, the ECM enters fail-safe mode and the MIL lights up.

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0102 P0103 P010C P010D	Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.
P0117 P0118	Engine coolant temperature sensor circuit	Engine coolant temperature will be determined by ECM based on the time after turning ignition switch ON or START. CONSULT-III displays the engine coolant temperature decided by ECM.
		Condition: Just as ignition switch is turned ON or START — Engine coolant temperature decided (CONSULT-III display): 40°C (104°F)
		Condition: More than approx. 4 minutes after ignition ON or START — Engine coolant temperature decided (CONSULT-III display): 80°C (176°F)
		Condition: Except as shown above — Engine coolant temperature decided (CONSULT-III display): 40 - 80°C (104 - 176°F) (Depends on the time)
		When the fail-safe system for engine coolant temperature sensor is activated, the cooling fan operates while engine is running.
P0122 P0123 P0222 P0223 P0227 P0228 P1239 P2132 P2133 P2135	Throttle position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.
P0643	Sensor power supply	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1233 P2101	Electric throttle control function	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1236 P2118	Throttle control motor	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1238 P2119	Electric throttle control actuator	(When electric throttle control actuator does not function properly due to the return spring malfunction:) ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.
		(When throttle valve opening angle in fail-safe mode is not in specified range:) ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.
		(When ECM detects the throttle valve is stuck open:) While the vehicle is driving, it slows down gradually by fuel cut. After the vehicle stops, the engine stalls. The engine can restart in N or P (A/T), Neutral (M/T) position, and engine speed will not exceed 1,000 rpm or more.
P1290 P2100 P2103	Throttle control motor relay	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

- When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.
  Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
  The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

Symptom Matrix Chart

NBS0003G

SYSTEM — BASIC ENGINE CONTROL SYSTEM

		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Fuel	Fuel pump circuit	1	1	2	3	2		2	2			3		2	EC-691
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-80
	Fuel injector circuit	1	1	2	3	2		2	2			2			EC-686
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			EC-33
Air	Positive crankcase ventilation system	3	3	4	4	4	4	4	4	4		4	1		EC-44
	Incorrect idle speed adjustment						1	1	1	1		1			EC-71
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	EC-561, EC-580
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			EC-71
	Ignition circuit	1	1	2	2	2		2	2			2			EC-698
Power supply and ground circuit		2	2	3	3	3		3	3		2	3			EC-142

	SYMPTOM													Reference page
	HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Mass air flow sensor circuit	1			2										EC-197, EC-208
Engine coolant temperature sensor circuit						3			3					EC-223, EC-239
Air fuel ratio (A/F) sensor 1 circuit		1	2	3	2		2	2			2			EC-165, EC-248 , EC-257 , EC-266 , EC-275 , EC-659
Throttle position sensor circuit						2			2					EC-229, EC-361 , EC-557 , EC-559 , EC-582
Accelerator pedal position sensor circuit			3	2	1									EC-514, EC-633 , EC-641 , EC-650
Knock sensor circuit			2								3			EC-379
Crankshaft position sensor (POS) circuit	2	2												EC-386
Camshaft position sensor (PHASE) circuit	3	2												EC-394
Vehicle speed signal circuit		2	3		3						3			EC-496
Power steering pressure sensor circuit		2					3	3						EC-502
ECM	2	2	3	3	3	3	3	3	3	3	3			EC-508, EC-512
Intake valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-183
Exhaust valve timing control magnet retarder circuit		3	2		1	3	2	2	3		3			EC-160
Park/neutral position (PNP) switch circuit			3		3		3	3			3			EC-520
Refrigerant pressure sensor circuit		2				3			3		4			EC-710
Electrical load signal circuit							3							EC-684
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	ATC-33
VDC/TCS/ABS control unit ABS actuator and electric unit (control unit)			4											BRC-82, BRC-42

1 - 6: The numbers refer to the order of inspection.

(continued on next page)

SYSTEM — ENGINE MECHANICAL & OTHER

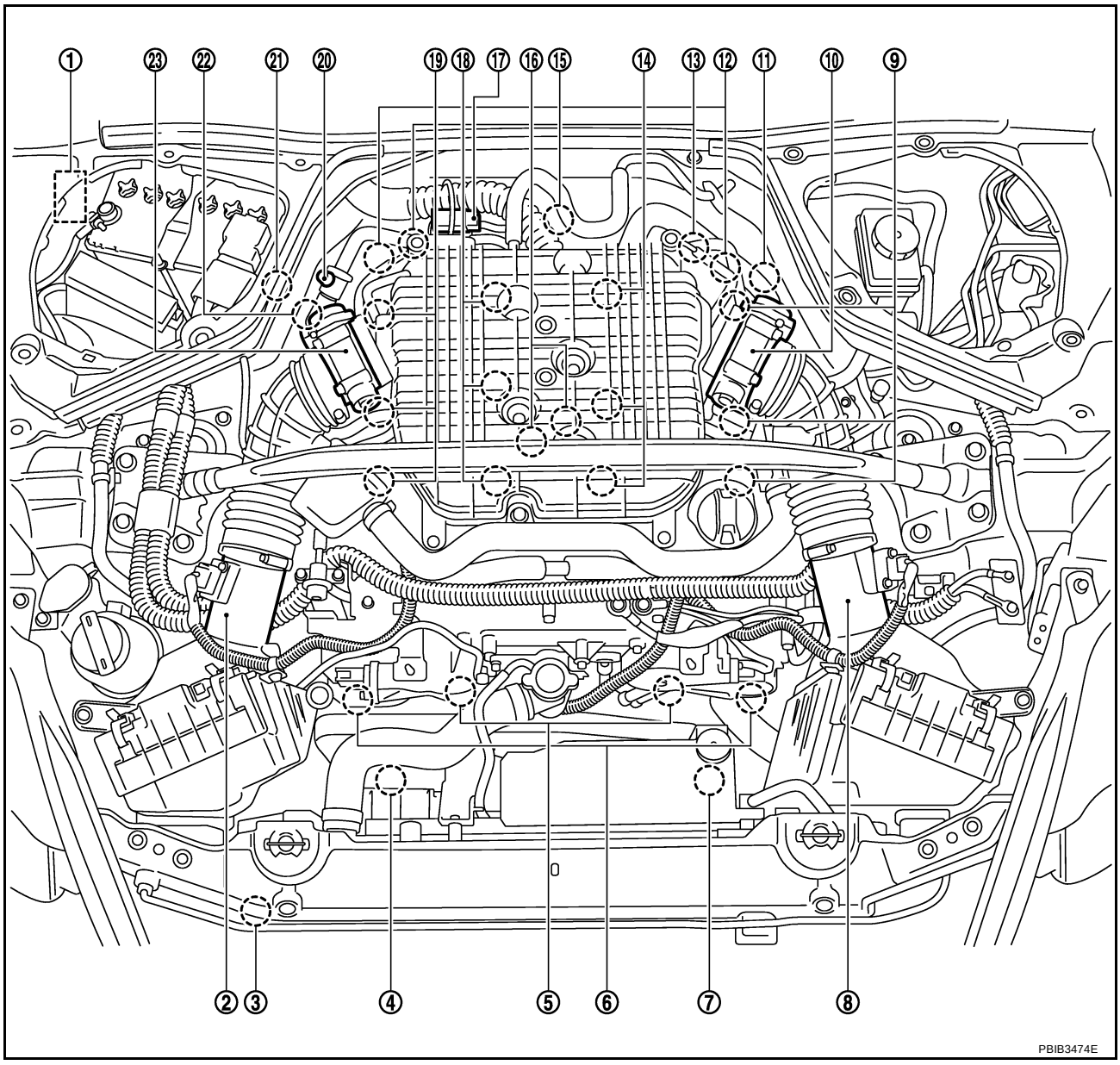
		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Fuel	Fuel tank	5	5												FL-10
	Fuel piping			5	5	5		5	5			5			EM-34
	Vapor lock														—
	Valve deposit	5		5	5	5		5	5			5			—
	Poor fuel (Heavy weight gasoline, Low octane)														—
Air	Air duct	5	5	5	5	5	5	5	5	5		5			EM-15
	Air cleaner														EM-15
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)														EM-15
	Electric throttle control actuator														EM-17
	Air leakage from intake manifold/ Collector/Gasket														EM-17, EM-20
Cranking	Battery	1	1	1		1		1	1			1		1	SC-4
	Generator circuit														SC-20
	Starter circuit	3													SC-8
	Signal plate	6													EM-107
	Park/neutral position (PNP) switch	4													MT-11 or AT-102
Engine	Cylinder head	5	5	5	5	5		5	5			5			EM-89
	Cylinder head gasket										4		3		
	Cylinder block	6	6	6	6	6		6	6			6	4		EM-107
	Piston														
	Piston ring														
	Connecting rod														
	Bearing														
	Crankshaft														

		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Valve mechanism	Timing chain	5	5	5	5	5		5	5			5			EM-53
	Camshaft														EM-72
	Intake valve timing control														EM-53
	Exhaust valve timing control														EM-53
	Intake valve												3		EM-89
	Exhaust valve														
Exhaust	Exhaust manifold/Tube/Muffler/Gasket	5	5	5	5	5		5	5			5			EM-22, EX-3
	Three way catalyst														
Lubrication	Oil pan/Oil strainer/Oil pump/Oil filter/Oil gallery	5	5	5	5	5		5	5			5			EM-26, LU-10 , LU-9
	Oil level (Low)/Filthy oil														LU-6
Cooling	Radiator/Hose/Radiator filler cap	5	5	5	5	5		5	5		4	5			CO-13, CO-17
	Thermostat									5					CO-26
	Water pump														CO-23
	Water gallery														CO-28
	Cooling fan									5					CO-21
	Coolant level (Low)/Contaminated coolant														CO-10
NVIS (NISSAN Vehicle Immobilizer System — NATS)		1	1												EC-46 or BL-150

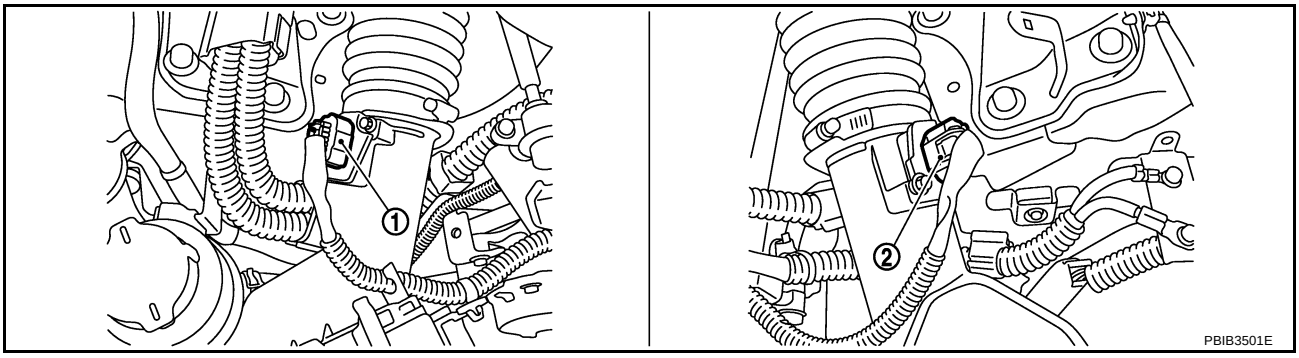
1 - 6: The numbers refer to the order of inspection.

Engine Control Component Parts Location

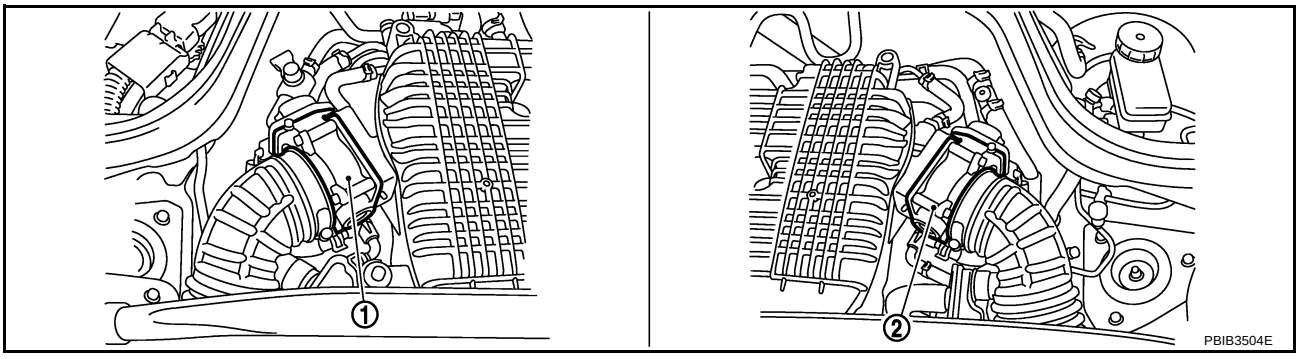
NBS0003I



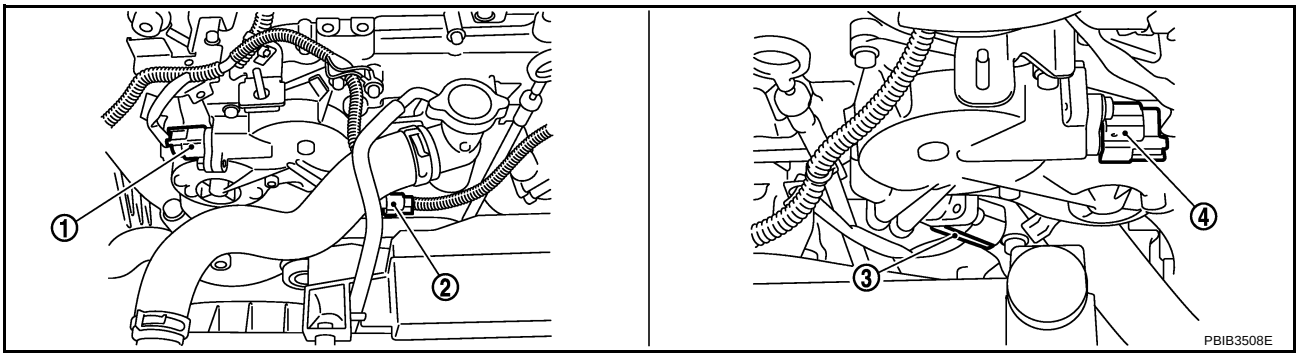
1. IPDM E/R
2. Mass air flow sensor (with intake air temperature sensor) (bank 1)
3. Refrigerant pressure sensor
4. Cooling fan motor-2
5. Intake valve timing control solenoid valve
6. Exhaust valve timing control magnet retarder
7. Cooling fan motor-1
8. Mass air flow sensor (with intake air temperature sensor) (bank 2)
9. Ignition coil (with power transistor) and spark plug (bank 2)
10. Electric throttle control actuator (bank 2)
11. A/F sensor 1 (bank 2)
12. Exhaust valve timing control position sensor
13. Camshaft position sensor (PHASE)
14. Fuel injector (bank 2)
15. Engine coolant temperature sensor
16. Knock sensor
17. EVAP canister purge volume control solenoid valve
18. Fuel injector (bank 1)
19. Ignition coil (with power transistor) and spark plug (bank 1)
20. EVAP service port
21. A/F sensor 1 (bank 1)
22. Crankshaft position sensor (POS)
23. Electric throttle control actuator (bank 1)



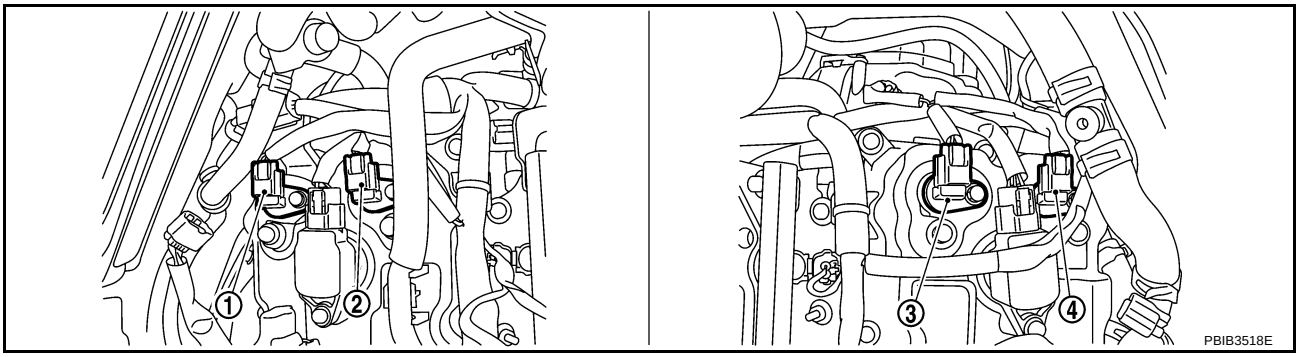
1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)



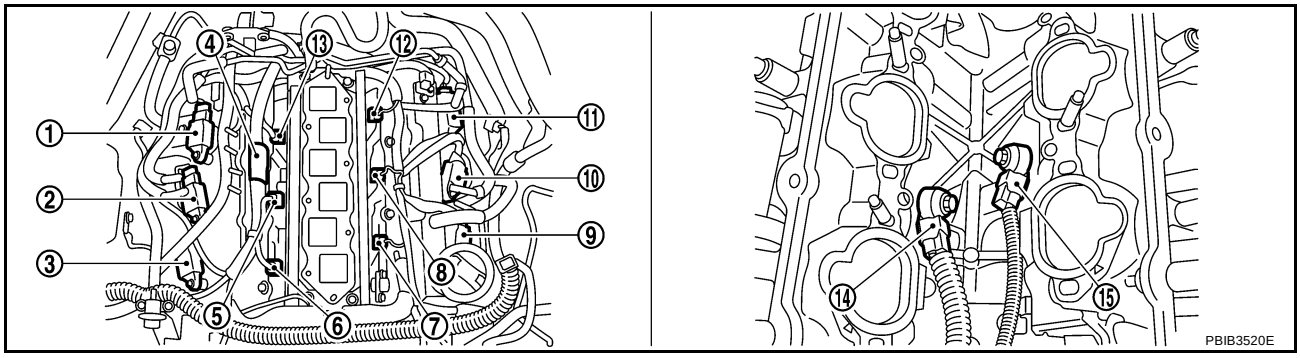
1. Electric throttle control actuator (bank 1)
2. Electric throttle control actuator (bank 2)



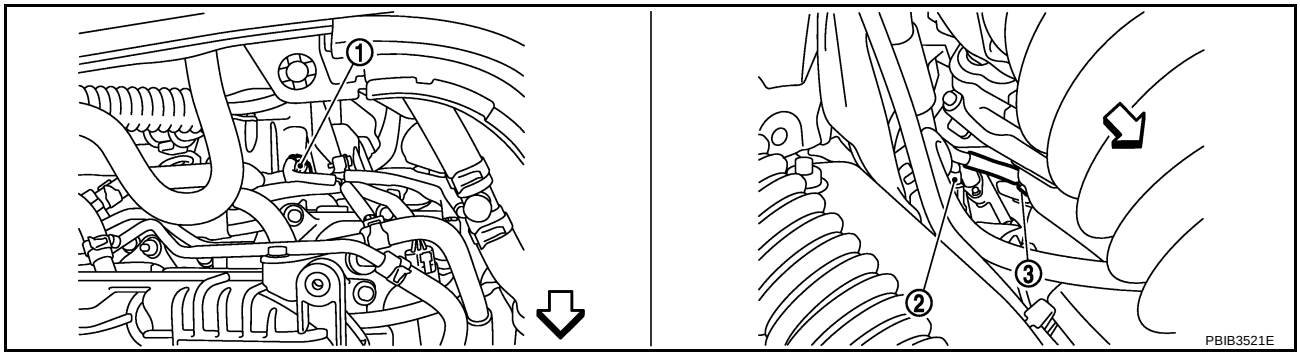
1. Exhaust valve timing control magnet retarder (bank 1) harness connector
2. Intake valve timing control solenoid valve (bank 1) harness connector
3. Intake valve timing control solenoid valve (bank 2) harness connector
4. Exhaust valve timing control magnet retarder (bank 2) harness connector



1. Exhaust valve timing control position sensor (bank 1)
2. Camshaft position sensor (PHASE) (bank 1)
3. Camshaft position sensor (PHASE) (bank 2)
4. Exhaust valve timing control position sensor (bank 2)

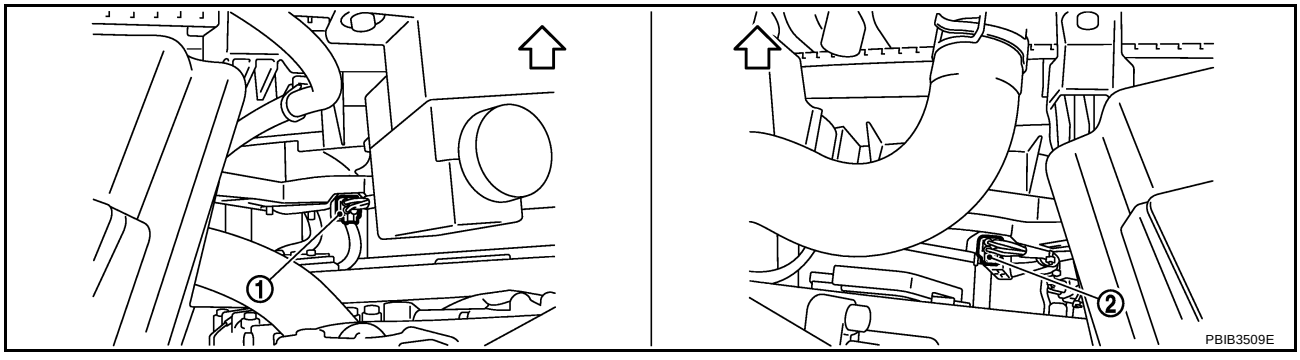


1. Ignition coil No.5 (with power transistor)
2. Ignition coil No.3 (with power transistor)
3. Ignition coil No.1 (with power transistor)
4. Condenser
5. Fuel injector No.3
6. Fuel injector No.1
7. Fuel injector No.2
8. Fuel injector No.4
9. Ignition coil No.2 (with power transistor)
10. Ignition coil No.4 (with power transistor)
11. ignition coil No.6 (with power transistor)
12. Fuel injector No.6
13. Fuel injector No.5
14. Knock sensor (bank 1)
15. Knock sensor (bank 2)



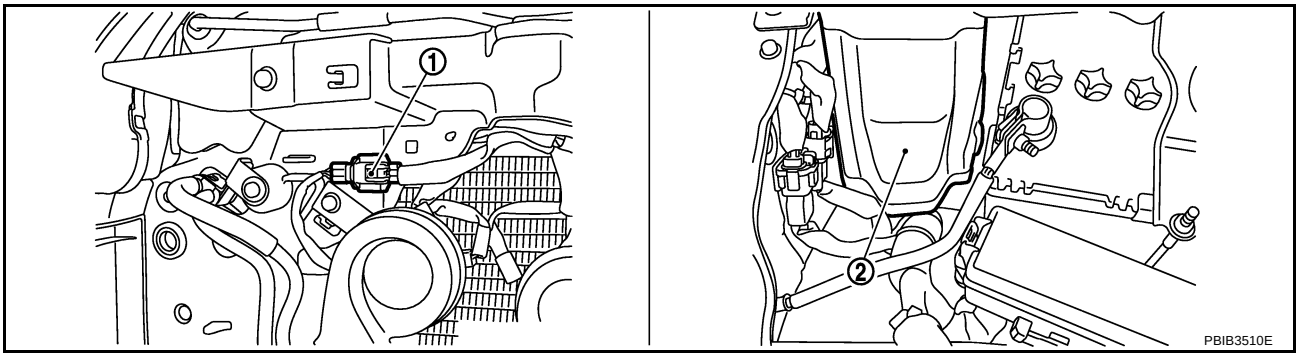
1. Engine coolant temperature sensor
2. A/F sensor 1 (bank 1)
3. Crankshaft position sensor

⇦: Vehicle front

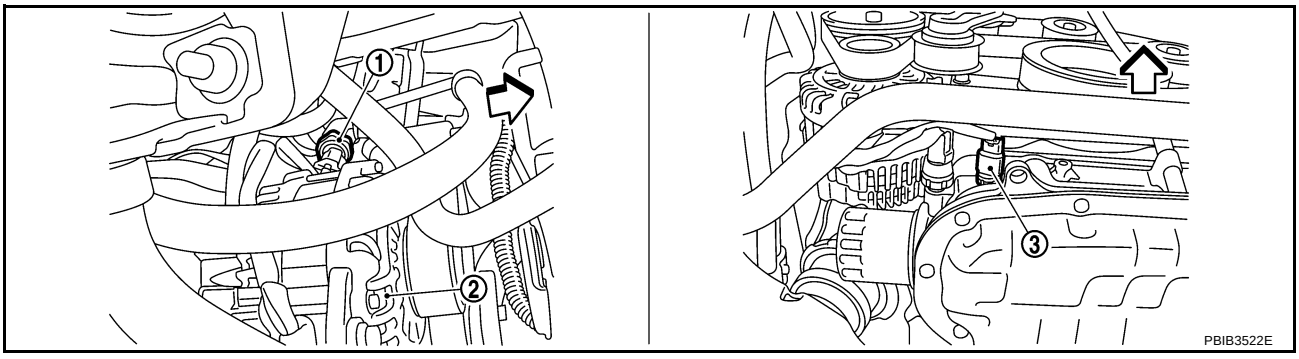


1. Cooling fan motor-1
2. Cooling fan motor-2

⇦: Vehicle front

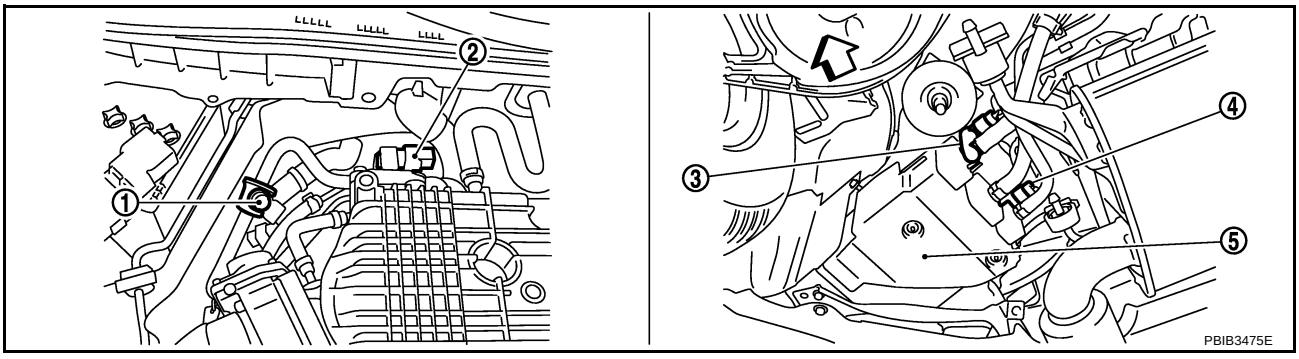


1. Refrigerant pressure sensor harness connector
2. IPDM E/R



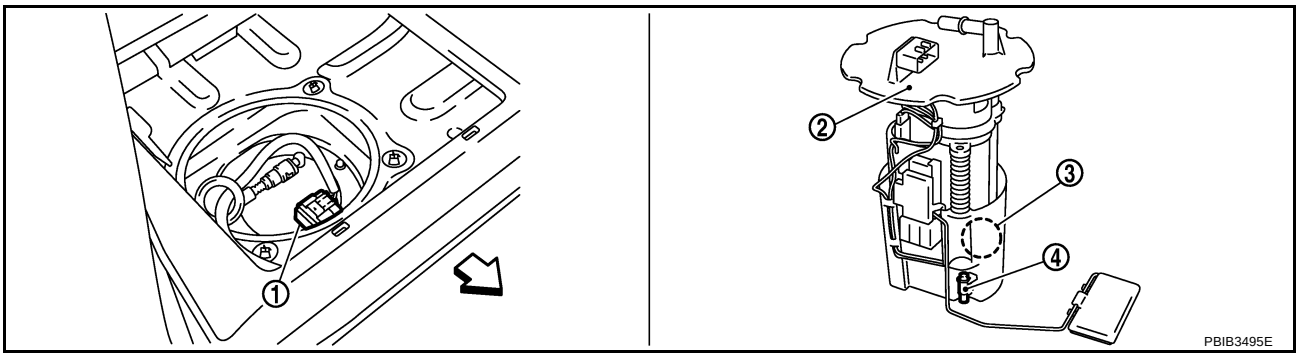
1. Power steering pressure sensor
2. Alternator
3. Engine oil temperature sensor

⇦: Vehicle front



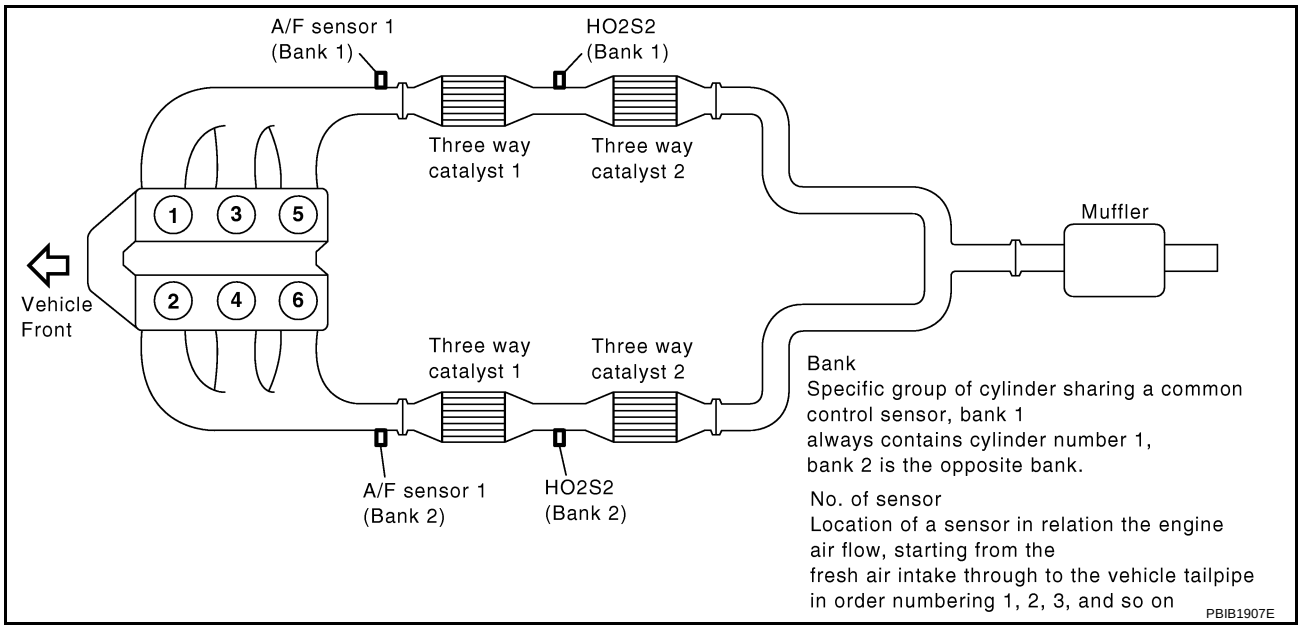
1. EVAP service port
2. EVAP canister purge volume control solenoid valve
3. EVAP canister vent control valve
4. EVAP control system pressure sensor
5. EVAP canister

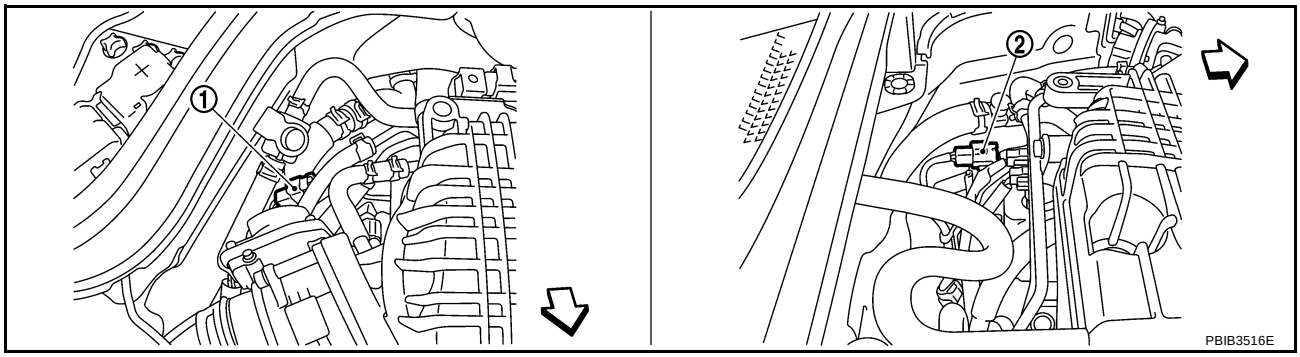
⇦: Vehicle front



1. Fuel level sensor unit and fuel pump harness connector
2. Fuel level sensor unit and fuel pump
3. Fuel pressure regurator
4. Fuel tank temperature sensor

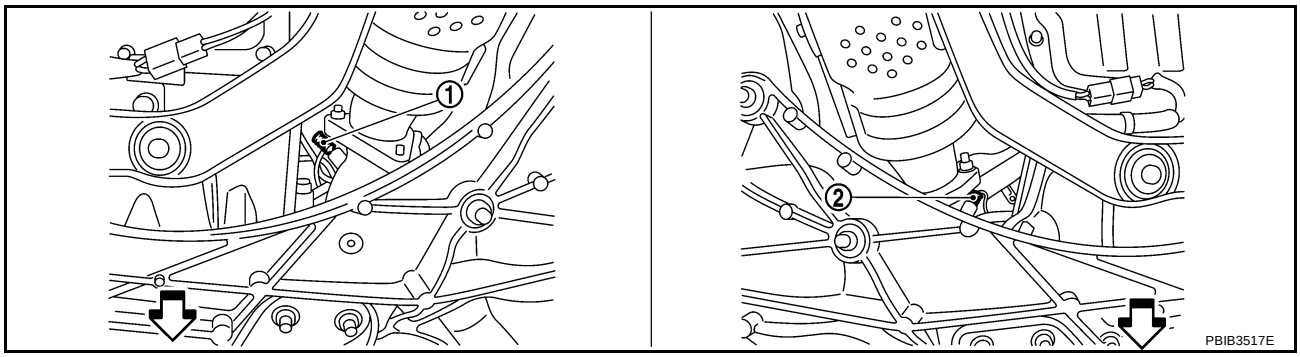
⇦: Vehicle front





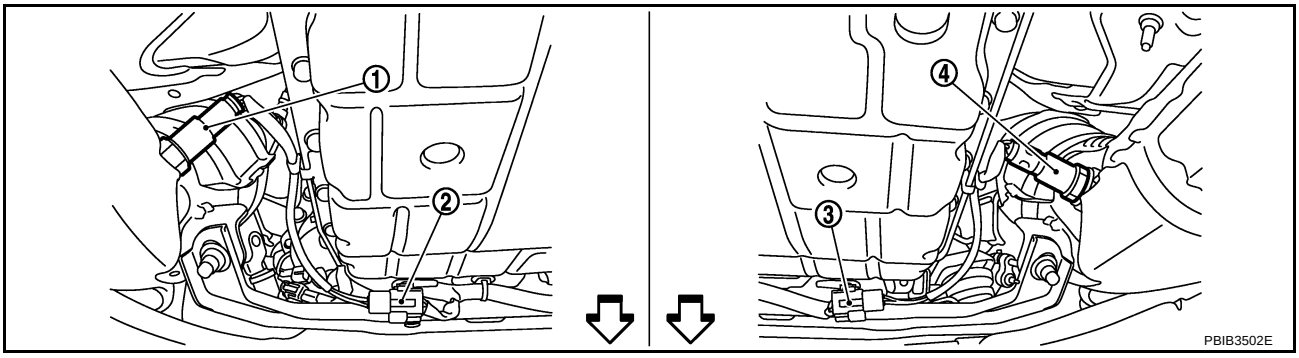
1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front



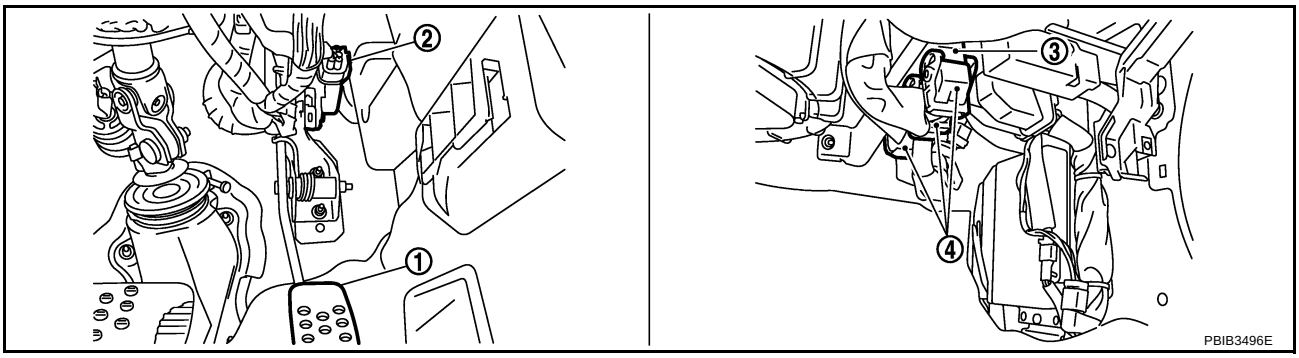
1. A/F sensor 1 (bank 1)
2. A/F sensor 1 (bank 2)

⇦: Vehicle front

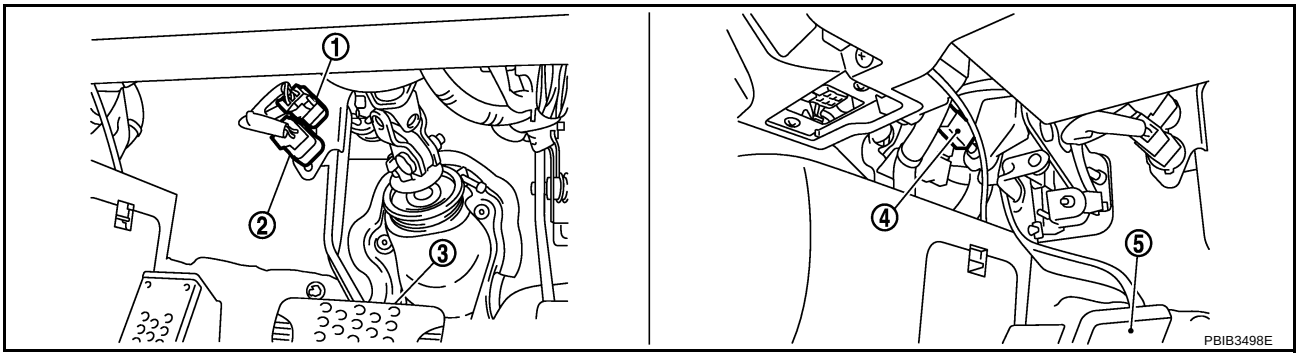


1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

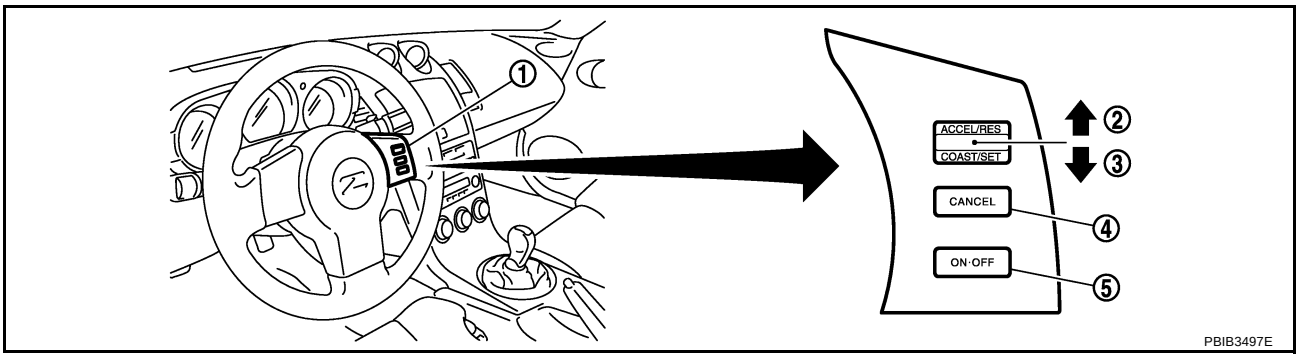
⇦: Vehicle front



1. Accelerator pedal
2. Accelerator pedal position sensor
3. ECM
4. ECM harness connector



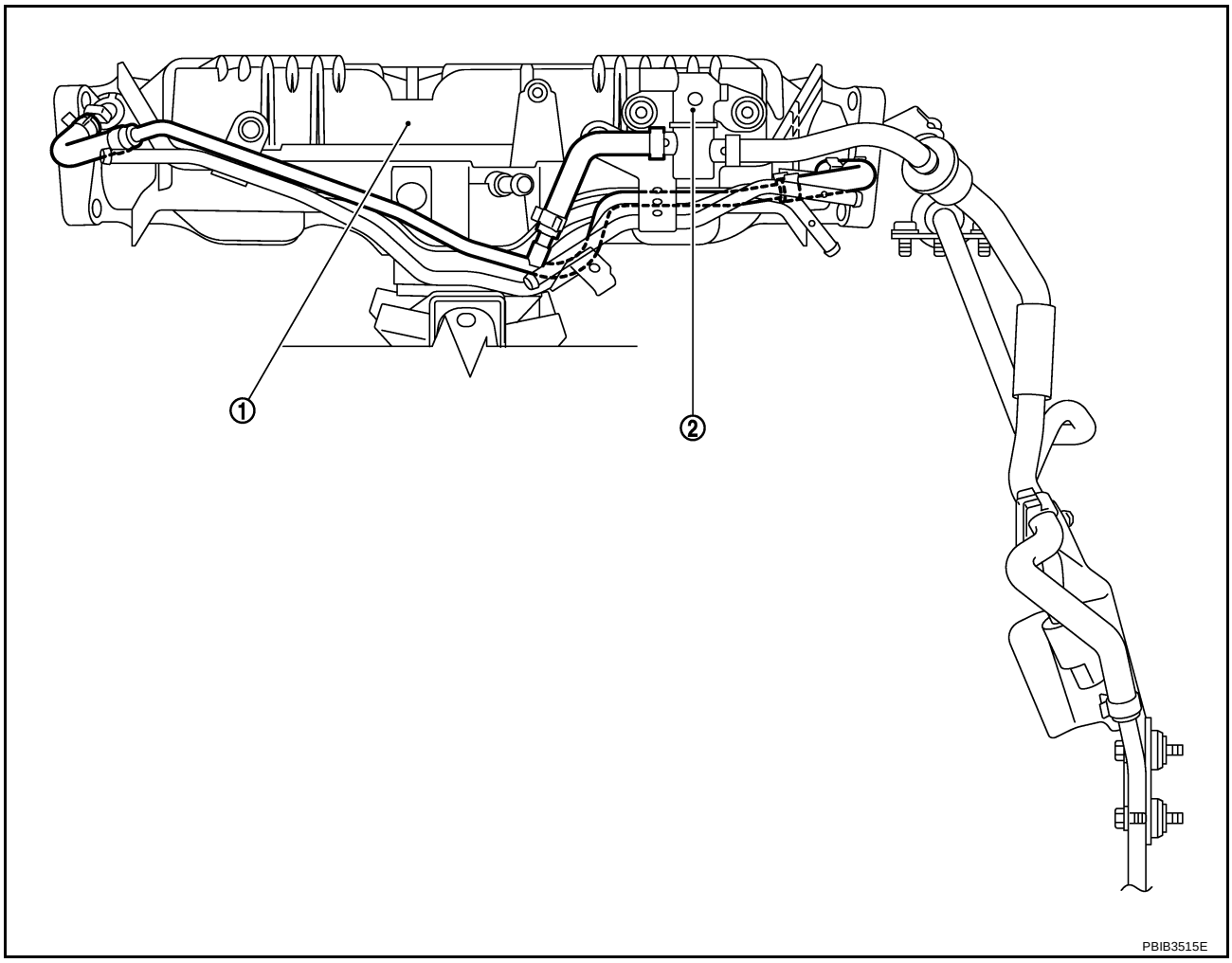
1. Stop lamp switch
2. ASCD brake switch
3. Brake pedal
4. ASCD clutch switch
5. Clutch pedal



1. ASCD steering switch
2. RESUME/ACCELERATE switch
3. SET/COAST switch
4. CANCEL switch
5. MAIN switch

Vacuum Hose Drawing

NBS0003J

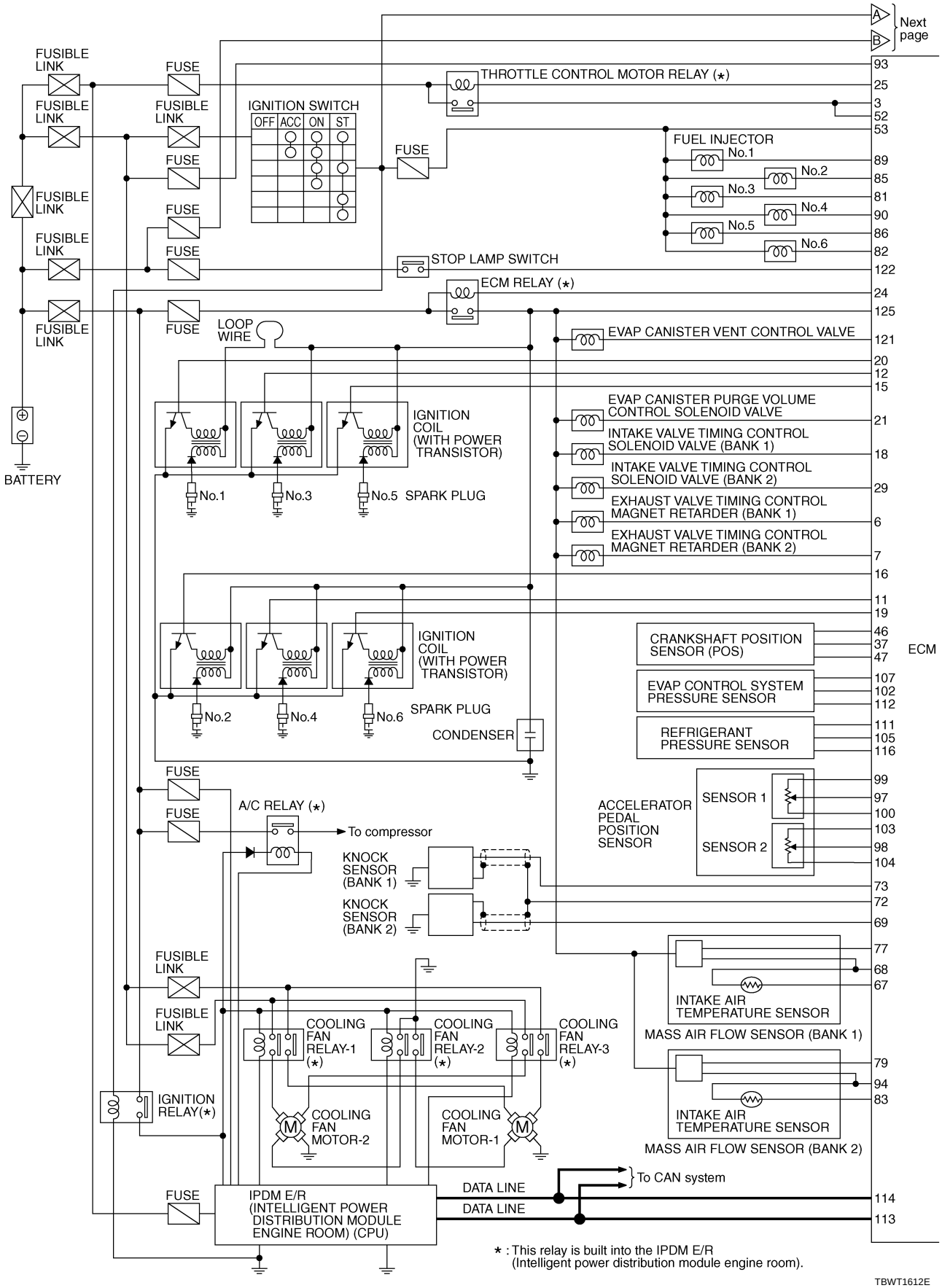


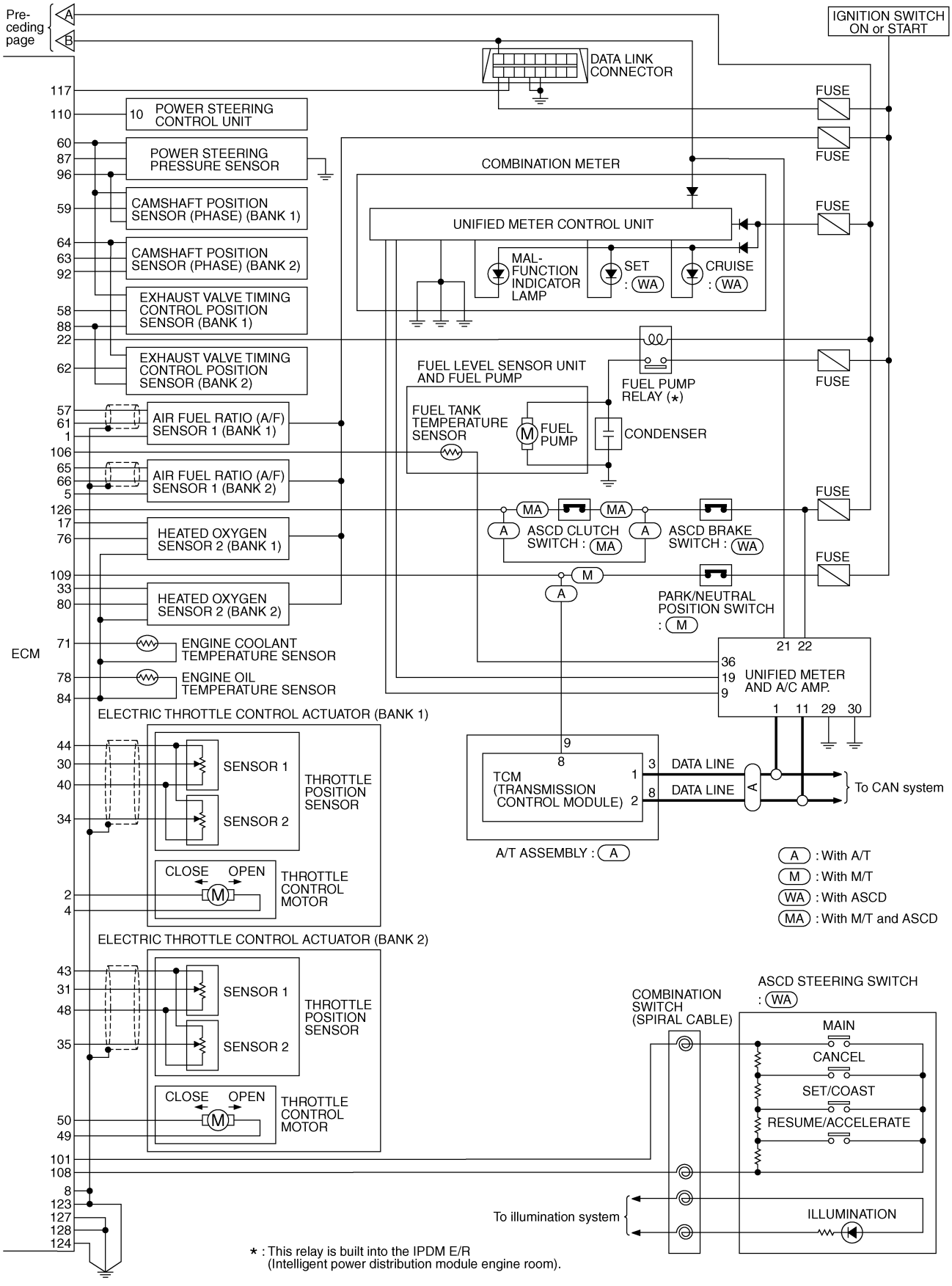
1. Intake manifold collector
2. EVAP canister purge volume control solenoid valve

Refer to EC-24, "System Diagram" for Vacuum Control System.

Circuit Diagram

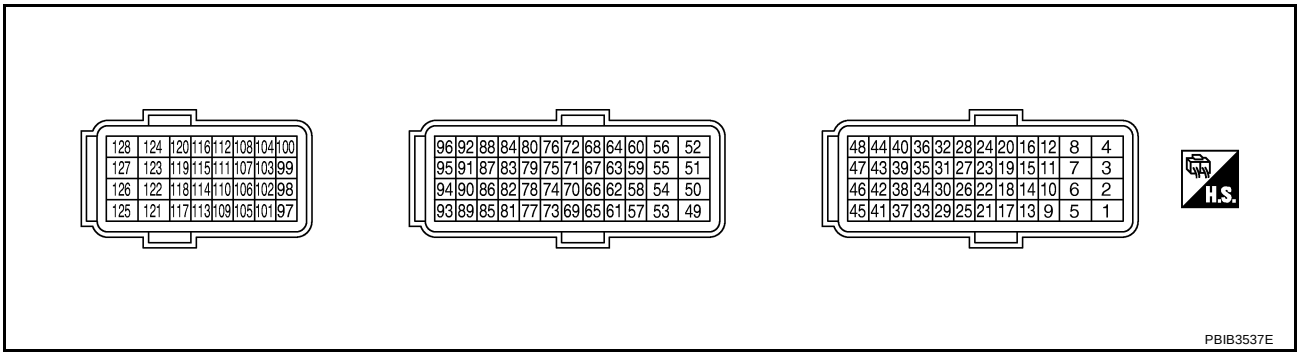
NBS0003K




Pre-ceding page
A
B
IGNITION SWITCH ON or START
DATA LINK CONNECTOR
FUSE
117
110
10 POWER STEERING CONTROL UNIT
60
87
96
POWER STEERING PRESSURE SENSOR
COMBINATION METER
59
CAMSHAFT POSITION SENSOR (PHASE) (BANK 1)
UNIFIED METER CONTROL UNIT
64
63
92
CAMSHAFT POSITION SENSOR (PHASE) (BANK 2)
MAL-FUNCTION INDICATOR LAMP
SET : WA
CRUISE : WA
58
88
22
EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 1)
62
EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 2)
FUEL LEVEL SENSOR UNIT AND FUEL PUMP
FUEL PUMP RELAY (*)
57
61
1
AIR FUEL RATIO (A/F) SENSOR 1 (BANK 1)
FUEL TANK TEMPERATURE SENSOR
FUEL PUMP
CONDENSER
106
65
66
5
AIR FUEL RATIO (A/F) SENSOR 1 (BANK 2)
126
17
76
HEATED OXYGEN SENSOR 2 (BANK 1)
MA
A
ASCD CLUTCH SWITCH : MA
ASCD BRAKE SWITCH : WA
109
33
80
HEATED OXYGEN SENSOR 2 (BANK 2)
M
PARK/NEUTRAL POSITION SWITCH : M
ECM
71
ENGINE COOLANT TEMPERATURE SENSOR
78
ENGINE OIL TEMPERATURE SENSOR
84
21 22
36
19
9
UNIFIED METER AND A/C AMP.
1 11 29 30
ELECTRIC THROTTLE CONTROL ACTUATOR (BANK 1)
44
30
40
34
SENSOR 1
SENSOR 2
THROTTLE POSITION SENSOR
CLOSE OPEN
THROTTLE CONTROL MOTOR
2
4
9
8
TCM (TRANSMISSION CONTROL MODULE)
3
1
8
2
DATA LINE
DATA LINE
To CAN system
A/T ASSEMBLY : A
A : With A/T
M : With M/T
WA : With ASCD
MA : With M/T and ASCD
ELECTRIC THROTTLE CONTROL ACTUATOR (BANK 2)
43
31
48
35
SENSOR 1
SENSOR 2
THROTTLE POSITION SENSOR
CLOSE OPEN
THROTTLE CONTROL MOTOR
50
49
COMBINATION SWITCH (SPIRAL CABLE)
ASCD STEERING SWITCH : WA
MAIN
CANCEL
SET/COAST
RESUME/ACCELERATE
101
108
8
123
127
128
124
To illumination system
ILLUMINATION
* : This relay is built into the IPDM E/R
(Intelligent power distribution module engine room).
TBWT1613E

ECM Harness Connector Terminal Layout

NBS0003L



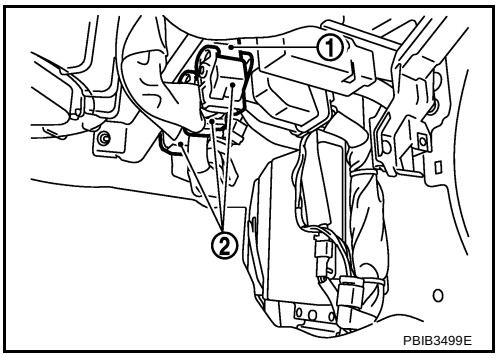
ECM Terminals and Reference Value

NBS0003M

PREPARATION

ECM (1) is located behind the passenger side instrument lower panel. For this inspection, remove passenger side instrument lower panel.

2 : ECM harness connector

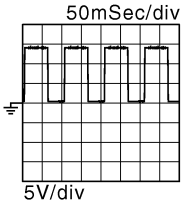


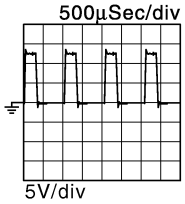
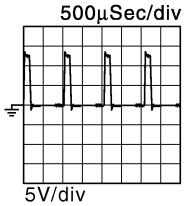
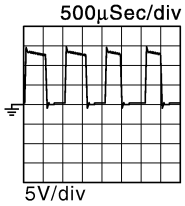
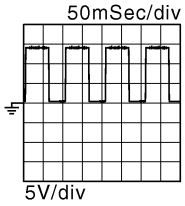
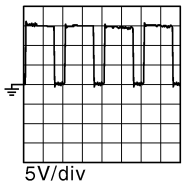
ECM INSPECTION TABLE

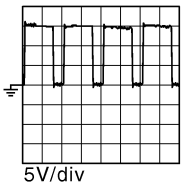
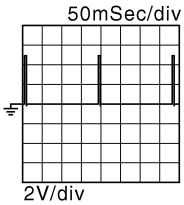
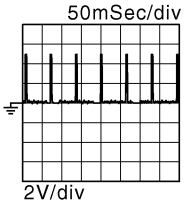
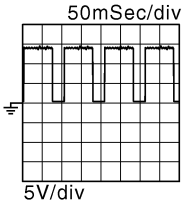
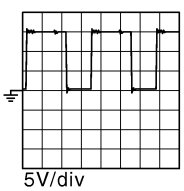
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

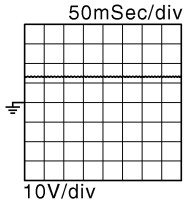
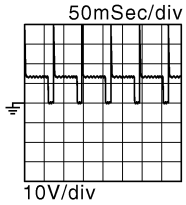
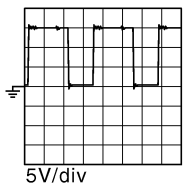
CAUTION:

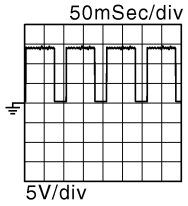
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECMs transistor. Use a ground other than ECM terminals, such as the ground.

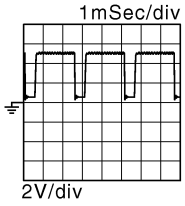
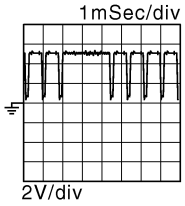
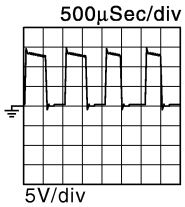
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E

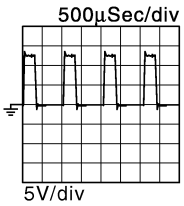
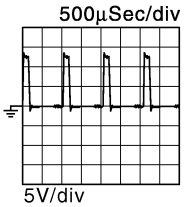
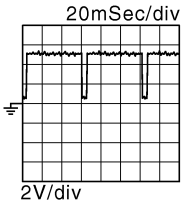
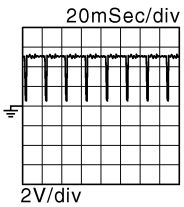
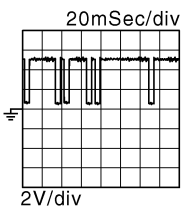
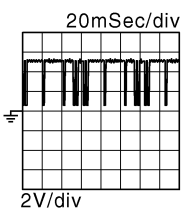
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	G	Throttle control motor (Open) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★  PBIB3538E
6	L/OR	Exhaust valve timing control magnet retarder (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Around 2,500 rpm while the engine speed is rising	7 - 12V★  PBIB3542E

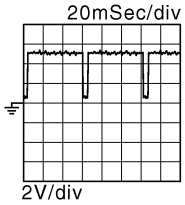
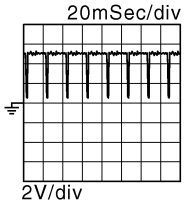
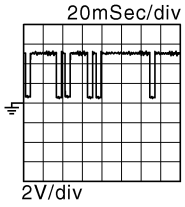
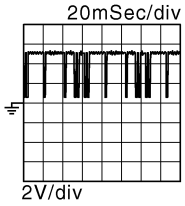
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
7	Y/R	Exhaust valve timing control magnet retarder (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Around 2,500 rpm while the engine speed is rising	7 - 12V★  5V/div PBIB3542E
8	B/P	ECM ground	**[Engine is running]** ● Idle speed	Body ground
11 12 15 16 19 20	GY LG/R PU G/B L/R Y/B	Ignition signal No. 4 Ignition signal No. 3 Ignition signal No. 5 Ignition signal No. 2 Ignition signal No. 6 Ignition signal No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  50mSec/div 2V/div PBIB3543E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	0.1 - 0.4V★  50mSec/div 2V/div PBIB3544E
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  50mSec/div 5V/div PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
18	W/G	Intake valve timing control solenoid valve (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	7 - 12V★  5V/div PBIB3546E

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
21	GY/R	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed ● Accelerator pedal: Not depressed even slightly, after engine starting.	BATTERY VOLTAGE (11 - 14V)★  PBIB3547E
			[Engine is running] ● Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14V)★  PBIB3548E
22	L/W	Fuel pump relay	**[Ignition switch: ON]** ● For 1 second after turning ignition switch ON **[Engine is running]**	0 - 1.5V
			[Ignition switch: ON] ● More than 1 second after turning ignition switch ON.	BATTERY VOLTAGE (11 - 14V)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
29	G/W	Intake valve timing control solenoid valve (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	7 - 12V★  PBIB3546E

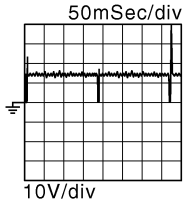
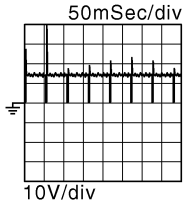
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
30	Y	Throttle position sensor 1 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
31	L/G	Throttle position sensor 1 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
34	L	Throttle position sensor 2 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
35	L/Y	Throttle position sensor 2 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
37	LG/B	Crankshaft position sensor (POS)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3549E
			[Engine is running] ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3550E
40	R	Sensor ground [Throttle position sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
47	Y/G	Sensor ground [Crankshaft position sensor (POS)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
48	W/L	Sensor ground [Throttle position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
49	L/B	Throttle control motor (Close) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E

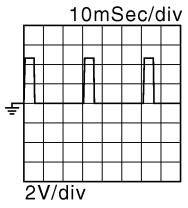
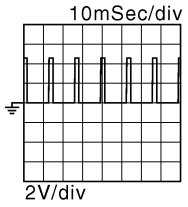
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
50	PU/W	Throttle control motor (Open) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
53	P/L	Ignition switch	**[Ignition switch: OFF]**	0V
			[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
58	Y/G	Exhaust valve timing control position sensor (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3551E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3552E
59	BR/Y	Camshaft position sensor (PHASE) (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	3.0 - 5.0V★  PBIB3553E
			[Engine is running] ● Engine speed: 2,000 rpm	3.0 - 5.0V★  PBIB3554E

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
62	B/Y	Exhaust valve timing control position sensor (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3551E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3552E
63	SB	Camshaft position sensor (PHASE) (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	3.0 - 5.0V★  PBIB3553E
			[Engine is running] ● Engine speed: 2,000 rpm	1.0 - 4.0V★  PBIB3554E
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
67	W/L	Intake air temperature sensor (bank 1)	**[Engine is running]**	0 - 4.8V Output voltage varies with intake air temperature.

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
68	B	Sensor ground [Mass air flow sensor (bank1), Intake air temperature sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
69	W	Knock sensor (bank 2)	**[Engine is running]** ● Idle speed	2.5V*
71	Y/B	Engine coolant temperature sensor	**[Engine is running]**	0 - 4.8V Output voltage varies with engine coolant temperature.
72	—	Sensor ground [Knock sensor (bank 1), Knock sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
73	W	Knock sensor (bank 1)	**[Engine is running]** ● Idle speed	2.5V*
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
77	L/W	Mass air flow sensor (bank1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
78	G/W	Engine oil temperature sensor	**[Engine is running]**	0 - 4.8V Output voltage varies with engine oil temperature.
79	GY/R	Mass air flow sensor (bank2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
81 82 85 86 89 90	R/B L/R BR W/B G/Y Y/R	Fuel injector No. 3 Fuel injector No. 6 Fuel injector No. 2 Fuel injector No. 5 Fuel injector No. 1 Fuel injector No. 4	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★ 
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★ 
83	G	Intake air temperature sensor (bank 2)	**[Engine is running]**	0 - 4.8V Output voltage varies with intake air temperature.
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
87	Y	Power steering pressure sensor	**[Engine is running]** ● Steering wheel: Being turned	0.5 - 4.5V
			[Engine is running] ● Steering wheel: Not being turned	0.4 - 0.8V
88	LG/B	Sensor ground [Exhaust valve timing control position sensor (bank 1), Exhaust valve timing control position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
92	B/P	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
93	P	Power supply for ECM (Back-up)	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
94	L/Y	Sensor ground [Mass air flow sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
96	P/L	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Power steering pressure sensor]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	1.95 - 2.40V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	2.0 - 2.5V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
101	G/Y	ASCD steering switch	**[Ignition switch: ON]** ● ASCD steering switch: OFF	4V
			[Ignition switch: ON] ● MAIN switch: Pressed	0V
			[Ignition switch: ON] ● CANCEL switch: Pressed	1V
			[Ignition switch: ON] ● RESUME/ACCELERATE switch: Pressed	3V
			[Ignition switch: ON] ● SET/COAST switch: Pressed	2V
102	LG	EVAP control system pressure sensor	**[Ignition switch: ON]**	1.8 - 4.8V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
105	L	Refrigerant pressure sensor	**[Engine is running]** ● **Warm-up condition** ● Both A/C switch and blower switch: ON (Compressor operates.)	1.0 - 4.0V
106	W	Fuel tank temperature sensor	**[Engine is running]**	0 - 4.8V Output voltage varies with fuel tank temperature.
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
108	B/Y	Sensor ground (ASCD steering switch)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
109	BR	PNP switch	**[Ignition switch: ON]** ● Shift lever: P or N (A/T), Neutral (M/T) position	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON] ● Shift lever: Except above position	0V

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
110	Y	Engine speed output signal	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle	1V★  PBIB3557E
			[Engine is running] ● Engine speed: 2,000 rpm	1V★  PBIB3558E
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V
112	PU	Sensor ground (EVAP control system pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
113	P	CAN communication line	—	—
114	L	CAN communication line	—	—
116	W	Sensor ground (Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
117	PU	Data link connector	**[Ignition switch: ON]** ● GST: Disconnected	5V - Battery voltage (11 - 14V)
121	LG	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
123 124	B/W B/R	ECM ground	**[Engine is running]** ● Idle speed	Body ground
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal: Slightly depressed (A/T) ● Brake pedal and/or clutch pedal: Slightly depressed (M/T)	0V
			[Ignition switch: ON] ● Brake pedal: Fully released (A/T) ● Brake pedal and clutch pedal: Fully released (M/T)	BATTERY VOLTAGE (11 - 14V)
127 128	B B	ECM ground	**[Engine is running]** ● Idle speed	Body ground

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

*: This may vary depending on internal resistance of the tester.

CONSULT-III Function (ENGINE)

NBS0003N

FUNCTION

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT-III unit.
Self-diagnostic results	Self-diagnostic results such as 1st trip DTC, DTCs and 1st trip freeze frame data or freeze frame data can be read and erased quickly.*
Data monitor	Input/Output data in the ECM can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.
Active test	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ECMs and also shifts some parameters in a specified range.
Function test	This mode is used to inform customers when their vehicle condition requires periodic maintenance.
DTC & SRT confirmation	The status of system monitoring tests and the self-diagnosis status/result can be confirmed.
ECU Identification	ECM part number can be read.

*: The following emission-related diagnostic information is cleared when the ECM memory is erased.

- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values

ENGINE CONTROL COMPONENT PARTS/CONTROL SYSTEMS APPLICATION

		Item	DIAGNOSTIC TEST MODE						
			WORK SUPPORT	SELF-DIAGNOSTIC RESULTS		DATA MONITOR	ACTIVE TEST	DTC & SRT CONFIRMATION	
				DTC*1	FREEZE FRAME DATA*2			SRT STATUS	DTC WORK SUPPORT
ENGINE CONTROL COMPONENT PARTS	INPUT	Crankshaft position sensor (POS)		×	×	×			
		Camshaft position sensor (PHASE)		×	×	×			
		Mass air flow sensor		×		×			
		Engine coolant temperature sensor		×	×	×	×		
		Engine oil temperature sensor				×			
		Air Fuel ratio (A/F) sensor 1		×		×		×	×
		Heated oxygen sensor 2		×		×		×	×
		Vehicle speed sensor		×	×	×			
		Accelerator pedal position sensor		×		×			
		Throttle position sensor		×	×	×			
		Fuel tank temperature sensor		×		×	×		
		EVAP control system pressure sensor		×		×			
		Intake air temperature sensor		×	×	×			
		Knock sensor		×					
		Refrigerant pressure sensor				×			
		Closed throttle position switch (accelerator pedal position sensor signal)				×			
		Air conditioner switch				×			
		Park/neutral position (PNP) switch		×		×			
		Stop lamp switch		×		×			
		Power steering pressure sensor		×		×			
		Battery voltage				×			
		Load signal				×			
		Exhaust valve timing control position sensor		×		×			
		Fuel level sensor		×		×			
		ASCD steering switch		×		×			
		ASCD brake switch		×		×			
		ASCD clutch switch		×		×			

Item			DIAGNOSTIC TEST MODE						
			WORK SUPPORT	SELF-DIAGNOSTIC RESULTS		DATA MONITOR	ACTIVE TEST	DTC & SRT CONFIRMATION	
				DTC*1	FREEZE FRAME DATA*2			SRT STATUS	DTC WORK SUPPORT
ENGINE CONTROL COMPONENT PARTS	OUTPUT	Fuel injector				×	×		
		Power transistor (Ignition timing)				×	×		
		Throttle control motor relay		×		×			
		Throttle control motor		×					
		EVAP canister purge volume control solenoid valve		×		×	×		×
		Air conditioner relay				×			
		Fuel pump relay	×			×	×		
		Cooling fan relay		×		×	×		
		Air fuel ratio (A/F) sensor 1 heater		×		×		×*3	
		Heated oxygen sensor 2 heater		×		×		×*3	
		EVAP canister vent control valve	×	×		×	×		
		Intake valve timing control solenoid valve		×		×	×		
		Exhaust valve timing control magnet retarder	×	×		×	×		
		Calculated load value			×	×			

X: Applicable

*1: This item includes 1st trip DTCs.

*2: This mode includes 1st trip freeze frame data or freeze frame data. The items appear on CONSULT-III screen in freeze frame data mode only if a 1st trip DTC or DTC is detected. For details, refer to EC-119, "Freeze Frame Data and 1st Trip Freeze Frame Data" .

*3: Always “CMPLT” is displayed.

INSPECTION PROCEDURE

Refer to GI-36, "CONSULT-III/GST CHECKING SYSTEM" .

WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE
FUEL PRESSURE RELEASE	● FUEL PUMP WILL STOP BY TOUCHING START DURING IDLING. CRANK A FEW TIMES AFTER ENGINE STALLS.	When releasing fuel pressure from fuel line
IDLE AIR VOL LEARN	● THE IDLE AIR VOLUME THAT KEEPS THE ENGINE WITHIN THE SPECIFIED RANGE IS MEMORIZED IN ECM.	When learning the idle air volume
SELF-LEARNING CONT	● THE COEFFICIENT OF SELF-LEARNING CONTROL MIXTURE RATIO RETURNS TO THE ORIGINAL COEFFICIENT.	When clearing the coefficient of self-learning control value

WORK ITEM	CONDITION	USAGE
EVAP SYSTEM CLOSE	CLOSE THE EVAP CANISTER VENT CONTROL VALVE IN ORDER TO MAKE EVAP SYSTEM CLOSE UNDER THE FOLLOWING CONDITIONS. ● IGN SW ON ● ENGINE NOT RUNNING ● AMBIENT TEMPERATURE IS ABOVE 0°C (32°F). ● NO VACUUM AND NO HIGH PRESSURE IN EVAP SYSTEM ● FUEL TANK TEMP. IS MORE THAN 0°C (32°F). ● WITHIN 10 MINUTES AFTER STARTING EVAP SYSTEM CLOSE ● WHEN TRYING TO EXECUTE EVAP SYSTEM CLOSE UNDER THE CONDITION EXCEPT ABOVE, CONSULT-III WILL DISCONTINUE IT AND DISPLAY APPROPRIATE INSTRUCTION. **NOTE:** **WHEN STARTING ENGINE, CONSULT-III MAY DISPLAY "BATTERY VOLTAGE IS LOW. CHARGE BATTERY", EVEN IN USING CHARGED BATTERY.**	When detecting EVAP vapor leak point of EVAP system
VIN REGISTRATION	● IN THIS MODE, VIN IS REGISTERED IN ECM.	When registering VIN in ECM
EXH V/T CONTROL LEARN	● IN THIS MODE, OPERATION TO LEARN EXHAUST VALVE TIMING CONTROL MAGNET RETARDER CHARACTERISTIC.	When learning the exhaust valve timing control
TARGET IDLE RPM ADJ*	● IDLE CONDITION	When setting target idle speed
TARGET IGN TIM ADJ*	● IDLE CONDITION	When adjusting target ignition timing

*: This function is not necessary in the usual service procedure.

SELF-DIAG RESULTS MODE

Self Diagnostic Item

Regarding items of DTC and 1st trip DTC, refer to EC-48, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS" .)

Freeze Frame Data and 1st Trip Freeze Frame Data

Freeze frame data item*	Description
DIAG TROUBLE CODE [PXXXX]	● The engine control component part/control system has a trouble code, it is displayed as PXXXX. (Refer to EC-8, "INDEX FOR DTC" .)
FUEL SYS-B1	● "Fuel injection system status" at the moment a malfunction is detected is displayed.
FUEL SYS-B2	● One mode in the following is displayed. Mode2: Open loop due to detected system malfunction Mode3: Open loop due to driving conditions (power enrichment, deceleration enleanment) Mode4: Closed loop - using oxygen sensor(s) as feedback for fuel control Mode5: Open loop - has not yet satisfied condition to go to closed loop
CAL/LD VALUE [%]	● The calculated load value at the moment a malfunction is detected is displayed.
COOLANT TEMP [°C] or [°F]	● The engine coolant temperature at the moment a malfunction is detected is displayed.
L-FUEL TRM-B1 [%]	● "Long-term fuel trim" at the moment a malfunction is detected is displayed.
L-FUEL TRM-B2 [%]	● The long-term fuel trim indicates much more gradual feedback compensation to the base fuel schedule than short-term fuel trim.
S-FUEL TRM-B1 [%]	● "Short-term fuel trim" at the moment a malfunction is detected is displayed.
S-FUEL TRM-B2 [%]	● The short-term fuel trim indicates dynamic or instantaneous feedback compensation to the base fuel schedule.

Freeze frame data item*	Description
ENGINE SPEED [rpm]	● The engine speed at the moment a malfunction is detected is displayed.
VEHICL SPEED [km/h] or [mph]	● The vehicle speed at the moment a malfunction is detected is displayed.
ABSOL TH-P/S [%]	● The throttle valve operating angle at the moment a malfunction is detected is displayed.
B/FUEL SCHDL [msec]	● The base fuel schedule at the moment a malfunction is detected is displayed.
INT/A TEMP SE [°C] or [°F]	● The intake air temperature at the moment a malfunction is detected is displayed.

*: This item is the same as that of 1st trip freeze frame data.

DATA MONITOR MODE

Monitored Item

×: Applicable

Monitored item [Unit]	Description	Remarks
ENG SPEED [rpm]	● Indicates the engine speed computed from the signals of the crankshaft position sensor (POS) and camshaft position sensor (PHASE).	● Accuracy becomes poor if engine speed drops below the idle rpm. ● If the signal is interrupted while the engine is running, an abnormal value may be indicated.
MAS A/F SE-B1 [V]	● The signal voltage of the mass air flow sensor is displayed.	● When the engine is stopped, a certain value is indicated. ● When engine is running specification range is indicated in “SPEC”.
MAS A/F SE-B2 [V]		
B/FUEL SCHDL [msec]	● “Base fuel schedule” indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	● When engine is running specification range is indicated in “SPEC”.
A/F ALPHA-B1 [%]	● The mean value of the air-fuel ratio feedback correction factor per cycle is indicated.	● When the engine is stopped, a certain value is indicated. ● This data also includes the data for the air-fuel ratio learning control. ● When engine is running specification range is indicated in “SPEC”.
A/F ALPHA-B2 [%]		
COOLAN TEMP/S [°C] or [°F]	● The engine coolant temperature (determined by the signal voltage of the engine coolant temperature sensor) is displayed.	● When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The engine coolant temperature determined by the ECM is displayed.
A/F SEN1 (B1) [V]	● The A/F signal computed from the input signal of the A/F sensor 1 is displayed.	
A/F SEN1 (B2) [V]		
HO2S2 (B1) [V]	● The signal voltage of the heated oxygen sensor 2 is displayed.	
HO2S2 (B2) [V]		
HO2S2 MNTR(B1) [RICH/LEAN]	● Display of heated oxygen sensor 2 signal: RICH: Means the amount of oxygen after three way catalyst is relatively small. LEAN: Means the amount of oxygen after three way catalyst is relatively large.	● When the engine is stopped, a certain value is indicated.
HO2S2 MNTR(B2) [RICH/LEAN]		
VHCL SPEED SE [km/h] or [mph]	● The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
BATTERY VOLT [V]	● The power supply voltage of ECM is displayed.	
ACCEL SEN 1 [V]	● The accelerator pedal position sensor signal voltage is displayed.	● ACCEL SEN 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
ACCEL SEN 2 [V]		

Monitored item [Unit]	Description	Remarks
TP SEN 1-B1 [V]	● The throttle position sensor signal voltage is displayed.	● THRTL SEN 2-B1 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
TP SEN 2-B1 [V]		
FUEL T/TMP SE [°C] or [°F]	● The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed.	
INT/A TEMP SE [°C] or [°F]	● The intake air temperature (determined by the signal voltage of the intake air temperature sensor) is indicated.	
EVAP SYS PRES [V]	● The signal voltage of EVAP control system pressure sensor is displayed.	
FUEL LEVEL SE [V]	● The signal voltage of the fuel level sensor is displayed.	
START SIGNAL [ON/OFF]	● Indicates start signal status [ON/OFF] computed by the ECM according to the signals of engine speed and battery voltage.	● After starting the engine, [OFF] is displayed regardless of the starter signal.
CLSD THL POS [ON/OFF]	● Indicates idle position [ON/OFF] computed by ECM according to the accelerator pedal position sensor signal.	
AIR COND SIG [ON/OFF]	● Indicates [ON/OFF] condition of the air conditioner switch as determined by the air conditioner signal.	
P/N POSI SW [ON/OFF]	● Indicates [ON/OFF] condition from the park/neutral position (PNP) switch signal.	
PW/ST SIGNAL [ON/OFF]	● [ON/OFF] condition of the power steering system (determined by the signal voltage of the power steering pressure sensor) is indicated.	
LOAD SIGNAL [ON/OFF]	● Indicates [ON/OFF] condition from the electrical load signal. ON: Rear window defogger switch is ON and/or lighting switch is in 2nd position. OFF: Both rear window defogger switch and lighting switch are OFF.	
IGNITION SW [ON/OFF]	● Indicates [ON/OFF] condition from ignition switch signal.	
HEATER FAN SW [ON/OFF]	● Indicates [ON/OFF] condition from the heater fan switch signal.	
BRAKE SW [ON/OFF]	● Indicates [ON/OFF] condition from the stop lamp switch signal.	
INJ PULSE-B1 [msec]	● Indicates the actual fuel injection pulse width compensated by ECM according to the input signals.	● When the engine is stopped, a certain computed value is indicated.
INJ PULSE-B2 [msec]		
IGN TIMING [BTDC]	● Indicates the ignition timing computed by ECM according to the input signals.	● When the engine is stopped, a certain value is indicated.
CAL/LD VALUE [%]	● “Calculated load value” indicates the value of the current air flow divided by peak air flow.	
MASS AIRFLOW [g·m/s]	● Indicates the mass air flow computed by ECM according to the signal voltage of the mass air flow sensor.	
PURG VOL C/V [%]	● Indicates the EVAP canister purge volume control solenoid valve control value computed by the ECM according to the input signals. ● The opening becomes larger as the value increases.	
INT/V TIM(B1) [°CA]	● Indicates [°CA] of intake camshaft advanced angle.	
INT/V TIM(B2) [°CA]		
EXH/V TIM B1 [°CA]	● Indicates [°CA] of exhaust camshaft retarded angle.	
EXH/V TIM B2 [°CA]		

Monitored item [Unit]	Description	Remarks
INT/V SOL(B1) [%]	● The control value of the intake valve timing control solenoid valve (determined by ECM according to the input signals) is indicated. ● The advance angle becomes larger as the value increases.	
INT/V SOL(B2) [%]		
EX VTC DTY B1 [%]	● The control value of the exhaust valve timing control magnet retarder (determined by ECM according to the input signals) is indicated. ● The retard angle becomes larger as the value increases.	
EX VTC DTY B2 [%]		
TP SEN 1-B2 [V]	● The throttle position sensor signal voltage is displayed.	● THRTL SEN 2-B2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
TP SEN 2-B2 [V]		
AIR COND RLY [ON/OFF]	● The air conditioner relay control condition (determined by ECM according to the input signals) is indicated.	
FUEL PUMP RLY [ON/OFF]	● Indicates the fuel pump relay control condition determined by ECM according to the input signals.	
VENT CONT/V [ON/OFF]	● The control condition of the EVAP canister vent control valve (determined by ECM according to the input signals) is indicated. ON: Closed OFF: Open	
THRTL RELAY [ON/OFF]	● Indicates the throttle control motor relay control condition determined by the ECM according to the input signals.	
COOLING FAN [HI/LOW/OFF]	● The control condition of the cooling fan (determined by ECM according to the input signals) is indicated. HI: High speed operation LOW: Low speed operation OFF: Stop	
HO2S2 HTR (B1) [ON/OFF]	● Indicates [ON/OFF] condition of heated oxygen sensor 2 heater determined by ECM according to the input signals.	
HO2S2 HTR (B2) [ON/OFF]		
I/P PULLY SPD [rpm]	● Indicates the engine speed computed from the turbine revolution sensor signal.	
VEHICLE SPEED [km/h] or [mph]	● Indicates the vehicle speed computed from the revolution sensor signal.	
IDL A/V LEARN [YET/CMPLT]	● Display the condition of Idle Air Volume Learning YET: Idle Air Volume Learning has not been performed yet. CMPLT: Idle Air Volume Learning has already been performed successfully.	
TRVL AFTER MIL [km] or [mile]	● Distance traveled while MIL is activated.	
ENG OIL TEMP [°C] or [°F]	● The engine oil temperature (determined by the signal voltage of the engine oil temperature sensor) is displayed.	
A/F S1 HTR(B1) [%]	● Indicates A/F sensor 1 heater control value computed by ECM according to the input signals. ● The current flow to the heater becomes larger as the value increases.	
A/F S1 HTR(B2) [%]		
AC PRESS SEN [V]	● The signal voltage from the refrigerant pressure sensor is displayed.	

Monitored item [Unit]	Description	Remarks
VHCL SPEED SE [km/h] or [mph]	● The vehicle speed computed from the vehicle speed signal sent from TCM is displayed.	
SET VHCL SPD [km/h] or [mph]	● The preset vehicle speed is displayed.	
MAIN SW [ON/OFF]	● Indicates [ON/OFF] condition from MAIN switch signal.	
CANCEL SW [ON/OFF]	● Indicates [ON/OFF] condition from CANCEL switch signal.	
RESUME/ACC SW [ON/OFF]	● Indicates [ON/OFF] condition from RESUME/ACCELERATE switch signal.	
SET SW [ON/OFF]	● Indicates [ON/OFF] condition from SET/COAST switch signal.	
BRAKE SW1 [ON/OFF]	● Indicates [ON/OFF] condition from ASCD brake switch signal and ASCD clutch switch signal (M/T)	
BRAKE SW2 [ON/OFF]	● Indicates [ON/OFF] condition of stop lamp switch signal.	
VHCL SPD CUT [NON/CUT]	● Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low compared with the ASCD set speed, and ASCD operation is cut off.	
LO SPEED CUT [NON/CUT]	● Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low, and ASCD operation is cut off.	
AT OD MONITOR [ON/OFF]	● Indicates [ON/OFF] condition of A/T O/D according to the input signal from the TCM.	● For M/T models always “OFF” is displayed.
AT OD CANCEL [ON/OFF]	● Indicates [ON/OFF] condition of A/T O/D cancel request signal.	● For M/T models always “OFF” is displayed.
CRUISE LAMP [ON/OFF]	● Indicates [ON/OFF] condition of CRUISE lamp determined by the ECM according to the input signals.	
SET LAMP [ON/OFF]	● Indicates [ON/OFF] condition of SET lamp determined by the ECM according to the input signals.	
EXH V/T LEARN [YET/CMPLT]	● Display the condition of Exhaust Valve Timing Control Learning YET: Exhaust Valve Timing Control Learning has not been performed yet. CMPLT: Exhaust Valve Timing Control Learning has already been performed successfully.	
A/F ADJ-B1	● Indicates the correction of factor stored in ECM. The factor is calculated from the difference between the target air-fuel ratio stored in ECM and the air-fuel ratio calculated from A/F sensor 1 signal.	
A/F ADJ-B2		
Voltage [V]	● Voltage, frequency, duty cycle or pulse width measured by the probe.	● Only “#” is displayed if item is unable to be measured. ● Figures with “#”s are temporary ones. They are the same figures as an actual piece of data which was just previously measured.
Frequency [msec], [Hz] or [%]		
DUTY-HI		
DUTY-LOW		
PLS WIDTH-HI		
PLS WIDTH-LOW		

NOTE:
Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

ACTIVE TEST MODE

Test Item

TEST ITEM	CONDITION	JUDGEMENT	CHECK ITEM (REMEDY)
FUEL INJECTION	● Engine: Return to the original trouble condition ● Change the amount of fuel injection using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Fuel injector ● Air fuel ratio (A/F) sensor 1
IGNITION TIMING	● Engine: Return to the original trouble condition ● Timing light: Set ● Retard the ignition timing using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Perform Idle Air Volume Learning.
POWER BALANCE	● Engine: After warming up, idle the engine. ● A/C switch OFF ● Shift lever: P or N (A/T), Neutral (M/T) ● Cut off each fuel injector signal one at a time using CONSULT-III.	Engine runs rough or dies.	● Harness and connectors ● Compression ● Fuel injector ● Power transistor ● Spark plug ● Ignition coil
COOLING FAN*	● Ignition switch: ON ● Turn the cooling fan “HI”, “LOW” and “OFF” using CONSULT-III.	Cooling fan moves and stops.	● Harness and connectors ● Cooling fan motor ● IPDM E/R
ENG COOLANT TEMP	● Engine: Return to the original trouble condition ● Change the engine coolant temperature using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Engine coolant temperature sensor ● Fuel injector
FUEL PUMP RELAY	● Ignition switch: ON (Engine stopped) ● Turn the fuel pump relay “ON” and “OFF” using CONSULT-III and listen to operating sound.	Fuel pump relay makes the operating sound.	● Harness and connectors ● Fuel pump relay
PURG VOL CONT/V	● Engine: After warming up, run engine at 1,500 rpm. ● Change the EVAP canister purge volume control solenoid valve opening percent using CONSULT-III.	Engine speed changes according to the opening percent.	● Harness and connectors ● Solenoid valve
FUEL/T TEMP SEN	● Change the fuel tank temperature using CONSULT-III.		
VENT CONTROL/V	● Ignition switch: ON (Engine stopped) ● Turn solenoid valve “ON” and “OFF” with the CONSULT-III and listen to operating sound.	Solenoid valve makes an operating sound.	● Harness and connectors ● Solenoid valve
INT V/T ASSIGN ANGLE	● Engine: Return to the original trouble condition ● Change intake valve timing using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Intake valve timing control solenoid valve
EXH V/T ASSIGN ANGLE	● Engine: Return to the original trouble condition ● Change exhaust valve timing using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Exhaust valve timing control magnet retarder

*: Leaving cooling fan “OFF” with CONSULT-III while engine is running may cause the engine to overheat.

DTC & SRT CONFIRMATION MODE

SRT STATUS Mode

For details, refer to EC-53, "SYSTEM READINESS TEST (SRT) CODE" .

SRT WORK SUPPORT Mode

This mode enables a technician to drive a vehicle to set the SRT while monitoring the SRT status.

DTC WORK SUPPORT Mode

Test mode	Test item	Corresponding DTC No.	Reference page
EVAPORATIVE SYSTEM	PURG FLOW P0441	P0441	EC-411
	EVP SML LEAK P0442/P1442*	P0442	EC-416
	EVP V/S LEAK P0456/P1456*	P0456	EC-482
	PURG VOL CN/V P1444	P0443	EC-423
A/F SEN1	A/F SEN1 (B1) P1276	P0130	EC-248
	A/F SEN1 (B1) P1278/P1279	P0133	EC-275
	A/F SEN1 (B2) P1286	P0150	EC-248
	A/F SEN1 (B2) P1288/P1289	P0153	EC-275
HO2S2	HO2S2 (B1) P0139	P0139	EC-313
	HO2S2 (B1) P1146	P0138	EC-298
	HO2S2 (B1) P1147	P0137	EC-287
	HO2S2 (B2) P0159	P0159	EC-313
	HO2S2 (B2) P1166	P0158	EC-298
	HO2S2 (B2) P1167	P0157	EC-287

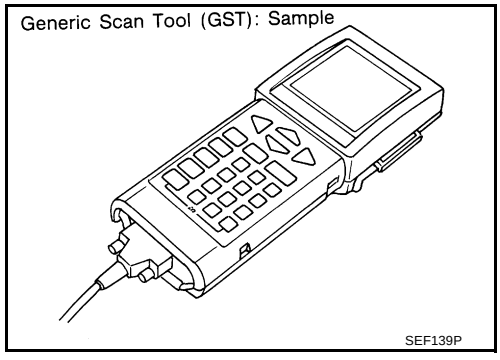
*: DTC P1442 and P1456 does not apply to Z33 models but appears in DTC WORK SUPPORT Mode screens.

Generic Scan Tool (GST) Function

NBS0003O

DESCRIPTION

Generic Scan Tool (OBDII scan tool) complying with SAE J1978 has 8 different functions explained below.
ISO9141 is used as the protocol.
The name GST or Generic Scan Tool is used in this service manual.



FUNCTION

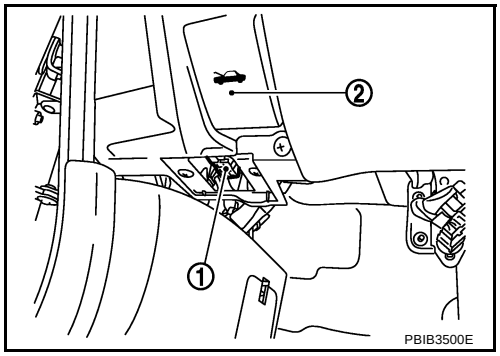
Diagnostic test mode		Function
Service $01	READINESS TESTS	This diagnostic service gains access to current emission-related data values, including analog inputs and outputs, digital inputs and outputs, and system status information.
Service $02	(FREEZE DATA)	This diagnostic service gains access to emission-related data value which were stored by ECM during the freeze frame. For details, refer to EC-53, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA" .
Service $03	DTCs	This diagnostic service gains access to emission-related power train trouble codes which were stored by ECM.

Diagnostic test mode		Function
Service $04	CLEAR DIAG INFO	This diagnostic service can clear all emission-related diagnostic information. This includes: ● Clear number of diagnostic trouble codes (Service $01) ● Clear diagnostic trouble codes (Service $03) ● Clear trouble code for freeze frame data (Service $01) ● Clear freeze frame data (Service $02) ● Reset status of system monitoring test (Service $01) ● Clear on board monitoring test results (Service $06 and $07)
Service $06	(ON BOARD TESTS)	This diagnostic service accesses the results of on board diagnostic monitoring tests of specific components/systems that are not continuously monitored.
Service $07	(ON BOARD TESTS)	This diagnostic service enables the off board test drive to obtain test results for emission-related powertrain components/systems that are continuously monitored during normal driving conditions.
Service $08	—	This diagnostic service can close EVAP system in ignition switch ON position (Engine stopped). When this diagnostic service is performed, EVAP canister vent control valve can be closed. In the following conditions, this mode cannot function. ● Low ambient temperature ● Low battery voltage ● Engine running ● Ignition switch OFF ● Low fuel temperature ● Too much pressure is applied to EVAP system
Service $09	(CALIBRATION ID)	This diagnostic service enables the off-board test device to request specific vehicle information such as Vehicle Identification Number (VIN) and Calibration IDs.

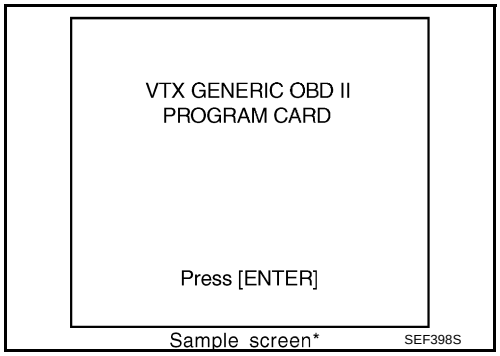
INSPECTION PROCEDURE

1. Turn ignition switch OFF.
2. Connect GST to data link connector (1), which is located under LH dash panel near the hood opener handle.

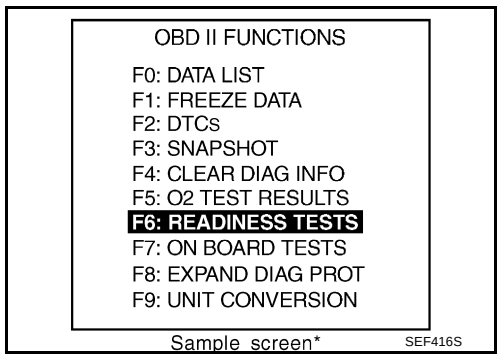
   2 : Hood opener handle



3. Turn ignition switch ON.
4. Enter the program according to instruction on the screen or in the operation manual.
   (*: Regarding GST screens in this section, sample screens are shown.)



5. Perform each diagnostic mode according to each service procedure.
For further information, see the GST Operation Manual of the tool maker.



CONSULT-III Reference Value in Data Monitor

NBS0003P

Remarks:
- Specification data are reference values.
- Specification data are output/input values which are detected or supplied by the ECM at the connector.
  * Specification data may not be directly related to their components signals/values/operations.
  i.e. Adjust ignition timing with a timing light before monitoring IGN TIMING, because the monitor may show the specification data in spite of the ignition timing not being adjusted to the specification data. This IGN TIMING monitors the data calculated by the ECM according to the signals input from the camshaft position sensor and other ignition timing related sensors.

MONITOR ITEM	CONDITION		SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-III value with the tachometer indication.		Almost the same speed as the tachometer indication
MAS A/F SE-B1	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
MAS A/F SE-B2	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
B/FUEL SCHDL	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
A/F ALPHA-B1 A/F ALPHA-B2	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
COOLAN TEMP/S	● Engine: After warming up		More than 70°C (158°F)
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V
HO2S2 (B1) HO2S2 (B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		LEAN ←→ RICH
VHCL SPEED SE	● Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Almost the same speed as the speedometer indication
BATTERY VOLT	● Ignition switch: ON (Engine stopped)		11 - 14V
ACCEL SEN 1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN 2*1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
TP SEN 1-B1 TP SEN 2-B1*1	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T) or 1st (M/T) position	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V
FUEL T/TMP SE	● Ignition switch: ON		Indicates fuel tank temperature
INT/A TEMP SE	● Ignition switch: ON		Indicates intake air temperature

MONITOR ITEM	CONDITION		SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON		Approx. 1.8 - 4.8V
FUEL LEVEL SE	● Ignition switch: ON		Depending on fuel level of fuel tank
START SIGNAL	● Ignition switch: ON → START → ON		OFF → ON → OFF
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF
AIR COND SIG	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
P/N POSI SW	● Ignition switch: ON	Shift lever: P or N (A/T), Neutral (M/T) position	ON
		Shift lever: Except above position	OFF
PW/ST SIGNAL	● Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
		Steering wheel: Being turned	ON
LOAD SIGNAL	● Ignition switch: ON	Rear window defogger switch: ON and/or lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	● Ignition switch: ON → OFF → ON		ON → OFF → ON
HEATER FAN SW	● Engine: After warming up, idle the engine	Heater fan switch: ON	ON
		Heater fan switch: OFF	OFF
BRAKE SW	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
INJ PULSE-B1 INJ PULSE-B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
IGN TIMING	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	6° - 16° BTDC
		2,000 rpm	25° - 45° BTDC
CAL/LD VALUE	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s
PURG VOL C/V	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle (Accelerator pedal is not depressed even slightly, after engine starting)	0%
		2,000 rpm	—

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V TIM(B1) INT/V TIM(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		2,000 rpm	Approx. 0° - 30°CA
EXH/V TIM B1 EXH/V TIM B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°CA
INT/V SOL(B1) INT/V SOL(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		2,000 rpm	Approx. 0% - 50%
EX VTC DTY B1 EX VTC DTY B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%
TP SEN 1-B2 TP SEN 2-B2*1	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T) or 1st (M/T) position	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V
AIR COND RLY	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates)	ON
FUEL PUMP RLY	● For 1 second after turning ignition switch ON ● Engine running or cranking		ON
	● Except above conditions		OFF
VENT CONT/V	● Ignition switch: ON		OFF
THRTL RELAY	● Ignition switch: ON		ON
COOLING FAN	● Engine: After warming up, idle the engine ● Air conditioner switch: OFF	Engine coolant temperature is 97°C (206°F) or less	OFF
		Engine coolant temperature is between 98°C (208°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	HI
HO2S2 HTR (B1) HO2S2 HTR (B2)	● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		ON
	● Engine speed: Above 3,600 rpm		OFF
I/P PULLY SPD	● Vehicle speed: More than 20 km/h (12 MPH)		Almost the same speed as the tachometer indication
VEHICLE SPEED	● Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Almost the same speed as the speedometer indication

MONITOR ITEM	CONDITION		SPECIFICATION
IDL A/V LEARN	● Engine: Running	Idle air volume learning has not been performed yet.	YET
		Idle air volume learning has already been performed successfully.	CMPLT
ENG OIL TEMP	● Engine: After warming up		More than 70°C (158°F)
TRVL AFTER MIL	● Ignition switch: ON	Vehicle has traveled after MIL has turned ON.	0 - 65,535 km (0 - 40,723 mile)
A/F S1 HTR(B1) A/F S1 HTR(B2)	● Engine: After warming up, idle the engine (More than 140 seconds after starting engine)		4 - 100%
AC PRESS SEN	● Engine: Idle ● Both A/C switch and blower switch are ON. (Compressor operates.)		1.0 - 4.0V
VHCL SPEED SE	● Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Almost the same speed as the speedometer indication
SET VHCL SPD	● Engine: Running	ASCD: Operating	The preset vehicle speed is displayed.
MAIN SW	● Ignition switch: ON	MAIN switch: Pressed	ON
		MAIN switch: Released	OFF
CANCEL SW	● Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	● Ignition switch: ON	RESUME/ACCELERATE switch: Pressed	ON
		RESUME/ACCELERATE switch: Released	OFF
SET SW	● Ignition switch: ON	SET/COAST switch: Pressed	ON
		SET/COAST switch: Released	OFF
BRAKE SW1 (ASCD brake switch)	● Ignition switch: ON	● Brake pedal: Fully released (A/T) ● Brake pedal and clutch pedal: Fully released (M/T)	ON
		● Brake pedal: Slightly depressed (A/T) ● Brake pedal and/or clutch pedal: Slightly depressed (M/T)	OFF
BRAKE SW2 (Stop lamp switch)	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
VHCL SPD CUT	● Ignition switch: ON		NON
LO SPEED CUT	● Ignition switch: ON		NON
AT OD MONITOR	● Ignition switch: ON		OFF
AT OD CANSEL	● Ignition switch: ON		OFF
CRUISE LAMP	● Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● MAIN switch: ON ● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89MPH)	ASCD: Operating	ON
		ASCD: Not operating	OFF
EXH V/T LEARN	● Engine: Running	Exhaust Valve Timing Control Learning has not been performed yet.	YET
		Exhaust Valve Timing Control Learning has not been performed yet.	CMPLT
A/F ADJ B1	● Engine: Running		–0.330 - 0.330
A/F ADJ B2	● Engine: Running		–0.330 - 0.330

*1: Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

PFP:00031

Description

NBS0003R

The specification (SP) value indicates the tolerance of the value that is displayed in “SPEC” in “DATA MONITOR” mode of CONSULT-III during normal operation of the Engine Control System. When the value in “SPEC” in “DATA MONITOR” mode is within the SP value, the Engine Control System is confirmed OK. When the value in “SPEC” in “DATA MONITOR” mode is NOT within the SP value, the Engine Control System may have one or more malfunctions.
The SP value is used to detect malfunctions that may affect the Engine Control System, but will not light the MIL.
The SP value will be displayed for the following three items:

- B/FUEL SCHDL (The fuel injection pulse width programmed into ECM prior to any learned on board correction)
- A/F ALPHA-B1/B2 (The mean value of air-fuel ratio feedback correction factor per cycle)
- MAS A/F SE-B1/B2 (The signal voltage of the mass air flow sensor)

Testing Condition

NBS0003S

- Vehicle driven distance: More than 5,000 km (3,107 miles)
- Barometric pressure: 98.3 - 104.3 kPa (1.003 - 1.064 kg/cm^2 , 14.25 - 15.12 psi)
- Atmospheric temperature: 20 - 30°C (68 - 86°F)
- Engine coolant temperature: 75 - 95°C (167 - 203°F)
- Transmission: Warmed-up
  - For A/T models: After the engine is warmed up to normal operating temperature, drive vehicle until “ATF TEMP 1” (A/T fluid temperature sensor signal) indicates more than 60°C (140°F).
  - For M/T models: After the engine is warmed up to normal operating temperature, drive vehicle for 5 minutes.
- Electrical load: Not applied
  - Rear window defogger switch, air conditioner switch, lighting switch are OFF. Steering wheel is straight ahead.
- Engine speed: Idle

Inspection Procedure

NBS0003T

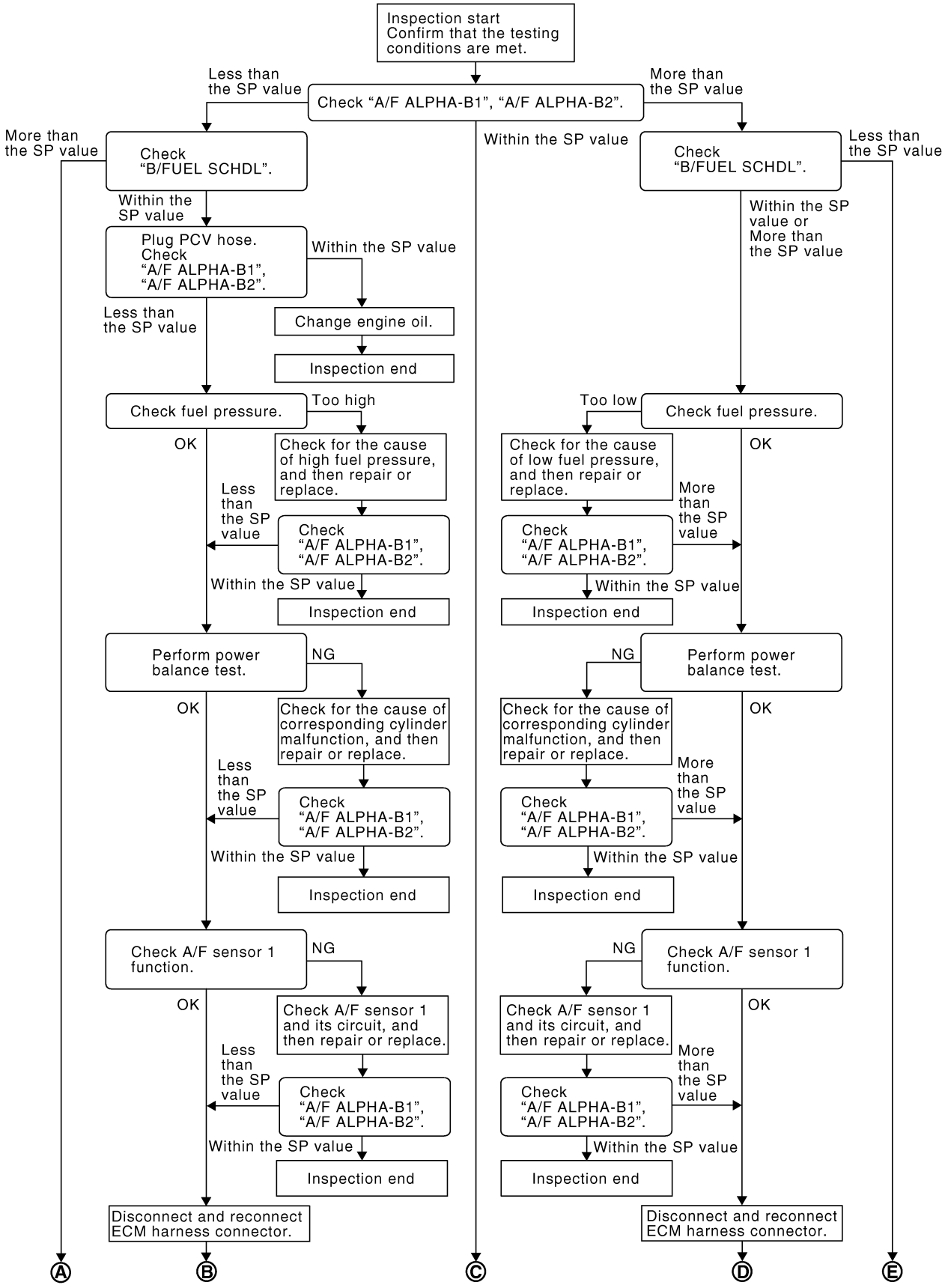
NOTE:
Perform “SPEC” in “DATA MONITOR” mode in maximum scale display.

1. Perform EC-71, "Basic Inspection" .
2. Confirm that the testing conditions indicated above are met.
3. Select “B/FUEL SCHDL”, “A/F ALPHA-B1”, “A/F ALPHA-B2”, “MAS A/F SE-B1” and “MAS A/F SE-B2” in “SPEC” of ”DATA MONITOR” mode with CONSULT-III.
4. Make sure that monitor items are within the SP value.
5. If NG, go to EC-133, "Diagnostic Procedure" .

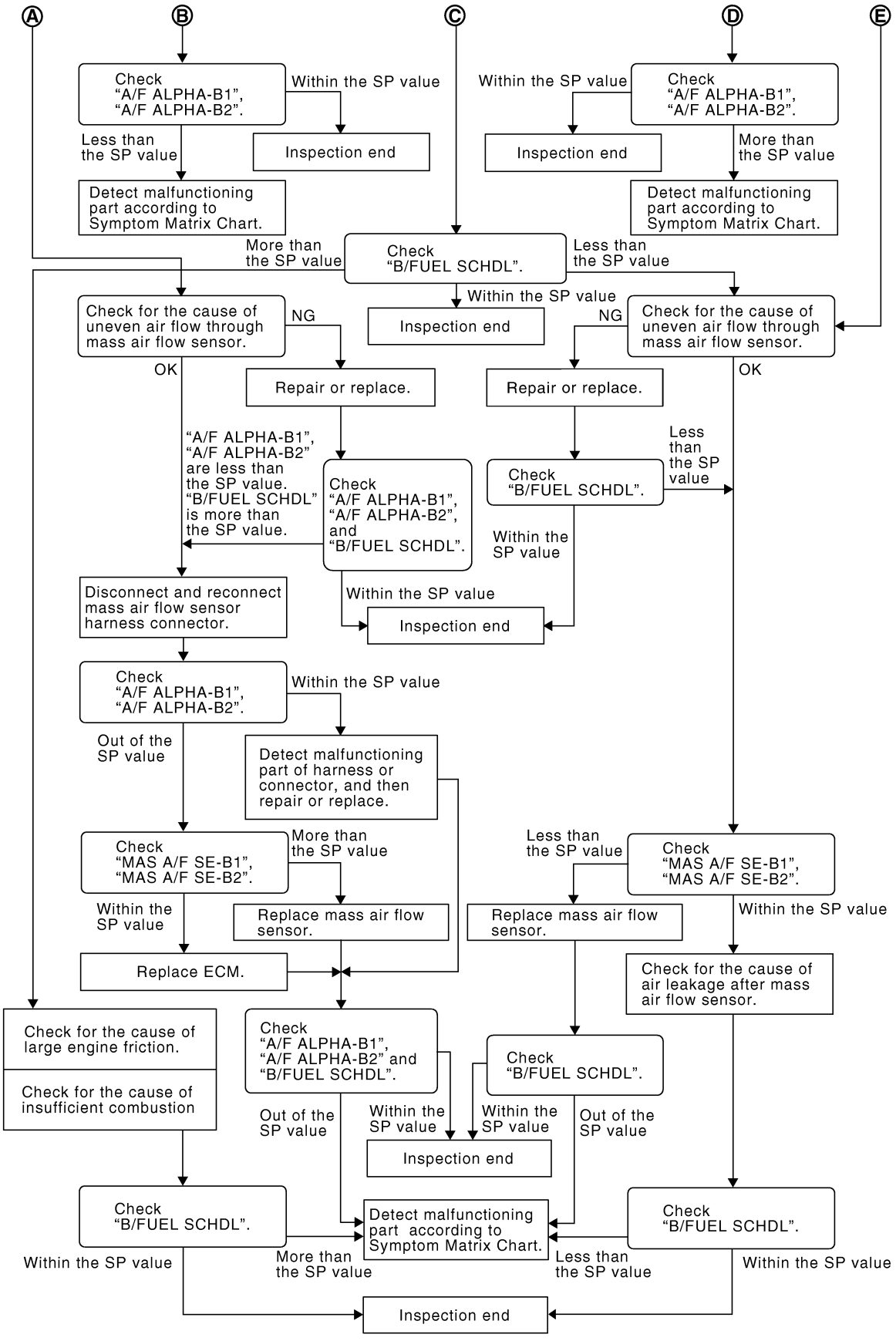
Diagnostic Procedure

NBS0003U

OVERALL SEQUENCE



PBIB2268E


Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Check "A/F ALPHA-B1", "A/F ALPHA-B2".
Within the SP value
Inspection end
Less than the SP value
Detect malfunctioning part according to Symptom Matrix Chart.
Within the SP value
Check "A/F ALPHA-B1", "A/F ALPHA-B2".
Inspection end
More than the SP value
Detect malfunctioning part according to Symptom Matrix Chart.
More than the SP value
Check "B/FUEL SCHDL".
Less than the SP value
Within the SP value
Inspection end
Check for the cause of uneven air flow through mass air flow sensor.
NG
OK
Repair or replace.
NG
Check for the cause of uneven air flow through mass air flow sensor.
OK
Repair or replace.
"A/F ALPHA-B1", "A/F ALPHA-B2" are less than the SP value. "B/FUEL SCHDL" is more than the SP value.
Check "A/F ALPHA-B1", "A/F ALPHA-B2", and "B/FUEL SCHDL".
Check "B/FUEL SCHDL".
Less than the SP value
Within the SP value
Within the SP value
Inspection end
Disconnect and reconnect mass air flow sensor harness connector.
Check "A/F ALPHA-B1", "A/F ALPHA-B2".
Within the SP value
Out of the SP value
Detect malfunctioning part of harness or connector, and then repair or replace.
Check "MAS A/F SE-B1", "MAS A/F SE-B2".
More than the SP value
Within the SP value
Replace mass air flow sensor.
Replace ECM.
Less than the SP value
Check "MAS A/F SE-B1", "MAS A/F SE-B2".
Within the SP value
Replace mass air flow sensor.
Check for the cause of air leakage after mass air flow sensor.
Check for the cause of large engine friction.
Check for the cause of insufficient combustion
Check "A/F ALPHA-B1", "A/F ALPHA-B2" and "B/FUEL SCHDL".
Check "B/FUEL SCHDL".
Out of the SP value
Within the SP value
Within the SP value
Out of the SP value
Inspection end
Check "B/FUEL SCHDL".
Within the SP value
More than the SP value
Detect malfunctioning part according to Symptom Matrix Chart.
Less than the SP value
Check "B/FUEL SCHDL".
Within the SP value
Inspection end
PBIB3531E

DETAILED PROCEDURE

1. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Confirm that the testing conditions are met. Refer to EC-132, "Testing Condition" .
3. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” in mode, and make sure that the each indication is within the SP value.

   NOTE:
   Check “A/F ALPHA-B1”, “A/F ALPHA-B2” for approximately 1 minute because they may fluctuate. It is NG if the indication is out of the SP value even a little.

OK or NG

OK >> GO TO 17.
NG (Less than the SP value)>>GO TO 2.
NG (More than the SP value)>>GO TO 3.

2. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> GO TO 4.
NG (More than the SP value)>>GO TO 19.

3. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> GO TO 6.
NG (More than the SP value)>>GO TO 6.
NG (Less than the SP value)>>GO TO 25.

4. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Stop the engine.
2. Disconnect PCV hose, and then plug it.
3. Start engine.
4. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> GO TO 5.
NG >> GO TO 6.

5. CHANGE ENGINE OIL

1. Stop the engine.
2. Change engine oil.

   NOTE:
   This symptom may occur when a large amount of gasoline is mixed with engine oil because of driving conditions (such as when engine oil temperature does not rise enough since a journey distance is too short during winter). The symptom will not be detected after changing engine oil or changing driving condition.

>> **INSPECTION END**

6. CHECK FUEL PRESSURE

Check fuel pressure. (Refer to EC-79, "Fuel Pressure Check" .)

OK or NG

OK >> GO TO 9.
NG (Fuel pressure is too high)>>Replace fuel pressure regulator, refer to EC-79, "Fuel Pressure Check" . GO TO 8.
NG (Fuel pressure is too low)>>GO TO 7.

7. DETECT MALFUNCTIONING PART

1. Check the following.
- Clogged and bent fuel hose and fuel tube
- Clogged fuel filter
- Fuel pump and its circuit (Refer to EC-691, "FUEL PUMP" .)
2. If NG, repair or replace the malfunctioning part. (Refer to EC-79, "Fuel Pressure Check" .)
If OK, replace fuel pressure regulator.

>> GO TO 8.

8. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. PERFORM POWER BALANCE TEST

1. Perform “POWER BALANCE” in “ACTIVE TEST” mode.
2. Make sure that the each cylinder produces a momentary engine speed drop.

OK or NG

OK >> GO TO 12.
NG >> GO TO 10.

10. DETECT MALFUNCTIONING PART

1. Check the following.
- Ignition coil and its circuit (Refer to EC-698, "IGNITION SIGNAL" .)
- Fuel injector and its circuit (Refer to EC-686, "FUEL INJECTOR" .)
- Intake air leakage
- Low compression pressure (Refer to EM-89, "CHECKING COMPRESSION PRESSURE" .)
2. If NG, repair or replace the malfunctioning part.
If OK, replace fuel injector. (It may be caused by leakage from fuel injector or clogging.)

>> GO TO 11.

11. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 12.

12. CHECK A/F SENSOR 1 FUNCTION

Perform all DTC Confirmation Procedure related with A/F sensor 1.

- For DTC P0130, P0150, refer to EC-248, "DTC Confirmation Procedure" .
- For DTC P0131, P0151, refer to EC-267, "DTC Confirmation Procedure" .
- For DTC P0132, P0152, refer to EC-660, "DTC Confirmation Procedure" .
- For DTC P0133, P0153, refer to EC-276, "DTC Confirmation Procedure" .
- For DTC P2A00, P2A03, refer to EC-660, "DTC Confirmation Procedure" .

OK or NG

OK >> GO TO 15.
NG >> GO TO 13.

13. CHECK A/F SENSOR 1 CIRCUIT

Perform Diagnostic Procedure according to corresponding DTC.

>> GO TO 14.

14. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 15.

15. DISCONNECT AND RECONNECT ECM HARNESS CONNECTOR

1. Stop the engine.
2. Disconnect ECM harness connector. Check pin terminal and connector for damage, and then reconnect it.

>> GO TO 16.

16. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> Detect malfunctioning part according to EC-90, "Symptom Matrix Chart" .

17. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG (More than the SP value)>>GO TO 18.
NG (Less than the SP value)>>GO TO 25.

18. DETECT MALFUNCTIONING PART

1. Check for the cause of large engine friction. Refer to the following.
- Engine oil level is too high
- Engine oil viscosity
- Belt tension of power steering, alternator, A/C compressor, etc. is excessive
- Noise from engine
- Noise from transmission, etc.
2. Check for the cause of insufficient combustion. Refer to the following.
- Valve clearance malfunction
- Intake valve timing control function malfunction
- Camshaft sprocket installation malfunction, etc.

>> Repair or replace malfunctioning part, and then GO TO 30.

19. CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system

OK or NG

OK >> GO TO 21.
NG >> Repair or replace malfunctioning part, and then GO TO 20.

20. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”, AND “B/FUEL SCHDL”

Select “A/F ALPHA-B1”, “A/F ALPHA-B2”, and “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG (“B/FUEL SCHDL” is more, “A/F ALPHA-B1”, “A/F ALPHA-B2” are less than the SP value)>>GO TO 21.

21. DISCONNECT AND RECONNECT MASS AIR FLOW SENSOR HARNESS CONNECTOR

1. Stop the engine.
2. Disconnect mass air flow sensor harness connector. Check pin terminal and connector for damage and then reconnect it again.

>> GO TO 22.

22. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> 1. Detect malfunctioning part of mass air flow sensor circuit and repair it.
Refer to EC-197, "DTC P0101, P010B MAF SENSOR" .
2. GO TO 29.

NG >> GO TO 23.

23. CHECK “MAS A/F SE-B1”, “MAS A/F SE-B2”

Select “MAS A/F SE-B1”, “MAS A/F SE-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> GO TO 24.
NG (More than the SP value)>>Replace mass air flow sensor, and then GO TO 29.

24. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS(NATS) system and registration of all NVIS(NATS) ignition key IDs.
Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> GO TO 29.

25. CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system

OK or NG

OK >> GO TO 27.
NG >> Repair or replace malfunctioning part, and then GO TO 26.

26. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG (Less than the SP value)>>GO TO 27.

27. CHECK “MAS A/F SE-B1”, “MAS A/F SE-B2”

Select “MAS A/F SE-B1”, “MAS A/F SE-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> GO TO 28.
NG (Less than the SP value)>>Replace mass air flow sensor, and then GO TO 30.

28. CHECK INTAKE SYSTEM

Check for the cause of air leak after the mass air flow sensor. Refer to the following.

- Disconnection, looseness, and cracks in air duct
- Looseness of oil filler cap
- Disconnection of oil level gauge
- Open stuck, breakage, hose disconnection, or cracks of PCV valve
- Disconnection or cracks of EVAP purge hose, open stuck of EVAP canister purge volume control solenoid valve
- Malfunctioning seal of rocker cover gasket
- Disconnection, looseness, or cracks of hoses, such as vacuum hose, connecting to intake air system parts
- Malfunctioning seal of intake air system, etc.

>> GO TO 30.

29. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”, AND “B/FUEL SCHDL”

Select “A/F ALPHA-B1”, “A/F ALPHA-B2”, and “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> Detect malfunctioning part according to EC-90, "Symptom Matrix Chart" .

30. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and then make sure that the indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> Detect malfunctioning part according to EC-90, "Symptom Matrix Chart" .

TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

PFP:00006

Description

NBS0003V

Intermittent incidents may occur. In many cases, the malfunction resolves itself (the part or circuit function returns to normal without intervention). It is important to realize that the symptoms described in the customer's complaint often do not recur on (1st trip) DTC visits. Realize also that the most frequent cause of intermittent incidents occurrences is poor electrical connections. Because of this, the conditions under which the incident occurred may not be clear. Therefore, circuit checks made as part of the standard diagnostic procedure may not indicate the specific malfunctioning area.

Common intermittent incidents Report Situations

STEP in Work Flow	Situation
2	The CONSULT-III is used. The SELF-DIAG RESULTS screen shows time data other than [0] or [1t].
3 or 4	The symptom described by the customer does not recur.
5	(1st trip) DTC does not appear during the DTC Confirmation Procedure.
10	The Diagnostic Procedure for PXXXX does not indicate the malfunctioning area.

Diagnostic Procedure

NBS0003W

1. INSPECTION START

Erase (1st trip) DTCs.
Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 2.

2. CHECK GROUND TERMINALS

Check ground terminals for corroding or loose connection.
Refer to EC-150, "Ground Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. SEARCH FOR ELECTRICAL INCIDENT

Perform GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" , “INCIDENT SIMULATION TESTS”.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK CONNECTOR TERMINALS

Refer to GI-24, "How to Check Terminal" , “HOW TO PROBE CONNECTORS”, “How to Check Enlarged Contact Spring of Terminal”.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace connector.

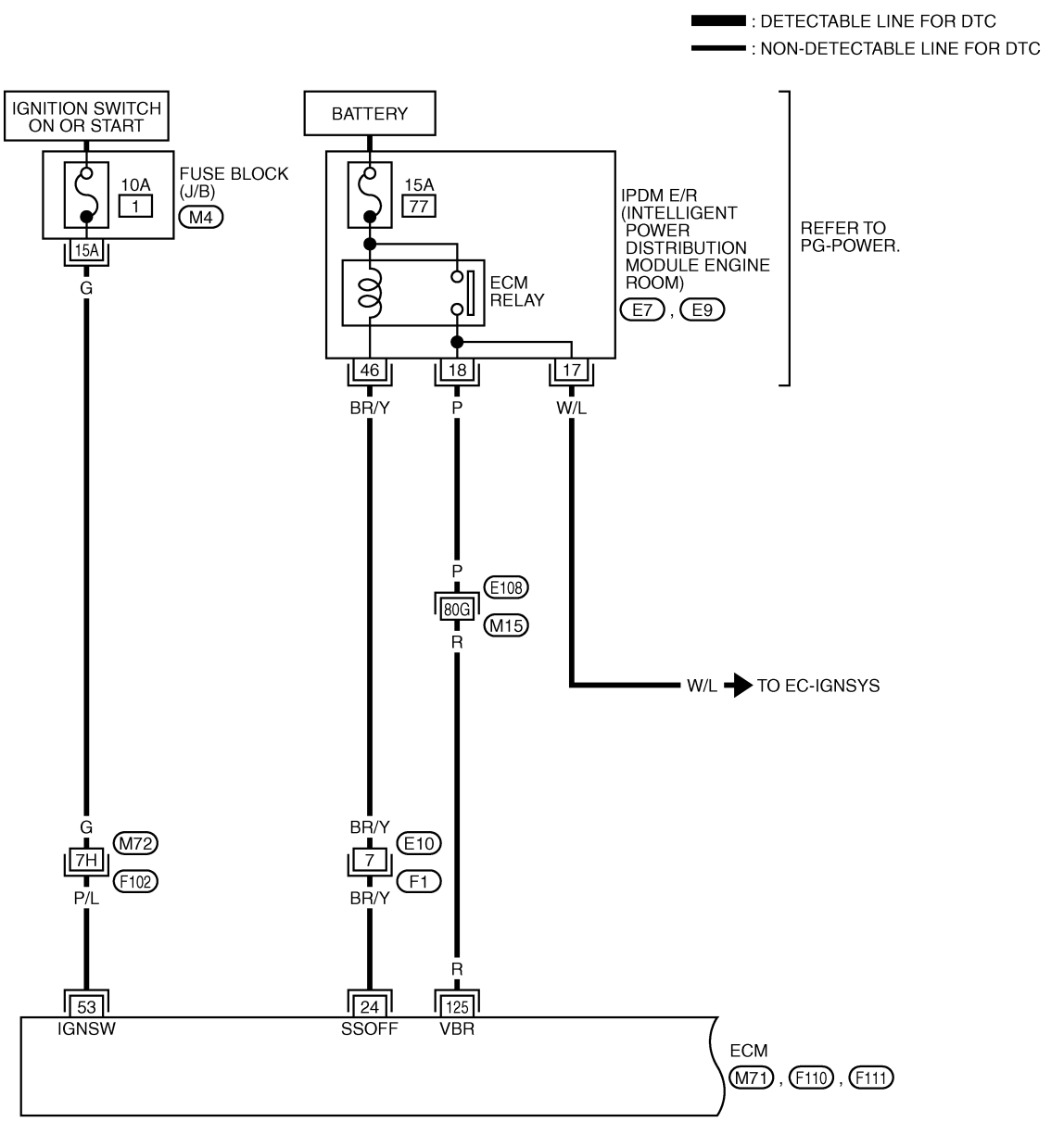
POWER SUPPLY AND GROUND CIRCUIT

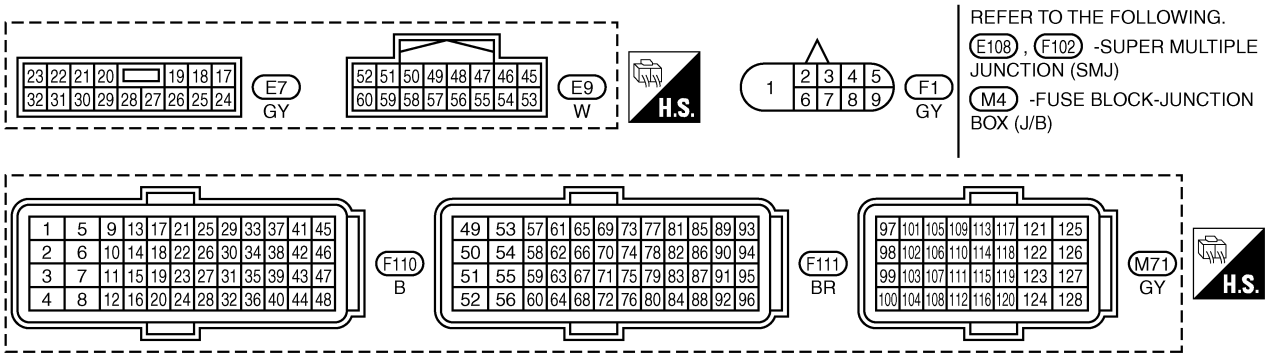
PFP:24110

Wiring Diagram

NBS0003X

EC-MAIN-01





TBWT1614E

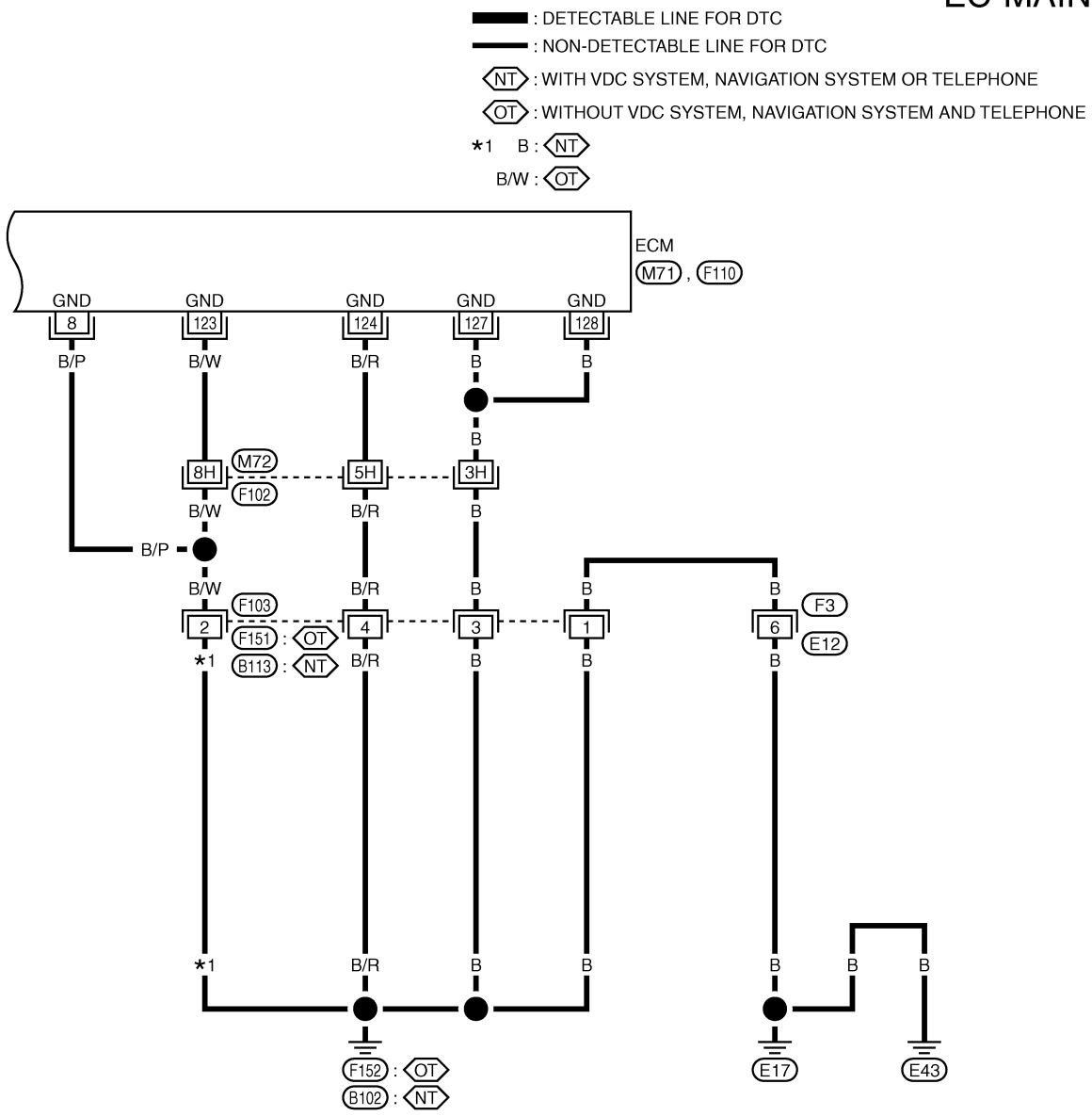
Specification data are reference values and are measured between each terminal and ground.

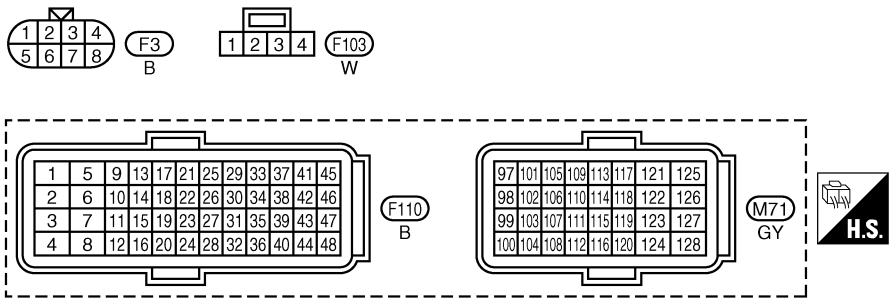
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
53	P/L	Ignition switch	**[Ignition switch: OFF]**	0V
			[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

EC-MAIN-02





REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1615E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
8	B/P	ECM ground	**[Engine is running]** ● Idle speed	Body ground
123 124	B/W B/R	ECM ground	**[Engine is running]** ● Idle speed	Body ground
127 128	B B	ECM ground	**[Engine is running]** ● Idle speed	Body ground

Diagnostic Procedure

NBS0003Y

1. INSPECTION START

Start engine.

Is engine running?

Yes or No

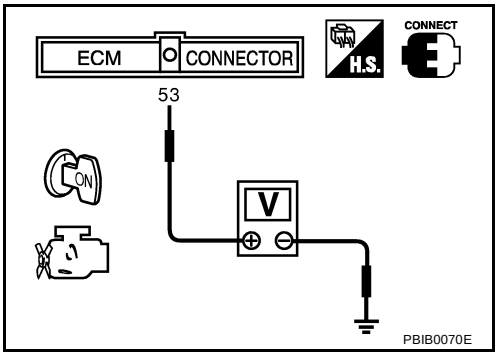
Yes >> GO TO 8.

No >> GO TO 2.

2. CHECK ECM POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF and then ON.
2. Check voltage between ECM terminal 53 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

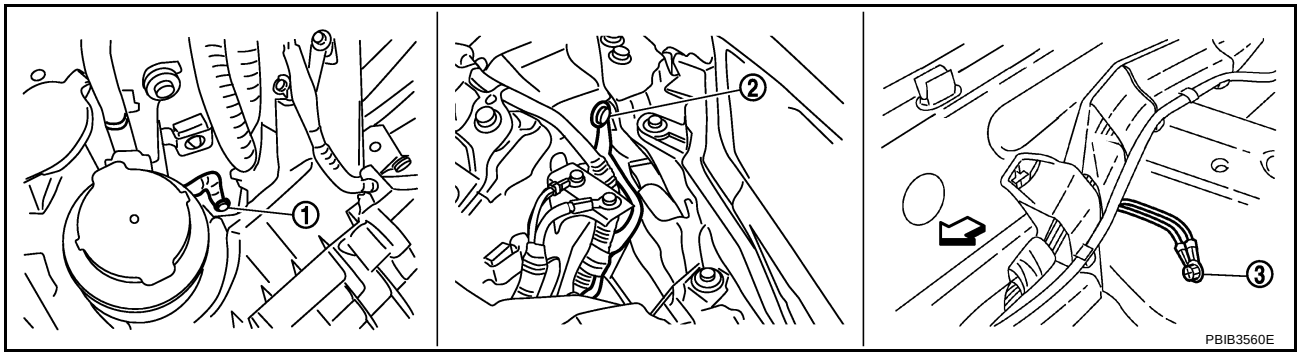
- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between ECM and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

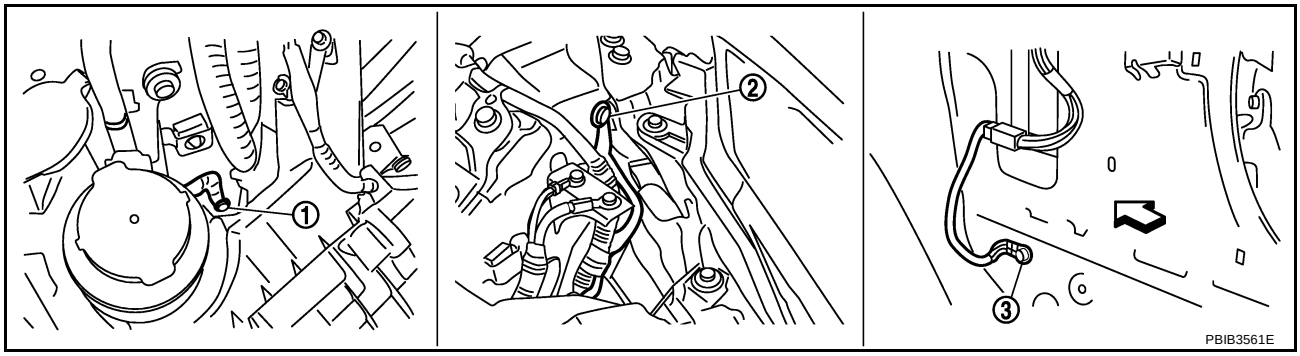


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 5.
NG >> Repair or replace ground connections.

5. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-I

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 8, 123, 124, 127, 128 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

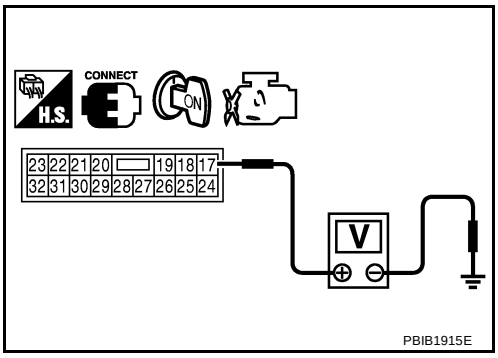
- Harness connectors M72, F102
- Harness connectors F103, B113 (Models with VDC system, navigation system or telephone) or F151 (Models without VDC system, navigation system and telephone)
- Harness connectors F3, E12
- Harness for open or short between ECM and ground

>> Repair open circuit or short to power in harness or connectors.

7. CHECK ECM POWER SUPPLY CIRCUIT-II

1. Reconnect ECM harness connector disconnected.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R terminal 17 and ground with CONSULT-III or tester.

Voltage: Battery voltage



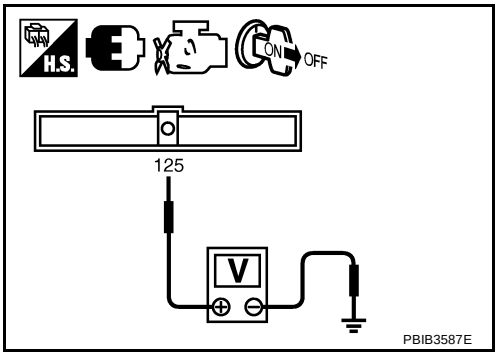
OK or NG

OK >> Go to EC-698, "IGNITION SIGNAL" .
NG >> GO TO 8.

8. CHECK ECM POWER SUPPLY CIRCUIT-III

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON and then OFF.
3. Check voltage between ECM terminals 125 and ground with CONSULT-III or tester.

Voltage: After turning ignition switch OFF, battery voltage will exist for a few seconds, then drop approximately 0V.



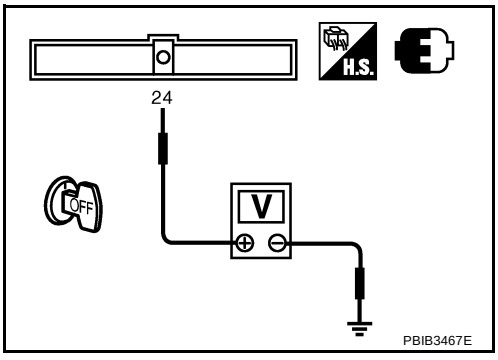
OK or NG

OK >> GO TO 15.
NG (Battery voltage does not exist.)>>GO TO 9.
NG (Battery voltage exists for more than a few seconds.)>>GO TO 12.

9. CHECK ECM POWER SUPPLY CIRCUIT-IV

Check voltage between ECM terminal 24 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 10.
NG >> GO TO 12.

10. CHECK ECM POWER SUPPLY CIRCUIT-V

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E7.
3. Check harness continuity between ECM terminals 125 and IPDM E/R terminal 18.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 18.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E108, M15
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK ECM POWER SUPPLY CIRCUIT-VI

1. Disconnect IPDM E/R harness connector E9.
2. Check harness continuity between ECM terminal 24 and IPDM E/R terminal 46.
   Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E10, F1
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK 15A FUSE

1. Disconnect 15A fuse from IPDM E/R.
2. Check 15A fuse.

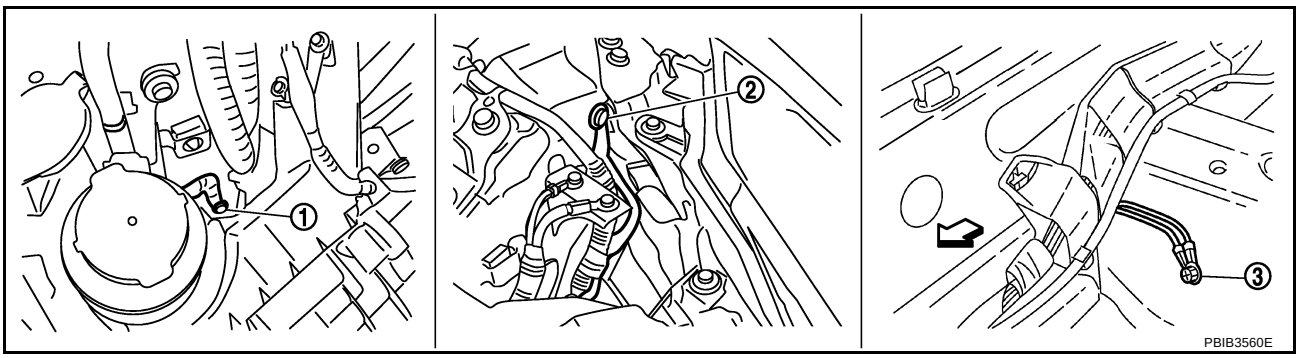
OK or NG

OK >> GO TO 18.
NG >> Replace 15A fuse.

15. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

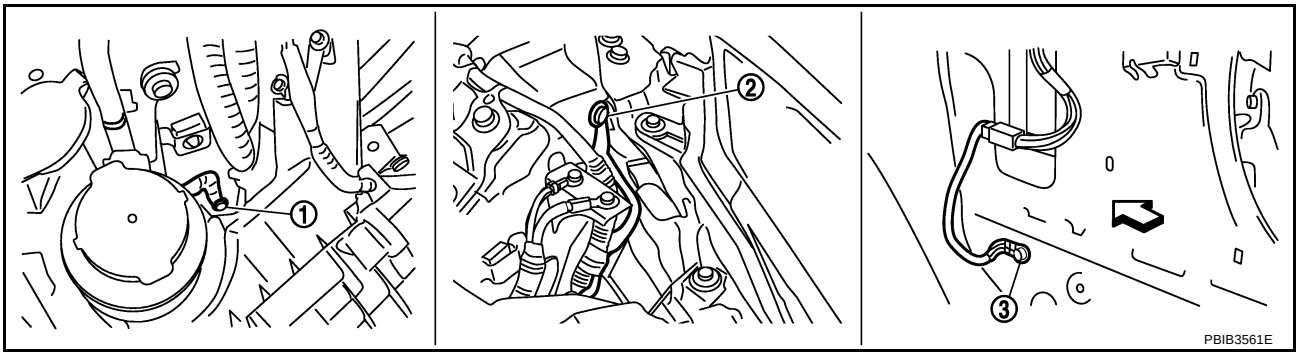


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 16.
NG >> Repair or replace ground connections.

16. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-II

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 8, 123, 124, 127, 128 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 18.
NG >> GO TO 17.

17. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F103, B113 (Models with VDC system, navigation system or telephone) or F151 (Models without VDC system, navigation system and telephone)
- Harness or connectors F3, E12
- Harness or connectors M72, F102
- Harness for open or short between ECM and ground.

>> Repair open circuit or short to power in harness or connectors.

18. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

Ground Inspection

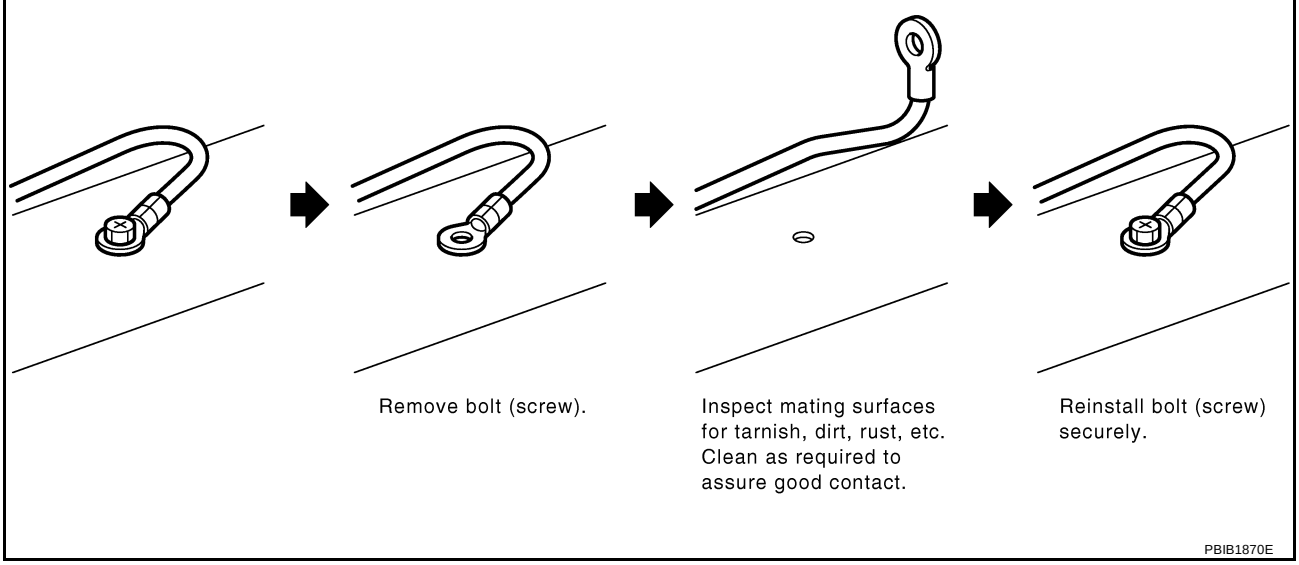
NBS0003Z

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This unwanted resistance can change the way a circuit works.
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically affect an electronically controlled circuit. A poor or corroded ground can easily affect the circuit. Even when the ground connection looks clean, there can be a thin film of rust on the surface.
When inspecting a ground connection follow these rules:

- Remove the ground bolt or screw.
- Inspect all mating surfaces for tarnish, dirt, rust, etc.
- Clean as required to assure good contact.
- Reinstall bolt or screw securely.
- Inspect for “add-on” accessories which may be interfering with the ground circuit.
- If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure no ground wires have excess wire insulation.

For detailed ground distribution information, refer to PG-27, "Ground Distribution" .

Ground Inspection



DTC U1000, U1001 CAN COMMUNICATION LINE

PFP:23710

Description

NBS00040

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

NBS006T0

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1000*1 1000*1	CAN communication line	● When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.	● Harness or connectors (CAN communication line is open or shorted)
U1001*2 1001*2		● When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	

*1: **This self-diagnosis has the one trip detection logic.**
*2: **The MIL will not light up for this self-diagnosis.**

DTC Confirmation Procedure

NBS006T1

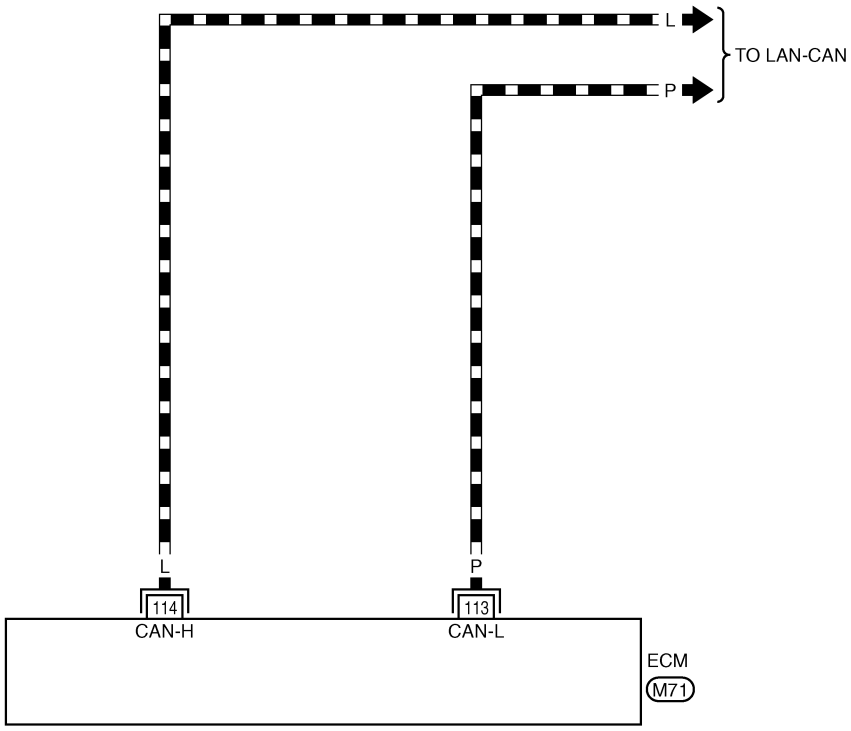
1. Turn ignition switch ON and wait at least 3 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-153, "Diagnostic Procedure" .

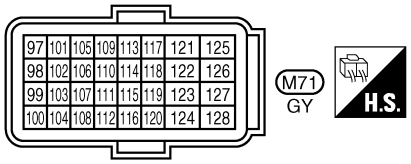
Wiring Diagram

NBS006T2

EC-CAN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
: DATA LINE





TBWT1616E

Diagnostic Procedure

NBS006T3

Go to LAN-48, "CAN System Specification Chart" .

DTC U1010 CAN COMMUNICATION

PFP:23710

Description

NBS002VL

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

NBS006T4

- **This self-diagnosis has one trip detection logic (A/T models).**
- **The MIL will not light up for this self-diagnosis (M/T models).**

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1010 1010	CAN communication bus	When detecting error during the initial diagnosis of CAN controller of ECM.	● ECM

DTC Confirmation Procedure

NBS002VN

WITH CONSULT-III

1. Turn ignition switch ON.
2. Check DTC.
3. If DTC is detected, go to EC-155, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS002VO

1. INSPECTION START

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” mode with CONSULT-III.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-154, "DTC Confirmation Procedure" .
5. Is the DTC U1010 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform DTC Confirmation Procedure.**
   See EC-154, "DTC Confirmation Procedure" .
4. Is the DTC U1010 displayed again?

Yes or No

Yes >> GO TO 2.
No >> **INSPECTION END**

2. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning"
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0011, P0021 IVT CONTROL

PFP:23796

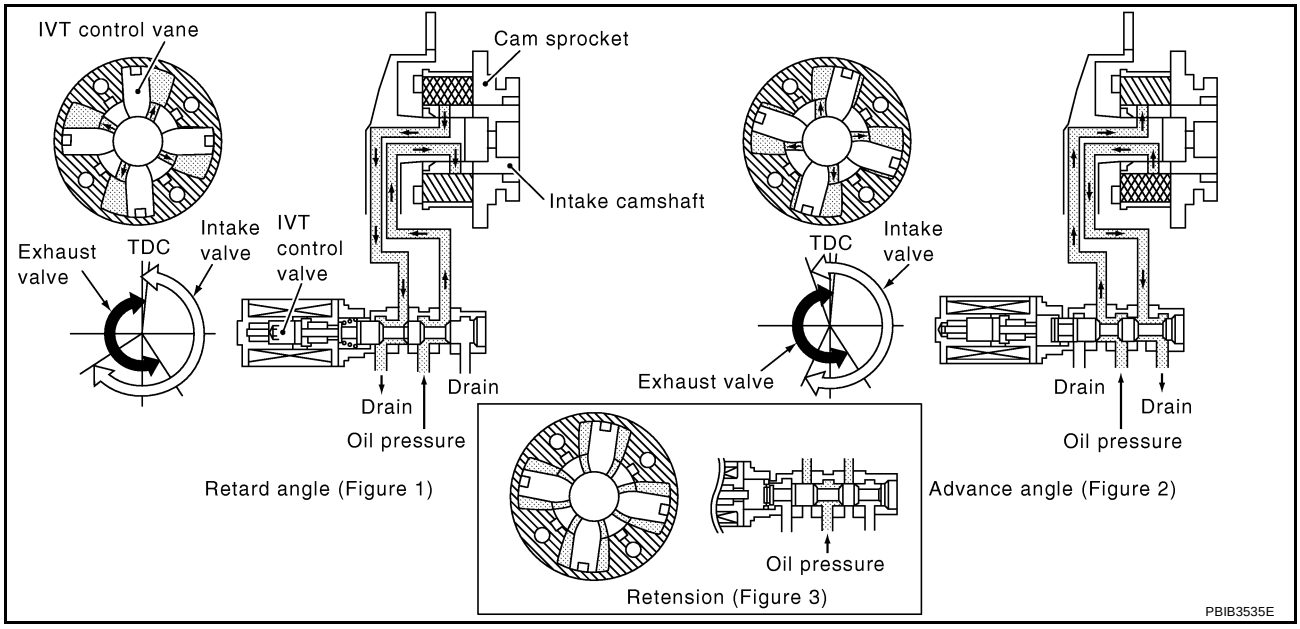
Description

NBS00045

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed and piston position	Intake valve timing control	Intake valve timing control solenoid valve
Camshaft position sensor (PHASE)			
Engine coolant temperature sensor	Engine coolant temperature		
Wheel sensor	Vehicle speed*		

*: This signal is sent to the ECM through CAN Communication line



This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the intake valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the intake valve timing control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the intake valve to increase engine torque in low/mid speed range and output in high-speed range.

CONSULT-III Reference Value in Data Monitor Mode

NBS00046

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V TIM(B1) INT/V TIM(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		2,000 rpm	Approx. 0° - 30°CA
INT/V SOL(B1) INT/V SOL(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		2,000 rpm	Approx. 0% - 50%

On Board Diagnosis Logic

NBS00047

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0011 0011 (Bank 1)	Intake valve timing control performance	There is a gap between angle of target and phase-control angle degree.	● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) ● Intake valve timing control solenoid valve ● Accumulation of debris to the signal pick-up portion of the camshaft ● Timing chain installation ● Foreign matter caught in the oil groove for intake valve timing control
P0021 0021 (Bank 2)			

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Intake valve timing control	The signal is not energized to the solenoid valve and the valve control does not function.

DTC Confirmation Procedure

NBS00048

CAUTION:

Always drive at a safe speed.

NOTE:

- **If DTC P0011 or P0021 is displayed with DTC P0075 or P0081, first perform trouble diagnosis for DTC P0075 or P0081. Refer to EC-183, "DTC P0075, P0081 IVT CONTROL SOLENOID VALVE" .**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10V and 16V at idle.

WITH CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Maintain the following conditions for at least 6 consecutive seconds.
   Hold the accelerator pedal as steady as possible.

ENG SPEED	500 - 2,000 rpm (A constant rotation is maintained.)
COOLANT TEMP/S	More than 60°C (140°F)
B/FUEL SCHDL	More than 3.5 msec
Shift lever	P or N (A/T), neutral (M/T) position

4. Let engine idle for 10 seconds.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-158, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to next step.
7. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,700 - 3,175 rpm (A constant rotation is maintained.)
COOLANT TEMP/S	More than 70°C (158°F)
Shift lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

8. Check 1st trip DTC.
9. If 1st trip DTC is detected, go to EC-158, "Diagnostic Procedure" .

WITH GST

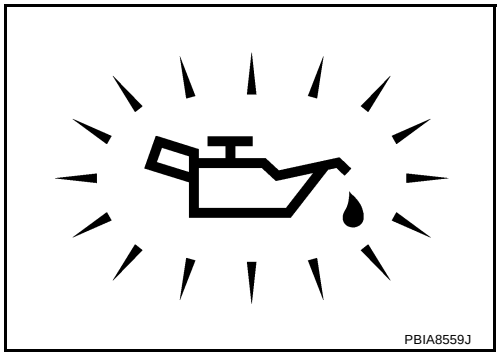
Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS00049

1. CHECK OIL PRESSURE WARNING LAMP

1. Start engine.
2. Check oil pressure warning lamp and confirm it is not illuminated.



OK or NG

OK >> GO TO 2.
NG >> Go to LU-7, "OIL PRESSURE CHECK" .

2. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-159, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace malfunctioning intake valve timing control solenoid valve.

3. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-393, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace crankshaft position sensor (POS).

4. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-405, "Component Inspection" .

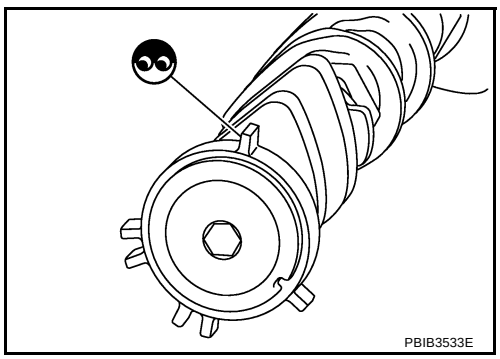
OK or NG

OK >> GO TO 5.
NG >> Replace malfunctioning camshaft position sensor (PHASE).

5. CHECK CAMSHAFT (INT)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end



OK or NG

OK >> GO TO 6.
NG >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.

6. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misaligned.
Are there any service records that may cause timing chain misaligned?

Yes or No

Yes >> Check timing chain installation. Refer to EM-53, "TIMING CHAIN" .
No >> GO TO 7.

7. CHECK LUBRICATION CIRCUIT

Refer to EM-74, "INSPECTION AFTER REMOVAL" .

OK or NG

OK >> GO TO 8.
NG >> Clean lubrication line.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
For Wiring Diagram, refer to EC-388 for crankshaft position sensor (POS) and EC-397 for camshaft position sensor (PHASE).

>> **INSPECTION END**

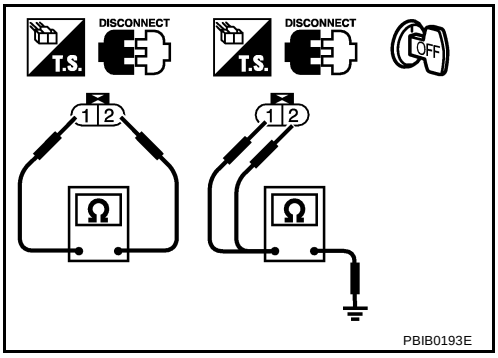
Component Inspection

NBS0004A

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

1. Disconnect intake valve timing control solenoid valve harness connector.
2. Check resistance between intake valve timing control solenoid valve as follows.

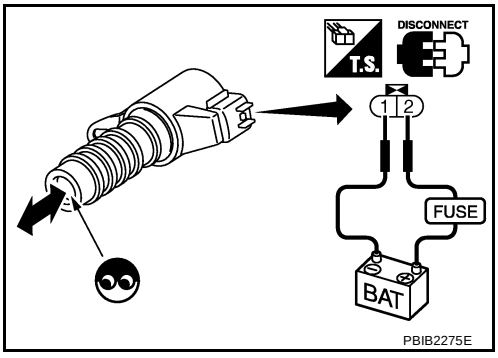
Terminal	Resistance
1 and 2	7.0 - 7.5Ω [at 20°C (68°F)]
1 or 2 and ground	∞ Ω (Continuity should not exist.)



PBIB0193E

If NG, replace intake valve timing control solenoid valve.
If OK, go to next step.

3. Remove intake valve timing control solenoid valve.
4. Provide 12V DC between intake valve timing control solenoid valve terminals and then interrupt it. Make sure that the plunger moves as shown in the figure.



PBIB2275E

CAUTION:
Do not apply 12V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.
If NG, replace intake valve timing control solenoid valve.

NOTE:
Always replace O-ring when intake valve timing control solenoid valve is removed.

Removal and Installation

NBS0004B

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EM-53, "TIMING CHAIN" .

DTC P0014 P0024 EVT CONTROL

PFP:23795

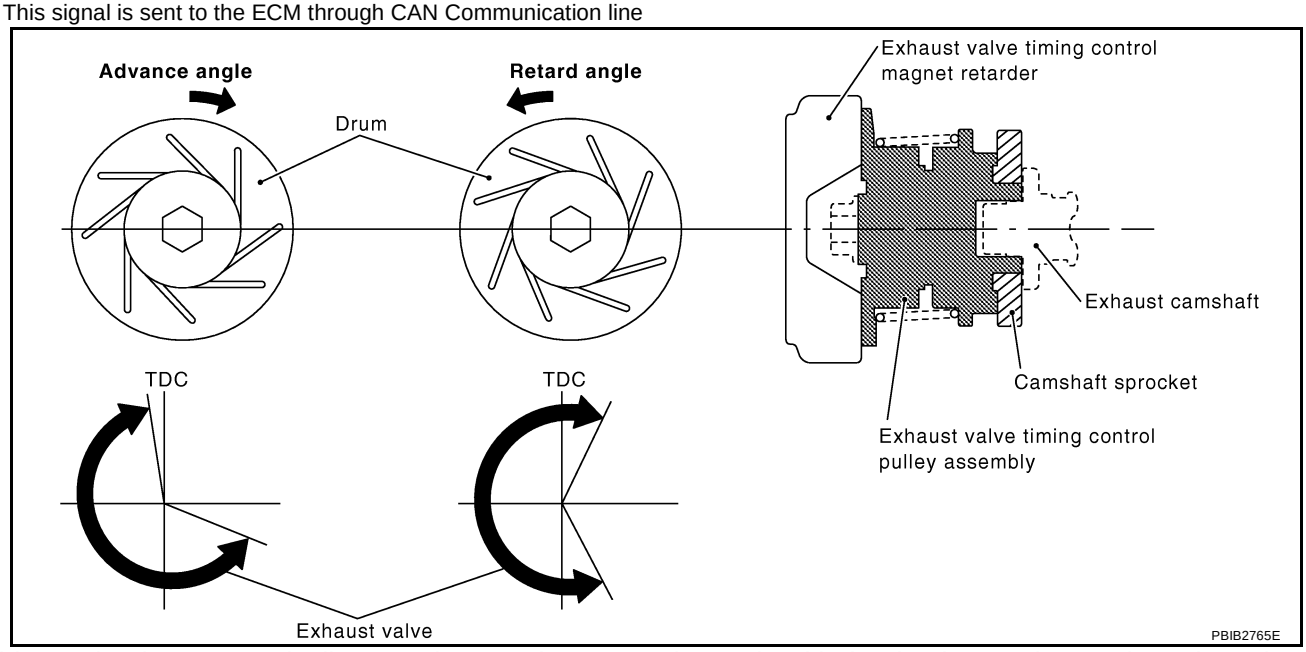
Description

NBS0004C

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed and piston position	Exhaust valve timing control	Exhaust valve timing control magnet retarder
Camshaft position sensor (PHASE)			
Engine coolant temperature sensor	Engine coolant temperature		
Exhaust valve timing control position sensor	Exhaust valve timing signal		
Wheel sensor	Vehicle speed*		

*: This signal is sent to the ECM through CAN Communication line



This mechanism magnetically controls cam phases continuously with the fixed operating angle of the exhaust valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the exhaust valve timing control magnet retarder depending on driving status. This makes it possible to control the shut/open timing of the exhaust valve to increase engine torque and output in a range of high engine speed.

CONSULT-III Reference Value in Data Monitor Mode

NBS0004D

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
EXH/V TIM B1 EXH/V TIM B2	● Engine: After warming up ● Shift lever: Neutral ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°CA
EX VTC DTY B1 EX VTC DTY B2	● Engine: After warming up ● Shift lever: Neutral ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%

On Board Diagnosis Logic

NBS0004E

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0014 0014 (Bank 1)	Exhaust valve timing control performance	There is a gap between angle of target and phase-control angle degree.	● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) ● Exhaust valve timing control position sensor ● Exhaust valve timing control magnet retarder ● Accumulation of debris to the signal pick-up portion of the camshaft ● Timing chain installation ● Exhaust valve timing control pulley assembly
P0024 0024 (Bank 2)			

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Exhaust valve timing control	The signal is not energized to the Exhaust valve timing control magnet retarder and the magnet retarder control does not function.

DTC Confirmation Procedure

NBS0004F

CAUTION:

Always drive at a safe speed.

NOTE:

- **If DTC P0014 or P0024 is displayed with DTC P0078, P0084, P1078 or P1084, first perform trouble diagnosis for DTC P0078, P0084 or P1078, P1084. Refer to EC-190, "DTC P0078 P0084 EVT CONTROL MAGNET RETARDER" or EC-528, "DTC P1078 P1084 EVT CONTROL POSITION SENSOR" .**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10V and 16V at idle.

WITH CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Maintain the following conditions for at least 6 consecutive seconds.
   Hold the accelerator pedal as steady as possible.

ENG SPEED	500 - 2,000 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 60°C (140°F)
B/FUEL SCHDL	More than 3.5 msec
Shift lever	P or N (A/T), neutral (M/T) position

4. Let engine idle for 10 seconds.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-162, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to next step.
7. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,700 - 2,950 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 70°C (158°F)
Shift lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

8. Check 1st trip DTC.
9. If 1st trip DTC is detected, go to EC-162, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS0004G

1. INSPECTION START

Do you have CONSULT-III?

Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. CHECK FUNCTION OF EXHAUST VALVE TIMING CONTROL-I

With CONSULT-III

1. Turn ignition switch ON.
2. Select “EXH V/T ANGLE” in “ACTIVE TEST” mode with CONSULT-III.
3. Start engine and keep the engine speed at 2,500 rpm, then touch “START”.
4. Make sure that the values of “EXH/V TIM B1” and “EXH/V TIM B2” change when touching “UP” or “DOWN”.

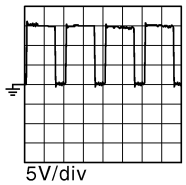
OK or NG

OK >> GO TO 12.
NG >> GO TO 4.

3. CHECK FUNCTION OF EXHAUST VALVE TIMING CONTROL-II

Without CONSULT-III

1. Start engine and keep the engine speed at 2,500 rpm, then touch “START”.
2. Read the voltage signal between ECM terminal 6 (bank 1), 7 (bank 2) and ground with oscilloscope.
3. Verify that the oscilloscope screen shows the signal wave as shown below.



PBIB3542E

OK or NG

OK >> GO TO 12.
NG >> GO TO 4.

4. CHECK EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

Refer to EC-164, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. REPLACE EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Replace exhaust valve timing control magnet retarder.
2. Perform EC-76, "Exhaust Valve Timing Control Learning" .

>> **INSPECTION END**

6. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Refer to EC-539, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace malfunctioning exhaust valve timing control position sensor.

7. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-393, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace crankshaft position sensor (POS).

8. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-405, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace malfunctioning camshaft position sensor (PHASE).

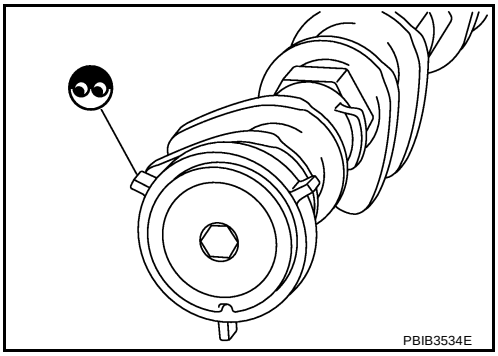
9. CHECK CAMSHAFT (EXH)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 10.
NG >> Remove debris and clean the signal plate of camshaft rear end or malfunctioning replace camshaft.



10. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misaligned.
Are there any service records that may cause timing chain misaligned?

Yes or No

Yes >> Check timing chain installation. Refer to EM-53, "TIMING CHAIN" .
No >> GO TO 11.

11. REPLACE EXHAUST VALVE TIMING CONTROL PULLEY ASSEMBLY

1. Replace exhaust valve timing control pulley assembly and exhaust valve timing control magnet retarder. Refer to EM-72, "CAMSHAFT" and EM-44, "FRONT TIMING CHAIN CASE" .
2. Perform EC-76, "Exhaust Valve Timing Control Learning" .

>> **INSPECTION END**

12. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
For Wiring Diagram, refer to EC-388 for crankshaft position sensor (POS) and EC-397 for camshaft position sensor (PHASE).

>> **INSPECTION END**

Component Inspection

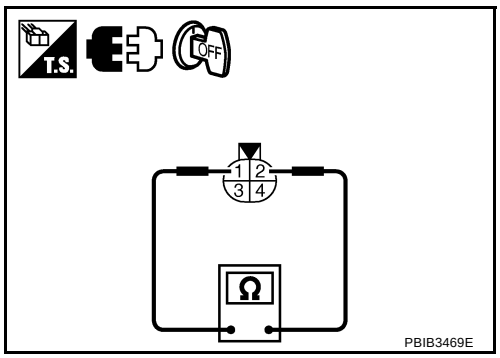
NBS0004H

EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Disconnect exhaust valve timing control magnet retarder harness connector.
2. Check resistance between exhaust valve timing control magnet retarder terminals 1 and 2.

   Resistance: 9.0 - 11.0Ω [at 20°C (68°F)]

3. If NG, replace exhaust valve timing control magnet retarder and go to the next step.
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .



Removal and Installation

NBS0004I

EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

Refer to EM-44, "FRONT TIMING CHAIN CASE" .

DTC P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

PFP:22693

Description

NBS000B6

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE) Crankshaft position sensor (POS)	Engine speed	Air fuel ratio (A/F) sensor 1 heater control	Air fuel ratio (A/F) sensor 1 heater
Mass air flow sensor	Amount of intake air		

The ECM performs ON/OFF duty control of the A/F sensor 1 heater corresponding to the engine operating condition to keep the temperature of A/F sensor 1 element at the specified range.

CONSULT-III Reference Value in Data Monitor Mode

NBS000B7

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
A/F S1 HTR(B1) A/F S1 HTR(B2)	● Engine: After warming up, idle the engine (More than 140 seconds after starting engine)	4 - 100%

On Board Diagnosis Logic

NBS000B8

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0031 0031 (Bank 1) P0051 0051 (Bank 2)	Air fuel ratio (A/F) sensor 1 heater control circuit low input	The current amperage in the air fuel ratio (A/F) sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	● Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1 heater
P0032 0032 (Bank 1) P0052 0052 (Bank 2)	Air fuel ratio (A/F) sensor 1 heater control circuit high input	The current amperage in the air fuel ratio (A/F) sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	● Harness or connectors (The A/F sensor 1 heater circuit is shorted.) ● Air fuel ratio (A/F) sensor 1 heater

DTC Confirmation Procedure

NBS000B9

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is between 10.5V and 16V at idle.

WITH CONSULT-III

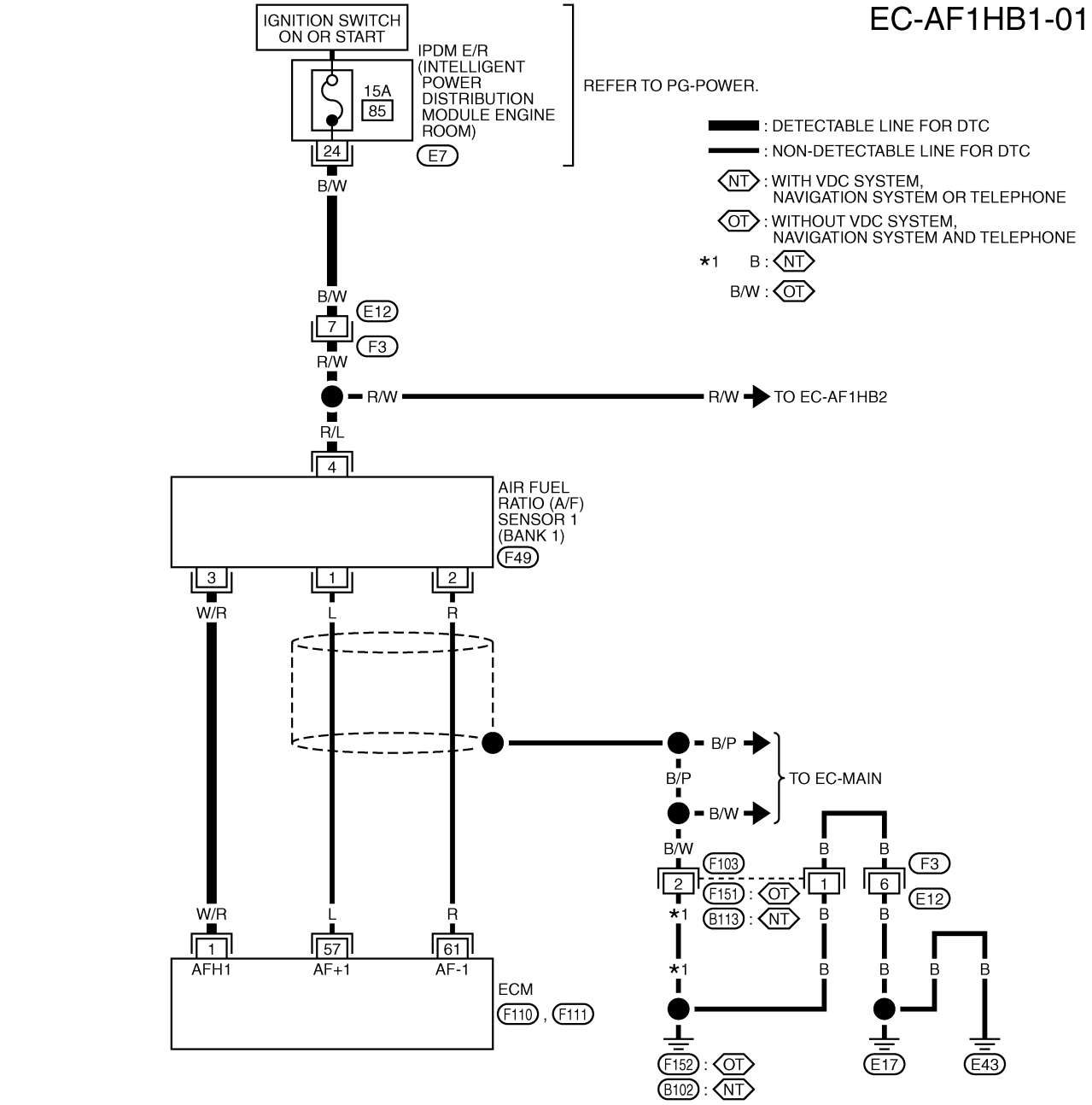
1. Start engine and let it idle for at least 10 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-170, "Diagnostic Procedure" .

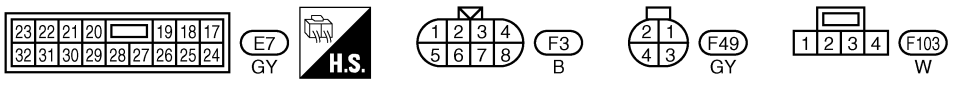
WITH GST

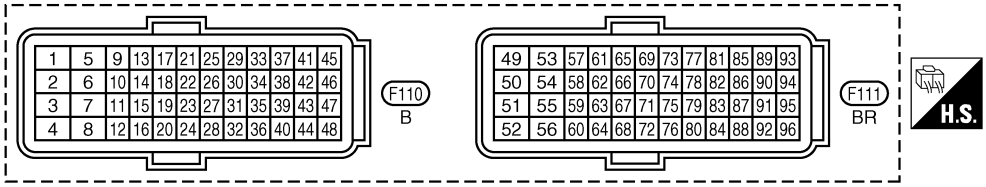
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS000BA





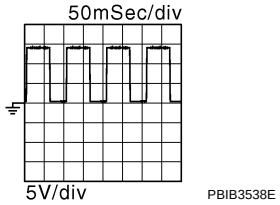


TBWT1617E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

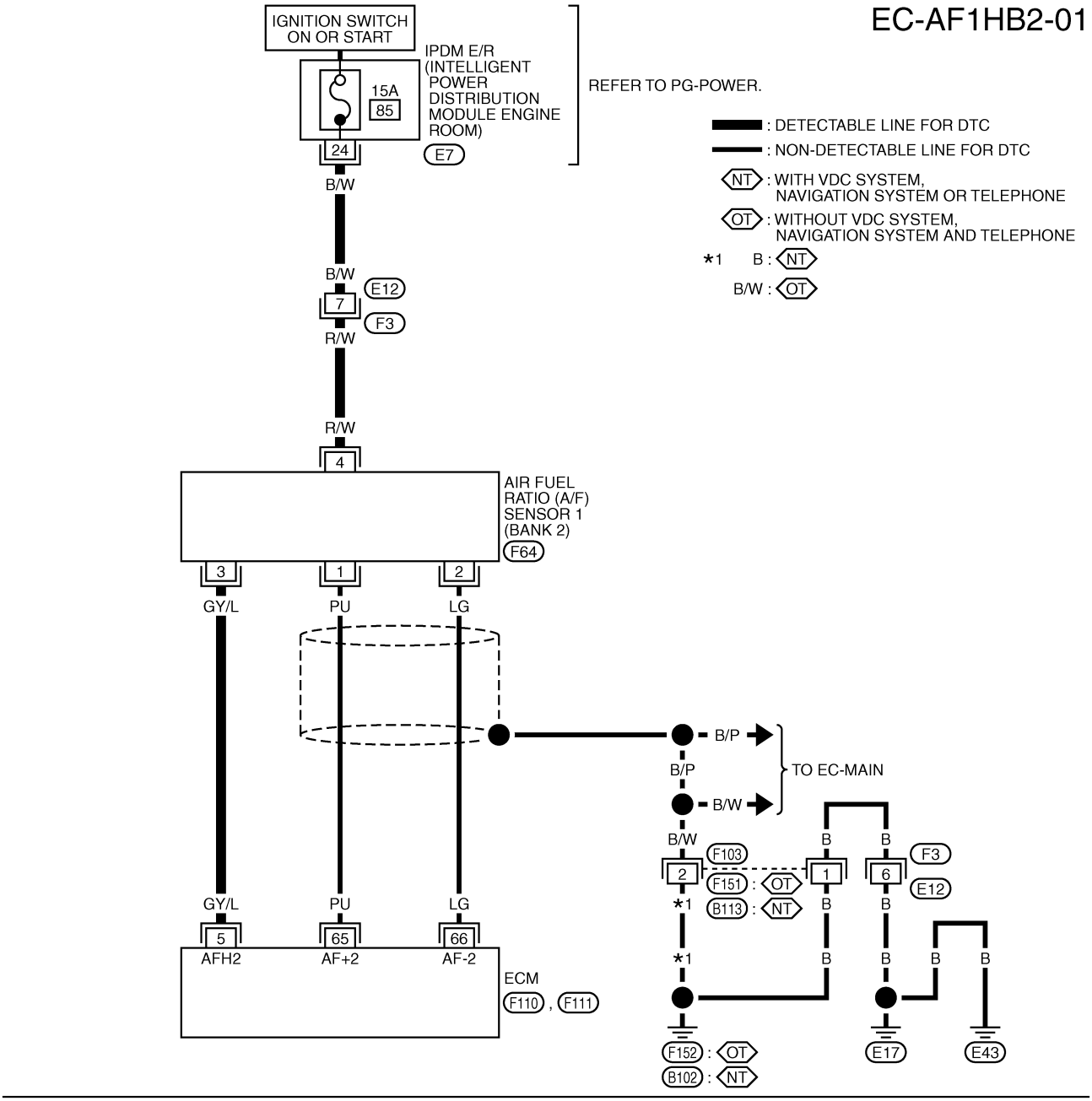
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★ 
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

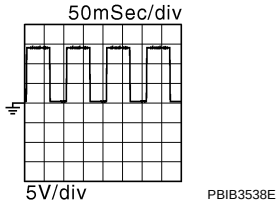


TBWT1618E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

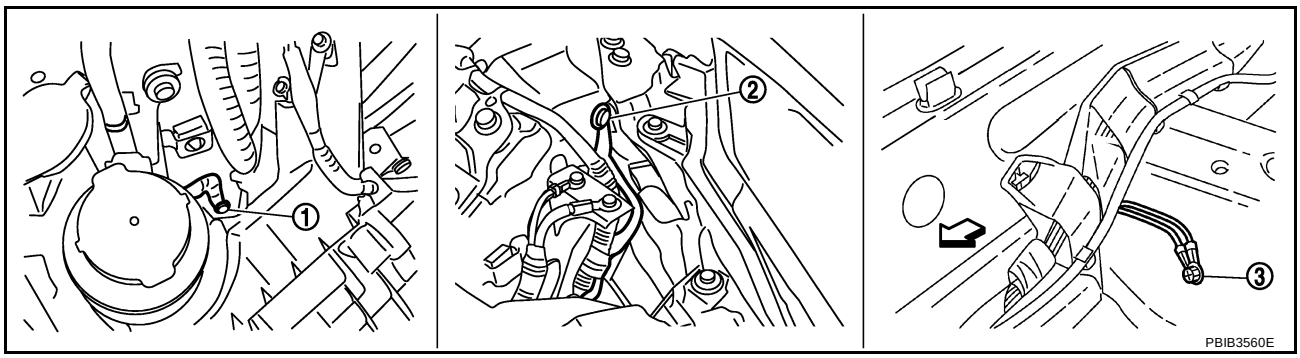
Diagnostic Procedure

NBS000BB

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

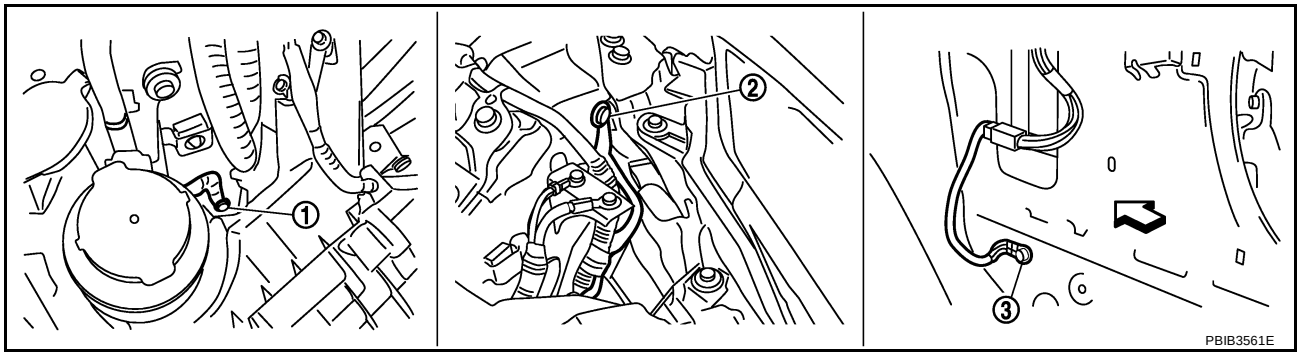


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

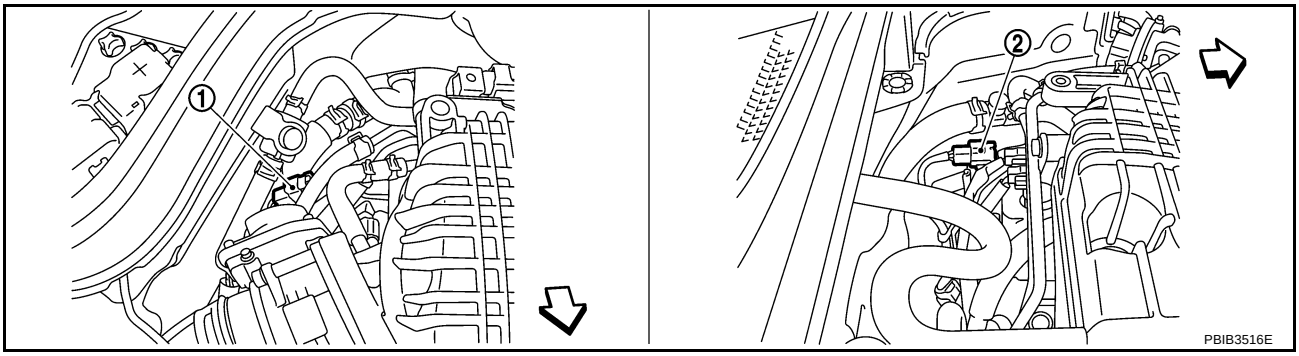
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

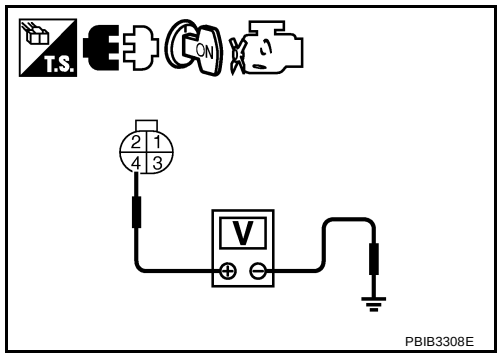


1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle fornt

2. Turn ignition switch ON.
3. Check voltage between air fuel ratio sensor (A/F) sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between air fuel ratio (A/F) sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 1 (bank 1) or 5 (bank 2) and air fuel ratio (A/F) sensor 1 terminal 3.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground or short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to EC-172, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning air fuel ratio (A/F) sensor 1.

6. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

NBS000BC

AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Check resistance between terminals 3 and 4.

Resistance: 1.8 - 2.44Ω [at 25°C (77°F)]

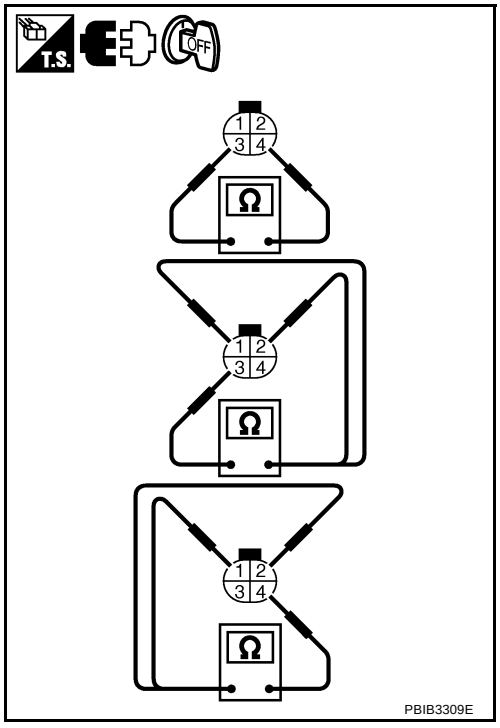
Check continuity between terminals 3 and 1, 2, terminals 4 and 1, 2.

Continuity should not exist.

If NG, replace the air fuel ratio (A/F) sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**



Removal and Installation

NBS000BD

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

PFP:226A0

Description

NBS0004J

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE)	Engine speed	Heated oxygen sensor 2 (HO2S2) heater control	Heated oxygen sensor 2 (HO2S2) heater
Crankshaft position sensor (POS)			
Engine coolant temperature sensor	Engine coolant temperature		
Mass air flow sensor	Amount of intake air		

The ECM performs ON/OFF control of the heated oxygen sensor 2 (HO2S2) heater corresponding to the engine speed, amount of intake air and engine coolant temperature.

OPERATION

Engine speed rpm	Heated oxygen sensor 2 heater
Above 3,600	OFF
Below 3,600 rpm after the following conditions are met. ● Engine: After warming up ● Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON

CONSULT-III Reference Value in Data Monitor Mode

NBS0004K

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 HTR (B1) HO2S2 HTR (B2)	● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON
	● Engine speed: Above 3,600 rpm	OFF

On Board Diagnosis Logic

NBS0004L

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0037 0037 (Bank 1) P0057 0057 (Bank 2)	HO2S2 heater control circuit low	The current amperage in the HO2S2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the HO2S2 heater.)	● Harness or connectors (The HO2S2 heater circuit is open or shorted.) ● HO2S2 heater
P0038 0038 (Bank 1) P0058 0058 (Bank 2)	HO2S2 heater control circuit high	The current amperage in the HO2S2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the HO2S2 heater.)	● Harness or connectors (The HO2S2 heater circuit is shorted.) ● HO2S2 heater

DTC Confirmation Procedure

NBS0004M

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is between 11V and 16V at idle.

WITH CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-179, "Diagnostic Procedure" .

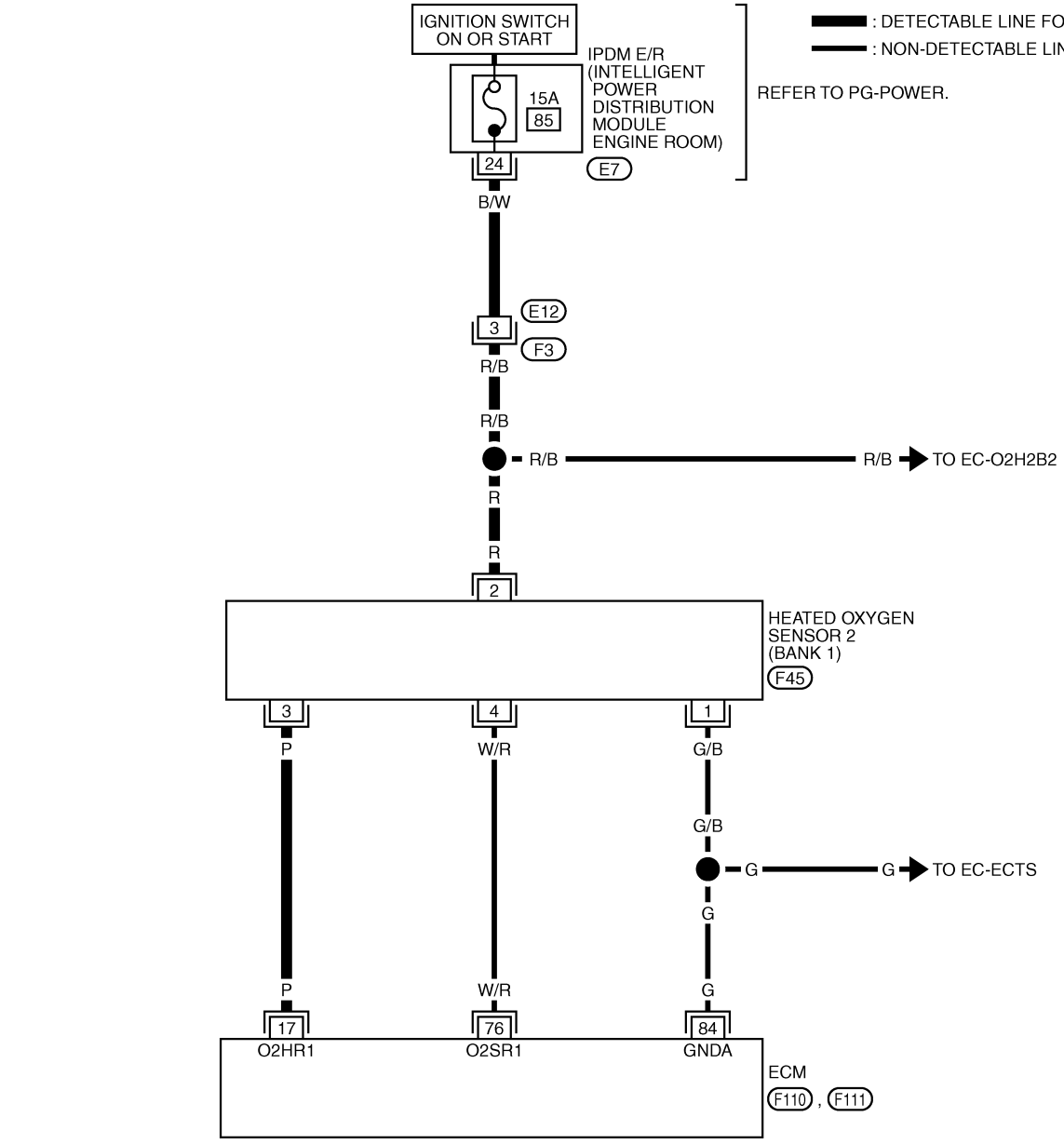
WITH GST

Follow the procedure “WITH CONSUT-III” above.

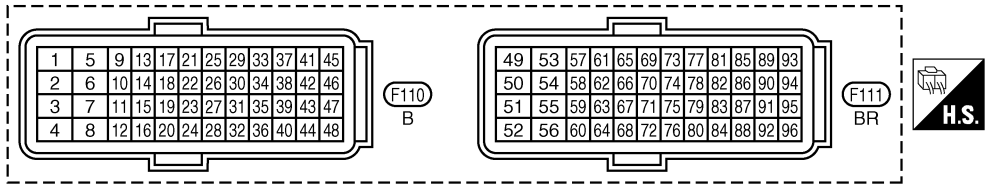
Wiring Diagram
BANK 1

NBS0004N

EC-O2H2B1-01





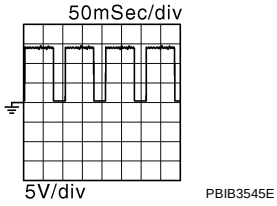


TBWT1619E

Specification data are reference values and are measured between each terminal and ground.

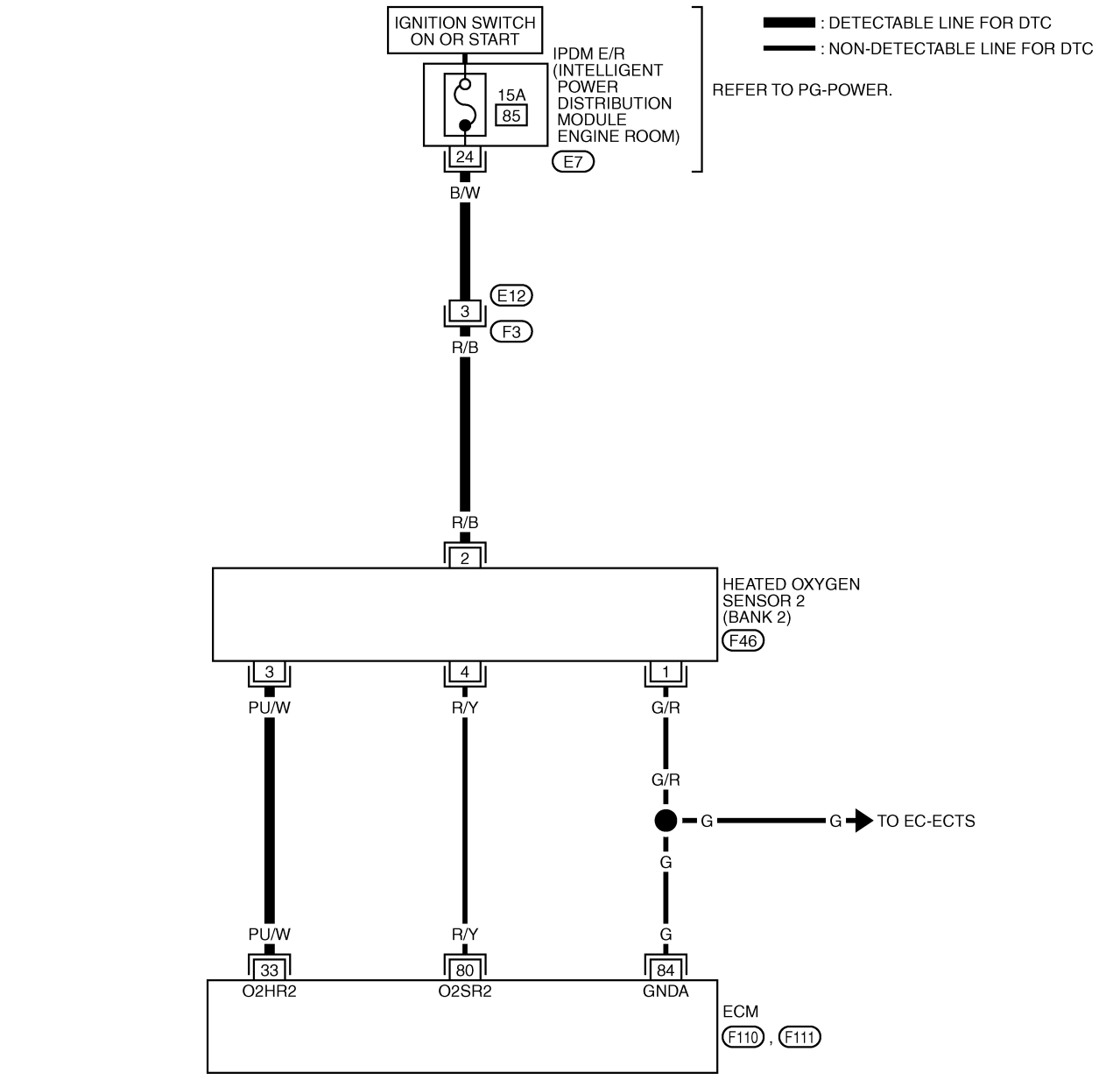
CAUTION:

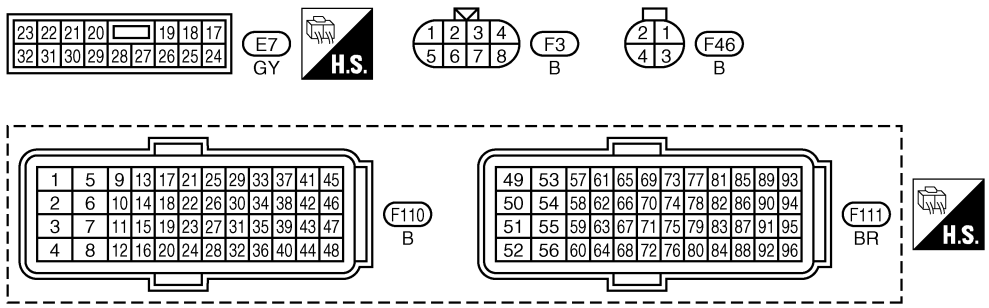
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★ 
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

BANK 2

EC-O2H2B2-01



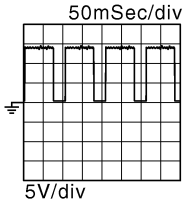


TBWT1620E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

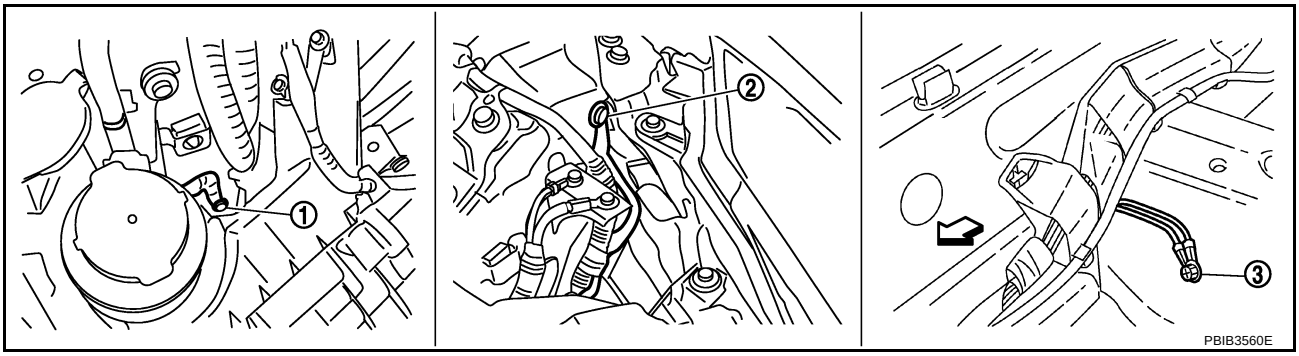
Diagnostic Procedure

NBS0004O

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

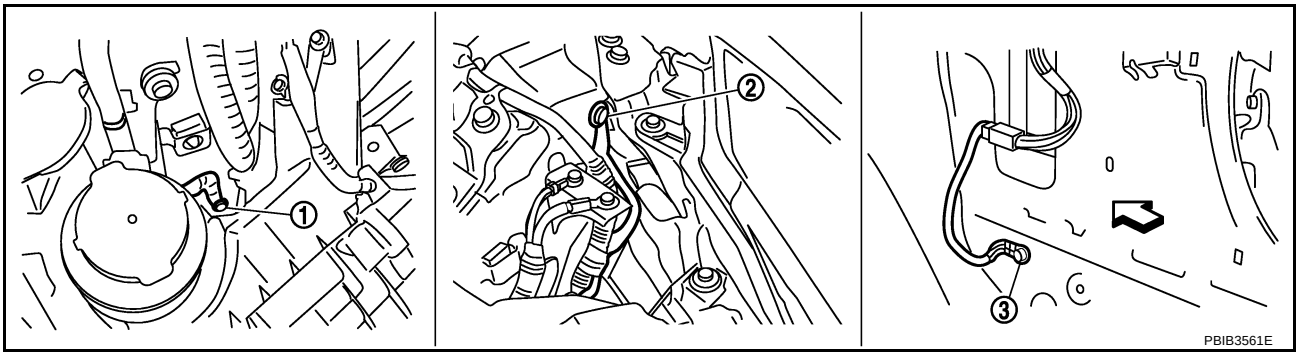


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

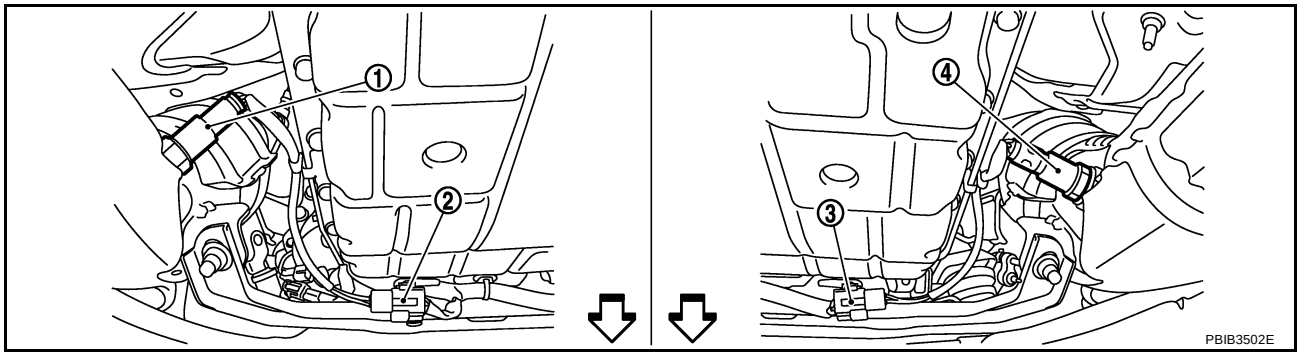
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK HO2S2 POWER SUPPLY CIRCUIT

1. Disconnect heated oxygen sensor 2 harness connector.

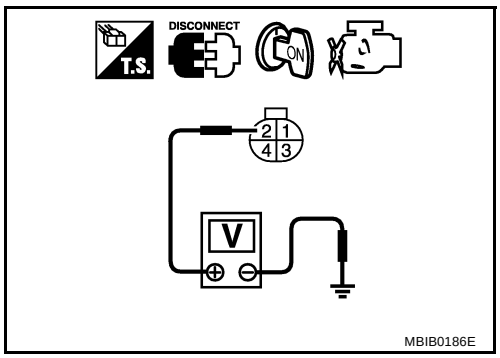


1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

2. Turn ignition switch ON.
3. Check voltage between HO2S2 terminal 2 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between heated oxygen sensor 2 and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 HEATER OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0037, P0038	17	3	1
P0057, P0058	33	3	2

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2 HEATER

Refer to EC-181, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

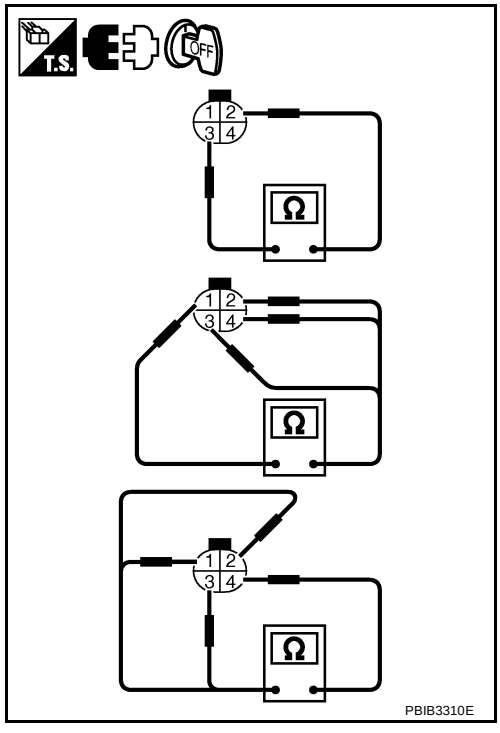
Component Inspection

NBS0004P

HEATED OXYGEN SENSOR 2 HEATER

1. Check resistance between HO2S2 terminals as follows.

Terminal No.	Resistance
2 and 3	3.4 - 4.4 Ω [at 25°C (77°F)]
1 and 2, 3, 4	∞ Ω (Continuity should not exist)
4 and 1, 2, 3	



2. If NG, replace heated oxygen sensor 2.

CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

NBS0004Q

HEATED OXYGEN SENSOR 2

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

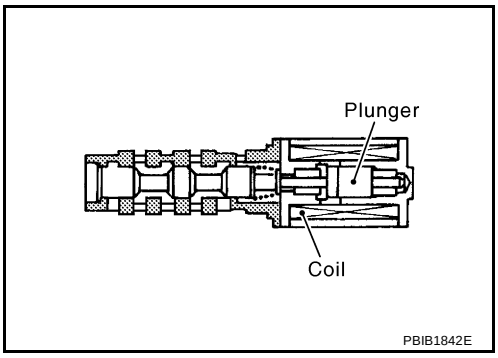
DTC P0075, P0081 IVT CONTROL SOLENOID VALVE

PFP:23796

Component Description

NBS000BR

Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.
The intake valve timing control solenoid valve changes the oil amount and direction of flow through intake valve timing control unit or stops oil flow.
The longer pulse width advances valve angle.
The shorter pulse width retards valve angle.
When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the intake valve angle at the control position.



CONSULT-III Reference Value in Data Monitor Mode

NBS000BS

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V SOL(B1) INT/V SOL(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		2,000 rpm	Approx. 0% - 50%

On Board Diagnosis Logic

NBS000BT

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0075 0075 (Bank 1)	Intake valve timing control solenoid valve circuit	An improper voltage is sent to the ECM through intake valve timing control solenoid valve.	● Harness or connectors (The intake valve timing control solenoid valve circuit is open or shorted.) ● Intake valve timing control solenoid valve
P0081 0081 (Bank 2)			

DTC Confirmation Procedure

NBS000BU

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-188, "Diagnostic Procedure" .

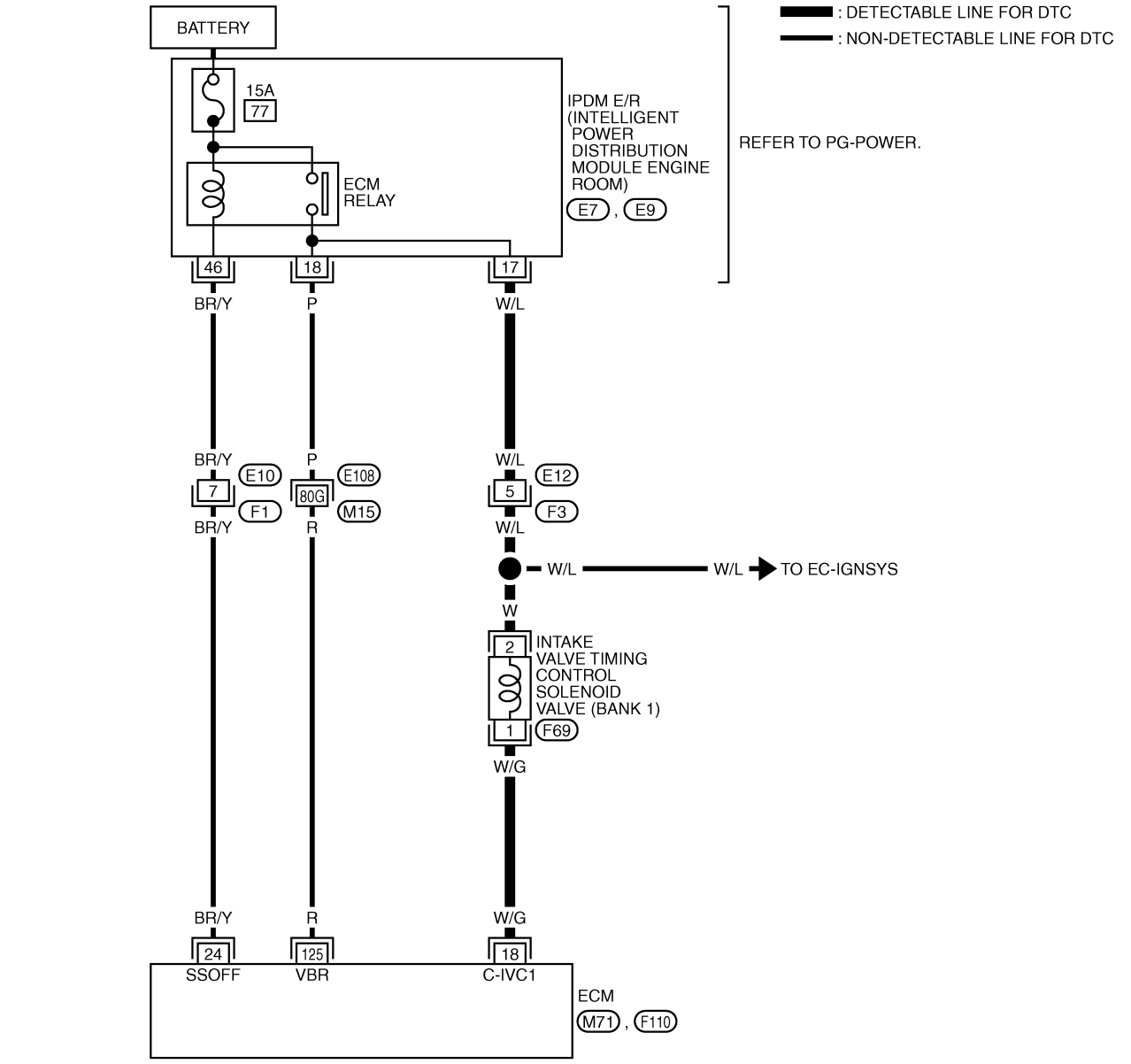
WITH GST

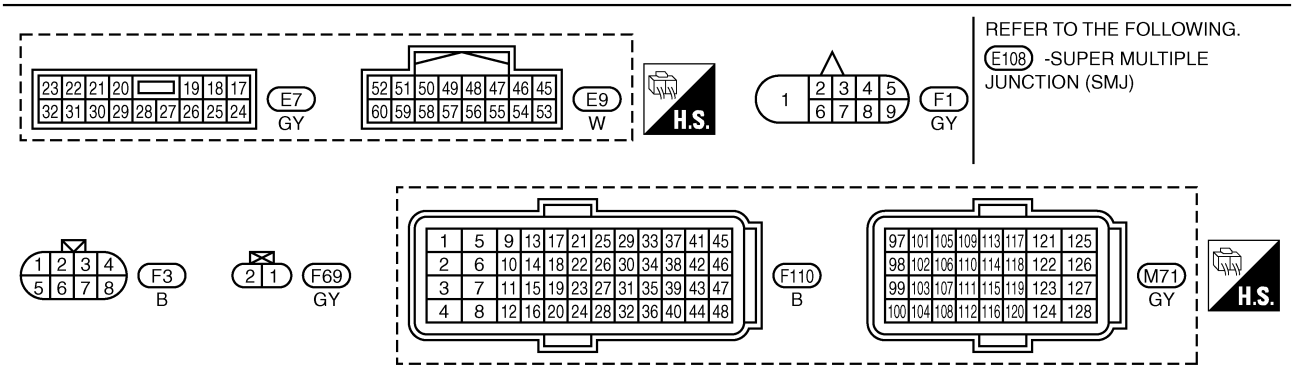
Following the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS000BV

EC-IVCB1-01

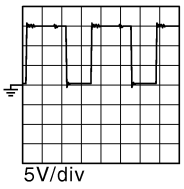




TBWT1621E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

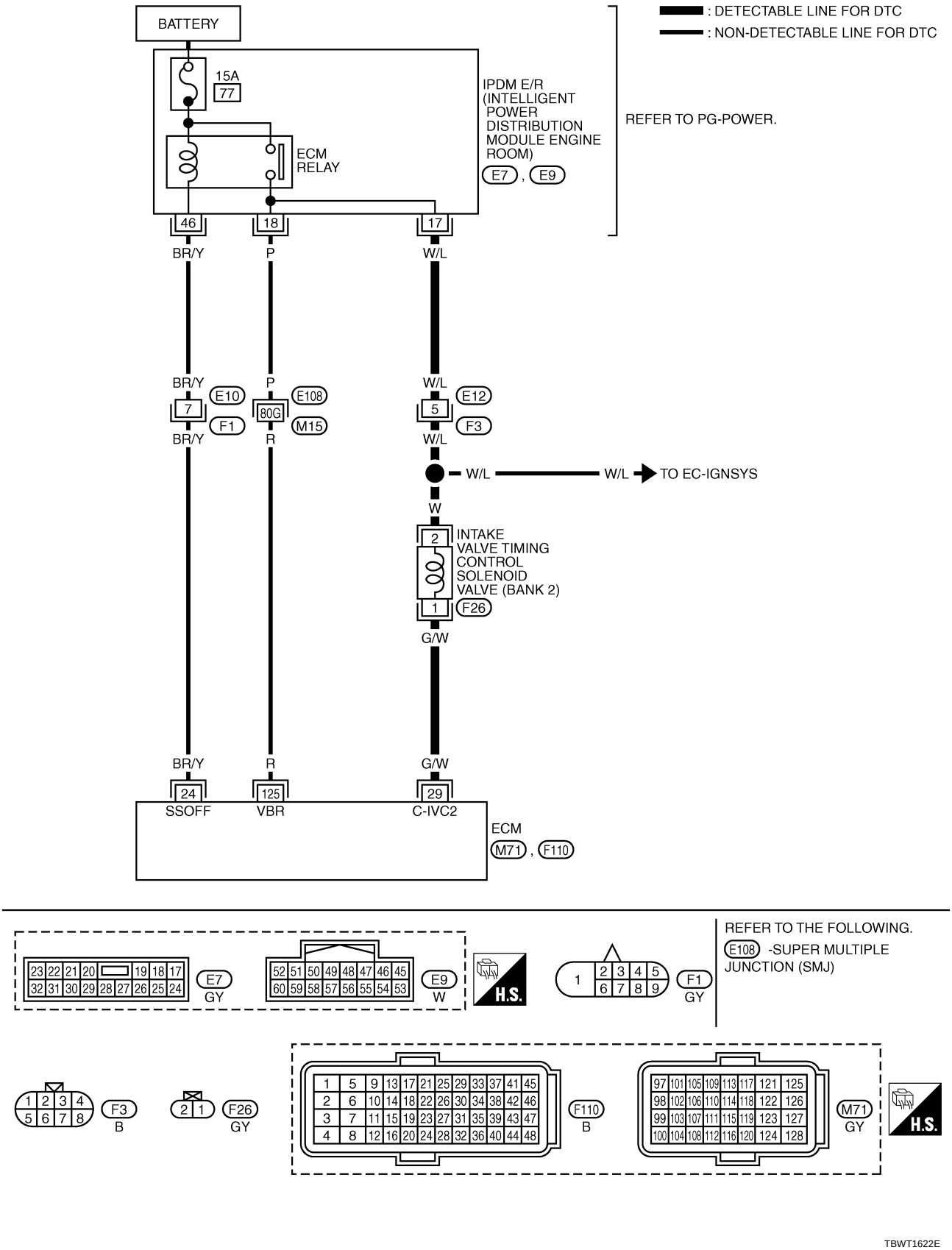
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
18	W/G	Intake valve timing control solenoid valve (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	7 - 12V★  PBIB3546E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

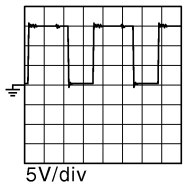
EC-IVCB2-01



TBWT1622E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
29	G/W	Intake valve timing control solenoid valve (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	7 - 12V★  5V/div PBIB3546E
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

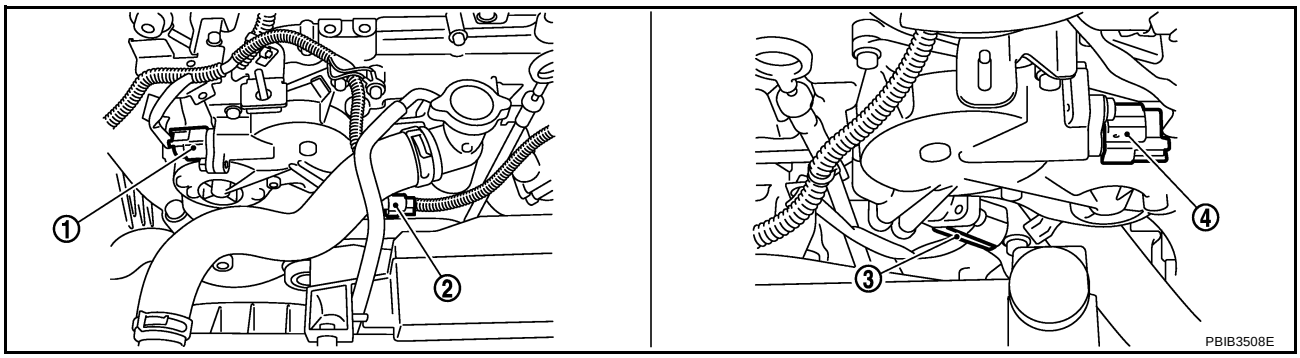
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS000BW

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

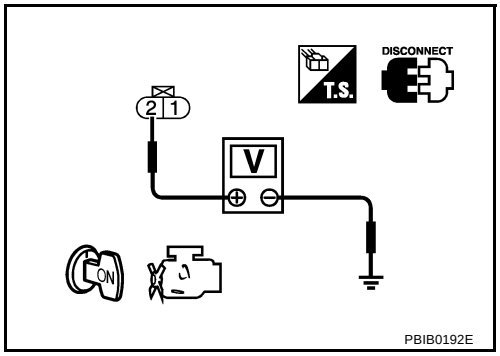
1. Turn ignition switch OFF.
2. Disconnect intake valve timing control solenoid valve harness connector.



1. Exhaust valve timing control magnet retarder (bank 1) harness connector
2. Intake valve timing control solenoid valve (bank 1) harness connector
3. Intake valve timing control solenoid valve (bank 2) harness connector
4. Exhaust valve timing control magnet retarder (bank 2) harness connector

3. Turn ignition switch ON.
4. Check voltage between intake valve timing control solenoid valve terminal 2 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between intake valve timing control solenoid valve and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 18 (bank 1) or 29 (bank 2) and intake valve timing control solenoid valve terminal 1. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-189, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace malfunctioning intake valve timing control solenoid valve.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

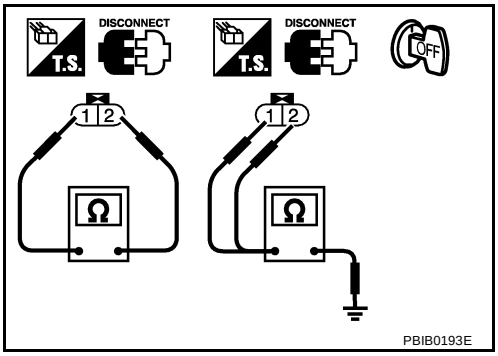
NBS000BX

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

1. Disconnect intake valve timing control solenoid valve harness connector.
2. Check resistance between intake valve timing control solenoid valve as follows.

Terminal	Resistance
1 and 2	7.0 - 7.5Ω [at 20°C (68°F)]
1 or 2 and ground	∞ Ω (Continuity should not exist.)

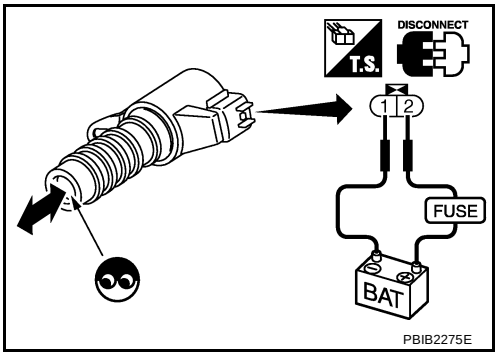
If NG, replace intake valve timing control solenoid valve.
If OK, go to next step.



3. Remove intake valve timing control solenoid valve.
4. Provide 12V DC between intake valve timing control solenoid valve terminals and then interrupt it. Make sure that the plunger moves as shown in the figure.

CAUTION:
Do not apply 12V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.
If NG, replace intake valve timing control solenoid valve.

NOTE:
Always replace O-ring when intake valve timing control solenoid valve is removed.



Removal and Installation

NBS000BY

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EM-53, "TIMING CHAIN" .

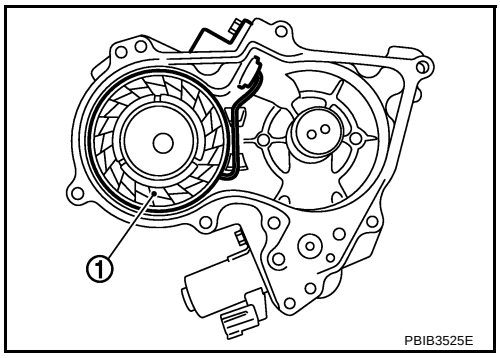
DTC P0078 P0084 EVT CONTROL MAGNET RETARDER

PFP:23795

Component Description

NBS0004R

Exhaust valve timing control magnet retarder (1) controls the shut/open timing of the exhaust valve by ON/OFF pulse duty signals sent from the ECM.
The longer pulse width retards valve angle.
The shorter pulse width advances valve angle.



CONSULT-III Reference Value in Data Monitor Mode

NBS0004S

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
EX VTC DTY B1 EX VTC DTY B2	● Engine: After warming up ● Shift lever: Neutral ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%

On Board Diagnosis Logic

NBS0004T

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0078 0078 (Bank 1)	Exhaust valve timing control magnet retarder circuit	An improper voltage is sent to the ECM through exhaust valve timing control magnet retarder.	● Harness or connectors (Exhaust valve timing control magnet retarder circuit is open or shorted.) ● Exhaust valve timing control magnet retarder
P0084 0084 (Bank 2)			

DTC Confirmation Procedure

NBS0004U

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-195, "Diagnostic Procedure" .

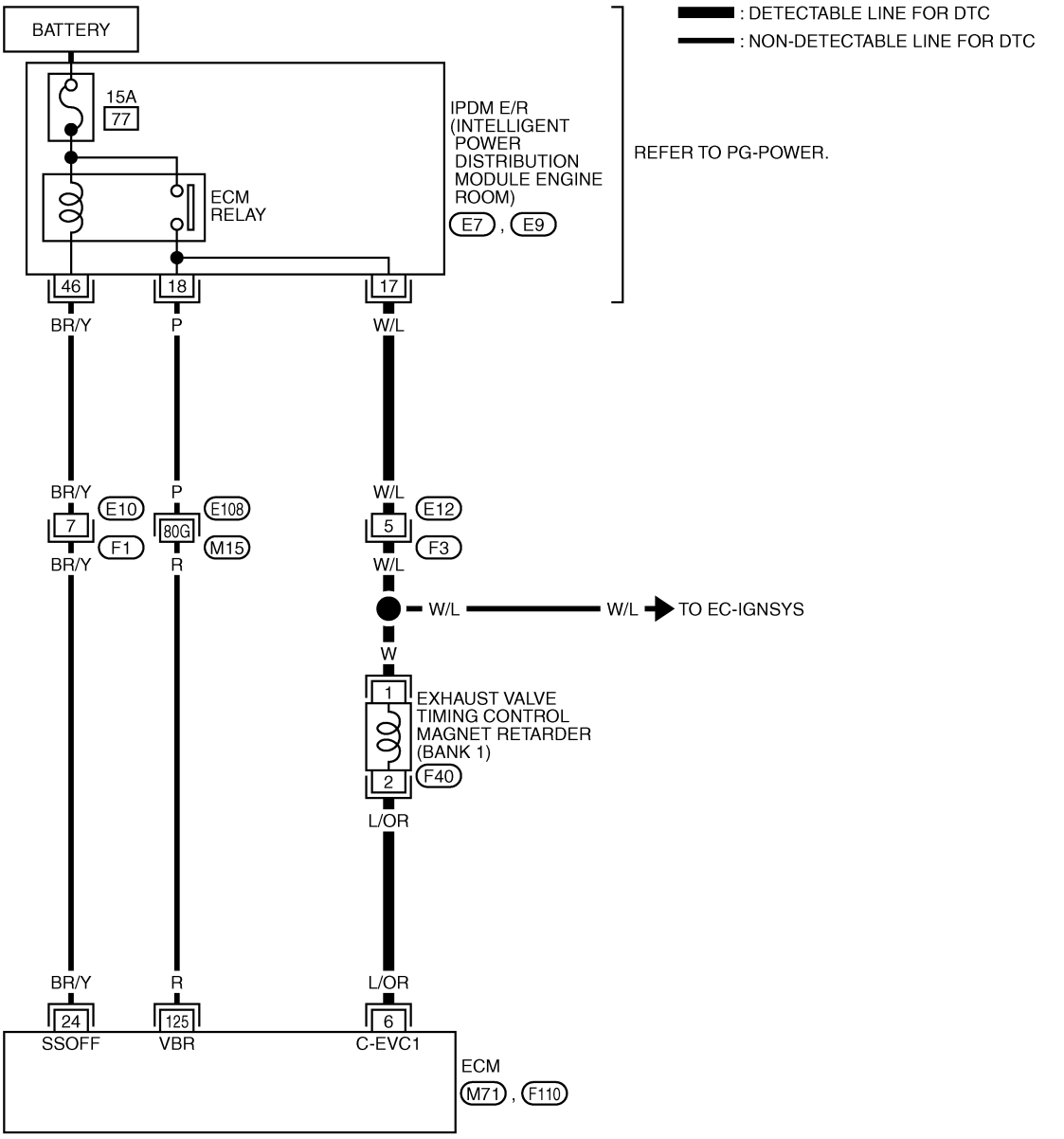
WITH GST

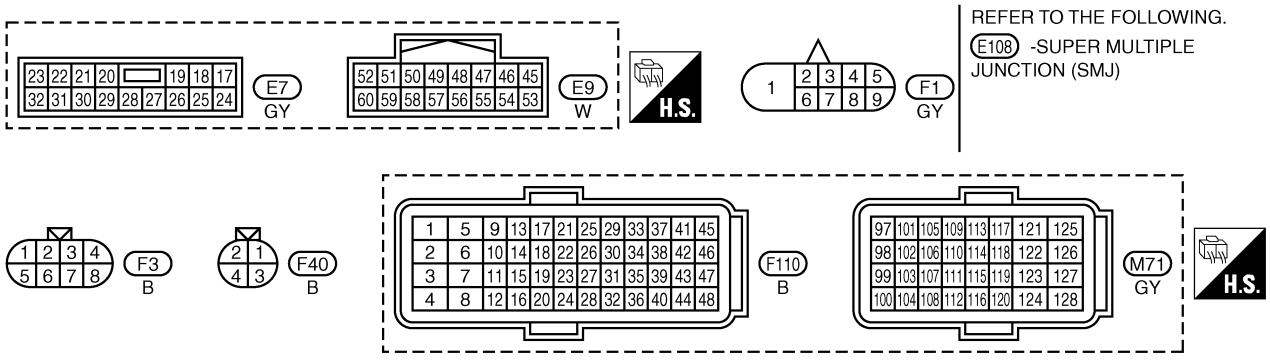
Following the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS0004V

EC-EVCB1-01



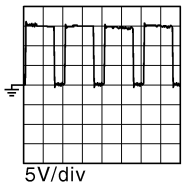


TBWT1623E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

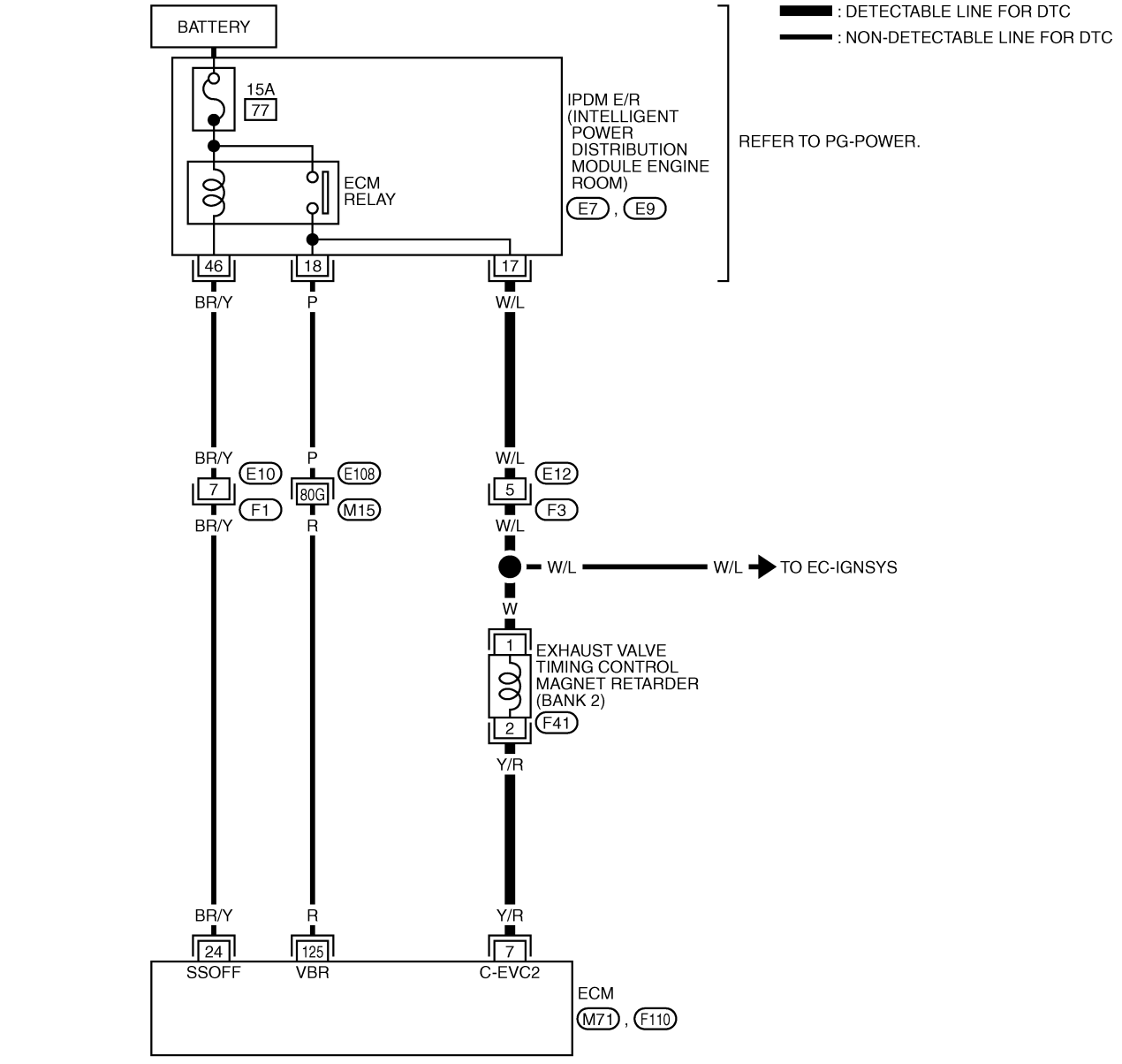
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

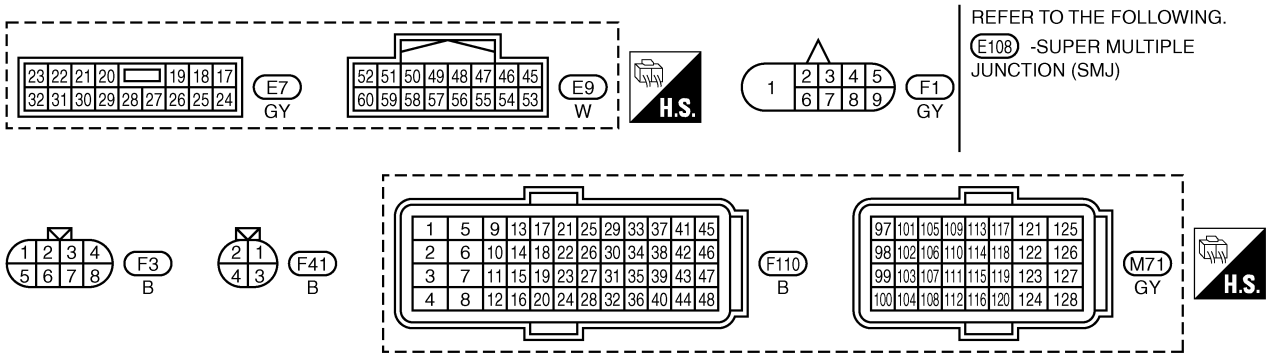
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
6	L/OR	Exhaust valve timing control magnet retarder (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Around 2,500 rpm while the engine speed is rising	7 - 12V★  PBIB3542E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

EC-EVCB2-01



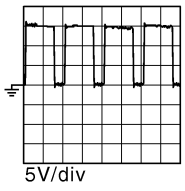


TBWT1624E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
7	Y/R	Exhaust valve timing control magnet retarder (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Around 2,500 rpm while the engine speed is rising	7 - 12V★  PBIB3542E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

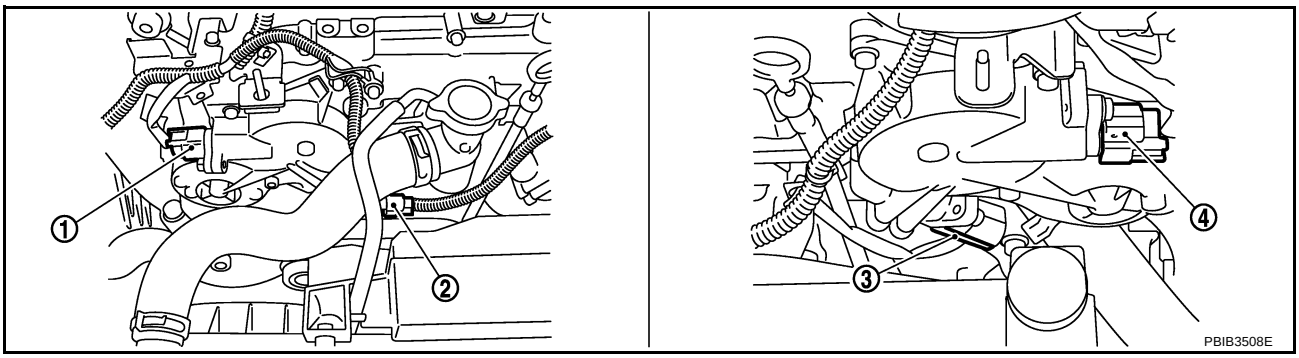
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS0004W

1. CHECK EXHAUST VALVE TIMING CONTROL MAGNET RETARDER POWER SUPPLY CIRCUIT

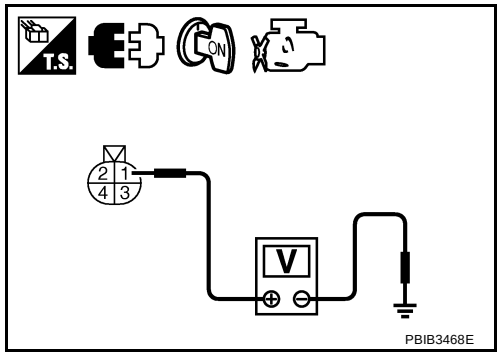
1. Turn ignition switch OFF.
2. Disconnect exhaust valve timing control magnet retarder harness connector.



1. Exhaust valve timing control magnet retarder (bank 1) harness connector
2. Intake valve timing control solenoid valve (bank 1) harness connector
3. Intake valve timing control solenoid valve (bank 2) harness connector
4. Exhaust valve timing control magnet retarder (bank 2) harness connector

3. Turn ignition switch ON.
4. Check voltage between exhaust valve timing control magnet retarder terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between exhaust valve timing control magnet retarder and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EXHAUST VALVE TIMING CONTROLMAGNET RETARDER OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Checking harness continuity between exhaust valve timing control magnet retarder terminal 2 and ECM terminal 6 (bank 1), 7 (bank 2).
   Refer to Wiring Diagram

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

Refer to EC-196, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. REPLACE EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Replace malfunctioning exhaust valve timing control magnet retarder.
2. Perform EC-76, "Exhaust Valve Timing Control Learning" .

>> **INSPECTION END**

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

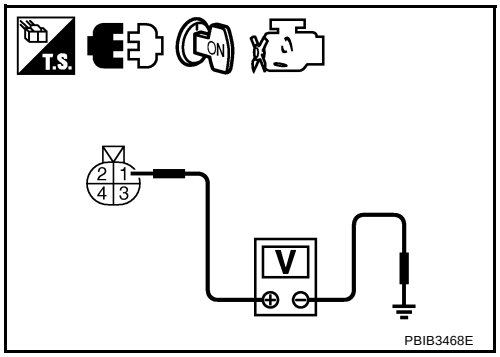
NBS0004X

EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Disconnect exhaust valve timing control magnet retarder harness connector.
2. Check resistance between exhaust valve timing control magnet retarder terminals 1and 2.

Resistance: 9.0 - 11.0Ω [at 20°C (68°F)]

3. If NG, replace exhaust valve timing control magnet retarder and go to the next step.
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .



Removal and Installation

NBS0004Y

EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

Refer to EM-44, "FRONT TIMING CHAIN CASE" .

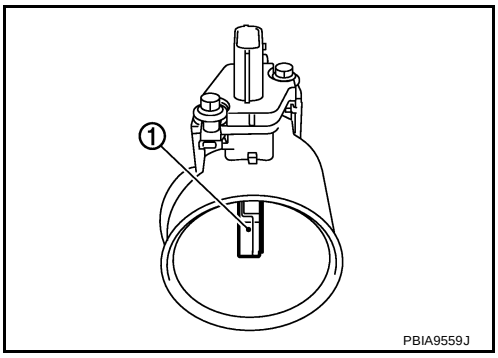
DTC P0101, P010B MAF SENSOR

PFP:22680

Component Description

NBS0004Z

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire is to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The more air, the greater the heat loss.
Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-III Reference Value in Data Monitor Mode

NBS00050

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAS A/F SE-B1	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
MAS A/F SE-B2			
CAL/LD VALUE	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s

On Board Diagnosis Logic

NBS00051

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0101 0101 (Bank 1)	Mass air flow sensor circuit range/performance problem	A)	A high voltage from the sensor is sent to ECM under light load driving condition.	● Harness or connectors (The sensor circuit is open or shorted.) ● Mass air flow sensor ● EVAP control system pressure sensor ● Intake air temperature sensor
P010B 010B (Bank 2)		B)	A low voltage from the sensor is sent to ECM under heavy load driving condition.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air leaks ● Mass air flow sensor ● EVAP control system pressure sensor ● Intake air temperature sensor

DTC Confirmation Procedure

NBS00052

Perform PROCEDURE FOR MALFUNCTION A first.
If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

NOTE:
If engine will not start or stops soon, wait at least 10 seconds with engine stopped (Ignition switch ON) instead of running engine at idle speed.

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Run engine for at least 10 seconds at idle speed.
3. Check 1st trip DTC.
4. If 1st trip DTC is detected, go to EC-203, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION B

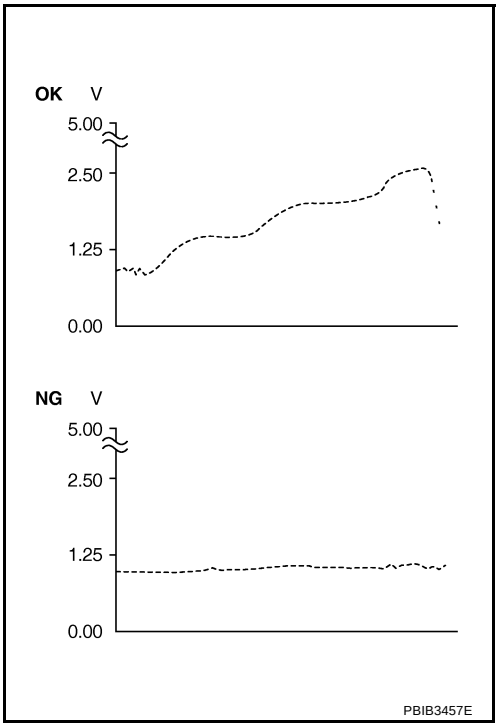
CAUTION:
Always drive vehicle at a safe speed.

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
   If engine cannot be started, go to EC-203, "Diagnostic Procedure" .
2. Select “DATA MONITOR” mode with CONSULT-III.
3. Check the voltage of “MAS A/F SE-B1” and “MAS A/F SE-B2” with “DATA MONITOR”.
4. Increases engine speed to about 4,000 rpm.
5. Monitor the linear voltage rise in response to engine speed increases.
   If NG, go to EC-203, "Diagnostic Procedure" .
   If OK, go to following step.
6. Maintain the following conditions for at least 10 consecutive seconds.

ENG SPEED	More than 2,000 rpm
THRTL SEN 1	More than 3V
THRTL SEN 2	More than 3V
Shift lever	Suitable position
Driving location	Driving vehicle uphill (Increased engine load) will help maintain the driving conditions required for this test.

7. Check 1st trip DTC.
8. If 1st trip DTC is detected, go to EC-203, "Diagnostic Procedure" .



Overall Function Check

NBS00053

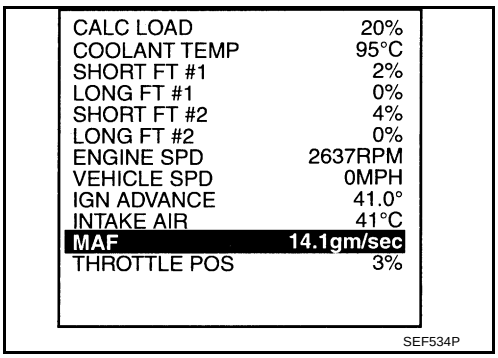
PROCEDURE FOR MALFUNCTION B

Use this procedure to check the overall function of the mass air flow sensor circuit. During this check, a 1st trip DTC might not be confirmed.

With GST

1. Start engine and warm it up to normal operating temperature.
2. Select Service $01 with GST.

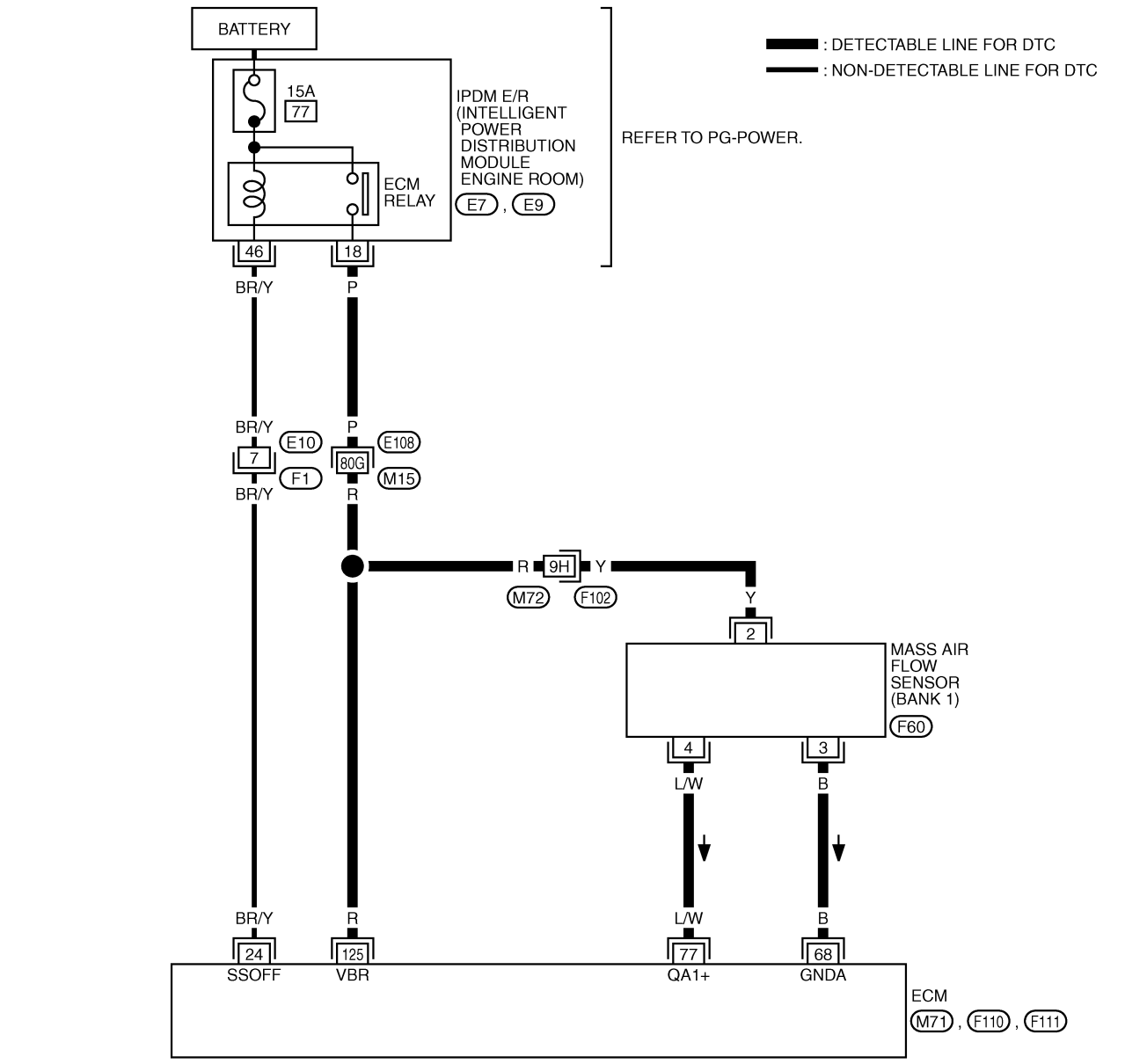
3. Check the mass air flow sensor signal with Service $01.
4. Check for linear mass air flow sensor signal value rise in response to increases to about 4,000 rpm in engine speed.
5. If NG, go to EC-203, "Diagnostic Procedure" .



Wiring Diagram
BANK 1

NBS00054

EC-MAFSB1-01



TBWT1625E

Specification data are reference values and are measured between each terminal and ground.

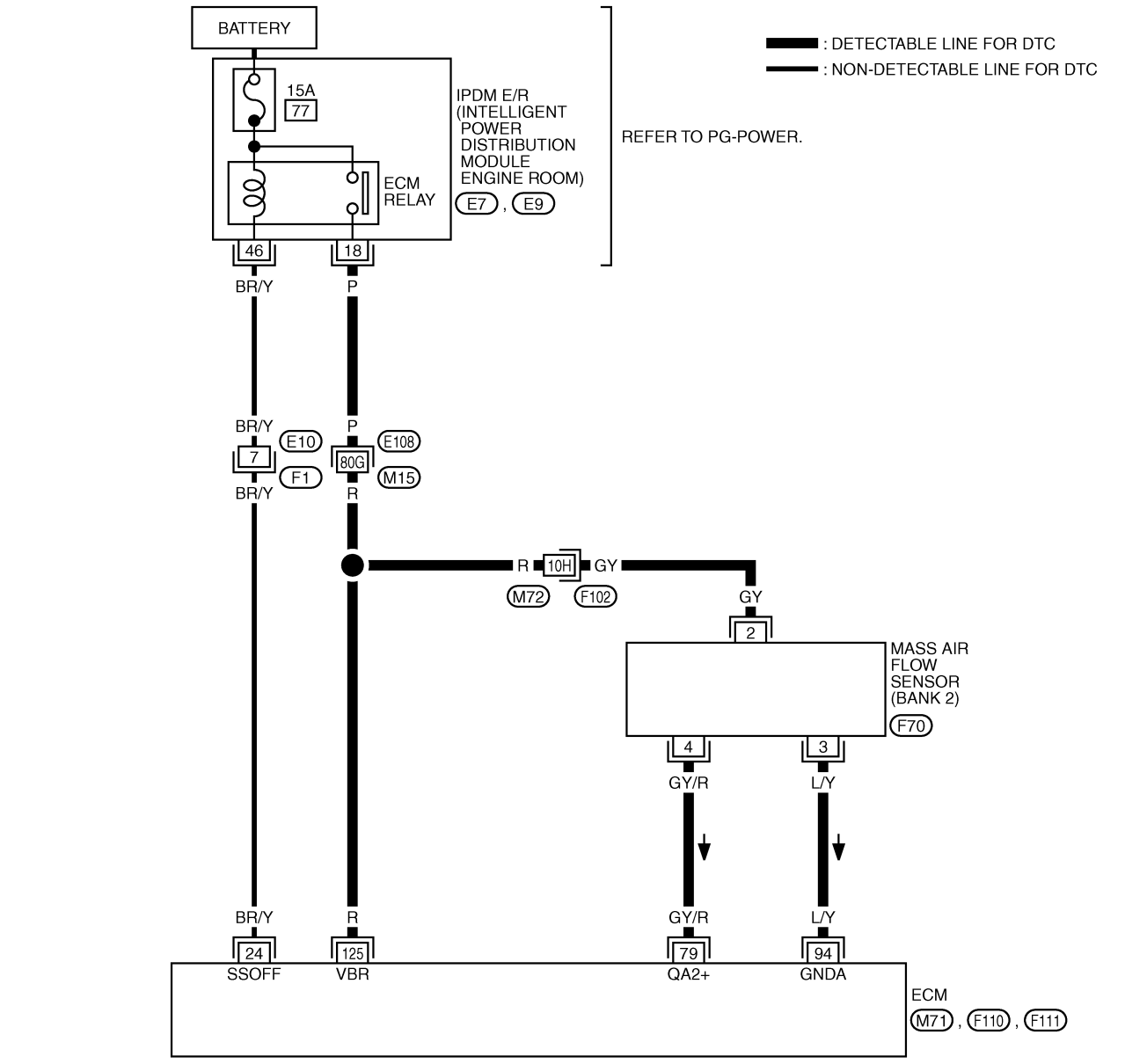
CAUTION:

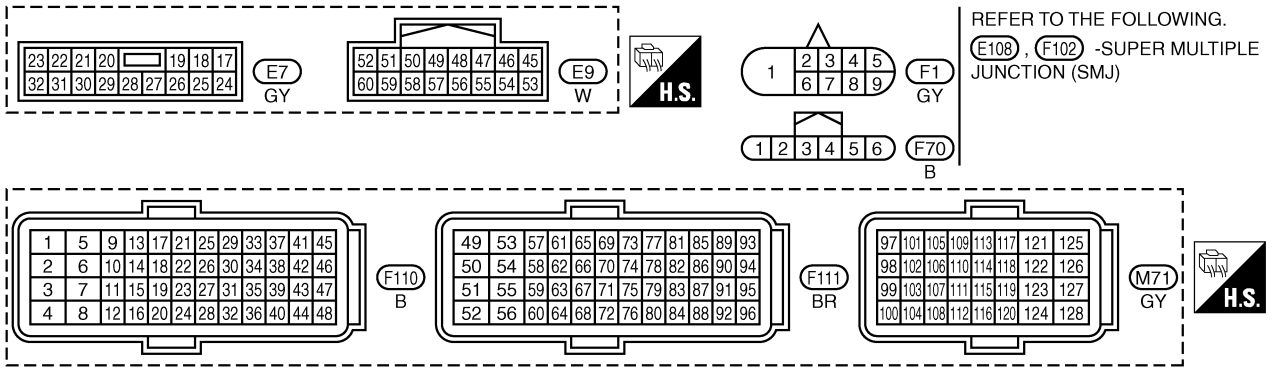
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
68	B	Sensor ground [Mass air flow sensor (bank1), Intake air temperature sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
77	L/W	Mass air flow sensor (bank1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

BANK 2

EC-MAFSB2-01





TBWT1626E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
79	GY/R	Mass air flow sensor (bank2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
94	L/Y	Sensor ground [Mass air flow sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS00055

1. INSPECTION START

Which malfunction (A or B) is duplicated?

A or B

A >> GO TO 3.
B >> GO TO 2.

2. CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct and intake manifold

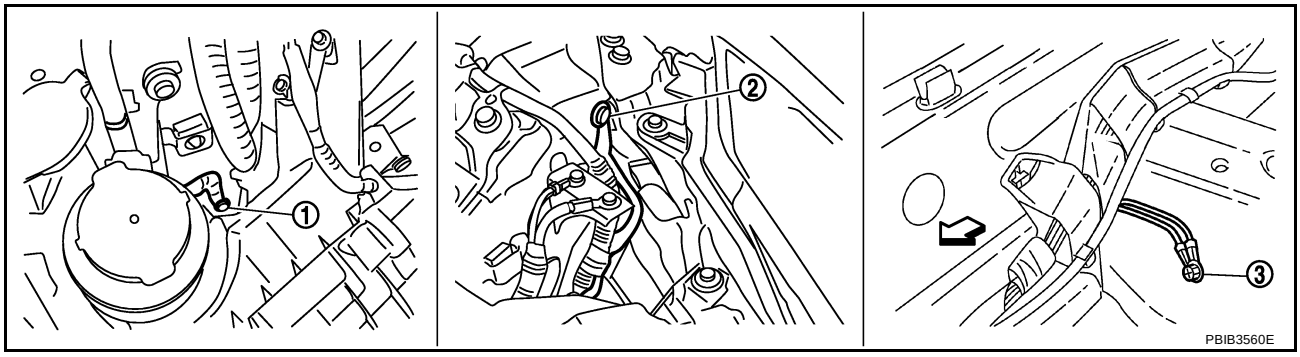
OK or NG

OK >> GO TO 3.
NG >> Reconnect the parts.

3. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

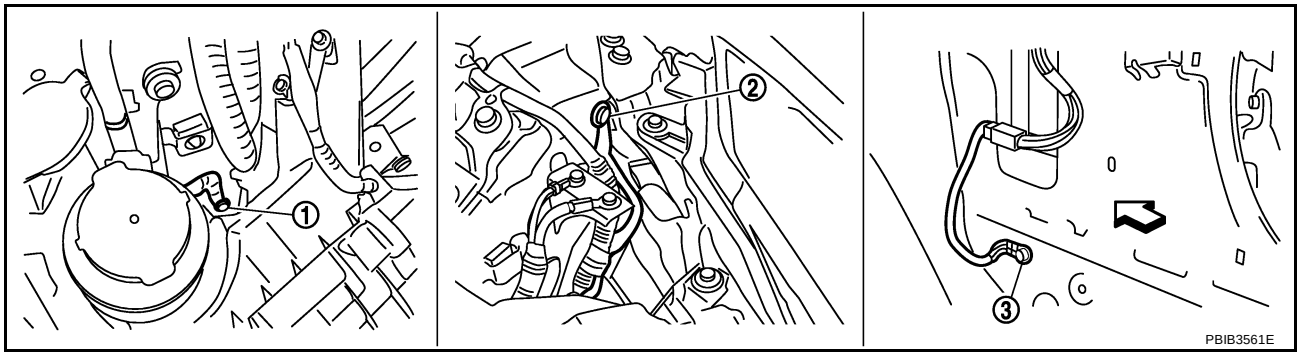


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

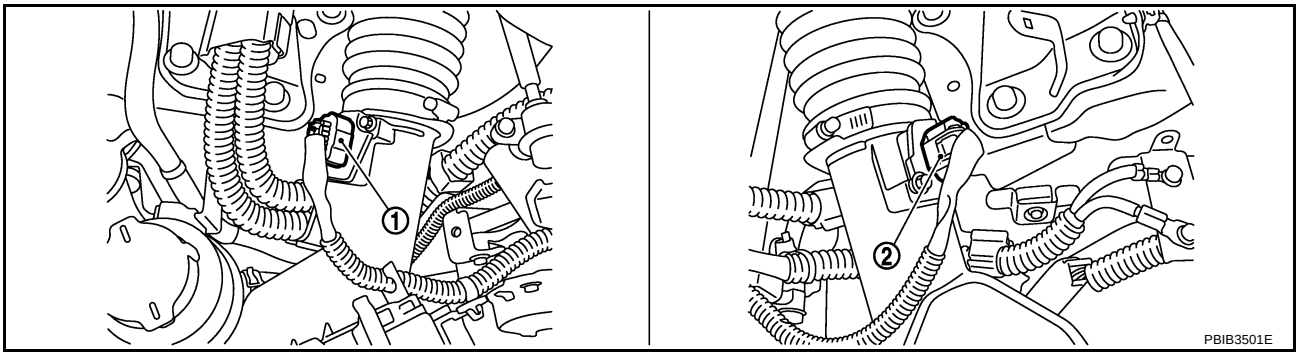
⇦: Vehicle front

OK or NG

OK >> GO TO 4.
NG >> Repair or replace ground connections.

4. CHECK MASS AIR FLOW SENSOR POWER SUPPLY CIRCUIT

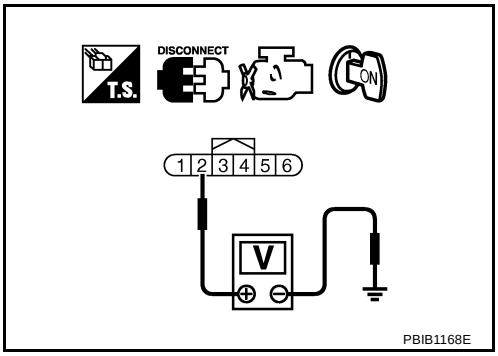
1. Disconnect mass air flow sensor harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

2. Turn ignition switch ON.
3. Check voltage between mass air flow sensor terminal 2 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK MASS AIR FLOW SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between mass air flow sensor terminal 3 and ECM terminal 68 (bank 1), 94 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK MASS AIR FLOW SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between mass air flow sensor terminal 4 and ECM terminal 77 (bank 1), 79 (bank 2).
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTAKE AIR TEMPERATURE SENSOR

Check mass air flow sensor (with intake air temperature sensor) (bank 1).
Refer to EC-245, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace mass air flow sensor (with intake air temperature sensor) (bank 1).

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP control system pressure sensor.

10. CHECK MASS AIR FLOW SENSOR

Refer to EC-206, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace malfunctioning mass air flow sensor.

11. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

NBS006UZ

MASS AIR FLOW SENSOR

With CONSULT-III

1. Reconnect all harness connectors disconnected.
2. Start engine and warm it up to normal operating temperature.
3. Connect CONSULT-III and select “DATA MONITOR” mode.
4. Select “MAS A/F SE-B1” and “MAS A/F SE-B2”, and check indication under the following conditions.

Monitor item	Condition	Indication
MAS A/F SE-B1 MAS A/F SE-B2	Ignition switch ON (Engine stopped.)	Approx. 0.4V
	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1V
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7V
	Idle to about 4,000 rpm	0.8 - 1.1V to Approx. 2.4V*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

5. If the voltage is out of specification, proceed the following.

a. Check for the cause of uneven air flow through mass air flow sensor. Refer to following.

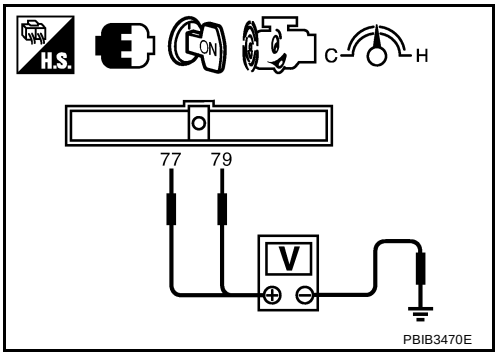
- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

b. If NG, repair or replace malfunctioning part and perform step 2 to 4 again.
If OK, go to next step.

6. Turn ignition switch OFF.
7. Disconnect mass air flow sensor harness connector and reconnect it again.
8. Perform step 2 to 4 again.
9. If NG, clean or replace mass air flow sensor.

Without CONSULT-III

1. Reconnect all harness connectors disconnected.
2. Start engine and warm it up to normal operating temperature.
3. Check voltage between ECM terminal 77 [Mass air flow sensor (bank 1) signal], 79 [Mass air flow sensor (bank 2) signal] and ground.



Condition	Voltage V
Ignition switch ON (Engine stopped.)	Approx. 0.4
Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
Idle to about 4,000 rpm	0.8 - 1.1 to Approx. 2.4*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

4. If the voltage is out of specification, proceed the following.

a. Check for the cause of uneven air flow through mass air flow sensor. Refer to following.

- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

b. If NG, repair or replace malfunctioning part and perform step 2 and 3 again.
If OK, go to next step.

5. Turn ignition switch OFF.
6. Disconnect mass air flow sensor harness connector and reconnect it again.
7. Perform step 2 and 3 again.
8. If NG, clean or replace mass air flow sensor.

Removal and Installation

NBS006V0

MASS AIR FLOW SENSOR

Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

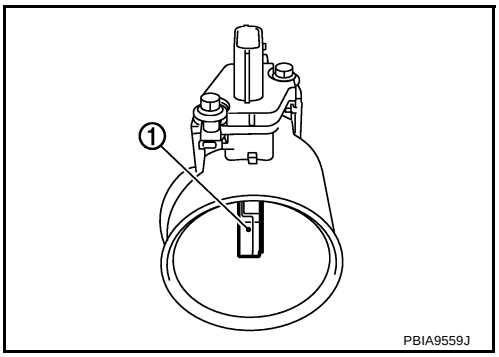
DTC P0102, P0103, P010C, P010D MAF SENSOR

PFP:22680

Component Description

NBS00058

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire is to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The more air, the greater the heat loss.
Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-III Reference Value in Data Monitor Mode

NBS00059

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAS A/F SE-B1	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
MAS A/F SE-B2			
CAL/LD VALUE	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s

On Board Diagnosis Logic

NBS0005A

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0102 0102 (Bank 1) P010C 010C (Bank 2)	Mass air flow sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air leaks ● Mass air flow sensor
P0103 0103 (Bank 1) P010D 010D (Bank 2)	Mass air flow sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Mass air flow sensor

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.

DTC Confirmation Procedure

NBS0005B

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P0102, P010C

With CONSULT-III

1. Start engine and wait at least 5 seconds.
2. Check DTC.
3. If DTC is detected, go to EC-213, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR DTC P0103, P010D

With CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.
3. If DTC is detected, go to EC-213, "Diagnostic Procedure" .
   If DTC is not detected, go to next step.
4. Start engine and wait at least 5 seconds.
5. Check DTC.
6. If DTC is detected, go to EC-213, "Diagnostic Procedure" .

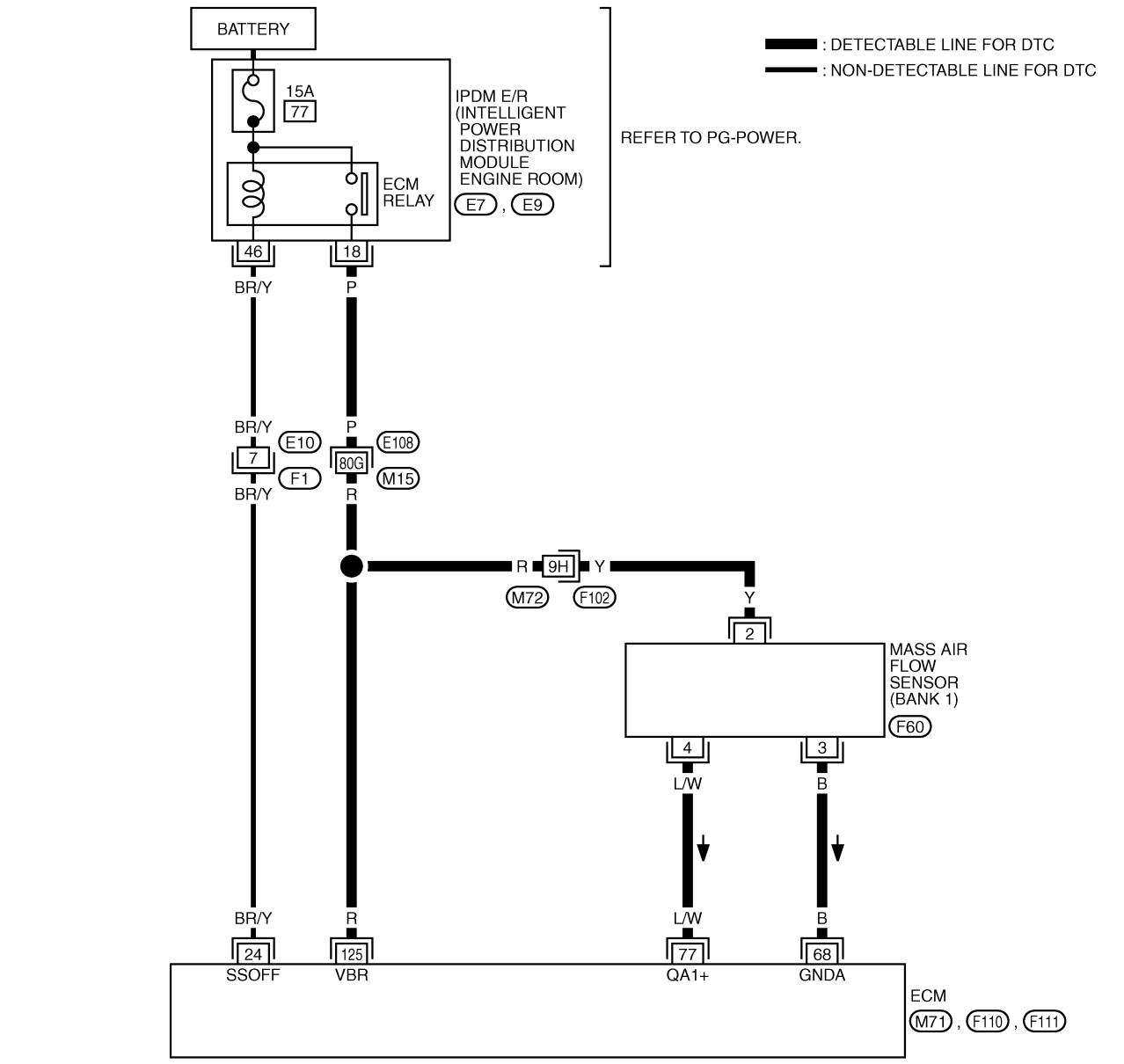
With GST

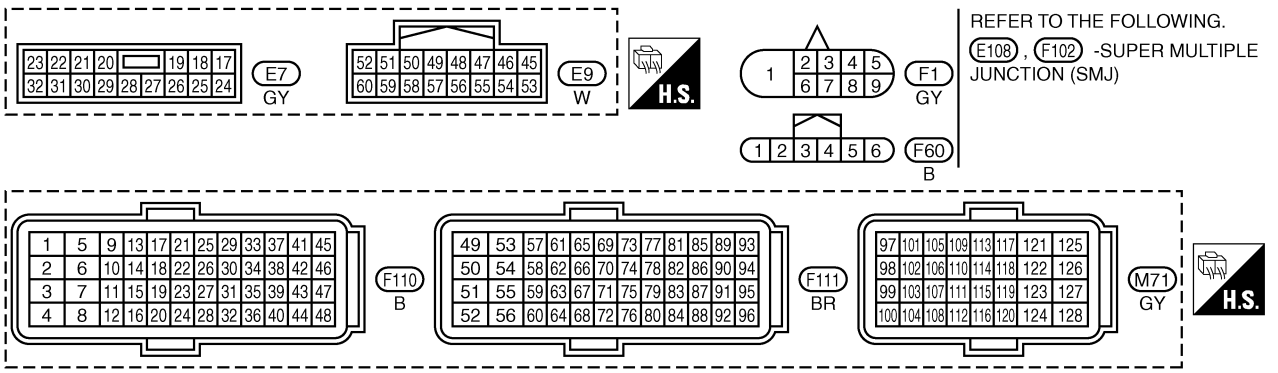
Follow the procedure “With CONSULT-III” above.

Wiring Diagram
BANK 1

NBS006U1

EC-MAFSB1-01





TBWT1625E

Specification data are reference values and are measured between each terminal and ground.

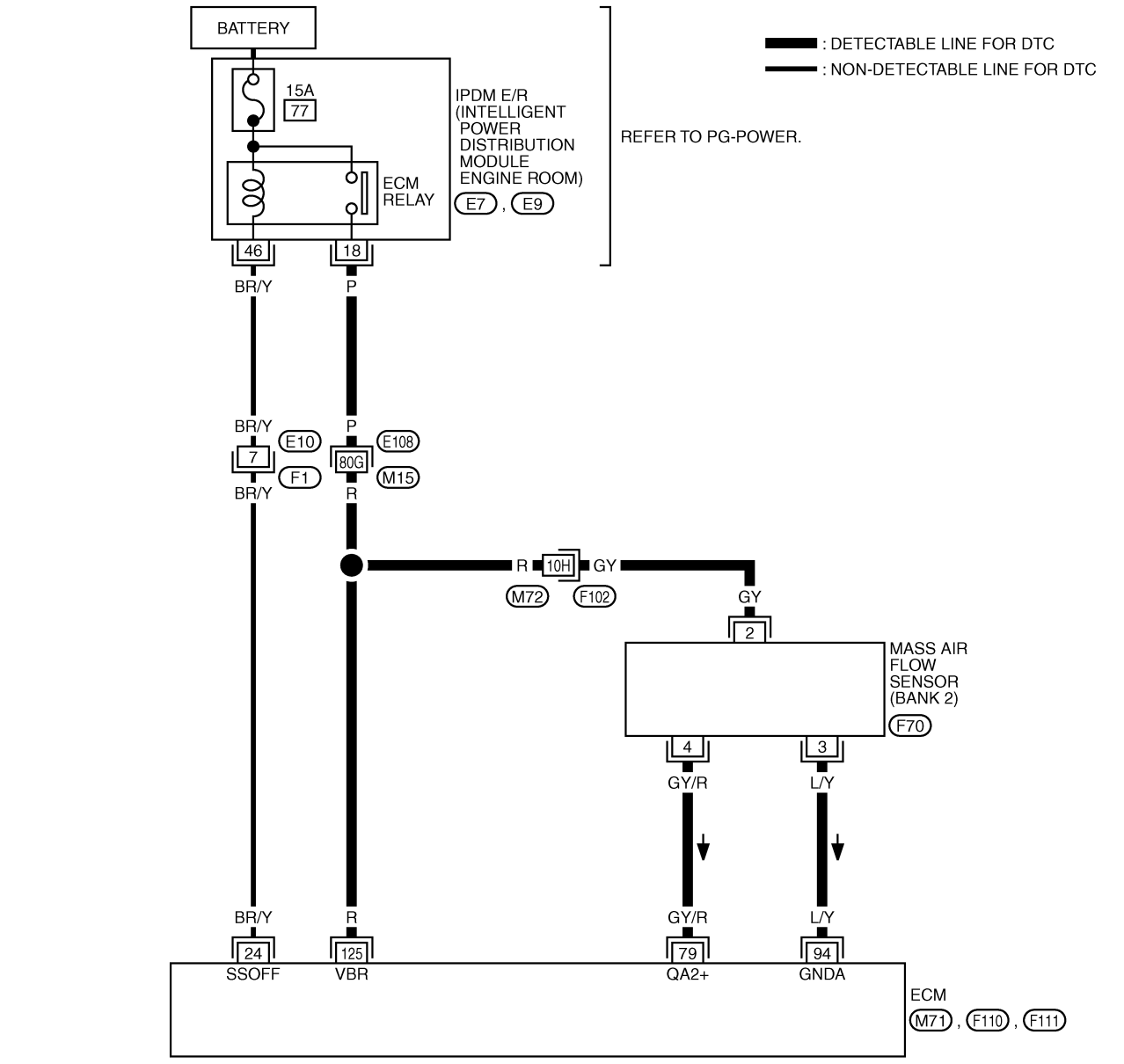
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
68	B	Sensor ground [Mass air flow sensor (bank1), Intake air temperature sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
77	L/W	Mass air flow sensor (bank1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

BANK 2

EC-MAFSB2-01



TBWT1626E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
79	GY/R	Mass air flow sensor (bank2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
94	L/Y	Sensor ground [Mass air flow sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS006U2

1. INSPECTION START

Confirm the detected DTC.

Which DTC is detected?

P0102, P010C>>GO TO 2.
P0103, P010D>>GO TO 3.

2. CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct and intake manifold

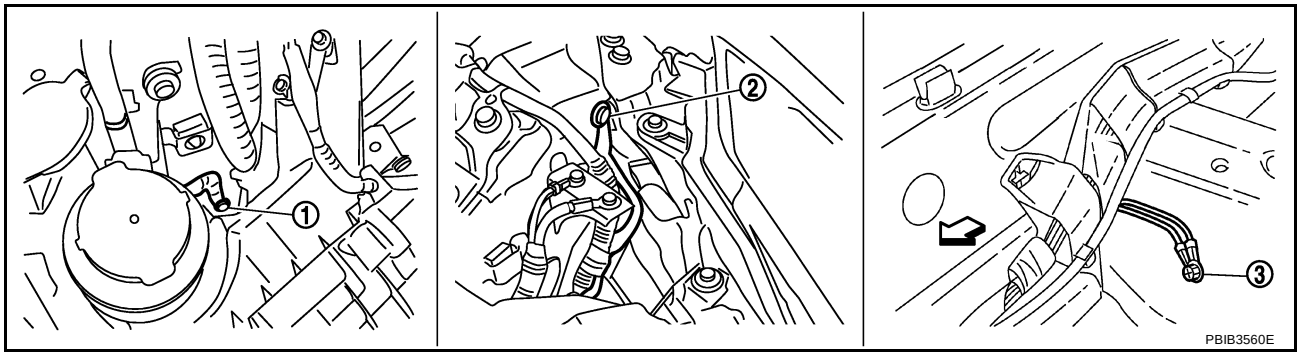
OK or NG

OK >> GO TO 3.
NG >> Reconnect the parts.

3. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

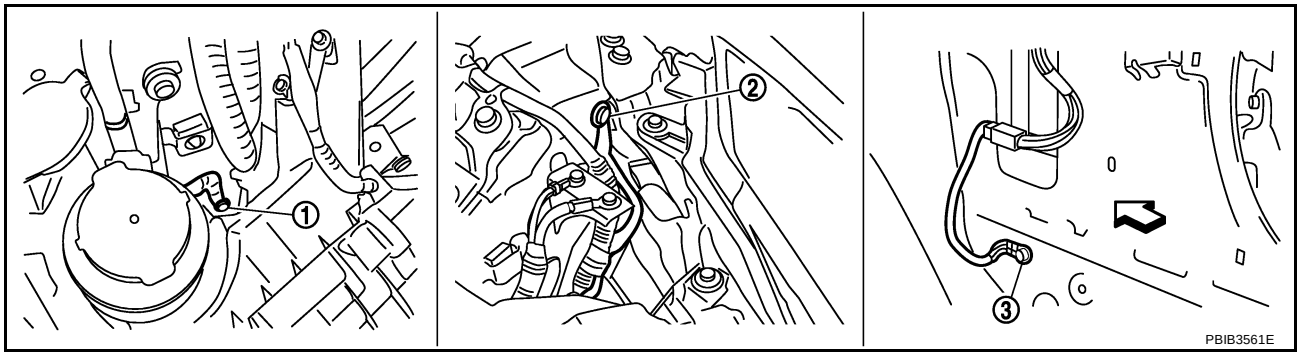


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

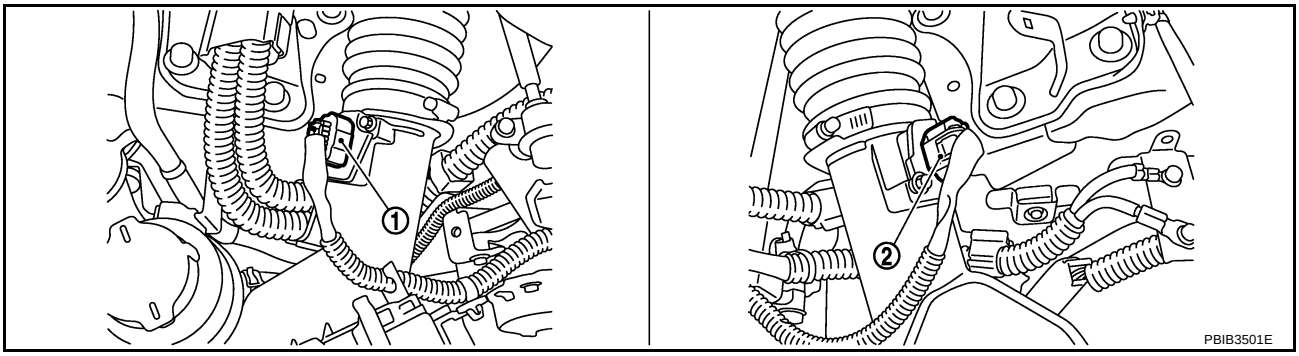
⇦: Vehicle front

OK or NG

OK >> GO TO 4.
NG >> Repair or replace ground connections.

4. CHECK MASS AIR FLOW SENSOR POWER SUPPLY CIRCUIT

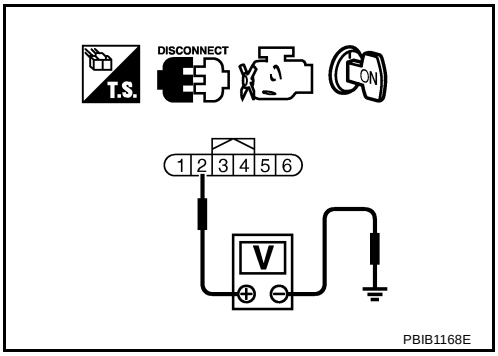
1. Disconnect mass air flow sensor harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

2. Turn ignition switch ON.
3. Check voltage between mass air flow sensor terminal 2 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK MASS AIR FLOW SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between mass air flow sensor terminal 3 and ECM terminal 68 (bank 1), 94 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK MASS AIR FLOW SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between mass air flow sensor terminal 4 and ECM terminal 77 (bank 1), 79 (bank 2).
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK MASS AIR FLOW SENSOR

Refer to EC-216, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace malfunctioning mass air flow sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

NBS006V1

MASS AIR FLOW SENSOR

With CONSULT-III

1. Reconnect all harness connectors disconnected.
2. Start engine and warm it up to normal operating temperature.
3. Connect CONSULT-III and select “DATA MONITOR” mode.
4. Select “MAS A/F SE-B1” and “MAS A/F SE-B2”, and check indication under the following conditions.

Monitor item	Condition	Indication
MAS A/F SE-B1 MAS A/F SE-B2	Ignition switch ON (Engine stopped.)	Approx. 0.4V
	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1V
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7V
	Idle to about 4,000 rpm	0.8 - 1.1V to Approx. 2.4V*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

5. If the voltage is out of specification, proceed the following.

a. Check for the cause of uneven air flow through mass air flow sensor. Refer to following.
   - Crushed air ducts
   - Malfunctioning seal of air cleaner element
   - Uneven dirt of air cleaner element
   - Improper specification of intake air system parts

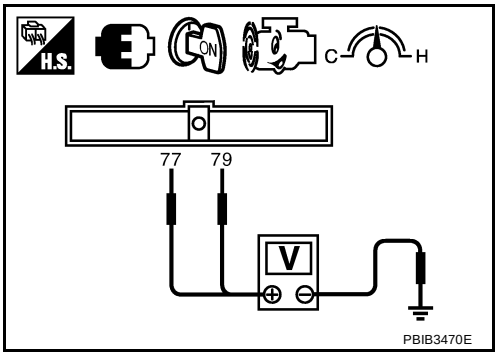
b. If NG, repair or replace malfunctioning part and perform step 2 to 4 again.
   If OK, go to next step.

6. Turn ignition switch OFF.
7. Disconnect mass air flow sensor harness connector and reconnect it again.
8. Perform step 2 to 4 again.
9. If NG, clean or replace mass air flow sensor.

Without CONSULT-III

1. Reconnect all harness connectors disconnected.

2. Start engine and warm it up to normal operating temperature.
3. Check voltage between ECM terminal 77 [Mass air flow sensor (bank 1) signal], 79 [Mass air flow sensor (bank 2) signal] and ground.



Condition	Voltage V
Ignition switch ON (Engine stopped.)	Approx. 0.4
Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
Idle to about 4,000 rpm	0.8 - 1.1 to Approx. 2.4*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

4. If the voltage is out of specification, proceed the following.

a. Check for the cause of uneven air flow through mass air flow sensor. Refer to following.
   - Crushed air ducts
   - Malfunctioning seal of air cleaner element
   - Uneven dirt of air cleaner element
   - Improper specification of intake air system parts

b. If NG, repair or replace malfunctioning part and perform step 2 and 3 again.
   If OK, go to next step.

5. Turn ignition switch OFF.
6. Disconnect mass air flow sensor harness connector and reconnect it again.
7. Perform step 2 and 3 again.
8. If NG, clean or replace mass air flow sensor.

Removal and Installation

NBS006V2

MASS AIR FLOW SENSOR

Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

DTC P0112, P0113 IAT SENSOR

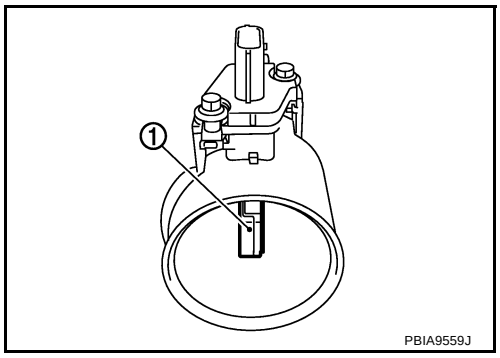
PFP:22630

Component Description

NBS0005G

The intake air temperature sensor is built-into mass air flow sensor (1). The sensor detects intake air temperature and transmits a signal to the ECM.
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.

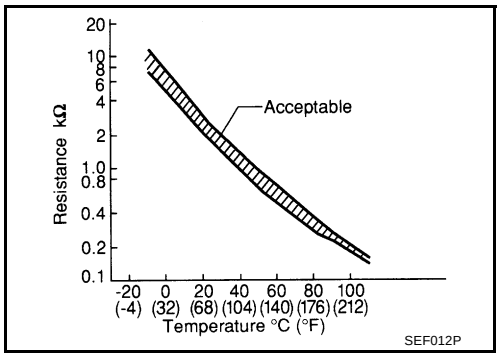
NOTE:
ECM uses only the intake air temperature sensor (bank 1) for engine control and self-diagnosis.
It does not use the intake air temperature sensor (bank 2)



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

*: This data is reference values and is measured between ECM terminal 67 (Intake air temperature sensor) (bank 1) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS0005H

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0112 0112 (Bank 1)	Intake air temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air temperature sensor
P0113 0113 (Bank 1)	Intake air temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC Confirmation Procedure

NBS0005I

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-220, "Diagnostic Procedure" .

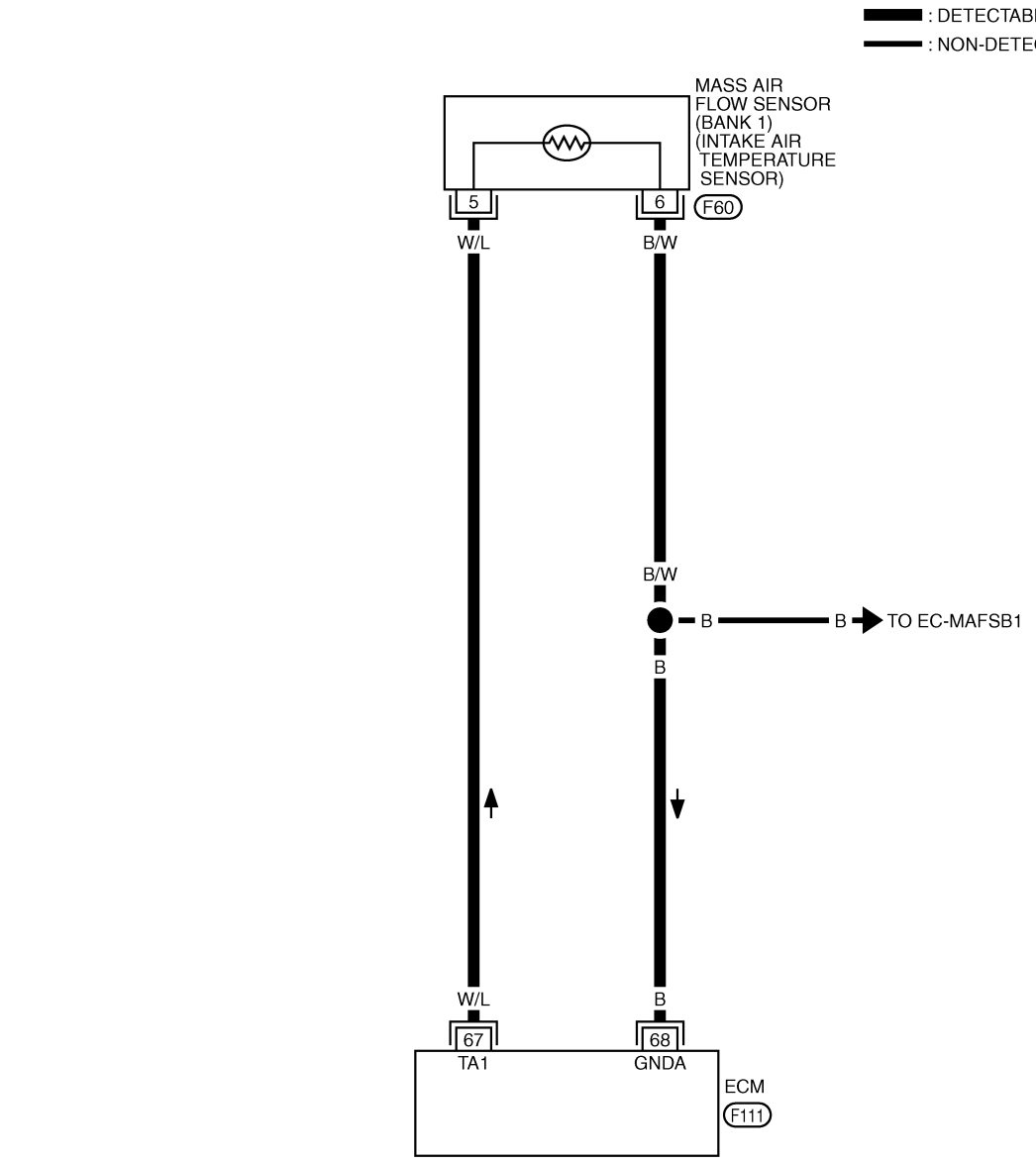
WITH GST

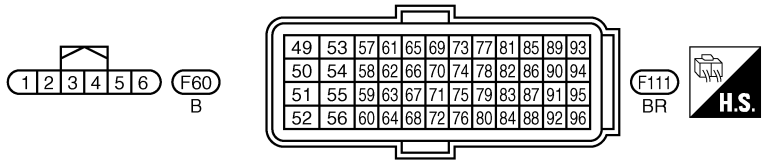
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS0005J

EC-IATSB1-01





TBWT1627E

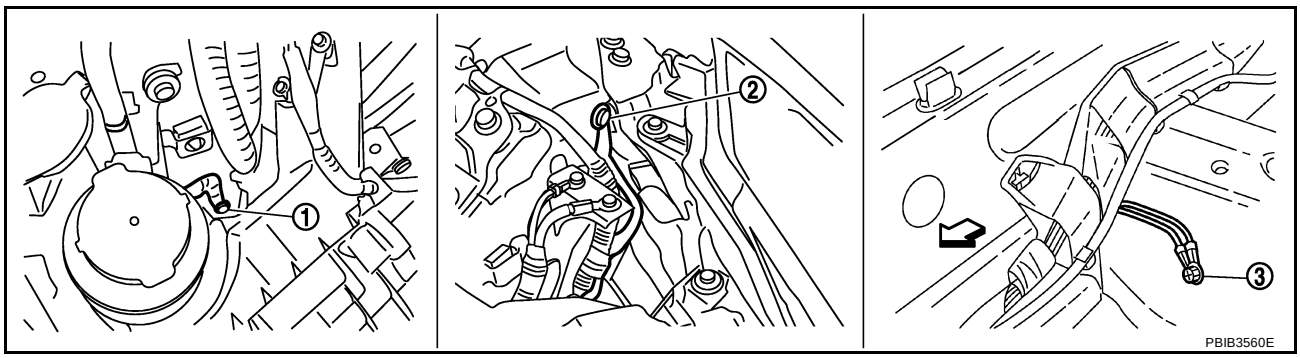
Diagnostic Procedure

NBS0005K

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

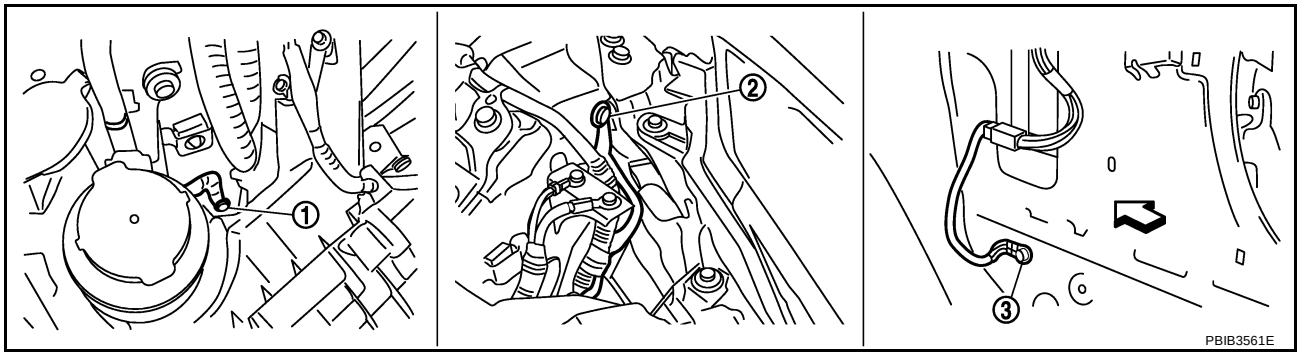


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

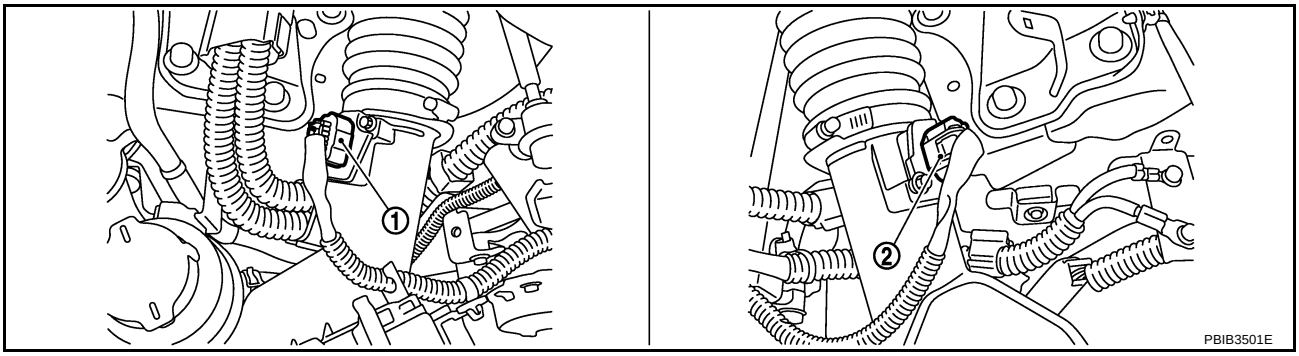
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

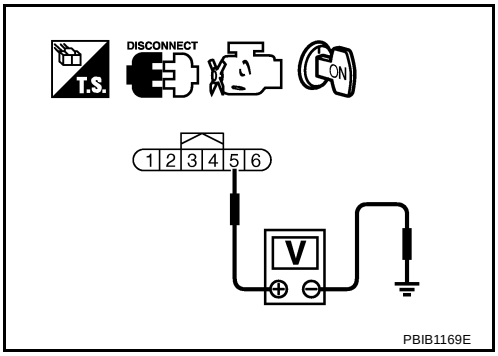
1. Disconnect mass air flow sensor (with intake air temperature sensor) (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

2. Turn ignition switch ON.
3. Check voltage between mass air flow sensor (with intake air temperature sensor) (bank 1) terminal 5 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK INTAKE AIR TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between mass air flow sensor (with intake air temperature sensor) (bank 1) terminal 6 and ECM terminal 68.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-222, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace mass air flow sensor (with intake air temperature sensor) (bank 1).

5. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

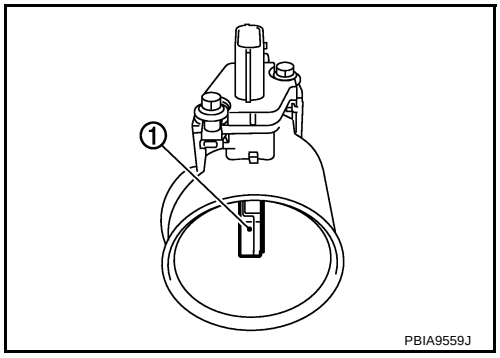
NBS0005L

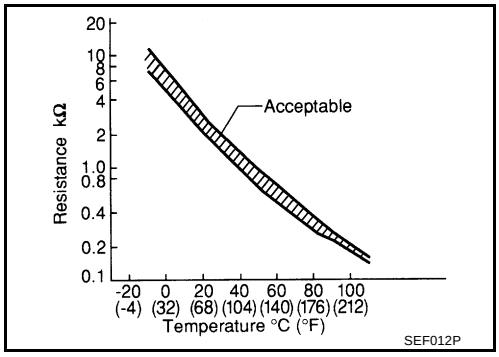
INTAKE AIR TEMPERATURE SENSOR

1. Check resistance between mass air flow sensor (with intake air temperature sensor) (bank 1) (1) terminals 5 and 6 under the following conditions.

Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.800 - 2.200

2. If NG, replace mass air flow sensor (with intake air temperature sensor) (bank 1).





Removal and Installation

NBS0005M

MASS AIR FLOW SENSOR

Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

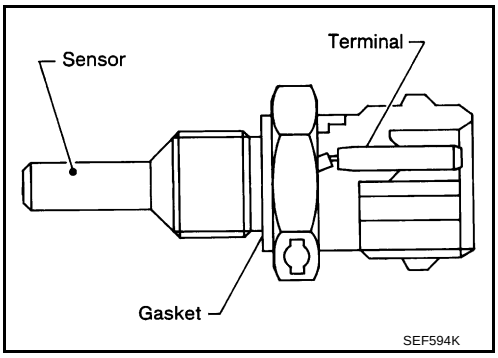
DTC P0117, P0118 ECT SENSOR

PFP:22630

Component Description

NBS0005N

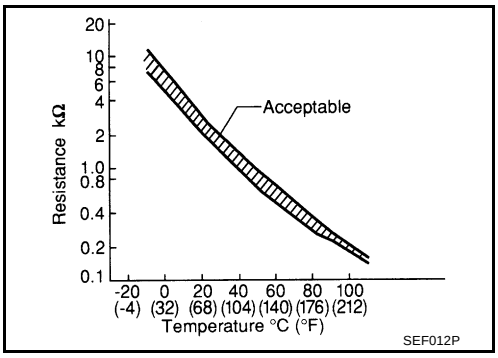
The engine coolant temperature (ECT) sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 71 (Engine coolant temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS0005O

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P0117 0117	Engine coolant temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Engine coolant temperature sensor
P0118 0118	Engine coolant temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode	
Engine coolant temperature sensor circuit	Engine coolant temperature will be determined by ECM based on the time after turning ignition switch ON or START. CONSULT-III displays the engine coolant temperature decided by ECM.	
	Condition	Engine coolant temperature decided (CONSULT-III display)
	Just as ignition switch is turned ON or START	40°C (104°F)
	More than approx. 4 minutes after ignition ON or START	80°C (176°F)
	Except as shown above	40 - 80°C (104 - 176°F) (Depends on the time)
	When the fail-safe system for engine coolant temperature sensor is activated, the cooling fan operates while engine is running.	

DTC Confirmation Procedure

NBS0005P

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.
3. If DTC is detected, go to EC-226, "Diagnostic Procedure" .

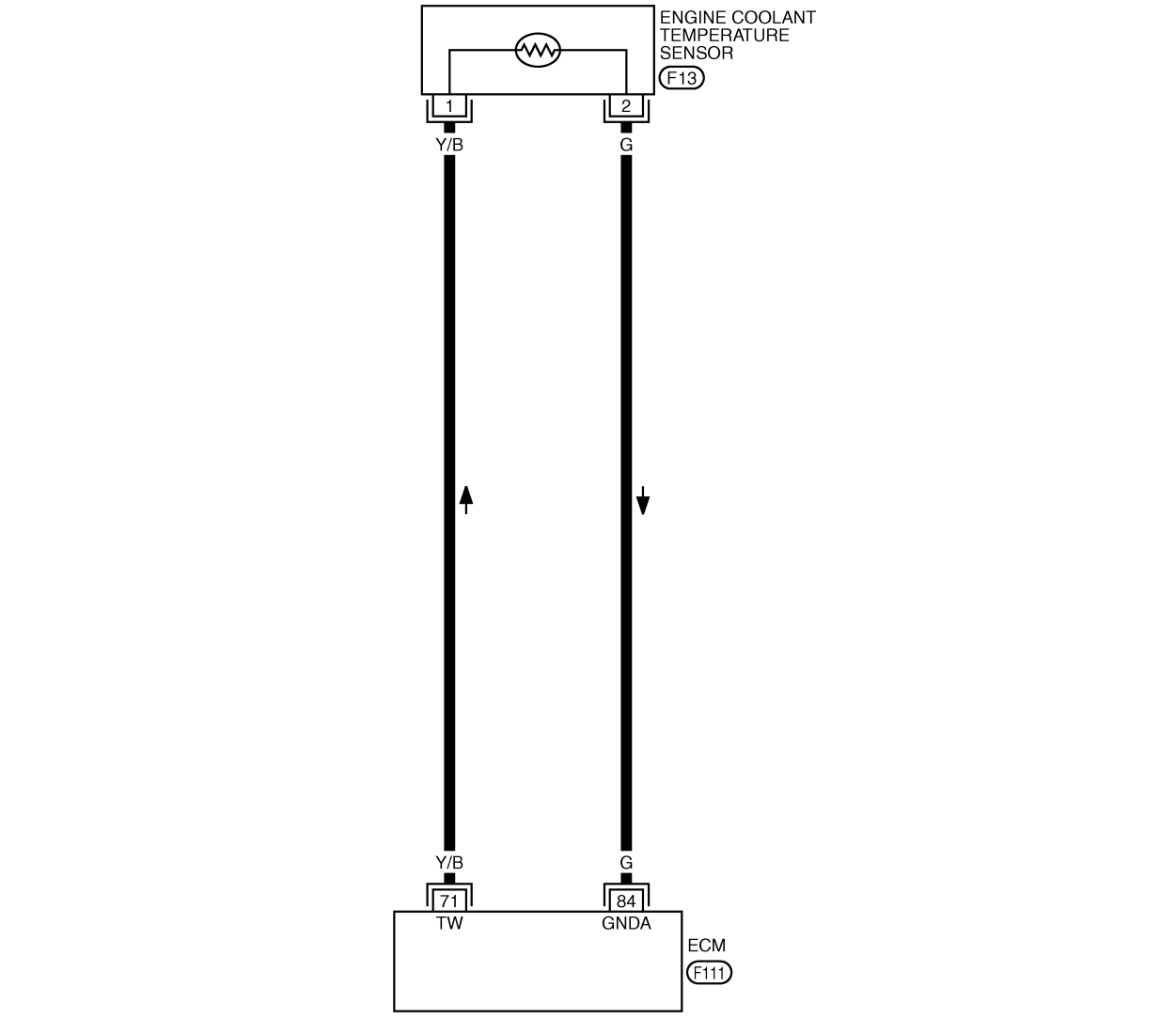
WITH GST

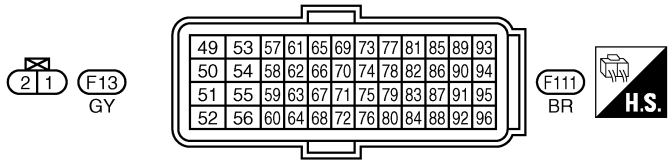
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS0005Q

EC-ECTS-01





TBWT1629E

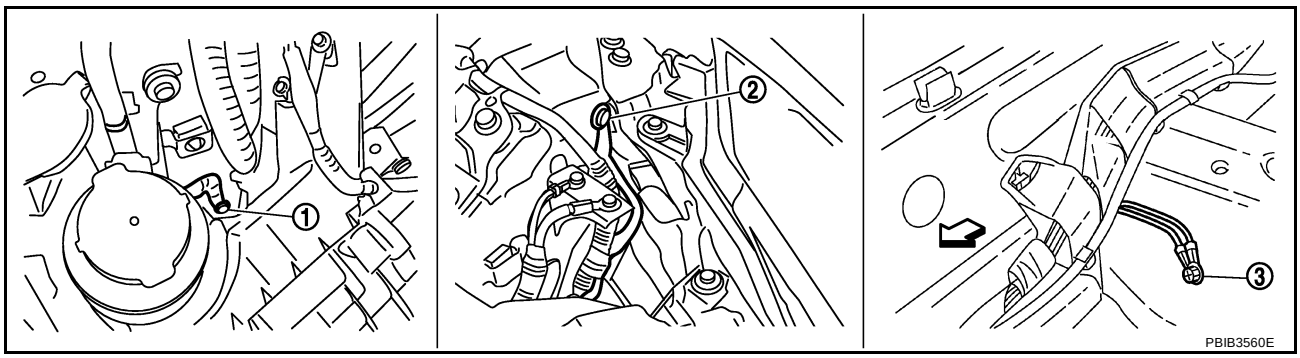
Diagnostic Procedure

NBS0005R

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

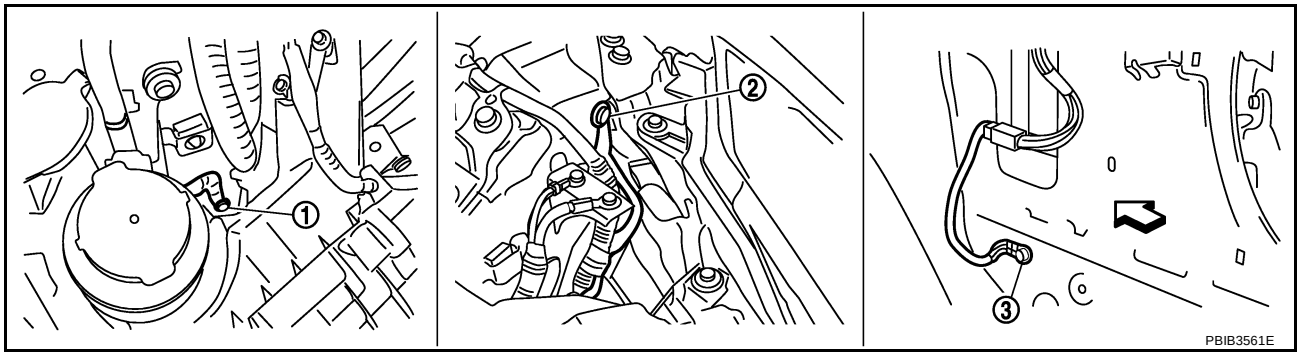


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

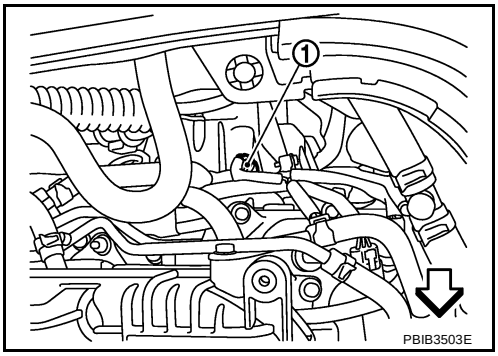
OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect engine coolant temperature sensor harness connector (1).

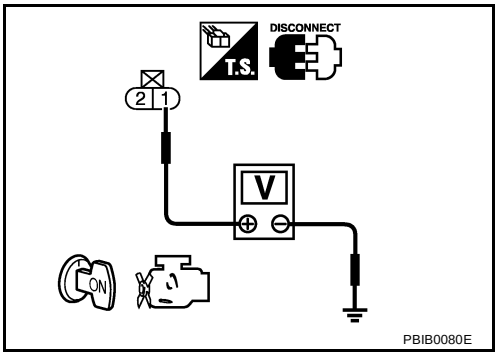
   ⇦ : Vehicle front

2. Turn ignition switch ON.



3. Check voltage between engine coolant temperature sensor terminal 1 and ground with CONSULT-III or tester.

   Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK ENGINE COOLANT TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ENGINE COOLANT TEMPERATURE sensor terminal 2 and ECM terminal 84.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-228, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace engine coolant temperature sensor.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

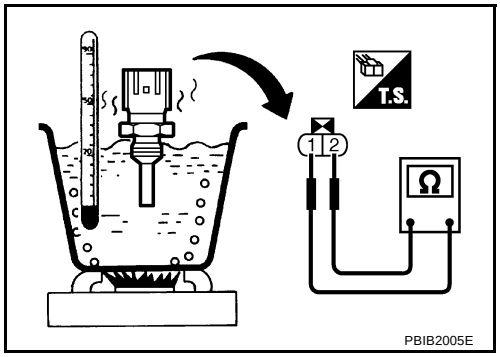
>> **INSPECTION END**

Component Inspection

NBS0005S

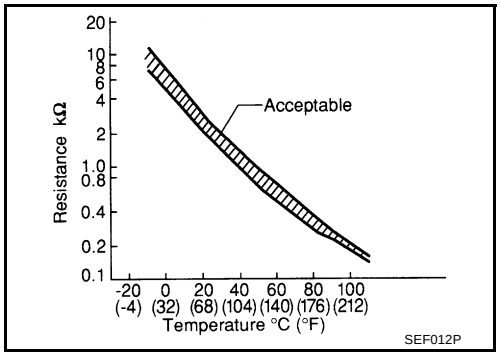
ENGINE COOLANT TEMPERATURE SENSOR

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.37 - 2.63
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

NBS0005T

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-28, "WATER OUTLET AND WATER PIPING" .

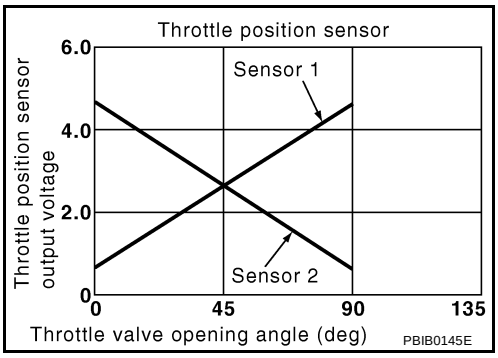
DTC P0122, P0123, P0227, P0228 TP SENSOR

PFP:16119

Component Description

NBS0005U

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-III Reference Value in Data Monitor Mode

NBS0005V

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
TP SEN 1-B1 TP SEN 1-B2 TP SEN 2-B1* TP SEN 2-B2*	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

NBS0005W

These self-diagnoses have the one trip detection logic.

NOTE:
If DTC P0122, P0123, P0227 or P0228 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0122 0122 (Bank 1) P0227 0227 (Bank 2)	Throttle position sensor 2 circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	● Harness or connectors (TP sensor 2 circuit is open or shorted.) ● Electric throttle control actuator (TP sensor 2)
P0123 0123 (Bank 1) P0228 0228 (Bank 2)	Throttle position sensor 2 circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS0005X

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-235, "Diagnostic Procedure" .

WITH GST

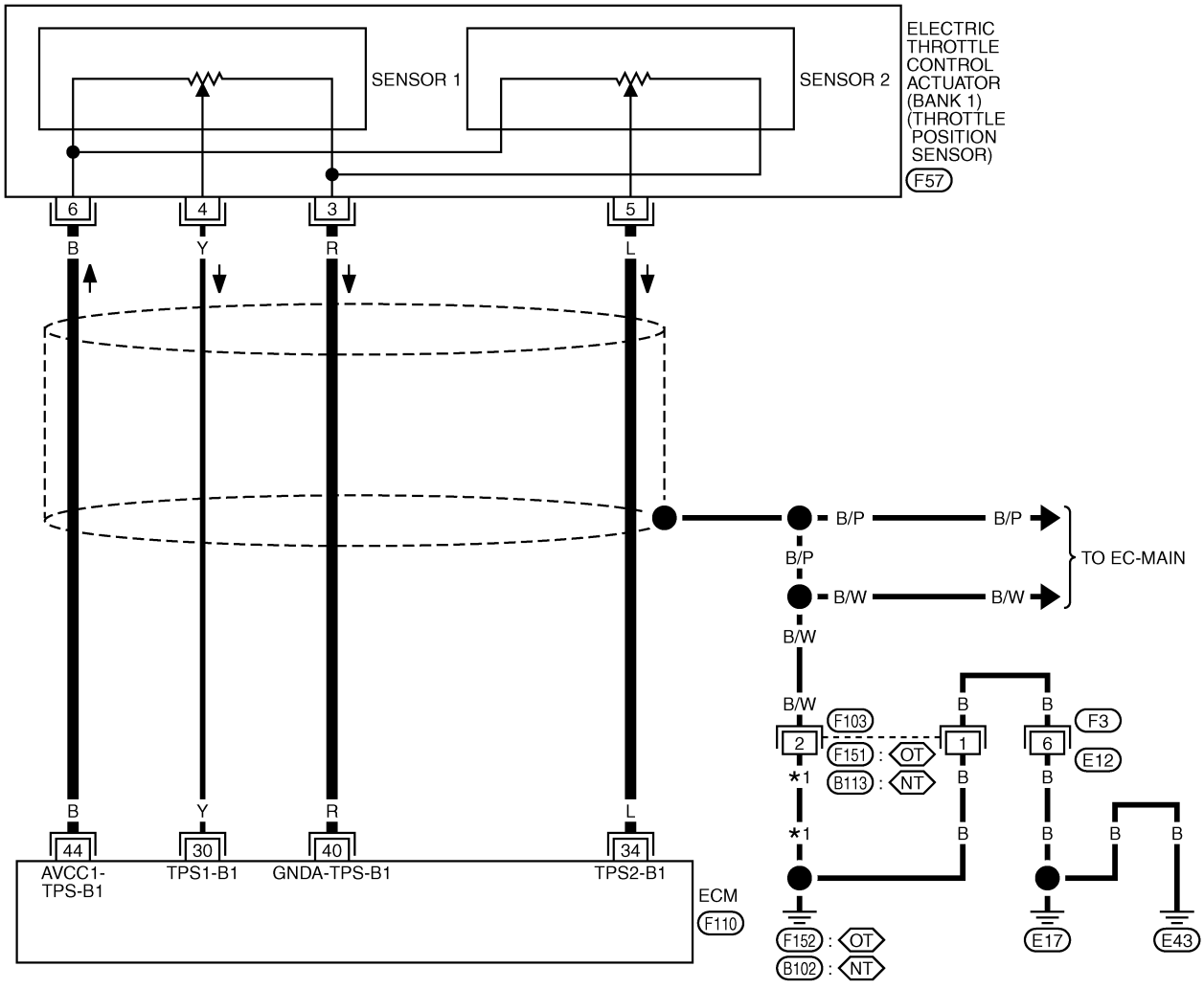
Follow the procedure “WITH CONSULT-III” above.

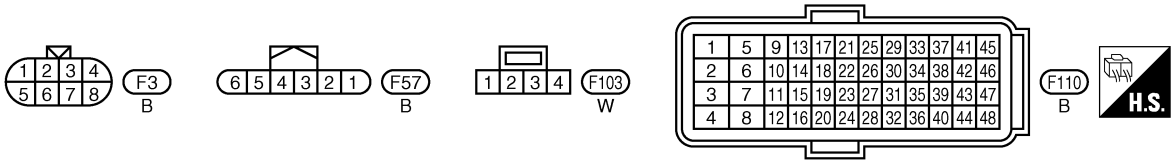
Wiring Diagram
BANK 1

NBS0005Y

EC-TPS2B1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
*1 B : NT
B/W : OT





TBWT1630E

Specification data are reference values and are measured between each terminal and ground.

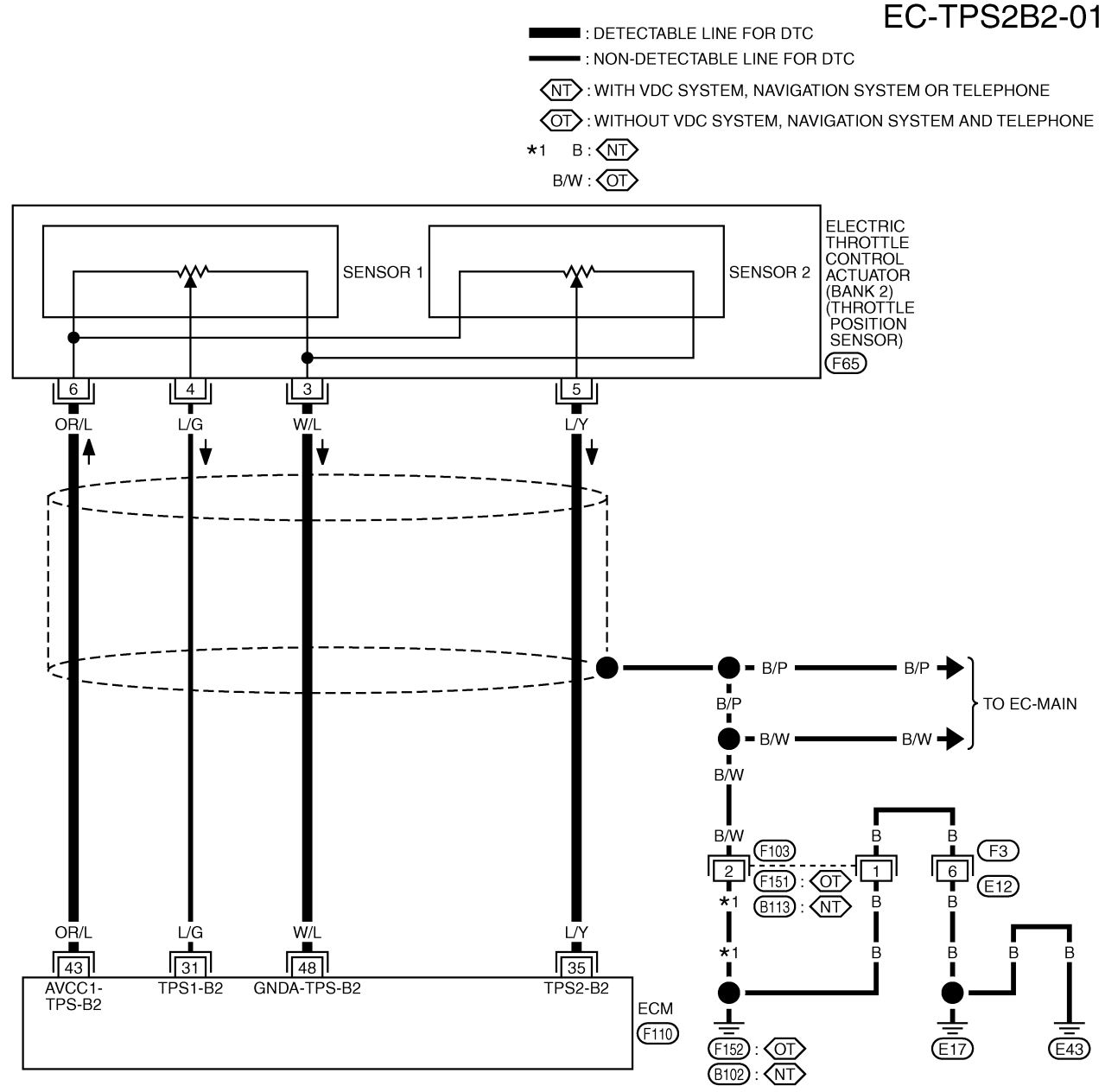
CAUTION:

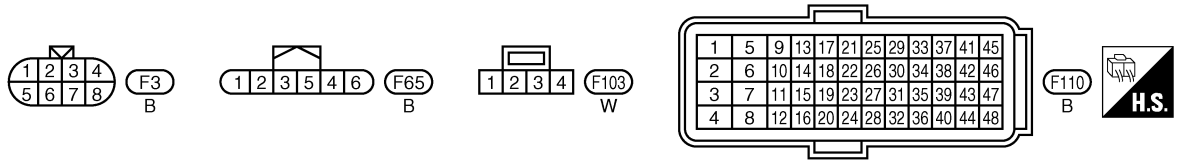
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
30	Y	Throttle position sensor 1 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
34	L	Throttle position sensor 2 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
40	R	Sensor ground [Throttle position sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V

BANK 2

EC-TPS2B2-01





TBWT1631E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
31	L/G	Throttle position sensor 1 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
35	L/Y	Throttle position sensor 2 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
48	W/L	Sensor ground [Throttle position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

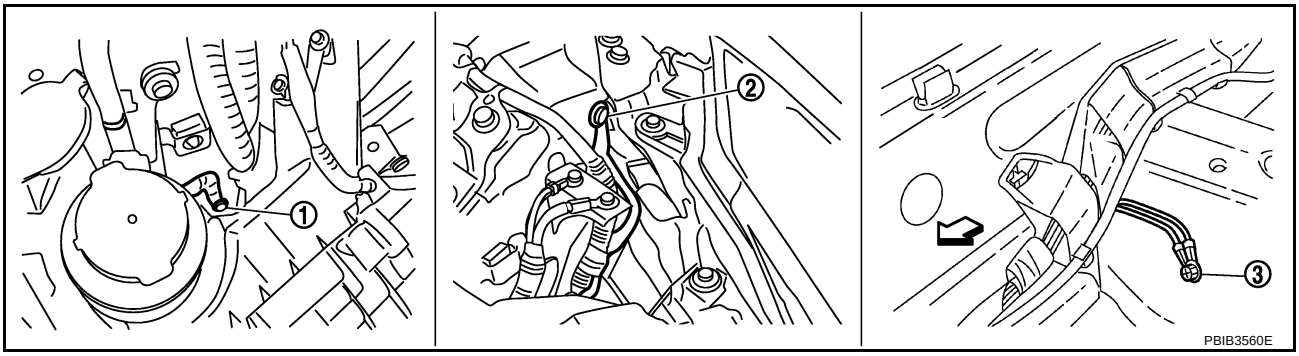
Diagnostic Procedure

NBS0005Z

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

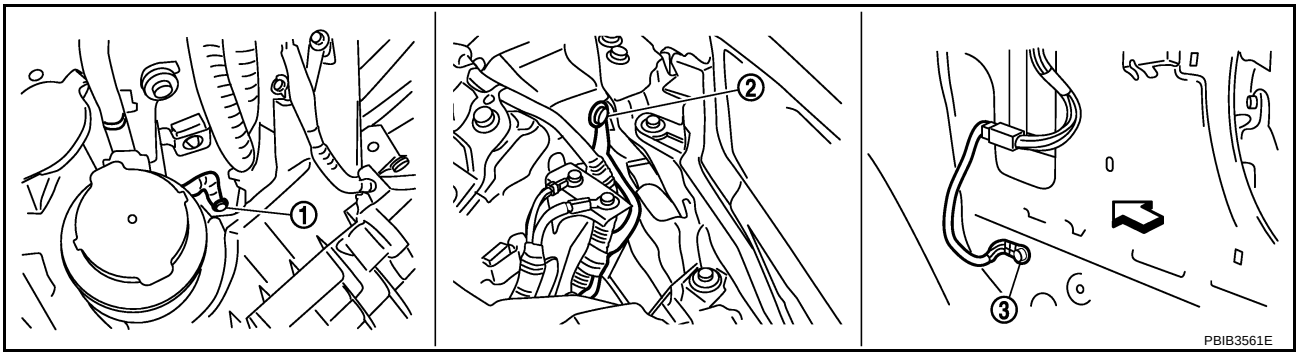


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

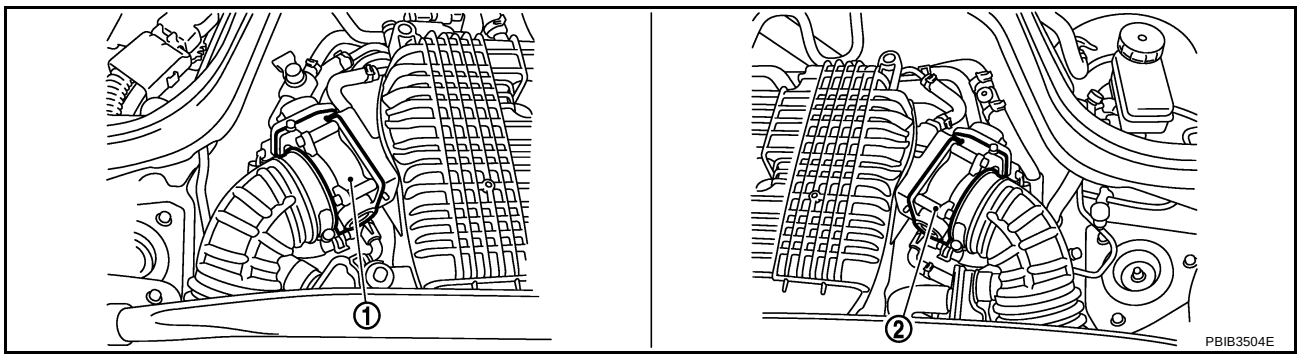
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

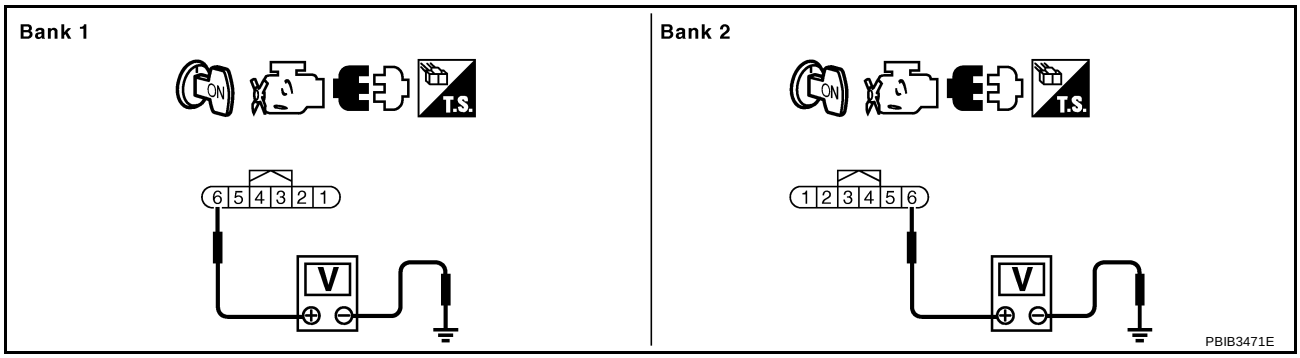
2. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control actuator (bank 1)
2. Electric throttle control actuator (bank 2)

2. Turn ignition switch ON.
3. Check voltage between electric throttle control actuator terminal 6 and ground with CONSULT-III or tester.



Voltage: Approximately 5V

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

3. CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 3 and ECM terminal 40 (bank 1) or 48 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 34 (bank 1) or 35 (bank 2) and electric throttle control actuator terminal 5.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK THROTTLE POSITION SENSOR

Refer to EC-237, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace malfunctioning electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

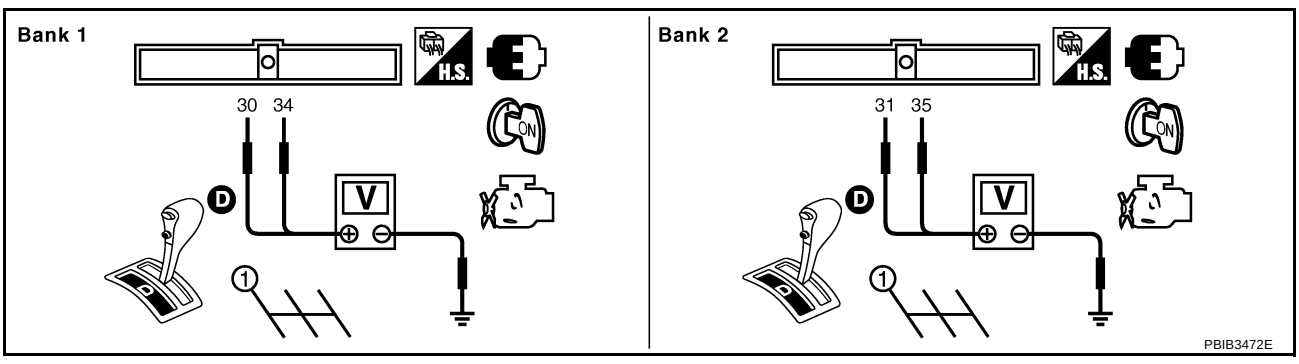
>> **INSPECTION END**

Component Inspection

NBS00060

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.
5. Check voltage between ECM terminals 30 [TP sensor 1 (bank 1) signal], 31 [TP sensor 1 (bank 2) signal], 34 [TP sensor 2 (bank 1) signal], 35 [TP sensor 2 (bank 2) signal] and ground under the following conditions.



Terminal	Accelerator pedal	Voltage
30 [TP sensor 1 (bank 1)] 31 [TP sensor 1 (bank 2)]	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
34 [TP sensor 2 (bank 1)] 35 [TP sensor 2 (bank 2)]	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V

6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS00061

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

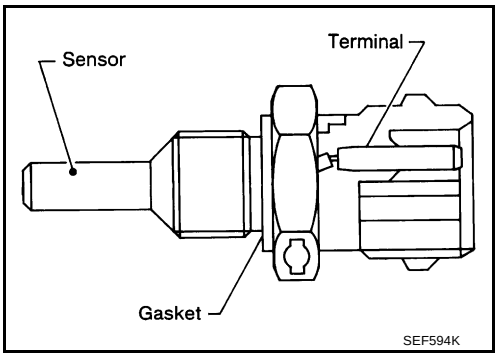
DTC P0125 ECT SENSOR

PFP:22630

Component Description

NBS00062

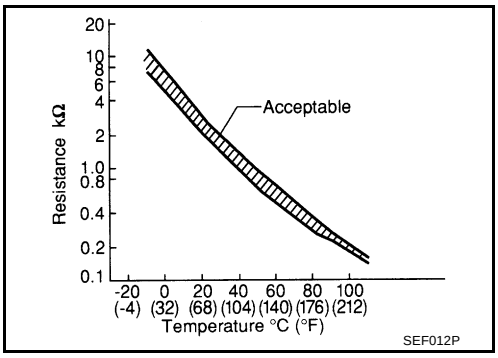
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 71 (Engine coolant temperature sensor) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS00063

NOTE:
If DTC P0125 is displayed with P0117 or P0118, first perform the trouble diagnosis for DTC P0117 or P0118.
Refer to EC-223, "DTC P0117, P0118 ECT SENSOR" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0125 0125	Insufficient engine coolant temperature for closed loop fuel control	● Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine. ● Engine coolant temperature is insufficient for closed loop fuel control.	● Harness or connectors (High resistance in the circuit) ● Engine coolant temperature sensor ● Thermostat

DTC Confirmation Procedure

NBS00064

CAUTION:

Be careful not to overheat engine.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-III.
3. Check that “COOLAN TEMP/S” is above 10°C (50°F).
   If it is above 10°C (50°F), the test result will be OK.
   If it is below 10°C (50°F), go to following step.
4. Start engine and run it for 65 minutes at idle speed.
   If “COOLAN TEMP/S” increases to more than 10°C (50°F) within 65 minutes, stop engine because the test result will be OK.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-241, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

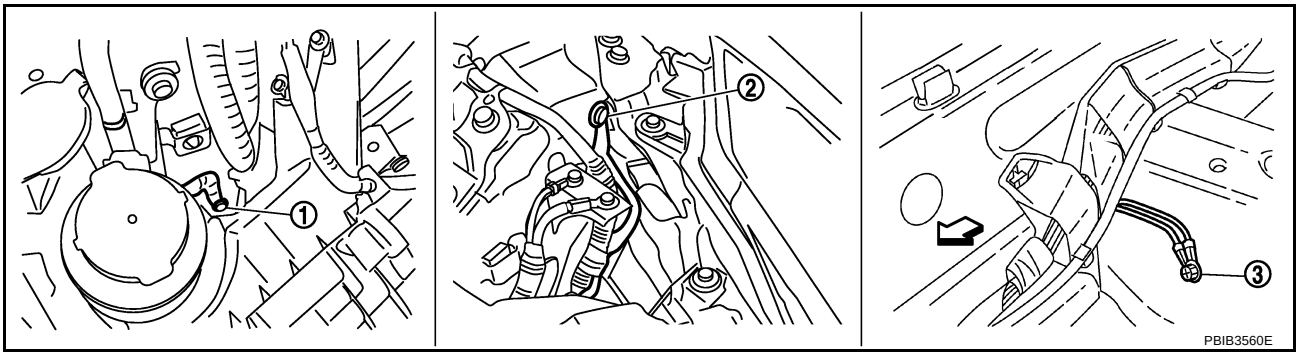
Diagnostic Procedure

NBS00065

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

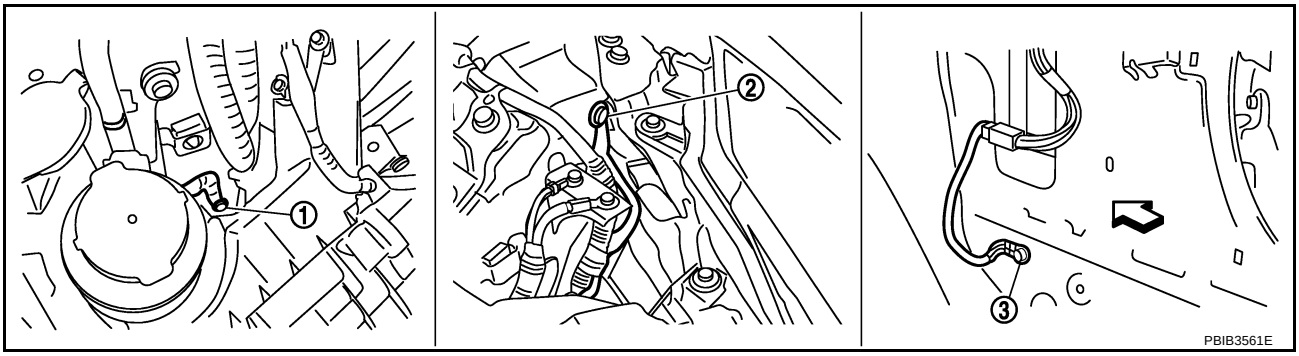


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-242, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace engine coolant temperature sensor.

3. CHECK THERMOSTAT OPERATION

When the engine is cold [lower than 70°C (158°F)] condition, grasp lower radiator hose and confirm the engine coolant does not flow.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace thermostat. Refer to CO-26, "WATER INLET AND THERMOSTAT ASSEMBLY" .

4. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-225, "Wiring Diagram" .

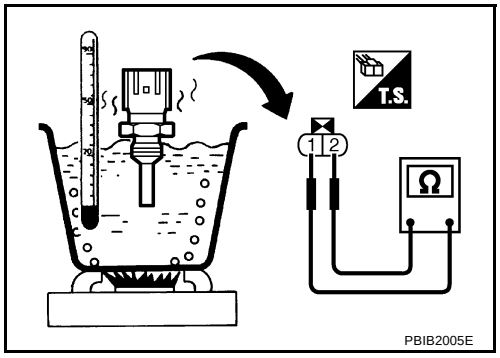
>> **INSPECTION END**

Component Inspection

NBS00066

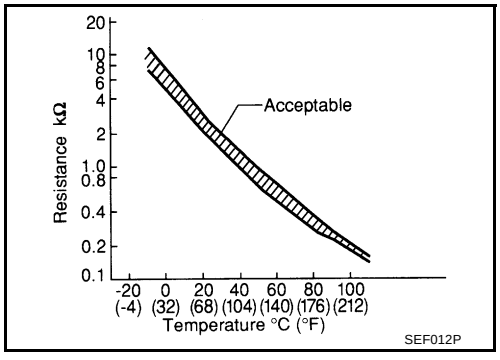
ENGINE COOLANT TEMPERATURE SENSOR

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.37 - 2.63
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

NBS00067

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-28, "WATER OUTLET AND WATER PIPING" .

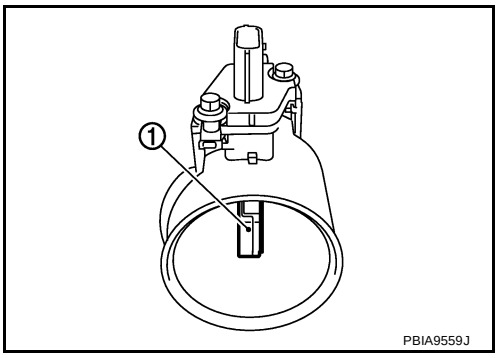
DTC P0127 IAT SENSOR

PFP:22630

Component Description

NBS00068

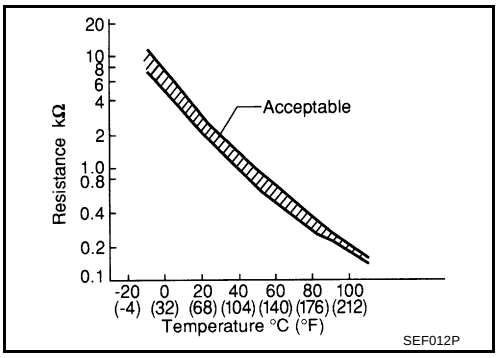
The intake air temperature sensor (1) is built into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

*: This data is reference values and is measured between ECM terminal 67 [Intake air temperature sensor (bank 1)] and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS00069

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0127 0127	Intake air temperature too high	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signal from engine coolant temperature sensor.	● Harness or connectors (The sensor circuit is open or shorted) ● Intake air temperature sensor

DTC Confirmation Procedure

NBS0006A

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:
This test may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-III

1. Wait until engine coolant temperature is less than 90°C (194°F)
a. Turn ignition switch ON.
b. Select “DATA MONITOR” mode with CONSULT-III.
c. Check the engine coolant temperature.
d. If the engine coolant temperature is not less than 90°C (194°F), turn ignition switch OFF and cool down engine.

   NOTE:
   Perform the following steps before engine coolant temperature is above 90°C (194°F).
2. Turn ignition switch ON.
3. Select “DATA MONITOR” mode with CONSULT-III.

4. Start engine.
5. Hold vehicle speed at more than 70 km/h (43 MPH) for 100 consecutive seconds.
6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-244, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

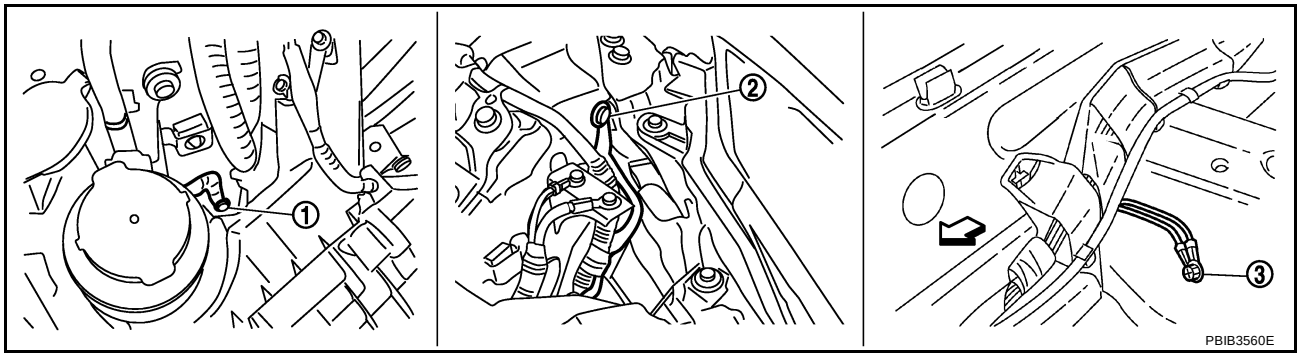
Diagnostic Procedure

NBS0006B

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

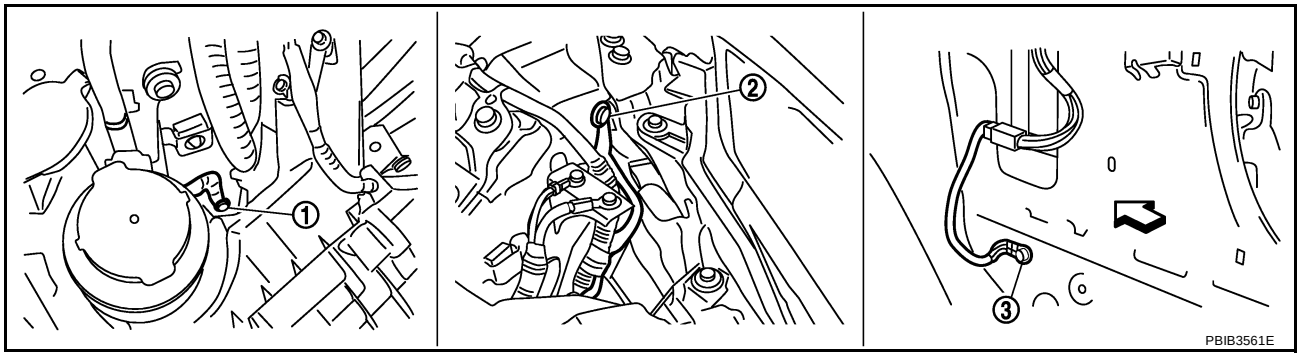


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-222, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace mass air flow sensor (with intake air temperature sensor) (bank 1).

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-219, "Wiring Diagram" .

>> **INSPECTION END**

Component Inspection

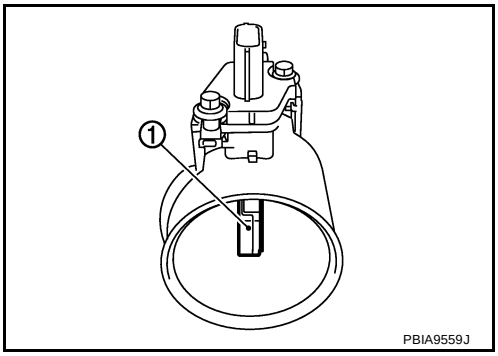
NBS0006C

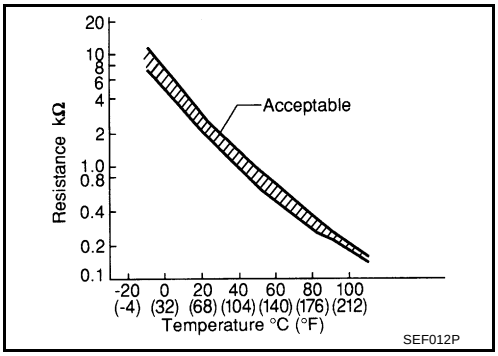
INTAKE AIR TEMPERATURE SENSOR

1. Check resistance between mass air flow sensor (with intake air temperature sensor) (bank 1) (1) terminals 5 and 6 under the following conditions.

Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.800 - 2.200

2. If NG, replace mass air flow sensor (with intake air temperature sensor) (bank 1).





Removal and Installation

NBS0006D

MASS AIR FLOW SENSOR

Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

DTC P0128 THERMOSTAT FUNCTION

PFP:21200

On Board Diagnosis Logic

NBS0006E

Engine coolant temperature has not risen enough to open the thermostat even though the engine has run long enough.
This is due to a leak in the seal or the thermostat stuck open.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0128 0128	Thermostat function	The engine coolant temperature does not reach to specified temperature even though the engine has run long enough.	● Thermostat ● Leakage from sealing portion of thermostat ● Engine coolant temperature sensor

DTC Confirmation Procedure

NBS0006F

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:

- **For best results, perform at ambient temperature of –10°C (14°F) or higher.**
- **For best results, perform at engine coolant temperature of –10°C (14°F) to 68°C (154°F).**

WITH CONSULT-III

1. Replace thermostat with new one. Refer to CO-26, "WATER INLET AND THERMOSTAT ASSEMBLY" . Use only a genuine NISSAN thermostat as a replacement. If an incorrect thermostat is used, the MIL may come on.
2. Turn ignition switch ON.
3. Select “COOLAN TEMP/S” in “DATA MONITOR” mode with CONSULT-III.
4. Check the indication of “COOLAN TEMP/S”.
   If it is below 68°C (154°F), go to following step.
   If it is above 68°C (154°F), cool down the engine to less than 60°C (140°F), then go to next step.
5. Drive vehicle for 10 consecutive minutes under the following conditions.

VHCL SPEED SE	80 - 120 km/h (50 - 75 MPH)

6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-246, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS0006G

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-247, "Component Inspection" .

OK or NG

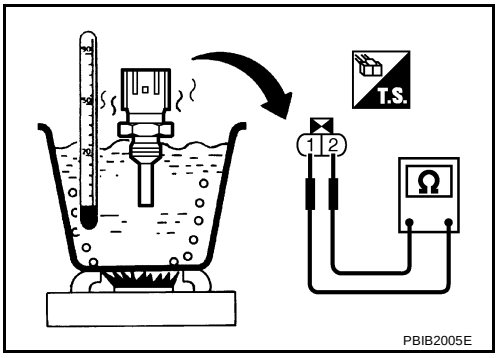
OK >> **INSPECTION END**
NG >> Replace engine coolant temperature sensor.

Component Inspection

NBS0006H

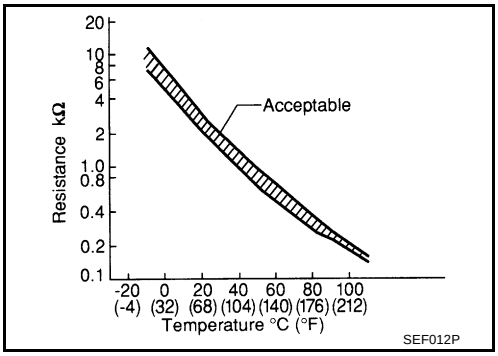
ENGINE COOLANT TEMPERATURE SENSOR

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.37 - 2.63
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

NBS0006I

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-28, "WATER OUTLET AND WATER PIPING" .

DTC P0130, P0150 A/F SENSOR 1

PFP:22693

Component Description

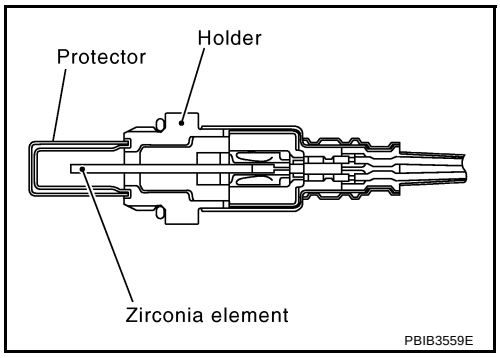
NBS006U5

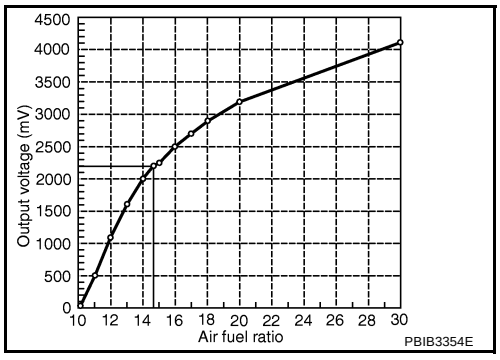
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS000ET

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS000EU

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0130 0130 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly in the range other than approx. 2.2V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P0150 0150 (Bank 2)		● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2V.	

DTC Confirmation Procedure

NBS006U6

Perform PROCEDURE FOR MALFUNCTION A first.
If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

PROCEDURE FOR MALFUNCTION A

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Let engine idle for 2 minutes.

3. Check 1st trip DTC.
4. If 1st trip DTC is detected, go to EC-254, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION B

CAUTION:
Always drive vehicle at a safe speed.

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-III.
3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.
   If the indication is constantly approx. 1.5V and does not fluctuates, go to EC-254, "Diagnostic Procedure" .
   If the indication fluctuates around 1.5V, go to next step.
4. Select “A/F SEN1 (B1) P1276” (for DTC P0130) or “A/F SEN1 (B2) P1286” (for DTC P0150) of “A/F SEN1” in “DTC WORK SUPPORT” mode with CONSULT-III.
5. Touch “START”.
6. When the following conditions are met, “TESTING” will be displayed on the CONSULT-III screen.

ENG SPEED	1,100 - 3,200 rpm
VHCL SPEED SE	More than 64 km/h (40 MPH)
B/FUEL SCHDL	1.0 - 8.0 msec
Shift lever	D position (A/T) 5th position (M/T)

   If “TESTING” is not displayed after 20 seconds, retry from step 2.
7. Release accelerator pedal fully.
   NOTE:
   Never apply brake during releasing the accelerator pedal.
8. Make sure that “TESTING” changes to “COMPLETED”.
   If “TESTING” changed to “OUT OF CONDITION”, retry from step 6.
9. Make sure that “OK” is displayed after touching “SELF-DIAG RESULT”.
   If “NG” is displayed, go to EC-254, "Diagnostic Procedure" .

Overall Function Check

NBS006U7

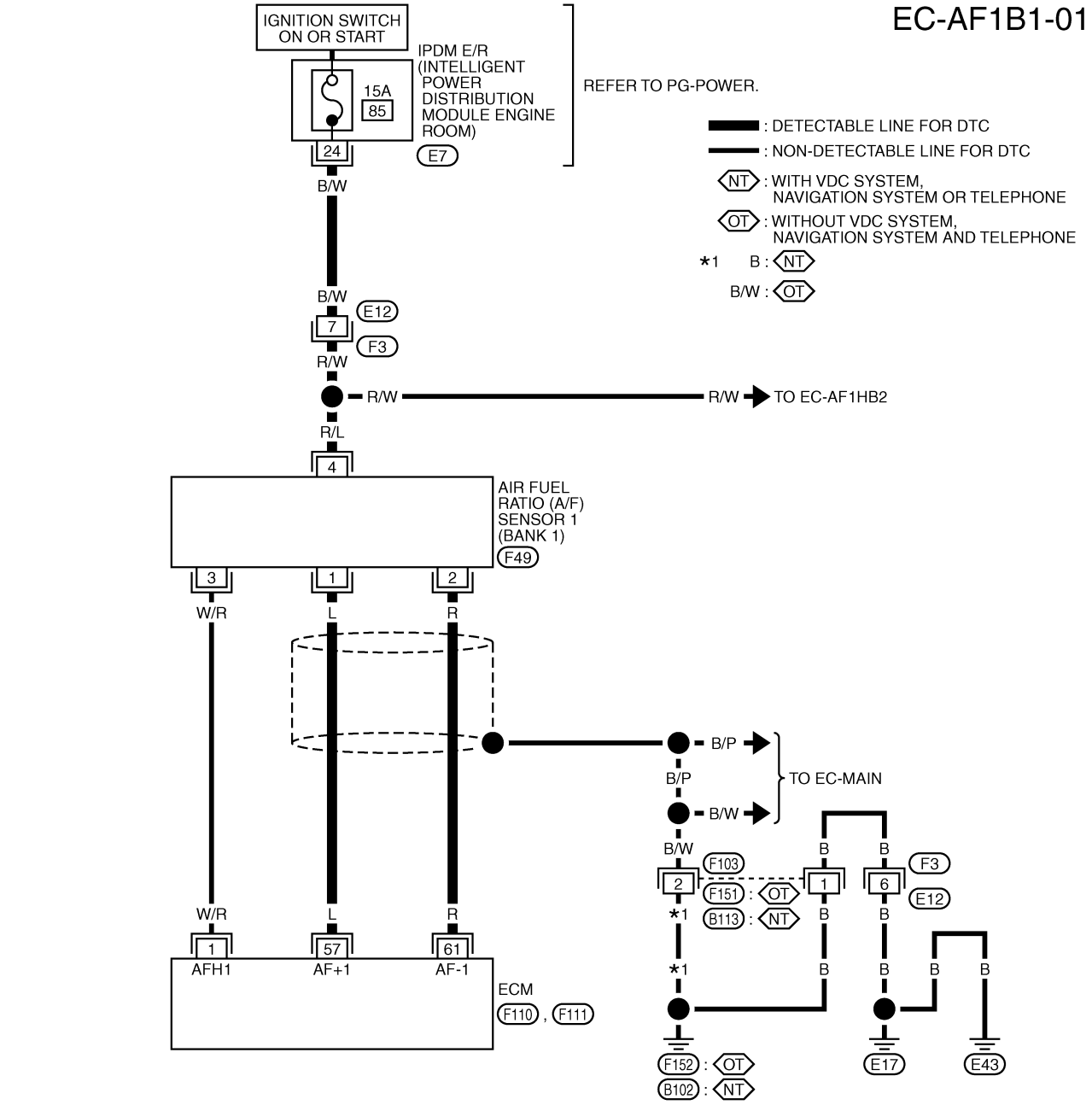
Use this procedure to check the overall function of the A/F sensor 1 circuit. During this check, a 1st trip DTC might not be confirmed.

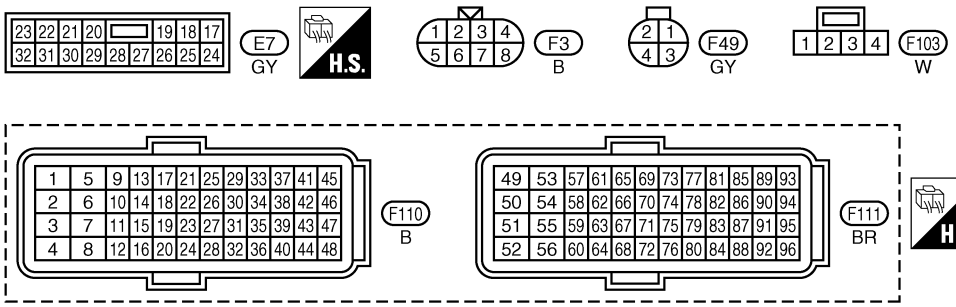
WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in the suitable gear position.
3. Set shift lever to D position (A/T) or 5th position (M/T), then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (30 MPH).
   NOTE:
   Never apply brake during releasing the accelerator pedal.
4. Repeat steps 2 and 3 for five times.
5. Stop the vehicle and turn ignition switch OFF.
6. Wait at least 10 seconds and restart engine.
7. Repeat steps 2 and 3 for five times.
8. Stop the vehicle and connect GST to the vehicle.
9. Make sure that no 1st trip DTC is displayed.
   If the 1st trip DTC is displayed, go to EC-254, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS006U8

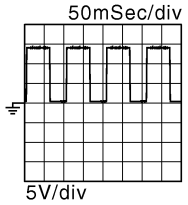




TBWT1632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

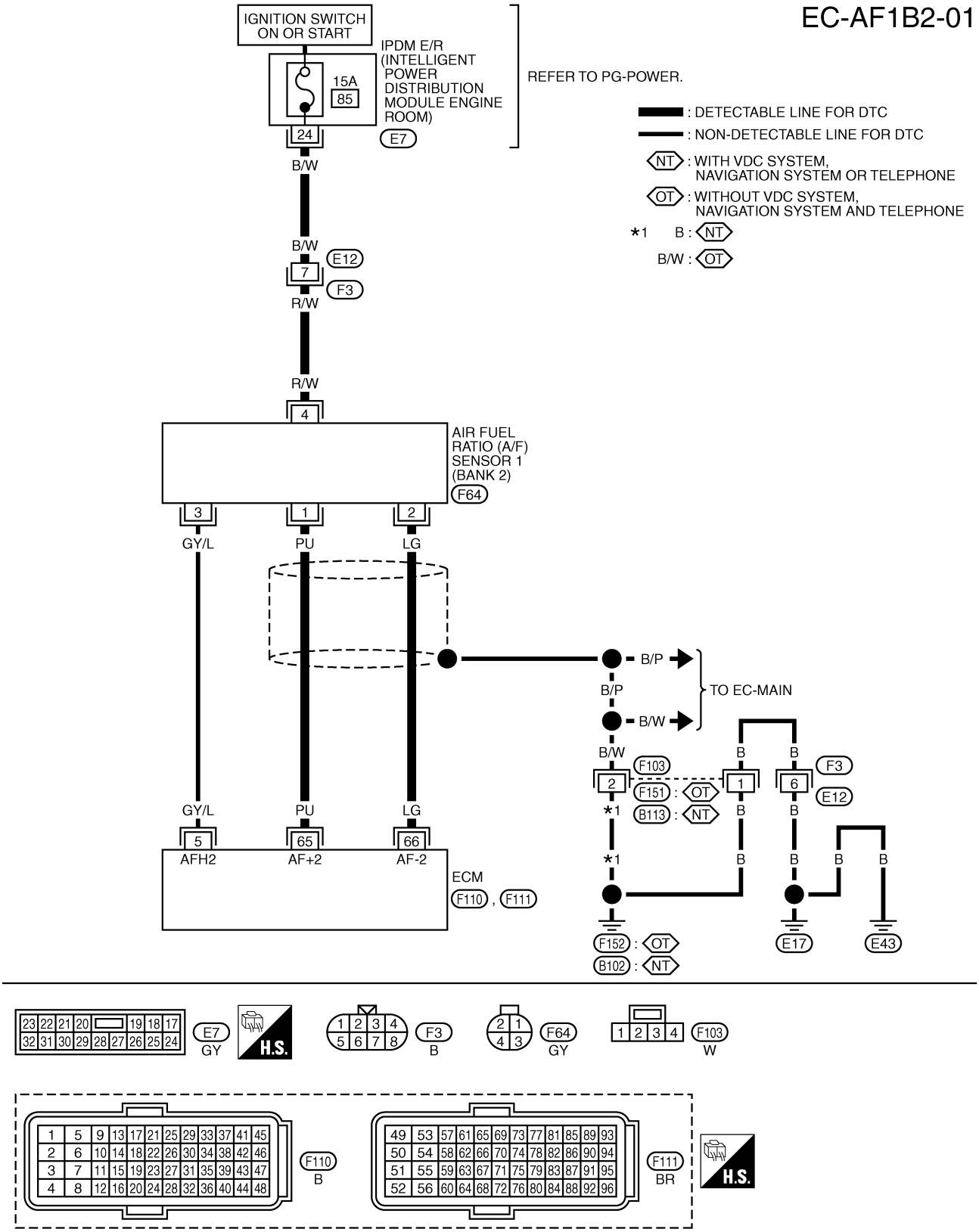
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

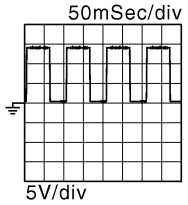
EC-AF1B2-01



TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★  PBIB3538E
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

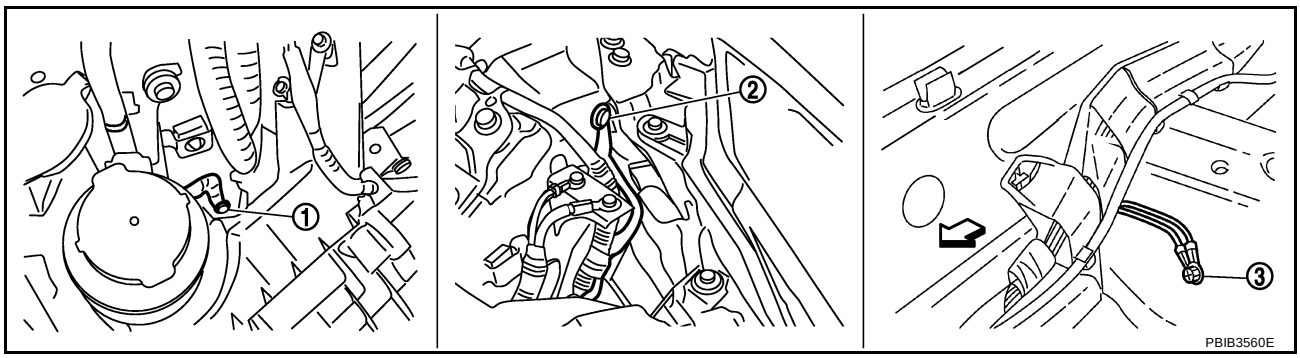
Diagnostic Procedure

NBS006U9

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

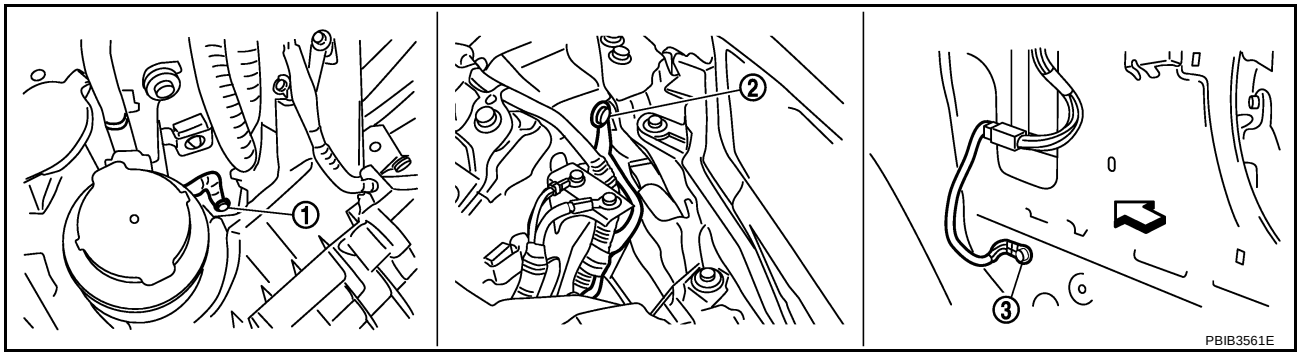


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

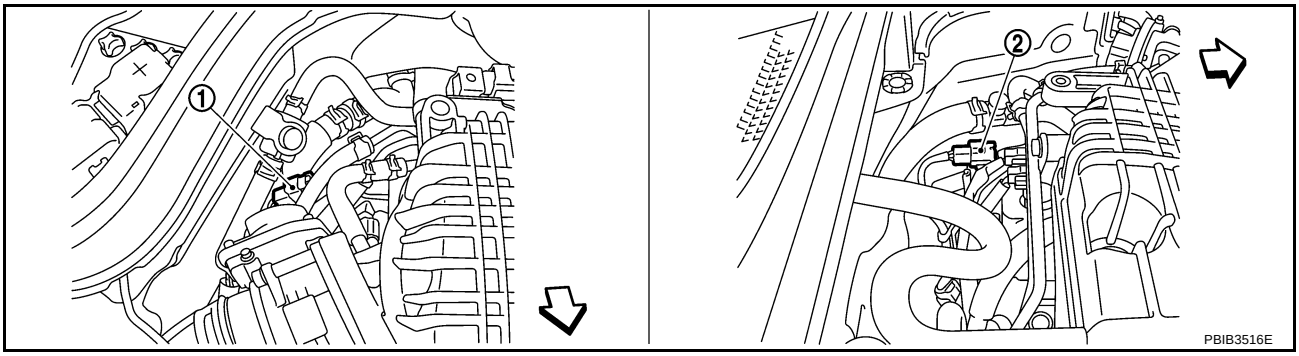
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

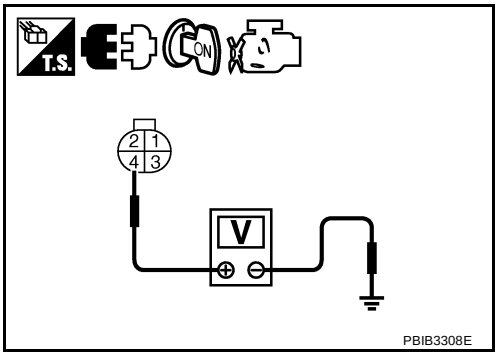


1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace.

6. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads (using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12) and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

NBS006UA

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0131, P0151 A/F SENSOR 1

PFP:22693

Component Description

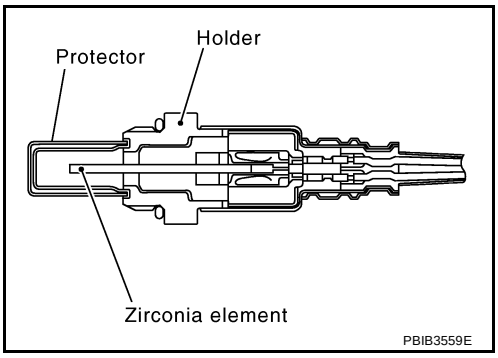
NBS006UB

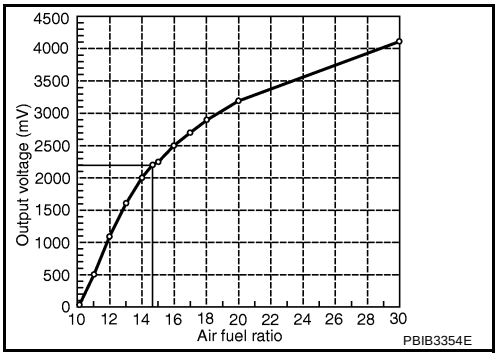
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS006UC

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS006UD

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0131 0131 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit low voltage	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 0V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P0151 0151 (Bank 2)			

DTC Confirmation Procedure

NBS006UE

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-III.
3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.
   If the indication is constantly approx. 0V, go to EC-263, "Diagnostic Procedure" .
   If the indication is not constantly approx. 0V, go to next step.
4. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
5. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.
6. Maintain the following conditions for about 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 MPH)
B/FUEL SCHDL	1.5 - 9.0 msec
Shift lever	Suitable position

NOTE:
- **Keep the accelerator pedal as steady as possible during the cruising.**
- **If this procedure is not completed within 1 minute after restarting engine at step 4, return to step 4.**

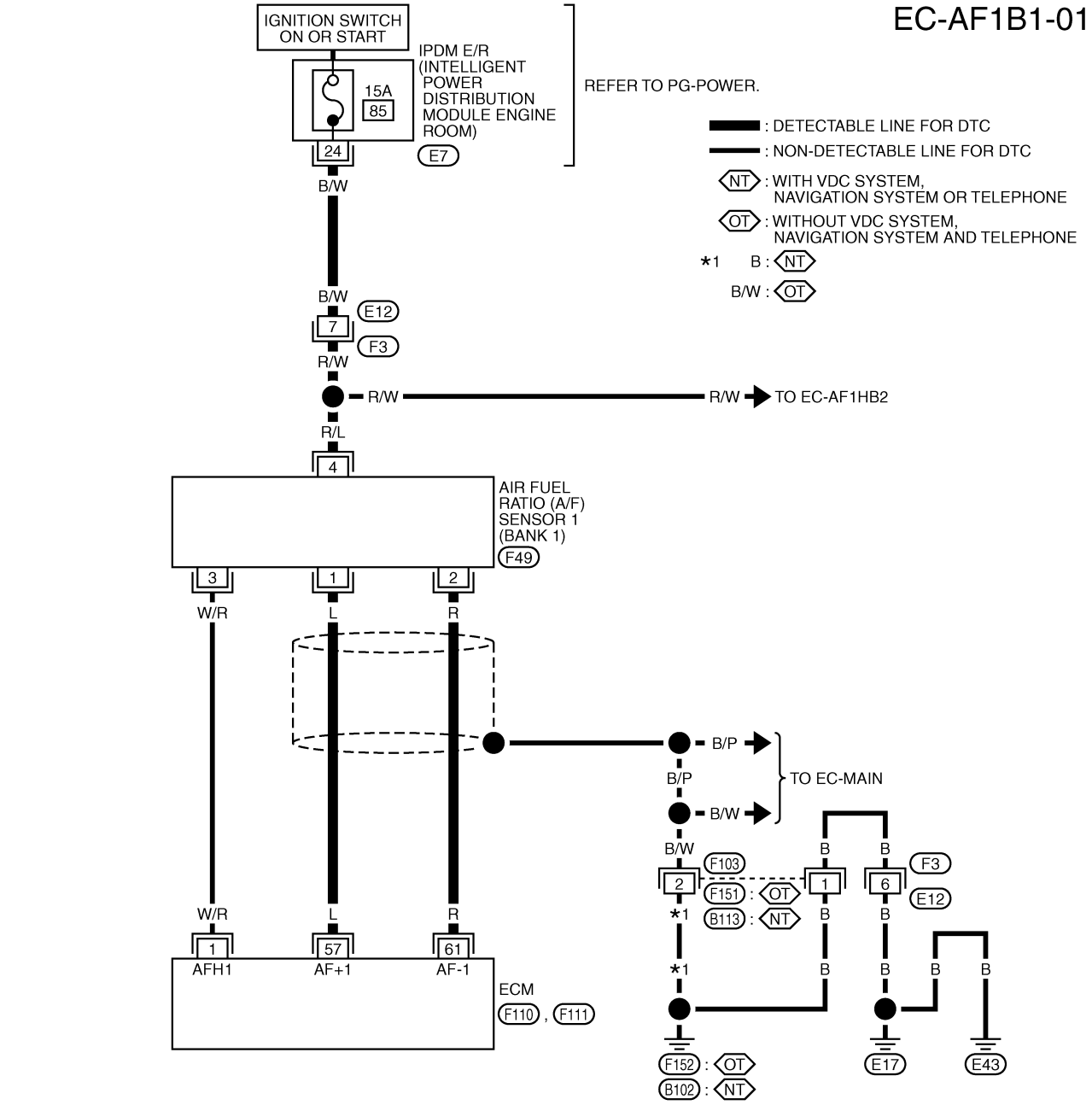
7. Check 1st trip DTC.
8. If 1st trip DTC is displayed, go to EC-263, "Diagnostic Procedure" .

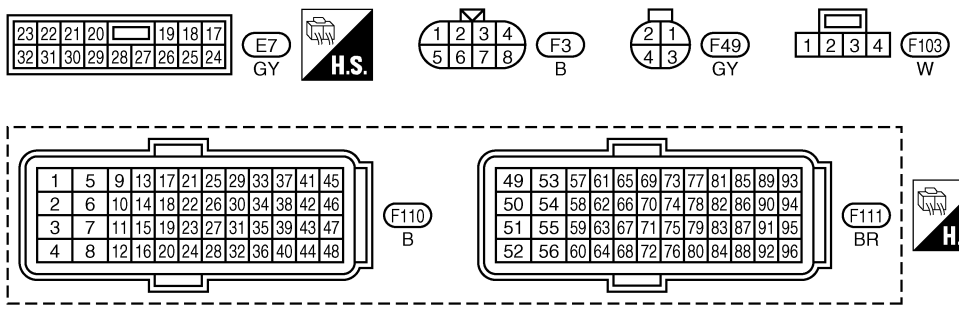
WITH GST

Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS006UF



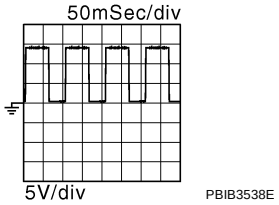


TBWT1632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

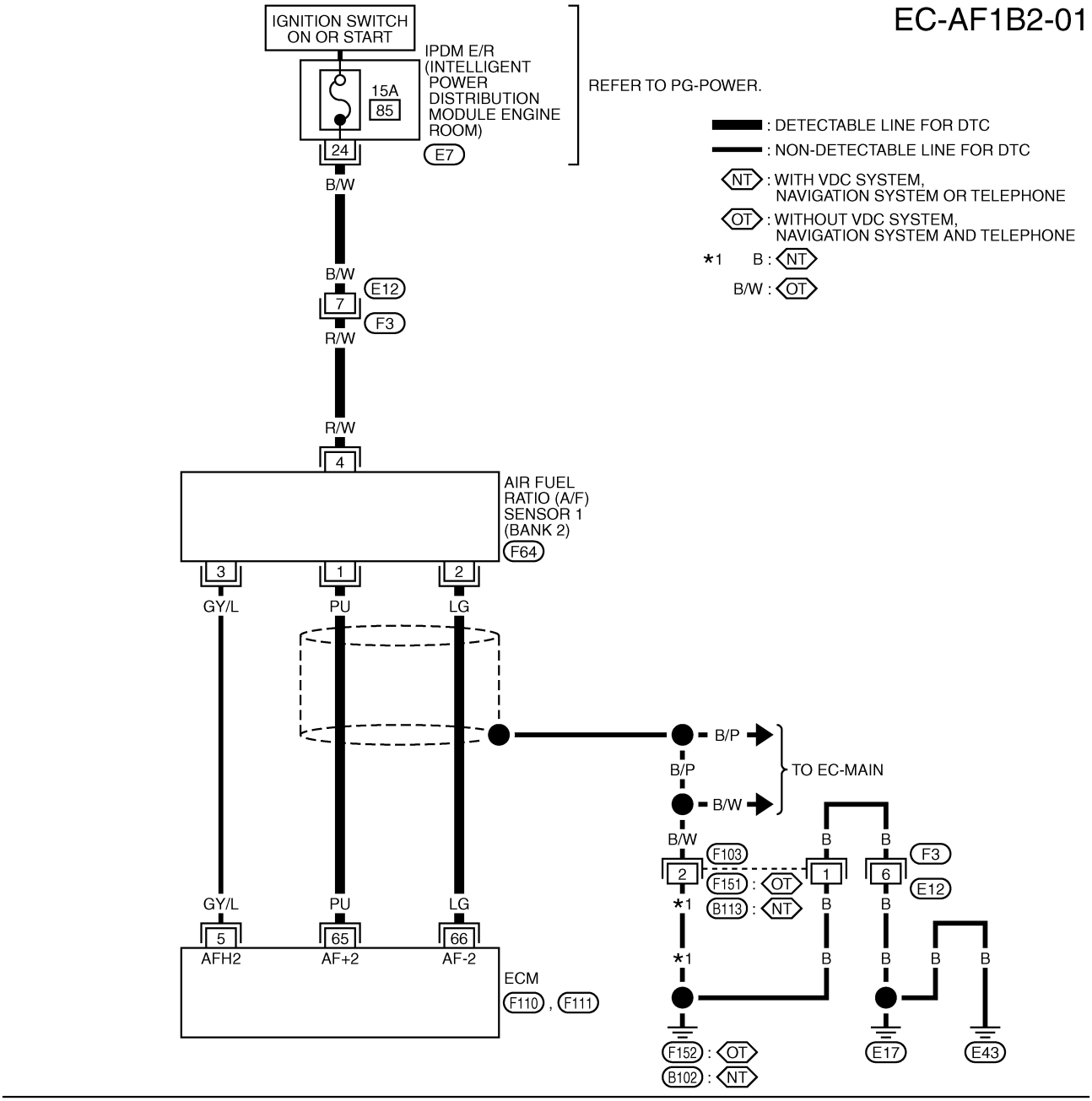
CAUTION:

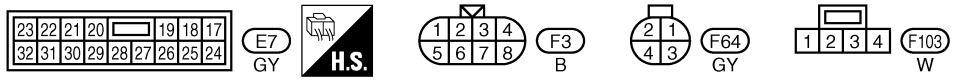
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

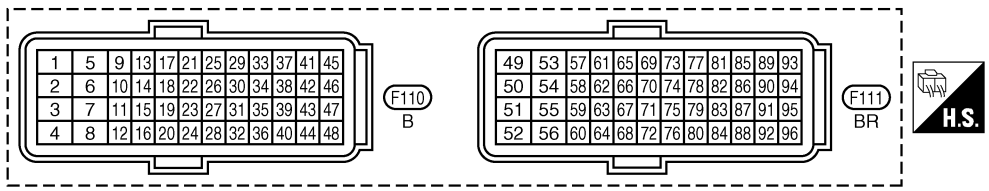
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★ 
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2





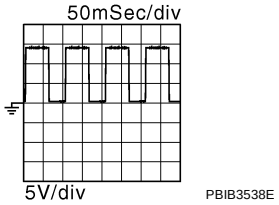


TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

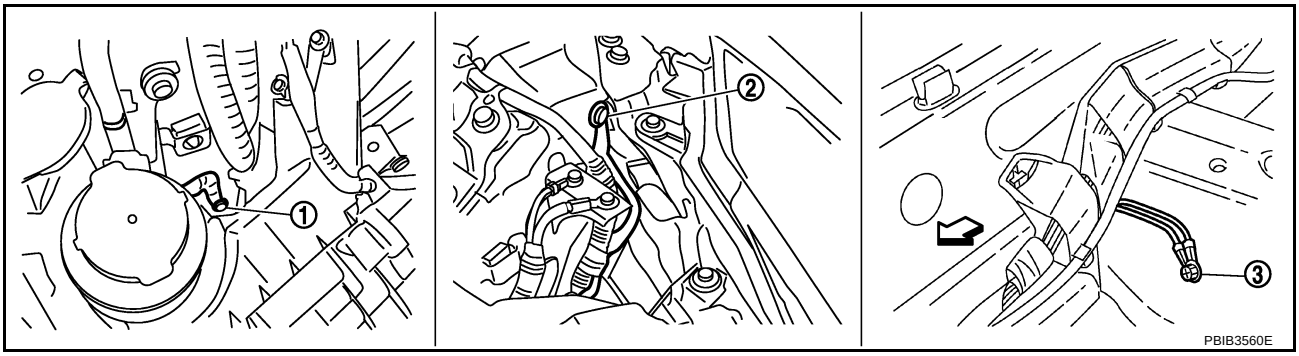
Diagnostic Procedure

NBS006UG

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

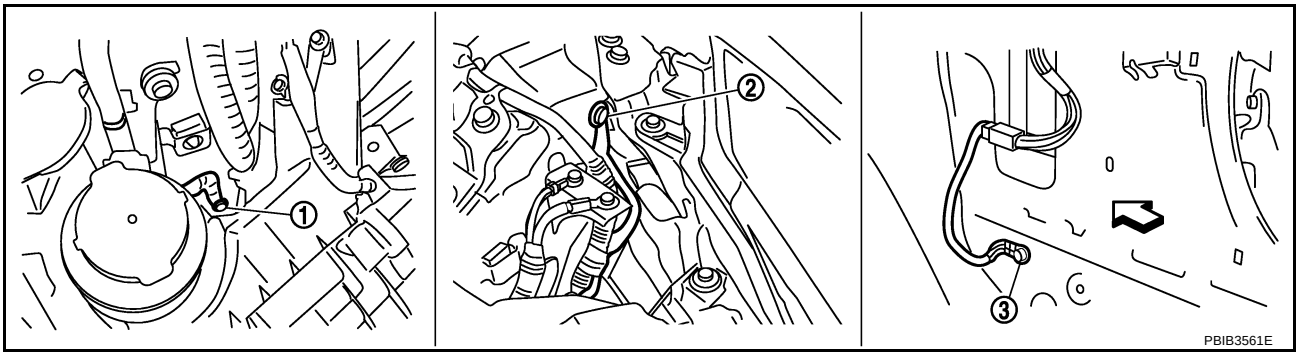


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

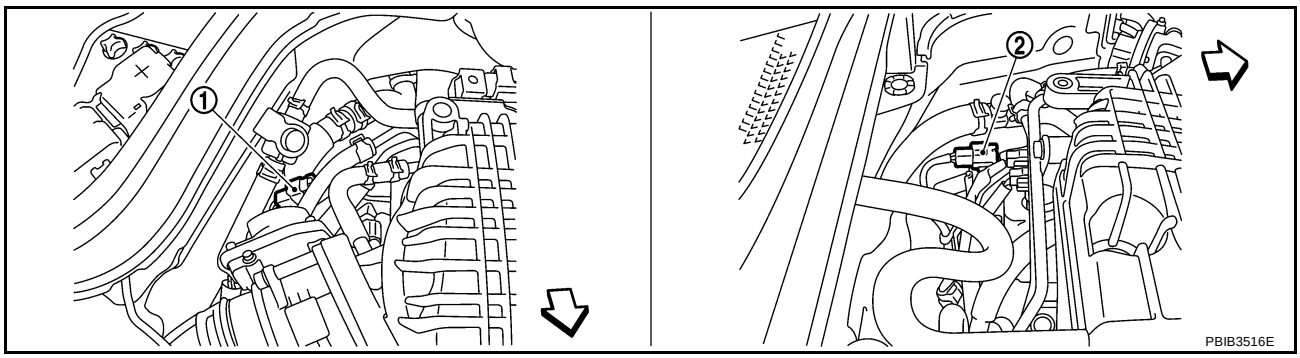
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

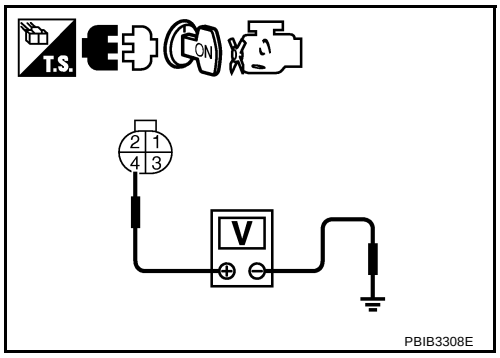


1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace.

6. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads (using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12) and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

NBS006UH

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0132, P0152 A/F SENSOR 1

PFP:22693

Component Description

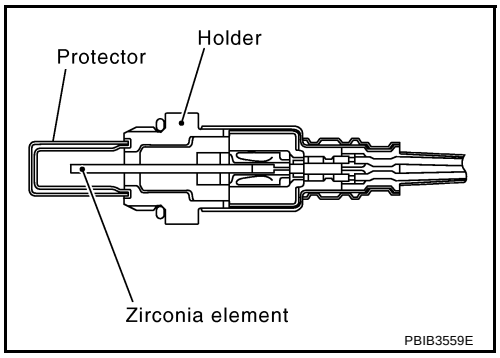
NBS006UI

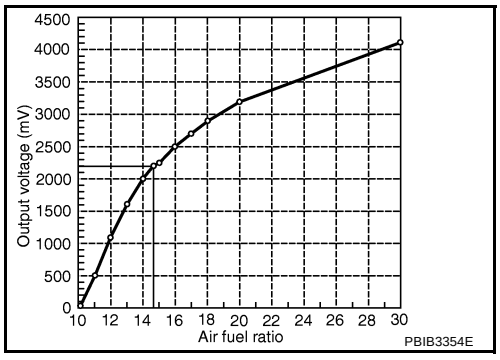
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS006UJ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS006UK

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0132 0132 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit high voltage	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 5V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P0152 0152 (Bank 2)			

DTC Confirmation Procedure

NBS000EA

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-III.
3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.
   If the indication is constantly approx. 5V, go to EC-272, "Diagnostic Procedure" .
   If the indication is not constantly approx. 5V, go to next step.
4. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
5. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.
6. Maintain the following conditions for about 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 MPH)
B/FUEL SCHDL	1.5 - 9.0 msec
Shift lever	Suitable position

NOTE:
- **Keep the accelerator pedal as steady as possible during the cruising.**
- **If this procedure is not completed within 1 minute after restarting engine at step 4, return to step 4.**

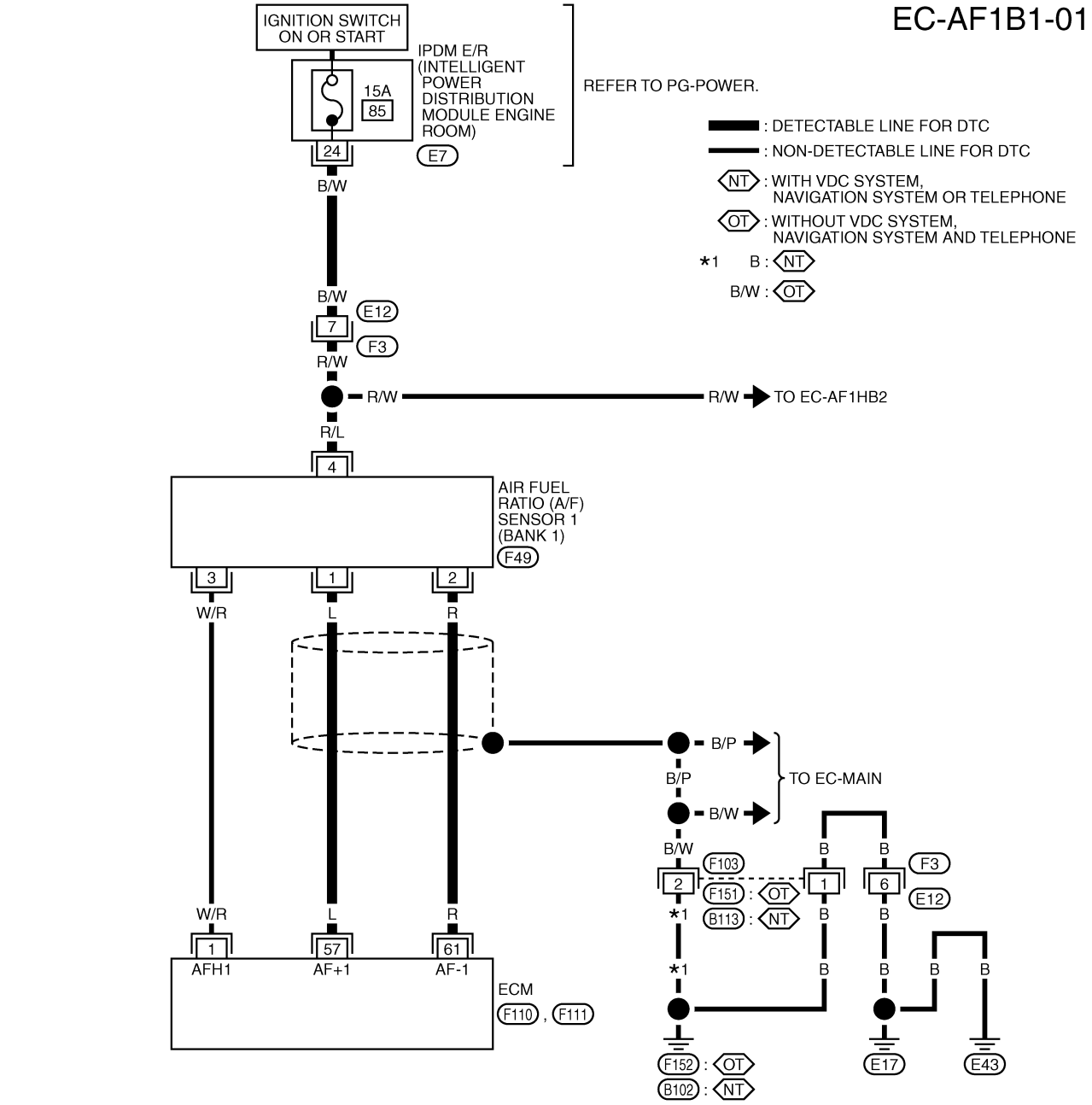
7. Check 1st trip DTC.
8. If 1st trip DTC is displayed, go to EC-272, "Diagnostic Procedure" .

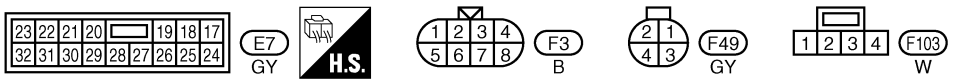
WITH GST

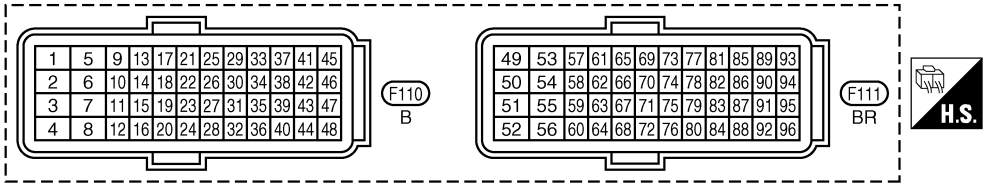
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS006UL



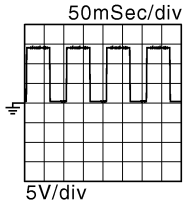




TBWT1632E

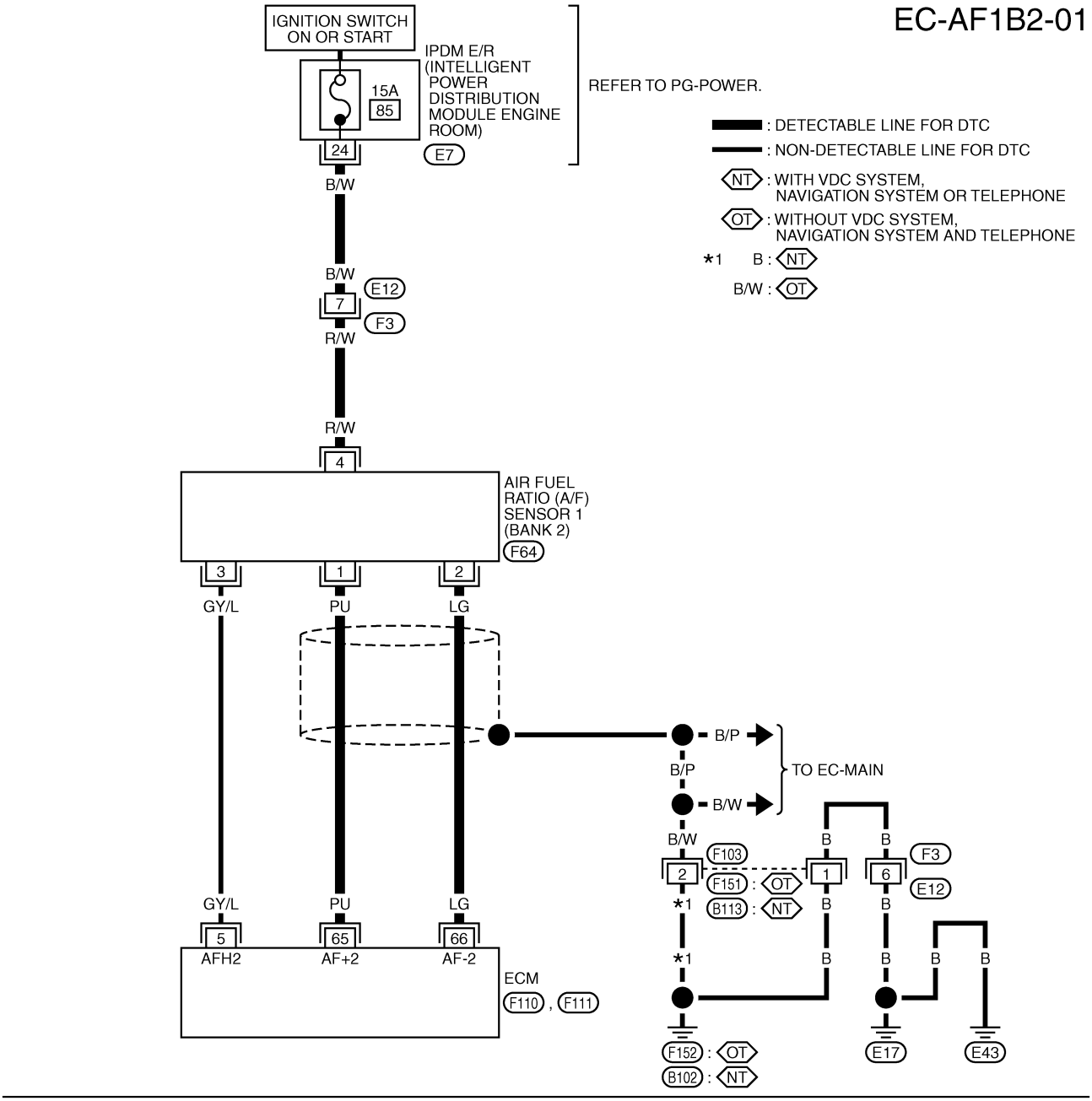
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

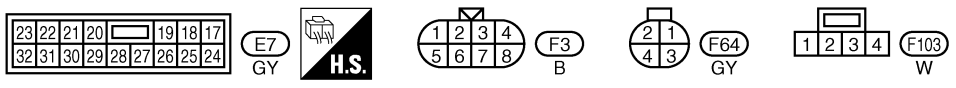
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

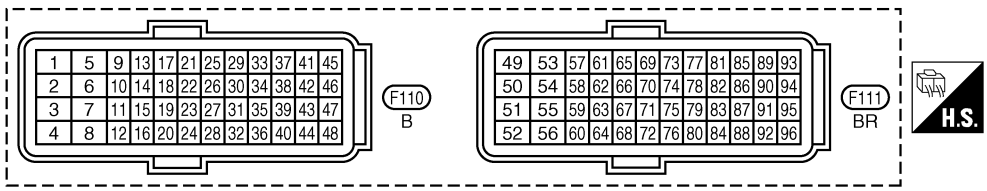
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2



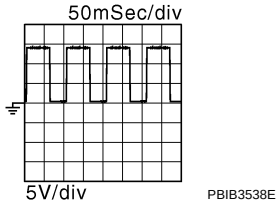




TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

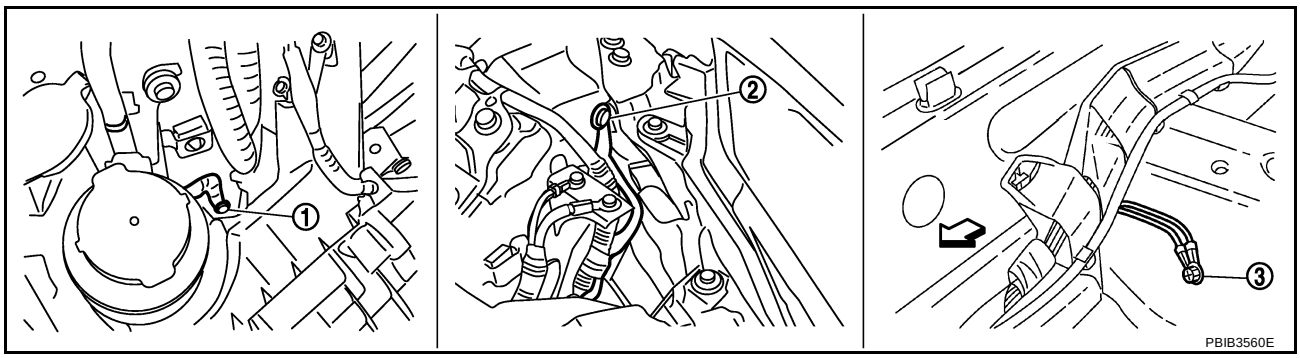
Diagnostic Procedure

NBS006UM

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

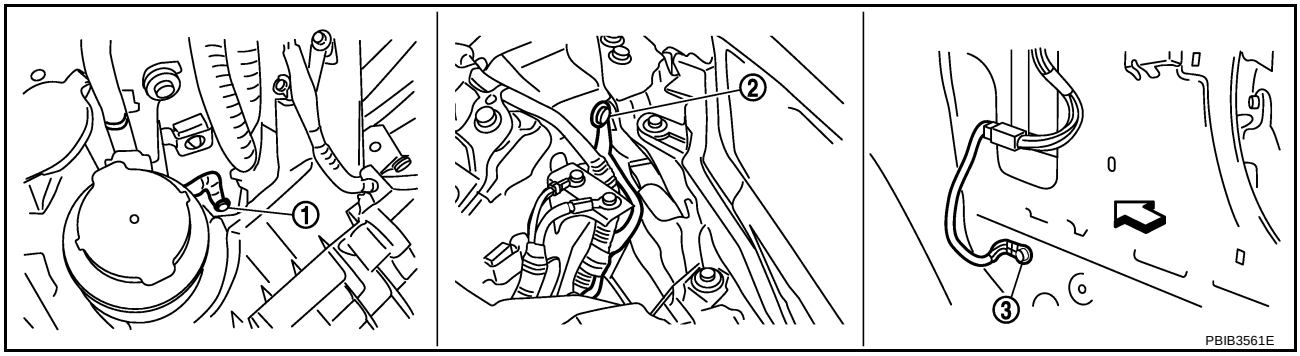


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

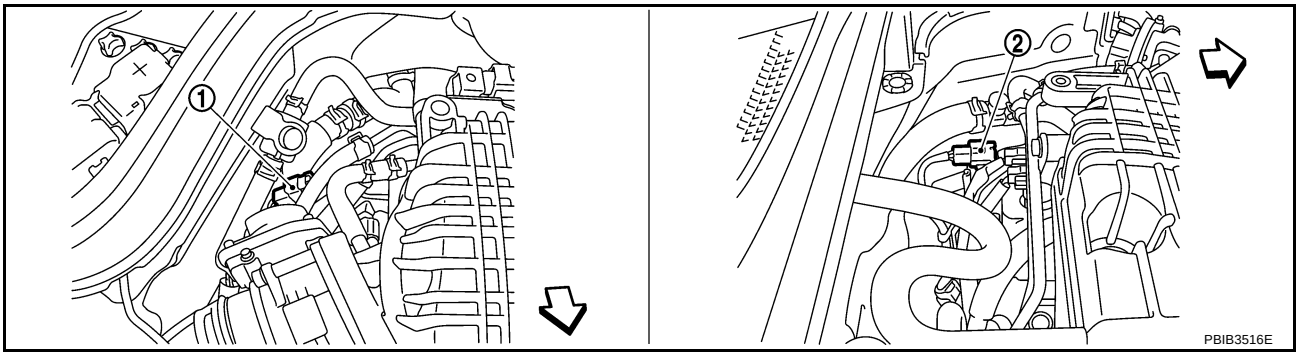
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

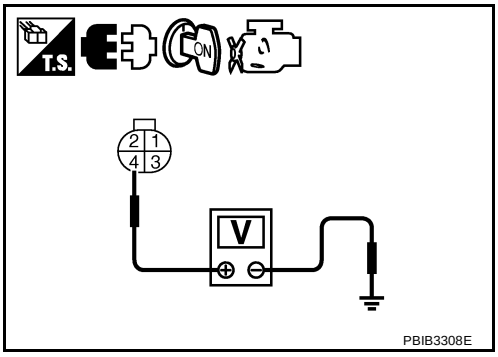


1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace.

6. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads (using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12) and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

NBS006UN

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0133, P0153 A/F SENSOR 1

PFP:22693

Component Description

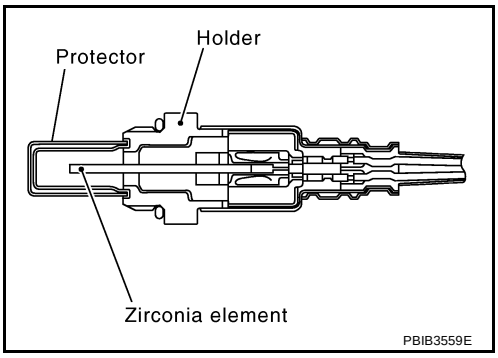
NBS006UO

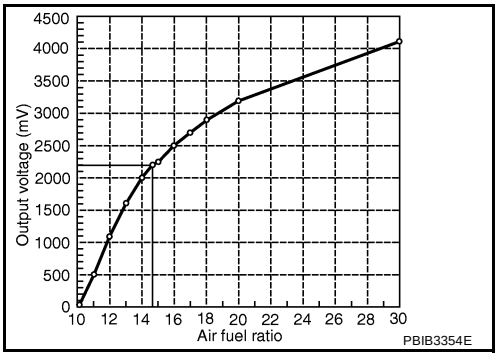
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS006UP

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS000F2

To judge the malfunction of A/F sensor 1, this diagnosis measures response time of the A/F signal computed by ECM from the A/F sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and the A/F sensor 1 temperature index. Judgment is based on whether the compensated time (the A/F signal cycling time index) is inordinately long or not.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0133 0133 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit slow response	● The response of the A/F signal computed by ECM from A/F sensor 1 signal takes more than the specified time.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater ● Fuel pressure ● Fuel injector ● Intake air leaks ● Exhaust gas leaks ● PCV valve ● Mass air flow sensor
P0153 0153 (Bank 2)			

DTC Confirmation Procedure

NBS000F3

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1minute under no load.
4. Let engine idle for 1 minute.
5. Select “A/F SEN1(B1) P1278/P1279” (for DTC P0133) or “A/F SEN1(B2) P1288/P1289” (for DTC P0153) of “A/F SEN1” in “DTC WORK SUPPORT” mode with CONSULT-III.
6. Touch “START”.
   If “COMPLETED” appears on CONSULT-III screen, go to step 10.
   If “COMPLETED” does not appear on CONSULT-III screen, go to the following step.
7. After perform the following procedure, “TESTING” will be displayed on the CONSULT-III screen.

a. Increase the engine speed up to 4,000 to 5,000 rpm and keep it for 10 seconds.
b. Fully release accelerator pedal and then let engine idle for about 10 seconds.
   If “TESTING” is not displayed after 10 seconds, refer to EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .

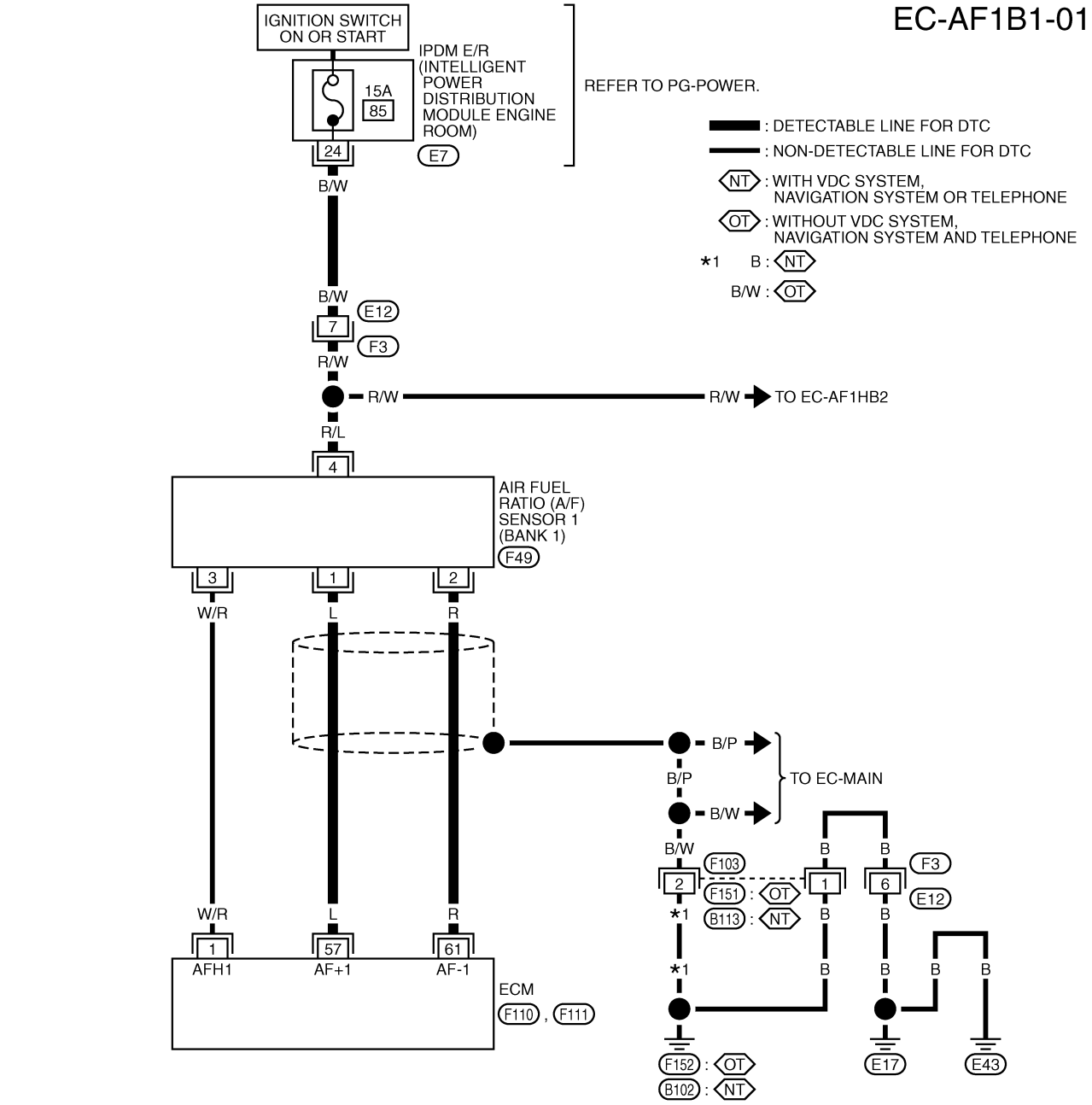
8. Wait for about 20 seconds at idle at under the condition that “TESTING” is displayed on the CONSULT-III screen.
9. Make sure that “TESTING” changes to “COMPLETED”.
   If “TESTING” changed to “OUT OF CONDITION”, refer to EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .
10. Make sure that “OK” is displayed after touching “SELF-DIAG RESULT”.
    If “NG” is displayed, go to EC-281, "Diagnostic Procedure" .

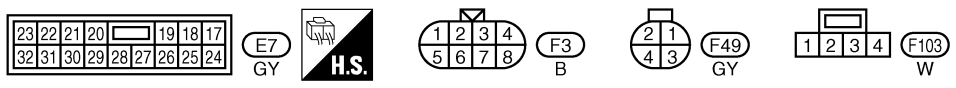
WITH GST

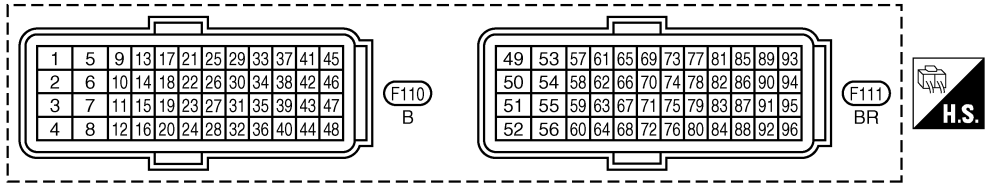
1. Start engine and warm it up to normal operating temperature.
2. Select Service $01 with GST.
3. Calculate the total value of “Short term fuel trim” and “Long term fuel trim” indications.
   Make sure that the total percentage should be within ±15%.
   If OK, go to the following step.
   If NG, check the following.
   - Intake air leaks
   - Exhaust gas leaks
   - Incorrect fuel pressure
   - Lack of fuel
   - Fuel injector
   - Incorrect PCV hose connection
   - PCV valve
   - Mass air flow sensor
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1minute under no load.
6. Let engine idle for 1 minute.
7. Increase the engine speed up to 4,000 to 5,000 rpm and keep it for 10 seconds.
8. Fully release accelerator pedal and then let engine idle for about 1 minute.
9. Select Service $07 with GST.
   If 1st trip DTC is detected, go to EC-281, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS006UQ





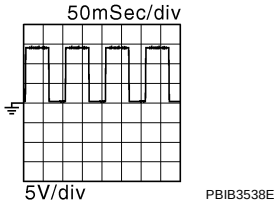


TBWT1632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

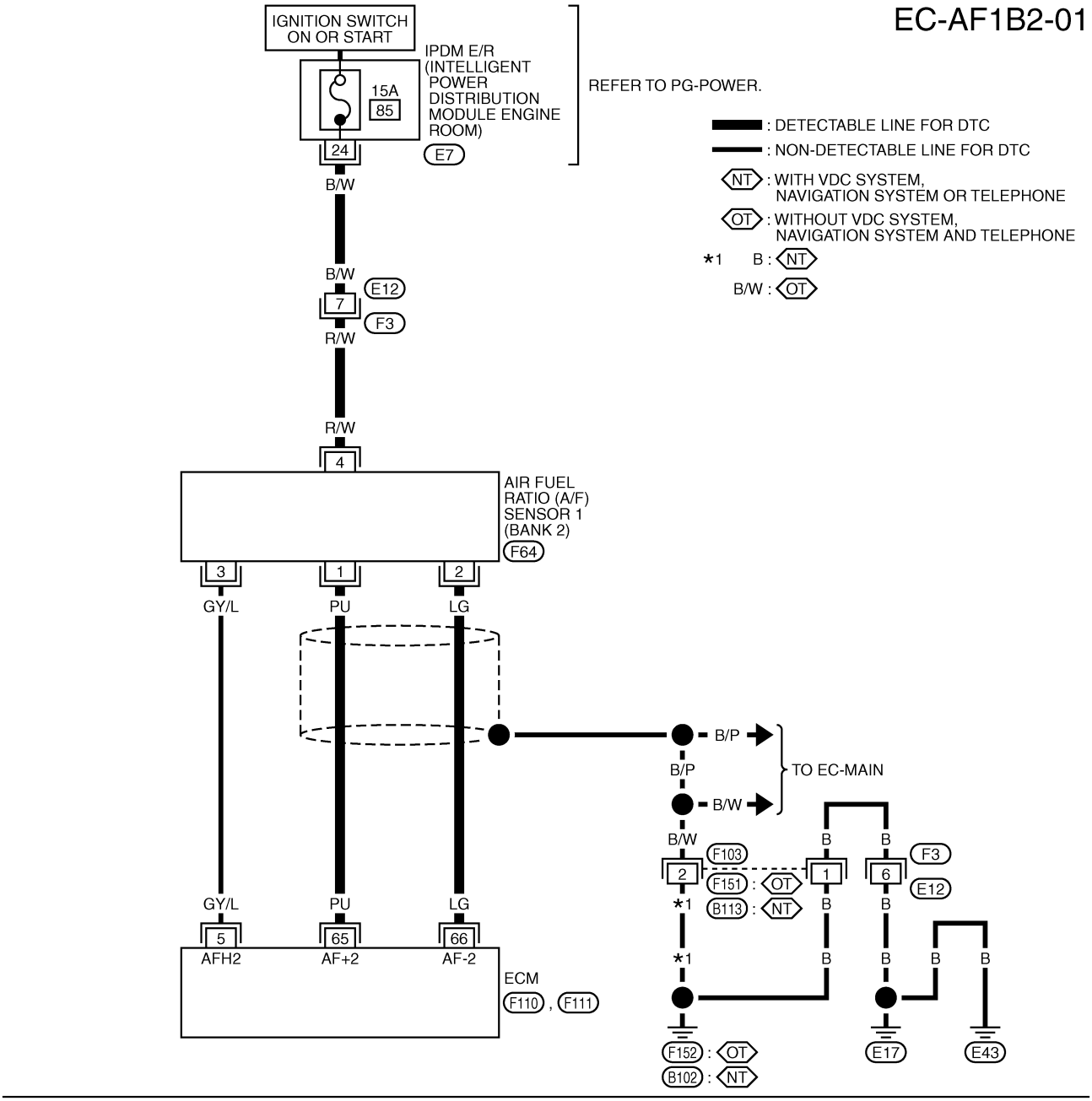
CAUTION:

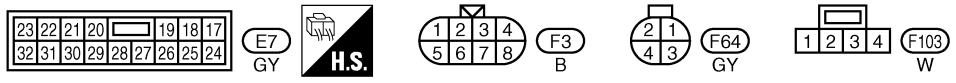
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

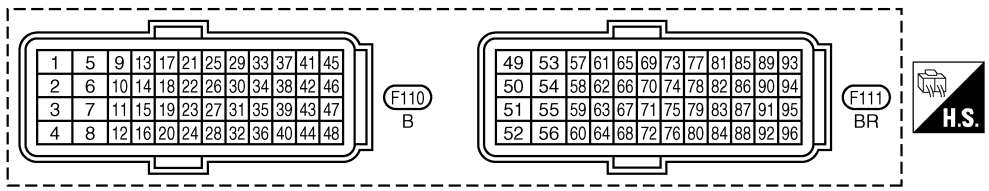
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★ 
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2





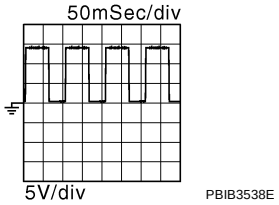


TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

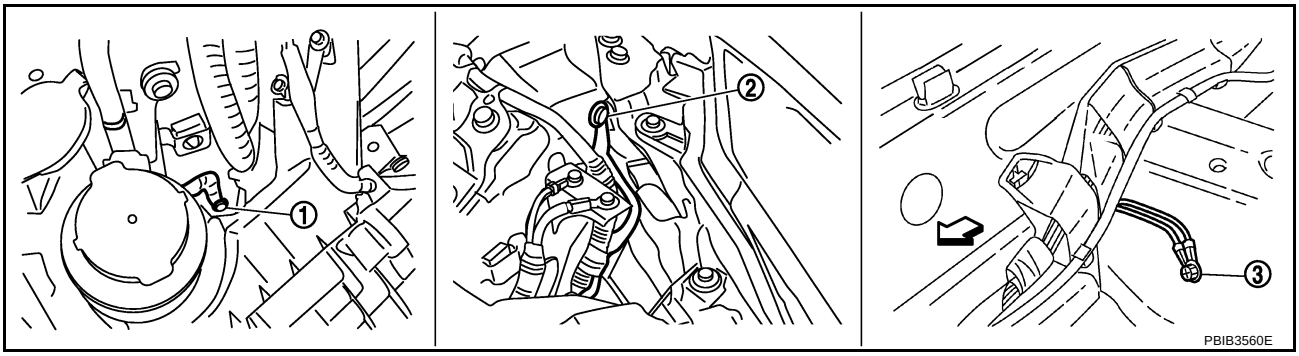
Diagnostic Procedure

NBS006UR

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

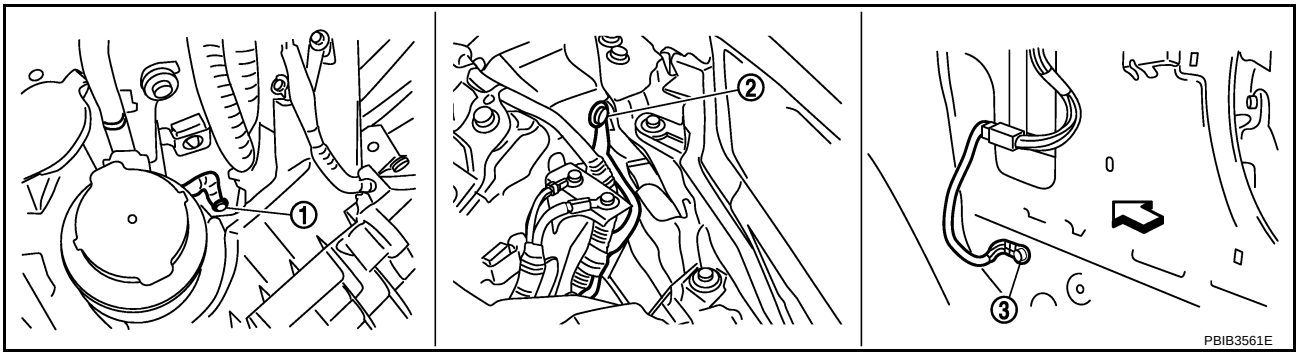


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

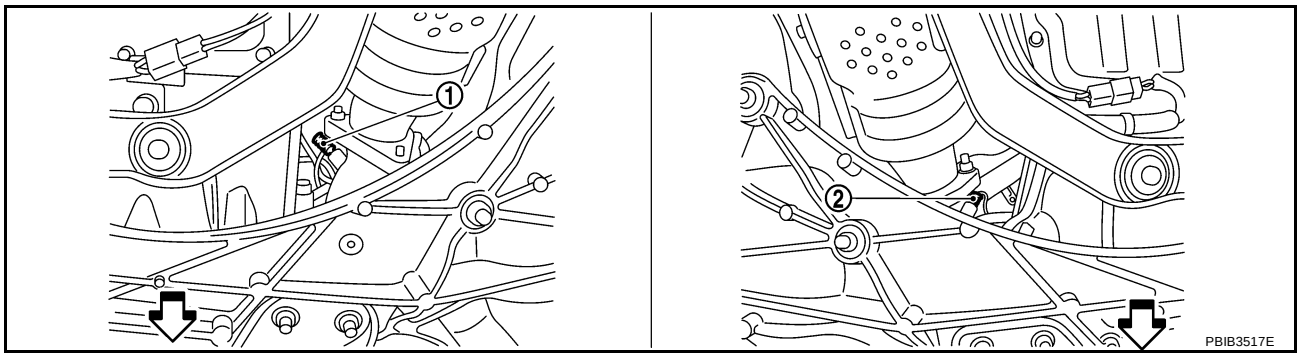
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. RETIGHTEN AIR FUEL RATIO (A/F) SENSOR 1

Loosen and retighten the air fuel ratio (A/F) sensor 1.



1. A/F sensor 1 (bank 1)
2. A/F sensor 1 (bank 2)

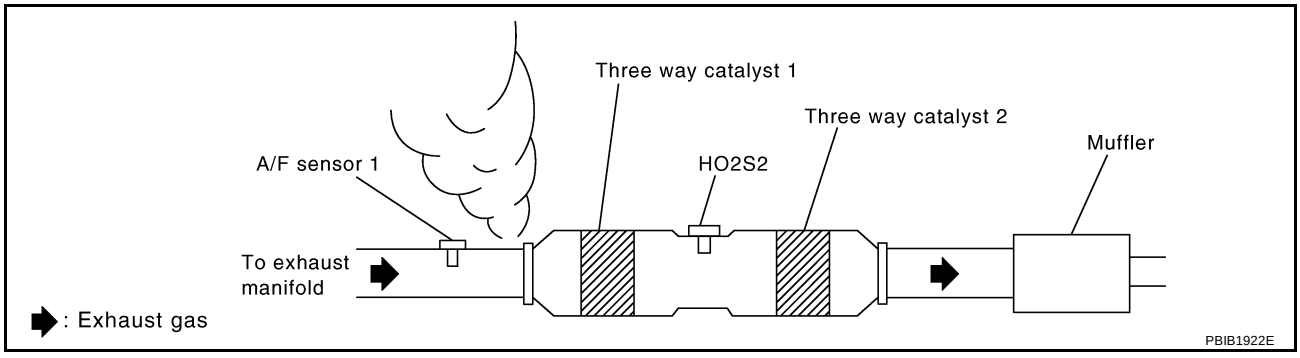
⇦: Vehicle front

Tightening torque: 50 N-m (5.1 kg-m, 37 ft-lb)

>> GO TO 3.

3. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace.

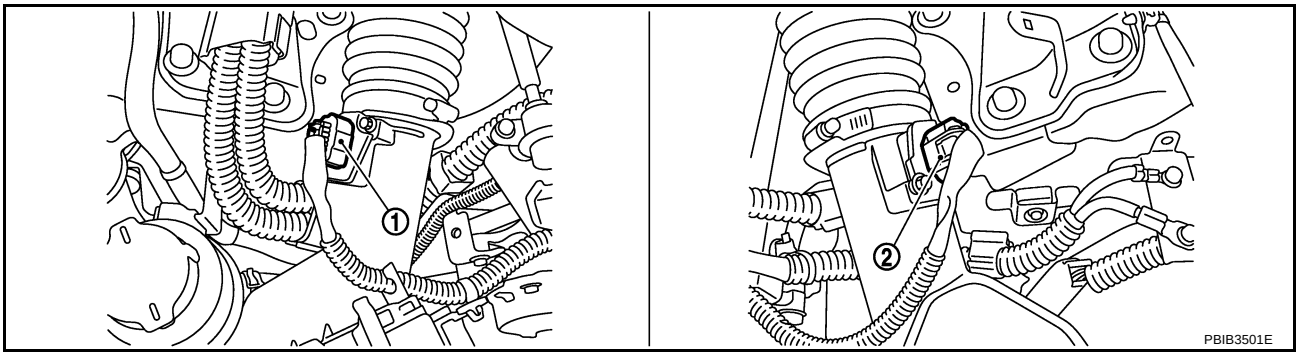
5. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR” or “START”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0174 or P0172 or P0175 detected? Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.
9. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0174 or P0172 or P0175 detected? Is it difficult to start engine?

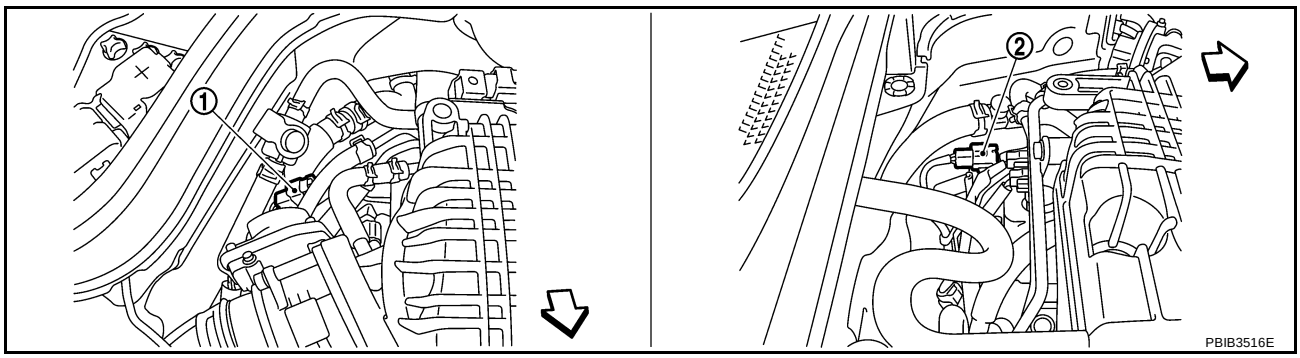
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-324, "DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION" or EC-334, "DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 6.

6. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.

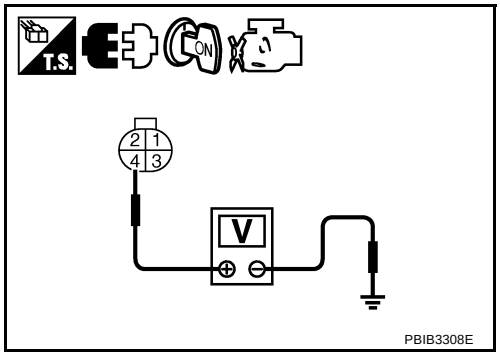


1. A/F sensor 1 harness connector (bank 1)
2. A/F sensor 1 harness connector (bank 2)

⇦: Vehicle front

3. Turn ignition switch ON.
4. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

8. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to EC-172, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace malfunctioning A/F sensor 1.

10. CHECK MASS AIR FLOW SENSOR

Refer to EC-206, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace malfunctioning mass air flow sensor.

11. CHECK PCV VALVE

Refer to EC-44, "POSITIVE CRANKCASE VENTILATION" .

OK or NG

OK >> GO TO 12.
NG >> Repair or replace PCV valve.

12. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 13.
NG >> Repair or replace.

13. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads (using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12) and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

NBS006US

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

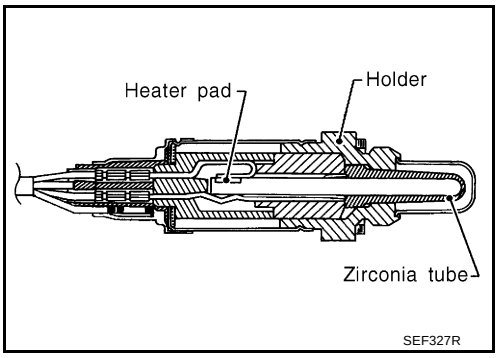
DTC P0137, P0157 HO2S2

PFP:226A0

Component Description

NBS000CW

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-III Reference Value in Data Monitor Mode

NBS000CX

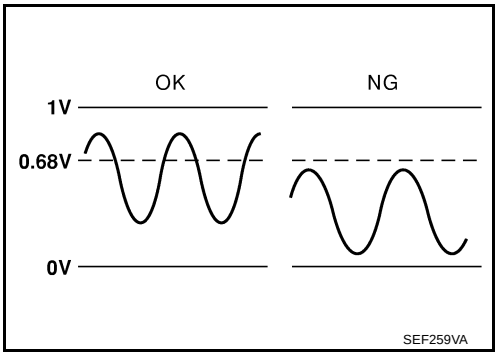
Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	LEAN ←→ RICH

On Board Diagnosis Logic

NBS000CY

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity before the three way catalyst 1 causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the maximum voltage of the sensor is sufficiently high during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0137 0137 (Bank 1) P0157 0157 (Bank 2)	Heated oxygen sensor 2 circuit low voltage	The maximum voltage from the sensor is not reached to the specified voltage.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector ● Intake air leaks

DTC Confirmation Procedure

NBS000CZ

NOTE:
If DTC confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

TESTING CONDITION:
For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that "COOLAN TEMP/S" indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).
7. Open engine hood.
8. Select "HO2S2 (B1) P1147" (for DTC P0137) or "HO2S2 (B2) P1167" (for DTC P0157) of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-III.
9. Start engine and following the instruction of CONSULT-III.

   NOTE:
   It will take at most 10 minutes until "COMPLETED" is displayed.
10. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
    If "NG" is displayed, refer to EC-293, "Diagnostic Procedure" .
    If "CAN NOT BE DIAGNOSED" is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).

b. Return to step 1.

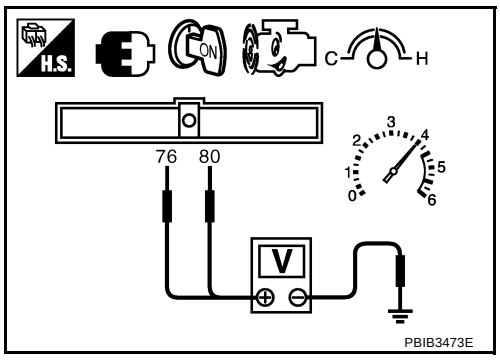
Overall Function Check

NBS000D0

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.68V at least once during this procedure.
   If the voltage can be confirmed in step 6, step 7 is not necessary.

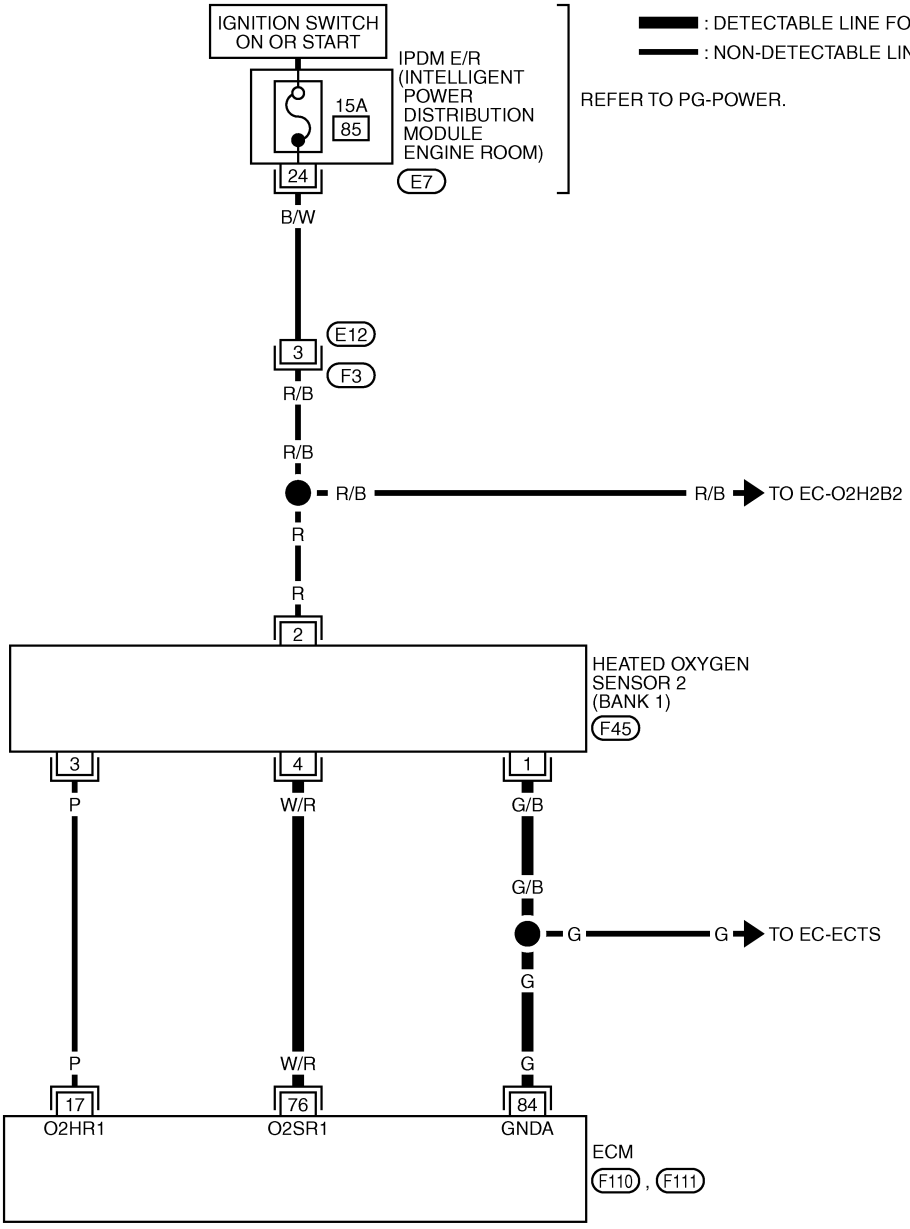


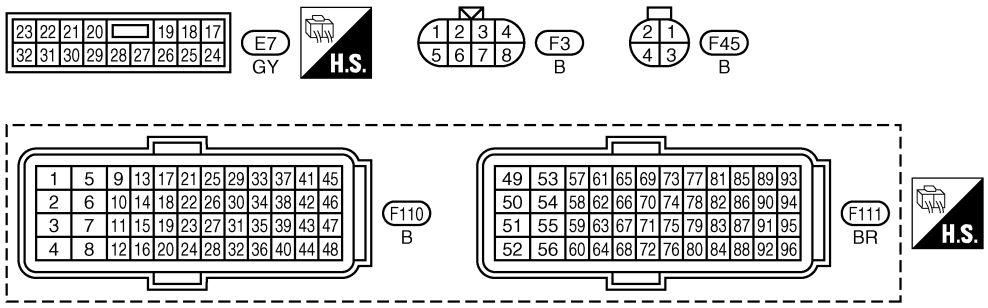
7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be above 0.68V at least once during this procedure.
8. If NG, go to EC-293, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS000D1

EC-O2S2B1-01



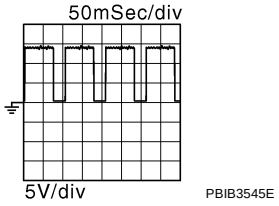


TBWT1634E

Specification data are reference values and are measured between each terminal and ground.

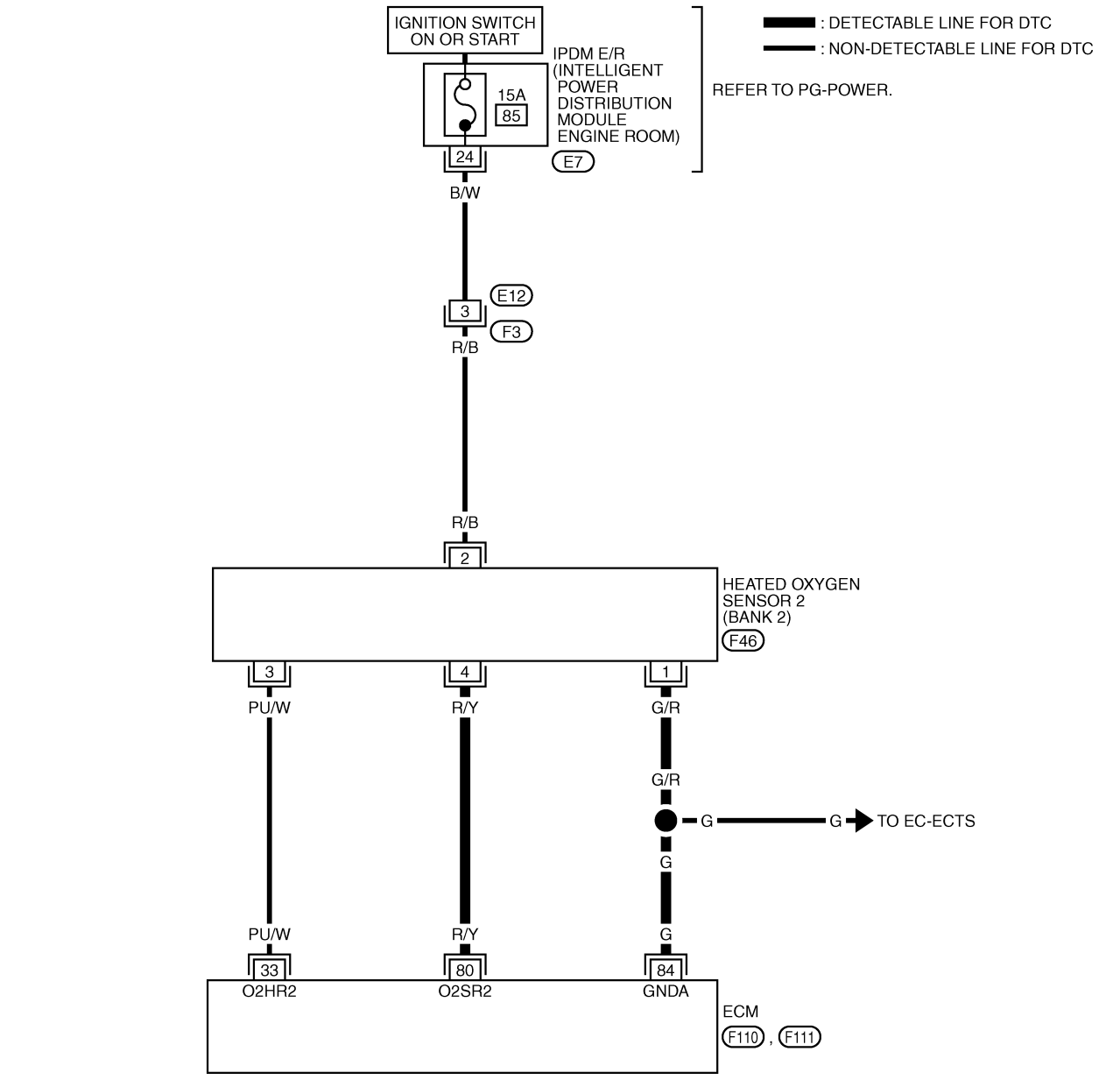
CAUTION:

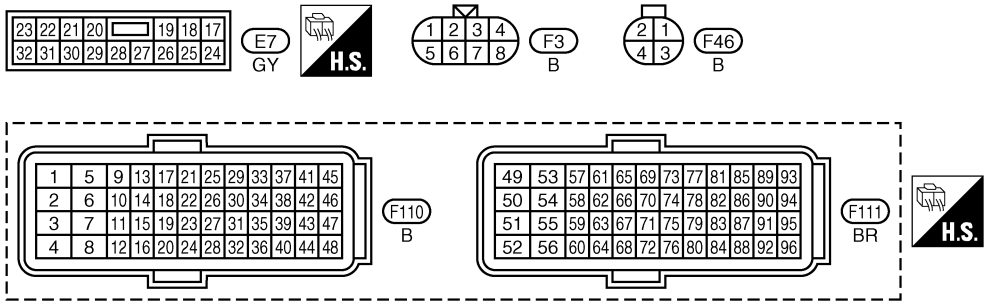
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

BANK 2

EC-O2S2B2-01



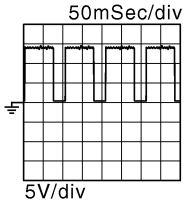


TBWT1635E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

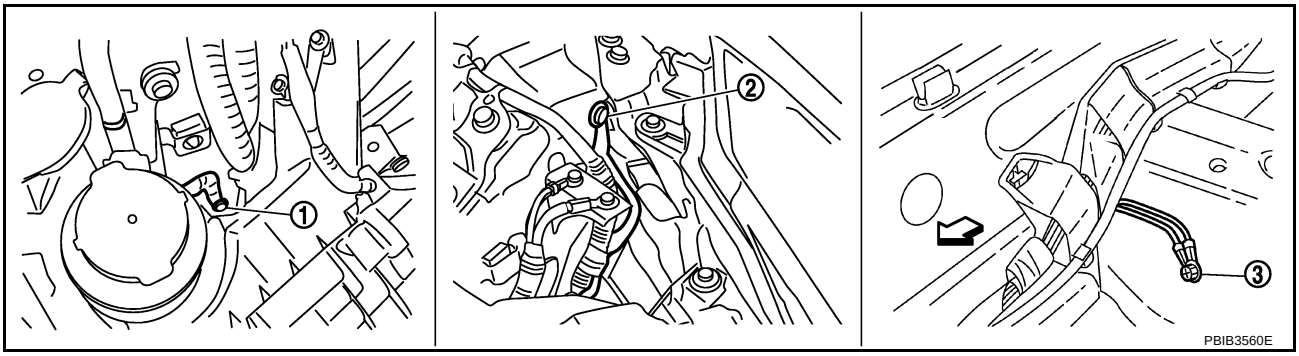
Diagnostic Procedure

NBS000D2

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

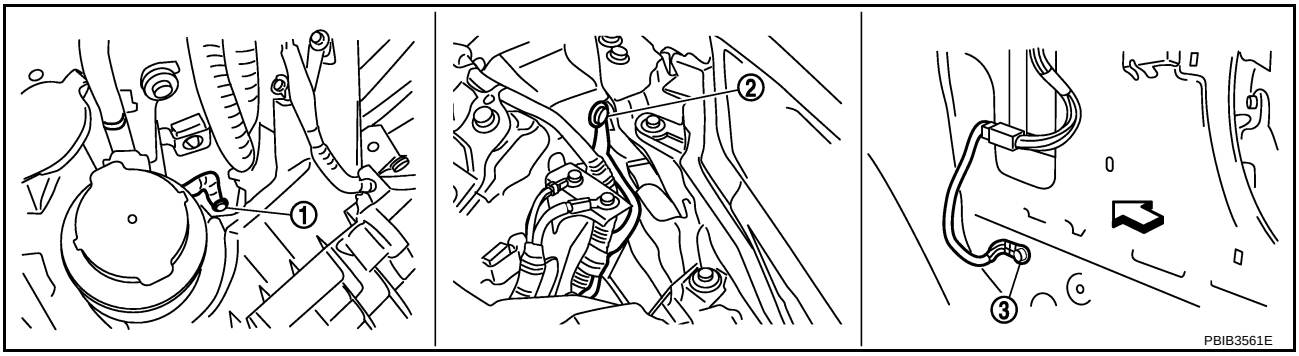


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

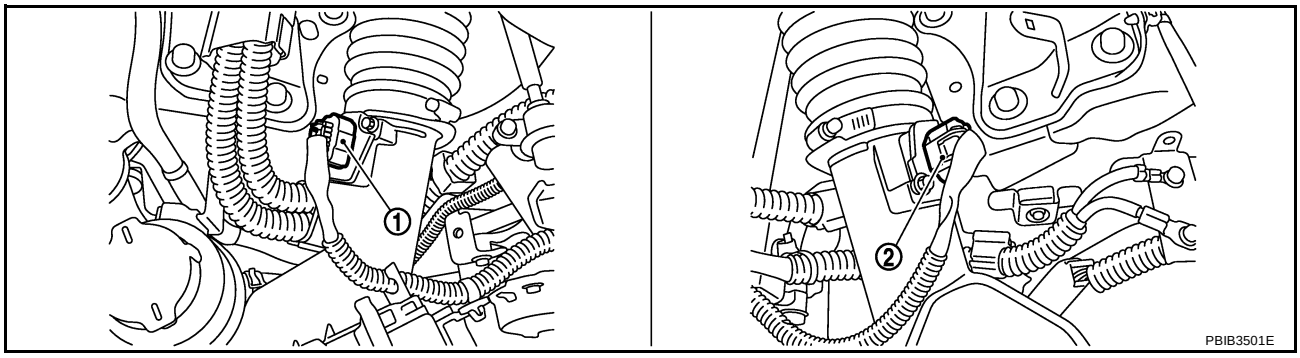
2. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171 or P0174 detected?
   Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector, and restart and run engine for at least 5 seconds at idle speed.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171 or P0174 detected?
   Is it difficult to start engine?

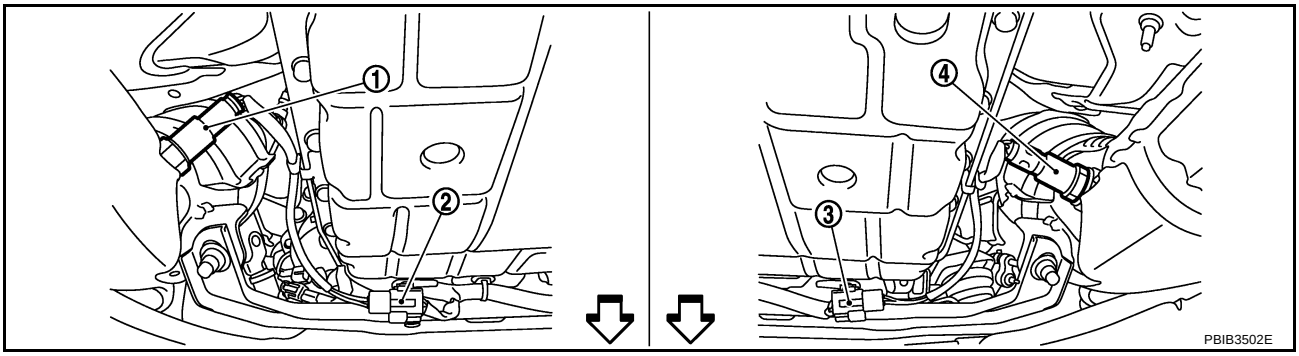
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171or P0174. Refer to EC-324, "DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect heated oxygen sensor 2 harness connector.



1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

4. Check harness continuity between HO2S2 terminal 1 and ECM terminal 84. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0137	76	4	1
P0157	80	4	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0137	76	4	1
P0157	80	4	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-296, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

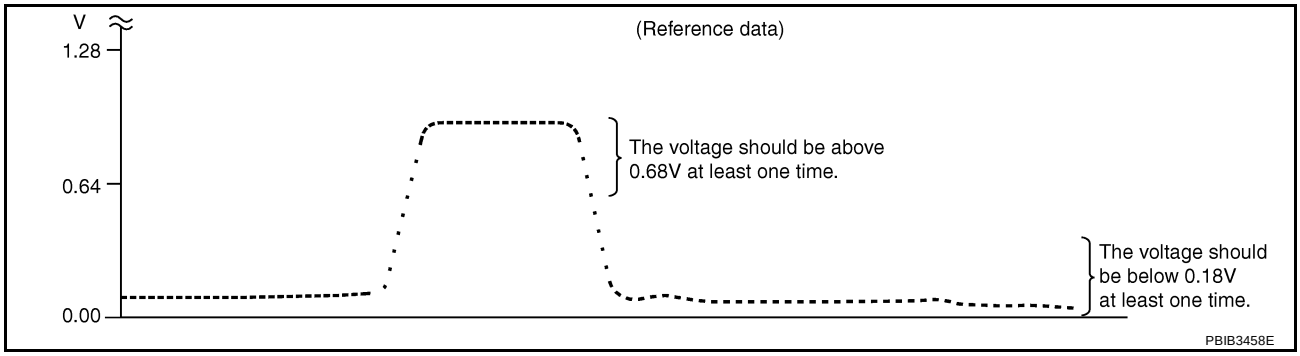
Component Inspection

NBS000D3

HEATED OXYGEN SENSOR 2

With CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-III.
7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.68V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is −25%.

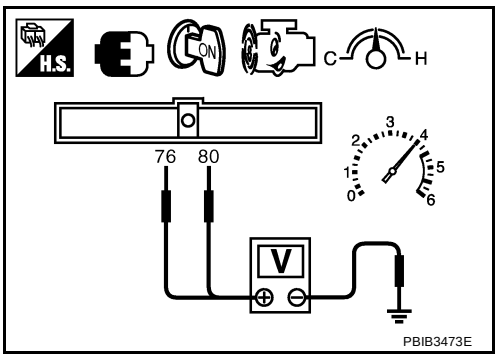
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
(Depress and release accelerator pedal as soon as possible.)
The voltage should be above 0.68V at least once during this procedure.
If the voltage is above 0.68V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

NBS000D4

HEATED OXYGEN SENSOR 2

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

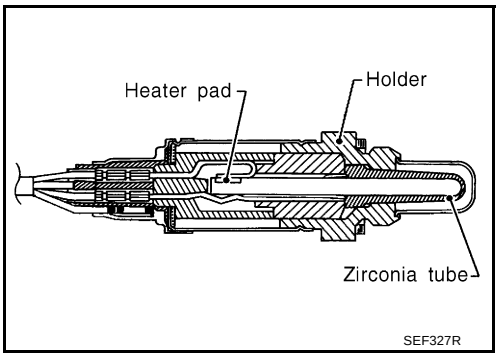
DTC P0138, P0158 HO2S2

PFP:226A0

Component Description

NBS001NK

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-III Reference Value in Data Monitor Mode

NBS001NL

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	LEAN ←→ RICH

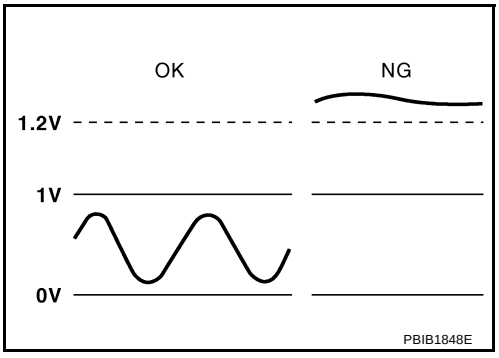
On Board Diagnosis Logic

NBS001NM

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst 1 causes the longer switching time.

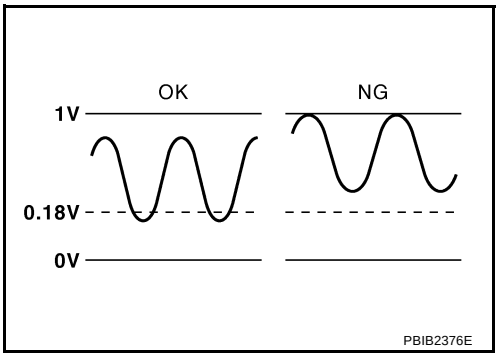
MALFUNCTION A

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during the various driving condition such as fuel-cut.



MALFUNCTION B

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0138 0138 (Bank 1)	Heated oxygen sensor 2 circuit high voltage	A)	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2
P0158 0158 (Bank 2)		B)	The minimum voltage from the sensor is not reached to the specified voltage.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector

DTC Confirmation Procedure

NBS001NN

Perform PROCEDURE FOR MALFUNCTION A first.
If DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

With CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 2 minutes.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-305, "PROCEDURE FOR MALFUNCTION A" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION B

With CONSULT-III

TESTING CONDITION:
For better results, perform “DTC WORK SUPPORT” at a temperature of 0 to 30 °C (32 to 86 °F).

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Make sure that “COOLAN TEMP/S” indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when “COOLAN TEMP/S” indication reaches to 70°C (158°F).
6. Open engine hood.
7. Select “HO2S2 (B1) P1146” (for DTC P0138) or “HO2S2 (B2) P1166” (for DTC P0158) of “HO2S2” in “DTC WORK SUPPORT” mode with CONSULT-III.
8. Start engine and following the instruction of CONSULT-III.
   NOTE:
   It will take at most 10 minutes until “COMPLETED” is displayed.
9. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”.
   If “NG” is displayed, refer to EC-308, "PROCEDURE FOR MALFUNCTION B" .
   If “CAN NOT BE DIAGNOSED” is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
b. Return to step 1.

Overall Function Check

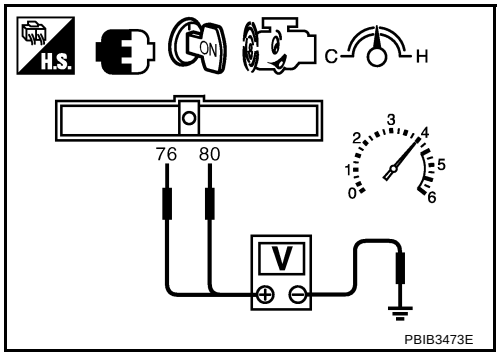
NBS001NW

PROCEDURE FOR MALFUNCTION B

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

With GST

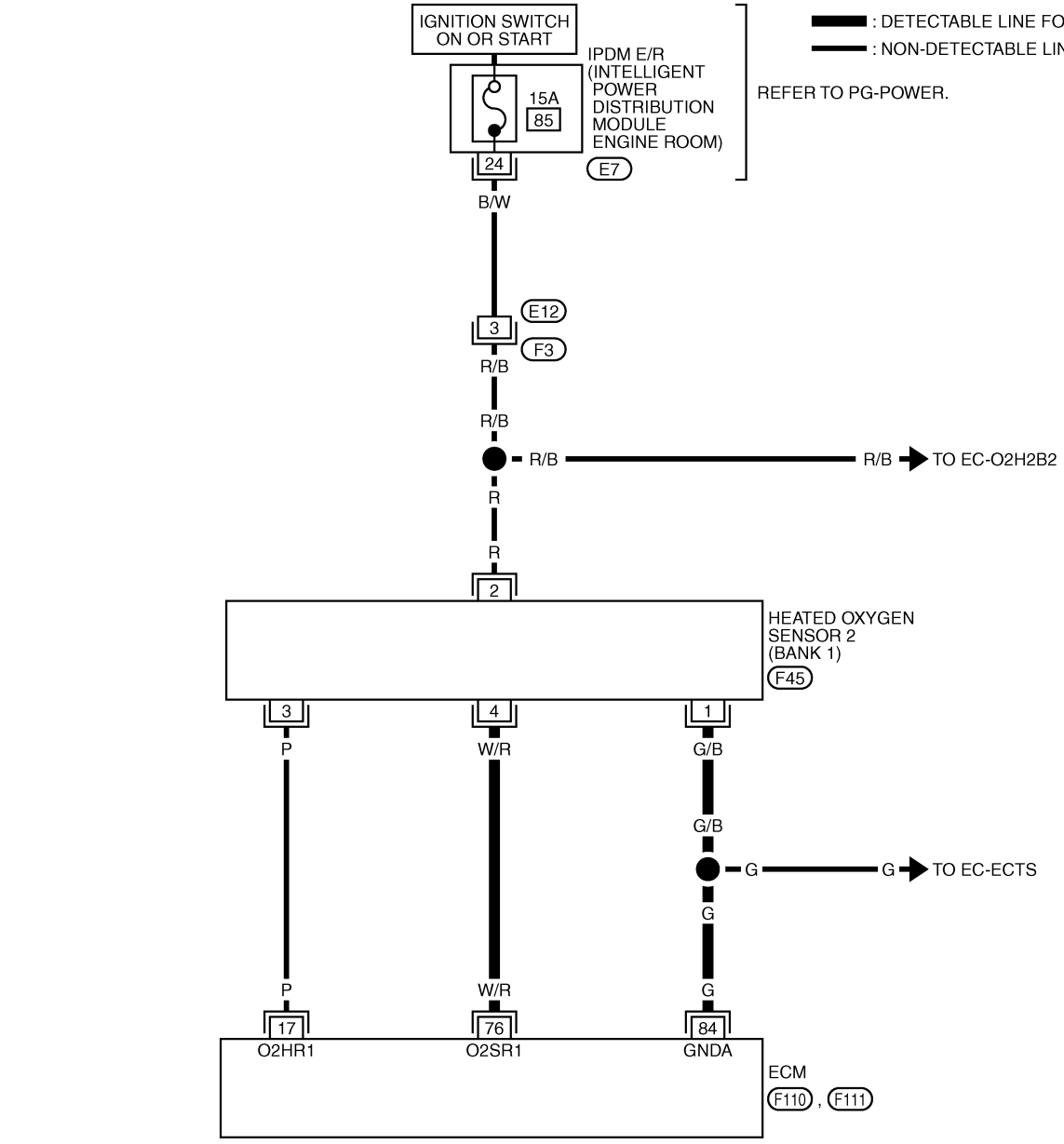
1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B2) signal] or 80 [HO2S2 (B1) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be below 0.18V at least once during this procedure.
   If the voltage can be confirmed in step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position.
   The voltage should be below 0.18V at least once during this procedure.
8. If NG, go to EC-308, "PROCEDURE FOR MALFUNCTION B" .



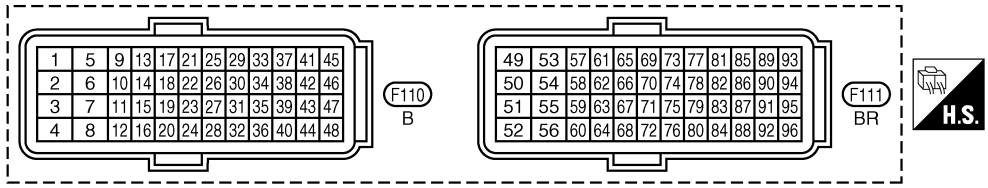
Wiring Diagram
BANK 1

NBS006UT

EC-O2S2B1-01





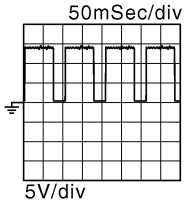


TBWT1634E

Specification data are reference values and are measured between each terminal and ground.

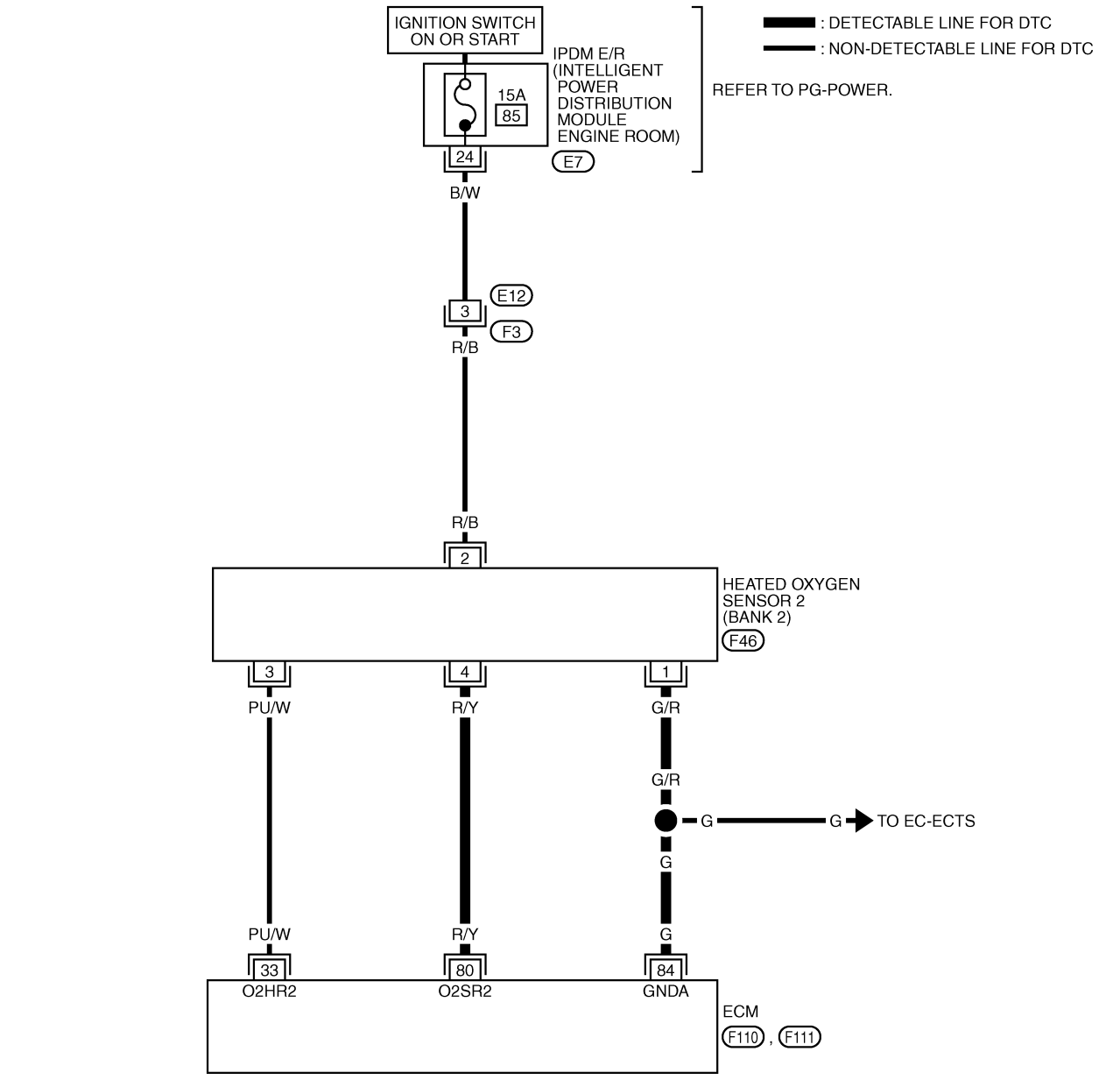
CAUTION:

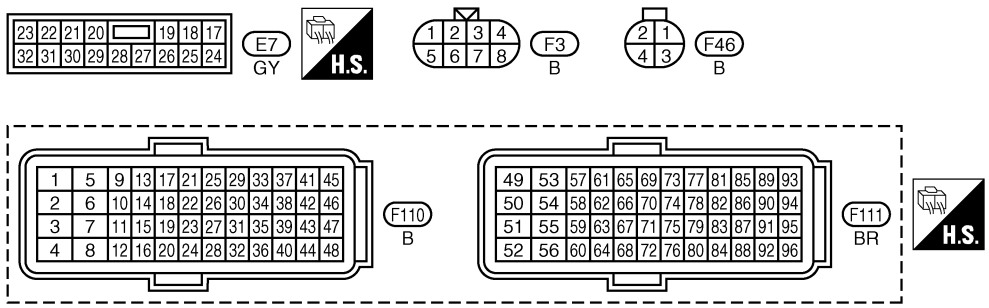
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

BANK 2

EC-O2S2B2-01



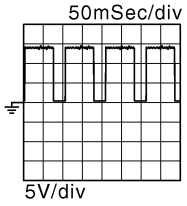


TBWT1635E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

Diagnostic Procedure

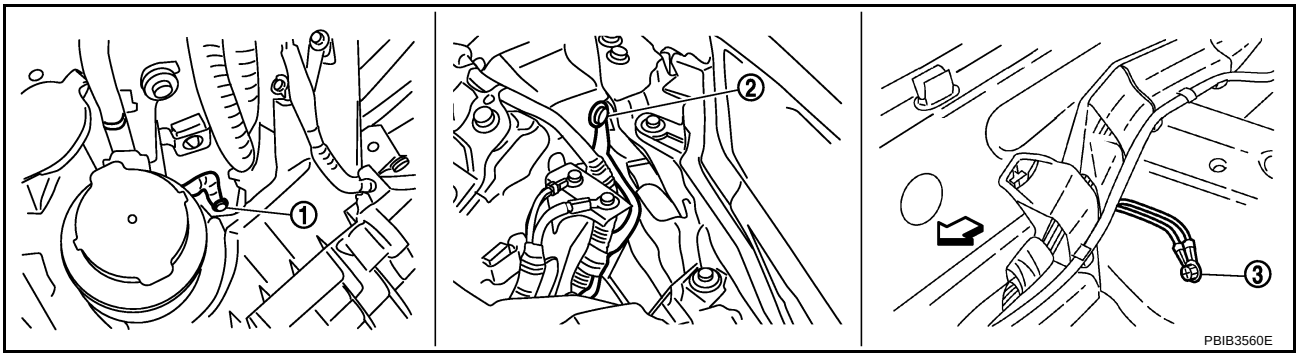
NBS001NO

PROCEDURE FOR MALFUNCTION A

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

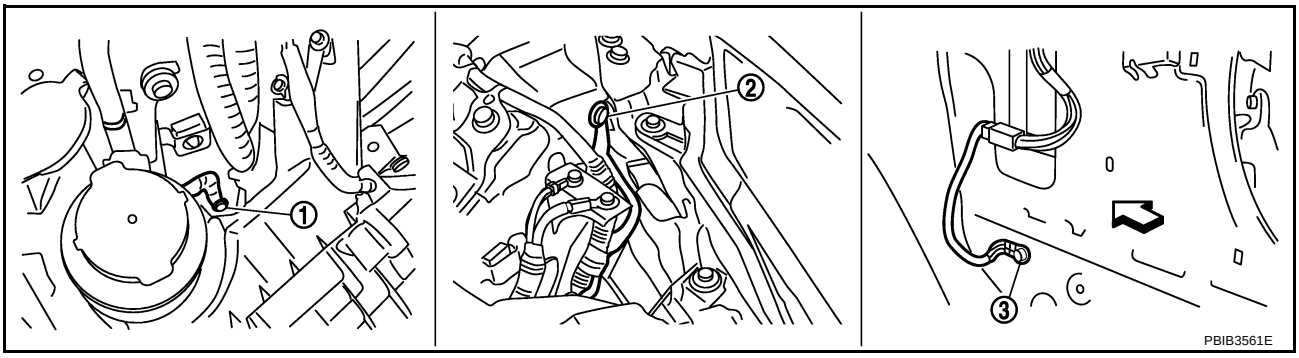


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

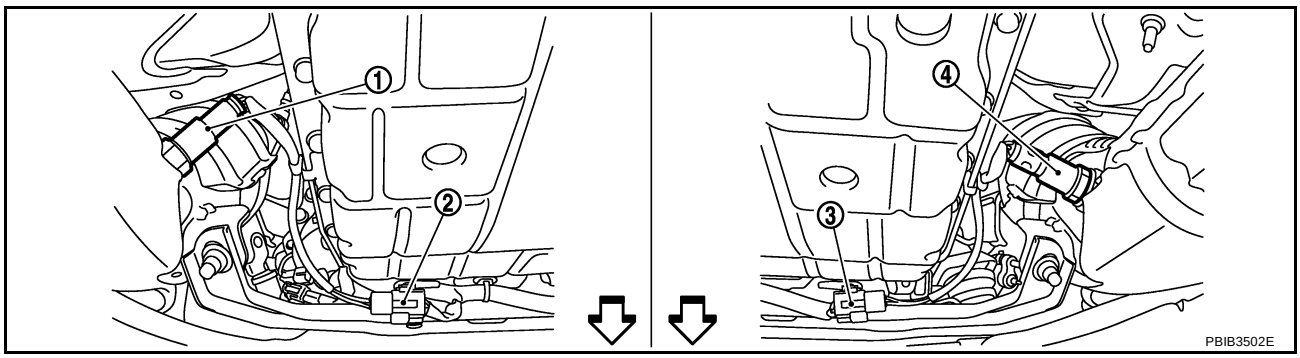
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Disconnect heated oxygen sensor 2 harness connector.



1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

2. Disconnect ECM harness connector.
3. Check harness continuity between HO2S2 terminal 1 and ECM terminal 84. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	76	4	1
P0158	80	4	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	76	4	1
P0158	80	4	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 CONNECTOR FOR WATER

Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-296, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

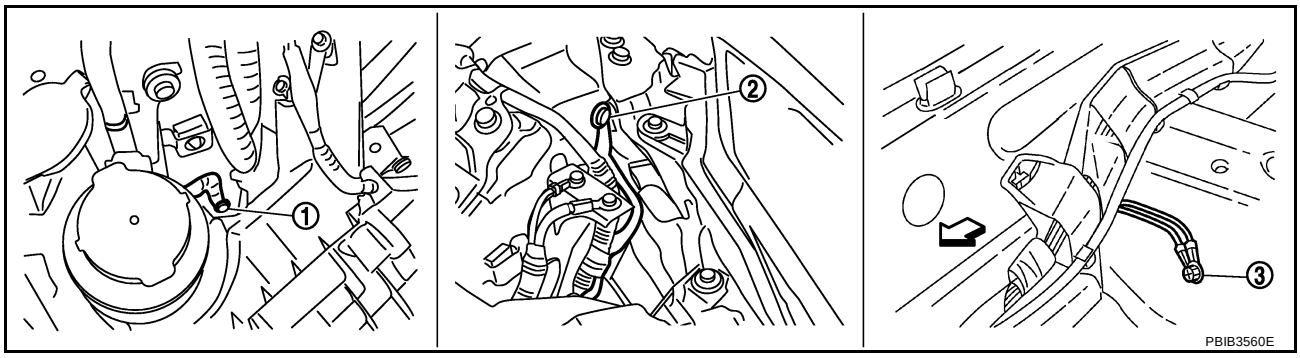
>> **INSPECTION END**

PROCEDURE FOR MALFUNCTION B

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

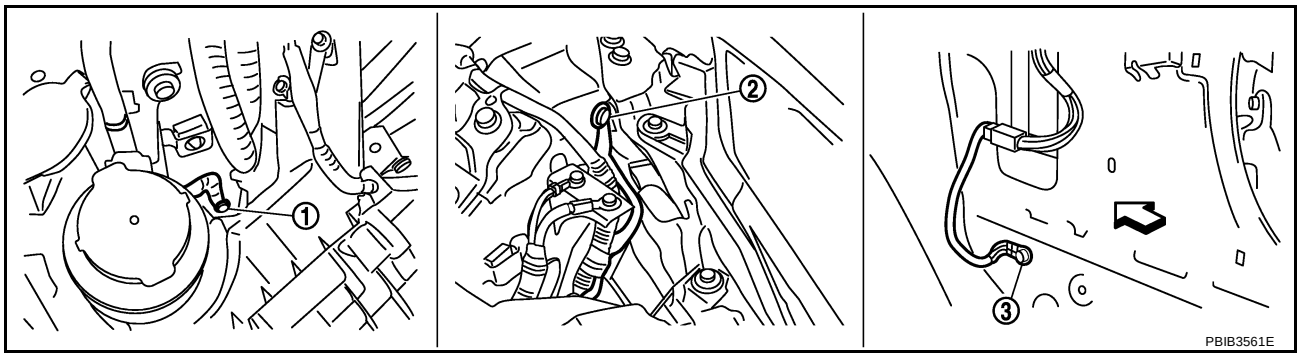


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

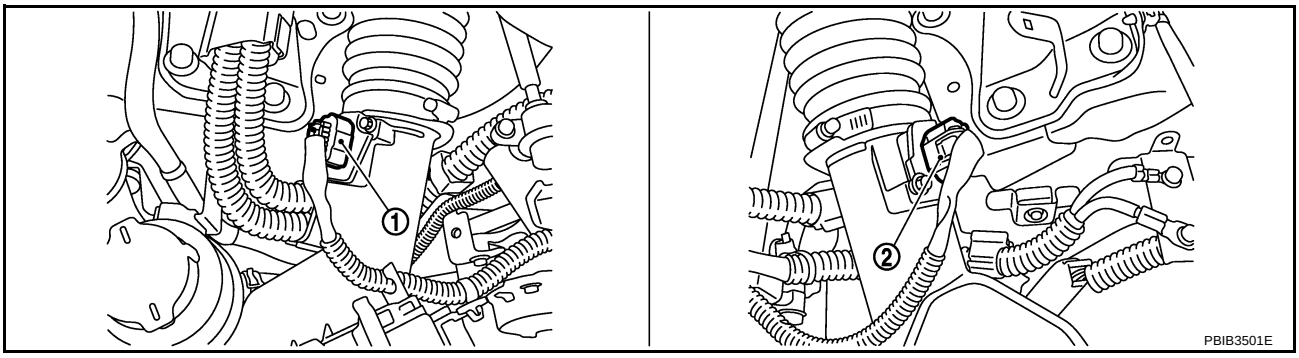
2. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0172 or P0175 detected?
   Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector, and restart and run engine for at least 5 seconds at idle speed.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0172 or P0175 detected?
   Is it difficult to start engine?

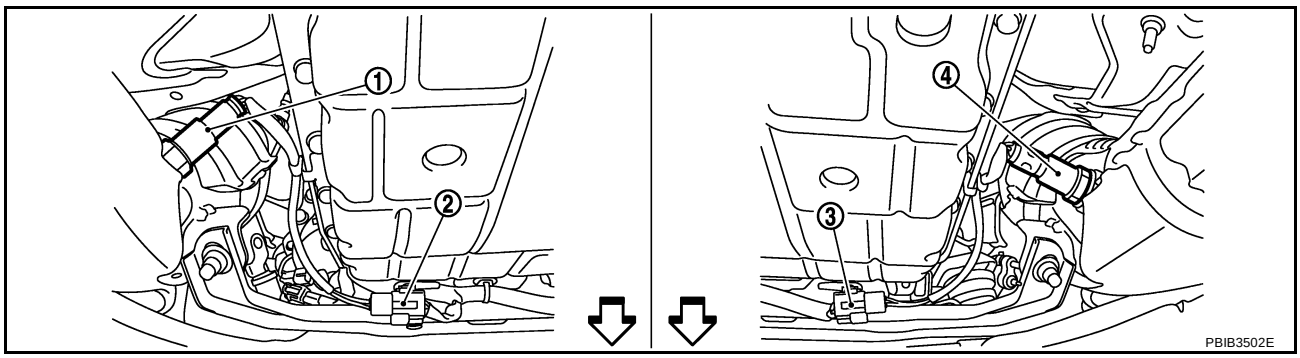
Yes or No

Yes >> Perform trouble diagnosis for DTC P0172, P0175. Refer to EC-334, "DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 harness connector.



1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between HO2S2 terminal 1 and ECM terminal 84. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	76	4	1
P0158	80	4	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	76	4	1
P0158	80	4	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-296, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

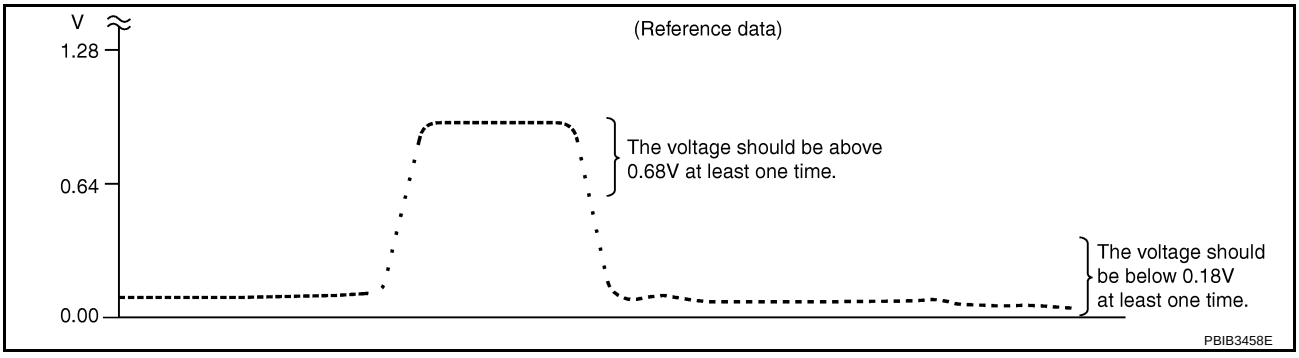
Component Inspection

NBS0006P

HEATED OXYGEN SENSOR 2

With CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-III.
7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.68V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is −25%.

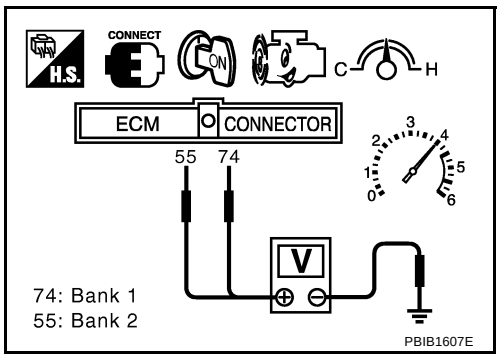
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.68V at least once during this procedure.
   If the voltage is above 0.68V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

NBS0006Q

HEATED OXYGEN SENSOR 2

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

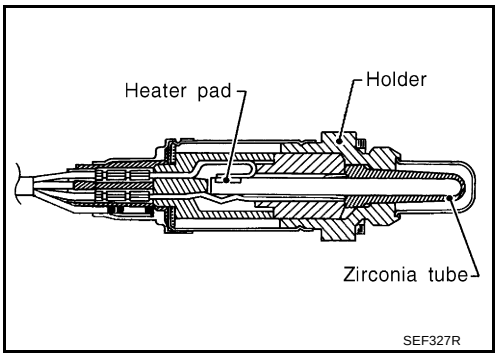
DTC P0139, P0159 HO2S2

PFP:226A0

Component Description

NBS0006R

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-III Reference Value in Data Monitor Mode

NBS0006S

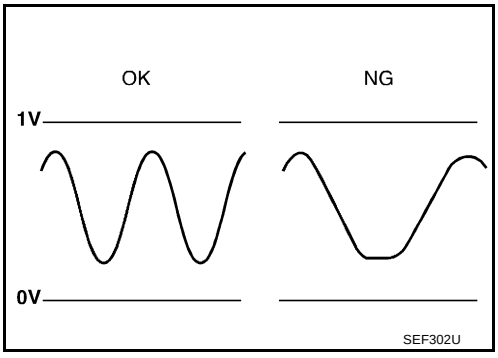
Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	LEAN ←→ RICH

On Board Diagnosis Logic

NBS0006T

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity before the three way catalyst 1 causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the switching response of the sensor's voltage is faster than specified during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0139 0139 (Bank 1) P0159 0159 (Bank 2)	Heated oxygen sensor 2 circuit slow response	It takes more time for the sensor to respond between rich and lean than the specified time.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector ● Intake air leaks

DTC Confirmation Procedure

NBS0006U

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

TESTING CONDITION:
For better results, perform “DTC WORK SUPPORT” at a temperature of 0 to 30 °C (32 to 86 °F).

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Make sure that “COOLAN TEMP/S” indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when “COOLAN TEMP/S” indication reaches to 70°C (158°F).
6. Select “HO2S2 (B1) P0139” or “HO2S2 (B2) P0159” of “HO2S2” in “DTC WORK SUPPORT” mode with CONSULT-III.
7. Start engine and following the instruction of CONSULT-III.
   NOTE:
   It will take at most 10 minutes until “COMPLETED” is displayed.
8. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”.
   If “NG” is displayed, refer to EC-319, "Diagnostic Procedure" .
   If “CAN NOT BE DIAGNOSED” is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
b. Return to step 1.

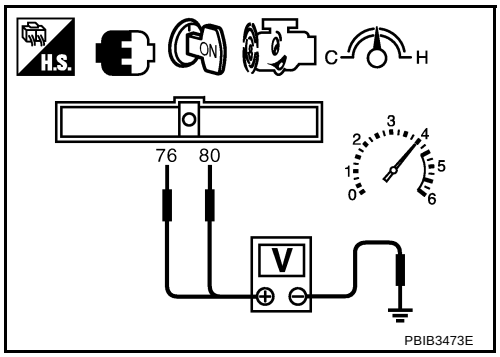
Overall Function Check

NBS0006V

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

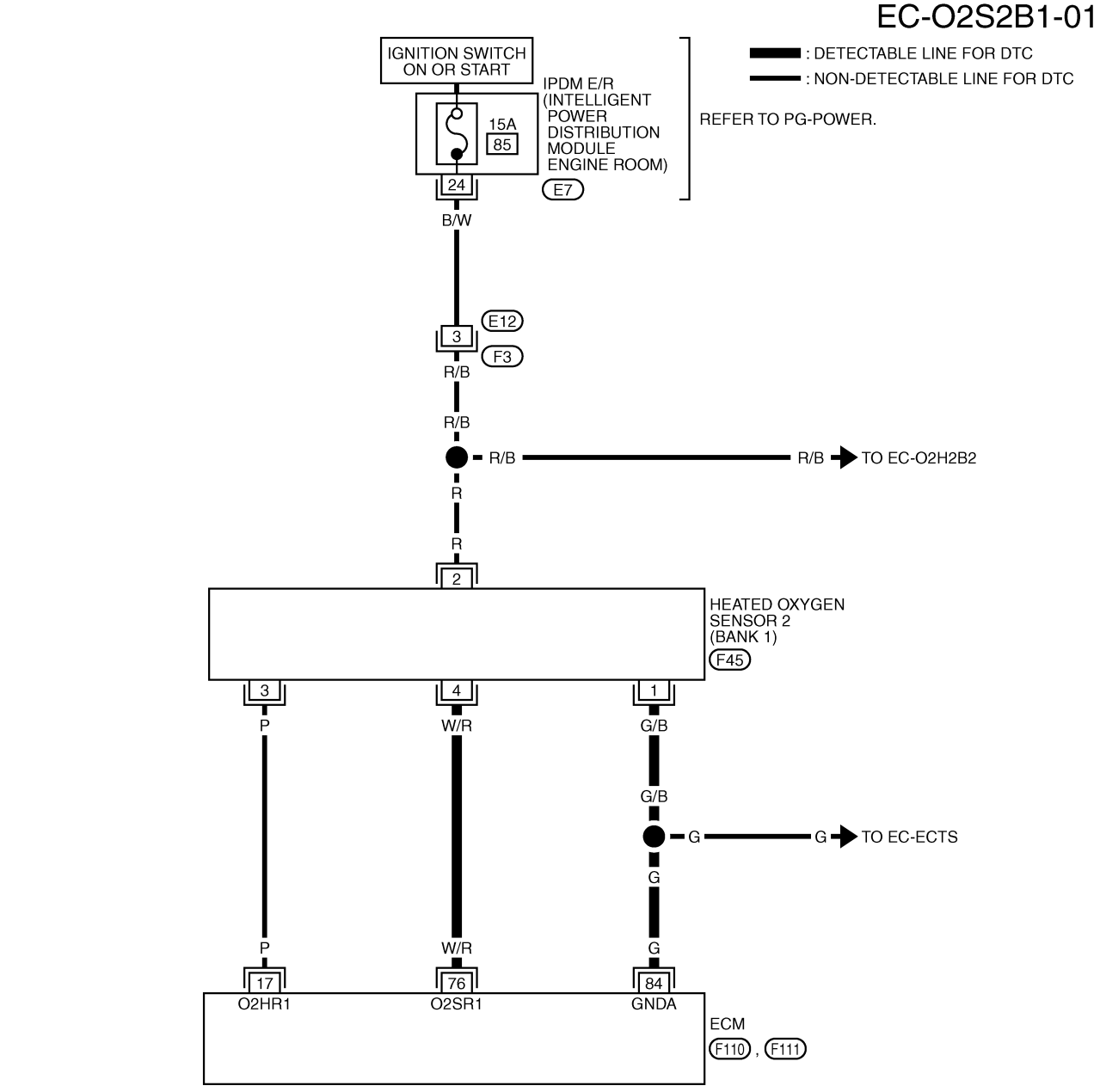
1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   A change of voltage should be more than 0.24V for 1 second during this procedure.
   If the voltage can be confirmed in step 6, step 7 is not necessary.

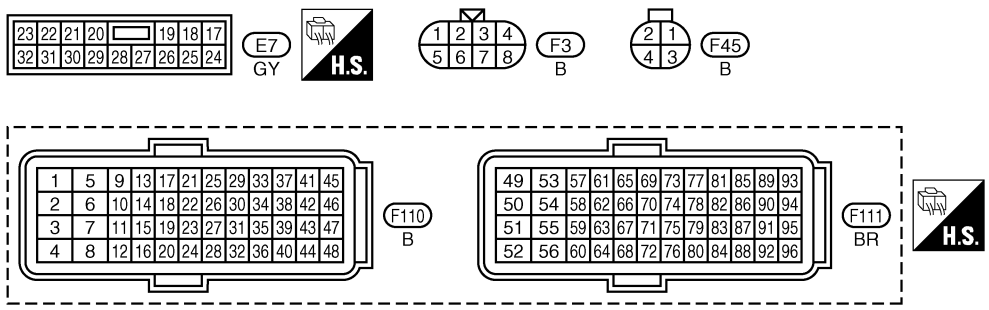


7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   A change of voltage should be more than 0.24V for 1 second during this procedure.
8. If NG, go to EC-319, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS006UU



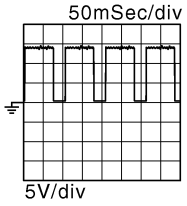


TBWT1634E

Specification data are reference values and are measured between each terminal and ground.

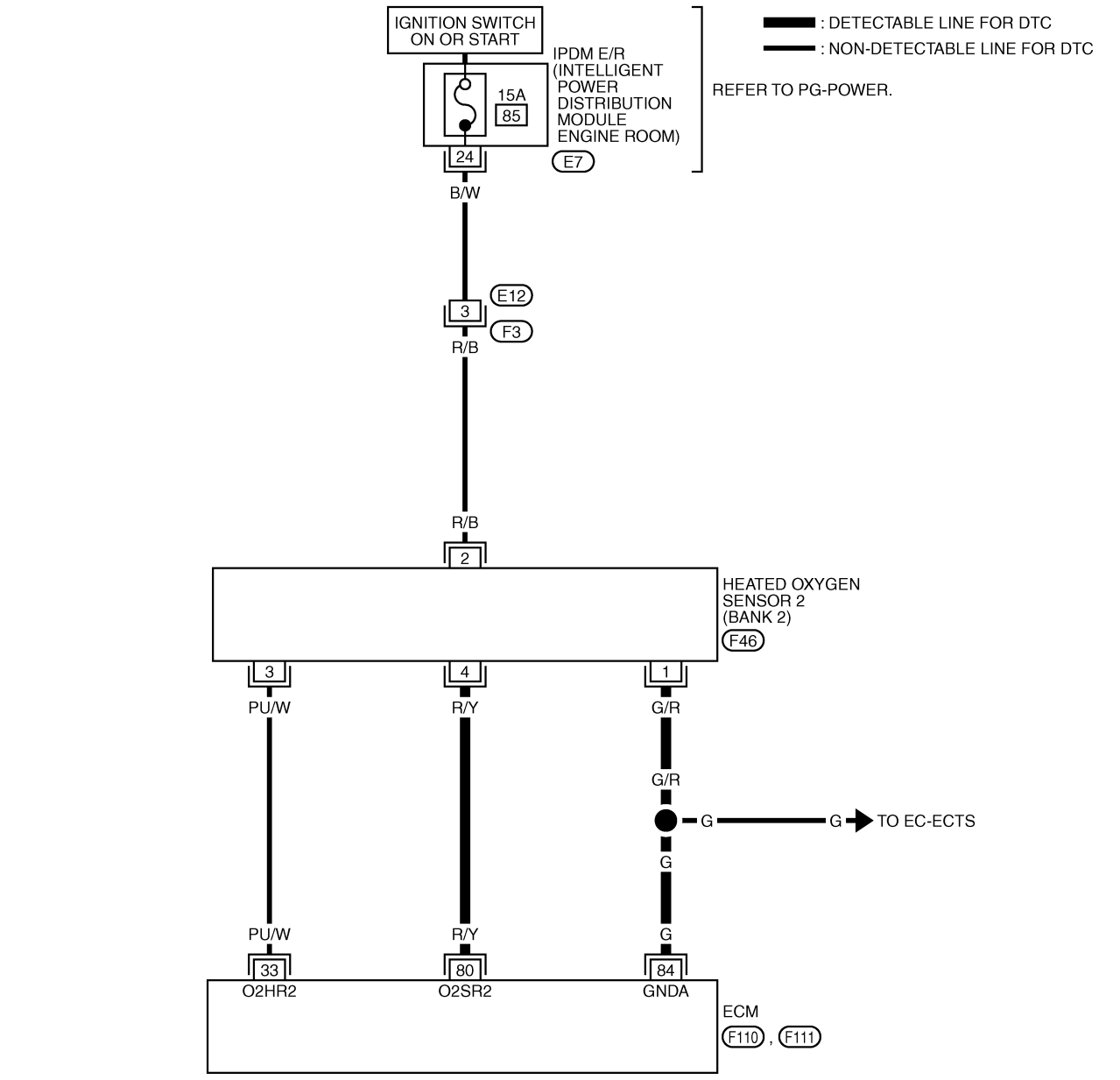
CAUTION:

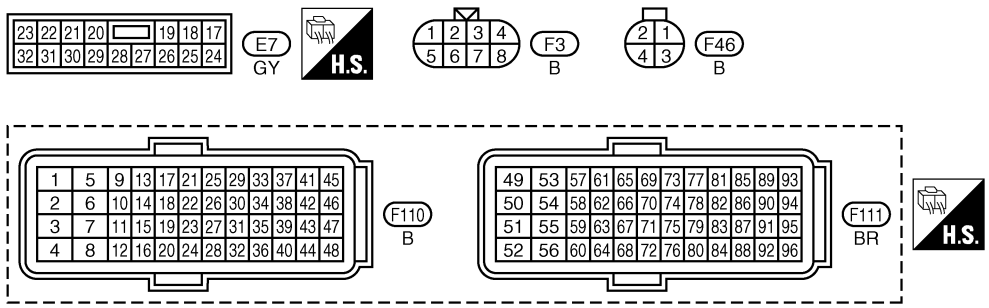
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

BANK 2

EC-O2S2B2-01



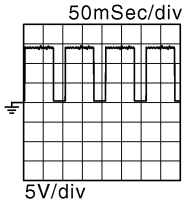


TBWT1635E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

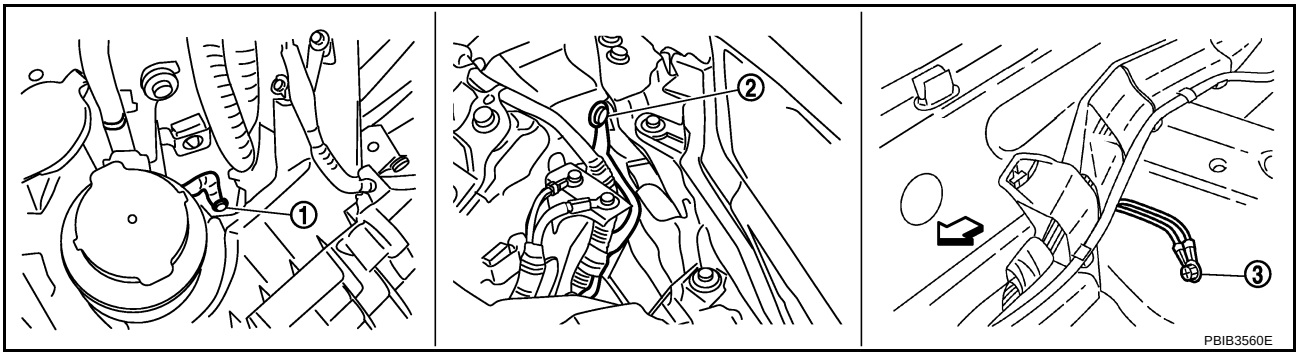
Diagnostic Procedure

NBS006UV

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

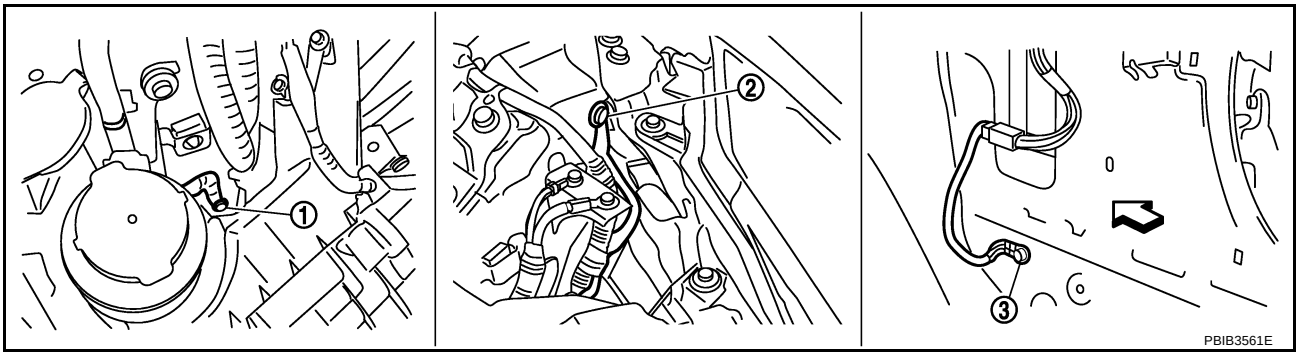


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

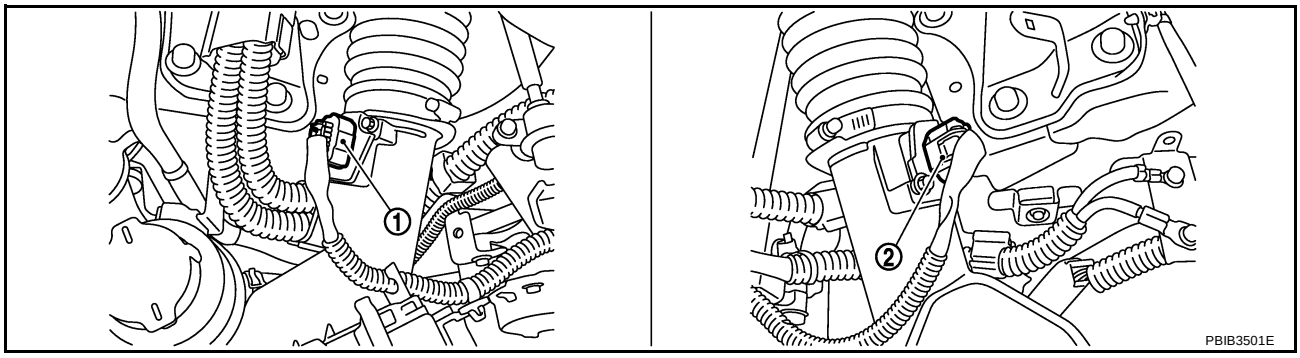
2. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector, and restart and run engine for at least 5 seconds at idle speed.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

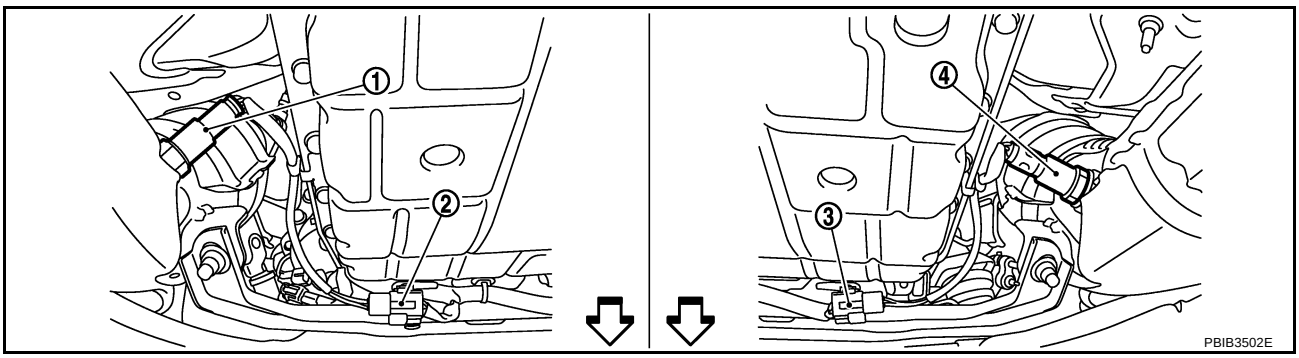
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-324, "DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION" or EC-334, "DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 harness connector.



1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between HO2S2 terminal 1 and ECM terminal 84. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0139	76	4	1
P0159	80	4	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0139	76	4	1
P0159	80	4	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-322, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

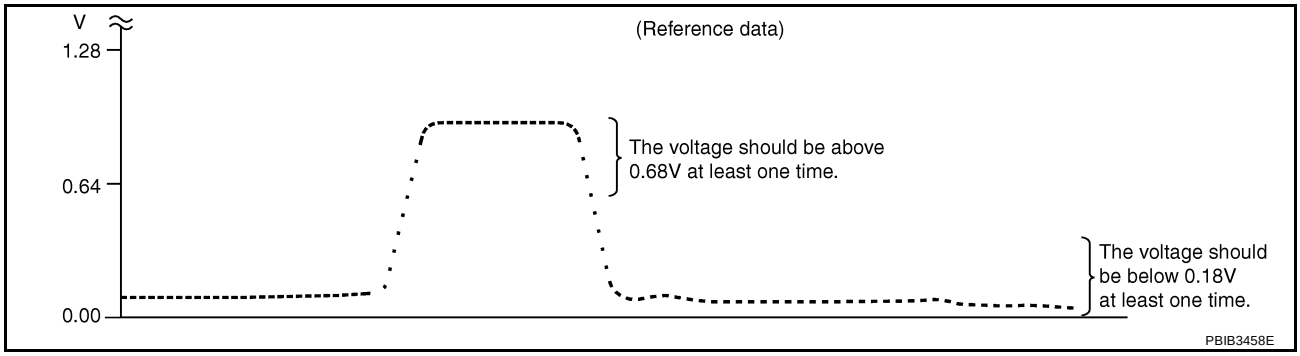
Component Inspection

NBS006UW

HEATED OXYGEN SENSOR 2

With CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-III.
7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.68V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is −25%.

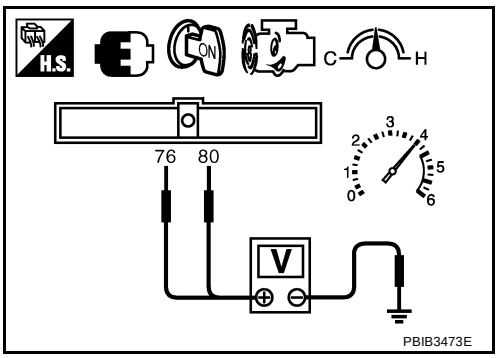
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
(Depress and release accelerator pedal as soon as possible.)
The voltage should be above 0.68V at least once during this procedure.
If the voltage is above 0.68V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

NBS006UX

HEATED OXYGEN SENSOR 2

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

NBS00070

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from the air fuel ratio (A/F) sensors 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.
In case the amount of the compensation value is extremely large (The actual mixture ratio is too lean.), the ECM judges the condition as the fuel injection system malfunction and lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0171 0171 (Bank 1)	Fuel injection system too lean	● Fuel injection system does not operate properly. ● The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)	● Intake air leaks ● Air fuel ratio (A/F) sensor 1 ● Fuel injector ● Exhaust gas leaks ● Incorrect fuel pressure ● Lack of fuel ● Mass air flow sensor ● Incorrect PCV hose connection
P0174 0174 (Bank 2)			

DTC Confirmation Procedure

NBS00071

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
4. Clear the self-learning control coefficient by touching “CLEAR”.
5. Start engine again and le it idle for at least 10 minutes.
6. Check 1st trip DTC.
   The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to EC-330, "Diagnostic Procedure" .

   NOTE:
   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

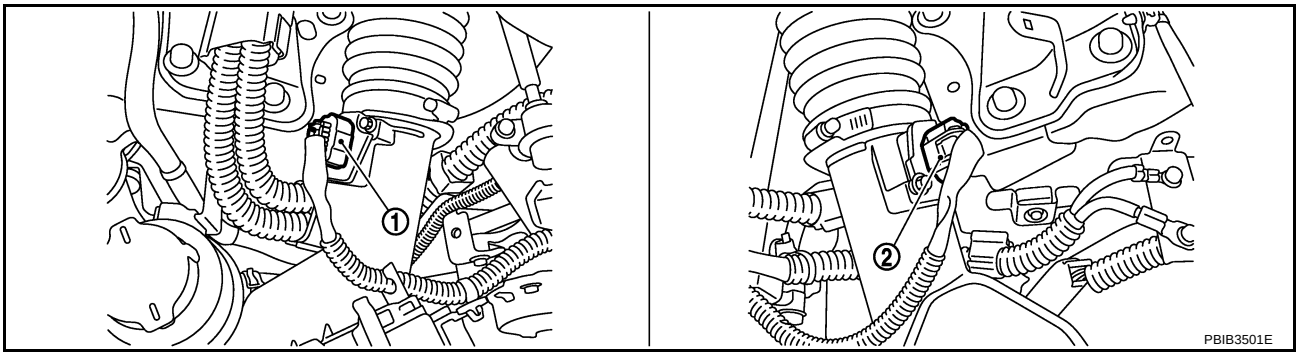
a. Turn ignition switch OFF and wait at least 10 seconds.
b. Start engine and select “DATA MONITOR” mode with CONSULT-III.
c. Drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for 10 minutes.
   Refer to the table below.
   Hold the accelerator pedal as steady as possible.
   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
8. Crank engine while depressing accelerator pedal. If engine starts, go to EC-330, "Diagnostic Procedure" . If engine does not start, check exhaust and intake air leak visually.

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
6. Select Service $03 with GST. Make sure DTC P0102 is detected.
7. Select Service $04 with GST and erase the DTC P0102.
8. Start engine again and let it idle for at least 10 minutes.
9. Select Service $07 with GST. The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to EC-330, "Diagnostic Procedure" .

   NOTE:
   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

a. Turn ignition switch OFF and wait at least 10 seconds.
b. Start engine and drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for 10 minutes. Refer to the table below.
   Hold the accelerator pedal as steady as possible.
   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

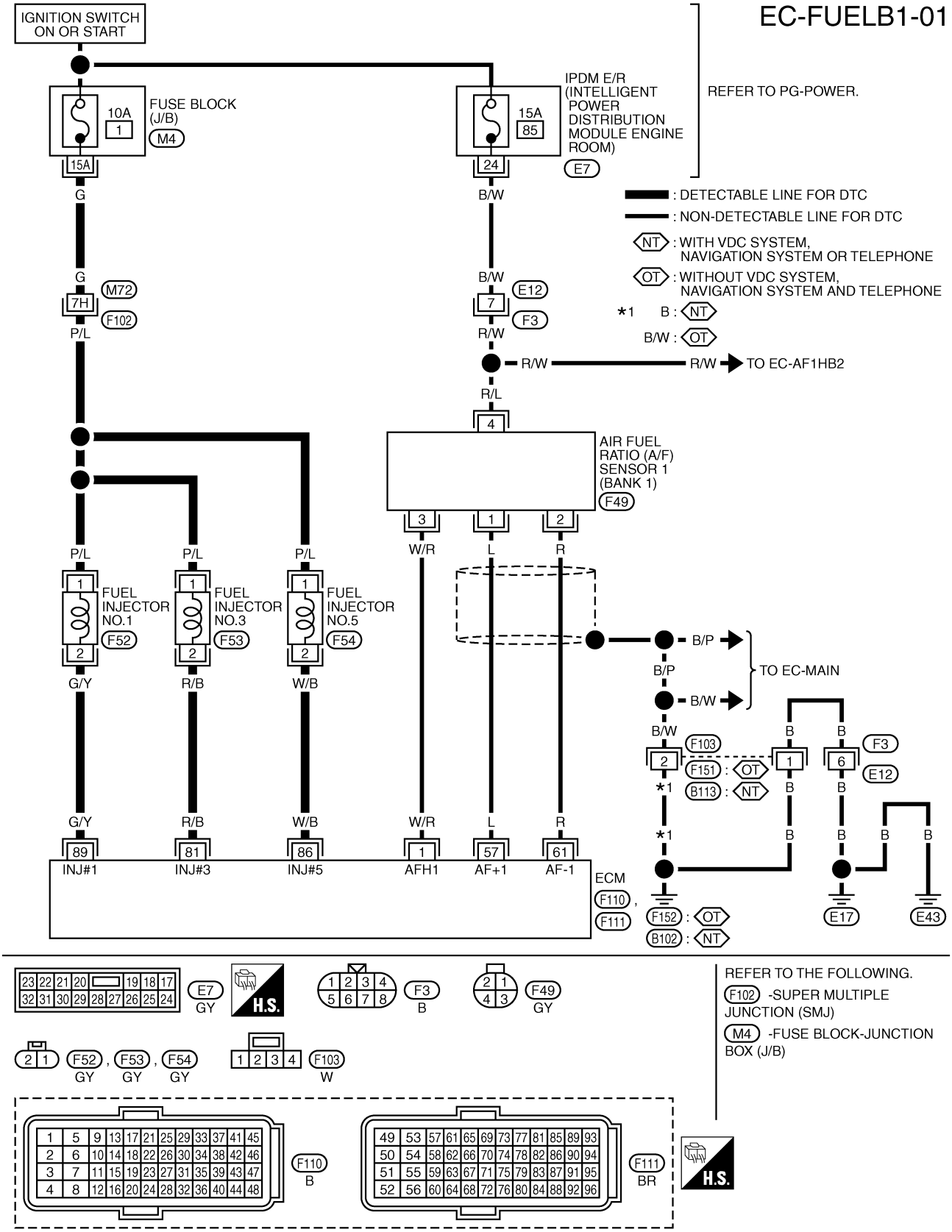
Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

10. If it is difficult to start engine at step 8, the fuel injection system has a malfunction.
11. Crank engine while depressing accelerator pedal. If engine starts, go to EC-330, "Diagnostic Procedure" . If engine does not start, check exhaust and intake air leak visually.

Wiring Diagram

NBS00072

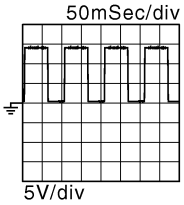
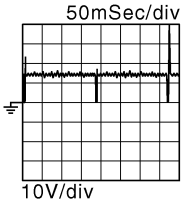
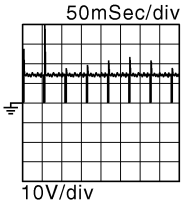
BANK 1



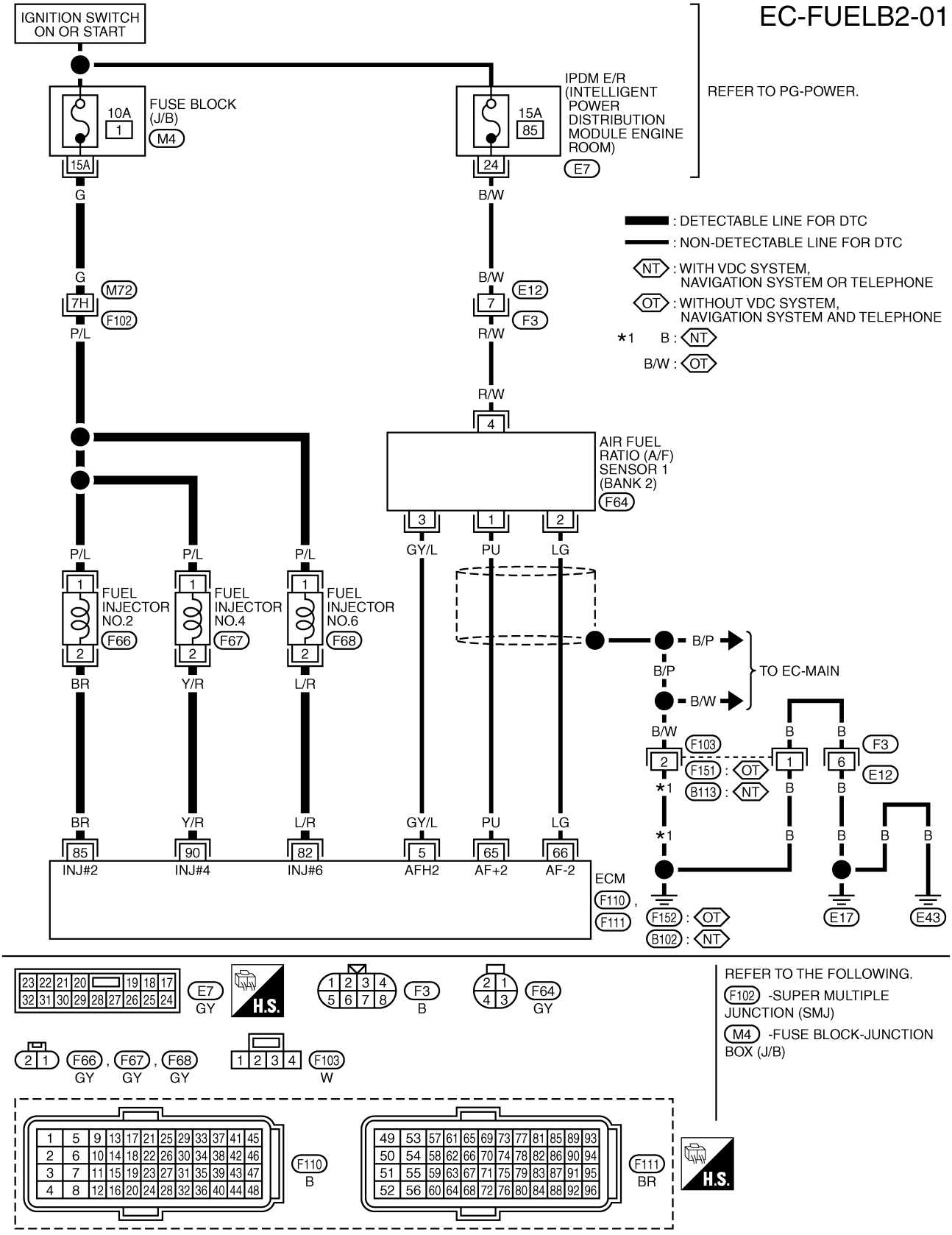
TBWT1636E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
81 86 89	R/B W/B G/Y	Fuel injector No. 3 Fuel injector No. 5 Fuel injector No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

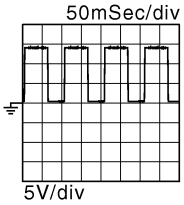
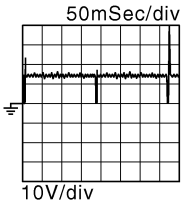
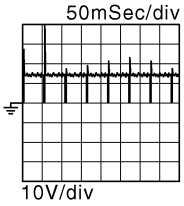
BANK 2



TBWT1638E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

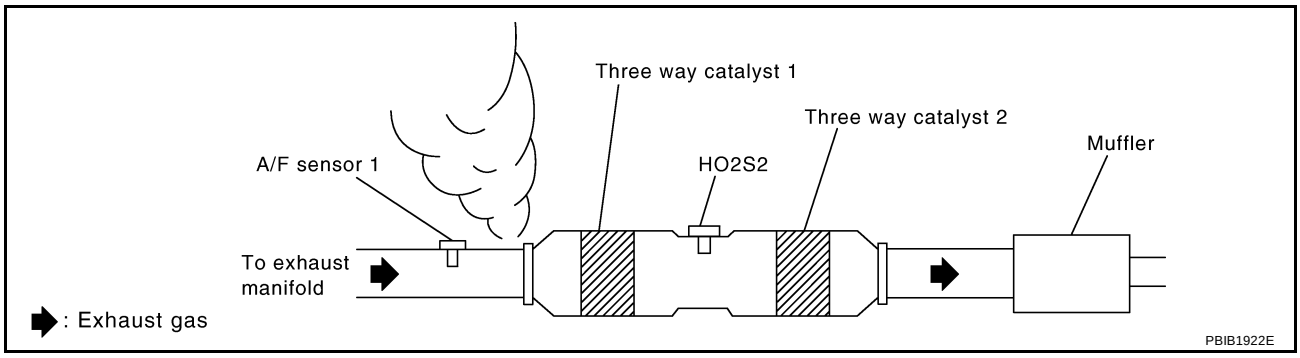
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★  PBIB3538E
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
82 85 90	L/R BR Y/R	Fuel injector No. 6 Fuel injector No. 2 Fuel injector No. 4	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

Diagnostic Procedure

NBS00073

1. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

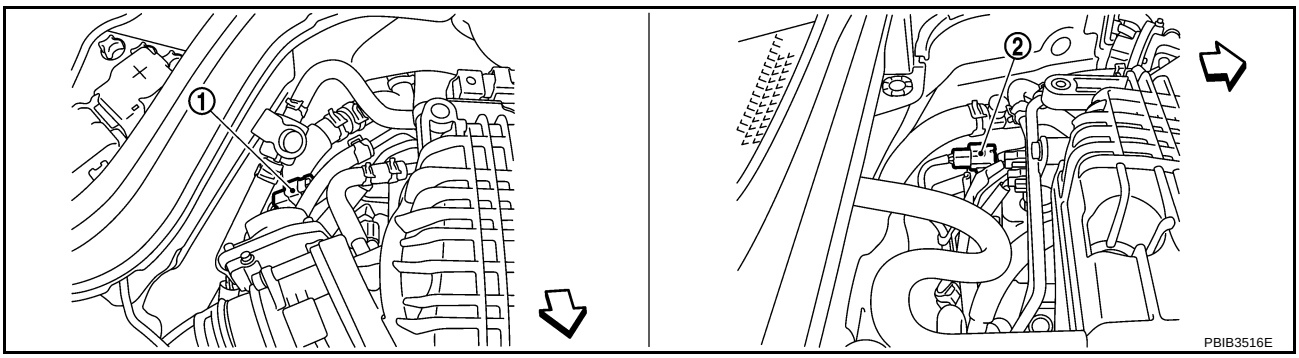
1. Listen for an intake air leak after the mass air flow sensor.
2. Check PCV hose connection.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.



1. A/F sensor 1 harness connector (bank 1)
2. A/Fsensor 1 harness connector (bank 2)

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank 1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

5. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

6. Also check harness for short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

1. Release fuel pressure to zero. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Install fuel pressure gauge and check fuel pressure. Refer to EC-80, "FUEL PRESSURE CHECK" .

At idling: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-691, "FUEL PUMP" .)
- Fuel pressure regulator (Refer to EC-80, "FUEL PRESSURE CHECK")
- Fuel lines (Refer to FL-3, "Checking Fuel Lines" .)
- Fuel filter for clogging

>> Repair or replace.

6. CHECK MASS AIR FLOW SENSOR

With CONSULT-III

1. Install all removed parts.
2. Start engine and warm it up normal temperature.
3. Check “MASS AIR FLOW” in “DATA MONITOR” mode with CONSULT-III.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

1. Install all removed parts.
2. Start engine and warm it up normal temperature.
3. Check mass air flow sensor signal in Service $01 with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 7.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to EC-197, "DTC P0101, P010B MAF SENSOR" .

7. CHECK FUNCTION OF FUEL INJECTOR

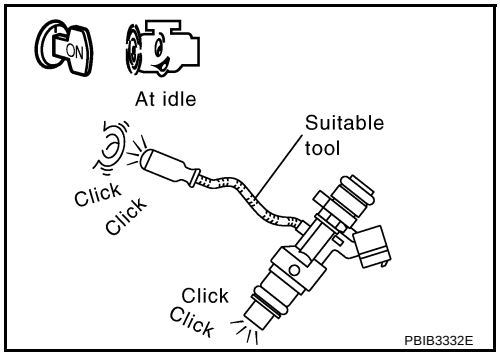
With CONSULT-III

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
3. Make sure that each circuit produces a momentary engine speed drop.

Without CONSULT-III

1. Start engine and let it idle.
2. Listen to each fuel injector operating sound.

Clickng sound should be heard.



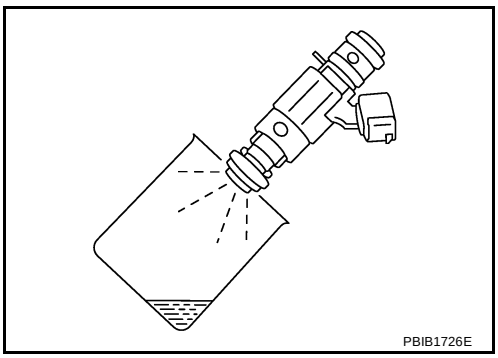
OK or NG

OK >> GO TO 8.
NG >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-686, "FUEL INJECTOR" .

8. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
3. Disconnect all fuel injector harness connectors.
4. Remove fuel injector gallery assembly. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all fuel injectors connected to fuel injector gallery.
5. For DTC P0171, reconnect fuel injector harness connectors on bank 1.
   For DTC P0174, reconnect fuel injector harness connectors on bank 2.
6. Disconnect all ignition coil harness connectors.
7. Prepare pans or saucers under each fuel injector.
8. Crank engine for about 3 seconds.
   For DTC P0171, make sure that fuel sprays out from fuel injectors on bank 1.
   For DTC P0174, make sure that fuel sprays out from fuel injectors on bank 2.

Fuel should be sprayed evenly for each fuel injector.



OK or NG

OK >> GO TO 9.
NG >> Replace fuel injectors from which fuel does not spray out. Always replace O-ring with new ones.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

NBS00074

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from the air fuel ratio (A/F) sensors 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.
In case the amount of the compensation value is extremely large (The actual mixture ratio is too rich.), the ECM judges the condition as the fuel injection system malfunction and lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0172 0172 (Bank 1) P0175 0175 (Bank 2)	Fuel injection system too rich	● Fuel injection system does not operate properly. ● The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)	● Air fuel ratio (A/F) sensor 1 ● Fuel injector ● Exhaust gas leaks ● Incorrect fuel pressure ● Mass air flow sensor

DTC Confirmation Procedure

NBS00075

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
4. Clear the self-learning control coefficient by touching “CLEAR”.
5. Start engine again and let it idle for at least 10 minutes.
6. Check 1st trip DTC.
   The 1st trip DTC P0172, P0175 should be detected at this stage, if a malfunction exists.
   If so, go to EC-340, "Diagnostic Procedure" .
   NOTE:
   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

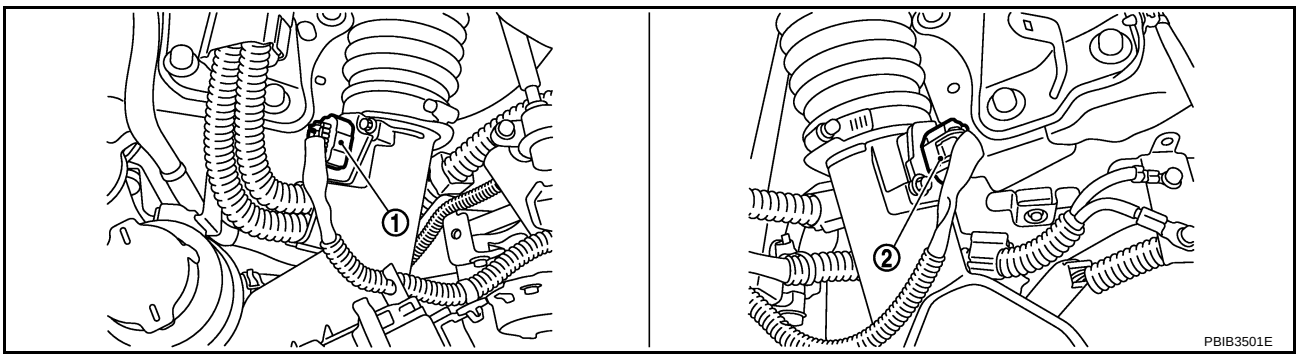
a. Turn ignition switch OFF and wait at least 10 seconds.
b. Start engine and select “DATA MONITOR” mode with CONSULT-III.
c. Drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for a certain time.
   Refer to the table below.
   Hold the accelerator pedal as steady as possible.
   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
8. Crank engine while depressing accelerator pedal.
   If engine starts, go to EC-340, "Diagnostic Procedure" . If engine does not start, remove ignition plugs and check for fouling, etc.

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor (bank 1) harness connector. Then restart and run engine for at least 5 seconds at idle speed.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
5. Select Service $03 with GST. Make sure DTC P0102 is detected.
6. Select Service $04 with GST and erase the DTC P0102.
7. Start engine again and let it idle for at least 10 minutes.
8. Select Service $07 with GST. The 1st trip DTC P0172 or P0175 should be detected at this stage, if a malfunction exists. If so, go to EC-340, "Diagnostic Procedure" .

   NOTE:
   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

a. Turn ignition switch OFF and wait at least 10 seconds.

b. Start engine and drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.
   Hold the accelerator pedal as steady as possible.
   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

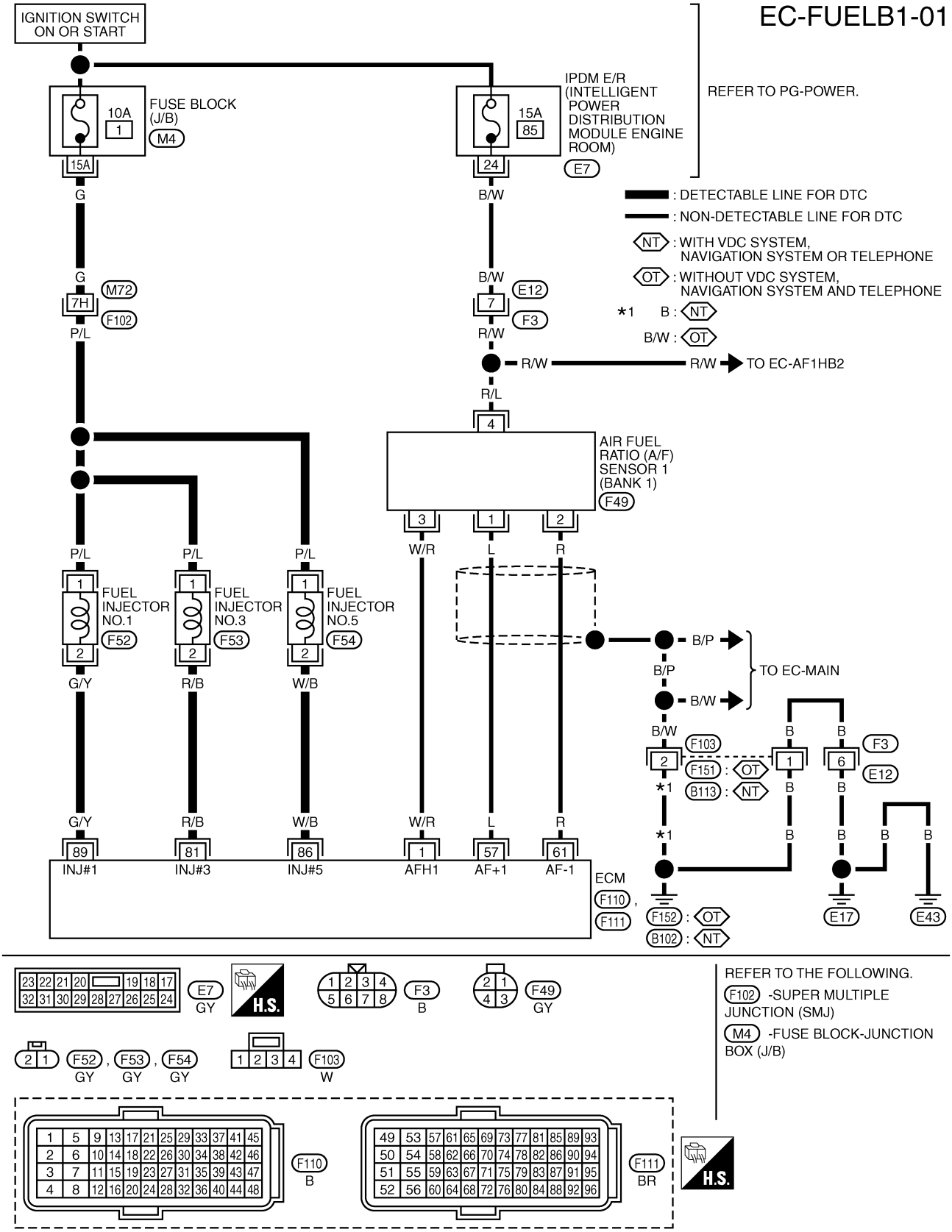
Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

9. If it is difficult to start engine at step 7, the fuel injection system has a malfunction.
10. Crank engine while depressing accelerator pedal.
    If engine starts, go to EC-340, "Diagnostic Procedure" . If engine does not start, remove ignition plugs and check for fouling, etc.

Wiring Diagram

NBS006UY

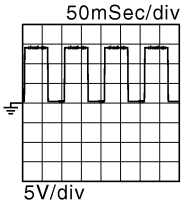
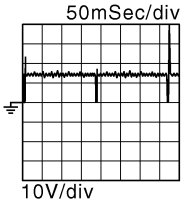
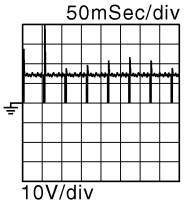
BANK 1



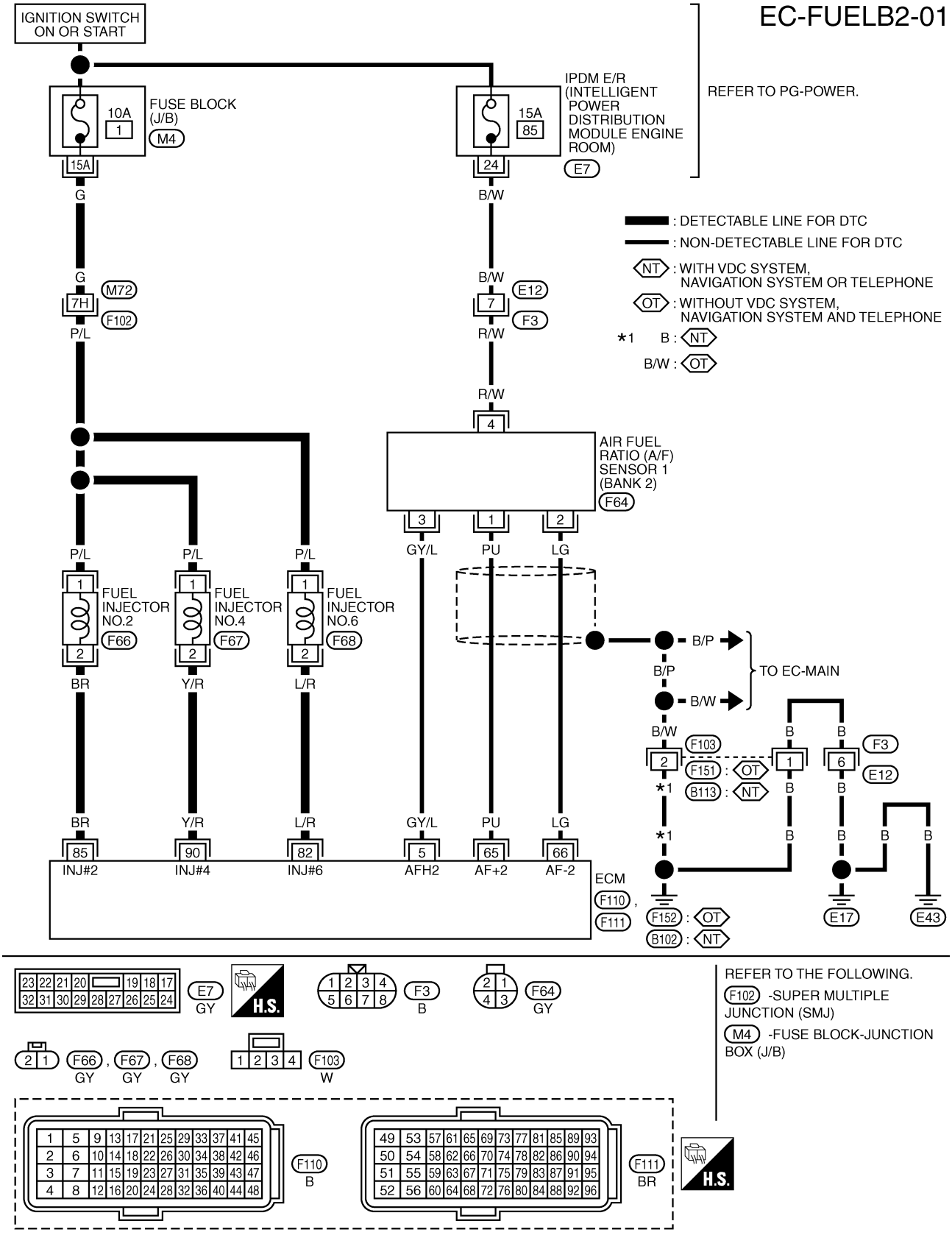
TBWT1636E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
81 86 89	R/B W/B G/Y	Fuel injector No. 3 Fuel injector No. 5 Fuel injector No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

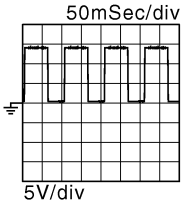
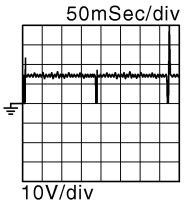
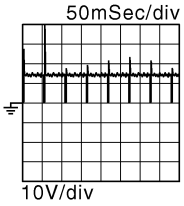
BANK 2



TBWT1638E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

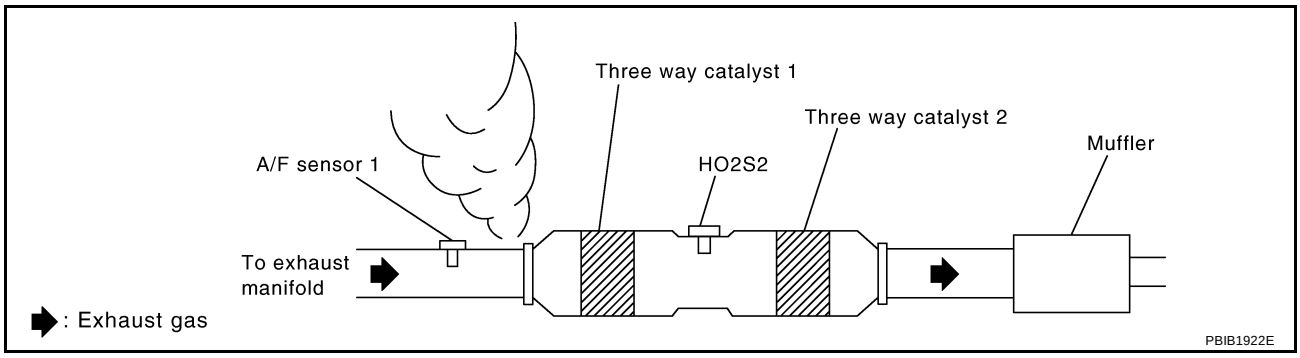
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★  PBIB3538E
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
82 85 90	L/R BR Y/R	Fuel injector No. 6 Fuel injector No. 2 Fuel injector No. 4	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

Diagnostic Procedure

NBS00077

1. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

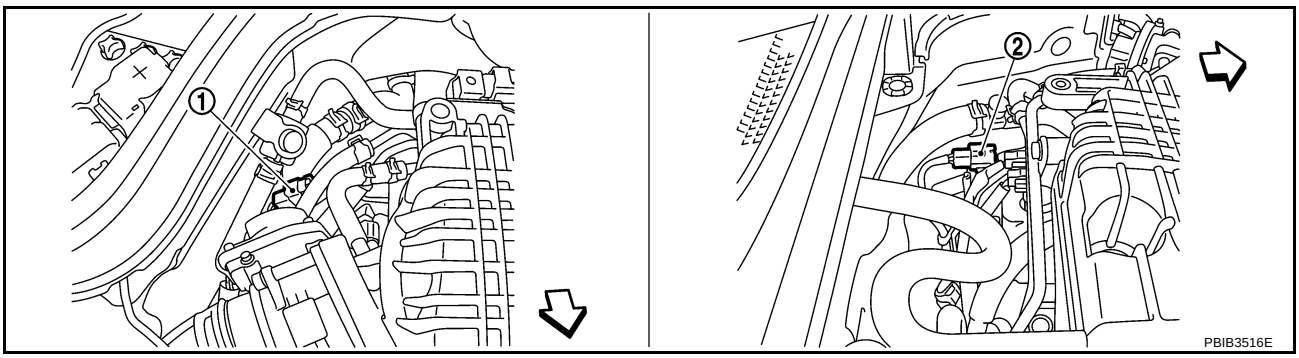
Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.



1. A/F sensor 1 harness connector (bank 1)
2. A/F sensor 1 harness connector (bank 2)

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank 1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

5. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

6. Also check harness for short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

1. Release fuel pressure to zero. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Install fuel pressure gauge and check fuel pressure. Refer to EC-80, "FUEL PRESSURE CHECK" .

At idling: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-691, "FUEL PUMP" .)
- Fuel pressure regulator (Refer to EC-80, "FUEL PRESSURE CHECK" .)

>> Repair or replace.

6. CHECK MASS AIR FLOW SENSOR

With CONSULT-III

1. Install all removed parts.
2. Start engine and warm it up to normal temperature.
3. Check “MASS AIR FLOW” in “DATA MONITOR” mode with CONSULT-III.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

1. Install all removed parts.
2. Start engine and warm it up to normal temperature.
3. Check mass air flow sensor signal in Service $01 with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 7.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to EC-197, "DTC P0101, P010B MAF SENSOR" .

7. CHECK FUNCTION OF FUEL INJECTOR

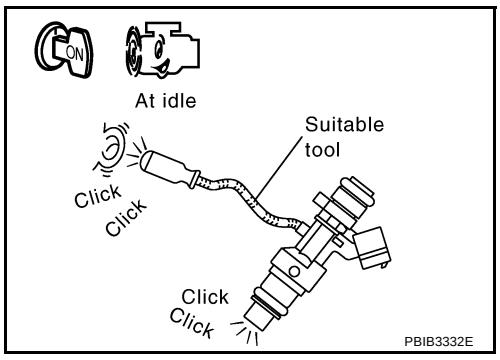
With CONSULT-III

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
3. Make sure that each circuit produces a momentary engine speed drop.

Without CONSULT-III

1. Start engine and let it idle.
2. Listen to each fuel injector operating sound.

Clickng sound should be heard.



OK or NG

OK >> GO TO 8.
NG >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-686, "FUEL INJECTOR" .

8. CHECK FUEL INJECTOR

1. Remove fuel injector assembly. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all fuel injectors connected to fuel injector gallery.
2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
3. Disconnect all fuel injector harness connectors.
4. Disconnect all ignition coil harness connectors.
5. Prepare pans or saucers under each fuel injectors.
6. Crank engine for about 3 seconds.
   Make sure fuel does not drip from fuel injector.

OK or NG

OK (Does not drip.)>>GO TO 9.
NG (Drips.)>>Replace the fuel injectors from which fuel is dripping. Always replace O-ring with new one.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

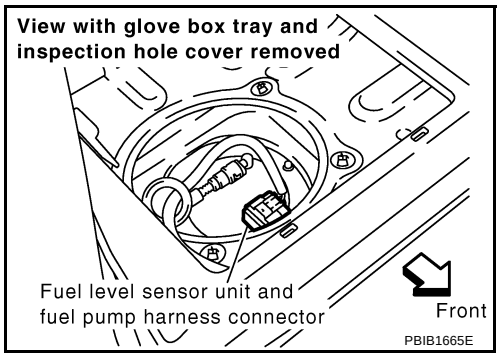
DTC P0181 FTT SENSOR

PFP:22630

Component Description

NBS00078

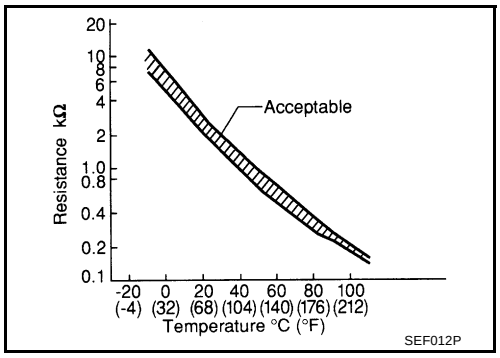
The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Fluid temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90

*: This data is reference values and is measured between ECM terminal 106 (Fuel tank temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS00079

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0181 0181	Fuel tank temperature sensor circuit range/ performance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	● Harness or connectors (The sensor circuit is open or shorted) ● Fuel tank temperature sensor

DTC Confirmation Procedure

NBS0007A

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 10 seconds.
2. Check 1st trip DTC.
   If 1st trip DTC is detected, go to EC-346, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to following step.
3. Select “DATA MONITOR” mode with CONSULT-III.
4. Check “COOLAN TEMP/S” value.
   If “COOLAN TEMP/S” is less than 60°C (140°F), the result will be OK.
   If “COOLAN TEMP/S” is above 60°C (140°F), go to the following step.
5. Cool engine down until “COOLAN TEMP/S” is less than 60°C (140°F).
6. Wait at least 10 seconds.
7. Check 1st trip DTC.
8. If 1st trip DTC is detected, go to EC-346, "Diagnostic Procedure" .

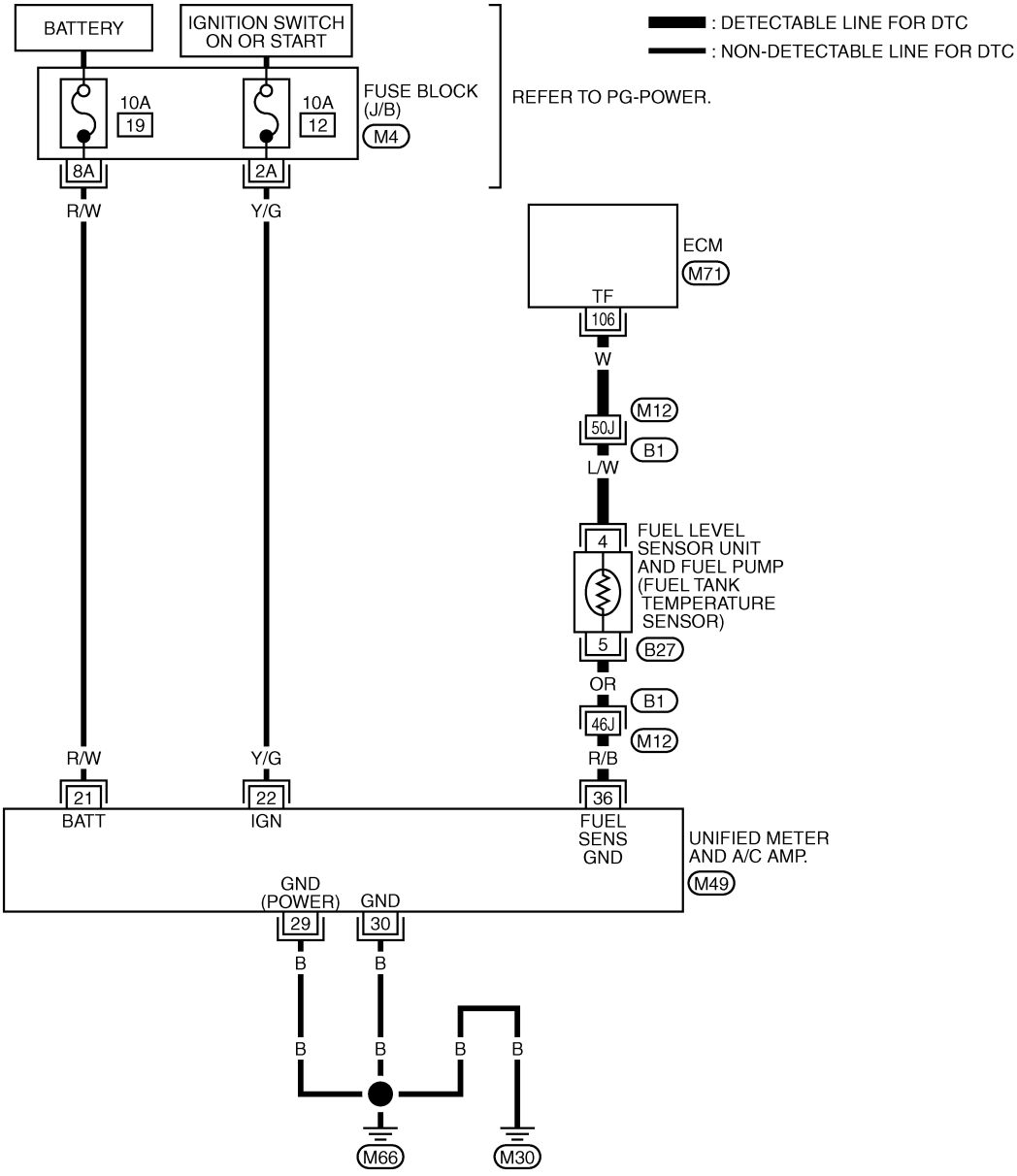
WITH GST

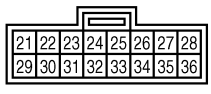
Follow the procedure “WITH CONSULT-III” above.

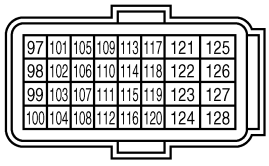
Wiring Diagram

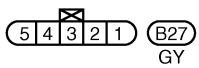
NBS0007B

EC-FTTS-01









REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1640E

Diagnostic Procedure

NBS0007C

1. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

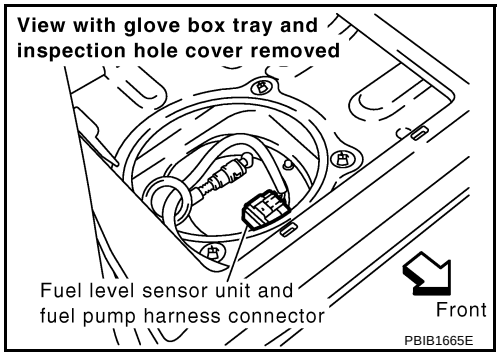
Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

OK or NG

OK >> GO TO 2.
NG >> Go to DI-19, "Fuel Level Sensor Signal Inspection" .

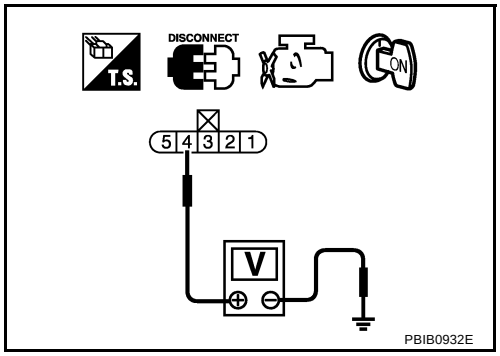
2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Turn ignition switch ON.



3. Check voltage between “fuel level sensor unit and fuel pump” terminal 4 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between ECM and “fuel level sensor unit and fuel pump”

>> Repair open circuit or short to ground or short to power in harness or connector.

4. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect “unified meter and A/C amp.” harness connector M49.
3. Check harness continuity between “fuel level sensor unit and fuel pump” terminal 5 and “unified meter and A/C amp.” terminal 36. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between “fuel level sensor unit and fuel pump” and “unified meter and A/C amp.”

>> Repair open circuit or short to ground or short to power in harness or connector.

6. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace fuel level sensor unit.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

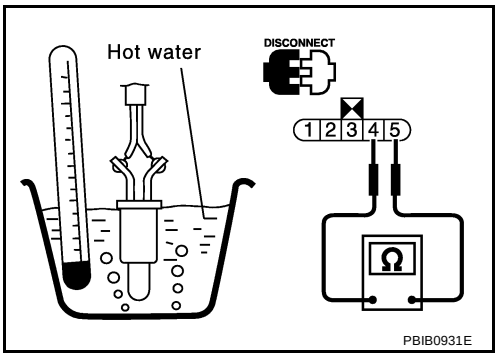
NBS0007D

FUEL TANK TEMPERATURE SENSOR

1. Remove fuel level sensor unit.
2. Check resistance between “fuel level sensor unit and fuel pump” terminals 4 and 5 by heating with hot water as shown in the figure.

Temperature °C (°F)	Resistance kΩ
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90

3. If NG, replace fuel level sensor unit.



Removal and Installation

NBS0007E

FUEL TANK TEMPERATURE SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

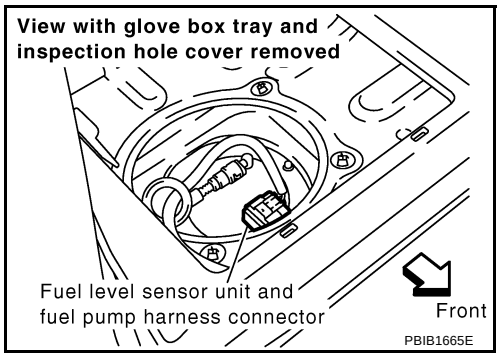
DTC P0182, P0183 FTT SENSOR

PFP:22630

Component Description

NBS0007F

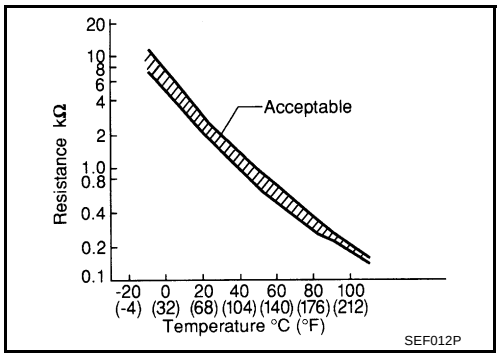
The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Fluid temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90

*: This data is reference values and is measured between ECM terminal 106 (Fuel tank temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS0007G

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0182 0182	Fuel tank temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Fuel tank temperature sensor
P0183 0183	Fuel tank temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC Confirmation Procedure

NBS0007H

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-350, "Diagnostic Procedure" .

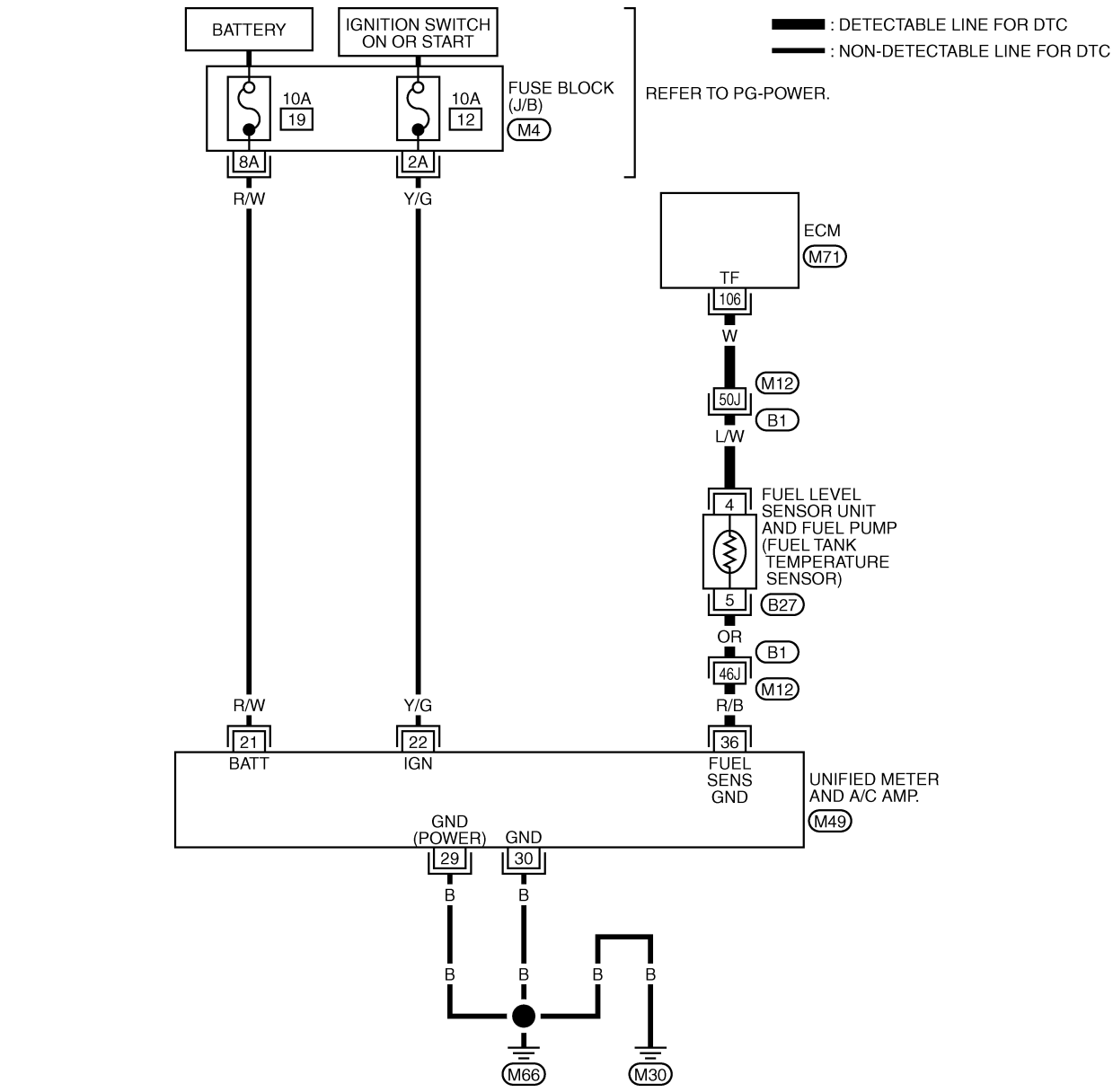
WITH GST

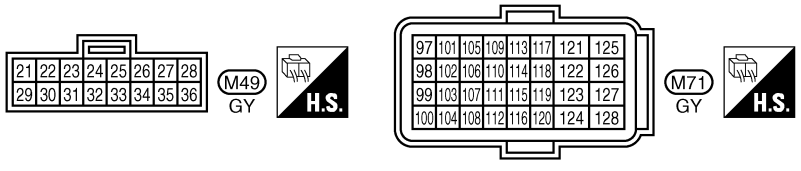
Follow the procedure “WITH CONSULT-III” above.

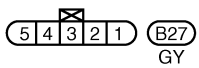
Wiring Diagram

NBS0007I

EC-FTTS-01







REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1640E

Diagnostic Procedure

NBS0007J

1. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

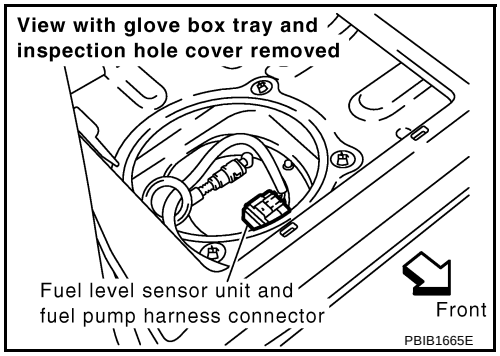
Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

OK or NG

OK >> GO TO 2.
NG >> Go to DI-19, "Fuel Level Sensor Signal Inspection" .

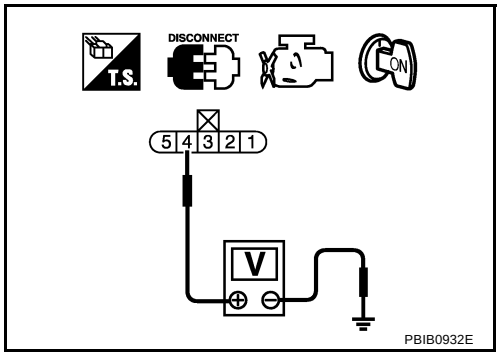
2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Turn ignition switch ON.



3. Check voltage between “fuel level sensor unit and fuel pump” terminal 4 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between ECM and “fuel level sensor unit and fuel pump”

>> Repair open circuit or short to ground or short to power in harness or connector.

4. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect “unified meter and A/C amp.” harness connector M49.
3. Check harness continuity between “fuel level sensor unit and fuel pump” terminal 5 and “unified meter and A/C amp.” terminal 36. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between “fuel level sensor unit and fuel pump” and “unified meter and A/C amp.”

>> Repair open circuit short to ground or short to power in harness or connector.

6. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace fuel level sensor unit.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

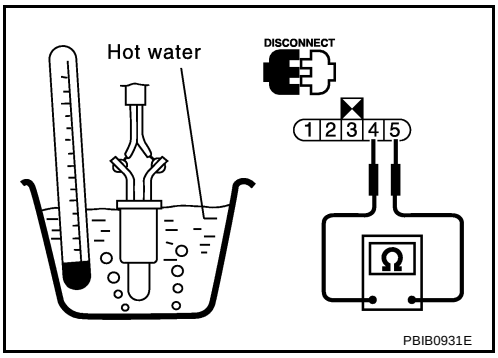
NBS0007K

FUEL TANK TEMPERATURE SENSOR

1. Remove fuel level sensor unit.
2. Check resistance between “fuel level sensor unit and fuel pump” terminals 4 and 5 by heating with hot water as shown in the figure.

Temperature °C (°F)	Resistance kΩ
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90

3. If NG, replace fuel level sensor unit.



Removal and Installation

NBS0007L

FUEL TANK TEMPERATURE SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

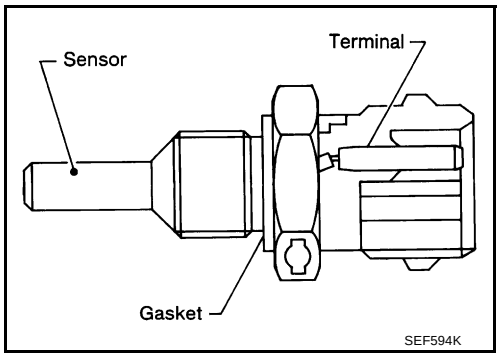
DTC P0196 EOT SENSOR

PFP:22630

Component Description

NBS006TK

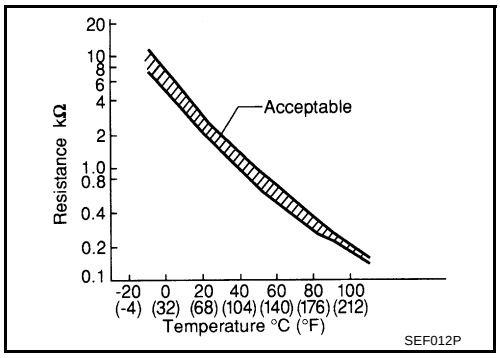
The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



< Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153

*: This data is reference values and is measured between ECM terminal 78 (Engine oil temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS006TL

NOTE:

If DTC P0196 is displayed with P0197 or P0198, first perform the trouble diagnosis for DTC P0197 or P0198. Refer to EC-356, "DTC P0197, P0198 EOT SENSOR" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0196 0196	Engine oil temperature sensor range/performance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	● Harness or connectors (The sensor circuit is open or shorted) ● Engine oil temperature sensor

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Engine oil temperature sensor	Exhaust valve timing control does not function.

DTC Confirmation Procedure

NBS006TM

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and let it idle for 5 minutes and 10 seconds.
4. Check 1st trip DTC.
   If 1st trip DTC is detected, go to EC-354, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to following steps.
5. Select “DATA MONITOR” mode with CONSULT-III.
6. Check that “COOLAN TEMP/S” indicates above 80°C (176°F).
   If it is above 80°C (176°F), go to the following steps.
   If it is below 80°C (176°F), warm engine up until “COOLAN TEMP/S” indicates more than 80°C (176°F). Then go to the following steps.
7. Turn ignition switch OFF and soak the vehicle at cool place.
8. Turn ignition switch ON.
   NOTE:
   Do not turn ignition switch OFF until step 12
9. Select “DATA MONITOR” mode with CONSULT-III.
10. Check the following.

COOLAN TEMP/S	Below 40°C (104°F)
INT/A TEMP SE	Below 40°C (104°F)
Difference between “COOLAN TEMP/S” and “INT/A TEMP SE”	Within 6°C (11°F)

   If they are within the specified range, go to following steps.
   If they are out of the specified range, soak the vehicle to met the above conditions. Then go to following steps.
   NOTE:
   - **Do not turn ignition switch OFF.**
   - **If it is supposed to need a long period of time, do not deplete the battery.**
11. Start engine and let it idle for 5 minutes.
12. Check 1st trip DTC.
13. If 1st trip DTC is detected, go to EC-354, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

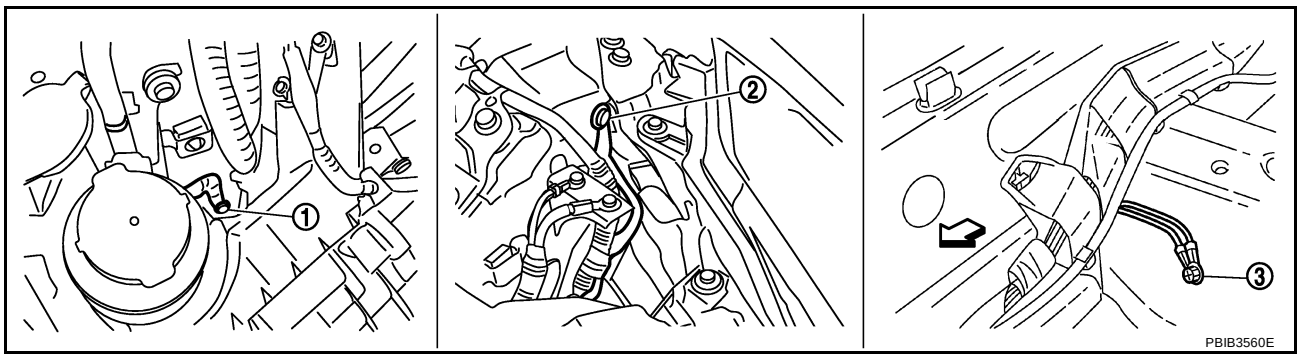
Diagnostic Procedure

NBS006TN

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

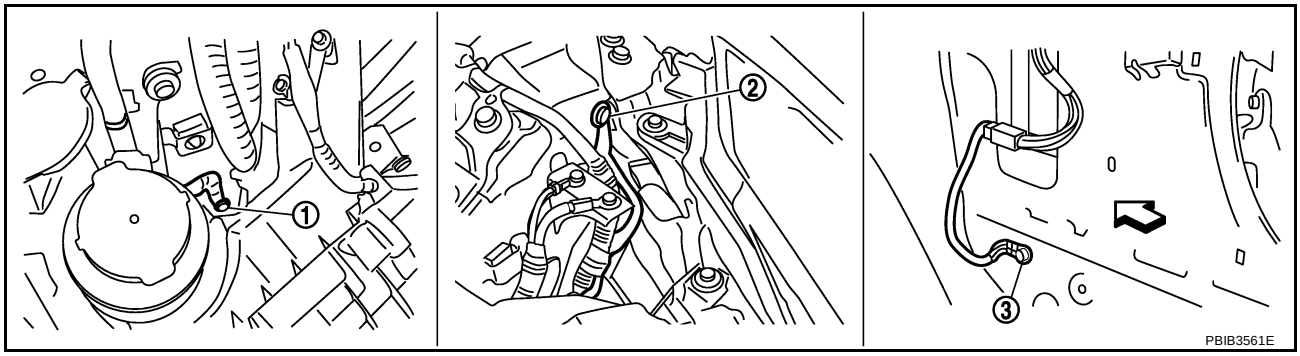


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ENGINE OIL TEMPERATURE SENSOR

Refer to EC-355, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace engine oil temperature sensor.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-357, "Wiring Diagram" .

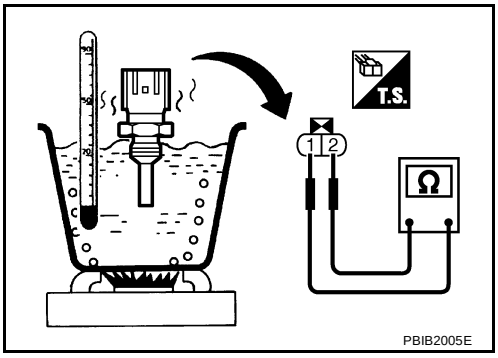
>> **INSPECTION END**

Component Inspection

NBS006TO

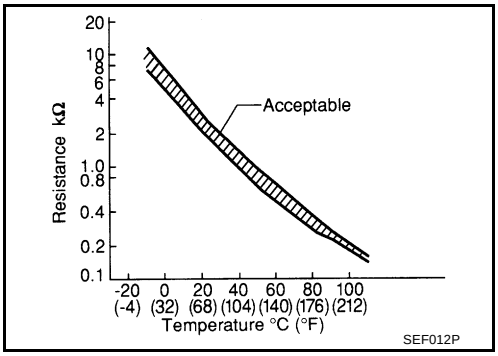
ENGINE OIL TEMPERATURE SENSOR

1. Check resistance between engine oil temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine oil temperature sensor.

Removal and Installation

NBS006TP

ENGINE OIL TEMPERATURE SENSOR

Refer to EM-26, "OIL PAN AND OIL STRAINER" .

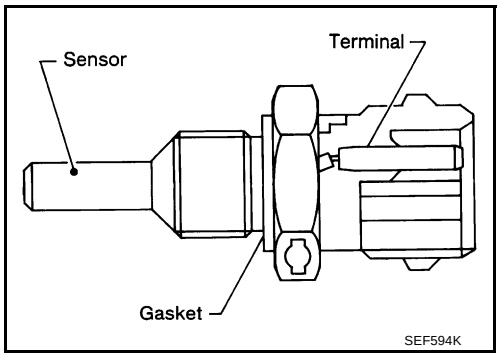
DTC P0197, P0198 EOT SENSOR

PFP:22630

Component Description

NBS006TQ

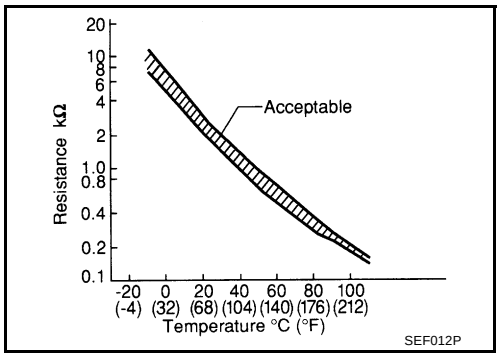
The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153

*: This data is reference value and is measured between ECM terminal 78 (Engine oil temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS006TR

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P0197 0197	Engine oil temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (Engine coolant temperature sensor circuit is open or shorted.) ● Engine oil temperature sensor
P0198 0198	Engine oil temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Engine oil temperature sensor	Exhaust valve timing control does not function.

DTC Confirmation Procedure

NBS006TS

NOTE:

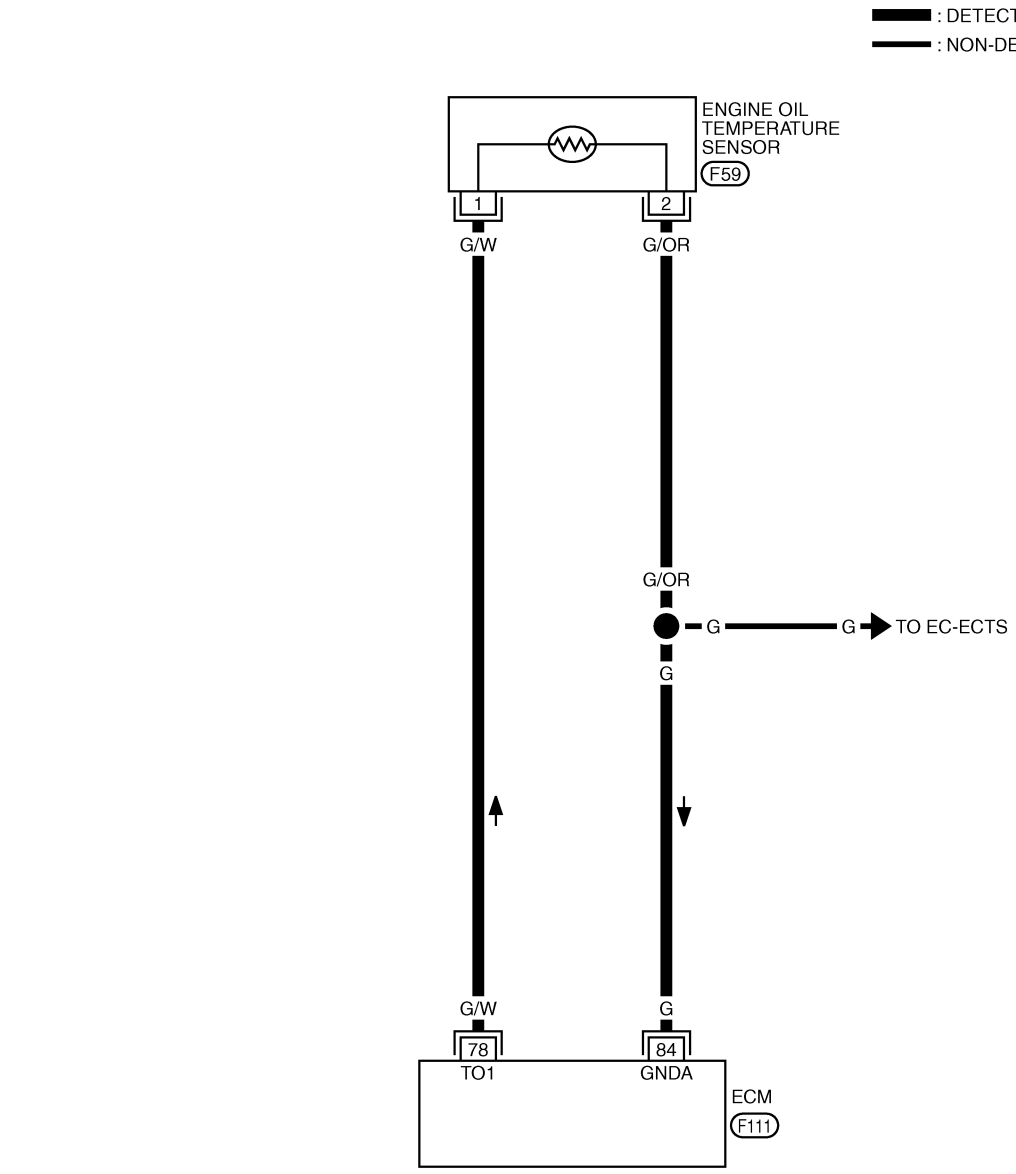
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

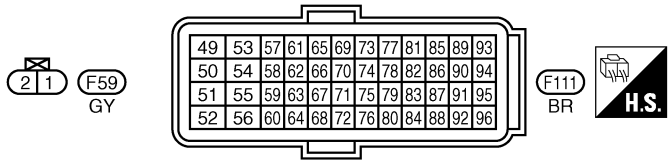
1. Start engine and wait at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-358, "Diagnostic Procedure" .

Wiring Diagram

NBS006TT

EC-EOTS-01





TBWT1684E

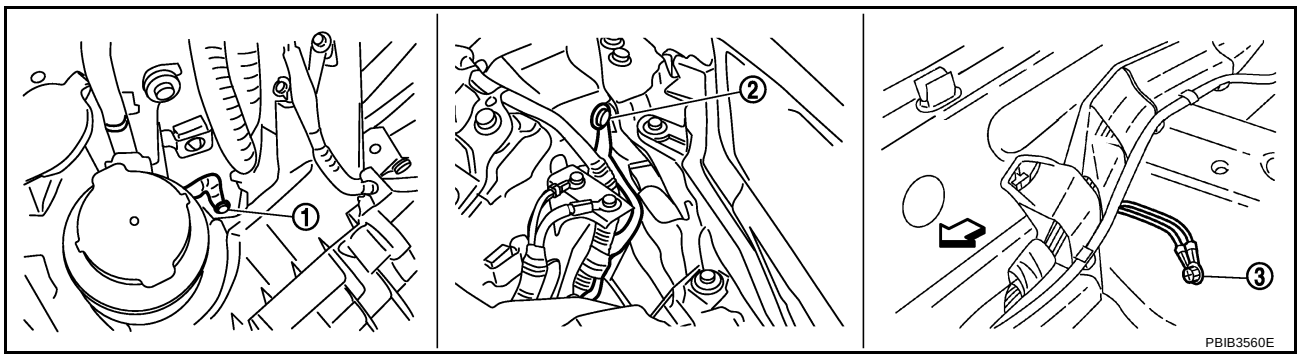
Diagnostic Procedure

NBS006TU

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

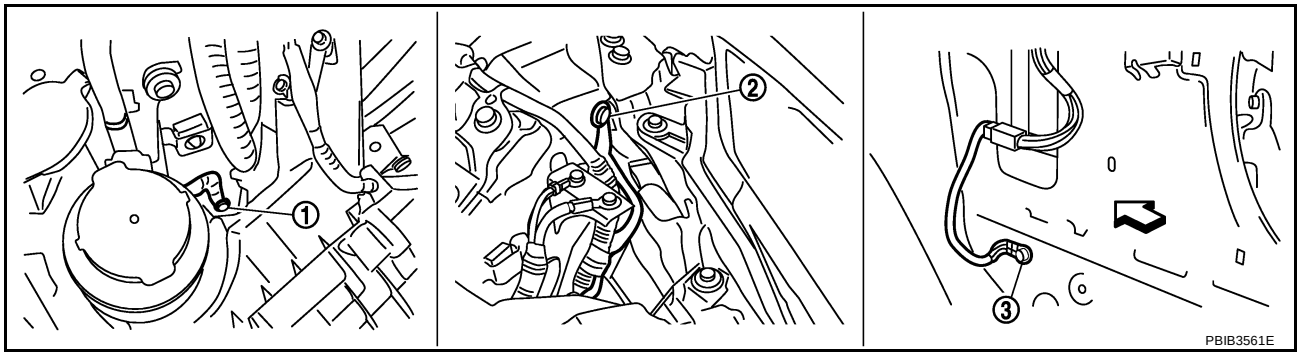


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

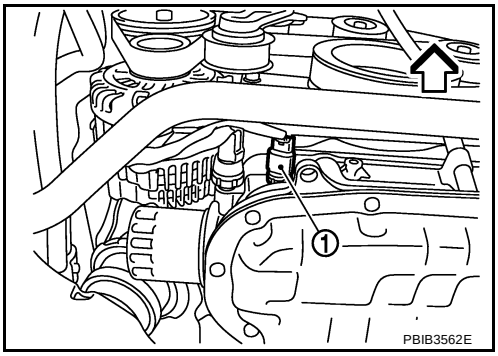
OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK EOT SENSOR POWER SUPPLY CIRCUIT

1. Disconnect engine oil temperature (EOT) sensor (1) harness connector.

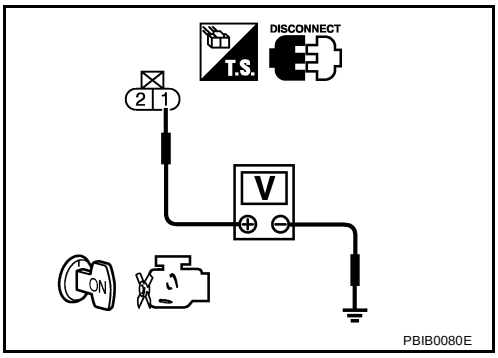
   ⇦ : Vehicle front

2. Turn ignition switch ON.



3. Check voltage between EOT sensor terminal 1 and ground with CONSULT-III or tester.

   Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EOT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 84 and ECT sensor terminal 2. Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ENGINE OIL TEMPERATURE SENSOR

Refer to EC-360, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace engine oil temperature sensor.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

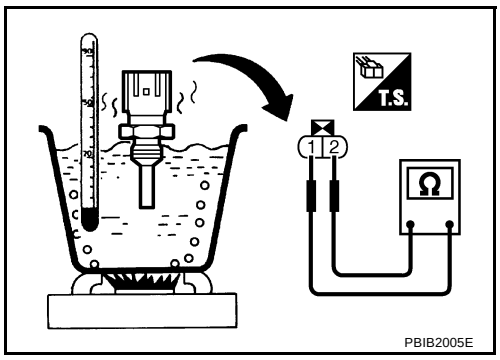
>> **INSPECTION END**

Component Inspection

NBS006TV

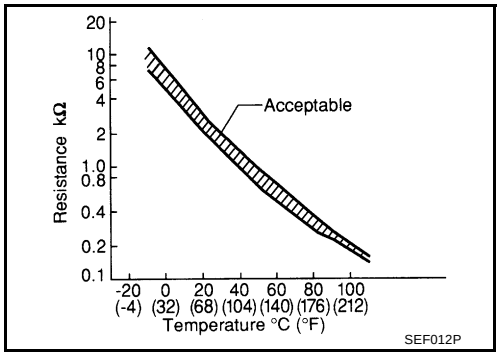
ENGINE OIL TEMPERATURE SENSOR

1. Check resistance between engine oil temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Temperature °C (°F)	Resistance kΩ
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine oil temperature sensor.

Removal and Installation

NBS006TW

ENGINE OIL TEMPERATURE SENSOR

Refer to EM-26, "OIL PAN AND OIL STRAINER" .

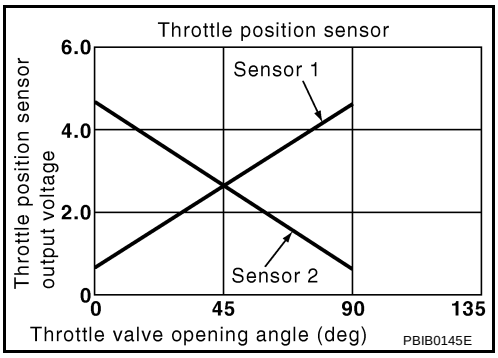
DTC P0222, P0223, P2132, P2133 TP SENSOR

PFP:16119

Component Description

NBS0007M

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-III Reference Value in Data Monitor Mode

NBS0007N

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
TP SEN 1-B1 TP SEN 1-B2 TP SEN 2-B1* TP SEN 2-B2*	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

NBS0007O

These self-diagnoses have the one trip detection logic.

NOTE:
If DTC P0222, P0223, P2132 or P2133 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0222 0222 (Bank 1) P2132 2133 (Bank 2)	Throttle position sensor 1 circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	● Harness or connectors (TP sensor 1 circuit is open or shorted.) ● Electric throttle control actuator (TP sensor 1)
P0223 0223 (Bank 1) P2133 2133 (Bank 2)	Throttle position sensor 1 circuit high input	An excessively high voltage from the TP sensor 1 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode an the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS0007P

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-367, "Diagnostic Procedure" .

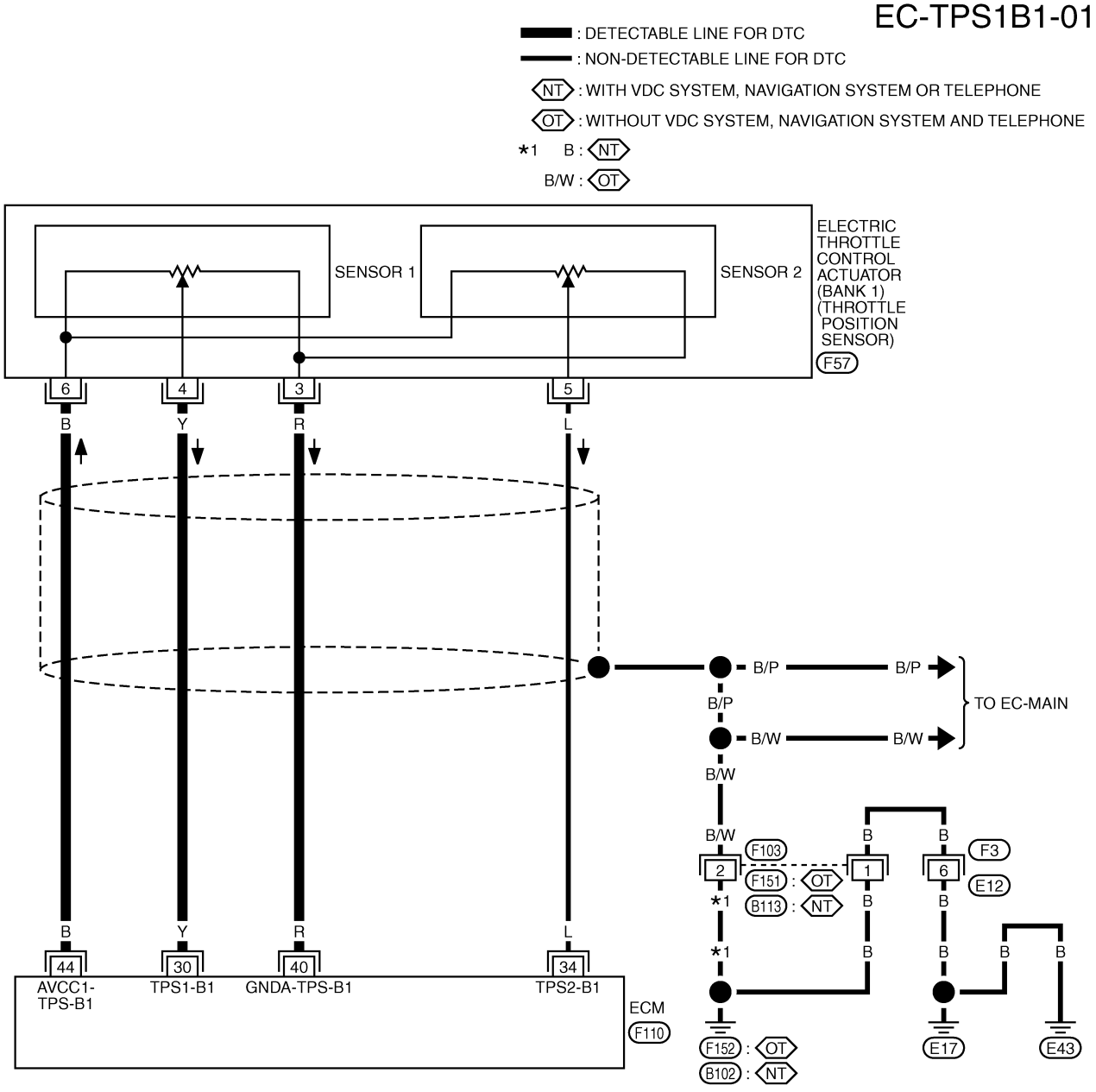
WITH GST

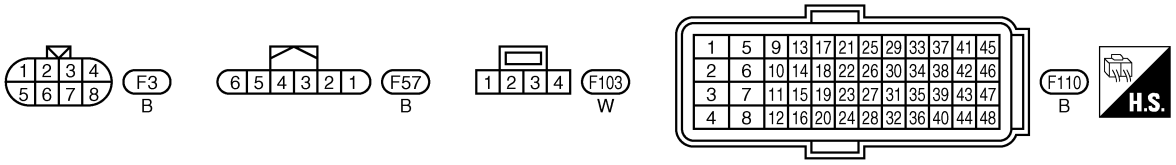
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS006V3

EC-TPS1B1-01





TBWT1641E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

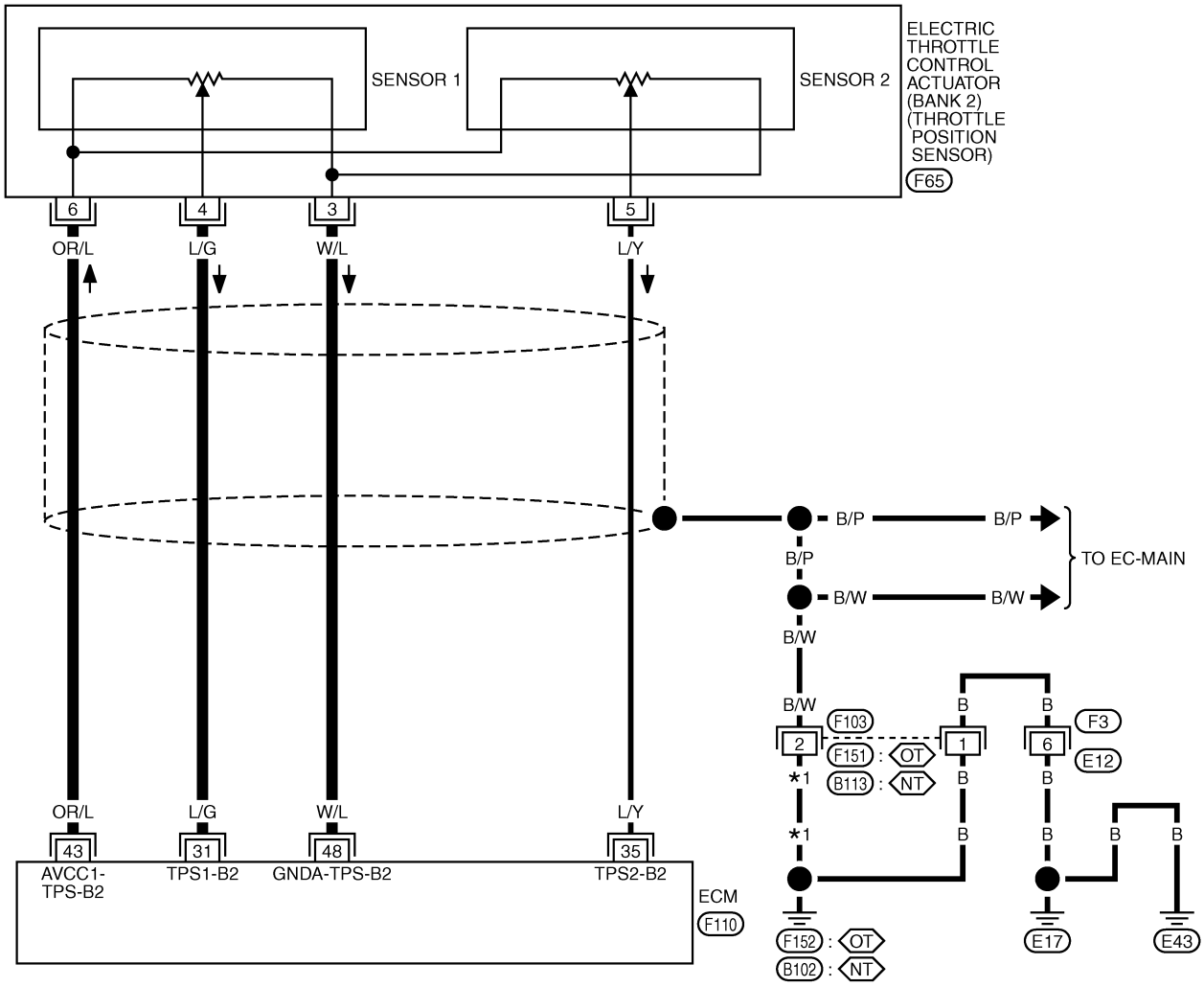
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

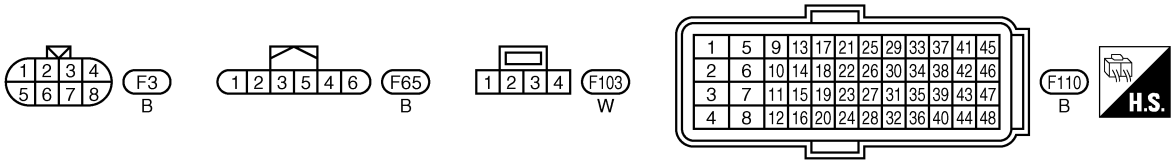
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
30	Y	Throttle position sensor 1 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
34	L	Throttle position sensor 2 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
40	R	Sensor ground [Throttle position sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V

BANK 2

EC-TPS1B2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
*1 B : NT
B/W : OT





TBWT1642E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
31	L/G	Throttle position sensor 1 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
35	L/Y	Throttle position sensor 2 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
48	W/L	Sensor ground [Throttle position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

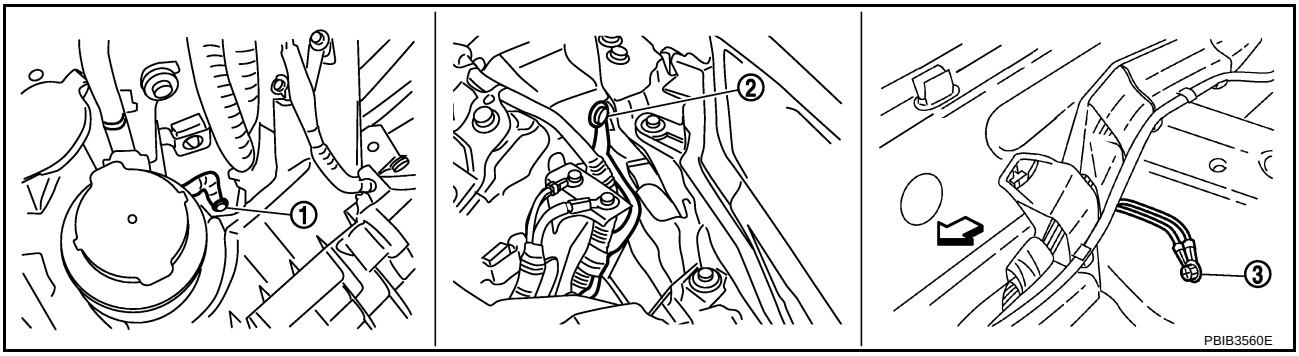
Diagnostic Procedure

NBS0007R

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

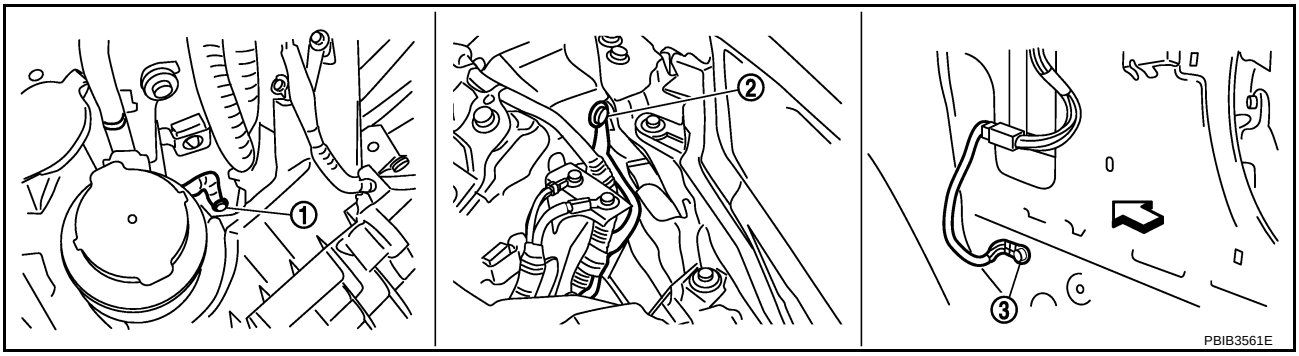


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

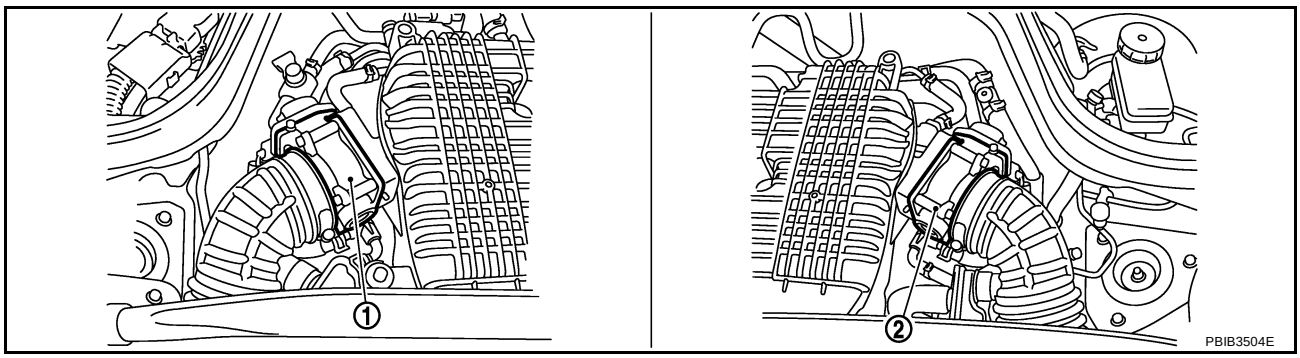
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

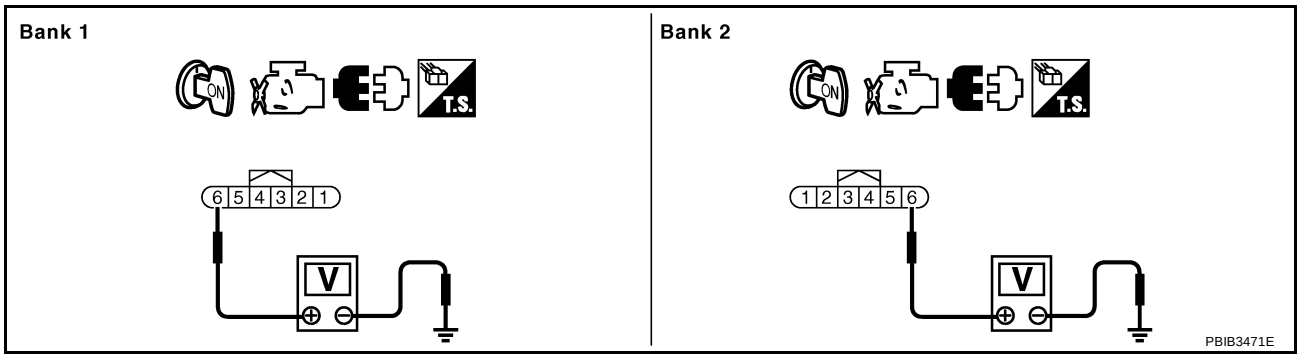
2. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control actuator (bank 1)
2. Electric throttle control actuator (bank 2)

2. Turn ignition switch ON.
3. Check voltage between electric throttle control actuator terminal 6 and ground with CONSULT-III or tester.



Voltage: Approximately 5V

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness.

3. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 6 and ECM terminal 44 (bank 1) or 43 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit.

4. CHECK THROTTLE POSITION SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 3 and ECM terminal 40 (bank 1) or 48 (bank 2). Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 30 (bank 1) or 31 (bank 2) and electric throttle control actuator terminal 4. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK THROTTLE POSITION SENSOR

Refer to EC-369, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

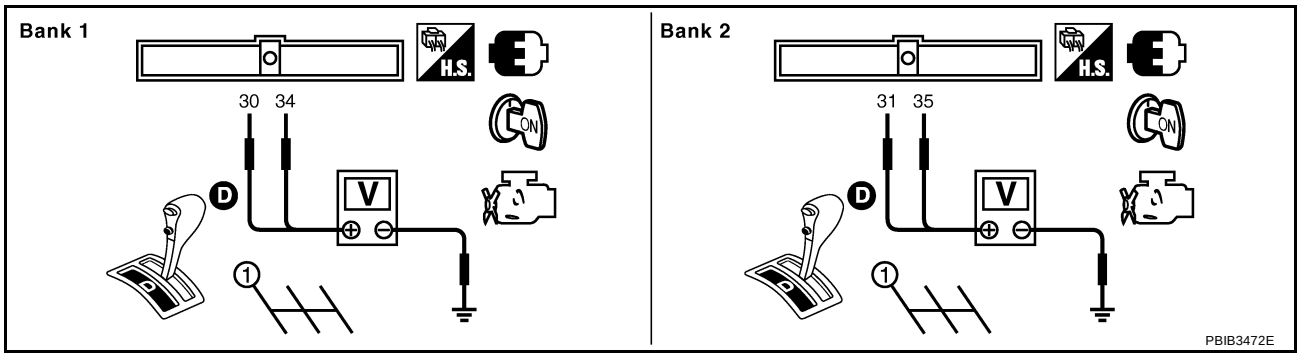
Component Inspection

NBS006V4

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.

5. Check voltage between ECM terminals 30 [TP sensor 1 (bank 1) signal], 31 [TP sensor 1 (bank 2) signal], 34 [TP sensor 2 (bank 1) signal], 35 [TP sensor 2 (bank 2) signal] and ground under the following conditions.



Terminal	Accelerator pedal	Voltage
30 [TP sensor 1 (bank 1)] 31 [TP sensor 1 (bank 2)]	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
34 [TP sensor 2 (bank 1)] 35 [TP sensor 2 (bank 2)]	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V

6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS006V5

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

PFP:00000

On Board Diagnosis Logic

NBS0007U

When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crankshaft position (CKP) sensor (POS) signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input Signal to ECM	ECM function
Crankshaft position sensor (POS)	Engine speed	On board diagnosis of misfire

The misfire detection logic consists of the following two conditions.

1. One Trip Detection Logic (Three Way Catalyst Damage)
   On the 1st trip that a misfire condition occurs that can damage the three way catalyst (TWC) due to overheating, the MIL will blink.
   When a misfire condition occurs, the ECM monitors the CKP sensor signal every 200 engine revolutions for a change.
   When the misfire condition decreases to a level that will not damage the TWC, the MIL will turn off.
   If another misfire condition occurs that can damage the TWC on a 2nd trip, the MIL will blink.
   When the misfire condition decreases to a level that will not damage the TWC, the MIL will remain on.
   If another misfire condition occurs that can damage the TWC, the MIL will begin to blink again.
2. Two Trip Detection Logic (Exhaust quality deterioration)
   For misfire conditions that will not damage the TWC (but will affect vehicle emissions), the MIL will only light when the misfire is detected on a 2nd trip. During this condition, the ECM monitors the CKP sensor signal every 1,000 engine revolutions.
   A misfire malfunction can be detected on any one cylinder or on multiple cylinders.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0300 0300	Multiple cylinder misfire detected	Multiple cylinder misfire.	● Improper spark plug ● Insufficient compression ● Incorrect fuel pressure ● The fuel injector circuit is open or shorted ● Fuel injector ● Intake air leak ● The ignition signal circuit is open or shorted ● Lack of fuel ● Signal plate ● Air fuel ratio (A/F) sensor 1 ● Incorrect PCV hose connection
P0301 0301	No.1 cylinder misfire detected	No. 1 cylinder misfires.	
P0302 0302	No. 2 cylinder misfire detected	No. 2 cylinder misfires.	
P0303 0303	No. 3 cylinder misfire detected	No. 3 cylinder misfires.	
P0304 0304	No. 4 cylinder misfire detected	No. 4 cylinder misfires.	
P0305 0305	No. 5 cylinder misfire detected	No. 5 cylinder misfires.	
P0306 0306	No. 6 cylinder misfire detected	No. 6 cylinder misfires.	

DTC Confirmation Procedure

NBS0007V

CAUTION:

Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws when driving.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Restart engine and let it idle for about 15 minutes.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-372, "Diagnostic Procedure" .

   NOTE:

   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

a. Turn ignition switch OFF and wait at least 10 seconds.

b. Start engine and drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.

   Hold the accelerator pedal as steady as possible.

   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

The time to driving varies according to the engine speed in the freeze frame data.

Engine speed	Time
Around 1,000 rpm	Approximately 10 minutes
Around 2,000 rpm	Approximately 5 minutes
More than 3,000 rpm	Approximately 3.5 minutes

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS0007W

1. CHECK FOR INTAKE AIR LEAK AND PCV HOSE

1. Start engine and run it at idle speed.
2. Listen for the sound of the intake air leak.
3. Check PCV hose connection.

OK or NG

OK >> GO TO 2.
NG >> Discover air leak location and repair.

2. CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

OK or NG

OK (With CONSULT-III)>>GO TO 3.
OK (Without CONSULT-III)>>GO TO 4.
NG >> Repair or replace it.

3. PERFORM POWER BALANCE TEST

With CONSULT-III

1. Perform “POWER BALANCE” in “ACTIVE TEST” mode.
2. Is there any cylinder which does not produce a momentary engine speed drop?

Yes or No

Yes >> GO TO 4.
No >> GO TO 9.

4. CHECK FUNCTION OF FUEL INJECTOR

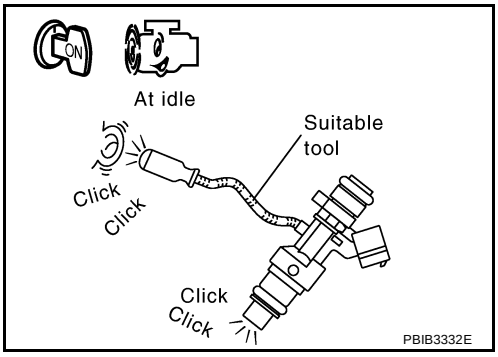
With CONSULT-III

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
3. Make sure that each circuit produces a momentary engine speed drop.

Without CONSULT-III

1. Start engine and let it idle.
2. Listen to each fuel injector operating sound.

Clickng sound should be heard.



OK or NG

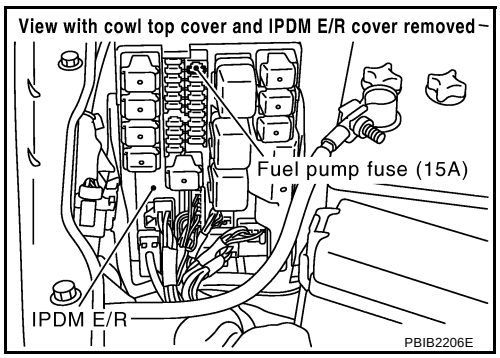
OK >> GO TO 5.
NG >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-686, "FUEL INJECTOR" .

5. CHECK FUNCTION OF IGNITION COIL-I

CAUTION:
Do the following procedure in the place where ventilation is good without the combustible.

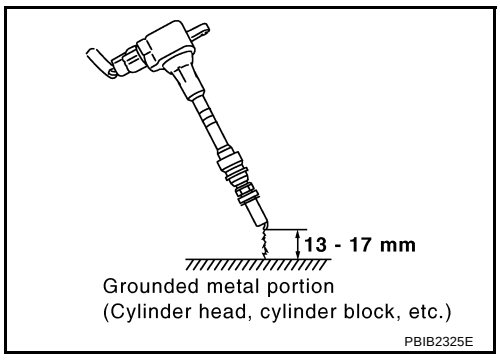
1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

   NOTE:
   Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.
4. Start engine.
5. After engine stalls, crank it two or three times to release all fuel pressure.
6. Turn ignition switch OFF.
7. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
8. Remove ignition coil and spark plug of the cylinder to be checked.



9. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
10. Connect spark plug and harness connector to ignition coil.
11. Fix ignition coil using a rope etc. with gap of 13 - 17 mm between the edge of the spark plug and grounded metal portion as shown in the figure.
12. Crank engine for about 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

    Spark should be generated.



CAUTION:

- **Do not approach to the spark plug and the ignition coil within 50cm. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20kV or more.**
- **It might cause to damage the ignition coil if the gap of more than 17 mm is taken.**

NOTE:
When the gap is less than 13 mm, the spark might be generated even if the coil is malfunctioning.

OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. CHECK FUNCTION OF IGNITION COIL-II

1. Turn ignition switch OFF.
2. Disconnect spark plug and connect a known-good spark plug.
3. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

   Spark should be generated.

OK or NG

OK >> GO TO 7.
NG >> Check ignition coil, power transistor and their circuits. Refer to EC-698, "IGNITION SIGNAL" .

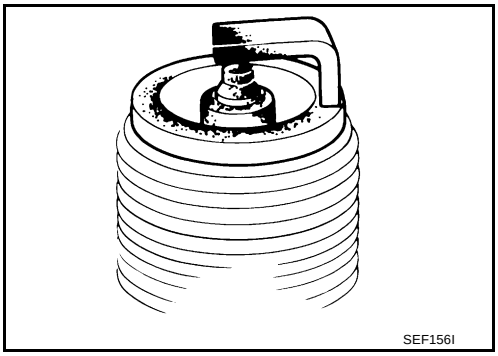
7. CHECK SPARK PLUG

Check the initial spark plug for fouling, etc.

OK or NG

OK >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to MA-18, "Changing Spark Plugs (Iridium-Tipped Type)" .

NG >> 1. Repair or clean spark plug.
2. GO TO 8.



8. CHECK FUNCTION OF IGNITION COIL-III

1. Reconnect the initial spark plugs.
2. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

OK or NG

OK >> **INSPECTION END**

NG >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to MA-18, "Changing Spark Plugs (Iridium-Tipped Type)" .

9. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to EM-89, "CHECKING COMPRESSION PRESSURE" .

OK or NG

OK >> GO TO 10.

NG >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

10. CHECK FUEL PRESSURE

1. Install all removed parts.
2. Release fuel pressure to zero. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Install fuel pressure gauge and check fuel pressure. Refer to EC-80, "FUEL PRESSURE CHECK" .

At idle: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 12.

NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-691, "FUEL PUMP" .)
- Fuel pressure regulator (Refer to EC-80, "FUEL PRESSURE CHECK" .)
- Fuel lines (Refer tor FL-3, "Checking Fuel Lines" .)
- Fuel filter for clogging

>> Repair or replace.

12. CHECK IGNITION TIMING

Check the following items. Refer to EC-71, "Basic Inspection" .

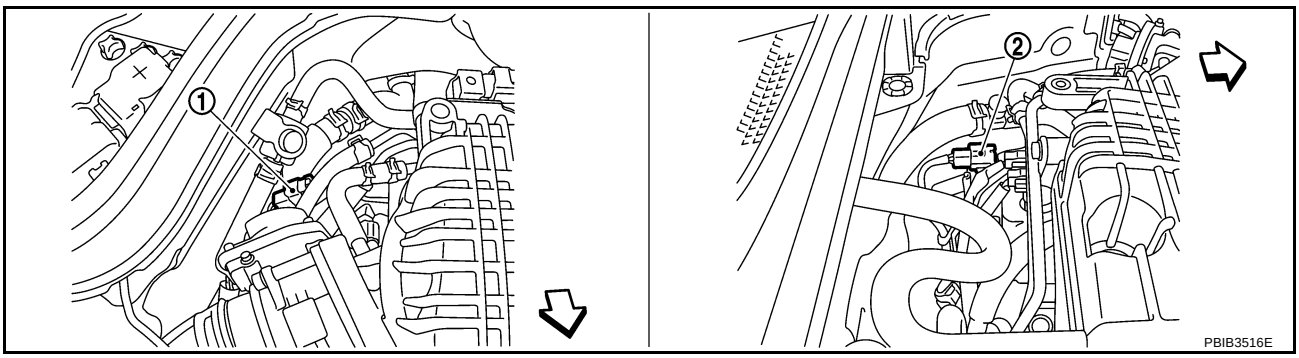
Items	Specifications
Target idle speed	A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in neutral position)
Ignition timing	A/T: 15 ± 5° BTDC (in P or N position) M/T: 15 ± 5° BTDC (in neutral position)

OK or NG

OK >> GO TO 13.
NG >> Follow the EC-71, "Basic Inspection" .

13. CHECK A/F SENSOR 1 INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.



1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank 1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

5. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

6. Also check harness for short to power.

OK or NG

OK >> GO TO 14.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK A/F SENSOR 1 HEATER

Refer to EC-172, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> Replace malfunctioning A/F sensor 1.

15. CHECK MASS AIR FLOW SENSOR

With CONSULT-III

1. Start engine and warm it up to normal temperature.
2. Check mass air flow sensor signal in “DATA MONITOR” mode with CONSULT-III.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

1. Start engine and warm it up to normal temperature.
2. Check mass air flow sensor signal in Service $01 with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 16.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to EC-197, "DTC P0101, P010B MAF SENSOR" .

16. CHECK SYMPTOM MATRIX CHART

Check items on the rough idle symptom in EC-90, "Symptom Matrix Chart" .

OK or NG

OK >> GO TO 17.
NG >> Repair or replace.

17. ERASE THE 1ST TRIP DTC

Some tests may cause a 1st trip DTC to be set.
Erase the 1st trip DTC from the ECM memory after performing the tests.
Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 18.

18. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0327, P0328, P0332, P0333 KS

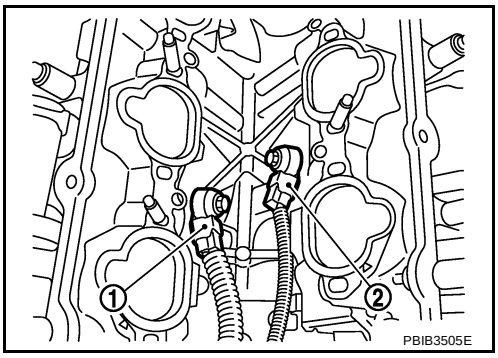
PFP:22060

Component Description

NBS0007X

The knock sensor is attached to the cylinder block. It senses engine knocking using a piezoelectric element. A knocking vibration from the cylinder block is sensed as vibrational pressure. This pressure is converted into a voltage signal and sent to the ECM.

1 : Knock sensor (bank 1)
2 : Knock sensor (bank 2)



On Board Diagnosis Logic

NBS0007Y

The MIL will not light up for these self-diagnoses.

DTC No.	Trouble diagnosis name	DTC detected condition	Possible cause
P0327 0327 (Bank 1)	Knock sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Knock sensor
P0332 0332 (Bank 2)			
P0328 0328 (Bank 1)	Knock sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	
P0333 0333 (Bank 2)			

DTC Confirmation Procedure

NBS0007Z

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-III

1. Start engine and run it for at least 5 seconds at idle speed.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-383, "Diagnostic Procedure" .

WITH GST

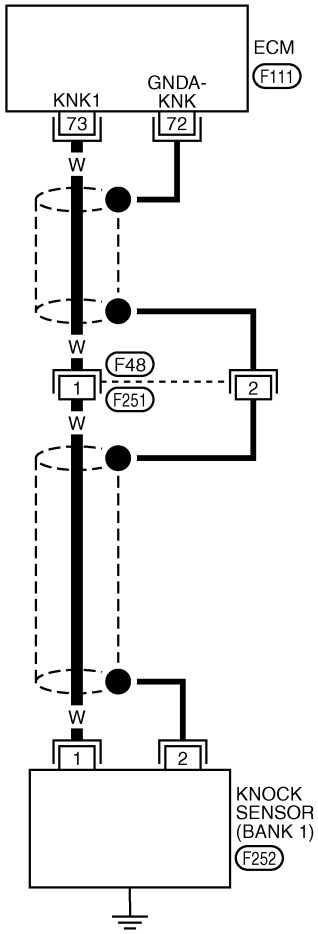
Follow the procedure “WITH CONSULT-III” above.

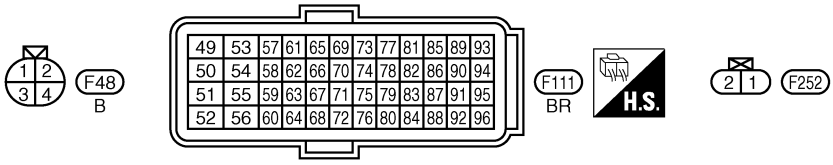
Wiring Diagram
BANK 1

NBS00080

EC-KSB1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1643E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

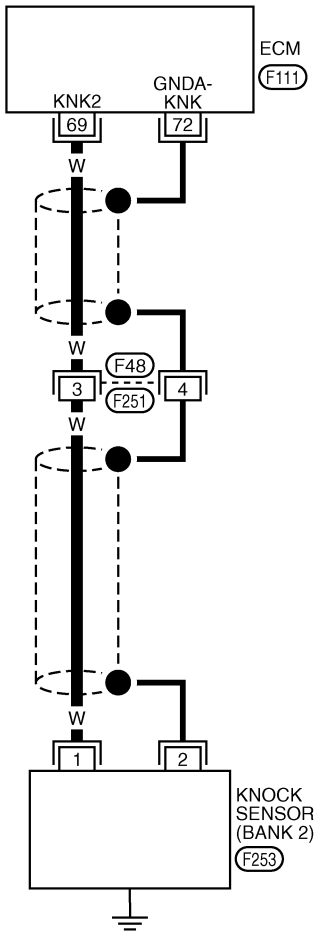
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

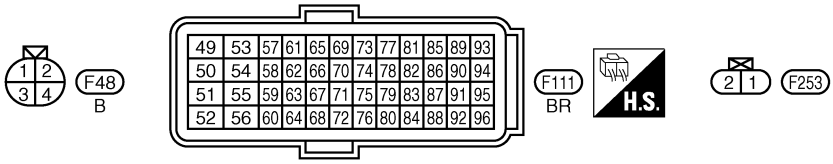
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
72	—	Sensor ground [Knock sensor (bank 1), Knock sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
73	W	Knock sensor (bank 1)	**[Engine is running]** ● Idle speed	Approximately 2.5V

BANK 2

EC-KSB2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1644E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
69	W	Knock sensor (bank 2)	**[Engine is running]** ● Idle speed	Approximately 2.5V
72	—	Sensor ground [Knock sensor (bank 1), Knock sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

Diagnostic Procedure

NBS00081

1. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check resistance between ECM terminal 73 (bank 1), 69 (bank 2) and ground. Refer to Wiring Diagram.

   NOTE:
   It is necessary to use an ohmmeter which can measure more than 10 MΩ.

   Resistance: Approximately 532 - 588 kΩ [at 20°C (68°F)]

4. Also check harness for short to ground and short to power.

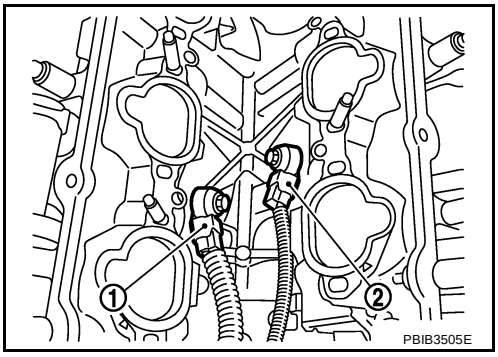
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

1. Disconnect knock sensor harness connector.

   1 : Knock sensor (bank 1)
   2 : Knock sensor (bank 2)



2. Check harness continuity between ECM terminal 73 (bank 1), 69 (bank 2) and knock sensor terminal 1. Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F48, F251
- Harness for open or short between ECM and knock sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK KNOCK SENSOR

Refer to EC-385, "Component Inspection" .

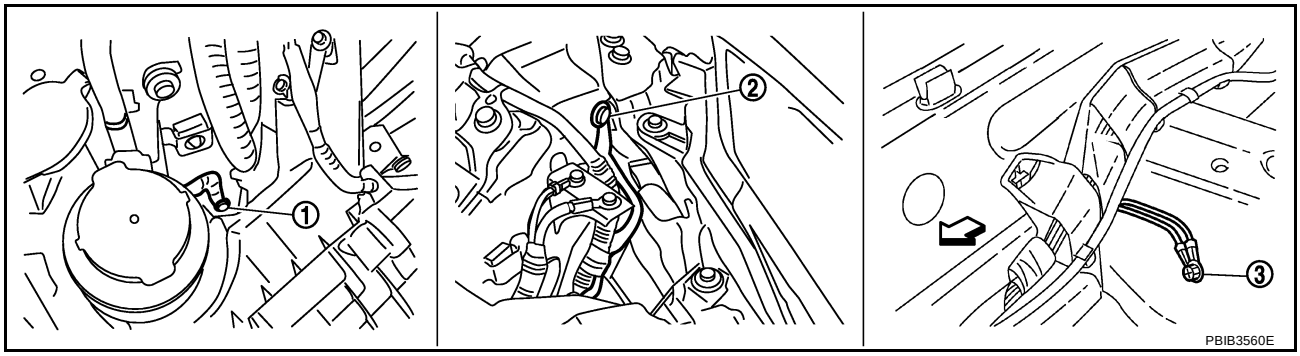
OK or NG

OK >> GO TO 5.
NG >> Replace knock sensor.

5. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

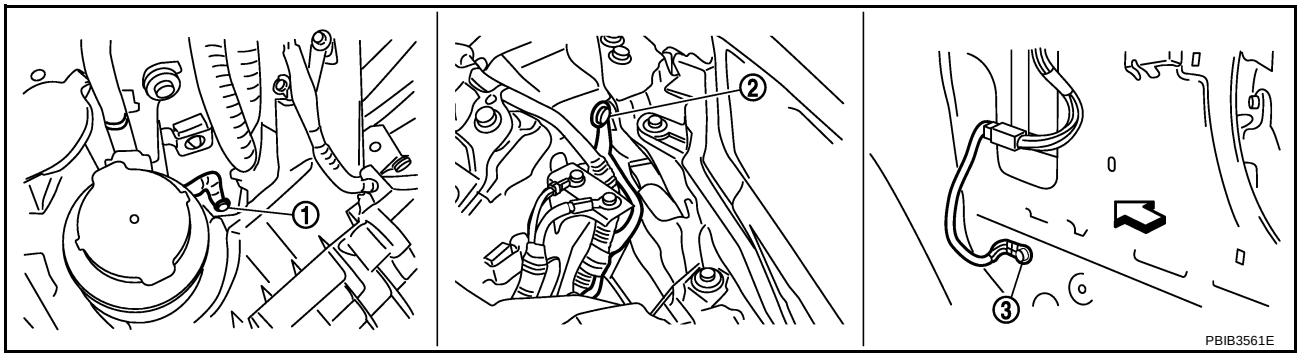


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 6.
NG >> Repair or replace ground connections.

6. CHECK KNOCK SENSOR SHIELD CIRCUIT FOR OPEN AND SHORT

1. Disconnect knock sensor harness connector.
2. Check harness continuity between ECM terminal 72 and knock sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F48, F251
- Harness for open or short between ECM and knock sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

NBS00082

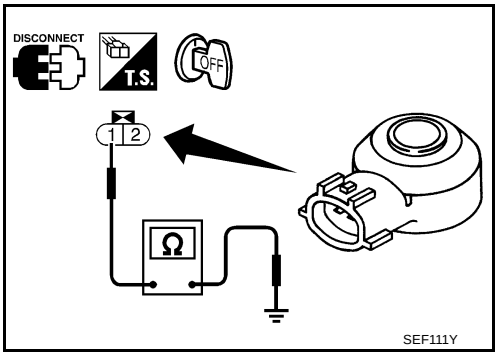
KNOCK SENSOR

Check resistance between knock sensor terminal 1 and ground.

NOTE:
It is necessary to use an ohmmeter which can measure more than 10 MΩ.

Resistance: Approximately 532 - 588 kΩ [at 20°C (68°F)]

CAUTION:
Do not use any knock sensors that have been dropped or physically damaged. Use only new ones.



Removal and Installation

NBS00083

KNOCK SENSOR

Refer to EM-107, "CYLINDER BLOCK" .

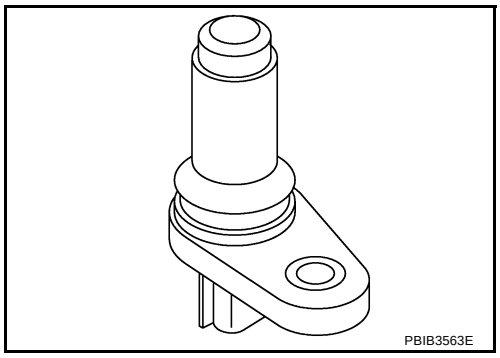
DTC P0335 CKP SENSOR (POS)

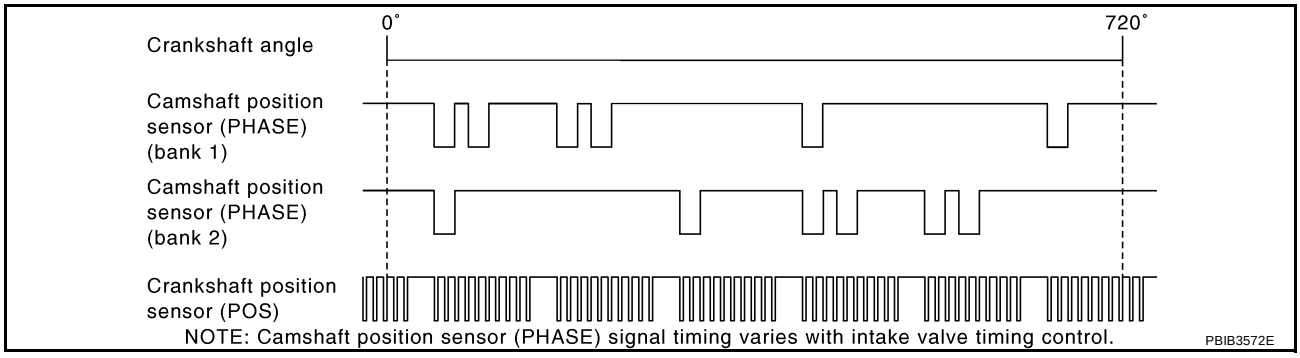
PFP:23731

Component Description

NBS00084

The crankshaft position sensor (POS) is located on the oil pan facing the gear teeth (cogs) of the signal plate. It detects the fluctuation of the engine revolution.
The sensor consists of a permanent magnet and Hall IC.
When the engine is running, the high and low parts of the teeth cause the gap with the sensor to change.
The changing gap causes the magnetic field near the sensor to change.
Due to the changing magnetic field, the voltage from the sensor changes.
The ECM receives the voltage signal and detects the fluctuation of the engine revolution.
ECM receives the signals as shown in the figure.


PBIB3563E



CONSULT-III Reference Value in Data Monitor Mode

NBS00085

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-III value with the tachometer indication.	Almost the same speed as the tachometer indication.

On Board Diagnosis Logic

NBS00086

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0335 0335	Crankshaft position sensor (POS) circuit	● The crankshaft position sensor (POS) signal is not detected by the ECM during the first few seconds of engine cranking. ● The proper pulse signal from the crankshaft position sensor (POS) is not sent to ECM while the engine is running. ● The crankshaft position sensor (POS) signal is not in the normal pattern during engine running.	● Harness or connectors [CKP sensor (POS) circuit is open or shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● EVAP control system pressure sensor ● Refrigerant pressure sensor ● Signal plate

DTC Confirmation Procedure

NBS00087

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch ON.

WITH CONSULT-III

1. Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-390, "Diagnostic Procedure" .

WITH GST

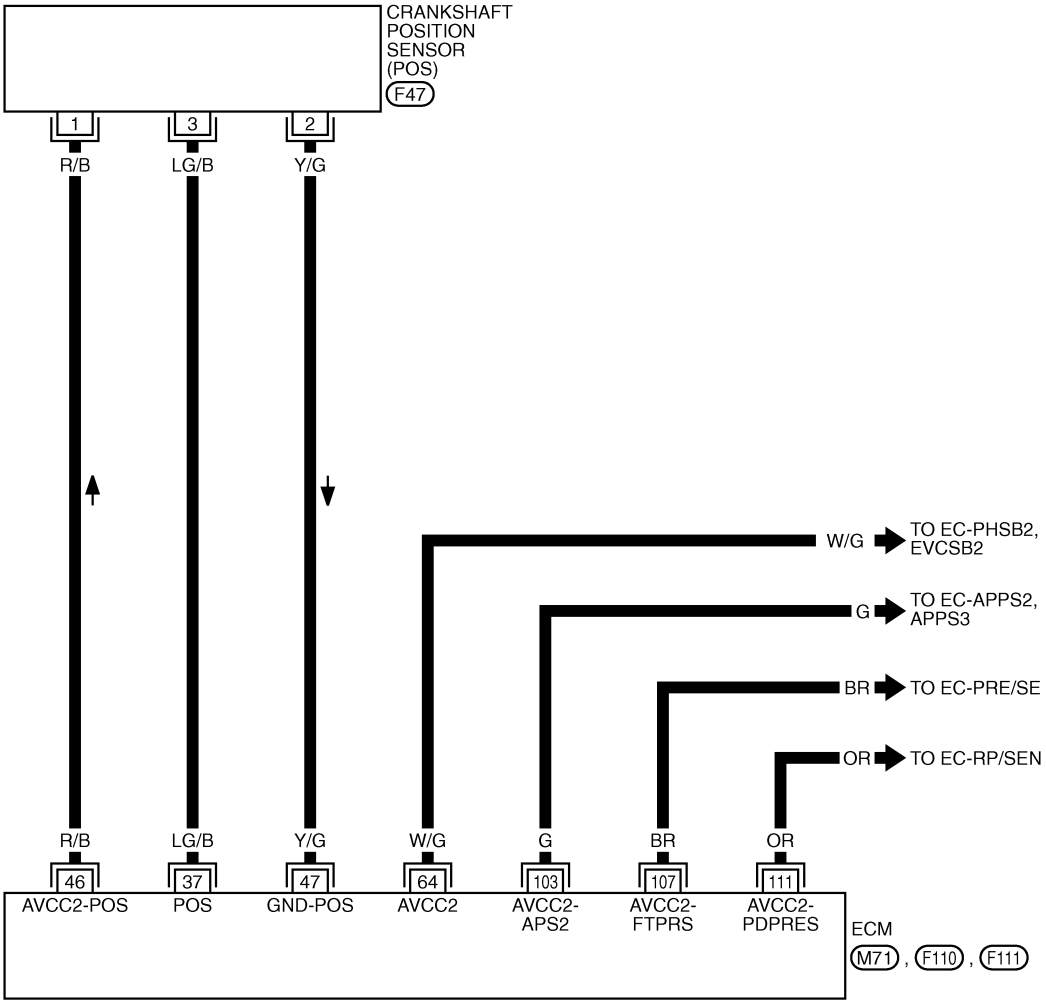
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

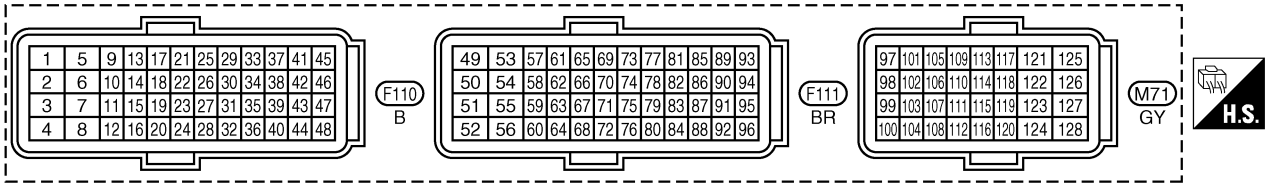
NBS00088

EC-POS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



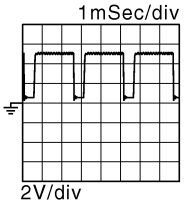
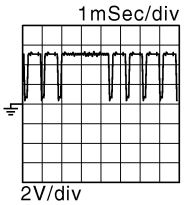




TBWT1645E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
37	LG/B	Crankshaft position sensor (POS)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3549E
			[Engine is running] ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3550E
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
47	Y/G	Sensor ground [Crankshaft position sensor (POS)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

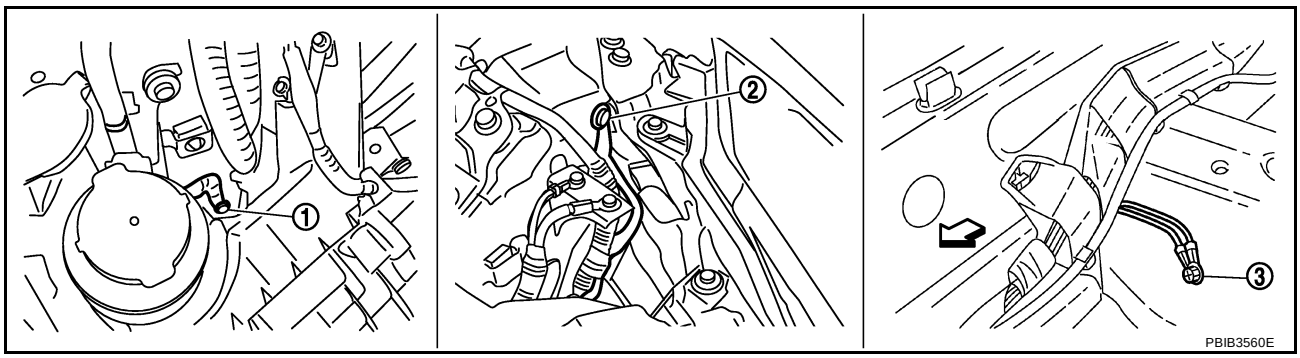
Diagnostic Procedure

NBS00089

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

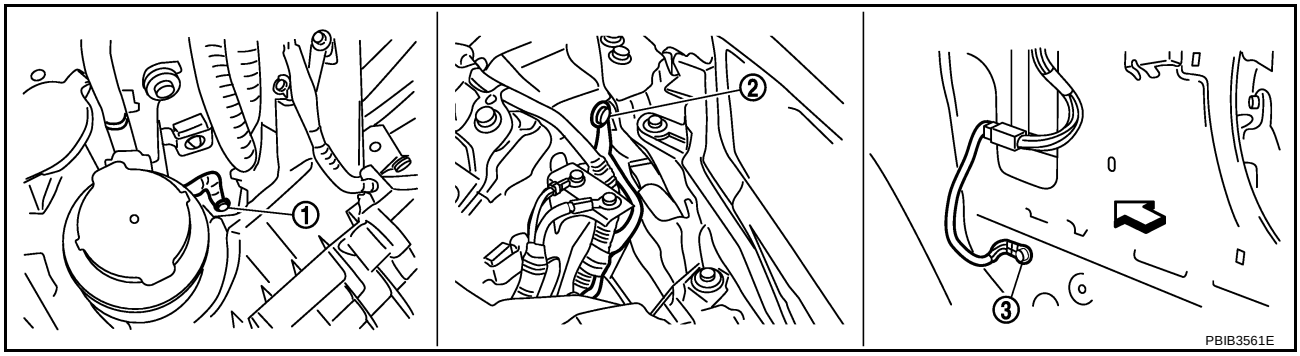


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

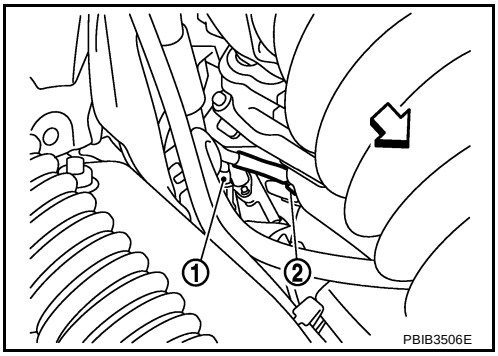
2. CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY CIRCUIT-I

1. Disconnect crankshaft position (CKP) sensor (POS) (2) harness connector.

   1 : A/F sensor 1 (bank 1)

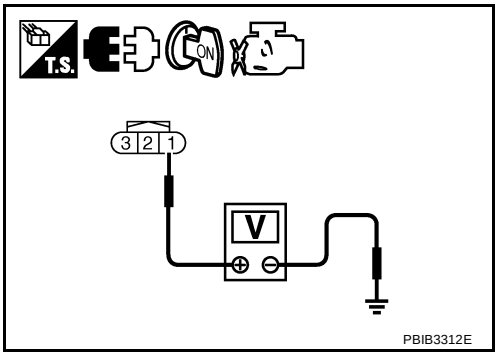
   ⇦ : Vehicle front

2. Turn ignition switch ON.



3. Check voltage between CKP sensor (POS) terminal 1 and ground with CONSULT-III or tester.

   Voltage: Approximately 5V



OK or NG

OK >> GO TO 8.
NG >> GO TO 3.

3. CHECK CKP SENSOR (POS) POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between CKP sensor (POS) terminal 1 and ECM terminal 46. Refer to Wiring Diagram.

   Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit.

4. CHECK CKP SENSOR (POS) POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor terminal 1	EC-711

OK or NG

OK >> GO TO 5.
NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK COMPONENTS

Check the following.

- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning component.

6. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> GO TO 7.

7. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

8. CHECK CKP SENSOR (POS) GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between CKP sensor (POS) terminal 2 and ECM terminal 47.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

9. CHECK CKP SENSOR (POS) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between CKP sensor (POS) terminal 3 and ECM terminal 37.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-393, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace CKP sensor (POS).

11. CHECK GEAR TOOTH

Visually check for chipping signal plate gear tooth.

OK or NG

OK >> GO TO 12.
NG >> Replace the signal plate.

12. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

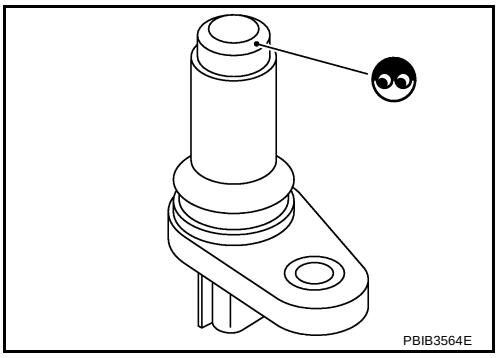
>> **INSPECTION END**

Component Inspection

NBS0008A

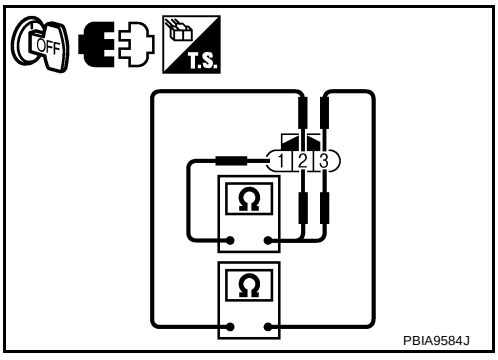
CRANKSHAFT POSITION SENSOR (POS)

1. Loosen the fixing bolt of the sensor.
2. Disconnect CKP sensor (POS) harness connector.
3. Remove the sensor.
4. Visually check the sensor for chipping.



5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	Except 0 or ∞
1 (+) - 3 (-)	
2 (+) - 3 (-)	



Removal and Installation

NBS0008B

CRANKSHAFT POSITION SENSOR (POS)

Refer to EM-26, "OIL PAN AND OIL STRAINER" .

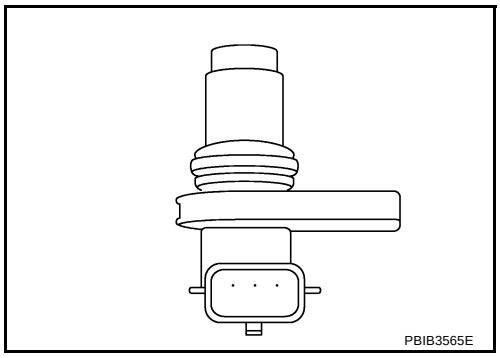
DTC P0340, P0345 CMP SENSOR (PHASE)

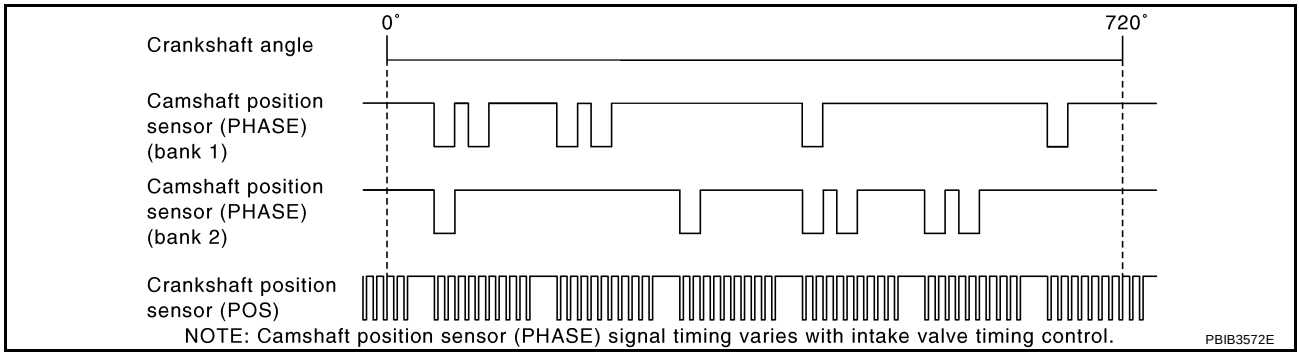
PFP:23731

Component Description

NBS0008C

The camshaft position sensor (PHASE) senses the retraction of camshaft (INT) to identify a particular cylinder. The camshaft position sensor (PHASE) senses the piston position.
When the crankshaft position sensor (POS) system becomes inoperative, the camshaft position sensor (PHASE) provides various controls of engine parts instead, utilizing timing of cylinder identification signals.
The sensor consists of a permanent magnet and Hall IC.
When engine is running, the high and low parts of the teeth cause the gap with the sensor to change.
The changing gap causes the magnetic field near the sensor to change.
Due to the changing magnetic field, the voltage from the sensor changes.
ECM receives the signals as shown in the figure.


PBIB3565E



CONSULT-III Reference Value in Data Monitor Mode

NBS0008D

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-III value with the tachometer indication.	Almost the same speed as the tachometer indication.

On Board Diagnosis Logic

NBS0008E

NOTE:
If DTC P0340 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0340 0340 (Bank 1)	Camshaft position sensor (PHASE) circuit	● The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking. ● The cylinder No. signal is not sent to ECM during engine running. ● The cylinder No. signal is not in the normal pattern during engine running.	● Harness or connectors [CMP sensor (PHASE) (bank 1) circuit is open or shorted.] ● Camshaft position sensor (PHASE) (bank 1) ● Camshaft (INT) ● Starter motor (Refer to SC-8, "STARTING SYSTEM" .) ● Starting system circuit (Refer to SC-8, "STARTING SYSTEM" .) ● Dead (Weak) battery
P0345 0345 (Bank 2)			● Harness or connectors [CMP sensor (PHASE) (bank 2) circuit is open or shorted.] [CKP sensor (POS) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Camshaft position sensor (PHASE) (bank 2) ● Crankshaft position sensor (POS) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● EVAP control system pressure sensor ● Refrigerant pressure sensor ● Camshaft (INT) ● Starter motor (Refer to SC-8, "STARTING SYSTEM" .) ● Starting system circuit (Refer to SC-8, "STARTING SYSTEM" .) ● Dead (Weak) battery

DTC Confirmation Procedure

NBS0008F

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch ON.

WITH CONSULT-III

1. Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-400, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to next step.
4. Maintaining engine speed at more than 800 rpm for at least 5 seconds.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-400, "Diagnostic Procedure" .

WITH GST

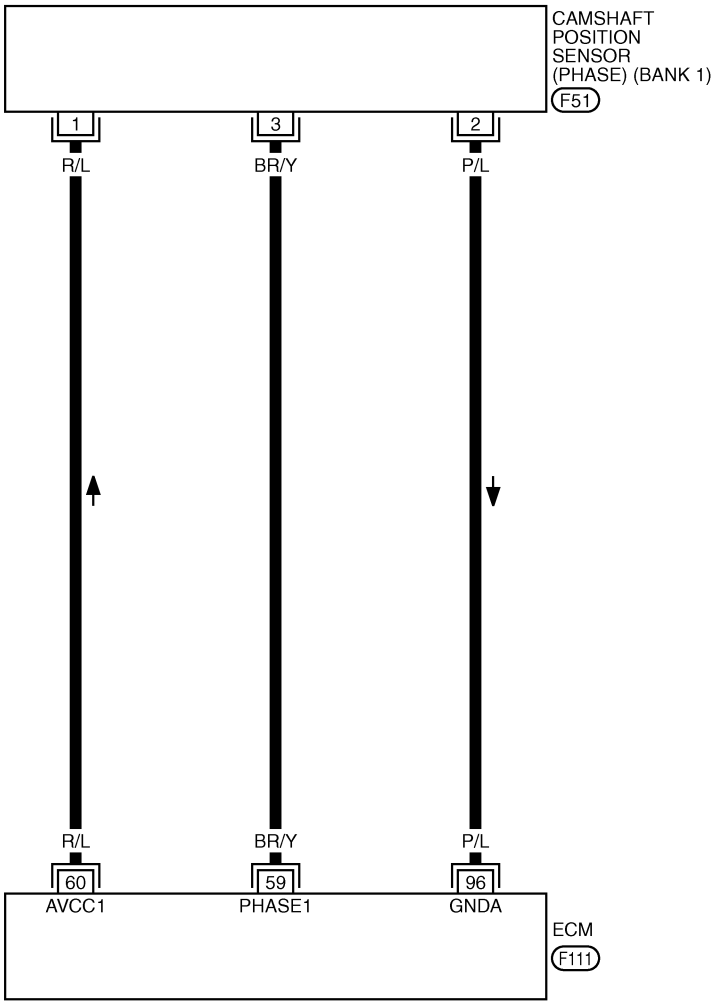
Follow the procedure “WITH CONSULT-III” above.

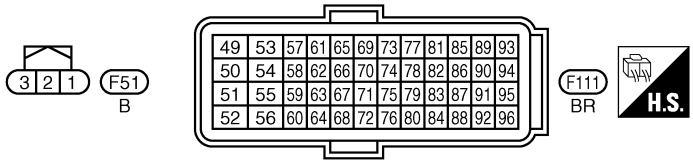
Wiring Diagram
BANK 1

NBS0008G

EC-PHSB1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



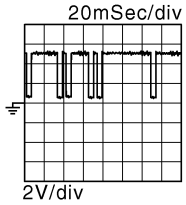
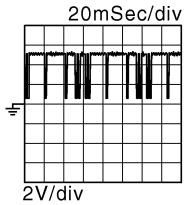


TBWT1646E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

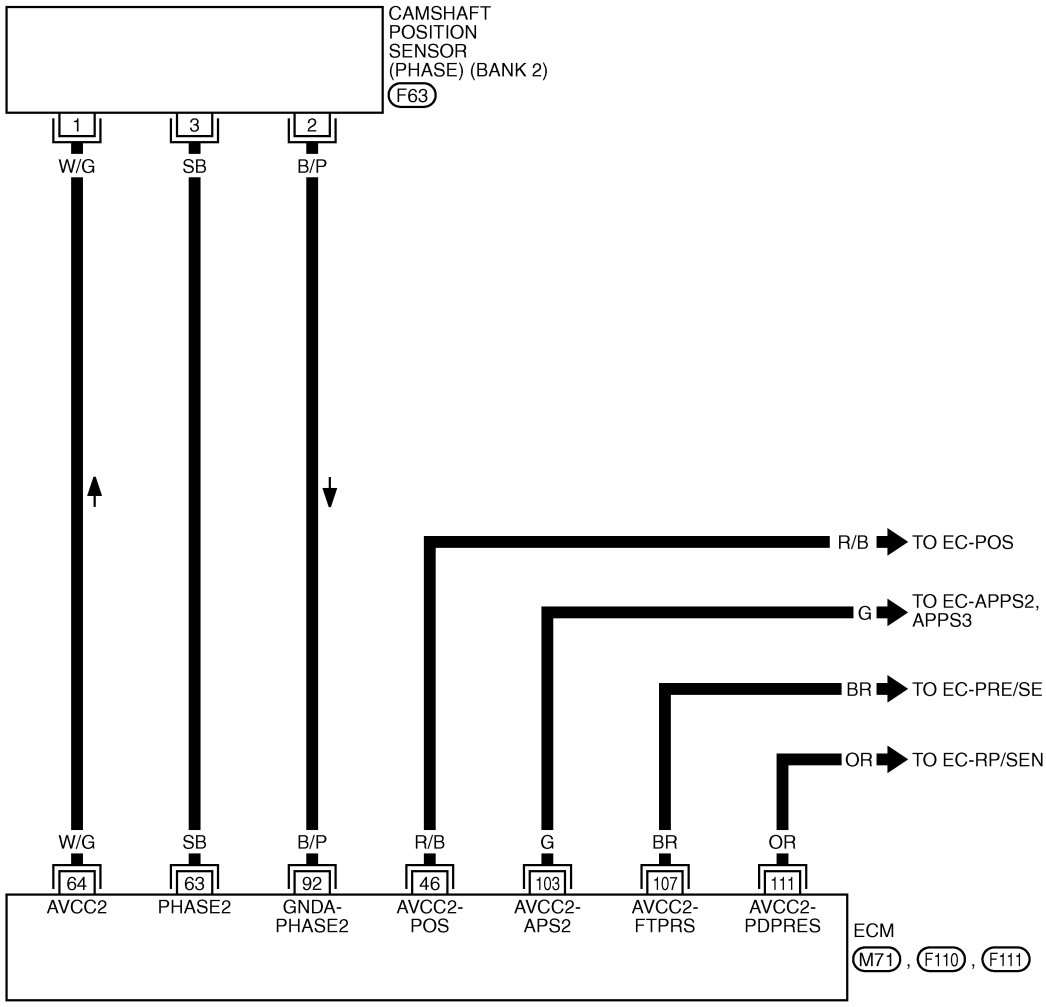
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
59	BR/Y	Camshaft position sensor (PHASE) (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	3.0 - 5.0V★  PBIB3553E
			[Engine is running] ● Engine speed: 2,000 rpm	3.0 - 5.0V★  PBIB3554E
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
96	P/L	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Power steering pressure sensor]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

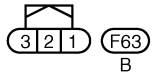
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

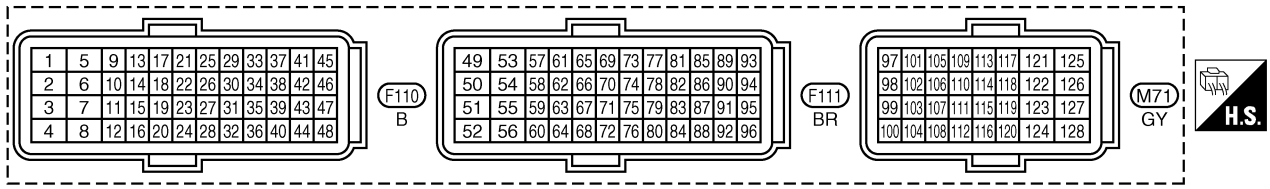
BANK 2

EC-PHSB2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





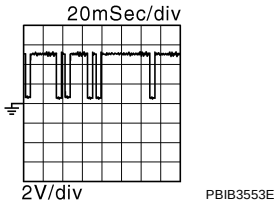
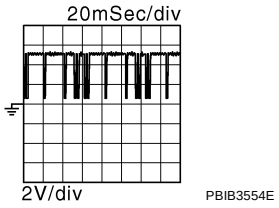


TBWT1647E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
63	SB	Camshaft position sensor (PHASE) (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	3.0 - 5.0V★  PBIB3553E
			[Engine is running] ● Engine speed: 2,000 rpm	1.0 - 4.0V★  PBIB3554E
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
92	B/P	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS0008H

1. CHECK STARTING SYSTEM

Turn ignition switch to START position.

Does the engine turn over?

Does the starter motor operate?

Yes or No

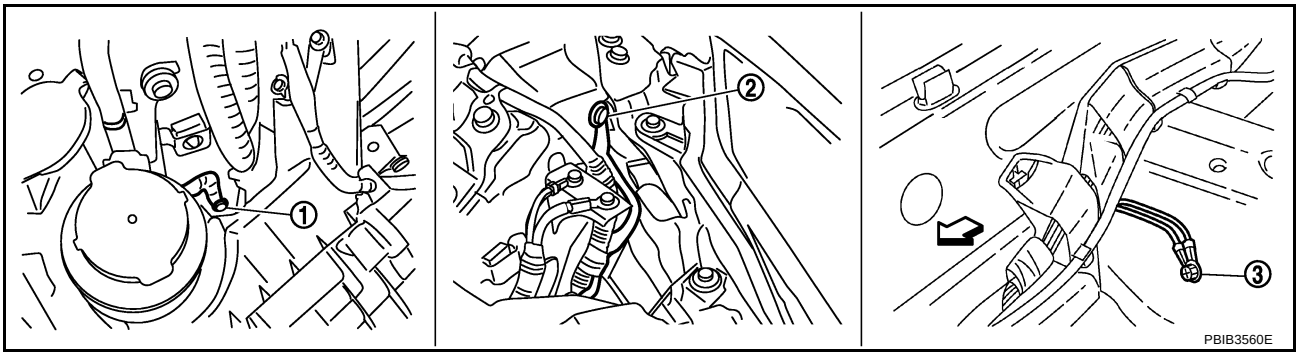
Yes >> GO TO 2.

No >> Check starting system. (Refer to SC-8, "STARTING SYSTEM" .)

2. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

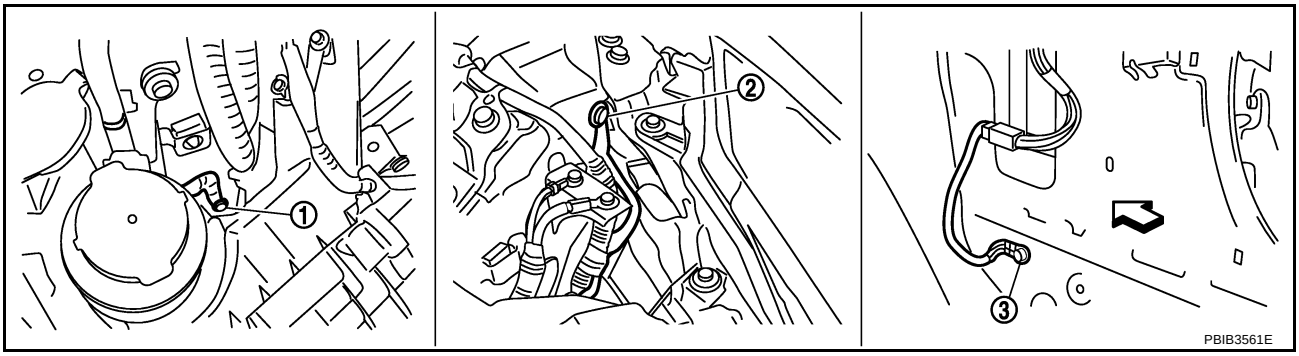


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 3.
NG >> Repair or replace ground connections.

3. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY CIRCUIT-I

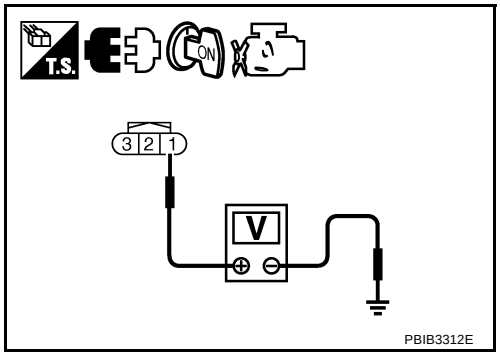
1. Disconnect camshaft position (CMP) sensor (PHASE) harness connector.



1. Exhaust valve timing control position sensor (bank 1)
2. Camshaft position sensor (PHASE) (bank 1)
3. Camshaft position sensor (PHASE) (bank 2)
4. Exhaust valve timing control position sensor (bank 2)

2. Turn ignition switch ON.
3. Check voltage between CMP sensor (PHASE) terminal 1 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 9.
NG-1 >> P0340: Repair open circuit or short to ground or short to power in harness or connectors.
NG-2 >> P0345: GO TO 4.

4. CHECK CMP SENSOR (PHASE) POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between CMP sensor (PHASE) terminal 1 and ECM terminal 64. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit.

5. CHECK CMP SENSOR (PHASE) POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor 1	EC-711

OK or NG

OK >> GO TO 6.
NG >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 7.
NG >> Replace malfunctioning component.

7. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> GO TO 8.

8. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

9. CHECK CMP SENSOR (PHASE) GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ECM terminal 92 (bank 2) or 96 (bank 1) and CMP sensor (PHASE) terminal 2.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground short to power.

OK or NG

OK >> GO TO 10.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK CMP SENSOR (PHASE) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 59 (bank 1) or 63 (bank 2) and CMP sensor (PHASE) terminal 2.
   Refer to Wiring Diagram.

   Continuity should exist.
3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 11.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

11. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-405, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> Replace malfunctioning CMP sensor (PHASE).

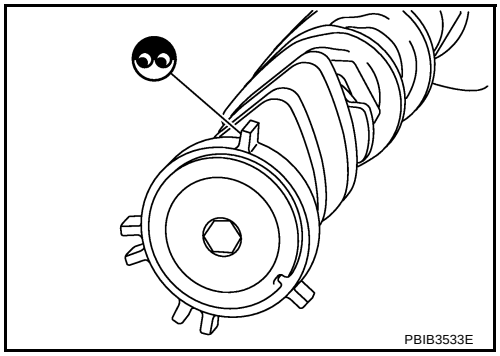
12. CHECK CAMSHAFT (INT)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 13.
NG >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.



13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

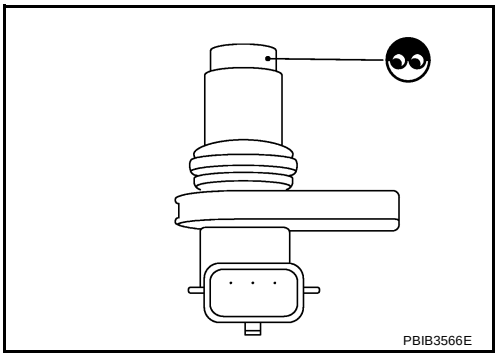
>> **INSPECTION END**

Component Inspection

NBS0008I

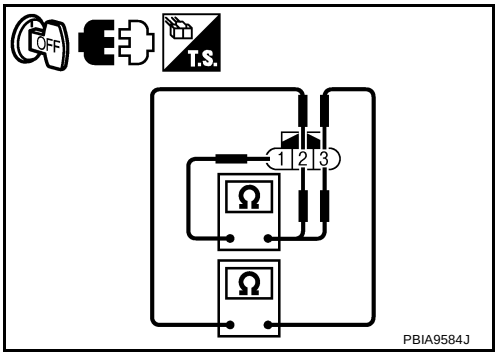
CAMSHAFT POSITION SENSOR (PHASE)

1. Loosen the fixing bolt of the sensor.
2. Disconnect CMP sensor (PHASE) harness connector.
3. Remove the sensor.
4. Visually check the sensor for chipping.



5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	Except 0 or ∞
1 (+) - 3 (-)	
2 (+) - 3 (-)	



Removal and Installation

NBS0008J

CAMSHAFT POSITION SENSOR (PHASE)

Refer to EM-72, "CAMSHAFT" .

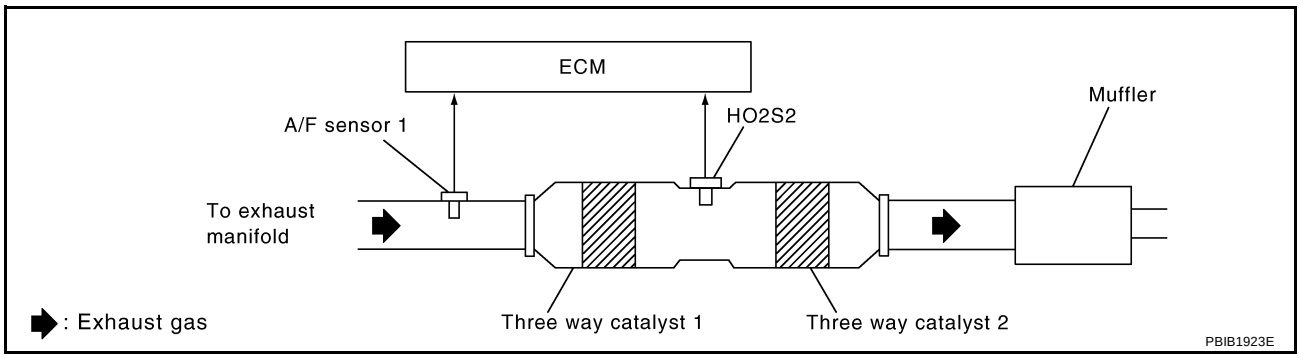
DTC P0420, P0430 THREE WAY CATALYST FUNCTION

PFP:20905

On Board Diagnosis Logic

NBS0008K

The ECM monitors the switching frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2. A three way catalyst 1 with high oxygen storage capacity will indicate a low switching frequency of heated oxygen sensor 2. As oxygen storage capacity decreases, the heated oxygen sensor 2 switching frequency will increase.
When the frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2 approaches a specified limit value, the three way catalyst 1 malfunction is diagnosed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0420 0420 (Bank 1)	Catalyst system efficiency below threshold	● Three way catalyst 1 does not operate properly. ● Three way catalyst 1 does not have enough oxygen storage capacity.	● Three way catalyst 1 ● Exhaust tube ● Intake air leaks ● Fuel injector ● Fuel injector leaks ● Spark plug ● Improper ignition timing
P0430 0430 (Bank 2)			

DTC Confirmation Procedure

NBS0008L

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

TESTING CONDITION:
Do not hold engine speed for more than the specified minutes below.

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that “COOLAN TEMP/S” indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when “COOLAN TEMP/S” indication reaches to 70°C (158°F).
7. Open engine hood.
8. Select “DTC & SRT CONFIRMATION” then “SRT WORK SUPPORT” mode with CONSULT-III.
9. Rev engine up to 2,000 to 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely.
   If “INCMP” of “CATALYST” changed to “CMPLT”, go to step 12.
10. Wait 5 seconds at idle.
11. Rev engine up to 2,000 to 3,000 rpm and maintain it until “INCMP” of “CATALYST” changes to “CMPLT” (It will take approximately 5 minutes).
    If not “CMPLT”, stop engine and cool it down to less than 70°C (158°F) and then retest from step 1.
12. Select “SELF-DIAG RESULTS” mode with CONSULT-III.

13. Confirm that the 1st trip DTC is not detected.
If the 1st trip DTC is detected, go to EC-407, "Diagnostic Procedure" .

Overall Function Check

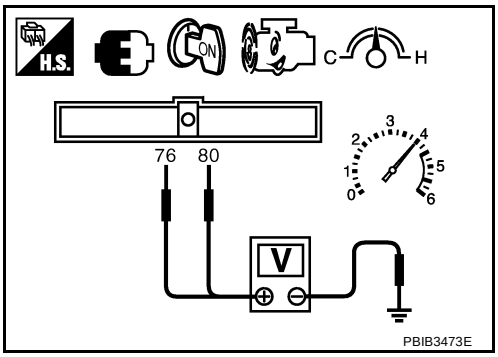
NBS0008M

Use this procedure to check the overall function of the three way catalyst 1. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1minute.
5. Open engine hood.
6. Set voltmeters probes between ECM terminal 76 [HO2S2 (bank 1) signal], 80 [HO2S2 (bank 2) signal] and ground.
7. Keep engine speed at 2,500 rpm constant under no load.
8. Make sure that the voltage does not vary for more than 5 seconds. It the voltage fluctuation cycle take less than 5 seconds. Go to EC-407, "Diagnostic Procedure" .

- 1cycle: 0.6 - 1.0 → 0 - 0.3 → 0.6 - 1.0



Diagnostic Procedure

NBS0008N

1. CHECK EXHAUST SYSTEM

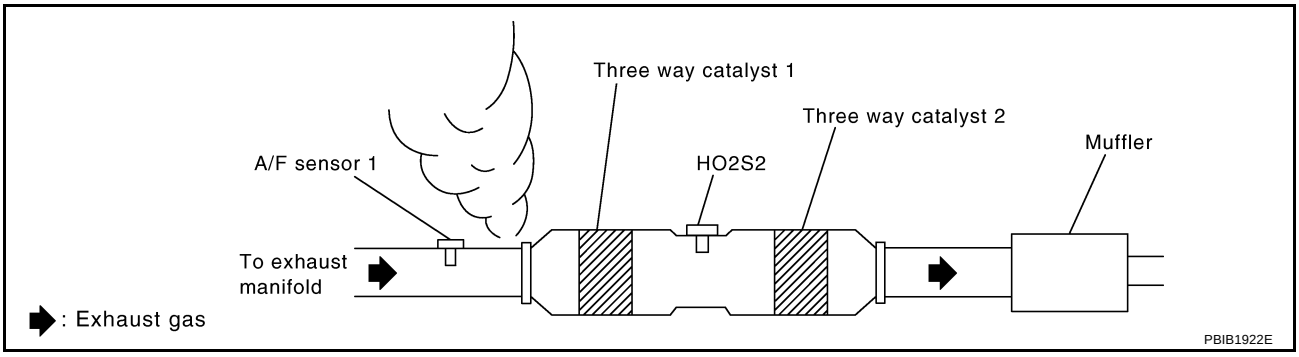
Visually check exhaust tubes and muffler for dent.

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before the three way catalyst 1.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK IGNITION TIMING

Check the following items. Refer to EC-71, "Basic Inspection" .

Items	Specifications	
Target idle speed	A/T	650 ± 50 rpm (in P or N position)
	M/T	650 ± 50 rpm (in Neutral position)
Ignition timing	A/T	15 ± 5° BTDC (in P or N position)
	M/T	15 ± 5° BTDC (in Neutral position)

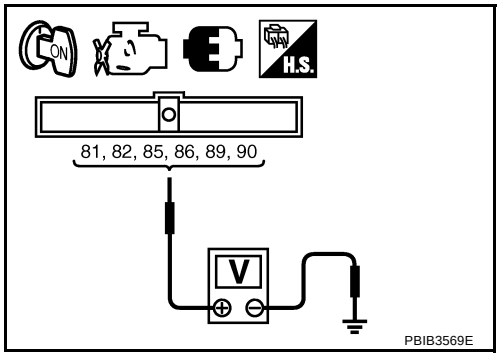
OK or NG

OK >> GO TO 5.
NG >> Follow the EC-71, "Basic Inspection" .

5. CHECK FUEL INJECTOR

1. Stop engine and turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Turn ignition switch ON.
4. Check voltage between ECM terminals 81, 82, 85, 86, 89, 90 and ground with CONSULT-III or tester.
   Refer to Wiring Diagram for fuel injectors, EC-687, "Wiring Diagram" .

   Voltage: Battery voltage



OK or NG

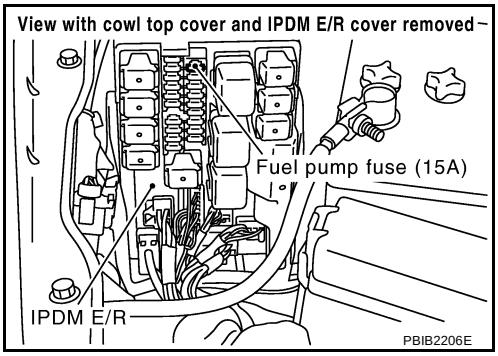
OK >> GO TO 6.
NG >> Perform EC-688, "Diagnostic Procedure" .

6. CHECK FUNCTION OF IGNITION COIL-I

CAUTION:
Do the following procedure in the place where ventilation is good without the combustible.

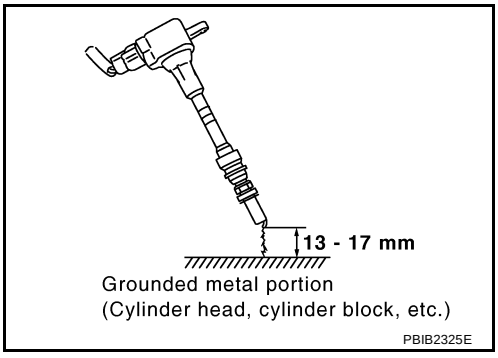
1. Turn ignition switch OFF.
2. Reconnect ECM harness connector disconnected.
3. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

   NOTE:
   Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.
4. Start engine.
5. After engine stalls, crank it two or three times to release all fuel pressure.
6. Turn ignition switch OFF.
7. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
8. Remove ignition coil and spark plug of the cylinder to be checked.



9. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
10. Connect spark plug and harness connector to ignition coil.
11. Fix ignition coil using a rope etc. with gap of 13 - 17 mm between the edge of the spark plug and grounded metal portion as shown in the figure.
12. Crank engine for about 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

    Spark should be generated.



CAUTION:

- **Do not approach to the spark plug and the ignition coil within 50cm. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20kV or more.**
- **It might cause to damage the ignition coil if the gap of more than 17 mm is taken.**

NOTE:
When the gap is less than 13 mm, the spark might be generated even if the coil is malfunctioning.

OK or NG

OK >> GO TO 10.
NG >> GO TO 7.

7. CHECK FUNCTION OF IGNITION COIL-II

1. Turn ignition switch OFF.
2. Disconnect spark plug and connect a known-good spark plug.
3. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

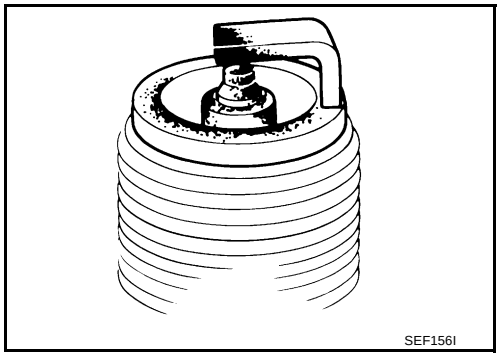
   Spark should be generated.

OK or NG

OK >> GO TO 8.
NG >> Check ignition coil, power transistor and their circuits. Refer to EC-698, "IGNITION SIGNAL" .

8. CHECK SPARK PLUG

1. Turn ignition switch OFF.
2. Check the spark plugs and check for fouling, etc.



OK or NG

OK >> GO TO 9.
NG >> Repair or replace spark plug (s) with standard type one (s). For spark plug type ignition coil. Refer to MA-18, "Changing Spark Plugs (Iridium-Tipped Type)" .

9. CHECK FUNCTION OF IGNITION COIL-III

1. Reconnect the initial spark plugs.
2. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

OK or NG

OK >> **INSPECTION END**
NG >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to MA-18, "Changing Spark Plugs (Iridium-Tipped Type)" .

10. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Remove fuel injector assembly.
   Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all fuel injectors connected to fuel injector gallery.
3. Disconnect all ignition coil harness connectors.
4. Reconnect all fuel injector harness connectors disconnected.
5. Turn ignition switch ON.
   Make sure fuel does not drip from fuel injector.

OK or NG

OK (Does not drip.)>>GO TO 11.
NG (Drips.)>>Replace the fuel injector(s) from which fuel is dripping.

11. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

Trouble is fixed.>>**INSPECTION END**
Trouble is not fixed.>>Replace three way catalyst assembly.

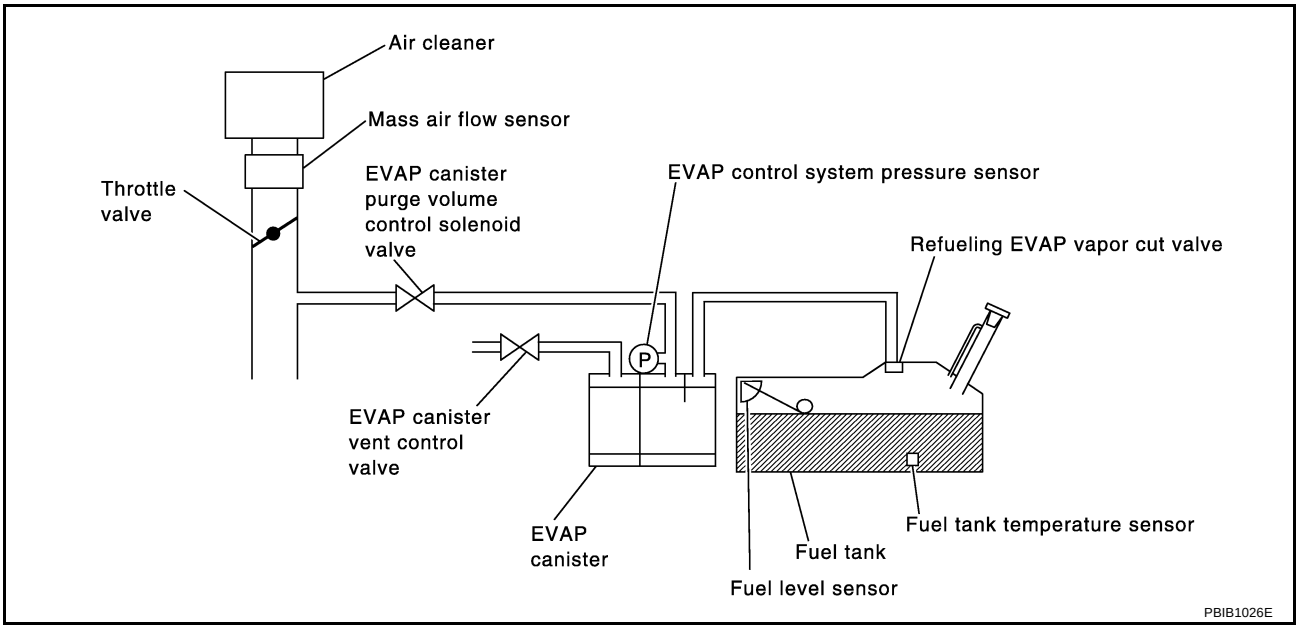
DTC P0441 EVAP CONTROL SYSTEM

PFP:14950

System Description

NBS0008O

NOTE:
If DTC P0441 is displayed with other DTC such as P2122, P2123, P2127, P2128 or P2138, first perform trouble diagnosis for other DTC.



In this evaporative emission (EVAP) control system, purge flow occurs during non-closed throttle conditions. Purge volume is related to air intake volume. Under normal purge conditions (non-closed throttle), the EVAP canister purge volume control solenoid valve is open to admit purge flow. Purge flow exposes the EVAP control system pressure sensor to intake manifold vacuum.

On Board Diagnosis Logic

NBS0008P

Under normal conditions (non-closed throttle), sensor output voltage indicates if pressure drop and purge flow are adequate. If not, a malfunction is determined.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0441 0441	EVAP control system incorrect purge flow	EVAP control system does not operate properly, EVAP control system has a leak between intake manifold and EVAP control system pressure sensor.	● EVAP canister purge volume control solenoid valve stuck closed ● EVAP control system pressure sensor and the circuit ● Loose, disconnected or improper connection of rubber tube ● Blocked rubber tube ● Cracked EVAP canister ● EVAP canister purge volume control solenoid valve circuit ● Accelerator pedal position sensor ● Blocked purge port ● EVAP canister vent control valve

DTC Confirmation Procedure

NBS0008Q

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and let it idle for at least 70 seconds.
4. Select “PURG FLOW P0441” of “EVAPORATIVE SYSTEM” in “DTC & SRT CONFIRMATION” mode with CONSULT-III.
5. Touch “START”.
   If “COMPLETED” is displayed, go to step 7.
6. When the following conditions are met, “TESTING” will be displayed on the CONSULT-III screen. Maintain the conditions continuously until “TESTING” changes to “COMPLETED”. (It will take at least 35 seconds.)

Shift lever	Suitable position
VHCL SPEED SE	32 - 120 km/h (20 - 75 MPH)
ENG SPEED	500 - 3,000 rpm
B/FUEL SCHDL	1.3 - 9.0 msec
COOLAN TEMP/S	70 - 100°C (158 - 212°F)

If “TESTING” is not changed for a long time, retry from step 2.

7. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”. If “NG” is displayed, refer to EC-413, "Diagnostic Procedure" .

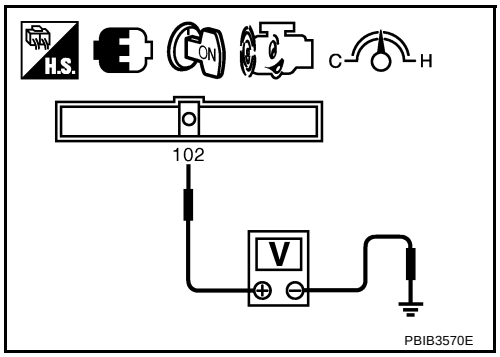
Overall Function Check

NBS0008R

Use this procedure to check the overall monitoring function of the EVAP control system purge flow monitoring. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Lift up drive wheels.
2. Start engine (VDC switch or TCS switch OFF) and warm it up to normal operating temperature.
3. Turn ignition switch OFF, wait at least 10 seconds.
4. Start engine and wait at least 70 seconds.
5. Set voltmeter probes to ECM terminals 102 (EVAP control system pressure sensor signal) and ground.
6. Check EVAP control system pressure sensor value at idle speed and note it.
7. Establish and maintain the following conditions for at least 1 minute.



Air conditioner switch	ON
Headlamp switch	ON
Rear window defogger switch	ON
Engine speed	Approx. 3,000 rpm
Shift lever	Any position other than P, N or R

8. Verify that EVAP control system pressure sensor value stays 0.1V less than the value at idle speed (measured at step 6) for at least 1 second.
9. If NG, go to EC-413, "Diagnostic Procedure" .

Diagnostic Procedure

NBS0008S

1. CHECK EVAP CANISTER

1. Turn ignition switch OFF.
2. Check EVAP canister for cracks.

OK or NG

OK (With CONSULT-III)>>GO TO 2.
OK (Without CONSULT-III)>>GO TO 3.
NG >> Replace EVAP canister.

2. CHECK PURGE FLOW

With CONSULT-III

1. Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .
2. Start engine and let it idle.
3. Select “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III.
4. Rev engine up to 2,000 rpm.
5. Touch “Qd” and “Qu” on CONSULT-III screen to adjust “PURG VOL CONT/V” opening and check vacuum existence.

PURG VOL CONT/V	Vacuum
100%	Should exist.
0%	Should not exist.

OK or NG

OK >> GO TO 7.
NG >> GO TO 4.

3. CHECK PURGE FLOW

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .
4. Start engine and let it idle.

   Do not depress accelerator pedal even slightly

5. Check vacuum gauge indication before 60 seconds passed after starting engine.

   Vacuum should not exist.

6. Revving engine up to 2,000 rpm after 100 seconds passed after starting engine.

   Vacuum should exist.

OK or NG

OK >> GO TO 7.
NG >> GO TO 4.

4. CHECK EVAP PURGE LINE

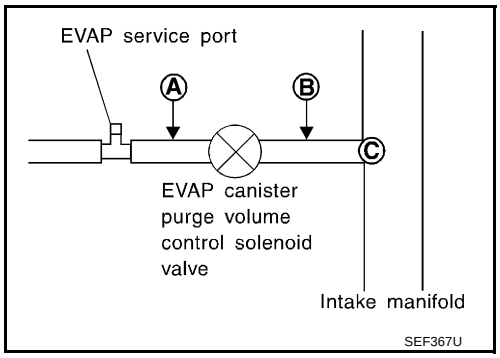
1. Turn ignition switch OFF.
2. Check EVAP purge line for improper connection or disconnection. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 5.
NG >> Repair it.

5. CHECK EVAP PURGE HOSE AND PURGE PORT

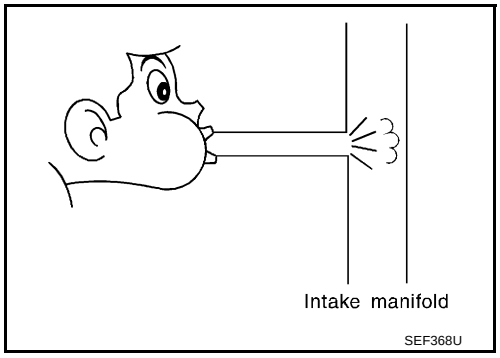
1. Disconnect purge hoses connected to EVAP service port **A** and EVAP canister purge volume control solenoid valve **B** .
2. Blow air into each hose and EVAP purge port **C** .



3. Check that air flows freely.

OK or NG

OK (With CONSULT-III)>>GO TO 6.
OK (Without CONSULT-III)>>GO TO 7.
NG >> Repair or clean hoses and/or purge port.



6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

1. Start engine.
2. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP canister purge volume control solenoid valve.

8. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 9.
NG >> Replace EVAP control system pressure sensor.

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION

Refer to EC-457, "DTC Confirmation Procedure" for DTC P0452 and EC-466, "DTC Confirmation Procedure" for P0453.

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP control system pressure sensor.

10. CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 11.
NG >> Clean the rubber tube using an air blower.

11. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> Replace EVAP canister vent control valve.

12. CHECK EVAP PURGE LINE

Inspect EVAP purge line (pipe and rubber tube). Check for evidence of leaks.
Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 13.
NG >> Replace it.

13. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 14.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

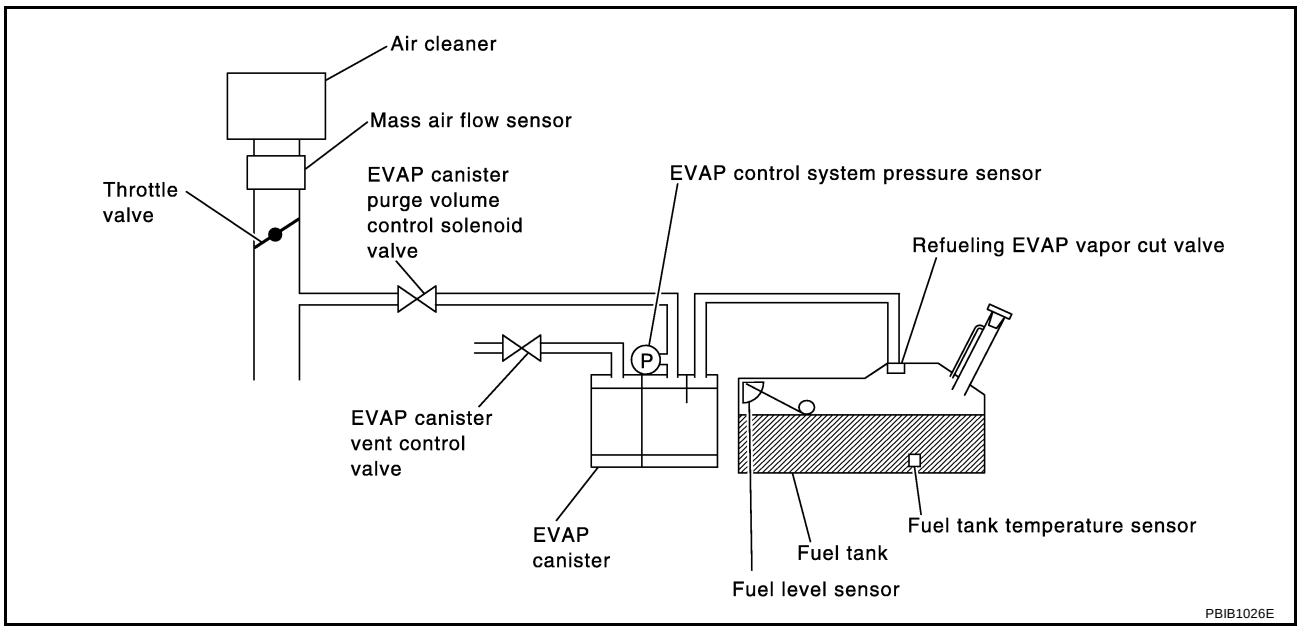
DTC P0442 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

NBS0008T

This diagnosis detects leaks in the EVAP purge line using engine intake manifold vacuum.
If pressure does not increase, the ECM will check for leaks in the line between the fuel tank and EVAP canister purge volume control solenoid valve, under the following Vacuum test conditions.
The EVAP canister vent control valve is closed to shut the EVAP purge line off. The EVAP canister purge volume control solenoid valve will then be opened to depressurize the EVAP purge line using intake manifold vacuum. After this occurs, the EVAP canister purge volume control solenoid valve will be closed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0442 0442	EVAP control system small leak detected (negative pressure)	EVAP control system has a leak, EVAP control system does not operate properly.	● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Fuel filler cap remains open or fails to close. ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged ● EVAP canister is saturated with water ● EVAP control system pressure sensor ● Fuel level sensor and the circuit ● Refueling EVAP vapor cut valve ● ORVR system leaks

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**
- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

NBS0008U

NOTE:

- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- **Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.**
- **Always perform test at a temperature of 0 to 30°C (32 to 86°F).**

WITH CONSULT-III

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
4. Make sure that the following conditions are met.
   COOLAN TEMP/S: 0 - 70°C (32 - 158°F)
   INT/A TEMP SE: 0 - 30°C (32 - 86°F)
5. Select "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.
   Follow the instruction displayed.

   NOTE:
   If the engine speed cannot be maintained within the range displayed on the CONSULT-III screen, go to EC-71, "Basic Inspection" .
6. Make sure that "OK" is displayed.
   If "NG" is displayed, refer to EC-418, "Diagnostic Procedure" .

   NOTE:
   Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

WITH GST

NOTE:
Be sure to read the explanation of EC-58, "Driving Pattern" before driving vehicle.

1. Start engine.
2. Drive vehicle according to EC-58, "Driving Pattern" .
3. Stop vehicle.
4. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
5. Select Service $07 with GST.

- If P0442 is displayed on the screen, go to EC-418, "Diagnostic Procedure" .
- If P0441 is displayed on the screen, go to EC-413, "Diagnostic Procedure" .

Diagnostic Procedure

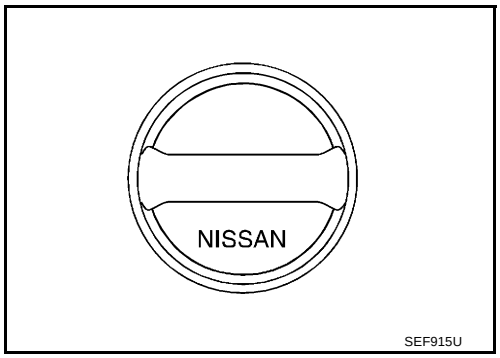
NBS0008V

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-36, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)" .

OK or NG

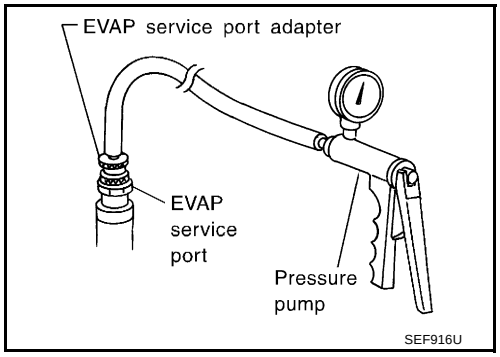
OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

With CONSULT-III>>GO TO 6.
Without CONSULT-III>>GO TO 7.

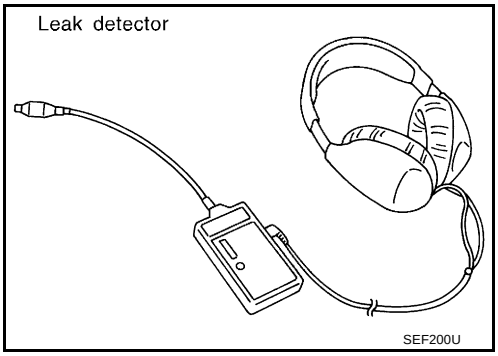


6. CHECK FOR EVAP LEAK

With CONSULT-III

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-III.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

   CAUTION:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



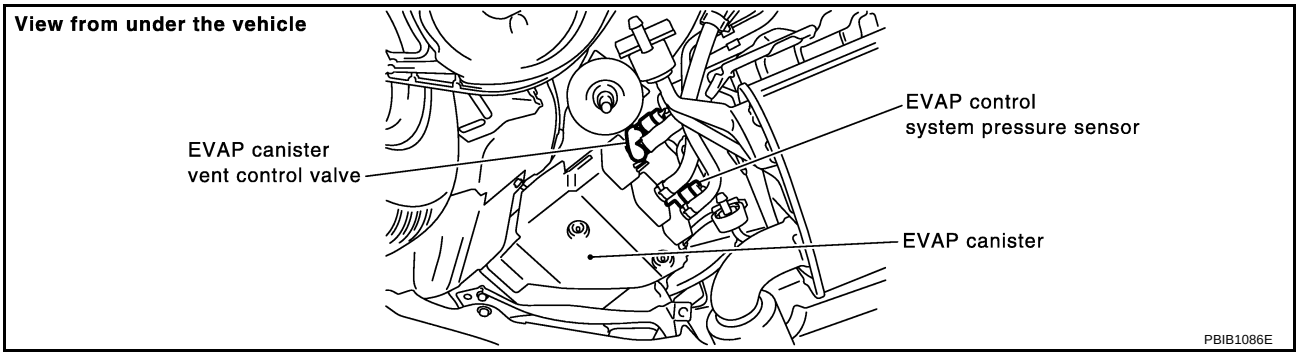
OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

7. CHECK FOR EVAP LEAK

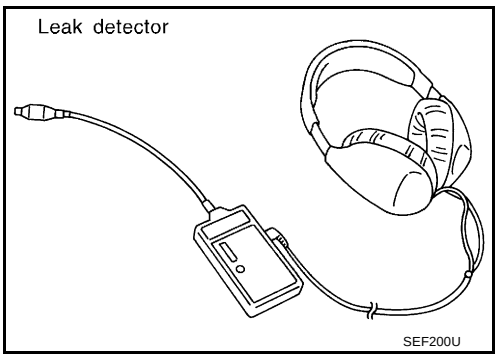
Without CONSULT-III

1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

   CAUTION:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
  Refer to EC-37, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-442, "Component Inspection" .

OK or NG

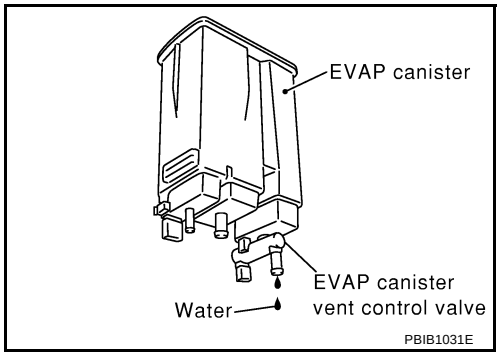
OK >> GO TO 9.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

9. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 10.
No (With CONSULT-III)>>GO TO 12.
No (Without CONSULT-III)>>GO TO 13.



10. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.
The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK (With CONSULT-III)>>GO TO 12.
OK (Without CONSULT-III)>>GO TO 13.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-III

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-III screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 16.
NG >> GO TO 14.

14. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-100, "Vacuum Hose Drawing" .

OK or NG

OK >> GO TO 15.
NG >> Repair or reconnect the hose.

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-464, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 19.
NG >> Repair or reconnect the hose.

19. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 20.

20. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-39, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 21.
NG >> Repair or replace hoses and tubes.

21. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 22.
NG >> Repair or replace hose, tube or filler neck tube.

22. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "REFUELING EVAP VAPOR CUT VALVE" .

OK or NG

OK >> GO TO 23.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

23. CHECK FUEL LEVEL SENSOR

Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .

OK or NG

OK >> GO TO 24.
NG >> Replace fuel level sensor unit.

24. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

PFP:14920

Description

NBS000FE

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	EVAP canister purge flow control	EVAP canister purge volume control solenoid valve
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Fuel tank temperature sensor	Fuel temperature in fuel tank		
Wheel sensor	Vehicle speed*2		

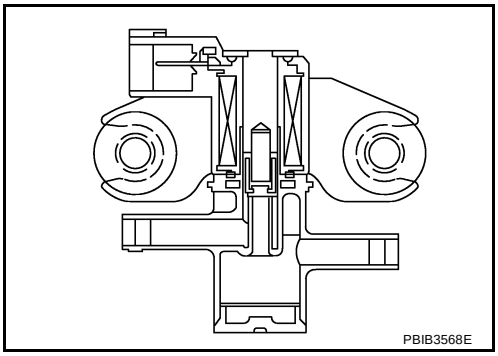
*1: ECM determines the start signal status by the signals of engine speed and battery voltage.

*2: This signal is sent to the ECM through CAN communication line.

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/OFF duty to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



CONSULT-III Reference Value in Data Monitor Mode

NBS000FF

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PURG VOL C/V	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle (Accelerator pedal is not depressed even slightly, after engine starting)	0%
		2,000 rpm	—

On Board Diagnosis Logic

NBS000FG

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0443 0443	EVAP canister purge volume control solenoid valve	The canister purge flow is detected during the specified driving conditions, even when EVAP canister purge volume control solenoid valve is completely closed.	● EVAP control system pressure sensor ● EVAP canister purge volume control solenoid valve (The valve is stuck open.) ● EVAP canister vent control valve ● EVAP canister ● Hoses (Hoses are connected incorrectly or clogged.)

DTC Confirmation Procedure

NBS000FH

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “PURG VOL CN/V P1444” of “EVAPORATIVE SYSTEM” in “DTC WORK SUPPORT” mode with CONSULT-III.
5. Touch “START”.
6. Start engine and let it idle until “TESTING” on CONSULT-III changes to “COMPLETED”. (It will take approximately 10 seconds.)
   If “TESTING” is not displayed after 5 minutes, retry from step 2.
7. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”. If “NG” is displayed, refer to EC-427, "Diagnostic Procedure" .

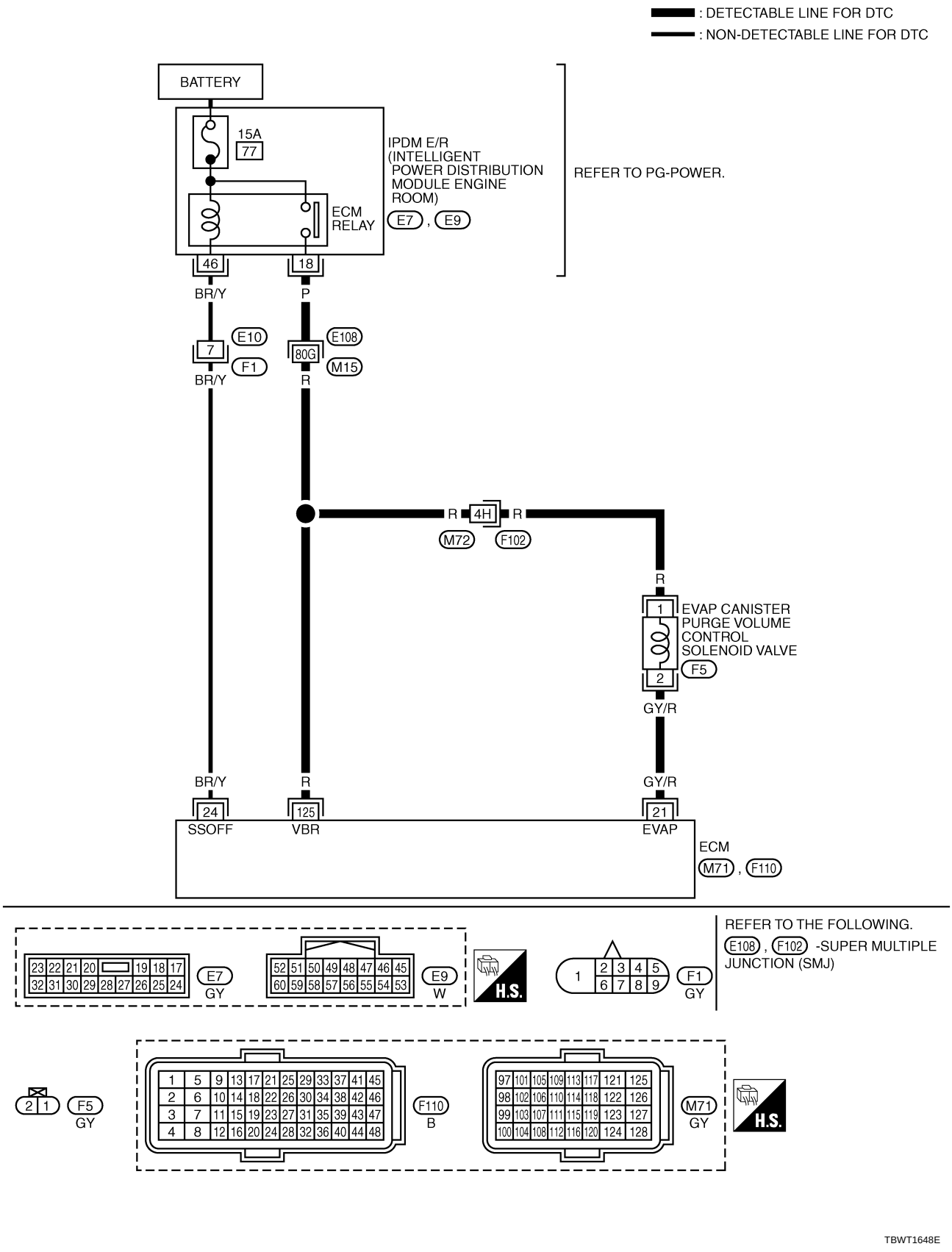
WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and let it idle for at least 20 seconds.
4. Select Service $07 with GST.
5. If 1st trip DTC is detected, go to EC-427, "Diagnostic Procedure" .

Wiring Diagram

NBS000FI

EC-PGC/V-01

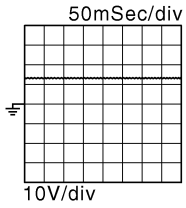
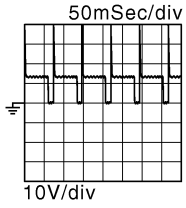


TBWT1648E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
21	GY/R	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed ● Accelerator pedal: Not depressed even slightly, after engine starting.	BATTERY VOLTAGE (11 - 14V)★  PBIB3547E
			[Engine is running] ● Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14V)★  PBIB3548E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

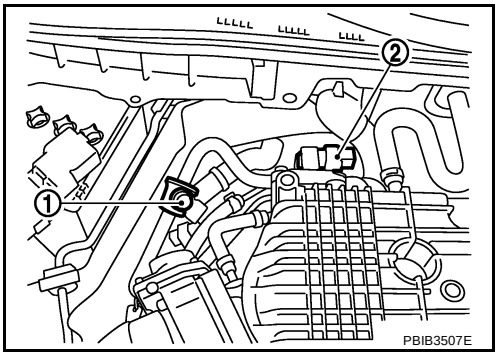
NBS000FJ

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister purge volume control solenoid valve (2) harness connector.

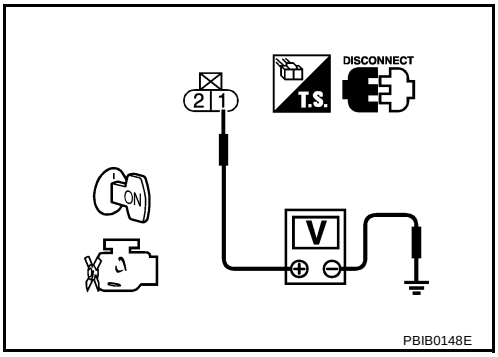
   1 : EVAP service port

3. Turn ignition switch ON.



4. Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-III or tester.

   Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 21 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.
NG >> Replace EVAP control system pressure sensor.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455, "Component Inspection" .

OK or NG

OK (With CONSULT-III)>>GO TO 6.
OK (Without CONSULT-III)>>GO TO 7.
NG >> Replace EVAP control system pressure sensor.

6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Start engine.
4. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-430, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP canister purge volume control solenoid valve.

8. CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 9.
NG >> Clean the rubber tube using an air blower.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

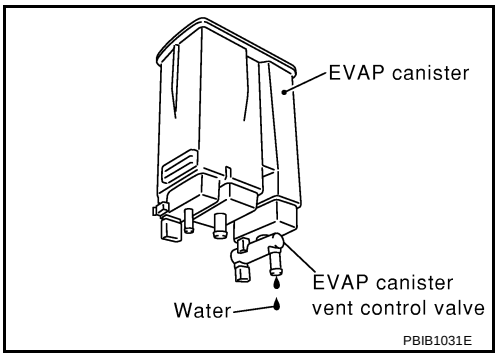
Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP canister vent control valve.

10. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?



OK or NG

OK >> GO TO 11.
NG >> GO TO 13.

11. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

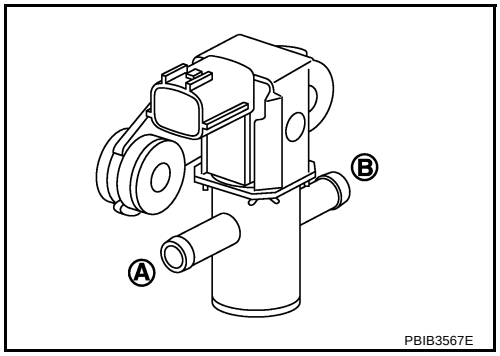
NBS000FK

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

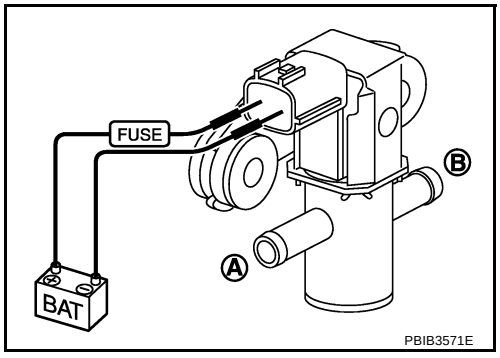
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



Without CONSULT-III

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



Removal and Installation

NBS000FL

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

PFP:14920

Description

NBS0008W

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	EVAP canister purge flow control	EVAP canister purge volume control solenoid valve
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Fuel tank temperature sensor	Fuel temperature in fuel tank		
Wheel sensor	Vehicle speed*2		

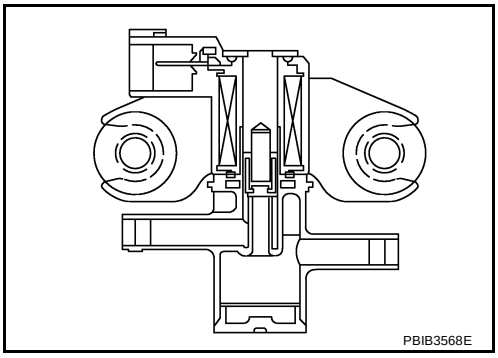
*1: ECM determines the start signal status by the signals of engine speed and battery voltage.

*2: This signal is sent to the ECM through CAN communication line.

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/OFF duty to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.


PBIB3568E

CONSULT-III Reference Value in Data Monitor Mode

NBS0008X

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PURG VOL C/V	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle (Accelerator pedal is not depressed even slightly, after engine starting)	0%
		2,000 rpm	—

On Board Diagnosis Logic

NBS0008Y

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0444 0444	EVAP canister purge volume control solenoid valve circuit open	An excessively low voltage signal is sent to ECM through the valve	● Harness or connectors (The solenoid valve circuit is open or shorted.) ● EVAP canister purge volume control solenoid valve
P0445 0445	EVAP canister purge volume control solenoid valve circuit shorted	An excessively high voltage signal is sent to ECM through the valve	● Harness or connectors (The solenoid valve circuit is shorted.) ● EVAP canister purge volume control solenoid valve

DTC Confirmation Procedure

NBS0008Z

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and let it idle for at least 13 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-435, "Diagnostic Procedure" .

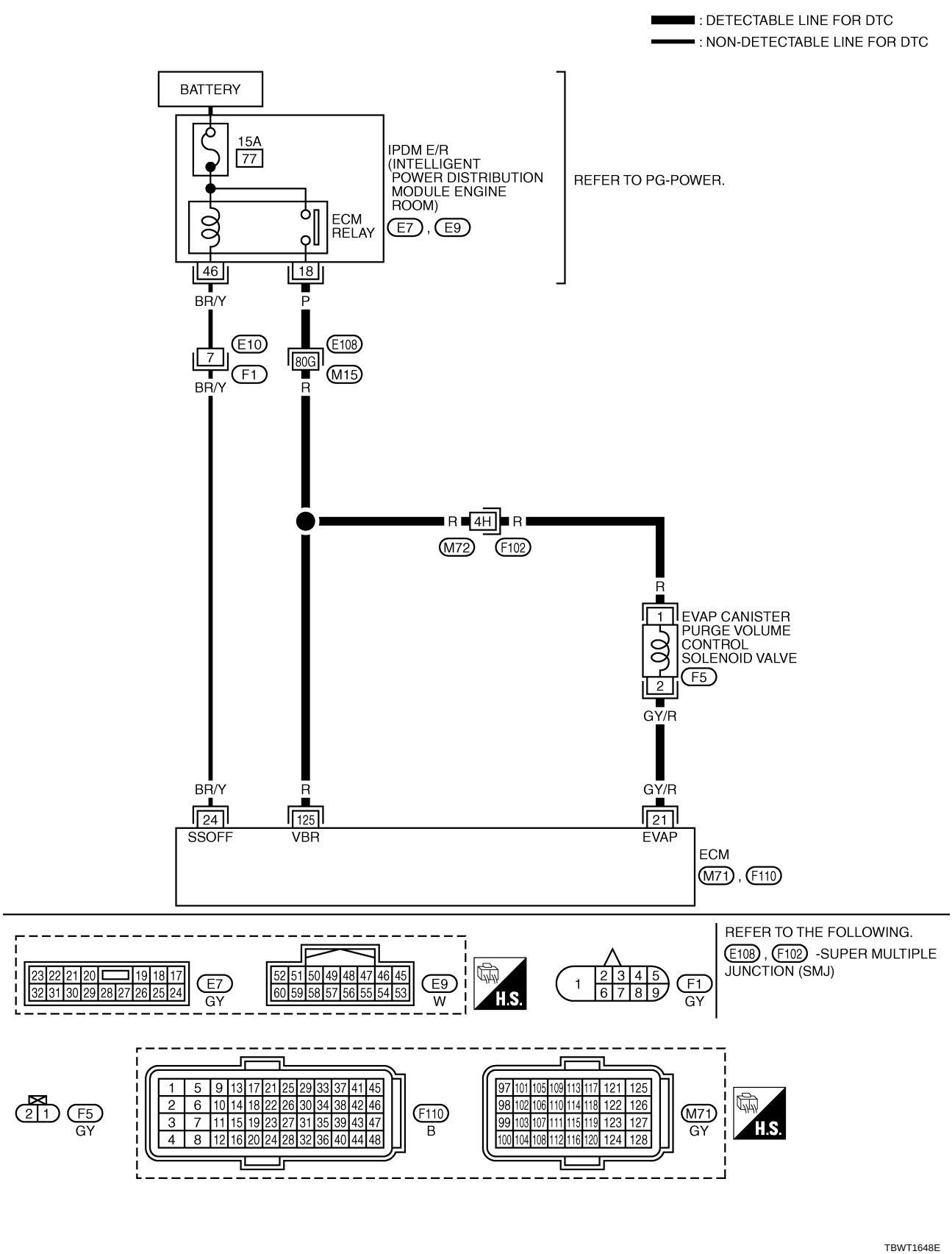
WITH GST

Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS00090

EC-PGC/V-01

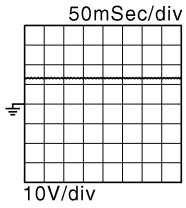
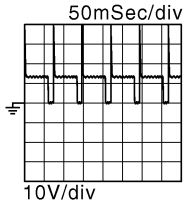


TBWT1648E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
21	GY/R	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed ● Accelerator pedal: Not depressed even slightly, after engine starting.	BATTERY VOLTAGE (11 - 14V)★  PBIB3547E
			[Engine is running] ● Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14V)★  PBIB3548E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

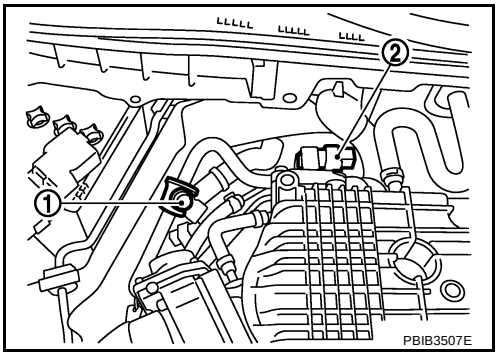
NBS00091

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister purge volume control solenoid valve (2) harness connector.

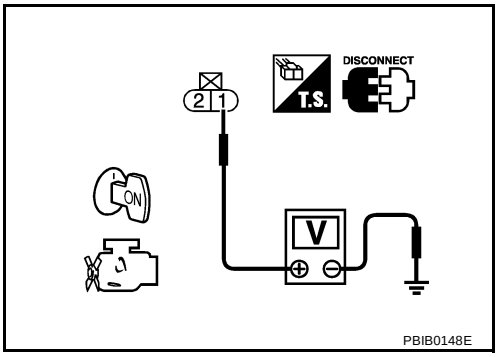
   1 : EVAP service port

3. Turn ignition switch ON.



4. Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-III or tester.

   Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 21 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK (With CONSULT-III)>>GO TO 4.
OK (Without CONSULT-III)>>GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-III

1. Reconnect all harness connectors disconnected.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace EVAP canister purge volume control solenoid valve.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

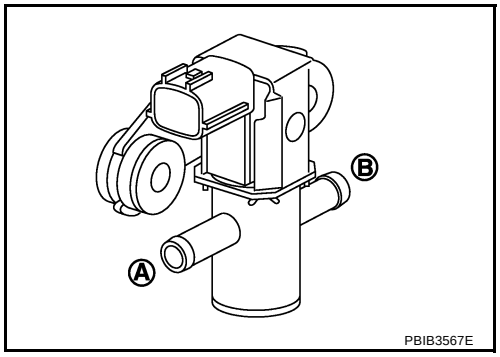
NBS00092

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

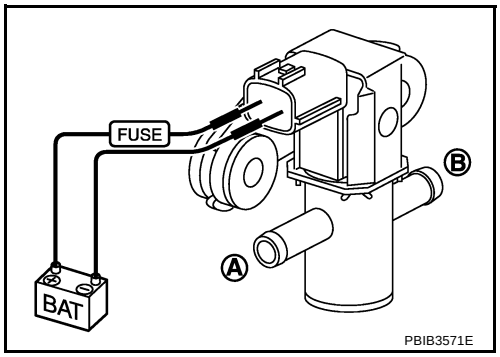
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



Without CONSULT-III

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



Removal and Installation

NBS00093

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

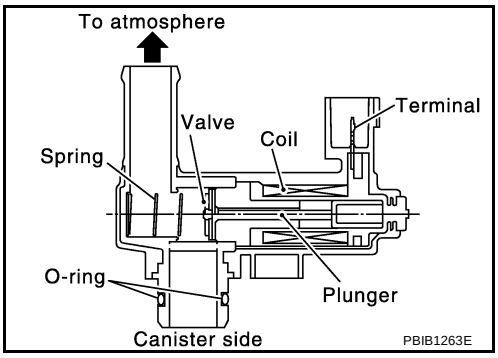
DTC P0447 EVAP CANISTER VENT CONTROL VALVE

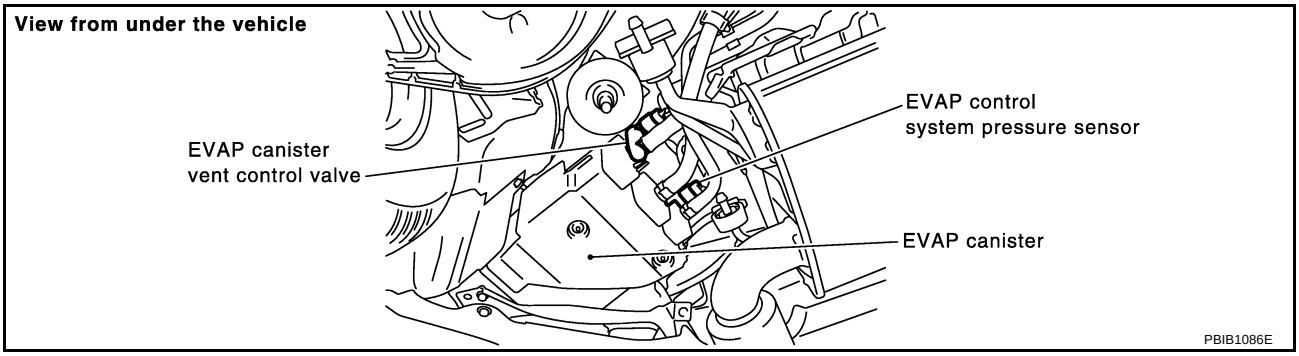
PFP:14935

Component Description

NBS00094

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.
This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.
This solenoid valve is used only for diagnosis, and usually remains opened.
When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows “EVAP Control System” diagnosis.





CONSULT-III Reference Value in Data Monitor Mode

NBS00095

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	● Ignition switch: ON	OFF

On Board Diagnosis Logic

NBS00096

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0447 0447	EVAP canister vent control valve circuit open	An improper voltage signal is sent to ECM through EVAP canister vent control valve.	● Harness or connectors (The valve circuit is open or shorted.) ● EVAP canister vent control valve

DTC Confirmation Procedure

NBS00097

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and wait at least 8 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-440, "Diagnostic Procedure" .

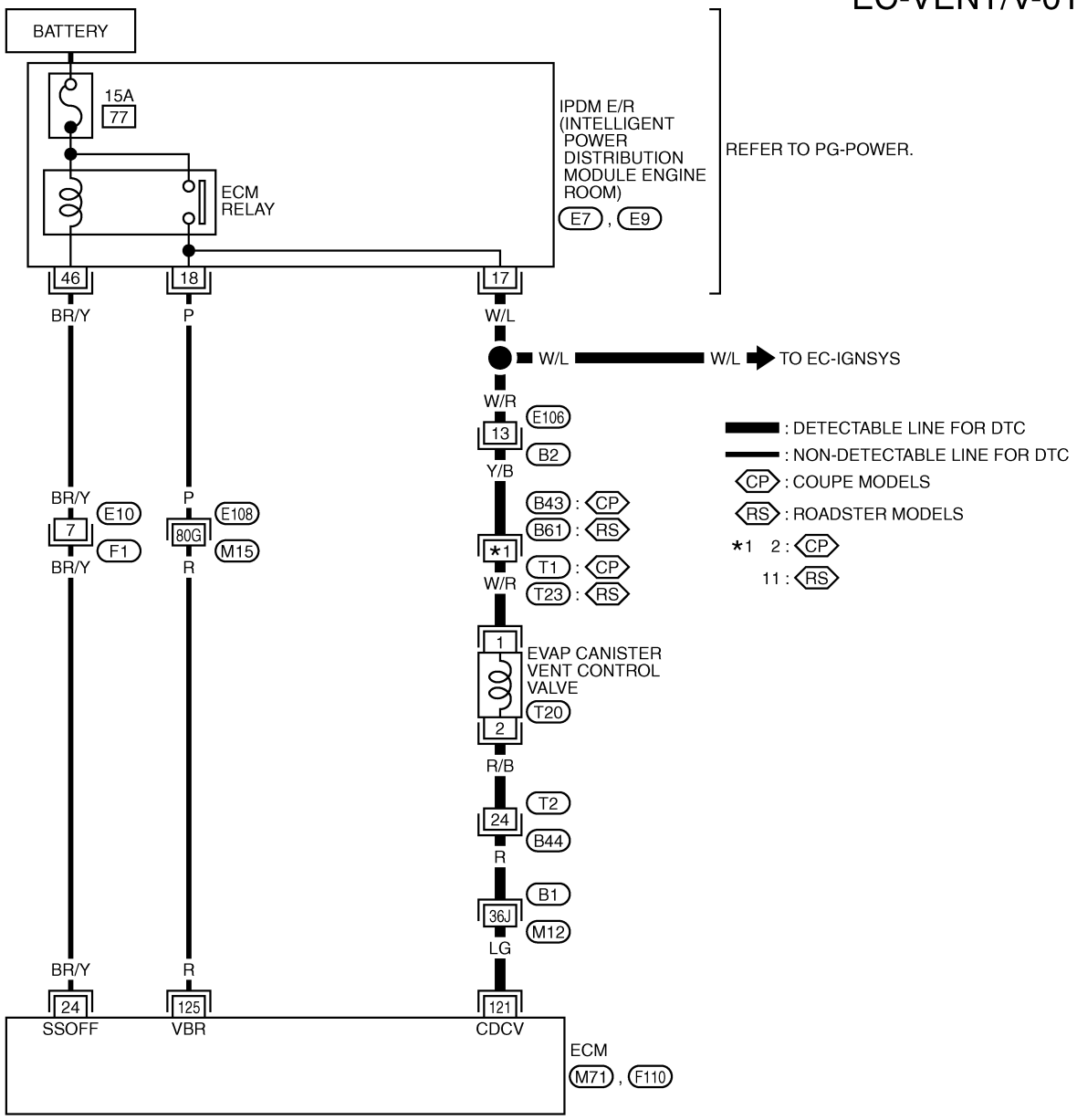
WITH GST

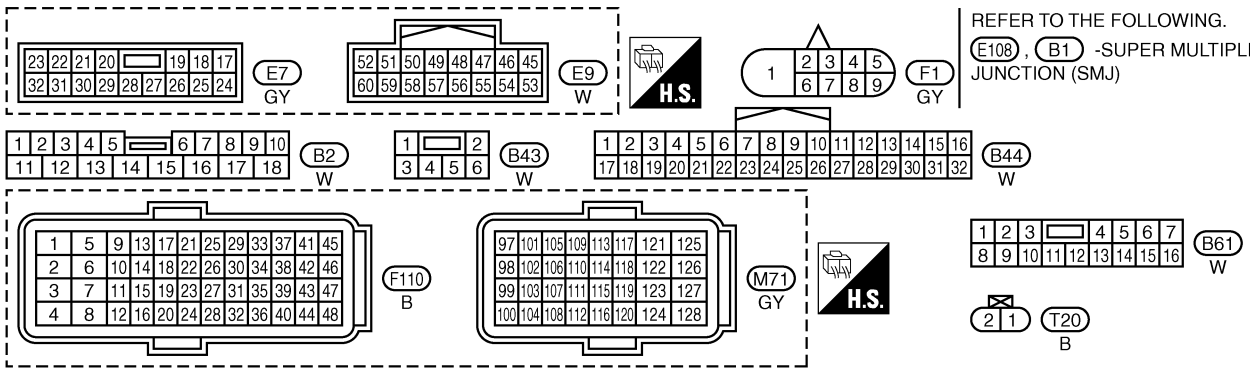
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS00098

EC-VENT/V-01





TBWT1649E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
121	LG	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS00099

1. INSPECTION START

Do you have CONSULT-III?

Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. CHECK EVAP CANISTER VENT CONTROL VALVE CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “VENT CONTROL/V” in “ACTIVE TEST” mode with CONSULT-III.
3. Touch “ON/OFF” on CONSULT-III screen.
4. Check for operating sound of the valve.

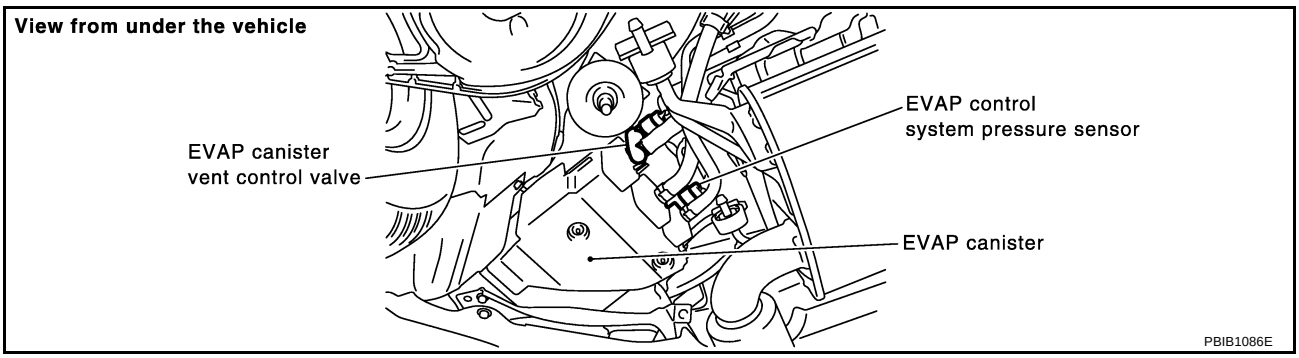
Clicking noise should be heard.

OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

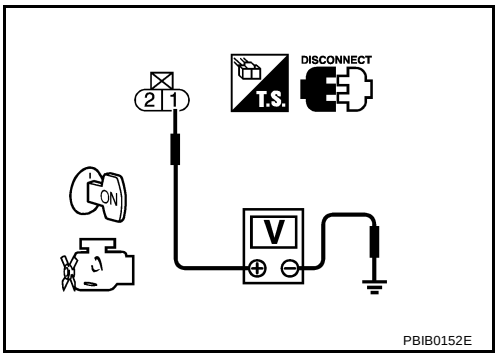
3. CHECK EVAP CANISTER VENT CONTROL VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister vent control valve harness connector.



3. Turn ignition switch ON.
4. Check voltage between EVAP canister vent control valve terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, B2
- Harness connectors B43, T1 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- IPDM E/R harness connector E7
- Harness for open or short between EVAP canister vent control valve and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK EVAP CANISTER VENT CONTROL VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 121 and EVAP canister vent control valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP canister vent control valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK RUBBER TUBE FOR CLOGGING

1. Turn ignition switch OFF.
2. Disconnect rubber tube connected to EVAP canister vent control valve.
3. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 8.
NG >> Clean the rubber tube using an air blower.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace EVAP canister vent control valve.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

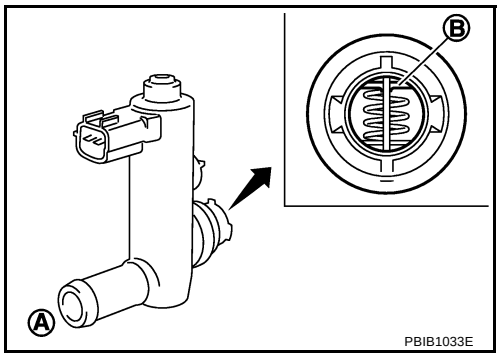
Component Inspection

NBS0009A

EVAP CANISTER VENT CONTROL VALVE

With CONSULT-III

1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.
   If NG, replace EVAP canister vent control valve.
   If OK, go to next step.
3. Reconnect harness connectors disconnected.
4. Turn ignition switch ON.
5. Perform “VENT CONTROL/V” in “ACTIVE TEST” mode.
6. Check air passage continuity and operation delay time.
   Make sure new O-ring is installed properly.



Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

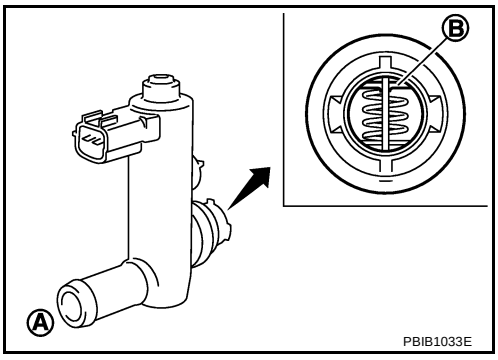
Operation takes less than 1 second.

If NG, replace EVAP canister vent control valve.
If OK, go to next step.

7. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
8. Perform step 6 again.

Without CONSULT-III

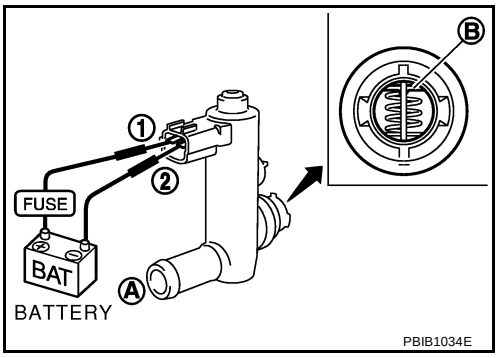
1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.



3. Check air passage continuity and operation delay time under the following conditions.
   Make sure new O-ring is installed properly.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes

Operation takes less than 1 second.



If NG, replace EVAP canister vent control valve.
If OK, go to next step.

4. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
5. Perform step 3 again.

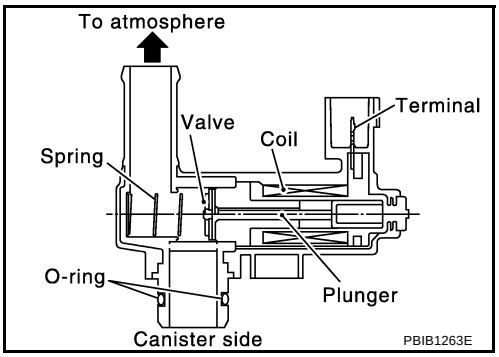
DTC P0448 EVAP CANISTER VENT CONTROL VALVE

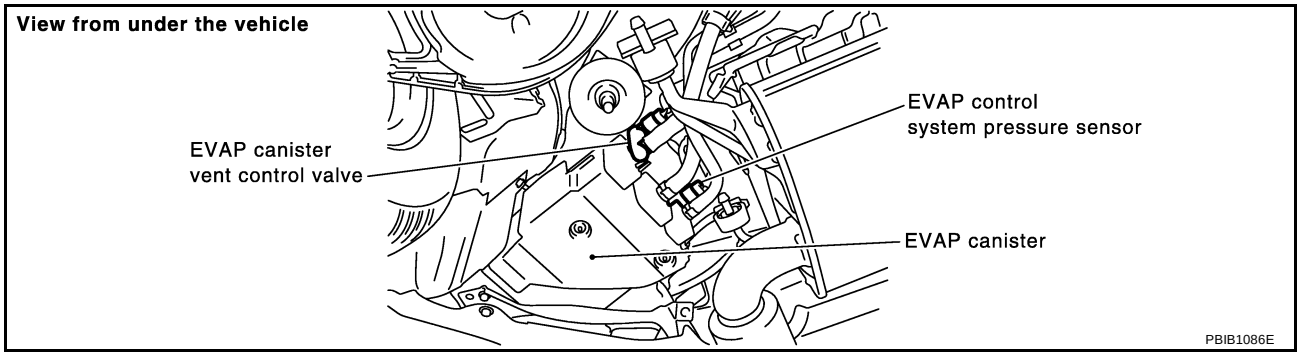
PFP:16935

Component Description

NBS000FM

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.
This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.
This solenoid valve is used only for diagnosis, and usually remains opened.
When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows “EVAP Control System” diagnosis.





CONSULT-III Reference Value in Data Monitor Mode

NBS000FN

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	● Ignition switch: ON	OFF

On Board Diagnosis Logic

NBS000FO

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0448 0448	EVAP canister vent control valve close	EVAP canister vent control valve remains closed under specified driving conditions.	● EVAP canister vent control valve ● EVAP control system pressure sensor and the circuit ● Blocked rubber tube to EVAP canister vent control valve ● EVAP canister is saturated with water

DTC Confirmation Procedure

NBS000FP

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
4. Start engine and let it idle for at least 1 minute.
5. Repeat next procedures for three times.

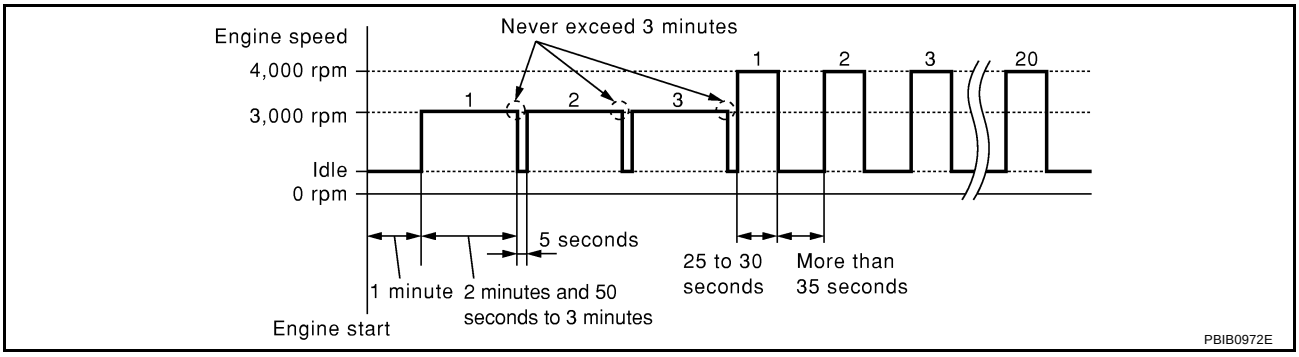
a. Increase the engine speed up to 3,000 to 3,500 rpm and keep it for 2 minutes and 50 seconds to 3 minutes.
Never exceed 3 minutes.

b. Fully released accelerator pedal and keep engine idle for about 5 seconds.

6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-447, "Diagnostic Procedure" .
If 1st trip DTC is not detected, go to the next step.
8. Repeat next procedure for 20 times.

a. Quickly increase the engine speed up to 4,000 to 4,500 rpm or more and keep it for 25 to 30 seconds.

b. Fully released accelerator pedal and keep engine idle for at least 35 seconds.



9. Check 1st trip DTC.
10. If 1st trip DTC is detected, go to EC-447, "Diagnostic Procedure" .

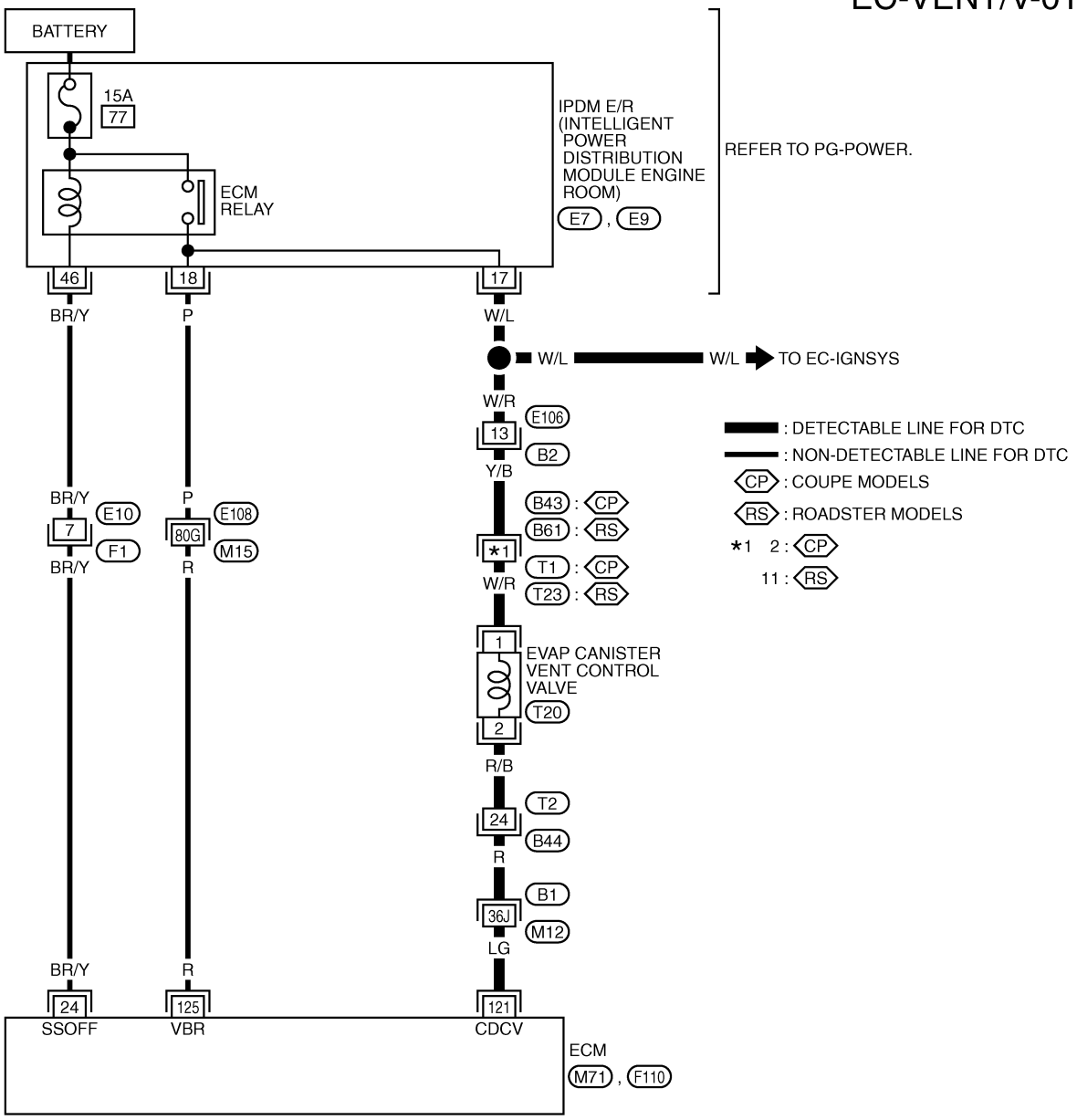
WITH GST

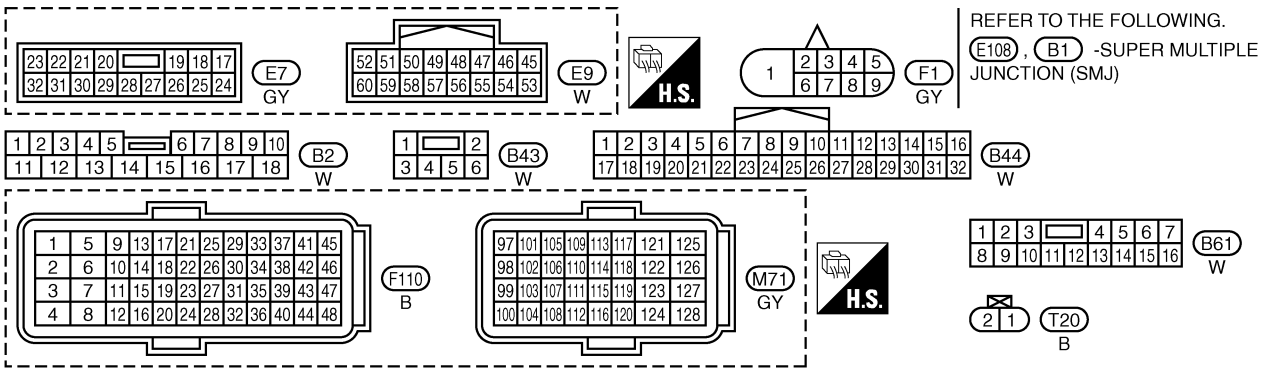
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000FQ

EC-VENT/V-01





TBWT1649E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

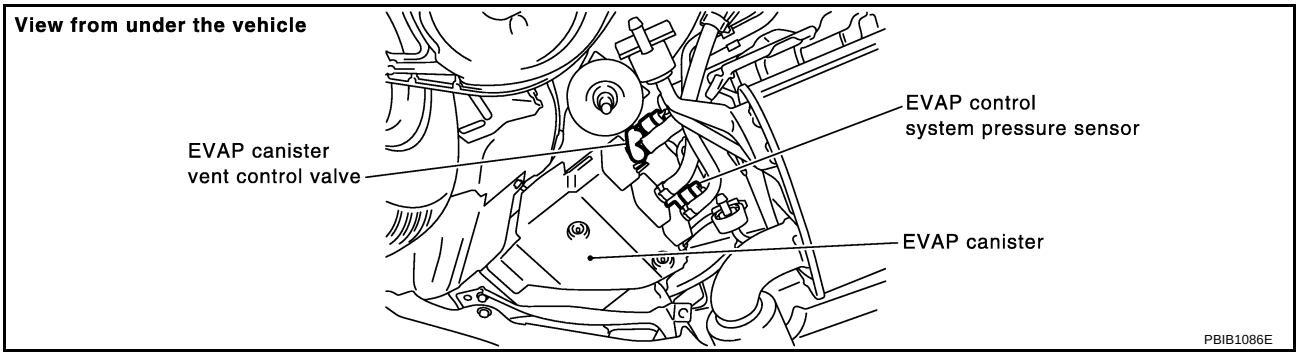
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
121	LG	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS000FR

1. CHECK RUBBER TUBE

1. Turn ignition switch OFF.
2. Disconnect rubber tube connected to EVAP canister vent control valve.



3. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 2.
NG >> Clean rubber tube using an air blower.

2. CHECK EVAP CANISTER VENT CONTROL VALVE

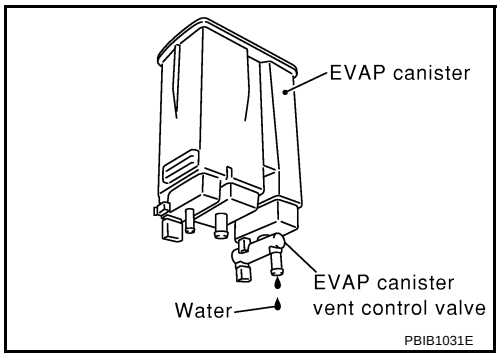
Refer to EC-449, "EVAP CANISTER VENT CONTROL VALVE" .

OK or NG

OK >> GO TO 3.
NG >> Replace EVAP canister vent control valve.

3. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?



OK or NG

OK >> GO TO 4.
NG >> GO TO 6.

4. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.
The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 7.
NG >> Replace EVAP control system pressure sensor.

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP control system pressure sensor.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

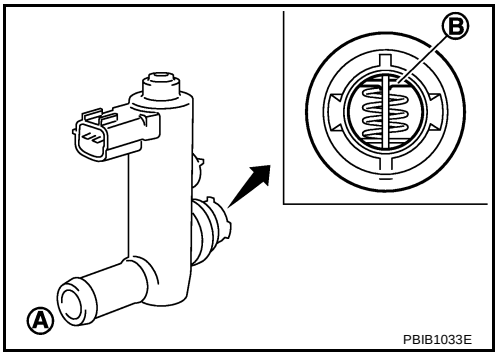
Component Inspection

NBS000FS

EVAP CANISTER VENT CONTROL VALVE

With CONSULT-III

1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.
   If NG, replace EVAP canister vent control valve.
   If OK, go to next step.
3. Reconnect harness connectors disconnected.
4. Turn ignition switch ON.
5. Perform “VENT CONTROL/V” in “ACTIVE TEST” mode.
6. Check air passage continuity and operation delay time.
   Make sure new O-ring is installed properly.



Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

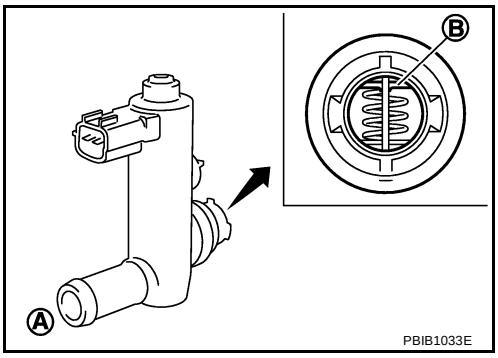
Operation takes less than 1 second.

If NG, replace EVAP canister vent control valve.
If OK, go to next step.

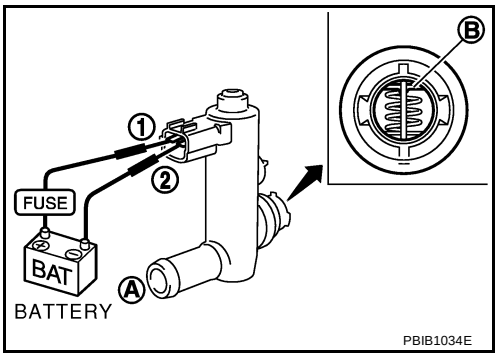
7. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
8. Perform step 6 again.

Without CONSULT-III

1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.



3. Check air passage continuity and operation delay time under the following conditions.
   Make sure new O-ring is installed properly.



Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes

Operation takes less than 1 second.

If NG, replace EVAP canister vent control valve.
If OK, go to next step.

4. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
5. Perform step 3 again.

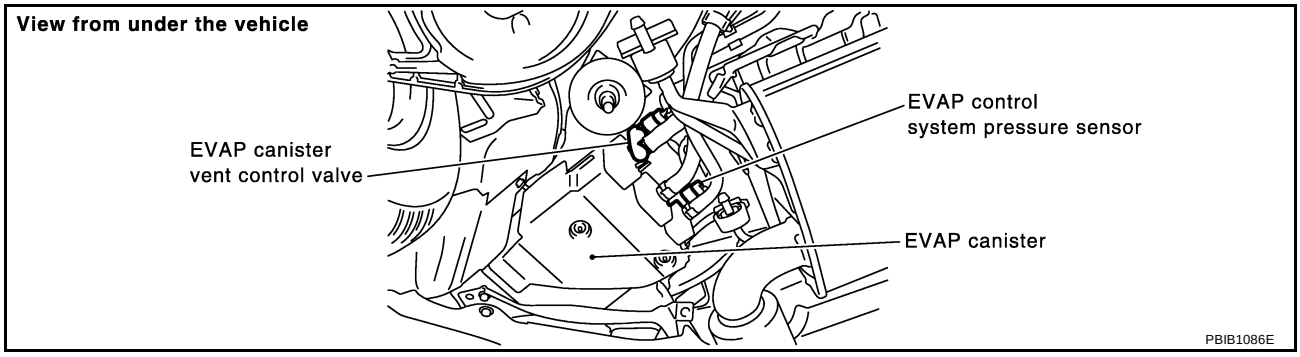
DTC P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR

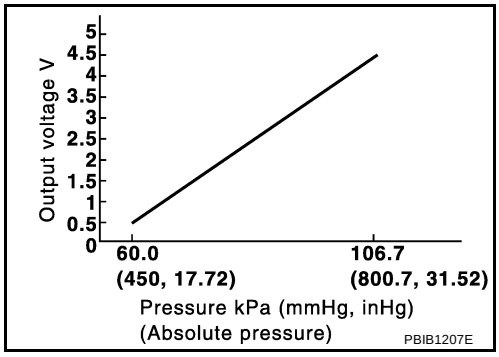
PFP:22365

Component Description

NBS0009B

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-III Reference Value in Data Monitor Mode

NBS0009C

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

NBS0009D

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0451 0451	EVAP control system pressure sensor performance	ECM detects a sloshing signal from the EVAP control system pressure sensor	● Harness or connectors (EVAP control system pressure sensor circuit is shorted.) [CKP sensor (POS) circuit is shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● EVAP control system pressure sensor ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● Refrigerant pressure sensor

DTC Confirmation Procedure

NBS0009E

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start engine and wait at least 40 seconds.
   NOTE:
   Do not depress accelerator pedal even slightly.
3. Check 1st trip DTC.
4. If 1st trip DTC is detected, go to EC-452, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

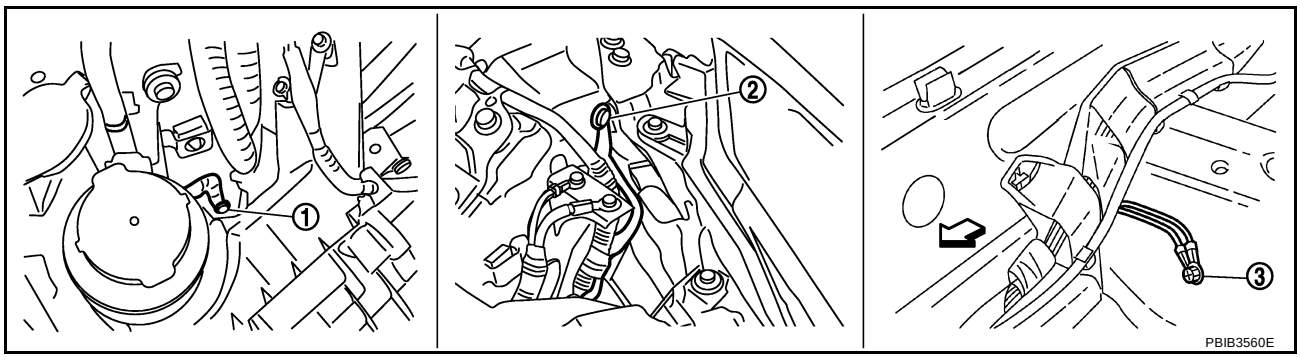
Diagnostic Procedure

NBS0009F

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

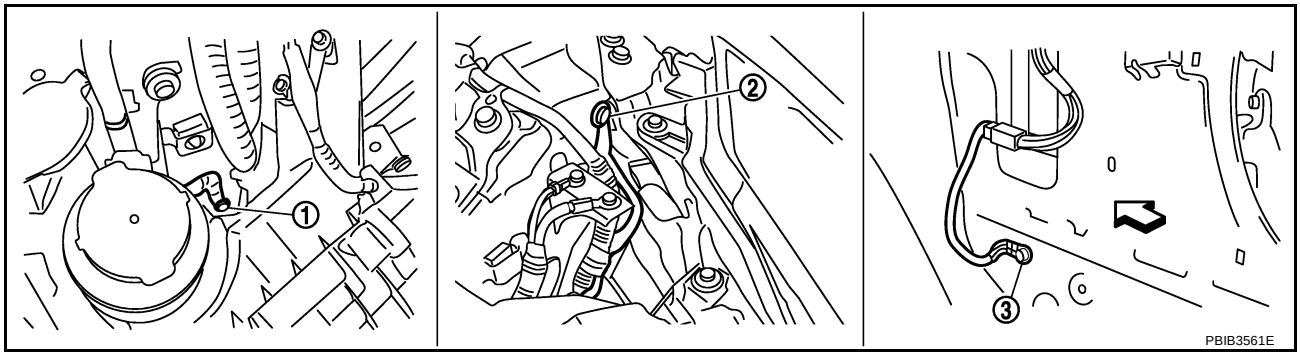


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

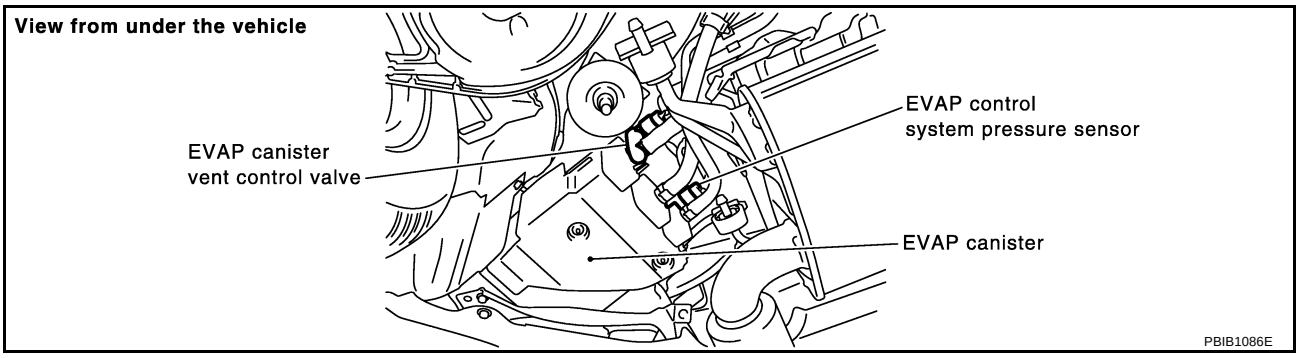
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR FOR WATER

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

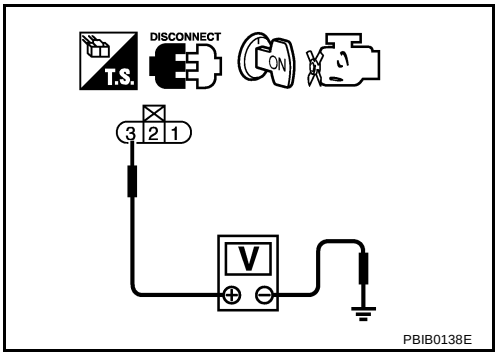
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 3 and ECM terminal 107. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

1. Harness connectors T2, B44
2. Harness connectors B1, M12
3. Harness for open between ECM and EVAP control system pressure sensor.

>> Repair open circuit.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor 1	EC-711

OK or NG

OK >> GO TO 7.
NG >> Repair short to ground or short to power in harness or connectors.

7. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 8.
NG >> Replace malfunctioning component.

8. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace EVAP control system pressure sensor.

11. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-458, "Wiring Diagram" .

>> **INSPECTION END**

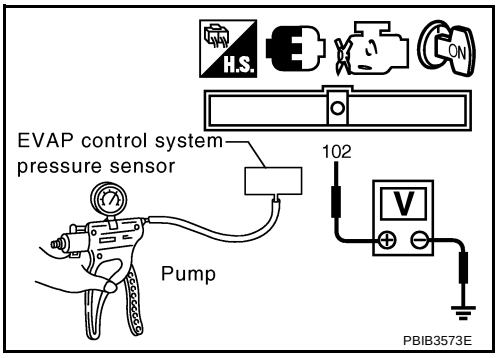
Component Inspection

NBS0009G

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Always replace O-ring with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 102 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

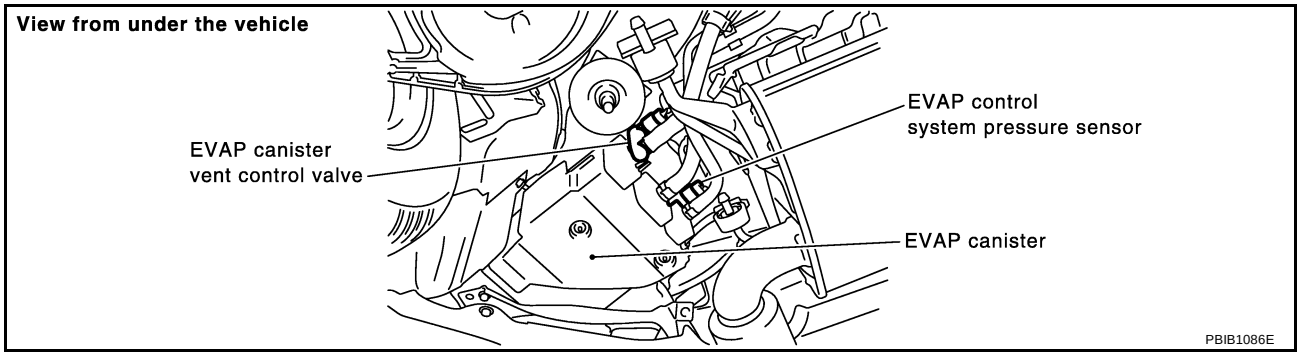
DTC P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

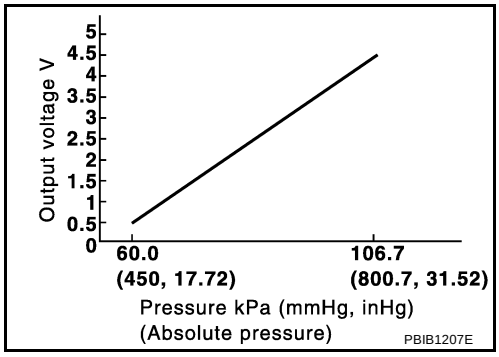
PFP:25085

Component Description

NBS0009H

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-III Reference Value in Data Monitor Mode

NBS0009I

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

NBS0009J

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0452 0452	EVAP control system pressure sensor low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (EVAP control system pressure sensor circuit is shorted.) [CKP sensor (POS) circuit is shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● EVAP control system pressure sensor ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● Refrigerant pressure sensor

DTC Confirmation Procedure

NBS0009K

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

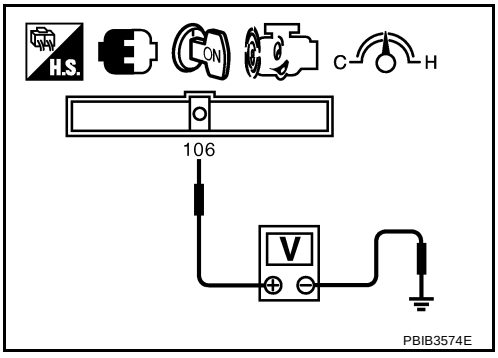
TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “DATA MONITOR” mode with CONSULT-III.
5. Make sure that “FUEL T/TEMP SE” is more than 0°C (32°F).
6. Start engine and wait at least 20 seconds.
7. Check 1st trip DTC.
8. If 1st trip DTC is detected, go to EC-460, "Diagnostic Procedure" .

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Check that voltage between ECM terminal 106 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and wait at least 20 seconds.
5. Select Service $07 with GST.
   If 1st trip DTC is detected, go to EC-460, "Diagnostic Procedure"
   .

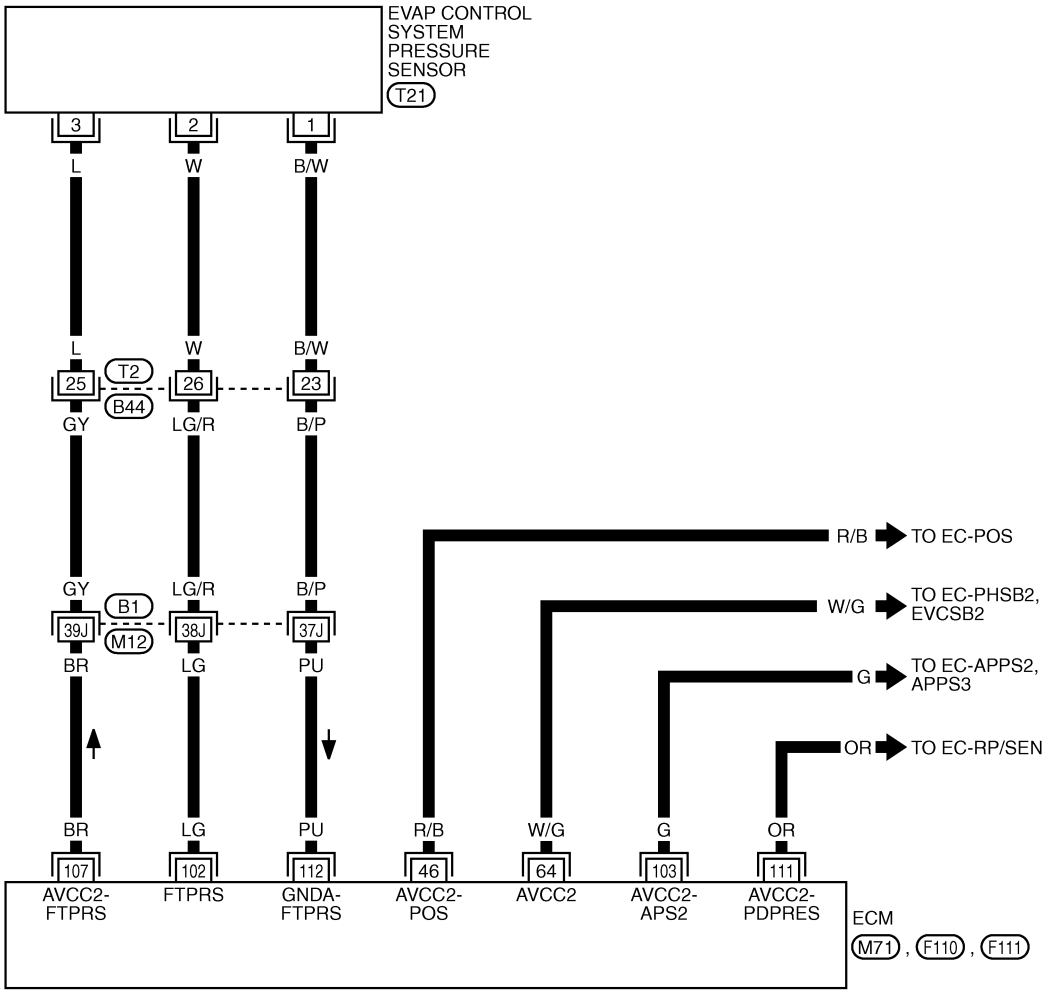


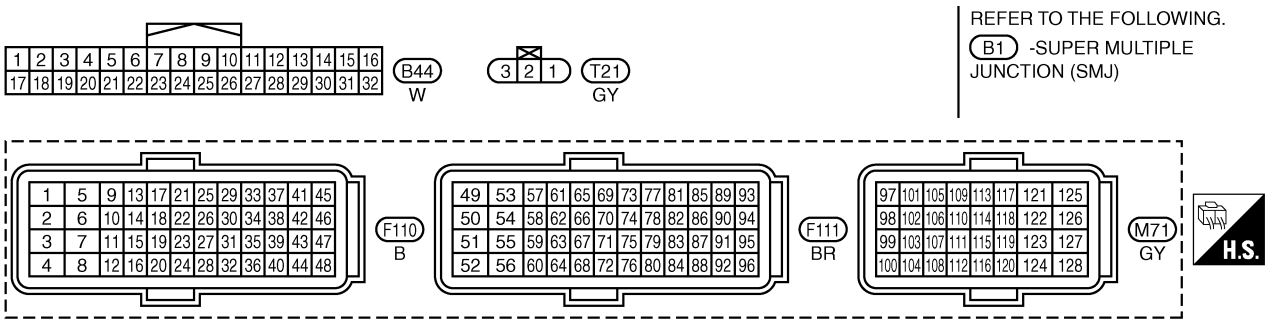
Wiring Diagram

NBS0009L

EC-PRE/SE-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1650E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
102	LG	EVAP control system pressure sensor	**[Ignition switch: ON]**	1.8 - 4.8V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V
112	PU	Sensor ground (EVAP control system pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

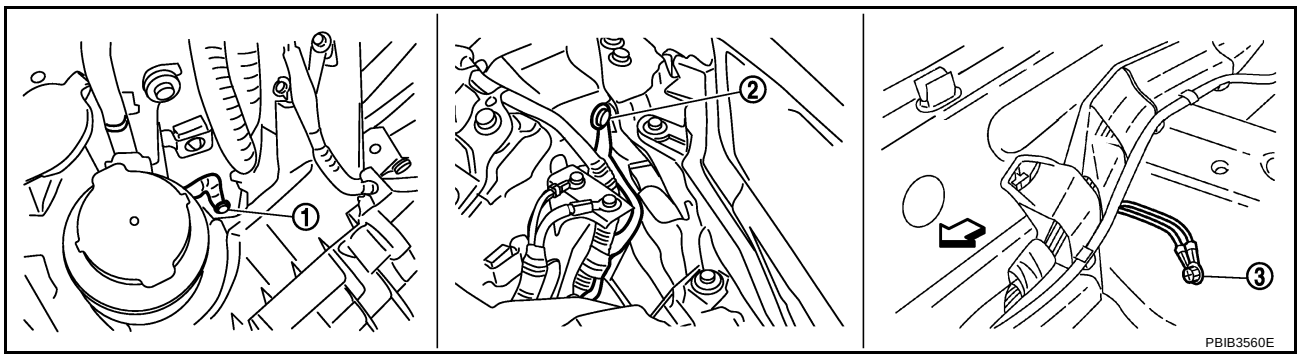
Diagnostic Procedure

NBS0009M

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

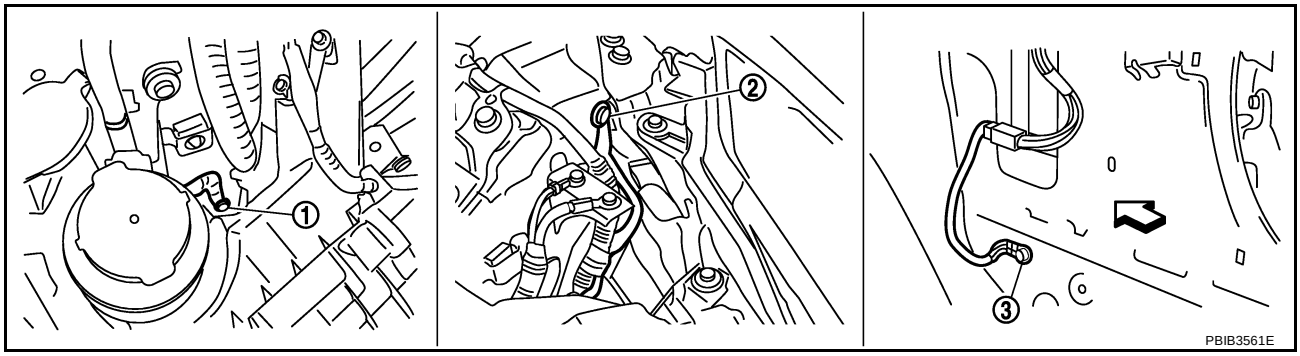


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

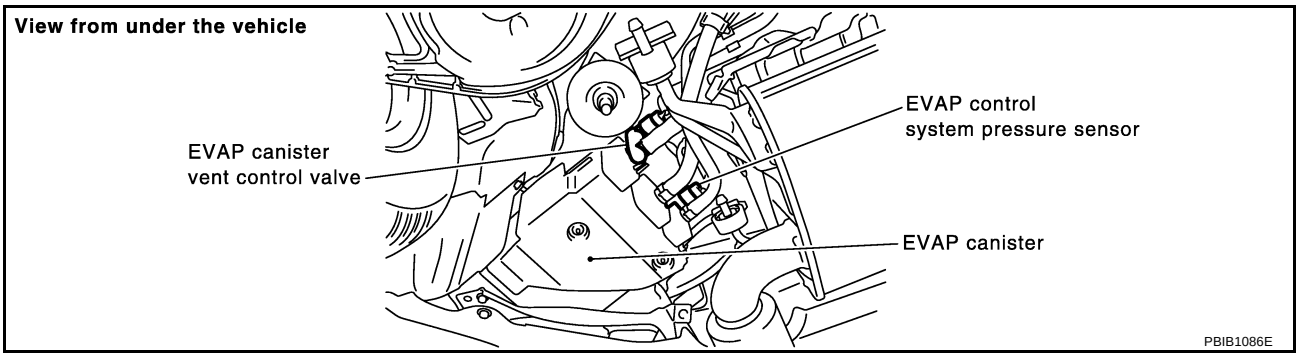
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

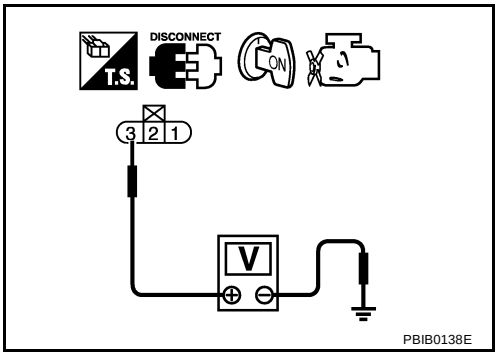
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 3 and ECM terminal 107. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

1. Harness connectors T2, B44
2. Harness connectors B1, M12
3. Harness for open between ECM and EVAP control system pressure sensor.

>> Repair open circuit.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor 1	EC-711

OK or NG

OK >> GO TO 7.
NG >> Repair short to ground or short to power in harness or connectors.

7. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 8.
NG >> Replace malfunctioning component.

8. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 112. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 102 and EVAP control system pressure sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-464, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> Replace EVAP control system pressure sensor.

15. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

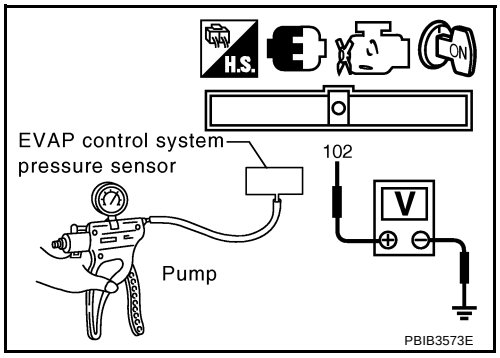
Component Inspection

NBS0009N

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Always replace O-ring with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 102 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

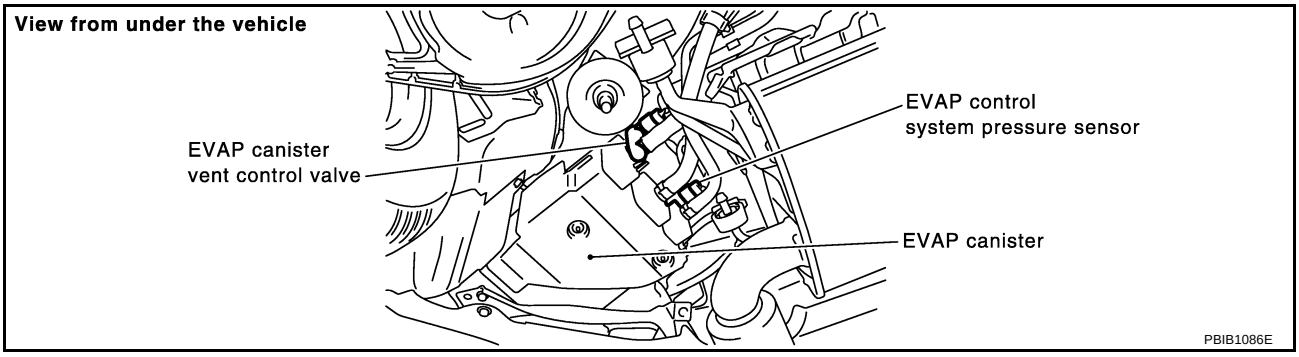
DTC P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

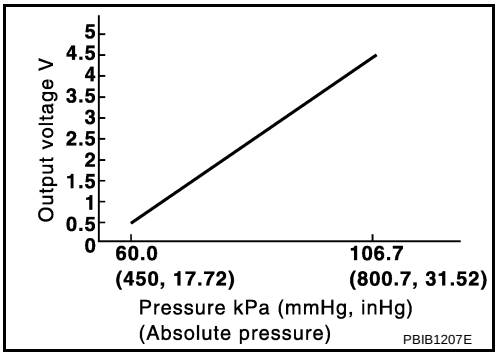
PFP:25085

Component Description

NBS0009O

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-III Reference Value in Data Monitor Mode

NBS0009P

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

NBS0009Q

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0453 0453	EVAP control system pressure sensor high input	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (EVAP control system pressure sensor circuit is shorted.) [CKP sensor (POS) circuit is shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● EVAP control system pressure sensor ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● Refrigerant pressure sensor ● EVAP canister vent control valve ● EVAP canister ● Rubber hose from EVAP canister vent control valve to vehicle frame

DTC Confirmation Procedure

NBS0009R

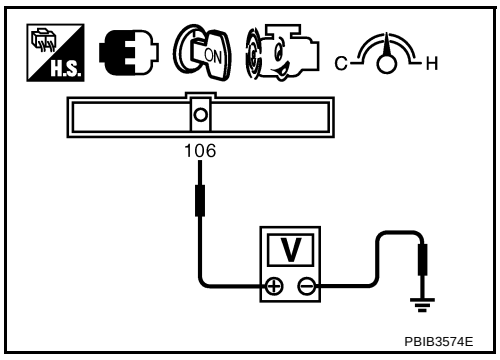
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “DATA MONITOR” mode with CONSULT-III.
5. Make sure that “FUEL T/TEMP SE” is more than 0°C (32°F).
6. Start engine and wait at least 20 seconds.
7. Check 1st trip DTC.
8. If 1st trip DTC is detected, go to EC-469, "Diagnostic Procedure" .

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Check that voltage between ECM terminal 106 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and wait at least 20 seconds.
5. Select Service $07 with GST.
   If 1st trip DTC is detected, go to EC-469, "Diagnostic Procedure"
   .

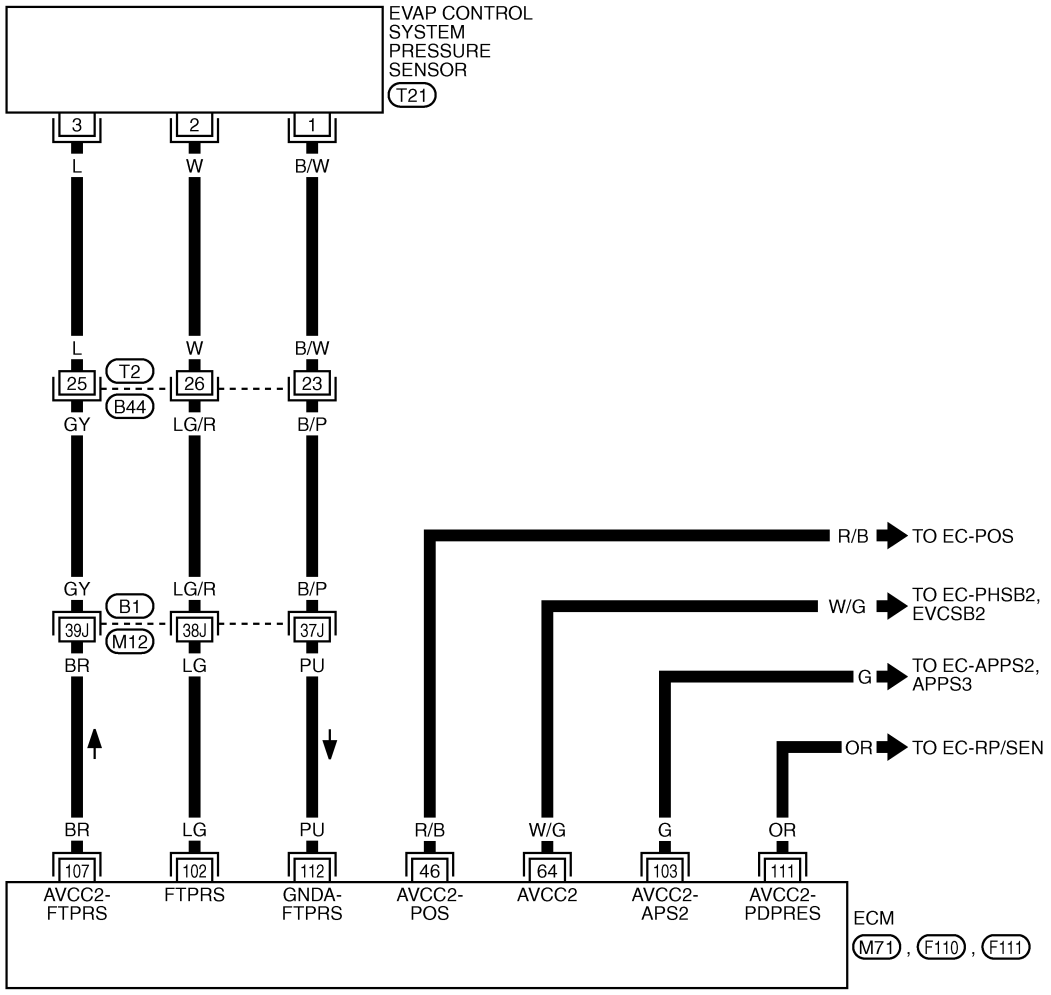


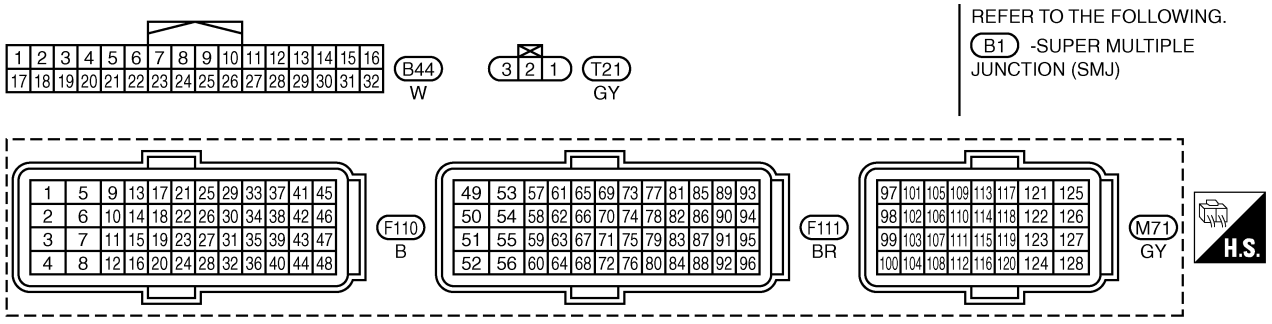
Wiring Diagram

NBS0009S

EC-PRE/SE-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1650E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
102	LG	EVAP control system pressure sensor	**[Ignition switch: ON]**	1.8 - 4.8V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V
112	PU	Sensor ground (EVAP control system pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

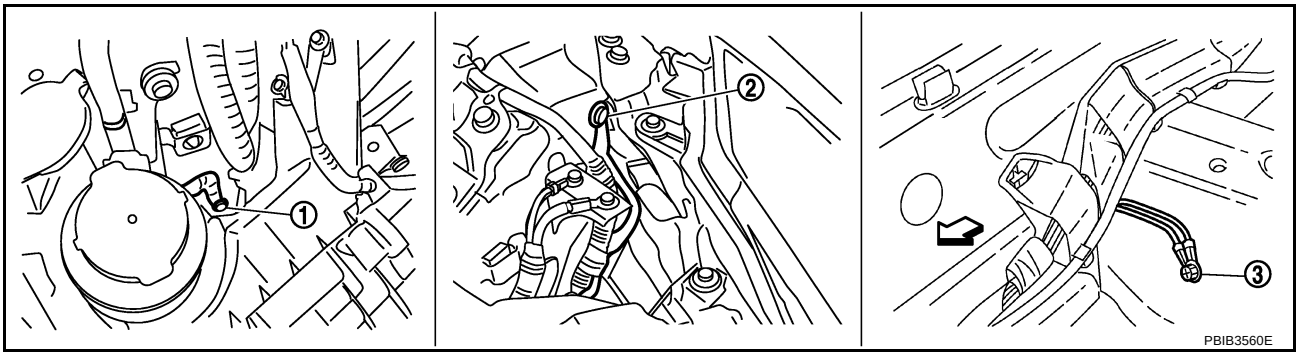
Diagnostic Procedure

NBS0009T

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

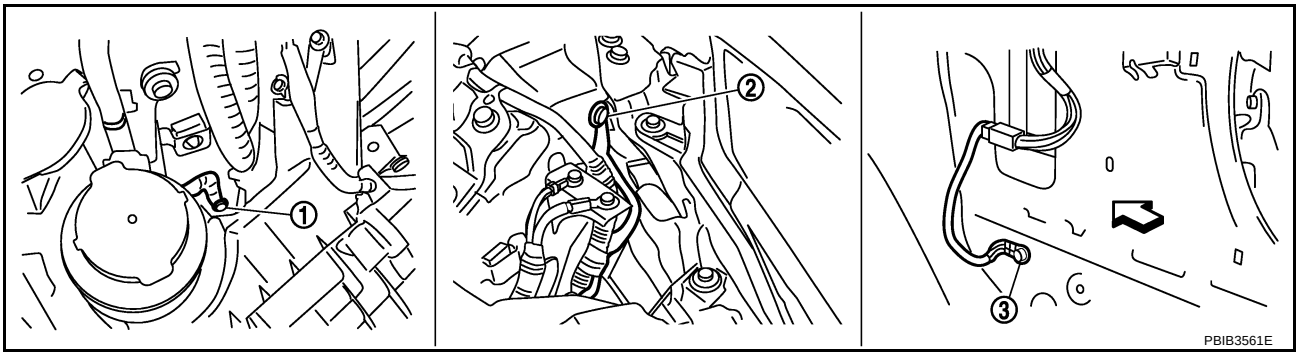


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

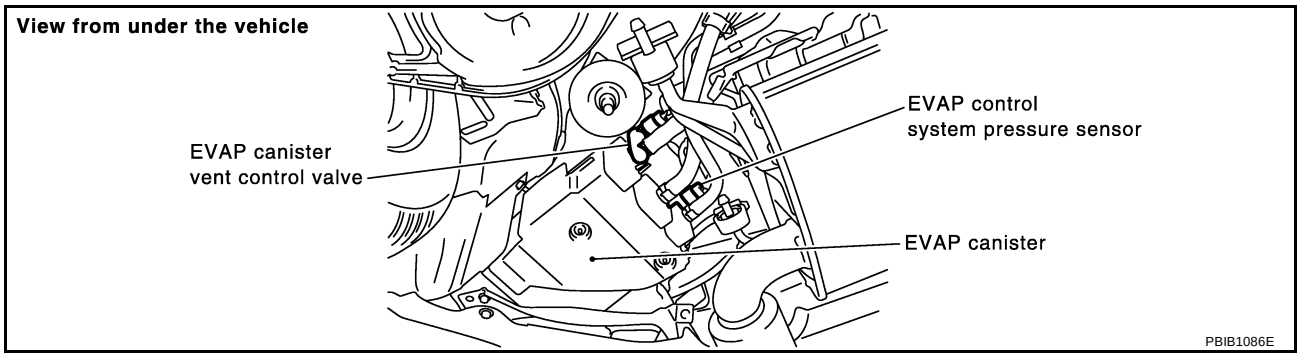
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

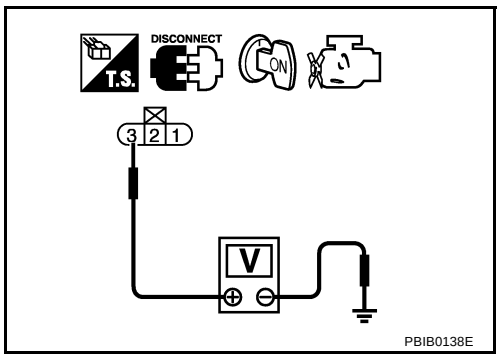
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 3 and ECM terminal 107. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

1. Harness connectors T2, B44
2. Harness connectors B1, M12
3. Harness for open between ECM and EVAP control system pressure sensor.

>> Repair open circuit.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor 1	EC-711

OK or NG

OK >> GO TO 7.
NG >> Repair short to ground or short to power in harness or connectors.

7. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .

OK or NG

OK >> GO TO 8.
NG >> Replace malfunctioning component.

8. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 20.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 112. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 102 and EVAP control system pressure sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK RUBBER TUBE

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging, vent and kinked.

OK or NG

OK >> GO TO 15.
NG >> Clean the rubber tube using an air blower.

15. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister vent control valve.

16. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-474, "Component Inspection" .

OK or NG

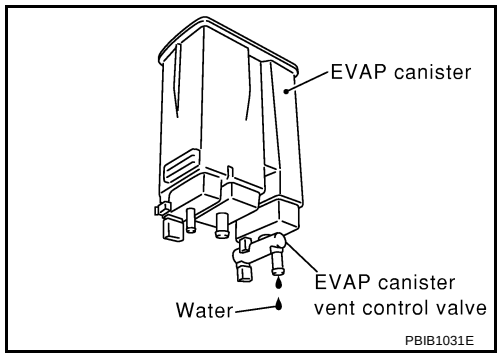
OK >> GO TO 17.
NG >> Replace EVAP control system pressure sensor.

17. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 18.
No >> GO TO 20.



18. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.
The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 20.
NG >> GO TO 19.

19. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

20. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

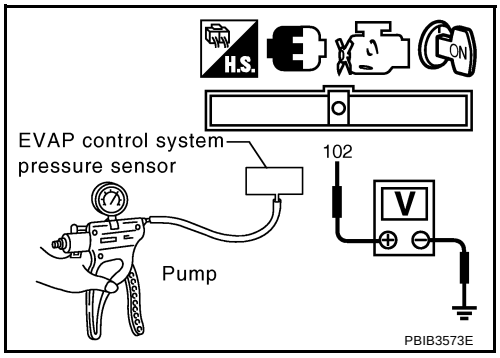
Component Inspection

NBS0009U

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Always replace O-ring with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 102 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

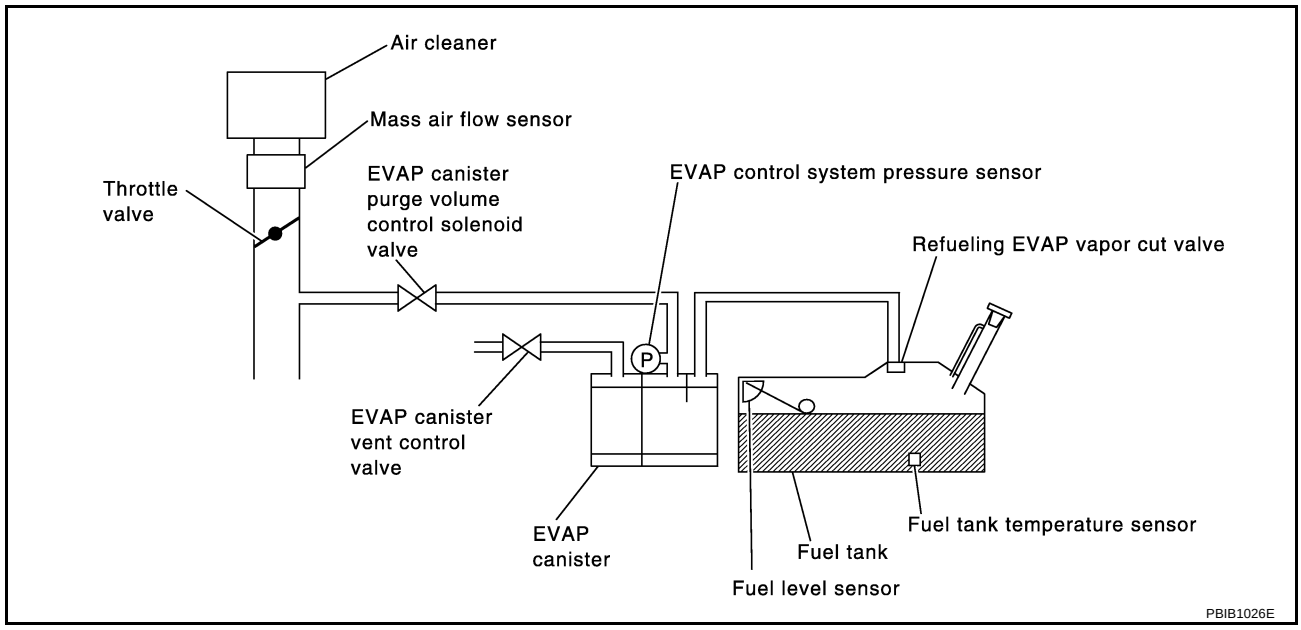
DTC P0455 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

NBS0009V

This diagnosis detects a very large leak (fuel filler cap fell off etc.) in EVAP system between the fuel tank and EVAP canister purge volume control solenoid valve.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0455 0455	EVAP control system gross leak detected	EVAP control system has a very large leak such as fuel filler cap fell off, EVAP control system does not operate properly.	● Fuel filler cap remains open or fails to close. ● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent. ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged. ● EVAP control system pressure sensor ● Refueling EVAP vapor cut valve ● ORVR system leaks

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**

- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

NBS0009W

CAUTION:

Never remove fuel filler cap during the DTC Confirmation Procedure.

NOTE:

- **Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- **Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.**
- **Open engine hood before conducting the following procedures.**

WITH CONSULT-III

1. Tighten fuel filler cap securely until ratcheting sound is heard.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
5. Make sure that the following conditions are met.
   COOLAN TEMP/S: 0 - 70°C (32 - 158°F)
   INT/A TEMP SE: 0 - 60°C (32 - 140°F)
6. Select "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.
   Follow the instruction displayed.

   NOTE:
   If the engine speed cannot be maintained within the range displayed on the CONSULT-III screen, go to EC-71, "Basic Inspection" .
7. Make sure that "OK" is displayed.
   If "NG" is displayed, select "SELF-DIAG RESULTS" mode and make sure that "EVAP GROSS LEAK [P0455]" is displayed. If it is displayed, refer to EC-477, "Diagnostic Procedure" .
   If P0442 is displayed, perform EC-418, "Diagnostic Procedure" for DTC P0442.

WITH GST

NOTE:

Be sure to read the explanation of EC-58, "Driving Pattern" before driving vehicle.

1. Start engine.
2. Drive vehicle according to EC-58, "Driving Pattern" .
3. Stop vehicle.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Select Service $07 with GST.
   - If P0441 is displayed on the screen, go to EC-413, "Diagnostic Procedure" , for DTC P0441.
   - If P0442 is displayed on the screen, go to EC-418, "Diagnostic Procedure" , for DTC P0442.
   - If P0455 is displayed on the screen, go to EC-477, "Diagnostic Procedure" .

Diagnostic Procedure

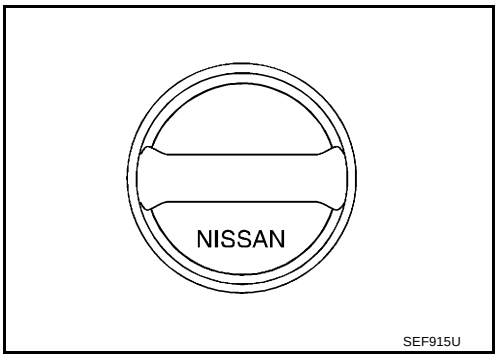
NBS0009X

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-36, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)" .

OK or NG

OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks, improper connection or disconnection.
Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 6.
NG >> Repair or reconnect the hose.

6. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 7.

7. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

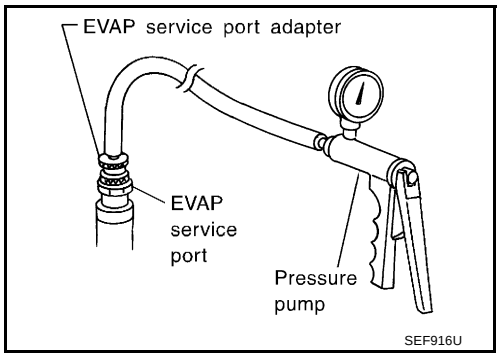
- EVAP canister vent control valve is installed properly.
  Refer to EC-37, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

8. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

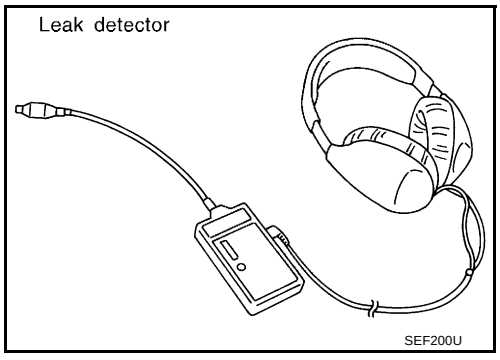
With CONSULT-III>>GO TO 9.
Without CONSULT-III>>GO TO 10.

9. CHECK FOR EVAP LEAK

With CONSULT-III

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-III.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

   CAUTION:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.
   Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



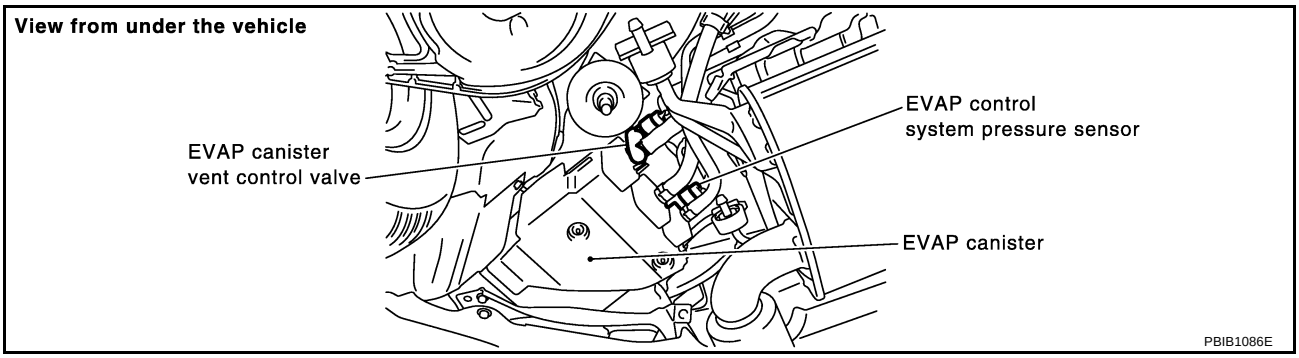
OK or NG

OK >> GO TO 11.
NG >> Repair or replace.

10. CHECK FOR EVAP LEAK

Without CONSULT-III

1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)

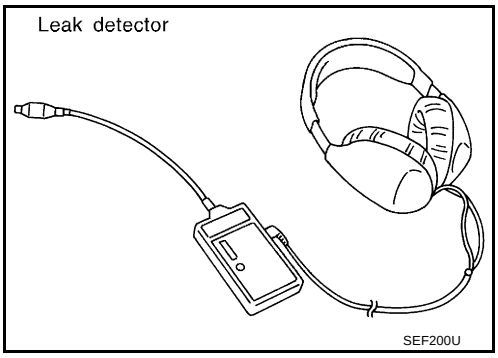


3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

CAUTION:

- **Never use compressed air or a high pressure pump.**
- **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**

4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



OK or NG

OK >> GO TO 12.
NG >> Repair or replace.

11. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-III

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-III screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15.
NG >> GO TO 13.

13. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-100, "Vacuum Hose Drawing" .

OK or NG

OK (With CONSULT-III)>>GO TO 14.
OK (Without CONSULT-III)>>GO TO 15.
NG >> Repair or reconnect the hose.

14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

1. Start engine.
2. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 16.
NG >> GO TO 15.

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-464, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-39, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 19.
NG >> Repair or replace hoses and tubes.

19. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 20.
NG >> Repair or replace hose, tube or filler neck tube.

20. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "REFUELING EVAP VAPOR CUT VALVE" .

OK or NG

OK >> GO TO 21.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

21. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

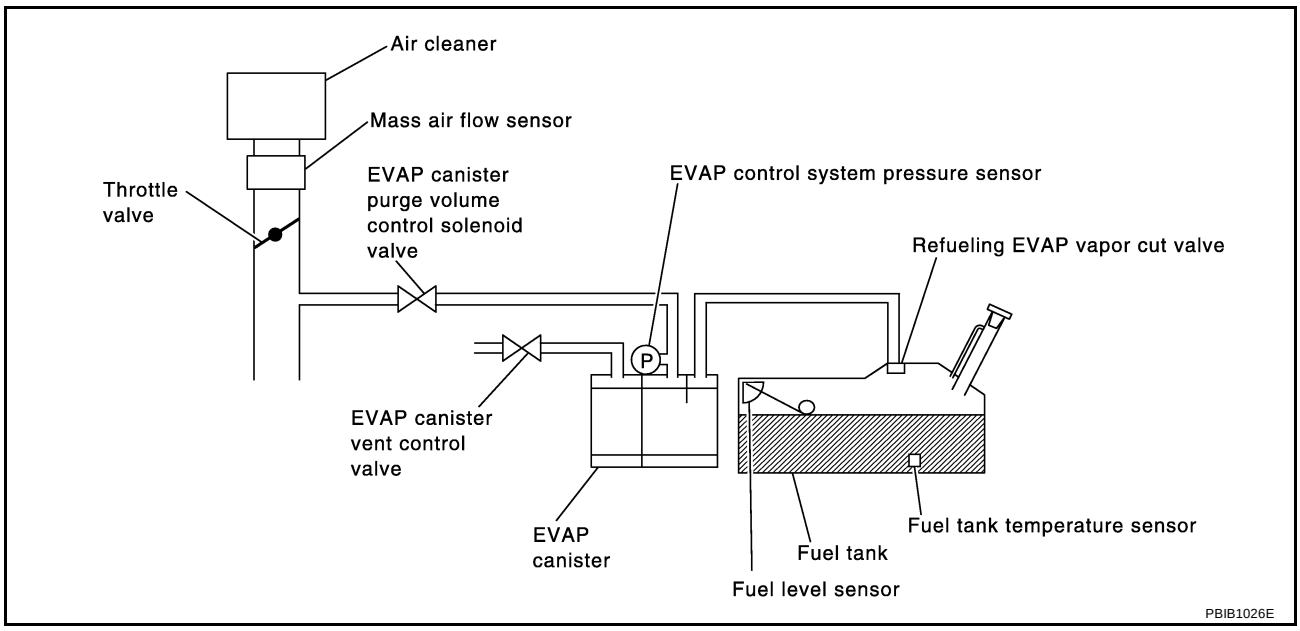
DTC P0456 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

NBS0009Y

This diagnosis detects very small leaks in the EVAP line between fuel tank and EVAP canister purge volume control solenoid valve, using the intake manifold vacuum in the same way as conventional EVAP small leak diagnosis.
If ECM judges a leak which corresponds to a very small leak, the very small leak P0456 will be detected.
If ECM judges a leak equivalent to a small leak, EVAP small leak P0442 will be detected.
If ECM judges there are no leaks, the diagnosis will be OK.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0456 0456	Evaporative emission control system very small leak (negative pressure check)	● EVAP system has a very small leak. ● EVAP system does not operate properly.	● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Fuel filler cap remains open or fails to close. ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged ● EVAP canister is saturated with water ● EVAP control system pressure sensor ● Refueling EVAP vapor cut valve ● ORVR system leaks ● Fuel level sensor and the circuit ● Foreign matter caught in EVAP canister purge volume control solenoid valve

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**
- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

NBS0009Z

NOTE:

- **If DTC P0456 is displayed with P0442, first perform trouble diagnosis for DTC P0456.**
- **After repair, make sure that the hoses and clips are installed properly.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- **Open engine hood before conducting following procedure.**
- **If any of following conditions are met just before the DTC confirmation procedure, leave the vehicle for more than 1 hour.**
  - **Fuel filler cap is removed.**
  - **Refilled or drained the fuel.**
  - **EVAP component parts is/are removed.**
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**

WITH CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Make sure the following conditions are met.
   FUEL LEVEL SE: 0.25 - 1.4V
   COOLAN TEMP/S: 0 - 32°C (32 - 90°F)
   FUEL T/TMP SE: 0 - 35°C (32 - 95°F)
   INT/A TEMP SE: More than 0°C (32°F)
   If NG, turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle) or refilling/draining fuel until the output voltage condition of the “FUEL LEVEL SE” meets within the range above and leave the vehicle for more than 1 hour. Then start from step 1).
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON.
5. Select “EVAP V/S LEAK P0456/P1456” of “EVAPORATIVE SYSTEM” in “DTC WORK SUPPORT” mode with CONSULT-III.
   Follow the instruction displayed.
6. Make sure that “OK” is displayed.
   If “NG” is displayed, refer to EC-484, "Diagnostic Procedure" .

   NOTE:
   - **If the engine speed cannot be maintained within the range displayed on CONSULT-III screen, go to EC-71, "Basic Inspection" .**
   - **Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.**

Overall Function Check

NBS000A0

WITH GST

Use this procedure to check the overall function of the EVAP very small leak function. During this check, a 1st trip DTC might not be confirmed.

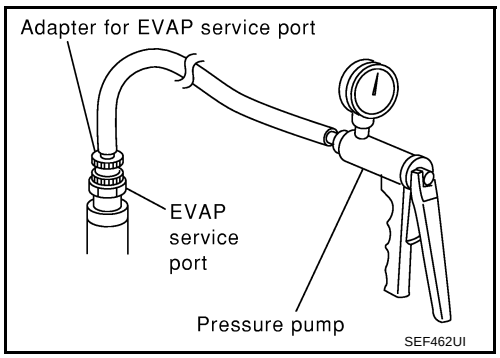
CAUTION:

- **Never use compressed air, doing so may damage the EVAP system.**
- **Do not start engine.**
- **Do not exceeded 4.12 kPa (0.042 kg/cm^2 , 0.6 psi).**

1. Attach the EVAP service port adapter securely to the EVAP service port. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

2. Set the pressure pump and a hose.
3. Also set a vacuum gauge via 3-way connector and a hose.
4. Turn ignition switch ON.
5. Connect GST and select Service $08.
6. Using Service $08 control the EVAP canister vent control valve (close).
7. Apply pressure and make sure the following conditions are satisfied.
   Pressure to be applied: 2.7 kPa (20 mmHg, 0.79 inHg)
   Time to be waited after the pressure drawn in to the EVAP system and the pressure to be dropped: 60 seconds and the pressure should not be dropped more than 0.4 kPa (3 mmHg, 0.12 inHg).
   If NG, go to EC-484, "Diagnostic Procedure" .
   If OK, go to next step.
8. Disconnect GST.
9. Start engine and warm it up to normal operating temperature.
10. Turn ignition switch OFF and wait at least 10 seconds.
11. Restart engine and let it idle for 90 seconds.
12. Keep engine speed at 2,000 rpm for 30 seconds.
13. Turn ignition switch OFF.

    NOTE:
    For more information, refer to GST Instruction Manual.



Diagnostic Procedure

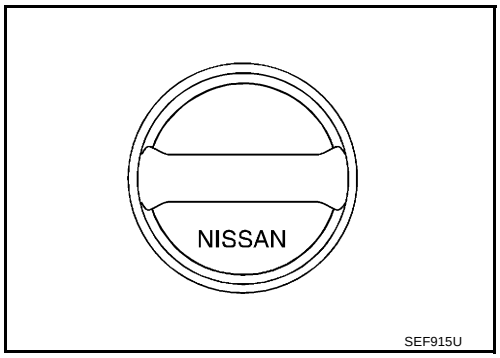
NBS000A1

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-36, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)" .

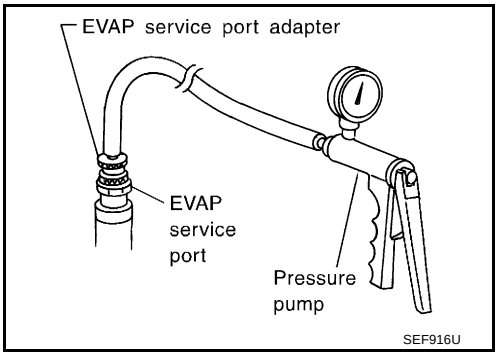
OK or NG

OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

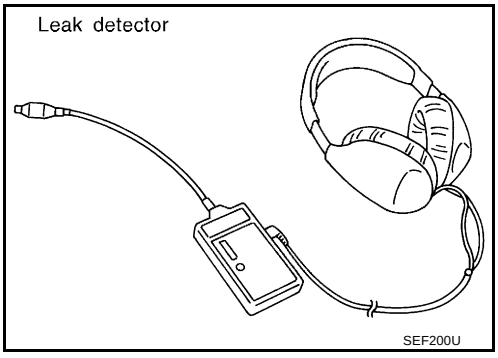


With CONSULT-III>>GO TO 6.
Without CONSULT-III>>GO TO 7.

6. CHECK FOR EVAP LEAK

With CONSULT-III

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-III.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.
   CAUTION:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.
   Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



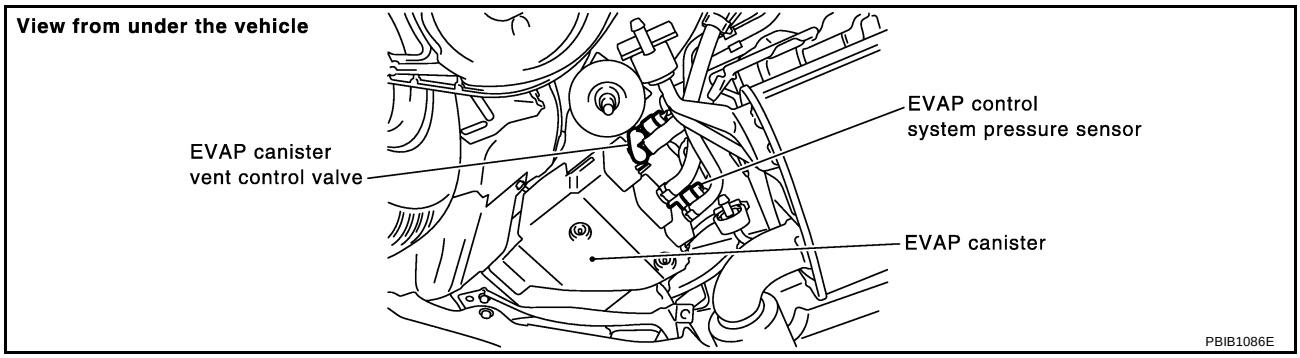
OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

7. CHECK FOR EVAP LEAK

Without CONSULT-III

1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)

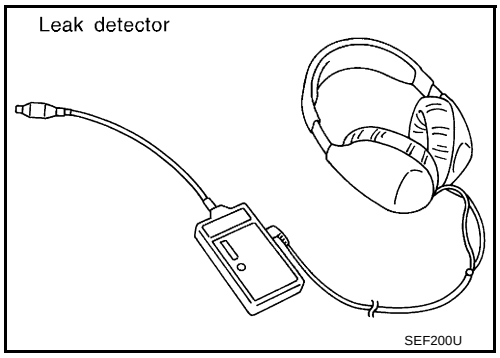


3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

CAUTION:

- **Never use compressed air or a high pressure pump.**
- **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**

4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
  Refer to EC-37, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-442, "Component Inspection" .

OK or NG

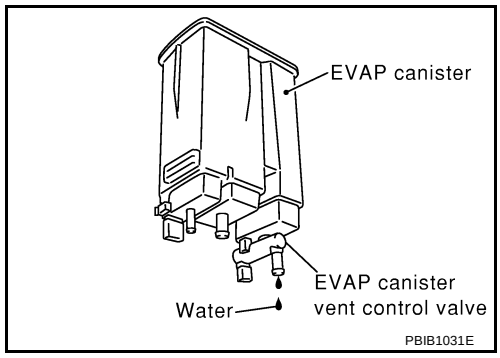
OK >> GO TO 9.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

9. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 10.
No (With CONSULT-III)>>GO TO 12.
No (Without CONSULT-III)>>GO TO 13.



10. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK (With CONSULT-III)>>GO TO 12.
OK (Without CONSULT-III)>>GO TO 13.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-III

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-III screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 16.
NG >> GO TO 14.

14. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-100, "Vacuum Hose Drawing" .

OK or NG

OK >> GO TO 15.
NG >> Repair or reconnect the hose.

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-464, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 19.
NG >> Repair or reconnect the hose.

19. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 20.

20. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-39, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 21.
NG >> Repair or replace hoses and tubes.

21. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 22.
NG >> Repair or replace hose, tube or filler neck tube.

22. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "Component Inspection" .

OK or NG

OK >> GO TO 23.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

23. CHECK FUEL LEVEL SENSOR

Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .

OK or NG

OK >> GO TO 24.
NG >> Replace fuel level sensor unit.

24. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0460 FUEL LEVEL SENSOR

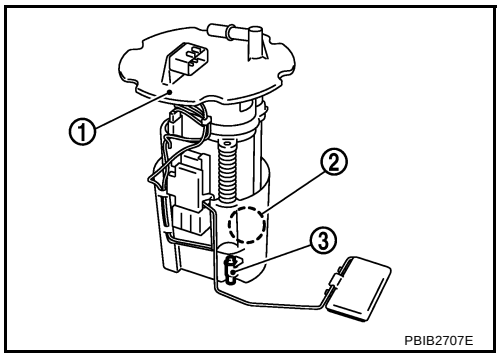
PFP:25060

Component Description

NBS000A2

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the “unified meter and A/C amp.”. The “unified meter and A/C amp.” sends the fuel level sensor signal to the ECM through CAN communication line.

1 : Fuel level sensor unit and fuel pump
2 : Fuel pressure regulator
3 : Fuel tank temperature sensor



It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

On Board Diagnosis Logic

NBS000A3

NOTE:

- **If DTC P0460 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P0460 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

When the vehicle is parked, naturally the fuel level in the fuel tank is stable. It means that output signal of the fuel level sensor does not change. If ECM senses sloshing signal from the sensor, fuel level sensor malfunction is detected.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0460 0460	Fuel level sensor circuit noise	Even though the vehicle is parked, a signal being varied is sent from the fuel level sensor to ECM.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor

DTC Confirmation Procedure

NBS000A4

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and wait maximum of 2 consecutive minutes.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-490, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000A5

1. CHECK FUEL GAUGE OPERATION

Refer to DI-15, "Self-Diagnosis Mode of Combination Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-15, "Self-Diagnosis Mode of Combination Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-19, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

NBS000A6

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

DTC P0461 FUEL LEVEL SENSOR

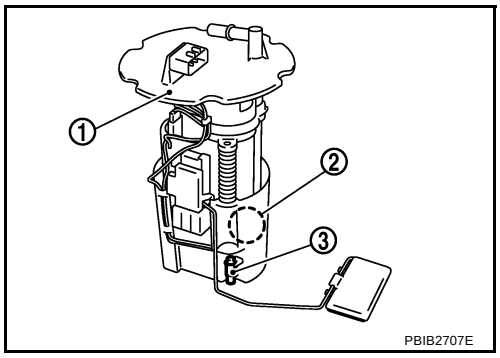
PFP:25060

Component Description

NBS006VA

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the “unified meter and A/C amp.”. The “unified meter and A/C amp.” sends the fuel level sensor signal to the ECM through CAN communication line.

1 : Fuel level sensor unit and fuel pump
2 : Fuel pressure regulator
3 : Fuel tank temperature sensor



It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

On Board Diagnosis Logic

NBS000A8

NOTE:

- **If DTC P0461 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE".**
- **If DTC P0461 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

Driving long distances naturally affect fuel gauge level.
This diagnosis detects the fuel gauge malfunction of the gauge not moving even after a long distance has been driven.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0461 0461	Fuel level sensor circuit range/performance	The output signal of the fuel level sensor does not change within the specified range even though the vehicle has been driven a long distance.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor

Overall Function Check

NBS000A9

Use this procedure to check the overall function of the fuel level sensor function. During this check, a 1st trip DTC might not be confirmed.

WARNING:
When performing following procedure, be sure to observe the handling of the fuel. Refer to FL-10, "FUEL TANK" .
TESTING CONDITION:
Before starting overall function check, preparation of draining fuel and refilling fuel is required.

WITH CONSULT-III

NOTE:
Start from step 10, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

1. Prepare a fuel container and a spare hose.
2. Release fuel pressure from fuel line, refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Remove the fuel feed hose on the fuel level sensor unit.
4. Connect a spare fuel hose where the fuel feed hose was removed.
5. Turn ignition switch OFF and wait at least 10 seconds then turn ON.
6. Select “FUEL LEVEL SE” in “DATA MONITOR” mode with CONSULT-III.
7. Check “FUEL LEVEL SE” output voltage and note it.
8. Select “FUEL PUMP” in “ACTIVE TEST” mode with CONSULT-III.

9. Touch “ON” and drain fuel approximately 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) and stop it.
10. Check “FUEL LEVEL SE” output voltage and note it.
11. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
12. Check “FUEL LEVEL SE” output voltage and note it.
13. Confirm whether the voltage changes more than 0.03V during step 7 to 10 and 10 to 12.
    If NG, go to EC-493, "Diagnostic Procedure" .

WITH GST

NOTE:
Start from step 8, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

1. Prepare a fuel container and a spare hose.
2. Release fuel pressure from fuel line. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Remove the fuel feed hose on the fuel level sensor unit.
4. Connect a spare fuel hose where the fuel feed hose was removed.
5. Turn ignition switch ON.
6. Drain fuel by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) from the fuel tank using proper equipment.
7. Confirm that the fuel gauge indication varies.
8. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
9. Confirm that the fuel gauge indication varies.
10. If NG, go to EC-493, "Diagnostic Procedure" .

Diagnostic Procedure

NBS000AA

1. CHECK FUEL GAUGE OPERATION

Refer to DI-15, "Self-Diagnosis Mode of Combination Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-15, "Self-Diagnosis Mode of Combination Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-19, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

NBS000AB

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY"

DTC P0462, P0463 FUEL LEVEL SENSOR

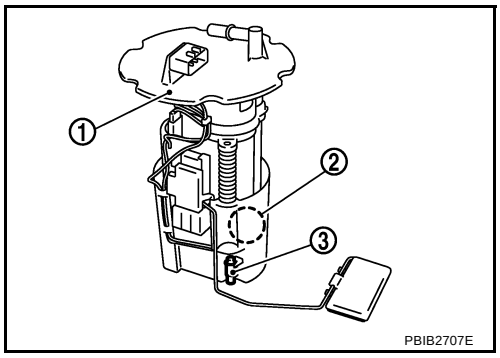
PFP:25060

Component Description

NBS006VB

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the “unified meter and A/C amp.”. The “unified meter and A/C amp.” sends the fuel level sensor signal to the ECM through CAN communication line.

1 : Fuel level sensor unit and fuel pump
2 : Fuel pressure regulator
3 : Fuel tank temperature sensor



It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

On Board Diagnosis Logic

NBS000AD

NOTE:

- **If DTC P0462 or P0463 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE".**
- **If DTC P0462 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

This diagnosis indicates the former, to detect open or short circuit malfunction.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0462 0462	Fuel level sensor circuit low input	An excessively low voltage is sent from the sensor is sent to ECM.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor
P0463 0463	Fuel level sensor circuit high input	An excessively high voltage is sent from the sensor is sent to ECM.	

DTC Confirmation Procedure

NBS000AE

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at ignition switch ON.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-494, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000AF

1. CHECK FUEL GAUGE OPERATION

Refer to DI-15, "Self-Diagnosis Mode of Combination Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-15, "Self-Diagnosis Mode of Combination Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-19, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

NBS000AG

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

DTC P0500 VSS

PFP:32702

Description

NBS000AH

NOTE:

- **If DTC P0500 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P0500 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

The vehicle speed signal is sent to the “unified meter and A/C amp”. from the VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) by CAN communication line. The unified meter and A/C amp. then sends the signal to the ECM by CAN communication line.

On Board Diagnosis Logic

NBS000AI

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0500 0500	Vehicle speed sensor	The almost 0 km/h (0 MPH) signal from vehicle speed sensor is sent to ECM even when vehicle is being driven.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The vehicle speed signal circuit is open or shorted) ● Wheel sensor ● Unified meter and A/C amp. ● VDC/TCS/ABS control unit (with VDC models) ● ABS actuator and electric unit (control unit) (without VDC models)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Vehicle speed sensor	When the fail-safe system for vehicle speed sensor is activated, the cooling fan operates (High) while engine is running.

DTC Confirmation Procedure

NBS000AJ

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Steps 1 and 2 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-III

1. Start engine (VDC switch or TCS switch OFF).
2. Read “VHCL SPEED SE” in “DATA MONITOR” mode with CONSULT-III. The vehicle speed on CONSULT-III should exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.
   If NG, go to EC-497, "Diagnostic Procedure" .
   If OK, go to following step.
3. Select “DATA MONITOR” mode with CONSULT-III.
4. Warm engine up to normal operating temperature.
5. Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,800 - 6,000 rpm (A/T) 1,800 - 6,000 rpm (M/T)
COOLAN TEMP/S	More than 70°C (158°F)

B/FUEL SCHDL	5.0 - 31.8 msec (A/T) 5.0 - 31.8 msec (M/T)
Shift lever	Except P or N position (A/T) Neutral position (M/T)
PW/ST SIGNAL	OFF

6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-497, "Diagnostic Procedure" .

Overall Function Check

NBS000AK

Use this procedure to check the overall function of the vehicle speed sensor circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Lift up drive wheels.
2. Start engine.
3. Read vehicle speed sensor signal in Service $01 with GST.
   The vehicle speed sensor on GST should be able to exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.
4. If NG, go to EC-497, "Diagnostic Procedure" .

Diagnostic Procedure

NBS000AL

1. CHECK DTC WITH “VDC/TCS/ABS CONTROL UNIT (WITH VDC MODELS)” OR “ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITHOUT VDC MODELS)”

Refer to BRC-82, "TROUBLE DIAGNOSIS" (with VDC models) or refer to BRC-42, "TROUBLE DIAGNOSIS" (without VDC models).

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK DTC WITH UNIFIED METER AND A/C AMP.

Refer to DI-4, "COMBINATION METERS" .

>> **INSPECTION END**

DTC P0506 ISC SYSTEM

PFP:23781

Description

NBS000AM

NOTE:
If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.
The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor (POS) detects the actual engine speed and sends a signal to the ECM.
The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration, and engine load (air conditioner, power steering and cooling fan operation, etc.).

On Board Diagnosis Logic

NBS000AN

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0506 0506	Idle speed control system RPM lower than expected	The idle speed is less than the target idle speed by 100 rpm or more.	● Electric throttle control actuator ● Intake air leak

DTC Confirmation Procedure

NBS000AO

NOTE:
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- **If the target idle speed is out of the specified value, perform EC-77, "Idle Air Volume Learning" , before conducting DTC Confirmation Procedure. For the target idle speed, refer to EC-718, "SERVICE DATA AND SPECIFICATIONS (SDS)" .**

TESTING CONDITION:
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**
- **Always perform the test at a temperature above −10°C (14°F).**

WITH CONSULT-III

1. Open engine hood.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Restart engine and run it for at least 1 minute at idle speed.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-498, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000AP

1. CHECK INTAKE AIR LEAK

1. Start engine and let it idle.
2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 2.
NG >> Discover air leak location and repair.

2. REPLACE ECM

1. Stop engine.
2. Replace ECM.
3. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-152, "ECM Re-communicating Function" .
4. Perform EC-76, "VIN Registration" .
5. Perform EC-76, "Exhaust Valve Timing Control Learning" .
6. Perform EC-77, "Accelerator Pedal Released Position Learning" .
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0507 ISC SYSTEM

PFP:23781

Description

NBS000AQ

NOTE:
If DTC P0507 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.
The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor (POS) detects the actual engine speed and sends a signal to the ECM.
The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration, and engine load (air conditioner, power steering and cooling fan operation, etc.).

On Board Diagnosis Logic

NBS000AR

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0507 0507	Idle speed control system RPM higher than expected	The idle speed is more than the target idle speed by 200 rpm or more.	● Electric throttle control actuator ● Intake air leak ● PCV system

DTC Confirmation Procedure

NBS000AS

NOTE:
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- **If the target idle speed is out of the specified value, perform EC-77, "Idle Air Volume Learning" , before conducting DTC Confirmation Procedure. For the target idle speed, refer to EC-718, "SERVICE DATA AND SPECIFICATIONS (SDS)" .**

TESTING CONDITION:
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**
- **Always perform the test at a temperature above −10°C (14°F).**

WITH CONSULT-III

1. Open engine hood.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Restart engine and run it for at least 1 minute at idle speed.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-500, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000AT

1. CHECK PCV HOSE CONNECTION

Confirm that PCV hose is connected correctly.

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK INTAKE AIR LEAK

1. Start engine and let it idle.
2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 3.
NG >> Discover air leak location and repair.

3. REPLACE ECM

1. Stop engine.
2. Replace ECM.
3. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-152, "ECM Re-communicating Function" .
4. Perform EC-76, "VIN Registration" .
5. Perform EC-76, "Exhaust Valve Timing Control Learning" .
6. Perform EC-77, "Accelerator Pedal Released Position Learning" .
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0550 PSP SENSOR

PFP:49763

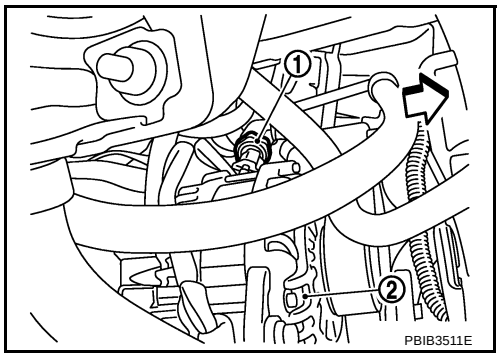
Component Description

NBS000AU

Power steering pressure (PSP) sensor (1) is installed to the power steering high-pressure tube and detects a power steering load. This sensor is a potentiometer which transforms the power steering load into output voltage, and emits the voltage signal to the ECM. The ECM controls the electric throttle control actuator and adjusts the throttle valve opening angle to increase the engine speed and adjusts the idle speed for the increased load.

2 : Alternator

⇦ : Vehicle front



CONSULT-III Reference Value in Data Monitor Mode

NBS000AV

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PW/ST SIGNAL	● Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
		Steering wheel: Being turned	ON

On Board Diagnosis Logic

NBS000AW

The MIL will not light up for this self-diagnosis.

NOTE:
If DTC P0550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0550 0550	Power steering pressure sensor circuit	An excessively low or high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted) ● Power steering pressure sensor

DTC Confirmation Procedure

NBS000AX

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-505, "Diagnostic Procedure" .

WITH GST

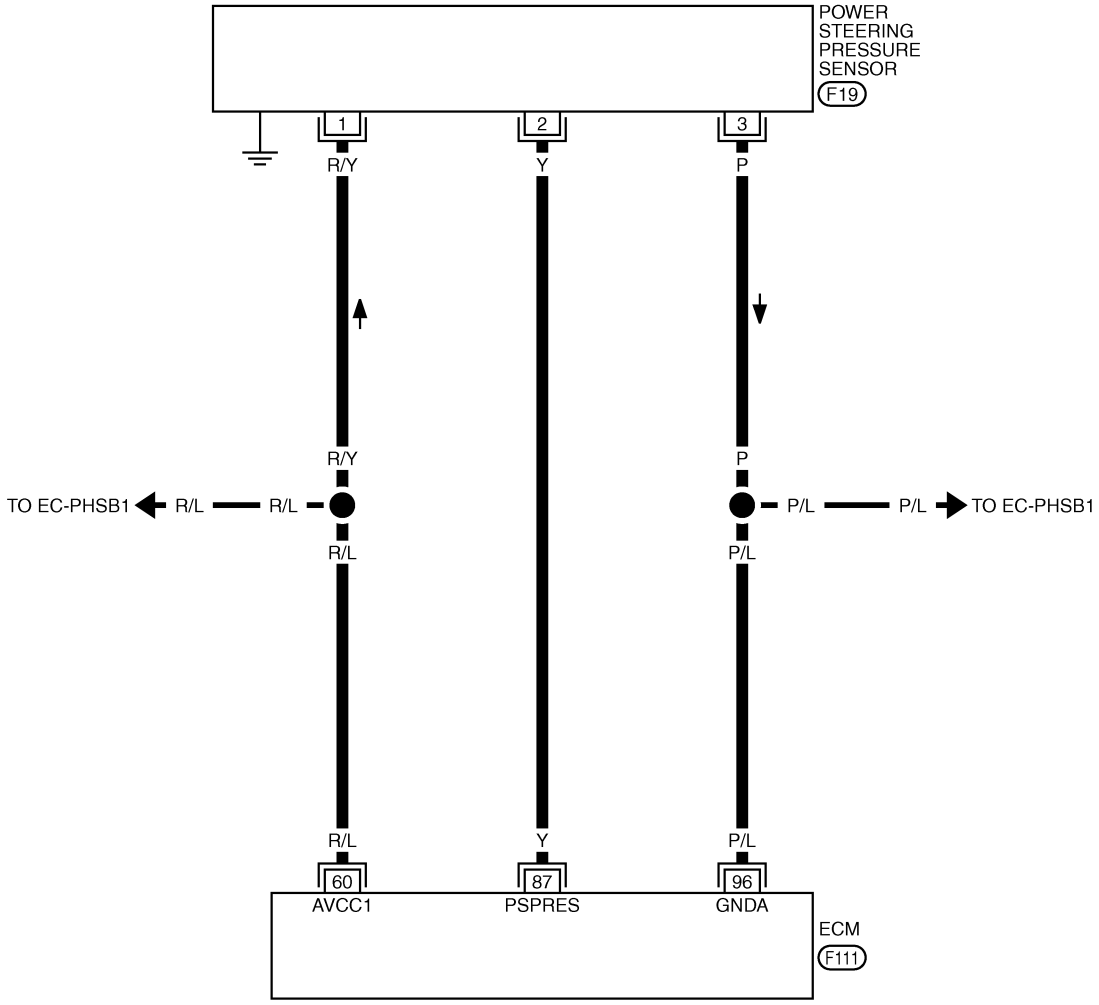
Follow the procedure “WITH CONSULT-III” above.

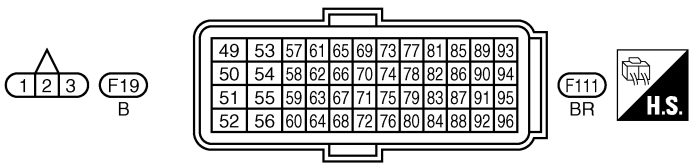
Wiring Diagram

NBS000AY

EC-PS/SEN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1651E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
87	Y	Power steering pressure sensor	**[Engine is running]** ● Steering wheel: Being turned	0.5 - 4.5V
			[Engine is running] ● Steering wheel: Not being turned	0.4 - 0.8V
96	P/L	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Power steering pressure sensor]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

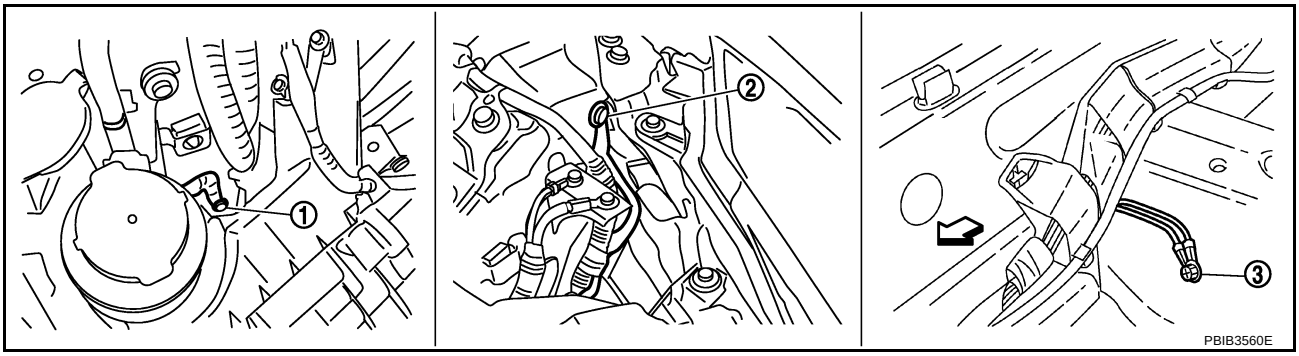
Diagnostic Procedure

NBS000AZ

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

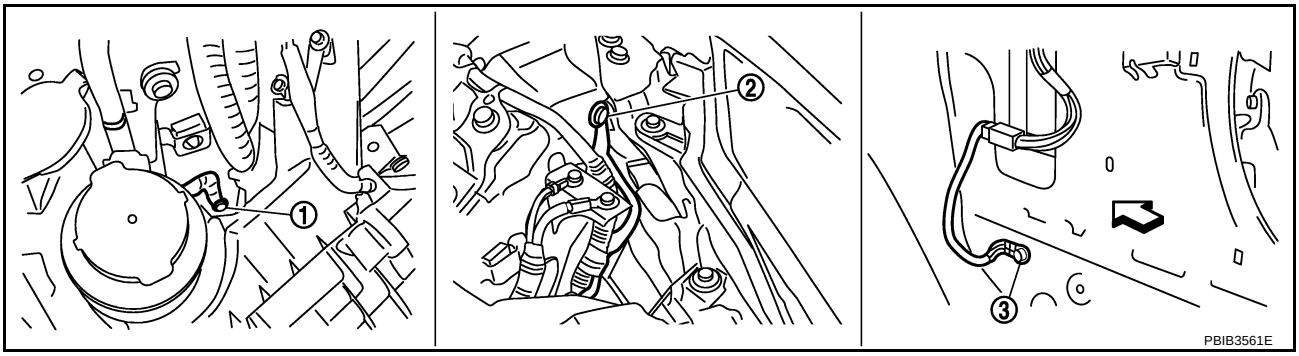


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

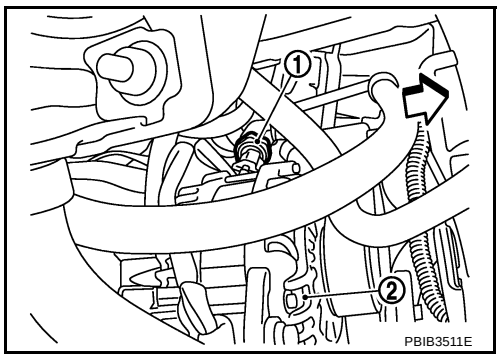
2. CHECK PSP SENSOR POWER SUPPLY CIRCUIT

1. Disconnect power steering pressure (PNP) sensor (1) harness connector.

   1 : Alternator

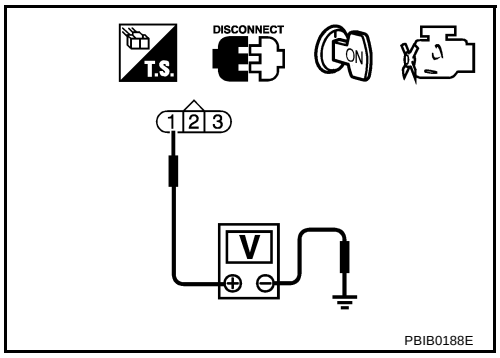
   ⇦ : Vehicle front

2. Turn ignition switch ON.



3. Check voltage between PSP sensor terminal 1 and ground with CONSULT-III or tester.

   Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK PSP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between PSP sensor terminal 3 and ECM terminal 96. Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK PSP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 87 and PSP sensor terminal 2. Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PSP SENSOR

Refer to EC-507, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace PNP sensor.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

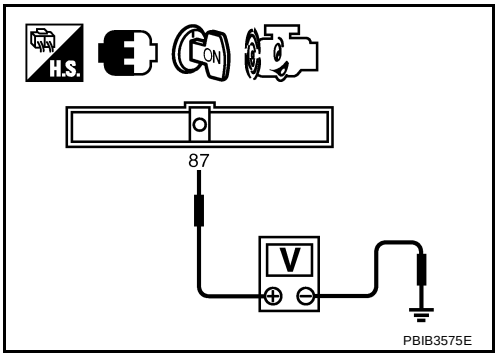
Component Inspection

NBS000B0

POWER STEERING PRESSURE SENSOR

1. Reconnect all harness connectors disconnected.
2. Start engine and let it idle.
3. Check voltage between ECM terminal 87 and ground under the following conditions.

Condition	Voltage
Steering wheel: Being turned	0.5 - 4.5V
Steering wheel: Not being turned	0.4 - 0.8V



Removal and Installation

NBS000B1

POWER STEERING PRESSURE SENSOR

Refer to PS-33, "HYDRAULIC LINE" .

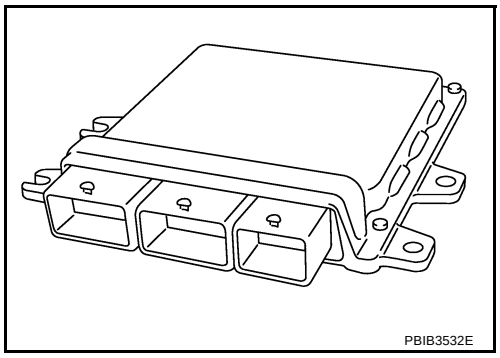
DTC P0603 ECM POWER SUPPLY

PFP:23710

Component Description

NBS000BE

Battery voltage is supplied to the ECM even when the ignition switch is turned OFF for the ECM memory function of the DTC memory, the air-fuel ratio feedback compensation value memory, the Idle Air Volume Learning value memory, etc.


PBIB3532E

On Board Diagnosis Logic

NBS000BF

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0603 0603	ECM power supply circuit	ECM back-up RAM system does not function properly.	● Harness or connectors [The ECM power supply (back-up) circuit is open or shorted.] ● ECM

DTC Confirmation Procedure

NBS000BG

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
3. Repeat steps 3 and 4 for four times.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-510, "Diagnostic Procedure" .

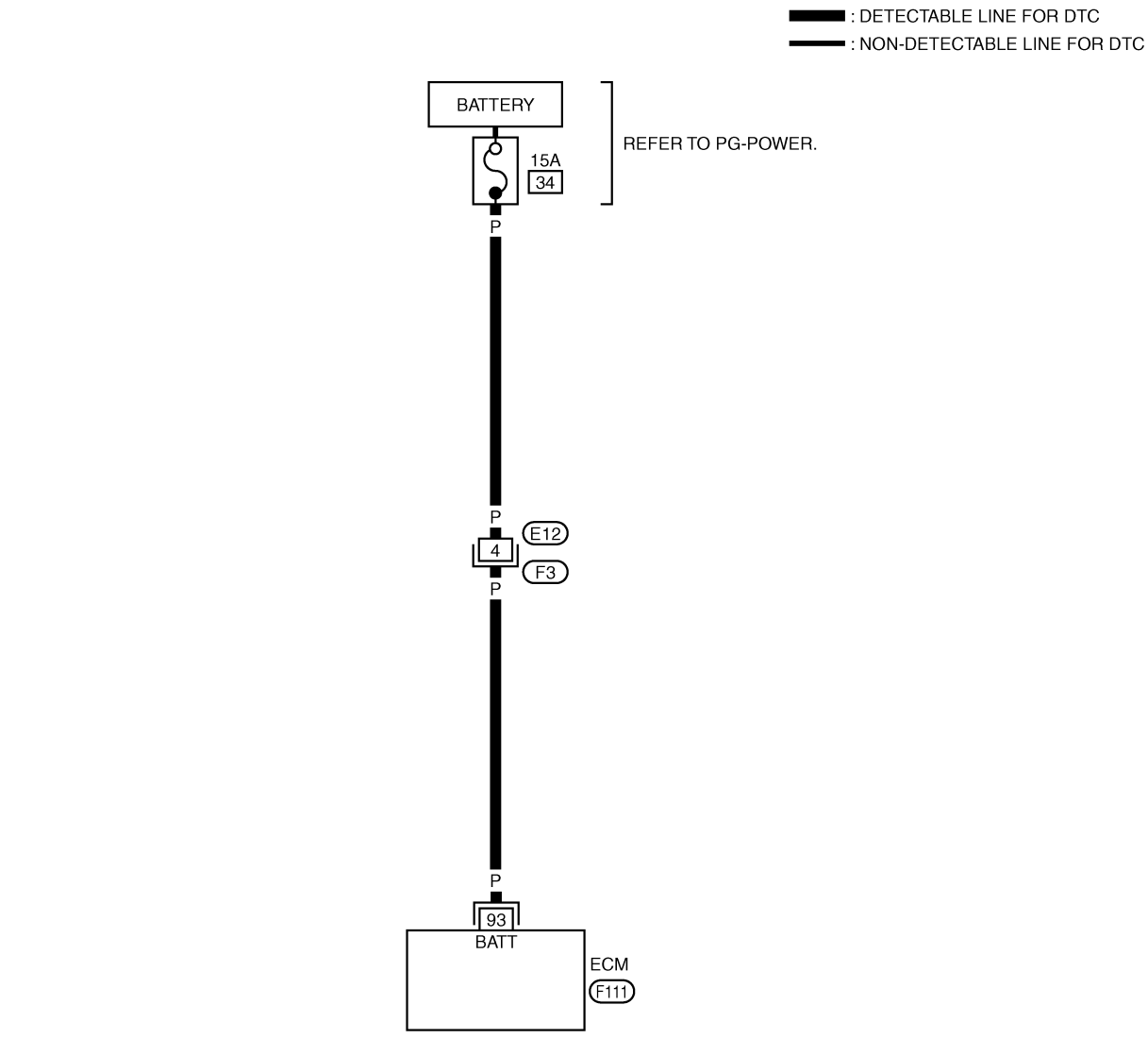
WITH GST

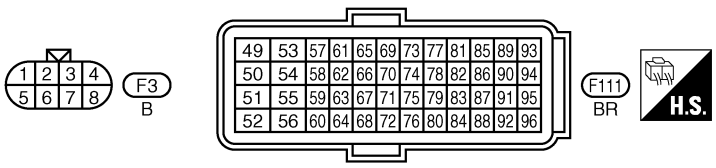
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000BH

EC-ECM/PW-01





TBWT1652E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
93	P	Power supply for ECM (Back-up)	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)

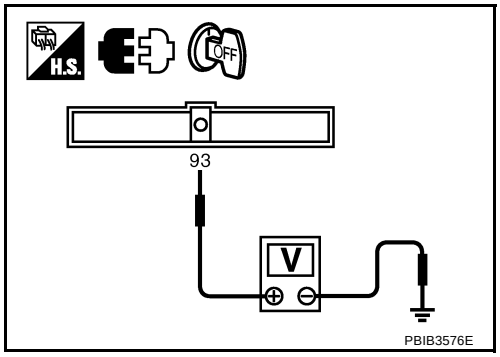
Diagnostic Procedure

NBS000BI

1. CHECK ECM POWER SUPPLY

1. Turn ignition switch OFF.
2. Check voltage between ECM terminal 93 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between ECM and battery

>> Repair or replace harness or connectors.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness or connectors.

4. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-III.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-508, "DTC Confirmation Procedure" .
5. Is the 1st trip DTC P0603 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform DTC Confirmation Procedure.**
   See EC-508, "DTC Confirmation Procedure" .
4. Is the 1st trip DTC P0603 displayed again?

Yes or No

Yes >> GO TO 5.
No >> **INSPECTION END**

5. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

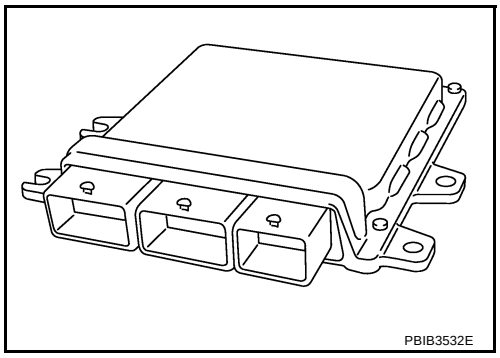
DTC P0605 ECM

PFP:23710

Component Description

NBS000B2

The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.



On Board Diagnosis Logic

NBS000B3

This self-diagnosis has one or two trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0605 0605	Engine control module	A)	ECM calculation function is malfunctioning.	● ECM
		B)	ECM EEP-ROM system is malfunctioning.	
		C)	ECM self shut-off function is malfunctioning.	

FAIL-SAFE MODE

ECM enters fail-safe mode when the malfunction A is detected.

Detected items	Engine operation condition in fail-safe mode
Malfunction A	● ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. ● ECM deactivates ASCD operation.

DTC Confirmation Procedure

NBS000B4

Perform PROCEDURE FOR MALFUNCTION A first. If the 1st trip DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B. If there is no malfunction on PROCEDURE FOR MALFUNCTION B, perform PROCEDURE FOR MALFUNCTION C.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

With CONSULT-III

1. Turn ignition switch ON.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-513, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION B

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
3. Check 1st trip DTC.
4. If 1st trip DTC is detected, go to EC-513, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION C

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
3. Repeat step 3 for 32 times.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-513, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

Diagnostic Procedure

NBS000B5

1. INSPECTION START

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-III.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-512, "DTC Confirmation Procedure" .
5. Is the 1st trip DTC P0605 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform DTC Confirmation Procedure.**
   See EC-512, "DTC Confirmation Procedure" .
4. Is the 1st trip DTC P0605 displayed again?

Yes or No

Yes >> GO TO 2.
No >> **INSPECTION END**

2. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0643 SENSOR POWER SUPPLY

PFP:18919

On Board Diagnosis Logic

NBS000DW

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0643 0643	Sensor power supply circuit short	ECM detects a voltage of power source for sensor is excessively low or high.	● Harness or connectors (APP sensor 1 circuit is shorted.) (TP sensor circuit is shorted.) [CMP sensor (PHASE) (bank 1) circuit is shorted.] [EVT control position sensor (bank 1) circuit is shorted.] (PSP sensor circuit is shorted.) ● Accelerator pedal position sensor ● Throttle position sensor ● Camshaft position sensor (PHASE) (bank 1) ● Exhaust valve timing control position sensor (bank 1) ● Power steering pressure sensor

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

NBS000DX

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-517, "Diagnostic Procedure" .

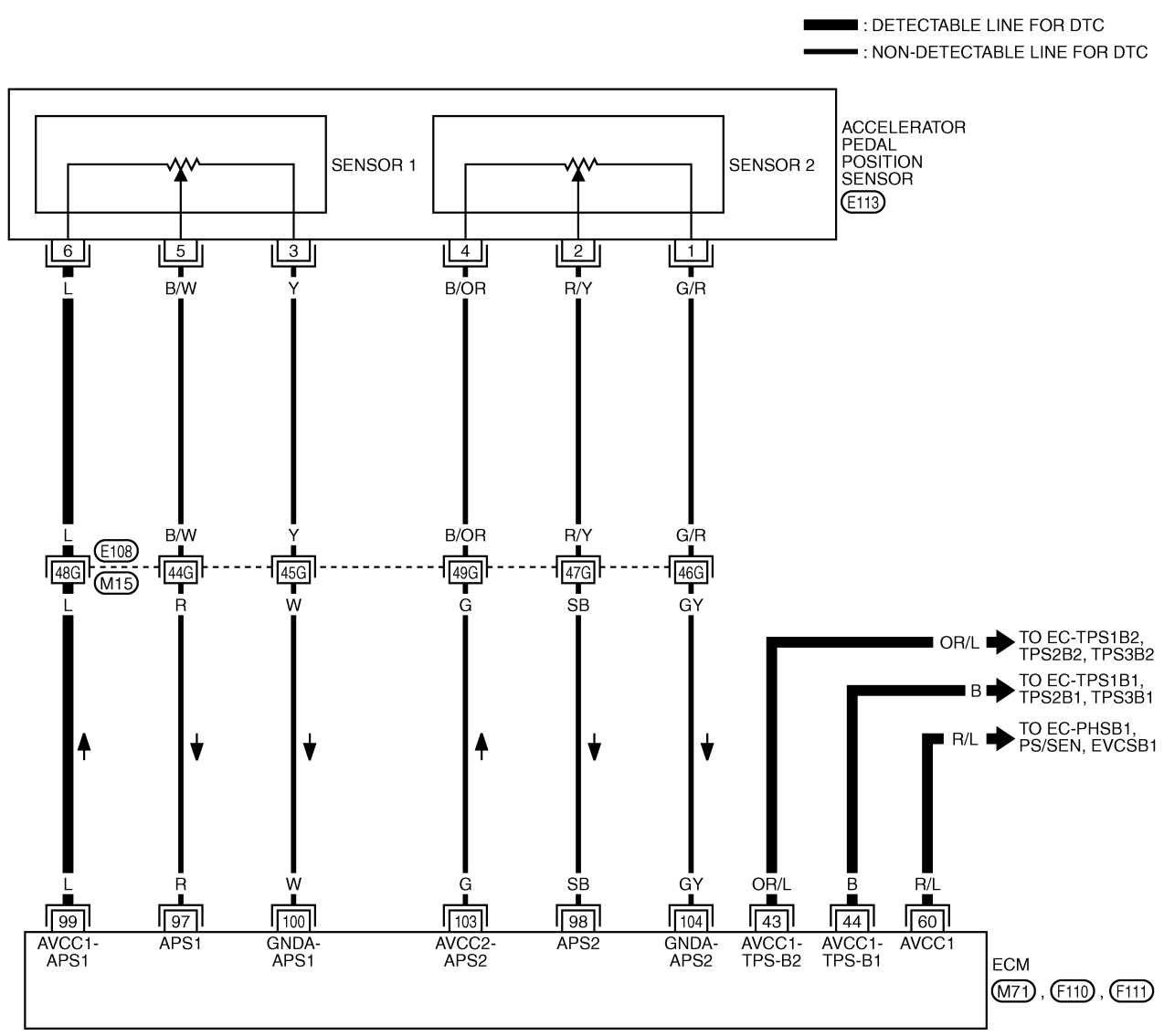
WITH GST

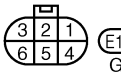
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

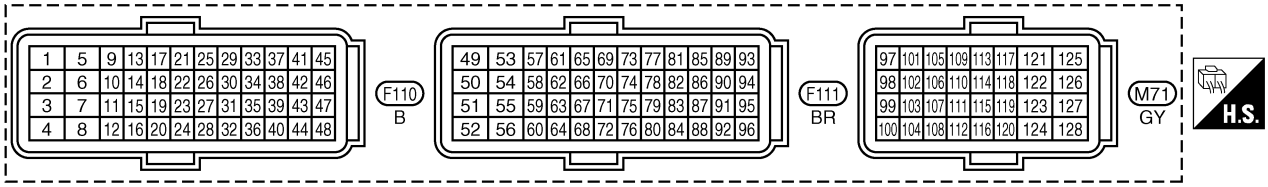
NBS000DY

EC-SEN/PW-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT1653E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	1.95 - 2.40V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

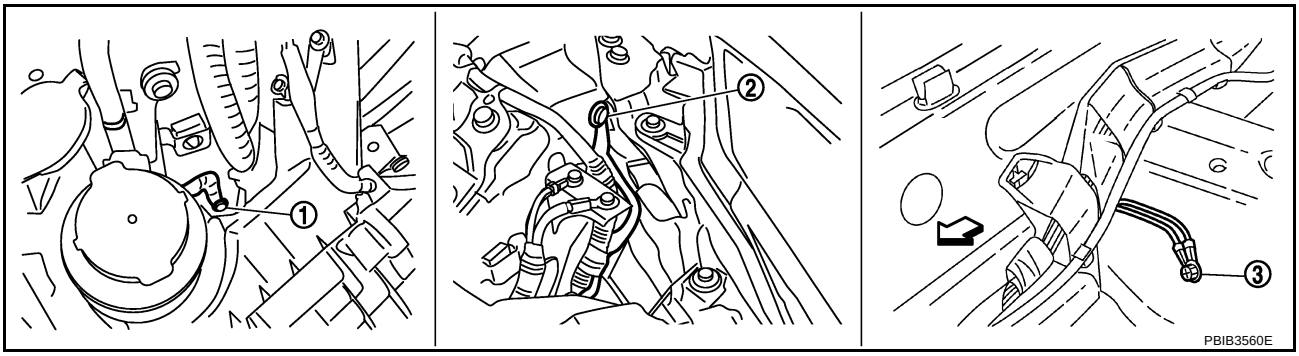
Diagnostic Procedure

NBS000DZ

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

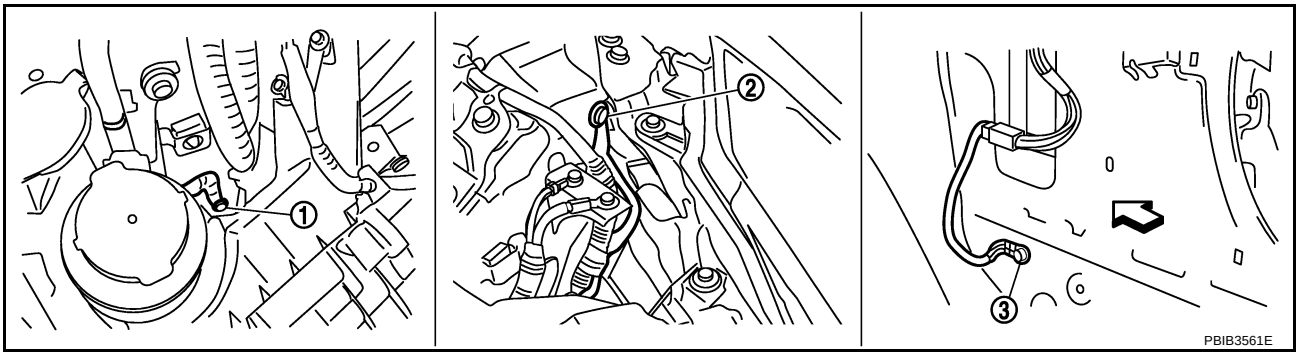


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

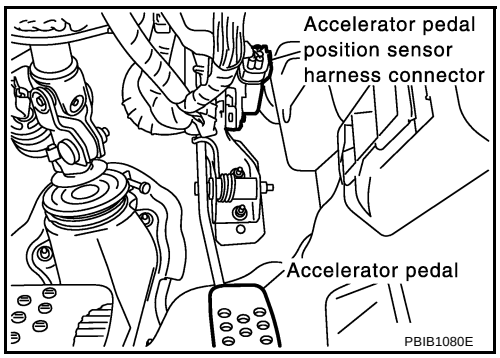
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

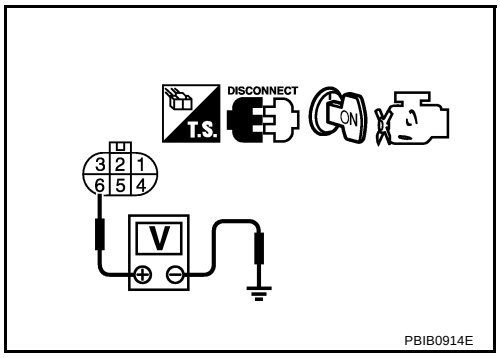
2. CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT-I

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 6 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

3. CHECK SENSOR POWER SUPPLY CIRCUITS

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
43	Electric throttle control actuator (bank 2) terminal 6	EC-365
44	Electric throttle control actuator (bank 1) terminal 6	EC-363
60	CMP sensor (PHASE) (bank 1) terminal 1	EC-397
	EVT control position sensor (bank 1) terminal 1	EC-530
	PSP sensor terminal 1	EC-503
99	APP sensor terminal 6	EC-515

OK or NG

OK >> GO TO 4.
NG >> Repair short to ground or short to power in harness or connectors.

4. CHECK COMPONENTS

Check the following.

- Camshaft position senosr (PHASE) (bank 1) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-539, "Component Inspection" .)
- Power steering pressure sensor (Refer to EC-507, "Component Inspection" .)

OK or NG

OK >> GO TO 5.
NG >> Replace malfunctioning component.

5. CHECK TP SENSOR

Refer to EC-369, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace malfunctioning electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK APP SENSOR

Refer to EC-640, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0850 PNP SWITCH

PFP:23006

Component Description

NBS000GB

When the shift position is P or N (A/T), Neutral (M/T), park/neutral position (PNP) switch is ON.
ECM detects the position because the continuity of the line (the ON signal) exists.

CONSULT-III Reference Value in Data Monitor Mode

NBS000GC

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
P/N POSI SW	● Ignition switch: ON	Shift lever: P or N (A/T), Neutral (M/T) position	ON
		Shift lever: Except above position	OFF

On Board Diagnosis Logic

NBS000GD

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0850 0850	Park/neutral position switch	The signal of the park/neutral position (PNP) switch is not changed in the process of engine starting and driving.	● Harness or connectors [The park/neutral position (PNP) switch circuit is open or shorted.] ● Park/neutral position (PNP) switch ● TCM (A/T models)

DTC Confirmation Procedure

NBS000GE

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “P/N POSI SW” in “DATA MONITOR” mode with CONSULT-III. Then check the “P/N POSI SW” signal under the following conditions.

Position (Shift lever)	Known-good signal
N or P position (A/T) Neutral position (M/T)	ON
Except above position	OFF

If NG, go to EC-525, "Diagnostic Procedure" .
If OK, go to following steps.

3. Select “DATA MONITOR” mode with CONSULT-III.
4. Start engine and warm it up to normal operating temperature.
5. Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,400 - 6375 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	2.0 - 31.8 msec
VHCL SPEED SE	More than 64 km/h (40 MPH)
Shift lever	Suitable position

6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-525, "Diagnostic Procedure" .

Overall Function Check

NBS000GF

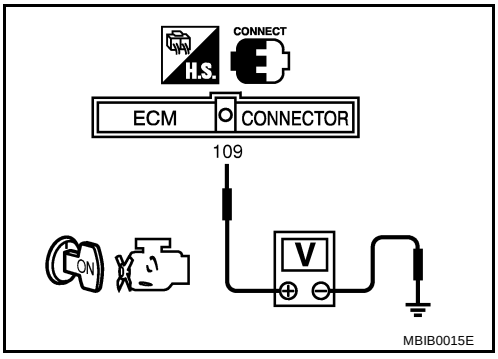
Use this procedure to check the overall function of the park/neutral position (PNP) switch circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 109 (PNP switch signal) and ground under the following conditions.

Condition (Shift lever)	Voltage V (Known-good data)
P or N position (A/T) Neutral position (M/T)	Approx. 0
Except above position	BATTERY VOLTAGE (11 - 14V)

3. If NG, go to EC-525, "Diagnostic Procedure" .

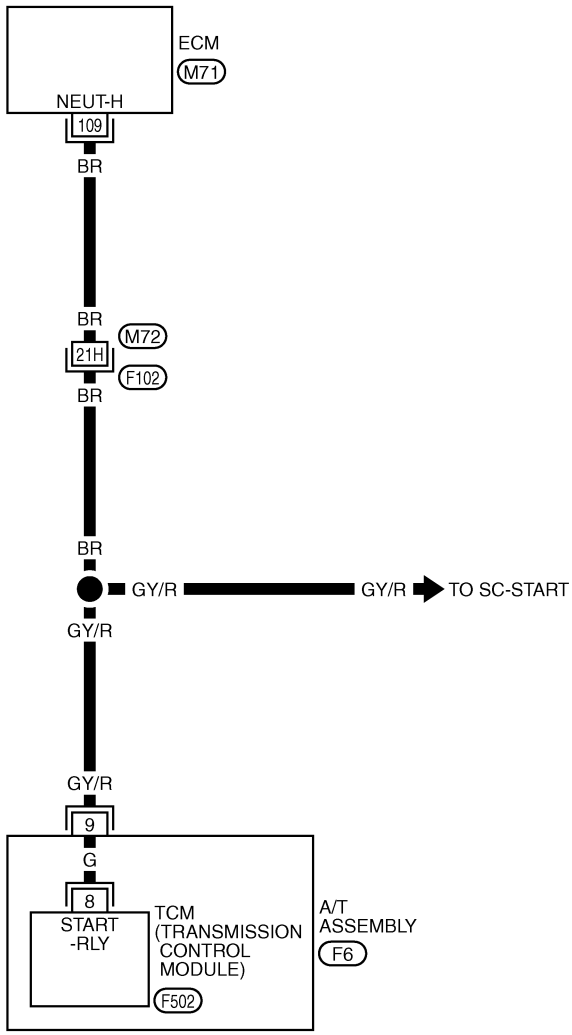


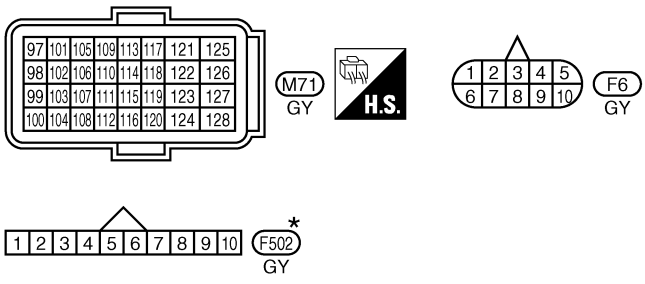
Wiring Diagram
A/T MODELS

NBS000GG

EC-PNP/SW-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1654E

Specification data are reference values and are measured between each terminal and ground.

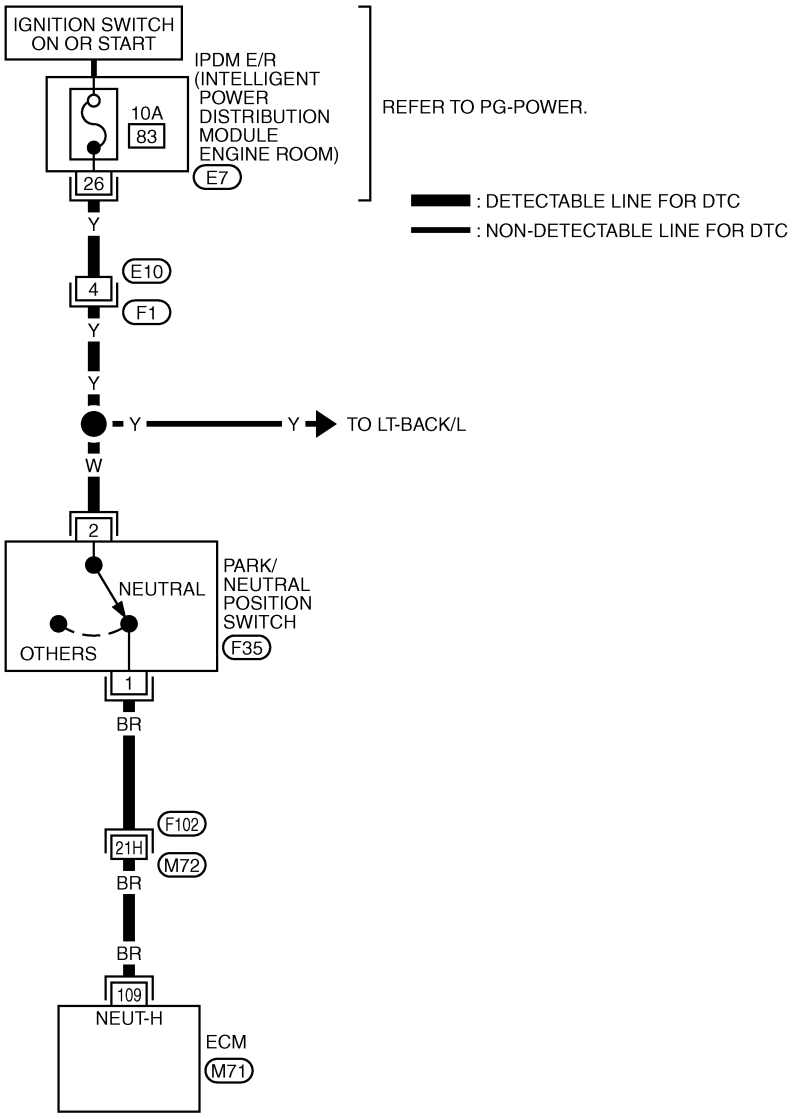
CAUTION:

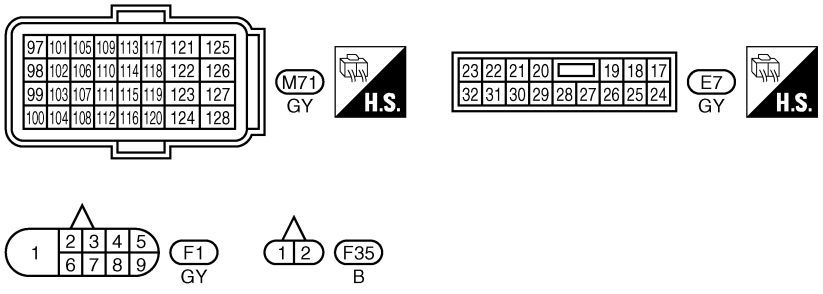
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
109	BR	PNP switch	**[Ignition switch: ON]** ● Shift lever: P or N position	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON] ● Shift lever: Except above position	0V

M/T MODELS

EC-PNP/SW-02





REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1655E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
109	BR	PNP switch	**[Ignition switch: ON]** ● Shift lever: Neutral position	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON] ● Shift lever: Except above position	0V

Diagnostic Procedure

NBS000GH

A/T MODELS

1. CHECK DTC WITH TCM

Refer to AT-37, "OBD-II Diagnostic Trouble Code (DTC)" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK STARTING SYSTEM

Turn ignition switch OFF, then turn it to START.

Does starter motor operate?

Yes or No

Yes >> GO TO 3.
No >> Refer to SC-8, "STARTING SYSTEM" .

3. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Disconnect ECM harness connector.
4. Check harness continuity between A/T assembly terminal 9 and ECM terminal 109. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness for open or short between A/T assembly and ECM.

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

1. Check harness continuity between A/T assembly terminal 9 and TCM terminal 8.
   Refer to AT-97, "DTC P0615 START SIGNAL CIRCUIT" .

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

M/T MODELS

1. CHECK PNP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect park/neutral position (PNP) switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between PNP switch terminal 2 and ground with CONSULT-III or tester.

   Voltage: Battery voltage

OK or NG

OK >> GO TO 3
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector E10, F1
- 10A fuse
- IPDM harness connector E7
- Harness for open or short between ECM and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 109 and PNP switch terminal 1.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector F102, M72
- Harness for open or short between PNP switch and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PNP SWITCH

Refer to MT-11, "PARK/NEUTRAL POSITION SWITCH" .

OK or NG

OK >> GO TO 6.
NG >> Replace PNP switch.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair open dircuit or short to ground or short to power in harness or connectors.

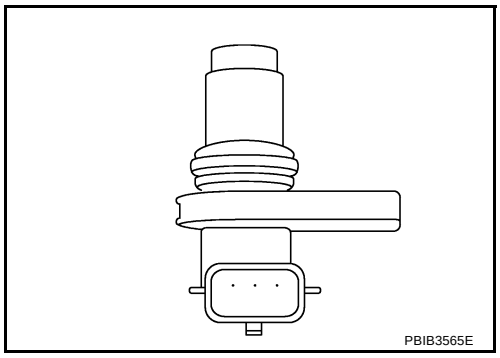
DTC P1078 P1084 EVT CONTROL POSITION SENSOR

PFP:23731

Component Description

NBS000BJ

Exhaust valve timing control position sensor detects the concave groove of the exhaust camshaft rear end.
This sensor signal is used for sensing a position of the exhaust camshaft.
This sensor uses a Hall IC.
Based on the position of the exhaust camshaft, ECM controls exhaust valve timing control magnet retarder to optimize the shut/open timing of exhaust valve for the driving condition.



CONSULT-III Reference Value in Data Monitor Mode

NBS000BK

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
EXH/V TIM B1 EXH/V TIM B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°CA

On Board Diagnosis Logic

NBS000BL

NOTE:
If DTC P1078 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1078 1078 (Bank 1)	Exhaust valve timing control position sensor circuit	An excessively high or low voltage from the sensor is sent to ECM.	● Harness or connectors [Exhaust valve timing control position sensor (bank 1) circuit is open or shorted) ● Exhaust valve timing control position sensor (bank 1) ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 1) ● Accumulation of debris to the signal pick-up portion of the camshaft
P1084 1084 (Bank 2)			● Harness or connectors [EVT control position sensor (bank 2) circuit is shorted.] [CKP sensor (POS) circuit is shorted.] [CMP sensor (PHASE) (bank 2) circuit is open or shorted.] (APP sensor 2 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Exhaust valve timing control position sensor (bank 2) ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Accelerator pedal position sensor ● EVAP control system pressure sensor ● Refrigerant pressure sensor ● Accumulation of debris to the signal pick-up portion of the camshaft

DTC Confirmation Procedure

NBS000BM

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for 10 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-534, "Diagnostic Procedure" .

WITH GST

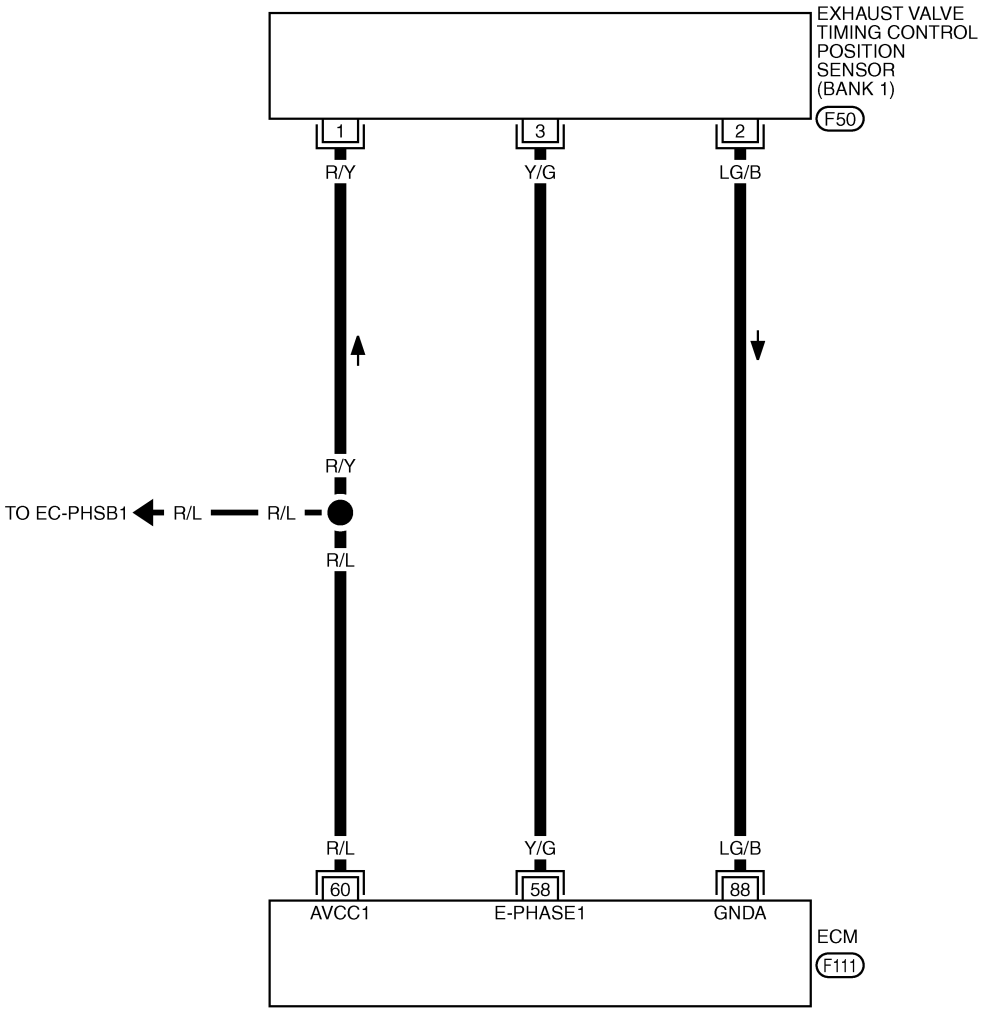
Follow the procedure WITH CONSULT-III above.

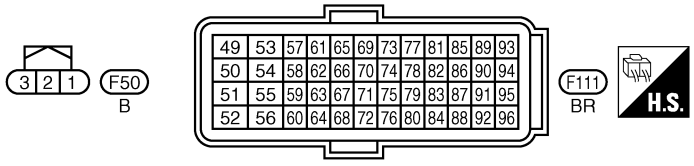
Wiring Diagram
BANK 1

NBS000BN

EC-EVCSB1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC

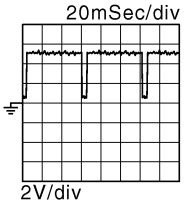
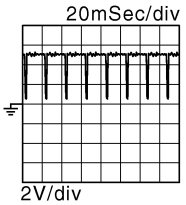




TBWT1656E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

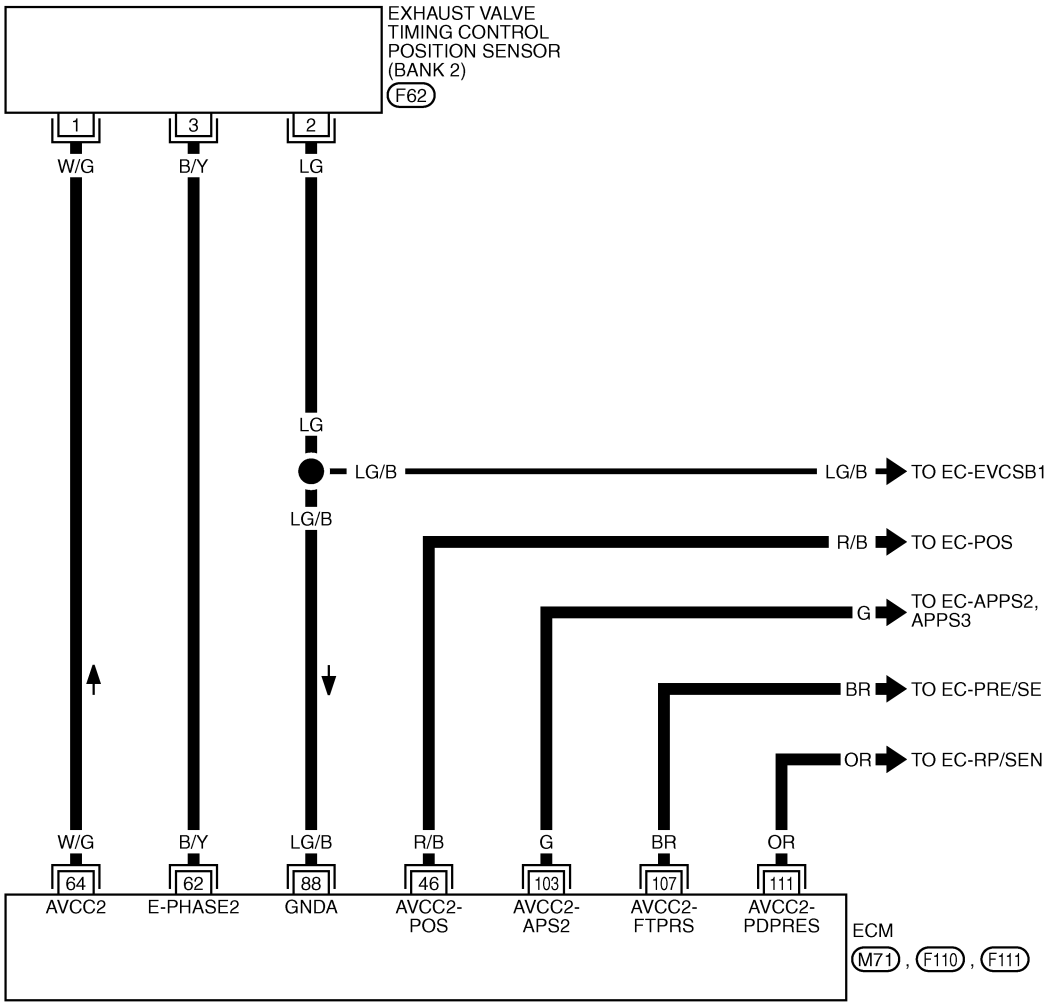
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	Y/G	Exhaust valve timing control position sensor (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3551E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3552E
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
88	LG/B	Sensor ground [Exhaust valve timing control position sensor (bank 1), Exhaust valve timing control position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

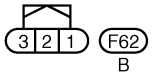
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

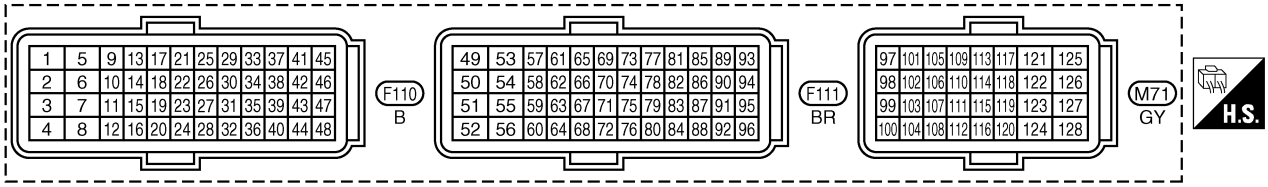
BANK 2

EC-EVCSB2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



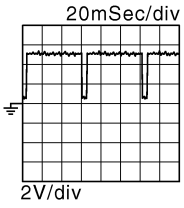
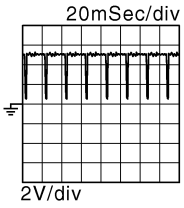




TBWT1657E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
62	B/Y	Exhaust valve timing control position sensor (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3551E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3552E
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
88	LG/B	Sensor ground [Exhaust valve timing control position sensor (bank 1), Exhaust valve timing control position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

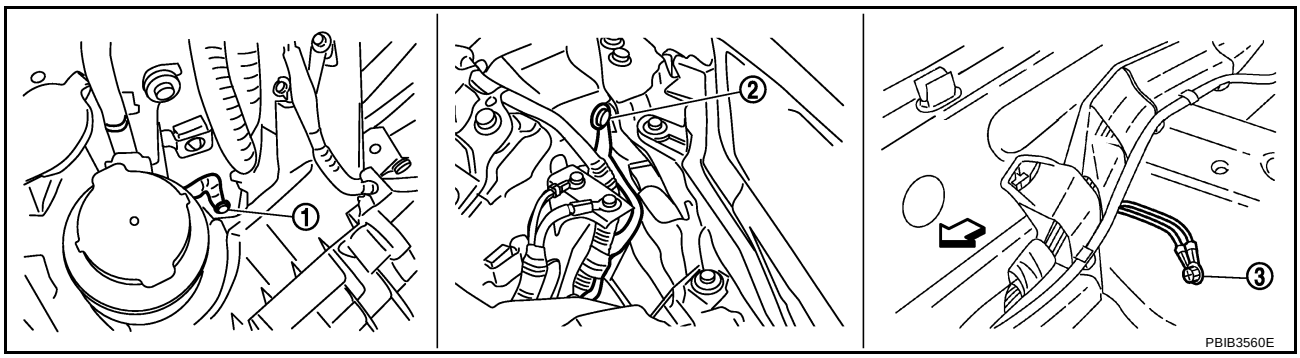
Diagnostic Procedure

NBS000BO

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

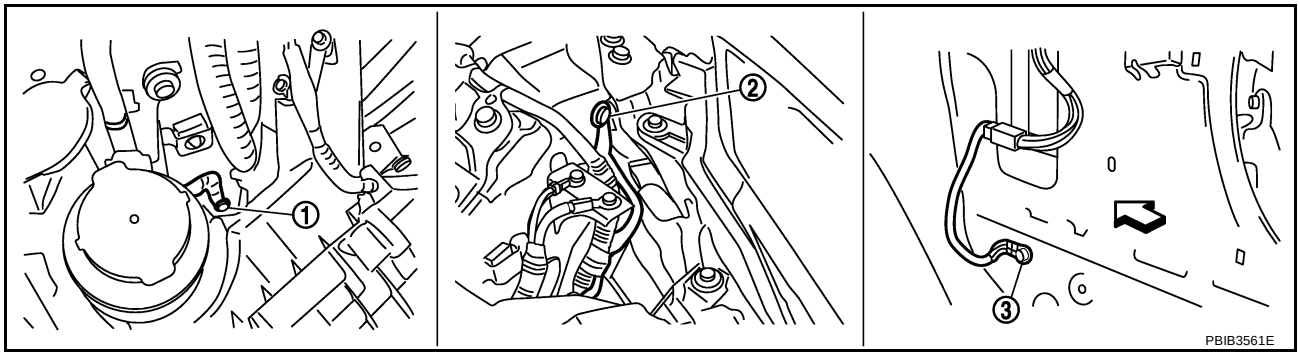


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-I

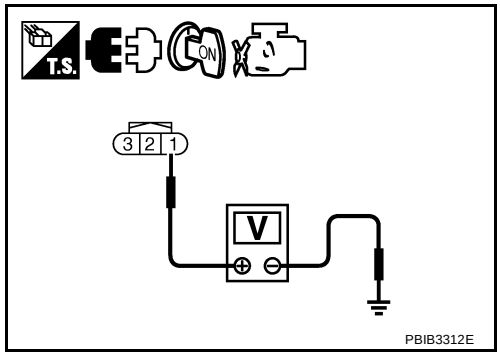
1. Disconnect exhaust valve timing control position sensor harness connector.



1. Exhaust valve timing control position sensor (bank 1)
2. Camshaft position sensor (PHASE) (bank 1)
3. Camshaft position sensor (PHASE) (bank 2)
4. Exhaust valve timing control position sensor (bank 2)

2. Turn ignition switch ON.
3. Check voltage between exhaust valve timing control position sensor terminal 1 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 8.
NG-1 >> P1078: Repair open circuit or short to ground or short to power in harness connector.
NG-2 >> P1084: GO TO 3.

3. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between exhaust valve timing control position sensor terminal 1 and ECM terminal 64.
   Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit.

4. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor terminal 1	EC-711

OK or NG

OK >> GO TO 5.
NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning component.

6. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 14.
NG >> GO TO 7.

7. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

8. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between exhaust valve timing control position sensor terminal 2 and ECM terminal 88. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors..

9. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 58 (bank 1) or 62 (bank 2) and exhaust valve timing control position sensor terminal 3.
Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Refer to EC-539, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace exhaust valve timing control position sensor.

11. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-393, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> Replace crankshaft position sensor (POS).

12. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-405, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> Replace malfunctioning camshaft position sensor (PHASE).

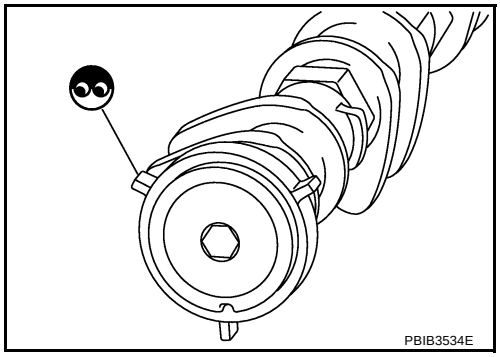
13. CHECK CAMSHAFT (EXH)

Check the following;

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 14.
NG >> Remove debris and clean the signal plate of camshaft rear end or replace malfunctioning camshaft.



14. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

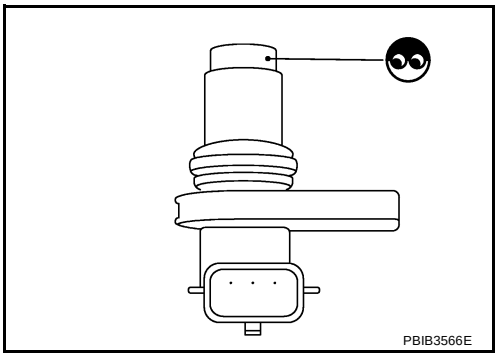
>> **INSPECTION END**

Component Inspection

NBS000BP

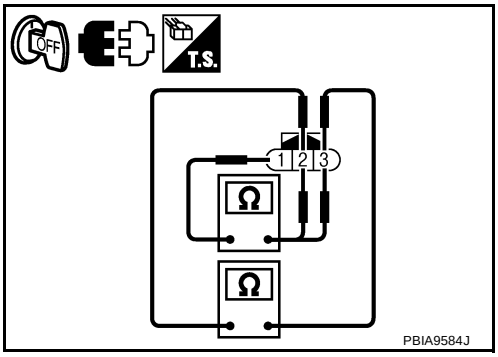
EXHAUST VALVE TIMING CONTROL POSITION SENSOR

1. Disconnect exhaust valve timing control position sensor harness connector.
2. Loosen the fixing bolt of the sensor.
3. Remove the sensor.
4. Visually check the sensor for chipping.



5. Check resistance as shown below.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	Except 0 or ∞
1 (+) - 3 (-)	
2 (+) - 3 (-)	



6. If NG, replace exhaust valve timing control position sensor.

Removal and Installation

NBS000BQ

EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Refer to EM-72, "CAMSHAFT" .

DTC P1148, P1168 CLOSED LOOP CONTROL

PFP:22690

On Board Diagnosis Logic

NBS000D5

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1148 1148 (Bank 1)	Closed loop control function	The closed loop control function for bank 1 does not operate even when vehicle is driving in the specified condition.	● Harness or connectors [The air fuel ratio (A/F) sensor 1 circuit is open or shorted.] ● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater
P1168 1168 (Bank 2)		The closed loop control function for bank 2 does not operate even when vehicle is driving in the specified condition.	

NOTE:
DTC P1148 or P1168 is displayed with another DTC for air fuel ratio (A/F) sensor 1.
Perform the trouble diagnosis for the corresponding DTC.

DTC P1211 TCS CONTROL UNIT

PFP:47850

Description

NBS000D6

The malfunction information related to TCS is transferred through the CAN communication line from VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) to ECM.

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) but also for ECM after TCS related repair.

On Board Diagnosis Logic

NBS000D7

- **Freeze frame data is not stored in the ECM for this self-diagnosis.**
- **The MIL will not light up for this self-diagnosis.**

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1211 1211	TCS control unit	ECM receives a malfunction information from VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models).	● VDC/TCS/ABS control unit (with VDC models) ● ABS actuator and electric unit (control unit) (without VDC models) ● TCS related parts

DTC Confirmation Procedure

NBS000D8

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

WITH CONSULT-III

1. Start engine and let it idle for at least 60 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-541, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000D9

Go to BRC-82, "TROUBLE DIAGNOSIS" (With VDC models) or BRC-42, "TROUBLE DIAGNOSIS" (Without VDC models).

DTC P1212 TCS COMMUNICATION LINE

PFP:47850

Description

NBS000DA

NOTE:

- **If DTC P1212 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1212 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

This CAN communication line is used to control the smooth engine operation during the TCS operation. Pulse signals are exchanged between ECM and VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models).

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) but also for ECM after TCS related repair.

On Board Diagnosis Logic

NBS000DB

- **Freeze frame data is not stored in the ECM for this self-diagnosis.**
- **The MIL will not light up for this self-diagnosis.**

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1212 1212	TCS communication line	ECM can not receive the information from VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) continuously.	● Harness or connectors (The CAN communication line is open or shorted.) ● VDC/TCS/ABS control unit (with VDC models) ● ABS actuator and electric unit (control unit) (without VDC models) ● Dead (Weak) battery

DTC Confirmation Procedure

NBS000DC

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

WITH CONSULT-III

1. Start engine and let it idle for at least 10 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-542, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000DD

Go to BRC-82, "TROUBLE DIAGNOSIS" (With VDC models) or BRC-42, "TROUBLE DIAGNOSIS" (Without VDC models).

DTC P1217 ENGINE OVER TEMPERATURE

PFP:00000

Description

NBS000DE

SYSTEM DESCRIPTION

NOTE:

- **If DTC P1217 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1217 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

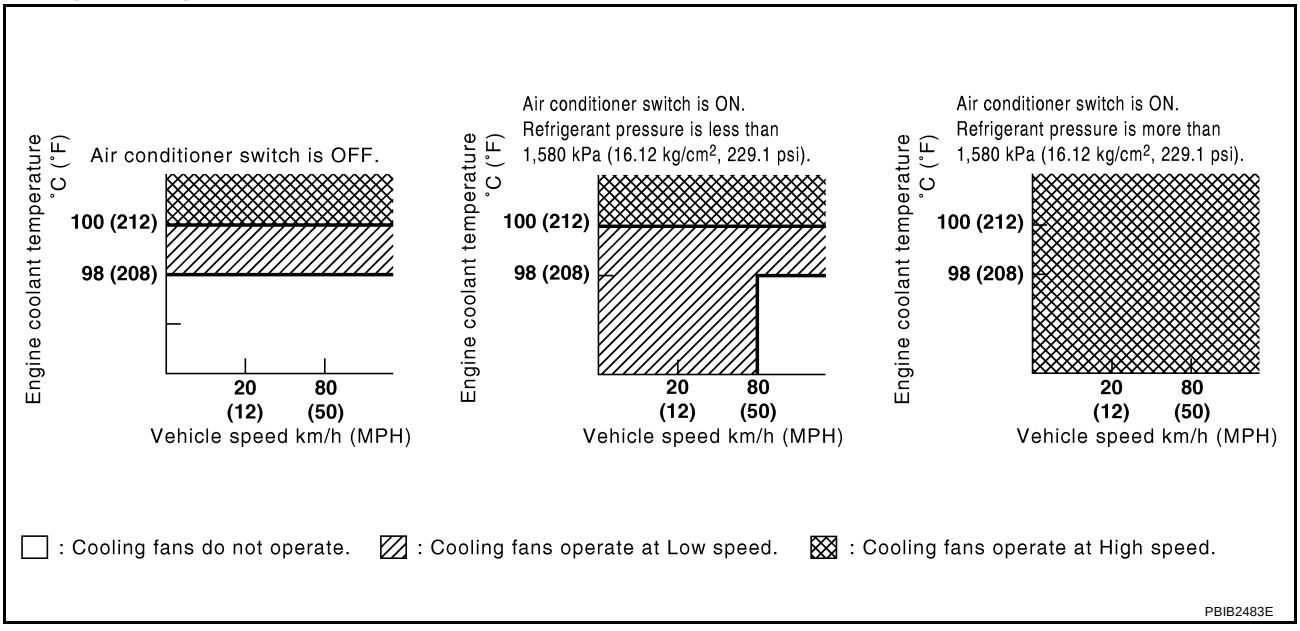
Cooling Fan Control

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	Cooling fan control	IPDM E/R (Cooling fan relays)
Battery	Battery voltage*1		
Wheel sensor	Vehicle speed*2		
Engine coolant temperature sensor	Engine coolant temperature		
Air conditioner switch	Air conditioner ON signal*2		
Refrigerant pressure sensor	Refrigerant pressure		

*1: The ECM determines the start signal status by the signals of engine speed and battery voltage.
*2: This signal is sent to ECM through CAN communication line.

The ECM controls the cooling fan corresponding to the vehicle speed, engine coolant temperature, refrigerant pressure, and air conditioner ON signal. The control system has 3-step control [HIGH/LOW/OFF].

Cooling Fan Operation



Cooling Fan Relay Operation

The ECM controls cooling fan relays in the IPDM E/R through CAN communication line.

Cooling fan speed	Cooling fan relay		
	1	2	3
Stop	OFF	OFF	OFF
Low	ON	OFF	OFF
High	ON	ON	ON

COMPONENT DESCRIPTION

Cooling Fan Motor

The cooling fan operates at each speed when the current flows in the cooling fan motor as follows.

Cooling fan speed	Cooling fan motor terminals	
	(+)	(–)
Low	1	4
	2	3
High	1 and 2	3 and 4

CONSULT-III Reference Value in Data Monitor Mode

NBS000DF

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
AIR COND SIG	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
COOLING FAN	● Engine: After warming up, idle the engine ● Air conditioner switch: OFF	Engine coolant temperature is 97°C (206°F) or less	OFF
		Engine coolant temperature is between 98°C (208°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	HI

On Board Diagnosis Logic

NBS000DG

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.
When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.
This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217 1217	Engine over temperature (Overheat)	● Cooling fan does not operate properly (Overheat). ● Cooling fan system does not operate properly (Overheat). ● Engine coolant was not added to the system using the proper filling method. ● Engine coolant is not within the specified range.	● Harness or connectors (The cooling fan circuit is open or shorted.) ● Cooling fan ● IPDM E/R (Cooling fan relays) ● Radiator hose ● Radiator ● Radiator cap ● Water pump ● Thermostat For more information, refer to EC-555, "Main 12 Causes of Overheating" .

CAUTION:
When a malfunction is indicated, be sure to replace the coolant. Refer to CO-10, "Changing Engine Coolant" . Also, replace the engine oil. Refer to LU-7, "Changing Engine Oil" .

1. **Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to MA-12, "ANTI-FREEZE COOLANT MIXTURE RATIO" .**
2. **After refilling coolant, run engine to ensure that no water-flow noise is emitted.**

Overall Function Check

NBS000DH

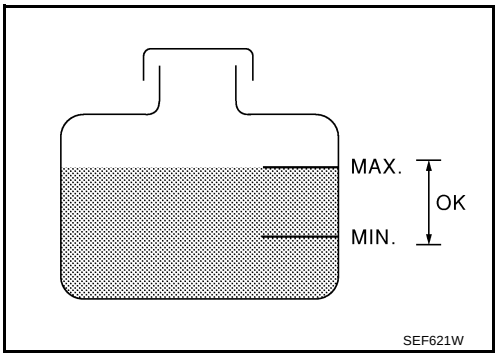
Use this procedure to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

WARNING:
Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.
Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

WITH CONSULT-III

1. Check the coolant level in the reservoir tank and radiator.

   NOTE:
   Allow engine to cool before checking coolant level.
   If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-549, "Diagnostic Procedure" .
2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-549, "Diagnostic Procedure" .
3. Turn ignition switch ON.
4. Perform “COOLING FAN” in “ACTIVE TEST” mode with CONSULT-III.
5. If the results are NG, go to EC-549, "Diagnostic Procedure" .

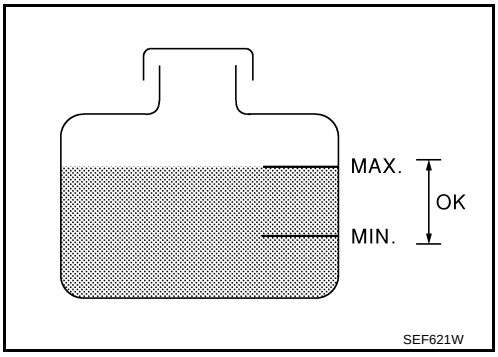


WITH GST

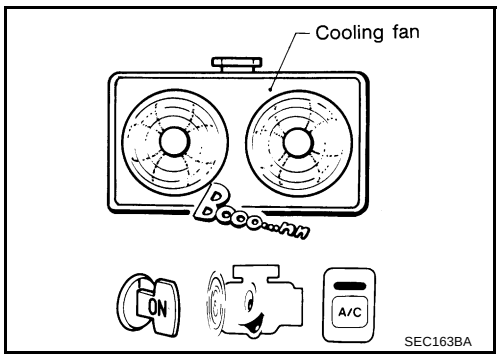
1. Check the coolant level in the reservoir tank and radiator.

   NOTE:
   Allow engine to cool before checking coolant level.
   If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-549, "Diagnostic Procedure" .
2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-549, "Diagnostic Procedure" .
3. Start engine.

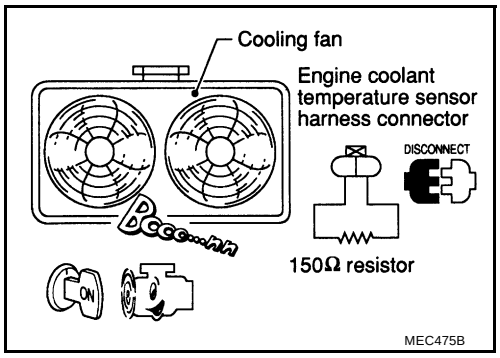
   CAUTION:
   Be careful not to overheat engine.
4. Turn air conditioner switch ON.
5. Turn blower fan switch ON.



6. Make sure that cooling fans operates at low speed.
   If NG, go to EC-549, "Diagnostic Procedure" .
   If OK, go to the following steps.
7. Turn ignition switch OFF.
8. Turn air conditioner switch and blower fan switch OFF.
9. Disconnect engine coolant temperature sensor harness connector.
10. Connect 150Ω resistor to engine coolant temperature sensor harness connector.

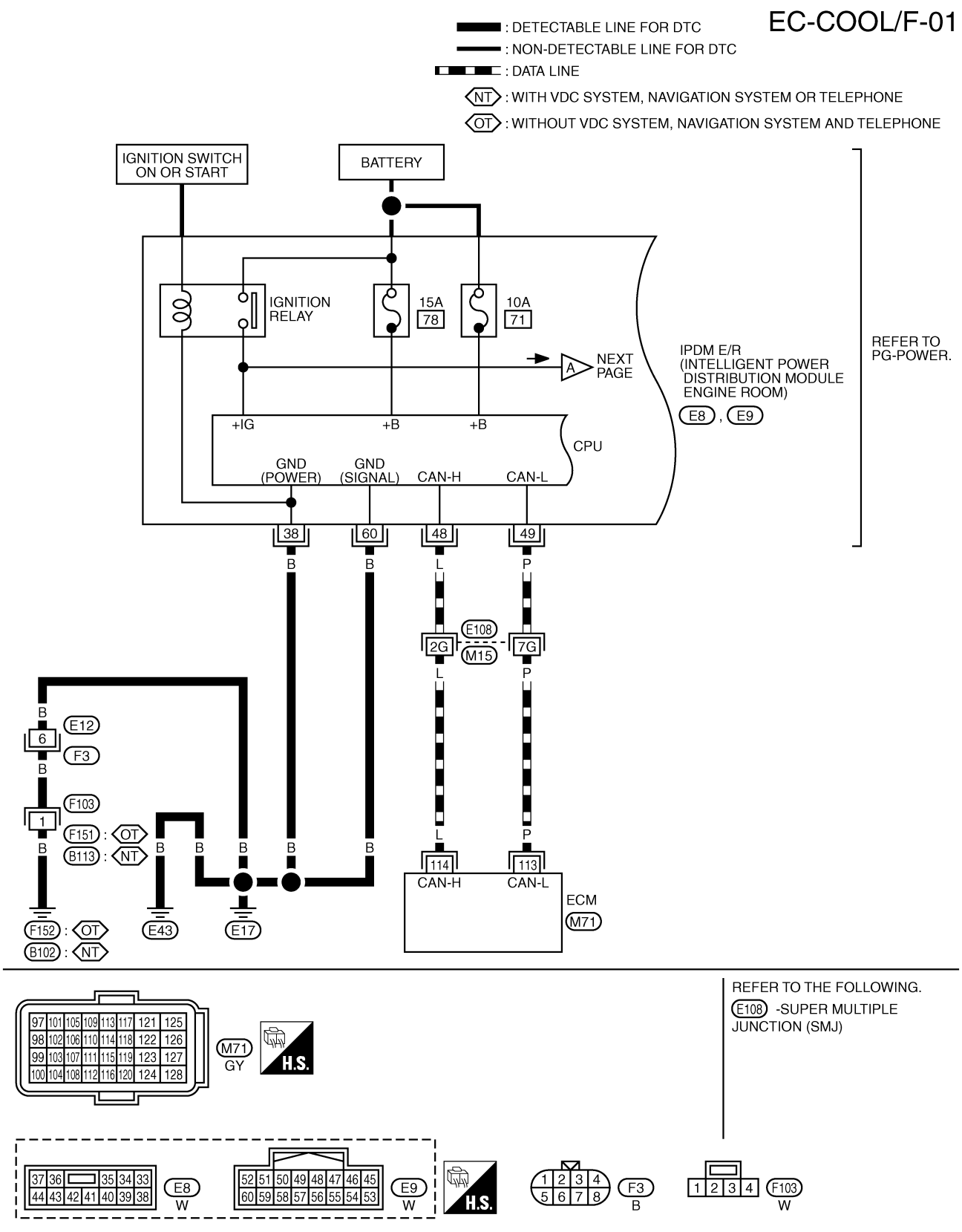


11. Restart engine and make sure that cooling fans operates at higher speed than low speed.
    CAUTION:
    Be careful not to overheat engine.
12. If NG, go to EC-549, "Diagnostic Procedure" .



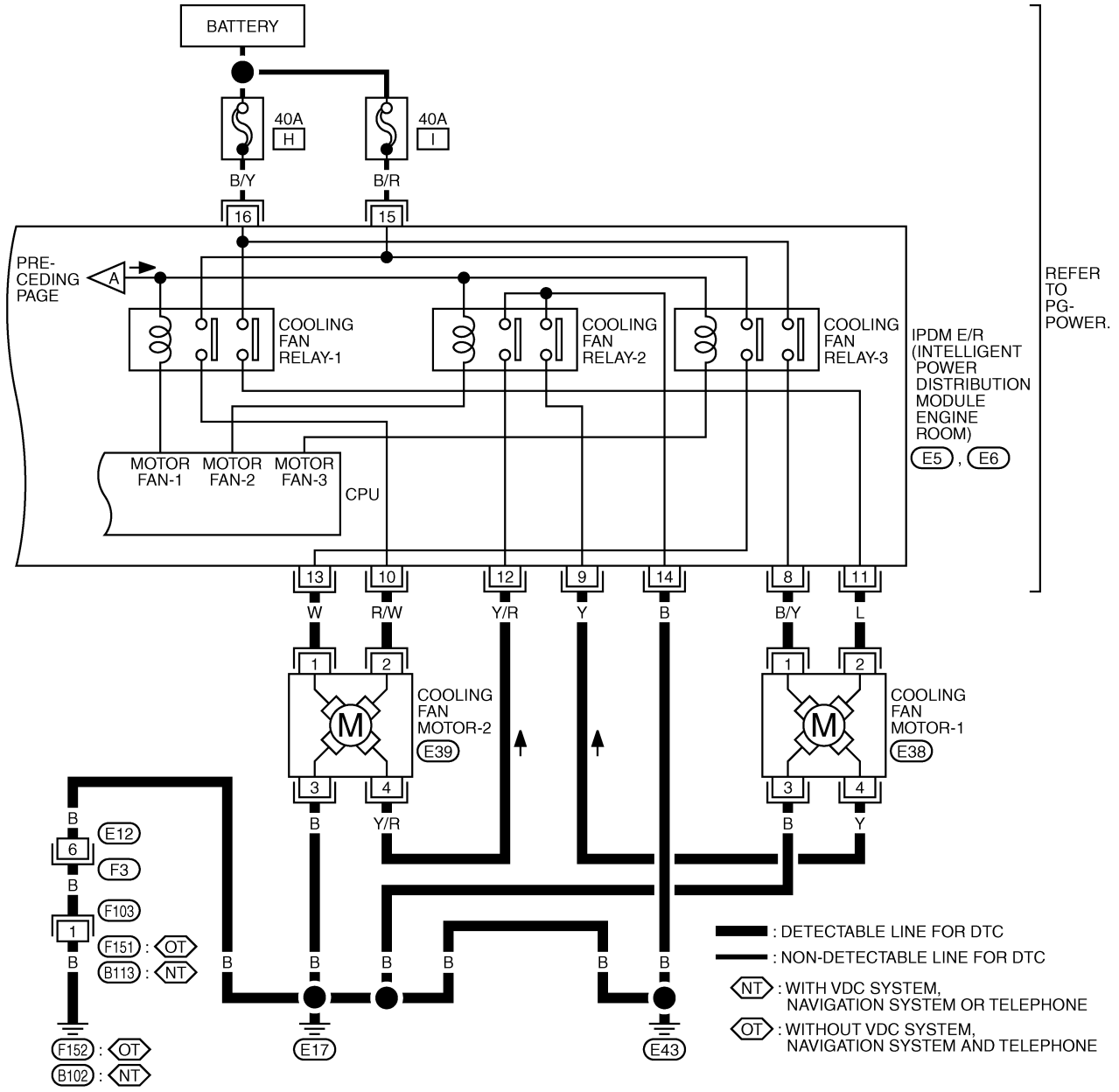
Wiring Diagram

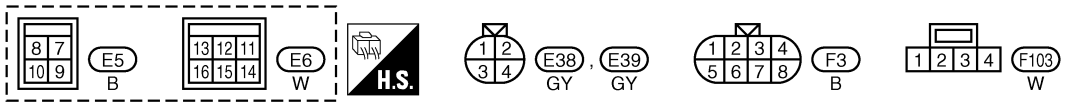
NBS000DI



TBWT1658E

EC-COOL/F-02





TBWT1659E

Diagnostic Procedure

NBS000DJ

1. INSPECTION START

Do you have CONSULT-III?

Yes or No

Yes >> GO TO 2.
No >> GO TO 4.

2. CHECK COOLING FAN LOW SPEED OPERATION

With CONSULT-III

1. Start engine and let it idle.
2. Select “COOLING FAN” in “ACTIVE TEST” mode with CONSULT-III and touch “LOW” on the CONSULT-III screen.
3. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

OK >> GO TO 3.
NG >> Check cooling fan low speed control circuit. (Go to EC-551, "PROCEDURE A" .)

3. CHECK COOLING FAN HIGH SPEED OPERATION

With CONSULT-III

1. Touch “HIGH” on the CONSULT-III screen.
2. Make sure that cooling fans-1 and -2 operate at higher speed than low speed.

OK or NG

OK >> GO TO 6.
NG >> Check cooling fan high speed control circuit. (Go to EC-554, "PROCEDURE B" .)

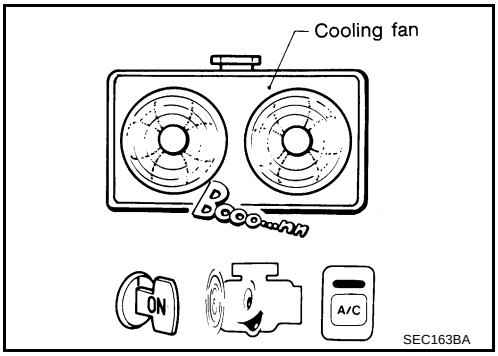
4. CHECK COOLING FAN LOW SPEED OPERATION

Without CONSULT-III

1. Start engine and let it idle.
2. Turn air conditioner switch ON.
3. Turn blower fan switch ON.
4. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

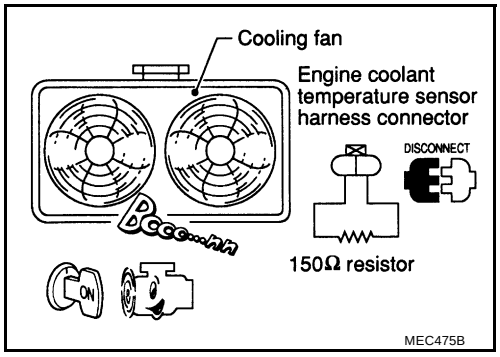
OK >> GO TO 5.
NG >> Check cooling fan low speed control circuit. (Go to EC-551, "PROCEDURE A" .)



5. CHECK COOLING FAN HIGH SPEED OPERATION

Without CONSULT-III

1. Turn ignition switch OFF.
2. Turn air conditioner switch and blower fan switch OFF.
3. Disconnect engine coolant temperature sensor harness connector.
4. Connect 150Ω resistor to engine coolant temperature sensor harness connector.
5. Restart engine and make sure that cooling fans-1 and -2 operate at higher speed than low speed.



OK or NG

OK >> GO TO 6.
NG >> Check cooling fan high speed control circuit. (Go to EC-554, "PROCEDURE B" .)

6. CHECK COOLING SYSTEM FOR LEAK

Refer to CO-10, "LEAK CHECK" .

OK or NG

OK >> GO TO 7.
NG >> Check the following for leak.

- Hose
- Radiator
- Water pump

7. CHECK RADIATOR CAP

Refer to CO-15, "Checking Radiator Cap" .

OK or NG

OK >> GO TO 8.
NG >> Replace radiator cap.

8. CHECK THERMOSTAT

Refer to CO-26, "WATER INLET AND THERMOSTAT ASSEMBLY" .

OK or NG

OK >> GO TO 9.
NG >> Replace thermostat

9. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-228, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace engine coolant temperature sensor.

10. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, go to EC-555, "Main 12 Causes of Overheating" .

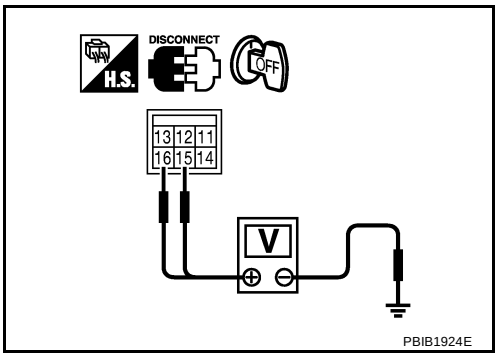
>> **INSPECTION END**

PROCEDURE A

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector E6.
3. Check voltage between IPDM E/R terminals 15, 16 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

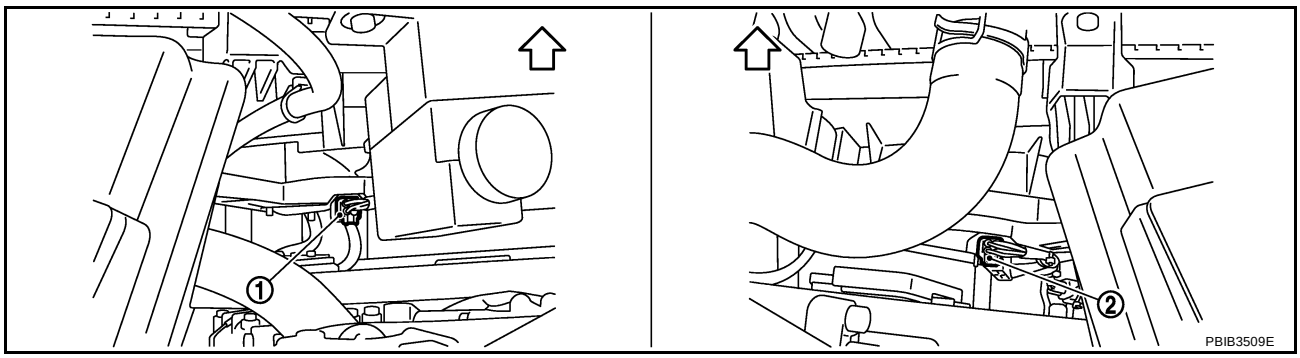
Check the following.

- 40A fusible links
- Harness for open or short between IPDM E/R and battery

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COOLING FAN MOTORS CIRCUIT

1. Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.



1. Cooling fan motor-1
2. Cooling fan motor-2

⇦: Vehicle front

2. Disconnect all IPDM E/R harness connectors.
3. Check harness continuity between the following;
   cooling fan motor-1 terminal 2 and IPDM E/R terminal 11,
   cooling fan motor-1 terminal 3 and ground,
   IPDM E/R terminal 38, 60 and ground,
   Refer to wiring diagram.

   Continuity should exist.

4. Check harness continuity between the following;
   cooling fan motor-2 terminal 2 and IPDM E/R terminal 10,
   cooling fan motor-2 terminal 3 and ground.
   Refer to wiring diagram.

   Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector E12, F3
- Harness connectors F103, B113 (Models with VDC system, navigation system or telephone) or F151 (Models wiithout VDC system, navigation system and telephone)
- Harness for open or short between cooling fan motors-1, 2 and IPDM E/R
- Harness for open or short between cooling fan motors-1, 2 and ground
- Harness for open or short between IPDM E/R and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK COOLING FAN MOTORS

Refer to EC-556, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning cooling fan motors.

6. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

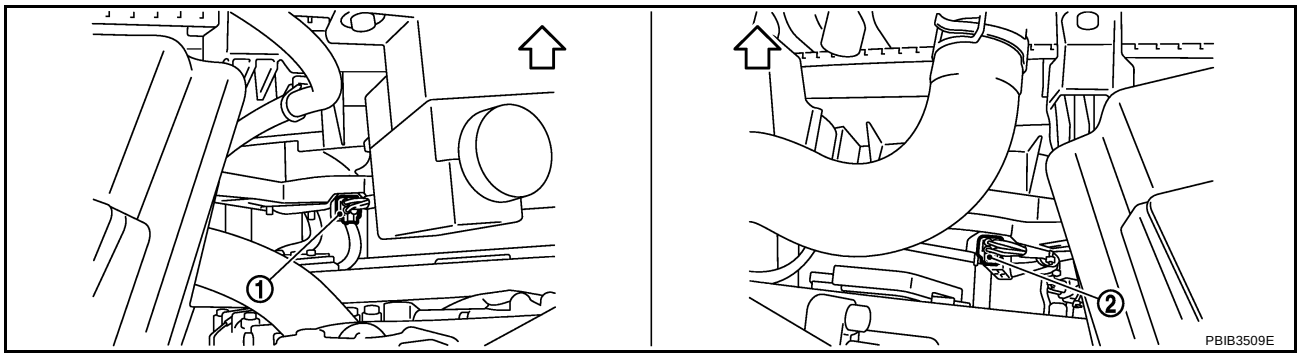
OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair or replace harness or connector.

PROCEDURE B

1. CHECK COOLING FAN MOTORS CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.



1. Cooling fan motor-1
2. Cooling fan motor-2

⇦: Vehicle front

3. Disconnect all IPDM E/R harness connectors.
4. Check harness continuity between the following;
   cooling fan motor-1 terminal 1 and IPDM E/R terminal 8,
   cooling fan motor-1 terminal 4 and IPDM E/R terminal 9,
   IPDM E/R terminal 14 and ground,
   Refer to wiring diagram.

   Continuity should exist.

5. Also check harness connector for short to ground or short to power.
6. Check harness continuity between the following;
   cooling fan motor-2 terminal 1 and IPDM E/R terminal 13,
   cooling fan motor-2 terminal 4 and IPDM E/R terminal 12,
   Refer to wiring diagram.

   Continuity should exist.

7. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness for open or short between cooling fan motors-1, 2 and IPDM E/R
- Harness for open or short between IPDM E/R and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COOLING FAN MOTORS

Refer to EC-556, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace malfunctioning cooling fan motors.

4. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair or replace harness or connectors.

Main 12 Causes of Overheating

NBS000DK

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	● Blocked radiator ● Blocked condenser ● Blocked radiator grille ● Blocked bumper	● Visual	No blocking	—
	2	● Coolant mixture	● Coolant tester	50 - 50% coolant mixture	MA-12
	3	● Coolant level	● Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-10
	4	● Radiator cap	● Pressure tester	88 - 127 kPa (0.90 - 1.30 kg/cm^2 , 12.8 - 18.4 psi) (Limit)	CO-15
ON*2	5	● Coolant leaks	● Visual	No leaks	CO-10
ON*2	6	● Thermostat	● Touch the upper and lower radiator hoses	Both hoses should be hot	CO-26
ON*1	7	● Cooling fan	● CONSULT-III	Operating	See trouble diagnosis for DTC P1217 (EC-543).
OFF	8	● Combustion gas leak	● Color checker chemical tester 4 Gas analyzer	Negative	—
ON*3	9	● Coolant temperature gauge	● Visual	Gauge less than 3/4 when driving	—
		● Coolant overflow to reservoir tank	● Visual	No overflow during driving and idling	CO-10
OFF*4	10	● Coolant return from reservoir tank to radiator	● Visual	Should be initial level in reservoir tank	CO-10
OFF	11	● Cylinder head	● Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	EM-89
	12	● Cylinder block and pistons	● Visual	No scuffing on cylinder walls or piston	EM-107

*1: Turn the ignition switch ON.
*2: Engine running at 3,000 rpm for 10 minutes.
*3: Drive at 90 km/h (55 MPH) for 30 minutes and then let idle for 10 minutes.
*4: After 60 minutes of cool down time.
For more information, refer to CO-6, "OVERHEATING CAUSE ANALYSIS" .

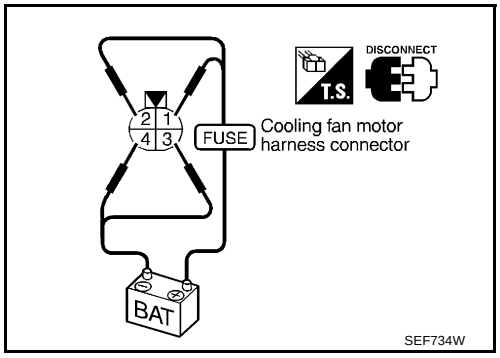
Component Inspection

NBS000DL

COOLING FAN MOTORS-1 AND -2

1. Disconnect cooling fan motor harness connectors.
2. Supply cooling fan motor terminals with battery voltage and check operation.

	Speed	terminals	
		(+)	(–)
Cooling fan motor	Low	1	4
		2	3
	High	1 and 2	3 and 4



Cooling fan motor should operate.

If NG, replace cooling fan motors.

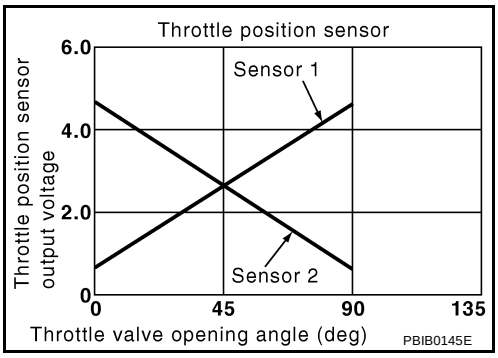
DTC P1225, P1234 TP SENSOR

PFP:16119

Component Description

NBS000DM

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



On Board Diagnosis Logic

NBS000DN

The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1225 1225	Closed throttle position learning performance	Closed throttle position learning value is excessively low.	● Electric throttle control actuator (TP sensor 1 and 2)

DTC Confirmation Procedure

NBS000DO

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-558, "Diagnostic Procedure" .

WITH GST

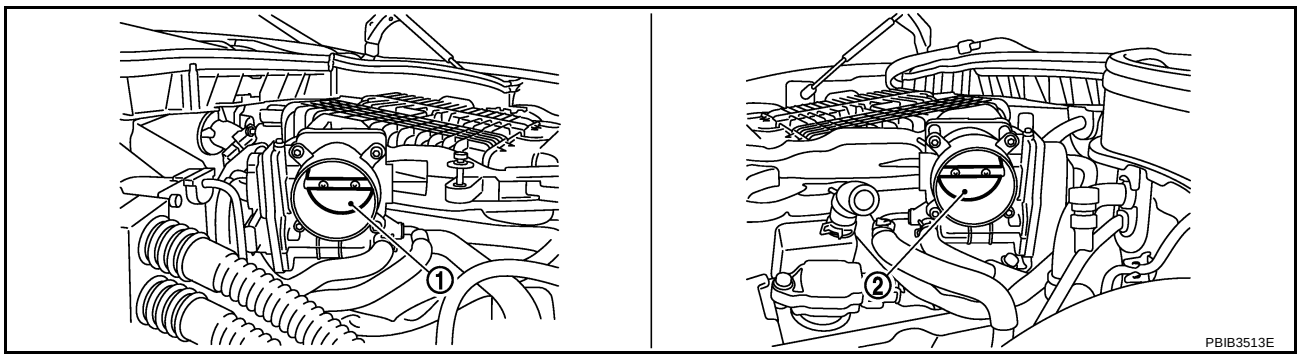
Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000DP

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.
2. Remove the intake air duct.
3. Check if foreign matter is caught between the throttle valve and the housing.



1. Throttle valve (bank 1)
2. Throttle valve (bank 2)

OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

Removal and Installation

NBS000DQ

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

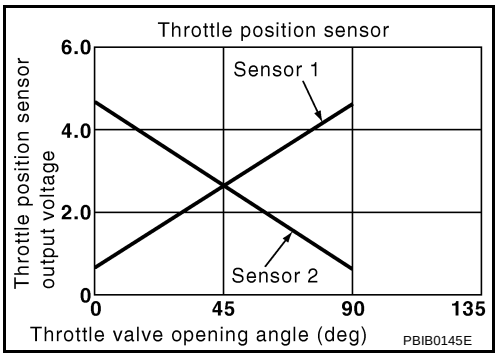
DTC P1226, P1235 TP SENSOR

PFP:16119

Component Description

NBS000DR

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



On Board Diagnosis Logic

NBS000DS

The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1226 1226	Closed throttle position learning performance	Closed throttle position learning is not performed successfully, repeatedly.	● Electric throttle control actuator (TP sensor 1 and 2)

DTC Confirmation Procedure

NBS000DT

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Repeat steps 3 and 4 for 32 times.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-560, "Diagnostic Procedure" .

WITH GST

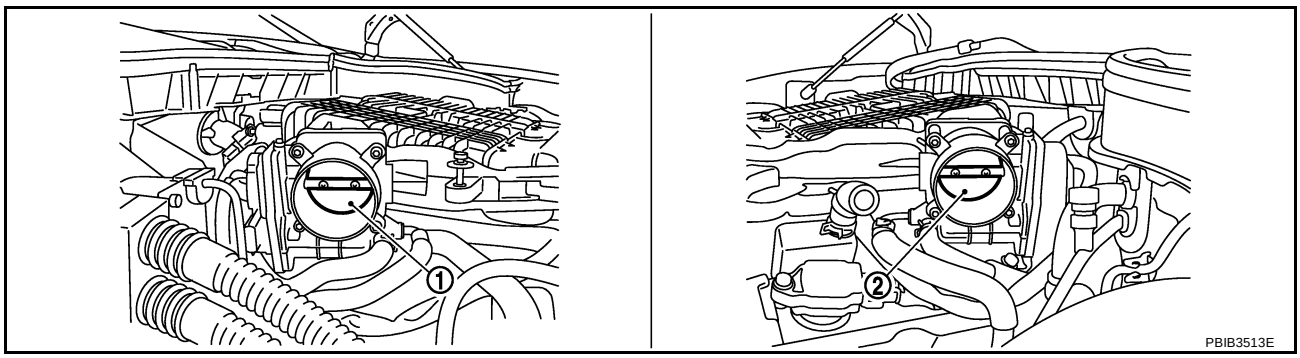
Follow the procedure “With CONSULT-III” above.

Diagnostic Procedure

NBS000DU

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.
2. Remove the intake air duct.
3. Check if foreign matter is caught between the throttle valve and the housing.



1. Throttle valve (bank 1)
2. Throttle valve (bank 2)

OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

Removal and Installation

NBS000DV

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P1233, P2101 ELECTRIC THROTTLE CONTROL FUNCTION

PFP:16119

Description

NBS000C3

NOTE:
If DTC P1233 or P2101 is displayed with DTC P1238, P1290, P2100, P2119 first perform the trouble diagnosis for DTC P1238, P2119 or P1290, P2100. Refer to EC-580, "DTC P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR" or EC-592, "DTC P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY" .

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.
The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The current opening angle of the throttle valve is detected by the throttle position sensor and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

NBS000C4

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1233 1233 (Bank 2) P2101 2101 (Bank 1)	Electric throttle control performance	Electric throttle control function does not operate properly.	● Harness or connectors (The throttle control motor circuit is open or shorted) ● Electric throttle control actuator

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

NBS000C5

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V when engine is running.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.
4. If DTC is detected, go to EC-566, "Diagnostic Procedure" .

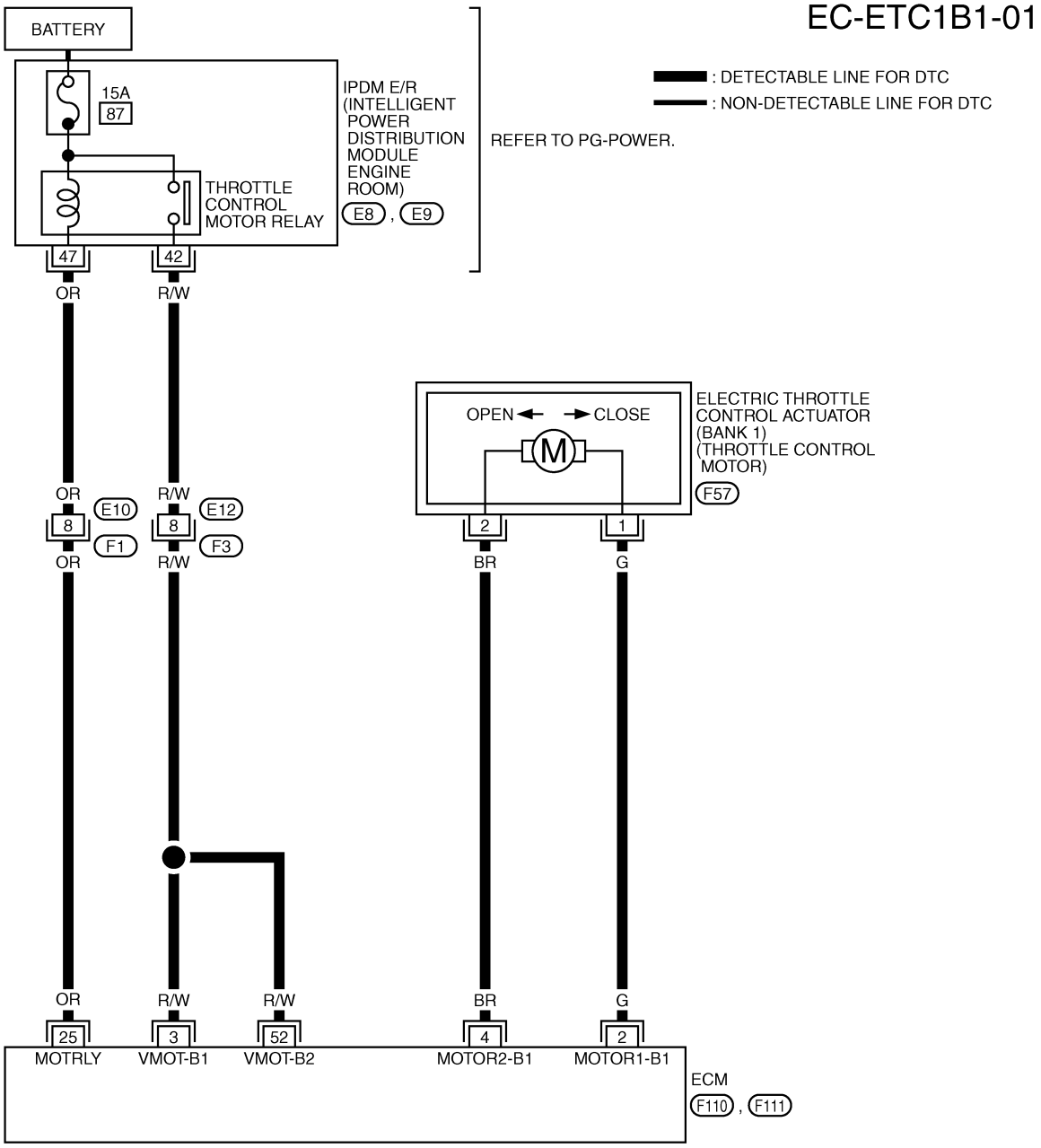
WITH GST

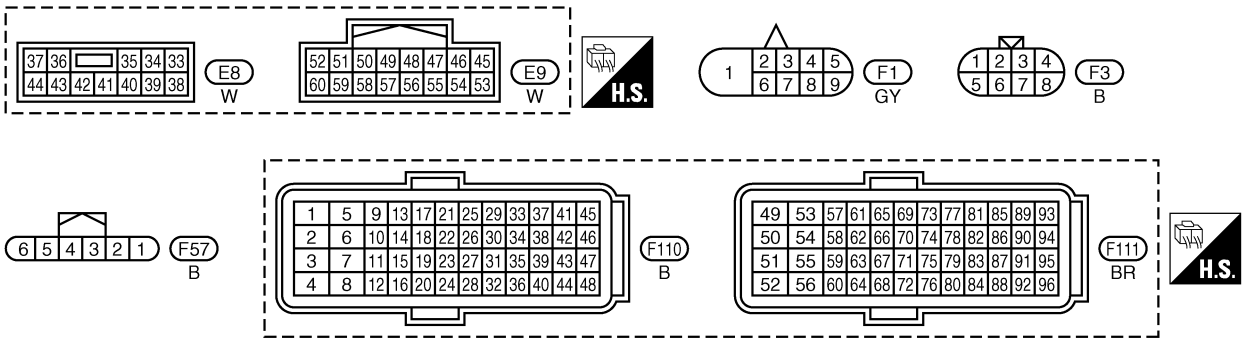
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000C6

BANK 1

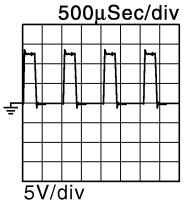
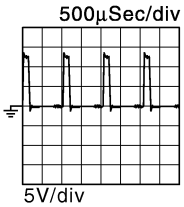
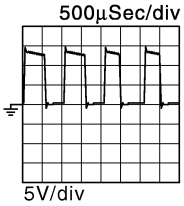




TBWT1666E

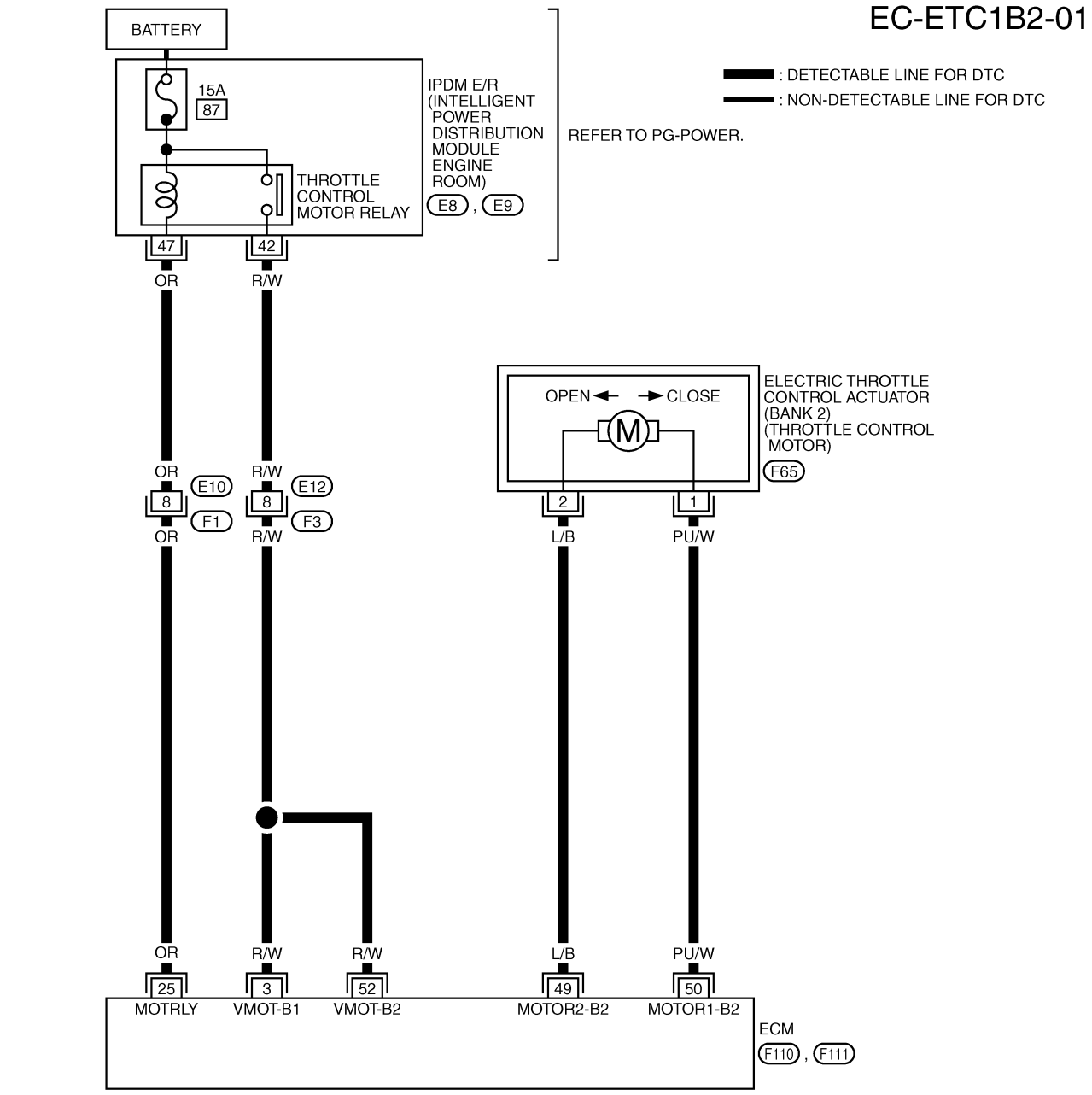
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

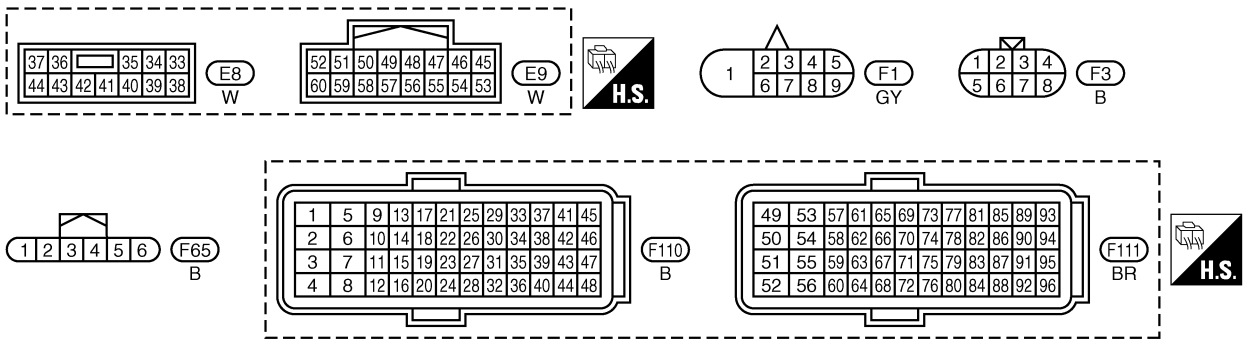
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	G	Throttle control motor (Open) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

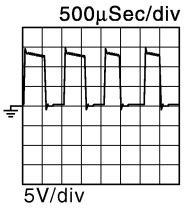
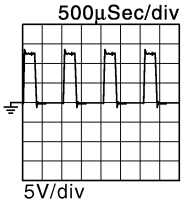
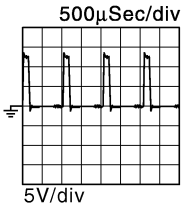




TBWT1667E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
49	L/B	Throttle control motor (Close) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
50	PU/W	Throttle control motor (Open) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

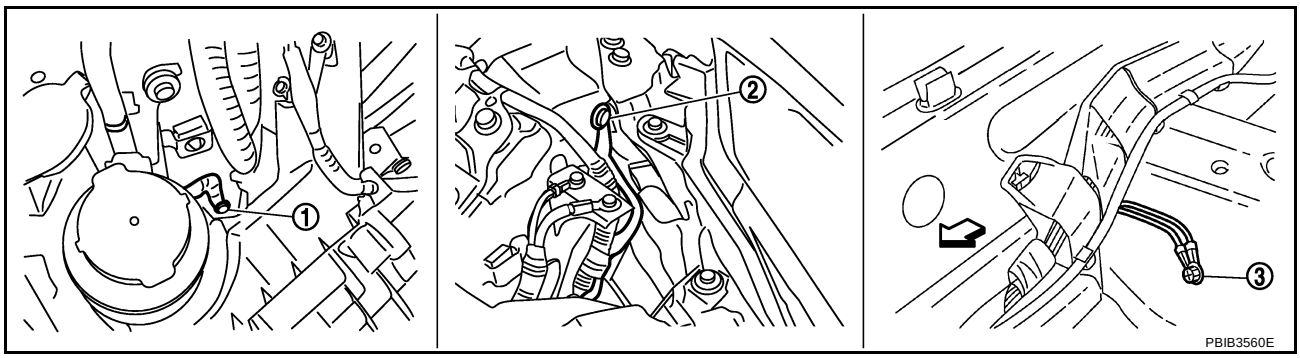
Diagnostic Procedure

NBS000C7

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

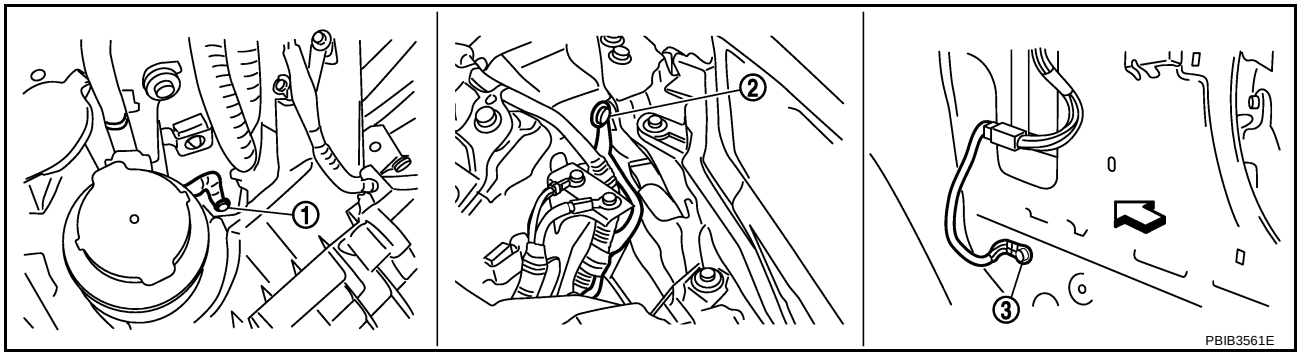


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

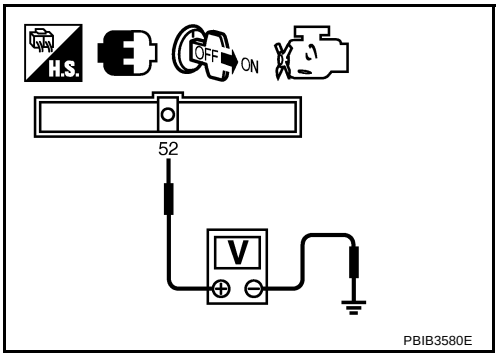
OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

Check voltage between ECM terminal 3 (bank 1), 52 (bank 2) and ground under the following conditions with CONSULT-III or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



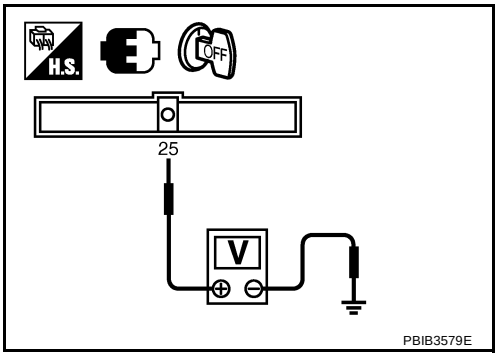
OK or NG

OK >> GO TO 12.
NG >> GO TO 3.

3. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Check voltage between ECM terminal 25 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 7.
NG >> GO TO 4.

4. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E9.
3. Check continuity between ECM terminal 25 and IPDM E/R terminal 47. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK FUSE

1. Disconnect 15A fuse.
2. Check 15A fuse for blown.

OK or NG

OK >> GO TO 9.
NG >> Replace 15A fuse.

7. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E8.
3. Check continuity between ECM terminal 3 (bank 1), 52 (bank 2) and IPDM E/R terminal 42. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

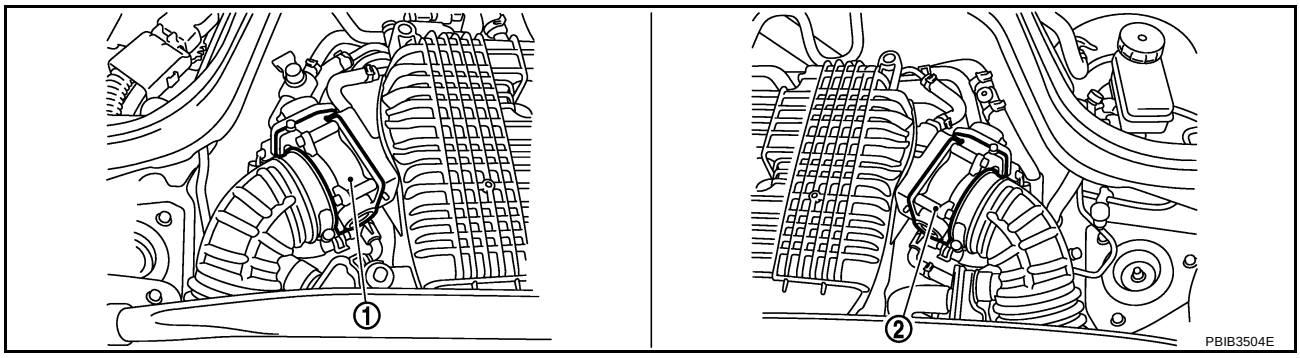
OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair or replace harness or connectors.

10. CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control acutator (bank 1)
2. Electric throttle control acutator (bank 2)

3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

Bank	Electric throttle control actuator terminal	ECM terminal	Continuity
1	1	2	Should exist
		4	Should not exist
	2	2	Should not exist
		4	Should exist
2	1	49	Should not exist
		50	Should exist
	2	49	Should exist
		50	Should not exist

5. Also check harness for short to ground and short to power.

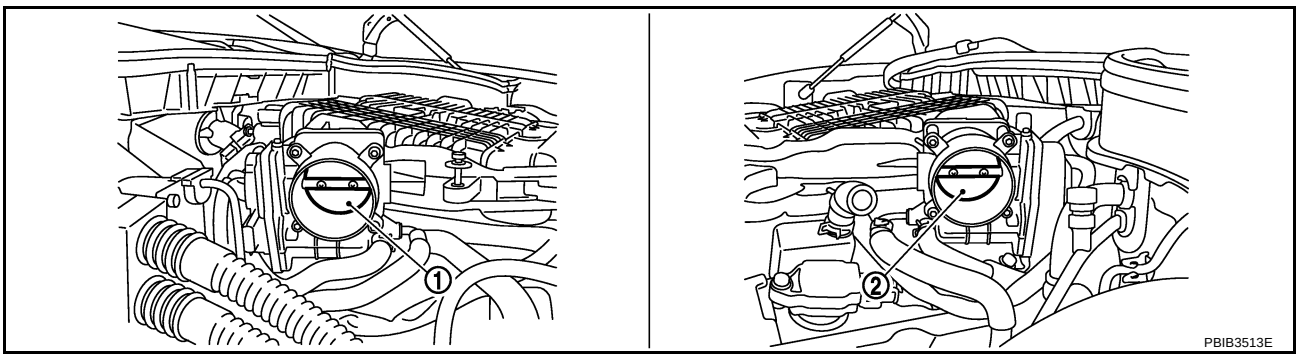
OK or NG

OK >> GO TO 11.

NG >> Repair or replace.

11. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct.
2. Check if foreign matter is caught between the throttle valve and the housing.



1. Throttle valve (bank 1)
2. Throttle valve (bank 2)

OK or NG

OK >> GO TO 12.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

12. CHECK THROTTLE CONTROL MOTOR

Refer to EC-570, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> GO TO 14.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 14.
NG >> Repair or replace harness or connectors.

14. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

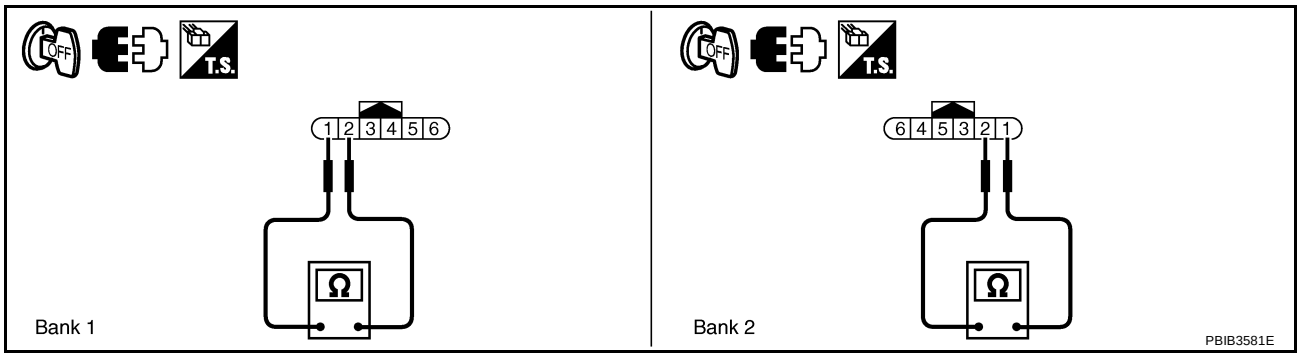
>> **INSPECTION END**

Component Inspection

NBS000C8

THROTTLE CONTROL MOTOR

1. Disconnect electric throttle control actuator harness connector.
2. Check resistance between terminals 1 and 2.



Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

3. If NG, replace electric throttle control actuator and go to next step.
4. Perform EC-77, "Throttle Valve Closed Position Learning" .
5. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000C9

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P1236, P2118 THROTTLE CONTROL MOTOR

PFP:16119

Component Description

NBS000CG

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The current opening angle of the throttle valve is detected by the throttle position sensor and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

NBS000CH

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1236 1236 (Bank 2) P2118 2118 (Bank 1)	Throttle control motor circuit short	ECM detects short in both circuits between ECM and throttle control motor.	● Harness or connectors (The throttle control motor circuit is shorted.) ● Electric throttle control actuator (Throttle control motor)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

NBS000CI

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.
4. If DTC is detected, go to EC-576, "Diagnostic Procedure" .

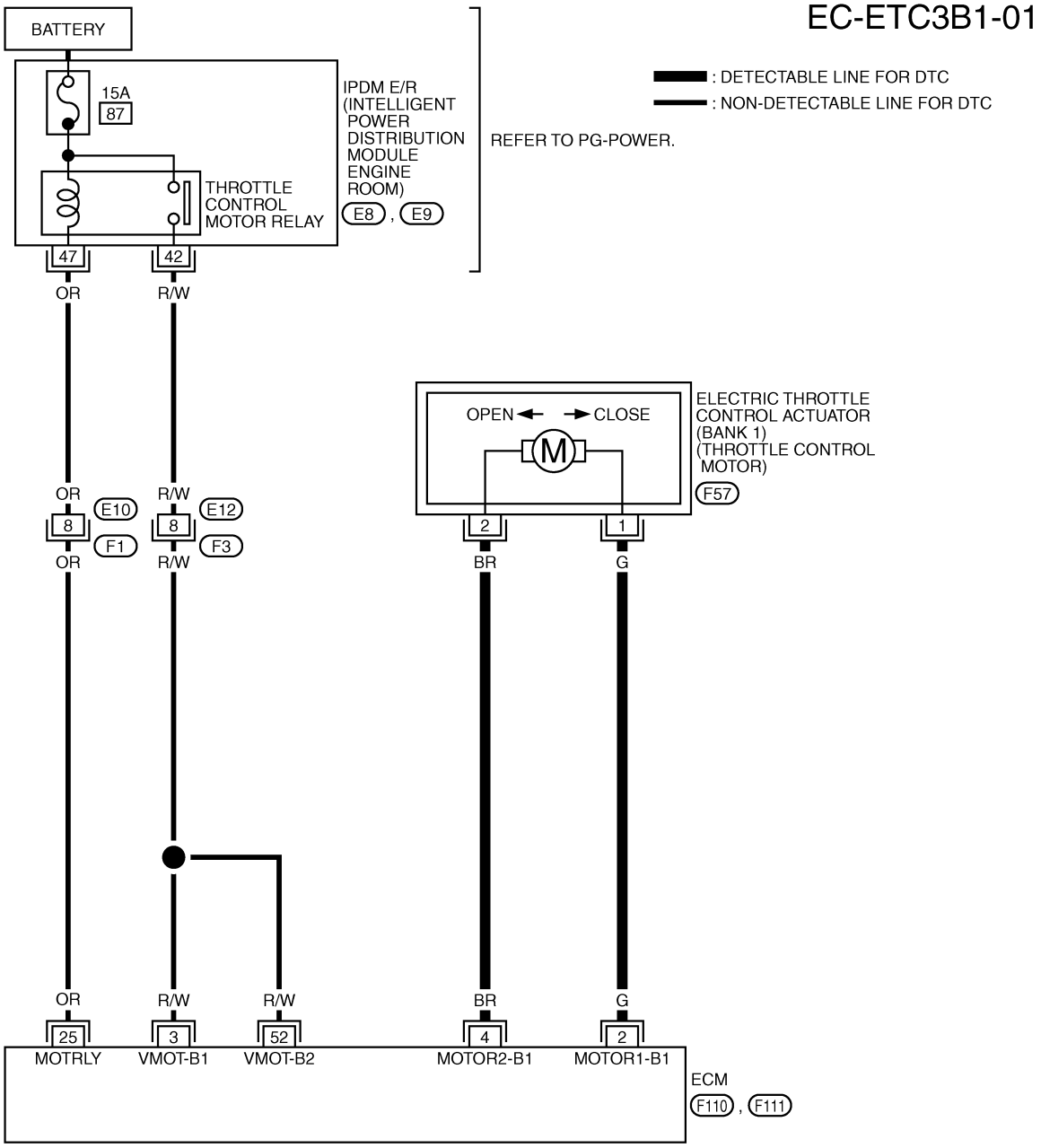
WITH GST

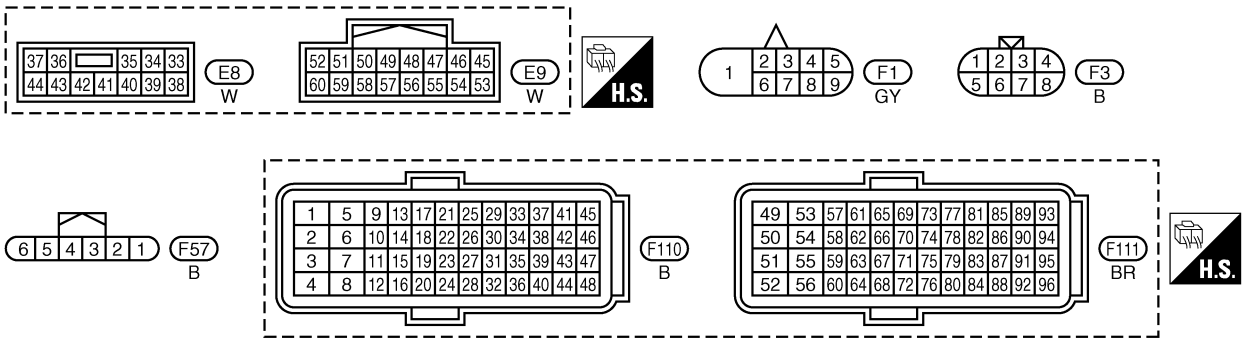
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000CJ

BANK 1

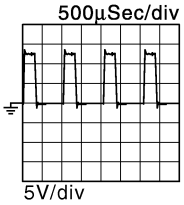
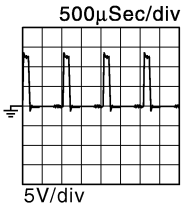
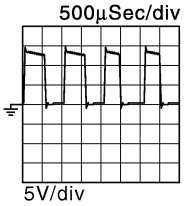




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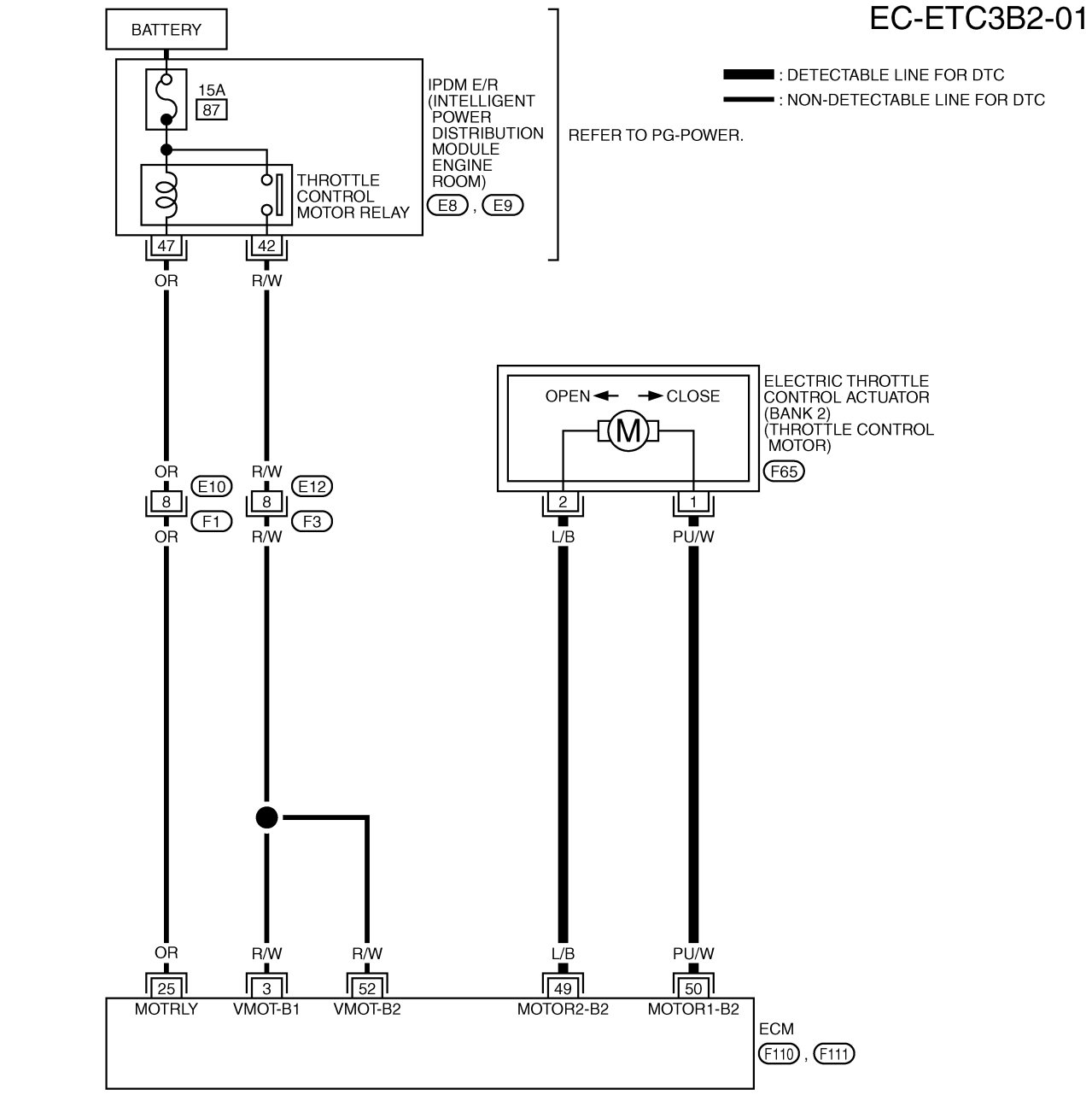
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

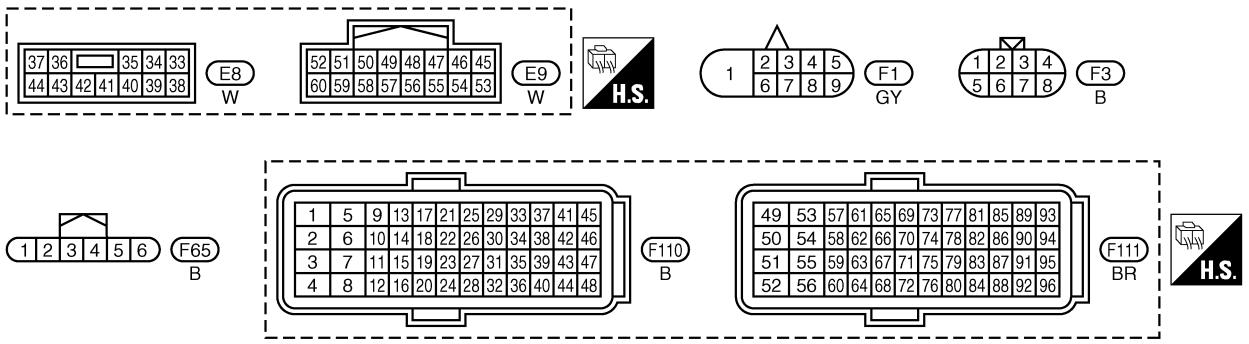
CAUTION:
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TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	G	Throttle control motor (Open) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

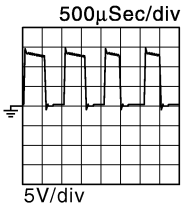
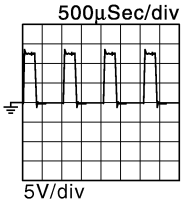
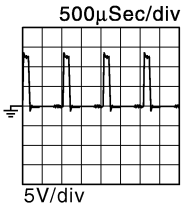




TBWT1669E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
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TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
49	L/B	Throttle control motor (Close) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
50	PU/W	Throttle control motor (Open) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

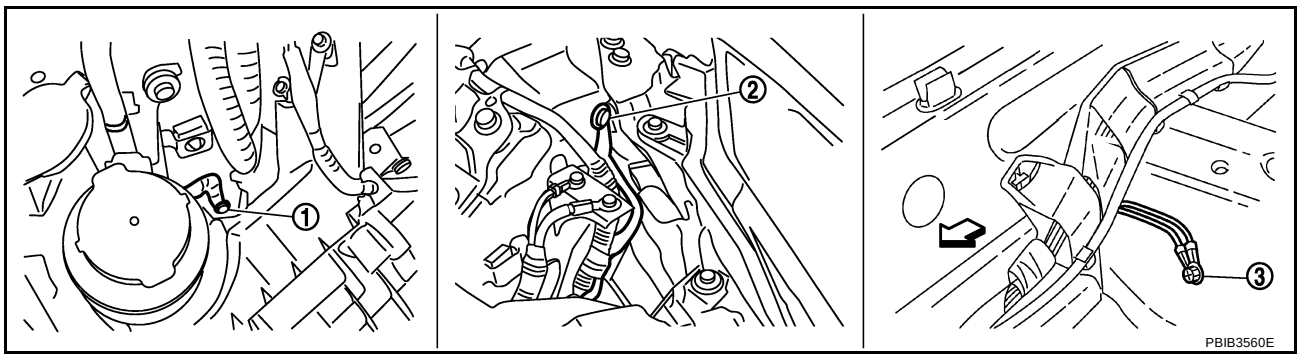
Diagnostic Procedure

NBS000CK

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

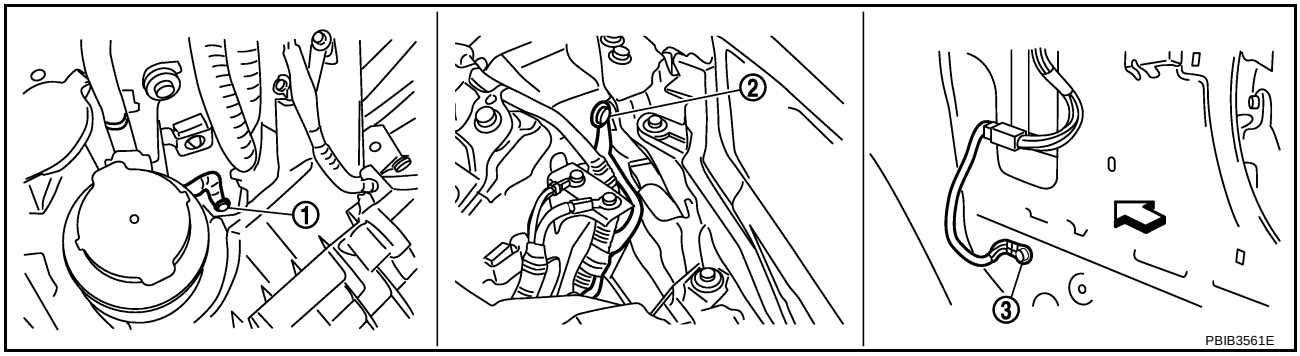


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

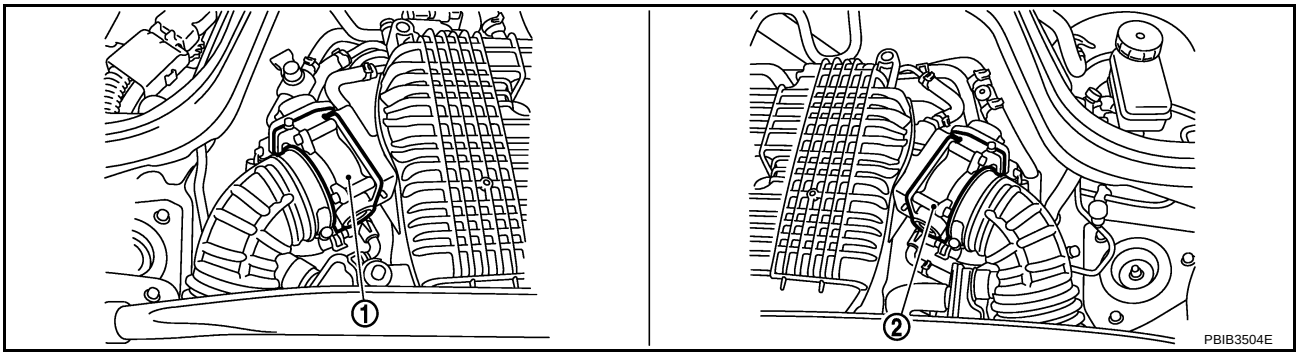
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN OR SHORT

1. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control acutator (bank 1)
2. Electric throttle control acutator (bank 2)

2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals. Refer to Wiring Diagram.

Bank	Electric throttle control actuator terminal	ECM terminal	Continuity
1	1	2	Should exist
		4	Should not exist
	2	2	Should not exist
		4	Should exist
2	1	49	Should not exist
		50	Should exist
	2	49	Should exist
		50	Should not exist

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK THROTTLE CONTROL MOTOR

Refer to EC-579, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 5.

4. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness or connectors.

5. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

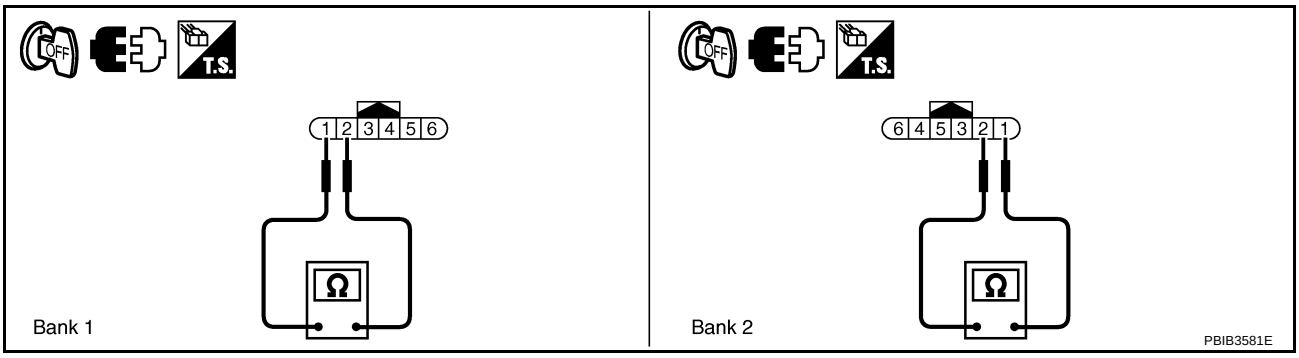
>> **INSPECTION END**

Component Inspection

NBS006V8

THROTTLE CONTROL MOTOR

1. Disconnect electric throttle control actuator harness connector.
2. Check resistance between terminals 1 and 2.



Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

3. If NG, replace electric throttle control actuator and go to next step.
4. Perform EC-77, "Throttle Valve Closed Position Learning" .
5. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS006V9

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

PFP:16119

Component Description

NBS000BZ

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.
The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The throttle position sensor detects the throttle valve position, and the opening and closing speed of the throttle valve and feeds the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

NBS000C0

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P1238 1238 (Bank 2)	Electric throttle control actuator	A)	Electric throttle control actuator does not function properly due to the return spring malfunction.	● Electric throttle control actuator
P2119 2119 (Bank 1)		B)	Throttle valve opening angle in fail-safe mode is not in specified range.	
		C)	ECM detects the throttle valve is stuck open.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Malfunction A	ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.
Malfunction B	ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.
Malfunction C	While the vehicle is driving, it slows down gradually by fuel cut. After the vehicle stops, the engine stalls. The engine can restart in N or P (A/T), Neutral (M/T) position, and engine speed will not exceed 1,000 rpm or more.

DTC Confirmation Procedure

NBS000C1

NOTE:

- **Perform PROCEDURE FOR MALFUNCTION A AND B first. If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION C.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A AND B

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Set shift lever to D position (A/T) or 1st position (M/T), and wait at least 3 seconds.
3. Set shift lever to P position (A/T) or Neutral position (M/T).
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Turn ignition switch ON and wait at least 1 second.
6. Set shift lever to D position (A/T) or 1st position (M/T), and wait at least 3 seconds.
7. Set shift lever to P position (A/T) or Neutral position (M/T).
8. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
9. Check DTC.
10. If DTC is detected, go to EC-581, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION C

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Set shift lever to D position (A/T) or 1st position (M/T) and wait at least 3 seconds.
3. Set shift lever to N, P position (A/T) or Neutral (M/T) position.
4. Start engine and let it idle for 3 seconds.
5. Check DTC.
6. If DTC is detected, go to EC-581, "Diagnostic Procedure" .

With GST

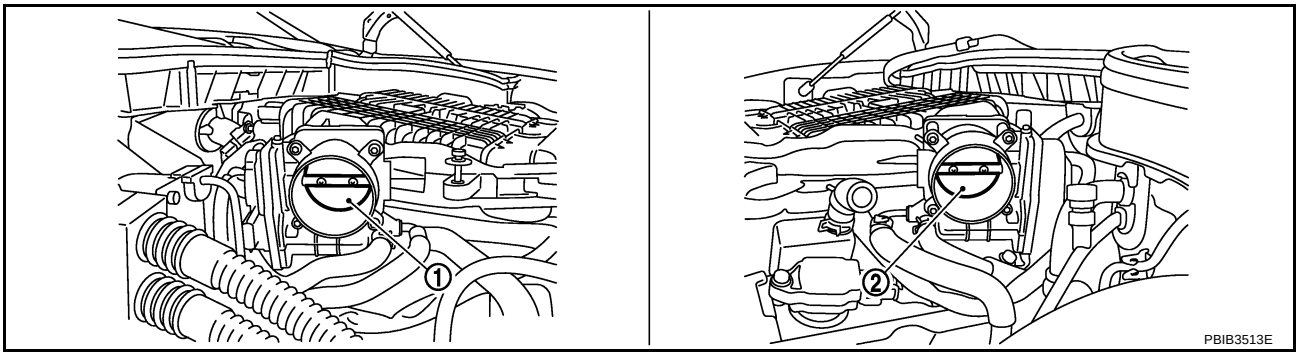
Follow the procedure “With CONSULT-III” above.

Diagnostic Procedure

NBS000C2

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct.
2. Check if foreign matter is caught between the throttle valve and the housing.



1. Throttle valve (bank 1)
2. Throttle valve (bank 2)

OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

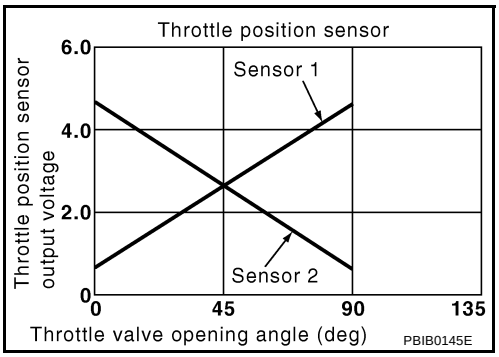
DTC P1239, P2135 TP SENSOR

PFP:16119

Component Description

NBS000H5

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-III Reference Value in Data Monitor Mode

NBS000H6

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
TP SEN 1-B1 TP SEN 2-B1*1 TP SEN 1-B2 TP SEN 2-B2*1	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T) or 1st (M/T) position	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

NBS000H7

This self-diagnosis has the one trip detection logic.

NOTE:
If DTC P1239 or P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2135 2135	Throttle position sensor circuit range/perfor-mance	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1 and TP sensor 2.	● Harness or connector (TP sensor 1 and 2 circuit is open or shorted.) ● Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS000H8

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

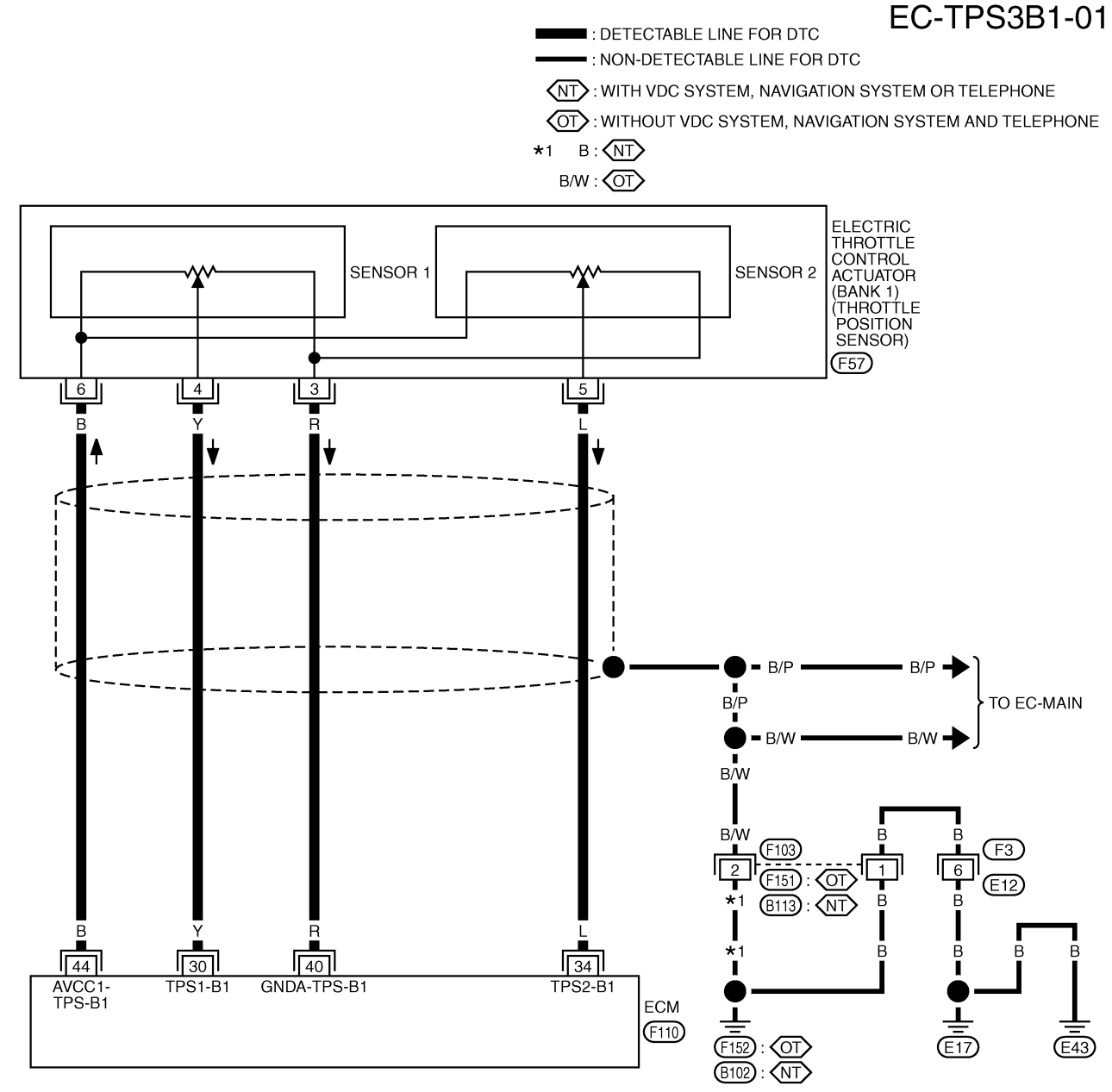
1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-588, "Diagnostic Procedure" .

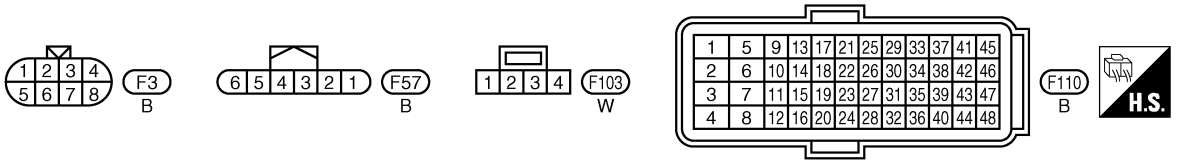
WITH GST

Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS000H9





TBWT1672E

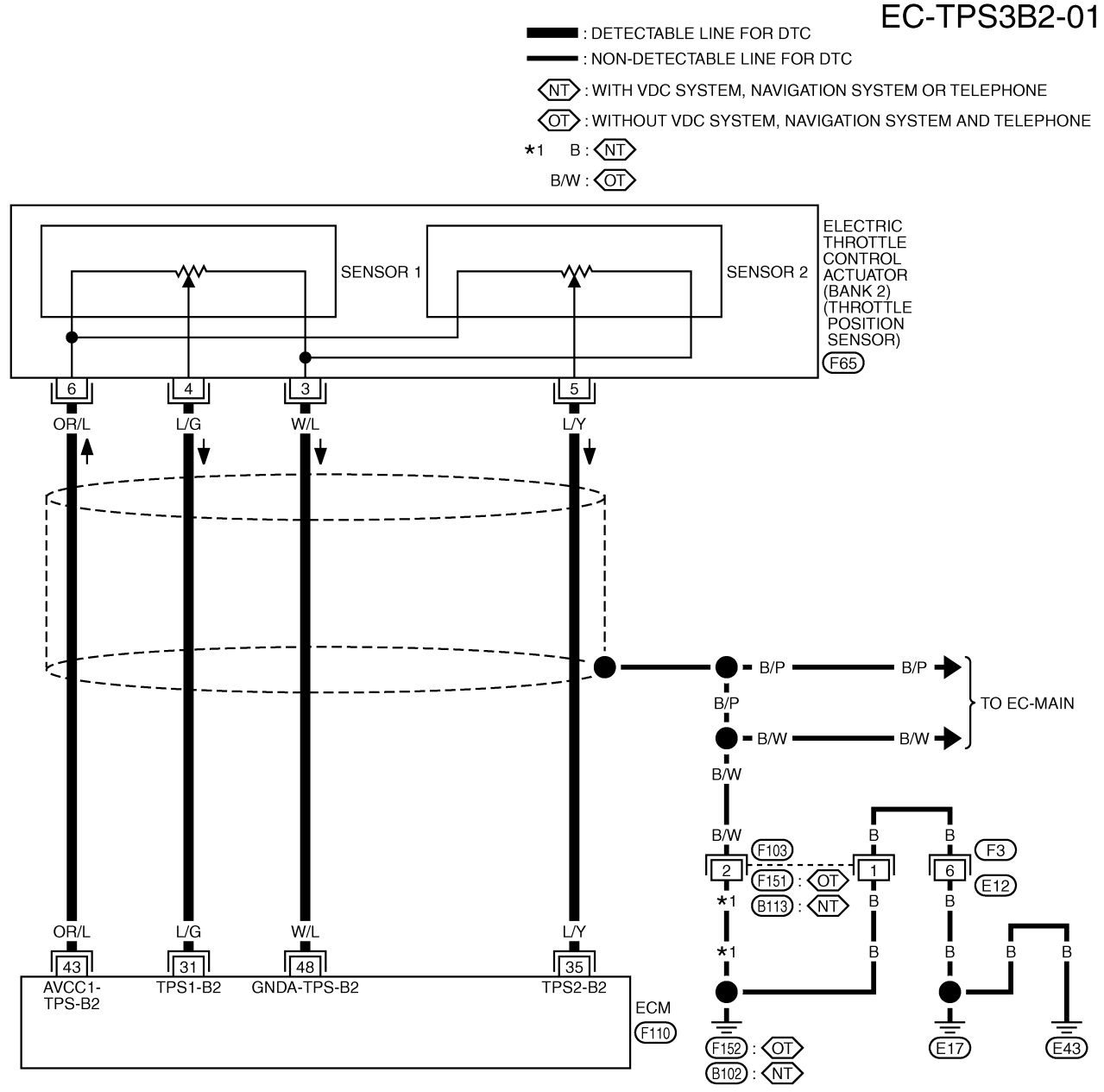
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

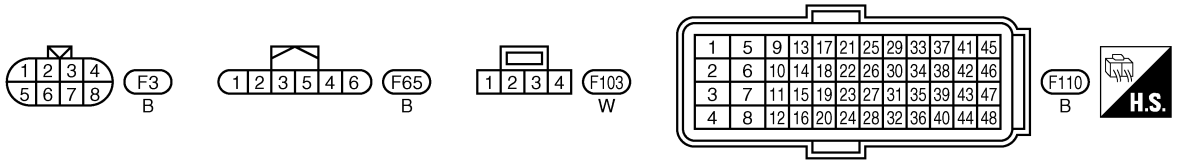
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
30	Y	Throttle position sensor 1 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
34	L	Throttle position sensor 2 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
40	R	Sensor ground [Throttle position sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V

BANK 2

EC-TPS3B2-01





TBWT1673E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
31	L/G	Throttle position sensor 1 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
35	L/Y	Throttle position sensor 2 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
48	W/L	Sensor ground [Throttle position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

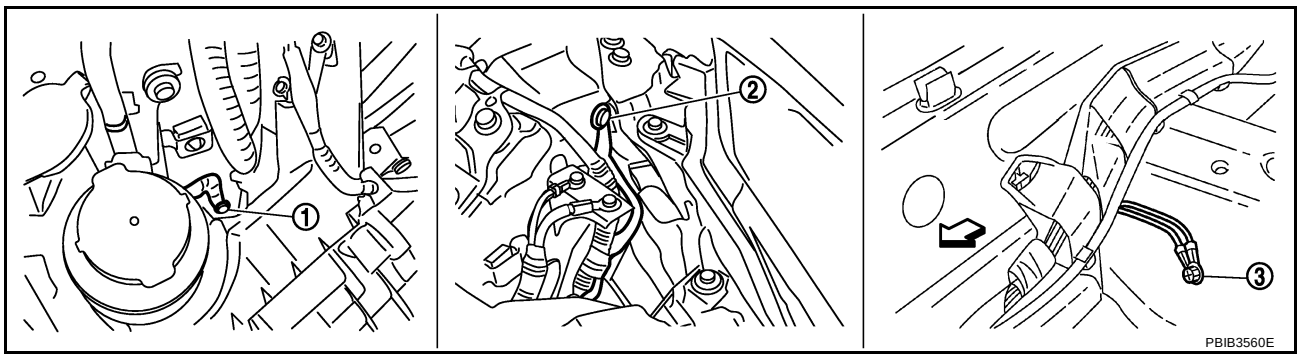
Diagnostic Procedure

NBS000HA

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

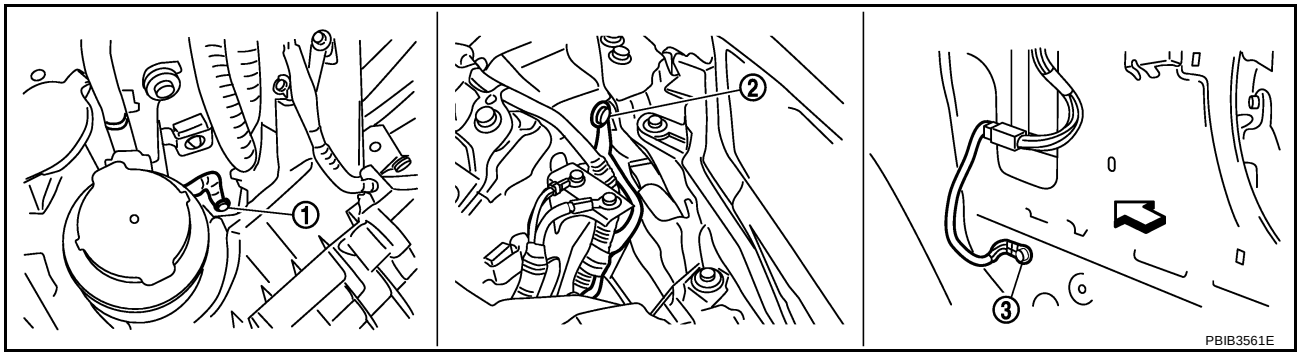


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

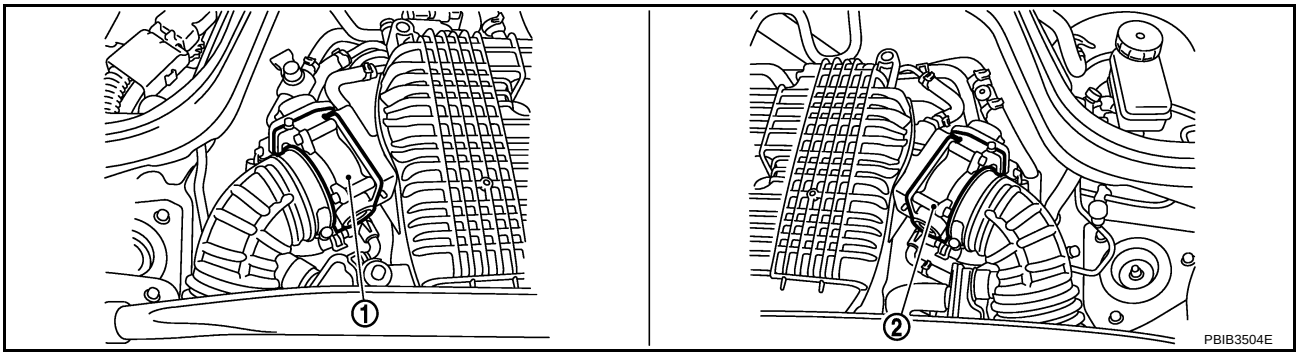
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

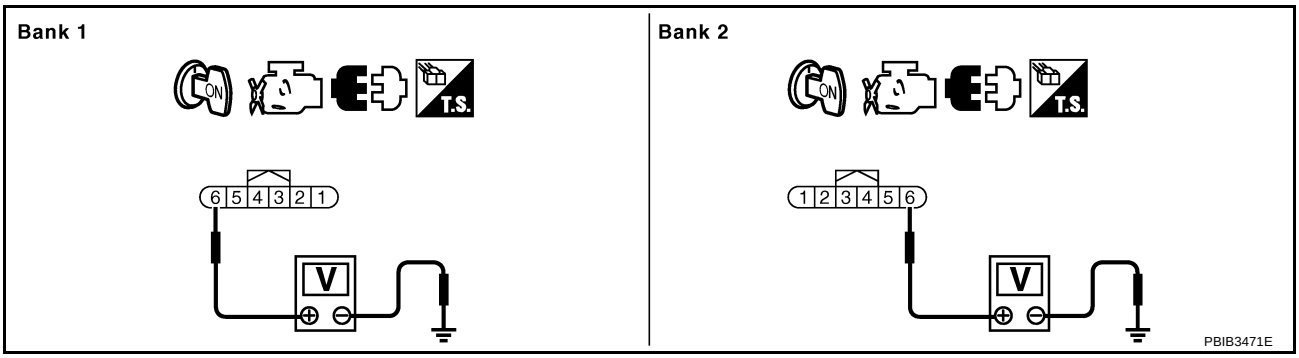
2. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control actuator (bank 1)
2. Electric throttle control actuator (bank 2)

2. Turn ignition switch ON.
3. Check voltage between electric throttle control actuator terminal 6 and ground with CONSULT-III or tester.



Voltage: Approximately 5V

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to ground or short to power in harness or connectors.

3. CHECK THROTTLE POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 3 and ECM terminal 40 (bank 1) or 48 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between the following;
   ECM terminal 30 (bank 1) or 31 (bank 2) and electric throttle control actuator terminal 4,
   ECM terminal 34 (bank 1) or 35 (bank 2) and electric throttle control actuator terminal 5.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK THROTTLE POSITION SENSOR

Refer to EC-590, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

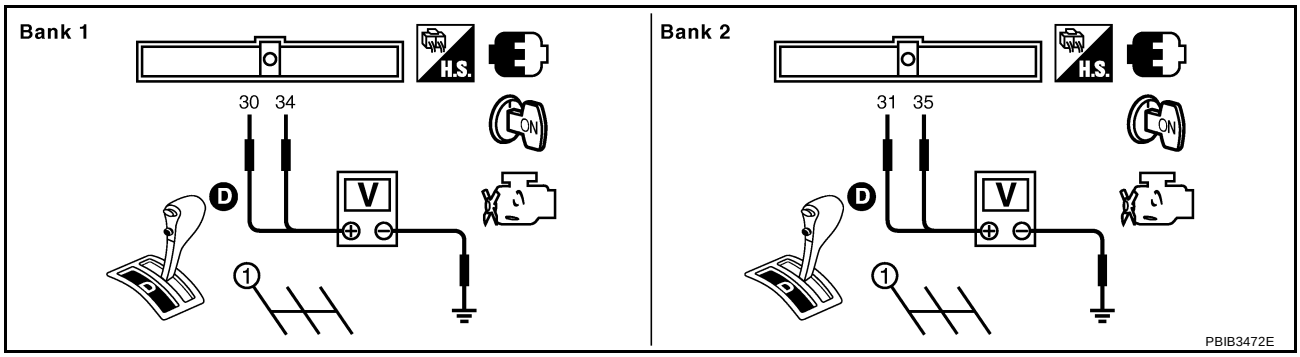
>> **INSPECTION END**

Component Inspection

NBS000HB

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.
5. Check voltage between ECM terminals 30 [TP sensor 1 (bank 1) signal], 31 [TP sensor 1 (bank 2) signal], 34 [TP sensor 2 (bank 1) signal]. 35 [TP sensor 2 (bank 2) signal] and ground under the following conditions.



Terminal	Accelerator pedal	Voltage
30 [TP sensor 1 (bank 1)] 31 [TP sensor 1 (bank 2)]	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
34 [TP sensor 2 (bank 1)] 35 [TP sensor 2 (bank 2)]	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V

6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000HC

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY

PFP:16119

Component Description

NBS000CA

Power supply for the throttle control motor is provided to the ECM via throttle control motor relay. The throttle control motor relay is ON/OFF controlled by the ECM. When the ignition switch is turned ON, the ECM sends an ON signal to throttle control motor relay and battery voltage is provided to the ECM. When the ignition switch is turned OFF, the ECM sends an OFF signal to throttle control motor relay and battery voltage is not provided to the ECM.

CONSULT-III Reference Value in Data Monitor Mode

NBS000CB

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
THRTL RELAY	● Ignition switch: ON	ON

On Board Diagnosis Logic

NBS000CC

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1290 1290 (Bank 2) P2100 2100 (Bank 1)	Throttle control motor relay circuit open	ECM detects a voltage of power source for throttle control motor is excessively low.	● Harness or connectors (The throttle control motor relay circuit is open) ● Throttle control motor relay
P2103 2103	Throttle control motor relay circuit short	ECM detect the throttle control motor relay is stuck ON.	● Harness or connectors (The throttle control motor relay circuit is shorted) ● Throttle control motor relay

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

NBS000CD

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P1290, P2100

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V.

With CONSULT-III

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.
4. If DTC is detected, go to EC-597, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR DTC P2103

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Start engine and let it idle for 5 seconds.

3. Check DTC.
4. If DTC is detected, go to EC-597, "Diagnostic Procedure" .

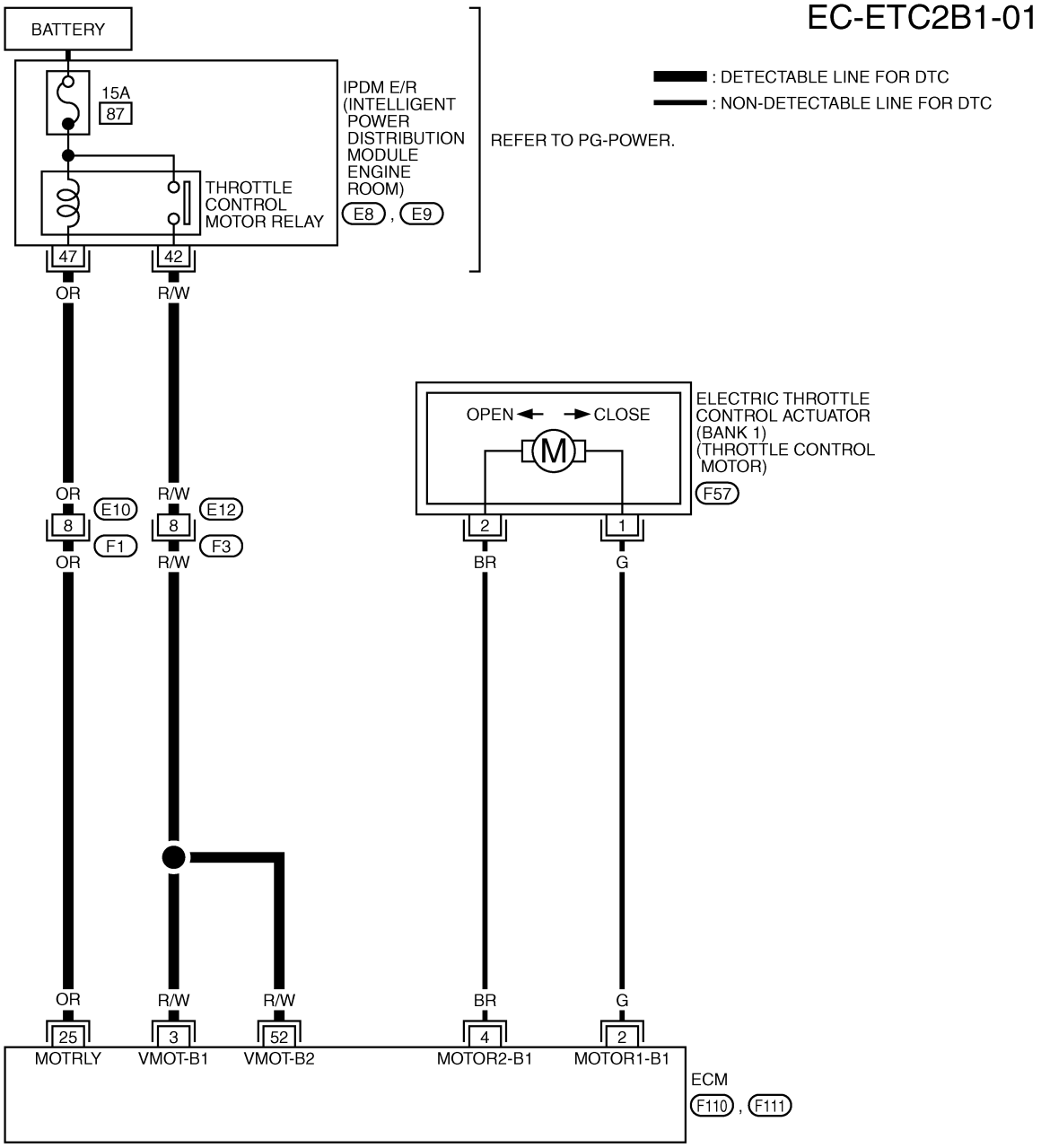
With GST

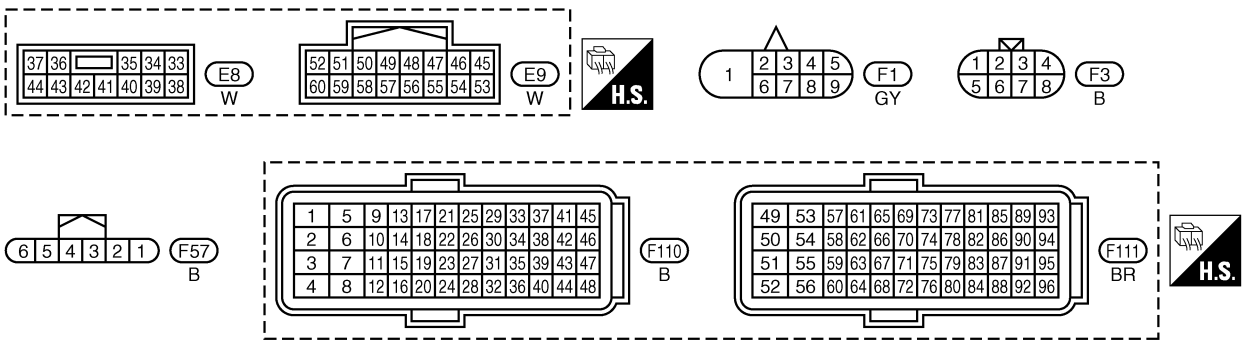
Follow the procedure “With CONSULT-III” above.

Wiring Diagram

NBS000CE

BANK 1

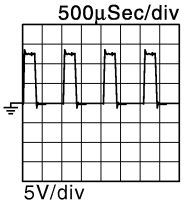
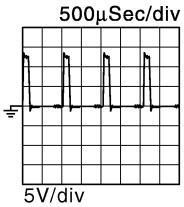
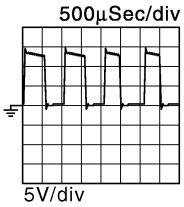




TBWT1664E

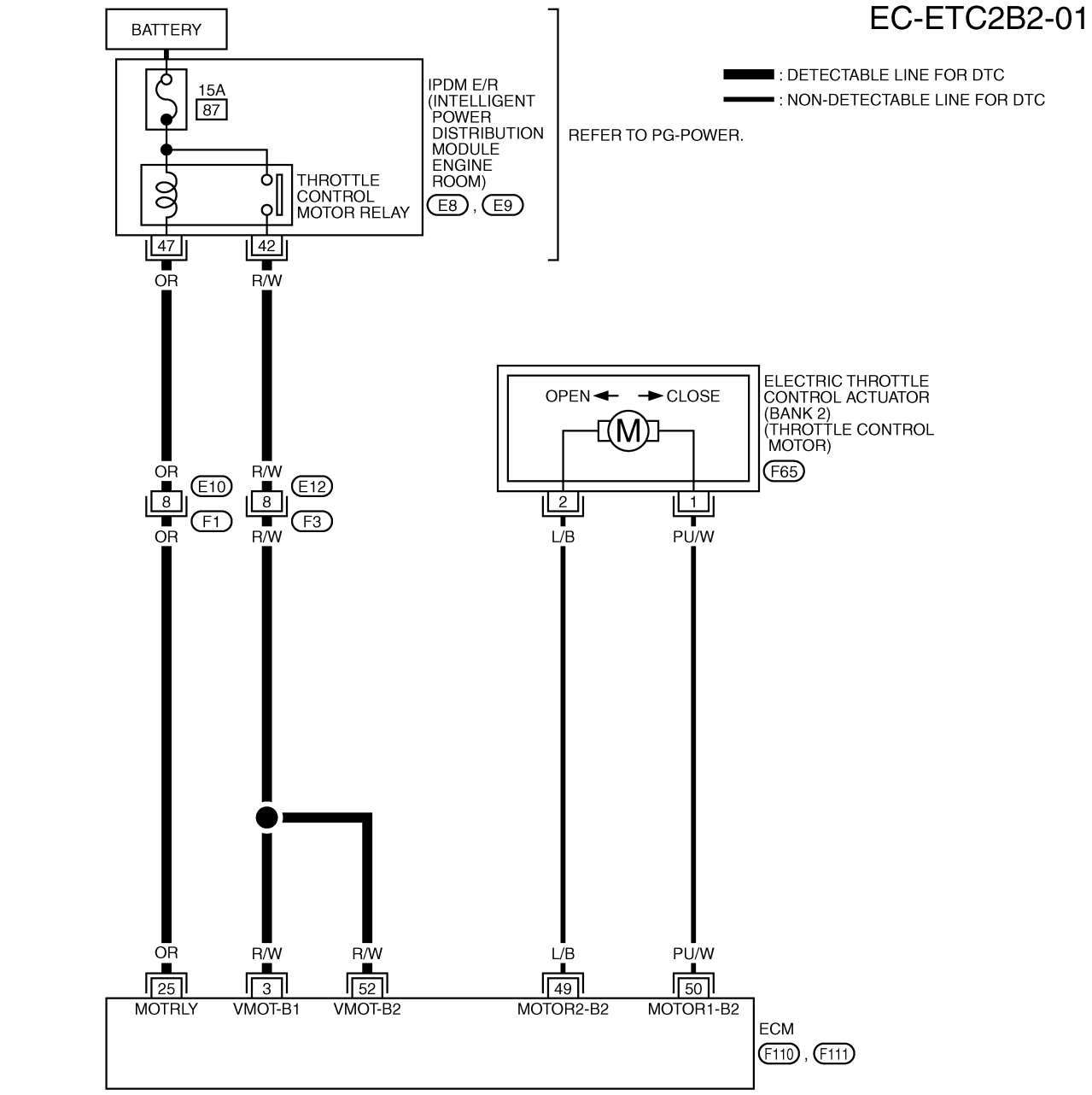
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

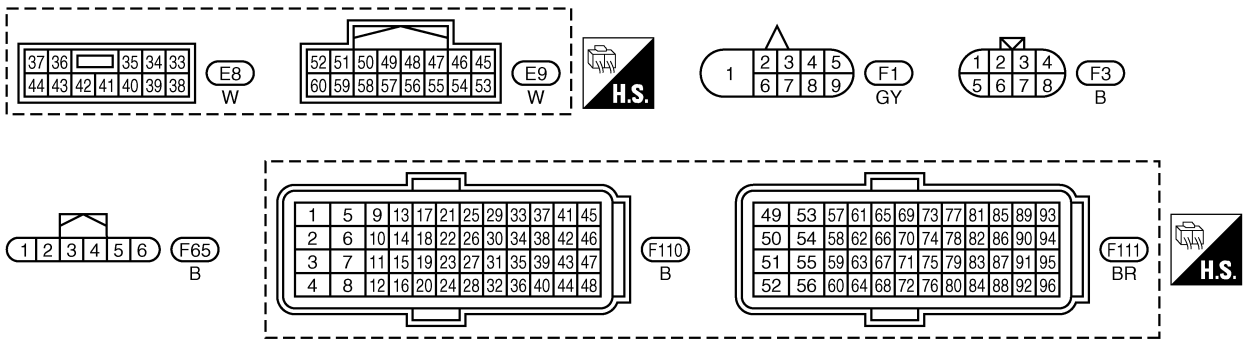
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	G	Throttle control motor (Open) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

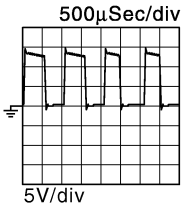
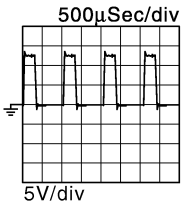
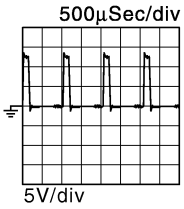




TBWT1665E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
49	L/B	Throttle control motor (Close) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
50	PU/W	Throttle control motor (Open) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

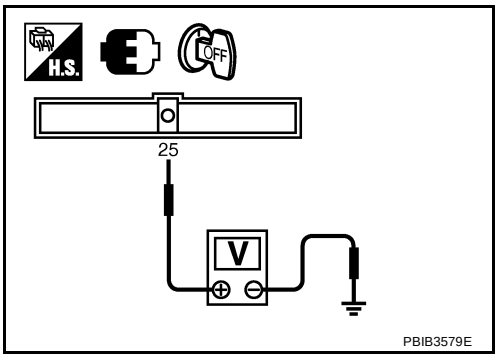
Diagnostic Procedure

NBS000CF

1. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Check voltage between ECM terminal 25 and ground with CONSULT-III or tester.

Voltage: Battery voltage



PBIB3579E

OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E9.
3. Check continuity between ECM terminal 25 and IPDM E/R terminal 47.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUSE

1. Disconnect 15A fuse.
2. Check 15A fuse for blown.

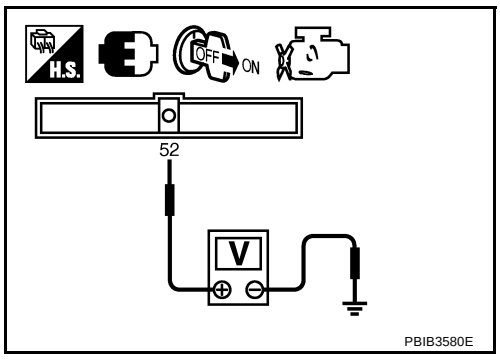
OK or NG

OK >> GO TO 8.
NG >> Replace 15A fuse.

5. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

Check voltage between ECM terminal 3 (bank 1), 52 (bank 2) and ground under the following conditions with CONSULT-III or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



OK or NG

OK >> GO TO 8.
NG >> GO TO 6.

6. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E8.
3. Check continuity between ECM terminal 3 (bank 1), 52 (bank 2) and IPDM E/R terminal 42.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair or replace harness or connectors.

DTC P1421 COLD START CONTROL

PFP:23710

Description

NBS006TX

ECM controls ignition timing and engine idle speed when engine is started with prewarming up condition. This control promotes the activation of three way catalyst by heating the catalyst and reduces emissions.

On Board Diagnosis Logic

NBS006TY

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1421 1421	Cold start emission reduction strategy monitoring	ECM does not control ignition timing and engine idle speed properly when engine is started with prewarming up condition.	● Lack of intake air volume ● Fuel injection system ● ECM

DTC Confirmation Procedure

NBS006TZ

NOTE:

- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- **If DTC P1421 is displayed with other DTC, first perform the trouble diagnosis for other DTC.**

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Select “DATA MONITOR” mode with CONSULT-III.
4. Check that the “COOLAN TEMP/S” indication is between 4°C (39°F) and 36°C (97°F).
   If “COOLAN TEMP/S” indication is within the specified value, go to the following step.
   If “COOLANT TEMP/S” indication is out of the specified value, cool engine down or warm engine up and go to step 1.
5. Start engine and let it idle for 5 minutes.
6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-600, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS006U0

1. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-77, "Idle Air Volume Learning" .
Is Idle Air Volume Learning carried out successfully?

Yes or No

Yes >> GO TO 2.
No >> Follow the instruction of Idle Air Volume Learning.

2. CHECK INTAKE SYSTEM

Check for the cause of intake air volume lacking. Refer to the following.

- Crushed intake air passage
- Intake air passage clogging

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning part

3. CHECK FUEL INJECTION SYSTEM FUNCTION

Perform EC-324, "DTC Confirmation Procedure" for DTC P0171.

OK or NG

OK >> GO TO 4.
NG >> Go to EC-330, "Diagnostic Procedure" for DTC P0171.

4. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-III.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-600, "DTC Confirmation Procedure" .
5. Is the 1st trip DTC P1421 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform DTC Confirmation Procedure.**
   See EC-600, "DTC Confirmation Procedure" .
4. Is the 1st trip DTC P1421 displayed again?

Yes or No

Yes >> GO TO 5.
No >> **INSPECTION END**

5. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

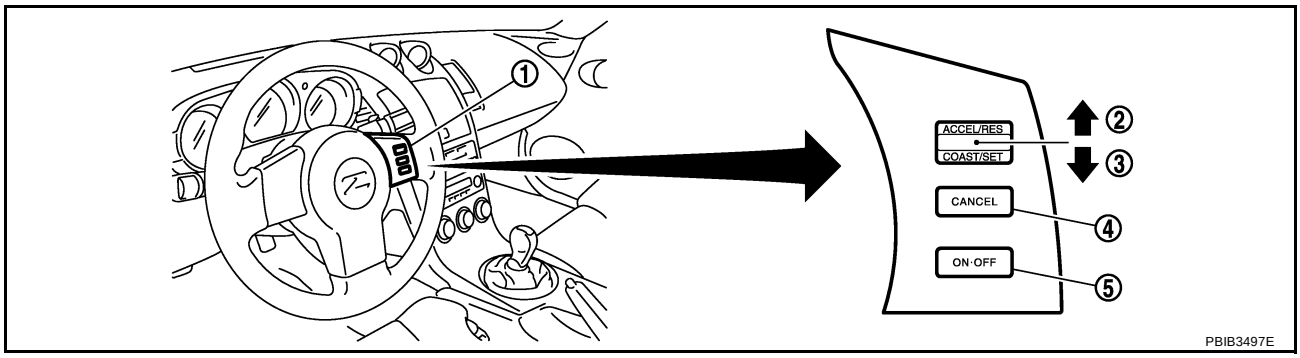
DTC P1564 ASCD STEERING SWITCH

PFP:25551

Component Description

NBS000FT

ASCD steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.



1. ASCD steering switch
2. RESUME/ACCELERATE switch
3. SET/COAST switch
4. CANCEL switch
5. MAIN switch

Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.

CONSULT-III Reference Value in Data Monitor Mode

NBS000FU

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAIN SW	● Ignition switch: ON	MAIN switch: Pressed	ON
		MAIN switch: Released	OFF
CANCEL SW	● Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	● Ignition switch: ON	RESUME/ACCELERATE switch: Pressed	ON
		RESUME/ACCELERATE switch: Released	OFF
SET SW	● Ignition switch: ON	SET/COAST switch: Pressed	ON
		SET/COAST switch: Released	OFF

On Board Diagnosis Logic

NBS000FV

- **This self-diagnosis has the one trip detection logic.**
- **The MIL will not light up for this self-diagnosis.**

NOTE:
If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605.
Refer to EC-512, "DTC P0605 ECM".

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1564 1564	ASCD steering switch	● An excessively high voltage signal from the ASCD steering switch is sent to ECM. ● ECM detects that input signal from the ASCD steering switch is out of the specified range. ● ECM detects that the ASCD steering switch is stuck ON.	● Harness or connectors (The switch circuit is open or shorted.) ● ASCD steering switch ● ECM

DTC Confirmation Procedure

NBS000FW

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 10 seconds.
2. Press MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
3. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
4. Press RESUME/ACCELERATE switch for at least 10 seconds, then release it and wait at least 10 seconds.
5. Press SET/COAST switch for at least 10 seconds, then release it and wait at least 10 seconds.
6. Check DTC.
7. If DTC is detected, go to EC-606, "Diagnostic Procedure" .

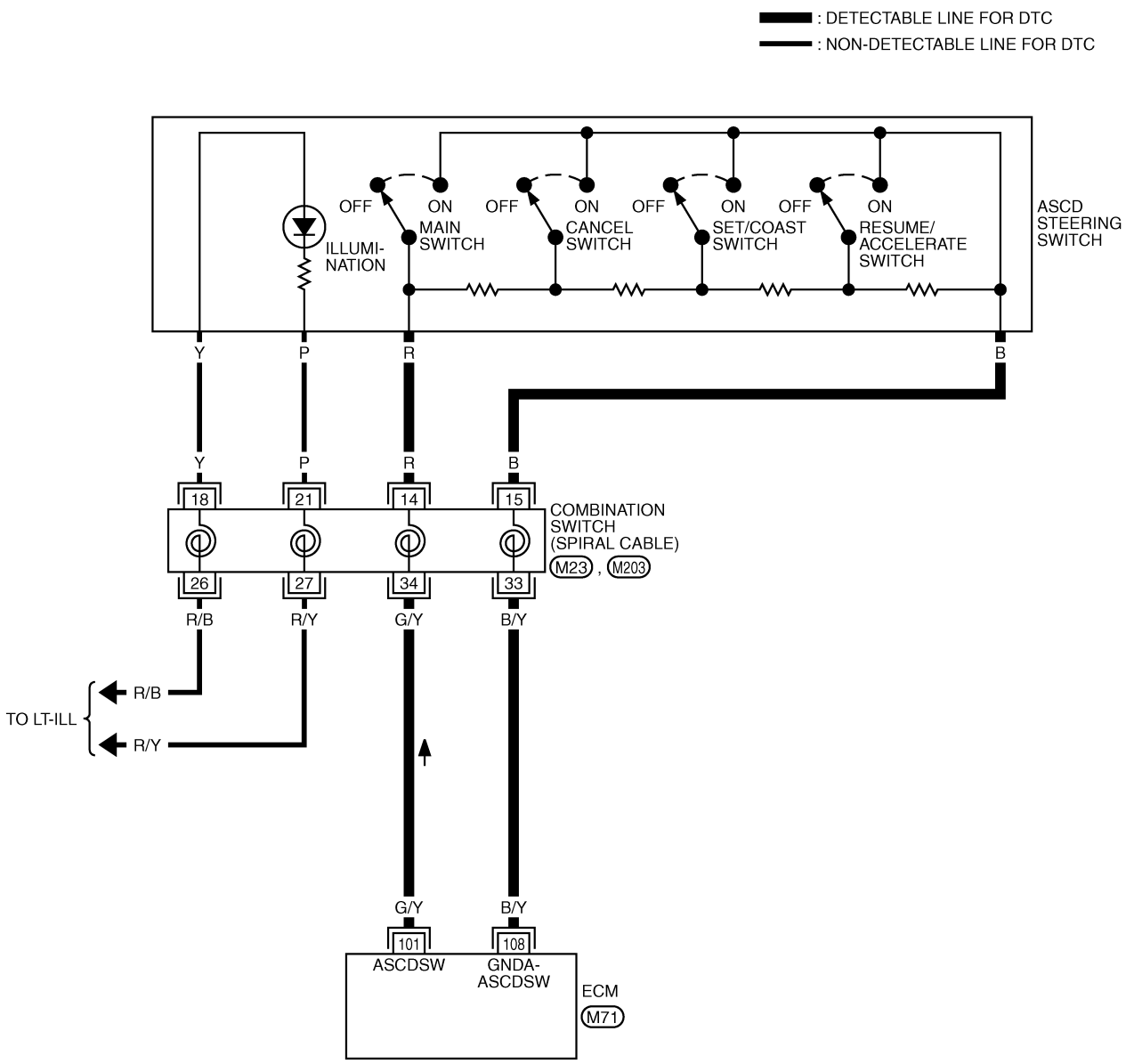
WITH GST

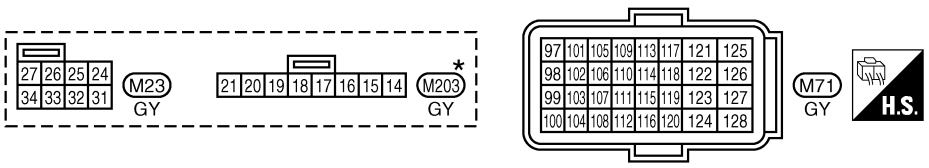
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000FX

EC-ASC/SW-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TBWT1660E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	G/Y	ASCD steering switch	**[Ignition switch: ON]** ● ASCD steering switch: OFF	4V
			[Ignition switch: ON] ● MAIN switch: Pressed	0V
			[Ignition switch: ON] ● CANCEL switch: Pressed	1V
			[Ignition switch: ON] ● RESUME/ACCELERATE switch: Pressed	3V
			[Ignition switch: ON] ● SET/COAST switch: Pressed	2V
108	B/Y	Sensor ground (ASCD steering switch)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

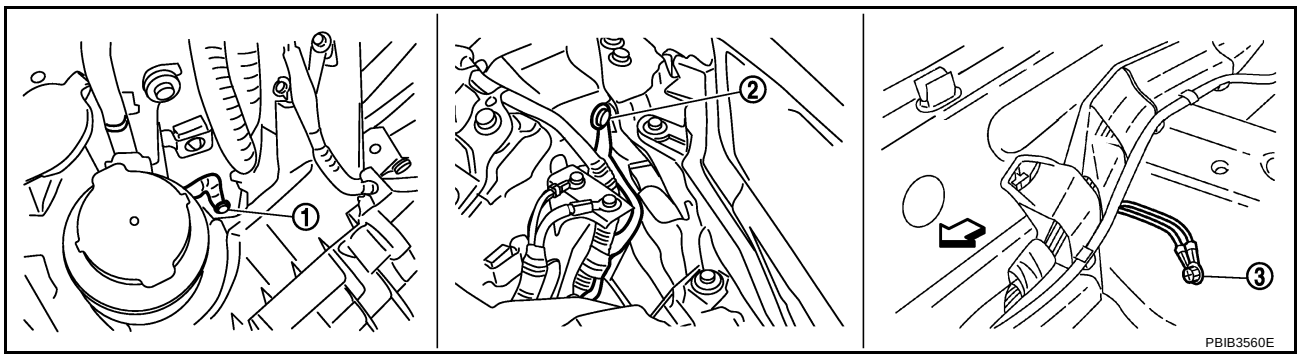
Diagnostic Procedure

NBS000FY

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

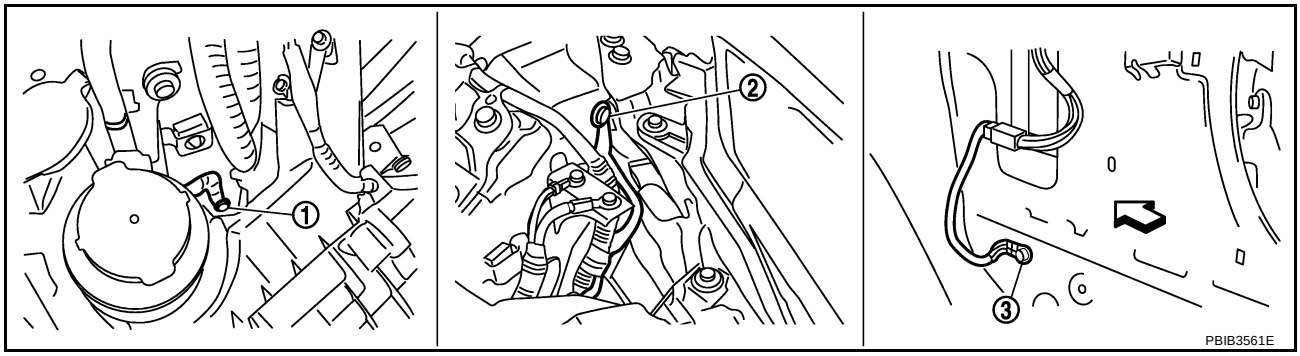


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ASCD STEERING SWITCH CIRCUIT

With CONSULT-III

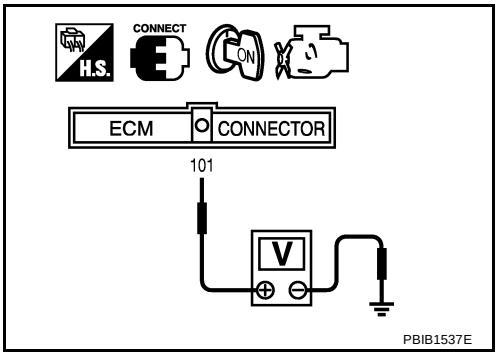
1. Turn ignition switch ON.
2. Select “MAIN SW”, “RESUME/ACC SW”, “SET SW” and “CANCEL SW” in “DATA MONITOR” mode with CONSULT-III.
3. Check each item indication under the following conditions.

Switch	Monitor item	Condition	Indication
MAIN switch	MAIN SW	Pressed	ON
		Released	OFF
CANCEL switch	CANCEL SW	Pressed	ON
		Released	OFF
RESUME/ACCELERATE switch	RESUME/ACC SW	Pressed	ON
		Released	OFF
SET/COAST switch	SET SW	Pressed	ON
		Released	OFF

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 101 and ground with pressing each button.

Switch	Condition	Voltage [V]
MAIN switch	Pressed	Approx. 0
	Released	Approx. 4
CANCEL switch	Pressed	Approx. 1
	Released	Approx. 4
RESUME/ACCELERATE switch	Pressed	Approx. 3
	Released	Approx. 4
SET/COAST switch	Pressed	Approx. 2
	Released	Approx. 4



OK or NG

OK >> GO TO 8.
NG >> GO TO 3.

3. CHECK ASCD STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect combination switch harness connector M203.
4. Check harness continuity between combination switch terminal 15 and ECM terminal 108. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 101 and combination switch terminal 14. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD STEERING SWITCH

Refer to EC-609, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace steering wheel.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

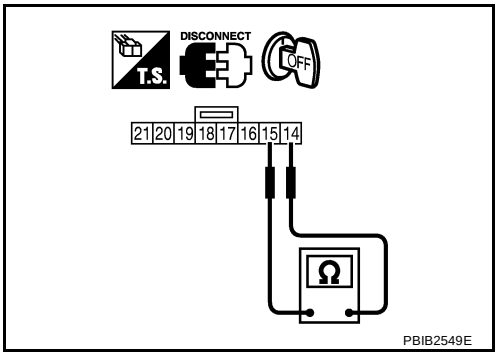
>> **INSPECTION END**

Component Inspection

NBS000FZ

ASCD STEERING SWITCH

1. Disconnect combination switch (spiral cable) harness connector M203.
2. Check continuity between combination switch harness connector terminals 14 and 15 with pushing each switch.



Switch	Condition	Resistance [Ω]
MAIN switch	Pressed	Approx. 0
	Released	Approx. 4,000
CANCEL switch	Pressed	Approx. 250
	Released	Approx. 4,000
RESUME/ACCELERATE switch	Pressed	Approx. 1,480
	Released	Approx. 4,000
SET/COAST switch	Pressed	Approx. 660
	Released	Approx. 4,000

3. If NG, replace ASCD steering switch.

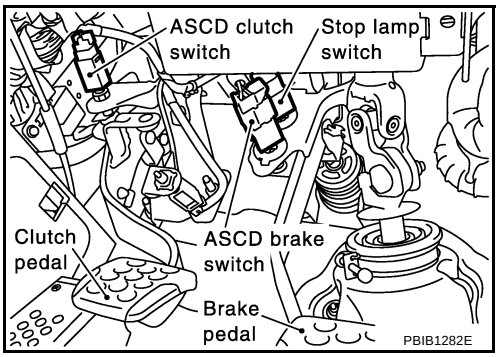
DTC P1572 ASCD BRAKE SWITCH

PFP:25320

Component Description

NBS000G0

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by this input of two kinds (ON/OFF signal).
Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-III Reference Value in Data Monitor Mode

NBS000G1

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW1 (ASCD brake switch)	● Ignition switch: ON	● Brake pedal: Fully released (A/T) ● Brake pedal and clutch pedal: Fully released (M/T)	ON
		● Brake pedal: Slightly depressed (A/T) ● Brake pedal and/or clutch pedal: Slightly depressed (M/T)	OFF
BRAKE SW2 (Stop lamp switch)	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

NBS000G2

- **This self-diagnosis has the one trip detection logic.**
- **The MIL will not light up for this self-diagnosis.**

NOTE:

- **If DTC P1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-512, "DTC P0605 ECM".**
- **This self-diagnosis has the one trip detection logic. When malfunction A is detected, DTC is not stored in ECM memory. And in that case, 1st trip DTC and 1st trip freeze frame data are displayed. 1st trip DTC is erased when ignition switch OFF. And even when malfunction A is detected in two consecutive trips, DTC is not stored in ECM memory.**

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition		Possible Cause
P1572 1572	ASCD brake switch	A)	When the vehicle speed is above 30km/h (19 MPH), ON signals from the stop lamp switch and the ASCD brake switch are sent to ECM at the same time.	● Harness or connectors (The stop lamp switch circuit is shorted.) ● Harness or connectors (The ASCD brake switch circuit is shorted.) ● Harness or connectors (The ASCD clutch switch circuit is shorted.) (M/T models) ● Stop lamp switch ● ASCD brake switch ● ASCD clutch switch (M/T models) ● Incorrect stop lamp switch installation ● Incorrect ASCD brake switch installation ● Incorrect ASCD clutch switch installation (M/T models) ● ECM
		B)	ASCD brake switch signal is not sent to ECM for extremely long time while the vehicle is driving	

DTC Confirmation Procedure

NBS000G3

CAUTION:
Always drive vehicle at a safe speed.

NOTE:

- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- Procedure for malfunction B is not described here. It takes extremely long time to complete procedure for malfunction B. By performing procedure for malfunction A, the incident that causes malfunction B can be detected.

TESTING CONDITION:
Steps 4 and 5 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-III

1. Start engine (VDC switch or TCS switch OFF).
2. Select “DATA MONITOR” mode with CONSULT-III.
3. Press MAIN switch and make sure that CRUISE indicator lights up.
4. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Shift lever	Suitable position

5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-615, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to the following step.
7. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Shift lever	Suitable position
Driving location	Depress the brake pedal for more than five seconds so as not to come off from the above-mentioned vehicle speed.

8. Check 1st trip DTC.
9. If 1st trip DTC is detected, go to EC-615, "Diagnostic Procedure" .

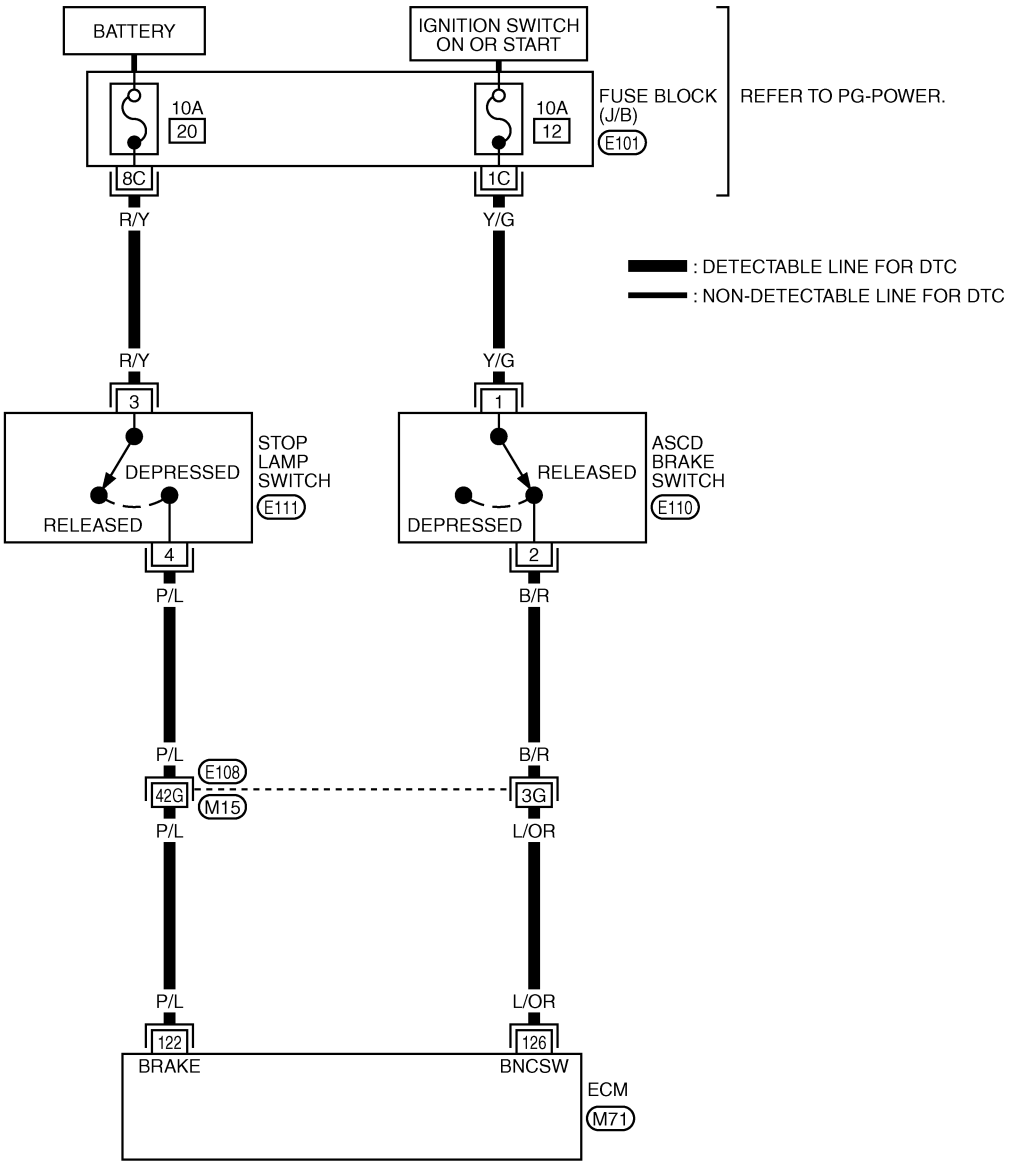
WITH GST

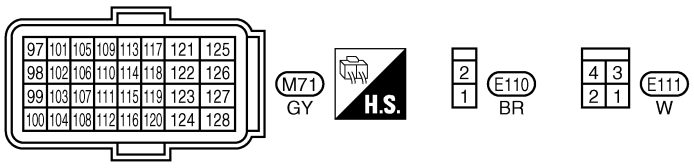
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
A/T MODELS

NBS000G4

EC-ASC/BS-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1661E

Specification data are reference values and are measured between each terminal and ground.

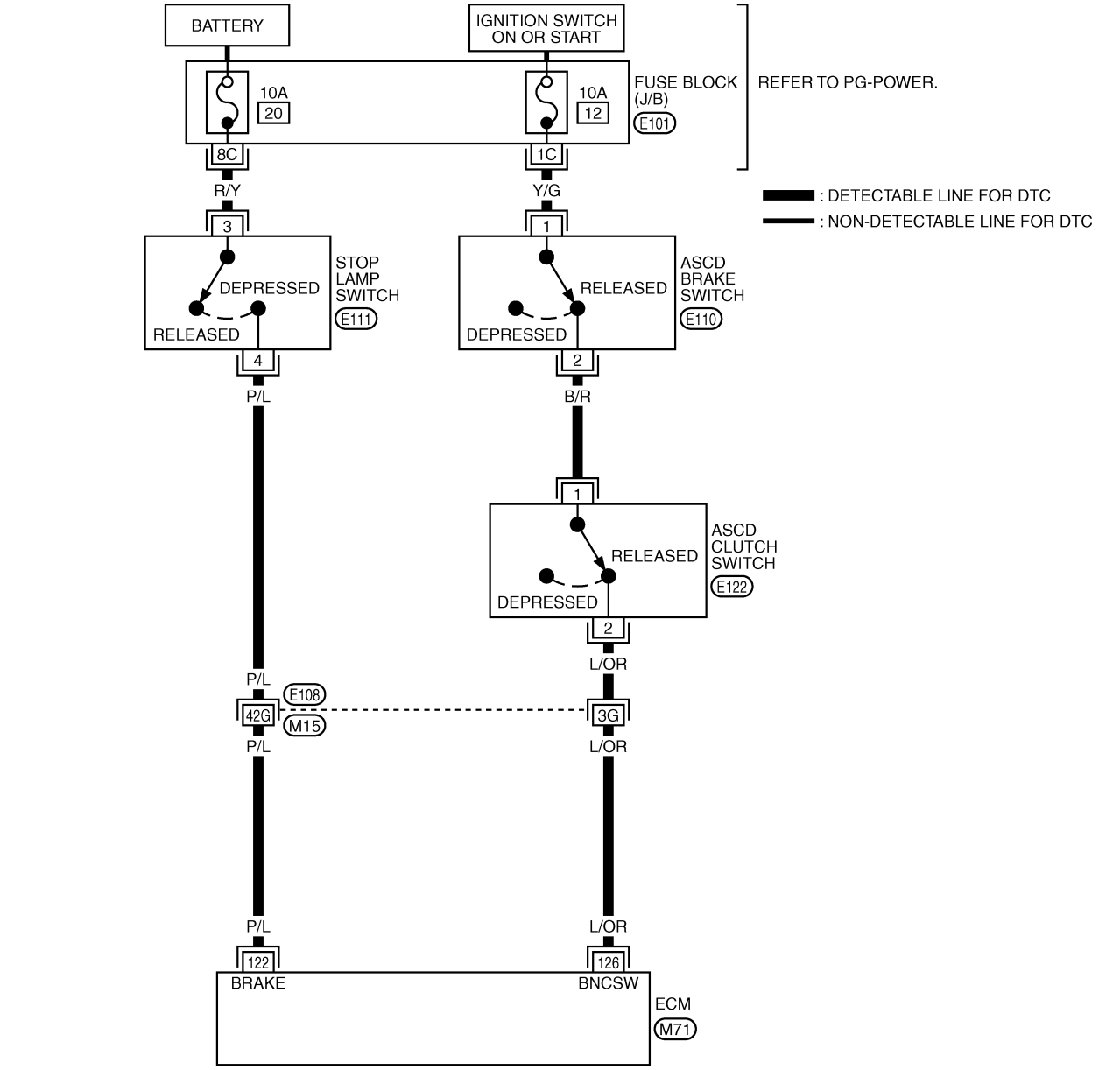
CAUTION:

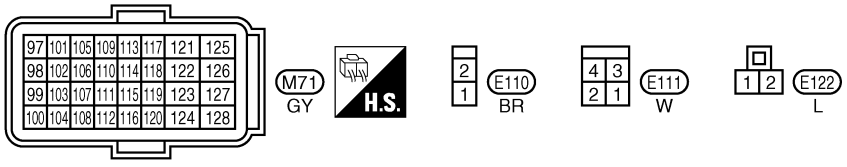
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal: Slightly depressed	0V
			[Ignition switch: ON] ● Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14V)

M/T MODELS

EC-ASC/BS-02





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1662E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal and/or clutch pedal: Slightly depressed	0V
			[Ignition switch: ON] ● Brake pedal and clutch pedal: Fully released	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS000G5

A/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-III

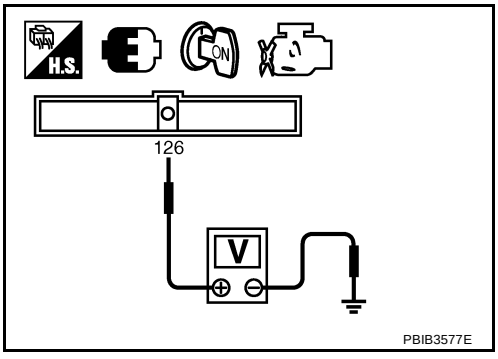
1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-III.
3. Check “BRAKE SW1” indication under the following conditions.

CONDITION	INDICATION
Brake pedal: Slightly depressed	OFF
Brake pedal: Fully released	ON

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 126 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal: Slightly depressed	Approximately 0V
Brake pedal: Fully released	Battery voltage



OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT-III

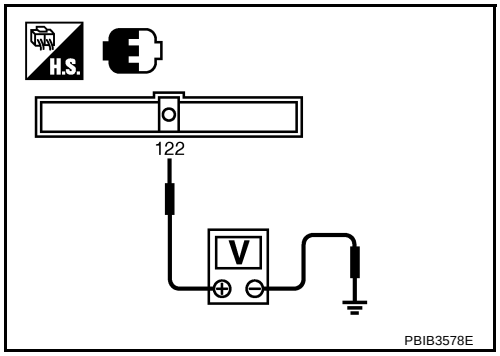
1. Select “BRAKE SW2” in “DATA MONITOR” mode with CONSULT-III.
2. Check “BRAKE SW2” indication under the following conditions.

CONDITION	INDICATION
Brake pedal: Fully released	OFF
Brake pedal: Slightly depressed	ON

Without CONSULT-III

Check voltage between ECM terminal 122 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal: Fully released	Approximately 0V
Brake pedal: Slightly depressed	Battery voltage

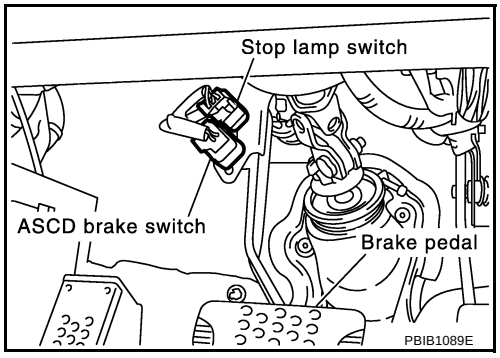


OK or NG

OK >> GO TO 13.
NG >> GO TO 8.

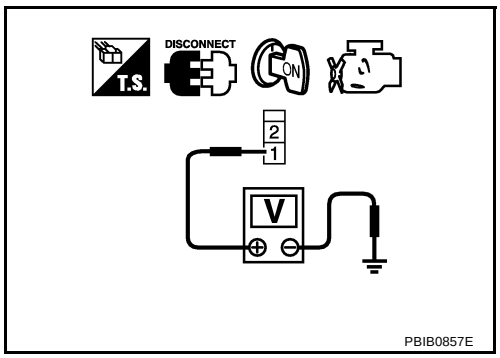
3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 126 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

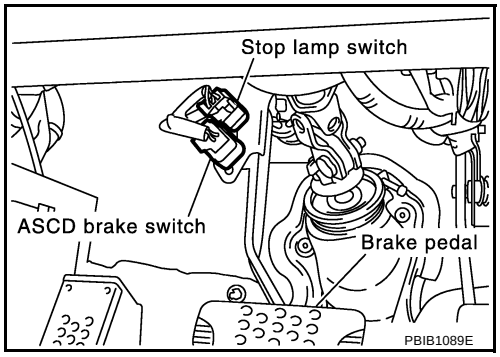
Refer to EC-624, "Component Inspection"

OK or NG

OK >> GO TO 13.
NG >> Replace ASCD brake switch.

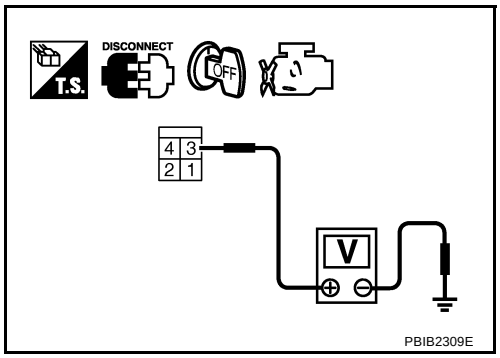
8. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.



3. Check voltage between stop lamp switch terminal 3 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and battery

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 122 and stop lamp switch terminal 4. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK STOP LAMP SWITCH

Refer to EC-624, "Component Inspection"

OK or NG

OK >> GO TO 13.
NG >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

M/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-III

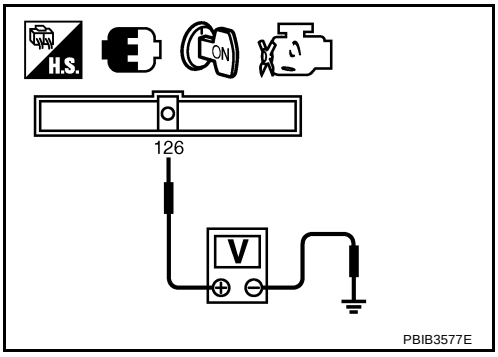
1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-III.
3. Check “BRAKE SW1” indication under the following conditions.

CONDITION	INDICATION
Brake pedal and/or clutch pedal: Slightly depressed	OFF
Brake pedal and clutch pedal: Fully released	ON

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 126 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal and/or clutch pedal: Slightly depressed	Approximately 0V
Brake pedal and clutch pedal: Fully released	Battery voltage



OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT-III

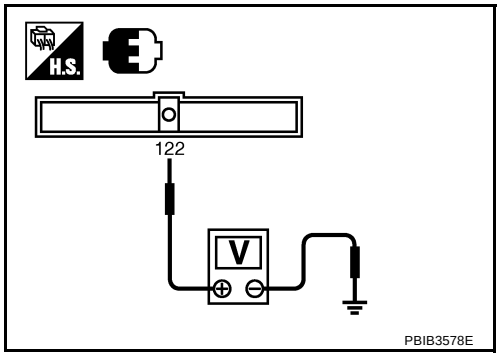
1. Select “BRAKE SW2” in “DATA MONITOR” mode with CONSULT-III.
2. Check “BRAKE SW2” indication under the following conditions.

CONDITION	INDICATION
Brake pedal: Fully released	OFF
Brake pedal: Slightly depressed	ON

Without CONSULT-III

Check voltage between ECM terminal 122 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal: Fully released	Approximately 0V
Brake pedal: Slightly depressed	Battery voltage

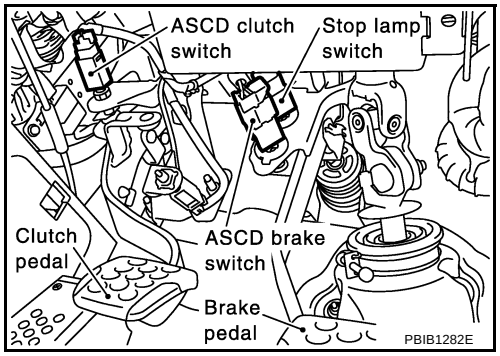


OK or NG

OK >> GO TO 16.
NG >> GO TO 11.

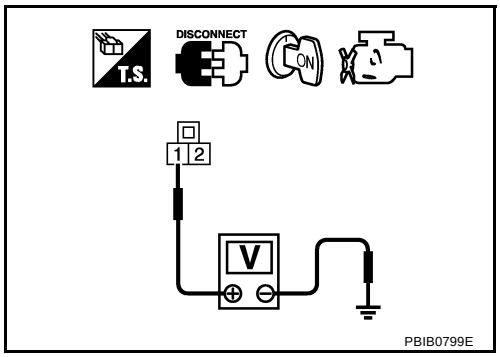
3. CHECK ASCD BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD clutch switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage

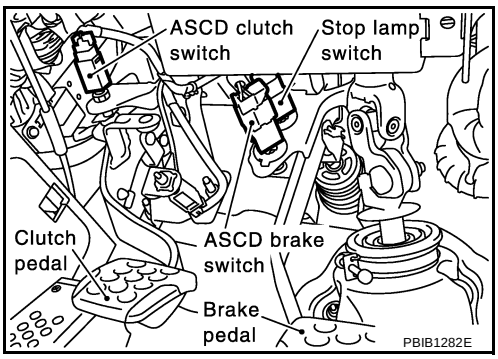


OK or NG

OK >> GO TO 8.
NG >> GO TO 4.

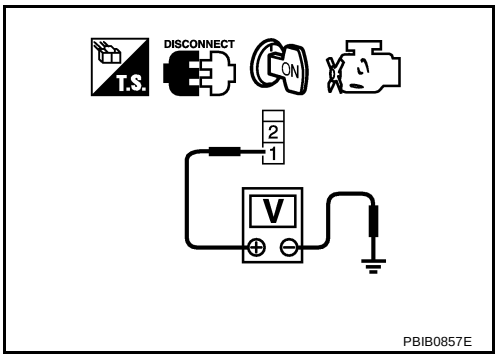
4. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ASCD brake switch terminal 2 and ASCD clutch switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Refer to EC-624, "Component Inspection"

OK or NG

OK >> GO TO 16.
NG >> Replace ASCD brake switch.

8. CHECK ASCD CLUTCH SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ASCD clutch switch terminal 2 and ECM terminal 126. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and ASCD clutch switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK ASCD CLUTCH SWITCH

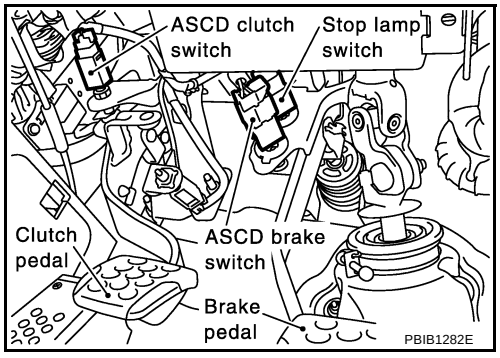
Refer to EC-624, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace ASCD clutch switch.

11. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.

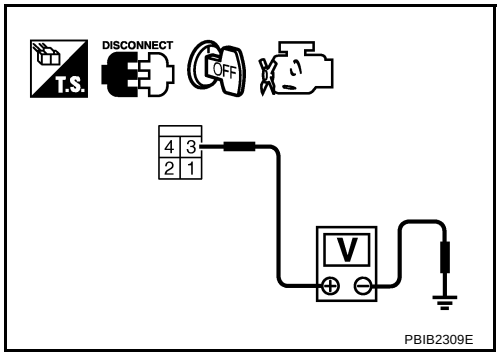


3. Check voltage between stop lamp switch terminal 3 and ground with CONSULT-III or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.



12. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and battery

>> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 122 and stop lamp switch terminal 4. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

15. CHECK STOP LAMP SWITCH

Refer to EC-624, "Component Inspection"

OK or NG

OK >> GO TO 16.
NG >> Replace stop lamp switch.

16. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

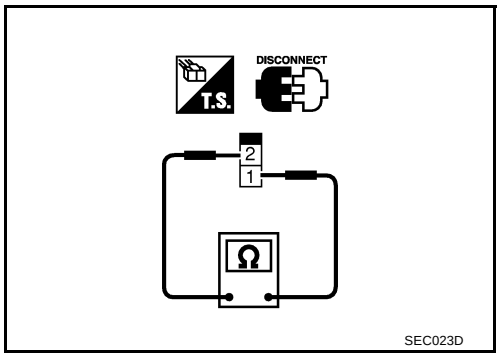
NBS000G6

ASCD BRAKE SWITCH

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Check continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
Brake pedal: Fully released	Should exist
Brake pedal: Slightly depressed	Should not exist

If NG, adjust ASCD brake switch installation, refer to BR-7, "BRAKE PEDAL" , and perform step 3 again.

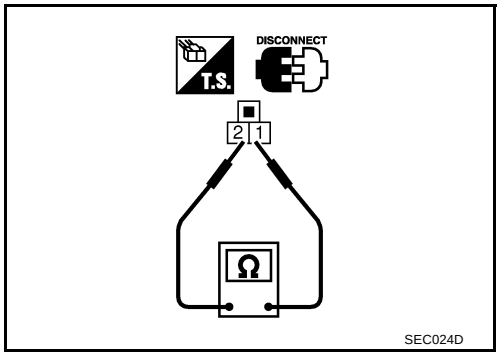


ASCD CLUTCH SWITCH (M/T MODELS)

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Check continuity between ASCD clutch switch terminals 1 and 2 under the following conditions.

Condition	Continuity
Clutch pedal: Fully released	Should exist
Clutch pedal: Slightly depressed	Should not exist

If NG, adjust ASCD clutch switch installation, refer to CL-5, "CLUTCH PEDAL" , and perform step 3 again.

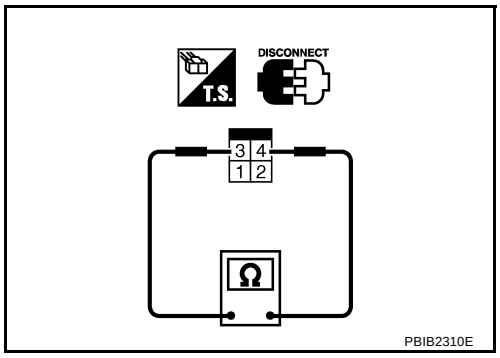


STOP LAMP SWITCH

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check continuity between stop lamp switch terminals 3 and 4 under the following conditions.

Condition	Continuity
Brake pedal: Fully released	Should not exist
Brake pedal: Slightly depressed	Should exist

If NG, adjust stop lamp switch installation, refer to BR-7, "BRAKE PEDAL" , and perform step 3 again.



DTC P1574 ASCD VEHICLE SPEED SENSOR

PFP:31036

Component Description

NBS000G7

The ECM receives two vehicle speed sensor signals via CAN communication line. One is sent from “unified meter and A/C amp.”, and the other is from TCM (Transmission control module). The ECM uses these signals for ASCD control. Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for ASCD functions.

On Board Diagnosis Logic

NBS000G8

- **This self-diagnosis has the one trip detection logic.**
- **The MIL will not light up for this self-diagnosis.**

NOTE:

- **If DTC P1574 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1574 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**
- **If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500. Refer to EC-496, "DTC P0500 VSS"**
- **If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-512, "DTC P0605 ECM"**

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1574 1574	ASCD vehicle speed sensor	ECM detects a difference between two vehicle speed signals is out of the specified range.	● Harness or connectors (The CAN communication line is open or shorted.) ● Unified meter and A/C amp. ● VDC/TCS/ABS control unit (with VDC models) ● ABS actuator and electric unit (control unit) (without VDC models) ● Wheel sensor ● TCM(A/T models) ● ECM

DTC Confirmation Procedure

NBS000G9

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Step 3 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-III

1. Start engine (VDC switch or TCS switch OFF).
2. Select “DATA MONITOR” mode with CONSULT-III.
3. Drive the vehicle at more than 40 km/h (25 MPH).
4. Check DTC.
5. If DTC is detected, go to EC-626, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000GA

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to AT-37 .

OK or NG

OK >> GO TO 2.
NG >> Perform trouble shooting relevant to DTC indicated.

2. CHECK DTC WITH “VDC/TSC/ABS CONTROL UNIT (WITH VDC MODELS)” OR “ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITHOUT VDC MODELS)”

Refer to BRC-82, "TROUBLE DIAGNOSIS" or refer to BRC-42, "TROUBLE DIAGNOSIS" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

Refer to DI-4, "COMBINATION METERS" .

>> **INSPECTION END**

DTC P1715 INPUT SPEED SENSOR (TURBINE REVOLUTION SENSOR)

PFP:31935

Description

NBS002VP

ECM receives turbine revolution sensor signal from TCM through CAN communication line. ECM uses this signal for engine control.

CONSULT-III Reference Value in Data Monitor Mode

NBS002VQ

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
I/P PULLY SPD	● Vehicle speed: More than 20 km/h (12 MPH)	Almost the same speed as the tachometer indication

On Board Diagnosis Logic

NBS002VR

NOTE:

- **If DTC P1715 is displayed with DTC U1000, U1001 first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1715 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**
- **If DTC P1715 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-512, "DTC P0605 ECM" .**
- **If DTC P1715 is displayed with DTC P0335, first perform the trouble diagnosis for DTC P0335. Refer to EC-386, "DTC P0335 CKP SENSOR (POS)" .**
- **If DTC P1715 is displayed with DTC P0340 or P0345 first perform the trouble diagnosis for DTC P0340 or P0345. Refer to EC-394, "DTC P0340, P0345 CMP SENSOR (PHASE)" .**

The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1715 1715	Input speed sensor (Turbine revolution sensor) (TCM output)	Turbine revolution sensor signal is different from the theoretical value calculated by ECM from revolution sensor signal and engine rpm signal.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (Turbine revolution sensor circuit is open or shorted) ● TCM

Diagnostic Procedure

NBS002VS

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to AT-37, "ON BOARD DIAGNOSTIC (OBD) SYSTEM" .

OK or NG

OK >> GO TO 2.
NG >> Perform trouble shooting relevant to DTC indicated.

2. REPLACE TCM

Replace TCM. Refer to AT-40, "TROUBLE DIAGNOSIS" .

>> **INSPECTION END**

DTC P1805 BRAKE SWITCH

PFP:25320

Description

NBS000GI

Brake switch signal is applied to the ECM through the stop lamp switch when the brake pedal is depressed. This signal is used mainly to decrease the engine speed when the vehicle is driving.

CONSULT-III Reference Value in Data Monitor Mode

NBS000GJ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

NBS000GK

The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1805 1805	Brake switch	A brake switch signal is not sent to ECM for extremely long time while the vehicle is driving.	● Harness or connectors (The stop lamp switch circuit is open or shorted.) ● Stop lamp switch

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Engine operating condition in fail-safe mode	
ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.	
Vehicle condition	Driving condition
When engine is idling	Normal
When accelerating	Poor acceleration

DTC Confirmation Procedure

NBS000GL

WITH CONSULT-III

1. Turn ignition switch ON.
2. Fully depress the brake pedal for at least 5 seconds.
3. Erase the DTC with CONSULT-III.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-630, "Diagnostic Procedure" .

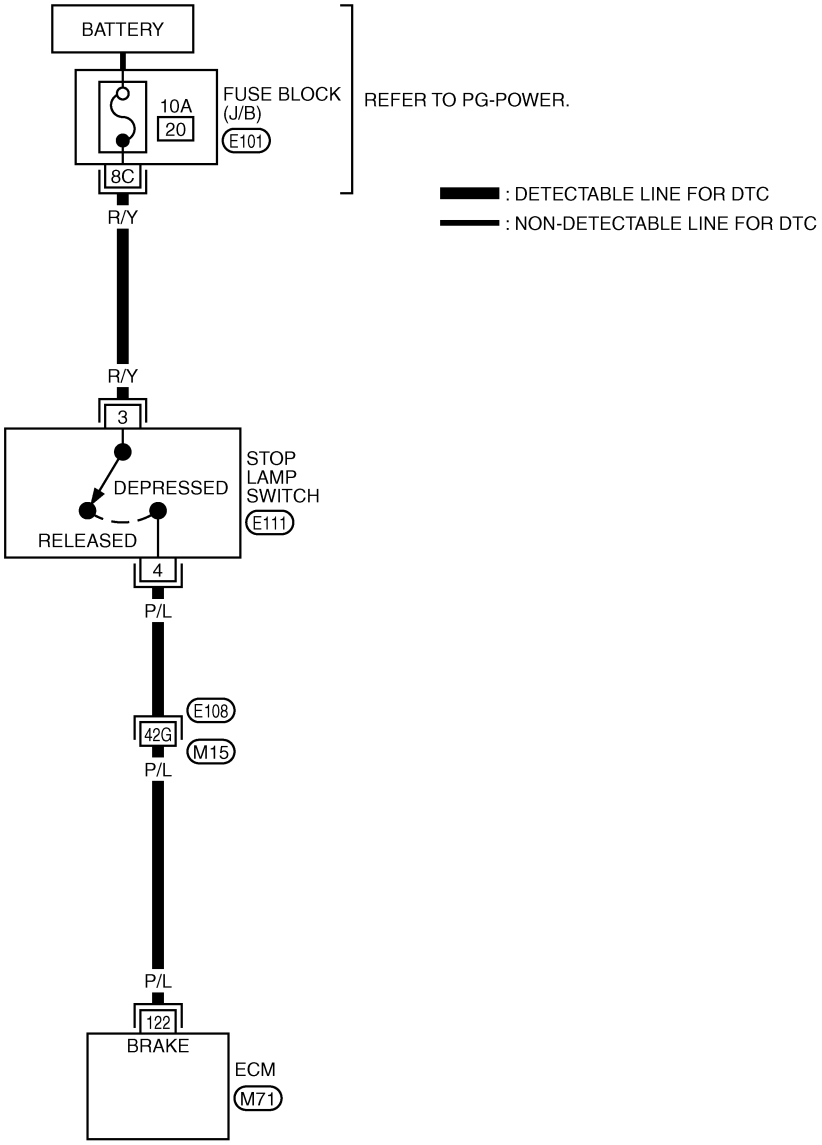
WITH GST

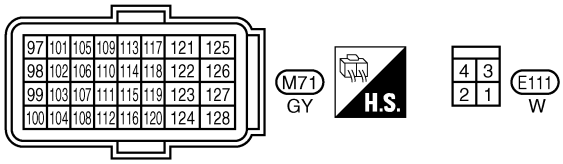
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000GM

EC-BRK/SW-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1663E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS000GN

1. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Check the stop lamp when depressing and releasing the brake pedal.

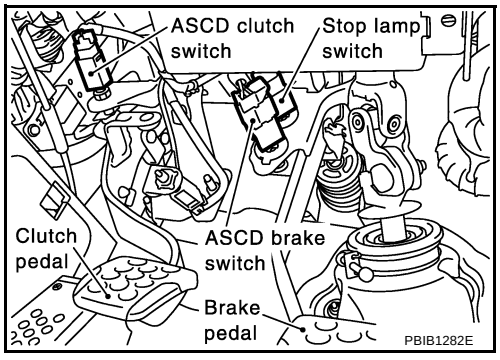
Brake pedal	Stop lamp
Fully released	Not illuminated
Slightly depressed	Illuminated

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

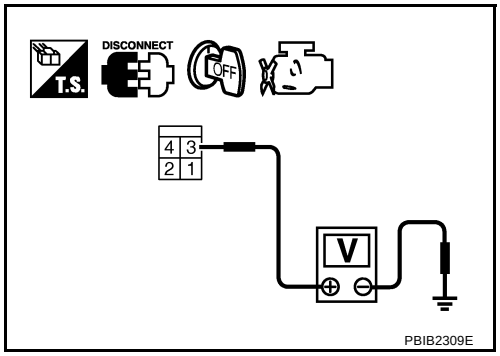
2. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.



2. Check voltage between stop lamp switch terminal 3 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- 10A fuse
- Fuse block (J/B) connector E101
- Harness for open and short between stop lamp switch and fuse

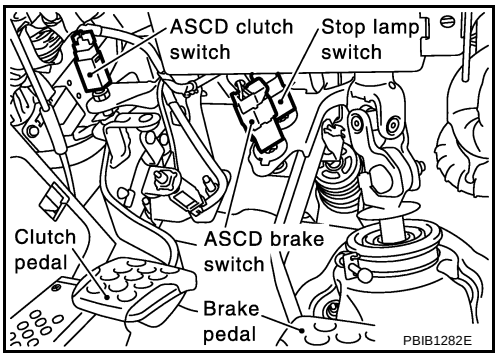
>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Disconnect stop lamp switch harness connector.
3. Check harness continuity between ECM terminal 122 and stop lamp switch terminal 4.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK STOP LAMP SWITCH

Refer to EC-632, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace stop lamp switch.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

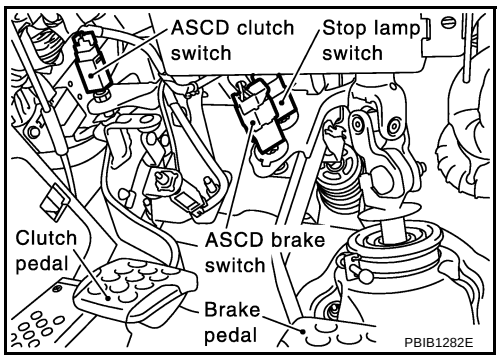
>> **INSPECTION END**

Component Inspection

NBS000GO

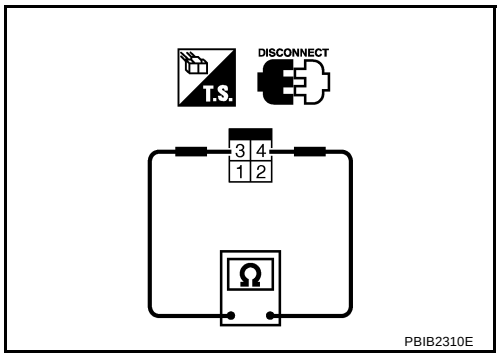
STOP LAMP SWITCH

1. Disconnect stop lamp switch harness connector.



2. Check continuity between stop lamp switch terminals 3 and 4 under the following conditions.

Conditions	Continuity
Brake pedal: Fully released	Should not exist
Brake pedal: Slightly depressed	Should exist



3. If NG, adjust stop lamp switch installation, refer to BR-7, "BRAKE PEDAL" , and perform step 2 again.

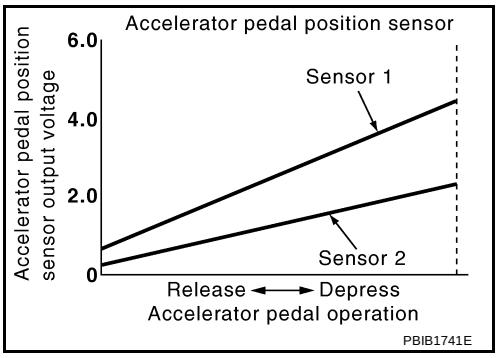
DTC P2122, P2123 APP SENSOR

PFP:18002

Component Description

NBS000GP

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



CONSULT-III Reference Value in Data Monitor Mode

NBS000GQ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN 1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN 2*1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage.

On Board Diagnosis Logic

NBS000GR

These self-diagnoses have the one trip detection logic.

NOTE:
If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2122 2122	Accelerator pedal position sensor 1 circuit low input	An excessively low voltage from the APP sensor 1 is sent to ECM.	● Harness or connectors (The APP sensor 1 circuit is open or shorted.) ● Accelerator pedal position sensor (APP sensor 1)
P2123 2123	Accelerator pedal position sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS000GS

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-637, "Diagnostic Procedure" .

WITH GST

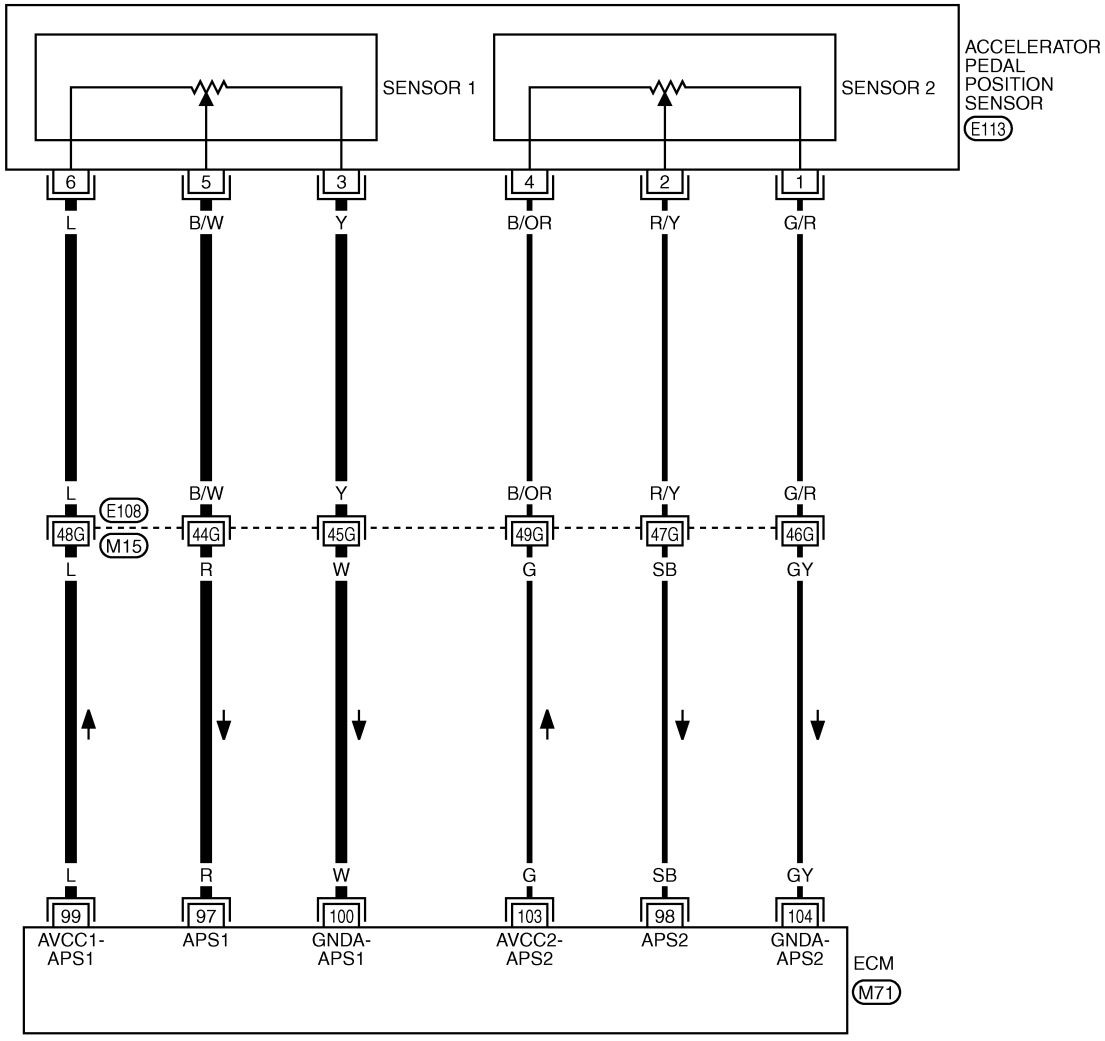
Follow the procedure “WITH CONSULT-III” above.

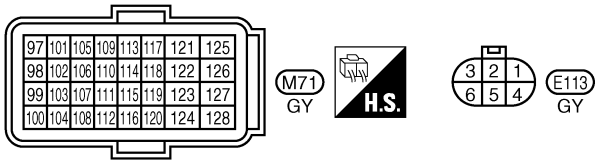
Wiring Diagram

NBS000GT

EC-APPS1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1670E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	1.95 - 2.40V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

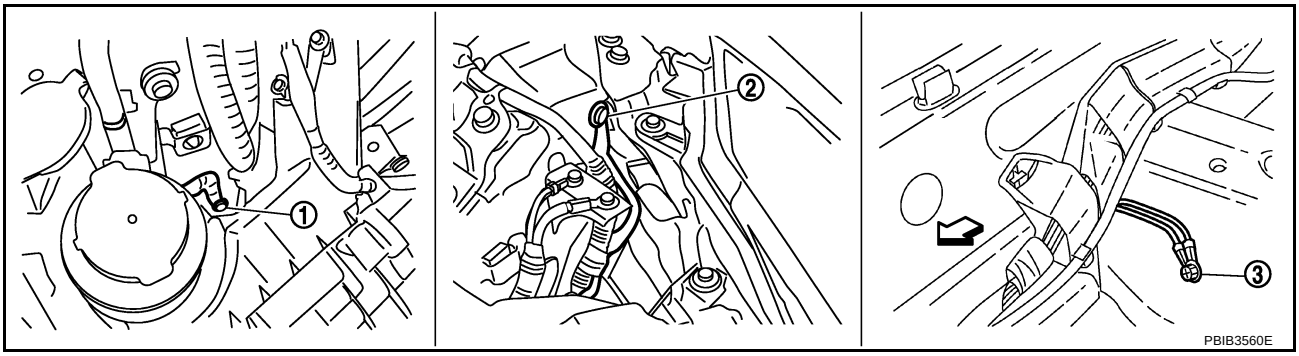
Diagnostic Procedure

NBS000GU

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

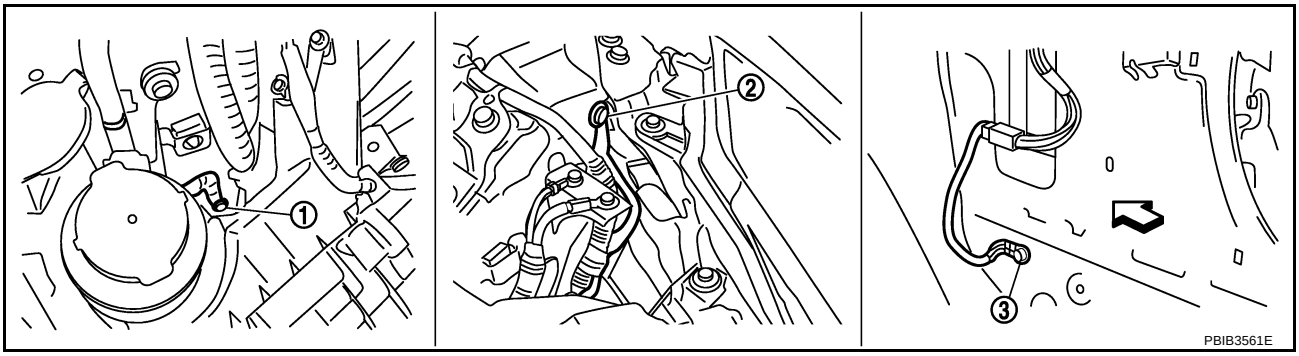


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

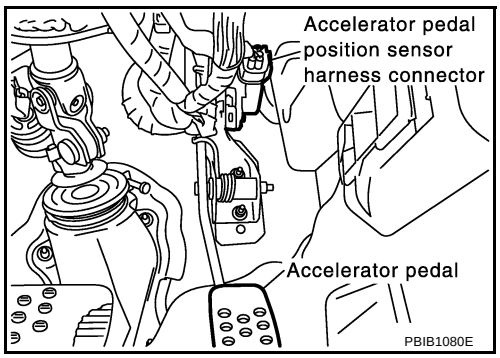
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

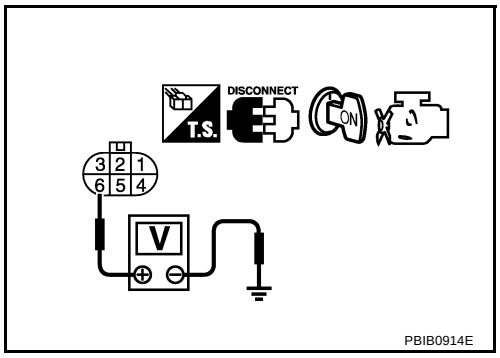
2. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 6 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 3 and ECM terminal 100. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 97 and APP sensor terminal 5. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK APP SENSOR

Refer to EC-658, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

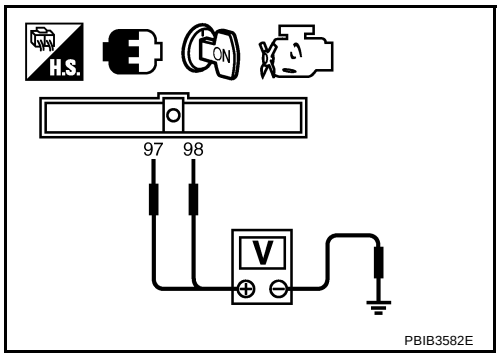
>> **INSPECTION END**

Component Inspection

NBS000GV

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 97 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.



Terminal	Accelerator pedal	Voltage
97 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V

4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000GW

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

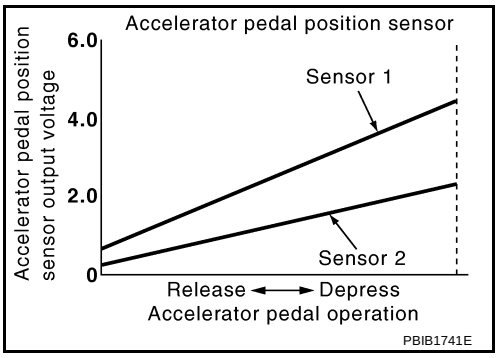
DTC P2127, P2128 APP SENSOR

PFP:18002

Component Description

NBS000GX

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



CONSULT-III Reference Value in Data Monitor Mode

NBS000GY

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN 1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN 2*1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage.

On Board Diagnosis Logic

NBS000GZ

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2127 2127	Accelerator pedal position sensor 2 circuit low input	An excessively low voltage from the APP sensor 2 is sent to ECM.	● Harness or connectors (APP sensor 2 dircuit is open or shorted.) [CKP sensor (POS) circuit is open or shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Accelerator pedal position sensor ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● EVAP control system pressure sensor ● Refrigerant pressure sensor
P2128 2128	Accelerator pedal position sensor 2 circuit high input	An excessively high voltage from the APP sensor 2 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS000H0

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-645, "Diagnostic Procedure" .

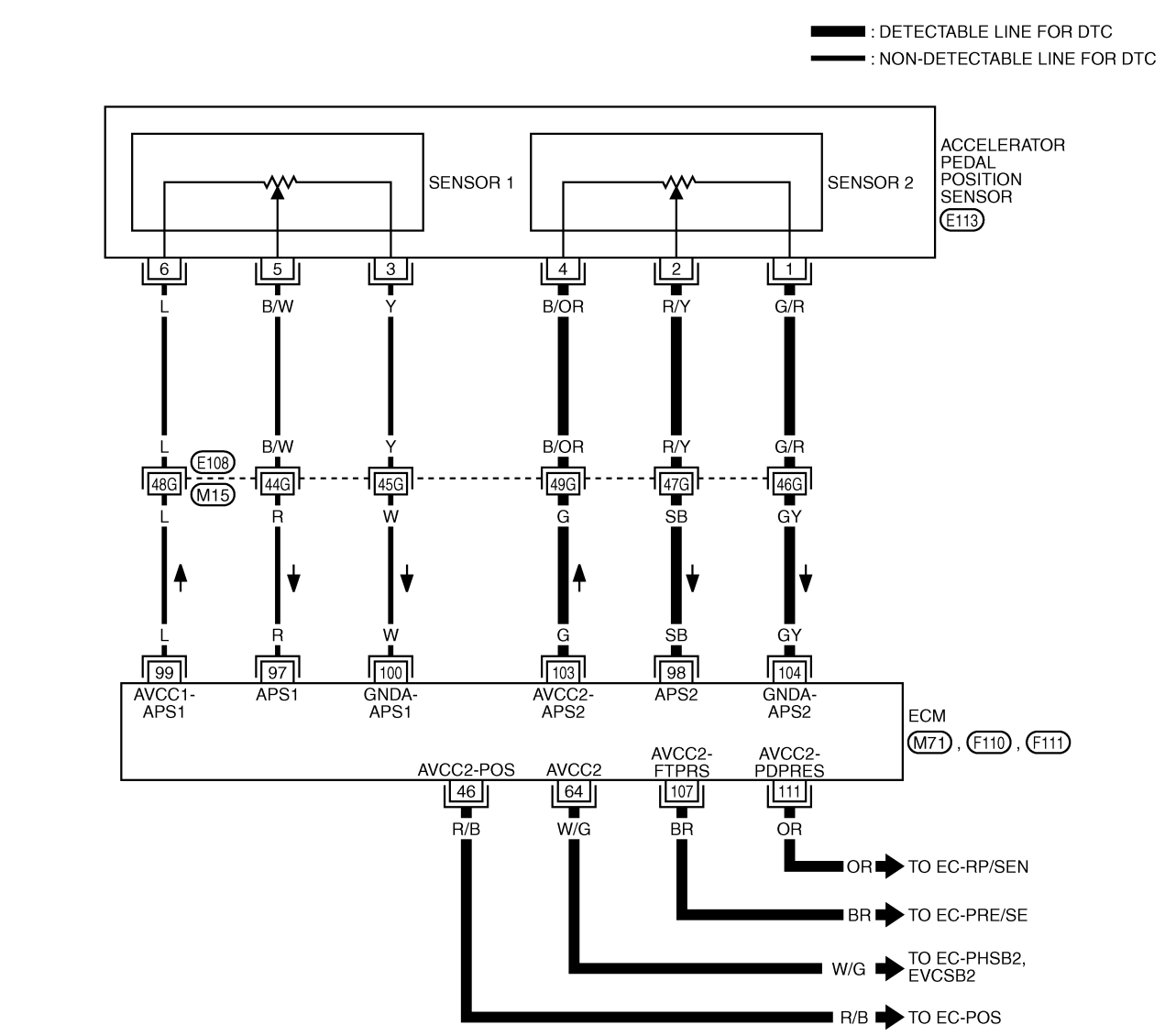
WITH GST

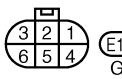
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

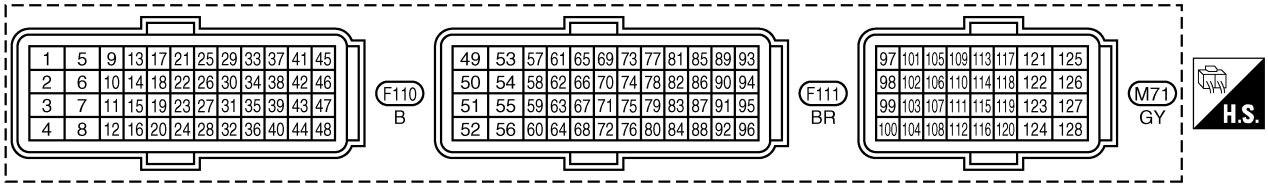
NBS000H1

EC-APPS2-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT1671E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	1.95 - 2.40V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

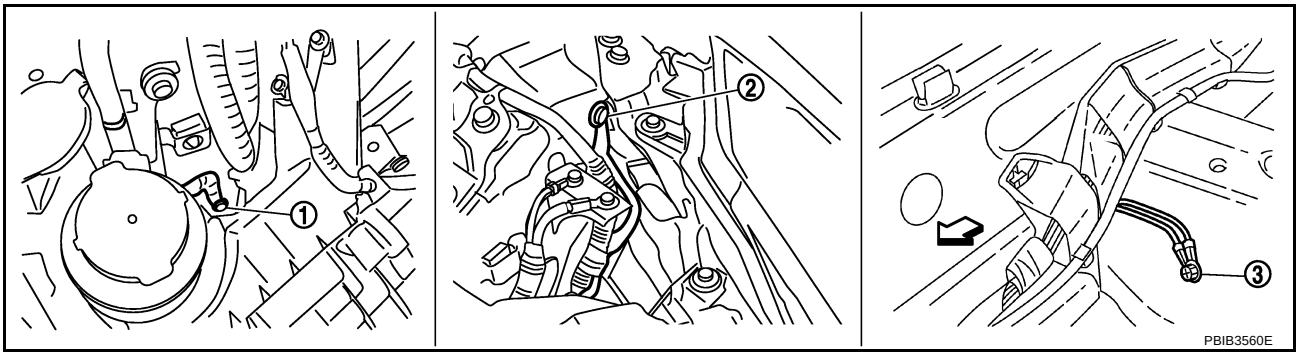
Diagnostic Procedure

NBS000H2

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

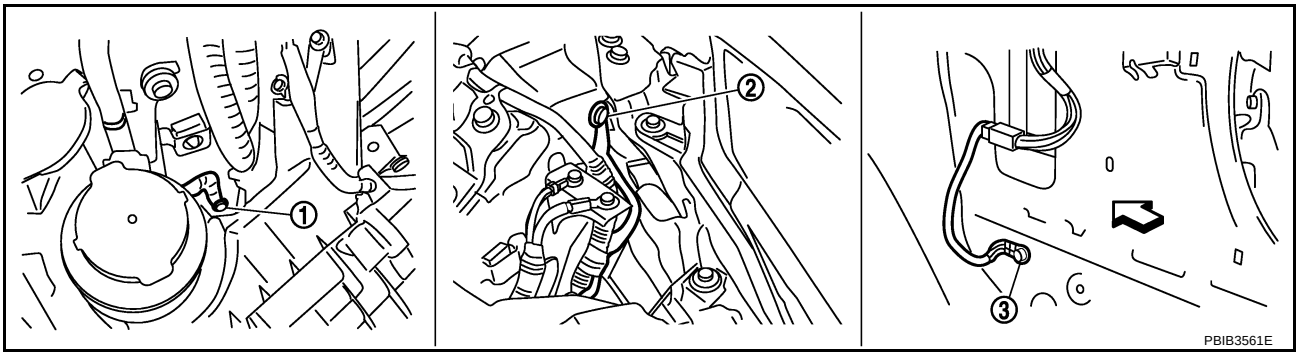


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

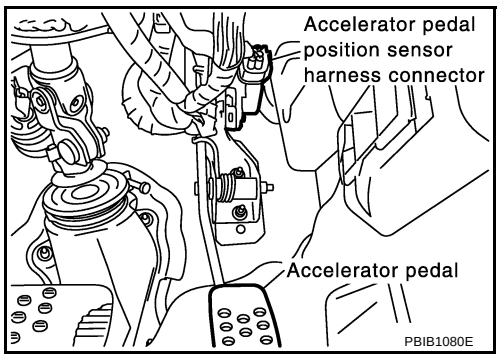
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

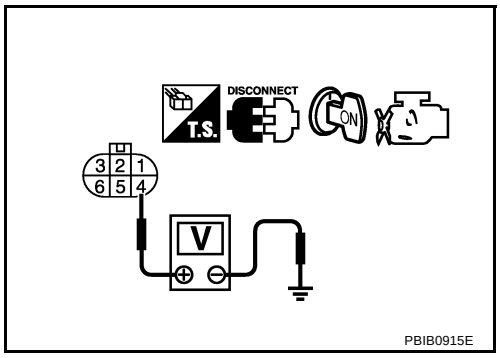
2. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT- I

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 4 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

3. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 4 and ECM terminal 103. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open between ECM and APP sensor

>> Repair open circuit.

5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor terminal 1	EC-711

OK or NG

OK >> GO TO 6.
NG >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 13.
NG >> Replace malfunctioning component.

7. CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 1 and ECM terminal 104.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 98 and APP sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 11.
NG >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

11. CHECK APP SENSOR

Refer to EC-658, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.

12. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

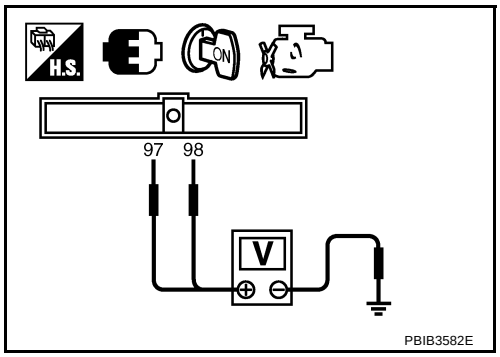
Component Inspection

NBS000H3

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 97 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
97 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V



4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000H4

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

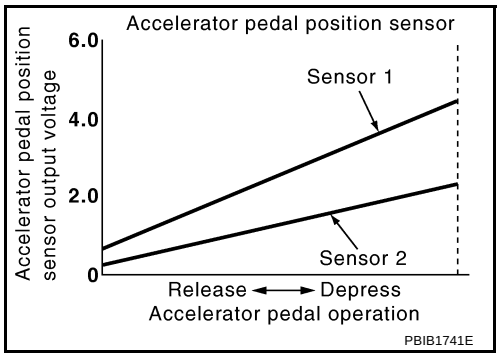
DTC P2138 APP SENSOR

PFP:18002

Component Description

NBS000HD

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



CONSULT-III Reference Value in Data Monitor Mode

NBS000HE

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN 1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN 2*1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage.

On Board Diagnosis Logic

NBS000HF

This self-diagnosis has the one trip detection logic.

NOTE:
If DTC P2138 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2138 2138	Accelerator pedal position sensor circuit range/performance	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.	● Harness or connector (The APP sensor 1 and 2 circuit is open or shorted.) Harness or connectors (APP sensor 2 dircuit is open or shorted.) [CKP sensor (POS) circuit is open or shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Accelerator pedal position sensor (APP sensor 1 and 2) ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● EVAP control system pressure sensor ● Refrigerant pressure sensor

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS000HG

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-654, "Diagnostic Procedure" .

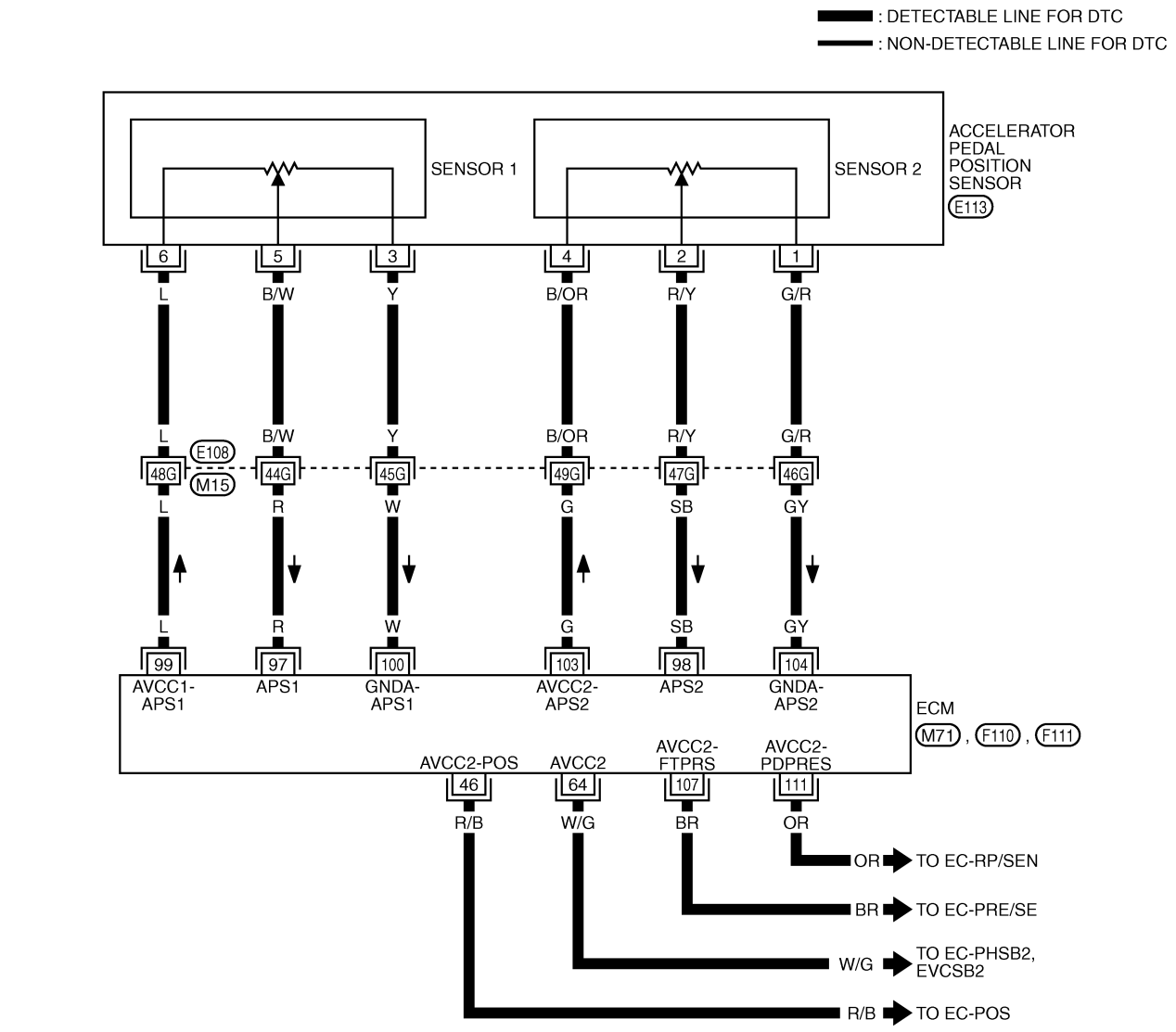
WITH GST

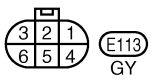
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

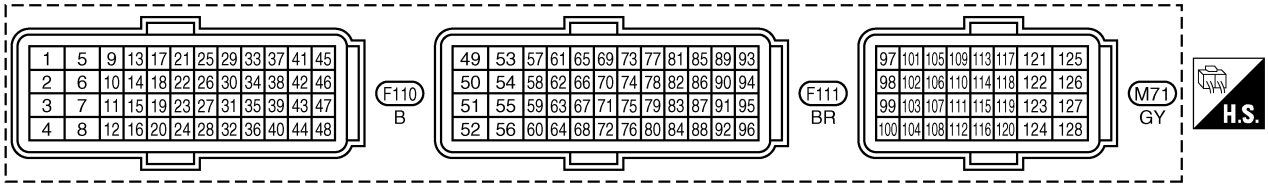
NBS000HH

EC-APPS3-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT1674E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	1.95 - 2.40V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

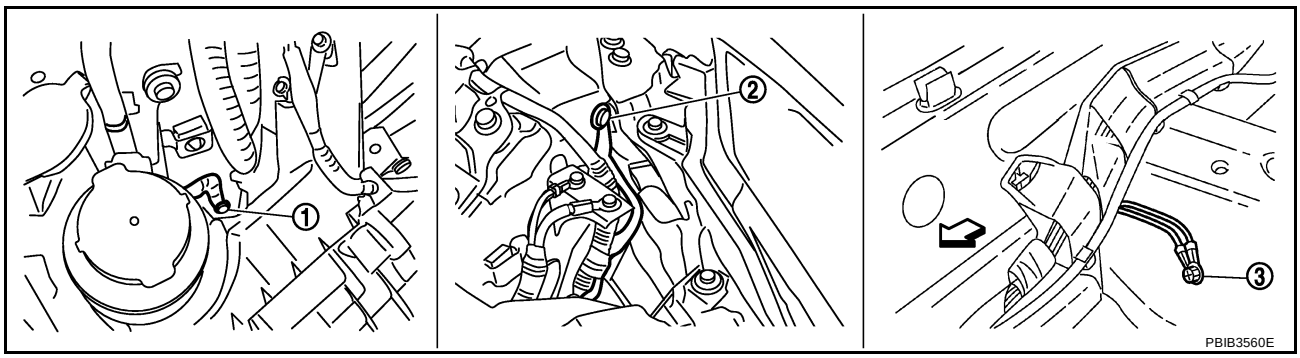
Diagnostic Procedure

NBS000HI

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

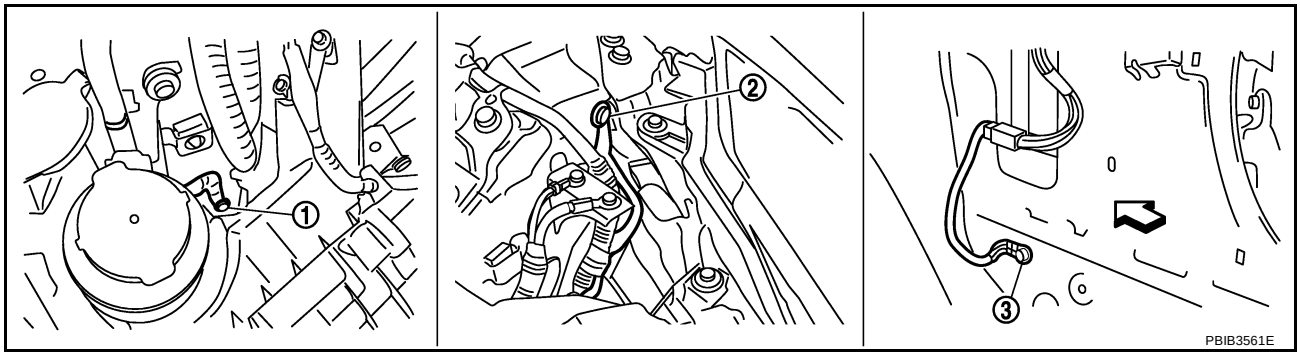


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

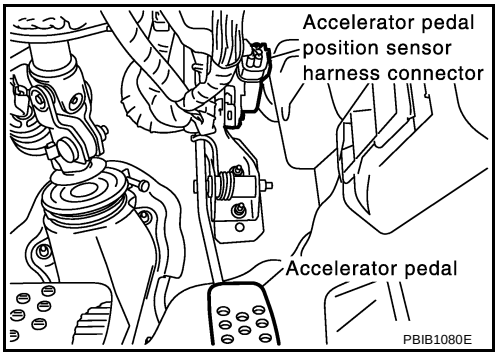
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.

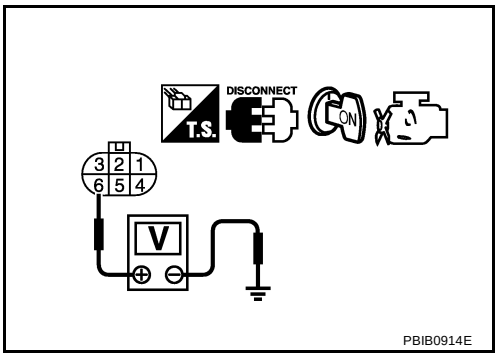


3. Check voltage between APP sensor terminal 6 and ground with CONSULT-III or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

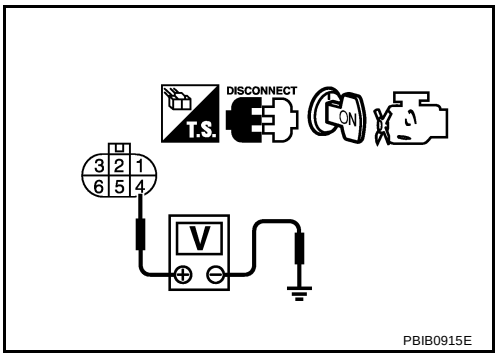
4. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-I

Check voltage between APP sensor terminal 4 and ground with CONSULT-III or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 9.
NG >> GO TO 5.



5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 4 and ECM terminal 103.
   Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open between ECM and APP sensor

>> Repair open circuit.

7. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor terminal 1	EC-711

OK or NG

OK >> GO TO 8.
NG >> Repair short to ground or short to power in harness or connectors.

8. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 15.
NG >> Replace malfunctioning component.

9. CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following;
   APP sensor terminal 3 and ECM terminal 100.
   APP sensor terminal 1 and ECM terminal 104,
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 11.
NG >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

11. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between the following;
   ECM terminal 97 and APP sensor terminal 5,
   ECM terminal 98 and APP sensor terminal 2.
   Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK APP SENSOR

Refer to EC-658, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

14. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

15. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

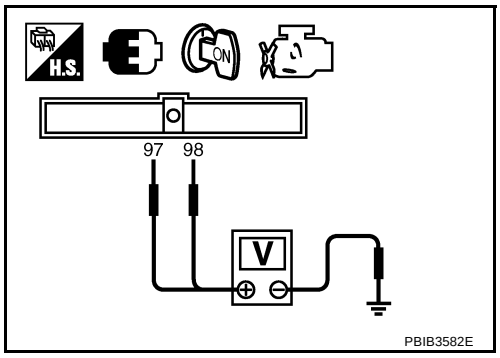
Component Inspection

NBS000HJ

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 97 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
97 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V



4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000HK

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

DTC P2A00, P2A03 A/F SENSOR 1

PFP:22693

Component Description

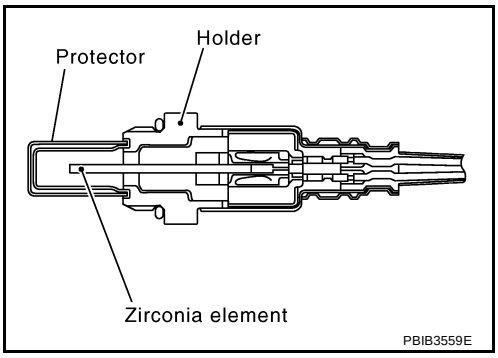
NBS006V7

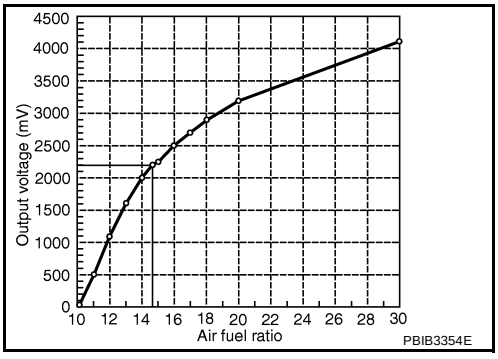
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS000EF

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS000EG

To judge the malfunction, the A/F signal computed by ECM from the A/F sensor 1 signal is monitored not to be shifted to LEAN side or RICH side.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P2A00 2A00 (Bank 1) P2A03 2A03 (Bank 2)	Air fuel ratio (A/F) sensor 1 circuit range/performance	● The output voltage computed by ECM from the A/F sensor 1 signal is shifted to the lean side for a specified period. ● The output voltage computed by ECM from the A/F sensor 1 signal is shifted to the rich side for a specified period.	● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater ● Fuel pressure ● Fuel injector ● Intake air leaks

DTC Confirmation Procedure

NBS000EH

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

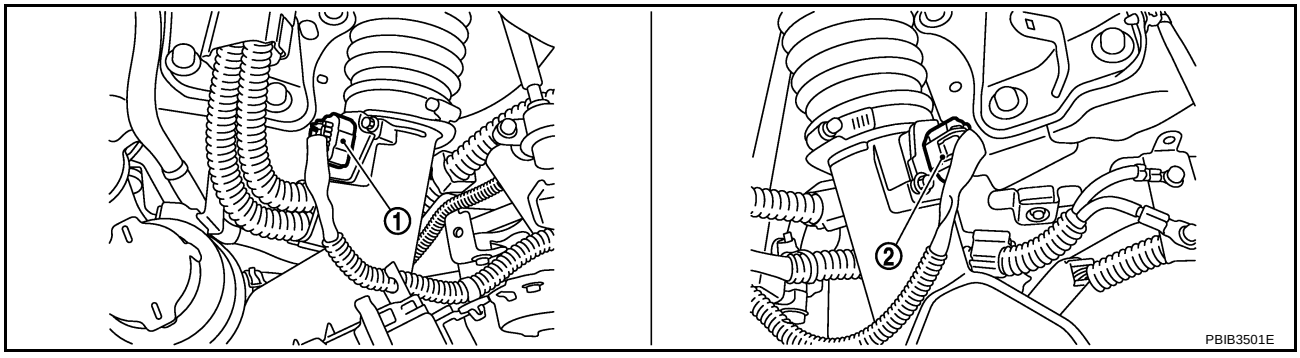
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
4. Clear the self-learning coefficient by touching “CLEAR”.
5. Turn ignition switch OFF and wait at least 10 seconds.
6. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
7. Let engine idle for 1 minute.
8. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
9. Check 1st trip DTC.
10. If 1st trip DTC is detected, go to EC-665, "Diagnostic Procedure" .

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor (bank 1) harness connector.

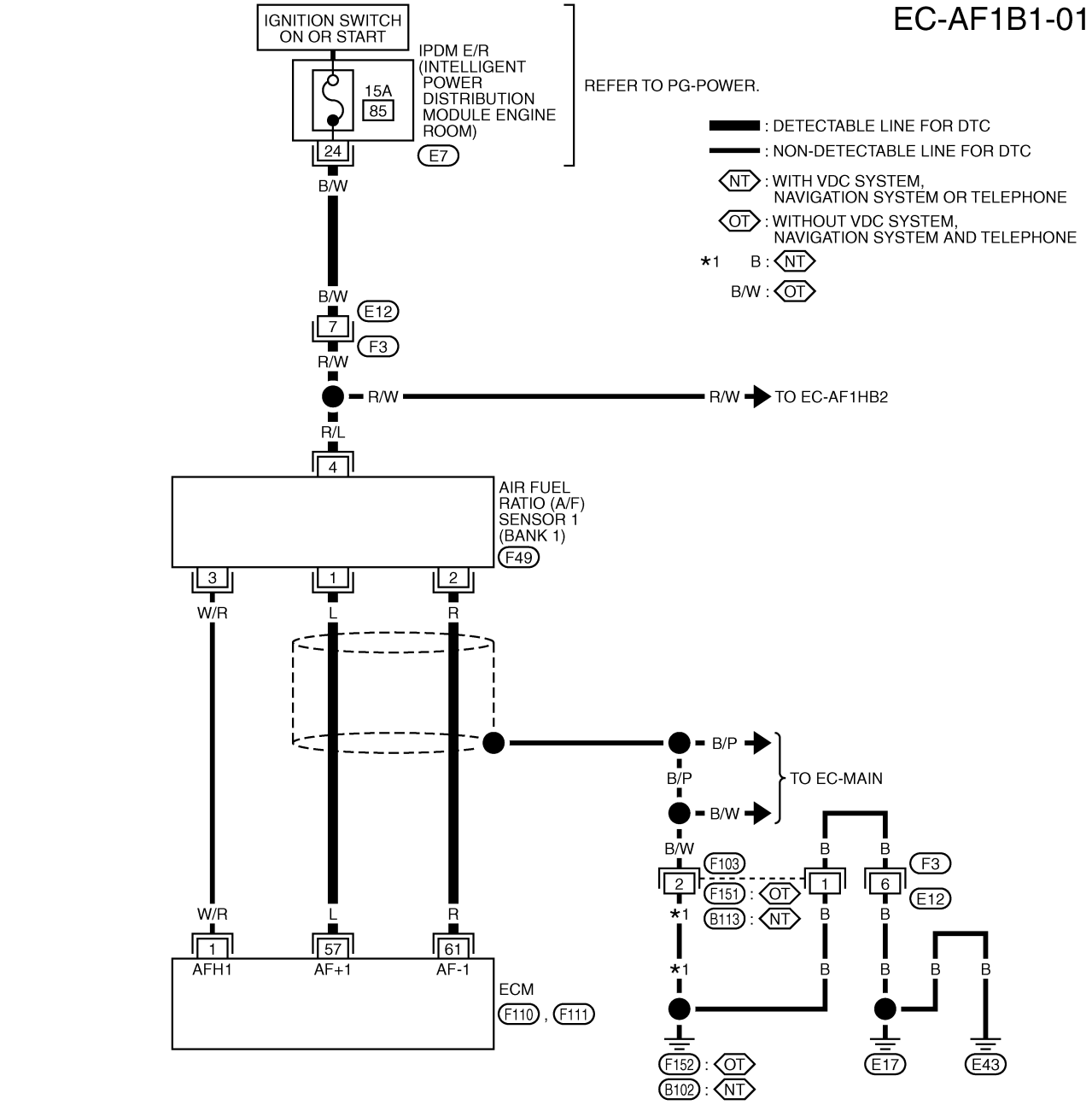


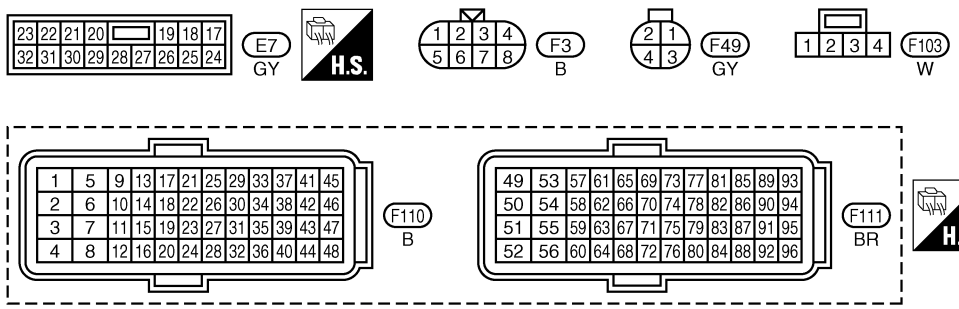
1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Start engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
6. Select Service $03 with GST and make sure that DTC P0102 is detected.
7. Select Service $04 with GST and erase the DTC P0102.
8. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
9. Let engine idle for 1 minute.
10. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
11. Select Service $07 with GST.
    If 1st trip DTC is detected, go to EC-665, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS000EI



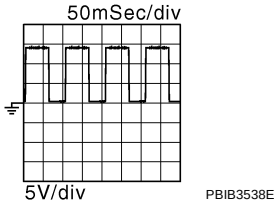


TBWT1632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

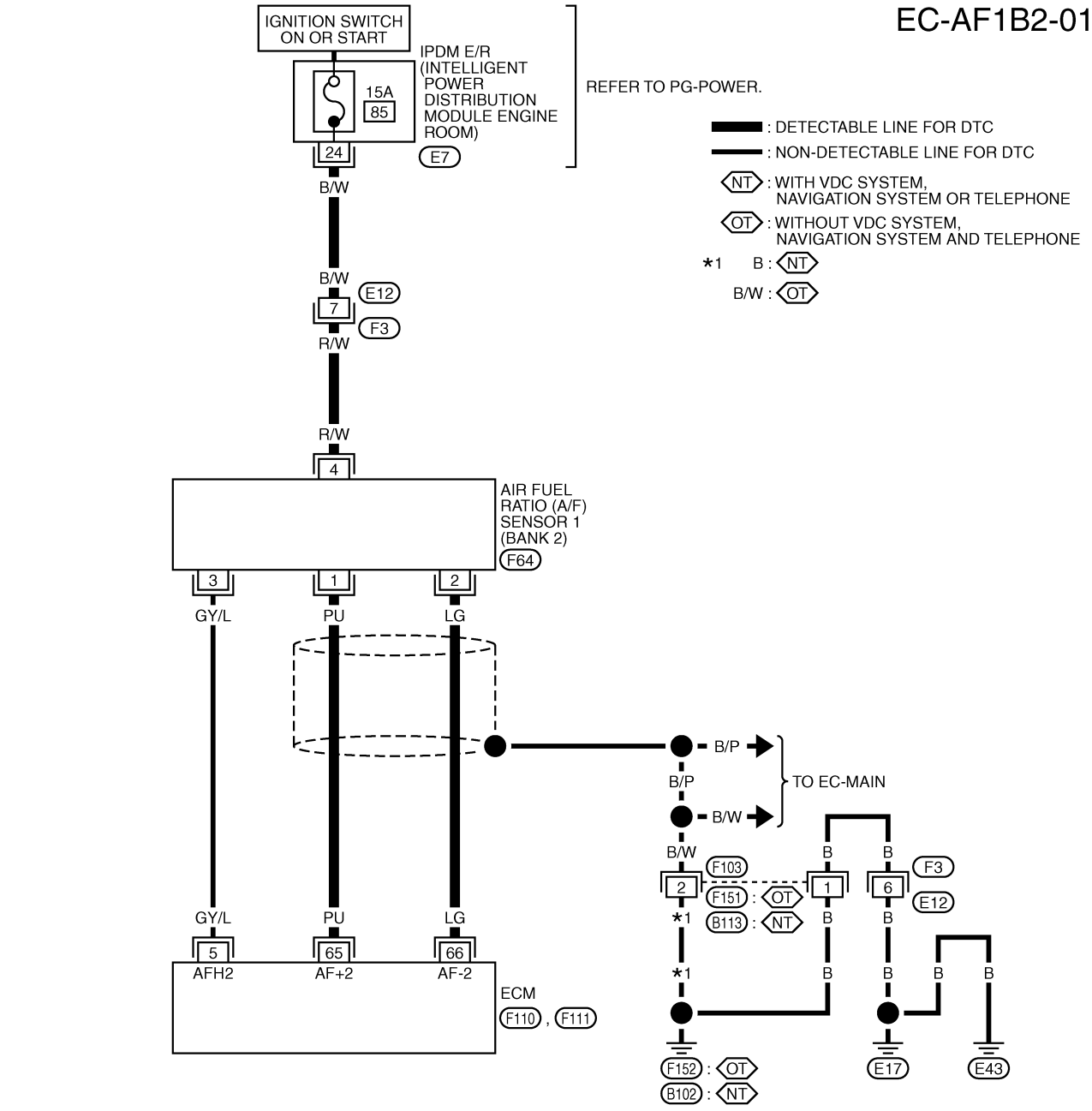
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

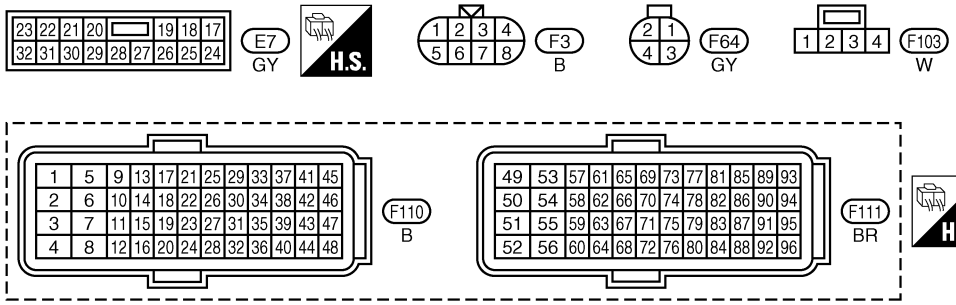
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★ 
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

EC-AF1B2-01



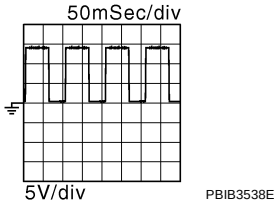


TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

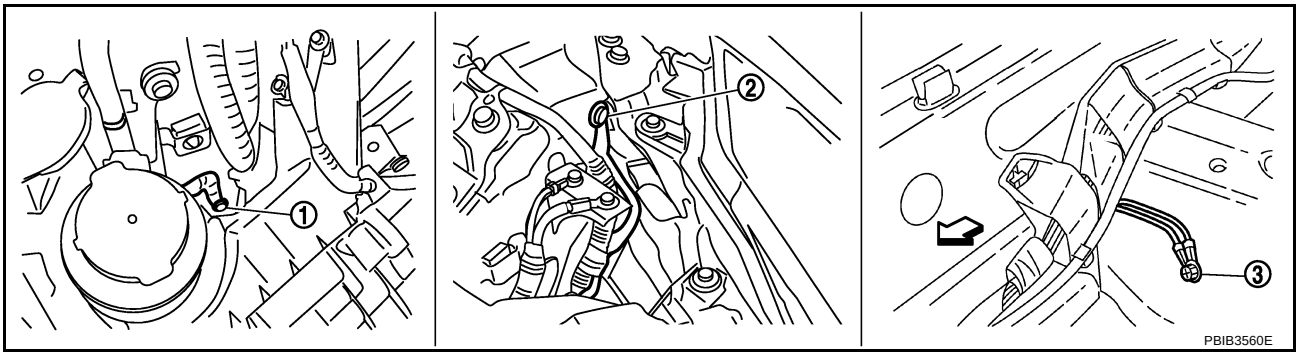
Diagnostic Procedure

NBS001NX

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

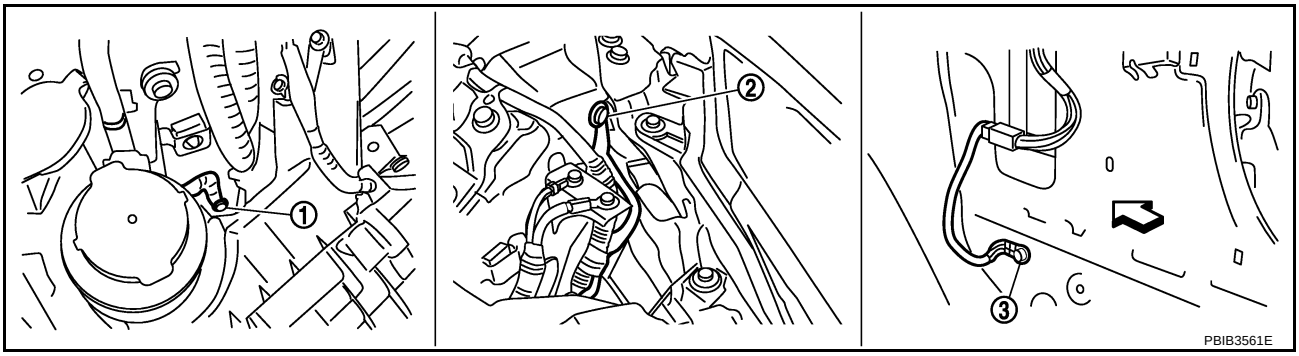


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

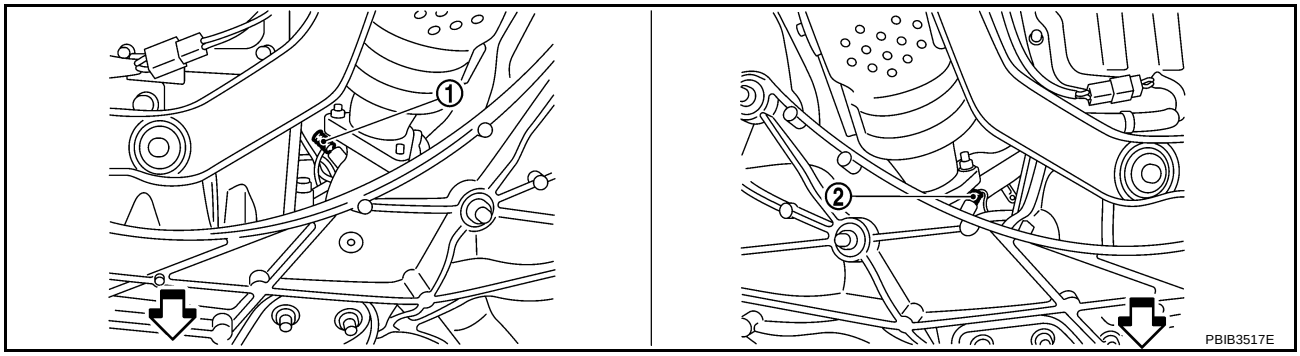
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. RETIGHTEN AIR FUEL RATIO SENSOR 1

1. Loosen and retighten the air fuel ratio (A/F) sensor 1.



1. A/F sensor 1 (bank1)
2. A/F sensor 1 (bank 2)

⇦: Vehicle front

Tightening torque: 50 N-m (5.1 kg-m, 37 ft-lb)

>> GO TO 3.

3. CHECK FOR INTAKE AIR LEAK

1. Start engine and run it at idle.
2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

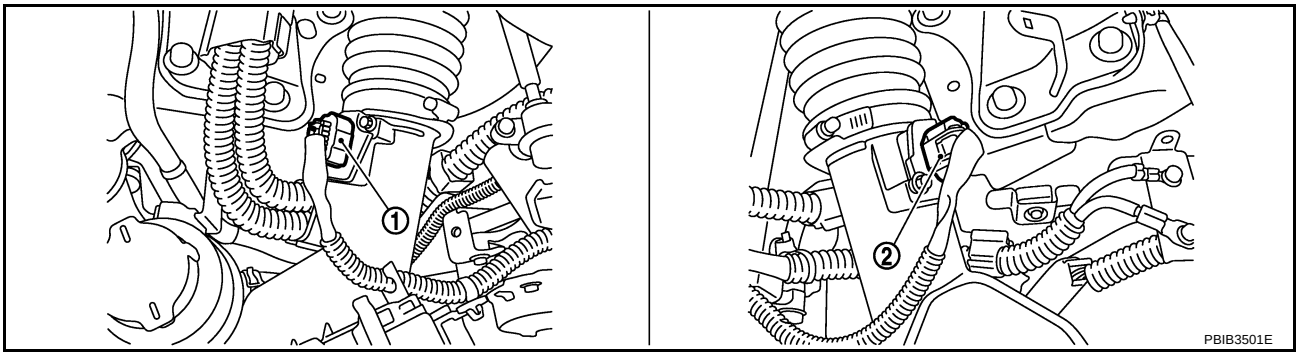
4. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.
9. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

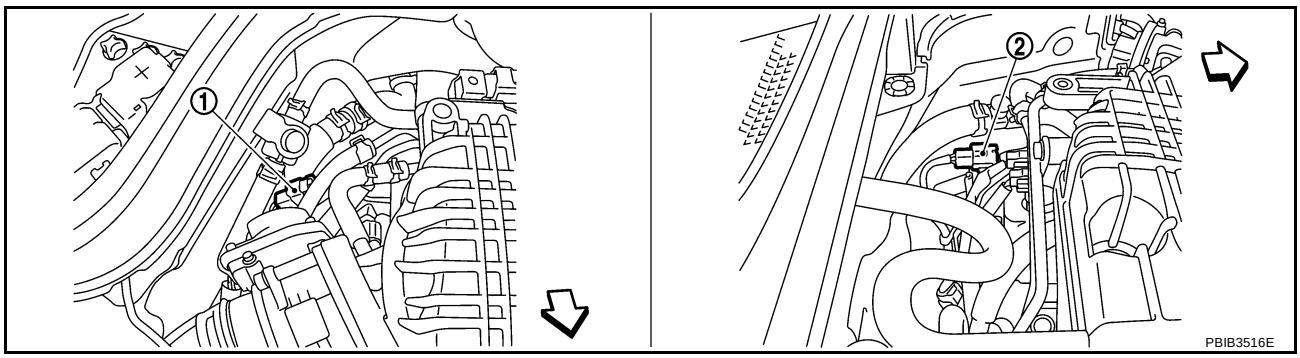
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-324, "DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION" or EC-334, "DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 5.

5. CHECK HARNESS CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.



1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

3. Check harness connector for water.

Water should not exit.

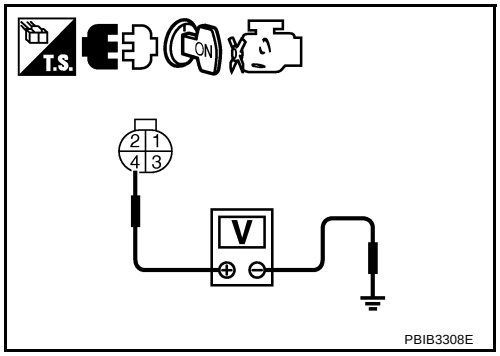
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness connector.

6. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- IPDM E/R harness connector E7
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

8. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to EC-172, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 11.

10. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 11.
NG >> Repair or replace.

11. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

>> GO TO 12.

12. CONFIRM A/F ADJUSTMENT DATA

1. Turn ignition switch ON.
2. Select “A/F ADJ-B1” and “A/F ADJ-B2” in “DATA MONITOR” mode with CONSULT-III.
3. Make sure that “0.000” is displayed on CONSULT-III screen.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 13.

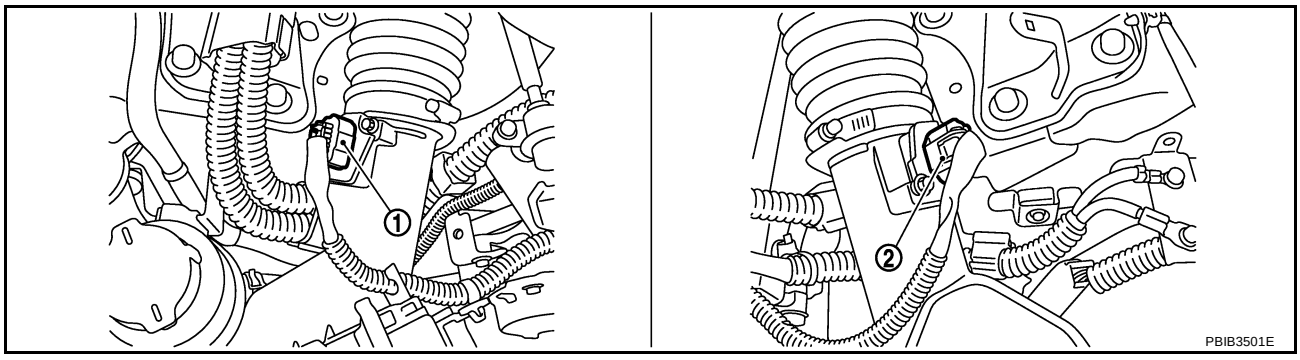
13. CLEAR THE SELF-LEARNING DATA.

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.

>> GO TO 14.

14. CONFIRM A/F ADJUSTMENT DATA

1. Turn ignition switch OFF and then ON.
2. Select “A/F ADJ-B1” and “A/F ADJ-B2” in “DATA MONITOR” mode with CONSULT-III.
3. Make sure that “0.000” is displayed on CONSULT-III screen.

>> **INSPECTION END**

Removal and Installation

NBS000EK

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

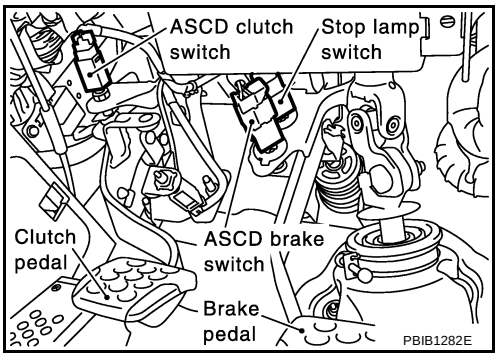
ASCD BRAKE SWITCH

PFP:25320

Component Description

NBS000I9

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by this input of two kinds (ON/OFF signal).
Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-III Reference Value in Data Monitor Mode

NBS000IA

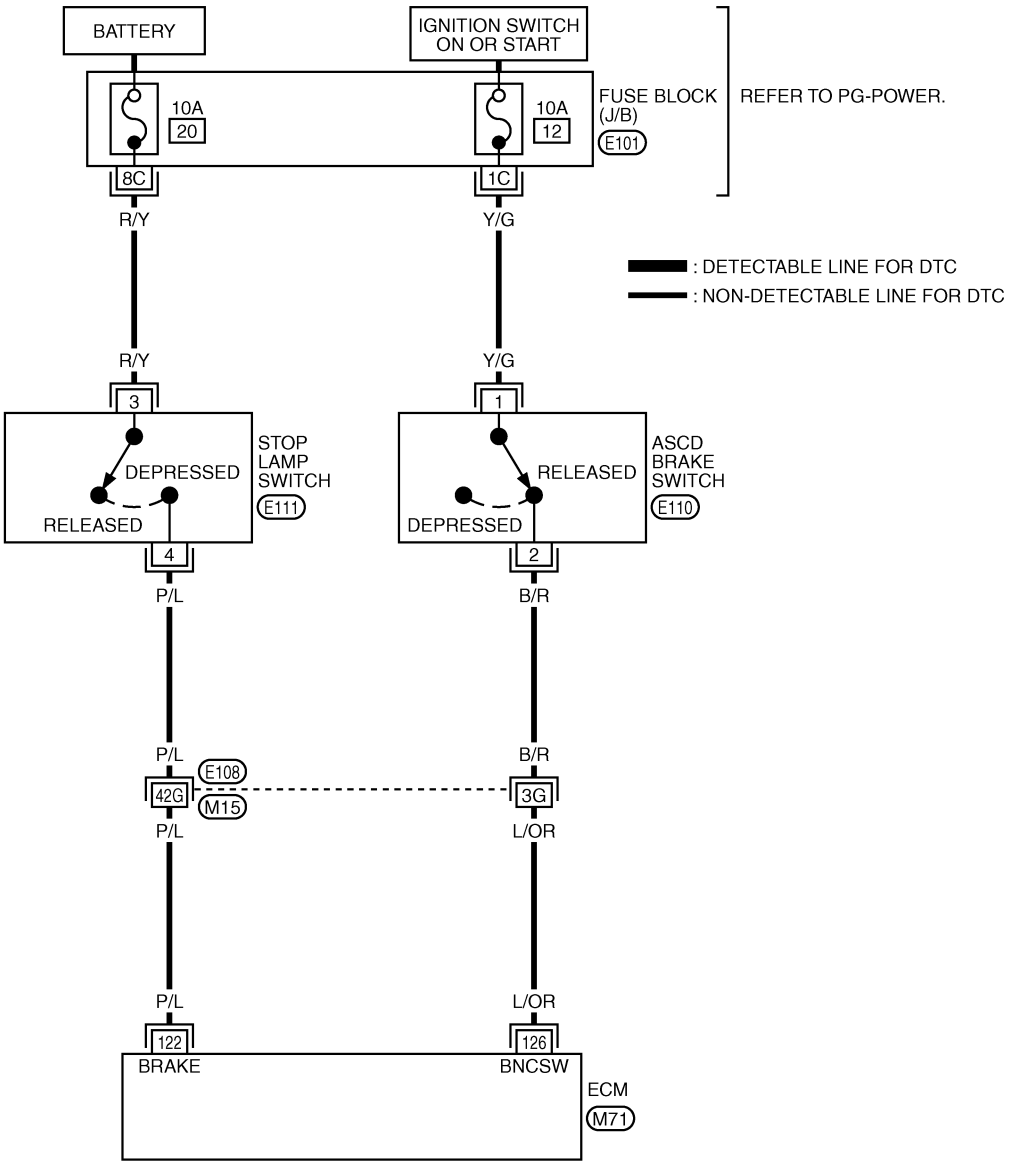
Specification data are reference values.

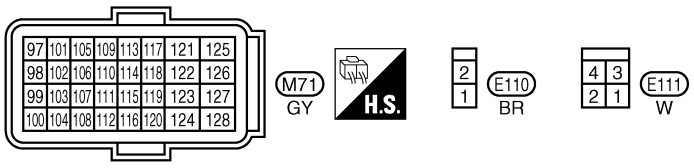
MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW1 (ASCD brake switch)	● Ignition switch: ON	● Brake pedal: Fully released (A/T) ● Brake pedal and clutch pedal: Fully released (M/T)	ON
		● Brake pedal: Slightly depressed (A/T) ● Brake pedal and/or clutch pedal: Slightly depressed (M/T)	OFF
BRAKE SW2 (Stop lamp switch)	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON

Wiring Diagram
A/T MODELS

NBS000IB

EC-ASCBOF-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1675E

Specification data are reference values and are measured between each terminal and ground.

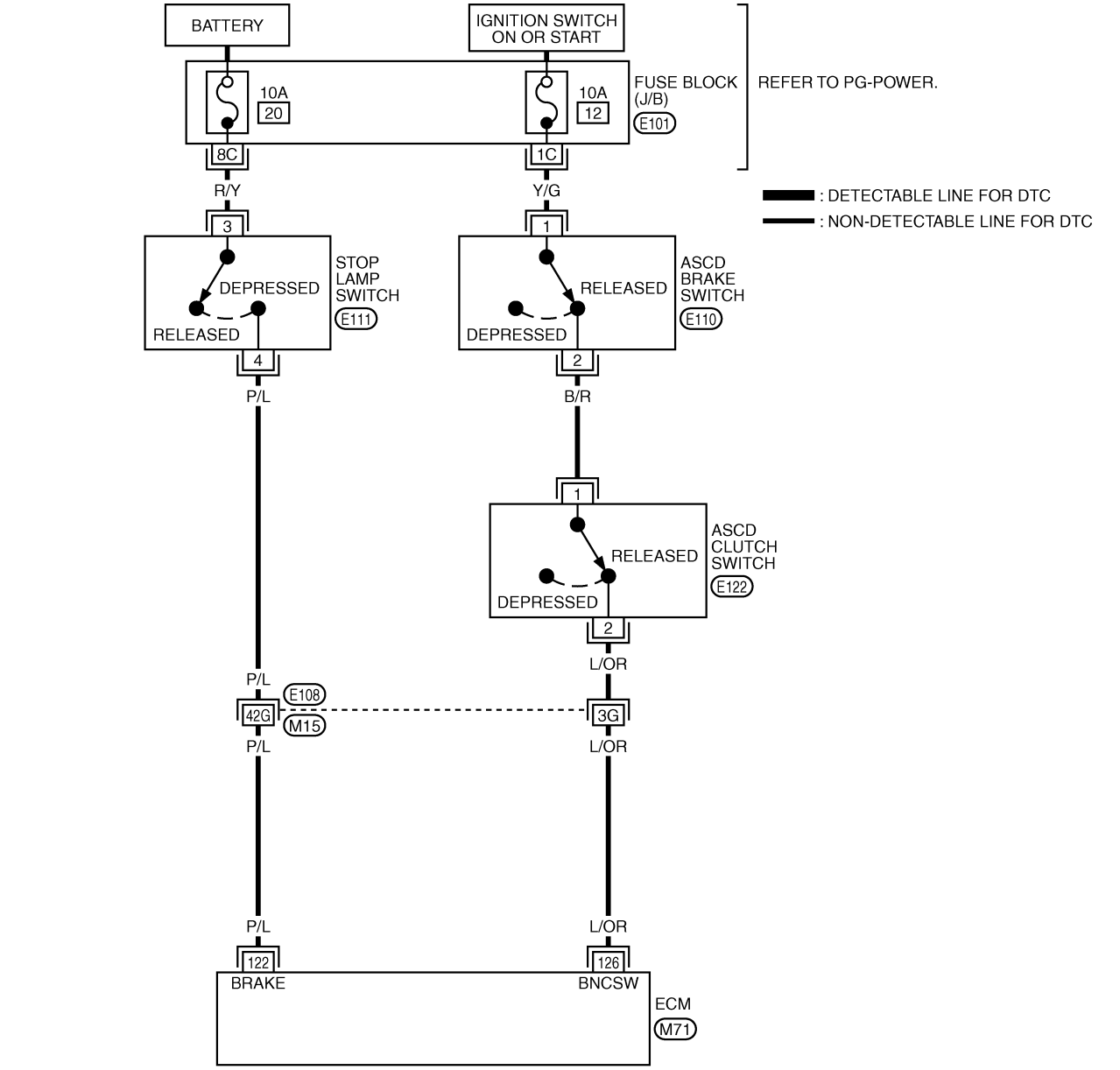
CAUTION:

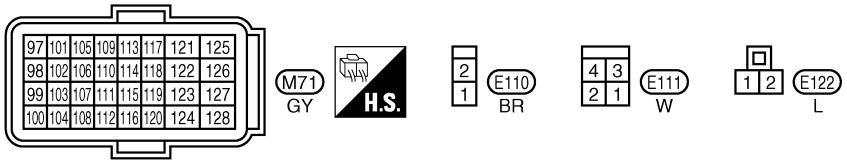
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal: Slightly depressed	0V
			[Ignition switch: ON] ● Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14V)

M/T MODELS

EC-ASCBOF-02





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1676E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal and/or clutch pedal: Slightly depressed	0V
			[Ignition switch: ON] ● Brake pedal and clutch pedal: Fully released	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS000IC

A/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-III

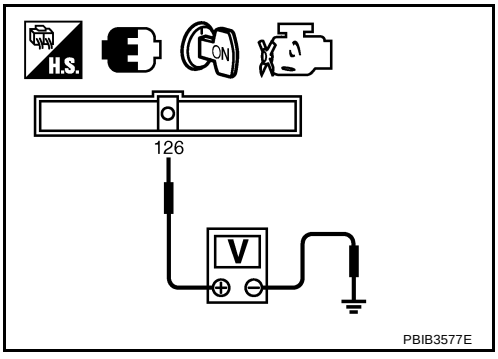
1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-III.
3. Check “BRAKE SW1” indication under the following conditions.

CONDITION	INDICATION
Brake pedal: Slightly depressed	OFF
Brake pedal: Fully released	ON

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 126 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal: Slightly depressed	Approximately 0V
Brake pedal: Fully released	Battery voltage



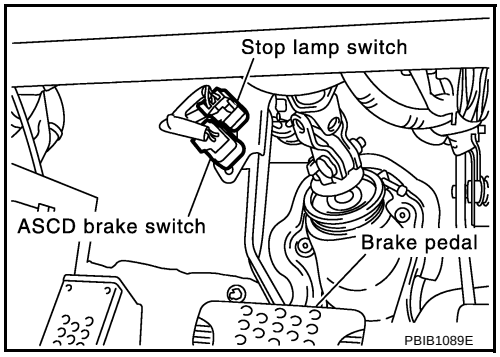
OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

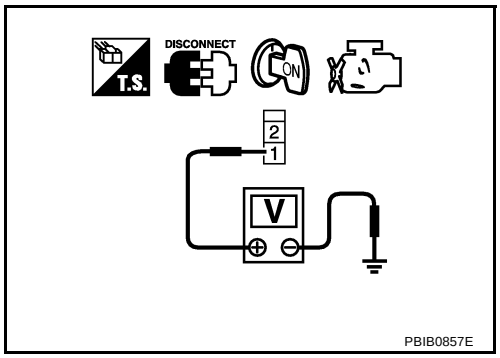
2. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 126 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH

Refer to EC-680, "Component Inspection"

OK or NG

OK >> GO TO 7.
NG >> Replace ASCD brake switch.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

M/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-III

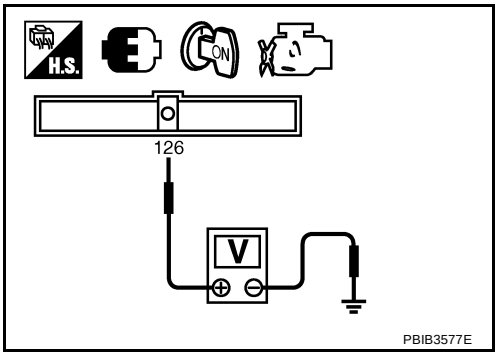
1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-III.
3. Check “BRAKE SW1” indication under the following conditions.

CONDITION	INDICATION
Brake pedal and/or clutch pedal: Slightly depressed	OFF
Brake pedal and clutch pedal: Fully released	ON

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 126 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal and/or clutch pedal: Slightly depressed	Approximately 0V
Brake pedal and clutch pedal: Fully released	Battery voltage

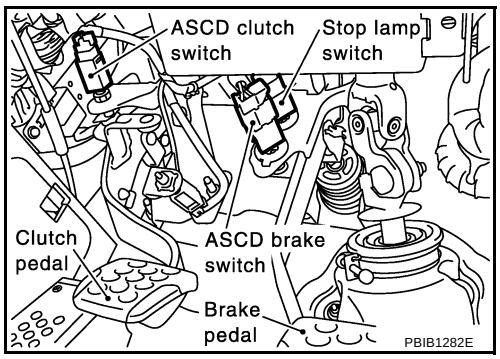


OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

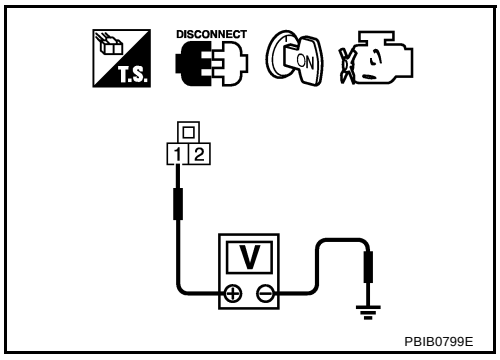
2. CHECK ASCD BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD clutch switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage

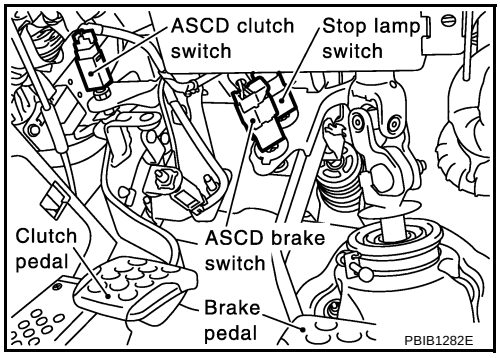


OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

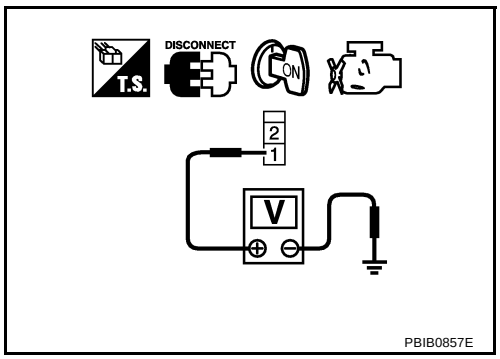
3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ASCD brake switch terminal 2 and ASCD clutch switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH

Refer to EC-680, "Component Inspection"

OK or NG

OK >> GO TO 10.
NG >> Replace ASCD brake switch.

7. CHECK ASCD CLUTCH SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ASCD clutch switch terminal 2 and ECM terminal 126. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and ASCD clutch switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK ASCD CLUTCH SWITCH

Refer to EC-680, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace ASCD clutch switch.

10. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

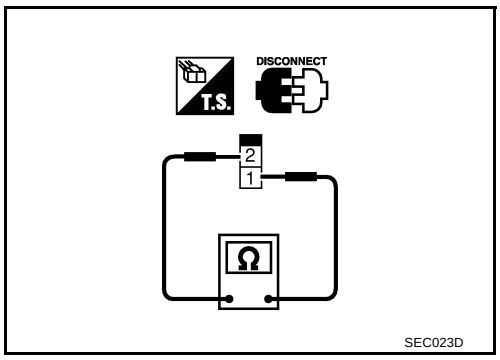
NBS000ID

ASCD BRAKE SWITCH

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Check continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
Brake pedal: Fully released	Should exist
Brake pedal: Slightly depressed	Should not exist

If NG, adjust ASCD brake switch installation, refer to BR-7, "BRAKE PEDAL" , and perform step 3 again.

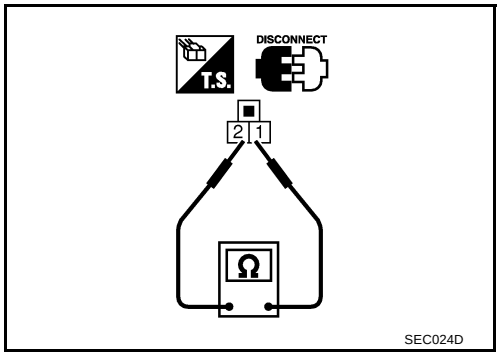


ASCD CLUTCH SWITCH (M/T MODELS)

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Check continuity between ASCD clutch switch terminals 1 and 2 under the following conditions.

Condition	Continuity
Clutch pedal: Fully released	Should exist
Clutch pedal: Slightly depressed	Should not exist

If NG, adjust ASCD clutch switch installation, refer to CL-5, "CLUTCH PEDAL" , and perform step 3 again.



ASCD INDICATOR

PFP:24814

Component Description

NBS000IE

ASCD indicator lamp illuminates to indicate ASCD operation status. Lamp has two indicators, CRUISE, SET, and is integrated in combination meter.
CRUISE indicator illuminates when MAIN switch on ASCD steering switch is turned ON to indicated that ASCD system is ready for operation.
SET indicator illuminates when following conditions are met.

- CRUISE indicator is illuminated.
- SET/COAST switch on ASCD steering switch is turned ON while vehicle speed is within the range of ASCD setting.

SET indicator remains lit during ASCD control.
Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.

CONSULT-III Reference Value in Data Monitor Mode

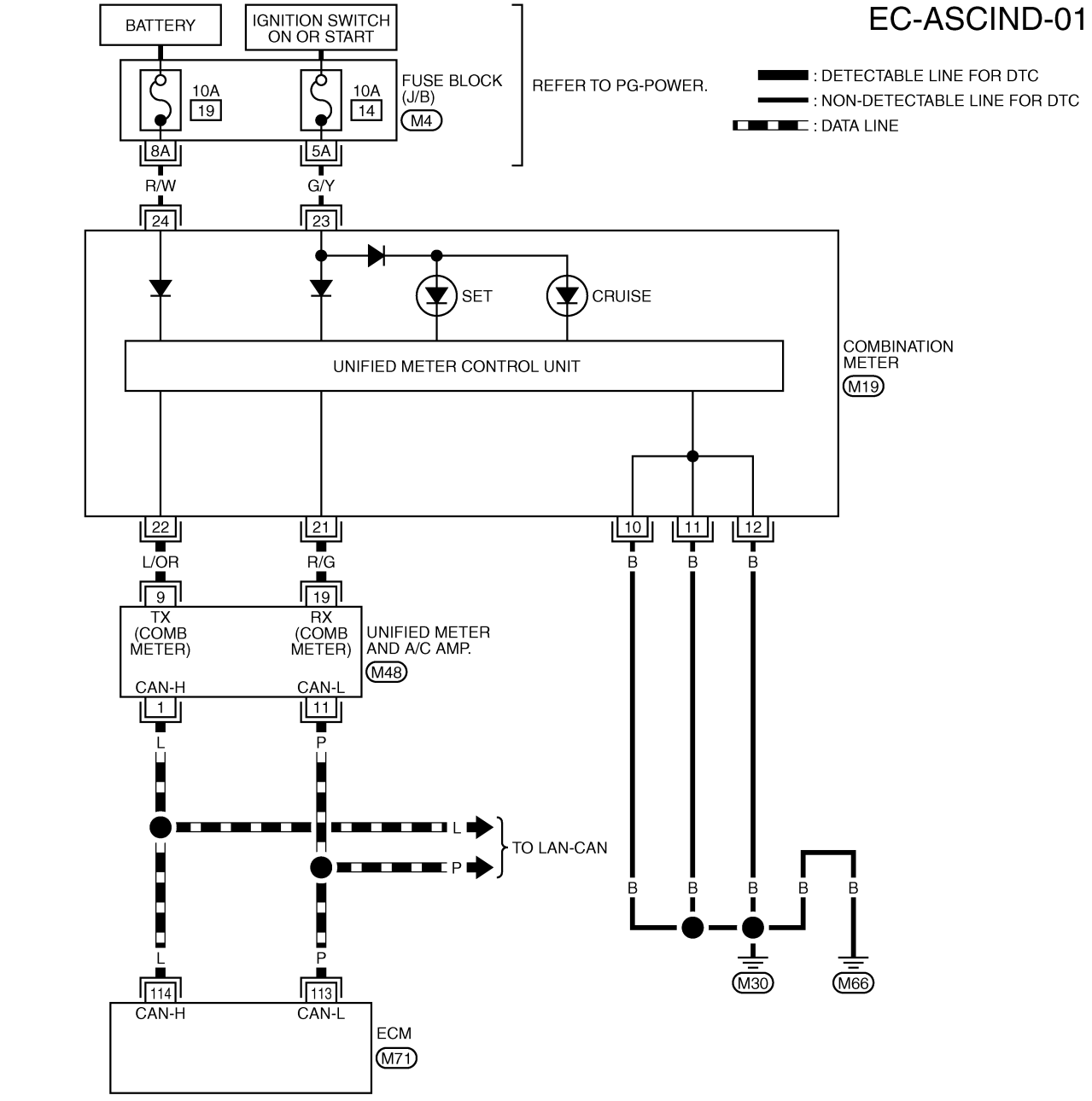
NBS000IF

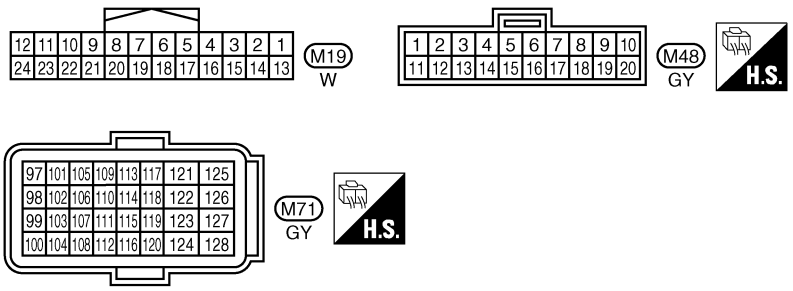
Specification data are reference value.

MONITOR ITEM	CONDITION		SPECIFICATION
CRUISE LAMP	● Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● MAIN switch: ON	ASCD: Operating	ON
	● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89MPH)	ASCD: Not operating	OFF

Wiring Diagram

NBS000IG





REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1677E

Diagnostic Procedure

NBS000IH

1. CHECK OVERALL FUNCTION

Check ASCD indicator under the following conditions.

ASCD INDICATOR	CONDITION		SPECIFICATION
CRUISE LAMP	● Ignition switch: ON	● MAIN switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● MAIN switch: ON ● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)	ASCD: Operating	ON
		ASCD: Not operating	OFF

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

2. CHECK DTC

Check that DTC U1000 or U1001 is not displayed.

OK or NG

OK >> GO TO 3.
NG >> Perform trouble diagnoses for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .

3. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

OK or NG

OK >> GO TO 4.
NG >> Go to DI-52, "DTC [B2202] Meter Communication Circuit" .

4. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

ELECTRICAL LOAD SIGNAL

PFP:25350

Description

NBS000I6

The electrical load signal (Headlamp switch signal, rear window defogger switch signal, etc.) is transferred through the CAN communication line from BCM to ECM via IPDM E/R.

CONSULT-III Reference Value in Data Monitor Mode

NBS000I7

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
LOAD SIGNAL	● Ignition switch: ON	Rear window defogger switch: ON and/or lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
HEATER FAN SW	● Engine: After warming up, idle the engine	Heater fan switch: ON	ON
		Heater fan switch: OFF	OFF

Diagnostic Procedure

NBS000I8

1. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-I

1. Turn ignition switch ON.
2. Connect CONSULT-III and select “DATA MONITOR” mode.
3. Select “LOAD SIGNAL” and check indication under the following conditions.

Condition	Indication
Rear window defogger switch: ON	ON
Rear window defogger switch: OFF	OFF

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-II

Check “LOAD SIGNAL” indication under the following conditions.

Condition	Indication
Lighting switch: ON at 2nd position	ON
Lighting switch: OFF	OFF

OK or NG

OK >> GO TO 3.
NG >> GO TO 5.

3. CHECK HEATER FAN SIGNAL CIRCUIT OVERALL FUNCTION

With CONSULT-III

Check “HEATER FAN SW” in “DATA MONITOR” mode with CONSULT-III under the following conditions.

Condition	Indication
Heater fan: Operating	ON
Heater fan: Not operating	OFF

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 6.

4. CHECK REAR WINDOW DEFOGGER SYSTEM

Refer to GW-56, "REAR WINDOW DEFOGGER" .

>> **INSPECTION END**

5. CHECK HEADLAMP SYSTEM

Refer to LT-5, "HEADLAMP (FOR USA)" or LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -" .

>> **INSPECTION END**

6. CHECK HEATER FAN CONTROL SYSTEM

Refer to ATC-33, "TROUBLE DIAGNOSIS" .

>> **INSPECTION END**

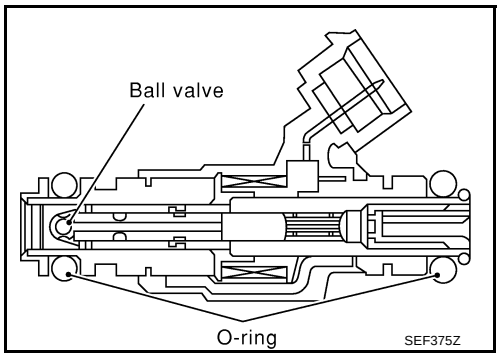
FUEL INJECTOR

PFP:16600

Component Description

NBS000HQ

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the fuel injector circuit, the coil in the fuel injector is energized. The energized coil pulls the ball valve back and allows fuel to flow through the fuel injector into the intake manifold. The amount of fuel injected depends upon the fuel injection pulse duration. Pulse duration is the length of time the fuel injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.



CONSULT-III Reference Value in Data Monitor Mode

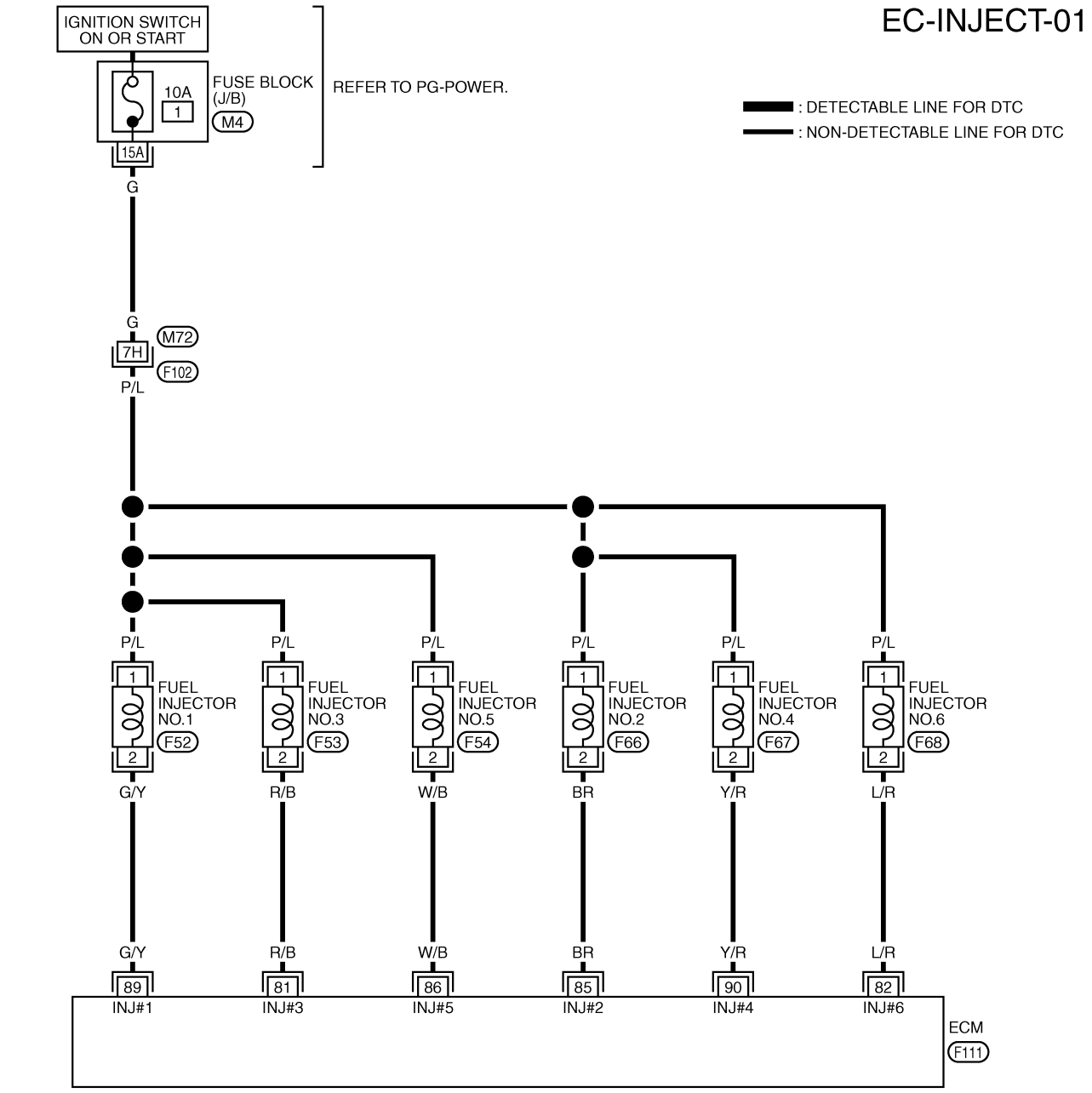
NBS000HR

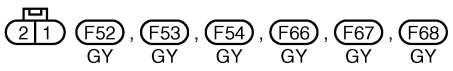
Specification data are reference values.

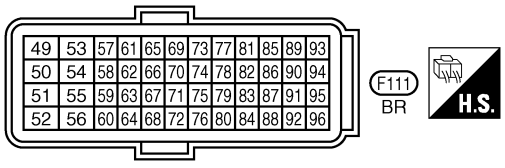
MONITOR ITEM	CONDITION		SPECIFICATION
B/FUEL SCHDL	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
INJ PULSE-B1 INJ PULSE-B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec

Wiring Diagram

NBS000HS







REFER TO THE FOLLOWING.

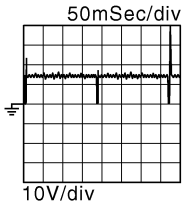
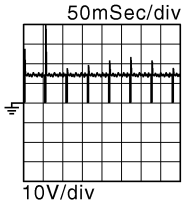
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1678E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
81 82 85 86 89 90	R/B L/R BR W/B G/Y Y/R	Fuel injector No. 3 Fuel injector No. 6 Fuel injector No. 2 Fuel injector No. 5 Fuel injector No. 1 Fuel injector No. 4	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS000HT

1. INSPECTION START

Turn ignition switch to START.
Is any cylinder ignited?

Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. CHECK OVERALL FUNCTION

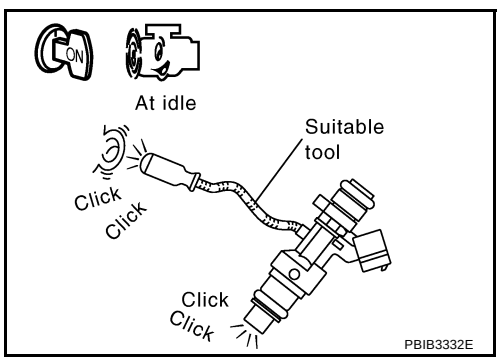
With CONSULT-III

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
3. Make sure that each circuit produces a momentary engine speed drop.

Without CONSULT-III

1. Start engine and let it idle.
2. Listen to each fuel injector operating sound.

Clickng sound should be heard.



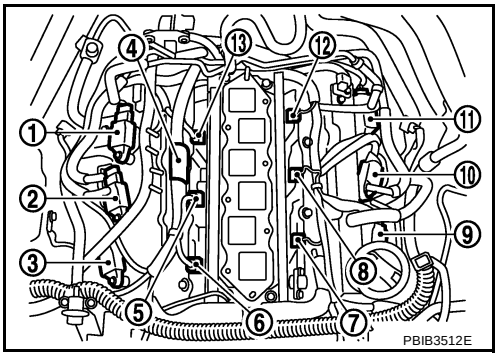
PBIB3332E

OK or NG

OK >> INSPECTION END.
NG >> GO TO 3.

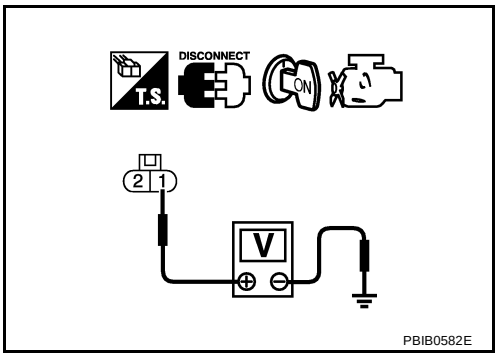
3. CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.



1 : Ignition coil No.5 (with power transistor)
2 : Ignition col No.3 (with power transistor)
3 : Ignition coil No.1 (with power transistor)
4 : Condenser
5 : Fuel injector No.3
6 : Fuel injector No.1
7 : Fuel injector No.2
8 : Fuel injector No.4
9 : Ignition coil No.2 (with power transistor)
10 : Ignition coil No.4 (with power transistor)
11 : Ignition coil No.6 (with power transistor)
12 : Fuel injector No.6
13 : Fuel injector No.5

3. Turn ignition switch ON.
4. Check voltage between fuel injector terminal 1 and ground with CONSULT-III or tester.



Voltage: Battery voltage

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between fuel injector and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK FUEL INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between fuel injector terminal 2 and ECM terminals 81, 82, 85, 86, 89, 90. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK FUEL INJECTOR

Refer to EC-690, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace malfunctioning fuel injector.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

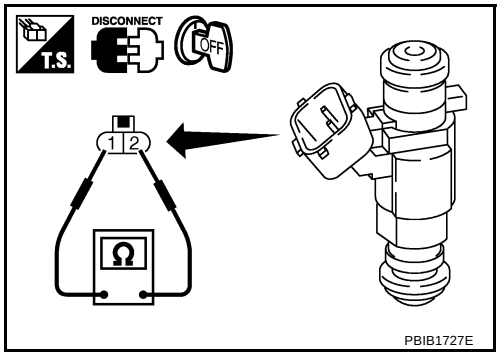
Component Inspection

NBS000HU

FUEL INJECTOR

1. Disconnect fuel injector harness connector.
2. Check resistance between terminals as shown in the figure.

Resistance: 11.1 - 14.3Ω [at 10 - 60°C (50 - 140°F)]



Removal and Installation

NBS000HV

FUEL INJECTOR

Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .

FUEL PUMP

PFP:17042

Description

NBS000HW

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM Function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*	Fuel pump control	Fuel pump relay
Battery	Battery voltage*		

*: ECM determines the start signal status by the signals of engine speed and battery voltage.

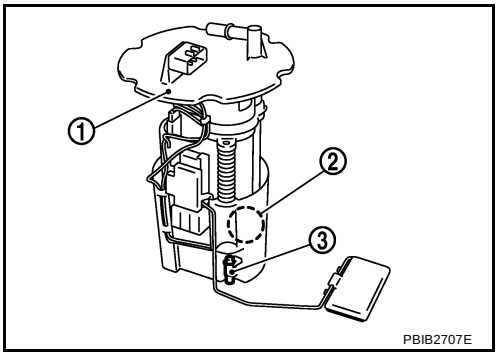
The ECM activates the fuel pump for several seconds after the ignition switch is turned ON to improve engine startability. If the ECM receives a engine speed signal from the camshaft position sensor (PHASE), it knows that the engine is rotating, and causes the pump to operate. If the engine speed signal is not received when the ignition switch is ON, the engine stalls. The ECM stops pump operation and prevents battery discharging, thereby improving safety. The ECM does not directly drive the fuel pump. It controls the ON/OFF fuel pump relay, which in turn controls the fuel pump.

Condition	Fuel pump operation
Ignition switch: ON	Operates for 1 second.
Engine running or cranking	Operates.
Engine: Stopped	Stops in 1.5 seconds.
Except as shown above	Stops.

COMPONENT DESCRIPTION

A turbine type design fuel pump is used in the fuel tank.

1 : Fuel level sensor unit and fuel pump
2 : Fuel pressure regulator
3 : Fuel tank temperature sensor



PBIB2707E

CONSULT-III Reference Value in Data Monitor Mode

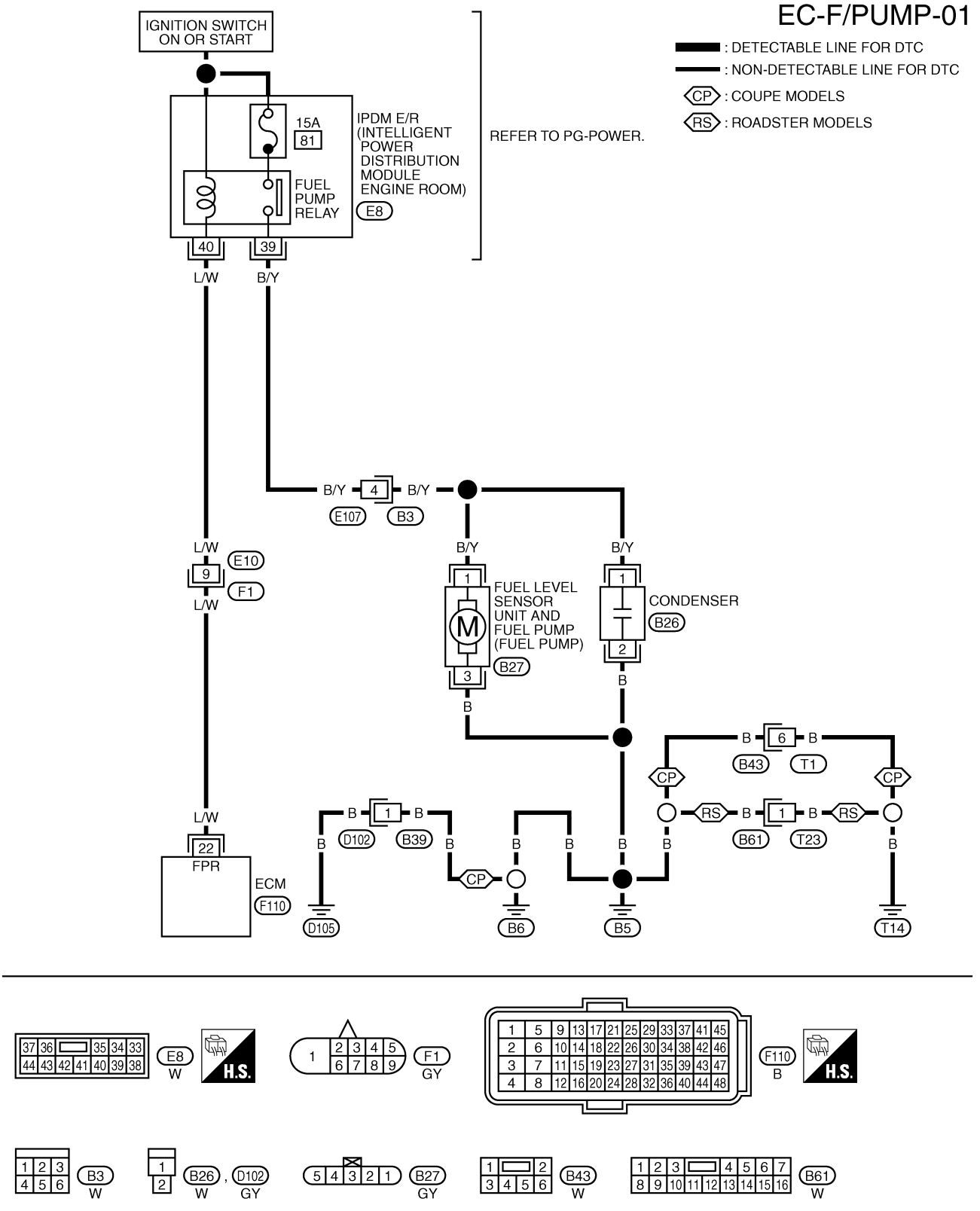
NBS000HX

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
FUEL PUMP RLY	● For 1 second after turning ignition switch ON ● Engine running or cranking	ON
	● Except above conditions	OFF

Wiring Diagram

NBS000HY



TBWT1679E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
22	L/W	Fuel pump relay	**[Ignition switch: ON]** ● For 1 second after turning ignition switch ON **[Engine is running]**	0 - 1.5V
			[Ignition switch: ON] ● More than 1 second after turning ignition switch ON.	BATTERY VOLTAGE (11 - 14V)

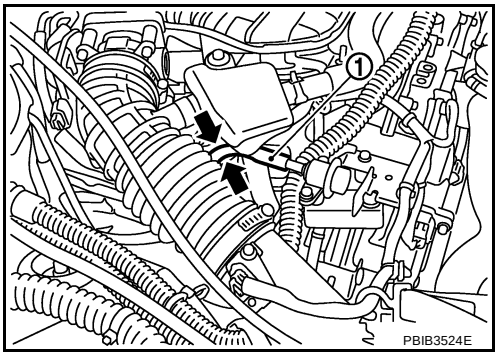
Diagnostic Procedure

NBS000HZ

1. CHECK OVERALL FUNCTION

1. Turn ignition switch ON.
2. Pinch fuel feed hose (1) with two fingers.

Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned ON.



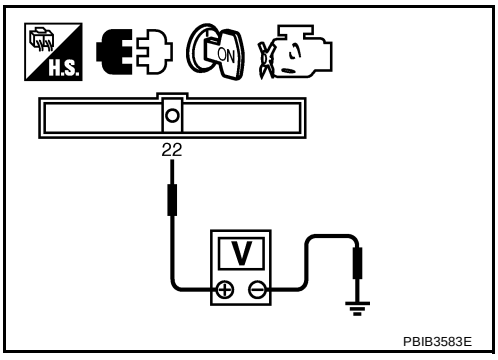
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

2. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Turn ignition switch ON.
4. Check voltage between ECM terminal 22 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

1. Disconnect IPDM E/R harness connector E8.
2. Check harness continuity between IPDM E/R terminal 40 and ECM terminal 22. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 15.

4. DETECT MALFUNCTIONING PART

Check the following.

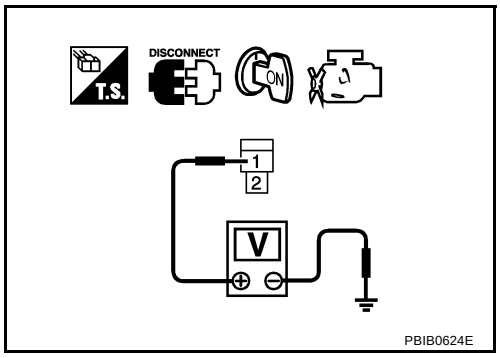
- Harness connectors E10, F1
- Harness for open or short between IPDM E/R and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK CONDENSER POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Disconnect condenser harness connector.
4. Turn ignition switch ON.
5. Check voltage between condenser terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage should exist for 1 second after ignition switch is turned ON.



OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. CHECK 15A FUSE

1. Turn ignition switch OFF.
2. Disconnect 15A fuse.
3. Check 15A fuse.

OK or NG

OK >> GO TO 7.
NG >> Replace fuse.

7. CHECK CONDENSER POWER SUPPLY CIRCUIT-II

1. Disconnect IPDM E/R harness connector E8.
2. Check harness continuity between IPDM E/R terminal 39 and condenser terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 15.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E107, B3
- Harness for open or short between IPDM E/R and condenser

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK CONDENSER GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check harness continuity between condenser terminal 2 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 11.
NG >> GO TO 10

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B43, T1 (Coupe models)
- Harness connectors B39, D102 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- Harness for open or short between condenser and ground

>> Repair open circuit or short to power in harness or connectors.

11. CHECK CONDENSER

Refer to EC-697, "Component Inspection" .

OK or NG

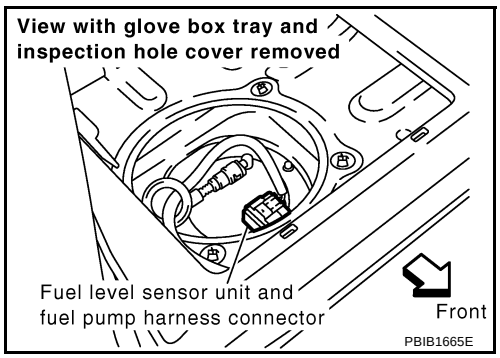
OK >> GO TO 12.
NG >> Replace condenser.

12. CHECK FUEL PUMP POWER SUPPLY AND GROUND CIRCUIT FOR OPEN AND SHORT

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Disconnect harness connectors E107, B3.
3. Check harness continuity between the following;
   “fuel level sensor unit and fuel pump” terminal 1 and harness connector B3 terminal 4,
   “fuel level sensor unit and fuel pump” terminal 3 and ground.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector B3
- Harness connectors B43, T1 (Coupe models)
- Harness connectors B39, D102 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- Harness for open or short between “fuel level sensor unit and fuel pump” and harness connector B3
- Harness for open or short between “fuel level sensor unit and fuel pump” and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK FUEL PUMP

Refer to EC-697, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> Replace “fuel level sensor unit and fuel pump”.

15. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair or replace harness or connectors.

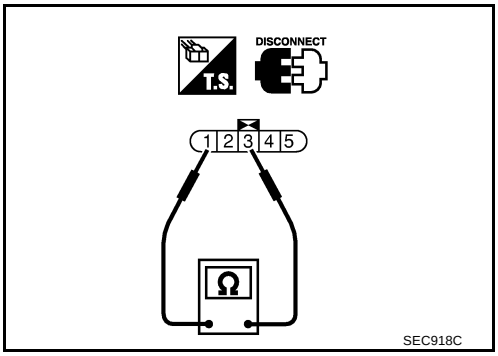
Component Inspection

NBS000I0

FUEL PUMP

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Check resistance between “fuel level sensor unit and fuel pump” terminals 1 and 3.

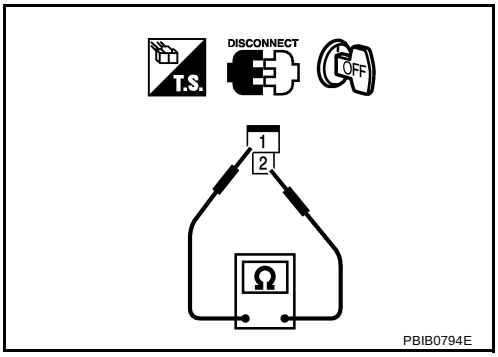
Resistance: 0.2 - 5.0Ω [at 25°C (77°F)]



CONDENSER

1. Disconnect condenser harness connector.
2. Check resistance between condenser terminals 1 and 2.

Resistance: Above 1 MΩ [at 25°C (77°F)]



Removal and Installation

NBS000I1

FUEL PUMP

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

IGNITION SIGNAL

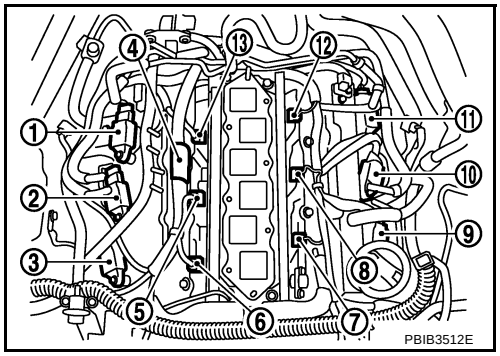
PFP:22448

Component Description

NBS000HL

IGNITION COIL & POWER TRANSISTOR

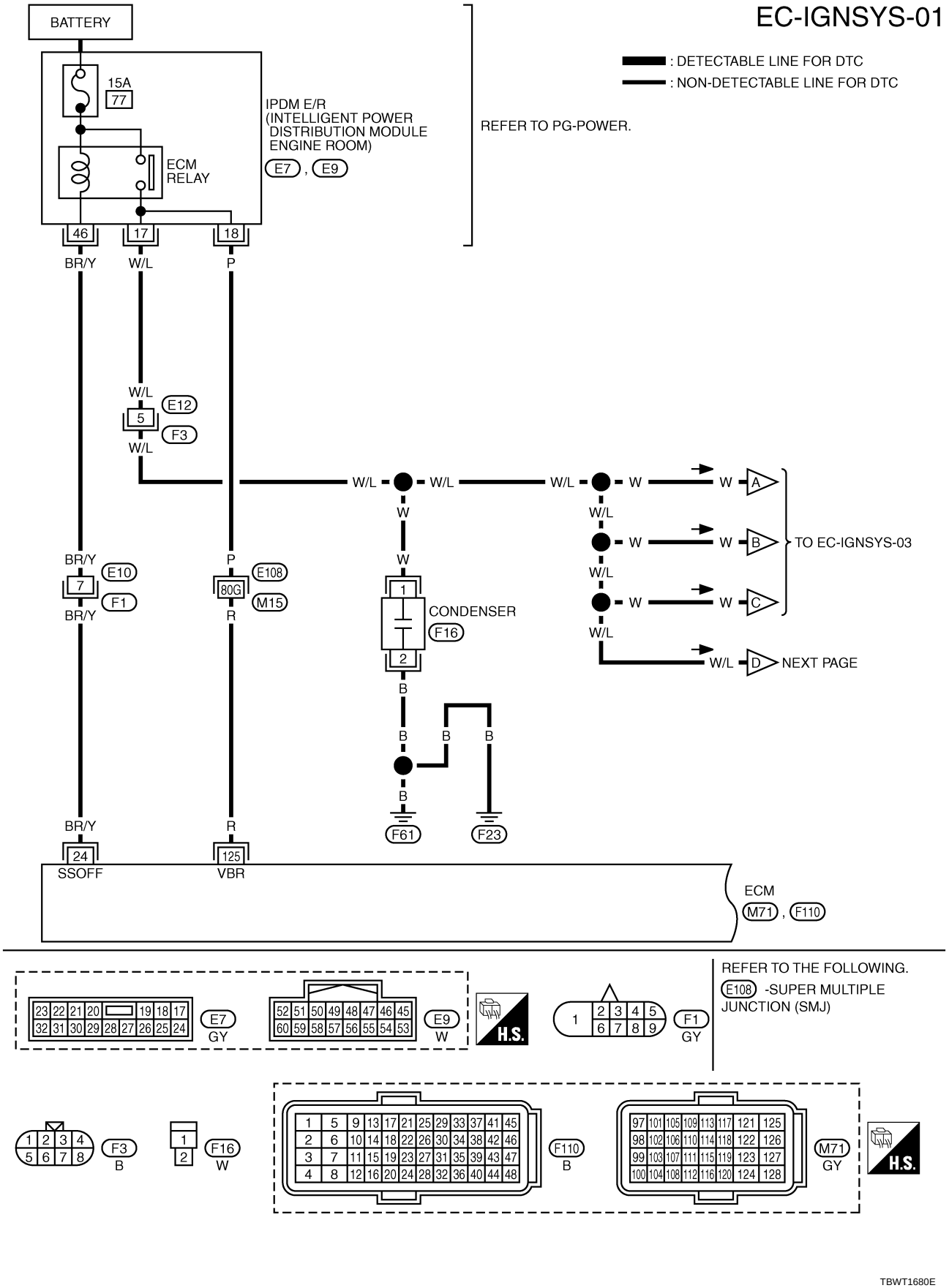
The ignition signal from the ECM is sent to and amplified by the power transistor. The power transistor turns ON and OFF the ignition coil primary circuit. This ON/OFF operation induces the proper high voltage in the coil secondary circuit.



1 : Ignition coil No.5 (with power transistor)
2 : Ignition col No.3 (with power transistor)
3 : Ignition coil No.1 (with power transistor)
4 : Condenser
5 : Fuel injector No.3
6 : Fuel injector No.1
7 : Fuel injector No.2
8 : Fuel injector No.4
9 : Ignition coil No.2 (with power transistor)
10 : Ignition coil No.4 (with power transistor)
11 : Ignition coil No.6 (with power transistor)
12 : Fuel injector No.6
13 : Fuel injector No.5

Wiring Diagram

NBS000HM



TBWT1680E

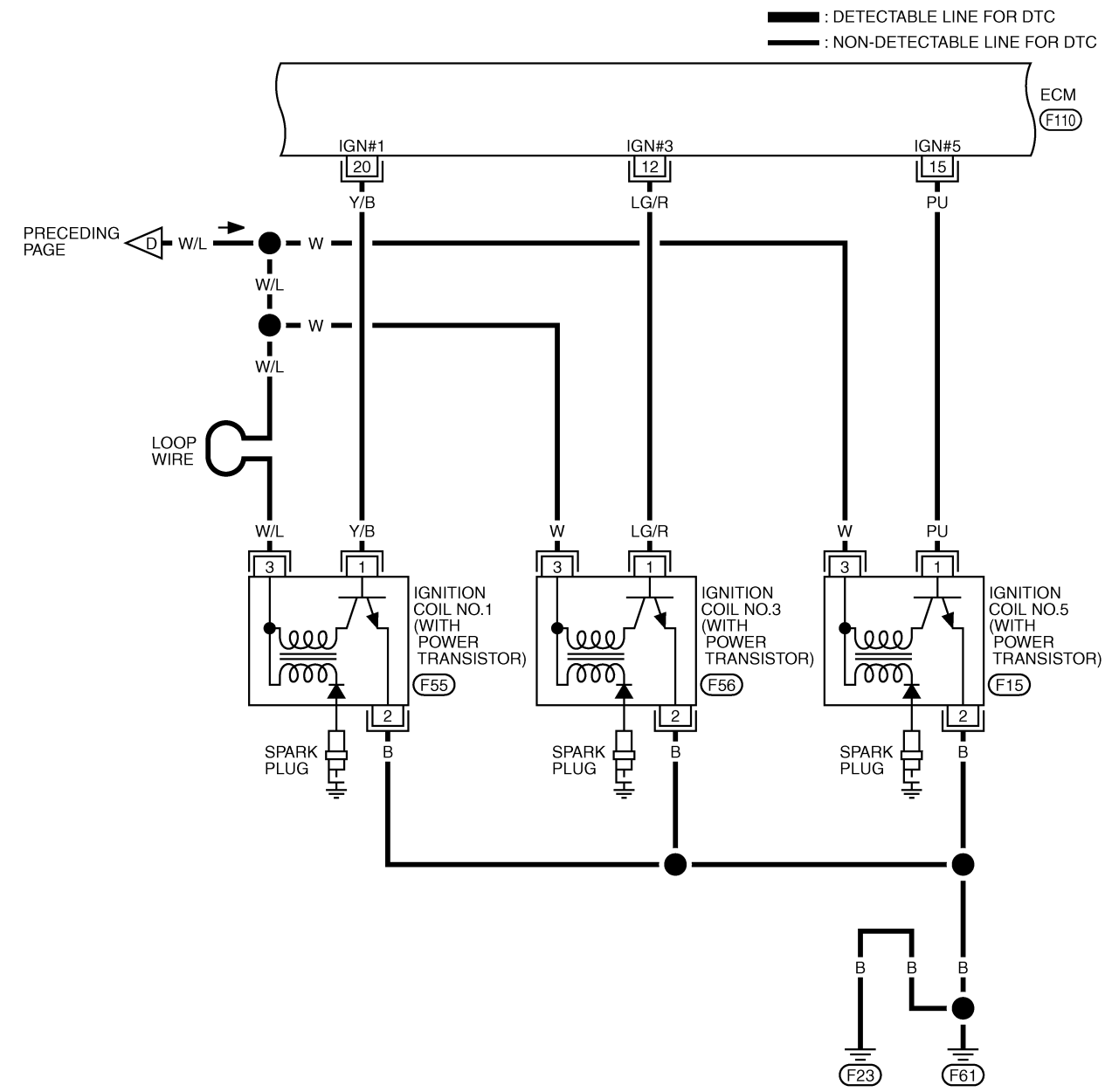
Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

EC-IGNSYS-02





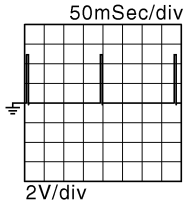
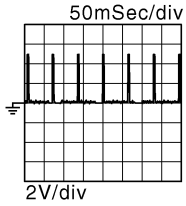
TBWT1681E

IGNITION SIGNAL

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

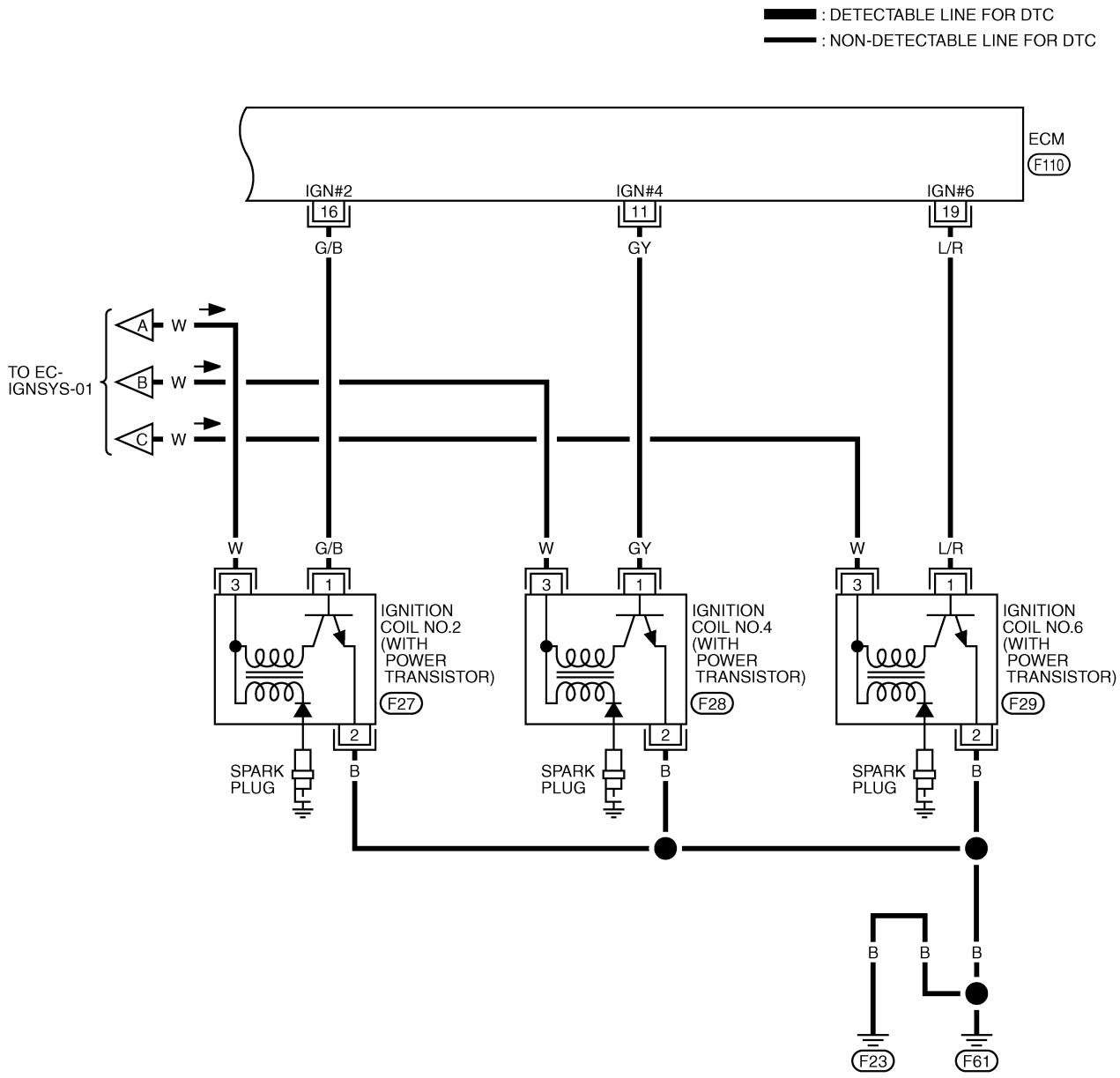
CAUTION:

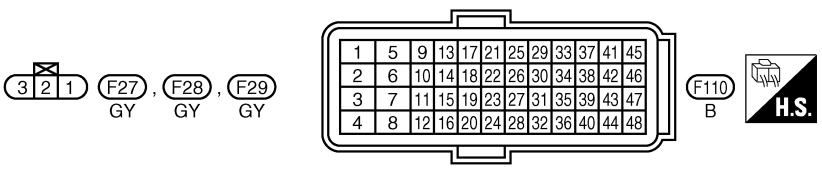
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
12 15 20	LG/R PU Y/B	Ignition signal No. 3 Ignition signal No. 5 Ignition signal No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  PBIB3543E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	0.1 - 0.4V★  PBIB3544E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

EC-IGNSYS-03



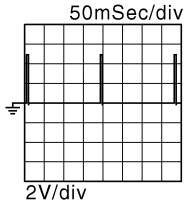
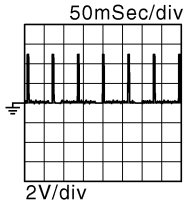


TBWT1682E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
11 16 19	GY G/B L/R	Ignition signal No. 4 Ignition signal No. 2 Ignition signal No. 6	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  PBIB3543E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	0.1 - 0.4V★  PBIB3544E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS000HN

1. CHECK ENGINE START

Turn ignition switch OFF and restart engine.
Is engine running?

Yes or No

Yes (With CONSULT-III)>>GO TO 2.
Yes (Without CONSULT-III)>>GO TO 3.
No >> GO TO 4.

2. CHECK OVERALL FUNCTION

With CONSULT-III

1. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
2. Make sure that each circuit produces a momentary engine speed drop.

OK or NG

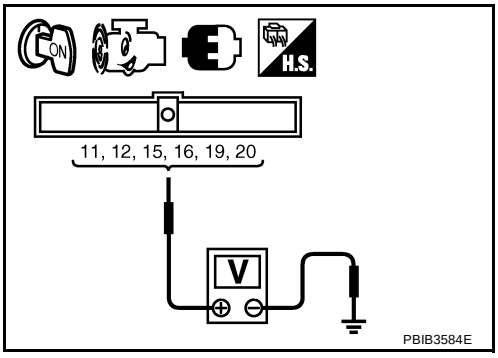
OK >> **INSPECTION END**
NG >> GO TO 10.

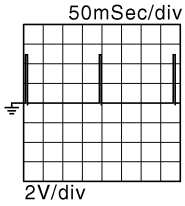
3. CHECK OVERALL FUNCTION

Without CONSULT-III

1. Let engine idle.
2. Read the voltage signal between ECM terminals 11, 12, 15, 16, 19, 20 and ground with an oscilloscope.
3. Verify that the oscilloscope screen shows the signal wave as shown below.

   NOTE:
   The pulse cycle changes depending on rpm at idle.





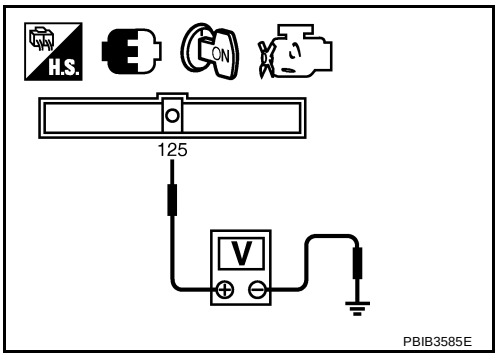
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

4. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
2. Check voltage between ECM terminals 125 and ground with CONSULT-III or tester.

   Voltage: Battery voltage

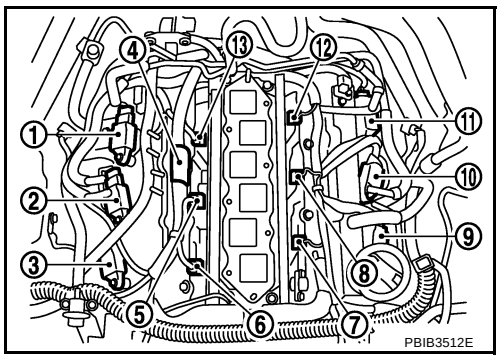


OK or NG

OK >> GO TO 5.
NG >> Go to EC-142, "POWER SUPPLY AND GROUND CIRCUIT" .

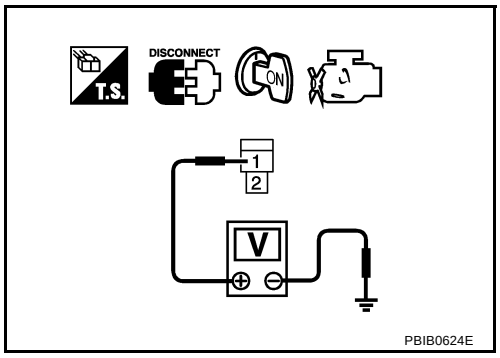
5. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.



1 : Ignition coil No.5 (with power transistor)
2 : Ignition col No.3 (with power transistor)
3 : Ignition coil No.1 (with power transistor)
4 : Condenser
5 : Fuel injector No.3
6 : Fuel injector No.1
7 : Fuel injector No.2
8 : Fuel injector No.4
9 : Ignition coil No.2 (with power transistor)
10 : Ignition coil No.4 (with power transistor)
11 : Ignition coil No.6 (with power transistor)
12 : Fuel injector No.6
13 : Fuel injector No.5

3. Turn ignition switch ON.
4. Check voltage between condenser terminal 1 and ground with CONSULT-III or tester.



Voltage: Battery voltage

OK or NG

OK >> GO TO 8.
NG >> GO TO 6.

6. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-III

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector E7.
3. Check harness continuity between IPDM E/R terminal 17 and condenser terminal 1. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between IPDM E/R and condenser

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK CONDENSER GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between condenser terminal 2 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to power in harness or connectors.

9. CHECK CONDENSER

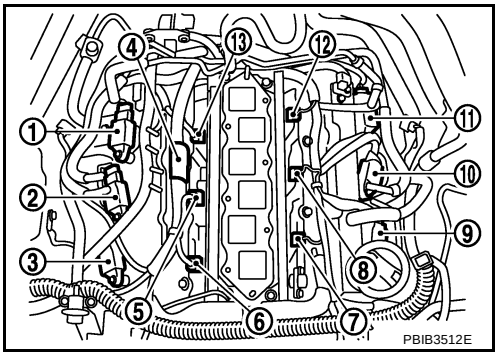
Refer to EC-708, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace condenser.

10. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-IV

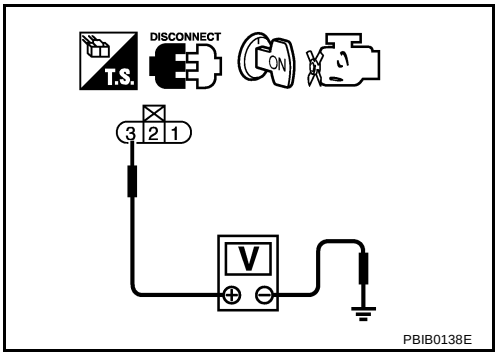
1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Disconnect ignition coil harness connector.



1 : Ignition coil No.5 (with power transistor)
2 : Ignition col No.3 (with power transistor)
3 : Ignition coil No.1 (with power transistor)
4 : Condenser
5 : Fuel injector No.3
6 : Fuel injector No.1
7 : Fuel injector No.2
8 : Fuel injector No.4
9 : Ignition coil No.2 (with power transistor)
10 : Ignition coil No.4 (with power transistor)
11 : Ignition coil No.6 (with power transistor)
12 : Fuel injector No.6
13 : Fuel injector No.5

4. Turn ignition switch ON.
5. Check voltage between ignition coil terminal 3 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 11.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

11. CHECK IGNITION COIL GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ignition coil terminal 2 and ground.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 12.
NG >> Repair open circuit or short to power in harness or connectors.

12. CHECK IGNITION COIL OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 11, 12, 15, 16, 19, 20 and ignition coil terminal 1.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 13.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK IGNITION COIL WITH POWER TRANSISTOR

Refer to EC-708, "Component Inspection" .

OK or NG

OK >> GO TO 14.
NG >> Replace malfunctioning ignition coil with power transistor.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

Component Inspection

NBS000HO

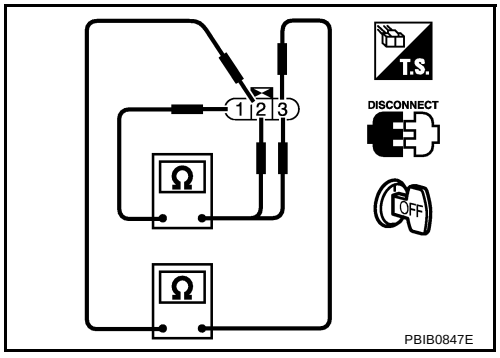
IGNITION COIL WITH POWER TRANSISTOR

CAUTION:

Do the following procedure in the place where ventilation is good without the combustible.

1. Turn ignition switch OFF.
2. Disconnect ignition coil harness connector.
3. Check resistance between ignition coil terminals as follows.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 and 2	Except 0 or ∞
1 and 3	Except 0
2 and 3	

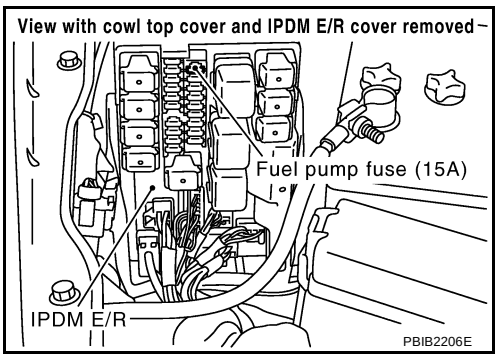


4. If NG, Replace ignition coil with power transistor.
   If OK, go to next step.
5. Turn ignition switch OFF.
6. Reconnect all harness connectors disconnected.

7. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

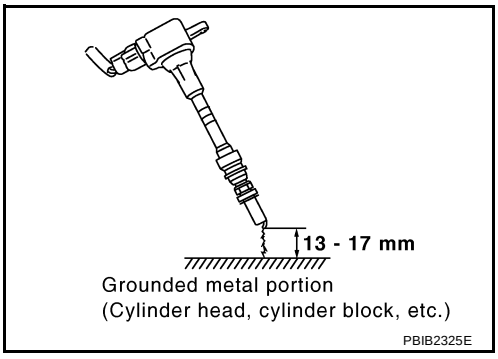
NOTE:
Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.

8. Start engine.
9. After engine stalls, crank it two or three times to release all fuel pressure.
10. Turn ignition switch OFF.
11. Remove ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
12. Remove ignition coil and spark plug of the cylinder to be checked.



13. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
14. Connect spark plug and harness connector to ignition coil.
15. Fix ignition coil using a rope etc. with gap of 13 - 17 mm between the edge of the spark plug and grounded metal portion as shown in the figure.
16. Crank engine for about 3 seconds, and check whether spark is generated between the spark plug and the grounded part.

Spark should be generated.



CAUTION:

- **Do not approach to the spark plug and the ignition coil within 50cm. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20kV or more.**
- **It might cause to damage the ignition coil if the gap of 17 mm or more is taken.**

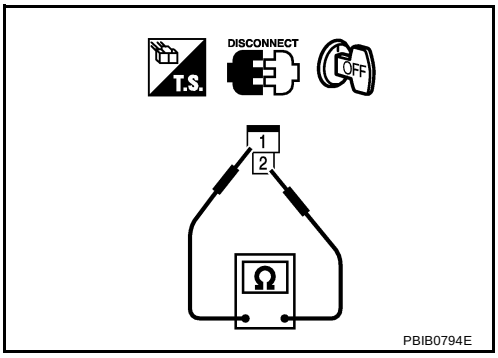
NOTE:
When the gap is less than 13 mm, the spark might be generated even if the coil is malfunctioning.

17. If NG, Replace ignition coil with power transistor.

CONDENSER

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.
3. Check resistance between condenser terminals 1 and 2.

Resistance: Above 1 MΩ [at 25°C (77°F)]



Removal and Installation

NBS000HP

IGNITION COIL WITH POWER TRANSISTOR

Refer to EM-31, "IGNITION COIL" .

REFRIGERANT PRESSURE SENSOR

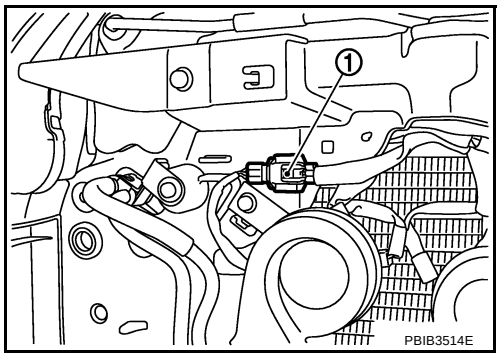
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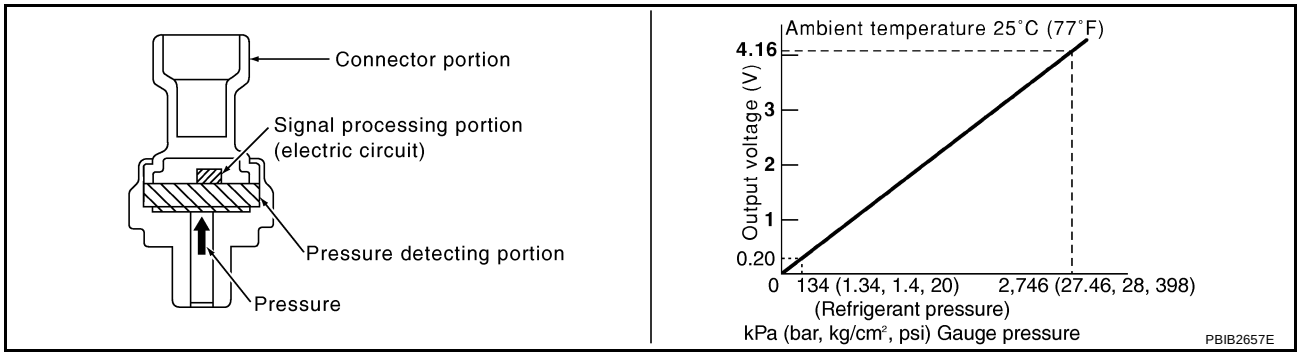
Component Description

NBS000I2

The refrigerant pressure sensor is installed at the condenser of the air conditioner system. The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. The voltage signal is sent to ECM, and ECM controls cooling fan system.

1 : Refrigerant pressure sensor harness connector



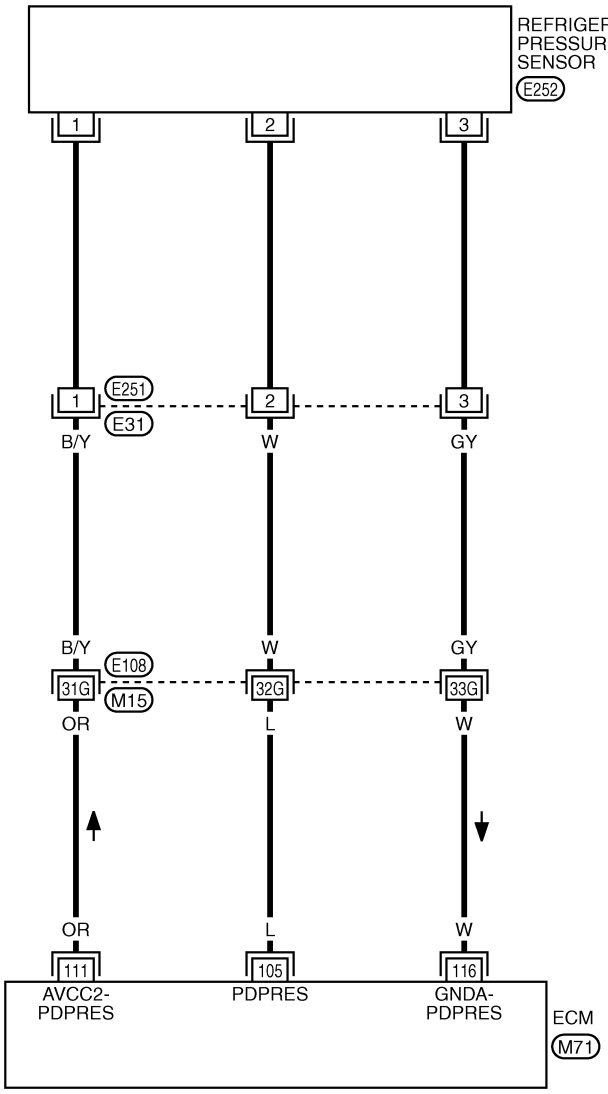


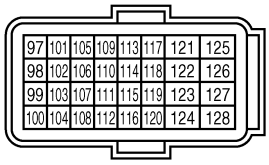
Wiring Diagram

NBS000I3

EC-RP/SEN-01

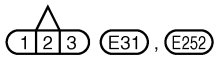
: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





M71
GY

H.S.



E31 , E252
B B

REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1683E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
105	L	Refrigerant pressure sensor	**[Engine is running]** ● **Warm-up condition** ● Both A/C switch and blower switch: ON (Compressor operates.)	1.0 - 4.0V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V
116	W	Sensor ground (Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

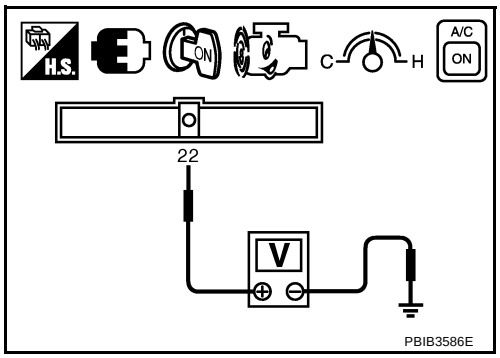
Diagnostic Procedure

NBS000I4

1. CHECK REFRIGERANT PRESSURE SENSOR OVERALL FUNCTION

1. Start engine and warm it up to normal operating temperature.
2. Turn A/C switch and blower fan switch ON.
3. Check voltage between ECM terminal 105 and ground with CONSULT-III or tester.

Voltage: 1.0 - 4.0V



OK or NG

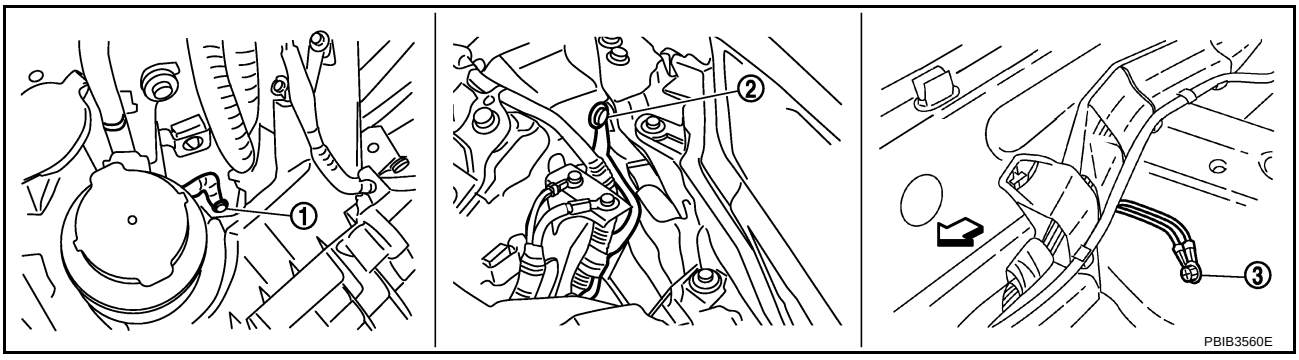
OK >> **INSPECTION END**

NG >> GO TO 2.

2. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn A/C switch and blower fan switch OFF.
2. Stop engine.
3. Turn ignition switch OFF.
4. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

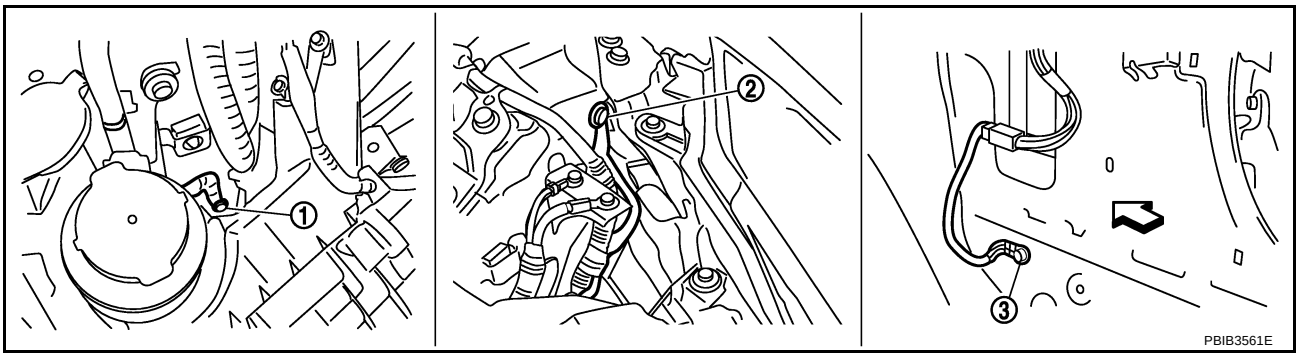


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn A/C switch and blower fan switch OFF.
2. Stop engine.
3. Turn ignition switch OFF.
4. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

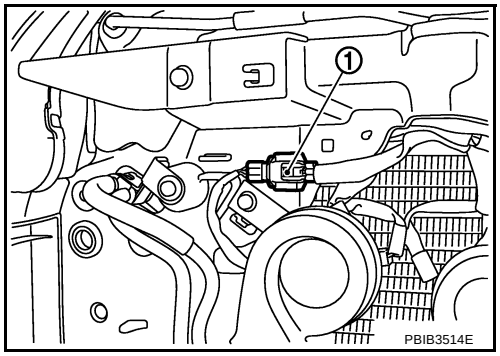
⇦: Vehicle front

OK or NG

OK >> GO TO 3.
NG >> Repair or replace ground connections.

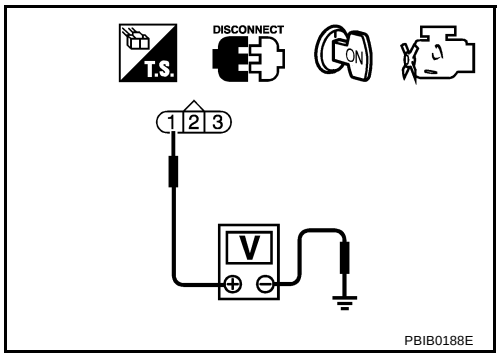
3. CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect refrigerant pressure sensor harness connector (1).
2. Turn ignition switch ON.



3. Check voltage between refrigerant pressure sensor terminal 1 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between refrigerant pressure sensor terminal 3 and ECM terminal 116. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 105 and refrigerant pressure sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace refrigerant pressure sensor.
NG >> Repair or replace.

Removal and Installation

NBS000I5

REFRIGERANT PRESSURE SENSOR

Refer to ATC-135, "Removal and Installation of Refrigerant Pressure Sensor" .

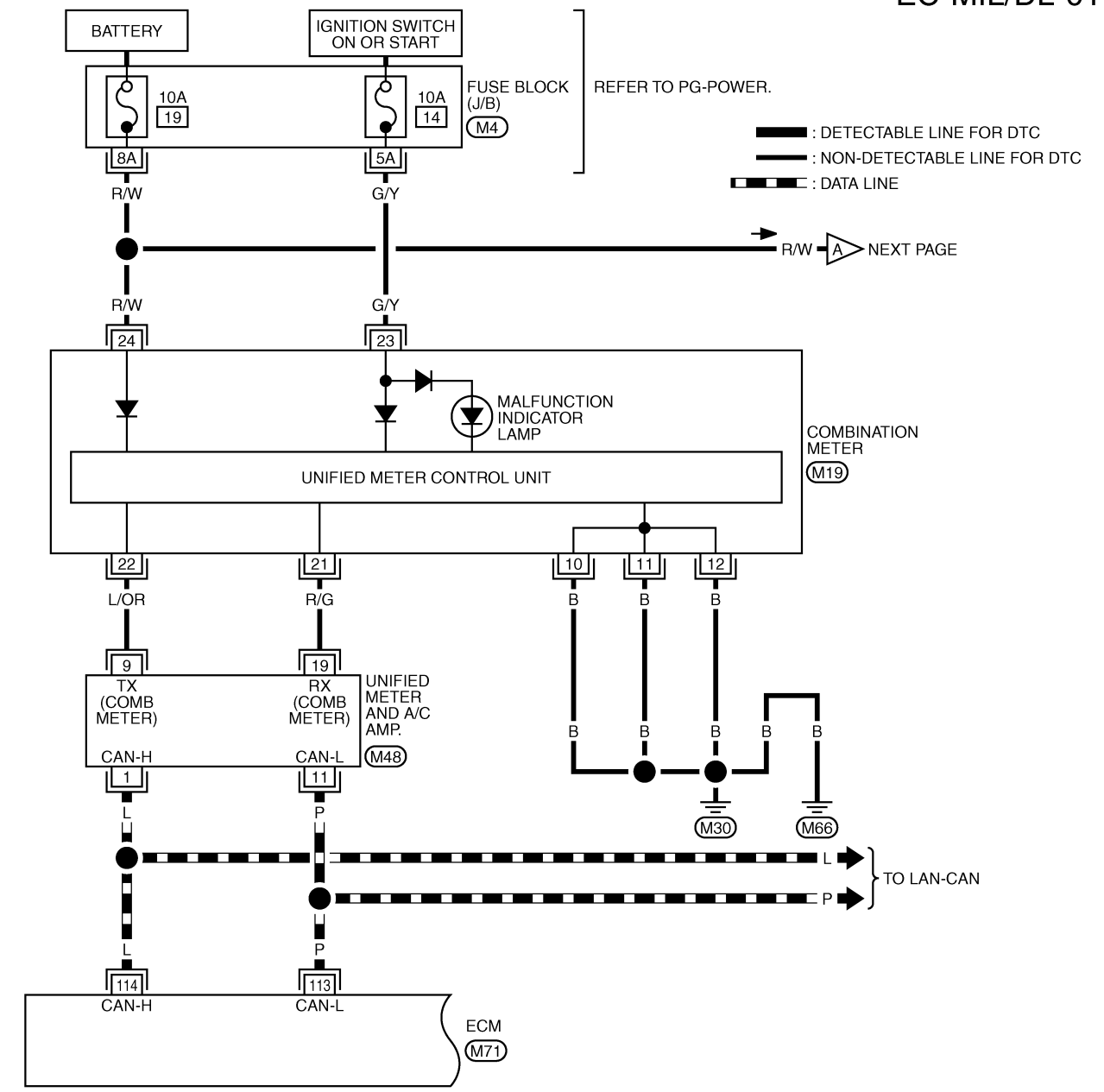
MIL AND DATA LINK CONNECTOR

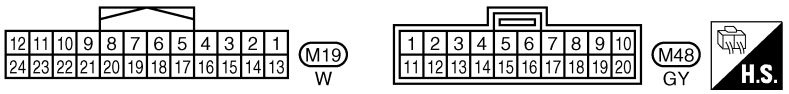
PFP:24814

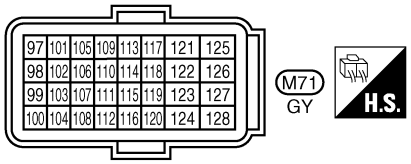
Wiring Diagram

NBS000II

EC-MIL/DL-01



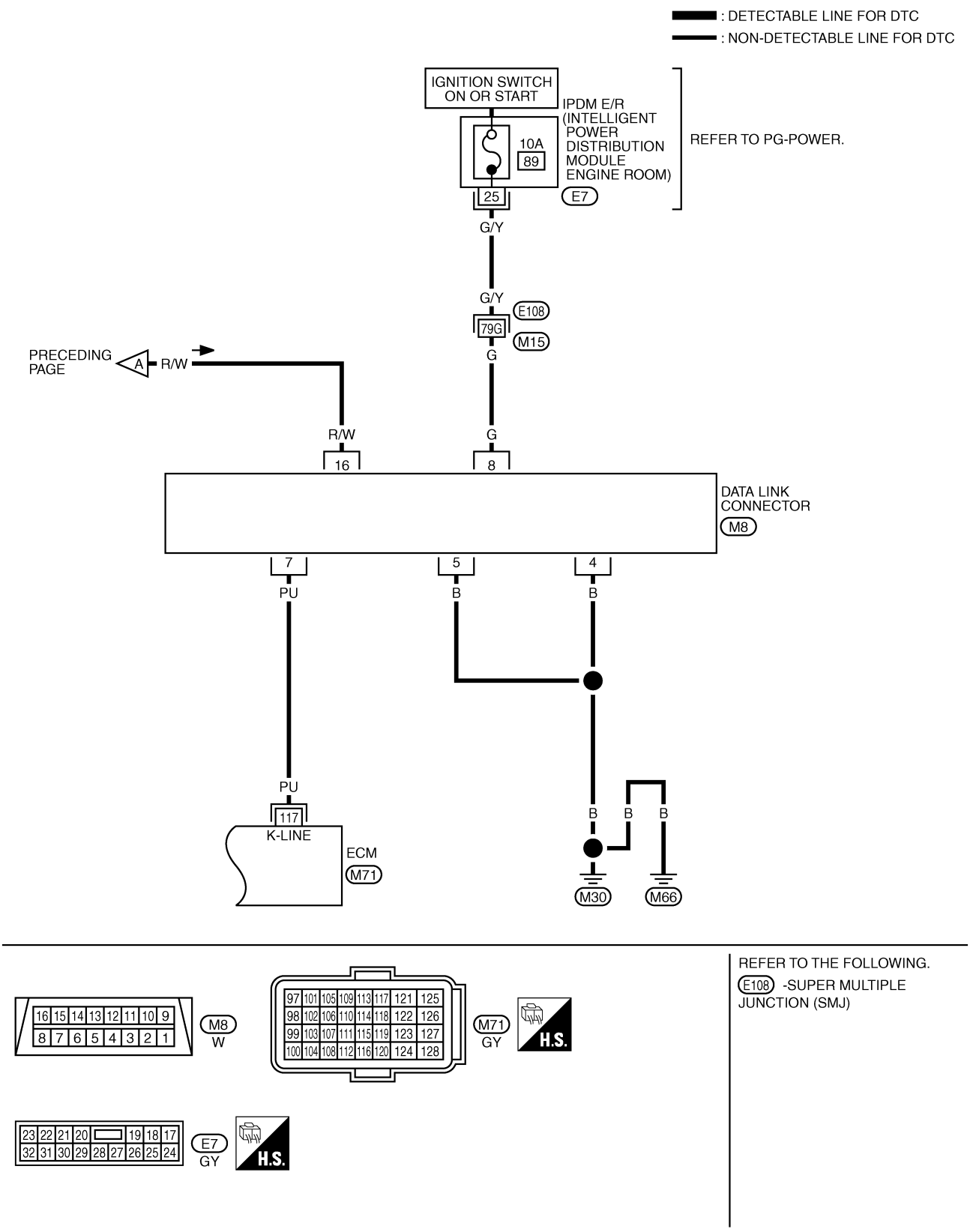




REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1685E

EC-MIL/DL-02



TBWT1686E

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Fuel Pressure

NBS000IJ

Fuel pressure at idling kPa (kg/cm^2 , psi)	Approximately 350 (3.57, 51)

Idle Speed and Ignition Timing

NBS000IK

Target idle speed	A/T	No load* (in P or N position)	650 ± 50 rpm
	M/T	No load* (in Neutral position)	
Air conditioner: ON	A/T	In P or N position	650 rpm or more
	M/T	In Neutral position	800 rpm or more
Ignition timing	A/T	In P or N position	15° ± 5° BTDC
	M/T	In Neutral position	

*: Under the following conditions:

- Air conditioner switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Calculated Load Value

NBS000IL

Conditions	Calculated load value % (Using CONSULT-III or GST)
At idle	5 - 35
At 2,500 rpm	5 - 35

Mass Air Flow Sensor

NBS000IM

Supply voltage	Battery voltage (11 - 14V)
Output voltage at idle	0.8 - 1.1V*
Mass air flow (Using CONSULT-III or GST)	2.0 - 6.0 g·m/sec at idle* 7.0 - 20.0 g·m/sec at 2,500 rpm*

*: Engine is warmed up to normal operating temperature and running under no load.

Intake Air Temperature Sensor

NBS000IN

Temperature °C (°F)	Resistance kΩ
25 (77)	1.800 - 2.200

Engine Coolant Temperature Sensor

NBS000IO

Temperature °C (°F)	Resistance kΩ
20 (68)	2.37 - 2.63
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260

Air Fuel Ratio (A/F) Sensor 1 Heater

NBS000IP

Resistance [at 25°C (77°F)]	1.8 - 2.44Ω

Heated Oxygen sensor 2 Heater

NBS000IQ

Resistance [at 25°C (77°F)]	3.4 - 4.4Ω

Crankshaft Position Sensor (POS)

NBS000IR

Refer to EC-393, "Component Inspection" .

Camshaft Position Sensor (PHASE)

NBS000IS

Refer to EC-405, "Component Inspection" .

Throttle Control Motor

NBS000IT

Resistance [at 25°C (77°F)]	Approximately 1 - 15Ω

Fuel Injector

NBS000IU

Resistance [at 10 - 60°C (50 - 140°F)]	11.1 - 14.3Ω

Fuel Pump

NBS000IV

Resistance [at 25°C (77°F)]	0.2 - 5.0Ω

SECTION EI
EXTERIOR & INTERIOR

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00086

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

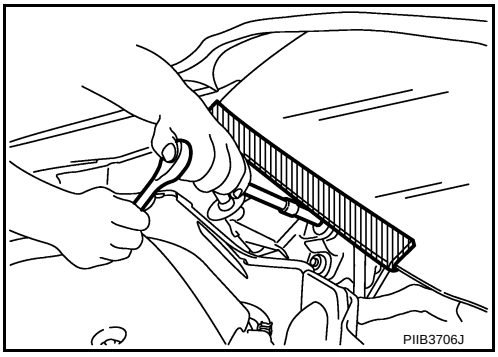
NIS001H4

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NIS001H5

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Work

NIS00088

- After removing and installing the opening/closing parts, be sure to carry out fitting adjustments to check their operation.
- Check the lubrication level, damage, and wear of each part. If necessary, grease or replace it.

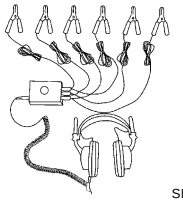
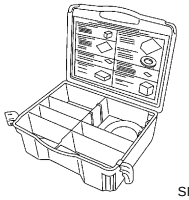
PREPARATION

PFP:00002

Special Service Tools

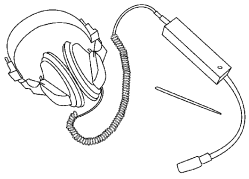
NIS00089

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J-39570) Chassis ear  SIIA0993E	Locationg the noise
(J-43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS0008A

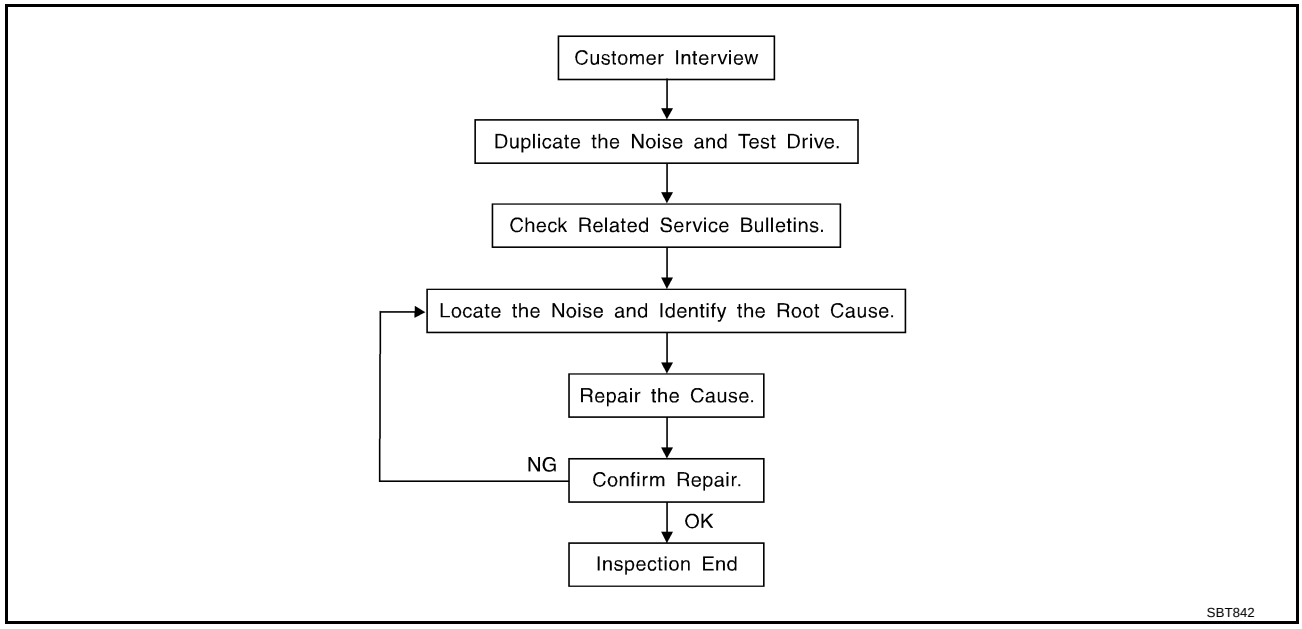
Tool name	Description
Engine ear  SIIA0995E	Locationg the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS0008B



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to EI-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to EI-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS0008C

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sun-visor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted under-hood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

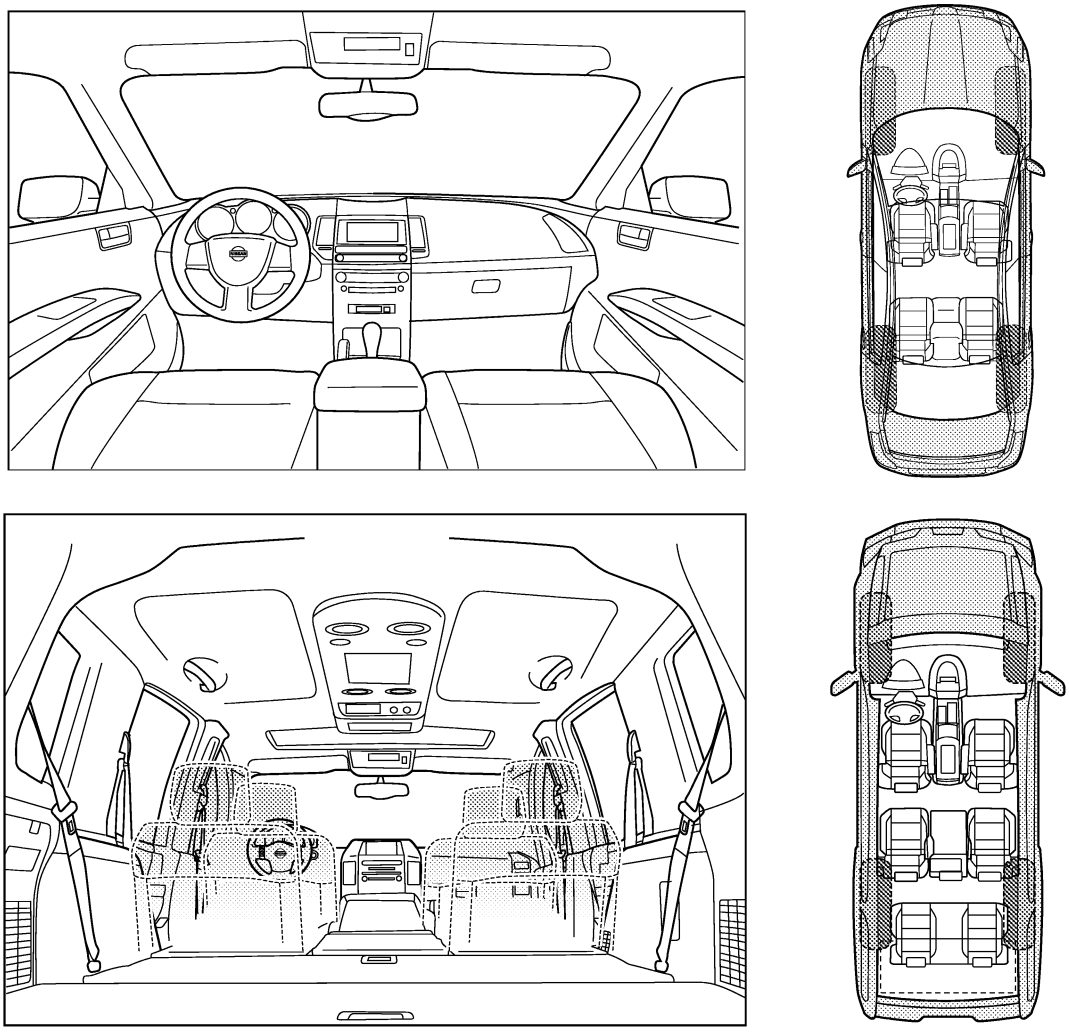
Diagnostic Worksheet

NIS0008D

SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

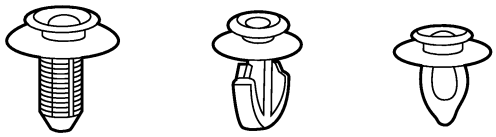
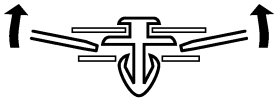
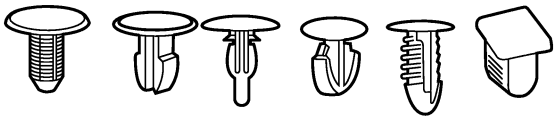
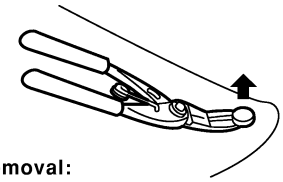
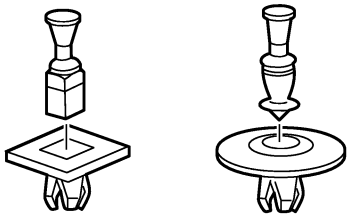
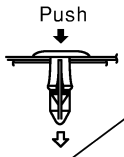
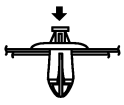
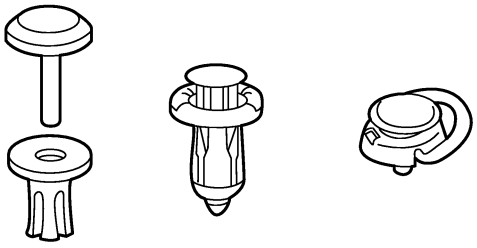
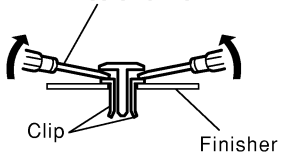
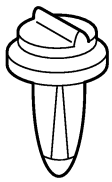
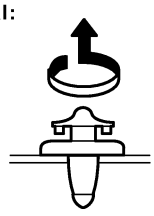
PIIB8742E

CLIP AND FASTENER

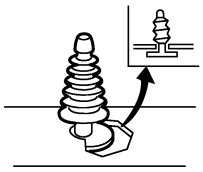
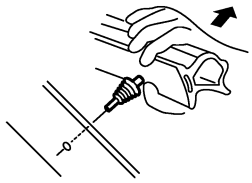
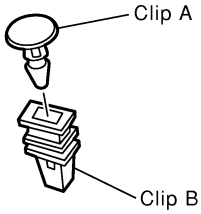
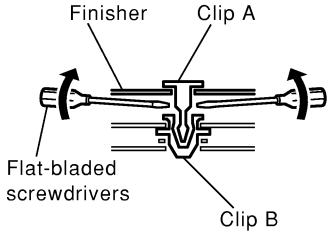
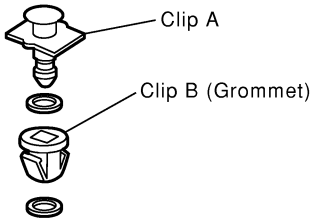
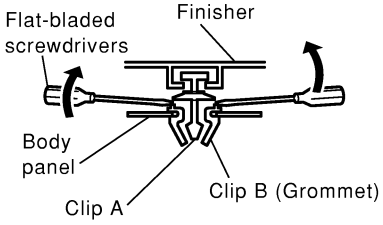
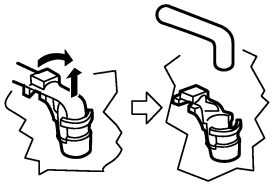
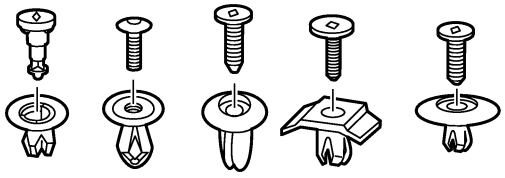
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Clip and Fastener

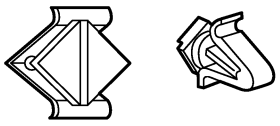
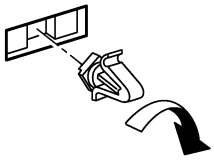
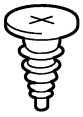
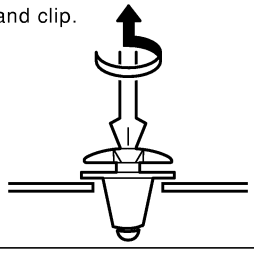
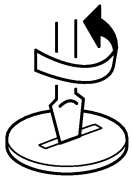
NIS0008E

Symbol No.	Shapes	Removal & Installation
C101		**Removal:** Remove by bending up with flat-bladed screwdrivers or clip remover. 
C103		 **Removal:** Remove with a clip remover.
C203		**Removal:** Push center pin to catching position. (Do not remove center pin by hitting it.) Push  Push  **Installation:**
C205		**Removal:** Flat-bladed screwdriver  Clip Finisher
C206		**Removal:** 

SIIA0315E

Symbol No.	Shapes	Removal & Installation
CE103 		**Removal:** 
CF110 		**Removal:** 
CF118 		**Removal:** 
CR103		**Removal:** Holder portion of clip must be spread out to remove rod. 
CS101 		**Removal:** 1. Screw out with a Phillips screwdriver. 2. Remove female portion with flat-bladed screwdriver. 

SIIA0316E

Symbol No.	Shapes	Removal & Installation
CG101 		**Removal:**  Rotate 45° to remove  **Removal:** **Installation:** 
CS102 		
CS113 		**Removal:** Disconnect upper connection of clip with a flat-bladed screwdriver, then remove clip while inserting a flat-bladed screwdriver between body panel and clip. 
C111 		

SIIA0317E

FRONT BUMPER

PFP:F2022

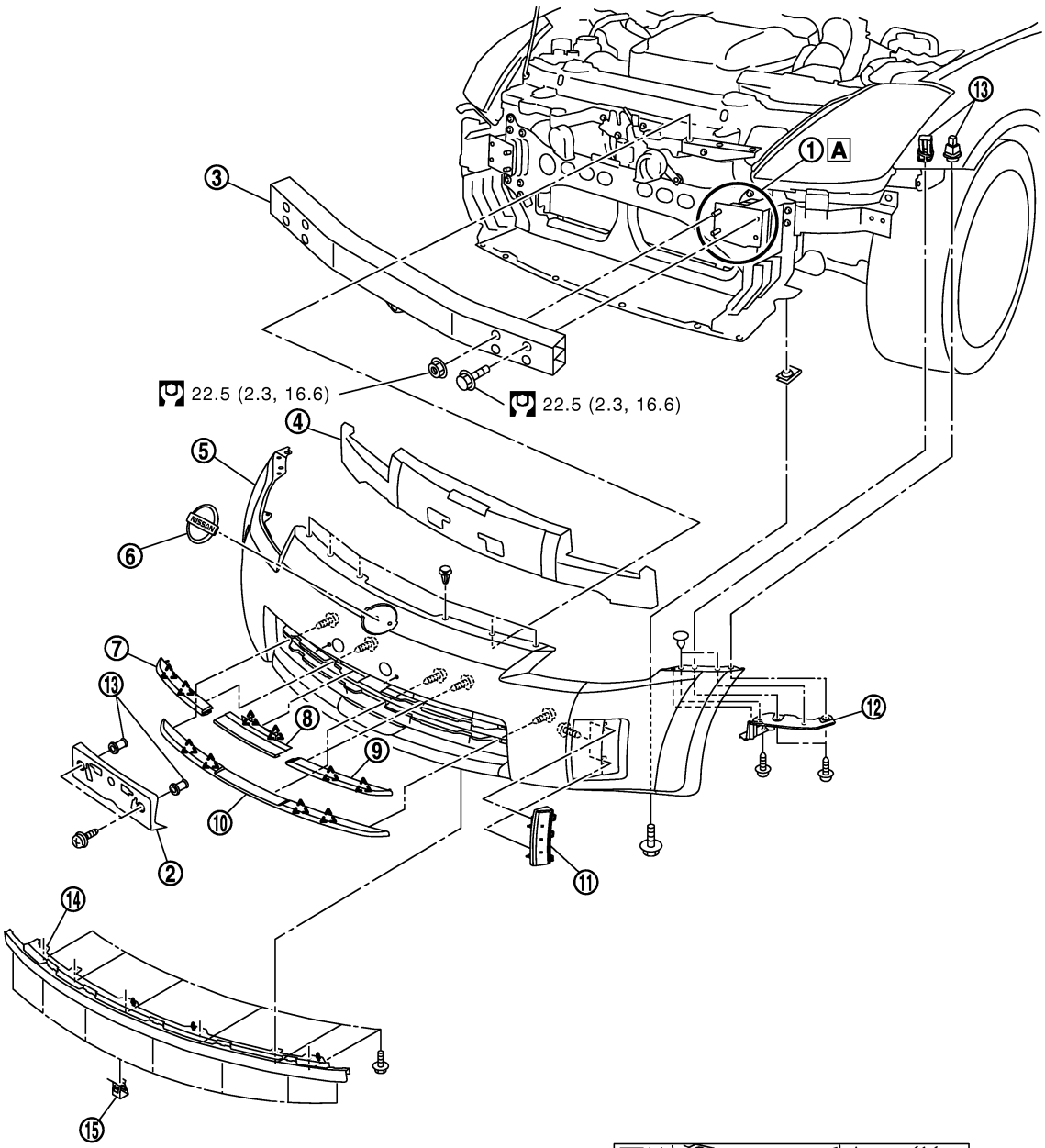
Removal and Installation

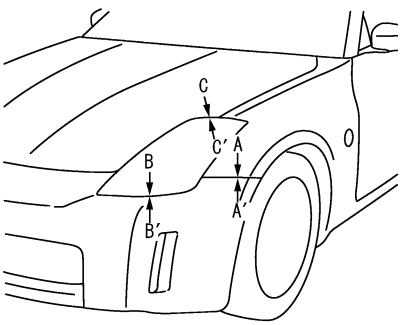
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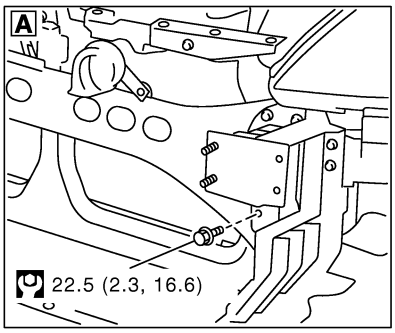
CAUTION:

Bumper fascia is made of resin. Do not apply strong force to it, and be careful to prevent contact with oil.

SEC. 620







: N•m (kg-m, ft-lb)

PIIB7143J

1. Bumper stay
2. License plate bracket
3. Bumper reinforcement
4. Energy absorber
5. Bumper fascia assembly
6. Front emblem
7. Bumper upper side molding (RH)
8. Front bumper center
9. Bumper upper side molding (LH)
10. Bumper lower molding
11. Bumper side reflector
12. Bumper side bracket
13. Grommet
14. Air spoiler
15. Retainer

Pawl

REMOVAL

1. Remove clips of bumper fascia upper portion.
2. Remove screw of bumper fascia lower portion.
3. Remove screws of bumper fascia both side.
4. Remove screws and bolts of both right/left fender protectors on front side. Refer to EI-21, "FENDER PROTECTOR" .
5. Pull out both right/left sides of bumper fascia and remove bumper fascia assembly.

   CAUTION:
   When removing bumper fascia, 2 workers are required so as to prevent it from dropping.
6. Remove energy absorber.
7. Remove bolts and nuts of bumper reinforcement and remove bumper fascia.
8. Remove clips of bumper shield-sight and remove bumper shield-sight.
9. Remove bolts of bumper stay and remove bumper stay.

INSTALLATION

Install in the reverse order of removal.

NOTE:
After installing, perform fitting adjustment.

	Portion	Clearance
Front bumper - Front fender	A - A	0 - 0.5 mm (0 - 0.020 in)
Front bumper - Head lamp	B - B	5.9 - 8.9 mm (0.232 - 0.350 in)
Hood - Head lamp	C - C	1.7 - 5.3 mm (0.067 - 0.209 in)

Removal and Installation of Bumper Side Reflector (Left Side)

NIS001H6

REMOVAL

1. Remove the front part of fender protector by removing screws and clips.
2. Remove screw of bumper side reflector (left side).

INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Bumper Side Reflector (Right Side)

NIS001H7

REMOVAL

1. Remove bumper assembly.
2. Remove screw of bumper side reflector (right side).

INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Bumper Molding (Upper side, Lower)

NIS001H8

REMOVAL

1. Remove front bumper fascia. Refer to EI-14, "Removal and Installation" .
2. Remove screw of bumper molding (upper side, lower).
3. Disengage the plastic pawls to remove the bumper molding (upper side, lower).

INSTALLATION

Install in the reverse order of removal.

REAR BUMPER

PFP:H5022

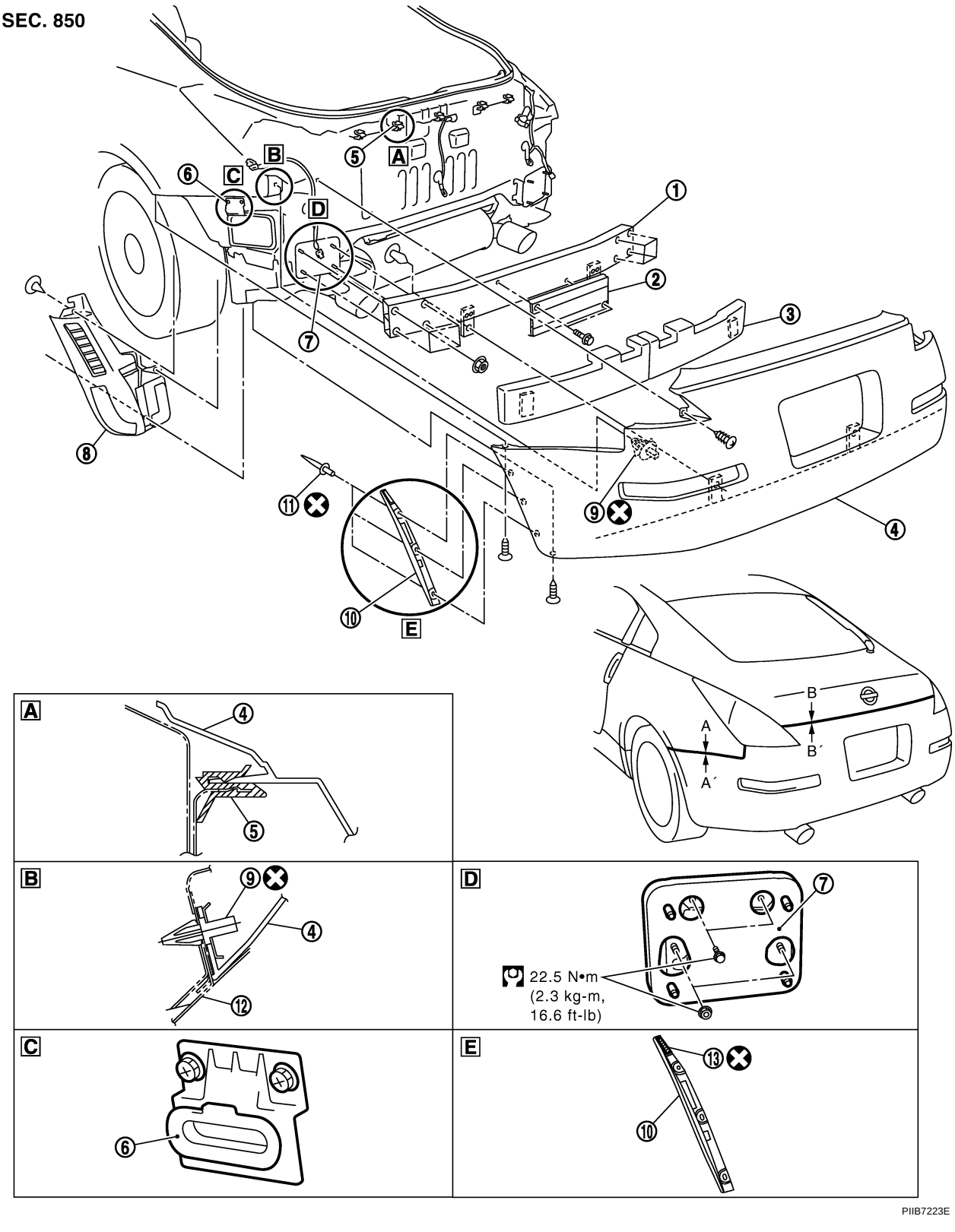
Removal and Installation

NIS0008G

CAUTION:

Bumper fascia is made of resin. Do not apply strong force to it, and be careful to prevent contact with oil.

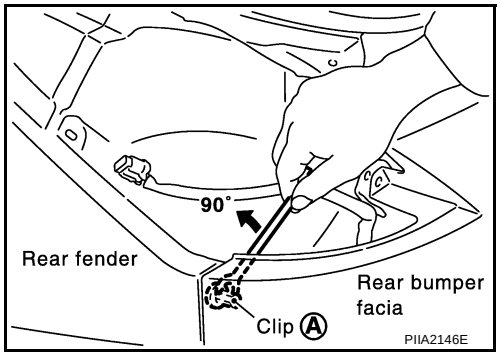
SEC. 850



1. Bumper reinforcement
2. Bumper over rider
3. Energy absorber
4. Bumper fascia assembly
5. Bumper clip
6. Bumper retainer
7. Bumper stay
8. Closing rear bumper
9. Clip (A)
10. Fillet molding (only 19in models)
11. Rivet
12. Rear fender panel
13. Double-faced adhesive tape

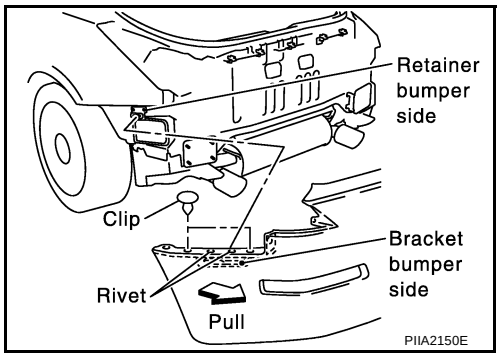
REMOVAL

1. Remove rear combination lamp assembly. Refer to LT-127, "Removal and Installation" .
2. Remove screw rear combination portion.
3. Remove clips of closing rear bumper.
4. Remove bolt and screw of both edges bumper fascia.
5. Rotate clip (A) in corner of bumper fascia 90 degrees and remove from bracket.
6. Remove clips from lower portion bumper fascia.
7. Pull out upper portion bumper fascia toward rear and disengage from clip.



8. Pull out both edges bumper fascia toward rear and disengage retainer from braked.
9. Disconnect license lamp and turn signal lamp harness connector and remove bumper fascia assembly.

   CAUTION:
   When removing bumper fascia, 2 workers are required so as to prevent it from dropping.
10. Remove bumper energy absorber.
11. Remove screws of bumper over rider.
12. Remove nuts and bolts of bumper reinforcement.
13. Remove bumper stay bolts.



INSTALLATION

Install in the reverse order of removal.

NOTE:
After installing, perform fitting adjustment.

	Portion	Clearance
Rear bumper - Rear fender	A - A	0 - 0.5 mm (0 - 0.020 in)
Rear bumper - Back door	B - B	3.9 - 7.1 mm (0.154 - 0.280 in)

REMOVAL AND INSTALLATION OF BUMPER SIDE BRACKETS AND FILLET MOLDING

REMOVAL

Shave head of rivet with drill [4.0 to 4.5 mm (0.157 to 0.177 in) dia.]

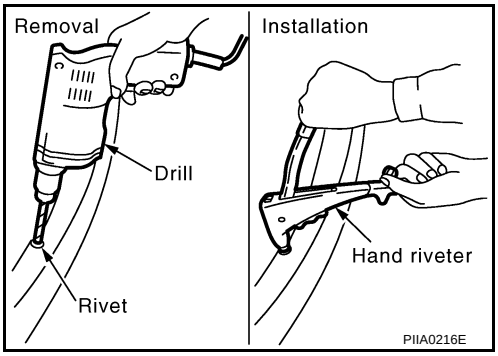
INSTALLATION

Install parts to fascia firmly with hand riveter.

NOTE:

Use the following rivet, when installing of parts.

Rivet thickness	**: 1.2 – 6.4 mm (0.047 – 0.252 in)**
Under hole diameter	**: 4.1 – 4.4 mm (0.161 – 0.173 in) dia.**

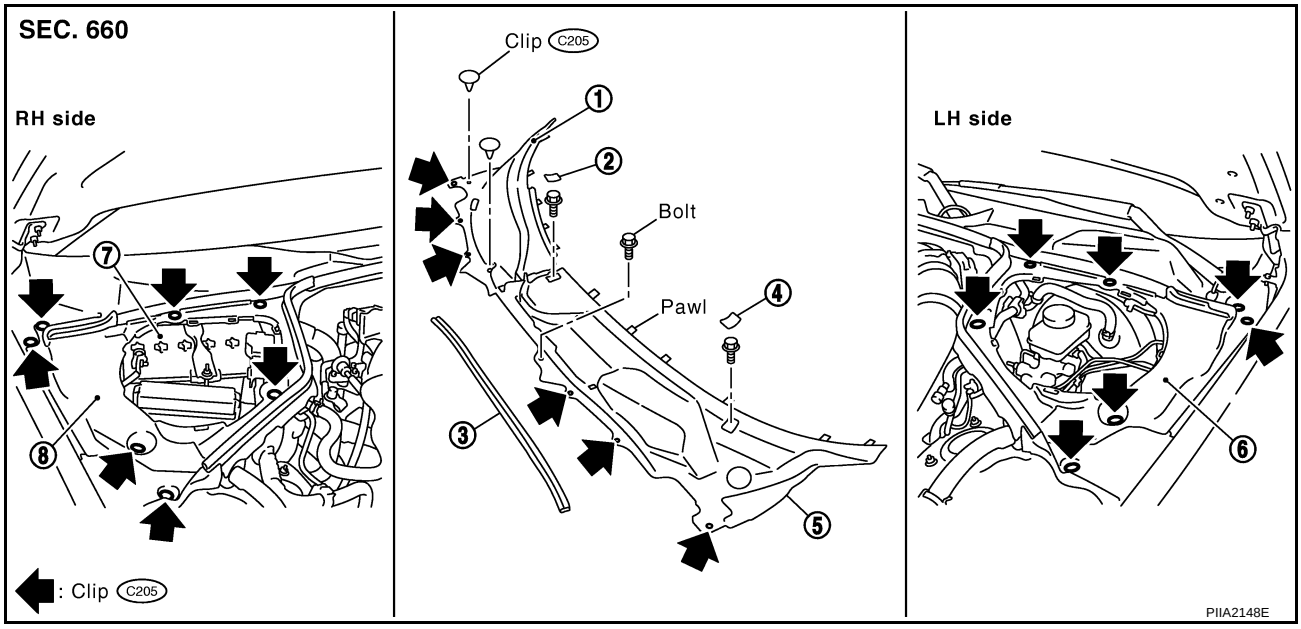


COWL TOP

PFP:66100

Removal and Installation

NIS0008H



1. Cowl top cover (RH)
2. Cap
3. Cowl top seal rubber
4. Cap
5. Cowl top cover (LH)
6. Hoodledge cover (LH)
7. Battery
8. Hoodledge cover (RH)

REMOVAL

1. Remove clips of hoodledge cover (LH/RH).
2. Remove both wiper arms (LH/RH). Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .
3. Remove cowl top seal rubber.
4. Remove clips of cowl top cover (RH) and remove cowl top cover (RH).
5. Remove clips, cap, screws and remove cowl top cover (LH).
6. Remove washer hose from cowl top cover.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

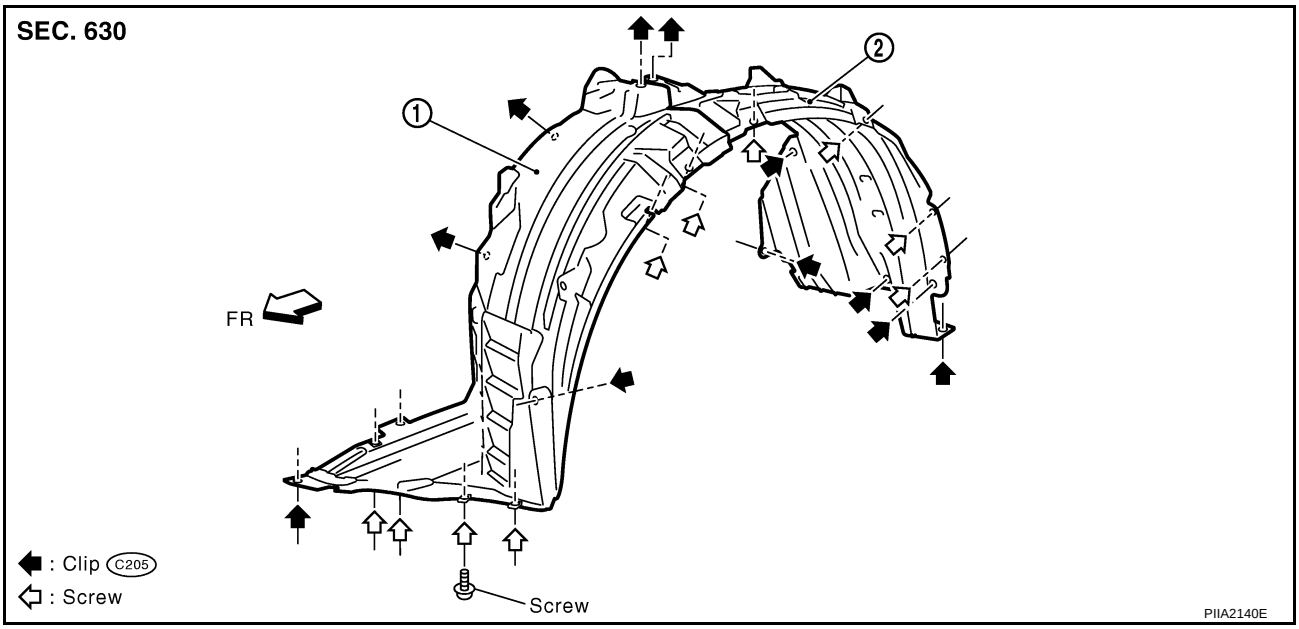
After installing, perform adjustment of wiper arm. Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .

FENDER PROTECTOR

PFP:63840

Removal and Installation

NIS0008I



1. Fender protector (front)
2. Fender protector (rear)

REMOVAL

1. Remove screws and clips of fender protector.
2. Remove fender protector front and remove fender protector rear.

INSTALLATION

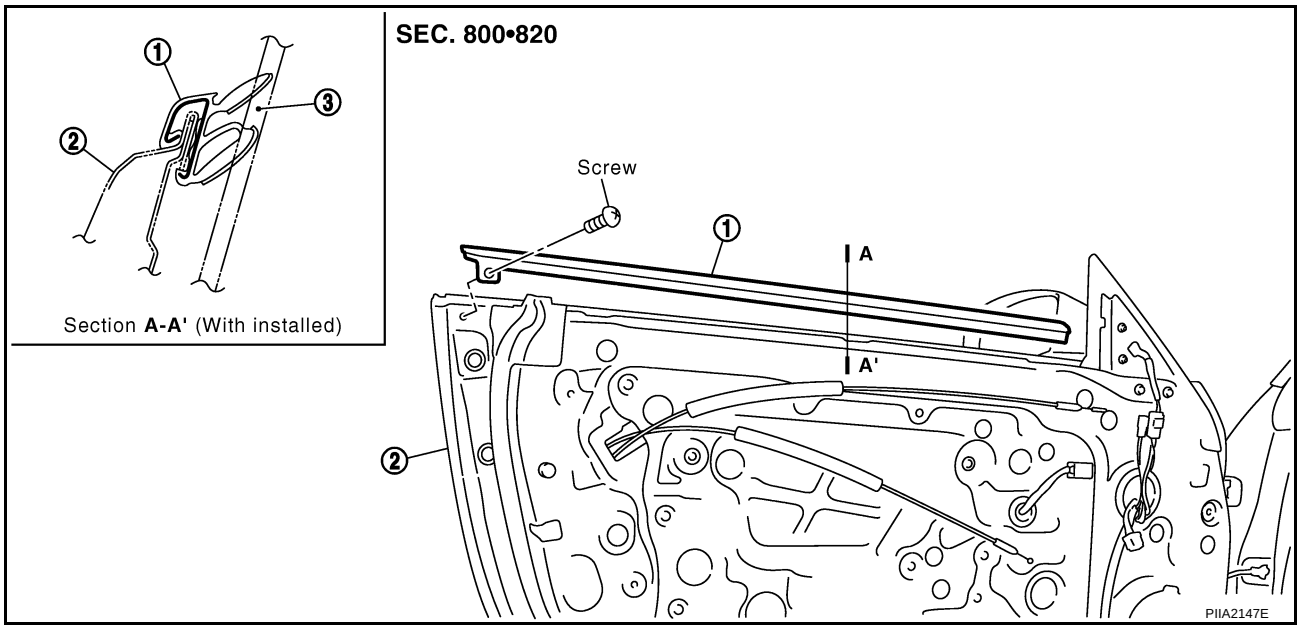
Install in the reverse order of removal.

DOOR OUTSIDE MOLDING

PFP:82820

Removal and Installation

NIS0008J



1. Door outside molding
2. Front door panel
3. Glass

REMOVAL

1. Open windows fully.
2. Remove door finisher. Refer to EI-33, "Removal and Installation" .
3. Remove rear end of door outside molding screw.
4. Disconnect pawls on front edge of molding.
5. Disconnect pawls in the order from front side of door panel portion, with clip clamp remover.
6. Remove slide molding rearward side, after disconnecting all pawls.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

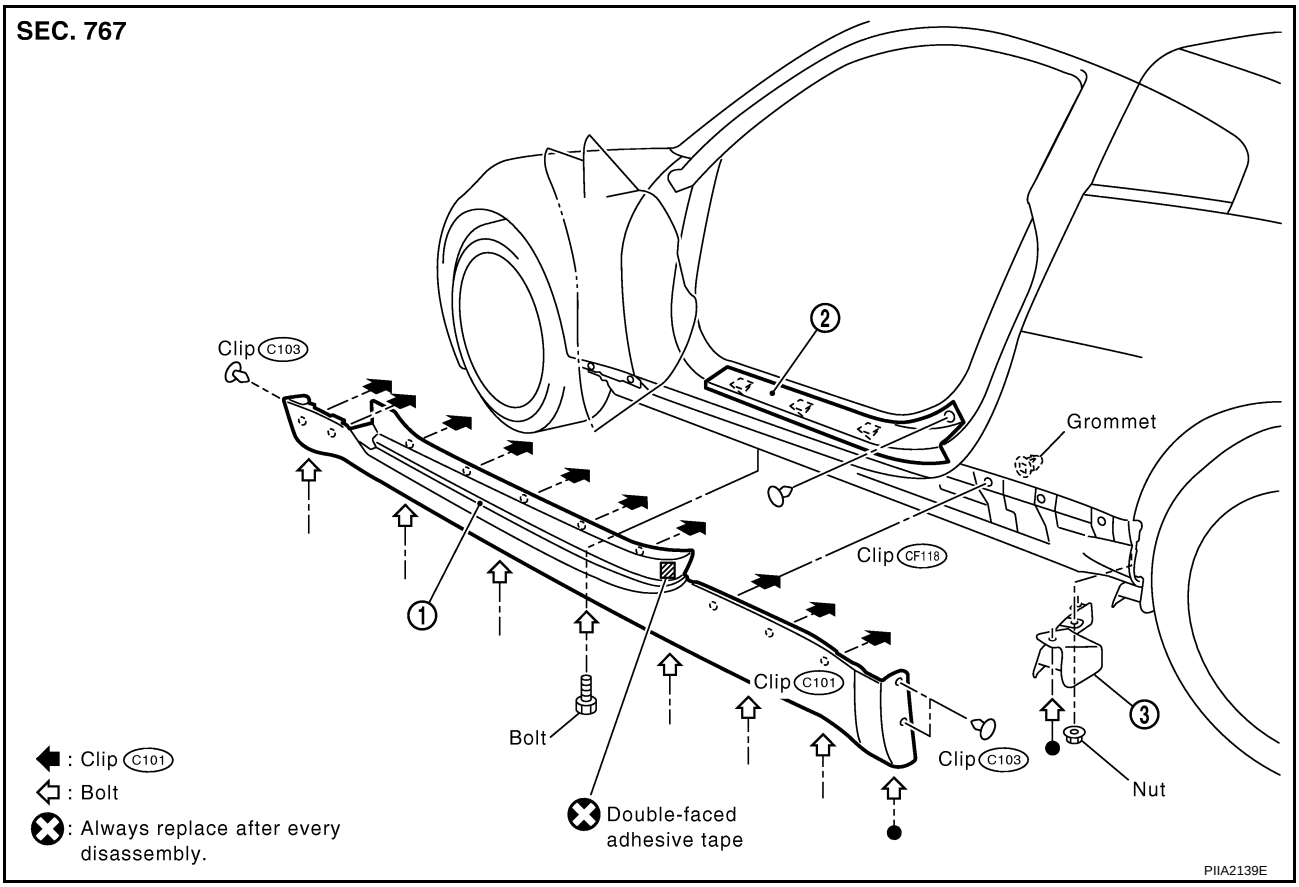
- **Be careful not to apply excessive force when removing because it is easy to deform parts.**
- **After removal, visually inspect molding, and if it is deformed, replace it with new molding.**

SIDE SILL FINISHER

PFP:76852

Removal and Installation

NIS0008K



1. Side sill finisher
2. Kicking plate outer
3. Reflector mudguard rear

REMOVAL

1. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove kicking plate outer. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove bolts of side sill finisher lower portion.
4. Remove clips of side sill finisher front and rear portion.
5. Remove bolt and nut of reflector mudguard rear.
6. Insert clip clamp remover between panel and side sill finisher, and pull up side sill finisher.

INSTALLATION

Install in the reverse order of removal.

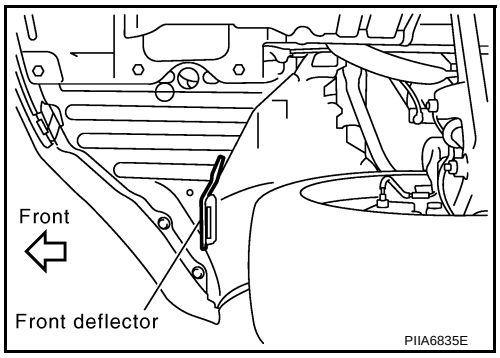
CAUTION:

When installing side sill finisher, check that clips are securely fitted in panel holes on body, and then press them in.

FRONT DEFLECTOR

Removal

Remove screws and clips of front deflector and remove front deflector.



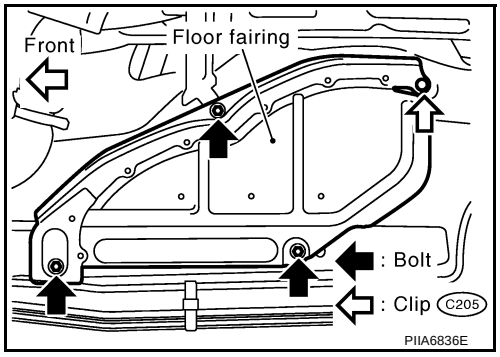
Installation

Install in the reverse order of removal.

FLOOR FAIRING

Removal

Remove bolts and clip of floor fairing and remove floor fairing.



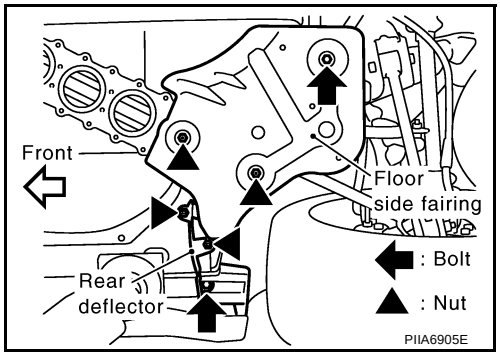
Installation

Install in the reverse order of removal.

FLOOR SIDE FAIRING

Removal

Remove nuts and bolt of floor side fairing and remove floor side fairing.



Installation

Install in the reverse order of removal.

REAR DEFLECTOR

Removal

Remove nuts and bolt of rear deflector and remove rear deflector.

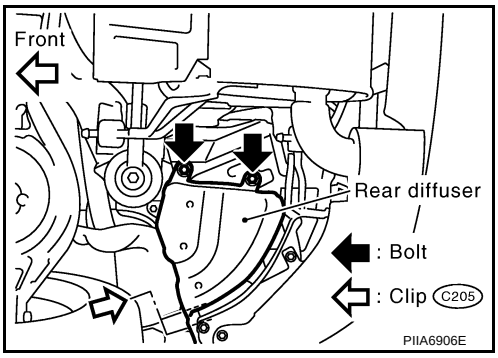
Installation

Install in the reverse order of removal.

REAR DIFFUSER

Removal

Remove bolts and clips of rear diffuser and remove rear diffuser.



Installation

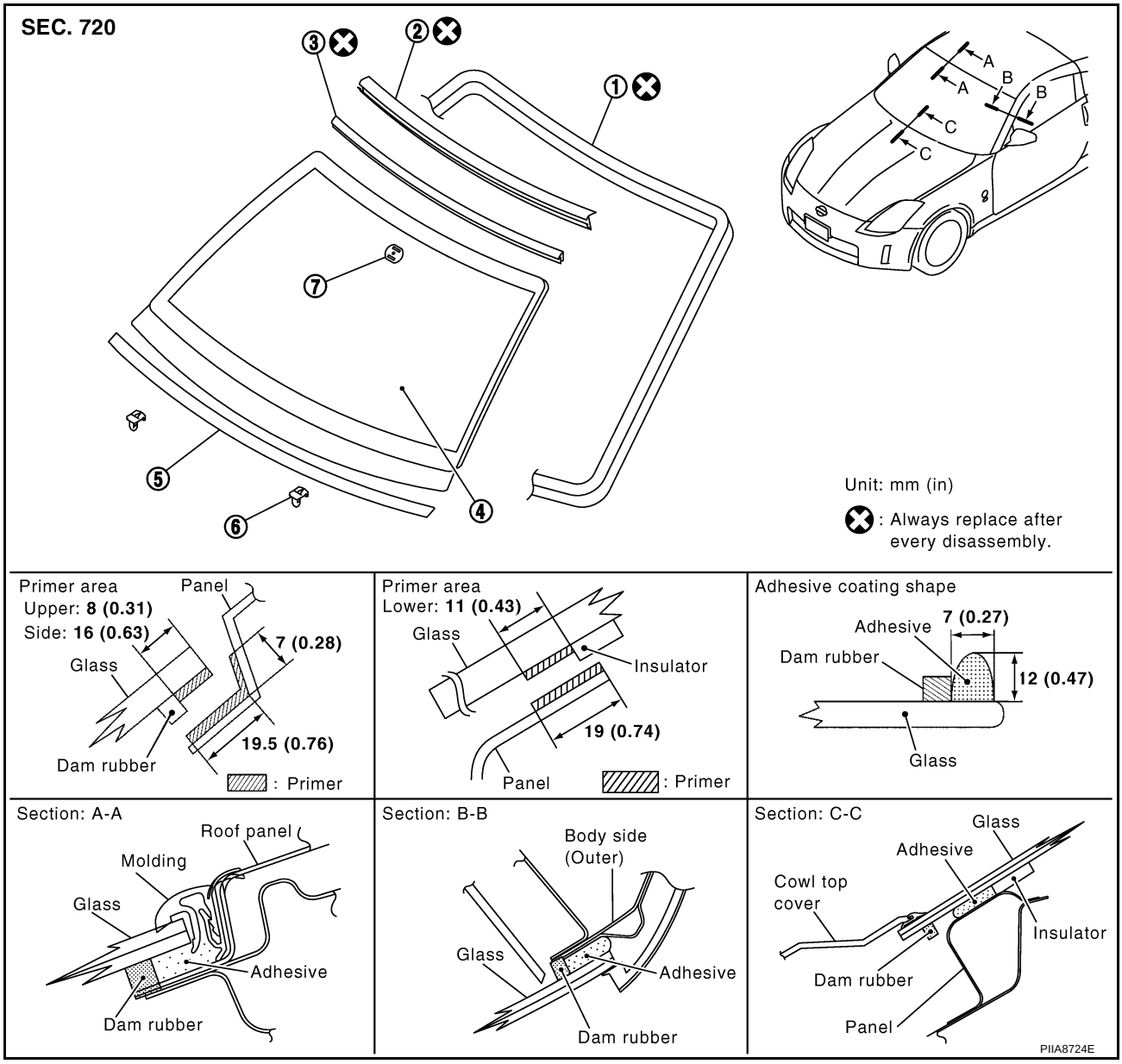
Install in the revers order of removal.

WINDSHIELD MOLDING

PFP:72700

Removal and Installation

NIS0008L



1. Dam rubber
2. Fastener
3. Molding (upper)
4. Windshield glass
5. Insulator
6. Spacer
7. Mirror base

REMOVAL

Remove windshield molding. Refer to GW-11, "WINDSHIELD GLASS" .

NOTE:

- Apply protective tape around circumference of windshield.
- Guiding a cutter knife along glass, cut surface of molding.
- Using pliers, draw out all remaining molding left in flanged area of body, and remove it completely from adhering surface on glass.

INSTALLATION

Install windshield molding. Refer to GW-11, "WINDSHIELD GLASS" .

NOTE:

- Align matching marks on body and glass. Install glass to body.

- Press entire surface of glass lightly to fit it completely.

Using a spatula, repair any adhesive overflow or shortage to make surface smooth. Position windshield moldings and allow their adhesion.

CAUTION:

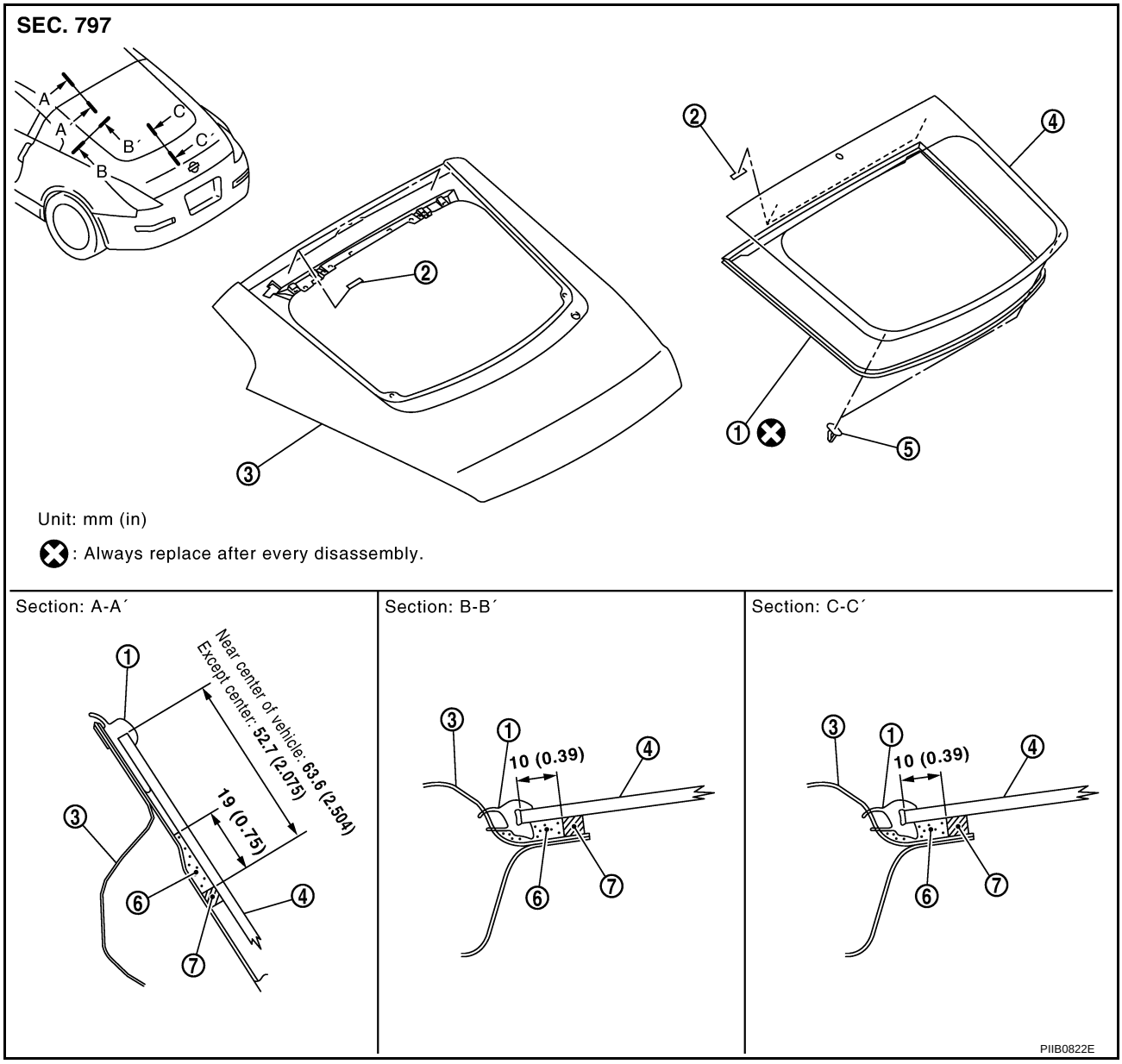
- **Be sure to install windshield molding before adhesive hardens.**
- **After installing glass, keep door windows open and avoid driving vehicle until adhesive has completely cured.**

REAR WINDOW MOLDING

PFP:79762

Removal and Installation

NIS0008M



1. Back door window molding
2. Dual lock fastener
3. Back door
4. Back door window glass
5. Holder
6. Adhesive
7. Dam rubber

REMOVAL OF BACK DOOR WINDOW MOLDING

Remove back door window molding. Refer to GW-14, "BACK DOOR WINDOW GLASS" .

NOTE:

Apply a strip of protective tape along the contour of back door window glass (molding) to prevent paint surface from being damaged.

INSTALLATION OF BACK DOOR WINDOW MOLDING

Install back door window molding. Refer to GW-14, "BACK DOOR WINDOW GLASS" .

NOTE:

- Clean adhesive portion of back door window glass and around circumference with white gasoline.
- Apply dam rubber to all surfaces of glass.
- Attach back door window molding to side face of glass.

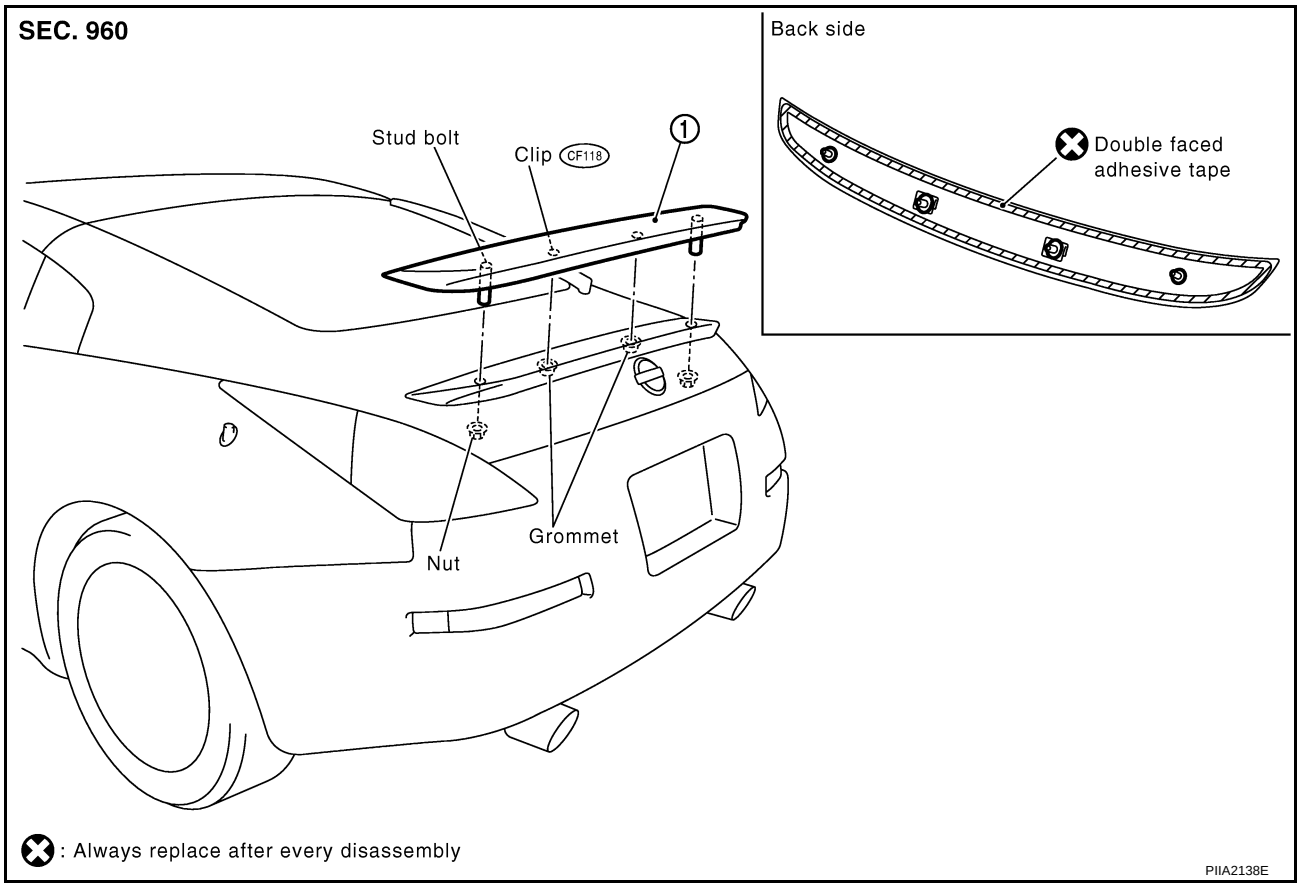
- Back door window molding should not overlap on the surface of back door window glass.

REAR SPOILER

PFP:96030

Removal and Installation

NIS0008N



1. Rear spoiler

REMOVAL

1. Remove back door finisher lower. Refer to EI-47, "Removal and Installation (for Coupe Models)" .
2. Remove nuts of rear spoiler.
3. Remove clip of rear spoiler.
4. Remove double-faced adhesive tapes with wide plastic spatula between back door and rear spoiler.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

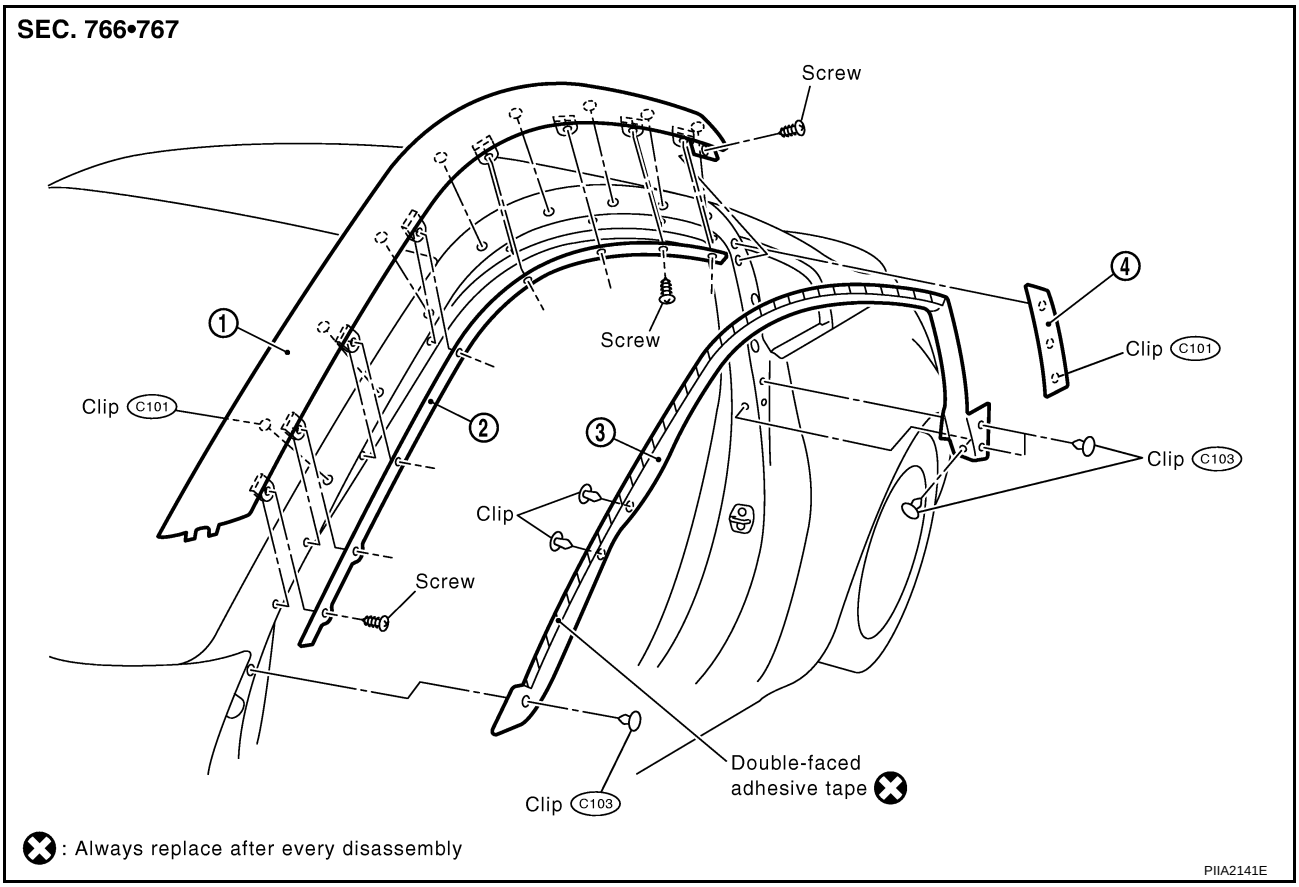
- **Do not let air between contact surfaces when installing.**
- **To secure contact, do not wash vehicle within 24 hours after installation.**

ROOF SIDE MOLDING

PFP:73854

Removal and Installation (for Coupe Models)

NIS0008O



1. Front pillar finisher
2. Retainer body side weatherstrip
3. Body side weatherstrip
4. Lock pillar finisher

FRONT PILLAR FINISHER

Removal

1. Remove lock pillar finisher.
2. Remove clip and double-faced adhesive tapes of body side weatherstrip.
3. Remove body side weatherstrip.
4. Remove screw of retainer body side weatherstrip.
5. Remove screw and clip of front pillar finisher.
6. Remove front pillar finisher.

Installation

Install in the reverse order of removal.

LOCK PILLER FINISHER

Removal

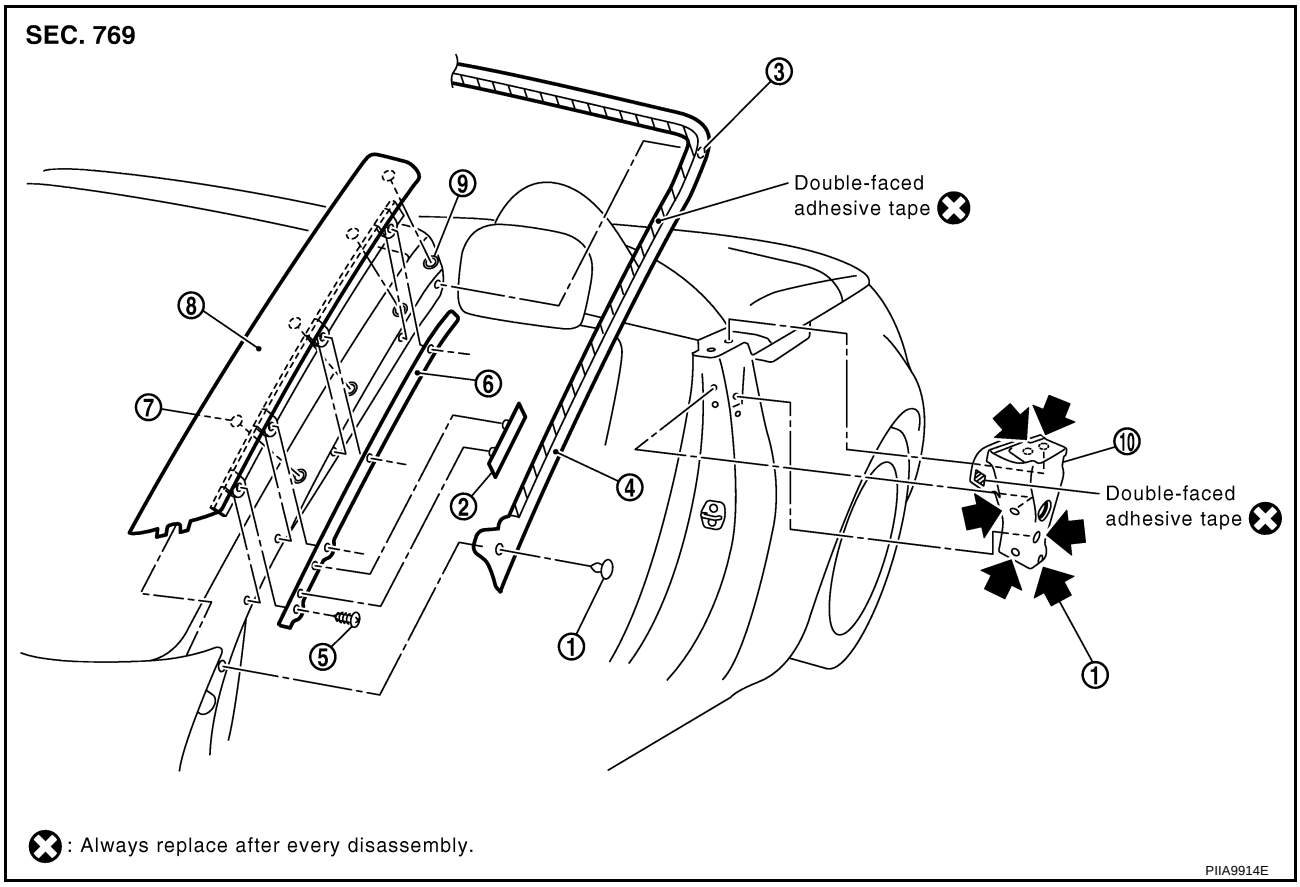
Lift and twist lock pillar finisher up from lock pillar disconnect clips.

Installation

Install in the reverse order of removal.

Removal and Installation (for Roadster Models)

NIS0008P



1. Clip (C103)
2. Clip
3. Clip (CE103)
4. Body side glass-run rubber
5. Screw
6. Retainer
7. Clip (C101)
8. Front pillar finisher
9. Grommet
10. Body side weatherstrip

FRONT PILLAR FINISHER

Removal

1. Open soft top.
2. Remove clip and double-faced adhesive tapes of body side glass-run rubber.
   NOTE:
   Slide body side glass run slightly upward to remove clip on middle portion of glass run rubber side from retainer.
3. Remove body side glass-run rubber.
4. Remove screw of retainer.
5. Remove screw and clips of front pillar finisher.
6. Remove front pillar finisher.

Installation

Install in the reverse order of removal.

BODY SIDE WEATHERSTRIP

Removal

1. Open soft top.
2. Disconnect clips and remove body side weatherstrip.

Installation

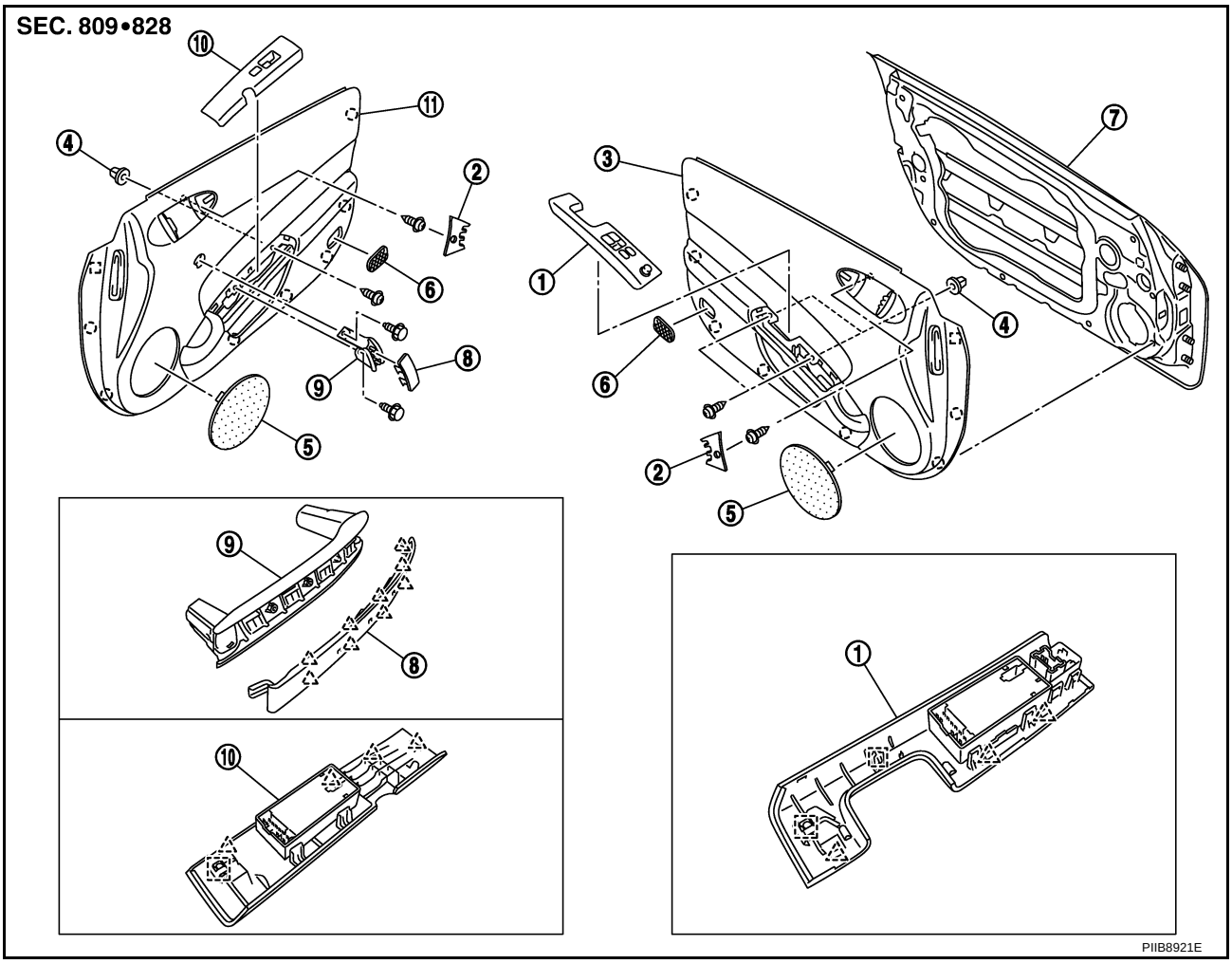
Install in the reverse order of removal.

DOOR FINISHER

PFP:80900

Removal and Installation

NIS0008Q



1. Power window main switch finisher	2. Inside handle escutcheon	3. Driver door finisher assembly
4. Grommet	5. Speaker grille	6. Step lamp lens
7. Door panel assembly (LH)	8. Door grip finisher	9. Door grip
10. Power window sub switch finisher	11. Passenger door finisher assembly	
Clip	Pawl	Metal clip

DRIVER DOOR FINISHER

Removal

1. Remove cap inside handle portion and remove screw.
2. Remove power window main switch finisher.
3. Disconnect harness connector power window main switch.
4. Remove screw of power window main switch portion.
5. Disengage both of the door main harness clip on the rear surface of the door finisher.
6. Disengage part of the bottle holder's illumination harness connector.
7. Pull up door finisher and remove connector inside handle cable and lock knob cable.

Installation

Install in the reverse order of removal.

CAUTION:

To install finisher, check if all clips are matched over holes of panel on vehicle, then push it.

PASSENGER DOOR FINISHER

Removal

1. Remove cap inside handle portion and remove screw.
2. Insert taping flat-bladed screwdriver into edge portion, disconnect pawls, and remove door grip finisher.
3. Remove screw of door grip portion.
4. Remove power window sub switch finisher.
5. Disconnect harness connector power window sub switch.
6. Disengage both of the door main harness clip on the rear surface of the door finisher.
7. Disengage part of the bottle holder's illumination harness connector.
8. Remove screw of power window sub switch portion.
9. Pull up door finisher and remove connector inside handle cable and lock knob cable.

Installation

Install in the reverse order of removal.

CAUTION:

To install finisher, check if all clips are matched over holes of panel on vehicle, then push it.

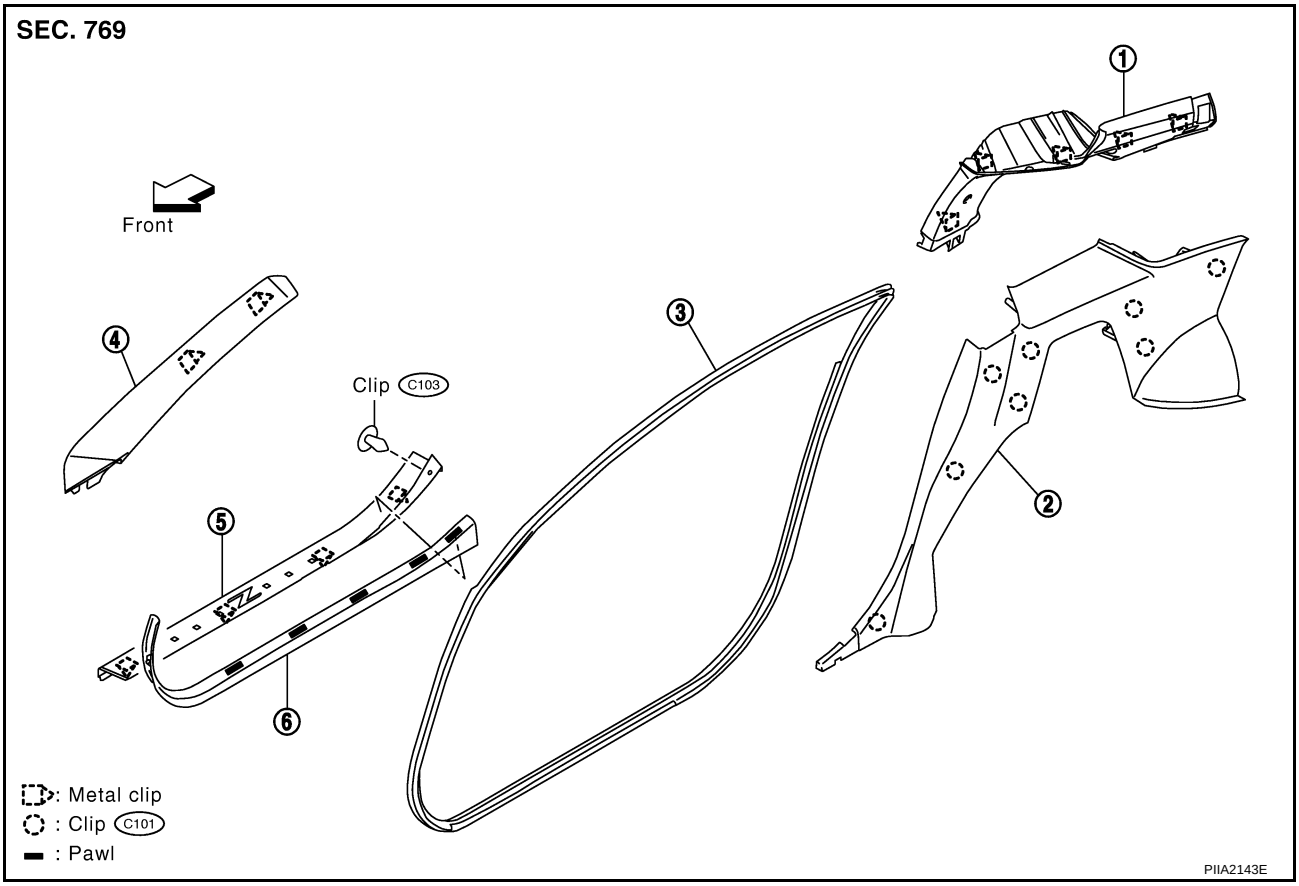
BODY SIDE TRIM

PFP:76913

Removal and Installation (for Coupe Models)

NIS0008R

CAUTION:
Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.



1. Rear pillar finisher
2. Rear side finisher
3. Body side welt
4. Front pillar garnish
5. Kicking plate outer
6. Kicking plate inner

REAR SIDE FINISHER

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove rear side finisher.

Installation

Install in the reverse order of removal.

REAR PILLAR FINISHER

Removal

1. Remove back door weatherstrip. Refer to BL-103, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower center. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Disconnect harness connector at luggage room lamp.
4. Remove luggage side finisher upper. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
5. Remove seat belt shoulder anchor. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" .
6. Remove kicking plate inner.
7. Remove body side welt.
8. Remove rear side finisher.
9. Remove rear pillar finisher.

Installation

Install in the reverse order of removal.

FRONT PILLAR GARNISH

Removal

1. Remove body side welt.
2. Remove front pillar garnish.

Installation

Install in the reverse order of removal.

KICKING PLATE

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove clip of kicking plate outer.
4. Remove kicking plate outer.

Installation

Install in the reverse order of removal.

BODY SIDE WELT

Removal

1. Remove kicking plate inner.
2. Remove body side welt.

Installation

Install in the reverse order of removal.

CAUTION:

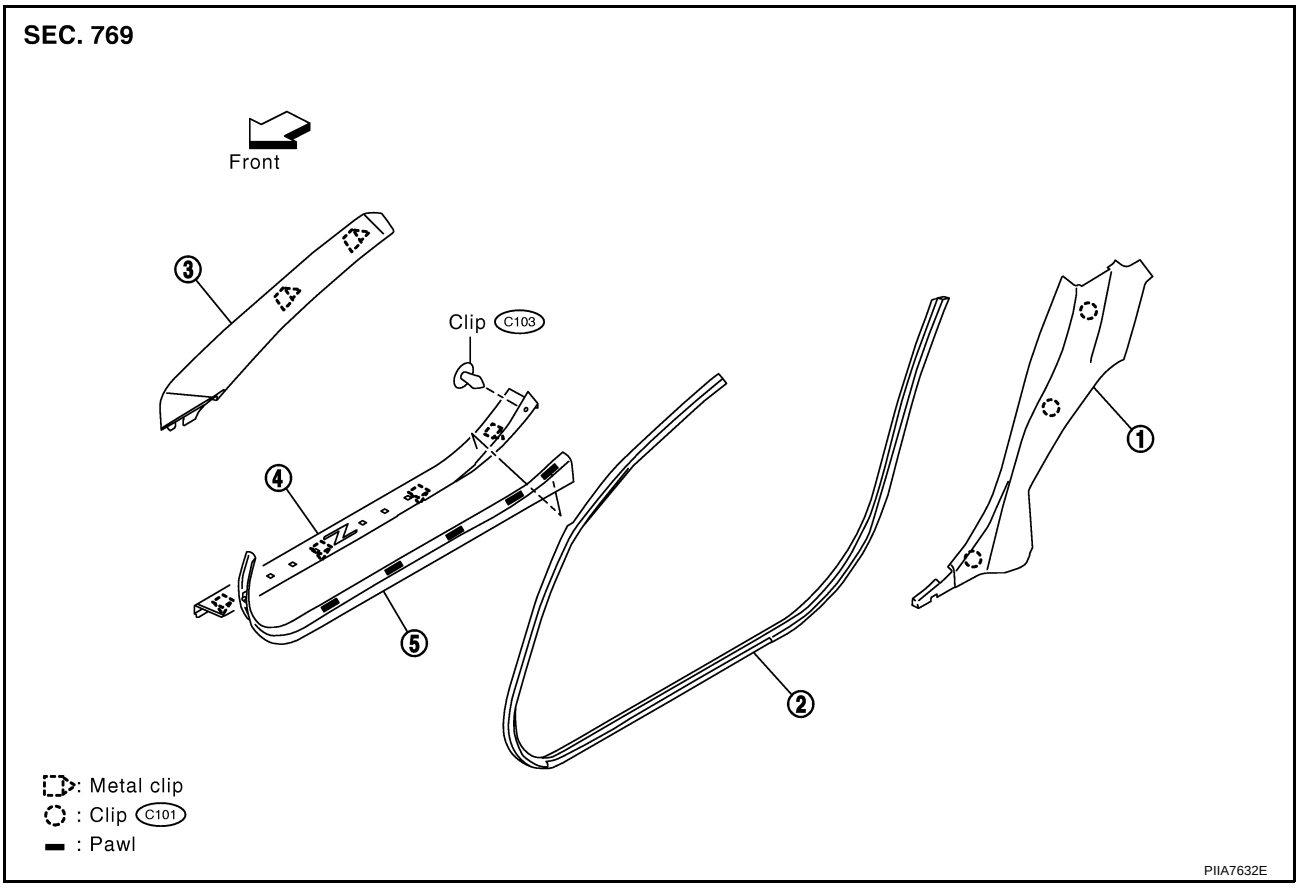
To install, check if all clips are matched over holes of panel on vehicle, then push on.

Removal and Installation (for Roadster Models)

NIS0008S

CAUTION:

Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.



1. Rear side finisher
2. Body side welt
3. Front pillar garnish
4. Kicking plate outer
5. Kicking plate inner

REAR SIDE FINISHER

Removal

1. Remove kicking plate inner.
2. Remove body side weatherstrip. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
3. Remove body side welt.
4. Remove rear side finisher.

Installation

Install in the reverse order of removal.

FRONT PILLAR GARNISH

Removal

1. Partially remove body side welt.
2. Remove front pillar garnish.

Installation

Install in the reverse order of removal.

KICKING PLATE

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove clip of kicking plate outer and remove kicking plate outer.

Installation

Install in the reverse order of removal.

BODY SIDE WELT

Removal

1. Remove kicking plate inner.
2. Remove body side welt.

Installation

Install in the reverse order of removal.

CAUTION:

To install, check if all clips are matched over holes of panel on vehicle, then push on.

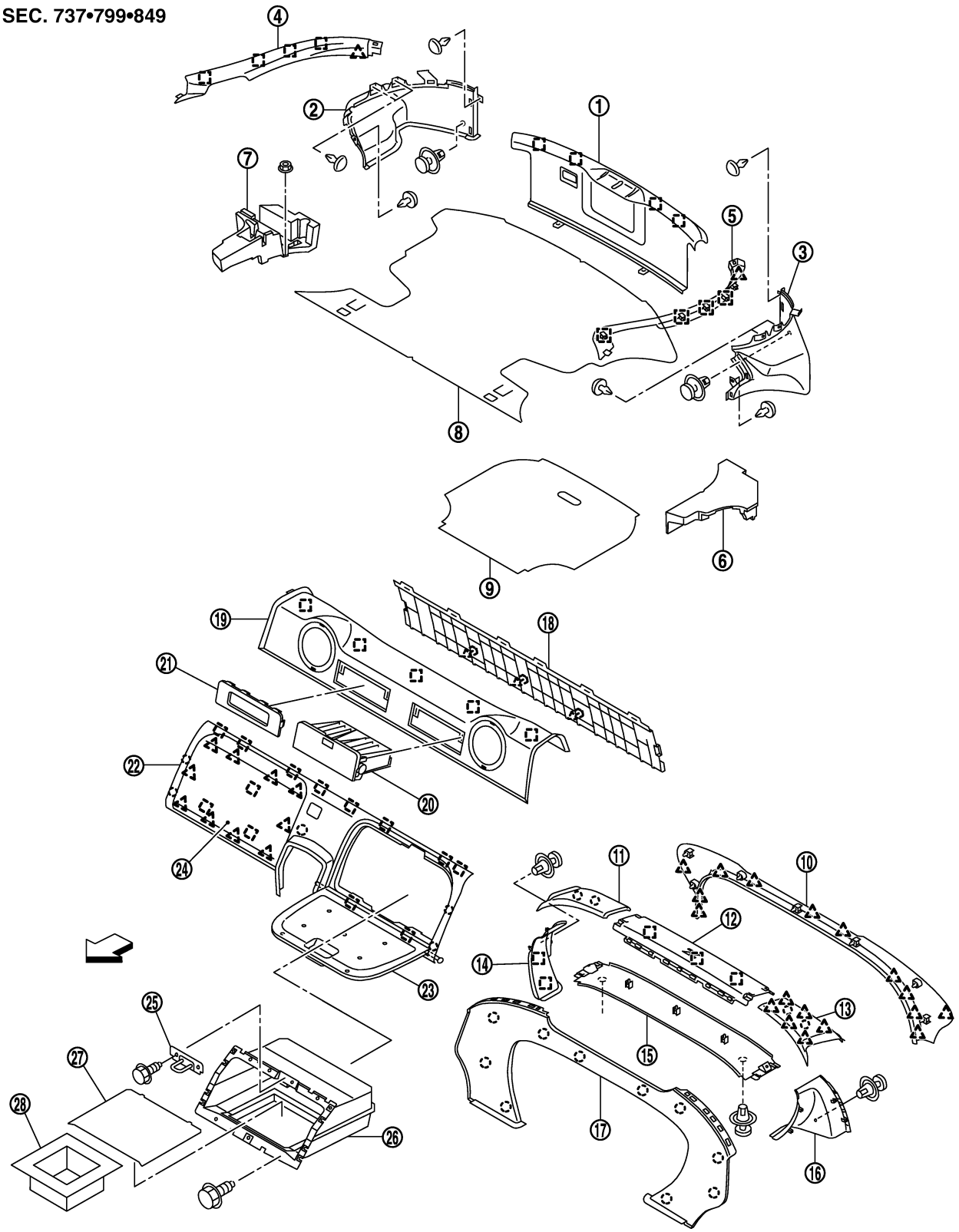
LUGGAGE FLOOR TRIM

PFP:84999

Removal and Installation (for Coupe Models)

NIS0008T

SEC. 737•799•849



PIIB7155J

1. Luggage finisher lower (center)
2. Luggage side finisher lower (RH)
3. Luggage side finisher lower (LH)
4. Luggage side finisher upper (RH)
5. Luggage side finisher upper (LH)
6. Trunk side box
7. Tool box
8. Luggage floor carpet
9. Spare tire cover
10. Strut cover rear
11. Strut cover upper (RH)
12. Strut cover upper (center)
13. Strut cover upper (LH)
14. Strut cover lower (RH)
15. Strut cover lower (center)
16. Strut cover lower (LH)
17. Strut cover front
18. Luggage floor finisher upper (rear)
19. Luggage floor finisher upper (front)
20. Rear parcel box
21. Rear parcel escutcheon
22. Luggage floor finisher lower
23. Rear floor box lid
24. Luggage floor finisher mask
25. Rear floor box striker
26. Rear floor box
27. Rear floor box mat
28. Tray

Clip

Pawl

Metal clip

LUGGAGE FLOOR TRIM

Removal

1. Remove back door welt. Refer to EI-47, "BACK DOOR" .
2. Remove luggage floor carpet.
3. Remove spare tire cover.
4. Remove luggage finisher lower (center).
5. Remove luggage side finisher upper (RH/LH).
6. Remove strut cover upper (RH/LH).
7. Remove strut cover rear.
8. Remove clip of luggage side finisher lower and remove luggage side finisher lower.
9. Remove strut cover front.
10. Remove strut cover upper (center).
11. Remove clip of strut cover lower (RH/LH) and remove strut cover lower.
12. Remove strut cover lower (center).

Installation

Install in the reverse order of removal.

REAR FLOOR BOX

Removal

1. Remove kicking plate inner. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove rear side finisher. Refer to EI-35, "BODY SIDE TRIM" .
4. Remove console box. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Remove screw of rear floor box and remove rear floor box.
6. Remove pins of rear floor box lid and remove rear floor box lid.
7. Remove luggage floor finisher mask.
8. Remove screws of rear floor box lock and remove rear floor box lock.
9. Remove tray.

Installation

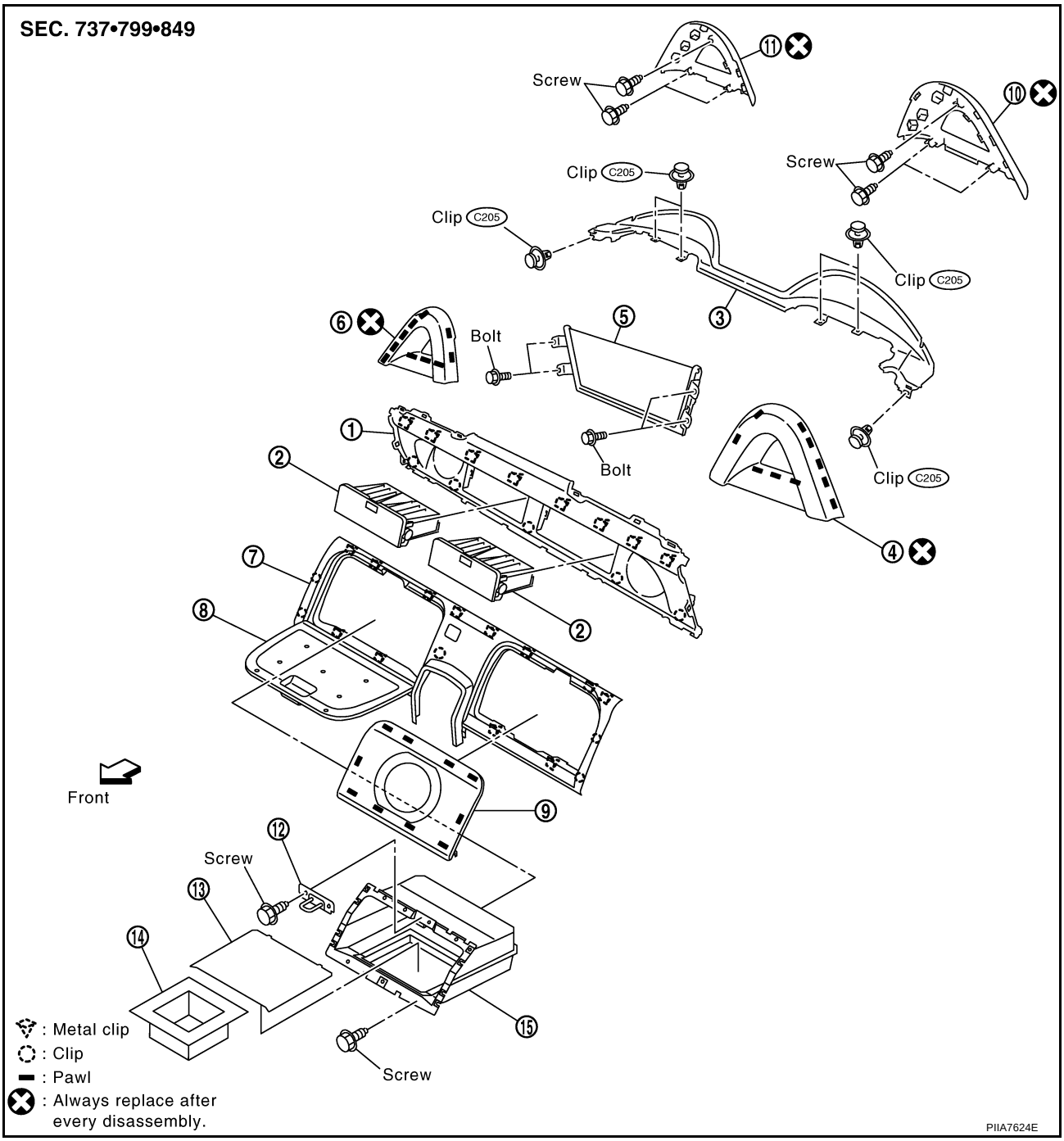
Install in the reverse order of removal.

CAUTION:

To install, check if all clips are matched over holes panel on vehicle, then push on.

Removal and Installation (for Roadster Models)

NIS0008U



1. Luggage floor finisher upper	2. Rear parcel box	3. Back panel finisher assembly
4. Guard frame protector front (LH)	5. Storage lid deflector	6. Guard frame protector front (RH)
7. Luggage floor finisher lower	8. Real floor box lid	9. Luggage floor finisher mask
10. Guard frame protector rear (LH)	11. Guard frame protector rear (RH)	12. Rear floor box striker
13. Rear floor box mat	14. Tray	15. Rear floor box

REAR FLOOR BOX

Removal

1. Remove center console finisher. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Remove luggage floor finisher lower.

5. Remove rear floor box lid and luggage floor finisher mask from luggage floor finisher lower.
6. Remove rear floor box mat and tray.
7. Remove screws, and remove rear floor box striker.
8. Loosen mounting screws and remove rear floor box.

Installation

Install in the reverse order of removal.

LUGGAGE FLOOR FINISHER UPPER

Removal

1. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove luggage floor finisher lower.
4. Remove rear parcel box (RH/LH).
5. Remove luggage floor finisher upper.

Installation

Install in the reverse order of removal.

BACK PANEL FINISHER

Removal

1. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove cover and shoulder anchor bolt of seat belt (RH/LH). Refer to SB-6, "Removal and Installation of Seat Belt (Roadster)" .
4. Remove front guard frame protector (RH/LH).
5. Loosen mounting bolts and remove storage lid deflector.
6. Loosen screws and remove rear guard frame protector (RH/LH).
7. Remove clips, remove back panel finisher assembly.

Installation

Install in the reverse order of removal.

CAUTION:

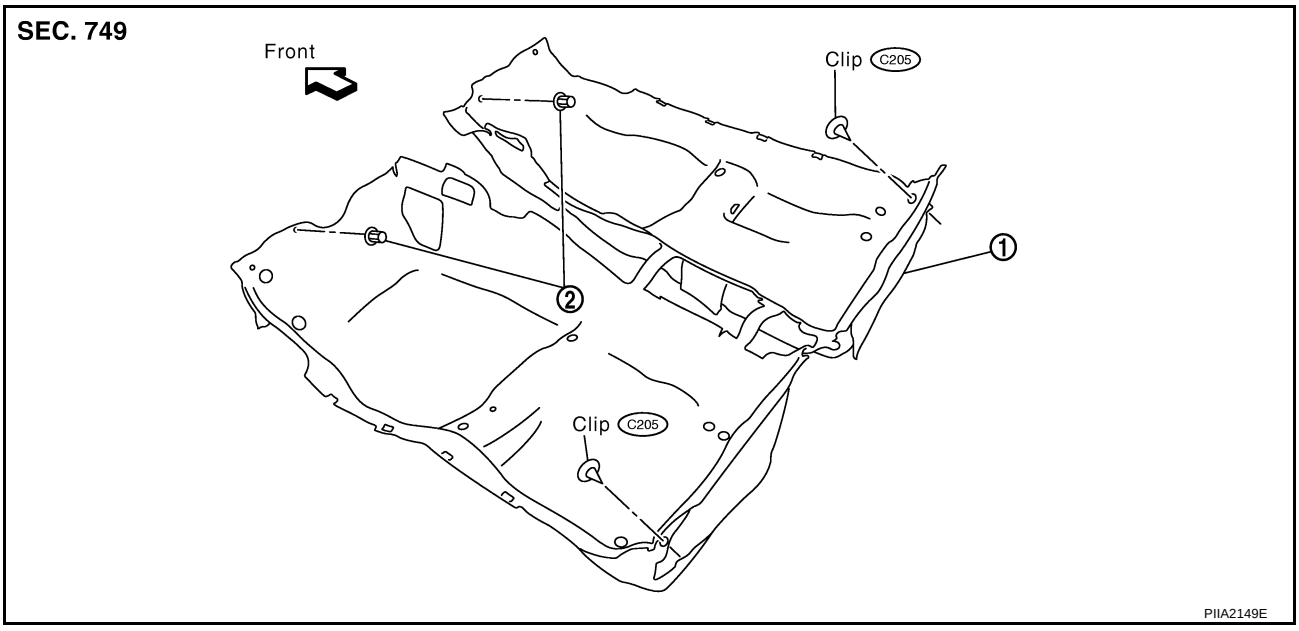
To install, check if all clips are matched over holes panel on vehicle, then push on.

FLOOR TRIM

PFP:74902

Removal and Installation

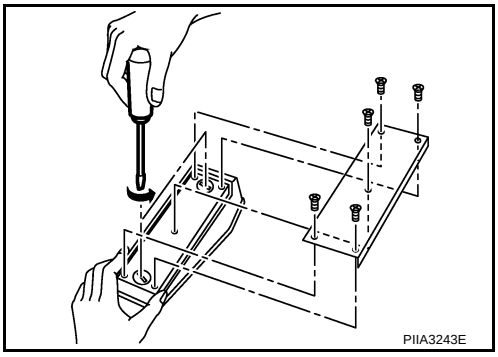
NIS0008V



1. Floor carpet assembly
2. Nut

REMOVAL

1. Remove driver seat and passenger seat. Refer to SE-67, "SEAT" .
2. Remove center console. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. Remove instrument side panel (left and right). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
5. Remove kicking plate inner. Refer to EI-35, "BODY SIDE TRIM" .
6. Remove screw of footrest and remove plate.
7. Remove clips of footrest and remove footrest.
8. Remove dash side finisher. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
9. Remove nut and clips of floor carpet.
10. Remove floor carpet assembly.



INSTALLATION

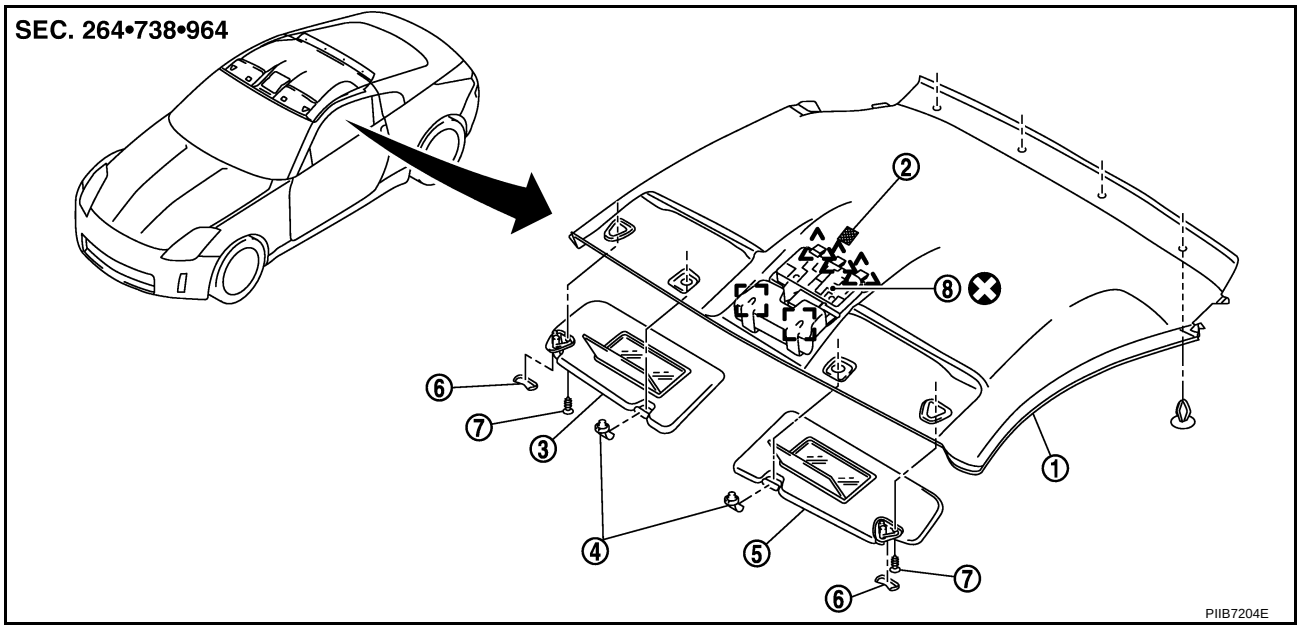
Install in the reverse order of removal.

HEADLINING

PFP:73910

Removal and Installation (for Coupe Models)

NIS0008W

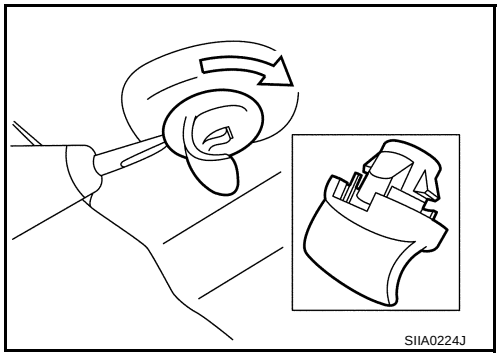


1. Headlining	2. Dual lock fastener	3. Sun-visor (RH)
4. Sun-visor holder	5. Sun-visor (LH)	6. cap
7. Screw	8. Map lamp assembly	
Pawl	Metal clip	

REMOVAL

1. Remove back door welt. Refer to EI-47, "BACK DOOR" .
2. Remove luggage floor carpet. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Remove luggage finisher lower center. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
4. Disconnect harness connector at luggage room lamp.
5. Remove luggage side finisher upper. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
6. Remove kicking plate inner. Refer to EI-36, "KICKING PLATE" .
7. Remove body side welt. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
8. Remove rear side finisher. Refer to EI-35, "REAR SIDE FINISHER" .
9. Remove seat belt anchor. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" .
10. Remove rear pillar finisher. Refer to EI-35, "REAR PILLAR FINISHER" .
11. Remove front pillar garnish. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
12. Disconnect harness connector at map lamp.
13. Remove sun-visor (RH/LH).
14. Remove sun-visors holder (RH/LH).

    NOTE:
    Insert flat-bladed screw driver to edge, and turn it 90 degrees and remove sun-visor holder.



15. Remove dual lock fastener.
16. Remove clips of headlining rear potion.

17. Remove headlining, turn to 90 degrees and take out from back door.

CAUTION:

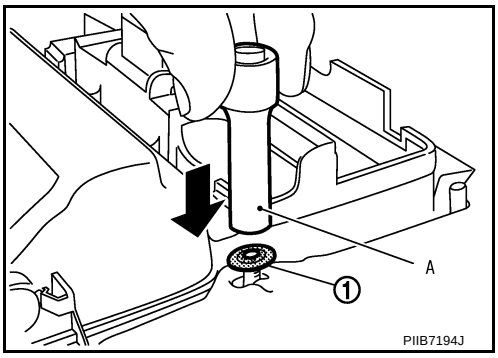
- **Always remove or install in a pair.**
- **Cover surroundings with waste to avoid scratches or damages.**
- **Do not bend headlining too hard.**

INSTALLATION

Install in the reverse order of removal.

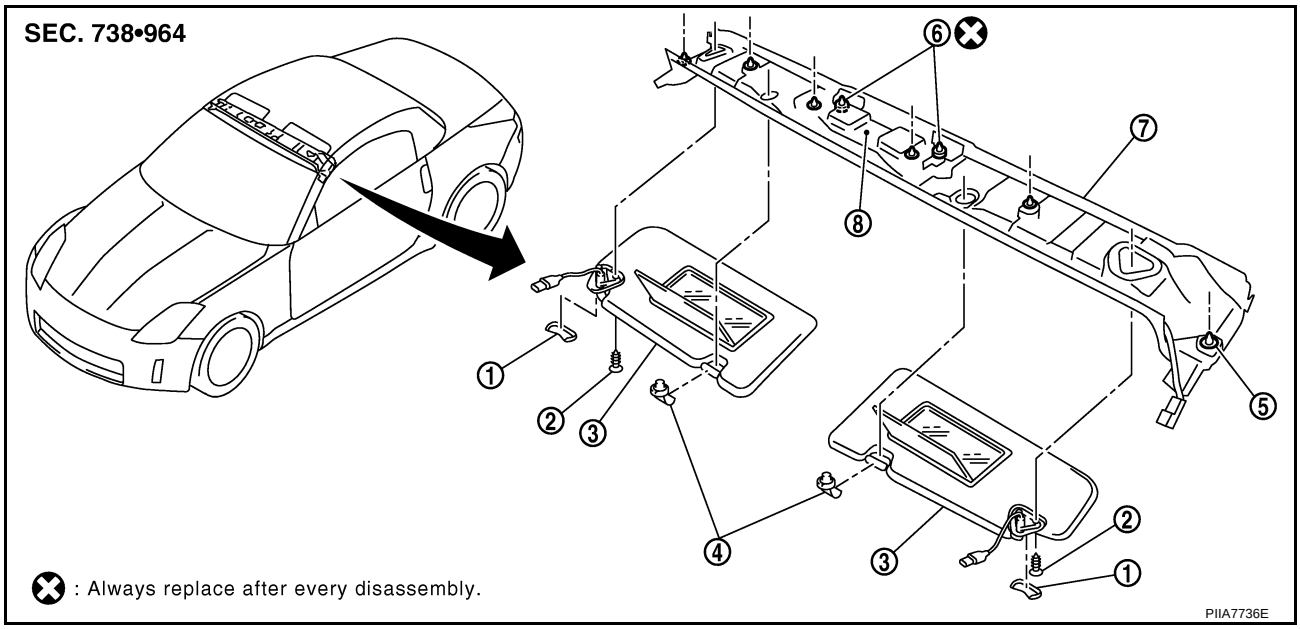
CAUTION:

- **Do not bend headlining when installing.**
- **When installing the map lamp assembly (new unit) or assist grip assembly (new unit), use tools like drafter or deep socket A to eliminate the gap between the headlining and the above new units while the push on nuts (1).**



Removal and Installation (for Roadster Models)

NIS0008X



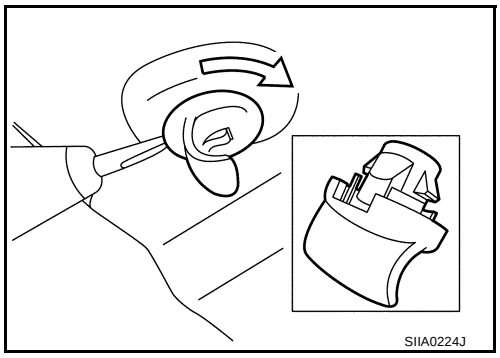
1. Cap	2. Screw	3. Sun-visor
4. Sun-visor holder	5. Clip (C101)	6. Clip (C101)
7. Roof front finisher	8. Map lamp	

ROOF FRONT FINISHER

Removal

1. Remove cap and screws and disconnect harness connector, then remove sun-visor.
2. Remove sun-visors holder (RH/LH).

   NOTE:
   Insert flat-bladed screw driver to edge, and turn it 90 degrees and remove sun-visor holder.



3. Remove body side welt and front pillar garnish. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Disconnect harness connector and remove roof front finisher.

Installation

Install in the reverse order of removal.

CAUTION:

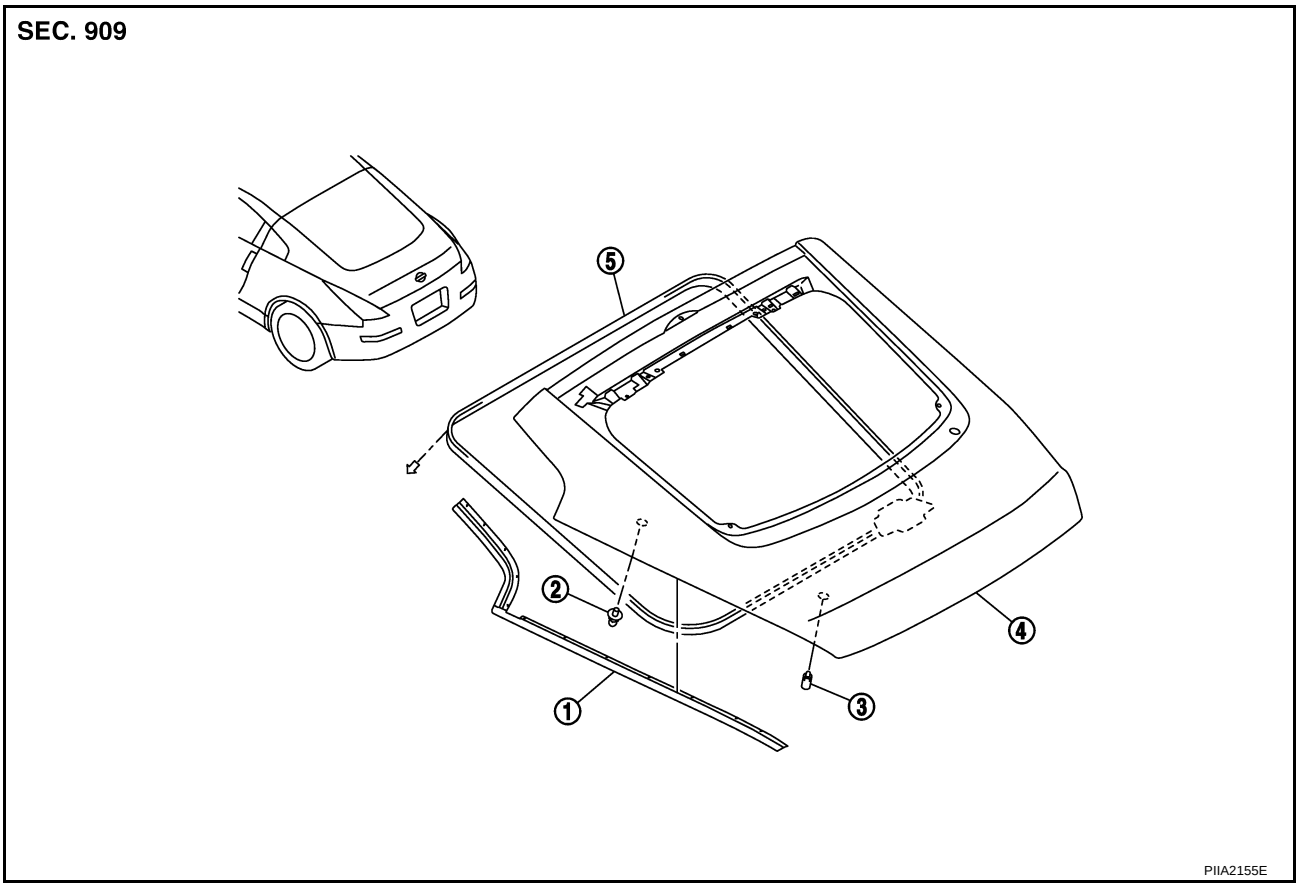
To install, check if all clips are matched over holes panel on vehicle, then push on.

BACK DOOR

PFP:90100

Removal and Installation (for Coupe Models)

NIS0008Y



1. Back door molding
2. Bumper rubber
3. Bumper rubber
4. Back door panel
5. Back door welt

BACK DOOR MOLDING

Removal

Remove clips of back door molding and remove back door molding.

Installation

Install in the reverse order of removal.

BACK DOOR WELT

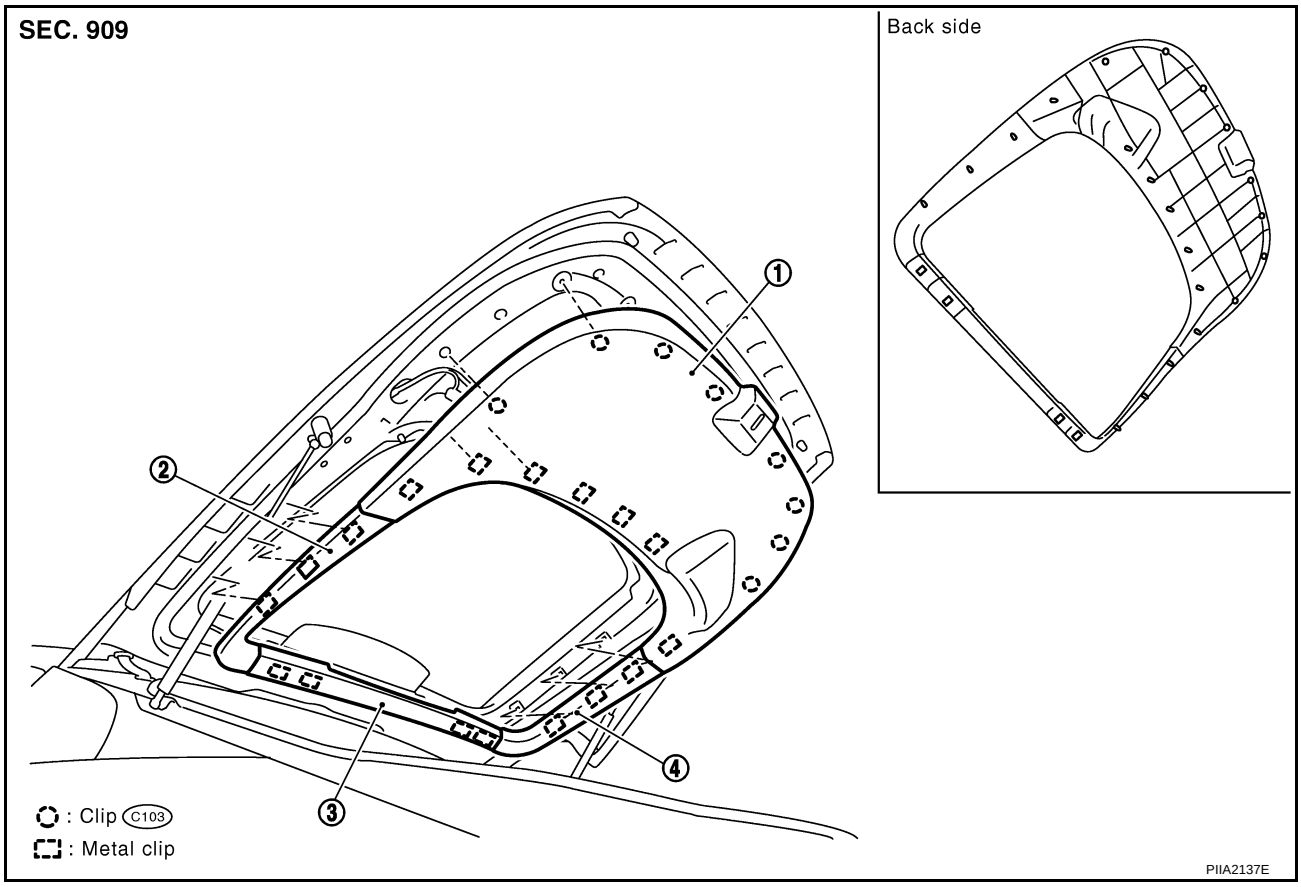
Removal

Remove back door welt.

Installation

Install in the reverse order of removal.

BACK DOOR FINISHER



1. Back door finisher lower
2. Back door finisher side (LH)
3. Back door finisher side (RH)
4. Back door finisher upper

Removal

1. Remove back door finisher lower.
2. Remove back door finisher upper.
3. Remove back door finisher side (RH/LH).

Installation

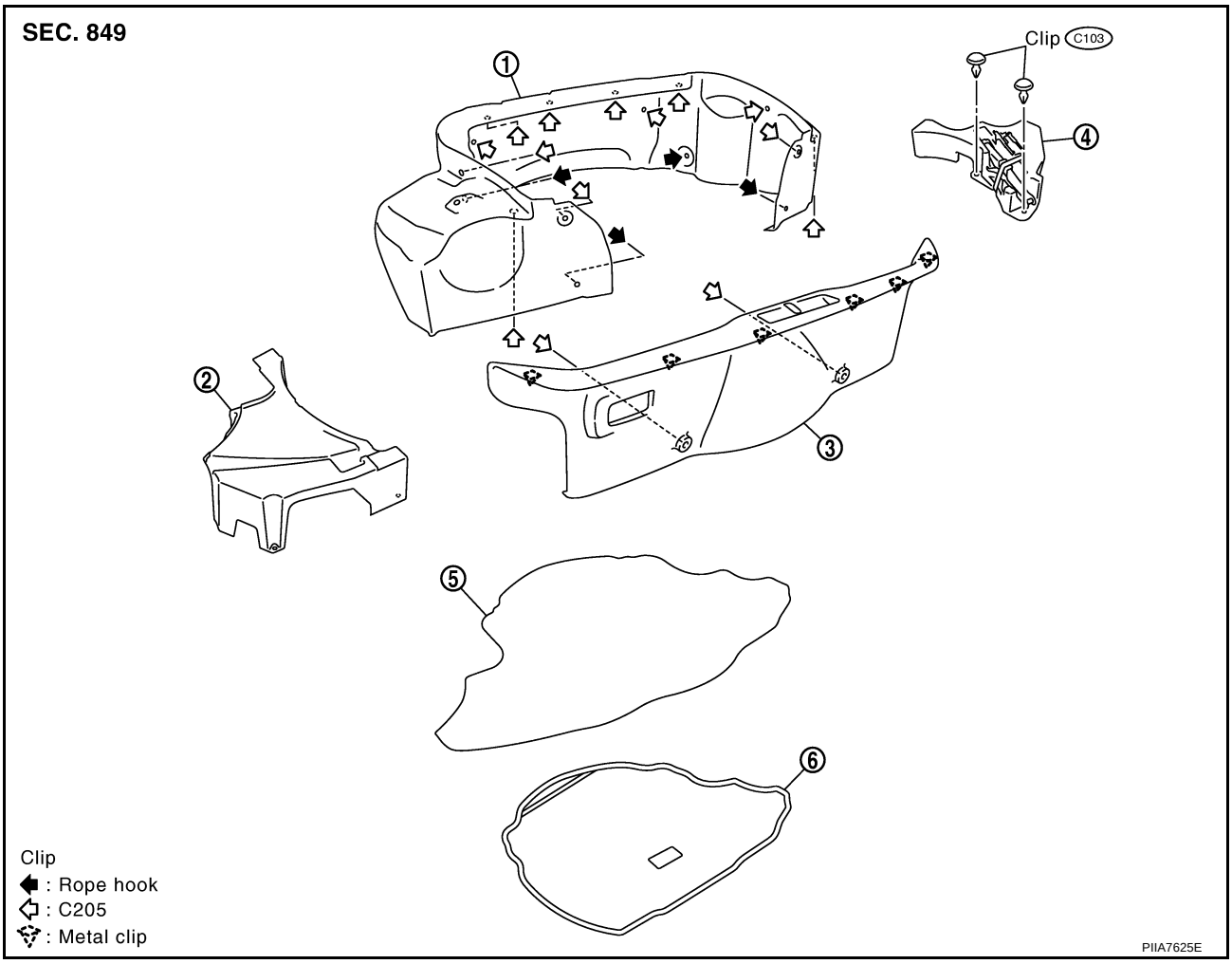
Install in the reverse order of removal.

TRUNK ROOM TRIM & TRUNK LID FINISHER

PFP:84920

Removal and Installation (for Roadstar Models)

NIS0008Z



1. Trunk front finisher
2. Trunk side box
3. Trunk rear finisher
4. Tool box
5. Trunk floor carpet
6. Spare tire cover

TRUNK ROOM TRIM

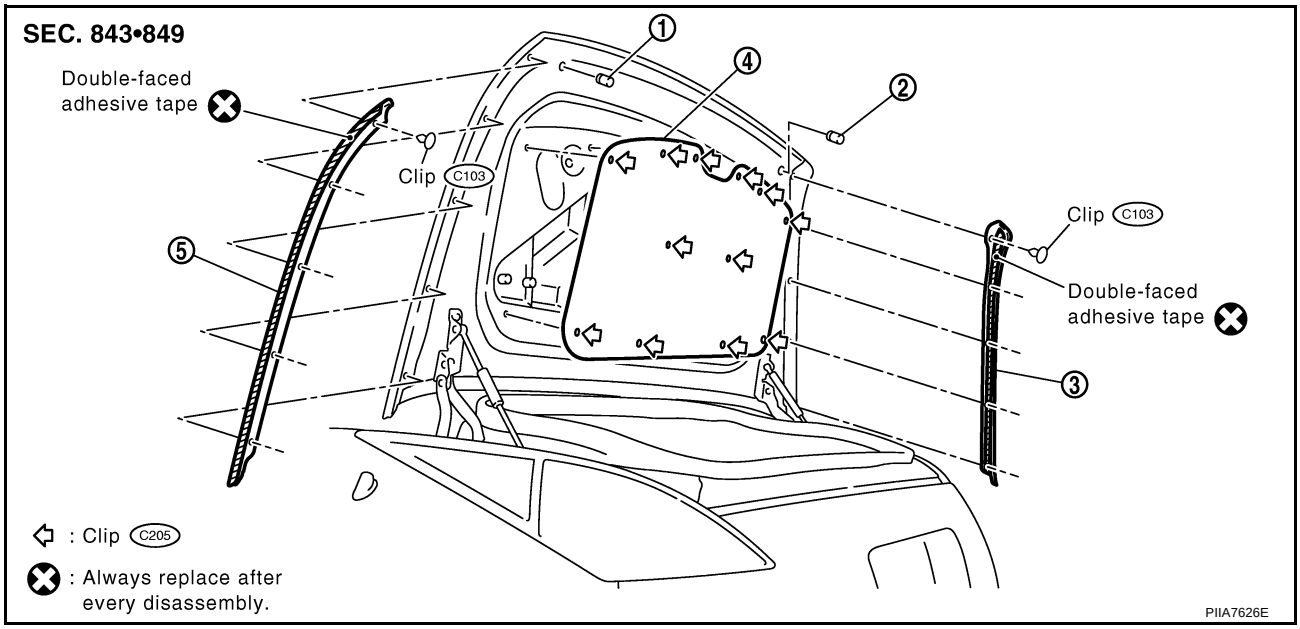
Removal

1. Remove trunk lid weatherstrip. Refer to BL-113, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk floor carpet.
3. Remove spare tire cover.
4. Remove trunk lid release lever from trunk rear finisher.
5. Remove clips and remove trunk rear finisher.
6. Remove clips of trunk front finisher and remove trunk front finisher.
7. Remove trunk side box.
8. Remove clips and remove tool box.

Installation

Install in the reverse order of removal.

TRUNK LID FINISHER



1. Bumper rubber
2. Bumper rubber
3. Trunk lid molding (RH)
4. Trunk lid finisher
5. Trunk lid molding (LH)

Removal

Remove clips of trunk lid finisher and remove trunk lid finisher.

Installation

Install in the reverse order of removal.

TRUNK LID MOLDING

Removal

1. Remove clips and double-faced adhesive tape of trunk lid molding.
2. Remove trunk lid molding (LH/RH).

Installation

Install in the reverse order of removal.

SECTION EM
ENGINE MECHANICAL

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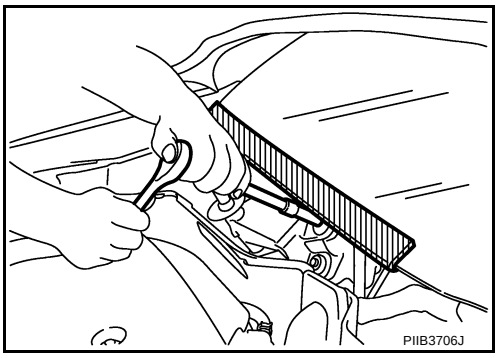
PRECAUTIONS

PFP:00001

Precautions for Procedures without Cowl Top Cover

NBS003FC

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Battery Service

NBS003FD

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Drain Engine Coolant and Engine Oil

NBS00002

Drain engine coolant and engine oil when engine is cooled.

Precautions for Disconnecting Fuel Piping

NBS00003

- Before starting work, make sure no fire or spark producing items are in the work area.
- Release fuel pressure before disconnecting and disassembly.
- After disconnecting pipes, plug openings to stop fuel leakage.

Precautions for Removal and Disassembly

NBS00004

- When instructed to use special service tools, use specified tools. Always be careful to work safely, avoid forceful or uninstructed operations.
- Exercise maximum care to avoid damage to mating or sliding surfaces.
- Cover openings of engine system with tape or equivalent, if necessary, to seal out foreign materials.
- Mark and arrange disassembly parts in an organized way for easy troubleshooting and re-assembly.
- When loosening bolts and nuts, as a basic rule, start with the one furthest outside, then the one diagonally opposite, and so on. If the order of loosening is specified, do exactly as specified. Power tools may be used in the step.

Precautions for Inspection, Repair and Replacement

NBS00005

Before repairing or replacing, thoroughly inspect parts. Inspect new replacement parts in the same way, and replace if necessary.

Precautions for Assembly and Installation

NBS00006

- Use torque wrench to tighten bolts or nuts to specification.
- When tightening bolts and nuts, as a basic rule, equally tighten in several different steps starting with the ones in center, then ones on inside and outside diagonally in this order. If the order of tightening is specified, do exactly as specified.
- Replace with new gasket, packing, oil seal or O-ring.
- Dowel pins are used for several parts alignment. When replacing and reassembling with dowel pins, make sure that dowel pins are installed in the original portion.
- Thoroughly wash, clean, and air-blow each part. Carefully check engine oil or engine coolant passages for any restriction and blockage.
- Avoid damaging sliding or mating surfaces. Completely remove foreign materials such as cloth lint or dust. Before assembly, oil sliding surfaces well.
- Release air within route when refilling after draining engine coolant.

- After repairing, start engine and increase engine speed to check engine coolant, fuel, engine oil, and exhaust gases for leakage.

Parts Requiring Angle Tightening

NBS00007

- Use angle wrench [SST: KV10112100 (BT8653-A)] for the final tightening of the following engine parts:
  - Cylinder head bolts
  - Lower cylinder block bolts
  - Connecting rod cap bolts
- Do not use a torque value for final tightening.
- The torque value for these parts are for a preliminary step.
- Ensure thread and seat surfaces are clean and coated with engine oil.

Precautions for Liquid Gasket

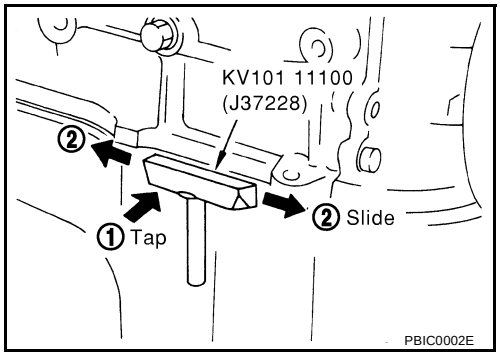
NBS00008

REMOVAL OF LIQUID GASKET SEALING

- After removing mounting bolts and nuts, separate the mating surface using seal cutter (SST) and remove old liquid gasket sealing.

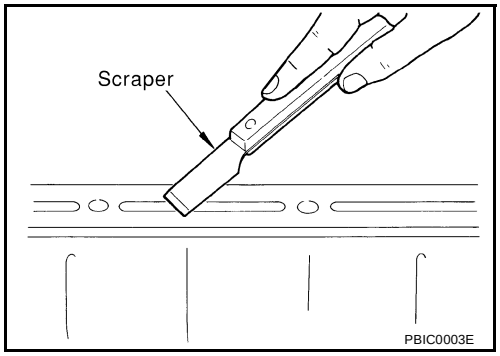
  CAUTION:
  Be careful not to damage the mating surfaces.
- Tap seal cutter to insert it, and then slide it by tapping on the side as shown in the figure.
- In areas where seal cutter (SST) is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

  CAUTION:
  If for some unavoidable reason tool such as screwdriver is used, be careful not to damage the mating surfaces.

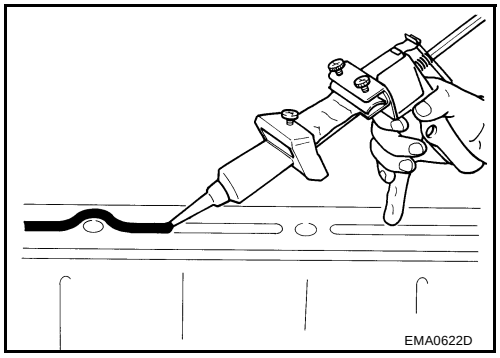


LIQUID GASKET APPLICATION PROCEDURE

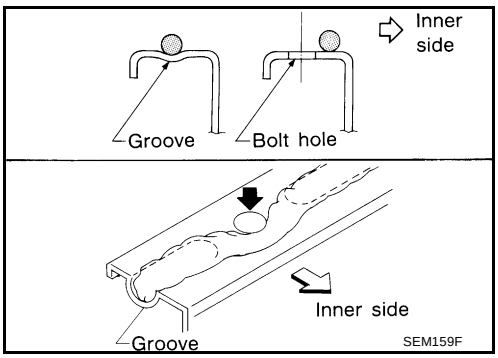
1. Using scraper, remove old liquid gasket adhering to the gasket application surface and the mating surface.
   - Remove liquid gasket completely from the groove of the gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.



3. Attach liquid gasket tube to tube presser [SST: WS39930000 (—)].
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for liquid gasket application, apply liquid gasket to the groove.



- As for bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of this manual.
- Within five minutes of liquid gasket application, install the mating component.
- If liquid gasket protrudes, wipe it off immediately.
- Do not retighten mounting bolts or nuts after the installation.
- After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



CAUTION:

If there are specific instructions in this manual, observe them.

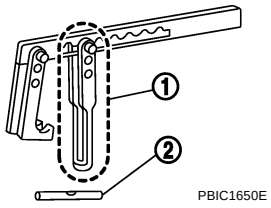
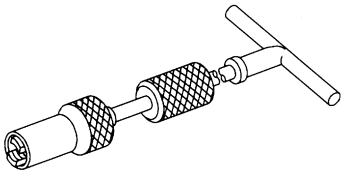
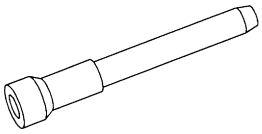
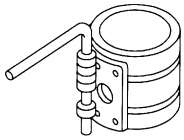
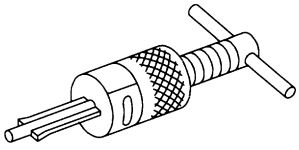
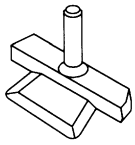
PREPARATION

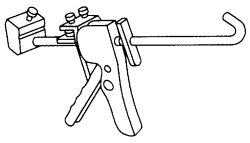
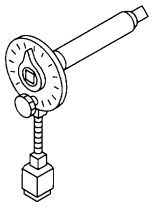
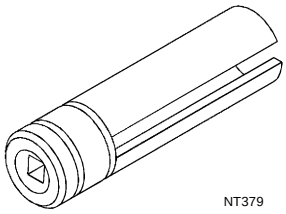
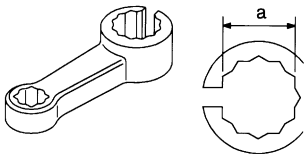
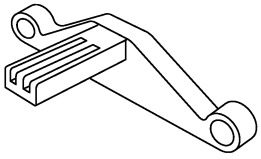
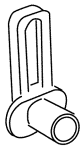
PFP:00002

Special Service Tools

NBS00009

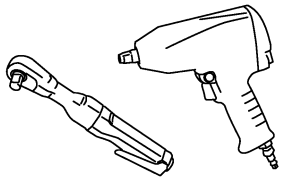
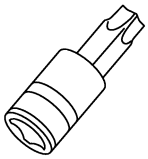
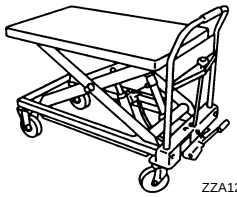
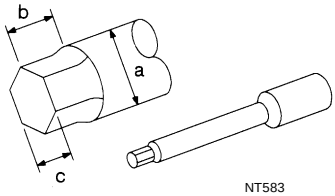
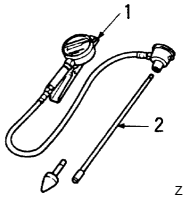
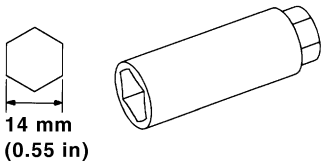
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

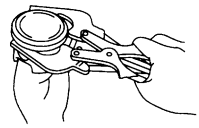
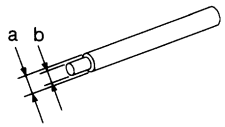
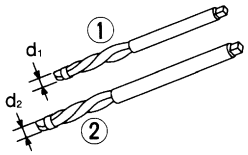
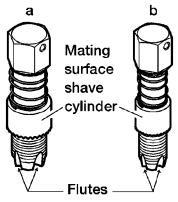
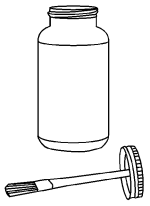
Tool number (Kent-Moore No.) Tool name		Description
KV10116200 (J26336-A) Valve spring compressor 1. KV10115900 (J26336-20) Attachment 2. KV10109220 (—) Adapter	 PBIC1650E	Disassembling valve mechanism Part (1) is a component of KV10116200 (J26336-A), but Part (2) is not so.
KV10107902 (J38959) Valve oil seal puller	 NT011	Replacing valve oil seal
— (J39386) Valve oil seal drift	 NT024	Installing valve oil seal
EM03470000 (J8037) Piston ring compressor	 NT044	Installing piston assembly into cylinder bore
ST16610001 (J23907) Pilot bushing puller	 NT045	Removing pilot bushing (M/T models) or pilot converter (A/T models)
KV10111100 (J37228) Seal cutter	 NT046	Removing oil pan (lower and upper), front and rear timing chain case, etc.

Tool number (Kent-Moore No.) Tool name		Description
WS39930000 (—) Tube presser	 NT052	Pressing the tube of liquid gasket
KV10112100 (BT8653-A) Angle wrench	 NT014	Tightening bolts for bearing cap, cylinder head, etc. in angle
KV10117100 (J3647-A) Heated oxygen sensor wrench	 NT379	Loosening or tightening heated oxygen sensor 2 **For 22 mm (0.87 in) width hexagon nut**
KV10114400 (J38365) Heated oxygen sensor wrench	 NT636	Loosening or tightening air fuel ratio sensor 1 **a: 22 mm (0.87 in)**
KV10118600 (J-48641) Ring gear stopper	 PBIC5052E	Removing and installing crankshaft pulley
— (J-45488) Quick connector release	 PBIC0198E	Removing fuel tube quick connectors in engine room

Commercial Service Tools

NBS0000A

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
TORX socket  PBIC1113E	Removing and installing flywheel **Size: T55**
(—) Manual lift table caddy  ZZA1210D	Removing and installing engine
(J24239-01) Cylinder head bolt wrench  NT583	Loosening and tightening cylinder head bolt, and used with angle wrench [SST: KV10112100 (BT8653-A)] **a: 13 (0.51) dia.** **b: 12 (0.47)** **c: 10 (0.39)** Unit: mm (in)
(—) 1. Compression gauge 2. Adapter  ZZA0008D	Checking compression pressure
(—) Spark plug wrench  **14 mm** **(0.55 in)** PBIC3874E	Removing and installing spark plug
(—) Valve seat cutter set  NT048	Finishing valve seat dimensions

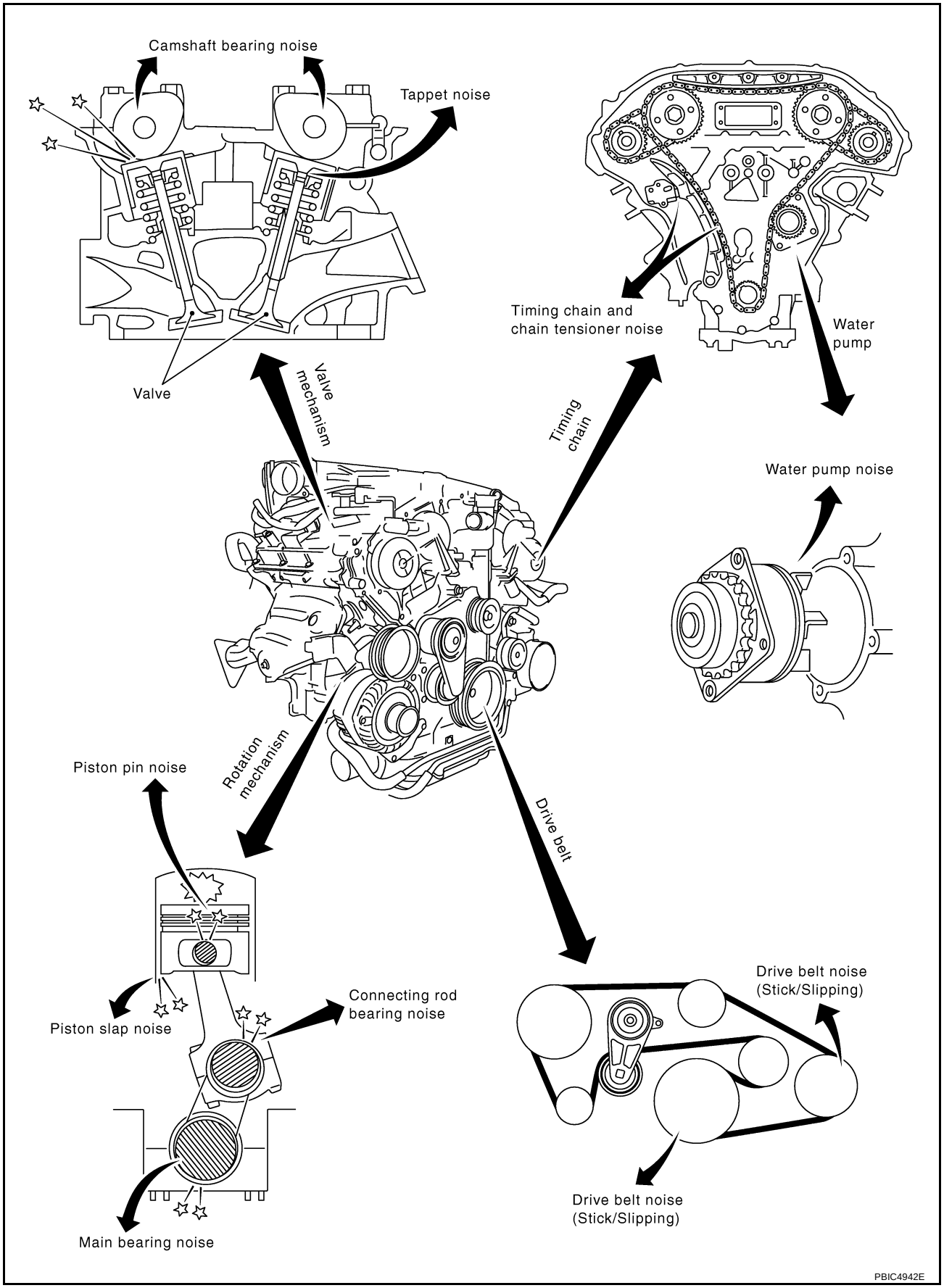
(Kent-Moore No.) Tool name	Description
(—) Piston ring expander  NT030	Removing and installing piston ring
(—) Valve guide drift  NT015	Removing and installing valve guide **Intake and Exhaust:** **a: 9.5 mm (0.374 in) dia.** **b: 5.5 mm (0.217 in) dia.**
(—) Valve guide reamer  NT016	(1): Reaming valve guide inner hole (2): Reaming hole for oversize valve guide **Intake and Exhaust:** **d_1 : 6.0 mm (0.236 in) dia.** **d_2 : 10.2 mm (0.402 in) dia.**
(J-43897-18) (J-43897-12) Oxygen sensor thread cleaner  AEM488	Reconditioning the exhaust system threads before installing a new air fuel ratio sensor and heated oxygen sensor (Use with anti-seize lubricant shown below.) **a: J-43897-18 [18 mm (0.71 in) dia.] for zirconia heated oxygen sensor and air fuel ratio sensor** **b: J-43897-12 [12 mm (0.47 in) dia.] for titania heated oxygen sensor**
(—) Anti-seize lubricant (Permatex 133AR or equivalent meeting MIL specification MIL-A-907)  AEM489	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting — Engine Noise

NBS0000B



Use the Chart Below to Help You Find the Cause of the Symptom.

NBS0000C

1. Locate the area where noise occurs.
2. Confirm the type of noise.
3. Specify the operating condition of engine.
4. Check specified noise source.

If necessary, repair or replace these parts.

Location of noise	Type of noise	Operating condition of engine						Source of noise	Check item	Reference page
		Before warm-up	After warm-up	When starting	When idling	When racing	While driving			
Top of engine Rocker cover Cylinder head	Ticking or clicking	C	A	—	A	B	—	Tappet noise	Valve clearance	EM-80
	Rattle	C	A	—	A	B	C	Camshaft bearing noise	Camshaft runout Camshaft journal oil clearance	EM-74 EM-74
Crankshaft pulley Cylinder block (Side of engine) Oil pan	Slap or knock	—	A	—	B	B	—	Piston pin noise	Piston to piston pin oil clearance Connecting rod bushing oil clearance	EM-125 EM-127
	Slap or rap	A	—	—	B	B	A	Piston slap noise	Piston to cylinder bore clearance Piston ring side clearance Piston ring end gap Connecting rod bend and torsion	EM-129 EM-126 EM-126 EM-127
	Knock	A	B	C	B	B	B	Connecting rod bearing noise	Connecting rod bushing oil clearance Connecting rod bearing oil clearance	EM-127 EM-131
	Knock	A	B	—	A	B	C	Main bearing noise	Main bearing oil clearance Crankshaft runout	EM-132 EM-131
Front of engine Timing chain case	Tapping or ticking	A	A	—	B	B	B	Timing chain and chain tensioner noise	Timing chain cracks and wear Timing chain tensioner operation	EM-60 EM-53
Front of engine	Squeaking or fizzing	A	B	—	B	—	C	Drive belts (Sticking or slipping)	Drive belts deflection	EM-12
	Creaking	A	B	A	B	A	B	Drive belts (Slipping)	Idler pulley bearing operation	
	Squall Creak	A	B	—	B	A	B	Water pump noise	Water pump operation	CO-23, "WATER PUMP"

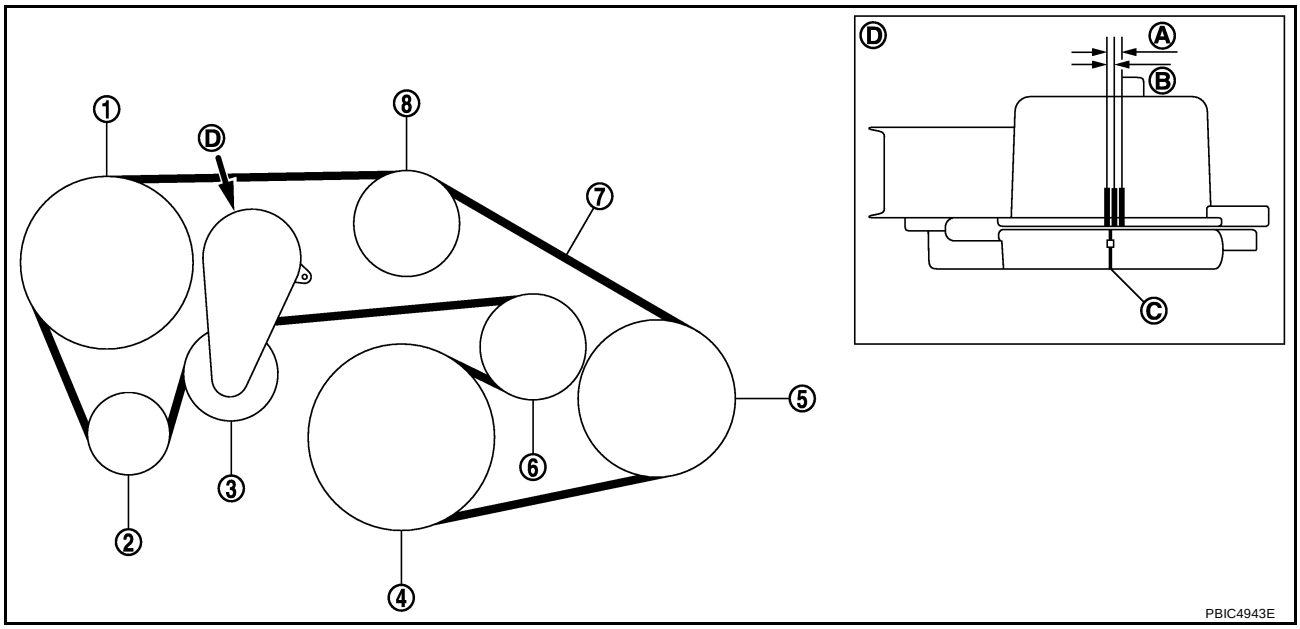
A: Closely related B: Related C: Sometimes related —: Not related

DRIVE BELTS

PFP:02117

Checking Drive Belts

NBS0000D



1.	Power steering oil pump	2.	Alternator	3.	Drive belt auto-tensioner
4.	Crankshaft pulley	5.	A/C compressor	6.	Idler pulley
7.	Drive belt	8.	Idler pulley		
A.	Possible use range	B.	Range when new drive belt is installed	C.	Indicator
D.	View D				

WARNING:

Be sure to perform this step when engine is stopped.

- Make sure that the indicator (C) (notch on fixed side) of drive belt auto-tensioner is within the possible use range (A).

  NOTE:

  Check the drive belt auto-tensioner indication when the engine is cold.
- When new drive belt is installed, the indicator (C) (notch on fixed side) should be within the range (B) in the figure.
- Visually check entire drive belt for wear, damage or cracks.
- If the indicator (C) (notch on fixed side) is out of the possible use range or belts is damaged, replace drive belt.

Tension Adjustment

NBS0000E

Belt tension is not necessary, as it is automatically adjusted by drive belt auto-tensioner.

Removal and Installation

NBS0000F

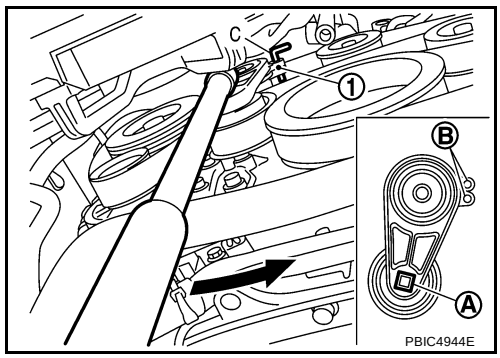
REMOVAL

1. Remove undercover with power tool.
2. Remove reservoir tank. Refer to CO-13, "RADIATOR" .

3. While securely holding the square hole (A) in pulley center of auto tensioner (1) with a spinner handle, move spinner handle in the direction of arrow (loosening direction of drive belt).

CAUTION:
Avoid placing hand in a location where pinching may occur if the holding tool accidentally comes off.

⬅ : Loosing direction of drive belt



4. Under the above condition, insert a metallic bar of approximately 6 mm (0.24 in) diameter [hexagonal wrench (C) shown as example in the figure] through the holding boss (B) to lock auto-tensioner pulley arm.
5. Remove drive belt.

INSTALLATION

Note the following, and install in the reverse order of removal.

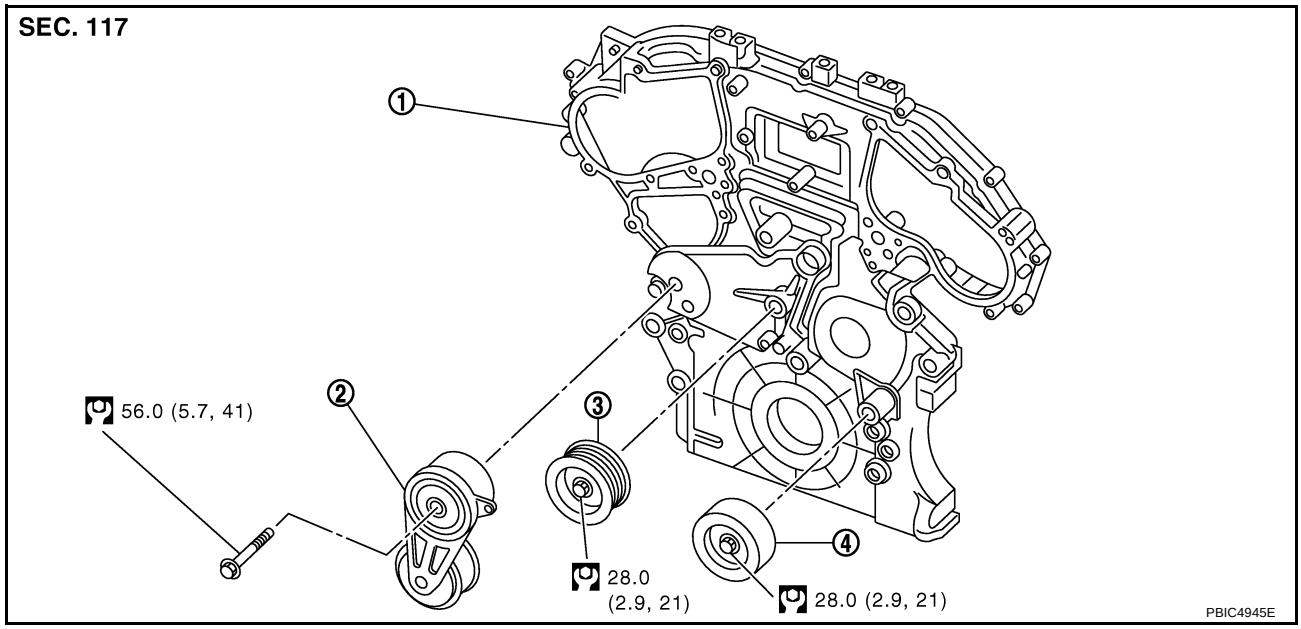
CAUTION:
- **Make sure drive belt is securely installed around all pulleys.**
- **Make sure drive belt is correctly engaged with the pulley groove.**
- **Check for engine oil and engine coolant are not adhered drive belt and pulley groove.**

INSPECTION AFTER INSTALLATION

Turn crankshaft pulley clockwise several times to equalize tension between each pulley, and then confirm tension of drive belt at indicator (notch on fixed side) is within the possible use range. Refer to EM-12, "Checking Drive Belts" .

Components

NBS006TG



1. Front timing chain case
2. Drive belt auto-tensioner
3. Idler pulley
4. Idler pulley

- Refer to GI-11, "Components" for symbol marks in the figure.

Removal and Installation of Drive Belt Auto-Tensioner

NBS006TH

REMOVAL

1. Remove drive belt. Refer to EM-12, "Removal and Installation" .
   - Keep auto-tensioner pulley arm locked after drive belt is removed.
2. Remove auto-tensioner and idler pulley.
   - Keep auto-tensioner pulley arm locked to install or remove auto-tensioner.

INSTALLATION

Installation is the reverse order of removal.

CAUTION:

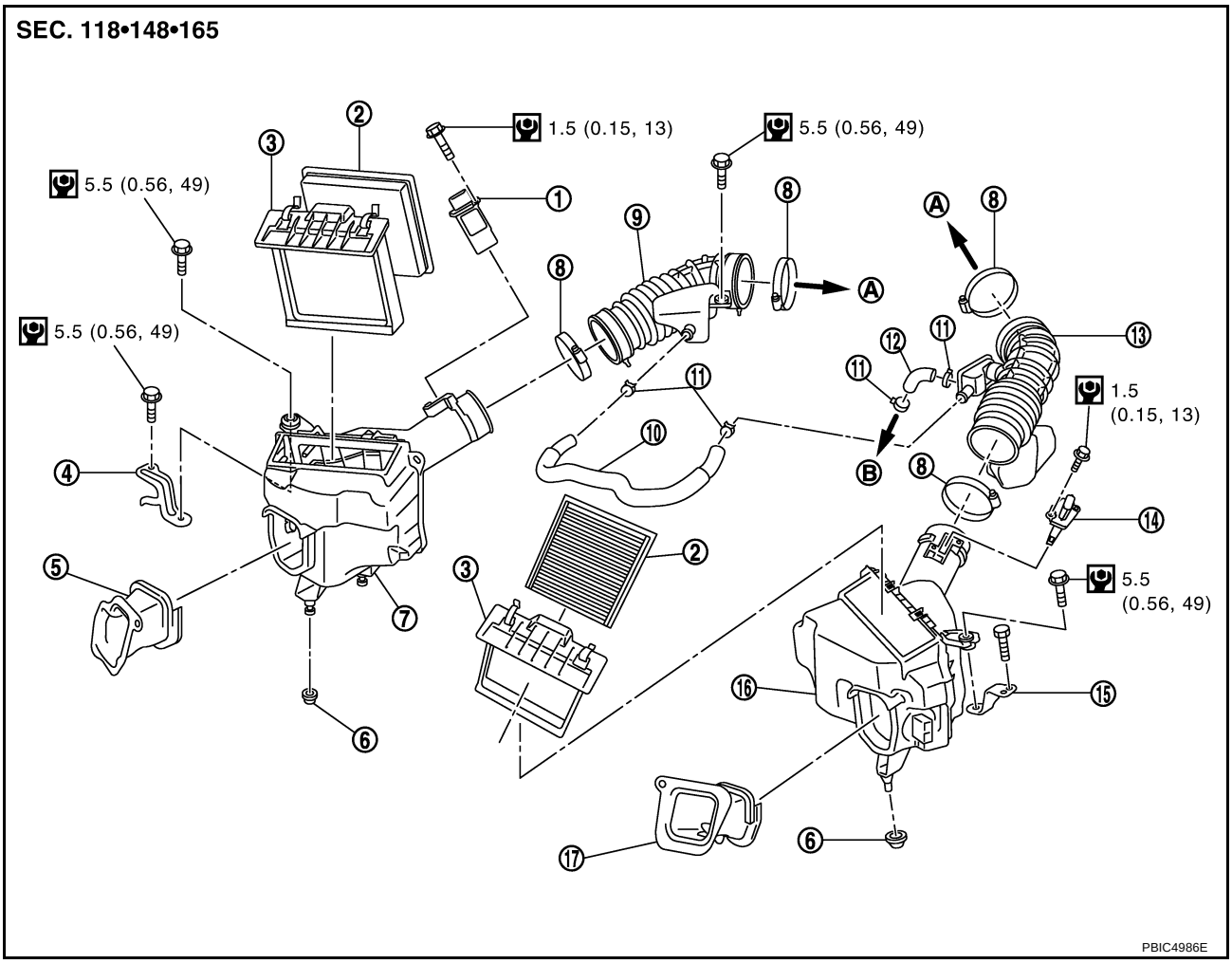
If there is damage greater than peeled paint, replace drive belt auto-tensioner.

AIR CLEANER AND AIR DUCT

PFP:16500

Removal and Installation

NBS0000G



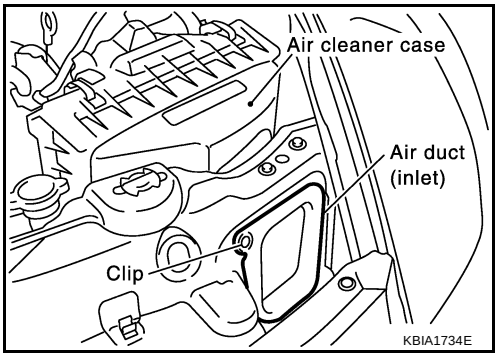
1. Mass air flow sensor (RH)	2. Air cleaner filter	3. Holder
4. Bracket	5. Air duct (inlet)	6. Grommet
7. Air cleaner case (RH)	8. Clamp	9. Air duct (RH)
10. Air hose	11. Clamp	12. PCV hose
13. Air duct (LH)	14. Mass air flow sensor (LH)	15. Bracket
16. Air cleaner case (LH)	17. Air duct (inlet)	
A. To electric throttle control actuator	B. To rocker cover (left bank)	

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove clips, and slide air duct (inlet) frontward, disengage clips and air cleaner case.

   NOTE:
   When removing air duct (inlet), remove front bumper and bumper fascia stay radiator core support center. Refer to EI-14, "FRONT BUMPER" and BL-19, "RADIATOR CORE SUPPORT".



2. Disconnect harness connector from mass air flow sensor.

3. Disconnect PCV hose.
4. Remove air cleaner case/mass air flow sensor assembly and air duct assembly disconnecting their joints.
   - Add marks as necessary for easier installation.
5. Remove mass air flow sensor from air cleaner case.

CAUTION:
Handle mass air flow sensor with care.
- **Do not shock it.**
- **Do not disassemble it.**
- **Do not touch its sensor.**

INSPECTION AFTER REMOVAL

Inspect air duct for crack or tear.

- If anything found, replace air duct.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Align marks. Attach each joint. Screw clamps firmly.

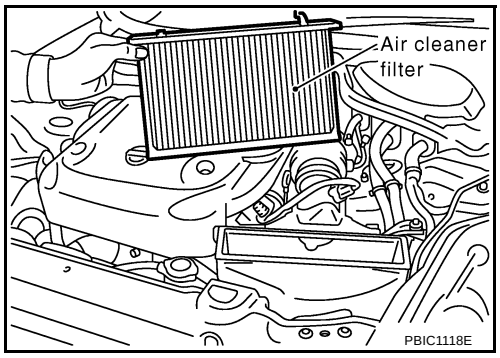
CAUTION:
Keep the clearance more than 5 mm between tower bar and air duct.

Changing Air Cleaner Filter

NBS0000H

REMOVAL

1. Unhook clips, and lift holder.
2. Remove air cleaner filter.



INSTALLATION

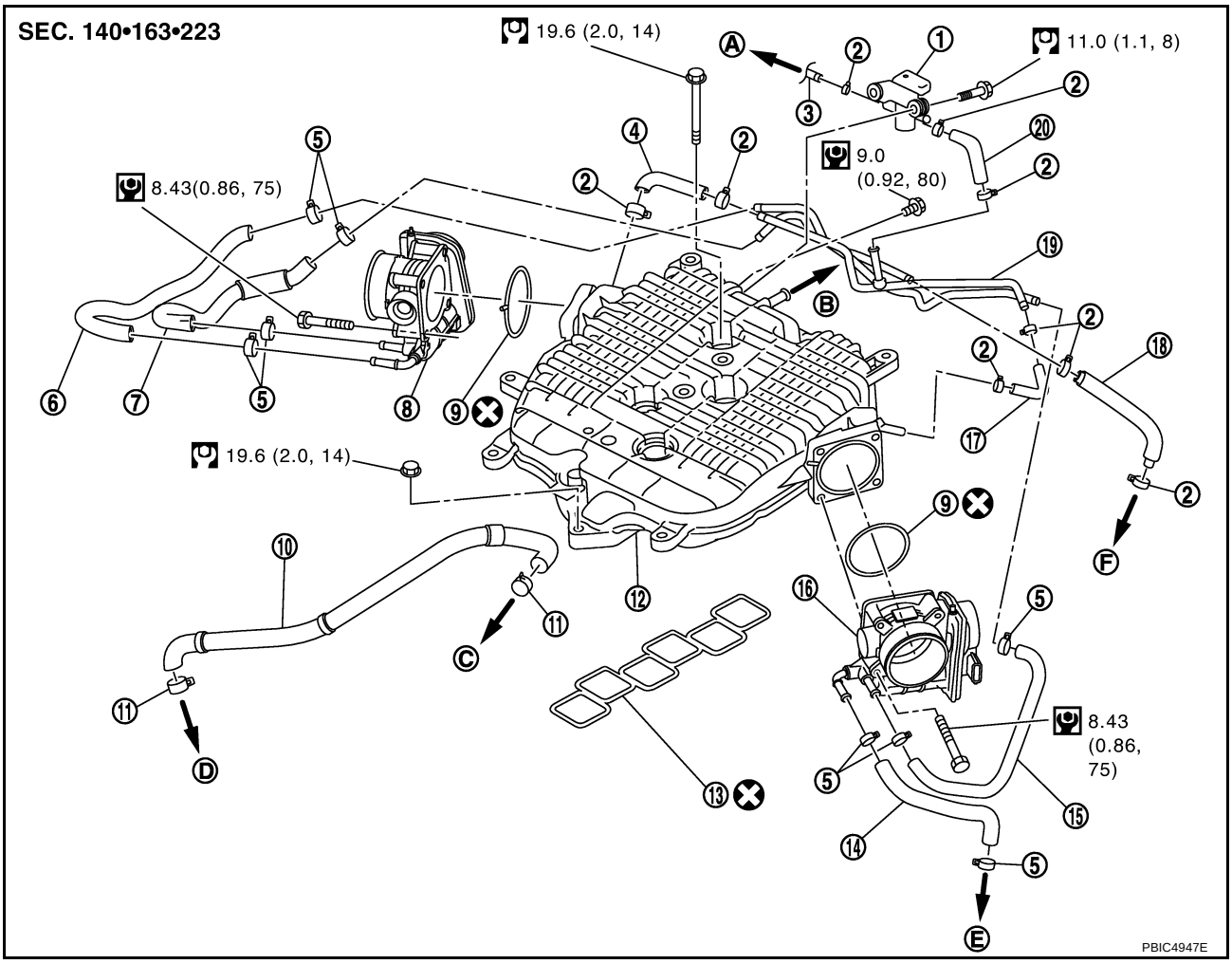
Installation is the reverse order of removal.

INTAKE MANIFOLD COLLECTOR

PFP:14003

Removal and Installation

NBS006VD



1.	EVAP canister purge control solenoid valve	2.	Clamp	3.	EVAP hose
4.	EVAP hose	5.	Clamp	6.	Water hose
7.	Water hose	8.	Electric throttle control actuator (bank1)	9.	Gasket
10.	PCV hose	11.	Clamp	12.	Intake manifold collector
13.	Gasket	14.	Water hose	15.	Water hose
16.	Electric throttle control actuator (bank2)	17.	EVAP hose	18.	Water hose
19.	EVAP tube assembly	20.	EVAP hose		
A.	To vacuum pipe	B.	To brake booster	C.	To intake manifold collector
D.	To PCV valve	E.	To heater pipe	F.	To water outlet (rear)

- Refer to GI-11, "Components" for symbol marks in the figure.

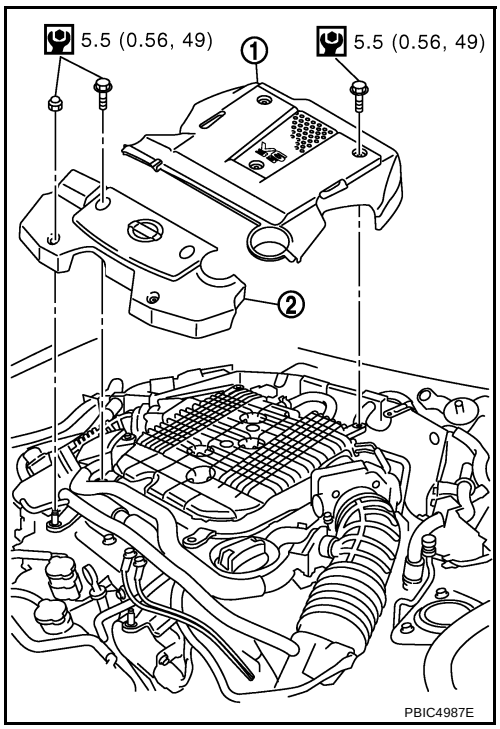
REMOVAL

WARNING:

To avoid the danger of being scalded, do not drain the engine coolant when the engine is hot.

1. Remove tower bar. Refer to FSU-20, "TOWER BAR" .

2. Remove engine cover (1) (2) with power tool.



3. Remove air cleaner case and air duct (RH, LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Remove electric throttle control actuator (bank1, bank2) as follows:

NOTE:
When removing only intake manifold collector, move electric throttle control actuator without disconnecting water hose.

a. Drain engine coolant.

CAUTION:
Perform this step when engine is cold.

b. Disconnect water hoses from electric throttle control actuator. When engine coolant is not drained from radiator, attach plug to water hoses to prevent engine coolant leakage.

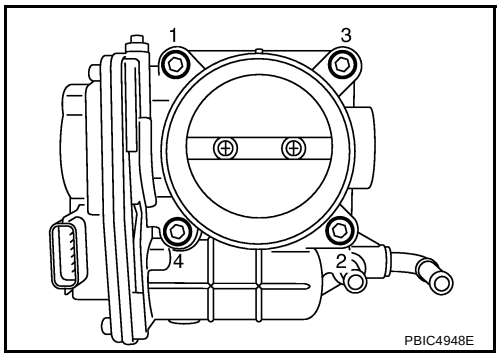
CAUTION:
Do not spill engine coolant on drive belt.

c. Disconnect harness connector.

d. Loosen mounting bolts in reverse order as shown in the figure.

CAUTION:
- **Handle carefully to avoid any shock to electric throttle control actuator.**
- **Do not disassemble.**

NOTE:
- Figure shows electric throttle control actuator (bank1) viewed from the air duct side.
- Viewed from the air duct side, order of loosening mounting bolts of electric throttle control actuator (bank2) is the same as that of the electric throttle control actuator (bank1).

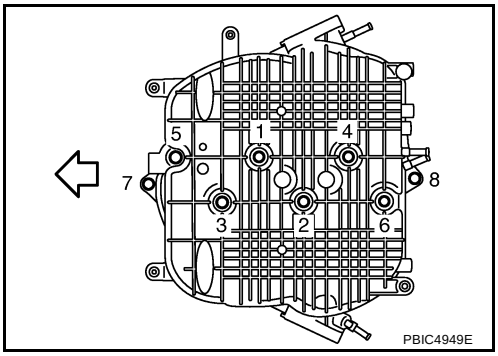


5. Disconnect vacuum hose, PCV hose and EVAP hose from intake manifold collector.
6. Remove EVAP canister purge volume control solenoid valve and EVAP tube assembly from intake manifold collector.

7. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove intake manifold collector.

⇦ : Engine front

CAUTION:
Cover engine openings to avoid entry of foreign materials.



8. Remove PCV hose [between intake manifold collector and rocker cover (right bank)].

INSTALLATION

Note the following, and install in the reverse order of removal.

Intake Manifold Collector

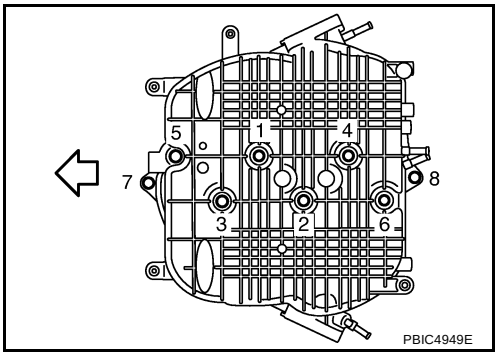
If stud bolts were removed, install them and tighten to the specified torque below.

: 10.8 N·m (1.1 kg-m, 8 ft-lb)

- Tighten mounting bolts in numerical order as shown in the figure.

⇦ : Engine front

NOTE:
Tighten mounting bolts to secure gasket and intake manifold collector.



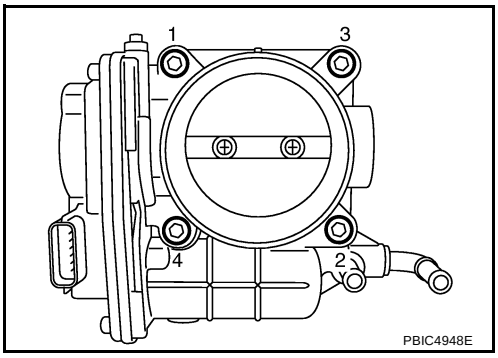
Water Hose

- Insert hose by 27 to 32 mm (1.06 to 1.26 in) from connector end.
- Clamp hose at location of 3 to 7 mm (0.12 to 0.28 in) from hose end.

Electric Throttle Control Actuator

- Install in the reverse order of removal.
- Tighten mounting bolts in numerical order as shown in the figure.

CAUTION:
- **Handle carefully to avoid any shock to electric throttle control actuator.**
- **Do not disassemble.**
- **The figure shows the electric throttle control actuator (bank1) viewed from the air duct side.**
- **Viewed from the air duct side, order of tightening mounting bolts of electric throttle control actuator (bank2) is the same as that of the electric throttle control actuator (bank1).**



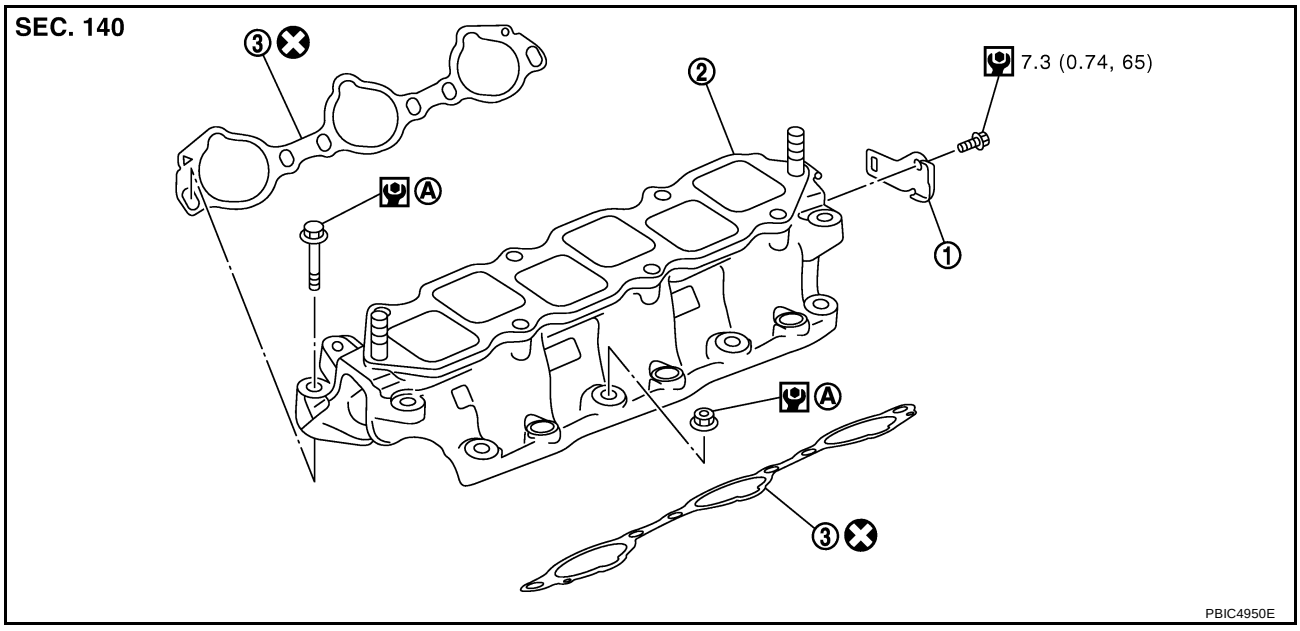
- Perform the “Throttle Valve Closed Position Learning” when harness connector of electric throttle control actuator is disconnected. Refer to EC-77, "Throttle Valve Closed Position Learning" .
- Perform the “Idle Air Volume Learning” and “Throttle Valve Closed Position Learning” when electric throttle control actuator is replaced. Refer to EC-77, "Idle Air Volume Learning" .

INTAKE MANIFOLD

PFP:14003

Removal and Installation

NBS0000J



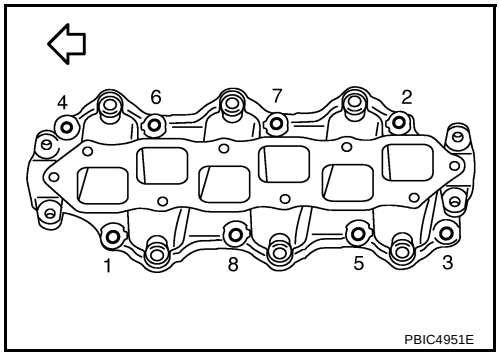
1. Harness bracket
2. Intake manifold
3. Gasket

A. Refer to EM-21

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
3. Remove fuel tube and fuel injector assembly. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
4. Remove harness bracket.
5. Loosen mounting nuts and bolts with power tool in reverse order as shown in the figure to remove intake manifold.



⇦ : Engine front

CAUTION:

- **Cover engine openings to avoid entry of foreign materials.**
- **Put a mark on the intake manifold and the cylinder head with paint before removal because they need installed in the specified direction.**
- **Loosen mounting bolts and nuts from the inside of manifold to the outside.**

6. Remove gaskets.

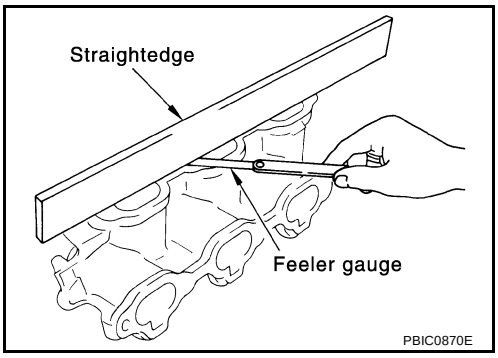
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of the intake manifold mating surface with straightedge and feeler gauge.

  Limit : 0.1 mm (0.004 in)

- If it exceeds the limit, replace intake manifold.



INSTALLATION

Note the following, and install in the reverse order of removal.

Intake Manifold

- If stud bolts were removed, install them and tighten to the specified torque below.

  : 9.8 N·m (1.0 kg-m, 7 ft-lb)

- Tighten all mounting nuts and bolts to the specified torque in two or more steps in numerical order shown in the figure.

  ⇦ : Engine front

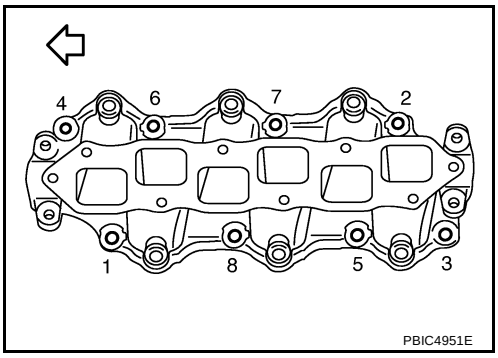
  CAUTION:
  - **Install intake manifold with the marks (put on the intake manifold and the cylinder head before removal) aligned.**
  - **Tighten mounting bolts and nuts from the outside of manifold to the inside.**

  1st step

  : 7.4 N·m (0.75 kg-m, 5 ft-lb)

  2nd step and after

  : 29.0 N·m (3.0 kg-m, 21 ft-lb)

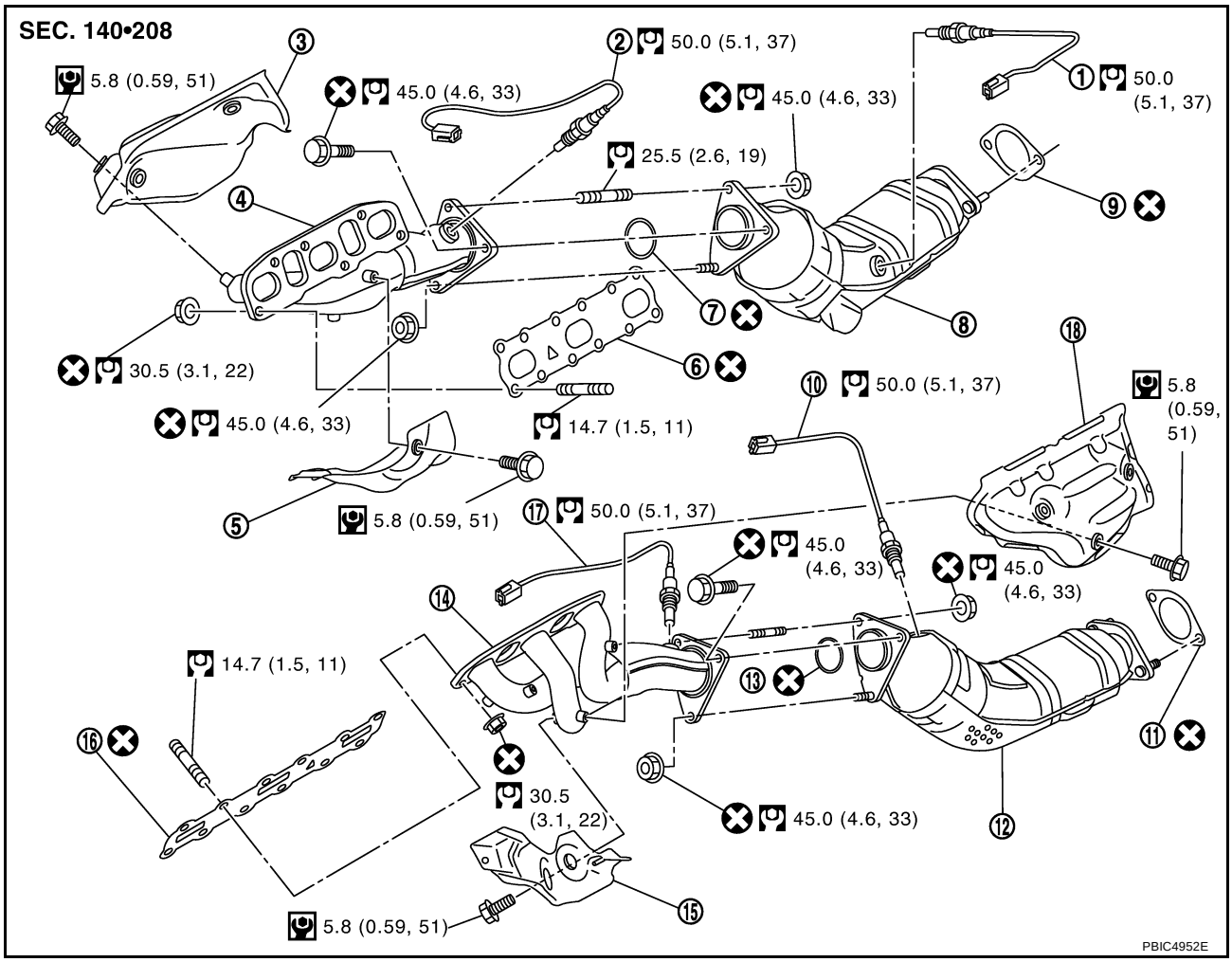


EXHAUST MANIFOLD AND THREE WAY CATALYST

PFP:14004

Removal and Installation

NBS0000K



1.	Heated oxygen sensor (bank 1)	2.	Air fuel ratio sensor (bank 1)	3.	Exhaust manifold cover (upper)
4.	Exhaust manifold (right bank)	5.	Exhaust manifold cover (lower)	6.	Gasket
7.	Ring gasket	8.	Three way catalyst (right bank)	9.	Gasket
10.	Heated oxygen sensor (bank 2)	11.	Gasket	12.	Three way catalyst (left bank)
13.	Ring gasket	14.	Exhaust manifold (left bank)	15.	Exhaust manifold cover (lower)
16.	Gasket	17.	Air fuel ratio sensor (bank 2)	18.	Exhaust manifold cover (upper)

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

WARNING:

Perform the work when the exhaust and cooling system have completely cooled down.

NOTE:

When removing right bank side parts only, step 3, 10 and 11 are unnecessary.

1. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
2. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
3. Drain engine coolant. Refer to CO-10, "Changing Engine Coolant" .

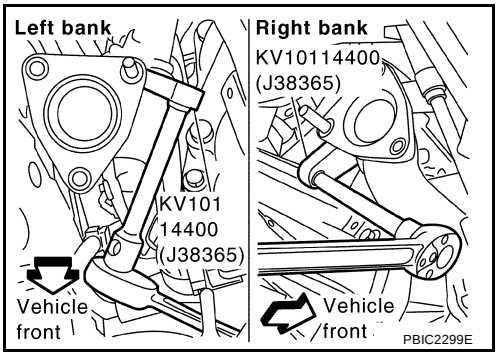
   CAUTION:

   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
4. Remove air cleaner case and air duct. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

5. Remove undercover with power tool.
6. Disconnect heated oxygen sensor harness connectors.

   CAUTION:
   - **Be careful not to damage heated oxygen sensor 2.**
   - **Discard any heated oxygen sensor 2 which has been dropped onto a hard surface such as a concrete floor. Replace with a new sensor.**
7. Remove exhaust mounting bracket between three way catalysts (right and left bank) and transmission. Refer to EX-3, "EXHAUST SYSTEM" .
8. Remove exhaust front tube and three way catalysts (right and left bank).
9. Disconnect harness connector and remove air fuel ratio sensor 1 on both banks using heated oxygen sensor wrench (SST).
   - Put marks to identify installation positions of each air fuel ratio sensor 1.

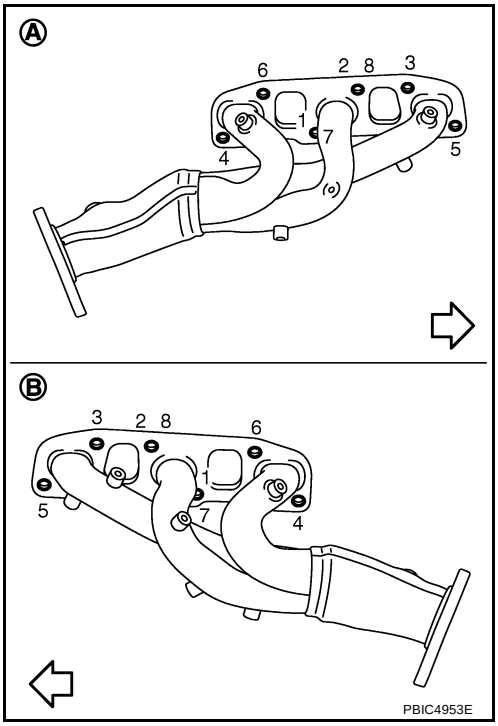
   CAUTION:
   - **Be careful not to damage air fuel ratio sensor 1.**
   - **Discard any air fuel ratio sensor 1 which has been dropped onto a hard surface such as a concrete floor. Replace with a new sensor.**



10. Disconnect steering lower joint at power steering gear assembly side, and release steering lower shaft. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE"
11. Remove water bypass pipe and heater pipe. Refer to CO-28, "WATER OUTLET AND WATER PIPING" .
12. Remove exhaust manifold cover.
13. Loosen mounting nuts in reverse order as shown in the figure to remove exhaust manifold.

    NOTE:
    Disregard the numerical order No. 7 and 8 in removal.

    A : Right bank
    B : Left bank
    ⇦ : Engine front



14. Remove gaskets.

    CAUTION:
    Cover engine openings to avoid entry of foreign materials.

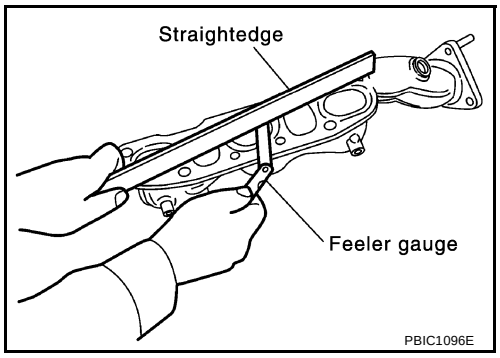
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of the exhaust manifold mating surface with straightedge and feeler gauge.

  Limit : 0.7 mm (0.028 in)

- If it exceeds the limit, replace exhaust manifold.



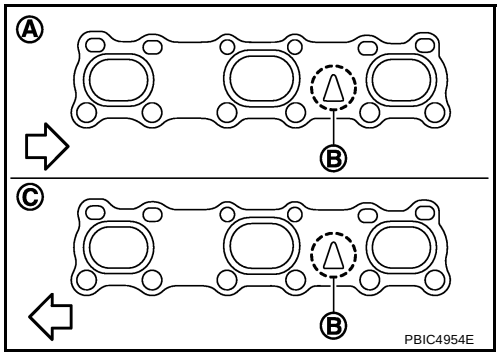
INSTALLATION

Note the following, and install in the reverse order of removal.

Exhaust Manifold Gasket

- Install exhaust manifold gasket in direction shown in the figure.

  A : Right bank
  B : Triangle press
  C : Left bank
  ⇦ : Engine front



Exhaust Manifold

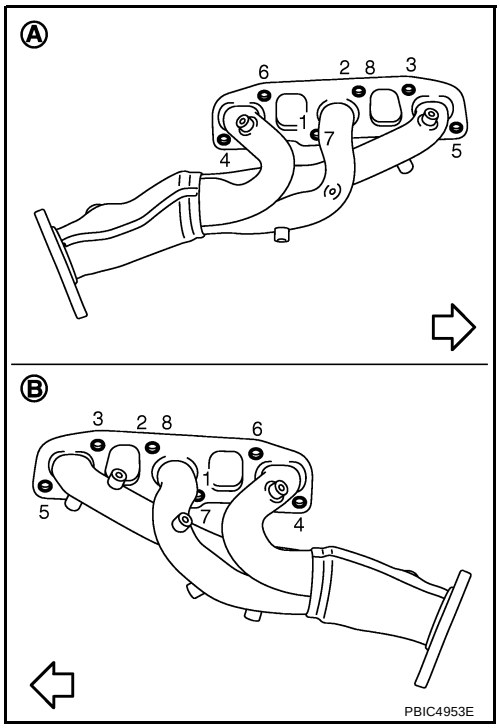
- If stud bolts were removed, install them and tighten to the specified torque below.

  : 14.7 N·m (1.5 kg-m, 11 ft-lb)

- Install mounting exhaust manifold in numerical order as shown in the figure.

  NOTE:
  Tighten nuts No. 1 and 2 in two steps. The numerical order No. 7 and 8 shown second step.

  A : Right bank
  B : Left bank
  ⇦ : Engine front



Air Fuel Ratio Sensor 1 and Heated Oxygen Sensor 2

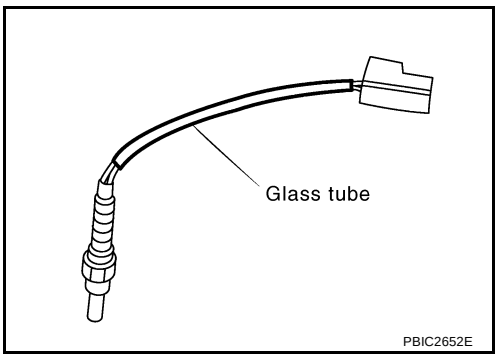
- Install air fuel ratio sensor 1 and heated oxygen sensor 2 in the original position.

- Install referring to the following if the installation positions cannot be identified.

Glass tube color

Air fuel ratio sensor 1*	**: Black**
Heated oxygen sensor 2 (bank 1)	**: White**
Heated oxygen sensor 2 (bank 2)	**: White**

***: Air fuel ratio sensor 1 is the same for both bank 1 and bank 2.**



CAUTION:

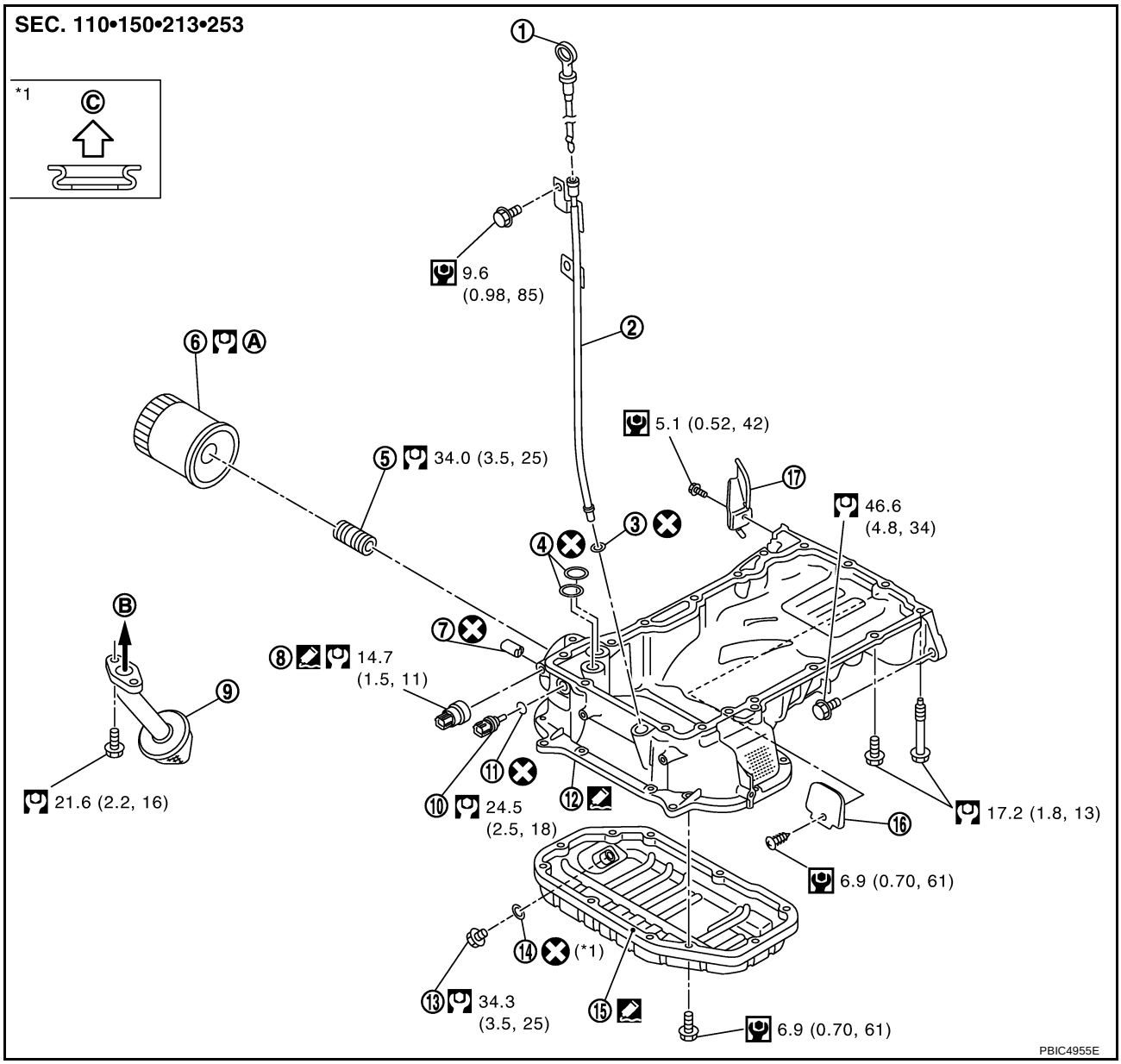
- **Before installing a new air fuel ratio sensor 1 and heated oxygen sensor 2, clean exhaust system threads using oxygen sensor thread cleaner (commercial service tool: J-43897-18 or J43897-12) and apply anti-seize lubricant (commercial service tool).**
- **Do not over torque air fuel ratio sensor 1 and heated oxygen sensor 2. Doing so may cause damage to air fuel ratio sensor 1 and heated oxygen sensor 2, resulting in the "MIL" coming on.**

OIL PAN AND OIL STRAINER

PFP:11110

Removal and Installation

NBS0000L



1.	Oil level gauge	2.	Oil level gauge guide	3.	O-ring
4.	O-ring	5.	Connector bolt	6.	Oil filter
7.	Plug	8.	Oil pressure switch	9.	Oil strainer
10.	Oil temperature sensor	11.	Washer	12.	Oil pan (upper)
13.	Drain plug	14.	Drain plug washer	15.	Oil pan (lower)
16.	Rear cover plate	17.	Rear plate cover		
A.	Refer to LU-9	B.	To oil pump	C.	Oil pan side

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

WARNING:

To avoid the danger of being scalded, do not drain engine oil when engine is hot.

CAUTION:

To remove oil pan (upper), remove engine assembly first.

NOTE:

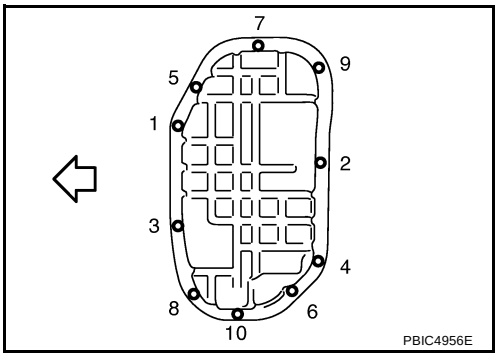
When removing oil pan (lower) only, remove engine assembly is not necessary. Perform step 1, 2 and 10.

1. Drain engine oil. Refer to LU-7, "Changing Engine Oil" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine oil on drive belts.**
2. Remove undercover with power tool.
3. Remove engine assembly from the vehicle, and separate front suspension member and transmission from engine. Refer to EM-101, "ENGINE ASSEMBLY" .
4. Lift the engine with hoist, and mount it onto widely use engine stand. Refer to EM-108, "DISASSEMBLY" .
5. Remove alternator. Refer to SC-20, "CHARGING SYSTEM" .
6. Remove starter motor. Refer to SC-8, "STARTING SYSTEM" .
7. Remove idler pulley and bracket assembly. Refer to EM-53, "TIMING CHAIN" .
8. Remove oil filter, as necessary. Refer to LU-9, "OIL FILTER" .
9. Remove oil temperature sensor, as necessary.
10. Remove oil pan (lower) as follows:

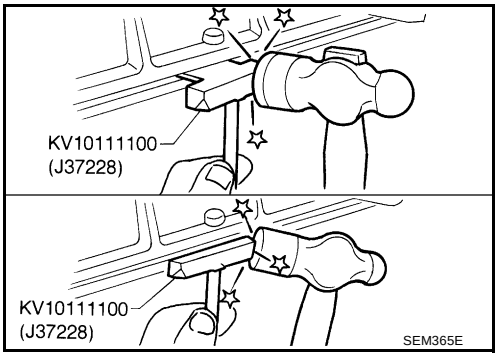
a. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove.

⇦ : Engine front



b. Insert seal cutter (SST) between oil pan (upper) and oil pan (lower).

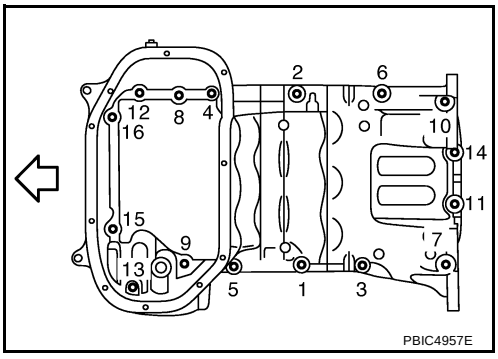
   CAUTION:
   - **Be careful not to damage the mating surfaces.**
   - **Do not insert screwdriver, this will damage the mating surface.**



11. Remove oil strainer.
12. Remove rear cover plate.
13. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove oil pan (upper).
    - Insert seal cutter [SST: KV10111100 (J37228)] between oil pan (upper) and cylinder block. Slide seal cutter by tapping on the side of tool with hammer. Remove oil pan (upper).

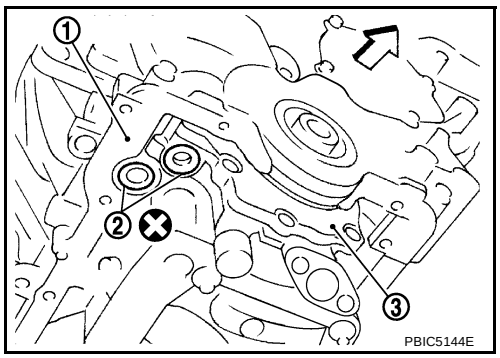
    CAUTION:
    - **Be careful not to damage mating surfaces.**
    - **Do not insert screwdriver, this will damage the mating surface.**

⇦ : Engine front



14. Remove O-rings (2) from bottom of lower cylinder block (1) and oil pump (3).

⇦ : Engine front



INSPECTION AFTER REMOVAL

Clean oil strainer if any object attached.

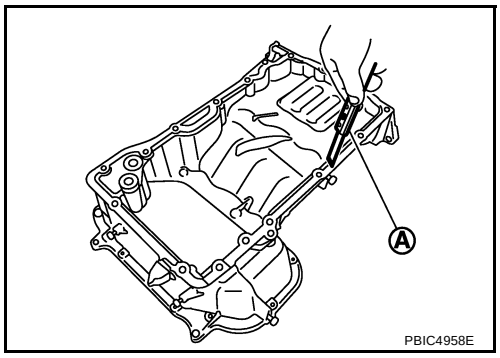
INSTALLATION

1. Install oil pan (upper) as follows:

a. Use scraper to remove old liquid gasket from mating surfaces.

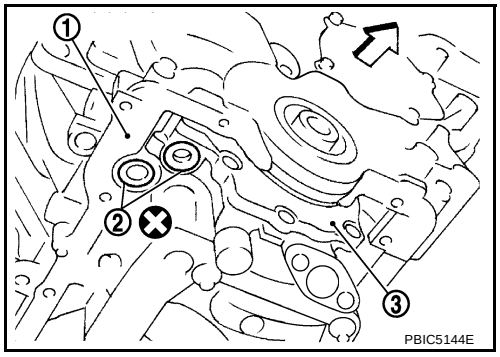
- Also remove the old liquid gasket from mating surface of lower cylinder block.
- Remove old liquid gasket from the bolt holes and threads.

CAUTION:
Do not scratch or damage the mating surfaces when cleaning off old liquid gasket.



b. Install new O-rings (2) on the bottom of lower cylinder block (1) and oil pump (3).

⇦ : Engine front

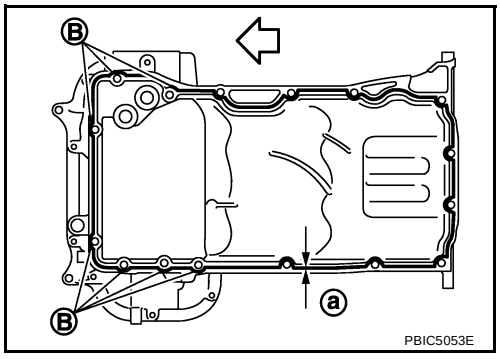


c. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to the lower cylinder block mating surface of oil pan (upper) to a limited portion as shown in the figure. **Use Genuine RTV Silicone Sealant or equivalent. Refer to** **GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"** **.**

a : 4.0 - 5.0 mm (0.157 - 0.197 in)

⇦ : Engine front

CAUTION:
- **For bolt holes (B) (7 locations), apply liquid gasket outside the holes.**
- **Attaching should be done within 5 minutes after coating.**



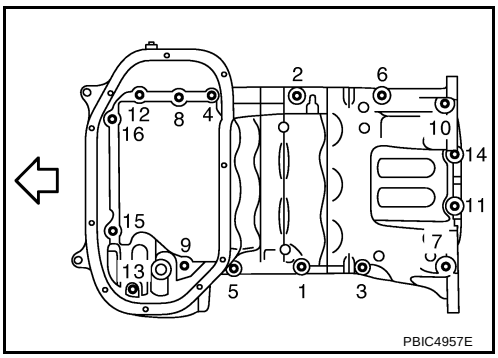
d. Install oil pan (upper).

CAUTION:
Install avoiding misalignment of both oil pan gasket and O-rings.

- Tighten mounting bolts in numerical order as shown in the figure.
- There are two types of mounting bolts. Refer to the following for locating bolts.

⇦ : Engine front

M8 × 92 mm (3.62 in) : 7, 10, 13
M8 × 25 mm (0.98 in) : Except the above



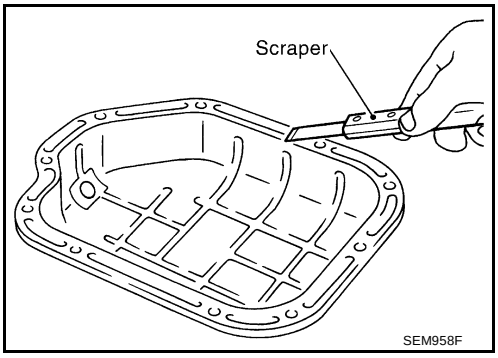
e. Tighten transmission joint bolts. Refer to MT-18, "TRANSMISSION ASSEMBLY" (M/T models) or AT-242, "TRANSMISSION ASSEMBLY" (A/T models).

2. Install oil strainer to oil pump.
- Apply locking sealant to the thread of mounting bolts.
Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

3. Install oil pan (lower) as follows:

a. Use scraper to remove old liquid gasket from mating surfaces.
- Also remove old liquid gasket from mating surface of oil pan (upper).
- Remove old liquid gasket from the bolt holes and thread.

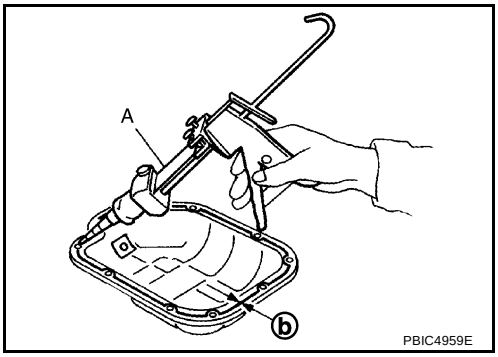
CAUTION:
Do not scratch or damage the mating surfaces when cleaning off old liquid gasket.



b. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] (A) to the oil pan (lower) as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

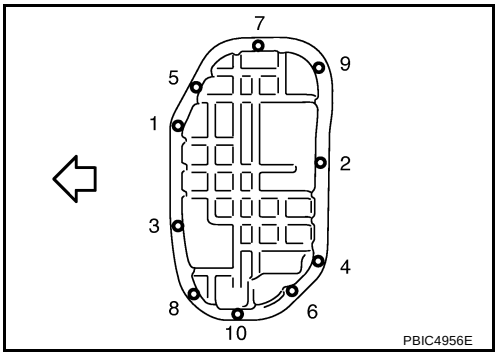
CAUTION:
Attaching should be done within 5 minutes after coating.

b : 4.0 – 5.0 mm (0.157 – 0.197 in)



c. Install oil pan (lower).
- Tighten mounting bolts in numerical order as shown in the figure.

⇦ : Engine front



4. Install oil pan drain plug.
- Refer to the figure of components of former page for installation direction of drain plug washer. Refer to EM-26, "Removal and Installation" .

5. Install in the reverse order of removal after this step.

NOTE:
At least 30 minutes after oil pan is installed, pour engine oil.

INSPECTION AFTER INSTALLATION

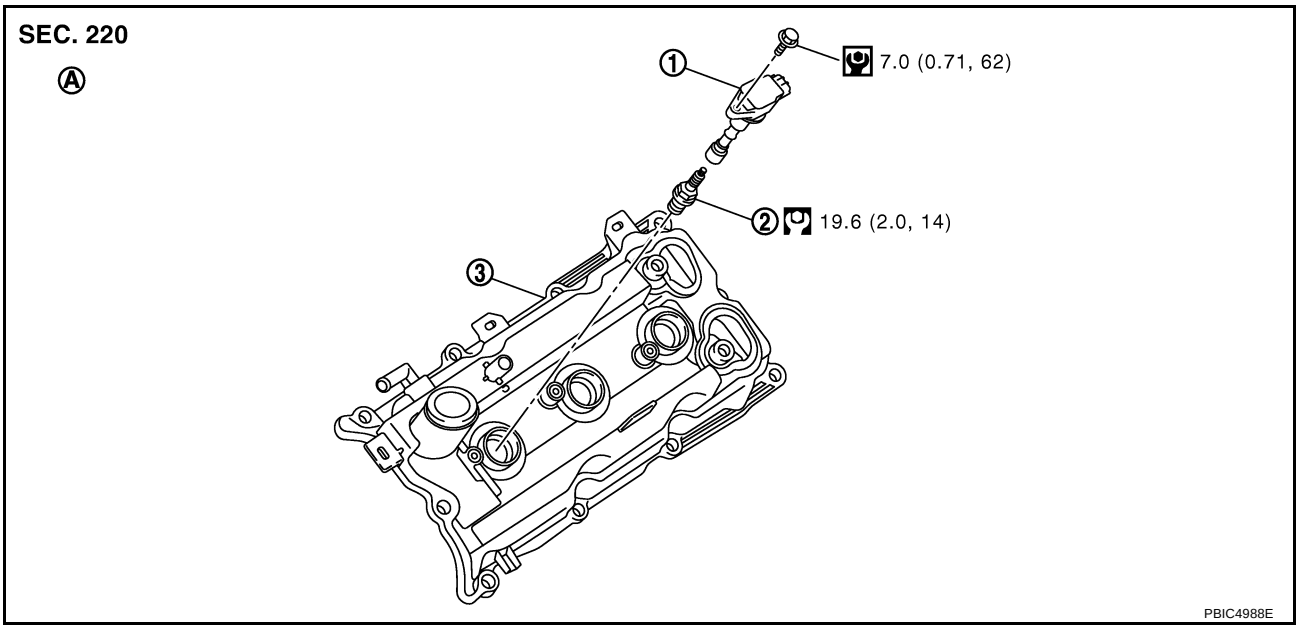
1. Check engine oil level and adjust engine oil. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leak of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check engine oil level again. Refer to LU-6, "ENGINE OIL" .

IGNITION COIL

PFP:22448

Removal and Installation

NBS0000M



1. Ignition coil
2. Spark plug
3. Rocker cover

A. Left bank

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove air cleaner case and air duct. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
3. Move aside harness, harness bracket, and hoses located above ignition coil.
4. Remove electric throttle control actuator. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
5. Disconnect harness connector from ignition coil.
6. Remove ignition coil.

CAUTION:
Do not shock it.

INSTALLATION

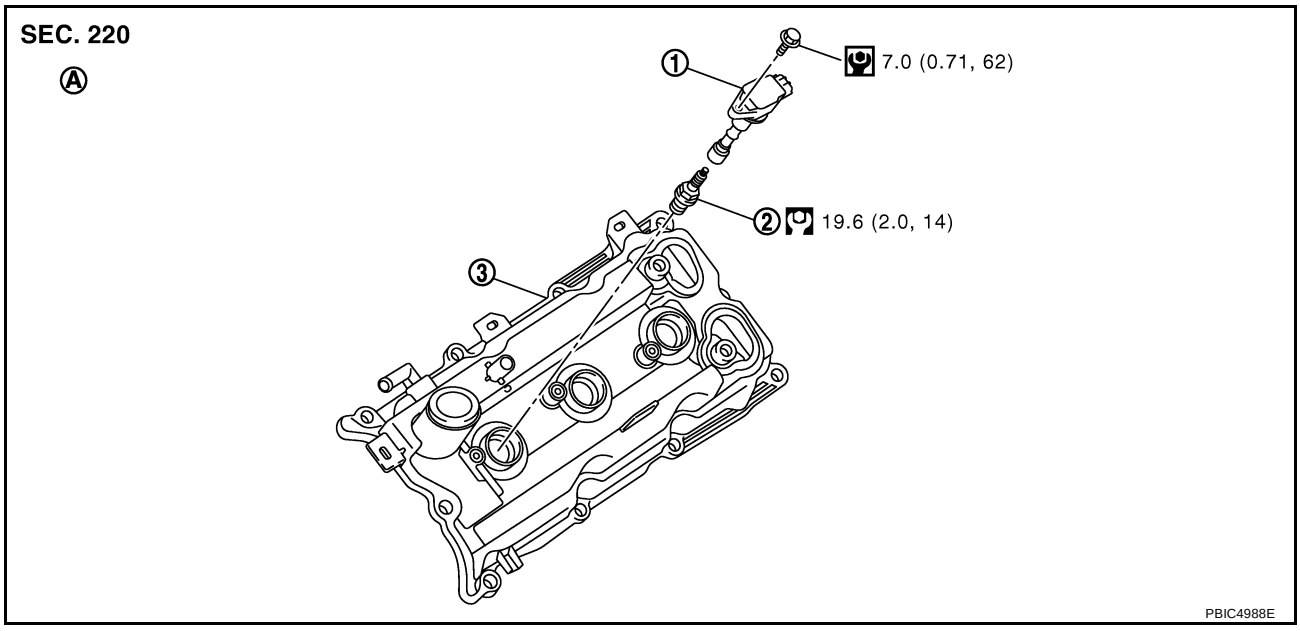
Installation is the reverse order of removal.

SPARK PLUG (IRIDIUM-TIPPED TYPE)

PFP:21478

Removal and Installation

NBS0000N



1. Ignition coil
2. Spark plug
3. Rocker cover

A. Left bank

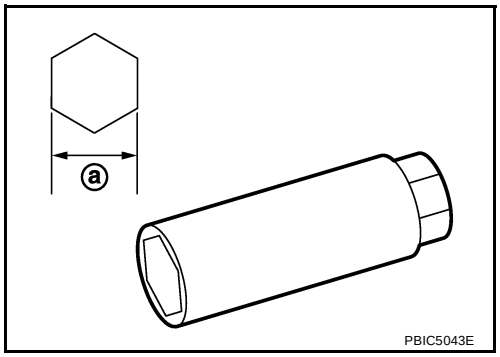
- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove ignition coil. Refer to EM-31, "IGNITION COIL" .
3. Remove spark plug using spark plug wrench (commercial service tool).

   CAUTION:
   Do not drop or shock it.

   a : 14 mm (0.55 in)



INSPECTION AFTER REMOVAL

Make	DENSO
Standard type	FXE22HR-11

Gap (Nominal) : 1.1 mm (0.043 in)

CAUTION:

- **Do not drop or shock spark plug.**

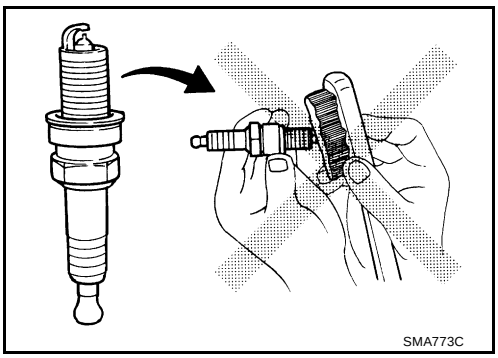
- **Do not use wire brush for cleaning.**
- **If plug tip is covered with carbon, spark plug cleaner may be used.**

  Cleaner air pressure:

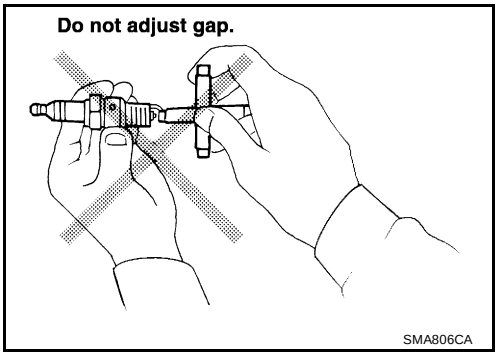
  Less than 588 kPa (6 kg/cm^2 , 85 psi)

  Cleaning time:

  Less than 20 seconds



- **Checking and adjusting plug gap is not required between change intervals.**



INSTALLATION

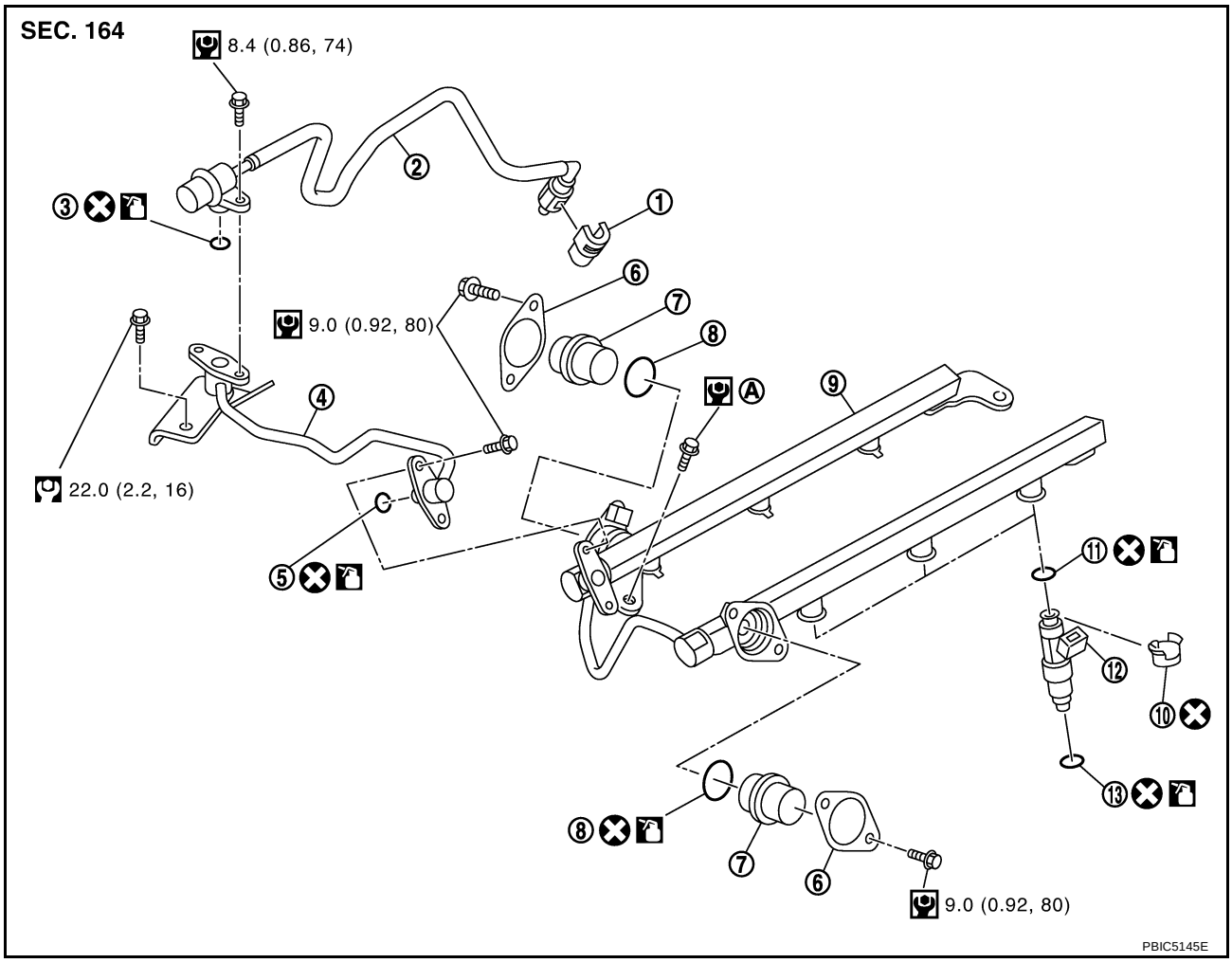
Installation is the reverse order of removal.

FUEL INJECTOR AND FUEL TUBE

PFP:16600

Removal and Installation

NBS0000O



1. Quick connector cap	2. Fuel feed hose (with damper)	3. O-ring
4. Fuel sub tube	5. O-ring	6. Fuel damper cap
7. Fuel damper	8. O-ring	9. Fuel tube
10. Clip	11. O-ring (black)	12. Fuel injector
13. O-ring (green)		
A. Refer to EM-37		

- Refer to GI-11, "Components" for symbol marks in the figure.

CAUTION:
Do not remove or disassemble parts unless instructed as shown in the figure.

REMOVAL

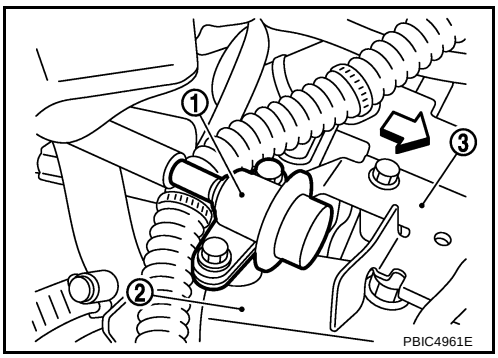
WARNING:

- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from the work area.**
- **To avoid the danger of being scalded, do not drain engine coolant when engine is hot.**

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Drain engine coolant, or when water hoses are disconnected, attach plug to prevent engine coolant leakage. Refer to CO-10, "Changing Engine Coolant" and EM-17, "INTAKE MANIFOLD COLLECTOR" .

CAUTION:
Perform this step when engine is cold.

4. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
5. Remove fuel feed hose (with damper) (1) from fuel sub-tube (2) and harness bracket (3).



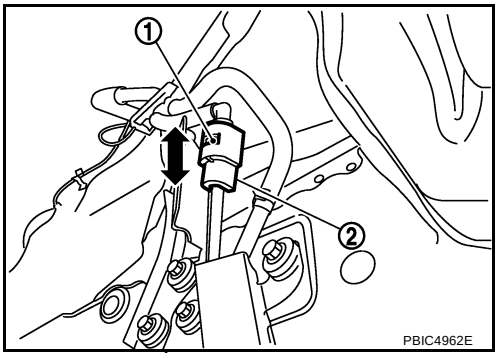
⇦ : Engine front

NOTE:
There is no fuel return route.

CAUTION:
- **While hoses are disconnected, plug them to prevent fuel from draining.**
- **Do not separate fuel damper and fuel feed hose.**

6. When separating fuel feed hose (with damper) and centralized under-floor piping connection, disconnect quick connector as follows:

a. Remove quick connector cap (2) from quick connector connection on right member side.
b. Disconnect fuel feed hose (with damper) (1) from bracket hose clamp.



c. Disconnect quick connector from centralized under-floor piping as follows:

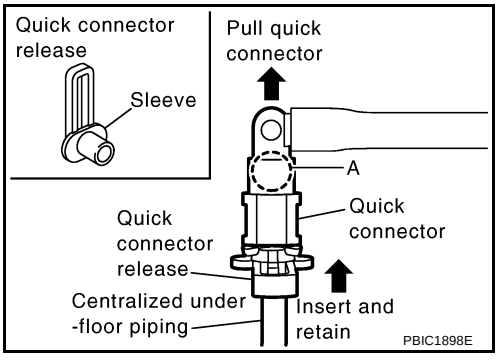
CAUTION:
Disconnect quick connector by using quick connector release [SST: — (J-45488)], not by picking out retainer tabs.

i. With the sleeve side of quick connector release facing quick connector, install quick connector release onto centralized under-floor piping.

ii. Insert quick connector release into quick connector until sleeve contacts and goes no further. Hold quick connector release on that position.

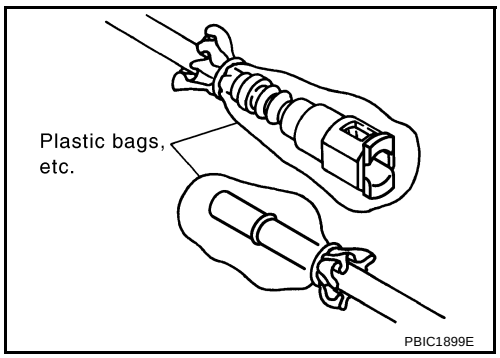
CAUTION:
Inserting quick connector release hard will not disconnect quick connector. Hold quick connector release where it contacts and goes no further.

iii. Draw and pull out quick connector straight from centralized under-floor piping.



CAUTION:
- **Pull quick connector holding “A” position as shown in the figure.**
- **Do not pull with lateral force applied. O-ring inside quick connector may be damaged.**
- **Prepare container and cloth beforehand as fuel will leak out.**
- **Avoid fire and sparks.**
- **Keep parts away from heat source. Especially, be careful when welding is performed around them.**
- **Do not expose parts to battery electrolyte or other acids.**
- **Do not bend or twist connection between quick connector and fuel feed hose (with damper) during installation/removal.**

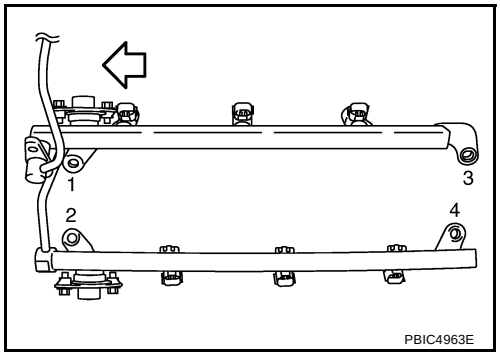
- **To keep clean the connecting portion and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



7. Disconnect harness connector from fuel injector.
8. Loosen mounting bolts in reverse order as shown in the figure, and remove fuel tube and fuel injector assembly.

CAUTION:
Do not tilt it, or remaining fuel in pipes may flow out from pipes.

⇦ : Engine front

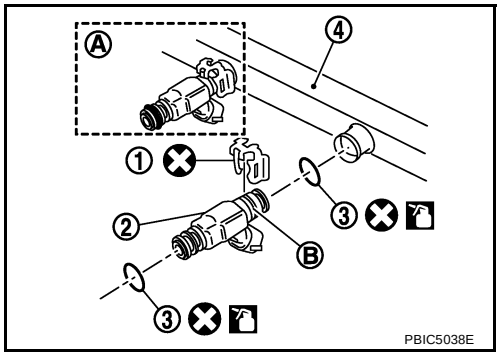


9. Remove fuel injector (2) from fuel tube (4) as follows:

3 : O-ring
A : Installed condition
B : Clip mounting groove

a. Open and remove clip (1).
b. Remove fuel injector (2) from fuel tube (4) by pulling straight.

CAUTION:
- **Be careful with remaining fuel that may go out from fuel tube.**
- **Be careful not to damage injector nozzles during removal.**
- **Do not bump or drop fuel injector.**
- **Do not disassemble fuel injector.**



10. Remove fuel sub-tube and fuel damper, if necessary.

INSTALLATION

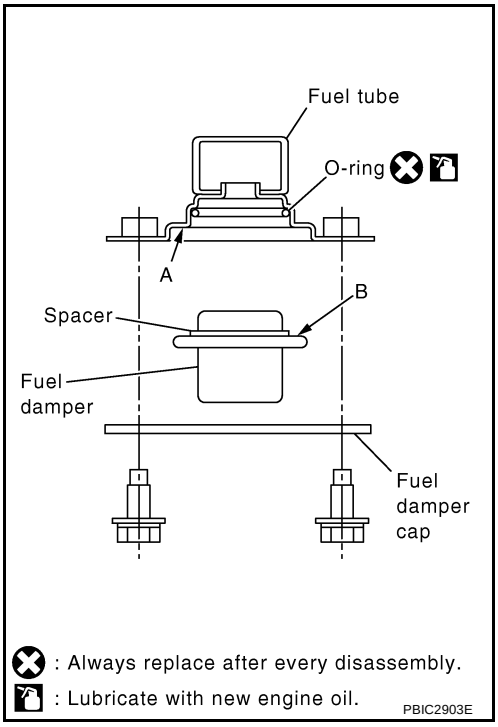
1. Install fuel damper as follows:

a. Install new O-ring to fuel tube as shown.

- When handling new O-ring, be careful of the following caution:

CAUTION:

- **Handle O-ring with bare hands. Do not wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Do not clean O-ring with solvent.**
- **Make sure that O-ring and its mating part are free of foreign material.**
- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, do not insert it quickly into fuel tube.**
- **Insert new O-ring straight into fuel tube. Do not twist it.**



b. Install spacer to fuel damper.

c. Insert fuel damper straight into fuel tube.

CAUTION:

- **Insert straight, making sure that the axis is lined up.**
- **Do not pressure-fit with excessive force.**

Reference value : 130 N (13.3 kg, 29.2 lb)

- Insert fuel damper unit “B” is touching “A” of fuel tube.

d. Tighten bolts evenly in turn.

- After tightening bolts, make sure that there is no gap between fuel damper cap and fuel tube.

2. Install fuel sub-tube.

- When handling new O-ring, be careful of the following caution:

CAUTION:

- **Handle O-ring with bare hands. Do not wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Do not clean O-ring with solvent.**
- **Make sure that O-ring and its mating part are free of foreign material.**
- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, do not insert it quickly into fuel tube.**
- **Insert O-ring straight into fuel tube. Do not decenter or twist it.**

- Insert fuel sub-tube straight into fuel tube.
- Tighten mounting bolts evenly in turn.
- After tightening mounting bolts, make sure that there is no gap between flange and fuel sub-tube.

3. Install O-rings to fuel injector, paying attention to the following.

CAUTION:

- **Upper and lower O-ring are different. Be careful not to confuse them.**

Fuel tube side : Black
Nozzle side : Green

- **Handle O-ring with bare hands. Do not wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Do not clean O-ring with solvent.**
- **Make sure that O-ring and its mating part are free of foreign material.**

- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, do not insert it quickly into fuel tube.**
- **Insert O-ring straight into fuel injector. Do not decenter or twist it.**

4. Install fuel injector to fuel tube as follows:

   2 : O-ring (Black)

   4 : O-ring (Green)

a. Insert clip (3) into clip mounting groove (D) on fuel injector (5).

CAUTION:

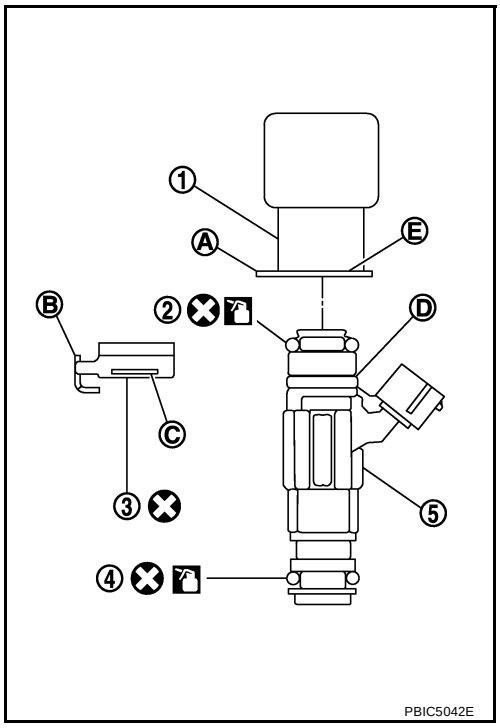
- **Do not reuse clip. Replace it with a new one.**
- **Be careful to keep clip from interfering with O-ring. If interference occurs, replace O-ring.**

b. Insert fuel injector (5) into fuel tube (1) with clip attached.

- Insert it while matching it to the axial center.
- Insert fuel injector (5) so that protrusion (A) of fuel tube matches cutout (B) of clip (3).
- Make sure that fuel tube flange (E) is securely fixed in flange fixing groove (C) on clip (3).

c. Make sure that installation is complete by checking that fuel injector does not rotate or come off.

- Make sure that protrusions of fuel injectors are aligned with cutouts of clips after installation.



5. Install fuel tube and fuel injector assembly to intake manifold.

CAUTION:

Be careful not to let tip of injector nozzle come in contact with other parts.

- Tighten mounting bolts in two steps in numerical order as shown in the figure.

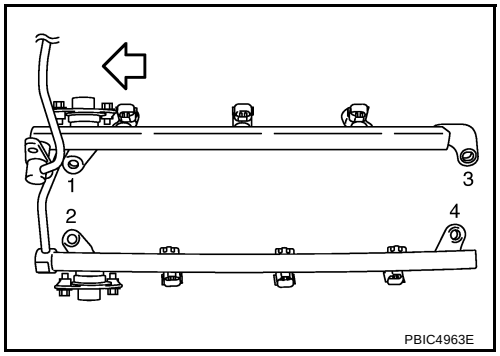
  ⇦ : Engine front

  1st step

  : 10.1 N·m (1.0 kg-m, 7 ft-lb)

  2nd step

  : 23.6 N·m (2.4 kg-m, 17 ft-lb)



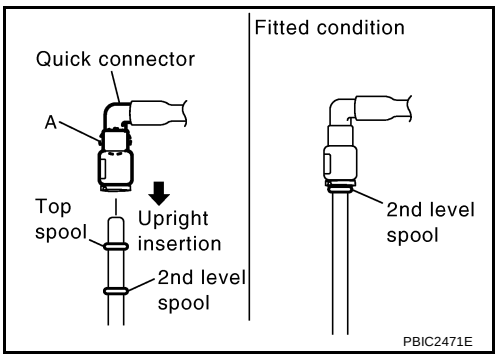
6. Connect fuel injector harness connector.
7. Connect fuel feed hose (with damper).
   - Handling procedure of O-ring is the same as that of fuel damper and fuel sub-tube.
   - Insert fuel damper straight into fuel sub-tube.
   - Tighten mounting bolts evenly in turn.
   - After tightening mounting bolts, make sure that there is no gap between flange and fuel sub-tube.
8. Connect quick connector between fuel feed hose (with damper) and centralized under-floor piping connection as follows:

a. Make sure no foreign substances are deposited in and around centralized under-floor piping and quick connector, and no damage on them.

b. Thinly apply new engine oil around centralized under-floor piping from tip end to spool end.

c. Align center to insert quick connector straightly into centralized under-floor piping.

- Insert quick connector to centralized under-floor piping until top spool is completely inside quick connector, and 2nd level spool exposes right below quick connector.



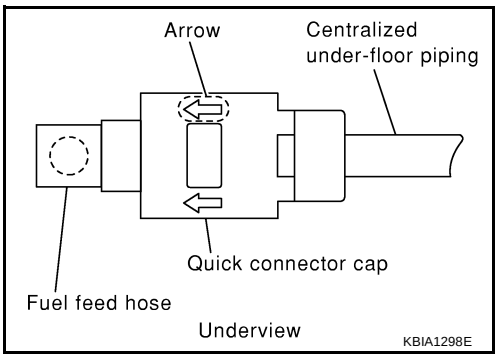
CAUTION:

- **Hold “A” position as shown in the figure when inserting centralized under-floor piping into quick connector.**
- **Carefully align center to avoid inclined insertion to prevent damage to O-ring inside quick connector.**
- **Insert until you hear a “click” sound and actually feel the engagement.**
- **To avoid misidentification of engagement with a similar sound, be sure to perform the next step.**

d. Pull quick connector by hand holding “A” position. Make sure it is completely engaged (connected) so that it does not come out from centralized under-floor piping.

e. Install quick connector cap to quick connector connection.

- Install quick connector cap with arrow on surface facing in direction of quick connector (fuel feed hose side).



CAUTION:

If cap cannot be installed smoothly, quick connector may have not been installed correctly. Check connection again.

9. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Check on Fuel Leakage

1. Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.

   NOTE:
   Use mirrors for checking at points out of clear sight.

2. Start engine. With engine speed increased, check again for fuel leakage at connection points.

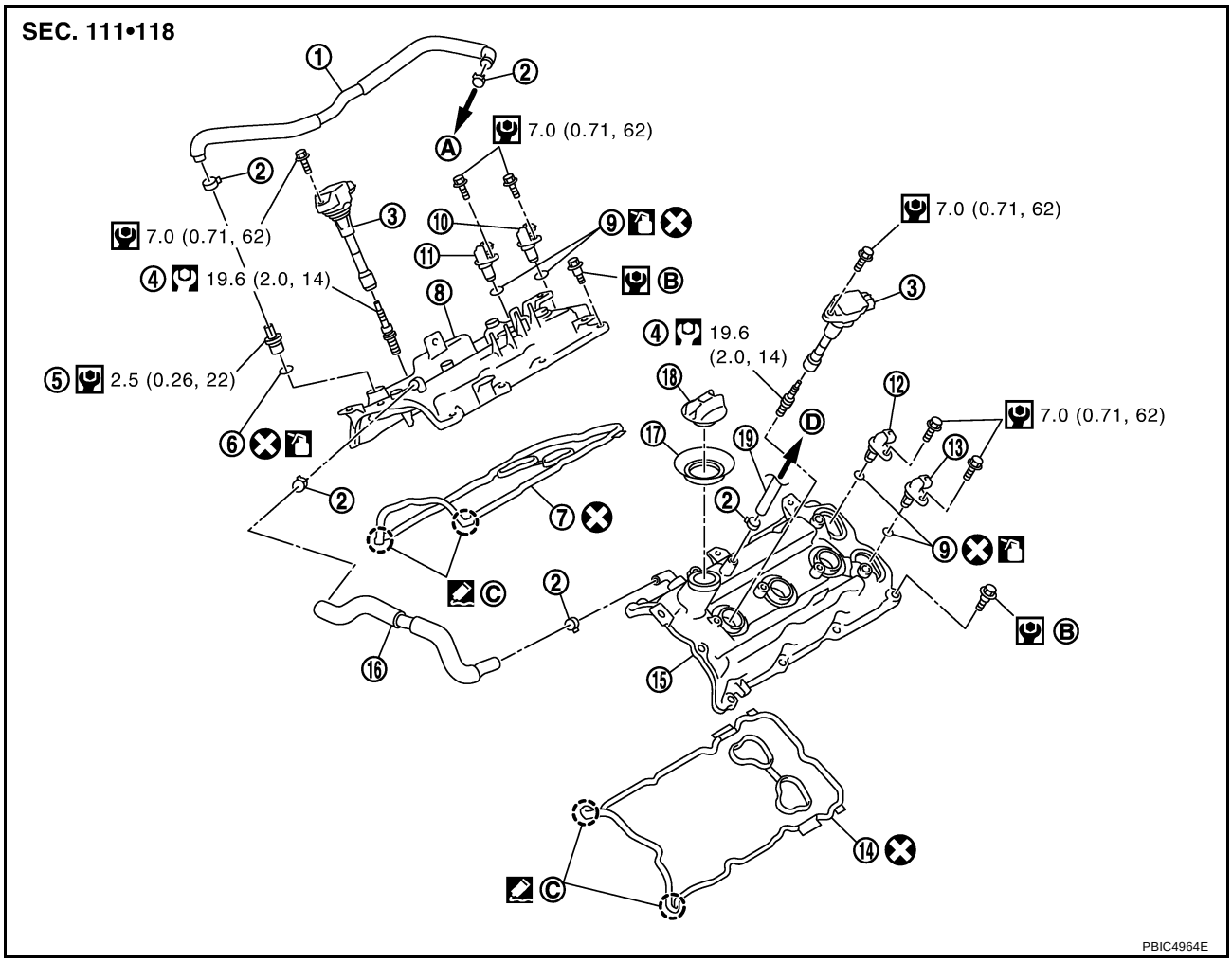
   CAUTION:
   Do not touch engine immediately after stopped, as engine becomes extremely hot.

ROCKER COVER

PFP:13264

Removal and Installation

NBS0000P



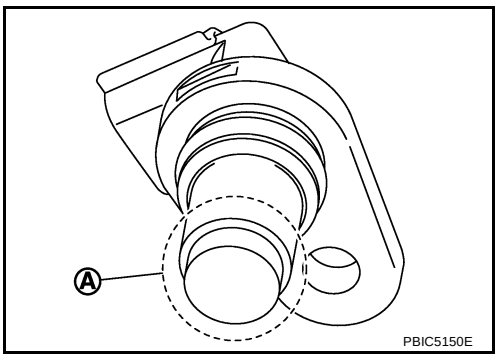
1.	PCV hose	2.	Clamp	3.	Ignition coil
4.	Spark plug	5.	PCV valve	6.	O-ring
7.	Rocker cover gasket (right bank)	8.	Rocker cover (right bank)	9.	O-ring
10.	Camshaft position sensor (bank 1)	11.	Exhaust valve timing control position sensor (bank 1)	12.	Camshaft position sensor (bank 2)
13.	Exhaust valve timing control position sensor (bank 2)	14.	Rocker cover gasket (left bank)	15.	Rocker cover (left bank)
16.	PCV hose	17.	Oil catcher	18.	Oil filler cap
19.	PCV hose				
A.	To intake manifold collector	B.	Refer to EM-40	C.	Camshaft bracket side
D.	To air duct				

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove engine cover. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
3. Separate engine harness removing their brackets from rocker covers.
4. Remove ignition coil. Refer to EM-31, "IGNITION COIL" .

5. Remove camshaft position sensor and exhaust valve timing control position sensor.

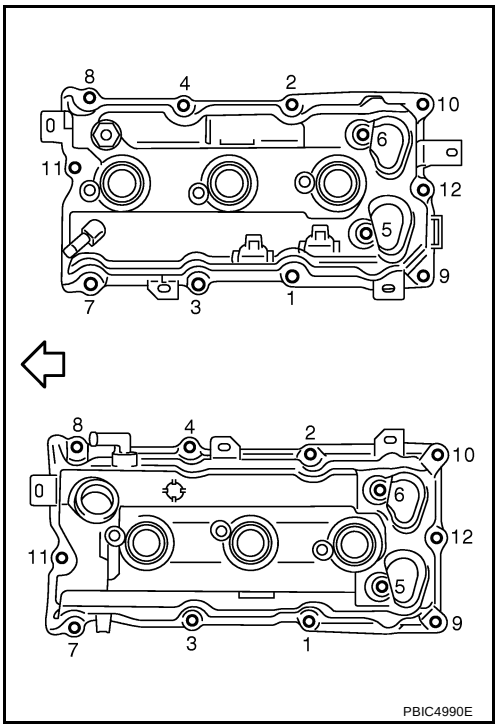


A : Keep off any magnetic materials

CAUTION:

- **Handle carefully to avoid dropping and shocks.**
- **Do not disassemble.**
- **Do not allow metal powder to adhere to magnetic part at sensor tip.**
- **Do not place sensors in a location where they are exceed to magnetism.**

6. Remove PCV hoses from rocker covers.
7. Remove PCV valve and O-ring from rocker cover, if necessary.
8. Remove oil filler cap from rocker cover, if necessary.
9. Loosen mounting bolts with power tool in reverse order as shown in the figure.



⇦ : Engine front

10. Remove rocker cover gaskets from rocker covers.
11. Use scraper to remove all trances of liquid gasket from cylinder head and camshaft bracket (No. 1).

CAUTION:

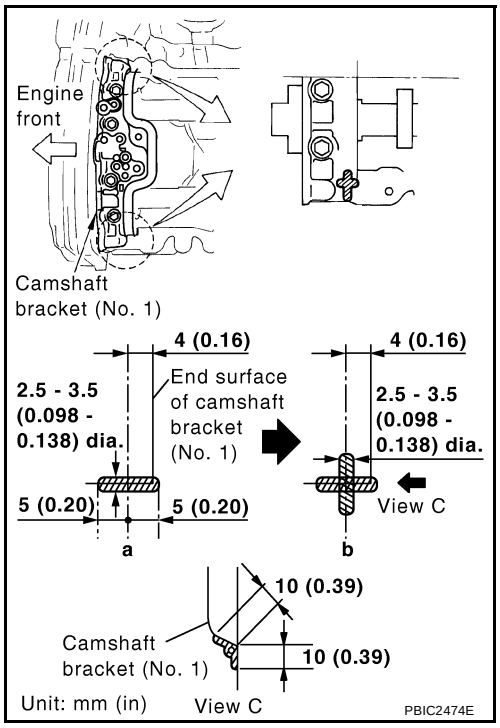
Do not scratch or damage the mating surface when cleaning off old liquid gasket.

INSTALLATION

1. Apply liquid gasket with tube presser [SST: WS39930000 (—)] to joint part among rocker cover, cylinder head and camshaft bracket (No. 1) as follows:
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   NOTE:
   The figure shows an example of left bank side [zoomed in shows camshaft bracket (No. 1)].

a. Refer to the figure “a” to apply liquid gasket to joint part of camshaft bracket (No. 1) and cylinder head.

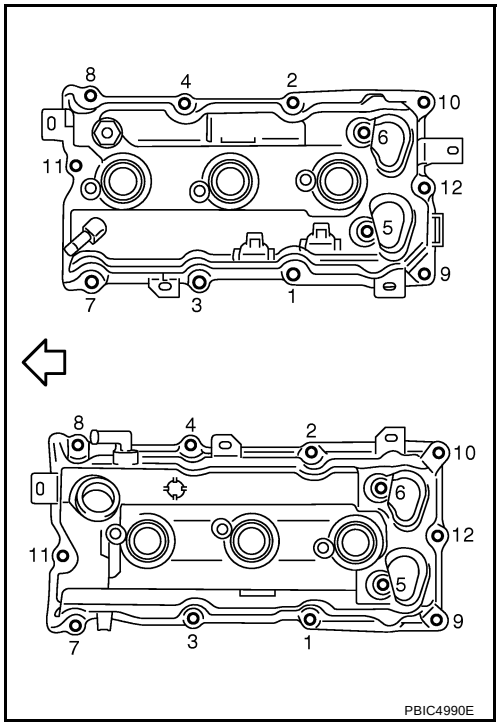
b. Refer to the figure “b” to apply liquid gasket to the figure “a” squarely.



2. Install new rocker cover gasket to rocker cover.
3. Install rocker cover.
   - Check if rocker cover gasket is not dropped from installation groove of rocker cover.
4. Tighten bolts in two steps separately in numerical order as shown in the figure.

   ⇦ : Engine front

   1st step
   : 2.0 N·m (0.2 kg-m, 18 in-lb)
   2nd step
   : 8.3 N·m (0.85 kg-m, 73 in-lb)



5. Install oil filler cap to rocker cover (left bank), if removed.
6. Install new O-ring and PCV valve to rocker cover (right bank), if removed.
7. Install PCV hose.
   - Insert PCV hose by 25 to 30 mm (0.98 to 1.18 in) from connector end.
   - When installing, be careful not to twist or come in contact with other parts.

- Install PCV hose between right and left rocker covers with its identification paint facing upward (right rocker cover side). Refer to component figure in EM-40, "Removal and Installation" .

8. Install in the reverse order of removal after this step.

FRONT TIMING CHAIN CASE

PFP:13599

Removal and Installation

NBS0000Q

NOTE:

- This section describes removal/installation procedure of front timing chain case and timing chain related parts without removing oil pan (upper) on vehicle.
- When oil pan (upper) needs to be removed or installed, or when rear timing chain case is removed or installed, remove oil pans (upper and lower) first. Then remove front timing chain case, timing chain related parts, and rear timing chain case in this order, and install in the reverse order of removal. Refer to EM-53, "TIMING CHAIN" .
- Refer to EM-53, "TIMING CHAIN" for component parts location.

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove undercover with power tool.
3. Release the fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
4. Disconnect the battery cable from the negative terminal.
5. Drain engine oil. Refer to LU-7, "Changing Engine Oil" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine oil on drive belts.**
6. Drain engine coolant from radiator. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
7. Remove radiator cooling fan assembly. Refer to CO-21, "COOLING FAN" .
8. Separate engine harnesses removing their brackets from front timing chain case.
9. Remove drive belts. Refer to EM-12, "DRIVE BELTS" .
10. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
11. Remove harness bracket and fuel sub tube mounting bolt on front timing chain case.
12. Remove oil level gauge and guide.
13. Remove power steering oil pump from bracket with piping connected, and temporarily secure it to aside. Refer to PS-28, "POWER STEERING OIL PUMP" .
14. Remove power steering oil pump bracket. Refer to PS-28, "POWER STEERING OIL PUMP" .
15. Remove alternator. Refer to SC-20, "CHARGING SYSTEM" .
16. Remove water outlet and water piping. Refer to CO-28, "WATER OUTLET AND WATER PIPING" .
17. Remove left and right valve timing control covers with the following procedure.

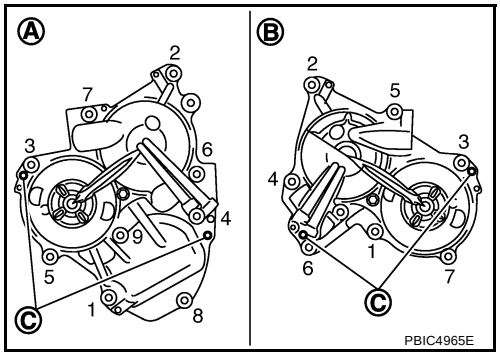
a. Disconnect valve timing control harness connector.

b. Loosen mounting bolts in reverse order as shown in the figure.

   A : Right bank

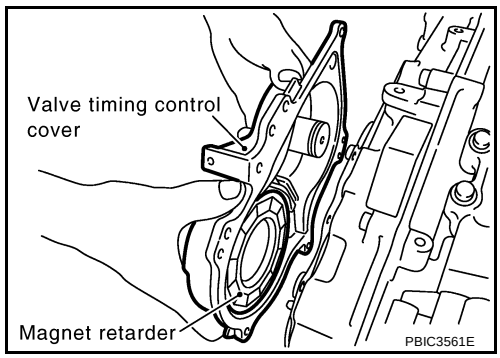
   B : Left bank

   C : Dowel pin hole



c. Shaft is engaged with intake side camshaft sprocket center hole on inside. Pull straight out so as not to tilt until the joint is disengaged.

- The mating surface of magnet retarder may be fitted with the exhaust side camshaft sprocket via the engine oil. Open valve timing control cover carefully.
- If the mating surface of magnet retarder is fitted with the camshaft sprocket, open the cover within the range that the load is not applied to the harness. And then, remove it so as to prevent magnet retarder from dropping.



CAUTION:

- **Be careful not to damage magnet retarder.**
- **When carrying valve timing control cover, face the magnet retarder side up to prevent the cover from falling from magnet retarder.**
- **Do not remove magnet retarder from valve timing control cover. (Disassembly prohibited parts)**

18. Remove rocker covers (right and left banks). Refer to EM-40, "ROCKER COVER" .

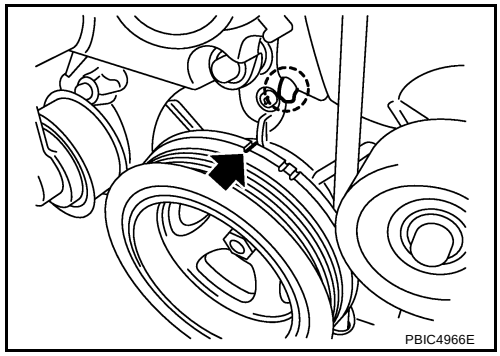
NOTE:
When only timing chain (primary) is removed, rocker cover does not need to be removed.

19. Obtain No. 1 cylinder at TDC of its compression stroke as follows:

NOTE:
When timing chain is not removed/installed, this step is not required.

a. Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.

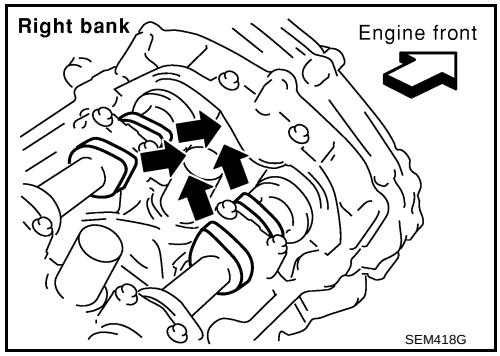
⬅ : Timing mark (grooved without color)



b. Make sure that intake and exhaust cam noses on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.

- If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.

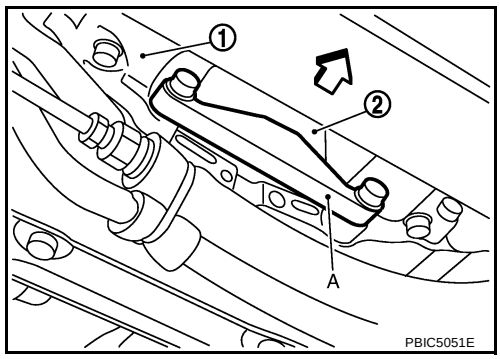
NOTE:
When only timing chain (primary) is removed, rocker cover does not need to be removed. To make sure that No. 1 cylinder is at its compression TDC, remove front timing chain case first. Then check mating marks on camshaft sprockets. Refer to EM-60, "INSTALLATION" .



20. Remove crankshaft pulley as follows:

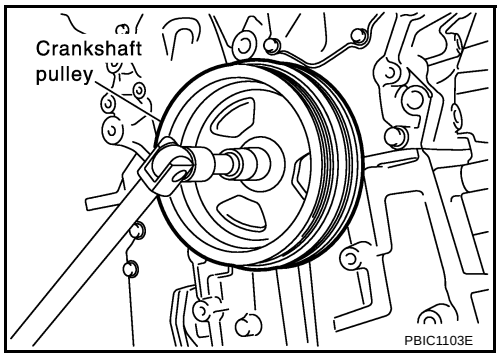
a. Remove rear cover plate and set ring gear stopper [SST: KV10118600 (J-48641)] (A) as shown in the figure.

1 : Oil pan
2 : Fly wheel (M/T models) or drive plate (A/T models)
⇦ : Vehicle front



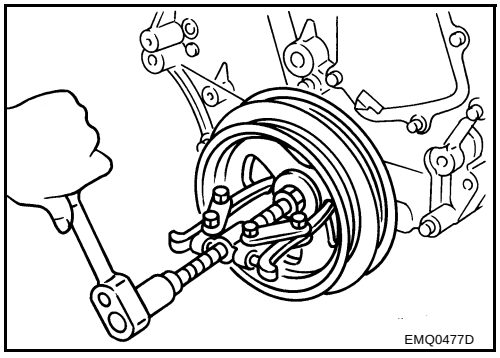
b. Loosen crankshaft pulley bolt and locate bolt seating surface as 10 mm (0.39 in) from its original position.

CAUTION:
Do not remove crankshaft pulley bolt as it will be used as a supporting point for suitable puller.



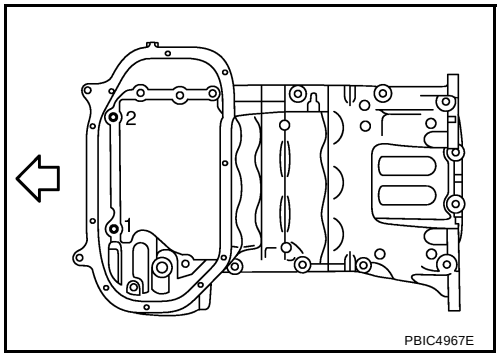
c. Place suitable puller tab on holes of crankshaft pulley, and pull crankshaft pulley through.

CAUTION:
Do not put suitable puller tab on crankshaft pulley periphery, as this will damage internal damper.



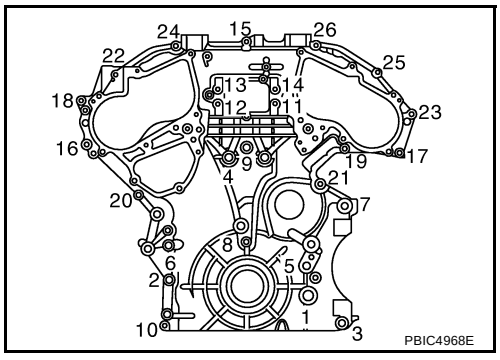
21. Remove oil pan (lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
22. Loosen two mounting bolts in front of oil pan (upper) in reverse order as shown in the figure.

⇦ : Engine front



23. Remove front timing chain case as follows:

a. Loosen mounting bolts in reverse order as shown in the figure.



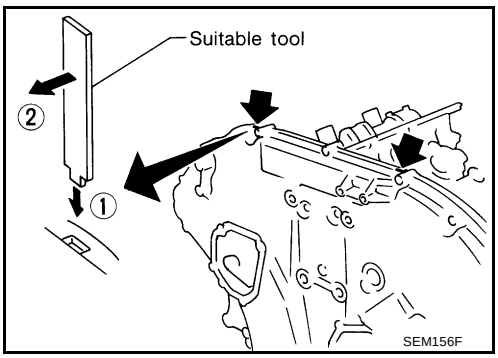
b. Insert suitable tool into the notch at the top of the front timing chain case as shown (1).

c. Pry off case by moving tool as shown (2).

- Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

CAUTION:

- **Do not use screwdriver or something similar.**
- **After removal, handle front timing chain case carefully so it does not tilt, cant, or warp under a load.**

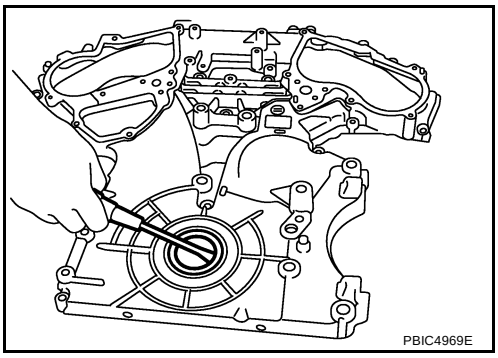


24. Remove front oil seal from front timing chain case using suitable tool.

- Use screwdriver for removal.

CAUTION:

Be careful not to damage front timing chain case.

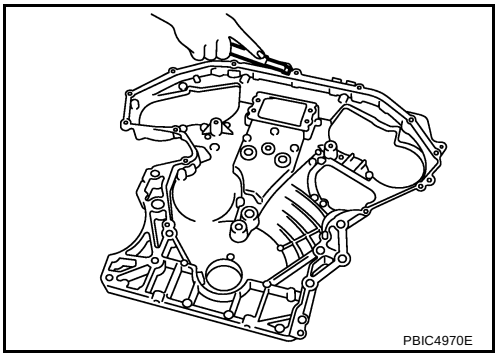


25. Remove timing chain and related parts. Refer to EM-53, "TIMING CHAIN" .

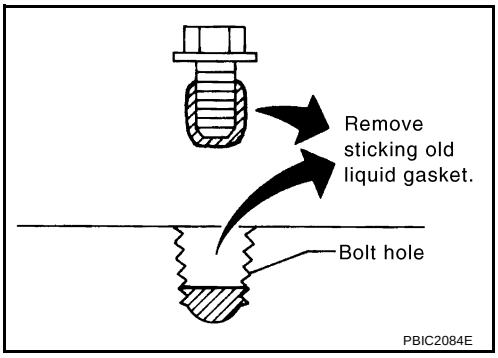
26. Use scraper to remove all traces of old liquid gasket from front and rear timing chain cases and oil pan (upper), and liquid gasket mating surfaces.

CAUTION:

Be careful not to allow gasket fragments to enter oil pan.



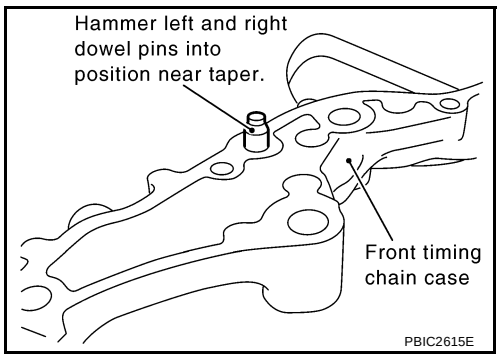
- Remove old liquid gasket from bolt hole and thread.



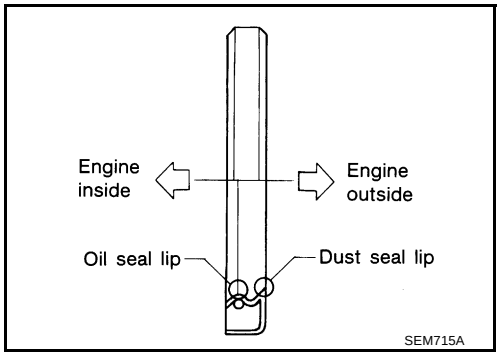
INSTALLATION

1. Install timing chain and related parts. Refer to EM-53, "TIMING CHAIN" .

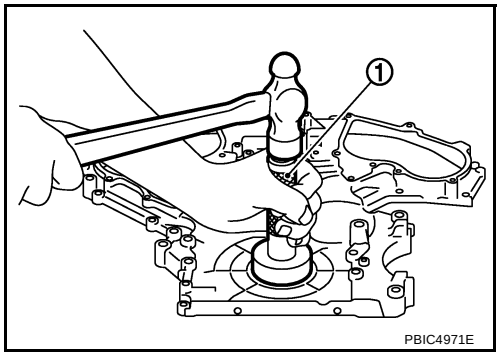
2. Hammer dowel pins (right and left) into front timing chain case up to a point close to taper in order to shorten protrusion length.



3. Install new front oil seal on the front timing chain case.
   - Apply new engine oil to both oil seal lip and dust seal lip.
   - Install it so that each seal lip is oriented as shown in the figure.



   - Using suitable drift [outer diameter: 60 mm (2.36 in)] (A), press-fit oil seal until it becomes flush with front timing chain case end face.
   - Make sure the garter spring is in position and seal lip is not inverted.

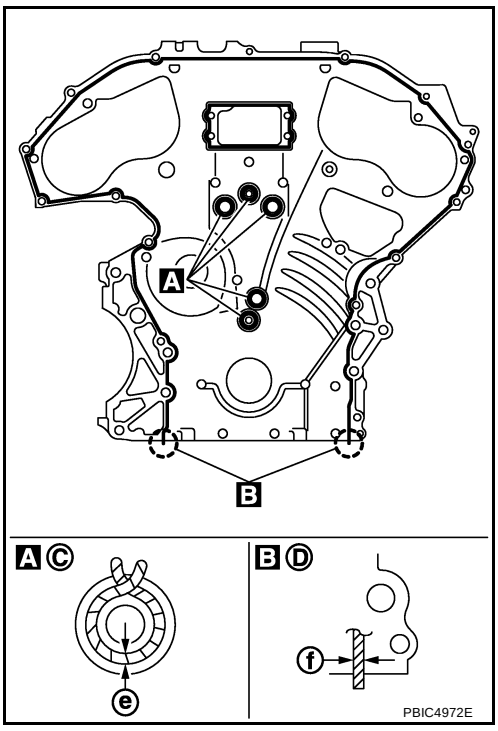


4. Install front timing chain case as follows:

a. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to front timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

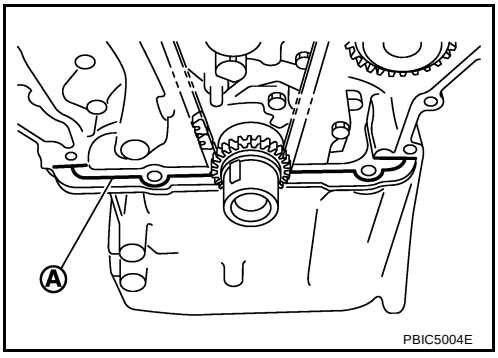
C : Bolt hole
D : Protrusion
e : 2.6 - 3.6 mm (0.102 - 0.142 in)
f : 3.4 - 4.4 mm (0.134 - 0.173 in)

NOTE:
Apply liquid gasket, start and end up application at the portions (A) shown in the figure.



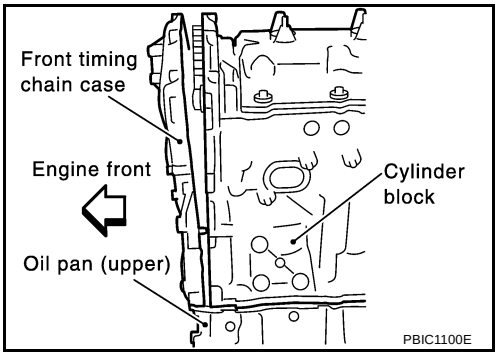
- Apply liquid gasket with tube presser [SST: WS39930000 (—)] to top surface of oil pan (upper) as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

A : 4.0 - 5.0 mm (0.157 - 0.197 in)



b. Assemble front timing chain case as follows:
Fit lower end of front timing chain case tightly onto top face of oil pan (upper). From the fitting point, make entire front timing chain case contact rear timing chain case completely.

CAUTION:
- **Be careful not to damage front oil seal by interference with front end of crankshaft.**
- **Attaching should be done within 5 minutes after liquid gasket application.**



c. Install front timing chain case as to fit its dowel pin hole together dowel pin on rear timing chain case.

d. Tighten mounting bolts to the specified torque in numerical order as shown in the figure.

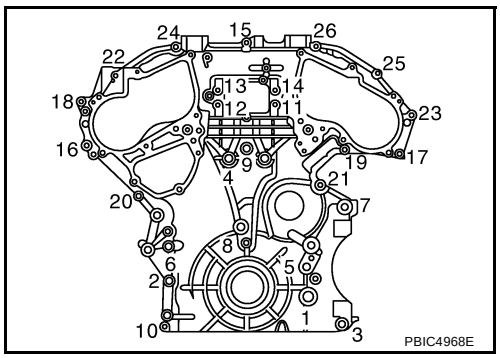
- There are two types of mounting bolts. Refer to the following for locating bolts.

M10 bolts : 1, 2, 3, 4, 5, 6, 7

: 55.0 N·m (5.6 kg-m, 41 ft-lb)

M6 bolts : Except the above

: 12.7 N·m (1.3 kg-m, 9 ft-lb)

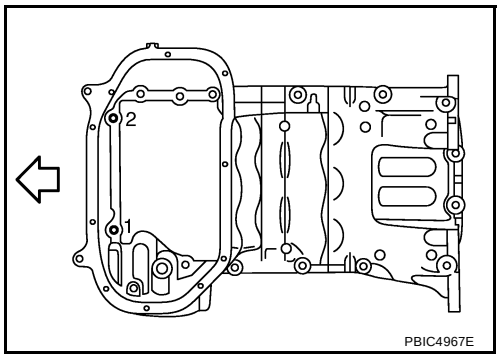


e. After all bolts tightened, retighten them to the specified torque in numerical order as shown in the figure.

5. Install two mounting bolts in front of oil pan (upper) in numerical order as shown in the figure.

: 17.2 N·m (1.8 kg-m, 13 ft-lb)

⇦ : Engine front



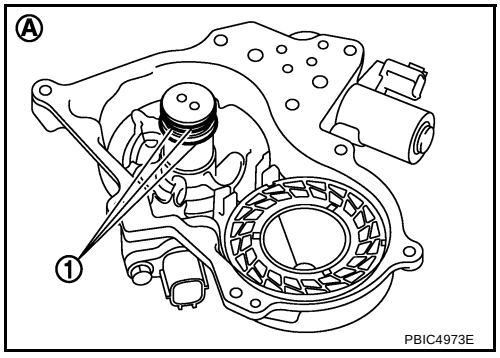
6. Install oil pan (lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
7. Install right and left valve timing control covers as follows.

a. Install new seal rings (1) in shaft grooves.

CAUTION:

When replacing seal ring, replace all rings with new one.

A : Left bank



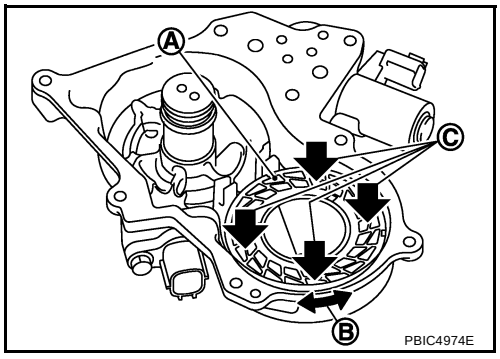
b. To check the joint between dowel pins and dowel pin holes, check the looseness in the axle direction by pushing the mating surface of magnet retarder (A) at several places and the circumferential looseness (between dowel pins and dowel pin holes) by twisting in the circumferential direction.

CAUTION:

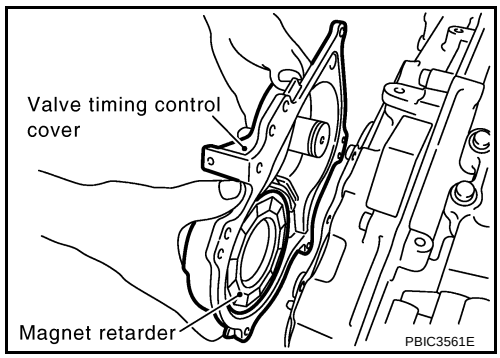
Always perform this procedure when removing because the gap between dowel pins and dowel pin holes may not be caused on purpose.

B : Moves slightly

C : Not shaken



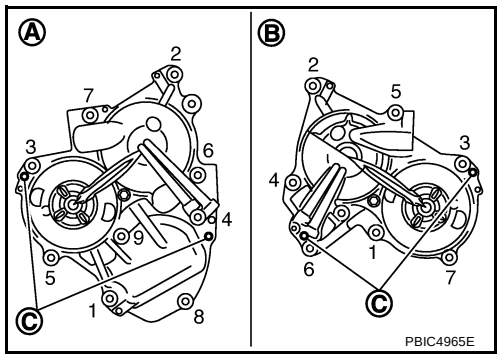
c. Install valve timing control cover with new gasket to front timing chain case.



CAUTION:

- **Do not face the magnet retarder side down to prevent magnet retarder from dropping.**
- **Check the mating surface of magnet retarder and the drum of exhaust side camshaft sprocket for foreign materials.**
- **Align the center of both shaft holes of the shaft and the intake side camshaft sprocket, and then insert them.**
- **Be careful not to drop the seal ring from the shaft groove.**
- **When setting the valve timing control cover in position by hand, if valve timing control cover is not contacting with the front timing chain case, the dowel pin of magnet retarder may not be aligned with the dowel pin holes of cover. In this case, return to step "b".**

d. Tighten mounting bolts in numerical order as shown in the figure.



CAUTION:

Completely tighten the mounting bolts with the seat surface of valve timing control cover contacting with front timing chain case.

: 11.3 N·m (1.2 kg-m, 8 ft-lb)

A : Right bank
B : Left bank
C : Dowel pin hole

- After all bolt are tightened, tighten No.1 bolt to the specified torque again.

8. Install crankshaft pulley as follows:

a. Fix crankshaft using ring gear stopper [SST: KV10118600 (J-48641)].

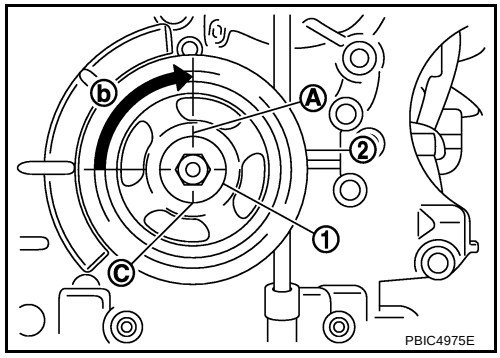
b. Install crankshaft pulley, taking care not to damage front oil seal.

- When press-fitting crankshaft pulley with plastic hammer, tap on its center portion (not circumference).

c. Tighten crankshaft pulley bolt.

: 44.1 N·m (4.5 kg-m, 33 ft-lb)

d. Place a paint mark (A) on crankshaft pulley (2) aligning with the angle mark (C) on crankshaft pulley bolt (1). Tighten the bolt 90 degrees (one marks) (b).



9. Rotate crankshaft pulley in normal direction (clockwise when viewed from front) to confirm it turns smoothly.

10. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluid leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .

- Run engine to check for unusual noise and vibration.

  NOTE:
  If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.
- Warm up engine thoroughly to make sure there is no leakage of exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level

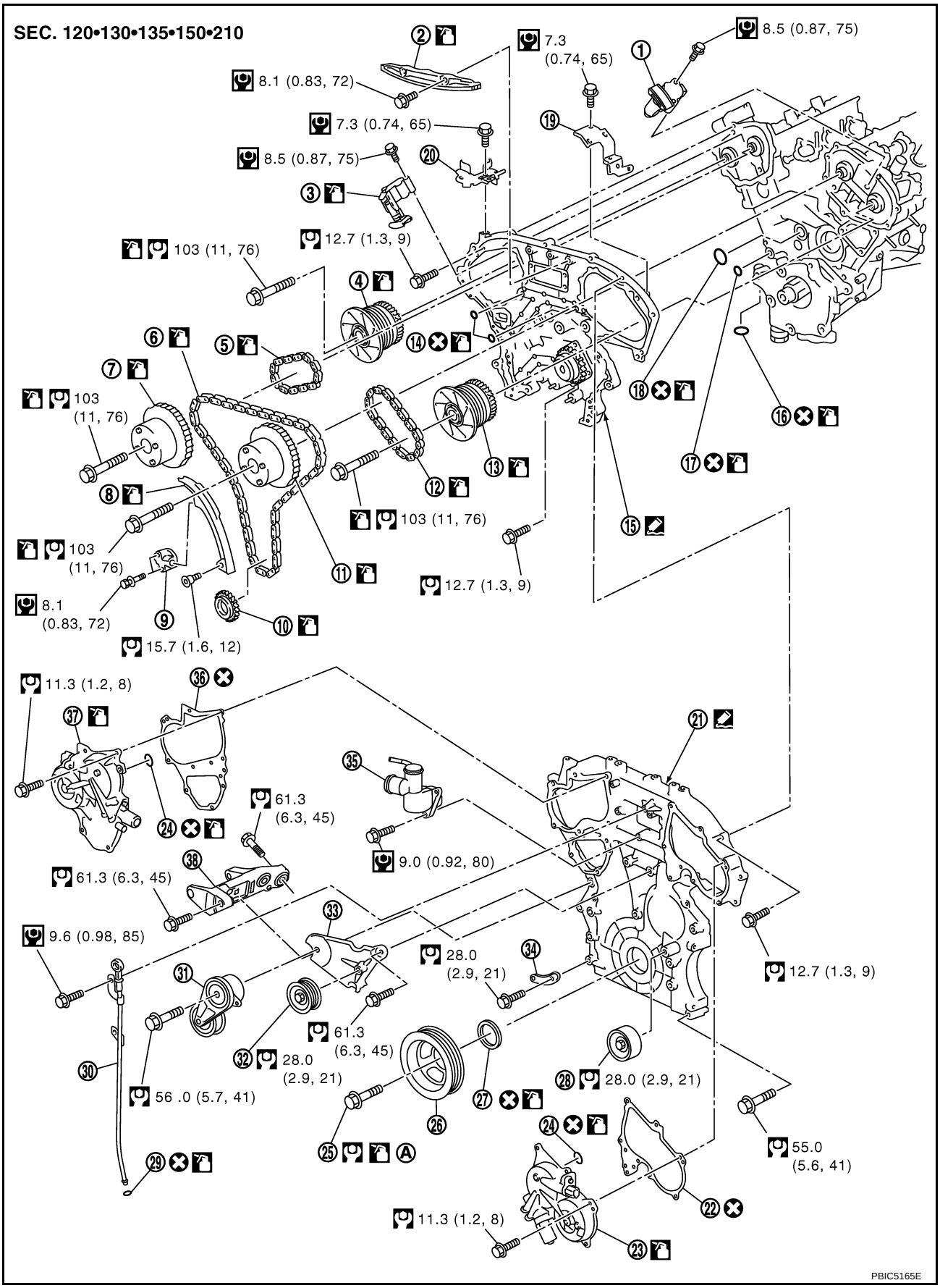
* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

TIMING CHAIN

PFP:13028

Removal and Installation

NBS0000S



1.	Timing chain tensioner (secondary) (left bank)	2.	Internal chain guide	3.	Timing chain tensioner (secondary) (right bank)
4.	Camshaft sprocket (EXH)	5.	Timing chain (secondary)	6.	Timing chain (primary)
7.	Camshaft sprocket (INT)	8.	Slack guide	9.	Timing chain tensioner (primary)
10.	Crankshaft sprocket	11.	Camshaft sprocket (INT)	12.	Timing chain (secondary)
13.	Camshaft sprocket (EXH)	14.	O-ring	15.	Rear timing chain case
16.	O-ring	17.	O-ring	18.	O-ring
19.	Bracket	20.	Bracket	21.	Front timing chain case
22.	Valve timing control cover gasket (LH)	23.	Valve timing control cover (LH)	24.	O-ring
25.	Crankshaft pulley bolt	26.	Crankshaft pulley	27.	Front oil seal
28.	Idler pulley	29.	O-ring	30.	Oil level gauge guide
31.	Drive belt auto-tensioner	32.	Idler pulley	33.	Idler pulley bracket
34.	Alternator bracket	35.	Water outlet (front)	36.	Valve timing control cover gasket (RH)
37.	Valve timing control cover (RH)	38.	Power steering oil pump bracket		
A.	Refer to EM-60				

- Refer to GI-11, "Components" for symbol marks in the figure.

NOTE:

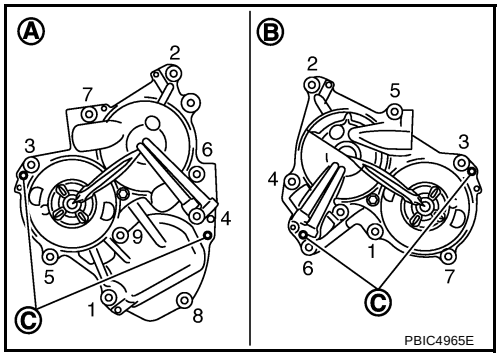
- This section describes procedures for removing/installing front timing chain case and timing chain related parts, and rear timing chain case, when oil pan (upper) needs to be removed/installed for engine overhaul, etc.
- To remove/install front timing chain case, timing chain, and its related parts without removing oil pan (upper), refer to EM-44, "FRONT TIMING CHAIN CASE" .

REMOVAL

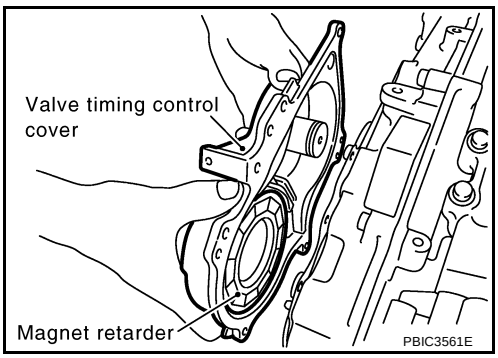
1. Remove engine assembly from the vehicle, and separate front suspension member and transmission from engine. Refer to EM-101, "ENGINE ASSEMBLY" .
2. Lift the engine with hoist and mount it onto widely use engine stand. Refer to EM-108, "DISASSEMBLY" .
3. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
4. Remove power steering oil pump bracket. Refer to PS-28, "POWER STEERING OIL PUMP" .
5. Remove alternator. Refer to SC-20, "CHARGING SYSTEM" .
6. Remove water bypass hose, water hose clamp and idler pulley bracket from front timing chain case.
7. Remove left and right valve timing control covers (including magnet retarder and cover) with the following procedure.

a. Loosen mounting bolts in reverse order as shown in the figure.

A : Right bank
B : Left bank
C : Dowel pin hole



b. Shaft is engaged with intake side camshaft sprocket center hole on inside. Pull straight out so as not to tilt until the joint is disengaged.
   - The mating surface of magnet retarder may be fitted with the exhaust side camshaft sprocket via the engine oil. Open valve timing control cover carefully.
   - If the mating surface of magnet retarder is fitted with the camshaft sprocket, open the cover within the range that the load is not applied to the harness. And then, remove it so as to prevent magnet retarder from dropping.

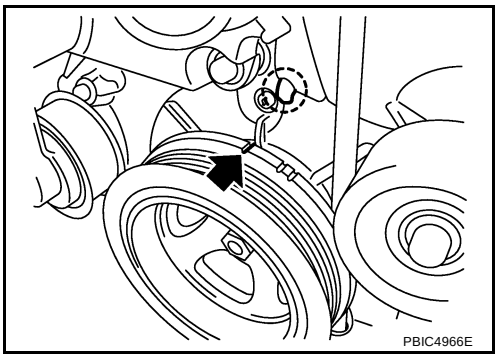


CAUTION:
- **Be careful not to damage magnet retarder.**
- **When carrying valve timing control cover, face the magnet retarder side up to prevent the cover from falling from magnet retarder.**
- **Do not remove magnet retarder from valve timing control cover. (Disassembly prohibited parts)**

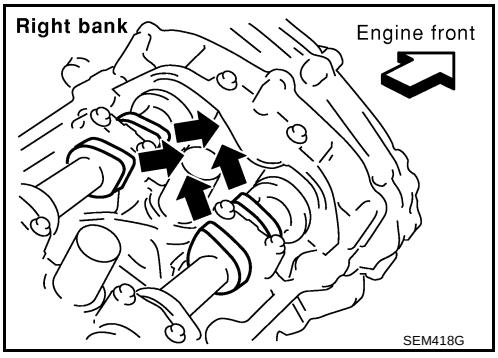
8. Remove rocker covers (right and left banks). Refer to EM-40, "ROCKER COVER" .
9. Obtain No. 1 cylinder at TDC of its compression stroke as follows:

a. Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.

   ⬅ : Timing mark (grooved line without color)



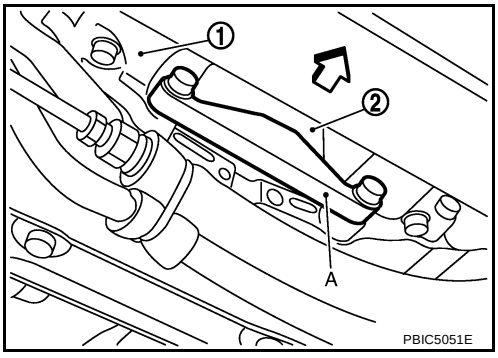
b. Make sure that intake and exhaust cam noses on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.
   - If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.



10. Remove crankshaft pulley as follows:

a. Remove rear cover plate and set ring gear stopper [SST: KV10118600 (J-48641)] (A) as shown in the figure.

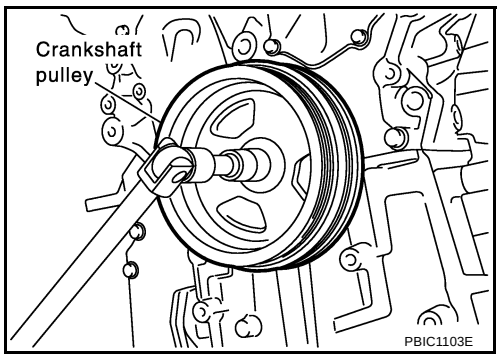
   1 : Oil pan
   2 : Fly wheel (M/T models) or drive plate (A/T models)
   ⇦ : Vehicle front



b. Loosen crankshaft pulley bolt and rotate bolt seating surface at 10 mm (0.39 in) from its original position.

CAUTION:

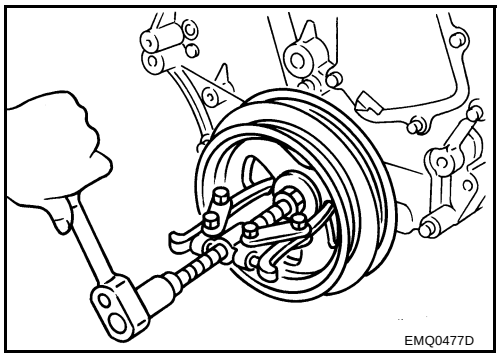
Do not remove crankshaft pulley bolt as it will be used as a supporting point for suitable puller.



c. Place suitable puller tab on holes of crankshaft pulley, and pull crankshaft pulley through.

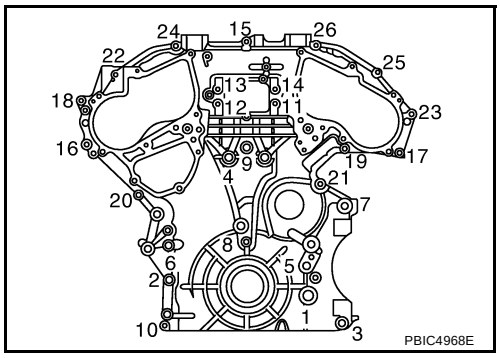
CAUTION:

Do not put suitable puller tab on crankshaft pulley periphery, as this will damage internal damper.



11. Remove oil pans (upper and lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
12. Remove front timing chain case as follows:

a. Loosen mounting bolts in reverse order as shown in the figure.



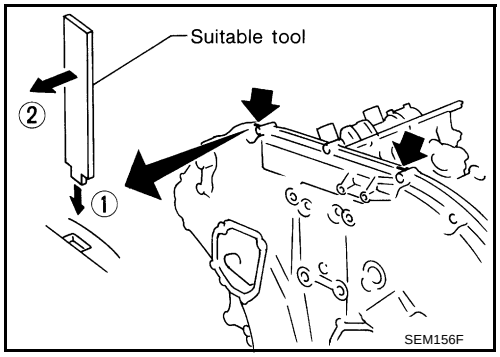
b. Insert suitable tool into the notch at the top of the front timing chain case as shown (1).

c. Pry off case by moving the tool as shown (2).

- Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

CAUTION:

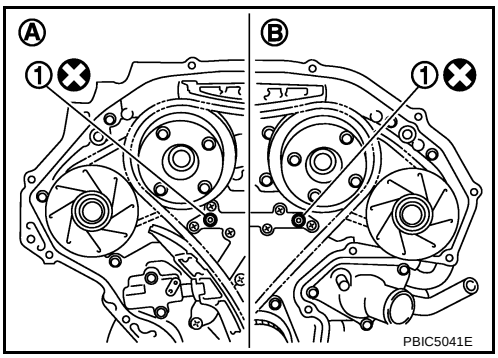
- **Do not use screwdriver or something similar.**
- **After removal, handle front timing chain case carefully so it does not tilt, cant, or warp under a load.**



13. Remove O-ring (1) from rear timing chain case.

A : Right bank

B : Left bank

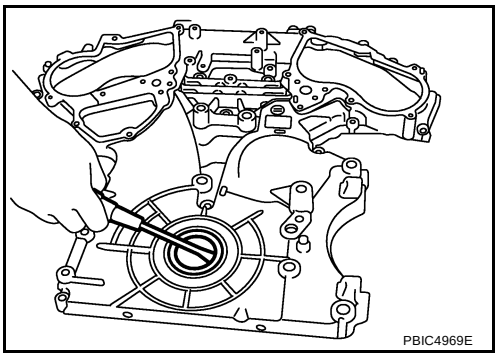


14. Remove front oil seal from front timing chain case using suitable tool.

- Use screwdriver for removal.

CAUTION:

Be careful not to damage front timing chain case.



15. Remove timing chain tensioner (primary) as follows:

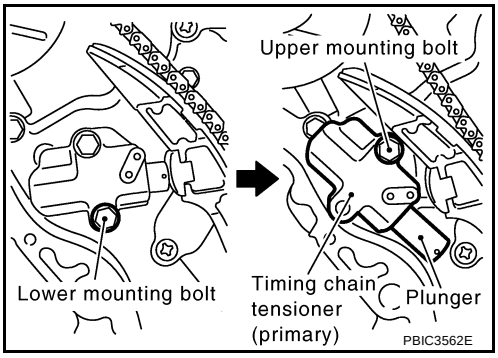
a. Remove lower mounting bolt.

b. Loosen upper mounting bolt slowly, and then turn timing chain tensioner (primary) on the mounting bolt so that plunger is fully expanded.

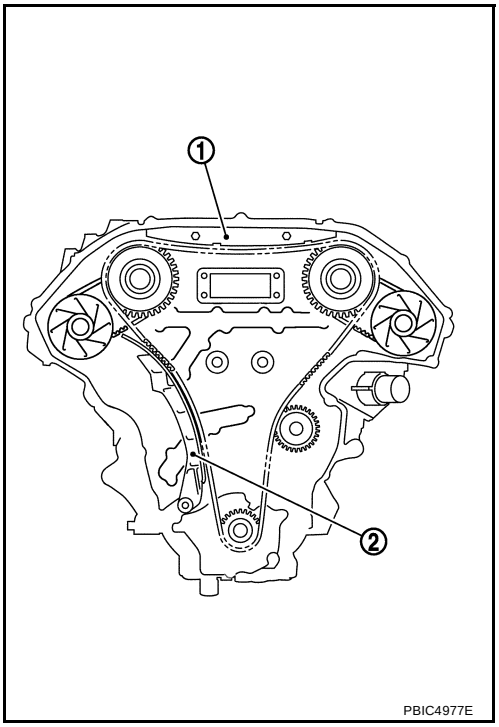
NOTE:

Even if plunger is fully expanded, it is not dropped from the body of timing chain tensioner (primary).

c. Remove upper mounting bolt, and then remove timing chain tensioner (primary).



16. Remove internal chain guide (1) and slack guide (2).



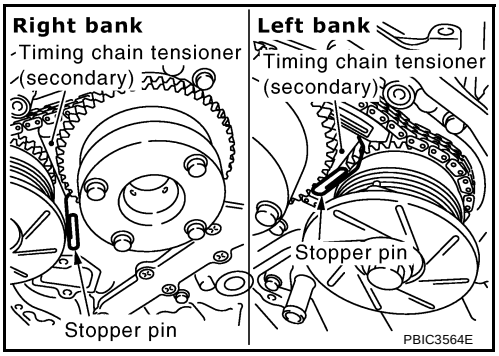
17. Remove timing chain (primary) and crankshaft sprocket.

CAUTION:
After removing timing chain (primary), do not turn crankshaft and camshaft separately, or valves will strike the piston heads.

18. Remove timing chain (secondary) and camshaft sprockets as follows:

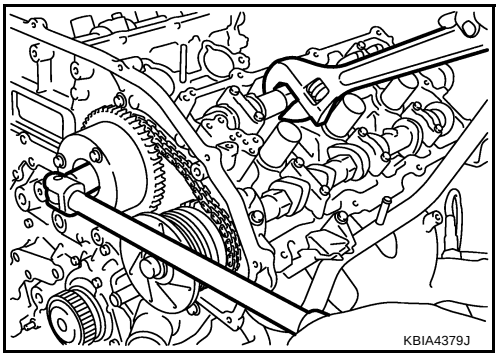
a. Attach suitable stopper pin to the right and left timing chain tensioners (secondary).

NOTE:
- Use approximately 0.5 mm (0.02 in) dia. hard metal pin as a stopper pin.
- For removal of timing chain tensioner (secondary), refer to EM-72, "CAMSHAFT" . [Removing camshaft bracket (No. 1) is required.]



b. Remove intake and exhaust camshaft sprocket bolts.
- Secure the hexagonal portion of camshaft using wrench to loosen mounting bolts.

CAUTION:
Do not loosen mounting bolts with securing anything other than the camshaft hexagonal portion or with tensioning the timing chain.

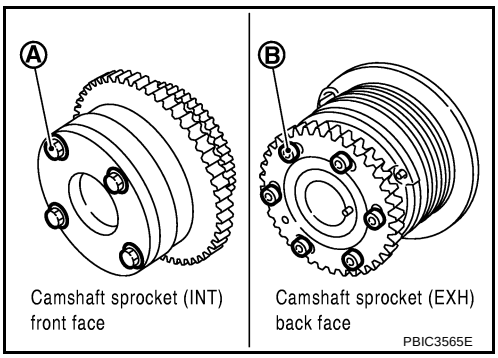


c. Remove timing chain (secondary) together with camshaft sprockets.

CAUTION:
- **Handle carefully to avoid any shock to camshaft sprocket.**

- **Do not disassemble. (Do not loosen bolts “A” and “B” as shown in the figure.)**

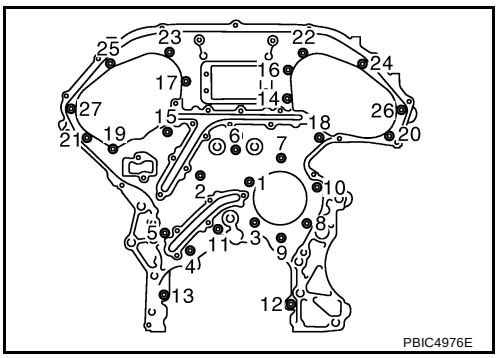
NOTE:
Camshaft sprocket (INT) is two-for-one structure of primary and secondary sprockets.



19. Remove water pump. Refer to CO-23, "WATER PUMP" .
20. Remove rear timing chain case as follows:

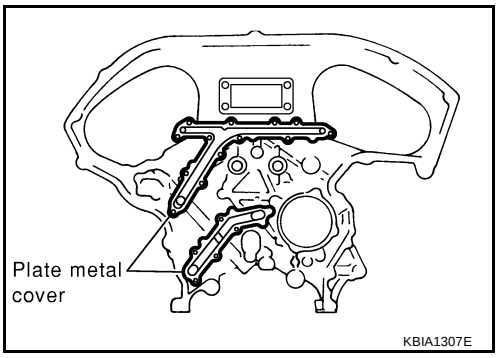
a. Loosen and remove mounting bolts in reverse order as shown in the figure.

b. Cut liquid gasket using seal cutter [SST: KV10111100 (J37228)] and remove rear timing chain case.

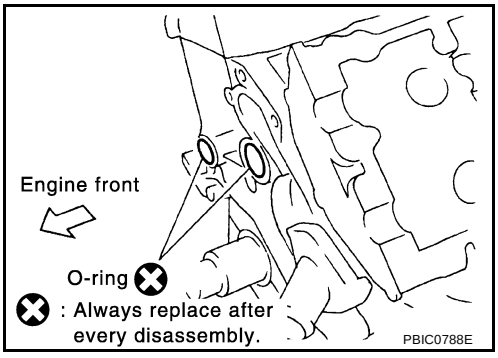


CAUTION:

- **Do not remove plate metal cover of oil passage.**
- **After removal, handle rear timing chain case carefully so it does not tilt, cant, or warp under a load.**



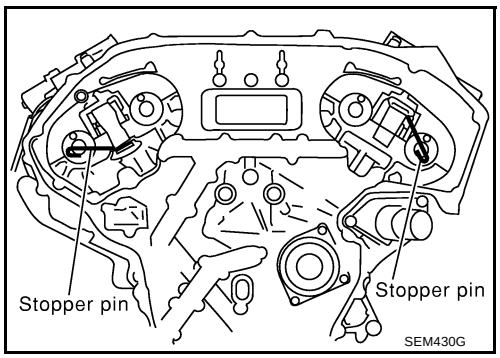
21. Remove O-rings from cylinder block.



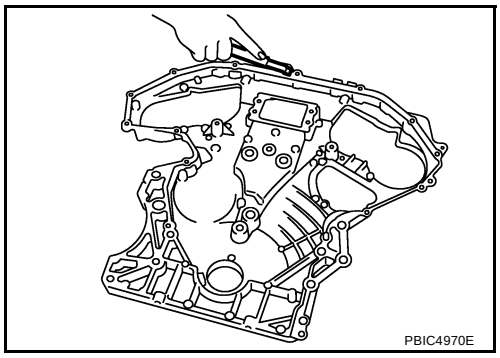
22. Remove timing chain tensioners (secondary) from cylinder head as follows, if necessary.

a. Remove camshaft brackets (No. 1). Refer to EM-72, "REMOVAL" .

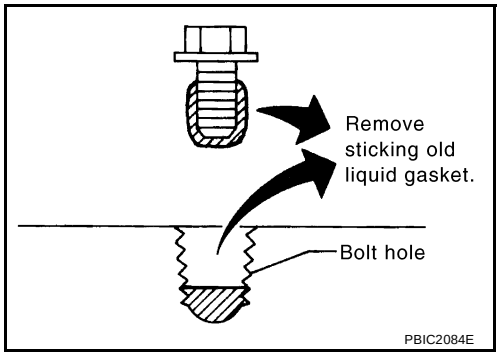
b. Remove timing chain tensioners (secondary) with stopper pin attached.



23. Use scraper to remove all traces of old liquid gasket from front and rear timing chain cases, and opposite mating surfaces.



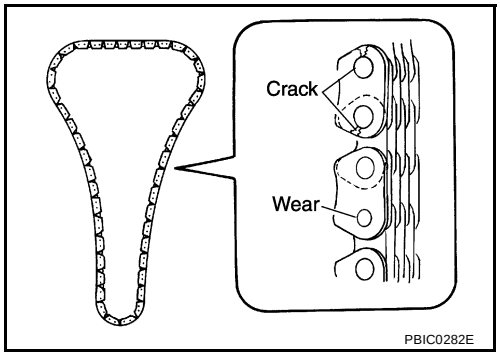
- Remove old liquid gasket from bolt hole and thread.



INSPECTION AFTER REMOVAL

Timing Chain

Check for cracks and any excessive wear at link plates and roller links of timing chain. Replace timing chain as necessary.

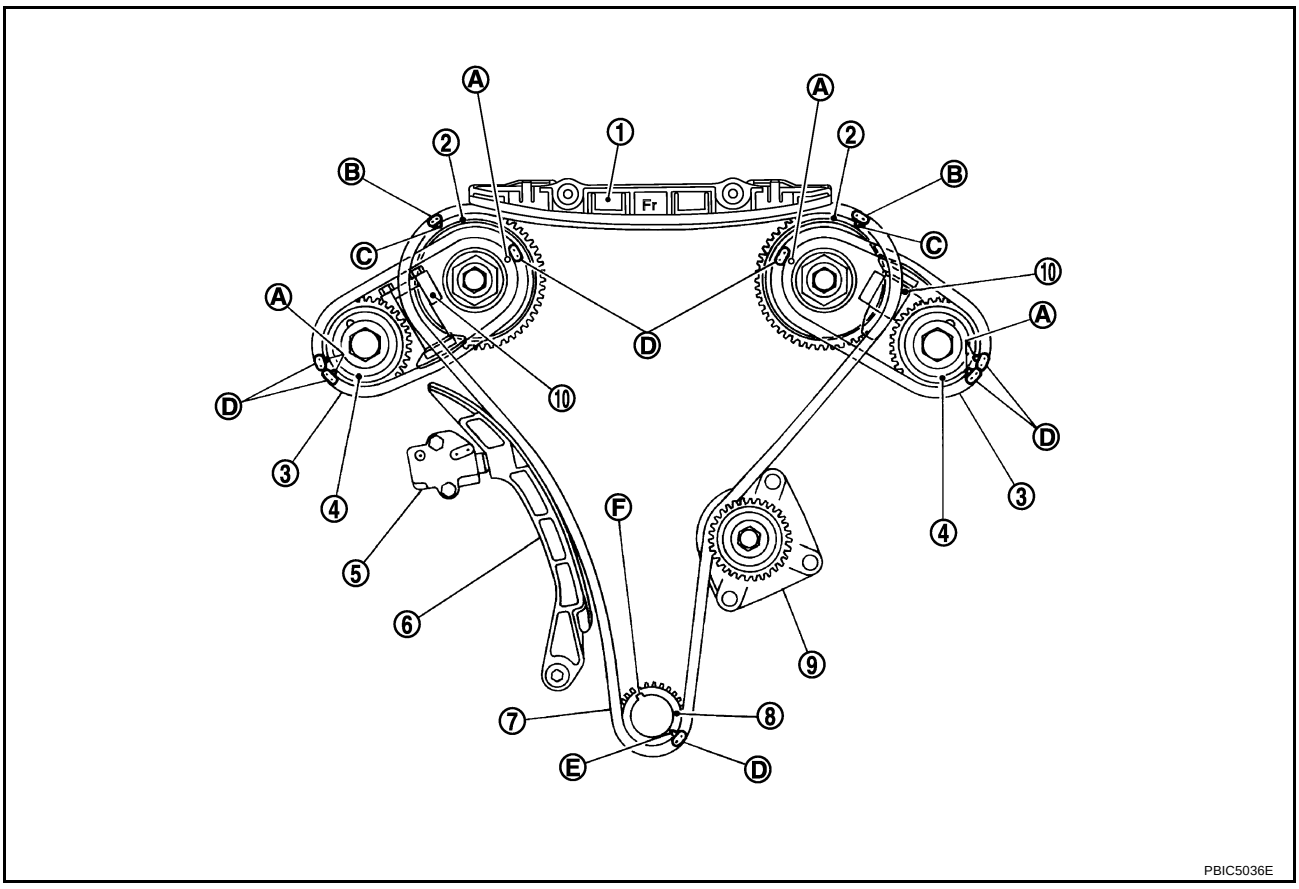


INSTALLATION

NOTE:

- The below figure shows the relationship between the mating mark on each timing chain and that on the corresponding sprocket, with the components installed.

- In this figure, the drum of exhaust side camshaft sprocket has been omitted.



1.	Internal chain guide	2.	Camshaft sprocket (INT)	3.	Timing chain (secondary)
4.	Camshaft sprocket (EXH)	5.	Timing chain tensioner (primary)	6.	Slack guide
7.	Timing chain (primary)	8.	Crankshaft sprocket	9.	Water pump
10.	Timing chain tensioner (secondary)				
A.	Mating mark [punched (back side)]	B.	Mating mark (yellow link)	C.	Mating mark (punched)
D.	Mating mark (orange link)	E.	Mating mark (notched)	F.	Crankshaft key

1. Install timing chain tensioners (secondary) to cylinder head as follows if removed. Refer to EM-77, "INSTALLATION" .

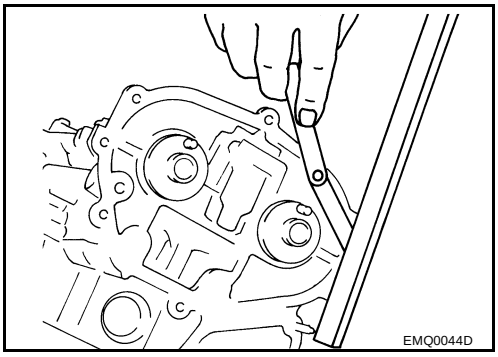
a. Install timing chain tensioners (secondary) with stopper pin attached and new O-ring.

b. Install camshaft brackets (No. 1). Refer to EM-77, "INSTALLATION" .

2. Measure difference in levels between front end faces of camshaft bracket (No.1) and cylinder head.

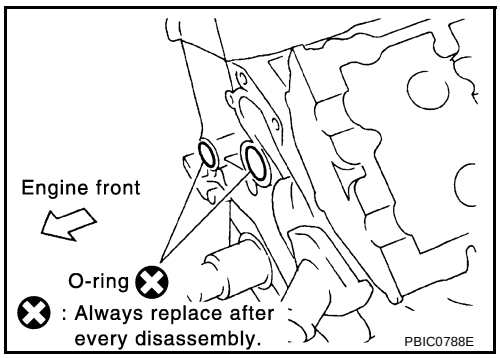
Standard : –0.14 to 0.14 mm (–0.0055 to 0.0055 in)

- Measure two positions (Both intake and exhaust side) for a single bank.
- If the measured value is out of the standard, re-install camshaft bracket (No.1).



3. Install rear timing chain case as follows:

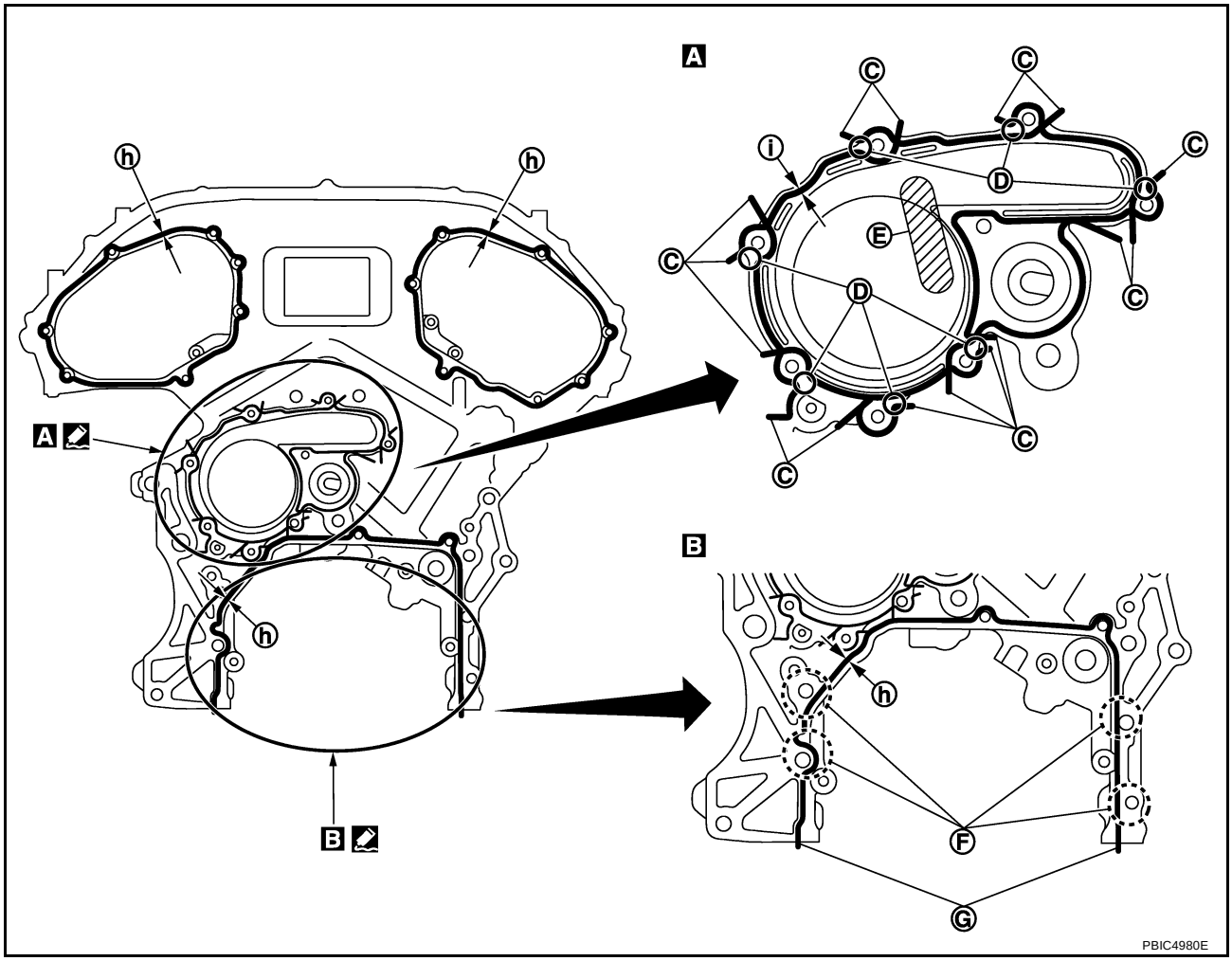
a. Install new O-rings onto cylinder block.



b. Apply liquid gasket with tube presser [SST: WS39930000 (—)] to rear timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

CAUTION:

- **For “A” in the figure, completely wipe out liquid gasket extended on a portion touching at engine coolant.**
- **Apply liquid gasket on installation position of water pump and cylinder head very completely.**

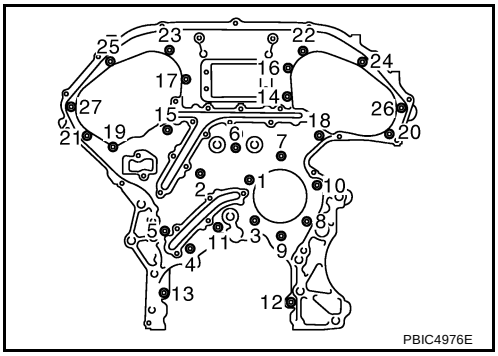


C.	Protrusion	D.	Clearance 1 mm (0.04 in)	E.	Do not protrude in this area
F.	Run along bolt hole inner side	G.	Protrusions at beginning and end of gasket		
h.	3.9 mm (0.154 in)	i	2.7 mm (0.106 in)		

- Refer to GI-11, "Components" for symbol marks in the figure.

c. Align rear timing chain case and water pump assembly with dowel pins (right and left) on cylinder block and install rear timing chain case.
   - Make sure O-rings stay in place during installation to cylinder block.

d. Tighten mounting bolts in numerical order as shown in the figure.
   - There are two types of mounting bolts. Refer to the following for locating bolts.



Bolt length: Bolt position

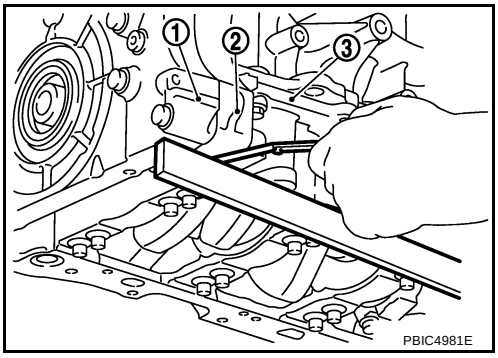
20 mm (0.79 in) : 1, 2, 3, 6, 7, 8, 9, 10

16 mm (0.63 in) : Except the above

: 12.7 N·m (1.3 kg-m, 9 ft-lb)

e. After all bolts are tightened, retighten them to the specified in numerical order shown in the figure.
   - If liquid gasket protrudes, wipe it off immediately.

f. After installing rear timing chain case, check the surface height difference between following parts on oil pan (upper) mounting surface.



1 : Front timing chain case
2 : Rear timing chain case
3 : Lower cylinder block

Standard

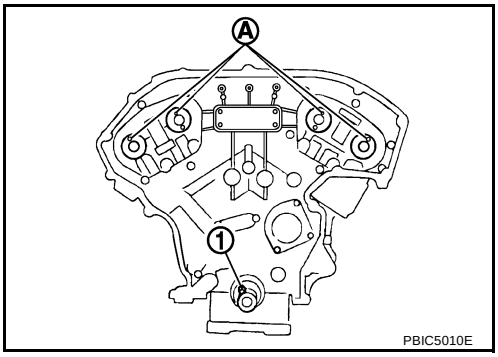
Rear timing chain case to cylinder block:

–0.24 to 0.14 mm (–0.0094 to 0.0055 in)

   - If not within standard, repeat the installation procedure.

4. Install water pump with new O-rings. Refer to CO-23, "WATER PUMP" .

5. Make sure that dowel pin (A) and crankshaft key (1) are located as shown in the figure. (No. 1 cylinder at compression TDC)



NOTE:
Though camshaft does not stop at the position as shown in the figure, for the placement of cam nose, it is generally accepted camshaft is placed for the same direction of the figure.

Camshaft dowel pin

: At cylinder head upper face side in each bank.

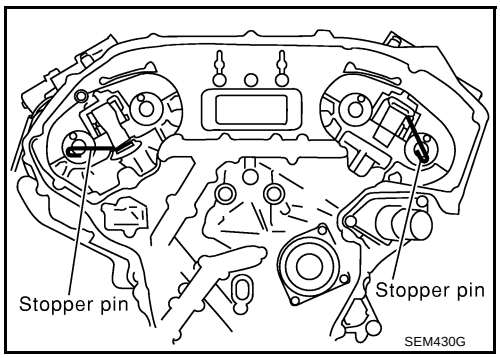
Crankshaft key

: At cylinder head side of right bank.

6. Install timing chains (secondary) and camshaft sprockets as follows:

CAUTION:
- **When replacing camshaft sprocket (EXH), replace valve timing control cover (including magnet retarder and cover).**
- **Mating marks between timing chain and sprockets slip easily. Confirm all mating mark positions repeatedly during the installation process.**

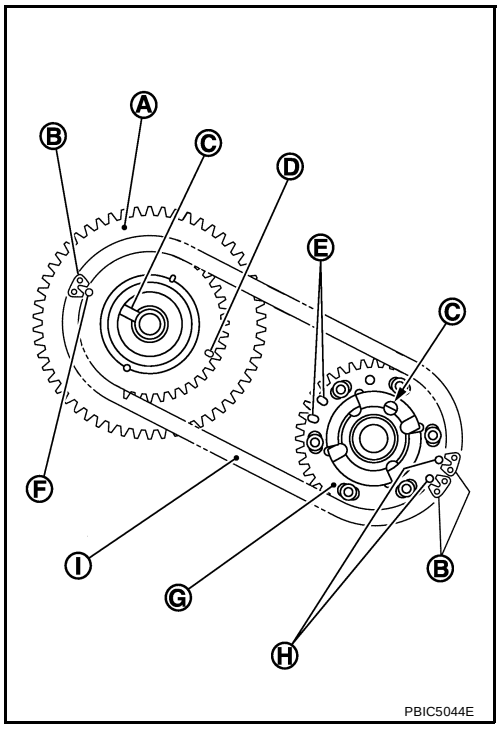
a. Push plunger of timing chain tensioner (secondary) and keep it pressed in with stopper pin.



b. Install timing chains (secondary) and camshaft sprockets.

NOTE:
Figure shows right bank (rear view).

A : Camshaft sprocket (INT) back face
B : Orange link
C : Dowel groove or hole
D : Mating mark (oval)
E : Mating mark (2 oval)
F : Mating mark (circle)
G : Camshaft sprocket (EXH) back face
H : Mating mark (2 circle)
I : Timing chain (secondary)



- Align the mating marks on timing chain (secondary) (orange link) with the ones on intake and exhaust camshaft sprockets (punched), and install them.

NOTE:
- Mating marks for intake camshaft sprocket are on the back side of camshaft sprocket (secondary).
- There are two types of mating marks, circle and oval types. They should be used for the right and left banks, respectively.

Right bank : Use circle type (F, H)
Left bank : Use oval type (D, E)

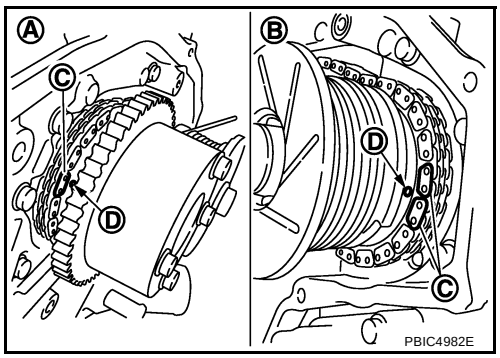
- Align dowel pin hole on the small diameter side of the camshaft front end with dowel pin on the back side of camshaft sprockets, and install them.
- In case that positions of each mating mark and each dowel pin are not fit on mating parts, make fine adjustment to the position holding the hexagonal portion on camshaft with wrench or equivalent.
- Mounting bolts for camshaft sprockets must be tightened in the step “d”. Tightening them by hand is enough to prevent the dislocation of dowel pins.

c. Make sure that timing chain (secondary) is not loose from each camshaft sprocket.

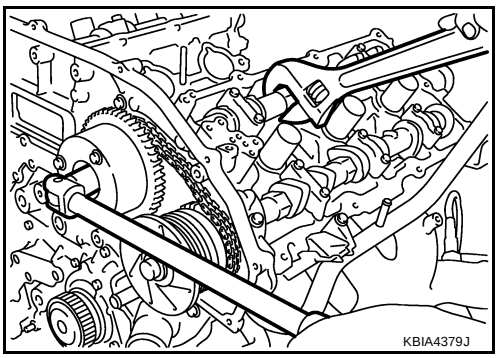
- Make sure the mating marks (punched) (D) on each camshaft sprocket are positioned on the mating marks (orange link) (C) on timing chain (secondary).

A : Intake side
B : Exhaust side

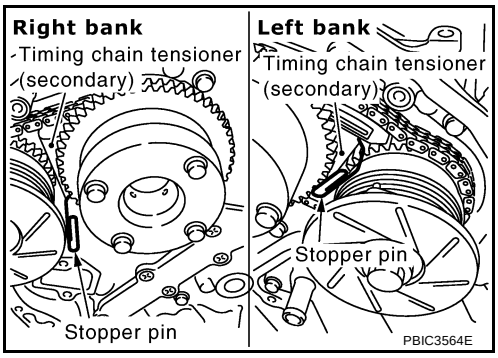
NOTE:
Mating mark (punched) in the figure is for checking loose at this step.



d. Tighten camshaft sprocket mounting bolts.
   - Secure camshaft using wrench at the hexagonal portion to tighten mounting bolts.

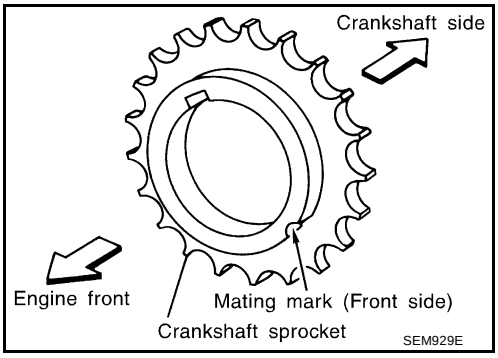


e. Pull stopper pins out from timing chain tensioners (secondary).



7. Install timing chain (primary) as follows:

a. Install crankshaft sprocket.
   - Make sure the mating marks on crankshaft sprocket face the front of engine.

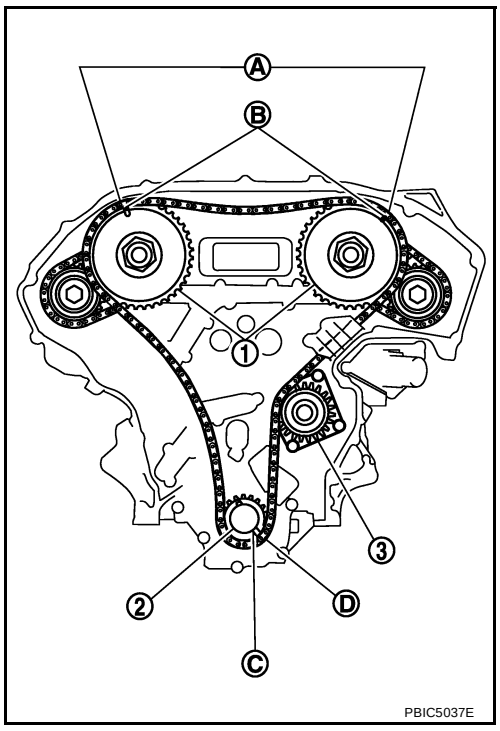


b. Install timing chain (primary).

- Install timing chain (primary) so the mating mark (punched) (B) on camshaft sprocket (INT) (1) is aligned with the yellow link (A) on timing chain, while the mating mark (notched) (C) on crankshaft sprocket (2) is aligned with the orange link (D) on timing chain, as shown in the figure.

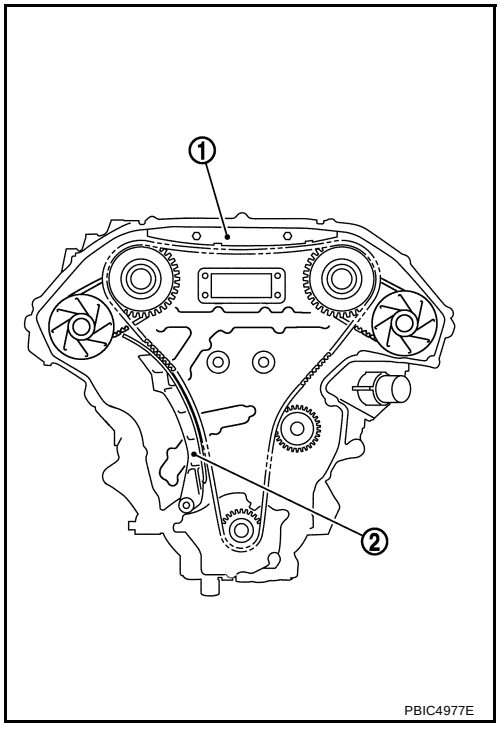
  3 : Water pump

- When it is difficult to align mating marks of timing chain (primary) with each sprocket, gradually turn camshaft using wrench on the hexagonal portion to align it with the mating marks.
- During alignment, be careful to prevent dislocation of mating mark alignments of timing chains (secondary).



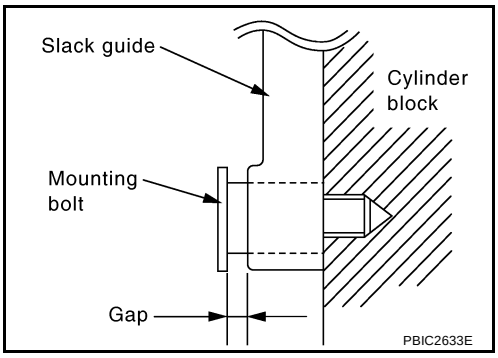
PBIC5037E

8. Install internal chain guide (1), slack guide (2) and timing chain tensioner (primary).



PBIC4977E

CAUTION:
Do not overtighten slack guide mounting bolts. It is normal for a gap to exist under the bolt seats when mounting bolts are tightened to specification.



9. Install the timing chain tensioner (primary) with the following procedure:

a. Pull plunger stopper tab up (or turn lever downward) so as to remove plunger stopper tab from the ratchet of plunger.

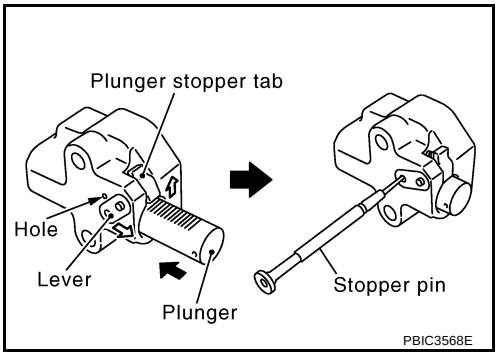
NOTE:
Plunger stopper tab and lever are synchronized.

b. Push plunger into the inside of tensioner body.

c. Hold plunger in the fully compressed position by engaging plunger stopper tab with the tip of ratchet.

d. To secure lever, insert stopper pin through hole of lever into tensioner body hole.

- The lever parts and the tab are synchronized. Therefore, the plunger will be secured under this condition.

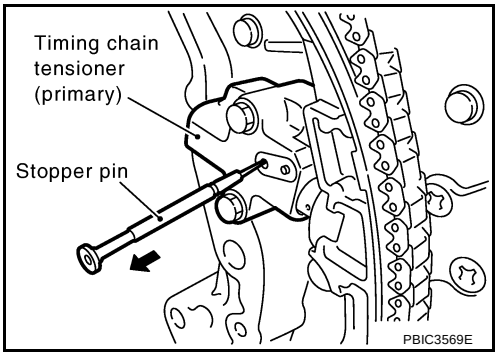


NOTE:
Figure shows the example of 1.2 mm (0.047 in) diameter thin screwdriver being used as the stopper pin.

e. Install timing chain tensioner (primary).

- Remove any dirt and foreign materials completely from the back and the mounting surfaces of timing chain tensioner (primary).

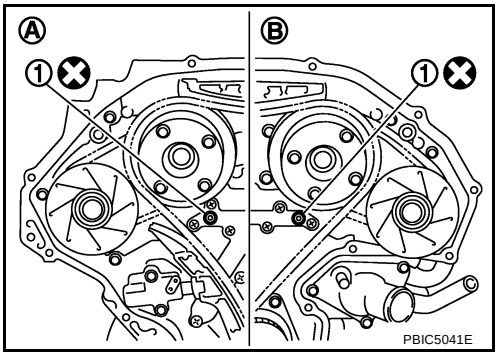
f. Pull out stopper pin after installing, and then release plunger.



10. Make sure again that the mating marks on sprockets and timing chain have not slipped out of alignment.

11. Install new O-ring (1) on rear timing chain case.

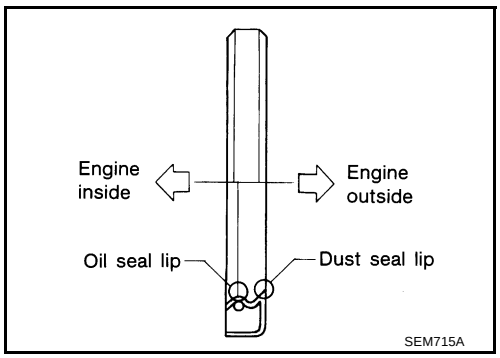
A : Right bank
B : Left bank



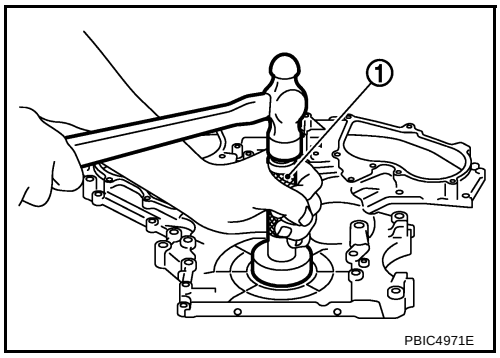
12. Install new front oil seal on front timing chain case.

- Apply new engine oil to both oil seal lip and dust seal lip.

- Install it so that each seal lip is oriented as shown in the figure.



- Using suitable drift (1), press-fit oil seal until it becomes flush with front timing chain case end face.
- Make sure the garter spring is in position and seal lip is not inverted.

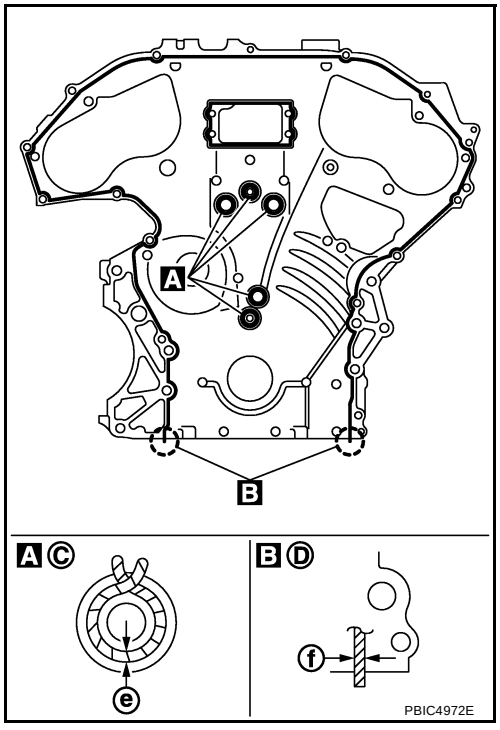


13. Install front timing chain case as follows:

a. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to front timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

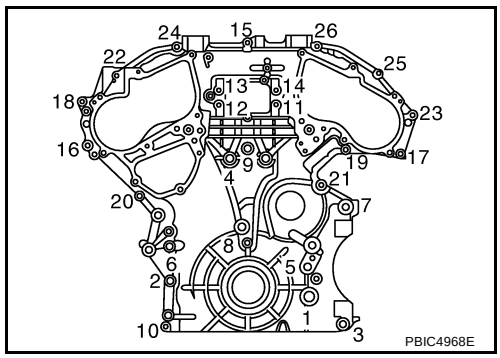
C : Bolt hole
D : Protrusion
e : 2.6 - 3.6 mm (0.102 - 0.142 in)
f : 3.4 - 4.4 mm (0.134 - 0.173 in)

NOTE:
Apply liquid gasket, start and end up application at the portions (a) shown in the figure.



b. Install front timing chain case as to fit its dowel pin hole together dowel pin on rear timing chain case.

c. Tighten mounting bolts to the specified torque in numerical order as shown in the figure.



- There are two types of mounting bolts. Refer to the following for locating bolts.

M8 bolts : 1, 2, 3, 4, 5, 6, 7

: 55.0 N·m (5.6 kg-m, 41 ft-lb)

M6 bolts : Except the above

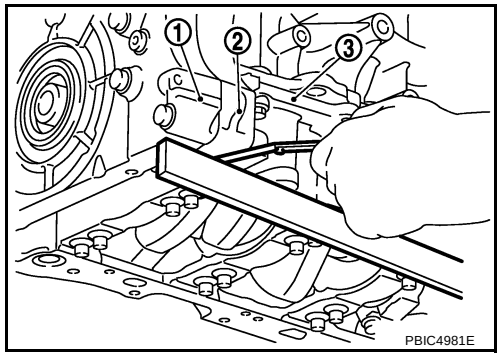
: 12.7 N·m (1.3 kg-m, 9 ft-lb)

d. After all bolts are tightened, retighten them to the specified torque in numerical order shown in the figure.

CAUTION:

Be sure to wipe off any excessive liquid gasket leaking on surface mating with oil pan (upper).

e. After installing front timing chain case, check the surface height difference between the following parts on the oil pan (upper) mounting surface.



1 : Front timing chain case
2 : Rear timing chain case
3 : Lower cylinder block

Standard

Front timing chain case to rear timing chain case:

–0.14 to 0.14 mm (–0.005 to 0.0055 in)

- If not within standard, repeat the installation procedure.

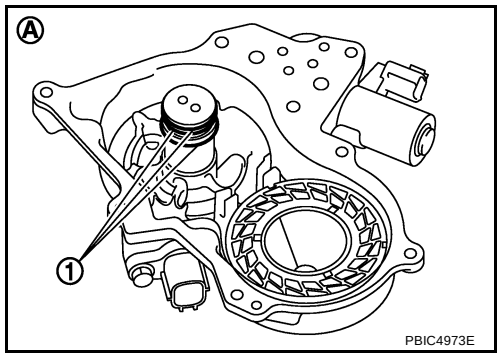
14. Install right and left valve timing control covers as follows:

a. Install new seal rings (1) in shaft grooves.

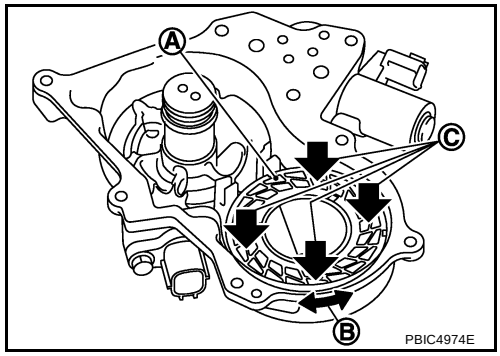
CAUTION:

When replacing seal rings, replace all rings with new one.

A : Left bank



b. To check the joint between dowel pins and dowel pin holes, check the looseness in the axle direction by pushing the mating surface of magnet retarder (A) at several places and the circumferential looseness (between dowel pins and dowel pin holes) by twisting in the circumferential direction.

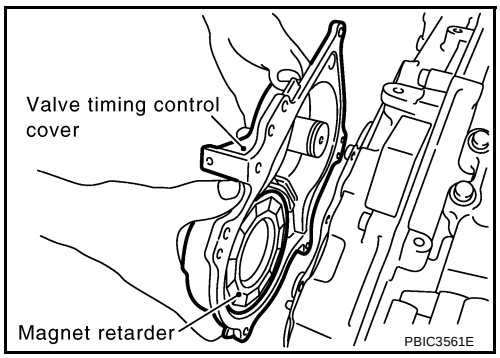


CAUTION:

Always perform this procedure when removing because the gap between dowel pins and dowel pin holes may not be caused on purpose.

B : Moves slightly
C : Not shaken

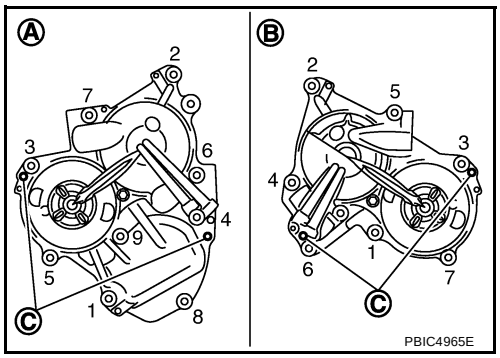
c. Install valve timing control cover to front timing chain case.



CAUTION:

- **Do not face the magnet retarder side down to prevent magnet retarder from dropping.**
- **Check the mating surface of magnet retarder and the drum of exhaust side camshaft sprocket for foreign materials.**
- **Align the center of both shaft holes of the shaft and the intake side camshaft sprocket, and then insert them.**
- **Be careful not to drop the seal ring from the shaft groove.**
- **When setting the valve timing control cover in position by hand, if valve timing control cover is not contacting with the front timing chain case, the dowel pin of magnet retarder may not be aligned with the dowel pin holes of cover. In this case, return to step "b".**

d. Tighten mounting bolts in numerical order as shown in the figure.



CAUTION:

Completely tighten the mounting bolts with the seat surface of valve timing control cover contacting with front timing chain case.

: 11.3 N·m (1.2 kg-m, 8 ft-lb)

A : Right bank
B : Left bank
C : Dowel pin hole

- After all bolts are tightened, tighten No.1 bolt to the specified torque again.

15. Install oil pans (upper and lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
16. Install rocker covers (right and left banks). Refer to EM-40, "ROCKER COVER" .
17. Install crankshaft pulley as follows:

a. Fix crankshaft using ring gear stopper [SST: KV10118600 (J-48641)].

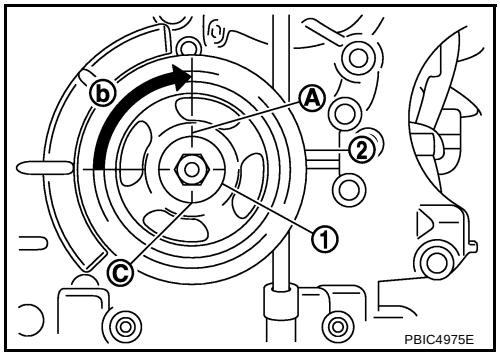
b. Install crankshaft pulley, taking care not to damage front oil seal.

- When press-fitting crankshaft pulley with plastic hammer, tap on its center portion (not circumference).

c. Tighten crankshaft pulley bolt.

: 44.1 N·m (4.5 kg-m, 33 ft-lb)

d. Place a paint mark (A) on crankshaft pulley (2) aligning with the angle mark (C) on crankshaft pulley bolt (1). Tighten the bolt 90 degrees (one marks) (b).



18. Rotate crankshaft pulley in normal direction (clockwise when viewed from engine front) to confirm it turns smoothly.
19. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

  NOTE:
  If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.
- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level
Fuel	Leakage	Leakage	Leakage
Exhaust gases	—	Leakage	—

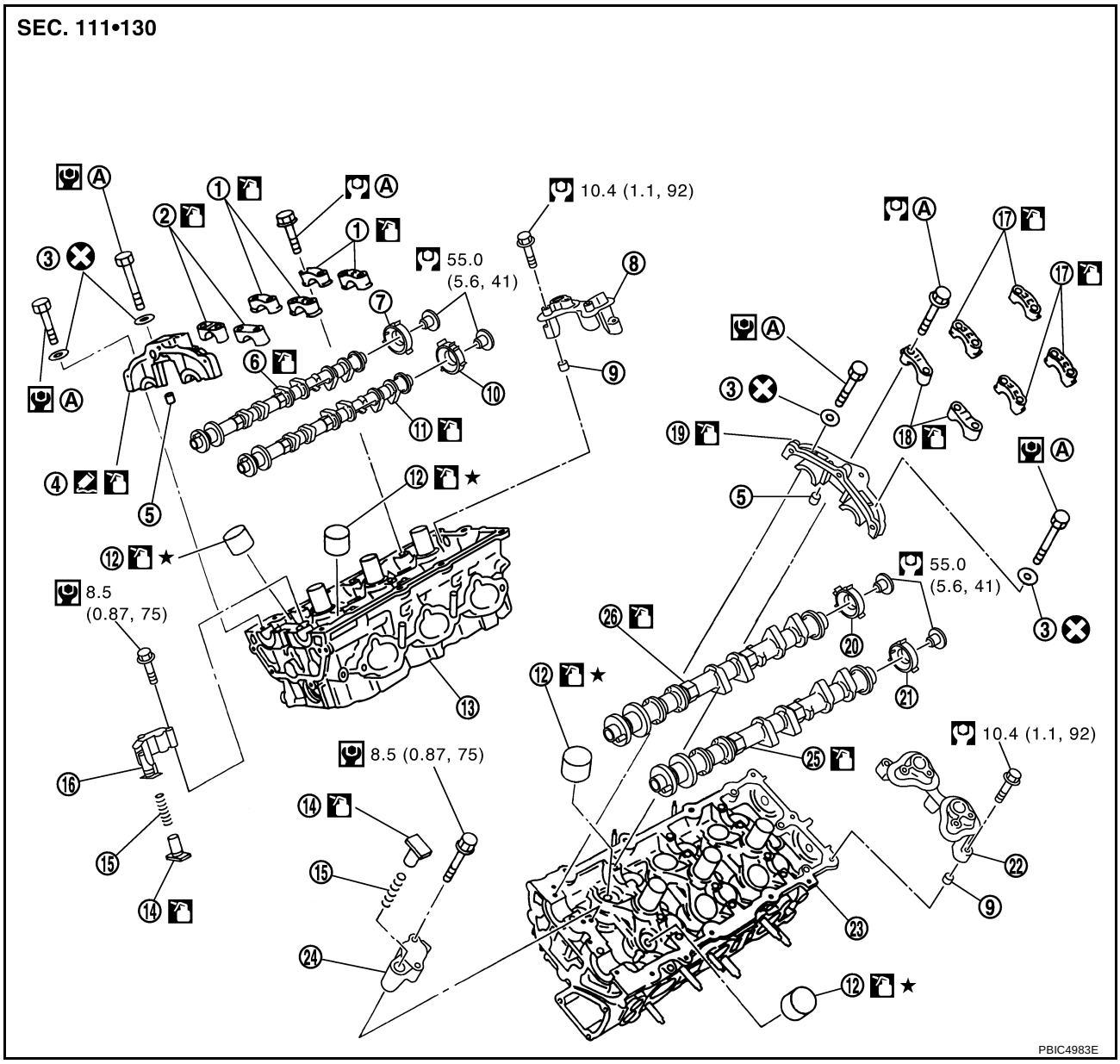
* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

CAMSHAFT

PFP:13001

Removal and Installation

NBS0000T



1. Camshaft bracket (No. 3, 4)	2. Camshaft bracket (No. 2)	3. Seal washer
4. Camshaft bracket (No. 1)	5. Dowel pin	6. Camshaft (EXH) (right bank)
7. Camshaft signal plate (EXH)	8. Camshaft sensor bracket	9. Dowel pin
10. Camshaft signal plate (INT)	11. Camshaft (INT) (right bank)	12. Valve lifter
13. Cylinder head (right bank)	14. Plunger	15. Spring
16. Timing chain tensioner (secondary) (right bank)	17. Camshaft bracket (No. 3, 4)	18. Camshaft bracket (No. 2)
19. Camshaft bracket (No. 1)	20. Camshaft signal plate (INT)	21. Camshaft signal plate (EXH)
22. Camshaft sensor bracket	23. Cylinder head (left bank)	24. Timing chain tensioner (secondary) (left bank)
25. Camshaft (EXH) (left bank)	26. Camshaft (INT) (left bank)	

A. Refer to EM-77

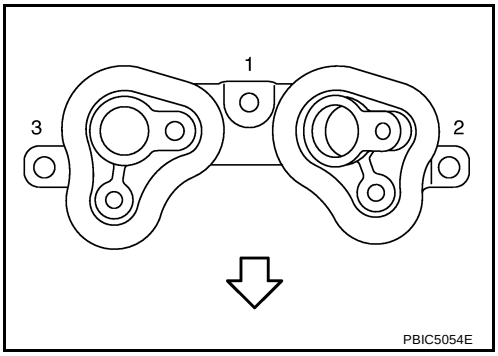
- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

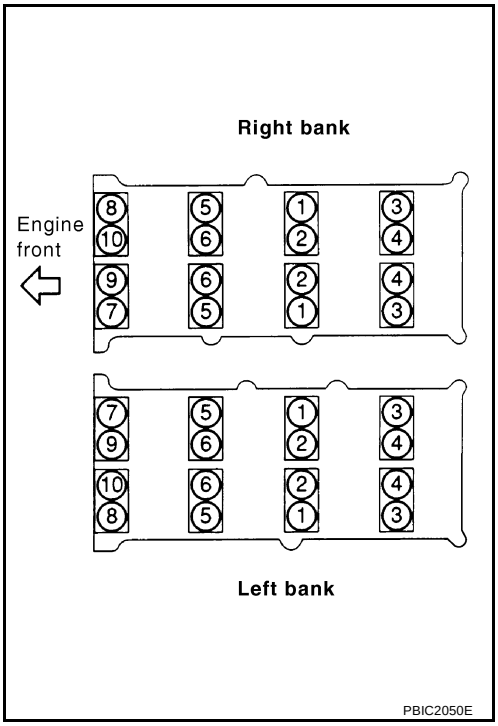
1. Remove front timing chain case, camshaft sprocket, and timing chain. Refer to EM-53, "TIMING CHAIN" .

2. Remove fuel sub tube. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
3. Remove camshaft sensor bracket bolts in reverse order as shown in the figure.

   ⇦ : Engine front



4. Remove intake and exhaust camshaft brackets.
   - Mark camshafts, camshaft brackets and bolts so they are placed in the same position and direction for installation.
   - Equally loosen camshaft bracket bolts in several steps in reverse order as shown in the figure.



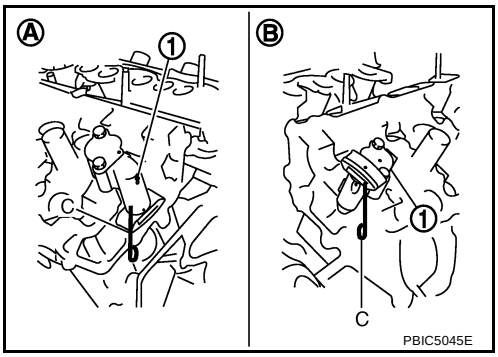
5. Remove camshaft.
6. Remove valve lifter.
   - Identify installation positions, and store them without mixing them up.
7. Remove timing chain tensioner (secondary) (1) from cylinder head.

   A : Right bank

   B : Left bank

   - Remove timing chain tensioner (secondary) (1) with its stopper pin (C) attached.

   NOTE:
   Stopper pin (C) was attached when timing chain (secondary) was removed.



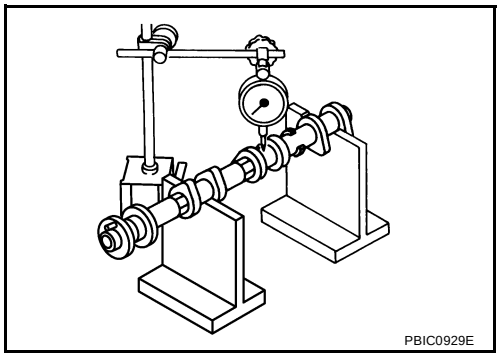
INSPECTION AFTER REMOVAL

Camshaft Runout

1. Put V-block on precise flat table, and support No. 2 and 4 journals of camshaft.

   CAUTION:
   Do not support journal No. 1 (on the side of camshaft sprocket) because it has a different diameter from the other three locations.
2. Set dial indicator vertically to No. 3 journal.
3. Turn camshaft to one direction with hands, and measure the camshaft runout on a dial indicator. (Total indicator reading)

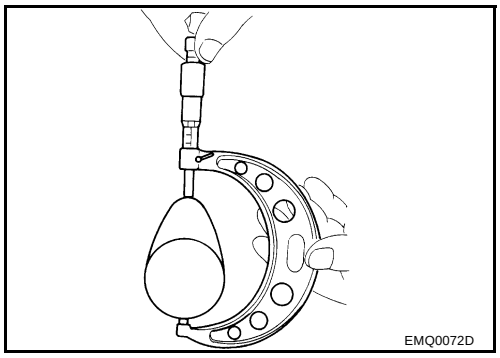
   Standard : Less than 0.02 mm (0.0008 in)
   Limit : 0.05 mm (0.0020 in)
4. If it exceeds the limit, replace camshaft.


PBIC0929E

Camshaft Cam Height

1. Measure the camshaft cam height with a micrometer.

   Standard cam height:
   Intake : 45.865 – 46.055 mm (1.8057 – 1.8132 in)
   Exhaust : 45.875 – 46.065 mm (1.8061 – 1.8136 in)
   Cam wear limit
   : 0.2 mm (0.008 in)
2. If wear is beyond the limit, replace camshaft.

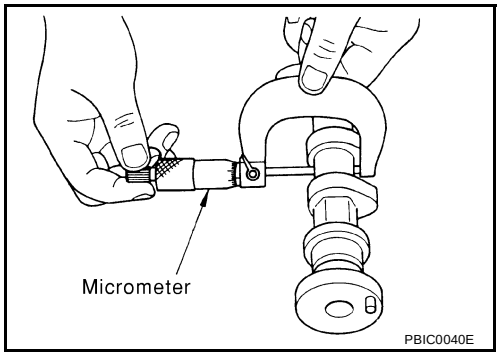

EMQ0072D

Camshaft Journal Oil Clearance

CAMSHAFT JOURNAL DIAMETER

- Measure the outer diameter of camshaft journal with a micrometer.

  Standard:
  No. 1 : 25.935 - 25.955 mm (1.0211 - 1.0218 in)
  No. 2, 3, 4 : 23.445 - 23.465 mm (0.9230 - 0.9238 in)

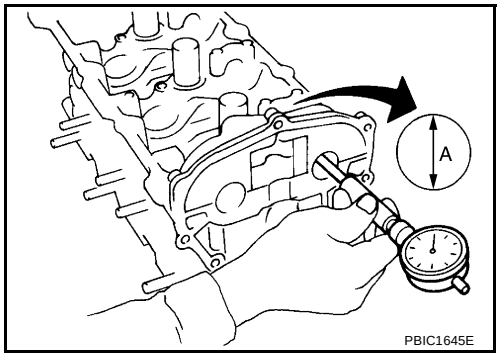


PBIC0040E

CAMSHAFT BRACKET INNER DIAMETER

- Tighten camshaft bracket bolt with the specified torque. Refer to EM-77, "INSTALLATION" for the tightening procedure.
- Measure the inner diameter “A” of camshaft bracket with a bore gauge.

  Standard:
  No. 1 : 26.000 - 26.021 mm (1.0236 - 1.0244 in)
  No. 2, 3, 4 : 23.500 - 23.521 mm (0.9252 - 0.9260 in)



PBIC1645E

CAMSHAFT JOURNAL OIL CLEARANCE

- (Oil clearance) = (Camshaft bracket inner diameter) – (Camshaft journal diameter)

Standard:

No. 1 : 0.045 - 0.086 mm (0.0018 - 0.0034 in)

No. 2, 3, 4 : 0.035 - 0.076 mm (0.0014 - 0.0030 in)

Limit : 0.15 mm (0.0059 in)

- If it exceeds the limit, replace either or both camshaft and cylinder head.

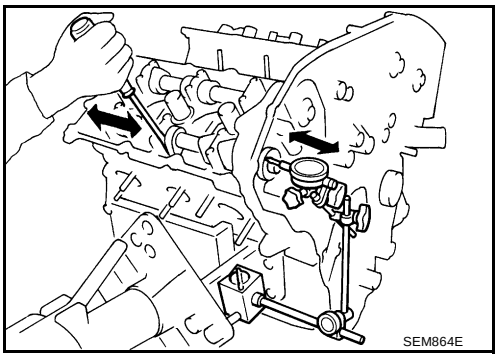
NOTE:
Camshaft brackets cannot be replaced as single parts, because there are machined together with cylinder head. Replace whole cylinder head assembly.

Camshaft End Play

- Install a dial indicator in thrust direction on front end of camshaft. Measure the end play of a dial indicator when camshaft is moved forward/backward (in direction to axis).

Standard : 0.115 - 0.188 mm (0.0045 - 0.0074 in)

Limit : 0.24 mm (0.0094 in)



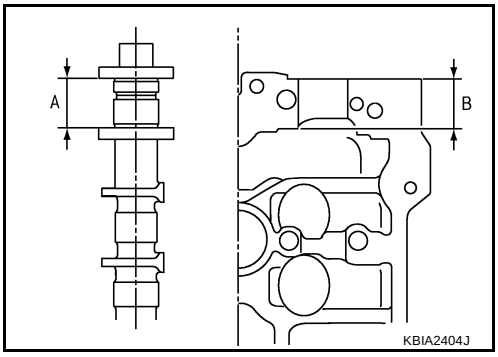
- Measure the following parts if out of the limit.
  - Dimension “A” for camshaft No. 1 journal

Standard : 27.500 - 27.548 mm (1.0827 - 1.0846 in)

  - Dimension “B” for cylinder head No. 1 journal bearing

Standard : 27.360 - 27.385 mm (1.0772 - 1.0781 in)

- Refer to the standards above, and then replace camshaft and/or cylinder head.



Camshaft Sprocket Runout

1. Put V-block on precise flat table, and support No. 2 and 4 journal of camshaft.

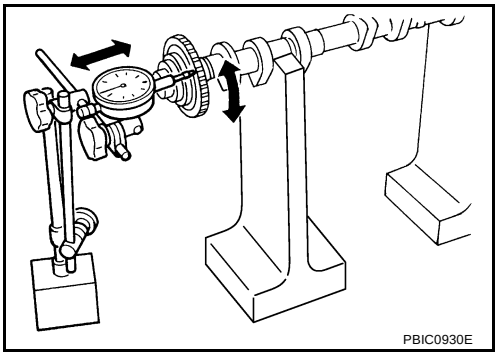
CAUTION:
Do not support journal No. 1 (on the side of camshaft sprocket) because it has a different diameter from the other three locations.

2. Measure the camshaft sprocket runout with a dial indicator. (Total indicator reading)

Limit : 0.15 mm (0.0059 in)

- If it exceeds the limit, replace camshaft sprocket.

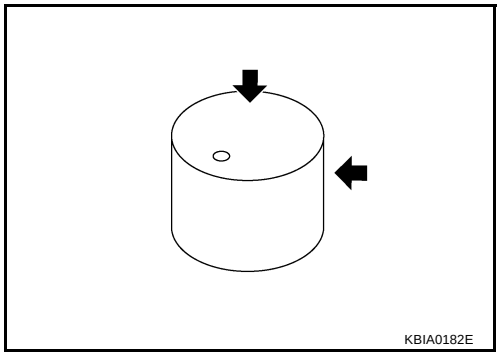
CAUTION:
When replacing camshaft sprocket (EXH), replace valve timing control cover (including magnet retarder and cover).



Valve Lifter

Check if surface of valve lifter has any wear or cracks.

- If anything above is found, replace valve lifter. Refer to EM-138, "Available Valve Lifter" .



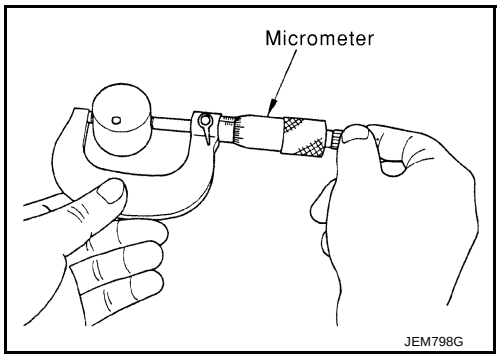
Valve Lifter Clearance

VALVE LIFTER OUTER DIAMETER

- Measure the outer diameter at 1/2 height of valve lifter with a micrometer since valve lifter is in barrel shape.

Standard (Intake and exhaust)

: 33.980 – 33.990 mm (1.3378 – 1.3382 in)

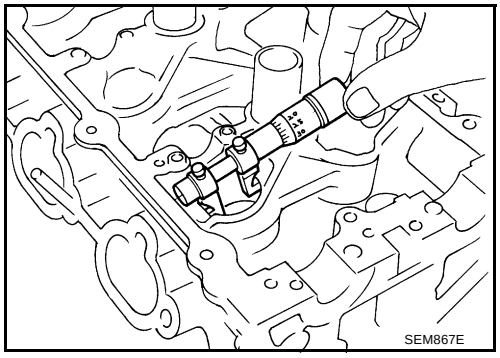


VALVE LIFTER HOLE DIAMETER

- Measure the inner diameter of valve lifter hole of cylinder head with an inside micrometer.

Standard (Intake and exhaust)

: 34.000 - 34.016 mm (1.3386 - 1.3392 in)



VALVE LIFTER CLEARANCE

- (Valve lifter clearance) = (Valve lifter hole diameter) – (Valve lifter outer diameter)

Standard (Intake and exhaust)

: 0.010 – 0.036 mm (0.0004 – 0.0014 in)

- If the calculated value is out of the standard, referring to each standard of valve lifter outer diameter and valve lifter hole diameter, replace either or both valve lifter and cylinder head.

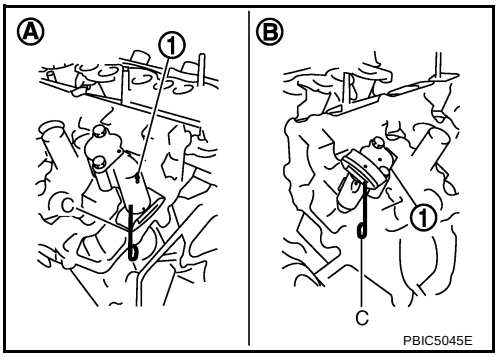
INSTALLATION

1. Install timing chain tensioners (secondary) (1) on both sides of cylinder head.

   A : Right bank

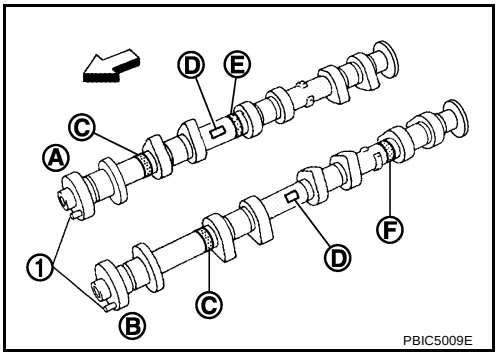
   B : Left bank

   - Install timing chain tensioner with its stopper pin (C) attached.
   - Install timing chain tensioner with sliding part facing downward on right-side cylinder head, and with sliding part facing upward on left-side cylinder head.



2. Install valve lifter.
   - Install it in the original position.
3. Install camshafts.
   - Follow your identification marks made during removal, or follow the identification marks that are present on new camshafts for proper placement and direction.

     ⇦ : Engine front

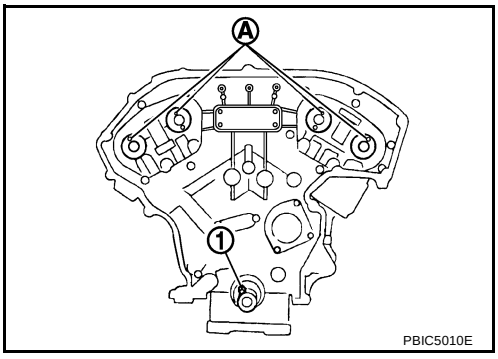


Bank	INT/EXH	Dowel pin (1)	Paint marks			Identification mark (D)
			M1 (E)	M2 (F)	M3 (C)	
RH	INT (A)	Yes	Green	No	Light blue	1E
	EXH (B)	Yes	No	Green	Light blue	1F
LH	INT (A)	Yes	Green	No	Light blue	1G
	EXH (B)	Yes	No	Green	Light blue	1H

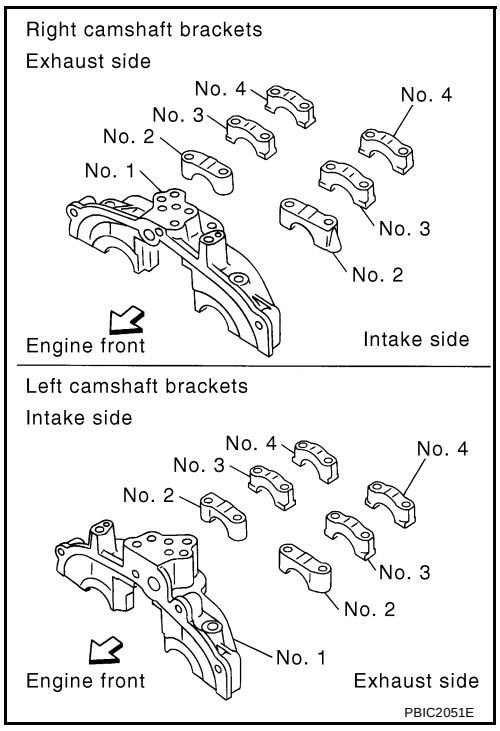
   - Install camshaft so that and dowel pin (A) on front end face are positioned as shown in the figure. (No. 1 cylinder TDC on its compression stroke)

     1 : Crankshaft key

     NOTE:
     Though camshaft does not stop at the portion as shown in the figure, for the placement of cam nose, it is generally accepted camshaft is placed for the same direction of the figure.

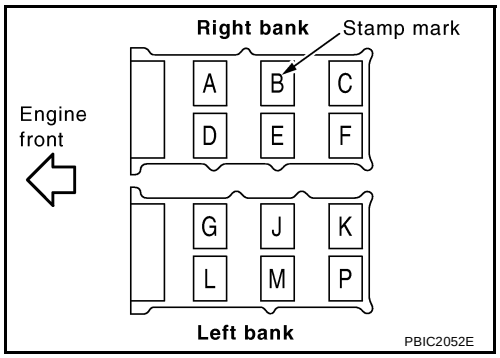


4. Install camshaft brackets.
   - Remove foreign material completely from camshaft bracket backside and from cylinder head installation face.
   - Install camshaft bracket in original position and direction as shown in the figure.



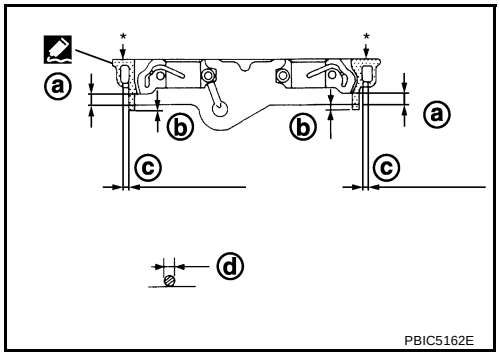
   - Install camshaft brackets (No. 2 to 4) aligning the stamp marks as shown in the figure.

     NOTE:
     There are no identification marks indicating left and right for camshaft bracket (No. 1).



   - Apply liquid gasket to mating surface of camshaft bracket (No. 1) as shown on right and left banks.
     Use Genuine RTV Silicone Sealant or equivalent. Refer to **GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"** **.**

     a : 8.5 mm (0.335 in)
     b : 2 mm
     c : Clearance 5 mm (0.20 in)
     d : ϕ 2.5 mm (0.098 in)



5. Tighten camshaft bracket bolts in the following steps, in numerical order as shown in the figure.

a. Tighten No. 7 to 10 in numerical order as shown.

: **1.96 N·m (0.2 kg-m, 17 in-lb)**

b. Tighten No. 1 to 6 in numerical order as shown.

: **1.96 N·m (0.2 kg-m, 17 in-lb)**

c. Tighten No. 1 to 10 in numerical order as shown.

: **5.88 N·m (0.6 kg-m, 52 in-lb)**

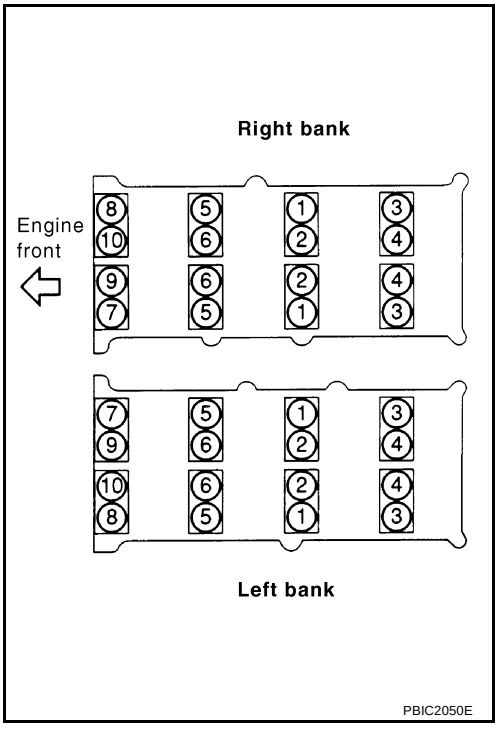
d. Tighten No. 1 to 10 in numerical order as shown.

: **10.4 N·m (1.1 kg-m, 92 in-lb)**

CAUTION:

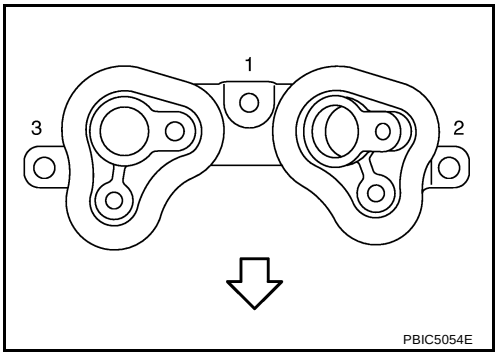
After tightening mounting bolts of camshaft brackets (No. 1), be sure to wipe off excessive liquid gasket from the parts list below.

- **Mating surface of rocker cover**
- **Mating surface of rear timing chain case**



6. Inspect and adjust the valve clearance. Refer to EM-80, "Valve Clearance" .
7. Install camshaft sensor bracket.
   - Tighten camshaft sensor bracket bolts in numerical order as shown in the figure.

   : Engine front



8. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Inspection of Camshaft Sprocket (INT) Oil Groove

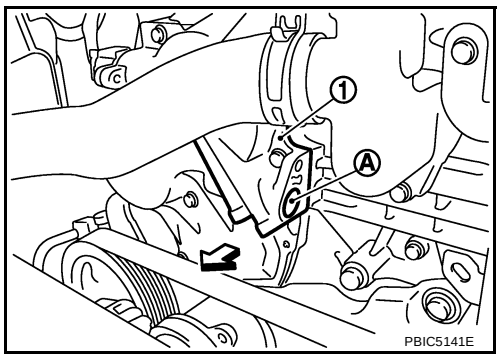
CAUTION:

- **Perform this inspection only when DTC P0011 or P0021 are detected in self-diagnostic results of CONSULT-III and it is directed according to inspection procedure of EC section. Refer to EC-81, "TROUBLE DIAGNOSIS" .**
- **Check when engine is cold so as to prevent burns from any splashing engine oil.**

1. Check the engine oil level. Refer to LU-6, "ENGINE OIL" .
2. Perform the following procedure so as to prevent the engine from being unintentionally started while checking.

a. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
b. Disconnect ignition coil and injector harness connectors.
3. Remove intake valve timing control solenoid valve. Refer to EM-72, "CAMSHAFT" .

4. Crank the engine, and then make sure that engine oil comes out from valve timing control solenoid valve hole. End crank after checking.



1 : Valve timing control solenoid valve

⇦ : Engine front

WARNING:

Be careful not to touch rotating parts (drive belts, idler pulley, and crankshaft pulley, etc.).

CAUTION:

Engine oil may squirt from intake valve timing control solenoid valve installation hole during cranking. Use a shop cloth to prevent the engine components and the vehicle. Do not allow engine oil to get on rubber components such as drive belt or engine mount insulators. Immediately wipe off any splashed engine oil.

- Clean oil groove between oil strainer and intake valve timing control solenoid valve if engine oil does not come out from valve timing control solenoid valve hole. Refer to LU-4, "LUBRICATION SYSTEM" .

5. Remove components between intake valve timing control solenoid valve and camshaft sprocket (INT), and then check each oil groove for clogging.
   - Clean oil groove if necessary. Refer to LU-4, "LUBRICATION SYSTEM" .
6. After inspection, install removed parts.

Inspection for Leaks

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

NOTE:

If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.

- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level
Fuel	Leakage	Leakage	Leakage
Exhaust gases	—	Leakage	—

* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

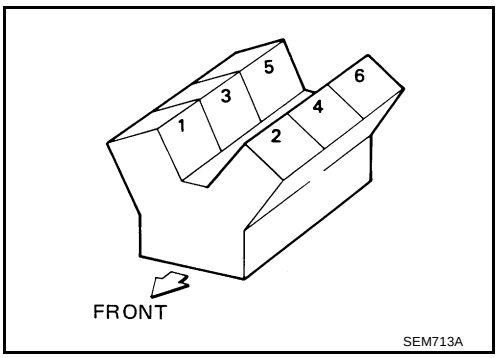
Valve Clearance

NBS0000U

INSPECTION

Perform inspection as follows after removal, installation or replacement of camshaft or valve-related parts, or if there is unusual engine conditions regarding valve clearance.

In cases of removing/installing or replacing camshaft and valve-related parts, or of unusual engine conditions due to changes in valve clearance (found malfunctions during stating, idling or causing noise), perform inspection as follows:

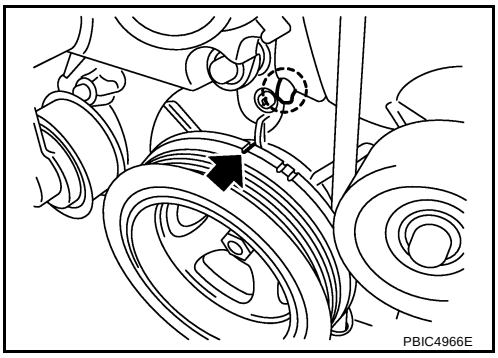


1. Remove rocker covers (right and left bank). Refer to EM-40, "ROCKER COVER" .
2. Measure the valve clearance as follows:

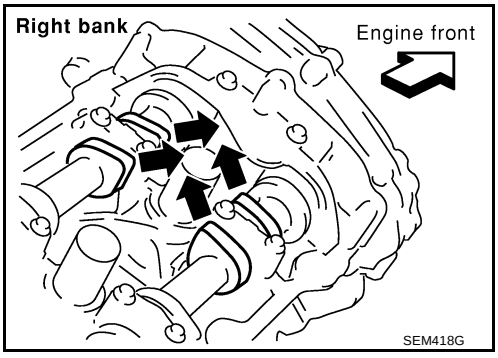
a. Set No. 1 cylinder at TDC of its compression stroke.

- Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.

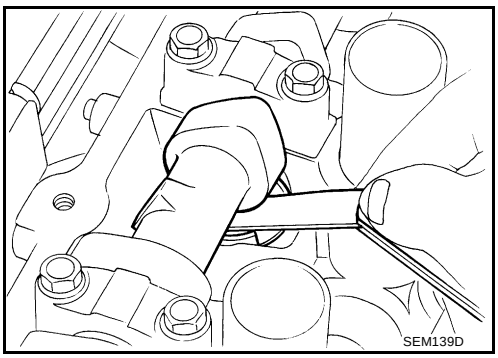
  ⬅ : Timing mark (grooved line without color)



- Make sure that intake and exhaust cam nose on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.
- If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.



b. Use a feeler gauge, measure the clearance between valve lifter and camshaft.



Valve clearance:

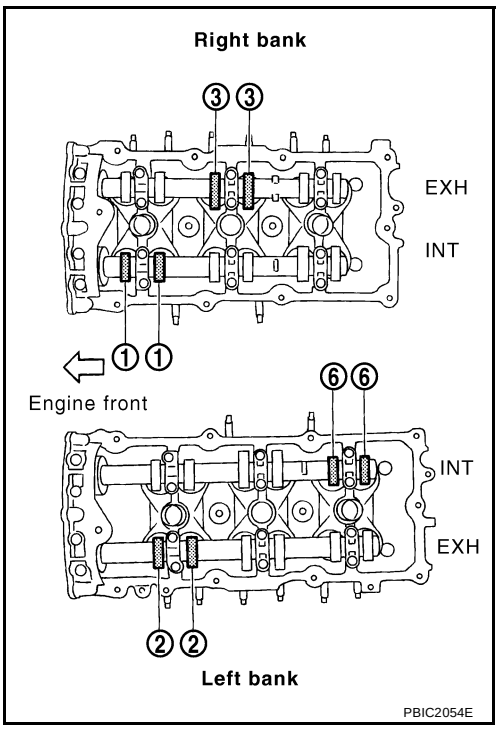
Unit: mm (in)

Items	Cold	Hot * (reference data)
Intake	0.26 - 0.34 (0.010 - 0.013)	0.304 - 0.416 (0.012 - 0.016)
Exhaust	0.29 - 0.37 (0.011 - 0.015)	0.308 - 0.432 (0.012 - 0.017)

*: Approximately 80°C (176°F)

- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).
- No. 1 cylinder at compression TDC

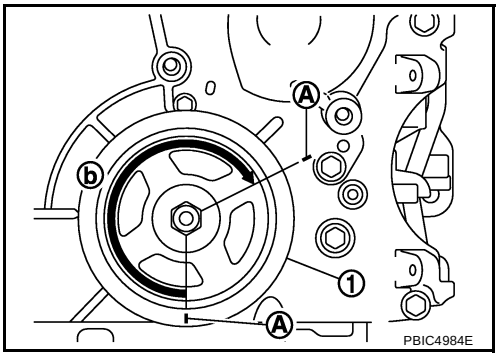
Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 1 cylinder at compression TDC	EXH		×	
	INT	×		
Measuring position (left bank)		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 1 cylinder at compression TDC	INT			×
	EXH	×		



c. Rotate crankshaft by 240 degrees clockwise (when viewed from engine front) to align No. 3 cylinder at TDC of its compression stroke.

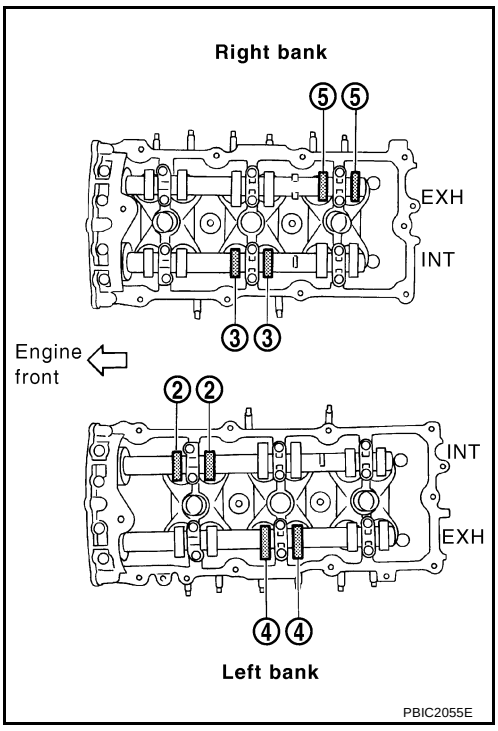
NOTE:

- To align cylinder No. 3 with the compression top dead center, place matching marks (A) on the crankshaft pulley (1) side and on the cylinder block side at a point 240° (b) counter-clockwise from the compression top dead center using the hex head of the crankshaft pulley bolt as a guide.



- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).
- No. 3 cylinder at compression TDC

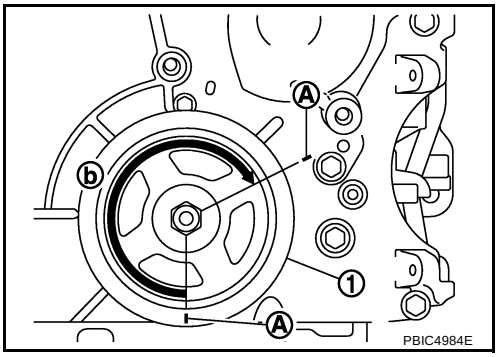
Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 3 cylinder at compression TDC	EXH			×
	INT		×	
Measuring position (left bank)		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 3 cylinder at compression TDC	INT	×		
	EXH		×	



d. Rotate crankshaft by 240 degrees clockwise (when viewed from engine front) to align No. 5 cylinder at TDC of its compression stroke.

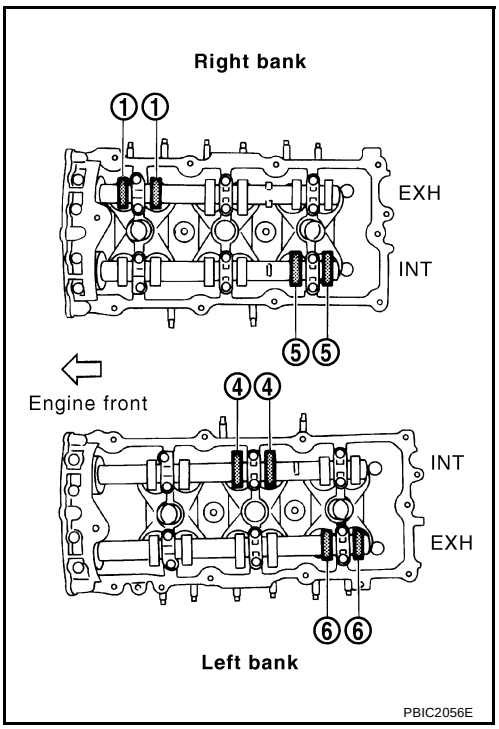
NOTE:

- To align cylinder No. 5 with the compression top dead center, place matching marks (A) on the crankshaft pulley (1) side and on the cylinder block side at a point 240° (b) counter-clockwise from the compression top dead center using the hex head of the crankshaft pulley bolt as a guide.



- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).
- No. 5 cylinder at compression TDC

Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 5 cylinder at compression TDC	EXH	×		
	INT			×
Measuring position (left bank)		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 5 cylinder at compression TDC	INT		×	
	EXH			×

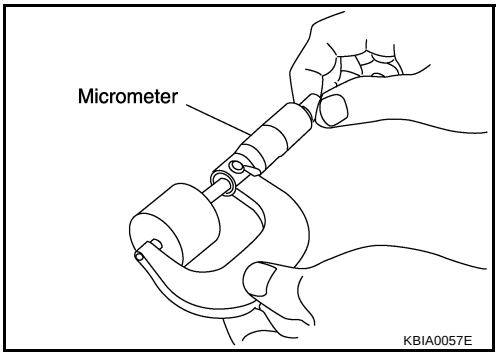


3. If the measured values are out of the standard, perform adjustment. Refer to EM-84, "ADJUSTMENT" .

ADJUSTMENT

- Perform adjustment depending on selected head thickness of valve lifter.

1. Measure the valve clearance. Refer to EM-80, "INSPECTION" .
2. Remove camshaft. Refer to EM-72, "REMOVAL" .
3. Remove valve lifters at the locations that are out of the standard.
4. Measure the center thickness of removed valve lifters with a micrometer.



5. Use the equation below to calculate valve lifter thickness for replacement.

Valve lifter thickness calculation: $t = t_1 + (C_1 - C_2)$

t = Valve lifter thickness to be replaced

t_1 = Removed valve lifter thickness

C_1 = Measured valve clearance

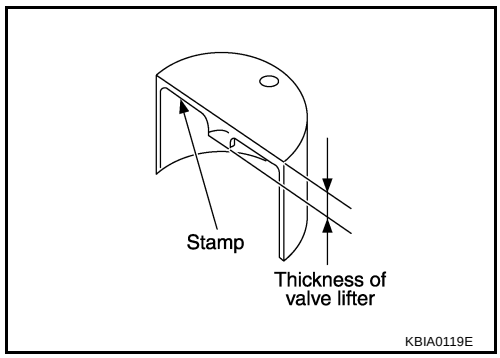
C_2 = Standard valve clearance:

Intake : 0.30 mm (0.012 in)*

Exhaust : 0.33 mm (0.013 in)*

***: Approximately 20°C (68°F)**

- Thickness of new valve lifter can be identified by stamp marks on the reverse side (inside the cylinder).
  Stamp mark 788T indicates 7.88 mm (0.3102 in) in thickness.



Available thickness of valve lifter: 27 sizes with range 7.88 to 8.40 mm (0.3102 to 0.3307 in) in steps of 0.02 mm (0.0008 in) (when manufactured at factory). Refer to EM-138, "Available Valve Lifter" .

6. Install selected valve lifter.
7. Install camshaft. Refer to EM-77, "INSTALLATION" .
8. Manually turn crankshaft pulley a few turns.
9. Make sure that the valve clearances for cold engine are within the specifications by referring to the specified values. Refer to EM-80, "INSPECTION" .
10. Install all removal parts in the reverse order of removal. Refer to EM-77, "INSTALLATION" .
11. Warm up the engine, and check for unusual noise and vibration.

OIL SEAL

PFP:00100

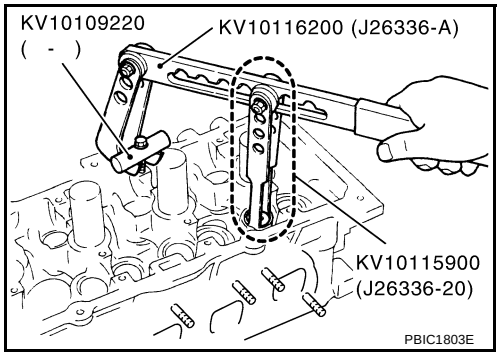
Removal and Installation of Valve Oil Seal

NBS0000V

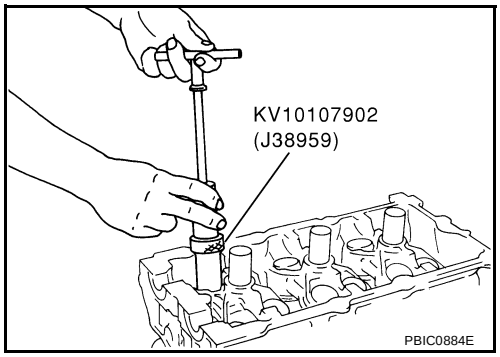
REMOVAL

1. Remove camshaft relating to valve oil seal to be removed. Refer to EM-72, "CAMSHAFT" .
2. Remove valve lifters. Refer to EM-72, "CAMSHAFT" .
3. Turn crankshaft until the cylinder requiring new oil seals is at TDC. This will prevent valve from dropping into cylinder.
4. Remove valve collet.
   - Compress valve spring with valve spring compressor, attachment, adapter (SST). Remove valve collet with magnet hand.

     CAUTION:
     When working, take care not to damage valve lifter holes.



5. Remove valve spring retainer, valve spring and valve spring seat.
6. Remove valve oil seal using valve oil seal puller (SST).

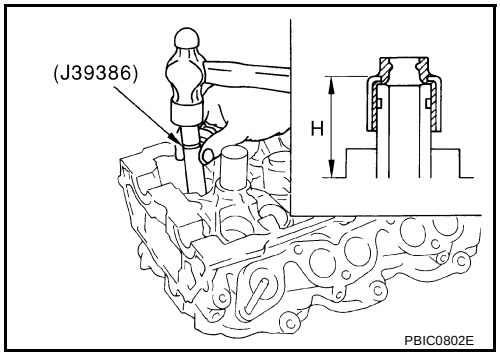


INSTALLATION

1. Apply engine oil on new valve oil seal joint and seal lip.
2. Using valve oil seal drift (SST), press fit valve oil seal to height “H” shown in the figure.

   NOTE:
   Dimension “H”: Height measured before valve spring seat installation

   Intake and exhaust : 14.3 - 14.9 mm (0.563 - 0.587 in)



3. Install in the reverse order of removal after this step.

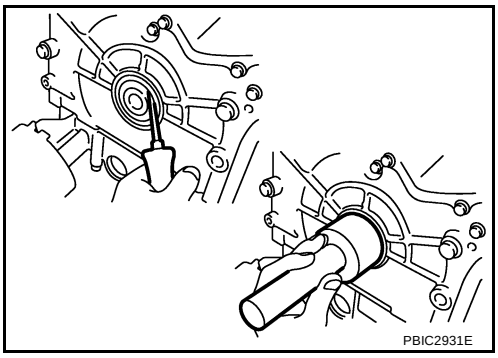
Removal and Installation of Front Oil Seal

NBS0000W

REMOVAL

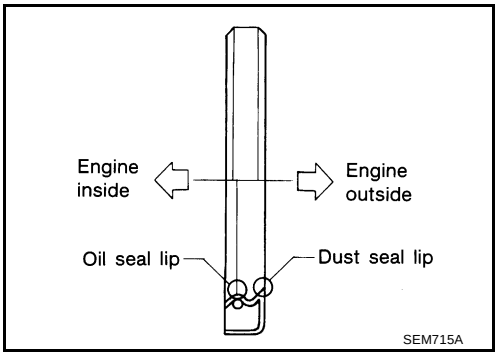
1. Remove the following parts:
   - Undercover
   - Drive belts: Refer to EM-12, "DRIVE BELTS" .
   - Radiator cooling fan assembly: Refer to CO-21, "COOLING FAN" .
   - Crankshaft pulley: Refer to EM-53, "TIMING CHAIN" .
2. Remove front oil seal using suitable tool.

CAUTION:
Be careful not to damage front timing chain case and crankshaft.



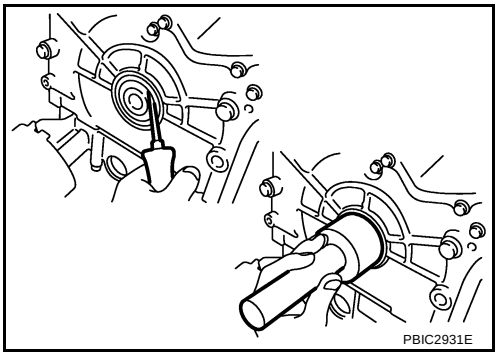
INSTALLATION

1. Apply engine oil to both oil seal lip and dust seal lip of new front oil seal.
2. Install front oil seal.
   - Install front oil seal so that each seal lip is oriented as shown in the figure.



   - Using suitable drift, press-fit until the height of front oil seal is level with the mounting surface.
     - Suitable drift: outer diameter 60 mm (2.36 in), inner diameter 50 mm (1.97 in).

CAUTION:
- **Be careful not to damage front timing chain case and crankshaft.**
- **Press-fit straight and avoid causing burrs or tilting oil seal.**



3. Install in the reverse order of removal after this step.

Removal and Installation of Rear Oil Seal

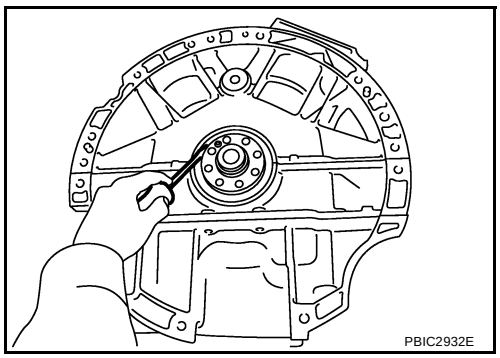
NBS0000X

REMOVAL

1. Remove transmission assembly. Refer to MT-18, "TRANSMISSION ASSEMBLY" (M/T models) or AT-242, "TRANSMISSION ASSEMBLY" (A/T models).
2. Remove clutch cover and clutch disk (M/T models). Refer to CL-16, "CLUTCH DISC, CLUTCH COVER" .
3. Remove flywheel (M/T models) or drive plate (A/T models). Refer to EM-107, "CYLINDER BLOCK" .

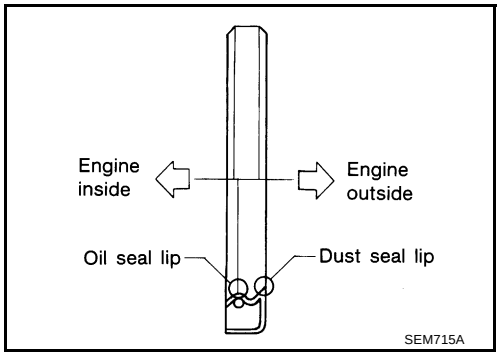
4. Remove rear oil seal with a suitable tool.

CAUTION:
Be careful not to damage crankshaft and cylinder block.

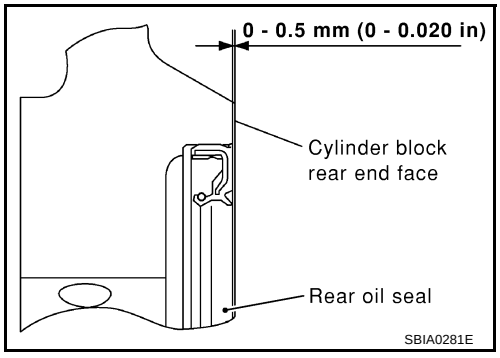


INSTALLATION

1. Apply new engine oil to new rear oil seal joint surface and seal lip.
2. Install rear oil seal so that each seal lip is oriented as shown.

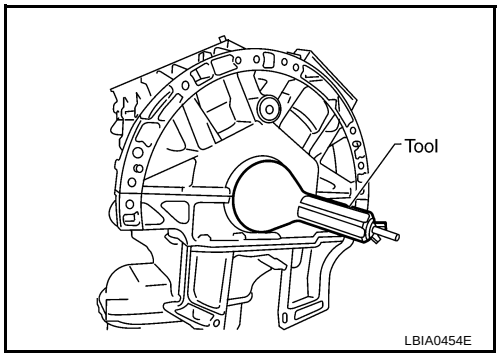


- Press in rear oil seal to the position as shown.



- Using suitable drift, press-fit until the height of front oil seal is level with the mounting surface.
  - Suitable drift: outer diameter 100 mm (3.94 in), inner diameter 85 mm (3.35 in).

CAUTION:
- **Be careful not to damage crankshaft and cylinder block.**
- **Press-fit oil seal straight to avoid causing burrs or tilting.**



3. Install in the reverse order of removal after this step.

CYLINDER HEAD

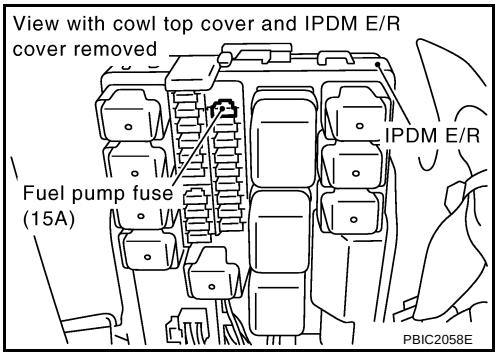
PFP:11041

On-Vehicle Service

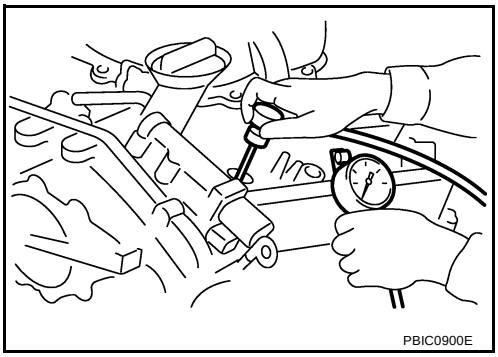
NBS0000Y

CHECKING COMPRESSION PRESSURE

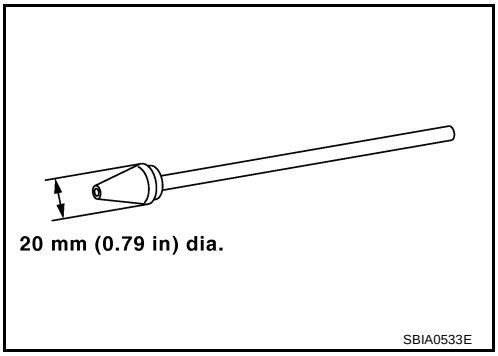
1. Warm up engine thoroughly. Then, stop it.
2. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Disconnect fuel pump fuse to avoid fuel injection during measurement.



4. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
5. Remove ignition coil and spark plug from each cylinder. Refer to EM-31, "IGNITION COIL" and EM-32, "SPARK PLUG (IRIDIUM-TIPPED TYPE)" .
6. Connect engine tachometer (not required in use of CONSULT-III).
7. Install compression tester (Commercial service tool) with adapter onto spark plug hole.



- Use the adapter whose picking up end inserted to spark plug hole is smaller than 20 mm (0.79 in) in diameter. Otherwise, it may be caught by cylinder head during removal.



8. With accelerator pedal fully depressed, turn ignition switch to “START” for cranking. When the gauge pointer stabilizes, read the compression pressure and engine rpm. Perform these steps to check each cylinder.

Compression pressure:

Unit: kPa (kg/cm^2 , psi) /rpm

Standard	Minimum	Differential limit between cylinders
1,275 (13.0, 185)/300	981 (10.0, 142)/300	98 (1.0, 14)/300

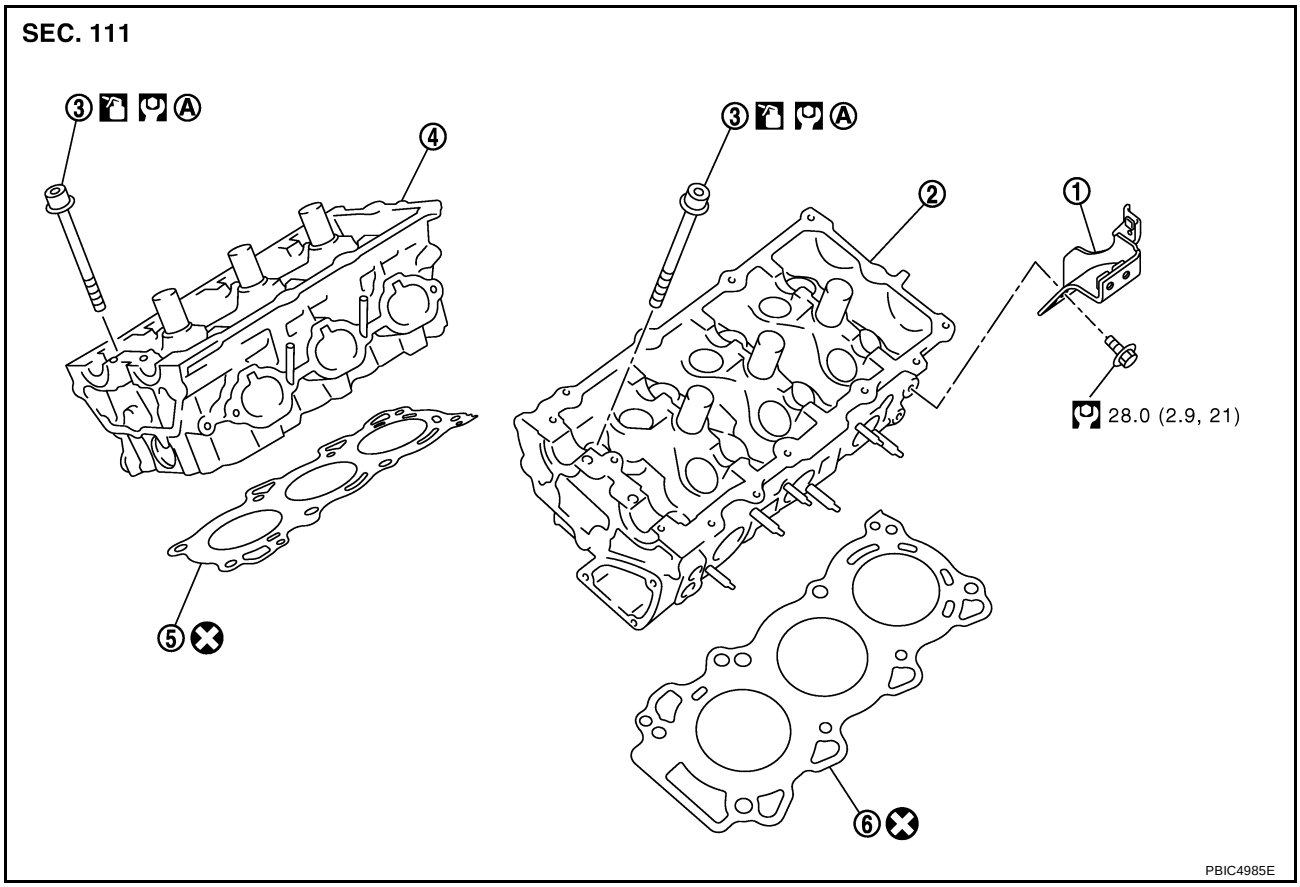
CAUTION:
Always use a fully changed battery to obtain specified engine speed.

- If the engine speed is out of specified range, check battery liquid for proper gravity. Check engine speed again with normal battery gravity.
- If compression pressure is below minimum value, check valve clearances and parts associated with combustion chamber (valve, valve seat, piston, piston ring, cylinder bore, cylinder head, cylinder head gasket). After the checking, measure compression pressure again.
- If some cylinders have low compression pressure, pour small amount of engine oil into the spark plug hole of the cylinder to re-check it for compression.
  - If the added engine oil improves the compression, piston rings may be worn out or damaged. Check the piston rings and replace if necessary.
  - If the compression pressure remains at low level despite the addition of engine oil, valves may be malfunctioning. Check valves for damage. Replace valve or valve seat accordingly.
- If two adjacent cylinders have respectively low compression pressure and their compression remains low even after the addition of engine oil, cylinder head gaskets are leaking. In such a case, replace cylinder head gaskets.

9. After inspection is completed, install removed parts.
10. Start engine, and make sure that engine runs smoothly.
11. Perform trouble diagnosis. If DTC appears, erase it. Refer to EC-81, "TROUBLE DIAGNOSIS" .

Removal and Installation

NBS0000Z



1. Engine rear lower slinger
2. Cylinder head (left bank)
3. Cylinder head bolt
4. Cylinder head (right bank)
5. Cylinder head gasket (right bank)
6. Cylinder head gasket (left bank)
7. Oil level gauge guide

A. Refer to EM-92

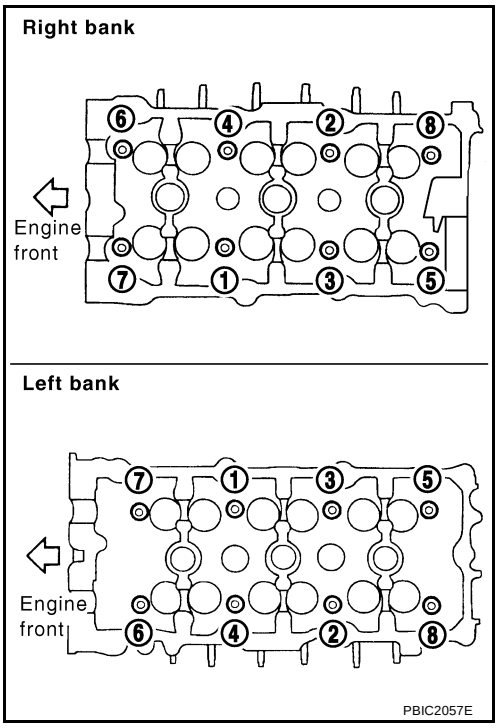
- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove engine assembly from vehicle, and separate front suspension member and transmission from engine. Refer to EM-101, "ENGINE ASSEMBLY" .
2. Remove the following parts:

- Fuel tube and fuel injector assembly: Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
- Intake manifold: Refer to EM-20, "INTAKE MANIFOLD" .
- Exhaust manifold: Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .
- Water inlet and thermostat assembly: Refer to CO-26, "WATER INLET AND THERMOSTAT ASSEMBLY" .
- Water outlet and water pipe: Refer to CO-28, "WATER OUTLET AND WATER PIPING" .
- Front and rear timing chain case: Refer to EM-53, "TIMING CHAIN" .

3. Remove camshaft (INT, EXH). Refer to EM-72, "CAMSHAFT" .
4. Remove cylinder head bolts in reverse order as shown in the figure with cylinder head bolt wrench (commercial service tool).



5. Remove cylinder head gaskets.

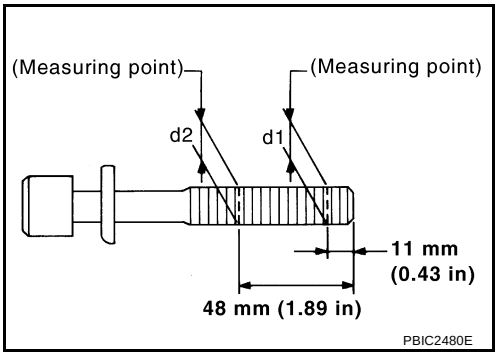
INSPECTION AFTER REMOVAL

Cylinder Head Bolts Outer Diameter

- Cylinder head bolts are tightened by plastic zone tightening method. Whenever the size difference between “d1” and “d2” exceeds the limit, replace them with new one.

  Limit (“d1” – “d2”) : 0.18 mm (0.0071 in)

- If reduction of outer diameter appears in a position other than “d2”, use it as “d2” point.



Cylinder Head Distortion

NOTE:
When performing this inspection, cylinder block distortion should be also checked. Refer to EM-128, "CYLINDER BLOCK DISTORTION" .

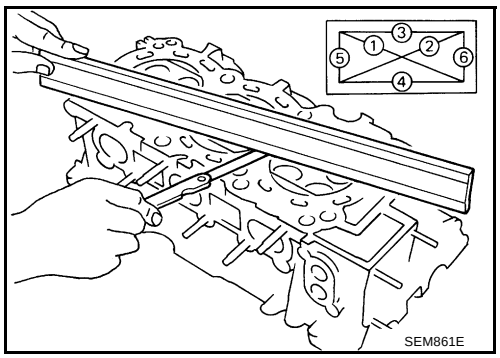
1. Using scraper, wipe off oil, scale, gasket, sealant and carbon deposits from surface of cylinder head.

   CAUTION:
   Do not allow gasket fragments to enter engine oil or engine coolant passages.

2. At each of several locations on bottom surface of cylinder head, measure the distortion in six directions.

   Limit : 0.1 mm (0.004 in)

   - If it exceeds the limit, replace cylinder head.

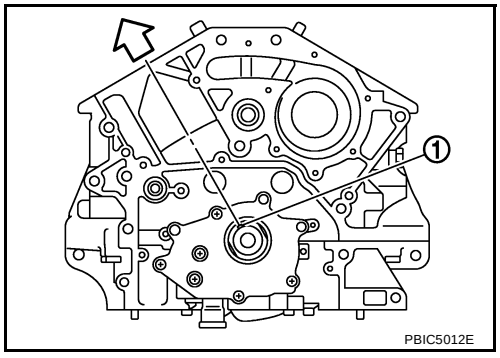


INSTALLATION

1. Install new cylinder head gaskets.
2. Turn crankshaft until No. 1 piston is set at TDC.
   - Crankshaft key should line up with the right bank cylinder center line as shown in the figure.

   1 : Crankshaft key

   ⇦ : Right bank side



3. Install cylinder head follow the steps below to tighten cylinder head bolts in numerical order as shown in the figure.

   CAUTION:
   If cylinder head bolts re-used, check their outer diameters before installation. Refer to EM-91, "Cylinder Head Bolts Outer Diameter" .

a. Apply new engine oil to threads and seat surfaces of cylinder head bolts.

b. Tighten all cylinder head bolts.

   : 105 N·m (11 kg-m, 77 ft-lb)

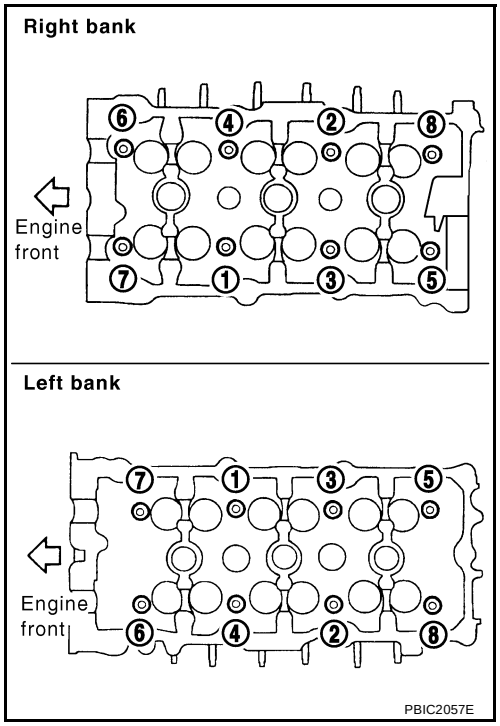
c. Completely loosen all cylinder head bolts.

   : 0 N·m (0 kg-m, 0 ft-lb)

   CAUTION:
   In step “c”, loosen bolts in reverse order of that indicated in the figure.

d. Tighten all cylinder head bolts.

   : 39.2 N·m (4.0 kg-m, 29 ft-lb)

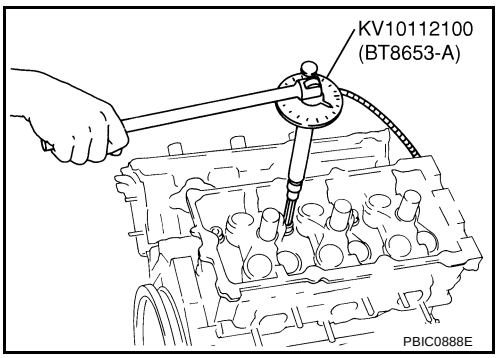


e. Turn all bolts 95 degrees clockwise (angle tightening).

CAUTION:
Check the tightening angle by using angle wrench (SST). Avoid judgment by visual inspection without tool.

- Check tightening angle indicated on angle wrench (SST) indicator plate.

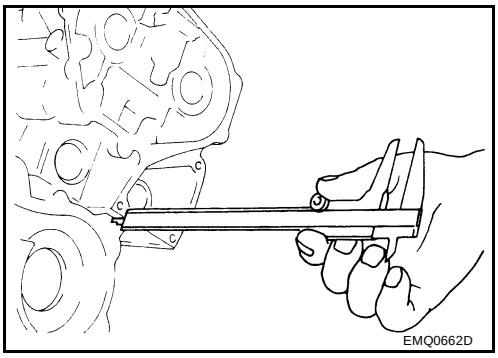
f. Turn all bolts 95 degrees clockwise again (angle tightening).



4. After installing cylinder head, measure distance between front end faces of cylinder block and cylinder head (left and right banks).

Standard : 14.1 - 14.9 mm (0.555 - 0.587 in)

- If the measured value is out of the standard, re-install cylinder head.



5. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

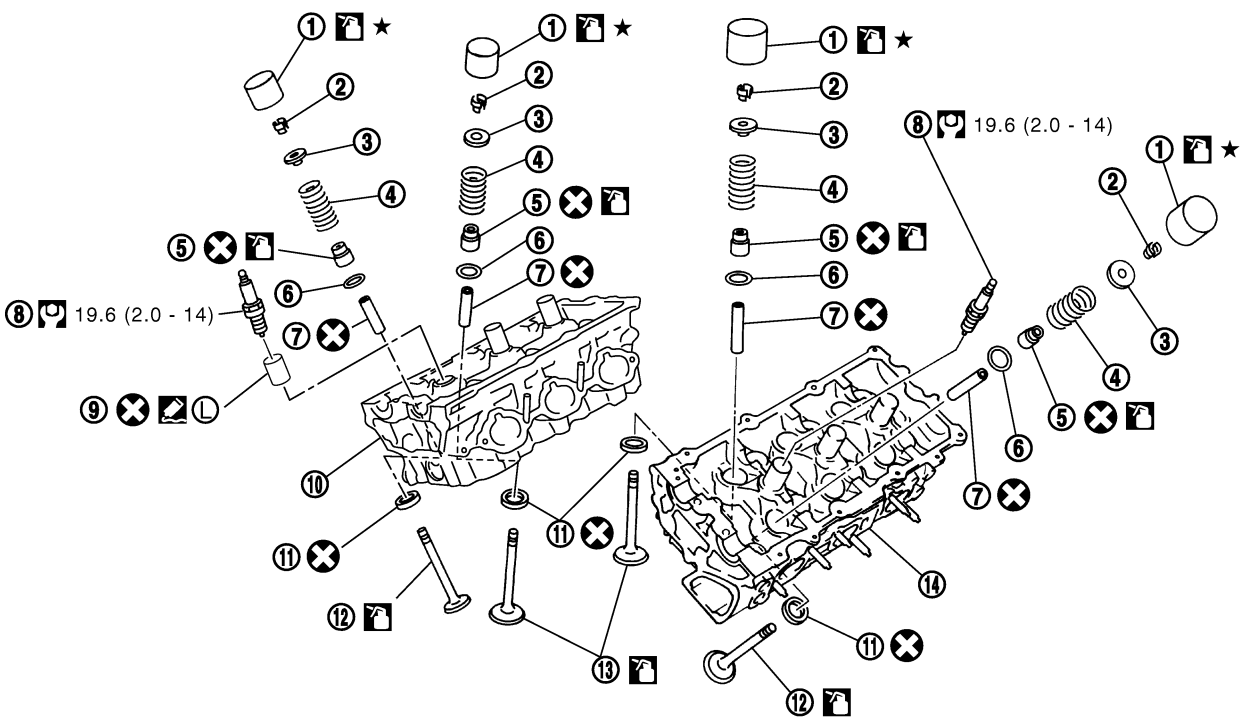
Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level
Fuel	Leakage	Leakage	Leakage
Exhaust gases	—	Leakage	—

* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

Disassembly and Assembly

NBS00010

SEC. 111•130•220



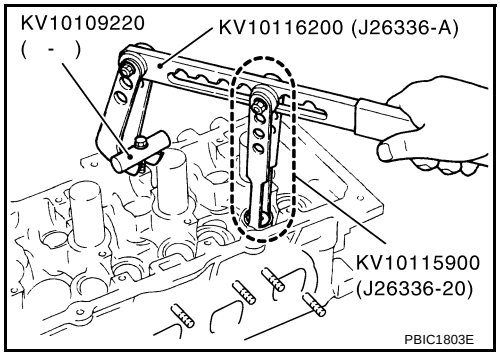
1. Valve lifter	2. Valve collet	3. Valve spring retainer
4. Valve spring	5. Valve oil seal	6. Valve spring seat
7. Valve guide	8. Spark plug	9. Spark plug tube
10. Cylinder head (right bank)	11. Valve seat	12. Valve (EXH)
13. Valve (INT)	14. Cylinder head (left bank)	

- Refer to GI-11, "Components" for symbol marks in the figure.

DISASSEMBLY

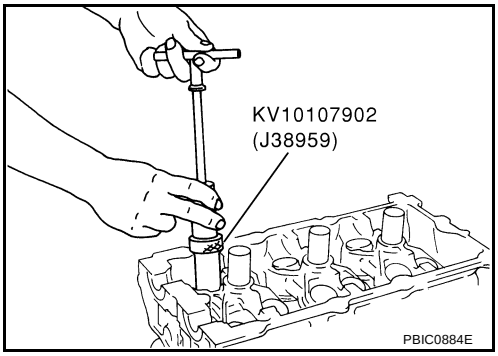
1. Remove spark plug with spark plug wrench (commercial service tool).
2. Remove valve lifter.
   - Identify installation positions, and store them without mixing them up.
3. Remove valve collet.
   - Compress valve spring with valve spring compressor, attachment and adapter (SST). Remove valve collet with magnet hand.

   CAUTION:
   When working, take care not to damage valve lifter holes.



4. Remove valve spring retainer, valve spring and valve spring seat.
5. Push valve stem to combustion chamber side, and remove valve.
   - Identify installation positions, and store them without mixing them up.

6. Remove valve oil seals using valve oil seal puller (SST).



7. If valve seat must be replaced, refer to EM-99, "VALVE SEAT REPLACEMENT" .
8. If valve guide must be replaced, refer to EM-97, "VALVE GUIDE REPLACEMENT" .
9. Remove spark plug tube, as necessary.
   - Using pair of pliers, pull spark plug tube out of cylinder head.

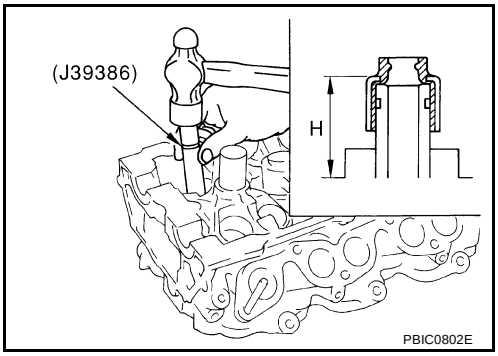
   CAUTION:
   - **Take care not to damage cylinder head.**
   - **Once removed, spark plug tube will be deformed and cannot be reused. Do not remove it unless absolutely necessary.**

ASSEMBLY

1. When valve guide is removed, install it. Refer to EM-97, "VALVE GUIDE REPLACEMENT" .
2. When valve seat is removed, install it. Refer to EM-99, "VALVE SEAT REPLACEMENT" .
3. Install valve oil seals.
   - Install with valve oil seal drift (SST) to match dimension in the figure.

   Height “H” (Without valve spring seat installed)

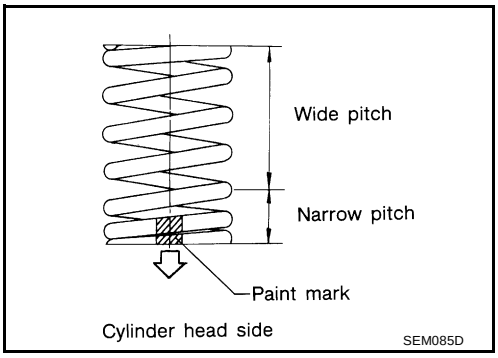
   Intake and exhaust : 14.3 - 14.9 mm (0.563 - 0.587 in)



4. Install valve spring seat.
5. Install valves.

   NOTE:
   Larger diameter valves are for intake side.
6. Install valve spring (uneven pitch type).
   - Install narrow pitch end (paint mark) to cylinder head side (valve spring seat side).

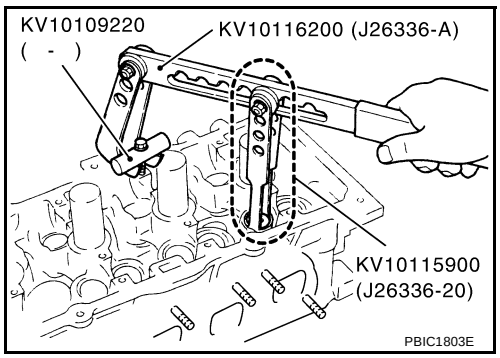
   Paint mark color : Yellowish green



7. Install valve spring retainer.

8. Install valve collet.
   - Compress valve spring with valve spring compressor, attachment and adapter (SST). Install valve collet with magnet hand.

     CAUTION:
     When working, take care not to damage valve lifter holes.
   - Tap valve stem edge lightly with plastic hammer after installation to check its installed condition.



9. Install valve lifter.
   - Install it in the original position.
10. Install spark plug tube.
   - Press-fit spark plug tube as follows:

a. Remove old liquid gasket adhering to cylinder head mounting hole.

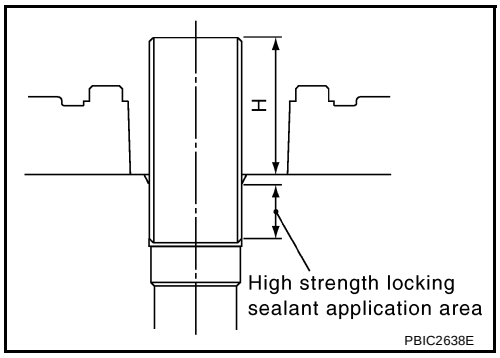
b. Apply liquid gasket to area within approximately 12 mm (0.47 in) from edge of spark plug tube press-fit side.
   Use Genuine High Strength Locking Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

c. Using drift, press-fit spark plug tube so that its height “H” is as specified in the figure.

   Standard press-fit height “H”:

   : 37.7 - 38.7 mm (1.484 - 1.524 in)

   CAUTION:
   - **When press-fitting, take care not to deform spark plug tube.**
   - **After press-fitting, wipe off liquid gasket protruding onto cylinder-head upper face.**



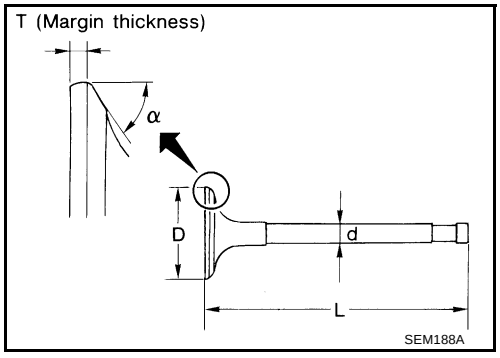
11. Install spark plug with spark plug wrench (commercial service tool).

Inspection After Disassembly

NBS00011

VALVE DIMENSIONS

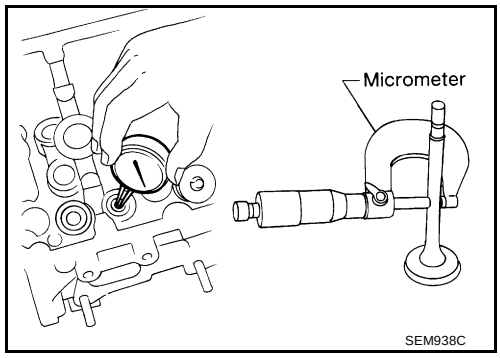
- Check dimensions of each valve. For dimensions, refer to EM-139, "Valve Dimensions" .
- If dimensions are out of the standard, replace valve and check valve seat contact. Refer to EM-99, "VALVE SEAT CONTACT" .



VALVE GUIDE CLEARANCE

Valve Stem Diameter

Measure diameter of valve stem with micrometer.



Standard

Intake : 5.965 - 5.980 mm (0.2348 - 0.2354 in)

Exhaust : 5.962 - 5.970 mm (0.2347 - 0.2350 in)

Valve Guide Inner Diameter

Measure inner diameter of valve guide with inside micrometer.

Standard

Intake and Exhaust : 6.000 - 6.018 mm (0.2362 - 0.2369 in)

Valve Guide Clearance

(Valve guide clearance) = (Valve guide inner diameter) – (Valve stem diameter)

Valve guide clearance:

Standard

Intake : 0.020 - 0.053 mm (0.0008 - 0.0021 in)

Exhaust : 0.030 - 0.056 mm (0.0012 - 0.0022 in)

Limit

Intake : 0.08 mm (0.0031 in)

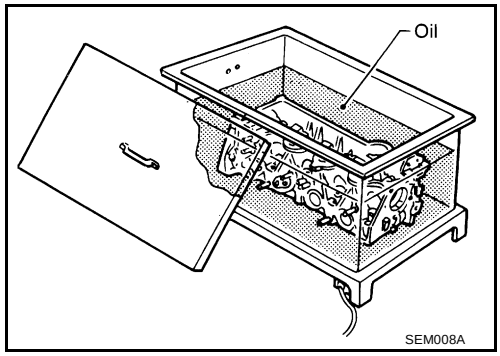
Exhaust : 0.09 mm (0.0035 in)

- If it exceeds the limit, replace valve and/or valve guide. When valve guide must be replaced, refer to EM-97, "VALVE GUIDE REPLACEMENT" .

VALVE GUIDE REPLACEMENT

When valve guide is removed, replace with Oversize (Service) [0.2 mm (0.008 in)] valve guide.

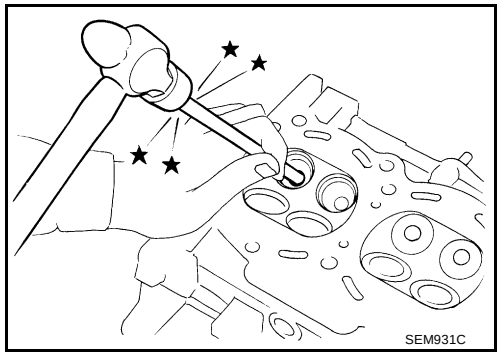
1. To remove valve guide, heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



2. Drive out valve guide with a press [under a 20 kN (2 ton, 2.2 US ton, 2.0 lmp ton) pressure] or hammer and suitable tool.

WARNING:

Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.

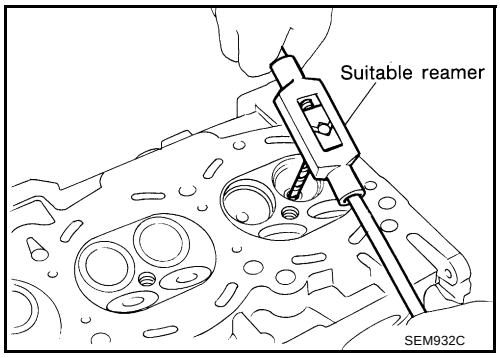


3. Using valve guide reamer (commercial service tool), ream cylinder head valve guide hole.

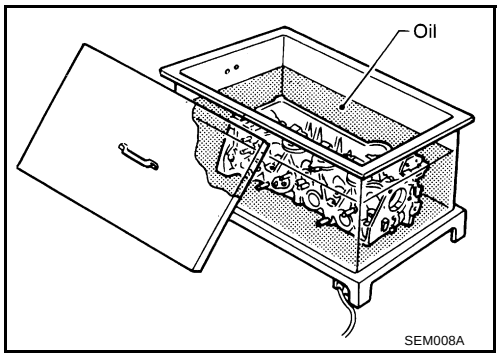
Valve guide hole diameter (for service parts):

Intake and exhaust

: 10.175 - 10.196 mm (0.4006 - 0.4014 in)



4. Heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



5. Using valve guide drift (commercial service tool), press valve guide from camshaft side to the dimensions as in the figure.

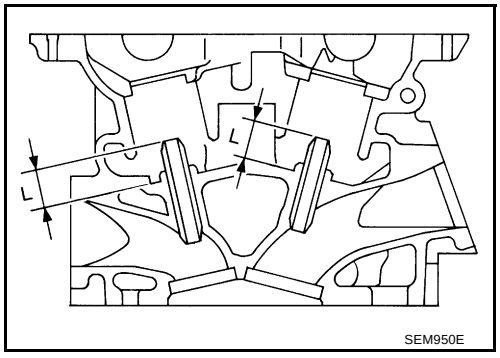
Projection "L"

Intake and exhaust

: 12.6 - 12.8 mm (0.496 - 0.504 in)

WARNING:

Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.

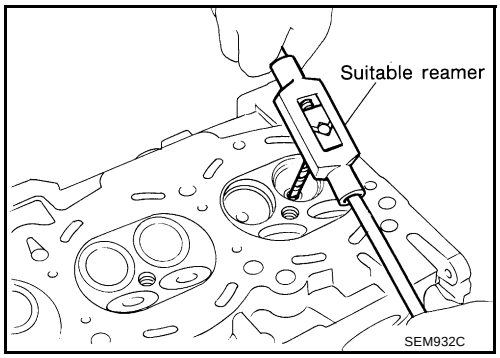


6. Using valve guide reamer (commercial service tool), apply reamer finish to valve guide.

Standard:

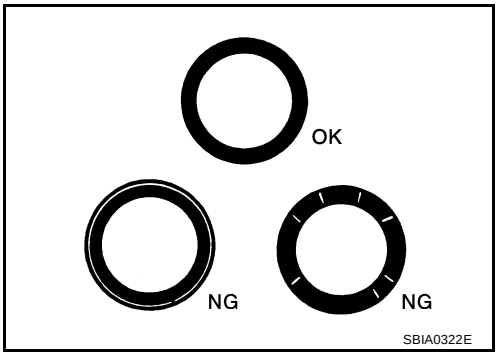
Intake and exhaust

: 6.000 - 6.018 mm (0.2362 - 0.2369 in)



VALVE SEAT CONTACT

- After confirming that the dimensions of valve guides and valves are within the specifications, perform this procedure.
- Apply prussian blue (or white lead) onto contacting surface of valve seat to check the condition of the valve contact on the surface.
- Check if the contact area band is continuous all around the circumference.
- If not, grind to adjust valve fitting and check again. If the contacting surface still has “NG” conditions even after the re-check, replace valve seat. Refer to EM-99, "VALVE SEAT REPLACEMENT" .



VALVE SEAT REPLACEMENT

When valve seat is removed, replace with Oversize (Service) [0.5 mm (0.020 in)] valve seat.

1. Bore out old seat until it collapses. Boring should not continue beyond the bottom face of the seat recess in cylinder head. Set the machine depth stop to ensure this. Refer to EM-141, "Valve Seat" .

   CAUTION:

   Prevent to scratch cylinder head by excessive boring.

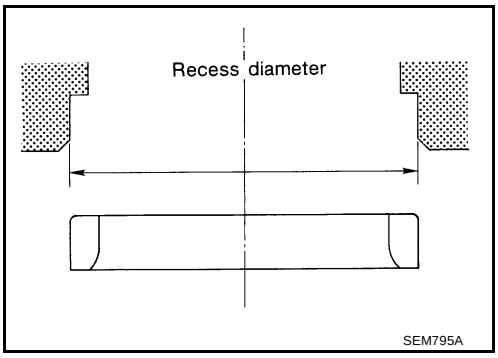
2. Ream cylinder head recess diameter for service valve seat.

   Oversize (Service) [0.5 mm (0.020 in)]

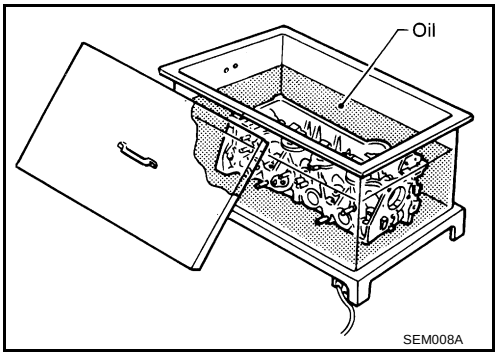
   Intake : 38.500 - 38.516 mm (1.5157 - 1.5164 in)

   Exhaust : 32.100 - 32.116 mm (1.2638 - 1.2644 in)

   - Be sure to ream in circles concentric to valve guide center. This will enable valve to fit correctly.



3. Heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



4. Provide valve seats cooled well with dry ice. Force fit valve seat into cylinder head.

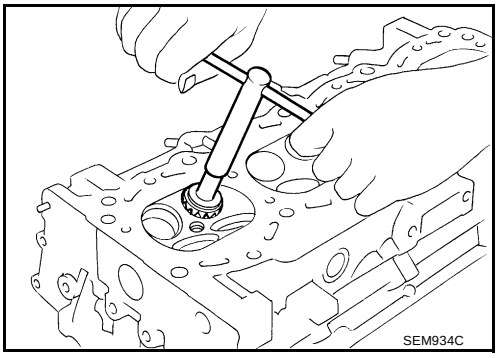
   WARNING:

   - **Avoid directly touching cold valve seats.**
   - **Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.**

5. Using valve seat cutter set (commercial service tool) or valve seat grinder, finish seat to the specified dimensions. Refer to EM-141, "Valve Seat" .

   CAUTION:

   When using valve seat cutter, firmly grip cutter handle with both hands. Then, press on the contacting surface all around the circumference to cut in a single drive. Improper pressure on with cutter or cutting many different times may result in stage valve seat.



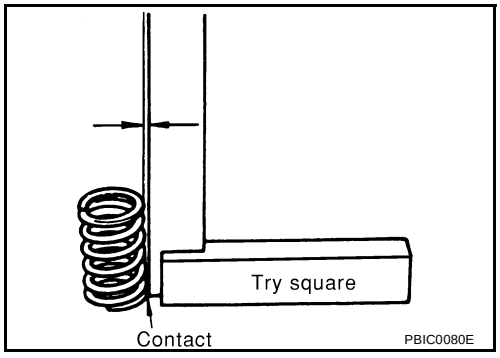
6. Using compound, grind to adjust valve fitting.
7. Check again for normal contact. Refer to EM-99, "VALVE SEAT CONTACT" .

VALVE SPRING SQUARENESS

- Set try square along the side of valve spring and rotate spring. Measure the maximum clearance between the top face of spring and try square.

  Limit: : 1.9 mm (0.075 in)

- If it exceeds the limit, replace valve spring.



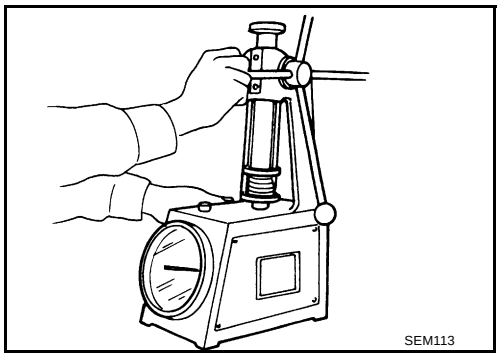
VALVE SPRING DIMENSIONS AND VALVE SPRING PRESSURE LOAD

- Check valve spring pressure at specified spring height.

Standard:

Intake and exhaust

Free height	**: 43.85 mm (1.7264 in)**
Installation height	**: 37.0 mm (1.457 in)**
Installation load	**: 166 – 188 N (16.9 – 19.2 kg, 37 – 42 lb)**
Height during valve open	**: 26.8 mm (1.055 in)**
Load with valve open	**: 502 – 566 N (51.2 – 57.7 kg, 113 – 127 lb)**



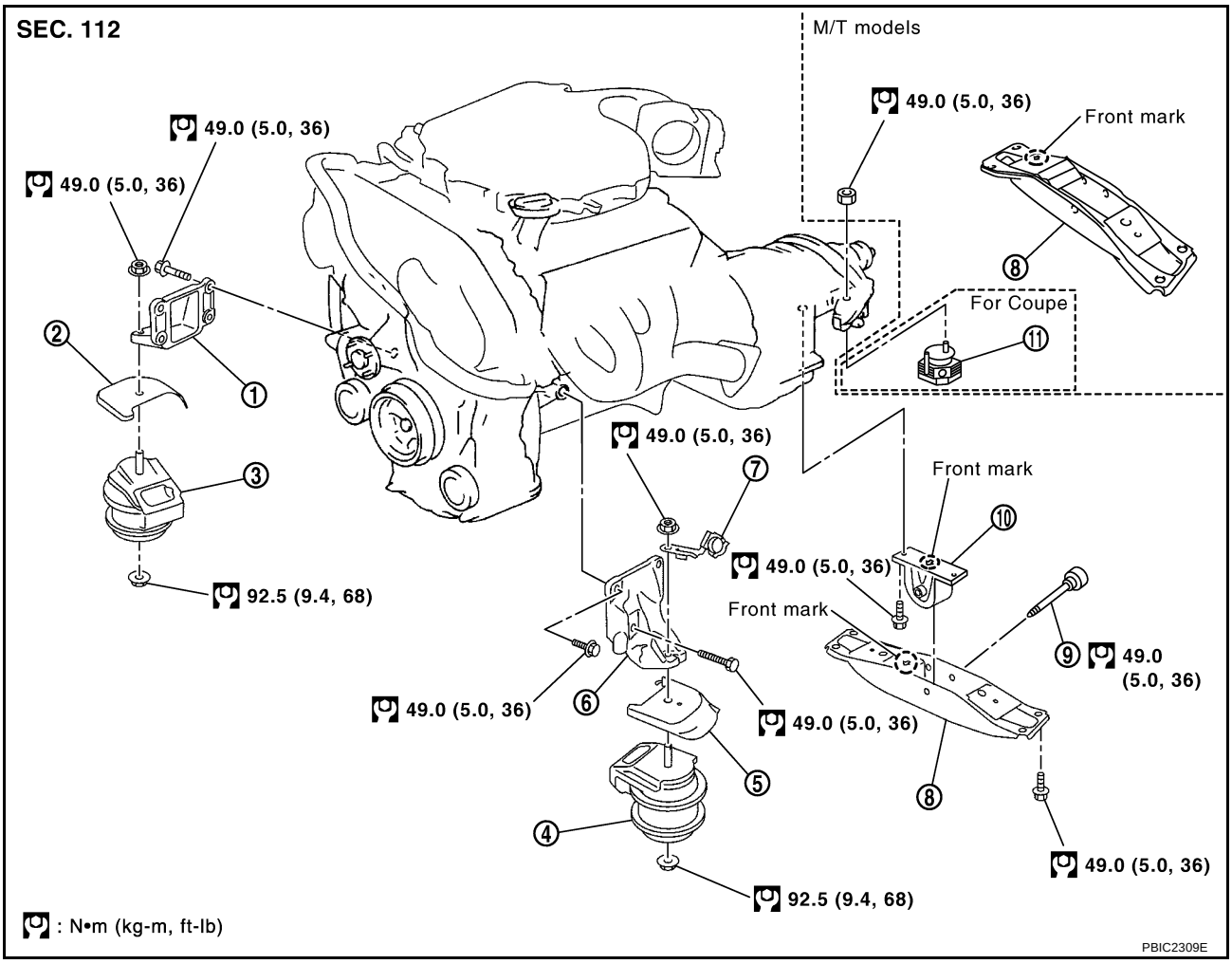
- If the installation load or load with valve open is out of the standard, replace valve spring.

ENGINE ASSEMBLY

PFP:10001

Removal and Installation

NBS00012



1. Engine mounting bracket (RH)
2. Heat insulator (RH)
3. Engine mounting Insulator (RH)
4. Engine mounting insulator (LH)
5. Heat insulator (LH)
6. Engine mounting bracket (LH)
7. Harness bracket
8. Rear engine mounting member
9. Mass damper
10. Engine mounting insulator (rear)
11. Dynamic damper

WARNING:

- **Situate vehicle on a flat and solid surface.**
- **Place chocks at front and back of rear wheels.**
- **For engines not equipped with engine slingers, attach proper slingers and bolts described in PARTS CATALOG.**

CAUTION:

- **Always be careful to work safely, avoid forceful or uninstructed operations.**
- **Do not start working until exhaust system and engine coolant are cool enough.**
- **If items or work required are not covered by the engine section, refer to the applicable sections.**
- **Always use the support point specified for lifting.**
- **Use either 2-pole lift type or separate type lift as best you can. If board-on type is used for unavoidable reasons, support at the rear axle jacking point with transmission jack or similar tool before starting work, in preparation for the backward shift of center of gravity.**
- **For supporting points for lifting and jacking point at rear axle, refer to GI-39, "Garage Jack and Safety Stand" .**

REMOVAL

Outline

At first, remove engine and transmission assembly with front suspension member from vehicle downward. Then separate engine from transmission.

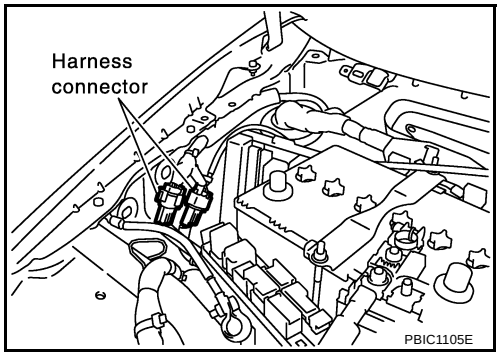
Preparation

1. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Drain engine coolant from radiator. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Disconnect both battery cables. Refer to SC-4, "BATTERY" .
4. Remove the following parts:
   - Tower bar: Refer to FSU-20, "TOWER BAR" .
   - Engine cover: Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
   - Cowl top cover (RH): Refer to EI-20, "COWL TOP" .
   - Undercover
   - Drive belts: Refer to EM-12, "DRIVE BELTS" .
   - Front road wheels and tires
5. Remove air cleaner case and air duct. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
6. Discharge refrigerant from A/C circuit. Refer to ATC-123, "REFRIGERANT LINES" .
7. Remove radiator cooling fan assembly, reservoir tank and hoses. Refer to CO-21, "COOLING FAN" and CO-13, "RADIATOR" .

Engine Room

1. Disconnect heater hose at engine-side, and fit a plug onto hose end to prevent engine coolant leak.
2. Disconnect ground cable (between vehicle to left cylinder head).
3. Disconnect battery positive cable harness at vehicle side and temporarily fasten it on engine.
4. Disconnect A/C piping from A/C compressor, and temporarily fasten it on vehicle with a rope.
5. Remove engine room harness connectors as shown in the figure.



6. Disconnect two body ground cables.
7. Disconnect brake booster vacuum hose.
8. Disconnect fuel feed hose (with damper) and EVAP hose. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .

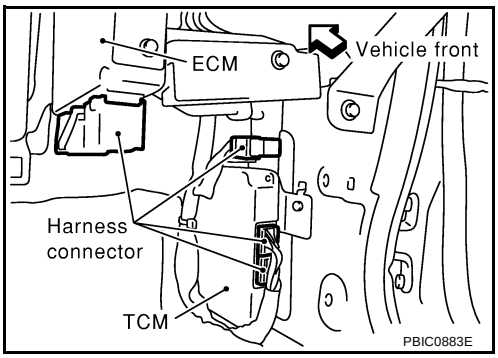
   CAUTION:
   Fit plugs onto disconnected hoses to prevent fuel leak.
9. Remove reservoir tank of power steering oil pump, and piping from vehicle, and temporarily secure them on engine.

   CAUTION:
   When temporarily securing, keep the reservoir tank upright to avoid a fluid leak.

Passenger Room Side

Follow procedure below to disconnect engine room harness connectors at passenger room side, and temporarily secure them on engine.

1. Remove passenger-side kicking plate inner, dash side finisher, and instrument passenger panel lower. Refer to EI-35, "BODY SIDE TRIM" and IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect engine room harness connectors at unit sides TCM (A/T models), ECM and other.



3. Disengage intermediate fixing point. Pull out engine room harnesses to engine room side, and temporarily secure them on engine.

CAUTION:

- **When pulling out harnesses, take care not to damage harnesses and connectors.**
- **After temporarily securing, cover connectors with vinyl or similar material to protect against foreign material adhesion.**

Vehicle Underbody

1. Remove exhaust front tube. Refer to EX-3, "EXHAUST SYSTEM" .
2. Disconnect steering lower joint at power steering gear assembly side, and release steering lower shaft. Refer to PS-10, "STEERING COLUMN" .
3. Remove propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

CAUTION:

Do not impact or damage propeller shaft tube.

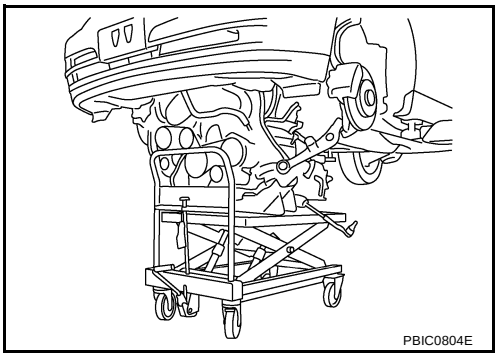
4. Disengage shift lever and remove clutch tube (M/T models). Refer to MT-18, "TRANSMISSION ASSEMBLY" and CL-15, "CLUTCH PIPING" .
5. Disengage A/T control rod at control device assembly side. Then, temporarily secure it on transmission, so that it does not sag (A/T models). Refer to AT-204, "SHIFT CONTROL SYSTEM" .
6. Remove rear plate cover from oil pan (upper). Then remove bolts fixing drive plate to torque converter (A/T models). Refer to EM-26, "OIL PAN AND OIL STRAINER" and AT-242, "TRANSMISSION ASSEMBLY" .
7. Remove bolts fixing transmission to lower rear side of oil pan (upper). Refer to MT-18, "TRANSMISSION ASSEMBLY" (M/T models) or AT-242, "TRANSMISSION ASSEMBLY" (A/T models).
8. Remove front stabilizer. Refer to FSU-18, "STABILIZER BAR" .
9. Separate steering outer sockets from steering knuckle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
10. Separate transverse links from suspension member and vehicle body. Refer to FSU-13, "TRANSVERSE LINK" .

Removal Work

1. Use a manual lift table caddy (commercial service tool) or equivalently rigid tool such as transmission jack. Securely support bottom of suspension member and transmission.

CAUTION:

Put a piece of wood or something similar as the supporting surface, secure a completely stable condition.



2. Remove front cross bar. Refer to FSU-5, "FRONT SUSPENSION ASSEMBLY" .

3. Remove rear engine mounting member bolts.
4. Remove front suspension member mounting nuts. Refer to FSU-5, "FRONT SUSPENSION ASSEMBLY" .
5. Carefully lower jack, or raise lift to remove the engine, transmission and front suspension member assembly. When performing work, observe the following caution:

CAUTION:

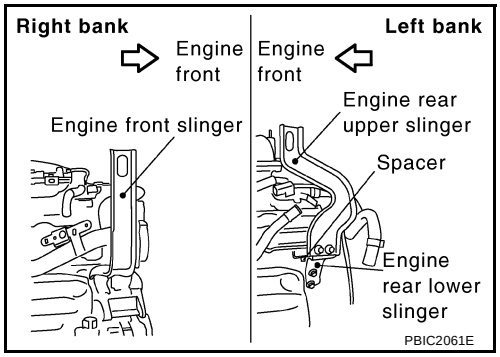
- **Confirm there is no interference with the vehicle.**
- **Make sure that all connection points have been disconnected.**
- **Keep in mind the center of the vehicle gravity changes. If necessary, use jack(s) to support the vehicle at rear jacking point(s) to prevent it from falling it off the lift.**

Separation Work

1. Install engine slingers into front of cylinder head (right bank) and rear of cylinder head (left bank).

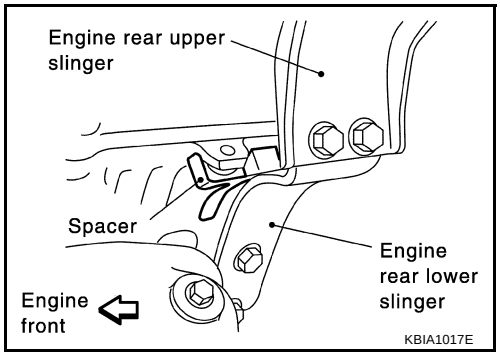
Slinger bolts:

: 28.0 N·m (2.9 kg-m, 21 ft-lb)



- To protect rocker cover against damage caused by tilting of engine slinger, insert spacer between cylinder head and engine rear lower slinger, in direction shown in the figure.

NOTE:
Spacer is a component part of engine rear upper slinger assembly.



2. Remove power steering oil pump from engine side. Refer to PS-28, "POWER STEERING OIL PUMP" .
3. Remove engine mounting insulators (RH and LH) under side nut.
4. Lift with hoist and separate engine and transmission assembly from front suspension member.

CAUTION:

- **Before and during this lifting, always make sure that any harnesses are left connected.**
- **Avoid damage to and oil/grease smearing or spills onto engine mounting insulator.**

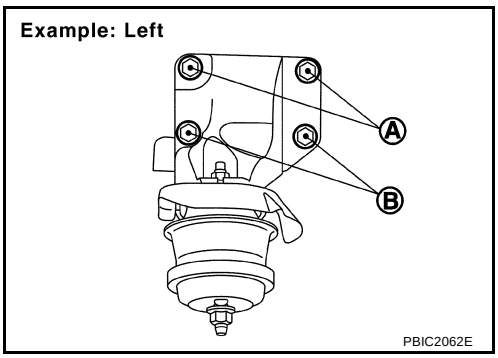
5. Remove alternator. Refer to SC-20, "CHARGING SYSTEM" .
6. Remove A/C compressor. Refer to ATC-125, "Removal and Installation of Compressor" .
7. Remove starter motor. Refer to SC-8, "STARTING SYSTEM" .
8. Separate engine from transmission. Refer to MT-18, "TRANSMISSION ASSEMBLY" (M/T models) or AT-242, "TRANSMISSION ASSEMBLY" (A/T models).
9. Remove engine mounting insulators (RH and LH) and brackets (RH and LH) from engine.
10. Remove rear engine mounting member and engine mounting insulator (rear) from transmission.

INSTALLATION

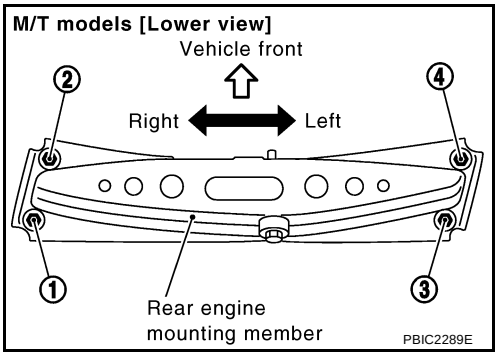
Note the following, and install in the reverse order of removal.

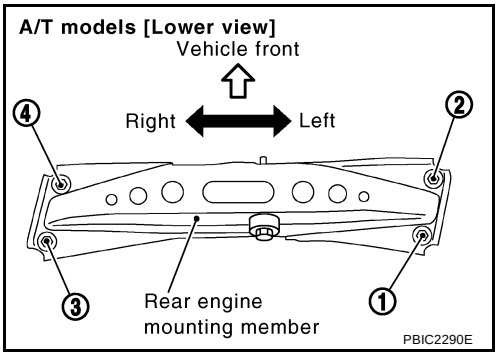
- Do not allow engine mounting insulator to be damage and careful no engine oil gets on it.
- For a location with a positioning pin, insert it securely into hole of mating part.
- For a part with a specified installation orientation, refer to component figure in EM-101, "Removal and Installation" .

- When installing engine mounting brackets (RH and LH) on cylinder block, tighten two upper bolts (shown as “A” in the figure) first. Then tighten two lower bolts (shown as “B” in the figure).



- Make sure all engine mounting insulators are seated properly, then tighten mounting nuts.
- Tighten rear engine mounting member bolts in numerical order as shown in the figure.





INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level
Fuel	Leakage	Leakage	Leakage
Exhaust gases	—	Leakage	—

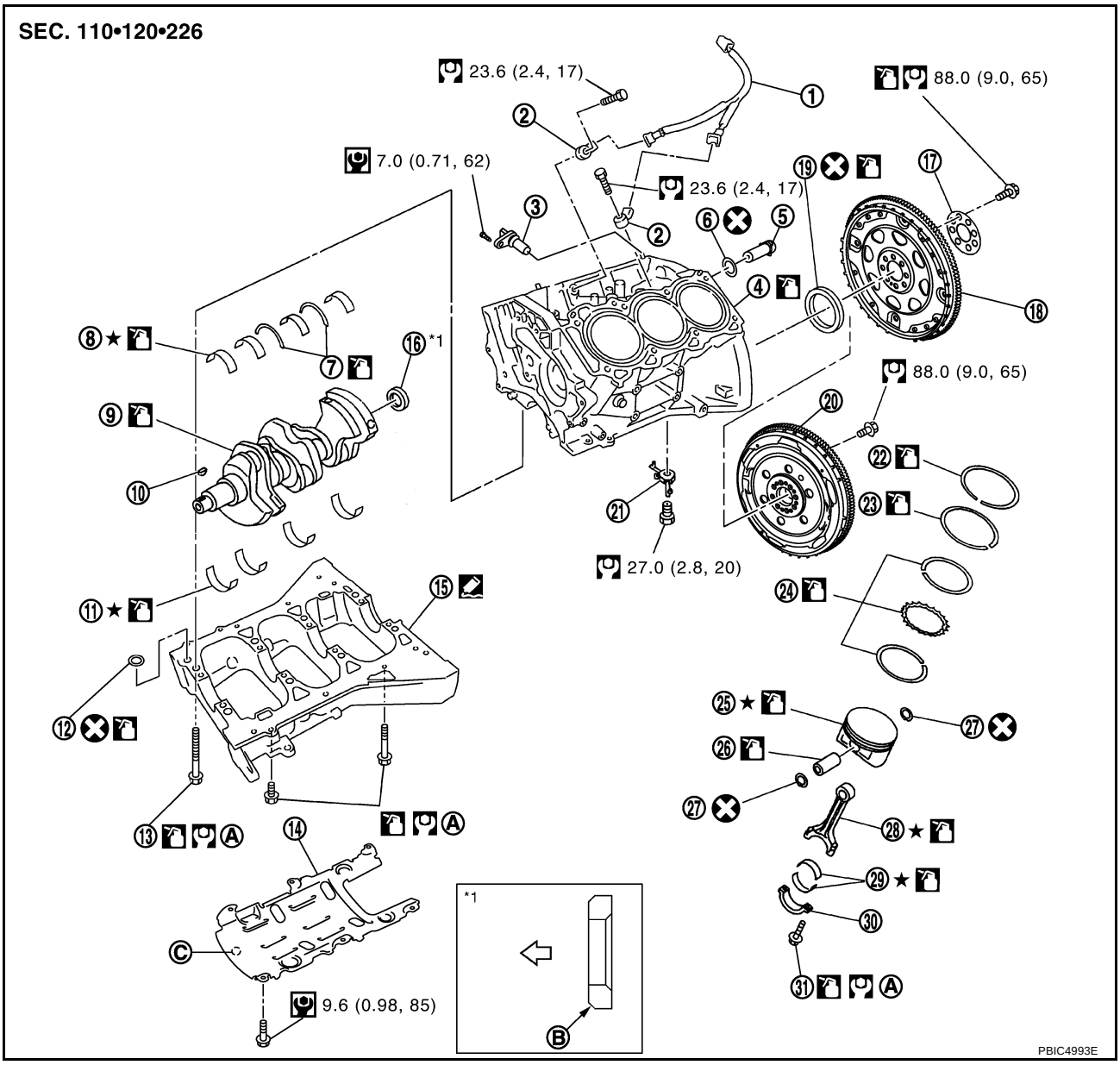
* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

CYLINDER BLOCK

PFP:11010

Disassembly and Assembly

NBS00013



1. Sub harness	2. Knock sensor	3. Crankshaft position sensor
4. Cylinder block	5. Cylinder block heater (for Canada)	6. O-ring
7. Thrust bearing	8. Main bearing (upper)	9. Crankshaft
10. Crankshaft key	11. Main bearing (lower)	12. O-ring
13. Lower cylinder block bolt	14. Baffle plate	15. Lower cylinder block
16. Pilot converter	17. Reinforcement plate	18. Drive plate (A/T models)
19. Rear oil seal	20. Fly wheel (M/T models)	21. Oil jet
22. Top ring	23. Second ring	24. Oil ring
25. Piston	26. Piston pin	27. Snap ring
28. Connecting rod	29. Connecting rod bearing	30. Connecting rod bearing cap
31. Connecting rod bolt		
A. Refer to EM-111	B. Chamfered	C. Front mark
⇦ Crankshaft side		

- Refer toGI-11, "Components" for symbol marks in the figure.

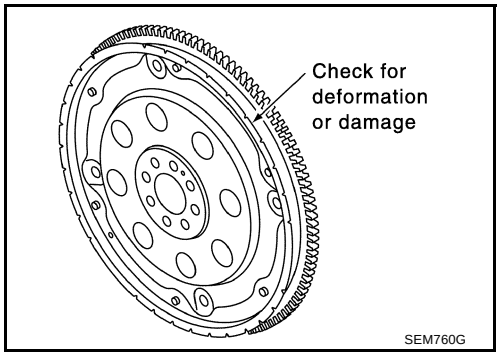
DISASSEMBLY

1. Remove engine assembly from vehicle, and separate front suspension member and transmission from engine. Refer to EM-101, "ENGINE ASSEMBLY" .
2. Remove engine mounting brackets (RH and LH). Refer to EM-101, "ENGINE ASSEMBLY" .
3. Remove the parts that may restrict installation of engine to widely use engine stand.

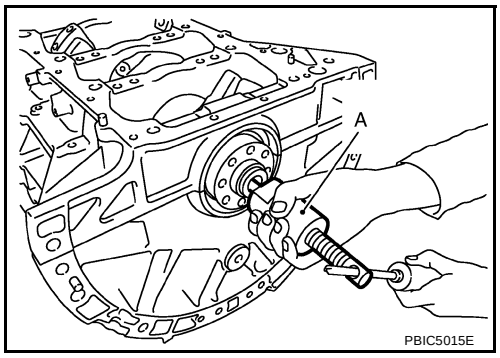
   NOTE:
   The procedure is described assuming that you use a widely use engine stand holding the surface, to which transmission is installed.

   - Remove clutch cover and clutch disk (M/T models). Refer to CL-16, "CLUTCH DISC, CLUTCH COVER" .
   - Remove flywheel (M/T models) or drive plate (A/T models). Fix crankshaft with a ring gear stopper [SST: KV10118600 (J-48641)], and remove mounting bolts.
   - Loosen mounting bolts in diagonal order.
   - Check for deformation or damage (A).

   CAUTION:
   - **Do not disassemble drive plate.**
   - **Never place drive plate with signal plate facing down.**
   - **When handling signal plate, take care not to damage or scratch it.**
   - **Handle signal plate in a manner that prevents it from becoming magnetized.**



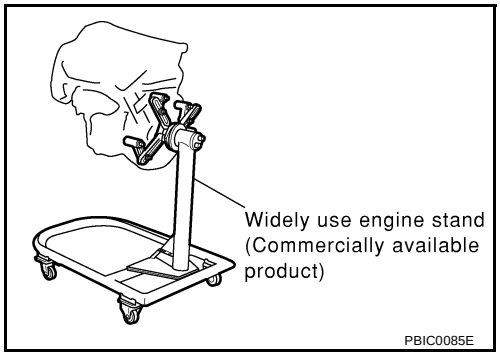
4. Remove pilot bushing (M/T models) or pilot converter (A/T models) using pilot bushing puller [SST: ST16610001 (J-23907)] (A) or suitable tool as necessary.



5. Lift the engine with hoist to install it onto the widely use engine stand.
   - A widely use engine stand can be used.

   CAUTION:
   Use engine stand that has a load capacity [approximately 220 kg (485 lb) or more] large enough for supporting the engine weight.

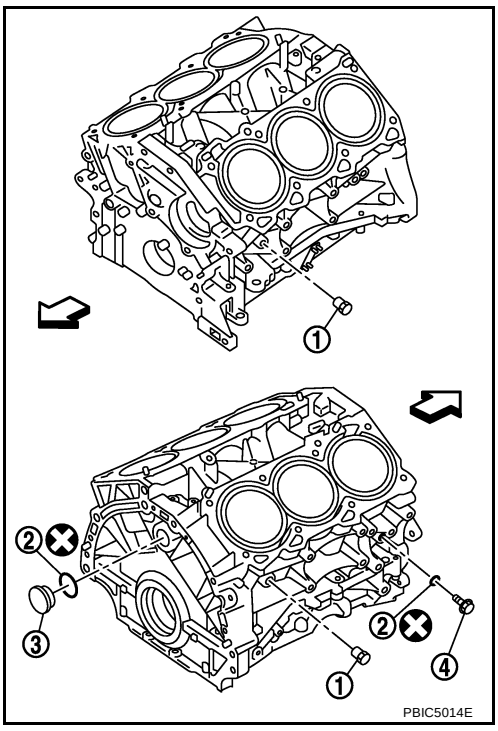
   NOTE:
   This example is engine stand for holding at transmission mounting side with flywheel (M/T models) or drive plate (A/T models) removed.



6. Drain engine oil. Refer to LU-7, "Changing Engine Oil" .

7. Drain engine coolant by removing water drain plugs (1, 4) from cylinder block both sides as shown in the figure.

   2 : Washer
   3 : Plug
   ⇦ : Engine front

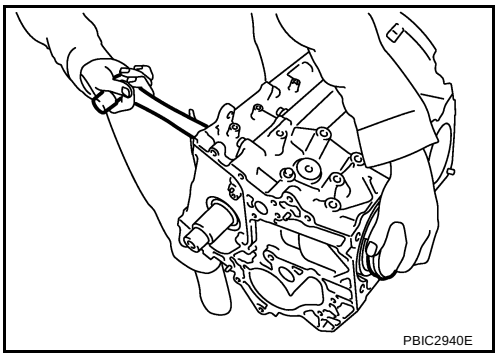


8. Remove oil pan (upper, lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
9. Remove front timing chain case, timing chain and rear timing chain case. Refer to EM-53, "TIMING CHAIN" .
10. Remove cylinder head. Refer to EM-89, "CYLINDER HEAD" .
11. Remove knock sensor.

    CAUTION:
    Carefully handle sensor avoiding shocks.
12. Remove rear oil seal.
13. Remove baffle plate from lower cylinder block.
14. Remove piston and connecting rod assembly as follows:
    - Before removing piston and connecting rod assembly, check the connecting rod side clearance. Refer to EM-125, "CONNECTING ROD SIDE CLEARANCE" .

a. Position crankshaft pin corresponding to connecting rod to be removed onto the bottom dead center.
b. Remove connecting rod bearing cap.
c. Using hammer handle or similar tool, push piston and connecting rod assembly out to the cylinder head side.

   CAUTION:
   Be careful not to damage the cylinder wall and crankshaft pin, resulting from an interference of the connecting rod big end.



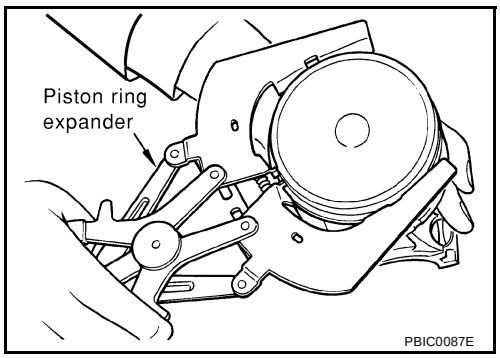
15. Remove connecting rod bearings from connecting rod and connecting rod bearing cap.

    CAUTION:
    Identify installation position, and store them without mixing them up.
16. Remove piston rings form piston.
    - Before removing piston rings, check the piston ring side clearance. Refer to EM-126, "PISTON RING SIDE CLEARANCE" .

- Use piston ring expander (commercial service tool).

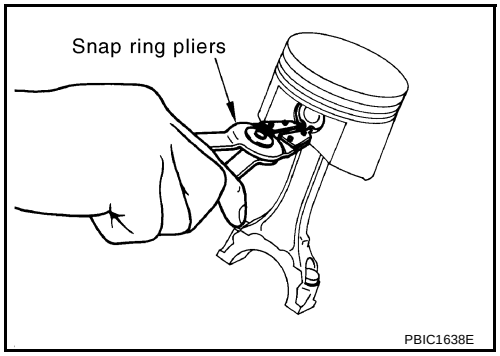
CAUTION:

- **When removing piston rings, be careful not to damage piston.**
- **Be careful not to damage piston rings by expanding them excessively.**

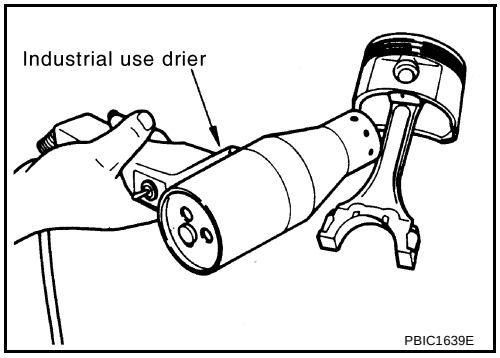


17. Remove piston from connecting rod as follows:

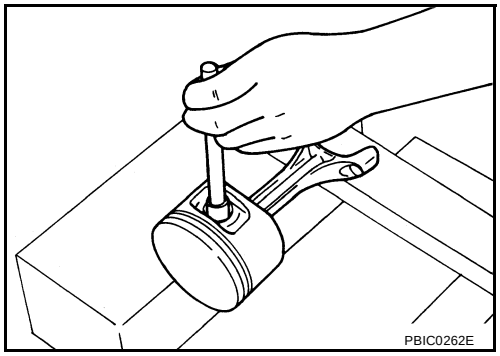
a. Using snap ring pliers, remove snap ring.



b. Heat piston to 60 to 70°C (140 to 158°F) with industrial use drier or equivalent.



c. Push out piston pin with stick of outer diameter approximately 20 mm (0.79 in).

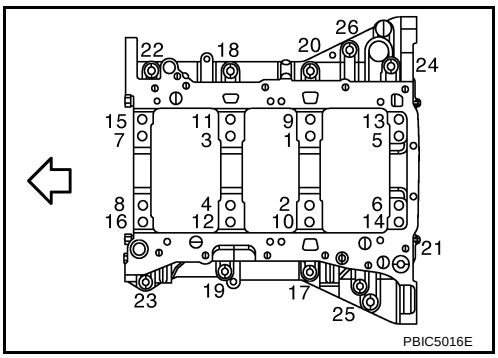


18. Remove lower cylinder block bolts.

NOTE:
Use TORX socket (size E14).

- Before loosening lower cylinder block bolts, measure the crankshaft end play. Refer to EM-125, "CRANKSHAFT END PLAY" .
- Loosen lower cylinder block bolts in reverse order shown in the figure in several different steps.

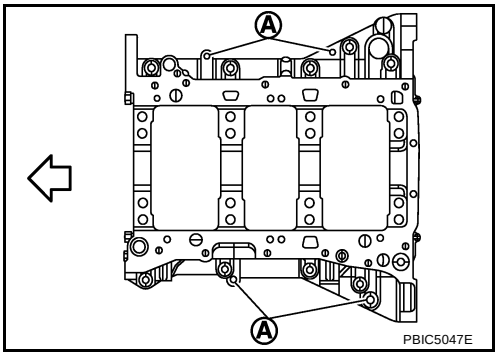
⇦ : Engine front



19. Remove lower cylinder block as follows:
Screw M8 bolt [Pitch: 1.25 mm (0.049 in), Length: approx. 50 mm (1.97 in)] into bolt holes (A) shown in the figure. Then equally tighten each bolt, and remove lower cylinder block.

⇦ : Engine front

CAUTION:
- **Be careful not to damage the mating surface.**
- **Do not tighten bolts too much.**
- **Do not insert screw driver, this will damage the mating surface.**



20. Remove crankshaft.
21. Pull rear oil seal out from rear end of crankshaft.
22. Remove main bearings and thrust bearings from cylinder block and lower cylinder block.

CAUTION:
- **Identify installation positions, and store them without mixing them up.**
- **Be careful not to drop main bearing, and to scratch the surface.**

23. Remove oil jet.

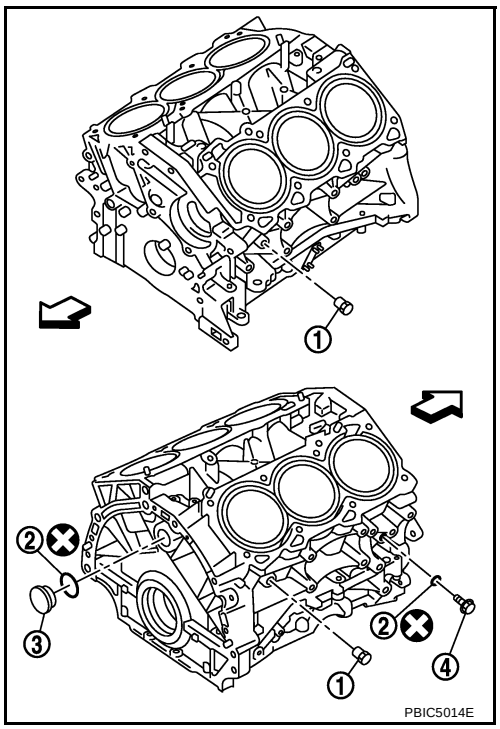
ASSEMBLY

1. Fully air-blow engine coolant and engine oil passages in cylinder block, cylinder bore and crankcase to remove any foreign material.

CAUTION:
Use a goggles to protect your eye.

2. Install each plug to cylinder block as shown in the figure.
   - Apply sealant to the thread of water drain plug (1).
     Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Apply sealant to the thread of plugs (3) and (4).
     Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Replace washers (2) with new one.

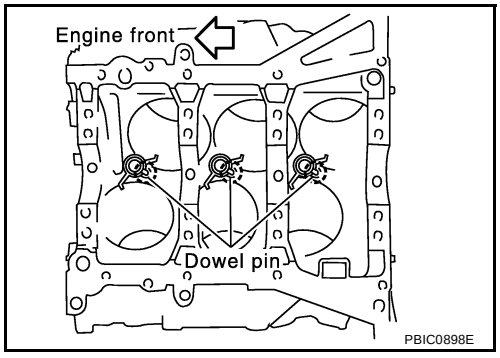
   ⇦ : Engine front



   - Tighten each plug as specified below.

Part	Washer	Tightening torque
1	No	19.6 N·m (2.0 kg-m, 14 in-lb)
3	Yes	78.0 N·m (8.0 kg-m, 58 ft-lb)
4	Yes	12.3 N·m (1.3 kg-m, 9 ft-lb)

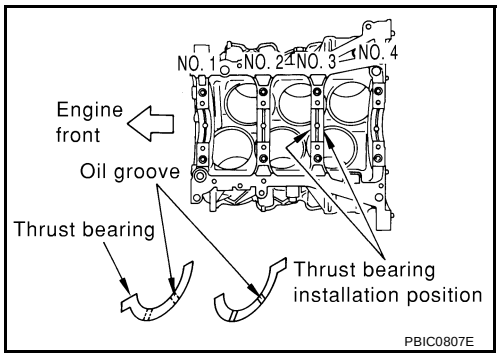
3. Install oil jet.
   - Insert oil jet dowel pin into cylinder block dowel pin hole, and tighten mounting bolts.



4. Install main bearings and thrust bearings as follows:

a. Remove dust, dirt, and engine oil on bearing mating surfaces of cylinder block and lower cylinder block.

b. Install thrust bearings to the both sides of the No. 3 journal housing on cylinder block.
   - Install thrust bearings with the oil groove facing crankshaft arm (outside).
   - Install thrust bearing with a protrusion on one end on cylinder block. Align each protrusion with mating notch.

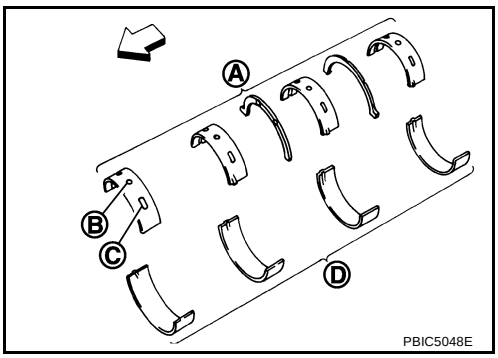


c. Install main bearings paying attention to the direction.

A : Cylinder block side

D : Lower cylinder block side

⇦ : Engine front



- Main bearing with oil hole (B) and groove (C) goes on cylinder block. The one without them goes on lower cylinder block.
- Before installing main bearings, apply engine oil to the bearing surface (inside). Do not apply engine oil to the back surface, but thoroughly clean it.
- When installing, align main bearing stopper protrusion to cut-out of cylinder block and lower cylinder block.
- Ensure the oil holes on cylinder block and those on the corresponding bearing are aligned.

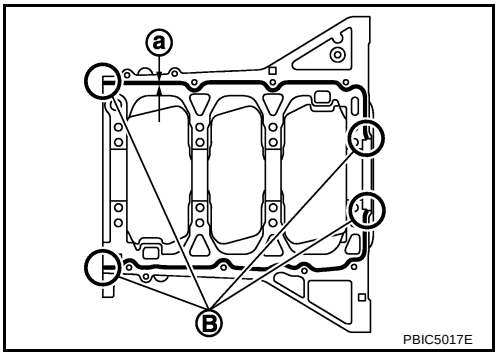
5. Install crankshaft to cylinder block.
   - While turning crankshaft by hand, check that it turns smoothly.
6. Install lower cylinder block.

NOTE:
Lower cylinder block cannot be replaced as a single part, because it is machined together with cylinder block.

- Apply a continuous bead of liquid gasket with the tube presser [SST: WS39930000(—)] to lower cylinder block as shown in the figure.

a : 3.5 – 4.5 mm (0.138 – 0.177 in) dia

b : Apply to end



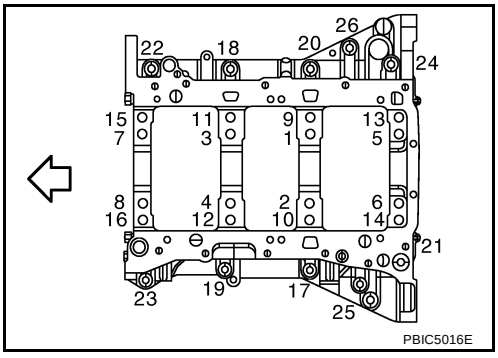
7. Inspect the outer diameter of lower cylinder block bolt. Refer to EM-133, "LOWER CYLINDER BLOCK BOLT OUTER DIAMETER" .
8. Install lower cylinder block bolts in numerical order as shown in the figure as follows:

a. Apply new engine oil to threads and seat surfaces of lower cylinder block bolts.

b. Tighten lower cylinder block bolt (No.17 to 26) in numerical order as shown in the figure.

: 25.0 N·m (2.6 kg-m, 18 ft-lb)

⇦ : Engine front



c. Repeat step b.

d. Tighten lower cylinder block bolts (No.1 to 16) in numerical order as shown in the figure.

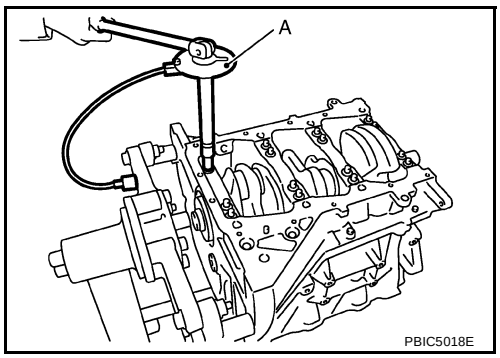
NOTE:
Use TORX socket (size E14) for bolts No.1 to 16.

: 35.3 N·m (3.6 kg-m, 26 ft-lb)

e. Turn lower cylinder block bolts (No.1 to 16) 90 degrees clockwise (angle tightening).

CAUTION:

Use the angle wrench [SST: KV10112100 (BT8653-A)] (A) to check tightening angle. Do not make judgment by visual inspection.

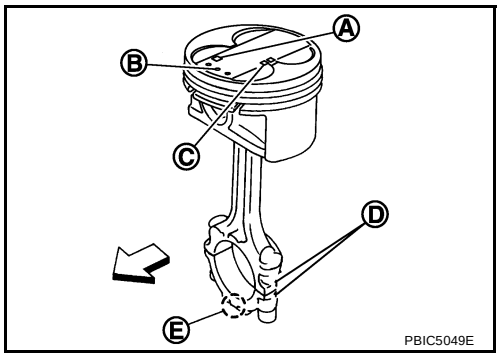


- After installing lower cylinder block bolts, make sure that crankshaft can be rotated smoothly by hand.
- Check the crankshaft end play. Refer to EM-125, "CRANKSHAFT END PLAY" .

9. Install piston to connecting rod as follows:

a. Using snap ring pliers, install new snap ring to the groove of piston rear side.
   - Insert it fully into groove to install.

b. Install piston to connecting rod.
   - Using industrial use drier or similar tool, heat piston until piston pin can be pushed in by hand without excess force [approx. 60 to 70°C (140 to 158°F)]. From the front to the rear, insert piston pin into piston and connecting rod.
   - Assemble so that the front mark on the piston head and the cylinder number on connecting rod are positioned as shown in the figure.



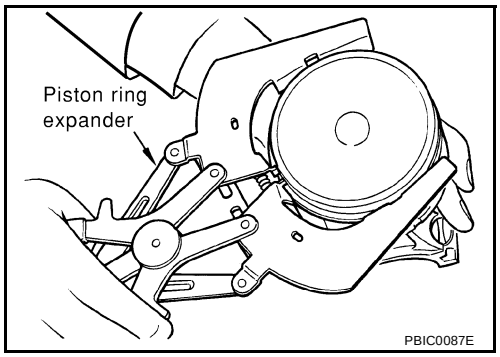
A	: Piston grade number
B	: Front mark
C	: Pin grade number
D	: Cylinder number
E	: Front mark
⇦	: Engine front

c. Install new snap ring to the groove of the piston front side.
   - Insert it fully into groove to install.
   - After installing, make sure that connecting rod moves smoothly.

10. Using piston ring expander (commercial service tool), install piston rings.

CAUTION:

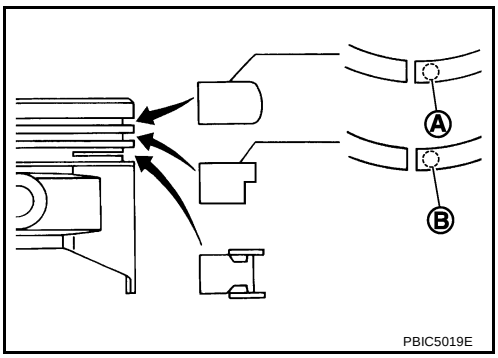
- **When installing piston rings, be careful not to damage piston.**
- **Be careful not to damage piston rings by expending them excessively.**



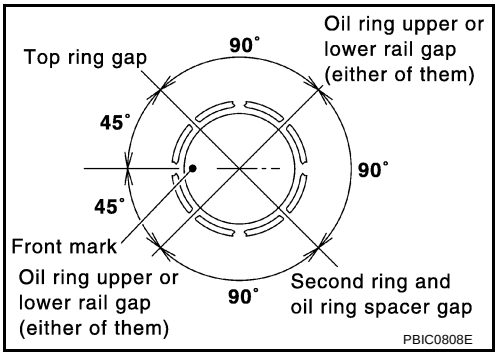
- If there is stamped mark on ring, mount it with marked side up.

Stamped mark:

Top ring (A)	**: 1N**
Second ring (B)	**: 2N**

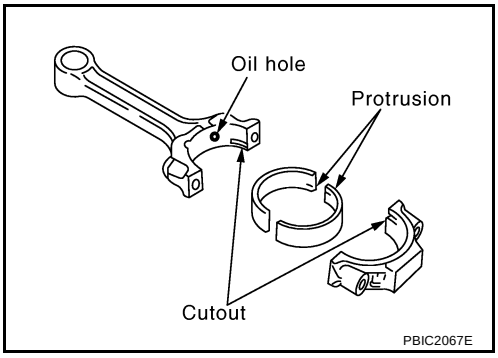


- Mount second ring with cut out side down.
- Position each ring with the gap as shown in the figure referring to the piston front mark.



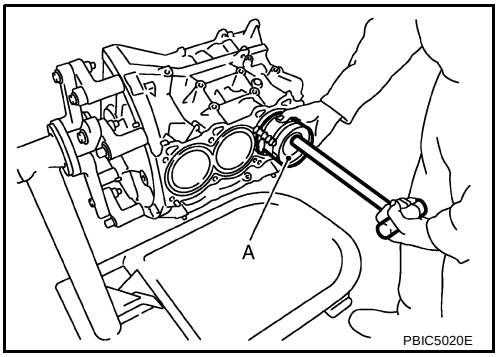
- Check the piston ring side clearance. Refer to EM-126, "PISTON RING SIDE CLEARANCE" .

11. Install connecting rod bearings to connecting rod and connecting rod bearing cap.
    - Before installing connecting rod bearings, apply engine oil to the bearing surface (inside). Do not apply engine oil to the back surface, but thoroughly clean it.
    - When installing, align connecting rod bearing stopper protrusion with cutout of connecting rods and connecting rod bearing caps to install.
    - Ensure the oil hole on connecting rod and that on the corresponding bearing are aligned.

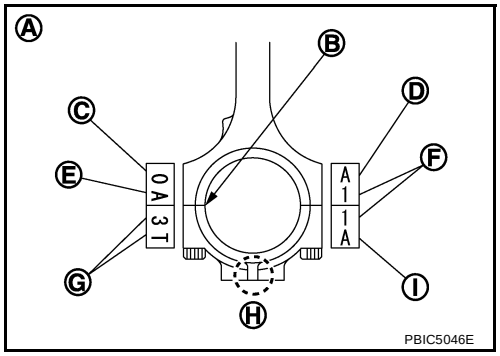


12. Install piston and connecting rod assembly to crankshaft.
    - Position crankshaft pin corresponding to connecting rod to be installed onto the bottom dead center.
    - Apply engine oil sufficiently to the cylinder bore, piston and crankshaft pin journal.
    - Match the cylinder position with the cylinder number on connecting rod to install.
    - Be sure that front mark on piston head is facing front of engine.
    - Using piston ring compressor [SST: EM03470000 (J8037)] (A) or suitable tool, install piston with the front mark on the piston head facing the front of engine.

CAUTION:
Be careful not to damage the cylinder wall and crankshaft pin, resulting from an interference of the connecting rod big end.



13. Install connecting rod bearing cap.
    - Match the stamped cylinder number marks on connecting rod with those on connecting rod bearing cap to install.
    - Be sure that front mark (H) on connecting rod bearing cap is facing front of engine.



A : Sample code
B : Bearing stopper groove
C : Small-end diameter grade
D : Big end diameter grade
E : Weight grade
F : Cylinder No.
G : Management code
I : Management code

14. Inspect the outer diameter of connecting rod bolt. Refer to EM-133, "LOWER CYLINDER BLOCK BOLT OUTER DIAMETER" .
15. Tighten connecting rod bolts as follows:

a. Apply engine oil to the threads and seats of connecting rod bolts.

b. Tighten connecting rod bolts.

: 28.4 N·m (2.9 kg-m, 21 ft-lb)

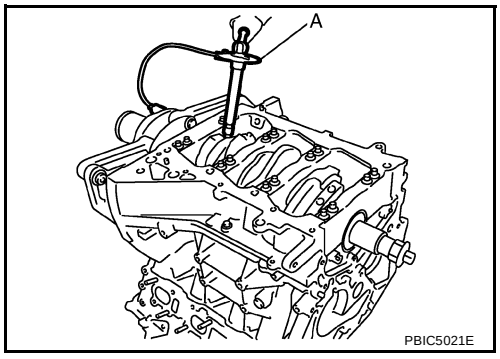
c. Completely loosen connecting rod bolts.

: 0 N·m (0 kg-m, 0 ft-lb)

d. Tighten connecting rod bolts.

: 24.5 N·m (2.5 kg-m, 18 ft-lb)

e. Then turn connecting rod bolts 90 degrees clockwise (angle tightening).



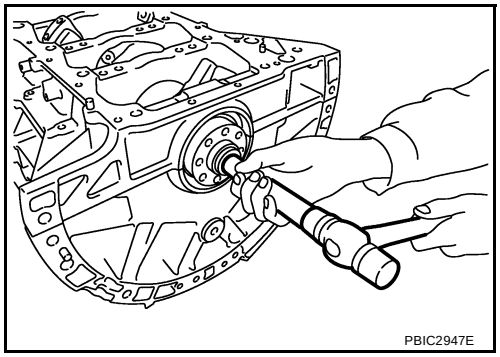
CAUTION:

Use angle wrench [SST: KV10112100 (BT8653-A)] (A) to check tightening angle. Do not make judgment by visual inspection.

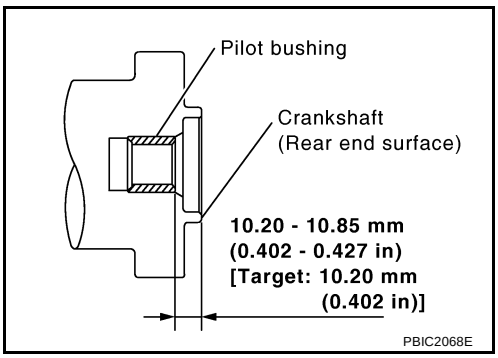
- After tightening connecting rod bolts, make sure that crankshaft rotates smoothly.
- Check the connecting rod side clearance. Refer to EM-125, "CONNECTING ROD SIDE CLEARANCE" .

16. Install baffle plate.
17. Install new rear oil seal. Refer to EM-86, "OIL SEAL" .
18. Install pilot bushing (M/T models) or pilot converter (A/T models).
    - With drift of the following outer diameter, press-fit as far as it will go.

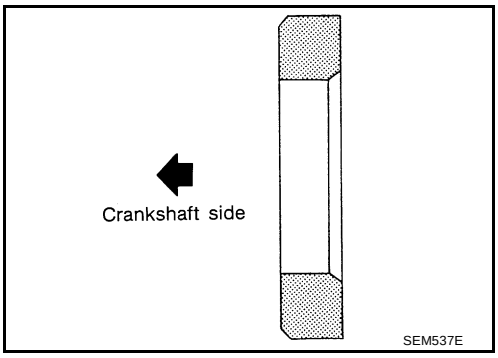
Pilot bushing : Approx. 17 mm (0.67 in)
Pilot converter : Approx. 33 mm (1.30 in)



- Press-fit pilot bushing as the dimension in the figure. (M/T models)



- Press-fit pilot converter with its chamfer facing crankshaft as shown in the figure. (A/T models)



19. Install cylinder head. Refer to EM-89, "CYLINDER HEAD" .
20. Install rear timing chain case. Refer to EM-53, "TIMING CHAIN" .
21. Install oil pan (upper). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
22. Install knock sensors.

A : Right bank
B : Left bank
⇦ : Engine front

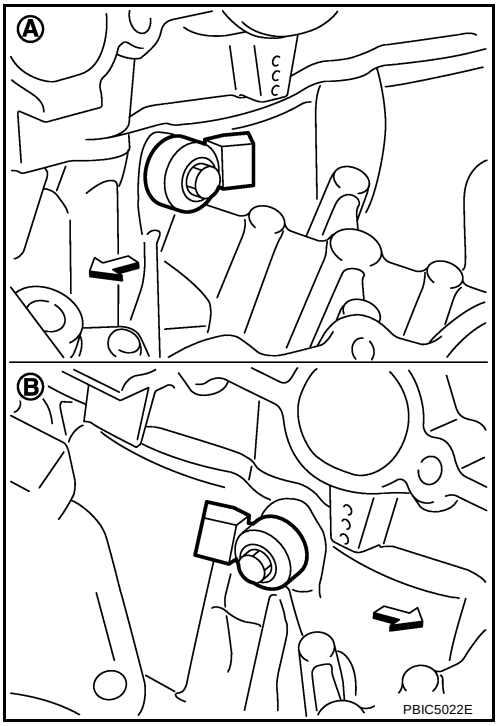
- Install knock sensor so that connector faces rear of engine.
- After installing knock sensor, connect harness connector, and lay it out to rear of engine.

CAUTION:

- **Do not tighten mounting bolts while holding connector.**
- **If any impact by dropping is applied to knock sensor, replace it with new one.**

NOTE:

- Make sure that there is no foreign material on the cylinder block mating surface and the back surface of knock sensor.
- Make sure that knock sensor does not interfere with other parts.

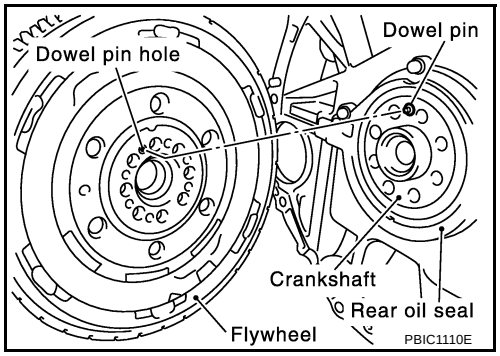


23. Note the following, assemble in the reverse order of disassembly after this step.

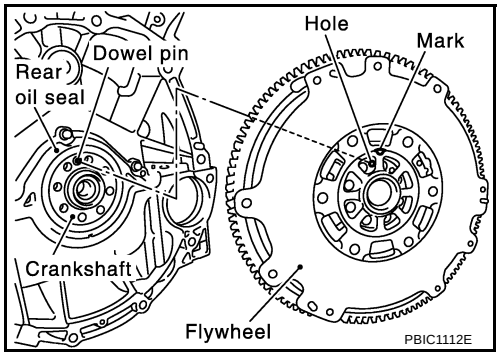
Flywheel (M/T models)

- When installing flywheel to crankshaft, be sure to correctly align crankshaft side dowel pin and flywheel side dowel pin hole.

  CAUTION:
  If these are not aligned correctly, engine runs roughly and "MIL" turns on.



- There is a mating mark on the clutch cover side of flywheel. Refer it during installation.



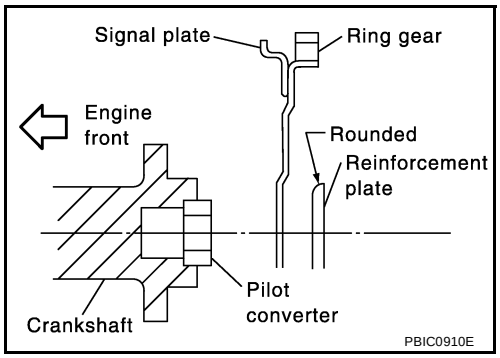
- Holding ring gear with ring gear stopper [SST: KV11018600 (J-48641)], tighten securing bolts with TORX socket (size: T55, commercial service tool).
- Tighten the mounting bolts crosswise over several times.

Drive plate (A/T models)

- When installing drive plate to crankshaft, be sure to correctly align crankshaft side dowel pin and drive plate side dowel pin hole.

  CAUTION:
  If these are not aligned correctly, engine runs roughly and "MIL" turns on.

- Install drive plate and reinforcement plate as shown in the figure.
- Holding ring gear with ring gear stopper [SST: KV10118600 (J-48641)].
- Tighten the mounting bolts crosswise over several times.



How to Select Piston and Bearing

NBS00014

DESCRIPTION

Selection points	Selection parts	Selection items	Selection methods
Between cylinder block to crankshaft	Main bearing	Main bearing grade (bearing thickness)	Determined by match of cylinder block bearing housing grade (inner diameter of housing) and crankshaft journal grade (outer diameter of journal)
Between crankshaft to connecting rod	Connecting rod bearing	Connecting rod bearing grade (bearing thickness)	Combining service grades for connecting rod big end diameter and crankshaft pin outer diameter determine connecting rod bearing selection.
Between cylinder block to piston	Piston and piston pin assembly (Piston is available together with piston pin as assembly.)	Piston grade (piston skirt diameter)	Piston grade = cylinder bore grade (inner diameter of bore)
Between piston to connecting rod*	—	—	—

*: For the service parts, the grade for fitting cannot be selected between piston pin and connecting rod. (Only “0” grade is available.) The information at the shipment from the plant is described as a reference.

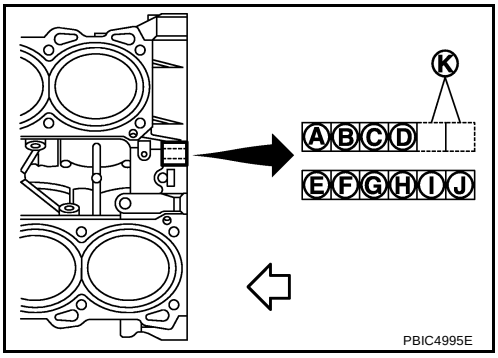
- The identification grade stamped on each part is the grade for the dimension measured in new condition. This grade cannot apply to reused parts.
- For reused or repaired parts, measure the dimension accurately. Determine the grade by comparing the measurement with the values of each selection table.
- For details of the measurement method of each part, the reuse standards and the selection method of the selective fitting parts, refer to the text.

HOW TO SELECT PISTON

When New Cylinder Block is Used

Check the cylinder bore grade (“1”, “2” or “3”) on rear side of cylinder block, and select piston of the same grade.

NOTE:
Piston is available with piston pin as a set for the service part. (Only “0” grade piston pin is available.)

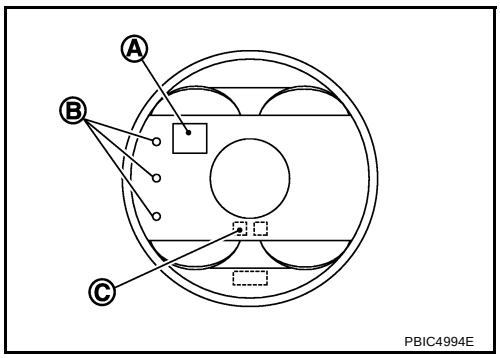


A : Bearing housing grade No. 1
B : Bearing housing grade No. 2
C : Bearing housing grade No. 3
D : Bearing housing grade No. 4
E : Cylinder bore grade No. 1
F : Cylinder bore grade No. 2
G : Cylinder bore grade No. 3
H : Cylinder bore grade No. 4
I : Cylinder bore grade No. 5
J : Cylinder bore grade No. 6
K : Identification code
⇦ : Engine front

When Cylinder Block is Reused

1. Measure the cylinder bore inner diameter. Refer to EM-129, "Cylinder Bore Inner Diameter" .

2. Determine the bore grade by comparing the measurement with the values under the cylinder bore inner diameter of the “Piston Selection Table”.



A : Piston grade number
B : Front mark
C : Piston pin grade number

3. Select piston of the same grade.

Piston Selection Table

Unit: mm (in)

Grade	1	2	3
Cylinder bore inner diameter	95.500 - 95.510 (3.7598 - 3.7602)	95.510 - 95.520 (3.7602 - 3.7606)	95.520 - 95.530 (3.7606 - 3.7610)
Piston skirt diameter	95.480 - 95.490 (3.7590 - 3.7594)	95.490 - 95.500 (3.7594 - 3.7598)	95.500 - 95.510 (3.7598 - 3.7602)

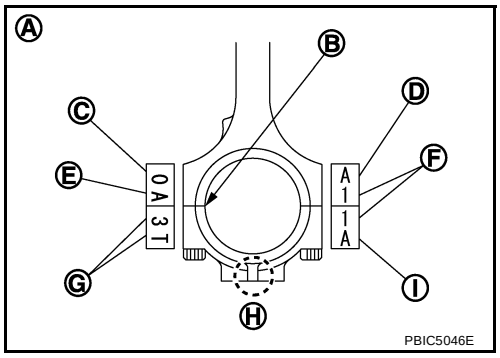
NOTE:

- Piston is available together with piston pin as assembly.
- Piston pin (piston pin hole) grade is provided only for the parts installed at the plant. For service parts, no piston pin grades can be selected. (Only “0” grade is available.)
- No second grade mark is available on piston.

HOW TO SELECT CONNECTING ROD BEARING

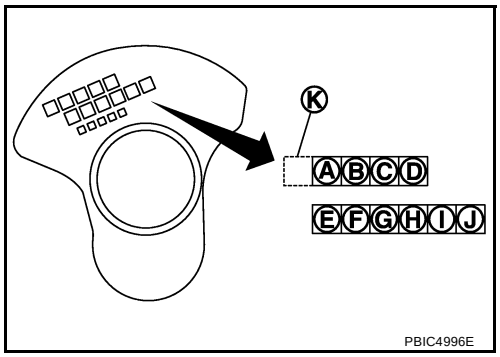
When New Connecting Rod and Crankshaft are Used

1. “Connecting Rod Bearing Selection Table” rows correspond to connecting rod big end diameter grade (D) stamped on side face of connecting rod.



A : Sample code
B : Bearing stopper groove
C : Small end diameter grade
D : Big end diameter grade
E : Weight grade
F : Cylinder No.
G : Management code
H : Front mark
I : Management code

2. “Connecting Rod Bearing Selection Table” columns correspond to pin journal diameter grade (E - J) on front side of crankshafts.



A : Main journal diameter grade No. 1
B : Main journal diameter grade No. 2
C : Main journal diameter grade No. 3
D : Main journal diameter grade No. 4
E : Pin diameter grade No. 1
F : Pin diameter grade No. 2
G : Pin diameter grade No. 3
H : Pin diameter grade No. 4
I : Pin diameter grade No. 5
J : Pin diameter grade No. 6
K : Identification code

3. Select connecting rod bearing grade at the point where selected row and column meet in “Connecting Rod Bearing Selection Table”.

When Crankshaft and Connecting Rod are Reused

1. Measure the connecting rod big end diameter and crankshaft pin journal diameter. Refer to EM-127, "CONNECTING ROD BIG END DIAMETER" . and EM-131, "CRANKSHAFT PIN JOURNAL DIAMETER" .
2. Correspond the measured dimension in “Connecting rod big end diameter” row of “Connecting Rod Bearing Selection Table”.
3. Correspond the measured dimension in “Crankshaft pin journal diameter” column of “Connecting Rod Bearing Selection Table”.
4. Select connecting rod bearing grade at the point where selected row and column meet in following selection table.

Connecting Rod Bearing Selection Table

Crankshaft pin journal diameter Unit: mm (in) / Connecting rod big end diameter Unit: mm (in)		Mark	0	1	2	3	4	5	6	7	8	9	W	X	Y
		Hole diameter	57.000 - 57.001 (2.2441 - 2.2441)	57.001 - 57.002 (2.2441 - 2.2442)	57.002 - 57.003 (2.2442 - 2.2442)	57.003 - 57.004 (2.2442 - 2.2442)	57.004 - 57.005 (2.2442 - 2.2443)	57.005 - 57.006 (2.2443 - 2.2443)	57.006 - 57.007 (2.2443 - 2.2444)	57.007 - 57.008 (2.2444 - 2.2444)	57.008 - 57.009 (2.2444 - 2.2444)	57.009 - 57.010 (2.2444 - 2.2445)	57.010 - 57.011 (2.2445 - 2.2445)	57.011 - 57.012 (2.2445 - 2.2446)	57.012 - 57.013 (2.2446 - 2.2446)
Mark	Axle diameter														
A	53.974 - 53.973 (2.1250 - 2.1249)		0	0	0	0	0	0	1	1	1	1	1	1	2
B	53.973 - 53.972 (2.1249 - 2.1249)		0	0	0	0	0	1	1	1	1	1	1	2	2
C	53.972 - 53.971 (2.1249 - 2.1248)		0	0	0	0	1	1	1	1	1	1	2	2	2
D	53.971 - 53.970 (2.1248 - 2.1248)		0	0	0	1	1	1	1	1	1	2	2	2	2
E	53.970 - 53.969 (2.1248 - 2.1248)		0	0	1	1	1	1	1	1	2	2	2	2	2
F	53.969 - 53.968 (2.1248 - 2.1247)		0	1	1	1	1	1	1	2	2	2	2	2	2
G	53.968 - 53.967 (2.1247 - 2.1247)		1	1	1	1	1	1	2	2	2	2	2	2	3
H	53.967 - 53.966 (2.1247 - 2.1246)		1	1	1	1	1	2	2	2	2	2	2	3	3
J	53.966 - 53.965 (2.1246 - 2.1246)		1	1	1	1	2	2	2	2	2	2	3	3	3
K	53.965 - 53.964 (2.1246 - 2.1246)		1	1	1	2	2	2	2	2	2	3	3	3	3
L	53.964 - 53.963 (2.1246 - 2.1245)		1	1	2	2	2	2	2	2	3	3	3	3	3
M	53.963 - 53.962 (2.1245 - 2.1245)		1	2	2	2	2	2	2	3	3	3	3	3	3
N	53.962 - 53.961 (2.1245 - 2.1244)		2	2	2	2	2	2	3	3	3	3	3	3	4
P	53.961 - 53.960 (2.1244 - 2.1244)		2	2	2	2	2	3	3	3	3	3	3	4	4
R	53.960 - 53.959 (2.1244 - 2.1244)		2	2	2	2	3	3	3	3	3	3	4	4	4
S	53.959 - 53.958 (2.1244 - 2.1243)		2	2	2	3	3	3	3	3	3	4	4	4	4
T	53.958 - 53.957 (2.1243 - 2.1243)		2	2	3	3	3	3	3	3	4	4	4	4	4
U	53.957 - 53.956 (2.1243 - 2.1242)		2	3	3	3	3	3	3	4	4	4	4	4	4

PBIC5023E

Connecting Rod Bearing Grade Table

Grade number	Thickness mm (in)	Identification color (mark)
0	1.497 – 1.500 (0.0589 – 0.0591)	Black
1	1.500 – 1.503 (0.0591 – 0.0592)	Brown

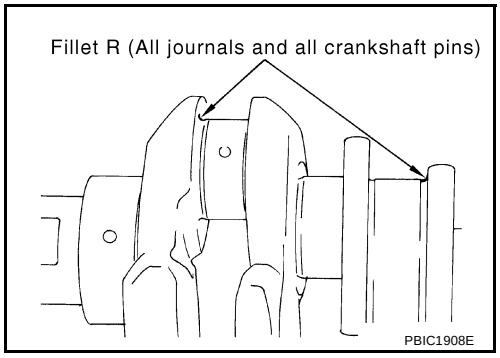
Grade number	Thickness mm (in)	Identification color (mark)
2	1.503 – 1.506 (0.0592 – 0.0593)	Green
3	1.506 – 1.509 (0.0593 – 0.0594)	Yellow
4	1.509 – 1.512 (0.0594 – 0.0595)	Blue

Undersize Bearings Usage Guide

- When the specified connecting rod bearing oil clearance is not obtained with standard size connecting rod bearings, use undersize (US) bearings.
- When using undersize (US) bearing, measure the connecting rod bearing inner diameter with bearing installed, and grind crankshaft pin so that the connecting rod bearing oil clearance satisfies the standard.

CAUTION:

In grinding crankshaft pin to use undersize bearings, keep the fillet R [1.5 – 1.7 mm (0.059 – 0.067 in)].



Bearing undersize table

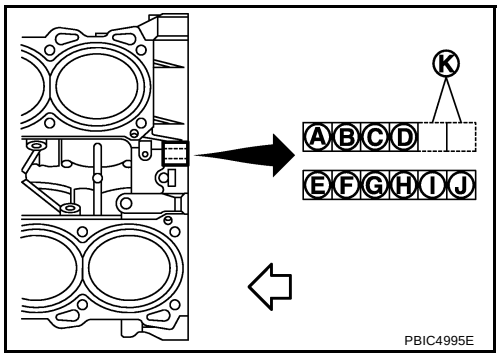
Unit: mm (in)

Size	Thickness
US 0.25 (0.0098)	1.626 - 1.634 (0.0640 - 0.0643)

HOW TO SELECT MAIN BEARING

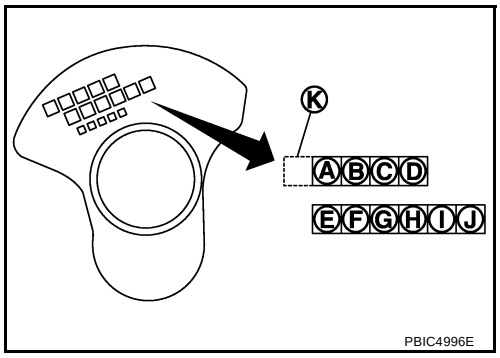
When New Cylinder Block and Crankshaft are Used

1. “Main Bearing Selection Table” rows correspond to bearing housing grade on rear left side of cylinder block.



A : Bearing housing grade No. 1
B : Bearing housing grade No. 2
C : Bearing housing grade No. 3
D : Bearing housing grade No. 4
E : Cylinder bore grade No. 1
F : Cylinder bore grade No. 2
G : Cylinder bore grade No. 3
H : Cylinder bore grade No. 4
I : Cylinder bore grade No. 5
J : Cylinder bore grade No. 6
K : Identification code
⇦ : Engine front

2. “Main Bearing Selection Table” columns correspond to journal diameter grade on front side of crankshaft.



A : Main journal diameter grade No. 1
B : Main journal diameter grade No. 2
C : Main journal diameter grade No. 3
D : Main journal diameter grade No. 4
E : Pin diameter grade No. 1
F : Pin diameter grade No. 2
G : Pin diameter grade No. 3
H : Pin diameter grade No. 4

I : Pin diameter grade No. 5

J : Pin diameter grade No. 6

K : Identification code

3. Select main bearing grade at the point where selected row and column meet in “Main Bearing Selection Table”.

When Cylinder Block and Crankshaft are Reused

1. Measure cylinder block main bearing housing inner diameter and crankshaft main journal diameter. Refer to EM-129, "MAIN BEARING HOUSING INNER DIAMETER" and EM-130, "CRANKSHAFT MAIN JOURNAL DIAMETER" .
2. Correspond the measured dimension in “Cylinder block main bearing housing inner diameter” row of “Main Bearing Selection Table”.
3. Correspond the measured dimension in “Crankshaft main journal diameter” column of “Main Bearing Selection Table”.
4. Select main bearing grade at the point where selected row and column meet in following selection table.

Main Bearing Selection Table

Cylinder block main bearing housing inner diameter Unit: mm (in) / Crankshaft main journal diameter Unit: mm (in)		Mark	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	4	7
		Hole diameter	69.993 - 69.994 (2.7556 - 2.7557)	69.994 - 69.995 (2.7557 - 2.7557)	69.995 - 69.996 (2.7557 - 2.7557)	69.996 - 69.997 (2.7557 - 2.7558)	69.997 - 69.998 (2.7558 - 2.7558)	69.998 - 69.999 (2.7558 - 2.7559)	69.999 - 70.000 (2.7559 - 2.7559)	70.000 - 70.001 (2.7559 - 2.7559)	70.001 - 70.002 (2.7559 - 2.7560)	70.002 - 70.003 (2.7560 - 2.7560)	70.003 - 70.004 (2.7560 - 2.7561)	70.004 - 70.005 (2.7561 - 2.7561)	70.005 - 70.006 (2.7561 - 2.7561)	70.006 - 70.007 (2.7561 - 2.7562)	70.007 - 70.008 (2.7562 - 2.7562)	70.008 - 70.009 (2.7562 - 2.7563)	70.009 - 70.010 (2.7563 - 2.7563)	70.010 - 70.011 (2.7563 - 2.7563)	70.011 - 70.012 (2.7563 - 2.7564)	70.012 - 70.013 (2.7564 - 2.7564)	70.013 - 70.014 (2.7564 - 2.7565)	70.014 - 70.015 (2.7565 - 2.7565)	70.015 - 70.016 (2.7565 - 2.7565)	70.016 - 70.017 (2.7565 - 2.7566)
Mark	Axle diameter																									
A	64.975 - 64.974 (2.5581 - 2.5580)		0	0	0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34
B	64.974 - 64.973 (2.5580 - 2.5580)		0	0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4
C	64.973 - 64.972 (2.5580 - 2.5579)		0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4
D	64.972 - 64.971 (2.5579 - 2.5579)		01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4
E	64.971 - 64.970 (2.5579 - 2.5579)		01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45
F	64.970 - 64.969 (2.5579 - 2.5578)		01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45
G	64.969 - 64.968 (2.5578 - 2.5578)		1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45
H	64.968 - 64.967 (2.5578 - 2.5578)		1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5
J	64.967 - 64.966 (2.5578 - 2.5577)		1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5
K	64.966 - 64.965 (2.5577 - 2.5577)		12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5
L	64.965 - 64.964 (2.5577 - 2.5576)		12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56
M	64.964 - 64.963 (2.5576 - 2.5576)		12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56
N	64.963 - 64.962 (2.5576 - 2.5576)		2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56
P	64.962 - 64.961 (2.5576 - 2.5575)		2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6
R	64.961 - 64.960 (2.5575 - 2.5575)		2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6
S	64.960 - 64.959 (2.5575 - 2.5574)		23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6
T	64.959 - 64.958 (2.5574 - 2.5574)		23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67
U	64.958 - 64.957 (2.5574 - 2.5574)		23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67
V	64.957 - 64.956 (2.5574 - 2.5573)		3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67
W	64.956 - 64.955 (2.5573 - 2.5573)		3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7
X	64.955 - 64.954 (2.5573 - 2.5572)		3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7
Y	64.954 - 64.953 (2.5572 - 2.5572)		34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7
4	64.953 - 64.952 (2.5572 - 2.5572)		34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7	X
7	64.952 - 64.951 (2.5572 - 2.5571)		34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7	X	X

PBIC5024E

Main Bearing Grade Table (All Journals)

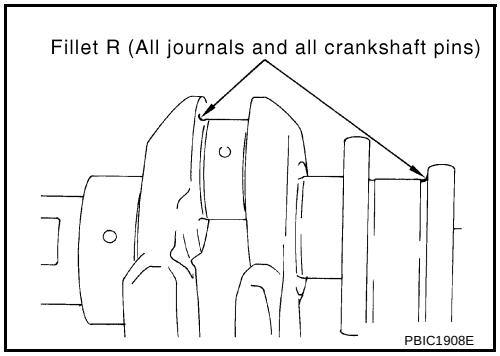
Grade number		Thickness Unit: mm (in)	Width Unit: mm (in)	Identification color	Remarks
0		2.500 - 2.503 (0.0984 - 0.0985)	19.9 - 20.1 (0.783 - 0.791)	Black	Grade and color are the same for upper and lower bearings.
1		2.503 - 2.506 (0.0985 - 0.0987)		Brown	
2		2.506 - 2.509 (0.0987 - 0.0988)		Green	
3		2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
4		2.512 - 2.515 (0.0989 - 0.0990)		Blue	
5		2.515 - 2.518 (0.0990 - 0.0991)		Pink	
6		2.518 - 2.521 (0.0991 - 0.0993)		Purple	
7		2.521 - 2.524 (0.0993 - 0.0994)		White	
01	UPR	2.503 - 2.506 (0.0985 - 0.0987)		Brown	Grade and color are different for upper and lower bearings.
	LWR	2.500 - 2.503 (0.0984 - 0.0985)		Black	
12	UPR	2.506 - 2.509 (0.0987 - 0.0988)		Green	
	LWR	2.503 - 2.506 (0.0985 - 0.0987)		Brown	
23	UPR	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
	LWR	2.506 - 2.509 (0.0987 - 0.0988)		Green	
34	UPR	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
	LWR	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
45	UPR	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
	LWR	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
56	UPR	2.518 - 2.521 (0.0991 - 0.0993)		Purple	
	LWR	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
67	UPR	2.521 - 2.524 (0.0993 - 0.0994)		White	
	LWR	2.518 - 2.521 (0.0991 - 0.0993)		Purple	

Undersize Bearing Usage Guide

- When the specified main bearing oil clearance is not obtained with standard size main bearings, use underside (US) bearing.
- When using undersize (US) bearing, measure the main bearing inner diameter with bearing installed, and grind main journal so that the main bearing oil clearance satisfies the standard.

CAUTION:

In grinding crankshaft main journal to use undersize bearings, keep the fillet R [1.5 – 1.7 mm (0.059 – 0.067 in)].



Bearing undersize table

Unit: mm (in)

Size	Thickness
US 0.25 (0.0098)	2.633 - 2.641 (0.1037 - 0.1040)

Inspection After Disassembly

NBS00015

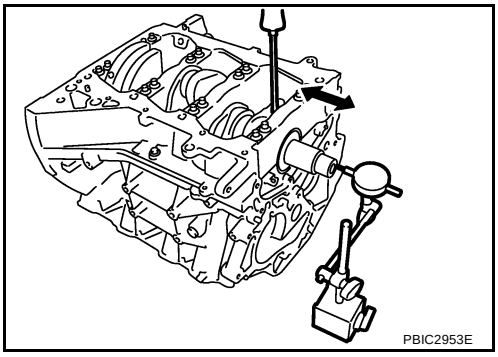
CRANKSHAFT END PLAY

- Measure the clearance between thrust bearings and crankshaft arm when crankshaft is moved fully forward or backward with dial indicator.

Standard : 0.10 - 0.25 mm (0.0040 - 0.0098 in)

Limit : 0.30 mm (0.0120 in)

- If the measured value exceeds the limit, replace thrust bearings, and measure again. If it still exceeds the limit, replace crankshaft also.


PBIC2953E

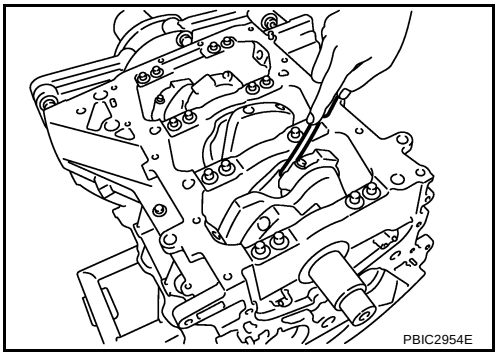
CONNECTING ROD SIDE CLEARANCE

- Measure the side clearance between connecting rod and crankshaft arm with feeler gauge.

Standard : 0.20 - 0.35 mm (0.0080 - 0.0138 in)

Limit : 0.40 mm (0.0160 in)

- If the measured value exceeds the limit, replace connecting rod, and measure again. If it still exceeds the limit, replace crankshaft also.

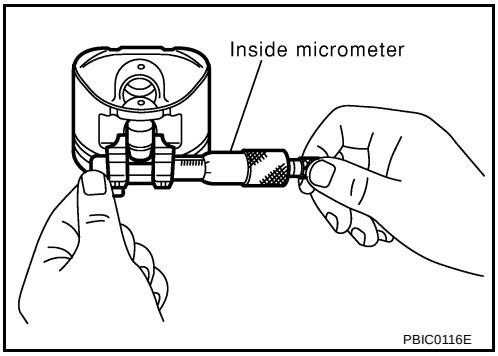

PBIC2954E

PISTON TO PISTON PIN OIL CLEARANCE

Piston Pin Hole Diameter

Measure the inner diameter of piston pin hole with inside micrometer.

Standard : 21.993 - 22.005 mm (0.8659 - 0.8663 in)

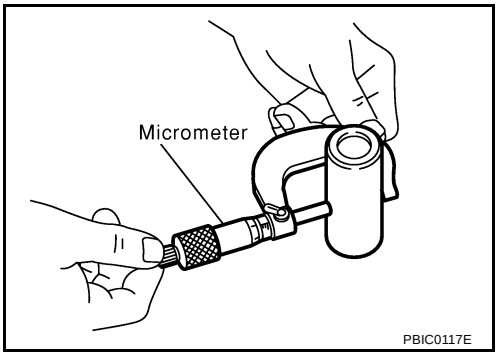


PBIC0116E

Piston Pin Outer Diameter

Measure the outer diameter of piston pin with micrometer.

Standard : 21.989 - 22.001 mm (0.8657 - 0.8662 in)



PBIC0117E

Piston to Piston Pin Oil Clearance

(Piston to piston pin oil clearance) = (Piston pin hole diameter) – (Piston pin outer diameter)

Standard : 0.002 - 0.006 mm (0.0001 - 0.0002 in)

- If the calculated value is out of the standard, replace piston and piston pin assembly.

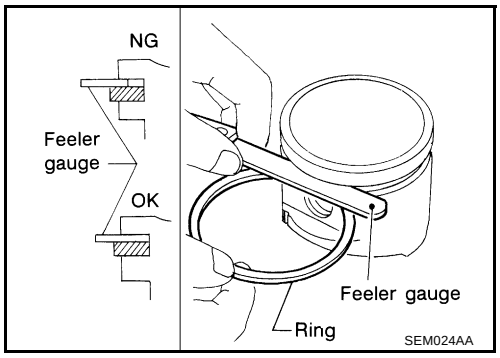
- When replacing piston and piston pin assembly, refer to EM-119, "HOW TO SELECT PISTON" .

NOTE:

- Piston is available together with piston pin as assembly.
- Piston pin (piston pin hole) grade is provided only for the parts installed at the plant. For service parts, no piston pin grades can be selected. (Only “0” grade is available.)

PISTON RING SIDE CLEARANCE

- Measure the side clearance of piston ring and piston ring groove with feeler gauge.



Standard:

Top ring	**: 0.040 - 0.080 mm (0.0016 - 0.0031 in)**
2nd ring	**: 0.030 - 0.070 mm (0.0012 - 0.0028 in)**
Oil ring	**: 0.055 - 0.155 mm (0.0022 - 0.0061 in)**

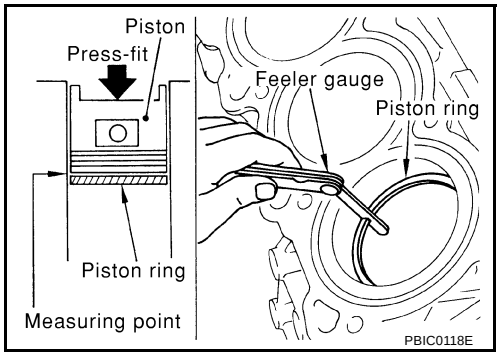
Limit

Top ring	**: 0.11 mm (0.0043 in)**
2nd ring	**: 0.10 mm (0.0040 in)**
Oil ring	**: 0.19 mm (0.0075 in)**

- If the measured value exceeds the limit replace piston ring, and measure again. If it still exceeds the limit replace piston also.

PISTON RING END GAP

- Make sure that cylinder bore inner diameter is within the specification. Refer to EM-129, "Cylinder Bore Inner Diameter" .
- Lubricate with new engine oil to piston and piston ring, and then insert piston ring until middle of cylinder with piston, and measure the piston ring end gap with feeler gauge.



Standard:

Top ring	**: 0.23 - 0.33 mm (0.0091 - 0.0130 in)**
2nd ring	**: 0.33 - 0.48 mm (0.0130 - 0.0189 in)**
Oil ring	**: 0.17 - 0.47 mm (0.0067 - 0.0185 in)**

Limit:

Top ring	**: 0.42 mm (0.0165 in)**
2nd ring	**: 0.57 mm (0.0224 in)**
Oil ring	**: 0.63 mm (0.0248 in)**

- If the measured value exceeds the limit, replace piston ring, and measure again. If it still exceeds the limit, re-bore cylinder and use oversize piston and piston rings.

CONNECTING ROD BEND AND TORSION

- Check with connecting rod aligner.

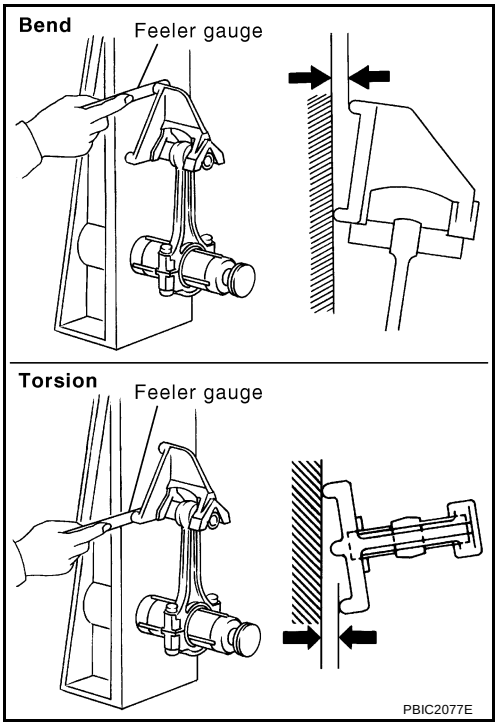
Bend:

Limit: 0.15 mm (0.0059 in) per 100 mm (3.94 in) length

Torsion:

Limit: 0.30 mm (0.0120 in) per 100 mm (3.94 in) length

- If it exceeds the limit, replace connecting rod assembly.

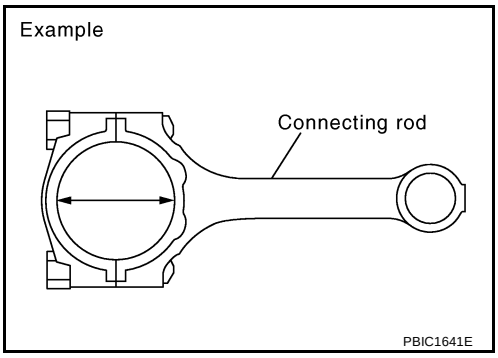


CONNECTING ROD BIG END DIAMETER

- Install connecting rod bearing cap without installing connecting rod bearing, and tightening connecting rod bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of connecting rod big end with inside micrometer.

Standard : 57.000 - 57.013 mm (2.2441 - 2.2446 in)

- If out of the standard, replace connecting rod assembly.

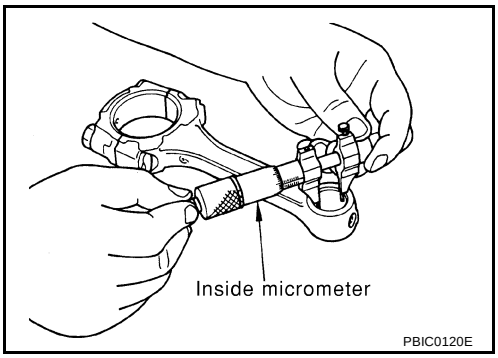


CONNECTING ROD BUSHING OIL CLEARANCE

Connecting Rod Bushing Inner Diameter

Measure the inner diameter of connecting rod bushing with inside micrometer.

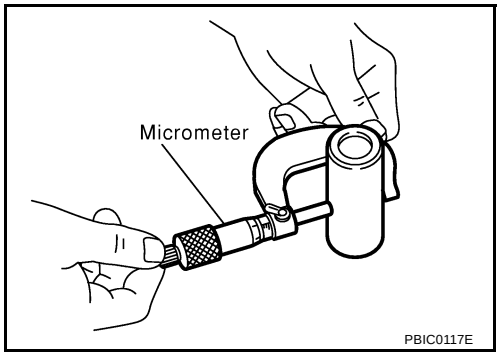
Standard : 22.000 - 22.012 mm (0.8661 - 0.8666 in)



Piston Pin Outer Diameter

Measure the outer diameter of piston pin with micrometer.

Standard : 21.989 - 22.001 mm (0.8657 - 0.8662 in)



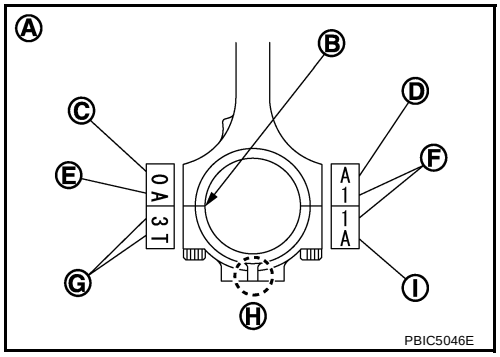
Connecting Rod Bushing Oil Clearance

(Connecting rod bushing oil clearance) = (Connecting rod bushing inner diameter) – (Piston pin outer diameter)

Standard : 0.005 - 0.017 mm (0.0002 - 0.0007 in)

Limit : 0.030 mm (0.0012 in)

- If the measured value exceeds the limit, replace connecting rod assembly and/or piston and piston pin assembly.
- If replacing piston and piston pin assembly, refer to EM-119, "HOW TO SELECT PISTON" .
- If replacing connecting rod assembly, refer to EM-131, "CONNECTING ROD BEARING OIL CLEARANCE" to select the connecting rod bearing.

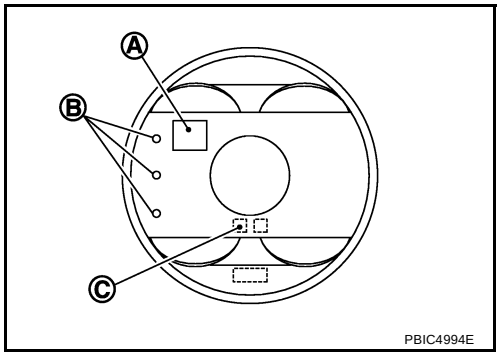


A : Sample code
B : Bearing stopper groove
C : Small end diameter grade
D : Big end diameter grade
E : Weight grade
F : Cylinder No.
G : Management code
H : Front mark
I : Management code

Factory installed parts grading:

- Service parts apply only to grade “0”.

A : Piston grade number
B : Front mark
C : Piston pin grade number



Unit: mm (in)

Grade	0	1
Connecting rod bushing inner diameter *	22.000 - 22.006 (0.8661 - 0.8664)	22.006 - 22.012 (0.8664 - 0.8666)
Piston pin hole diameter	21.993 - 21.999 (0.8659 - 0.8661)	21.999 - 22. 005 (0.8661 - 0.8663)
Piston pin outer diameter	21.989 - 21.995 (0.8657- 0.8659)	21.995 - 22.001 (0.8659 - 0.8662)

*: After installing in connecting rod

CYLINDER BLOCK DISTORTION

- Using scraper, remove gasket on the cylinder block surface, and also remove engine oil, scale, carbon, or other contamination.

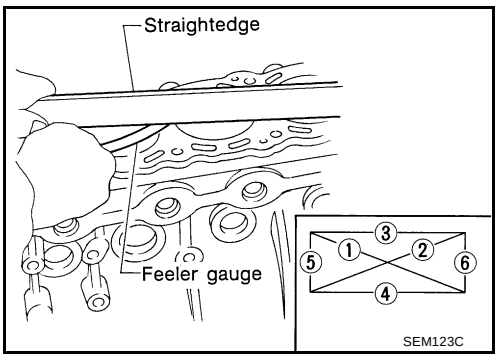
CAUTION:

Be careful not to allow gasket flakes to enter engine oil or engine coolant passages.

- Measure the distortion on the cylinder block upper face at some different points in six directions with straightedge and feeler gauge.

  Limit : 0.1 mm (0.004 in)

- If it exceeds the limit, replace cylinder block.



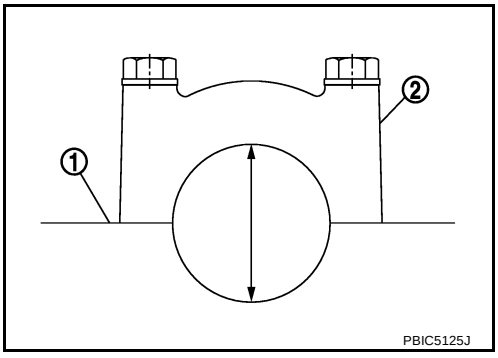
MAIN BEARING HOUSING INNER DIAMETER

- Install lower cylinder block (2) without installing main bearings, and tighten lower cylinder block bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of main bearing housing with bore gauge.

  Standard : 69.993 - 70.017 mm (2.7556 - 2.7566 in)

- If out of the standard, replace cylinder block (1) and lower cylinder block (2) as assembly.

  NOTE:
  Cylinder block cannot be replaced as a single part, because it is machined together with lower cylinder block.

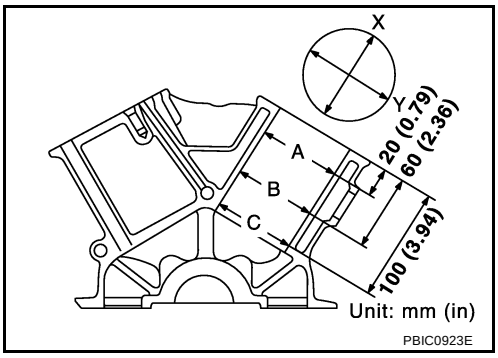


PISTON TO CYLINDER BORE CLEARANCE

Cylinder Bore Inner Diameter

- Using bore gauge, measure cylinder bore for wear, out-of-round and taper at six different points on each cylinder. (“X” and “Y” directions at “A”, “B” and “C”) (“X” is in longitudinal direction of engine)

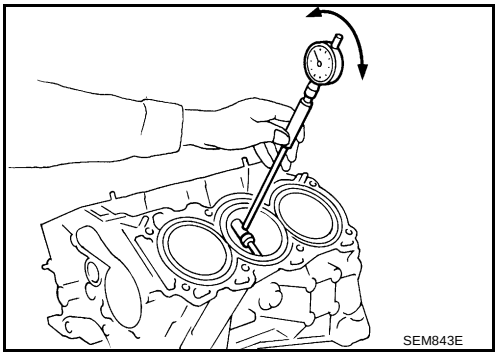
  Standard inner diameter:
  95.500 - 95.530 mm (3.7598 - 3.7610 in)
  Wear limit:
  0.2 mm (0.008 in)
  Out-of-round (Difference between “X” and “Y”):
  0.015 mm (0.0006 in)
  Taper limit (Difference between “A” and “C”):
  0.01 mm (0.0004 in)



- If the measured value exceeds the limit, or if there are scratches and/or seizure on the cylinder inner wall, hone or re-bore the inner wall.
- Oversize piston is provided. When using oversize piston, re-bore cylinder so that the clearance of the piston-to-cylinder bore satisfies the standard.

  CAUTION:
  When using oversize piston, use over size pistons for all cylinders with oversize piston rings.

  Oversize (OS) : 0.2 mm (0.008 in)



Piston Skirt Diameter

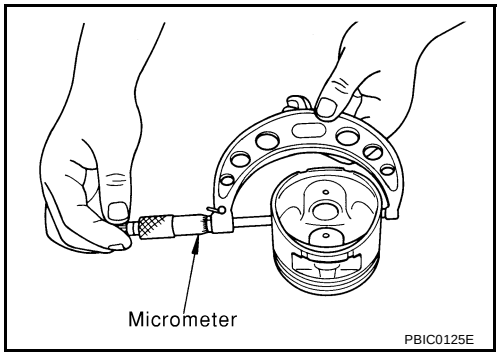
Measure the outer diameter of piston skirt with micrometer.

Measure point

: Distance from the top 38.8 mm (1.528 in)

Standard

: 95.480 - 95.510 mm (3.7590 - 3.7602 in)



Piston to Cylinder Bore Clearance

Calculate by piston skirt diameter and cylinder bore inner diameter (direction “Y”, position “B”).
(Clearance) = (Cylinder bore inner diameter) – (Piston skirt diameter).

Standard : 0.010 - 0.030 mm (0.0004 - 0.0012 in)

Limit : 0.08 mm (0.0031 in)

- If calculated value exceeds the limit, replace piston and piston pin assembly. Refer to EM-119, "HOW TO SELECT PISTON" .

Re-boring Cylinder Bore

1. Cylinder bore size is determined by adding piston to cylinder bore clearance to piston skirt diameter.

   Re-bored size calculation: D = A + B – C

   where,

   D: Bored diameter

   A: Piston skirt diameter as measured

   B: Piston to cylinder bore clearance (standard value)

   C: Honing allowance 0.02 mm (0.0008 in)

2. Install lower cylinder block, and tighten to the specified torque. Otherwise, cylinder bores may be distorted in final assembly.
3. Cut cylinder bores.

   NOTE:
   - When any cylinder needs boring, all other cylinders must also be bored.
   - Do not cut too much out of cylinder bore at a time. Cut only 0.05 mm (0.0020 in) or so in diameter at a time.
4. Hone cylinders to obtain the specified piston to cylinder bore clearance.
5. Measure finished cylinder bore for the out-of-round and taper.

   NOTE:
   Measurement should be done after cylinder bore cools down.

CRANKSHAFT MAIN JOURNAL DIAMETER

- Measure the outer diameter of crankshaft main journals with micrometer.

  Standard : 64.951 - 64.975 mm (2.5571 - 2.5581 in) dia.

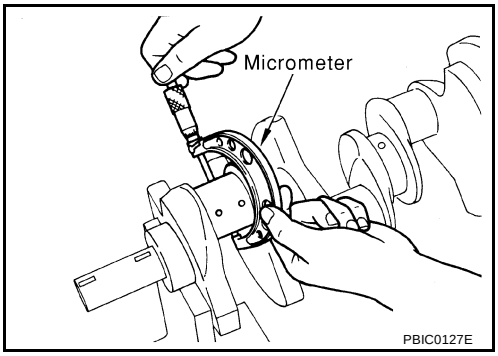
- If out of the standard, measure the main bearing oil clearance. Then use undersize bearing. Refer to EM-132, "MAIN BEARING OIL CLEARANCE" .

CRANKSHAFT PIN JOURNAL DIAMETER

- Measure the outer diameter of crankshaft pin journal with micrometer.

Standard : 53.956 - 53.974 mm (2.1242 - 2.1250 in) dia.

- If out of the standard, measure the connecting rod bearing oil clearance. Then use undersize bearing. Refer to EM-131, "CONNECTING ROD BEARING OIL CLEARANCE" .



CRANKSHAFT OUT-OF-ROUND AND TAPER

- Measure the dimensions at four different points as shown in the figure on each main journal and pin journal with micrometer.
- Out-of-round is indicated by the difference in the dimensions between “X” and “Y” at “A” and “B”.
- Taper is indicated by the difference in the dimensions between “A” and “B” at “X” and “Y”.

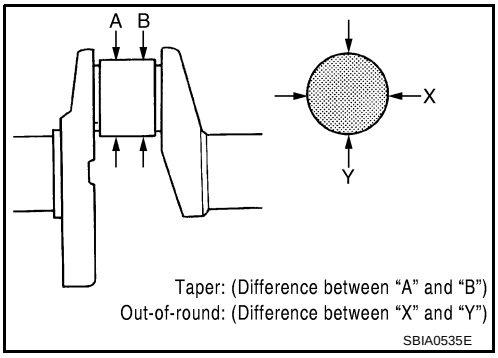
Limit:

Out-of-round (Difference between “X” and “Y”)

: 0.0025 mm (0.0001 in)

Taper (Difference between “A” and “B”)

: 0.0025 mm (0.0001 in)



- If the measured value exceeds the limit, correct or replace crankshaft.
- If corrected, measure the bearing oil clearance of the corrected main journal and/or pin journal. Then select the main bearing and/or connecting rod bearing. Refer to EM-132, "MAIN BEARING OIL CLEARANCE" and/or EM-131, "CONNECTING ROD BEARING OIL CLEARANCE" .

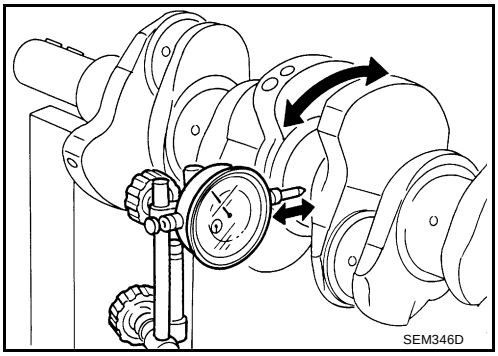
CRANKSHAFT RUNOUT

- Place V-block on precise flat table, and support the journals on the both end of crankshaft.
- Place dial indicator straight up on the No. 3 journal.
- While rotating crankshaft, read the movement of the pointer on dial indicator. (Total indicator reading)

Standard : Less than 0.05 mm (0.0020 in)

Limit : 0.10 mm (0.004 in)

- If it exceeds the limit, replace crankshaft.



CONNECTING ROD BEARING OIL CLEARANCE

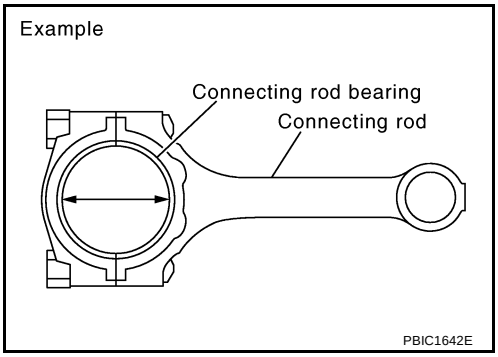
Method by Calculation

- Install connecting rod bearings to connecting rod and cap, and tighten connecting rod bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of connecting rod bearing with inside micrometer.

(Bearing oil clearance) = (Connecting rod bearing inner diameter) – (Crankshaft pin journal diameter)

Standard : 0.040 - 0.053 mm (0.0016 - 0.0021 in) (actual clearance)

Limit : 0.070 mm (0.0028 in)



- If the calculated value exceeds the limit, select proper connecting rod bearing according to connecting rod big end diameter and crankshaft pin journal diameter to obtain the specified bearing oil clearance. Refer to EM-120, "HOW TO SELECT CONNECTING ROD BEARING" .

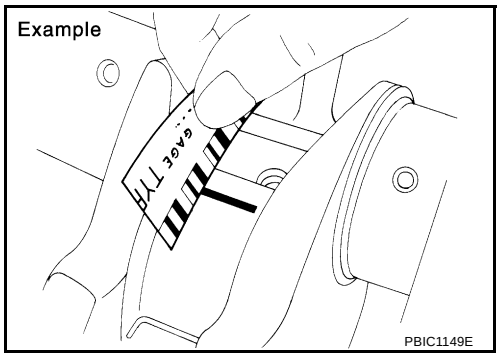
Method of Using Plastigage

- Remove oil and dust on crankshaft pin journal and the surfaces of each bearing completely.
- Cut plastigage slightly shorter than the bearing width, and place it in crankshaft axial direction, avoiding oil holes.
- Install connecting rod bearings to connecting rod and cap, and tighten connecting rod bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.

  CAUTION:
  Do not rotate crankshaft.

- Remove connecting rod bearing cap and bearing, and using scale on plastigage bag, measure the plastigage width.

  NOTE:
  The procedure when the measured value exceeds the limit is same as that described in the “Method by Calculation”.



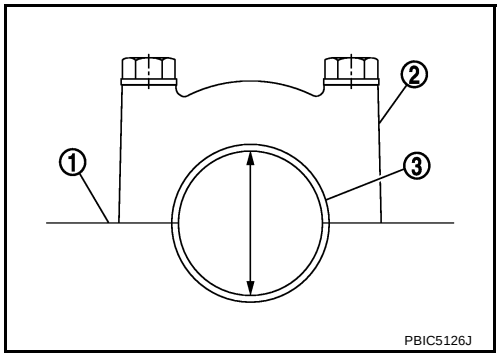
MAIN BEARING OIL CLEARANCE

Method by Calculation

- Install main bearings (3) to cylinder block (1) and lower cylinder block (2), and tighten lower cylinder block bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of main bearing with bore gauge.

(Bearing clearance) = (Main bearing inner diameter) – (Crankshaft main journal diameter)

Standard	**:**	**0.035 - 0.045 mm (0.0014 - 0.0018 in) (actual clearance)**
Limit	**:**	**0.065 mm (0.0026 in)**



- If the clearance exceeds the limit, select proper main bearing according to main bearing inner diameter and crankshaft main journal diameter to obtain the specified bearing oil clearance. Refer to EM-122, "HOW TO SELECT MAIN BEARING" .

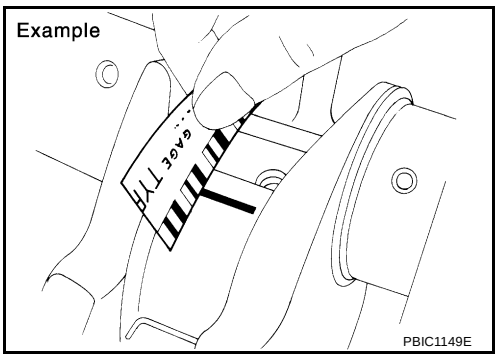
Method of Using Plastigage

- Remove oil and dust on crankshaft main journal and the surfaces of each bearing completely.
- Cut plastigage slightly shorter than the bearing width, and place it in crankshaft axial direction, avoiding oil holes.
- Install main bearings to cylinder block and lower cylinder block, and tighten lower cylinder block bolts with lower cylinder block to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.

  CAUTION:
  Do not rotate crankshaft.

- Remove lower cylinder block and bearings, and using scale on plastigage bag, measure the plastigage width.

  NOTE:
  The procedure when the measured value exceeds the limit is same as that described in the “Method by Calculation”.

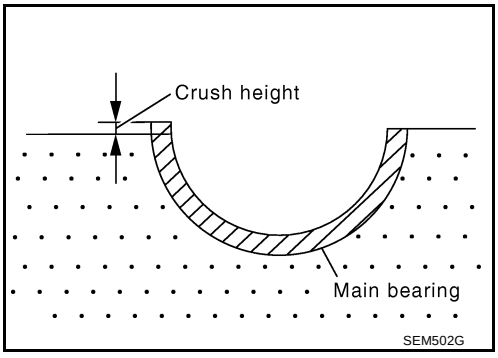


CRUSH HEIGHT OF MAIN BEARING

- When lower cylinder block is removed after being tightened to the specified torque with main bearings installed, the tip end of bearing must protrude. Refer to EM-111, "ASSEMBLY" for the tightening procedure.

  Standard : There must be crush height.

- If the standard is not met, replace main bearings.

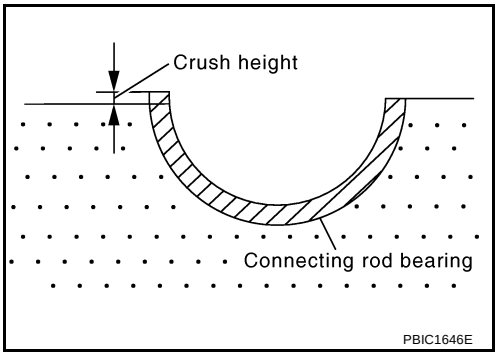


CRUSH HEIGHT OF CONNECTING ROD BEARING

- When connecting rod bearing cap is removed after being tightened to the specified torque with connecting rod bearings installed, the tip end of bearing must protrude. Refer to EM-111, "ASSEMBLY" for the tightening procedure.

  Standard : There must be crush height.

- If the standard is not met, replace connecting rod bearings.

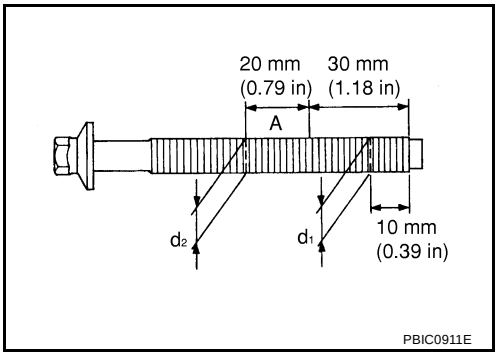


LOWER CYLINDER BLOCK BOLT OUTER DIAMETER

- Measure the outer diameters (“d_1 ”, “d_2 ”) at two positions as shown in the figure.
- If reduction appears in “A” range, regard it as “d_2 ”.

  Limit (“d_1 ” – “d_2 ”) : 0.11 mm (0.0043 in)

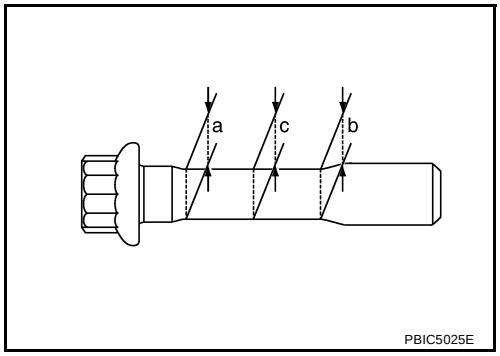
- If it exceeds the limit (large difference in dimensions), replace lower cylinder block bolt with new one.



CONNECTING ROD BOLT OUTER DIAMETER

- Measure the outer diameter (“a”, “b” and “c”) at the position shown in the figure.

  a : Value at the end of the smaller diameter of the bolt
  b : Value at the end of the smaller diameter of the bolt (opposite side “a”)
  c : Value of the smallest diameter of the smaller of the bolt



- Obtain a mean value (d) of (a) and (b).
- Subtract (c) from (d).

Limit (“d” – “c”) : 0.09 mm (0.0035 in)

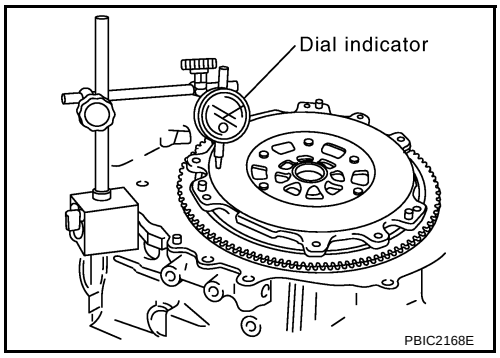
- If it exceeds the limit (large difference in dimensions), replace the bolt with new one.

FLYWHEEL DEFLECTION (M/T MODELS)

- Measure the deflection of flywheel contact surface to clutch with dial indicator.
- Measure the deflection at 210 mm (8.27 in) dia.

Standard : 0.45 mm (0.0177 in) or less

- If the measured value is out of the standard, replace flywheel.



MOVEMENT AMOUNT OF FLYWHEEL (M/T MODELS)

CAUTION:
Do not disassemble double mass flywheel.

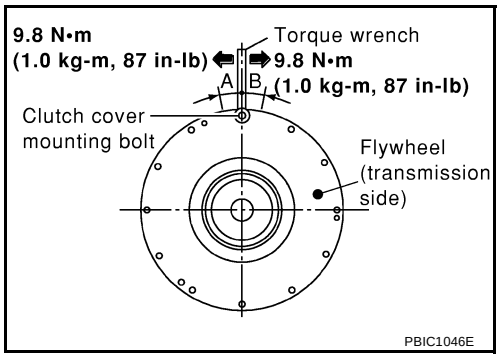
Movement Amount of Radial (Rotation) Direction

Check the movement amount of radial (rotation) direction as follows:

1. Install bolt to clutch cover mounting hole, and place a torque wrench on the extended line of the flywheel center line.
   - Tighten bolt at a force of 9.8 N·m (1.0 kg-m, 87 in-lb) to keep it from loosening.
2. Put a mating mark on circumferences of the two flywheel masses without applying any load (Measurement standard points).
3. Apply a force of 9.8 N·m (1.0 kg-m, 87 in-lb) in each direction, and mark the movement amount on the mass on the transmission side.
4. Measure dimensions of movement amounts “A” and “B” on circumference of flywheel on the transmission side.

Standard : 24 mm (0.94 in) or less

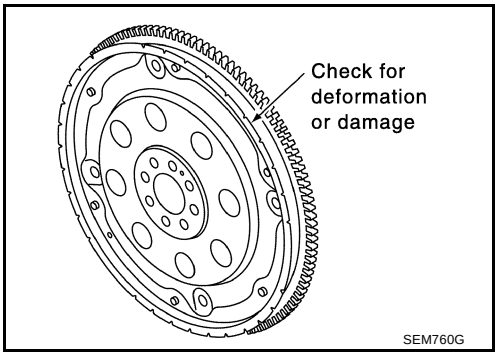
- If the measured value is out of the standard, replace flywheel.



DRIVE PLATE (A/T MODELS)

- Check drive plate and signal plate for deformation or cracks.

  CAUTION:
  - **Do not disassemble drive plate.**
  - **Do not place drive plate with signal plate facing down.**
  - **When handling signal plate, take care not to damage or scratch it.**
  - **Handle signal plate in a manner that prevents it from becoming magnetized.**
- If anything is found, replace drive plate.

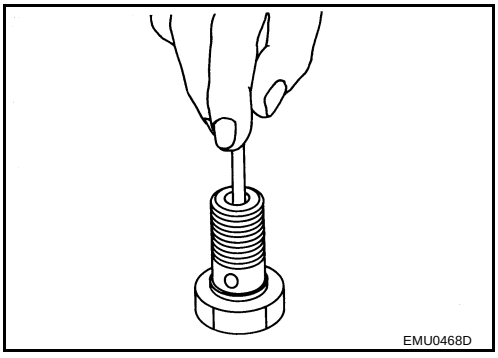


OIL JET

- Check nozzle for deformation and damage.
- Blow compressed air from nozzle, and check for clogs.
- If it is not satisfied, clean or replace oil jet.

OIL JET RELIEF VALVE

- Using clean plastic stick, press check valve in oil jet relief valve. Make sure that valve moves smoothly with proper reaction force.
- If it is not satisfied, replace oil jet relief valve.



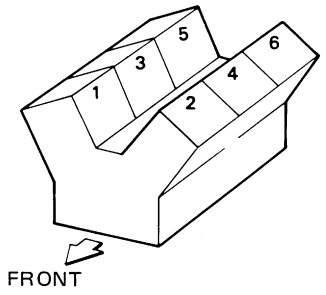
SERVICE DATA AND SPECIFICATIONS (SDS)

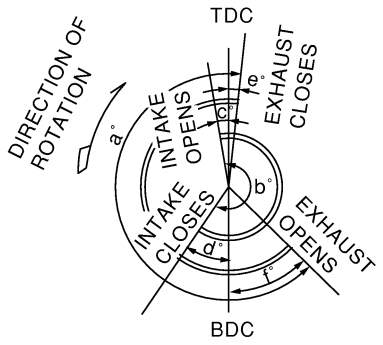
PFP:00100

Standard and Limit

NBS00016

GENERAL SPECIFICATIONS

Cylinder arrangement		V-6
Displacement cm^3 (cu in)		3,498 (213.45)
Bore and stroke mm (in)		95.5 x 81.4 (3.76 x 3.205)
Valve arrangement		DOHC
Firing order		1-2-3-4-5-6
Number of piston rings	Compression	2
	Oil	1
Number of main bearings		4
Compression ratio		10.6
Compression pressure kPa (kg/cm^2 , psi)/300 rpm	Standard	1,275 (13.0, 185)
	Minimum	981 (10.0, 142)
	Differential limit between cylinders	98 (1.0, 14)
Cylinder number	 SEM713A	

Valve timing (Intake valve timing control - “OFF”)	 PBIC0187E

Unit: degree

a	b	c	d	e	f
248	248	2	66	0	68

INTAKE MANIFOLD COLLECTOR, INTAKE MANIFOLD AND EXHAUST MANIFOLD

Unit: mm (in)

Items		Limit
Surface distortion	Intake manifold collector	0.1 (0.004)
	Intake manifold	0.1 (0.004)
	Exhaust manifold	0.3 (0.012)

SPARK PLUG

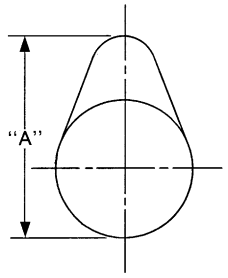
Unit: mm (in)

Make	DENSO
Standard type	FXE22HR11
Gap (Nominal)	1.1 (0.043)

CAMSHAFT AND CAMSHAFT BEARING

Unit: mm (in)

Items		Standard	Limit
Camshaft journal oil clearance	No. 1	0.045 - 0.086 (0.0018 - 0.0034)	0.15 (0.0059)
	No. 2, 3, 4	0.035 - 0.076 (0.0014 - 0.0030)	
Camshaft bracket inner diameter	No. 1	26.000 - 26.021 (1.0236 - 1.0244)	—
	No. 2, 3, 4	23.500 - 23.521 (0.9252 - 0.9260)	—
Camshaft journal diameter	No. 1	25.935 - 25.955 (1.0211 - 1.0218)	—
	No. 2, 3, 4	23.445 - 23.465 (0.9230 - 0.9238)	—
Camshaft end play		0.115 - 0.188 (0.0045 - 0.0074)	0.24 (0.0094)
Camshaft cam height “A”	Intake	45.865 - 46.055 (1.8057 - 1.8132)	0.2 (0.008)*1
	Exhaust	45.875 - 46.065 (1.8061 - 1.8136)	
Camshaft runout (TIR*2)		Less than 0.02 (0.0008)	0.05 (0.0020)
Camshaft sprocket runout (TIR*2)		—	0.15 (0.0059)



SEM671

*1 : Cam wear limit

*2 : Total indicator reading

Valve Lifter

Unit: mm (in)

Items	Standard
Valve lifter outer diameter	33.980 - 33.990 (1.3378 - 1.3382)
Valve lifter hole diameter	34.000 - 34.016 (1.3386 - 1.3392)
Valve lifter clearance	0.010 - 0.036 (0.0004 - 0.0014)

Valve Clearance

Unit: mm (in)

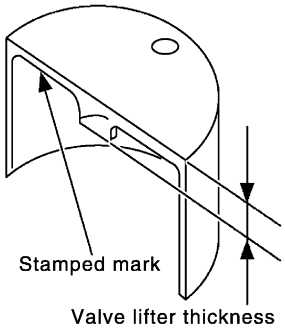
Items	Cold	Hot* (reference data)
Intake	0.26 - 0.34 (0.010 - 0.013)	0.304 - 0.416 (0.012 - 0.016)
Exhaust	0.29 - 0.37 (0.011 - 0.015)	0.308 - 0.432 (0.012 - 0.017)

*: Approximately 80°C (176°F)

Available Valve Lifter

Unit: mm (in)

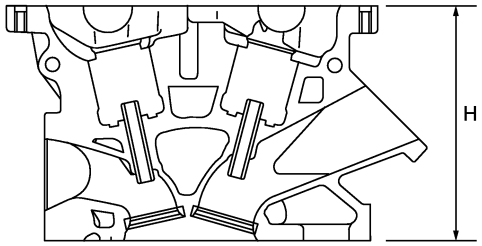
Identification (stamped) mark	Thickness
788T	7.88 (0.3102)
790T	7.90 (0.3110)
792T	7.92 (0.3118)
794T	7.94 (0.3126)
796T	7.96 (0.3134)
798T	7.98 (0.3142)
800T	8.00 (0.3150)
802T	8.02 (0.3157)
804T	8.04 (0.3165)
806T	8.06 (0.3173)
808T	8.08 (0.3181)
810T	8.10 (0.3189)
812T	8.12 (0.3197)
814T	8.14 (0.3205)
816T	8.16 (0.3213)
818T	8.18 (0.3220)
820T	8.20 (0.3228)
822T	8.22 (0.3236)
824T	8.24 (0.3244)
826T	8.26 (0.3252)
828T	8.28 (0.3260)
830T	8.30 (0.3268)
832T	8.32 (0.3276)
834T	8.34 (0.3283)
836T	8.36 (0.3291)
838T	8.38 (0.3299)
840T	8.40 (0.3307)



CYLINDER HEAD

Unit: mm (in)

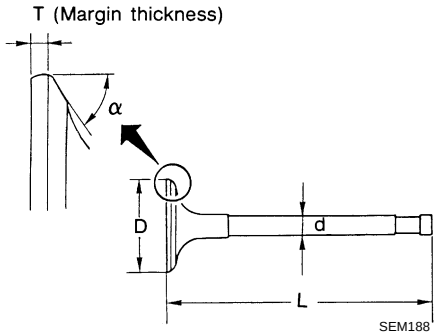
Items	Standard	Limit
Head surface distortion	Less than 0.03 (0.0012)	0.1 (0.004)
Normal cylinder head height “H”	126.3 - 126.5 (4.972 - 4.980)	—



PBIC0924E

Valve Dimensions

Unit: mm (in)

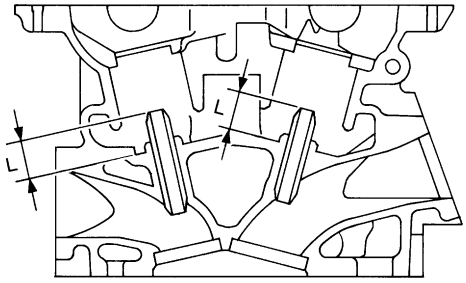


SEM188

Valve head diameter “D”	Intake	36.6 - 36.9 (1.441 - 1.453)
	Exhaust	30.2 - 30.5 (1.189 - 1.201)
Valve length “L”	Intake	97.13 (3.8240)
	Exhaust	94.67 (3.7272)
Valve stem diameter “d”	Intake	5.965 - 5.980 (0.2348 - 0.2354)
	Exhaust	5.962 - 5.970 (0.2347 - 0.2350)
Valve seat angle “α”	Intake	45°15′ - 45°45′
	Exhaust	
Valve margin “T”	Intake	1.1 (0.043)
	Exhaust	1.3 (0.051)
Valve margin “T” limit		0.5 (0.020)
Valve stem end surface grinding limit		0.2 (0.008)

Valve Guide

Unit: mm (in)

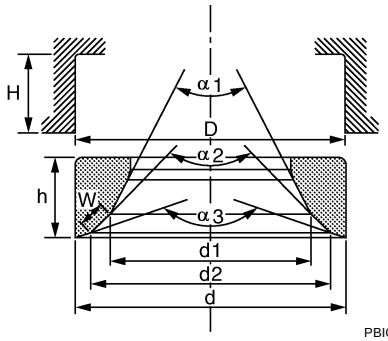


SEM950E

Items		Standard	Oversize (Service) [0.2 (0.008)]
Valve guide	Outer diameter	10.023 - 10.034 (0.3946 - 0.3950)	10.223 - 10.234 (0.4025 - 0.4029)
	Inner diameter (Finished size)	6.000 - 6.018 (0.2362 - 0.2369)	
Cylinder head valve guide hole diameter		9.975 - 9.996 (0.3927 - 0.3935)	10.175 - 10.196 (0.4006 - 0.4014)
Interference fit of valve guide		0.027 - 0.059 (0.0011 - 0.0023)	
Items		Standard	Limit
Valve guide clearance	Intake	0.020 - 0.053 (0.0008 - 0.0021)	0.08 (0.0031)
	Exhaust	0.030 - 0.056 (0.0012 - 0.0022)	0.09 (0.0035)
Projection length “L”		12.6 - 12.8 (0.496 - 0.504)	

Valve Seat

Unit: mm (in)



PBIC2745E

Items		Standard	Oversize (Service) [0.5 (0.02)]
Cylinder head seat recess diameter “D”	Intake	38.000 - 38.016 (1.4961 - 1.4967)	38.500 - 38.516 (1.5157 - 1.5164)
	Exhaust	31.600 - 31.616 (1.2441 - 1.2447)	32.100 - 32.116 (1.2638 - 1.2644)
Valve seat outer diameter “d”	Intake	38.097 - 38.113 (1.4999 - 1.5005)	38.597 - 38.613 (1.5196 - 1.5202)
	Exhaust	31.680 - 31.696 (1.2472 - 1.2479)	32.180 - 32.196 (1.2669 - 1.2676)
Valve seat interference fit	Intake	0.081 - 0.113 (0.0032 - 0.0044)	
	Exhaust	0.064 - 0.096 (0.0025 - 0.0038)	
Diameter “d1”*1	Intake	34.6 (1.36)	
	Exhaust	27.7 (1.091)	
Diameter “d2”*2	Intake	35.9 - 36.4 (1.413 - 1.433)	
	Exhaust	29.3 - 29.8 (1.154 - 1.173)	
Angle “α1”	Intake	60°	
	Exhaust	60°	
Angle “α2”	Intake	88°45′ - 90°15′	
	Exhaust	88°45′ - 90°15′	
Angle “α3”	Intake	120°	
	Exhaust	120°	
Contacting width “W”*3	Intake	1.0 - 1.4 (0.039 - 0.055)	
	Exhaust	1.2 - 1.6 (0.047 - 0.063)	
Height “h”	Intake	5.9 - 6.0 (0.232 - 0.236)	5.05 - 5.15 (0.1988 - 0.2028)
	Exhaust	5.9 - 6.0 (0.232 - 0.236)	4.95 - 5.05 (0.1949 - 0.1988)
Depth “H”		6.0 (0.236)	

*1 : Diameter made by intersection point of conic angles “α1” and “α2”

*2 : Diameter made by intersection point of conic angles “α2” and “α3”

*3 : Machining data

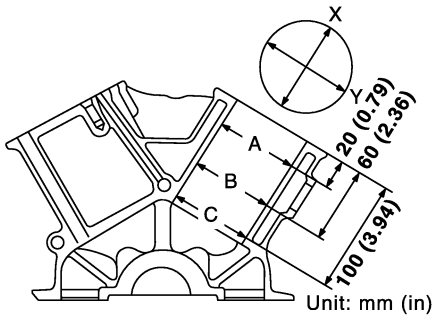
Valve Spring

Unit: mm (in)

Items	
Free height	43.85 (1.7264)
Installation height	37.00 (1.4567)
Installation load	166 - 188 N (16.9 - 19.2 kg, 37 - 42 lb)
Height during valve open	26.8 (1.0551)
Load with valve open	502 - 566 N (51.2 - 57.7 kg, 113 - 127 lb)
squareness	1.9 (0.075)

CYLINDER BLOCK

Unit: mm (in)



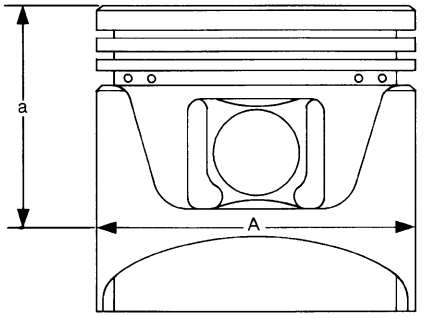
PBIC0923E

Surface distortion		Standard		Less than 0.03 (0.0012)
		Limit		0.1 (0.004)
Main bearing housing inner diameter		Standard		69.993 - 70.017 (2.7556 - 2.7566)
Cylinder bore	Inner diameter	Standard	Grade No. 1	95.500 - 95.510 (3.7598 - 3.7602)
			Grade No. 2	95.510 - 95.520 (3.7602 - 3.7606)
			Grade No. 3	95.520 - 95.530 (3.7606 - 3.7610)
		Wear limit		0.2 (0.008)
Out-of-round (Difference between “X” and “Y”)		Limit		0.015 (0.0006)
Taper (Difference between “A” and “C”)				0.01 (0.0004)
Main bearing housing inner diameter (Without bearing)			Grade No. A	69.993 - 69.994 (2.7556 - 2.7557)
			Grade No. B	69.994 - 69.995 (2.7557 - 2.7557)
			Grade No. C	69.995 - 69.996 (2.7557 - 2.7557)
			Grade No. D	69.996 - 69.997 (2.7557 - 2.7558)
			Grade No. E	69.997 - 69.998 (2.7558 - 2.7558)
			Grade No. F	69.998 - 69.999 (2.7558 - 2.7559)
			Grade No. G	69.999 - 70.000 (2.7559 - 2.7559)
			Grade No. H	70.000 - 70.001 (2.7559 - 2.7559)
			Grade No. J	70.001 - 70.002 (2.7559 - 2.7560)
			Grade No. K	70.002 - 70.003 (2.7560 - 2.7560)
			Grade No. L	70.003 - 70.004 (2.7560 - 2.7561)
			Grade No. M	70.004 - 70.005 (2.7561 - 2.7561)
			Grade No. N	70.005 - 70.006 (2.7561 - 2.7561)
			Grade No. P	70.006 - 70.007 (2.7561 - 2.7562)
			Grade No. R	70.007 - 70.008 (2.7562 - 2.7562)
			Grade No. S	70.008 - 70.009 (2.7562 - 2.7563)
			Grade No. T	70.009 - 70.010 (2.7563 - 2.7563)
			Grade No. U	70.010 - 70.011 (2.7563 - 2.7563)
			Grade No. V	70.011 - 70.012 (2.7563 - 2.7564)
			Grade No. W	70.012 - 70.013 (2.7564 - 2.7564)
			Grade No. X	70.013 - 70.014 (2.7564 - 2.7565)
			Grade No. Y	70.014 - 70.015 (2.7565 - 2.7565)
			Grade No. 4	70.015 - 70.016 (2.7565 - 2.7565)
			Grade No. 7	70.016 - 70.017 (2.7565 - 2.7566)
Difference in inner diameter between cylinders		Standard		Less than 0.03 (0.0012)

PISTON, PISTON RING AND PISTON PIN

Available Piston

Unit: mm (in)



SEM882E

Items		Standard	Oversize (Service) [0.20 (0.008)]
"a" dimension		38.8 (1.528)	
Piston skirt diameter "A"	Grade No. 1	95.480 - 95.490 (3.7590 - 3.7594)	—
	Grade No. 2	95.490 - 95.500 (3.7594 - 3.7598)	—
	Grade No. 3	95.500 - 95.510 (3.7598 - 3.7602)	—
	Service	—	95.680 - 95.710 (3.7669 - 3.7681)
Items		Standard	Limit
Piston pin hole diameter	Grade No. 0	21.993 - 21.999 (0.8659 - 0.8661)	—
	Grade No. 1	21.999 - 22.005 (0.8661 - 0.8663)	—
Piston to cylinder bore clearance		0.010 - 0.030 (0.0004 - 0.0012)	0.08 (0.0031)

Piston Ring

Unit: mm (in)

Items		Standard	Limit
Side clearance	Top	0.040 - 0.080 (0.0016 - 0.0031)	0.11 (0.0043)
	2nd	0.030 - 0.070 (0.0012 - 0.0028)	0.10 (0.004)
	Oil ring	0.055 - 0.155 (0.0022 - 0.0061)	—
End gap	Top	0.23 - 0.33 (0.0091 - 0.0130)	0.42 (0.0165)
	2nd	0.33 - 0.48 (0.0130 - 0.0189)	0.57 (0.0224)
	Oil (rail ring)	0.17 - 0.47 (0.0067 - 0.0185)	0.63 (0.0248)

Piston Pin

Unit: mm (in)

Items		Standard	Limit
Piston pin outer diameter	Grade No. 0	21.989 - 21.995 (0.8657 - 0.8659)	—
	Grade No. 1	21.995 - 22.001 (0.8659 - 0.8662)	—
Piston to piston pin oil clearance		0.002 - 0.006 (0.0001 - 0.0002)	—
Connecting rod bushing oil clearance		0.005 - 0.017 (0.0002 - 0.0007)	0.030 (0.0012)

CONNECTING ROD

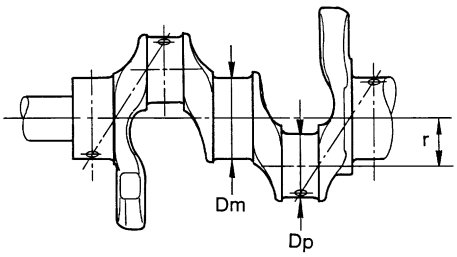
Unit: mm (in)

Items		Standard	Limit
Center distance		144.15 - 144.25 (5.6752 - 5.6791)	—
Bend [per 100 (3.94)]		—	0.15 (0.0059)
Torsion [per 100 (3.94)]		—	0.30 (0.0120)
Connecting rod bushing inner diameter*	Grade No. 0	22.000 - 22.006 (0.8661 - 0.8664)	—
	Grade No. 1	22.006 - 22.012 (0.8664 - 0.8666)	—
Connecting rod big end diameter (Without bearing)		57.000 - 57.013 (2.2441 - 2.2446)	—
Side clearance		0.20 - 0.35 (0.0080 - 0.0138)	0.40 (0.0160)

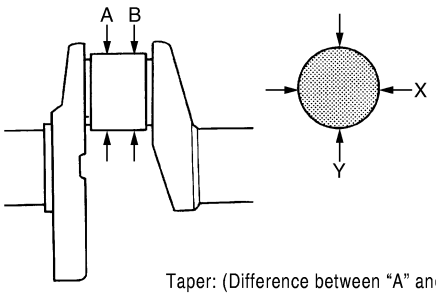
*: After installing in connecting rod

CRANKSHAFT

Unit: mm (in)



SEM645



Taper: (Difference between “A” and “B”)
Out-of-round: (Difference between “X” and “Y”)

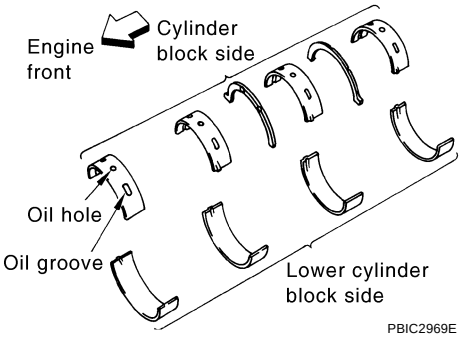
SBIA0535E

Main journal diameter. “Dm” grade	Standard	Grade No. A	64.975 - 64.974 (2.5581 - 2.5580)
		Grade No. B	64.974 - 64.973 (2.5580 - 2.5580)
		Grade No. C	64.973 - 64.972 (2.5580 - 2.5579)
		Grade No. D	64.972 - 64.971 (2.5579 - 2.5579)
		Grade No. E	64.971 - 64.970 (2.5579 - 2.5579)
		Grade No. F	64.970 - 64.969 (2.5579 - 2.5578)
		Grade No. G	64.969 - 64.968 (2.5578 - 2.5578)
		Grade No. H	64.968 - 64.967 (2.5578 - 2.5578)
		Grade No. J	64.967 - 64.966 (2.5578 - 2.5577)
		Grade No. K	64.966 - 64.965 (2.5577 - 2.5577)
		Grade No. L	64.965 - 64.964 (2.5577 - 2.5576)
		Grade No. M	64.964 - 64.963 (2.5576 - 2.5576)
		Grade No. N	64.963 - 64.962 (2.5576 - 2.5576)
		Grade No. P	64.962 - 64.961 (2.5576 - 2.5575)
		Grade No. R	64.961 - 64.960 (2.5575 - 2.5575)
		Grade No. S	64.960 - 64.959 (2.5575 - 2.5574)
		Grade No. T	64.959 - 64.958 (2.5574 - 2.5574)
		Grade No. U	64.958 - 64.957 (2.5574 - 2.5574)
		Grade No. V	64.957 - 64.956 (2.5574 - 2.5573)
		Grade No. W	64.956 - 64.955 (2.5573 - 2.5573)
		Grade No. X	64.955 - 64.954 (2.5573 - 2.5572)
		Grade No. Y	64.954 - 64.953 (2.5572 - 2.5572)
		Grade No. 4	64.953 - 64.952 (2.5572 - 2.5572)
		Grade No. 7	64.952 - 64.951 (2.5572 - 2.5571)
Pin journal diameter. “Dp”	Standard	Grade No. A	53.974 - 53.973 (2.1250 - 2.1249)
		Grade No. B	53.973 - 53.972 (2.1249 - 2.1249)
		Grade No. C	53.972 - 53.971 (2.1249 - 2.1248)
		Grade No. D	53.971 - 53.970 (2.1248 - 2.1248)
		Grade No. E	53.970 - 53.969 (2.1248 - 2.1248)
		Grade No. F	53.969 - 53.968 (2.1248 - 2.1247)
		Grade No. G	53.968 - 53.967 (2.1247 - 2.1247)
		Grade No. H	53.967 - 53.966 (2.1247 - 2.1246)
		Grade No. J	53.966 - 53.965 (2.1246 - 2.1246)
		Grade No. K	53.965 - 53.964 (2.1246 - 2.1246)
		Grade No. L	53.964 - 53.963 (2.1246 - 2.1245)
		Grade No. M	53.963 - 53.962 (2.1245 - 2.1245)
		Grade No. N	53.962 - 53.961 (2.1245 - 2.1244)
		Grade No. P	53.961 - 53.960 (2.1244 - 2.1244)
		Grade No. R	53.960 - 53.959 (2.1244 - 2.1244)
		Grade No. S	53.959 - 53.958 (2.1244 - 2.1243)
		Grade No. T	53.958 - 53.957 (2.1243 - 2.1243)
		Grade No. U	53.957 - 53.956 (2.1243 - 2.1242)

Center distance “r”		40.66 - 40.74 (1.6008 - 1.6039)
Out-of-round (Difference between “X” and “Y”)	Limit	0.0025 (0.0001)
Taper (Difference between “A” and “B”)		0.0025 (0.0001)
Crankshaft runout (TIR*)	Standard	Less than 0.05 (0.0020)
	Limit	0.10 (0.004)
Crankshaft end play	Standard	0.10 - 0.25 (0.0040 - 0.0098)
	Limit	0.30 (0.0120)

*: Total indicator reading

MAIN BEARING



Grade number	UPR/LWR	Thickness mm (in)	Width mm (in)	Identification color	Remarks
0	—	2.500 - 2.503 (0.0984 - 0.0985)	19.9 - 20.1 (0.783 - 0.791)	Black	Grade is the same for upper and lower bearings.
1	—	2.503 - 2.506 (0.0985 - 0.0987)		Brown	
2	—	2.506 - 2.509 (0.0987 - 0.0988)		Green	
3	—	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
4	—	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
5	—	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
6	—	2.518 - 2.521 (0.0991 - 0.0993)		Purple	
7	—	2.521 - 2.524 (0.0993 - 0.0994)		White	
01	UPR	2.503 - 2.506 (0.0985 - 0.0987)		Brown	Grade is different for upper and lower bearings.
	LWR	2.500 - 2.503 (0.0984 - 0.0985)		Black	
12	UPR	2.506 - 2.509 (0.0987 - 0.0988)		Green	
	LWR	2.503 - 2.506 (0.0985 - 0.0987)		Brown	
23	UPR	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
	LWR	2.506 - 2.509 (0.0987 - 0.0988)		Green	
34	UPR	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
	LWR	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
45	UPR	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
	LWR	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
56	UPR	2.518 - 2.521 (0.0991 - 0.0993)		Purple	
	LWR	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
67	UPR	2.521 - 2.524 (0.0993 - 0.0994)		White	
	LWR	2.518 - 2.521 (0.0991 - 0.0993)		Purple	

Undersize

Unit: mm (in)

Items	Thickness	Main journal diameter
0.25 (0.0098)	2.132 - 2.140 (0.0839 - 0.0843)	Grind so that bearing clearance is the specified value.

Main Bearing Oil Clearance

Unit: mm (in)

Items	Standard	Limit
Main bearing oil clearance	0.035 - 0.045 (0.0014 - 0.0018)*	0.065 (0.0026)

*: Actual clearance

CONNECTING ROD BEARING

Grade number	Thickness mm (in)	Identification color (mark)
0	1.497 - 1.500 (0.0589 - 0.0591)	Black
1	1.500 - 1.503 (0.0591 - 0.0592)	Brown
2	1.503 - 1.506 (0.0592 - 0.0593)	Green
3	1.506 - 1.509 (0.0593 - 0.0594)	Yellow
4	1.509 - 1.512 (0.0594 - 0.0595)	Blue

Undersize

Unit: mm (in)

Items	Thickness	Crank pin journal diameter
0.25 (0.0098)	1.626 - 1.634 (0.0640 - 0.0643)	Grind so that bearing clearance is the specified value.

Connecting Rod Bearing Oil Clearance

Unit: mm (in)

Items	Standard	Limit
Connecting rod bearing oil clearance	0.040 - 0.053 (0.0016 - 0.0021)*	0.070 (0.0028)

*: Actual clearance

SECTION EX
EXHAUST SYSTEM

CONTENTS

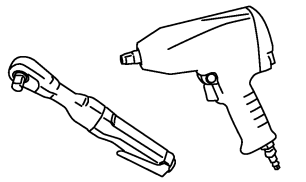
PREPARATION 2
Commercial Service Tools 2
EXHAUST SYSTEM 3
Checking Exhaust System 3
Removal and Installation 3
REMOVAL 4
INSTALLATION 4
INSPECTION AFTER INSTALLATION 5

PREPARATION

PFP:00002

Commercial Service Tools

NBS000J4

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening nuts and bolts

EXHAUST SYSTEM

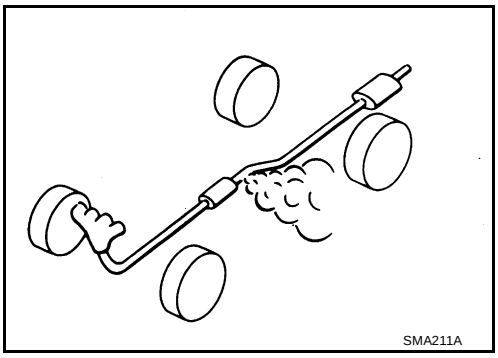
PFP:20100

Checking Exhaust System

NBS000J5

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage or deterioration.

- If anything is found, repair or replace damaged parts.

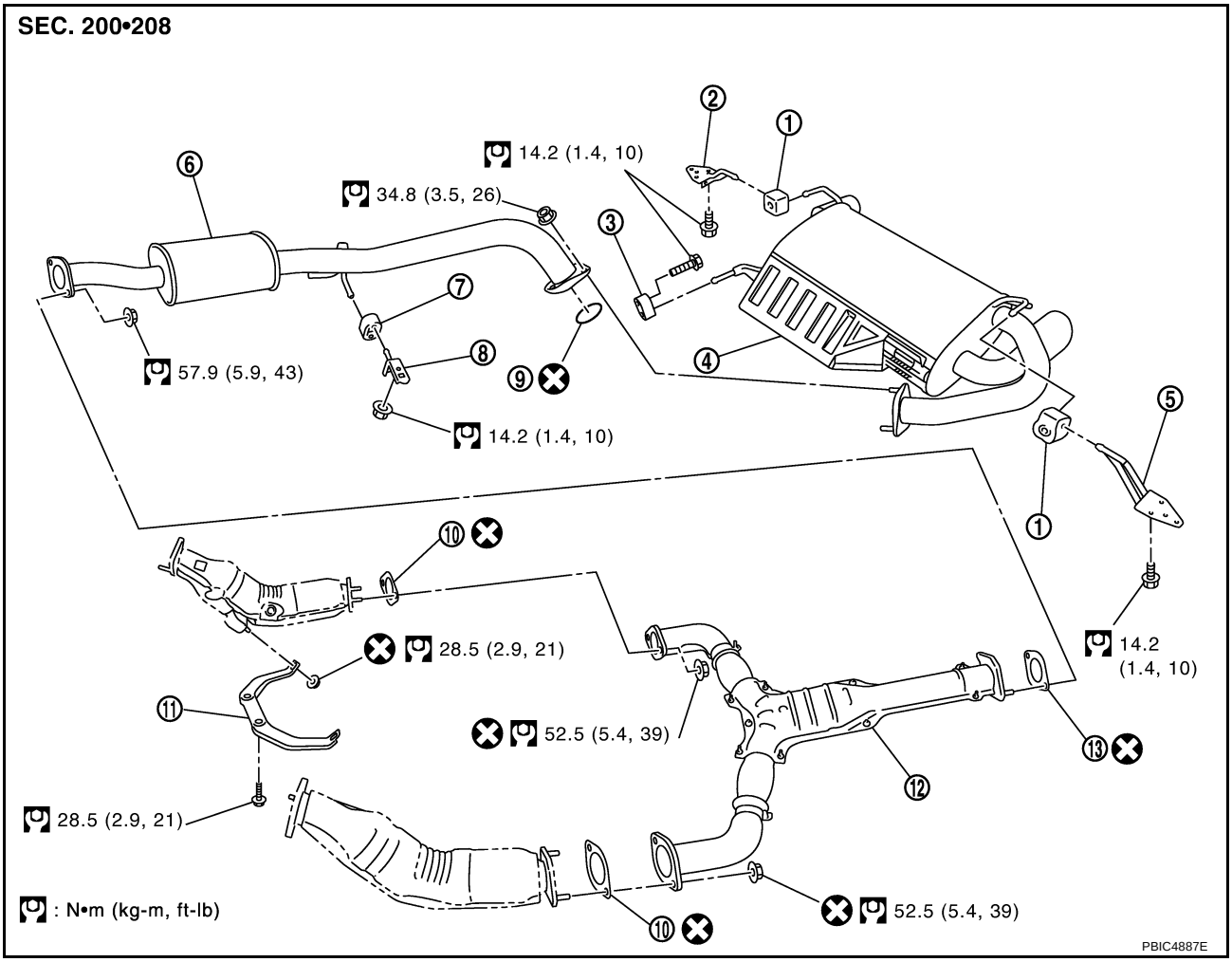


Removal and Installation

NBS000J6

CAUTION:

- **Be sure to use genuine exhaust system parts or equivalents which are specially designed for heat resistance, corrosion resistance, and shape.**
- **Perform the operation with the exhaust system fully cooled down because the system will be hot just after engine stops.**
- **Be careful not to cut your hand on the insulator edge.**



1. Mounting rubber
2. Main muffler mounting bracket
3. Mounting rubber
4. Main muffler
5. Main muffler mounting bracket
6. Center muffler
7. Mounting rubber
8. Mounting bracket
9. Ring gasket

10. Gasket
11. Exhaust mounting bracket
12. Exhaust front tube
13. Gasket

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

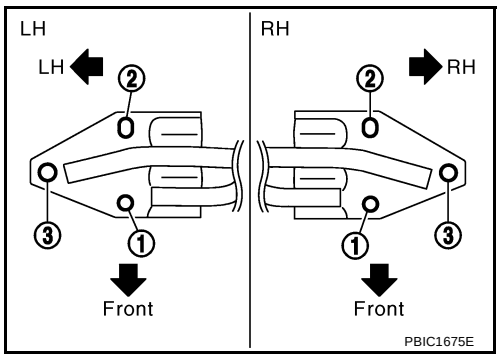
- Disconnect each joint and mounting with power tool.
- When removing main muffler, remove main muffler mounting bracket bolts.
- For removing and installing parts around propeller shaft, be careful of the following caution.

CAUTION:
Be sure to prevent propeller shaft from interfering parts and tools. If necessary, install protector to propeller shaft to prevent damage.
For propeller shaft protector, refer to PR-5, "REAR PROPELLER SHAFT" .

INSTALLATION

Note the following, and install in the reverse order of removal.

- Tighten main muffler mounting bracket bolts in numerical order as shown in the figure.

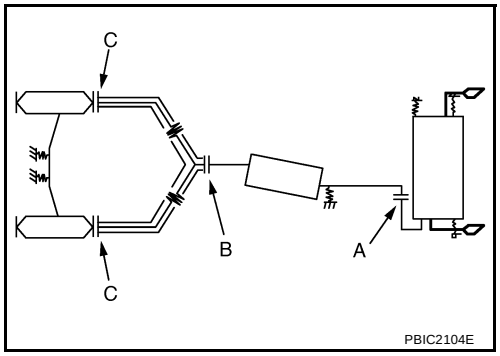


When reassembling main muffler only.

1. Temporarily tighten connecting flange (A).
2. Move main muffler front/rear/left/right so that clearance between tail tube and bumper is even.
3. Tighten connecting flange (A) to the specified torque.

When reassembling center muffler.

1. Temporarily tighten connecting flanges in order of (A) and (B).
2. Move main muffler front/rear/left/right so that clearance between tail tube and bumper is even.
3. Tighten connecting flanges in order of (A) and (B) to the specified torque.



When reassembling exhaust front tube.

1. Temporarily tighten connecting flanges of center muffler in order of (B) and (C).
2. Move main muffler front/rear/left/right so that clearance between tail tube and bumper is even.
3. Tighten connecting flanges in order of (B) and (C) to the specified torque.

CAUTION:

- **Always replace exhaust tube gaskets with new ones when reassembling.**
- **If heat insulator is badly deformed, repair or replace it. If deposits such as mud pile up on heat insulator, remove them.**
- **When installing heat insulator avoid large gaps or interference between heat insulator and each exhaust pipe.**
- **Remove deposits from the sealing surface of each connection. Connect them securely to avoid gas leakage.**
- **Temporarily tighten mounting nuts on the exhaust manifold side and mounting bolts on the vehicle side. Check each part for unusual interference, and then tighten them to the specified torque.**
- **When installing each mounting rubber, avoid twisting or unusual extension in up/down and right/left directions.**

INSPECTION AFTER INSTALLATION

- Make sure that clearance between tail tube and bumper is even.
- With engine running, check exhaust tube joints for gas leakage and unusual noises.
- Make sure that mounting brackets and mounting rubbers are installed properly and free from undue stress. Improper installation could result in excessive noise and vibration.

SECTION FAX
FRONT AXLE

CONTENTS

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Commercial Service Tools 2
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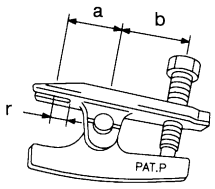
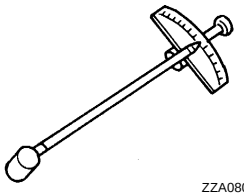
PREPARATION

PFP:00002

Special Service Tools

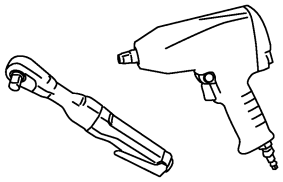
NDS0000N

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
HT72520000 (J-25730-A) Ball joint remover a: 33 mm (1.30 in) b: 50 mm (1.97 in) r: 11.5 mm (0.453 in)  NT546	Removing steering outer socket
ST3127S000 (J-25765-A) Preload gauge  ZZA0806D	Measuring rotating torque of ball joint

Commercial Service Tools

NDS0000O

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NDS0000P

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			FAX-4	—	FAX-4	NVH in WT section.	NVH in WT section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Parts interference	Wheel bearing damage	TIRES	ROAD WHEEL	STEERING
Symptom	FRONT AXLE	Noise	×	×		×	×	×
		Shake	×	×		×	×	×
		Vibration	×	×		×		×
		Shimmy	×	×		×	×	×
		Judder	×			×	×	×
		Poor quality ride or handling	×	×	×	×	×	

×: Applicable

FRONT WHEEL HUB AND KNUCKLE

PFP:40202

On-Vehicle Inspection

NDS0000Q

Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

WHEEL BEARING INSPECTION

- Move wheel hub in the axial direction by hand. Make sure there is no looseness of wheel bearing.

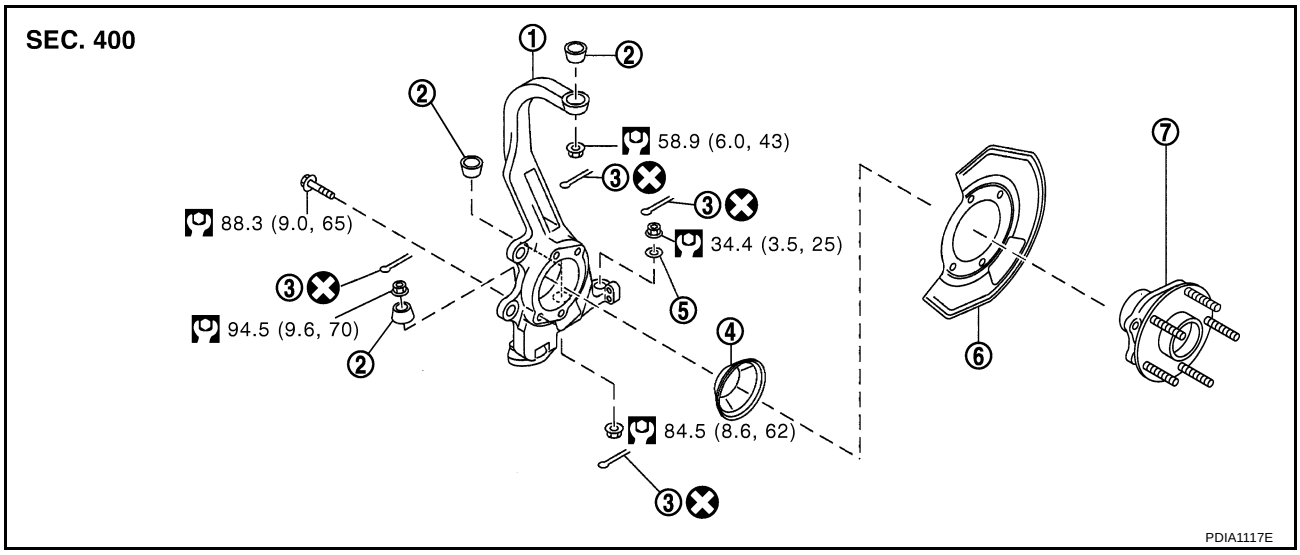
  Axial end play : 0.05 mm (0.002 in) or less

- Rotate wheel hub and make sure there is no unusual noise or other irregular conditions. If there are any irregular conditions, replace wheel hub and bearing assembly.

Removal and Installation

NDS0000R

COMPONENTS



1. Steering knuckle
2. Ball seat
3. Cotter pin
4. Hub cap
5. Washer
6. Splash guard
7. Wheel hub and bearing assembly

Refer to GI-11, "Components" , for the symbols in figure

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-26, "FRONT DISC BRAKE" .

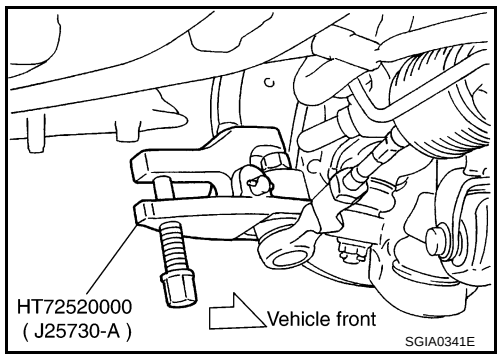
   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
4. Remove disc rotor.
5. Remove wheel sensor from steering knuckle. Refer to BRC-73, "WHEEL SENSORS" (with TCS), BRC-128, "WHEEL SENSORS" (with VDC).

   CAUTION:
   Do not pull on wheel sensor harness.
6. Remove brake hose bracket from steering knuckle. Refer to BR-12, "BRAKE TUBE AND HOSE" .
7. Remove cotter pin at steering outer socket, then loosen mounting nut.

8. Use a ball joint remover to remove steering outer socket from steering knuckle. Be careful not to damage ball joint boot.

CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (SST) from coming off.

9. After removing upper link, transverse link, compression rod and cotter pin at steering knuckle, loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove upper link, transverse link and compression rod from steering knuckle. Be careful not to damage ball joint boot.



CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.

11. Remove steering knuckle and wheel hub and bearing assembly fixing bolt.
12. Remove wheel hub and bearing assembly from steering knuckle.

INSPECTION AFTER REMOVAL

- About the inspection for upper link, compression rod, steering outer socket, refer to FSU-14, "UPPER LINK" , FSU-16, "COMPRESSION ROD" , PS-17, "POWER STEERING GEAR AND LINKAGE" .

Visual Inspection

- Check steering knuckle and ball seat for deformation, cracks, and other damage. Replace steering knuckle and ball seat if cracks, deformation or other damage is found.
- Check ball joint boot for deformation, damage, and also for grease leakage. Replace steering knuckle assembly if cracks, deformation or also for grease leakage is found.

Steering Knuckle Ball Joint Inspection

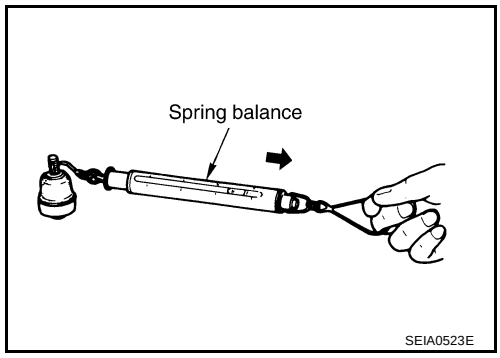
- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

CAUTION:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

- Hook spring balance at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.

Swing force:
0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)
Spring balance measurement
2.23 - 21.2 N (0.22 - 2.16 kg, 0.50 - 4.77 lb)

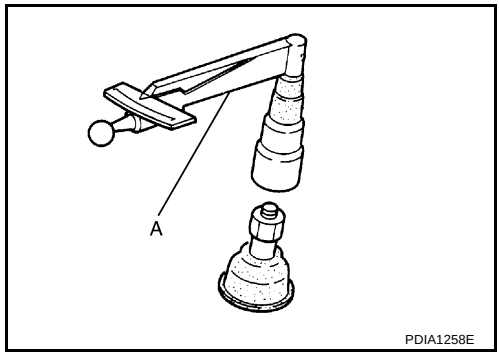


- If it is outside the standard, replace steering knuckle.

Rotating Torque Inspection

- Attach mounting nut to ball stud. Check that rotating torque is within specifications with a preload gauge.

Tool number A: ST3127S000 (J–25765–A)
Rotating torque:
0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)



- If it is outside the standard, replace steering knuckle.

Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

Axial end play : 0 mm (0 in)

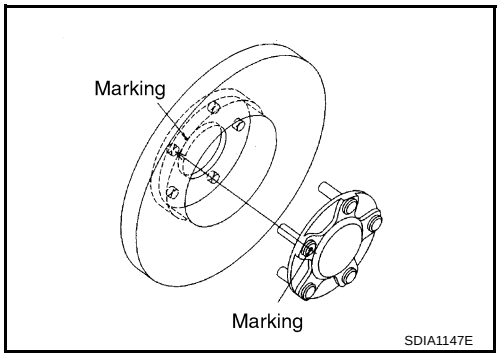
- If it is outside the standard, replace steering knuckle.

INSTALLATION

- Refer to FAX-4, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

- Wheel hub and bearing assembly and disc must be installed to fit the marked position each other.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Bearing

NDS0000S

Axial end play	0.05 mm (0.002 in) or less

BALL JOINT

Swing force	0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)
Measurement on spring balance (Spring balance hooking position: cotter pin mounting hole)	2.23 - 21.2 N (0.22 - 2.16 kg, 0.50 - 4.77 lb)
Rotating torque	0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)
Axial end play	0 mm (0 in)

SECTION FL
FUEL SYSTEM

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Standard and Limit 12
Tightening Torque 12

PRECAUTIONS

PFP:00001

Precautions for Battery Service

NBS000IW

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

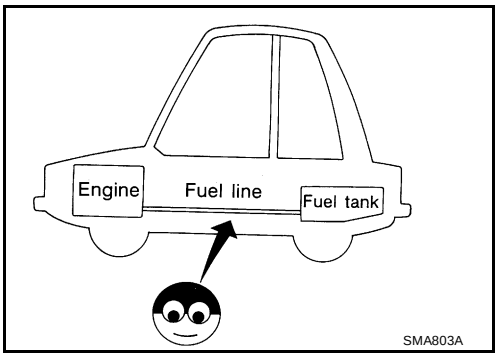
FUEL SYSTEM

PFP:17503

Checking Fuel Lines

NBS000IX

Inspect fuel lines, fuel filler cap and fuel tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.



General Precautions

NBS000IY

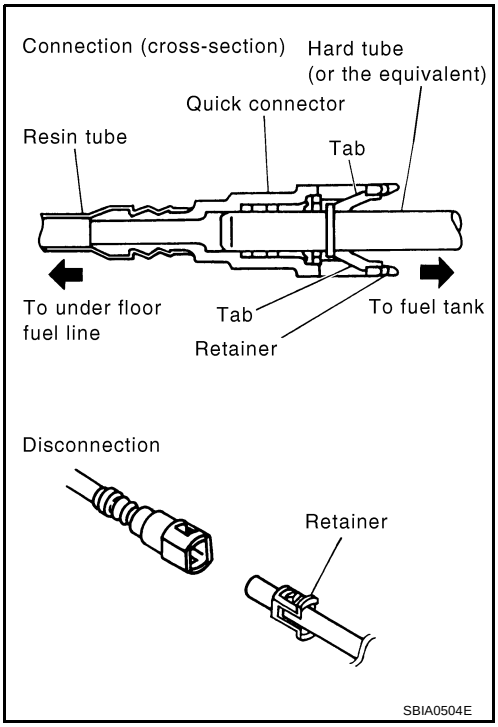
WARNING:

When replacing fuel line parts, be sure to observe the following.

- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from the work area.**
- **Put drained fuel in an explosion-proof container and put the lid on securely. Keep the container in safe area.**

CAUTION:

- **Use gasoline required by the regulations for octane number. Refer to GI-5, "Precautions for Fuel (Unleaded Premium Gasoline Required)" .**
- **Before removing fuel line parts, perform the following procedures:**
  - **Release fuel pressure from the fuel lines. Refer to EC-79, "FUEL PRESSURE RELEASE" .**
  - **Disconnect negative battery terminal.**
- **Always replace O-rings and clamps with new ones.**
- **Do not kink or twist tubes when they are being installed.**
- **Do not tighten hose clamps excessively to avoid damaging hoses.**
- **After connecting fuel tube quick connectors, make sure quick connectors are secure.**
  Ensure that connector and resin tube do not contact any adjacent parts.
- **After installing tubes, make sure there is no fuel leakage at connections in the following steps.**
  - **Apply fuel pressure to fuel lines with turning ignition switch “ON” (with engine stopped). Then check for fuel leaks at connections.**
  - **Start engine and rev it up and check for fuel leaks at connections.**
- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the “MIL” may come on.**
- **For servicing “Evaporative Emission System” parts, refer to EC-33, "EVAPORATIVE EMISSION SYSTEM" .**

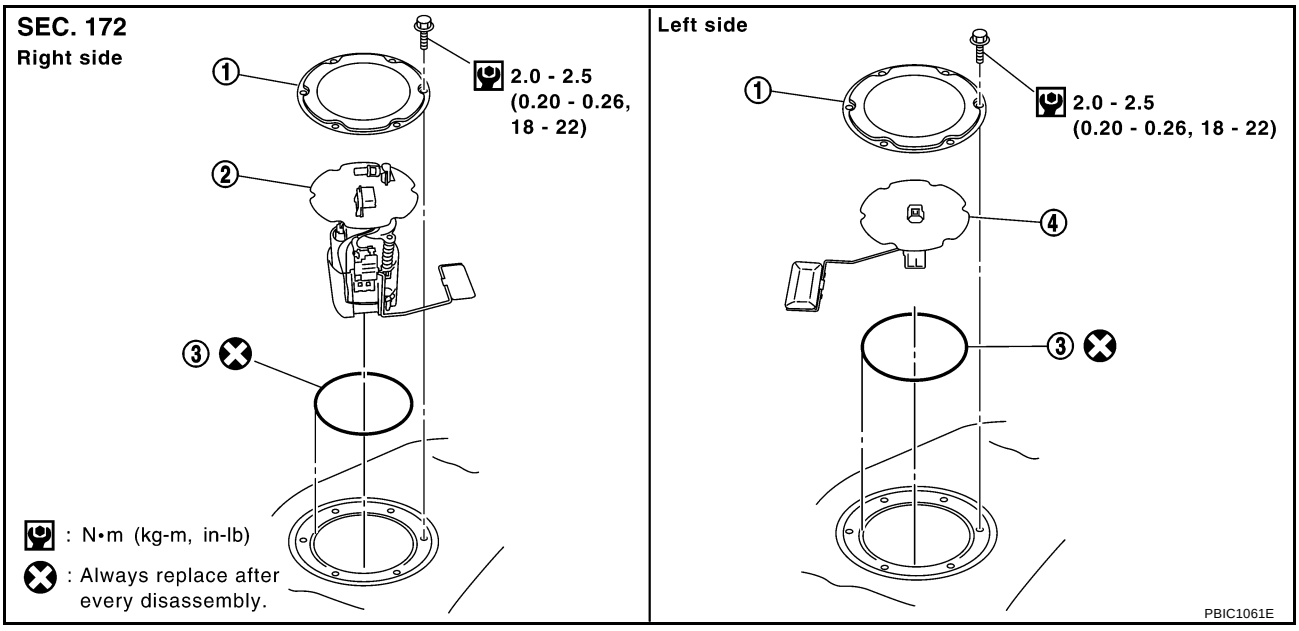


FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY

PFP:17042

Removal and Installation

NBS000IZ



1. Retainer
2. Main fuel level sensor unit, fuel filter and fuel pump assembly
3. O-ring
4. Sub fuel level sensor unit

REMOVAL

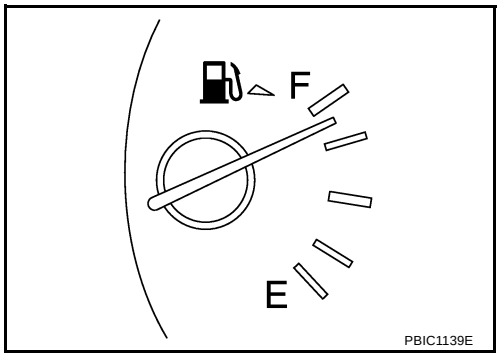
WARNING:

Be sure to read “General Precautions” when working on the fuel system. Refer to FL-3, "General Precautions" .

1. Check fuel level on fuel gauge. If fuel gauge indicates more than the level as shown in the figure (full or almost full), drain fuel from fuel tank until gauge indicates level as shown in the figure or below.

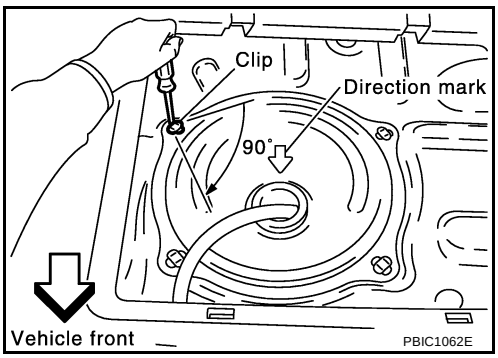
   NOTE:
   Because fuel will be spilled when removing main and sub fuel level sensor units for the top of the fuel is above the main and sub fuel level sensor units installation surface.

   - As a guide, fuel level becomes the position as shown in the figure or below when approximately 20 ℓ (5-1/4 US gal, 4-3/8 Imp gal) of fuel are drained from fuel tank.
   - In a case that fuel pump does not operate, perform the following procedure.

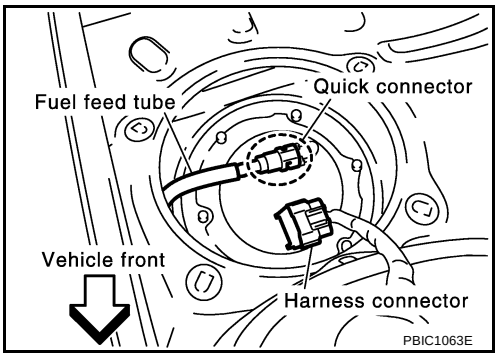


a. Insert hose of less than 25 mm (0.98 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from fuel filler tube.
b. Disconnect fuel filler hose from fuel filler tube. Refer to FL-10, "FUEL TANK" .
c. Insert hose into fuel tank through fuel filler hose to draw fuel from fuel tank.
2. Release the fuel pressure from the fuel lines. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Open fuel filler lid.
4. Open filler cap and release the pressure inside fuel tank.
5. Remove woofer or rear floor box mat and rear floor box. Refer to AV-49, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" or EI-39, "LUGGAGE FLOOR TRIM" .

6. Remove inspection hole cover for main and sub fuel level sensor units by turning clips clockwise by 90 degrees.

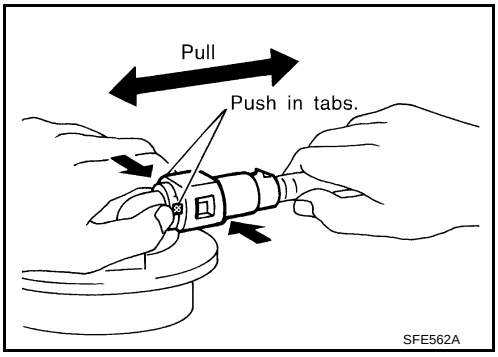


7. Disconnect harness connector and quick connector.



Disconnect quick connector as follows:

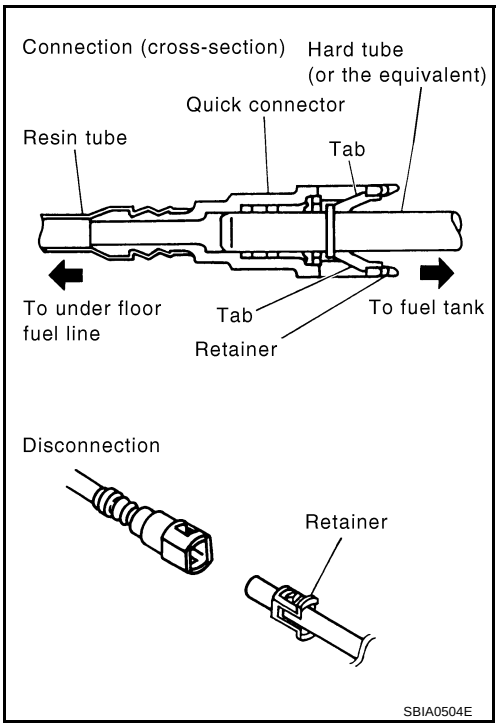
- Hold the sides of connector, push in tabs and pull out fuel feed tube.
- If quick connector sticks to tube of fuel level sensor unit, push and pull quick connector several times until it start to move. Then disconnect quick connector by pulling.



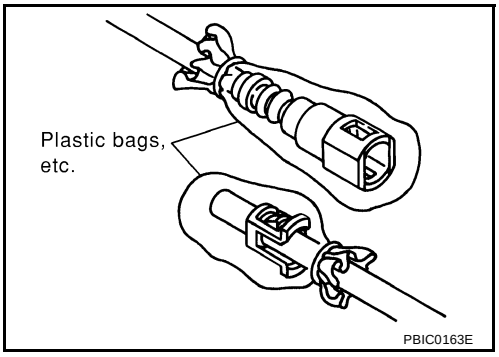
CAUTION:

- **Quick connector can be disconnected when the tabs are completely depressed. Do not twist it more than necessary.**
- **Do not use any tools to disconnect quick connector.**
- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Do not bend or twist resin tube during installation and disconnection.**
- **Do not remove the remaining retainer on hard tube (or equivalent) except when resin tube or retainer is replaced.**
- **When resin tube or hard tube (or equivalent) is replaced, also replace retainer with new one.**
- **Replace same color retainer as before replacing.**

Retainer color: White



- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



8. Remove main fuel level sensor unit, fuel filter and fuel pump assembly, and sub fuel level sensor unit as follows.

CAUTION:

- **Do not bend float arm during removal.**
- **Avoid polluting the inside by residue fuel. Draw out with avoiding inclination by supporting with a cloth.**
- **Avoid impacts such as falling when handling components.**

a. Removal of main fuel level sensor unit, fuel filter and fuel pump assembly:

i. Remove retainer.

ii. Raise main fuel level sensor unit, fuel filter and fuel pump assembly, and using snap ring pliers, remove fuel hose connector.

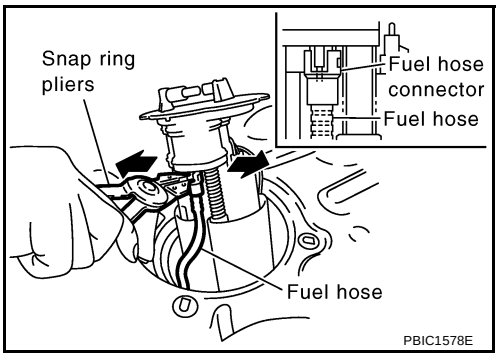
CAUTION:

Be careful not to damage fuel hose connector by expanding them excessively.

b. Removal of sub fuel level sensor unit:

i. Remove retainer.

ii. Raise and release sub fuel level sensor unit to remove.

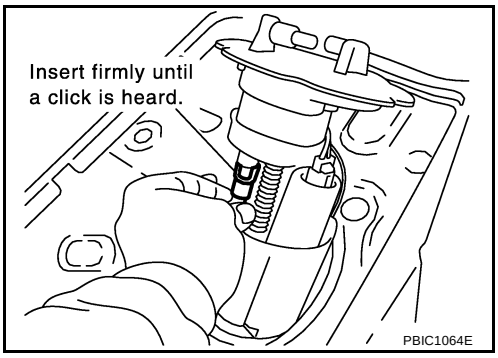


INSTALLATION

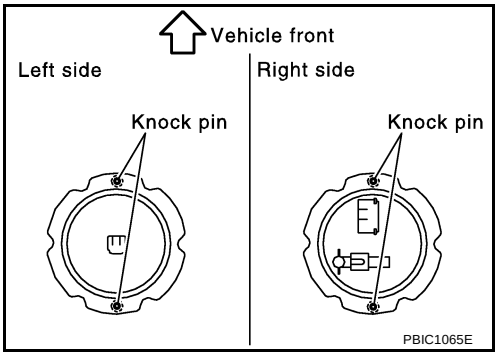
Note the following, and install in the reverse order of removal.

Main and Sub Fuel Level Sensor Unit

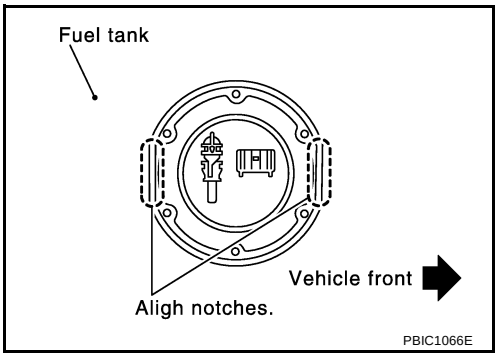
- When installing fuel hose connector insert them fully until a click sound of full stopper engagement is heard.



- Face main and sub fuel level sensor units as shown in the figure, and install them with the knock pin on back aligned with pin hole on fuel tank.



- Install retainer so that its notch becomes parallel with the notch on fuel tank.



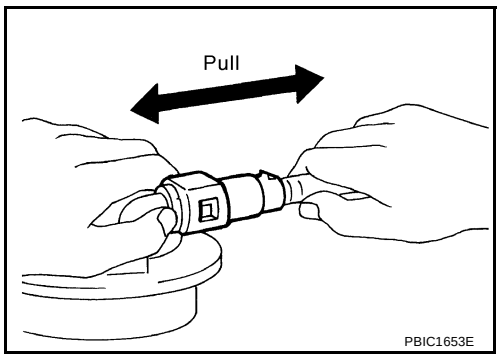
- Tighten retainer mounting bolts evenly.

Quick Connector

Connect quick connector of fuel feed hose as follows:

1. Check the connection for damage or any foreign materials.
2. Align the connector with the tube, then insert the connector straight into the tube until a click sound is heard.
3. After connecting, make sure that the connection is secure by following method.
   - Visually confirm that the two tabs are connected to the connector.

- Pull the tube and the connector to make sure they are securely connected.



Inspection Hole Cover

1. Install inspection hole cover with direction mark (arrow) facing front of vehicle.
2. Lock clips by turning counter-clockwise.

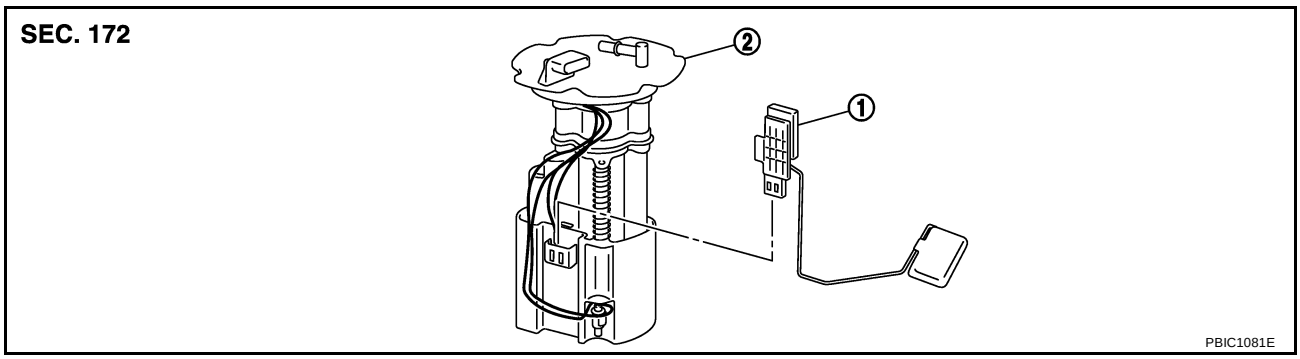
INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), then check connections for leaks by applying fuel pressure to fuel piping.
2. Start engine and rev it up and make sure there are no fuel leaks at the fuel system connections.

Disassembly and Assembly

NBS000J0



1. Fuel level sensor unit
2. Fuel filter and fuel pump assembly

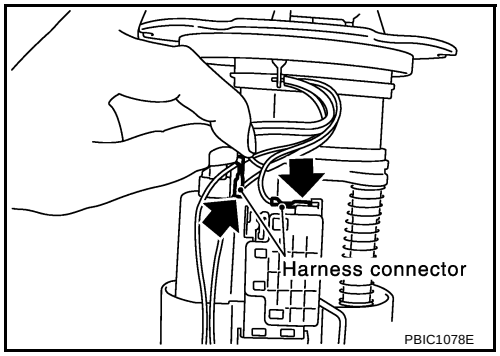
CAUTION:

Sub fuel level sensor unit cannot be disassembled and should be replaced as a unit.

DISASSEMBLY

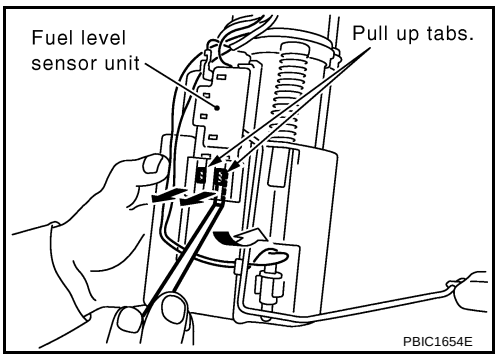
Remove fuel level sensor unit as follows.

1. Disconnect harness connector.
   - Hold connector by fingers and pull it out, because there is no stopper release tab.



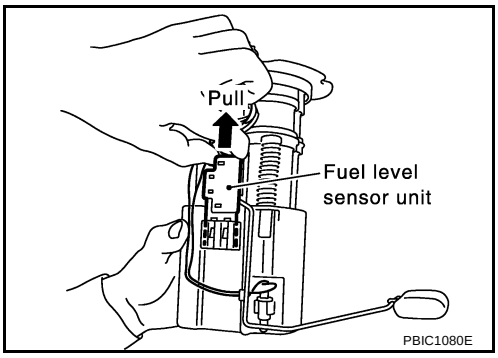
2. Using suitable tool, pull up tabs points as shown in the figure (two points) to release the lock.

CAUTION:
Be careful not to damage it.



3. After fixing tabs are disengaged, slide fuel level sensor unit out in direction shown by the arrow.

CAUTION:
Do not disassemble fuel filter and fuel pump assembly.



ASSEMBLY

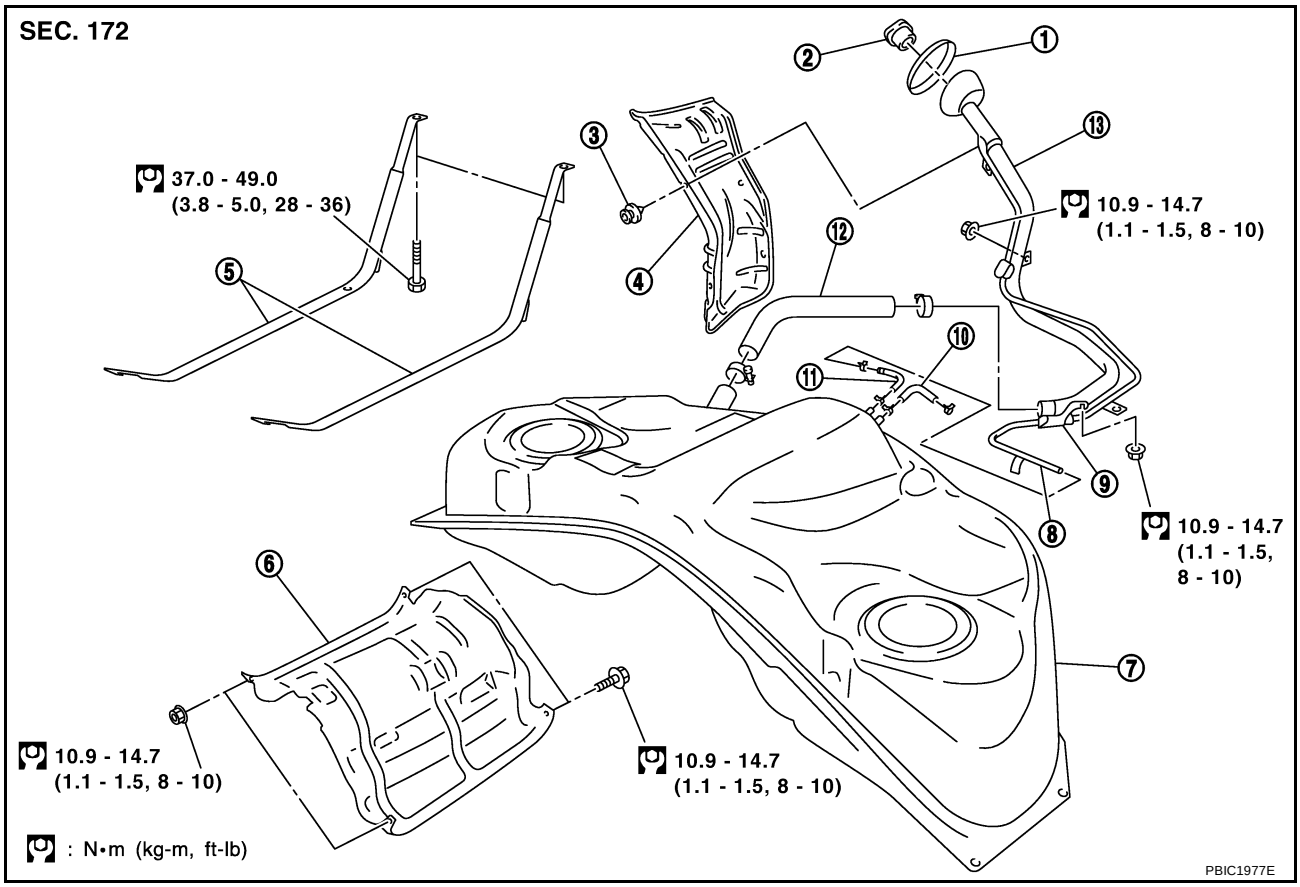
1. Check for damage of fuel level sensor unit installation position on the side of fuel filter and fuel pump assembly.
2. Slide fuel level sensor unit until it aligns to installation groove, then insert it until it stops.
   - Insert until you hear a “click” sound and actually feel the engagement.
   - After inserting, apply force in reverse direction (removal direction) to ensure it cannot be pulled out.
3. Connect harness connector.
   - Securely insert harness connector until it stops.

FUEL TANK

PFP:17202

Removal and Installation

NBS000J1



1. Grommet
2. Fuel filler cap
3. Clip
4. Fuel filler tube protector
5. Fuel tank mounting band
6. Fuel tank protector
7. Fuel tank
8. Vent tube
9. Vent hose
10. EVAP hose
11. Vent hose
12. Fuel filler hose
13. Fuel filler tube

REMOVAL

WARNING:

Be sure to read “General Precautions” before working on the fuel system. Refer to FL-3, "General Precautions" .

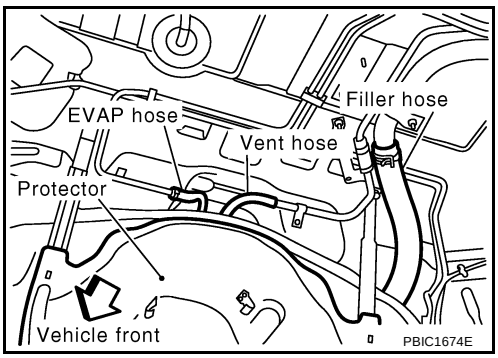
- Drain fuel from fuel tank if necessary. Refer to FL-4, "REMOVAL" .
- Perform work on level place.

1. Perform steps 2 to 7 of “REMOVAL” in “ FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY” on main and sub fuel level sensor units. Refer to FL-4, "REMOVAL" .
2. Remove tunnel stay. Refer to RSU-5, "REAR SUSPENSION ASSEMBLY" .
3. Remove exhaust front tube, center muffler and main muffler. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

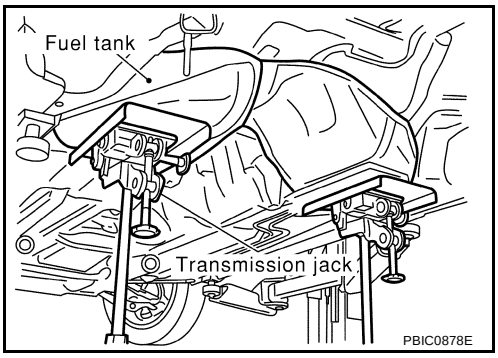
   CAUTION:

   Do not impact or damage propeller shaft tube.
5. Remove parking rear brake cables. Refer to PB-4, "PARKING BRAKE CONTROL" .
6. Remove rear suspension assembly. Refer to RSU-5, "REAR SUSPENSION ASSEMBLY" .
7. Remove fuel tank protector.

8. Disconnect fuel filler hose, vent hose and EVAP hoses at fuel tank side.



9. Remove fuel tank mounting band bolts while supporting fuel tank.



10. Supporting with hands, descend transmission jack carefully, and remove fuel tank.

CAUTION:

- **Make sure that all connection points have been disconnected.**
- **Confirm there is no interference with vehicle.**

11. Remove fuel filler tube, if necessary.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Surely clamp fuel hoses and insert hose to the length below.

Fuel filler hose	**: 35 mm (1.38 in)**
The other hoses	**: 25 mm (0.98 in)**

- Be sure hose clamp is not placed on swelled area of fuel tube.
- Tighten fuel hose clamp so that the distance between its lugs becomes to the following.

Fuel tank side	**: 8 - 12 mm (0.31 - 0.47 in)**
Fuel filler tube side	**: 5.7 - 9.7 mm (0.224 - 0.382 in)**

- To connect quick connector, refer to FL-7, "Quick Connector" .

INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), and check connections for leakage by applying fuel pressure to fuel piping.
2. Start engine and rev it up and make sure there are no fuel leaks at the fuel system connections.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

NBS000J2

Fuel tank capacity	Approx. 76 ℓ (20 US gal, 16-3/4 Imp gal)
Fuel recommendation	Refer to GI-5

Tightening Torque

NBS000J3

Unit : N·m (kg-m, ft-lb)
N·m (kg-m, in-lb)*

Main fuel level sensor unit, fuel filter and fuel pump assembly	2.0 - 2.5 (0.20 - 0.26, 18 - 22)*
Sub fuel level sensor unit	2.0 - 2.5 (0.20 - 0.26, 18 - 22)*
Fuel tank mounting band	37.0 - 49.0 (3.8 - 5.0, 28 - 36)
Fuel filler tube	10.9 - 14.7 (1.1 - 1.5, 8 - 10)
Fuel tank protector	10.9 - 14.7 (1.1 - 1.5, 8 - 10)

SECTION FSU
FRONT SUSPENSION

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PRECAUTIONS

PFP:00001

Caution

NES00001

- When installing rubber bushings, final tightening must be carried out under unladen conditions with tires on ground. Oil will shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Caulking nuts are not reusable. Always use new ones when installing. Since new caulking nuts are pre-oiled, tighten as they are.
- Avoid burden to front cross bar.

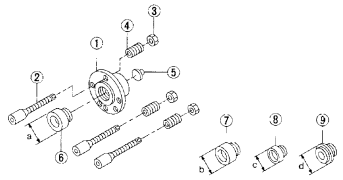
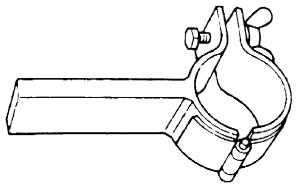
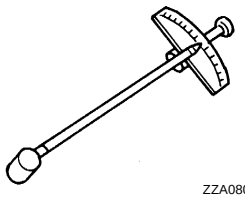
PREPARATION

PFP:00002

Special Service Tools

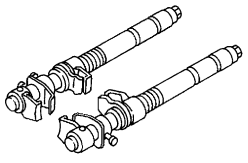
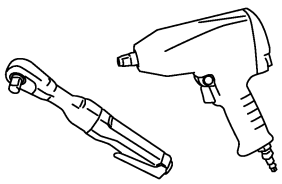
NES00002

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV991040S0 (—) CCK gauge attachment 1. Plate 2. Guide bolts 3. Nuts 4. Springs 5. Center plate 6. KV99104020 Adapter A a: 72 mm (2.83 in) dia. 7. KV99104030 Adapter B b: 65 mm (2.56 in) dia. 8. KV99104040 Adapter C c: 57 mm (2.24 in) dia. 9. KV99104050 Adapter D d: 53.4 mm (2.102 in) dia.  S-NT498	Measuring wheel alignment
ST35652000 (—) Strut attachment  ZZA0807D	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A)  ZZA0806D	Measuring rotating torque of ball joint

Commercial Service Tools

NES00003

Tool name	Description
Spring compressor  S-NT717	Removing coil spring
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NES00004

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			FSU-8	FSU-11	—	—	—	FSU-8	FSU-6	FSU-18	NVH in PR section	NVH in RFD section.	NVH in FAX and FSU section.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	FRONT SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×	×	×	×
		Shake	×	×	×	×		×			×		×	×	×	×	×	×
		Vibration	×	×	×	×	×				×		×	×		×		×
		Shimmy	×	×	×	×			×				×	×	×		×	×
		Judder	×	×	×								×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×			

×: Applicable

FRONT SUSPENSION ASSEMBLY

PFP:54010

On-Vehicle Inspection

NES00005

Make sure the mounting conditions (looseness, back lash) of each component and component statues (wear, damage) are normal.

INSPECTION OF BALL JOINT END PLAY OF EACH LINK

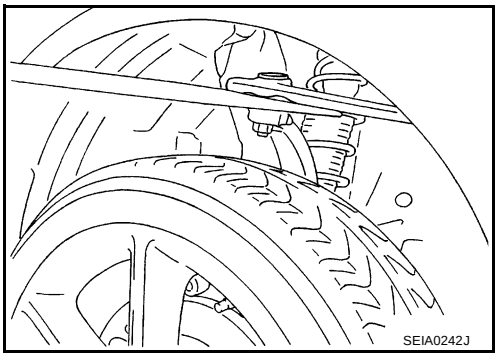
1. Set front wheels in a straight-ahead position. Do not depress brake pedal.
2. Check ball joint axial end play of each link.

CAUTION:
Be careful not to damage ball joint boot.

Upper Link Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between upper link and steering knuckle.

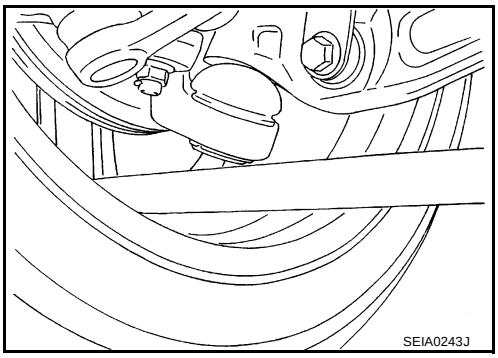
Axial end play : 0 mm (0 in)


SEIA0242J

Steering Knuckle Lower Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between steering knuckle and wheel.

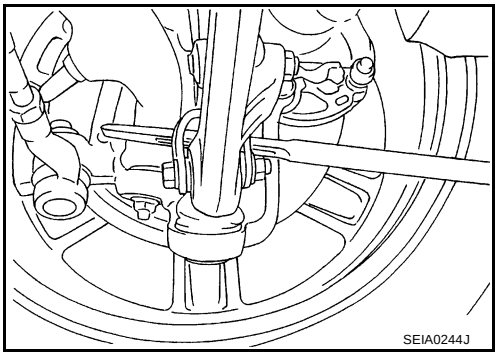
Axial end play : 0 mm (0 in)


SEIA0243J

Compression Rod Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between compression rod and transverse link.

Axial end play : 0 mm (0 in)


SEIA0244J

SHOCK ABSORBER INSPECTION

Check shock absorber for oil leakage, damage and replace if necessary. Refer to FSU-10, "COIL SPRING AND SHOCK ABSORBER" .

Wheel Alignment Inspection

NES00006

DESCRIPTION

- Measure wheel alignment under unladen conditions.

  NOTE:
  Unladen conditions mean that fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats are designated positions.

PRELIMINARY CHECK

- Check tires for improper air pressure and wear.
- Check road wheels for runout.
- Check wheel bearing axial end play.
- Check ball joint axial end play of compression rod, upper link, and steering knuckle
- Check shock absorber operation.
- Check each mounting part of axle and suspension for looseness and deformation.
- Check each link, rod and member for cracks, deformation and other damage.
- Check vehicle posture.

GENERAL INFORMATION AND RECOMMENDATIONS

- A four-wheel thrust alignment should be performed.
  - This type of alignment is recommended for any NISSAN/INFINITI vehicle.
  - The four-wheel “thrust” process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
  - The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
  - The rack should be checked to ensure that it is level.
- Make sure the machine is properly calibrated.
  - Your alignment equipment should be regularly calibrated in order to give correct information.
  - Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

THE ALIGNMENT PROCESS

IMPORTANT:

Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Do not use these indicators.**
  - The alignment specifications programmed into your machine that operate these indicators may not be correct.
  - This may result in an ERROR.
- Some newer alignment machines are equipped with an optional “Rolling Compensation” method to “compensate” the sensors (alignment targets or head units). **Do not use this “Rolling Compensation” method.**
  - Use the “Jacking Compensation Method”. After installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.
  - See Instructions in the alignment machine you're using for more information on this.

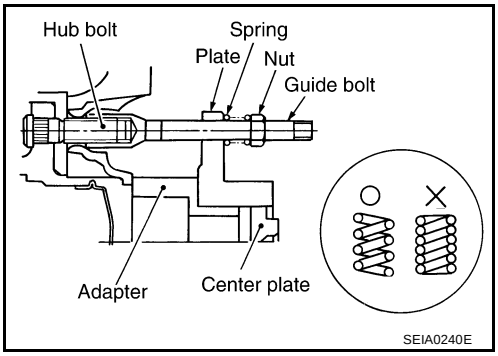
INSPECTION OF CAMBER, CASTER AND KINGPIN INCLINATION ANGLES

- Camber, caster, kingpin inclination angles cannot be adjusted.
- Before inspection, mount front wheels onto turning radius gauge. Mount rear wheels onto a stand that has same height so vehicle will remain horizontal.

Using a CCK Gauge

Install the CCK gauge attachment [SST: KV991040S0 (–)] with the following procedure on wheel, then measure wheel alignment.

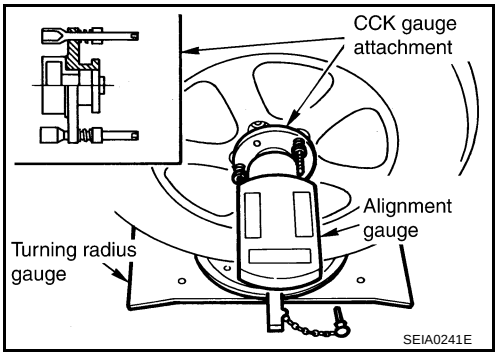
1. Remove there wheel nuts, and install a guide bolt to hub bolt.
2. Screw adapter into plate body until it contacts body tightly.
3. Screw center plate into plate.
4. Insert plate on guide bolt. Put spring in, and then evenly screw both guide bolt nut. When fastening guide bolt nut, do not completely compress spring.



5. Place the dent of alignment gauge onto the projection of center plate and tightly contact them to measure.

Camber, caster, kingpin inclination angles:

Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .



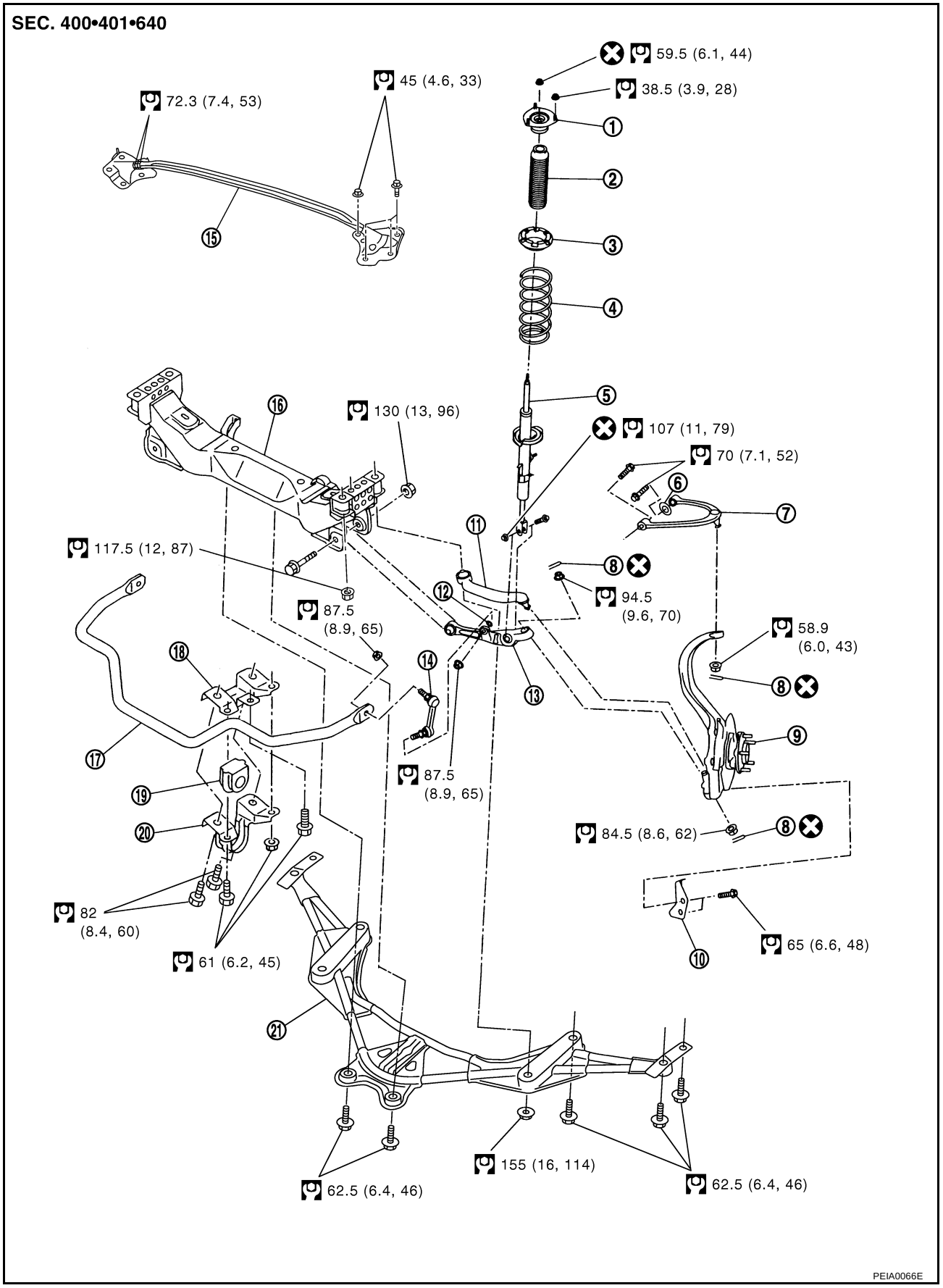
CAUTION:

- **If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage, and replace suspect parts if necessary.**
- **King pin inclination angle is reference value, no inspection is required. (Due to the type of suspension, the kingpin inclination angle cannot be measured correctly using a normal alignment tester.)**

Components

NES00007

SEC. 400•401•640



1. Mounting insulator	2. Bound bumper	3. Spring upper seat
4. Coil spring	5. Shock absorber	6. Stopper rubber
7. Upper link	8. Cotter pin	9. Front axle
10. Steering stopper bracket	11. Compression rod	12. Washer
13. Transverse link	14. Stabilizer connecting rod	15. Tower bar
16. Front suspension member	17. Stabilizer bar	18. Stabilizer clamp bracket
19. Stabilizer bushing	20. Stabilizer clamp	21. Front cross bar

Refer to GI-11, "Components" ,for the symbols in the figure.

Removal and Installation

NES00008

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-26, "FRONT DISC BRAKE" .
3. Remove undercover with power tool.
4. Remove fixing bolts and nuts, then remove front cross bar from vehicle with power tool.
5. Remove steering hydraulic piping bracket from front suspension member. Refer to PS-33, "HYDRAULIC LINE" .
6. Remove steering gear and front suspension member attachment bolts and hang steering gear on vehicle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
7. Set jack under engine.

   CAUTION:
   When setting jack to engine, use a wooden block or an equivalent for the setting.
8. Remove fixing bolt and nut between shock absorber and transverse link with power tool.
9. Remove cotter pin of upper link ball joint, then loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove upper link from steering knuckle. Be careful not to damage ball joint boot.

    CAUTION:
    Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
11. Remove fixing nut and washer located at the bottom of stabilizer connecting rod, and then remove stabilizer connecting rod from transverse link with power tool.
12. Remove fixing nuts between engine mounting insulator and front suspension member. Refer to EM-101, "ENGINE ASSEMBLY" .
13. Remove fixing nuts between front suspension member and body with power tool.
14. Remove front suspension assembly form vehicle.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

COIL SPRING AND SHOCK ABSORBER

PFP:54302

Removal and Installation

NES00009

REMOVAL

1. Remove tire with power tool.
2. Remove undercover with power tool.
3. Remove harness of wheel sensor from shock absorber. Refer to BRC-73, "WHEEL SENSORS" (With TCS), BRC-128, "WHEEL SENSORS" (With VDC).

   CAUTION:
   Do not pull on wheel sensor harness.
4. Remove mounting nuts of brake hose from shock absorber.
5. Remove mounting bolt and nut between shock absorber and transverse link with power tool.
6. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
7. Remove mounting nuts on mounting insulator with power tool, then remove shock absorber from vehicle.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

Disassembly and Assembly

NES0000A

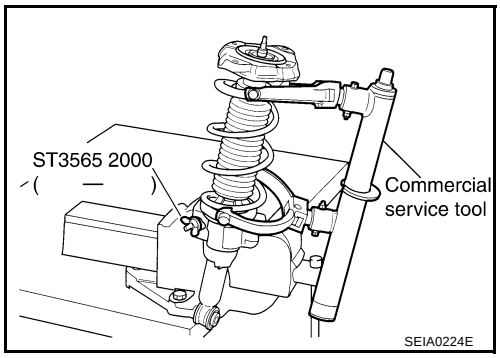
DISASSEMBLY

NOTE:
Make sure piston rod on shock absorber is not damaged when removing components from shock absorber.

1. Install strut attachment (SST) to shock absorber and fix it in a vise.

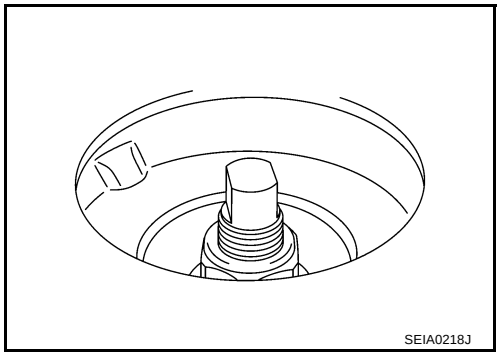
   CAUTION:
   When installing strut attachment (SST) to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.
2. Using a spring compressor (commercial service tool), compress coil spring between spring upper seat and spring lower seat (on shock absorber) until coil spring is free.

   CAUTION:
   Be sure spring compressor (commercial service tool) is securely attached to coil spring. Compress coil spring.



3. Check that coil spring between spring upper seat and spring lower seat is free and then secure piston rod tip so that piston rod does not turn, and remove piston rod lock nut.
4. Remove mounting insulator, bound bumper, spring upper seat. Then remove coil spring from shock absorber.
5. Gradually release spring compressor (commercial service tool), and remove coil spring.

   CAUTION:
   Loosen while making sure coil spring attachment position does not move.
6. Remove strut attachment (SST) from shock absorber.



INSPECTION AFTER DISASSEMBLY

Shock Absorber Inspection

- Check shock absorber for deformation, cracks, damage, and replace if necessary.
- Check piston rod for damage, uneven wear, distortion, and replace if necessary.
- Check welded and sealed areas for oil leakage, and replace if necessary.

Mounting Insulator and Rubber Parts Inspection

Check mounting insulator for cracks and rubber parts for wear. Replace them if necessary.

Coil Spring Inspection

Check coil spring for cracks, wear or damage, and replace if necessary.

ASSEMBLY

NOTE:

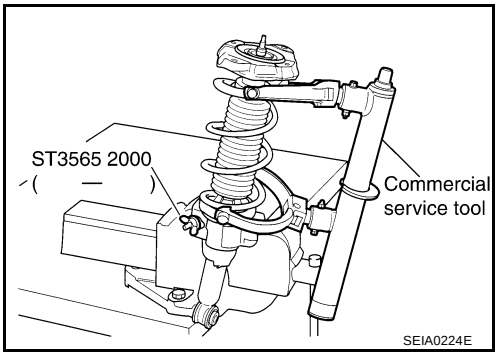
Make sure piston rod on shock absorber is not damaged when attaching components to shock absorber.

1. Install strut attachment (SST) to shock absorber and fix it in a vise.

   CAUTION:

   When installing strut attachment (SST) to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.

2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber.



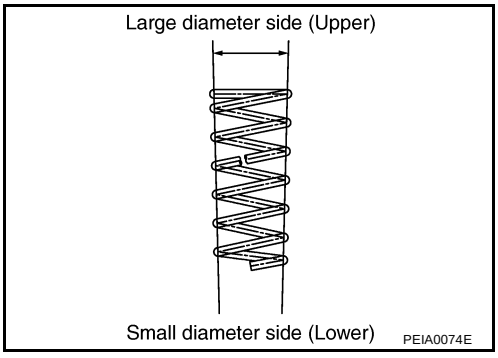
CAUTION:

- **Install coil spring as shown in the figure.**
- **Be sure spring compressor (commercial service tool) is securely attached to coil spring. Compress coil spring.**

3. Apply soapy water to bound bumper and insert into mounting insulator.

   CAUTION:

   Do not use machine oil.

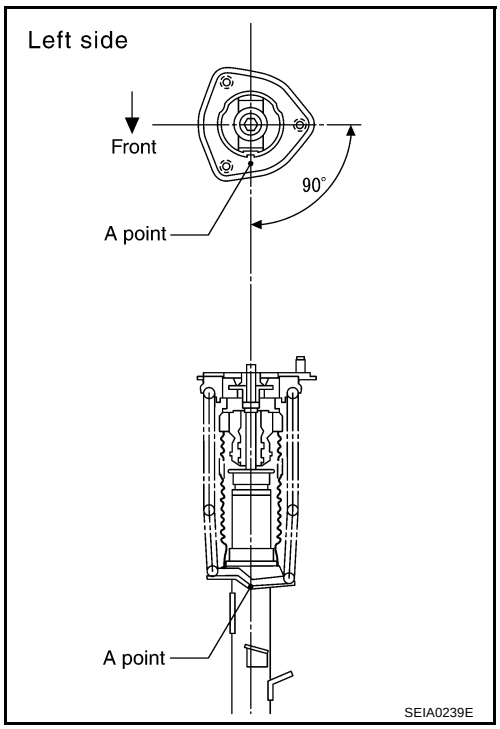


4. Attach spring upper seat and mounting insulator as shown in the figure.

   CAUTION:
   - **Make sure coil spring is securely seated in spring mounting groove of spring upper seat.**
   - **The bottom part of spring should be at the position of A point of spring seat.**

5. Secure piston rod tip so that piston rod does not turn, and tighten the specified torque on piston rod lock nut.
6. Gradually release spring compressor (commercial service tool), and remove coil spring.

   CAUTION:
   Loosen spring compressor (commercial service tool) while making sure coil spring attachment position does not move.
7. Remove strut attachment (SST) from shock absorber.



TRANSVERSE LINK

PFP:54500

Removal and Installation

NES0000B

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove mounting nut and washer on lower portion of stabilizer connecting rod with power tool.
4. Remove mounting nut between transverse link and shock absorber on lower position.
5. Remove mounting nut between transverse link and front suspension member with power tool.
6. Remove transverse link from steering knuckle. Refer to FAX-4, "FRONT WHEEL HUB AND KNUCKLE" .
7. Remove transverse link from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

Check transverse link and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of front suspension member installation position and shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

UPPER LINK

PFP:54524

Removal and Installation

NES0000C

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove shock absorber. Refer to FSU-10, "COIL SPRING AND SHOCK ABSORBER" .
4. Remove cotter pin of upper link ball joint, then loosen mounting nut.
5. Use a ball joint remover (suitable tool) to remove upper link from steering knuckle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove bolts holding upper link to body with power tool.
7. Remove upper link from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check upper link and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks, or other damage, and also for grease leakage. If any non-standard condition is found, replace it.

Ball Joint Inspection

- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

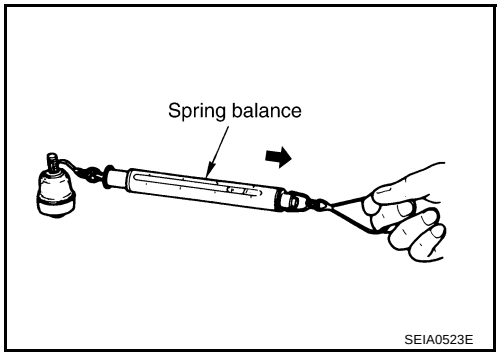
- Hook spring balance at ball stud. Confirm spring balance measurement value is within the specifications when ball stud begins moving.

  Swing torque:

  Less than 2.0 N·m (0.20 kg-m, 18 in-lb)

  Measured value of spring balance:

  Less than 34.8 N (3.5 kg, 7.8 lb)
- If it is outside the specified range, replace upper link assembly.



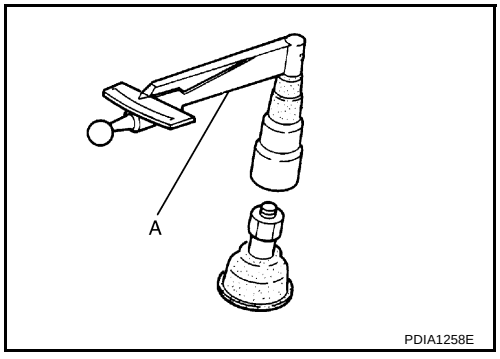
Rotating Torque Inspection

- Attach mounting nut to ball stud. Check that rotating torque is within specifications with a preload gauge.

  Tool number A: ST3127S000 (J–25765–A)

  Rotating torque:

  Less than 2.0 N·m (0.20 kg-m, 18 in-lb)
- If it is outside the specified range, replace upper link assembly.



Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

Axial end play : 0 mm (0 in)

- If it is outside the specified range, replace upper link assembly.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

- Perform final tightening of front suspension member installation position (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

COMPRESSION ROD

PFP:54468

Removal and Installation

NES0000D

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove front cross bar from vehicle with power tool.
4. Remove cotter pin of compression rod ball joint, and loosen nut.
5. Use a ball joint remover (suitable tool) to remove compression rod from steering knuckle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove compression rod from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check compression rod and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks, or other damage, and also for grease leakage. If any non-standard condition is found, replace it.

Ball Joint Inspection

- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

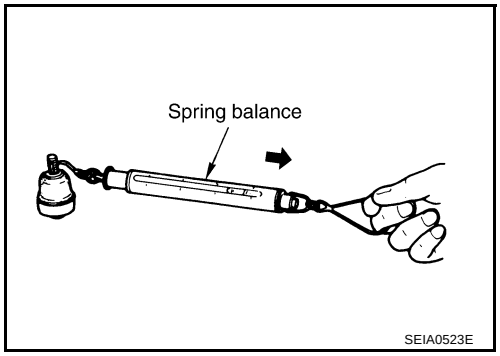
- Hook spring balance at ball stud. Confirm spring balance measurement value is within the specifications when ball stud begins moving.

  Swing torque:

  0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb)

  Measured value of spring balance:

  2.37 - 39.5 N (0.24 - 4.03 kg, 0.53 - 8.88 lb)



- If it is outside the specified range, replace compression rod assembly.

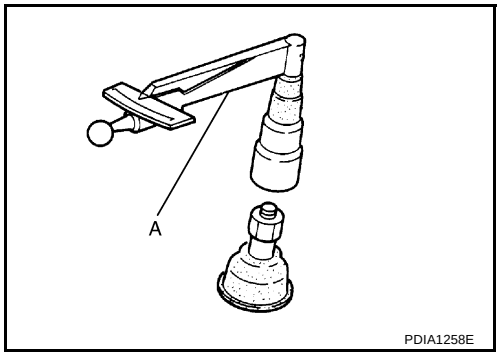
Rotating Torque Inspection

- Attach mounting nut to ball stud. Check that rotating torque is within the specifications with a preload gauge.

  Tool number A: ST3127S000 (J–25765–A)

  Rotating torque:

  0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb)



- If it is outside the specified range, replace compression rod assembly.

AXIAL END PLAY INSPECTION

- Move tip of ball joint in axial direction to check for looseness.

Axial end play : 0 mm (0 in)

- If it is outside the specified range, replace compression rod assembly.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

- Perform final tightening of installation position between front suspension member and front cross bar (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

STABILIZER BAR

PFP:54611

Removal and Installation

NES0000E

REMOVAL

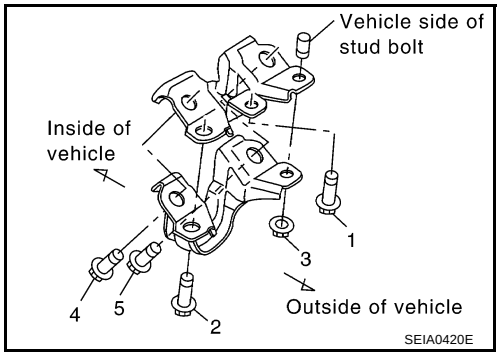
1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove mounting nut on upper portion of stabilizer connecting rod with power tool.
4. Remove fixing bolts and nuts, then remove stabilizer clamp, stabilizer bushing, and stabilizer clamp bracket.
5. Remove stabilizer bar from vehicle.

INSPECTION AFTER REMOVAL

Check stabilizer bar, stabilizer connecting rod, stabilizer bushing, stabilizer clamp and stabilizer clamp bracket for deformation, cracks and damage, and replace if necessary.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.
- Tighten each bolt and nut as shown in the figure for tightening stabilizer bracket and stabilizer clamp. Tightening order is as follows. 1 (fully tighten) → 2 (temporarily tighten) → 3 (temporarily tighten) → 2 (fully tighten) → 3 (fully tighten) → 4, 5 (temporarily tighten) → 4, 5 (fully tighten).



FRONT SUSPENSION MEMBER

PFP:54401

Removal and Installation

NES0000F

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove fixing bolts and nuts, then remove front cross bar from vehicle with power tool.
4. Remove steering hydraulic piping bracket from front suspension member. Refer to PS-33, "HYDRAULIC LINE" .
5. Remove steering gear and front suspension member attachment bolts and hang steering gear on vehicle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
6. Remove transverse link from front suspension member with power tool. Refer to FSU-13, "TRANSVERSE LINK" .
7. Set jack under engine.

   CAUTION:
   When setting jack to engine, use a wooden block or an equivalent for the setting.
8. Remove fixing nuts between engine mounting insulator and front suspension member. Refer to EM-101, "ENGINE ASSEMBLY" .
9. Remove fixing nuts between front suspension member and body with power tool.
10. Remove front suspension member from vehicle.

INSPECTION AFTER REMOVAL

Check front suspension member for deformation, cracks, or any other damage. Replace if necessary.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.
- Perform final tightening of installation position between front suspension member and transverse link (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

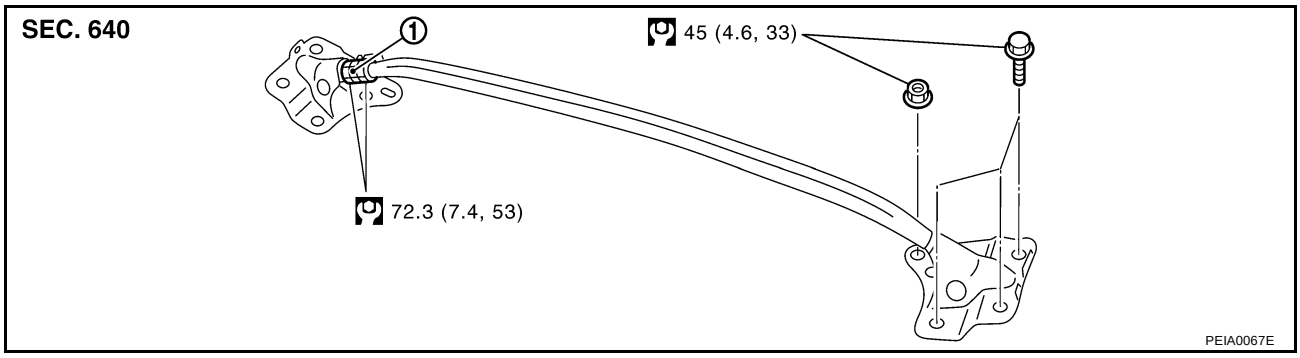
TOWER BAR

PFP:544A2

Removal and Installation

NES0000G

COMPONENTS

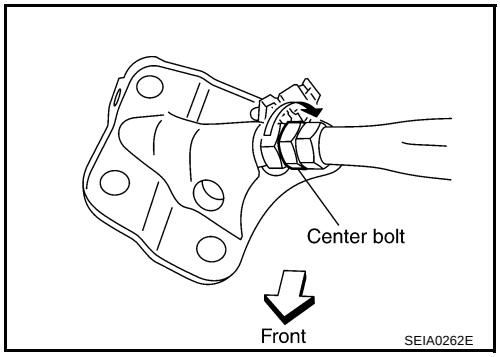


1. Center bolt

Refer to GI-11, "Components" ,for the symbols in the figure

REMOVAL

1. Fix center bolt, and then loosen nut in the right and left side.
2. Loosen center bolt to the direction in the figure on 660° (Or turn bolt 1.7 times) to place the black mark of center bolt above.
3. Remove tower bar fixing bolts and nuts, and remove tower bar from vehicle with power tool.

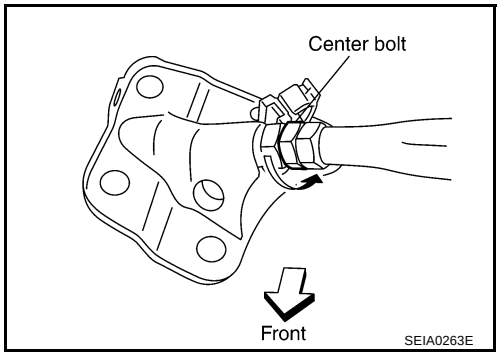


INSTALLATION

1. Install tower bar and tighten at the specified torque.

   NOTE:
   If it is hard to install tower bar, install it turning center bolt.
2. Tighten center bolt to the direction in the figure on 660° (Or turn bolt 1.7 times) to place the black mark of center bolt above.

   NOTE:
   The space between tower bar and engine collector should be between 10.0 mm (0.394 in) and 17.0 mm (0.669 in).
3. Tighten both nut of the right and left side of center bolt.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Alignment (Unladen*)

NES0000H

Camber Degree minute (Decimal degree)		Minimum	–1° 20′ (–1.33°)
		Nominal	–0° 35′ (–0.58°)
		Maximum	0° 10′ (0.17°)
		Left and right difference	45′ (0.75°)
Caster Degree minute (Decimal degree)		Minimum	7° 25′ (7.42°)
		Nominal	8° 10′ (8.17°)
		Maximum	8° 55′ (8.92°)
		Left and right difference	45′ (0.75°)
Kingpin inclination Degree minute (Decimal degree)		Minimum	4° 20′ (4.33°)
		Nominal	5° 05′ (5.08°)
		Maximum	5° 50′ (5.83°)
Total toe-in	Distance	Minimum	0 mm (0 in)
		Nominal	1 mm (0.04 in)
		Maximum	2 mm (0.08 in)
	Angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0° 00′ (0.00°)
		Nominal	0° 02′ 30″ (0.04°)
		Maximum	0° 05′ (0.08°)

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

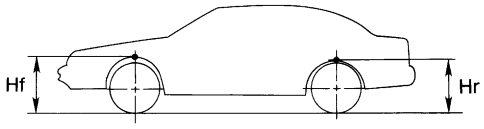
Ball Joint

NES0000I

Swing torque	Less than 2.0 N·m (0.20 kg-m, 18 in-lb) (Upper link) 0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb) (Compression rod)
Measurement on spring balance (cotter pinhole position)	Less than 34.8 N (3.5 kg, 7.8 lb) (Upper link) 2.37 - 39.5 N (0.24 - 4.03 kg, 0.53 - 8.88 lb) (Compression rod)
Rotating torque	Less than 2.0 N·m (0.20 kg-m, 18 in-lb) (Upper link) 0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb) (Compression rod)
Axial end play	0 mm (0 in)

Wheelarch Height (Unladen*)

NES0000J



SFA818A

Applied model	225/45R18 (Front) 245/45R18 (Rear)		245/40R18 (Front) 265/35R19 (Rear)
	Coupe	Roadster	Coupe
Front (Hf)	683 mm (26.89 in)		683 mm (26.89 in)
Rear (Hr)	706 mm (27.80 in)	705 mm (27.76 in)	703 mm (27.68 in)

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

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NISSAN
350Z
MODEL Z33 SERIES

QUICK REFERENCE INDEX

A GENERAL INFORMATION	GI	General Information
B ENGINE	EM	Engine Mechanical
	LU	Engine Lubrication System
	CO	Engine Cooling System
	EC	Engine Control System
	FL	Fuel System
	EX	Exhaust System
	ACC	Accelerator Control System
C TRANSMISSION/ TRANSAXLE	CL	Clutch
	MT	Manual Transmission
	AT	Automatic Transmission
D DRIVELINE/AXLE	PR	Propeller Shaft
	RFD	Rear Final Drive
	FAX	Front Axle
	RAX	Rear Axle
E SUSPENSION	FSU	Front Suspension
	RSU	Rear Suspension
	WT	Road Wheels & Tires
F BRAKES	BR	Brake System
	PB	Parking Brake System
	BRC	Brake Control System
G STEERING	PS	Power Steering System
	STC	Steering Control System
H RESTRAINTS	SB	Seat Belts
	SRS	Supplemental Restraint System (SRS)
I BODY	BL	Body, Lock & Security System
	GW	Glasses, Window System & Mirrors
	RF	Roof
	EI	Exterior & Interior
	IP	Instrument Panel
	SE	Seat
J AIR CONDITIONER	ATC	Automatic Air Conditioner
K ELECTRICAL	SC	Starting & Charging System
	LT	Lighting System
	DI	Driver Information System
	WW	Wiper, Washer & Horn
	BCS	Body Control System
	LAN	LAN System
	AV	Audio Visual, Navigation & Telephone System
	ACS	Auto Cruise Control System
	PG	Power Supply, Ground & Circuit Elements
L MAINTENANCE	MA	Maintenance
M INDEX	IDX	Alphabetical Index

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FOREWORD

This manual contains maintenance and repair procedure for the 2007 NISSAN 350Z.

In order to assure your safety and the efficient functioning of the vehicle, this manual should be read thoroughly. It is especially important that the PRECAUTIONS in the GI section be completely understood before starting any repair task.

All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

IMPORTANT SAFETY NOTICE

The proper performance of service is essential for both the safety of the technician and the efficient functioning of the vehicle.
The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately.
Service varies with the procedures used, the skills of the technician and the tools and parts available. Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by NISSAN must first be completely satisfied that neither personal safety nor the vehicle's safety will be jeopardized by the service method selected.

NISSAN MOTOR CO., LTD.

QUICK REFERENCE CHART 350Z

PFP:00000

ENGINE TUNE-UP DATA (VQ35HR)

ELS0003W

Engine model		VQ35HR
Firing order		1-2-3-4-5-6
Idle speed rpm A/T (In “P” or “N” position) M/T (In “Neutral” position)		650 ± 50
Ignition timing (BTDC at idle speed) A/T (In “P” or “N” position) M/T (In “Neutral” position)		15° ± 5°
CO% at idle		0.7 - 9.9 % and engine runs smoothly
Tension of drive belts		Auto adjustment by auto tensioner
Radiator cap relief pressure kPa (kg/cm^2 , psi)	Standard	108 - 127 (1.1 - 1.3, 16 - 18)
	Limit	88 (0.9, 13)
Cooling system leakage testing pressure kPa (kg/cm^2 , psi)		157 (1.6, 23)
Compression pressure kPa (kg/cm^2 , psi)/rpm		
	Standard	1,275 (13.0, 185)/300
	Minimum	981 (10.0, 142)/300
	Differential limit between cylinders	98 (1.0, 14)/300
Spark plug	Standard type	FXE22HR11
	Gap (Nominal) mm (in)	1.1 (0.043)

FRONT WHEEL ALIGNMENT (Unladen*)

ELS0003X

Camber Degree minute (Decimal degree)		Minimum	–1°20′ (–1.33°)
		Nominal	–0°35′ (–0.58°)
		Maximum	0°10′ (0.17°)
		Left and right difference	45′ (0.75°)
Caster Degree minute (Decimal degree)		Minimum	7°25′ (7.42°)
		Nominal	8°10′ (8.17°)
		Maximum	8°55′ (8.92°)
		Left and right difference	45′ (0.75°)
Kingpin inclination Degree minute (Decimal degree)		Minimum	4°20′ (4.33°)
		Nominal	5°05′ (5.08°)
		Maximum	5°50′ (5.83°)
Total toe-in	Distance	Minimum	0 mm (0 in)
		Nominal	1 mm (0.04 in)
		Maximum	2 mm (0.08 in)
	Angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0°00′ (0.00°)
		Nominal	0°02′30″ (0.04°)
		Maximum	0°05′ (0.08°)

Wheel turning angle (Full turn)	Inside Degree minute (Decimal degree)	Minimum	35°55′ (35.9°)
		Nominal	38°55′ (38.9°)
		Maximum	39°55′ (39.9°)
	Outside Degree minute (Decimal degree)	Nominal	30°40′ (30.7°)

* : Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

REAR WHEEL ALIGNMENT (Unladen*)

ELS0003Y

Camber Degree minute (Decimal degree)		Minimum	–2°05′ (–2.08°)
		Nominal	–1°35′ (–1.58°)
		Maximum	–1°05′ (–1.08°)
Total toe-in	Distance	Minimum	1.1 mm (0.043 in)
		Nominal	1.9 mm (0.075 in)
		Maximum	2.7 mm (0.106 in)
	Angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0°02′54″ (0.05°)
		Nominal	0°04′54″ (0.08°)
		Maximum	0°06′54″ (0.12°)

* : Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

BRAKE

ELS0003Z

Unit : mm (in)

Front brake	Pad repair limit thickness	2.0 (0.079)
	Rotor repair limit thickness	Other than brembo : 26.0 (1.024) With brembo : 28.4 (1.118)
Rear brake	Pad repair limit thickness	2.0 (0.079)
	Rotor repair limit thickness	Other than brembo : 14.0 (0.551) With brembo : 20.2 (0.795)
Brake pedal height (from dash lower panel top surface)		M/T : 153.2 - 163.2 (6.03 - 6.43) A/T : 161.5 - 171.5 (6.36 - 6.75)
Depressed pedal height*		M/T : More than 90 (3.54) A/T : More than 95 (3.74)

* : Under a force of 490 N(50 kg, 110 lb) with the engine running.

REFILL CAPACITIES

ELS00040

UNIT		Liter	US measure
Fuel tank		76	20 gal
Engine coolant (With reservoir tank)		9.0	9-1/2 qt
Engine	Drain and refill		
	With oil filter change	4.7	5 qt
	Without oil filter change	4.4	4-5/8 qt
	Dry engine (Overhaul)	5.4	5-3/4 qt
Transmission	A/T	10.3	10-7/8 qt
	M/T	2.9	3-1/8 qt
Differential carrier		1.4	3 pt
Power steering system		1.0	1 1/8 qt
Air conditioning system	Compressor oil	0.15	5.3 fl oz
	Refrigerant	0.55 kg	1.21 lb

SECTION GI
GENERAL INFORMATION

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PRECAUTIONS

PFP:00001

Description

NAS00001

Observe the following precautions to ensure safe and proper servicing. These precautions are not described in each individual section.

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NAS00002

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

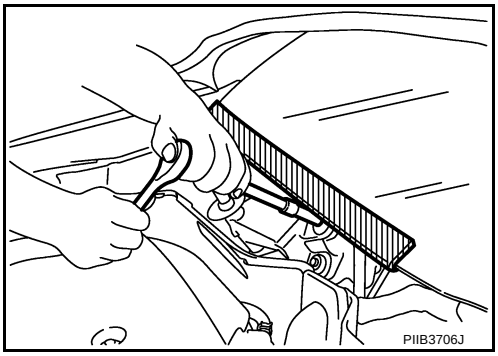
NAS00004

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NAS0005O

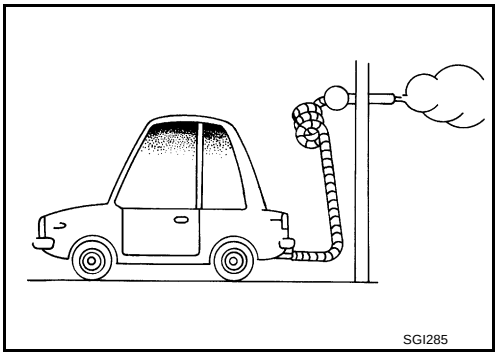
When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.


PIIB3706J

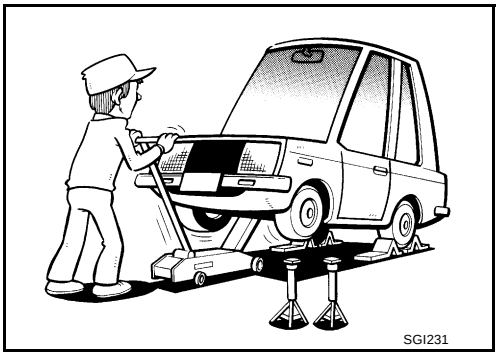
General Precautions

NAS00005

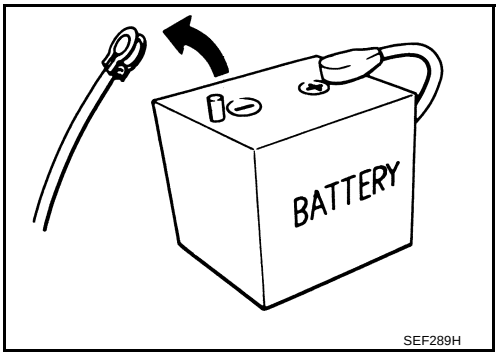
- Do not operate the engine for an extended period of time without proper exhaust ventilation.
  Keep the work area well ventilated and free of any flammable materials. Special care should be taken when handling any flammable or poisonous materials, such as gasoline, refrigerant gas, etc. When working in a pit or other enclosed area, be sure to properly ventilate the area before working with hazardous materials.
  Do not smoke while working on the vehicle.


SGI285

- Before jacking up the vehicle, apply wheel chocks or other tire blocks to the wheels to prevent the vehicle from moving. After jacking up the vehicle, support the vehicle weight with safety stands at the points designated for proper lifting before working on the vehicle.
  These operations should be done on a level surface.
- When removing a heavy component such as the engine or transaxle/transmission, be careful not to lose your balance and drop them. Also, do not allow them to strike adjacent parts, especially the brake tubes and master cylinder.

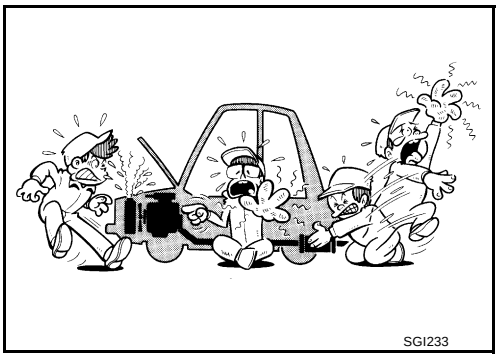

SGI231

- Before starting repairs which do not require battery power:
  Turn off ignition switch.
  Disconnect the negative battery terminal.
- If the battery terminals are disconnected, recorded memory of radio and each control unit is erased.
- Battery posts, terminals and related accessories contain lead and lead compounds. Wash hands after handling.

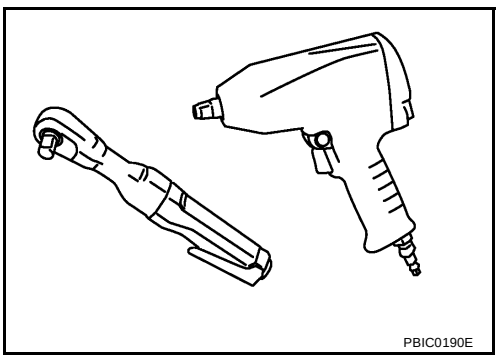


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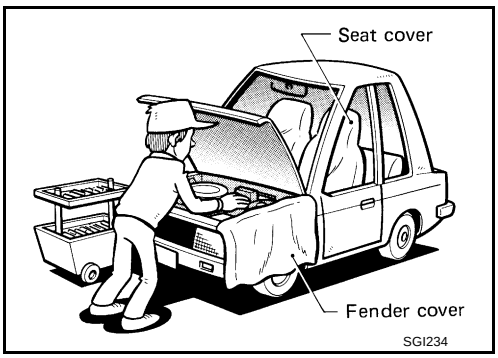
- To prevent serious burns:
  Avoid contact with hot metal parts.
  Do not remove the radiator cap when the engine is hot.
- Dispose of or recycle drained oil or the solvent used for cleaning parts in an appropriate manner.
- Do not attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically.
  Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.
- Clean all disassembled parts in the designated liquid or solvent prior to inspection or assembly.


SGI233

- Replace oil seals, gaskets, packings, O-rings, locking washers, cotter pins, self-locking nuts, etc. with new ones.
- Replace inner and outer races of tapered roller bearings and needle bearings as a set.
- Arrange the disassembled parts in accordance with their assembled locations and sequence.
- Do not touch the terminals of electrical components which use microcomputers (such as ECM).
  Static electricity may damage internal electronic components.
- After disconnecting vacuum or air hoses, attach a tag to indicate the proper connection.
- Use only the fluids and lubricants specified in this manual.
- Use approved bonding agent, sealants or their equivalents when required.
- Use hand tools, power tools (disassembly only) and recommended special tools where specified for safe and efficient service repairs.
- When repairing the fuel, oil, water, vacuum or exhaust systems, check all affected lines for leaks.


PBIC0190E

- Before servicing the vehicle:
  Protect fenders, upholstery and carpeting with appropriate covers.
  Take caution that keys, buckles or buttons do not scratch paint.



WARNING:
To prevent ECM from storing the diagnostic trouble codes, do not carelessly disconnect the harness connectors which are related to the engine control system and TCM (transmission control module) system. The connectors should be disconnected only when working according to the WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.

Precautions for Three Way Catalyst

NAS00006

If a large amount of unburned fuel flows into the catalyst, the catalyst temperature will be excessively high. To prevent this, follow the instructions.

- Use unleaded gasoline only. Leaded gasoline will seriously damage the three way catalyst.
- When checking for ignition spark or measuring engine compression, make tests quickly and only when necessary.
- Do not run engine when the fuel tank level is low, otherwise the engine may misfire, causing damage to the catalyst.

Do not place the vehicle on flammable material. Keep flammable material off the exhaust pipe and the three way catalyst.

Precautions for Fuel (Unleaded Premium Gasoline Required)

NAS0005P

Use unleaded premium gasoline with an octane rating of at least 91 AKI (Anti-Knock Index) number (Research octane number 96).

If unleaded premium gasoline is not available, unleaded regular gasoline with an octane rating of at least 87 AKI number (Research octane number 91) can be used, but only under the following precautions:

- have the fuel tank filled only partially with unleaded regular gasoline, and fill up with unleaded premium gasoline as soon as possible.
- avoid full throttle driving and abrupt acceleration.

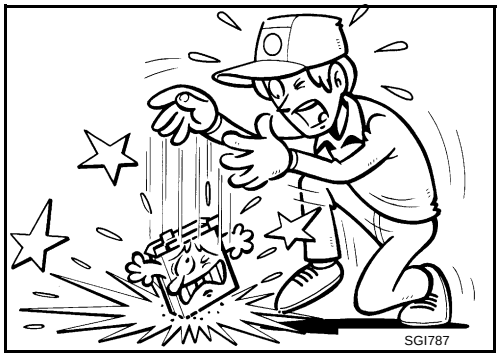
However, for maximum vehicle performance, the use of unleaded premium gasoline is recommended.

CAUTION:
Do not use leaded gasoline. Using leaded gasoline will damage the three way catalyst. Do not use E-85 fuel (85% fuel ethanol, 15% unleaded gasoline) unless the vehicle is specifically designed for E-85 fuel (i.e. Flexible Fuel Vehicle - FFV models). Using a fuel other than that specified could adversely affect the emission control devices and systems, and could also affect the warranty coverage validity.

Precautions for Multiport Fuel Injection System or Engine Control System

NAS00008

- Before connecting or disconnecting any harness connector for the multiport fuel injection system or ECM:
  Turn ignition switch to “OFF” position.
  Disconnect negative battery terminal.
  Otherwise, there may be damage to ECM.
- Before disconnecting pressurized fuel line from fuel pump to injectors, be sure to release fuel pressure.
- Be careful not to jar components such as ECM and mass air flow sensor.

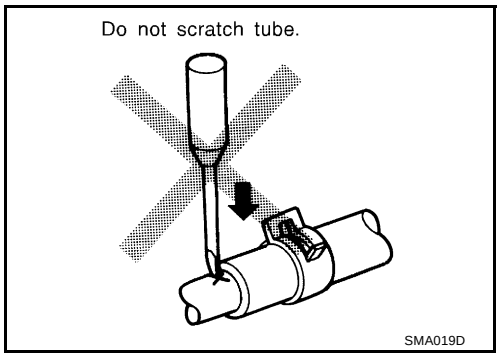


Precautions for Hoses

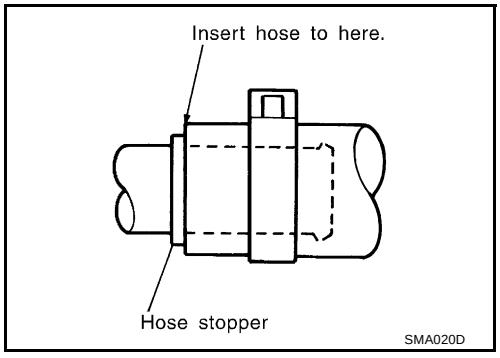
NAS00009

HOSE REMOVAL AND INSTALLATION

- To prevent damage to rubber hose, do not pry off rubber hose with tapered tool or screwdriver.

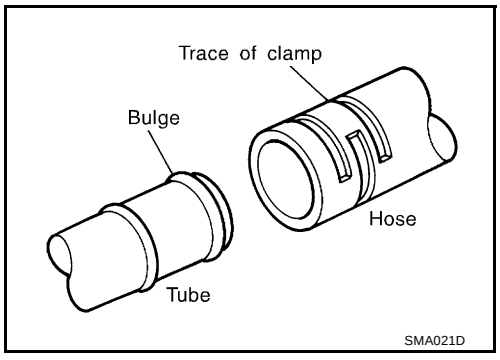


- To reinstall the rubber hose securely, make sure that hose insertion length and orientation is correct. (If tube is equipped with hose stopper, insert rubber hose into tube until it butts up against hose stopper.)

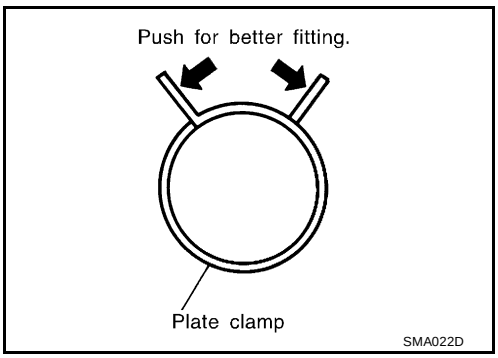


HOSE CLAMPING

- If old rubber hose is re-used, install hose clamp in its original position (at the indentation where the old clamp was). If there is a trace of tube bulging left on the old rubber hose, align rubber hose at that position.
- Discard old clamps; replace with new ones.



- After installing plate clamps, apply force to them in the direction of the arrow, tightening rubber hose equally all around.



Precautions for Engine Oils

NAS0000A

Prolonged and repeated contact with used engine oil may cause skin cancer. Try to avoid direct skin contact with used oil.
If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

HEALTH PROTECTION PRECAUTIONS

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Do not put oily rags in pockets.
- Avoid contaminating clothes, particularly underpants, with oil.
- Heavily soiled clothing and oil-impregnated footwear should not be worn. Overalls must be cleaned regularly.
- First aid treatment should be obtained immediately for open cuts and wounds.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin.
- Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
- Do not use gasoline, kerosene, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- If skin disorders develop, obtain medical advice without delay.
- Where practical, degrease components prior to handling.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.

ENVIRONMENTAL PROTECTION PRECAUTIONS

Dispose of used oil and used oil filters through authorized waste disposal contractors to licensed waste disposal sites, or to the waste oil reclamation trade. if in doubt, contact the local authority for advice on disposal facilities.
It is illegal to pour used oil on to the ground, down sewers or drains, or into water sources.
The regulations concerning pollution vary between regions.

Precautions for Air Conditioning

NAS0000B

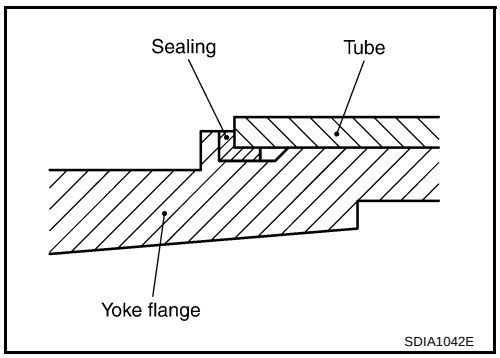
Use an approved refrigerant recovery unit any time the air conditioning system must be discharged. Refer to ATC/MTC section “HFC-134a (R-134a) Service Procedure”, “REFRIGERANT LINES” for specific instructions.

Precautions for Propeller Shaft

NAS0000C

- If propeller shaft is dropped, replace propeller shaft with new one.
- Do not hit, impact, or damage tube.

- If damage such as cracks or peeling off in sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- If there is chipping or looseness in tube, replace propeller shaft with new one.
- Protect propeller shaft with protector (special service tool) during work.



HOW TO USE THIS MANUAL

PFP:00008

Description

NAS0000D

This volume explains “Removal, Disassembly, Installation, Inspection and Adjustment” and “Trouble Diagnoses”.

Terms

NAS0000E

- The captions **WARNING** and **CAUTION** warn you of steps that must be followed to prevent personal injury and/or damage to some part of the vehicle.
  WARNING indicates the possibility of personal injury if instructions are not followed.
  CAUTION indicates the possibility of component damage if instructions are not followed.
  BOLD TYPED STATEMENTS except **WARNING** and **CAUTION** give you helpful information.
  Standard value:Tolerance at inspection and adjustment.
  Limit value:The maximum or minimum limit value that should not be exceeded at inspection and adjustment.

Units

NAS0000F

- The **UNITS** given in this manual are primarily expressed as the SI UNIT (International System of Unit), and alternatively expressed in the metric system and in the yard/pound system.
  Also with regard to tightening torque of bolts and nuts, there are descriptions both about range and about the standard tightening torque.

  “Example”
  Range

  Outer Socket Lock Nut : 59 - 78 N·m (6.0 - 8.0 kg-m, 43 - 58 ft-lb)

  Standard

  Drive Shaft Installation Bolt : 44.3 N·m (4.5 kg-m, 33 ft-lb)

Contents

NAS0000G

- **ALPHABETICAL INDEX** is provided at the end of this manual so that you can rapidly find the item and page you are searching for.
- **A QUICK REFERENCE INDEX**, a black tab (e.g. BR) is provided on the first page. You can quickly find the first page of each section by matching it to the section's black tab.
- **THE CONTENTS** are listed on the first page of each section.
- **THE TITLE** is indicated on the upper portion of each page and shows the part or system.
- **THE PAGE NUMBER** of each section consists of two or three letters which designate the particular section and a number (e.g. “BR-5”).
- **THE SMALL ILLUSTRATIONS** show the important steps such as inspection, use of special tools, knacks of work and hidden or tricky steps which are not shown in the previous large illustrations.
  Assembly, inspection and adjustment procedures for the complicated units such as the automatic transaxle or transmission, etc. are presented in a step-by-step format where necessary.

Relation between Illustrations and Descriptions

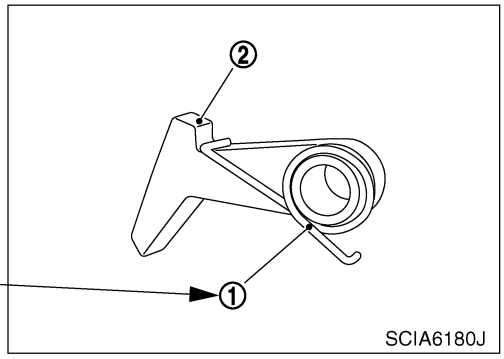
NAS000A2

The following sample explains the relationship between the part description in an illustration, the part name in the text and the service procedures.

< Example 1 >

1. Remove return spring (1) from parking pawl (2).

The identifier number of the part name in the text is consistent with the identifier part number in the illustration.

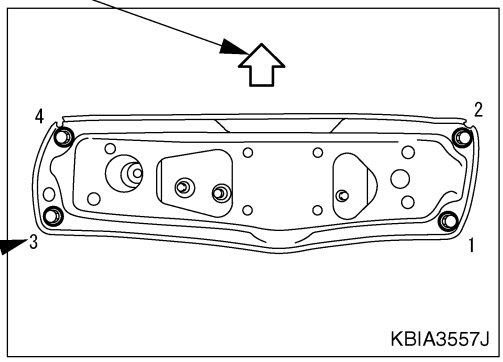


Direction mark

< Example 2 >

- ⇨ : Vehicle front
- Tighten rear member mounting bolts following the numerical order shown in the illustration.
- Note : View upward

The numbers in the illustration are consistent with the service operation instructions.

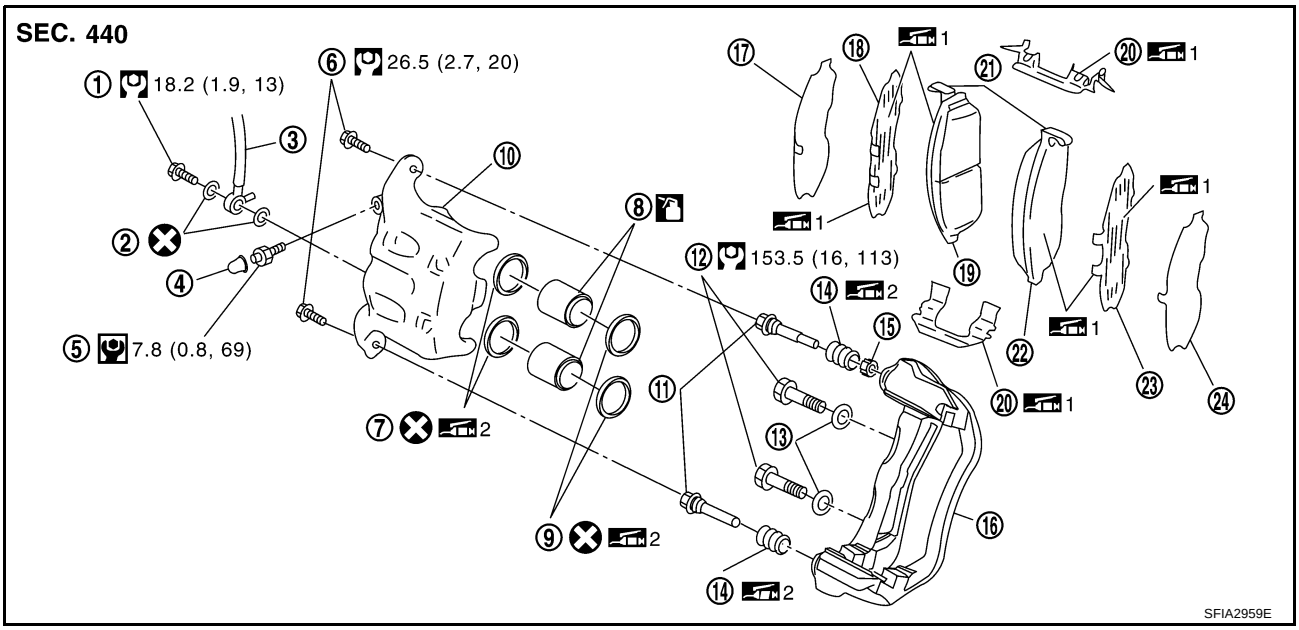


SAIA0519E

Components

NAS0000H

- **THE LARGE ILLUSTRATIONS** are exploded views (see the following) and contain tightening torques, lubrication points, section number of the **PARTS CATALOG** (e.g. SEC. 440) and other information necessary to perform repairs.
  The illustrations should be used in reference to service matters only. When ordering parts, refer to the appropriate **PARTS CATALOG** .
  Components shown in an illustration may be identified by a circled number. When this style of illustration is used, the text description of the components will follow the illustration.



1. Union bolt	2. Copper washer	3. Brake hose
4. Cap	5. Bleed valve	6. Sliding pin bolt
7. Piston seal	8. Piston	9. Piston boot
10. Cylinder body	11. Sliding pin	12. Torque member mounting bolt
13. Washer	14. Sliding pin boot	15. Bushing
16. Torque member	17. Inner shim cover	18. Inner shim
19. Inner pad	20. Pad retainer	21. Pad wear sensor
22. Outer pad	23. Outer shim	24. Outer shim cover
1: PBC (Poly Butyl Cuprysil) grease or silicone-based grease	2: Rubber grease	: Brake fluid

Refer to GI section for additional symbol definitions.

SYMBOLS

SYMBOL	DESCRIPTION		SYMBOL	DESCRIPTION
	Tightening torque The tightening torque specifications of bolts and nuts may be presented as either a range or a standard tightening torque.	: N•m (kg-m, ft-lb)		Always replace after every disassembly.
		: N•m (kg-m, in-lb)	Ⓟ	Apply petroleum jelly.
	Should be lubricated with grease. Unless otherwise indicated, use recommended multi-purpose grease.		Ⓜ	Apply molybdenum added petroleum jelly.
	Should be lubricated with oil.		ATF	Apply ATF.
	Sealing point		★	Select with proper thickness.
Ⓛ	Sealing point with locking sealant.		☆	Adjustment is required.
	Checking point			

SAIA0749E

How to Follow Trouble Diagnoses

NAS0000I

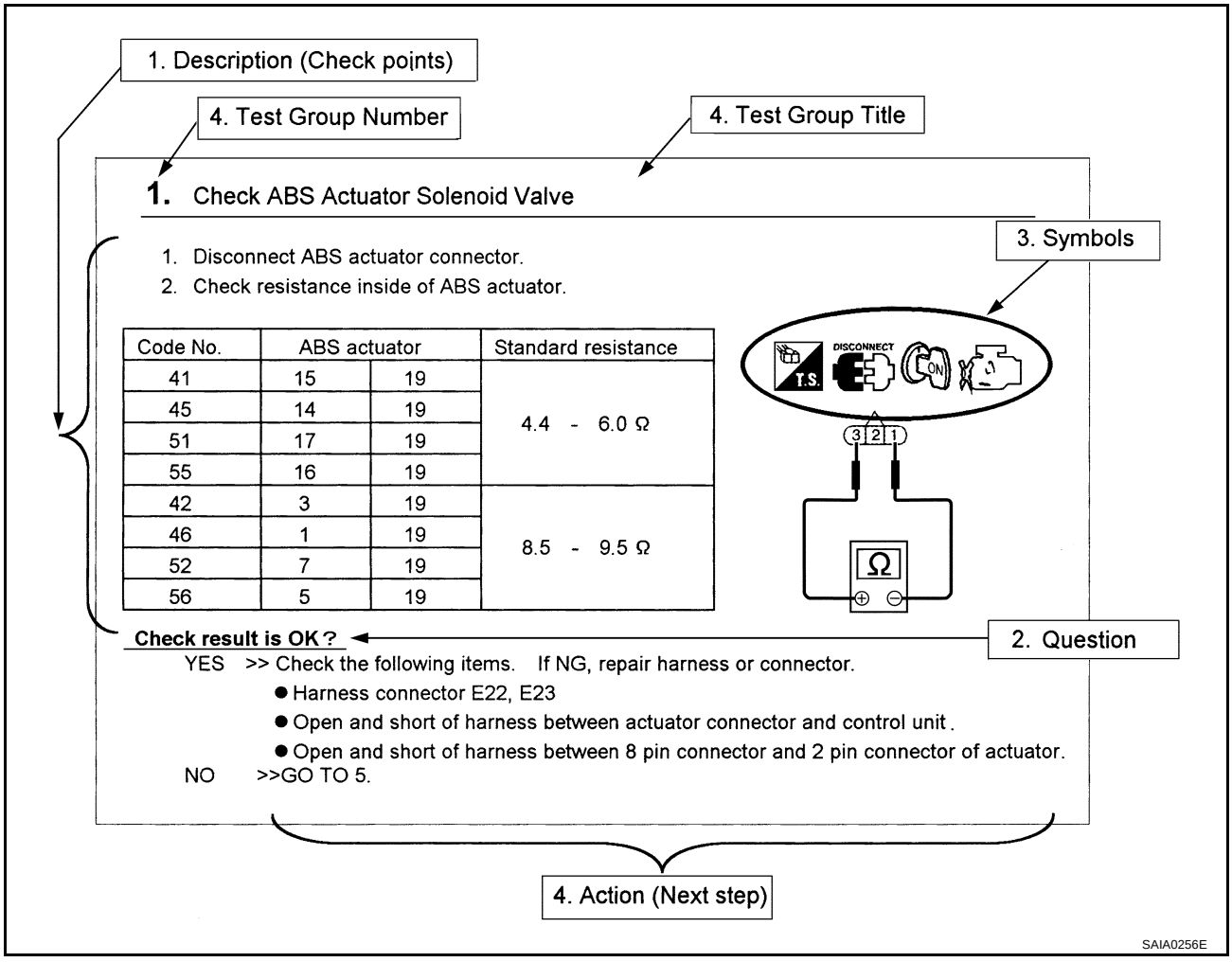
DESCRIPTION

NOTICE:

Trouble diagnoses indicate work procedures required to diagnose problems effectively. Observe the following instructions before diagnosing.

1. **Before performing trouble diagnoses, read the "Preliminary Check", the "Symptom Chart" or the "Work Flow".**
2. **After repairs, re-check that the problem has been completely eliminated.**
3. **Refer to Component Parts and Harness Connector Location for the Systems described in each section for identification/location of components and harness connectors.**
4. **Refer to the Circuit Diagram for quick pinpoint check.**
   If you need to check circuit continuity between harness connectors in more detail, such as when a sub-harness is used, refer to Wiring Diagram in each individual section and Harness Layout in PG section for identification of harness connectors.
5. **When checking circuit continuity, ignition switch should be OFF.**
6. **Before checking voltage at connectors, check battery voltage.**
7. **After accomplishing the Diagnostic Procedures and Electrical Components Inspection, make sure that all harness connectors are reconnected as they were.**

HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES



1. **Work and diagnostic procedure**
   Start to diagnose a problem using procedures indicated in enclosed test groups.
2. **Questions and required results**
   Questions and required results are indicated in bold type in test group.
   The meaning of are as follows:

a. Battery voltage → 11 - 14V or approximately 12V

b. Voltage : Approximately 0V → Less than 1V

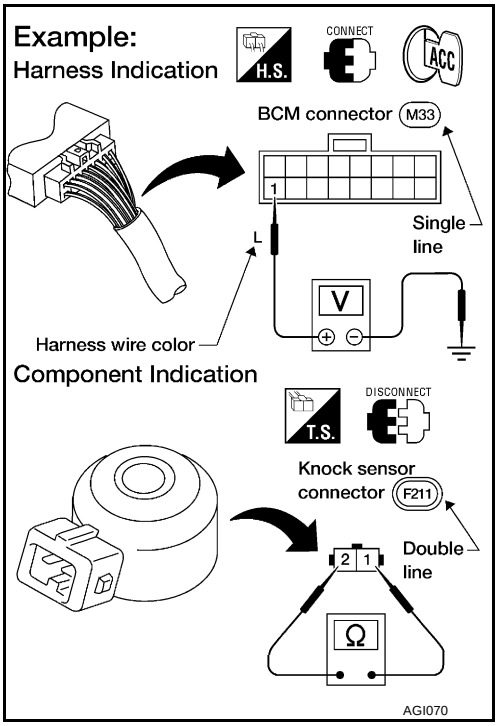
3. **Symbol used in illustration**
   Symbols included in illustrations refer to measurements or procedures. Before diagnosing a problem, familiarize yourself with each symbol. Refer to "Connector Symbols" in GI Section and "KEY TO SYMBOLS SIGNIFYING MEASUREMENTS OR PROCEDURES" below.
4. **Action items**
   Next action for each test group is indicated based on result of each question. Test group number is shown in the left upper portion of each test group.

HARNESS WIRE COLOR AND CONNECTOR NUMBER INDICATION

There are two types of harness wire color and connector number indication.

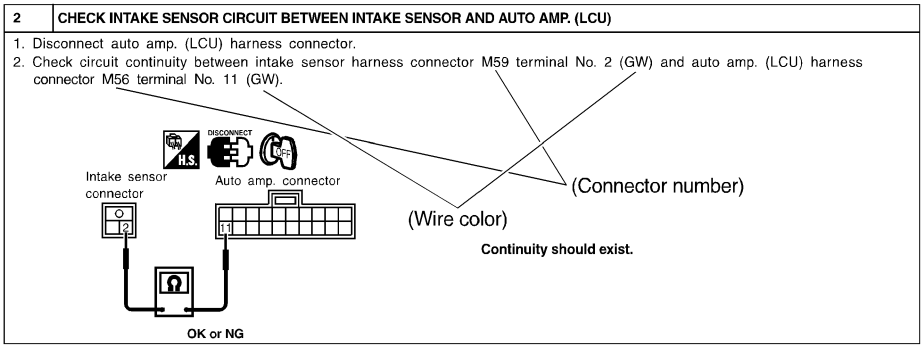
TYPE 1: Harness Wire Color and Connector Number are Shown in Illustration

- Letter designations next to test meter probe indicate harness wire color.
- Connector numbers in a single circle (e.g. M33) indicate harness connectors.
- Connector numbers in a double circle (e.g. F211) indicate component connectors.

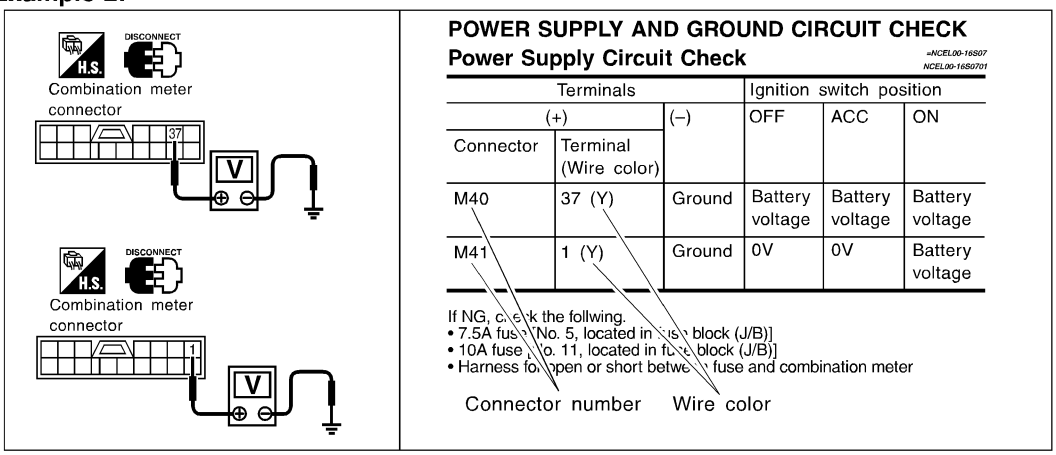


TYPE 2: Harness Wire Color and Connector Number are Shown in Text

Example 1:



Example 2:

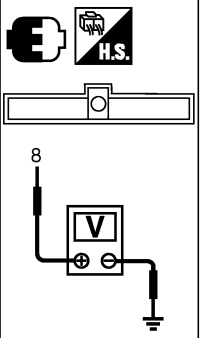


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KEY TO SYMBOLS SIGNIFYING MEASUREMENTS OR PROCEDURES

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Check after disconnecting the connector to be measured.	GST	Procedure with Generic Scan Tool. (GST, OBD-II scan tool)
	Check after connecting the connector to be measured.	NO TOOLS	Procedure without CONSULT-II, CONSULT-III or GST
	Insert key into ignition switch.	A/C OFF	A/C switch is “OFF”.
	Remove key from ignition switch.	A/C ON	A/C switch is “ON”.
	Insert and remove key repeatedly.		REC switch is “ON”.
OFF	Turn ignition switch to “OFF” position.		REC switch is “OFF”.
ACC	Turn ignition switch to “ACC” position.		Fan switch is “ON”. (At any position except for “OFF” position)
ON	Turn ignition switch to “ON” position.		Fan switch is “OFF”.
ST	Turn ignition switch to “START” position.	FUSE	Apply fuse.
OFF ACC	Turn ignition switch from “OFF” to “ACC” position.	FUSE BAT	Apply positive voltage from battery with fuse directly to components.
ACC ON	Turn ignition switch from “ACC” to “ON” position.		
ACC OFF	Turn ignition switch from “ACC” to “OFF” position.		

SAIA1539E

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Turn ignition switch from "OFF" to "ON" position.		Drive vehicle.
	Turn ignition switch from "ON" to "OFF" position.		
	Do not start engine, or check with engine stopped.		Disconnect battery negative cable.
	Start engine, or check with engine running.		Depress brake pedal.
	Apply parking brake.		Release brake pedal.
	Release parking brake.		Depress accelerator pedal.
	Check after engine is warmed up sufficiently.		Release accelerator pedal.
	Votage should be measured with a voltmeter.		Pin terminal check for SMJ type ECM or TCM connectors. **For details regarding the terminal arrangement, refer to the "ELECTRICAL UNITS" electrical reference page at the end of the manual.**
	Circuit resistance should be measured with an ohmmeter.		
	Current should be measured with an ammeter.		
	Pulse signal should be checked with an oscilloscope.		
	Procedure with CONSULT-III		
	Procedure without CONSULT-III		
	Place selector lever in "P" position.		
	Place selector lever in "N" position.		
	Jack up front portion.		
	Jack up rear portion.		
	Inspect under engine room.		
	Inspect under floor.		
	Inspect rear under floor.		

SAIA1540E

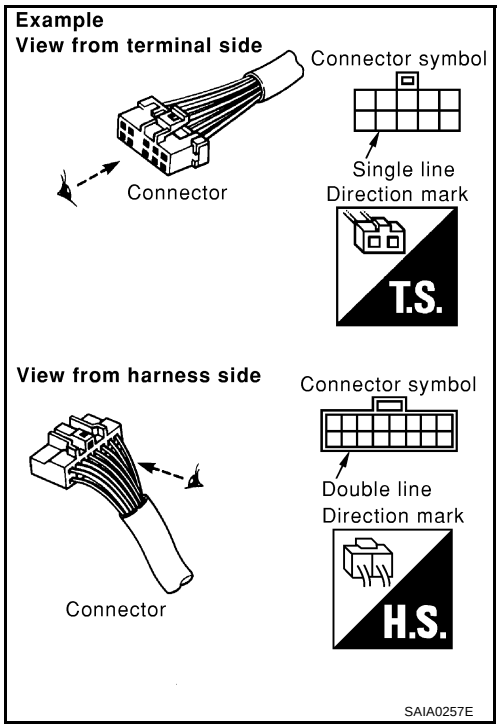
How to Read Wiring Diagrams

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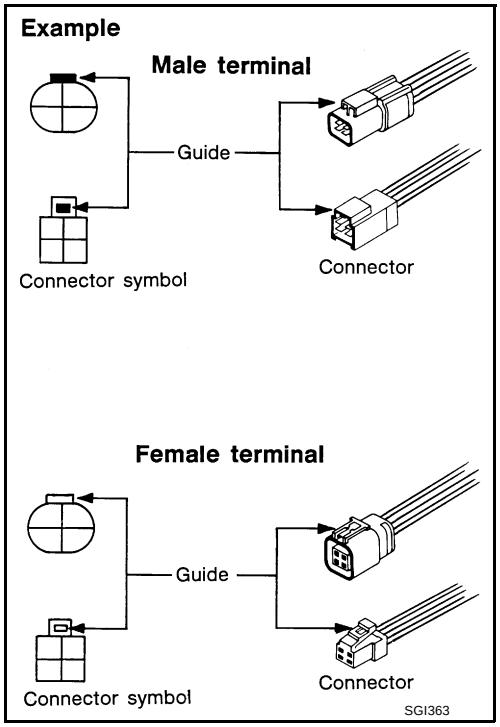
CONNECTOR SYMBOLS

Most of connector symbols in wiring diagrams are shown from the terminal side.

- Connector symbols shown from the terminal side are enclosed by a single line and followed by the direction mark.
- Connector symbols shown from the harness side are enclosed by a double line and followed by the direction mark.
- Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to PG section, “Description”, “HARNESS CONNECTOR”.

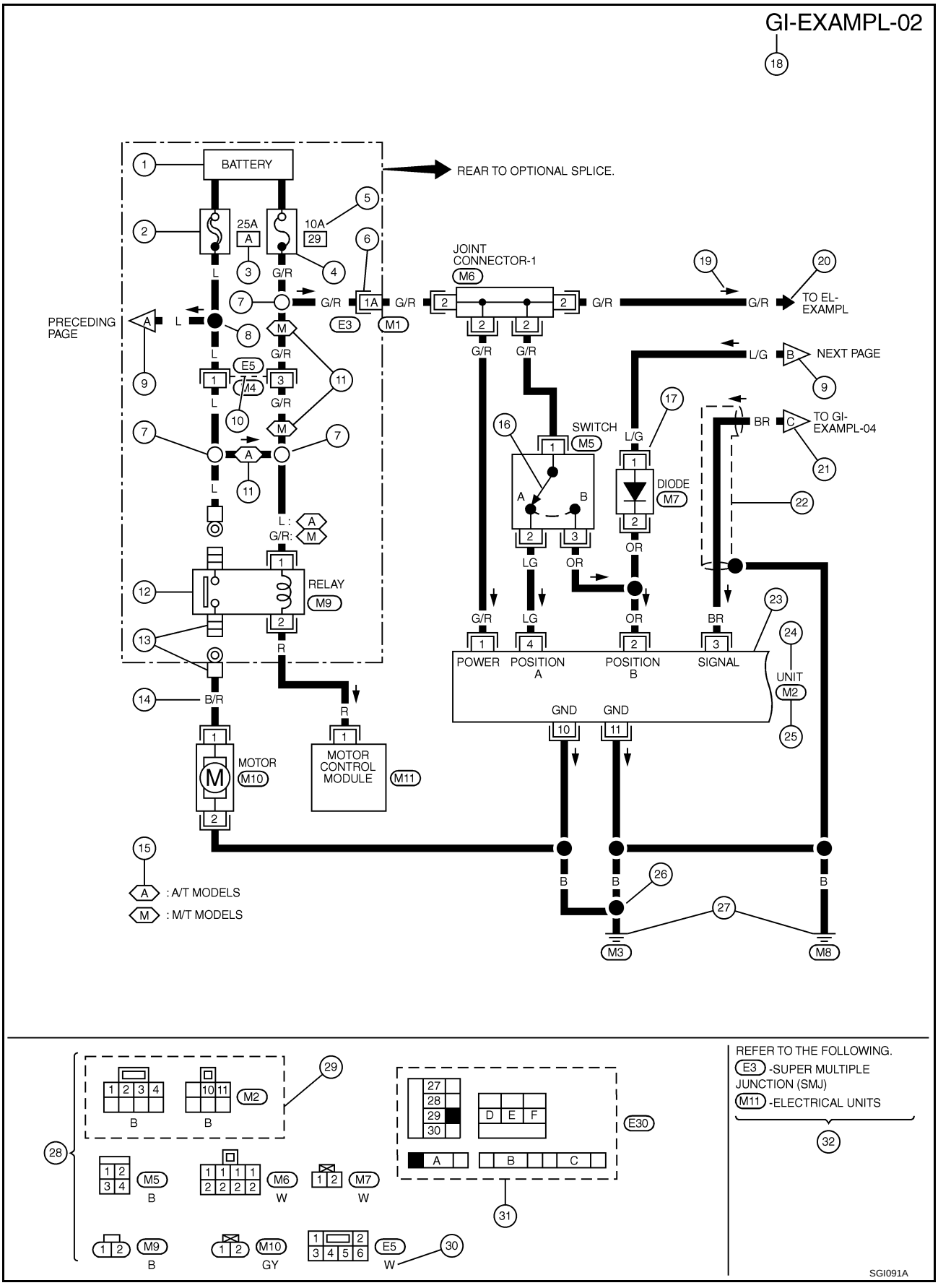


- Male and female terminals
  Connector guides for male terminals are shown in black and female terminals in white in wiring diagrams.

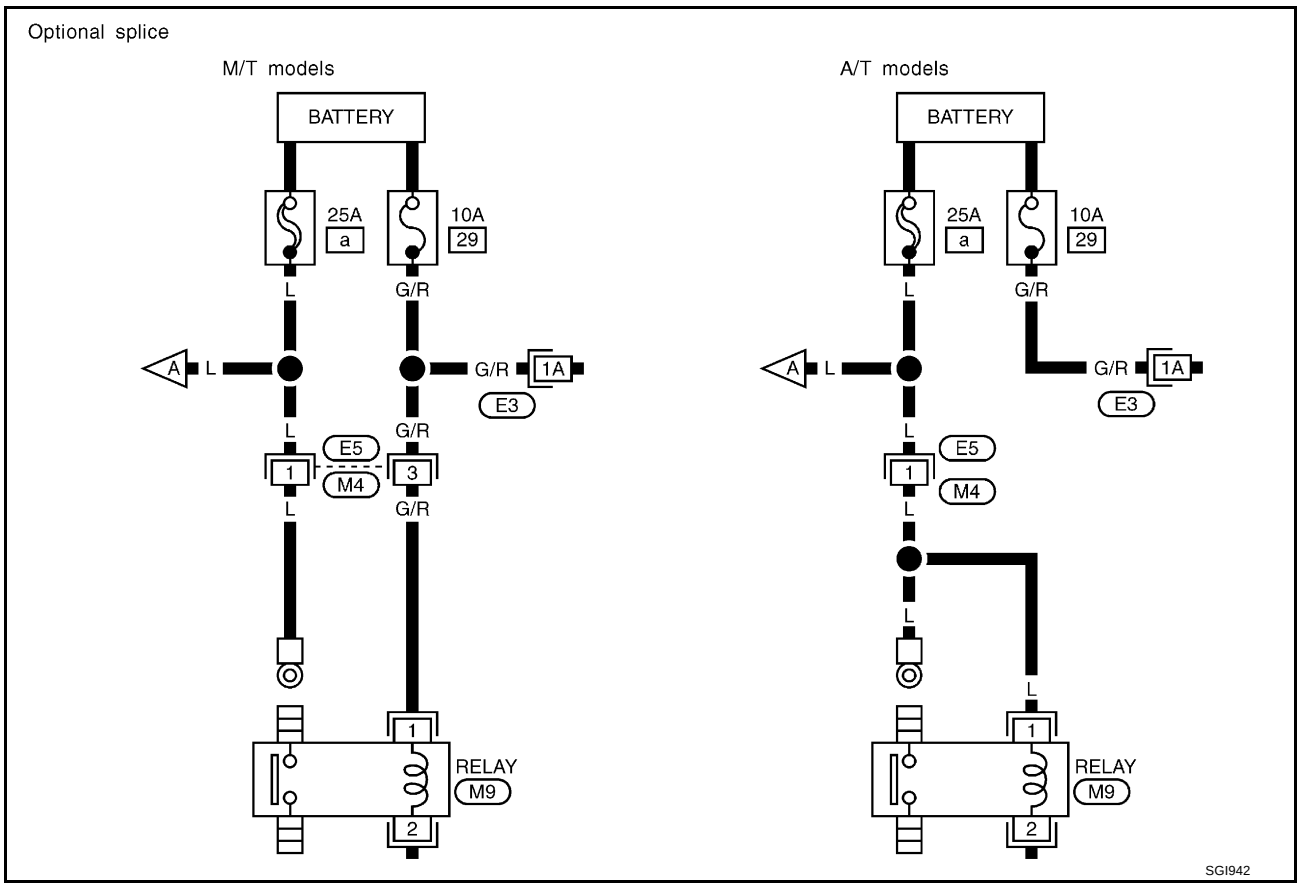


SAMPLE/WIRING DIAGRAM - EXAMPL -

- For detail, refer to following “DESCRIPTION”.



Optional Splice



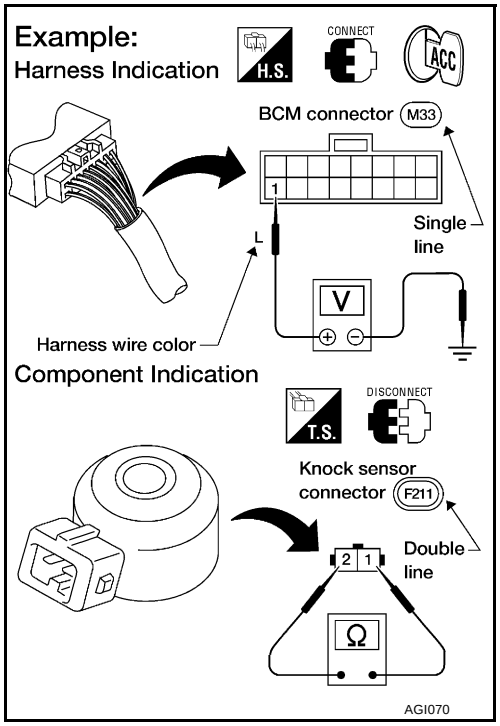
DESCRIPTION

Number	Item	Description
1	Power condition	● This shows the condition when the system receives battery positive voltage (can be operated).
2	Fusible link	● The double line shows that this is a fusible link. ● The open circle shows current flow in, and the shaded circle shows current flow out.
3	Fusible link/fuse location	● This shows the location of the fusible link or fuse in the fusible link or fuse box. For arrangement, refer to PG section, POWER SUPPLY ROUTING.
4	Fuse	● The single line shows that this is a fuse. ● The open circle shows current flow in, and the shaded circle shows current flow out.
5	Current rating	● This shows the current rating of the fusible link or fuse.
6	Connectors	● This shows that connector E3 is female and connector M1 is male. ● The G/R wire is located in the 1A terminal of both connectors. ● Terminal number with an alphabet (1A, 5B, etc.) indicates that the connector is SMJ connector. Refer to PG section, SMJ (SUPER MULTIPLE JUNCTION).
7	Optional splice	● The open circle shows that the splice is optional depending on vehicle application.
8	Splice	● The shaded circle shows that the splice is always on the vehicle.
9	Page crossing	● This arrow shows that the circuit continues to an adjacent page. ● The A will match with the A on the preceding or next page.
10	Common connector	● The dotted lines between terminals show that these terminals are part of the same connector.
11	Option abbreviation	● This shows that the circuit is optional depending on vehicle application.
12	Relay	● This shows an internal representation of the relay. For details, refer to PG section, STANDARDIZED RELAY.
13	Connectors	● This shows that the connector is connected to the body or a terminal with bolt or nut.

Number	Item	Description
14	Wire color	● This shows a code for the color of the wire.
		B = Black W = White R = Red G = Green L = Blue Y = Yellow LG = Light Green BR = Brown OR or O = Orange P = Pink PU or V (Violet) = Purple GY or GR = Gray SB = Sky Blue CH = Dark Brown DG = Dark Green
		When the wire color is striped, the base color is given first, followed by the stripe color as shown below: Example: L/W = Blue with White Stripe
15	Option description	● This shows a description of the option abbreviation used on the page.
16	Switch	● This shows that continuity exists between terminals 1 and 2 when the switch is in the A position. Continuity exists between terminals 1 and 3 when the switch is in the B position.
17	Assembly parts	● Connector terminal in component shows that it is a harness incorporated assembly.
18	Cell code	● This identifies each page of the wiring diagram by section, system and wiring diagram page number.
19	Current flow arrow	● Arrow indicates electric current flow, especially where the direction of standard flow (vertically downward or horizontally from left to right) is difficult to follow. ● A double arrow “ ⟷ ” shows that current can flow in either direction depending on circuit operation.
20	System branch	● This shows that the system branches to another system identified by cell code (section and system).
21	Page crossing	● This arrow shows that the circuit continues to another page identified by cell code. ● The C will match with the C on another page within the system other than the next or preceding pages.
22	Shielded line	● The line enclosed by broken line circle shows shield wire.
23	Component box in wave line	● This shows that another part of the component is also shown on another page (indicated by wave line) within the system.
24	Component name	● This shows the name of a component.
25	Connector number	● This shows the connector number. ● The letter shows which harness the connector is located in. ● Example: **M** : main harness. For detail and to locate the connector, refer to PG section "Main Harness", “Harness Layout”. A coordinate grid is included for complex harnesses to aid in locating connectors.
26	Ground (GND)	● The line spliced and grounded under wire color shows that ground line is spliced at the grounded connector.
27	Ground (GND)	● This shows the ground connection. For detailed ground distribution information, refer to "Ground Distribution" in PG section.
28	Connector views	● This area shows the connector faces of the components in the wiring diagram on the page.
29	Common component	● Connectors enclosed in broken line show that these connectors belong to the same component.
30	Connector color	● This shows a code for the color of the connector. For code meaning, refer to wire color codes, Number 14 of this chart.
31	Fusible link and fuse box	● This shows the arrangement of fusible link(s) and fuse(s), used for connector views of "POWER SUPPLY ROUTING" in PG section. The open square shows current flow in, and the shaded square shows current flow out.
32	Reference area	● This shows that more information on the Super Multiple Junction (SMJ) and Joint Connectors (J/C) exists on the PG section. Refer to "Reference Area" for details.

Harness Indication

- Letter designations next to test meter probe indicate harness (connector) wire color.
- Connector numbers in a single circle M33 indicate harness connectors.



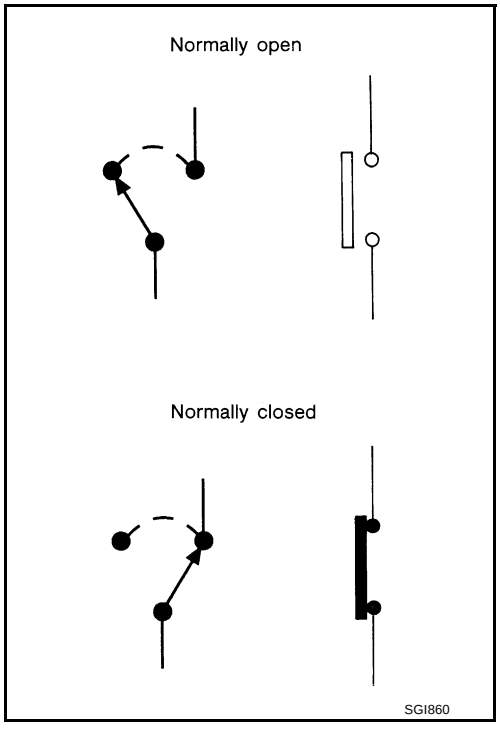
Component Indication

Connector numbers in a double circle F211 indicate component connectors.

Switch Positions

Switches are shown in wiring diagrams as if the vehicle is in the “normal” condition.
A vehicle is in the “normal” condition when:

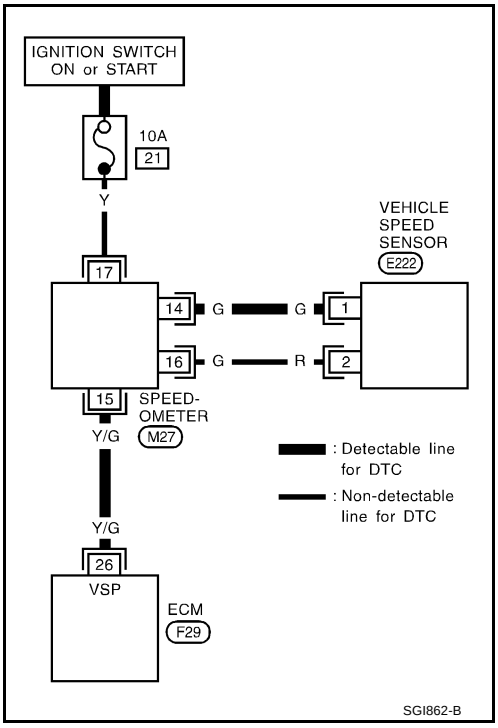
- ignition switch is “OFF”,
- doors, hood and trunk lid/back door are closed,
- pedals are not depressed, and
- parking brake is released.



Detectable Lines and Non-Detectable Lines

In some wiring diagrams, two kinds of lines, representing wires, with different weight are used.

- A line with regular weight (wider line) represents a “detectable line for DTC (Diagnostic Trouble Code)”. A “detectable line for DTC” is a circuit in which ECM can detect its malfunctions with the on board diagnostic system.
- A line with less weight (thinner line) represents a “non-detectable line for DTC”. A “non-detectable line for DTC” is a circuit in which ECM cannot detect its malfunctions with the on board diagnostic system.



Multiple Switch

The continuity of multiple switch is described in two ways as shown below.

- The switch chart is used in schematic diagrams.
- The switch diagram is used in wiring diagrams.

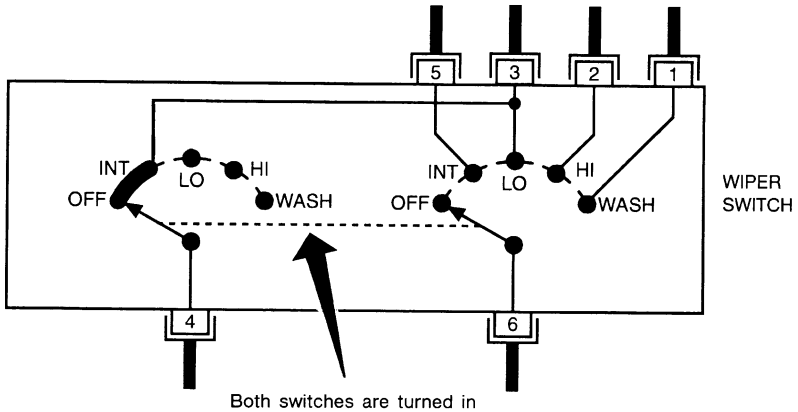
Example

(SWITCH CHART)

WIPER SWITCH

	OFF	INT	LO	HI	WASH
1					○
2				○	
3	○	○	○		
4	○	○			
5		○			
6		○	○	○	○

(SWITCH DIAGRAM)



Continuity circuit of wiper switch

SWITCH POSITION	CONTINUITY CIRCUIT
OFF	3 - 4
INT	3 - 4, 5 - 6
LO	3 - 6
HI	2 - 6
WASH	1 - 6

SGI875

Abbreviations

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The following **ABBREVIATIONS** are used:

ABBREVIATION	DESCRIPTION
A/C	Air Conditioner
A/T	Automatic Transaxle/Transmission
ATF	Automatic Transmission Fluid
D_1	Drive range 1st gear
D_2	Drive range 2nd gear
D_3	Drive range 3rd gear
D_4	Drive range 4th gear
FR, RR	Front, Rear
LH, RH	Left-Hand, Right-Hand
M/T	Manual Transaxle/Transmission
OD	Overdrive
P/S	Power Steering
SAE	Society of Automotive Engineers, Inc.
SDS	Service Data and Specifications
SST	Special Service Tools
2WD	2-Wheel Drive
2_2	2nd range 2nd gear
2_1	2nd range 1st gear
1_2	1st range 2nd gear
1_1	1st range 1st gear

SERVICE INFORMATION FOR ELECTRICAL INCIDENT

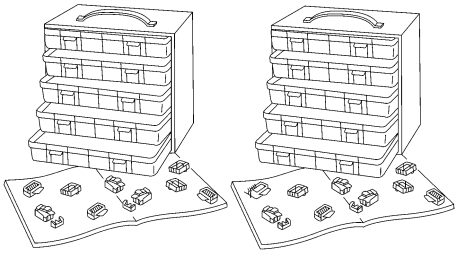
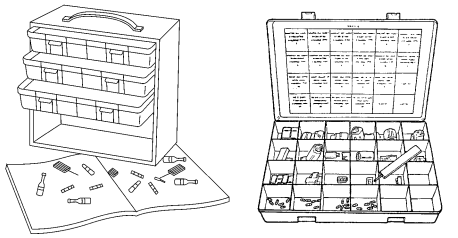
PFP:00000

How to Check Terminal

NAS0000L

CONNECTOR AND TERMINAL PIN KIT

Use the connector and terminal pin kits listed below when replacing connectors or terminals.
The connector and terminal pin kits contain some of the most commonly used NISSAN/INFINITI connectors and terminals. For detailed connector and terminal pin replacement procedures, refer to the latest NISSAN/INFINITI CONNECTOR AND TERMINAL PIN SERVICE MANUAL.

Tool number (Kent-Moore No.) Tool name	Description
- (J38751-95NI) Connector and terminal pin kit (NISSAN) - (J38751-95INF) Connector and terminal pin kit (INFINITI) - (J42992-98KIT) OBD and terminal repair kit - (J42992-2000UPD) OBD-II Connector Kit Update	J38751-95NI, J38751-95INF  WAIA0004E J42992-98KIT, J42992-2000UPD  WAIA0005E

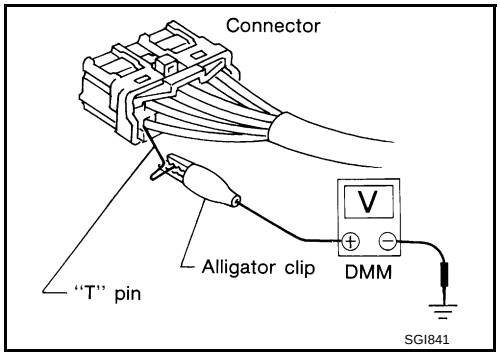
HOW TO PROBE CONNECTORS

Connector damage and an intermittent connection can result from improperly probing of the connector during circuit checks.
The probe of a digital multimeter (DMM) may not correctly fit the connector cavity. To correctly probe the connector, follow the procedures below using a “T” pin. For the best contact grasp the “T” pin using an alligator clip.

Probing from Harness Side

Standard type (not waterproof type) connector should be probed from harness side with “T” pin.

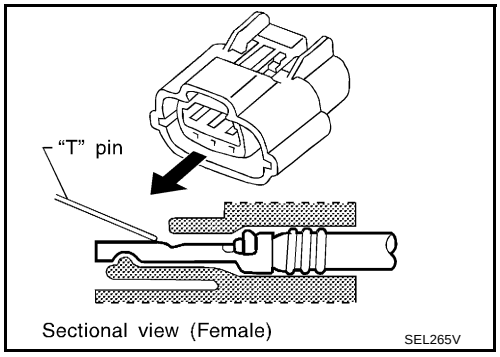
- If the connector has a rear cover such as a ECM connector, remove the rear cover before probing the terminal.
- Do not probe waterproof connector from harness side. Damage to the seal between wire and connector may result.



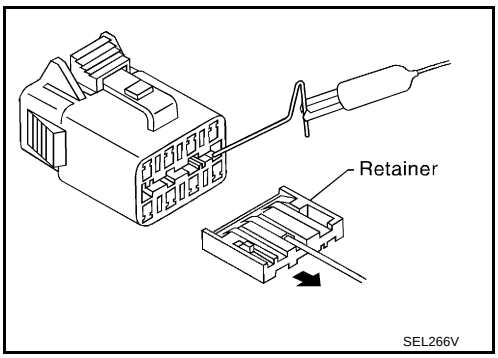
Probing from Terminal Side

FEMALE TERMINAL

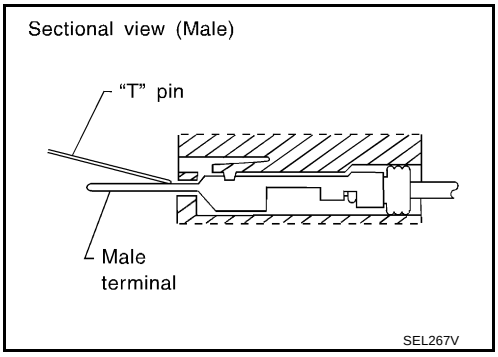
- There is a small notch above each female terminal. Probe each terminal with the “T” pin through the notch.
  Do not insert any object other than the same type male terminal into female terminal.



- Some connectors do not have a notch above each terminal. To probe each terminal, remove the connector retainer to make contact space for probing.



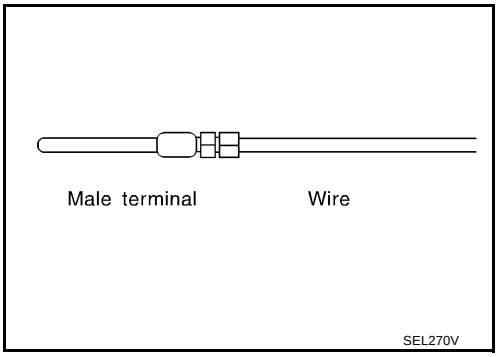
MALE TERMINAL
Carefully probe the contact surface of each terminal using a “T” pin.
Do not bend terminal.



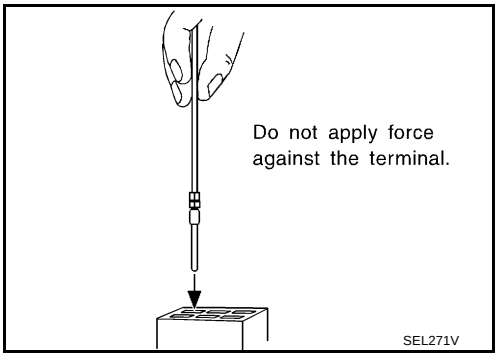
How to Check Enlarged Contact Spring of Terminal

An enlarged contact spring of a terminal may create intermittent signals in the circuit.
If the intermittent open circuit occurs, follow the procedure below to inspect for open wires and enlarged contact spring of female terminal.

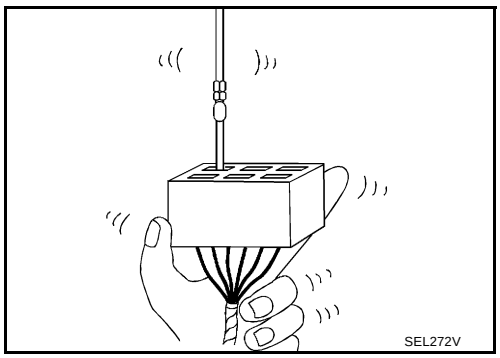
1. Assemble a male terminal and approx. 10 cm (3.9 in) of wire.
   Use a male terminal which matches the female terminal.
2. Disconnect the suspected faulty connector and hold it terminal side up.



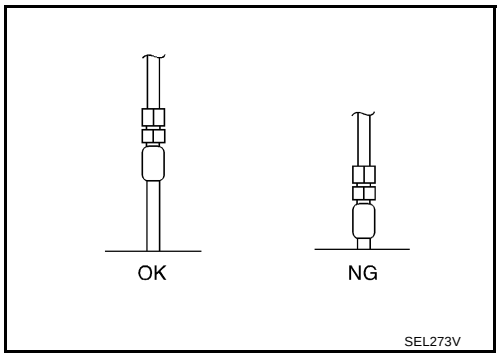
3. While holding the wire of the male terminal, try to insert the male terminal into the female terminal.
   Do not force the male terminal into the female terminal with your hands.



4. While moving the connector, check whether the male terminal can be easily inserted or not.



- If the male terminal can be easily inserted into the female terminal, replace the female terminal.

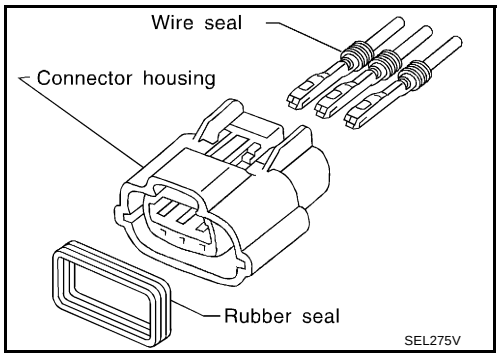


Waterproof Connector Inspection

If water enters the connector, it can short interior circuits. This may lead to intermittent problems. Check the following items to maintain the original waterproof characteristics.

RUBBER SEAL INSPECTION

- Most waterproof connectors are provided with a rubber seal between the male and female connectors. If the seal is missing, the waterproof performance may not meet specifications.
- The rubber seal may come off when connectors are disconnected. Whenever connectors are reconnected, make sure the rubber seal is properly installed on either side of male or female connector.

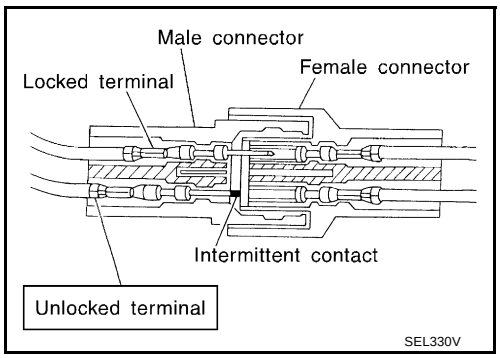


WIRE SEAL INSPECTION

The wire seal must be installed on the wire insertion area of a waterproof connector. Be sure that the seal is installed properly.

Terminal Lock Inspection

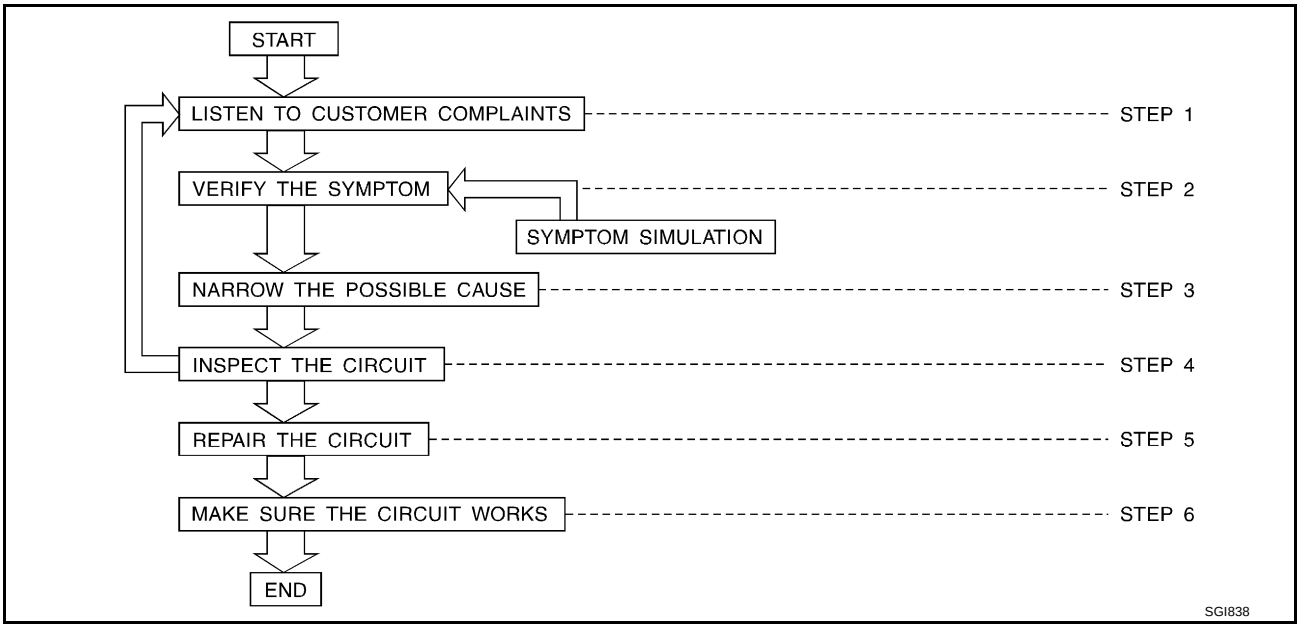
Check for unlocked terminals by pulling wire at the end of connector. An unlocked terminal may create intermittent signals in the circuit.



How to Perform Efficient Diagnosis for an Electrical Incident

NAS0000M

WORK FLOW



STEP	DESCRIPTION	
STEP 1	Get detailed information about the conditions and the environment when the incident occurred. The following are key pieces of information required to make a good analysis:	
	WHAT	Vehicle Model, Engine, Transmission/Transaxle and the System (i.e. Radio).
	WHEN	Date, Time of Day, Weather Conditions, Frequency.
	WHERE	Road Conditions, Altitude and Traffic Situation.
	HOW	System Symptoms, Operating Conditions (Other Components Interaction). Service History and if any After Market Accessories have been installed.
STEP 2	Operate the system, road test if necessary. Verify the parameter of the incident. If the problem cannot be duplicated, refer to “Incident Simulation Tests”.	
STEP 3	Get the proper diagnosis materials together including: ● Power Supply Routing ● System Operation Descriptions ● Applicable Service Manual Sections ● Check for any Service Bulletins Identify where to begin diagnosis based upon your knowledge of the system operation and the customer comments.	
STEP 4	Inspect the system for mechanical binding, loose connectors or wiring damage. Determine which circuits and components are involved and diagnose using the Power Supply Routing and Harness Layouts.	
STEP 5	Repair or replace the incident circuit or component.	
STEP 6	Operate the system in all modes. Verify the system works properly under all conditions. Make sure you have not inadvertently created a new incident during your diagnosis or repair steps.	

INCIDENT SIMULATION TESTS

Introduction

Sometimes the symptom is not present when the vehicle is brought in for service. If possible, re-create the conditions present at the time of the incident. Doing so may help avoid a No Trouble Found Diagnosis. The following section illustrates ways to simulate the conditions/environment under which the owner experiences an electrical incident.

The section is broken into the six following topics:

- Vehicle vibration
- Heat sensitive

- Freezing
- Water intrusion
- Electrical load
- Cold or hot start up

Get a thorough description of the incident from the customer. It is important for simulating the conditions of the problem.

Vehicle Vibration

The problem may occur or become worse while driving on a rough road or when engine is vibrating (idle with A/C on). In such a case, you will want to check for a vibration related condition. Refer to the following illustration.

CONNECTORS & HARNESS

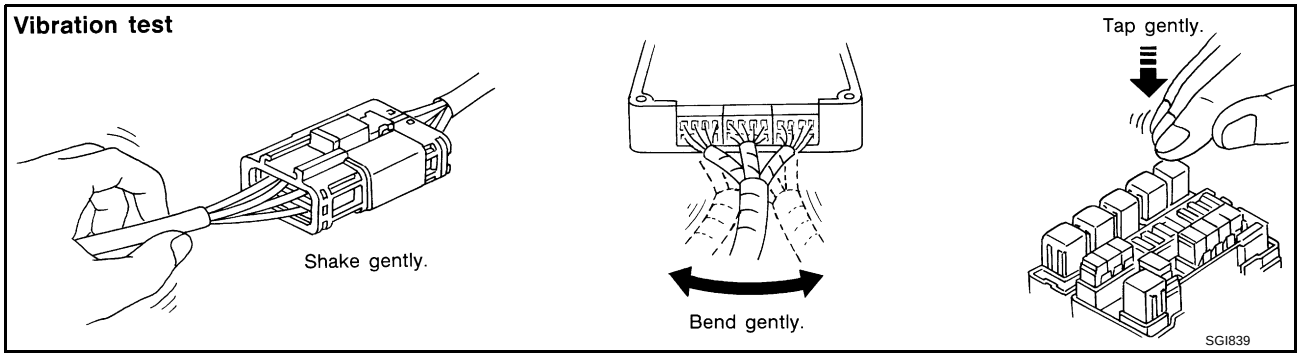
Determine which connectors and wiring harness would affect the electrical system you are inspecting. Gently shake each connector and harness while monitoring the system for the incident you are trying to duplicate. This test may indicate a loose or poor electrical connection.

HINT

Connectors can be exposed to moisture. It is possible to get a thin film of corrosion on the connector terminals. A visual inspection may not reveal this without disconnecting the connector. If the problem occurs intermittently, perhaps the problem is caused by corrosion. It is a good idea to disconnect, inspect and clean the terminals on related connectors in the system.

SENSORS & RELAYS

Gently apply a slight vibration to sensors and relays in the system you are inspecting.
This test may indicate a loose or poorly mounted sensor or relay.



ENGINE COMPARTMENT

There are several reasons a vehicle or engine vibration could cause an electrical complaint. Some of the things to check for are:

- Connectors not fully seated.
- Wiring harness not long enough and is being stressed due to engine vibrations or rocking.
- Wires laying across brackets or moving components.
- Loose, dirty or corroded ground wires.
- Wires routed too close to hot components.

To inspect components under the hood, start by verifying the integrity of ground connections. (Refer to Ground Inspection described later.) First check that the system is properly grounded. Then check for loose connection by gently shaking the wiring or components as previously explained. Using the wiring diagrams inspect the wiring for continuity.

BEHIND THE INSTRUMENT PANEL

An improperly routed or improperly clamped harness can become pinched during accessory installation. Vehicle vibration can aggravate a harness which is routed along a bracket or near a screw.

UNDER SEATING AREAS

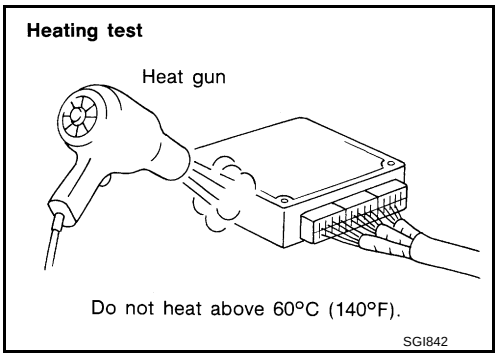
An unclamped or loose harness can cause wiring to be pinched by seat components (such as slide guides) during vehicle vibration. If the wiring runs under seating areas, inspect wire routing for possible damage or pinching.

Heat Sensitive

The customer's concern may occur during hot weather or after car has sat for a short time. In such cases you will want to check for a heat sensitive condition.

To determine if an electrical component is heat sensitive, heat the component with a heat gun or equivalent.

Do not heat components above 60°C (140°F). If incident occurs while heating the unit, either replace or properly insulate the component.

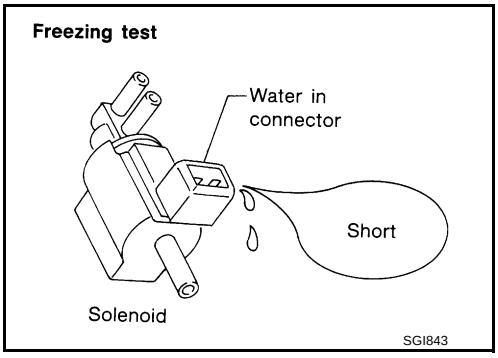


Freezing

The customer may indicate the incident goes away after the car warms up (winter time). The cause could be related to water freezing somewhere in the wiring/electrical system.

There are two methods to check for this. The first is to arrange for the owner to leave his car overnight. Make sure it will get cold enough to demonstrate his complaint. Leave the car parked outside overnight. In the morning, do a quick and thorough diagnosis of those electrical components which could be affected.

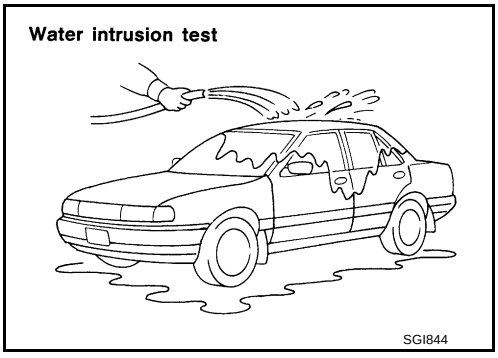
The second method is to put the suspect component into a freezer long enough for any water to freeze. Reinstall the part into the car and check for the reoccurrence of the incident. If it occurs, repair or replace the component.



Water Intrusion

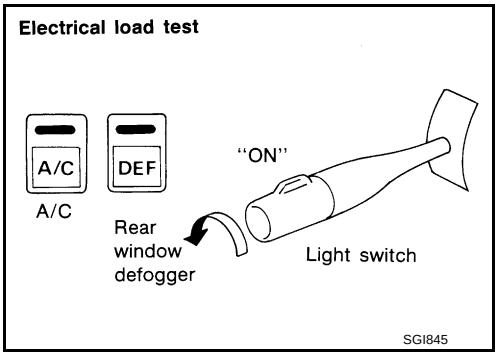
The incident may occur only during high humidity or in rainy/snowy weather. In such cases the incident could be caused by water intrusion on an electrical part. This can be simulated by soaking the car or running it through a car wash.

Do not spray water directly on any electrical components.



Electrical Load

The incident may be electrical load sensitive. Perform diagnosis with all accessories (including A/C, rear window defogger, radio, fog lamps) turned on.



Cold or Hot Start Up

On some occasions an electrical incident may occur only when the car is started cold, or it may occur when the car is restarted hot shortly after being turned off. In these cases you may have to keep the car overnight to make a proper diagnosis.

CIRCUIT INSPECTION

Introduction

In general, testing electrical circuits is an easy task if it is approached in a logical and organized method. Before beginning it is important to have all available information on the system to be tested. Also, get a thorough understanding of system operation. Then you will be able to use the appropriate equipment and follow the correct test procedure.
You may have to simulate vehicle vibrations while testing electrical components. Gently shake the wiring harness or electrical component to do this.

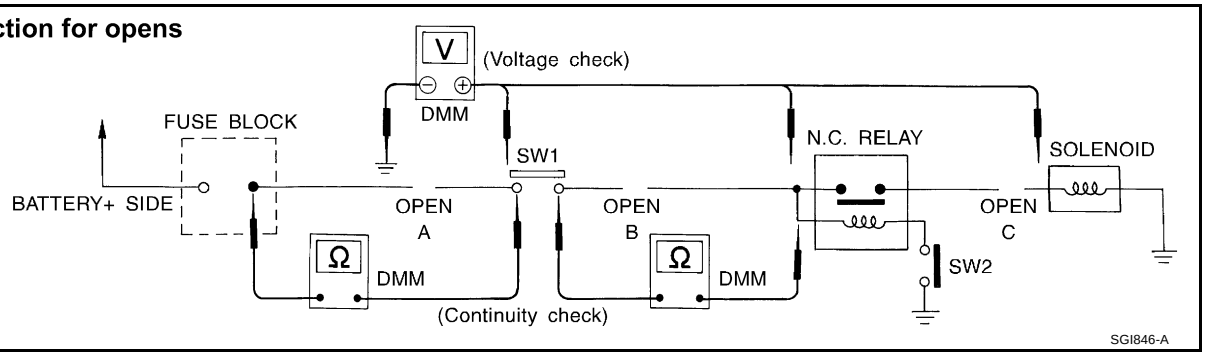
OPEN	A circuit is open when there is no continuity through a section of the circuit.	
SHORT	There are two types of shorts.	
	● SHORT CIRCUIT	When a circuit contacts another circuit and causes the normal resistance to change.
	● SHORT TO GROUND	When a circuit contacts a ground source and grounds the circuit.

NOTE:
Refer to “How to Check Terminal” to probe or check terminal.

Testing for “Opens” in the Circuit

Before you begin to diagnose and test the system, you should rough sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system.

Inspection for opens



CONTINUITY CHECK METHOD
The continuity check is used to find an open in the circuit. The digital multimeter (DMM) set on the resistance function will indicate an open circuit as over limit (no beep tone or no ohms symbol). Make sure to always start with the DMM at the highest resistance level.
To help in understanding the diagnosis of open circuits, please refer to the previous schematic.

- Disconnect the battery negative cable.
- Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
- Connect one probe of the DMM to the fuse block terminal on the load side.
- Connect the other probe to the fuse block (power) side of SW1. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
- Connect the probes between SW1 and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
- Connect the probes between the relay and the solenoid. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

Any circuit can be diagnosed using the approach in the previous example.

VOLTAGE CHECK METHOD

To help in understanding the diagnosis of open circuits please refer to the previous schematic.
In any powered circuit, an open can be found by methodically checking the system for the presence of voltage. This is done by switching the DMM to the voltage function.

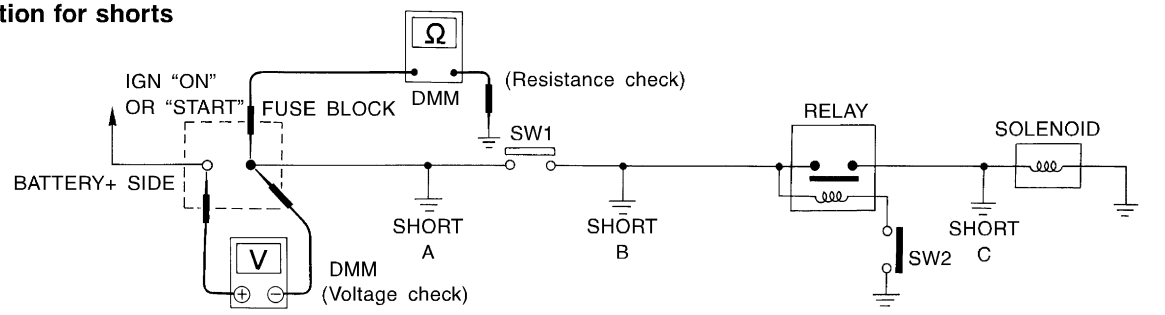
- Connect one probe of the DMM to a known good ground.
- Begin probing at one end of the circuit and work your way to the other end.
- With SW1 open, probe at SW1 to check for voltage.
  voltage; open is further down the circuit than SW1.
  no voltage; open is between fuse block and SW1 (point A).
- Close SW1 and probe at relay.
  voltage; open is further down the circuit than the relay.
  no voltage; open is between SW1 and relay (point B).
- Close the relay and probe at the solenoid.
  voltage; open is further down the circuit than the solenoid.
  no voltage; open is between relay and solenoid (point C).

Any powered circuit can be diagnosed using the approach in the previous example.

Testing for “Shorts” in the Circuit

To simplify the discussion of shorts in the system, please refer to the following schematic.

Inspection for shorts



RESISTANCE CHECK METHOD

- Disconnect the battery negative cable and remove the blown fuse.
- Disconnect all loads (SW1 open, relay disconnected and solenoid disconnected) powered through the fuse.
- Connect one probe of the DMM to the load side of the fuse terminal. Connect the other probe to a known good ground.
- With SW1 open, check for continuity.
  continuity; short is between fuse terminal and SW1 (point A).
  no continuity; short is further down the circuit than SW1.
- Close SW1 and disconnect the relay. Put probes at the load side of fuse terminal and a known good ground. Then, check for continuity.
  continuity; short is between SW1 and the relay (point B).
  no continuity; short is further down the circuit than the relay.
- Close SW1 and jump the relay contacts with jumper wire. Put probes at the load side of fuse terminal and a known good ground. Then, check for continuity.
  continuity; short is between relay and solenoid (point C).
  no continuity; check solenoid, retrace steps.

VOLTAGE CHECK METHOD

- Remove the blown fuse and disconnect all loads (i.e. SW1 open, relay disconnected and solenoid disconnected) powered through the fuse.
- Turn the ignition key to the ON or START position. Verify battery voltage at the battery + side of the fuse terminal (one lead on the battery + terminal side of the fuse block and one lead on a known good ground).
- With SW1 open and the DMM leads across both fuse terminals, check for voltage.
  voltage; short is between fuse block and SW1 (point A).

no voltage; short is further down the circuit than SW1.

- With SW1 closed, relay and solenoid disconnected and the DMM leads across both fuse terminals, check for voltage.
  voltage; short is between SW1 and the relay (point B).
  no voltage; short is further down the circuit than the relay.
- With SW1 closed, relay contacts jumped with fused jumper wire check for voltage.
  voltage; short is down the circuit of the relay or between the relay and the disconnected solenoid (point C).
  no voltage; retrace steps and check power to fuse block.

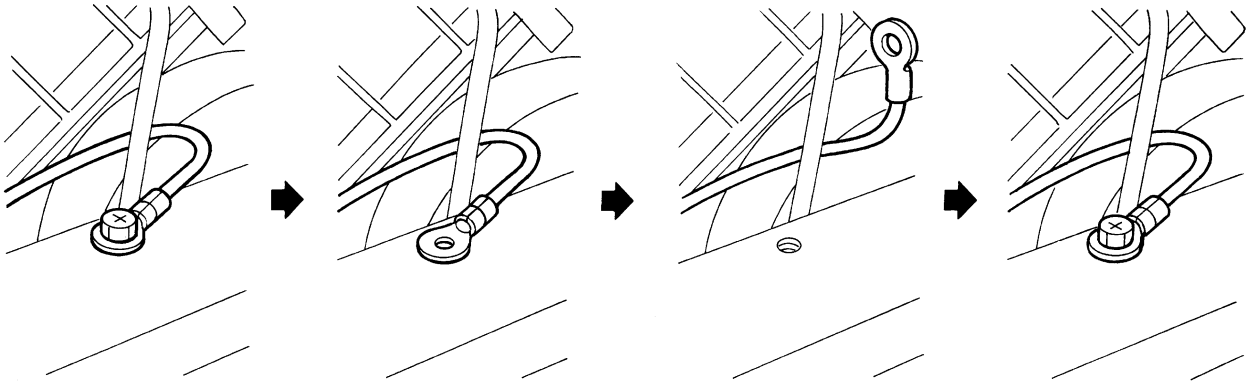
Ground Inspection

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This unwanted resistance can change the way a circuit works.
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically affect an electronically controlled circuit. A poor or corroded ground can easily affect the circuit. Even when the ground connection looks clean, there can be a thin film of rust on the surface.
When inspecting a ground connection follow these rules:

- Remove the ground bolt or screw.
- Inspect all mating surfaces for tarnish, dirt, rust, etc.
- Clean as required to assure good contact.
- Reinstall bolt or screw securely.
- Inspect for “add-on” accessories which may be interfering with the ground circuit.
- If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure no ground wires have excess wire insulation.

For detailed ground distribution information, refer to “Ground Distribution” in PG section.

Ground Inspection



Voltage Drop Tests

Voltage drop tests are often used to find components or circuits which have excessive resistance. A voltage drop in a circuit is caused by a resistance when the circuit is in operation.
Check the wire in the illustration. When measuring resistance with DMM, contact by a single strand of wire will give reading of 0 ohms. This would indicate a good circuit. When the circuit operates, this single strand of wire is not able to carry the current. The single strand will have a high resistance to the current. This will be picked up as a slight voltage drop.
Unwanted resistance can be caused by many situations as follows:

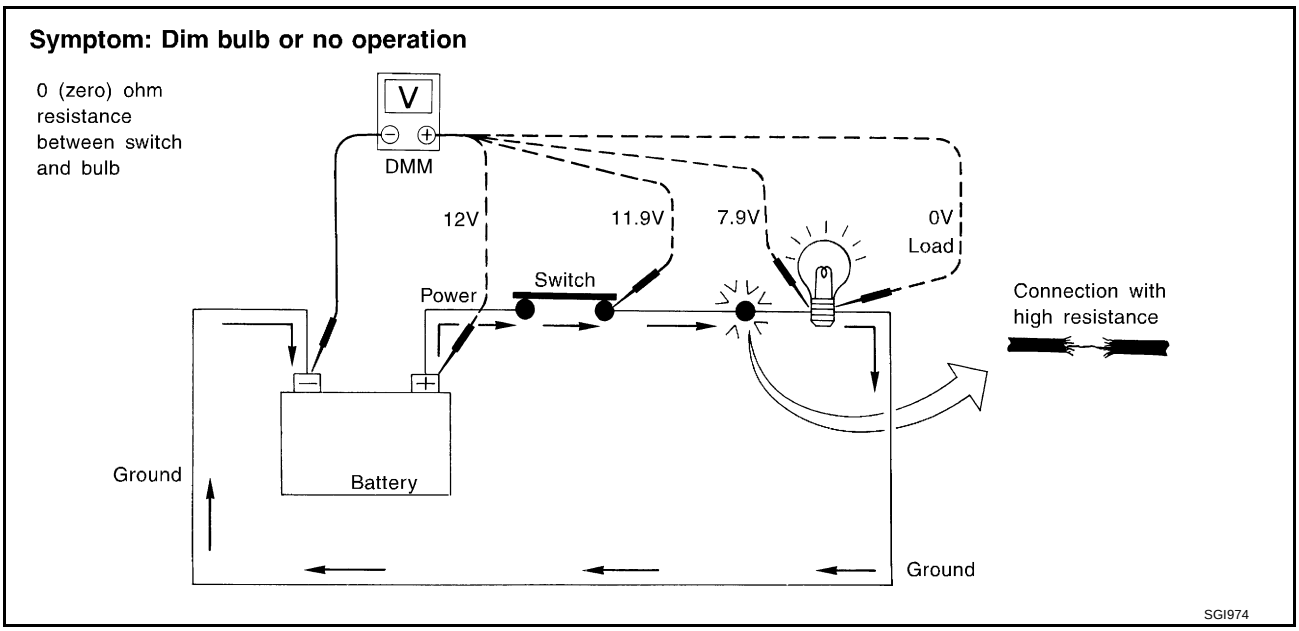
- Undersized wiring (single strand example)
- Corrosion on switch contacts
- Loose wire connections or splices.

If repairs are needed always use wire that is of the same or larger gauge.

MEASURING VOLTAGE DROP — ACCUMULATED METHOD

- Connect the DMM across the connector or part of the circuit you want to check. The positive lead of the DMM should be closer to power and the negative lead closer to ground.
- Operate the circuit.
- The DMM will indicate how many volts are being used to “push” current through that part of the circuit.

Note in the illustration that there is an excessive 4.1 volt drop between the battery and the bulb.



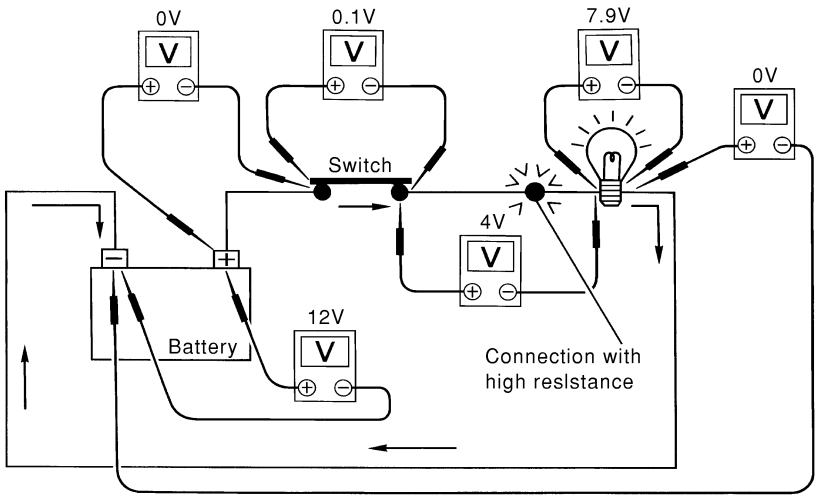
MEASURING VOLTAGE DROP — STEP-BY-STEP

The step-by-step method is most useful for isolating excessive drops in low voltage systems (such as those in “Computer Controlled Systems”).

Circuits in the “Computer Controlled System” operate on very low amperage.

The (Computer Controlled) system operations can be adversely affected by any variation in resistance in the system. Such resistance variation may be caused by poor connection, improper installation, improper wire gauge or corrosion.

The step by step voltage drop test can identify a component or wire with too much resistance.



1. Connect the DMM as shown, starting at the battery and working your way around the circuit.
2. An unusually large voltage drop will indicate a component or wire that needs to be repaired, As you can see the illustration above, the poor connection causes a 4 volt drop.

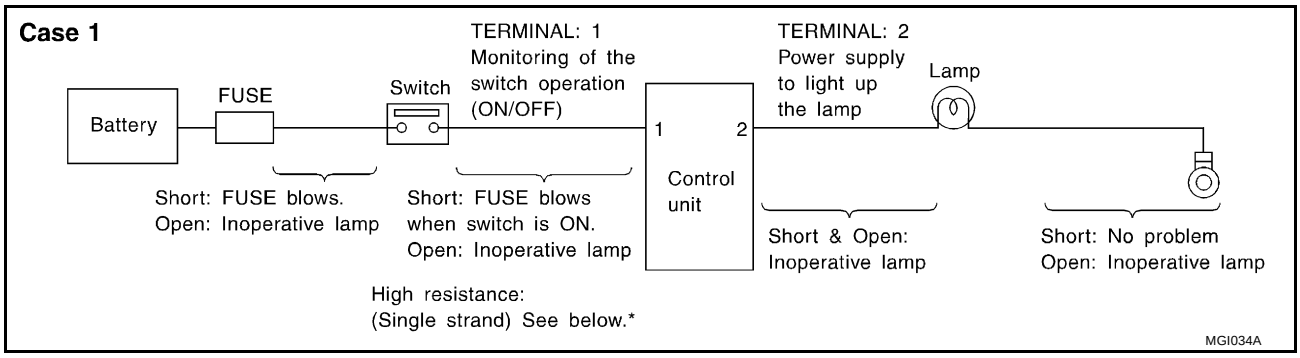
The chart that follows illustrates some maximum allowable voltage drops. These values are given as a guideline, the exact value for each component may vary.

COMPONENT	VOLTAGE DROP
Wire	negligible < .001 volts
Ground Connections	Approx. 0.1 volts
Switch Contacts	Approx. 0.3 volts

SAIA0258E

Control Unit Circuit Test

System Description:When the switch is ON, the control unit lights up the lamp.

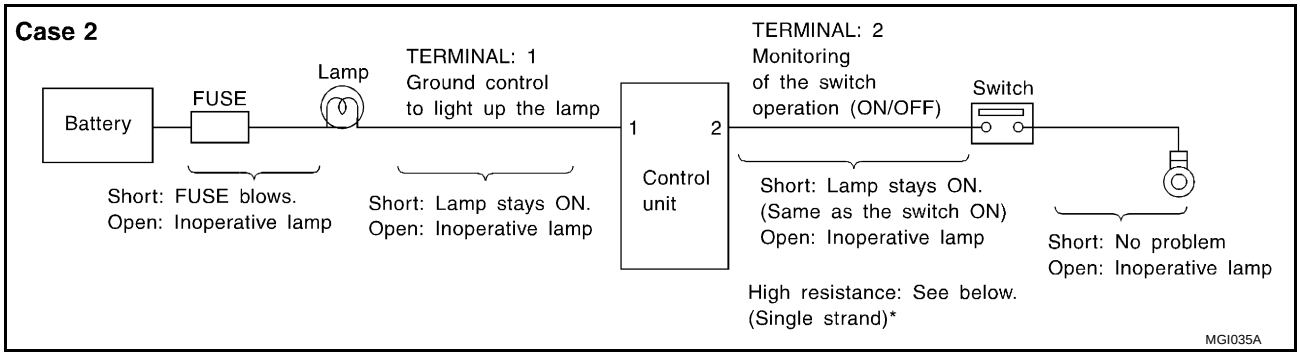


INPUT-OUTPUT VOLTAGE CHART

Pin No.	Item	Condition	Voltage value [V]	In case of high resistance such as single strand [V] *
1	Switch	Switch ON	Battery voltage	Lower than battery voltage Approx. 8 (Example)
		Switch OFF	Approx. 0	Approx. 0
2	Lamp	Switch ON	Battery voltage	Approx. 0 (Inoperative lamp)
		Switch OFF	Approx. 0	Approx. 0

The voltage value is based on the body ground.

*:If high resistance exists in the switch side circuit (caused by a single strand), terminal 1 does not detect battery voltage. Control unit does not detect the switch is ON even if the switch does not turn ON. Therefore, the control unit does not supply power to light up the lamp.



INPUT-OUTPUT VOLTAGE CHART

Pin No.	Item	Condition	Voltage value [V]	In case of high resistance such as single strand [V] *
1	Lamp	Switch ON	Approx. 0	Battery voltage (Inoperative lamp)
		Switch OFF	Battery voltage	Battery voltage
2	Switch	Switch ON	Approx. 0	Higher than 0 Approx. 4 (Example)
		Switch OFF	Approx. 5	Approx. 5

The voltage value is based on the body ground.

*:If high resistance exists in the switch side circuit (caused by a single strand), terminal 2 does not detect approx. 0V. Control unit does not detect the switch is ON even if the switch does not turn ON. Therefore, the control unit does not control ground to light up the lamp.

Control Units and Electrical Parts

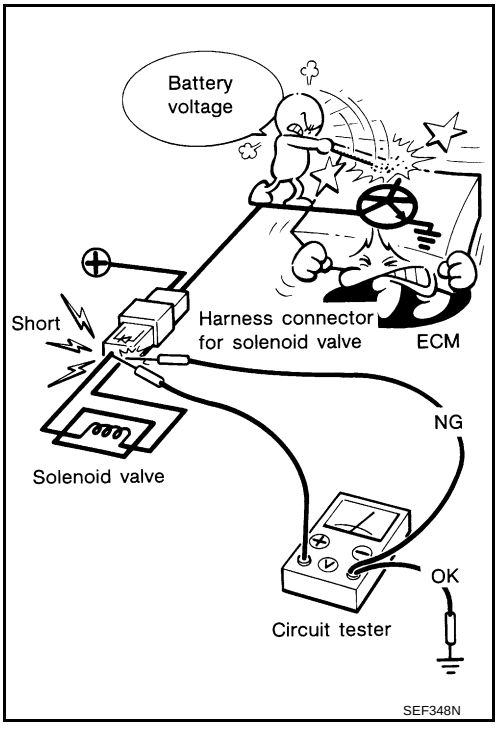
NAS0009Q

PRECAUTIONS

- Never reverse polarity of battery terminals.
- Install only parts specified for a vehicle.
- Before replacing the control unit, check the input and output and functions of the component parts.
- Do not apply excessive force when disconnecting a connector.
- Do not apply excessive shock to the control unit by dropping or hitting it.
- Be careful to prevent condensation in the control unit due to rapid temperature changes and do not let water or rain get on it. If water is found in the control unit, dry it fully and then install it in the vehicle.
- Be careful not to let oil to get on the control unit connector.
- Avoid cleaning the control unit with volatile oil.
- Do not disassemble the control unit, and do not remove the upper and lower covers.



- When using a DMM, be careful not to let test probes get close to each other to prevent the power transistor in the control unit from damaging battery voltage because of short circuiting.
- When checking input and output signals of the control unit, use the specified check adapter.



CONSULT-III/GST CHECKING SYSTEM

PFP:00000

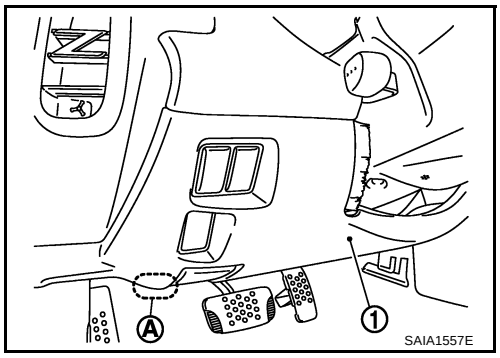
Description

NAS000A4

- When CONSULT-III/GST is connected with a data link connector (A) equipped on the vehicle side, it will communicate with the control unit equipped in the vehicle and then enable various kinds of diagnostic tests.

1 : Instrument driver lower panel

- Refer to CONSULT-III operation manual for more information.



Function and System Application

NAS0000P

Diagnostic test mode	Function	ENGINE	A/T	ABS (Including TCS)	ABS (Including VDC)	AIR BAG	BCM	METER A/C AMP	NATS(NVIS) *	AIR PRESSURE MONITOR	IPDM E/R
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-II.	x	-	-	x	-	x	-	-	x	-
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	x	x	x	x	x	x	x	x	x	x
Trouble diagnostic record	Current self-diagnostic results and all trouble diagnostic records previously stored can be read.	-	-	-	-	x	-	-	-	-	-
Data monitor	Input/Output data in the ECU can be read.	x	x	x	x	-	x	x	-	x	x
CAN diagnosis support monitor	The condition of CAN communication line can be read.	x	x	x	x	-	x	x	-	-	x
Active test	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ECUs and also shifts some parameters in a specified range.	x	-	x	x	-	x	-	-	-	x
DTC & SRT confirmation	The results of SRT (System Readiness Test) and the self-diagnosis status/result can be confirmed.	x	-	-	-	-	-	-	-	-	-
DTC work support	This mode enables a technician to monitor the status/results of self-diagnosis performed by the ECU.	-	x	-	-	-	-	-	-	-	-
ECU (ECM/TCM) part number	ECU (ECM/TCM) part number can be read.	x	x	x	x	-	-	-	-	x	-
ECU discriminated No.	Classification number of a replacement ECU can be read to prevent an incorrect ECU from being installed.	-	-	-	-	x	-	-	-	-	-
Function test	This mode can show results of self-diagnosis of ECU with either ‘OK’ or ‘NG’. For engines, more practical tests regarding sensors/switches and/or actuators are available.	x	x	x	x	x	-	-	-	-	-
Control unit initialization	All registered ignition key IDs in NATS components can be initialized and new IDs can be registered.	-	-	-	-	-	-	-	x	-	-

x: Applicable

*: Nissan Anti-Theft System (Nissan Vehicle Immobilizer System)

CONSULT-III Data Link Connector (DLC) Circuit

NAS000A5

INSPECTION PROCEDURE

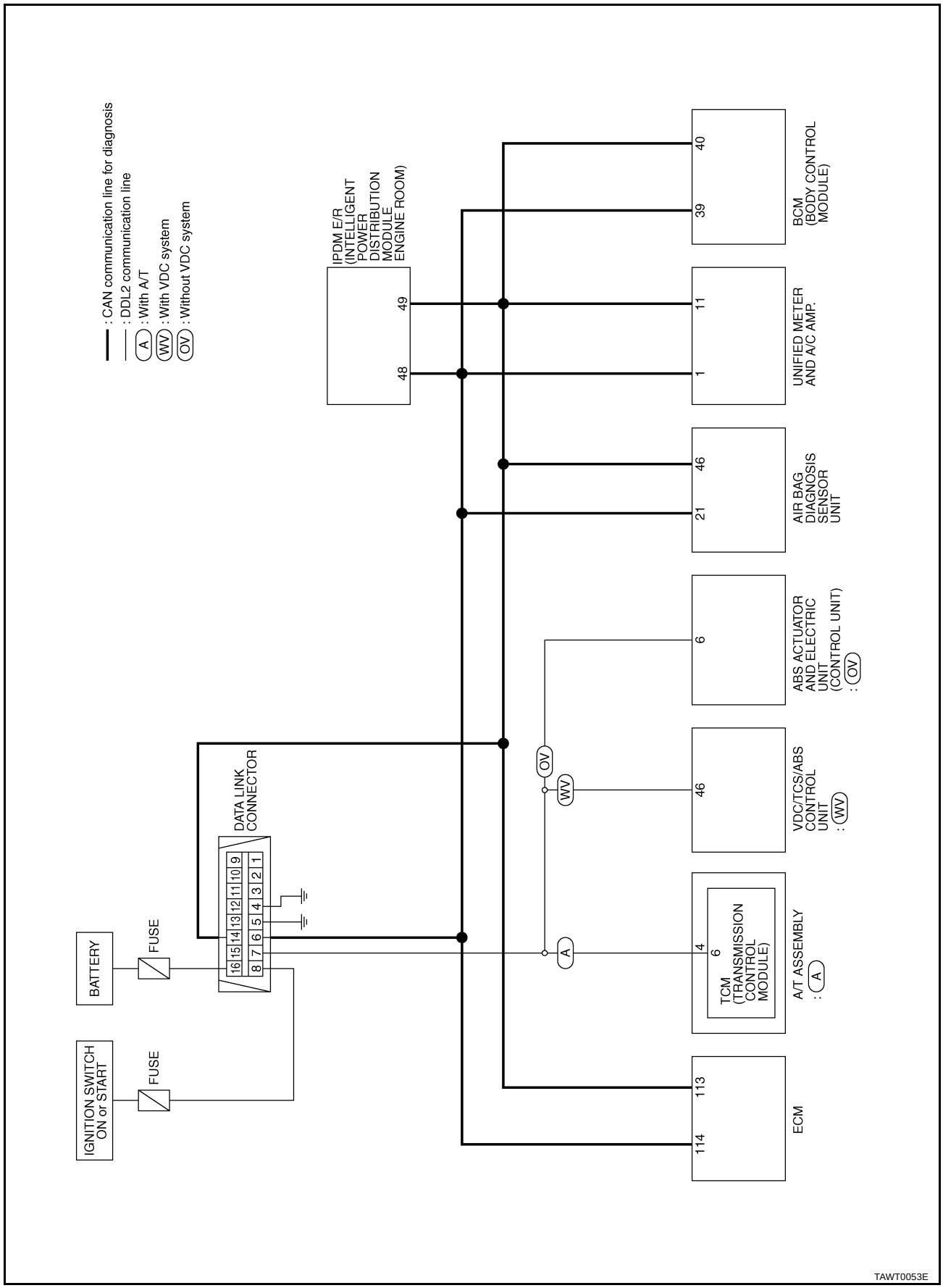
If the CONSULT-III cannot diagnose the system properly, check the following items.

Symptom	Check item
CONSULT-III cannot access any system.	● CONSULT-III DLC power supply circuit (Terminal 8) and ground circuit (Terminal 4)
CONSULT-III cannot access individual system. (Other systems can be accessed.)	● Power supply and ground circuit for the control unit of the system (For detailed circuit, refer to wiring diagram for each system.) ● Open or short circuit between the system and CONSULT-III DLC (For detailed circuit, refer to wiring diagram for each system.) ● Open or short circuit CAN communication line. Refer to LAN-16, "Trouble Diagnosis Flow Chart" .

NOTE:

The DDL1 and DDL2 circuits from DLC pins 12, 13, 14 and 15 may be connected to more than one system. A short in a DDL circuit connected to a control unit in one system may affect CONSULT-III access to other systems.

CIRCUIT DIAGRAM

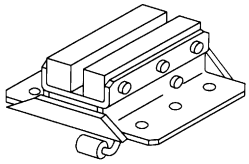
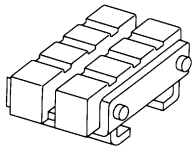


LIFTING POINT

PFP:00000

Commercial Service Tools

NAS0000U

Tool name	Description
Board on attachment	 S-NT001
Safety stand attachment	 S-NT002

CAUTION:

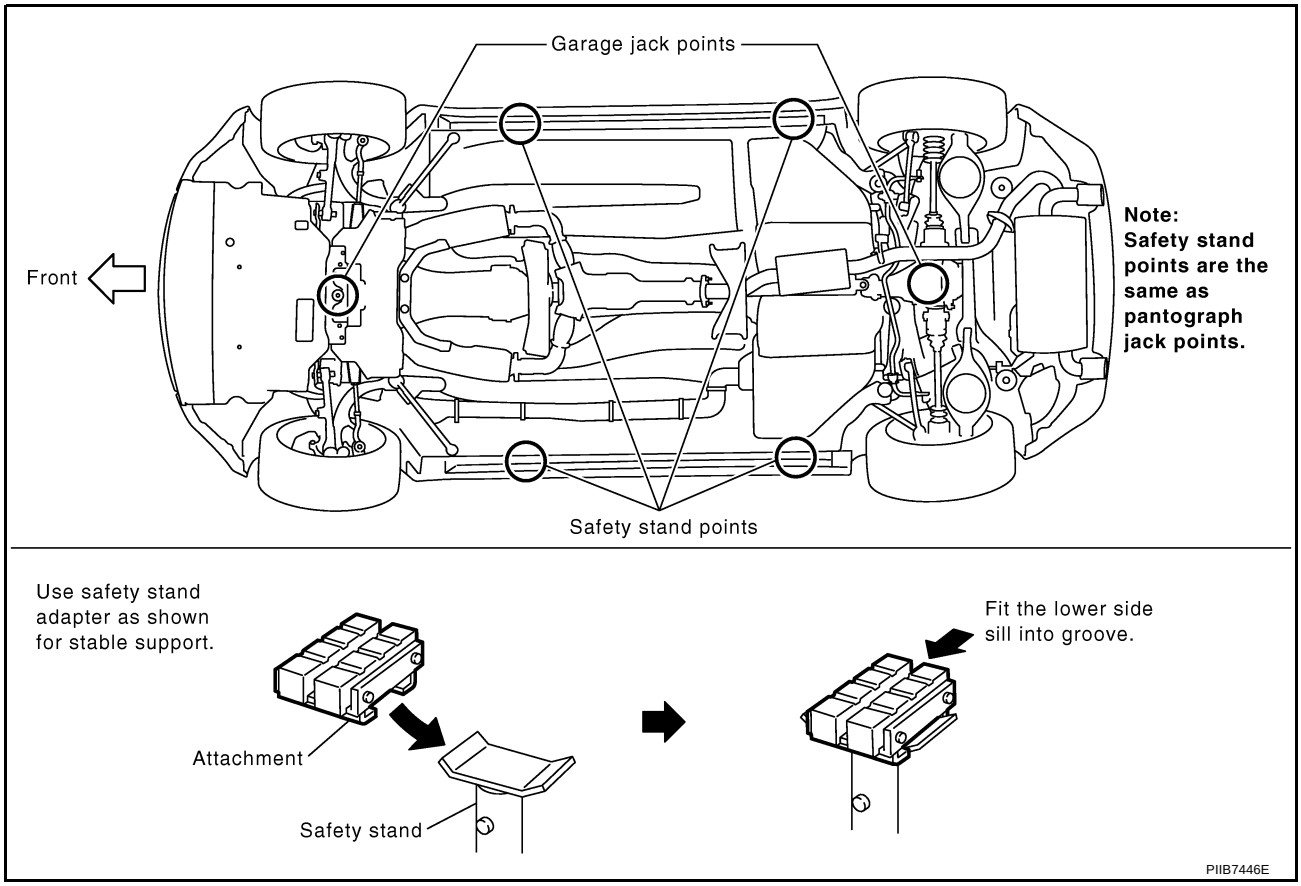
- **Every time the vehicle is lifted up, maintain the complete vehicle curb condition.**
- **Since the vehicle's center of gravity changes when removing main parts on the front side (engine, transmission, suspension etc.), support a jack up point on the rear side garage jack with a mission jack or equivalent.**
- **Since the vehicle's center of gravity changes when removing main parts on the rear side (rear axle, suspension, etc.), support a jack up point on the front side garage jack with a mission jack or equivalent.**
- **Be careful not to smash or do not do anything that would affect piping parts.**

Garage Jack and Safety Stand

NAS0000V

WARNING:

- **Park the vehicle on a level surface when using the jack. Make sure to avoid damaging pipes, tubes, etc. under the vehicle.**
- **Never get under the vehicle while it is supported only by the jack. Always use safety stands when you have to get under the vehicle.**
- **Place wheel chocks at both front and back of the wheels on the ground.**



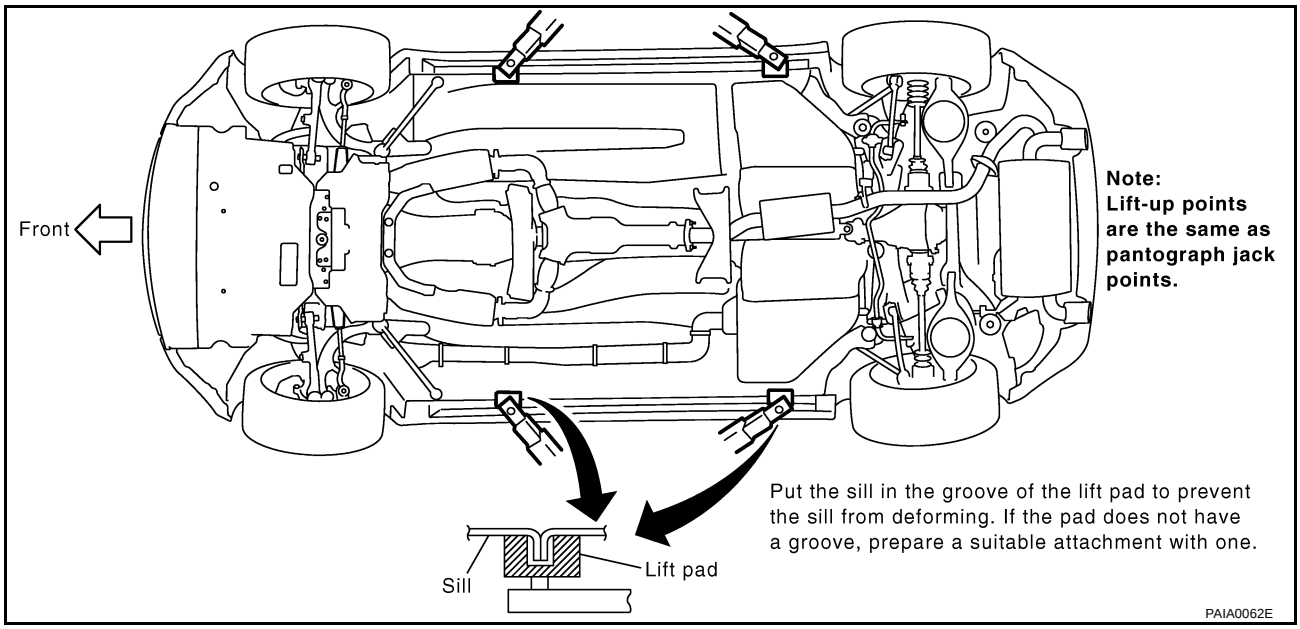
2-Pole Lift

NAS0000W

WARNING:

When lifting the vehicle, open the lift arms as wide as possible and ensure that the front and rear of the vehicle are well balanced.

When setting the lift arm, do not allow the arm to contact the brake tubes, brake cable, fuel lines and sill spoiler.



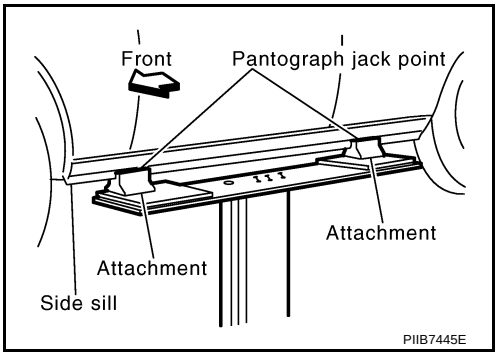
Board-on Lift

NAS0000X

CAUTION:

Make sure vehicle is empty when lifting.

- **The board-on lift attachment set at front end of vehicle should be set on the front of the sill under the front door opening.**
- **Position attachments at front and rear ends of board-on lift.**



TOW TRUCK TOWING

PFP:00000

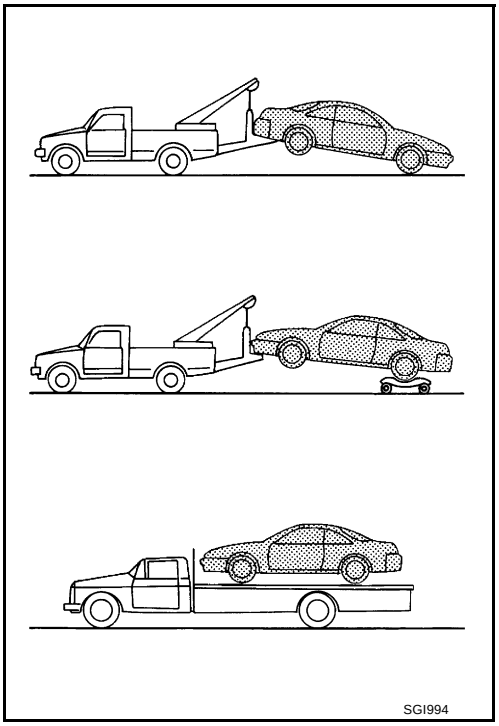
Tow Truck Towing

NAS0000Y

CAUTION:

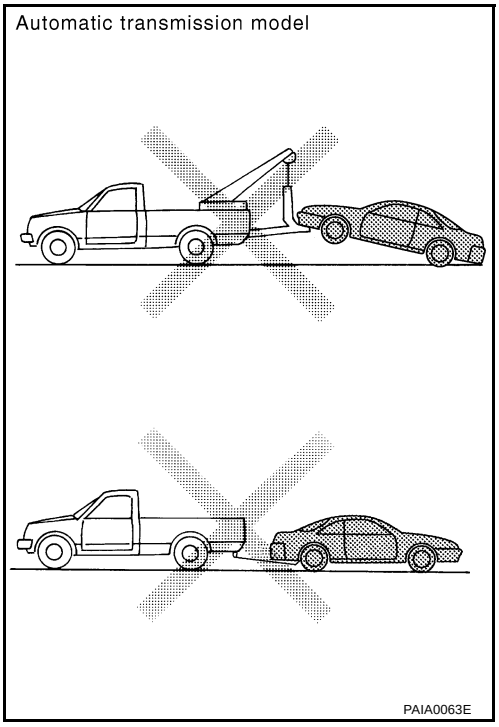
- **All applicable state or Provincial (in Canada) laws and local laws regarding the towing operation must be obeyed.**
- **It is necessary to use proper towing equipment to avoid possible damage to the vehicle during towing operation. Towing is in accordance with Towing Procedure Manual at dealer.**
- **Always attach safety chains before towing.**
- **When towing, make sure that the transmission, steering system and power train are in good order. If any unit is damaged, dollies must be used.**

NISSAN recommends that the vehicle be towed with the driving (rear) wheels off the ground as illustrated.


SGI994

CAUTION:

- **Never tow an automatic transmission model with the rear wheels or four wheels on the ground (forward or backward). This may cause serious and expensive damage to the transmission.**
- **When towing with the front wheels on the ground (if you do not use towing dollies), turn the ignition key to the OFF position, and secure the steering wheel in the straight-ahead position with a rope or similar device. Never place the ignition key in the LOCK position. This will result in damage to the steering lock mechanism.**
- **When towing a manual transmission model with the rear wheels on the ground (if you do not use towing dollies), release the parking brake and move the shift lever to the N (Neutral) position.**



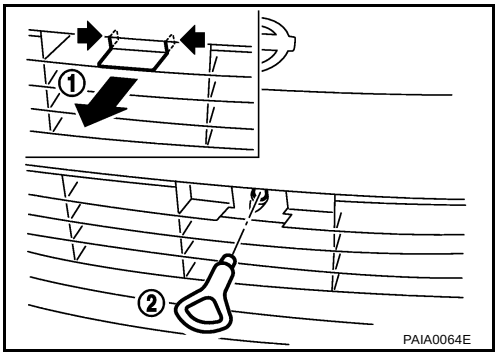
PAIA0063E

Vehicle Recovery (Freeing a Stuck Vehicle)

NAS0000Z

FRONT

After removing the front licence plate (if so equipped),
1 Remove the recovery hook cover from the bumper.
2 Securely install the recovery hook stored with jacking tools.
Make sure that the hook is properly secured in the stored place after use.



WARNING:

- **Stand clear of a stuck vehicle.**
- **Do not spin your tires at high speed. This could cause them to explode and result in serious injury. Parts of your vehicle could also overheat and be damaged.**

CAUTION:

- **Tow chains or cables must be attached only to the vehicle recovery hooks or main structural members of the vehicle. Otherwise, the vehicle body will be damaged.**
- **Do not use the vehicle tie downs to free a vehicle stuck in sand, snow, mud, etc. Never tow a vehicle using the vehicle tie downs or recovery hooks.**
- **Always pull the cable straight out from the front of the vehicle. Never pull on the vehicle at an angle.**
- **Pulling devices should be routed so they do not touch any part of the suspension, steering, brake or cooling systems.**
- **Pull devices such as ropes or canvas straps are not recommended for use in vehicle towing or recovery.**

If your vehicle is stuck in sand, snow, mad, etc., use the following procedure:

1. Turn off the Vehicle Dynamic Control System (if so equipped).
2. Make sure the area in front and behind the vehicle is clear of obstructions.
3. Turn the steering wheel right and left to clear an area around front tires.
4. Slowly rock the vehicle forward and backward.
   - Shift back and forth between R (reverse) and D (drive) (automatic transmission models) or 1st (low) and R (reverse) (manual transmission models).
   - Apply the accelerator as little as possible to maintain the rocking motion.
   - Release the accelerator pedal before shifting between R and D (automatic transmission models) or 1st and R (manual transmission models).
   - Do not spin the tires above 35 MPH (55 km/h).
5. If the vehicle cannot be freed after a few tires, contact a professional towing service to remove the vehicle.

REAR

- Towing hook is not available.

TIGHTENING TORQUE OF STANDARD BOLTS

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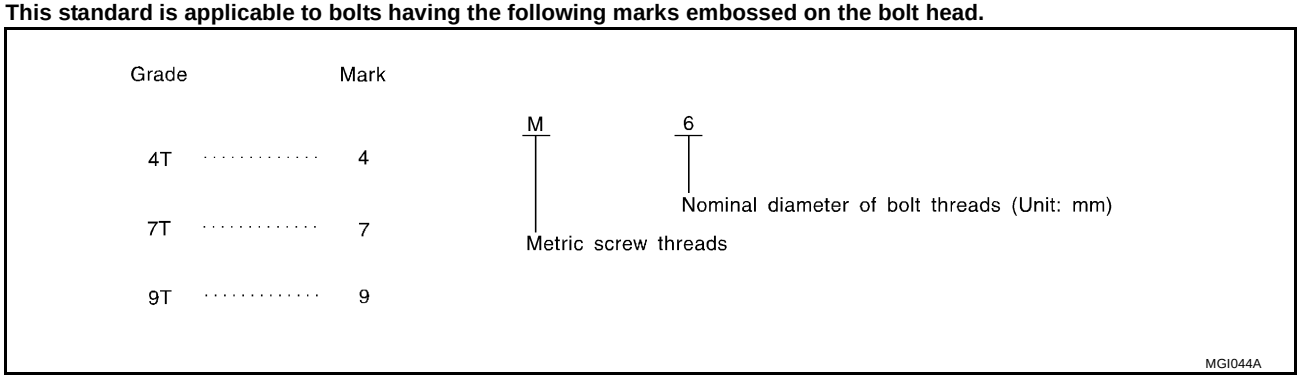
Tightening Torque Table

NAS00010

Grade	Bolt size	Bolt diameter * mm	Pitch mm	Tightening torque (Without lubricant)							
				Hexagon head bolt				Hexagon flange bolt			
				N·m	kg-m	ft-lb	in-lb	N·m	kg-m	ft-lb	in-lb
4T	M6	6.0	1.0	5.5	0.56	4	49	7	0.71	5	62
	M8	8.0	1.25	13.5	1.4	10	—	17	1.7	13	—
			1.0	13.5	1.4	10	—	17	1.7	13	—
	M10	10.0	1.5	28	2.9	21	—	35	3.6	26	—
			1.25	28	2.9	21	—	35	3.6	26	—
	M12	12.0	1.75	45	4.6	33	—	55	5.6	41	—
			1.25	45	4.6	33	—	65	6.6	48	—
	M14	14.0	1.5	80	8.2	59	—	100	10	74	—
7T	M6	6.0	1.0	9	0.92	7	80	11	1.1	8	97
	M8	8.0	1.25	22	2.2	16	—	28	2.9	21	—
			1.0	22	2.2	16	—	28	2.9	21	—
	M10	10.0	1.5	45	4.6	33	—	55	5.6	41	—
			1.25	45	4.6	33	—	55	5.6	41	—
	M12	12.0	1.75	80	8.2	59	—	100	10	74	—
			1.25	80	8.2	59	—	100	10	74	—
	M14	14.0	1.5	130	13	96	—	170	17	125	—
9T	M6	6.0	1.0	11	1.1	8	—	13.5	1.4	10	—
	M8	8.0	1.25	28	2.9	21	—	35	3.6	26	—
			1.0	28	2.9	21	—	35	3.6	26	—
	M10	10.0	1.5	55	5.6	41	—	80	8.2	59	—
			1.25	55	5.6	41	—	80	8.2	59	—
	M12	12.0	1.75	100	10	74	—	130	13	96	—
			1.25	100	10	74	—	130	13	96	—
	M14	14.0	1.5	170	17	125	—	210	21	155	—

*: Nominal diameter

1. **Special parts are excluded.**
2. **This standard is applicable to bolts having the following marks embossed on the bolt head.**



RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS

PFP:00000

Recommended Chemical Products and Sealants

NAS00011

Refer to the following chart for help in selecting the appropriate chemical product or sealant.

	Product Description	Purpose	Nissan North America Part No. (USA)	Nissan Canada Part No. (Canada)	Aftermarket Cross-reference Part Nos.
1	Rear View Mirror Adhesive	Used to permanently remount rear view mirrors to windows.	999MP-AM000P	99998-50505	Permatex 81844
2	Anaerobic Liquid Gasket	For metal-to-metal flange sealing. Can fill a 0.38 mm (0.015 inch) gap and provide instant sealing for most powertrain applications.	999MP-AM001P	99998-50503	Permatex 51813 and 51817
3	High Performance Thread Sealant	Provides instant sealing on any threaded straight or parallel threaded fitting. (Thread sealant only, no locking ability.) ● Do not use on plastic.	999MP-AM002P	999MP-AM002P	Permatex 56521
4	Silicone RTV	Gasket Maker	999MP-AM003P (Ultra Grey)	99998-50506 (Ultra Grey)	Permatex Ultra Grey 82194; Three Bond 1207,1215, 1216, 1217F, 1217G and 1217H Nissan RTV Part No. 999MP-A7007
		Gasket Maker for Maxima/ Quest 5-speed automatic transmission (RE5F22A)	–	–	Three Bond 1281B or exact equivalent in its quality
5	High Temperature, High Strength Thread Locking Sealant (Red)	Threadlocker	999MP-AM004P	999MP-AM004P	Permatex 27200; Three Bond 1360, 1360N, 1305 N&P, 1307N, 1335, 1335B, 1363B, 1377C, 1386B, D&E and 1388 Loctite 648
6	Medium Strength Thread Locking Sealant (Blue)	Threadlocker (service tool removable)	999MP-AM005P	999MP-AM005P	Permatex 24200, 24206, 24240, 24283 and 09178; Three Bond 1322, 1322N, 1324 D&N, 1333D, 1361C, 1364D, 1370C and 1374

IDENTIFICATION INFORMATION

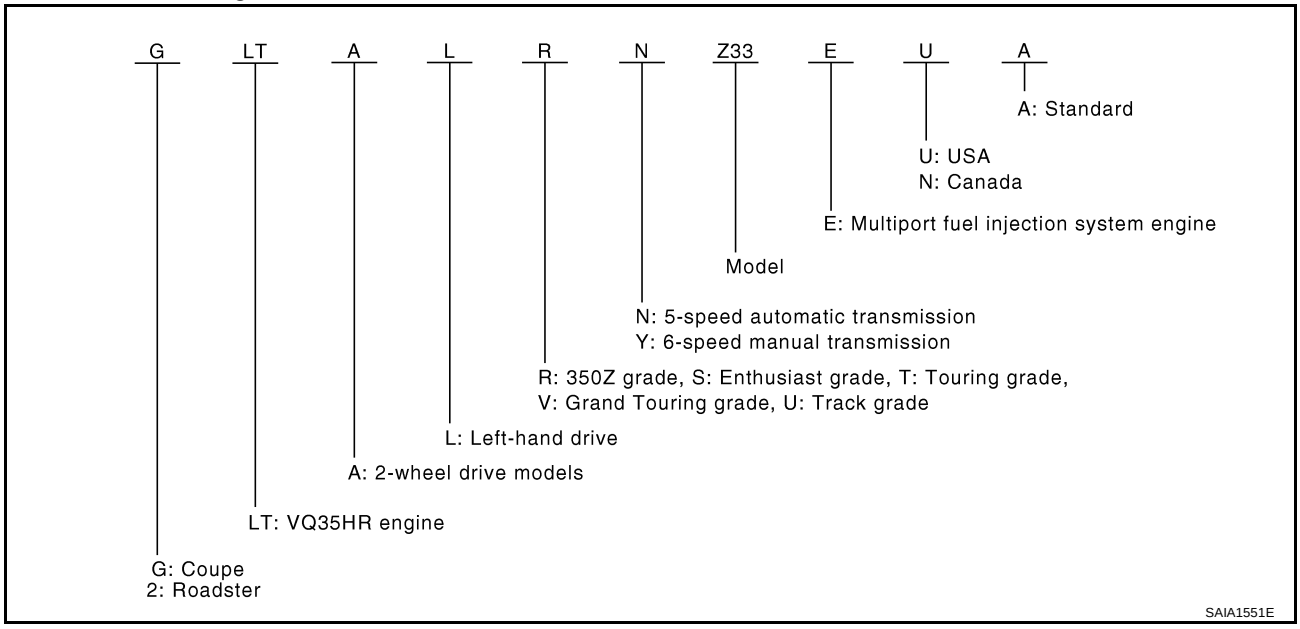
PFP:00010

Model Variation

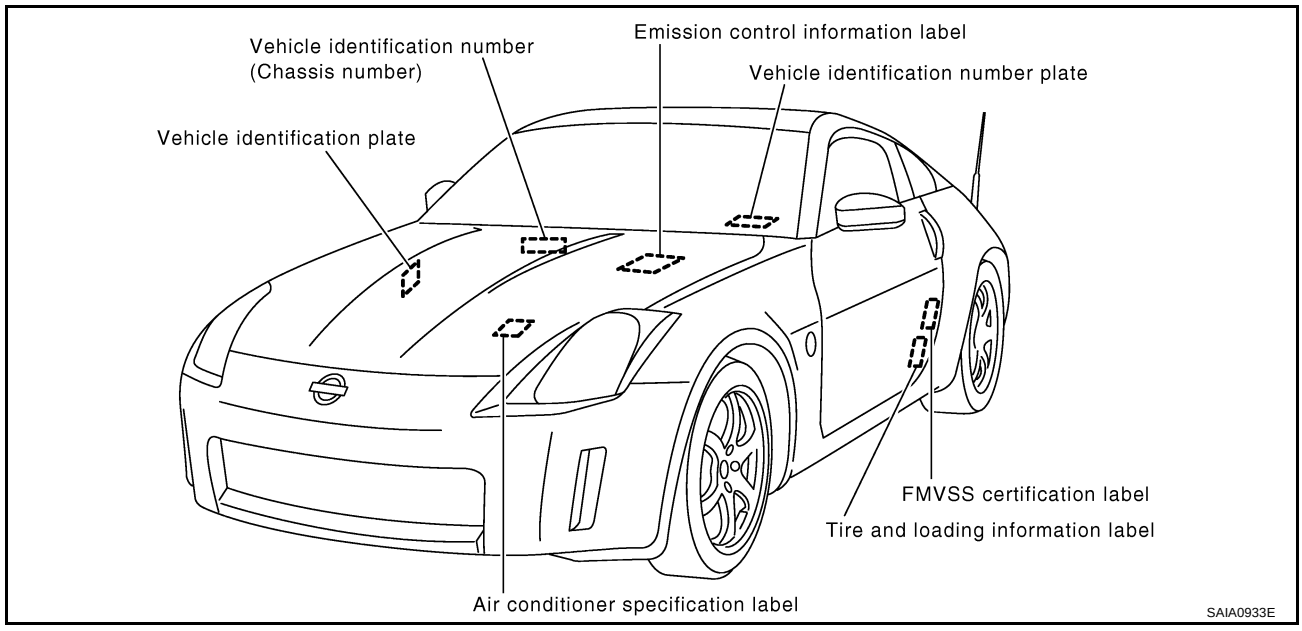
NAS00012

Body	Engine	Transmission	Destination	
			USA	Canada
Coupe	VQ35HR	RE5R05A (5A/T)	GLTALSN-EUA	GLTALTN-ENA
			GLTALTN-EUA	GLTALVN-ENA
			GLTALVN-EUA	—
		FS6R31A (6M/T)	GLTALRY-EUA	GLTALTY-ENA
			GLTALSY-EUA	GLTALVY-ENA
			GLTALTY-EUA	—
			GLTALUY-EUA	—
			GLTALVY-EUA	—
Roadster		RE5R05A (5A/T)	2LTALSN-EUA	2LTALTN-ENA
			2LTALTN-EUA	2LTALVN-ENA
			2LTALVN-EUA	—
		FS6R31A (6M/T)	2LTALSY-EUA	2LTALTY-ENA
			2LTALTY-EUA	2LTALVY-ENA
			2LTALVY-EUA	—

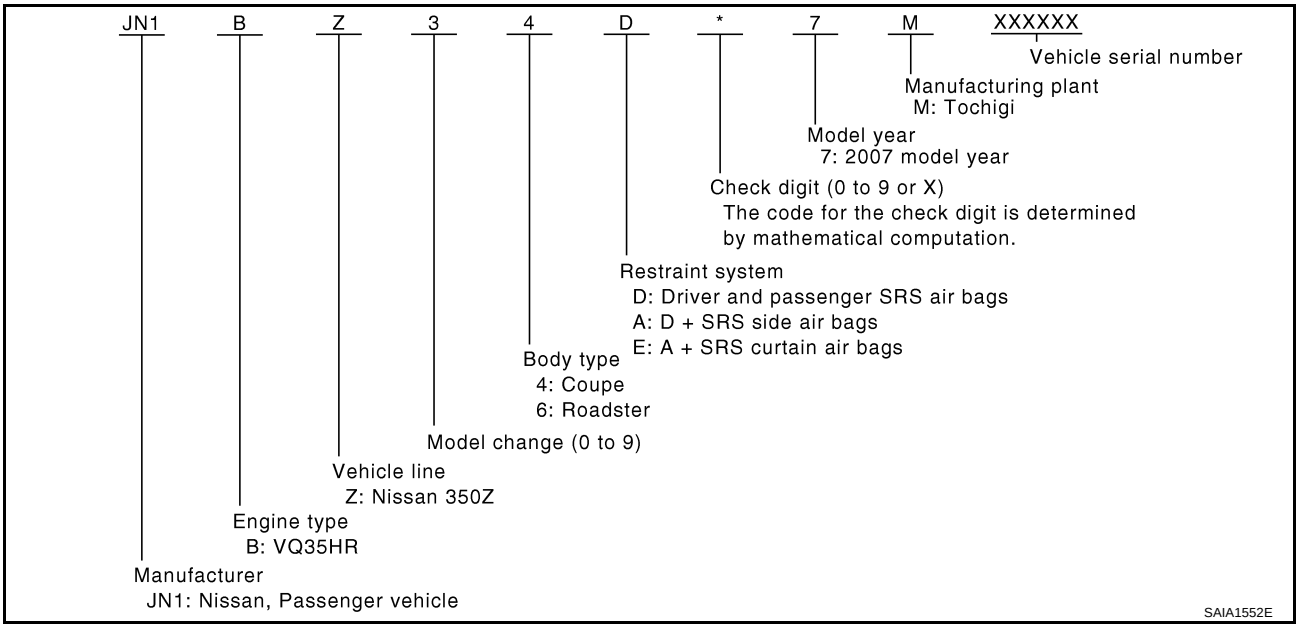
Prefix and suffix designations:



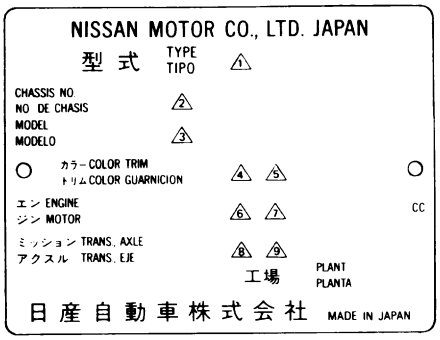
IDENTIFICATION NUMBER



Vehicle Identification Number Arrangement



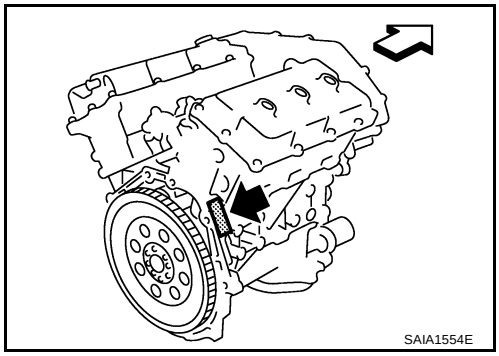
IDENTIFICATION PLATE



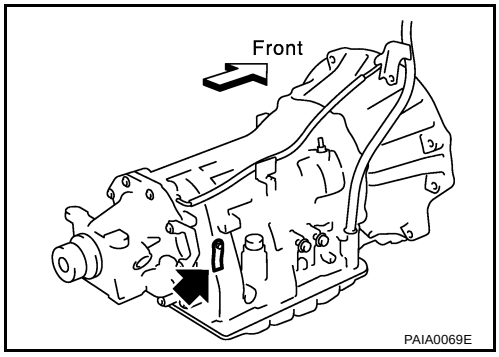
1 Type
2 Vehicle identification number (Chassis number)
3 Model
4 Body color code
5 Trim color code
6 Engine model
7 Engine displacement
8 Transmission model
9 Axle model

SGI315

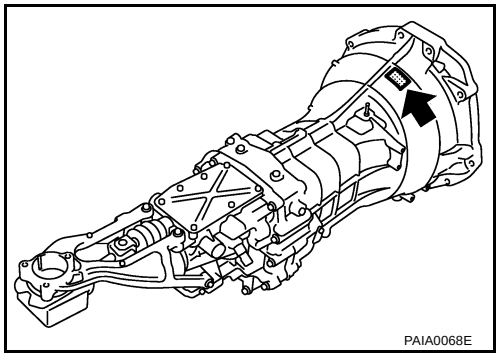
ENGINE SERIAL NUMBER



AUTOMATIC TRANSMISSION NUMBER



MANUAL TRANSMISSION NUMBER



Dimensions

NAS00013

Unit: mm (in)

Model	Coupe	Roadster
Overall length	4,314 (169.8)	4,314 (169.8)
Overall width	1,815 (71.5)	1,815 (71.5)
Overall height	1,323 (52.1)	1,333 (52.5)
Front tread	1,536 (60.5)	1,536 (60.5)
Rear tread	1,540 (60.6)*1, 1,546 (60.9)*2	1,540 (60.6)
Wheelbase	2,650 (104.3)	2,650 (104.3)

*1: For model with 245/45R18 tires
*2: For model with 265/35R19 tires

Wheels & Tires

NAS00014

	Type		Size	Offset mm (in)
Road wheel	Aluminum	Front	18 x 8JJ	30 (1.18)
			18 x 9 JJ	
		Rear	18 x 8-1/2JJ	33 (1.30)
			19 x 10JJ	30 (1.18)
	Spare		17 x 4T	30 (1.18)
Tire	Conventional	Front	225/45R18 91W 245/40R18 93W*	
		Rear	245/45R18 96W 265/35R19 94W*	
	Spare		T145/80D17 107M	

TERMINOLOGY

PFP:00011

SAE J1930 Terminology List

NAS00017

All emission related terms used in this publication in accordance with SAE J1930 are listed. Accordingly, new terms, new acronyms/abbreviations and old terms are listed in the following chart.

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Air cleaner	ACL	Air cleaner
Barometric pressure	BARO	***
Barometric pressure sensor-BCDD	BAROS-BCDD	BCDD
Camshaft position	CMP	***
Camshaft position sensor	CMPS	Crank angle sensor
Canister	***	Canister
Carburetor	CARB	Carburetor
Charge air cooler	CAC	Intercooler
Closed loop	CL	Closed loop
Closed throttle position switch	CTP switch	Idle switch
Clutch pedal position switch	CPP switch	Clutch switch
Continuous fuel injection system	CFI system	***
Continuous trap oxidizer system	CTOX system	***
Crankshaft position	CKP	***
Crankshaft position sensor	CKPS	***
Data link connector	DLC	***
Data link connector for CONSULT-II	DLC for CONSULT-II	Diagnostic connector for CONSULT-II
Diagnostic test mode	DTM	Diagnostic mode
Diagnostic test mode selector	DTM selector	Diagnostic mode selector
Diagnostic test mode I	DTM I	Mode I
Diagnostic test mode II	DTM II	Mode II
Diagnostic trouble code	DTC	Malfunction code
Direct fuel injection system	DFI system	***
Distributor ignition system	DI system	Ignition timing control
Early fuel evaporation-mixture heater	EFE-mixture heater	Mixture heater
Early fuel evaporation system	EFE system	Mixture heater control
Electrically erasable programmable read only memory	EEPROM	***
Electronic ignition system	EI system	Ignition timing control
Engine control	EC	***
Engine control module	ECM	ECCS control unit
Engine coolant temperature	ECT	Engine temperature
Engine coolant temperature sensor	ECTS	Engine temperature sensor
Engine modification	EM	***
Engine speed	RPM	Engine speed
Erasable programmable read only memory	EPROM	***
Evaporative emission canister	EVAP canister	Canister
Evaporative emission system	EVAP system	Canister control solenoid valve
Exhaust gas recirculation valve	EGR valve	EGR valve

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Exhaust gas recirculation control-BPT valve	EGRC-BPT valve	BPT valve
Exhaust gas recirculation control-solenoid valve	EGRC-solenoid valve	EGR control solenoid valve
Exhaust gas recirculation temperature sensor	EGRT sensor	Exhaust gas temperature sensor
EGR temperature sensor		
Flash electrically erasable programmable read only memory	FEEPROM	***
Flash erasable programmable read only memory	FEPROM	***
Flexible fuel sensor	FFS	***
Flexible fuel system	FF system	***
Fuel pressure regulator	***	Pressure regulator
Fuel pressure regulator control solenoid valve	***	PRVR control solenoid valve
Fuel trim	FT	***
Heated Oxygen sensor	HO2S	Exhaust gas sensor
Idle air control system	IAC system	Idle speed control
Idle air control valve-air regulator	IACV-air regulator	Air regulator
Idle air control valve-auxiliary air control valve	IACV-AAC valve	Auxiliary air control (AAC) valve
Idle air control valve-FICD solenoid valve	IACV-FICD solenoid valve	FICD solenoid valve
Idle air control valve-idle up control solenoid valve	IACV-idle up control solenoid valve	Idle up control solenoid valve
Idle speed control-FI pot	ISC-FI pot	FI pot
Idle speed control system	ISC system	***
Ignition control	IC	***
Ignition control module	ICM	***
Indirect fuel injection system	IFI system	***
Intake air	IA	Air
Intake air temperature sensor	IAT sensor	Air temperature sensor
Knock	***	Detonation
Knock sensor	KS	Detonation sensor
Malfunction indicator lamp	MIL	Check engine light
Manifold absolute pressure	MAP	***
Manifold absolute pressure sensor	MAPS	***
Manifold differential pressure	MDP	***
Manifold differential pressure sensor	MDPS	***
Manifold surface temperature	MST	***
Manifold surface temperature sensor	MSTS	***
Manifold vacuum zone	MVZ	***
Manifold vacuum zone sensor	MVZS	***
Mass air flow sensor	MAFS	Air flow meter
Mixture control solenoid valve	MC solenoid valve	Air-fuel ratio control solenoid valve
Multiport fuel injection System	MFI system	Fuel injection control

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Nonvolatile random access memory	NVRAM	***
On board diagnostic system	OBD system	Self-diagnosis
Open loop	OL	Open loop
Oxidation catalyst	OC	Catalyst
Oxidation catalytic converter system	OC system	***
Oxygen sensor	O2S	Exhaust gas sensor
Park position switch	***	Park switch
Park/neutral position switch	PNP switch	Park/neutral switch Inhibitor switch Neutral position switch
Periodic trap oxidizer system	PTOX system	***
Positive crankcase ventilation	PCV	Positive crankcase ventilation
Positive crankcase ventilation valve	PCV valve	PCV valve
Powertrain control module	PCM	***
Programmable read only memory	PROM	***
Pulsed secondary air injection control solenoid valve	PAIRC solenoid valve	AIV control solenoid valve
Pulsed secondary air injection system	PAIR system	Air induction valve (AIV) control
Pulsed secondary air injection valve	PAIR valve	Air induction valve
Random access memory	RAM	***
Read only memory	ROM	***
Scan tool	ST	***
Secondary air injection pump	AIR pump	***
Secondary air injection system	AIR system	***
Sequential multiport fuel injection system	SFI system	Sequential fuel injection
Service reminder indicator	SRI	***
Simultaneous multiport fuel injection system	***	Simultaneous fuel injection
Smoke puff limiter system	SPL system	***
Supercharger	SC	***
Supercharger bypass	SCB	***
System readiness test	SRT	***
Thermal vacuum valve	TVV	Thermal vacuum valve
Three way catalyst	TWC	Catalyst
Three way catalytic converter system	TWC system	***
Three way + oxidation catalyst	TWC + OC	Catalyst
Three way + oxidation catalytic converter system	TWC + OC system	***
Throttle body	TB	Throttle chamber SPI body
Throttle body fuel injection system	TBI system	Fuel injection control
Throttle position	TP	Throttle position
Throttle position sensor	TPS	Throttle sensor
Throttle position switch	TP switch	Throttle switch
Torque converter clutch solenoid valve	TCC solenoid valve	Lock-up cancel solenoid Lock-up solenoid

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Transmission control module	TCM	A/T control unit
Turbocharger	TC	Turbocharger
Vehicle speed sensor	VSS	Vehicle speed sensor
Volume air flow sensor	VAFS	Air flow meter
Warm up oxidation catalyst	WU-OC	Catalyst
Warm up oxidation catalytic converter system	WU-OC system	***
Warm up three way catalyst	WU-TWC	Catalyst
Warm up three way catalytic converter system	WU-TWC system	***
Wide open throttle position switch	WOTP switch	Full switch

***: Not applicable

SECTION GW

GLASSES, WINDOW SYSTEM & MIRRORS

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00049

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

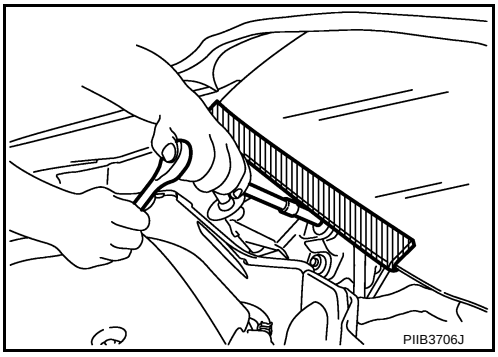
NIS0004A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NIS001L6

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Handling for Adhesive and Primer

NIS0004B

- Do not use an adhesive which is past its usable date. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.
- Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.
- Open the seal of the primer and adhesive just before application. Discard the remainder.
- Before application, be sure to shake the primer container to stir the contents. If any floating material is found, do not use it.
- If any primer or adhesive contacts the skin, wipe it off with gasoline or equivalent and wash the skin with soap.
- When using primer and adhesive, always observe the precautions in the instruction manual.

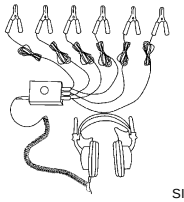
PREPARATION

PFP:00002

Special Service Tools

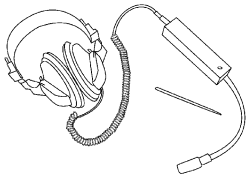
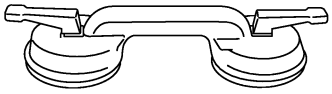
NIS0004D

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS0004E

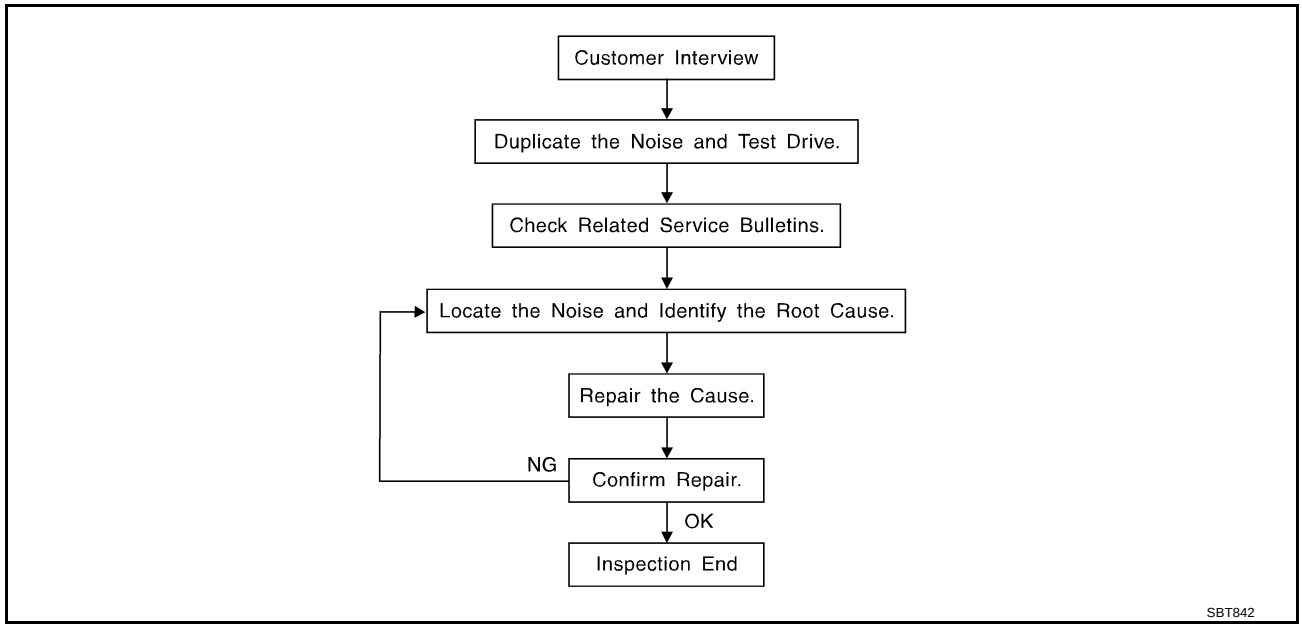
Tool name	Description
Engine ear  SIIA0995E	Locating the noise
Suction lifter  PIIB1805J	Remove the windshield, back door window glass

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS0004F



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to GW-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to GW-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS0004G

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

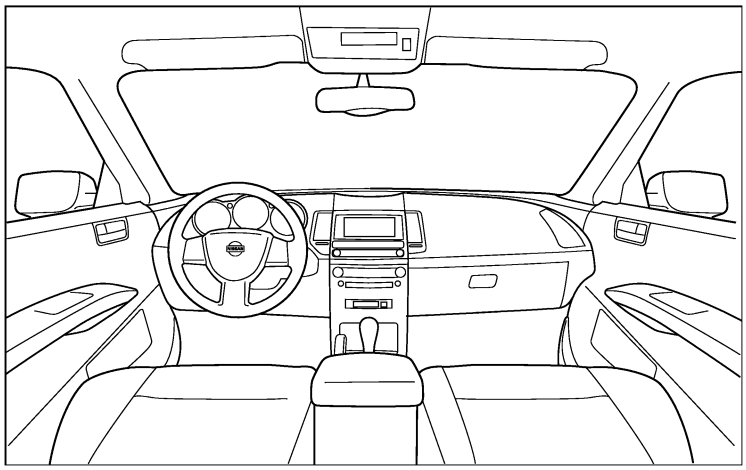
Diagnostic Worksheet

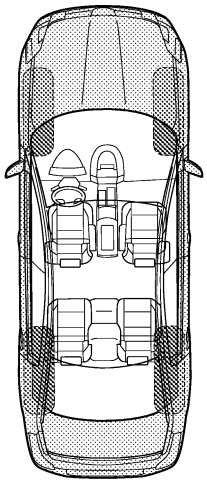
NIS0004H

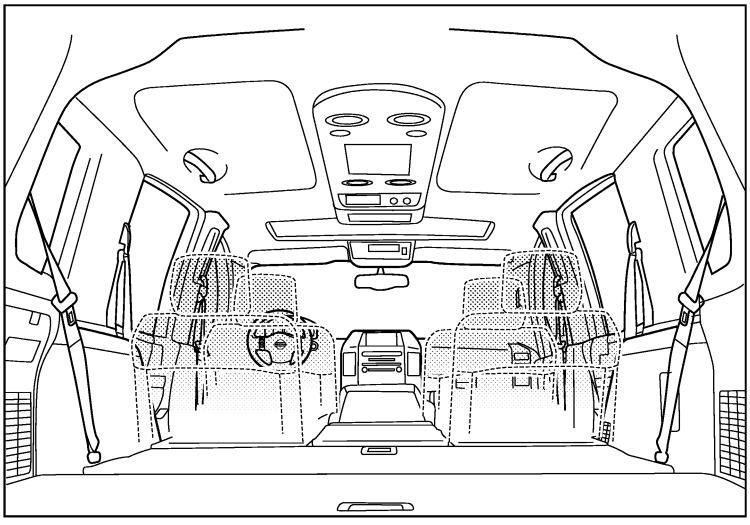
SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

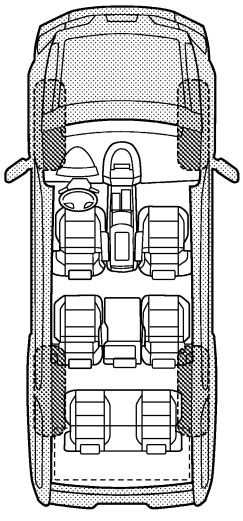
Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.









Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

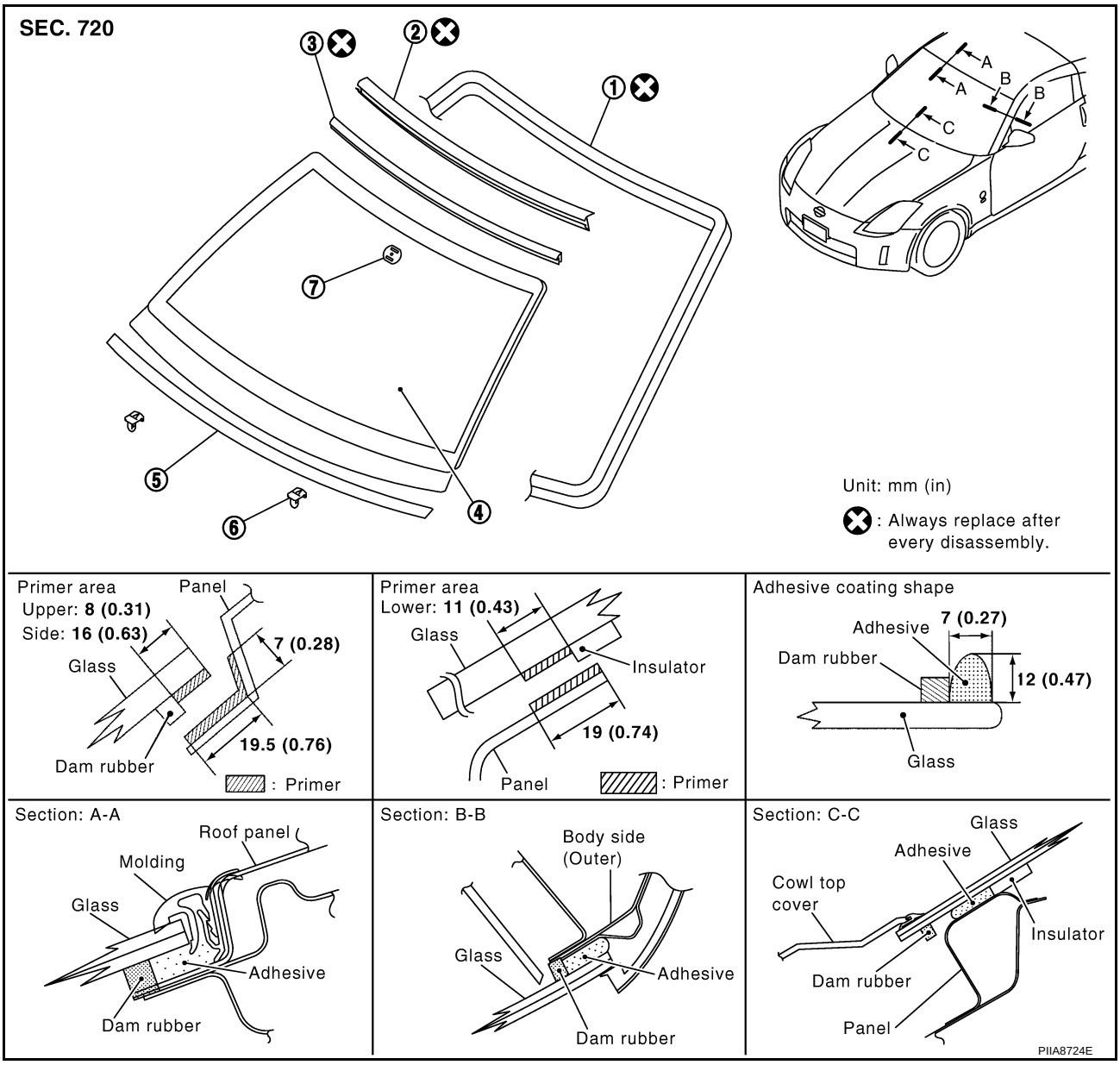
PIIB8742E

WINDSHIELD GLASS

PFP:72712

Removal and Installation

NIS0004I



1. Dam rubber
2. Fastener
3. Molding (upper)
4. Windshield glass
5. Insulator
6. Spacer
7. Mirror base

REMOVAL (COUPE)

1. Remove the front pillar finisher. Refer to EI-31, "Removal and Installation (for Coupe Models)" .
2. Partially remove the headlining (front edge). Refer to EI-44, "Removal and Installation (for Coupe Models)" .
3. Remove the front pillar garnish. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
4. Remove the front wiper arms. Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .
5. Remove the cowl top cover. Refer to EI-20, "COWL TOP" .
6. Apply a protective tape around the windshield glass to protect the painted surface from damage.

NOTE:

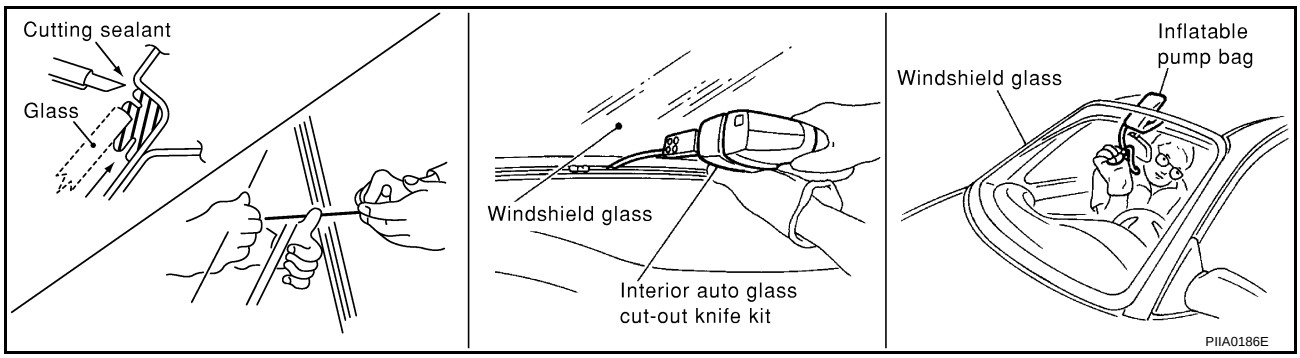
- After removing moldings, remove glass using piano wire or power cutting tool and an inflatable pump bag.
- If a windshield glass is to be reused, mark the body and the glass with mating marks.

WARNING:
When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:
- **When a windshield glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**

7. Remove the windshield glass, using suction lifter.

NOTE:
Do not set or stand the glass on its edge. Small chips may develop into cracks.



REMOVAL (ROADSTER)

1. Open the soft top.
2. Remove the front pillar finisher. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
3. Remove the roof front finisher. Refer to EI-46, "Removal and Installation (for Roadster Models)" .
4. Remove the front pillar garnish. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
5. Remove the front wiper arms. Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .
6. Remove the cowl top cover. Refer to EI-20, "COWL TOP" .
7. Apply a protective tape around the windshield glass to protect the painted surface from damage.

NOTE:
- After removing moldings, remove glass using piano wire or power cutting tool and an inflatable pump bag.
- If a windshield glass is to be reused, mark the body and the glass with mating marks.

WARNING:
When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:
- **When a windshield glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**

8. Remove the windshield glass, using suction lifter.

NOTE:
Do not set or stand the glass on its edge. Small chips may develop into cracks.

INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit (if available) or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- The molding must be installed securely so that it is in position and leaves no gap.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:
- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**

- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the windshield in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

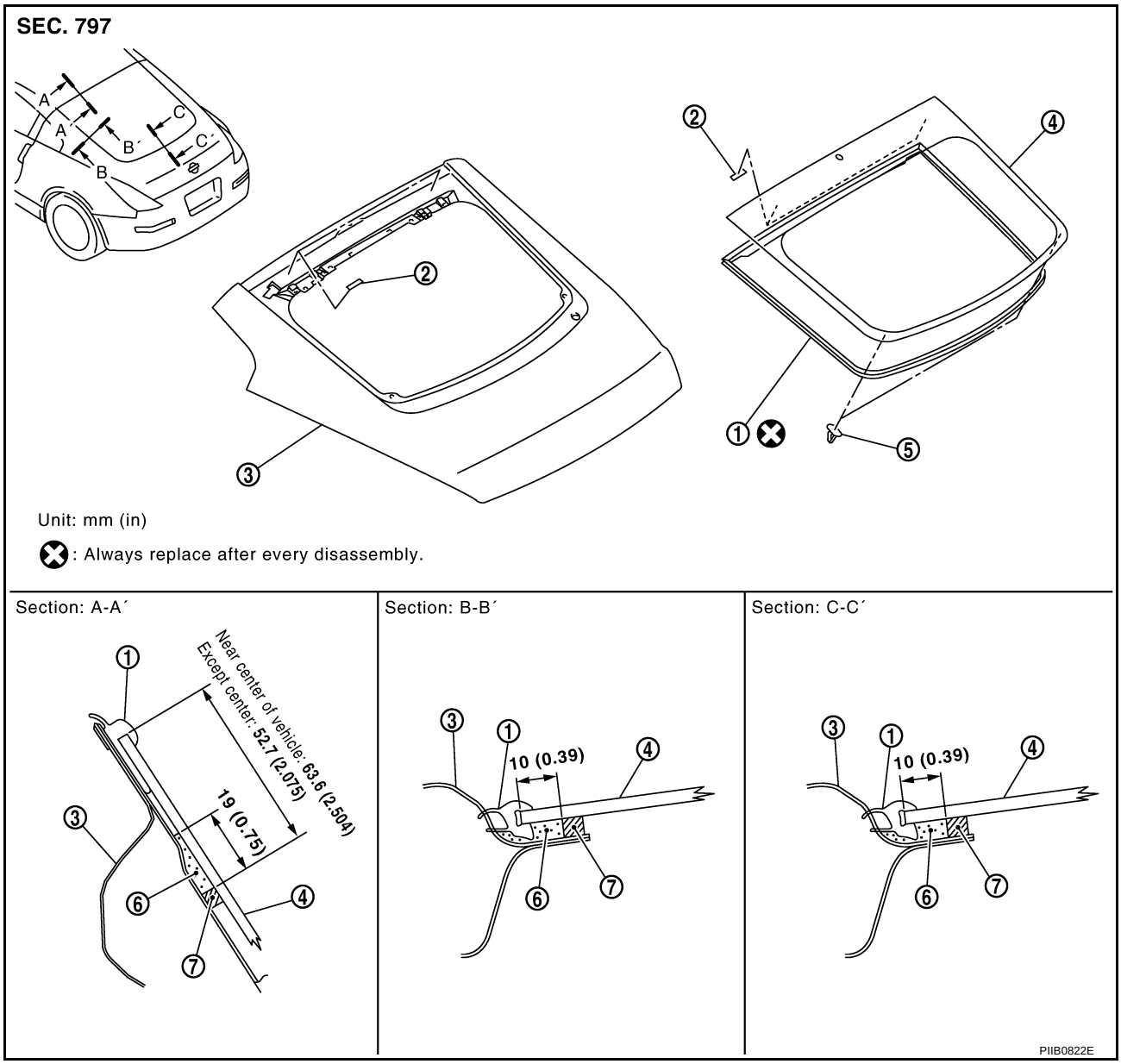
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the windshield area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

BACK DOOR WINDOW GLASS

PFP:90300

Removal and Installation

NIS0004J



1. Back door window molding
2. Dual lock fastener
3. Back door
4. Back door window glass
5. Holder
6. Adhesive
7. Dam rubber

REMOVAL

1. Remove back door finisher. Refer to EI-48, "BACK DOOR FINISHER" .
2. Remove rear wiper arm. Refer to WW-46, "Removal and Installation of Rear Wiper Arm, Adjustment of Wiper Arms Stop Location" .
3. Remove connectors and grounds for rear window defogger.
4. Apply a protective tape around the back door window glass to protect the painted surface from damage. remove glass using piano wire or power cutting tool and an inflatable pump bag.

NOTE:

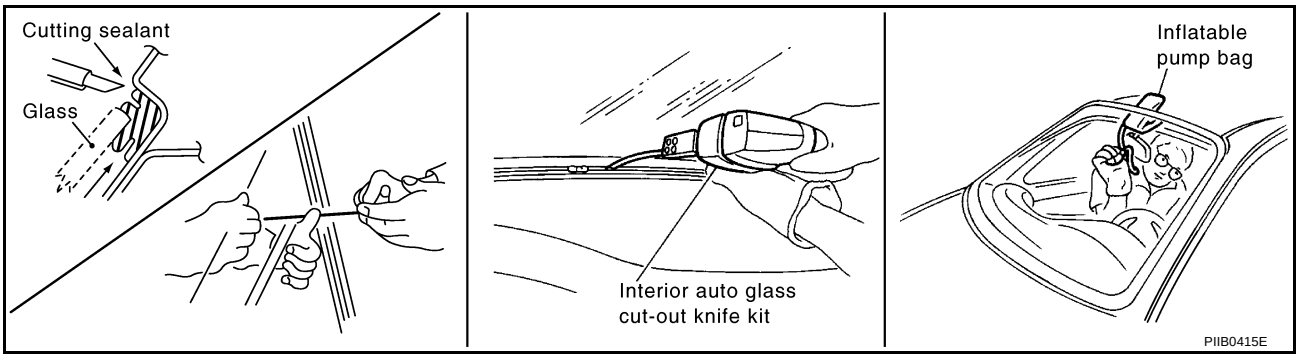
If a back door window glass is to be reused, mark the body and the glass with mating marks.

WARNING:

When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:

- **When a back door window glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**
- **Do not set or stand the glass on its edge. Small chips may develop into cracks.**



5. Remove the back door window glass, using suction lifter.

INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit (if available) or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:

- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**
- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the back door window in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

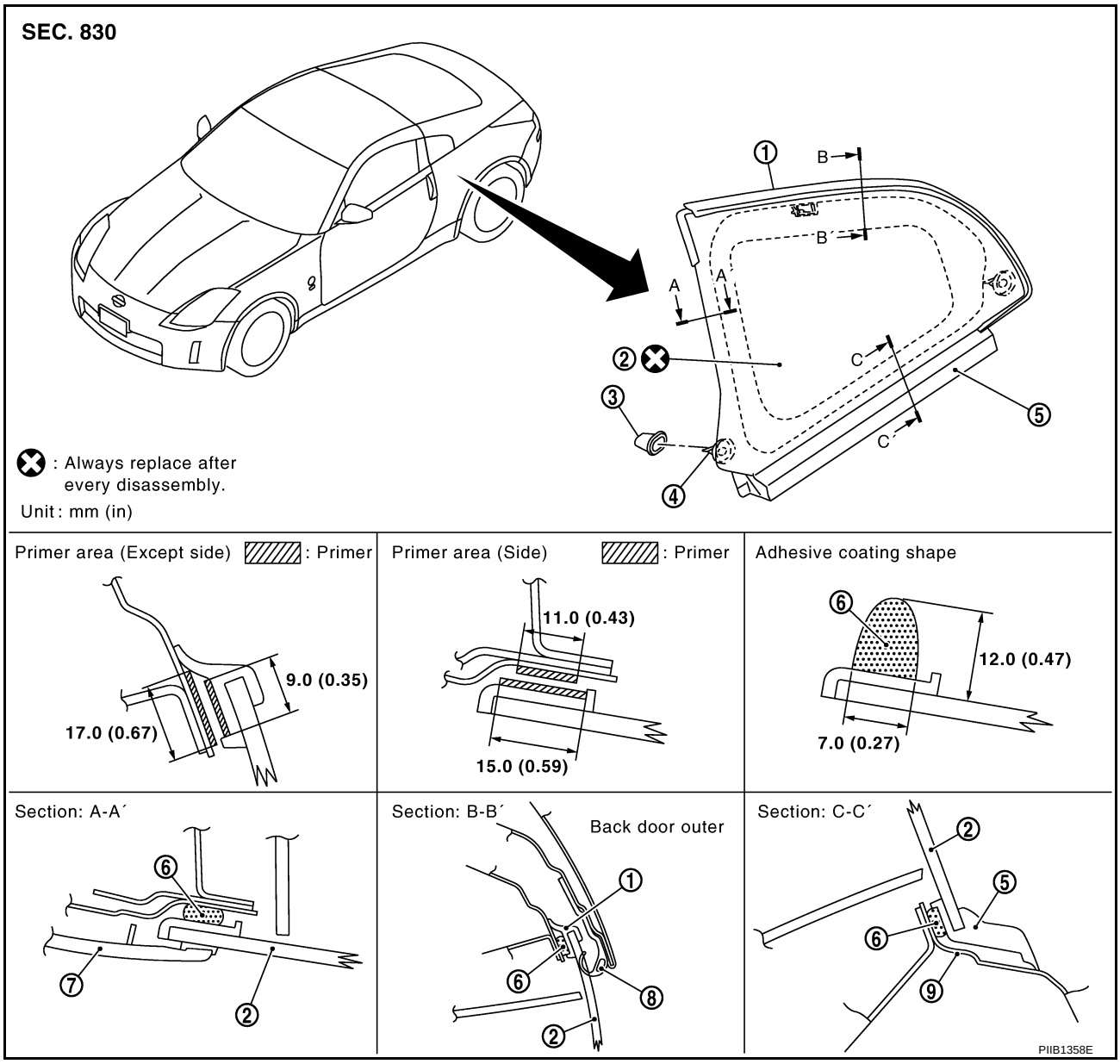
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the back door window area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

SIDE WINDOW GLASS

PFP:83300

Removal and Installation

NIS0004K



1. Side window glass molding (upper)
2. Side window glass
3. Grommet
4. Clip
5. Side window glass molding (lower)
6. Adhesive
7. Lock pillar finisher
8. Back door molding
9. Rear fender

REMOVAL

1. Remove rear side finisher. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove rear pillar finisher. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove headlining. Refer to EI-44, "HEADLINING" .
4. Remove lock pillar finisher. Refer to EI-31, "ROOF SIDE MOLDING" .

NOTE:
If a side window glass is to be reused, mark the body and the glass with mating marks.

WARNING:
When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:
- **Be careful not to scratch the glass when removing.**

- **Do not set or stand the glass on its edge. Small chips may develop into cracks.**

INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit (if available) or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- The molding must be installed securely so that it is in position and leaves no gap.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:

- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**
- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the side window in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

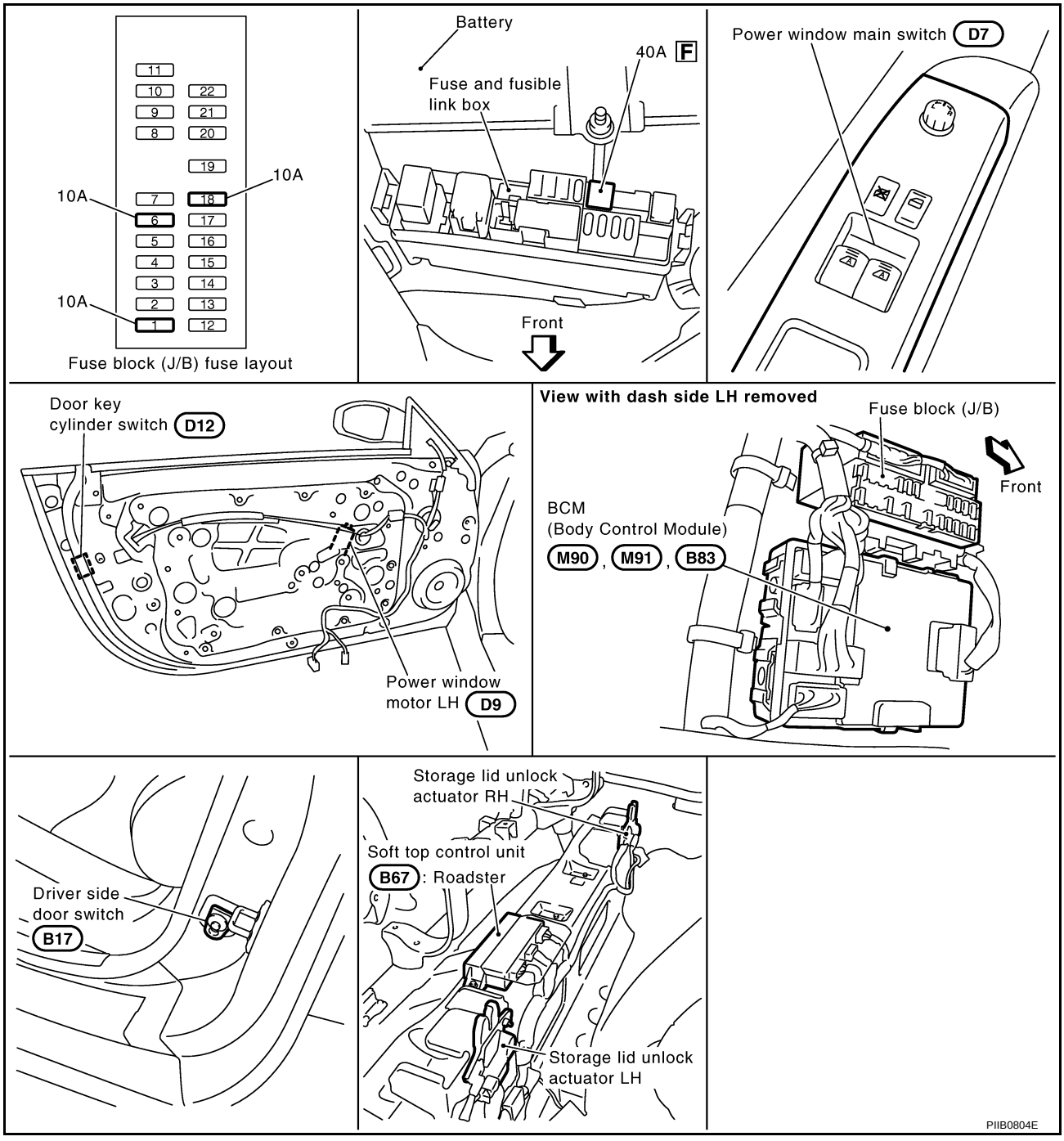
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the side window area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

POWER WINDOW SYSTEM

PFP:25401

Component Parts and Harness Connector Location

NIS0004L



System Description

NIS0004M

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55.
- through 10A fuse [No. 18, located in the fuse block (J/B)]
- to BCM terminal 42.
- through BCM terminal 54
- to power window main switch terminal 1.
- to power window sub-switch terminal 10.

With ignition switch in ON or START position, power is supplied

- through 10A fuse [No.1, located in the fuse block (J/B)]
- to BCM terminal 38.
- through BCM terminal 53
- to power window main switch terminal 10.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66.
- to power window main switch terminal 15
- through grounds M30 and M66.
- to power window sub-switch terminal 11
- through grounds M30 and M66.

MANUAL OPERATION

Driver Side Door

WINDOW UP

When the driver side window switch in the power window main switch is pressed in the up position,
Power is supplied

- through power window main switch terminal 8
- to driver side power window motor terminal 2.

Ground is supplied

- through driver side power window motor terminal 1
- to power window main switch terminal 11.

Then, the motor raises the window until the switch is released.

WINDOW DOWN

When the driver side window switch in the power window main switch is pressed in the down position,
Power is supplied

- through power window main switch terminal 11
- to driver side power window motor terminal 1.

Ground is supplied

- through side power window motor terminal 2.
- to power window main switch terminal 8

Then, the motor lowers the window until the switch is released.

Passenger Side Door

POWER WINDOW SUB-SWITCH OPERATION

WINDOW UP

When the power window sub-switch is pressed in the up position,
Power is supplied

- through power window sub-switch terminal 8
- to passenger side power window motor terminal 2.

Ground is supplied

- through passenger side power window motor terminal 1.

- to power window sub-switch terminal 9

Then, the motor raises the window until the switch is released.

WINDOW DOWN

When the power window sub-switch is pressed in the down position,
Power is supplied

- through power window sub-switch terminal 9
- to passenger side power window motor terminal 1.

Ground is supplied

- through passenger side power window motor terminal 2.
- to power window sub-switch terminal 8

Then, the motor lowers the window until the switch is released.

POWER WINDOW MAIN SWITCH OPERATION

Signal is sent

- though power window main switch terminal 12.
- to power window sub-switch terminal 16

The operation of passenger side power window with power window main switch is as same as the operation with power window sub-switch.

POWER WINDOW SERIAL LINK

Power window main switch, power window sub-switch and BCM transmit and receive the signal by power window serial link.
The under mentioned signal is transmitted from BCM to power window main switch.

- Driver side door switch signal
- Keyless power window down signal

The under mentioned signal is transmitted from BCM to power window sub-switch.

- Passenger side door switch signal
- Keyless power window down signal

The under mentioned signal is transmitted from power window main switch to power window sub-switch.

- Passenger side door window operation signal
- Power window control by key cylinder switch signal
- Retained power operation signal
- Power window lock signal

AUTO OPERATION

The power window AUTO feature enables the driver to open or close the window without holding the window switch in the down or up position.

POWER WINDOW LOCK

The power window lock is designed to lock operation of passenger side door window.
When the lock position, power window lock signal is sent by using power window serial link from power window main switch to power window sub-switch.
When power window sub-switch is receiving the lock signal, prohibits the operation of passenger side power window by power window sub-switch.

RETAINED POWER OPERATION

When the ignition switch is turned to the OFF position from ON or START position.
Power is supplied for 45 seconds

- through BCM terminal 53.
- to power window main switch terminal 10

When power and ground are supplied, the BCM continues to be energized, and the power window can be operated.
The retained power operation is canceled when the driver side door or the passenger side door is opened.
RAP signal period can be changed by CONSULT-III. Refer to GW-29, "CONSULT-III Function (BCM)" .

ANTI-PINCH SYSTEM

Power window main switch and power window sub-switch monitors the power window motor operation and the power window position (full closed or other) for driver side and passenger side power window by the signals from encoder and limit switch in power window motor (driver side and passenger side).
When power window main switch detects interruption during the following close operation,

- automatic close operation when ignition switch is in the “ON” position
- automatic close operation during retained power operation
- manual close operation during retained power operation

Power window main switch or power window sub-switch controls each power window motor for open and the power window will be lowered about 150 mm (5.91 in).

POWER WINDOW CONTROL BY THE KEY CYLINDER SWITCH

When ignition key switch is OFF, power window can be opened or closed by turning the door key cylinder UNLOCK / LOCK position more then 1.5 second over condition.

- Power window can be opened as the door key cylinder is kept fully turning to the UNLOCK position.
- Power window can be closed as the door key cylinder is kept fully turning to the LOCK position.

The power window operation by the key cylinder switch stops when the following operations are performed.

- While performing open / close the window with power window main switch.
- When the ignition switch is turned ON while the power window control operation by the key cylinder switch.

AUTOMATIC WINDOW ADJUSTING FUNCTION

When the driver's / passenger's door(s) is opened, the window of the opened door is lowered approx. 10 mm (0.39in).
When the door is closed, the window is raised to fully-closed positions.
Automatic window adjusting function system (opening operation) does not operate when the following.

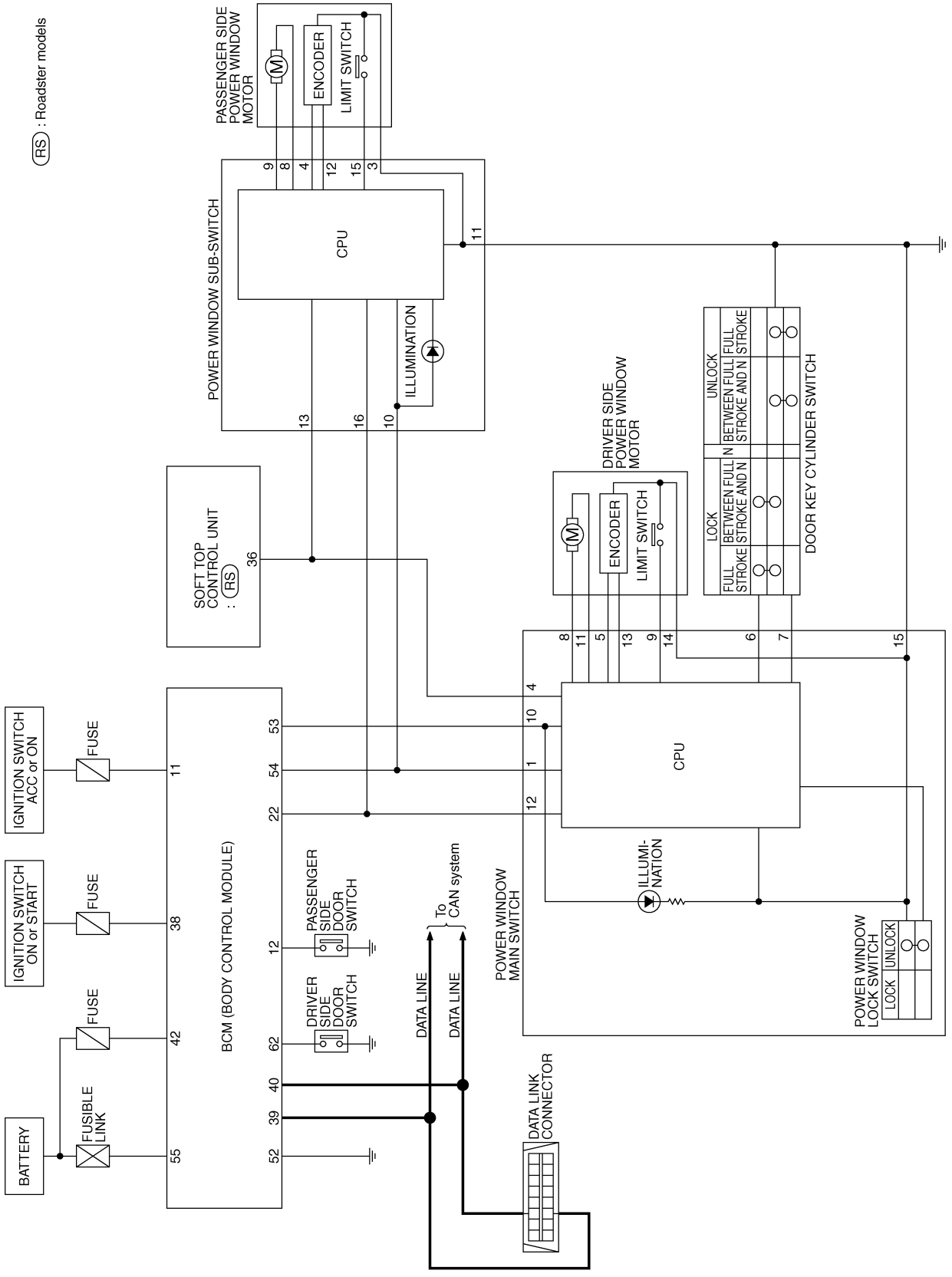
- The window is 10 mm (0.39 in) or more open from fully-closed positions.

Automatic window adjusting function system (closing operation) does not operate when the following.

- The automatic window adjusting function system (opening operation) operation.
- The keyless power window operation.
- The power window control by the key cylinder switch operation.

Schematic

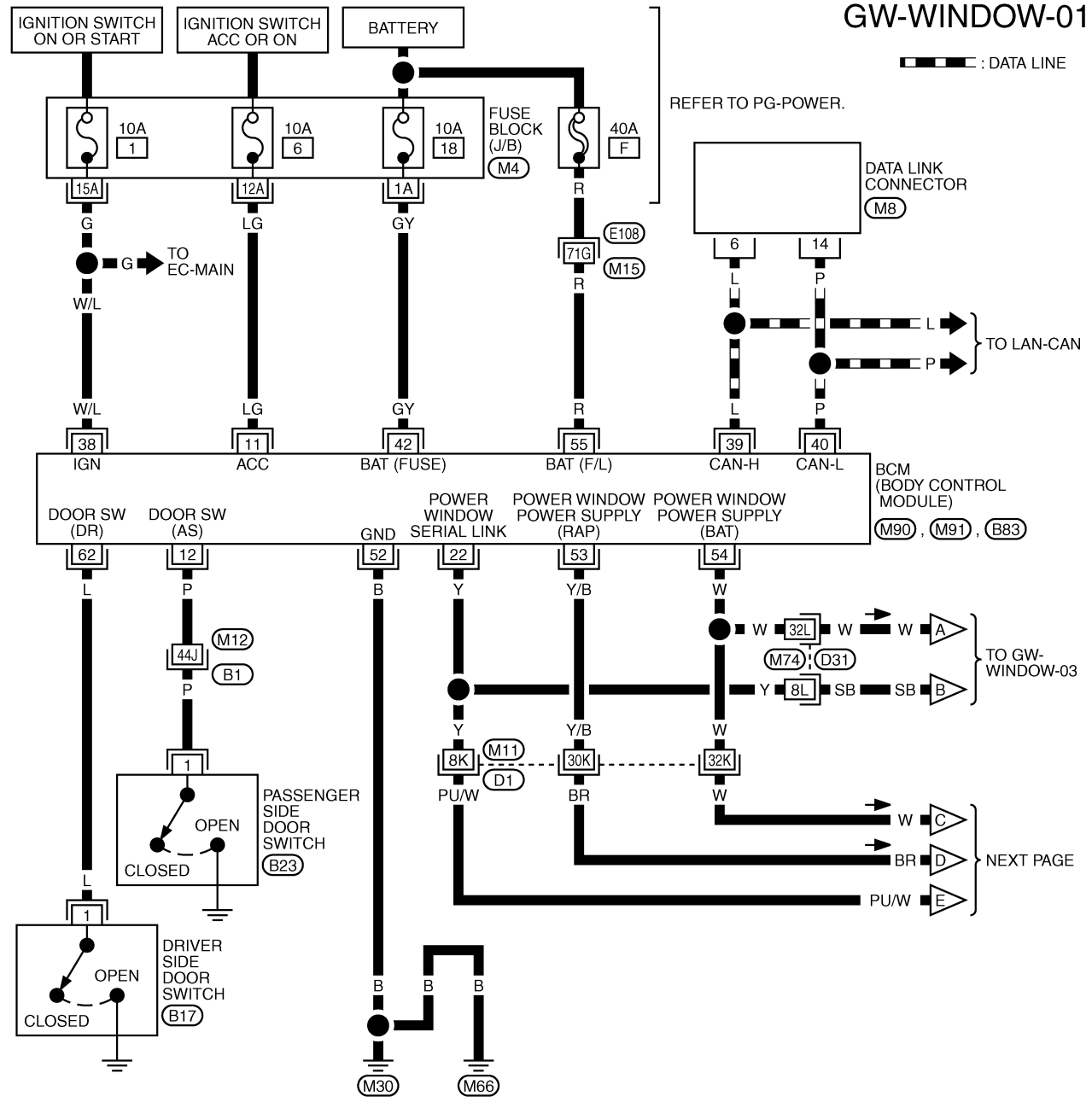
NIS0004N

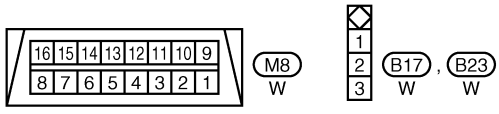


TIWT0969E

Wiring Diagram — WINDOW —

NIS0004O

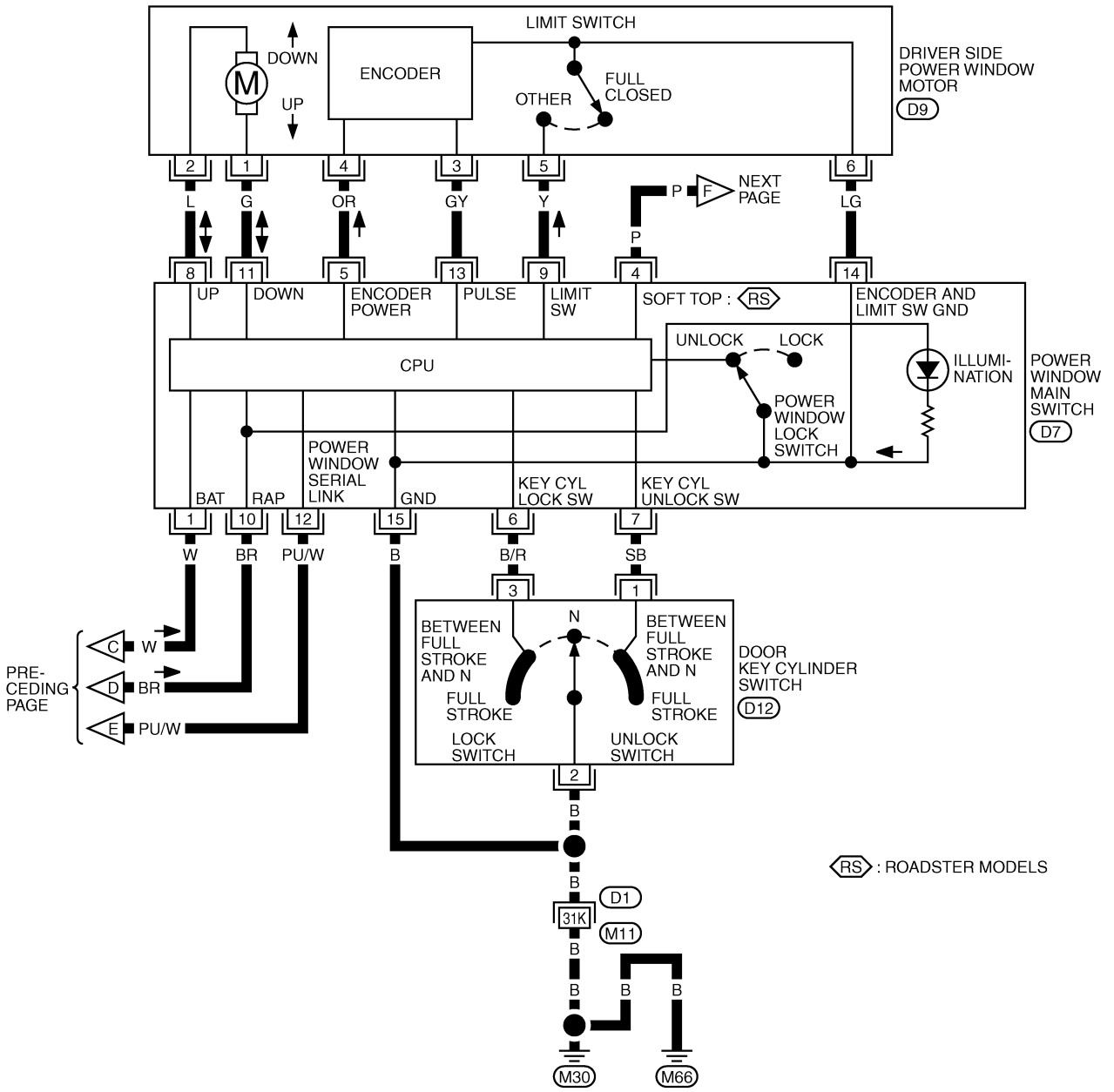




REFER TO THE FOLLOWING.
E108, B1, D1, D31
-SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91, B83
-ELECTRICAL UNITS

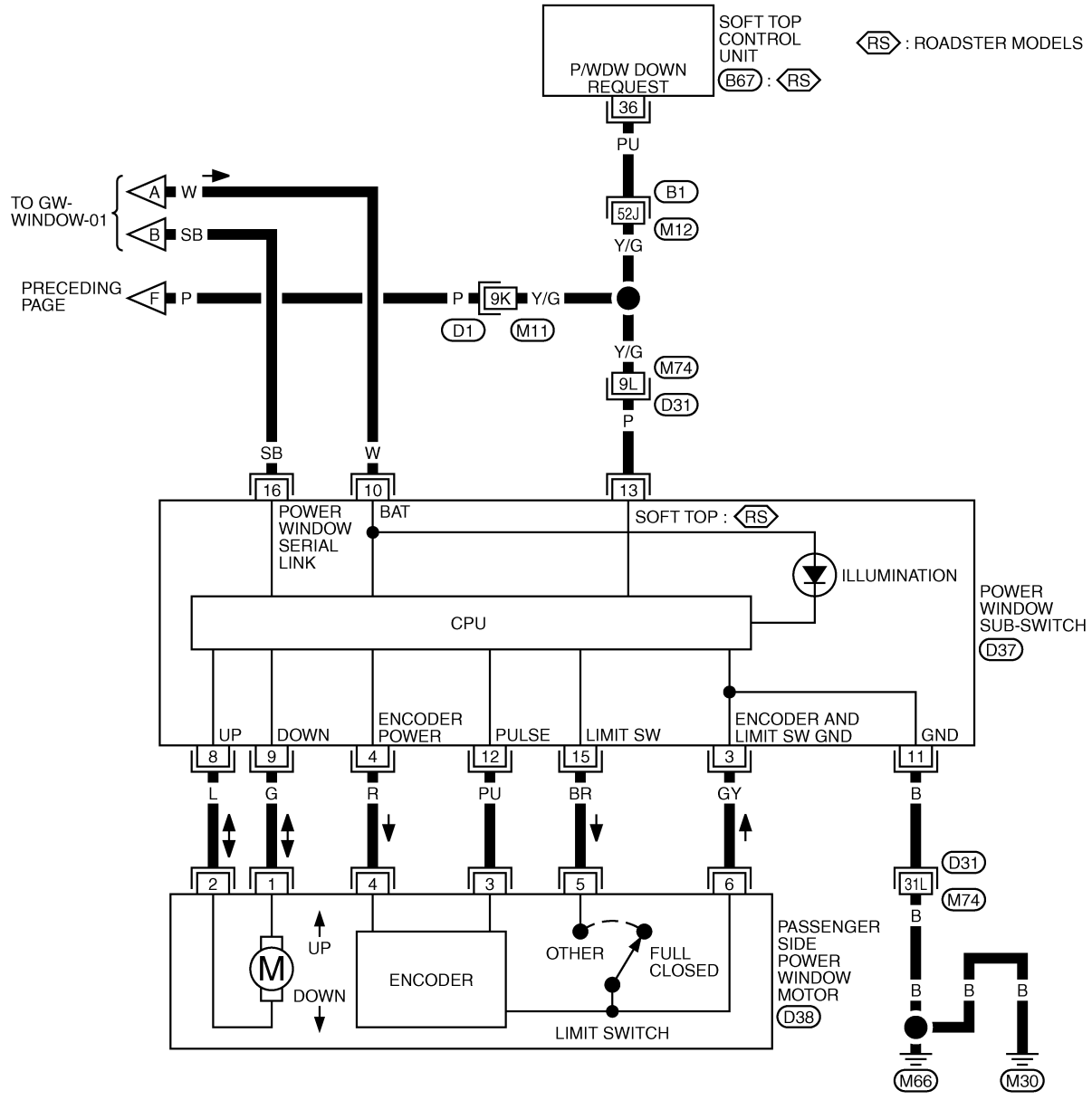
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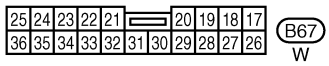
GW-WINDOW-02

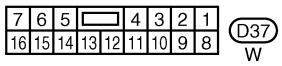


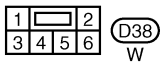
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GW-WINDOW-03







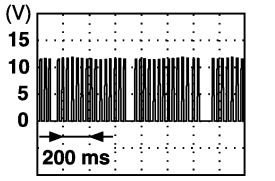


REFER TO THE FOLLOWING.
B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

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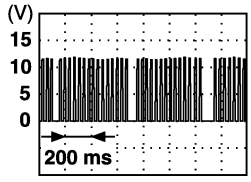
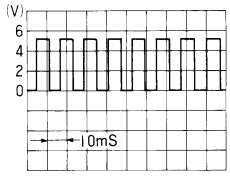
Terminal and Reference Value for BCM

NIS0004P

Terminal	Wire color	Item	Signal input/output	Condition	Voltage (V) (Approx.)
11	LG	Ignition switch ACC power supply (ACC or ON)	Input	Ignition switch (ACC or ON position)	Battery voltage
12	P	Passenger side door switch	Input	ON (open)	0
				OFF (closed)	Battery voltage
22	Y	Power window serial link	Input/Output	—	 PIIA2344J
38	W/L	Ignition switch ON power supply (ON or START)	Input	Ignition switch (ON or START position)	Battery voltage
39	L	CAN-H	Input/Output	—	—
40	P	CAN-L	Input/Output	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0
53	Y/B	Rap signal	Output	IGN SW ON	Battery voltage
				Within 45 second after ignition switch is turned to OFF	Battery voltage
				When driver side or passenger side door is open in power window timer operates	0
54	W	Power window switch power supply	Output	—	Battery voltage
55	R	Power source (Fusible link)	Input	—	Battery voltage
62	L	Driver side door switch	Input	ON (open)	0
				OFF (closed)	Battery voltage

Terminal and Reference Value for Power Window Main Switch

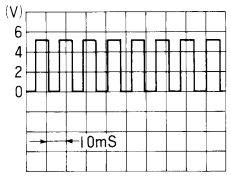
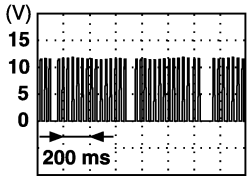
NIS0004Q

Terminal	Wire Color	Item	Signal input/output	Condition	Voltage (V) (Approx.)
1	W	BAT power supply	Input	—	Battery voltage
4*	P	Power window down request signal	Input	When soft top open/close function starts and window down function is operating.	0
				Other than above	5
5	OR	Encoder power supply	Input	—	10
6	B/R	Key cylinder lock switch	Output	Key position (Neutral → Locked)	5 → 0
7	SB	Key cylinder unlock switch	Output	Key position (Neutral → Unlocked)	5 → 0
8	L	Driver side power window motor UP signal	Output	When power window motor UP operation.	Battery voltage
9	Y	Limit switch signal	Input	Driver side door window is between fully-open and just before fully-closed position (ON).	0
				Driver side door window is between just before fully-closed position and fully-closed position (OFF).	5
10	BR	Rap signal	Output	IGN SW ON	Battery voltage
				Within 45 second after ignition switch is turned to OFF	Battery voltage
				When driver side or passenger side door is open in power window timer is operates	0
11	G	Driver side power window motor DOWN signal	Output	When power window motor DOWN operation.	Battery voltage
12	PU/W	Power window serial link	Input/Output	—	 PIIA2344J
13	GY	Encoder pulse signal	Input/Output	When power window motor operates.	 OCC3383D
14	LG	Limit switch and encoder ground	—	—	0
15	B	Ground	—	—	0

*: For Roadster

Terminal and Reference Value for Power Window Sub-Switch

NIS0004R

Terminal	Wire Color	Item	Signal input/output	Condition	Voltage (V) (Approx)
3	GY	Limit switch and encoder ground	—	—	0
4	R	Encoder power supply	Input	—	10
8	L	Passenger side power window motor UP signal	Output	When power window motor UP operation.	Battery voltage
9	G	Passenger side power window motor DOWN signal	Output	When power window motor DOWN operation.	Battery voltage
10	W	BAT power supply	Input	—	Battery voltage
11	B	Ground	—	—	0
12	PU	Encoder pulse signal	Input/Output	When power window motor operates.	 OCC3383D
13*	P	Power window down request signal	Input	When soft top open/close function starts and window down function is operating.	0
				Except the above	5
15	BR	Limit switch signal	Input	Passenger side door window is between fully-open and just before fully-closed position (ON).	0
				Passenger side door window is between just before fully-closed position and fully-closed position (OFF).	5
16	SB	Power window serial link	Input/Output	—	 PIIA2344J

*: For Roadster

CONSULT-III Function (BCM)

NIS0004S

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnostic test item	Check item diagnostic test mode	Content
RETAINED PWR	Work support	Changes setting of each function.
	Data monitor	Displays the input data of BCM in real time.
	Active test	Gives a drive signal to a load to check the operation.

WORK SUPPORT

Work item	Description
RETAINED PWR	Rap signal's power supply period can be changed by mode setting. Selects rap signal's power supply period between three steps ● MODE 1 (45 sec.) / MODE 2 (OFF) / MODE 3 (2 min.).

DATE MONITOR

Monitor item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
DOOR SW–DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW–AS	Indicates [ON/OFF] condition of passenger side door switch.

ACTIVE TEST

Test item	Description
RETAINED PWR	This test is able to supply RAP signal (power) from BCM (body control module) to power window system and power sunroof system (if equipped). Those systems can be operated when turning on "RETAINED PWR" on CONSULT-III screen even if the ignition switch is turned OFF. **NOTE:** During this test, CONSULT-III can be operated with ignition switch in "OFF" position. "RETAINED PWR" should be turned "ON" or "OFF" on CONSULT-III screen when ignition switch is ON. Then turn ignition switch OFF to check retained power operation. CONSULT-III might be stuck if "RETAINED PWR" is turned to "ON" or "OFF" on CONSULT-III screen when ignition switch is OFF position.

Work Flow

NIS0004T

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to GW-19, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to GW-30, "Trouble Diagnoses Symptom Chart" .
4. Does power window system operate normally? If Yes, GO TO 5, If No, GO TO 3.
5. INSPECTION END

Trouble Diagnoses Symptom Chart

NIS0004U

- Make sure that other systems using the signal of the following check systems operate normally.

Symptom	Diagnoses / service procedure	Reference page
None of the power windows can be operated using any switch.	1. Check BCM power supply and ground circuit	GW-32
	2. Check power window main switch power supply and ground circuit	GW-46
	3. Check power window serial link	GW-44
	4. Replace BCM.	BCS-17
Driver side power window cannot be operated	1.Check driver side power window motor circuit	GW-33
	2. Replace the power window main switch.	GW-46
Passenger side power window cannot be operated.	1. Check power window sub-switch power supply and ground circuit	GW-47
	2. Check power window serial link	GW-44
	3. Check passenger side power window motor circuit	GW-33
	4. Replace BCM.	BCS-17
Anti-pinch system does not operate normally (driver side).	1. Door window sliding part malfunction ● A foreign material adheres to window glass or grass run rubber. ● Glass run rubber wear or deformation. ● Sash is tilted too much, or not enough.	—
	2. Limit switch adjusting	GW-52
	3. Check limit switch circuit (driver side)	GW-34
	4. Check encoder circuit (driver side)	GW-37
Anti-pinch system does not operate normally (passenger side).	1. Door window sliding part malfunction ● A foreign material adheres to window glass or grass run rubber. ● Glass run rubber wear or deformation. ● Sash is tilted too much, or not enough.	—
	2. Limit switch adjusting	GW-52
	3. Check limit switch circuit (passenger side)	GW-36
	4. Check encoder circuit (passenger side)	GW-39
Power window retained power operation does not operate properly.	1. Check the retained power operation mode setting.	GW-29
	2. Check door switch	GW-42
	3. Replace BCM.	BCS-17

Symptom	Diagnoses / service procedure	Reference page
Automatic window adjusting function does not operate.	1. Check door switch	GW-42
	2. Limit switch adjusting	GW-52
	3. Check limit switch circuit (driver side)	GW-34
	4. Check limit switch circuit (passenger side)	GW-36
	5. Check power window serial link	GW-44
	6. Replace BCM.	BCS-17
Does not operate by the key cylinder switch.	1. Check door key cylinder switch	GW-48
	2. Replace the power window main switch.	EI-33
Power window lock switch does not function.	1. Check power window serial link	GW-44
	2. Replace the power window main switch.	EI-33
Auto operation does not operate but manual operate normally (driver side)	1. Check encoder circuit (driver side)	GW-37
	2. Replace power window main switch	EI-33
Auto operation does not operate but manual operate normally (passenger side)	1. Check encoder circuit (passenger side)	GW-39
	2. Replace power window sub-switch	EI-33

Check BCM Power Supply and Ground Circuit

NIS0004V

1. CHECK FUSE

- Check 10A fuse [No.1, located in fuse block (J/B)]
- Check 10A fuse [No.18, located in fuse block (J/B)]
- Check 40A fusible link (letter **F** , located in the fuse and fusible link box).

NOTE:
Refer to GW-18, "Component Parts and Harness Connector Location" .

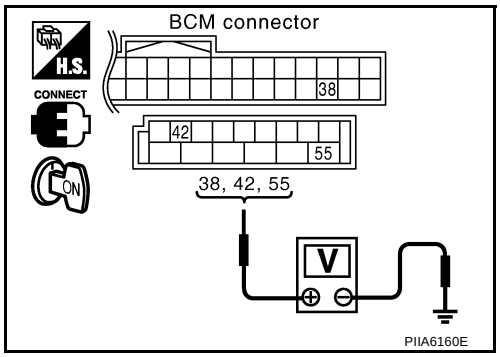
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between BCM connector M90, M91 terminal 38, 42, 55 and ground.

38 (W/L) – Ground : Battery voltage
42 (GY) – Ground : Battery voltage
55 (R) – Ground : Battery voltage



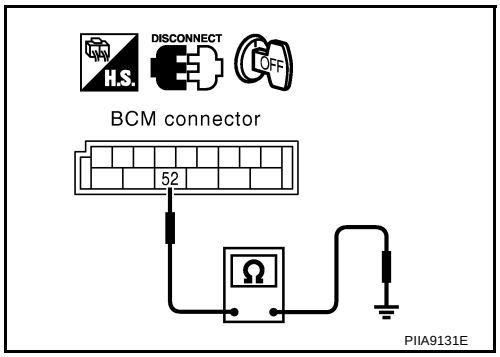
OK or NG

OK >> GO TO 3.
NG >> Check BCM power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM connector M91 terminal 52 and ground.

52 (B) – Ground :Continuity should exist.



OK or NG

OK >> Power supply and ground circuit are OK.
NG >> Check BCM ground circuit for open or short.

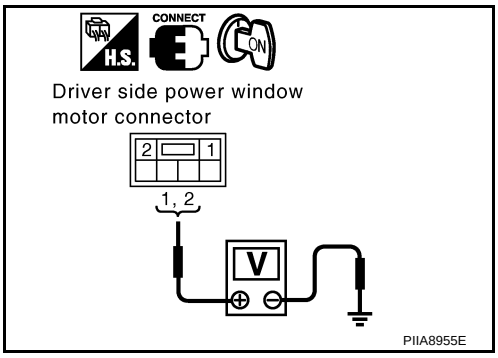
Check Drive Side Power Window Motor Circuit

NIS0004W

1. CHECK POWER WINDOW MAIN SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Power window main switch operate, check voltage between driver side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition of power window main switch	Voltage (V) (Approx.)
	(+)	(-)		
D9	1 (G)	Ground	UP	0
			DOWN	Battery voltage
	2 (L)		UP	Battery voltage
			DOWN	0



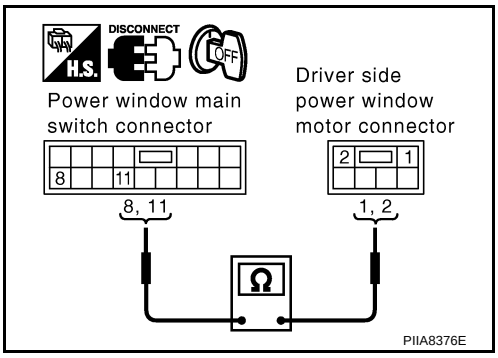
OK or NG

OK >> Replace driver side power window motor.
NG >> GO TO 2.

2. CHECK POWER WINDOW MAIN SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminals 8, 11 and driver side power window motor connector D9 terminals 1, 2.

8 (L) – 2 (L) : Continuity should exist.
11 (G) – 1 (G) : Continuity should exist.



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Repair or replace harness.

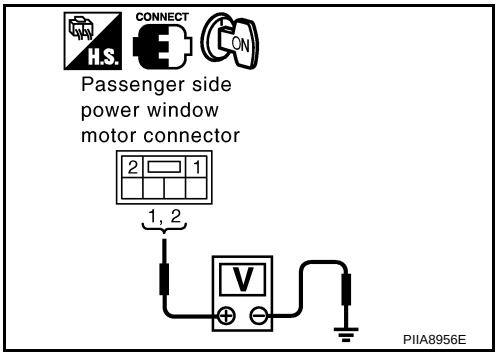
Check Passenger Side Power Window Motor Circuit

NIS0004X

1. CHECK POWER WINDOW SUB-SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Power window sub-switch operate, check voltage between passenger side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition of power window sub-switch	Voltage (V) (Approx.)
	(+)	(-)		
D38	1 (G)	Ground	UP	0
			DOWN	Battery voltage
	2 (L)		UP	Battery voltage
			DOWN	0



OK or NG

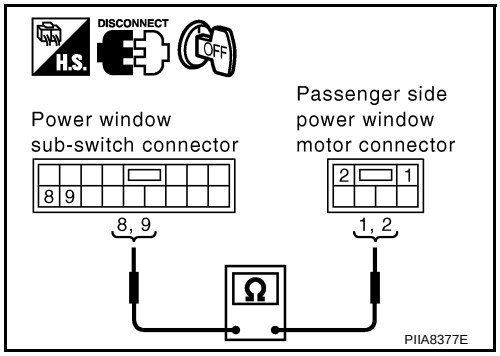
OK >> Replace passenger side power window motor.
NG >> GO TO 2.

2. CHECK PASSENGER SIDE POWER WINDOW MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminals 8, 9 and passenger side power window motor connector D38 terminals 1, 2.

9 (G) – 1 (G) : Continuity should exist.

8 (L) – 2 (L) : Continuity should exist.



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.

NG >> Repair or replace harness.

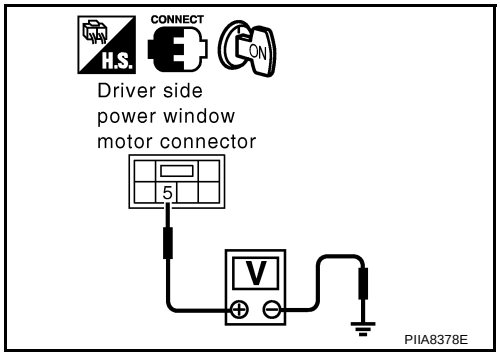
Check Limit Switch Circuit (Driver Side)

NIS0004Y

1. CHECK DRIVER DOOR LIMIT SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check voltage between driver side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
D9	5 (Y)	Ground	Driver side door window is between fully-open and just before fully-closed position (ON)	0
			Driver side door window is between just before fully-closed position and fully-closed position (OFF)	5



OK or NG

OK >> Limit switch circuit is OK.

NG >> GO TO 2.

2. CHECK LIMIT SWITCH GROUND CIRCUIT

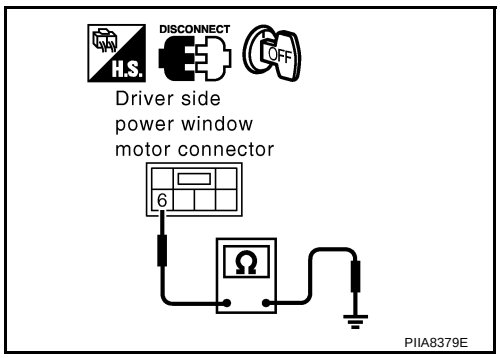
1. Turn ignition switch OFF.
2. Disconnect driver side power window motor connector.
3. Check continuity between driver side power window motor connector D9 terminal 6 and ground.

6 (LG) – Ground : Continuity should exist.

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.



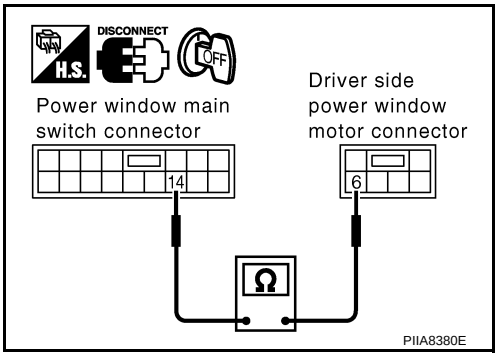
3. CHECK HARNESS CONTINUITY

1. Disconnect power window main switch connector.
2. Check continuity between power window main switch connector D7 terminal 14 and driver side power window motor connector D9 terminal 6.

14 (LG) – 6 (LG) : Continuity should exist.

OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.



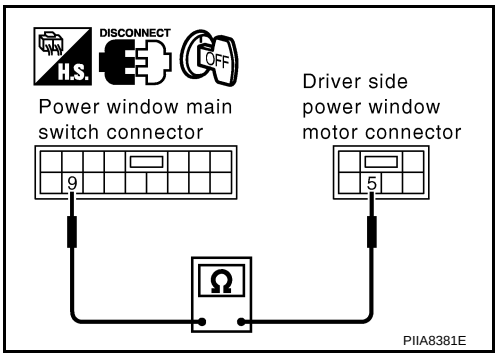
4. CHECK HARNESS CONTINUITY

1. Disconnect power window main switch connector.
2. Check continuity between power window main switch connector D7 terminal 9 and driver side power window motor connector D9 terminal 5.

9 (Y) – 5 (Y) : Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.



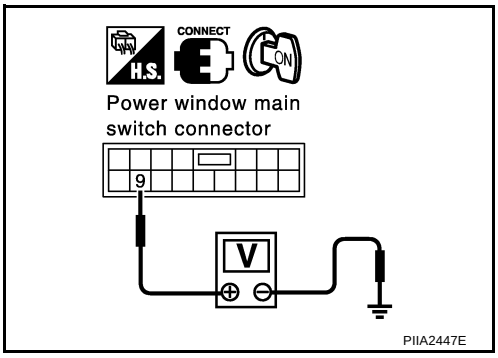
5. CHECK POWER WINDOW MAIN SWITCH OUTPUT SIGNAL

1. Connect power window main switch connector.
2. Turn ignition switch ON.
3. Check voltage between power window main switch connector D7 terminal 9 and ground.

9 (Y) – Ground : Approx. 5V

OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace power window main switch.



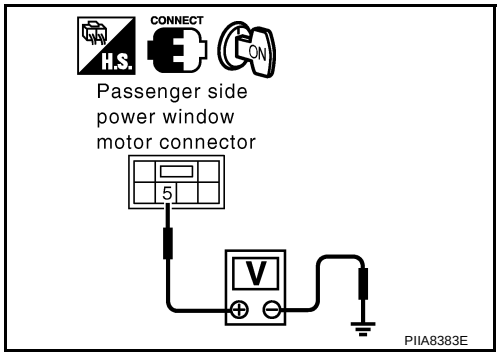
Check Limit Switch Circuit (Passenger Side)

NIS0004Z

1. CHECK POWER WINDOW LIMIT SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check voltage between passenger side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
D38	5 (BR)	Ground	Passenger side door window is between fully-open and just before fully-closed position (ON)	0
			Passenger side door window is between just before fully-closed position and fully-closed position (OFF)	5



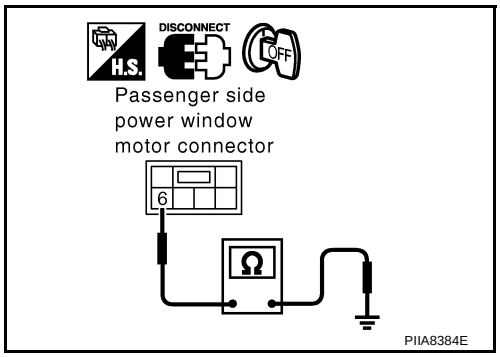
OK or NG

OK >> Limit switch circuit is OK.
NG >> GO TO 2.

2. CHECK LIMIT SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect passenger side power window motor connector.
3. Check continuity between passenger side power window motor connector D38 terminal 6 and ground.

6 (GY) – Ground : Continuity should exist.



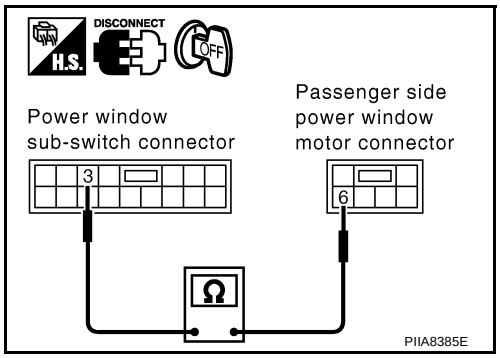
OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK HARNESS CONTINUITY

1. Disconnect power window sub-switch connector.
2. Check continuity between power window sub-switch connector D37 terminal 3 and passenger side power window motor connector D38 terminal 6.

3 (GY) – 6 (GY) : Continuity should exist.



OK or NG

OK >> Replace power window sub-switch.
NG >> Repair or replace harness.

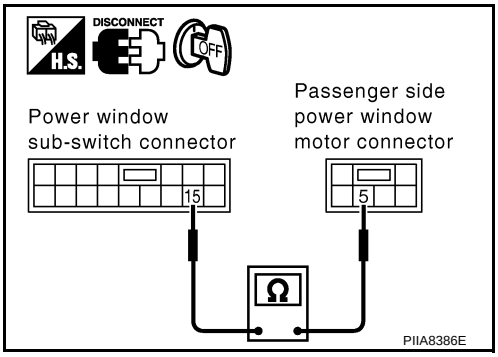
4. CHECK HARNESS CONTINUITY

1. Disconnect power window sub-switch connector.
2. Check continuity between power window sub-switch connector D37 terminal 15 and passenger side power window motor connector D38 terminal 5.

15 (BR) – 5 (BR) : Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.



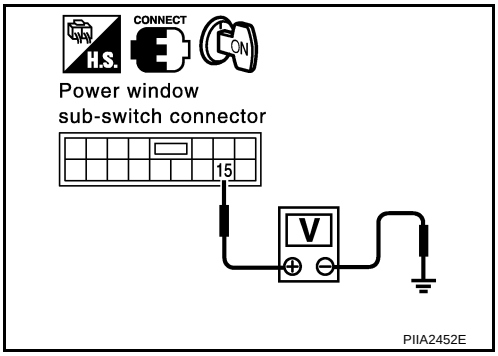
5. CHECK POWER WINDOW SUB-SWITCH OUTPUT SIGNAL

1. Connect power window sub-switch connector.
2. Turn ignition switch ON.
3. Check voltage between power window sub-switch connector D37 terminal 15 and ground.

15 (BR) – Ground : Approx. 5V

OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace power window sub-switch.



Check Encoder Circuit (Driver Side)

NIS00050

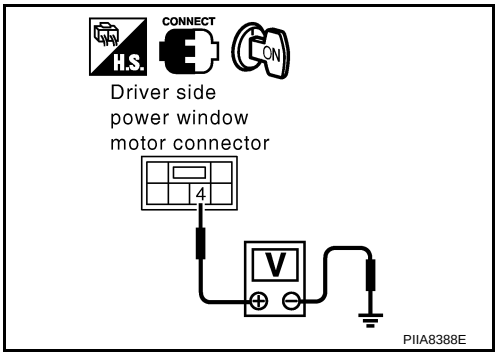
1. CHECK DRIVER SIDE POWER WINDOW MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between driver side power window motor connector D9 terminal 4 and ground.

4 (OR) – Ground : Approx. 10V

OK or NG

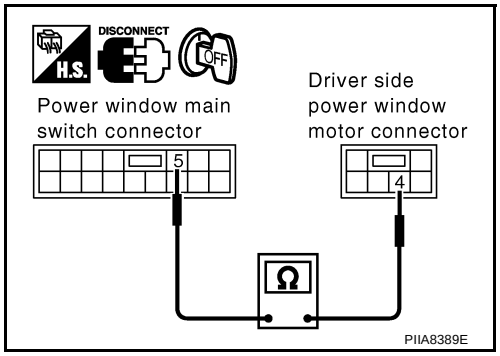
OK >> GO TO 3.
NG >> GO TO 2.



2. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminal 5 and driver side power window motor connector D9 terminal 4.

5 (OR) – 4 (OR) : Continuity should exist.



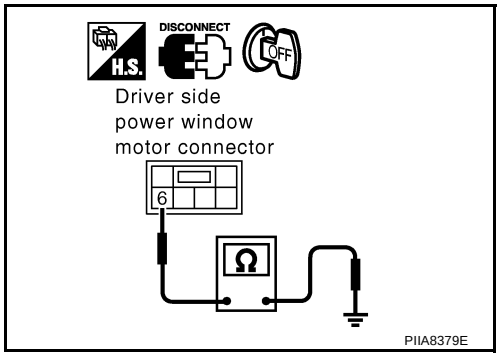
OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.

3. CHECK ENCODER GROUND

1. Turn ignition switch OFF.
2. Disconnect driver side power window motor connector.
3. Check continuity between driver side power window motor connector D9 terminal 6 and ground.

6 (LG) – Ground : Continuity should exist.



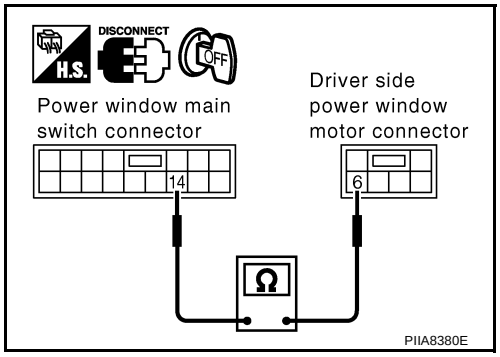
OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK ENCODER GROUND CIRCUIT

1. Disconnect power window main switch connector.
2. Check continuity between power window main switch connector D7 terminal 14 and driver side power window motor connector D9 terminal 6.

14 (LG) – 6 (LG) : Continuity should exist.

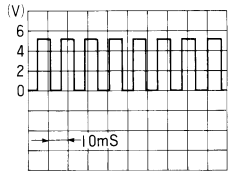


OK or NG

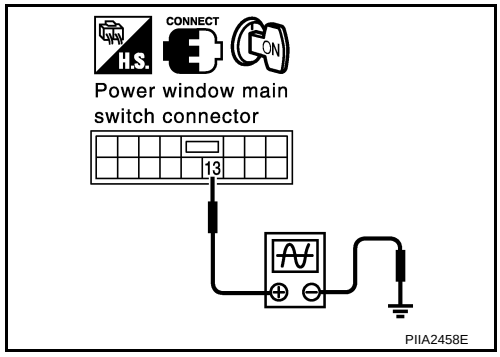
OK >> Replace power window main switch.
NG >> Repair or replace harness.

5. CHECK ENCODER SIGNAL

1. Connect driver side power window motor connector.
2. Turn ignition switch ON.
3. Check signal between power window main switch connector and ground with oscilloscope.

Connector	Terminals (Wire color)		Condition	Signal (Reference valve)
	(+)	(-)		
D7	13 (GY)	Ground	DOWN	

OCC3383D



PIIA2458E

OK or NG

OK >> Replace power window main switch.
NG >> GO TO 6.

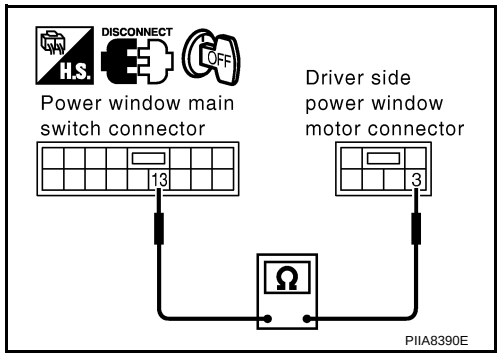
6. CHECK ENCODER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminal 13 and driver side power window motor connector D9 terminal 3.

13 (GY) – 3 (GY) : Continuity should exist.

OK or NG

OK >> Replace driver side power window motor.
NG >> Repair or replace harness.



PIIA8390E

Check Encoder Circuit (Passenger Side)

NIS00051

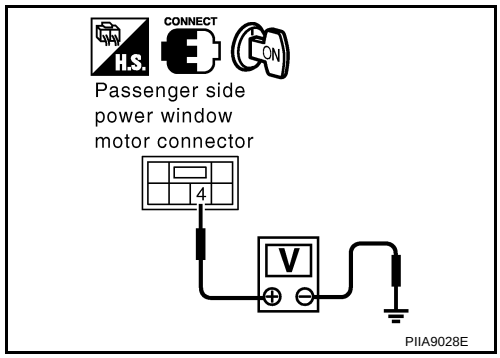
1. CHECK PASSENGER SIDE POWER WINDOW MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between passenger side power window motor connector D38 terminal 4 and ground.

4 (R) – Ground : Approx. 10V

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

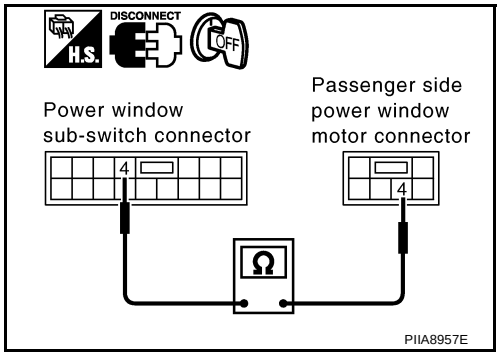


PIIA9028E

2. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminal 4 and passenger side power window motor connector D38 terminal 4.

4 (R) – 4 (R) : Continuity should exist.



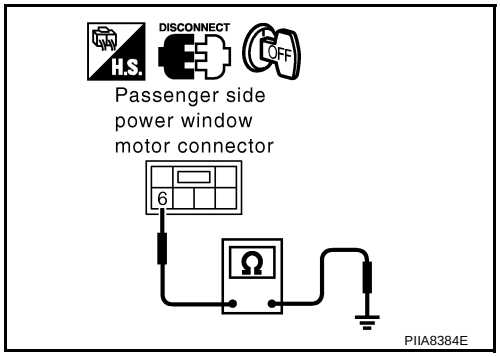
OK or NG

OK >> Replace power window sub-switch.
NG >> Repair or replace harness.

3. CHECK ENCODER GROUND

1. Turn ignition switch OFF.
2. Disconnect passenger side power window motor connector.
3. Check continuity between passenger side power window motor connector D38 terminal 6 and ground.

6 (GY) – Ground : Continuity should exist.



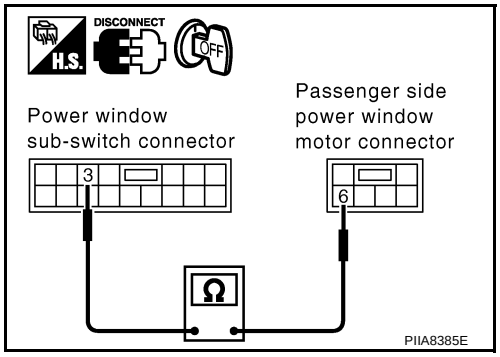
OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK ENCODER GROUND CIRCUIT

1. Disconnect power window sub-switch connector.
2. Check continuity between power window sub-switch connector D37 terminal 3 and passenger side power window motor connector D38 terminal 6.

3 (GY) – 6 (GY) : Continuity should exist.

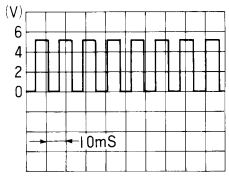


OK or NG

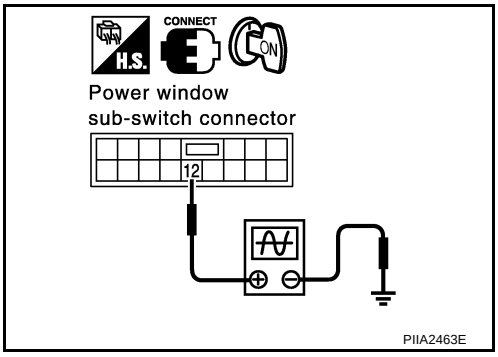
OK >> Replace power window sub switch.
NG >> Repair or replace harness.

5. CHECK ENCODER SIGNAL

1. Connect passenger side power window motor connector.
2. Turn ignition ON.
3. Check signal between power window sub-switch connector and ground with oscilloscope.

Connector	Terminals (Wire color)		Condition	Signal (Reference valve)
	(+)	(-)		
D37	12 (PU)	Ground	DOWN	

OCC3383D



PIIA2463E

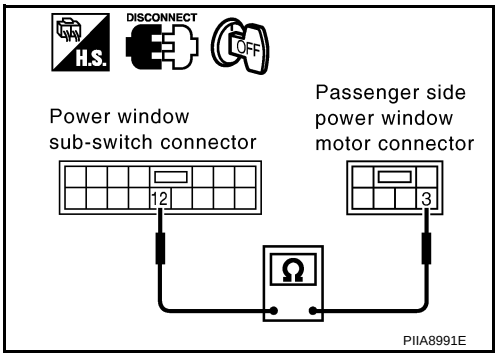
OK or NG

OK >> Replace power window sub-switch.
NG >> GO TO 6.

6. CHECK ENCODER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminal 12 and passenger side power window motor connector D38 terminal 3.

12 (PU) – 3 (PU) : Continuity should exist.



PIIA8991E

OK or NG

OK >> Replace passenger side power window motor.
NG >> Repair or replace harness.

Check Door Switch

NIS00052

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

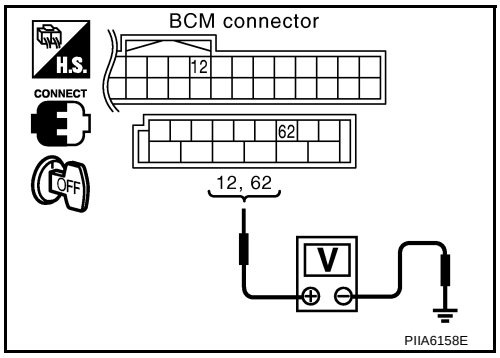
Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

1. Turn ignition switch OFF.
2. Check voltage between BCM connector and ground.

Item	Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
		(+)	(–)		
Passenger side door switch	M90	12 (P)	Ground	OPEN	0
				CLOSE	Battery voltage
Driver side door switch	B83	62 (L)		OPEN	0
				CLOSE	Battery voltage



OK or NG

OK >> Door switch is OK.
NG >> GO TO 2.

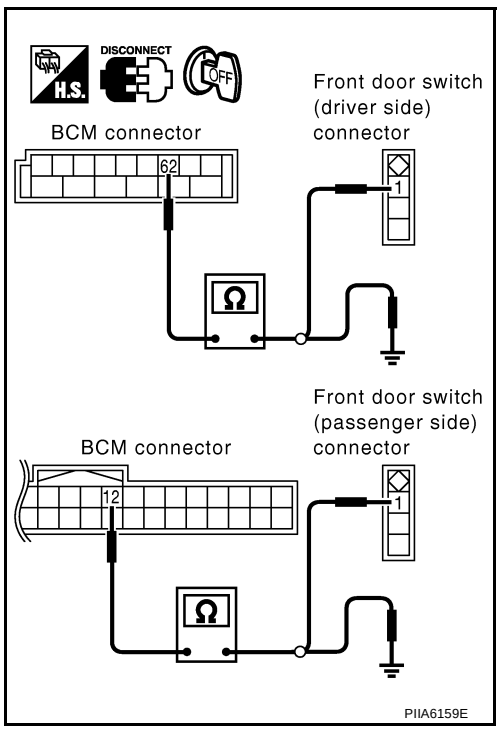
2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between BCM connector M90, B83 terminals 12, 62 and door switch connector B17, B23 terminals 1.

12 (P) – 1 (P) : Continuity should exist.
62 (L) – 1 (L) : Continuity should exist.

4. Check continuity between BCM connector M90, B83 terminals 12, 62 and ground.

12 (P) – Ground : Continuity should not exist.
62 (L) – Ground : Continuity should not exist.



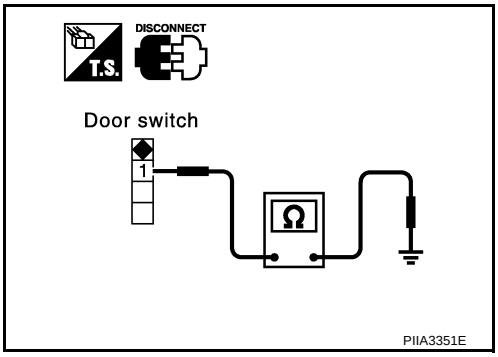
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK DOOR SWITCH

Check continuity between door switch (driver side) or (passenger side) and ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Ground part of door switch	Pushed	No
		Released	Yes



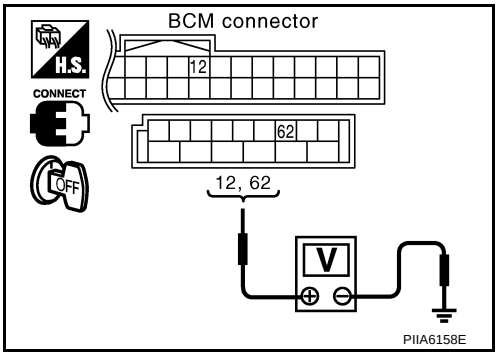
OK or NG

OK >> GO TO 4.
NG >> Replace malfunction door switch.

4. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM connector M90, B83 terminals 12, 62 and ground.

12 (P) – Ground : Battery voltage
62 (L) – Ground : Battery voltage



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Replace BCM.

Check Power Window Serial Link

NIS00053

1. CHECK POWER WINDOW SWITCH OUTPUT SIGNAL

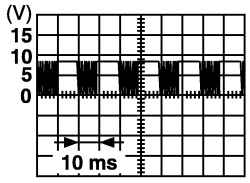
With CONSULT-III

Check door lock and unlock switch (“LOCK SW DR/AS”, “UNLK SW DR/AS”) in DATA MONITOR mode with CONSULT-III. Refer to BL-35, "DATA MONITOR" .

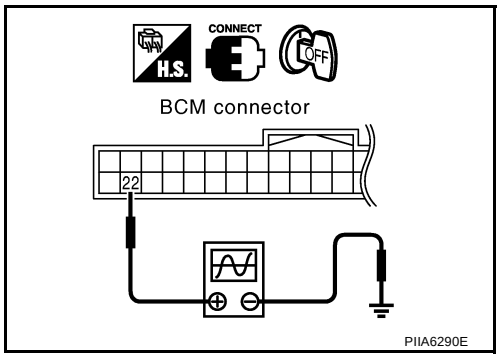
Monitor item	Condition
CDL LOCK SW	LOCK: ON
	UNLOCK: OFF
CDL UNLOCK SW	LOCK: OFF
	UNLOCK: ON

Without CONSULT-III

1. Remove key from ignition switch, and the door of driver side and passenger side is closed.
2. Check signal between BCM connector and ground with oscilloscope when door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.
3. Make sure signals which are shown in the figure below can be detected during 10 second just after door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.

Connector	Terminals (Wire color)		Signal (Reference valve)
	(+)	(–)	
M90	22 (Y)	Ground	

PIIA1297E



PIIA6290E

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK BCM OUTPUT SIGNAL

Check power window serial link (“POWER WINDOW DOWN”) in “ACTIVE TEST” mode with CONSULT-III. Refer to BL-74, "Active Test" .
When “ACTIVE TEST” is perform, is the window of driver side and passenger side lowered?

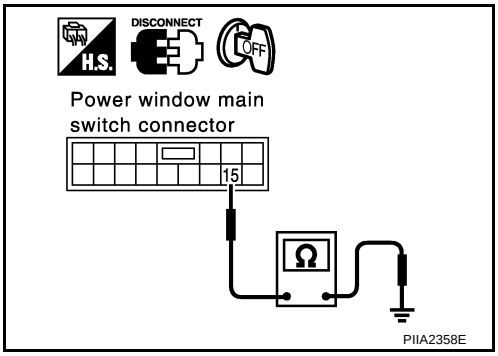
OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace BCM.

3. CHECK POWER WINDOW SWITCH GROUND

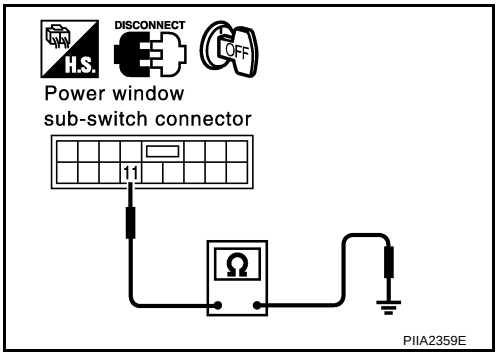
1. Turn ignition switch OFF.
2. Disconnect power window main switch and power window sub-switch connector.
3. Check continuity between power window main switch connector D7 terminals 15 and ground.

15 (B) – Ground : Continuity should exist.



4. Check continuity between power window sub-switch connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



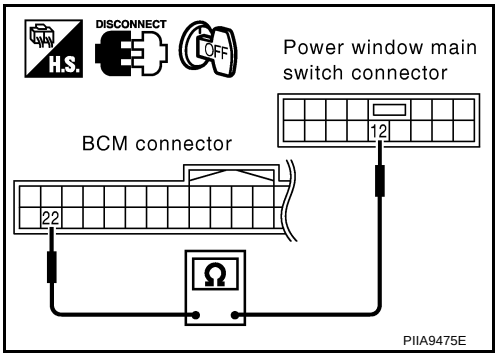
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK POWER WINDOW SERIAL LINK CIRCUIT

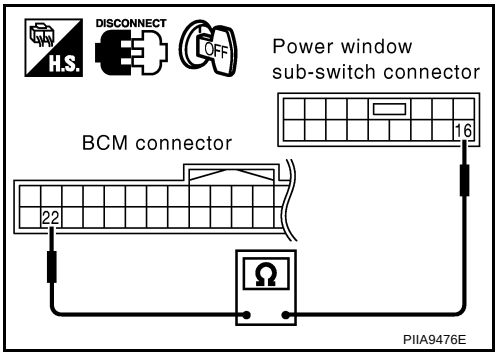
1. Disconnect BCM connector.
2. Check continuity between BCM connector M90 terminal 22 and power window main switch connector D7 terminal 12.

22 (Y) – 12 (PU/W) : Continuity should exist.



3. Check continuity between BCM connector M90 terminal 22 and power window sub-switch connector D37 terminal 16.

22 (Y) – 16 (SB) : Continuity should exist.



OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.

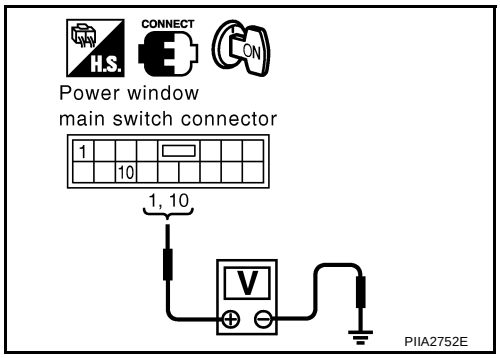
Check Power Window Main Switch Power Supply and Ground Circuit

NIS00054

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between power window main switch connector D7 terminals 1, 10 and ground.

1 (W) – Ground : Battery voltage
10 (BR) – Ground : Battery voltage



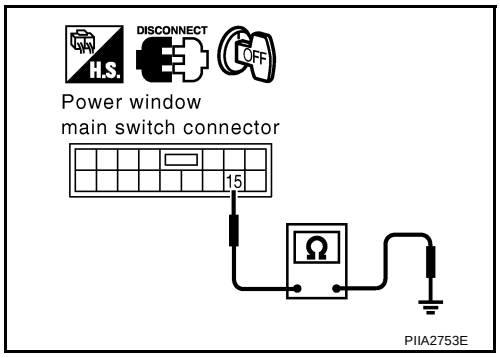
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch connector.
3. Check continuity between power window main switch connector D7 terminal 15 and ground.

15 (B) – Ground : Continuity should exist.



OK or NG

OK >> Power window main switch power supply and ground circuits are OK.
NG >> Repair or replace harness.

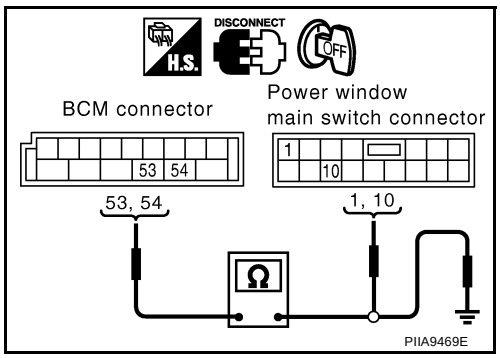
3. CHECK POWER WINDOW MAIN SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and power window main switch connector.
3. Check continuity between BCM connector M91 terminals 53, 54 and power window main switch connector D7 terminal 1, 10.

53 (Y/B) – 10 (BR) : Continuity should exist.
54 (W) – 1 (W) : Continuity should exist.

4. Check continuity between BCM connector M91 terminals 53, 54 and ground.

53 (Y/B) – Ground : Continuity should not exist.
54 (W) – Ground : Continuity should not exist.



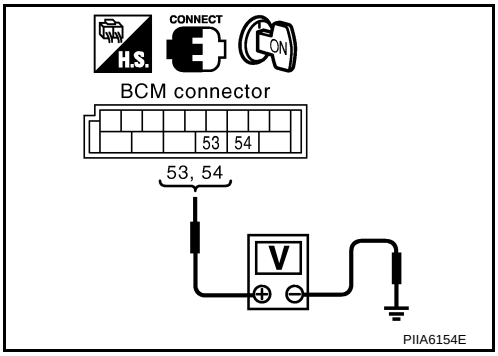
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM connector M91 terminals 53, 54 and ground.

53 (Y/B) – Ground : Battery voltage
54 (W) – Ground : Battery voltage



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace BCM.

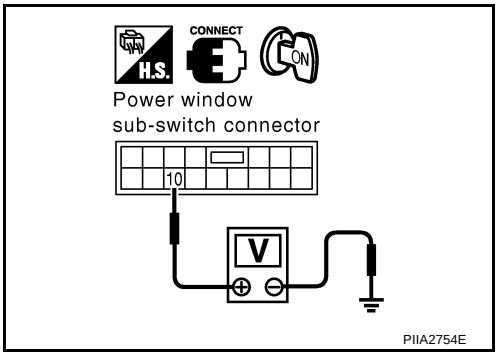
Check Power Window Sub-switch Power Supply and Ground

NIS00055

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between power window sub-switch connector D37 terminal 10 and ground.

10 (W) – Ground : Battery voltage



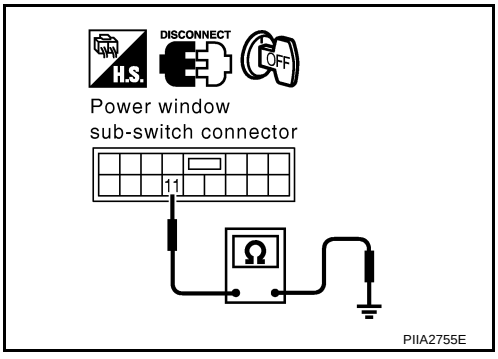
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch connector.
3. Check continuity between power window sub-switch connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



OK or NG

OK >> Power window sub-switch power supply and ground circuit are OK.
NG >> Repair or replace harness.

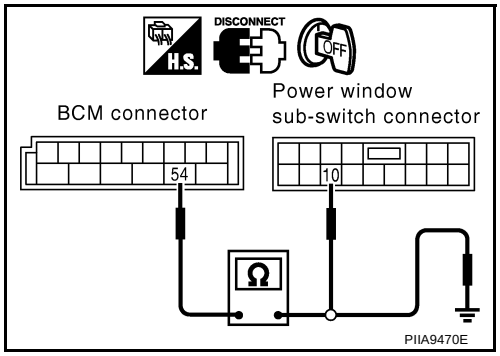
3. CHECK POWER WINDOW SUB-SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and power window sub-switch connector.
3. Check continuity between BCM connector M91 terminal 54 and power window sub-switch connector D37 terminal 10.

54 (W) – 10 (W) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) – Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness.

Check Door Key Cylinder Switch

NIS00056

1. CHECK DOOR KEY CYLINDER SWITCH INPUT SIGNAL

With CONSULT-III

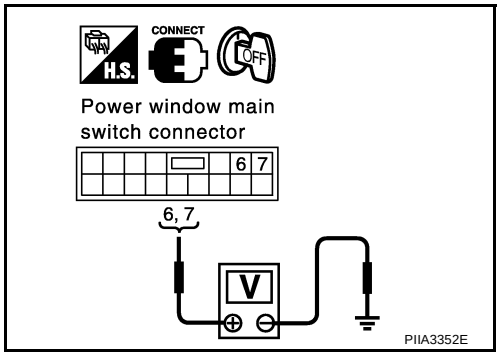
Check door key cylinder switch (“KEY CYL LK-SW”, “KEY CYL UN-SW”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition
KEY CYL LK- SW	Lock: ON
	Neutral/Unlock: OFF
KEY CYL UN- SW	Unlock: ON
	Neutral/Lock: OFF

Without CONSULT-III

1. Turn ignition switch OFF.
2. Check voltage between power window main switch connector and ground.

Connector	Terminals (Wire color)		Key position	Voltage (V) (Approx.)
	(+)	(–)		
D7	6 (B/R)	Ground	Neutral/Unlock	5
			Lock	0
	7 (SB)		Neutral/Lock	5
			Unlock	0



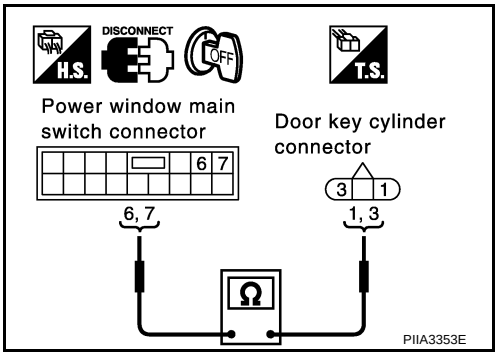
OK or NG

OK >> Door key cylinder switch is OK.
NG >> GO TO 2.

2. CHECK DOOR KEY CYLINDER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch and door key cylinder switch connector.
3. Check continuity between power window main switch connector D7 terminal 6, 7 and door key cylinder switch connector D12 terminals 1, 3.

6 (B/R) – 3 (B/R) : Continuity should exist.
7 (SB) – 1 (SB) : Continuity should exist.



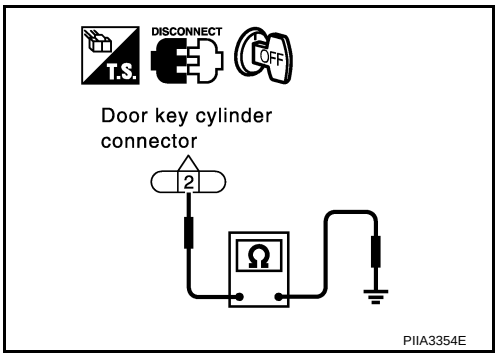
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK DOOR KEY CYLINDER SWITCH GROUND

Check continuity between door key cylinder switch connector D12 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



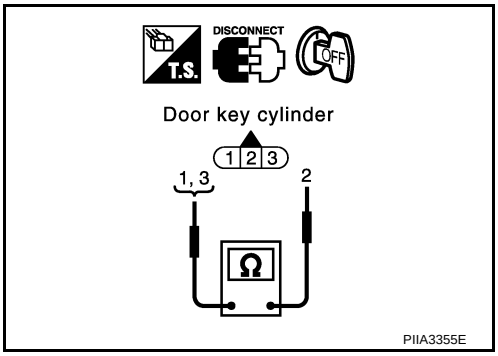
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK DOOR KEY CYLINDER SWITCH

Check continuity between door key cylinder switch connector D12 terminals 1, 3 and 2.

Connector	Terminal		Key position	Continuity
D12	1	2	Neutral/Lock	No
			Unlock	Yes
	3		Neutral/Unlock	No
			Lock	Yes



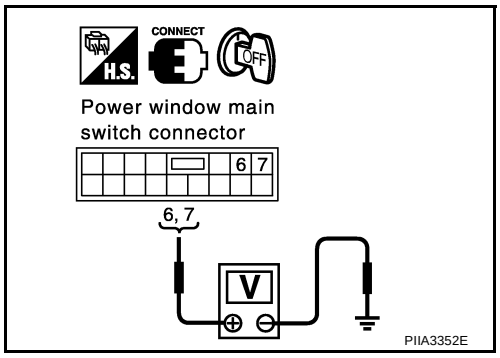
OK or NG

OK >> GO TO 5.
NG >> Replace door key cylinder switch.

5. CHECK POWER WINDOW MAIN SWITCH OUTPUT SIGNAL

1. Connect power window main switch connector.
2. Check voltage between power window main switch connector D7 terminals 6, 7 and ground.

6 (B/R) – Ground : Battery voltage
7 (SB) – Ground : Battery voltage



OK or NG

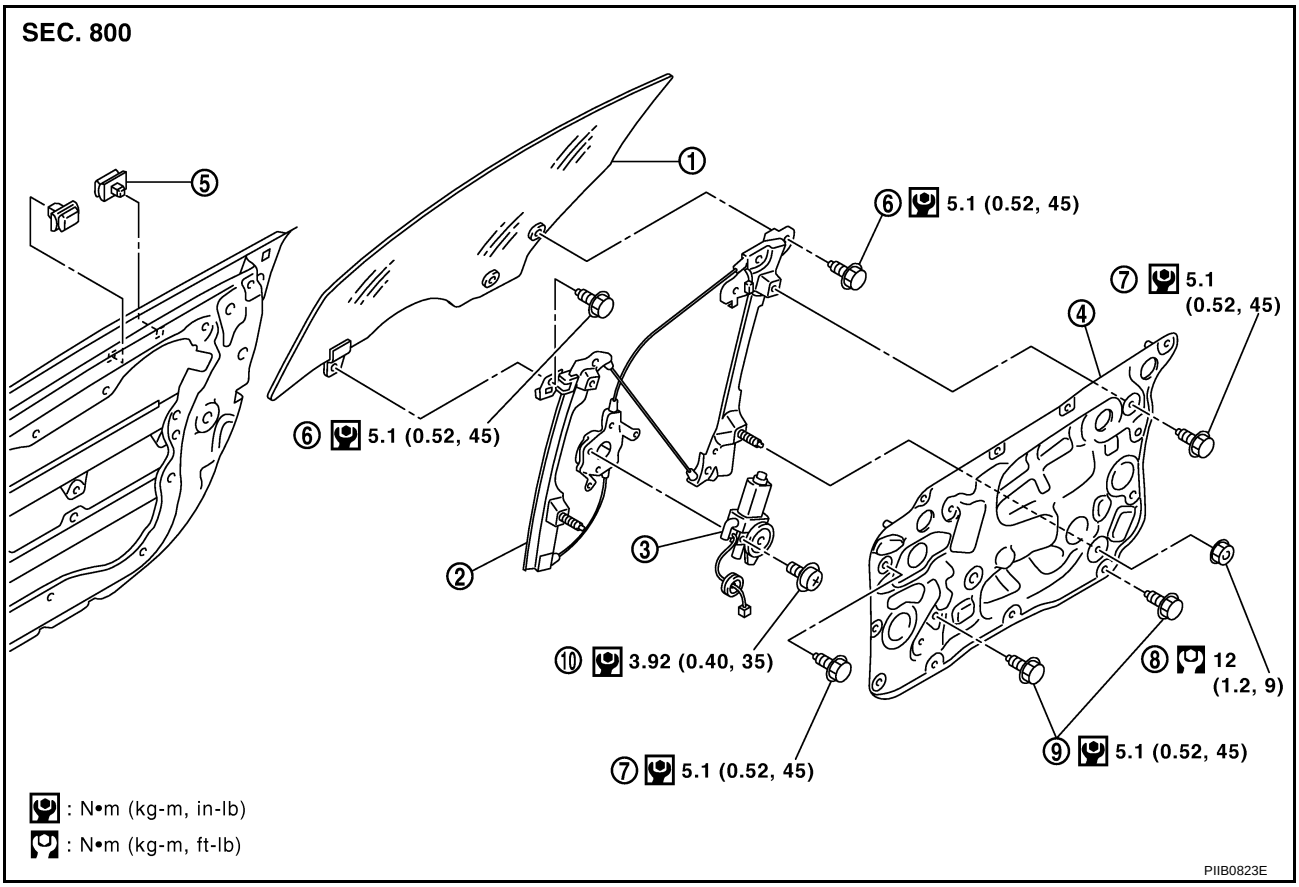
OK >> Check the condition of the harness and the connector.
NG >> Replace power window main switch.

FRONT DOOR GLASS AND REGULATOR

PFP:80300

Removal and Installation

NIS00057

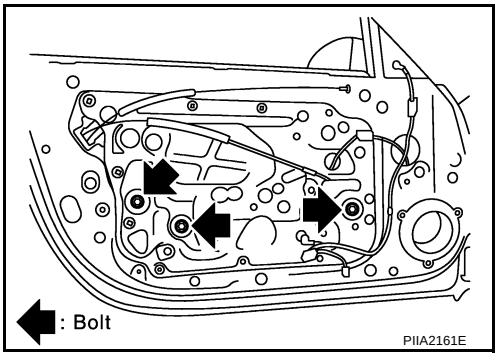


1. Door glass	2. Regulator assembly	3. Power window motor
4. Module assembly	5. Glass stabilizer	6. Glass mounting bolt
7. Regulator mounting bolt	8. Regulator mounting nut	9. Module mounting bolt
10. Power window motor mounting bolt		

DOOR GLASS

Removal

1. Remove front door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Operate power window main switch to raise/lower door window until glass mounting bolts can be seen.
3. Remove the glass mounting bolts.



4. While holding door window, raise it at rear end to pull the glass out of sash toward outside of door.

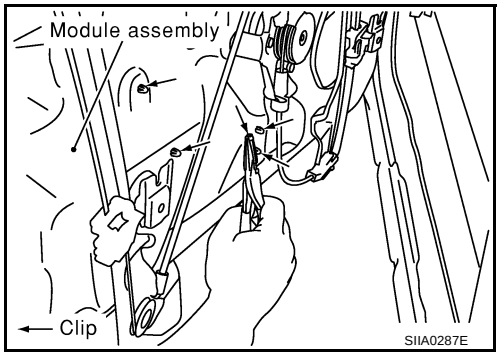
Installation

Install in the reverse order of removal.

REGULATOR ASSEMBLY

Removal

1. Remove front door finisher. Refer to GW-51, "DOOR GLASS" .
2. Remove mounting bolts, and remove module assembly.
3. Disconnect harness connector for the module assembly, and unclip the harness from the back.



Installation

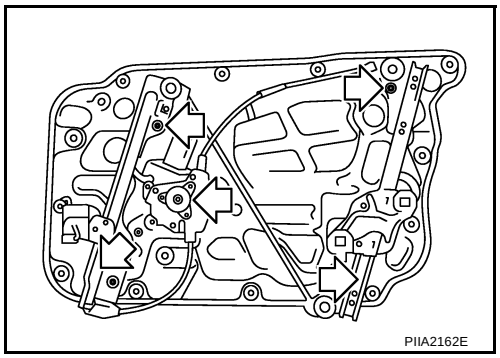
Install in the reverse order of removal.

Inspection after Removal

Check regulator assembly for the following items. If a malfunction is detected, replace or grease it.

- Wire wear
- Regulator deformation
- Grease condition for each sliding part

The arrows in the figure show the application points of body grease.



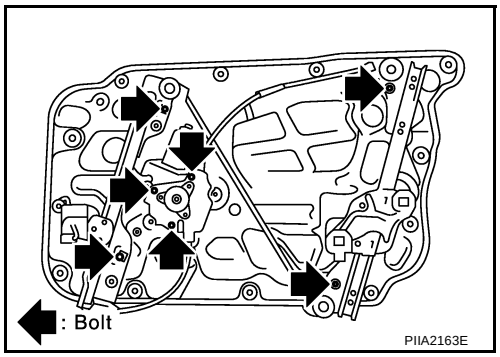
Disassembly and Assembly

NIS00058

REGULATOR ASSEMBLY

Disassembly

Remove power window motor and guide rail from module assembly.



Assembly

Assemble in the reverse order of removal.

Inspection after Installation

NIS00059

SETTING OF LIMIT SWITCH

If any of the following work has been done, set the limit switch (integrated in the motor).

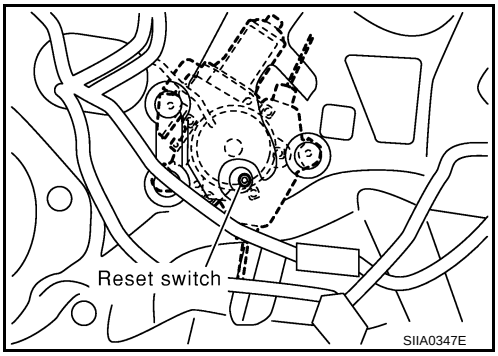
- Removal and installation of regulator.
- Removal and installation of motor from regulator.
- Operate the regulators as a unit.
- Removal and installation of the glass.

Resetting

After installing each component to the vehicle, follow the steps below.

1. With the door open, lift up and hold the power window switch until the door glass is fully closed.
2. Get inside the vehicle and close the door.

   NOTE:
   You need to close the door so the door switch is fully depressed.
3. Press and hold the reset switch. While holding the reset switch, press down and hold the power window switch until the door glass is fully opened.
4. Relese the reset switch.Then, lift up and hold the power window switch until the door glass is fully closed.
5. Open the door to release the door switch. The door glass should partially move down.



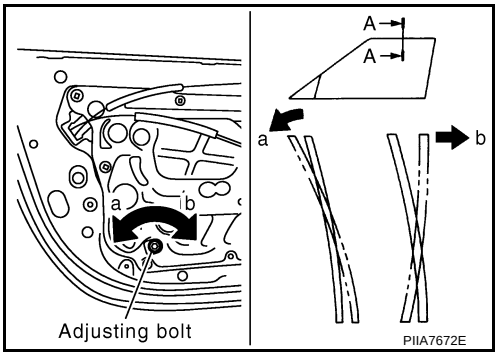
CAUTION:

- **Do not use the window auto function.**
- **Do not release the switch before the window is fully stopped.**

FITTING INSPECTION

- Check that glass is securely fit into glass run groove.
- Lower glass slightly [approx. 10 to 20 mm (0.39 to 0.79 in)] and check the distance between the edge of glass and the body side welt. If the distance is not constant, adjust the glass position by loosening and tightening following bolts.
  - Regulator mounting bolt and nut
  - Glass and guide rail mounting bolt
- Raise the glass fully and adjust the glass top end and body side welt fitting with the adjusting bolt at the lower of the regulator rear rail.

  NOTE:
  - Turn the adjusting bolt clockwise to move the door glass upper end outward.
  - Turn the adjusting bolt counterclockwise to move the door glass upper end inward.
  - If water leaks, repair the fitting (Roadster only). Refer to RF-116, "Repairing Method for Water Leakage Around Doors" .



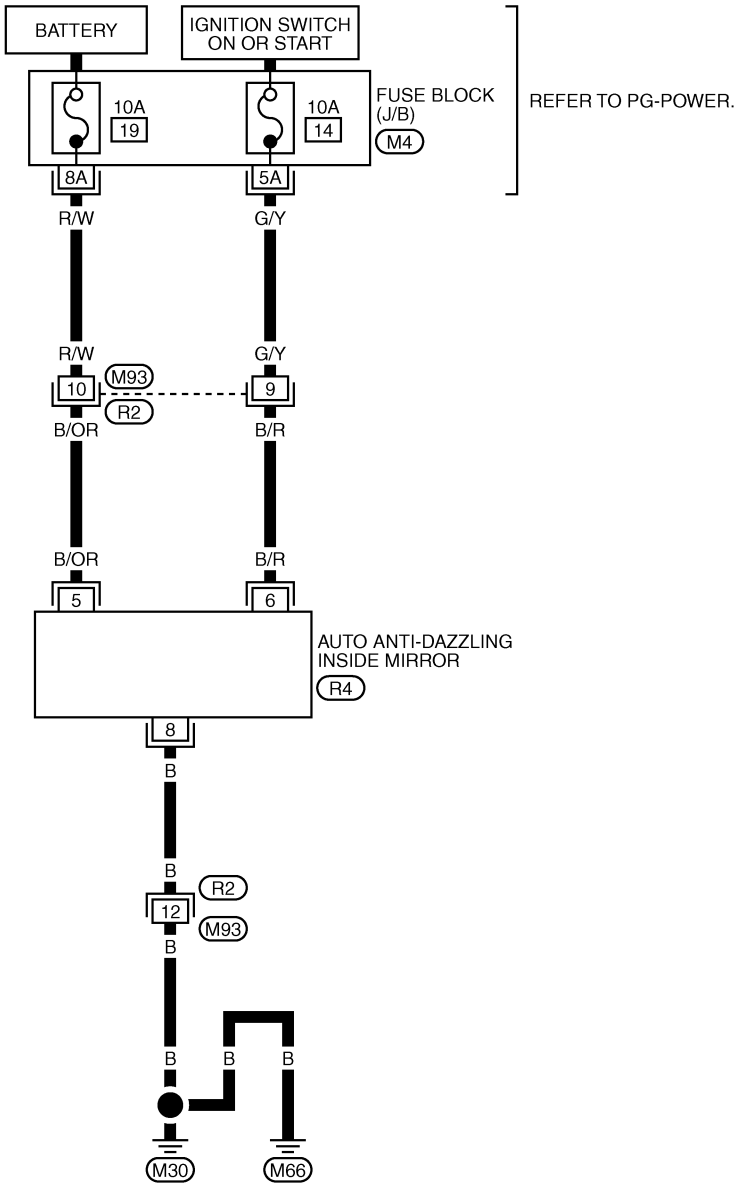
INSIDE MIRROR

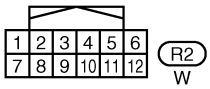
PFP:96321

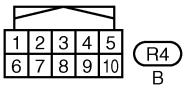
Wiring Diagram –I/MIRR–

NIS0005A

GW-I/MIRR-01





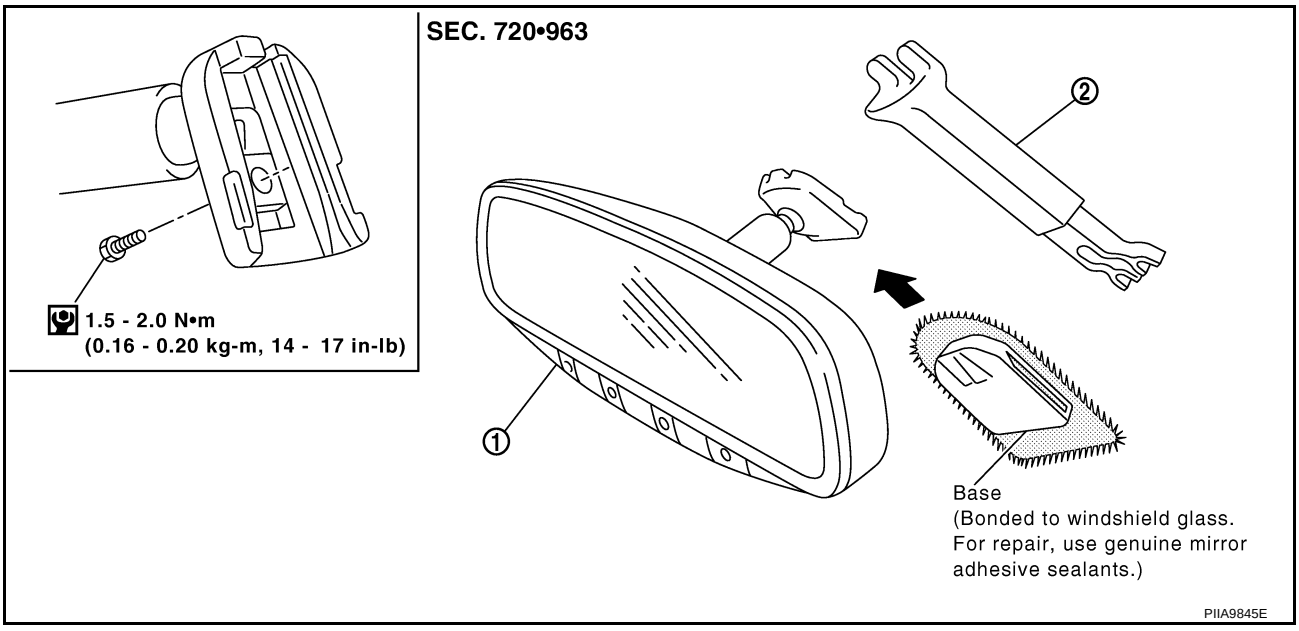


REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT2276E

Removal and Installation

NIS0005B



1. Inside mirror
2. Inside mirror finisher

REMOVAL

1. Remove inside mirror finisher.
2. Remove screw of the mirror base.
3. Slide the mirror base upward to remove.
4. Disconnect the connector.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

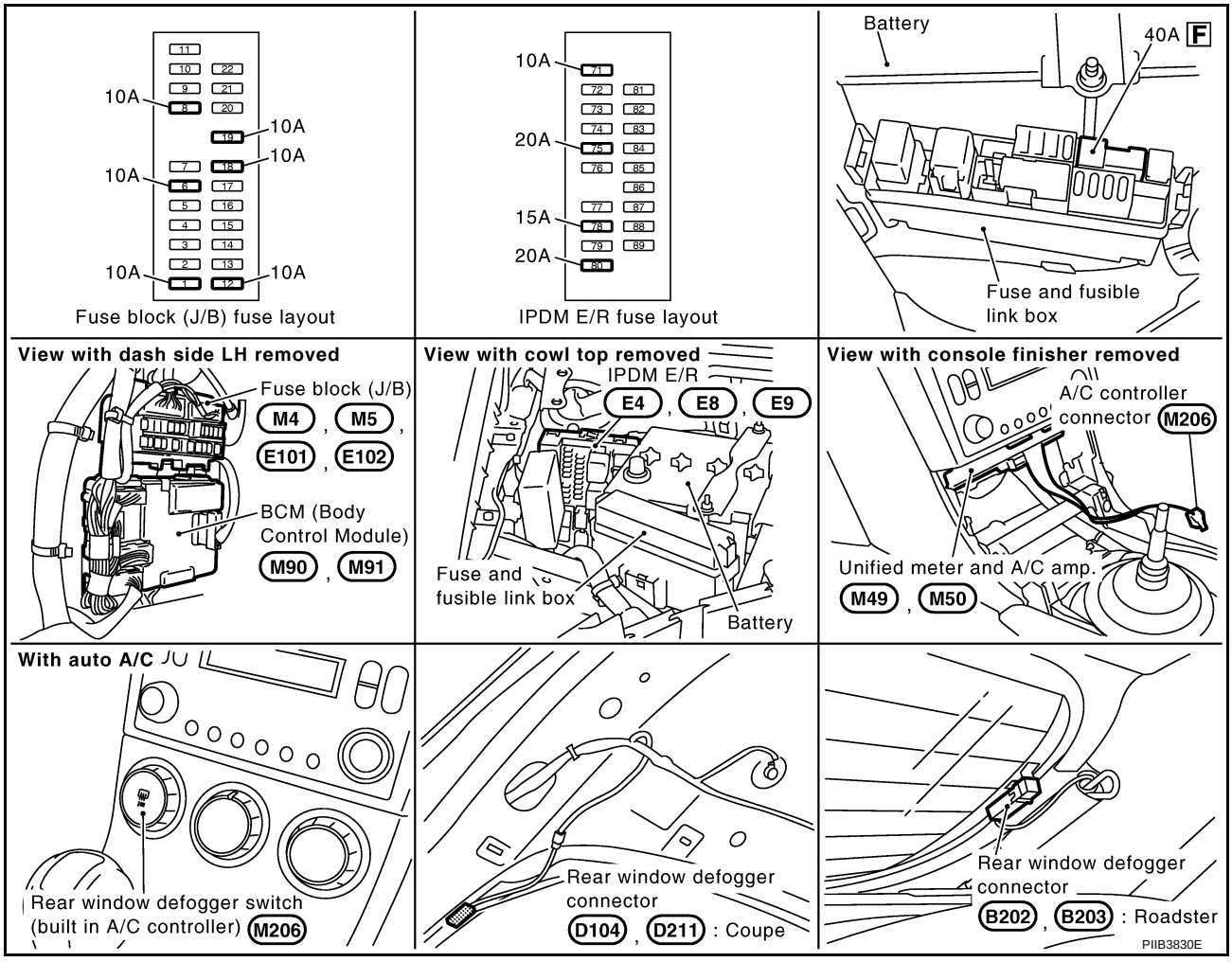
Apply Genuine Mirror Adhesive or equivalent to bonding surface of mounting bracket. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

REAR WINDOW DEFOGGER

PFP:25350

Component Parts and Harness Connector Location

NIS0005C



System Description

NIS0005D

The rear window defogger system is controlled by BCM (Body Control Module) and IPDM E/R (Intelligent Power Distribution Module Engine Room). The rear window defogger operates only for approximately 15 minutes.

Power is supplied at all times

- through 20A fuse [No. 75 and 80, located in the IPDM E/R]
- to rear window defogger relay terminal 3 and 6.
- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55.
- through 10A fuse [No. 18, located in the fuse block (J/B)]
- to BCM terminal 42.
- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 21.

With the ignition switch turned to ON or START position, power is supplied

- through 10A fuse [No. 1, located in the fuse block (J/B)]
- to BCM terminal 38.
- through 10A fuse [No. 12, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 22 and rear window defogger relay terminal 1
- and then through unified meter and A/C amp.
- to A/C controller (rear window defogger switch) terminal 72 and 84.

Ground is supplied

- to BCM terminal 52
- through body grounds M30, and M66.
- to unified meter and A/C amp. terminal 29 and 30
- through body grounds M30 and M66.
- to internal CPU of IPDM E/R terminal 38 and 60
- through body grounds E17, E43, B102 (with VDC system or navigation system) and F152 (without VDC system and navigation system).

When A/C controller (rear window defogger switch) is turned ON,
Rear window defogger switch signals are transmitted,

- through A/C controller terminal 87
- to unified meter and A/C amp.

Then ground is supplied

- to BCM terminal 9
- through unified meter and A/C amp. terminal 38
- through unified meter and A/C amp. terminal 30
- through body grounds M30 and M66.

Then BCM recognizes that rear window defogger switch is turned ON.
Then it sends rear window defogger switch signals to IPDM E/R via DATA LINE (CAN H, CAN L).
When IPDM E/R receives rear window defogger switch signals,
Ground is supplied

- to rear window defogger relay terminal 2
- through IPDM E/R terminal 52
- through internal CPU of IPDM E/R
- through IPDM E/R terminal 60
- through body grounds E17, E43, B102 (with VDC system or navigation system), F152 (without VDC system and navigation system), and then rear window defogger relay is energized.

When rear window defogger relay is turned ON,
Signals are transmitted

- to rear window defogger terminal 1
- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 5. (For Roadster)

Rear window defogger terminal 2 is grounded through body ground D212. (For Coupe)
Rear window defogger terminal 2 is grounded through body ground B5, B6 and T14. (For Roadster)
With power and ground supplied, rear window defogger filaments heat and defog the rear window.
When rear window defogger relay is turned ON,
Power is supplied

- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 7 (For Roadster)
- through fuse block (J/B) terminal 2C
- through 10A fuse [No. 8, located in the fuse block (J/B)]
- through fuse block (J/B) terminal 5B
- to door mirror defogger (Driver side and passenger side) terminal 2.

Door mirror defogger (Driver side and passenger side) terminal 1 is grounded through body grounds M30 and M66.
With power and ground supplied, door mirror defogger filaments heat and defog the mirror.
When rear window defogger relay is turned ON,
Power is supplied

- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 5. (For Roadster)
- to unified meter and A/C amp. terminal 56

Then ground is supplied

- to A/C controller terminal 78
- through unified meter and A/C amp.
- through unified meter and A/C amp. terminal 29 and 30
- through body grounds M30 and M66.

This energizes rear window defogger indicator.

CAN Communication System Description

NIS0005E

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

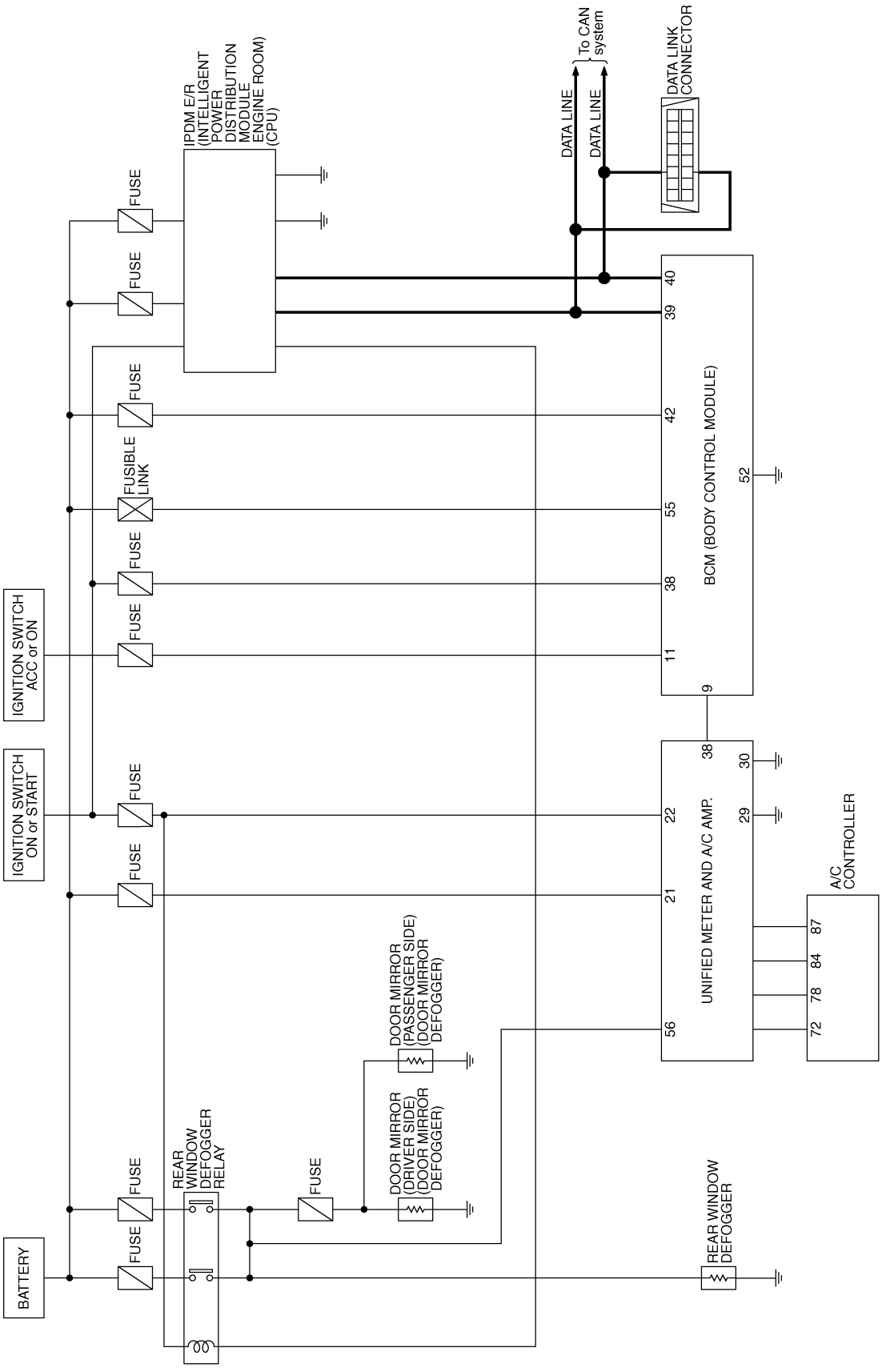
CAN Communication Unit

NIS0005F

Refer to LAN-48, "CAN System Specification Chart" .

Schematic– DEF – / For Coupe

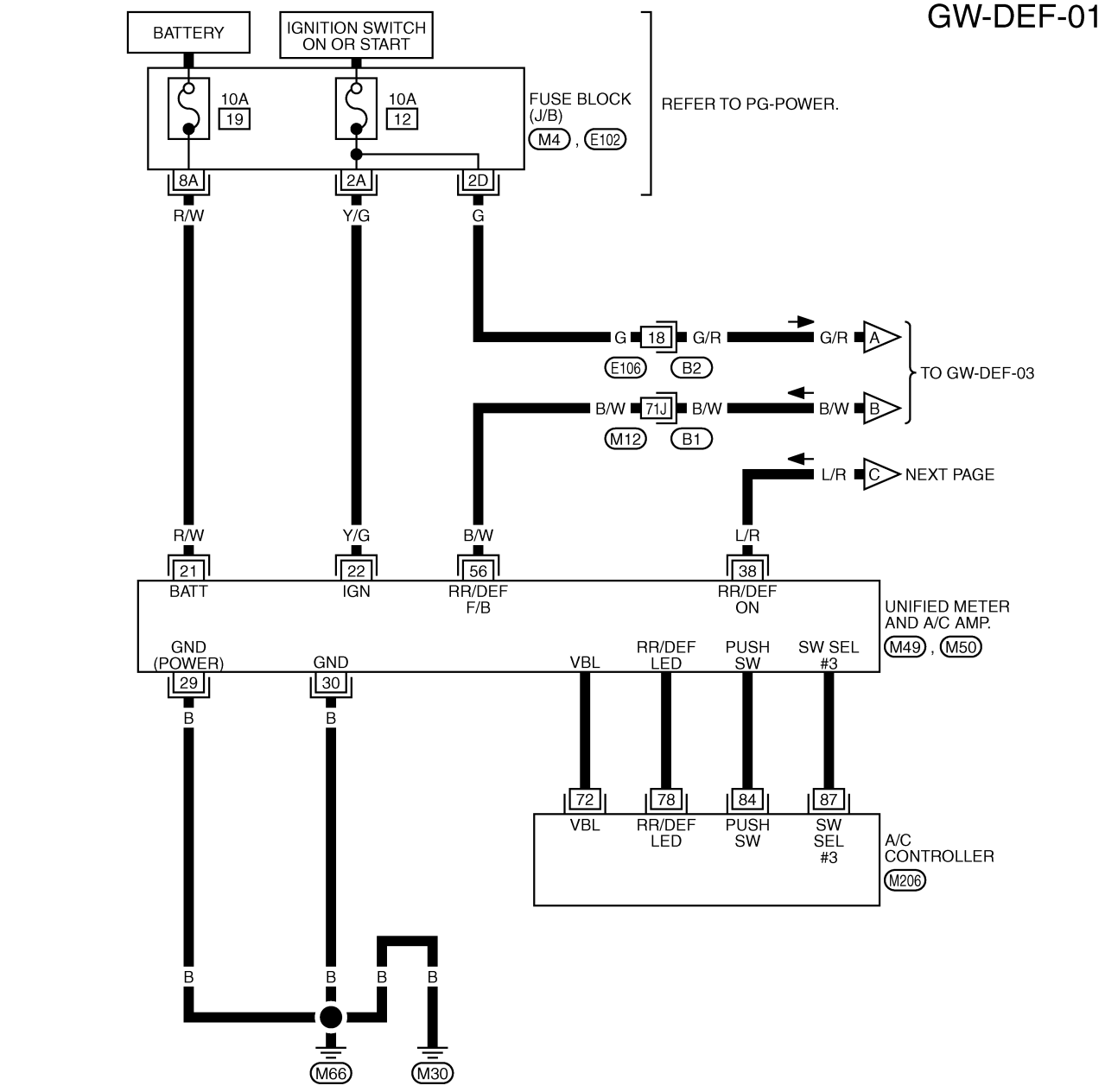
NIS0005G

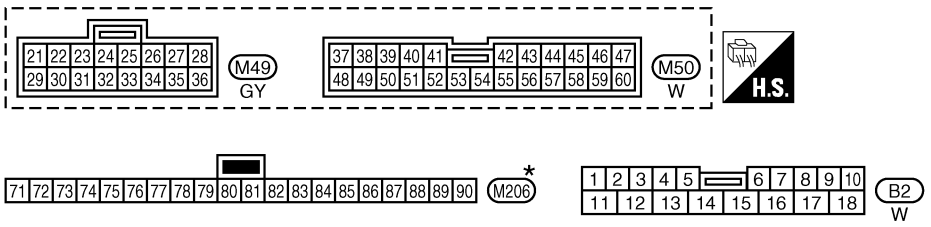


TIWT0972E

Wiring Diagram –DEF– / For Coupe

NIS0005H



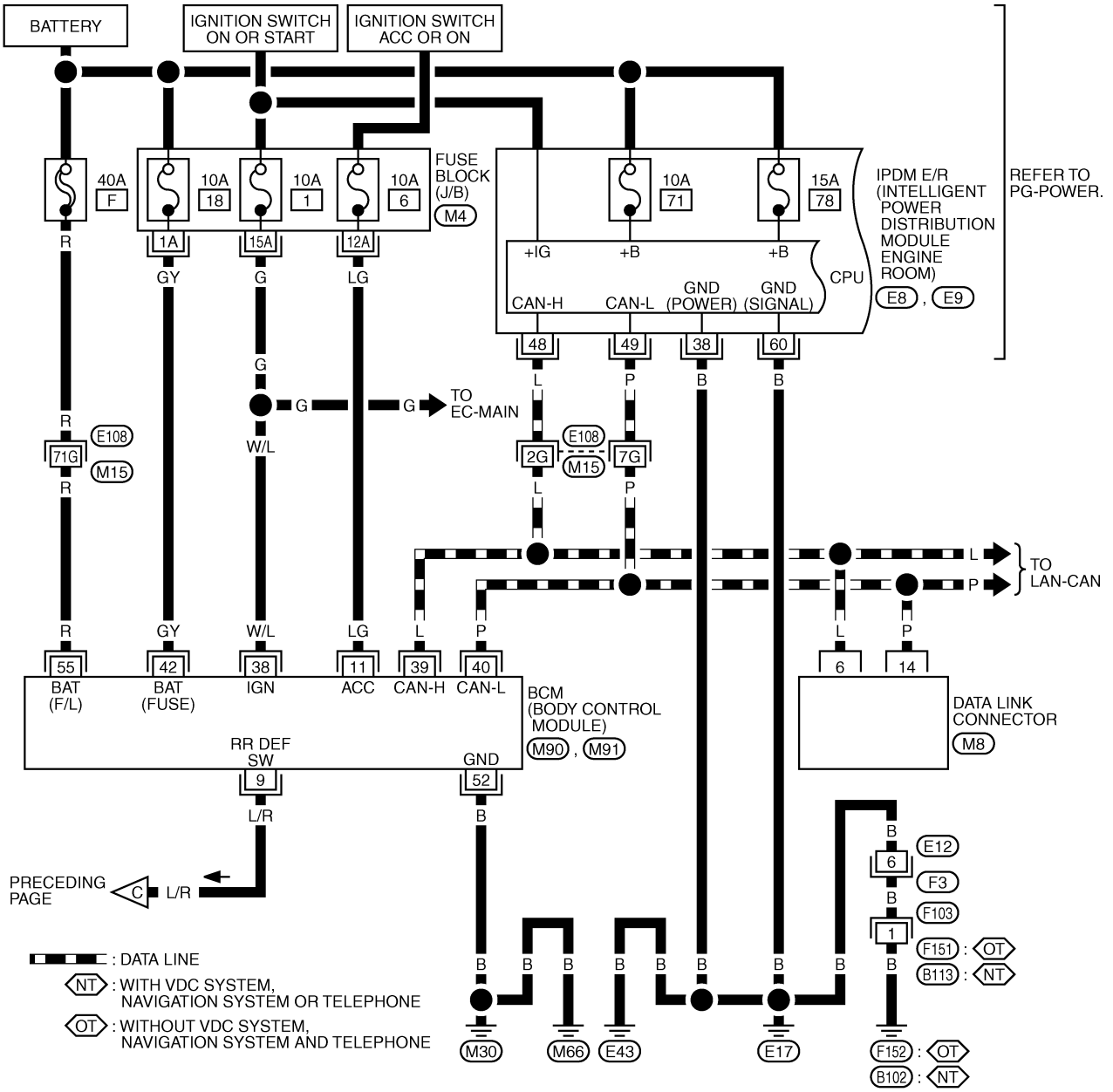


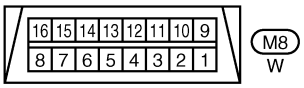
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

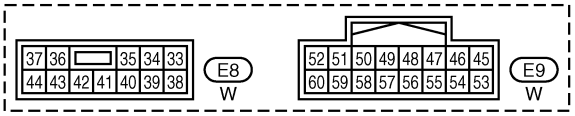
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

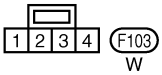
TIWT1595E

GW-DEF-02



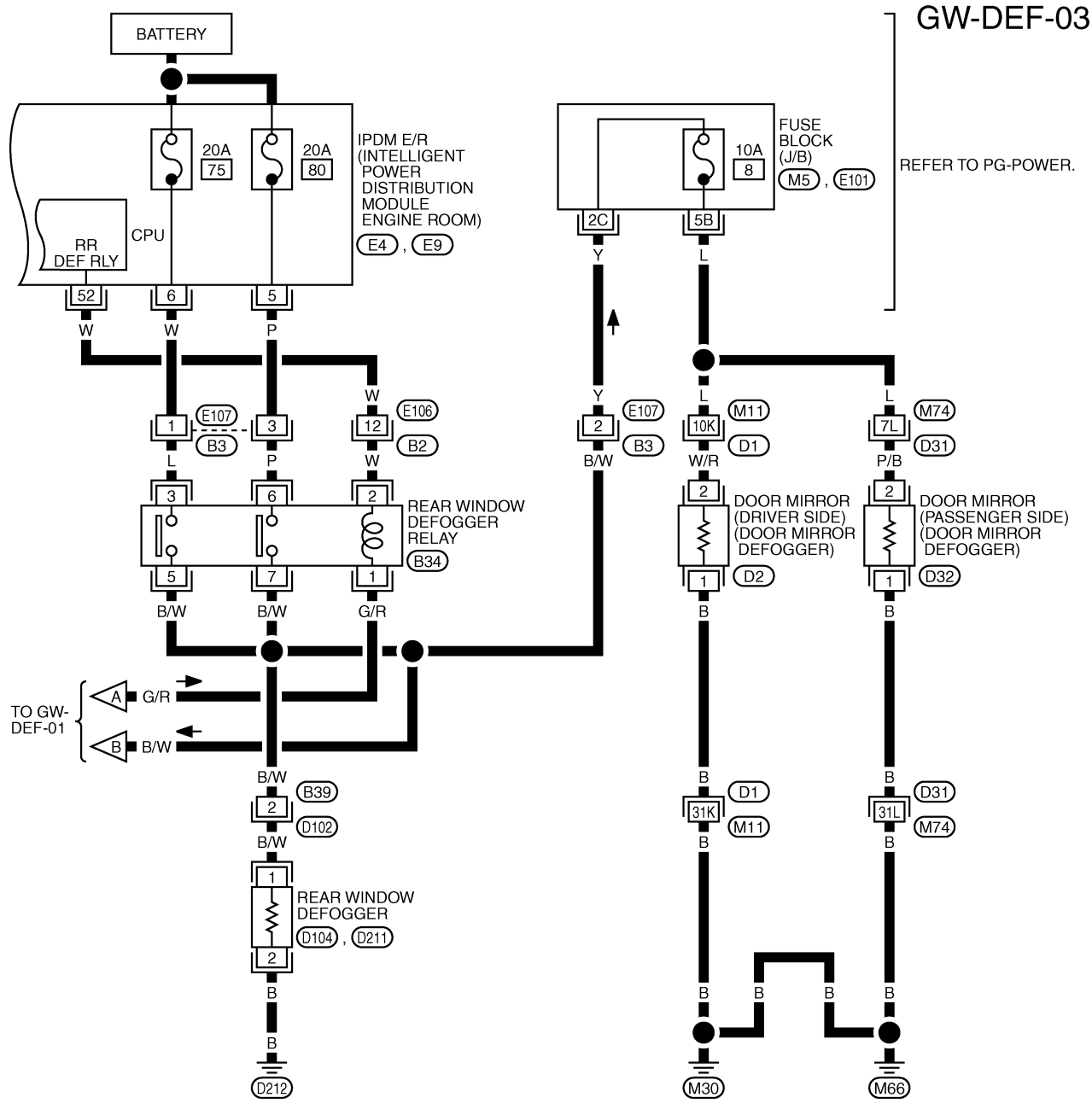






REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91 -ELECTRICAL UNITS

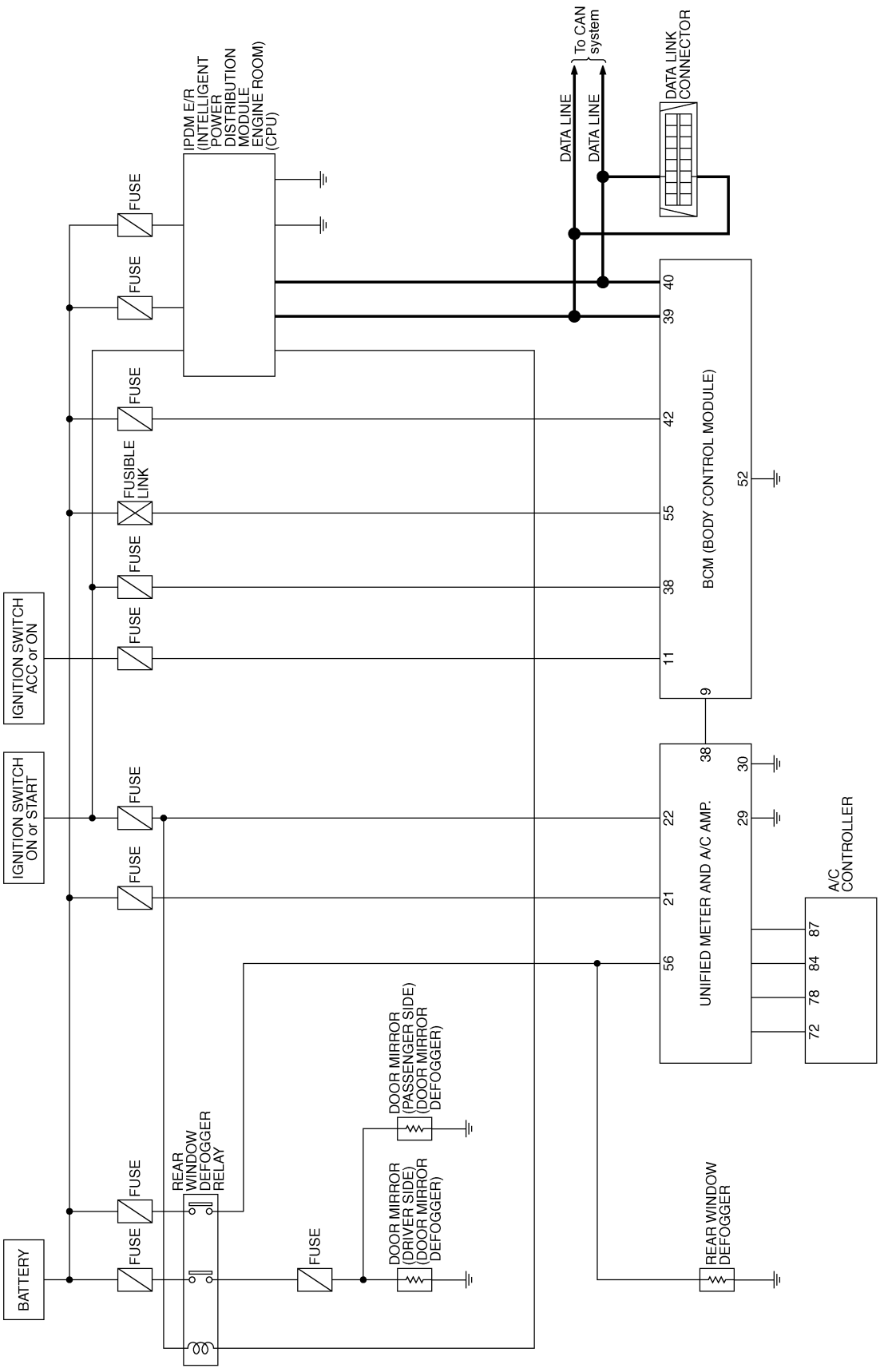
TIWT2277E


GW-DEF-03
BATTERY
20A 75
20A 80
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E4 , E9
RR DEF RLY
CPU
52
6
5
W
W
P
FUSE BLOCK (J/B)
M5 , E101
10A 8
2C
5B
Y
L
REFER TO PG-POWER.
E107
B3
E106
B2
M11
D1
M74
D31
REAR WINDOW DEFOGGER RELAY
B34
DOOR MIRROR (DRIVER SIDE) (DOOR MIRROR DEFOGGER)
D2
DOOR MIRROR (PASSENGER SIDE) (DOOR MIRROR DEFOGGER)
D32
B/W
G/R
W/R
P/B
B
TO GW-DEF-01
A G/R
B B/W
B39
D102
31K
31L
REAR WINDOW DEFOGGER
D104 , D211
D212
M30
M66
H.S.
E4
E9
B2
B3
B34
D2 , D32
D102
D104
D211
REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M5 , E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT1597E

Schematic – DEF – / For Roadster

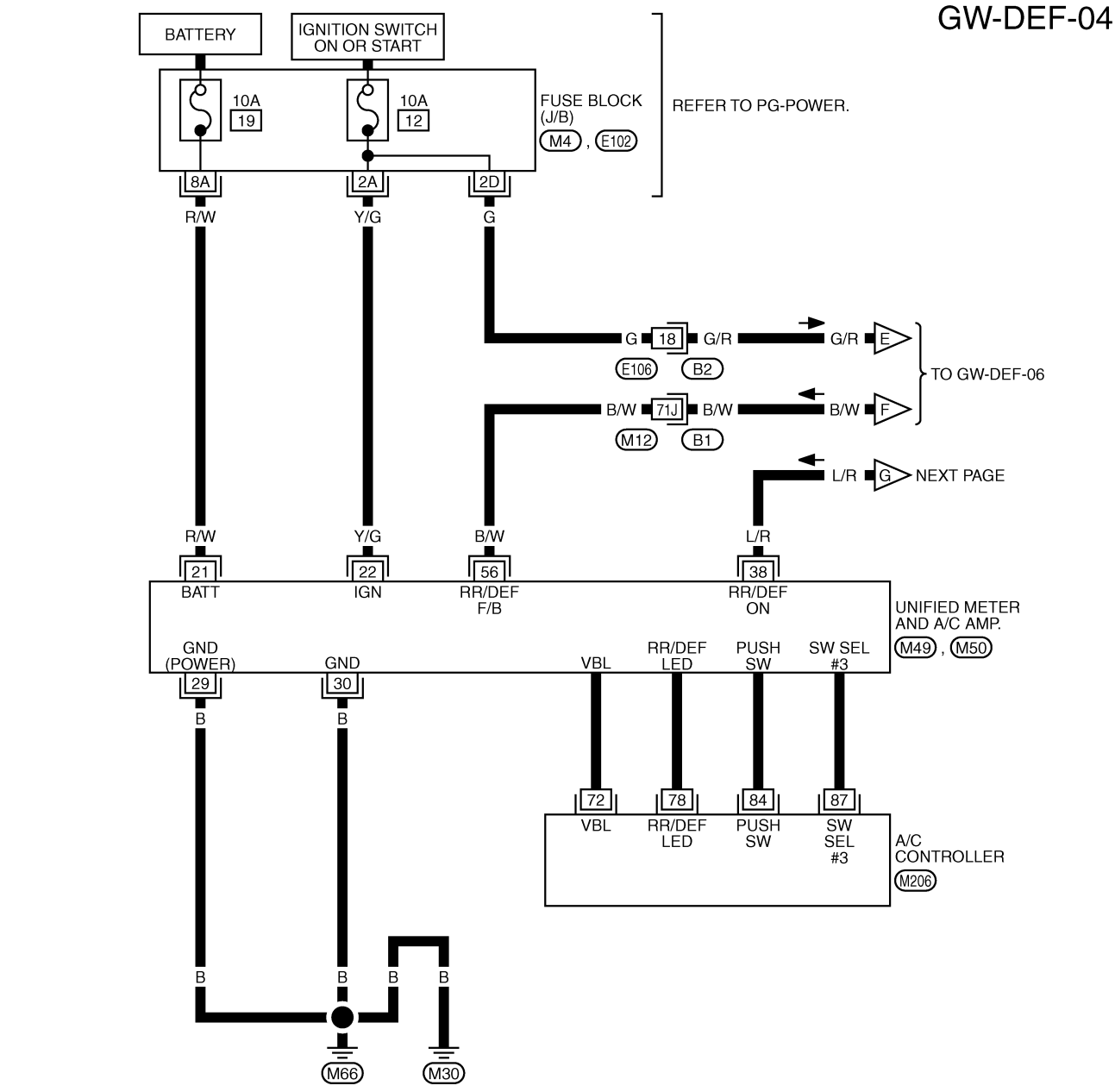
NIS0005I

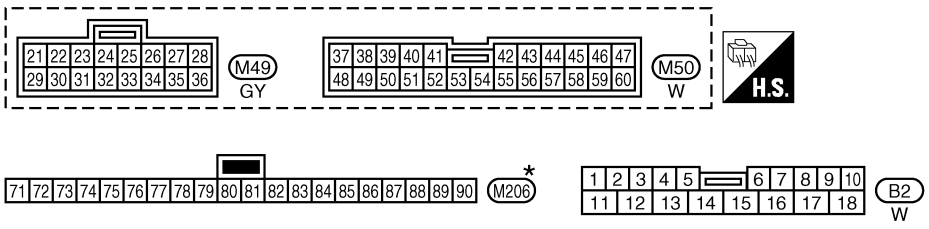


TIWT0975E

Wiring Diagram –DEF– / For Roadster

NIS0005J



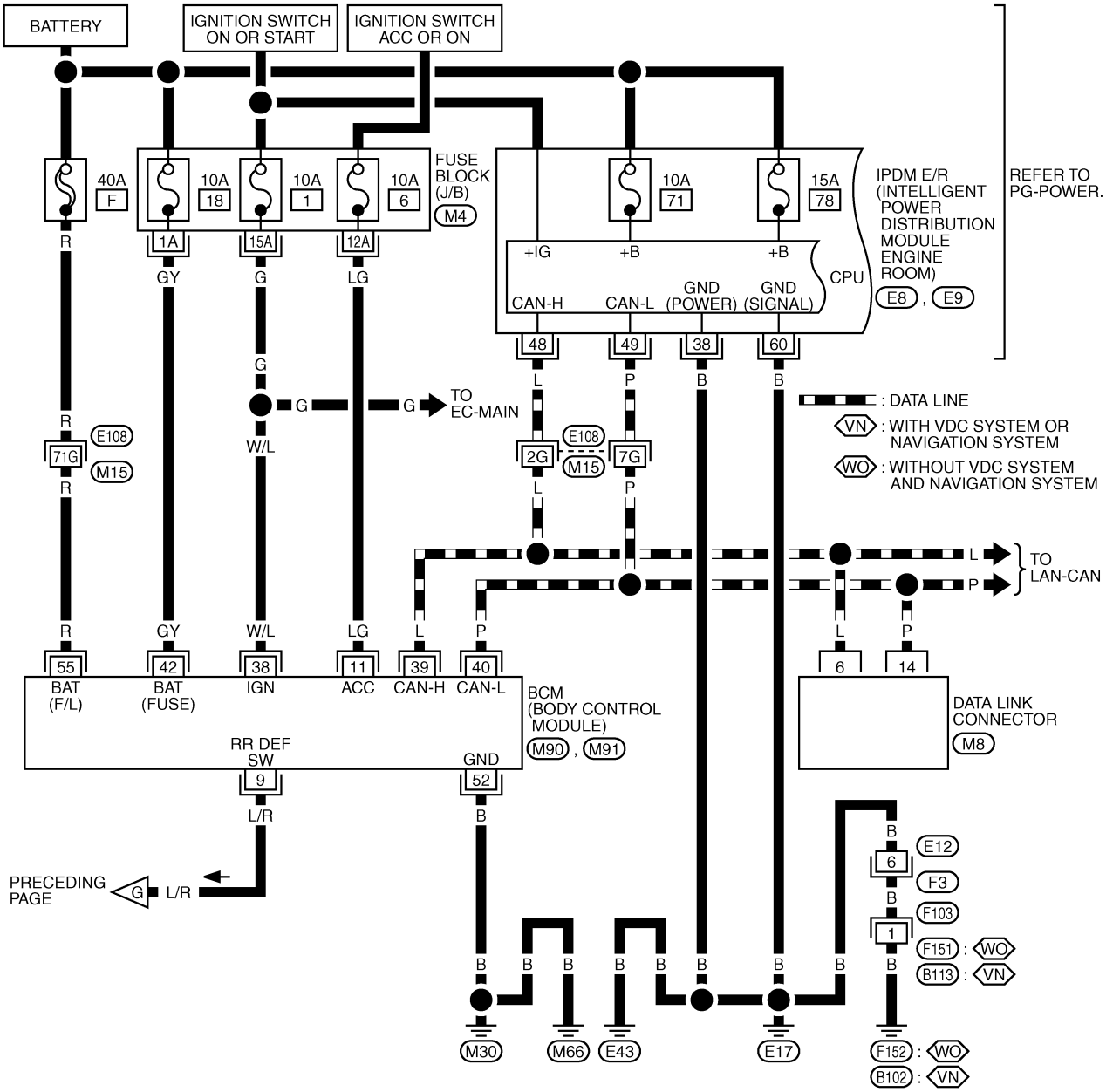


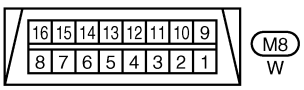
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

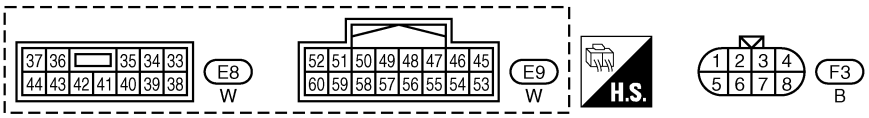
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

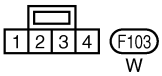
TIWT1598E

GW-DEF-05









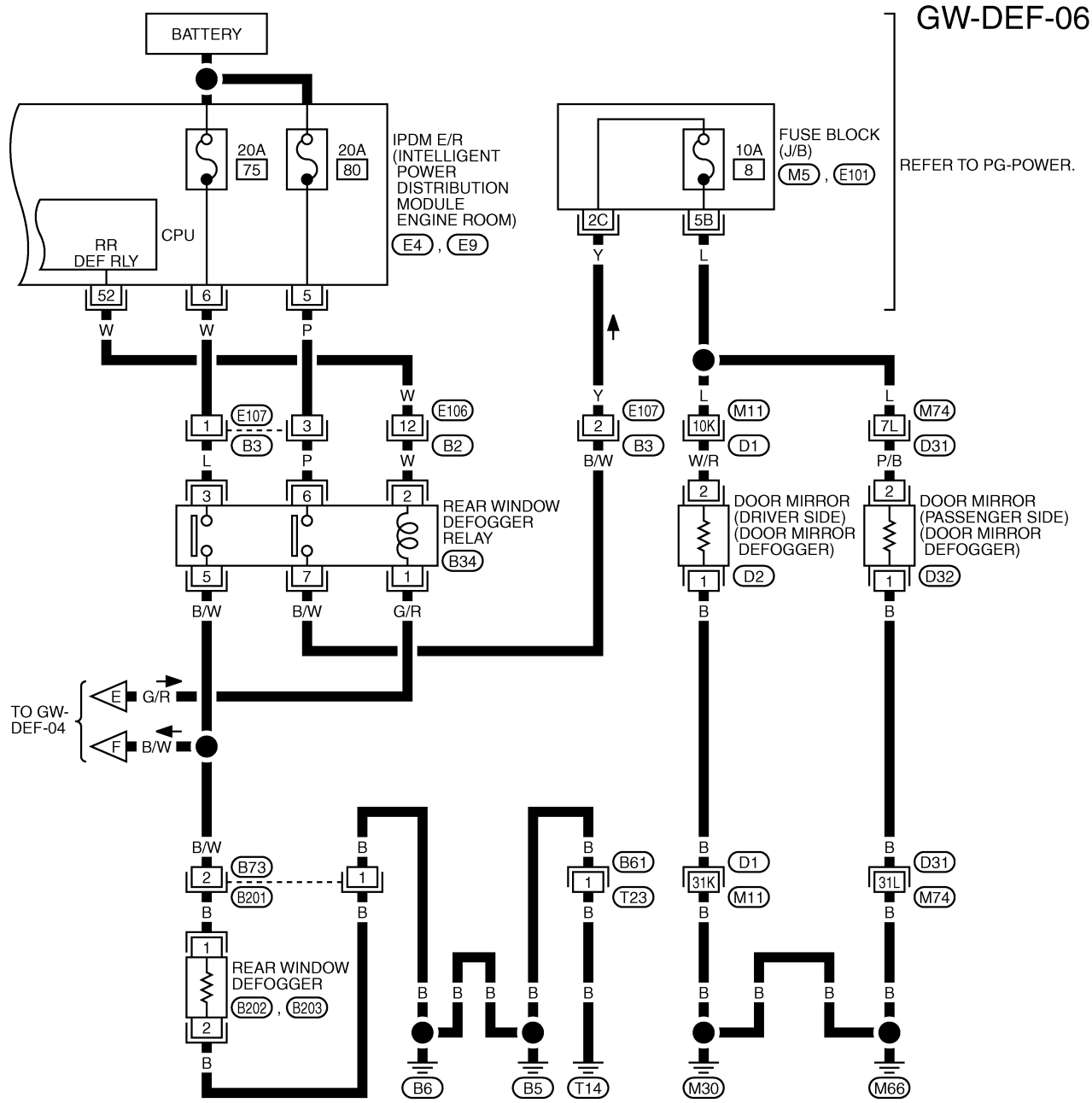
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TIWT2278E


GW-DEF-06
BATTERY
20A 75
20A 80
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E4 , E9
CPU
RR DEF RLY
52
6
5
W
W
P
10A 8
FUSE BLOCK (J/B)
M5 , E101
REFER TO PG-POWER.
2C
5B
Y
L
E107
B3
E106
B2
M11
D1
M74
D31
REAR WINDOW DEFOGGER RELAY
B34
DOOR MIRROR (DRIVER SIDE) (DOOR MIRROR DEFOGGER)
D2
DOOR MIRROR (PASSENGER SIDE) (DOOR MIRROR DEFOGGER)
D32
B/W
B/W
G/R
W/R
P/B
B
TO GW-DEF-04
E G/R
F B/W
B73
B201
B61
T23
D1
M11
D31
M74
REAR WINDOW DEFOGGER
B202 , B203
B6
B5
T14
M30
M66
E4
W
E9
W
H.S.
B2
W
B3
W
B34
BR
B61
W
B201
B
B202
B
B203
B
D2 , D32
W W
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.
REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M5 , E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT1600E

Terminal and Reference Value for BCM

NIS0005K

Terminal	Wire Color	Item	Signal input/output	Condition		Voltage (V) (Approx.)
9	L/R	Rear window defogger switch signal	Output	Rear window defogger switch	: Pressed	0
					: OFF	5
11	LG	Ignition switch ACC power supply (ACC or ON)	Input	Ignition switch (ACC or ON position)		Battery voltage
38	W/L	Ignition switch ON power supply (ON or START)	Input	Ignition switch (ON or START position)		Battery voltage
39	L	CAN-H	Input/Output	—		—
40	P	CAN-L	Input/Output	—		—
42	GY	Power source (Fuse)	Input	—		Battery voltage
52	B	Ground	—	—		0
55	R	Power source (Fusible link)	Input	—		Battery voltage

Terminal and Reference Value for IPDM E/R.

NIS0005L

Terminal	Wire Color	Item	Signal input/output	Condition		Voltage (V) (Approx.)
5	P	Battery power supply	Output	—		Battery voltage
6	W	Battery power supply	Output	—		Battery voltage
38	B	Ground (Power)	—	—		0
48	L	CAN-H	Input/Output	—		—
49	P	CAN-L	Input/Output	—		—
52	W	Rear window defogger relay control signal	Input	Rear window defogger switch	: ON	0
					: OFF	Battery voltage
60	B	Ground (Signal)	—	—		0

Terminal and Reference Value for Unified Meter and A/C Amp.

NIS0005M

Terminal	Wire Color	Item	Signal input/output	Condition		Voltage (V) (Approx.)
21	R/W	Power source (Fuse)	Input	—		Battery voltage
22	Y/G	Ignition switch ON power supply (ON or START)	Input	Ignition switch (ON or START position)		Battery voltage
29	B	Ground (Power)	—	—		0
30	B	Ground	—	—		0
38	L/R	Rear window defogger switch signal	Input	Rear window defogger switch.	: Pressed	0
					: OFF	5
56	B/W	Rear window defogger ON signal	Input	Rear window defogger switch	: ON	Battery voltage
					: OFF	0
72	—	Indicator power supply	Input	Ignition switch (ON or START position)		5
78	—	Rear window defogger indicator signal	Input	Rear window defogger switch	: ON	0
					: OFF	5

Ter-minal	Wire Color	Item	Signal input/out-put	Condition		Voltage (V) (Approx.)
84	—	A/C control push switch power supply	Input	Ignition switch (ON or START position)		5
87	—	Rear window defogger switch ON signal	Input	Rear window defogger switch	: ON	0
					: OFF	5

CONSULT-III Function (BCM)

NIS0005N

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnostic test item	Check item diagnostic test mode	Content
REAR DEFOGGER	Data monitor	Displays the input data of BCM in real time.
	Active test	Gives a drive signal to a load to check the operation.

DATA MONITOR

Display Item List

Monitor item “Operation”		Content
REAR DEF SW	“ON/OFF”	Displays “Press (ON)/others (OFF)” status determined with the rear window defogger switch.
IGN ON SW	“ON/OFF”	Displays “IGN (ON)/OFF” status determined with the ignition switch signal.

ACTIVE TEST

Display Item List

Test item	Content
REAR DEFOGGER	Gives a drive signal to the rear window defogger to activate it.

CONSULT-III Function (IPDM E/R)

NIS0005O

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

IPDM E/R diagnostic test item	Check item diagnostic test mode	Content
REAR DEFOGGER	Data monitor	Displays the input data of BCM in real time.
	Active test	Gives a drive signal to a load to check the operation.

DATA MONITOR

Monitored Item	Description
RR DEF REQ	Indicates [ON/OFF] condition of rear window defogger function by IPDM E/R.

ACTIVE TEST

Test Item	Description
REAR DEFOGGER	This test is able to check rear window defogger operation. Rear window defogger operates when “ON” on CONSULT-III screen is touched.

Work Flow

NIS0005P

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to GW-56, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to GW-69, "Trouble Diagnoses Symptom Chart" .
4. Does rear window defogger operate normally? YES: GO TO 5, NO: GO TO 4.
5. INSPECTION END

Trouble Diagnoses Symptom Chart

NIS0005Q

Make sure that other systems using the signal of the following systems operate normally.

Symptom	Diagnoses / service procedure	Refer to page
Rear window defogger does not operate.	1. CAN communication inspection using CONSLUT-III (self-diagnosis)	BCS-16
	2. Check IPDM E/R operation	GW-70
	3. Check rear window defogger switch circuit	GW-70
	4. Check rear window defogger power supply circuit	GW-71
	5. Replace IPDM E/R.	PG-26
Rear window defogger does not response but door mirror defoggers operate.	1. Check rear window defogger circuit	GW-73*1 GW-74*2
	2. Check filament	GW-78
Both of door mirror defoggers do not response but rear window defogger operates.	Check door mirror defogger power supply circuit	GW-75
Driver side door mirror defogger does not operate.	Check driver side door mirror defogger circuit	GW-76
Passenger side door mirror defogger does not operate.	Check passenger side door mirror defogger circuit	GW-76

*1 : For Coupe

*2 : For Roadster

Check IPDM E/R Operation

NIS0005R

1. CHECK IPDM E/R OPERATION

With CONSULT-III

Check IPDM E/R “REAR DEFOGGER” in “ACTIVE TEST” mode with CONSULT-III.
Refer to GW-68, "ACTIVE TEST" .

When “ACTIVE TEST” is performed, does rear defogger switch indicator illuminate?

YES or NO

YES >> GO TO diagnosis/service procedure 3 in “Trouble Diagnosis Symptom Chart”. Refer to GW-69 .
NO >> GO TO diagnosis/service procedure 4 in “Trouble Diagnosis Symptom Chart”. Refer to GW-69 .

Check Rear Window Defogger Switch Circuit

NIS0005S

1. CHECK REAR WINDOW DEFOGGER SWITCH OPERATION

With CONSULT-III

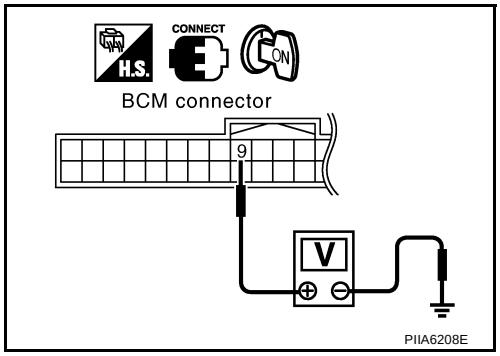
Check (“REAR DEF SW” and “IGN ON SW”) in DATA MONITOR mode with CONSULT-III. Refer to GW-68, "DATA MONITOR" .

When rear defogger switch is turned to ON
REAR DEF SW :ON
When ignition switch is turned to ON
IGN ON SW :ON

With out CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between BCM connector ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(–)			
M90	9 (L/R)	Ground	Rear window defogger switch	: ON	0
				: OFF	5



OK or NG

OK >> Rear window defogger switch check is OK.
NG >> GO TO 2.

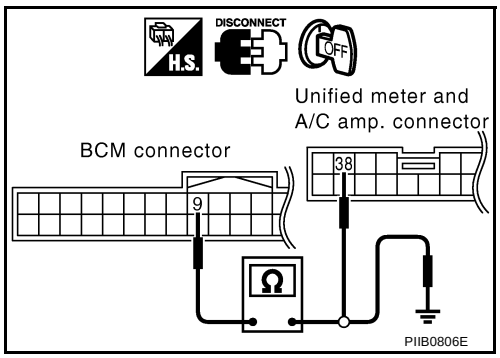
2. REAR WINDOW DEFOGGER SWITCH SIGNAL CIRCUIT HARNESS CONTINUITY INSPECTION

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp.connector.
3. Check continuity between BCM connector M90 terminal 9 and unified meter and A/C amp. connector M50 terminal 38.

9 (L/R) – 38 (L/R) : Continuity should exist

4. Check continuity between BCM harness connector M90 terminal 9 and ground

9 (L/R) – Ground : Continuity should not exist



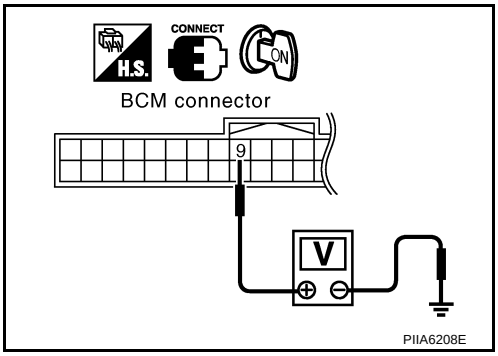
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM connector M90 terminal 9 and ground.

9 (L/R) – Ground :Approx. 5V



OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Replace BCM.

Check Rear Window Defogger Power Supply Circuit

NIS0005T

1. CHECK FUSE

Check 10A fuse [No. 12, located in fuse block (J/B)].

NOTE:
Refer to GW-56, "Component Parts and Harness Connector Location" .

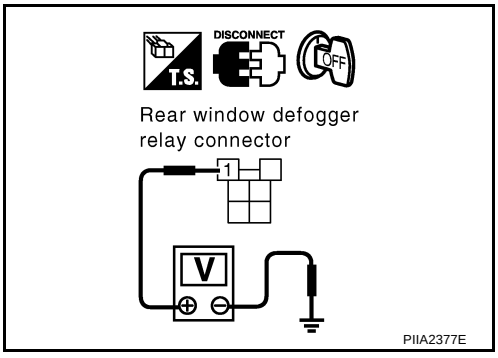
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse, refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. REAR WINDOW DEFOGGER RELAY POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Remove rear window defogger relay.
3. Check voltage between rear window defogger relay connector B34 terminal 1 and ground.

1 (G/R) – Ground : Battery voltage



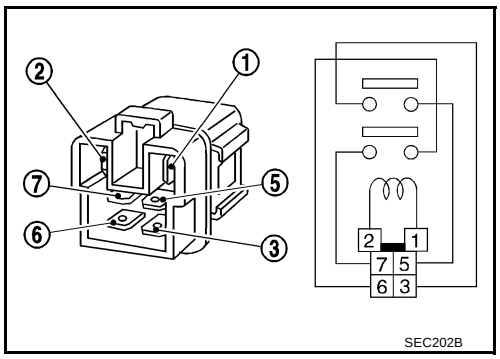
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. REAR WINDOW DEFOGGER RELAY INSPECTION

1. Remove rear window defogger relay.
2. Check continuity between rear window defogger relay terminals 3 and 5, 6 and 7.

Terminal		Condition	Continuity
3	5	12V direct current supply between terminals 1 and 2	Yes
		No current supply	No
6	7	12V direct current supply between terminals 1 and 2	Yes
		No current supply	No



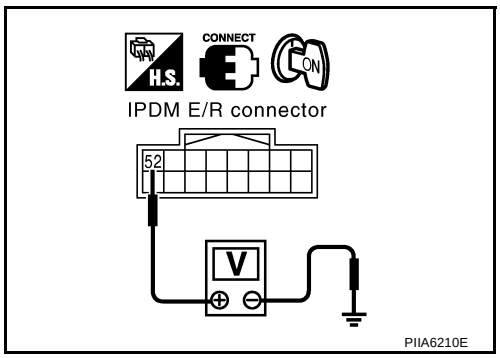
OK or NG

OK >> GO TO 4.
NG >> Replace rear window defogger relay.

4. REAR WINDOW DEFOGGER RELAY GROUND CIRCUIT INSPECTION

1. Installation rear window defogger relay.
2. Turn ignition switch ON.
3. Turn rear window defogger switch OFF.
4. Check voltage between IPDM E/R connector E9 terminal 52 and ground.

52 (B) – Ground : Battery voltage



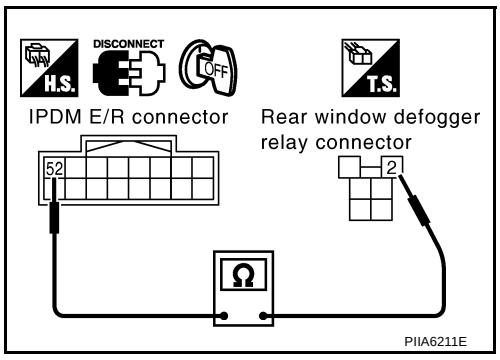
OK or NG

OK >> Rear window defogger power supply circuit is OK.
NG >> GO TO 5.

5. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and rear window defogger relay.
3. Check continuity between IPDM E/R connector E9 terminal 52 and rear window defogger relay connector B34 terminal 2.

52 (W) - 2 (W) :Continuity should exist.



OK or NG

OK >> Check the condition of harness and the connector.
NG >> Repair or replace harness.

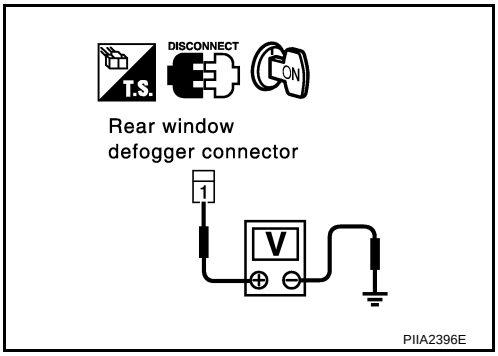
Check Rear Window Defogger Circuit / For Coupe

NIS0005U

1. REAR WINDOW DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Turn ignition switch ON.
4. Check voltage between rear window defogger connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D104	1 (B/W)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0



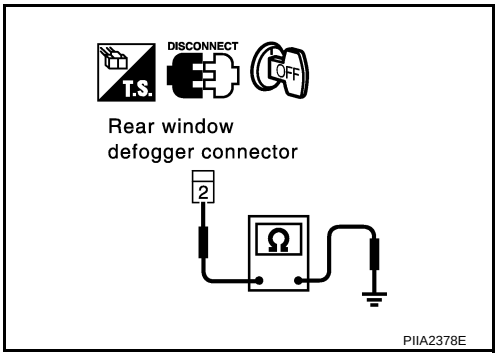
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. REAR WINDOW DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Check continuity between rear window defogger connector D211 terminal 2 and ground.

2 (B) – Ground : Continuity should exist



OK or NG

OK >> Rear window defogger circuit is OK.
NG >> Repair or replace harness.

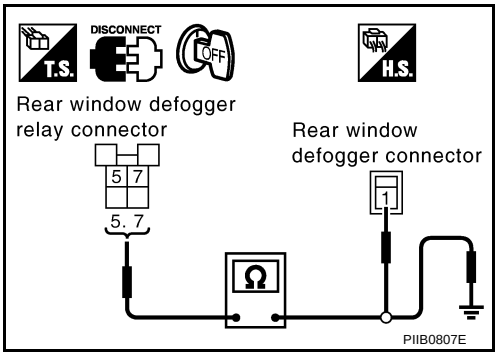
3. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect rear window defogger relay connector.
3. Check continuity between rear window defogger relay connector B34 terminal 5, 7 and rear window defogger connector D104 terminal 1.

5 (B/W) – 1 (B/W) : Continuity should exist.
7 (B/W) – 1 (B/W) : Continuity should exist.

4. Check continuity between rear window defogger relay connector B34 terminal 5, 7 and ground.

5 (B/W) – Ground : Continuity should not exist.
7 (B/W) – Ground : Continuity should not exist.



OK or NG

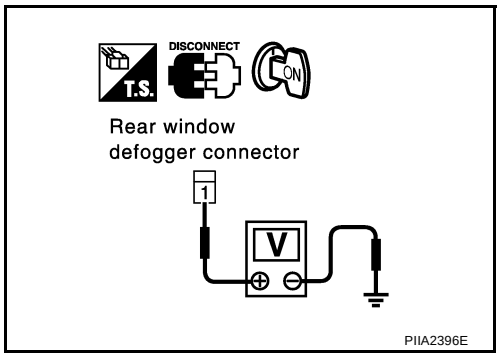
OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness.

Check Rear Window Defogger Circuit / For Roadster

NIS0005V

1. REAR WINDOW DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Turn ignition switch ON.
4. Check voltage between rear window defogger connector and ground.



Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
B202	1 (B)	Ground	Rear window defogger relay	: ON	Battery voltage
				: OFF	0

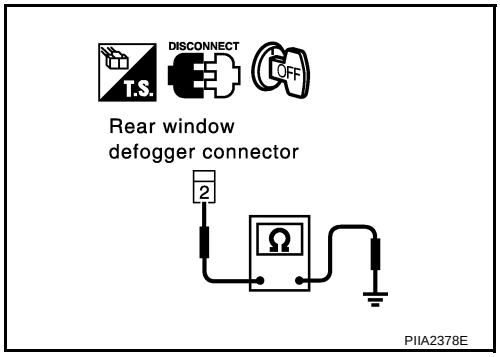
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. REAR WINDOW DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Check continuity between rear window defogger connector D203 terminal 2 and ground.

2(B) – Ground : Continuity should exist



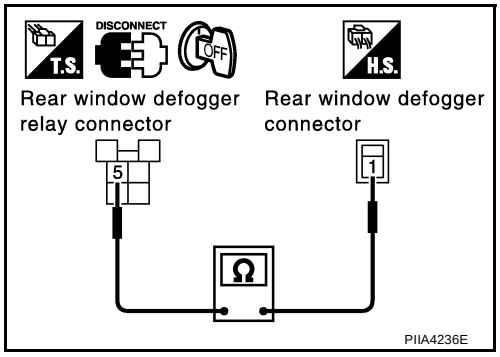
OK or NG

OK >> Rear window defogger circuit is OK.
NG >> Repair or replace harness.

3. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect rear window defogger relay connector.
3. Check continuity between rear window defogger relay connector B34 terminal 5 and rear window defogger connector B202 terminal 1.

5 (B/W) – 1 (B) : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness.

Check Door Mirror Defogger Power Supply Circuit

NIS0005W

1. CHECK FUSE

- Check 10A fuse [No. 8, located in fuse block (J/B)].

NOTE:
Refer to GW-56, "Component Parts and Harness Connector Location" .

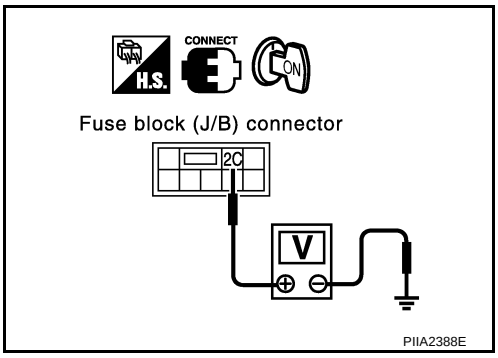
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse, refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION 1

1. Turn ignition switch ON.
2. Rear window defogger switch operate, check voltage between fuse block (J/B) connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
E101	2C (Y)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0



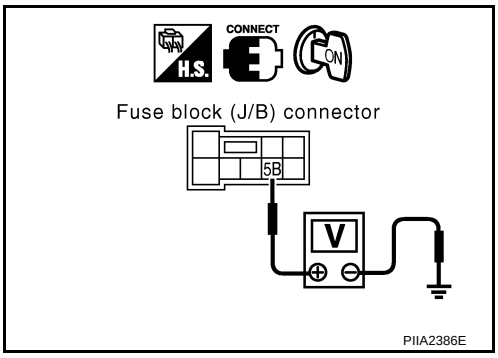
OK or NG

OK >> GO TO 3.
NG >> Repair or replace between harness.

3. DOOR MIRROR DEFOGGER POWER SUPPLY INSPECTION 2

Rear window defogger switch operate, check voltage between Fuse block (J/B) connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
M5	5B (L)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0



OK or NG

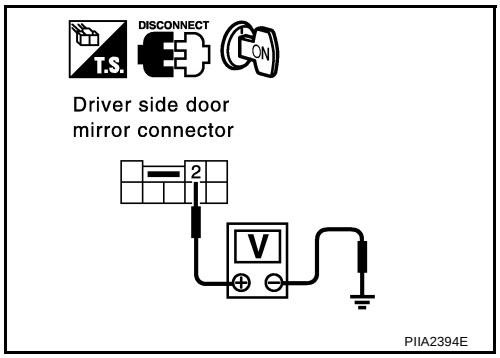
OK >> Repair or replace harness.
NG >> Replace fuse block (J/B).

Check Driver Side Door Mirror Defogger Circuit

NIS0005X

1. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect driver side door mirror defogger connector.
3. Turn ignition switch ON.
4. Rear window defogger switch operate, check voltage between driver side door mirror defogger connector and ground.



Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D2	2 (W/R)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0

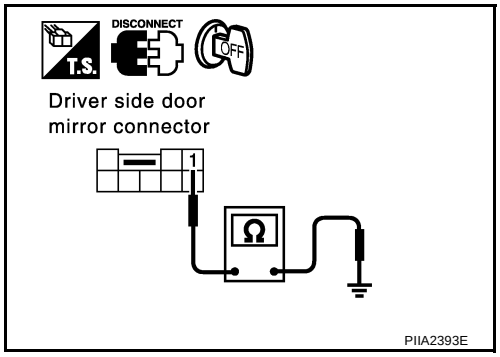
OK or NG

OK >> GO TO 2.
NG >> Repair or replace harness.

2. DOOR MIRROR DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Check continuity between driver side door mirror defogger connector D2 terminal 1 (B) and ground.

1 (B) – Ground : Continuity should exist.



OK or NG

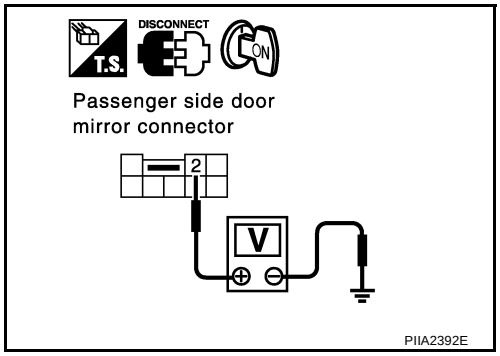
OK >> Check door mirror defogger firmament continuity.
NG >> Repair or replace harness.

Check Passenger Side Door Mirror Defogger Circuit

NIS0005Y

1. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch ON.
2. Disconnect passenger side door mirror defogger connector.
3. Rear window defogger switch operate, check voltage between passenger side door mirror defogger connector and ground.



Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D32	2 (P/B)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0

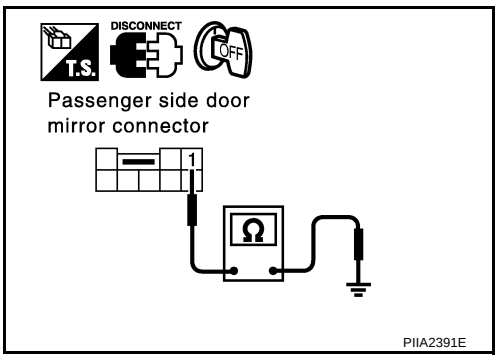
OK or NG

OK >> GO TO 2.
NG >> Repair or replace harness.

2. DOOR MIRROR DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Check continuity between passenger side door mirror defogger connector D32 terminal 1 and ground.

1 (B) – Ground : Continuity should exist.



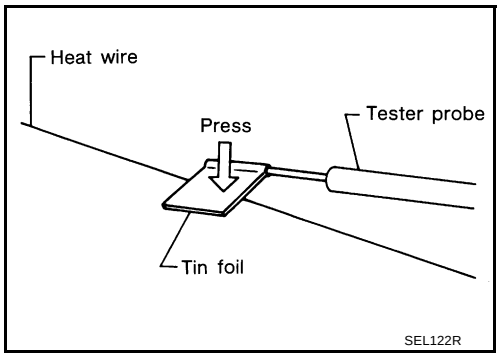
OK or NG

OK >> Check door mirror defogger firmament continuity.
NG >> Repair or replace harness.

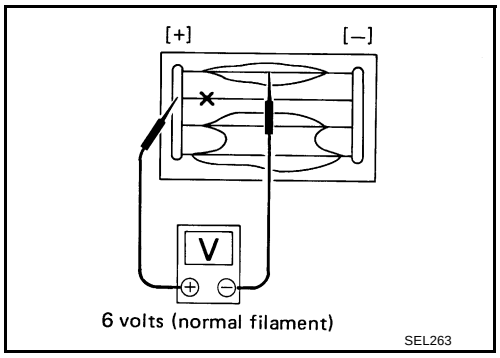
Check Filament

NIS0005Z

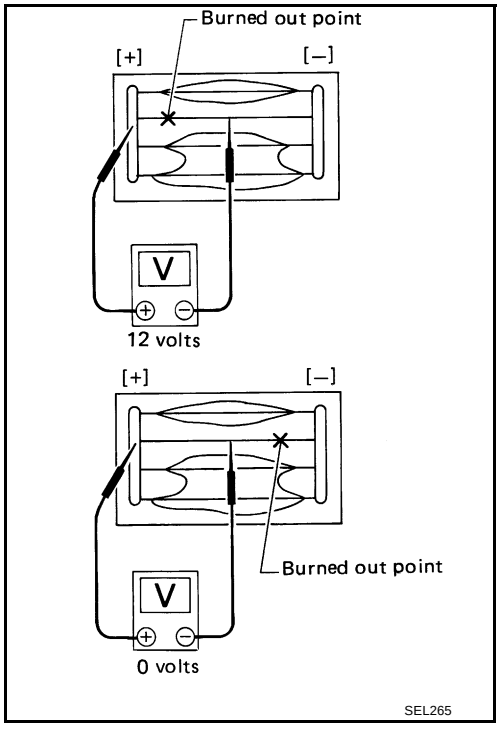
1. When measuring voltage, wrap tin foil around the top of the negative probe. Then press the foil against the wire with your finger.



2. Attach probe circuit tester (in Volt range) to middle portion of each filament.



3. If a filament is burned out, circuit tester registers 0 or battery voltage.
4. To locate burned out point, move probe to left and right along filament. Test needle will swing abruptly when probe passes the point.



Filament Repair

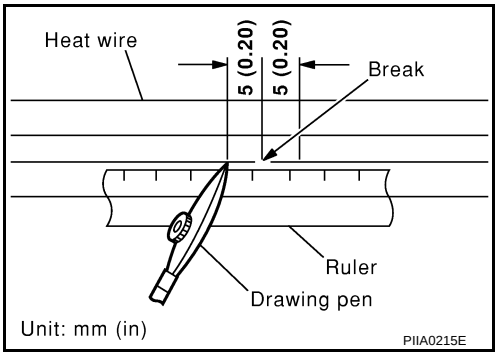
NIS00060

REPAIR EQUIPMENT

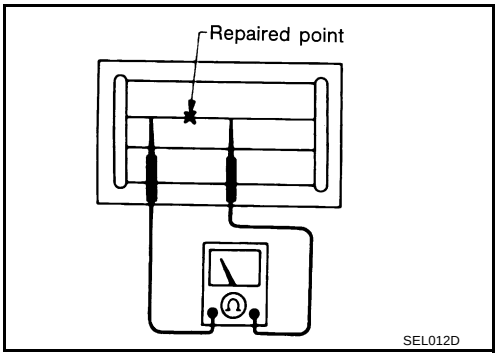
- Conductive silver composition (Dupont No. 4817 or equivalent)
- Ruler 30 cm (11.8 in) long
- Drawing pen
- Heat gun
- Alcohol
- Cloth

REPAIRING PROCEDURE

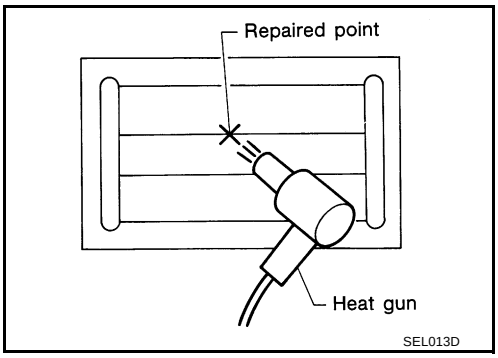
1. Wipe broken heat wire and its surrounding area clean with a cloth dampened in alcohol.
2. Apply a small amount of conductive silver composition to tip of drawing pen.
   Shake silver composition container before use.
3. Place ruler on glass along broken line. Deposit conductive silver composition on break with drawing pen. Slightly overlap existing heat wire on both sides [preferably 5 mm (0.20 in)] of the break.



4. After repair has been completed, check repaired wire for continuity. This check should be performed 10 minutes after silver composition is deposited.
   Do not touch repaired area while test is being performed.



5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet.
   If a heat gun is not available, let the repaired area dry for 24 hours.

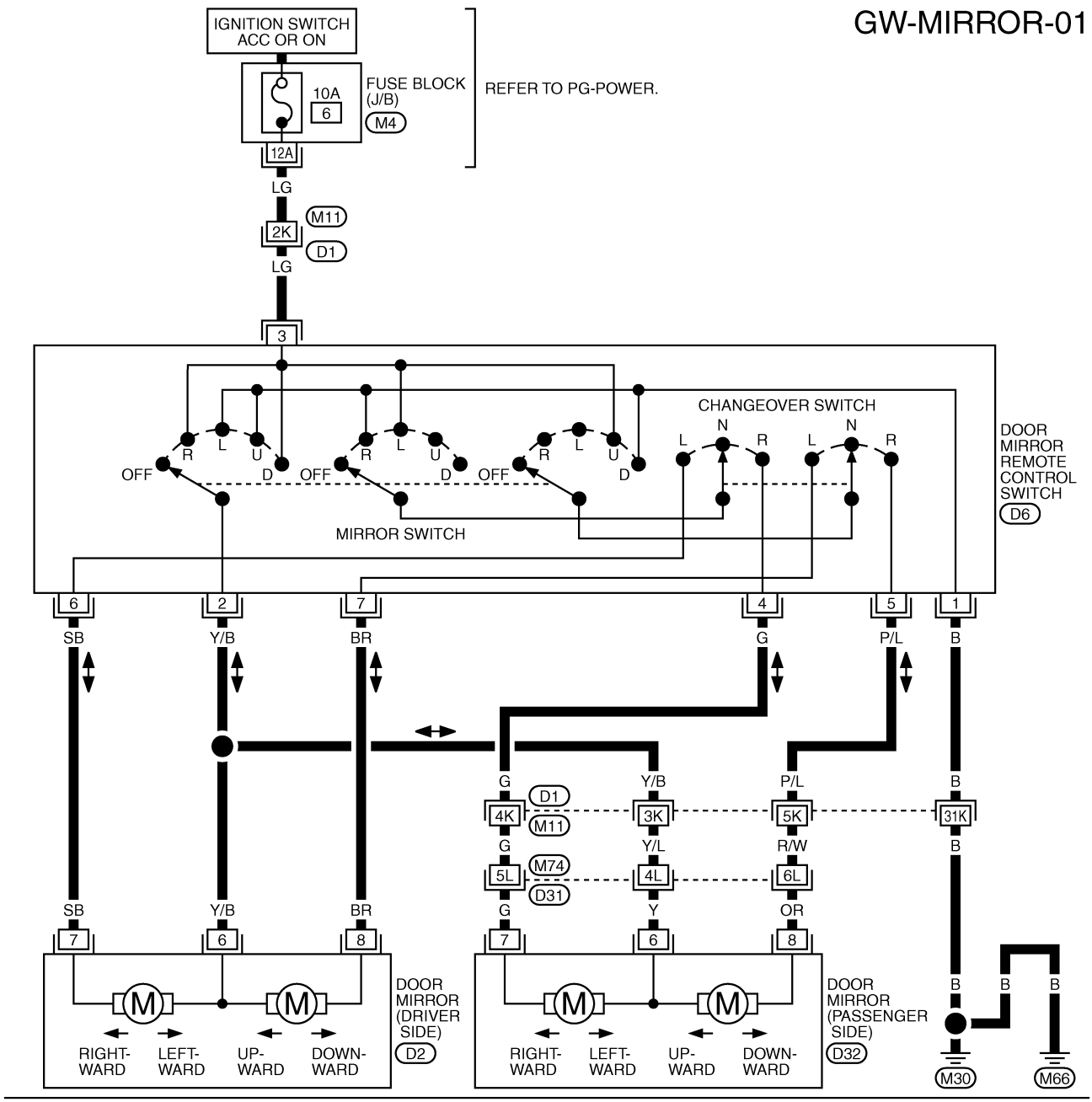


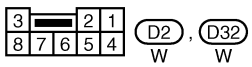
DOOR MIRROR

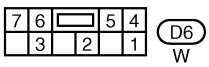
PFP:96301

Wring Diagram –MIRROR–

NIS00061







REFER TO THE FOLLOWING.

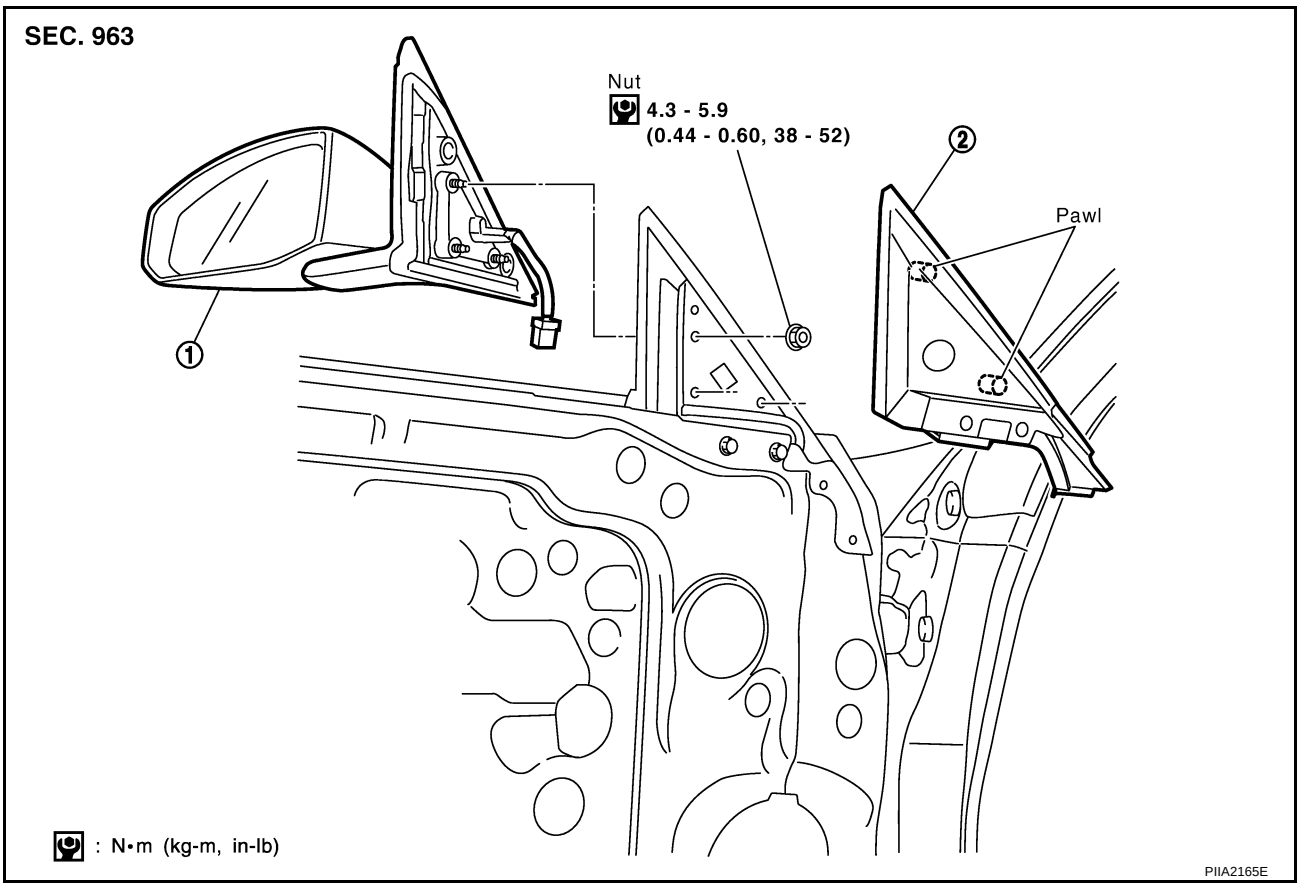
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT1601E

Removal and Installation

NIS00062



1. Door mirror assembly
2. Corner cover inner

REMOVAL

1. Remove door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Remove corner cover inner.
3. Disconnect door mirror harness connector.
4. Remove door mirror mounting nuts, and remove door mirror assembly.

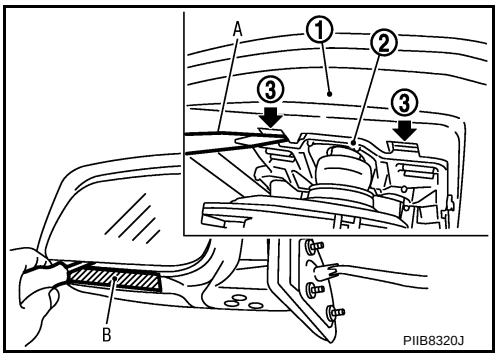
INSTALLATION

Install in the reverse order of removal.

DISASSEMBLY

1. Place the mirror body with mirror glass facing upward.
2. Put a strip of protective tape B on mirror body.
3. As shown in the figure, insert a small slotted screwdriver A into the recess between mirror base (mirror holder) (1) and mirror holder bracket (2) and push up two pawls (3) to remove mirror holder lower half side.

   NOTE:
   When pushing up pawls do not attempt to use one recess only, be sure to push up with both recesses.
   Insert screwdriver into recesses, and push up while rotating (twist) to make work easier.



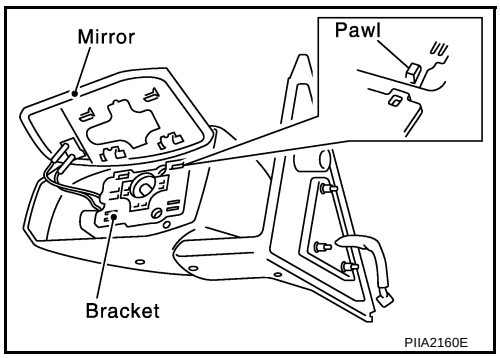
4. Remove two terminals of mirror heater attachment.
5. Lightly lift up lower side of mirror surface from mirror surface, and detach pawls of upper side as if pulling it out. Remove mirror surface from mirror body.

NOTE:
Be certain not to allow grease on sealing agent in center of mirror body assembly (actuator) or back side of mirror surface (mirror holder).

ASSEMBLY

1. Place mirror holder bracket and mirror body assembly (actuator) in a horizontal position.
2. Connect terminals of heater installed mirror.
3. Fit the upper pawls on the mirror face onto the mirror holder bracket first, then press the lower side of mirror face until a click sound is heard to engage the lower pawls.

NOTE:
After installation, visually check that lower pawls are securely engaged from the bottom of mirror face.



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ALPHABETICAL INDEX

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SECTION IP
INSTRUMENT PANEL

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00090

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NIS00091

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions

NIS00092

- Disconnect both battery cables in advance.
- Disconnect air bag system line in advance.
- Never tamper with or force air bag lid open, as this may adversely affect air bag performance.
- Be careful not to scratch pad and other parts.
- When removing or disassembling any part, be careful not to damage or deform it. Protect parts, which may get in the way with cloth.
- When removing parts with a screwdriver or other tool, protect parts by wrapping them with vinyl or tape.
- Keep removed parts protected with cloth.
- If a clip is deformed or damaged, replace it.
- If an unreusable part is removed, replace it with a new one.
- Tighten bolts and nuts firmly to the specified torque.
- After re-assembly has been completed, make sure each part functions correctly.
- Remove stains in the following way.

Water-soluble stains:
Dip a soft cloth in warm water, and then squeeze it tightly. After wiping the stain, wipe with a soft dry cloth.
Oil stain:
Dissolve a synthetic detergent in warm water (density of 2 to 3% or less), dip the cloth, then clean off the stain with the cloth. Next, dip the cloth in fresh water and squeeze it tightly. Then clean off the detergent completely. Then wipe the area with a soft dry cloth.

- Do not use any organic solvent, such as thinner or benzine.

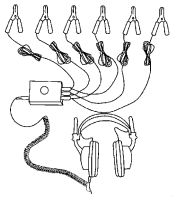
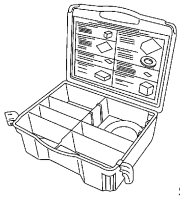
PREPARATION

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Special Service Tools

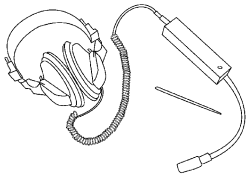
NIS00093

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS00094

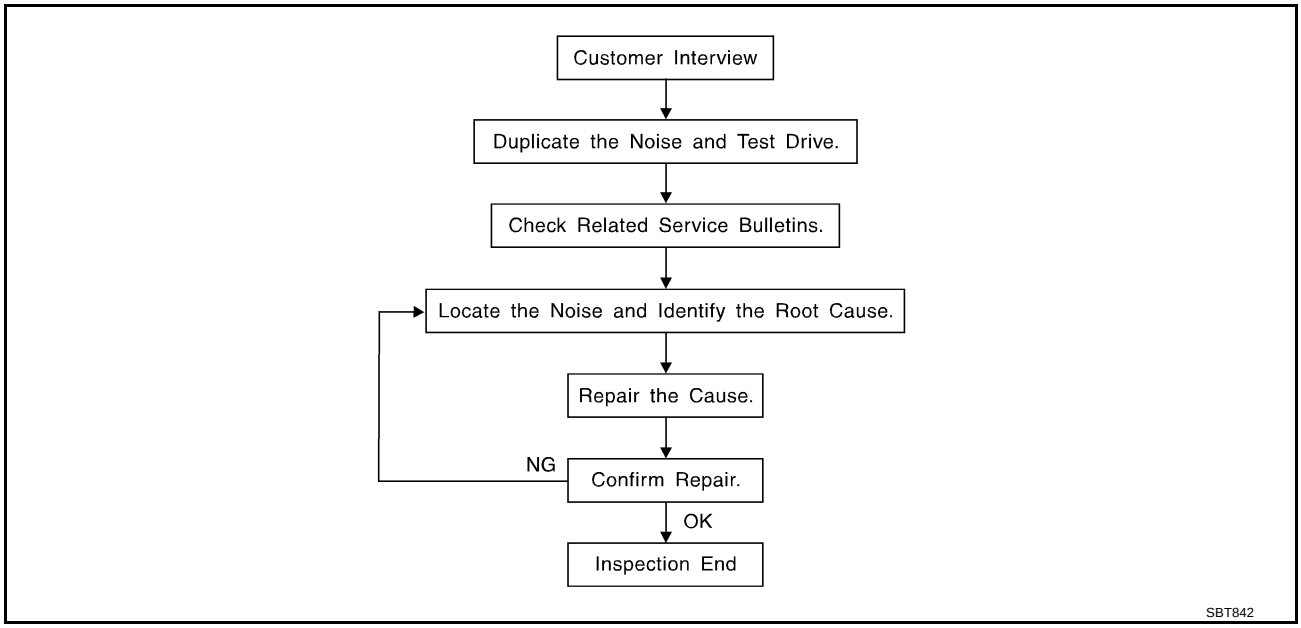
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS00095



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to IP-8, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to IP-6, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS00096

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

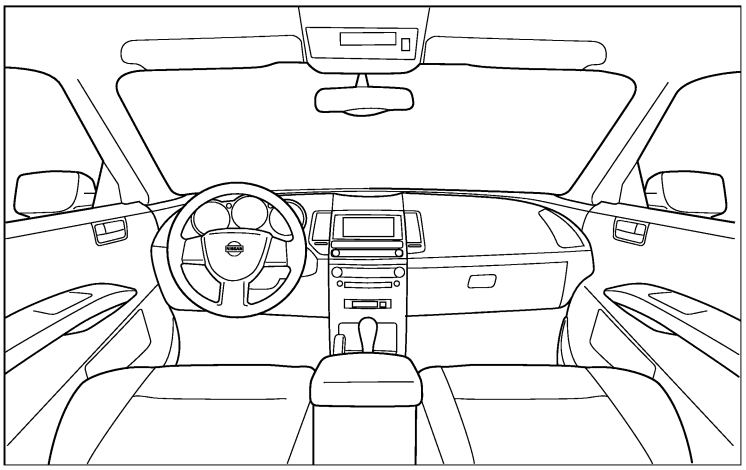
Diagnostic Worksheet

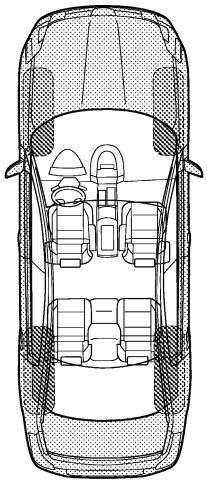
NIS00097

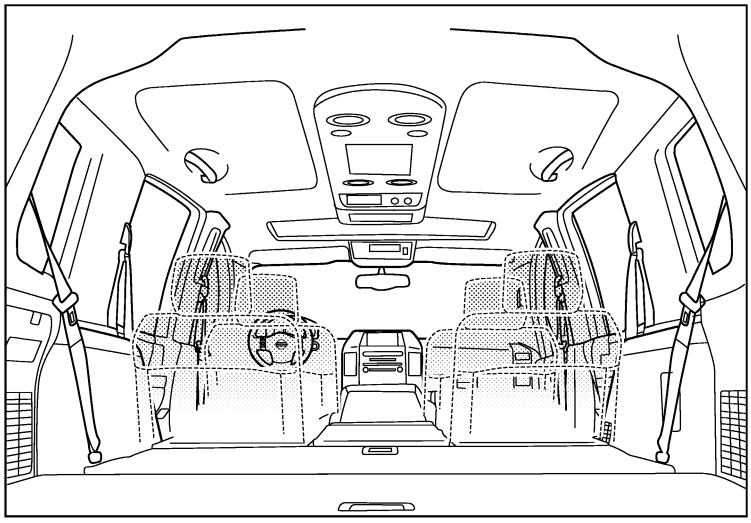
SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

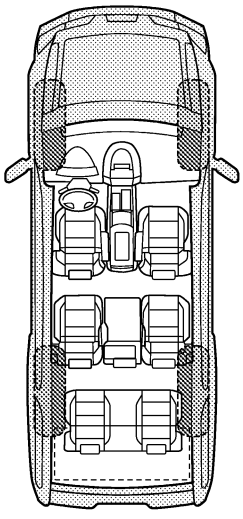
Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.









Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

PIIB8742E

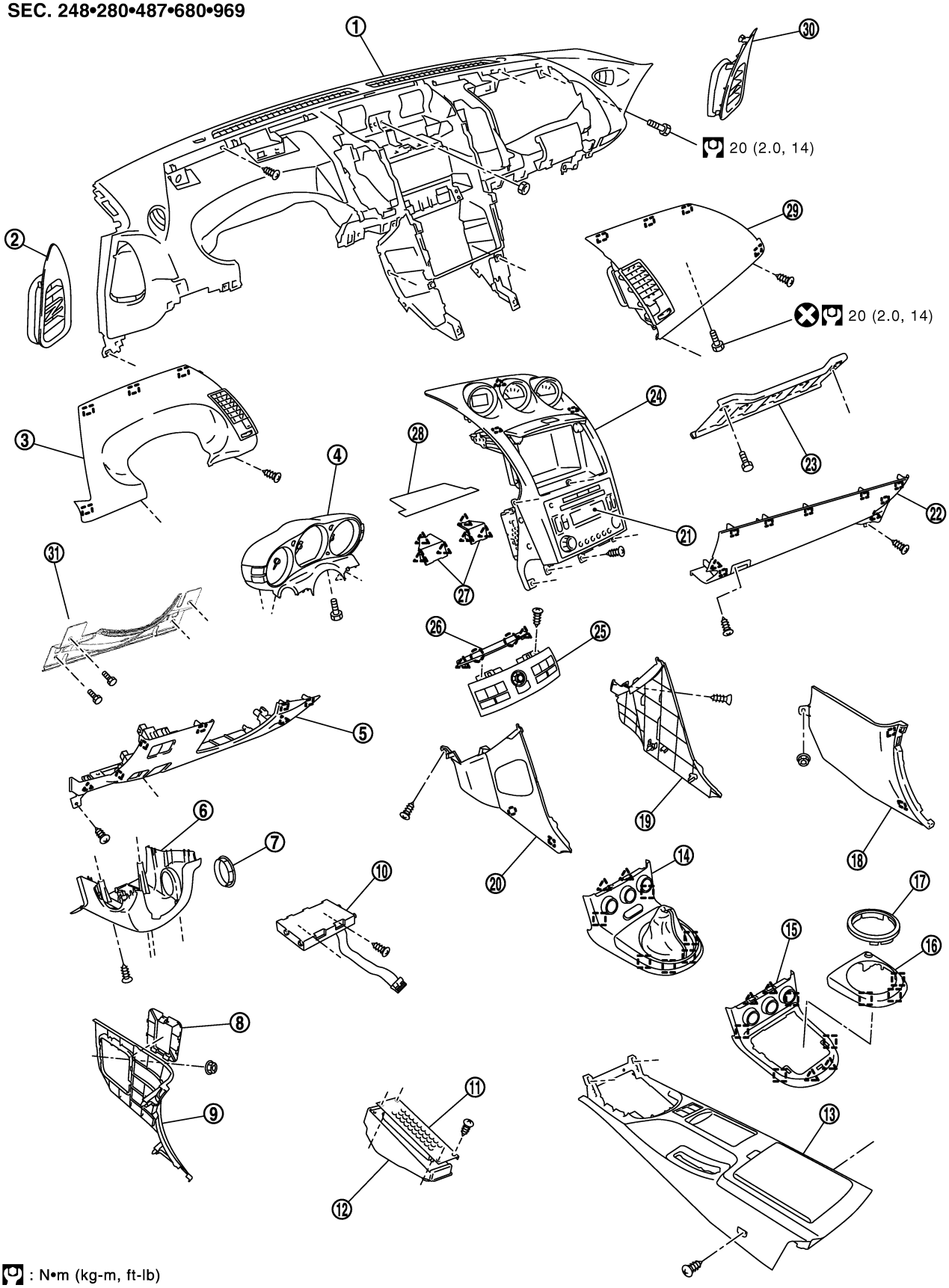
INSTRUMENT PANEL ASSEMBLY

PFP:68200

Component Parts Drawing

NIS00098

SEC. 248•280•487•680•969



: N•m (kg-m, ft-lb)

PIIB9056E

1. Instrument panel
2. Instrument side finisher (LH)
3. Instrument driver panel upper
4. Combination meter
5. Instrument driver panel lower
6. Steering column cover
7. Steering lock escutcheon
8. Fuse cover
9. Dash side finisher (LH)
10. Unified meter and A/C amp.
11. Foot rest plate
12. Foot rest
13. Center console
14. Console boot (M/T)
15. Cluster lid C lower
16. Console finisher (A/T)
17. Console finisher (A/T ring)
18. Dash side finisher (RH)
19. Instrument side panel (RH)
20. Instrument side panel (LH)
21. Audio unit
22. Instrument passenger panel lower
23. Knee protector (RH)
24. Cluster lid C
25. NAVI switch
26. Instrument center panel
27. Instrument finisher (LH/RH)
28. Pocket mat
29. Instrument passenger panel upper
30. Instrument side finisher (RH)
31. Knee protector (LH)

Pawl Clip Metal clip

Removal and Installation

NIS00099

WORK STEP

When removing instrument panel, combination meter, audio and console assembly, take steps in the order shown by the numbers below.

CAUTION:

- **Disconnect both battery cables in advance.**
- **Disconnect air bag system line in advance.**
- **Never tamper with or force air bag lid open, as this may adversely affect air bag performance.**
- **Be careful not to scratch pad and other parts.**

Parts		Reference page	Instrument panel	Combination meter	Audio	Center console
(A)	Kicking plate (RH / LH)	EI-35	[1]	[1]		
(B)	Foot rest	EI-43	[2]	[2]		
(C)	Dash side finisher (RH / LH)	EI-35	[3]	[3]		
(D)	Instrument driver panel lower	IP-12	[4]	[4]		
(E)	Steering column lower cover	IP-12	[5]	[5]		
(F)	Combination meter	IP-12	[6]	[6]		
(G)	Spiral cable	SRS-42	[7]			
(H)	Console finisher (A/T Models)	IP-13	[8]		[1]	[1]
(I)	Cluster lid C lower (A/T Models)	IP-13	[8]		[1]	[1]
(J)	Console boot (M/T Models)	IP-13	[8]		[1]	[1]
(K)	Center console *1	IP-13	[10]			[2]
(L)	Instrument passenger panel lower	IP-13	[11]			
(M)	Instrument side panel (RH / LH)	IP-13	[12]			
(N)	Unified meter and A/C amp.	IP-13	[13]		[2]	
(O)	Instrument center panel (with NAVI models)	IP-14	[14]		[3]	
(P)	NAVI switch (with NAVI models)	IP-14	[15]		[4]	
(Q)	Cluster lid C*2	IP-14	[16]		[5]	
(R)	Display unit (with NAVI models)	IP-14	[17]			
(S)	Front pillar garnish (RH / LH)	EI-36	[18]			
(T)	Instrument driver panel upper	IP-14	[19]			
(U)	Instrument passenger panel upper	IP-14	[20]			
(V)	Instrument side finisher (RH)	IP-14	[21]			
(V)	Instrument panel	IP-15	[22]			

[ ]:number indicates step in removal procedures.

NOTE:

*1: Console rear pocket and coin holder bracket assembly. Refer to IP-16, "CENTER CONSOLE" .

*2: Audio, Instrument upper box, and triple meter assembly. Refer to IP-17, "CLUSTER LID C" .

REMOVAL

(A) Kicking Plate (RH/LH)

Remove kicking plate (RH/LH). Refer to EI-35, "BODY SIDE TRIM" .

(B) Foot Rest

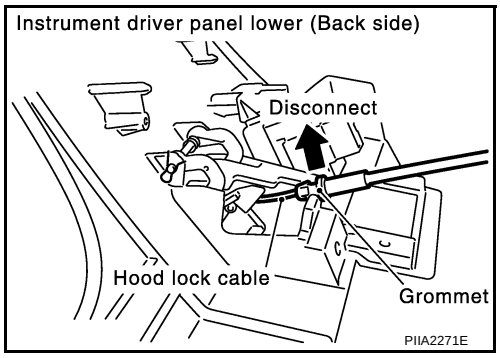
Remove foot rest. Refer to EI-43, "FLOOR TRIM" .

(C) Dash Side Finisher (RH/LH)

1. Remove plastics nut.
2. Remove dash side finisher (RH/LH).

(D) Instrument Driver Panel Lower

1. Remove screws.
2. Remove data link connector.
3. Pull to disengage metal clip by removing panel in horizontal direction.
4. Disconnect in-vehicle sensor and each electrical parts.
5. Remove the grommet, and remove hood lock cable.

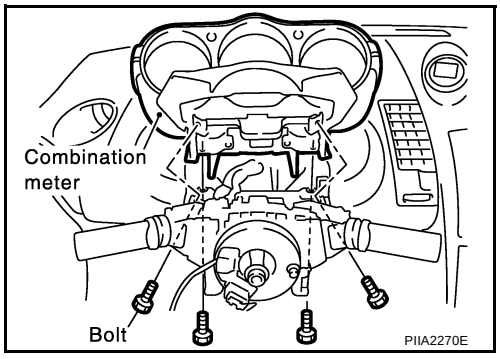


(E) Steering Column Lower Cover

1. Remove screws.
2. Disengage the tab, remove only lower side. (Upper side is integrated in combination meter.)

(F) Combination Meter

After removing bolts, remove harness connector.



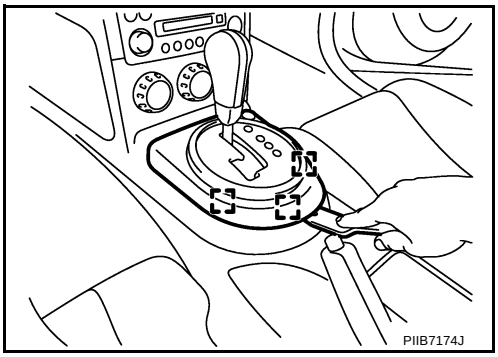
(G) Spiral cable

Remove bolts and remove spiral cable. Refer to SRS-42, "SPIRAL CABLE" .

(H) Console Finisher (A/T Models)

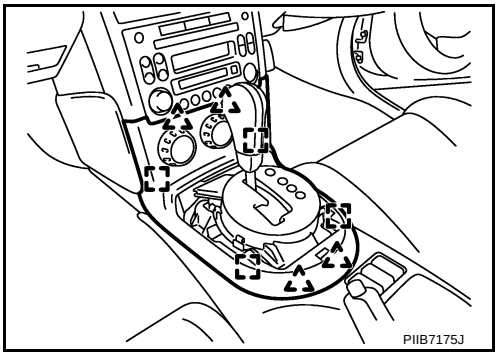
1. Insert a thin flat-bladed screwdriver wrapped with tape from behind console finisher, and remove metal clip on back. Then pull up and back to disengage from front metal clip.
2. Disconnect harness connector, and remove console finisher.

NOTE:
A/C controller is assembled in the console finisher. Therefore, when installing and removing be careful not to use excessive force, etc.



(I) Cluster lid C lower (A/T Models)

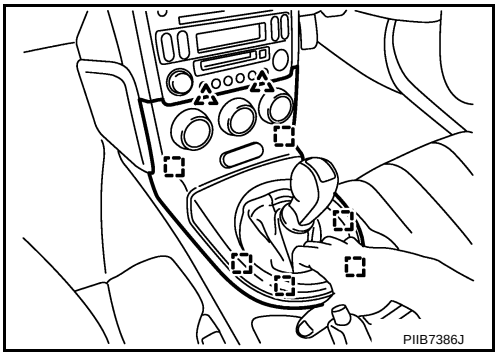
1. Disconnect harness connector.
2. Remove metal clips and pawls, and remove cluster lid C lower.



(J) Console Boot (M/T Models)

1. Remove metal clip.
2. Remove shift knob. Refer to MT-12, "Removal and Installation" .
3. Disconnect harness connector, and remove console boot.

NOTE:
A/C controller is assembled in the console boot. Therefore, when installing and removing be careful not to use excessive force, etc.



(K) Center Console

1. Remove coin holder and ashtray.
2. Remove screws.
3. Remove console sub-harness.
4. After removing, disassemble each parts. Refer to IP-16, "CENTER CONSOLE" .

NOTE:
When removing console, be careful not to pull the harness.

(L) Instrument Passenger Panel Lower

1. Remove screws and bolt.
2. Pull panel horizontally toward you and disengage from metal clip.

(M) Instrument Side Panel (RH/LH)

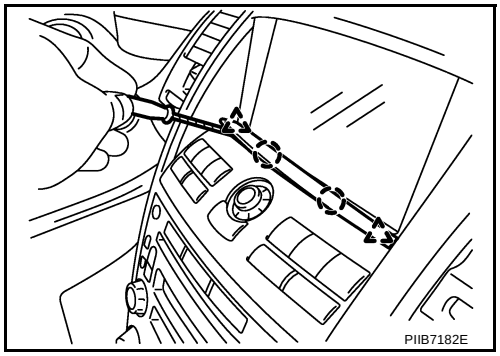
1. Remove screws.
2. Pull to the side, disconnect metal clips, and remove instrument side panel.

(N) Unified Meter And A/C Amp.

Remove screws, and disconnect harness connector, and remove unified meter and A/C amp. Refer to ATC-103, "AUTO AMP" .

(O) Instrument Center Panel

Insert a screwdriver wrapped with tape into the gap and then remove instrument center panel.

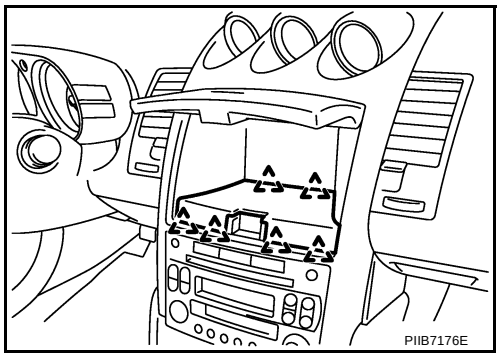


(P) NAVI Switch (With NAVI Models)

Remove NAVI switch. Refer to AV-99, "Removal and Installation of NAVI Switch" .

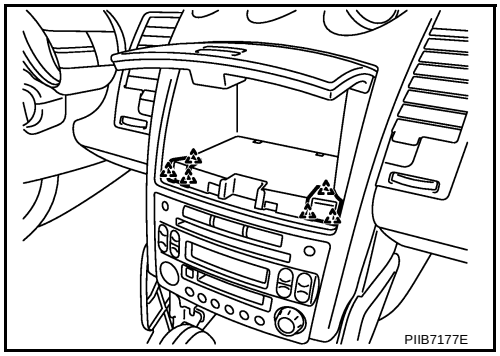
(Q) Cluster Lid C

1. Lift upward while disengaging the pawls, and pull backward to remove the pocket mat. (Without NAVI)



2. Pull backward to remove the instrument finisher (left/right). (Without NAVI)
3. Disengage the metal clip with the upper center pawls.
4. Remove the harness connector of the triple meter and audio unit by pulling backward, and then remove cluster lid C.

   CAUTION:
   Unit is heavy, so be careful not to pinch your fingers when working.
5. After remove cluster lid C and then remove triple meter, instrument upper box and audio unit. Refer to IP-17, "CLUSTER LID C" .



(R) Display Unit (With NAVI Models)

Remove display unit. Refer to AV-99, "Removal and Installation of Display Unit" .

(S) Front Pillar Garnish

Pull to inside of vehicle, disconnect metal clips and remove front pillar garnish. Refer to EI-35, "BODY SIDE TRIM" .

(T) Instrument Driver Panel Upper

1. Remove screws.
2. Disconnect metal clips, then remove instrument driver panel upper.

(U) Instrument Passenger Panel Upper

1. Remove screws.
2. Disconnect metal clips, then remove instrument passenger panel upper.

(V) Instrument Side Finisher (RH)

Using a screwdriver wrapped with tape, pry up and remove instrument side finisher.
Disconnect from metal clip and pull toward you.

(W) Instrument Panel

Remove bolts, nut and screws, and remove instrument panel from passenger door opening portion.

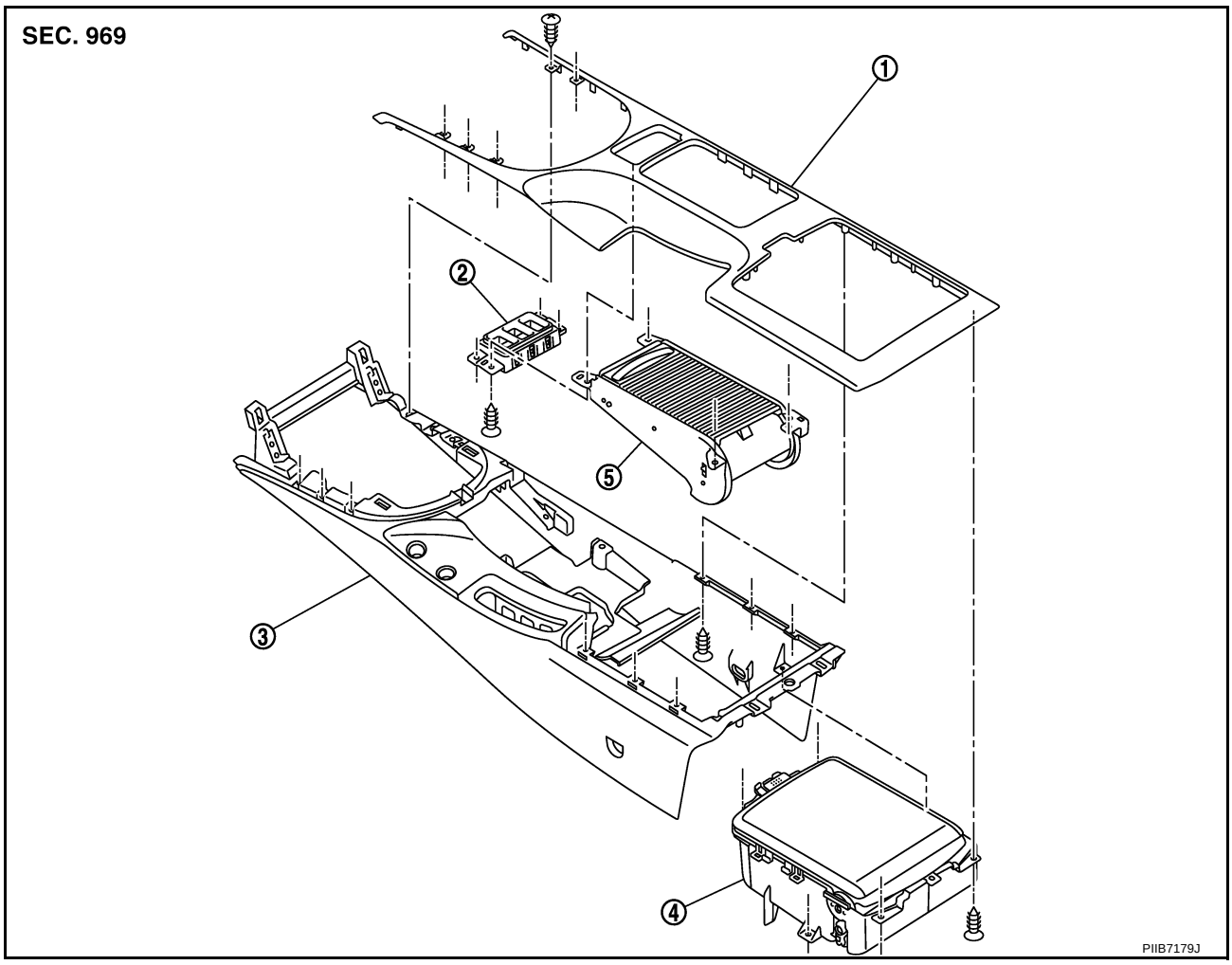
INSTALLATION

To install, reverse the removal procedure sequence.
Assemble the following three parts carefully.

Disassembly and Assembly

NIS0009A

CENTER CONSOLE



1. Console body upper
2. Switch bracket
3. Console body lower
4. Console rear pocket
5. Cup holder

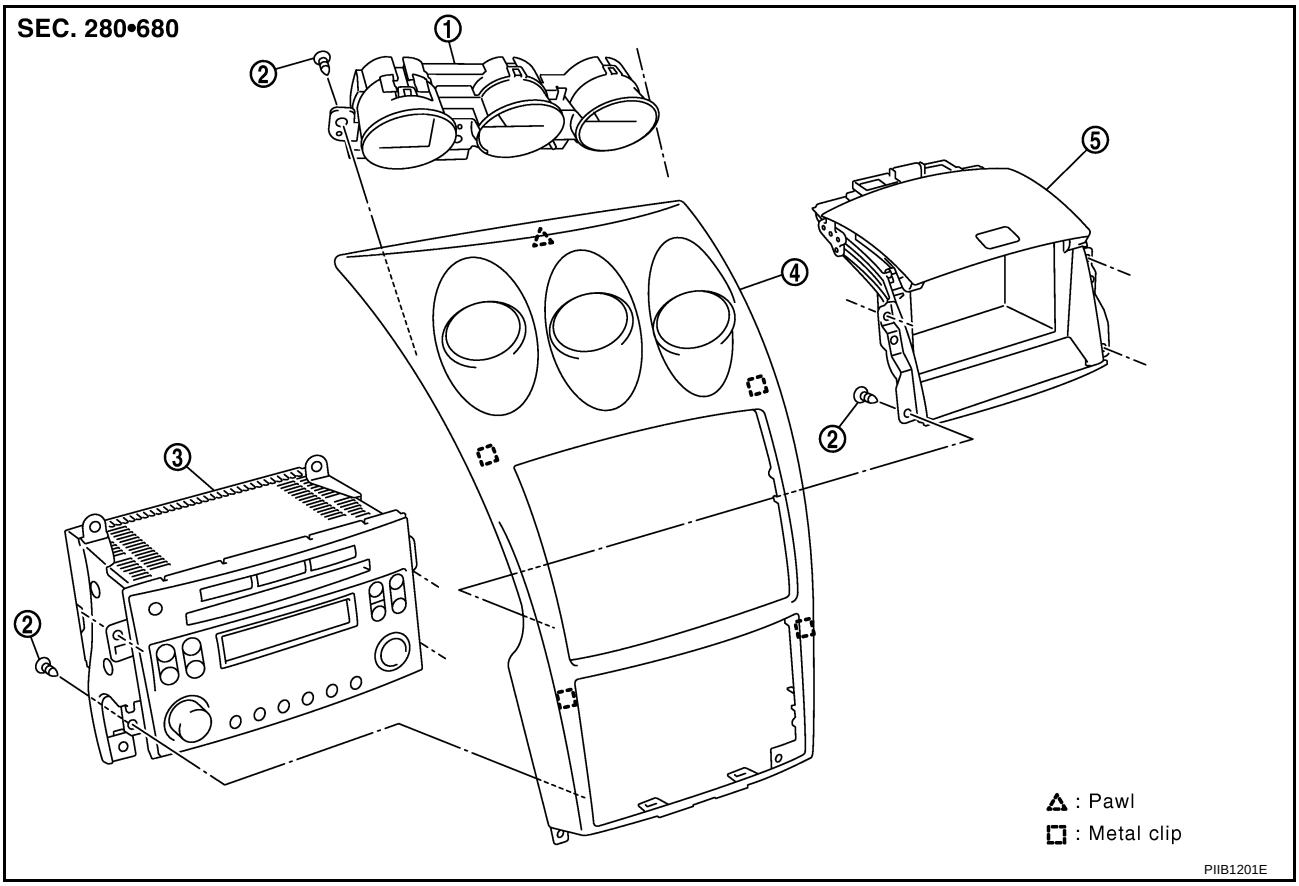
Disassembly

1. Remove screws, remove console body upper.
2. Remove screws, and then remove console rear pocket from console body lower.
3. Remove screws, and then remove switch bracket from console body upper.
4. Remove screws, and then remove cup holder from console body upper.

Assembly

Assemble in the reverse order of disassembly.

CLUSTER LID C



1. Triple meter
2. Screw
3. Audio
4. Cluster lid C
5. Instrument upper box

Disassembly

1. Remove screws, and then triple meter.
2. Remove screws, and then instrument upper box. (Without NAVI models)
3. Remove screws, and then audio unit. Refer to AV-46, "Removal and Installation of Audio Unit (Base system)" ,AV-46, "Locking CD Auto Changer Mechanism (Audio unit of BOSE system)" and AV-47, "Removal and Installation of Audio Unit (BOSE system)" .

Assembly

Assemble in the reverse order of disassembly.

SECTION LAN

LAN SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Trouble Diagnosis

NKS004PA

CAUTION:

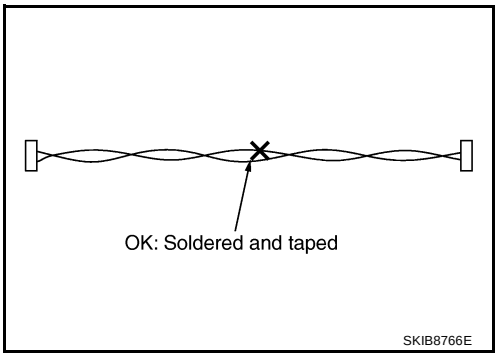
- **Never apply 7.0 V or more to the measurement terminal.**
- **Use a tester with open terminal voltage of 7.0 V or less.**
- **Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.**

Precautions for Harness Repair

NKS004PB

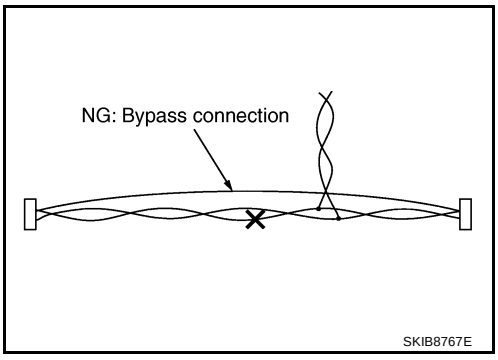
- Solder the repaired area and wrap tape around the soldered area.

  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.

  NOTE:
  Bypass connection may cause CAN communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



- Replace the applicable harness as an assembly if error is detected on the shield lines of CAN communication line.

SYSTEM DESCRIPTION

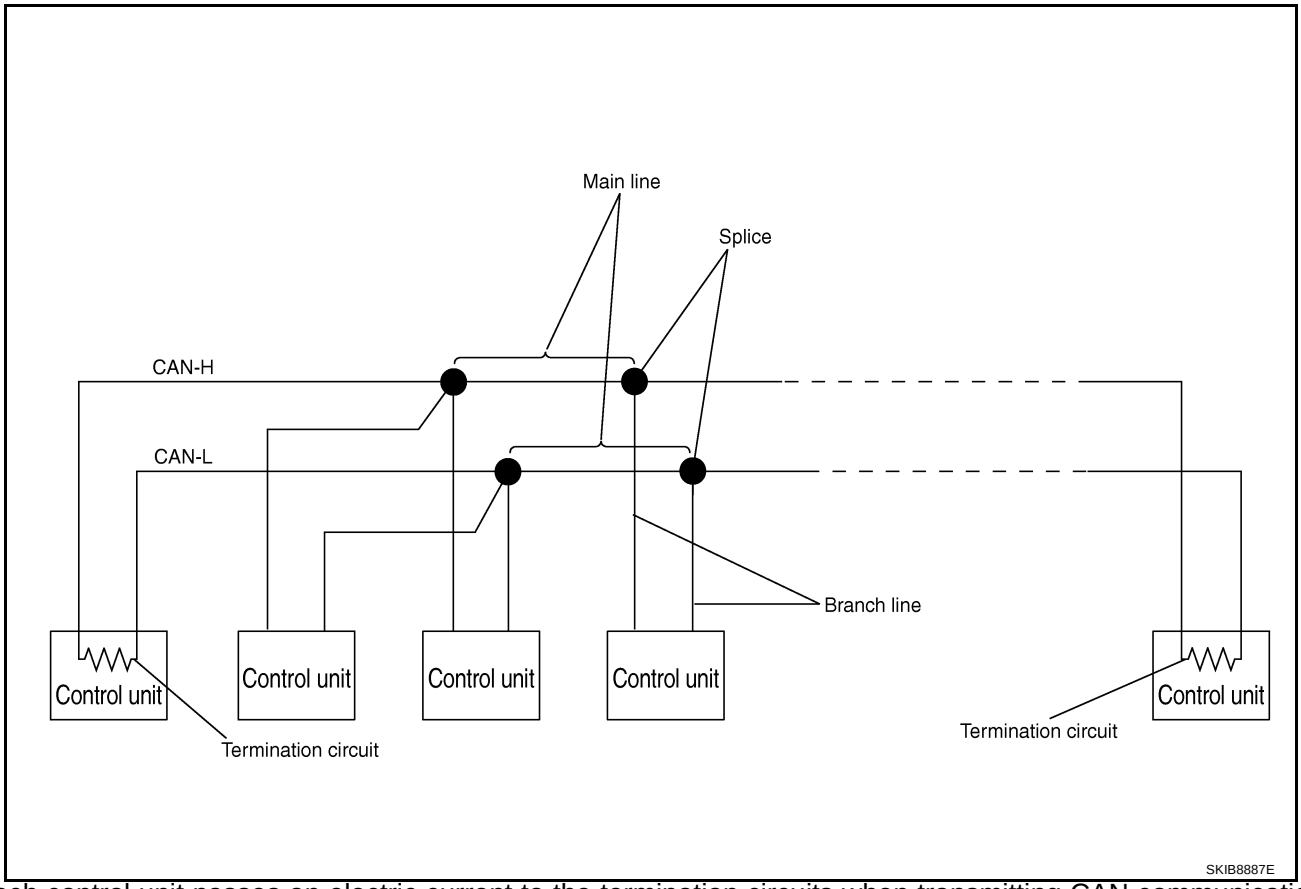
PFP:00000

CAN Communication System

NKS004PC

- CAN communication is a multiplex communication system. This enables the system to transmit and receive large quantities of data at high speed by connecting control units with two communication lines (CAN-H and CAN-L).
- Control units on the CAN network transmit signals using the CAN communication control circuit. They receive only necessary signals from other control units to operate various functions.
- CAN communication lines adopt twisted-pair line style (two lines twisted) for noise immunity.

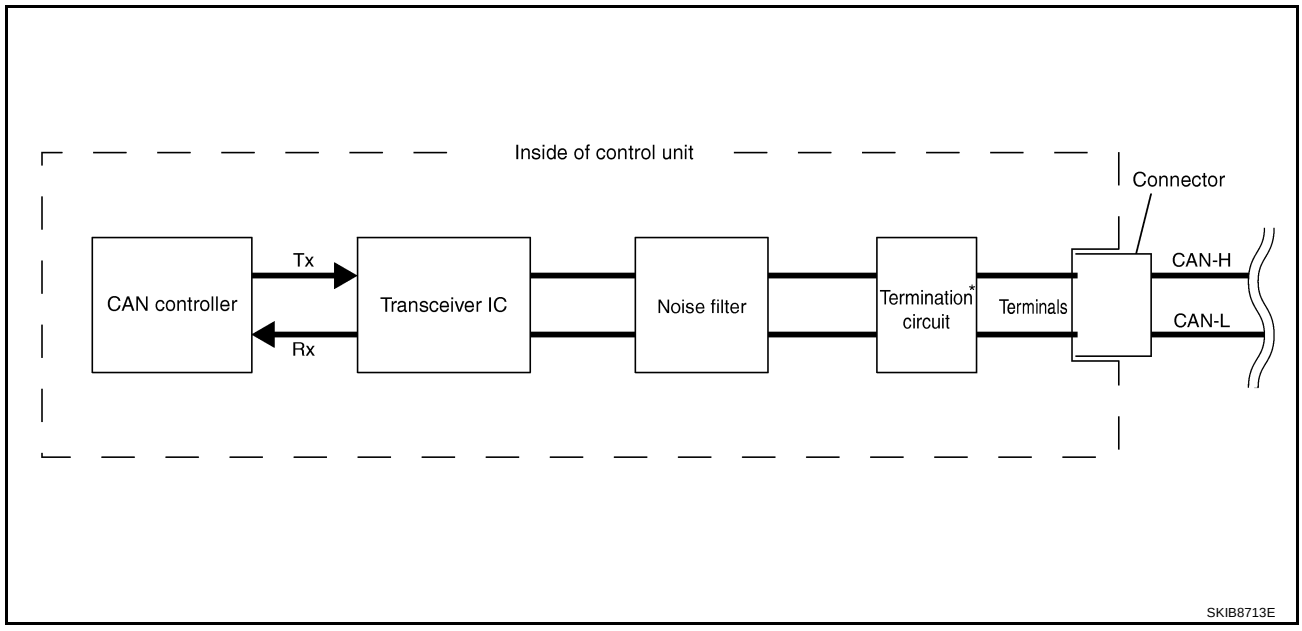
SYSTEM DIAGRAM



Each control unit passes an electric current to the termination circuits when transmitting CAN communication signal. The termination circuits produce an electrical potential difference between CAN-H and CAN-L. CAN communication system transmits and receives CAN communication signals by the potential difference.

Component	Description
Main line	CAN communication line between splices
Branch line	CAN communication line between splice and a control unit
Splice	A point connecting a branch line with a main line
Termination circuit	Refer to LAN-5, "CAN COMMUNICATION CONTROL CIRCUIT" .

CAN COMMUNICATION CONTROL CIRCUIT



Component	System description
CAN controller	It controls CAN communication signal transmission and reception, error detection, etc.
Transceiver IC	It converts digital signal into CAN communication signal, and CAN communication signal into digital signal.
Noise filter	It eliminates noise of CAN communication signal.
Termination circuit* (Resistance of approx. 120 Ω)	It produces potential difference.

*: These are the only control units wired with both ends of CAN communication system.

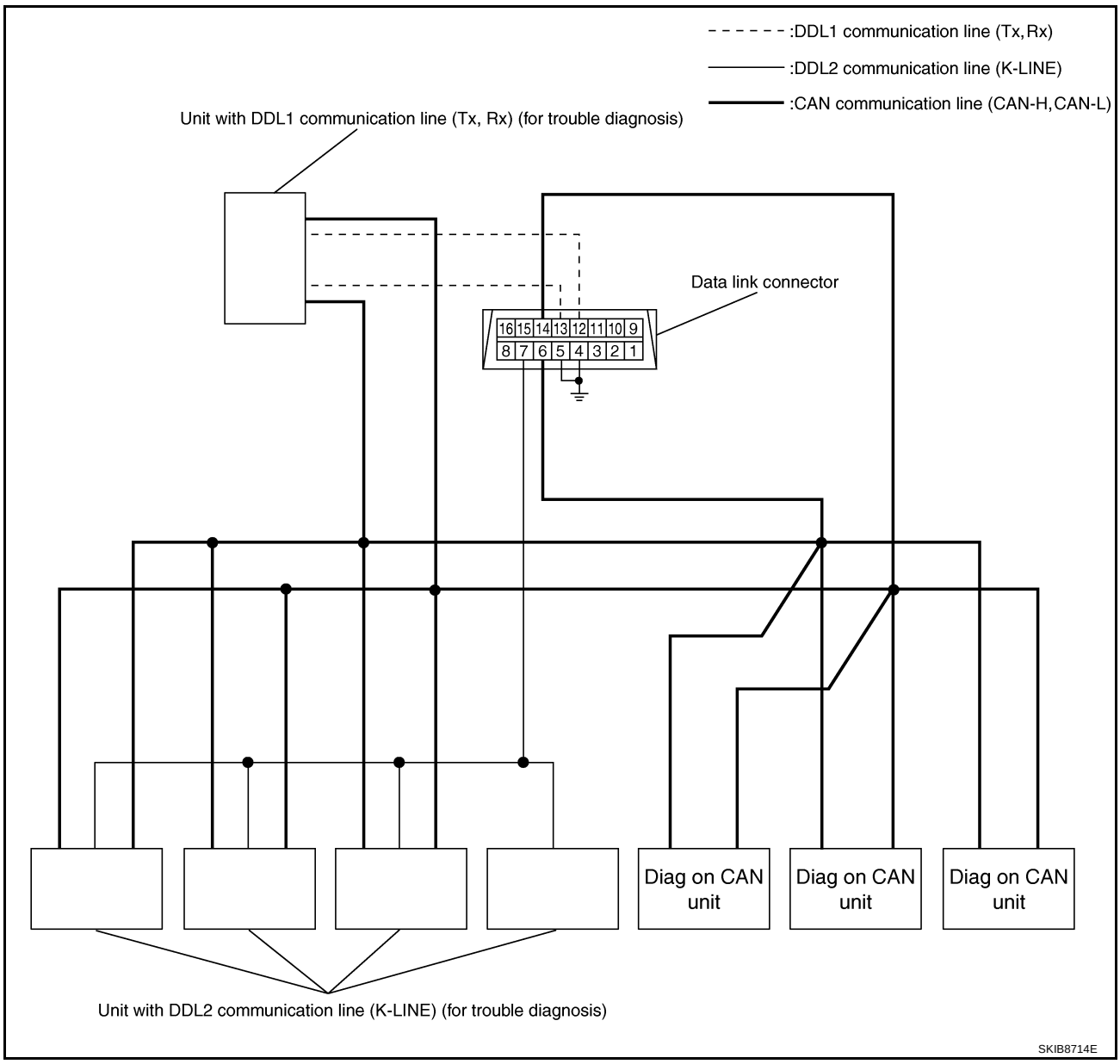
Diag on CAN

NKS004PD

DESCRIPTION

"Diag on CAN" is a diagnosis using CAN communication instead of previous DDL1 and DDL2 communication line, between control unit and diagnosis unit.

SYSTEM DIAGRAM



Name	Harness	Description
DDL1	Tx Rx	It is used for trouble diagnosis. (CAN-H and CAN-L are used for controlling)
DDL2	K-LINE	It is used for trouble diagnosis. (CAN-H and CAN-L are used for controlling)
Diag on CAN	CAN-H CAN-L	It is used for trouble diagnosis and control.

TROUBLE DIAGNOSIS

PFP:00004

Condition of Error Detection

NKS004PE

"U1000" or "U1001" is indicated on SELF-DIAG RESULTS on CONSULT-III if CAN communication signal is not transmitted or received between units for 2 seconds or more.

CAN COMMUNICATION SYSTEM ERROR

- CAN communication line open (CAN-H, CAN-L, or both)
- CAN communication line short (ground, between CAN communication lines, other harnesses)
- Error of CAN communication control circuit of the unit connected to CAN communication line

WHEN INDICATED "U1000" OR "U1001" IS INDICATED EVEN THOUGH CAN COMMUNICATION SYSTEM IS NORMAL

- Removal/installation of parts: Error may be detected when removing and installing CAN communication unit and related parts while turning the ignition switch ON. (A DTC except for CAN communication may be detected.)
- Fuse blown out (removed): CAN communication of the unit may cease.
- Voltage drop: Error may be detected if voltage drops due to discharged battery when turning the ignition switch ON (Depending on the control unit which carries out CAN communication).
- Error may be detected if the power supply circuit of the control unit, which carries out CAN communication, malfunctions (Depending on the control unit which carries out CAN communication).
- Error may be detected if reprogramming is not completed normally.

NOTE:
CAN communication system is normal if "U1000" or "U1001" is indicated on SELF-DIAG RESULTS of CONSULT-III under the above conditions. Erase the memory of the self-diagnosis of each unit.

Symptom When Error Occurs in CAN Communication System

NKS004PF

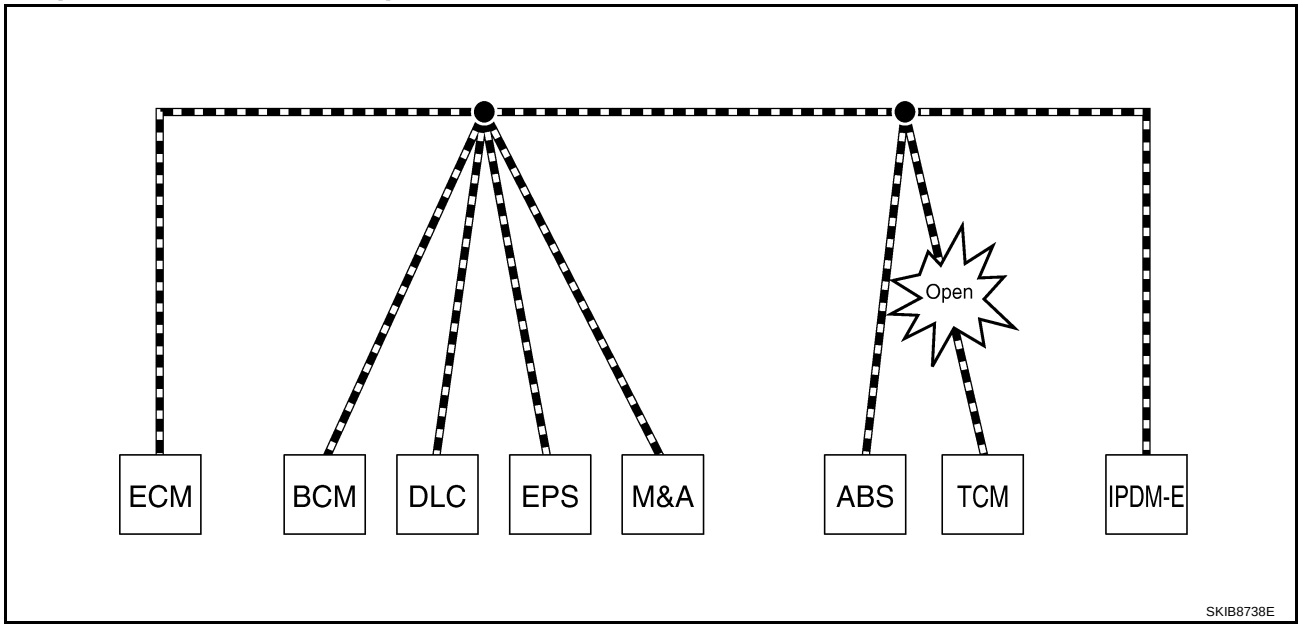
In CAN communication system, multiple units mutually transmit and receive signals. Each unit cannot transmit and receive signals if any error occurs on CAN communication line. Under this condition, multiple control units related to the root cause malfunction or go into fail-safe mode.

ERROR EXAMPLE

NOTE:

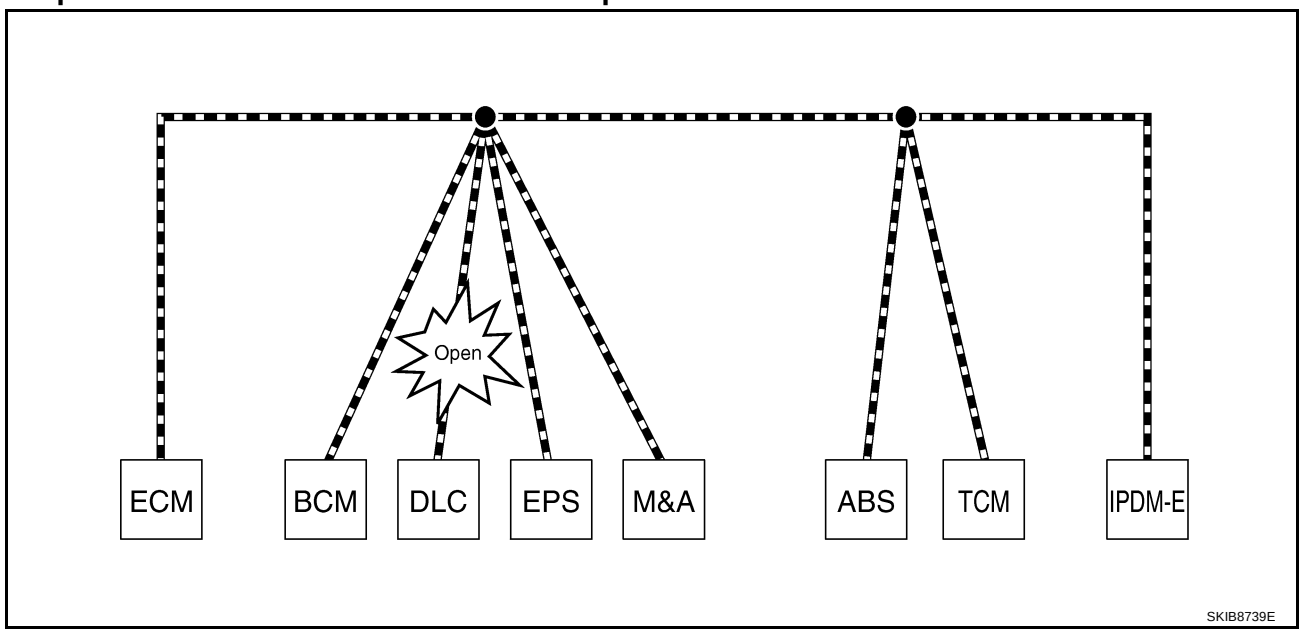
- Each vehicle differs in symptom of each unit under fail-safe mode and CAN communication line wiring.
- Refer to LAN-41, "Abbreviation List" for the unit abbreviation.

Example: TCM branch line open circuit



Unit name	Symptom
ECM	Engine torque limiting is affected, and shift harshness increases.
BCM	Reverse warning chime does not sound.
EPS control unit	Normal operation.
Combination meter	● Shift position indicator and OD OFF indicator turn OFF. ● Warning lamps turn ON.
ABS actuator and electric unit (control unit)	Normal operation.
TCM	No impact on operation.
IPDM E/R	Normal operation.

Example: Data link connector branch line open circuit



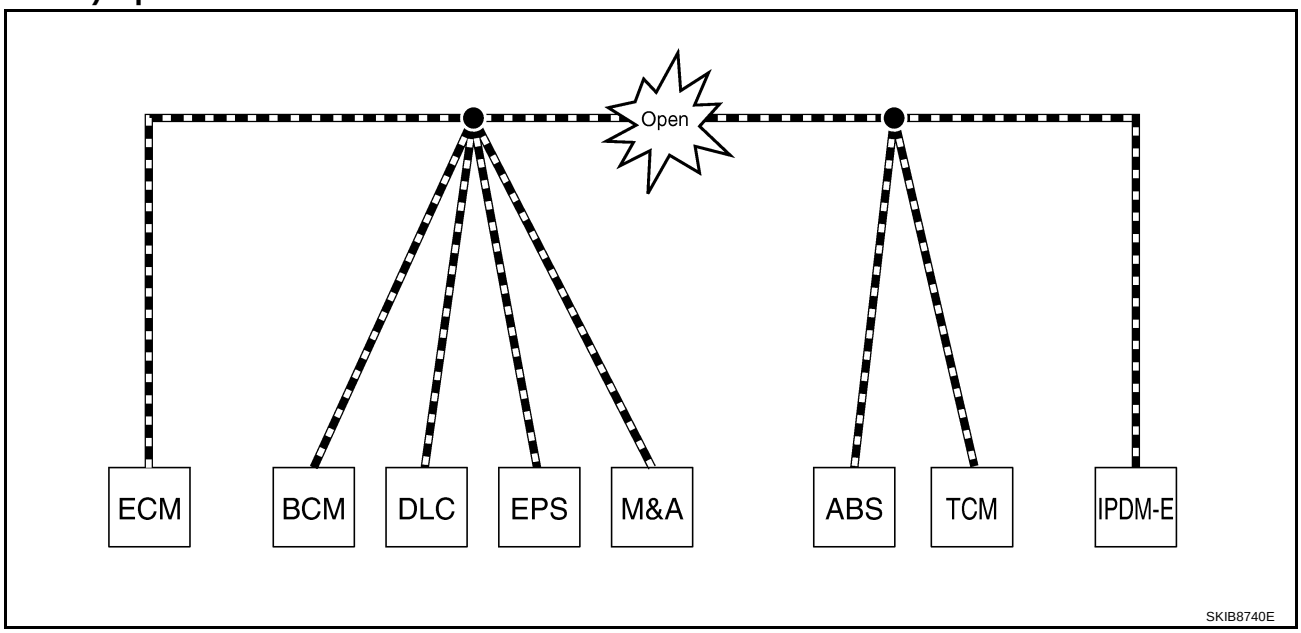
Unit name	Symptom
ECM	Normal operation.
BCM	
EPS control unit	
Combination meter	
ABS actuator and electric unit (control unit)	
TCM	
IPDM E/R	

NOTE:

- When data link connector branch line is open, transmission and reception of CAN communication signals is not affected. Therefore, no symptoms occur. However, be sure to repair malfunctioning circuit.
- When data link connector branch line is open, “ECU list” displayed on the CONSULT-III “CAN DIAG SUPPORT MNTR” may be the same as when the CAN communication line has short-circuit. However, symptoms differ depending on the case. See below chart for the differences.

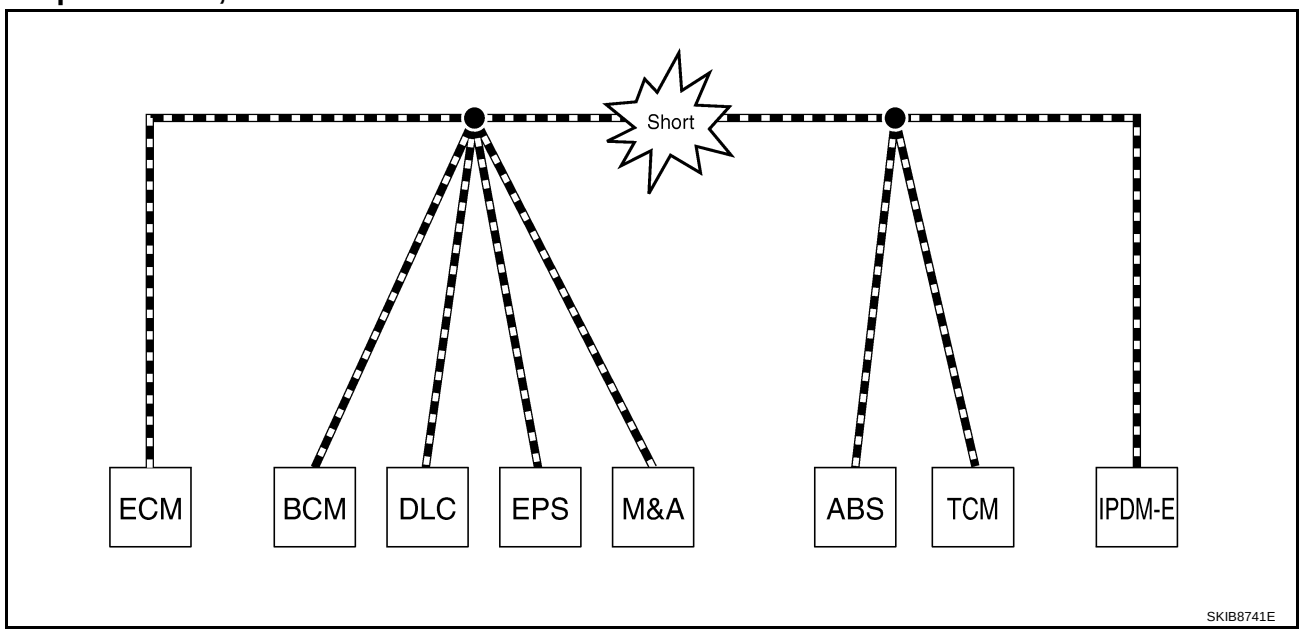
	“ECU list” on the “CAN DIAG SUPPORT MNTR” (CONSULT-III)	Difference of symptom
Data link connector branch line open circuit	All Diag on CAN units are not indicated.	Normal operation.
CAN-H, CAN-L harness short-circuit		Most the units which are connected to the CAN communication system enter fail-safe mode or are deactivated.

Example: Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Open Circuit



Unit name	Symptom
ECM	Engine torque limiting is affected, and shift harshness increases.
BCM	● Reverse warning chime does not sound. ● The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position.
EPS control unit	The steering effort increases.
Combination meter	● The shift position indicator and OD OFF indicator turn OFF. ● The speedometer is inoperative. ● The odo/trip meter stops.
ABS actuator and electric unit (control unit)	Normal operation.
TCM	No impact on operation.
IPDM E/R	When the ignition switch is ON, ● The headlamps (Lo) turn ON. ● The cooling fan continues to rotate.

Example: CAN-H, CAN-L Harness Short Circuit



Unit name	Symptom
ECM	● Engine torque limiting is affected, and shift harshness increases. ● Engine speed drops.
BCM	● Reverse warning chime does not sound. ● The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position. ● The room lamp does not turn ON. ● The engine does not start (if an error or malfunction occurs while turning the ignition switch is OFF.) ● The steering lock does not release (if an error or malfunction occurs while turning the ignition switch is OFF.)
EPS control unit	The steering effort increases.
Combination meter	● The tachometer and the speedometer do not move. ● Warning lamps turn ON. ● Indicator lamps do not turn ON.
ABS actuator and electric unit (control unit)	Normal operation.
TCM	No impact on operation.
IPDM E/R	When the ignition switch is ON, ● The headlamps (Lo) turn ON. ● The cooling fan continues to rotate.

Self-Diagnosis

NKS004PG

DTC	Self-diagnosis item (CONSULT-III indication)	DTC detection condition	Inspection/Action
U1000	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.	Refer to LAN-15, "TROUBLE DIAGNOSES WORK FLOW" .
		When a control unit (except for ECM) is not transmitting or receiving CAN communication signal for 2 seconds or more.	
U1001	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	
U1002	SYSTEM COMM	When a control unit is not transmitting or receiving CAN communication signal for 2 seconds or less.	Start the inspection. Refer to the applicable section of the indicated control unit.
U1010	CONTROL UNIT [CAN]	When an error is detected during the initial diagnosis for CAN controller of each control unit.	Replace the control unit indicating “U1010”.

CAN Diagnostic Support Monitor

NKS004PH

CONSULT-III and CAN diagnostic support monitor (on-board diagnosis function) are used for detecting root cause.

MONITOR ITEM (CONSULT-III)

Example: CAN DIAG SUPPORT MNTR indication

Without PAST

ECM		
	PRSNT	PAST
INITIAL DIAG	OK	
TRANSMIT DIAG	OK	
TCM	OK	
VDC/TCS/ABS	UNKWN	
METER/M&A	OK	
ICC	UNKWN	
BCM/SEC	OK	
IPDM E/R	OK	

With PAST

ECM		
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	-	-
METER/M&A	OK	OK
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	OK	OK
EPS	-	-
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	OK	OK

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Without PAST

Item	PRSNT	Description
Initial diagnosis	OK	Normal at present
	NG	Control unit error (Except for some control units)
Transmission diagnosis	OK	Normal at present
	UNKWN	Unable to transmit signals for 2 seconds or more.
		Diagnosis not performed
Control unit name (Reception diagnosis)	OK	Normal at present
	UNKWN	Unable to receive signals for 2 seconds or more.
		Diagnosis not performed
		No control unit for receiving signals. (No applicable optional parts)

With PAST

Item	PRSNT	PAST	Description
Transmission diagnosis	OK	OK	Normal at present and in the past
		1 – 39	Normal at present, but unable to transmit signals for 2 seconds or more in the past. (The number indicates the number of ignition switch cycles from OFF to ON.)
	UNKWN	0	Unable to transmit signals for 2 seconds or more at present.
Control unit name (Reception diagnosis)	OK	OK	Normal at present and in the past
		1 – 39	Normal at present, but unable to receive signals for 2 seconds or more in the past. (The number indicates the number of ignition switch cycles from OFF to ON.)
	UNKWN	0	Unable to receive signals for 2 seconds or more at present
	–	–	Diagnosis not performed.
			No control unit for receiving signals. (No applicable optional parts)

MONITOR ITEM (ON-BOARD DIAGNOSIS)

NOTE:
For some models, CAN communication diagnosis result is received from the vehicle monitor. (CONSULT-III is not available.)

Example: Vehicle Display

Item	Result indicated	Error counter	Description
CAN_COMM (Initial diagnosis)	OK	0	Normal at present
	NG	1 – 50	Control unit error (The number indicates how many times diagnosis has been run.)
CAN_CIRC_1 (Transmission diagnosis)	OK	0	Normal at present
	UNKWN	1 – 50	Unable to transmit for 2 seconds or more at present. (The number indicates how many times diagnosis has been run.)
CAN_CIRC_2 – 9 (Reception diagnosis of each unit)	OK	0	Normal at present
	UNKWN	1 – 50	Unable to transmit for 2 seconds or more at present. (The number indicates how many times diagnosis has been run.)
			Diagnosis not performed.
			No control unit for receiving signals. (No applicable optional parts)

TROUBLE DIAGNOSES WORK FLOW

PFP:00004

Information Needed for Trouble Diagnosis

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CAN communication system performs trouble diagnosis with the following tools.

Tool	Usage
Interview sheet	For filling in vehicle information and interview with customer.
Data sheet	For copying on-board diagnosis data.
Diagnosis sheet	For detecting the root cause. (Diagnosis sheet includes system diagram for every CAN system type)
ECU list (On the “CAN DIAG SUPPORT MNTR”)	For checking the condition of control units and the status of CAN communication.
SELF-DIAG RESULTS (CONSULT-III)	
CAN DIAG SUPPORT MNTR (CONSULT-III)	
CAN communication signal chart	For converting information received from a customer into CAN communication signal transmission and reception. This information can be used to judge whether a circuit between control units is normal or abnormal.
Abbreviation list	For checking abbreviations in CAN communication signal chart and diagnosis sheet.

How to Use CAN Communication Signal Chart

NKS004PJ

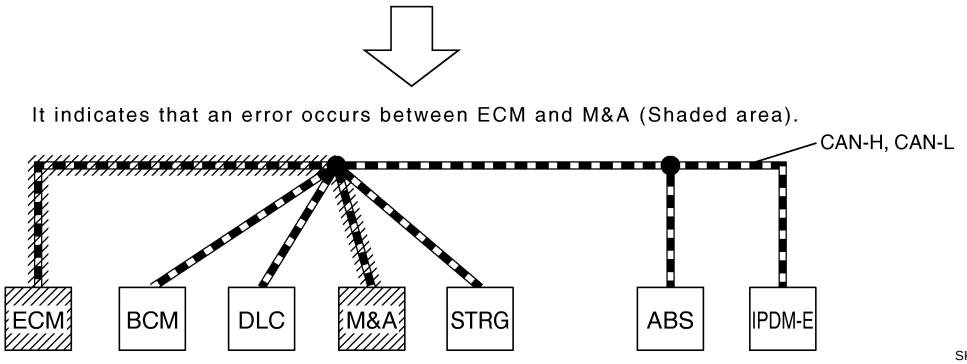
The CAN communication signal chart lists the signals needed for trouble diagnosis. It is useful for detecting the root cause by finding a signal related to the symptom, and by checking transmission and reception unit.

Example: Tachometer does not move even though the engine rotates.

T: Transmit R: Receive

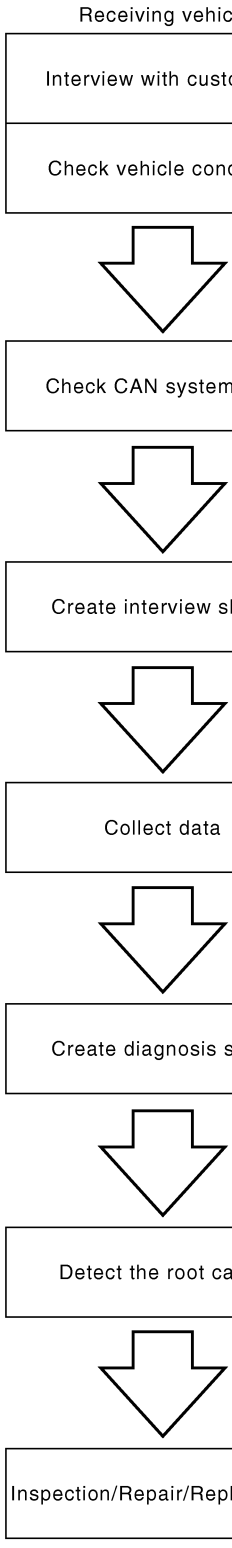
Signal name/Connecting unit	ECM	BCM	M&A	STRG	ABS	IPDM-E
A/C compressor feedback signal	T		R			
A/C compressor request signal	T					R
Accelerator pedal position signal	T				R	
Cooling fan motor operation signal	T					R
Engine coolant temperature signal	T		R			
Engine speed signal	T		R		R	
Fuel consumption monitor signal	T		R			
Malfunction indicator lamp signal	T		R			
A/C switch signal	R	T				
Ignition switch signal		T				R
Sleep/wake up signal		T	R			R

No communication between ECM and M&A.



Trouble Diagnosis Flow Chart

NKS004PK



- Interview with customer. (Since when? In which condition? What symptoms? etc.)
- Check whether or not “U1000” or “U1001” is indicated on self-diagnosis results.
- Check whether or not it is reproduced error.
- Check CAN system type with CAN system type specification chart.
- Fill in interviewed items from customer on the interview sheet.
- Print out or save CONSULT-III data (SELF-DIAG RESULTS and CAN DIAG SUPPORT MNTR).
- Check the diagnosis result of CAN communication with on-board diagnosis function, and copy the item on on-board diagnosis copy sheet.
- Print out applicable CAN system type diagnosis sheet.
- Make sure that all ECUs are received, referring to “ECU list” on the CAN DIAG SUPPORT MNTR.
- Detect the root cause with diagnosis sheet.
- Inspect the root cause and repair or replace the applicable parts.

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Trouble Diagnosis Procedure

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INTERVIEW WITH CUSTOMER

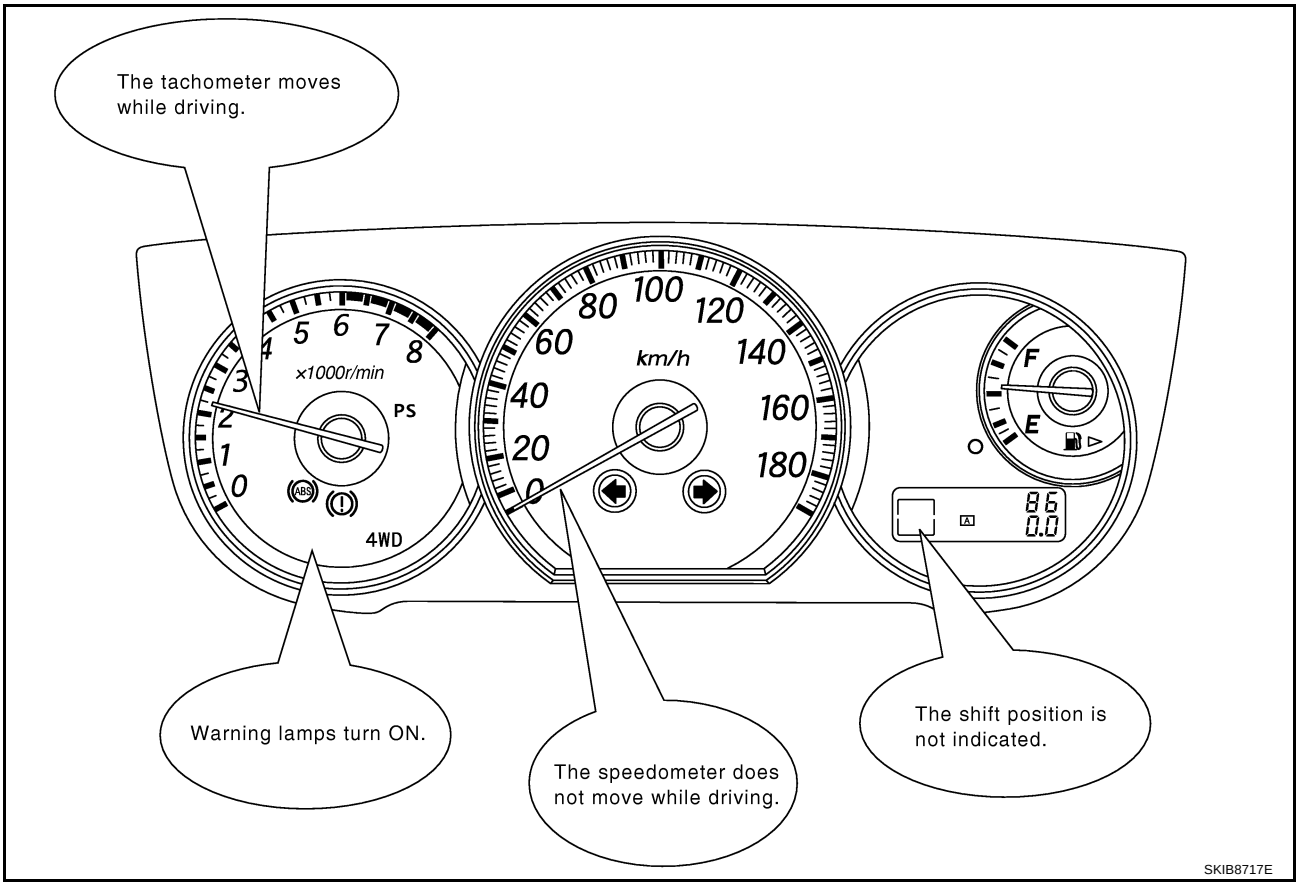
Interview with the customer is important to detect the root cause of CAN communication system errors and to understand vehicle condition and symptoms for proper trouble diagnosis.

Points in interview

- What: Parts name, system name
- When: Date, Frequency
- Where: Road condition, Place
- In what condition: Driving condition/environment
- Result: Symptom

NOTE:

- Check normal units as well as error symptoms.
  - Example: Circuit between ECM and the combination meter is judged normal if the customer indicates tachometer functions normally.
- When a CAN communication system error is present, multiple control units may malfunction or go into fail-safe mode.
- Indication of the combination meter is important to detect the root cause because it is the most obvious from the customer, and it performs CAN communication with many units.



INSPECTION OF VEHICLE CONDITION

- Check whether or not “U1000” or “U1001” is indicated on “SELF-DIAG RESULTS” by CONSULT-III.

  NOTE:
  Root cause cannot be detected using the procedure in this section if “U1000” or “U1001” is not indicated.
- Check whether the symptom is reproduced or not.

  NOTE:
  - Never turn the ignition switch OFF or disconnect the battery cable while the reproducing the error. The error may temporarily correct itself, making it difficult to determine the root cause.
  - The procedures for present errors differ from the procedures for past errors. Refer to LAN-25, "DETECT THE ROOT CAUSE" .

CHECK OF CAN SYSTEM TYPE (HOW TO USE CAN SYSTEM TYPE SPECIFICATION CHART)

Determine CAN system type based on vehicle equipment. Then choose the correct diagnosis sheet.

NOTE:

There are two styles for CAN system type specification charts. Depending on the number of available system types, either style A or style B may be used.

CAN System Type Specification Chart (Style A)

NOTE:

CAN system type is easily checked with the vehicle equipment identification information shown in the chart.

Example:

Vehicle is equipped as follows: Wagon, AWD, VQ35DE, CVT, VDC, and Intelligent Key system. (oval shows an example of CAN system type.)

CAN System Specification Chart

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

Body type	Wagon					
Axle	2WD				AWD	
Engine	QR25DE		VQ35DE			
Transmission	A/T		CVT			
Brake control	ABS				VDC	
Intelligent Key system		×		×		×
CAN system type	1	2	3	4	5	6
Diagnosis sheet	(XX-XX)	(XX-XX)	(XX-XX)	(XX-XX)	(XX-XX)	(XX-XX)
CAN communication signal chart	XX-XX. "TYPE 1/TYPE 2"		XX-XX. "TYPE 3/TYPE 4"		XX-XX. "TYPE 5/TYPE 6"	

Check the vehicle equipment with the vehicle identification number plate.

Check the vehicle equipment.

The number indicates the CAN system type of the vehicle.

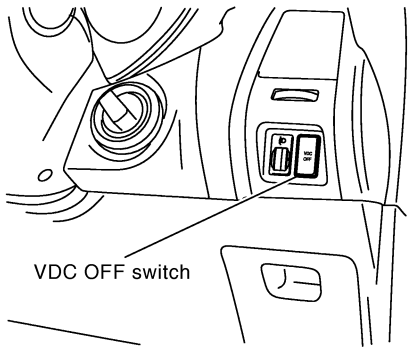
×: Applicable

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

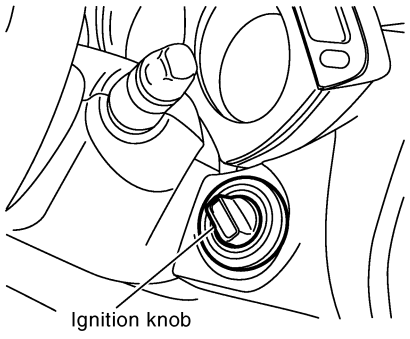
NOTE:

Check CAN system type from the vehicle shape and equipment.

With VDC



With Intelligent Key system



In the above example,

- Checking VDC OFF switch leads to judge whether or not VDC is equipped.
- Checking the ignition knob leads to judge whether or not Intelligent Key system is equipped.

For the above case, CAN system type is "6".

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CAN System Type Specification Chart (Style B)

NOTE:
CAN system type is easily checked with the vehicle equipment identification information shown in the chart.

Example:
Vehicle is equipped as follows: Sedan, 2WD, MR20DE, CVT, ABS, Active AFS, Intelligent Key system, Navigation system and Automatic drive positioner. (⬭ shows an example of CAN system type.)

CAN System Specification Chart

Refer to the specification as shown in the chart.

Body type	Sedan		
Axle	2WD		AWD
Engine	HR15DE	MR20DE	HR15DE
Transmission	A/T	CVT	A/T
Brake control	ABS		
Specification chart	XX.XX "SPECIFICATION CHART A"	YY.YY "SPECIFICATION CHART B"	XX.XX "SPECIFICATION CHART C"

Check the vehicle equipment with the vehicle identification number plate.
Check the vehicle equipment.
Select the applicable vehicle equipment. Refer to the specification chart.

×: Applicable

SPECIFICATION CHART B

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

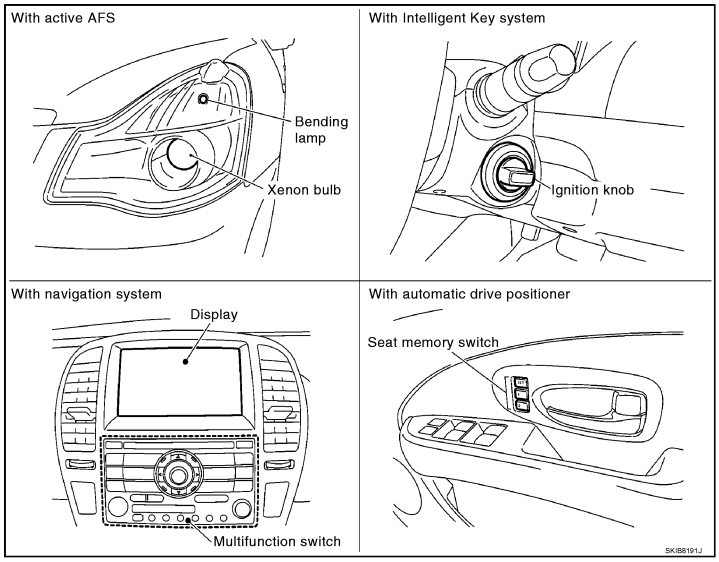
Body type	Sedan											
Axle	2WD											
Engine	MR20DE											
Transmission	CVT											
Brake control	ABS											
Active AFS		×			×	×			×	×		×
Intelligent Key system			×		×		×	×	×	×	×	×
Navigation system				×		×	×		×		×	×
Automatic drive positioner								×		×	×	×
CAN system type	9	10	11	12	13	14	15	16	17	18	19	20
Diagnosis sheet	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX
CAN communication signal chart	XX.XX "TYPE 9/TYPE 10/TYPE 11/TYPE 12/TYPE 13/TYPE 14/TYPE 15/TYPE 16/TYPE 17/TYPE 18/TYPE 19/TYPE 20"											

Check the vehicle equipment.
The number indicates the CAN system type of the vehicle.

×: Applicable

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

NOTE:
Check CAN system type from the vehicle shape and equipment.



In the above example,
- Checking Xenon bulb and bending lamp lead to judge whether or not Active AFS is equipped.
- Checking the ignition knob leads to judge whether or not Intelligent Key system is equipped.
- Checking display and multifunction switch lead to judge whether or not Navigation system is equipped.
- Checking seat memory switch leads to judge whether or not Automatic drive positioner is equipped.

For the above case, CAN system type is "20".

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CREATE INTERVIEW SHEET

Fill out the symptom described by the customer, vehicle condition, and CAN system type on the interview sheet.

Interview Sheet (Example)

CAN Communication System Diagnosis Interview Sheet

Date received: 3, Feb. 2005

Type: DBA-KG11

VIN No.: KG11-005040

Model: BDRARGZ397EDA-E-J-

First registration: 10, Jan. 2005

Mileage: 621

CAN system type: Type 19

Symptom (Results from interview with customer)

- Headlamps suddenly turn ON while driving the vehicle.
- The engine does not restart after stopping the vehicle and turning the ignition switch OFF.
- The cooling fan continues rotating while turning the ignition switch ON.

Condition at inspection

Error Symptom: (Present) / Past

The engine does not start.
While turning the ignition switch ON,
- The headlamps (Lo) turn ON, and the cooling fan continues rotating.
- The interior lamp does not turn ON.

On CONSULT-III screen,
- IPDM E/R is not indicated on SELECT SYSTEM.
- ENGINE: U1001
- BCM, ADAPTIVE LIGHT: U1000

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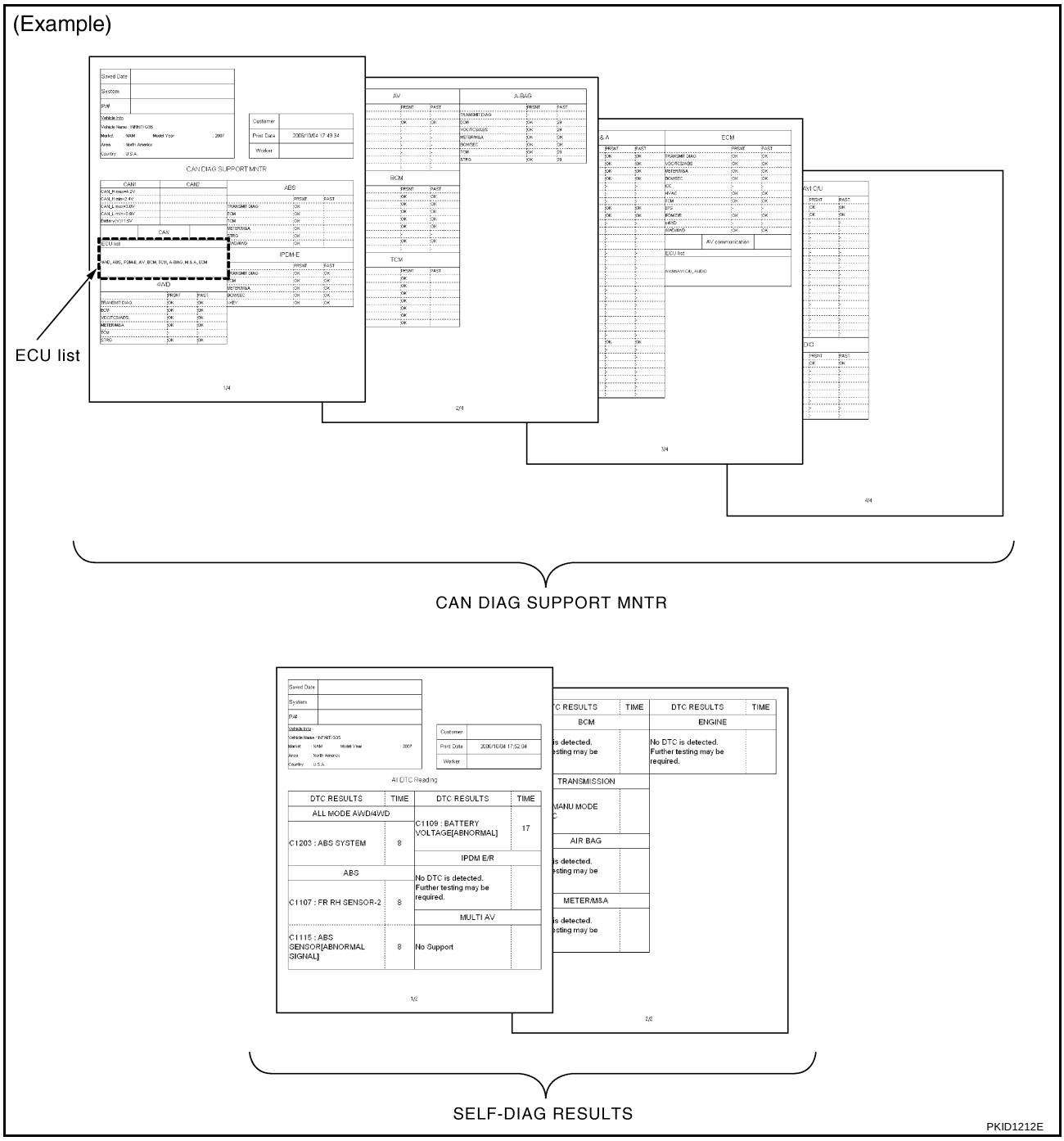
COLLECT DATA

Collect CONSULT-III Data

Print out or save the following CONSULT-III data.

- SELF-DIAG RESULTS
- CAN DIAG SUPPORT MNTR (“ECU list” included)

NOTE:
Some items may not be needed depending on CAN system type of vehicle.



Create On-board Diagnosis Copy Sheet

Display the trouble diagnosis result of CAN communication with the on-board diagnosis function on the vehicle monitor, etc. Copy them on the on-board diagnosis copy sheet.

NOTE:
For some models, CAN communication diagnosis result is received from the vehicle monitor. (CONSULT-III is not available.)

Example: Copy the diagnosis result of CAN communication from the vehicle monitor.

Vehicle monitor indication

CAN DIAG SUPPORT MONITOR

Delete

CAN_COMM	OK	0
CAN_CIRC_1	OK	0
CAN_CIRC_2	UNKWN	12
CAN_CIRC_3	UNKWN	12
CAN_CIRC_4	UNKWN	0
CAN_CIRC_5	OK	0
CAN_CIRC_6	UNKWN	0
CAN_CIRC_7	OK	0
CAN_CIRC_8	UNKWN	0
CAN_CIRC_9	UNKWN	50

Copy

Vehicle monitor (Display control unit) CAN DIAG SUPPORT MONITOR copy sheet

Indication item (Diagnosis item)	Vehicle monitor		Indication item (Diagnosis item)	Vehicle monitor	
	Result indicated	Error counter		Result indicated	Error counter
CAN_COMM (Initial diagnosis)	**OK**	**0**	CAN_CIRC_5 (Receive diagnosis of Unified meter and A/C amp.)	**OK**	**0**
CAN_CIRC_1 (Transmit diagnosis)	**OK**	**0**	CAN_CIRC_6	Not available	
CAN_CIRC_2 (Receive diagnosis of BCM)	**UNKWN**	**12**	CAN_CIRC_7 (Receive diagnosis of IPDM E/R)	**OK**	**0**
CAN_CIRC_3 (Receive diagnosis of ECM)	**UNKWN**	**12**	CAN_CIRC_8	Not available	
CAN_CIRC_4	Not available		CAN_CIRC_9	Not available	

Result indicated: Fill in the indication (OK, NG or UNKWN).
Error counter: Fill in the indicated number.

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CREATE DIAGNOSIS SHEET

NOTE:
Be sure to use the diagnosis sheet for the correct CAN system type.

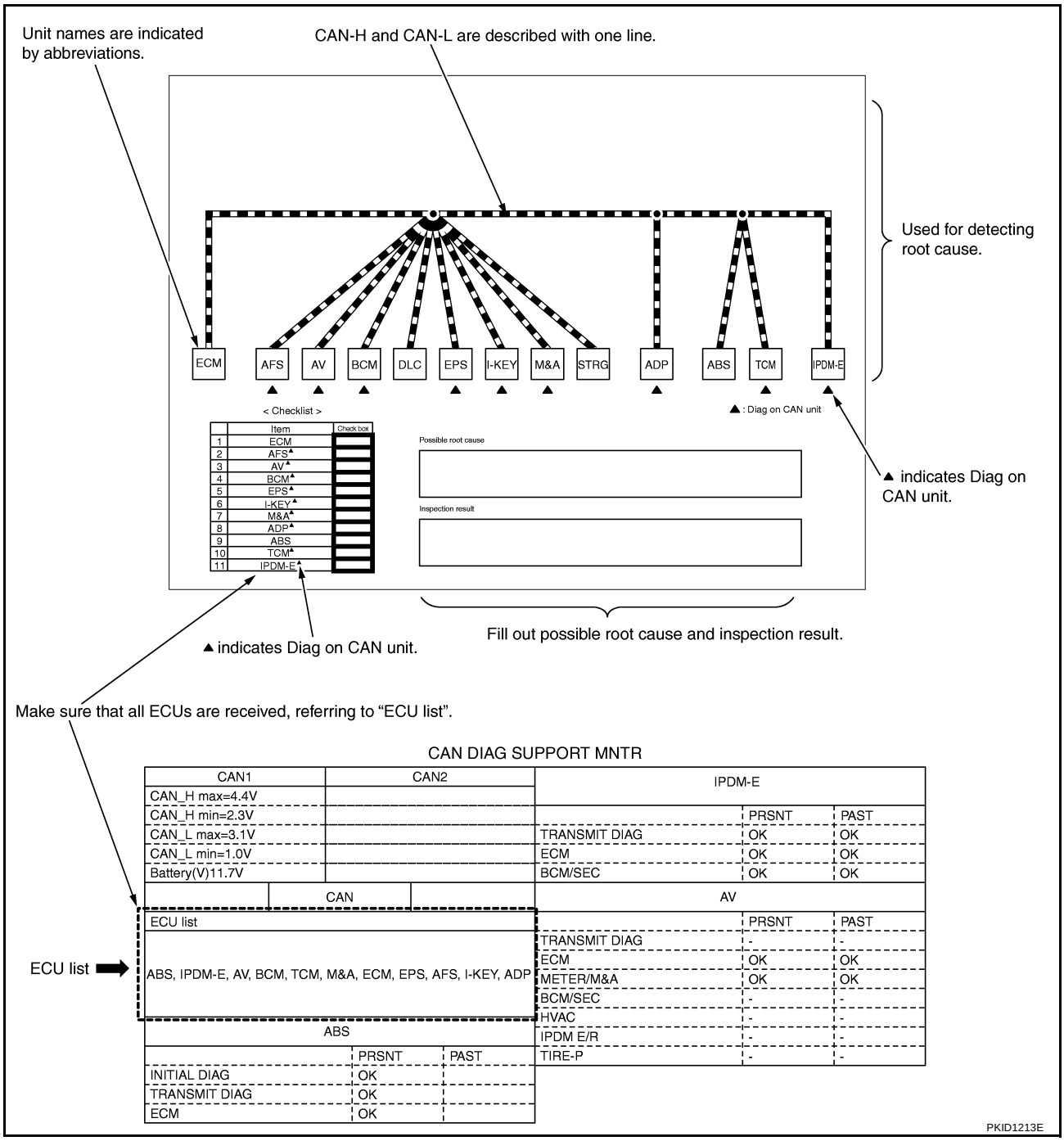
Print Diagnosis Sheet

Print the diagnosis sheet for the applicable CAN system type.

Check Collected Data

Make sure that all ECUs are received, referring to “ECU list”.

- For abbreviations, refer to LAN-41, "Abbreviation List" .



DETECT THE ROOT CAUSE

Identify the root cause using the created diagnosis sheet.

Identifying the root cause

- Draw a line on the diagnosis sheet to indicate the possible cause. Narrow the search.

  NOTE:
  - Color-code when drawing lines.
  - Do not draw a line onto a existing line.
- Drawing a line is not necessary if the circuit is shorted. Refer to LAN-32, "Present Error — Short Circuit —" , LAN-39, "Past Error — Short Circuit —" .

Refer to the following for details of the trouble diagnosis procedure.

- LAN-26, "Present Error — Open Circuit —"
- LAN-32, "Present Error — Short Circuit —"
- LAN-33, "Past Error — Open Circuit —"
- LAN-39, "Past Error — Short Circuit —"

NOTE:
When the root cause appears to be a branch line or short circuit, be sure to check the control unit as well as the communication line.

Present Error — Open Circuit —

Identify the error circuit using information from the “CAN DIAG SUPPORT MNTR” (“ECU list” included).

1. ECU list: Check the items indicated in “ECU list”. Draw a line on the diagnosis sheet to indicate the error circuit.

   NOTE:
   CAN communication line has no error if units other than Diag on CAN units are indicated. An error may be on the power supply of the control unit, DDL1 line or DDL2 line.

a. “TCM” which is Diag on CAN unit, is not indicated on “ECU list”. This indicates that DLC is not receiving a signal from TCM. Draw a line to indicate an error between DLC and TCM (line 1-a in the figure).

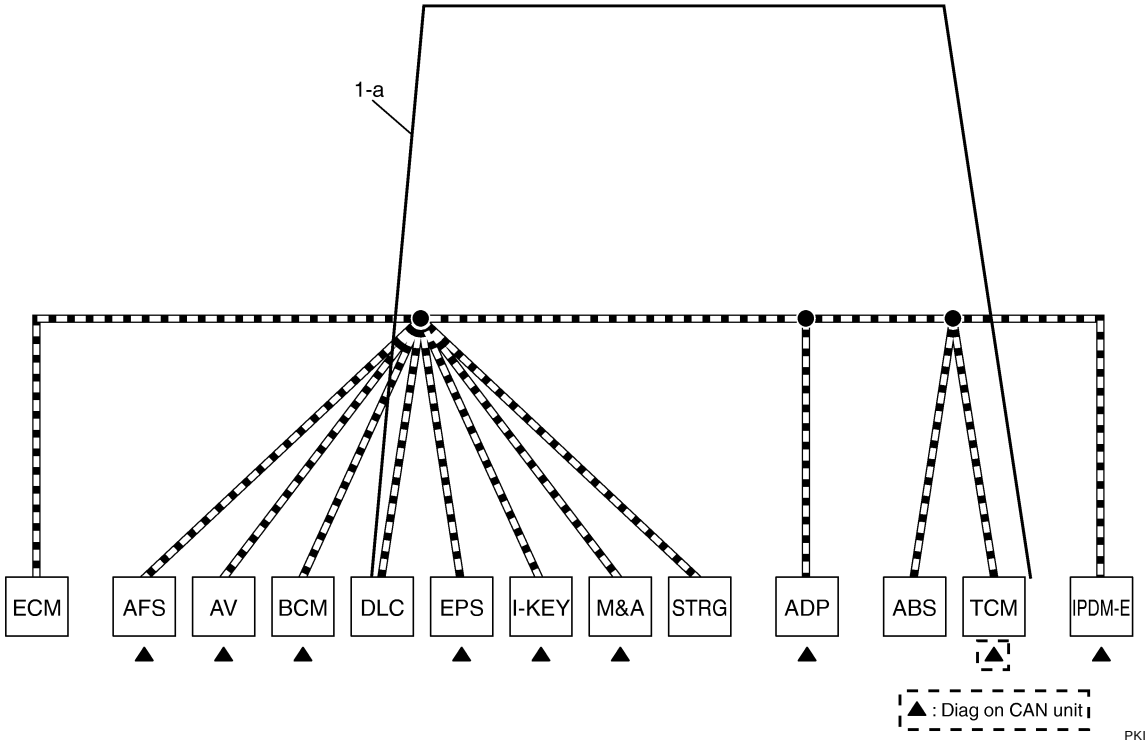
   NOTE:
   - Diag on CAN units are not indicated on the “ECU list” when the CAN line between Diag on CAN unit and the data link connector is open.
   - For a description of Diag on CAN, refer to LAN-6, "Diag on CAN" .

(Example)

CAN DIAG SUPPORT MNTR

CAN1	CAN2	IPDM-E		
CAN_H max=4.3V				
CAN_H min=1.0V			PRSNT	PAST
CAN_L max=3.1V		TRANSMIT DIAG	OK	OK
CAN_L min=0.6V		ECM	OK	OK
Battery(V)11.7V		BCM/SEC	OK	OK

CAN	AV		
ECU list		PRSNT	PAST
	TRANSMIT DIAG	-	-
ABS, IPDM-E, AV, BCM, M&A, ECM, EPS, AFS, I-KEY, ADP	ECM	OK	OK
	METER/M&A	OK	OK
	BCM/SEC	-	-
	HVAC	-	-
	[illegible]	-	



2. CAN DIAG SUPPORT MNTR: Check each item on “CAN DIAG SUPPORT MNTR”. Draw a line on the diagnosis sheet to indicate the error circuit.

a. Reception item of “ECM”: On “TCM”, “UNKWN” is indicated. This means ECM cannot receive the signal from TCM. Draw a line to indicate an error between ECM and TCM (line 2-a in the figure).

NOTE:
If “UNKWN” is indicated on “TRANSMIT DIAG”, then the control unit cannot transmit CAN communication signal to each unit. Draw a line between the control unit and the splice.

b. Reception item of “AFS”: On “TCM”, “UNKWN” is indicated. This means AFS cannot receive the signal from TCM. Draw a line to indicate an error between AFS and TCM (line 2-b in the figure).

c. Reception item of “AV”: “UNKWN” is not indicated. This indicates normal communication between AV and its receiving units. Do not draw any line.

(Example)

ECM

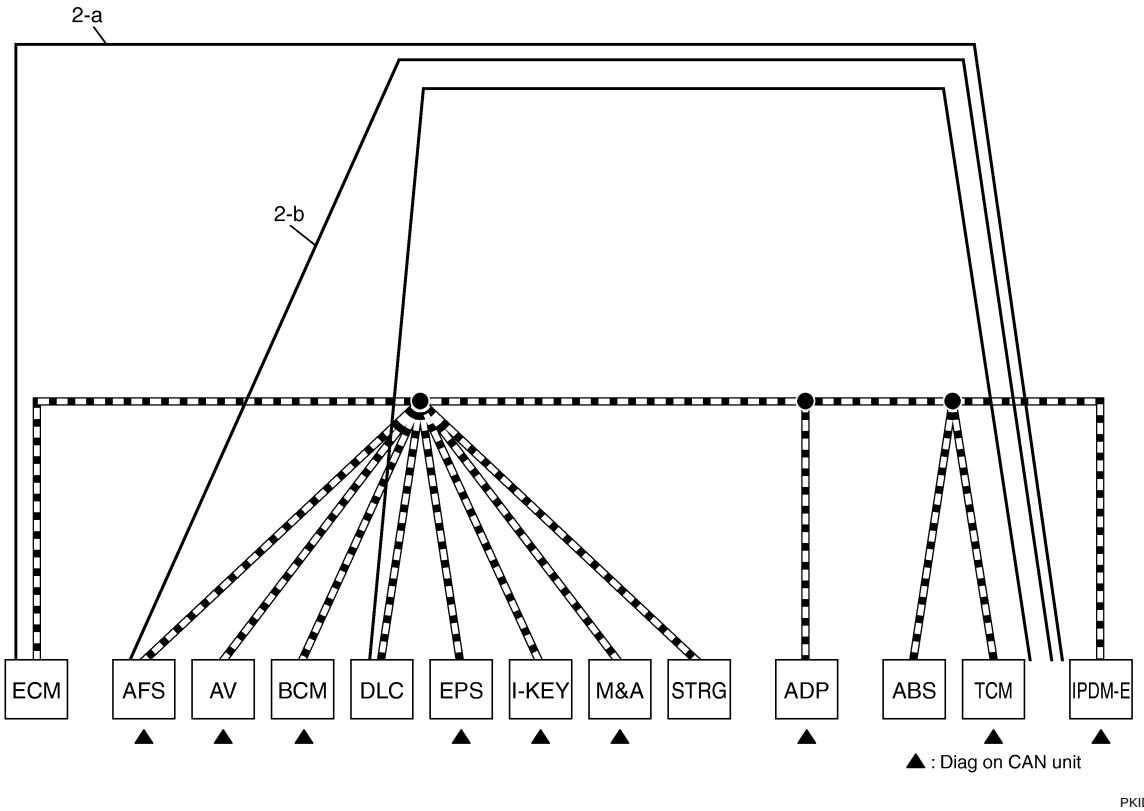
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	OK	OK
METER/M&A	-	-
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	UNKWN	0
EPS	OK	OK
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	-	-

AFS

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	OK
METER/M&A	OK	OK
TCM	UNKWN	0
STRG	OK	OK
EPS	-	-
IPDM E/R	OK	OK

AV

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	OK
METER/M&A	OK	OK
BCM/SEC	-	-
HVAC	-	-
IPDM E/R	-	-
TIRE-P	-	-



d. Reception item of “BCM”: On “TCM”, “UNKWN” is indicated. This means BCM cannot receive the signal from TCM. Draw a line to indicate an error between BCM and TCM (line 2-d in the figure).

e. Reception item of “EPS” and “I-KEY”: “UNKWN” is not indicated. This indicates normal communication between EPS and I-KEY and their receiving units. Do not draw any line.

NOTE:
On CAN DIAG SUPPORT MNTR (without PAST), “UNKWN” is indicated even though the item is not used in the trouble diagnosis. For the details of each item on CAN diagnostic support monitor, refer to LAN-44, "CAN Diagnostic Support Monitor" .

(Example)

BCM

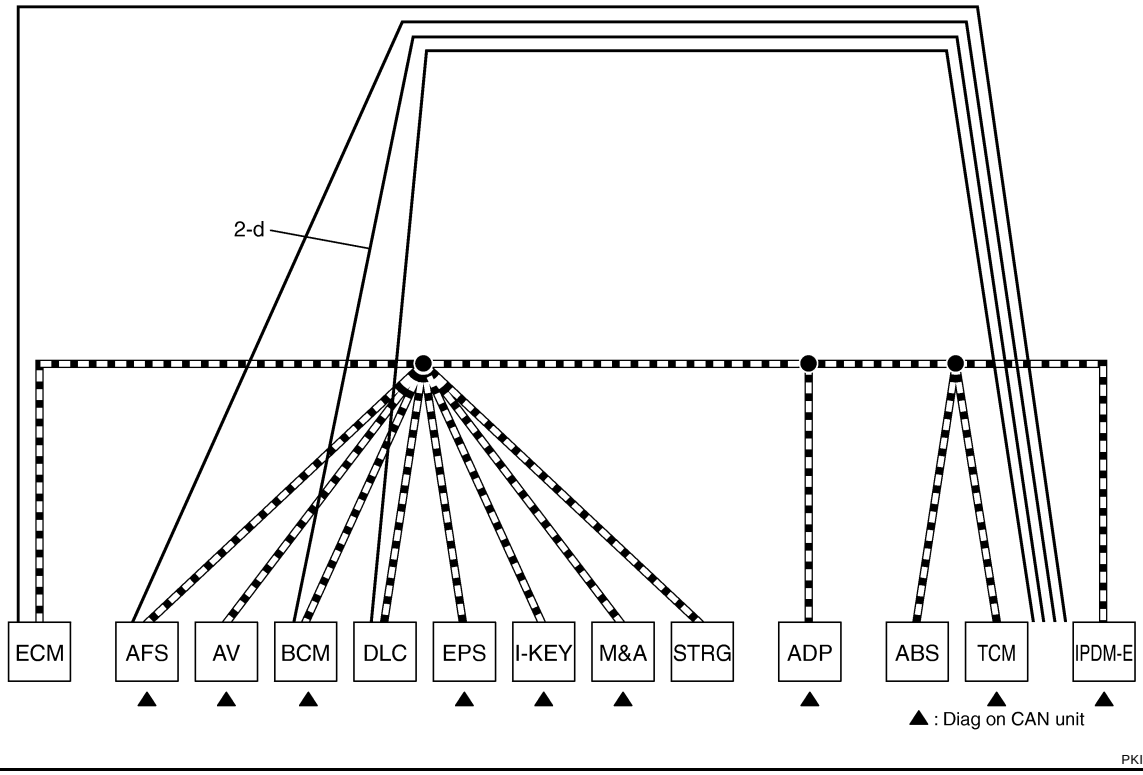
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
METER/M&A	OK	OK
TCM	UNKWN	0
MULTI AV	-	-
IPDM E/R	OK	OK
I-KEY	OK	OK

EPS

	PRSNT	PAST
TRANSMIT DIAG	OK	
ECM	OK	
VDC/TCS/ABS	OK	
METER/M&A	OK	

I-KEY

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
METER/M&A	OK	OK
BCM/SEC	OK	OK



f. Reception item of “M&A”: On “TCM”, “UNKWN” is indicated. This means M&A cannot receive the signal from TCM. Draw a line to indicate an error between M&A and TCM (line 2-f in the figure).

g. Reception item of “ADP”: On “TCM”, “UNKWN” is indicated. This means ADP cannot receive the signal from TCM. Draw a line to indicate an error between ADP and TCM (line 2-g in the figure).

h. Reception item of “ABS”: “UNKWN” is not indicated. This indicates normal communication between ABS and its receiving units. Do not draw any line.

(Example)

M&A

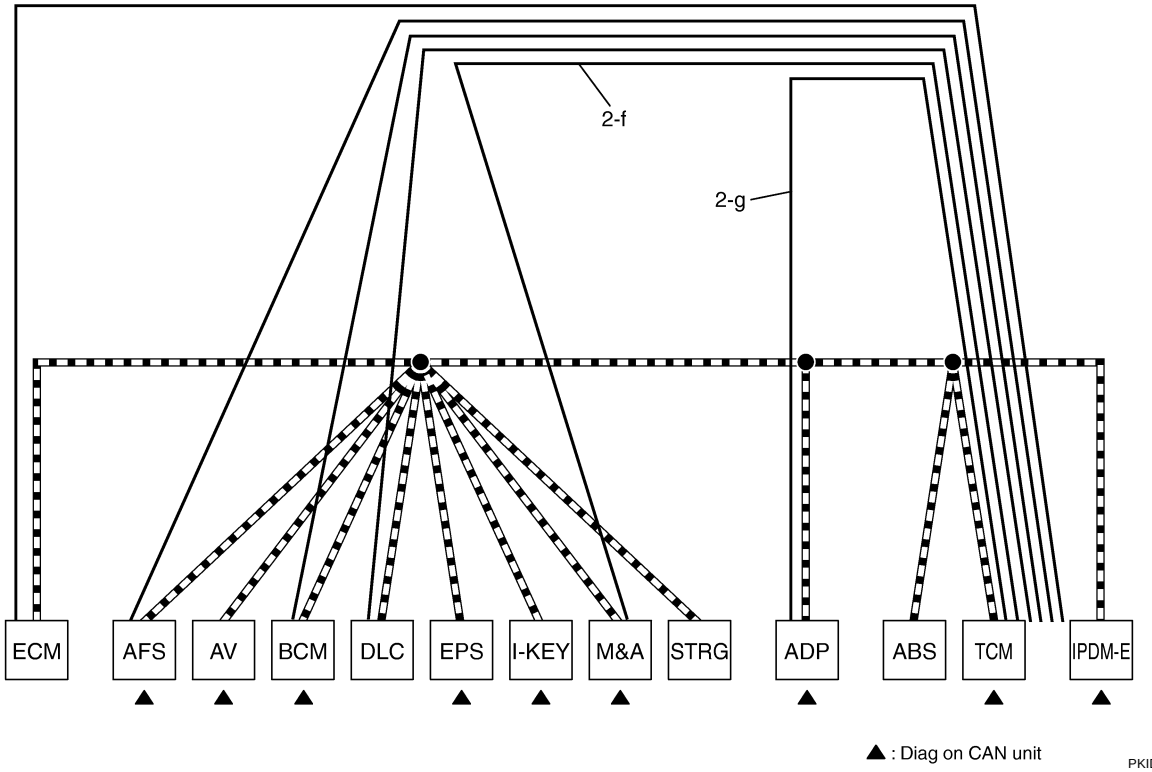
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
TCM	UNKWN	0
BCM/SEC	OK	OK
VDC/TCS/ABS	OK	OK
IPDM E/R	-	-
DISPLAY	-	-
I-KEY	OK	OK
EPS	OK	OK
AWD/4WD	-	-
e4WD	-	-
ICC	-	-
LANE KEEP	-	-
TIRE-P	-	-

ADP

	PRSNT	PAST
TRANSMIT DIAG	-	-
METER/M&A	OK	OK
BCM/SEC	OK	OK
TCM	UNKWN	0

ABS

	PRSNT	PAST
INITIAL DIAG	OK	
TRANSMIT DIAG	OK	
ECM	OK	



i. Reception item of “IPDM-E”: “UNKWN” is not indicated. This indicates normal communication between IPDM-E and its receiving units. Do not draw any line.

3. Based on information received from “CAN DIAG SUPPORT MNTR”, place a check mark on the known good CAN communication line between ECM and IPDM-E.

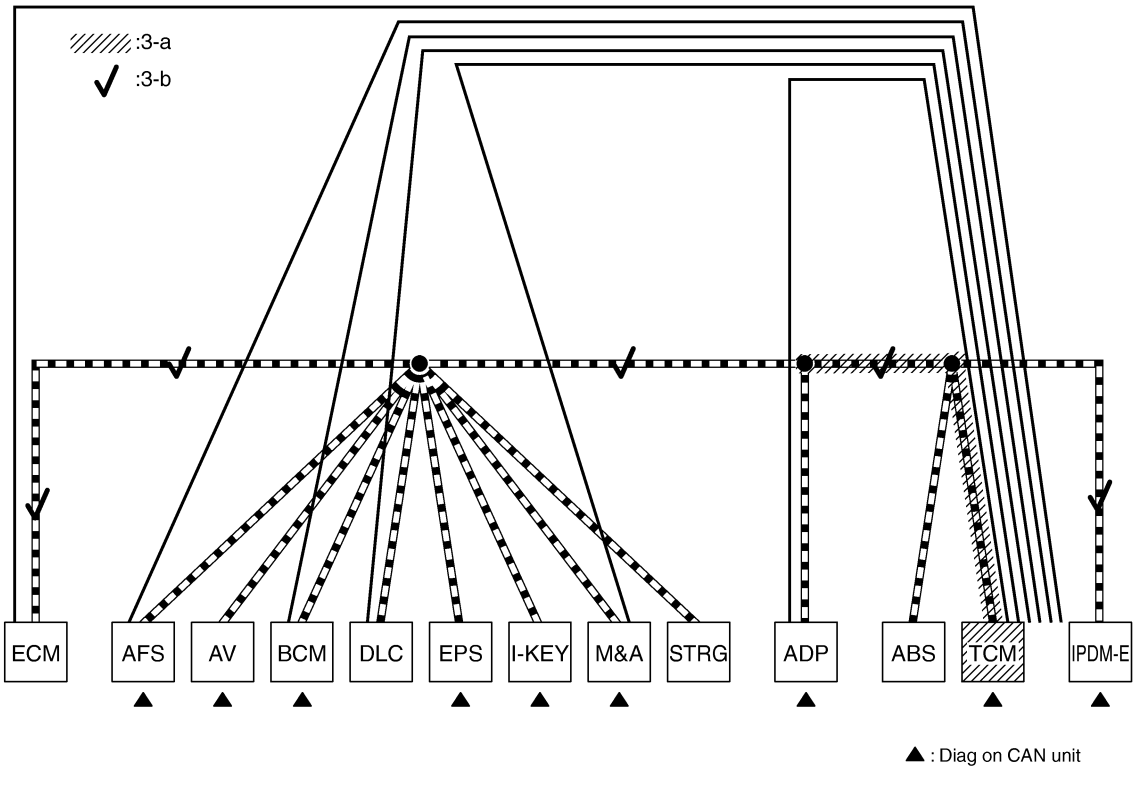
a. Through the previous procedure, the circuit between ADP splice and TCM has the most amount of lines (shade 3-a in the figure).

b. Place a check mark on the known good lines to establish the error circuit.
Reception item of “IPDM-E”: On “ECM”, “OK” is indicated. IPDM-E communicates normally with ECM. Put a check mark on the normal circuit between ECM and IPDM-E (check mark 3-b in the figure).

(Example)

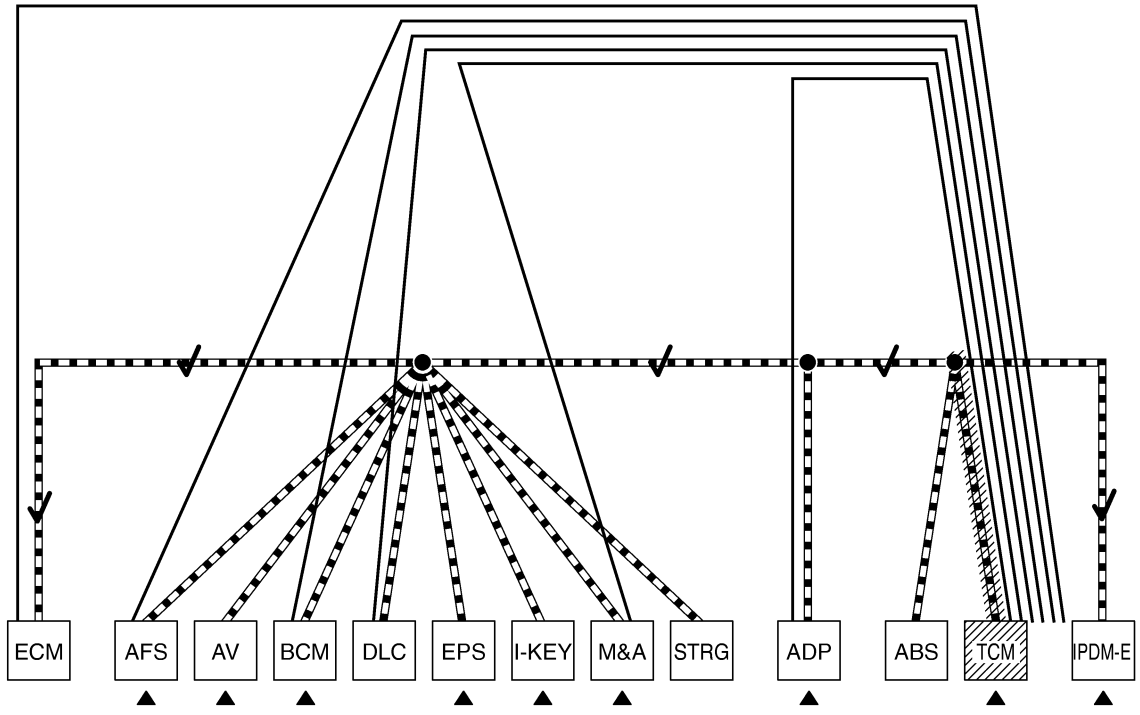
IPDM-E

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
BCM/SEC	OK	OK



4. Through the above procedure, the error is detected in the TCM branch line (shaded in the figure).
   NOTE:
   For abbreviations, refer to LAN-41, "Abbreviation List" .
5. Perform the inspection for the detected error circuit. For the inspection procedure, refer to LAN-65, "Malfunction Area Chart" .

(Example)



< Checklist >

	Item	Check box
1	ECM	✓
2	AFS▲	✓
3	AV▲	✓
4	BCM▲	✓
5	EPS▲	✓
6	I-KEY▲	✓
7	M&A▲	✓
8	ADP▲	✓
9	ABS	✓
10	TCM▲	N-IDC
11	IPDM-E▲	✓

Possible root cause

· Error between TCM and splice.
· Error in TCM.

Inspection result

PKID1219E

Present Error — Short Circuit —

When the symptoms listed below exist, a short circuit of the CAN communication line is a possible cause.

Received data

Item (CONSULT-III)	Indication
ECU list (on the CAN DIAG SUPPORT MNTR)	All Diag on CAN units are not indicated.
CAN DIAG SUPPORT MNTR	“UNKWN” is indicated under “TRANSMIT DIAG” and most reception items.

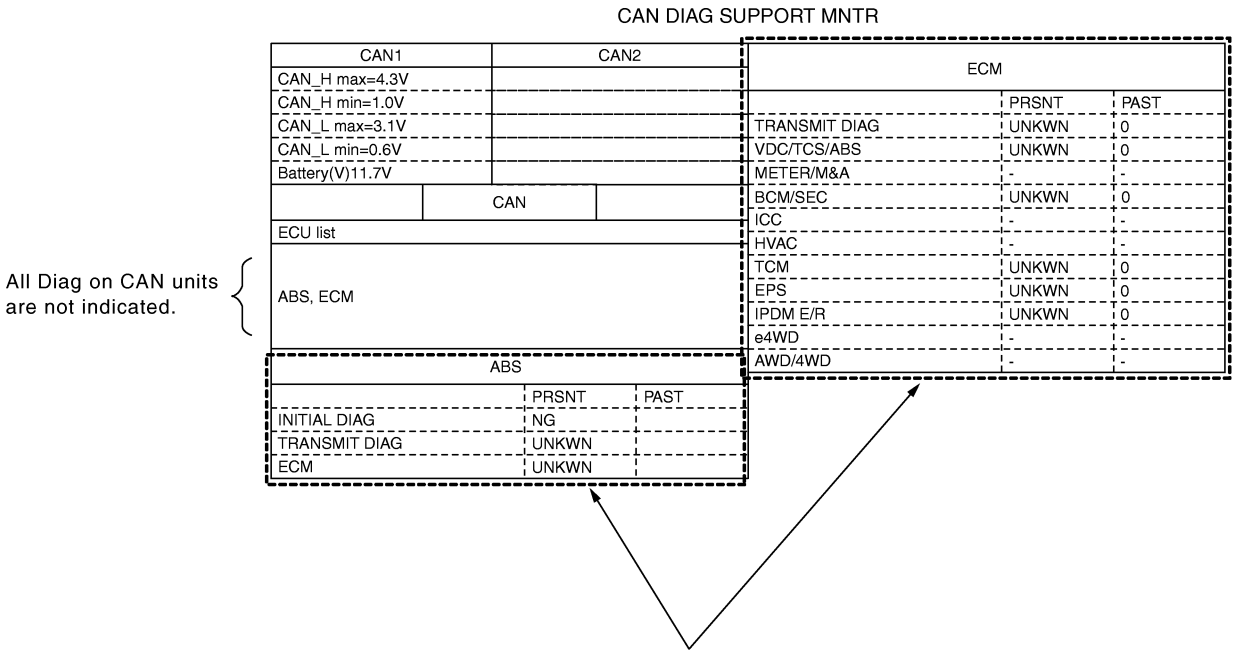
Error symptom

- Most the units connected to the CAN communication system go into fail-safe mode or are deactivated.

Inspection procedure

- Refer to LAN-65, "Malfunction Area Chart" .

(Example)



Past Error — Open Circuit —

Review CAN communication signal chart based on information received from the interview with the customer and on past error information from SELF-DIAG RESULTS and CAN DIAG SUPPORT MNTR.

1. SELF-DIAG RESULTS: Inspect the control units indicating “U1000” or “U1001” on SELF-DIAG RESULTS.

ALL DTC READING

DTC RESULTS	TIME	DTC RESULTS	TIME
ABS		BCM	
U1000 : CAN COMM CIRCUIT	3	No DTC is detected. Further testing may be required.	
IPDM E/R		TRANSMISSION	
No DTC is detected. Further testing may be required.		U1000 : CAN COMM CIRCUIT	3
MULTI AV		METER	
No DTC is detected. Further testing may be required.		U1000 : CAN COMM CIRCUIT	3

DTC RESULTS	TIME	DTC RESULTS	TIME
EPS		AUTO DRIVE POS.	
U1000 : CAN COMM CIRCUIT	PAST	No DTC is detected. Further testing may be required.	
ENGINE			
U1001 : CAN COMM CIRCUIT	1t		
ADAPTIVE LIGHT			
No DTC is detected. Further testing may be required.			
INTELLIGENT KEY			
No DTC is detected. Further testing may be required.			

PKID1221E

2. CAN DIAG SUPPORT MNTR (with PAST): Check the CAN DIAG SUPPORT MNTR (with PAST) of units indicating “U1000” or “U1001” on SELF-DIAG RESULTS. Draw a line on the diagnosis sheet to indicate the possible error circuit.

NOTE:
For the details of each indication on CAN DIAG SUPPORT MNTR, refer to LAN-44, "CAN Diagnostic Support Monitor" .

a. Reception item of “ECM”: “VDC/TCS/ABS”, “3” is indicated in the “PAST”. This means ECM could not receive the signal from ABS in the past. Draw a line between ECM and ABS (line 2-a in the figure).

b. Reception item of “M&A”: “VDC/TCS/ABS”, “3” is indicated in the “PAST”. This means M&A could not receive the signal from ABS in the past. Draw a line between M&A and ABS (line 2-b in the figure).

c. Reception item of “TCM”: “VDC/TCS/ABS”, “3” is indicated in the “PAST”. This means TCM could not receive the signal from ABS in the past. Draw a line between TCM and ABS (line 2-c in the figure).

(Example)

ECM

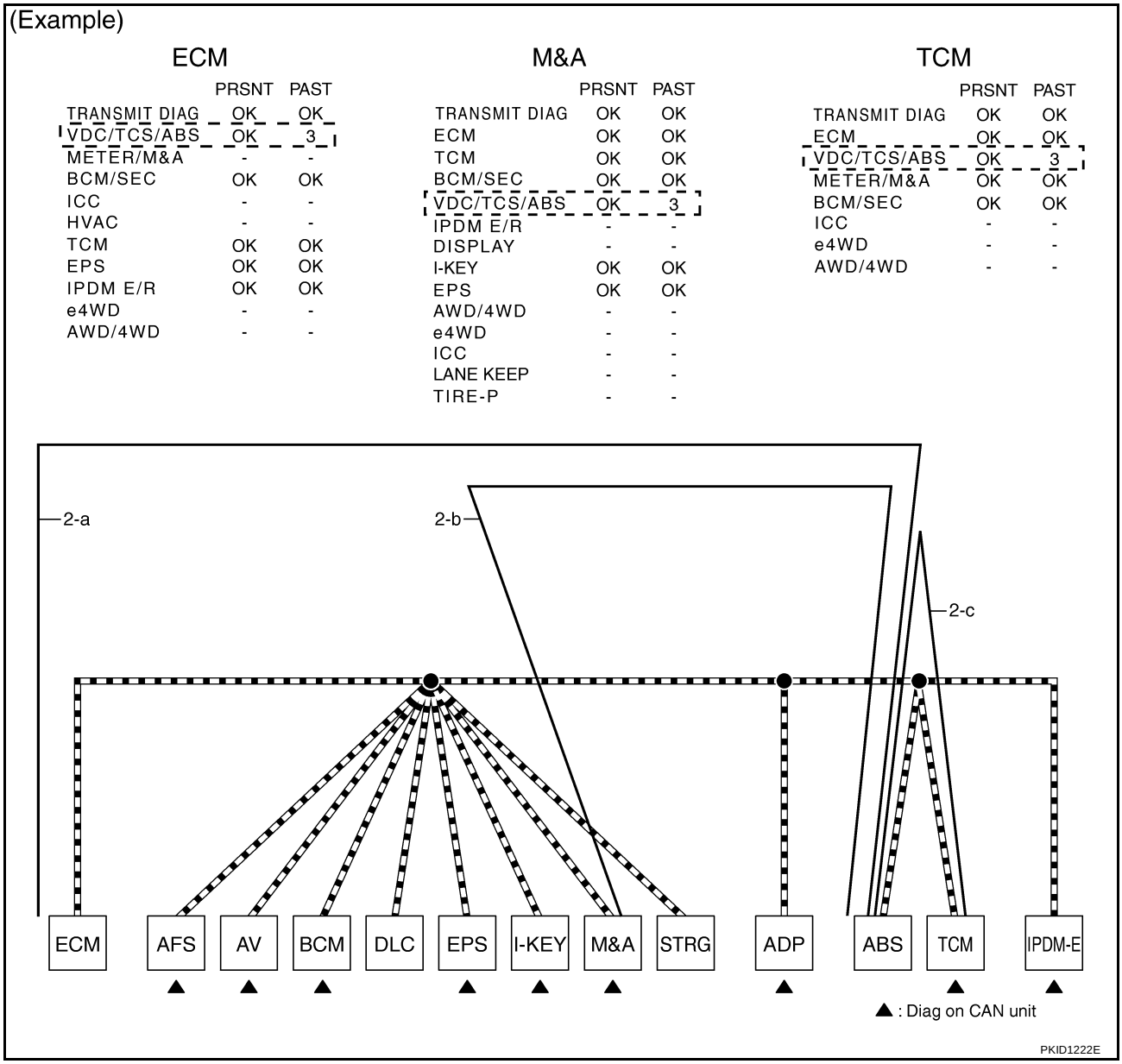
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	OK	3
METER/M&A	-	-
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	OK	OK
EPS	OK	OK
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	-	-

M&A

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
TCM	OK	OK
BCM/SEC	OK	OK
VDC/TCS/ABS	OK	3
IPDM E/R	-	-
DISPLAY	-	-
I-KEY	OK	OK
EPS	OK	OK
AWD/4WD	-	-
e4WD	-	-
ICC	-	-
LANE KEEP	-	-
TIRE-P	-	-

TCM

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
VDC/TCS/ABS	OK	3
METER/M&A	OK	OK
BCM/SEC	OK	OK
ICC	-	-
e4WD	-	-
AWD/4WD	-	-



3. CAN DIAG SUPPORT MNTR (without PAST): Check the CAN DIAG SUPPORT MNTR (without PAST) of units indicating “U1000” or “U1001” on SELF-DIAG RESULTS. Draw a line on the diagnosis sheet to indicate the possible error circuit.

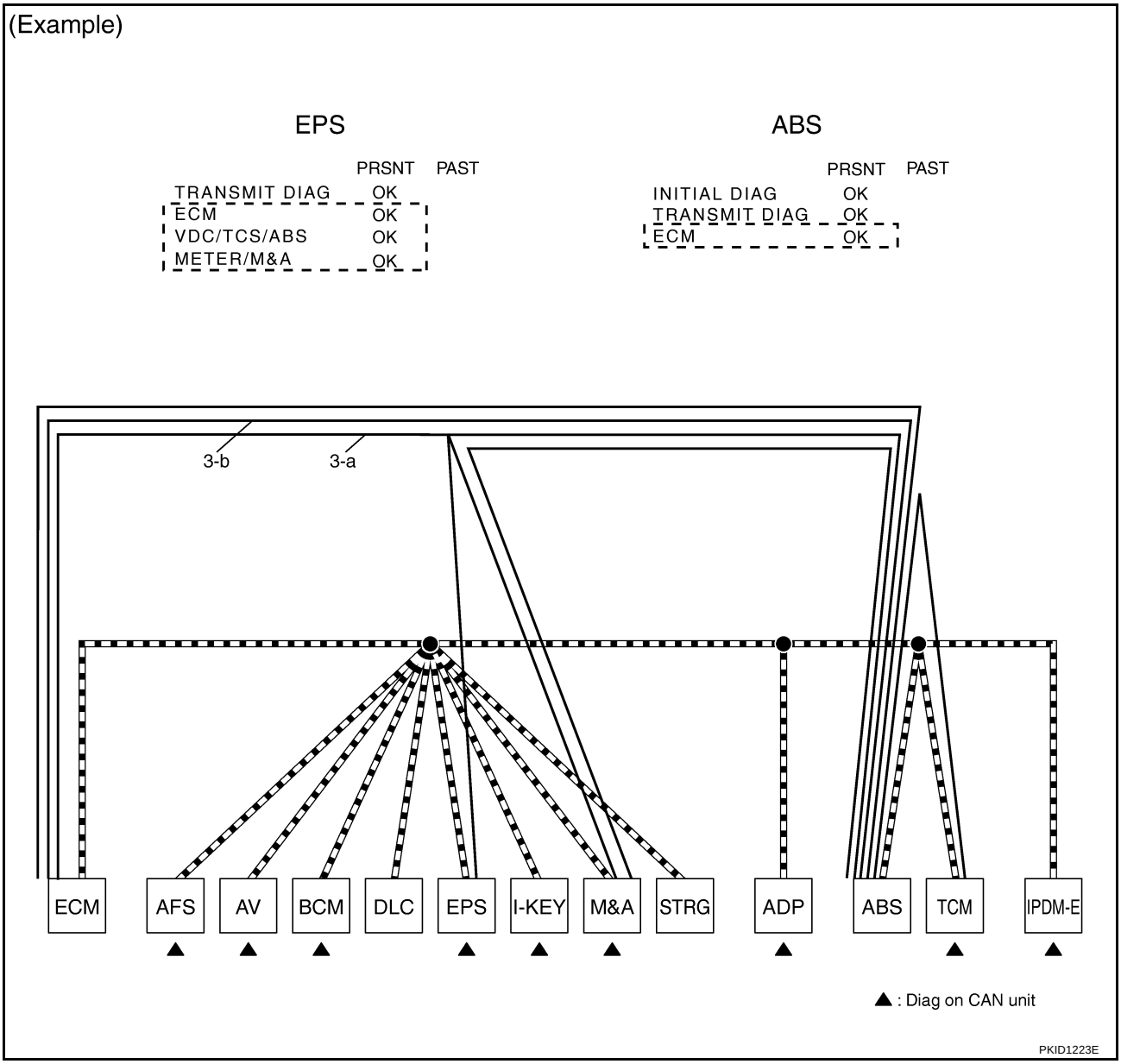
NOTE:

- While an error occurred in the past according to SELF-DIAG RESULTS, it is unclear which signal is not received. Assume that errors were detected from all reception items.
- Draw a single line among the unit and all reception items. (Work flow differs from CAN DIAG SUPPORT MNTR (with PAST).)

a. Reception item of “EPS”: Assume that the unit could not receive the signals from ECM, ABS, and M&A. Draw a line among EPS, ECM, ABS, and M&A (line 3-a in the figure).

b. Reception item of “ABS”: Assume that the unit could not receive the signal from ECM. Draw a line between ABS and ECM (line 3-b in the figure).

(Example)



4. Search for the possible cause using CAN communication signal chart using information from the interview with the customer.

NOTE:
For the details of CAN communication signal, refer to LAN-49, "CAN Communication Signal Chart" .

a. ABS warning lamp turned ON and speedometer did not move: This means that “ABS warning lamp signal” and “Vehicle speed signal” could not communicate between M&A and ABS (4-a in the figure).

b. The tachometer moved normally: This means that “Engine speed signal” could communicate normally between ECM and M&A (4-b in the figure).

(Example)

First registration: 28, Jan. 2005

CAN system type: Type 20

Symptom (Results from interview with customer)

While driving,
- ABS warning lamp turned ON.
- Speedometer did not move.
- Tachometer moved normally.

CAN Communication Signal Chart

T: Transmit R: Receive

Signal name/Connecting unit	ECM	AFS*1	AV*2	BCM	EPS	I-KEY*3	M&A	STRG*1	ADP*4	ABS	TCM	IPDM-E
A/C compressor request signal	T											R
Accelerator pedal position signal	T										R	
Closed throttle position signal	T										R	
Cooling fan speed request signal	T											R
Engine and CVT integrated control signal	T										R	
	R										T	
Engine coolant temperature signal	T						R				R	
4-b Engine speed signal	T						R				R	
Engine status signal	T		R		R							
Fuel consumption monitor signal	T		R				R					
MI signal	T						R					
Wide open throttle position signal	T										R	
ABS warning lamp signal							R			T		
Brake warning lamp signal							R			T		
4-a Steering angle sensor signal		R						T				
Vehicle speed signal	R				R		R			T	R	
		R		R	R	R	T		R			
Input shaft revolution signal	R										T	
Output shaft revolution signal	R										T	
Shift position indicator signal	R	R	R	R*5			R		R*6		T	
Second position indicator signal							R				T	
Front wiper stop position signal				R								T
High beam status signal	R	R										T
Low beam status signal	R	R										T

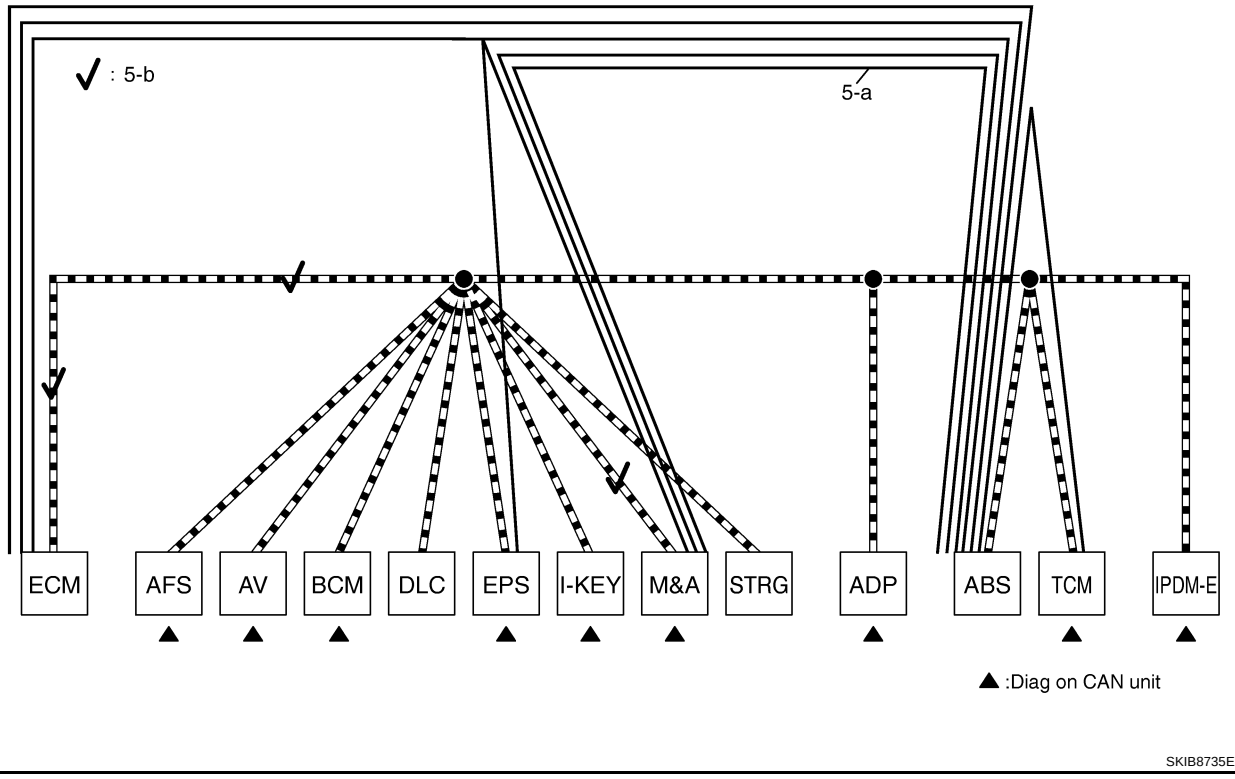
SKIB8895E

5. Fill out the diagnosis sheet based on information from step 4.

a. The ABS warning lamp turned ON and speedometer did not move: Assume that a possible cause is no communication between M&A and ABS. Draw a line between M&A and ABS. (Line 5-a in the figure).

b. The tachometer moved normally: Put check marks between ECM and M&A. The circuit between ECM and M&A is functioning properly (check marks 5-b in the figure).

(Example)

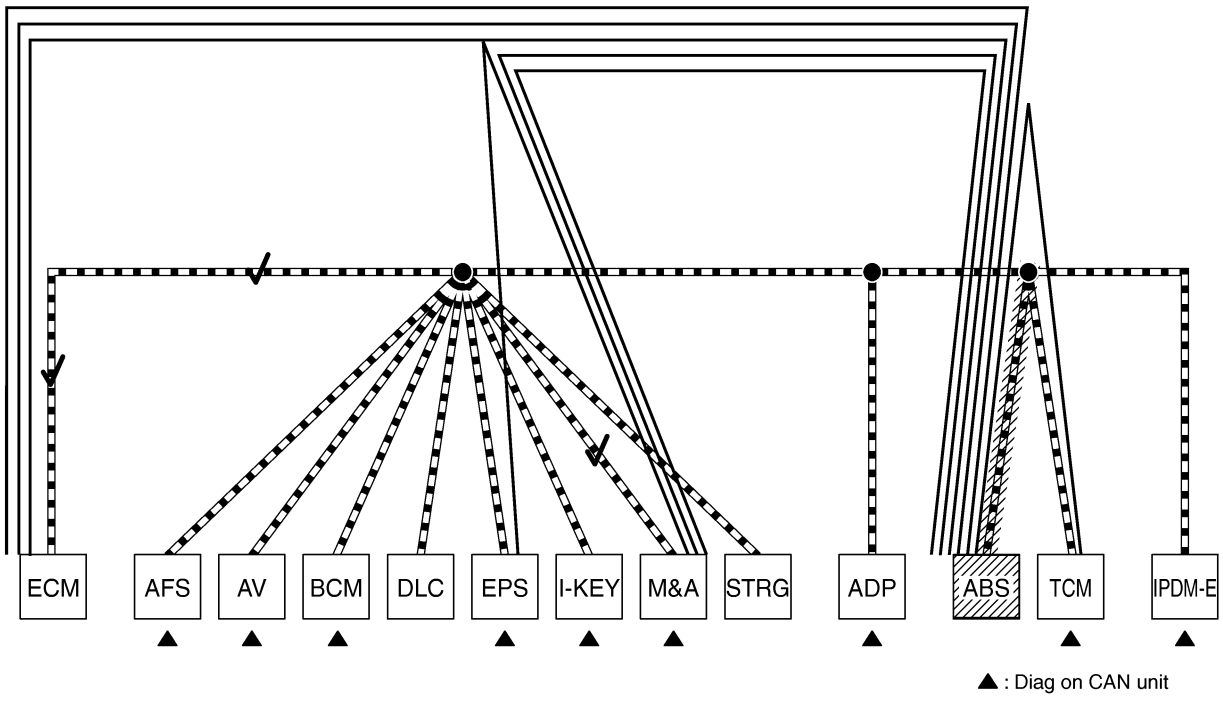


6. The circuit which has the most amount of lines are the possible cause. Error is detected from ABS actuator and electric unit (control unit) branch line (shaded in the figure).

   NOTE:
   For abbreviations, refer to LAN-41, "Abbreviation List" .

7. Perform the inspection procedure for the possible cause. Refer to LAN-65, "Malfunction Area Chart" .

(Example)



< Checklist >

	Item	Check box
1	ECM	✓
2	AFS▲	✓
3	AV▲	✓
4	BCM▲	✓
5	EPS▲	✓
6	I-KEY▲	✓
7	M&A▲	✓
8	ADP▲	✓
9	ABS	✓
10	TCM▲	✓
11	IPDM-E▲	✓

Possible root cause

- Error between ABS actuator and electric unit (control unit) and splice.
- Error in ABS actuator and electric unit (control unit).

Inspection result

PKID1224E

Past Error — Short Circuit —

When the symptoms listed below exist, a short circuit of the CAN communication line is a possible cause.

Item (CONSULT-III)	Indication	Inspection procedure
SELF-DIAG RESULTS	“U1000” and “U1001” is indicated in the past for most units.	Refer to LAN-65, "Malfunction Area Chart" .
CAN DIAG SUPPORT MNTR	Only on CAN DIAG SUPPORT MNTR (with PAST), “1 - 39” is indicated on “PAST” of “TRANSMIT DIAG” and the reception item.	

(Example)

DTC RESULTS	TIME
ENGINE	
U1000 : CAN COMM CIRCUIT	1t
U1001 : CAN COMM CIRCUIT	1t

DTC RESULTS	TIME
ADAPTIVE LIGHT	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
MULTI AV	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
BCM	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
EPS	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
INTELLIGENT KEY	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
METER	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
AUTO DRIVE POS.	
U1000 : CAN COMM CIRCUIT	PAST

“U1000” and “U1001” is indicated in the past for most units.

ECM

	PRSNT	PAST
TRANSMIT DIAG	OK	5
VDC/TCS/ABS	OK	5
METER/M&A	-	-
BCM/SEC	OK	5
ICC	-	-
HVAC	-	-
TCM	OK	5
EPS	OK	5
IPDM E/R	OK	5
e4WD	-	-
AWD/4WD	-	-

AFS

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	5
METER/M&A	OK	5
TCM	OK	5
STRG	OK	5
EPS	-	-
IPDM E/R	OK	5

AV

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	5
METER/M&A	OK	5
BCM/SEC	-	-
HVAC	-	-
IPDM E/R	-	-
TIRE-P	-	-

BCM

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
METER/M&A	OK	5
TCM	OK	5
MULTI AV	-	-
IPDM E/R	OK	5
I-KEY	OK	5

Only on CAN DIAG SUPPORT MNTR (with PAST), “1-39” is indicated on “PAST” of “TRANSMIT DIAG ” and the reception item.

EPS

	PRSNT	PAST
TRANSMIT DIAG	OK	
ECM	OK	
VDC/TCS/ABS	OK	
METER/M&A		

I-KEY

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
METER/M&A	OK	5
	OK	5

M&A

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
TCM	OK	5
BCM/SEC	OK	5
VDC/TCS/ABS	OK	5
IPDM E/R	-	-
	-	-
	OK	5
		5

ADP

	PRSNT	PAST
TRANSMIT DIAG	-	-
METER/M&A	OK	5
BCM/SEC	OK	5
TCM	OK	5

PKID1225E

INDEX FOR DTC

PFP:00004

DTC No. Index

NKS004PM

DTC	Self-diagnosis item (CONSULT-III indication)	DTC detection condition	Inspection
U1000	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.	Refer to LAN-41, "HOW TO USE THIS SECTION" .
		When a control unit (except for ECM) is not transmitting or receiving CAN communication signal for 2 seconds or more.	
U1001	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	
U1002	SYSTEM COMM	When a control unit is not transmitting or receiving CAN communication signal for 2 seconds or less.	Start the inspection. Refer to the applicable section of the indicated control unit.
U1010	CONTROL UNIT [CAN]	When an error is detected during the initial diagnosis for CAN controller of each control unit.	Replace the control unit indicating “U1010”.

HOW TO USE THIS SECTION

PFP:00008

Caution

NKS004PN

- This section describes information peculiar to a vehicle, sheets for trouble diagnosis, and inspection procedures.
- For trouble diagnosis procedure, refer to LAN-17, "Trouble Diagnosis Procedure" .

Abbreviation List

NKS004PO

Abbreviations in CAN communication signal chart, and the diagnosis sheet are as per the following list.

Abbreviation	Unit name	SELECT SYSTEM (CONSULT-III)	CAN DIAG SUPPORT MNTR (CONSULT-III)
A-BAG	Air bag diagnosis sensor unit	AIR BAG	—
ABS	ABS actuator and electric unit (control unit)	ABS	VDC/TCS/ABS
	VDC/TCS/ABS control unit		
BCM	BCM	BCM	BCM/SEC
DLC	Data link connector	—	—
ECM	ECM	ENGINE	ECM
IPDM-E	IPDM E/R	IPDM E/R	IPDM E/R
M&A	Unified meter and A/C amp.	METER/M&A	METER/M&A
STRG	Steering angle sensor	—	STRG
TCM	TCM	A/T	TCM

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS004PP

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS0053P

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Trouble Diagnosis

NKS004PR

CAUTION:

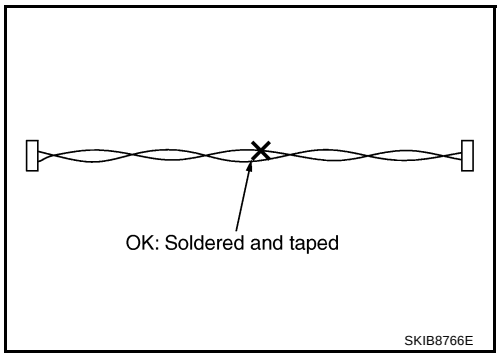
- **Never apply 7.0 V or more to the measurement terminal.**
- **Use a tester with open terminal voltage of 7.0 V or less.**
- **Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.**

Precautions for Harness Repair

NKS004PS

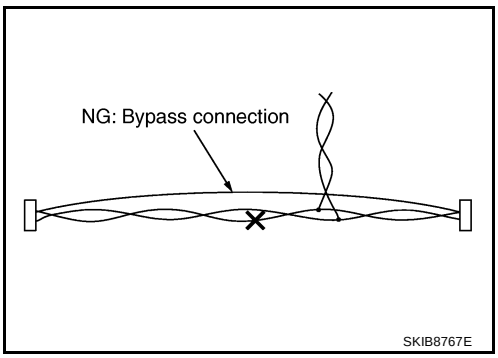
- Solder the repaired area and wrap tape around the soldered area.

  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.

  NOTE:
  Bypass connection may cause CAN communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



- Replace the applicable harness as an assembly if error is detected on the shield lines of CAN communication line.

TROUBLE DIAGNOSIS

PFP:00004

CAN Diagnostic Support Monitor

NKS004PT

Use “CAN DIAG SUPPORT MNTR” for detecting the root cause.

MONITOR ITEM LIST (CONSULT-III)

ECM

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal		Error	
			PRSNT	PAST	PRSNT	PAST
ECM	TRANSMIT DIAG	Signal transmission status	OK	OK or 1 – 39*	UNKWN	0
	VDC/TCS/ABS	With VDC: Signal receiving status from the VDC/TCS/ABS control unit				
		With TCS: Signal receiving status from the ABS actuator and electric unit (control unit)				
		With ABS: Not used even though indicated				
	METER/M&A	Signal receiving status from the unified meter and A/C amp.	OK	OK or 1 – 39*	UNKWN	0
	BCM/SEC	Signal receiving status from the BCM				
	ICC	Not used even though indicated				
	HVAC					
	TCM	Signal receiving status from the TCM	OK	OK or 1 – 39*	UNKWN	0
	EPS	Not used even though indicated				
	IPDM E/R	Signal receiving status from the IPDM E/R	OK	OK or 1 – 39*	UNKWN	0
	e4WD	Not used even though indicated				
	AWD/4WD					

*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

VDC/TCS/ABS Control Unit

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
ABS	INITIAL DIAG	Status of CAN controller	OK	NG[Caution]
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		
	TCM	Signal receiving status from the TCM		
	METER/M&A	Signal receiving status from the unified meter and A/C amp.		
	STRG	Signal receiving status from the steering angle sensor		

CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

TCM

NOTE:
Replace the unit when “NG” is indicated on the “INITIAL DIAG”.

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
TCM	INITIAL DIAG	Status of CAN controller	OK	NG
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		
	VDC/TCS/ABS	With VDC: Signal receiving status from the VDC/TCS/ABS control unit		
		Without VDC: Signal receiving status from the ABS actuator and electric unit (control unit)		
	METER/M&A	Signal receiving status from the unified meter and A/C amp.		
	ICC/e4WD	Not used even though indicated		
	AWD/4WD			

BCM

NOTE:
Replace the unit when “NG” is indicated on the “INITIAL DIAG”.

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
BCM	INITIAL DIAG	Status of CAN controller	OK	NG
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		
	IPDM E/R	Signal receiving status from the IPDM E/R		
	METER/M&A	Signal receiving status from the unified meter and A/C amp.		
	I-KEY	Not used even though indicated		

Unified Meter and A/C Amp.

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal		Error	
			PRSNT	PAST	PRSNT	PAST
M&A	TRANSMIT DIAG	Signal transmission status	OK	OK or 1 – 39*	UNKWN	0
	ECM	Signal receiving status from the ECM				
	TCM	Signal receiving status from the TCM				
	BCM/SEC	Signal receiving status from the BCM				
	VDC/TCS/ABS	With VDC: Signal receiving status from the VDC/TCS/ABS control unit				
		Without VDC: Signal receiving status from the ABS actuator and electric unit (control unit)				
	IPDM E/R	Not used even though indicated				
	DISPLAY					
	I-KEY					
	EPS					
	AWD/4WD					
	e4WD					
	ICC					
	LANE KEEP					
	TIRE-P					

*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

ABS Actuator and Electric Unit (Control Unit)

Models with ABS

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
ABS	INITIAL DIAG	Status of CAN controller	OK	NG[Caution]
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		

CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

Models with TCS

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
ABS	INITIAL DIAG	Status of CAN controller	OK	NG[Caution]
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		
	TCM	Signal receiving status from the TCM		

CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

IPDM E/R

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal		Error	
			PRSNT	PAST	PRSNT	PAST
IPDM-E	TRANSMIT DIAG	Signal transmission status	OK	OK or 1 – 39*	UNKWN	0
	ECM	Signal receiving status from the ECM				
	BCM/SEC	Signal receiving status from the BCM				

*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

CAN System Specification Chart

NKS004PU

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

NOTE:

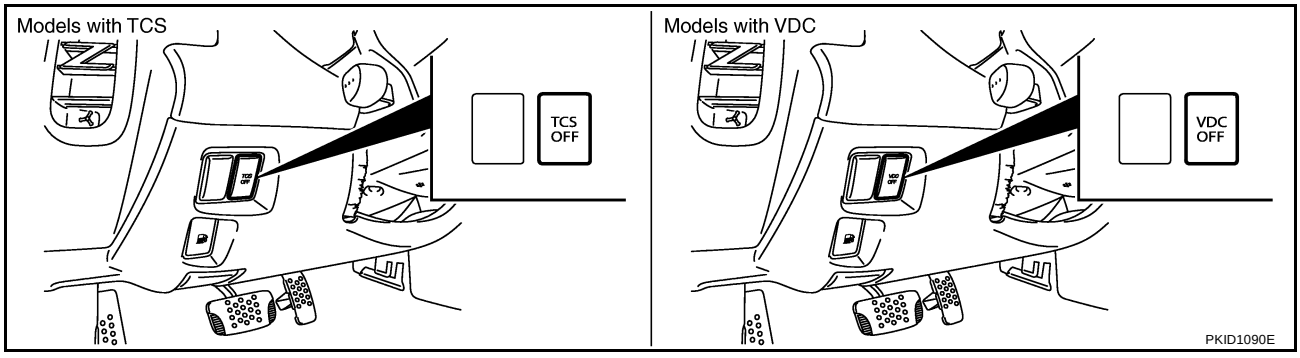
Refer to LAN-19, "CHECK OF CAN SYSTEM TYPE (HOW TO USE CAN SYSTEM TYPE SPECIFICATION CHART)" for how to use CAN system specification chart.

Body type	Coupe/Roadster				
Axle	2WD				
Engine	VQ35HR				
Transmission	M/T		A/T	M/T	A/T
Brake control	ABS	TCS		VDC	
CAN system type	1	2	3	4	5
Diagnosis sheet	LAN-59	LAN-60	LAN-61	LAN-62	LAN-63
CAN communication signal chart	LAN-49, "TYPE 1"	LAN-50, "TYPE 2/TYPE 3"		LAN-51, "TYPE 4/TYPE 5"	

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

NOTE:

Check CAN system type from the vehicle shape and equipment.



CAN Communication Signal Chart

NKS004PV

Refer to LAN-15, "How to Use CAN Communication Signal Chart" for how to use CAN communication signal chart.

TYPE 1

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	BCM	M&A	ABS	IPDM-E
A/C compressor feedback signal	T		R		
A/C compressor request signal	T				R
Accelerator pedal position signal	T			R	
ASCD CRUISE lamp signal	T		R		
ASCD SET lamp signal	T		R		
Cooling fan speed request signal	T				R
Engine coolant temperature signal	T		R		
Engine speed signal	T		R	R	
Fuel consumption monitor signal	T		R		
Malfunction indicator lamp signal	T		R		
A/C switch signal	R	T			
Blower fan motor switch signal	R	T			
Buzzer output signal		T	R		
Day time running light request signal		T			R
Door switch signal		T	R		R
Front wiper request signal		T			R
High beam request signal		T	R		R
Horn chirp signal		T			R
Ignition switch signal		T			R
Low beam request signal		T			R
Position lights request signal		T	R		R
Rear window defogger switch signal		T			R
Sleep request 1 signal		T	R		
Sleep request 2 signal		T			R
Theft warning horn request signal		T			R
Tire pressure signal		T	R		
Turn indicator signal		T	R		
Wake up request 1 signal		T	R		
Fuel level sensor signal	R		T		
Seat belt buckle switch signal		R	T		
Vehicle speed signal	R	R	T		
			R	T	
ABS warning lamp signal			R	T	
Brake warning lamp signal			R	T	
Front wiper stop position signal		R			T
High beam status signal	R				T
Hood switch signal		R			T

Signal name/Connecting unit	ECM	BCM	M&A	ABS	IPDM-E
Low beam status signal	R				T
Rear window defogger control signal	R				T

NOTE:
CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

TYPE 2/TYPE 3

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	TCM	BCM	M&A	ABS	IPDM-E
A/C compressor feedback signal	T			R		
A/C compressor request signal	T					R
Accelerator pedal position signal	T	R			R	
ASCD CRUISE lamp signal	T			R		
ASCD OD cancel request signal	T	R				
ASCD operation signal	T	R				
ASCD SET lamp signal	T			R		
Battery voltage signal	T	R				
Closed throttle position signal	T	R				
Cooling fan speed request signal	T					R
Engine coolant temperature signal	T			R		
Engine speed signal	T	R		R	R	
Fuel consumption monitor signal	T			R		
Malfunction indicator lamp signal	T			R		
Wide open throttle position signal	T	R				
A/T CHECK indicator lamp signal		T		R		
A/T position indicator signal		T		R	R	
A/T self-diagnosis signal	R	T				
Manual mode gear position signal		T		R		
Manual mode indicator signal		T		R		
Output shaft revolution signal	R	T				
Turbine revolution signal	R	T				
A/C switch signal	R		T			
Blower fan motor switch signal	R		T			
Buzzer output signal			T	R		
Day time running light request signal			T			R
Door switch signal			T	R		R
Front wiper request signal			T			R
High beam request signal			T	R		R
Horn chirp signal			T			R
Ignition switch signal			T			R
Low beam request signal			T			R
Position lights request signal			T	R		R

Signal name/Connecting unit	ECM	TCM	BCM	M&A	ABS	IPDM-E
Rear window defogger switch signal			T			R
Sleep request 1 signal			T	R		
Sleep request 2 signal			T			R
Theft warning horn request signal			T			R
Tire pressure signal			T	R		
Turn indicator signal			T	R		
Wake up request 1 signal			T	R		
Fuel level sensor signal	R			T		
Manual mode shift down signal		R		T		
Manual mode shift up signal		R		T		
Manual mode signal		R		T		
Not manual mode signal		R		T		
Seat belt buckle switch signal			R	T		
Stop lamp switch signal		R		T		
Vehicle speed signal	R	R	R	T		
				R	T	
A/T shift schedule change demand signal		R			T	
ABS operation signal		R			T	
ABS warning lamp signal				R	T	
Brake warning lamp signal				R	T	
SLIP indicator lamp signal				R	T	
TCS OFF indicator lamp signal				R	T	
Front wiper stop position signal			R			T
High beam status signal	R					T
Hood switch signal			R			T
Low beam status signal	R					T
Rear window defogger control signal	R					T

NOTE:
CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

TYPE 4/TYPE 5

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
A/C compressor feedback signal	T				R		
A/C compressor request signal	T						R
Accelerator pedal position signal	T	R	R				
ASCD CRUISE lamp signal	T				R		
ASCD OD cancel request signal	T		R				
ASCD operation signal	T		R				
ASCD SET lamp signal	T				R		
Battery voltage signal	T		R				

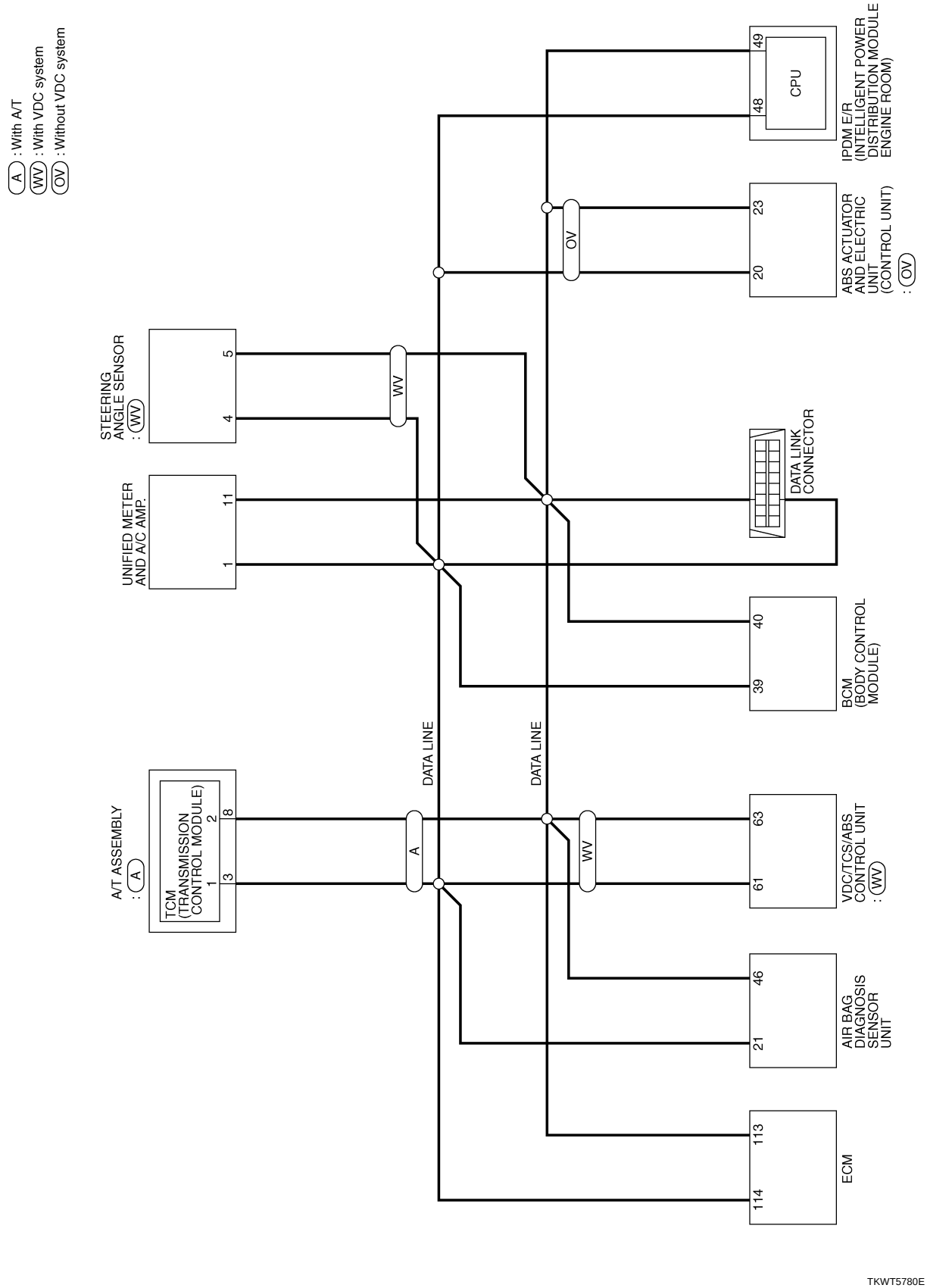
Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
Closed throttle position signal	T		R				
Cooling fan speed request signal	T						R
Engine coolant temperature signal	T				R		
Engine speed signal	T	R	R		R		
Fuel consumption monitor signal	T				R		
Malfunction indicator lamp signal	T				R		
Wide open throttle position signal	T		R				
A/T shift schedule change demand signal		T	R				
ABS operation signal		T	R				
ABS warning lamp signal		T			R		
Brake warning lamp signal		T			R		
SLIP indicator lamp signal		T			R		
VDC OFF indicator lamp signal		T			R		
Vehicle speed signal		T			R		
	R		R	R	T		
A/T CHECK indicator lamp signal			T		R		
A/T position indicator signal		R	T		R		
A/T self-diagnosis signal	R		T				
Manual mode gear position signal			T		R		
Manual mode indicator signal			T		R		
Output shaft revolution signal	R		T				
Turbine revolution signal	R		T				
A/C switch signal	R			T			
Blower fan motor switch signal	R			T			
Buzzer output signal				T	R		
Day time running light request signal				T			R
Door switch signal				T	R		R
Front wiper request signal				T			R
High beam request signal				T	R		R
Horn chirp signal				T			R
Ignition switch signal				T			R
Low beam request signal				T			R
Position lights request signal				T	R		R
Rear window defogger switch signal				T			R
Sleep request 1 signal				T	R		
Sleep request 2 signal				T			R
Theft warning horn request signal				T			R
Tire pressure signal				T	R		
Turn indicator signal				T	R		
Wake up request 1 signal				T	R		
Fuel level sensor signal	R				T		
Manual mode shift down signal			R		T		
Manual mode shift up signal			R		T		

Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
Manual mode signal			R		T		
Not manual mode signal			R		T		
Seat belt buckle switch signal				R	T		
Stop lamp switch signal			R		T		
Steering angle sensor signal		R				T	
Front wiper stop position signal				R			T
High beam status signal	R						T
Hood switch signal				R			T
Low beam status signal	R						T
Rear window defogger control signal	R						T

NOTE:
CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

Schematic

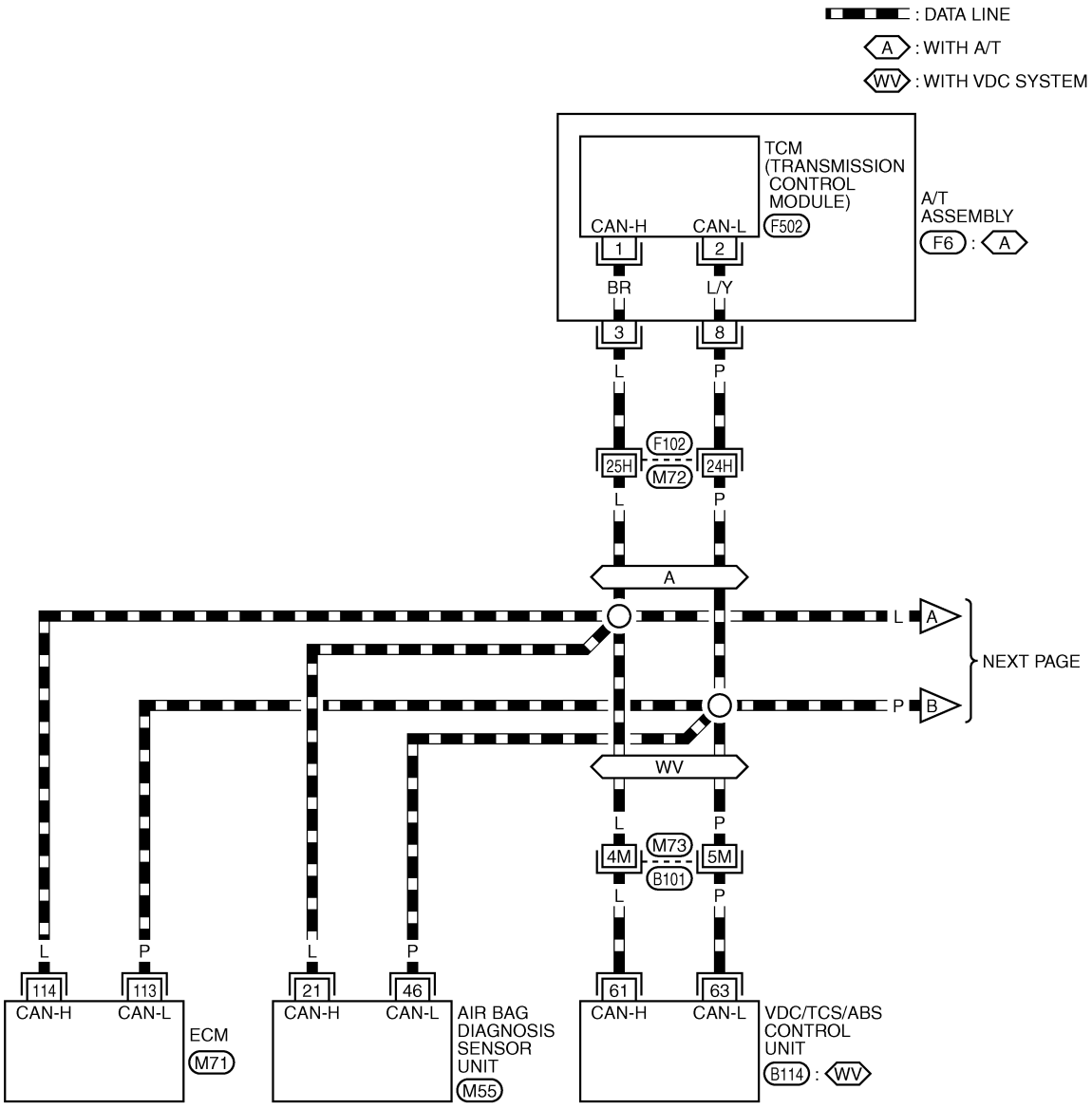
NKS004PW

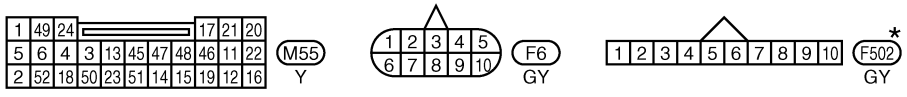


Wiring Diagram — CAN —

NKS004PX

LAN-CAN-01





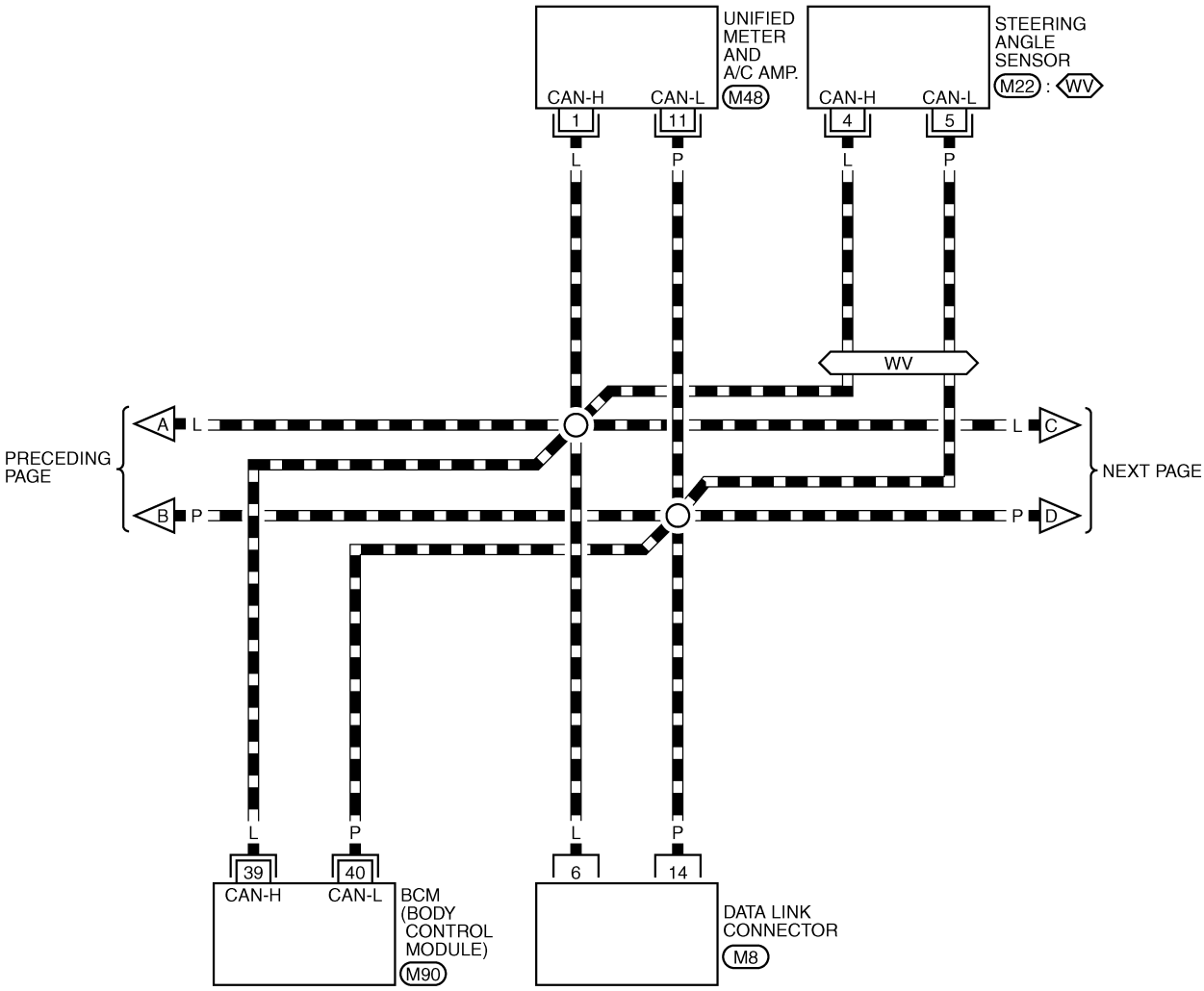
∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

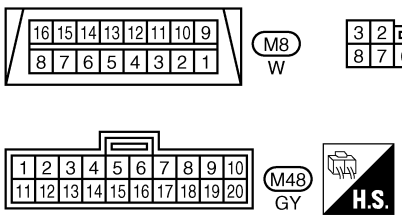
REFER TO THE FOLLOWING.
F102 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M71 , B114 -ELECTRICAL UNITS

TKWT5781E

LAN-CAN-02

: DATA LINE
WV : WITH VDC SYSTEM

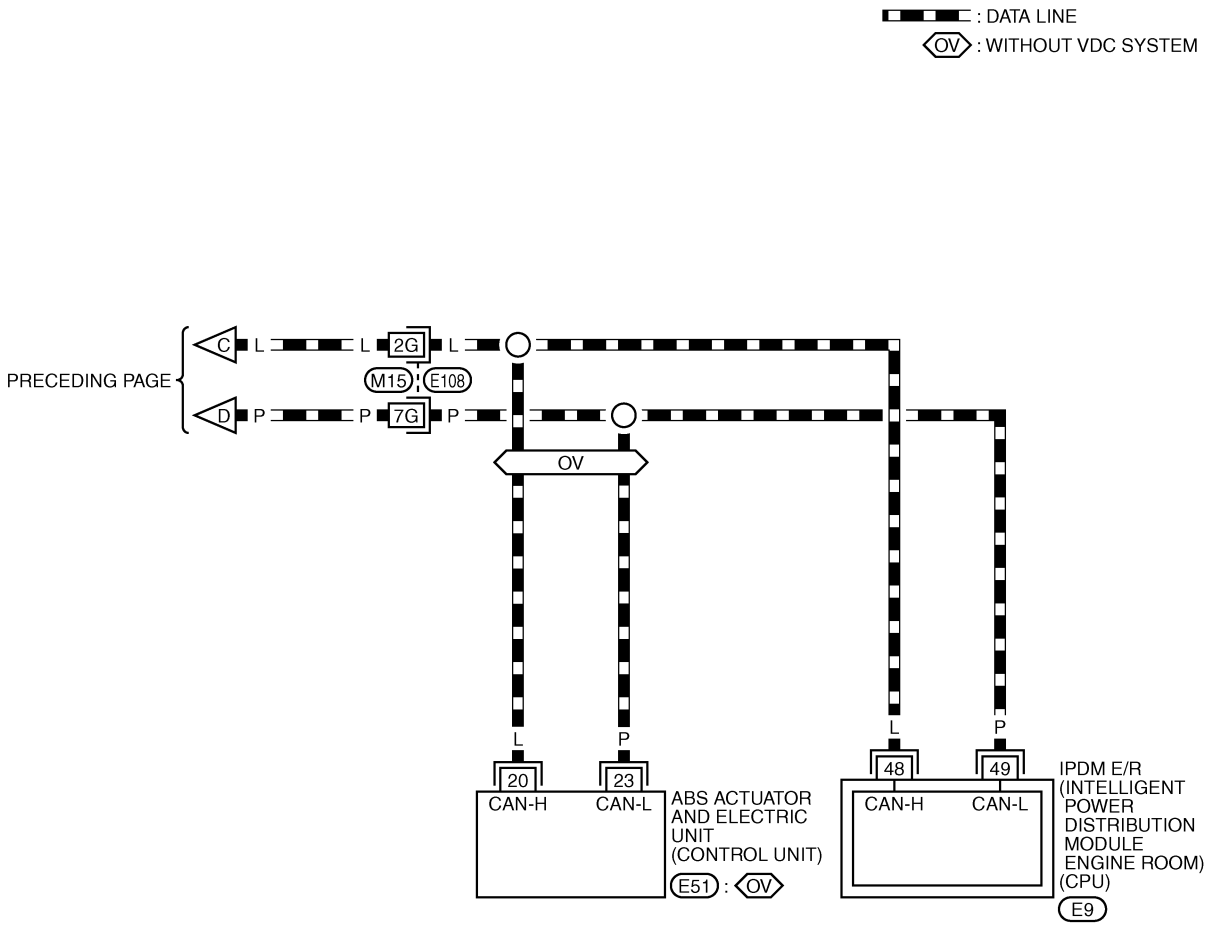


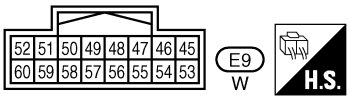


REFER TO THE FOLLOWING.
M90 -ELECTRICAL UNITS

TKWT5782E

LAN-CAN-03





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E51 -ELECTRICAL UNITS

TKWB4321E

Interview Sheet

NKS004PY

CAN Communication System Diagnosis Interview Sheet

Date received:

Type: VIN No.:

Model:

First registration: Mileage:

CAN system type:

Symptom (Results from interview with customer)

Condition at inspection

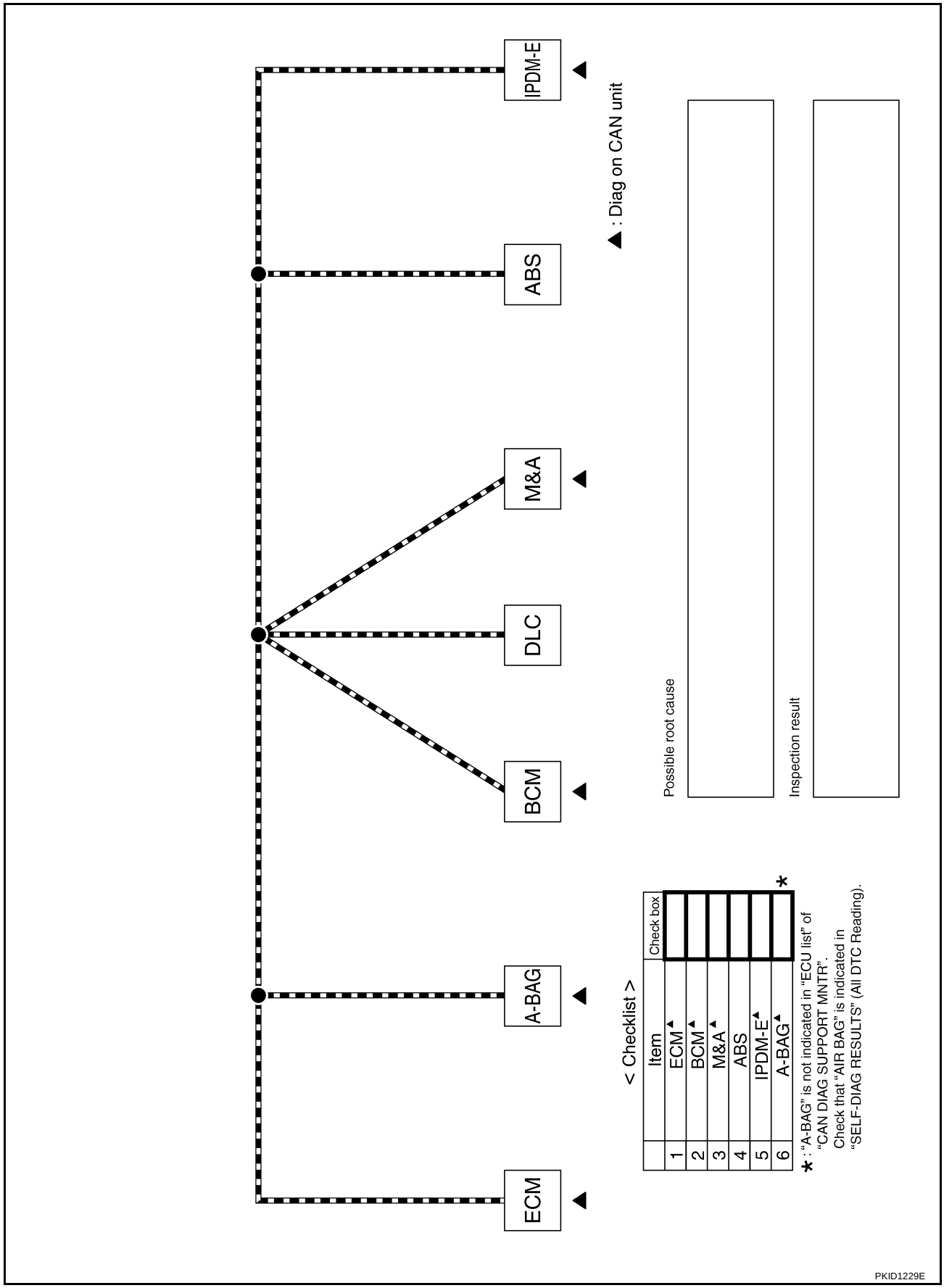
Error symptom : Present / Past

SKIB8898E

CAN System (Type 1)

NKS004Q0

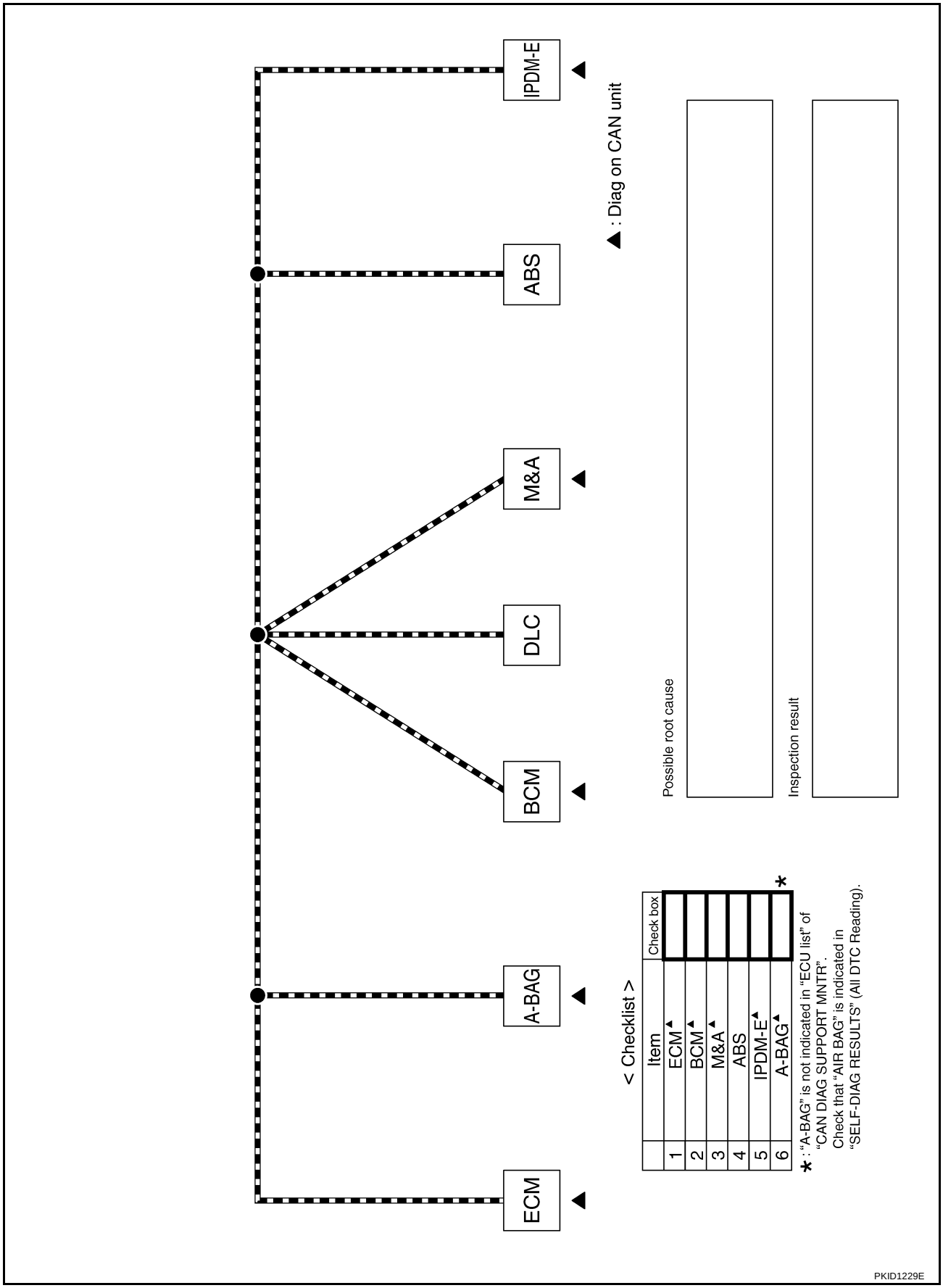
DIAGNOSIS SHEET



CAN System (Type 2)

NKS004Q1

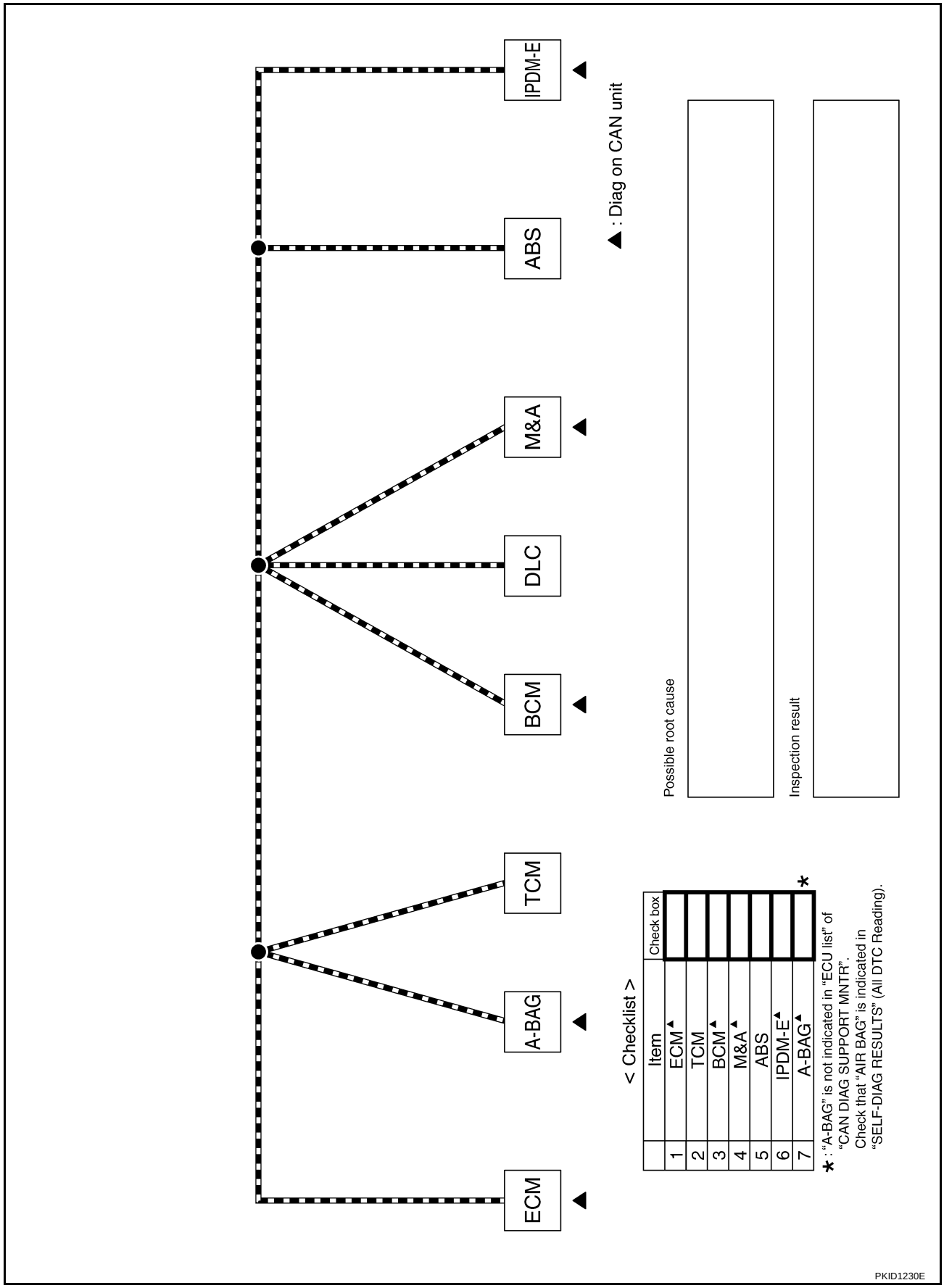
DIAGNOSIS SHEET



CAN System (Type 3)

NKS004S1

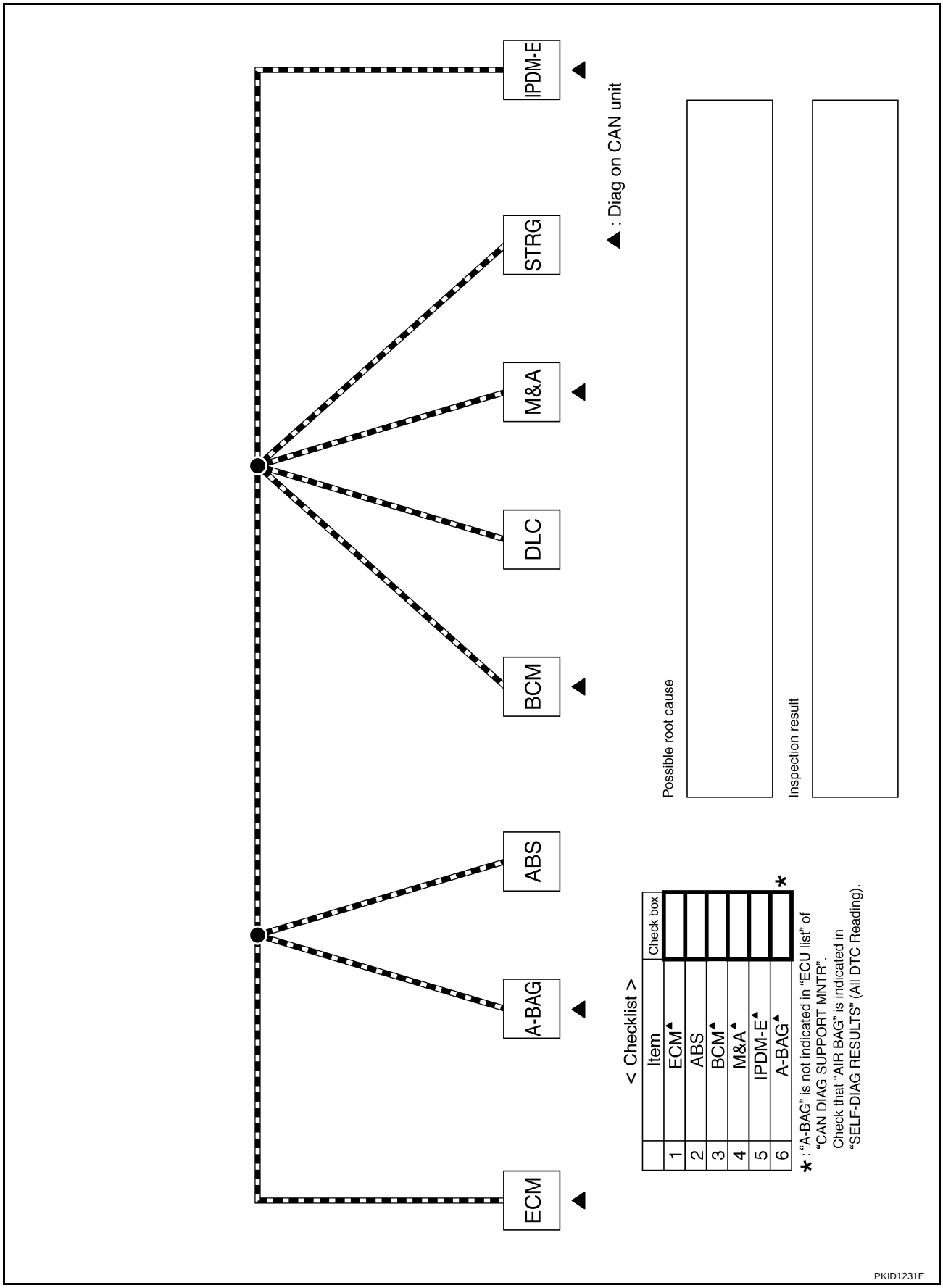
DIAGNOSIS SHEET



CAN System (Type 4)

NKS004Q3

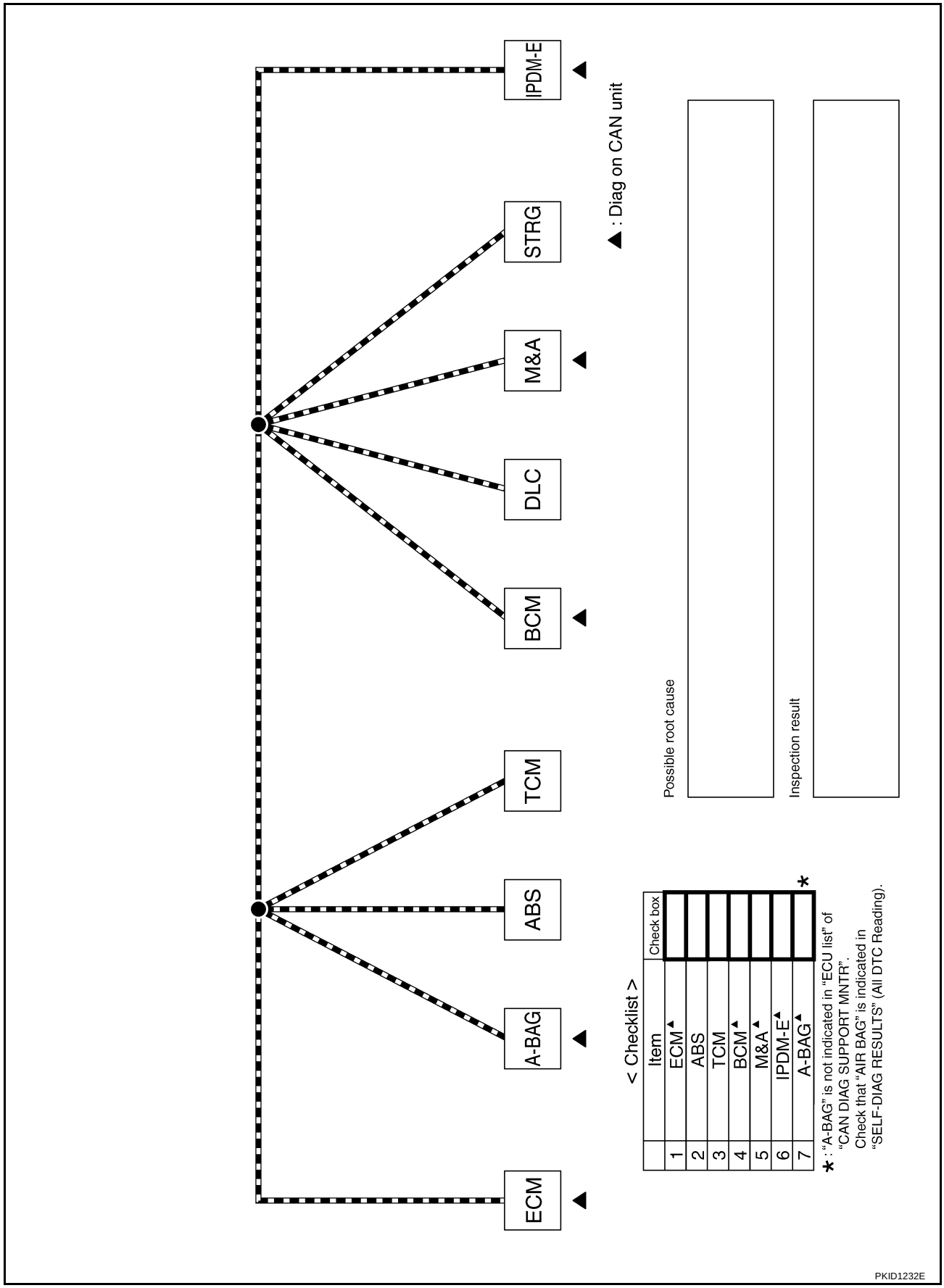
DIAGNOSIS SHEET



CAN System (Type 5)

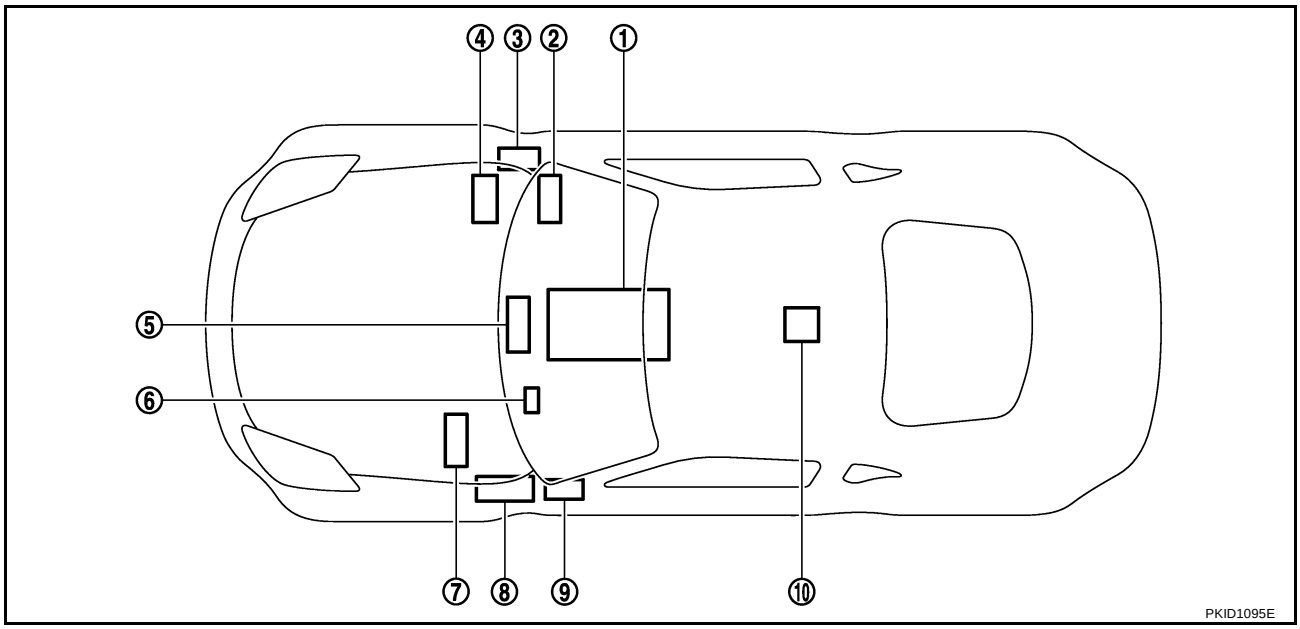
NKS004Q4

DIAGNOSIS SHEET



Component Parts Location

NKS004RJ



1. A/T assembly F6
2. ECM M71
3. VDC/TCS/ABS control unit B114
4. IPDM E/R E9
5. Unified meter and A/C amp. M48
6. Steering angle sensor M22
7. ABS actuator and electric unit (control unit) E51
8. BCM M90
9. Data link connector M8
10. Air bag diagnosis sensor unit M55

Harness Layout

NKS004RK

Refer to PG-41, "Harness Layout" .

Malfunction Area Chart

NKS004RL

MAIN LINE

Malfunction Area	Reference
Main line between VDC/TCS/ABS control unit and data link connector	LAN-66, "Main Line Between VDC/TCS/ABS Control Unit and Data Link Connector"
Main line between TCM and data link connector	LAN-66, "Main Line Between TCM and Data Link Connector"
Main line between data link connector and ABS actuator and electric unit (control unit)	LAN-67, "Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit)"

BRANCH LINE

Malfunction Area	Reference
ECM branch line circuit	LAN-68, "ECM Branch Line Circuit"
Air bag diagnosis sensor unit branch line circuit	LAN-68, "Air Bag Diagnosis Sensor Unit Branch Line Circuit"
VDC/TCS/ABS control unit branch line circuit	LAN-69, "VDC/TCS/ABS Control Unit Branch Line Circuit"
TCM branch line circuit	LAN-69, "TCM Branch Line Circuit"
BCM branch line circuit	LAN-70, "BCM Branch Line Circuit"
Data link connector branch line circuit	LAN-71, "Data Link Connector Branch Line Circuit"
Unified meter and A/C amp. branch line circuit	LAN-71, "Unified Meter and A/C Amp. Branch Line Circuit"
Steering angle sensor branch line circuit	LAN-72, "Steering Angle Sensor Branch Line Circuit"
ABS actuator and electric unit (control unit) branch line circuit	LAN-72, "ABS Actuator and Electric Unit (Control Unit) Branch Line Circuit"
IPDM E/R branch line circuit	LAN-73, "IPDM E/R Branch Line Circuit"

SHORT CIRCUIT

Malfunction Area	Reference
CAN communication circuit	LAN-74, "CAN Communication Circuit"

Main Line Between VDC/TCS/ABS Control Unit and Data Link Connector

NKS0054K

INSPECTION PROCEDURE

1. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the following harness connectors.
- ECM harness connector
- Harness connectors B101 and M73
4. Check the continuity between the Harness connector M73 and the data link connector.

Harness connector		Data link connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
M73	4M	M8	6	Yes
	5M		14	Yes

OK or NG

OK >> ● Present error: Check the following items again.
- Decision of CAN system type.
- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
- Procedure for detecting root cause.

● Past error: Error was detected in the main line between the VDC/TCS/ABS control unit and the data link connector.

NG >> Repair the main line between the harness connector M73 and the data link connector.

Main Line Between TCM and Data Link Connector

NKS0054L

INSPECTION PROCEDURE

1. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the following harness connectors.
- ECM harness connector
- Harness connectors F102 and M72
4. Check the continuity between the Harness connector M72 and the data link connector.

Harness connector		Data link connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
M72	25H	M8	6	Yes
	24H		14	Yes

OK or NG

OK >> ● Present error: Check the following items again.
- Decision of CAN system type.
- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
- Procedure for detecting root cause.

● Past error: Error was detected in the main line between the TCM and the data link connector.

NG >> Repair the main line between the harness connector M72 and the data link connector.

Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit)

NKS0054M

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (connector side and harness side).

- Harness connector M15
- Harness connector E108

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the harness connectors M15 and E108.
2. Check the continuity between the data link connector and the harness connector.

Data link connector		Harness connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
M8	6	M15	2G	Yes
	14		7G	Yes

OK or NG

OK >> GO TO 3.
NG >> Repair the main line between the data link connector and the harness connector M15.

3. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the connector of ABS actuator and electric unit (control unit).
2. Check the continuity between the harness connector and the ABS actuator and electric unit (control unit) harness connector.

Harness connector		ABS actuator and electric unit (control unit) harness connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
E108	2G	E51	20	Yes
	7G		23	Yes

OK or NG

OK >> ● Present error: Check the following items again.
- Decision of CAN system type.
- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
- Procedure for detecting root cause.

● Past error: Error was detected in the main line between the data link connector and the ABS actuator and electric unit (control unit).

NG >> Replace the main line between the harness connector E108 and the ABS actuator and electric unit (control unit).

ECM Branch Line Circuit

NKS0054N

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the ECM for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of ECM.
2. Check the resistance between the ECM harness connector terminals.

ECM harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M71	114	113	Approx. 108 – 132

OK or NG

OK >> GO TO 3.
NG >> Repair the ECM branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the ECM. Refer to EC-142, "POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> ● Present error: Replace the ECM. Refer to EC-76, "Procedure After Replacing ECM" .
● Past error: Error was detected in the ECM branch line.
NG >> Repair the power supply and the ground circuit.

Air Bag Diagnosis Sensor Unit Branch Line Circuit

NKS0054O

INSPECTION PROCEDURE

1. CHECK AIR BAG DIAGNOSIS SENSOR UNIT

Check the air bag diagnosis sensor unit. Refer to SRS-9, "TROUBLE DIAGNOSIS" .

OK or NG

OK >> Replace the main harness.
NG >> Replace parts whose air bag system has a malfunction.

VDC/TCS/ABS Control Unit Branch Line Circuit

NKS0054P

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).

- VDC/TCS/ABS control unit connector
- Harness connector B101
- Harness connector M73

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of VDC/TCS/ABS control unit.
2. Check the resistance between the VDC/TCS/ABS control unit harness connector terminals.

VDC/TCS/ABS control unit harness connector			Resistance (Ω)
Connector No.	Terminal No.		
B114	61	63	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the VDC/TCS/ABS control unit branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the VDC/TCS/ABS control unit. Refer to BRC-87, "Wiring Diagram — VDC —" .

OK or NG

OK >> ● Present error: Replace the VDC/TCS/ABS control unit. Refer to BRC-129, "Removal and Installation" .
● Past error: Error was detected in the VDC/TCS/ABS control unit branch line.
NG >> Repair the power supply and the ground circuit.

TCM Branch Line Circuit

NKS0054Q

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).

- A/T assembly connector
- Harness connector F102
- Harness connector M72

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of A/T assembly.
2. Check the resistance between the A/T assembly harness connector terminals.

A/T assembly harness connector			Resistance (Ω)
Connector No.	Terminal No.		
F6	3	8	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the TCM branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the TCM. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >>
- Present error: Replace the control valve with TCM. Refer to AT-242, "Removal and Installation" .
- Past error: Error was detected in the TCM branch line.

NG >> Repair the power supply and the ground circuit.

BCM Branch Line Circuit

NKS0054R

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the BCM for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of BCM.
2. Check the resistance between the BCM harness connector terminals.

BCM harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M90	39	40	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the BCM branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the BCM. Refer to BCS-11, "Schematic" .

OK or NG

OK >>
- Present error: Replace the BCM. Refer to BCS-17, "Removal and Installation of BCM" .
- Past error: Error was detected in the BCM branch line.

NG >> Repair the power supply and the ground circuit.

Data Link Connector Branch Line Circuit

NKS0054S

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the data link connector for damage, bend and loose connection (connector side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

Check the resistance between the data link connector terminals.

Data link connector			Resistance (Ω)
Connector No.	Terminal No.		
M8	6	14	Approx. 54 – 66

OK or NG

OK >>
- Present error: Check the following items again.
  - Decision of CAN system type.
  - Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
  - Procedure for detecting root cause.
- Past error: Error was detected in the data link connector branch line circuit.

NG >> Repair the data link connector branch line.

Unified Meter and A/C Amp. Branch Line Circuit

NKS0054T

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the unified meter and A/C amp. for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of unified meter and A/C amp.
2. Check the resistance between the unified meter and A/C amp. harness connector terminals.

Unified meter and A/C amp. harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M48	1	11	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the unified meter and A/C amp. branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the unified meter and A/C amp. Refer to DI-49, "Power Supply and Ground Circuit Inspection" .

OK or NG

OK >> ● Present error: Replace the unified meter and A/C amp. Refer to DI-55, "Removal and Installation of Unified Meter and A/C Amp." .
● Past error: Error was detected in the unified meter and A/C amp. branch line.

NG >> Repair the power supply and the ground circuit.

Steering Angle Sensor Branch Line Circuit

NKS0054U

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the steering angle sensor for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of steering angle sensor.
2. Check the resistance between the steering angle sensor harness connector terminals.

Steering angle sensor harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M22	4	5	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the steering angle sensor branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the steering angle sensor. Refer to BRC-86, "Schematic" .

OK or NG

OK >> ● Present error: Replace the steering angle sensor. Refer to BRC-133, "Removal and Installation" .
● Past error: Error was detected in the steering angle sensor branch line.

NG >> Repair the power supply and the ground circuit.

ABS Actuator and Electric Unit (Control Unit) Branch Line Circuit

NKS0054V

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the ABS actuator and electric unit (control unit) for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of ABS actuator and electric unit (control unit).
2. Check the resistance between the ABS actuator and electric unit (control unit) harness connector terminals.

ABS actuator and electric unit (control unit) harness connector			Resistance (Ω)
Connector No.	Terminal No.		
E51	20	23	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the ABS actuator and electric unit (control unit) branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the ABS actuator and electric unit (control unit). Refer to BRC-13, "Schematic" .

OK or NG

OK >>
- Present error: Replace the ABS actuator and electric unit (control unit). Refer to BRC-36, "Removal and Installation" .
- Past error: Error was detected in the ABS actuator and electric unit (control unit) branch line.

NG >> Repair the power supply and the ground circuit.

IPDM E/R Branch Line Circuit

NKS0054W

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).

- IPDM E/R connector
- Harness connector E108 (Models with VDC)
- Harness connector M15 (Models with VDC)

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of IPDM E/R.
2. Check the resistance between the IPDM E/R harness connector terminals.

IPDM E/R harness connector			Resistance (Ω)
Connector No.	Terminal No.		
E9	48	49	Approx. 108 – 132

OK or NG

OK >> GO TO 3.
NG >> Repair the IPDM E/R branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the IPDM E/R. Refer to PG-24, "IPDM E/R Power/Ground Circuit Inspection" .

OK or NG

OK >> ● Present error: Replace the IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
● Past error: Error was detected in the IPDM E/R branch line.

NG >> Repair the power supply and the ground circuit.

CAN Communication Circuit

NKS0054X

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect all the unit connectors on CAN communication system.
4. Check terminals and connectors for damage, bend and loose connection.

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

Check the continuity between the data link connector terminals.

Data link connector			Continuity
Connector No.	Terminal No.		
M8	6	14	No

OK or NG

OK >> GO TO 3.
NG >> Check the harness and repair the root cause.

3. CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

Check the continuity between the data link connector and the ground.

Data link connector		Ground	Continuity
Connector No.	Terminal No.		
M8	6		No
	14		No

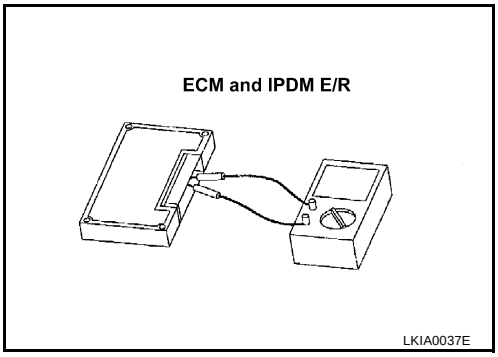
OK or NG

OK >> GO TO 4.
NG >> Check the harness and repair the root cause.

4. CHECK ECM AND IPDM E/R TERMINATION CIRCUIT

1. Remove the ECM and the IPDM E/R.
2. Check the resistance between the ECM terminals.

ECM		Resistance (Ω)
Terminal No.		
114	113	Approx. 108 – 132



3. Check the resistance between the IPDM E/R terminals.

IPDM E/R		Resistance (Ω)
Terminal No.		
48	49	Approx. 108 – 132

OK or NG

OK >> GO TO 5.
NG >> Replace the ECM and/or the IPDM E/R.

5. CHECK SYMPTOM

Connect all the connectors. Check if the symptoms described in the “Symptom (Results from interview with customer)” are reproduced.

Inspection result

Reproduced>>GO TO 6.
Non-reproduced>>Start the diagnosis again. Follow the trouble diagnosis procedure when past error is detected.

6. CHECK UNIT REPRODUCTION

Perform the reproduction test as per the following procedure for each unit.

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect one of the unit connectors of CAN communication system.

   NOTE:
   ECM and IPDM E/R have a termination circuit. Check other units first.
4. Connect the battery cable to the negative terminal. Check if the symptoms described in the “Symptom (Results from interview with customer)” are reproduced.

   NOTE:
   Although unit-related error symptoms occur, do not confuse them with other symptoms.

Inspection result

Reproduced>>Connect the connector. Check other units as per the above procedure.
Non-reproduced>>Replace the unit whose connector was disconnected.

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LIGHTING SYSTEM

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PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS00541

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS00542

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

General Precautions for Service Operations

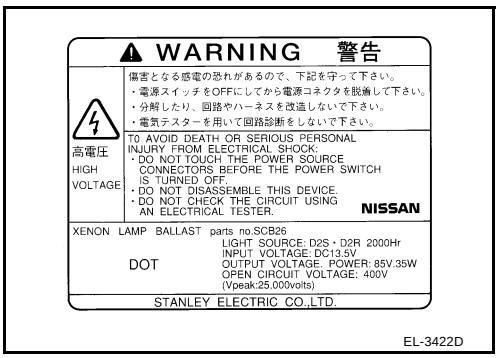
NKS00543

- Never work with wet hands.
- Xenon headlamp includes high voltage generating part. Be sure to disconnect battery negative cable (negative terminal) or power fuse before removing, installing, or touching the xenon headlamp (including lamp bulb).
- Turn the lighting switch OFF before disconnecting and connecting the connector.
- When turning the xenon headlamp on and while it is illuminated, never touch the harness, bulb, and socket of the headlamp.
- When checking the headlamp on/off operation, check it on vehicle and with the power connected to the vehicle-side connector.



PKIB7344E

- Do not touch the headlamp bulb glass surface with bare hands or allow oil or grease to get on it. Do not touch the headlamp bulb just after the headlamp is turned off, because it is very hot.
- Install the xenon headlamp bulb socket correctly. If it is installed improperly, high-voltage leak or corona discharge may occur that can melt the bulb, connector, and housing. Do not illuminate the xenon headlamp bulb out of the headlamp housing. Doing so can cause fire and harm your eyes.
- When the bulb has burned out, wrap it in a thick vinyl bag and discard. Do not break the bulb.
- Leaving the bulb removed from the headlamp housing for a long period of time can deteriorate the performance of the lens and reflector (dirt, clouding). Always prepare a new bulb and have it on hand when replacing the bulb.



EL-3422D

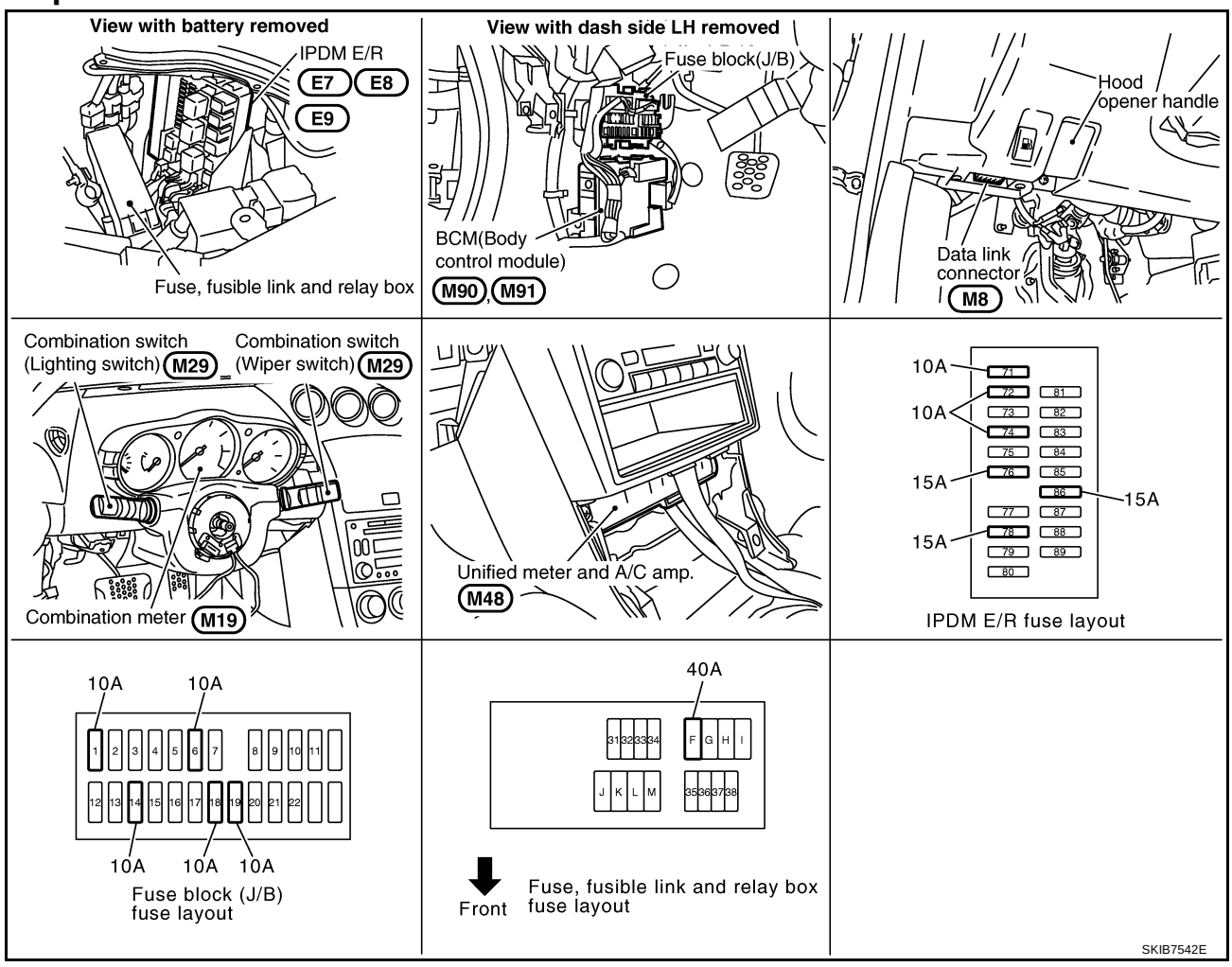
- When adjusting the headlamp aiming, turn the aiming adjustment screw only in the tightening direction. (If it is necessary to loosen the screw, first fully loosen the screw, and then turn it in the tightening direction.)
- Do not use organic solvent (paint thinner or gasoline) to clean lamps and to remove old sealant.

HEADLAMP (FOR USA)

PFP:26010

Component Parts and Harness Connector Location

NKS004WM



System Description

NKS004WN

Control of the headlamp system operation is dependent upon the position of the combination switch (lighting switch). When the lighting switch is placed in the 2ND position, the BCM (body control module) receives input signal requesting the headlamps (and tail lamps) illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) through the CAN communication lines. The CPU (central processing unit) of the IPDM E/R controls the headlamp high and headlamp low relay coils. These relays, when energized, direct power to the respective headlamps, which then illuminate.

OUTLINE

Power is supplied at all times

- to headlamp high relay, located in IPDM E/R and
- to headlamp low relay, located in IPDM E/R, from battery directly,
- through 40A fusible link [letter F, located in fuse, fusible link and relay box]
- to BCM terminal 55,
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM terminal 42,
- through 15A fuse [No.78 located in IPDM E/R]
- to CPU located in IPDM E/R,
- through 10A fuse [No.71,located in IPDM E/R]
- to CPU located in IPDM E/R,
- through 10A fuse [No.19, located in fuse block (J/B)]

- to combination meter terminal 24.

With ignition switch in ON or START position, power is supplied

- to CPU located in IPDM E/R,
- through 10A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

HEADLAMP OPERATION

Low Beam Operation

With the lighting switch in 2ND position, the BCM receives input signal from combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION") the headlamp to illuminate. This input signal is communicated to the IPDM E/R through the CAN communication lines. The CPU located in the IPDM E/R controls the headlamp low relay coil, which when energized, supplies power,

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7.

Ground is supplied

- to front combination lamp RH terminal 4, and
- to front combination lamp LH terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With power and ground supplied, low beam headlamps illuminate.

High Beam Operation/Flash-to-Pass Operation

With the lighting switch in 2ND position and placed in HIGH or PASS position, the BCM receives input signal requesting headlamp high beams to illuminate. High beam request signal and low beam request signal is communicated to the IPDM E/R through CAN communication. The CPU located in the IPDM E/R controls headlamp high relay and headlamp low relay turned ON, which when energized, supplies power,

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7,
- through 10A fuse [No. 72, located in IPDM E/R]
- through IPDM E/R terminal 27

- to front combination lamp RH terminal 3,
- through 10A fuse [No. 74, located in IPDM E/R]
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 3.

Ground is supplied

- to front combination lamp RH terminals 4, and
- to front combination lamp LH terminals 4,
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With the power and ground supplied, headlamp bulbs illuminate. High beam solenoids move the bulb shades in the front combination lamps, and the bulb shades change to high beam position.
Unified meter and A/C amp. receives signal from BCM through CAN communication lines, and then combination meter indicator illuminates high beam.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (ON), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.
Under this condition, the headlamps remain illuminated for 5 minutes, then the headlamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

REMOTE KEYLESS ENTRY SYSTEM OPERATION

Refer to BL-59, "REMOTE KEYLESS ENTRY SYSTEM" .

VEHICLE SECURITY SYSTEM

The vehicle security system will flash the high beams if the system is triggered. Refer to BL-125, "VEHICLE SECURITY (THEFT WARNING) SYSTEM" .

XENON HEADLAMP

Xenon type lamps are used for headlamps. Xenon bulbs do not use a filament. Instead, they produce light when a high voltage current is passed between two tungsten electrodes through a mixture of xenon (an inert gas) and certain other metal halides. In addition to strong lighting power, electronic control of the power supply gives the headlamps stable quality and tone color.
Followings are some advantages of the xenon type headlamp.

- The light produced by the headlamps is white color similar to sunlight that is easy to the eyes.
- Light output is nearly double that of halogen headlamps, affording increased area of illumination.
- Counter-reflected luminance increases and the contrast enhances on the wet road in the rain. That makes visibility go up more than the increase of the light volume.
- Power consumption is approximately 25 percent less than halogen headlamps, reducing battery load.

CAN Communication System Description

NKS004WO

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

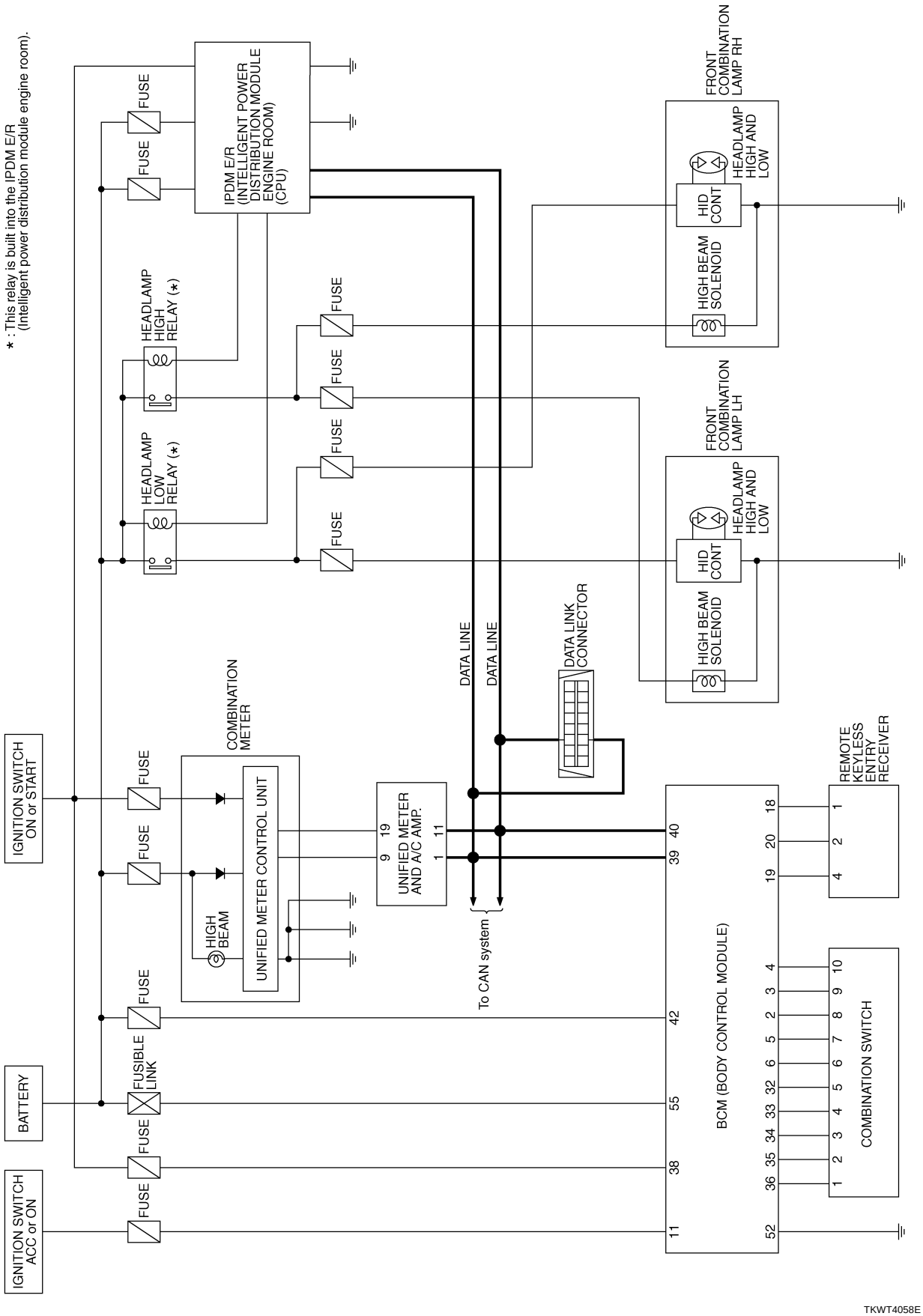
CAN Communication Unit

NKS004WP

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

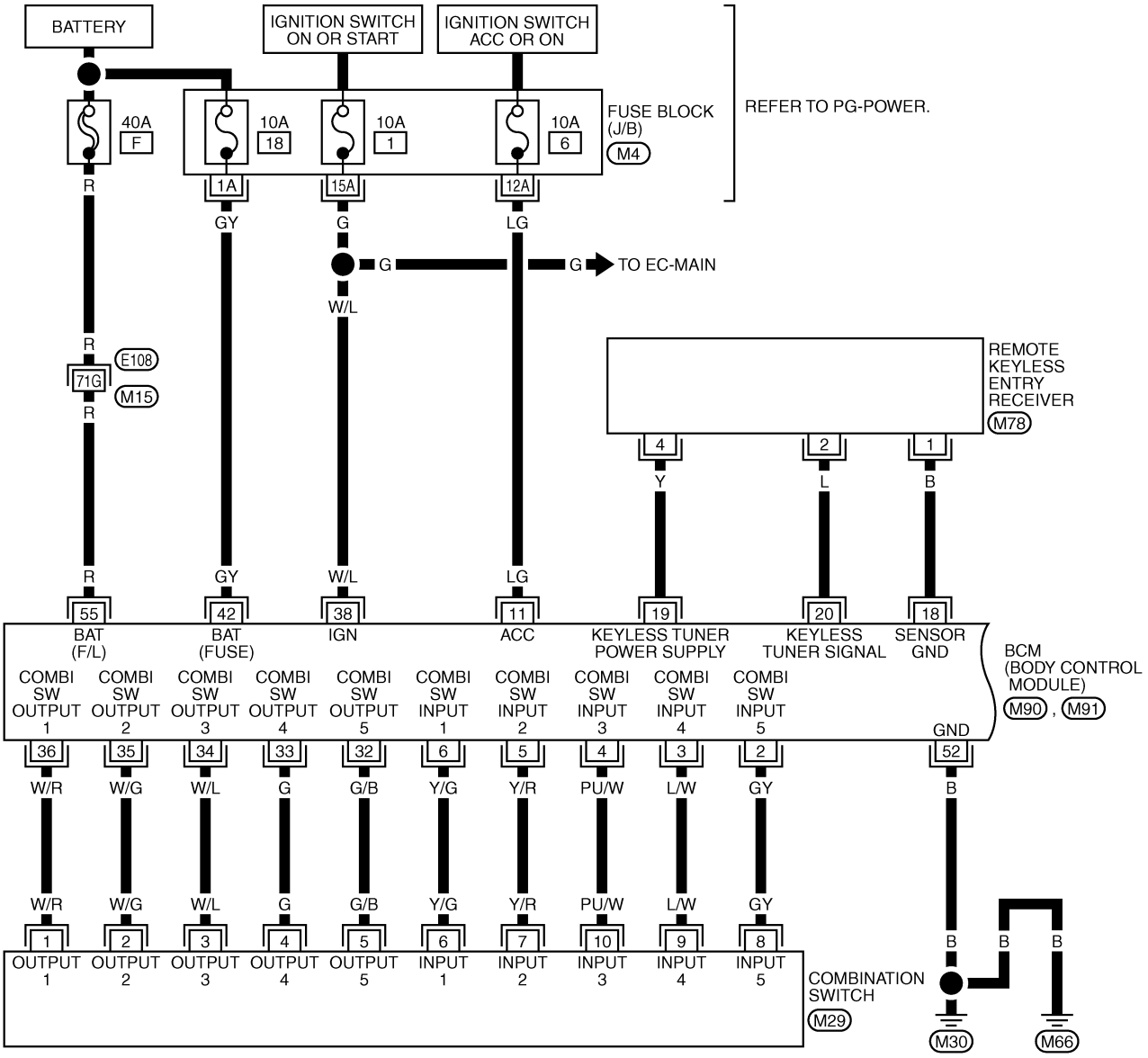
NKS004WQ

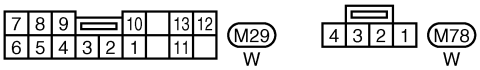


Wiring Diagram — H/LAMP —

NKS004WR

LT-H/LAMP-01





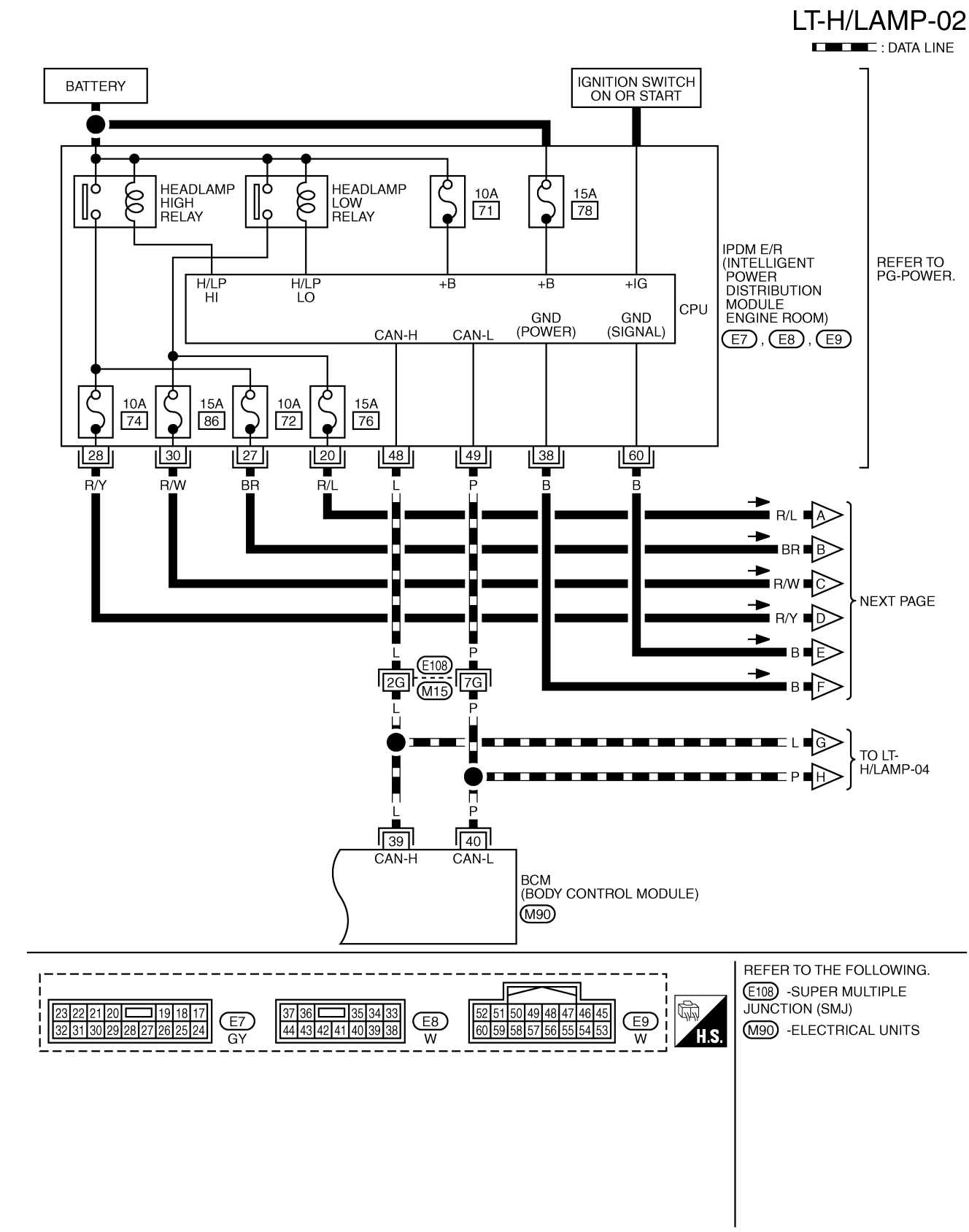
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

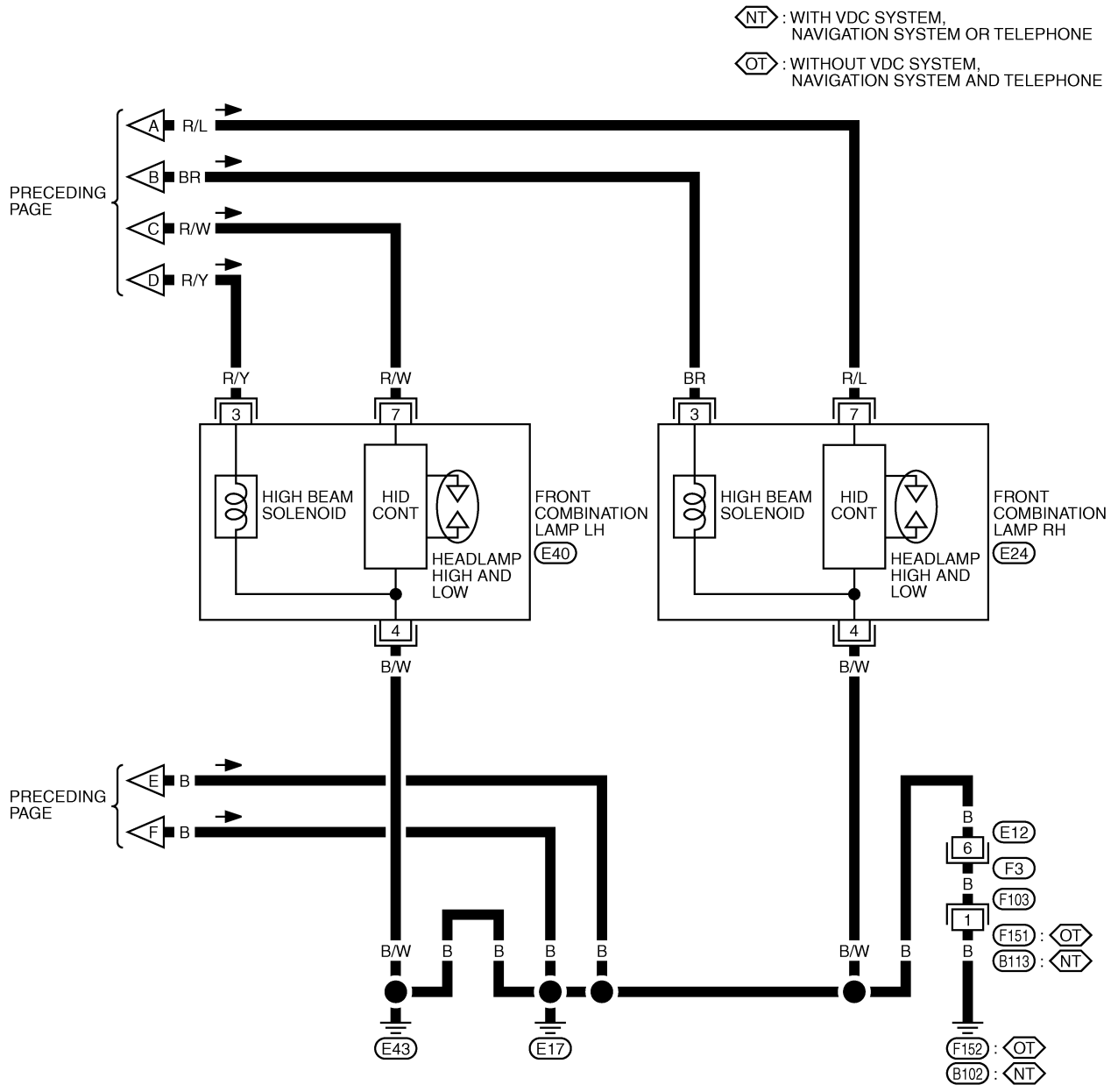
M90 , M91 -ELECTRICAL UNITS

TKWT5744E


LT-H/LAMP-02
: DATA LINE
BATTERY
IGNITION SWITCH ON OR START
HEADLAMP HIGH RELAY
HEADLAMP LOW RELAY
10A 71
15A 78
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E7 , E8 , E9
REFER TO PG-POWER.
H/LP HI
H/LP LO
+B
+B
+IG
CPU
GND (POWER)
GND (SIGNAL)
CAN-H
CAN-L
10A 74
15A 86
10A 72
15A 76
28
30
27
20
48
49
38
60
R/Y
R/W
BR
R/L
L
P
B
B
R/L A
BR B
R/W C
R/Y D
B E
B F
NEXT PAGE
E108
2G
M15
7G
L G
P H
TO LT-H/LAMP-04
39
40
CAN-H
CAN-L
BCM (BODY CONTROL MODULE)
M90
23 22 21 20 19 18 17
32 31 30 29 28 27 26 25 24
E7
GY
37 36 35 34 33
44 43 42 41 40 39 38
E8
W
52 51 50 49 48 47 46 45
60 59 58 57 56 55 54 53
E9
W
H.S.
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M90 -ELECTRICAL UNITS

TKWT5745E

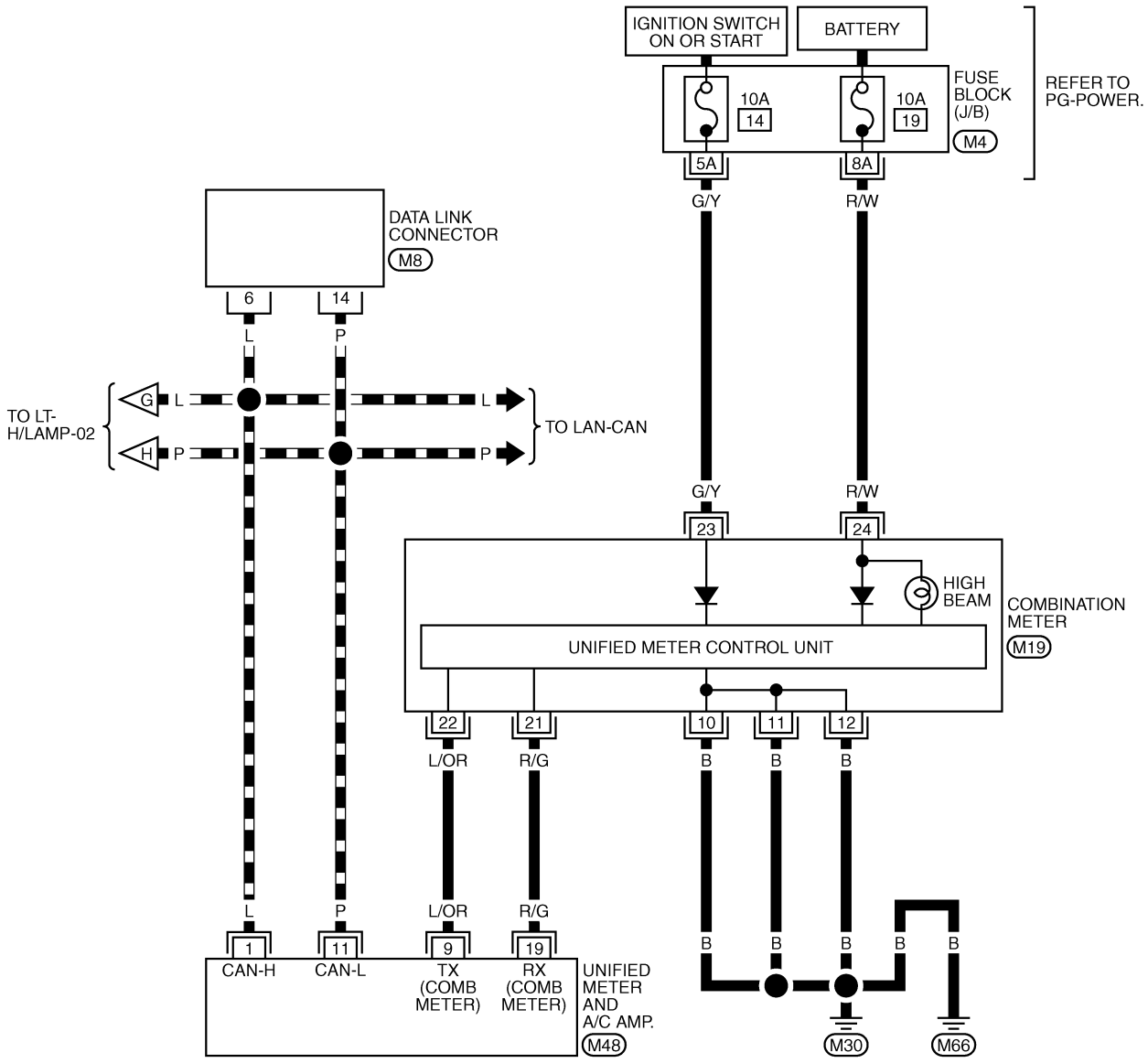
LT-H/LAMP-03

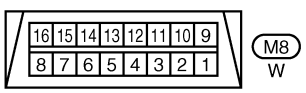


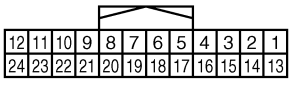
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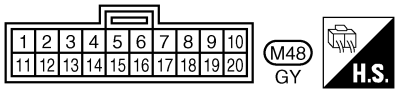
LT-H/LAMP-04

: DATA LINE









REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

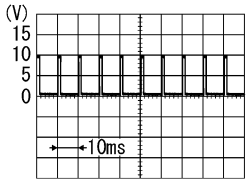
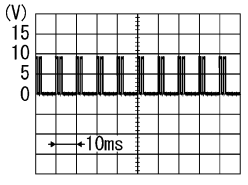
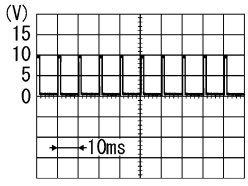
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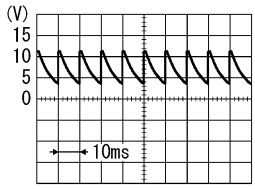
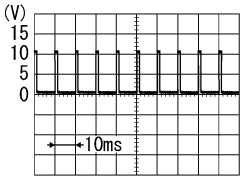
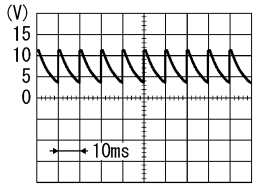
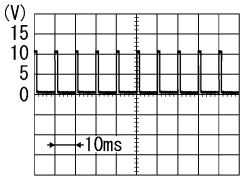
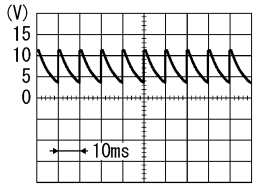
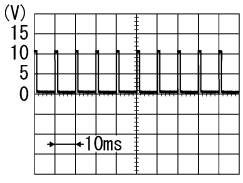
Terminals and Reference Values for BCM

NKS004WS

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch)	 PKIB4959J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4959J Approx. 1.0 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Lighting switch 1ST (The same result with lighting switch 2ND)	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch)	 PKIB4958J Approx. 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
39	L	CAN – H	—	—	—
40	P	CAN – L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0 V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

NKS004WT

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R/L	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0 V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0 V
					ON	Battery voltage
30	R/W	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
48	L	CAN – H	—	—		—
49	P	CAN – L	—	—		—
60	B	Ground	ON	—		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS004WU

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-5, "System Description" .
3. Perform the preliminary check. Refer to LT-15, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does headlamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004WV

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6

Unit	Power source	Fuse and fusible link No.
IPDM E/R	Battery	72
		74
		76
		86

Refer to LT-9, "Wiring Diagram — H/LAMP —" .

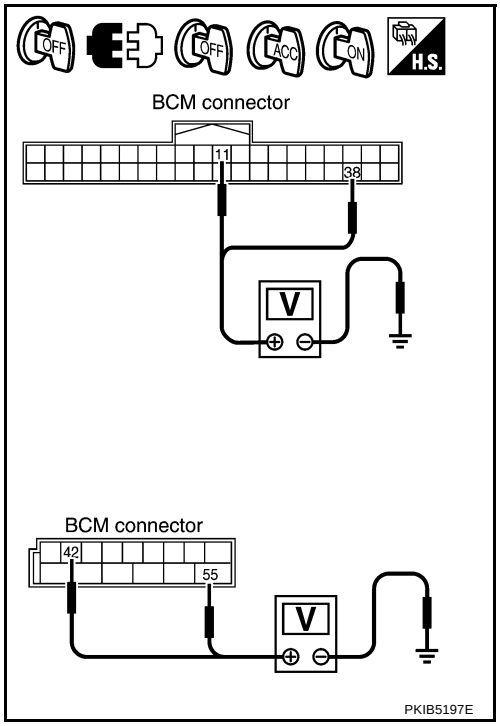
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
BCM connector	Terminal				
M90	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage



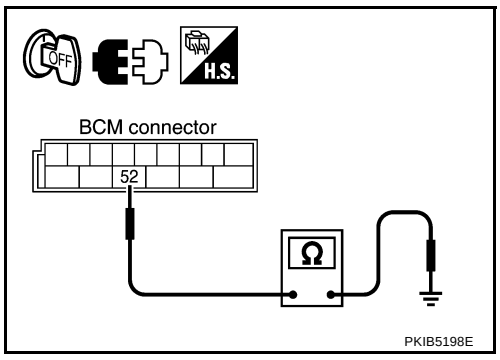
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Function (BCM)

NKS004WW

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
HEADLAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
BCM	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT
Display Item List

Item	Description	CONSULT-III	Factory setting
BATTERY SAVER SET	Exterior lamp battery saver control mode can be changed in this mode. Selects exterior lamp battery saver control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR
Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“ON/OFF”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 1: ON/Others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1 ST	“ON/OFF”	Displays status (lighting switch 1ST or 2ND position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW NOTE	“ON/OFF”	—
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays status of passenger door as judged from passenger door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - RR NOTE	“OFF”	—
DOOR SW - RL NOTE	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
TURN SIGNAL R	“ON/OFF”	Displays status (Turn right: ON/Others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays status (Turn left: ON/Others: OFF) as judged from lighting switch signal.
CARGO LAMP SW NOTE	“OFF”	—

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST
Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON–OFF.
HEAD LAMP	Allows headlamp relay to operate by switching ON–OFF.
FR FOG LAMP NOTE	—
CORNERING LAMP NOTE	—

NOTE:
This item is displayed, but cannot be tested.

CONSULT-III Function (IPDM E/R)

NKS004WX

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Check Item, Diagnosis Mode	Description
SELF-DIAGNOSTIC RESULTS	Refer to PG-18, "SELF-DIAG RESULTS" .
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

DATA MONITOR
All Signals, Main Signals, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL & CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST
Display Item List

Test item	CONSULT-III screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON–OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON–OFF every 1 second).

Headlamp Does Not Change To High Beam (Both Sides)

NKS004WY

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select “HI BEAM SW” of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is HIGH BEAM : HI BEAM SW ON

CHECK THE COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "LAMPS" of IPDM E/R active test item.
2. With operating the test item, check the headlamp high beam operation.

Headlamp high beam should operate.
(Headlamp high beam repeats ON-OFF every 1 second).

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

CONSULT-III DATA MONITOR

1. Select "HL LO REQ" and "HL HI REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status

When lighting switch is HIGH BEAM : HL LO REQ ON : HL HI REQ ON

OK or NG

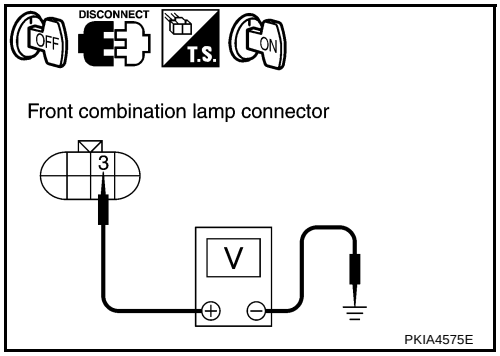
OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select "LAMPS" of IPDM E/R active test item
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

NOTE:
Headlamp high beam repeats ON–OFF every 1 second.



Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

NOTE:
Headlamp high beam repeats ON–OFF every 1 second.

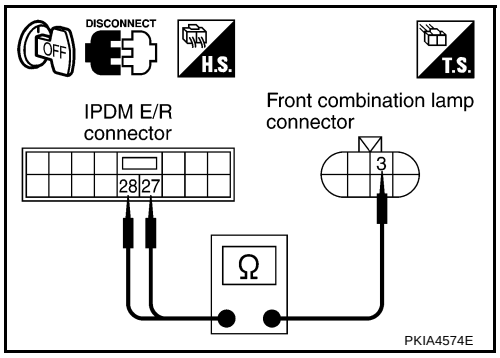
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp (RH and LH) harness connector.



Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	27	E24	3	Yes
LH		28	E40	3	

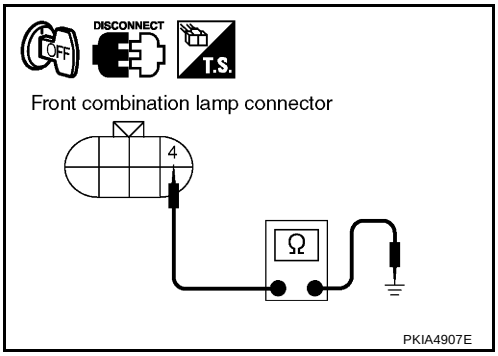
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

6. CHECK HEADLAMP GROUND

Check continuity between front combination lamp (RH and LH) harness connector and ground.

Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		



OK or NG

OK >> Check headlamp harness, connector and bulb.
NG >> Repair harness or connector.

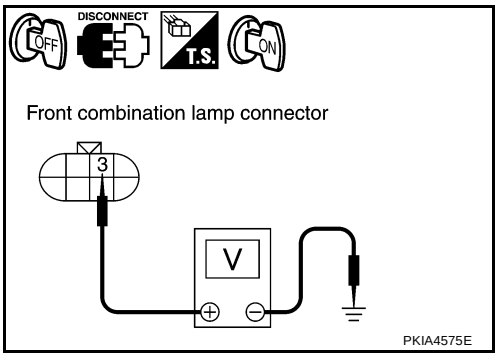
Headlamp Does Not Change To High Beam (One Side)

NKS004WZ

1. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned HIGH BEAM position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.

Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		



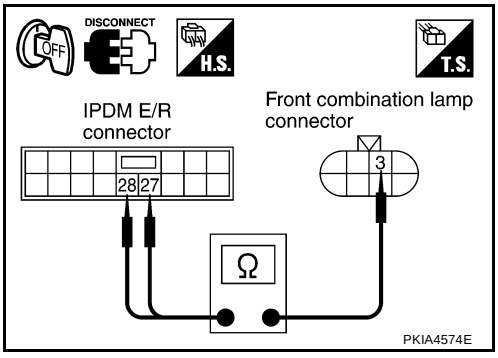
OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp RH or LH harness connector.

Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	27	E24	3	Yes
LH		28	E40	3	



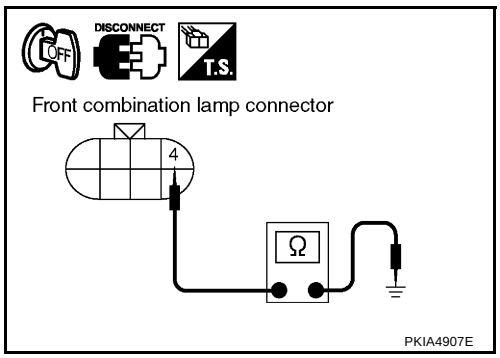
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

3. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH or LH harness connector and ground.

Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		



OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

High Beam Indicator Lamp Does Not Illuminate

NKS004X0

1. CHECK BULB

Check bulb of high beam indicator lamp.

OK or NG

OK >> Replace combination meter. Refer to DI-24, "Removal and Installation for Combination Meter" .
NG >> Replace indicator bulb.

Headlamp Low Beam Does Not Illuminate (Both Sides)

NKS004X1

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP SW1" and "HEAD LAMP SW2" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND position : HEAD LAMP SW1 ON
: HEAD LAMP SW2 ON

CHECK THE COMBINATION SWITCH
Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "LAMPS" of IPDM E/R active test item.
2. With operating the test item, check the headlamp low beam operation.

Headlamp low beam should operate.

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the headlamp low beam operation.

Headlamp low beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

CONSULT-III DATA MONITOR

1. Select "HL LO REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND position : HL LO REQ ON

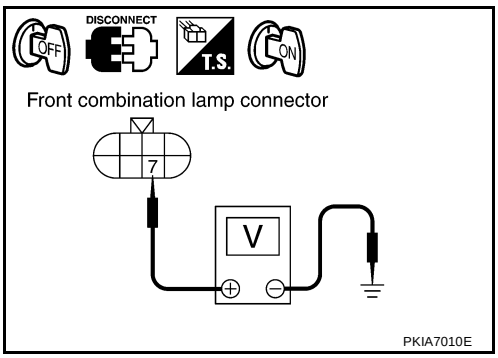
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select "LAMPS" of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(-)	
Front combination lamp connector	Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

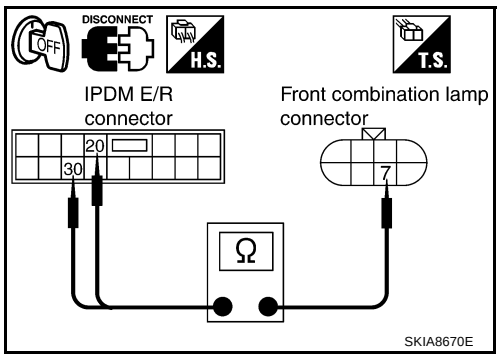
Terminals			Voltage (Approx.)
(+)		(-)	
Front combination lamp connector	Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp (RH and LH) harness connector.



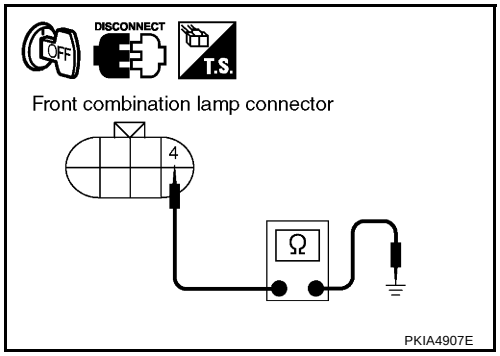
Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	20	E24	7	Yes
LH		30	E40	7	

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

6. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp (RH and LH) harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		

OK or NG

OK >> Check headlamp harness and connectors, ballasts (HID control unit), and xenon bulbs. Refer to LT-27, "Xenon Headlamp Trouble Diagnosis" .
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

NKS004X2

1. CHECK BULB

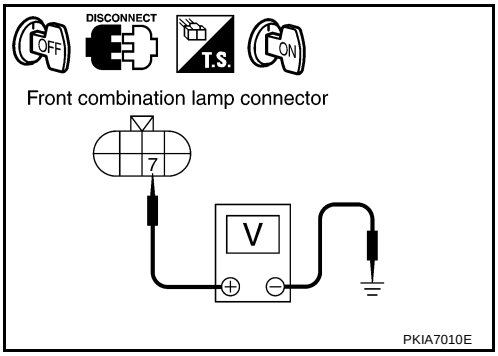
Check ballast (HID control unit) and xenon bulb of lamp which does not illuminate. Refer to LT-27, "Xenon Headlamp Trouble Diagnosis" .

OK or NG

OK >> GO TO 2.
NG >> Replace malfunctioning part.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned 2ND position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.



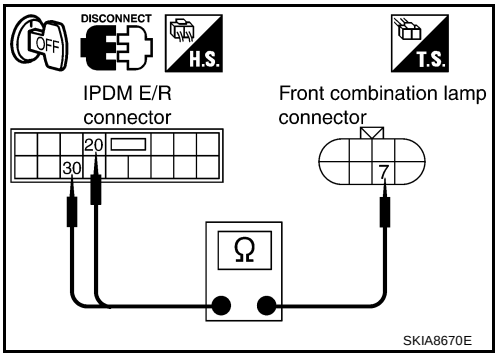
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp RH or LH harness connector.



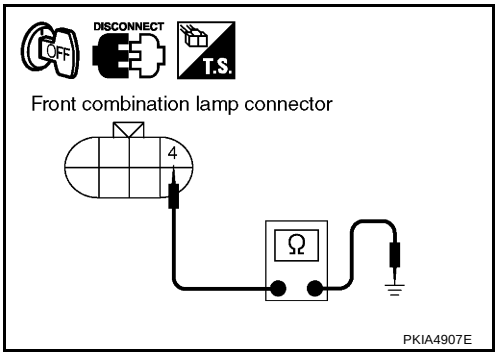
Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	20	E24	7	Yes
LH		30	E40	7	

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

4. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH or LH harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		

OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

Headlamps Does Not Turn OFF

NKS004X3

1. CHECK HEADLAMP TURN OFF

Make sure that lighting switch is OFF. And check if headlamp turns off when ignition switch is turned OFF.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP1" and "HEAD LAMP2" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is OFF : HEAD LAMP SW1 OFF
: HEAD LAMP SW2 OFF

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

3. CHECKING CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

Perform self-diagnosis for “BCM” with CONSULT-III.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
CAN COMM CIRCUIT>> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

General Information for Xenon Headlamp Trouble Diagnosis

NKS004X4

In most cases, malfunction of xenon headlamp - “does not illuminate”, “flickers” or “dark” - is caused by a malfunctioning xenon bulb. A malfunctioning HID control unit or lamp housing, however, may be a cause. Be sure to perform trouble diagnosis following the steps described below.

Caution:

NKS004X5

- Installation or removal of connector must be done with lighting switch OFF.
- Disconnect the battery cable from the negative terminal or remove power fuse.

  CAUTION:
  After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
- When the lamp is illuminated (when lighting switch is ON), never touch harness, HID control unit, inside of lamp, or lamp metal parts.
- To check illumination, temporarily install lamp in vehicle. Be sure to connect power at vehicle side connector.
- If error can be traced directly to electrical system, first check for items such as blown fuses and fusible links, broken wires or loose connectors, dislocated terminals, and improper connections.
- Never work with wet hands.
- Using a tester for HID control unit circuit trouble diagnosis is prohibited.
- Disassembling HID control unit or harnesses (bulb socket harness, ECM harness) is prohibited.
- Immediately after illumination, light intensity and color will fluctuate, but there is nothing wrong.
- When bulb has come to end of its life, brightness will drop significantly, it will flash repeatedly, or light color will turn reddish.

Xenon Headlamp Trouble Diagnosis

NKS004X6

1. CHECK 1: XENON HEADLAMP LIGHTING

Install normal xenon bulb to corresponding xenon bulb headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon bulb.
NG >> GO TO 2.

2. CHECK 2: XENON HEADLAMP LIGHTING

Install normal HID control unit to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace HID control unit.
NG >> GO TO 3.

3. CHECK 3: XENON HEADLAMP LIGHTING

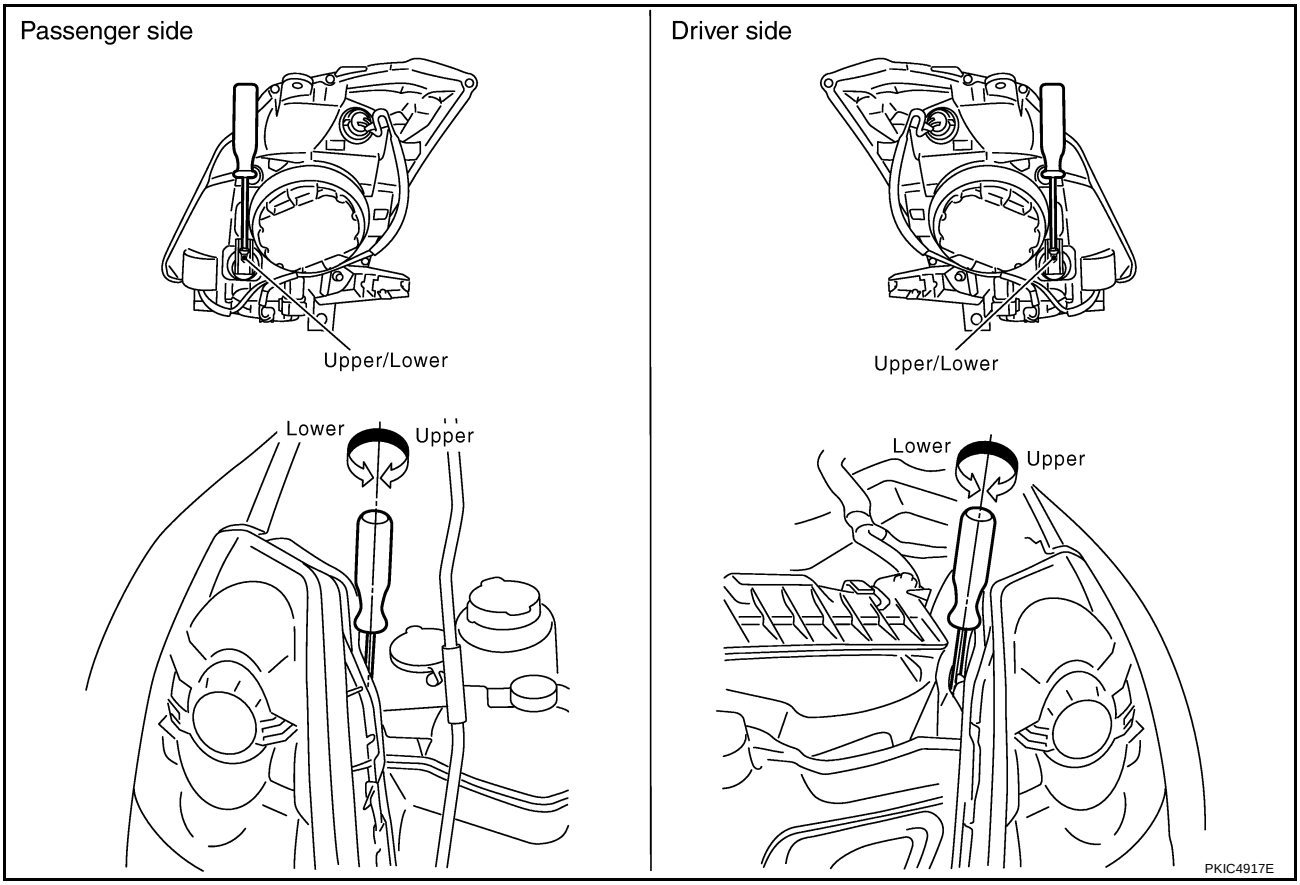
Install normal xenon lamp housing assembly to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon headlamp housing assembly. [Malfunction in starter (boosting circuit) in xenon headlamp housing]
NG >> INSPECTION END

Aiming Adjustment

NKS004X7



PREPARATION BEFORE ADJUSTING

For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

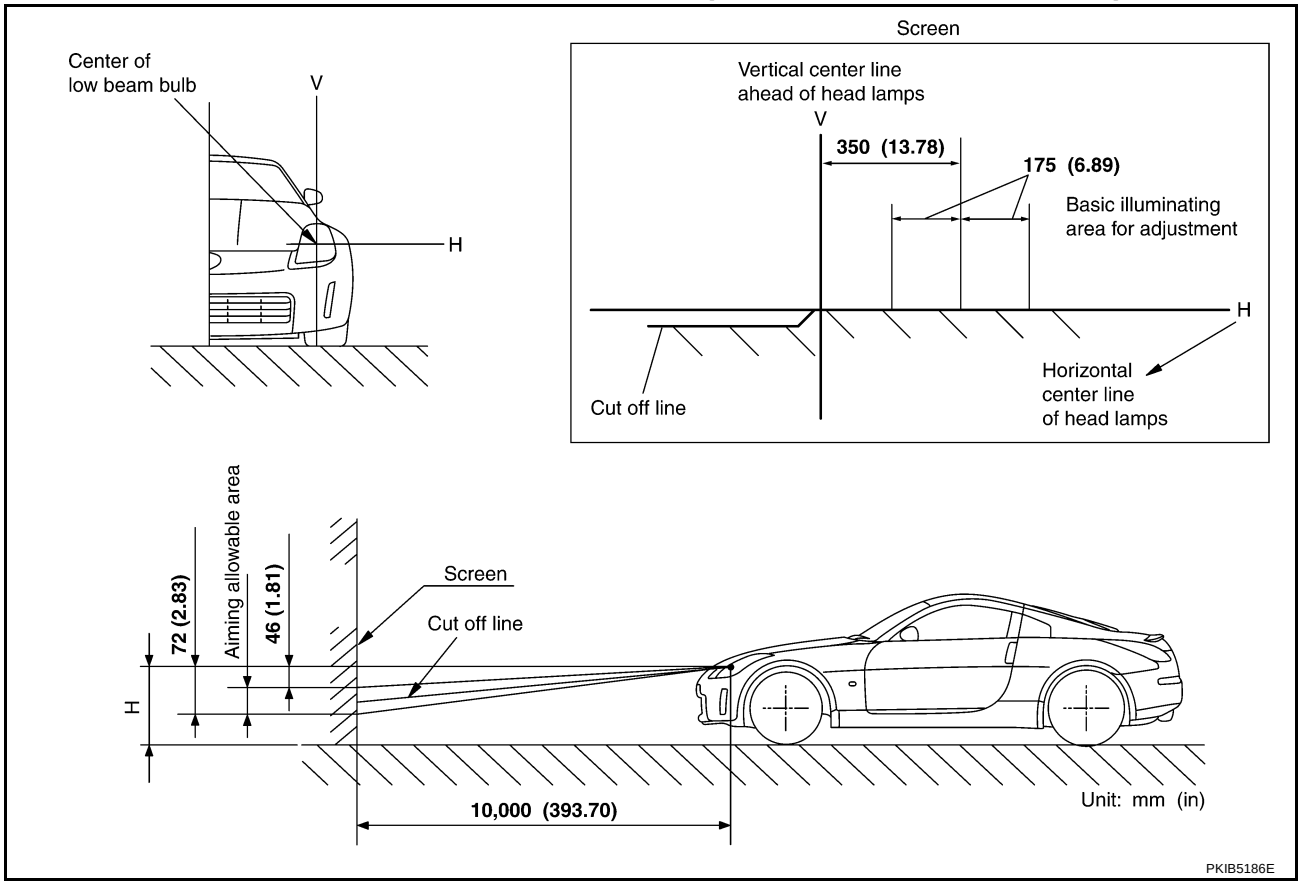
1. Keep all tires inflated to correct pressures.
2. Place vehicle on level surface.

3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam ON.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

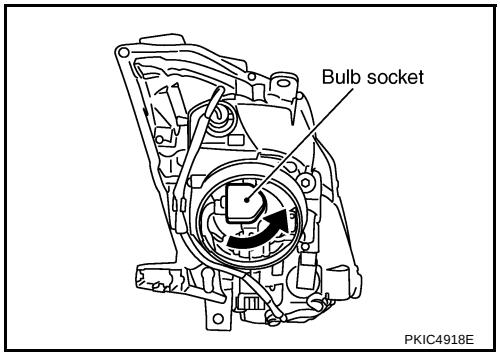
Bulb Replacement

NKS004X8

HEADLAMP HIGH/LOW BEAM

1. Turn lighting switch OFF.
2. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal or remove power fuse.

   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove headlamp. Refer to LT-29, "Removal and Installation" .
4. Turn plastic cap counterclockwise and unlock it.
5. Turn bulb socket counterclockwise and unlock it.
6. Unlock retaining spring and remove bulb from headlamp.
7. Installation is reverse order of removal.



NOTE:
After installation, perform aiming adjustment. Refer to LT-27, "Aiming Adjustment" .

Headlamp high/low beam (Xenon) : 12V - 35W (D2R)

PARKING LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" .
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Installation is reverse order of removal.

Parking lamp : 12V - 5W

FRONT TURN SIGNAL LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" .
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Installation is reverse order of removal.

Front turn signal lamp/— : 12V - 28/8W (amber)

FRONT SIDE MARKER LAMP

1. Remove headlamp. Refer to LT-29, "Removal and Installation" .
2. Replacement integral with headlamp housing assembly.
3. Installation is reverse order of removal.

Front side marker lamp : LED

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

Removal and Installation

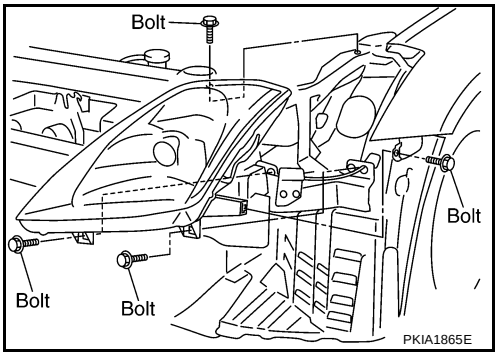
NKS004X9

REMOVAL

1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal or remove power fuse.

   CAUTION:
   After battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

2. Remove front bumper fascia. Refer to EI-14, "FRONT BUMPER" .
3. Remove headlamp mounting bolts.
4. Pull head lamp toward vehicle front, disconnect connector, and remove headlamp.



INSTALLATION

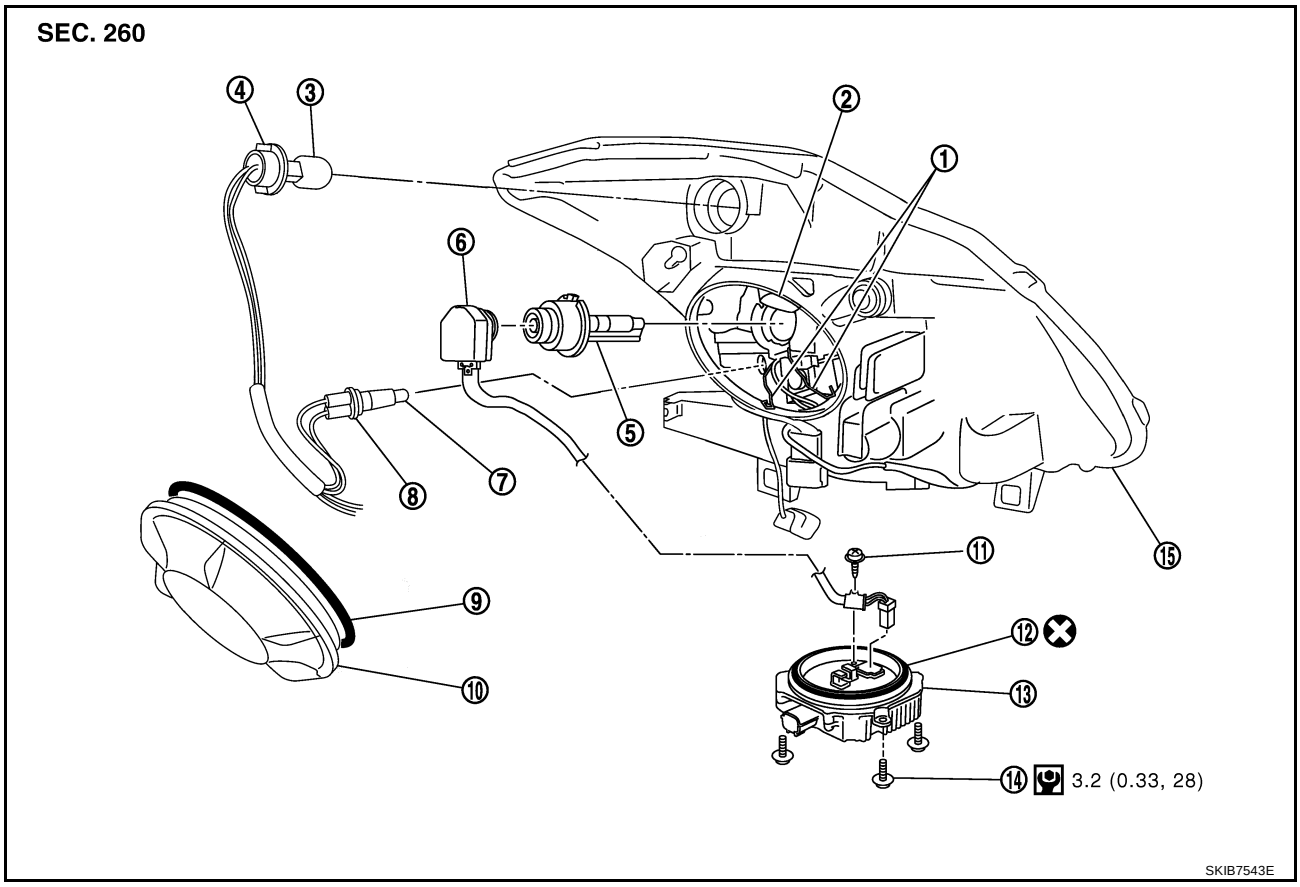
Installation is the reverse order of removal.

Headlamp mounting bolt : 6.1 N·m (0.62 kg-m, 54 in-lb)

NOTE:
After installation, perform aiming adjustment. Refer to LT-27, "Aiming Adjustment" .

Disassembly and Assembly

NKS004XA



1. Retaining spring
2. Xenon bulb socket ground
3. Front turn signal lamp bulb
4. Front turn signal lamp bulb socket
5. Xenon bulb
6. Xenon bulb socket
7. Parking lamp bulb
8. Parking lamp bulb socket
9. Seal packing
10. Plastic cap
11. Ground screw
12. Seal packing
13. HID control unit
14. HID control unit mounting screw
15. Headlamp housing assembly

:N·m (kg-m, in-lb)

: Always replace after every disassembly.

DISASSEMBLY

1. Turn plastic cap counterclockwise, and unlock it.
2. Turn xenon bulb socket counterclockwise, and unlock it.
3. Unlock retaining spring, and remove xenon bulb.
4. Disconnect xenon bulb socket ground.
5. Remove HID control unit mounting screws.
6. Remove ground screw from HID control unit.
7. Disconnect connectors from HID control unit.
8. Pull out xenon bulb socket from head lamp housing assembly.
9. Turn parking lamp bulb socket counterclockwise and unlock it.
10. Remove parking lamp bulb from its socket.
11. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
12. Remove front turn signal lamp bulb from its socket.

ASSEMBLY

Assembly is the reverse order of disassembly.

HID control unit mounting screw : 3.2 N·m (0.33 kg-m, 28 in-lb)

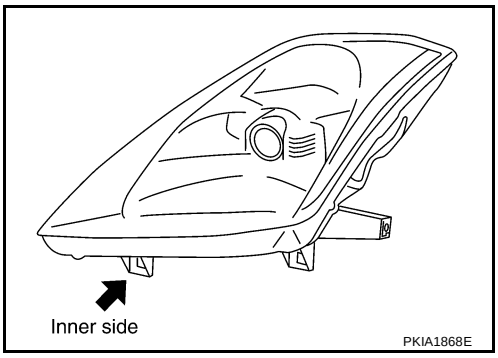
CAUTION:

- **When HID control unit is removed, reinstall it securely and avoid any looseness.**
- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness**

Servicing to Replace Headlamps When Damaged

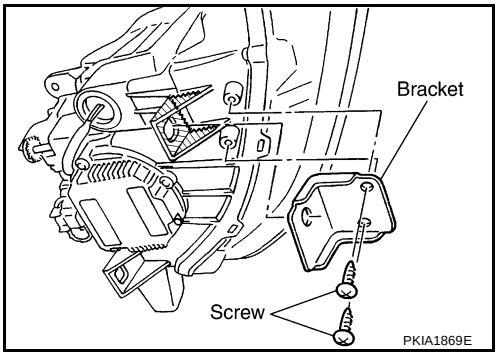
NKS004XB

If only installation part as shown in the figure is damaged, and headlamp housing itself is not damaged, repair can be completed easily by installing correction brackets.



INSTALLATION OF HEADLAMP BRACKET

1. Remove headlamps. Refer to LT-29, "Removal and Installation" .
2. Cut damaged section of installation part, then shape with sandpaper.
3. Attach each correction bracket to headlamp housing boss with 2 screws.

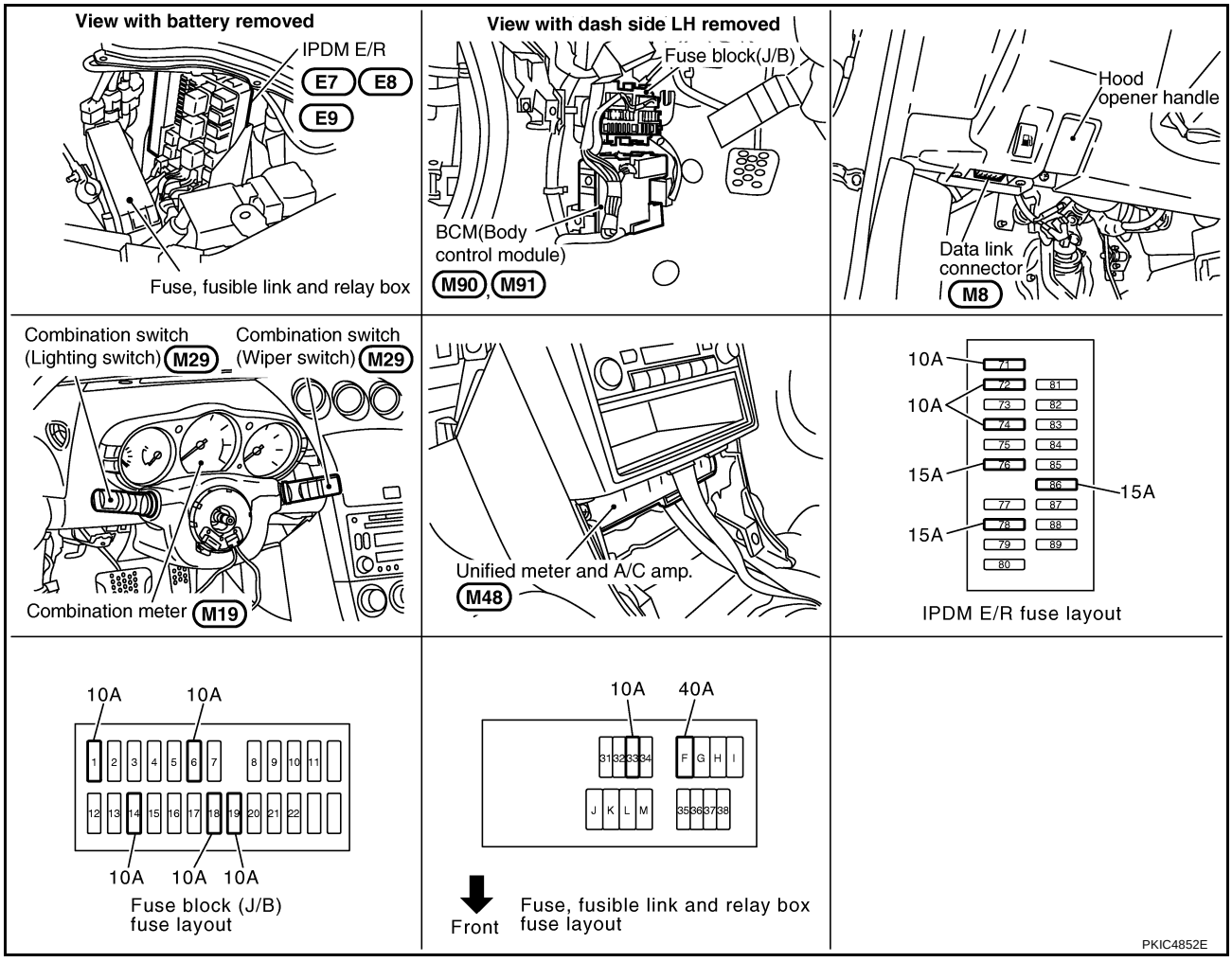


HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -

PFP:26010

Component Parts and Harness Connector Location

NKS004XC



System Description

NKS004XD

- BCM (Body Control Module) controls headlamps low beam, high beam and daytime light operation.
- Daytime light system operates parking, license plate, side marker, tail lamps and headlamp low beam according to signals from unified meter and A/C amp. (receive parking brake switch signal through CAN communication), ECM (receive engine status signal through CAN communication), lighting switch, and ignition switch.
- IPDM E/R (Intelligent Power Distribution Module Engine Room) operates parking, license plate, side marker, tail lamps, headlamp bulbs and high beam solenoids according to CAN communication signals from BCM.
- Unified meter and A/C amp. operates high beam indicator lamp according to CAN communication signals from BCM.

OUTLINE

Power is supplied at all times

- to headlamp high relay, located in IPDM E/R and
- to headlamp low relay, located in IPDM E/R, from battery directly,
- through 15A fuse [No. 78, located in IPDM E/R]
- to CPU (central processing unit) located in IPDM E/R,
- through 40A fusible link [letter F, located in the fuse, fusible link and relay box]
- to BCM terminal 55,
- through 10A fuse [No.18, located in fuse block (J/B)]

- to BCM terminal 42,
- through 10A fuse [No. 71, located in IPDM E/R]
- to CPU located in IPDM E/R,
- through 10A fuse [No.19, located in fuse block (J/B)]
- to combination meter terminal 24,
- through 10A fuse [No.33, located in the fuse, fusible link and relay box]
- to daytime light relay terminals 1 and 3.

With ignition switch in ON or START position, power is supplied

- to CPU located in IPDM E/R,
- through 10A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to BCM terminal 52
- through grounds M30 and M66,
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

HEADLAMP OPERATION

Low Beam Operation

With the lighting switch in 2ND position, the BCM receives input signal requesting the headlamps to illuminate. This input signal is communicated to the IPDM E/R through CAN communication. The CPU located in the IPDM E/R controls the headlamp low relay turned ON, which when energized, supplies power,

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7.

Ground is supplied

- to front combination lamp RH terminal 4, and
- to front combination lamp LH terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With power and ground supplied, headlamp bulbs illuminate.

High Beam Operation /Flash-to-Pass Operation

With the lighting switch in 2ND position and placed in HIGH or PASS position, the BCM receives input signal requesting headlamp high beams to illuminate. High beam request signal and low beam request signal is communicated to the IPDM E/R through CAN communication. The CPU located in the IPDM E/R controls headlamp high relay and headlamp low relay turned ON, which when energized, supplies power,

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,

- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7,
- through 10A fuse [No.72, located in IPDM E/R]
- through IPDM E/R terminal 27
- to front combination lamp RH terminal 3,
- through 10A fuse [No.74, located in IPDM E/R]
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 3.

Ground is supplied

- to front combination lamp RH terminal 4, and
- to front combination lamp LH terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With the power and ground supplied, headlamp bulbs illuminate. High beam solenoids move the bulb shades in the front combination lamps, and the bulb shades change to high beam position.
Unified meter and A/C amp. receives signal from BCM through CAN communication, and then combination meter indicator illuminates high beam,

DAYTIME LIGHT OPERATION

Once the parking brake is turned OFF after ignition switch ON, if the lighting switch is turned OFF while engine is running, the BCM outputs the signal requesting parking, license plate, side marker, tail lamps and headlamp low beam to illuminate. This output signal is communicated to the IPDM E/R through CAN communication. The CPU located in the IPDM E/R controls headlamp low relay and daytime light relay turned ON, which when energized, supplies power,

- through 15A fuse [No.76, located in the IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,
- through 15A fuse [No.86, located in the IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7,
- through 10A fuse [No.33, located in the fuse, fusible link and relay box]
- through daytime light relay terminal 2
- to IPDM E/R terminal 55,
- through daytime light relay terminal 5
- to front combination lamp RH terminal 6
- to front combination lamp LH terminal 6
- to rear combination lamp RH terminal 2
- to rear combination lamp LH terminal 2
- to license plate lamp RH terminal 2
- to license plate lamp LH terminal 2.

Ground is supplied

- to front combination lamp RH terminal 4
- to front combination lamp LH terminal 4
- to front combination lamp RH terminal 8
- to front combination lamp LH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp RH terminal 3
- to rear combination lamp LH terminal 3
- to license plate lamp RH terminal 1

- to license plate lamp LH terminal 1
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

With power and ground supplied, the headlamp low, parking, license plate and tail lamps illuminate.

OPERATION

Engine		With engine stopped									With engine running								
Lighting switch		OFF			1ST			2ND			OFF			1ST			2ND		
		OFF	Hi	P	T	Hi	P	Lo	Hi	P	OFF	Hi	P	T	Hi	P	Lo	Hi	P
Headlamp	High beams	–	–	–	–	–	×	–	×	×	–	–	×	–	–	×	–	×	×
	Low beams	–	–	–	–	–	–	×	–	–	×*	×*	–	×*	×*	–	×	–	–
Parking, license plate, side marker and tail lamps		–	–	–	×	–	×	×	×	×	×*	×*	–	×	×	×	×	×	×
Illumination		–	–	–	×	–	×	×	×	×	–	–	–	×	×	×	×	×	×

- T: “TAIL LAMP” position
- Hi: “HIGH BEAM” position
- Lo: “LOW BEAM” position
- P: “FLASH TO PASS” position
- ×: Lamp “ON”
- –: Lamp “OFF”
- *: Once the parking brake is turned OFF after ignition switch ON, parking, license plate, side marker, tail lamps and headlamp low are turned ON.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (ON), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.
Under this condition, the headlamps remain illuminated for 5 minutes, then the headlamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

INTERLOCKED OPERATION WITH REMOTE KEYLESS ENTRY SYSTEM

Refer to BL-59, "REMOTE KEYLESS ENTRY SYSTEM" .

INTERLOCKED OPERATION WITH VEHICLE SECURITY SYSTEM

Refer to BL-125, "VEHICLE SECURITY (THEFT WARNING) SYSTEM" .

XENON HEADLAMP

Xenon type lamps are used for headlamps. Xenon bulbs do not use a filament. Instead, they produce light when a high voltage current is passed between two tungsten electrodes through a mixture of xenon (an inert gas) and certain other metal halides. In addition to strong lighting power, electronic control of the power supply gives the headlamps stable quality and tone color.
Followings are some advantages of the xenon type headlamp.

- The light produced by the headlamps is white color similar to sunlight that is easy to the eyes.
- Light output is nearly double that of halogen headlamps, affording increased area of illumination.
- Counter-reflected luminance increases and the contrast enhances on the wet road in the rain. That makes visibility go up more than the increase of the light volume.
- Power consumption is approximately 25 percent less than halogen headlamps, reducing battery load.

CAN Communication System Description

NKS004XE

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

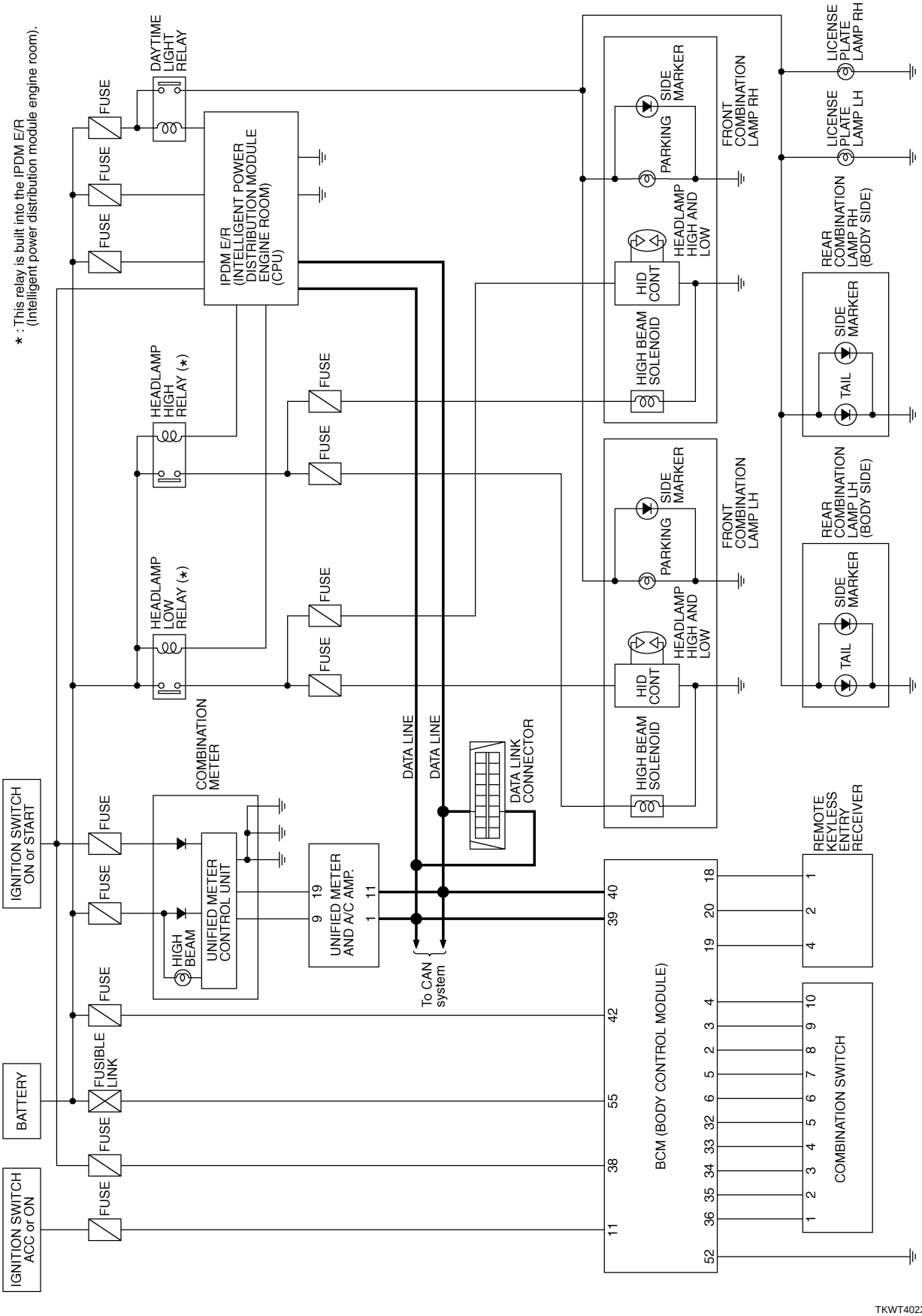
CAN Communication Unit

NKS004XF

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

NKS004XG

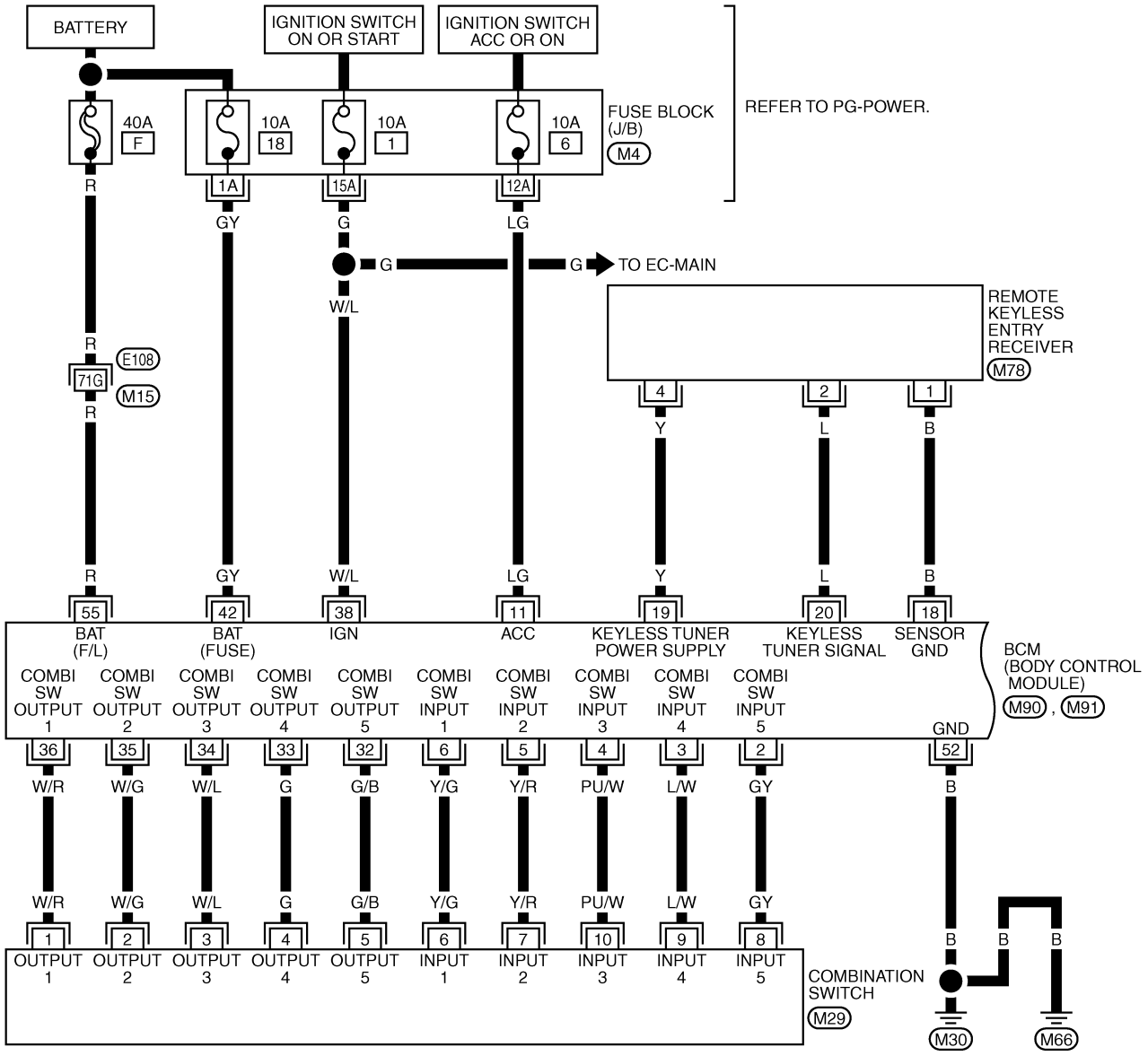


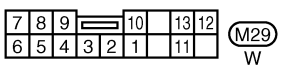
TKWT4022E

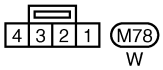
Wiring Diagram — DTRL —

NKS004XH

LT-DTRL-01







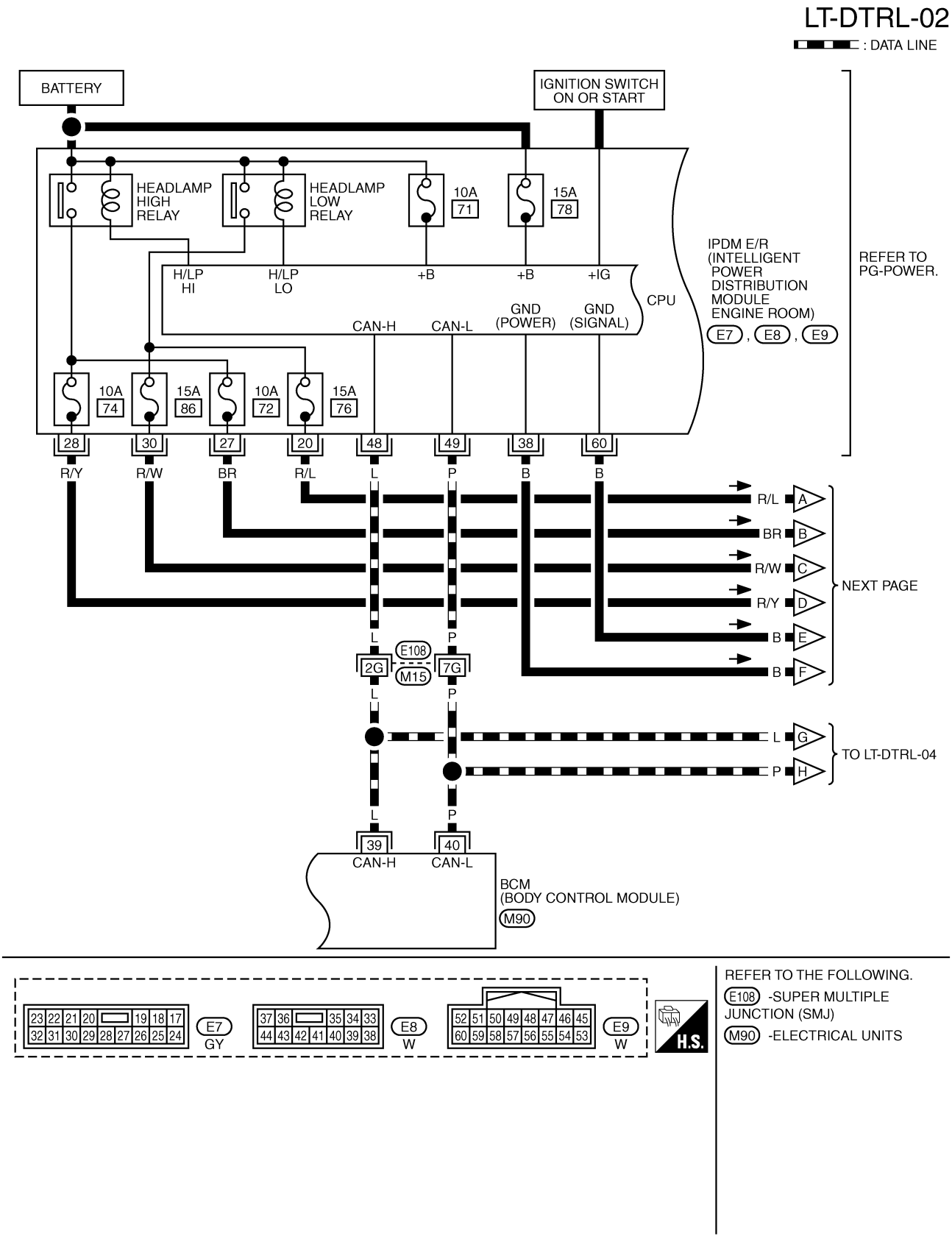
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

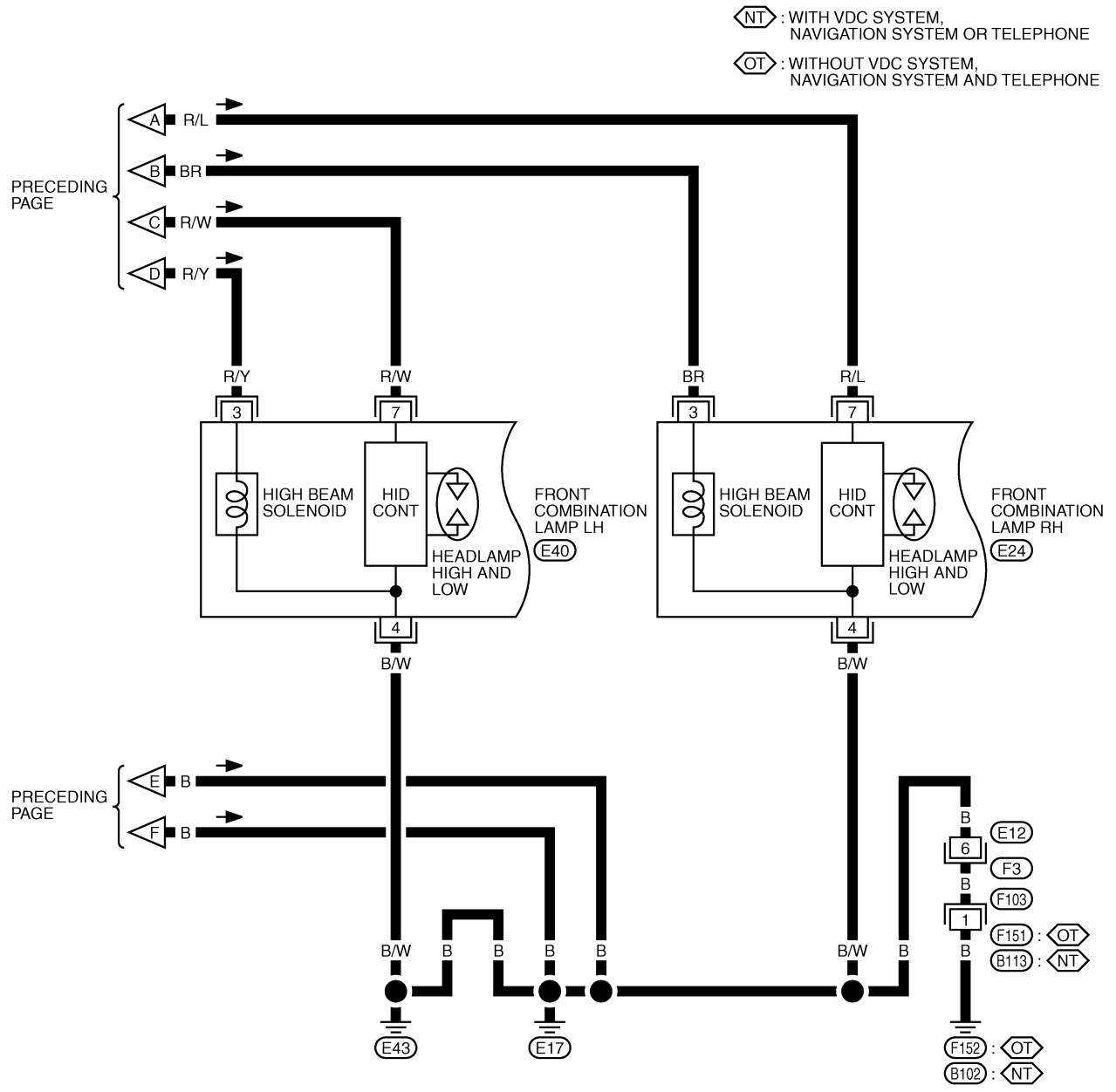
M90 , M91 -ELECTRICAL UNITS

TKWT5747E


LT-DTRL-02
: DATA LINE
BATTERY
IGNITION SWITCH ON OR START
HEADLAMP HIGH RELAY
HEADLAMP LOW RELAY
10A 71
15A 78
H/LP HI
H/LP LO
+B
+B
+IG
CPU
GND (POWER)
GND (SIGNAL)
CAN-H
CAN-L
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E7 , E8 , E9
REFER TO PG-POWER.
10A 74
15A 86
10A 72
15A 76
28
30
27
20
48
49
38
60
R/Y
R/W
BR
R/L
L
P
B
B
R/L A
BR B
R/W C
R/Y D
B E
B F
NEXT PAGE
E108
2G
M15
7G
L G
P H
TO LT-DTRL-04
39
40
CAN-H
CAN-L
BCM (BODY CONTROL MODULE)
M90
23 22 21 20 19 18 17
32 31 30 29 28 27 26 25 24
E7
GY
37 36 35 34 33
44 43 42 41 40 39 38
E8
W
52 51 50 49 48 47 46 45
60 59 58 57 56 55 54 53
E9
W
H.S.
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M90 -ELECTRICAL UNITS

TKWT5748E

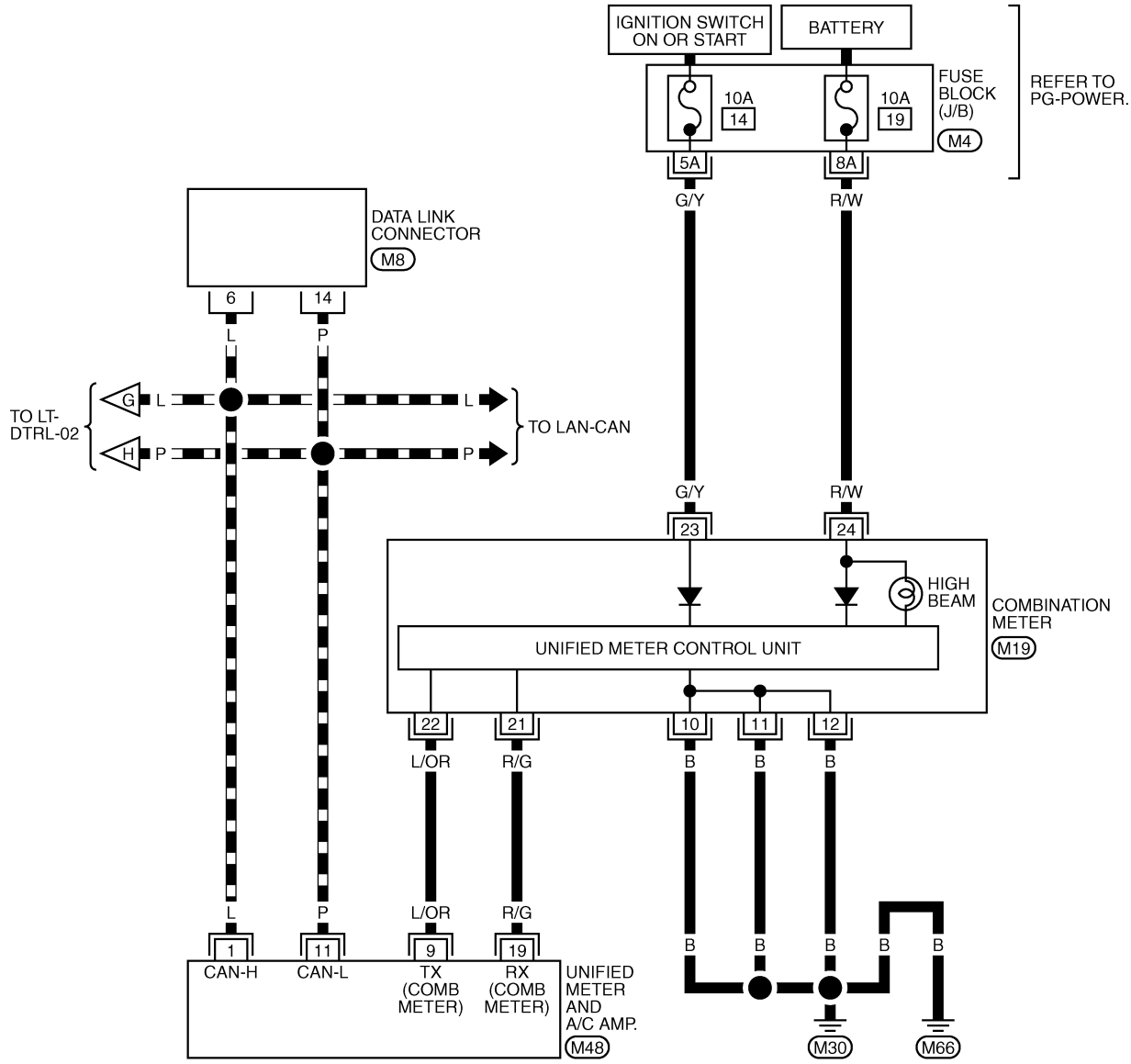
LT-DTRL-03

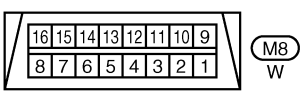


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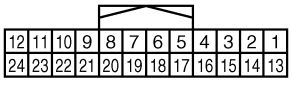
LT-DTRL-04

: DATA LINE

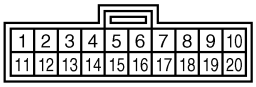




M8
W



M19
W

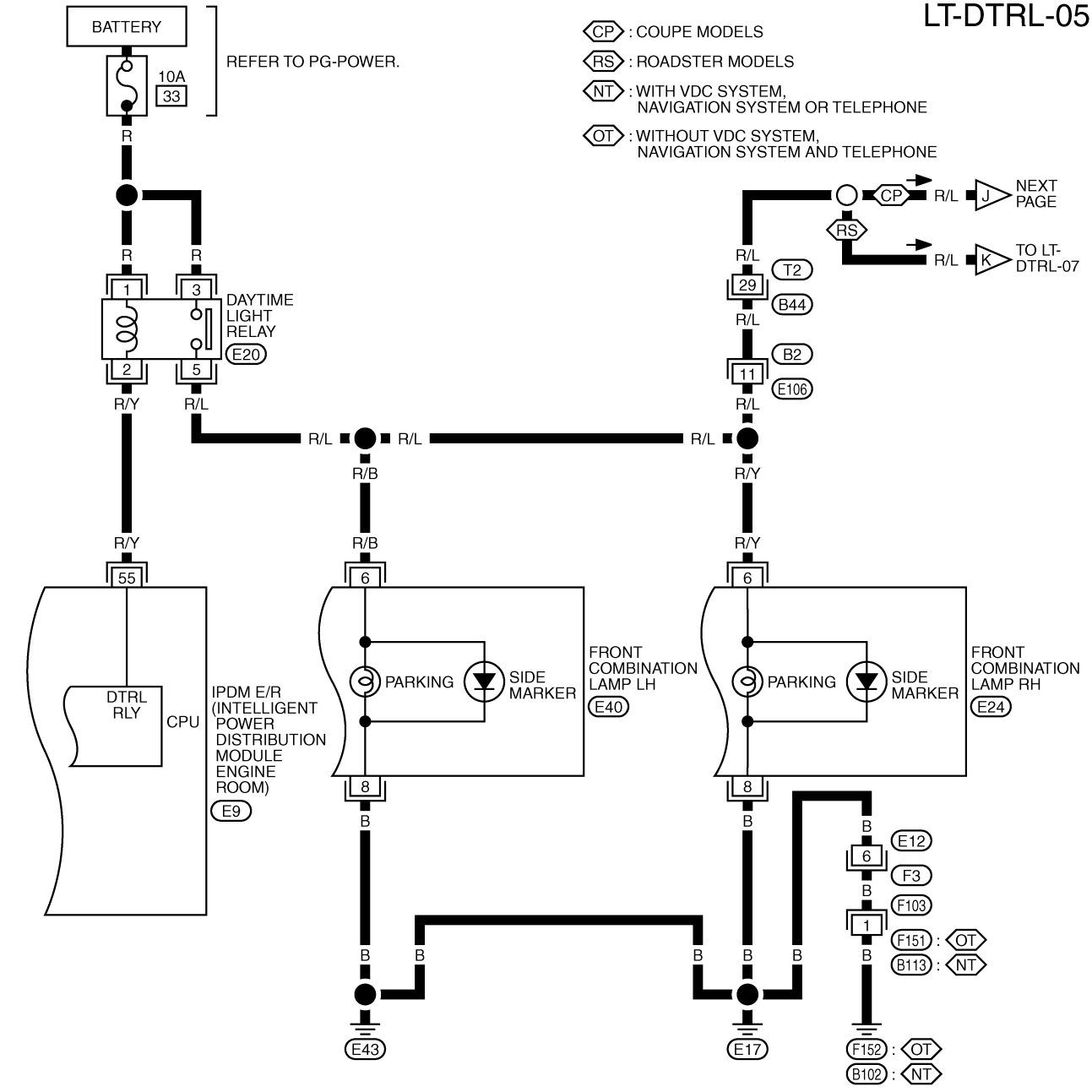


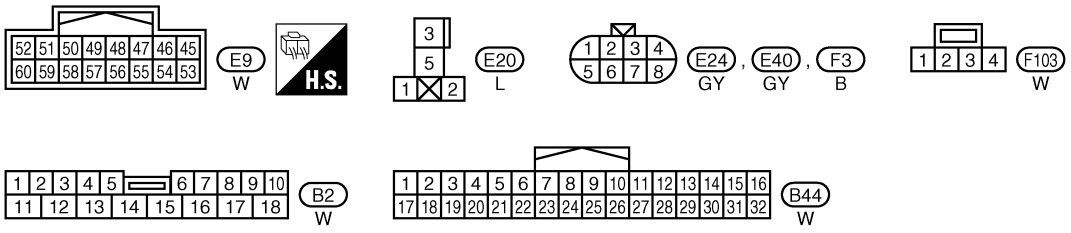
M48
GY

H.S.

REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

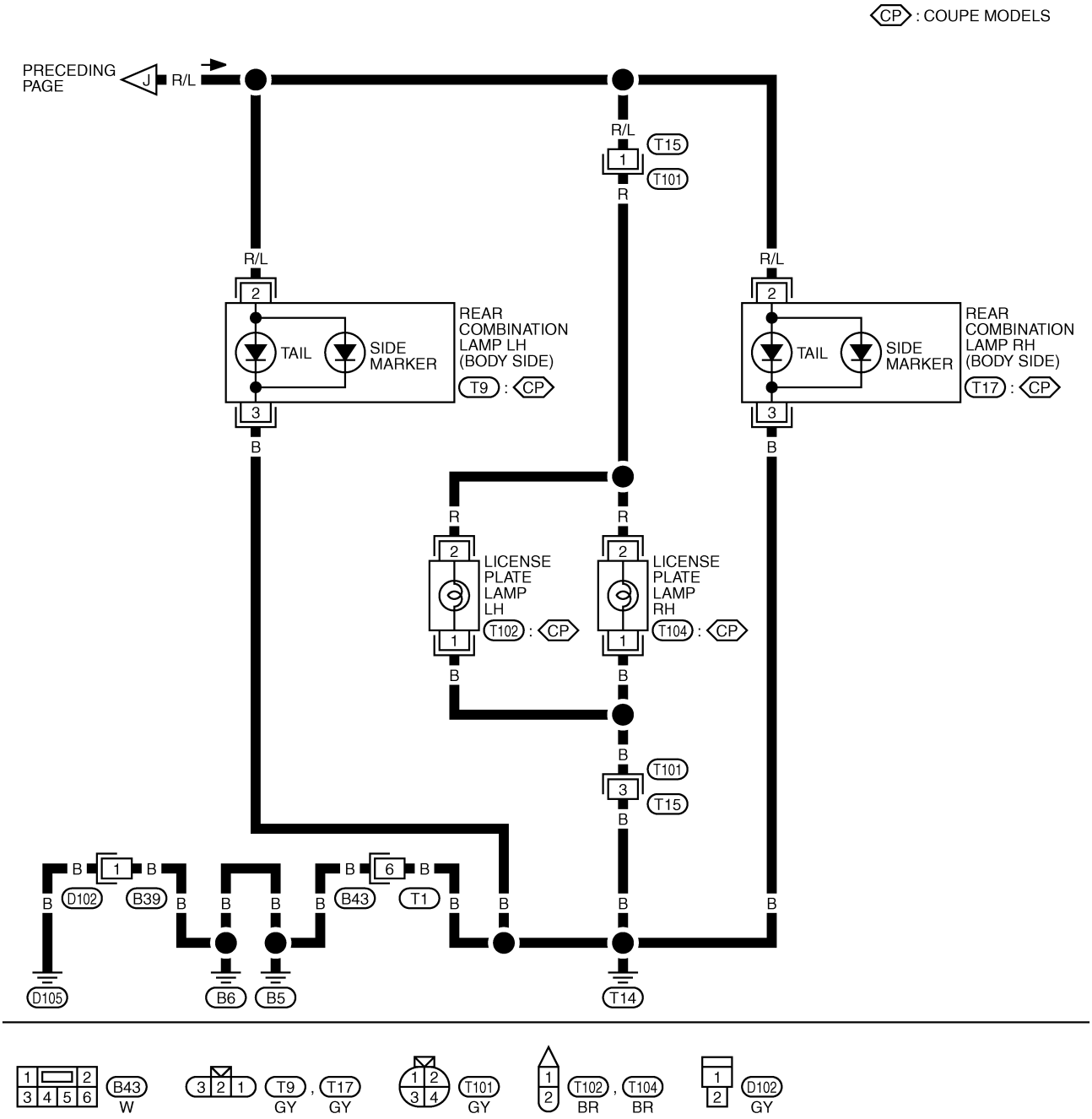
TKWT4026E


LT-DTRL-05
BATTERY
10A
33
REFER TO PG-POWER.
CP : COUPE MODELS
RS : ROADSTER MODELS
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
CP R/L J NEXT PAGE
RS R/L K TO LT-DTRL-07
DAYTIME LIGHT RELAY
E20
T2
B44
B2
E106
DTRL RLY
CPU
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E9
PARKING
SIDE MARKER
FRONT COMBINATION LAMP LH
E40
FRONT COMBINATION LAMP RH
E24
E12
F3
F103
F151 : OT
B113 : NT
F152 : OT
B102 : NT
E43
E17


E9 W
H.S.
E20 L
E24 , E40 , F3 GY GY B
F103 W
B2 W
B44 W

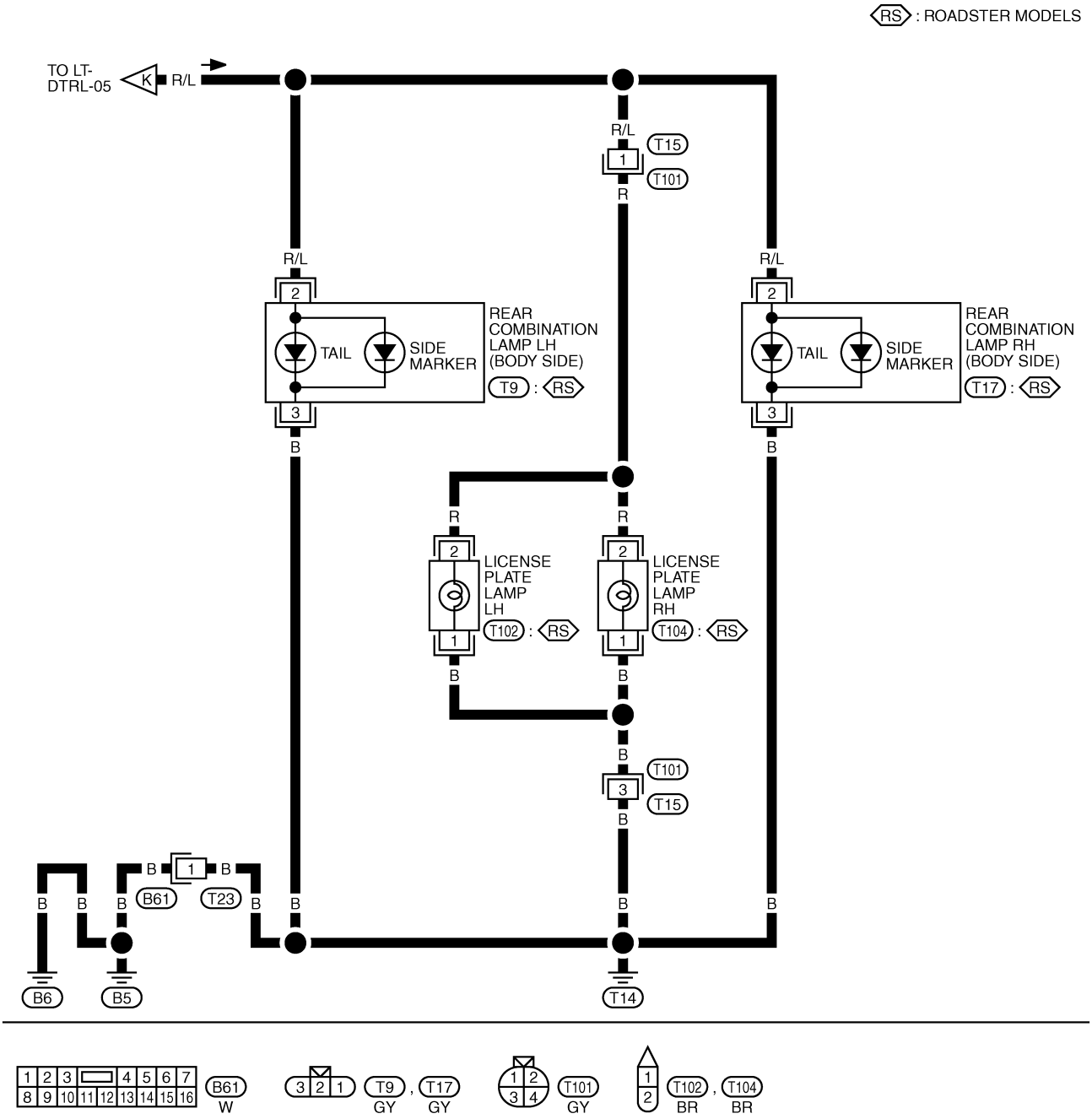
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LT-DTRL-06



TKWT4028E

LT-DTRL-07



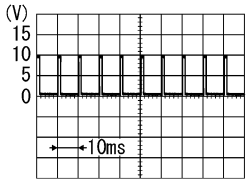
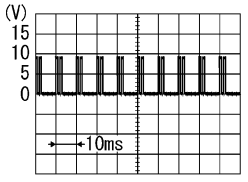
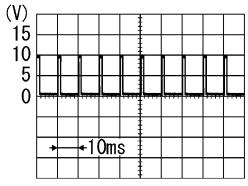
TKWT4029E

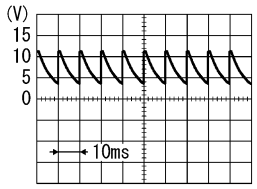
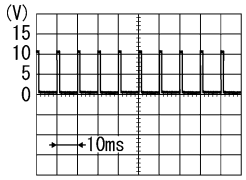
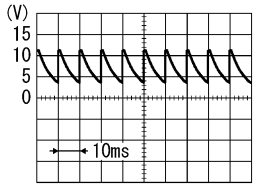
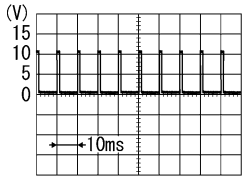
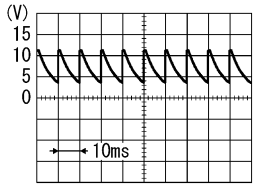
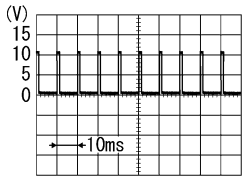
Terminals and Reference Values for BCM

NKS004XI

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch)	 PKIB4959J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4959J Approx. 1.0 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Lighting switch 1ST (The same result with lighting switch 2ND)	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch)	 PKIB4958J Approx. 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
39	L	CAN – H	—	—	—
40	P	CAN – L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0 V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

NKS004XJ

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R/L	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0 V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0 V
					ON	Battery voltage
30	R/W	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
48	L	CAN – H	—	—		—
49	P	CAN – L	—	—		—
55	R/Y	Daytime light relay signal	ON	Lighting switch 1ST position	OFF	Approx. 0 V
					ON	Battery voltage
60	B	Ground	ON	—		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS004XK

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-32, "System Description" .
3. Perform the preliminary check. Refer to LT-47, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does headlamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004XL

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

UNIT	POWER SOURCE	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6

UNIT	POWER SOURCE	Fuse and fusible link No.
IPDM E/R	Battery	33
		72
		74
		76
		86

Refer to LT-38, "Wiring Diagram — DTRL —" .

OK or NG

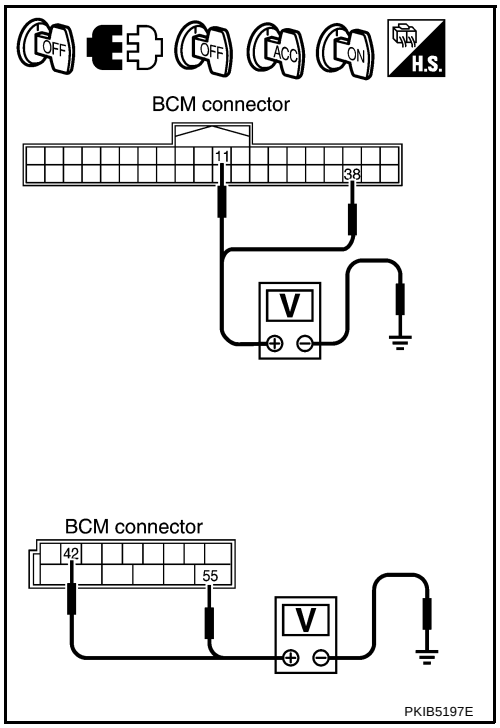
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
BCM connector	Terminal				
M90	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage



OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

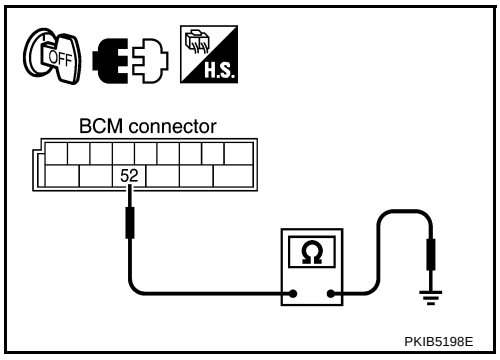
Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.



CONSULT-III Function (BCM)

NKS004XM

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
HEADLAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
BCM	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT
Display Item List

Item	Description	CONSULT-III	Factory setting
BATTERY SAVER SET	Exterior lamp battery saver control mode can be changed in this mode. Select exterior lamp battery saver control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR
Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“ON/OFF”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 1: ON/Others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1 ST	“ON/OFF”	Displays status (lighting switch 1ST or 2ND position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW NOTE	“ON/OFF”	—
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/ Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays status of passenger door as judged from passenger door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - RR NOTE	“OFF”	—
DOOR SW - RL NOTE	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
TURN SIGNAL R	“ON/OFF”	Displays status (Turn right: ON/Others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays status (Turn left: ON/Others: OFF) as judged from lighting switch signal.
ENGINE RUN	“ON/OFF”	Displays status (engine running: ON/ engine stopped: OFF) of engine judged from engine run signal.
PKB SW	“ON/OFF”	Displays status (parking brake released: ON/ parking brake applied: OFF) of parking brake switch judged from parking brake switch signal.
CARGO LAMP SW NOTE	“OFF”	—

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST
Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON–OFF.
HEAD LAMP	Allows headlamp relay to operate by switching ON–OFF.
FR FOG LAMP NOTE	—
CORNERING LAMP NOTE	—
DAYTIME RUNNING LIGHT	Allows headlamp low relay and daytime light relay to operate switching ON–OFF.

NOTE:
This item is displayed, but cannot be tested.

CONSULT-III Function (IPDM E/R)

NKS004XN

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Check Item, Diagnosis Mode	Description
SELF-DIAG RESULTS	Refer to PG-18, "SELF-DIAG RESULTS" .
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

DATA MONITOR
All Signals, Main Signals, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	Monitor item selection			Description
			ALL SIG-NALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL&CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM
Daytime running light request	DTRL REQ	ON/OFF	×		×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST
Display Item List

Test item	CONSULT-III screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON–OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON–OFF every 1 second).

Daytime Light Control Does Not Operate

NKS004XO

NOTE:
Check if parking, license plate, side marker, tail lamps and head lamps low operates normally.

1. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "DAYTIME RUNNING LIGHT" of BCM active test item.
2. With operating the test item, check the headlamp low beam, parking, license plate and tail lamps operate.

Headlamp low beam, parking, license plate and tail lamps should operate.

OK or NG

OK >> GO TO 2.
NG >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

2. CHECK INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP" of BCM data monitor item.
2. With the engine running or stop, check the monitor status.

Engine running	**: ENGINE RUN ON**
Engine stop	**: ENGINE RUN OFF**

3. With operating the parking brake, check the monitor status.

Parking brake ON	**: PKB SW ON**
Parking brake OFF	**: PKB SW OFF**

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

Headlamp Does Not Change To High Beam (Both Sides)

NKS004XP

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is HIGH BEAM	**: HI BEAM SW ON**

Without CONSULT-III
Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "LAMPS" of IPDM E/R active test item.
2. With operating the test item, check the headlamp high beam operation.

Headlamp high beam should operate.
(Headlamp high beam repeats ON-OFF every 1 second).

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select "HL LO REQ" and "HL HI REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status

When lighting switch is	**: HL LO REQ ON**
HIGH BEAM	**: HL HI REQ ON**

OK or NG

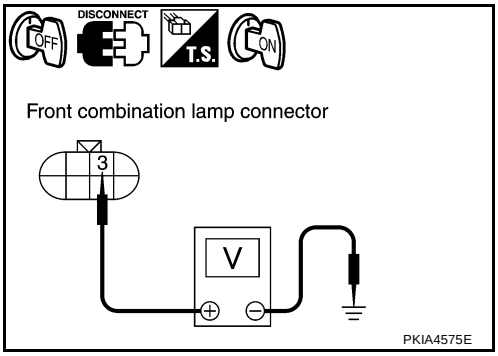
OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select "LAMPS" of IPDM E/R active test item
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

NOTE:
Headlamp high beam repeats ON–OFF every 1 second.



Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

NOTE:
Headlamp high beam repeats ON–OFF every 1 second.

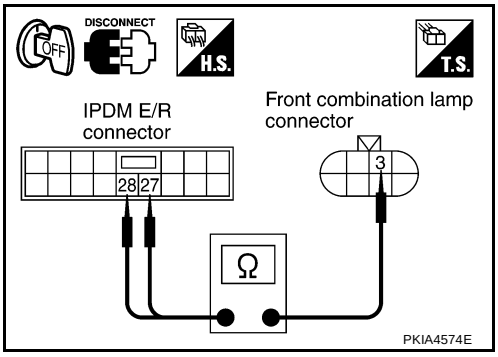
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp (RH and LH) harness connector.



Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	27	E24	3	Yes
LH		28	E40	3	

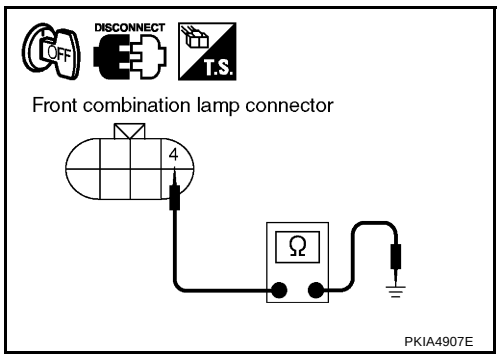
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

6. CHECK HEADLAMP GROUND

Check continuity between front combination lamp (RH and LH) harness connector and ground.

Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		



OK or NG

OK >> Check headlamp harness, connector and bulb.
NG >> Repair harness or connector.

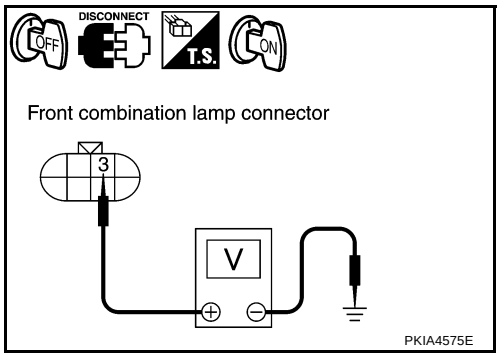
Headlamp Does Not Change To High Beam (One Side)

NKS004XQ

1. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned HIGH BEAM position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.

Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		



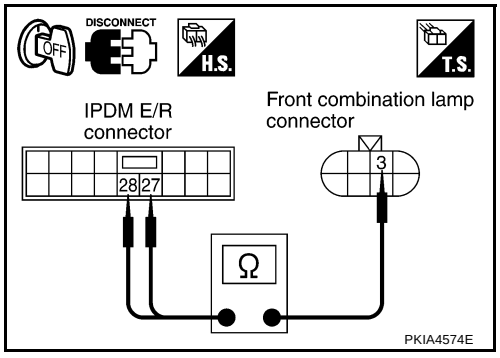
OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp RH or LH harness connector.

Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	27	E24	3	Yes
LH		28	E40	3	



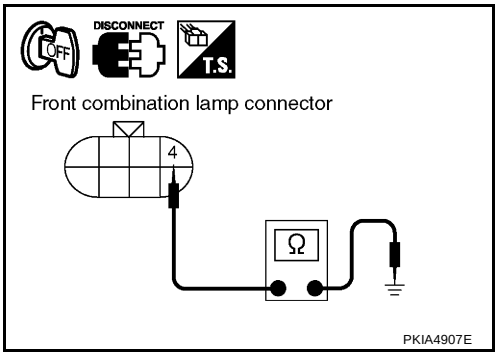
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

3. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH or LH harness connector and ground.

Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		



OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

High Beam Indicator Lamp Does Not Illuminate

NKS004XR

1. CHECK BULB

Check bulb of high beam indicator lamp.

OK or NG

OK >> Replace combination meter. Refer to DI-24, "Removal and Installation for Combination Meter" .
NG >> Replace indicator bulb.

Headlamp Low Beam Does Not Illuminate (Both Sides)

NKS004XS

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP SW1" and "HEAD LAMP SW2" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND : HEAD LAMP SW 1 ON
: HEAD LAMP SW 2 ON

CHECK COMBINATION SWITCH
Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "LAMPS" of IPDM E/R active test item.
2. With operating the test item, check the headlamp low beam operation.

Headlamp low beam should operate.

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the headlamp low beam operation.

Headlamp low beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select "HL LO REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND position : HL LO REQ ON

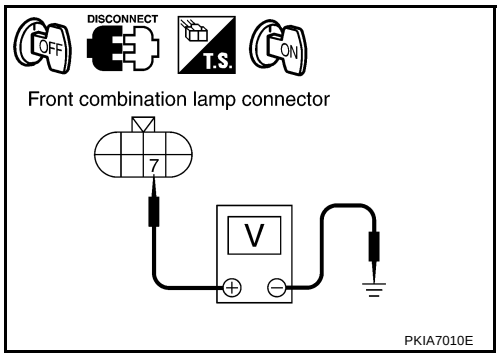
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select "LAMPS" of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.



Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

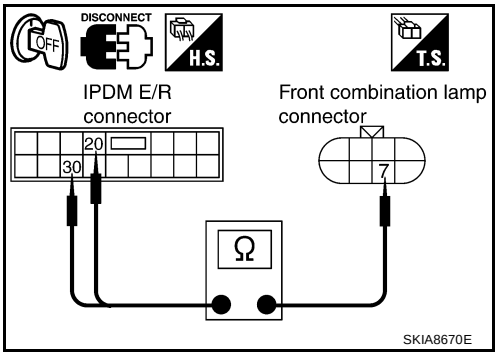
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp (RH and LH) harness connector.



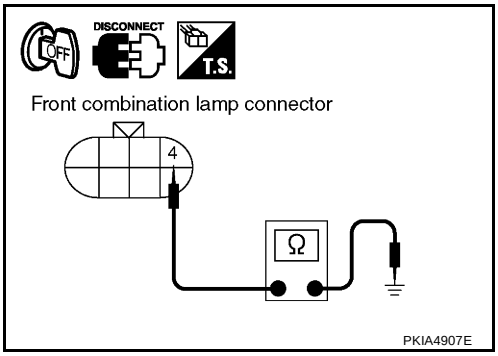
Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	20	E24	7	Yes
LH		30	E40	7	

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

6. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp (RH and LH) harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		

OK or NG

OK >> Check headlamp harness and connectors, ballasts (HID control unit), and xenon bulbs. Refer to LT-60, "Xenon Headlamp Trouble Diagnosis" .
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

NKS004XT

1. CHECK BULB

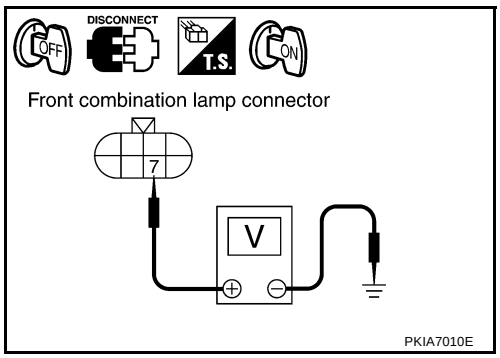
Check ballast (HID control unit) and xenon bulb of lamp which does not illuminate. Refer to LT-60, "Xenon Headlamp Trouble Diagnosis" .

OK or NG

OK >> GO TO 2.
NG >> Replace malfunctioning part.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned 2ND position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.



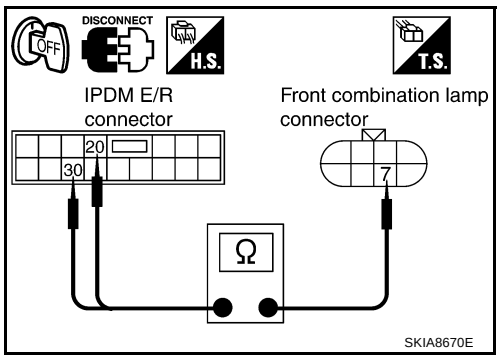
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp RH or LH harness connector.



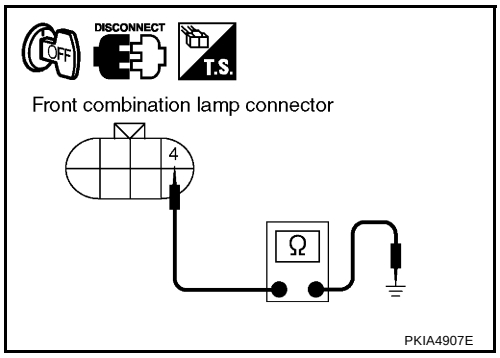
Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	20	E24	7	Yes
LH		30	E40	7	

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

4. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH or LH harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		

OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

Headlamps Does Not Turn OFF

NKS004XU

1. CHECK HEADLAMP TURN OFF

Make sure that lighting switch is OFF. And check if headlamp turns off when ignition switch is turned OFF.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP1" and "HEAD LAMP2" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is OFF : HEAD LAMP SW1 OFF
: HEAD LAMP SW2 OFF

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

3. CHECKING CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

Perform self-diagnosis for “BCM” with CONSULT-III.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
CAN COMM CIRCUIT>> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

General Information for Xenon Headlamp Trouble Diagnosis

NKS004XV

In most cases, malfunction of xenon headlamp - “does not illuminate”, “flickers” or “dark” - is caused by a malfunctioning xenon bulb. A malfunctioning HID control unit or lamp housing, however, may be a cause. Be sure to perform trouble diagnosis following the steps described below.

Caution:

NKS004XW

- Installation or removal of connector must be done with lighting switch OFF.
- Disconnect the battery cable from the negative terminal or remove power fuse.

  CAUTION:
  After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
- When the lamp is illuminated (when lighting switch is ON), never touch harness, HID control unit, inside of lamp, or lamp metal parts.
- To check illumination, temporarily install lamp in vehicle. Be sure to connect power at vehicle side connector.
- If error can be traced directly to electrical system, first check for items such as blown fuses and fusible links, broken wires or loose connectors, dislocated terminals, and improper connections.
- Never work with wet hands.
- Using a tester for HID control unit circuit trouble diagnosis is prohibited.
- Disassembling HID control unit or harnesses (bulb socket harness, ECM harness) is prohibited.
- Immediately after illumination, light intensity and color will fluctuate, but there is nothing wrong.
- When bulb has come to end of its life, brightness will drop significantly, it will flash repeatedly, or light color will turn reddish.

Xenon Headlamp Trouble Diagnosis

NKS004XX

1. CHECK 1: XENON HEADLAMP LIGHTING

Install normal xenon bulb to corresponding xenon bulb headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon bulb.
NG >> GO TO 2.

2. CHECK 2: XENON HEADLAMP LIGHTING

Install normal HID control unit to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace HID control unit.
NG >> GO TO 3.

3. CHECK 3: XENON HEADLAMP LIGHTING

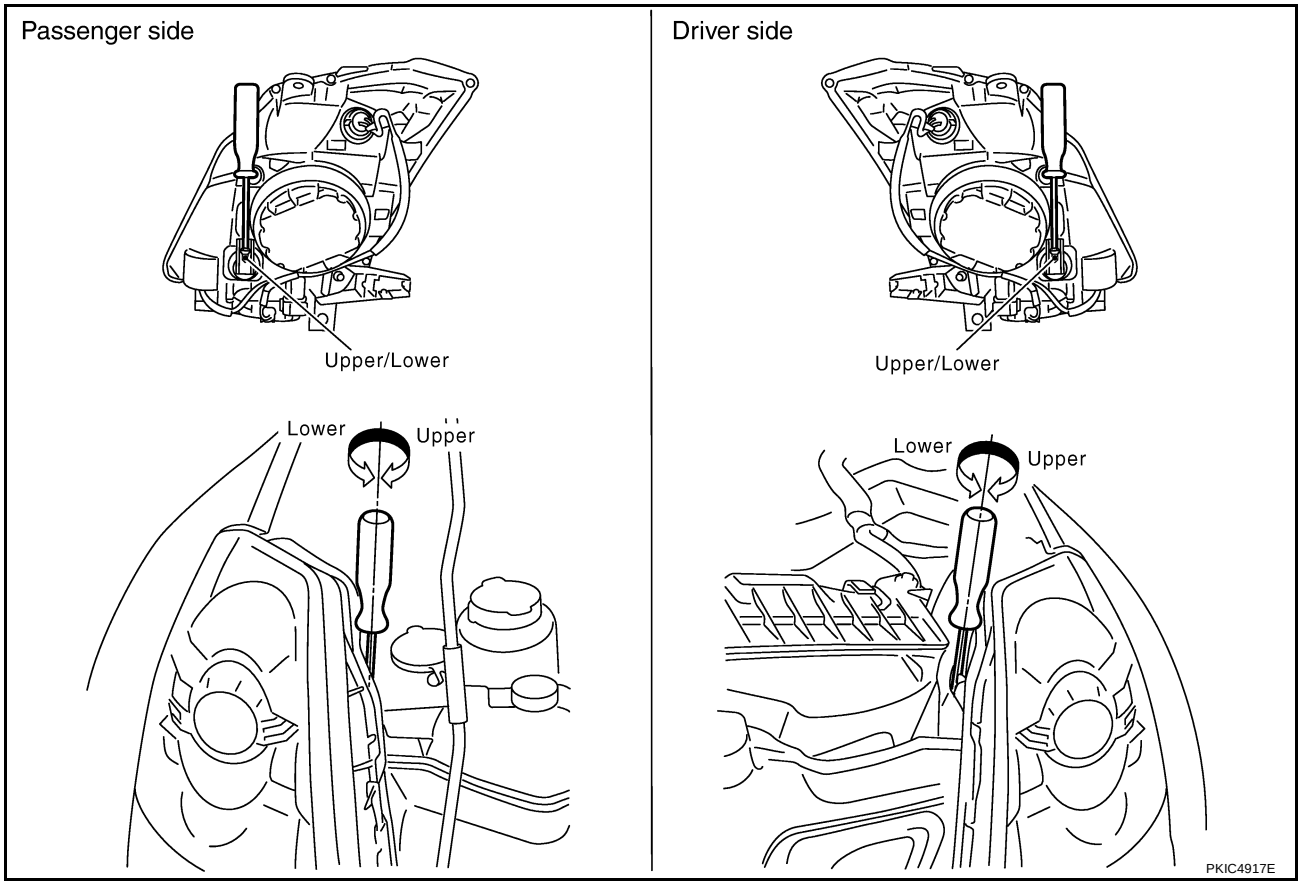
Install normal xenon lamp housing assembly to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon headlamp housing assembly. [Malfunction in starter (boosting circuit) in xenon headlamp housing]
NG >> INSPECTION END

Aiming Adjustment

NKS004XY



PREPARATION BEFORE ADJUSTING

For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

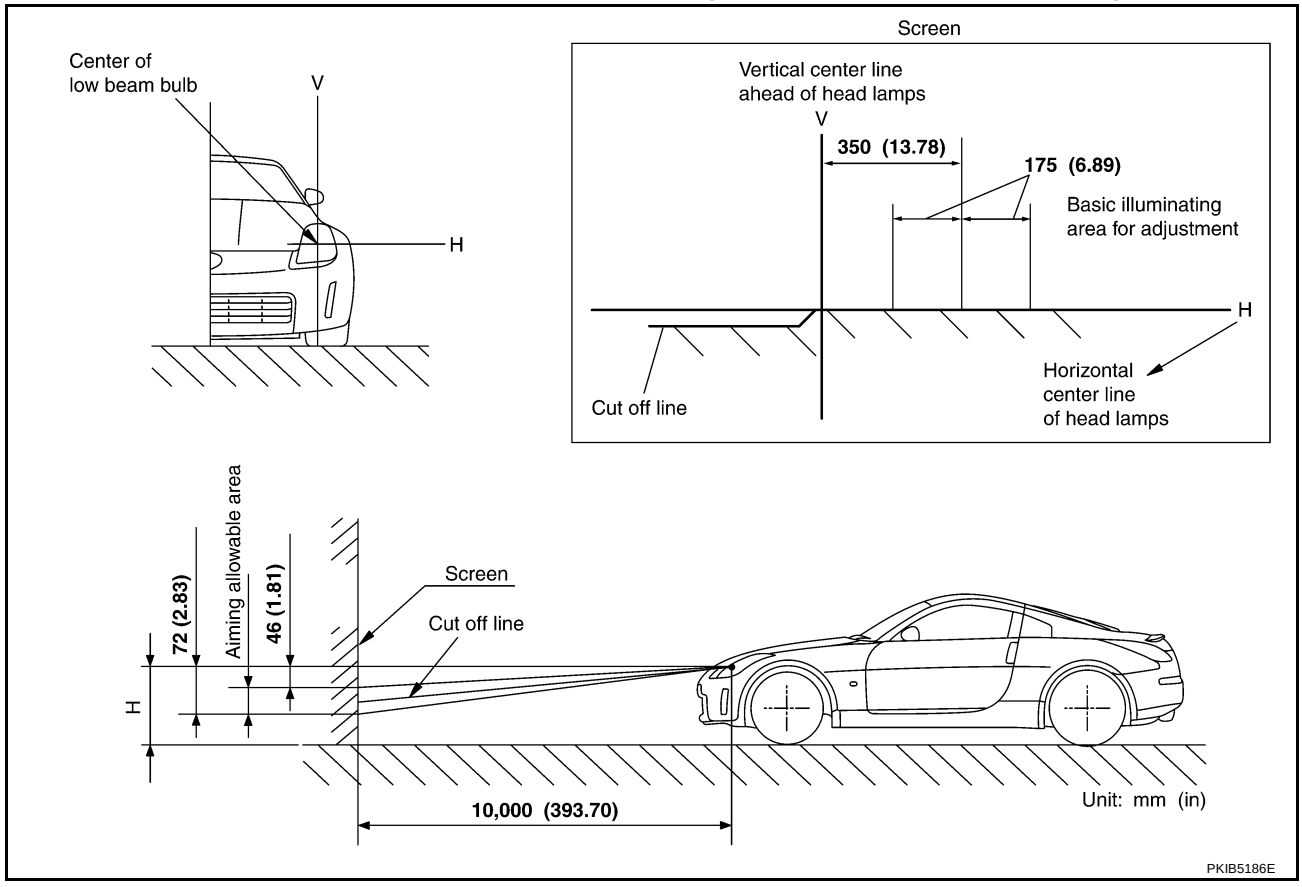
1. Keep all tires inflated to correct pressures.
2. Place vehicle on level surface.

3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam ON.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

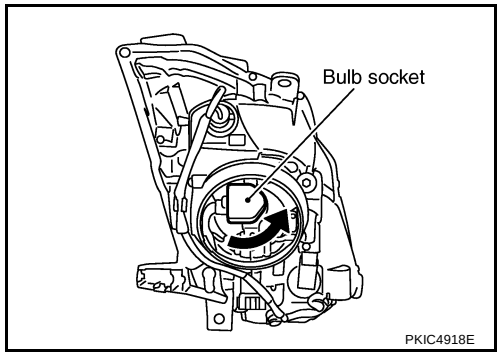
Bulb Replacement

NKS004XZ

HEADLAMP HIGH/LOW BEAM

1. Turn lighting switch OFF.
2. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal or remove power fuse.

   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove headlamp. Refer to LT-62, "Removal and Installation" .
4. Turn plastic cap counterclockwise and unlock it.
5. Turn bulb socket counterclockwise and unlock it.
6. Unlock retaining spring and remove bulb from headlamp.
7. Installation is the reverse order of removal.



NOTE:
After installation, perform aiming adjustment. Refer to LT-60, "Aiming Adjustment" .

Headlamp high/low beam (Xenon) : 12V - 35W (D2R)

PARKING LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" .
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Installation is the reverse order of removal.

Parking lamp : 12V - 5W

FRONT TURN SIGNAL LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" .
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Installation is the reverse order of removal.

Front turn signal lamp/— : 12V - 28/8W (amber)

FRONT SIDE MARKER LAMP

1. Remove headlamp. Refer to LT-62, "Removal and Installation" .
2. Replacement integral with headlamp housing assembly.
3. Installation is reverse order of removal.

Front side marker lamp : LED

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

Removal and Installation

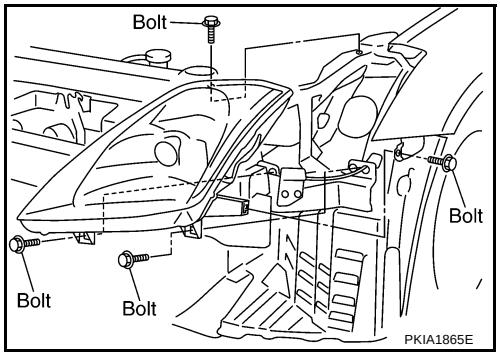
NKS004Y0

REMOVAL

1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal or remove power fuse.

   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

2. Remove front bumper fascia. Refer to EI-14, "FRONT BUMPER" .
3. Remove headlamp mounting bolts.
4. Pull head lamp toward vehicle front, disconnect connector, and remove headlamp.



INSTALLATION

Installation is the reverse order of removal.

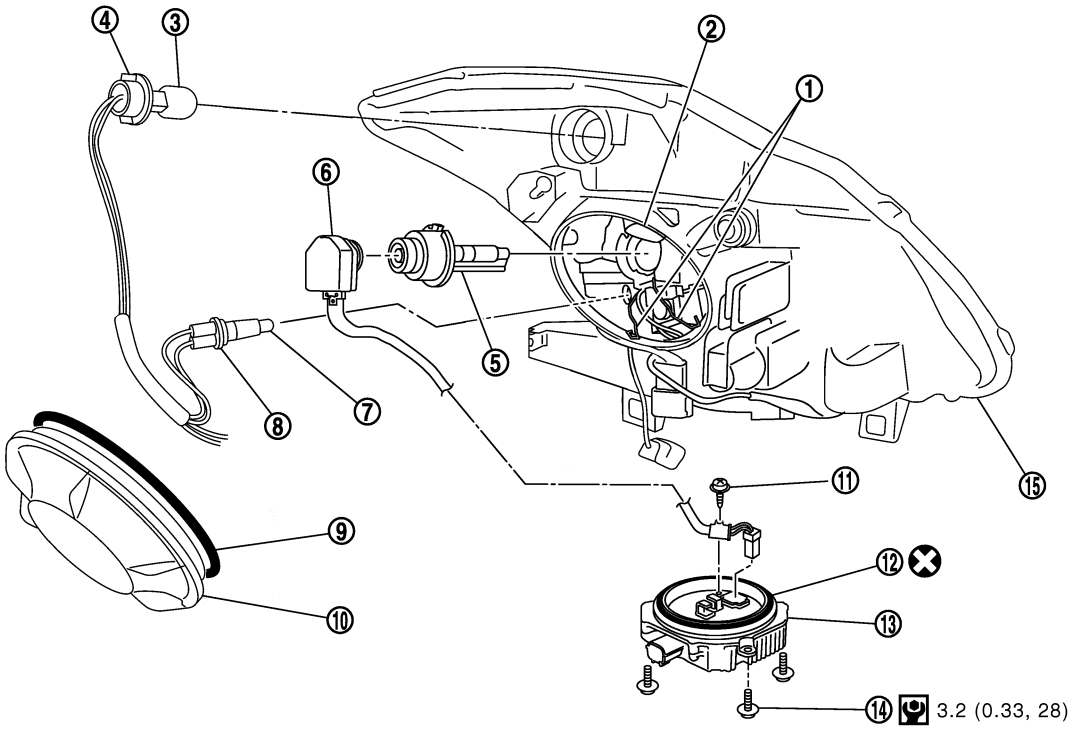
Headlamp mounting bolt : 6.1N·m (0.62 kg-m, 54 in lb)

NOTE:
After installation, perform aiming adjustment. Refer to LT-60, "Aiming Adjustment" .

Disassembly and Assembly

NKS004Y1

SEC. 260



1. Retaining spring	2. Xenon bulb socket ground	3. Front turn signal lamp bulb
4. Front turn signal lamp bulb socket	5. Xenon bulb	6. Xenon bulb socket
7. Parking lamp bulb	8. Parking lamp bulb socket	9. Seal packing
10. Plastic cap	11. Ground screw	12. Seal packing
13. HID control unit	14. HID control unit mounting screw	15. Headlamp housing assembly

:N·m (kg-m, in-lb)

: Always replace after every disassembly.

DISASSEMBLY

1. Turn plastic cap counterclockwise, and unlock it.
2. Turn xenon bulb socket counterclockwise, and unlock it.
3. Unlock retaining spring, and remove xenon bulb.
4. Disconnect xenon bulb socket ground.
5. Remove HID control unit mounting screws.
6. Remove ground screw from HID control unit.
7. Disconnect connectors from HID control unit.
8. Pull out xenon bulb socket from head lamp housing assembly.
9. Turn parking lamp bulb socket counterclockwise and unlock it.
10. Remove parking lamp bulb from its socket.
11. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
12. Remove front turn signal lamp bulb from its socket.

ASSEMBLY

Assembly is the reverse order of disassembly.

HID control unit mounting screw : 3.2 N·m (0.33 kg-m, 28 in-lb)

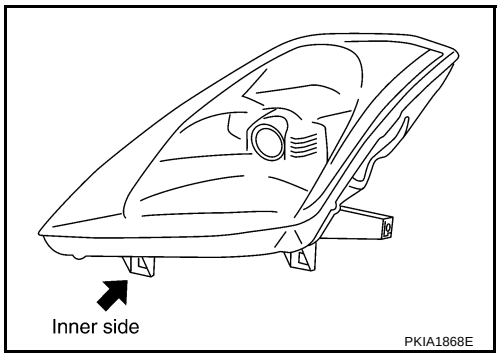
CAUTION:

- **When HID control unit is removed, reinstall it securely and avoid any looseness.**
- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness**

Serving to Replace Headlamps When Damaged

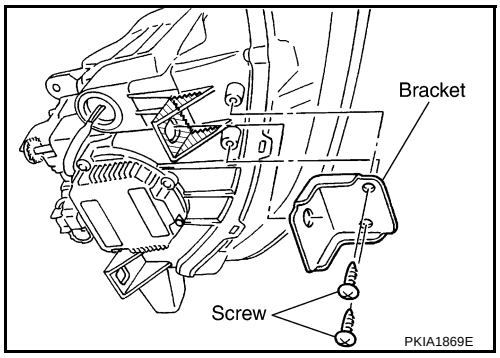
NKS004Y2

If only installation part as shown in the figure is damaged, and headlamp housing itself is not damaged, repair can be completed easily by installing correction brackets.



INSTALLATION OF HEADLAMP BRACKET

1. Remove headlamps. Refer to LT-62, "Removal and Installation" .
2. Cut damaged section of installation part, then shape with sandpaper.
3. Attach each correction bracket to headlamp housing boss with 2 screws.

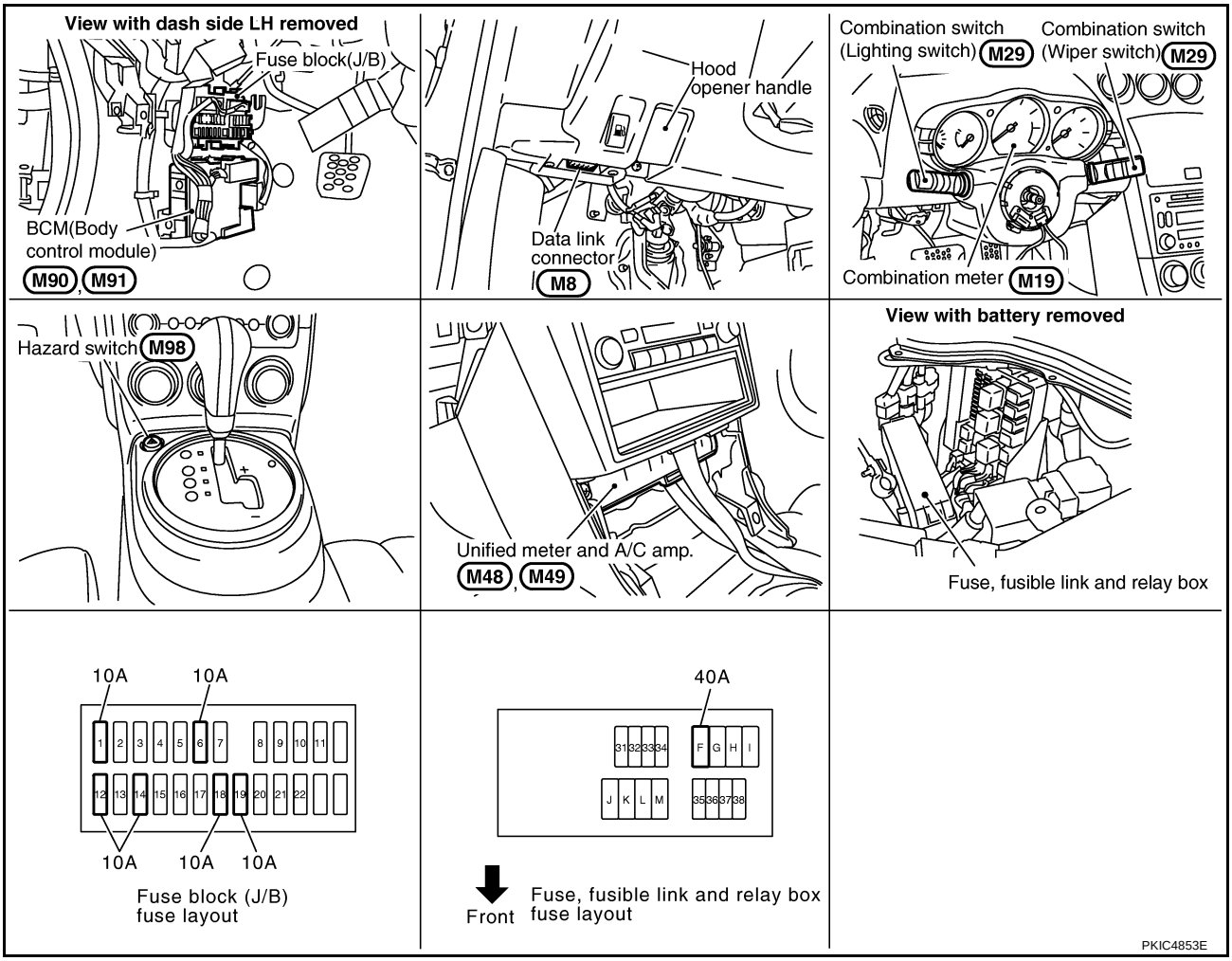


TURN SIGNAL AND HAZARD WARNING LAMPS

PFP:26120

Component Parts and Harness Connector Location

NKS004Y3



System Description

NKS004Y4

TURN SIGNAL OPERATION

When the ignition switch is in ON or START position, power is supplied

- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38,
- through 10A fuse [No.12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 22,
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

Ground is supplied

- to BCM terminal 52
- to unified meter and A/C amp. terminals 29 and 30, and
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

LH Turn Signal Lamp

When the turn signal switch is moved to the left position, the BCM receives left turn signal by combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION"). Power is supplied

- through BCM terminal 45
- to front combination lamp LH terminal 2

- to rear combination lamp LH terminal 2.

Ground is supplied

- to front combination lamp LH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp LH terminal 4
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

The BCM also supplies ground to unified meter and A/C amp. terminals 1and 11 through the CAN communication lines. This input signal is processed by the unified meter control unit in the combination meter through unified meter and A/C amp., which in turn supplies ground to left turn signal indicator lamp.
With the power and ground supplied, BCM controls the flashing of LH turn signal lamps.

RH Turn Signal Lamp

When the turn signal switch is moved to the right position, the BCM receives right turn signal by combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION"). Power is supplied

- through BCM terminal 46
- to front combination lamp RH terminal 2
- to rear combination lamp RH terminal 2.

Ground is supplied

- to front combination lamp RH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp RH terminal 4
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

The BCM also supplies ground to unified meter and A/C amp. terminals 1 and 11 through CAN communication lines. This input signal is processed by unified meter control unit in combination meter through unified meter and A/C amp., which in turn supplies ground to the right turn signal indicator lamp.
With power and ground supplied, BCM controls the flashing of RH turn signal lamps.

HAZARD WARNING LAMP OPERATION

Power is supplied at all times

- through 40A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55,
- through 10A fuse [No. 18, located in fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No. 19, located in fuse block (J/B)]
- to combination meter terminal 24, and
- to unified meter and A/C amp. terminal 21.

Ground is supplied

- to BCM terminals 52
- to unified meter and A/C amp. terminals 29 and 30, and
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

When the hazard switch is depressed, power is supplied

- through BCM terminal 29
- to hazard lamp switch terminal 2.

Ground is supplied

- through hazard lamp switch terminal 1
- to grounds M30 and M66.

The BCM then supplies power

- through BCM terminal 45
- to front combination lamp LH terminal 2
- to rear combination lamp LH terminal 2,
- through BCM terminal 46
- to front combination lamp RH terminal 2
- to rear combination lamp RH terminal 2.

Ground is supplied

- to front combination lamp LH terminal 8, and
- to front combination lamp RH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp LH terminal 4, and
- to rear combination lamp RH terminal 4
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

The BCM also supplies input to unified meter and A/C amp. terminals 1 and 11 through the CAN communication lines. This input signal is processed by the unified meter control unit in the combination meter through the unified meter and A/C amp., which in turn supplies ground to the left and right turn signal indicator lamps. With the power and ground supplied, BCM controls the flashing of hazard warning lamps.

REMOTE KEYLESS ENTRY SYSTEM OPERATION

Refer to BL-59, "REMOTE KEYLESS ENTRY SYSTEM" .

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

CAN Communication System Description

NKS004Y5

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

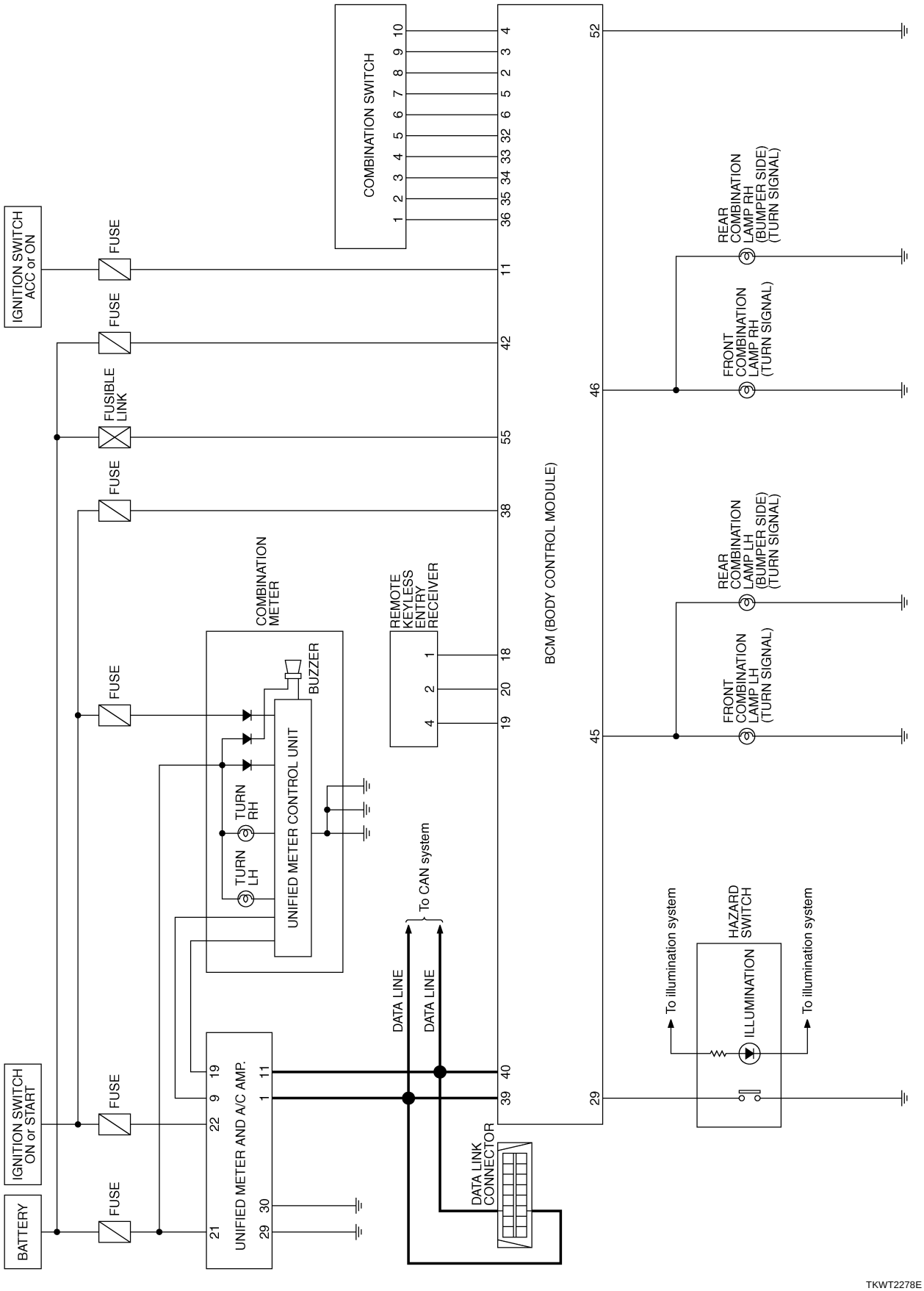
CAN Communication Unit

NKS004Y6

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

NKS004Y7

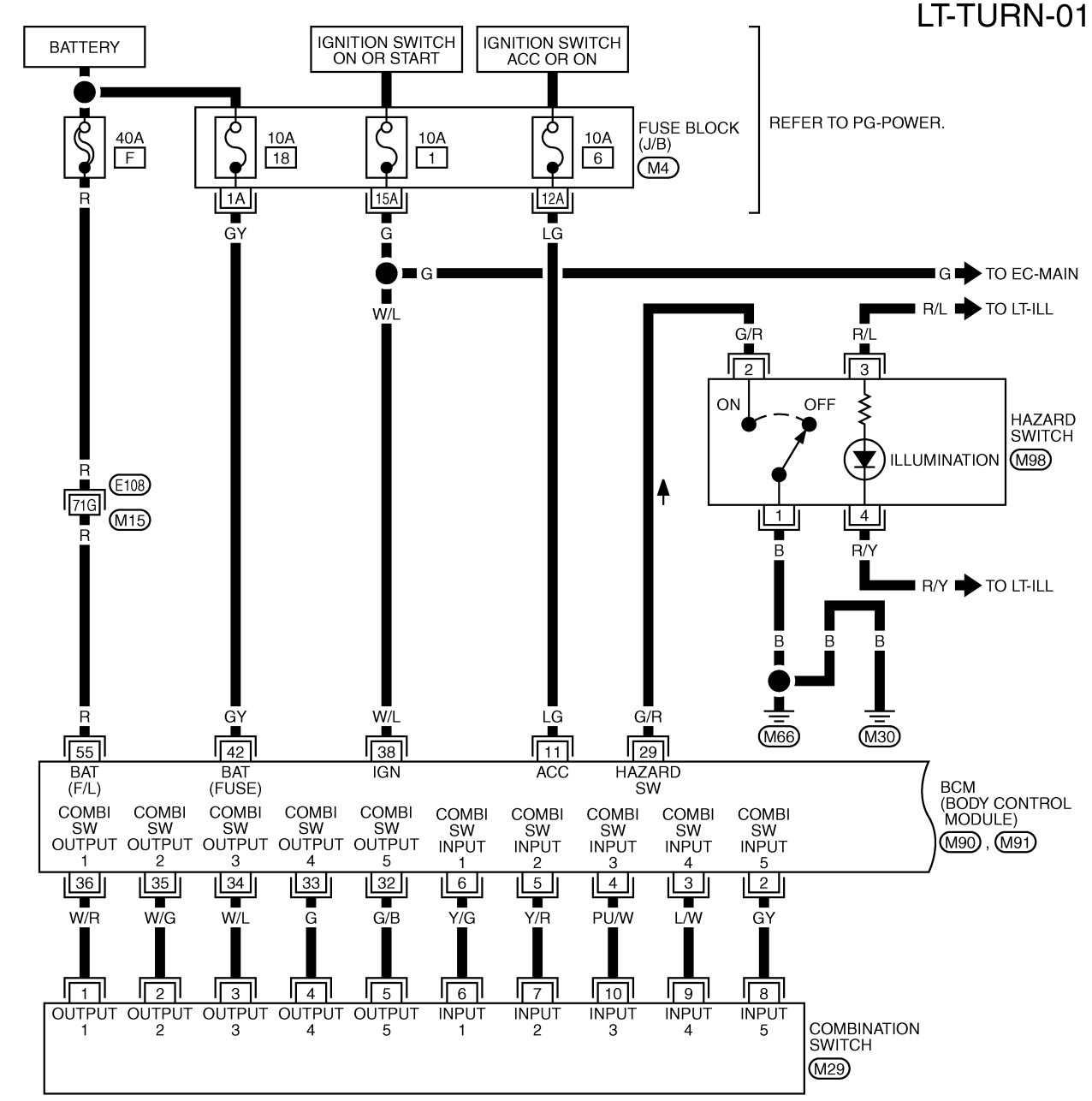


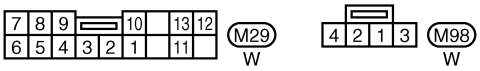
Wiring Diagram — TURN —

NKS004Y8

COUPE MODELS

LT-TURN-01





REFER TO THE FOLLOWING.

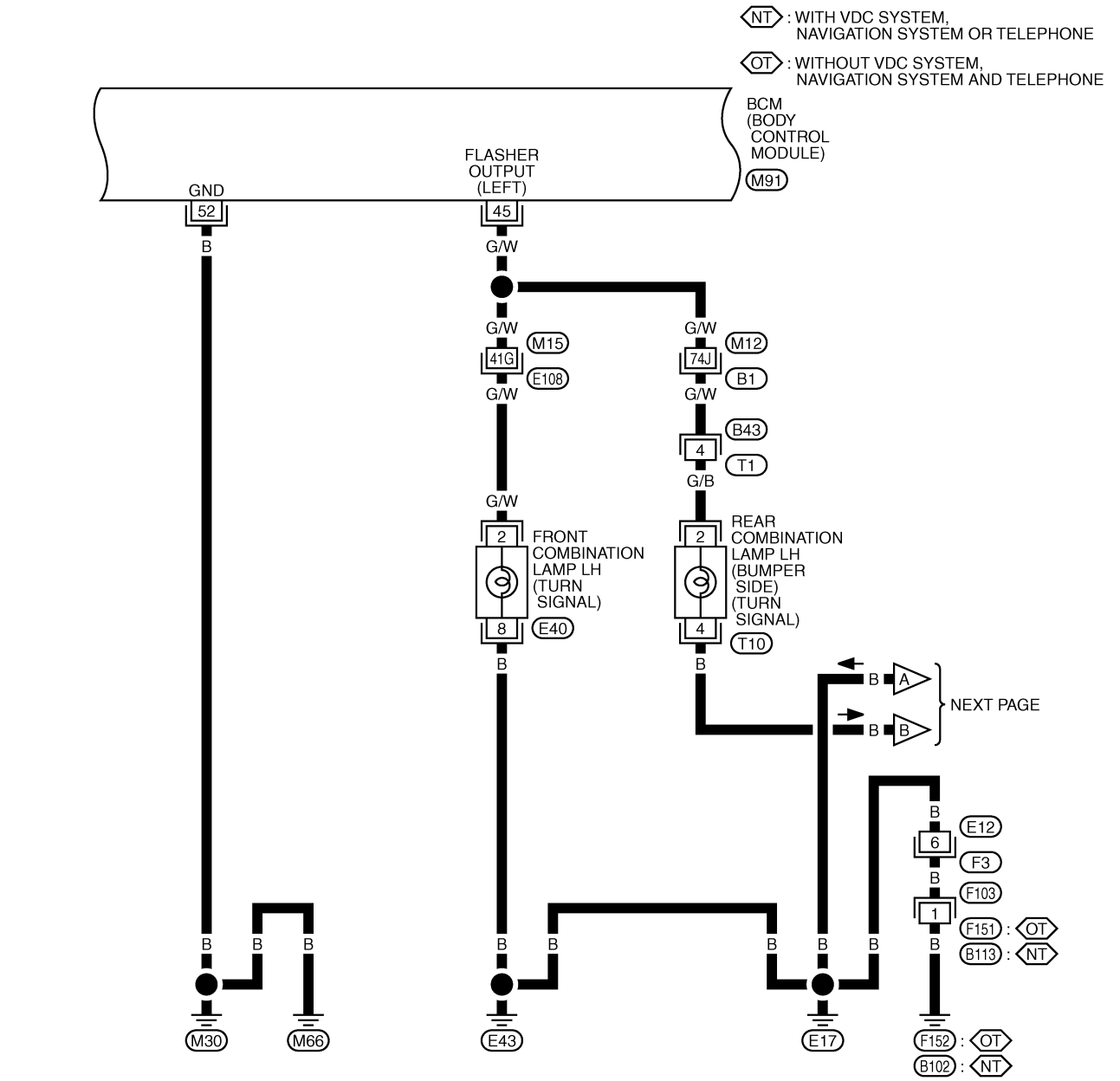
E108 -SUPER MULTIPLE JUNCTION (SMJ)

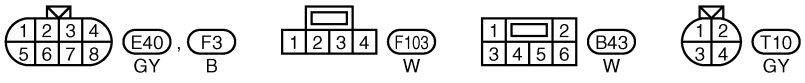
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TKWT5751E

LT-TURN-02





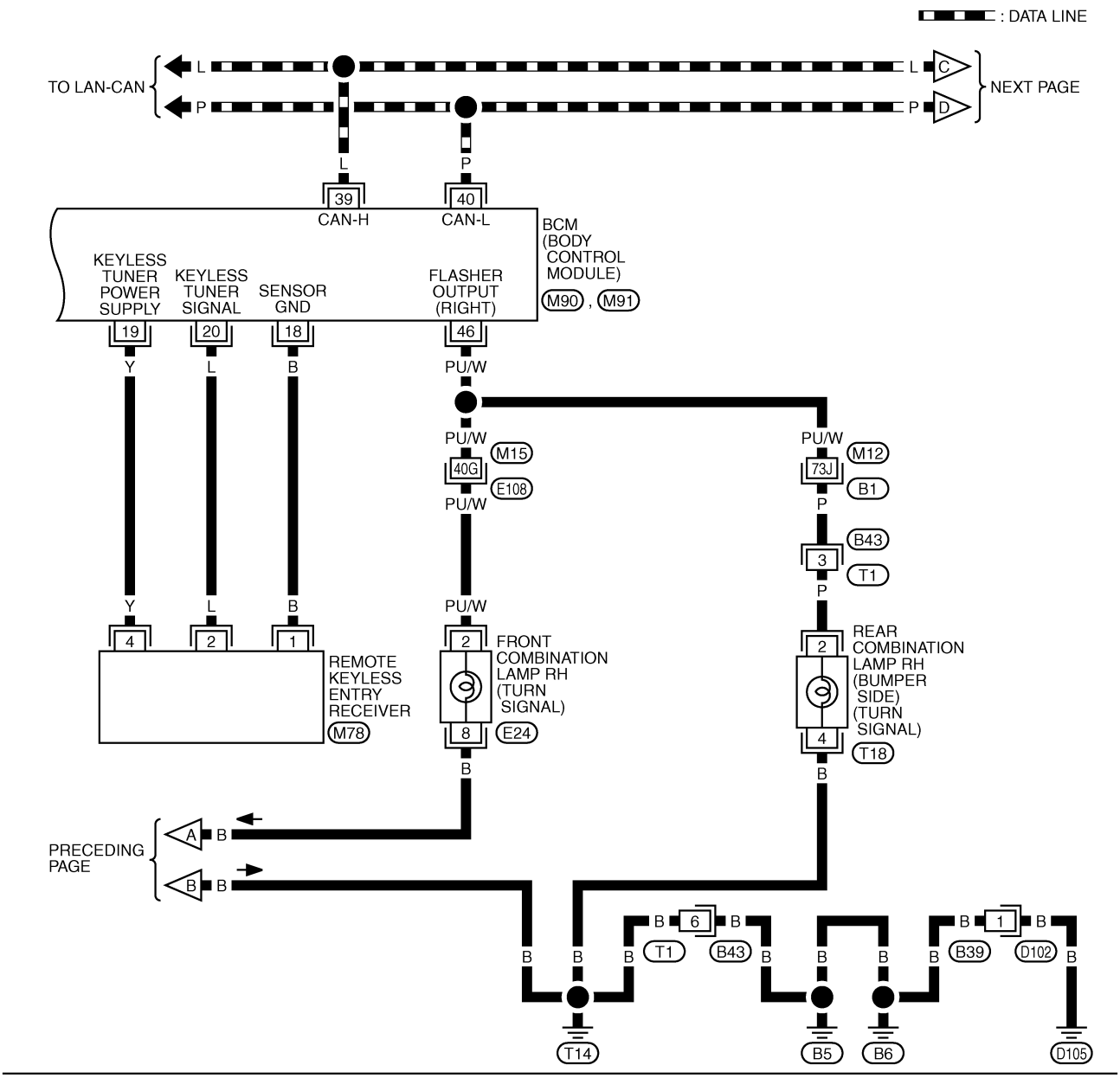
REFER TO THE FOLLOWING.

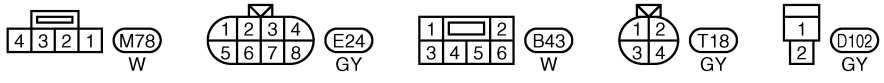
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M91 -ELECTRICAL UNITS

TKWT5752E

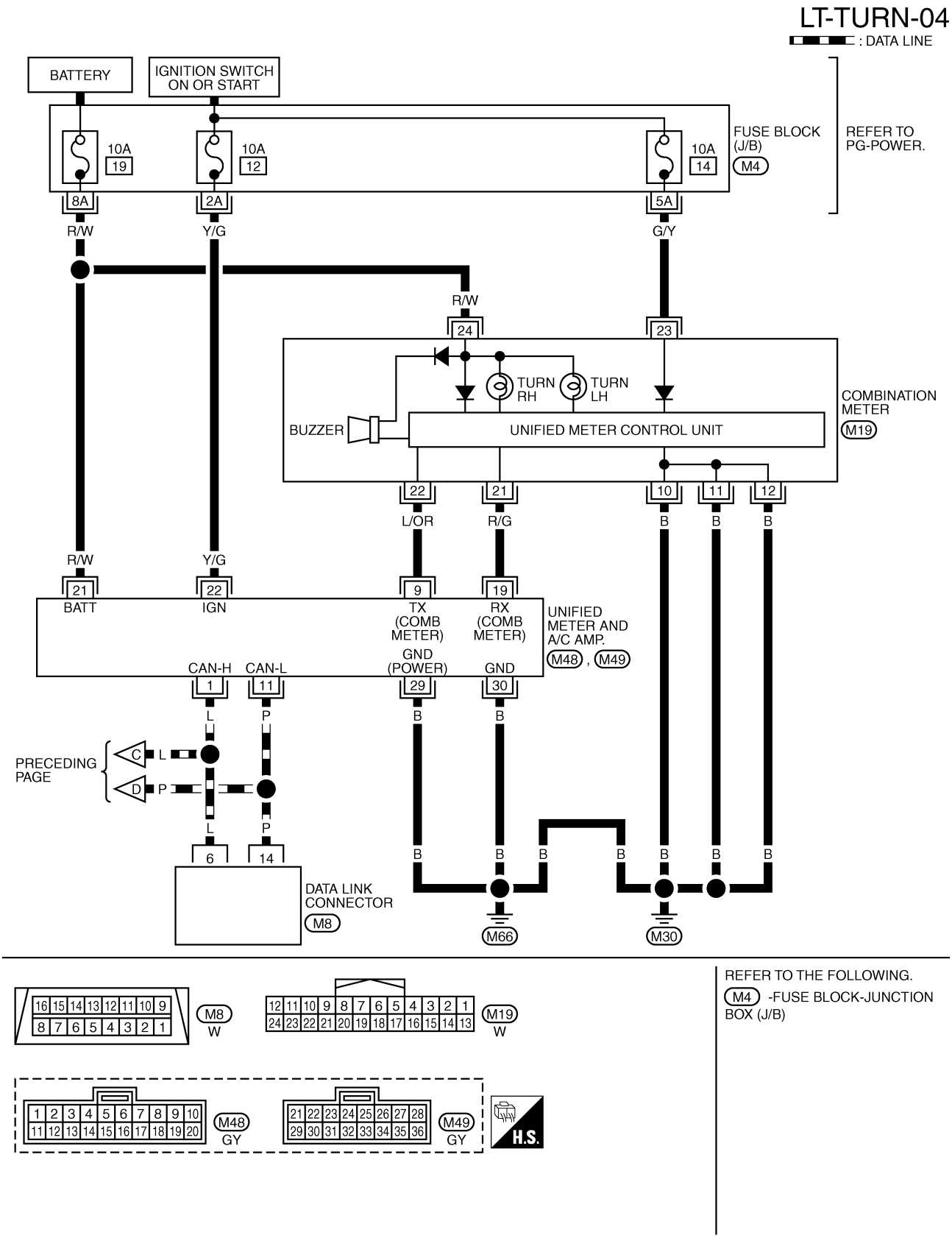
LT-TURN-03





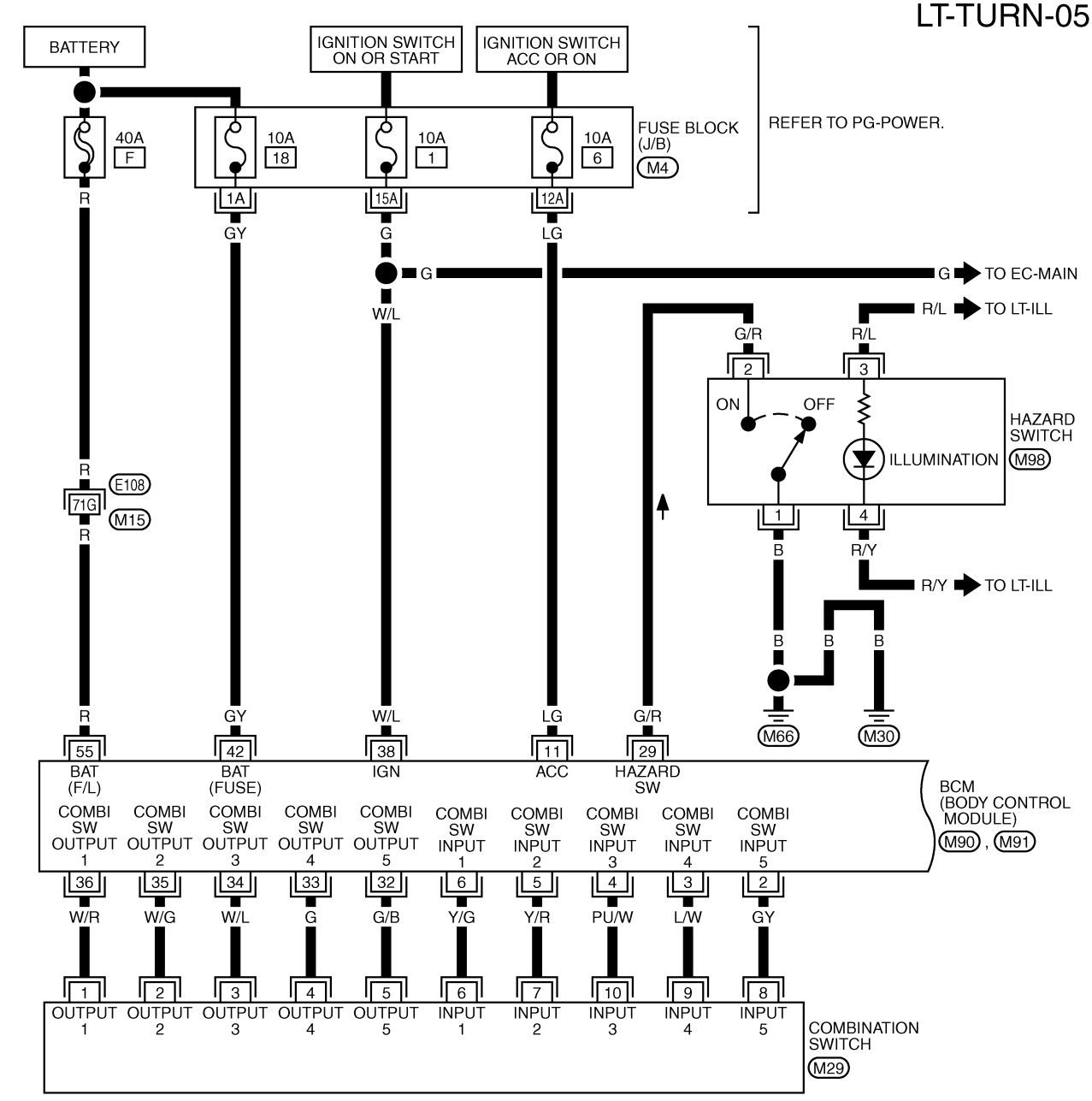
REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 -ELECTRICAL UNITS

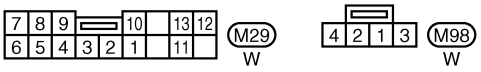
TKWT4032E


LT-TURN-04
: DATA LINE
BATTERY
IGNITION SWITCH ON OR START
10A 19
10A 12
10A 14
FUSE BLOCK (J/B) M4
REFER TO PG-POWER.
8A
2A
5A
R/W
Y/G
G/Y
R/W
24
23
TURN RH
TURN LH
BUZZER
UNIFIED METER CONTROL UNIT
COMBINATION METER M19
22
21
10
11
12
L/OR
R/G
B
B
B
R/W
Y/G
21
22
9
19
BATT
IGN
TX (COMB METER)
RX (COMB METER)
UNIFIED METER AND A/C AMP. M48, M49
CAN-H
CAN-L
GND (POWER)
GND
1
11
29
30
L
P
B
B
PRECEDING PAGE
C
D
L
P
6
14
DATA LINK CONNECTOR M8
M66
M30
M8 W
M19 W
M48 GY
M49 GY
H.S.
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
TKWT2281E

ROADSTER MODELS

LT-TURN-05





REFER TO THE FOLLOWING.

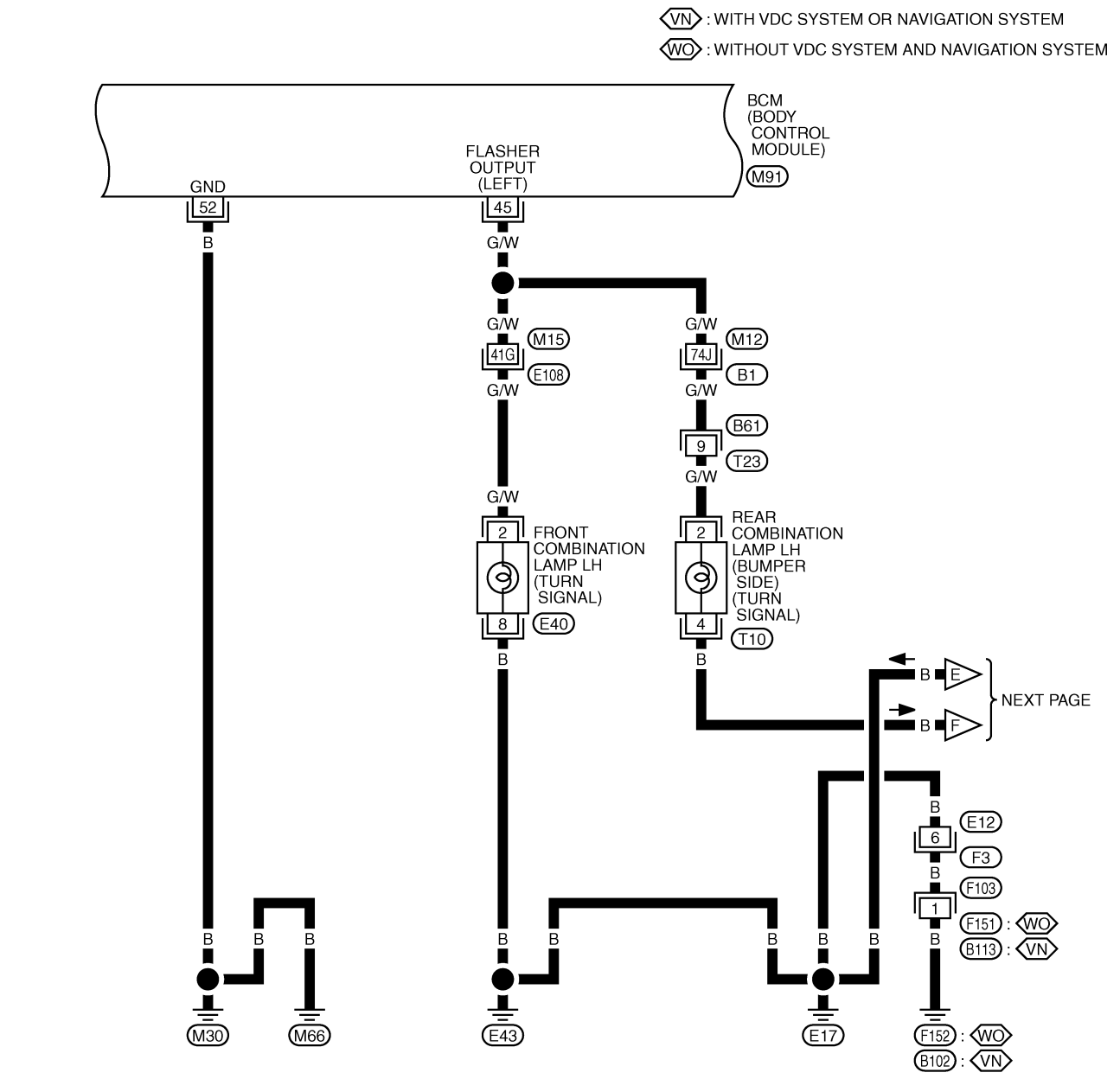
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91 -ELECTRICAL UNITS

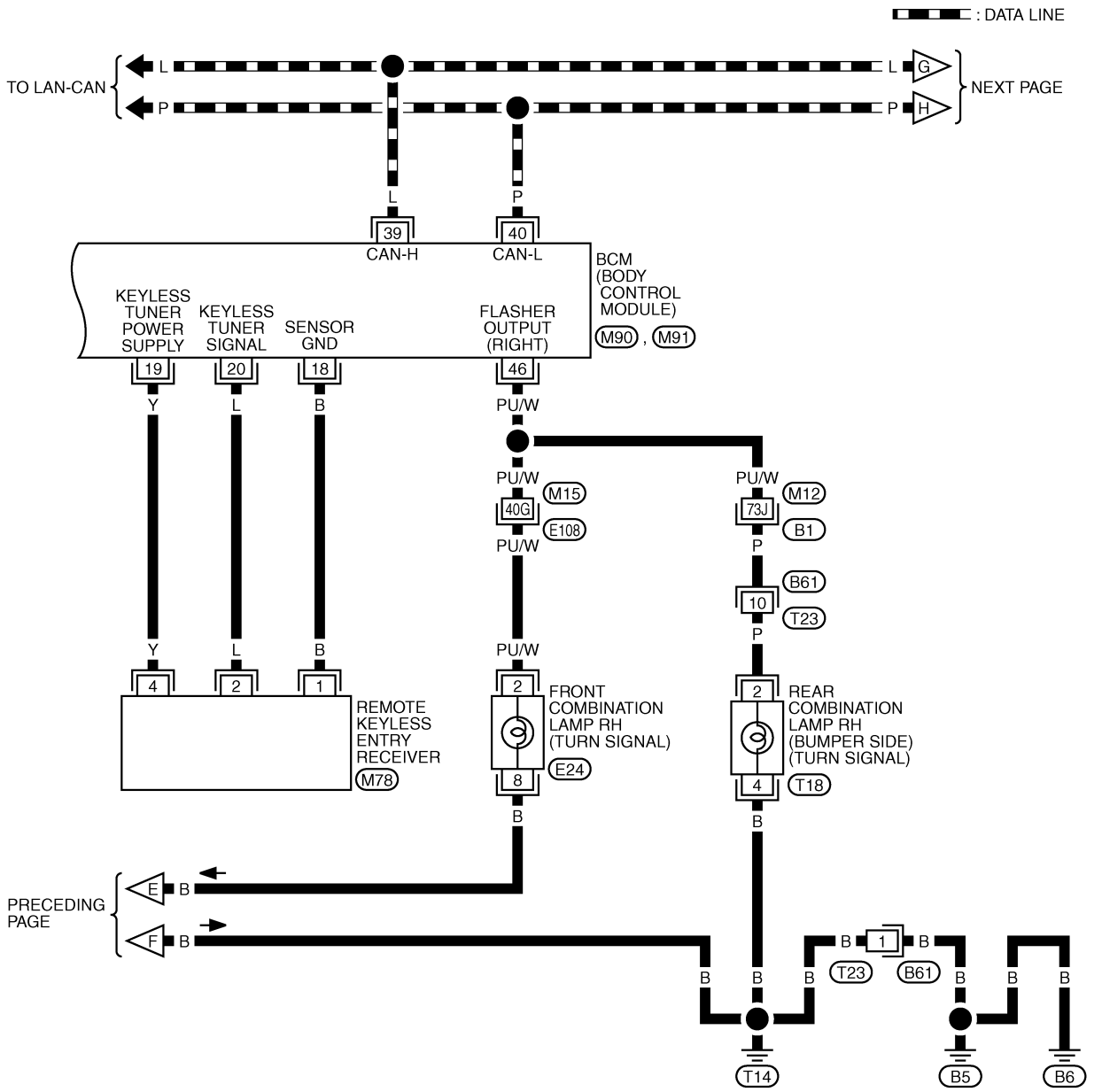
TKWT5753E

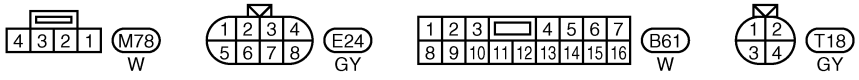
LT-TURN-06



TKWT5583E

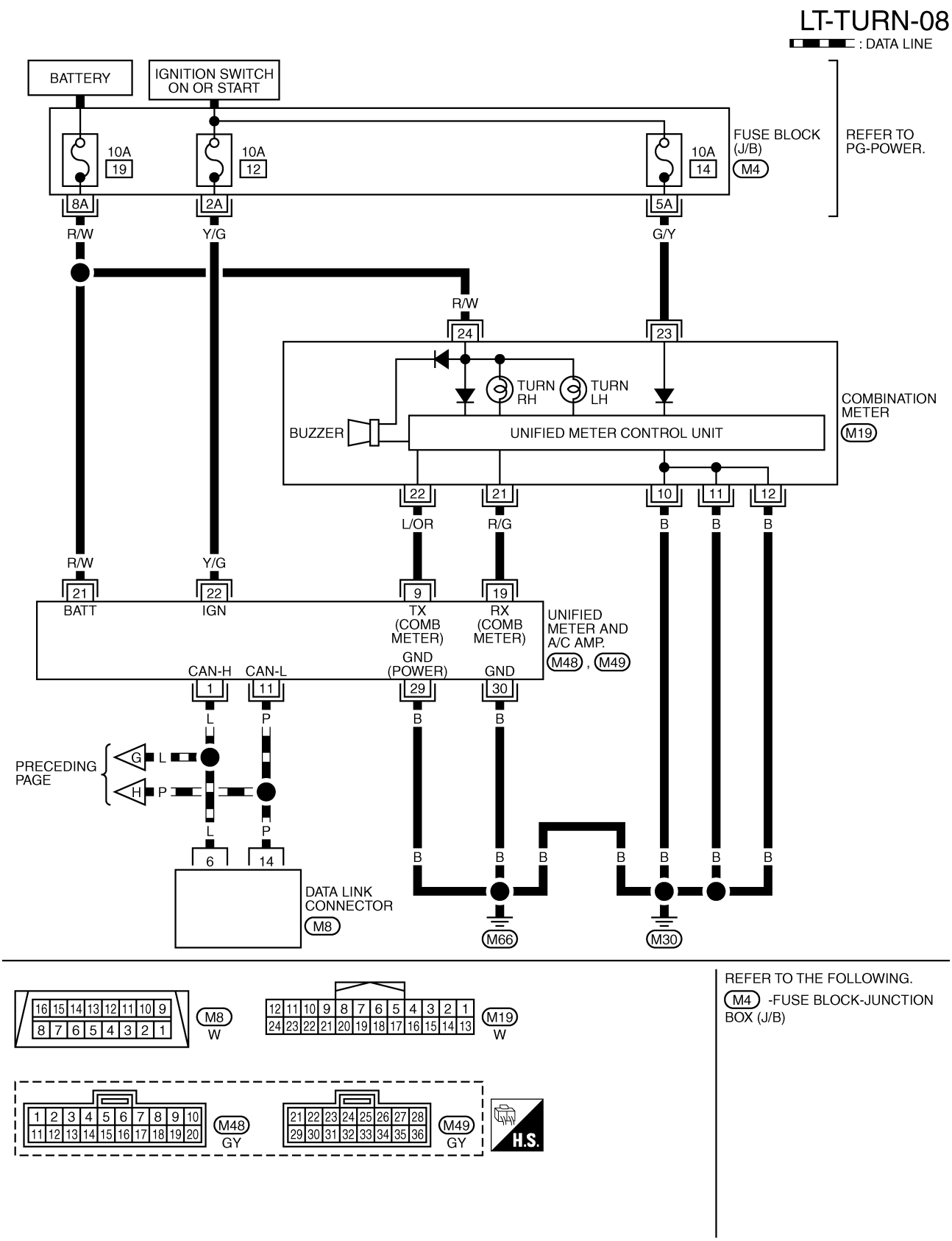
LT-TURN-07





REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 -ELECTRICAL UNITS

TKWT4035E

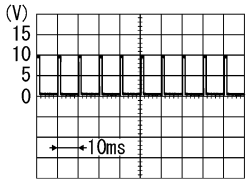
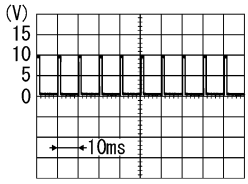
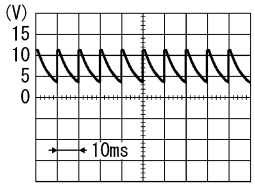
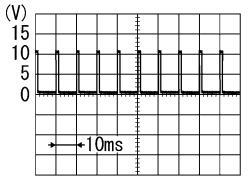

LT-TURN-08
: DATA LINE
BATTERY
IGNITION SWITCH ON OR START
10A 19
10A 12
10A 14
FUSE BLOCK (J/B) M4
REFER TO PG-POWER.
8A
2A
5A
R/W
Y/G
G/Y
R/W
24
23
TURN RH
TURN LH
BUZZER
UNIFIED METER CONTROL UNIT
COMBINATION METER M19
22
21
10
11
12
L/OR
R/G
B
B
B
R/W
Y/G
21
22
9
19
BATT
IGN
TX (COMB METER)
RX (COMB METER)
UNIFIED METER AND A/C AMP. M48 , M49
CAN-H
CAN-L
GND (POWER)
GND
1
11
29
30
L
P
B
B
PRECEDING PAGE
G
H
L
P
6
14
DATA LINK CONNECTOR M8
M66
M30
M8 W
M19 W
M48 GY
M49 GY
H.S.
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
TKWT2284E

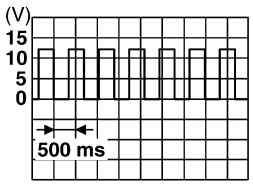
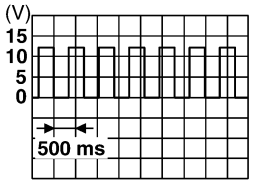
Terminals and Reference Values for BCM

NKS004Y9

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Turn signal switch to right	 PKIB4959J Approx. 1.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Turn signal switch to left	 PKIB4959J Approx. 1.0 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage
29	G/R	Hazard signal	OFF	Hazard switch	OFF	Battery voltage
					ON	Approx. 0 V
36	W/R	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Turn signal switch to right ● Turn signal switch to left	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
42	GY	Battery power supply	OFF	—		Battery voltage
45	G/W	Turn signal (left)	ON	Combination switch	Turn left ON	 SKIA3009J
46	PU/W	Turn signal (right)	ON	Combination switch	Turn right ON	 SKIA3009J
52	B	Ground	ON	—		Approx. 0V
55	R	Battery power supply	OFF	—		Battery voltage

How to Proceed With Trouble Diagnosis

NKS004YA

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-65, "System Description" .
3. Perform preliminary check. Refer to LT-79, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Do turn signal and hazard warning lamps operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004YB

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

UNIT	POWER SOURCE	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6

Refer to LT-69, "Wiring Diagram — TURN —" .

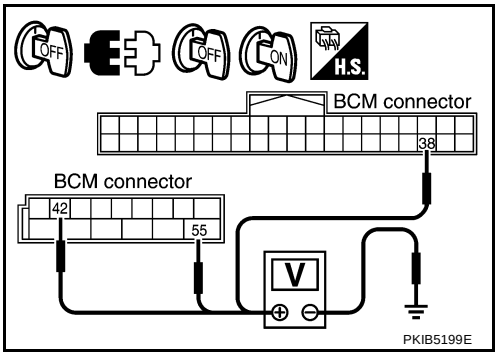
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connectors.
3. Check voltage between BCM harness connector terminals and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M90	38	Ground	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

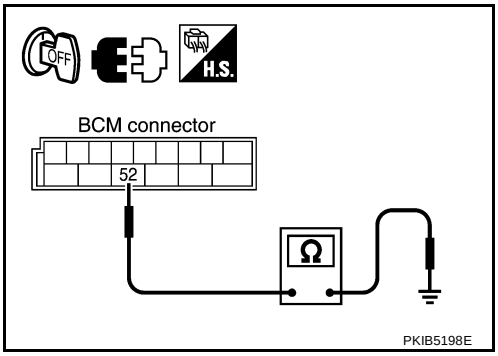
OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector terminal and ground.



BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.

CONSULT-III Function (BCM)

NKS004YC

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
FLASHER	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from ignition switch signal.
HAZARD SW	“ON/OFF”	Displays “Hazard ON (ON)/Hazard OFF (OFF)” status, determined from hazard switch signal.
TURN SIGNAL R	“ON/OFF”	Displays “Turn right (ON)/Other (OFF)” status, determined from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays “Turn left (ON)/Other (OFF)” status, determined from lighting switch signal.
BRAKE SW NOTE	“OFF”	—

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
FLASHER	With a certain operation (OFF, RH, LH), turn signal lamp can be operated.

Turn Signal Lamp Does Not Operate

NKS004YD

1. CHECK BULB

Check bulb standard of each turn signal lamp is correct.

OK or NG

OK >> GO TO 2.
NG >> Replace turn signal lamp bulb.

2. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "TURN SIGNAL R" and "TURN SIGNAL L" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is TURN RH position : TURN SIGNAL R ON

When lighting switch is TURN LH position : TURN SIGNAL L ON

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

3. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "FLASHER" of BCM active test item.
2. With operating the test item, check the turn signal lamp operation.

Turn signal lamp should operate.

GO TO 4

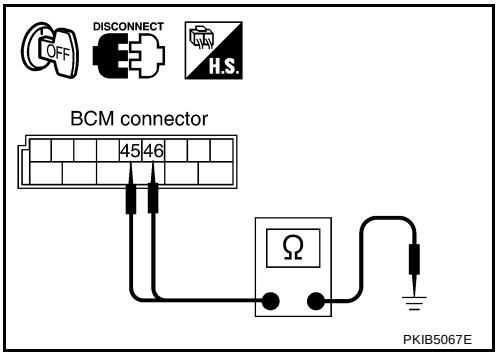
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 4.

4. CHECK SHORT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and all turn signal lamp connectors.
3. Check continuity (short circuit) between BCM harness connector and ground.

BCM connector		Terminal	Ground	Continuity
RH	M91	46		No
LH		45		



OK or NG

OK >> Replace BCM if turn signal lamps does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

Hazard Warning Lamp Does Not Operate But Turn Signal Lamp Operate

NKS004YE

1. CHECK BULB

Make sure bulb standard of each turn signal lamp is correct.

OK or NG

OK >> GO TO 2.
NG >> Replace bulb.

2. CHECK HAZARD SWITCH INPUT SIGNAL

With CONSULT-III

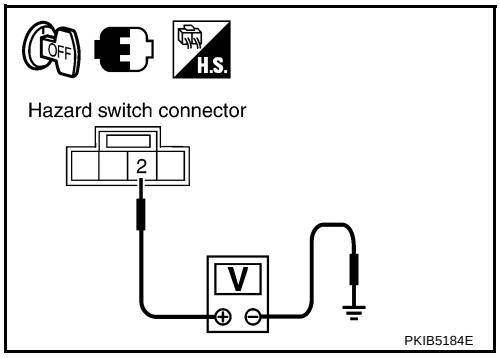
1. Select "HAZARD SW" of BCM data monitor item.
2. With operating the hazard switch, check the monitor status.

When hazard switch is ON position : HAZARD SW ON

Without CONSULT-III

Check voltage between hazard switch harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(-)		
Hazard switch connector	Terminal			
M98	2	Ground	Hazard switch is ON	0V
			Hazard switch is OFF	5V



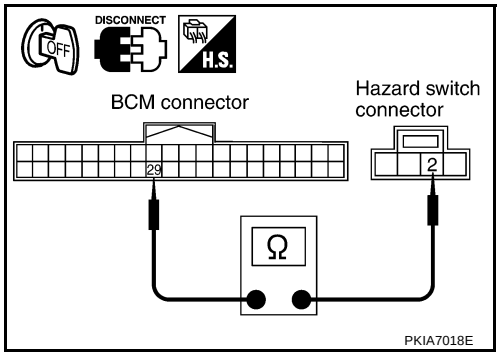
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 3.

3. CHECK HAZARD SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and hazard switch connector.
3. Check continuity BCM harness connector and hazard switch harness connector.

Terminals				Continuity
BCM		Hazard switch		
Connector	Terminal	Connector	Terminal	
M90	29	M98	2	Yes



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

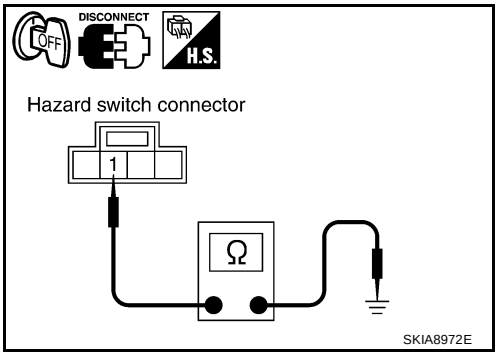
4. CHECK GROUND

Check continuity hazard switch harness connector and ground.

Hazard switch connector	Terminal	Ground	Continuity
M98	1		Yes

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.



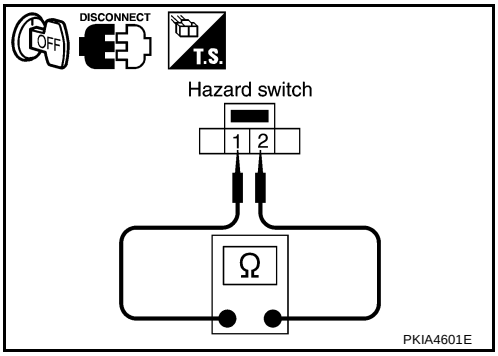
5. CHECK HAZARD SWITCH

Check continuity hazard switch.

Terminal		Condition	Continuity
Hazard switch			
1	2	Hazard switch is ON.	Yes
		Hazard switch is OFF.	No

OK or NG

OK >> Replace BCM if turn signal lamps does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace hazard switch.



Turn Signal Indicator Lamp Does Not Operate

NKS004YF

1. CHECK BULB

Check bulb of turn signal indicator lamp in combination meter.

OK or NG

OK >> Replace combination meter.
NG >> Replace indicator bulb.

Bulb Replacement (Front Turn Signal Lamp)

NKS004YG

Refer to LT-28, "Bulb Replacement" .

Bulb Replacement (Rear Turn Signal Lamp)

NKS004YH

Refer to LT-126, "Bulb Replacement" .

Removal and Installation of Front Turn Signal Lamp

NKS004YI

Refer to LT-29, "Removal and Installation" .

Removal and Installation of Rear Turn Signal Lamp

NKS004YJ

Refer to LT-127, "Removal and Installation" .

LIGHTING AND TURN SIGNAL SWITCH

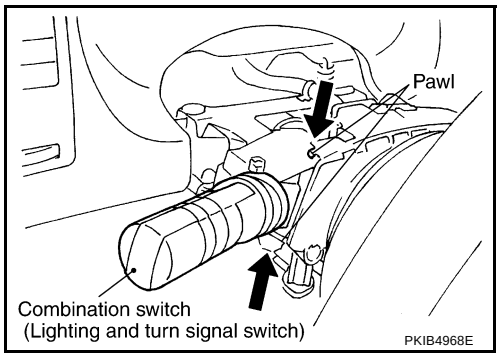
PFP:25540

Removal and Installation

NKS004YK

REMOVAL

1. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove column upper cover and combination meter assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. While pressing pawls in direction as shown in the figure, pull lighting and turn signal switch toward driver door and disconnect from the base.



INSTALLATION

Installation is the reverse order of removal.

HAZARD SWITCH

PFP:25290

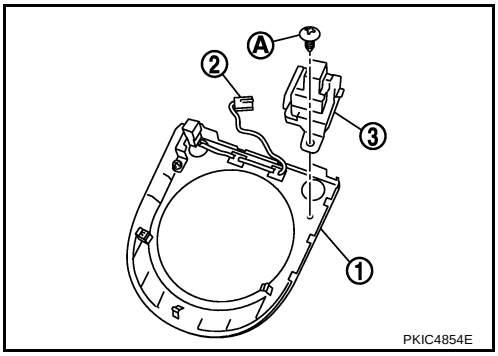
Removal and Installation

NKS004YL

HAZARD SWITCH (A/T MODELS)

Removal

1. Remove console finisher (1). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect hazard switch connector (2).
3. Remove screw (A), and remove hazard switch (3).



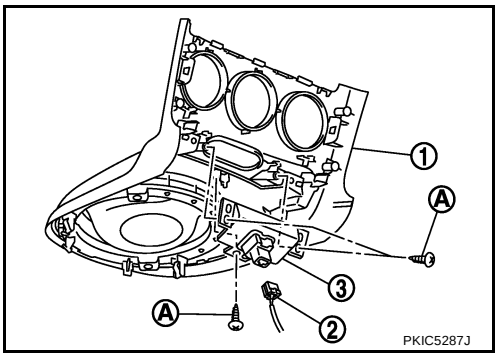
Installation

Installation is the reverse order of removal.

HAZARD SWITCH (M/T MODELS)

Removal

1. Removal console boot (1). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect hazard switch connector (2).
3. Remove screw (A), and remove hazard switch (3).



Installation

Installation is the reverse order of removal.

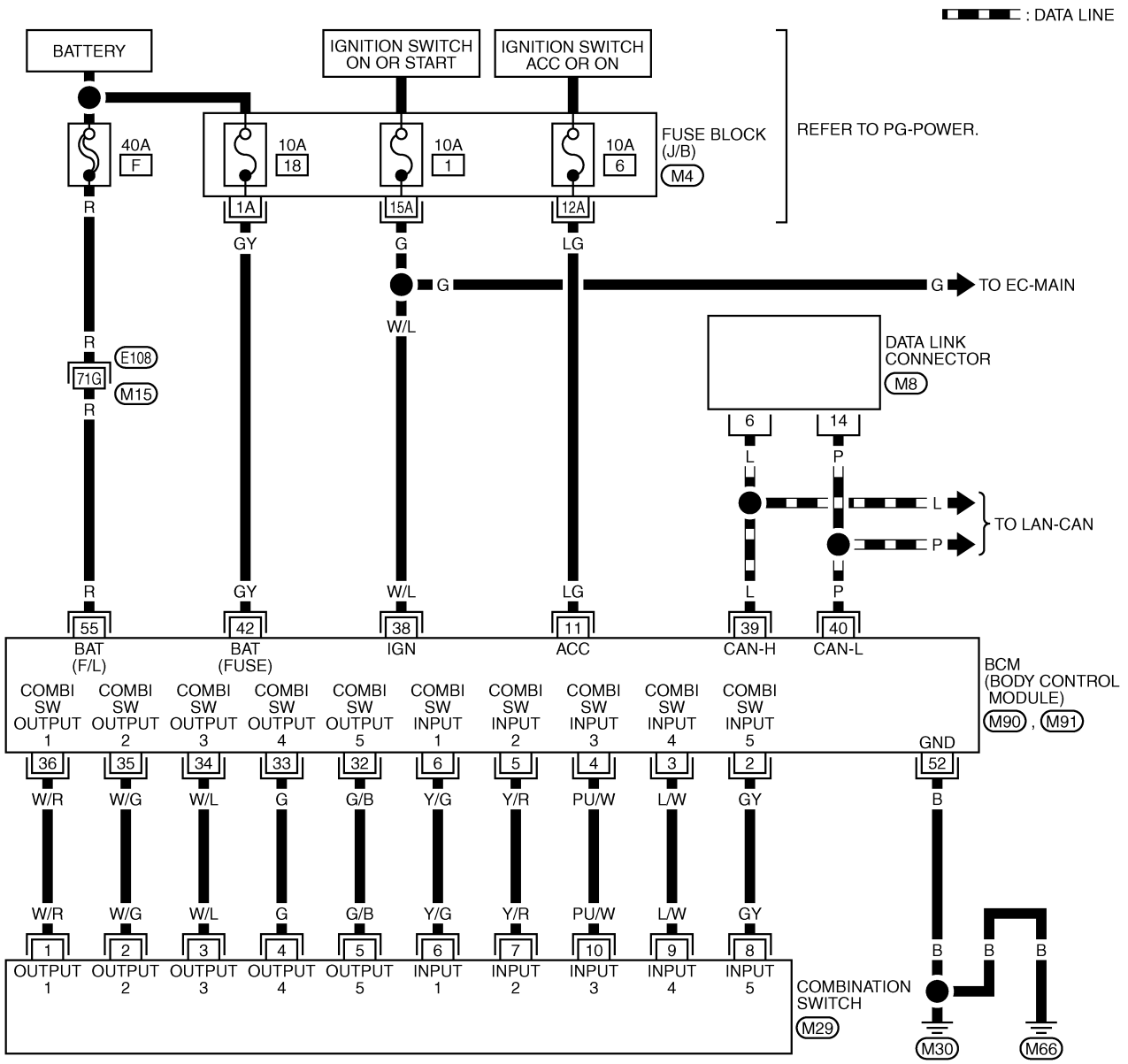
COMBINATION SWITCH

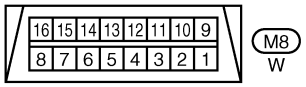
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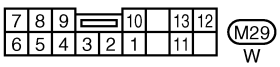
Wiring Diagram —COMBSW—

NKS004YM

LT-COMBSW-01







REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TKWT5754E

Combination Switch Reading Function

NKS004YN

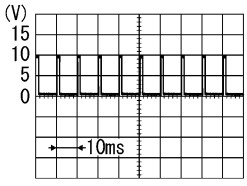
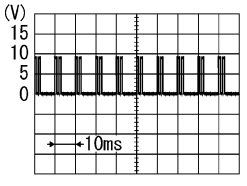
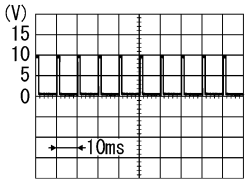
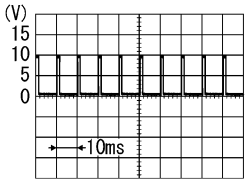
Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

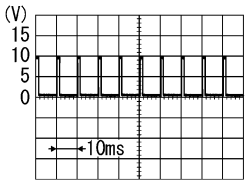
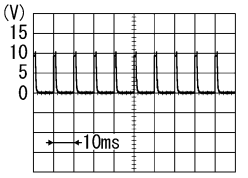
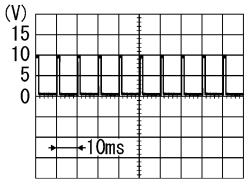
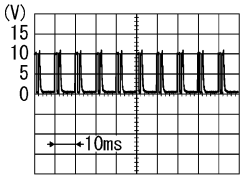
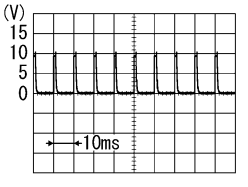
Terminals and Reference Values for BCM

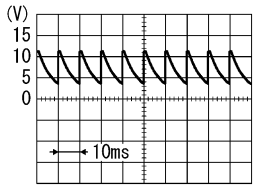
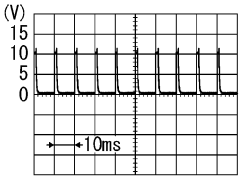
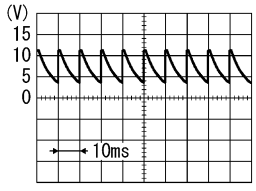
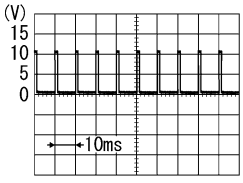
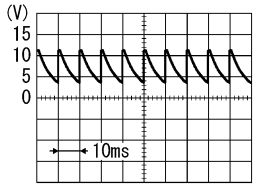
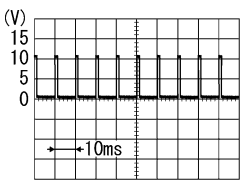
NKS004YO

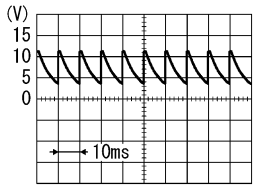
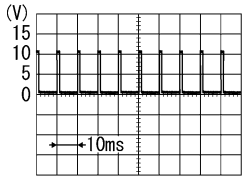
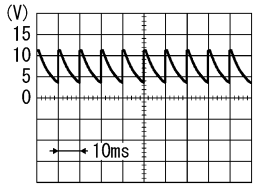
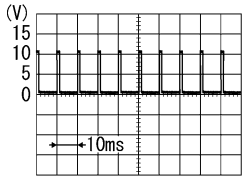
CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch) ● Turn signal switch to right	 PKIB4959J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch) ● Turn signal switch to left	 PKIB4959J Approx. 1.0 V
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Front wiper switch MIST ● Front wiper switch INT ● Front wiper switch LO	 PKIB4959J Approx. 1.0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	Approx. 0 V
					Any of the conditions below ● Front washer switch ● Rear washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4959J Approx. 1.0 V
					Rear wiper switch ON (Wiper intermittent dial position 4)	 PKIB4955J Approx. 0.8 v
6	Y/G	Combination switch input 1	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	Approx. 0 V
					Any of the conditions below ● Front wiper switch HI ● Rear wiper switch INT ● Wiper intermittent dial position 3	 PKIB4959J Approx. 1.0 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2	 PKIB4952J Approx. 1.7 V
					Any of the conditions below ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4955J Approx. 0.8 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4956J Approx. 1.0 V
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 1ST (The same result with lighting switch 2ND) ● Rear wiper switch INT ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch) ● Rear washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 3	 PKIB4958J Approx. 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch) ● Front wiper switch INT ● Front wiper switch HI	 PKIB4958J Approx. 1.2 V
36	W/R	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Turn signal switch to right ● Turn signal switch to left ● Front wiper switch MIST ● Front wiper switch LO ● Front washer switch	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	GY	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0V
55	R	Battery power supply	OFF	—		Battery voltage

CONSULT-III Function (BCM)

NKS004YP

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
COMB SW	DATA MONITOR	Displays BCM input data in real time.

DATA MONITOR
Display Item List

Monitor item name “OPERATION OR UNIT”		Contents
TURN SIGNAL R	“ON/OFF”	Displays “Turn Right (ON)/Other (OFF)” status, determined from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays “Turn Left (ON)/Other (OFF)” status, determined from lighting switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1ST	“ON/OFF”	Displays status (lighting switch 1ST or 2ND position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW NOTE	“ON/OFF”	—
FR WIPER HI	“ON/OFF”	Displays “Front Wiper HI (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WIPER LOW	“ON/OFF”	Displays “Front Wiper LOW (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WIPER INT	“ON/OFF”	Displays “Front Wiper INT (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WASHER SW	“ON/OFF”	Displays “Front Washer Switch (ON)/Other (OFF)” status, determined from wiper switch signal.
INT VOLUME	[1 - 7]	Displays intermittent operation knob setting (1 - 7), determined from wiper switch signal.
RR WIPER ON	“ON/OFF”	Displays “rear Wiper (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT	“ON/OFF”	Displays “rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW	“ON/OFF”	Displays “rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.

NOTE:
This item is displayed, but cannot be monitored.

Combination Switch Inspection

NKS004YQ

1. SYSTEM CHECK

Referring to table below, check which system malfunctioning switch belongs to.

System 1	System 2	System 3	System 4	System 5
—	FR WASHER	FR WIPER LO	TURN LH	TURN RH
FR WIPER HI	—	FR WIPER INT	PASSING	HEAD LAMP 1
INT VOLUME 1	RR WASHER	—	HEAD LAMP 2	HI BEAM
RR WIPER INT	INT VOLUME 3	—	—	LIGHT SW 1ST
INT VOLUME 2	RR WIPER ON	—	—	—

>> Check the system to which malfunctioning switch belongs, and GO TO 2.

2. SYSTEM CHECK

With CONSULT-III

1. Select "COMBI SW" of BCM data monitor item.
2. Confirm that other switches in malfunctioning system operate normally.
   Example: When the HI BEAM switch is malfunctioning, confirm that “TURN RH”, “HEAD LAMP 1” and “LIGHT SW 1 ST” in System 5, to which the HI BEAM switch belongs, turn ON-OFF normally.

Without CONSULT-III

Operating combination switch, and confirm that other switches in malfunctioning system operate normally.
Example: When the HI BEAM switch is malfunctioning, confirm that “TURN RH”, “HEAD LAMP 1” and “LIGHT SW 1 ST” in System 5, to which HI BEAM switch belongs, turn ON-OFF normally.

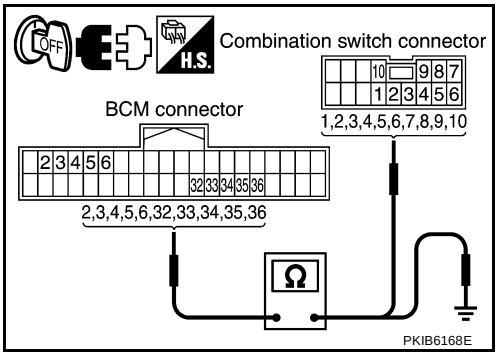
Check results

Other switches in malfunctioning system operate normally.>>Replace lighting switch or wiper switch.
Other switches in malfunctioning system do not operate normally.>>GO TO 3.

3. HARNESS INSPECTION

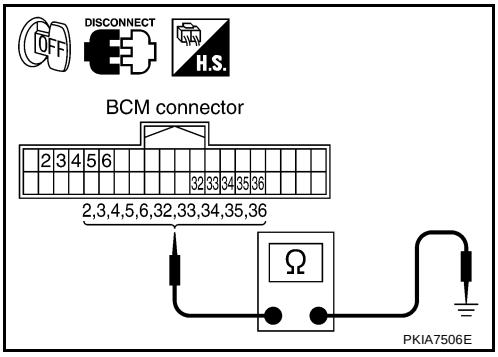
1. Turn ignition switch OFF.
2. Disconnect BCM and combination switch connectors.
3. Check for continuity between BCM harness connector of the suspect system and the corresponding combination switch harness connector.

Suspect system	BCM			Combination switch		Continuity
	Connector	Terminal		Connector	Terminal	
1	M90	Input 1	6	M29	6	Yes
		Output 1	36		1	
2		Input 2	5		7	
		Output 2	35		2	
3		Input 3	4		10	
		Output 3	34		3	
4		Input 4	3		9	
		Output 4	33		4	
5		Input 5	2		8	
		Output 5	32		5	



4. Check for continuity between BCM harness connector in suspect malfunctioning system and ground.

Suspect system	BCM				Continuity
	Connector	Terminal			
1	M90	Input 1	6	Ground	No
		Output 1	36		
2		Input 2	5		
		Output 2	35		
3		Input 3	4		
		Output 3	34		
4		Input 4	3		
		Output 4	33		
5		Input 5	2		
		Output 5	32		

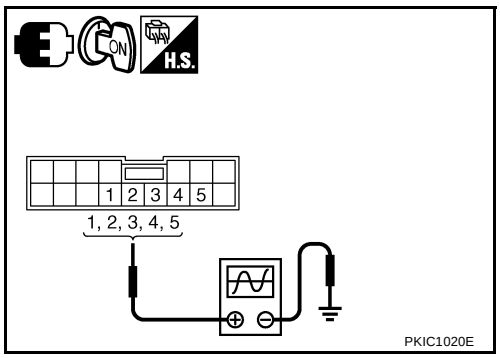


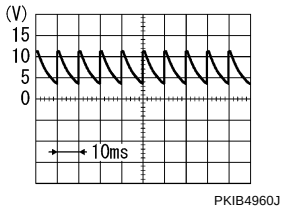
OK or NG

OK >> GO TO 4.
NG >> Check harness between BCM and combination switch for open or short circuit.

4. BCM OUTPUT TERMINAL INSPECTION

1. Connect BCM and combination switch connectors.
2. Set wiper intermittent dial position 4.
3. Turn ignition switch ON.
4. Check BCM output terminal voltage waveform of suspect malfunctioning system.



Suspect system	Terminals (+) Combination switch connector	Terminals (+) Terminal	Terminals (-)	Reference value (Approx.)
1	M29	1	Ground	 PKIB4960J 7.2 V
2		2		
3		3		
4		4		
5		5		

OK or NG

OK >> Open circuit in combination switch, GO TO 5.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

5. COMBINATION SWITCH INSPECTION

Referring to table below, perform combination switch inspection.

Procedure										
1	2		3	4		5	6		7	
Replace lighting switch	Confirm check results	OK	INSPECTION END	Confirm check results	OK	INSPECTION END	Confirm check results	OK	INSPECTION END	
		NG	Replace wiper switch		NG	Replace switch base		NG	Confirm symptom again	

>> INSPECTION END

Removal and Installation

NKS004YR

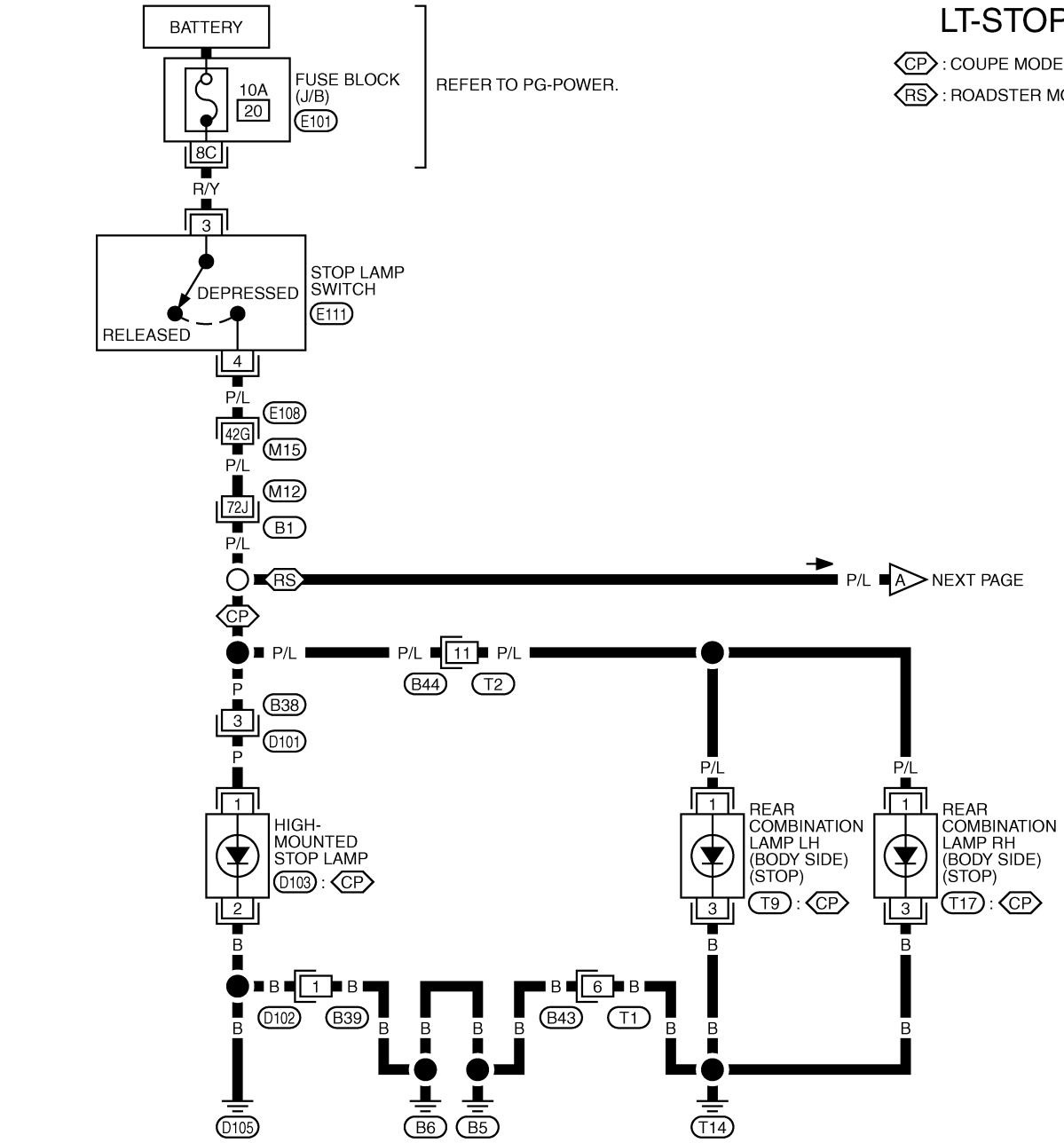
Refer to LT-84, "LIGHTING AND TURN SIGNAL SWITCH" .

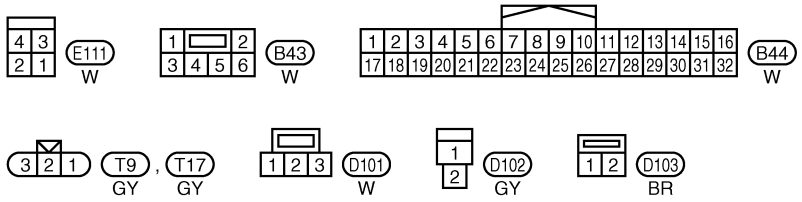
STOP LAMP

PFP:26550

Wiring Diagram — STOP/L —

NKS004YS



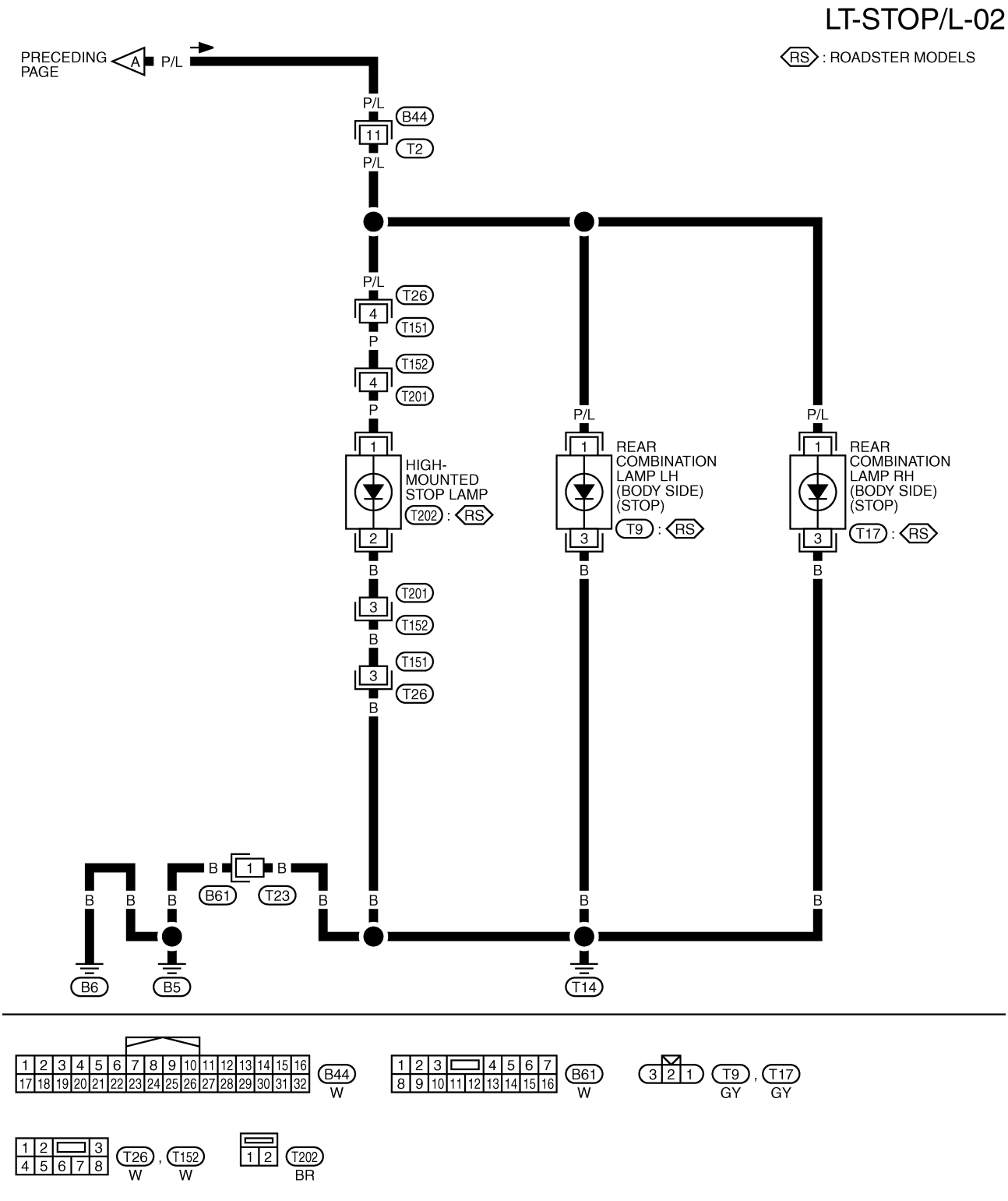


REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5755E

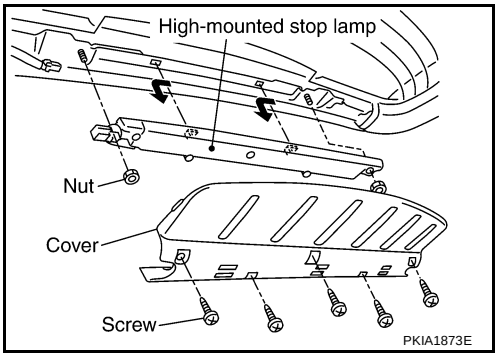

LT-STOP/L-02
RS : ROADSTER MODELS
PRECEDING PAGE
A
P/L
B44
11
T2
T26
4
T151
T152
T201
HIGH-MOUNTED STOP LAMP
T202 : RS
REAR COMBINATION LAMP LH (BODY SIDE) (STOP)
T9 : RS
REAR COMBINATION LAMP RH (BODY SIDE) (STOP)
T17 : RS
3
B61
T23
B6
B5
T14
W
GY
BR
TKWT4038E

High-Mounted Stop Lamp (Coupe Models)

NKS004YT

BULB REPLACEMENT, REMOVAL AND INSTALLATION

1. Remove back door finisher upper. Refer to EI-48, "BACK DOOR FINISHER" .
2. Disconnect high-mounted stop lamp connector.
3. Remove nuts and remove high-mounted stop lamp with cover from back door. Be sure to pull toward the arrow in the figure.
4. Remove screws and remove high-mounted stop lamp assembly from cover.
5. Installation is the reverse order of removal.



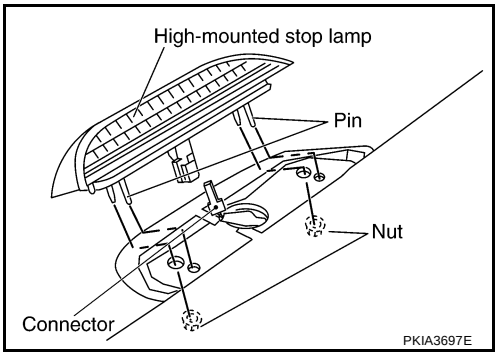
High-mounted stop lamp : LED

High-Mounted Stop Lamp (Roadster Models)

NKS004YU

BULB REPLACEMENT, REMOVAL AND INSTALLATION

1. Turn ignition switch ON, and turn soft-top OPEN/CLOSE switch ON.
2. When the storage lid is fully opened, soft-top OPEN/CLOSE switch to OFF.
3. Remove battery negative cable.
4. Disconnect high-mounted stop lamp connector.
5. Remove high-mounted stop lamp.
6. Remove high-mounted stop lamp assembly from storage lid.
7. Installation is the reverse order of removal.



High-mounted stop lamp : LED

Stop Lamp

NKS004YV

BULB REPLACEMENT

Refer to LT-126, "Bulb Replacement" .

REMOVAL AND INSTALLATION

Refer to LT-127, "Removal and Installation" .

BACK-UP LAMP

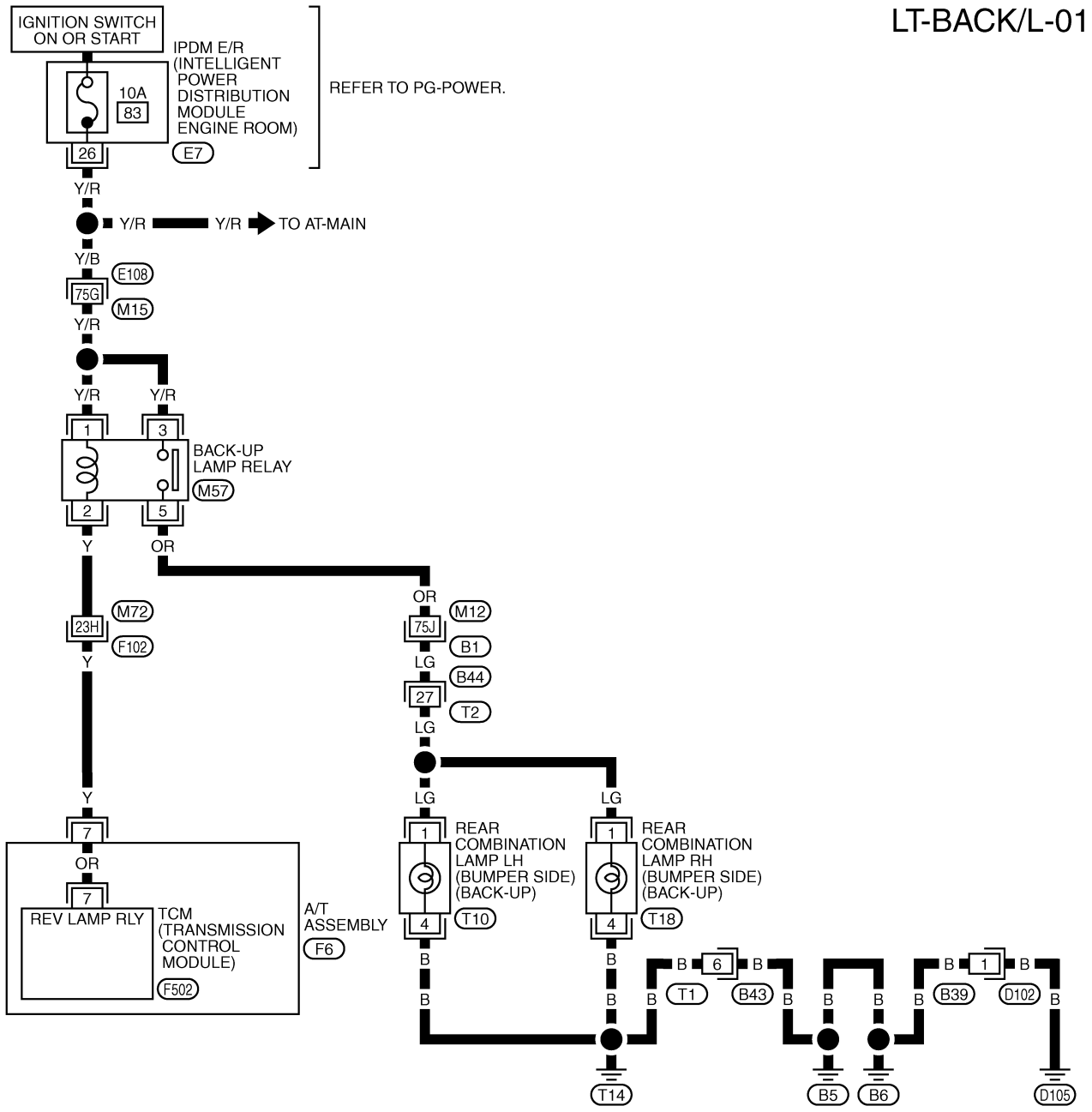
PFP:26550

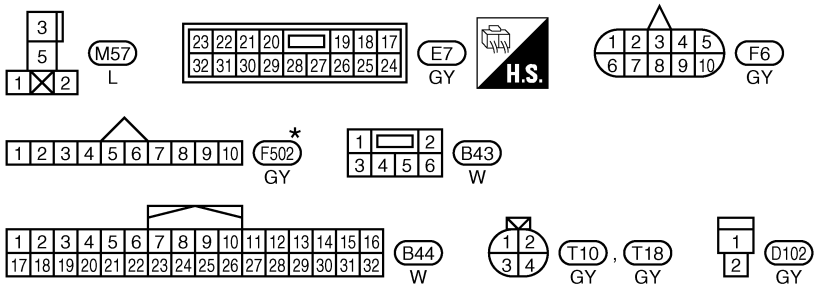
Wiring Diagram — BACK/L —

NKS004YW

COUPE MODELS (A/T)

LT-BACK/L-01





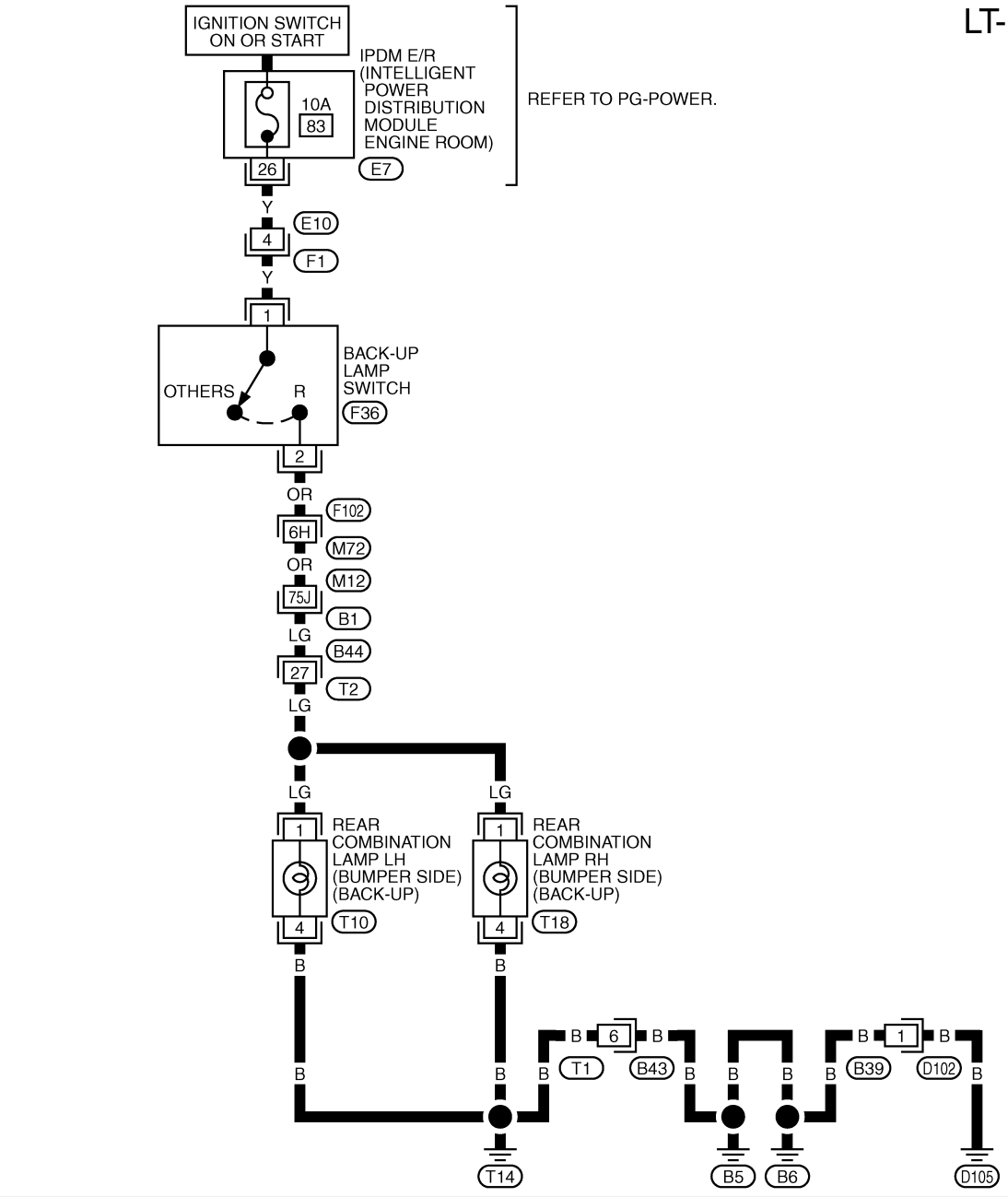
REFER TO THE FOLLOWING.
E108 , F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

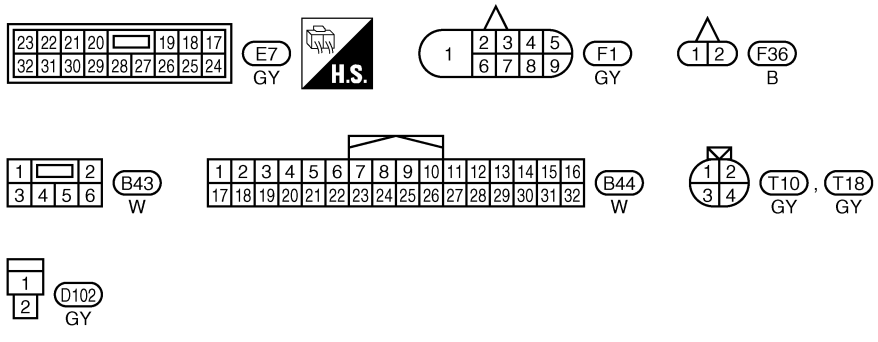
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5756E

COUPE MODELS (M/T)

LT-BACK/L-02



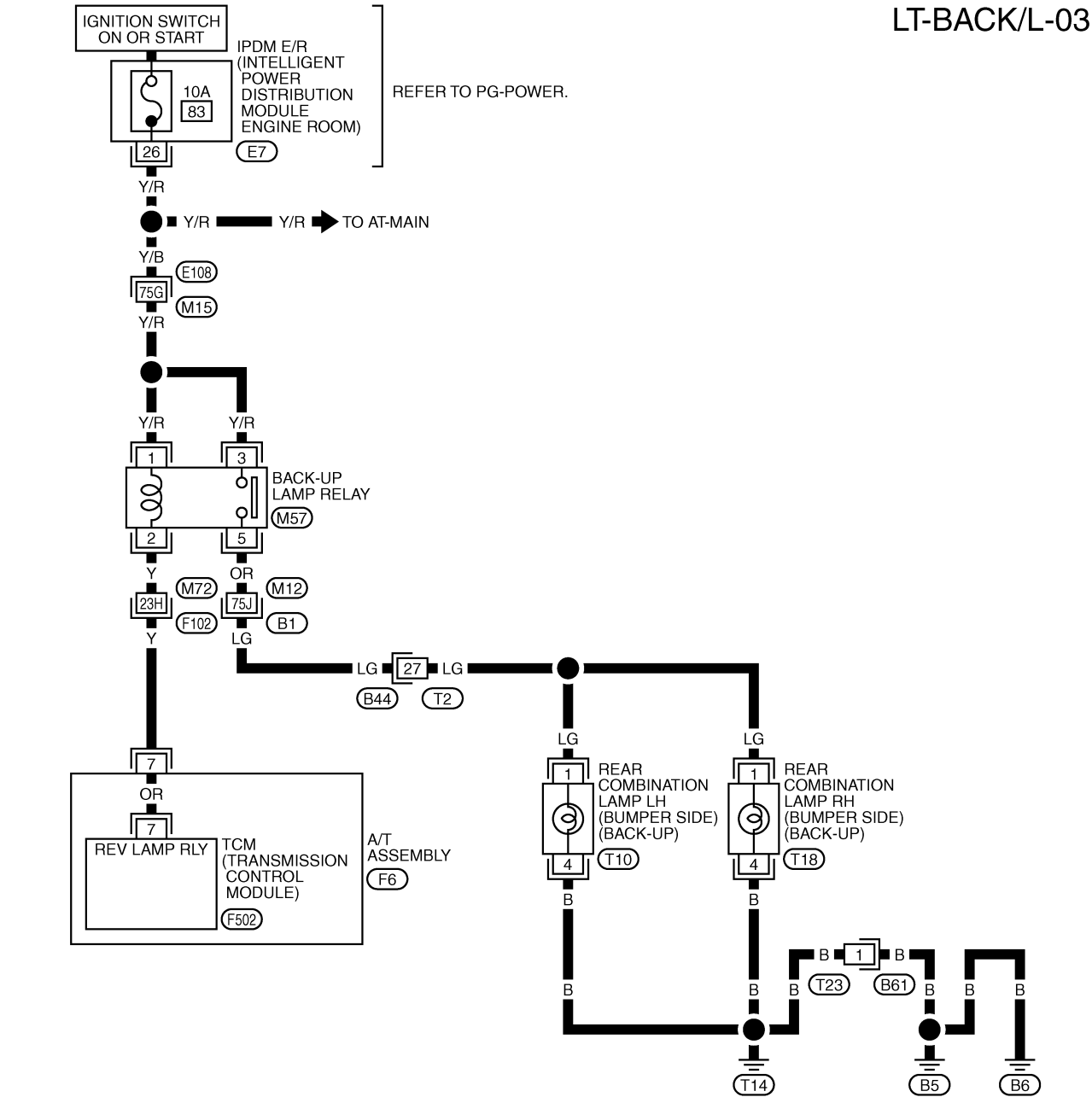


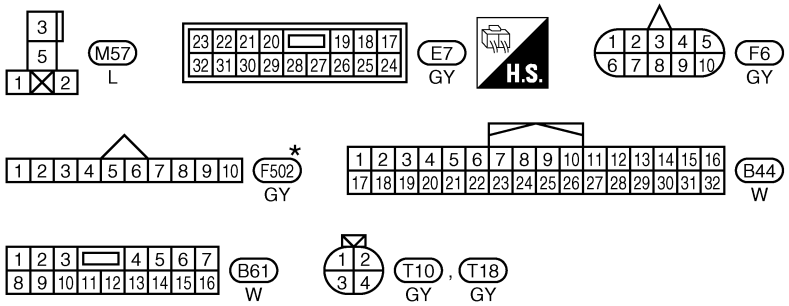
REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5757E

ROADSTER MODELS (A/T)

LT-BACK/L-03





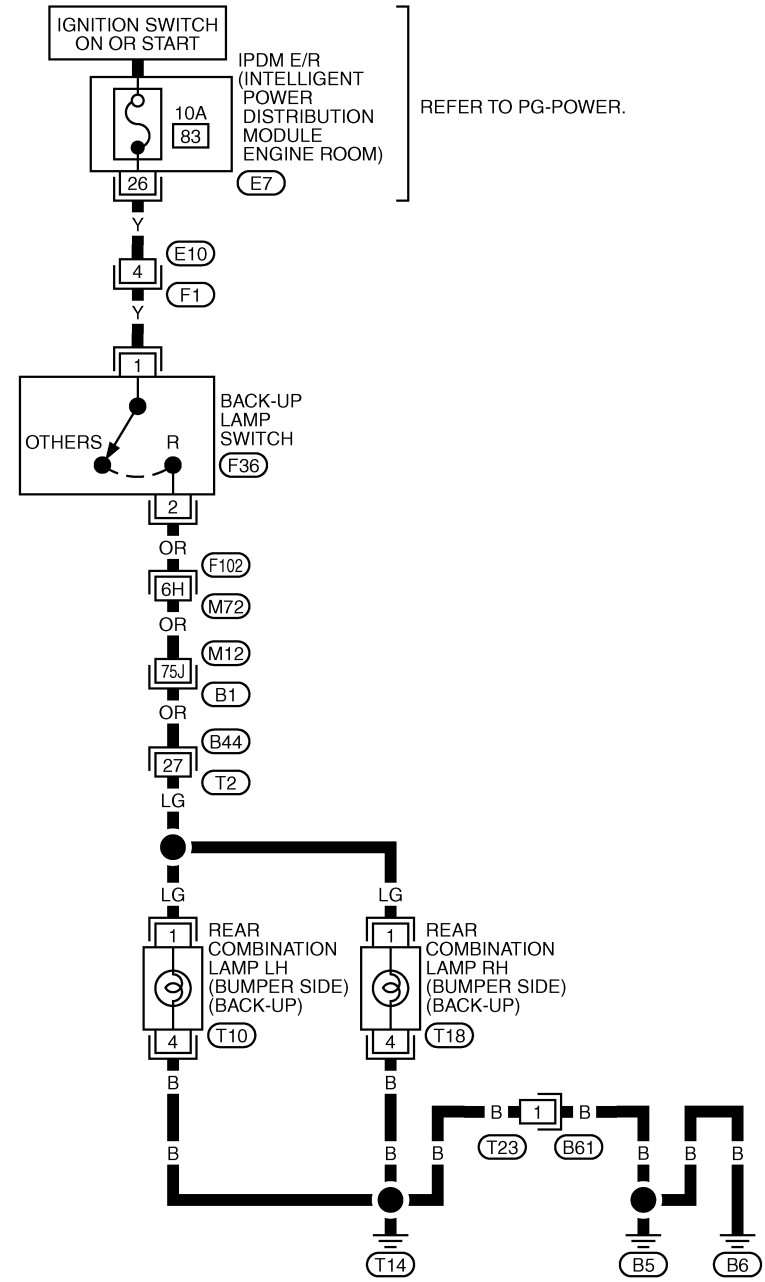
REFER TO THE FOLLOWING.
E108 , F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

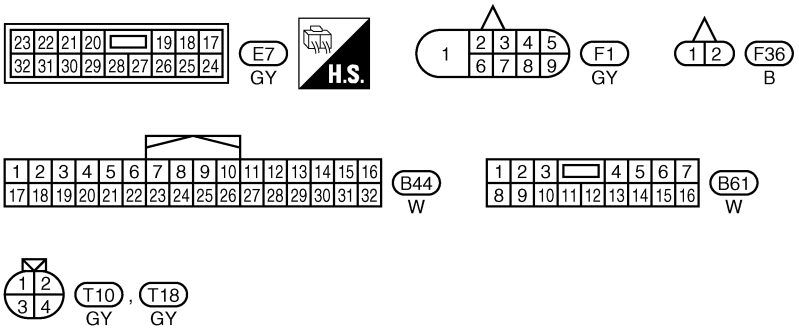
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5758E

ROADSTER MODELS (M/T)

LT-BACK/L-04





REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5759E

Bulb Replacement

NKS004YX

Refer to LT-126, "Bulb Replacement" .

Removal and Installation

NKS004YY

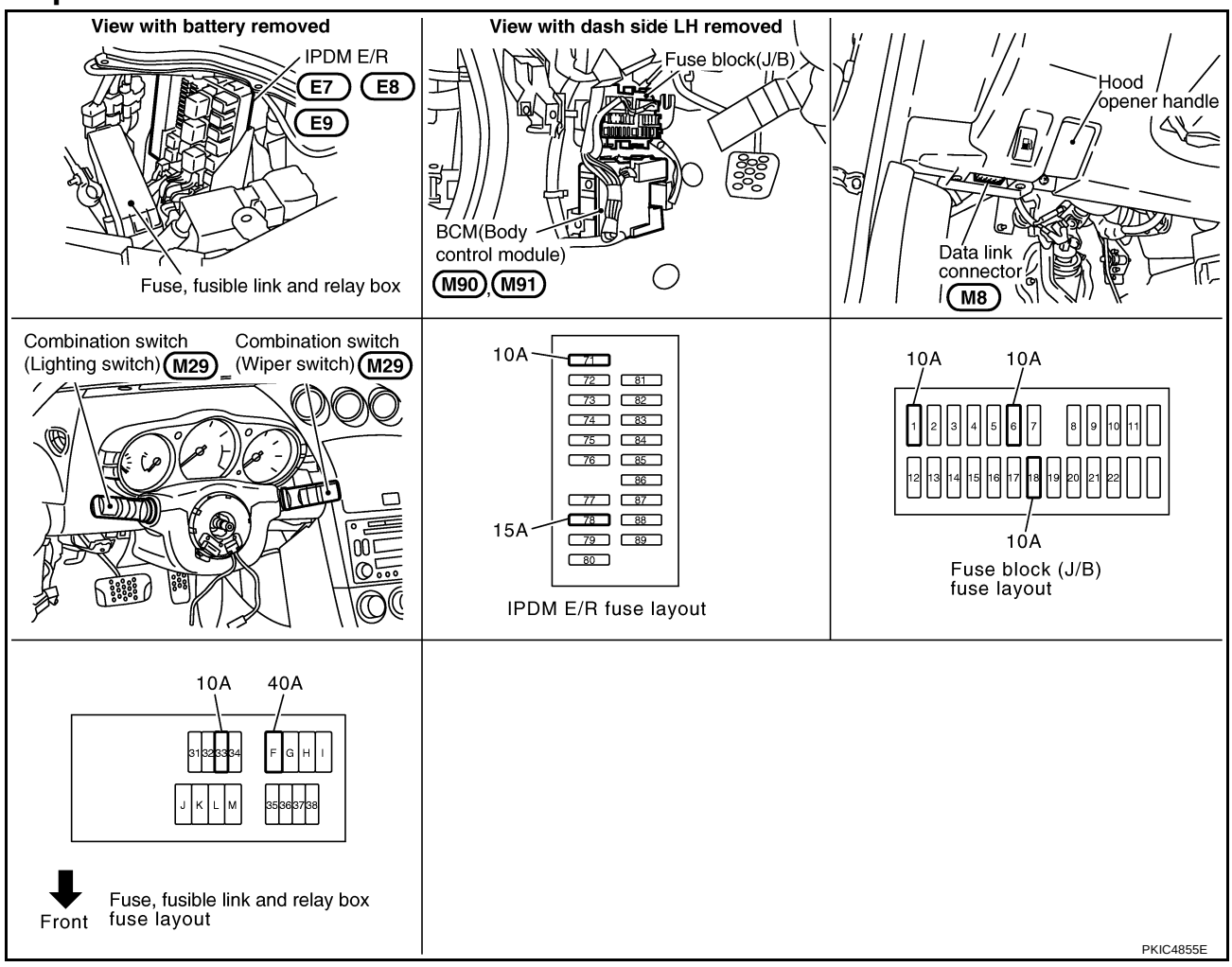
Refer to LT-127, "Removal and Installation" .

PARKING, LICENSE PLATE AND TAIL LAMPS

PFP:26550

Component Parts and Harness Connector Location

NKS004YZ



System Description

NKS004Z0

Control of parking, license plate, side maker and tail lamps operation is dependent upon the position of lighting switch (combination switch). When the lighting switch is in the 1ST position, the BCM (body control module) receives input signal requesting the parking, license plate, side marker and tail lamps to illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) through CAN communication. The CPU (central processing unit) located in the IPDM E/R controls the tail lamp relay coil and daytime light relay* coil. These relay, when energized, directs power to parking, license plate, side marker and tail lamps, which then illuminate.

NOTE:
Daytime light relay*: Canada models

OUTLINE

Power is supplied at all times

- through 10A fuse (No.71, located in IPDM E/R)
- to tail lamp relay, located in IPDM E/R, and
- to CPU located in IPDM E/R,
- through 15A fuse (No.78, located in IPDM E/R)
- to CPU located in IPDM E/R,
- through 40A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in fuse block (J/B)]

- to BCM terminal 42.

With ignition switch in ON or START position, power is supplied

- to CPU located in IPDM E/R,
- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM terminal 38.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

OPERATION BY LIGHTING SWITCH

With the lighting switch in the 1ST or 2ND position, the BCM receives input signal requesting the parking, license plate, side marker and tail lamps to illuminate. This input is communicated to the IPDM E/R through the CAN communication lines. The CPU located in the IPDM E/R controls the tail lamp relay coil and daytime light relay* coil. These relay, when energized, directs power to parking, license plate, side marker and tail lamps, which when energized, directs power

- through IPDM E/R terminal 22 (USA models)
- through daytime light relay terminal 5 (Canada models)
- to front combination lamp LH terminals 6
- to front combination lamp RH terminals 6
- to rear combination lamp LH terminals 2
- to rear combination lamp RH terminals 2
- to license plate lamp LH terminal 2, and
- to license plate lamp RH terminal 2.

Ground is supplied at all times

- to front combination lamp LH terminal 8, and
- to front combination lamp RH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp LH terminals 3
- to rear combination lamp RH terminals 3
- to license plate lamp LH terminal 1, and
- to license plate lamp RH terminal 1
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

With power and ground supplied, parking, license plate side marker and tail lamps illuminate.

NOTE:
Daytime light relay*: Canada models

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (ON), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.
Under this condition, the parking, license, side marker and tail lamps remain illuminated for 5 minutes, then the headlamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

CAN Communication System Description

NKS004Z1

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

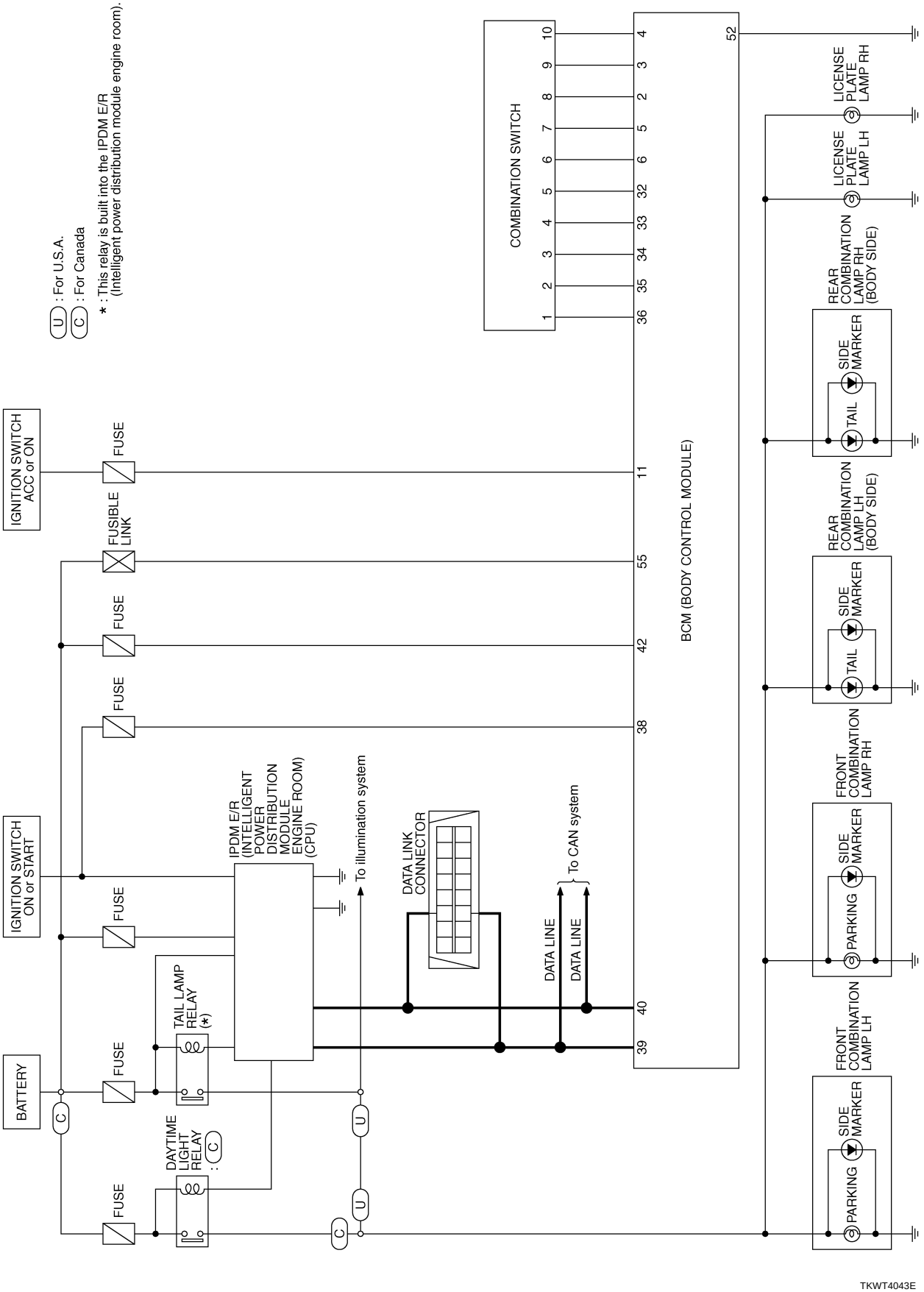
CAN Communication Unit

NKS004Z2

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

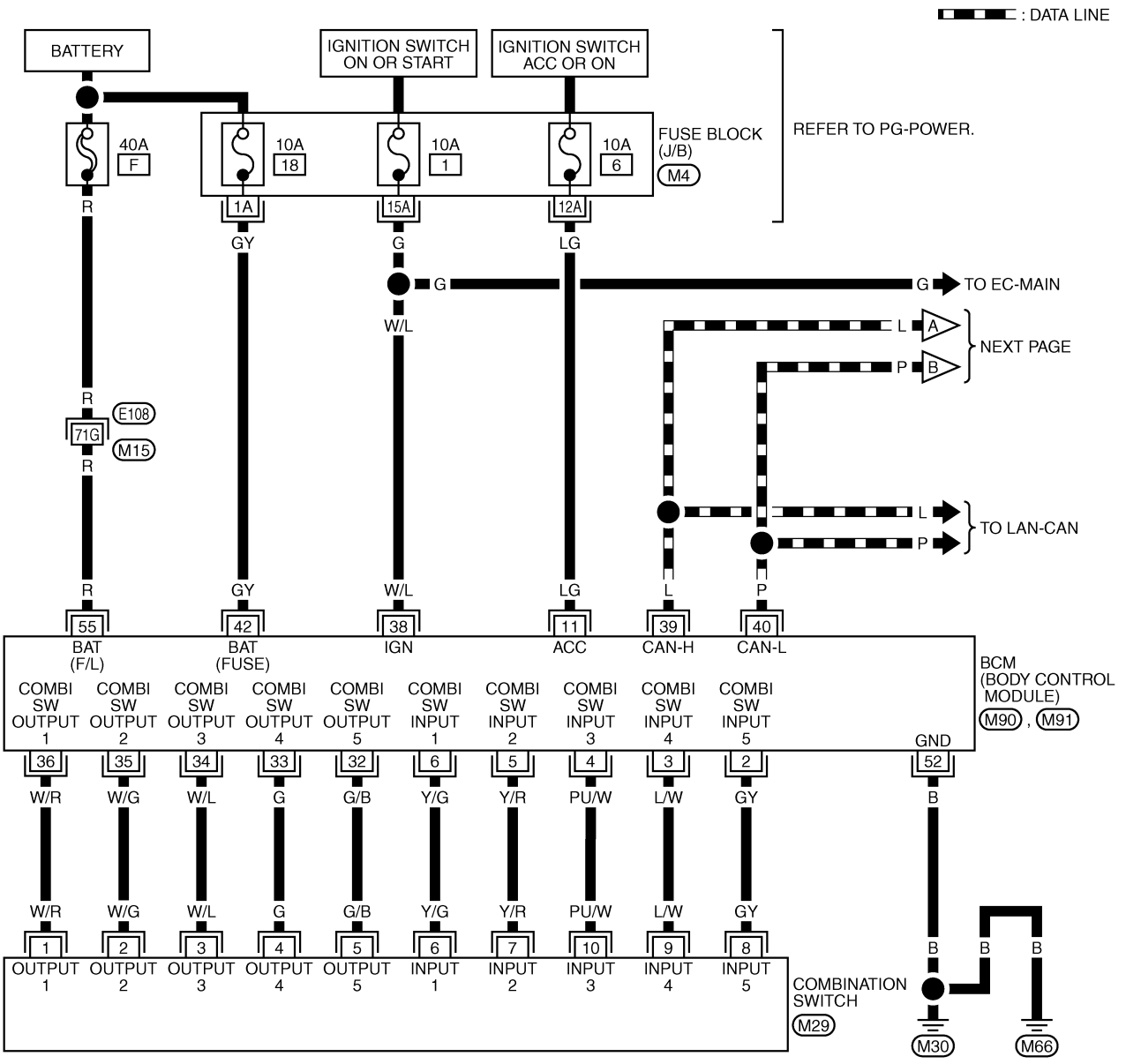
NKS004Z3

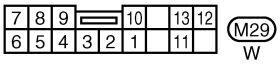


Wiring Diagram — TAIL/L —

NKS004Z4

LT-TAIL/L-01





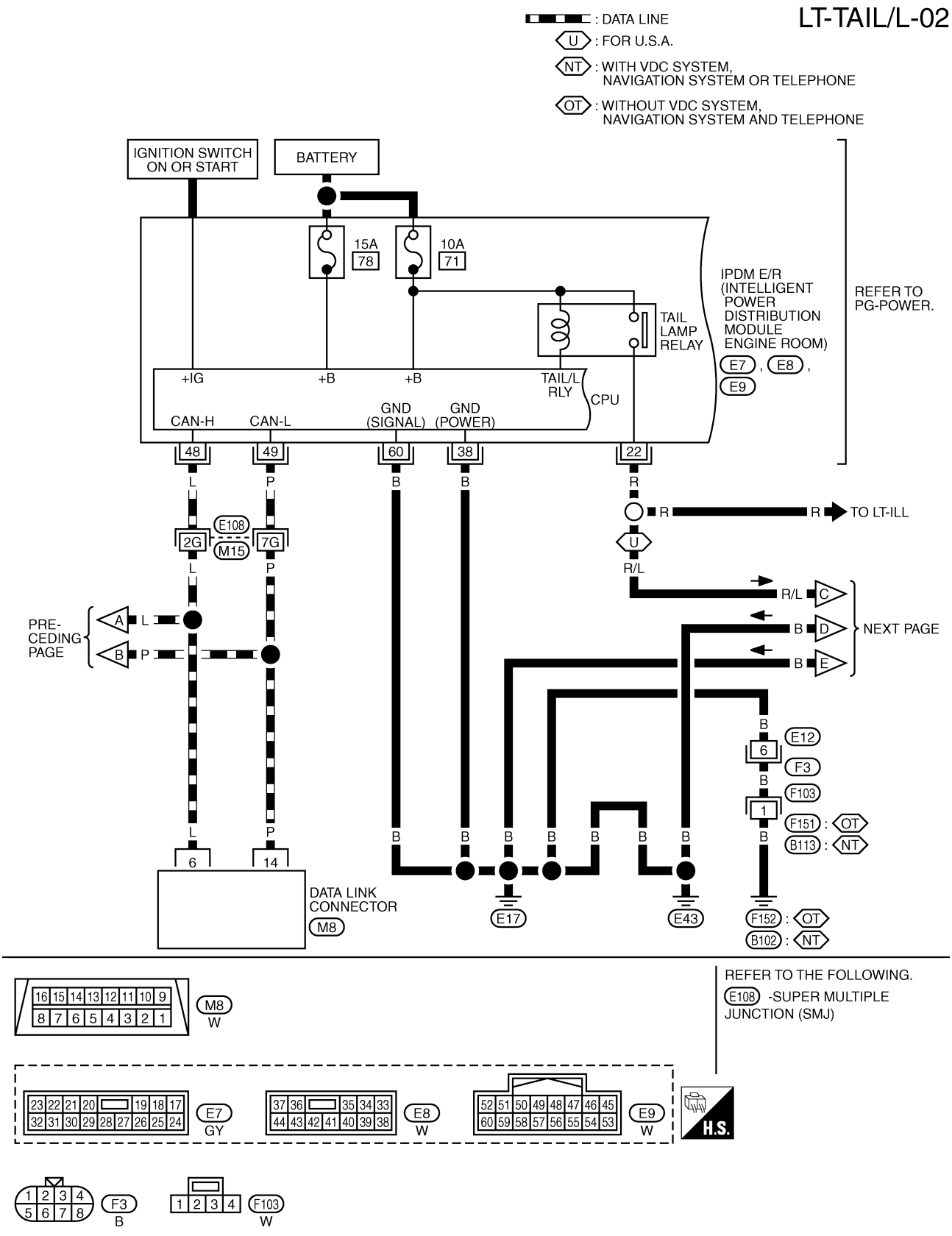
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

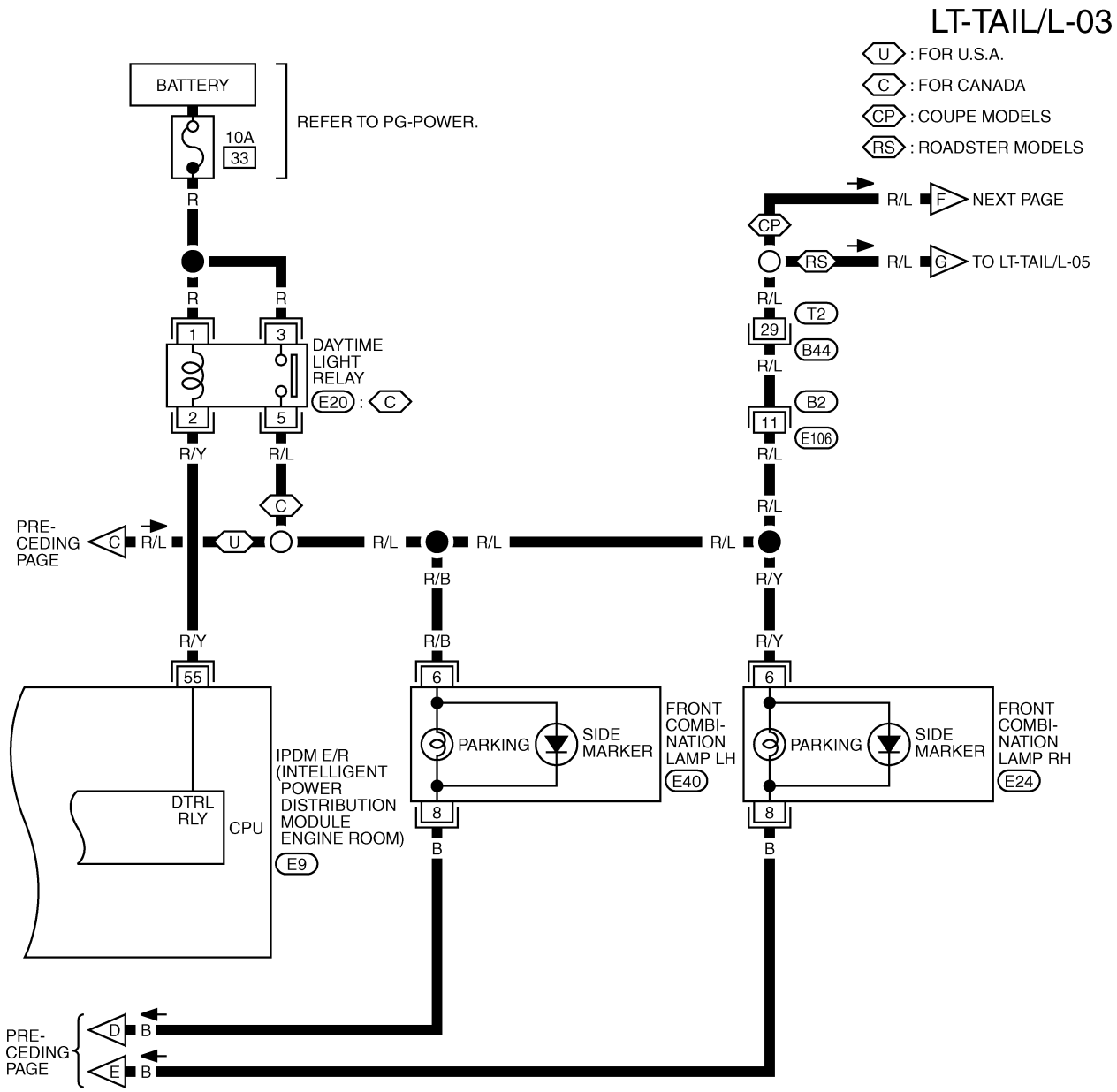
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TKWT5760E


LT-TAIL/L-02
: DATA LINE
U : FOR U.S.A.
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
IGNITION SWITCH ON OR START
BATTERY
15A 78
10A 71
TAIL LAMP RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E7, E8, E9
REFER TO PG-POWER.
+IG
+B
+B
TAIL/L RLY
CPU
CAN-H
CAN-L
GND (SIGNAL)
GND (POWER)
48
49
60
38
22
L
P
B
B
R
E108
2G
M15
7G
R
R
TO LT-ILL
U
R/L
R/L C
B D
B E
NEXT PAGE
PRE-CEDING PAGE
A L
B P
B E12
6
F3
B
F103
1
F151 : OT
B113 : NT
6
14
DATA LINK CONNECTOR M8
E17
E43
F152 : OT
B102 : NT
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M8 W
E7 GY
E8 W
E9 W
H.S.
F3 B
F103 W

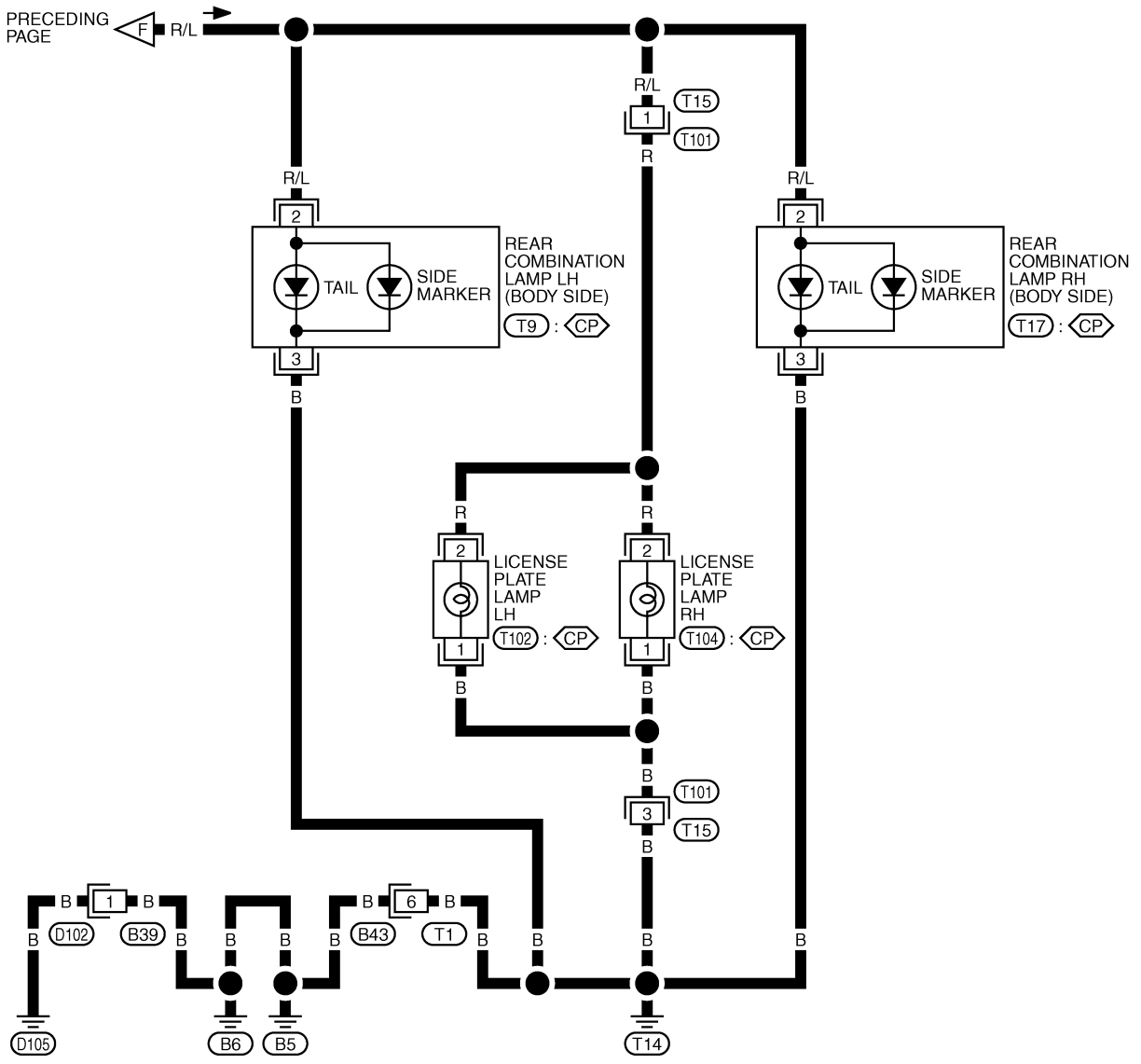
TKWT5761E

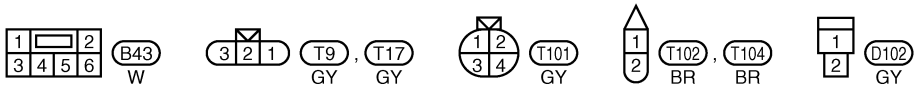

LT-TAIL/L-03
U : FOR U.S.A.
C : FOR CANADA
CP : COUPE MODELS
RS : ROADSTER MODELS
BATTERY
REFER TO PG-POWER.
10A
33
R
R/L
F
NEXT PAGE
CP
RS
R/L
G
TO LT-TAIL/L-05
R
R
R/L
T2
29
B44
R/L
B2
11
E106
R/L
1
3
DAYTIME
LIGHT
RELAY
E20 : C
2
5
R/Y
R/L
C
R/L
PRE-
CEDING
PAGE
C
R/L
U
R/L
R/L
R/L
R/B
R/Y
R/Y
R/B
R/Y
55
6
6
DTRL
RLY
CPU
IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE ROOM)
E9
PARKING
SIDE
MARKER
FRONT
COMBI-
NATION
LAMP LH
E40
PARKING
SIDE
MARKER
FRONT
COMBI-
NATION
LAMP RH
E24
8
8
B
B
PRE-
CEDING
PAGE
D
B
E
B
52 51 50 49 48 47 46 45
60 59 58 57 56 55 54 53
E9
W
H.S.
3
5
1 2
E20
L
1 2 3 4
5 6 7 8
E24 , E40
GY GY
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18
B2
W
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
B44
W

TKWT5762E

LT-TAIL/L-04

CP : COUPE MODELS

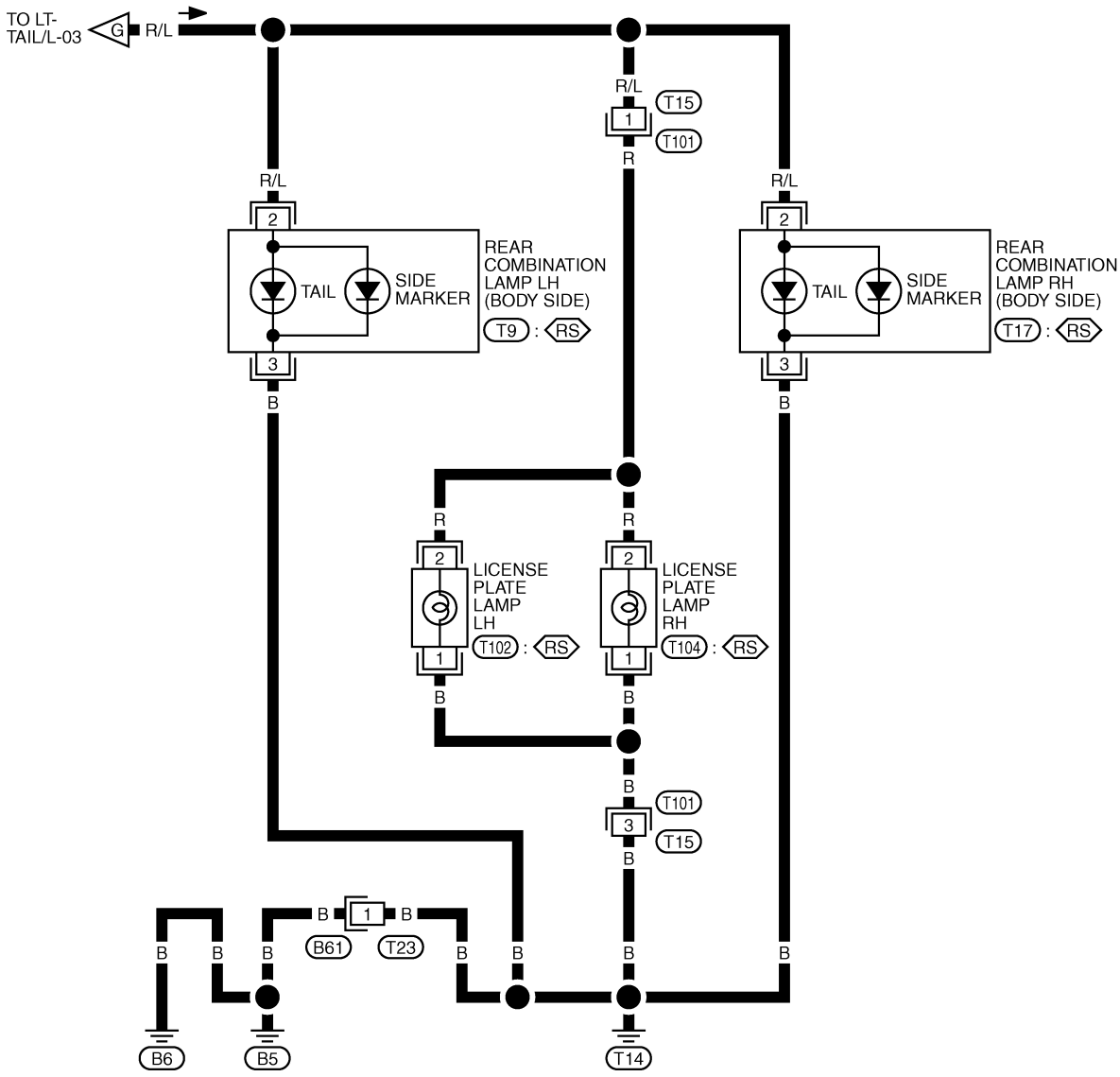


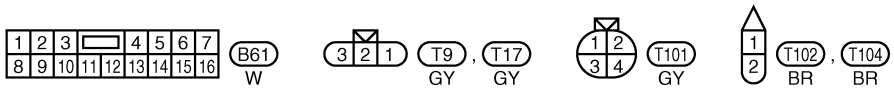


TKWT4047E

LT-TAIL/L-05

RS : ROADSTER MODELS





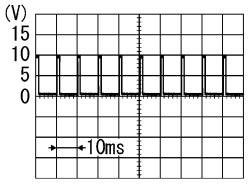
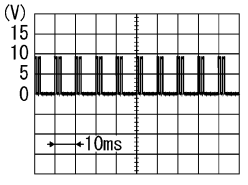
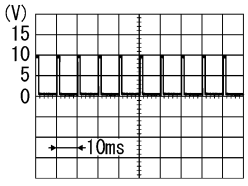
TKWT4048E

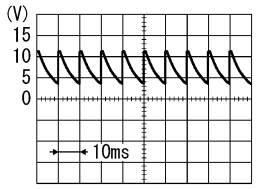
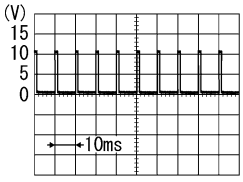
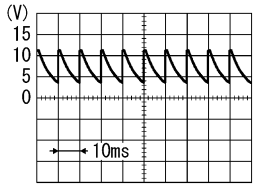
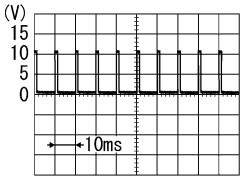
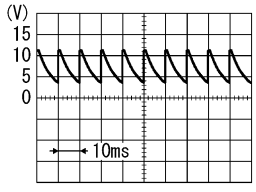
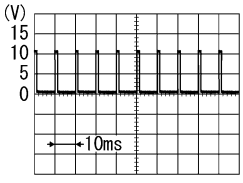
Terminals and Reference Values for BCM

NKS004Z5

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch)	 PKIB4959J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4959J Approx. 1.0 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Lighting switch 1ST (The same result with lighting switch 2ND)	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch)	 PKIB4958J Approx. 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
39	L	CAN – H	—	—	—
40	P	CAN – L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0 V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

NKS004Z6

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
22	R	Parking, license plate, side marker and tail lamp	ON	Lighting switch 1ST position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
48	L	CAN – H	—	—		—
49	P	CAN – L	—	—		—
60	B	Ground	ON	—		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS004Z7

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-103, "System Description" .
3. Carry out preliminary check. Refer to LT-114, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Do parking, license plate, side marker and tail lamps operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004Z8

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	71

Refer to LT-107, "Wiring Diagram — TAIL/L —" .

OK or NG

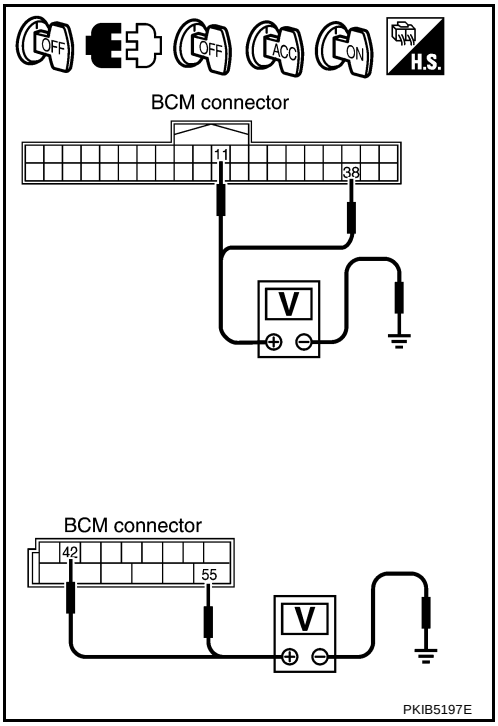
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector terminals and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
BCM connector	Terminal				
M90	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage



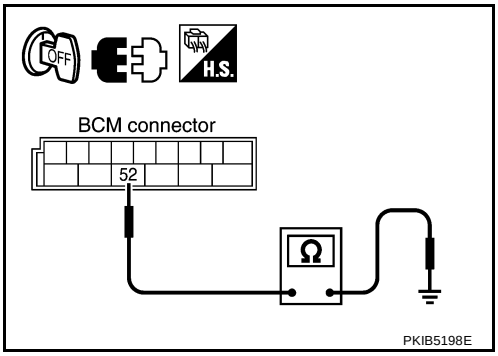
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector terminal and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Function (BCM)

NKS004Z9

Refer to LT-17, "CONSULT-III Function (BCM)" in HEADLAMP (FOR USA).
Refer to LT-49, "CONSULT-III Function (BCM)" in HEADLAMP (FOR CANADA).

CONSULT-III Function (IPDM E/R)

NKS004ZA

Refer to LT-18, "CONSULT-III Function (IPDM E/R)" in HEADLAMP (FOR USA).
Refer to LT-50, "CONSULT-III Function (IPDM E/R)" in HEADLAMP (FOR CANADA).

Parking, License Plate, Side Marker and Tail Lamps Do Not Illuminate (for USA)

NKS004ZB

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "LIGHT SW 1ST" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : LIGHT SW 1ST ON

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "TAIL LAMP" of IPDM E/R active test item.
2. With operating the test item, check the parking, license plate, side marker and tail lamps operation.

Parking, license plate, side marker and tail lamps should operate.

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the parking, license plate, side marker and tail lamps operation.

Parking, license plate, side marker and tail lamps should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select "TAIL&CLR REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : TAIL&CLR REQ ON

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK IPDM E/R

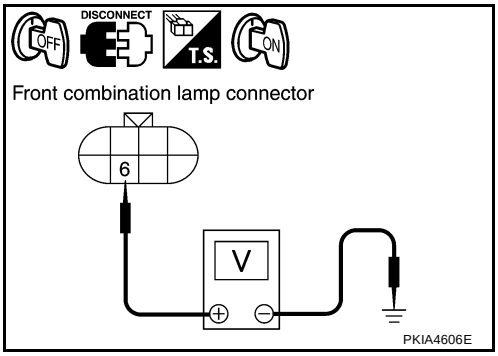
CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connectors.
3. Select "TAIL LAMP" of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

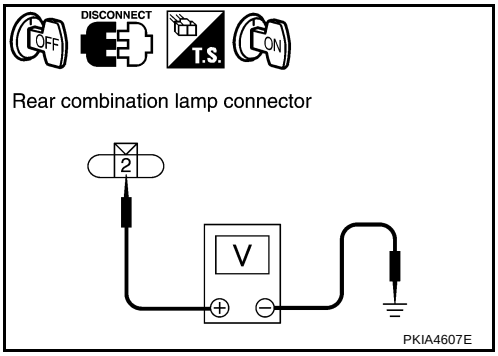
IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

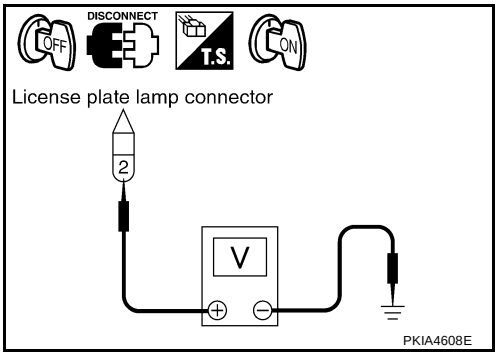
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	6	Ground	Battery voltage
LH	E40			



Terminals				Voltage (Approx.)
(+)			(-)	
Rear combination lamp connector		Terminal		
RH	T17	2	Ground	Battery voltage
LH	T9			



Terminals				Voltage (Approx.)
(+)			(-)	
License plate lamp connector		Terminal		
RH	T104	2	Ground	Battery voltage
LH	T102			



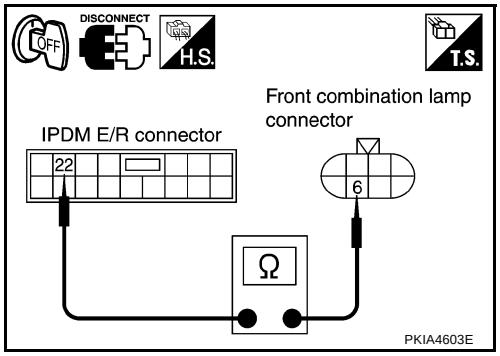
OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

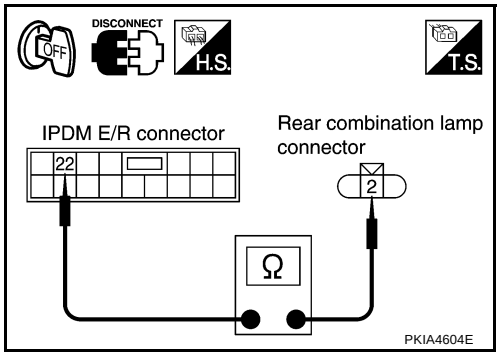
5. CHECK CIRCUIT BETWEEN IPDM E/R AND PARKING, LICENSE PLATE, SIDE MARKER AND TAIL LAMPS

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp, rear combination lamp and license plate lamp harness connector.

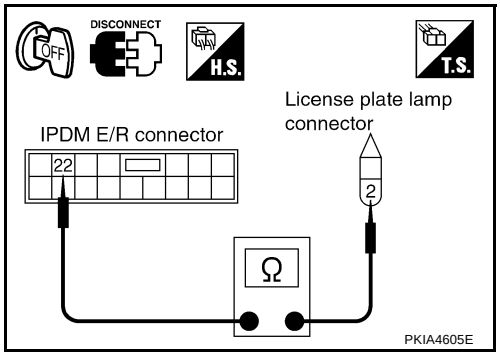
Terminals					Continuity
IPDM E/R		Front combination lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	E24	6	Yes
		LH	E40	6	



Terminals					Continuity
IPDM E/R		Rear combination lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	T17	2	Yes
		LH	T9	2	



Terminals					Continuity
IPDM E/R		Licence plat lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	T104	2	Yes
		LH	T102	2	



OK or NG

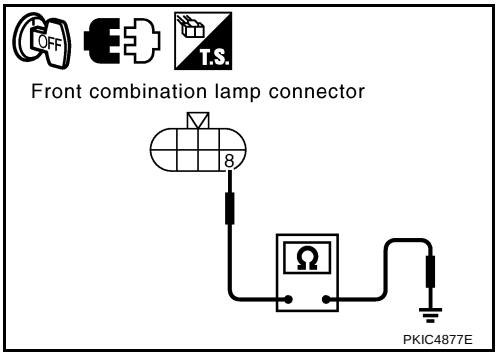
OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

NG >> Repair harness or connector.

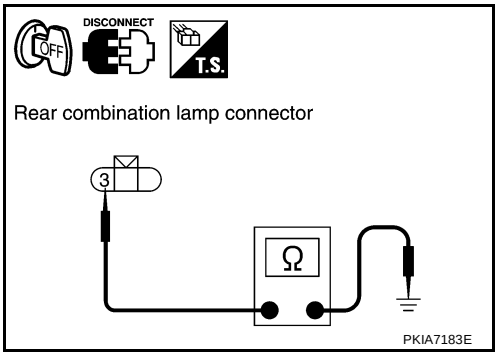
6. CHECK GROUND

1. Check continuity between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

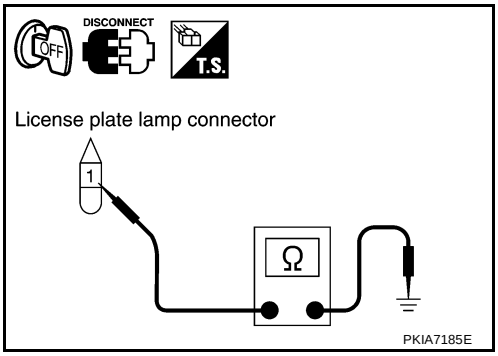
Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	8		Yes
LH	E40			



Rear combination lamp connector		Terminal	Ground	Continuity
RH	T17	3		Yes
LH	T9			



License plate lamp connector		Terminal	Ground	Continuity
RH	T104	1		Yes
LH	T102			



OK or NG

OK >> Check bulb.
NG >> Repair harness or connector.

Parking, License Plate, Side Marker, and Tail Lamps Do Not Illuminate (for Canada)

NKS004ZC

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "LIGHT SW 1ST" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : LIGHT SW 1ST ON

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "TAIL LAMP" of IPDM E/R active test item.
2. With operating the test item, check the parking, license plate, side marker and tail lamps operation.

Parking, license plate, side marker and tail lamps should operate.

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. With operating the test item, check the parking, license plate, side marker and tail lamps operation.

Parking, license plate, side marker and tail lamps should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select "TAIL&CLR REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : TAIL&CLR REQ ON

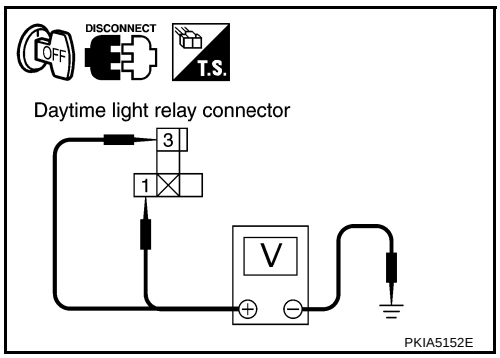
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK POWER SUPPLY CIRCUIT TO DAYTIME LIGHT RELAY

1. Turn ignition OFF.
2. Disconnect daytime light relay.
3. Check voltage between daytime light relay harness connector and ground.

Terminal			
(+)		(–)	voltage (Approx.)
Daytime light relay connector	Terminal		
E20	1	Ground	Battery voltage
	3		



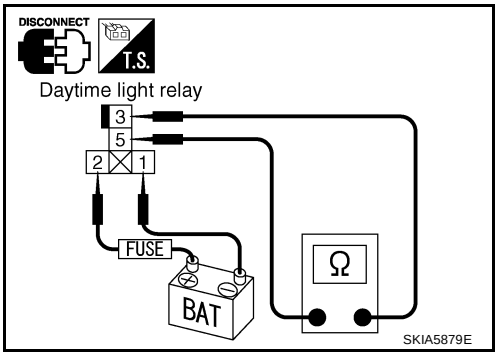
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK DAYTIME LIGHT RELAY

Apply battery voltage to between daytime light relay E20 terminal 1, 2 and check continuity between terminal 3 and 5.

3 – 5 : Continuity should exist.



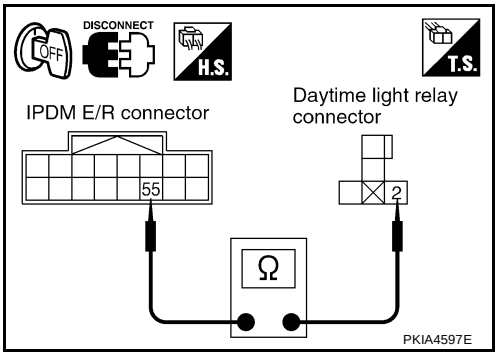
OK or NG

OK >> GO TO 6.
NG >> Replace daytime light relay.

6. CHECK DAYTIME LIGHT RELAY CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector and daytime light relay harness connector.

Terminals				Continuity
IPDM E/R		Daytime light relay		
Connector	Terminal	Connector	Terminal	
E9	55	E20	2	Yes



OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK IPDM E/R

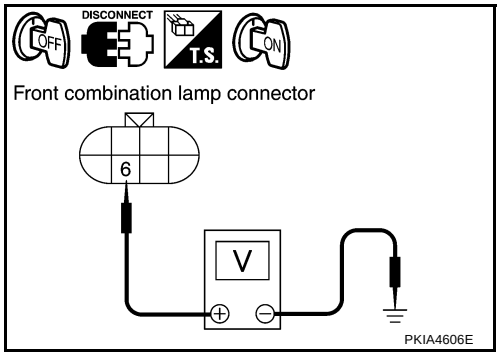
CONSULT-III ACTIVE TEST

1. Connect daytime light relay and IPDM E/R connector.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connectors.
3. Select "TAIL LAMP" of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

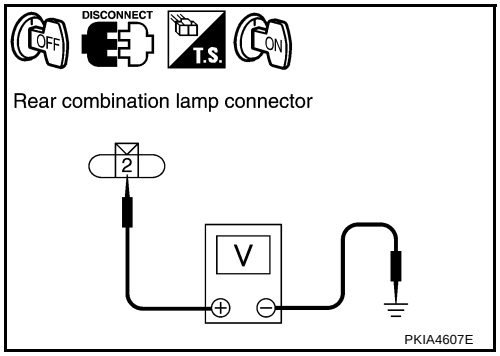
IPDM E/R AUTO ACTIVE TEST

1. Connect daytime light relay and IPDM E/R connector.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

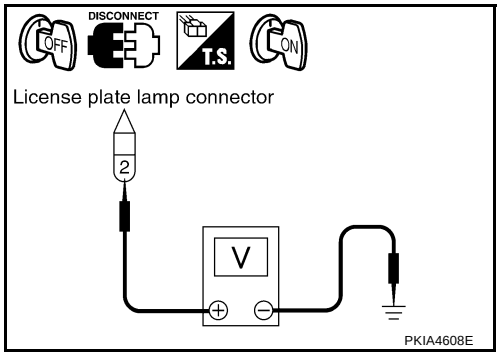
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	6	Ground	Battery voltage
LH	E40			



Terminals				Voltage (Approx.)
(+)			(-)	
Rear combination lamp connector		Terminal		
RH	T17	2	Ground	Battery voltage
LH	T9			



Terminals				Voltage (Approx.)
(+)			(-)	
License plate lamp connector		Terminal		
RH	T104	2	Ground	Battery voltage
LH	T102			



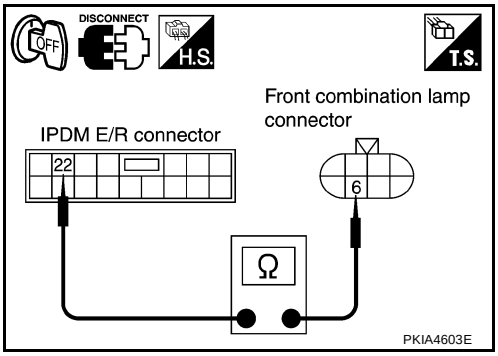
OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

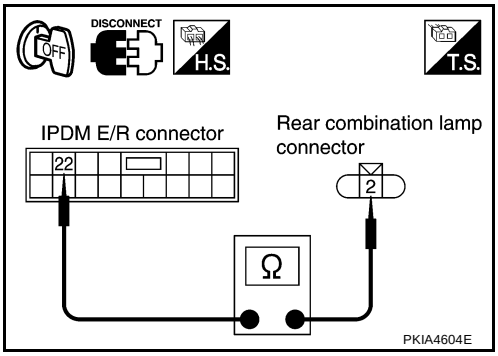
8. CHECK CIRCUIT BETWEEN IPDM E/R AND PARKING, LICENSE PLATE, SIDE MARKER AND TAIL LAMPS

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp, rear combination lamp and license plate lamp harness connector.

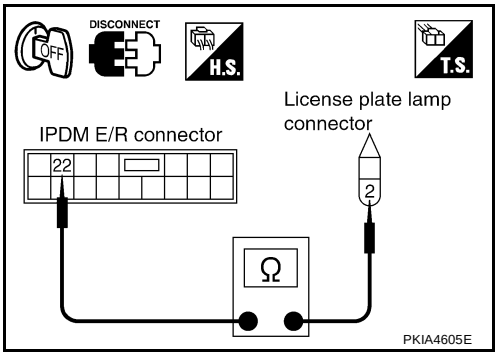
Terminals					Continuity
IPDM E/R		Front combination lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	E24	6	Yes
		LH	E40	6	



Terminals					Continuity
IPDM E/R		Rear combination lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	T17	2	Yes
		LH	T9	2	



Terminals					Continuity
IPDM E/R		Licence plat lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	T104	2	Yes
		LH	T102	2	



OK or NG

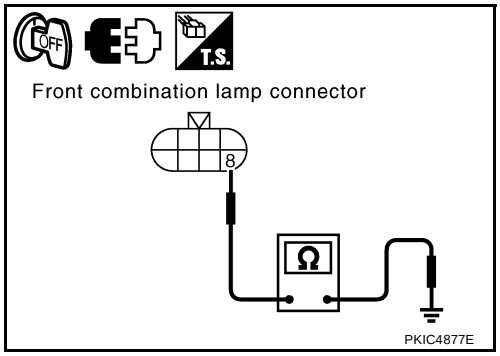
OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

NG >> Repair harness or connector.

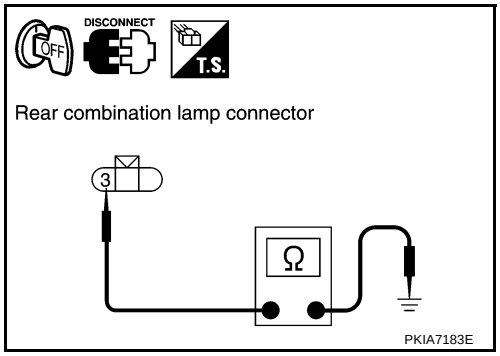
9. CHECK GROUND

1. Check continuity between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

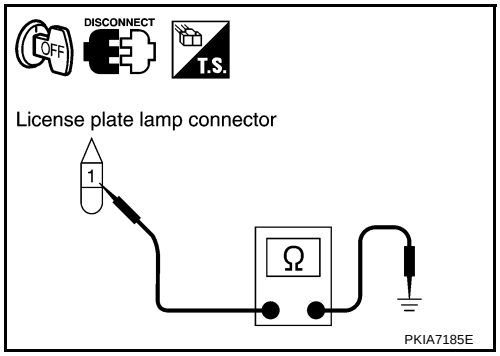
Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	8		Yes
LH	E40			



Rear combination lamp connector		Terminal	Ground	Continuity
RH	T17	3		Yes
LH	T9			



License plate lamp connector		Terminal	Ground	Continuity
RH	T104	1		Yes
LH	T102			



OK or NG

OK >> Check bulb.
NG >> Repair harness or connector.

Parking, Side Marker, License Plate and Tail Lamps Do Not Turn OFF (After Approx. 10 Minutes)

NKS004ZD

1. CHECK IPDM E/R

1. Turn ignition switch ON. Place combination switch (lighting switch) in the ON position. Turn ignition switch OFF.
2. Make sure parking, license plate, and tail lamps turn OFF after approximately 10 minutes.

OK or NG

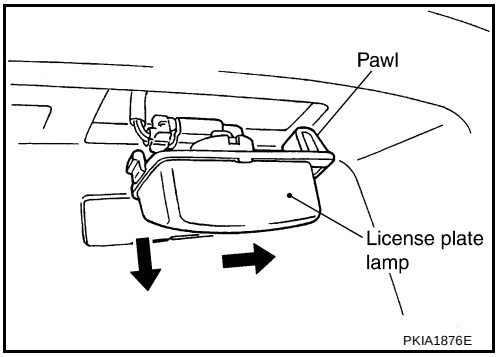
OK >> INSPECTION END.
NG >> Ignition relay malfunction. Refer to PG-17, "Function of Detecting Ignition Relay Malfunction" .

License Plate Lamp

NKS004ZE

BULB REPLACEMENT, REMOVAL AND INSTALLATION

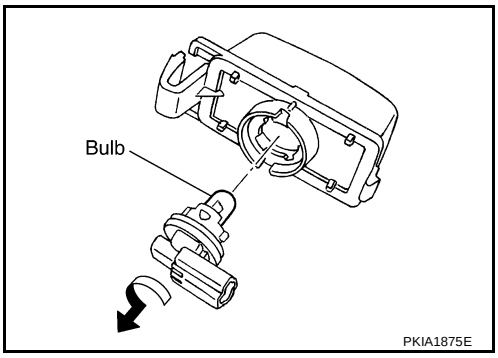
1. While pressing license plate lamp to rightward, pull left side of it and remove.
2. Disconnect license plate lamp connector.



3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from it's socket.

License plate lamp : 12V - 5W

5. Installation is the reverse order of removal.



Front Parking Lamp

NKS004ZF

BULB REPLACEMENT

Refer to LT-28, "Bulb Replacement" .

REMOVAL AND INSTALLATION

Refer to LT-29, "Removal and Installation" .

Tail Lamp

NKS004ZG

BULB REPLACEMENT

Refer to LT-126, "Bulb Replacement" .

REMOVAL AND INSTALLATION

Refer to LT-127, "Removal and Installation" .

REAR COMBINATION LAMP

PFP:26554

Bulb Replacement

NKS004ZH

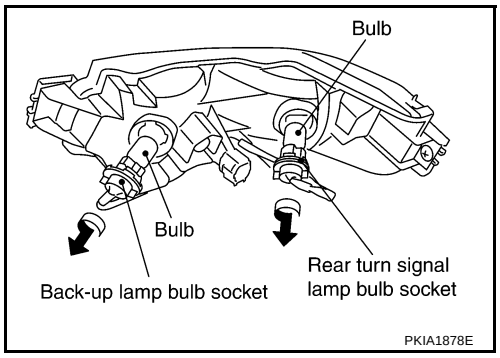
REAR FENDER SIDE (STOP & TAIL LAMP, REAR SIDE MARKER LAMP)

1. Remove rear combination lamp. Refer to LT-127, "Removal and Installation" .
2. Replacement integral with rear combination lamp (rear fender side).

Stop/tail lamp	**: LED**
Rear side marker lamp	**: LED**

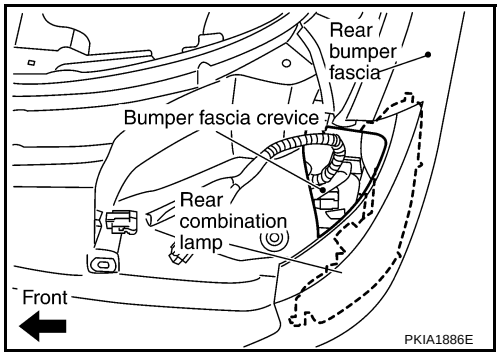
REAR BUMPER SIDE (BACK-UP LAMP BULB, REAR TURN SIGNAL LAMP BULB)

1. Remove rear combination lamp. Refer to LT-127, "Removal and Installation"
2. Turn bulb socket counterclockwise and unlock it through bumper fascia crevice.



3. Remove bulb.
4. Installation is the reverse order of removal.

Rear turn signal lamp (rear bumper side)	**: 12 V - 21 W (amber)**
Back-up lamp (rear bumper side)	**: 12 V - 21 W**



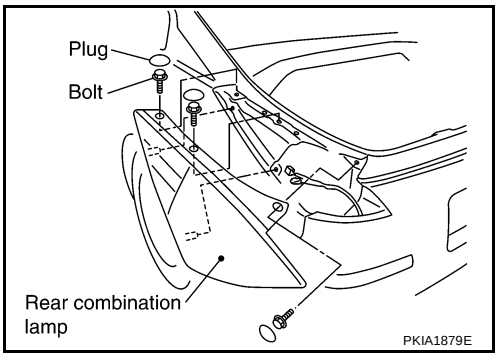
Removal and Installation

NKS004ZI

REMOVAL

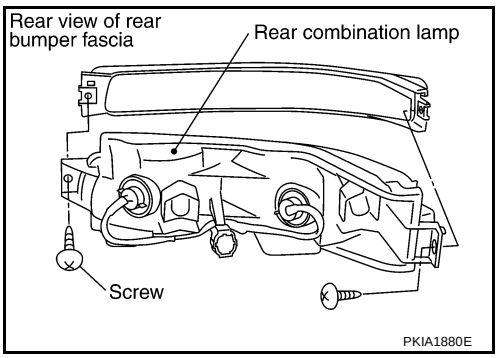
Rear Fender Side

1. Remove plugs and remove rear combination lamp mounting bolts.
2. Pull rear combination lamp toward side of the vehicle and remove from the vehicle.
3. Disconnect rear combination lamp connector.



Rear Bumper Side

1. Remove rear bumper fascia. Refer to EI-17, "REAR BUMPER" .
2. Disconnect rear combination lamp connector.
3. Remove rear combination lamp mounting screws.
4. Remove rear combination lamp from rear bumper fascia.



INSTALLATION

Installation is the reverse order of removal. Be careful of the following:

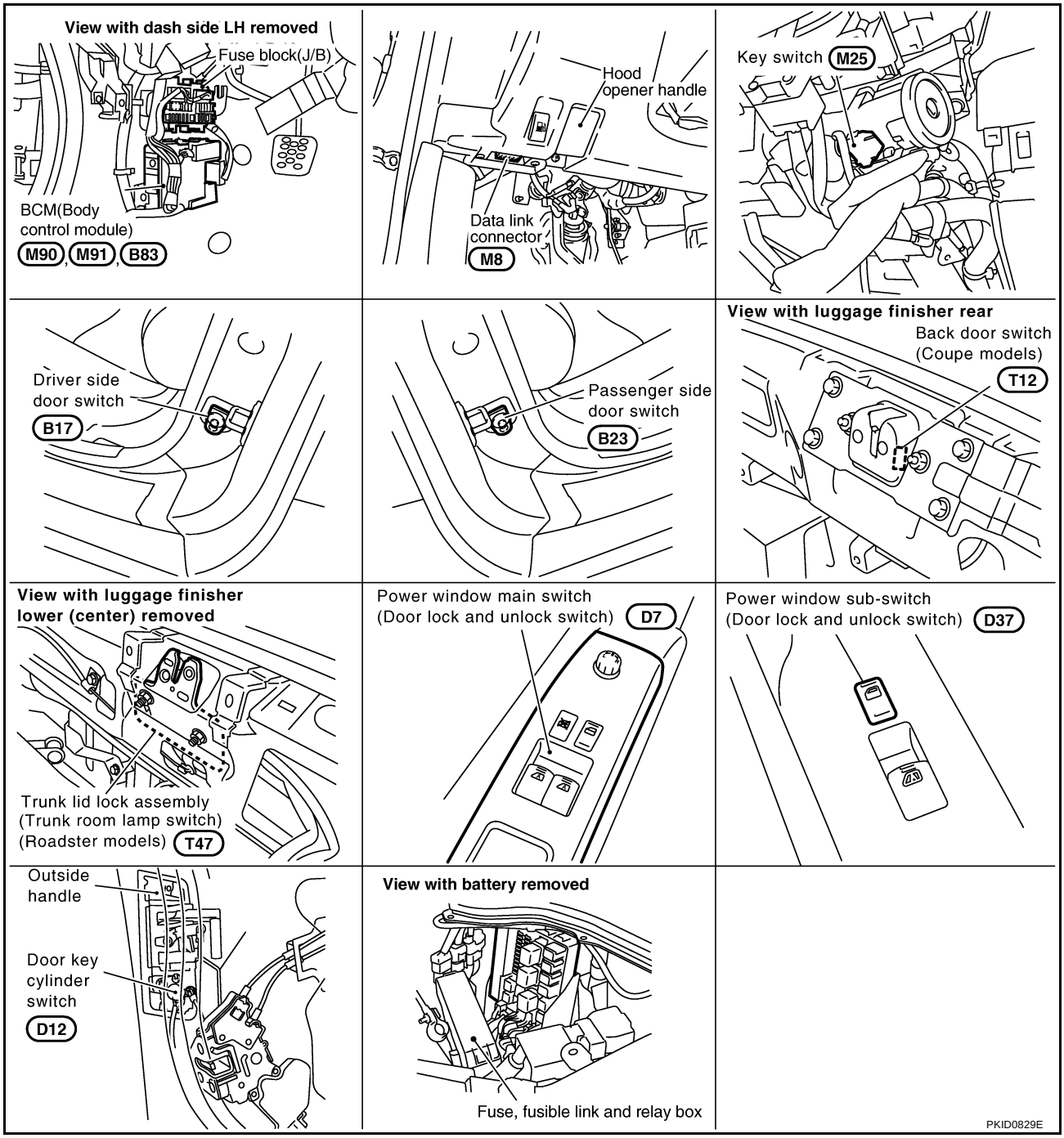
Rear combination lamp (Rear fender side) mounting bolt : 5.5 N·m (0.56 kg-m, 49 in-lb)

INTERIOR ROOM LAMP

PFP:26410

Component Parts and Harness Connector Location

NKS004ZJ



System Description

NKS004ZK

When the map lamp switch is in the DOOR position, map lamp ON/OFF is controlled by timer according to signals from switches including key switch, door switch driver side and assist side, unlock and lock signal from key fob, door lock and unlock switch, key cylinder lock and unlock switch, ignition switch.
When the map lamp turns ON, there is a gradual brightening over 1 second. When map lamp turns OFF, there is a gradual dimming over 1 second.
Map lamp timer is controlled by BCM (body control module).
Map lamp timer control settings can be changed with CONSULT-III.
Ignition key hole illumination turns ON at time when driver door is opened (door switch ON) or removed key fob from key cylinder. Illumination turns OFF when driver door is closed (door switch OFF).

POWER SUPPLY AND GROUND

Power is supplied at all times

- through 10A fuse [No.21, located in fuse block (J/B)]
- to key switch terminal 2,
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM terminal 42,
- through 40A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55.

When key is removed from ignition key cylinder, power is interrupted

- through key switch terminal 1
- to BCM terminal 37.

With ignition switch in ON or START position, power is supplied

- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM terminal 38.

When map lamp and vanity mirror lamp power is supplied at times

- through BCM terminal 41
- to ignition key hole illumination terminal1
- to map lamp terminal 3 (Coupe models)
- to map lamp terminal 2 (Roadster models)
- to luggage room lamp terminal 1 (Coupe models)
- to trunk room lamp terminal 1 (Roadster models) and
- to vanity mirror lamp LH and RH terminals 1.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66.

When driver side door is opened, ground is supplied

- through case ground of driver side door switch
- to BCM terminal 62.

When passenger side door is opened, ground is supplied

- through case ground of passenger side door switch
- to BCM terminal 12.

When back door is opened, ground is supplied (Coupe models)

- through grounds B5, B6, D105 and T14
- to back door switch terminal 3
- through back door switch terminal 1
- to BCM terminal 58.

When trunk lid is opened, ground is supplied (Roadster models)

- through grounds B5, B6 and T14
- to trunk lid lock assembly (trunk room lamp switch) terminal 1
- through trunk lid lock assembly (trunk room lamp switch) terminal 3
- to BCM terminal 57.

When the driver side door or passenger side door is unlocked by door lock and unlock switch, The BCM receives unlock signal with power window serial link

- through grounds M30 and M66
- to power window main switch (door lock and unlock switch) terminal 15 or power window sub switch (door lock and unlock switch) terminal 11
- through power window main switch (door lock and unlock switch) terminal 12 and power window sub switch (door lock and unlock switch) terminal 16
- to BCM terminal 22.

When the driver side door is unlocked by door key cylinder switch, The BCM receives information by communicating with power window main switch

- through grounds M30 and M66
- to door key cylinder switch terminal 2
- through door key cylinder switch terminal 1
- to power window main (door lock and unlock switch) switch terminal 7
- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

When a signal, or combination of signals is received by BCM, ground is supplied

- through BCM terminal 48
- to map lamp terminal 2 (Coupe models)
- to map lamp terminal 3 (Roadster models).

With power and ground are supplied, map lamp illuminates.

SWITCH OPERATION

When map lamp switch is ON, ground is supplied

- to map lamp terminal 1 (Coupe models)
- to map lamp terminal 1 (Roadster models)
- through grounds M30 and M66.

And power is supplied

- through BCM terminal 41
- to ignition key hole illumination terminal 1
- to map lamp terminal 3 (Coupe models)
- to map lamp terminal 2 (Roadster models).

When vanity mirror lamp LH and RH is ON, ground is supplied

- to vanity mirror lamp LH and RH terminals 2
- through grounds M30 and M66.

And power is supplied

- through BCM terminal 41
- to vanity mirror lamp terminal 1.

MAP LAMP TIMER OPERATION

When the map lamp switch is in the DOOR position, and when all conditions below are met, BCM performs timer control (maximum 30 seconds) for map lamp ON/OFF.
In addition, when map lamp turns ON or OFF there is gradual brightening or dimming over 1 second.
Power is supplied at all times

- to 10A fuse [No. 21 located in fuse block (J/B)]
- through key switch terminal 2.

When all doors are closed (all door switches OFF) and key is removed from key cylinder (key switch OFF), power will not be supplied to BCM terminal 37.
Ground is supplied

- through BCM terminal 22
- to power window main switch (door lock and unlock switch) terminal 12.

At this time, BCM detects that driver door is unlocked. It determines that map lamp timer operation conditions are met, and turns map lamp ON for 30 seconds.
When all doors are closed (all door switches OFF) and key is in key cylinder (key switch ON),
Power is supplied

- through key switch terminal 1
- to BCM terminal 37.

When the key is removed from key switch (key switch OFF), power supply to BCM terminal 37 is terminated. BCM detects that key has been removed. It determines that map lamp timer conditions are met, and turns map lamp ON for 30 seconds.

When driver door opens → closes, and key is not inserted in key switch (key switch OFF), BCM terminal 62 changes between 0V (door open) → 5V (door closed). BCM determines that conditions for spot lamp operation are met and turns interior lamp ON for 30 seconds.
Timer control is canceled under the following conditions.

- Driver door is locked (When locked key fob or power window main switch (door lock and unlock switch, door key cylinder switch).
- Driver door is opened (driver door switch turns ON).
- Ignition switch ON.

INTERIOR LAMP BATTERY SAVER CONTROL

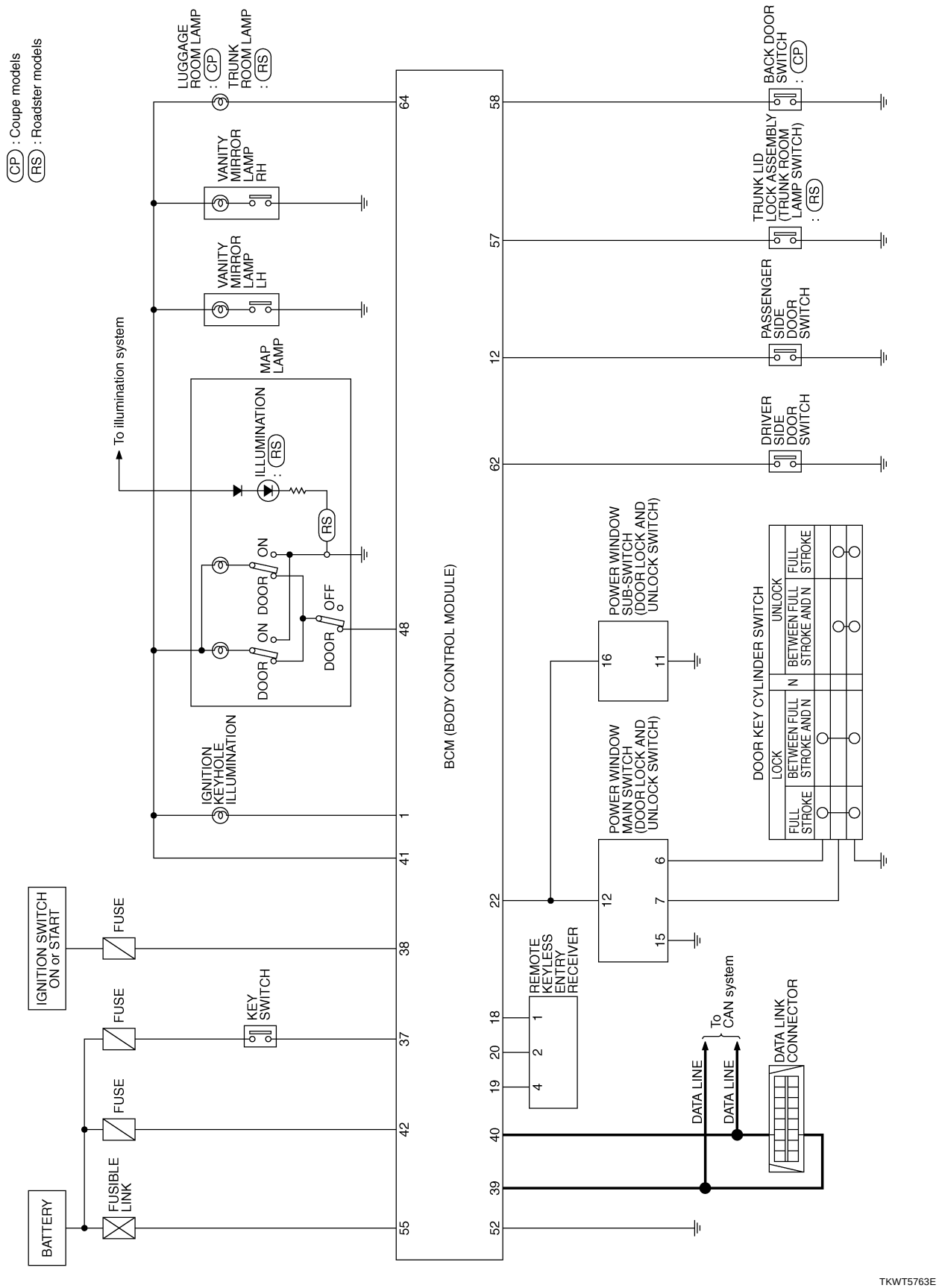
If the room lamp remains illuminated by door switch open signal, or if room lamp switch is in the ON position for more than 30 minutes after the ignition switch is turned to the OFF position, BCM will automatically turn off map lamp, luggage room lamp (Coupe models), trunk room lamp (Roadster models) and vanity mirror lamp.
After lamps turn OFF by battery saver system, the lamps illuminate again when

- signal from key fob, door lock and unlock switch, or key cylinder is locked or unlocked,
- door is opened or closed,
- key is removed from ignition key cylinder or inserted in ignition key cylinder.

Interior lamp battery saver control period can be changed by the function setting of CONSULT-III.

Schematic

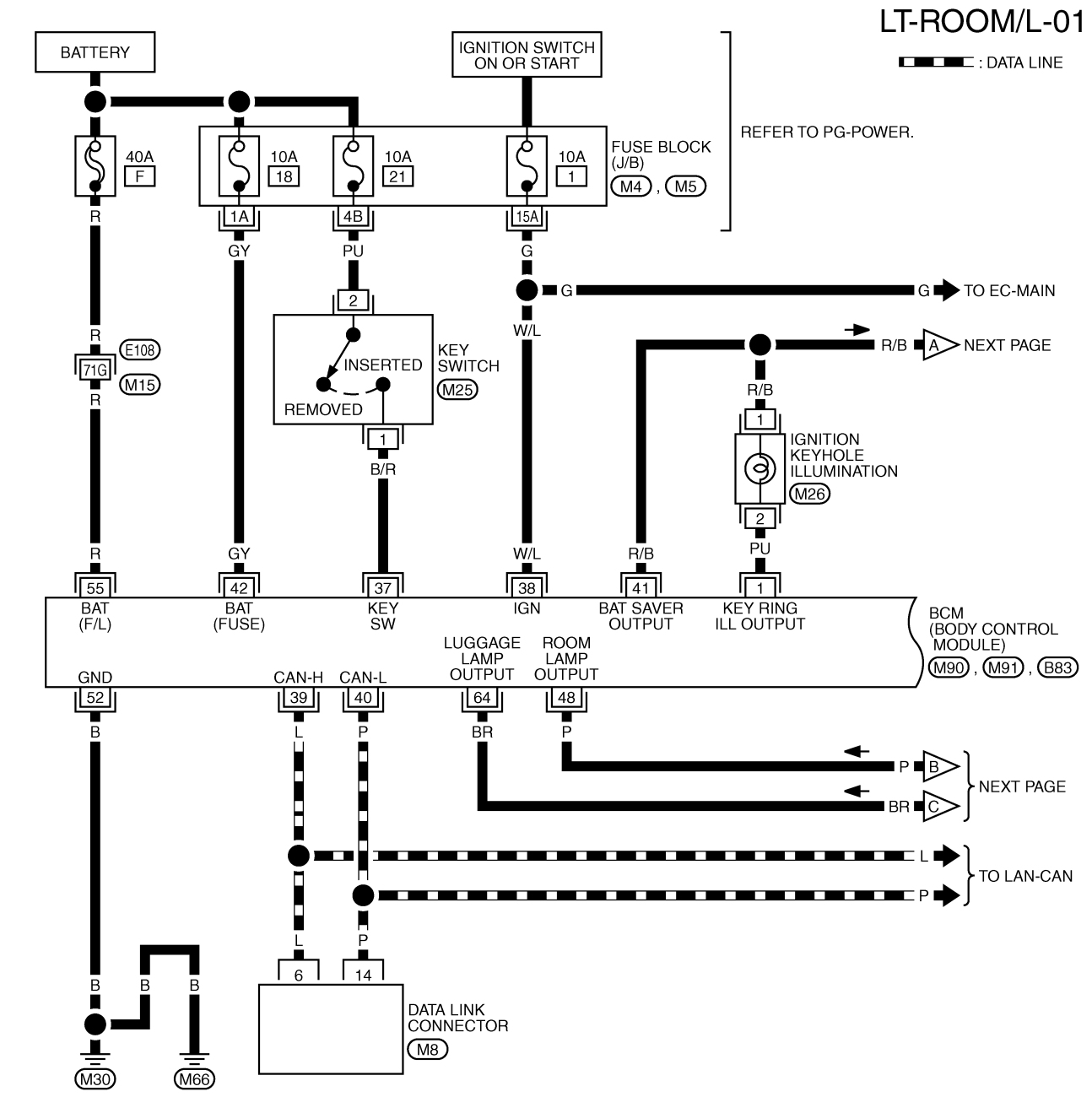
NKS004ZL

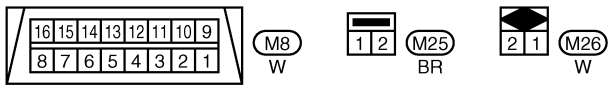


Wiring Diagram — ROOM/L —

NKS004ZM

COUPE MODELS

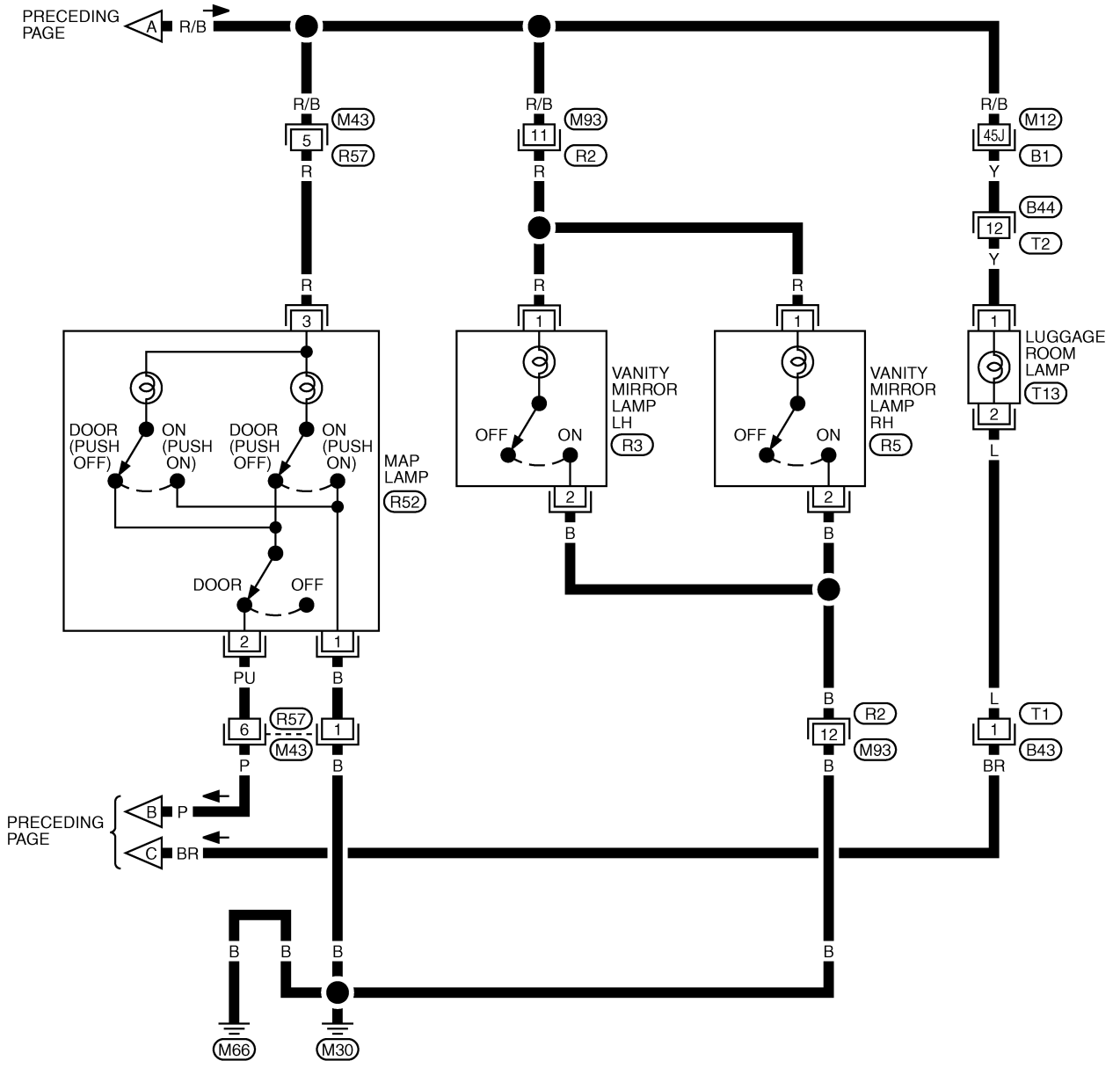


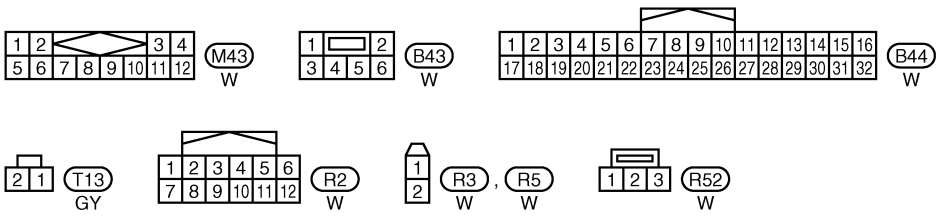


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TKWT5764E

LT-ROOM/L-02



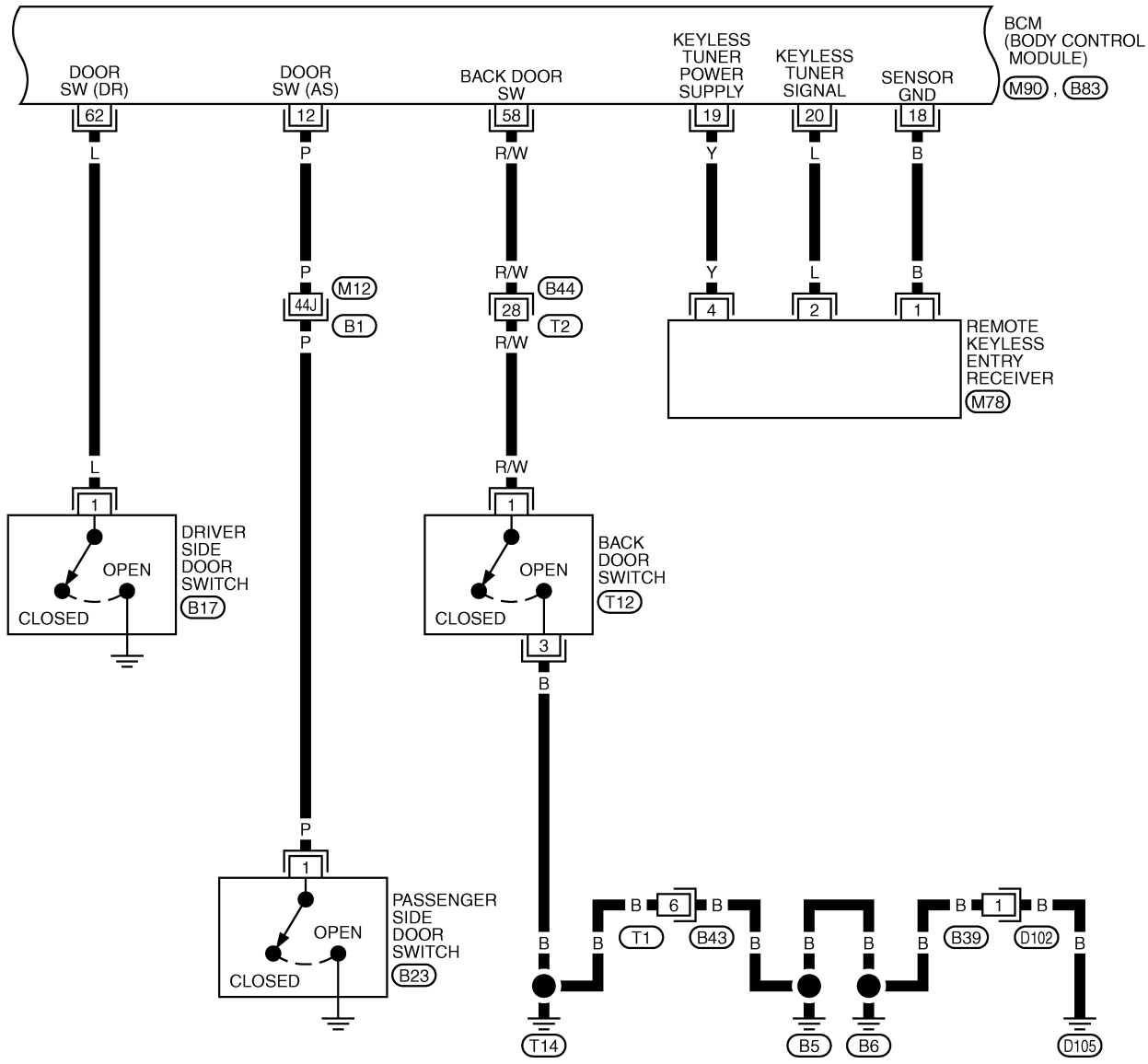


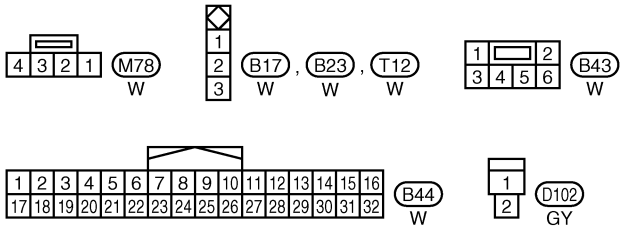
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5589E

LT-ROOM/L-03

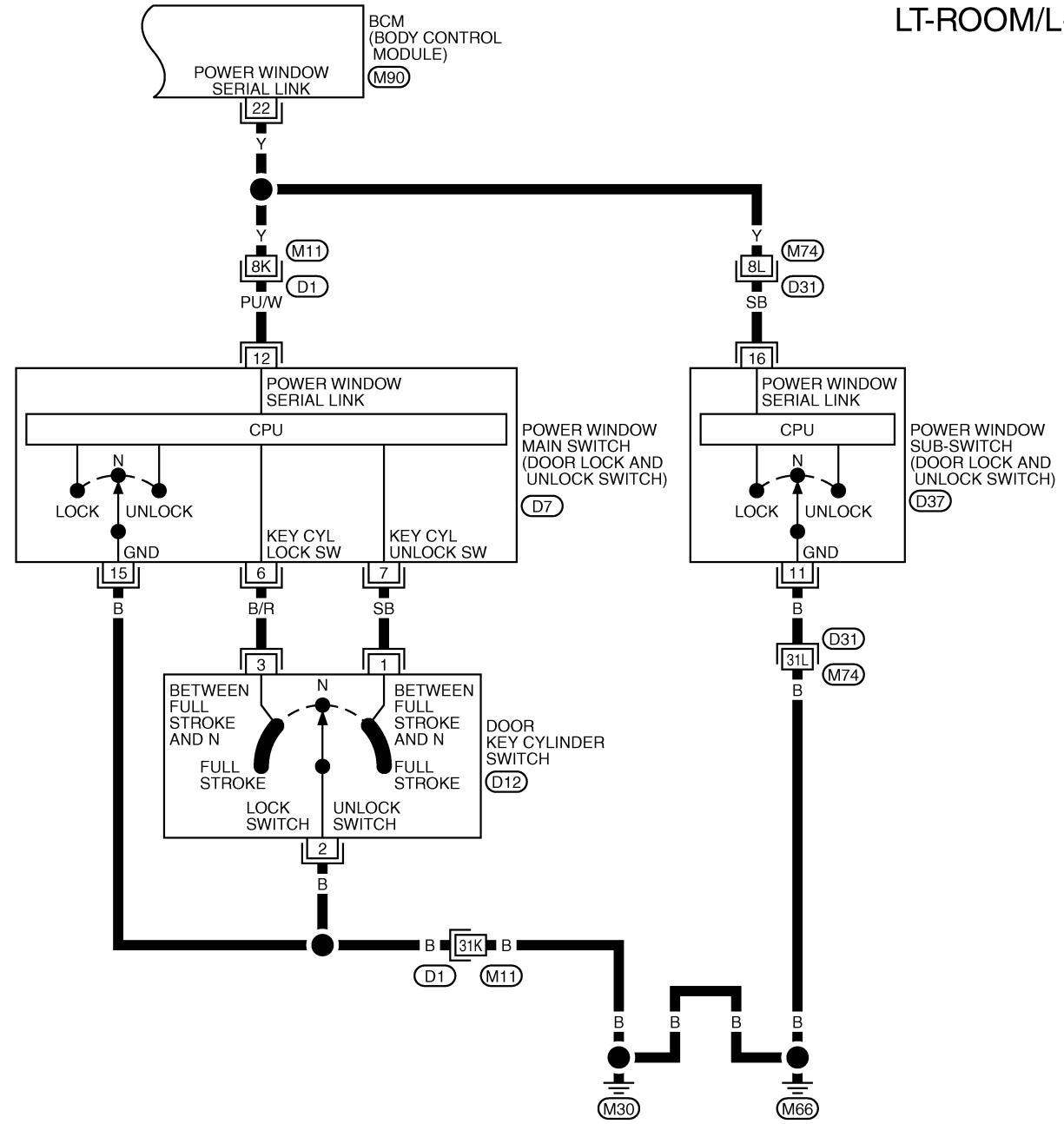


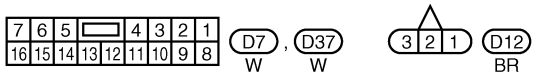


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

TKWT4052E

LT-ROOM/L-04





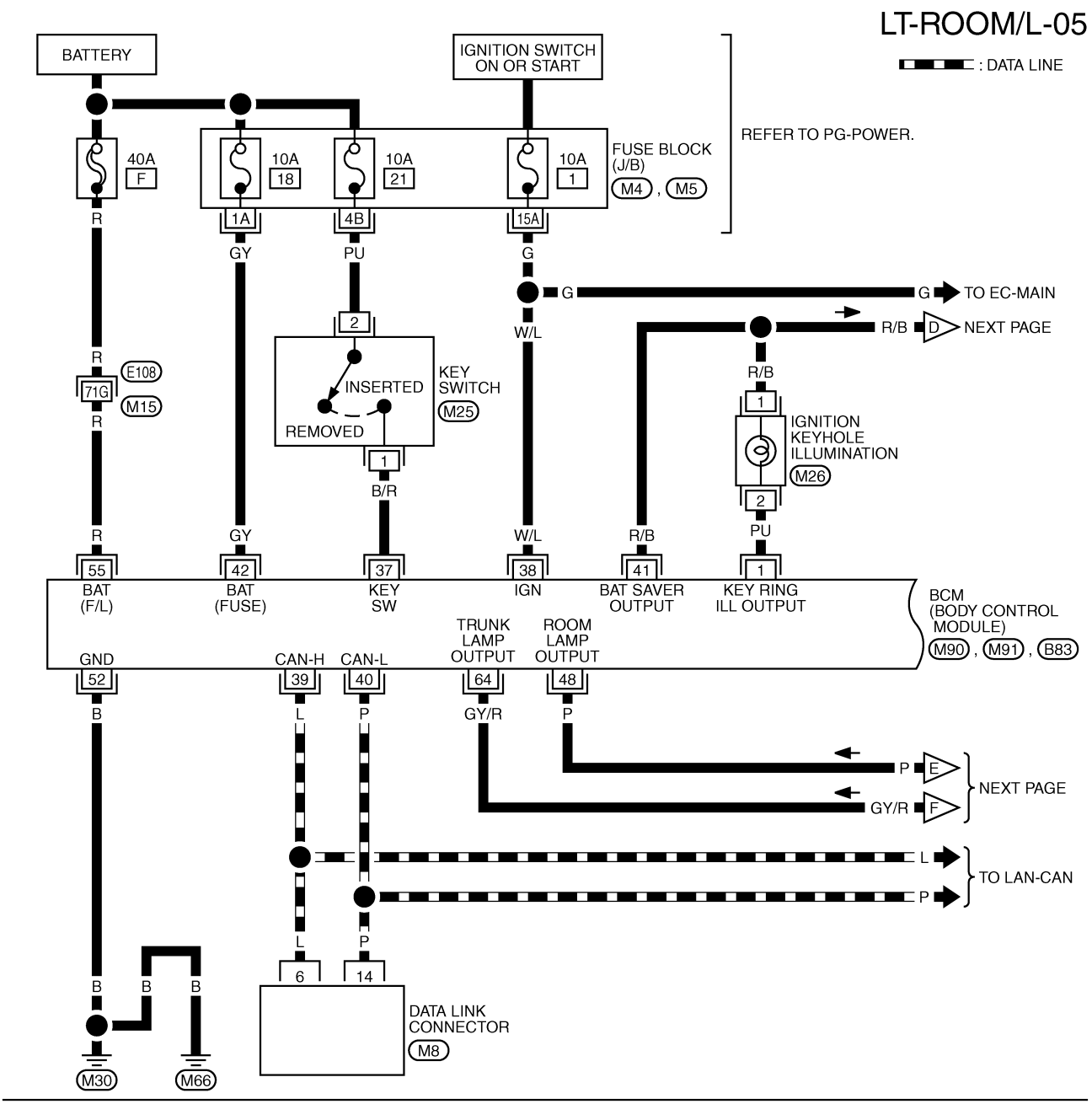
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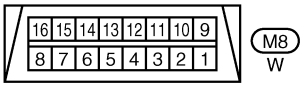
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

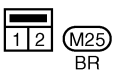
M90 -ELECTRICAL UNITS

TKWT4053E

ROADSTER MODELS





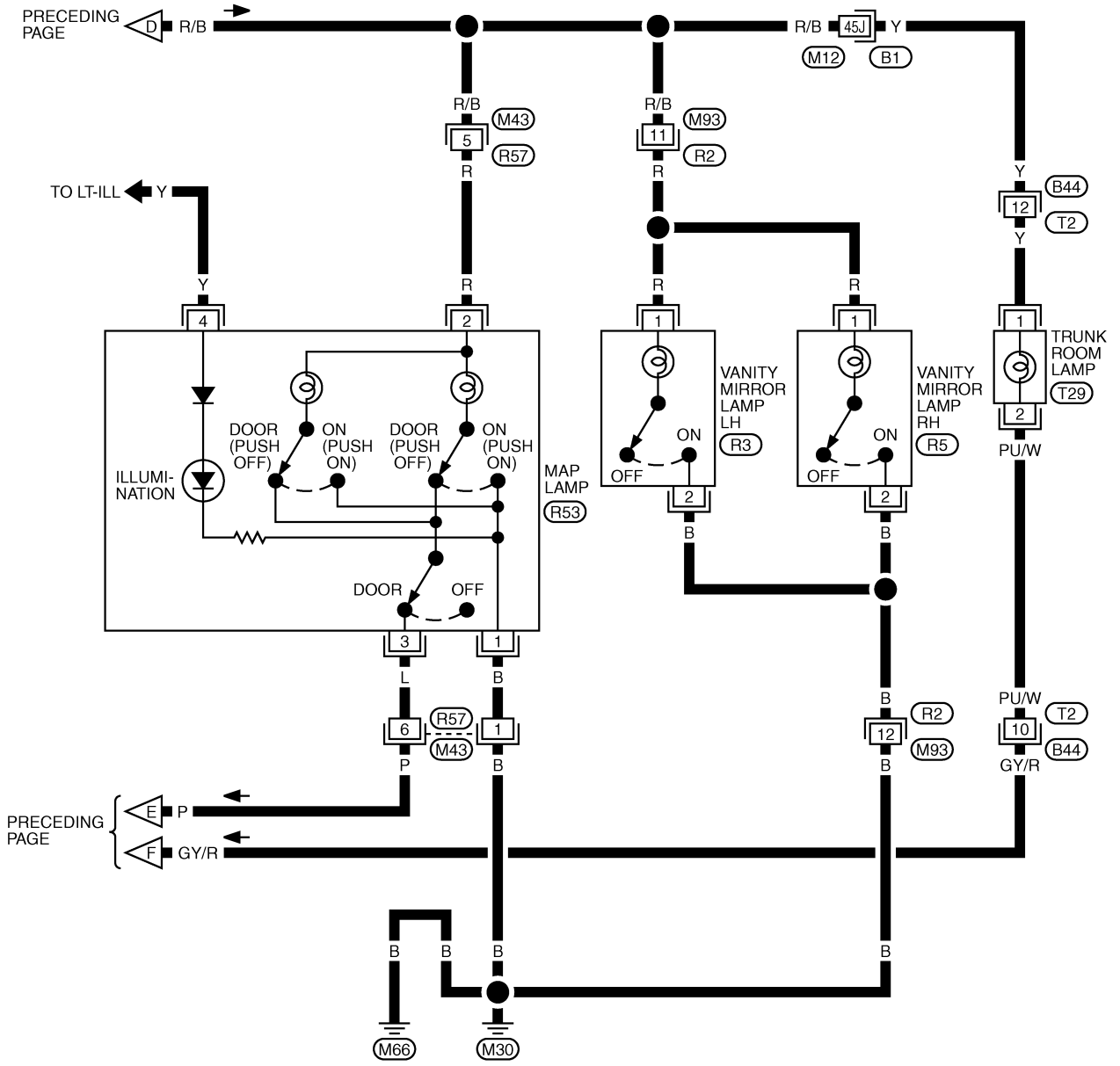




REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

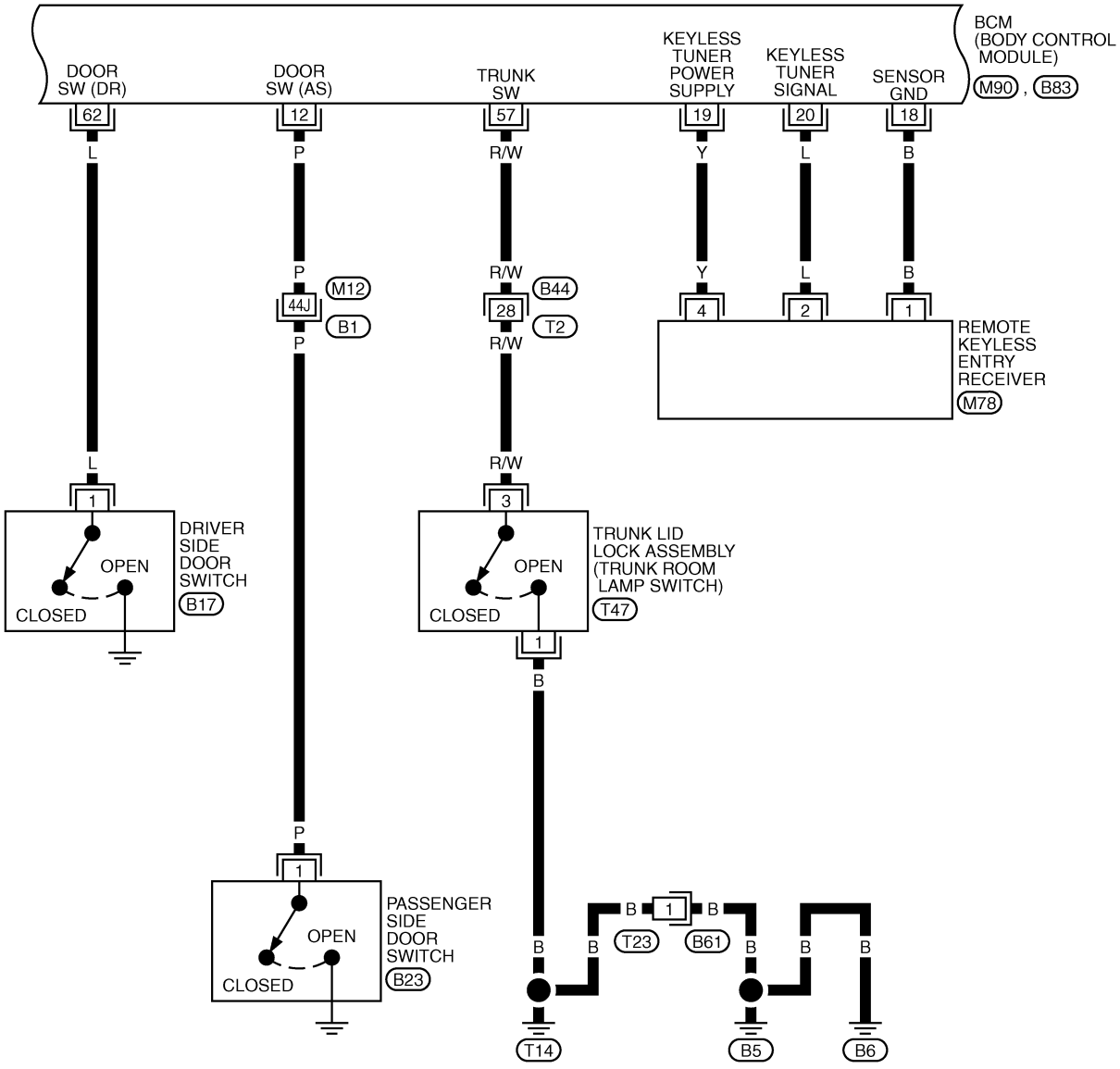
TKWT5765E

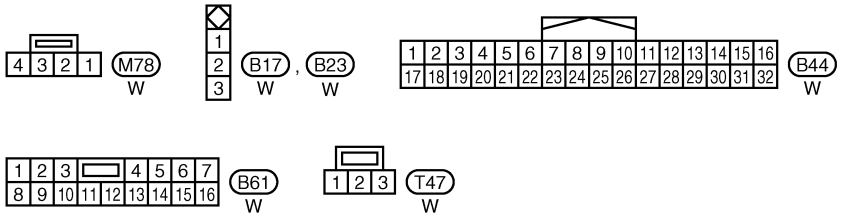
LT-ROOM/L-06



TKWT5766E

LT-ROOM/L-07

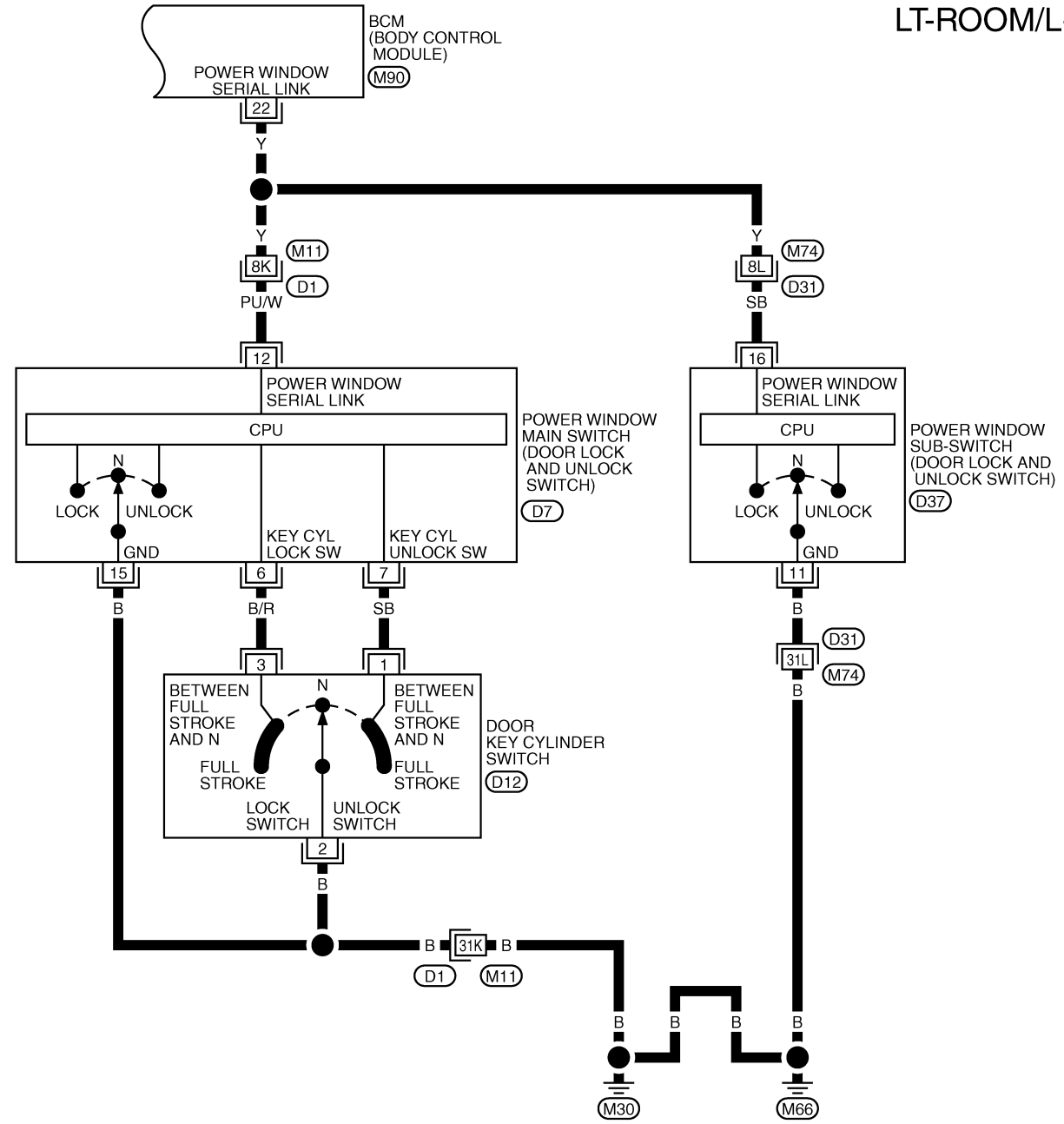


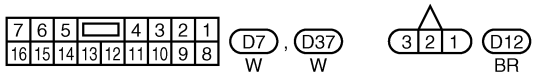


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

TKWT5592E

LT-ROOM/L-08





REFER TO THE FOLLOWING.

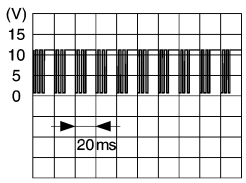
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M90 -ELECTRICAL UNITS

TKWT4057E

Terminals and Reference Values for BCM

NKS004ZN

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
1	PU	Ignition keyhole illumination signal	OFF	Door is locked. (SW OFF)		Battery voltage
				Door is unlocked. (SW ON)		Approx. 0 V
12	P	Front door switch AS signal	OFF	Front door switch AS	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage
22	Y	Power window switch serial link	ON	—		 PKIA7023E
37	B/R	Key-in detection switch signal	OFF	Vehicle key is removed.		Approx. 0 V
				Vehicle key is inserted.		Battery voltage
38	W/L	Ignition power supply	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
41	R/B	Battery saver output signal	OFF	30 minutes after ignition switch is turned to OFF.		Approx. 0 V
			ON	—		Battery voltage
42	GY	Battery power supply	OFF	—		Battery voltage
48	P	Map lamp output signal	OFF	Map lamp door switch: DOOR position	Any door switch: ON (open)	Approx. 0 V
					Any door switch: OFF (closed)	Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	R	Battery power supply	OFF	—		Battery voltage
57*1	R/W	Trunk room lamp switch signal	OFF	Trunk room lamp switch	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage
58*2	R/W	Back door switch signal	OFF	Luggage room lamp switch	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage
62	L	Front door switch DR signal	OFF	Front door switch DR	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage
64	GY/R*1 BR*2	Trunk room lamp*1 or luggage lamp*2 switch signal	OFF	Trunk room lamp*1 or back door*2 switch	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage

*1: Roadster models, *2: Coupe models

How to Proceed with Trouble Diagnosis

NKS004ZO

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-128, "System Description" .
3. Perform preliminary check. Refer to LT-142, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does interior room lamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004ZP

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
		21
	Ignition switch ON or START position	1

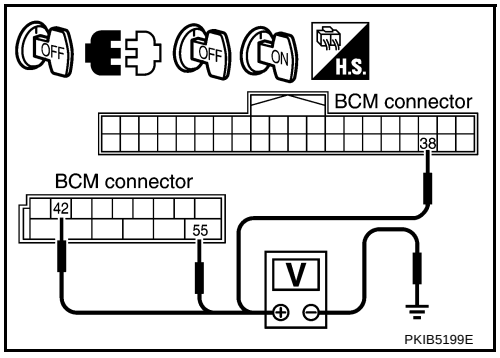
Refer to LT-133, "Wiring Diagram — ROOM/L —" .

OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M90	38	Ground	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

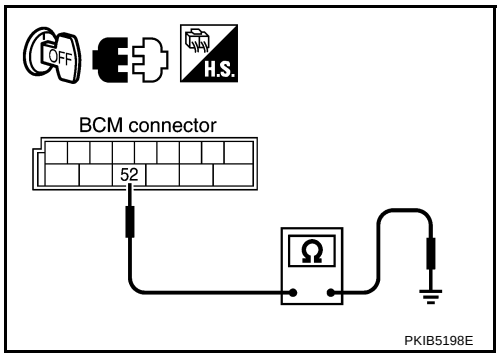
3. CHECK GROUND CIRCUIT

Check continuity between BCM and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.



CONSULT-III Function (BCM)

NKS004ZQ

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
INT LAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

WORK SUPPORT
Display Item List

Item	Description	CONSULT-III
SET I/L D–UNLCK INTCON	The 30 seconds glowing function interior room lamps and ignition keyhole illumination can be selected when driver door is released (unlocked).	ON/OFF
ROOM LAMP ON TIME SET	The time in order to escalate illumination can be adjusted when interior room lamps and ignition keyhole illumination is turned on.	MODE 1 – 7
ROOM LAMP OFF TIME SET	The time in order to diminish illumination can be adjusted when interior room lamps and ignition keyhole illumination is turned off.	MODE 1 – 7

Reference between “MODE” and “TIME” for “TURN ON/OFF”

MODE	1	2	3	4	5	6	7
Time (sec.)	0.5	1	2	3	4	5	0

DATA MONITOR
Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from ignition switch signal.
KEY ON SW	“ON/OFF”	Displays “Key inserted (ON)/key removed (OFF)” status judged from key switch signal.
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays “Door open (ON)/Door closed (OFF)” status, determined from passenger door switch signal.
DOOR SW - RR NOTE	“OFF”	—
DOOR SW - RL NOTE	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
KEY CYL LK - SW	“ON/OFF”	Displays “Door locked (ON) status, determined from key cylinder lock switch in driver door.
KEY CYL UN - SW	“ON/OFF”	Displays “Door unlocked (OFF) status, determined from key cylinder lock switch in driver door.
CDL LOCK SW	“ON/OFF”	Displays “Door locked (ON)/Door unlocked (OFF) status, determined from locking detection switch in driver door.
CDL UNLOCK SW	“ON/OFF”	Displays “Door unlocked (OFF)” status, determined from locking detection switch in passenger door.
KEYLESS LOCK	“ON/OFF”	Displays “Locked (ON)/Other (OFF)” status, determined from lock signal.
KEYLESS UNLOCK	“ON/OFF”	Displays “Unlocked (ON)/Other (OFF)” status, determined from unlock signal.

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
INT LAMP	Map lamp can be operated by any ON–OFF operations.
IGN ILLUM NOTE	—
STEM LAMP TEST NOTE	—
LUGGAGE LAMP TEST	● Luggage room lamp can be operated by any ON–OFF operations. (Coupe models) ● Trunk room lamp can be operated by any ON–OFF operations. (Roadster models)

NOTE:
This item is displayed, but cannot be tested.

Map Lamp Control Does Not Operate (Coupe models)

NKS004ZR

1. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "INT LAMP" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

OK or NG

OK >> GO TO 2.
NG >> Inspect malfunctioning switch system.

2. CHECK BETWEEN BCM AND MAP LAMP

1. Select "INT LAMP" of BCM active test item.
2. With operating the test item, check the map lamp operation (When map lamp switch is in DOOR position).

Map lamp should operate.

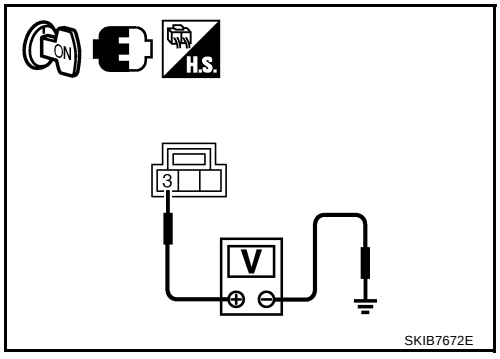
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 3.

3. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between map lamp harness connector and ground.

Terminal			Voltage (Approx.)
(+)		(-)	
Map lamp connector	Terminal		
R52	3	Ground	Battery voltage

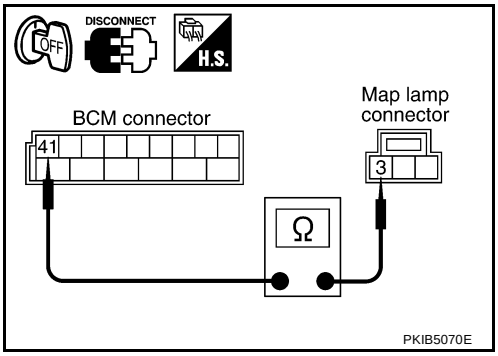


OK or NG

OK >> GO TO 6.
NG >> GO TO 4.

4. CHECK MAP LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and map lamp connector.
3. Check continuity between BCM harness connector and map lamp harness connector.



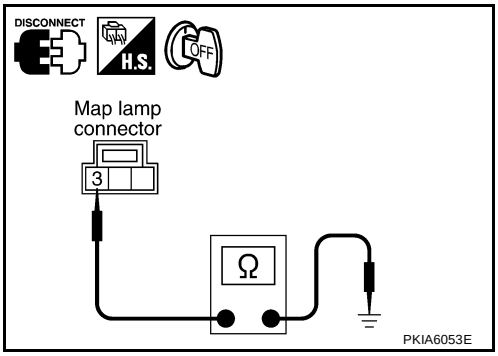
Terminals				Continuity
BCM		Map lamp		
Connector	Terminal	Connector	Terminal	
M91	41	R52	3	Yes

OK or NO

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK SHORT CIRCUIT

Check continuity between map lamp harness connector and ground.



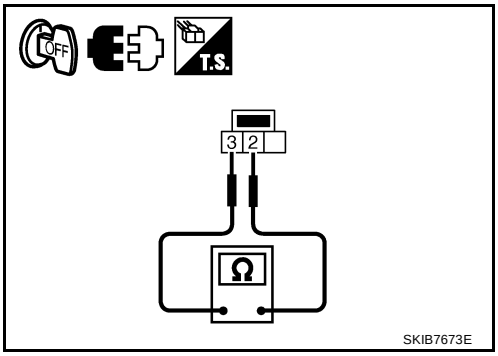
Map lamp connector	Terminal	Ground	Continuity
R52	3		No

OK or NG

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

6. CHECK MAP LAMP

1. Turn ignition switch OFF.
2. Disconnect map lamp connector.
3. Check continuity between map lamp.



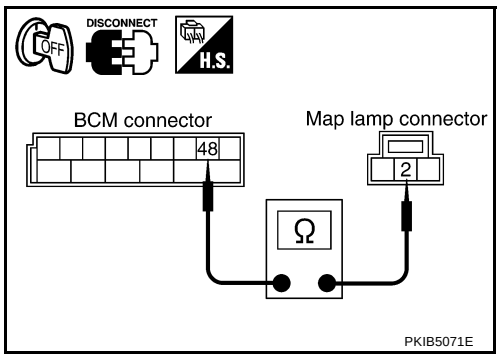
Terminal		Condition	Continuity
Map lamp			
3	2	Map lamp switch is DOOR.	Yes
		Map lamp switch is OFF.	No

OK or NG

OK >> GO TO 7.
NG >> Replace map lamp.

7. CHECK MAP LAMP CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector and map lamp harness connector.



Terminals				Continuity
BCM		Map lamp		
Connector	Terminal	Connector	Terminal	
M91	48	R52	2	Yes

OK or NO

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Map Lamp Control Does Not Operate (Roadster models)

NKS004ZS

1. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "INT LAMP" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

OK or NG

OK >> GO TO 2.

NG >> Inspect malfunctioning switch system.

2. CHECK BETWEEN BCM AND MAP LAMP

1. Select "INT LAMP" of BCM active test item.
2. With operating the test item, check the map lamp operation (When map lamp switch is in DOOR position).

Map lamp should operate.

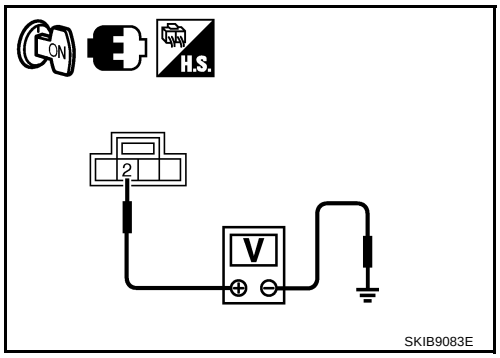
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 3.

3. CHECK BETWEEN BCM AND MAP LAMP

1. Turn ignition switch ON.
2. Check voltage between map lamp harness connector and ground.



Terminal			Voltage (Approx.)
(+)		(-)	
Map lamp connector	Terminal		
R53	2	Ground	Battery voltage

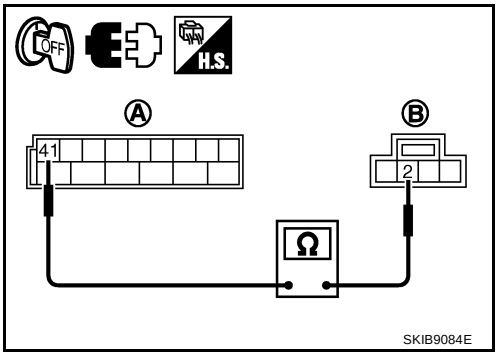
OK or NG

OK >> GO TO 6.

NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and map lamp connector.
3. Check continuity between BCM harness connector (A) and map lamp harness connector (B).



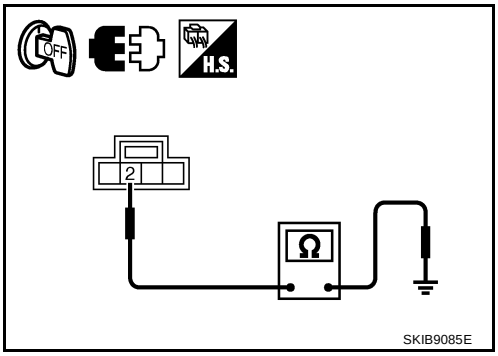
Terminals				Continuity
A		B		
Connector	Terminal	Connector	Terminal	
M91	41	R53	2	Yes

OK or NO

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK SHORT CIRCUIT

Check continuity between map lamp harness connector and ground.



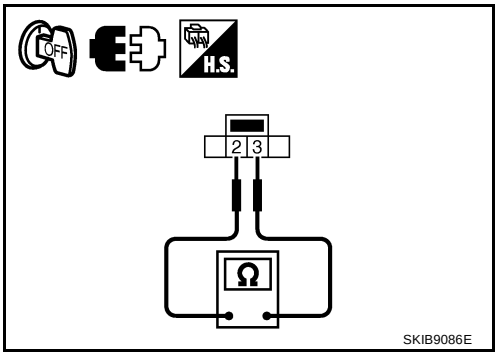
Map lamp connector	Terminal	Ground	Continuity
R53	2		No

OK or NG

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

6. CHECK MAP LAMP

1. Turn ignition switch OFF.
2. Disconnect map lamp connector.
3. Check continuity between map lamp.



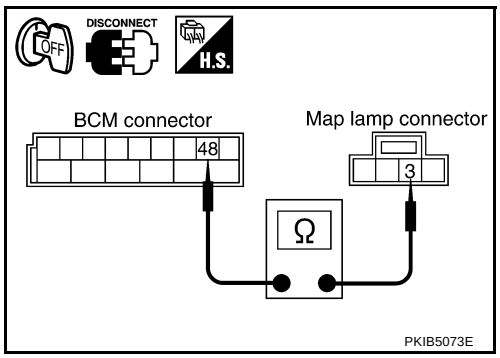
Terminal		Condition	Continuity
Map lamp			
3	2	Map lamp switch is DOOR.	Yes
		Map lamp switch is OFF.	No

OK or NG

OK >> GO TO 7.
NG >> Replace map lamp.

7. CHECK MAP LAMP CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector and map lamp harness connector.



Terminals				Continuity
BCM		Map lamp		
Connector	Terminal	Connector	Terminal	
M91	48	R53	3	Yes

OK or NO

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Ignition Key Hole Illumination Does Not Illuminate

NKS004ZT

1. CHECK BULB

Check bulb of lamp which does not operate.

OK or NG

OK >> GO TO 2.

NG >> Replace bulb.

2. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "INT LAMP" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

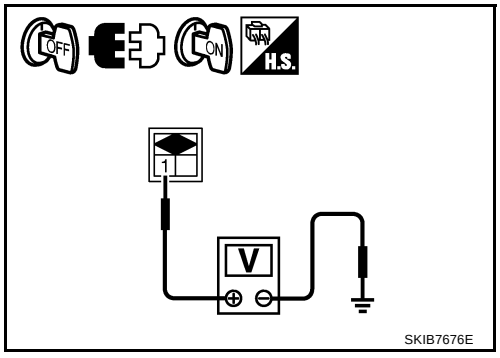
OK or NG

OK >> GO TO 3.

NG >> Inspect malfunctioning switch system.

3. CHECK POWER SUPPLY TO IGNITION KEY HOLE ILLUMINATION

1. Turn ignition switch OFF.
2. Disconnect ignition key hole illumination connector.
3. Turn ignition switch ON.
4. Check voltage between ignition key hole illumination harness connector and ground.



Terminal			Voltage (Approx.)
(+)		(-)	
Ignition key hole illumination connector	Terminal		
M26	1	Ground	Battery voltage

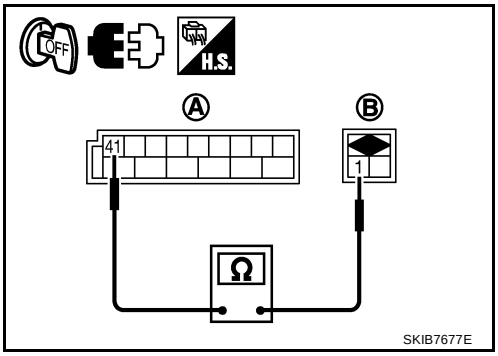
OK or NG

OK >> GO TO 5.

NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT FOR IGNITION KEY HOLE ILLUMINATION

1. Turn ignition switch OFF.
2. Disconnect BCM connector and key hole illumination connector.
3. Check continuity between BCM harness connector (A) and ignition key hole illumination harness connector (B).



Terminals				Continuity
A		B		
Connector	Terminal	Connector	Terminal	
M91	41	M26	1	Yes

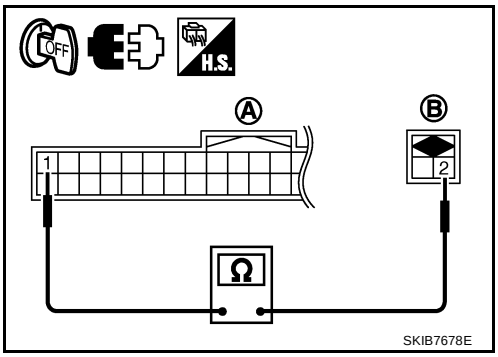
OK or NG

OK >> Replace BCM if ignition key hole illumination does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

5. CHECK GROUND CIRCUIT FOR IGNITION KEY HOLE ILLUMINATION

1. Turn ignition switch OFF.
2. Disconnect BCM connector and key hole illumination connector.
3. Check continuity between BCM harness connector (A) and ignition key hole illumination harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M90	1	M26	2	Yes

OK or NG

OK >> Replace BCM if ignition key hole illumination does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Luggage Room Lamp Does Not Illuminate (Coupe Models)

NKS004ZU

1. CHECK BULB

Inspect bulb of luggage room lamp.

OK or NG

OK >> GO TO 2.

NG >> Replace bulb of luggage room lamp.

2. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "LUGGAGE LAMP TEST" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

OK or NG

OK >> GO TO 3.

NG >> Inspect malfunctioning switch system.

3. CHECK BETWEEN BCM AND LUGGAGE ROOM LAMP

1. Select "LUGGAGE LAMP TEST" of BCM active test item.
2. With operating the test item, check the luggage room lamp operation.

Luggage room lamp should operate.

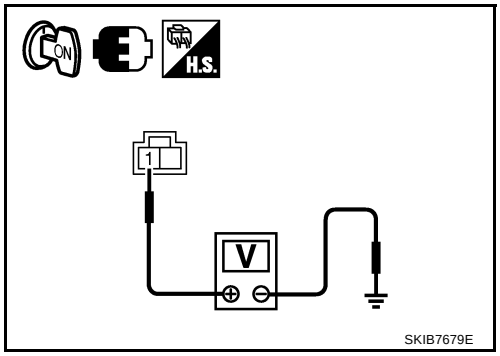
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between luggage room lamp harness connector and ground.

Terminal			Voltage (Approx.)
(+)		(-)	
Luggage room lamp connector	Terminal		
T13	1	Ground	Battery voltage



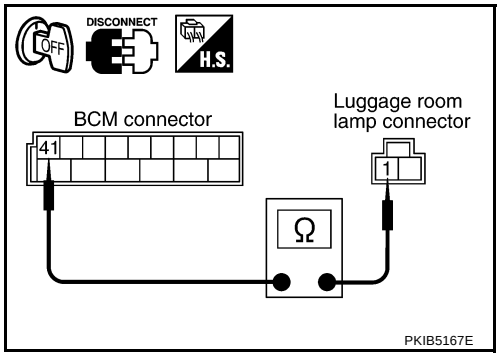
OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. CHECK LUGGAGE ROOM LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and luggage room lamp connector.
3. Check continuity between BCM harness connector and luggage room lamp harness connector.

Terminals				Continuity
BCM		Luggage room lamp		
Connector	Terminal	Connector	Terminal	
M91	41	T13	1	Yes



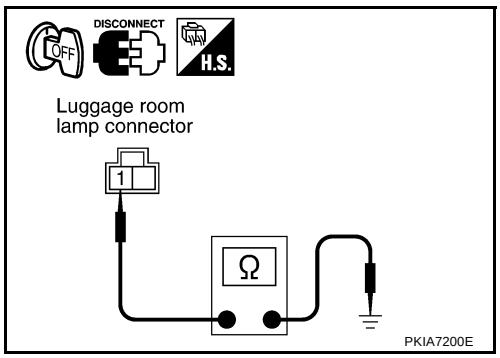
OK or NO

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK SHORT CIRCUIT

Check continuity between luggage room lamp harness connector and ground.

Luggage room lamp connector	Terminal	Ground	Continuity
T13	1		No

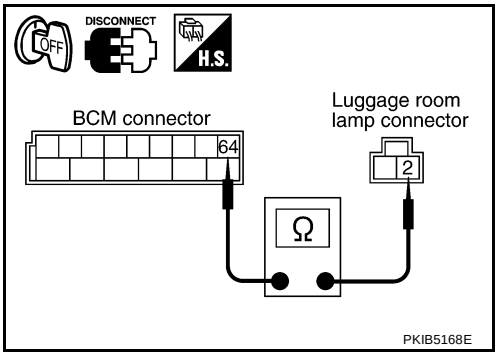


OK or NG

OK >> Replace BCM if luggage room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

7. CHECK LUGGAGE ROOM LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM harness connector and luggage room lamp harness connector.



Terminals				Continuity
BCM		Luggage room lamp		
Connector	Terminal	Connector	Terminal	
B83	64	T13	2	Yes

OK or NO

OK >> Replace BCM if luggage room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Trunk Room Lamp Does Not Illuminate (Roadster Models)

NKS004ZV

1. CHECK BULB

Inspect bulb of trunk room lamp.

OK or NG

OK >> GO TO 2.

NG >> Replace map lamp.

2. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "LUGGAGE LAMP TEST" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

OK or NG

OK >> GO TO 3.

NG >> Inspect malfunctioning switch system.

3. CHECK BETWEEN BCM AND TRUNK ROOM LAMP

1. Select “BCM” on CONSULT-III. Select “LUGGAGE LAMP TEST” active test.
2. With operating the test item, check the trunk room lamp operation.

Trunk room lamp should operate.

OK or NG

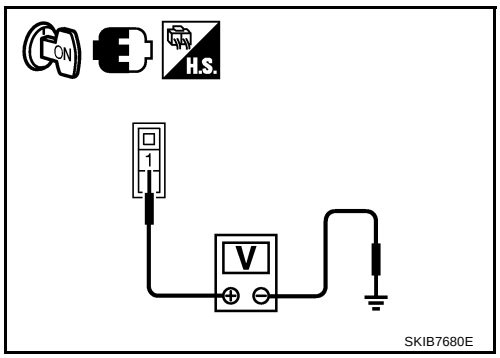
OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between trunk room lamp harness connector and ground.

Terminal			Voltage (Approx.)
(+)		(-)	
Trunk room lamp connector	Terminal		
T29	1	Ground	Battery voltage



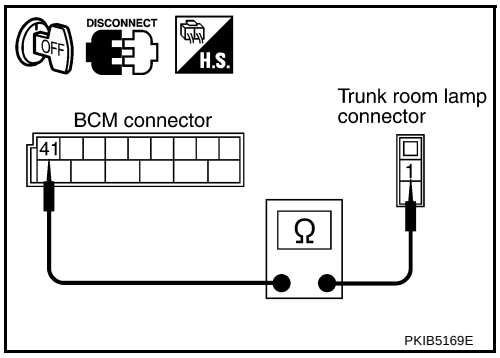
OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. CHECK TRUNK ROOM LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and trunk room lamp connector.
3. Check continuity between BCM harness connector and trunk room lamp harness connector.

Terminals				Continuity
BCM		Trunk room lamp		
Connector	Terminal	Connector	Terminal	
M91	41	T29	1	Yes



OK or NO

OK >> GO TO 6.
NG >> Repair harness or connector.

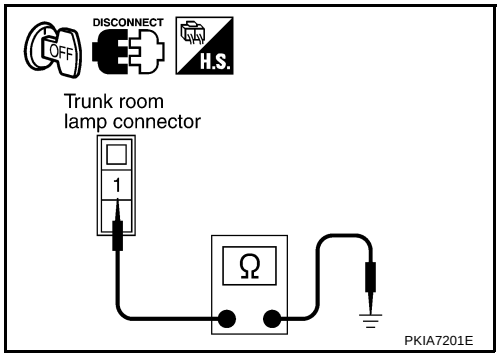
6. CHECK SHORT CIRCUIT

Check continuity between trunk room lamp harness connector and ground.

Trunk room lamp connector	Terminal	Ground	Continuity
T29	1		No

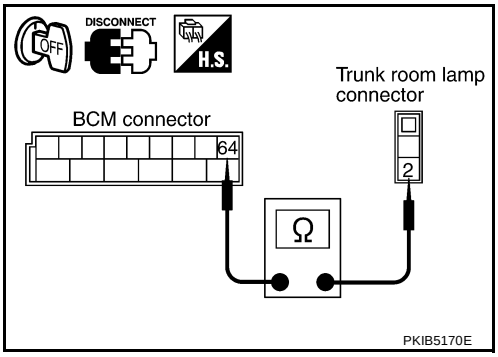
OK or NG

OK >> Replace BCM if trunk room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.



7. CHECK TRUNK ROOM LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM harness connector and trunk room lamp harness connector.



Terminals				Continuity
BCM		Trunk room lamp		
Connector	Terminal	Connector	Terminal	
B83	64	T29	2	Yes

OK or NO

OK >> Replace BCM if trunk room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Bulb Replacement

NKS004ZW

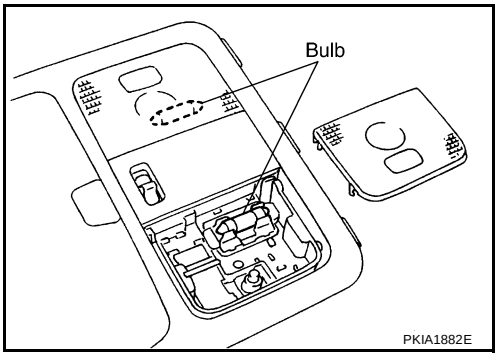
MAP LAMP

Coupe Models

1. Open driver and passenger window, and then disconnect battery cable from the negative terminal.

   CAUTION:
   After battery cables are disconnected, never open/close driver and/or passenger door with the window in the full up position. Automatic window adjusting function will not work and side roof panel may be damaged.
2. Remove lens using clip driver or suitable tool.
3. Remove bulb.

   Map lamp : 12V - 8W
4. Installation is the reverse order of removal.

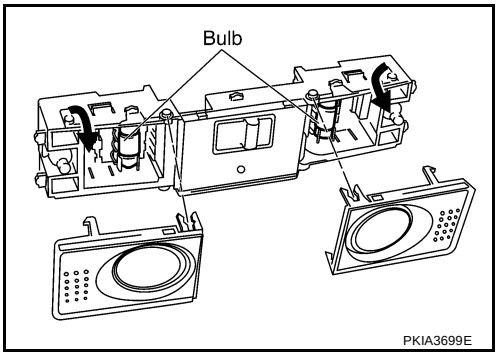


Roadster Models

1. Open driver and passenger window, and then disconnect battery cable from the negative terminal.

   CAUTION:
   After battery cables are disconnected, never open/close driver and/or passenger door with the window in the full up position. Automatic window adjusting function will not work and side roof panel may be damaged.
2. Remove lens using clip driver or suitable tool.
3. Remove bulb.

   Map lamp : 12V - 8W
4. Installation is the reverse order of removal.

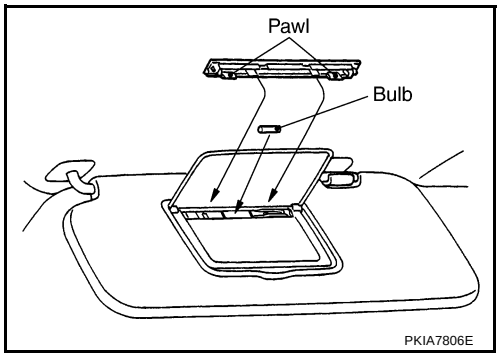


VANITY MIRROR LAMP

1. Insert a thin screwdriver in the lens end and remove lens.
2. Remove bulb.

Vanity mirror lamp : 12V - 1.32W

3. Installation is the reverse order of removal.



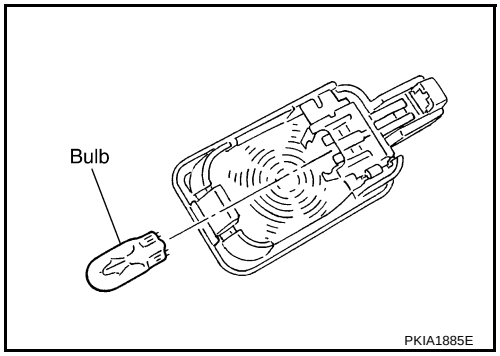
LUGGAGE ROOM LAMP & TRUNK ROOM LAMP

Luggage Room Lamp (Coupe Models)

1. Remove luggage room lamp. Refer to LT-155, "Removal and Installation" .
2. Remove bulb.

Luggage room lamp : 12V - 5W

3. Installation is the reverse order of removal.

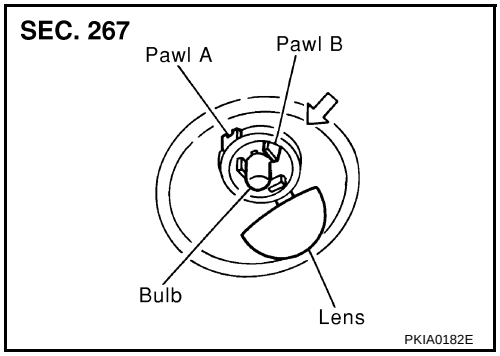


Trunk Room Lamp (Roadster Models)

1. Unfold pawl A and remove lens.
2. Remove trunk room lamp while pressing pawl B in the direction of the arrow.
3. Disconnect trunk room lamp connector.

Trunk room lamp : 12V - 3.4W

4. Installation is the reverse order of removal.

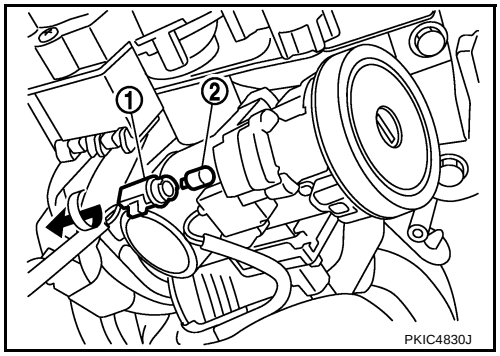


IGNITION KEY HOLE ILLUMINATION

1. Remove instrument lower driver panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Turn bulb socket to left to release lock and remove bulb socket (1).
3. Remove ignition key illumination bulb (2) from its socket.

Ignition key hole illumination : 12V - 1.4W

4. Installation is the reverse order of removal.



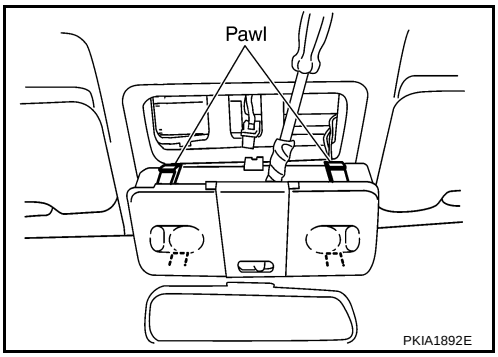
Removal and Installation

NKS004ZX

MAP LAMP

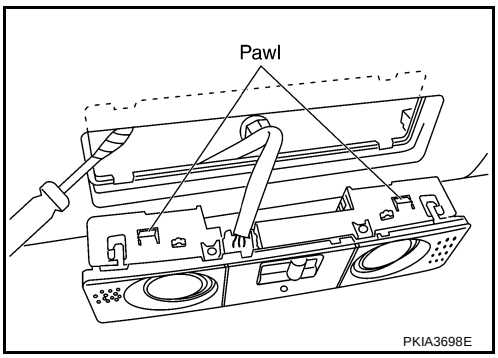
Coupe Models

1. Insert a clip driver or suitable tool and disengage pawl fittings of map lamp.
2. Disconnect map lamp connector and remove map lamp.
3. Installation is the reverse order of removal.



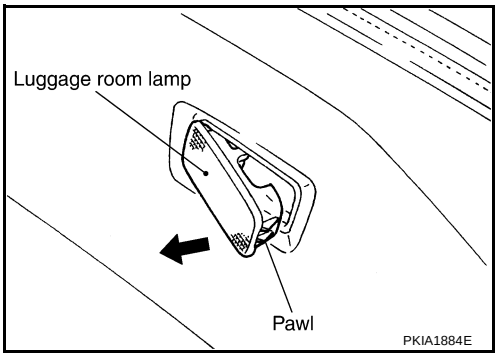
Roadster Models

1. Insert a clip driver or suitable tool and disengage pawl fittings of map lamp.
2. Disconnect map lamp connector and remove map lamp.
3. Installation is the reverse order of removal.



LUGGAGE ROOM LAMP

1. Pull out luggage room lamp in direction shown by the arrow in the figure.
2. Disconnect luggage room lamp connector.
3. Installation is the reverse order of removal.



ILLUMINATION

PFP:27545

System Description

NKS004ZY

Control of the illumination lamp operation is dependent upon the position of the lighting switch (combination switch). When the lighting switch is placed in the 1ST or 2ND position, the BCM (body control module) receives input signal requesting illumination lamps to illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) through the CAN communication lines. The CPU (central processing unit) located in the IPDM E/R controls tail lamp relay coil. This relay, when energized, directs power to illumination lamps, which then illuminate.

OUT LINE

Power is supplied at all times

- through 10A fuse (No.71, located in IPDM E/R)
- to tail lamp relay, located in IPDM E/R, and
- to CPU located in IPDM E/R,
- through 15A fuse (No.78, located in IPDM E/R)
- to CPU located in IPDM E/R.

Power is also supplied at all times

- through 40A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No.19, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 21,
- through 10A fuse [No.19, located in fuse block (J/B)]
- to combination meter terminal 24.

With ignition switch in the ON or START position, power is supplied

- to CPU located in IPDM E/R,
- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No.12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 22, and
- to NAVI control unit terminal 63 (With navigation system),
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

With ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No.6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to unified meter and A/C amp. terminals 29 and 30
- through grounds M30 and M66,
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66,
- to NAVI control unit terminal 1 (With navigation system)
- through ground B115 (With navigation system).

ILLUMINATION OPERATION BY LIGHTING SWITCH

With the lighting switch in the 1ST or 2ND position, the BCM receives input signal requesting illumination lamps to illuminate. This input signal is communicated to the IPDM E/R through the CAN communication lines. CPU located in the IPDM E/R controls tail lamp relay coil, which, when energized, directs power

- through terminal 22 of IPDM E/R
- to NAVI control unit terminal 61 (With navigation system)
- to NAVI switch terminal 2 (With navigation system)
- to audio unit terminal 8.
- to combination switch (spiral cable) terminal 26 (with steering switch)
- to soft top switch (illumination) terminal 5 (Roadster model)
- to A/T device (A/T illumination) terminal 3 (With A/T)
- to VDC off switch (illumination) terminal 3 (With VDC)
- to TCS off switch (illumination) terminal 3 (With TCS)
- to map lamp (illumination) terminal 4 (Roadster models)
- to hazard switch (illumination) terminal 3
- to heated seat switch (driver side) (illumination) terminal 5 (With hated seat)
- to heated seat switch (passenger side) (illumination) terminal 5 (With heated seat)
- to bottle holder illumination (driver side) terminal 1
- to bottle holder illumination (passenger side) terminal 1
- to cup holder illumination terminal 1
- to luggage floor box lamp terminal 1.

Ground is supplied at all times

- to NAVI control unit terminal 1 (with navigation system)
- through ground B115,
- to NAVI switch terminal 3 (With navigation system)
- to audio unit terminal 7
- to combination switch (spiral cable) terminal 27 (with steering switch)
- to soft top switch (illumination) terminal 6 (Roadster models)
- to A/T device (A/T illumination) terminal 5 (With A/T)
- to VDC off switch (illumination) terminal 4 (With VDC)
- to TCS off switch (illumination) terminal 4 (With TCS)
- to hazard switch (illumination) terminal 4
- to heated seat switch (driver side) (illumination) terminal 6 (With heated seat)
- to heated seat switch (passenger side) (illumination) terminal 6 (With heated seat)
- to bottle holder illumination (driver side) terminal 2, and
- to bottle holder illumination (passenger side) terminal 2
- through combination meter terminal 18,
- to map lamp (illumination) terminal 1 (Roadster models)
- to cup holder illumination terminal 2
- through grounds M30 and M66,
- to luggage floor box lamp terminal 2
- through grounds B5, B6, D105 and T14 (Coupe model)
- through grounds B5, B6 and T14 (Roadster model).

With power and ground supplied, illumination lamps illuminate.

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 1ST or 2ND position, and the ignition switch is turned from ON or ACC to OFF, battery saver control function is activated.
Under this condition, the illumination lamps remain illuminated for 5 minutes, then illumination lamps are turned off.
When the lighting switch is turned from OFF to 1ST or 2ND position after illumination lamps are turned off by battery saver control, and illumination lamps illuminate again.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

CAN Communication System Description

NKS004ZZ

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

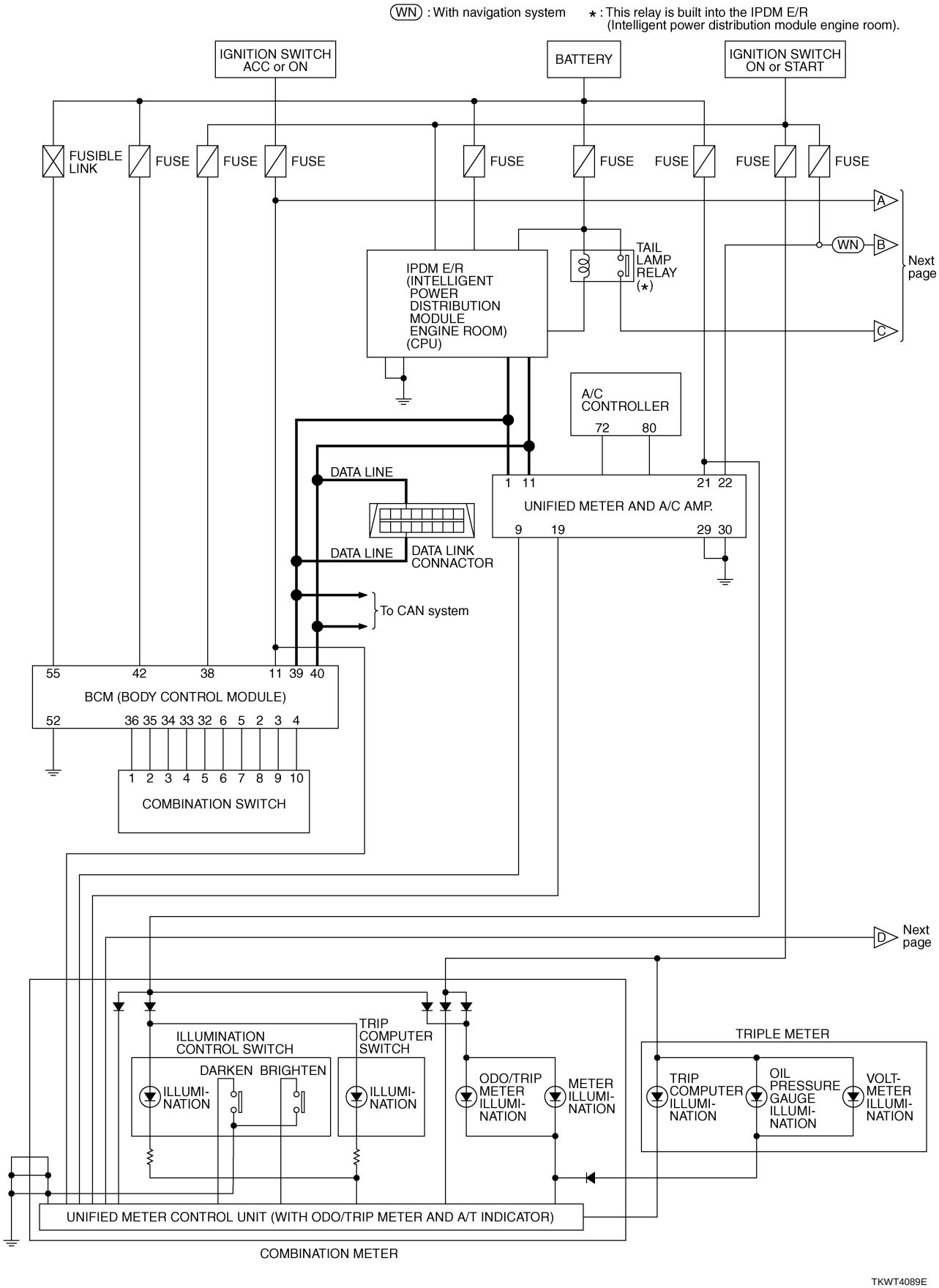
CAN Communication Unit

NKS00500

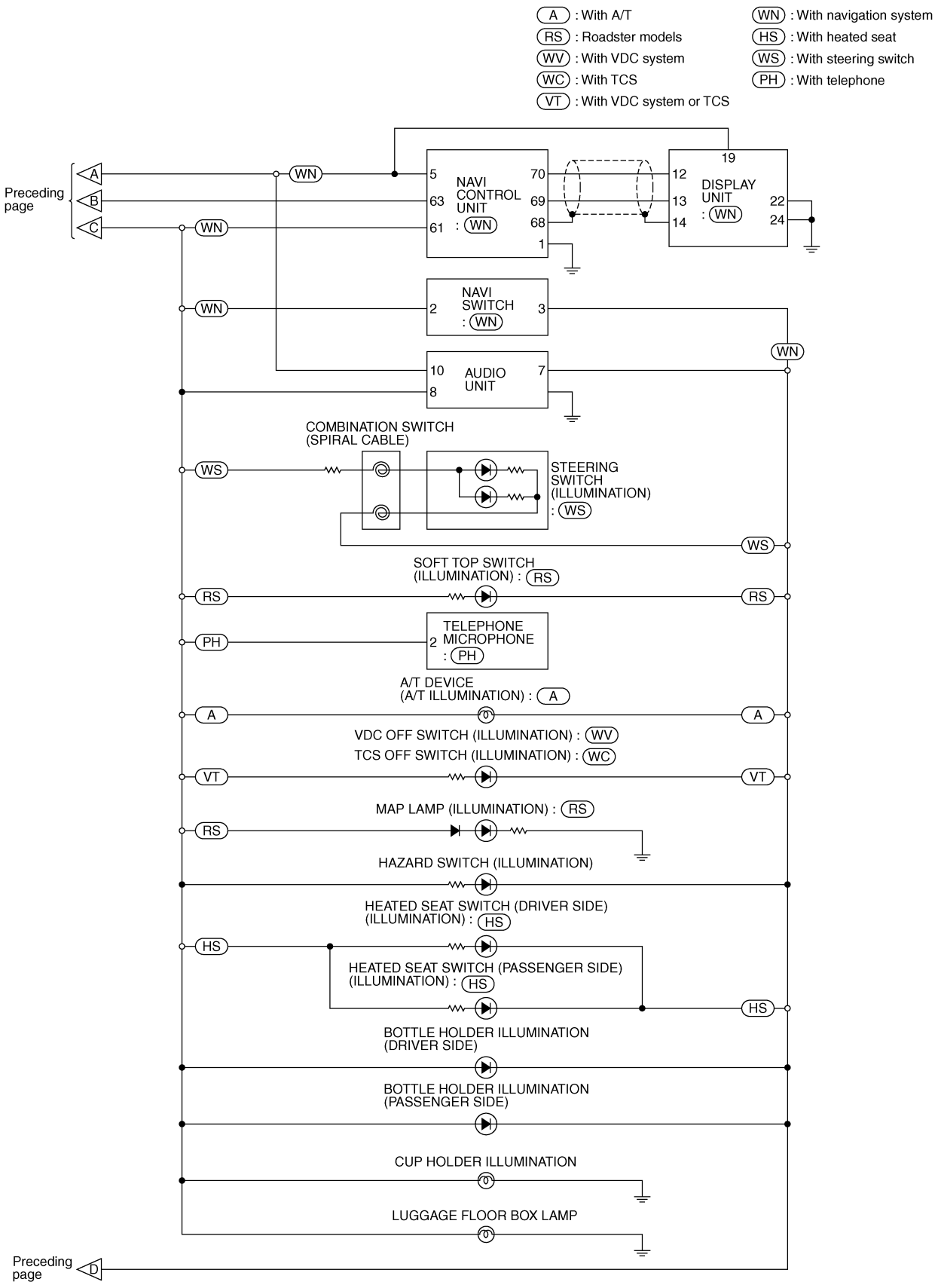
Refer to LAN-48, "CAN System Specification Chart" .

Schematic

NKS00501



TKWT4089E

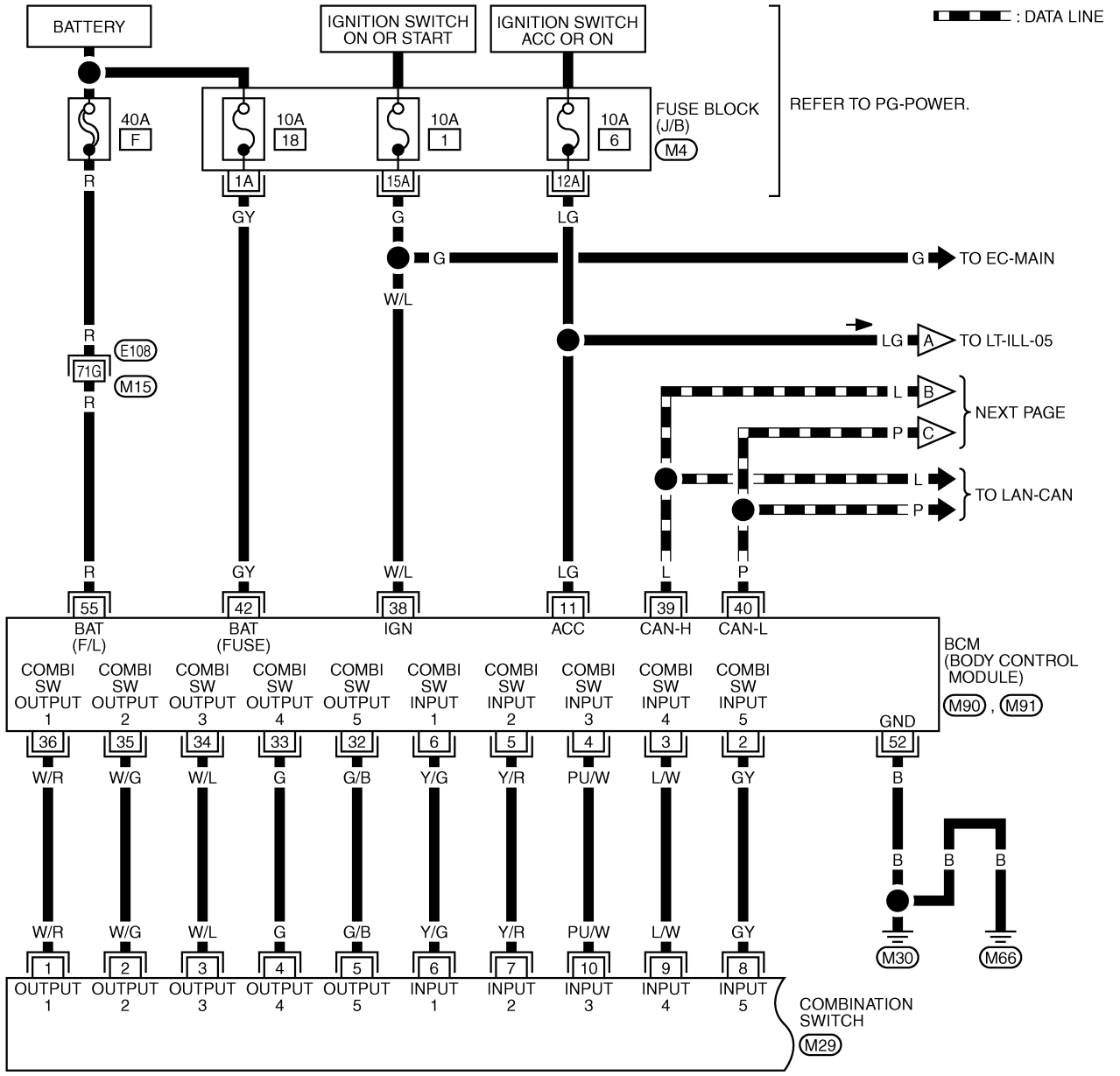

(A) : With A/T
(RS) : Roadster models
(WV) : With VDC system
(WC) : With TCS
(VT) : With VDC system or TCS
(WN) : With navigation system
(HS) : With heated seat
(WS) : With steering switch
(PH) : With telephone
Preceding page
A
B
C
WN
NAVI CONTROL UNIT : WN
5
63
61
70
69
68
1
19
DISPLAY UNIT : WN
12
13
14
22
24
NAVI SWITCH : WN
2
3
AUDIO UNIT
10
8
7
COMBINATION SWITCH (SPIRAL CABLE)
WS
STEERING SWITCH (ILLUMINATION) : WS
SOFT TOP SWITCH (ILLUMINATION) : RS
RS
TELEPHONE MICROPHONE : PH
PH
2
A/T DEVICE (A/T ILLUMINATION) : A
A
VDC OFF SWITCH (ILLUMINATION) : WV
TCS OFF SWITCH (ILLUMINATION) : WC
VT
MAP LAMP (ILLUMINATION) : RS
HAZARD SWITCH (ILLUMINATION)
HEATED SEAT SWITCH (DRIVER SIDE) (ILLUMINATION) : HS
HS
HEATED SEAT SWITCH (PASSENGER SIDE) (ILLUMINATION) : HS
BOTTLE HOLDER ILLUMINATION (DRIVER SIDE)
BOTTLE HOLDER ILLUMINATION (PASSENGER SIDE)
CUP HOLDER ILLUMINATION
LUGGAGE FLOOR BOX LAMP
Preceding page
D

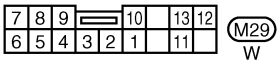
TKWT5767E

Wiring Diagram — ILL —

NKS00502

LT-ILL-01





REFER TO THE FOLLOWING.

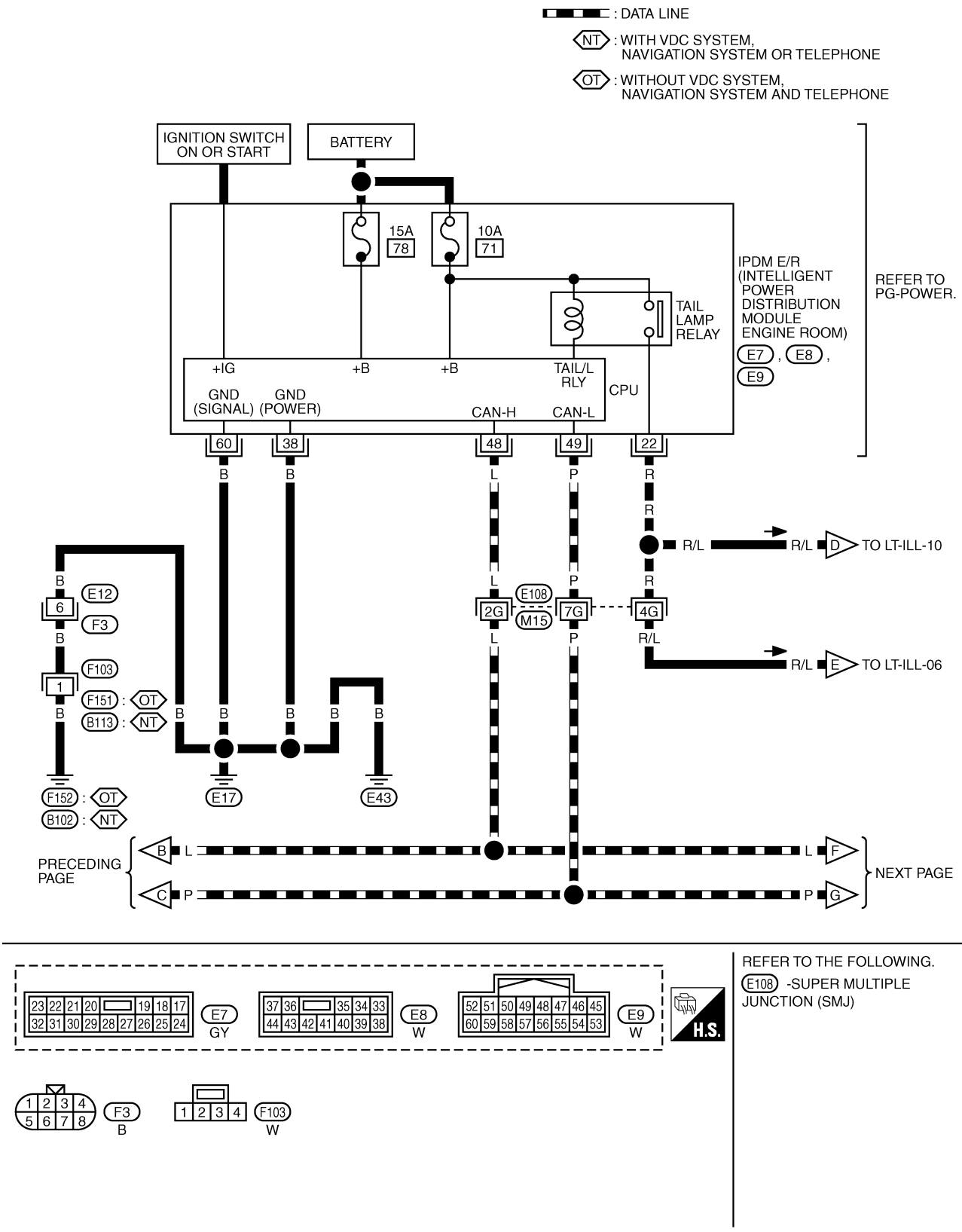
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

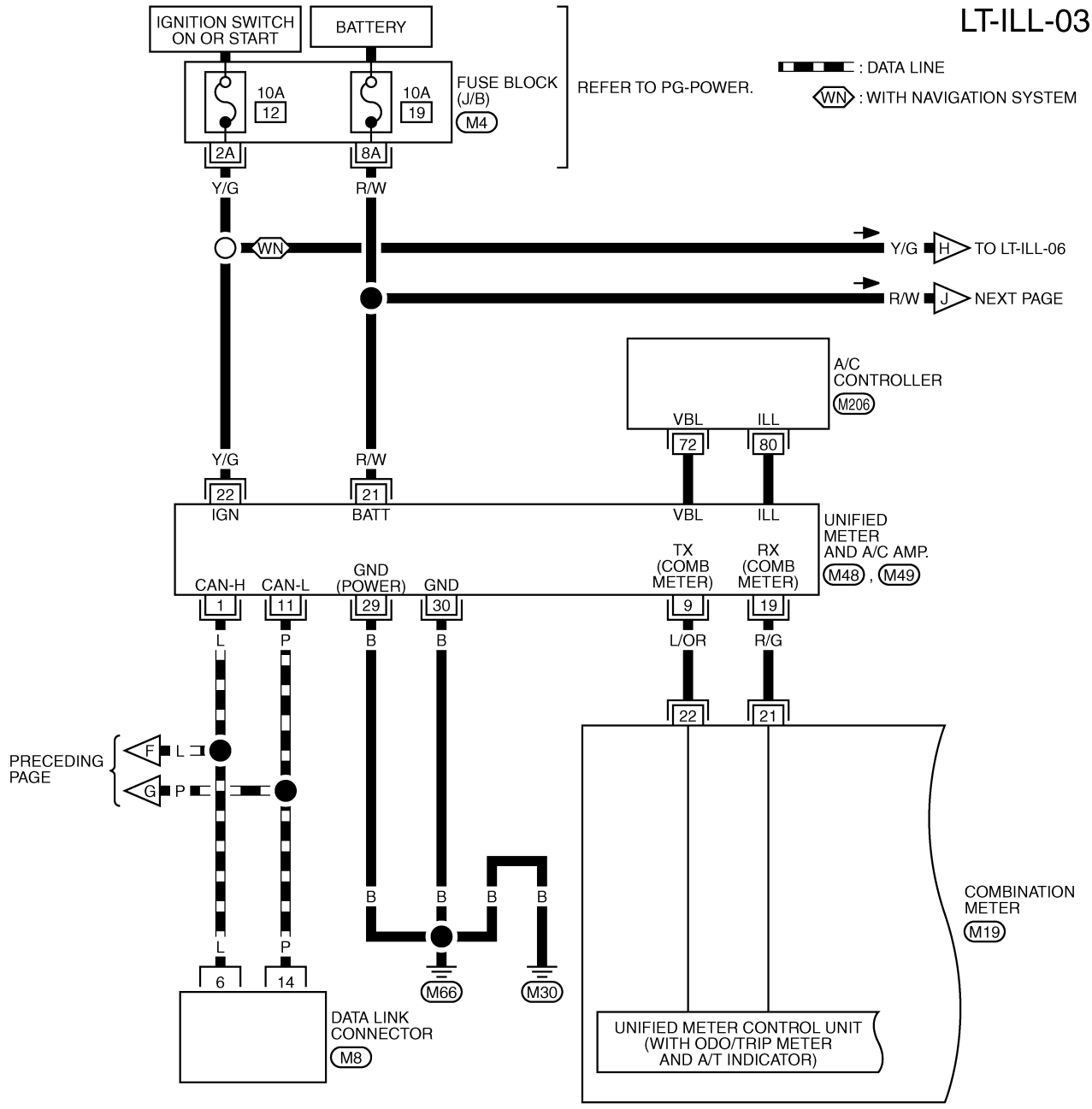
M90 , M91 -ELECTRICAL UNITS

TKWT5768E

LT-ILL-02

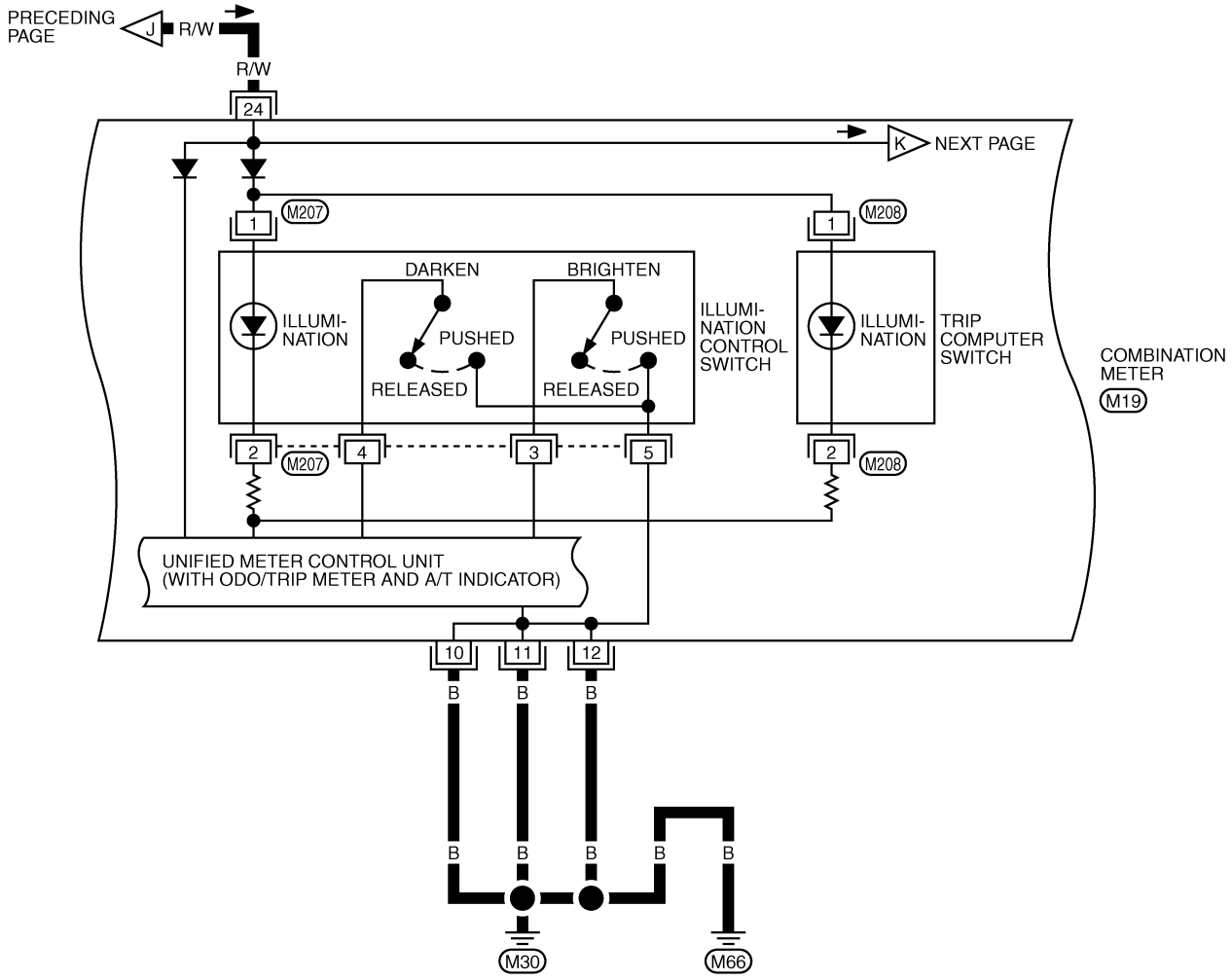


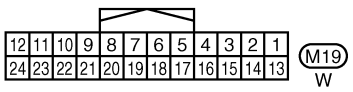
TKWT5769E

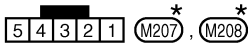

LT-ILL-03
IGNITION SWITCH ON OR START
BATTERY
FUSE BLOCK (J/B) M4
10A 12
10A 19
2A
8A
REFER TO PG-POWER.
: DATA LINE
WN : WITH NAVIGATION SYSTEM
Y/G
R/W
WN
Y/G H TO LT-ILL-06
R/W J NEXT PAGE
A/C CONTROLLER M206
VBL
ILL
72
80
22
IGN
21
BATT
UNIFIED METER AND A/C AMP. M48, M49
CAN-H
CAN-L
GND (POWER)
GND
TX (COMB METER)
RX (COMB METER)
1
11
29
30
9
19
L
P
B
L/OR
R/G
PRECEDING PAGE
F L
G P
6
14
DATA LINK CONNECTOR M8
M66
M30
COMBINATION METER M19
UNIFIED METER CONTROL UNIT (WITH ODO/TRIP METER AND A/T INDICATOR)
M8 W
M19 W
M48 GY
M49 GY
H.S.
M206
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT2296E

LT-ILL-04



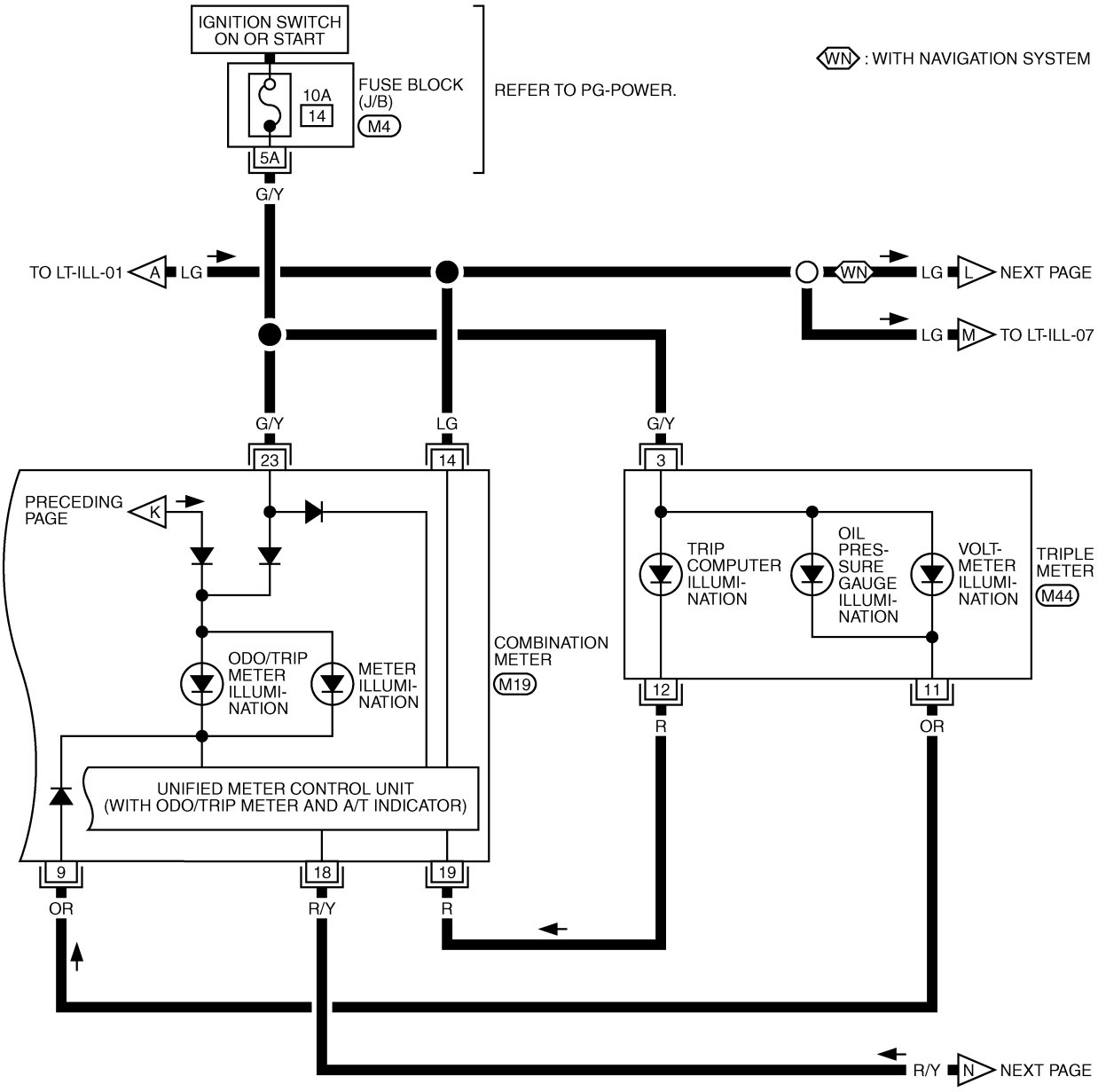


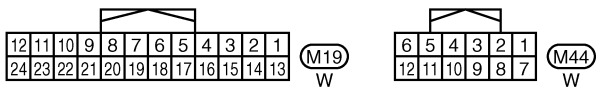


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT4093E

LT-ILL-05

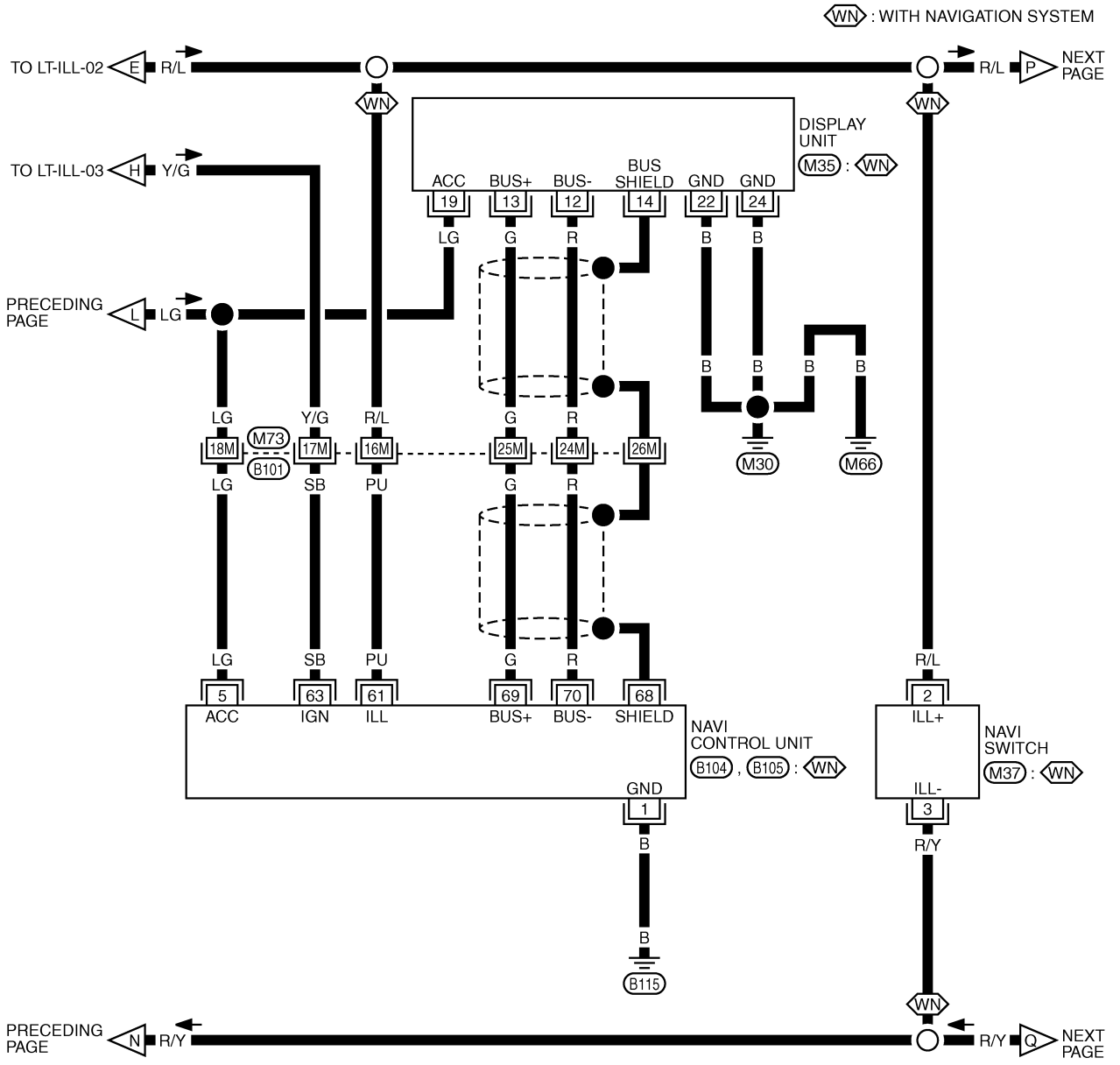


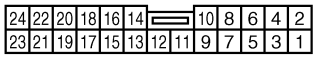


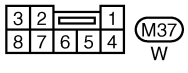
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1830E

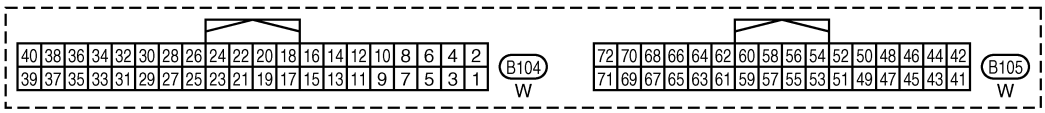
LT-ILL-06





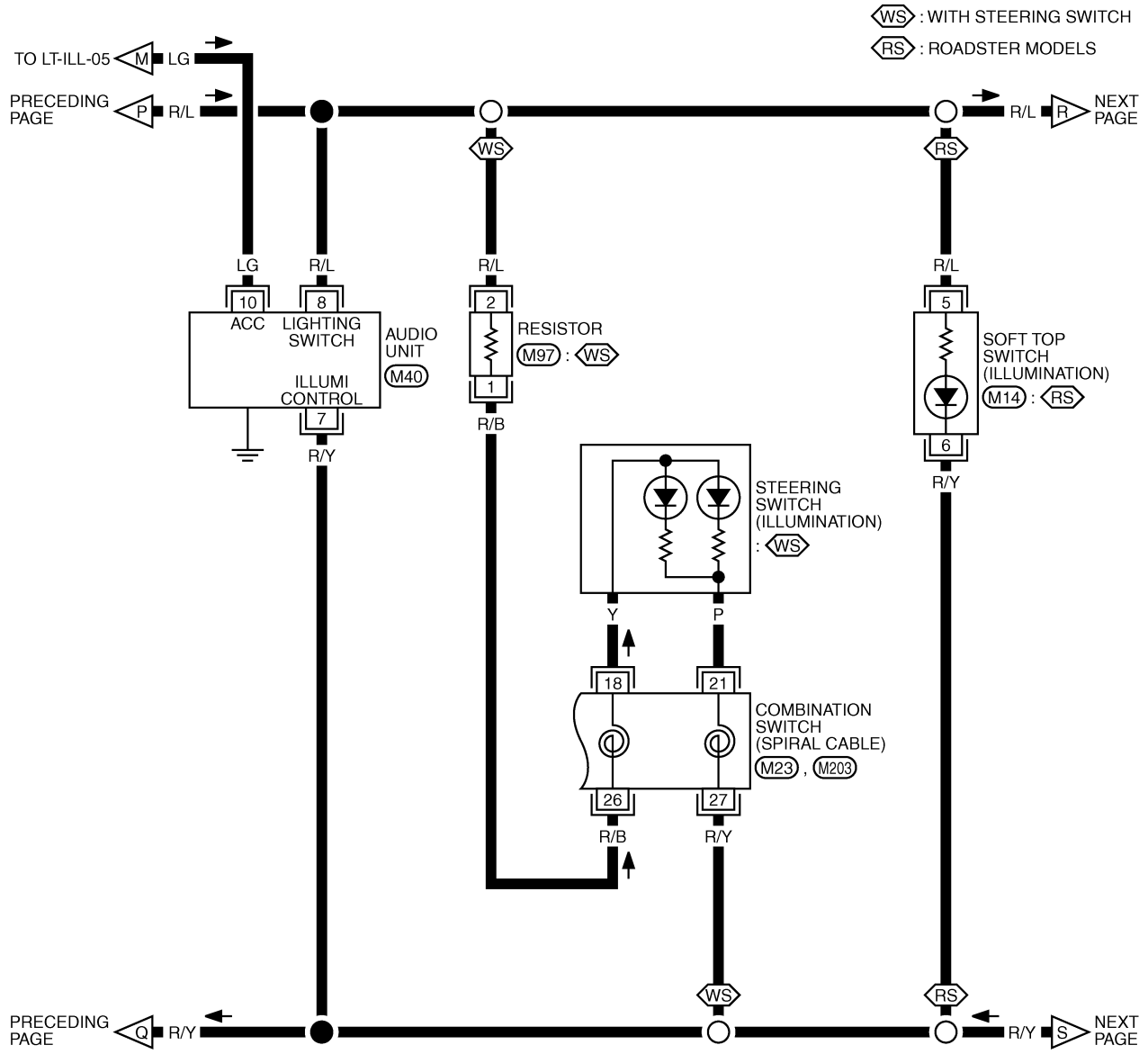


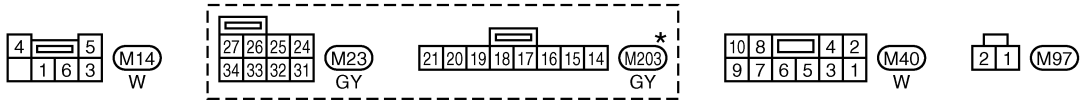
REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)



TKWT5596E

LT-ILL-07

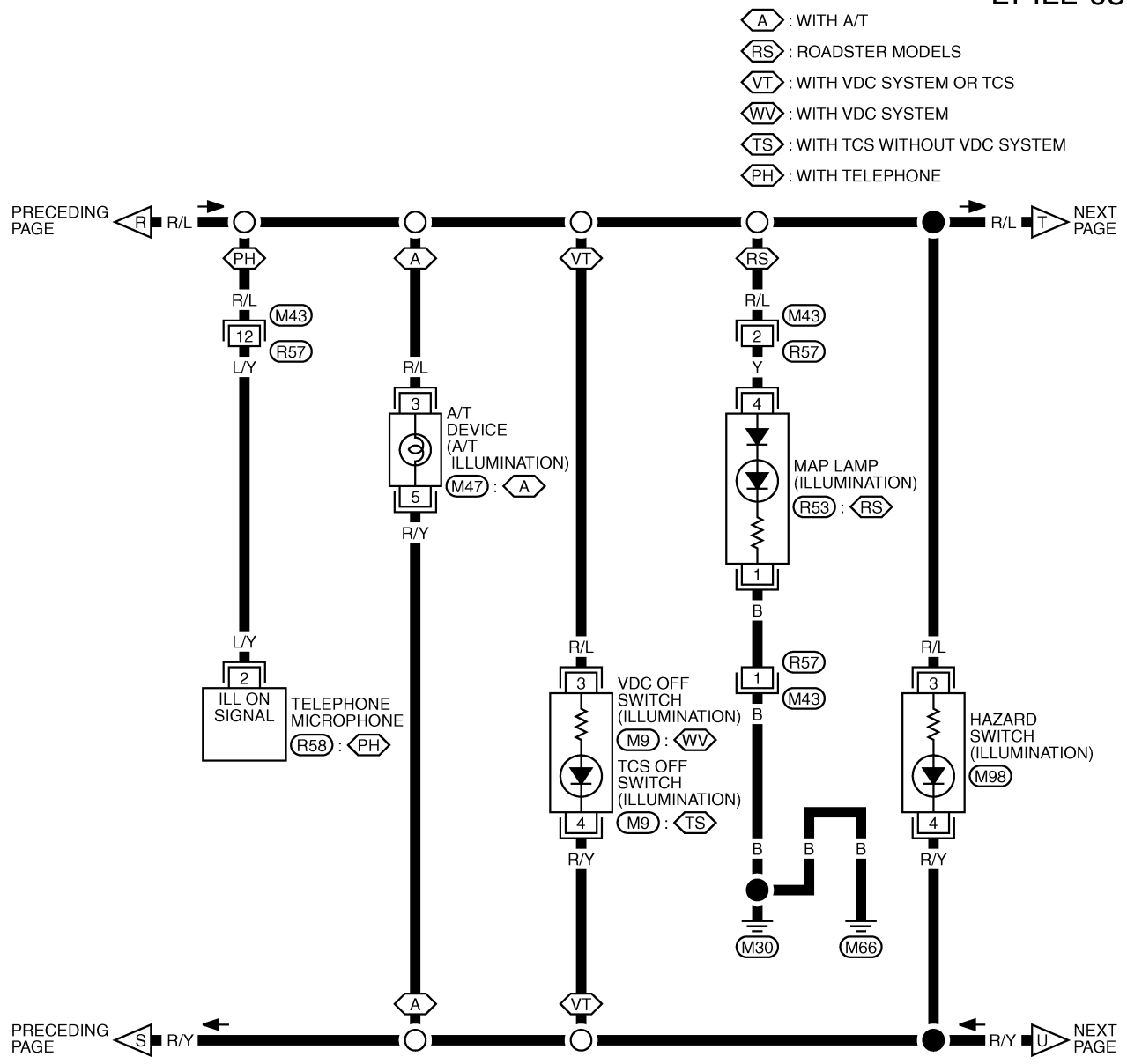


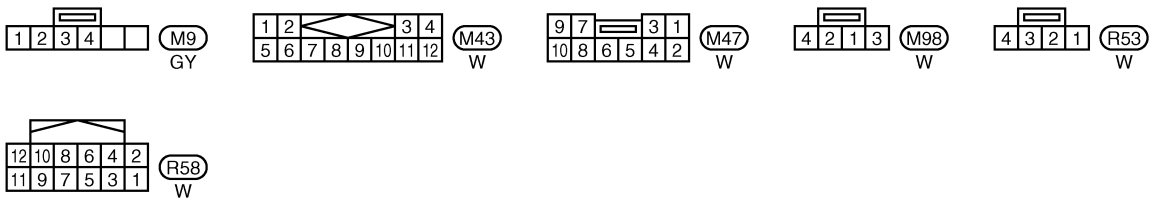


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT4095E

LT-ILL-08

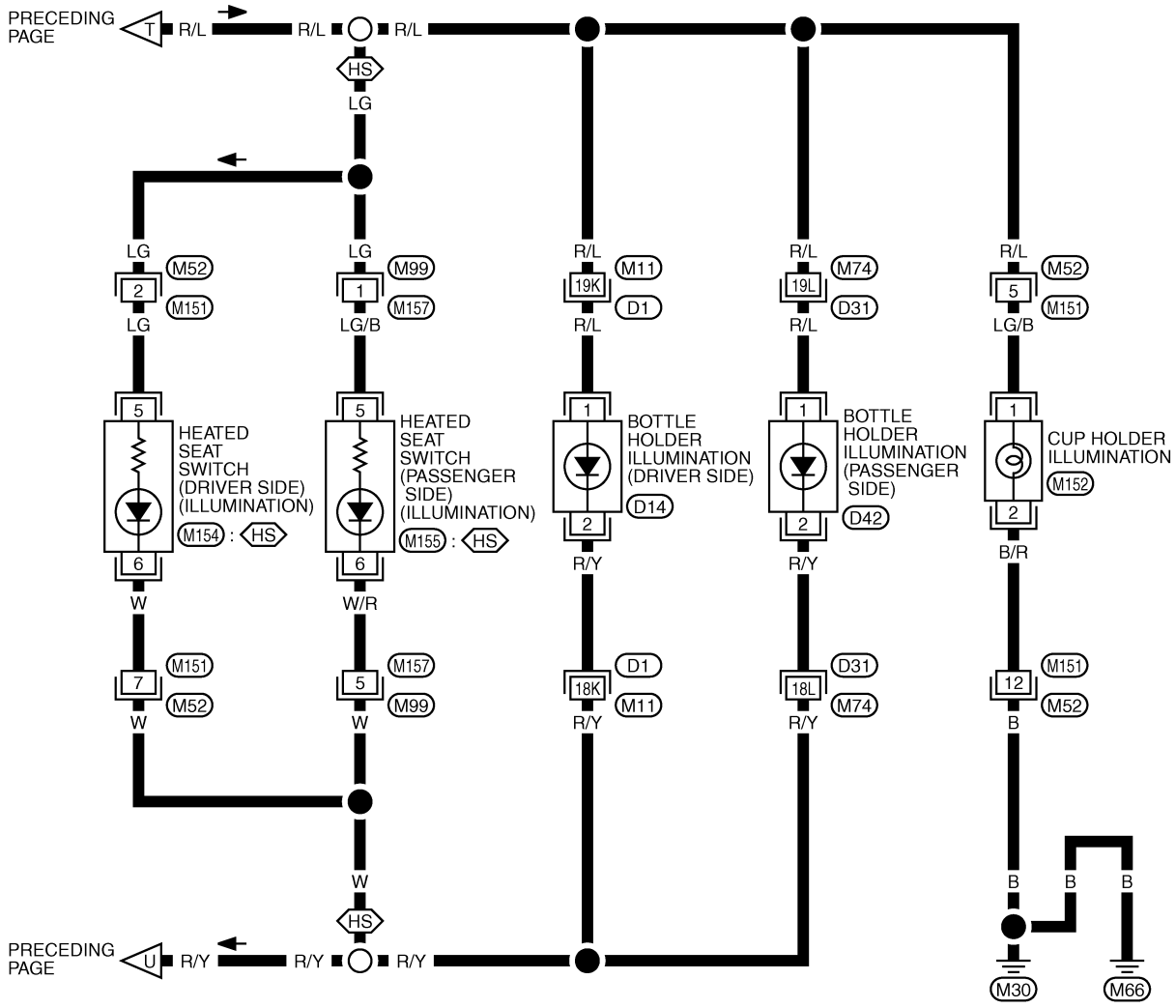




TKWT5771E

LT-ILL-09

HS : WITH HEATED SEAT



M52 W

M99 W

M152 W

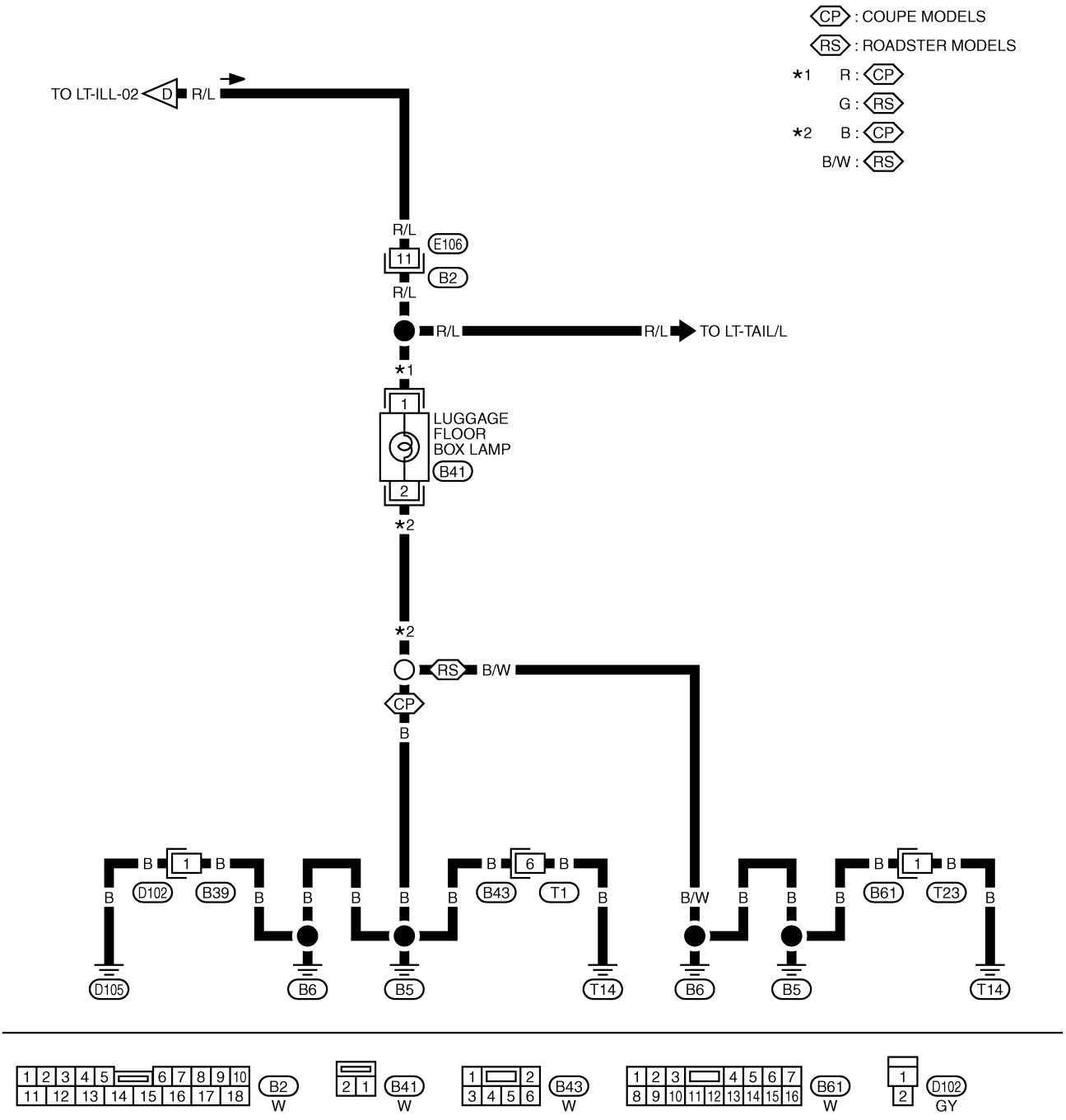
M154 , M155 W BR

D14 , D42 GY GY

REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT4097E

LT-ILL-10



TKWT5772E

Bulb Replacement

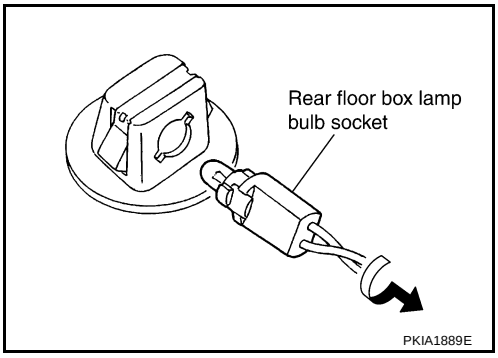
NKS00503

LUGGAGE FLOOR BOX LAMP

1. Remove luggage floor box lamp. Refer to
2. Turn bulb socket counterclockwise to release lock and remove it.

Luggage floor box lamp : 12 V - 1.4W

3. Installation is the reverse order of removal.

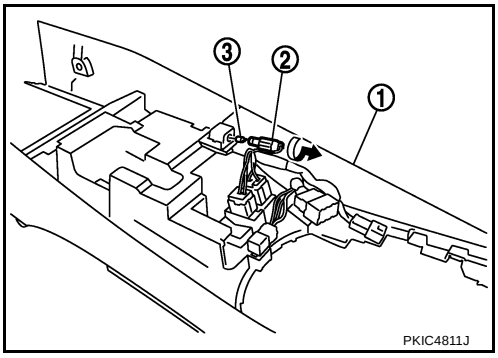


CUP HOLDER ILLUMINATION

1. Remove center console assembly (1). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Turn bulb socket counterclockwise to release lock and remove bulb socket (2).
3. Remove cup holder illumination bulb (3) from its socket.

Cup holder illumination : 12V - 1.1W

4. Installation is the reverse order of removal.

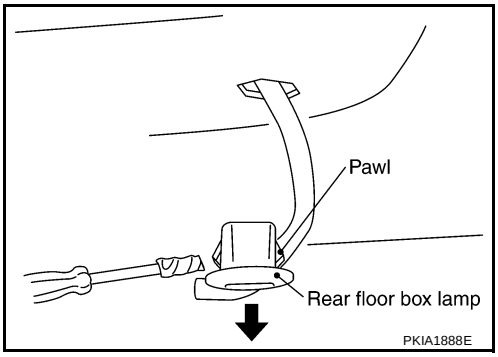


Removal and Installation

NKS00504

LUGGAGE FLOOR BOX LAMP

1. Pull out rear floor box lamp using screwdriver or similar tool.
2. Installation is the reverse order of removal.



BULB SPECIFICATIONS

PFP:26297

Headlamp

NKS00505

Item	Wattage (W)
High / Low	35 (D2R)

Exterior Lamp

NKS00506

Item		Wattage (W)
Front combination lamp	Front turn signal lamp/—	28/8 (amber)
	Parking lamp	5
	Front side marker lamp	LED
Rear combination lamp	Stop/Tail lamp	LED
	Rear turn signal lamp	21 (amber)
	Back-up lamp	21
	Rear side marker lamp	LED
License plate lamp		5
High-mounted stop lamp		LED

Interior Lamp/Illumination

NKS00507

Item	Wattage (W)
Luggage floor box lamp	1.4
Cup holder illumination lamp	1.1
Bottle holder illumination lamp	LED
Map lamp	8
Luggage room lamp	5
Trunk room lamp	3.4
Vanity mirror lamp	1.32
Ignition key hole illumination lamp	1.4

SECTION LU

ENGINE LUBRICATION SYSTEM

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Precautions for Battery Service 2
Precautions for Liquid Gasket 2
LIQUID GASKET APPLICATION PROCEDURE 2
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OIL CAPACITY (APPROXIMATE) 13
OIL PUMP 13
REGULATOR VALVE 13

PRECAUTIONS

PFP:00001

Precautions for Battery Service

NBS00018

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Liquid Gasket

NBS00019

LIQUID GASKET APPLICATION PROCEDURE

1. Removal old liquid gasket adhering to the liquid gasket application surface and the mating surface.
   - Remove liquid gasket completely from the liquid gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
3. Apply liquid gasket to the liquid gasket application surface.
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten mounting bolts or nuts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.

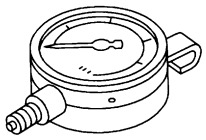
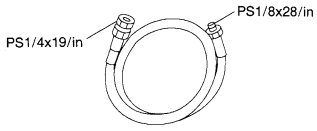
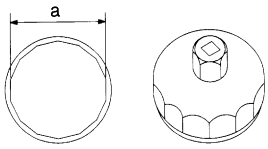
PREPARATION

PFP:00002

Special Service Tools

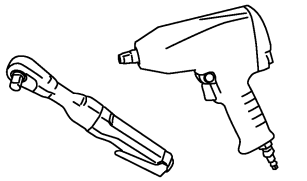
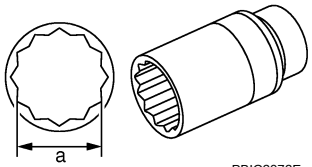
NBS0001A

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST25051001 (J25695-1) Oil pressure gauge  NT050	Measuring oil pressure **Maximum measuring range: 2,452 kPa (25 kg/cm^2 , 356 psi)**
ST25052000 (J25695-2) Hose  S-NT559	Adapting oil pressure gauge to oil pan (upper)
KV10115801 (J38956) Oil filter wrench  S-NT375	Removing oil filter **a: 64.3 mm (2.531 in)**

Commercial Service Tools

NBS0001B

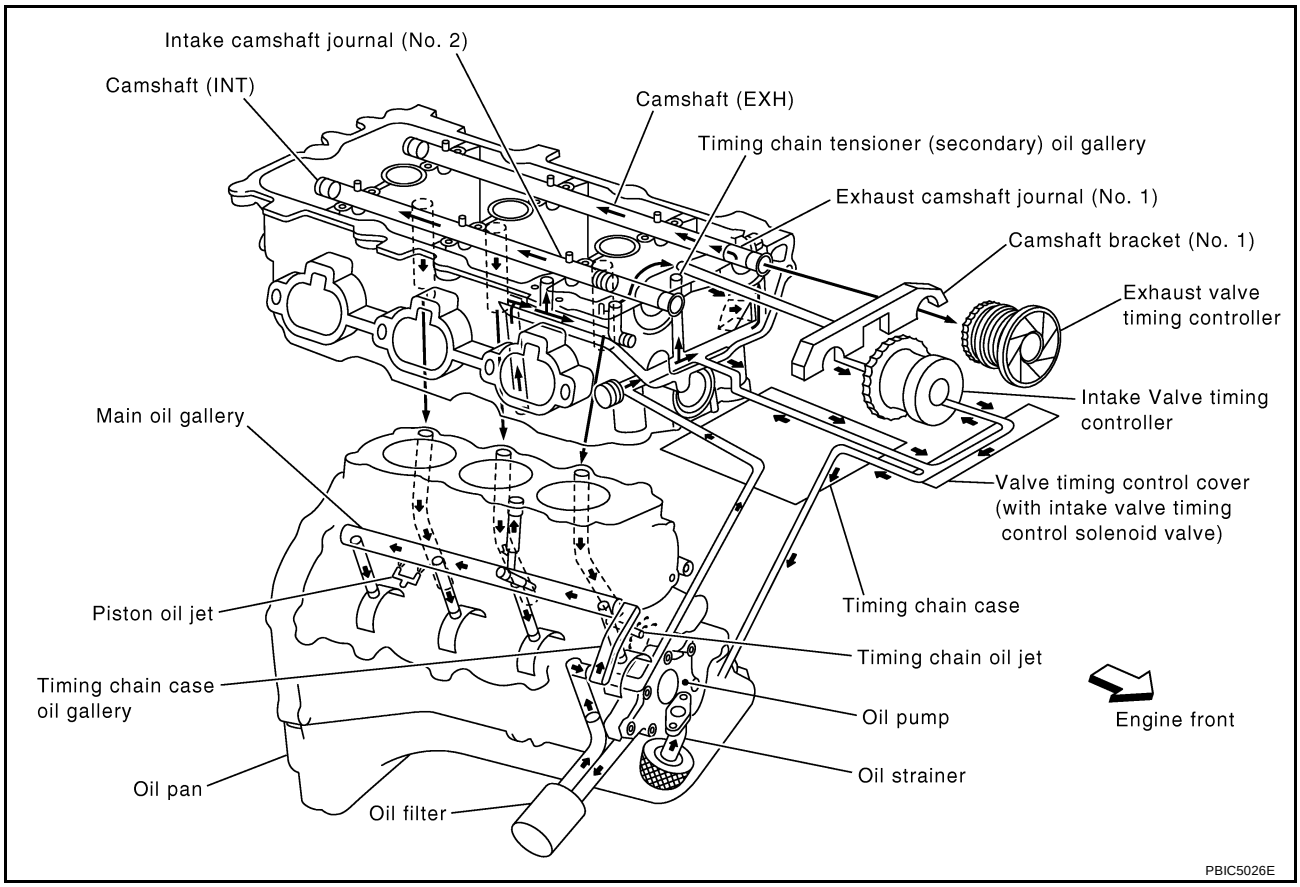
Tool name	Description
Power tool  PBIC0190E	Loosening nuts and bolts
Deep socket  PBIC2072E	Removing and installing oil pressure sensor **a: 24 mm (0.94 in)**

LUBRICATION SYSTEM

PFP:15010

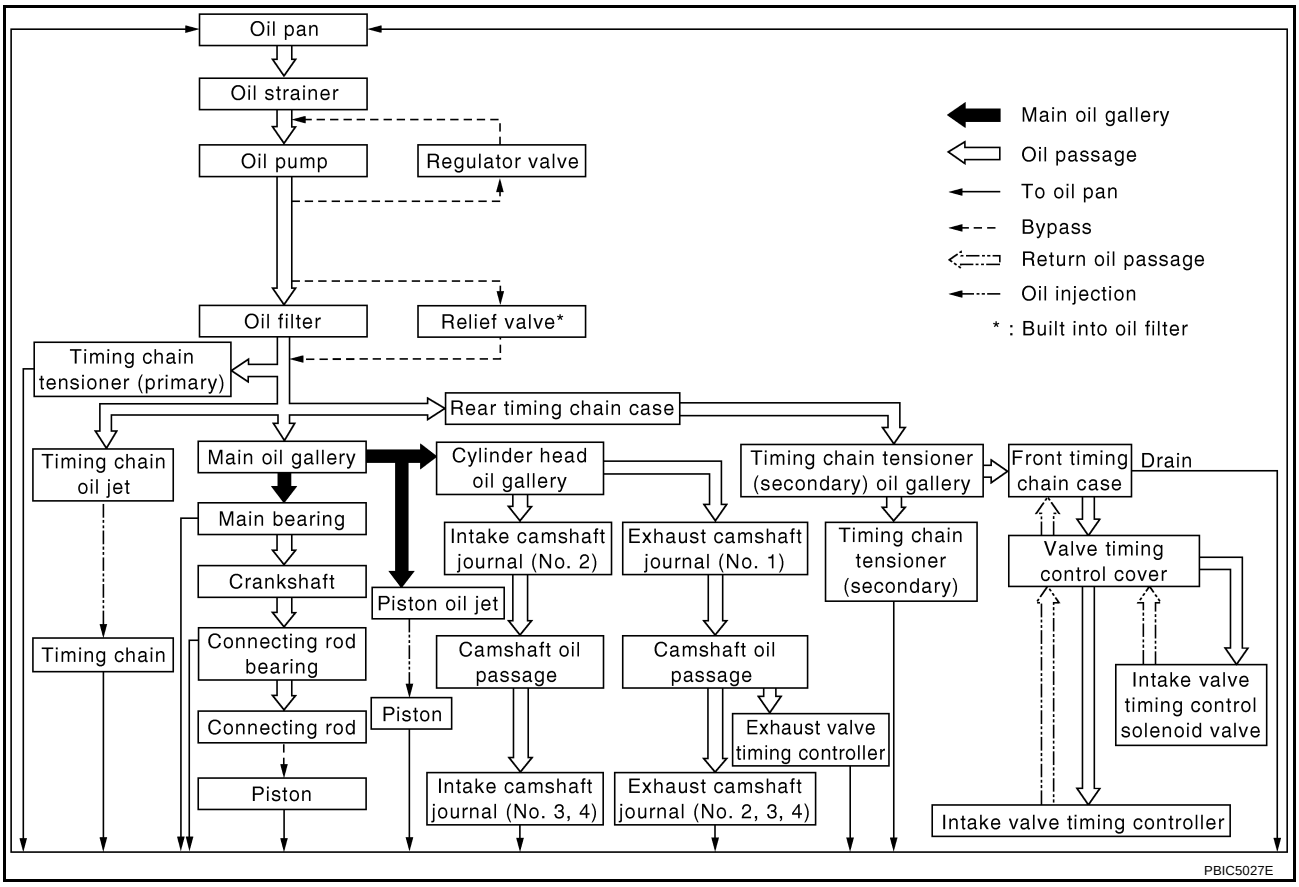
Lubrication Circuit

NBS0001C



System Chart

NBS0001D



ENGINE OIL

PFP:KLA92

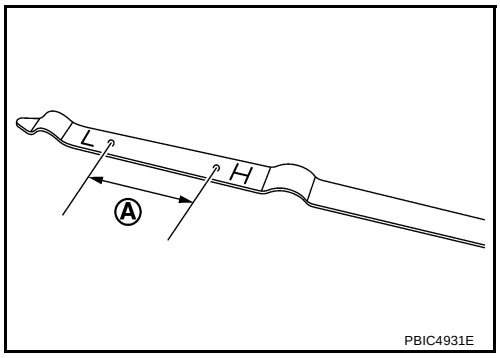
Inspection

NBS0001E

ENGINE OIL LEVEL

NOTE:
Before starting engine, put vehicle horizontally and check the engine oil level. If engine is already started, stop it and allow 10 minutes before checking.

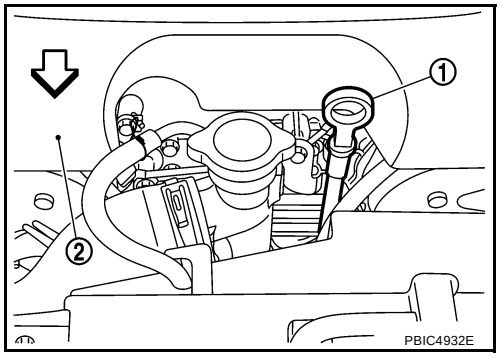
1. Pull out oil level gauge and wipe it clean.
2. Insert oil level gauge and make sure the engine oil level is within the range (A) shown in the figure.
3. If it is out of range, adjust it.



NOTE:
When checking oil level, insert oil level gauge (1) with its tip aligned with oil level gauge guide on cylinder head.

2 : Engine cover

⇦ : Engine front



ENGINE OIL APPEARANCE

- Check engine oil for white turbidity or heavy contamination.
- If engine oil becomes turbid and white, it is highly probable that it is contaminated with engine coolant. Repair or replace damaged parts.

ENGINE OIL LEAKAGE

Check for oil leakage around the following areas:

- Oil pans (lower and upper)
- Oil pan drain plug
- Oil pressure sensor
- Oil filter
- Valve timing control cover
- Mating surface between cylinder head and rocker cover
- Mating surface between front timing chain case and rear timing chain case
- Mating surface between rear timing chain case and cylinder head
- Mating surface between rear timing chain case and cylinder block
- Mating surface between rear timing chain case and oil pan (upper)
- Mating surface between cylinder block and cylinder head
- Mating surface between lower cylinder block and cylinder block
- Crankshaft oil seals (front and rear)
- Camshaft position sensor and exhaust valve timing control position sensor.

OIL PRESSURE CHECK

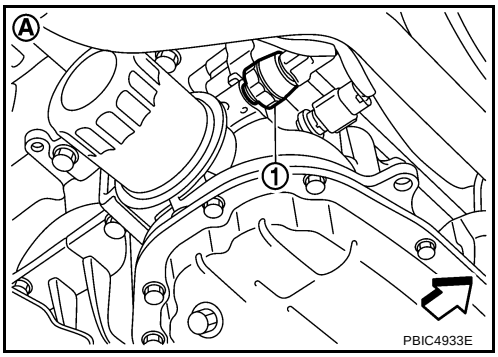
WARNING:

- **Be careful not to burn yourself, as engine oil may be hot.**
- **Oil pressure check should be done in “Neutral position” (M/T models) or “Parking position” (A/T models).**

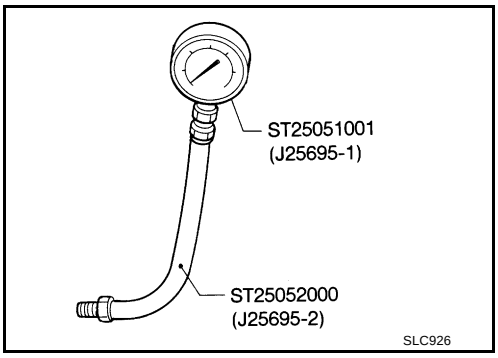
1. Check the engine oil level. Refer to LU-6, "ENGINE OIL LEVEL" .
2. Remove undercover with power tool.
3. Disconnect harness connector at oil pressure sensor, and remove oil pressure sensor using deep socket (commercial service tool).

   CAUTION:
   Do not drop or shock oil pressure sensor.

   1 : Oil pressure switch
   A : 2WD
   ⇦ : Engine front



4. Install the oil pressure gauge (SST) and hose (SST).



5. Start the engine and warm it up to normal operating temperature.
6. Check the engine oil pressure with engine running under no-load.

   NOTE:
   When the engine oil temperature is low, the engine oil pressure becomes high.

   Engine oil pressure [Engine oil temperature at 80 °C (176 °F)]

kPa (kg/cm^2 , psi)

Engine speed	Approximate discharge pressure
Idle speed	More than 98 (1.0, 14)
2,000 rpm	More than 294 (3.0, 43)

   If difference is extreme, check engine oil passage and oil pump for engine oil leaks.
7. After the inspections, install oil pressure sensor as follows:

a. Remove old liquid gasket adhering to oil presser sensor and the mating surface.
b. Apply liquid gasket and tighten oil pressure sensor to the specification.
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

   : 14.7 N·m (1.5 kg-m, 11 ft-lb)

c. After warming up engine, make sure there is no leakage of engine oil with running engine.

Changing Engine Oil

NBS0001F

WARNING:

- **Be careful not to burn yourself, as engine oil may be hot.**

- **Prolonged and repeated contact with used engine oil may cause skin cancer. Try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.**

1. Warm up engine, put vehicle horizontally and check for oil leakage from engine components. Refer to LU-6, "ENGINE OIL LEAKAGE" .
2. Stop the engine and wait for 10 minutes.
3. Loosen oil filler cap and then remove drain plug.
4. Drain engine oil.
5. Install drain plug with new washer. Refer to EM-26, "OIL PAN AND OIL STRAINER" .

   CAUTION:
   Be sure to clean drain plug and install with new washer.

   Oil pan drain plug:

   : 34.3 N·m (3.5 kg-m, 25 ft-lb)

6. Refill with new engine oil.
   Engine oil specification and viscosity:
   Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .

   Engine oil capacity (Approximate):

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.9 (5-1/8, 4-1/4)
	Without oil filter change	4.6 (4-7/8, 4)
Dry engine (Overhaul)		5.5 (5-3/4, 4-7/8)

CAUTION:
- **When filling engine oil, do not pull out oil level gauge.**
- **The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.**
- **Always use oil level gauge to determine the proper amount of engine oil in the engine.**

7. Warm up engine and check area around drain plug and oil filter for oil leakage.
8. Stop engine and wait for 10 minutes.
9. Check the engine oil level. Refer to LU-6, "ENGINE OIL LEVEL" .

OIL FILTER

PFP:15208

Removal and Installation

NBS0001G

REMOVAL

WARNING:

Be careful not to get burned when engine and engine oil may be hot.

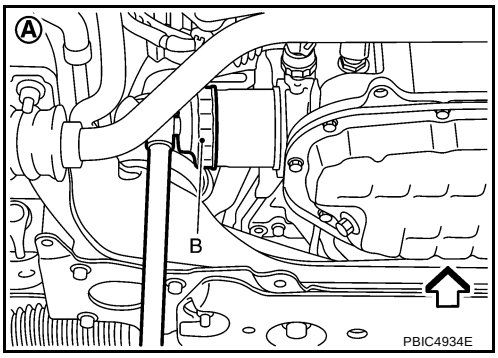
CAUTION:

- **Oil filter is provided with relief valve. Use Genuine NISSAN Oil Filter or equivalent.**
- **When removing, prepare a shop cloth to absorb any engine oil leakage or spillage.**
- **Do not allow engine oil to adhere to drive belts.**
- **Completely wipe off any engine oil that adheres to engine and vehicle.**

1. Remove undercover with power tool.
2. Using oil filter wrench [SST: KV10115801(J38956)] (B), remove oil filter.

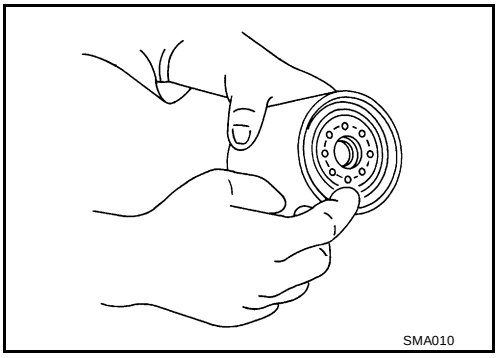
A : 2WD

⇦ : Engine front



INSTALLATION

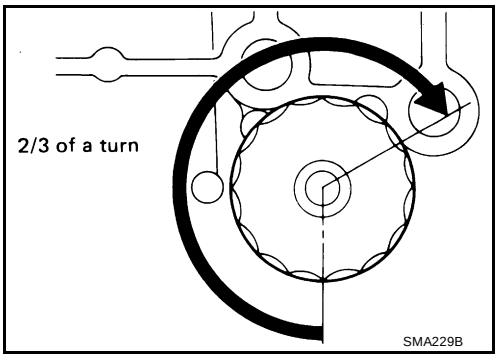
1. Remove foreign materials adhering to oil filter installation surface.
2. Apply engine oil to the oil seal contact surface of new oil filter.



3. Screw oil filter manually until it touches the installation surface, then tighten it by 2/3 turn. Or tighten to specification.

Oil filter:

: 17.7 N·m (1.8 kg-m, 13 ft-lb)



INSPECTION AFTER INSTALLATION

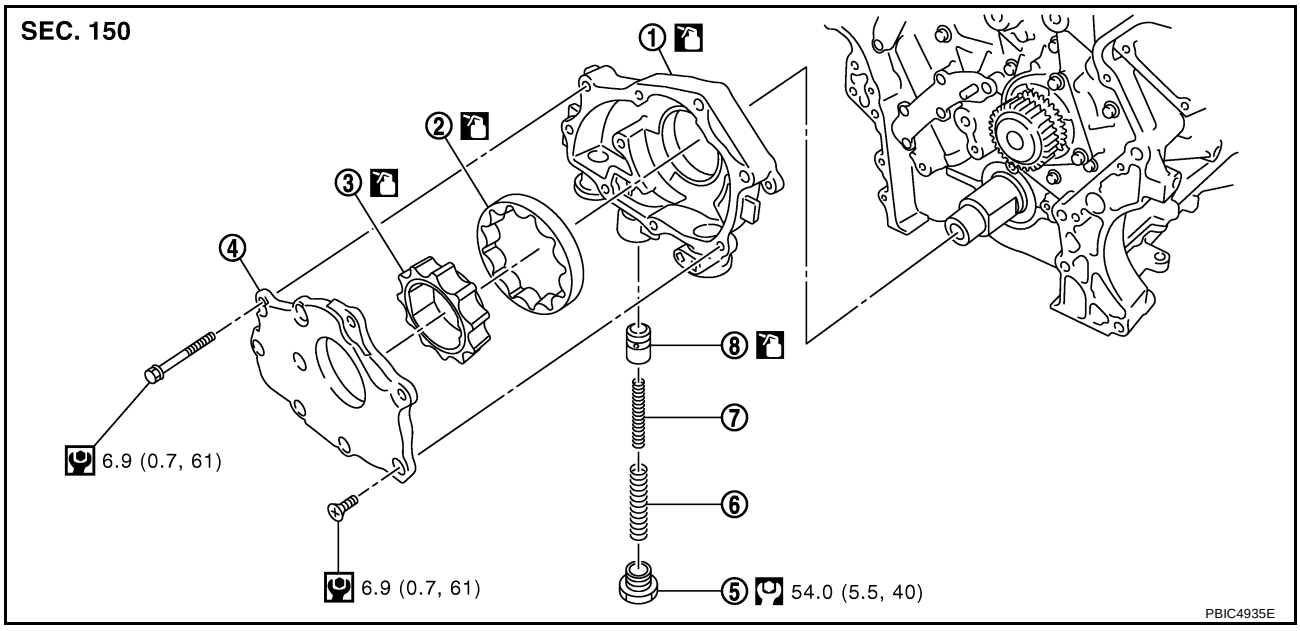
1. Check the engine oil level. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leaks of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and adjust engine oil. Refer to LU-6, "ENGINE OIL" .

OIL PUMP

PFP:15010

Removal and Installation

NBS0001I



1. Oil pump body
2. Oil pump outer rotor
3. Oil pump inner rotor
4. Oil pump cover
5. Regulator valve plug
6. Regulator valve spring
7. Regulator valve spring
8. Regulator valve

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove oil pan (lower) and oil strainer. Refer to EM-26, "OIL PAN AND OIL STRAINER" .
2. Remove front timing chain case and timing chain (primary). Refer to EM-53, "TIMING CHAIN" .
3. Remove oil pump assembly.

INSTALLATION

CAUTION:

Before installation, apply new engine oil to the parts as instructed in the figure.

Note the following, and install in the reverse order of removal.

- When installing, align crankshaft flat faces with inner rotor flat faces.

INSPECTION AFTER INSTALLATION

1. Check the engine oil level. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leaks of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and adjust engine oil. Refer to LU-6, "ENGINE OIL" .

Disassembly and Assembly

NBS0001J

DISASSEMBLY

1. Remove oil pump cover.
2. Remove oil pump inner rotor and oil pump outer rotor from oil pump body.
3. After removing regulator valve plug, remove regulator valve spring and regulator valve.

INSPECTION AFTER DISASSEMBLY

Oil Pump Clearance

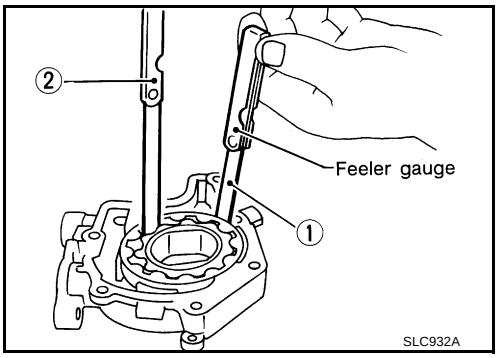
- Measure the clearance with feeler gauge.

– Clearance between oil pump outer rotor and oil pump body (Position “1”)

Standard : 0.114 - 0.260 mm (0.0045 - 0.0102 in)

– Tip clearance between oil pump inner rotor and oil pump outer rotor (Position “2”)

Standard : Below 0.180 mm (0.0071 in)



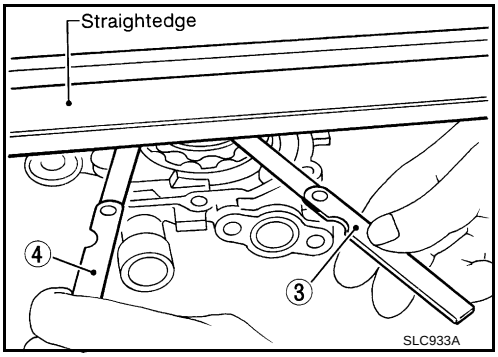
- Measure the clearance with feeler gauge and straightedge.

– Side clearance between oil pump inner rotor and oil pump body (Position “3”)

Standard : 0.030 - 0.070 mm (0.0012 - 0.0028 in)

– Side clearance between oil pump outer rotor and oil pump body (Position “4”)

Standard : 0.030 - 0.090 mm (0.0012 - 0.0035 in)



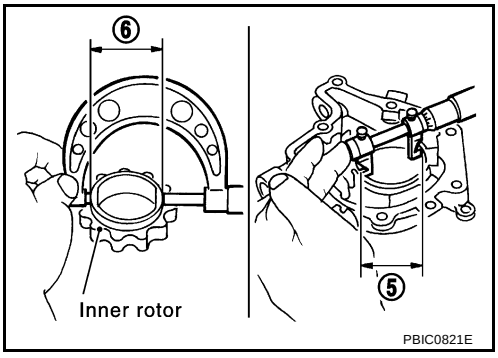
- Calculate the clearance between oil pump inner rotor and oil pump body as follows:

OIL PUMP BODY INNER DIAMETER

– Measure the inner diameter of oil pump body with inside micrometer. (Position “5”)

OIL PUMP INNER ROTOR OUTER DIAMETER

– Measure the outer diameter of protruded portion of oil pump inner rotor with micrometer. (Position “6”)



OIL PUMP INNER ROTOR TO OIL PUMP BODY CLEARANCE

– (Clearance) = (Oil pump body inner diameter) – (Oil pump inner rotor outer diameter)

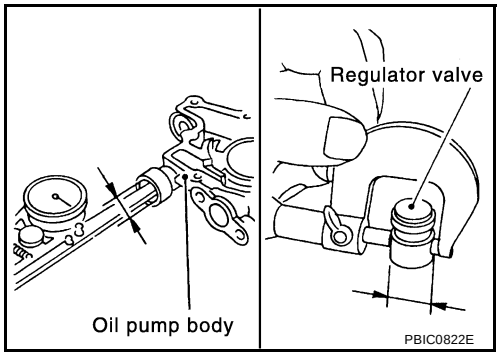
Standard : 0.045 - 0.091 mm (0.0018 - 0.0036 in)

- If measured/calculated values are out of the standard, replace oil pump assembly.

Regulator Valve Clearance

(Clearance) = (Valve hole diameter) – (Regulator valve outer diameter)

Standard : 0.040 - 0.097 mm (0.0016 - 0.0038 in)



- If the calculated value is out of the standard, replace oil pump assembly.

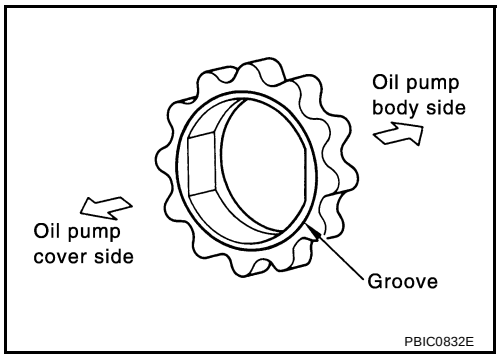
CAUTION:

- **Coat regulator valve with engine oil.**
- **Make sure that it falls smoothly into valve hole by its own weight.**

ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

- Install oil pump inner rotor with the groove faced to oil pump cover side.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

NBS0001K

OIL PRESSURE

kPa (kg/cm^2 , psi)

Engine speed	Approximate discharge pressure*
Idle speed	More than 98 (1.0, 14)
2,000 rpm	More than 294 (3.0, 43)

*: Engine oil temperature at 80°C (176°F)

OIL CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.9 (5-1/8, 4-1/4)
	Without oil filter change	4.6 (4-7/8, 4)
Dry engine (Overhaul)		5.5 (5-3/4, 4-7/8)

OIL PUMP

Unit: mm (in)

Oil pump body to oil pump outer rotor radial clearance	0.114 - 0.260 (0.0045 - 0.0102)
Oil pump inner rotor to oil pump outer rotor tip clearance	Below 0.180 (0.0071)
Oil pump body to oil pump inner rotor side clearance	0.030 - 0.070 (0.0012 - 0.0028)
Oil pump body to oil pump outer rotor side clearance	0.030 - 0.090 (0.0012 - 0.0035)
Oil pump inner rotor to oil pump body clearance	0.045 - 0.091 (0.0018 - 0.0036)

REGULATOR VALVE

Unit: mm (in)

Regulator valve to oil pump body clearance	0.040 - 0.097 (0.0016 - 0.0038)

SECTION MA
MAINTENANCE

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

NLS00001

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

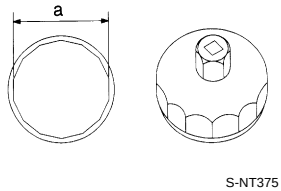
PREPARATION

PFP:00002

Special Service Tools

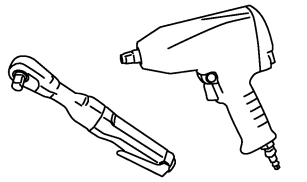
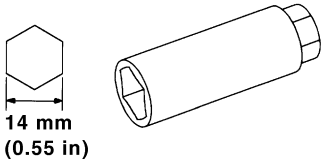
NLS00002

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV10115801 (J38956) Oil filter wrench  S-NT375	Removing and installing oil filter **a: 64.3 mm (2.531 in)**

Commercial Service Tools

NLS00003

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
Spark plug wrench  PBIC3874E	Removing and installing spark plug

GENERAL MAINTENANCE

PFP:00000

Explanation of General Maintenance

NLS00004

General maintenance includes those items which should be checked during the normal day-to-day operation of the vehicle. They are essential if the vehicle is to continue operating properly. The owners can perform checks and inspections themselves or have their NISSAN dealers do them.

OUTSIDE THE VEHICLE

The maintenance items listed here should be performed from time to time, unless otherwise specified.

Item		Reference page
Tires	Check the pressure with a gauge, including the spare, at least once a month and always prior to a long distance trips. Adjust to the specified pressure if necessary. Check carefully for damage, cuts or excessive wear.	—
Wheel nuts	When checking the tires, make sure no nuts are missing, and check for any loose nuts. Tighten if necessary.	—
Windshield	Clean the windshield on a regular basis. Check the windshield at least every six months for cracks or other damage. Repair as necessary.	—
Tire rotation	Tires cannot be rotated in this vehicle, as front tires are different size from rear tires and the direction of wheel rotation is fixed in each tire.	MA-25
Transmitter components in tire pressure monitoring system (TPMS)	Replace grommet seal, valve core and cap of the transmitter in TPMS every tire replacement by reaching wear limit of tire.	WT-10
Wheel alignment and balance	If the vehicle pulls to either side while driving on a straight and level road, or if you detect uneven or abnormal tire wear, there may be a need for wheel alignment. If the steering wheel or seat vibrates at normal highway speeds, wheel balancing may be needed.	MA-23, FSU-6
Windshield wiper blades	Check for cracks or wear if they do not wipe properly.	—
Doors and engine hood	Check that all doors and the engine hood operate smoothly as well as the trunk lid and back hatch. Also make sure that all latches lock securely. Lubricate if necessary. Make sure that the secondary latch keeps the hood from opening when the primary latch is released. When driving in areas using road salt or other corrosive materials, check lubrication frequently.	MA-28
Lamps	Make sure that the headlamps, stop lamps, tail lamps, turn signal lamps, and other lamps are all operating properly and installed securely. Also check headlamp aim. Clean the headlamps on a regular basis.	—

INSIDE THE VEHICLE

The maintenance items listed here should be checked on a regular basis, such as when performing periodic maintenance, cleaning the vehicle, etc.

Item		Reference page
Warning lamps and chimes	Make sure that all warning lamps and chimes are operating properly.	—
Windshield wiper and washer	Check that the wipers and washer operate properly and that the wipers do not streak.	—
Windshield defroster	Check that the air comes out of the defroster outlets properly and in sufficient quantity when operating the heater or air conditioner.	—
Steering wheel	Check that it has the specified play. Be sure to check for changes in the steering condition, such as excessive play, hard steering or strange noises. **Free play: Less than 35 mm (1.38 in)**	—
Seats	Check seat position controls such as seat adjusters, seatback recliner, etc. to make sure they operate smoothly and that all latches lock securely in every position. Check that the head restrains move up and down smoothly and that the locks (if equipped) hold securely in all latched positions. Check that the latches lock securely for folding-down rear seatbacks.	—

Item		Reference page
Seat belts	Check that all parts of the seat belt system (e.g. buckles, anchors, adjusters and retractors) operate properly and smoothly, and are installed securely. Check the belt webbing for cuts, fraying, wear or damage.	MA-29
Accelerator pedal	Check the pedal for smooth operation and make sure the pedal does not catch or require uneven effort. Keep the floor mats away from the pedal.	—
Clutch Pedal	Make sure the pedal operates smoothly and check it has the proper free play.	—
Brakes	Check that the brake does not pull the vehicle to one side when applied.	—
Brake pedal and booster	Check the pedal for smooth operation and make sure it has the proper distance under it when depressed fully. Check the brake booster function. Be sure to keep the floor mats away from the pedal.	BR-7, BR-23
Parking brake	Check that the lever has the proper travel and make sure that the vehicle is held securely on a fairly steep hill when only the parking brake is applied.	PB-3
Automatic transmission "Park" mechanism	Check that the lock release button on the selector lever operates properly and smoothly. On a fairly steep hill check that the vehicle is held securely with the selector lever in the "P" position without applying any brakes.	—

UNDER THE HOOD AND VEHICLE

The maintenance items listed here should be checked periodically (e.g. each time you check the engine oil or refuel).

Item		Reference page
Windshield washer fluid	Check that there is adequate fluid in the tank.	—
Engine coolant level	Check the coolant level when the engine is cold.	MA-13
Radiator and hoses	Check the front of the radiator and clean off any dirt, insects, leaves, etc., that may have accumulated. Make sure the hoses have no cracks, deformation, deterioration or loose connections.	—
Brake and clutch fluid levels	Make sure that the brake and clutch fluid levels are between the "MAX" and "MIN" lines on the reservoirs.	MA-25, MA-20
Battery	Check the fluid level in each cell. It should be between the "MAX" and "MIN" lines. Vehicles operated in high temperatures or under severe conditions require frequent checks of the battery fluid level.	—
Engine drive belts	Make sure that no belt is frayed, worn, cracked or oily.	MA-13
Engine oil level	Check the level on oil level gauge after parking the vehicle on a level spot and turning off the engine.	MA-16
Power steering fluid level and lines	Check the level on the dipstick with the engine off. Check the lines for improper attachment, leaks, cracks, etc.	MA-27
Exhaust system	Make sure there are no loose supports, cracks or holes. If the sound of the exhaust seems unusual or there is a smell of exhaust fumes, immediately locate the trouble and correct it.	MA-20
Underbody	The underbody is frequently exposed to corrosive substances such as those used on icy roads or to control dust. It is very important to remove these substances, otherwise rust will form on the floor pan, frame, fuel lines and around the exhaust system. At the end of winter, the underbody should be thoroughly flushed with plain water, being careful to clean those areas where mud and dirt can easily accumulate.	—
Fluid leaks	Check under the vehicle for fuel, oil, water or other fluid leaks after the vehicle has been parked for a while. Water dripping from the air conditioner after use is normal. If you should notice any leaks or gasoline fumes are evident, check for the cause and correct it immediately.	—

PERIODIC MAINTENANCE

PFP:00026

Introduction of Periodic Maintenance

NLS00005

Two different maintenance schedules are provided, and should be used, depending upon the conditions in which the vehicle is mainly operated. **After 60,000 miles (96,000 km) or 48 months, continue the periodic maintenance at the same mileage/time intervals.**

Schedule 1	Follow Periodic Maintenance Schedule 1 if the driving habits frequently include one or more of the following driving conditions: ● Repeated short trips of less than 5 miles (8 km). ● Repeated short trips of less than 10 miles (16 km) with outside temperatures remaining below freezing. ● Operating in hot weather in stop-and-go “rush hour” traffic. ● Extensive idling and/or low speed driving for long distances, such as police, taxi or door-to-door delivery use. ● Driving in dusty conditions. ● Driving on rough, muddy, or salt spread roads. ● Towing a trailer, using a camper or a car-top carrier.	Emission Control System Maintenance	MA-8
		Chassis and Body Maintenance	MA-9
Schedule 2	Follow Periodic Maintenance Schedule 2 if none of driving conditions shown in Schedule 1 apply to the driving habits.	Emission Control System Maintenance	MA-10
		Chassis and Body Maintenance	MA-10

Schedule 1

NLS00006

EMISSION CONTROL SYSTEM MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary. [ ]: At the mileage intervals only

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	3.75 (6) 3	7.50 (12) 6	11.25 (18) 9	15 (24) 12	18.75 (30) 15	22.5 (36) 18	26.25 (42) 21	30 (48) 24	
Drive belts	NOTE (1)									MA-13
Air cleaner filter	NOTE (2)								[R]	MA-16
EVAP vapor lines									I*	MA-19
Fuel lines									I*	MA-16
Fuel filter	NOTE (3)									-
Engine coolant	NOTE (4)									MA-13
Engine oil		R	R	R	R	R	R	R	R	MA-16
Engine oil filter (Use part No. 15208 65F01 or equivalent.)		R	R	R	R	R	R	R	R	MA-17
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (169,000 km).								MA-18
Intake & exhaust valve clearance*	NOTE (5)									EM-80

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	33.75 (54) 27	37.5 (60) 30	41.25 (66) 33	45 (72) 36	48.75 (78) 39	52.5 (84) 42	56.25 (90) 45	60 (96) 48	
Drive belts	NOTE (1)								I*	MA-13
Air cleaner filter	NOTE (2)								[R]	MA-16
EVAP vapor lines									I*	MA-19
Fuel lines									I*	MA-16
Fuel filter	NOTE (3)									-
Engine coolant	NOTE (4)								R*	MA-13
Engine oil		R	R	R	R	R	R	R	R	MA-16
Engine oil filter (Use part No. 15208 65F01 or equivalent.)		R	R	R	R	R	R	R	R	MA-17
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (169,000 km).								MA-18
Intake & exhaust valve clearance*	NOTE (5)									EM-80

NOTE:

(1) After 60,000 miles (96,000 km) or 48 months, inspect every 15,000 miles (24,000 km) or 12 months. Replace the drive belts if found damaged or if auto belt tensioner reading reaches maximum limit.

(2) If operating mainly in dusty conditions, more frequent maintenance may be required.

(3) Maintenance-free item. For service procedures, refer to FL section.

(4) After 60,000 miles (96,000 km) or 48 months, replace every 30,000 miles (48,000 km) or 24 months.

(5) If valve noise increases, inspect valve clearance.

* Maintenance items and intervals with “*” are recommended by NISSAN for reliable vehicle operation. The owner need not perform such maintenance in order to maintain the emission warranty or manufacturer recall liability. Other maintenance items and intervals are required.

CHASSIS AND BODY MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	3.75 (6) 3	7.50 (12) 6	11.25 (18) 9	15 (24) 12	18.75 (30) 15	22.5 (36) 18	26.25 (42) 21	30 (48) 24	
Brake lines & cables					I				I	MA-25
Brake pads & rotors			I		I		I		I	MA-25
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)				I				I	MA-20, MA-22 , MA-20 , MA-23
Steering gear & linkage, axle & suspension parts			I		I		I		I	MA-26, RSU-5 , MA-27
Tire rotation	NOTE (2)									MA-5, MA-25
Exhaust system			I		I		I		I	MA-20

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	33.75 (54) 27	37.5 (60) 30	41.25 (66) 33	45 (72) 36	48.75 (78) 39	52.5 (84) 42	56.25 (90) 45	60 (96) 48	
Brake lines & cables					I				I	MA-25
Brake pads & rotors			I		I		I		I	MA-25
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)				I				I	MA-20, MA-22 , MA-20 , MA-23
Steering gear & linkage, axle & suspension parts			I		I		I		I	MA-26, RSU-5 , MA-27
Tire rotation	NOTE (2)									MA-5, MA-25
Exhaust system			I		I		I		I	MA-20

NOTE:

(1) If towing a trailer, using a camper or a car-top carrier, or driving on rough or muddy roads, change (not just inspect) oil at every 30,000 miles (48,000 km) or 24 months. **Using automatic transmission fluid other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.**

(2) Tires cannot be rotated in this vehicle. Refer to “Tire rotation” under the “GENERAL MAINTENANCE” heading earlier in this section.

Schedule 2

NLS00007

EMISSION CONTROL SYSTEM MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary. [ ]: At the mileage intervals only

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	7.5 (12) 6	15 (24) 12	22.5 (36) 18	30 (48) 24	37.5 (60) 30	45 (72) 36	52.5 (84) 42	60 (96) 48	
Drive belts	NOTE (1)								I*	MA-13
Air cleaner filter					[R]				[R]	MA-16
EVAP vapor lines					I*				I*	MA-19
Fuel lines					I*				I*	MA-16
Fuel filter	NOTE (2)									-
Engine coolant	NOTE (3)								R*	MA-13
Engine oil		R	R	R	R	R	R	R	R	MA-16
Engine oil filter (Use part No. 15208 65F01 or equivalent.)		R	R	R	R	R	R	R	R	MA-17
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (169,000 km).								MA-18
Intake & exhaust valve clearance*	NOTE (4)									EM-80

NOTE:

(1) After 60,000 miles (96,000 km) or 48 months, inspect every 15,000 miles (24,000 km) or 12 months. Replace the drive belts if found damaged or if auto belt tensioner reading reaches maximum limit.

(2) Maintenance-free item. For service procedures, refer to FL section.

(3) After 60,000 miles (96,000 km) or 48 months, replace every 30,000 miles (48,000 km) or 24 months.

(4) If valve noise increases, inspect valve clearance.

* Maintenance items and intervals with "*" are recommended by NISSAN for reliable vehicle operation. The owner need not perform such maintenance in order to maintain the emission warranty or manufacturer recall liability. Other maintenance items and intervals are required

CHASSIS AND BODY MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	7.5 (12) 6	15 (24) 12	22.5 (36) 18	30 (48) 24	37.5 (60) 30	45 (72) 36	52.5 (84) 42	60 (96) 48	
Brake lines & cables			I		I		I		I	MA-25
Brake pads & rotors			I		I		I		I	MA-25
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)		I		I		I		I	MA-20, MA-20 , MA-23
Steering gear & linkage, axle & suspension parts					I				I	MA-26, RSU-5, MA-27
Tire rotation	NOTE (2)									MA-5, MA-25
Exhaust system					I				I	MA-20

NOTE:

(1) Using automatic transmission fluid other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.

(2) Tires cannot be rotated in this vehicle. Refer to "Tire rotation" under the "GENERAL MAINTENANCE" heading earlier in this section.

RECOMMENDED FLUIDS AND LUBRICANTS

PFP:00000

Fluids and Lubricants

NLS00008

		Capacity (Approximate)			Recommended Fluids/Lubricants
		US measure	Imp measure	Liter	
Engine oil Drain and refill	With oil filter change	5-1/8 qt	4-1/4 qt	4.9	● Engine oil with API Certification Mark*1 ● Viscosity SAE 5W-30
	Without oil filter change	4-7/8 qt	4 qt	4.6	
Dry engine (Overhaul)		5-3/4 qt	4-7/8 qt	5.5	
Cooling system	With reservoir tank	9-1/2 qt	7-7/8 qt	9.0	Genuine NISSAN Long Life Antifreeze/ Coolant or equivalent
	Reservoir tank	7/8 qt	3/4 qt	0.8	
Automatic transmission fluid		10-7/8 qt	9-1/8 qt	10.3	Genuine NISSAN Matic J ATF*2
Manual transmission gear oil		6-1/4 pt	5-1/8 pt	2.93	Genuine NISSAN Manual Transmission Fluid (MTF) HQ Multi 75W-85 or API GL-4,Viscosity SAE 75W-85 or 75W-90
Power steering fluid (PSF)		1-1/8 qt	7/8 qt	1.0	Genuine NISSAN PSF or equivalent*3
Brake and clutch fluid		—	—	—	Genuine NISSAN Super Heavy Duty Brake Fluid*4 or equivalent DOT 3 (US FMVSS No. 116)
Differential gear oil		3 pt	2-1/2 pt	1.4	API GL-5, Viscosity SAE 80W-90*5
Multi-purpose grease		—	—	—	NLGI No. 2 (Lithium soap base)
Windshield washer fluid		—	—	—	Genuine NISSAN Windshield Washer Concentrate Cleaner & Antifreeze or equivalent
Fuel recommendation		—	—	—	Refer toGI-5, "Precautions for Fuel (Unleaded Premium Gasoline Required)" .

*1: For further details, see “Engine Oil Recommendation”.

*2: **Using automatic transmission fluid other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty** .

*3: For Canada, NISSAN Automatic Transmission Fluid (ATF), DEXRON™ III/ MERCON™ or equivalent ATF may also be used.

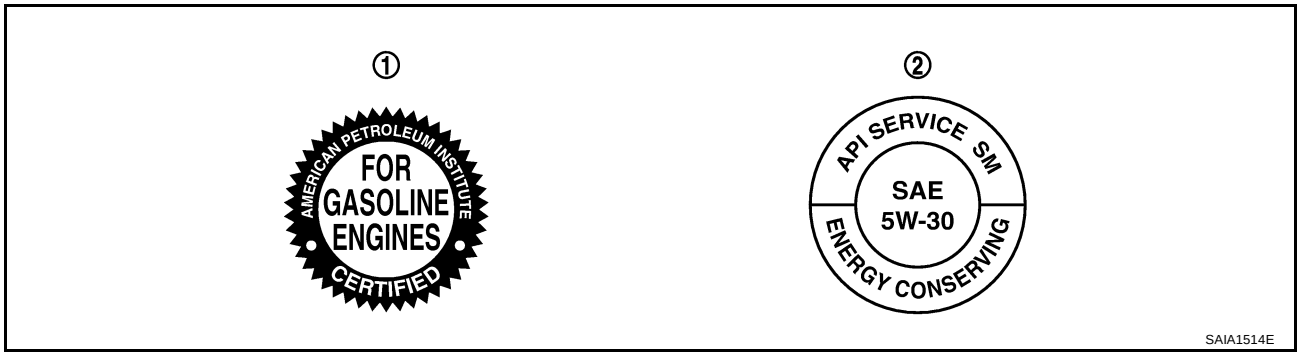
*4: Available in mainland U.S.A. through your NISSAN dealer.

*5: For hot climates, viscosity SAE 90 is suitable for ambient temperatures above 0°C(32°F).

Engine Oil Recommendation

NLS0009U

NISSAN recommends the use of an energy conserving oil in order to improve fuel economy.
Select only engine oils that meet the American Petroleum Institute (API) certification and International Lubricant Standardization and Approval Committee (ILSAC) certification and SAE viscosity standard. These oils have the API certification mark on the front of the container. Oils which do not have the specified quality label should not be used as they could cause engine damage.



1. API certification mark
2. API service symbol

ANTI-FREEZE COOLANT MIXTURE RATIO

The engine cooling system is filled at the factory with a high-quality, year-round, anti-freeze coolant solution. The anti-freeze solution contains rust and corrosion inhibitors. Therefore, additional cooling system additives are not necessary.

CAUTION:
When adding or replacing coolant, be sure to use only Genuine NISSAN Long Life Antifreeze/ Coolant or equivalent with the proper mixture ratio of 50% anti-freeze and 50% demineralized water/distilled water.
Other types of coolant solutions may damage your cooling system.

Outside temperature down to		Anti-freeze	Demineralized water or distilled water
°C	°F		
–35	–30	50%	50%

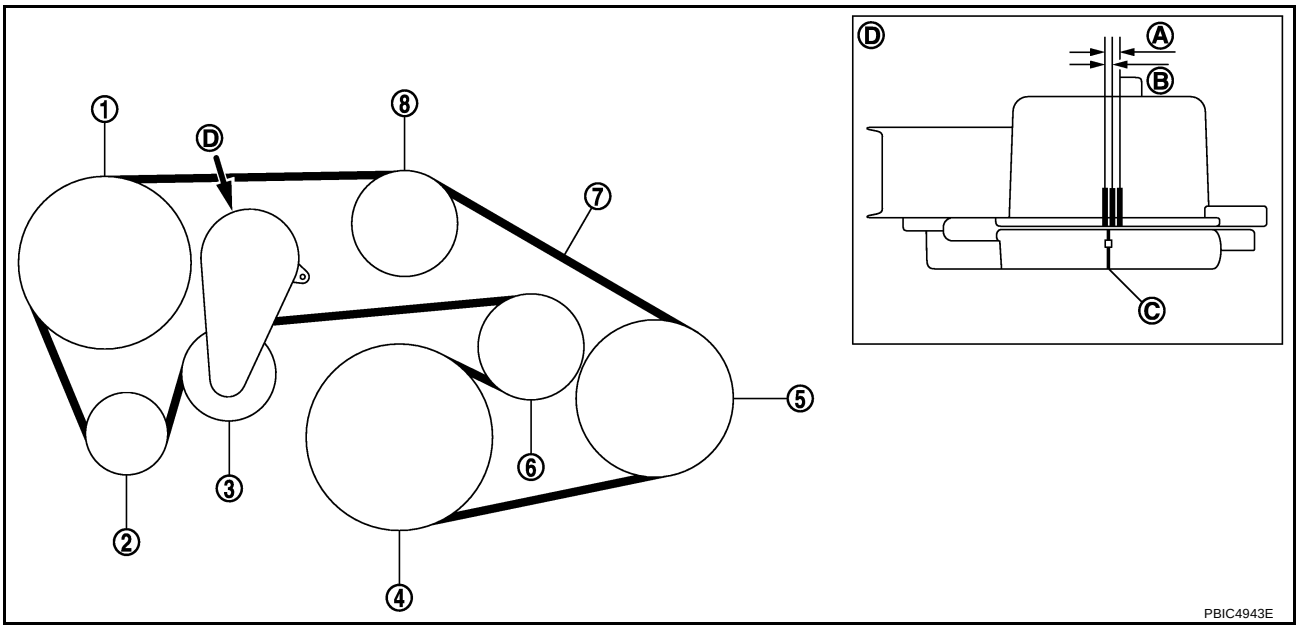
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ENGINE MAINTENANCE

PFP:00000

Checking Drive Belts

NLS0009V



1.	Power steering oil pump	2.	Alternator	3.	Drive belt auto-tensioner
4.	Crankshaft pulley	5.	A/C compressor	6.	Idler pulley
7.	Drive belt	8.	Idler pulley		
A.	Possible use range	B.	Range when new drive belt is installed	C.	Indicator
D.	View D				

WARNING:

Be sure to perform this step when engine is stopped.

- Make sure that the indicator (C) (notch on fixed side) of drive belt auto-tensioner is within the possible use range (A).

  NOTE:
  Check the drive belt auto-tensioner indication when the engine is cold.
- When new drive belt is installed, the indicator (C) (notch on fixed side) should be within the range (B) in the figure.
- Visually check entire drive belt for wear, damage or cracks.
- If the indicator (C) (notch on fixed side) is out of the possible use range or belts is damaged, replace drive belt.

Tension Adjustment

NLS0009W

Belt tension is not necessary, as it is automatically adjusted by drive belt auto-tensioner.

Changing Engine Coolant

NLS0000C

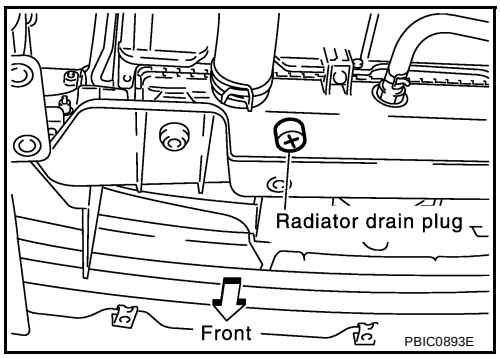
WARNING:

- **To avoid being scalded, do not change engine coolant when engine is hot.**
- **Wrap a thick cloth around cap and carefully remove cap. First, turn cap a quarter of a turn to release built-up pressure. Then turn cap all the way.**
- **Be careful not to allow engine coolant to contact drive belts.**

DRAINING ENGINE COOLANT

1. Remove undercover with power tool.

2. Open radiator drain plug at the bottom of radiator, and then remove radiator cap.



When drain all of engine coolant in the system, open water drain plugs on engine cylinder block. Refer to EM-108, "DISASSEMBLY" .

3. Remove reservoir tank as necessary, and drain engine coolant and clean reservoir tank before installing.
4. Check drained engine coolant for contaminants such as rust, corrosion or discoloration.
   If contaminated, flush the engine cooling system. Refer to MA-15, "FLUSHING COOLING SYSTEM" .

REFILLING ENGINE COOLANT

1. Install reservoir tank, and radiator drain plug.

   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

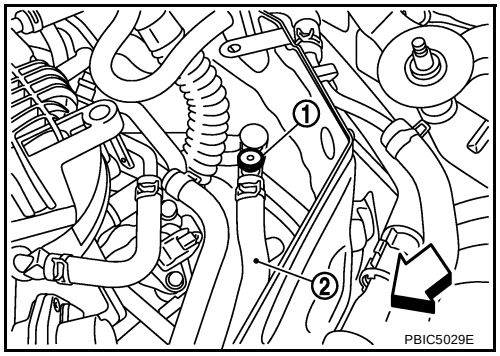
   Radiator drain plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-111, "ASSEMBLY" .

2. Make sure that each hose clamp has been firmly tightened.
3. Remove air relief plug (1) on heater hose (2).

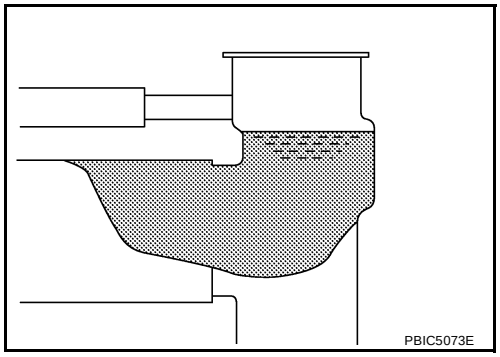
   ⇦ **: Vehicle front**



4. Fill radiator and reservoir tank to specified level.
   - **Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (2-1/8 US qt, 1-3/4 Imp qt) a minute to allow air in system to escape.**
   - **Use Genuine NISSAN Long Life Antifreeze/Coolant or equivalent mixed with water (distilled or demineralized). Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS".**

   Engine coolant capacity
   (with reservoir tank at "MAX" level)

   : Approx. 9.0 ℓ (9-1/2 US qt, 7-7/8 Imp qt)



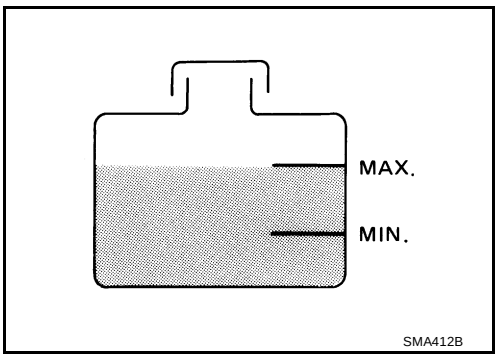
Reservoir tank capacity (at "MAX" level)

: 0.8 ℓ (7/8 US qt, 3/4 Imp qt)

- When engine coolant overflows air relief hole on heater hose, install air relief plug with new O-ring.

Air relief plug:

: 1.2 N·m (0.12 kg-m, 11 in-lb)



5. Install radiator cap.
6. Warm up until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
   - Make sure thermostat condition by touching radiator hose (lower) to see flow of warm water.

   CAUTION:
   Watch water temperature gauge so as not to overheat engine.
7. Stop engine and cool down to less than approximately 50°C (122°F).
   - Cool down using fan to reduce the time.
   - If necessary, refill radiator up to filler neck with engine coolant.
8. Refill reservoir tank to "MAX" level line with engine coolant.
9. Repeat steps 4 through 7 two or more times with radiator cap installed until engine coolant level no longer drops.
10. Check cooling system for leaks with engine running.
11. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between "COOL" and "WARM".
    - Sound may be noticeable at heater unit.
12. Repeat step 11 three times.
13. If sound is heard, bleed air from cooling system by repeating step 4 through 7 until engine coolant level no longer drops.
    - **Clean excess engine coolant from engine.**

FLUSHING COOLING SYSTEM

1. Install reservoir tank, and radiator drain plug.

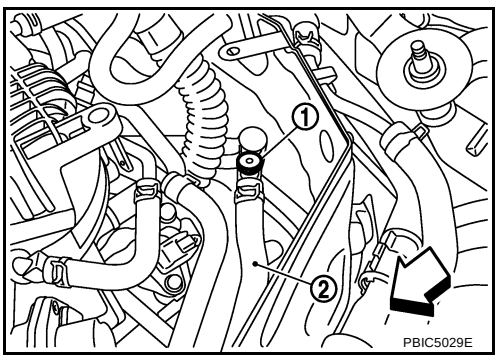
   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

   Radiator drain plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-111, "ASSEMBLY" .
2. Remove air relief plug (1) on heater hose (2).

   ⇦ **: Vehicle front**



3. Fill radiator with water until water spills from the air relief hole, then close air relief plug. Fill radiator and reservoir tank with water and reinstall radiator cap.

Air relief plug:

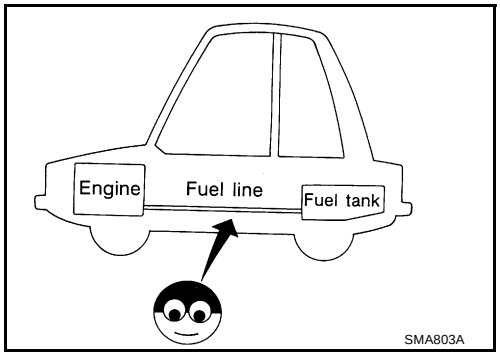
: 1.2 N·m (0.12 kg-m, 11 in-lb)

4. Run engine and warm it up to normal operating temperature.
5. Rev engine two or three times under no-load.
6. Stop engine and wait until it cools down.
7. Drain water from the system. Refer to MA-13, "DRAINING ENGINE COOLANT" .
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.

Checking Fuel Lines

NLS0000D

Inspect fuel lines, fuel filler cap and fuel tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.

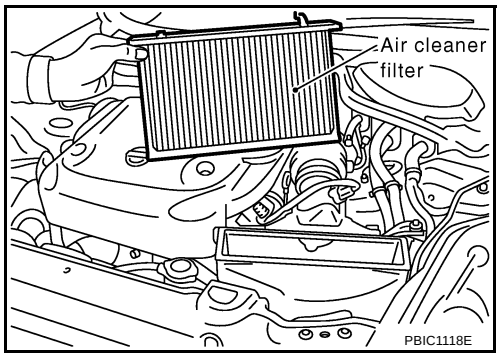


Changing Air Cleaner Filter

NLS0000E

VISCOUS PAPER TYPE

The viscous paper type filter does not need cleaning between replacement intervals. Refer to MA-7, "PERIODIC MAINTENANCE" .



Changing Engine Oil

NLS0000F

WARNING:

- **Be careful not to burn yourself, as engine oil may be hot.**
- **Prolonged and repeated contact with used engine oil may cause skin cancer. Try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.**

1. Warm up engine, put vehicle horizontally and check for oil leakage from engine components. Refer to LU-6, "ENGINE OIL LEAKAGE" .
2. Stop engine and wait for 10 minutes.
3. Loosen oil filler cap and then remove drain plug.
4. Drain engine oil.
5. Install drain plug with new washer. Refer to EM-26, "OIL PAN AND OIL STRAINER" .

   CAUTION:
   Be sure to clean drain plug and install with new washer.

   Oil pan drain plug:

   : 34.3 N·m (3.5 kg-m, 25 ft-lb)

6. Refill with new engine oil.
   Engine oil specification and viscosity:
   Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Engine oil capacity (Approximate):

Unit: ℓ (US qt, Imp qt)

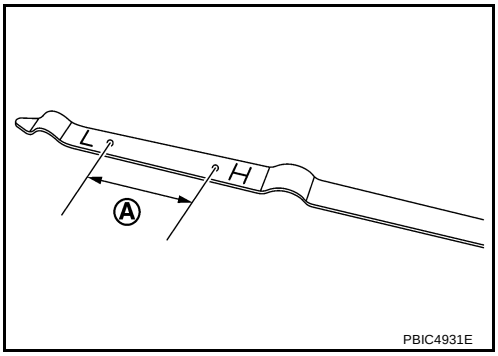
Drain and refill	With oil filter change	4.9 (5-1/8, 4-1/4)
	Without oil filter change	4.6 (4-7/8, 4)
Dry engine (Overhaul)		5.5 (5-3/4, 4-7/8)

CAUTION:

- **When filling engine oil, do not pull out oil level gauge.**
- **The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.**
- **Always use oil level gauge to determine the proper amount of engine oil in the engine.**

7. Warm up engine and check area around drain plug and oil filter for oil leakage.
8. Stop engine and wait for 10 minutes.
9. Check the engine oil level.

A : Make sure that the oil level is between "L" and "H"



Changing Oil Filter

NLS0000G

REMOVAL

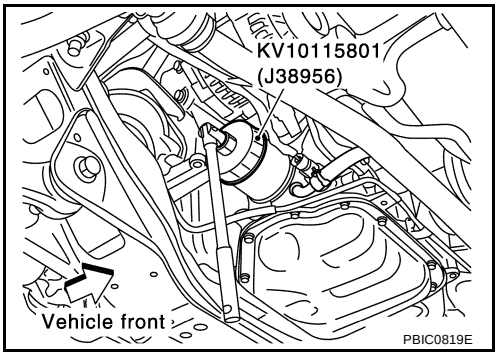
WARNING:

Be careful not to get burned when engine and engine oil may be hot.

1. Remove undercover with power tool.
2. Using oil filter wrench [SST], remove oil filter.

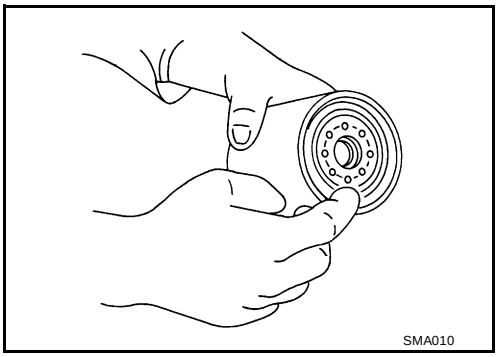
CAUTION:

- **Oil filter is provided with relief valve. Use Genuine NISSAN Oil Filter or equivalent.**
- **When removing, prepare a shop cloth to absorb any engine oil leakage or spillage.**
- **Do not allow engine oil to adhere to drive belts.**
- **Completely wipe off any engine oil that adheres to engine and vehicle.**



INSTALLATION

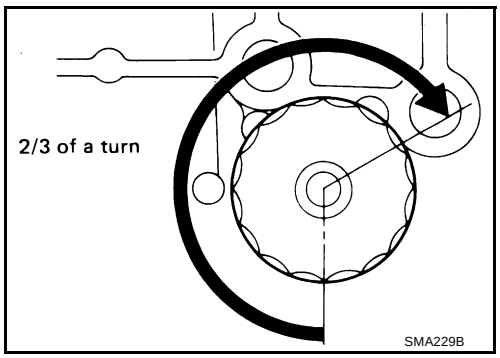
1. Remove foreign materials adhering to oil filter installation surface.
2. Apply engine oil to the oil seal contact surface of new oil filter.



3. Screw oil filter manually until it touches the installation surface, then tighten it by 2/3 turn. Or tighten to specification.

Oil filter:

: 17.7 N·m (1.8 kg-m, 13 ft-lb)



INSPECTION AFTER INSTALLATION

1. Check the engine oil level. Refer to MA-16, "Changing Engine Oil" .
2. Start engine, and check there is no leak of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and adjust engine oil. Refer to MA-16, "Changing Engine Oil" .

Changing Spark Plugs (Iridium-Tipped Type)

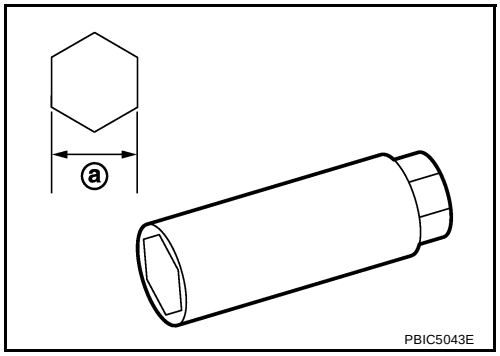
NLS0000H

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove ignition coil. Refer to EM-31, "IGNITION COIL" .
3. Remove spark plug using spark plug wrench (commercial service tool).

CAUTION:
Do not drop or shock it.

a : 14 mm (0.55 in)



INSPECTION AFTER REMOVAL

Make	DENSO
Standard type	FXE22HR-11

Gap (Nominal) : 1.1 mm (0.043 in)

CAUTION:

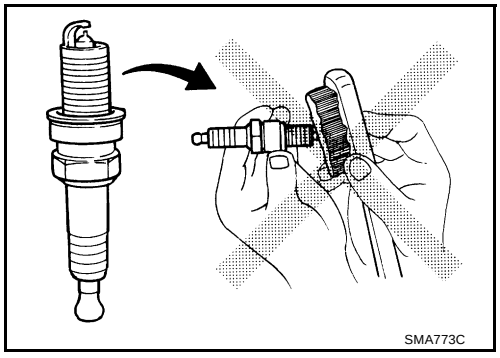
- **Do not drop or shock spark plug.**
- **Do not use wire brush for cleaning.**
- **If plug tip is covered with carbon, spark plug cleaner may be used.**

Cleaner air pressure:

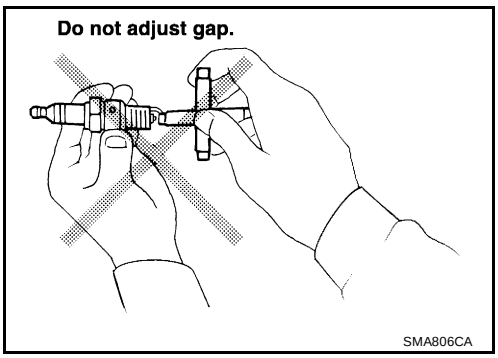
Less than 588 kPa (6 kg/cm^2 , 85 psi)

Cleaning time:

Less than 20 seconds



- **Checking and adjusting plug gap is not required between change intervals.**



INSTALLATION

Installation is the reverse order of removal.

Spark plug:

: 19.6 N·m (2.0 kg-m, 14 ft-lb)

Checking EVAP Vapor Lines

NLS0000I

1. Visually inspect EVAP vapor lines for improper attachment and for cracks, damage, loose connections, chafing and deterioration.
2. Inspect fuel tank filler cap vacuum relief valve for clogging, sticking, etc.
   Refer to EC-33, "EVAPORATIVE EMISSION SYSTEM" .

CHASSIS AND BODY MAINTENANCE

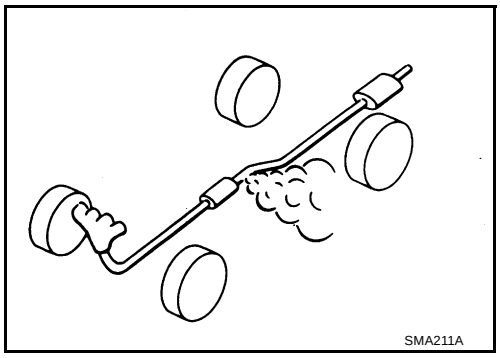
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Checking Exhaust System

NLS0000J

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage, chafing or deterioration.

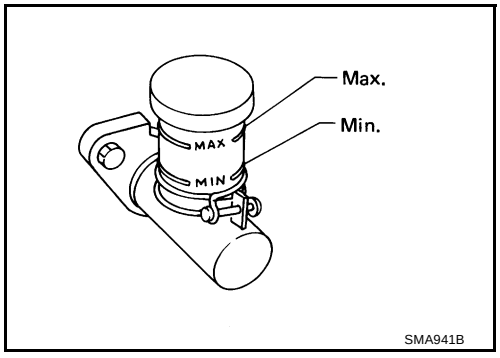
- If anything is found, repair or replace damaged parts.



Checking Clutch Fluid Level and Leaks

NLS0000K

If fluid level is extremely low, check clutch system for leaks.



Checking M/T Oil

NLS0000L

Check for oil leakage.

Changing M/T Oil

NLS0000M

1. Drain oil from drain plug and refill with new gear oil.
2. Check oil level.

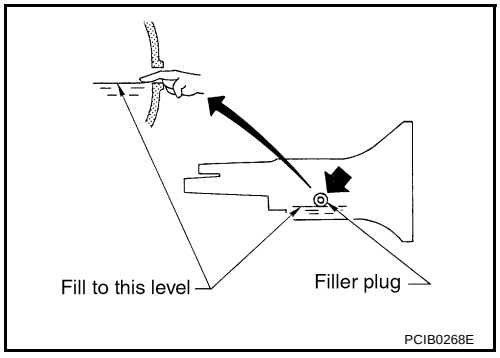
Oil grade and viscosity: **Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .**

Oil capacity: **Approx. 2.9 ℓ (3-1/8 US qt, 2-1/2 Imp qt)**

Filler plug and drain plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)

CAUTION:
Do not reuse gasket.

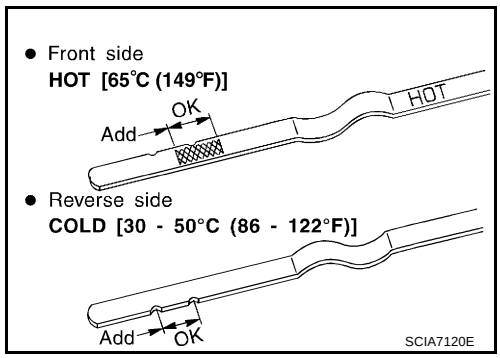


Checking A/T Fluid

NLS0000N

1. Warm up engine.
2. Check for A/T fluid leakage.
3. Loosen the level gauge bolt.

4. Before driving, A/T fluid level can be checked at A/T fluid temperatures of 30 to 50°C (86 to 122°F) using “COLD” range on A/T fluid level gauge as follows.



a. Park vehicle on level surface and set parking brake.

b. Start engine and move selector lever through each gear position. Leave selector lever in “P” position.

c. Check A/T fluid level with engine idling.

d. Remove A/T fluid level gauge and wipe clean with lint-free paper.

CAUTION:
When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.

e. Re-insert A/T fluid level gauge into A/T fluid charging pipe as far as it will go.

CAUTION:
To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions.

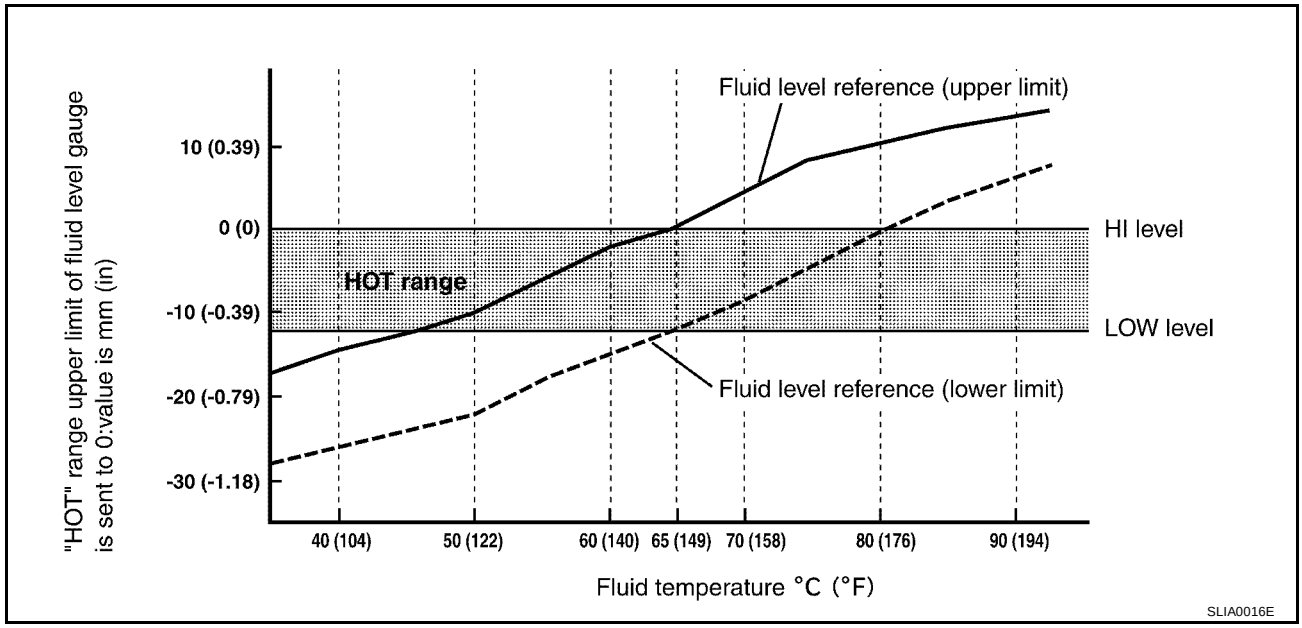
f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add ATF to the A/T fluid charging pipe.

CAUTION:
Do not overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.

6. Make the A/T fluid temperature approximately 65°C (149°F).

NOTE:
A/T fluid level will be greatly affected by temperature as shown in figure. Therefore, be certain to perform operation while checking data with CONSULT-II.



a. Connect CONSULT-II to data link connector.

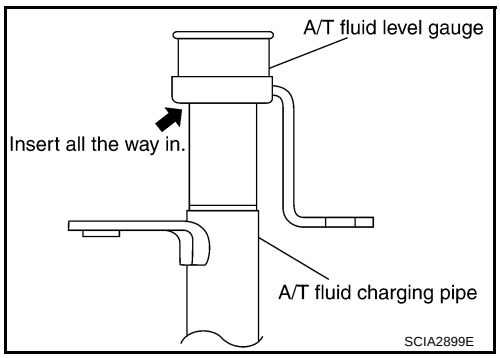
b. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.

c. Read out the value of “ATF TEMP 1”.

7. Re-check A/T fluid level at A/T fluid temperatures of approximately 65°C (149°F) using “HOT” range on A/T fluid level gauge.

CAUTION:
- **When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.**

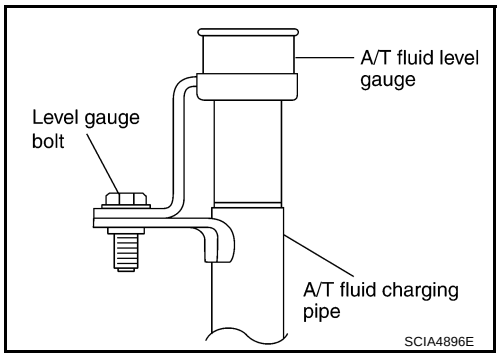
- **To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the gauge reversed from the normal attachment conditions as shown.**



8. Check A/T fluid condition.
   - If ATF is very dark or smells burned, check operation of A/T. Flush cooling system after repair of A/T.
   - If ATF contains frictional material (clutches, bands, etc.), replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to CO-13, "RADIATOR" and AT-14, "A/T Fluid Cooler Cleaning" .
9. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
10. Tighten the level gauge bolt.

Level gauge bolt:

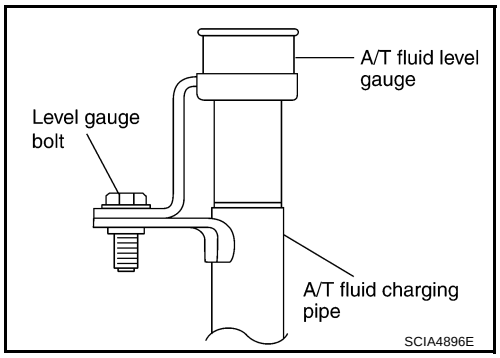
: 5.1N·m (0.52 kg-m, 45 in-lb)



Changing A/T Fluid

NLS0000O

1. Warm up ATF.
2. Stop engine.
3. Loosen the level gauge bolt.
4. Drain ATF from drain plug and refill with new ATF. Always refill same volume with drained ATF.
   - To replace the ATF, pour in new ATF at the A/T charging pipe with the engine idling and at the same time drain the old ATF from the radiator cooler hose return side.
   - When the color of the ATF coming out is about the same as the color of the new ATF, the replacement is complete. The amount of new ATF to use should be 30 to 50% increase of the stipulated amount.



ATF: Genuine NISSAN Matic J ATF

Fluid capacity: 10.3 ℓ (10-7/8 US qt, 9-1/8 Imp qt)

CAUTION:

- **Use only Genuine NISSAN Matic J ATF. Do not mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the NISSAN new vehicle limited warranty.**
- **When filling ATF, take care not to scatter heat generating parts such as exhaust.**
- **Do not reuse drain plug gasket.**

Drain plug:

: 34 N·m (3.5 kg-m, 25 ft-lb)

5. Run engine at idle speed for 5 minutes.
6. Check A/T fluid level and condition. Refer to MA-20, "Checking A/T Fluid" . If ATF is still dirty, repeat step 2. through 5.
7. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
8. Tighten the level gauge bolt.

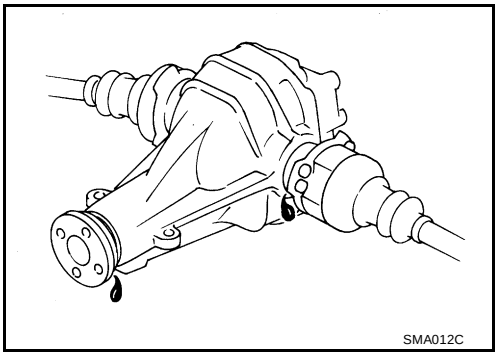
Level gauge bolt:

: 5.1 N·m (0.52 kg-m, 45 in-lb)

Checking Differential Gear Oil

NLS0000P

Check for oil leakage.



Changing Differential Gear Oil

NLS0000Q

1. Drain oil from drain plug and refill with new gear oil.
2. Check oil level.

Oil grade and Viscosity:

Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Capacity:

R200, R200V

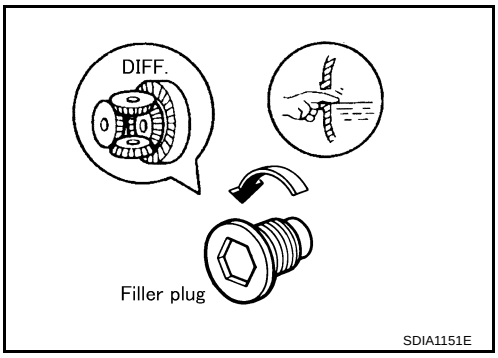
1.4 ℓ (3 US pt, 2 - 1/2 Imp pt)

Drain plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)

Filler plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)



CAUTION:

Gaskets are not reusable. Never reuse them.

Balancing Wheels (Bonding Weight Type)

NLS0000R

REMOVAL

1. Remove inner and outer balance weights from the road wheel.

CAUTION:

Be careful not to scratch the road wheel during removal.

2. Using releasing agent, remove double-faced adhesive tape from the road wheel.

CAUTION:

- **Be careful not to scratch the road wheel during removal.**
- **After removing double-faced adhesive tape, wipe clean traces of releasing agent from the road wheel.**

WHEEL BALANCE ADJUSTMENT

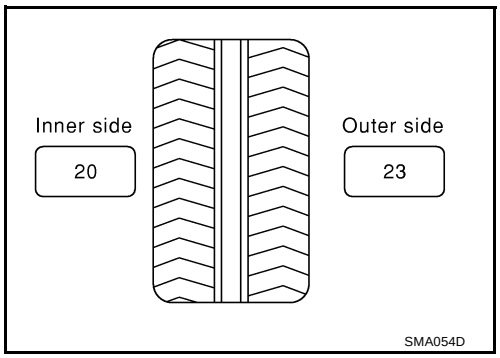
- If a tire balance machine has adhesion balance weight mode settings and drive-in weight mode setting, select and adjust a drive-in weight mode suitable for road wheels.

1. Set road wheel on tire balance machine using the center hole as a guide. Start the tire balance machine.
2. When inner and outer unbalance values are shown on the tire balance machine indicator, multiply outer unbalance value by 5/3 to determine balance weight that should be used. Select the outer balance weight with a value closest to the calculated value above and install it to the designated outer position of, or at the designated angle in relation to the road wheel.

CAUTION:

- **Do not install the inner balance weight before installing the outer balance weight.**
- **Before installing the balance weight, be sure to clean the mating surface of the road wheel.**

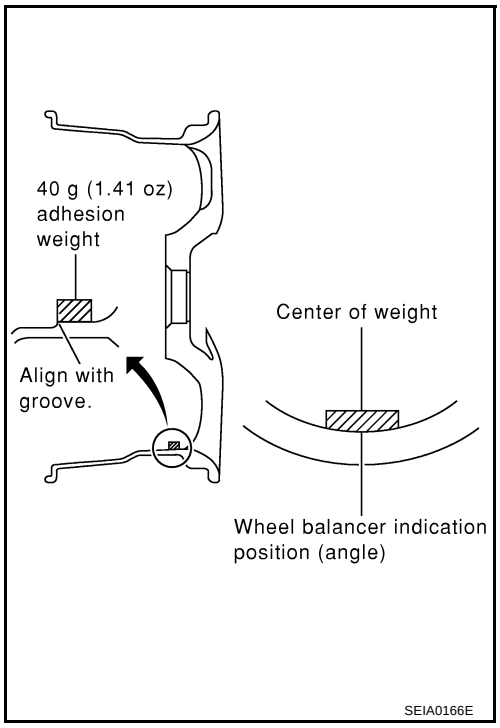
Indicated unbalance value × 5/3 = balance weight to be installed
Calculation example:
23 g (0.81 oz) × 5/3 = 38.33 g (1.35 oz) = 40 g (1.41 oz) balance weight (closer to calculated balance weight value)
Note that balance weight value must be closer to the calculated balance weight value.
Example:
37.4 = 35 g (1.23 oz)
37.5 = 40 g (1.41 oz)



a. Install balance weight in the position shown in the figure at right.
b. When installing balance weight to road wheels, set it into the grooved area on the inner wall of the road wheel as shown in the figure so that the balance weight center is aligned with the tire balance machine indication position (angle).

CAUTION:

- **Always use genuine NISSAN adhesion balance weights.**
- **Balance weights are unreusable; always replace with new ones.**
- **Do not install more than three sheets of balance weight.**

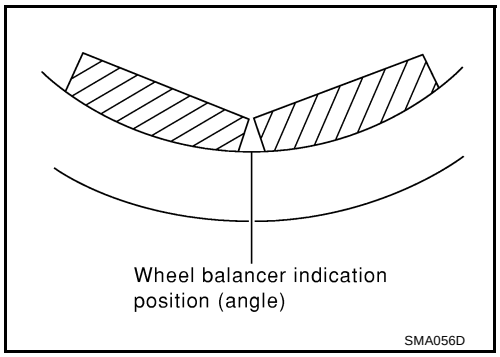


c. If calculated balance weight value exceeds 50 g (1.76 oz), install two balance weight sheets in line with each other (as shown in the figure).

CAUTION:
Do not install one balance weight sheet on top of another.

3. Start tire balance machine again.
4. Install drive-in balance weight on inner side of road wheel in the tire balance machine indication position (angle).

CAUTION:
Do not install more than two balance weights.



5. Start tire balance machine. Make sure that inner and outer residual unbalance values are 5 g (0.17 oz) each or below.
   - If either residual unbalance value exceeds 5 g (0.17 oz), repeat installation procedures.

Wheel balance (Maximum allowable unbalance):

Maximum allowable unbalance	Dynamic (At rim flange)	Less than 5 g (0.17 oz) (one side)
	Static (At rim flange)	Less than 10 g (0.35 oz)

Tire Rotation

NLS0000S

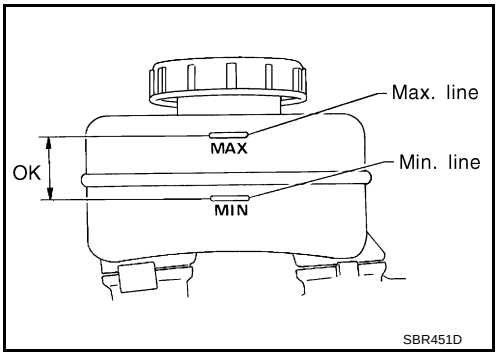
CAUTION:
Do not include the T-type spare tire when rotating the tires.
Use NISSAN genuine wheel nuts for aluminum wheels.

NOTE:
Tire cannot be rotated in vehicle, as front tire are different size from rear tire and the direction of wheel rotation is fixed in each tire.

Checking Brake Fluid Level and Leaks

NLS0000T

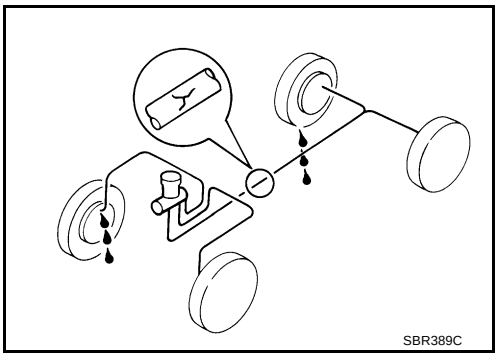
- If fluid level is extremely low, check brake system for leaks.



Checking Brake Lines and Cables

NLS0000U

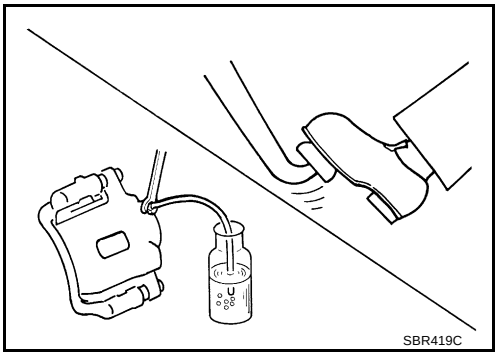
- Check brake fluid lines and parking brake cables for improper attachment, leaks, chafing, abrasions, deterioration, etc.



Changing Brake Fluid

NLS0000V

1. Drain brake fluid from each bleed valve.
2. Refill until new brake fluid comes out from each bleed valve.
   Use same procedure as in bleeding hydraulic system to refill brake fluid.
   Refer to BR-10, "BRAKE FLUID" .
   - Refill with recommended Genuine Brake Fluid or equivalent DOT 3 (US FMVSS No. 116).
     Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
   - Never reuse drained brake fluid.
   - Be careful not to splash brake fluid on painted areas.



Checking Disc Brake

NLS0000W

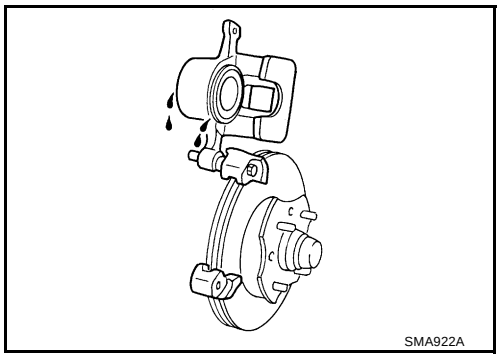
ROTOR

Check condition, wear, and damage.

	Front		Rear	
Brake model	Other than brembo	With brembo	Other than brembo	With brembo
Standard thickness (new)	28.0 mm (1.102 in)	30.0 mm (1.181 in)	16.0 mm (0.630 in)	22.0 mm (0.866 in)
Runout limit (with it attached to the vehicle)	0.035 mm (0.0014 in)	0.040 mm (0.0016 in)	0.055 mm (0.0022 in)	0.07 mm (0.0028 in)
Repair limit thickness	26.0 mm (1.024 in)	28.4 mm (1.118 in)	14.0 mm (0.551 in)	20.2 mm (0.795 in)

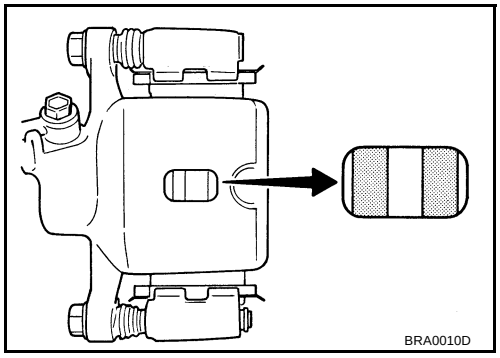
CALIPER

- Check for leakage.



PAD

- Check for wear or damage.



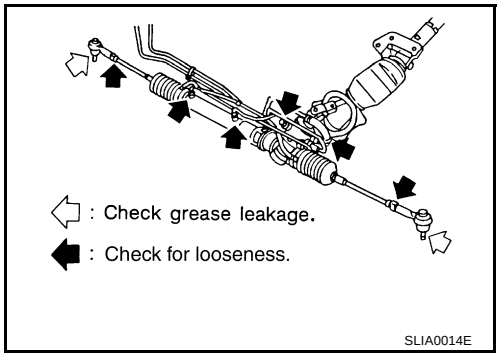
	Front		Rear	
Brake model	Other than brembo	With brembo	Other than brembo	With brembo
Standard thickness (new)	11.0 mm (0.433 in)	9.3 mm (0.366 in)	8.5 mm (0.335 in)	9.1 mm (0.358 in)
Repair limit thickness	2.0 mm (0.079 in)	2.0 mm (0.079 in)	2.0 mm (0.079 in)	2.0 mm (0.079 in)

Checking Steering Gear and Linkage

NLS0000X

STEERING GEAR

- Check gear housing and boots for looseness, damage and grease leakage.
- Check connection with steering column for looseness.



STEERING LINKAGE

Check ball joint, dust cover and other component parts for looseness, wear, damage and grease leakage.

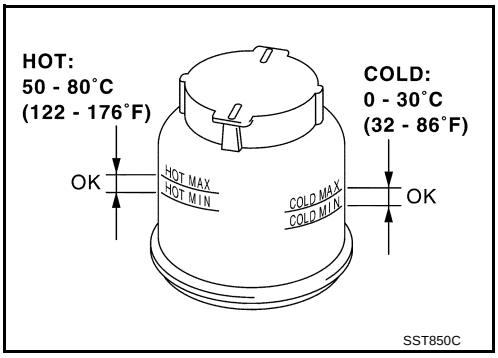
Checking Power Steering Fluid and Lines

NLS0000Y

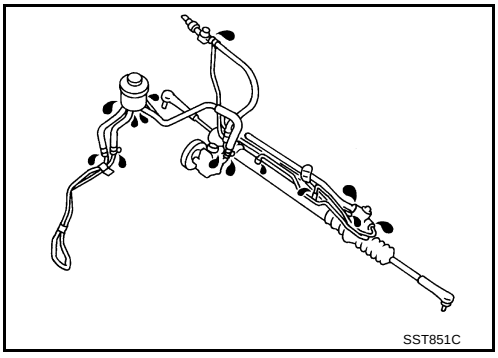
Check fluid level in reservoir tank with engine off.
Use “HOT” range at fluid temperatures of 50 to 80°C (122 to 176°F) or “COLD” range at fluid temperatures of 0 to 30°C (32 to 86°F).

CAUTION:

- **Do not overfill.**
- **Recommended fluid is Genuine NISSAN PSF or equivalent. Refer to** **MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS"**



- **Check lines for improper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.**
- **Check rack boots for accumulation of power steering fluid.**

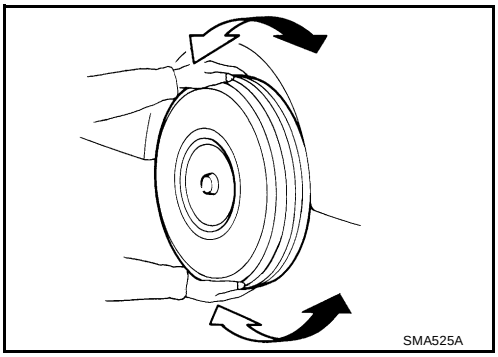


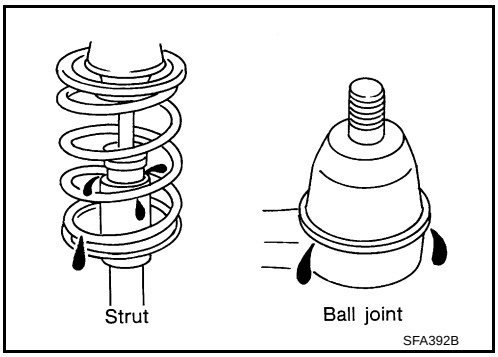
Axle and Suspension Parts

NLS0000Z

Check front and rear axle and suspension parts for excessive play, cracks, wear or other damage.

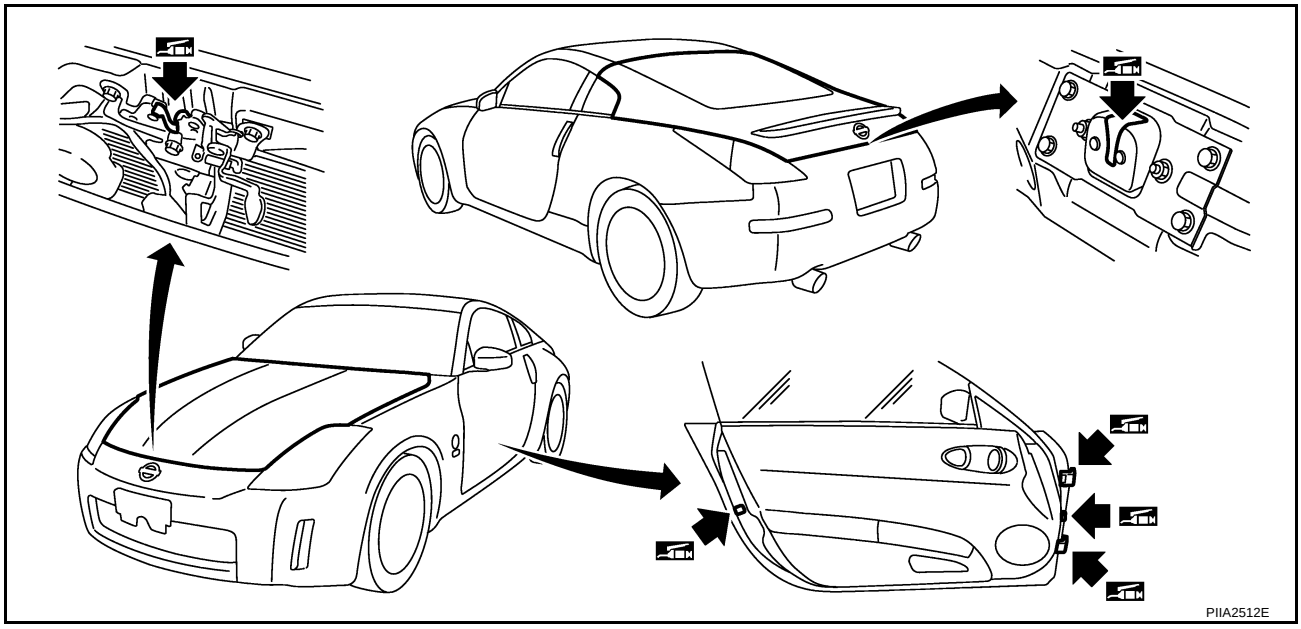
- Shake each wheel to check for excessive play.
- Check wheel bearings for smooth operation.
- Check axle and suspension nuts and bolts for looseness.
- Check strut (shock absorber) for oil leakage or other damage.
- Check suspension ball joint for grease leakage and ball joint dust cover for cracks or other damage.





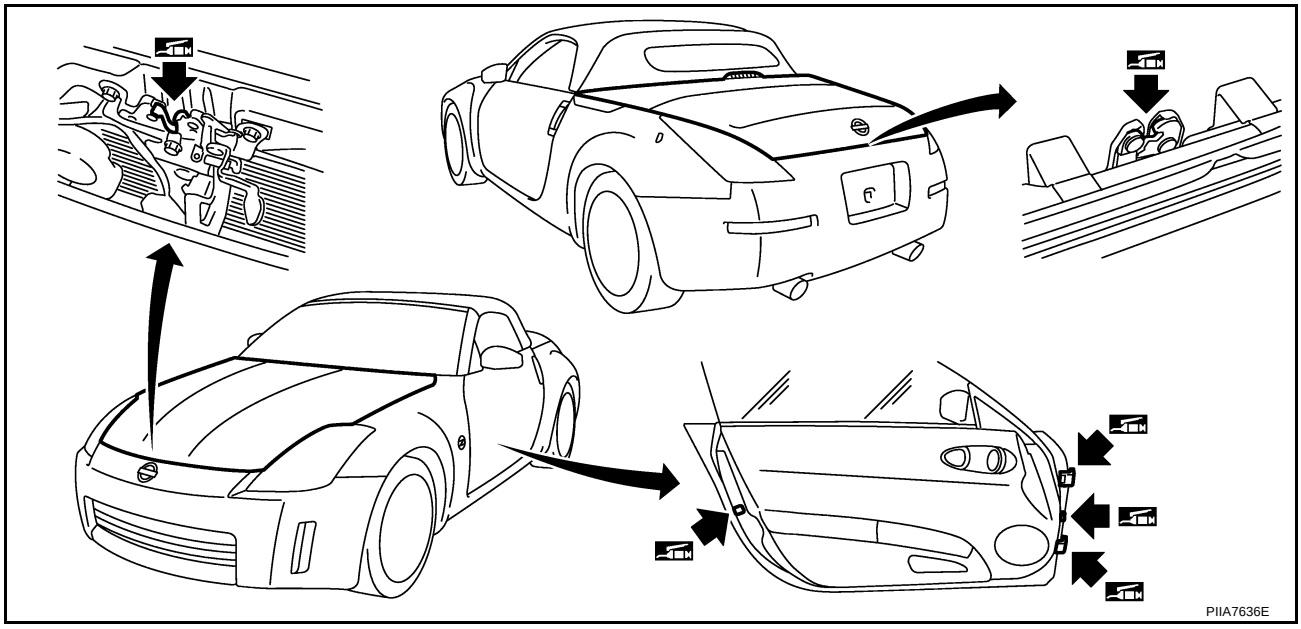
Lubricating Locks, Hinges and Hood Latch (Coupe)

NLS00010



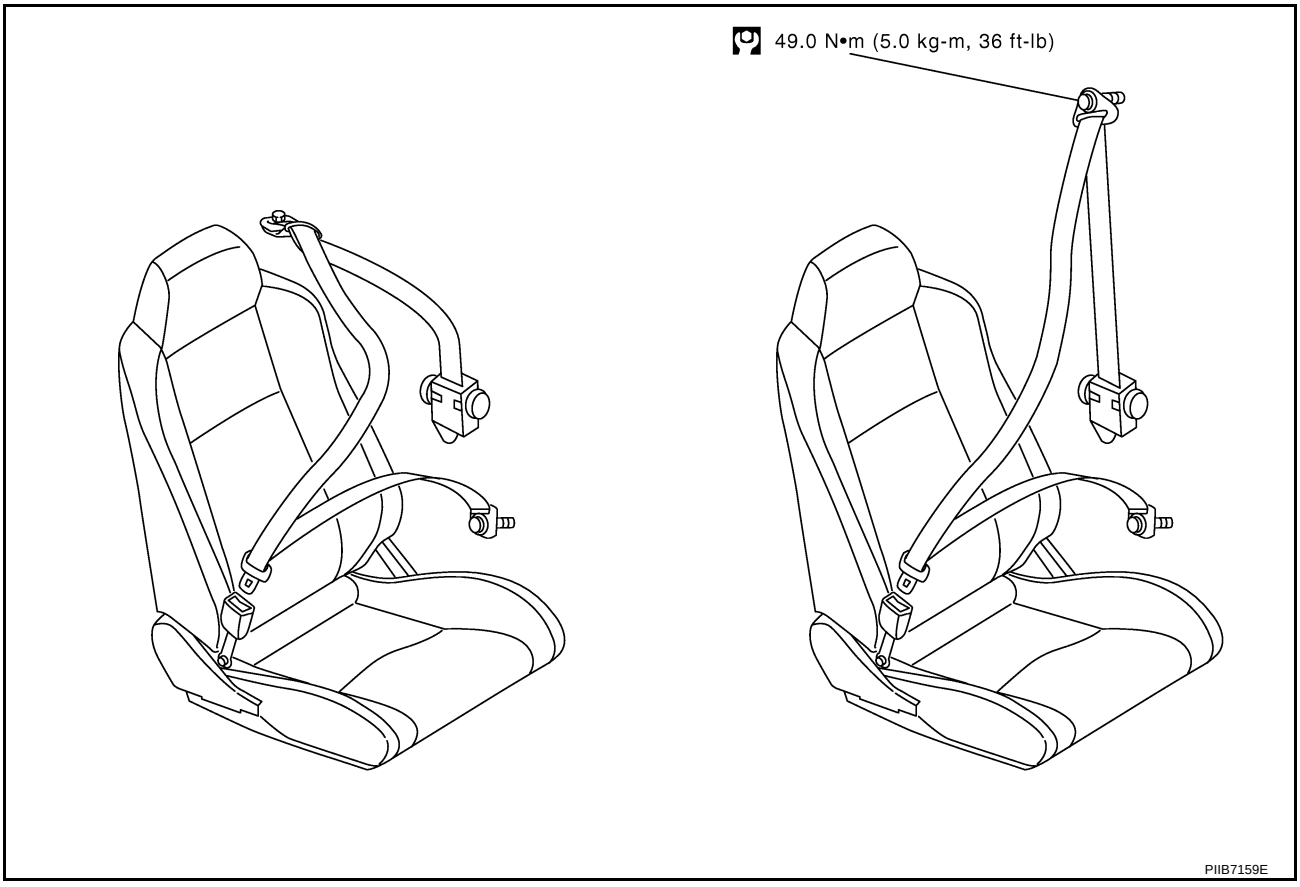
Lubricating Locks, Hinges and Hood Latch (Roadster)

NLS00011



Checking Seat Belt, Buckles, Retractors, Anchors and Adjusters

NLS0005L



CAUTION:

- **After any collision, inspect all seat belt assemblies, including retractors and other attached hardwares (I.e. anchor bolt, guide rail set). Nissan recommends to replace all seat belt assemblies in use during a collision, unless not damaged and properly operating after minor collision.**
  Also inspect seat belt assemblies not in use during a collision, and replace if damaged or improperly operating.
  Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision where the driver and passenger air bags are deployed.
- **If any component of seat belt assembly is questionable, do not repair.**
  Replace as seat belt assembly.
- **If webbing is cut, frayed, or damaged, replace belt assembly.**
- **Never oil tongue and buckle.**
- **Use a genuine NISSAN seat belt assembly.**

For details, refer to Refer to Service Manual in SB section.

- Check anchors for loose mounting
- Check belts for damage
- Check retractor for smooth operation
- Check function of buckles and tongues when buckled and released

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

NLS00014

BELT DEFLECTION AND TENSION

Tension of drive belts	Auto adjustment by auto tensioner

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at “MAX” level)	9.0 (9-1/2, 7-7/8)
Reservoir tank engine coolant capacity (at MAX level)	0.8 (7/8, 3/4)

ENGINE OIL CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.9 (5-1/8, 4-1/4)
	Without oil filter change	4.6 (4-7/8, 4)
Dry engine (Overhaul)		5.5 (5-3/4, 4-7/8)

SPARK PLUG (IRIDIUM-TIPPED TYPE)

Make	DENSO
Standard type	FXE22HR-11
Gap (Nominal)	1.1 mm (0.043 in)

WHEEL BALANCE

Maximum allowable unbalance	Dynamic (At rim flange)	Less than 5 g (0.17 oz) (one side)
	Static (At rim flange)	Less than 10 g (0.35 oz)

Tightening Torque

NLS00015

Unit: N·m (kg-m, ft-lb),
Unit: N·m (kg-m, in-lb)*

Radiator drain plug	1.2 (0.12, 11)*
Air relief plug	1.2 (0.12, 11)*
Oil pan drain plug	34.3 (3.5, 25)
Oil filter	17.7 (1.8, 13)
Spark plug	19.6 (2.0, 14)

SECTION MT
MANUAL TRANSMISSION

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

NCS0000N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Service Notice or Precautions

NCS0000O

- If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube . Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.
- Do not reuse transmission oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transmission clear of dust or dirt.
- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Be careful not to damage sliding surfaces and mating surfaces.
- Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.

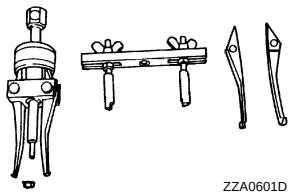
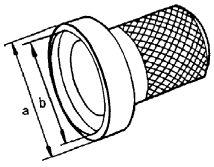
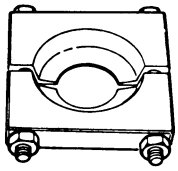
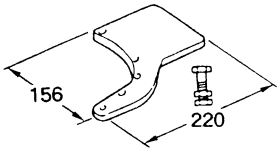
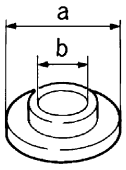
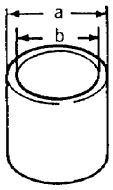
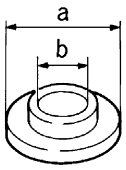
PREPARATION

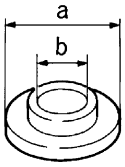
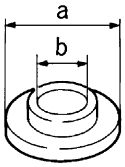
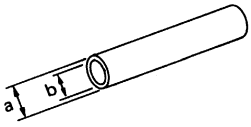
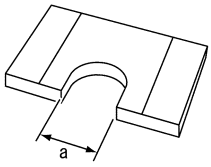
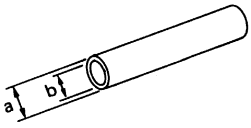
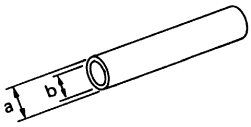
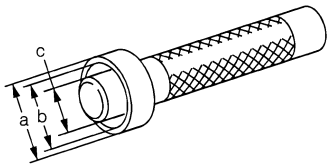
PFP:00002

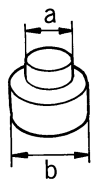
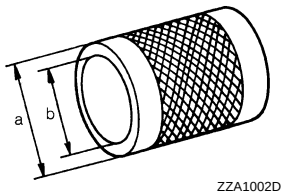
Special Service Tools

NCS0000P

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

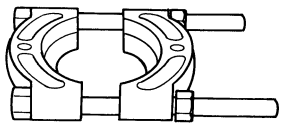
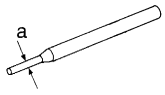
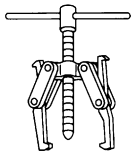
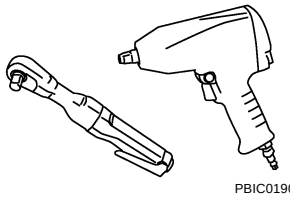
Tool number (Kent-Moore No.) Tool name		Description
KV381054S0 (J-34286) Oil seal puller	 ZZA0601D	Removing rear oil seal
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.	 ZZA0814D	Installing rear oil seal
ST30031000 (J-22912-01) Puller	 ZZA0537D	Measuring wear of inner baulk ring
ST22490000 (—) Adapter setting plate	 156 220 ZZC0465D	Holding a adapter plate
ST30911000 (—) Inserter a: 98 mm (3.86 in) dia. b: 40.5 mm (1.594 in) dia.	 a b ZZA0920D	● Installing main shaft bearing ● Installing 5th-6th synchronizer assembly ● Installing reverse main gear bushing ● Installing 3rd gear bushing ● Installing 3rd-4th synchronizer assembly
ST27861000 (—) Support ring a: 62 mm (2.44 in) dia. b: 52 mm (2.05 in) dia.	 a b ZZA0832D	● Installing 1st-2nd synchronizer assembly ● Installing 1st gear bushing
ST30022000 (—) Inserter a: 110 mm (4.33 in) dia. b: 46 mm (1.81 in) dia.	 a b ZZA0920D	● Installing 3rd main gear ● Installing 4th main gear

Tool number (Kent-Moore No.) Tool name	Description
KV40100630 (J-26092) Inserter a: 67.5 mm (2.657 in) dia. b: 38.5 mm (1.516 in) dia.  ZZA0920D	Installing 4th counter gear thrust washer
ST30032000 (J-26010-01) Inserter a: 80 mm (3.15 in) dia. b: 31 mm (1.22 in) dia.  ZZA0920D	Installing counter rear bearing inner race
KV32102700 (—) Drift a: 48.6 mm (1.913 in) dia. b: 41.6 mm (1.638 in) dia.  ZZA0534D	Installing main drive gear bearing
KV32103300 (J-46529) Press plate a: 73 mm (2.87 in) dia.  PCIB0165J	Installing reverse synchronizer assembly
ST01530000 (—) Drift a: 50 mm (1.97 in) dia. b: 41 mm (1.61 in) dia.  ZZA0534D	Installing reverse synchronizer assembly
ST23860000 (—) Drift a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia.  ZZA0534D	Installing reverse counter gear
KV38102100 (J-25803-01) Drift a: 44 mm (1.73 in) dia. b: 36 mm (1.42 in) dia. c: 24.5 mm (0.965 in) dia.  ZZA1046D	Installing front cover oil seal

Tool number (Kent-Moore No.) Tool name	Description
ST33061000 (J-8107-2) Drift a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.  ZZA1023D	Installing striking rod oil seal
ST33200000 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.  ZZA1002D	Installing counter rear bearing

Commercial Service Tools

NCS0000Q

Tool name	Description
Puller  ZZB0823D	Removing each bearing, gear and bushing
Pin punch a: 6.0 mm (0.24 in) dia.  NT410	Removing and installing each retaining pin
Puller  NT077	● Removing reverse synchronizer assembly ● Removing reverse counter gear ● Removing reverse main gear
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NCS0000R

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

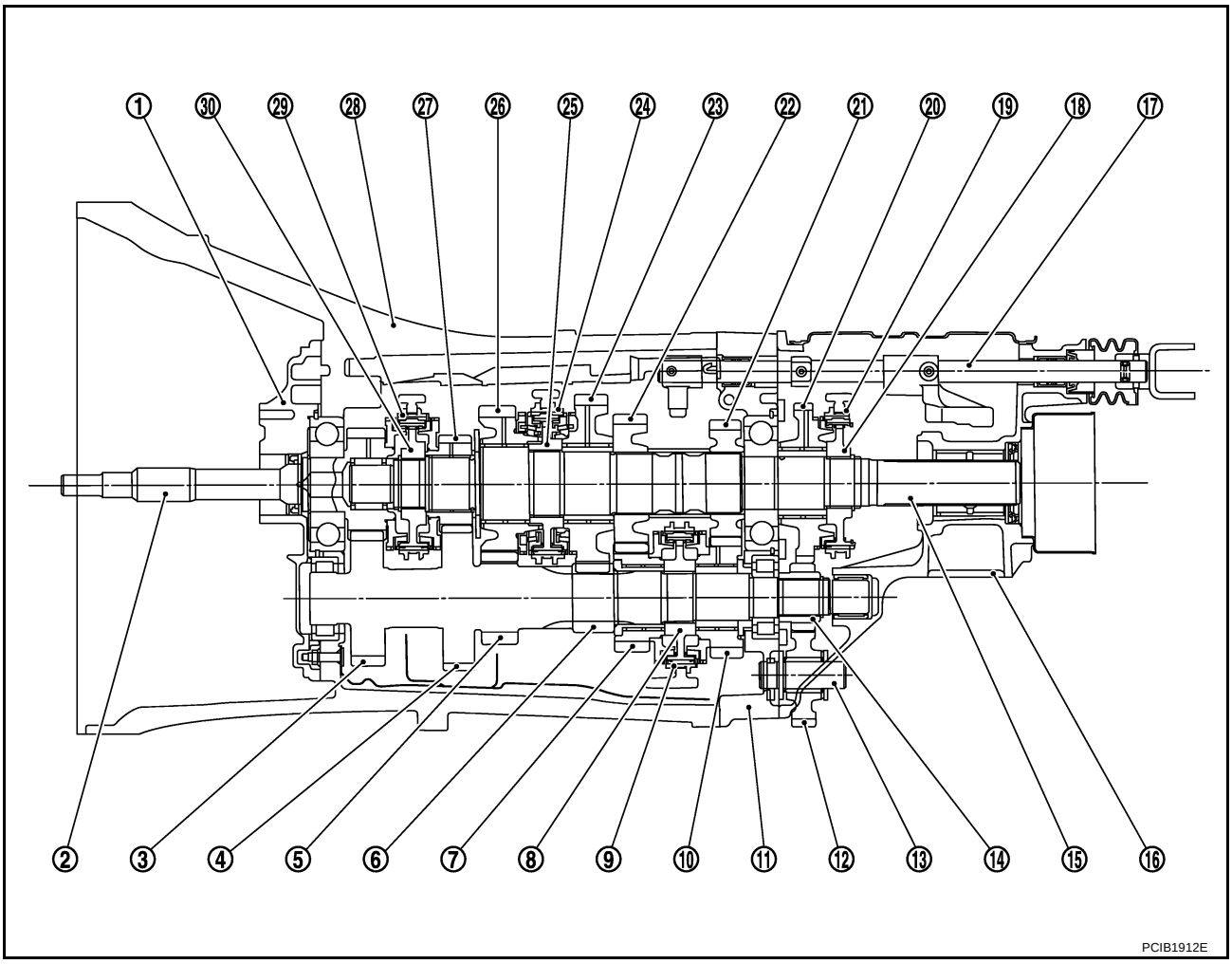
Reference page		MT-9	MT-9	MT-9	MT-22	MT-22	MT-12	MT-26	MT-26	MT-24	MT-24	MT-24	MT-24
SUSPECTED PARTS (Possible cause)		OIL (Oil level is low.)	OIL (Wrong oil.)	OIL (Oil level is high.)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	SHIFT CONTROL LINKAGE (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptoms	Noise	1	2							3	3		
	Oil leakage		3	1	2	2							
	Hard to shift or will not shift		1	1			2					2	2
	Jumps out of gear						1	1	2	2			

DESCRIPTION

PFP:00000

Cross-Sectional View

NCS0000S



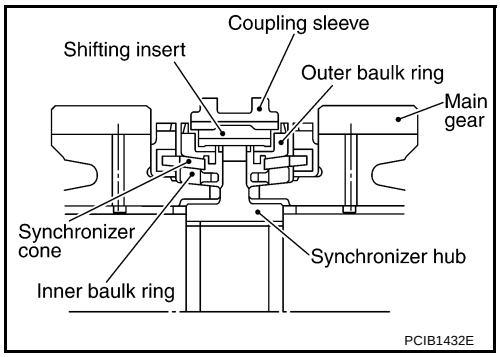
1. Front cover
2. Main drive gear
3. Counter shaft
4. 6th counter gear
5. 2nd counter gear
6. 1st counter gear
7. 3rd counter gear
8. 3rd-4th synchronizer hub
9. 3rd-4th coupling sleeve
10. 4th counter gear
11. Adapter plate
12. Reverse idler gear
13. Reverse idler shaft
14. Reverse counter gear
15. Main shaft
16. Rear extension
17. Striking rod
18. Reverse synchronizer hub
19. Reverse coupling sleeve
20. Reverse main gear
21. 4th main gear
22. 3rd main gear
23. 1st main gear
24. 1st-2nd coupling sleeve
25. 1st-2nd synchronizer hub
26. 2nd main gear
27. 6th main gear
28. Transmission case
29. 5th-6th coupling sleeve
30. 5th-6th synchronizer hub

DOUBLE-CONE SYNCHRONIZER

The 4th gear is equipped with a double-cone synchronizer to reduce the operating force of the shift lever.

TRIPLE-CONE SYNCHRONIZER

The 1st, 2nd and 3rd gears are equipped with a triple-cone synchronizer to reduce the operating force of the shift lever.



M/T OIL

PFP:KLD20

Changing M/T Oil

NCS0000T

DRAINING

1. Start the engine and warm up the transmission unit sufficiently.
2. After stopping engine, remove filler plug and drain plug to drain oil.
3. Replace gasket on drain plug with new one. Screw drain plug into transmission case, and tighten to the specified torque. Refer to MT-22, "Case Components" .

   CAUTION:
   Do not reuse gasket.

FILLING

1. Fill new oil into the transmission to the level of the filler plug mounting hole.

   Oil grade and viscosity : Refer to MA-11, "Fluids and Lubricants" .
   Oil capacity : Approx. 2.93 ℓ (6-1/4 US pt, 5-1/8 Imp pt)

2. Replace gasket on filler plug with new one. Screw filler plug into transmission case, and tighten to the specified torque. Refer to MT-22, "Case Components" .

   CAUTION:
   Do not reuse gasket.

Checking M/T Oil

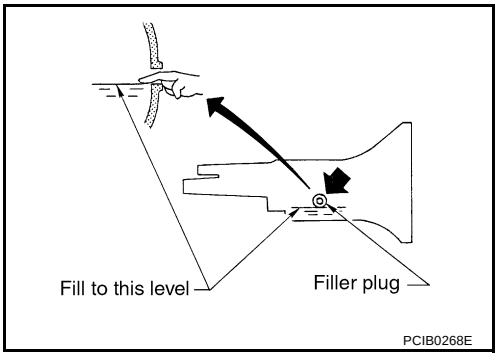
NCS0000U

OIL LEAKAGE AND OIL LEVEL

- Check if oil is leaking from transmission or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

  CAUTION:
  Never start engine while checking oil level.
- When screwing in filler plug with a new gasket, first screw into the transmission by hand, then tighten to the specified torque. Refer to MT-22, "Case Components" .

  CAUTION:
  Do not reuse gasket.



REAR OIL SEAL

PFP:33140

Removal and Installation

NCS0000V

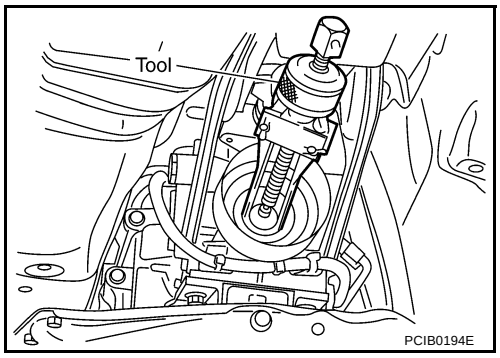
REMOVAL

1. Remove propeller shaft. Refer to PR-6, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.

2. Remove rear oil seal using oil seal puller.

   Tool number : KV381054S0 (J-34286)

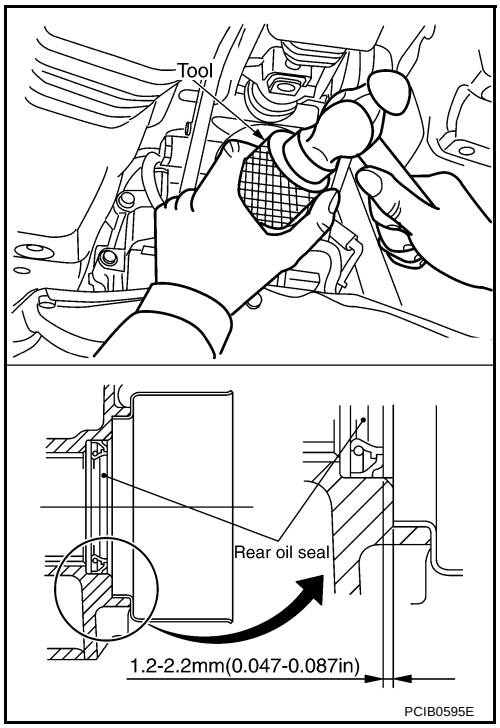


INSTALLATION

1. Apply multi-purpose grease to rear oil seal lip. Drive in rear oil seal until the edge is approximately 1.2 - 2.2 mm (0.047 - 0.087 in) above the boss edge using drift.

   Tool number : ST33400001 (J-26082)

   CAUTION:
   - **Do not reuse rear oil seal.**
   - **When installing, do not incline the rear oil seal.**



2. Install propeller shaft. Refer to PR-6, "Removal and Installation" .

   CAUTION:
   - **Do not impact or damage propeller shaft tube.**
   - **If lubricant leak has occurred, after finishing work, check oil level. Refer to MT-9, "Checking M/T Oil" .**

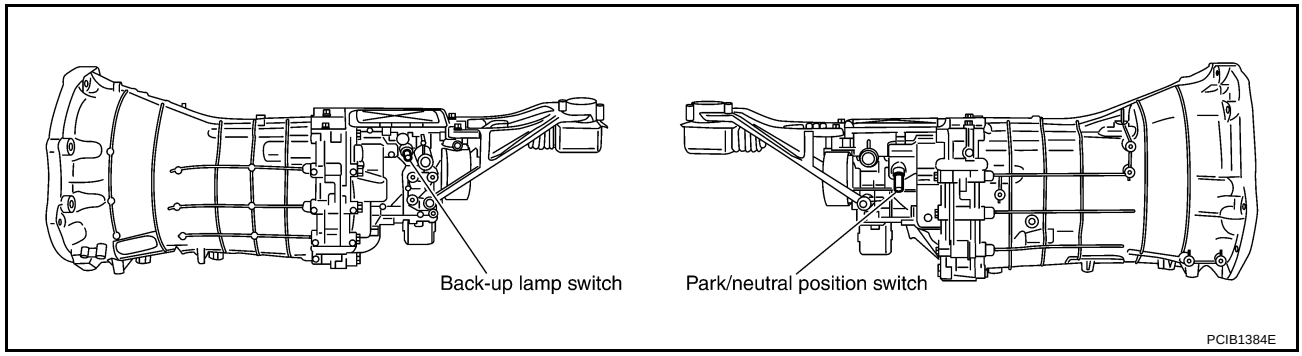
POSITION SWITCH

PFP:32005

Checking

NCS0000W

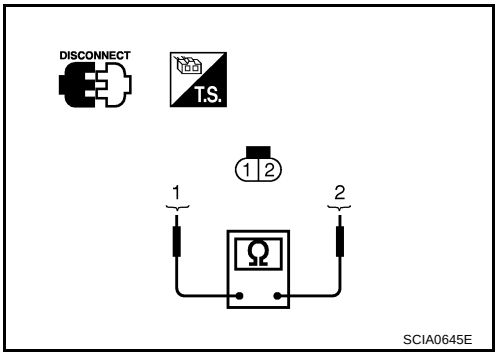
COMPONENT LOCATION



BACK-UP LAMP SWITCH

- Check continuity.

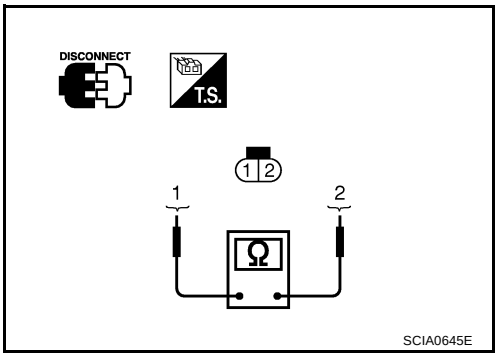
Gear position	Continuity
Reverse	Yes
Except reverse	No



PARK/NEUTRAL POSITION SWITCH

- Check continuity.

Gear position	Continuity
Neutral	Yes
Except neutral	No



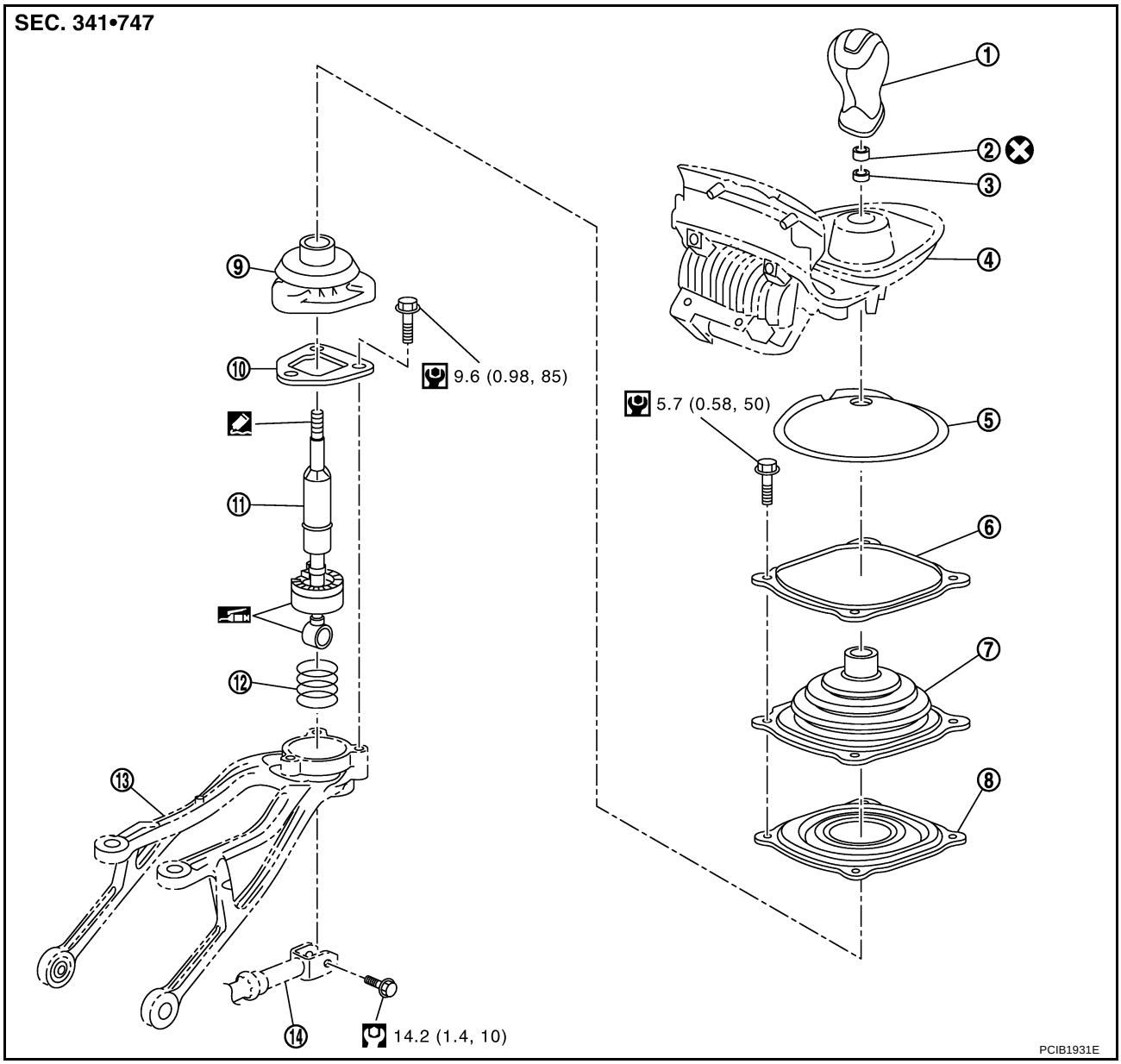
SHIFT CONTROL

PFP:34103

Removal and Installation

NCS0000X

COMPONENTS



1. Shift knob	2. Insulator	3. Seat
4. Console boot	5. Felt	6. Hole cover
7. Control lever boot B	8. Hole insulator	9. Control lever boot A
10. Guide plate	11. Control lever assembly	12. Control lever spring
13. Control lever housing	14. Control rod	

Refer to GI-11, "Components" and the followings for the symbols in the figure.

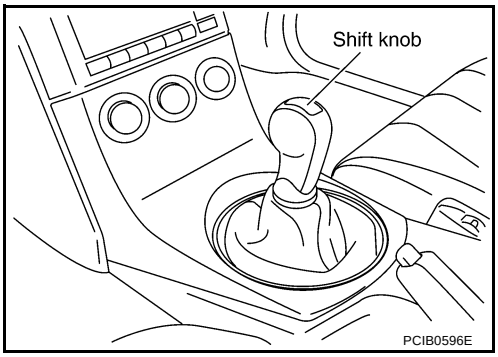
: Apply multi-purpose grease.

: Apply Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

REMOVAL

1. Remove the shift knob with the following procedure.

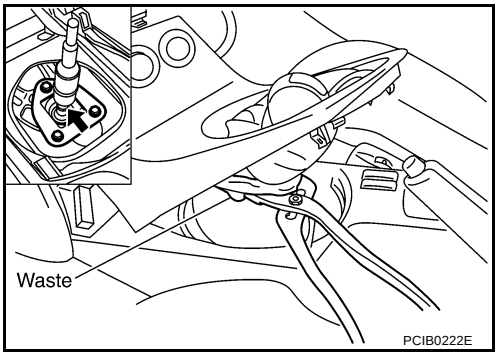
a. Release metal clips on console boot from center console. Refer to IP-11, "Removal and Installation" .



b. Lift console boot, and push down control lever boot B and control lever boot A. Set water pump pliers and others to control lever assembly.

CAUTION:

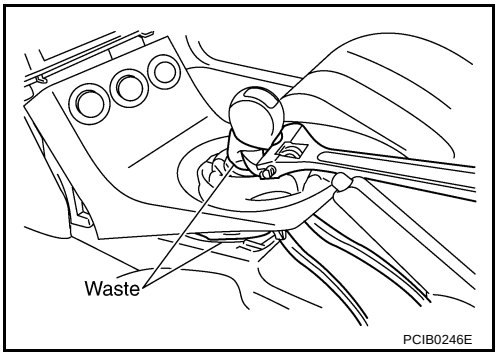
Put waste cloth between water pump pliers and control lever assembly to avoid damaging control lever assembly.



c. Set monkey wrench to shift knob.

CAUTION:

Put waste cloth between shift knob and monkey wrench to avoid damaging shift knob.



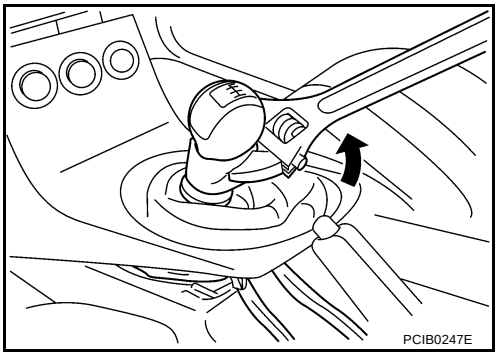
d. Keeping control lever assembly in place with water pump pliers, turn monkey wrench counterclockwise to loosen shift knob.

NOTE:

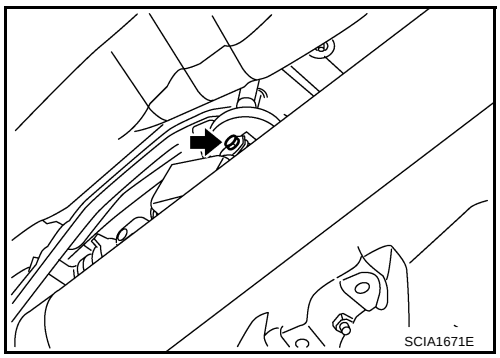
Remove shift knob from control lever assembly keeping water pump pliers in place because a certain power to turn shift knob is still necessary even after adhesive is peeled.

e. Remove shift knob from control lever assembly.

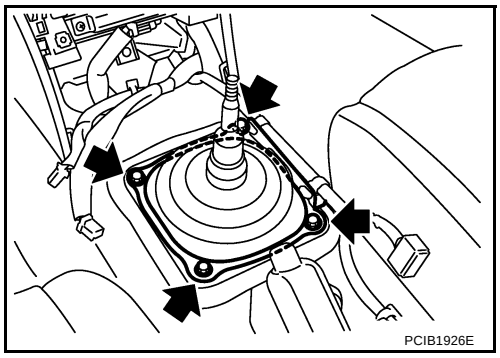
2. Remove insulator and seat from control lever assembly.
3. Remove console boot.
4. Remove center console assembly. Refer to IP-11, "Removal and Installation" .
5. Remove felt.



6. Release the boot, remove control rod mounting bolt, and separate control lever and control rod.

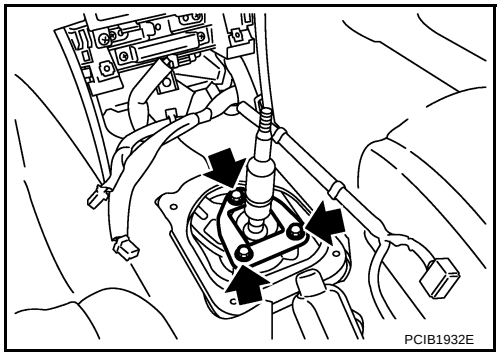


7. Remove the hole cover mounting bolts and then remove the hole cover.
8. Remove the control lever boot B and the hole insulator.
9. Remove the control lever boot A.



10. Remove guide plate mounting bolts, and then remove control lever assembly and control lever spring from control lever housing.

CAUTION:
Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.



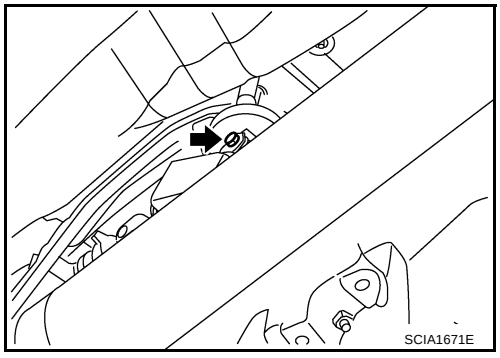
INSTALLATION

1. Set control lever spring, control lever assembly, and guide plate to control lever housing and then temporarily tightening guide plate mounting bolts.

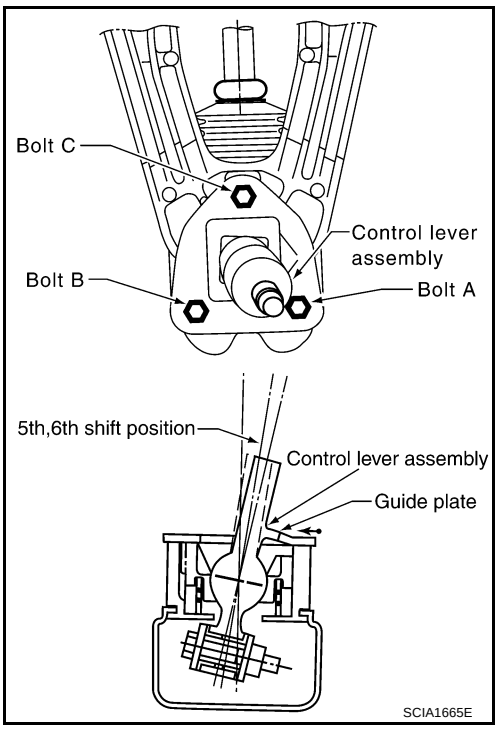
CAUTION:
Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.

2. Install control lever assembly to control rod and then tighten bolt to the specified torque. Refer to MT-12, "COMPONENTS" .
3. Install boot to control lever housing.

CAUTION:
Fit the boot to the groove on the control lever housing.

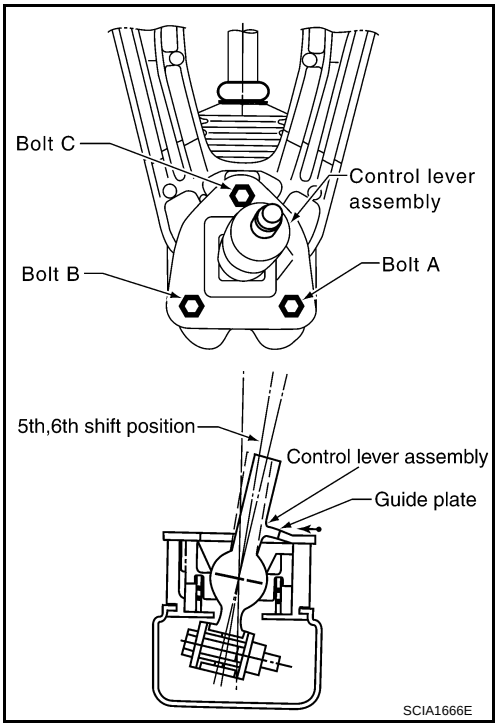


4. After shifting control lever assembly into 6th gear, push it toward reverse gear (to the right) until it comes to a stop.
5. At the point where the control lever assembly stops, bring the guide plate closer until guide plate stopper contacts control lever assembly claw, and then loosely tighten mounting bolt A.



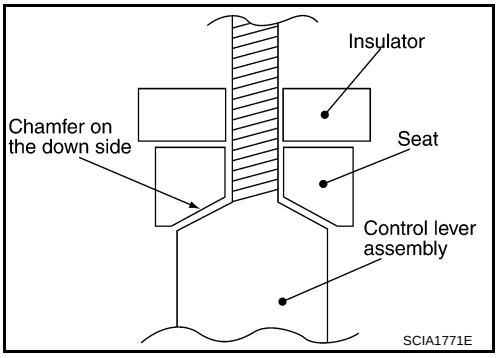
6. After shifting control lever assembly into 5th gear, push it toward reverse gear (to the right) until it comes to a stop.
7. At the point where control lever assembly stops, bring guide plate closer until the guide plate stopper contacts control lever assembly claw, and then tighten mounting bolt C to the specified torque. Refer to MT-12, "COMPONENTS" .
8. Tighten guide plate bolts A and B to the specified torque. Refer to MT-12, "COMPONENTS" .
9. Install control lever boot A.

   CAUTION:
   Fit the control lever boot A to the groove on the control lever housing.
10. Install hole insulator and control lever boot B.
11. Install hole cover and tighten bolts to the specified torque. Refer to MT-12, "COMPONENTS" .
12. Install felt.
13. Install center console assembly. Refer to IP-11, "Removal and Installation" .
14. Install console boot to center console assembly. Refer to IP-11, "Removal and Installation" .



15. As shown in the figure, assemble seat and insulator to control lever assembly.

    CAUTION:
    - **Do not reuse insulator.**
    - **Be careful with the orientation of seat.**
16. Apply locking sealant to control lever assembly threads, install shift knob.
    - **Use Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**



CAUTION:
Remove the remaining adhesive on control lever and shift knob threads.

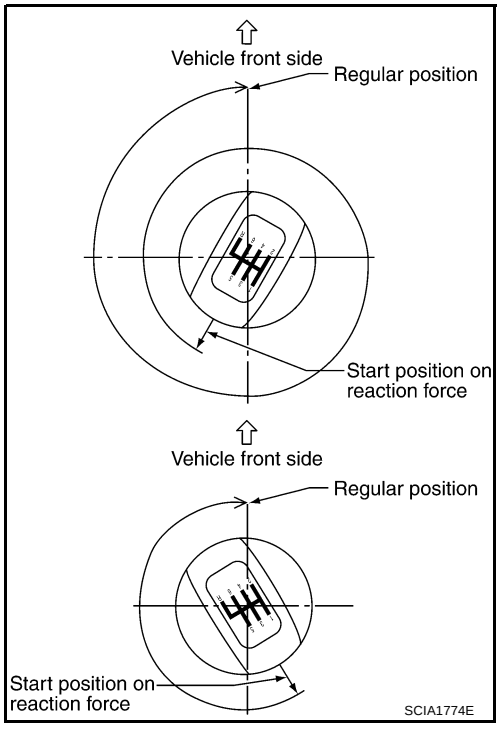
17. Put the shift knob in the correct position as the following indicates.

a. When tightening shift knob, if shift knob comes to the proper position within 1/2 turn from the position at which resistance begins to be felt, tighten it 1 more turn to set it in the proper position.

b. If it takes more than 1/2 turn from the position at which resistance begins to be felt, tighten it to set it in the proper position.

CAUTION:

- **Do not adjust the knob with loosing.**
- **After adjusting to the regular position, until 30 minutes pass, do not operate the shift intensely such as screwing or turning the shift knob to opposite direction since a locking sealant because stiff.**



INSPECTION AFTER INSTALLATION

After installing, confirm the following items:

- When control lever assembly is shifted to each position, make sure there is no binding or disconnection in each boot.
- When shifted to each position, make sure there is no noise, binding, and backlash. Especially when control lever assembly is shifted to 5th, 6th without pressing downward, check for binding.
- When control lever assembly is shifted to 1st, 2nd side and 5th, 6th side, confirm control lever assembly returns to neutral position smoothly.
- In any position other than reverse, confirm that control lever assembly can be pressed downward.
- With control lever assembly pressed downward, confirm that it can be shifted to reverse.
- When shifted from reverse to neutral position, confirm control lever assembly returns to neutral position smoothly with spring power.
- Without control lever assembly pressed downward, confirm that it cannot be shifted to reverse.

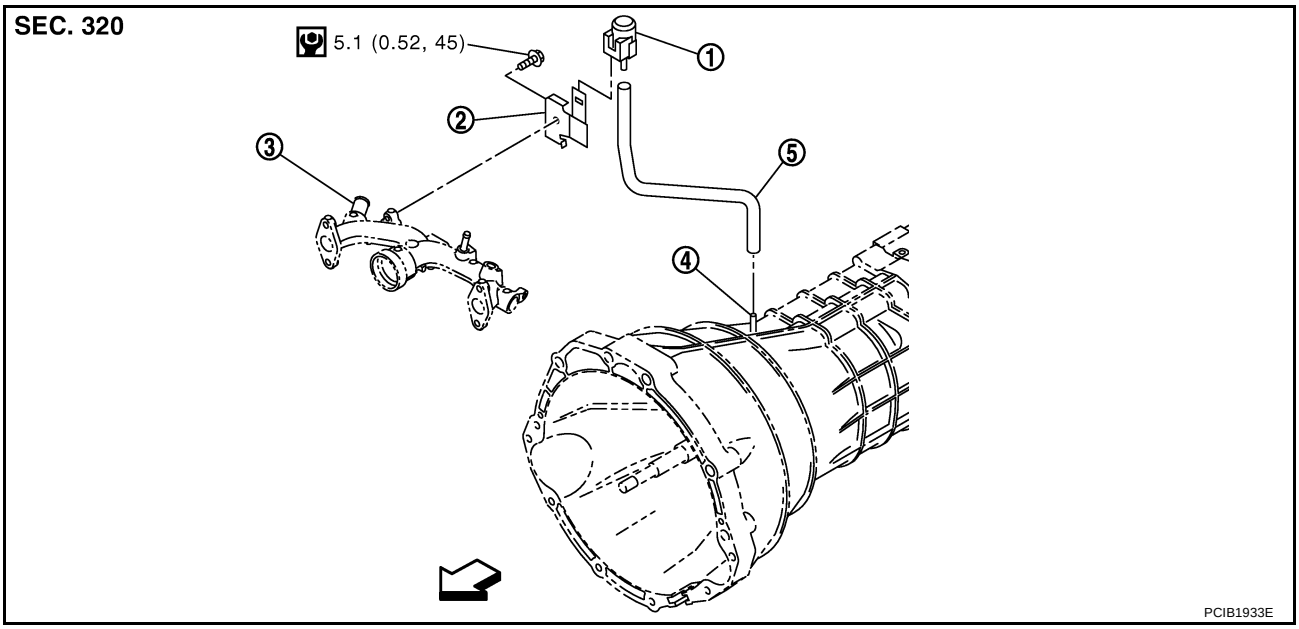
AIR BREATHER HOSE

PFP:31098

Removal and Installation

NCS0000Y

Refer to the figure for air breather hose removal and installation information.



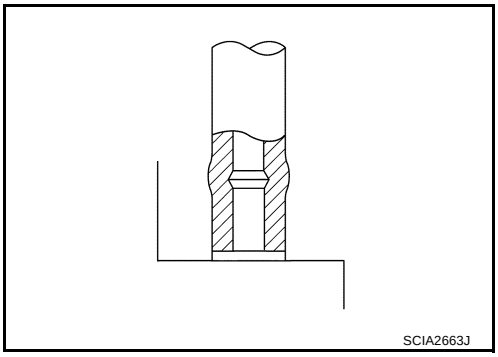
1. Breather
2. Bracket
3. Water outlet (rear)
4. Breather tube
5. Air breather hose

⇦ : Vehicle front

Refer to GI-11, "Components" ,for the symbols in the figure.

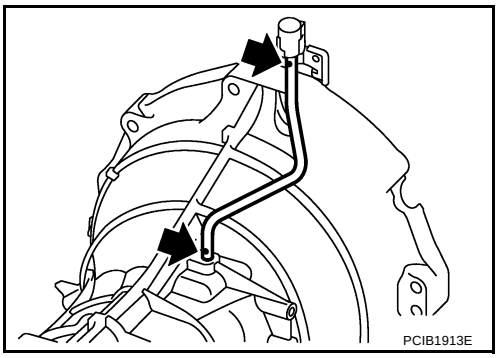
CAUTION:

- **Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.**
- **Be sure to insert air breather hose into breather tube until hose end reaches the tube's base.**
- **Be sure to insert air breather hose into breather until hose end reaches the breather's base.**



- **Set air breather hose with painted mark facing backward.**

⇦ : Painted mark



TRANSMISSION ASSEMBLY

PFP:32010

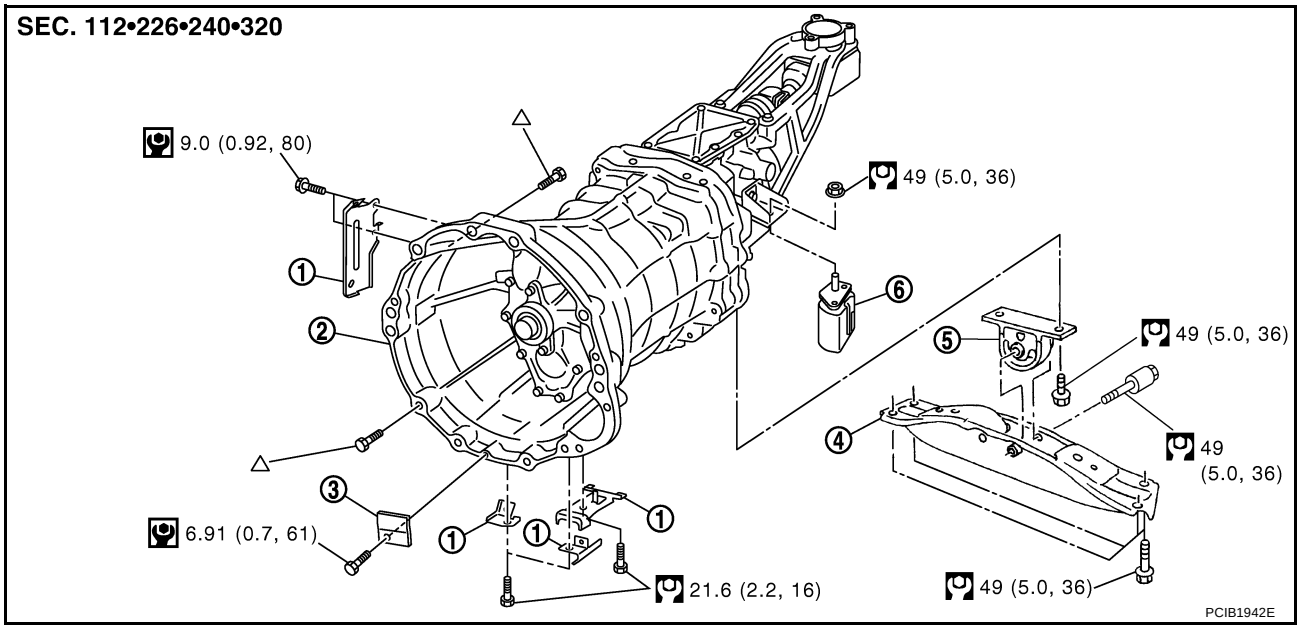
Removal and Installation

NCS0000Z

CAUTION:

If transmission assembly is removed from the Vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.

COMPONENTS



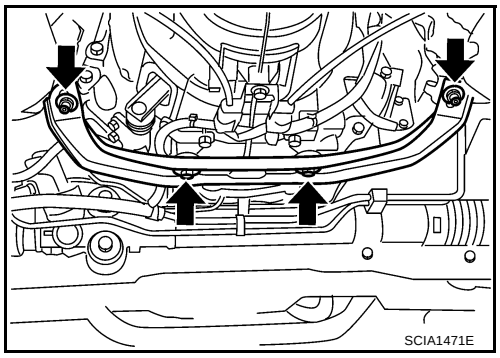
1. Harness bracket
2. Transmission assembly
3. Rear plate cover
4. Rear engine mounting member
5. Engine mounting insulator (rear)
6. Dynamic damper (For coupe)

Refer to GI-11, "Components" and the following for the symbols in the figure.

△: For the bolt tightening torque, refer to MT-20, "INSTALLATION" .

REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove tower bar. Refer to FSU-20, "Removal and Installation" .
3. Remove front cross bar with power tool. Refer to FSU-9, "REMOVAL" .
4. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .

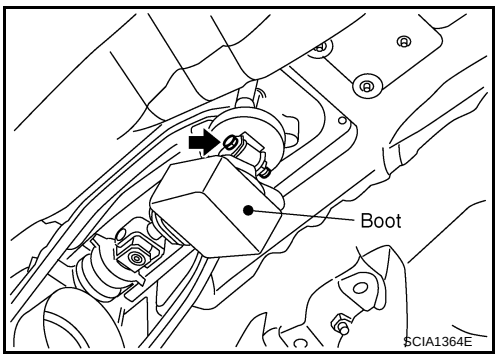


5. Remove nut connecting catalytic converter to exhaust manifold, and then remove three way catalyst and exhaust front tube as one unit. Refer to EX-3, "Removal and Installation" and EM-22, "Removal and Installation" .
6. Remove propeller shaft. Refer to PR-6, "Removal and Installation" .

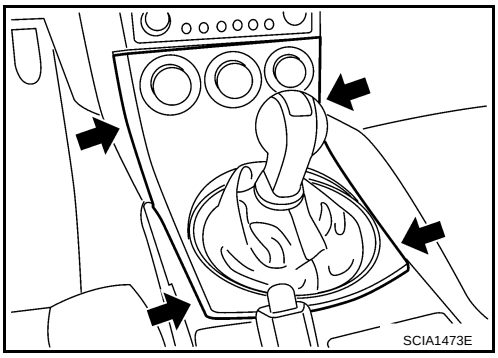
   CAUTION:

   Do not impact or damage propeller shaft tube.

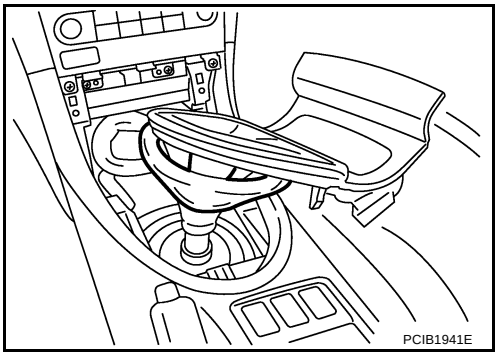
7. Remove control rod mounting bolt and then separate control lever assembly from the control rod.



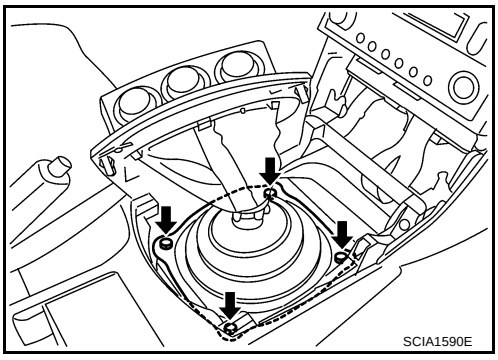
8. Using a suitable tool, release claws and separate console boot from center console. Refer to IP-11, "Removal and Installation" .



9. Remove felt as shown in the figure.
10. Slide center console assembly to remove hole cover mounting bolts.

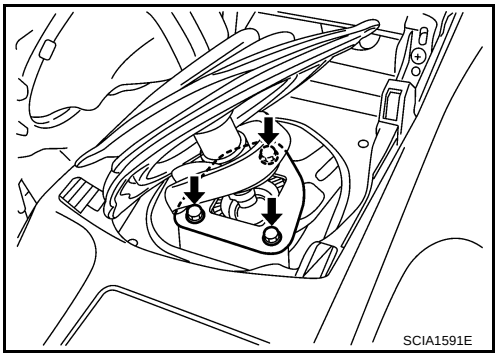


11. Remove hole cover.
12. Remove control lever boot B, hole insulator, and control lever boot A.

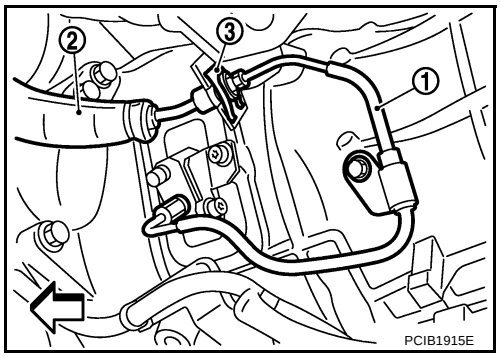


13. Remove guide plate mounting bolts and then separate control lever assembly from the control lever housing.

CAUTION:
Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.



14. Remove clutch tube (1), clutch hose (2), and lock plate (3). Refer to CL-15, "Removal and Installation" .



⇦ : Vehicle front

CAUTION:
- **Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.**
- **Do not depress clutch pedal during removal procedure.**

NOTE:
Insert a suitable plug into clutch hose and CSC (Concentric Slave Cylinder) tube after removing clutch tube.

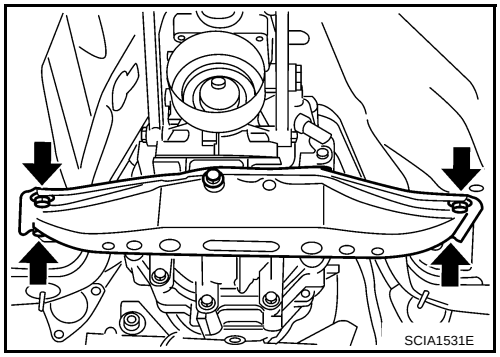
15. Remove crankshaft position sensor (POS). Refer to EM-107, "Disassembly and Assembly" .

CAUTION:
- **Do not subject it to impact by dropping or hitting.**
- **Do not disassemble.**
- **Do not allow iron dust, etc., to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

16. Remove starter motor. Refer to SC-17, "Removal and Installation" .
17. Remove rear plate cover. Refer to EM-26, "Removal and Installation" .
18. Disconnect Park/Neutral position (PNP) switch harness connector.
19. Remove harness brackets.
20. Separate heated oxygen sensor 2 wire harness, back-up lamp switch wire harness and Park/Neutral position (PNP) switch wire harness from the transmission.
21. Set transmission jack to the transmission assembly.

CAUTION:
When setting transmission jack, be careful not to contact with the switch.

22. Remove rear engine mounting member. Refer to EM-101, "Removal and Installation" .



23. Remove engine and transmission mounting bolts with power tool.
24. Lower a suitable jack to the position where the back-up lamp switch harness connector can be disconnect. Then disconnect back-up lamp switch harness connector.
25. Remove transmission assembly from the vehicle.

CAUTION:
- **Secure transmission assembly to a suitable jack while removing it.**
- **The transmission assembly must not interfere with the wire harnesses and clutch hose.**
- **Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.**

26. Remove dynamic damper.
27. Remove CSC (Concentric Slave Cylinder) body and tube. Refer to CL-11, "COMPONENTS" .

CAUTION:
If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.

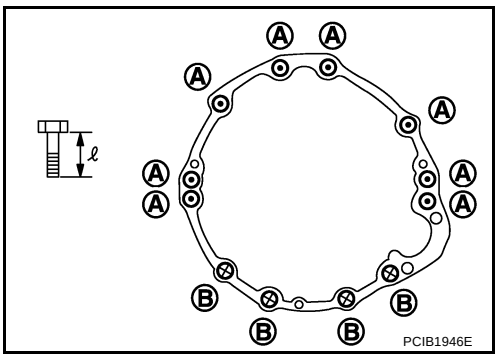
INSTALLATION

Note the following, and install in the reverse order of removal.

- Tighten transmission assembly mounting bolts to the specified torque. The figure is the view from the vehicle forward.

  : Transmission to engine

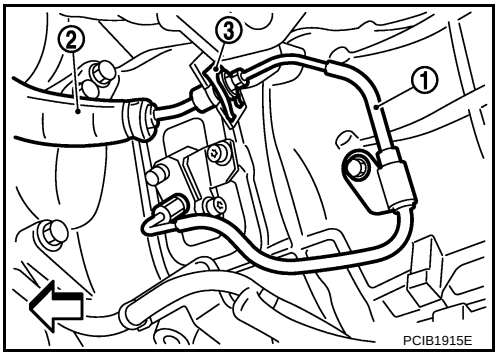
  : Engine to transmission



Bolt symbol	A	B
Quantity	8	4
" ℓ " mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7,55)	46.6 (4.8,34)

- Install clutch tube (1), clutch hose (2), and lock plate (3) and then tighten clutch tube flare nut to the specified torque. Refer to CL-15, "Removal and Installation" .

  : Vehicle front



Clutch tube mounting bolt tightening torque

: 8.1 N·m (0.83 kg-m, 72 in-lb)

CAUTION:

- **The transmission assembly must not interfere with the wire harnesses and clutch hose.**
- **When installing, be careful to avoid interference between transmission main drive gear and clutch cover.**
- **If flywheel is removed, align dowel pin with the smallest hole of flywheel. Refer to EM-111, "ASSEMBLY" .**
- **Do not impact or damage propeller shaft tube.**
- **Refer to MT-14, "INSTALLATION" and MT-16, "INSPECTION AFTER INSTALLATION" for control lever installation information.**
- **After installation, check oil level, and oil leaks and loose mechanisms. Refer to MT-9, "Checking M/T Oil" .**
- **Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.**

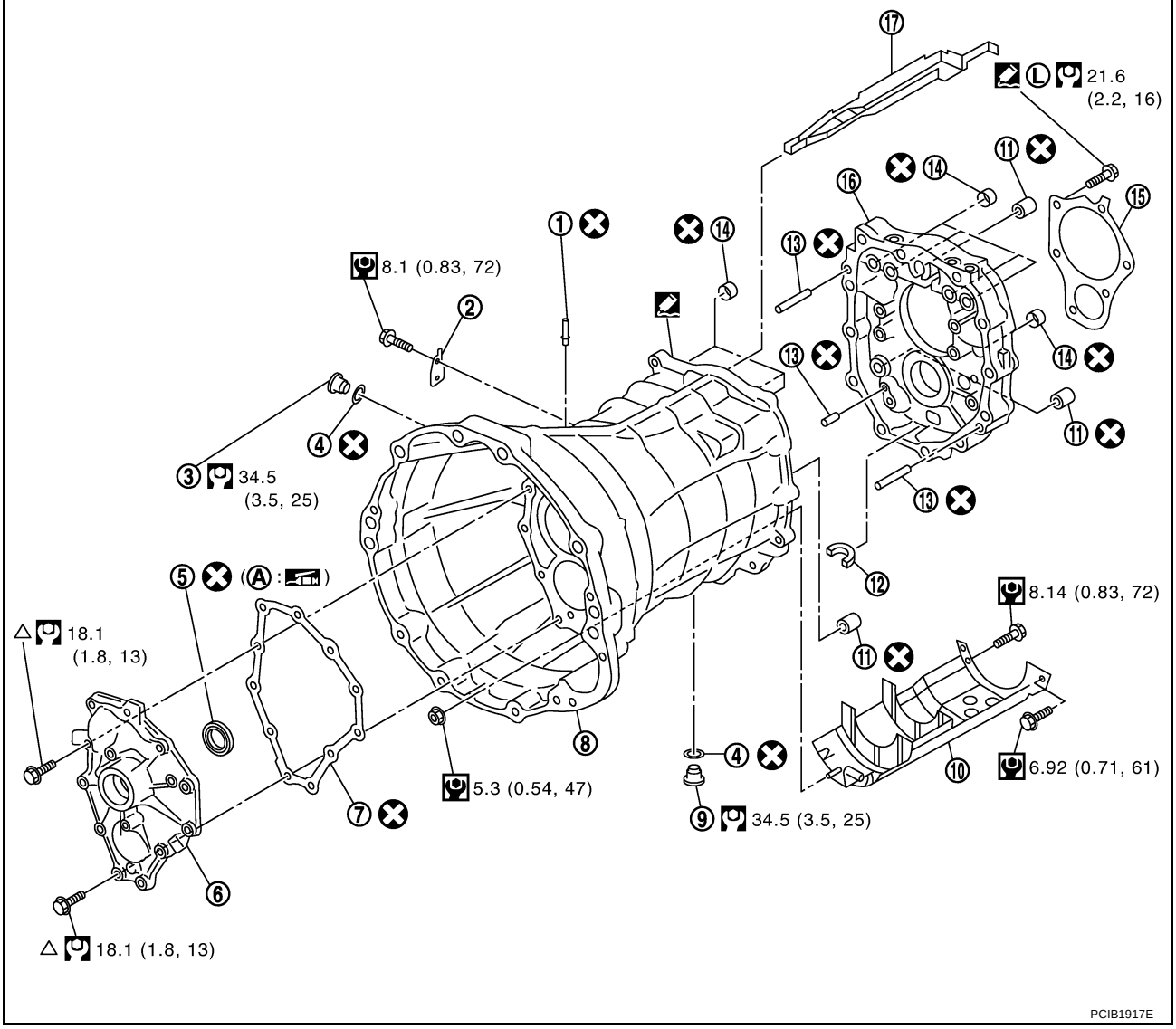
Disassembly and Assembly

NCS00011

COMPONENTS

Case Components

SEC. 321



1. Breather tube	2. Bracket	3. Filler plug
4. Gasket	5. Front cover oil seal	6. Front cover
7. Front cover gasket	8. Transmission case	9. Drain plug
10. Baffle plate	11. Sliding ball bearing	12. Magnet
13. Dowel pin	14. Bushing	15. Main shaft bearing retainer
16. Adapter plate	17. Oil gutter	
A. Seal lip		

Refer to GI-11, "Components" and the followings for the symbols in the figure.

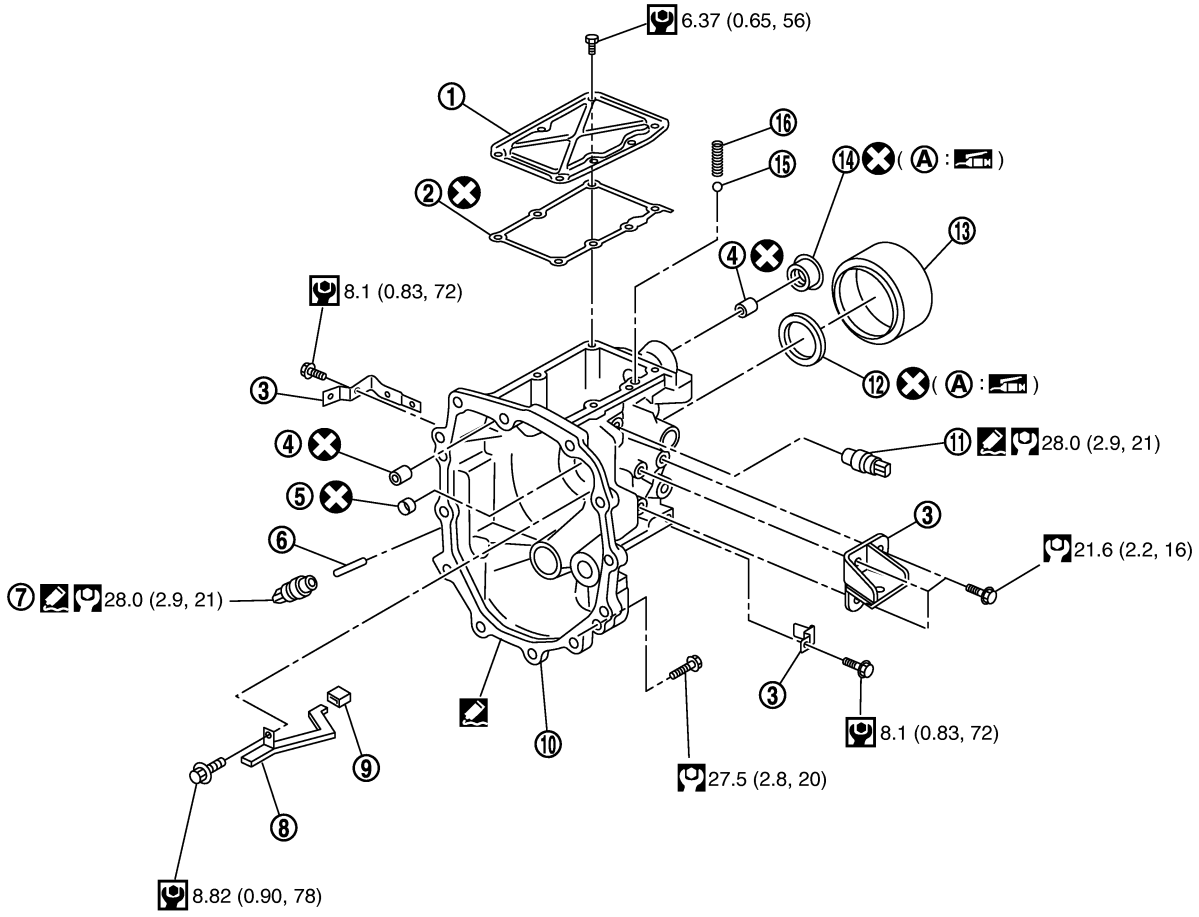
: Apply multi-purpose grease.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

: Apply Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

△ : For the bolt mounting positions, Refer to MT-56, "Case Components" .

SEC. 321



1. Rear extension upper cover	2. Rear extension upper cover gasket	3. Bracket
4. Sliding ball bearing	5. Bushing	6. Plunger
7. Park/Neutral position (PNP) switch	8. Rear extension oil gutter	9. Cap
10. Rear extension	11. Back-up lamp switch	12. Rear oil seal
13. Rear extension dust cover	14. Striking rod oil seal	15. Check ball
16. Check select spring		
A. Seal lip		

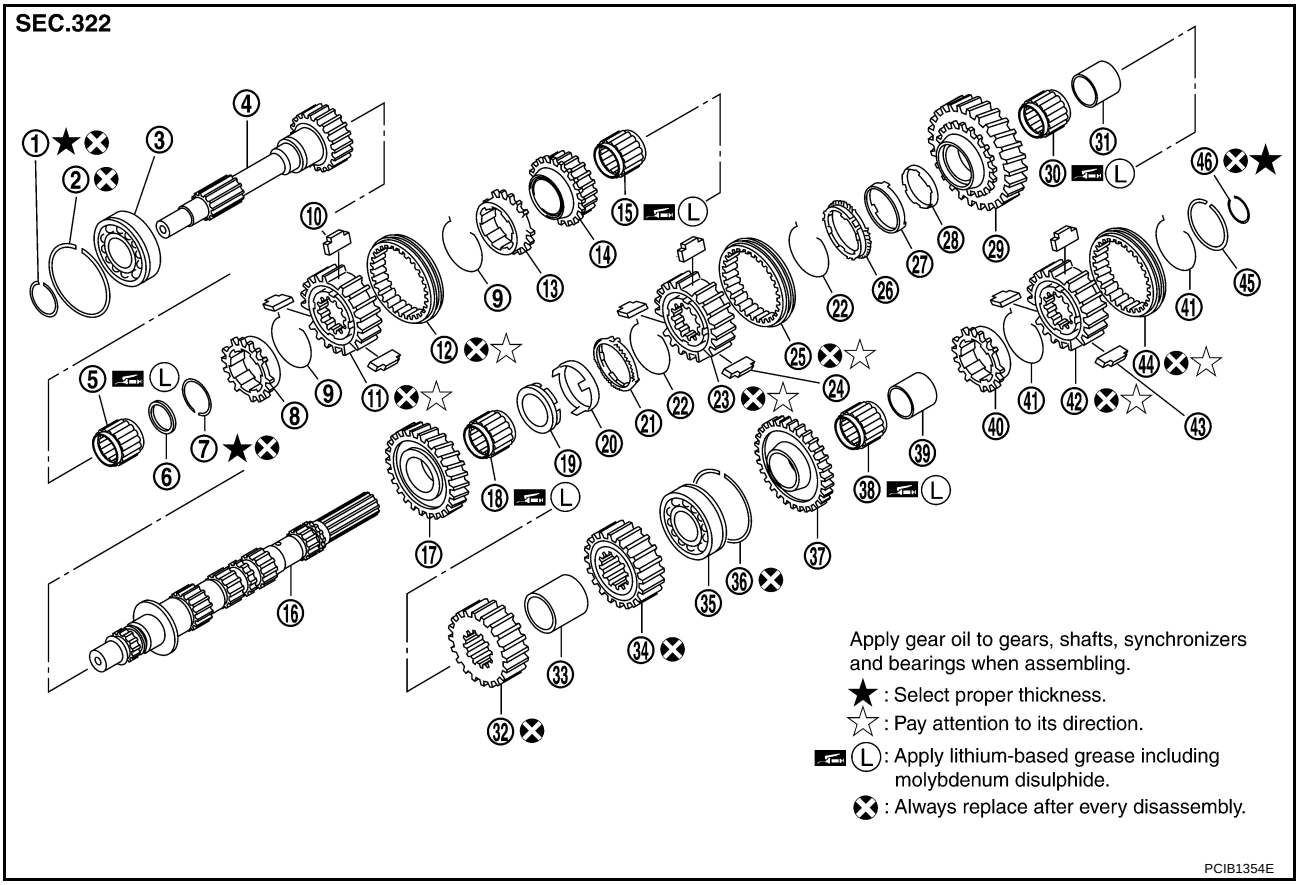
Refer to GI-11, "Components" and the followings for the symbols in the figure.

: Apply multi-purpose grease.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

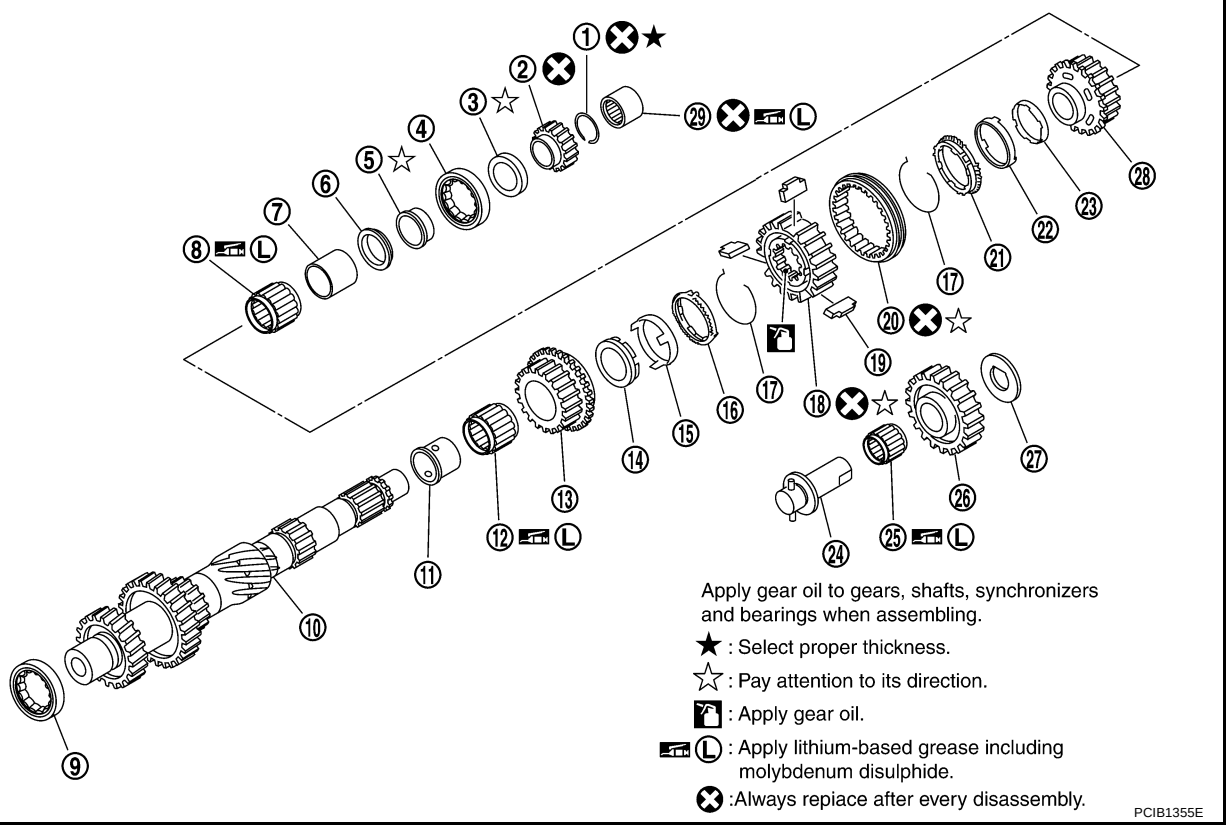
Gear Components

SEC.322



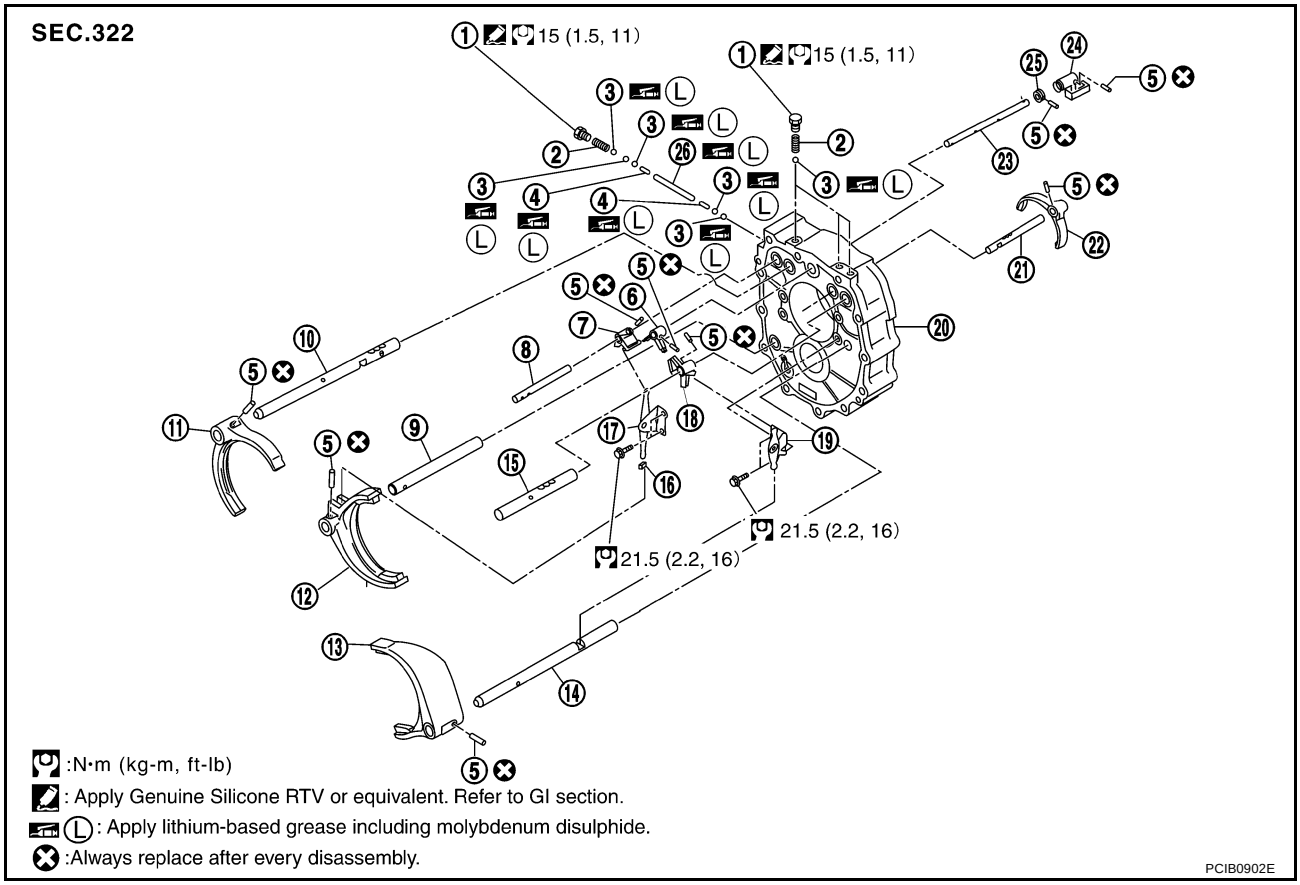
1. Snap ring
2. Snap ring
3. Main drive gear bearing
4. Main drive gear
5. Main pilot bearing
6. Pilot bearing spacer
7. Snap ring
8. 5th baulk ring
9. 5th-6th spread spring
10. 5th-6th shifting insert
11. 5th-6th synchronizer hub
12. 5th-6th coupling sleeve
13. 6th baulk ring
14. 6th main gear
15. 6th needle bearing
16. Main shaft
17. 2nd main gear
18. 2nd needle bearing
19. 2nd inner baulk ring
20. 2nd synchronizer cone
21. 2nd outer baulk ring
22. 1st-2nd spread spring
23. 1st-2nd synchronizer hub
24. 1st-2nd shifting insert
25. 1st-2nd coupling sleeve
26. 1st outer baulk ring
27. 1st synchronizer cone
28. 1st inner baulk ring
29. 1st main gear
30. 1st needle bearing
31. 1st gear bushing
32. 3rd main gear
33. 3rd-4th main spacer
34. 4th main gear
35. Main shaft bearing
36. Snap ring
37. Reverse main gear
38. Reverse main needle bearing
39. Reverse main gear bushing
40. Reverse baulk ring
41. Reverse spread spring
42. Reverse synchronizer hub
43. Reverse shifting insert
44. Reverse coupling sleeve
45. Snap ring
46. Snap ring

SEC.322



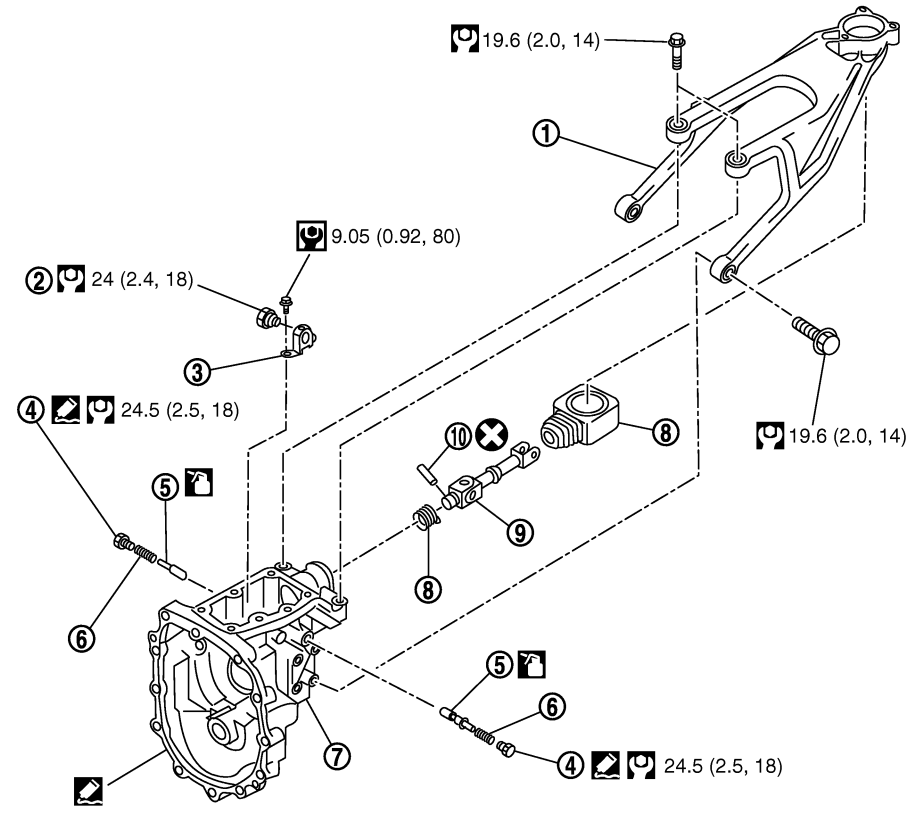
1. Snap ring
2. Reverse counter gear
3. Counter rear bearing spacer
4. Counter rear bearing
5. Counter rear bearing inner race
6. 4th counter gear thrust washer
7. 4th gear bushing
8. 4th needle bearing
9. Counter front bearing
10. Counter shaft
11. 3rd gear bushing
12. 3rd needle bearing
13. 3rd counter gear
14. 3rd inner baulk ring
15. 3rd synchronizer cone
16. 3rd outer baulk ring
17. 3rd-4th spread spring
18. 3rd-4th synchronizer hub
19. 3rd-4th shifting insert
20. 3rd-4th coupling sleeve
21. 4th outer baulk ring
22. 4th synchronizer cone
23. 4th inner baulk ring
24. Reverse idler shaft
25. Reverse idler needle bearing
26. Reverse idler gear
27. Reverse idler thrust washer
28. 4th counter gear
29. Counter end bearing

Shift Control Components



1. Check ball plug
2. Check ball spring
3. Check ball
4. Interlock pin
5. Retaining pin
6. Striking lever
7. 3rd-4th fork rod bracket
8. 3rd-4th fork rod
9. 3rd-4th fork rod (reversal side)
10. 1st-2nd fork rod
11. 1st-2nd shift fork
12. 3rd-4th shift fork
13. 5th-6th shift fork
14. 5th-6th fork rod (reversal side)
15. 5th-6th fork rod
16. Shiftier cap
17. 3rd-4th control lever
18. 5th-6th fork rod bracket
19. 5th-6th control lever
20. Adapter plate
21. Reverse fork rod
22. Reverse shift fork
23. Striking rod
24. Low/high control lever
25. Stopper ring
26. Interlock plunger

SEC. 321



1. Control lever housing
2. Check shift pin
3. Control bracket
4. Return spring plug
5. Return spring plunger
6. Return spring
7. Rear extension
8. Boot
9. Control rod
10. Retaining pin

Refer to GI-11, "Components" and the followings for the symbols in the figure.

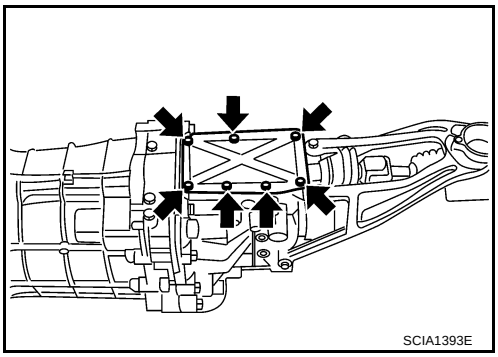
: Apply gear oil.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

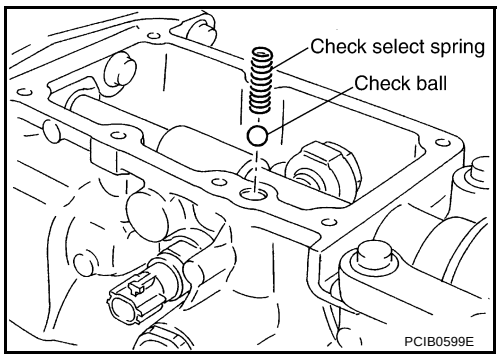
DISASSEMBLY

Case Components

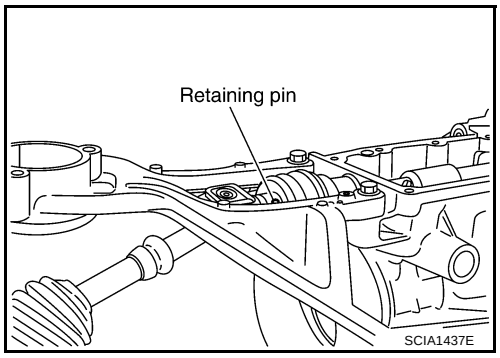
1. Remove rear extension upper cover mounting bolts.
2. Remove rear extension upper cover and rear extension upper cover gasket from the rear extension.



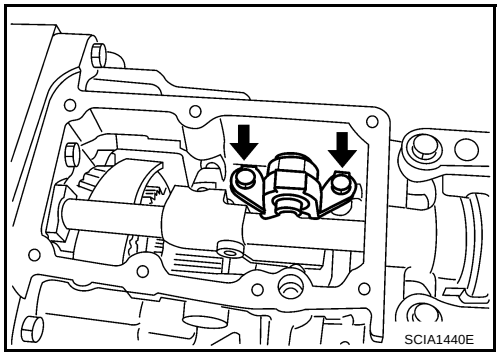
3. Remove check select spring and check ball from the rear extension.



4. Remove retaining pin using a pin punch, and remove control rod.
5. Remove Park/Neutral position (PNP) switch, plunger and back-up lamp switch from the rear extension.



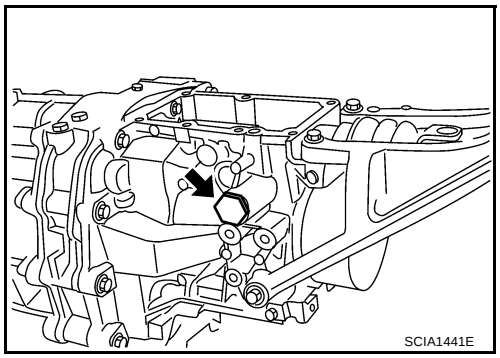
6. Remove control bracket mounting bolts. Then remove check shift pin and control bracket as one unit from the rear extension.



7. Remove right and left return spring plugs. Then remove return springs and return spring plungers from the rear extension.

CAUTION:
Return spring and return spring plunger have different lengths for right and left sides. Identify right and left side and then store.

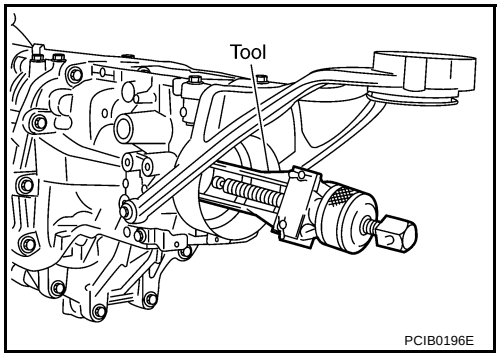
8. Remove bracket mounting bolts. Then remove brackets from the rear extension.



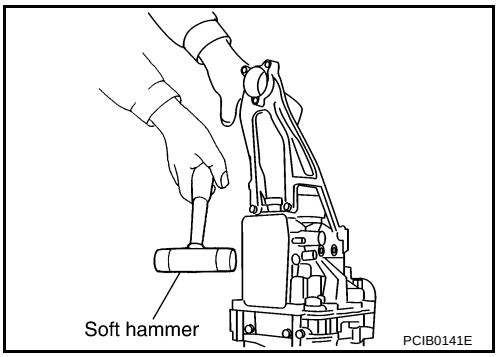
9. Remove rear oil seal from the rear extension using an oil seal puller.

Tool number : KV381054S0 (J-34286)

CAUTION:
Be careful not to damage rear extension.



10. Remove rear extension mounting bolts. Using a soft hammer, tap rear extension assembly to remove.

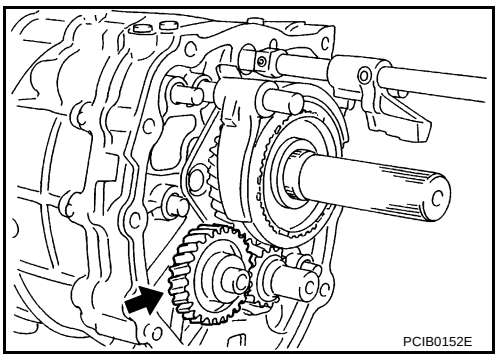


CAUTION:
Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.

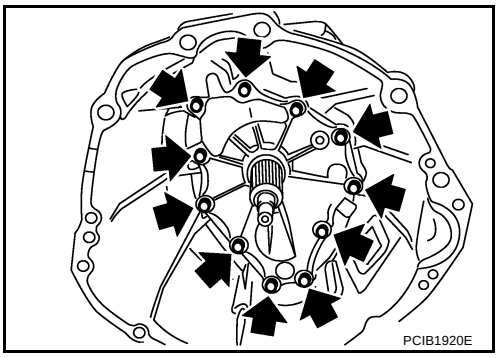
11. Remove control lever housing mounting bolts, and remove control lever housing from the rear extension.
12. Remove striking rod oil seal from the rear extension. Refer to MT-22, "Case Components" .

CAUTION:
Be careful not to damage rear extension.

13. Remove rear extension oil gutter and cap from the rear extension. Refer to MT-22, "Case Components" .
14. Remove reverse idler thrust washer, revers idler gear, and reverse idler needle bearing from the reverse idler shaft.
15. Remove reverse idler shaft from the adapter plate.

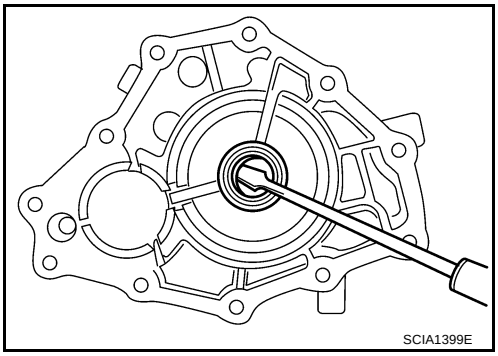


16. Remove front cover mounting bolts, then remove front cover and front cover gasket from the transmission case.

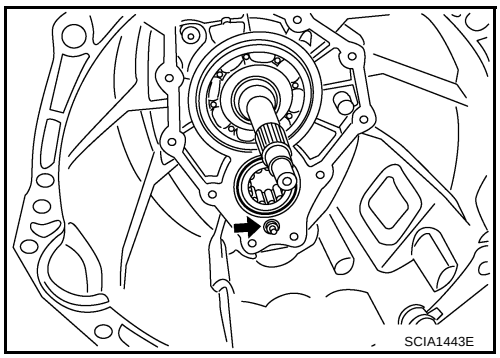


17. Remove front cover oil seal from the front cover, using a flat-bladed screwdriver.

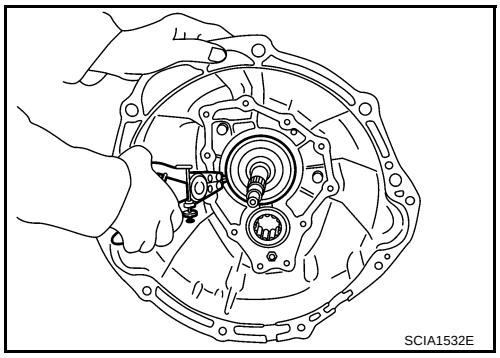
CAUTION:
Be careful not to damage front cover mating surface.



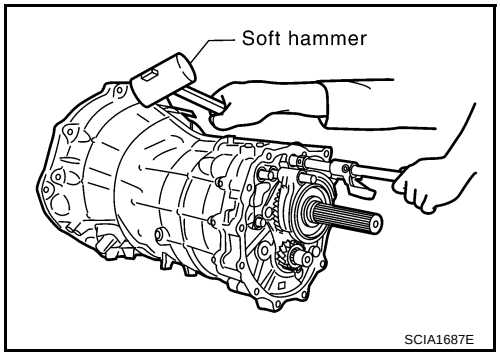
18. Remove baffle plate mounting nut from the transmission case.



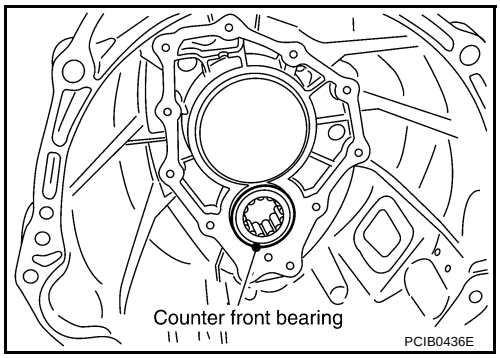
19. Remove snap ring from the main drive gear bearing, using snap ring pliers.



20. Using a soft hammer to carefully tap main shaft and counter shaft from the transmission case side, and then separate adapter plate and transmission case.



21. Remove counter front bearing from the transmission case.
22. Remove oil gutter and breather tube from the transmission case.
23. Remove filler plug, drain plug, and gaskets from transmission case.
24. Remove bracket mounting bolt and then remove bracket from transmission case.

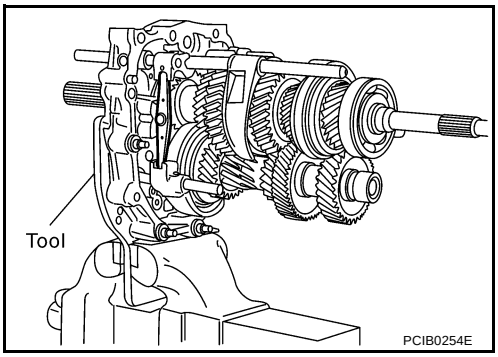


Shift Control Components

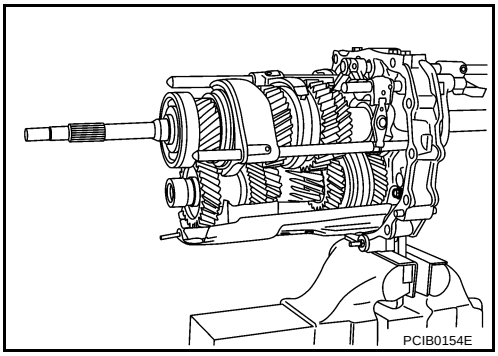
1. Install adapter setting plate to the adapter plate and then fixing in adapter setting plate using a vise.

   Tool number : ST22490000 (—)

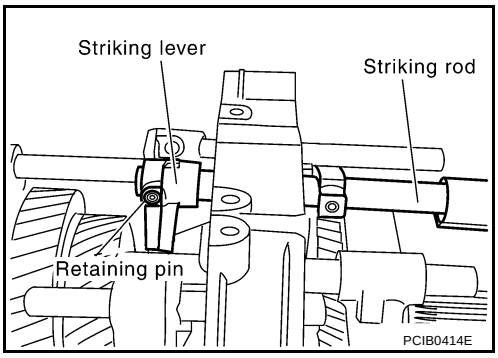
   CAUTION:
   Do not directly secure the surface in a vise.



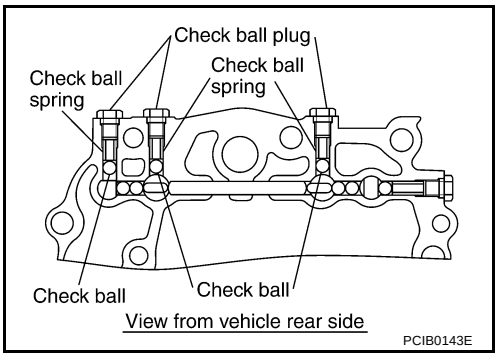
2. Remove baffle plate mounting bolts, and remove baffle plate from the adapter plate.



3. Remove retaining pin using a pin punch, and remove striking lever and striking rod.

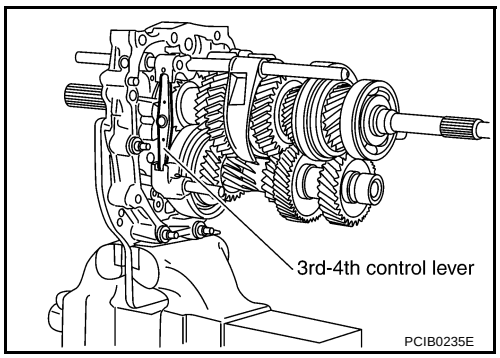


4. Remove check ball plugs and then remove check ball springs and check balls from the adapter plate.

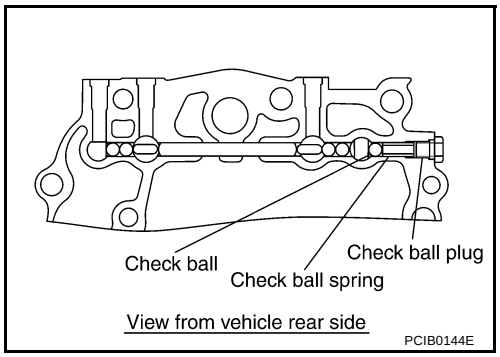


5. Remove 3rd-4th control lever mounting bolts and then remove 3rd-4th control lever and shifter cap.

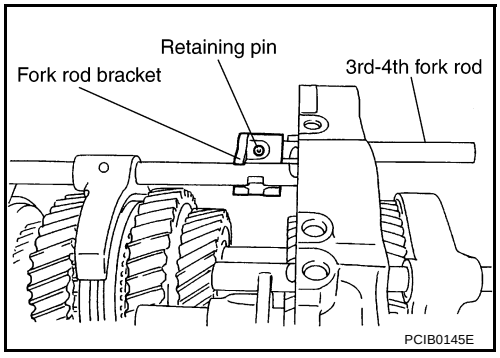
CAUTION:
Be careful not to lose shifter cap.



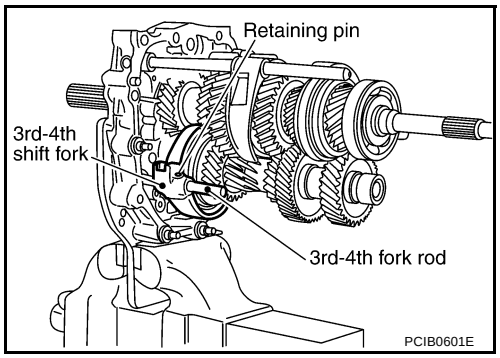
6. Remove check ball plug and then remove check ball spring and check ball from the adapter plate.



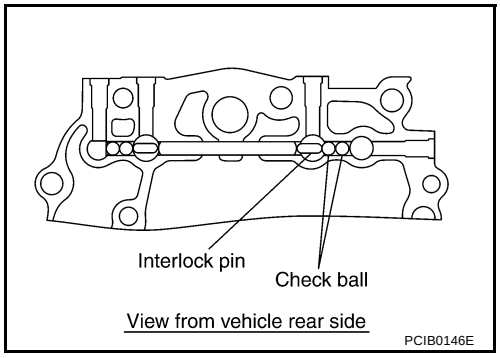
7. Using a pin punch to knock out retaining pin, and then remove 3rd-4th fork rod bracket and 3rd-4th fork rod.



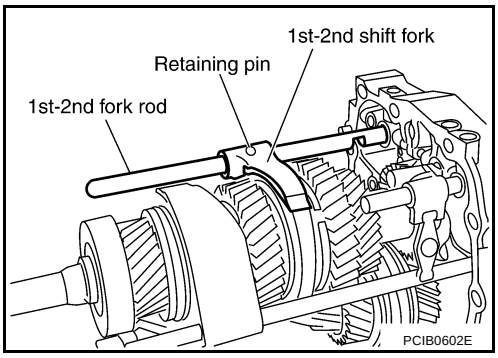
8. Using a pin punch to knock out retaining pin, and then remove 3rd-4th shift fork and 3rd-4th fork rod (reversal side).



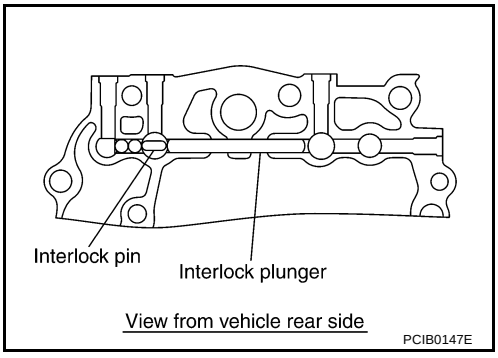
9. Remove check balls and interlock pin from the adapter plate.



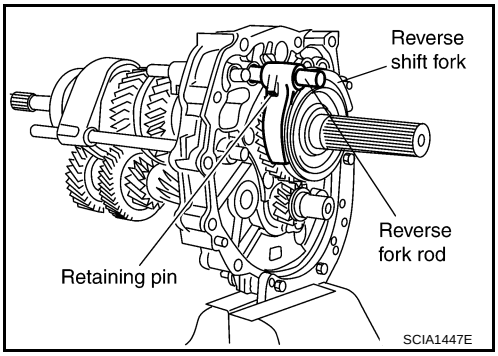
10. Using a pin punch to knock out retaining pin, and then remove 1st-2nd shift fork and 1st-2nd fork rod.



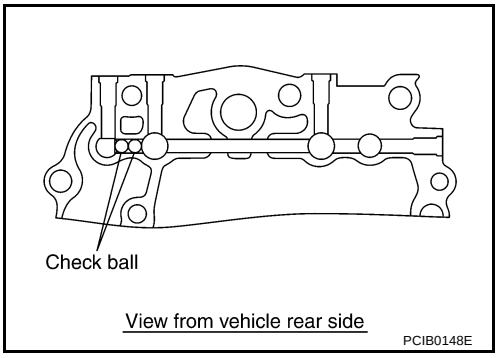
11. Remove interlock plunger and interlock pin from the adapter plate.



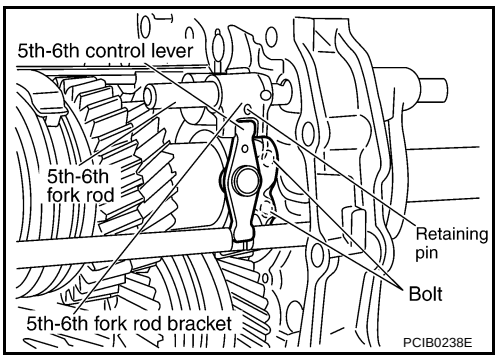
12. Using a pin punch to knock out retaining pin, and then remove reverse shift fork and reverse fork rod.



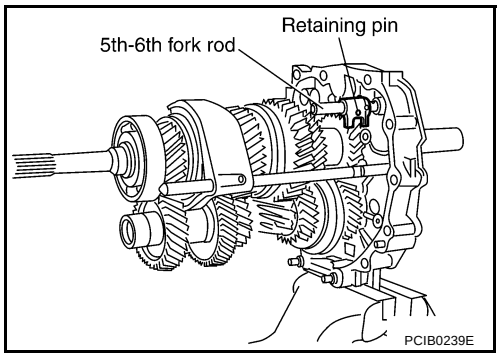
13. Remove check balls from the adapter plate.



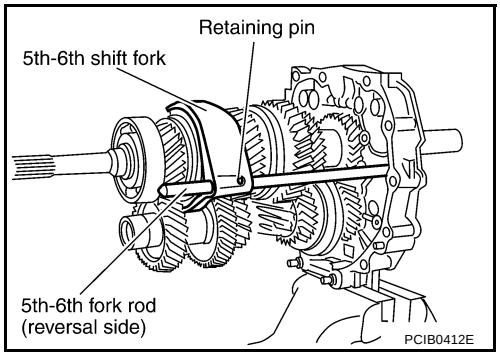
14. Remove 5th-6th control lever mounting bolts and then remove 5th-6th control lever from the adapter plate.



15. Using a pin punch to knock out retaining pin, and then remove 5th-6th fork rod bracket and 5th-6th fork rod.



16. Using a pin punch to knock out retaining pin, and then remove 5th-6th fork rod (reversal side) and 5th-6th shift fork.

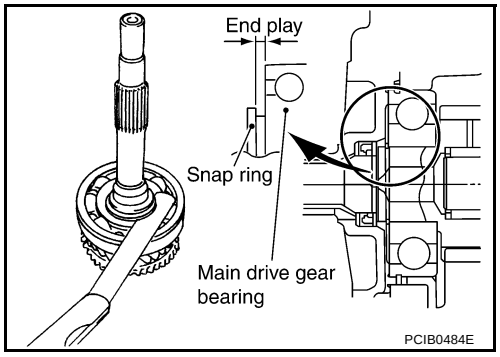


Gear Components

- Before disassembly, measure end play for each position. If the end play is outside the standards, disassemble and inspect.

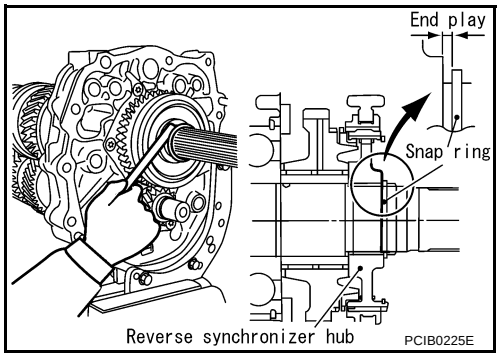
– Main drive gear

End play : 0 - 0.10 mm (0 - 0.004 in)



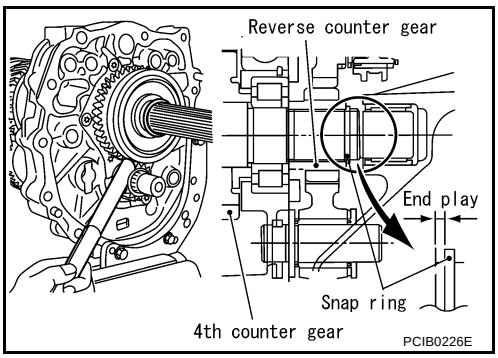
– Main shaft

End play : 0 - 0.10 mm (0 - 0.004 in)

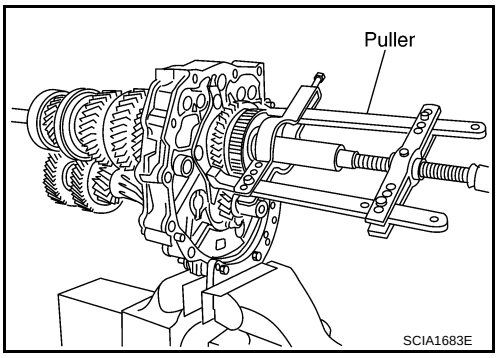


– Counter shaft

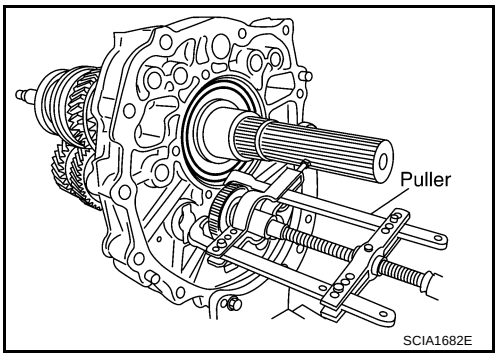
End play : 0 - 0.10 mm (0 - 0.004 in)



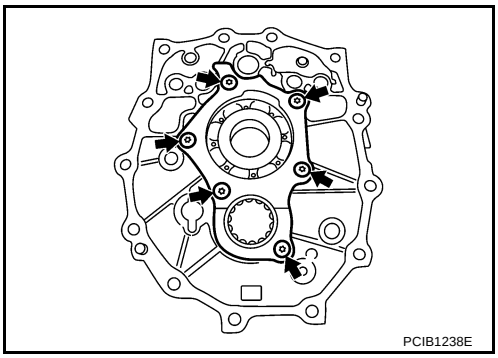
1. After removing snap ring and reverse coupling snap ring, using a puller to remove reverse main gear and reverse synchronizer assembly.
2. Remove reverse main needle bearing.



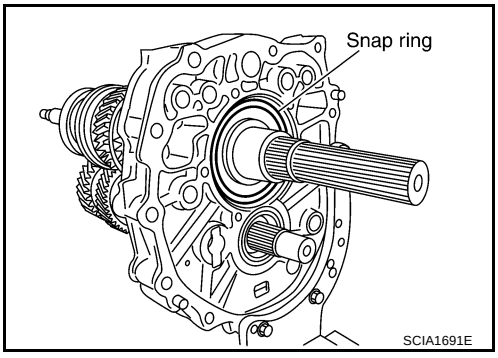
3. After removing snap ring, using the puller to remove reverse counter gear and counter rear bearing spacer.



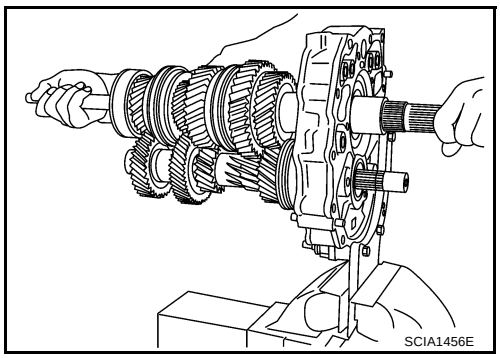
4. Remove main shaft bearing retainer mounting bolts and then remove main shaft bearing retainer.



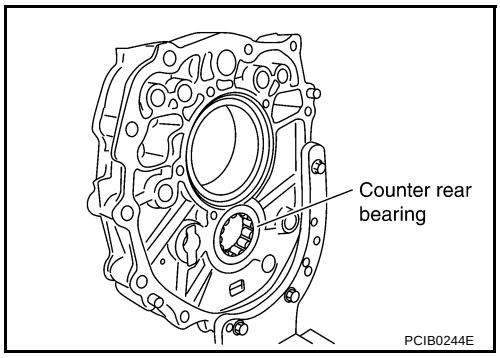
5. Remove snap ring from the main shaft bearing.



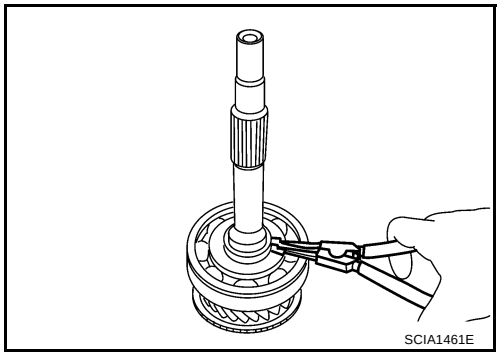
6. Carefully tap main shaft with a plastic hammer and then remove main shaft, main drive gear, and counter shaft from adapter plate.
7. Remove main pilot bearing, pilot bearing spacer and 5th baulk ring.



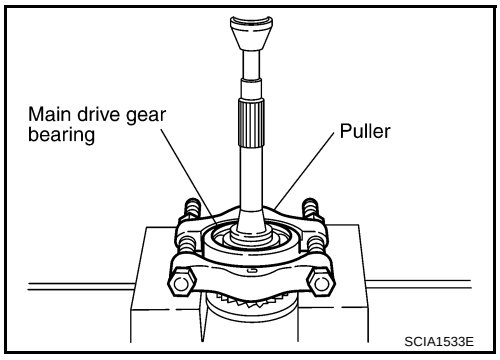
8. Remove counter rear bearing from the adapter plate.
9. Remove magnet from adapter plate.



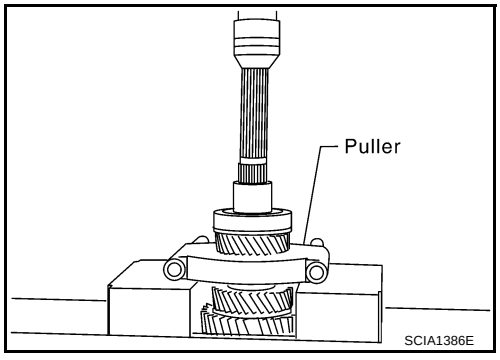
10. Remove snap ring from the main drive gear using snap ring pliers.



11. Set the suitable puller on the main drive gear and then using a press to remove main drive gear bearing from the main drive gear.



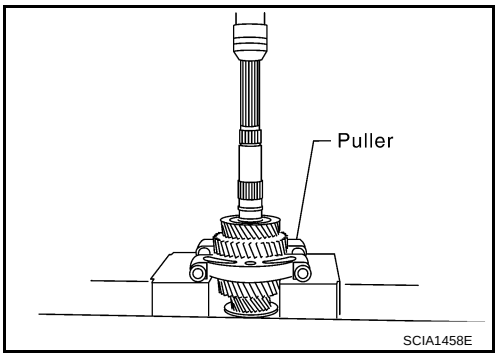
12. Using a press to remove the reverse main gear bushing, main shaft bearing and 4th main gear.
13. Remove 3rd-4th main spacer.



14. Using a press to remove 1st main gear and 3rd main gear.

CAUTION:
Be careful not to damage the baulk ring.

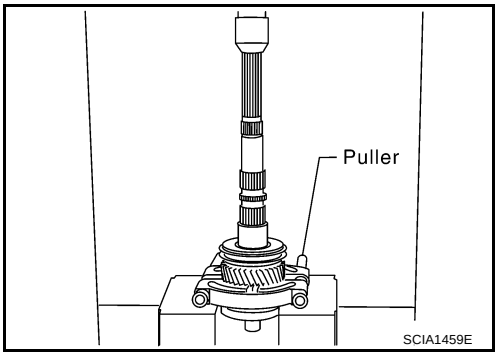
15. Remove 1st needle bearing.



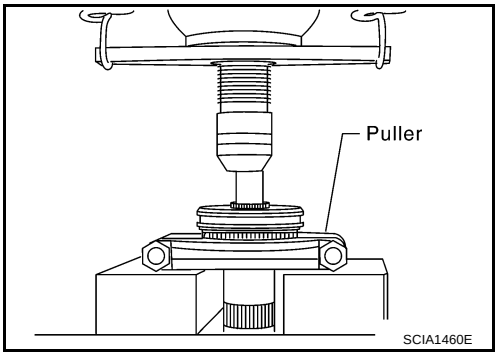
16. Using a press to remove 1st gear bushing, 1st-2nd synchronizer assembly, and 2nd main gear.

CAUTION:
Be aware that when using the press, if the main shaft gear positioner catches on the V-block, etc., the main shaft could be damaged.

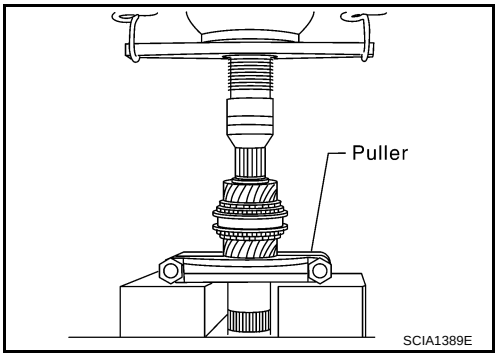
17. Remove 2nd needle bearing.



18. After removing snap ring, using a press to remove 6th main gear and 5th-6th synchronizer assembly.
19. Remove 6th needle bearing.

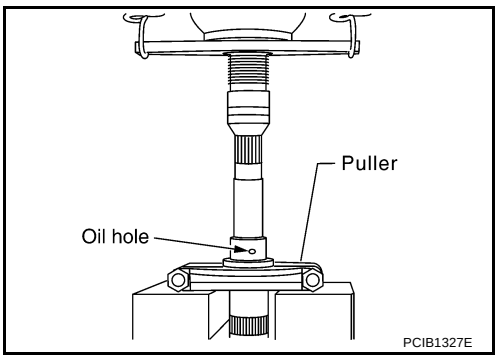


20. Using a press to remove the 3rd counter gear, 3rd-4th synchronizer assembly, 4th counter gear, 4th needle bearing, 4th gear bushing, 4th counter gear thrust washer, and counter rear bearing inner race.
21. Remove 3rd needle bearing.



22. Using a press to remove the 3rd gear bushing.

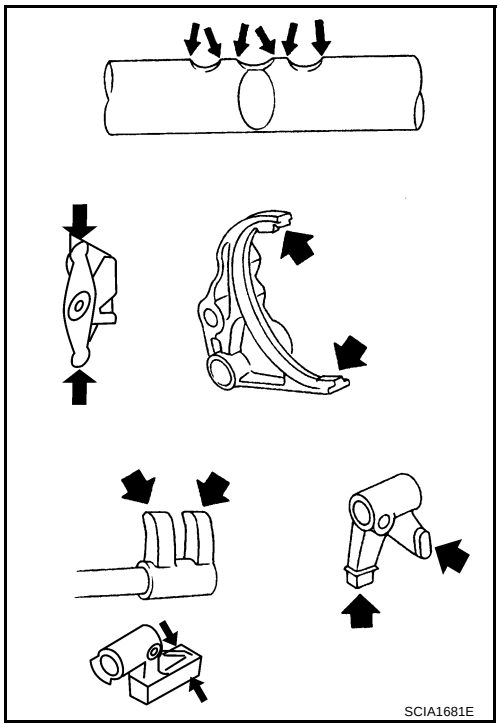
CAUTION:
Do not use oil hole of 3rd gear bushing when press out.



INSPECTION AFTER DISASSEMBLY

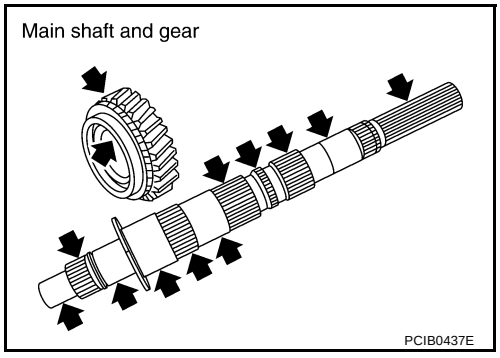
Shift Control

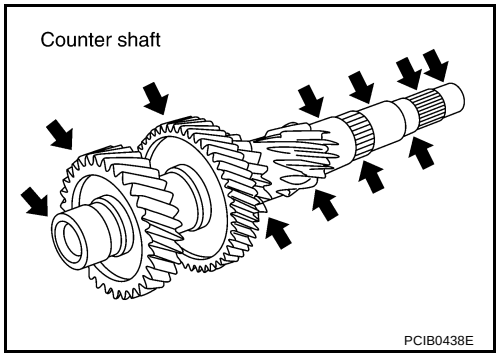
If the contact surface on striking lever, fork rod, shift fork, etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



Gear and Shaft

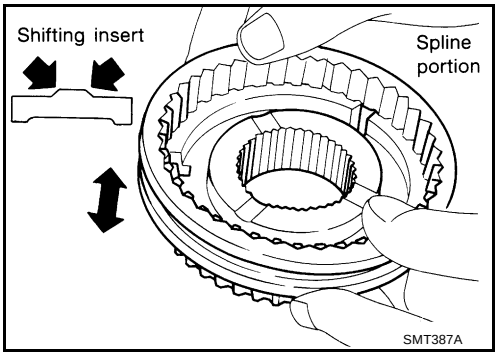
If the contact surface on each gear, main shaft, main drive gear, and counter shaft, etc. has damage, peeling, abrasion, dent, bent, or any other damage, replace the components.



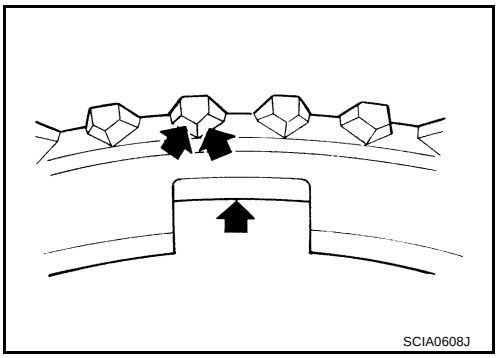


Synchronizer

- If the contact surface on coupling sleeve, synchronizer hub, and shifting insert has damage or abrasion, replace the components.
- Coupling sleeve and synchronizer hub shall move smoothly.



- If the cam surface on baulk ring or contact surface on insert has damage or excessive wear, replace with a new one.
- If spread spring is damaged, replace with a new one.



Baulk Ring Clearance

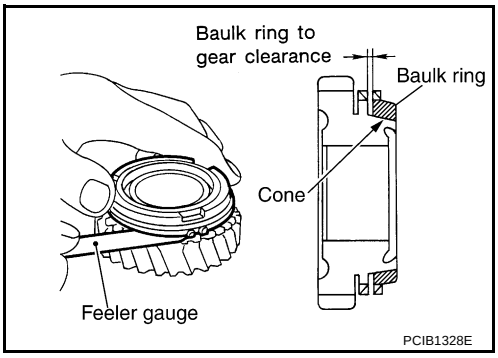
- **Single cone synchronizer (5th and 6th)**

– Push baulk ring on the cone and measure baulk ring back surface clearance at two locations or more on opposite sides, find the average value, and replace it if it is outside the limit value.

Clearance

Standard value : 0.70 - 1.35 mm (0.028 - 0.053 in)

Limit value : 0.5 mm (0.020 in) or less

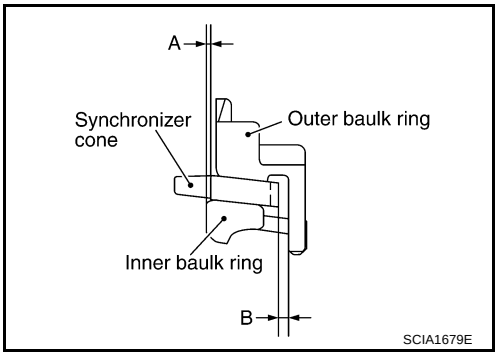


- **Double cone synchronizer (4th)**

Follow the instructions below and inspect the clearance of the outer baulk ring, synchronizer cone, inner baulk ring.

CAUTION:

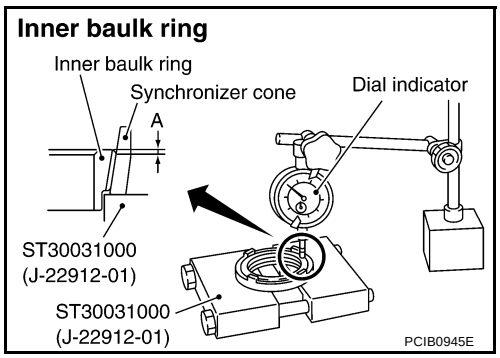
Clearances “A” and “B” of the outer baulk ring, synchronizer cone, and inner baulk ring are controlled as a set, so if the clearance is outside the limit value, replace the synchronizer assembly.



1. Using a dial indicator, measure clearance A at 2 or more points diagonally opposite, and calculate mean value.

Clearance A

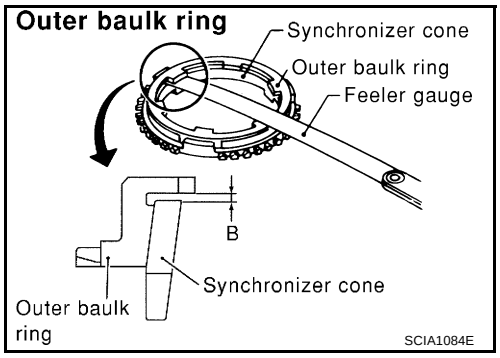
Standard value	**: 0.50 - 0.70 mm (0.020 - 0.028 in)**
Limit value	**: 0.3 mm (0.012 in) or less**



2. Using a feeler gauge, measure clearance B at 2 or more points diagonally opposite, and calculate mean value.

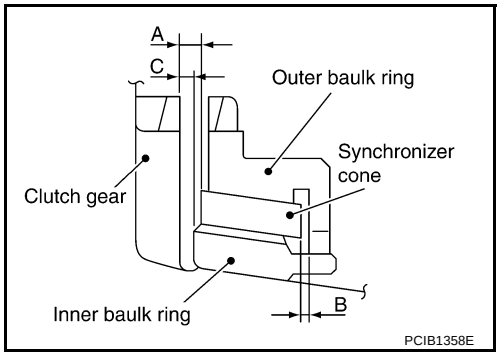
Clearance B

Standard value	**: 0.85 - 1.35 mm (0.033 - 0.053 in)**
Limit value	**: 0.7 mm (0.028 in) or less**



- **Triple cone synchronizer (1st, 2nd and 3rd)**
  Check clearance for outer baulk ring, synchronizer cone and inner baulk ring of triple cone synchronizer following the direction.

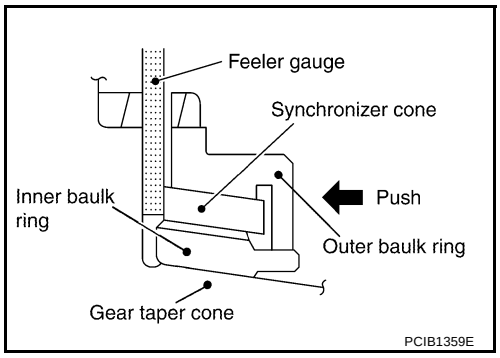
  NOTE:
  Outer baulk ring, synchronize cone and inner baulk ring, three control “clearance A, B and C” as a three-piece suite. If the value exceeds the limit value, replace them as a three-piece suite.



1. Using feeler gauge put and press baulk ring on gear taper cone, and then measure “clearance A” at more then 2 diagonal points, and calculate the average.

Clearance A

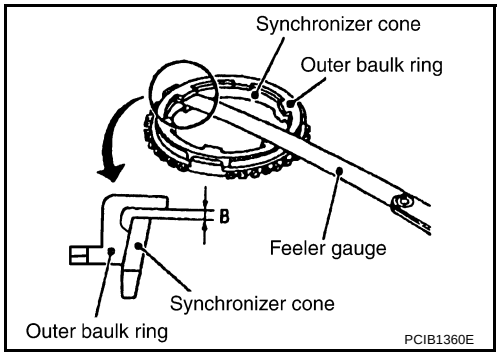
Standard value (1st)	**: 0.65 - 1.25 mm (0.026 - 0.049 in)**
Standard value (2nd, 3rd)	**: 0.60 - 1.30 mm (0.024 - 0.051 in)**
Limit value	**: 0.3 mm (0.012 in) or less**



2. Using feeler gauge measure “clearance B” at more than 2 diagonal positions, and calculate the average.

Clearance B

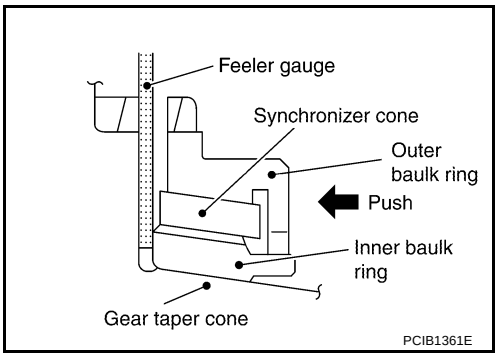
Standard value	**: 0.85 - 1.35 mm (0.033 - 0.053 in)**
Limit value	**: 0.7 mm (0.028 in) or less**



3. Using feeler gauge put and press baulk ring on gear taper cone, and then measure “clearance C” at more then 2 diagonal points, and calculate the average.

Clearance C

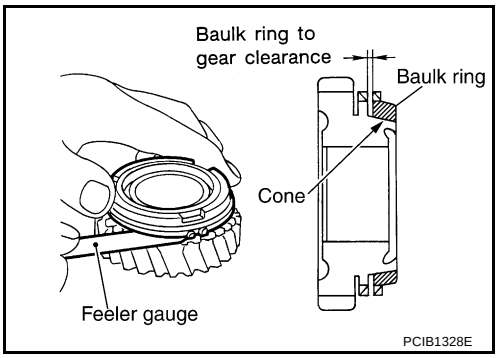
Standard value (1st)	**: 0.80 - 1.2 mm (0.031 - 0.047 in)**
Standard value (2nd, 3rd)	**: 0.75 - 1.25 mm (0.030 - 0.049 in)**
Limit value	**: 0.3 mm (0.012 in) or less**



- **Reverse synchronizer**
  Push baulk ring on the cone and measure baulk ring back surface clearance at two locations or more on opposite sides, find the average value, and replace if it is outside the limit value.

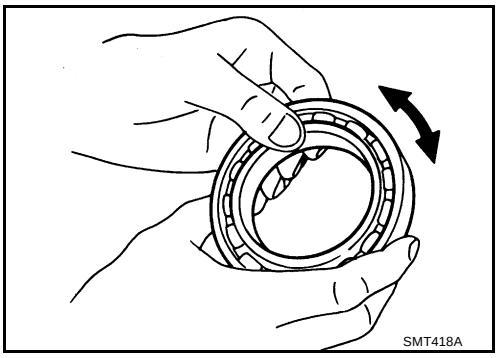
Clearance

Standard value	**: 0.75 - 1.20 mm (0.030 - 0.047 in)**
Limit value	**: 0.5 mm (0.020 in) or less**



Bearing

If the bearing does not rotate smoothly or the contact surface on ball or race is damaged or peeled, replace with new ones.



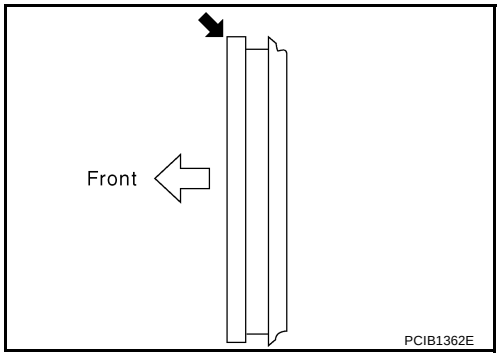
ASSEMBLY

Gear Components

1. Install 5th-6th coupling sleeve and 5th-6th shifting inserts in the 5th-6th synchronizer hub.

CAUTION:

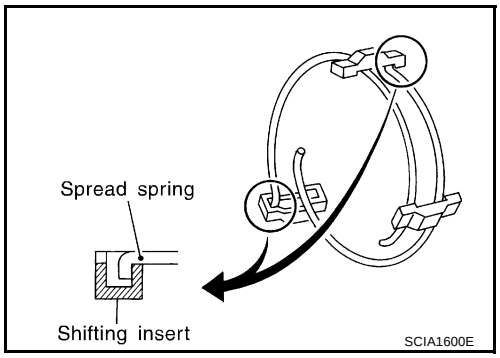
- **Do not reuse 5th-6th coupling sleeve and 5th-6th synchronizer hub.**
- **Replace 5th-6th coupling sleeve and 5th-6th synchronizer hub as a set.**
- **Install 5th-6th coupling sleeve with the large chamfer on the rear side.**



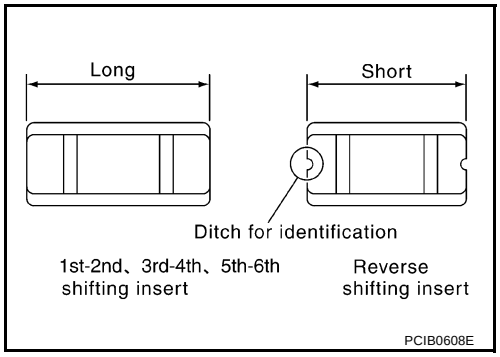
2. Install 5th-6th spread springs in the 5th-6th shifting inserts.

CAUTION:

- **Do not install 5th-6th spread spring hook onto the same 5th-6th shifting insert.**

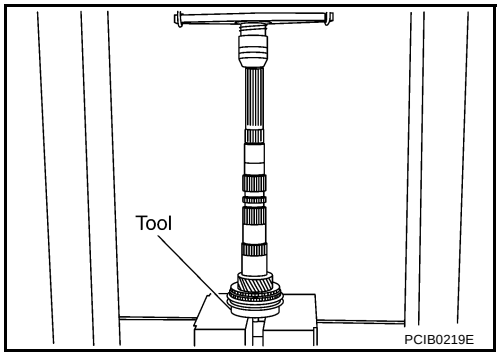


- **Be careful with the shape of reverse shifting insert to avoid misassembly.**

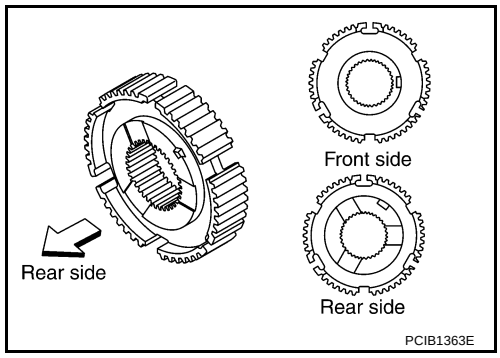


3. Apply recommended grease to 6th needle bearing.
4. Install 6th needle bearing, 6th main gear and 6th baulk ring on the main shaft and then using an inserter and a press to press fit the 5th-6th synchronizer assembly.

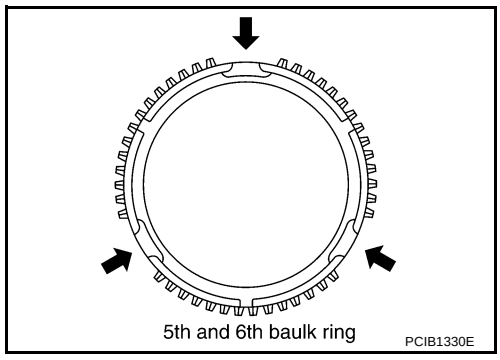
Tool number : ST30911000 (—)



CAUTION:
When press fitting, install with the side having the three boss edge oil grooves facing the rear side.



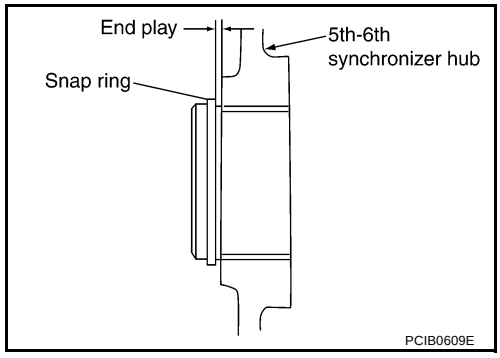
NOTE:
5th and 6th baulk rings have three spaces that four gear teeth are missing as shown in the figure.



5. Select and install a snap ring so that the end play comes within the standard value.

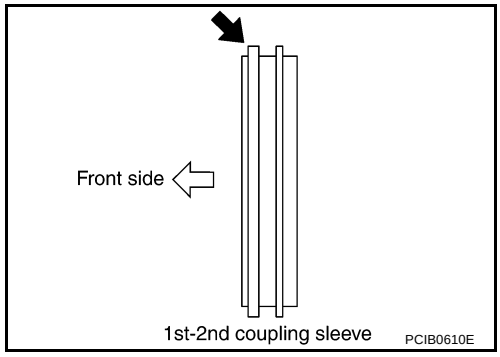
End play : 0 - 0.10 mm (0 - 0.004 in)

CAUTION:
Do not reuse snap ring.



6. Install 1st-2nd coupling sleeve and 1st-2nd shifting inserts into the 1st-2nd synchronizer hub.

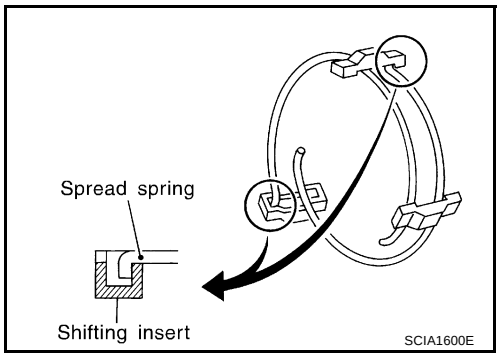
CAUTION:
- **Do not reuse 1st-2nd coupling sleeve and 1st-2nd synchronizer hub.**
- **Replace 1st-2nd coupling sleeve and 1st-2nd synchronizer hub as a set.**
- **Install 1st-2nd coupling sleeve with the thicker flange faced the front side.**



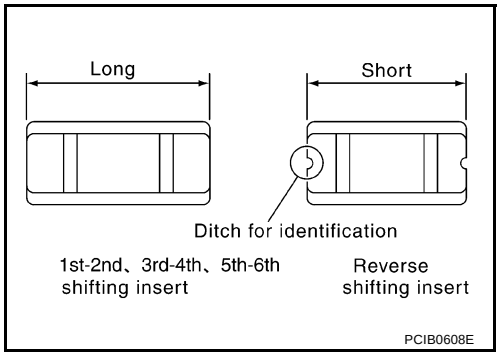
7. Install 1st-2nd spread springs in the 1st-2nd shifting inserts.

CAUTION:

- **Do not install 1st-2nd spread spring hook onto the same 1st-2nd shifting insert.**



- **Be careful with the shape of reverse shifting insert to avoid misassembly.**

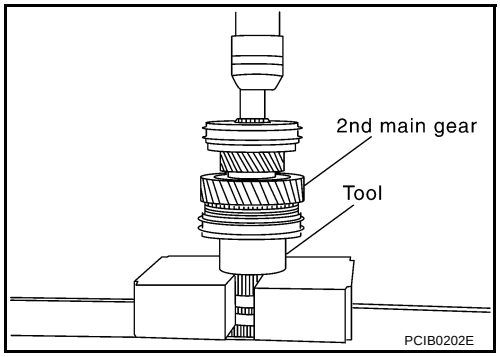


8. Apply recommended grease to 2nd needle bearing.
9. Install 2nd main gear, 2nd needle bearing, 2nd inner baulk ring, 2nd synchronizer cone and 2nd outer baulk ring on the main shaft and then using a support ring and a press to press fit the 1st-2nd synchronizer assembly.

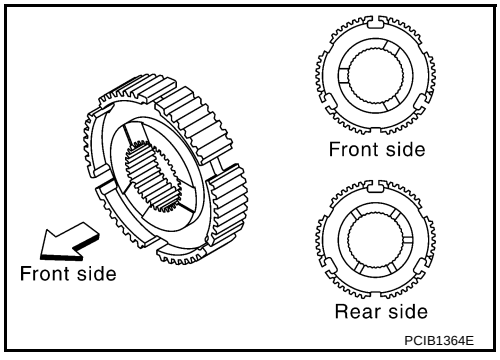
Tool number : ST27861000 (—)

CAUTION:

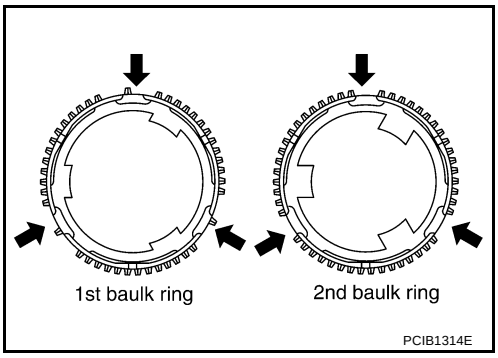
- **Replace 2nd inner baulk ring, 2nd synchronizer cone and 2nd outer baulk ring as a set.**



- **When press fitting, install with the side having the three boss edge oil grooves facing the front side.**

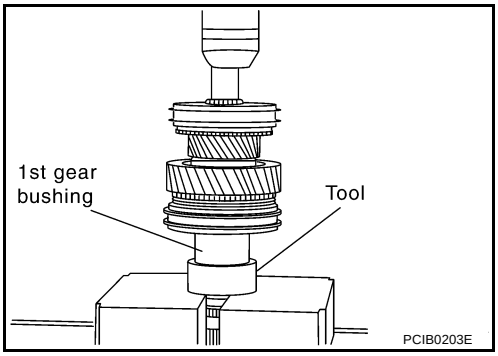


NOTE:
1st baulk ring has three spaces that four gear tooth is missing and 2nd baulk ring has three spaces that two gear teeth are missing.



10. Using a support ring and a press to press fit the 1st gear bushing.

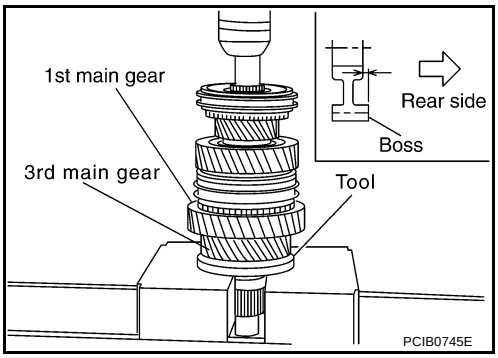
    Tool number : ST27861000 (—)



11. Apply recommended grease to 1st needle bearing.
12. Install 1st outer baulk ring, 1st synchronizer cone, 1st inner baulk ring, 1st needle bearing and 1st main gear on the main shaft and then using the inserter and a press to press fit the 3rd main gear.

    Tool number : ST30022000 (—)

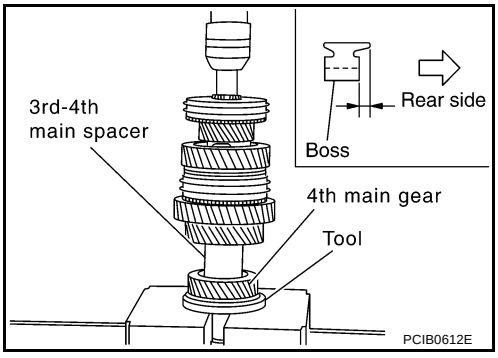
    CAUTION:
    - **Do not reuse 3rd main gear.**
    - **Replace 1st outer baulk ring, 1st synchronizer cone and 1st inner baulk ring as a set.**



13. Install 3rd-4th main spacer on the main shaft and then using the inserter and a press to press fit the 4th main gear.

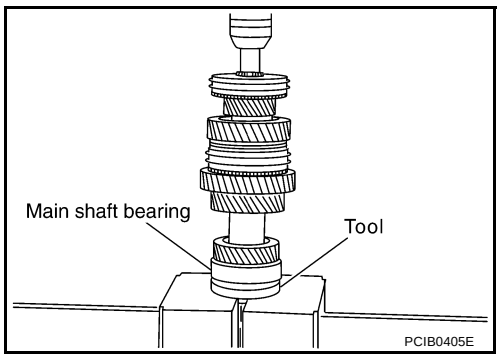
    Tool number : ST30022000 (—)

    CAUTION:
    - **Do not reuse 4th main gear.**
    - **When installing, set boss to rear side.**



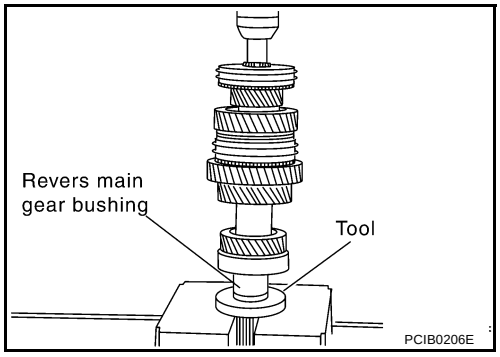
14. Using the inserter and a press to press fit the main shaft bearing onto the main shaft.

Tool number : ST30911000 (—)



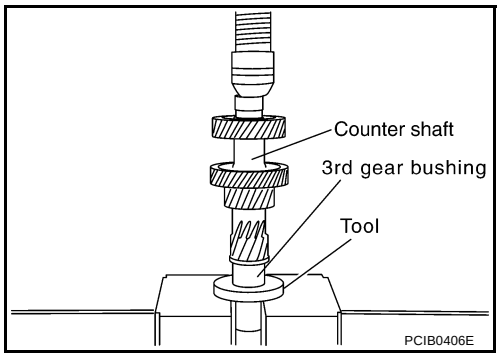
15. Using the inserter and a press to press fit the reverse main gear bushing onto the main shaft.

Tool number : ST30911000 (—)



16. Using the inserter and a press to press fit the 3rd gear bushing onto the counter shaft.

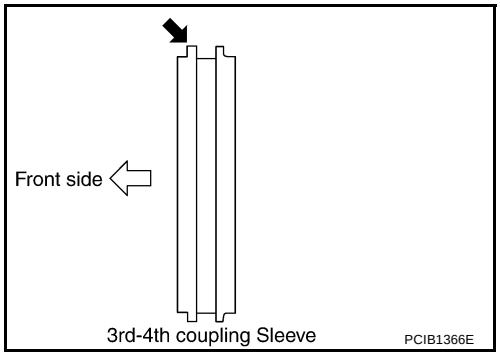
Tool number : ST30911000 (—)



17. Install 3rd-4th coupling sleeve and 3rd-4th shifting inserts into the 3rd-4th synchronizer hub.

CAUTION:

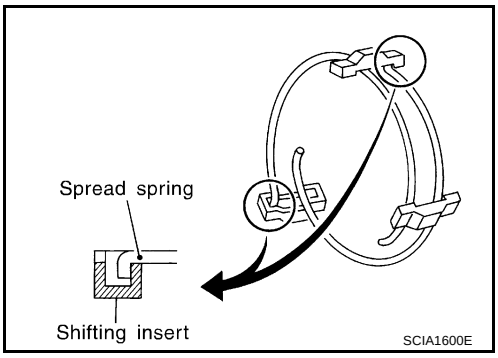
- **Do not reuse 3rd-4th coupling sleeve and 3rd-4th synchronizer hub.**
- **Replace 3rd-4th coupling sleeve and 3rd-4th synchronizer hub as a set.**
- **Install 3rd-4th coupling sleeve with the thicker flange faced the front side.**



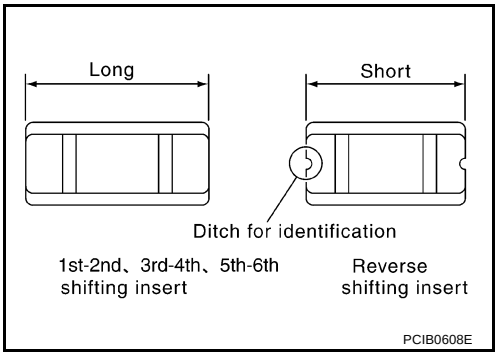
18. Install 3rd-4th spread springs in the 3rd-4th shifting inserts.

CAUTION:

- **Do not install 3rd-4th spread spring hook onto the same 3rd-4th shifting insert.**

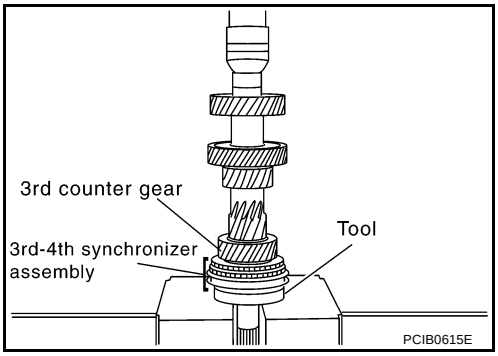


- **Be careful with the shape of reverse shifting insert to avoid misassembly.**



19. Apply recommended grease to 3rd needle bearing.
20. Apply gear oil to the hole spline press fitting side of 3rd-4th synchronizer hub.
21. Install 3rd needle bearing, 3rd counter gear, 3rd inner baulk ring, 3rd synchronizer cone and 3rd outer baulk ring on the counter shaft and then using the inserter and a press to press fit the 3rd-4th synchronizer assembly.

Tool number : ST30911000 (—)

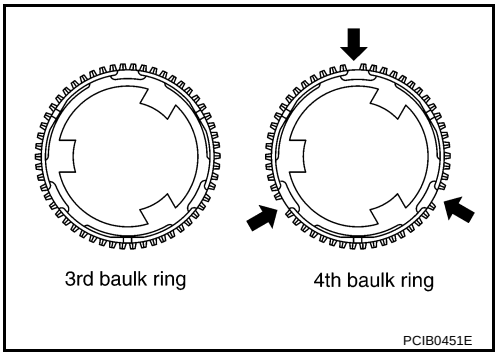


CAUTION:

Replace 3rd inner baulk ring, 3rd synchronizer cone and outer baulk ring as a set.

NOTE:

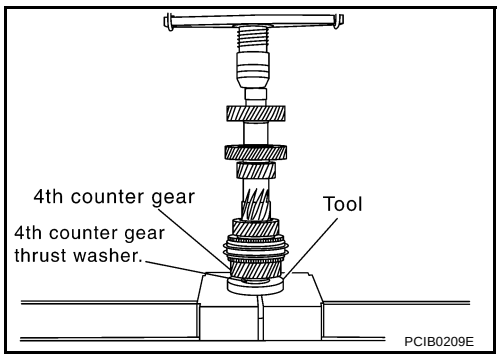
4th baulk ring has three spaces that one gear tooth is missing but 3rd baulk ring doesn't.



22. Apply recommended grease to 4th needle bearing.
23. Install 4th outer baulk ring, 4th synchronizer cone, 4th inner baulk ring, 4th needle bearing and 4th counter gear onto the counter shaft and then using the inserter and a press to press fit the 4th gear bushing and 4th counter gear thrust washer.

    Tool number : KV40100630 (J-26092)

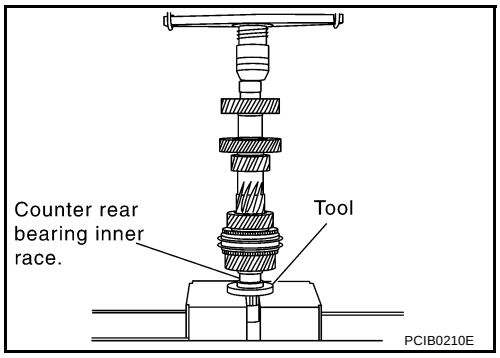
    CAUTION:
    Replace 4th outer baulk ring, 4th synchronizer cone and 4th inner baulk ring as a set.



24. Using the inserter and a press to press fit the counter rear bearing inner race onto the counter shaft.

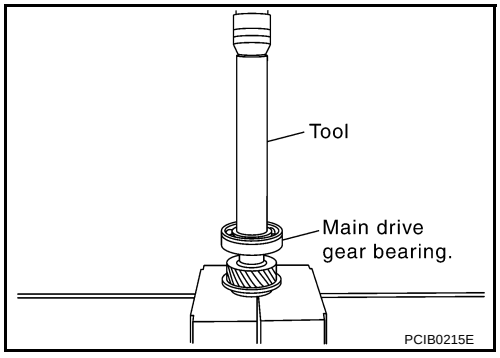
    Tool number : ST30032000 (J-26010-01)

    CAUTION:
    Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.



25. Using the drift and a press to press fit the main drive gear bearing onto the main drive gear.

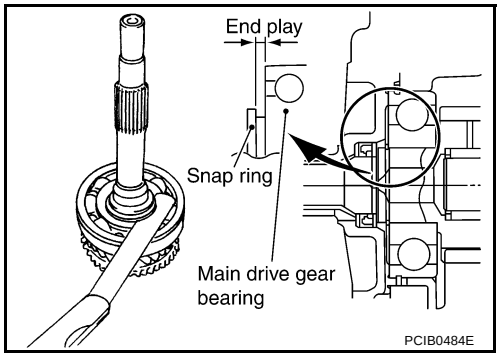
    Tool number : KV32102700 (—)



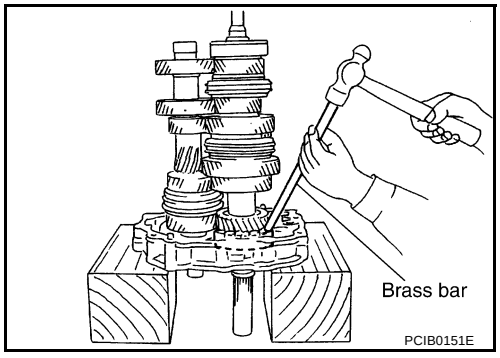
26. Select and install a snap ring to the main drive gear bearing so that the end play comes within the standard value.

    End play : 0 - 0.10 mm (0 - 0.004 in)

    CAUTION:
    Do not reuse snap ring.
27. Apply recommended grease to main pilot bearing.
28. Install main pilot bearing, pilot bearing spacer and 5th baulk ring to main drive gear.



29. Install main drive gear assembly, main shaft assembly, and counter shaft assembly combined in one unit to adapter plate using brass bar.

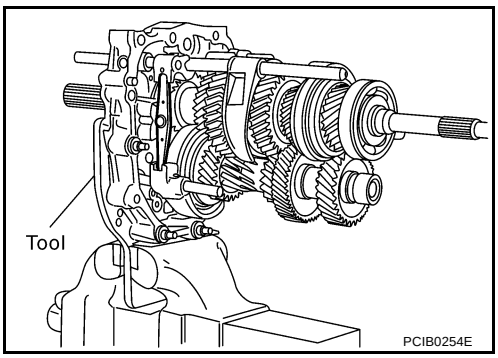


30. Install the adapter setting plate to adapter plate and then fixing in adapter setting plate using a vise.

    Tool number : ST22490000 (—)

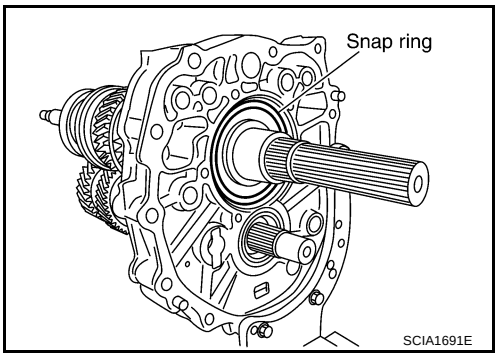
    CAUTION:
    Do not directly secure the surface in a vise.

31. Install magnet to adapter plate.



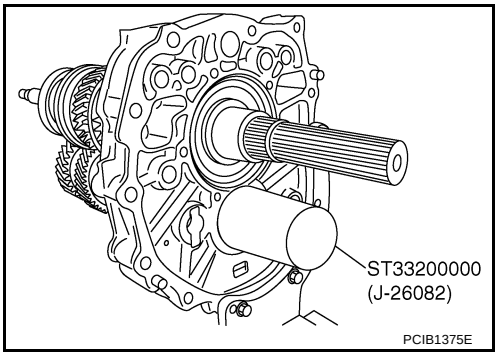
32. Install snap ring to mainshaft bearing.

    CAUTION:
    Do not reuse snap ring.



33. Install counter rear bearing onto the adapter plate using the drift.

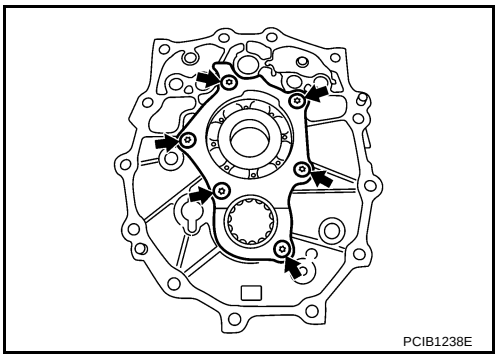
    CAUTION:
    Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.



34. Apply recommended thread locking sealant to the end of the bolts (first 3 to 4 threads), screw the bolts into the main shaft bearing retainer, and tighten it to the specified torque. Refer to MT-22, "Case Components" .

    - **Use Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

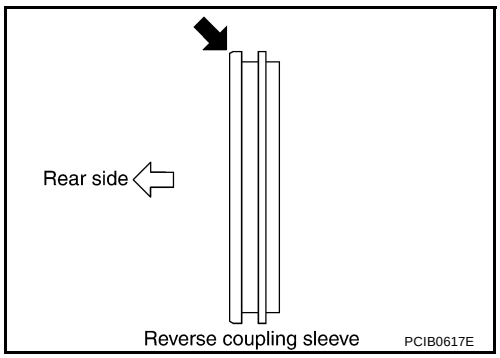
      CAUTION:
      Remove old sealant and oil adhering to threads.



35. Install reverse coupling sleeve and reverse shifting inserts into the reverse synchronizer hub.

    CAUTION:
    - **Do not reuse reverse coupling sleeve and reverse synchronizer hub.**
    - **Replace reverse coupling sleeve and reverse synchronizer hub as a set.**

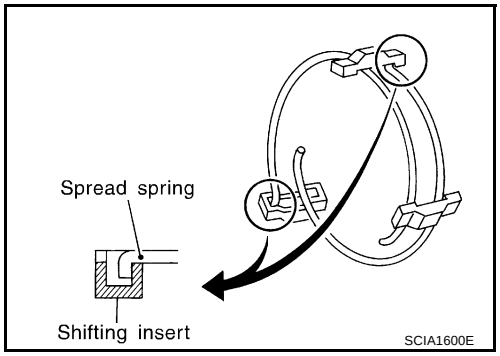
- **Install reverse coupling sleeve with the flat flange on the rear side.**



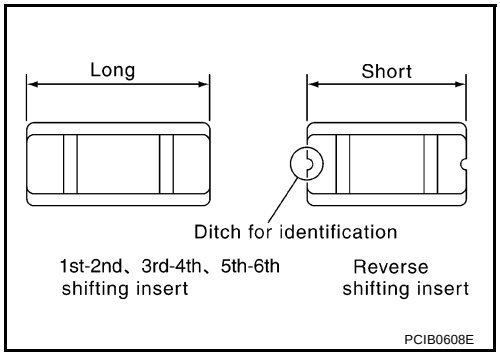
36. Install reverse spread springs in the reverse shifting inserts.

CAUTION:

- **Do not install reverse spread spring hook onto the same reverse shifting insert.**



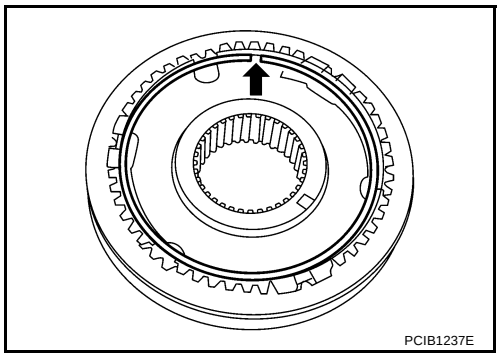
- **Be careful with the shape of 1st-2nd, 3rd-4th and 5th-6th shifting insert to avoid misassembly.**



37. Install snap ring to reverse synchronizer hub.

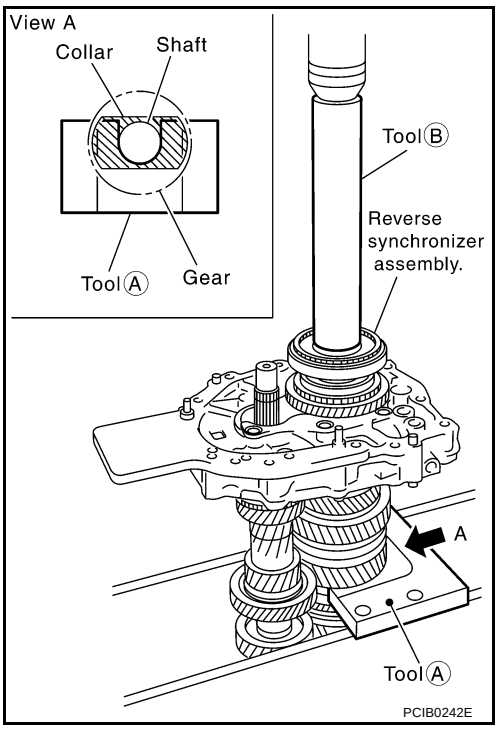
CAUTION:

- **Do not reuse snap ring.**
- **Do not align the snap ring notch with synchronizer hub groove when assembling.**

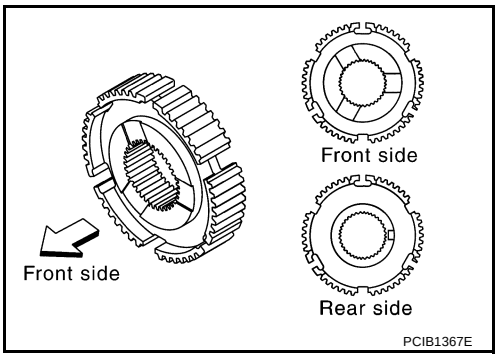


38. Apply recommended grease to reverse main needle bearing.
39. After installing reverse main gear bushing, reverse main needle bearing, reverse main gear and reverse baulk ring onto the main shaft, using the drift and press plate and a press to press fit the reverse synchronizer assembly.

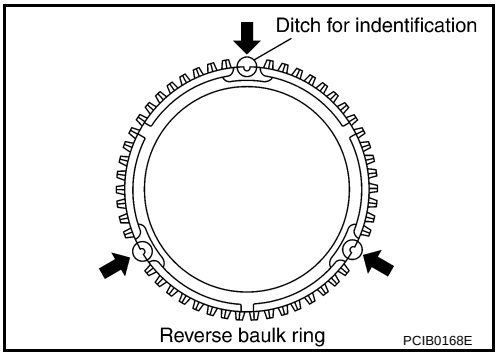
Tool number A: KV32103300 (J-46529)
Tool number B: ST01530000 (—)



CAUTION:
When installing, face the side with three ditches to the front side.



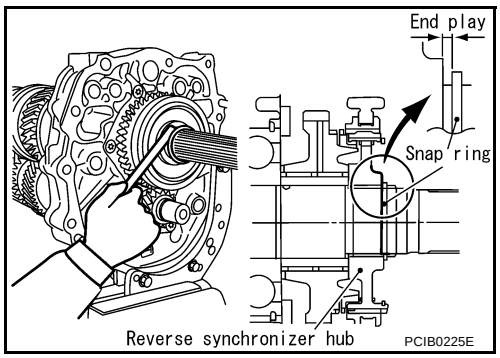
NOTE:
Reverse baulk ring has three spaces that two gear teeth are missing, and each space has small ditch for identification as shown in the figure.



40. Select and install a snap ring so that the end play comes within the standard value.

End play : 0 - 0.10 mm (0 - 0.004 in)

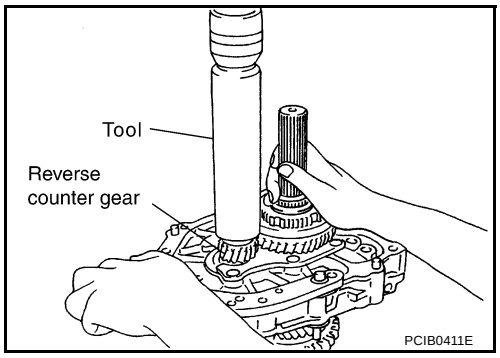
CAUTION:
Do not reuse snap ring.



41. After installing counter rear bearing spacer, press and fit reverse counter gear onto counter shaft with drift and press.

Tool number : ST23860000 (—)

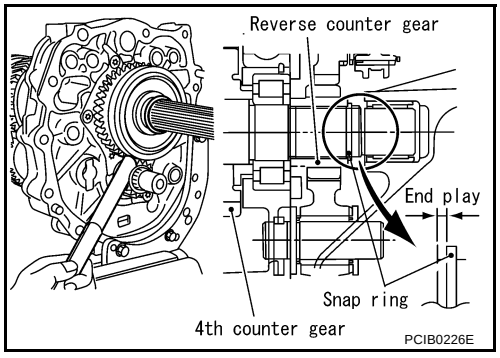
CAUTION:
- **Do not reuse reverse counter gear.**
- **When installing counter rear bearing spacer, identification ditch should face to the rear side.**
- **Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.**



42. Select and install a snap ring so that the end play comes within the standard value.

End play : 0 - 0.10 mm (0 - 0.004 in)

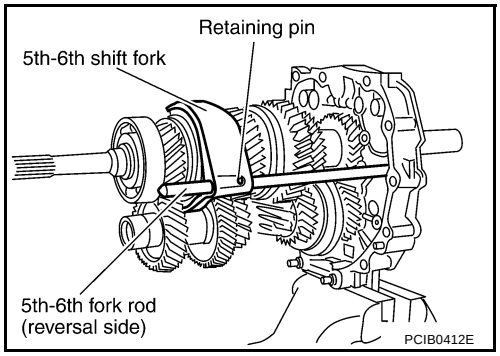
CAUTION:
Do not reuse snap ring.



Shift Control Components

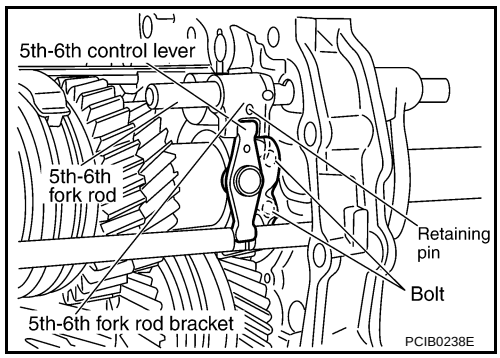
1. Install 5th-6th shift fork to the 5th-6th coupling sleeve.
2. Install 5th-6th fork rod (reversal side) to the 5th-6th shift fork.
3. Using a pin punch to tap the retaining pin into the 5th-6th shift fork.

CAUTION:
Do not reuse retaining pin.



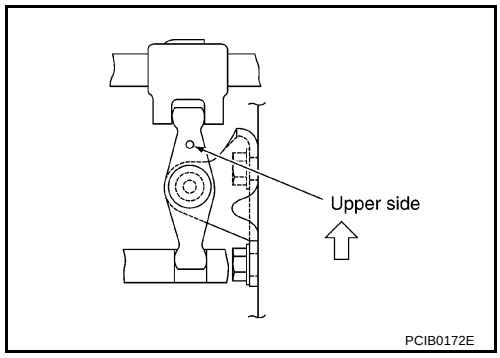
4. Install 5th-6th fork rod to the adapter plate.
5. Install 5th-6th fork rod bracket to the 5th-6th fork rod.
6. Using a pin punch to tap the retaining pin into the 5th-6th fork rod bracket.

CAUTION:
Do not reuse retaining pin.

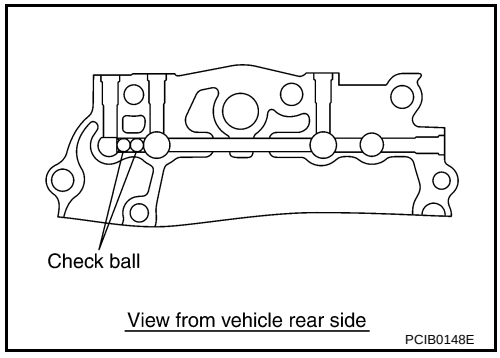


7. Install 5th-6th control lever to the adapter plate and then tighten mounting bolts to the specified torque. Refer to MT-26, "Shift Control Components" .

CAUTION:
Set the projection upward.

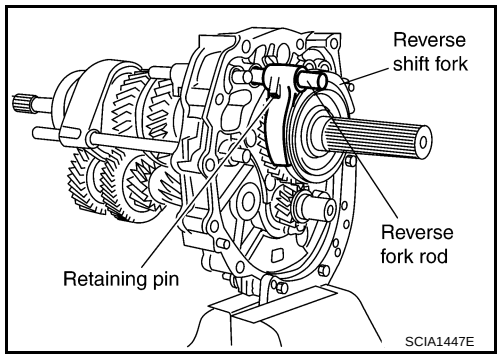


8. Apply recommended grease check balls and then install check balls to the adapter plate.

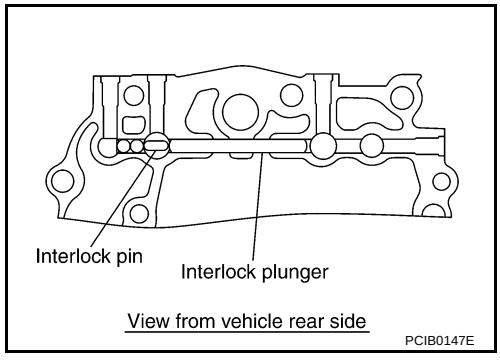


9. Install reverse shift fork to the reverse coupling sleeve.
10. Install reverse fork rod to the reverse shift fork.
11. Using a pin punch to tap the retaining pin into the reverse shift fork.

CAUTION:
Do not reuse retaining pin.

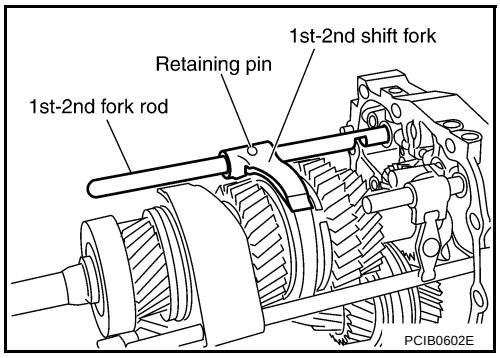


12. Apply recommended grease to interlock pin and interlock plunger.
13. Install interlock pin and interlock plunger to the adapter plate.



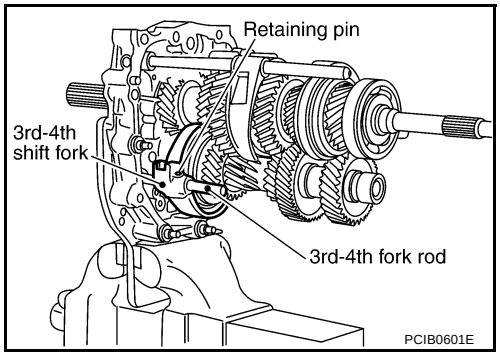
14. Install 1st-2nd shift fork to the 1st-2nd coupling sleeve.
15. Install 1st-2nd fork rod to the 1st-2nd shift fork.
16. Using a pin punch to tap the retaining pin into the 1st-2nd shift fork.

CAUTION:
Do not reuse retaining pin.

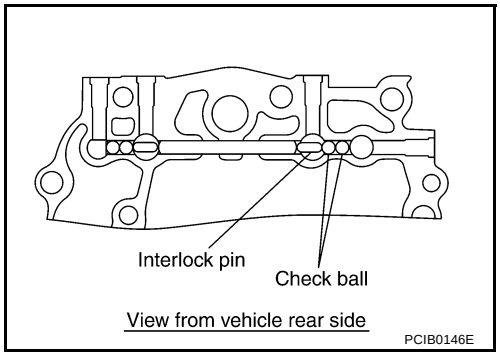


17. Install 3rd-4th shift fork to the 3rd-4th coupling sleeve.
18. Install 3rd-4th fork rod (reversal side) to the 3rd-4th shift fork.
19. Using a pin punch to tap the retaining pin into the 3rd-4th shift fork (reversal side).

CAUTION:
Do not reuse retaining pin.

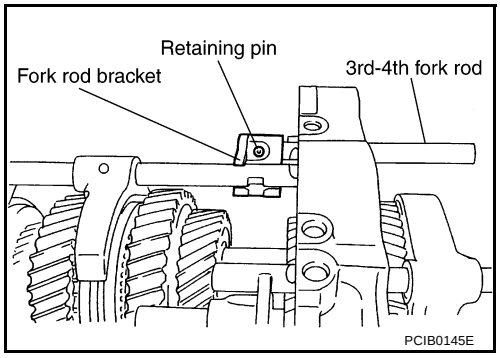


20. Apply recommended grease to interlock pin and check balls.
21. Install interlock pin and check balls to the adapter plate.



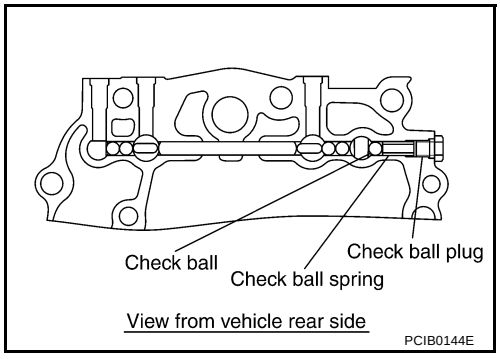
22. Install 3rd-4th fork rod to the adapter plate.
23. Install 3rd-4th fork rod bracket to the 3rd-4th fork rod.
24. Using a pin punch to tap the retaining pin into the 3rd-4th fork rod bracket.

CAUTION:
Do not reuse retaining pin.



25. Apply recommended grease to check ball and then install check ball and check ball spring into adapter plate.
26. Apply recommended sealant to threads of check ball plugs, and tighten check ball plugs to the specified torque. Refer to MT-26, "Shift Control Components" .
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

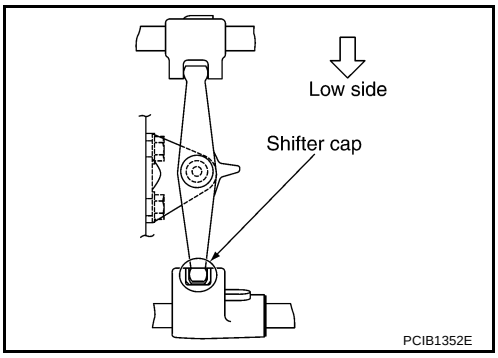
CAUTION:
Remove old sealant and oil adhering to threads.



27. Install 3rd-4th control lever to the adapter plate, and then tighten mounting bolts to the specified torque. Refer to MT-26, "Shift Control Components" .

CAUTION:

- **Make sure the top and bottom are oriented correctly.**
- **Do not drop shifter cap.**

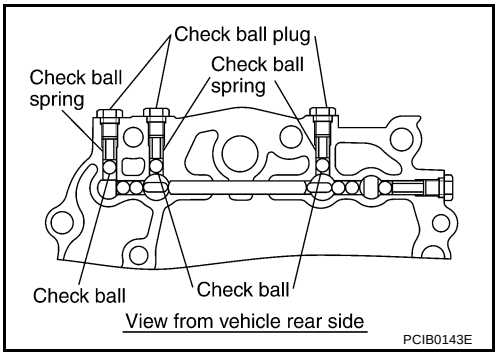


28. Apply recommended grease to check ball and then install check balls and check ball springs into adapter plate.
29. Apply recommended sealant to threads of check ball plugs, and tighten check ball plugs to the specified torque. Refer to MT-26, "Shift Control Components" .

- **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

CAUTION:

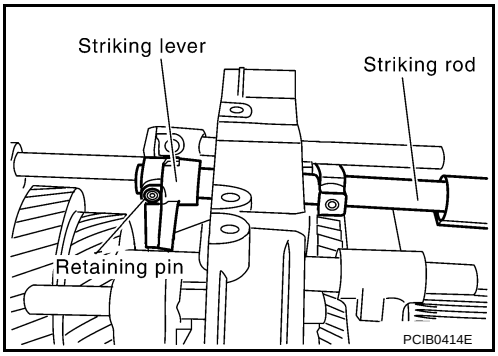
Remove old sealant and oil adhering to threads.



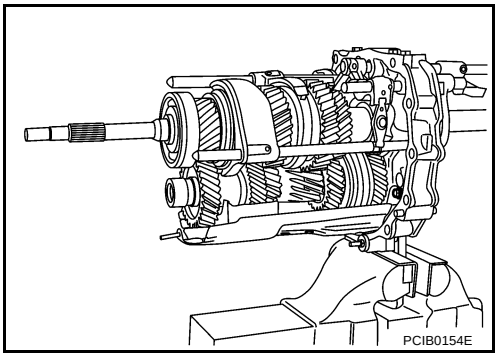
30. Install striking rod to the adapter plate.
31. Install striking lever to the striking rod.
32. Using a pin punch to tap the retaining pin into the striking lever.

CAUTION:

Do not reuse retaining pin.



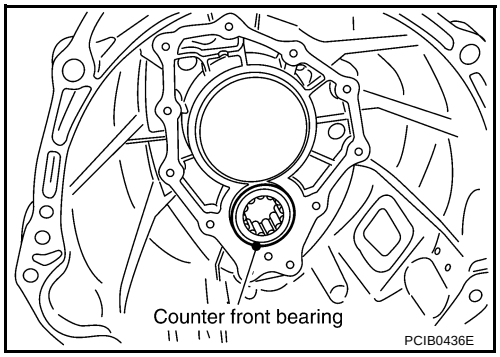
33. Install baffle plate to the adapter plate, and then tighten mounting bolts to the specified torque.



Case Components

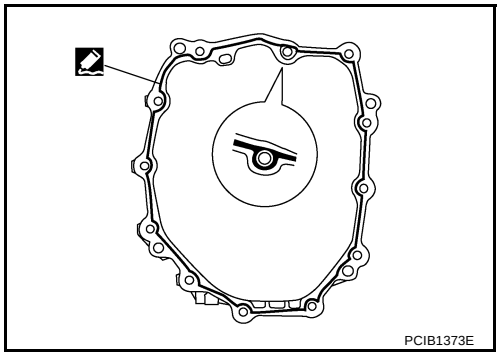
1. Install counter front bearing to the transmission case.
2. Install oil gutter to transmission case.
3. Install breather tube to transmission case.

CAUTION:
Do not reuse breather tube.

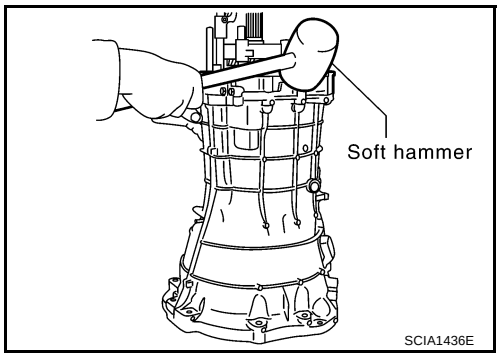


4. Apply recommended sealant to the transmission case adapter plate mounting surface as shown in the figure.
   - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

CAUTION:
Remove old sealant adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to both mounting surfaces.

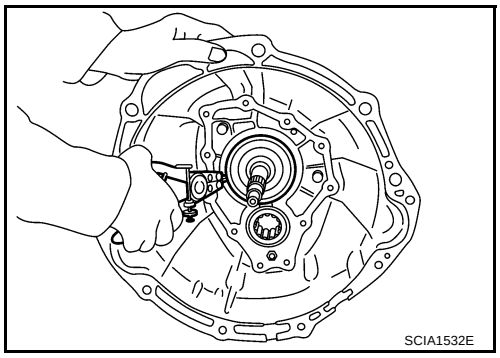


5. Place the adapter plate in the transmission case, using soft hammer to tap the adapter plate to install it into the transmission case.

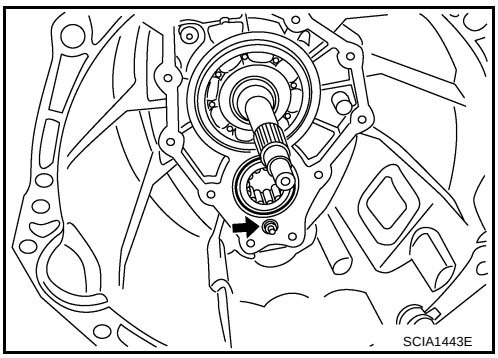


6. Install snap ring to main drive gear bearing, using snap ring pliers.

CAUTION:
Do not reuse snap ring.



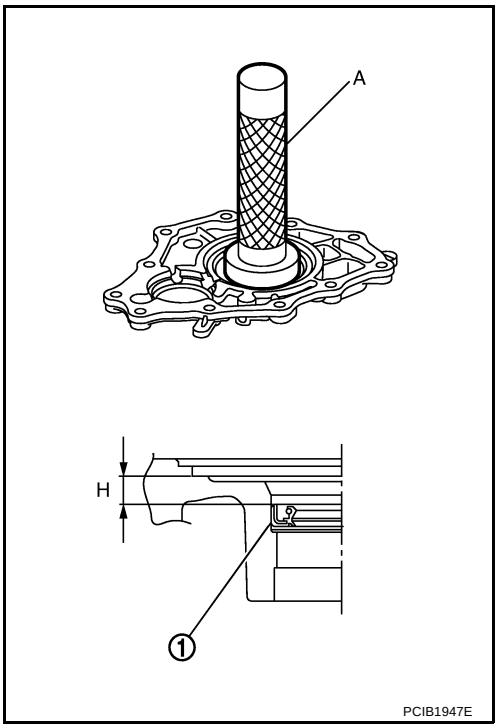
7. Tighten baffle plate mounting nut to the specified torque. Refer to MT-22, "Case Components" .



8. Apply multi-purpose grease to the lip of the front cover oil seal (1). Using a drift (A), to install oil seal approx. 8.55-9.55 mm (0.336-0.376 in) above from the front cover edge surface.

Tool number : KV38102100 (J-25803-01)

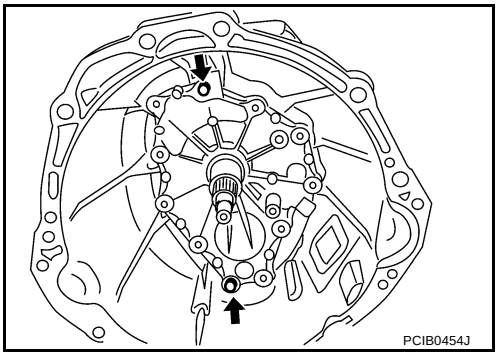
CAUTION:
- **Do not reuse front cover oil seal.**
- **When installing, do not incline the front cover oil seal.**



9. Install front cover gasket and front cover to the transmission case.

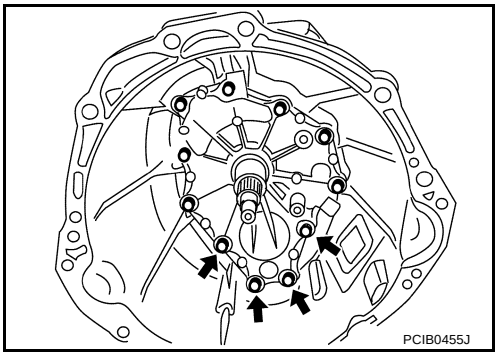
CAUTION:
- **Do not reuse front cover gasket.**
- **Do not damage front cover oil seal.**

10. Temporary tightening 2 bolts in the positions shown in the figure.

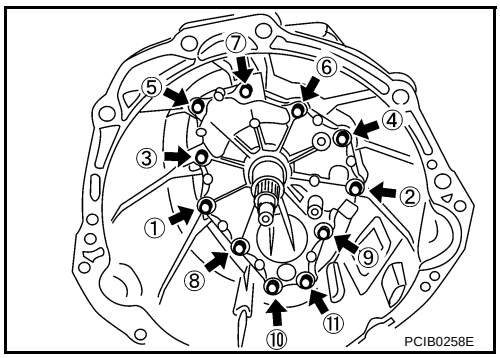


11. Temporary tightening remaining 9 bolts.

CAUTION:
Four bolts pointed by arrows in the figure are not reusable.



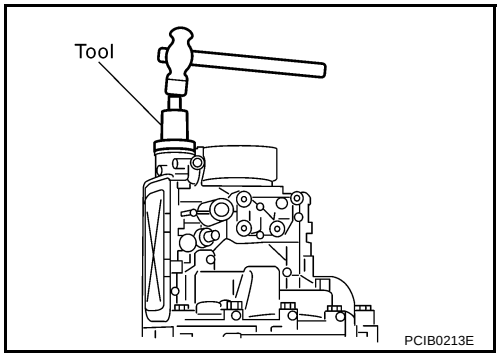
12. Tighten bolts to the specified torque in order as shown in the figure. Refer to MT-22, "Case Components"



13. Install rear extension oil gutter and cap to rear extension and then tighten mounting bolt to the specified torque. Refer to MT-22, "Case Components" .
14. Install bracket to transmission case and then tighten mounting bolt to the specified torque. Refer to MT-22, "Case Components" .
15. Apply recommended grease to reverse idler needle bearing.
16. Install reverse idler shaft, reverse idler needle bearing, reverse idler gear, and reverse idler thrust washer to the adapter plate.
17. Apply multi-purpose grease to the striking rod oil seal lip, and then using the drift to install striking rod oil seal.

    Tool number : ST33061000 (J-8107-2)

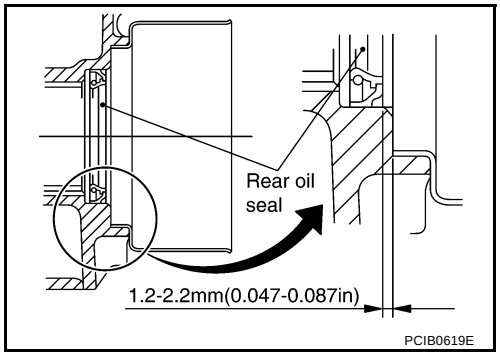
    CAUTION:
    - **Do not reuse striking rod oil seal.**
    - **When installing, do not incline the striking rod oil seal.**



18. Apply multi-purpose grease to the lip of the rear oil seal. Using a drift to install rear oil seal. 1.2 - 2.2 mm (0.047 - 0.087 in) above from the rear extension edge surface.

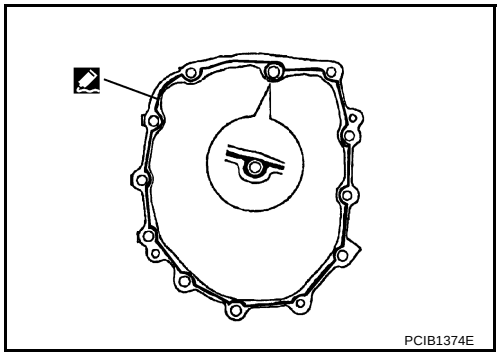
    Tool number : ST33400001 (J-26082)

    CAUTION:
    - **Do not reuse rear oil seal.**
    - **When installing, do not incline the rear oil seal.**



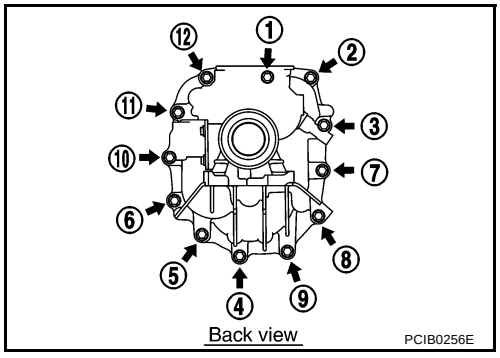
19. Apply recommended sealant to the adapter plate rear extension mounting surface as shown in the figure.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

    CAUTION:
    Remove old sealant adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to both mounting surfaces.



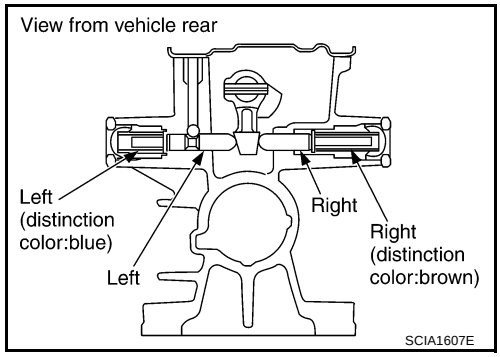
20. Install rear extension to the adapter plate and then tighten mounting bolts to the specified torque in order as shown on the figure. Refer to MT-22, "Case Components" .

    CAUTION:
    Do not damage rear oil seal and striking rod oil seal.
21. Install control lever housing to the rear extension and then tighten mounting bolts to the specified torque. Refer to MT-26, "Shift Control Components" .



CAUTION:
Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.

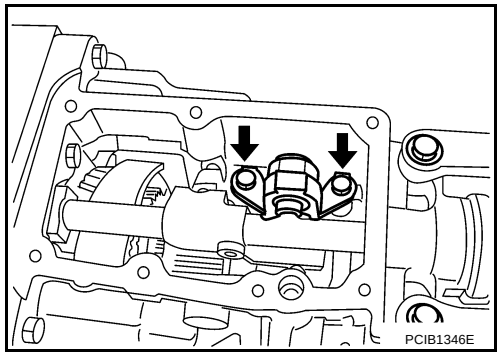
22. Apply gear oil to return spring plungers.
23. Install return spring plungers and return springs into the rear extension, apply recommended sealant to threads of return spring plugs, and then tighten return spring plugs to the specified torque. Refer to MT-26, "Shift Control Components" .
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**



Region	Return spring identification mark	Plunger groove
RH	Brown	No
LH	Blue	Yes

CAUTION:
- **The right and left return springs and return spring plungers are different, so make sure they are installed correctly.**
- **Remove old sealant and oil adhering to threads.**

24. Install shift check pin as a one unit with the control bracket to rear extension and then tighten mounting bolts to the specified torque. Refer to MT-26, "Shift Control Components" .
25. Install plunger to the rear extension, and then screwing Park/Neutral position (PNP) switch and back-up lamp switch to the rear extension with 1-2 pitches. Apply recommended sealant to threads of switches, and tighten switches to the specified torque. Refer to MT-22, "Case Components" .
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**



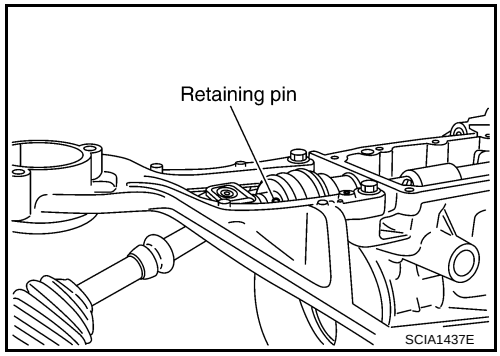
CAUTION:
Remove old sealant and oil adhering to threads.

26. Install brackets to rear extension and then tighten bracket mounting bolts to the specified torque. Refer tp MT-22, "Case Components" .
27. Install boot and control rod to striking rod.
28. Install retaining pin into the control rod, using a pin punch.

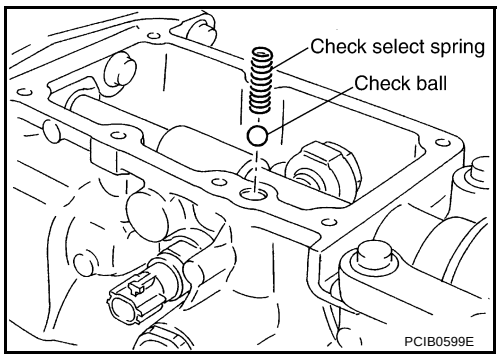
CAUTION:
Do not reuse retaining pin.

29. Install boot to control rod.

CAUTION:
Fit the boot to the groove on the control rod.



30. Install check ball and check select spring into the rear extension.

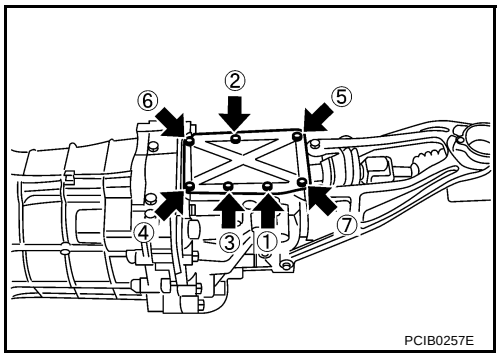


31. Install rear extension upper cover gasket and rear extension upper cover to rear extension.

CAUTION:

- **Do not reuse rear extension upper cover gasket.**
- **Avoid tangling check select spring.**

32. Tighten rear extension upper cover bolts to the specified torque in order as shown in the figure. Refer to MT-22, "Case Components" .



33. Install gasket to drain plug and then install it to transmission case. Tighten drain plug to the specified torque. Refer to MT-22, "Case Components" .

CAUTION:

Do not reuse gasket.

34. Install gasket to filler plug and then install it to transmission case. Tighten filler plug to the specified torque. Refer to MT-22, "Case Components" .

CAUTION:

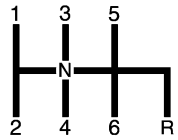
- **Do not reuse gasket.**
- **After oil is filled, tighten filler plug to specified torque.**

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NCS00012

Transmission model		FS6R31A
Number of speed		6
Shift pattern		 SCIA0955E
Synchromesh type		Warner
Gear ratio	1st	3.794
	2nd	2.324
	3rd	1.624
	4th	1.271
	5th	1.000
	6th	0.794
	Reverse	3.446
Main gear (Number of teeth)	Drive	26
	1st	37
	2nd	34
	3rd	33
	4th	31
	6th	31
	Reverse	42
Counter gear (Number of teeth)	Drive	32
	1st	12
	2nd	18
	3rd	25
	4th	30
	6th	48
	Reverse	15
Reverse idler gear (Number of teeth)		26
Oil capacity (Approx.)	ℓ (US pt, Imp pt)	2.93 (6-1/4, 5-1/8)
Remarks	Reverse synchronizer	Installed
	Double cone synchronizer	4th
	Triple cone synchronizer	1st, 2nd and 3rd

End Play

NCS00013

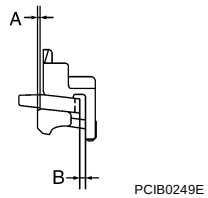
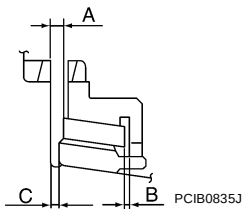
Unit: mm (in)

Item	Standard value
Counter shaft	0 - 0.10 (0 - 0.004)
Main drive gear	0 - 0.10 (0 - 0.004)
Main shaft	0 - 0.10 (0 - 0.004)

Baulk Ring Clearance

NCS00016

Unit: mm (in)

Measurement point		Standard value	Limit value
4th (Double-cone synchronizer)	Clearance between synchronizer cone and inner baulk ring end face “A”	0.50 - 0.70 (0.020 - 0.028)	0.3 (0.012)
 PCIB0249E	Clearance between outer baulk ring pawl and synchronizer cone “B”	0.85 - 1.35 (0.033 -0.053)	0.7 (0.028)
1st, 2nd and 3rd (Triple-cone synchronizer)	Clearance between synchronizer cone and clutch gear end face “A”	1st: 0.65 - 1.25 (0.026 - 0.049) 2nd: 0.60 - 1.30 (0.024 - 0.051) 3rd: 0.60 - 1.30 (0.024 - 0.051)	0.3 (0.012) 0.3 (0.012) 0.3 (0.012)
 PCIB0835J	Clearance between outer baulk ring pawl and synchronizer cone “B”	0.85 - 1.35 (0.033 - 0.053)	0.7 (0.028)
	Clearance between inner baulk ring and clutch gear end face “C”	1st: 0.8 - 1.2 (0.031 - 0.047) 2nd: 0.75 - 1.25 (0.030 - 0.049) 3rd: 0.75 - 1.25 (0.030 - 0.049)	0.3 (0.012) 0.3 (0.012) 0.3 (0.012)
5th and 6th		0.70 - 1.35 (0.028 - 0.053)	0.5 (0.020)
Reverse		0.75 - 1.20 (0.030 - 0.047)	0.5 (0.020)

SECTION PB
PARKING BRAKE SYSTEM

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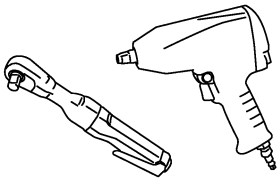
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PREPARATION

PFP:00002

Commercial Service Tools

NFS000TF

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

PARKING BRAKE SYSTEM

PFP:36010

On-Vehicle Service

NFS0001F

LEVER STROKE

- When parking brake lever is operated with a force of 196 N (20 kg, 44 lb), check that the stroke is within the specified number of notches. (Check it by listening and counting the ratchet clicks.)

Lever stroke : 6 to 7 notches

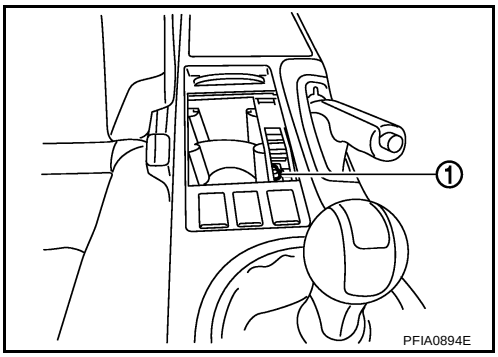
INSPECT COMPONENTS

- Make sure the components are attached properly (check for looseness, backlash, etc.).
- Check parking lever assembly for bend, damage and cracks, and replace if necessary.
- Check that there is no wear or damage to the cable, and replace if there is.
- Inspecting parking brake warning lamp switch is inspected and exchange if there is a faulty.

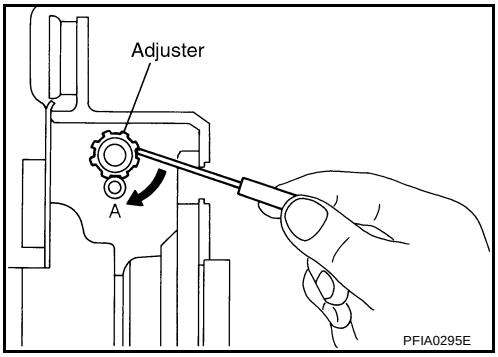
ADJUSTMENT

- To perform adjustment operations, remove tire from the vehicle with power tool.

1. Remove the coin pocket. Insert a deep socket wrench to rotate adjusting nut (1) and loosen the cable sufficiently. Then, return the lever.
2. Using wheel nuts, fix the disc rotor to the hub and prevent it from tilting.



3. Remove adjusting hole plug installed on the disc. Using a flat-bladed screwdriver, turn the disc in direction “A” as shown in the figure until the disc is locked. After locking, turn the adjuster in the opposite direction by 5 or 6 notches.
4. Rotate the disc to make sure there is no drag. Install the adjusting hole plug.
5. Adjust cable as follows:



a. Operate lever 10 or more times with a force of 294 N (30 kg, 66 lb).
b. Rotate adjusting nut with deep socket to adjust lever stroke.

CAUTION:
Do not reuse the adjusting nut after removing it.

c. When parking brake lever is operated with a force of 196 N (20 kg, 44 lb), check that the stroke is within the specified number of notches. (Check it by listening and counting the ratchet clicks.)

Lever stroke : 6 to 7 notches

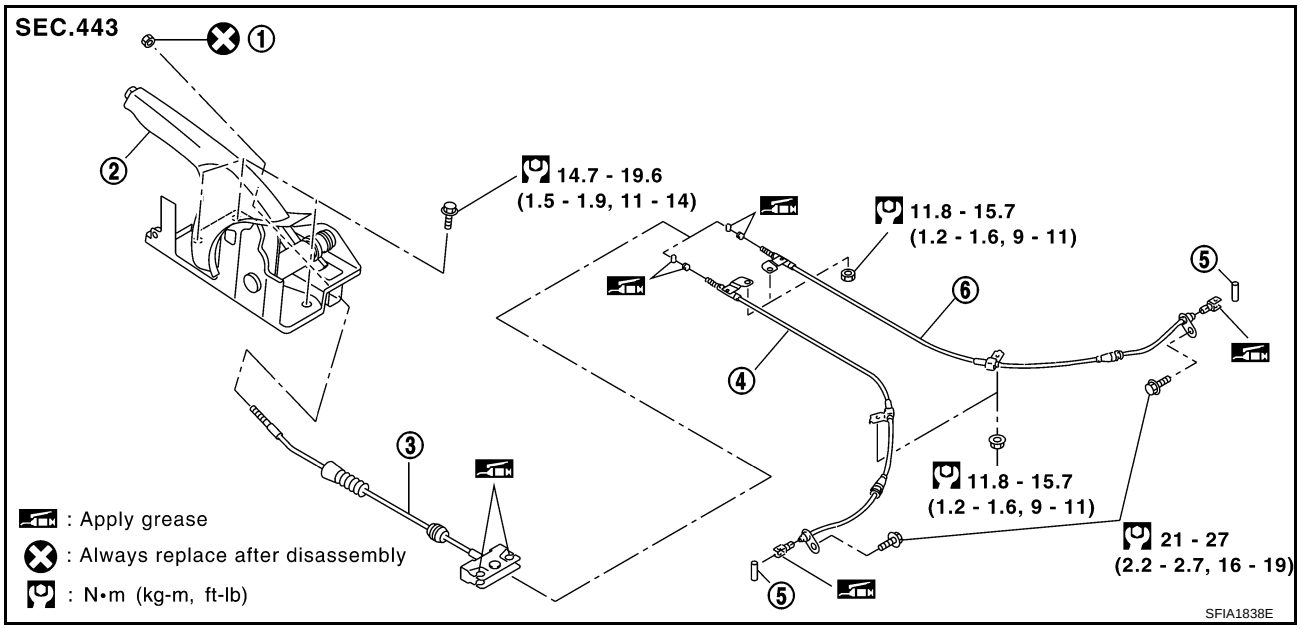
d. With the lever completely returned, make sure there is no drag on the rear brake.

PARKING BRAKE CONTROL

PFP:36010

Components

NFS0001G



1. Adjusting nut
2. Device assembly
3. Front cable
4. Rear left cable
5. Pin
6. Rear right cable

Removal and Installation

NFS0001H

REMOVAL

1. Remove center console. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove adjusting nut from device assembly.
3. Remove exhaust center muffler. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
5. Remove rear disc caliper and disc rotors. Refer to BR-44, "Removal and Installation of Brake Caliper Assembly (Other than Brembo Calipers)" or BR-45, "Removal and Installation of Brake Caliper Assembly (With Brembo Calipers)" .
6. Remove parking brake shoe, and remove rear cable from toggle lever. Refer to PB-5, "Components" .
7. Remove cable mounting nuts and bolts.
8. Remove right and left rear cables.
9. Remove front cable.
10. Remove device assembly mounting bolts and remove device assembly from vehicle.

INSTALLATION

1. Refer to “Component Parts Location” for tightening torque. Install in the reverse order of removal.

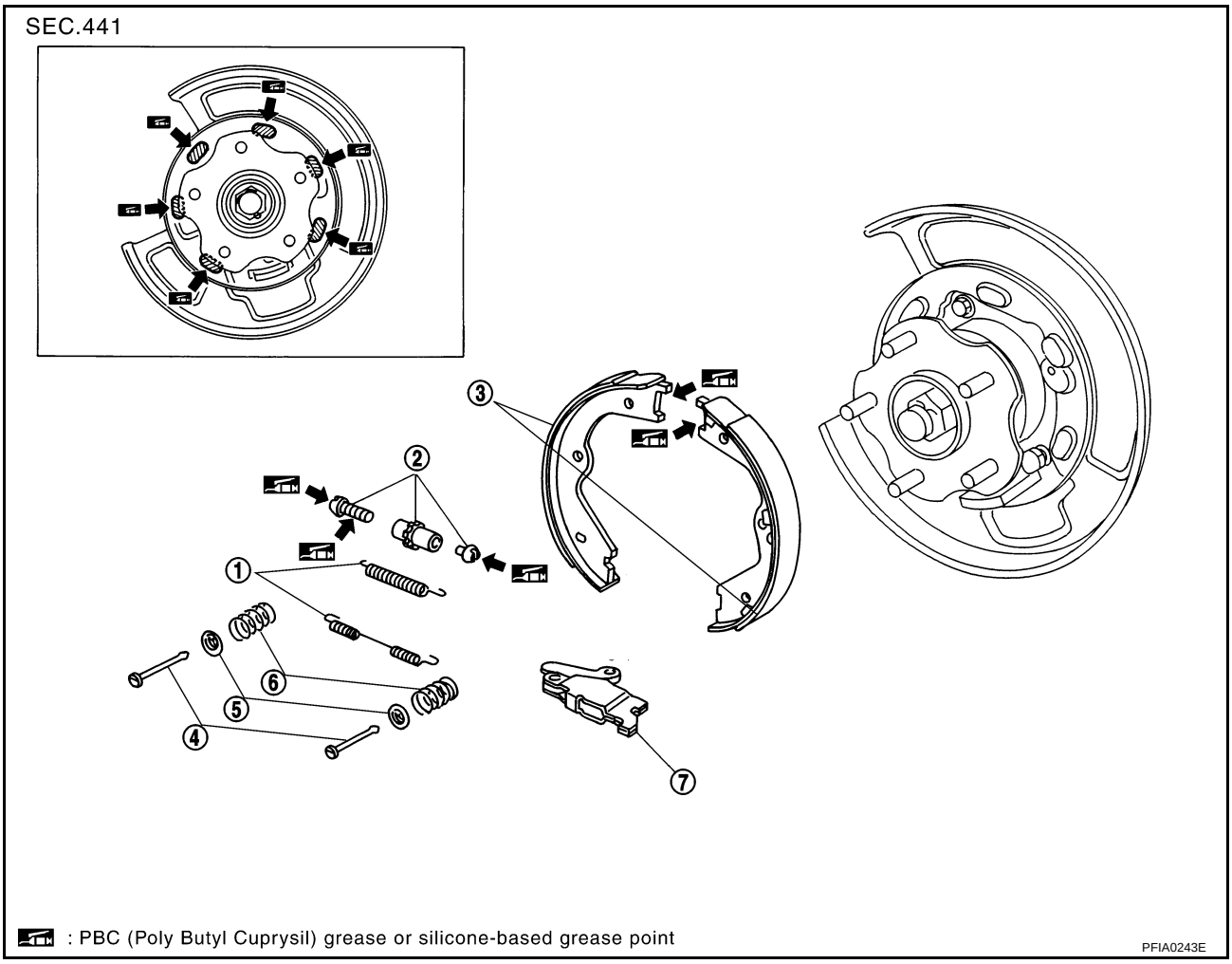
   CAUTION:
   Since the adjusting nut is not a reusable part, do not reuse it.
2. Adjust parking brake. Refer to PB-3, "ADJUSTMENT" .

PARKING BRAKE SHOE

PFP:44060

Components

NFS0001I



1. Return spring
2. Adjuster assembly
3. Shoe
4. Anti-rattle pin
5. Retainer
6. Anti-rattle spring
7. Toggle lever

Removal and Installation

NFS0001J

REMOVAL

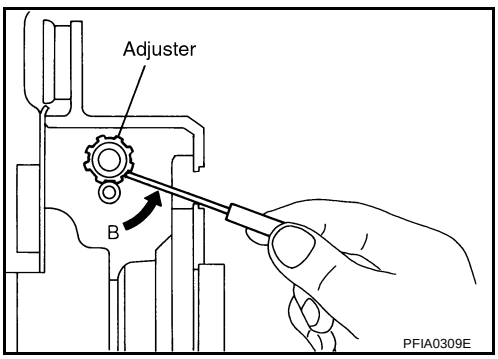
WARNING:

Clean brakes with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

Be careful of the following:

- Remove the disc rotor only with the parking brake lever completely in the returned position.
- If disc rotor cannot be removed, remove as follows:

1. Fix the disc rotor in place with wheel nuts and remove disc rotor plug. Using a flat-bladed screwdriver, rotate star wheel on the adjuster assembly in direction “B” to retract and loosen brake shoes.



INSPECTION AFTER REMOVAL

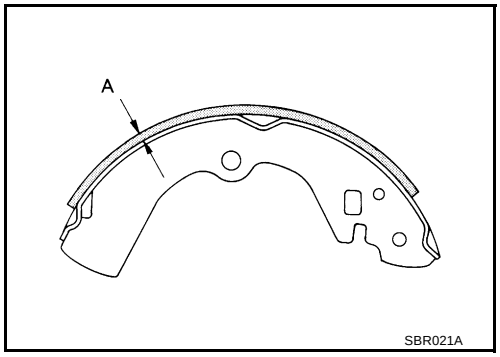
Lining Thickness Inspection

- Check the thickness of the lining.

Standard

Standard thickness “A” : 3.2 mm (0.126 in)

Wear limit thickness “A” : 1.5 mm (0.059 in)



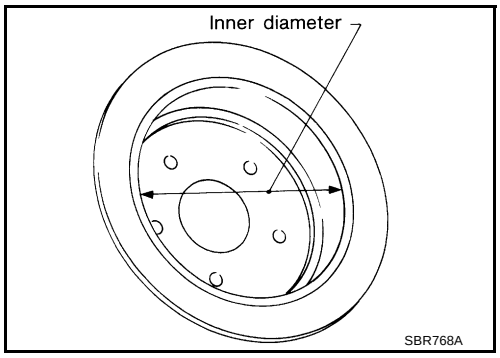
Drum Inner Diameter Inspection

- Check the inner diameter of the drum.

Standard

Standard inner diameter : 172 mm (6.77 in) dia.

Wear limit of inner diameter : 173 mm (6.81 in) dia.



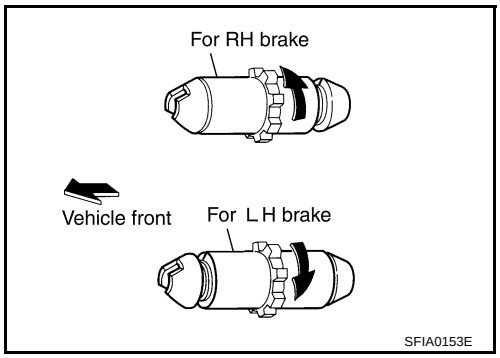
Other Inspections

- Check shoe sliding surface for excessive wear and damage.
- Check anti-rattle pin for excessive wear and corrosion.
- Check return spring for sagging.
- Does the adjustor move smoothly?
- Check either visually or with a vernier caliper to see if there is any excessive wear, cracks, or damage inside the drum.

INSTALLATION

Be careful of the following:

- Refer to “Component Parts Location” and apply brake grease to the specified points during assembly.
- Orientation of the adjuster is different from left to right. Assemble the adjuster so that threaded part expands when rotating it in the direction shown by the arrow.
- Collapse the adjuster to assemble
- When disassembling the adjuster, apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the threads.
- After replacing brake shoes or disc rotors, or if brakes do not function well, perform break-in operation as follows.



1. Adjust the parking brake lever stroke to the specified stroke.
2. Perform parking brake break-in (drag run) operation by driving the vehicle under the following conditions:

Drive forward

- **Perform the following.**
- **Vehicle speed approx. 30 ± 5 km/h (19 ± 3 MPH) set (forward)**
- **Parking brake operating force approx. 294 ± 49 N (30 ± 5 kg, 67 ± 11 lb) set**
- **Time (other than brembo): Approx. 30 sec.**
- **Time (made by brembo): Approx. 60 sec.**

3. After break-in operation, check lever stroke of the parking brake. Readjust if it is no longer at the specified stroke.
   - To prevent the lining from getting too hot, allow a cool off period of approximately 5 minutes after every break-in operation.
   - Do not perform excessive break-in operations, because it may cause uneven or early wear of the lining.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Parking Drum Brake

NFS0001K

Brake lining	Standard thickness (new)	3.2 mm (0.126 in)
	Wear limit thickness	1.5 mm (0.059 in)
Drum (disc)	Standard inner diameter (new)	172 mm (6.77 in) dia.
	Wear limit of inner diameter	173 mm (6.81 in) dia.

Parking Brake Control

NFS0001L

Control type	Center lever
Number of notches [under force of 196 N (20 kg,44 lb)]	6 – 7 notches
Number of notches when warning lamp comes on	1 notch

SECTION PG

POWER SUPPLY, GROUND & CIRCUIT ELEMENTS

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

NKS0054E

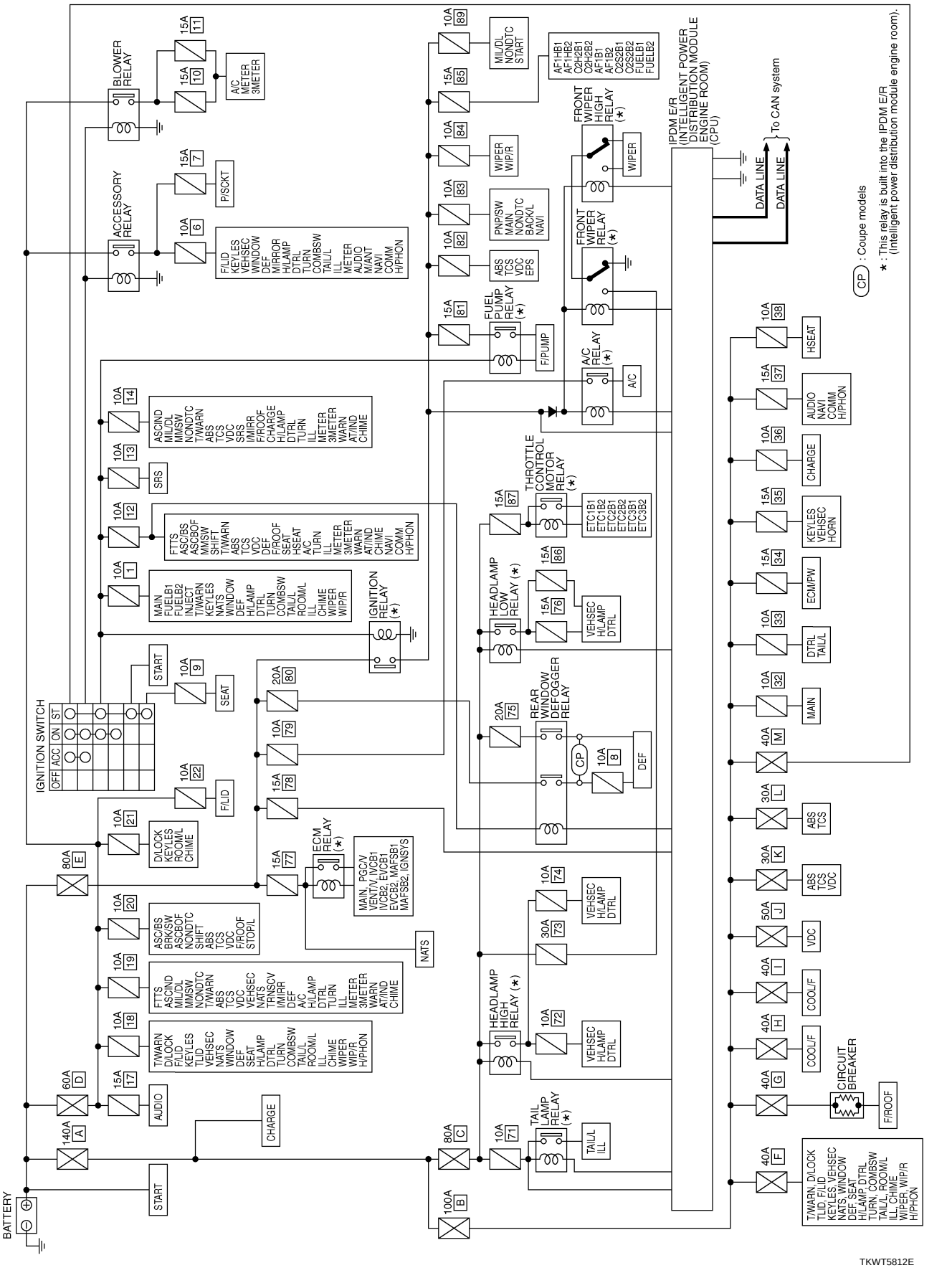
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

POWER SUPPLY ROUTING CIRCUIT

PFP:24110

Schematic

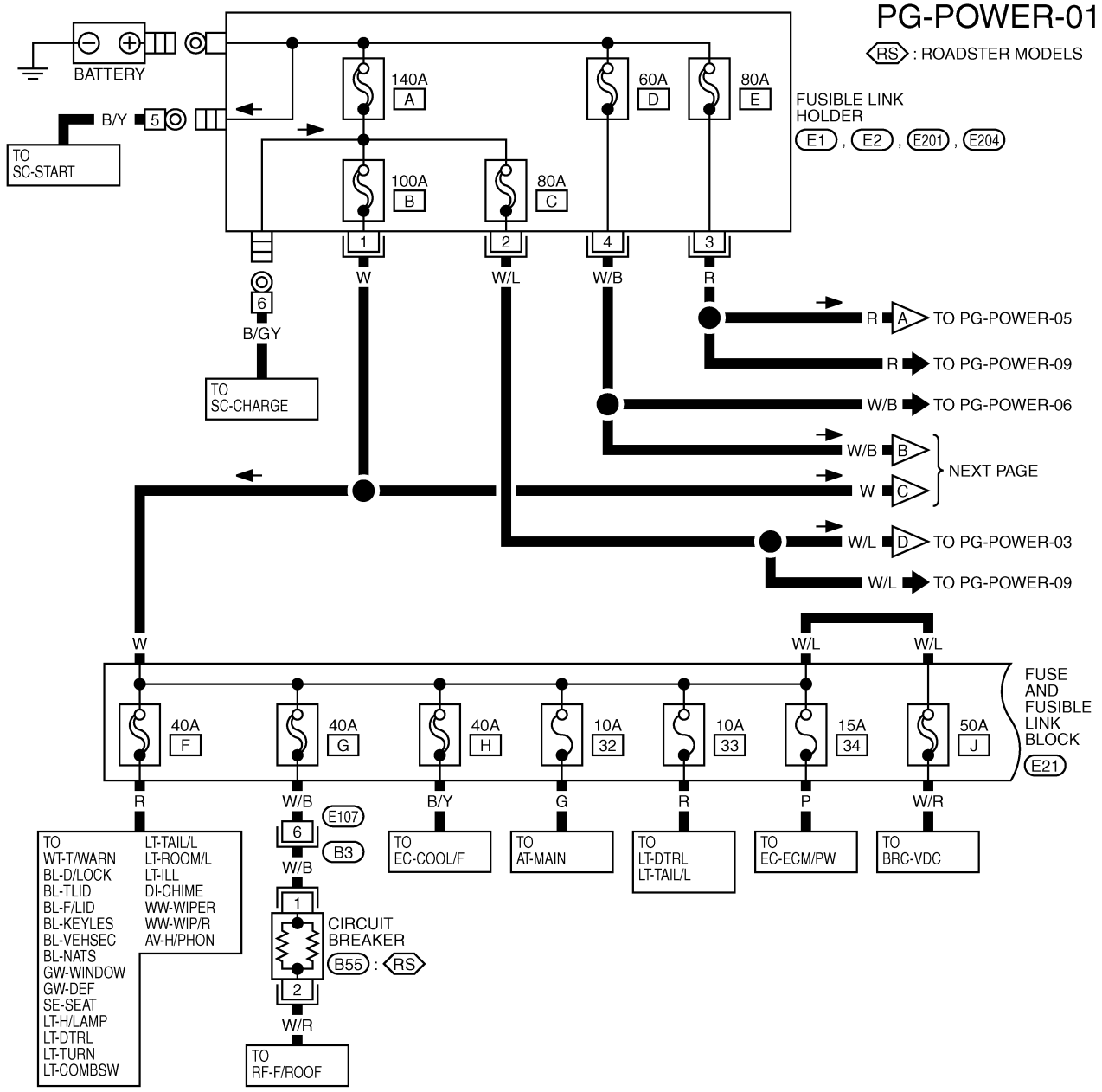
NKS004SX

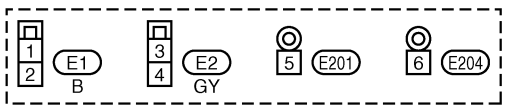


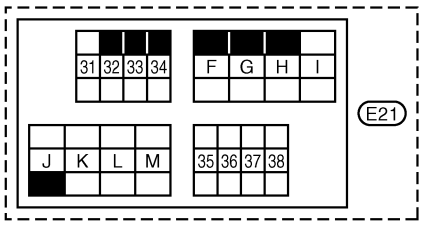
Wiring Diagram — POWER —

NKS004SY

BATTERY POWER SUPPLY — IGNITION SW. IN ANY POSITION



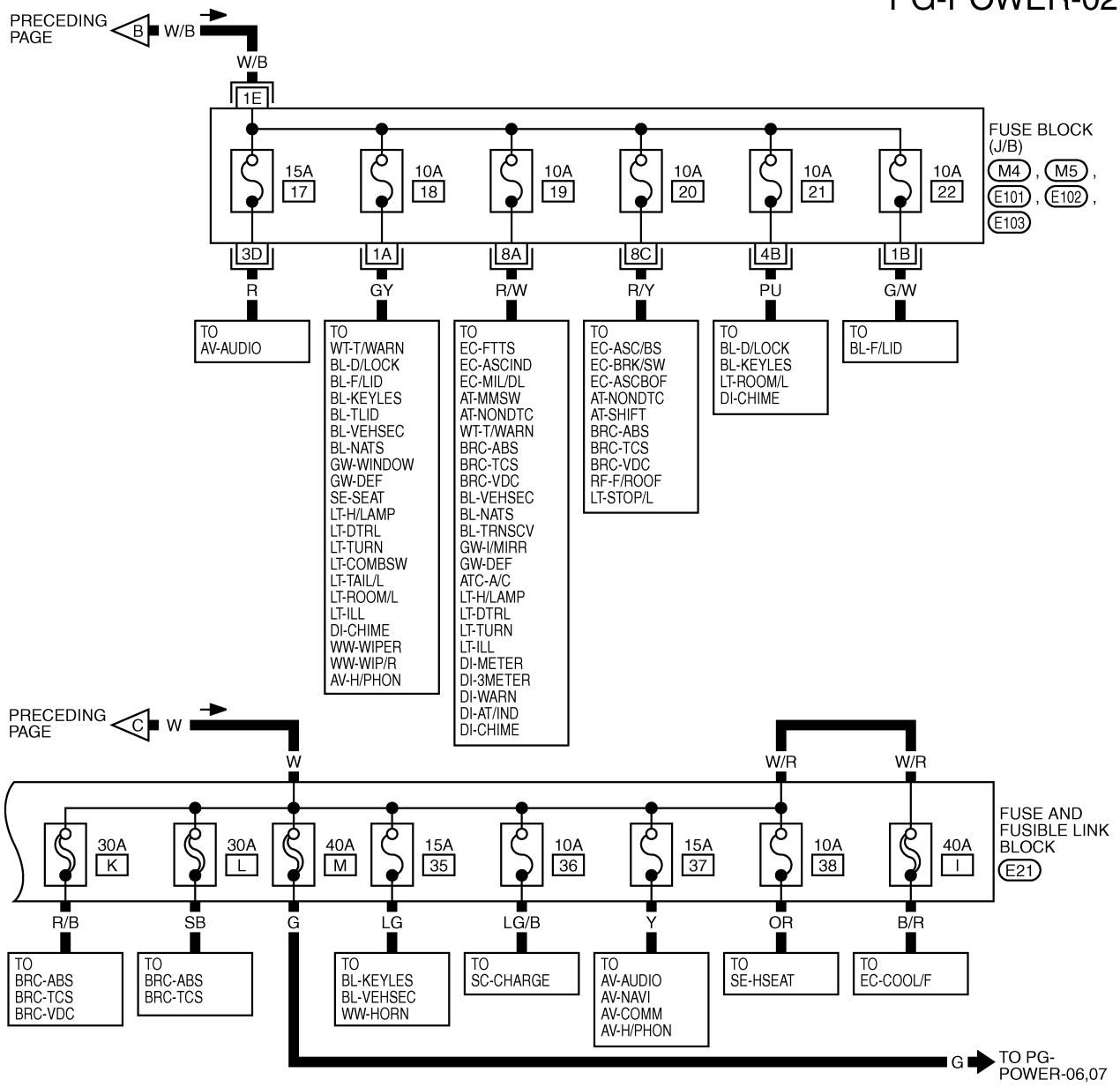


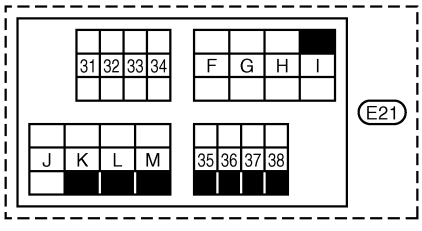




TKWT5813E

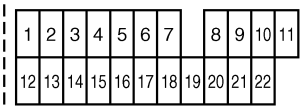
PG-POWER-02





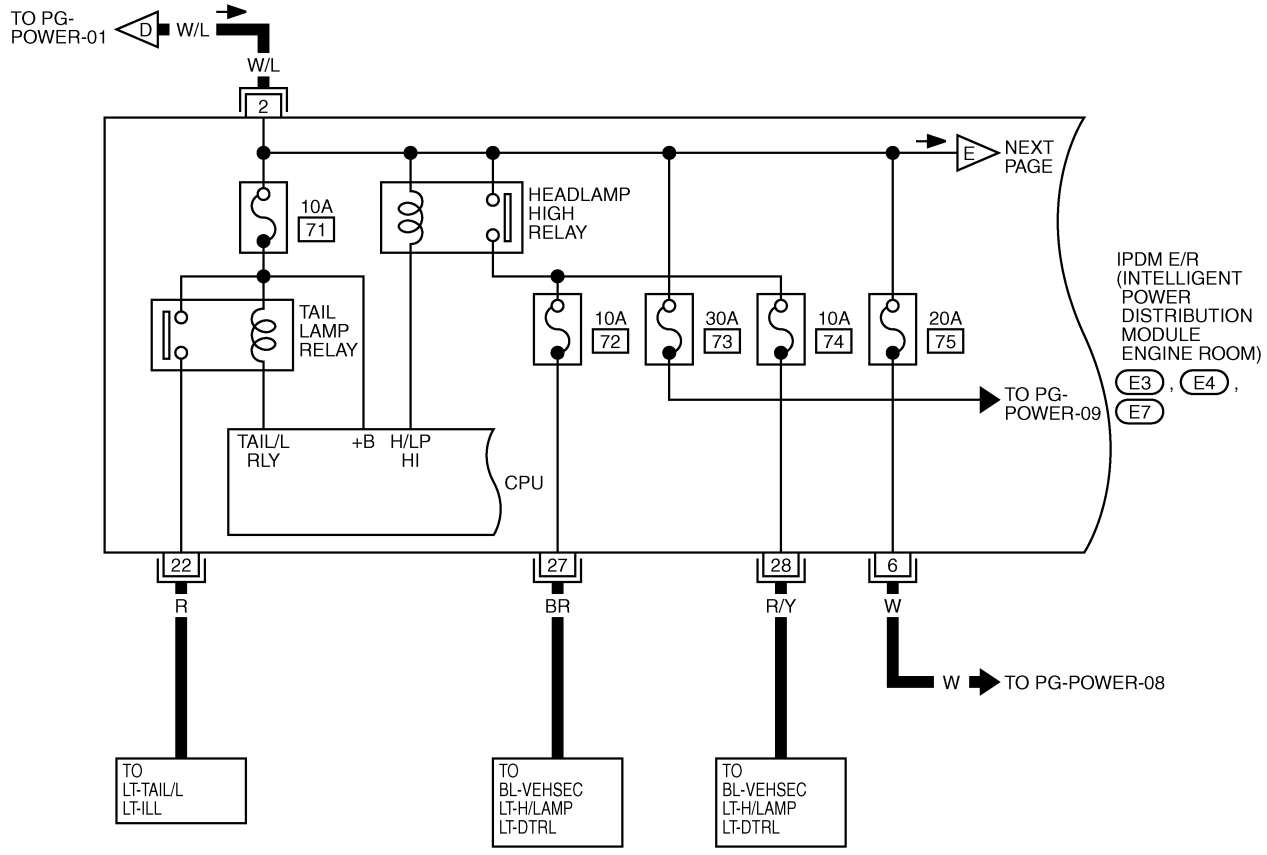
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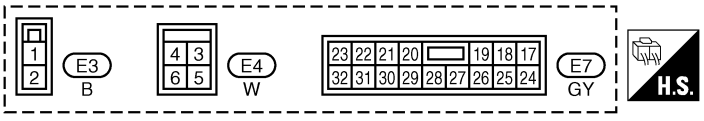
M4, M5, E101, E102, E103 -FUSE BLOCK-JUNCTION BOX (J/B)



TKWT5814E

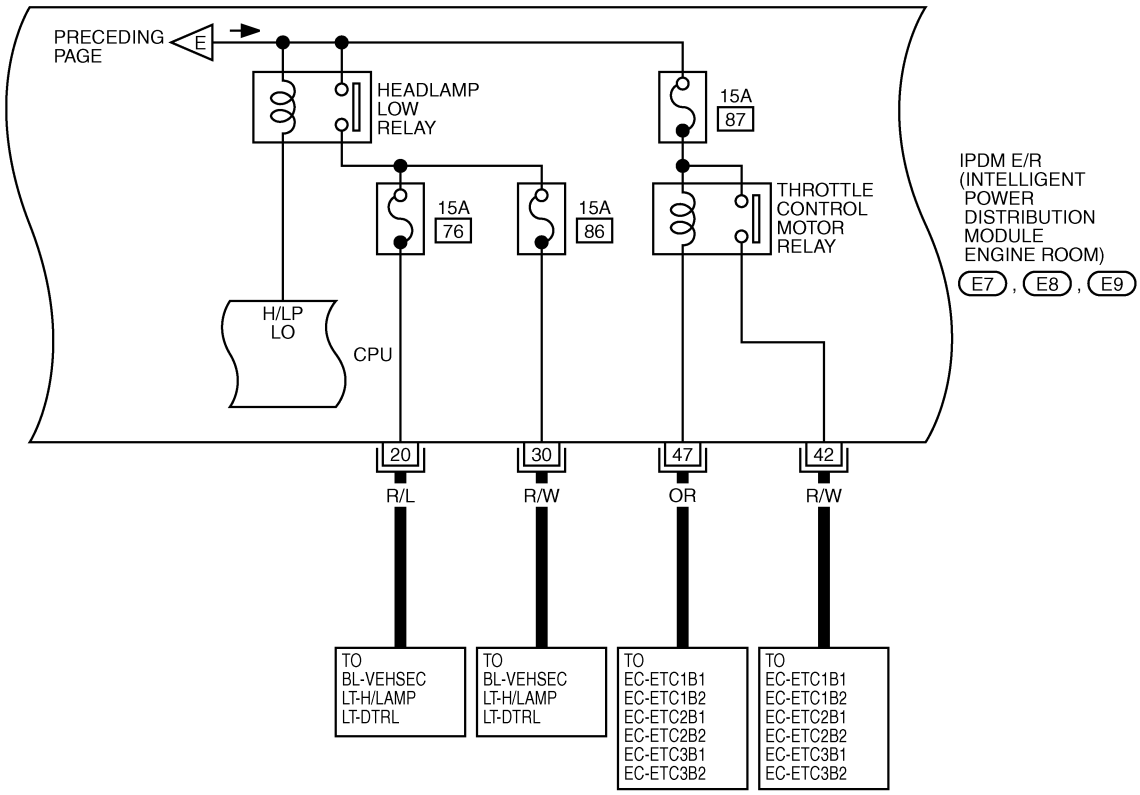
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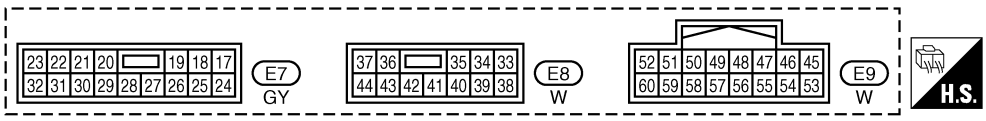




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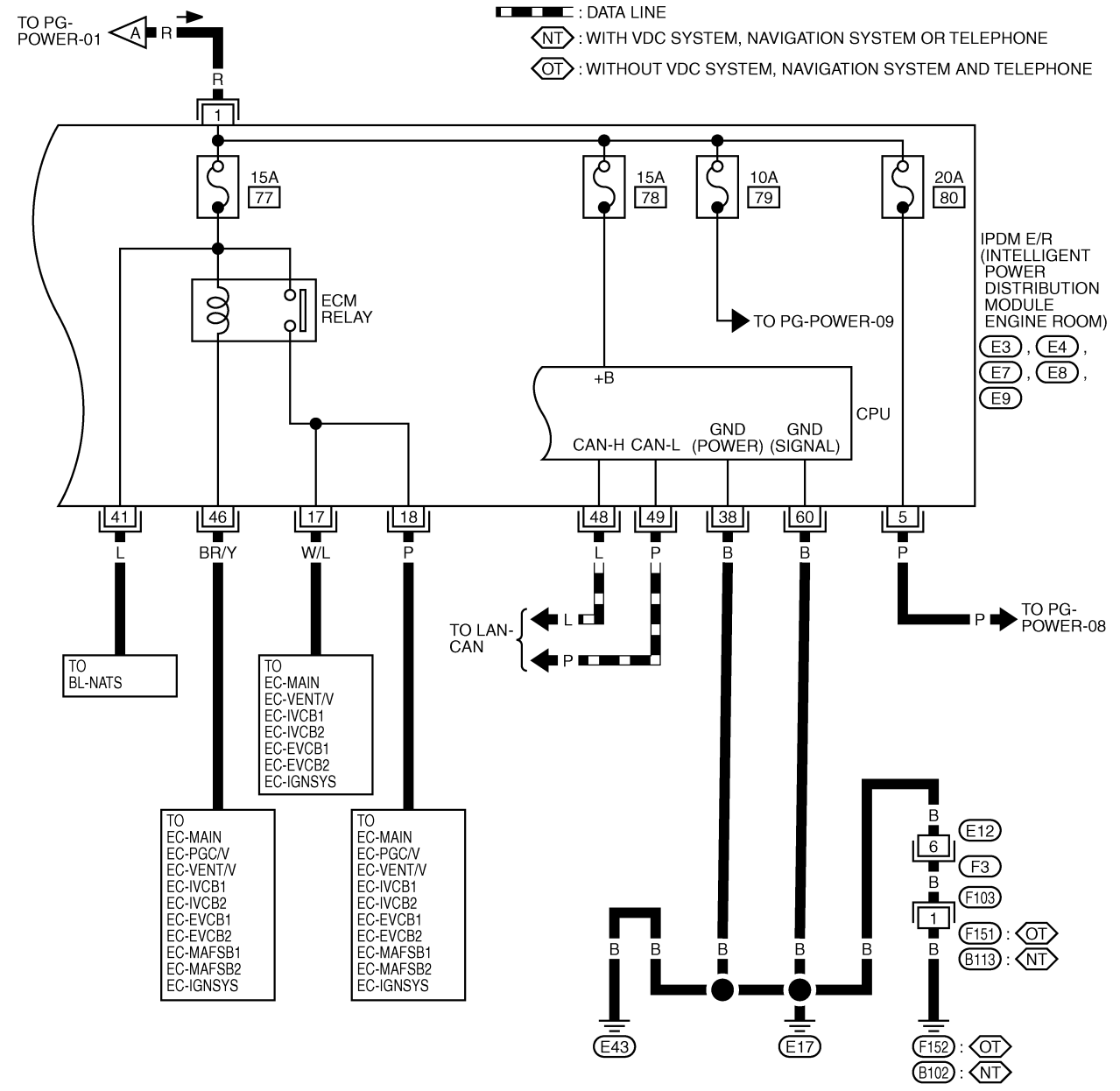
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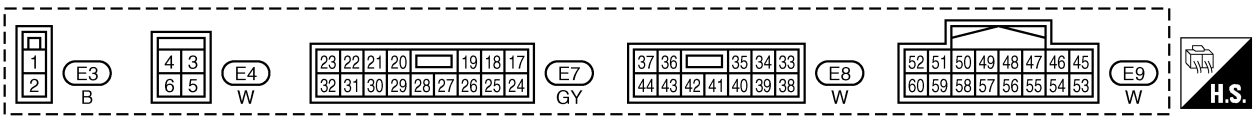


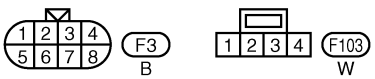


TKWT5816E

PG-POWER-05



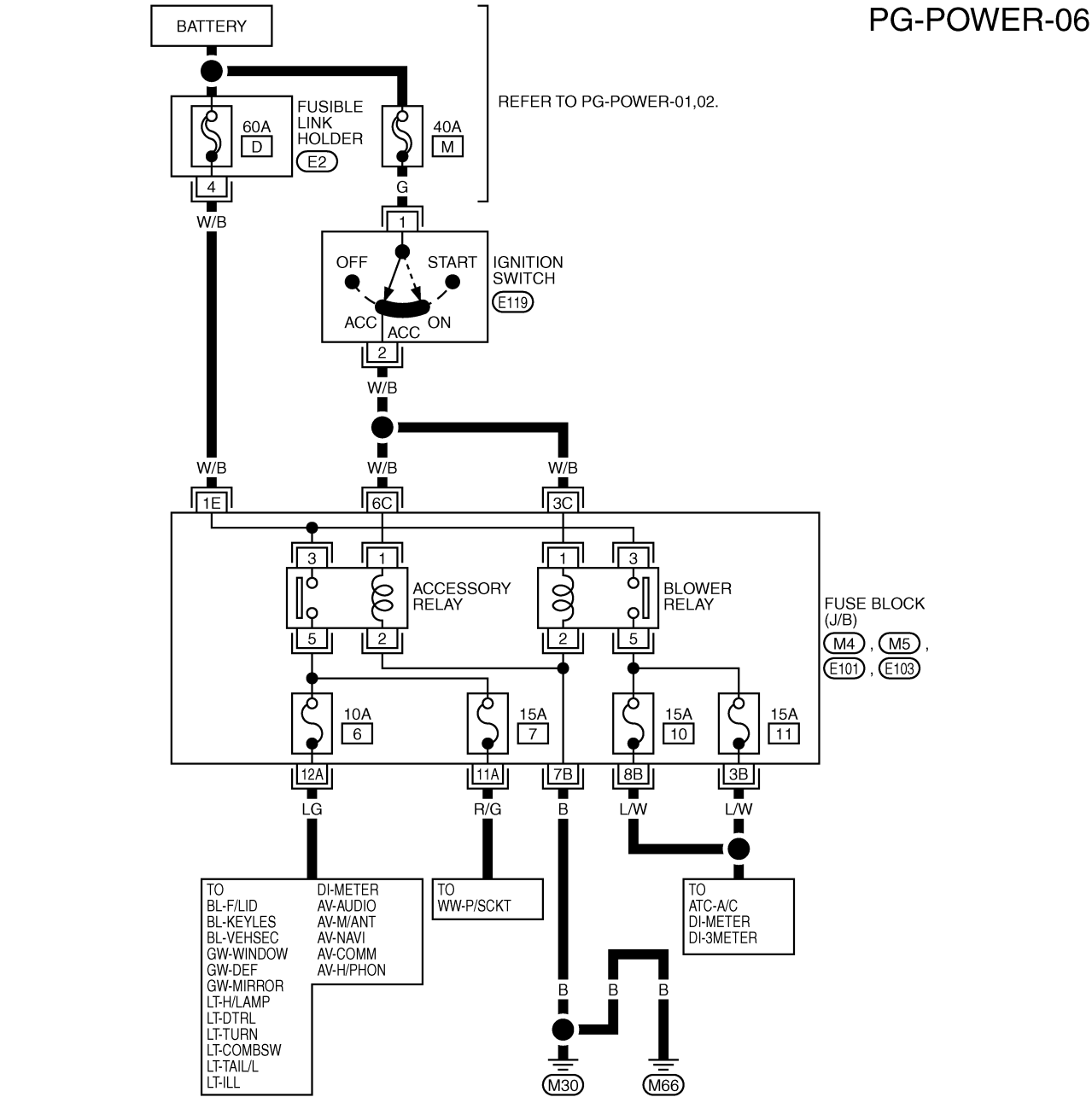


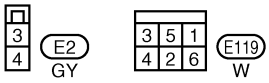


TKWT5817E

ACCESSORY POWER SUPPLY — IGNITION SW. IN “ACC” OR “ON”

PG-POWER-06





REFER TO THE FOLLOWING.

M4 , M5 , E101 , E103

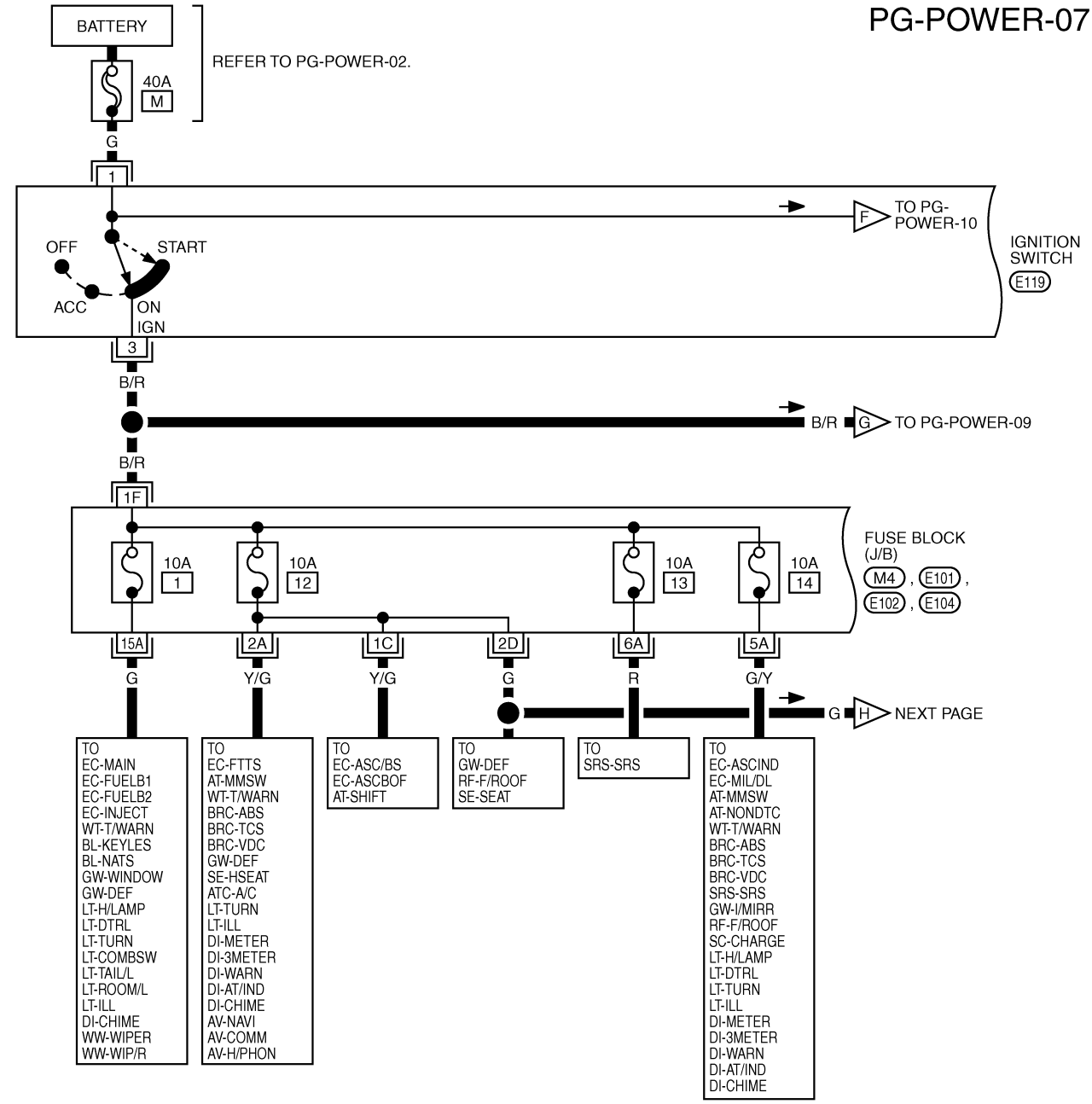
-FUSE BLOCK-JUNCTION BOX (J/B)

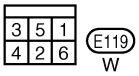
1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22

TKWT5818E

IGNITION POWER SUPPLY — IGNITION SW. IN “ON” AND/OR “START”

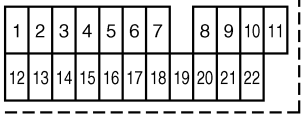
PG-POWER-07





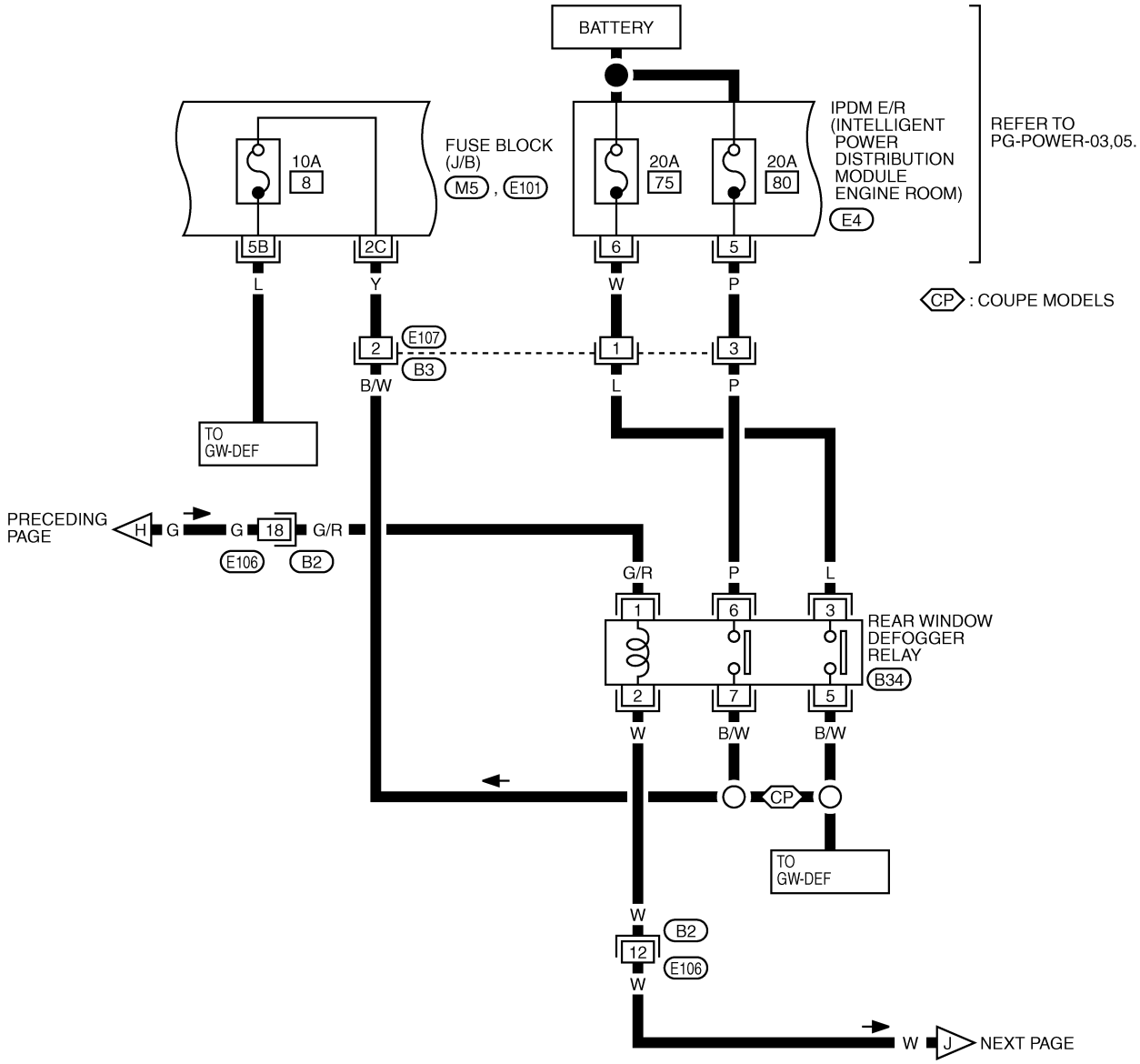
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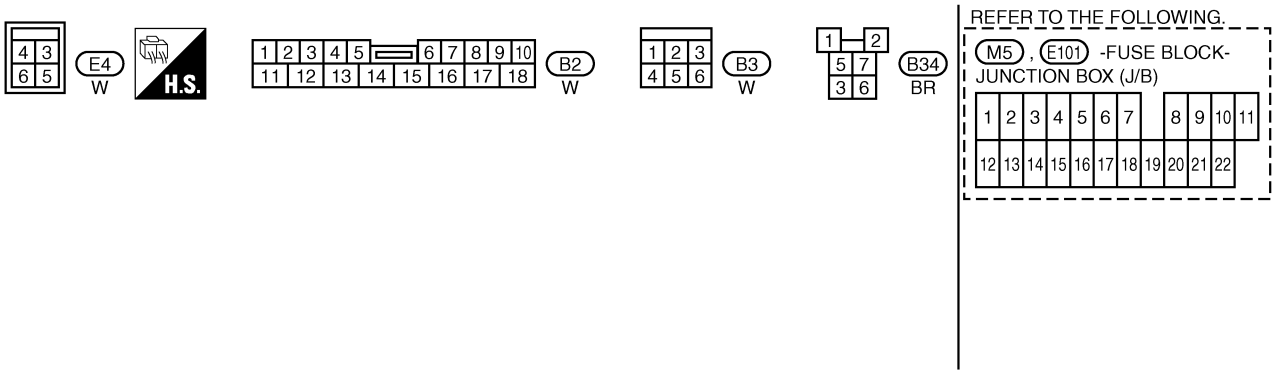
M4 , E101 , E102 , E104
-FUSE BLOCK-JUNCTION BOX (J/B)



TKWT5819E

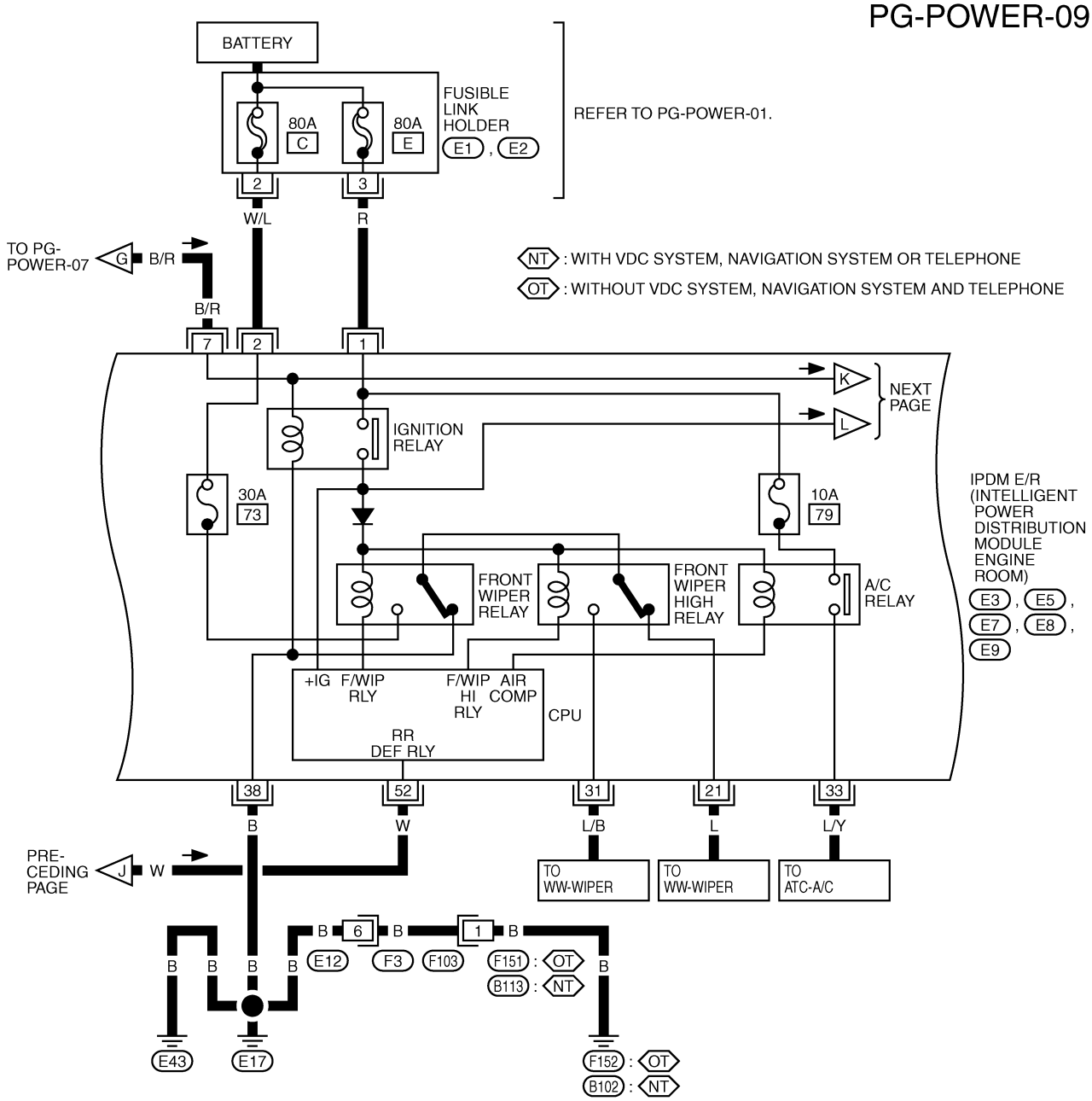
PG-POWER-08

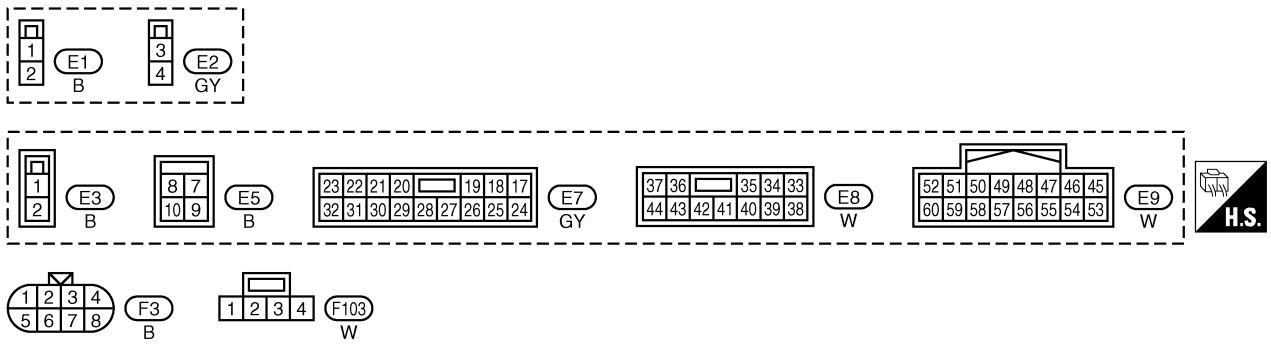




TKWT5820E

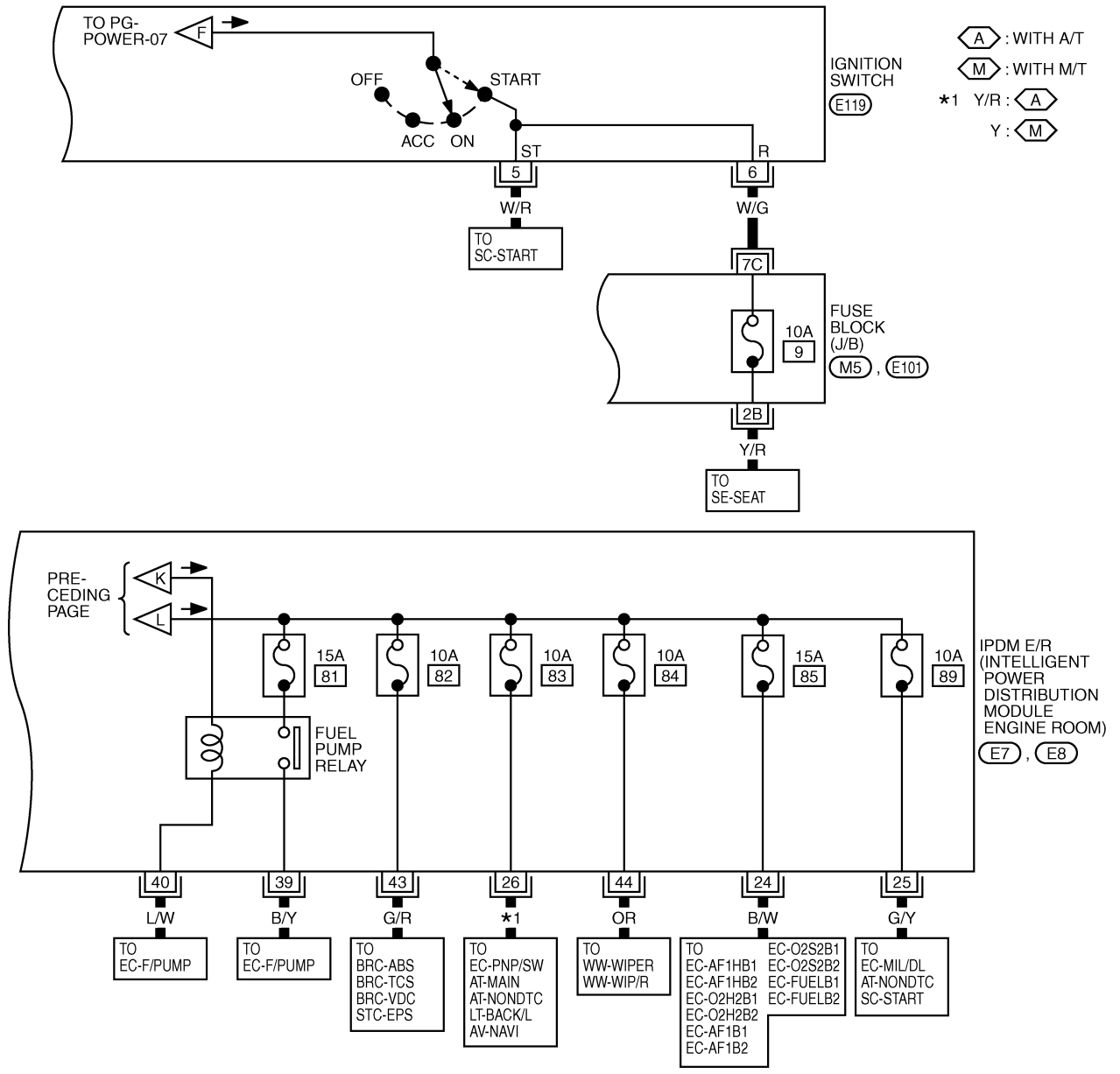
PG-POWER-09





TKWT5821E

PG-POWER-10

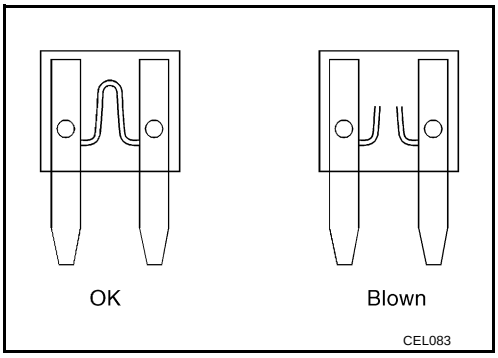


TKWT5822E

Fuse

NKS000E1

- If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse.
- Use fuse of specified rating. Never use fuse of more than specified rating.
- Do not partially install fuse; always insert it into fuse holder properly.
- Remove fuse for “ELECTRICAL PARTS (BAT)” if vehicle is not used for a long period of time.



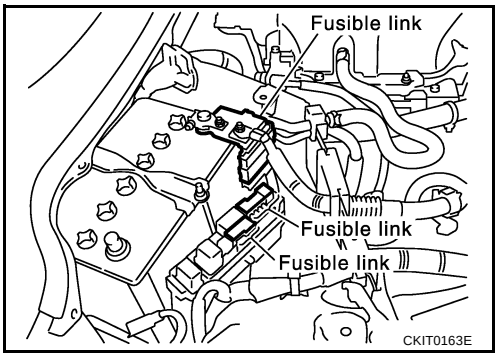
Fusible Link

NKS000E2

A melted fusible link can be detected either by visual inspection or by feeling with finger tip. If its condition is questionable, use circuit tester or test lamp.

CAUTION:

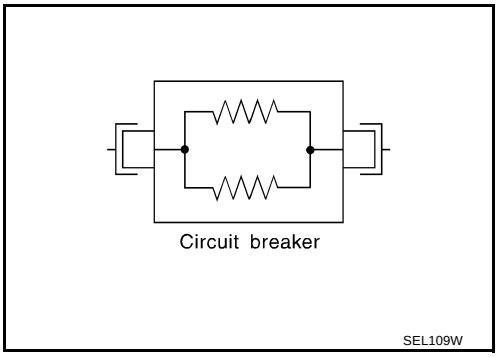
- **If fusible link should melt, it is possible that critical circuit (power supply or large current carrying circuit) is shorted. In such a case, carefully check and eliminate cause of malfunction.**
- **Never wrap outside of fusible link with vinyl tape. Important: Never let fusible link touch any other wiring harness, vinyl or rubber parts.**



Circuit Breaker

NKS000E3

The PTC thermistor generates heat in response to current flow. The temperature (and resistance) of the thermistor element varies with current flow. Excessive current flow will cause the element's temperature to rise. When the temperature reaches a specified level, the electrical resistance will rise sharply to control the circuit current. Reduced current flow will cause the element to cool. Resistance falls accordingly and normal circuit current flow is allowed to resume.



IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

PFP:284B7

System Description

NKS000E4

- IPDM E/R (Intelligent Power Distribution Module Engine Room) integrates relays and fuse blocks which were originally placed in engine room. It controls integrated relays via IPDM E/R control circuit.
- IPDM E/R integrated control unit performs ON-OFF operation of relay, hood switch signal reception, etc.
- It controls operation of each electrical part via ECM, BCM and CAN communication lines.

CAUTION:

None of the IPDM E/R-integrated relays can be removed.

SYSTEMS CONTROLLED BY IPDM E/R

IPDM E/R receives a request signal from each control unit with CAN communication. It controls each system.

Control system	Transmit control unit	Control part
Lamp control	BCM	● Head lamps (HI, LO) ● Parking lamps, license plate lamps and tail lamps
Wiper control	BCM	Front wipers
Rear window defogger control	BCM	Rear window defogger
A/C compressor control	ECM	A/C compressor (magnet clutch)
Cooling fan control	ECM	Cooling fan

CAN COMMUNICATION LINE CONTROL

With CAN communication, by connecting each control unit using two communication lines (CAN L line, CAN H line), it is possible to transmit maximum amount of information with minimum wiring. Each control unit can transmit and receive data, and reads necessary information only.

1. Fail-safe control
   - When CAN communication with other control units is impossible, IPDM E/R performs fail-safe control. After CAN communication recovers normally, it also returns to normal control.
   - Operation of control parts by IPDM E/R during fail-safe mode is as follows:

Controlled system	Fail-safe mode
Headlamp	● With the ignition switch ON, the headlamp (low) is ON. ● With the ignition switch OFF, the headlamp (low) is OFF.
Parking, license plate and tail lamps	● With the ignition switch ON, the parking, license plate and tail lamps are ON. ● With the ignition switch OFF, the parking, license plate and tail lamps are OFF.
Cooling fan	● With the ignition switch ON, the cooling fan HI operates. ● With the ignition switch OFF, the cooling fan stops.
Front wiper	Until the ignition switch is turned OFF, the front wiper LO and HI remains in the same status it was in just before fail–safe control was initiated.
Rear window defogger	Rear window defogger relay OFF
A/C compressor	A/C compressor OFF

IPDM E/R STATUS CONTROL

In order to save power, IPDM E/R switches status by itself based on each operating condition.

1. CAN communication status
   - CAN communication is normally performed with other control units.
   - Individual unit control by IPDM E/R is normally performed.
   - When sleep request signal is received from BCM, mode is switched to sleep waiting status.
2. Sleep waiting status
   - Process to stop CAN communication is activated.
   - All systems controlled by IPDM E/R are stopped. When 3 seconds have elapsed after CAN communication with other control units is stopped, mode switches to sleep status.
3. Sleep status
   - IPDM E/R operates in low power mode.
   - CAN communication is stopped.
   - When a change in CAN communication line is detected, mode switches to CAN communication status.
   - When a change in hood switch or ignition switch signal is detected, mode switches to CAN communication status.

CAN Communication System Description

NKS000E5

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicles are equipped with many electronic control units and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

NKS000E6

Refer to LAN-48, "CAN System Specification Chart" .

Function of Detecting Ignition Relay Malfunction

NKS000E7

- When contact point of integrated ignition relay is stuck and cannot be turned OFF, IPDM E/R turns ON parking lamp, license plate lamp and tail lamp for 10 minutes to indicate ignition relay malfunction.
- When a state of ignition relay having built-in does not agree with a state of Ignition switch signal input by a CAN communication from BCM, IPDM E/R lets tail lamp relay operate.

Ignition switch signal	Ignition relay status	Tail lamp relay and daytime light relay*1
ON	ON	—
OFF	OFF	—
ON	OFF	—
OFF	ON	ON (10 minutes)

NOTE:

- When the ignition switch is turned ON, tail lamp relay and daytime light relay are OFF.
- *1: Canada model only

CONSULT-III Function (IPDM E/R)

NKS000E8

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Inspection Item, Diagnosis Mode	Description
SELF-DIAG RESULTS	The IPDM E/R performs diagnosis of the CAN communication and self-diagnosis.
DATA MONITOR	The input/output data of the IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	The IPDM E/R sends a drive signal to electronic components to check their operation.

SELF-DIAG RESULTS

Display Item List

Display Items	CONSULT-III display code	Malfunction detecting condition	TIME		Possible causes
			CRNT	PAST	
NO DTC IS DETECTED.FURTHER TESTING MAY BE REQUIRED.	-	-	-	-	-
CAN COMM CIRC	U1000	● If CAN communication reception/transmission data has a malfunction, or if any of the control units malfunction, data reception/ transmission cannot be confirmed. ● When the data in CAN communication is not received before the specified time	×	×	Any of or several items below have errors. ● TRANSMIT DIAG ● ECM ● BCM

NOTE:

The details for display of the period are as follows:

- CRNT: Error currently detected with IPDM E/R.
- PAST: Error detected in the past and memorized with IPDM E/R.

DATA MONITOR

All Items, Main Items, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	SELECT MONITOR ITEM			Description
			ALL SIG-NALS	MAIN SIG-NALS	SELEC-TION FROM MENU	
Motor fan request	MOTOR FAN REQ	1/2/3/4	×	×	×	Signal status input from ECM
Compressor request	AC COMP REQ	ON/OFF	×	×	×	Signal status input from ECM
Parking request	TAIL&CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
H/L LO request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
H/L HI request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM
Front fog request	FR FOG REQ*1	ON/OFF	×	×	×	—
Head lamp washer request	HL WASHER REQ*1	ON/OFF	×		×	—
Front wiper request	FR WIP REQ	STOP/1LOW/ LOW/HI	×	×	×	Signal status input from BCM
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	×	×	×	Output status of IPDM E/R
Wiper protection	WIP PROT	OFF/Block	×	×	×	Control status of IPDM E/R
Starter request	ST RLY REQ*2	ON/OFF	×		×	Status of input signal
Ignition relay status	IGN RLY	ON/OFF	×	×	×	Ignition relay status monitored with IPDM E/R
Rear window defogger request	RR DEF REQ	ON/OFF	×	×	×	Signal status input from BCM

Item name	CONSULT-III screen display	Display or unit	SELECT MONITOR ITEM			Description
			ALL SIG-NALS	MAIN SIG-NALS	SELEC-TION FROM MENU	
Oil pressure switch	OIL P SW *1	OPEN/CLOSE	×		×	—
Day time light request	DTRL REQ *3	ON/OFF	×		×	Signal status input from BCM
Hood switch	HOOD SW*1	ON/OFF	×		×	—
Theft warning horn request	THFT HRN REQ	ON/OFF	×		×	Signal status input from BCM
Horn chirp	HORN CHIRP	ON/OFF	×		×	Output status of IPDM E/R

NOTE:

- Perform monitoring of IPDM E/R data with the ignition switch ON. When the ignition switch is at ACC, the display may not be correct.
- *1: This items is displayed, but does not function.
- *2: The vehicle without intelligent key system displays only ON without change.
- *3: Only the vehicle with daytime light system operates.

ACTIVE TEST

Display Item List

Test item	CONSULT-III screen display	Description
Tail lamp operation	TAIL LAMP	With a certain ON-OFF operation, the tail lamp relay can be operated.
Rear window defogger operation	REAR DEFOGGER	With a certain ON-OFF operation, the rear window defogger relay can be operated.
Front wiper (HI, LO) operation	FRONT WIPER	With a certain operation (OFF, HI ON, LO ON), the front wiper relay (Lo, Hi) can be operated.
Cooling fan operation	MOTOR FAN	With a certain operation (1,2,3,4), the cooling fan can be operated.
Headlamp washer NOTE 1	HEAD LAMP WASHER	—
Lamp (HI, LO, FOG NOTE 2) operation	LAMPS	With a certain operation (OFF, HI ON, LO ON, FOG ON NOTE), the lamp relay (Lo, Hi, Fog NOTE) can be operated.
Horn operation	HORN	Push “ON” button, horn relay operates 20 ms.

NOTE:

1. Headlamp washer item is displayed, but it cannot be tested.
2. Fog lamp item is displayed, but it cannot be tested.

Auto Active Test

NKS000E9

DESCRIPTION

In auto active test mode, operation inspection can be performed when IPDM E/R sends a drive signal to the following systems:

- Rear window defogger
- Front wipers
- Parking lamp, license plate lamp and tail lamp
- Headlamps (Hi, Lo)
- A/C compressor (magnetic clutch)
- Cooling fan

OPERATION PROCEDURE

1. Close hood and front door (passenger side), and then lift wiper arms away from windshield (to prevent glass damage by wiper operation).

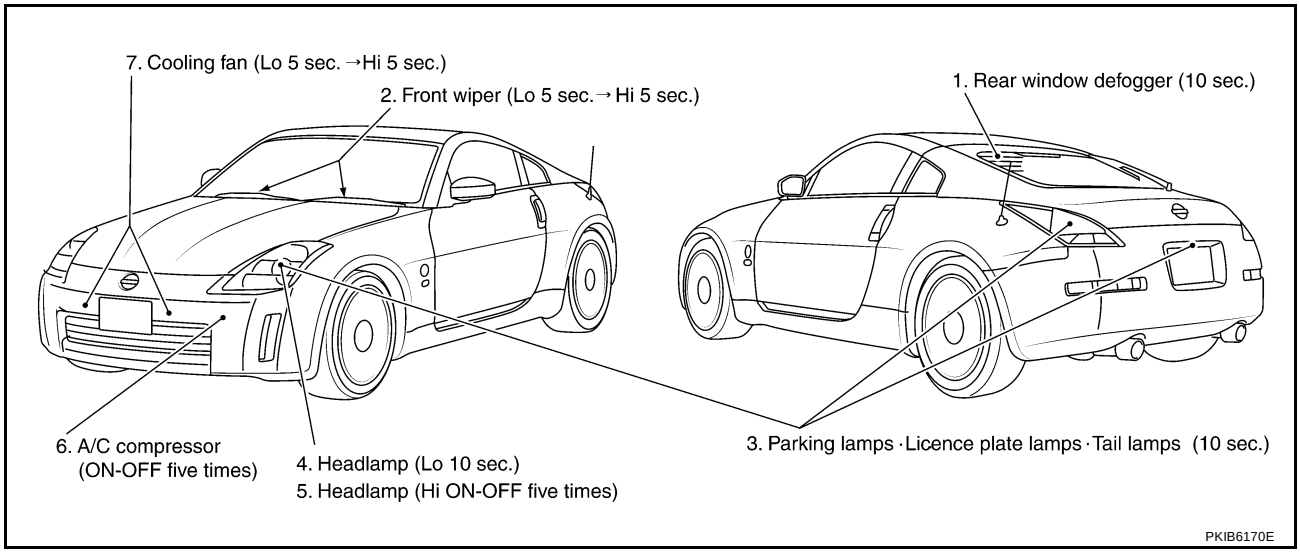
   NOTE:
   When auto active test is performed with hood opened, sprinkle water on windshield beforehand.
2. Turn ignition switch OFF.
3. Turn ignition switch ON, and, within 20 seconds, press driver's front door switch 10 times (close other door). Then turn ignition switch OFF.
4. Turn ignition switch ON within 10 seconds after ignition switch OFF.
5. When auto active test mode is actuated, horn chirps once. Oil pressure warning lamp starts blinking.
6. After a series of operations is repeated three times, auto active test is completed.

   NOTE:
   When auto active test mode has to be cancelled halfway, turn ignition switch OFF.

   CAUTION:
   Be sure to inspect BL-38, "Check Door Switch" when the auto active test cannot be performed.

INSPECTION IN AUTO ACTIVE TEST MODE

When auto active test mode is actuated, the following eight steps are repeated three times.



NOTE:
It takes 10 seconds from 3 to 4.

Concept of Auto Active Test

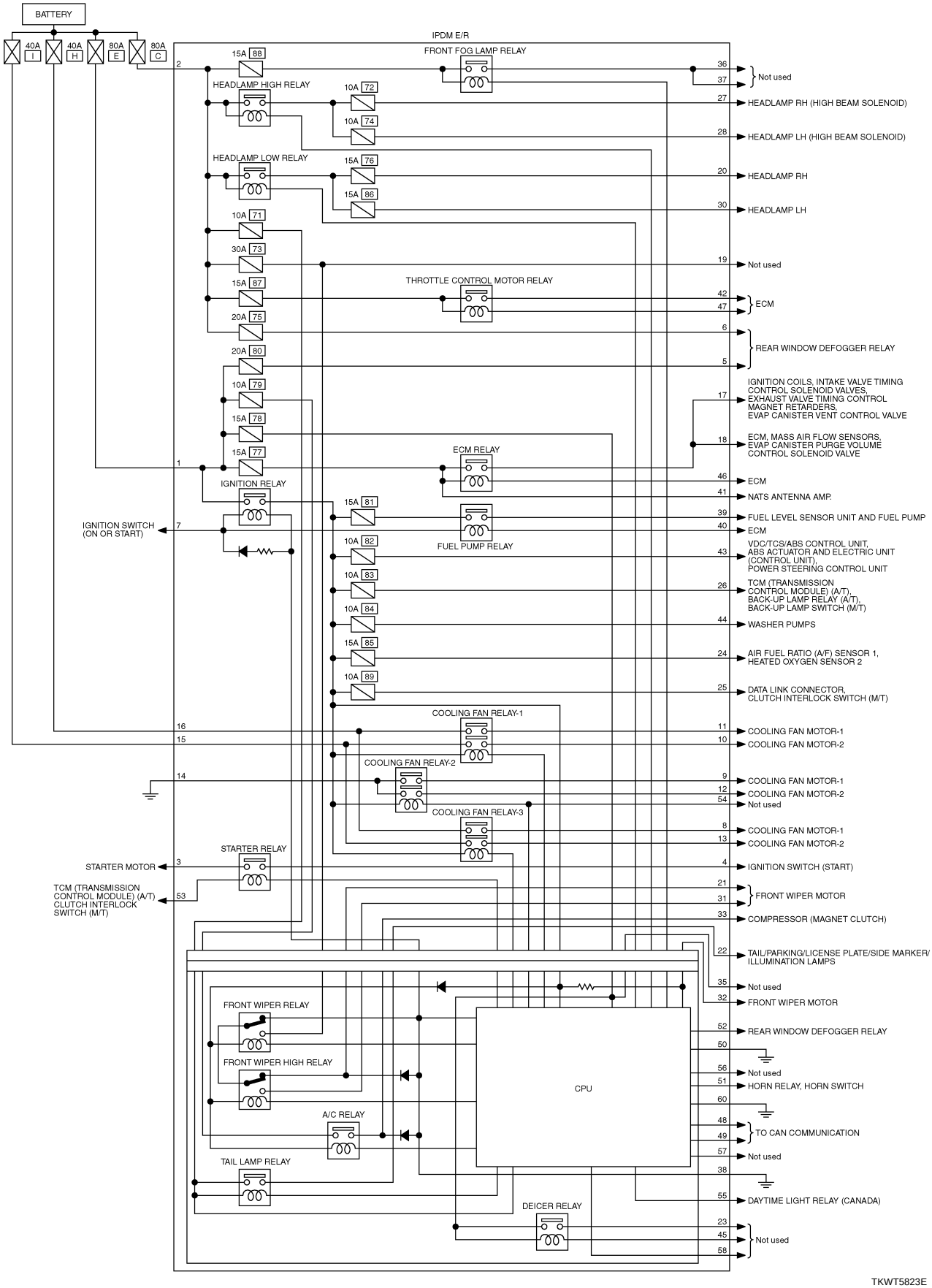
- IPDM E/R actuates auto active test mode when it receives door switch signal from BCM via CAN communication line. Therefore, when auto active test mode is activated successfully, CAN communication between IPDM E/R and BCM is normal.
- If any of systems controlled by IPDM E/R cannot be operated, possible cause can be easily diagnosed using auto active test.

Diagnosis chart in auto active test mode

Symptom	Inspection contents		Possible cause
Rear window defogger does not operate.	Perform auto active test. Does rear window defogger operate?	YES	● BCM signal input circuit
		NO	● Rear window defogger relay circuit ● Open circuit of rear window defogger ● IPDM E/R malfunction
Any of front wipers, tail and parking lamps, front fog lamps, and head lamps (Hi, Lo) do not operate.	Perform auto active test. Does system in question operate?	YES	● BCM signal input system
		NO	● Lamp/wiper motor malfunction ● Lamp/wiper motor ground circuit malfunction ● Harness/connector malfunction between IPDM E/R and system in question ● IPDM E/R (integrated relay) malfunction
A/C compressor does not operate.	Perform auto active test. Does magnetic clutch operate?	YES	● BCM signal input circuit ● CAN communication signal between BCM and ECM. ● CAN communication signal between ECM and IPDM E/R
		NO	● Magnetic clutch malfunction ● Harness/connector malfunction between IPDM E/R and magnetic clutch ● IPDM E/R (integrated relay) malfunction
Cooling fan does not operate.	Perform auto active test. Does cooling fan operate?	YES	● ECM signal input circuit ● CAN communication signal between ECM and IPDM E/R
		NO	● Cooling fan motor malfunction ● Harness/connector malfunction between IPDM E/R and cooling fan motor ● IPDM E/R (integrated relay) malfunction

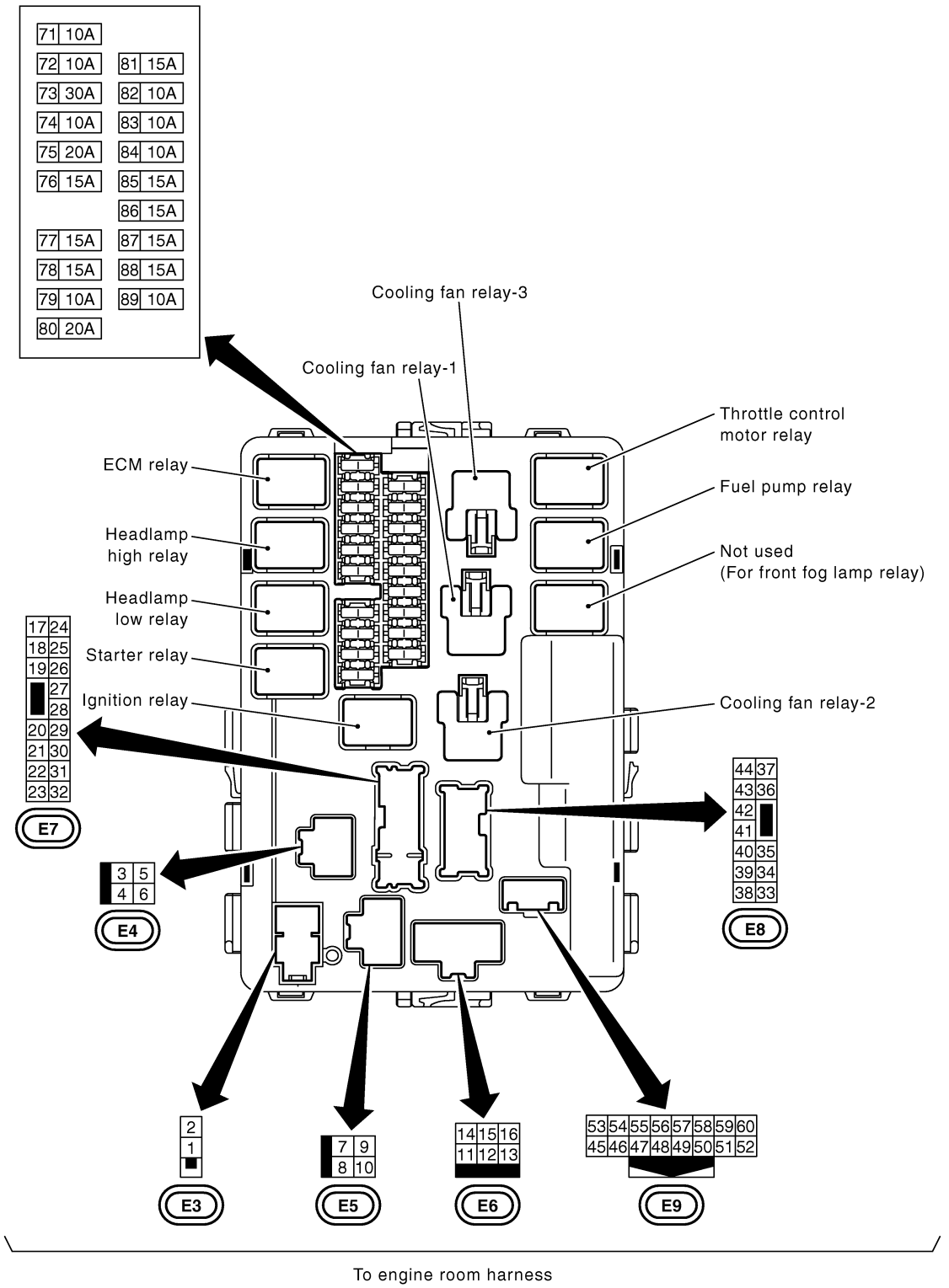
Schematic

NKS0054B



IPDM E/R Terminal Arrangement

NKS0054C



CKIT0850E

IPDM E/R Power/Ground Circuit Inspection

NKS000EC

1. CHECK FUSE AND FUSIBLE LINK

Make sure the following fusible links or IPDM E/R fuses are not blown.

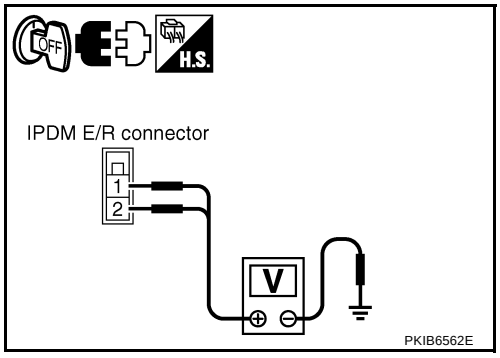
Terminal No.	Signal name	Fuse and fusible link No.
1	Battery power	E
2		C
—		71
		78

OK or NG

OK >> GO TO 2.
NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link.

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check voltage between IPDM E/R harness connector and ground.



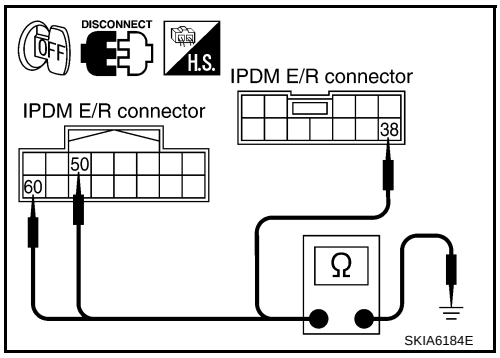
Terminal			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal		
E3	1	Ground	Battery voltage
	2		

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

1. Disconnect IPDM E/R harness connectors.
2. Check continuity between IPDM E/R harness connectors and ground.



IPDM E/R connector	Terminal		Continuity
E8	38	Ground	Yes
E9	50		
	60		

OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Inspection With CONSULT-III (Self-Diagnosis)

NKS000ED

1. CHECK SELF DIAGNOSTIC RESULT

CONSULT-III display	CONSULT-III display code	TIME		Details of diagnosis result
		CRNT	PAST	
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	—	—	—	No malfunction
CAN COMM CIRC	U1000	×	×	Any of or several items below have errors. ● TRANSMIT DIAG ● ECM ● BCM

NOTE:

The details for display of the period are as follows:

- CRNT: Error currently detected with IPDM E/R.
- PAST: Error detected in the past and memorized with IPDM E/R.

Contents displayed

NO DTC IS DETECTED.FURTHER TESTING MAY BE REQUIRED.>>INSPECTION END

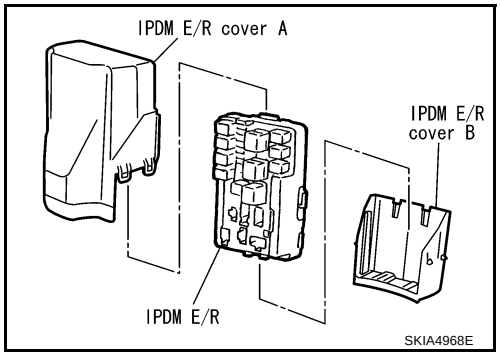
CAN COMM CIRC>>After print-out of the monitor items, refer to LAN-49, "CAN Communication Signal Chart" .

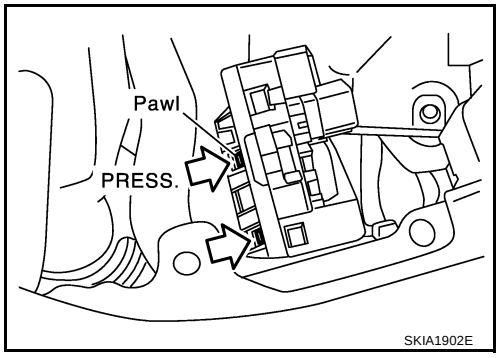
Removal and Installation of IPDM E/R

NKS000EE

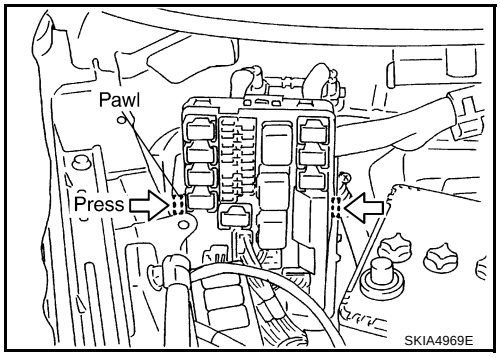
REMOVAL

1. Remove battery. Refer to SC-7, "Removal and Installation" .
2. Remove IPDM E/R cover A. While pressing pawl on backside of IPDM E/R cover B toward vehicle front to unlock, lift up IPDM E/R.





3. While pressing pawls on right and left side of IPDM E/R, remove IPDM E/R cover B from IPDM E/R.
4. Remove harness connector from IPDM E/R.



INSTALLATION

Installation is the reverse order of removal.

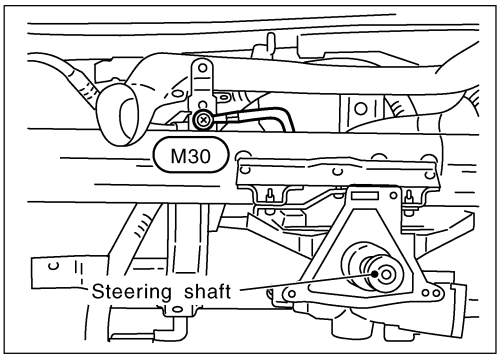
GROUND

PFP:00011

Ground Distribution

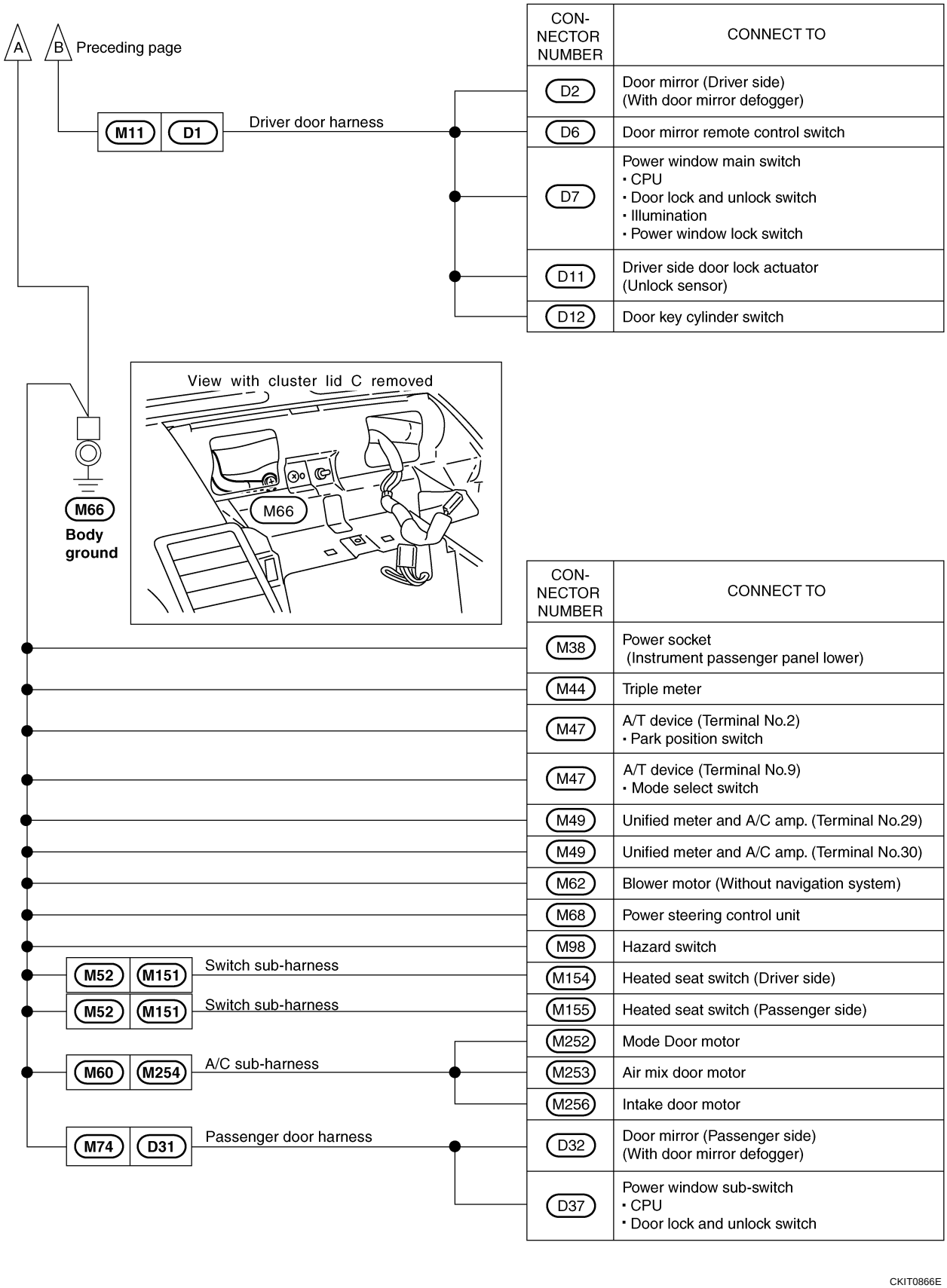
NKS000EF

MAIN HARNESS



CONNECTOR NUMBER	CONNECT TO
M5	Fuse block (J/B) (Terminal No.7B) • Accessory relay • Blower relay
M8	Data link connector (Terminal No.4)
M8	Data link connector (Terminal No.5)
M9	TCS off switch (With TCS Without VDC system)
M9	VDC off switch (With VDC system)
M13	Fuel lid opener switch
M14	Soft top switch
M19	Combination meter (Terminal No.10)
M19	Combination meter (Terminal No.11)
M19	Combination meter (Terminal No.12)
M22	Steering angle sensor
M28	NATS antenna amp.
M29	Combination switch
M35	Display unit (Terminal No.22)
M35	Display unit (Terminal No.24)
M37	NAVI switch
M55	Air bag diagnosis sensor unit
M91	BCM (Body control module)
M152	Cup holder illumination
R3	Vanity mirror lamp LH
R4	Auto anti-dazzling inside mirror
R5	Vanity mirror lamp RH
R8	Soft top front lock switch
R52	Map lamp (Coupe models)
R53	Map lamp (Roadster models) • Map lamp switches • Illumination
R58	Front passenger air bag off indicator

CKIT0865E

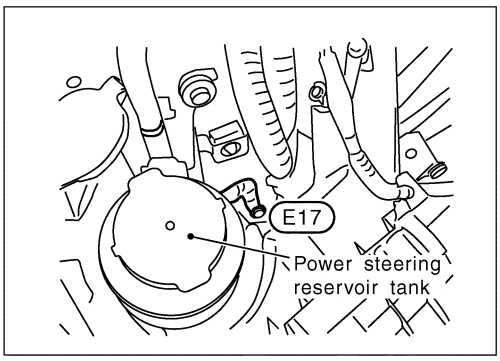


CON-NECTOR NUMBER	CONNECT TO
D2	Door mirror (Driver side) (With door mirror defogger)
D6	Door mirror remote control switch
D7	Power window main switch • CPU • Door lock and unlock switch • Illumination • Power window lock switch
D11	Driver side door lock actuator (Unlock sensor)
D12	Door key cylinder switch

CON-NECTOR NUMBER	CONNECT TO
M38	Power socket (Instrument passenger panel lower)
M44	Triple meter
M47	A/T device (Terminal No.2) • Park position switch
M47	A/T device (Terminal No.9) • Mode select switch
M49	Unified meter and A/C amp. (Terminal No.29)
M49	Unified meter and A/C amp. (Terminal No.30)
M62	Blower motor (Without navigation system)
M68	Power steering control unit
M98	Hazard switch
M154	Heated seat switch (Driver side)
M155	Heated seat switch (Passenger side)
M252	Mode Door motor
M253	Air mix door motor
M256	Intake door motor
D32	Door mirror (Passenger side) (With door mirror defogger)
D37	Power window sub-switch • CPU • Door lock and unlock switch

CKIT0866E

ENGINE ROOM HARNESS



E17
Body ground

CONNECTOR NUMBER	CONNECT TO
E8	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.38)
E9	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.50)
E9	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.60)
E24	Front combination lamp RH (Terminal No.4) ▪ Headlamp ▪ High beam solenoid
E24	Front combination lamp RH (Terminal No.8) ▪ Parking ▪ Side marker ▪ Turn signal
E38	Cooling fan motor-1
E39	Cooling fan motor-2
E52	Front wiper motor

E12 F3 Engine control harness

F103 F151 Engine control earth sub-harness

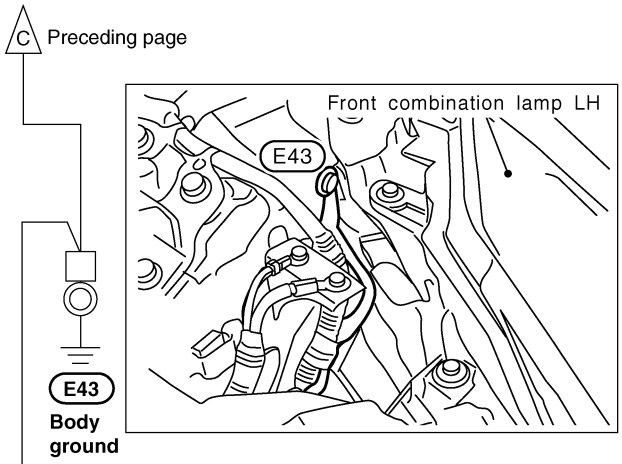
F103 B113 Body No.2 harness

D To engine control earth sub-harness (Without VDC system, navigation system and telephone)

J To body No.2 harness (With VDC system, navigation system or telephone)

C Next page

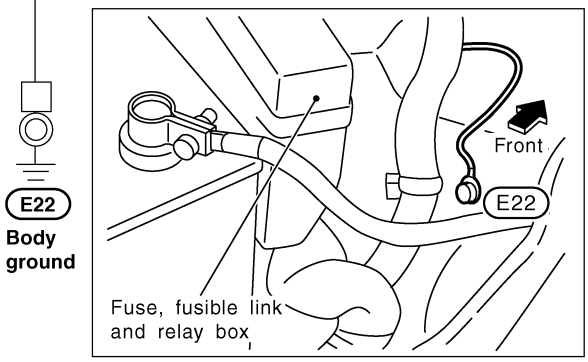
CKIT0867E



CON-NECTOR NUMBER	CONNECT TO
E6	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.14)
E19	Shift lock relay
E30	Washer level sensor
E33	Horn (Low)
E36	Horn (High)
E40	Front combination lamp LH (Terminal No. 4) ▪ Headlamp ▪ High beam solenoid
E40	Front combination lamp LH (Terminal No. 8) ▪ Parking ▪ Side marker ▪ Turn signal
E44	Brake fluid level switch
E51	ABS actuator and electric unit (Terminal No. 16)
E51	ABS actuator and electric unit (Terminal No. 30)

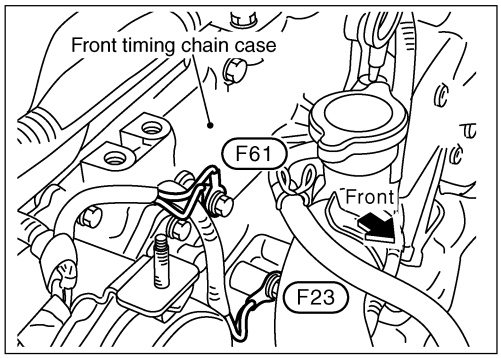
CKIT0868E

CON-NECTOR NUMBER	CONNECT TO
E37	Shield wire (Crash zone sensor)



CKIT0869E

ENGINE CONTROL HARNESS



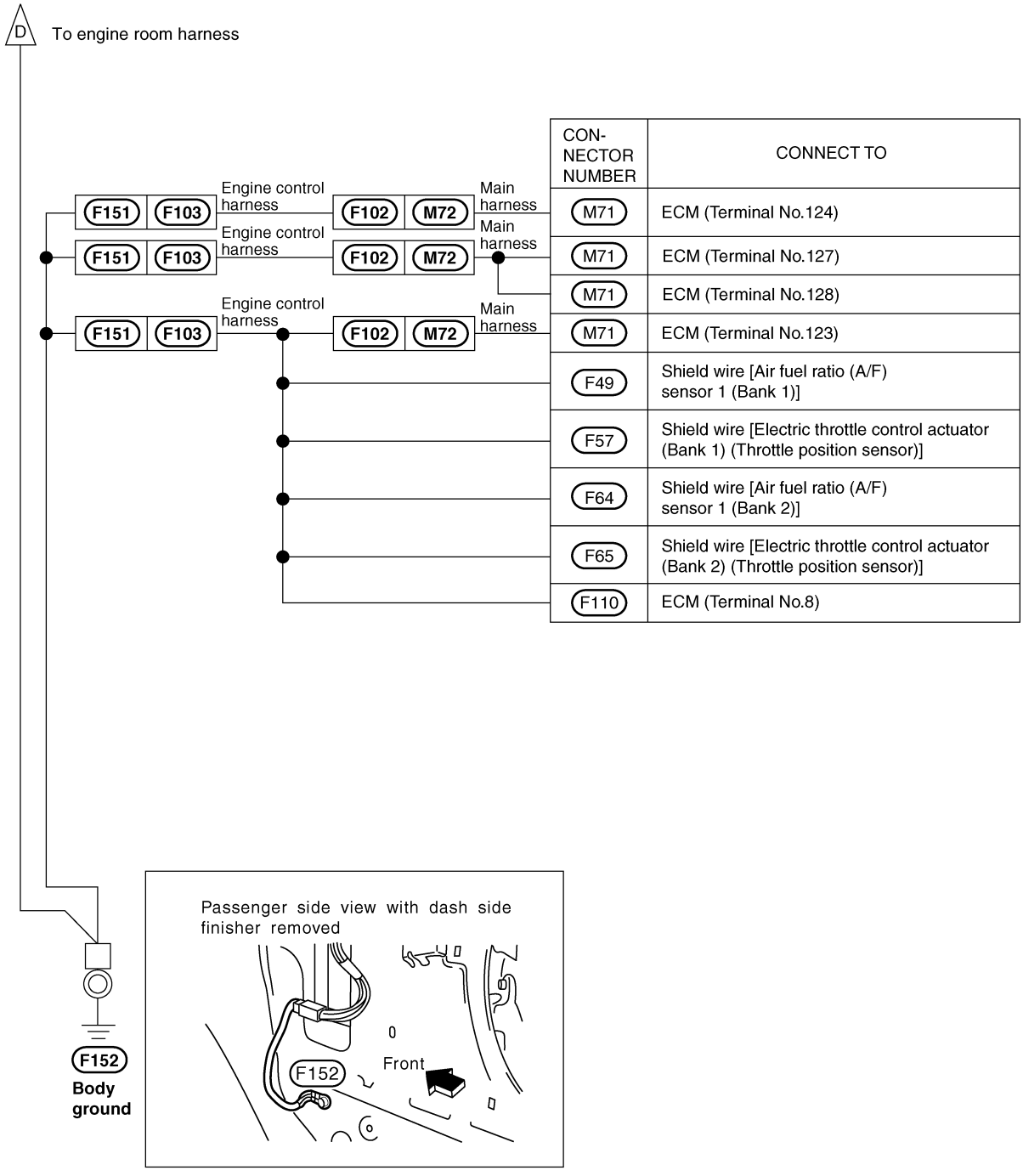
CON-NECTOR NUMBER	CONNECT TO
F6	A/T assembly (Terminal No.5)
F6	A/T assembly (Terminal No.10)

F23
Engine ground

CON-NECTOR NUMBER	CONNECT TO
F15	Ignition coil No.5 (With power transistor)
F16	Condenser
F27	Ignition coil No.2 (With power transistor)
F28	Ignition coil No.4 (With power transistor)
F29	Ignition coil No.6 (With power transistor)
F55	Ignition coil No.1 (With power transistor)
F56	Ignition coil No.3 (With power transistor)

F61
Engine ground

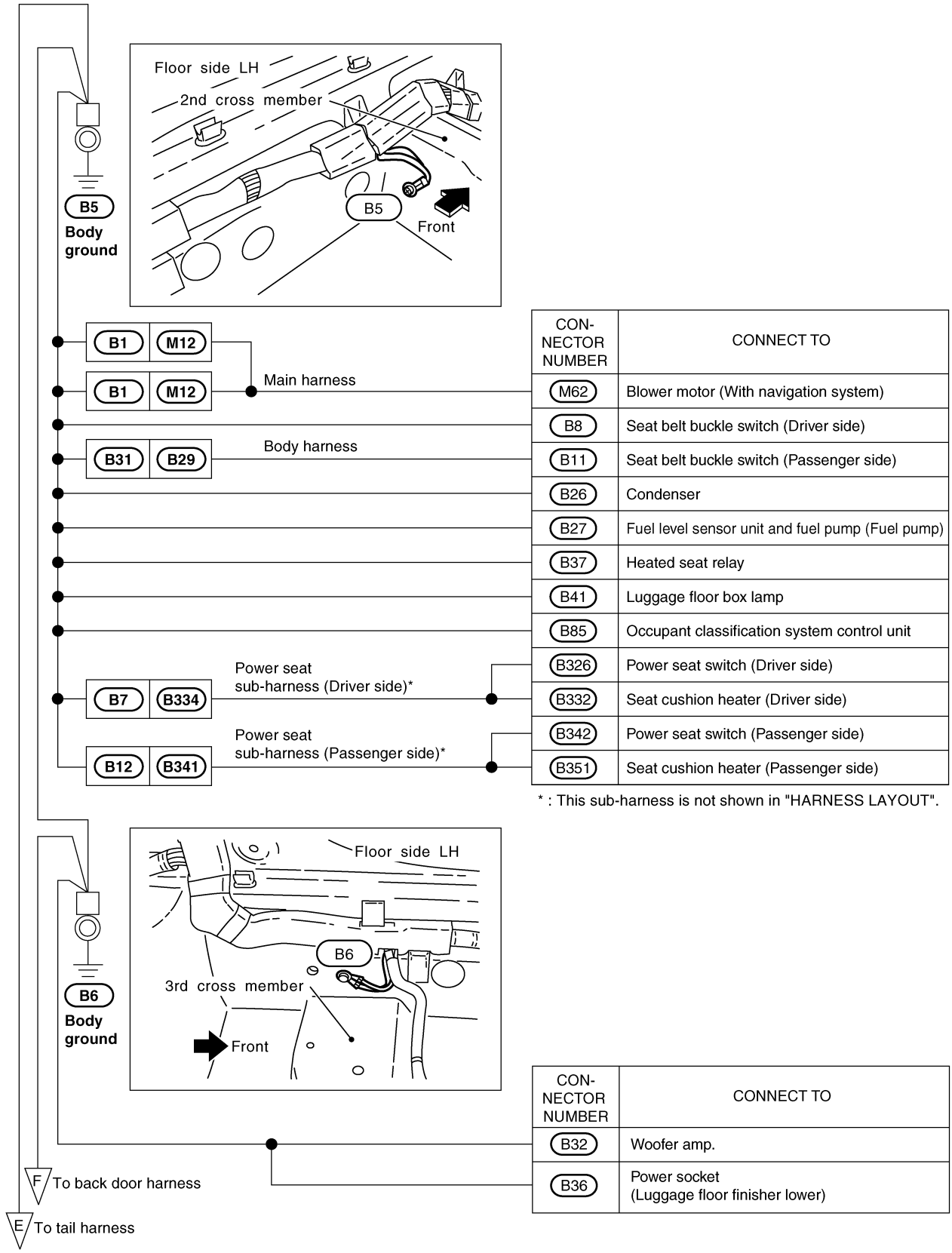
CKIT0870E



CON-NECTOR NUMBER	CONNECT TO
M71	ECM (Terminal No.124)
M71	ECM (Terminal No.127)
M71	ECM (Terminal No.128)
M71	ECM (Terminal No.123)
F49	Shield wire [Air fuel ratio (A/F) sensor 1 (Bank 1)]
F57	Shield wire [Electric throttle control actuator (Bank 1) (Throttle position sensor)]
F64	Shield wire [Air fuel ratio (A/F) sensor 1 (Bank 2)]
F65	Shield wire [Electric throttle control actuator (Bank 2) (Throttle position sensor)]
F110	ECM (Terminal No.8)

CKIT0871E

BODY HARNESS
Coupe Models



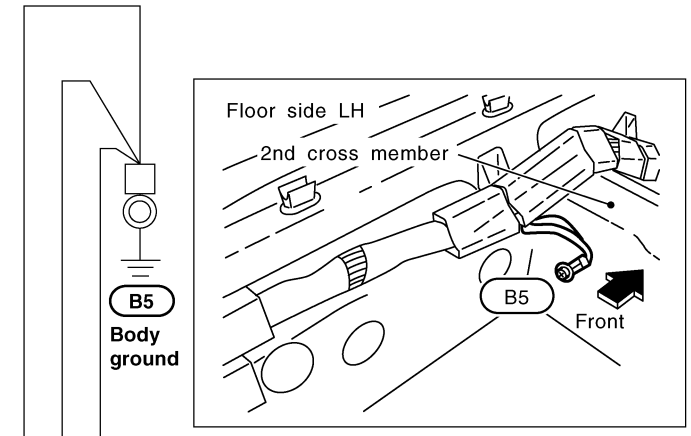
CONNECTOR NUMBER	CONNECT TO
M62	Blower motor (With navigation system)
B8	Seat belt buckle switch (Driver side)
B11	Seat belt buckle switch (Passenger side)
B26	Condenser
B27	Fuel level sensor unit and fuel pump (Fuel pump)
B37	Heated seat relay
B41	Luggage floor box lamp
B85	Occupant classification system control unit
B326	Power seat switch (Driver side)
B332	Seat cushion heater (Driver side)
B342	Power seat switch (Passenger side)
B351	Seat cushion heater (Passenger side)

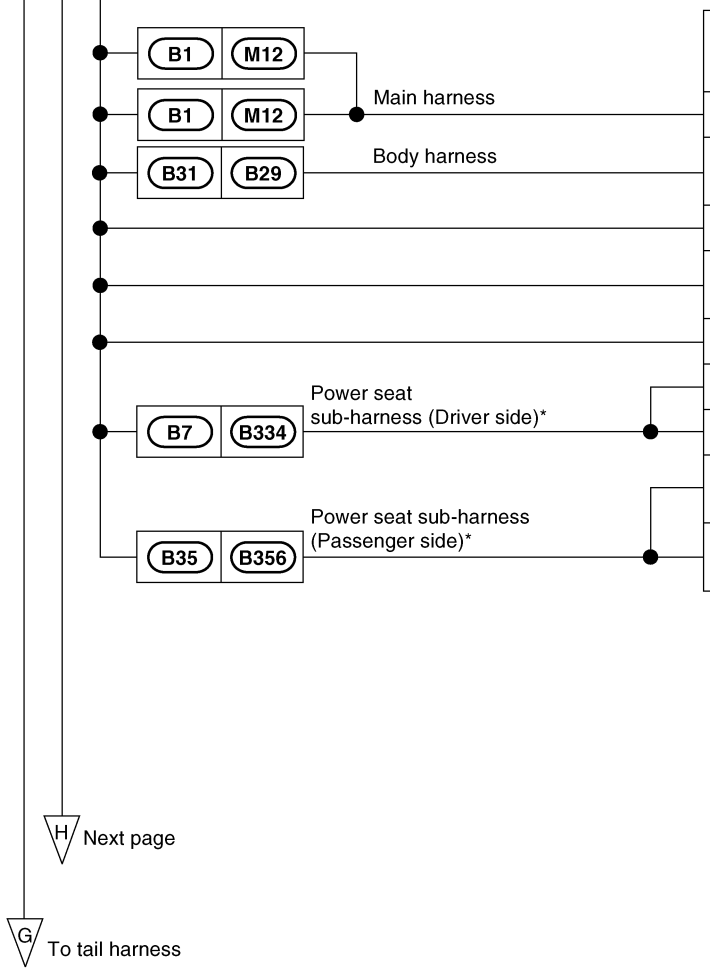
* : This sub-harness is not shown in "HARNESS LAYOUT".

CONNECTOR NUMBER	CONNECT TO
B32	Woofer amp.
B36	Power socket (Luggage floor finisher lower)

CKIT0856E

Roadster Models

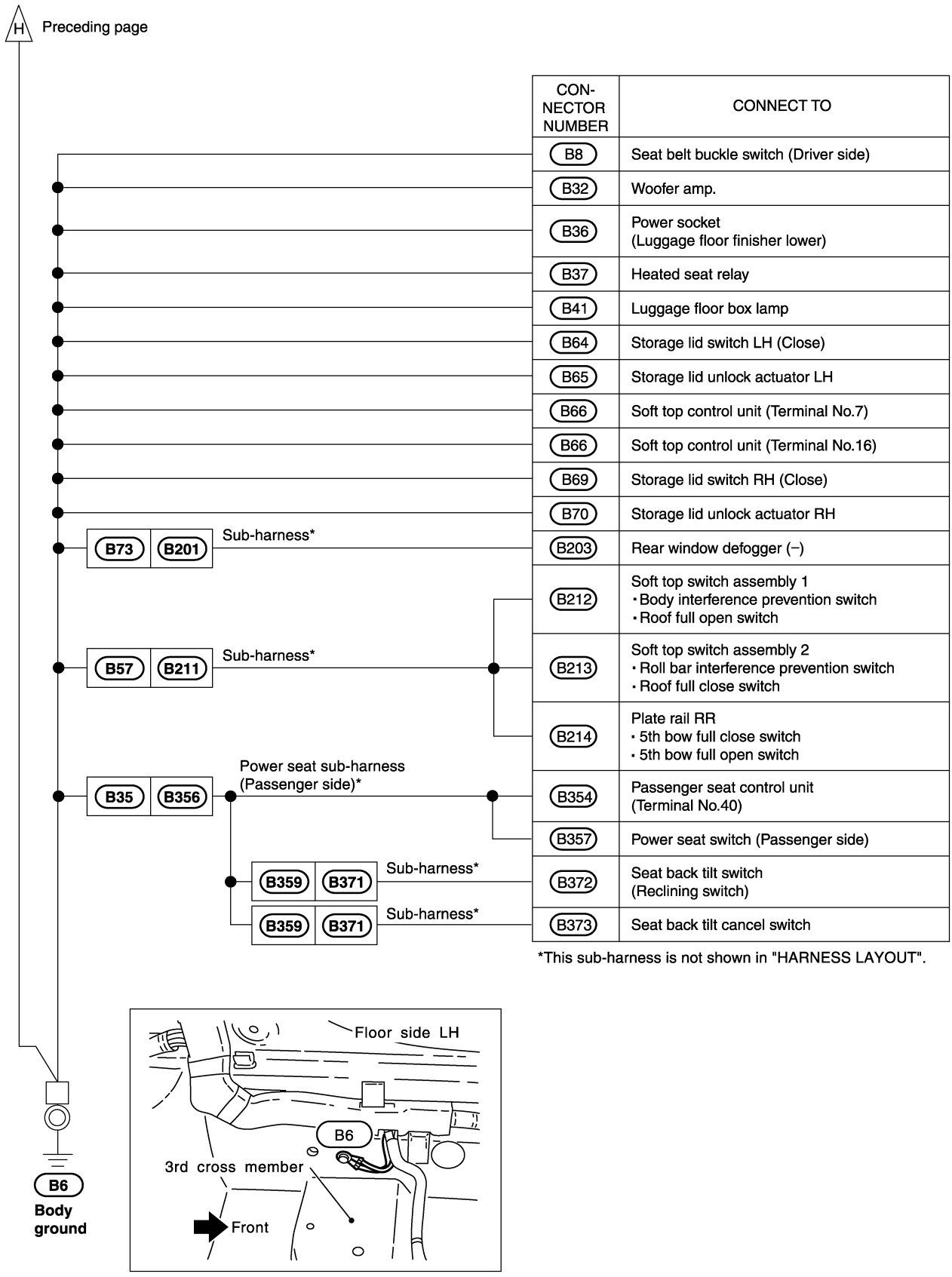




CON-NECTOR NUMBER	CONNECT TO
M62	Blower motor (With navigation system)
B11	Seat belt buckle switch (Passenger side)
B26	Condenser
B27	Fuel level sensor unit and fuel pump (Fuel pump)
B85	Occupant classification system control unit
B326	Power seat switch (Driver side)
B332	Seat cushion heater (Driver side)
B351	Seat cushion heater (Passenger side)
B354	Passenger seat control unit (Terminal No.48)

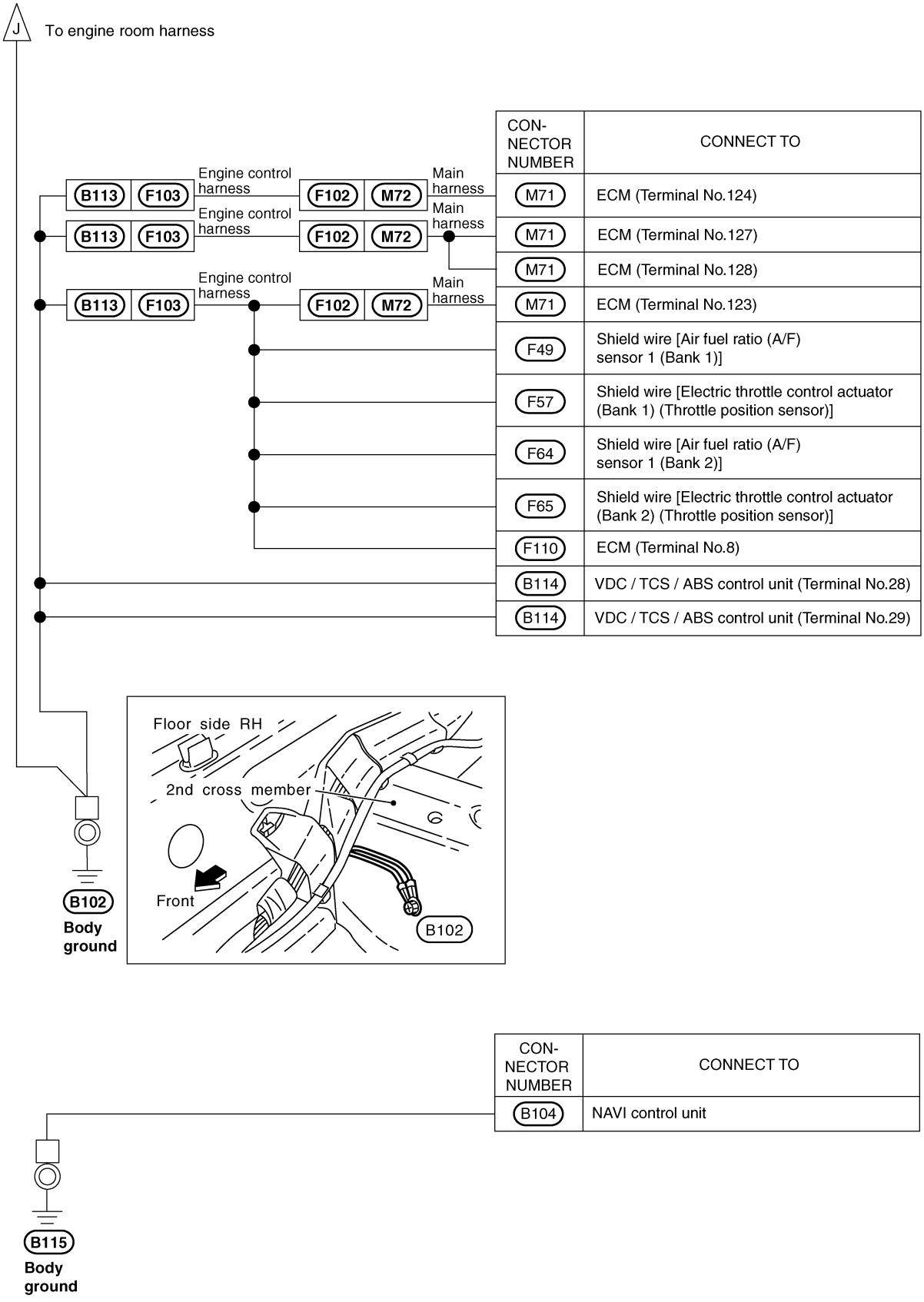
* : This sub-harness is not shown in "HARNESS LAYOUT".

CKIT0857E


H
Preceding page
CON-NECTOR NUMBER
CONNECT TO
B8
Seat belt buckle switch (Driver side)
B32
Woofer amp.
B36
Power socket (Luggage floor finisher lower)
B37
Heated seat relay
B41
Luggage floor box lamp
B64
Storage lid switch LH (Close)
B65
Storage lid unlock actuator LH
B66
Soft top control unit (Terminal No.7)
B66
Soft top control unit (Terminal No.16)
B69
Storage lid switch RH (Close)
B70
Storage lid unlock actuator RH
B73
B201
Sub-harness*
B203
Rear window defogger (−)
B212
Soft top switch assembly 1
• Body interference prevention switch
• Roof full open switch
B57
B211
Sub-harness*
B213
Soft top switch assembly 2
• Roll bar interference prevention switch
• Roof full close switch
B214
Plate rail RR
• 5th bow full close switch
• 5th bow full open switch
B35
B356
Power seat sub-harness (Passenger side)*
B354
Passenger seat control unit (Terminal No.40)
B357
Power seat switch (Passenger side)
B359
B371
Sub-harness*
B372
Seat back tilt switch (Reclining switch)
B359
B371
Sub-harness*
B373
Seat back tilt cancel switch
*This sub-harness is not shown in "HARNESS LAYOUT".
B6
Body ground
Floor side LH
B6
3rd cross member
Front

CKIT0735E

BODY NO. 2 HARNESS

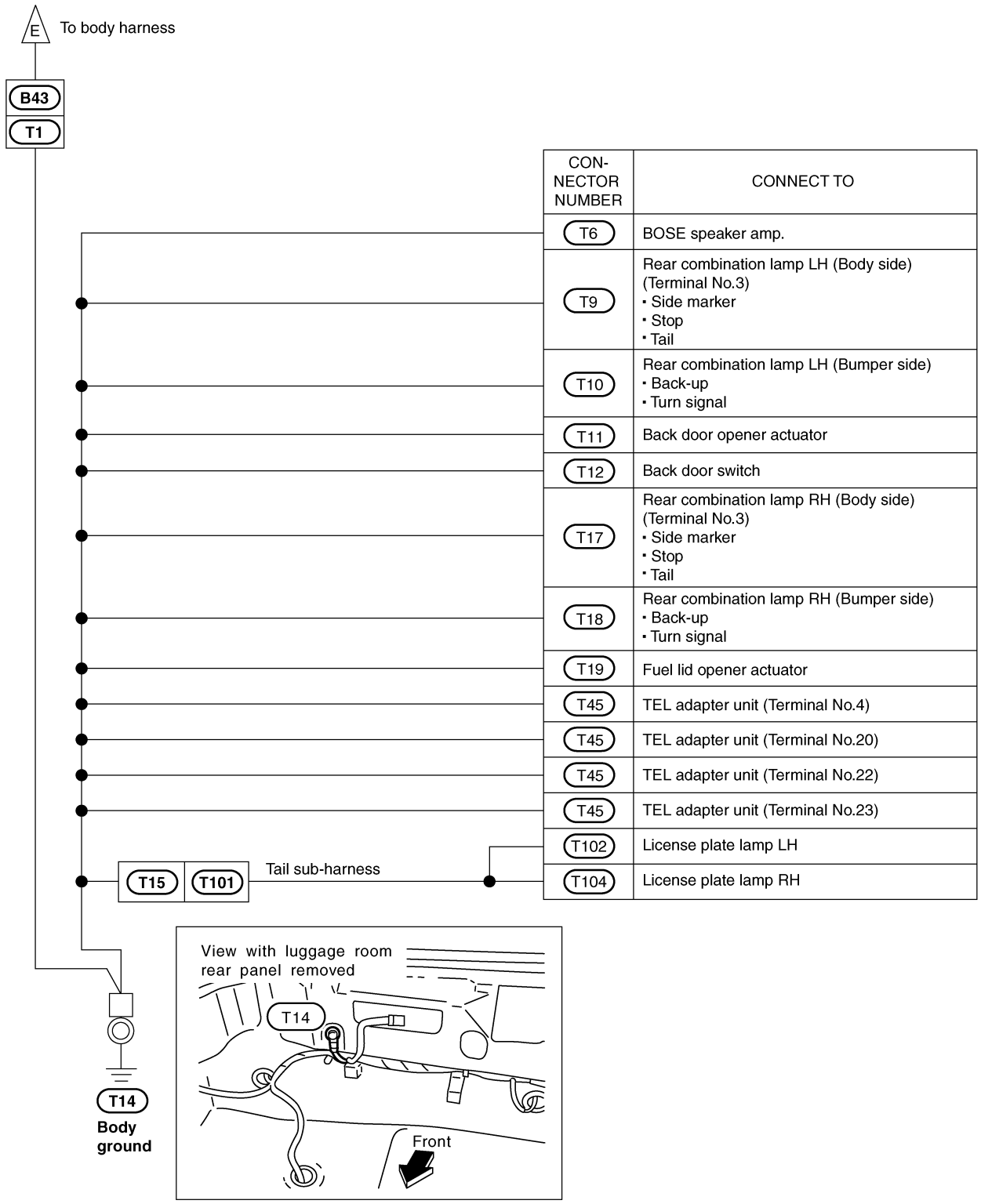


CON-NECTOR NUMBER	CONNECT TO
M71	ECM (Terminal No.124)
M71	ECM (Terminal No.127)
M71	ECM (Terminal No.128)
M71	ECM (Terminal No.123)
F49	Shield wire [Air fuel ratio (A/F) sensor 1 (Bank 1)]
F57	Shield wire [Electric throttle control actuator (Bank 1) (Throttle position sensor)]
F64	Shield wire [Air fuel ratio (A/F) sensor 1 (Bank 2)]
F65	Shield wire [Electric throttle control actuator (Bank 2) (Throttle position sensor)]
F110	ECM (Terminal No.8)
B114	VDC / TCS / ABS control unit (Terminal No.28)
B114	VDC / TCS / ABS control unit (Terminal No.29)

CON-NECTOR NUMBER	CONNECT TO
B104	NAVI control unit

CKIT0872E

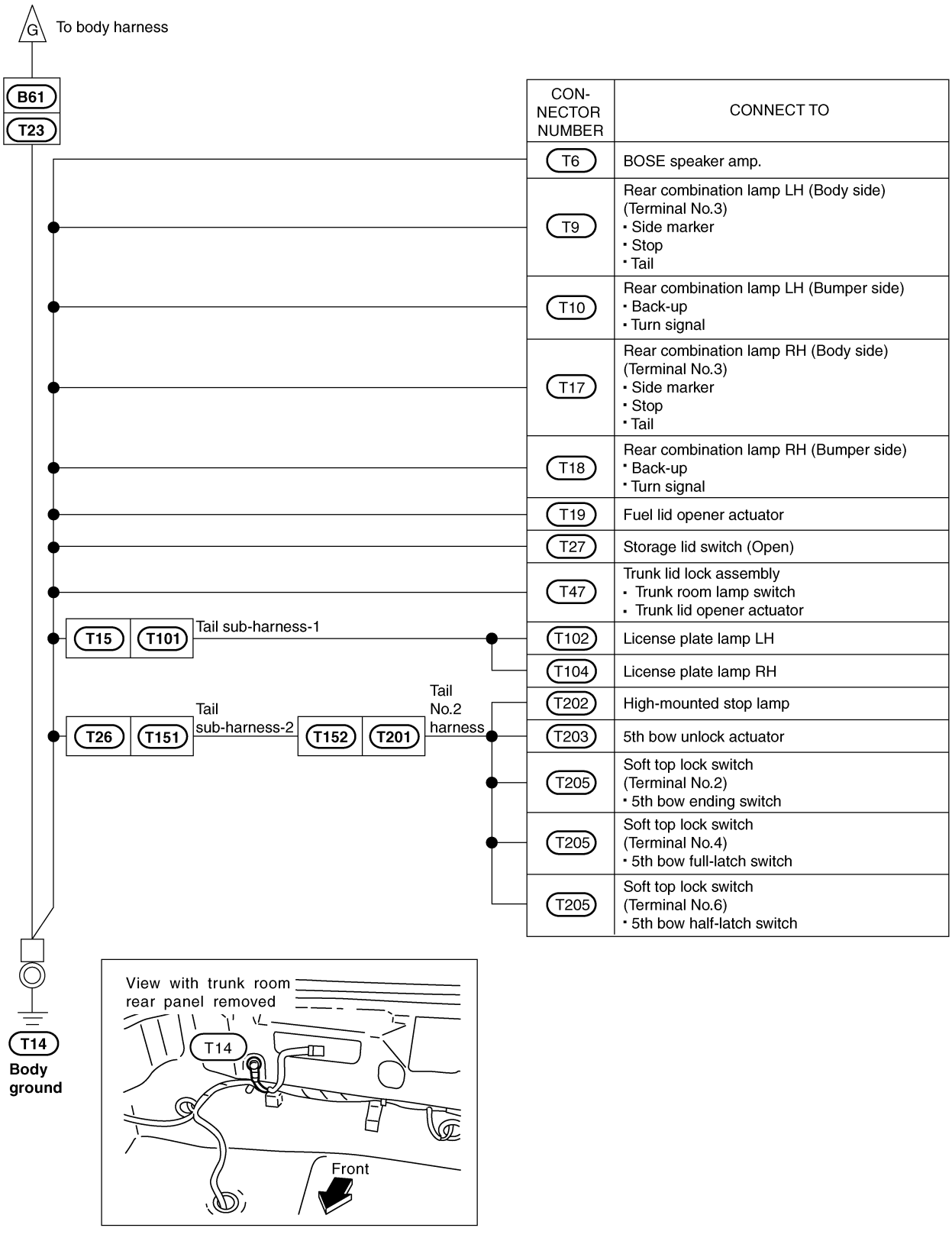
TAIL HARNESS
Coupe Models



CON-NECTOR NUMBER	CONNECT TO
T6	BOSE speaker amp.
T9	Rear combination lamp LH (Body side) (Terminal No.3) ▪ Side marker ▪ Stop ▪ Tail
T10	Rear combination lamp LH (Bumper side) ▪ Back-up ▪ Turn signal
T11	Back door opener actuator
T12	Back door switch
T17	Rear combination lamp RH (Body side) (Terminal No.3) ▪ Side marker ▪ Stop ▪ Tail
T18	Rear combination lamp RH (Bumper side) ▪ Back-up ▪ Turn signal
T19	Fuel lid opener actuator
T45	TEL adapter unit (Terminal No.4)
T45	TEL adapter unit (Terminal No.20)
T45	TEL adapter unit (Terminal No.22)
T45	TEL adapter unit (Terminal No.23)
T102	License plate lamp LH
T104	License plate lamp RH

CKIT0873E

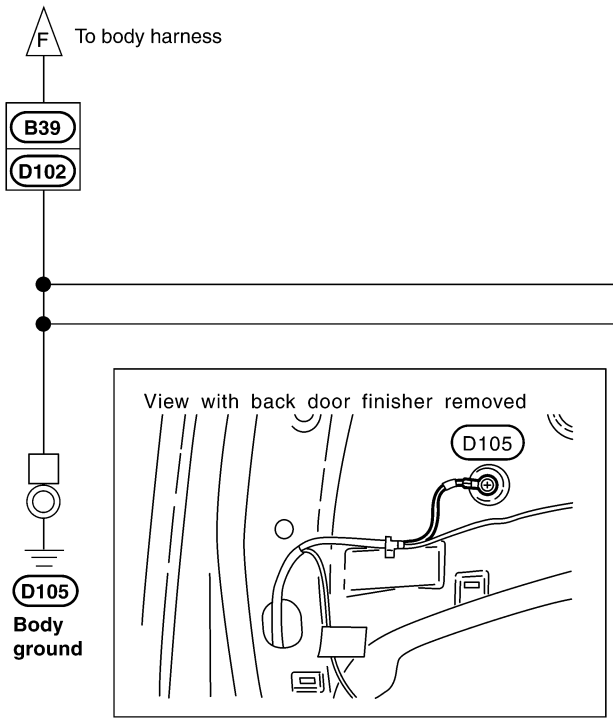
Roadster Models



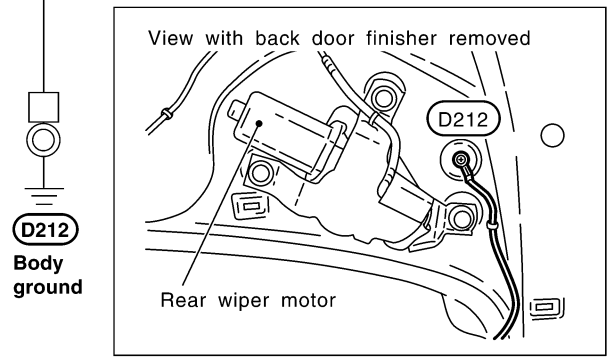
CONNECTOR NUMBER	CONNECT TO
T6	BOSE speaker amp.
T9	Rear combination lamp LH (Body side) (Terminal No.3) ▪ Side marker ▪ Stop ▪ Tail
T10	Rear combination lamp LH (Bumper side) ▪ Back-up ▪ Turn signal
T17	Rear combination lamp RH (Body side) (Terminal No.3) ▪ Side marker ▪ Stop ▪ Tail
T18	Rear combination lamp RH (Bumper side) ▪ Back-up ▪ Turn signal
T19	Fuel lid opener actuator
T27	Storage lid switch (Open)
T47	Trunk lid lock assembly ▪ Trunk room lamp switch ▪ Trunk lid opener actuator
T102	License plate lamp LH
T104	License plate lamp RH
T202	High-mounted stop lamp
T203	5th bow unlock actuator
T205	Soft top lock switch (Terminal No.2) ▪ 5th bow ending switch
T205	Soft top lock switch (Terminal No.4) ▪ 5th bow full-latch switch
T205	Soft top lock switch (Terminal No.6) ▪ 5th bow half-latch switch

CKIT0859E

BACK DOOR HARNESS



CON-NECTOR NUMBER	CONNECT TO
D103	High-mounted stop lamp
D106	Rear wiper motor



CON-NECTOR NUMBER	CONNECT TO
D211	Rear window defogger (-)

CKIT0464E

HARNESS

PFP:00011

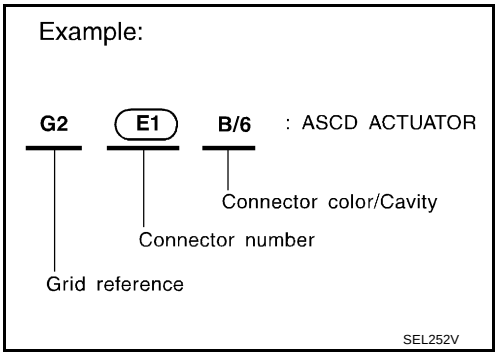
Harness Layout

NKS000EG

HOW TO READ HARNESS LAYOUT

The following Harness Layouts use a map style grid to help locate connectors on the figures:

- Main Harness
- Engine Room Harness (Engine Compartment)
- Engine Control Harness (Engine Compartment)
- Body Harness



To Use the Grid Reference

1. Find the desired connector number on the connector list.
2. Find the grid reference.
3. On the figure, find the crossing of the grid reference letter column and number row.
4. Find the connector number in the crossing zone.
5. Follow the line (if used) to the connector.

CONNECTOR SYMBOL

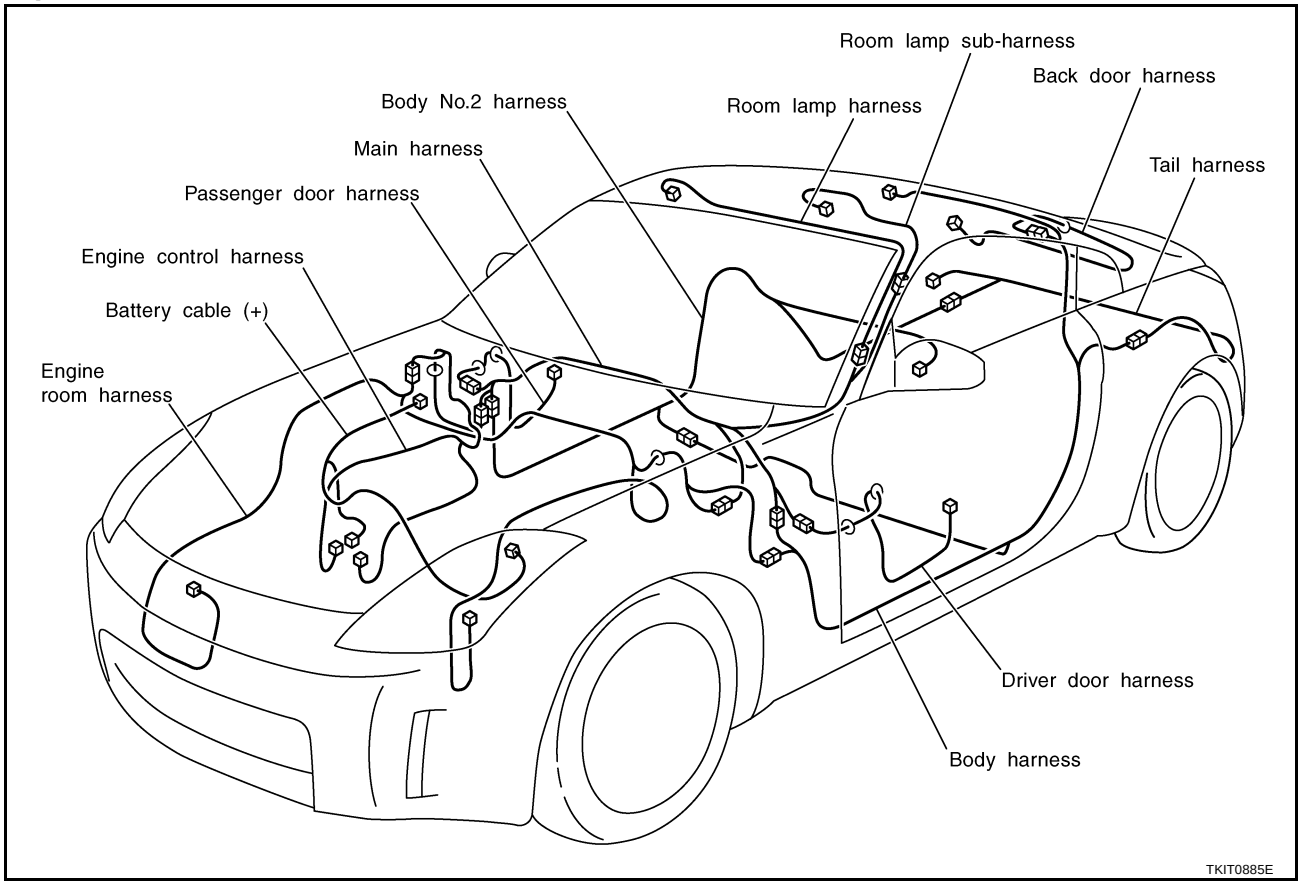
Main symbols of connector (in Harness Layout) are indicated in the below.

Connector type	Water proof type		Standard type	
	Male	Female	Male	Female
• Cavity: Less than 4 • Relay connector				
• Cavity: From 5 to 8				
• Cavity: More than 9				
• Ground terminal etc.	—			

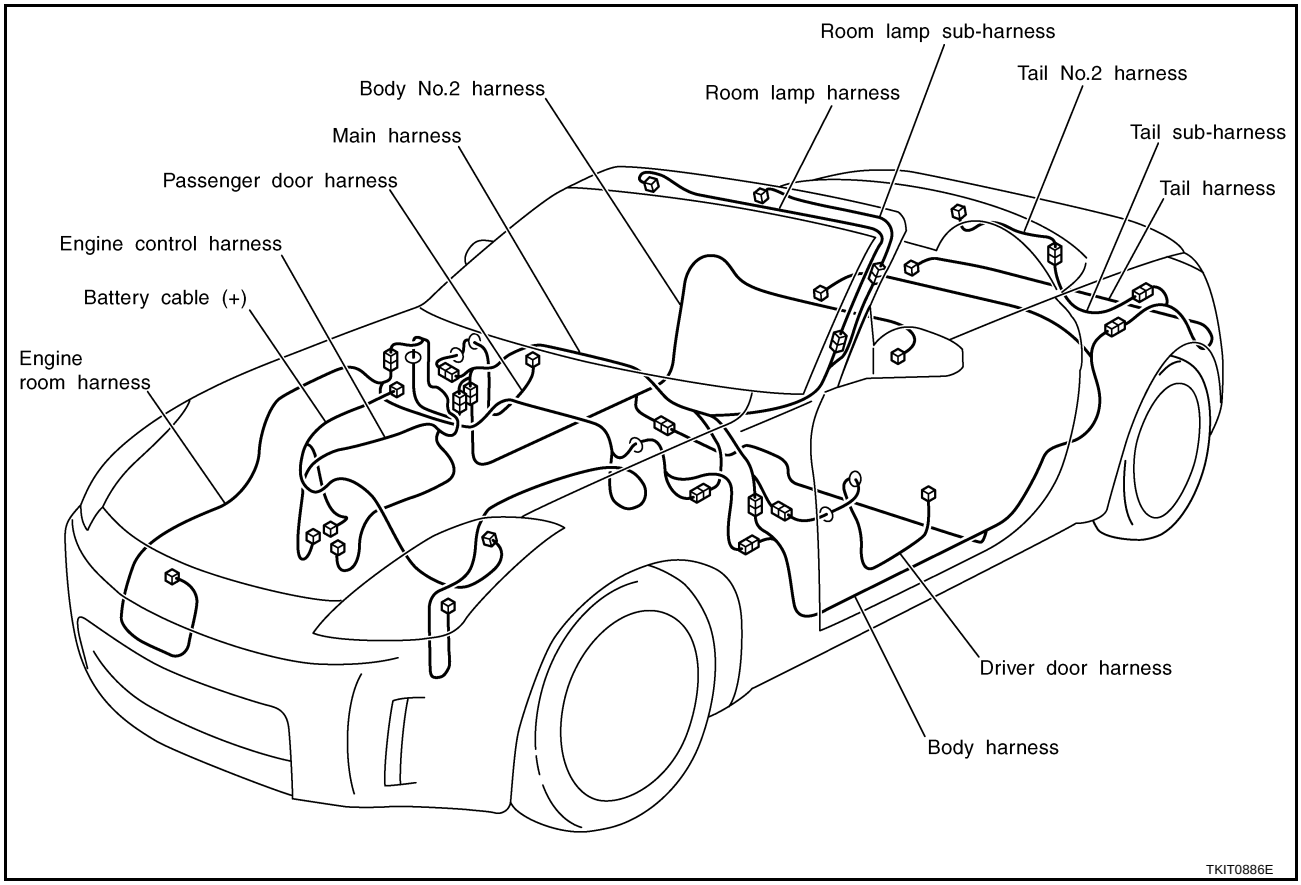
CKIT0108E

OUTLINE

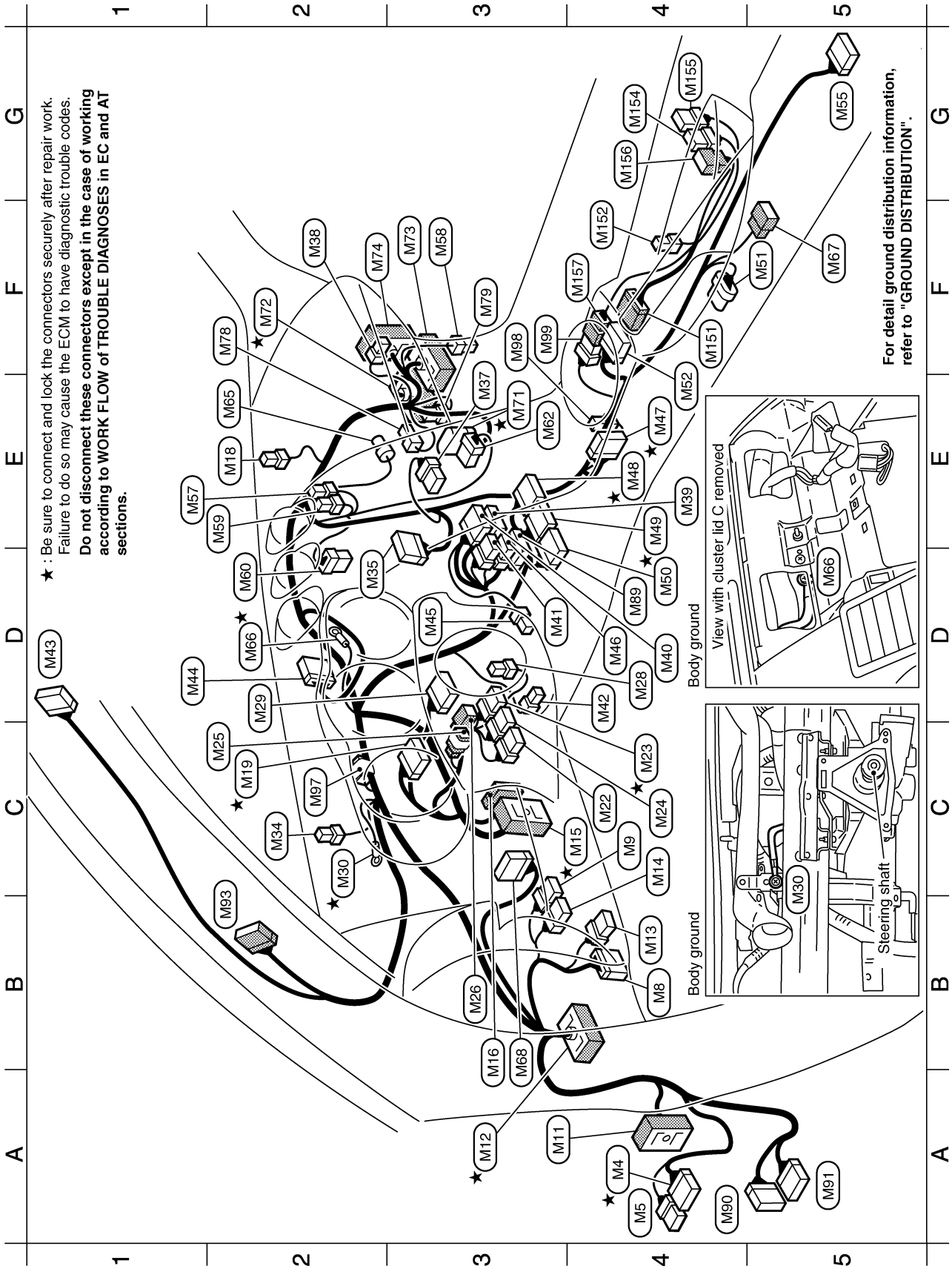
Coupe Models



Roadster Models



MAIN HARNESS



TKIT0887E

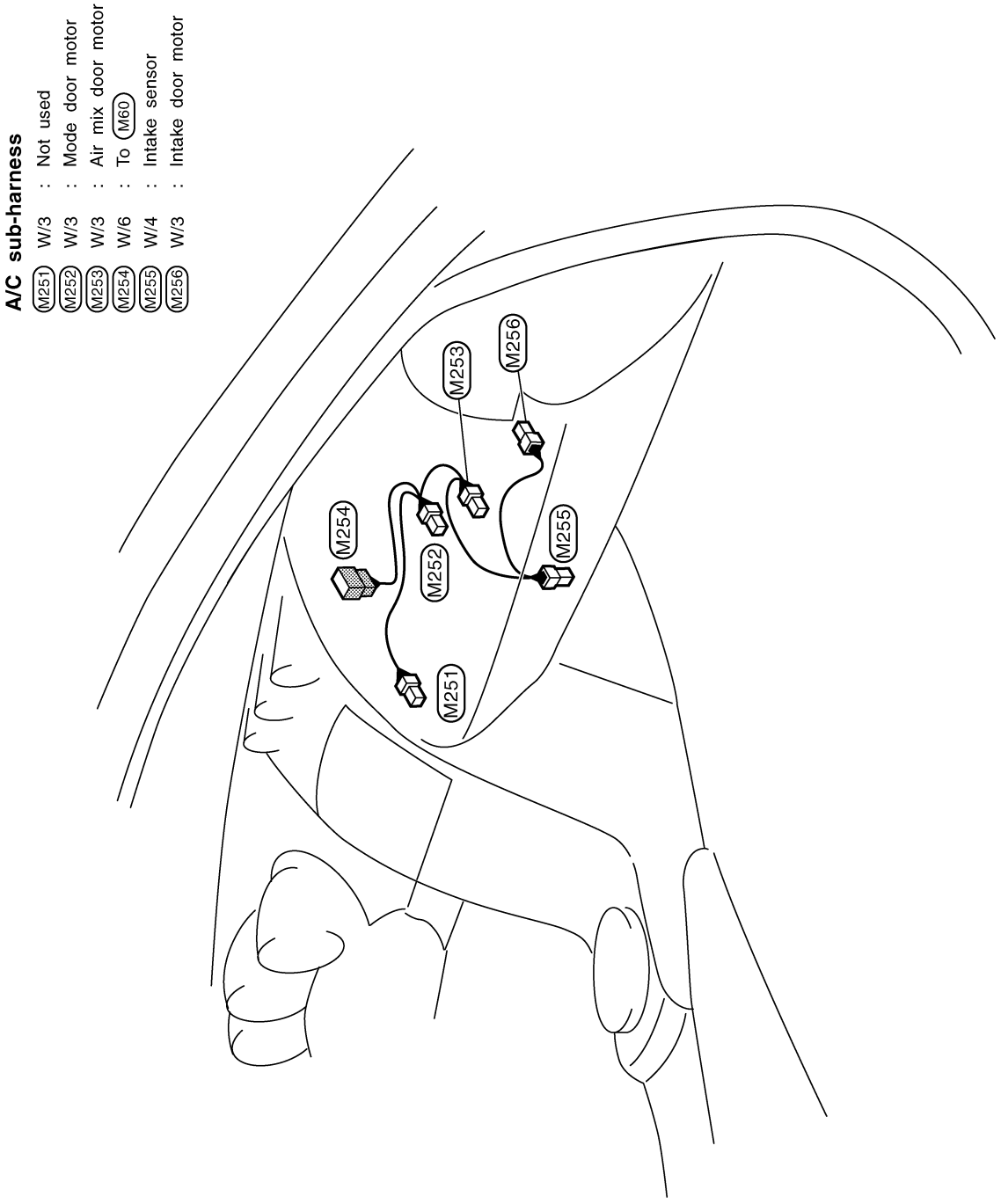
A4 ★	M4	W/16	:	Fuse block (J/B)
A4	M5	W/8	:	Fuse block (J/B)
B4	M8	W/16	:	Data link connector
C4	M9	GY/6	:	VDC off switch (With VDC system)
		GY/6	:	TCS off switch (Without VDC system)
A3	M11	SMJ	:	To D1
A3 ★	M12	SMJ	:	To B1
B4	M13	GY/6	:	Fuel lid opener switch
C4	M14	W/6	:	Soft top switch (For Roadster models)
C4 ★	M15	SMJ	:	To E108
B3	M16	W/16	:	To E109 (With VDC system)
E2	M18	B/2	:	Sunload sensor
C2 ★	M19	W/24	:	Combination meter
C4	M22	W/8	:	Steering angle sensor (With VDC system)
C4 ★	M23	GY/8	:	Combination switch (Spiral cable)
C4	M24	Y/6	:	Combination switch (Spiral cable)
C2	M25	BR/2	:	Key switch
B3	M26	W/2	:	Ignition Keyhole illumination
D4	M28	W/4	:	NATS antenna amp.
D2	M29	W/16	:	Combination switch
C2 ★	M30	—	:	Body ground
C2	M34	BR/2	:	Security indicator lamp
D2	M35	GY/24	:	Display unit (With navigation system)
E3	M37	W/8	:	NAVI switch (With navigation system)
F2	M38	B/2	:	Power socket
E4	M39	W/16	:	Audio unit [With A/T or with M/T (With VDC system, BOSE system or navigation system)]
D4	M40	W/10	:	Audio unit
D3	M41	W/6	:	Audio unit
D4	M42	W/2	:	In-vehicle sensor
D1	M43	W/12	:	To R57
D1	M44	W/12	:	Triple meter
D3	M45	BR/2	:	Antenna amp. (Via sub-harness)
D4	M46	BR/8	:	Audio unit (With navigation system or without telephone)
E4 ★	M47	W/10	:	A/T device (For A/T)
E4 ★	M48	GY/20	:	Unified meter and A/C amp.
E4 ★	M49	GY/16	:	Unified meter and A/C amp.
D4	M50	W/24	:	Unified meter and A/C amp.
F5	M51	B/6	:	Yaw rate / side G sensor (With VDC system)
E4	M52	W/12	:	To M151
G5	M55	Y/28	:	Air bag diagnosis sensor unit
E1	M57	L/4	:	Back-up lamp relay (For A/T)
F3	M58	W/4	:	To B112 (With VDC system)
E2	M59	L/4	:	Fuel lid opener relay (For Coupe models)
D2	M60	W/6	:	To M254
E3	M62	W/6	:	Blower motor
E2	M65	Y/4	:	Front passenger air bag module
D2 ★	M66	—	:	Body ground
F5	M67	W/8	:	To B86 (With navigation system)
B3	M68	W/12	:	Power steering control unit
E3 ★	M71	GY/32	:	ECM
F2 ★	M72	SMJ	:	To F102
F3	M73	SMJ	:	To B101 (With navigation system, VDC system or telephone)
F2	M74	SMJ	:	To D31
F2	M78	W/4	:	Remote keyless entry receiver
F3	M79	W/2	:	Tire pressure warning check connector
D4	M89	W/12	:	Audio unit (With BOSE system)
A4	M90	W/40	:	BCM (Body control module)
A5	M91	B/15	:	BCM (Body control module)
B2	M93	W/12	:	To R2
C2	M97	—/2	:	Resistor
F3	M98	W/4	:	Hazard switch
F3	M99	W/8	:	To M157 (For heated seat)

Switch sub-harness

F4	M151	W/12	:	To M52
F3	M152	W/2	:	Cup holder illumination
G4	M154	W/6	:	Heated seat switch (Driver side) (With heated seat)
G4	M155	BR/6	:	Heated seat switch (Passenger side) (With heated seat)
G4	M156	W/6	:	Not used
F4	M157	W/8	:	To M99 (For heated seat)

★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

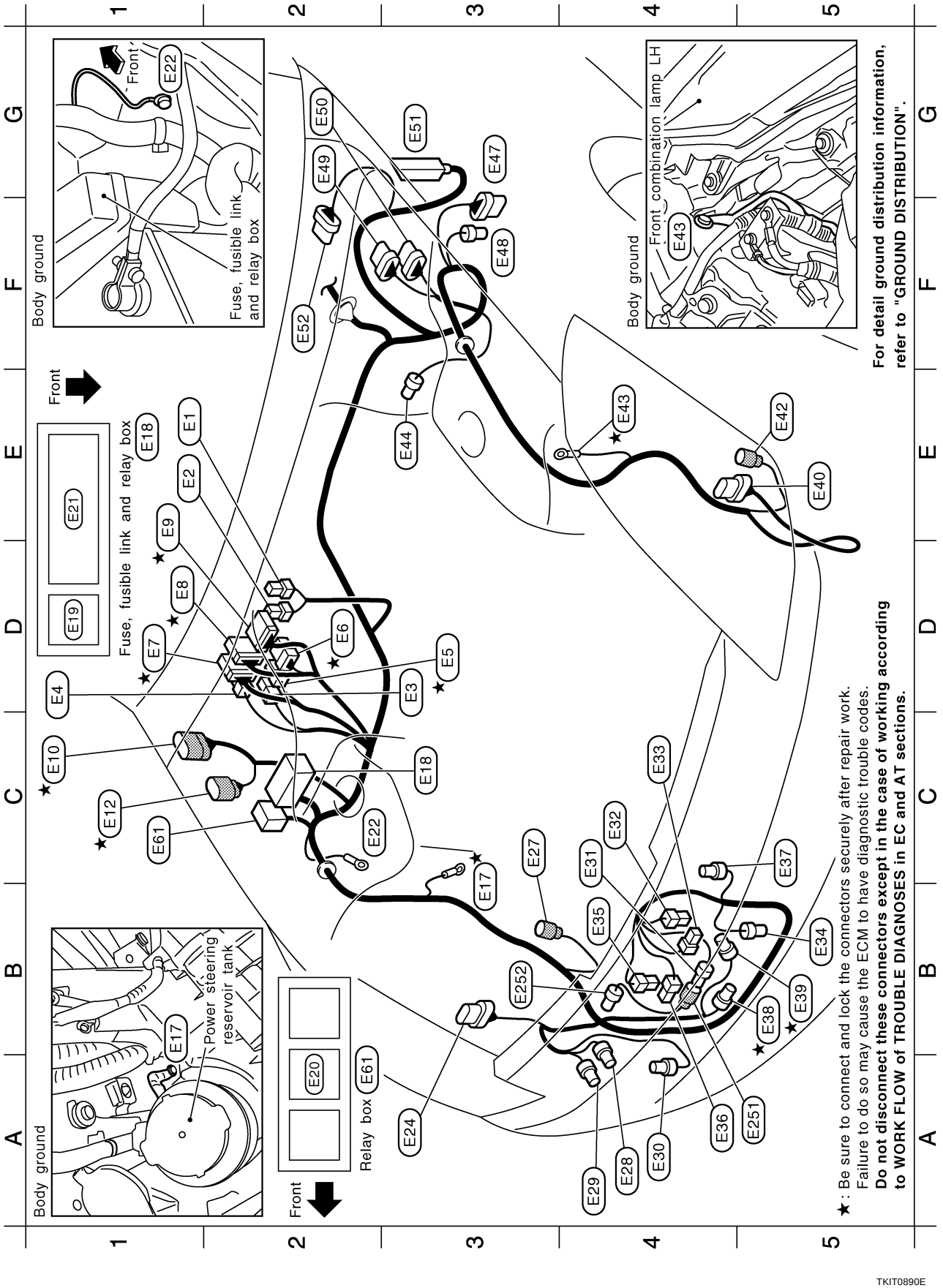
TKIT0888E


A/C sub-harness
M251 W/3 : Not used
M252 W/3 : Mode door motor
M253 W/3 : Air mix door motor
M254 W/6 : To M60
M255 W/4 : Intake sensor
M256 W/3 : Intake door motor
M253
M256
M254
M252
M255
M251

TKIT0889E

ENGINE ROOM HARNESS

Engine Compartment



TKIT0890E

E1	E1	B/2	:	Fusible link holder
E1	E2	GY/2	:	Fusible link holder
D3	E3	B/2	:	IPDM E/R (Intelligent power distribution module engine room)
D1	E4	W/4	:	IPDM E/R (Intelligent power distribution module engine room)
D3 ★	E5	B/4	:	IPDM E/R (Intelligent power distribution module engine room)
D2 ★	E6	W/6	:	IPDM E/R (Intelligent power distribution module engine room)
D1 ★	E7	GY/16	:	IPDM E/R (Intelligent power distribution module engine room)
D1 ★	E8	W/12	:	IPDM E/R (Intelligent power distribution module engine room)
E1 ★	E9	W/16	:	IPDM E/R (Intelligent power distribution module engine room)
C1 ★	E10	GY/9	:	To F1
C1 ★	E12	B/8	:	To F3
B3 ★	E17	—	:	Body ground
C3	E18	—	:	Fuse,fusible link and relay box
D1	E19	L/4	:	Shift lock relay (With A/T)
A2	E20	L/4	:	Daytime light relay (For Canada)
E1	E21	—	:	Fuse and fusible link block
C2	E22	—	:	Body ground
A3	E24	GY/8	:	Front combination lamp RH
C3	E27	GY/2	:	Front wheel sensor RH
A4	E28	GY/2	:	Rear washer pump
A4	E29	GY/2	:	Front washer pump
A4	E30	BR/2	:	Washer level sensor
C4	E31	B/3	:	To E251
C4	E32	B/1	:	Horn (Low)
C4	E33	B/1	:	Horn (Low)
B5	E34	B/2	:	Ambient sensor
B4	E35	B/1	:	Horn (High)
A4	E36	B/1	:	Horn (High)
C5	E37	Y/2	:	Crash zone sensor
B5 ★	E38	GY/4	:	Cooling fan motor-1 (Via sub-harness)
B5 ★	E39	GY/4	:	Cooling fan motor-2 (Via sub-harness)
E5	E40	GY/8	:	Front combination lamp LH
E5	E42	B/2	:	Front wheel sensor LH
E4 ★	E43	—	:	Body ground
E3	E44	GY/2	:	Brake fluid level switch
G3	E47	B/8	:	VDC relay box (With VDC system)
F3	E48	B/2	:	VDC relay box (With VDC system)
G2	E49	GY/8	:	VDC actuator (With VDC system)
G2	E50	B/8	:	VDC actuator (With VDC system)
G3	E51	SMJ	:	ABS actuator and electric unit (Without VDC system)
F2	E52	GY/5	:	Front wiper motor
C1	E61	—	:	Relay box (For Canada)

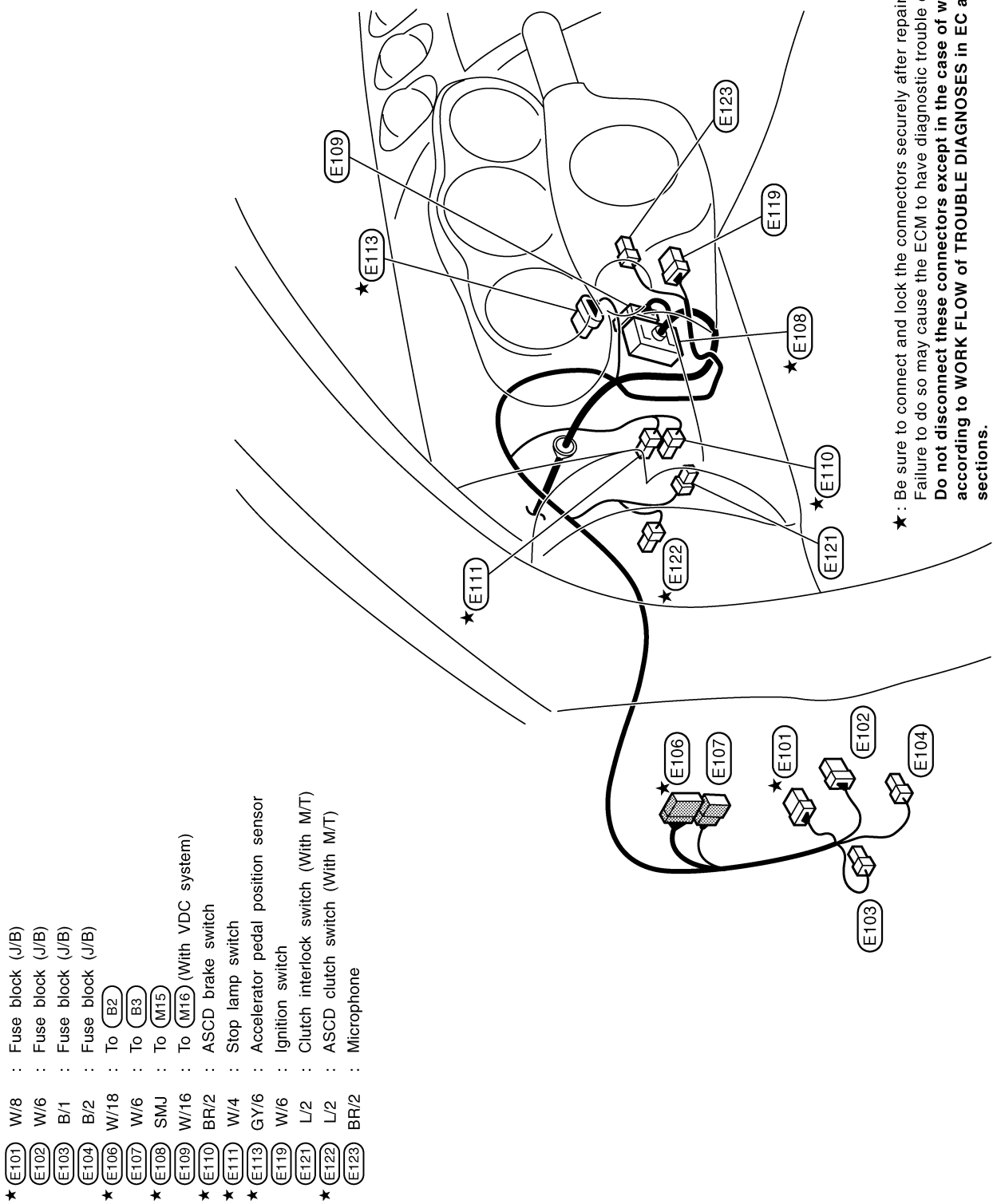
Sub-harness

A5	E251	B/3	:	To E31
B3	E252	B/3	:	Refrigerant pressure sensor

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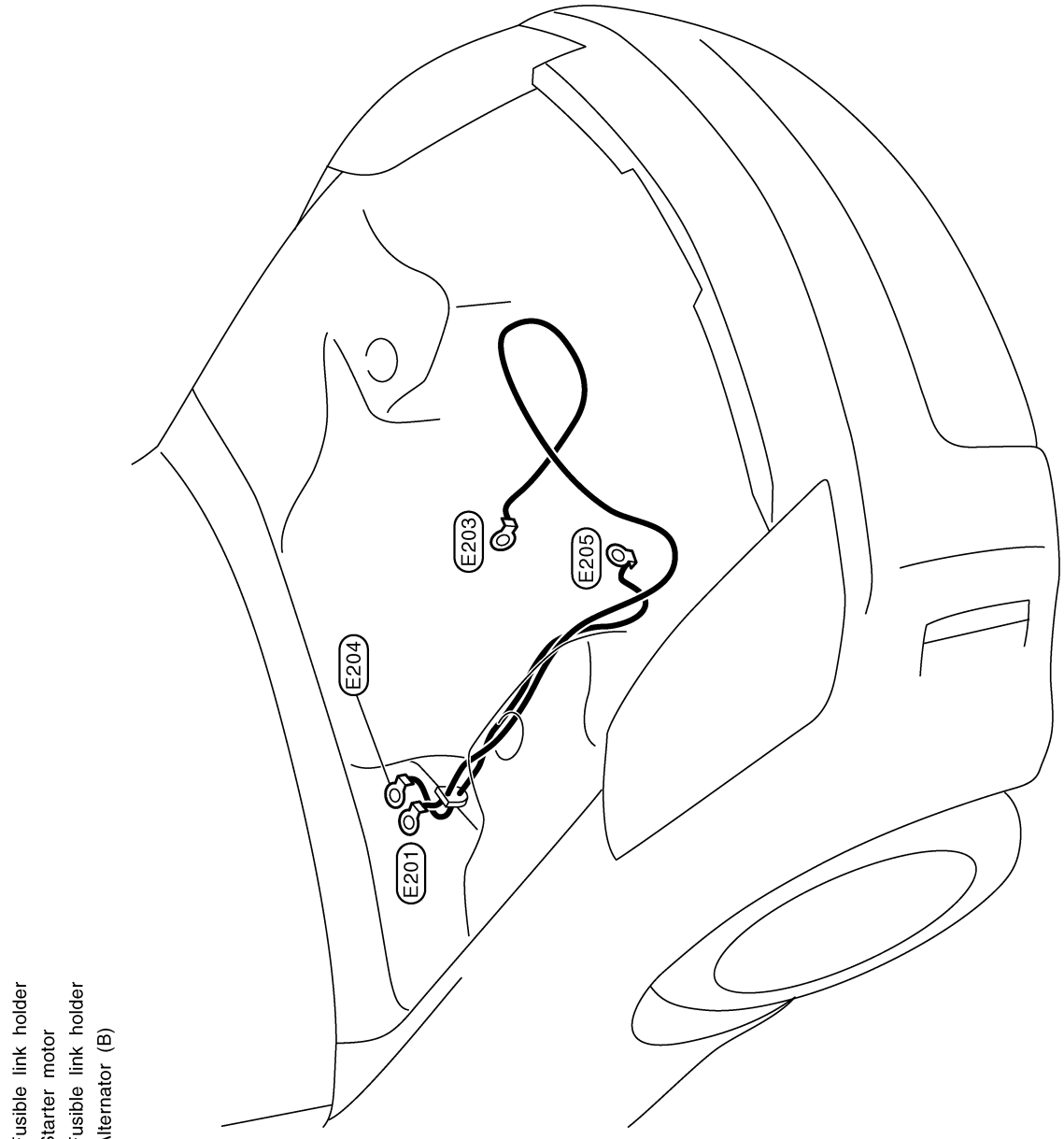
TKIT0891E

Passenger Compartment



TKIT0899E

Battery Cable

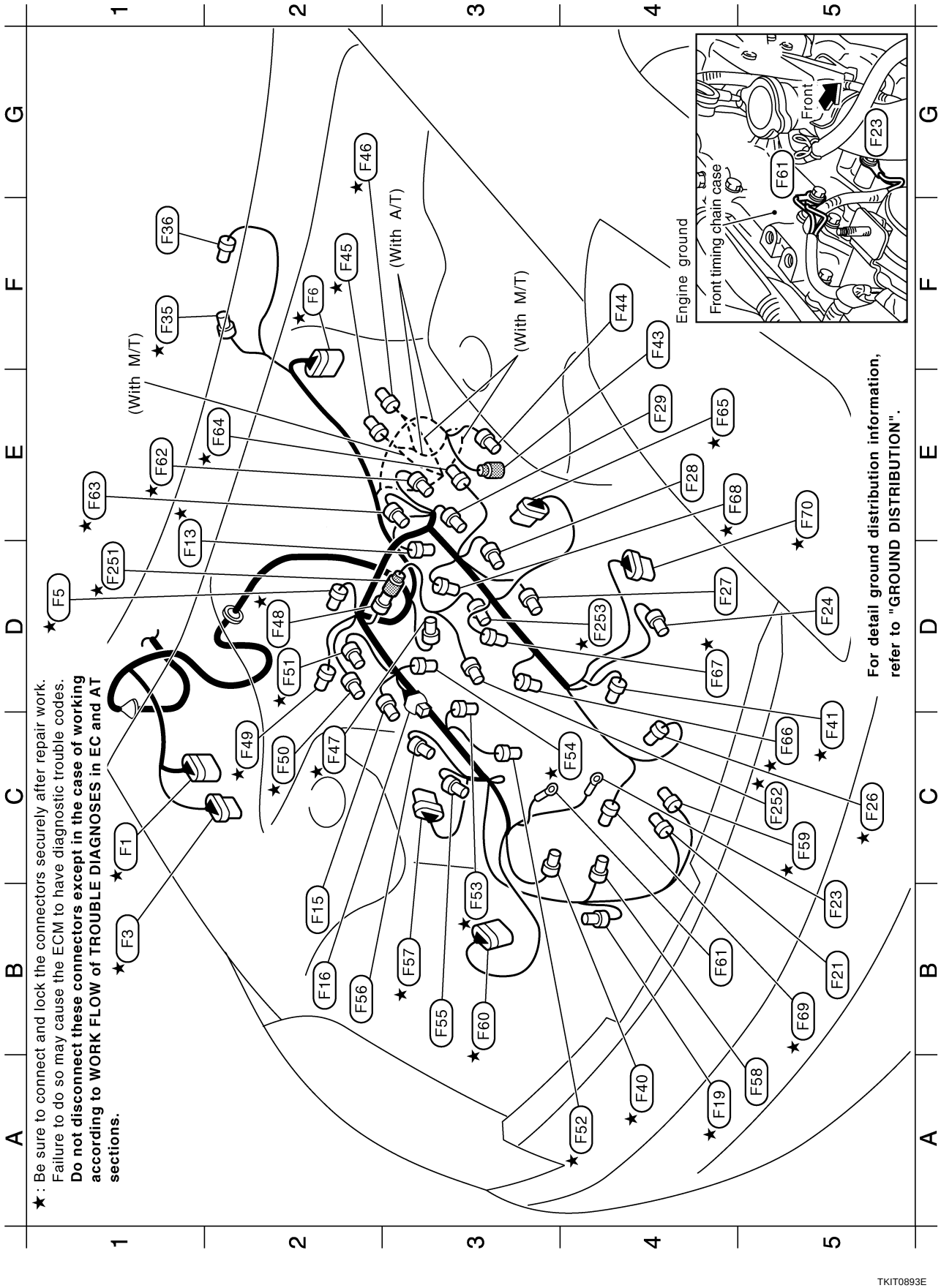


E201 : Fusible link holder
E203 : Starter motor
E204 : Fusible link holder
E205 : Alternator (B)

TKIT0892E

ENGINE CONTROL HARNESS

Engine Compartment



TKIT0893E

C1 ★ F1 GY/9 : To E10
B1 ★ F3 B/8 : To E12
D1 ★ F5 GY/2 : EVAP canister purge volume control solenoid valve
F2 ★ F6 GY/10 : A/T assembly (With A/T)
D1 ★ F13 GY/2 : Engine coolant temperature sensor
B2 F15 GY/3 : Ignition coil No.5 (With power transistor)
B2 F16 W/2 : Condenser
A4 ★ F19 B/3 : Power steering pressure sensor
B5 F21 B/3 : Oil pressure sensor
B5 F23 — : Engine ground
D5 F24 B/1 : Compressor
C5 ★ F26 GY/2 : Intake valve timing control solenoid valve (Bank 2)
D4 F27 GY/3 : Ignition coil No.2 (With power transistor)
E4 F28 GY/3 : Ignition coil No.4 (With power transistor)
E4 F29 GY/3 : Ignition coil No.6 (With power transistor)
F1 ★ F35 B/2 : Park/Neutral position switch (With M/T)
F1 F36 B/2 : Back-up lamp switch (With M/T)
A4 ★ F40 B/4 : Exhaust valve timing control magnet retarder (Bank 1)
C5 ★ F41 B/4 : Exhaust valve timing control magnet retarder (Bank 2)
F4 F43 GY/2 : Power steering solenoid valve
F4 F44 GY/1 : Starter motor
F2 ★ F45 B/4 : Heated oxygen sensor 2 (Bank 1)
G2 ★ F46 B/4 : Heated oxygen sensor 2 (Bank 2)
C2 ★ F47 B/3 : Crankshaft position sensor (POS)
D2 ★ F48 B/4 : To F251
C2 ★ F49 GY/4 : Air fuel ratio (A/F) sensor 1 (Bank 1)
C2 ★ F50 B/3 : Exhaust valve timing control position sensor (Bank 1)
D2 ★ F51 B/3 : Camshaft position sensor (PHASE) (Bank 1)
A4 ★ F52 GY/2 : Fuel injector No.1
B3 ★ F53 GY/2 : Fuel injector No.3
C4 ★ F54 GY/2 : Fuel injector No.5
B3 F55 GY/3 : Ignition coil No.1 (With power transistor)
B2 F56 GY/3 : Ignition coil No.3 (With power transistor)
B3 ★ F57 B/6 : Electric throttle control actuator (Bank 1)
A5 F58 B/3 : Alternator (S, L)
C5 ★ F59 GY/2 : Engine oil temperature sensor
B3 ★ F60 B/6 : Mass air flow sensor (Bank 1)
B4 F61 — : Engine ground
E1 ★ F62 B/3 : Exhaust valve timing control position sensor (Bank 2)
E1 ★ F63 B/3 : Camshaft position sensor (PHASE) (Bank 2)

TKIT0894E

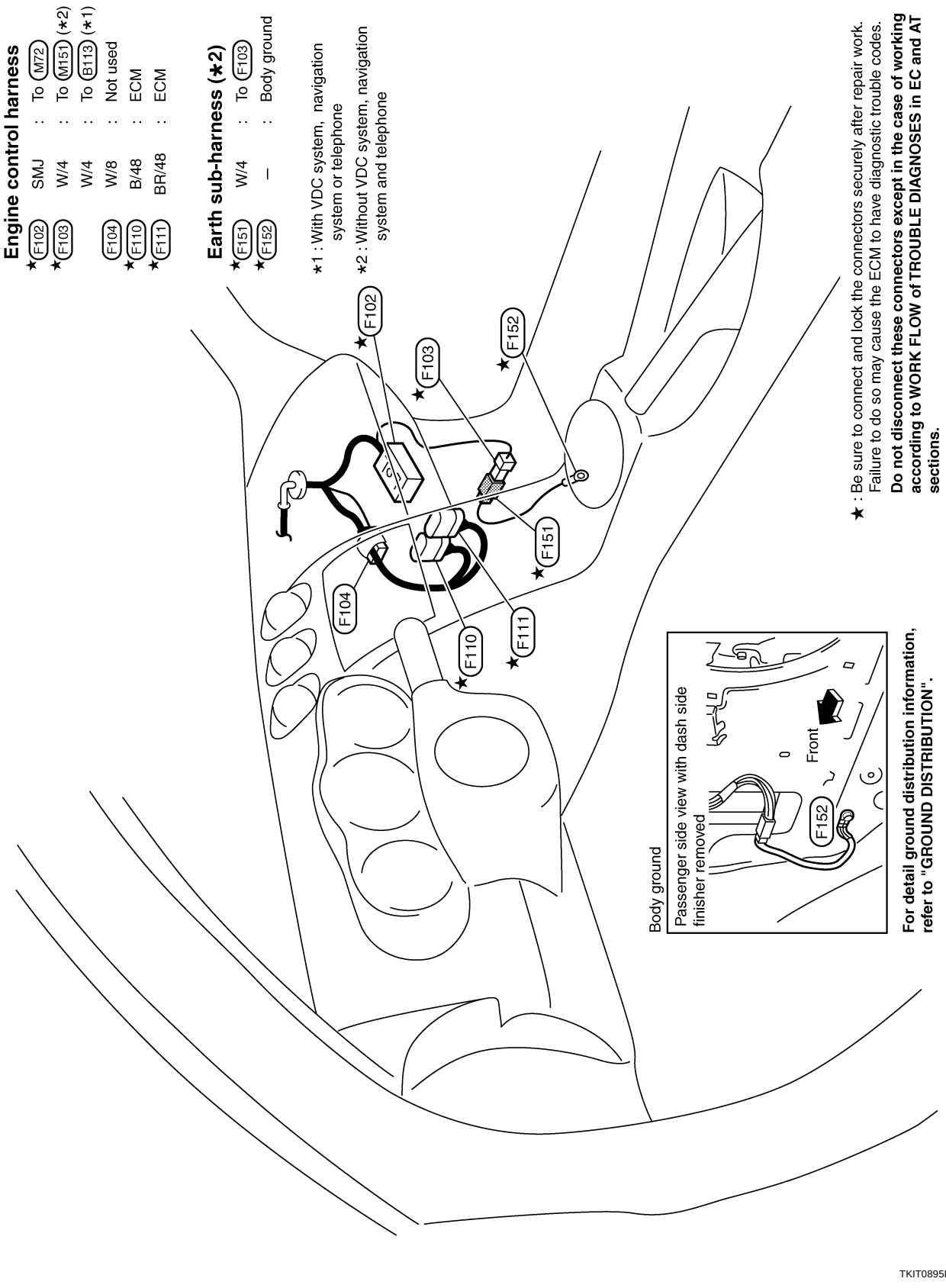
E2 ★ F64 GY/4 : Air fuel ratio (A/F) sensor 1 (Bank 2)
E4 ★ F65 B/6 : Electric throttle control actuator (Bank 2)
C5 ★ F66 GY/2 : Fuel injector No.2
D4 ★ F67 GY/2 : Fuel injector No.4
E4 ★ F68 GY/2 : Fuel injector No.6
B5 ★ F69 GY/2 : Intake valve timing control solenoid valve (Bank 1)
E5 ★ F70 B/6 : Mass air flow sensor (Bank 2)

Engine control sub-harness

D1 ★ F251 B/4 : To F48
C5 ★ F252 —/2 : Knock sensor (Bank 1)
D4 ★ F253 —/2 : Knock sensor (Bank 2)

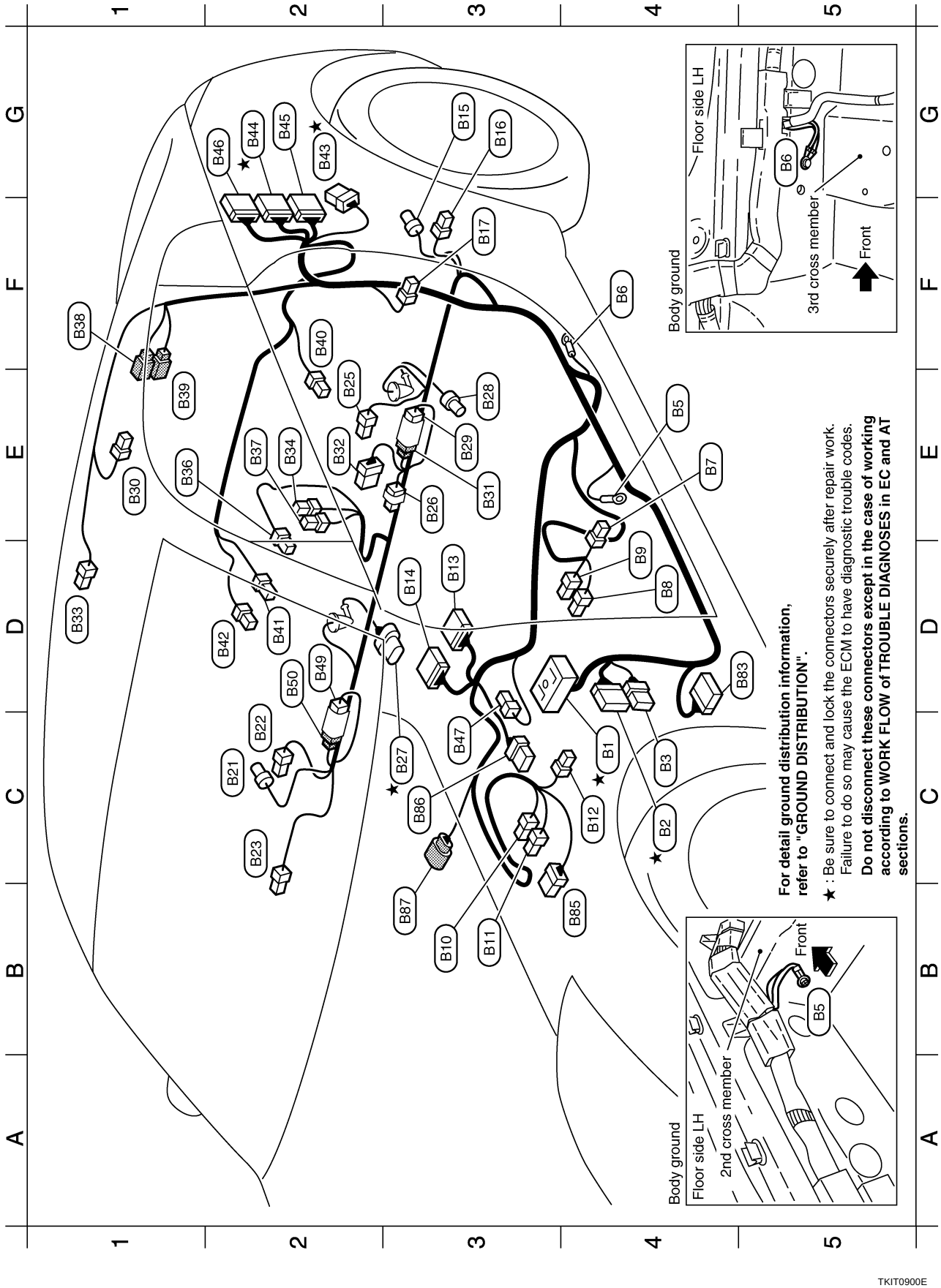
★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

Passenger Compartment



TKIT0895E

BODY HARNESS
Coupe Models



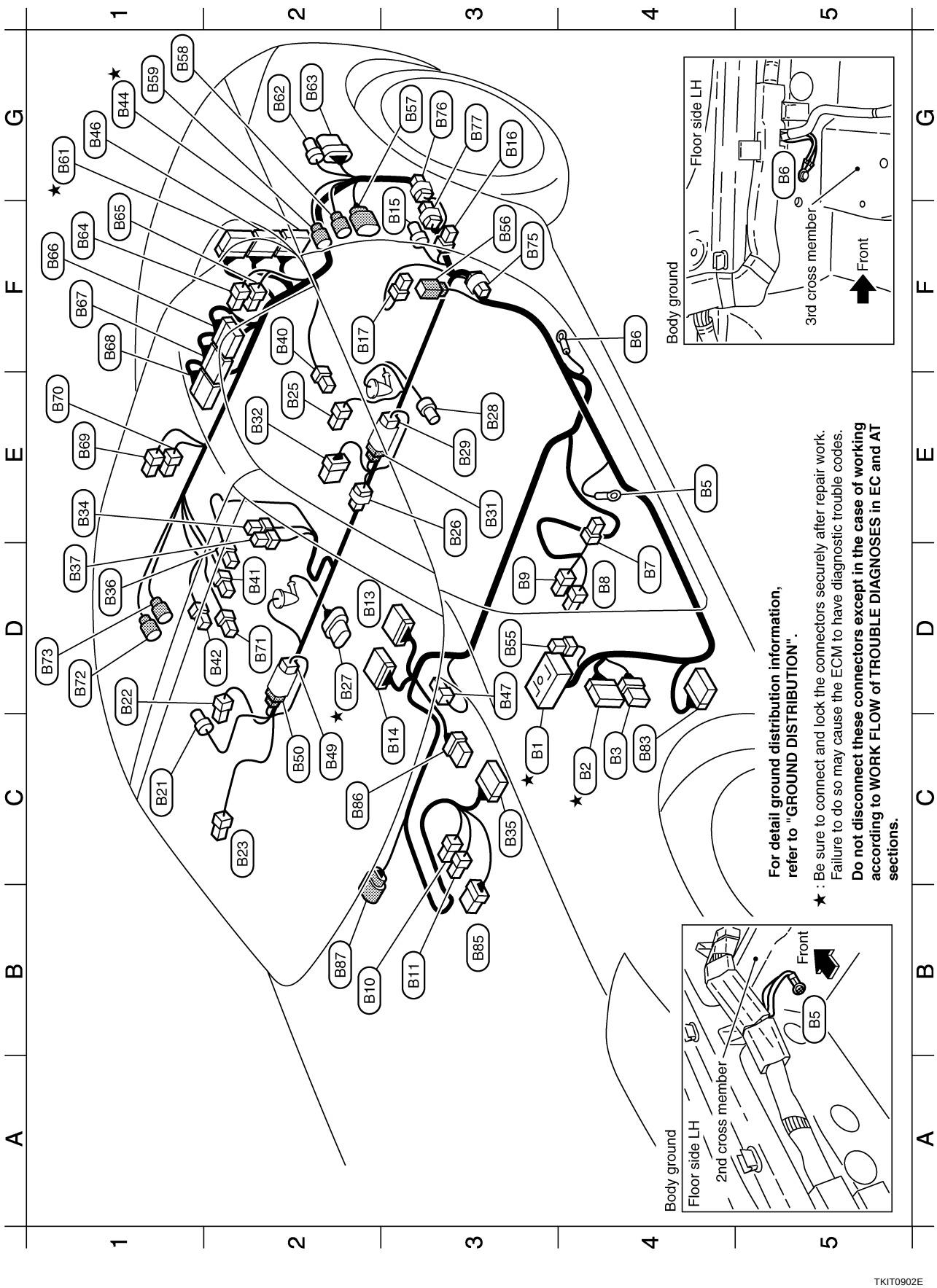
TKIT0900E

C4	★B1	SMJ	:	To M12
C4	★B2	W/18	:	To E106
C4	B3	W/6	:	To E107
E4	B5	—	:	Body ground
F4	B6	—	:	Body ground
E4	B7	W/4	:	Driver side seat (With heated seat or side air bag)
D4	B8	W/3	:	Seat belt buckle switch (Driver side)
D4	B9	Y/2	:	LH side air bag module (With side air bag)
B3	B10	Y/2	:	RH side air bag module (With side air bag)
B3	B11	W/3	:	Seat belt buckle switch (Passenger side)
C4	B12	W/4	:	Passenger side seat (With heated seat or side air bag)
D3	B13	Y/12	:	Air bag diagnosis sensor unit
D3	B14	Y/12	:	Air bag diagnosis sensor unit
G3	B15	Y/2	:	LH side air bag (satellite) sensor (With side air bag)
G3	B16	Y/2	:	Seat belt pre-tensioner LH
F3	B17	W/3	:	Driver side door switch
C2	B21	Y/2	:	RH side air bag (satellite) sensor (With side air bag)
C2	B22	Y/2	:	Seat belt pre-tensioner RH
C2	B23	W/3	:	Passenger side door switch
E2	B25	W/2	:	Woofer (With BOSE system)
E3	B26	W/2	:	Condenser
C3	★B27	GY/5	:	Fuel level sensor unit and fuel pump
E3	B28	GY/2	:	Fuel level sensor unit (Sub)
E3	B29	W/2	:	To B31
E1	B30	Y/2	:	LH side curtain air bag module (With side air bag)
E3	B31	W/2	:	To B29
E2	B32	BR/8	:	Woofer amp. (With BOSE system)
D1	B33	Y/2	:	RH side curtain air bag module (With side air bag)
E2	B34	BR/6	:	Rear window defogger relay
E1	B36	B/2	:	Power socket
E2	B37	L/4	:	Heated seat relay (With heated seat or side air bag)
F1	B38	W/3	:	To D101
E1	B39	GY/2	:	To D102
F2	B40	BR/2	:	Rear speaker LH
D2	B41	W/2	:	Luggage floor box lamp
D2	B42	BR/2	:	Rear speaker RH
G2	★B43	W/6	:	To T1
G2	★B44	W/32	:	To T2
G2	B45	W/10	:	To T3 (With BOSE system)
G2	B46	W/24	:	To T4 (With BOSE system)
C3	B47	B/1	:	Parking brake switch
D2	B49	BR/2	:	To B50
D2	B50	BR/2	:	To B49
D5	B83	W/15	:	BCM (Body control module)
B4	B85	W/8	:	Passenger side seat
C3	B86	W/8	:	To M67
B3	B87	GY/8	:	To B116

★ : Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

TKIT0901E

Roadster Models

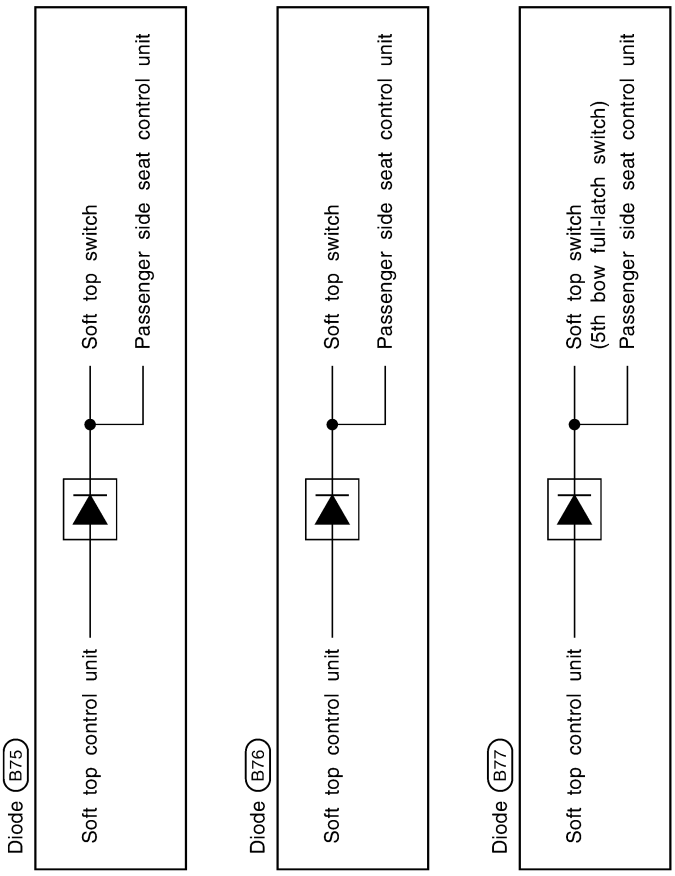


C3	★B1	SMJ	:	To M12
C4	★B2	W/18	:	To E106
C4	B3	W/6	:	To E107
E4	B5	—	:	Body ground
F4	B6	—	:	Body ground
D4	B7	W/4	:	Driver side seat
D4	B8	W/3	:	Seat belt buckle switch (Driver side)
D3	B9	Y/2	:	LH side air bag module (With side air bag)
B2	B10	Y/2	:	RH side air bag module (With side air bag)
B3	B11	W/3	:	Seat belt buckle switch (Passenger side)
D2	B13	Y/12	:	Air bag diagnosis sensor unit
C3	B14	Y/12	:	Air bag diagnosis sensor unit
F3	B15	Y/2	:	LH side air bag (satellite) sensor (With side air bag)
G3	B16	Y/2	:	Seat belt pre-tensioner LH
F2	B17	W/3	:	Driver side door switch
C1	B21	Y/2	:	RH side air bag (satellite) sensor (With side air bag)
D1	B22	Y/2	:	Seat belt pre-tensioner RH
C2	B23	W/3	:	Passenger side door switch
E2	B25	W/2	:	Woofer (With BOSE system)
E3	B26	W/2	:	Condenser
D2	★B27	GY/5	:	Fuel level sensor unit and fuel pump
E3	B28	GY/2	:	Fuel level sensor unit (Sub)
E3	B29	W/2	:	To B31
E3	B31	W/2	:	To B29
E2	B32	BR/8	:	Woofer amp. (With BOSE system)
E1	B34	BR/6	:	Rear window defogger relay
C3	B35	W/18	:	Passenger side seat
D1	B36	B/2	:	Power socket
D1	B37	L/4	:	Heated seat relay (With heated seat or side air bag)
F2	B40	BR/2	:	Rear speaker LH
D2	B41	W/2	:	Luggage floor box lamp
D2	B42	BR/2	:	Rear speaker RH
G1	★B44	W/32	:	To T2
G1	B46	W/24	:	To T4 (With BOSE system)
D3	B47	B/1	:	Parking brake switch
C2	B49	BR/2	:	To B50
C2	B50	BR/2	:	To B49
D3	B55	W/2	:	Circuit breaker
F3	B56	W/2	:	Short connector
G3	B57	GY/8	:	Soft top assembly
G1	B58	B/2	:	Soft top assembly
G1	B59	GY/2	:	Roof actuator LH
G1	★B61	W/16	:	To T23
G2	B62	GY/4	:	To T24 (With BOSE system)
G2	B63	B/6	:	To T25 (With BOSE system)
F1	B64	W/2	:	Storage lid switch LH (Close)
F1	B65	B/2	:	Storage lid unlock actuator LH
F1	B66	W/16	:	Soft top control unit
F1	B67	W/20	:	Soft top control unit
F1	B68	W/12	:	Soft top control unit
E1	B69	W/2	:	Storage lid switch RH (Close)
E1	B70	B/2	:	Storage lid unlock actuator RH
D2	B71	W/2	:	Trunk opener cancel switch
D1	B72	GY/2	:	Roof actuator RH
D1	B73	B/2	:	Rear window defogger (Via sub-harness)
F3	B75	W/2	:	Diode
G3	B76	W/2	:	Diode
G3	B77	W/2	:	Diode
C4	B83	W/15	:	BCM (Body control module)
B3	B85	W/8	:	Passenger side seat
C2	B86	W/8	:	To M67
B2	B87	GY/8	:	To B116

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Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.

TKIT0903E


Diode B75
Soft top control unit
Soft top switch
Passenger side seat control unit
Diode B76
Soft top control unit
Soft top switch
Passenger side seat control unit
Diode B77
Soft top control unit
Soft top switch
(5th bow full-latch switch)
Passenger side seat control unit

TKIT0117E

BODY NO. 2 HARNESS

TAIL HARNESS
Coupe Models

★ (T1) W/6 : To (B43)
★ (T2) W/32 : To (B44)
(T3) W/10 : To (B45) (With BOSE system)
(T4) W/24 : To (B46) (With BOSE system)
(T5) GY/4 : Rear wheel sensor
(T6) GY/8 : BOSE speaker amp. (With BOSE system)
(T7) B/24 : BOSE speaker amp. (With BOSE system)
(T9) GY/3 : Rear combination lamp LH (Body side)
(T10) GY/4 : Rear combination lamp LH (Bumper side)
(T11) W/4 : Back door opener actuator
(T12) W/3 : Back door switch
(T13) GY/2 : Luggage room lamp
(T14) — : Body ground
(T15) GY/4 : To (T101)
(T17) GY/3 : Rear combination lamp RH (Body side)
(T18) GY/4 : Rear combination lamp RH (Bumper side)
(T19) W/4 : Fuel lid opener actuator
★ (T20) B/2 : EVAP canister vent control valve
★ (T21) GY/3 : EVAP control system pressure sensor
(T42) W/16 : Satellite radio tuner (With BOSE system)
(T45) W/32 : TEL adapter unit (with telephone)
(T46) W/24 : To (B111) (With telephone)

Tail sub-harness-1

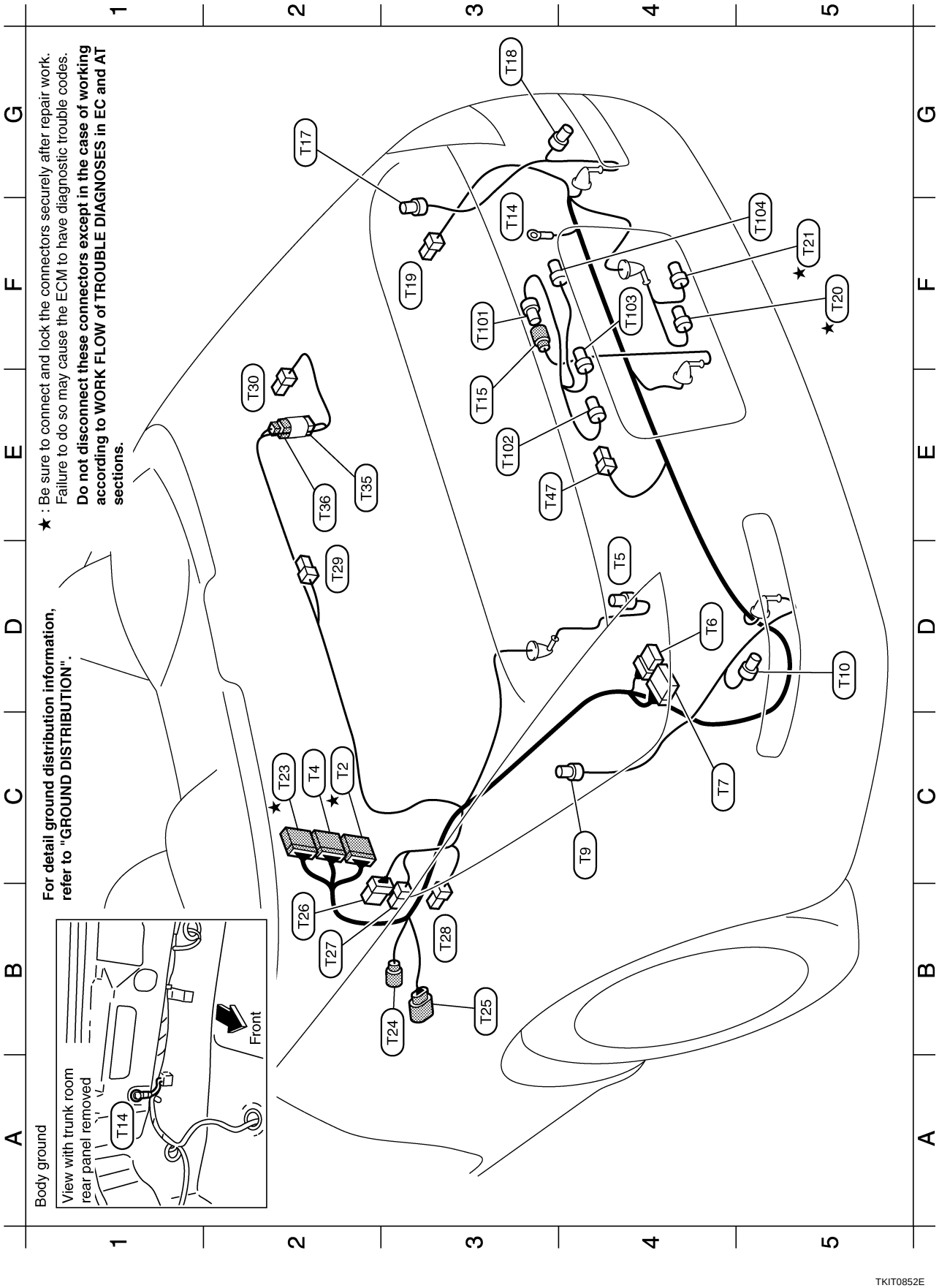
(T101) GY/4 : To (T15)
(T102) BR/2 : License plate lamp LH
(T103) GY/2 : Back door opener switch
(T104) BR/2 : License plate lamp RH

★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

For detail ground distribution information, refer to "GROUND DISTRIBUTION".

TKIT0897E

Roadster Models



TKIT0852E

C2	★T2	W/32	:	To B44
C2	T4	W/24	:	To B46 (With BOSE system)
D4	T5	GY/4	:	Rear wheel sensor
D4	T6	GY/8	:	BOSE speaker amp. (With BOSE system)
C4	T7	B/24	:	BOSE speaker amp. (With BOSE system)
C4	T9	GY/3	:	Rear combination lamp LH (Body side)
D5	T10	GY/4	:	Rear combination lamp LH (Bumper side)
F3	T14	—	:	Body ground
E3	T15	GY/4	:	To T101
G2	T17	GY/3	:	Rear combination lamp RH (Body side)
G3	T18	GY/4	:	Rear combination lamp RH (Bumper side)
F3	T19	W/4	:	Fuel lid opener actuator
F5	★T20	B/2	:	EVAP canister vent control valve
F5	★T21	GY/3	:	EVAP control system pressure sensor
C2	★T23	W/16	:	To B61
B3	T24	GY/4	:	To B62 (With BOSE system)
B3	T25	B/6	:	To B63 (With BOSE system)
B2	T26	W/8	:	To T151
B2	T27	B/2	:	Storage lid switch (Open)
B3	T28	W/2	:	Storage lid actuator LH
D2	T29	W/2	:	Trunk room lamp
E2	T30	W/2	:	Storage lid actuator RH
E2	T35	W/2	:	To T36
E2	T36	W/2	:	To T35
E3	T47	W/3	:	Trunk lid lock assembly

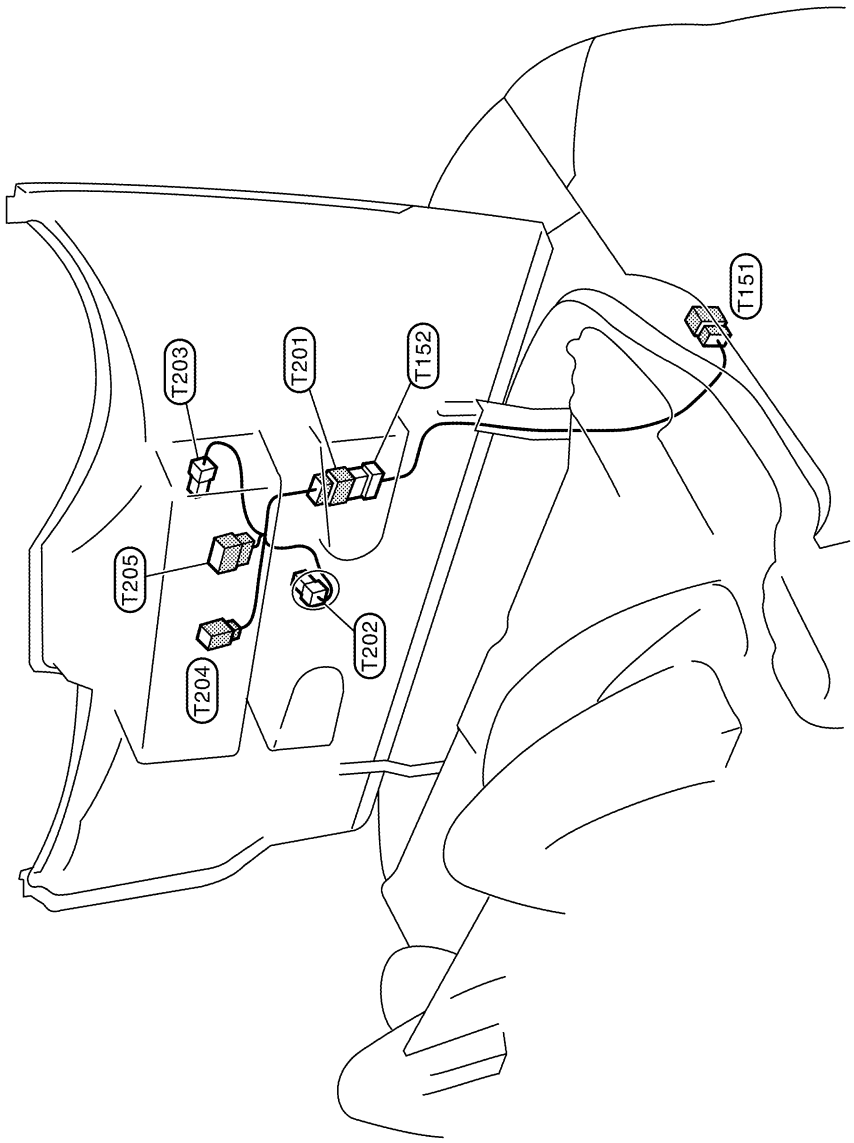
Tail sub-harness-1

F3	T101	GY/4	:	To T15
E3	T102	BR/2	:	License plate lamp LH
F4	T103	GY/2	:	Trunk lid opener switch
F5	T104	BR/2	:	License plate lamp RH

★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

TKIT0853E

TAIL NO. 2 HARNESS
Roadster Models



Tail No.2 harness

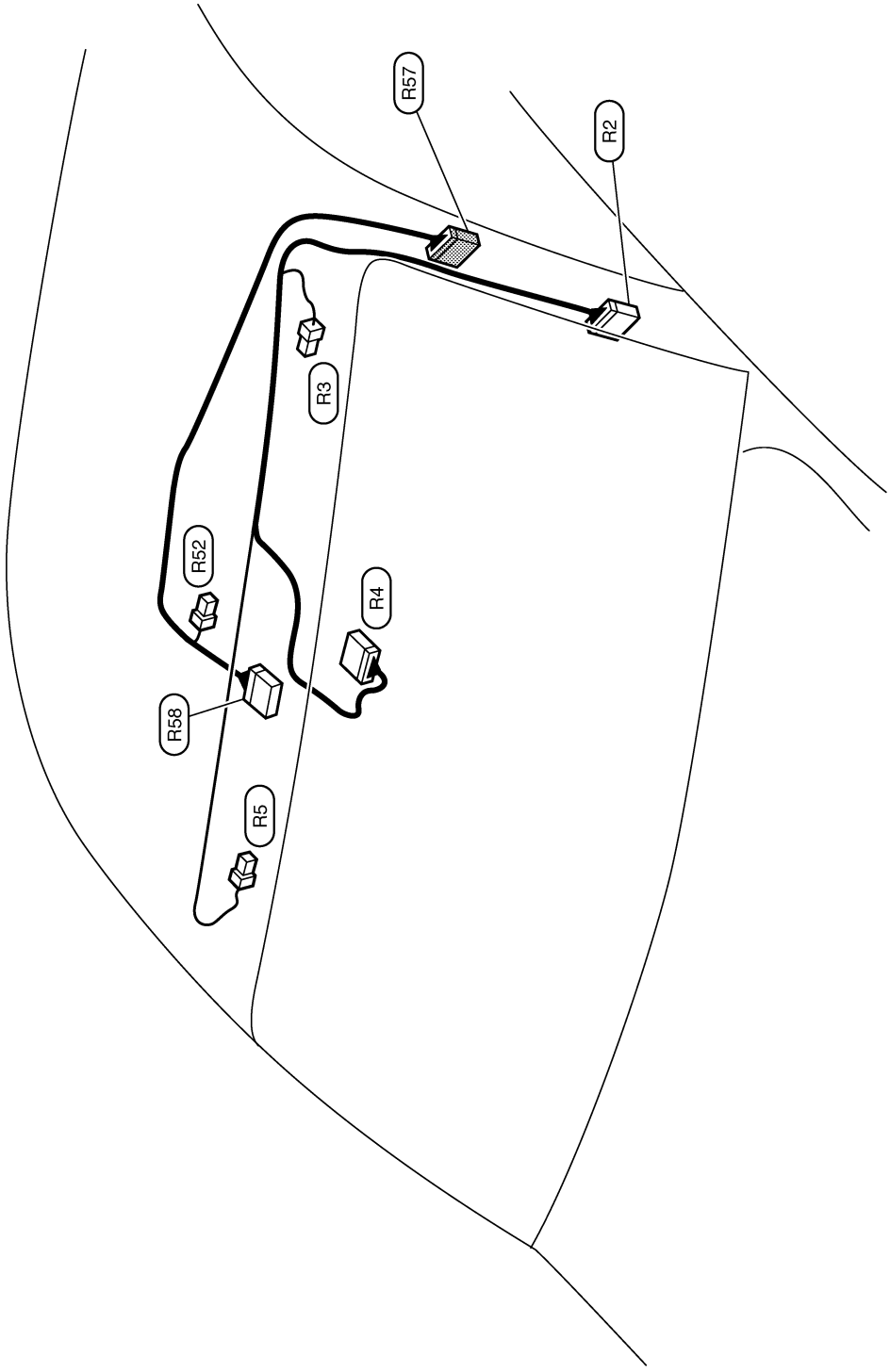
- T201 W/8 : To T152
- T202 BR/2 : High-mounted stop lamp
- T203 W/4 : 5th bow unlock actuator
- T204 B/2 : 5th bow closure motor
- T205 W/6 : Soft top lock switch

Tail sub-harness-2

- T151 W/8 : To T26
- T152 W/8 : To T201

TKIT0113E

ROOM LAMP HARNESS
Coupe Models



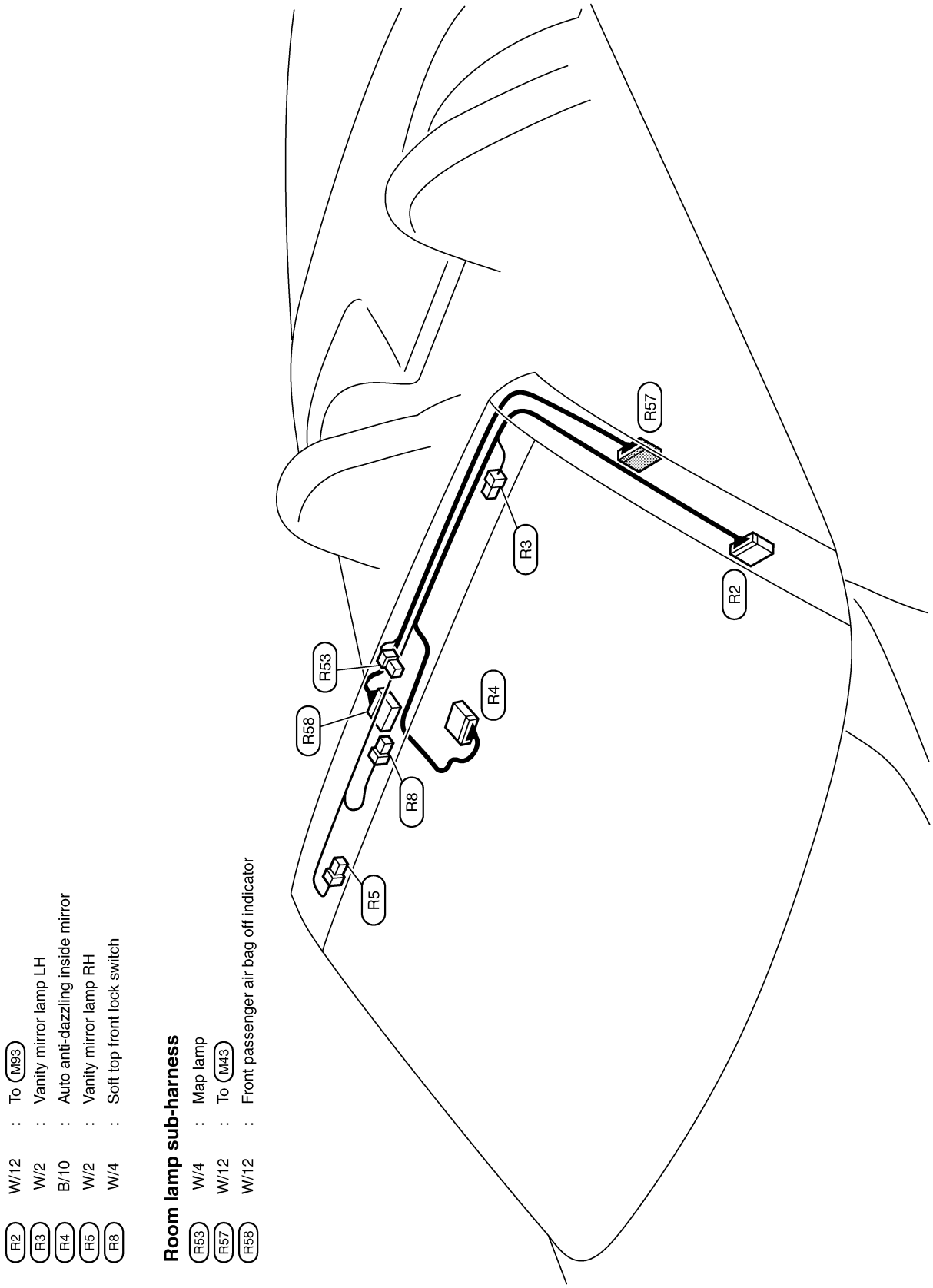
Room lamp sub-harness

R52	W/3	:	Map lamp
R57	W/12	:	To (M43)
R58	W/12	:	Front passenger air bag off indicator • Telephone microphone

R2	W/12	:	To (M93)
R3	W/2	:	Vanity mirror lamp LH
R4	B/10	:	Auto anti-dazzling inside mirror
R5	W/2	:	Vanity mirror lamp RH

TKIT0898E

Roadster Models

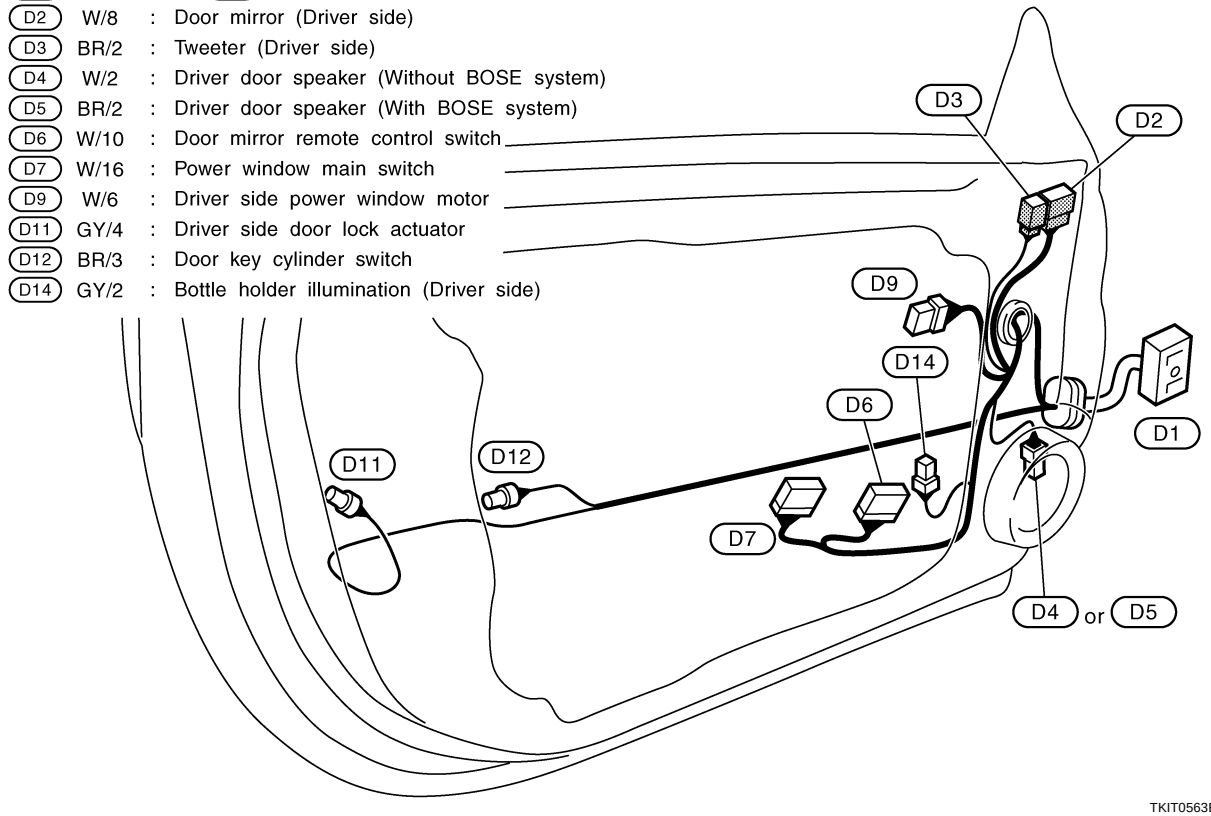


TKIT0855E

DOOR HARNESS

Driver Side Door

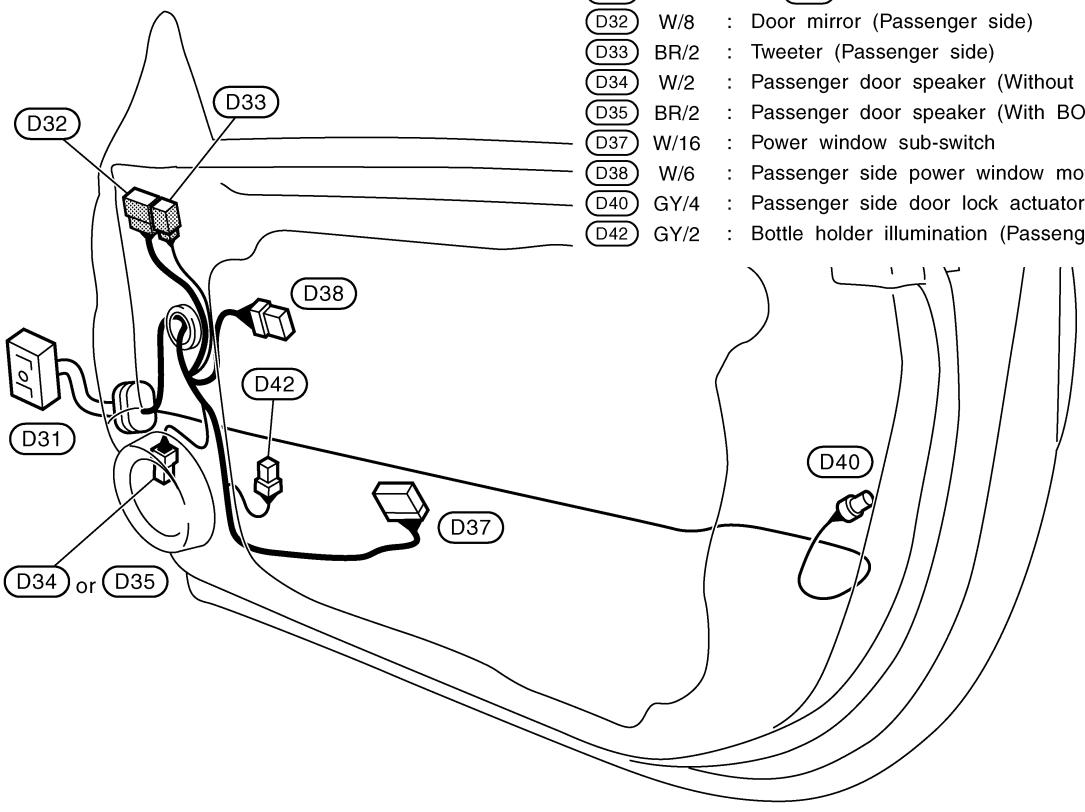
D1	SMJ	:	To M11
D2	W/8	:	Door mirror (Driver side)
D3	BR/2	:	Tweeter (Driver side)
D4	W/2	:	Driver door speaker (Without BOSE system)
D5	BR/2	:	Driver door speaker (With BOSE system)
D6	W/10	:	Door mirror remote control switch
D7	W/16	:	Power window main switch
D9	W/6	:	Driver side power window motor
D11	GY/4	:	Driver side door lock actuator
D12	BR/3	:	Door key cylinder switch
D14	GY/2	:	Bottle holder illumination (Driver side)



TKIT0563E

Passenger Side Door

D31	SMJ	:	To M74
D32	W/8	:	Door mirror (Passenger side)
D33	BR/2	:	Tweeter (Passenger side)
D34	W/2	:	Passenger door speaker (Without BOSE system)
D35	BR/2	:	Passenger door speaker (With BOSE system)
D37	W/16	:	Power window sub-switch
D38	W/6	:	Passenger side power window motor
D40	GY/4	:	Passenger side door lock actuator
D42	GY/2	:	Bottle holder illumination (Passenger side)



TKIT0564E

Back Door

Defogger harness (-)
D211 B/1 : Rear window defogger (-)
D212 — : Body ground
D101 W/3 : To B38
D102 GY/2 : To B39
D103 BR/2 : High-mounted stop lamp
D104 B/1 : Rear window defogger
D105 — : Body ground
D106 W/4 : Rear wiper motor
D212
D106
D211
D105
D104
D103
D101
D102
Body ground
View with back door finisher removed
D105
Body ground
View with back door finisher removed
D212
Rear wiper motor
For detail ground distribution information, refer to "GROUND DISTRIBUTION".
TKIT0068E

Wiring Diagram Codes (Cell Codes)

NKS000EH

Use the chart below to find out what each wiring diagram code stands for.
Refer to the wiring diagram code in the alphabetical index to find the location (page number) of each wiring diagram.

Code	Section	Wiring Diagram Name
3METER	DI	Triple Meter
ABS	BRC	Anti-Lock Braking System
A/C	ATC	Air Conditioner
AF1B1	EC	Air Fuel Ratio Sensor 1 (Bank 1)
AF1B2	EC	Air Fuel Ratio Sensor 1 (Bank 2)
AF1HB1	EC	Air Fuel Ratio Sensor 1 Heater (Bank 1)
AF1HB2	EC	Air Fuel Ratio Sensor 1 Heater (Bank 2)
APPS1	EC	Accelerator Pedal Position Sensor
APPS2	EC	Accelerator Pedal Position Sensor
APPS3	EC	Accelerator Pedal Position Sensor
ASC/BS	EC	Automatic Speed Control Device (ASCD) Brake Switch
ASC/SW	EC	Automatic Speed Control Device (ASCD) Steering Switch
ASCBOF	EC	Automatic Speed Control Device (ASCD) Brake Switch
ASCIND	EC	Automatic Speed Control Device (ASCD) Indicator
AT/IND	DI	A/T Indicator Lamp
AUDIO	AV	Audio
BACK/L	LT	Back-Up Lamp
BRK/SW	EC	Brake Switch
CAN	AT	CAN Communication Line
CAN	EC	CAN Communication Line
CAN	LAN	CAN System
CHARGE	SC	Charging System
CHIME	DI	Warning Chime
COMBSW	LT	Combination Switch
COMM	AV	Audio Visual Communication Line
COOL/F	EC	Cooling Fan Control
DEF	GW	Rear Window Defogger
D/LOCK	BL	Power Door Lock
DTRL	LT	Headlamp - With Daytime Light System
ECM/PW	EC	ECM Power Supply for Back-Up
ECTS	EC	Engine Coolant Temperature Sensor
EOTS	EC	Engine Oil Temperature Sensor
EPS	STC	Electric Controlled Power Steering System
ETC1B1	EC	Electric Throttle Control Function (Bank 1)
ETC1B2	EC	Electric Throttle Control Function (Bank 2)
ETC2B1	EC	Electric Throttle Control Motor Relay (Bank 1)
ETC2B2	EC	Electric Throttle Control Motor Relay (Bank 2)
ETC3B1	EC	Electric Throttle Control Motor (Bank 1)
ETC3B2	EC	Electric Throttle Control Motor (Bank 2)
EVCB1	EC	Exhaust Valve Timing Control Magnet Retarder (Bank 1)
EVCB2	EC	Exhaust Valve Timing Control Magnet Retarder (Bank 2)

Code	Section	Wiring Diagram Name
EVCSB1	EC	Exhaust Valve Timing Control Position Sensor (Bank 1)
EVCSB2	EC	Exhaust Valve Timing Control Position Sensor (Bank 2)
F/LID	BL	Fuel Lid Opener
F/PUMP	EC	Fuel Pump
F/ROOF	RF	Soft Top
FTS	AT	A/T Fluid Temperature Sensor Circuit
FTTS	EC	Fuel Tank Temperature Sensor
FUELB1	EC	Fuel Injection System Function (Bank 1)
FUELB2	EC	Fuel Injection System Function (Bank 2)
H/LAMP	LT	Headlamp
H/PHON	AV	Handsfree Telephone System
HORN	WW	Horn
HSEAT	SE	Heated Seat
IATSB1	EC	Intake Air Temperature Sensor (Bank 1)
IGNSYS	EC	Ignition System
ILL	LT	Illumination
I/MIRR	GW	Inside Mirror (Auto Anti-Dazzling Mirror)
INJECT	EC	Injector
IVCB1	EC	Intake Valve Timing Control Solenoid Valve (Bank 1)
IVCB2	EC	Intake Valve Timing Control Solenoid Valve (Bank 2)
KEYLES	BL	Remote Keyless Entry System
KSB1	EC	Knock Sensor (Bank 1)
KSB2	EC	Knock Sensor (Bank 2)
MAFSB1	EC	Mass Air Flow Sensor (Bank 1)
MAFSB2	EC	Mass Air Flow Sensor (Bank 2)
MAIN	AT	Main Power Supply and Ground Circuit
MAIN	EC	Main Power Supply and Ground Circuit
M/ANT	AV	Manual Antenna
METER	DI	Speedometer, Tachometer, Temp. and Fuel Gauges
MIL/DL	EC	MIL & Data Link Connector
MIRROR	GW	Power Door Mirror
MMSW	AT	Manual Mode Switch
NATS	BL	Nissan Anti-Theft System
NAVI	AV	Navigation System
NONDTC	AT	Non-Detective Items
O2H2B1	EC	Heated Oxygen Sensor 2 Heater (Bank 1)
O2H2B2	EC	Heated Oxygen Sensor 2 Heater (Bank 2)
O2S2B1	EC	Heated Oxygen Sensor 2 (Bank 1)
O2S2B2	EC	Heated Oxygen Sensor 2 (Bank 2)
PGC/V	EC	EVAP Canister Purge Volume Control Solenoid Valve
PHSB1	EC	Camshaft Position Sensor (PHASE) (Bank 1)
PHSB2	EC	Camshaft Position Sensor (PHASE) (Bank 2)
PNP/SW	AT	Park/Neutral Position Switch
PNP/SW	EC	Park/Neutral Position Switch

Code	Section	Wiring Diagram Name
POS	EC	Crankshaft Position Sensor (CKPS) (POS)
POWER	PG	Power Supply Routing
PRE/SE	EC	EVAP Control System Pressure Sensor
P/SCKT	WW	Power Socket
PS/SEN	EC	Power Steering Pressure Sensor
ROOM/L	LT	Interior Room Lamp
RP/SEN	EC	Refrigerant Pressure Sensor
SEAT	SE	Power Seat
SEN/PW	EC	Sensor Power Supply
SHIFT	AT	A/T Shift Lock System
SRS	SRS	Supplemental Restraint System
START	SC	Starting System
STOP/L	LT	Stop Lamp
STSIG	AT	Start Signal Circuit
TAIL/L	LT	Parking, License and Tail Lamps
TCS	BRC	Traction Control System
TLID	BL	Trunk Lid Opener
TPS1B1	EC	Throttle Position Sensor (Sensor 1) (Bank 1)
TPS1B2	EC	Throttle Position Sensor (Sensor 1) (Bank 2)
TPS2B1	EC	Throttle Position Sensor (Sensor 2) (Bank 1)
TPS2B2	EC	Throttle Position Sensor (Sensor 2) (Bank 2)
TPS3B1	EC	Throttle Position Sensor (Bank 1)
TPS3B2	EC	Throttle Position Sensor (Bank 2)
TRNSCV	BL	Homelink Universal Transceiver
TURN	LT	Turn Signal and Hazard Warning Lamp
T/WARN	WT	Low Tire Pressure Warning System
VDC	BRC	Vehicle Dynamics Control System
VEHSEC	BL	Vehicle Security System
VENT/V	EC	EVAP Canister Vent Control Valve
VSSA/T	AT	Vehicle Speed Sensor A/T (Revolution Sensor)
WARN	DI	Warning Lamps
WINDOW	GW	Power Window
WIPER	WW	Front Wiper and Washer
WIP/R	WW	Rear Wiper and Washer

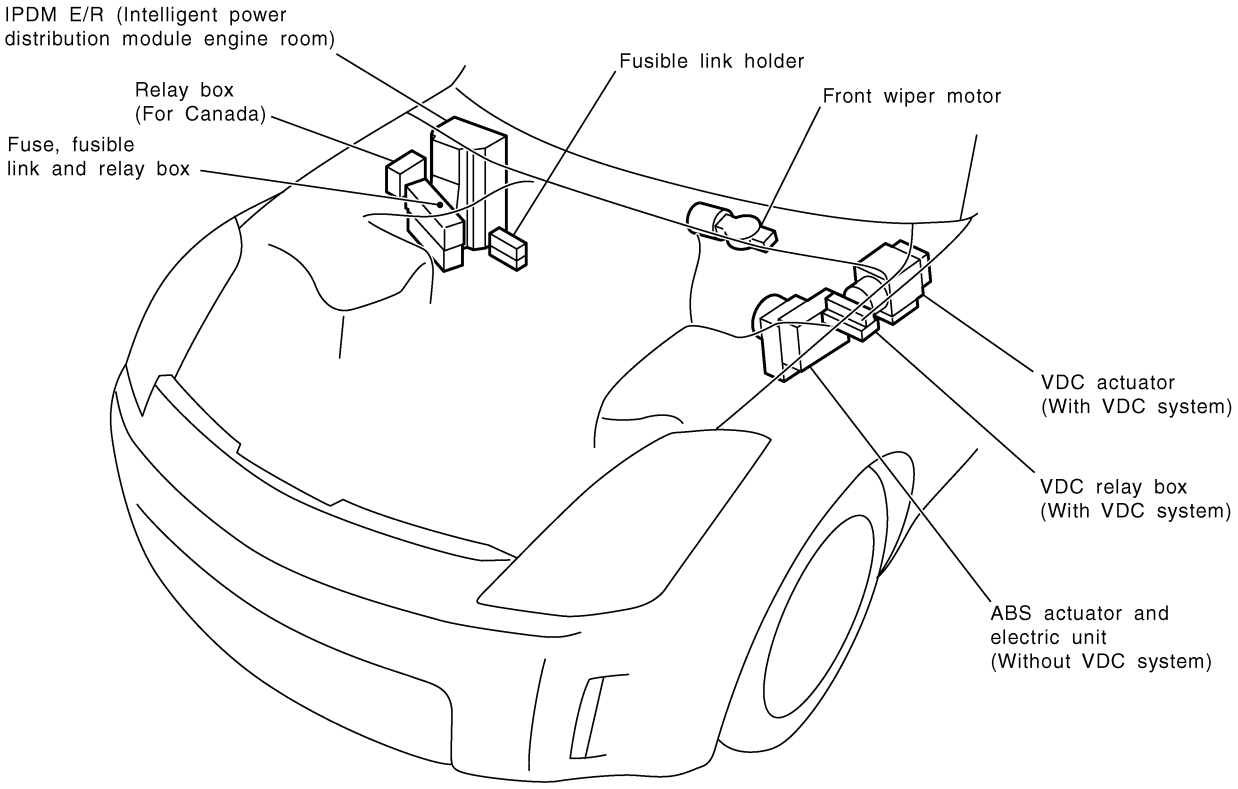
ELECTRICAL UNITS LOCATION

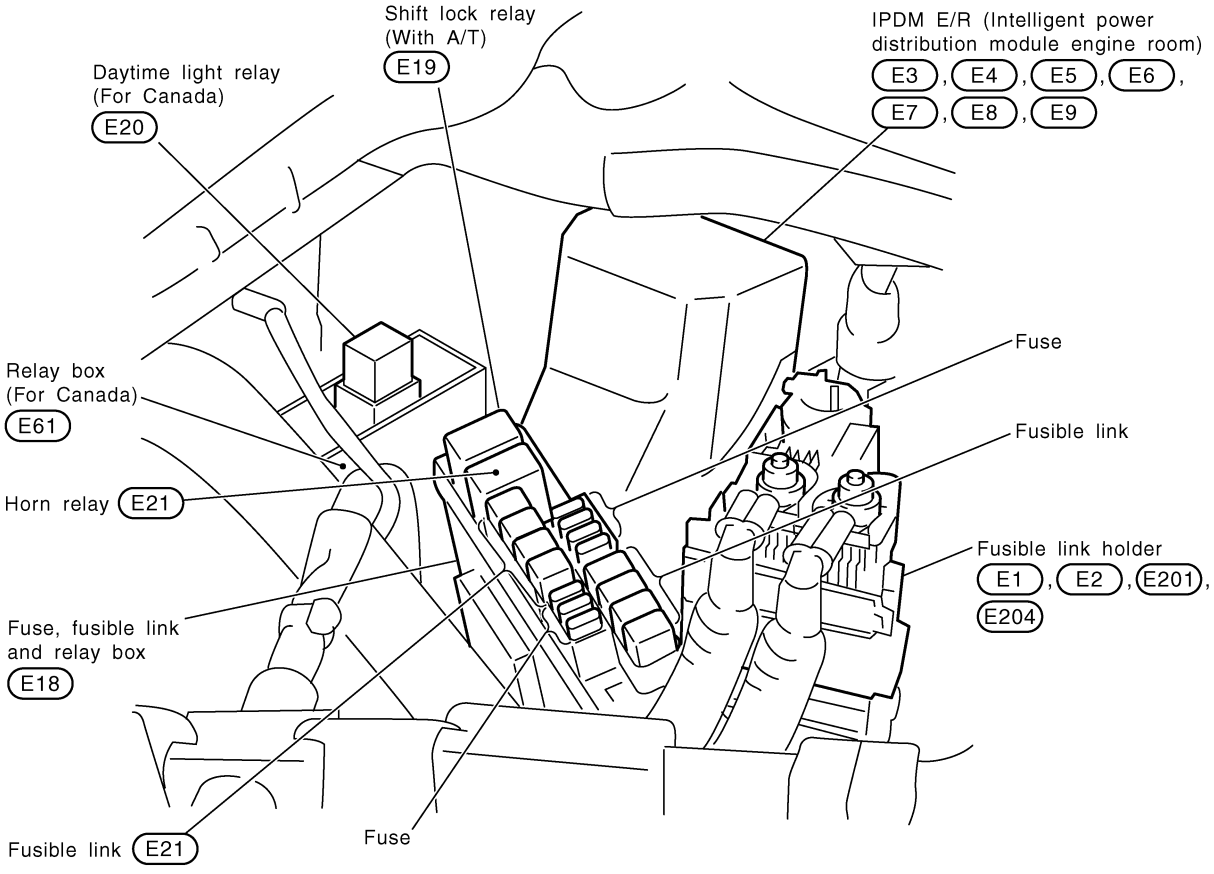
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Electrical Units Location

NKS000EI

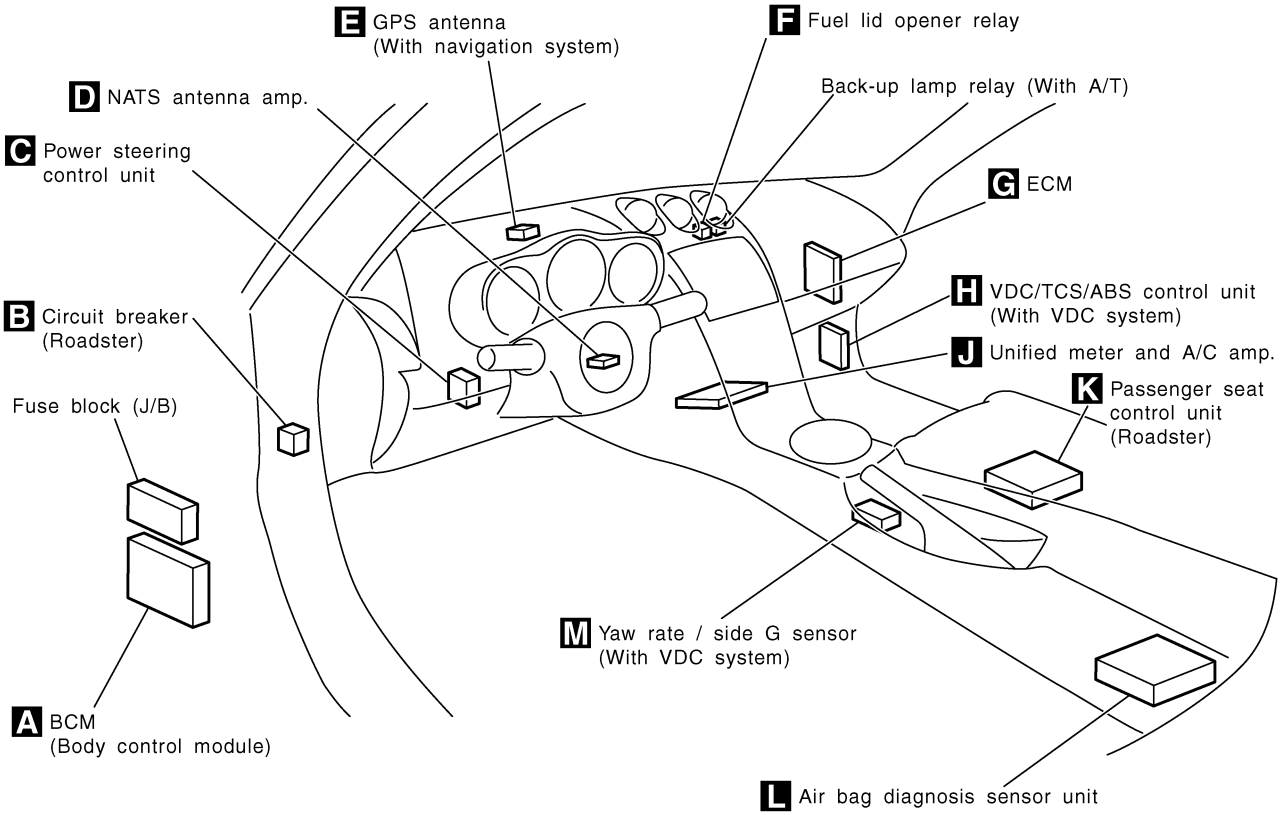
ENGINE COMPARTMENT



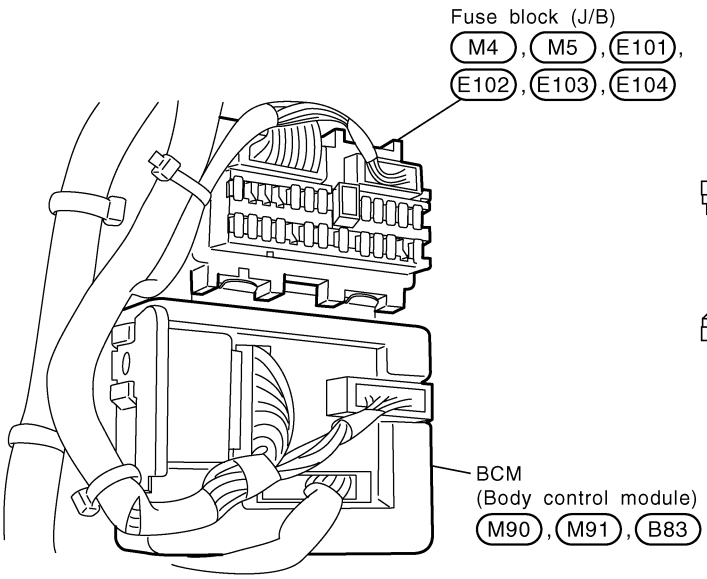


CKIT0874E

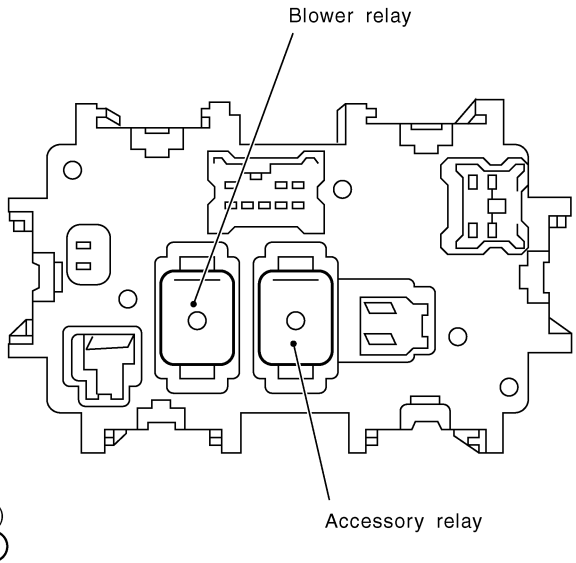
PASSENGER COMPARTMENT



A Behind dash side lower LH finisher

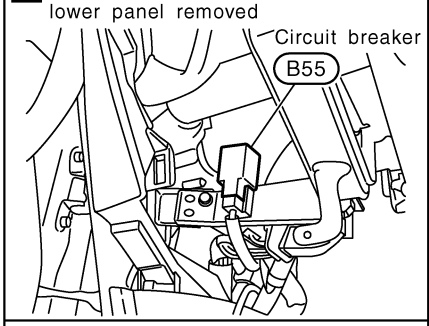


Fuse block (J/B) rear view

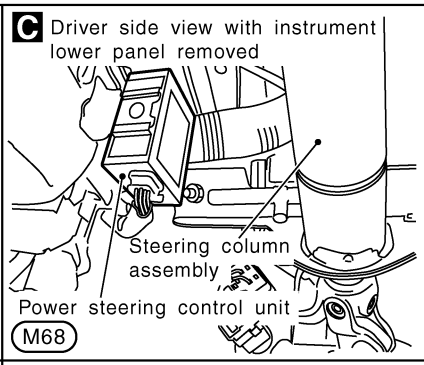


CKIT0860E

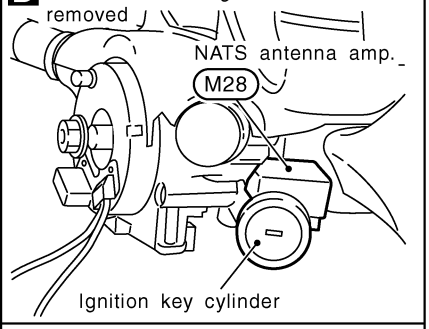
B Driver side view with instrument lower panel removed



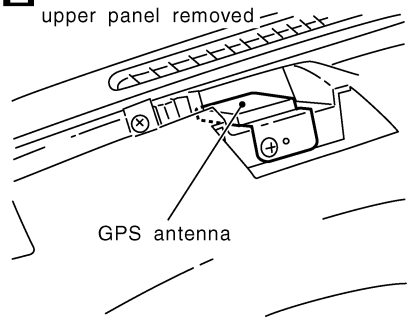
C Driver side view with instrument lower panel removed



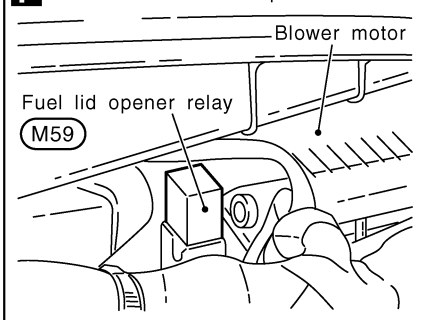
D View with steering column cover removed



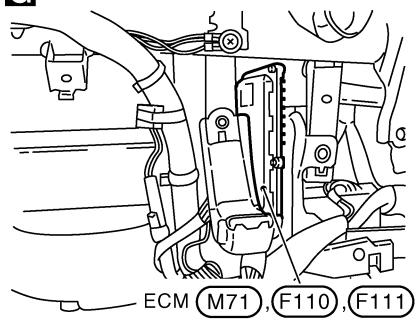
E Driver side view with instrument upper panel removed



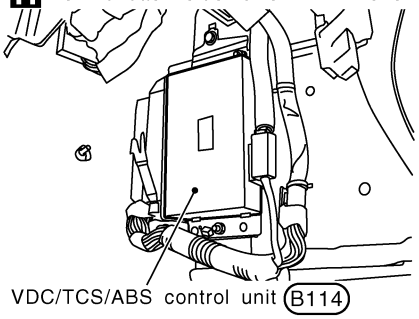
F View with instrument panel removed



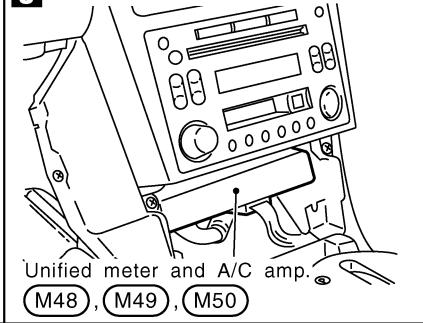
G Blower motor RH side



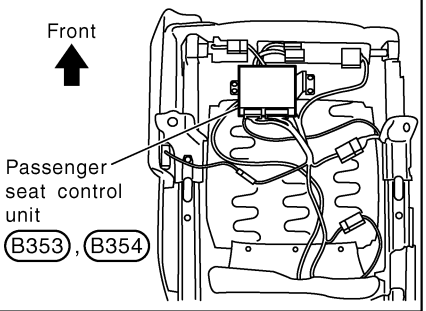
H Behind dash side lower RH finisher



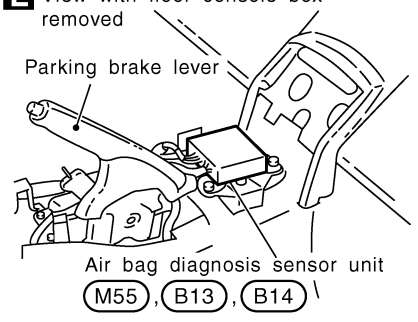
J View with console finisher removed



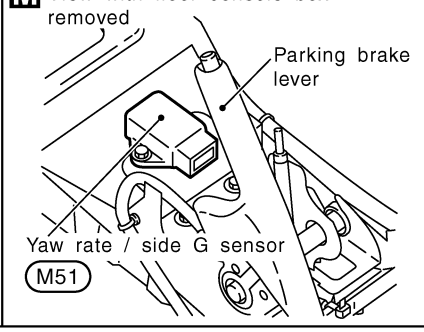
K Under passenger seat



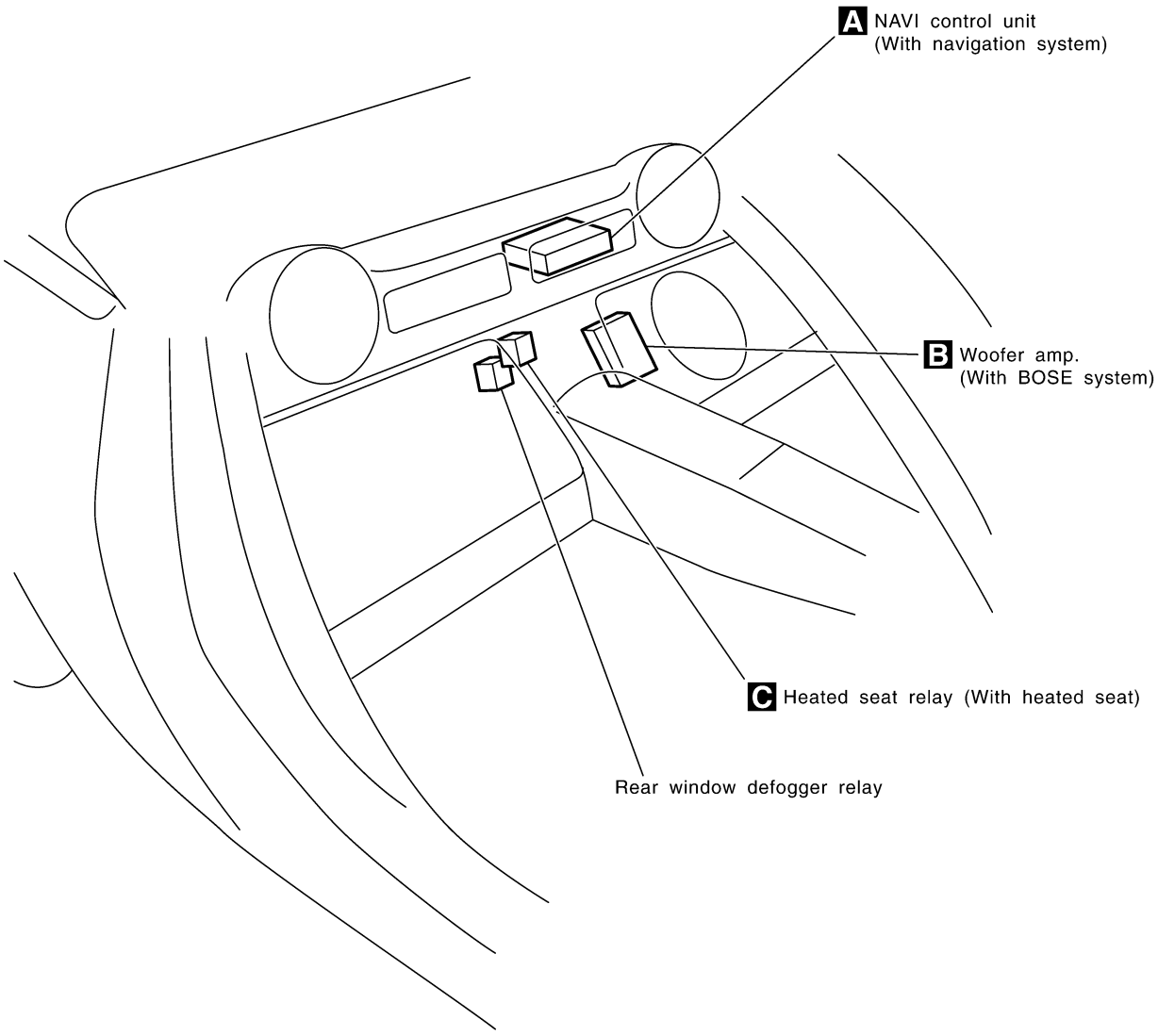
L View with floor console box removed

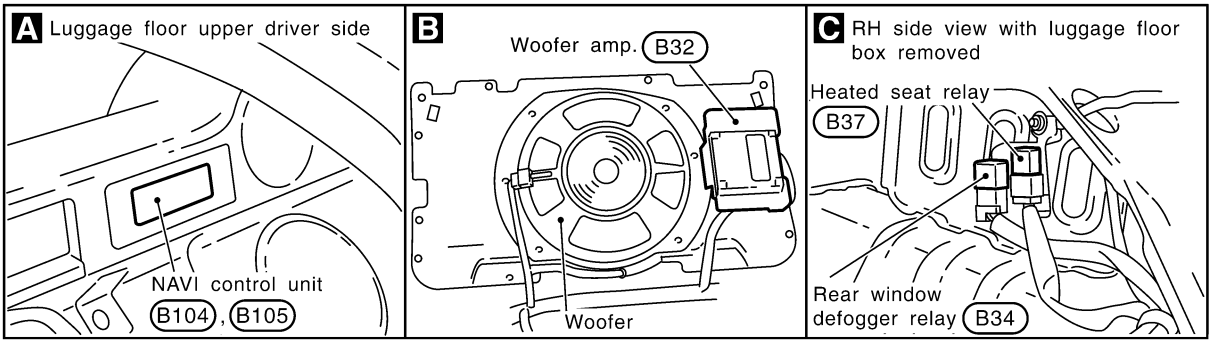


M View with floor console box removed



CKIT0875E

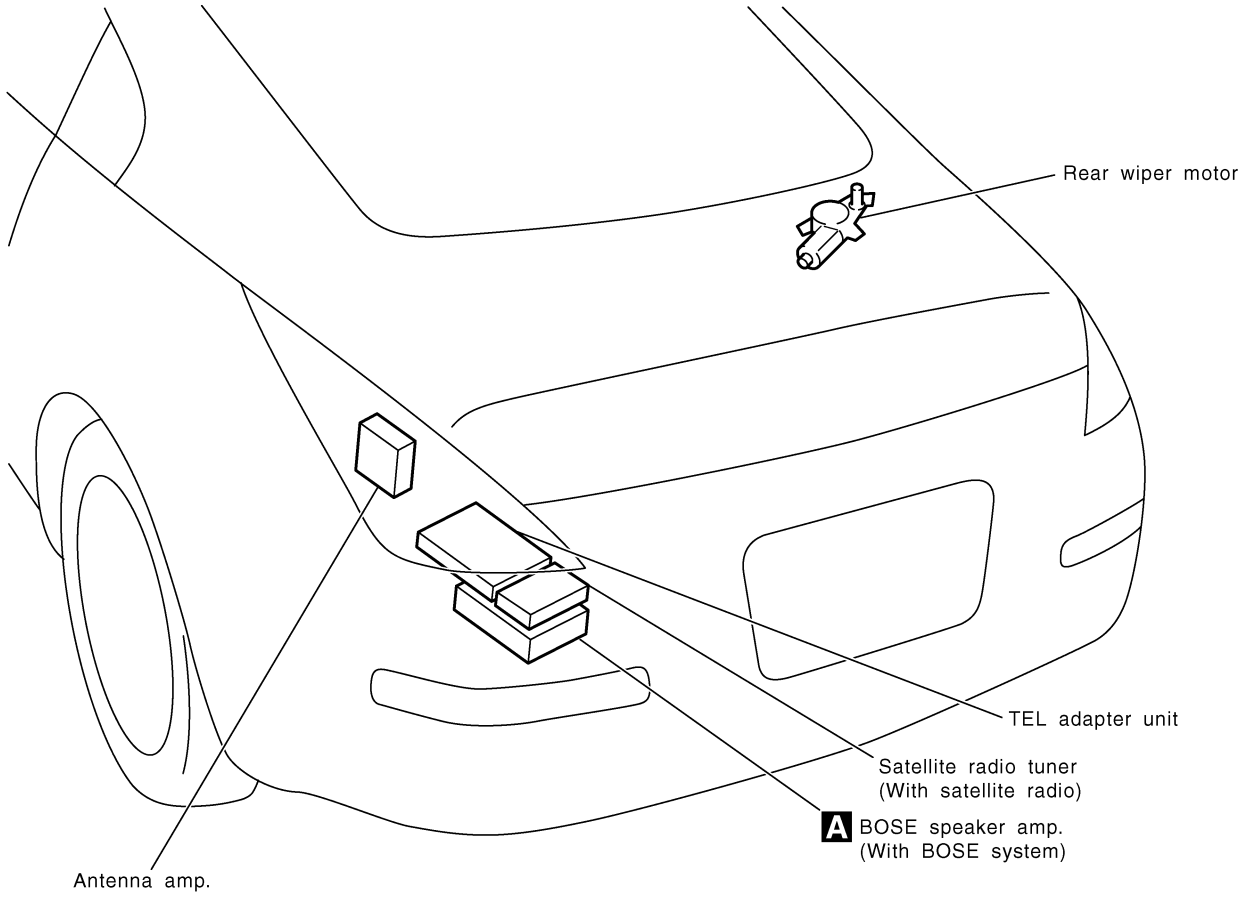

A NAVI control unit
(With navigation system)
B Woofer amp.
(With BOSE system)
C Heated seat relay (With heated seat)
Rear window defogger relay

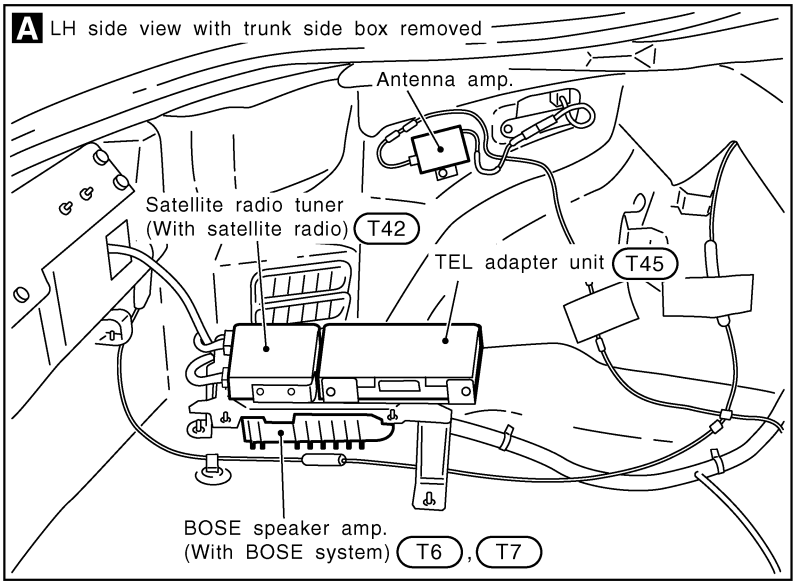

A Luggage floor upper driver side
NAVI control unit
B104, B105
B
Woofer amp. B32
Woofer
C RH side view with luggage floor box removed
Heated seat relay
B37
Rear window defogger relay B34

CKIT0349E

LUGGAGE COMPARTMENT

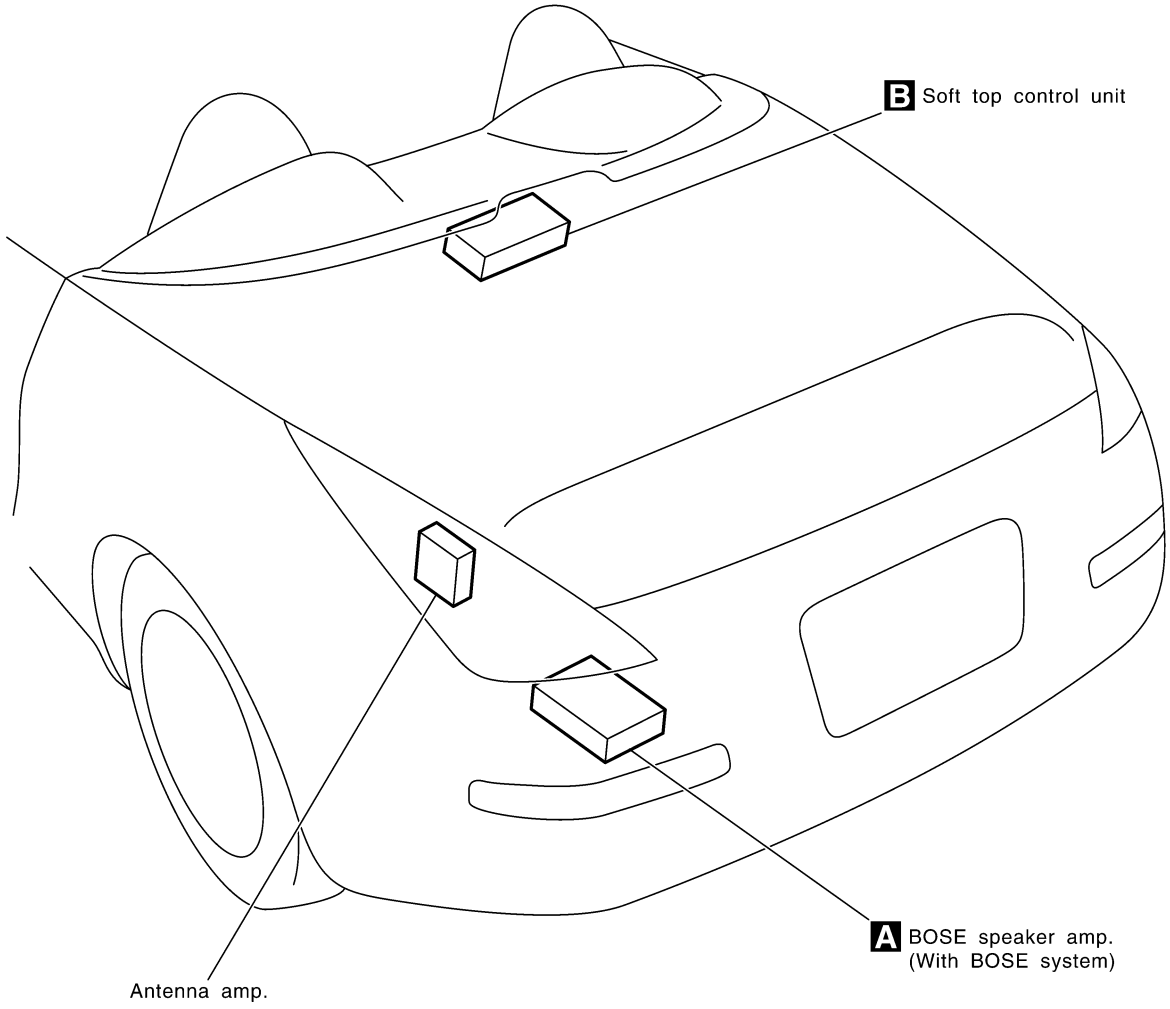
Coupe Models

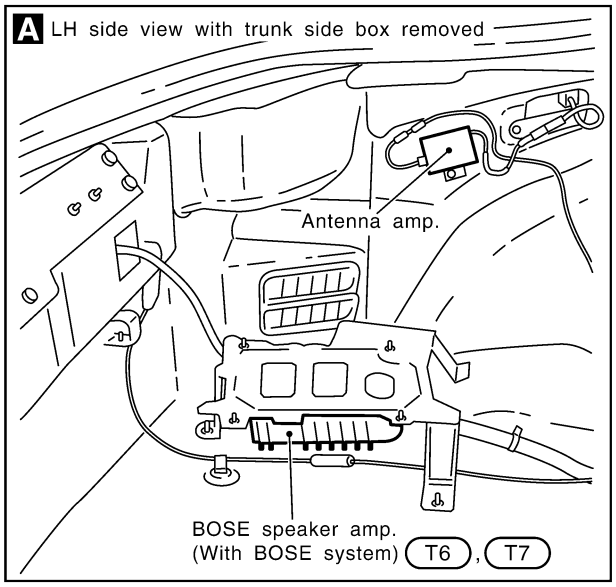


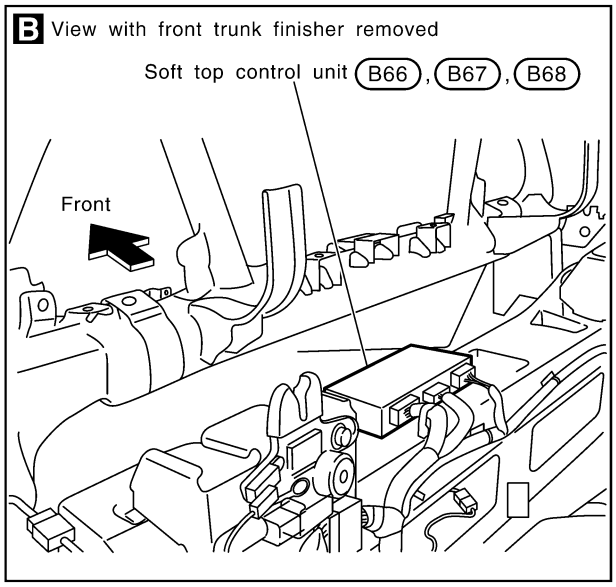


CKIT0878E

Roadster Models







CKIT0350E

HARNESS CONNECTOR

PFP:00011

Description

NKS004SA

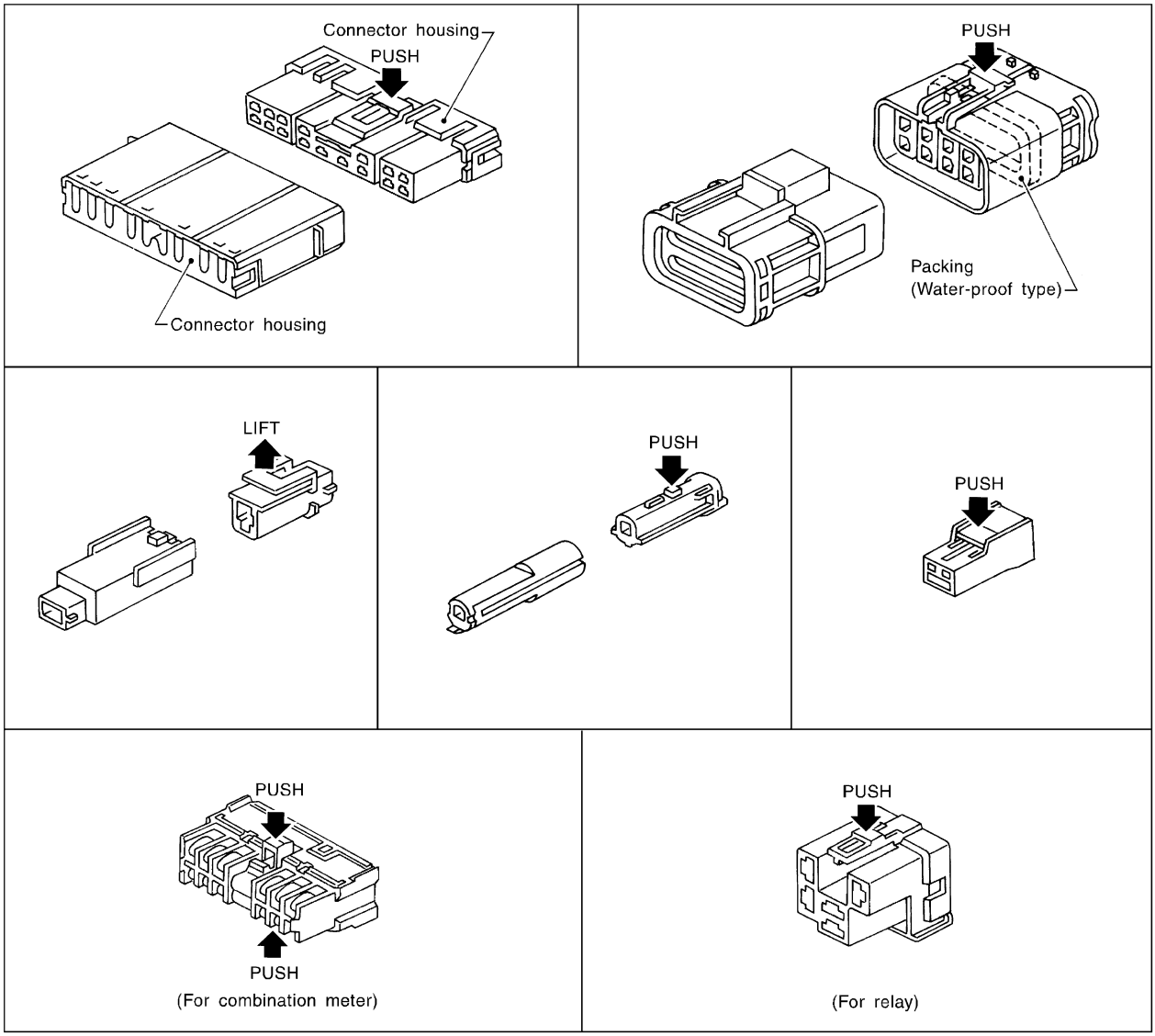
HARNESS CONNECTOR (TAB-LOCKING TYPE)

- The tab-locking type connectors help prevent accidental looseness or disconnection.
- The tab-locking type connectors are disconnected by pushing or lifting the locking tab(s). Refer to the figure below.

CAUTION:

Never pull the harness or wires when disconnecting the connector.

[Example]



SEL769DA

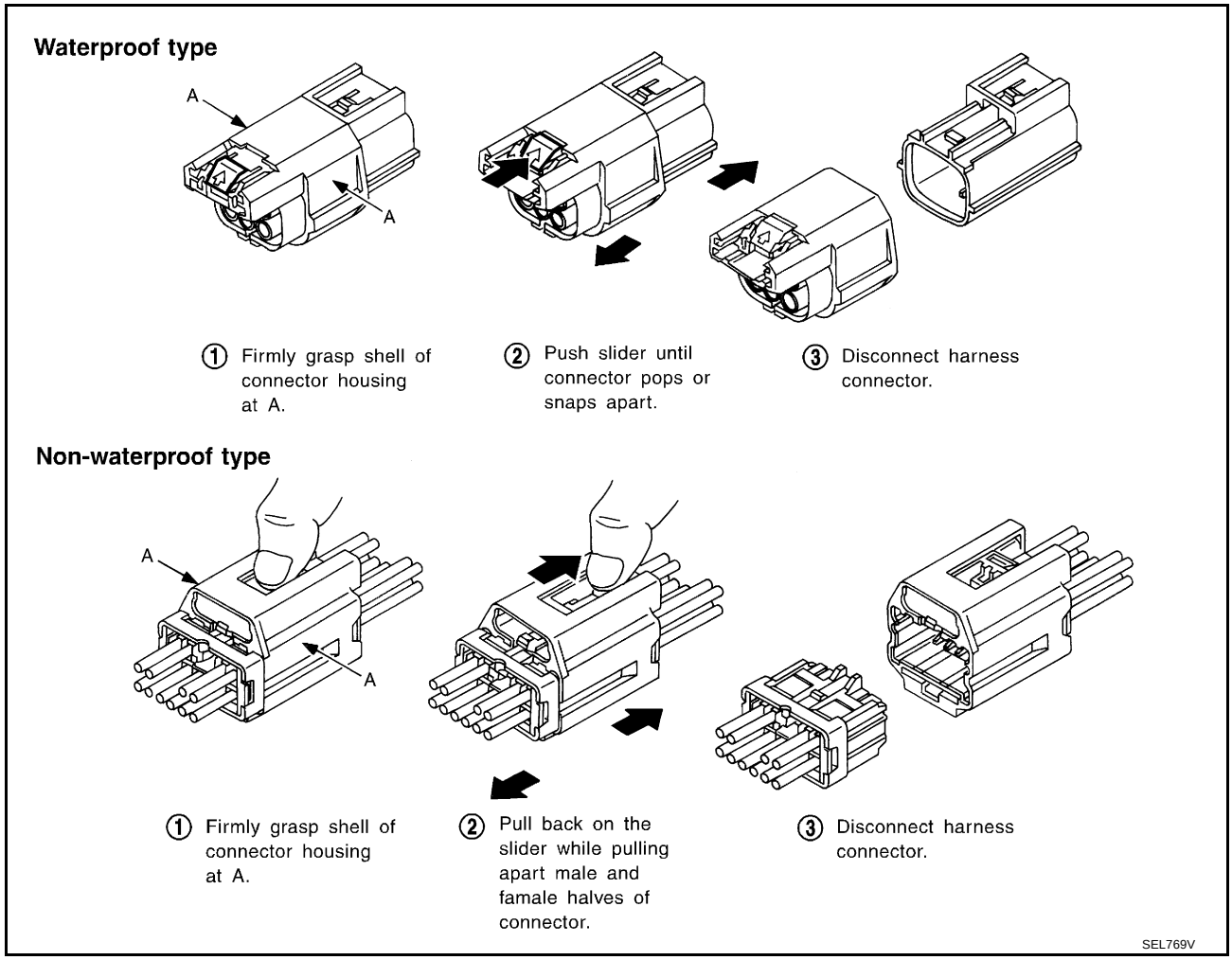
HARNESS CONNECTOR (SLIDE-LOCKING TYPE)

- A new style slide-locking type connector is used on certain systems and components, especially those related to OBD.
- The slide-locking type connectors help prevent incomplete locking and accidental looseness or disconnection.
- The slide-locking type connectors are disconnected by pushing or pulling the slider. Refer to the figure below.

CAUTION:

- **Never pull the harness or wires when disconnecting the connector.**
- **Be careful not to damage the connector support bracket when disconnecting the connector.**

[Example]

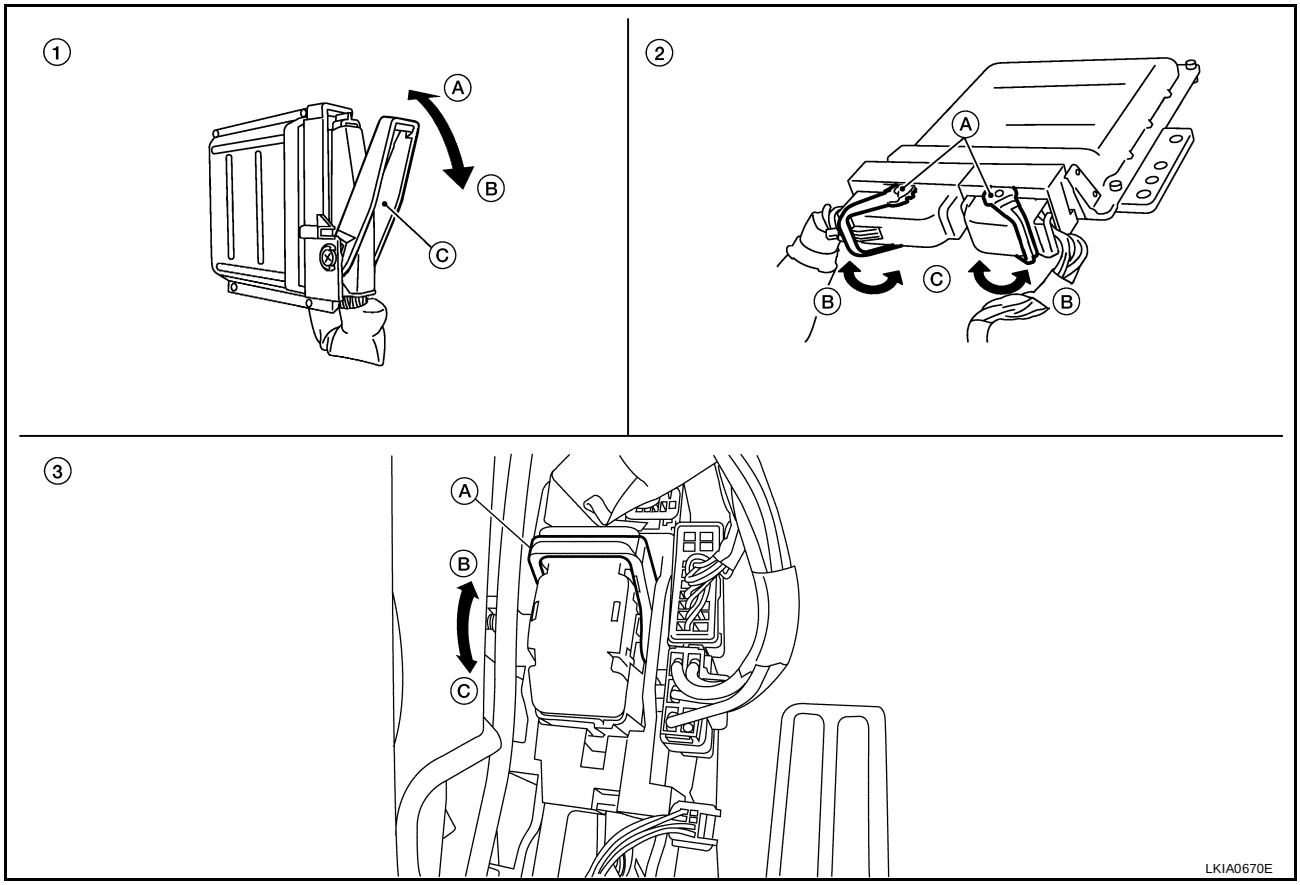


HARNESS CONNECTOR (LEVER LOCKING TYPE)

- Lever locking type harness connectors are used on certain control units and control modules such as ECM, ABS actuator and electric unit (control unit), etc.
- Lever locking type harness connectors are also used on super multiple junction (SMJ) connectors.
- Always confirm the lever is fully locked in place by moving the lever as far as it will go to ensure full connection.

CAUTION:

Always confirm the lever is fully released (loosened) before attempting to disconnect or connect these connectors to avoid damage to the connector housing or terminals.



1. Control unit with single lever
   A. Fasten
   B. Loosen
   C. Lever
2. Control unit with dual levers
   A. Levers
   B. Fasten
   C. Loosen
3. SMJ connector
   A. Lever
   B. Fasten
   C. Loosen

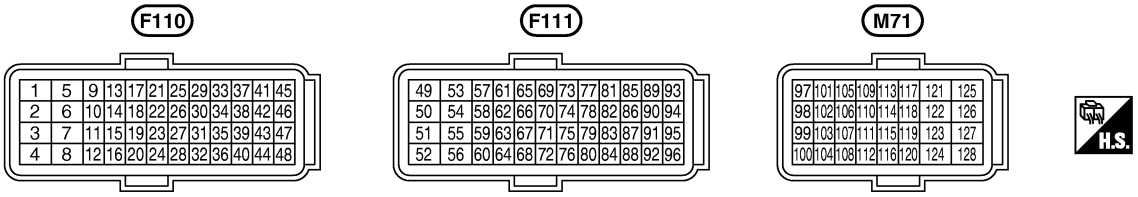
ELECTRICAL UNITS

PFP:00011

Terminal Arrangement

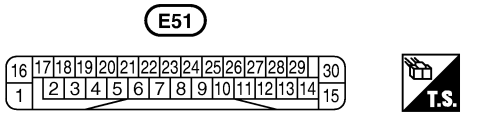
NKS004SB

ECM



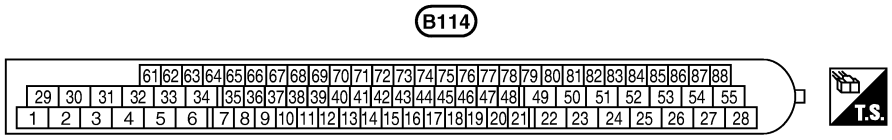
(Black) (Brown) (Gray)

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)



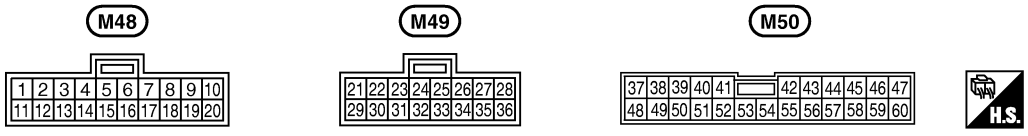
(Gray)

VDC/TCS/ABS CONTROL UNIT



(Black)

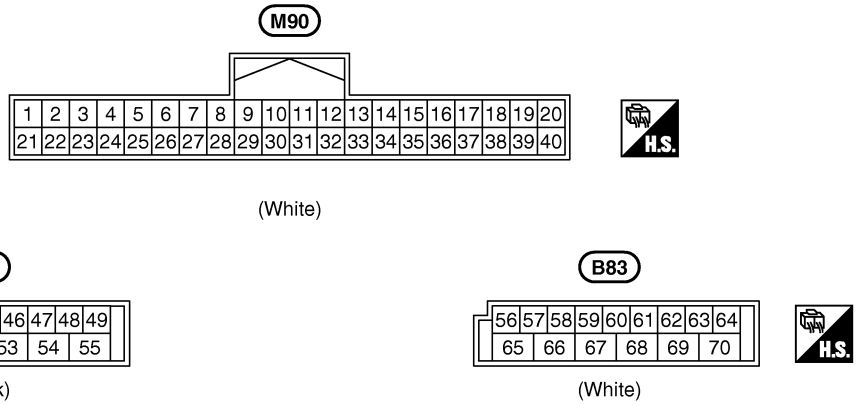
UNIFIED METER AND A/C AMP.



(Gray) (Gray) (White)

CKIT0876E

BCM (BODY CONTROL MODULE)



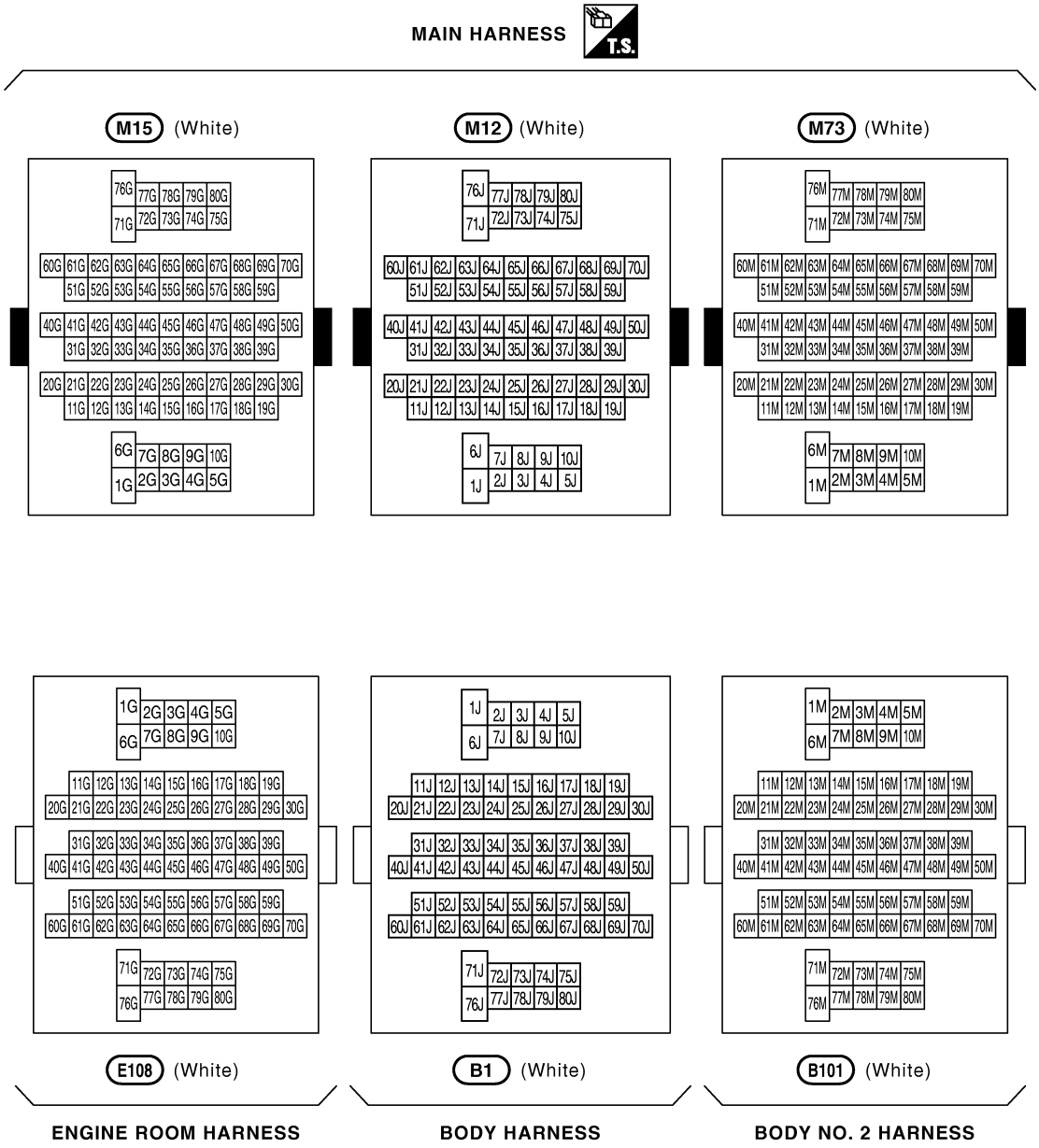
CKIT0647E

SMJ (SUPER MULTIPLE JUNCTION)

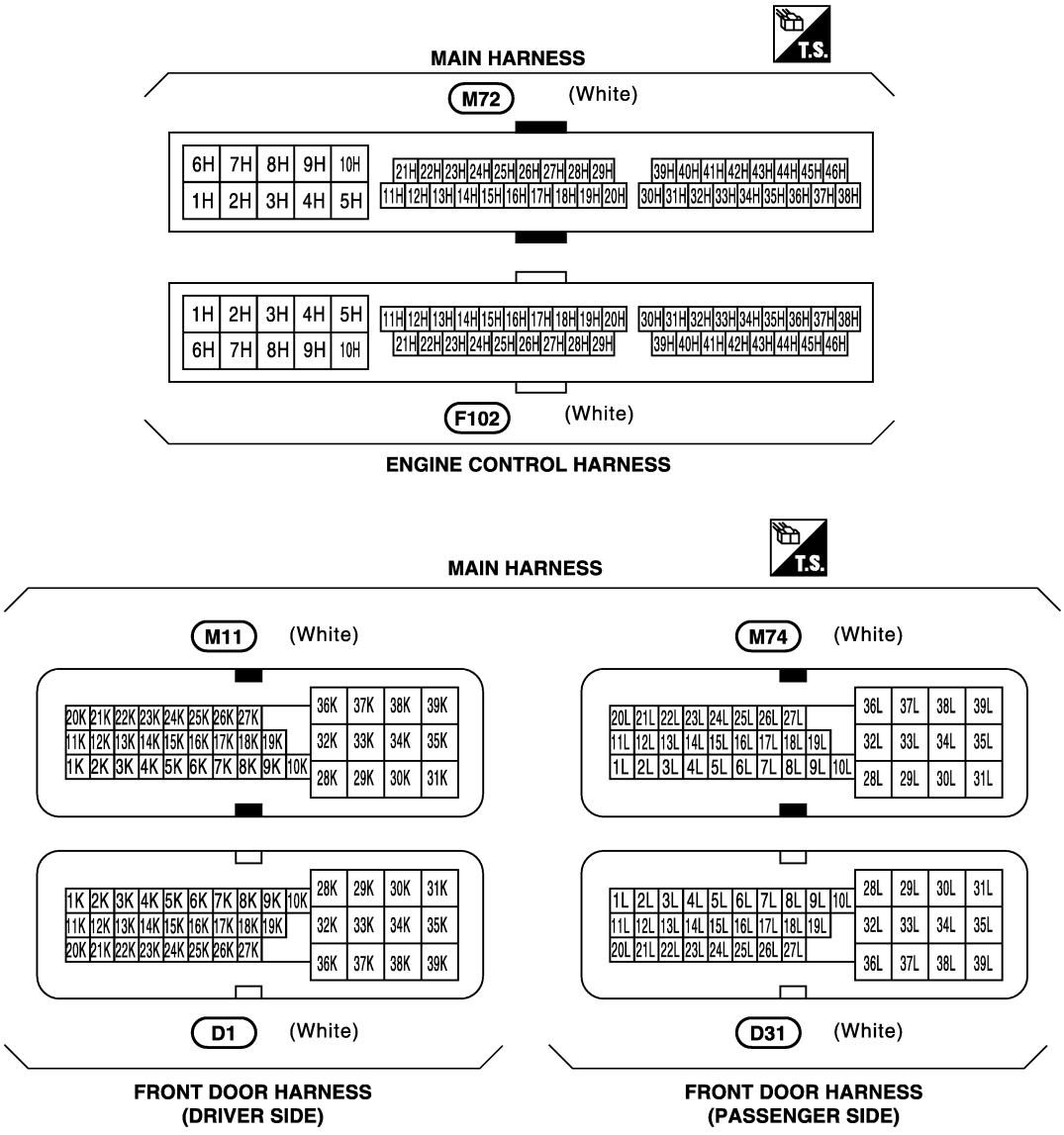
PFP:B4341

Terminal Arrangement

NKS000EL



CKIT0743E


MAIN HARNESS
T.S.
M72
(White)
6H 7H 8H 9H 10H
1H 2H 3H 4H 5H
21H 22H 23H 24H 25H 26H 27H 28H 29H
11H 12H 13H 14H 15H 16H 17H 18H 19H 20H
39H 40H 41H 42H 43H 44H 45H 46H
30H 31H 32H 33H 34H 35H 36H 37H 38H
1H 2H 3H 4H 5H
6H 7H 8H 9H 10H
11H 12H 13H 14H 15H 16H 17H 18H 19H 20H
21H 22H 23H 24H 25H 26H 27H 28H 29H
30H 31H 32H 33H 34H 35H 36H 37H 38H
39H 40H 41H 42H 43H 44H 45H 46H
F102
(White)
ENGINE CONTROL HARNESS
MAIN HARNESS
T.S.
M11
(White)
20K 21K 22K 23K 24K 25K 26K 27K
11K 12K 13K 14K 15K 16K 17K 18K 19K
1K 2K 3K 4K 5K 6K 7K 8K 9K 10K
36K 37K 38K 39K
32K 33K 34K 35K
28K 29K 30K 31K
M74
(White)
20L 21L 22L 23L 24L 25L 26L 27L
11L 12L 13L 14L 15L 16L 17L 18L 19L
1L 2L 3L 4L 5L 6L 7L 8L 9L 10L
36L 37L 38L 39L
32L 33L 34L 35L
28L 29L 30L 31L
1K 2K 3K 4K 5K 6K 7K 8K 9K 10K
11K 12K 13K 14K 15K 16K 17K 18K 19K
20K 21K 22K 23K 24K 25K 26K 27K
28K 29K 30K 31K
32K 33K 34K 35K
36K 37K 38K 39K
D1
(White)
1L 2L 3L 4L 5L 6L 7L 8L 9L 10L
11L 12L 13L 14L 15L 16L 17L 18L 19L
20L 21L 22L 23L 24L 25L 26L 27L
28L 29L 30L 31L
32L 33L 34L 35L
36L 37L 38L 39L
D31
(White)
FRONT DOOR HARNESS
(DRIVER SIDE)
FRONT DOOR HARNESS
(PASSENGER SIDE)

CKIT0158E

STANDARDIZED RELAY

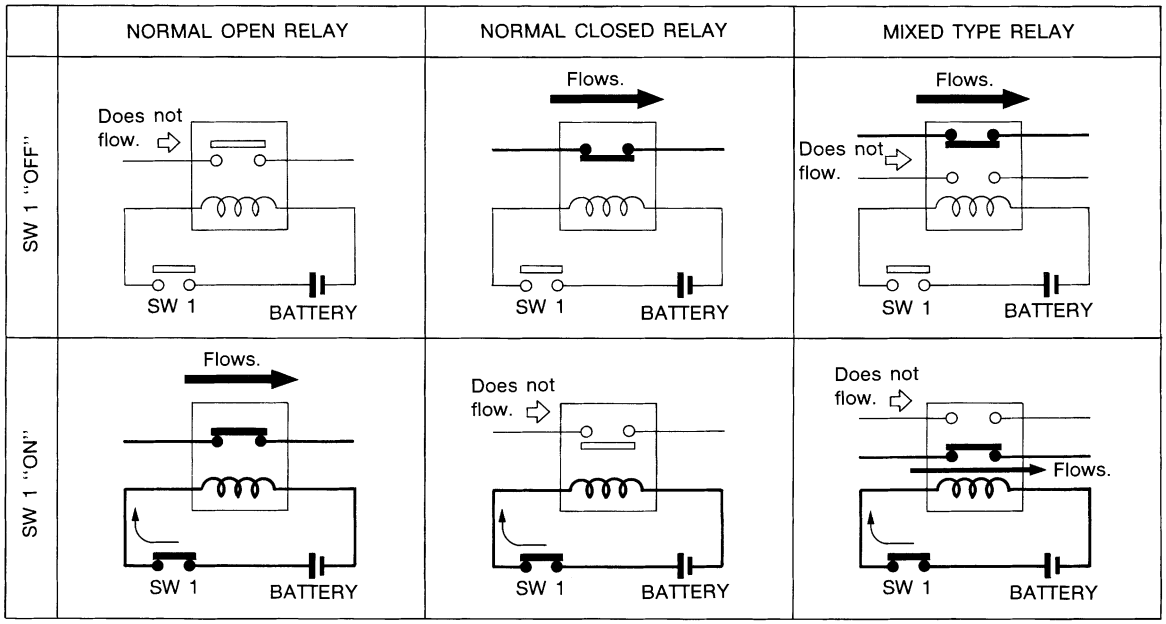
PFP:00011

Description

NKS000EM

NORMAL OPEN, NORMAL CLOSED AND MIXED TYPE RELAYS

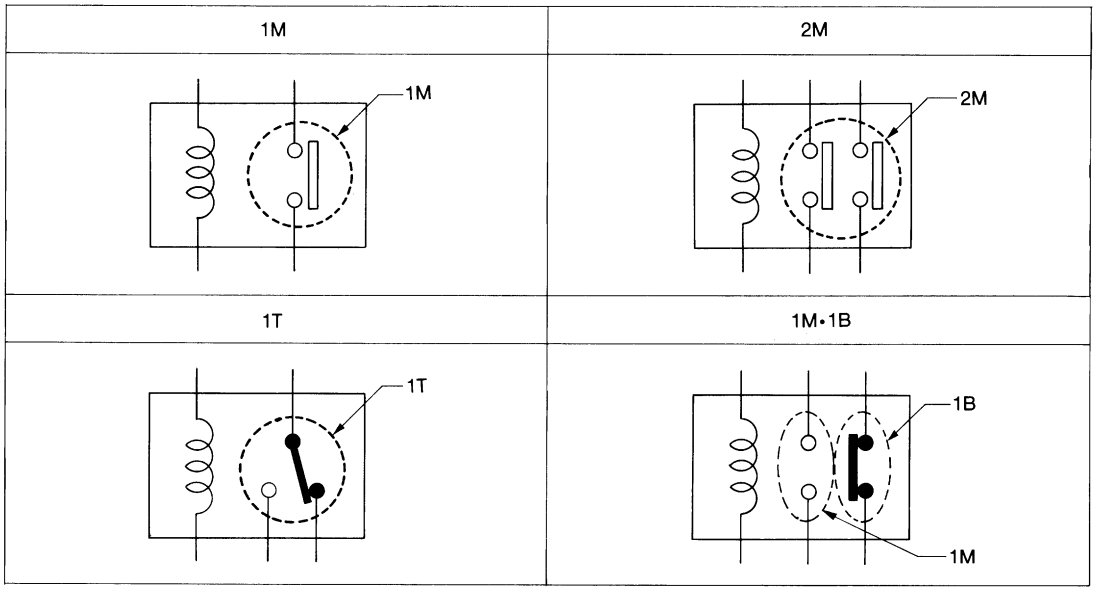
Relays can mainly be divided into three types: normal open, normal closed and mixed type relays.



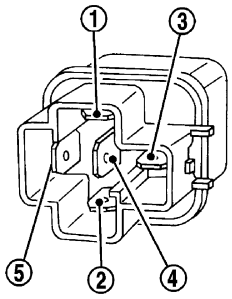
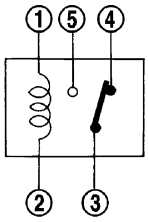
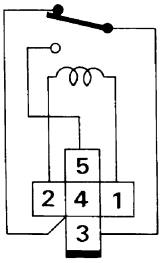
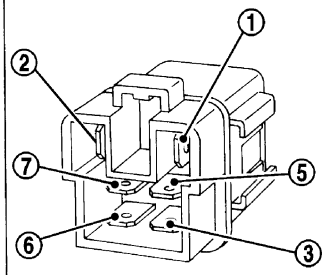
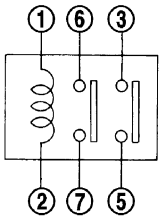
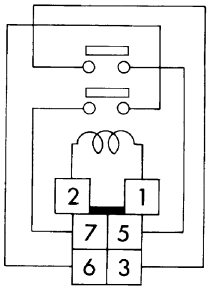
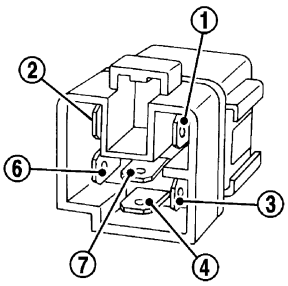
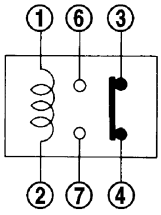
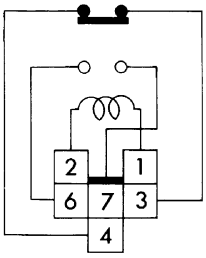
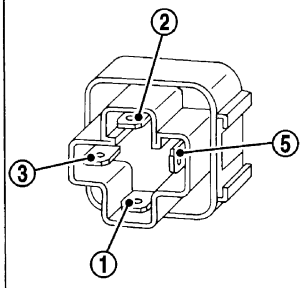
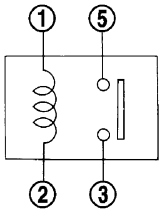
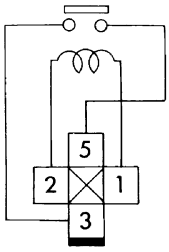
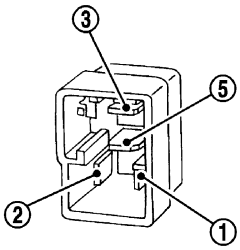
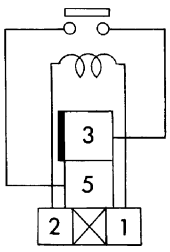
SEL881H

TYPE OF STANDARDIZED RELAYS

1M ..... 1 Make
2M ..... 2 Make
1T ..... 1 Transfer
1M·1B ..... 1 Make 1 Break



SEL882H

Type	Outer view	Circuit	Connector symbol and connection	Case color
1T				BLACK
2M				BROWN
1M•1B				GRAY
1M				BLUE
				

The arrangement of terminal numbers on the actual relays may differ from those shown above.

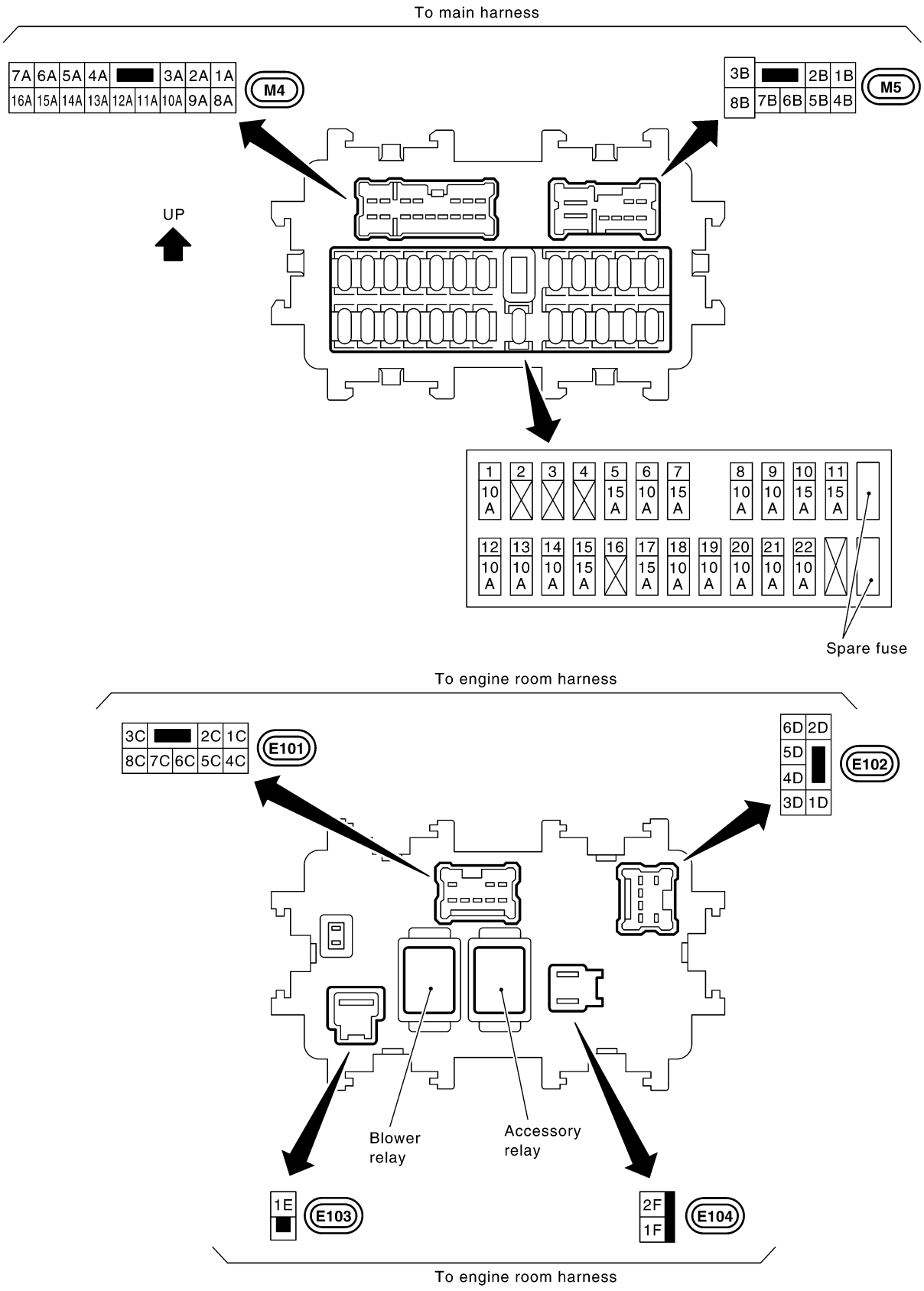
SEL188W

FUSE BLOCK - JUNCTION BOX (J/B)

PFP:24350

Terminal Arrangement

NKS000EN



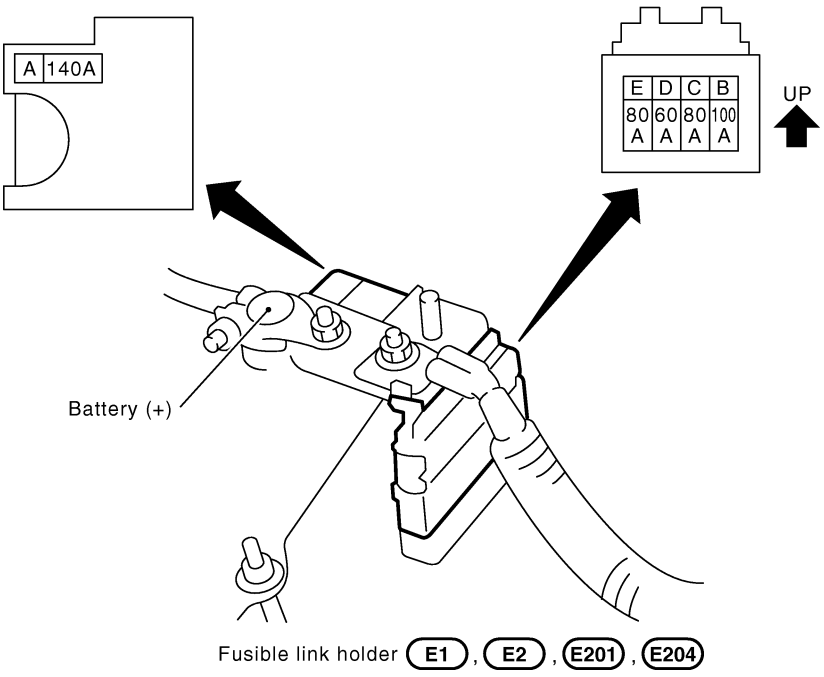
CKIT0363E

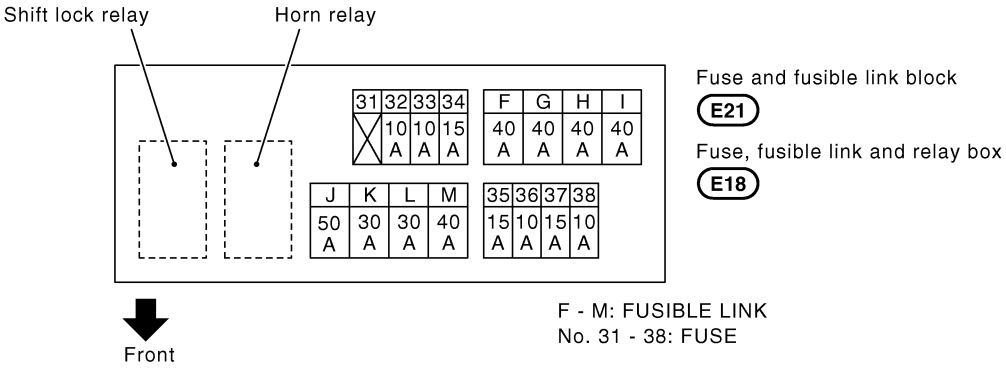
FUSE, FUSIBLE LINK AND RELAY BOX

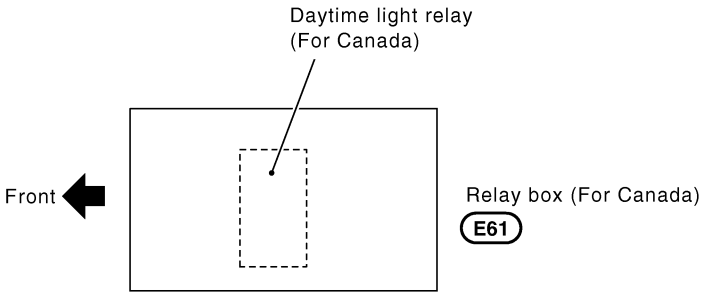
PFP:24382

Terminal Arrangement

NKS000EO







CKIT0877E

SECTION PR
PROPELLER SHAFT

CONTENTS

PRECAUTIONS 2
Precautions for Propeller Shaft 2
PREPARATION 3
Special Service Tools 3
NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 4
NVH Troubleshooting Chart 4
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APPEARANCE AND NOISE INSPECTION 5
PROPELLER SHAFT VIBRATION 5
Components 6
Removal and Installation 6
REMOVAL 6
INSPECTION 7
INSTALLATION 8
SERVICE DATA AND SPECIFICATIONS (SDS) 10
General Specifications 10
Propeller Shaft Runout Limit 10

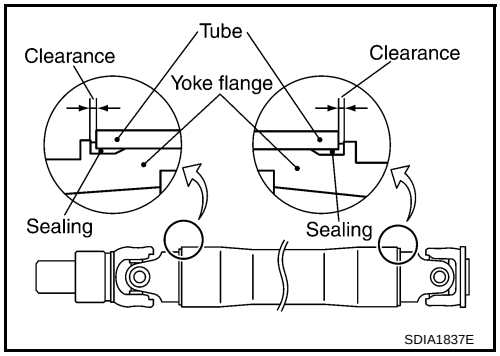
PRECAUTIONS

PFP:00001

Precautions for Propeller Shaft

NDS00001

- If propeller shaft is dropped, replace propeller shaft with new one.
- Do not hit, impact, or damage tube.
- If damage such as cracks or peeling off in sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- If there is chipping or bend in tube, replace propeller shaft with new one.
- Check that the clearance is between tube and yoke flange. If there is no clearance, replace propeller shaft.
- Protect propeller shaft with protector (special service tool) during work.



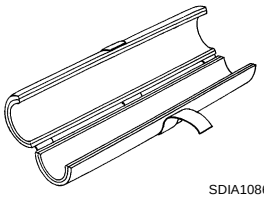
PREPARATION

PFP:00002

Special Service Tools

NDS00002

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
— (J-46208) Propeller shaft protector  SDIA1086E	Removing and installing propeller shaft

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NDS00003

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

		Reference page	PR-5	—	—	—	—	PR-5	PR-7	NVH in RFD section	NVH in FAX, RAX, FSU, and RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in BR section	NVH in PS section
		Possible cause and SUSPECTED PARTS	Uneven rotating torque	Center bearing improper installation	Excessive center bearing axial end play	Center bearing mounting (insulator) cracks, damage or deterioration	Excessive joint angle	Rotation imbalance	Excessive runout	DIFFERENTIAL	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	Noise		×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Shake			×			×				×	×	×	×	×	×
	Vibration		×	×	×	×	×	×	×		×	×		×		×

×: Applicable

REAR PROPELLER SHAFT

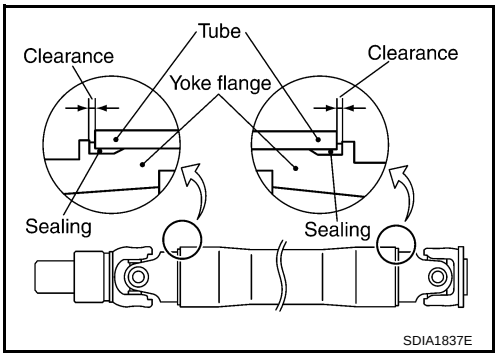
PFP:37000

On-Vehicle Inspection

NDS00004

APPEARANCE AND NOISE INSPECTION

- Check the propeller shaft tube surface for dents or cracks. If damaged, replace propeller shaft assembly.
- If damage such as cracks or peeling off sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- Check that the gap is between tube and yoke flange. If there is no gap, replace propeller shaft.

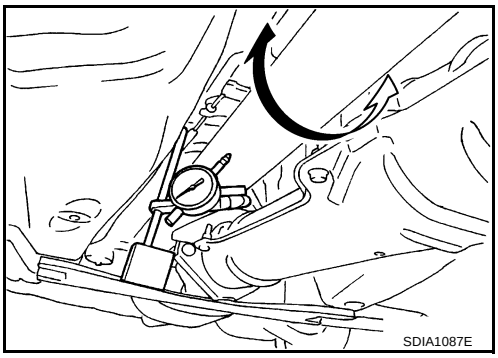


PROPELLER SHAFT VIBRATION

If vibration is present at high speed, inspect propeller shaft runout first.

1. Measure propeller shaft runout at runout measuring points by rotating final drive companion flange with hands.

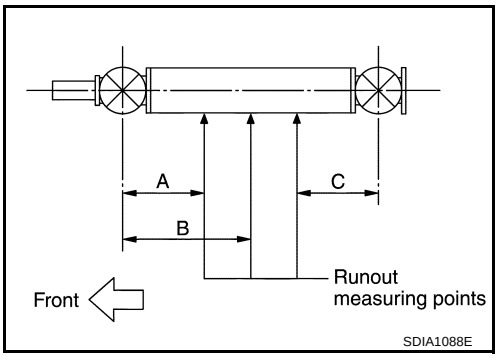
Propeller shaft runout limit : 1.5 mm (0.059 in) or less



Propeller shaft runout measuring points

Dimension for M/T models
A: 340 mm (13.39 in)
B: 660.5 mm (26.00 in)
C: 340 mm (13.39 in)

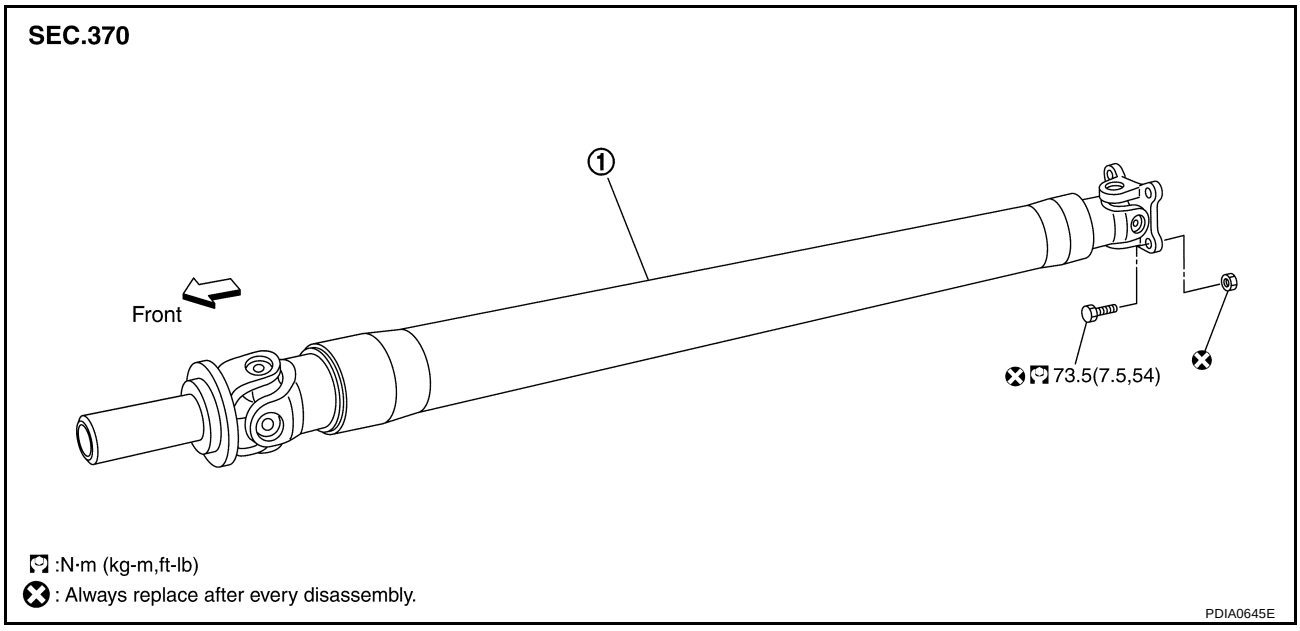
Dimension for A/T models
A: 340 mm (13.39 in)
B: 641.5 mm (25.26 in)
C: 340 mm (13.39 in)



2. If runout still exceeds specifications, separate propeller shaft at final drive companion flange; then rotate companion flange 90, 180, 270 degrees and install propeller shaft.
3. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
4. Check the vibration by driving vehicle.

Components

NDS00005



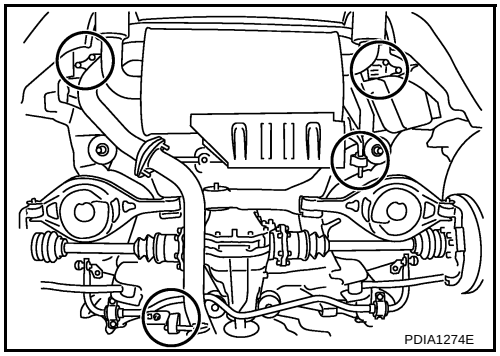
1. Propeller shaft

Removal and Installation

NDS00006

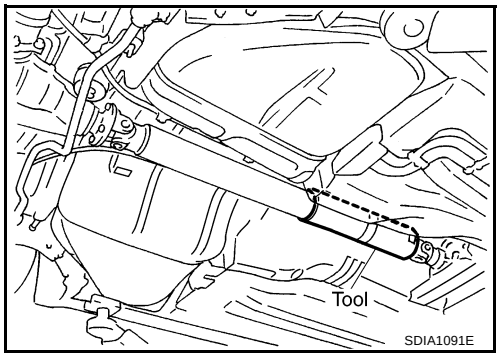
REMOVAL

1. Set transmission to neutral position.
2. Release parking brake.
3. To keep space for removing propeller shaft, first detach rear-side mounts (4 locations) of exhaust tube and main muffler. Then lower exhaust tube and main muffler, and support them with jack or equivalent. (See the figure.)



4. Attach protector (special service tool) to propeller shaft. (When reused.)

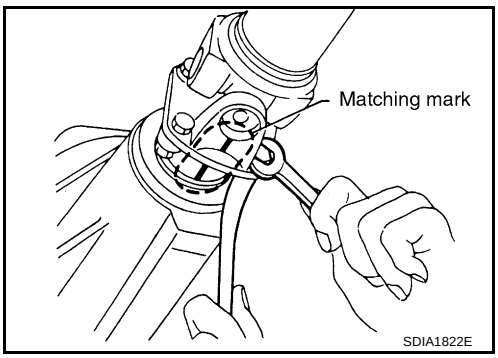
Tool number : — (J-46208)



5. Put matching marks on flange yoke with final drive companion flange. (When reused.)

CAUTION:
For matching mark, use paint. Do not damage flange yoke and companion flange.

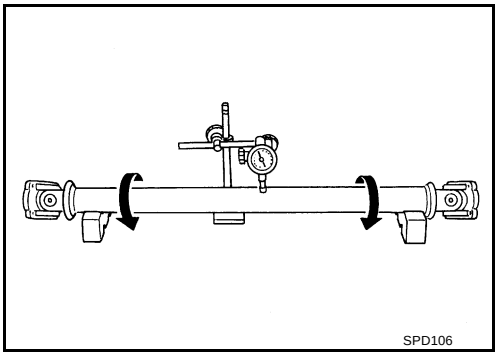
6. Remove propeller shaft fixing bolts and nuts. Then propeller shaft.



INSPECTION

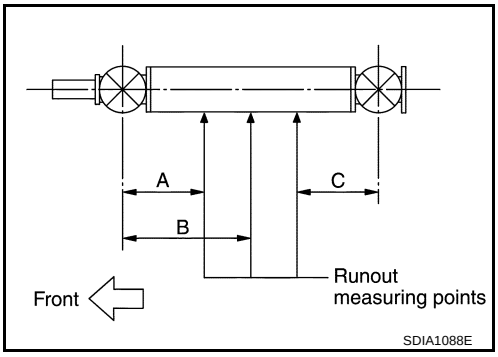
- Inspect propeller shaft runout at measuring points. If runout exceeds specifications, replace propeller shaft assembly.

Propeller shaft runout limit : 1.5 mm (0.059 in) or less



Propeller shaft runout measuring points

Dimension for M/T models	**A: 340 mm (13.39 in)**
	B: 660.5 mm (26.00 in)
	C: 340 mm (13.39 in)
Dimension for A/T models	**A: 340 mm (13.39 in)**
	B: 641.5 mm (25.26 in)
	C: 340 mm (13.39 in)

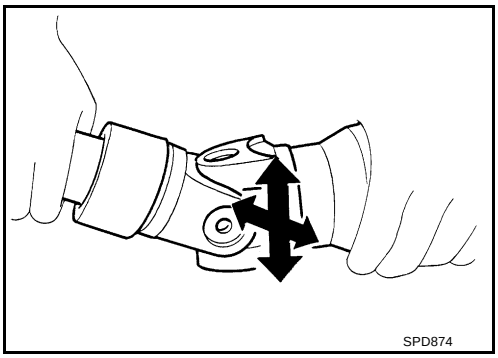


- Inspect journal axial play. If the play exceeds specifications, replace propeller shaft assembly.

Journal axial play : 0 mm (0 in)

- Check propeller shaft for bend and damage. If damage is detected, replace propeller shaft assembly.

CAUTION:
Do not disassemble joints.



INSTALLATION

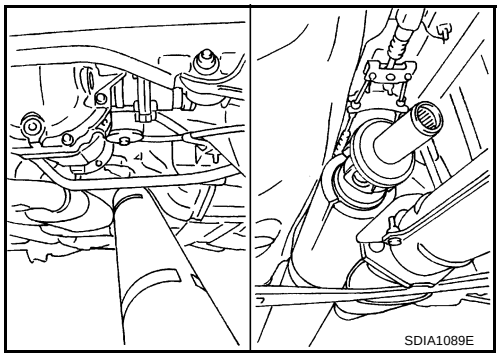
When Installing New Propeller Shaft

CAUTION:

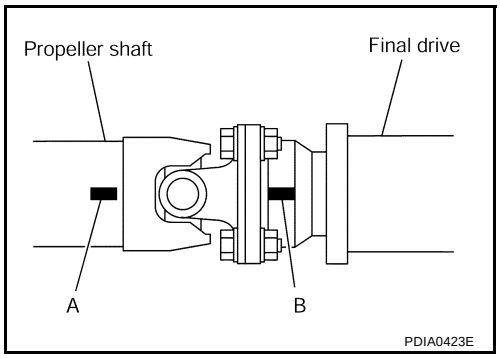
- **When installing propeller shaft, handle it carefully.**
- **Propeller shaft must be installed with packing material attached (delivered condition). Do not install propeller shaft with packing material removed.**

1. Insert propeller shaft with packing material between floor reinforcement and floor panel.

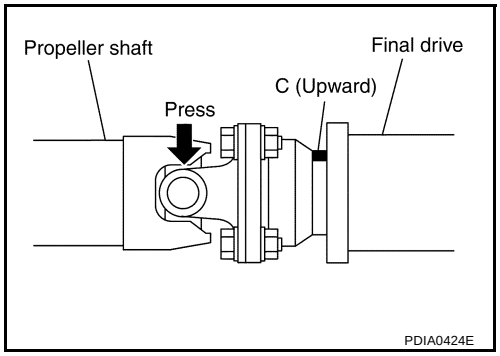
   CAUTION:
   After insertion, check that shift control boot does not come off (M/T models).



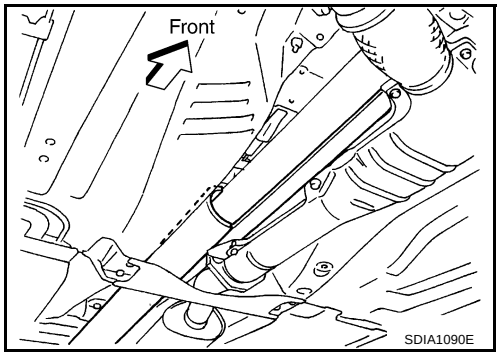
2. Install propeller shaft while aligning its matching mark A with the matching mark B on the joint as close as possible.
3. Temporarily tighten bolts and nuts.



4. Press down propeller shaft with matching mark C facing upward. Then tighten fixing bolts and nuts to the specified torque. Refer to PR-6, "Components" .



5. Remove packing material from propeller shaft.
6. Return exhaust system to its original position. For tightening torque, EX-3, "EXHAUST SYSTEM" .
7. After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive. Reinstall companion flange after rotating it by 90, 180, 270 degrees. Then perform driving test and check propeller shaft vibration again at each point.



When Installing Reused Propeller Shaft

CAUTION:

When installing propeller shaft, handle it carefully.

1. With protector (special service tool) attached, align matching marks to install propeller shaft to final drive companion flange, and then tighten to specified torque. Refer to PR-6, "Components" .
2. Remove protector (special service tool) from propeller shaft.
3. Return exhaust system to its original position. For tightening torque, EX-3, "EXHAUST SYSTEM" .
4. After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive. Reinstall companion flange after rotating it by 90, 180, 270 degrees. Then perform driving test and check propeller shaft vibration again at each point.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NDS00007

Applied model	VQ35DE	
	M/T	A/T
Propeller shaft model	2S80A CFRP	
Number of joints	2	
Coupling method with transmission	Sleeve type	
Type of journal bearings	Shell type (Non-disassembly type)	
Distance between yokes	95 mm (3.74 in)	
Shaft length (Spider to spider)	1321 mm (52.007 in)	1283 mm (50.512 in)
Shaft outer diameter	85.0 mm (3.346 in)	

Propeller Shaft Runout Limit

NDS00008

Model	2S80A CFRP
Propeller shaft runout limit	1.5 mm (0.059 in) or less

SECTION PS
POWER STEERING SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NGS000FR

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NGS000FS

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Steering System

NGS00003

- Before disassembly, thoroughly clean the outside of the unit.
- Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- For easier and proper assembly, place disassembled parts in order on a parts rack.
- Use nylon cloth or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.
- Before inspection or reassembly, carefully clan all parts in order on a parts rack.
- Before assembly, apply a coat of recommended power steering fluid to hydraulic parts. Petroleum jelly may be applied to O-rings and seals. Do not use any grease.
- Replace all gaskets, seals and O-rings. Avoid damaging O-rings, seals and gaskets during installation. Perform functional tests whenever designated.

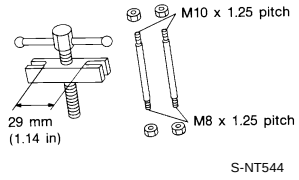
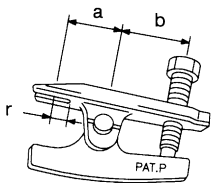
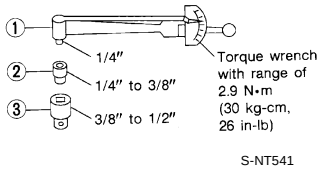
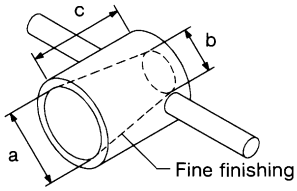
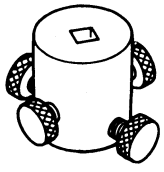
PREPARATION

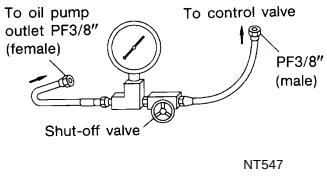
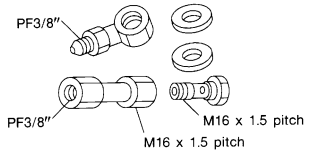
PFP:00002

Special Service Tools

NGS00004

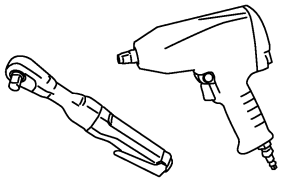
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST27180001 (J-25726-A) Steering wheel puller		Removing steering wheel
HT72520000 (J-25730-A) Ball joint remover a: 33 mm (1.30 in) b: 50 mm (1.97 in) r: 11.5 mm (0.453 in)		Removing outer socket ball joint
ST3127S000 (See J-25765-A) Preload gauge 1. GG9103000 (J-25765-A) Torque wrench 2. HT62940000 (–) Socket adapter 3. HT62900000 (–) Socket adapter		Inspecting of rotating torque
KV48104400 (–) Teflon ring installation tool a: 50 mm (1.97 in) dia. b: 36 mm (1.42 in) dia. c: 100 mm (3.94 in)		Installing of rack Teflon ring
KV48103400 (–) Torque adapter		Inspecting rotating torque

Tool number (Kent-Moore No.) Tool name	Description
KV48103500 (J-26357) Pressure gauge  NT547	Measuring oil pump relief pressure
KV48102500 (J-33914) Pressure gauge adapter  NT542	Measuring oil pump relief pressure

Commercial Service Tools

NGS00005

Tool name	Description
Power tool  PBIC0190E	Removing oil pump and wheel nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NGS00006

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		PS-6	PS-6	PS-21	PS-21	PS-21	PS-6	PS-7	PS-21	EM-12	PS-7	PS-15	PS-17	PS-10	PS-10	PS-17	NVH in PR section	NVH in RFD section	NVH in FAX, RAX, FSU, RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in BR section
Possible cause and suspected parts		Fluid level	Air in hydraulic system	Outer socket ball joint swinging force	Outer socket ball joint sliding torque	Outer socket ball joint end play	Steering fluid leakage	Steering wheel play	Steering gear rack sliding force	Drive belt looseness	Improper steering wheel	Improper installation or looseness of tilt lock lever	Mounting rubber deterioration	Steering column deformation or damage	Improper installation or looseness of steering column	Steering linkage looseness	PROPELLER SHAFT	DIFFERENTIAL	AXLE and SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES
Symptom	Noise	×	×	×	×	×	×	×	×	×							×	×	×	×	×	×	×
	Shake										×	×	×				×		×	×	×	×	×
	Vibration										×	×	×	×	×		×		×	×		×	
	Shimmy										×	×	×			×			×	×	×		×
	Judder												×			×			×	×	×		×

×: Applicable

POWER STEERING FLUID

PFP:KLF20

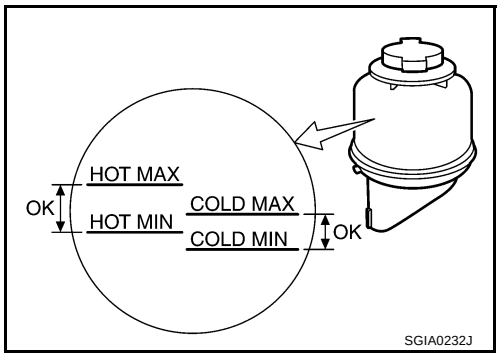
Checking Fluid Level

NGS00007

- Stop engine before performing a fluid level check.
- Ensure that fluid level is between the MAX range and MIN level.
- Because fluid level differs within the HOT range and the COLD range, check it carefully.

HOT : Fluid temperatures from 50 to 80 °C (122 to 176°F)

COLD : Fluid temperatures from 0 to 30°C (32 to 86°F)



CAUTION:

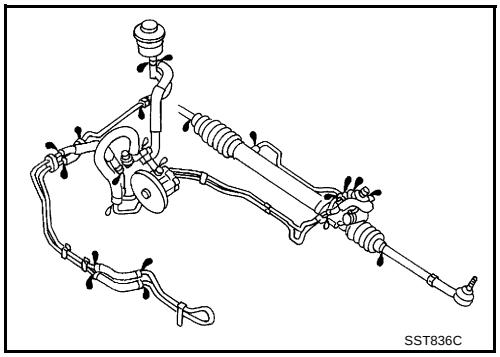
- **Do not overfill the MAX level.**
- **Do not reuse any used power steering fluid.**

Checking Fluid Leakage

NGS00008

Check that hydraulic piping lines for improper attachment and for leaks, cracks, damage, loose connections, chafing or deterioration.

1. Run engine until fluid temperature reaches 50 to 80° C (122 to 176°F) in reservoir tank. Keep engine speed idle.
2. Turn steering wheel right-to-left several times.
3. Hold steering wheel at each “lock” position for five seconds to check fluid leakage.



CAUTION:

Do not hold steering wheel in a locked position for more than 10 seconds. (There is the possibility that oil pump may be damaged.)

4. If fluid leakage at connections is noticed, then loosen flare nut and then retighten. Do not over tighten connector as this can damage O-ring, washer and connector.
5. If fluid leakage at the connectors is noticed, then loosen the flare nut and retighten it.
6. Check steering gear boots for accumulation of fluid indicating a from steering gear.

Air Bleeding Hydraulic System

NGS00009

Incomplete air bleeding causes the following. When this happens, bleed air again.

- Generation of air bubbles in reservoir tank
- Generation of clicking noise in oil pump
- Excessive buzzing in oil pump

NOTE:

When vehicle is stationary or while steering wheel is being turned slowly, some noise may be heard from oil pump or gear. This noise is normal and does not affect any system.

1. Stop engine, and then turn steering wheel fully to right and left several times.

CAUTION:

Do not allow steering fluid reservoir tank to go below the low-level line. Check tank frequenter and add fluid as needed.

2. Run engine at idle speed. Turn steering wheel fully to the right and then fully to the left, and keep for about three seconds. Then check whether a fluid leakage has occurred.
3. Repeat the 2nd procedure several times at about three seconds intervals.

CAUTION:

Do not hold steering wheel in the locked position more than 10 seconds. (There is the possibility that oil pump may be damaged.)

4. Check generation of air bubbles and cloud in fluid.
5. If air bubbles and the cloud don't fade, stop engine, hold air bleeding until air bubbles and the cloud fade. Perform the 2nd and the 3rd procedures again.
6. Stop engine, check fluid level.

STEERING WHEEL

PFP:48430

On-Vehicle Inspection and Service

NGS0000A

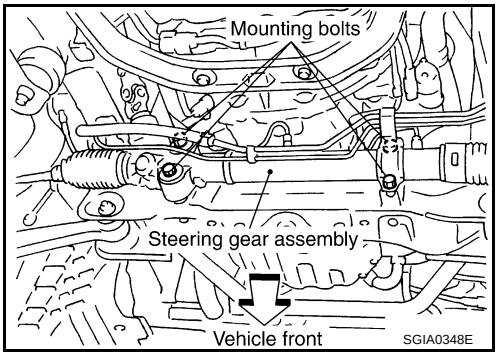
CHECKING CONDITION OF INSTALLATION

- Check installation condition of steering gear assembly, front suspension, axle and steering column.
- Check if movement exists when steering wheel is moved up and down, to the left and right and to the axial direction.

End play of the axle direction for steering wheel:

0 mm (0 in)

- Check if the mounting bolts for steering gear assembly are loose or not. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .



CHECKING STEERING WHEEL PLAY

1. Set tires to the straight ahead, start engine, then turn steering wheel to the left and right lightly, and measure steering wheel movement on the outer circumference when steering wheel is turned up to the point where tires start moving.

Steering wheel play on the outer circumference : 0 - 35 mm (0 - 1.38 in)

CHECKING NEUTRAL POSITION ON STEERING WHEEL

- Check neutral position on steering wheel after confirming that front wheel alignment is correct. Refer to PS-35, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

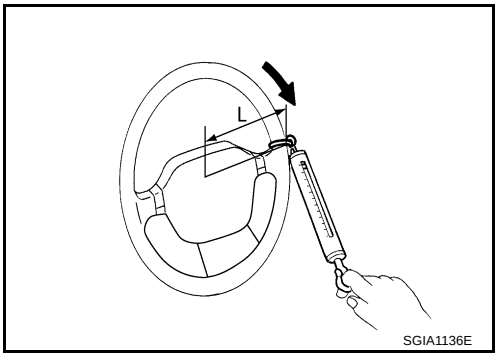
1. Set the vehicle to the straight ahead-direction, check if steering wheel is in the neutral position.
2. If it is not in the neutral position, remove steering wheel and reinstall it correctly.
3. If the neutral position cannot adjust in the two teeth of steering gear assembly, loosen tie-rod lock nuts of steering outer sockets, then adjust tie-rods by the same amount in the opposite direction.

CHECKING STEERING WHEEL TURNING FORCE

1. Park vehicle on a level and dry surface, set parking brake.
2. Start engine.
3. Bring power steering fluid up to adequate operating temperature. [Make sure temperature of fluid is approximately 50 to 80°C (122 to 176°F).]
4. Check steering wheel turning force when steering wheel has been turned 540° from neutral position.

Steering wheel turning force : 7.45 N·m (0.76 kg-m, 66 in-lb)

NOTE:
Multiply the distance (L) from the hook of spring scale to the center of steering wheel by the measurement value with a spring scale.



5. If steering wheel turning force is out of the specification, check rack sliding force and relief hydraulic pressure of oil pump. Regarding relief hydraulic pressure of oil pump, refer to PS-28, "CHECKING RELIEF OIL PRESSURE" .

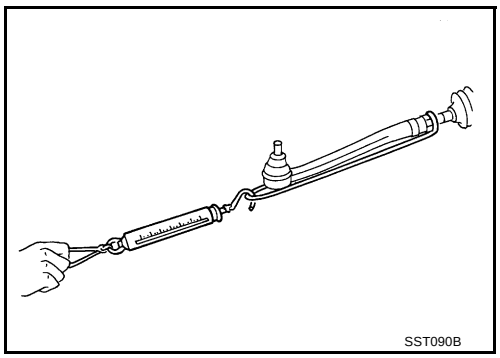
a. Disconnect lower joint and steering knuckle from steering gear assembly. Refer to PS-17, "Removal and Installation" , FAX-4, "Removal and Installation" .

b. Start and run engine at idle to make sure steering fluid has reached normal operating temperature.

c. While pulling outer socket slowly in ± 11.5 mm (± 0.453 in) range from neutral position, make sure rack sliding force is within specification.

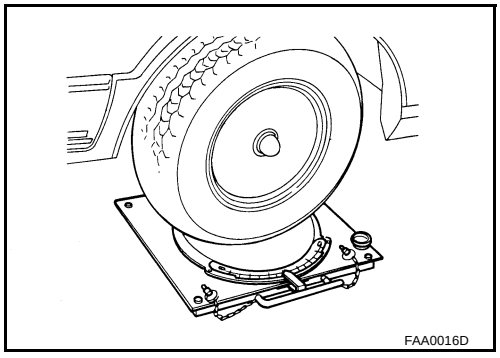
Rack sliding force: 171 - 234 N (17.4 - 23.9 kg, 38 - 53 lb)

d. If rack sliding force is not within specification, overhaul steering gear assembly.



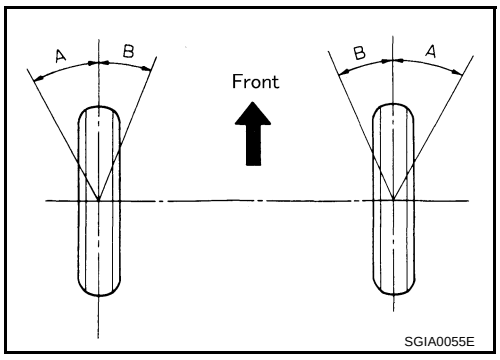
CHECKING FRONT WHEEL TURNING ANGLE

- Check front wheel turning angle after the toe-in inspection. Place front wheels on turning radius gauges and rear wheels on stands so that vehicle can be level. Check the maximum inner and outer wheel turning angles for LH and RH road wheels.



- Start engine and run at idle, turn steering wheel all the way right and left, measure the turning angle.

Inner wheel (Angle: A)	Minimum	35° 55' (35.9°)
	Nominal	38° 55' (38.9°)
	Maximum	39° 55' (39.9°)
Outer wheel (Angle: B)	Nominal	30° 40' (30.7°)

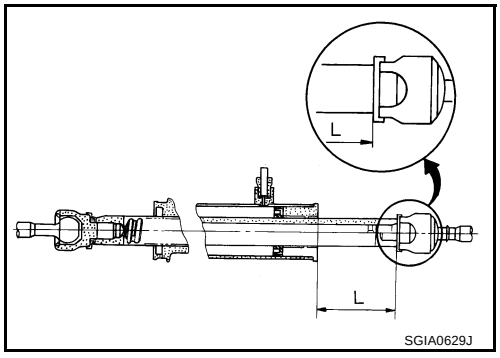


- If it is not within specification, measure rack strokes.

Rack stroke "L" : 64.5 mm (2.539 in)

- If rack stroke is out of specification, disassemble steering gear assembly to check rack stroke.
- Any turning angles are not adjustable. If any of steering angles are out of the specification, check if the following parts are wear or damaged.
  - Steering gear
  - Steering column
  - Front suspension components

  If found that they are worn or damaged, replace them with new ones respectively.



Removal and Installation

NGS0000B

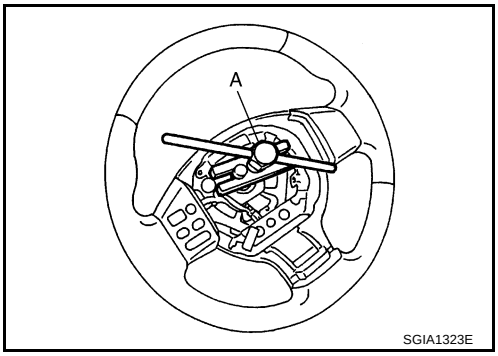
REMOVAL

NOTE:

When reconnecting spiral cable, fix cable with a tape so that fixing case and rotating part keep aligned. This will omit neutral position alignment procedure during spiral cable installation.

1. Set vehicle to the straight-ahead position.
2. Remove driver air bag module. Refer to SRS-40, "Removal and Installation" .
3. Remove steering wheel lock nut after steering is locked.
4. Remove steering wheel with the steering wheel puller A.

Tool number A: ST27180001 (J-25726-A)



INSTALLATION

Installation is the reverse order of removal. For tightening torque, refer to PS-10, "Removal and Installation" .

NOTE:

Check the spiral cable neutral position after replacing or rotating spiral cable. Refer to SRS-42, "Removal and Installation" .

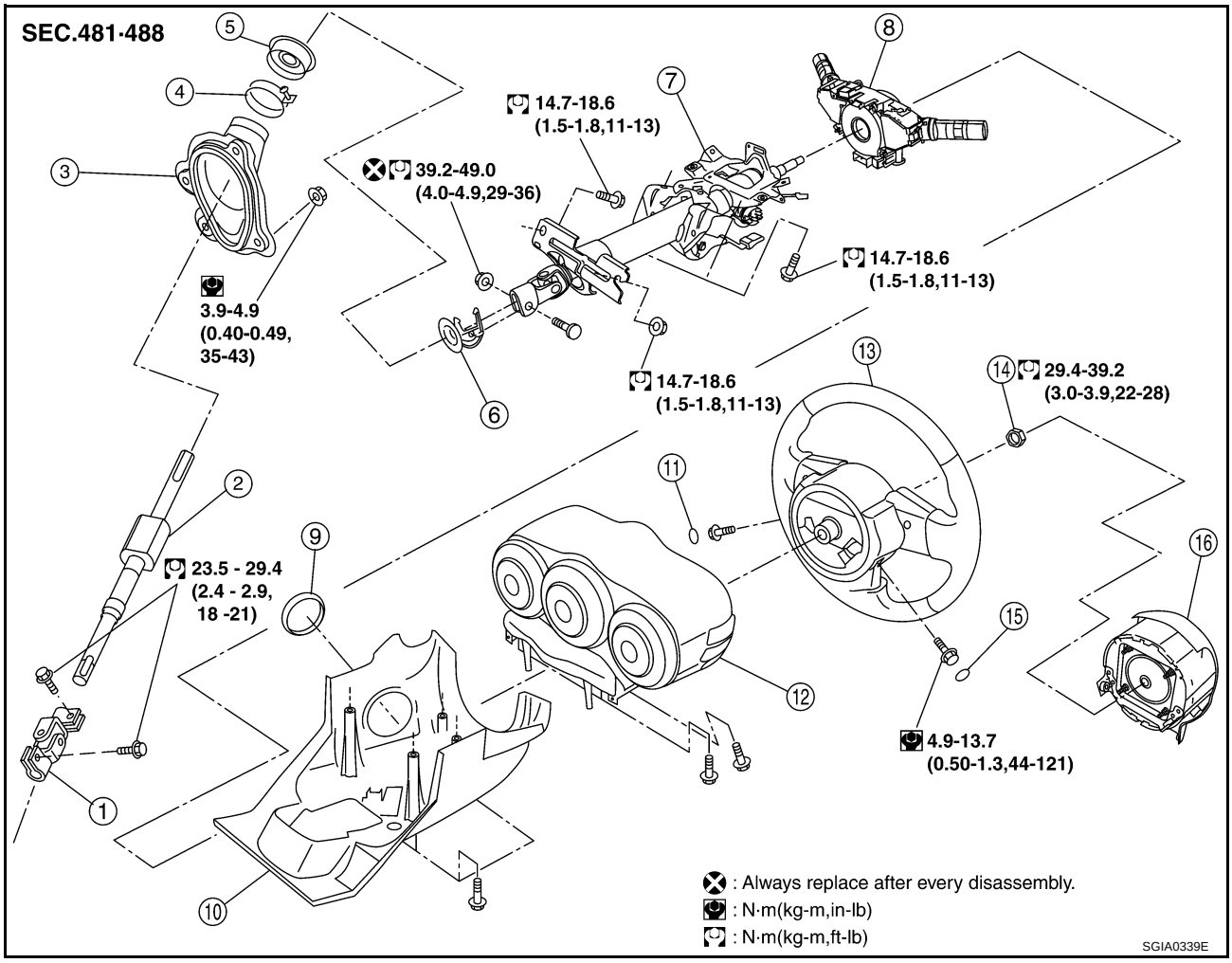
STEERING COLUMN

PFP:48810

Removal and Installation

NGS0000C

COMPONENTS



1.	Lower joint	2.	Lower shaft	3.	Hole cover
4.	Clamp	5.	Hole cover seal	6.	Collar
7.	Steering column assembly	8.	Combination switch & spiral cable	9.	Escutcheon
10.	Column lower cover	11.	Right lid	12.	Combination meter & column upper cover
13.	Steering wheel	14.	Steering wheel lock nut	15.	Left lid
16.	Driver air bag module				

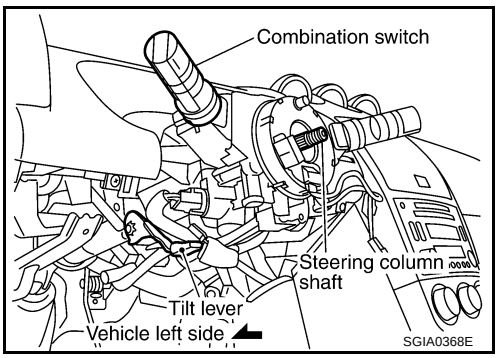
CAUTION:

- **Care must be taken not to give axial impact to steering column assembly during removal and installation.**
- **Care must be taken not to move steering gear during removal of steering column assembly.**

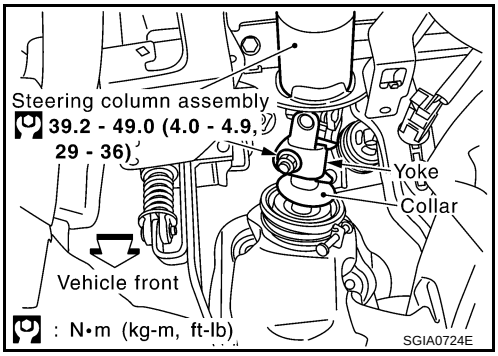
REMOVAL

1. Set vehicle to the straight ahead-direction.
2. Remove driver air bag module from steering wheel. Refer to SRS-40, "DRIVER AIR BAG MODULE" .
3. Disconnect steering switch connector, remove steering wheel lock nut, then remove steering wheel. Refer to PS-7, "STEERING WHEEL" .
4. Remove dash side finisher (LH). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Remove instrument driver panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
6. Remove column lower cover and combination meter (which is connected with steering column upper cover) from steering column assembly. Refer to DI-24, "Removal and Installation for Combination Meter" .

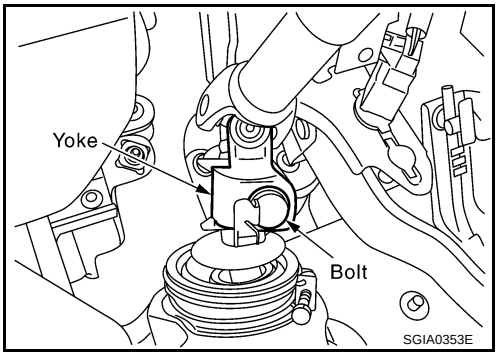
7. Remove combination switch & spiral cable from steering column assembly. Refer to SRS-42, "Removal and Installation" .
8. Disconnect the following connector from steering column assembly.
   - Steering lock harness connector
   - Ignition switch harness connector
   - Key switch harness connector
9. Remove control unit with VDC/TCS/ABS control unit. Refer to BRC-129, "VDC/TCS/ABS CONTROL UNIT" .
10. Disconnect brake switch harness connector.
11. Remove steering column shaft from lower shaft in the following procedure.



a. Remove lock nut from yoke.

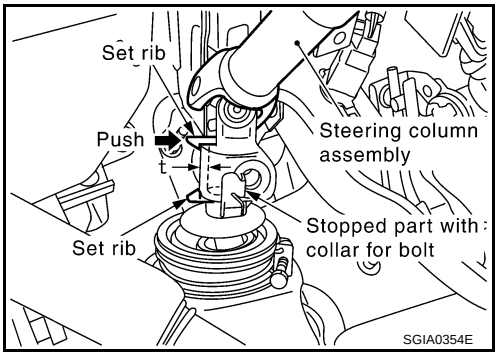


b. Turn steering wheel to the right to appear the head of bolt.
c. Remove the fixed part of collar for bolt to the outside of its head, remove bolt.

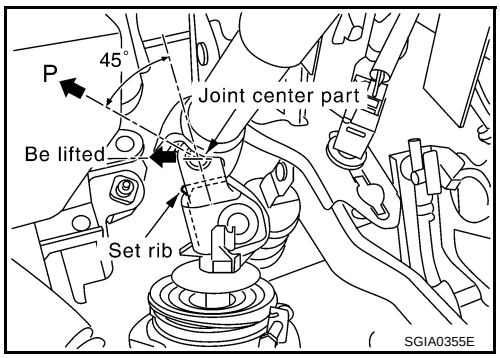


d. Remove the set lib of steering column assembly side from yoke, push it equal to the thick part of yoke.

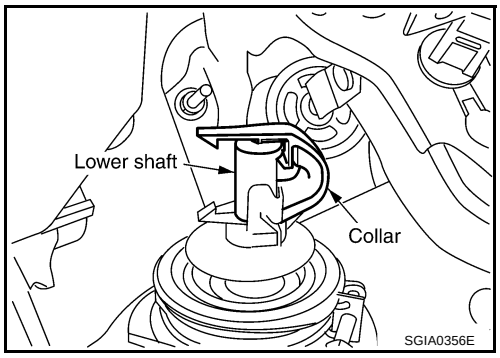
NOTE:
Because collar is set in lower shaft, if the set lib is pushed (action), joint center will be lifted in the opposite direction (reaction), and then the set lib will be in squeezed to the thick part of yoke.



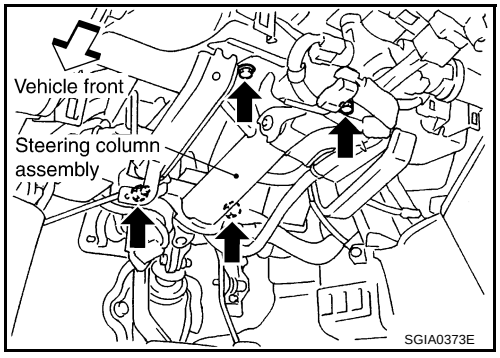
e. Yoke will be removed from collar, when steering column assembly is lifted about 45° oblique upward.



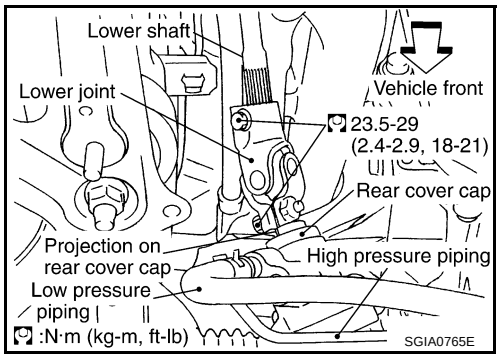
f. Collar remains on lower shaft.



12. Remove bolts and nut from steering member, remove steering column assembly from steering member.
13. Remove collar from lower shaft.
14. Remove hole cover seal from lower shaft.
15. Remove mounting bolts, then remove hole cover from panel.

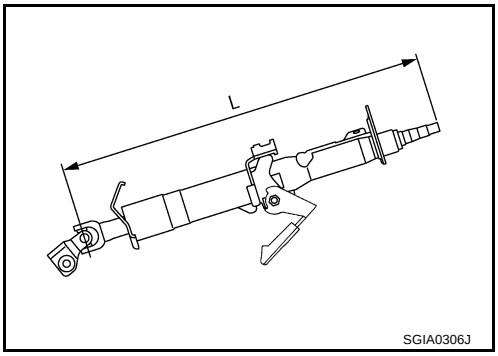


16. Raise vehicle, then loosen bolt for lower yoke of lower joint and remove joint together with lower shaft.



INSPECTION AFTER REMOVAL

- Check if there is something wrong with jacket tube of steering column assembly and collar etc. And then if they are damaged, replace with new one.
- If vehicle has a collision light shocked, check column length “L” as shown in the figure. Then if it is out of the specified value, replace with new one.



Specified value

Steering column length “L”: 548 mm (21.57 in)

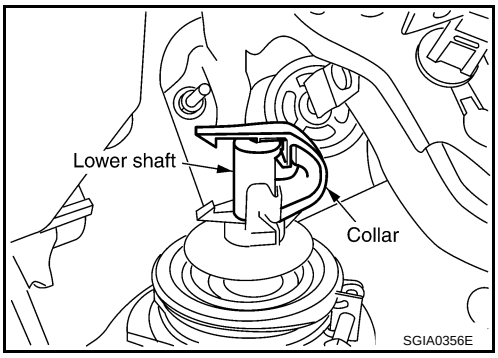
- Check the turning torque of steering column with preload gauge (SST: ST3127S000 [J-25765-A]). If it is out of the specified value, repair it or replace with new one.

Specified value

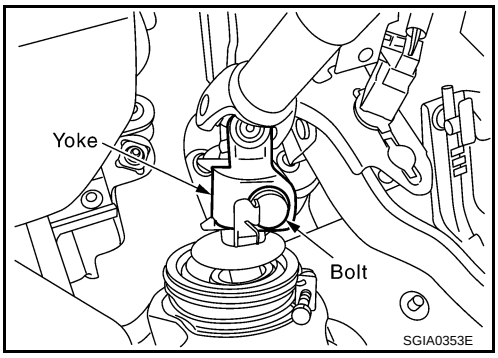
Turning torque : 0 - 0.2 N·m (0 - 0.02 kg-m, 0 - 2 in-lb)

INSTALLATION

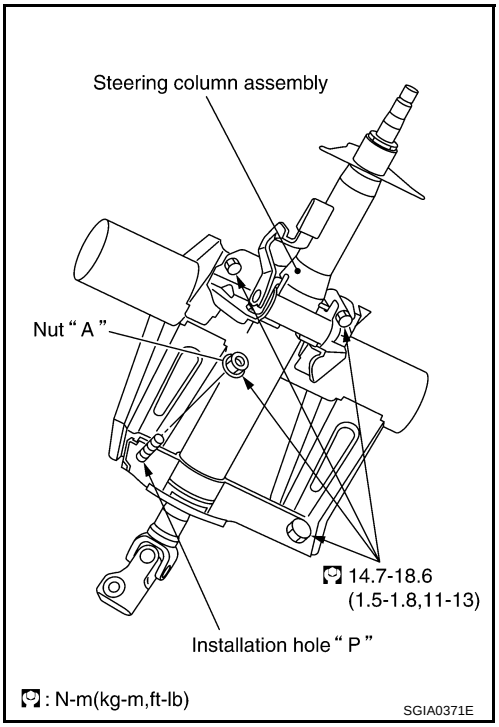
1. Install collar to lower shaft.



2. Install yoke of column shaft to collar, tack bolt and nut.



3. Put steering column assembly (installation hole “P”) on bolt for steering member side and install nut “A” then tighten it together with the other bolts at the specified torque.
4. Connect yoke and collar with bolt, tighten nut at the specified torque.



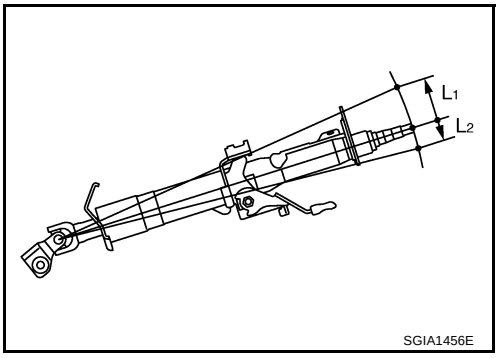
INSPECTION AFTER INSTALLATION

- After installing steering column to vehicle, check tilt device and its operation range “L_1” , “L_2” .

Tilt operating range “L_1 ” : 28 - 32 mm (1.10 - 1.26 in)

“L_2 ” : 13 - 17 mm (0.51 - 0.67 in)

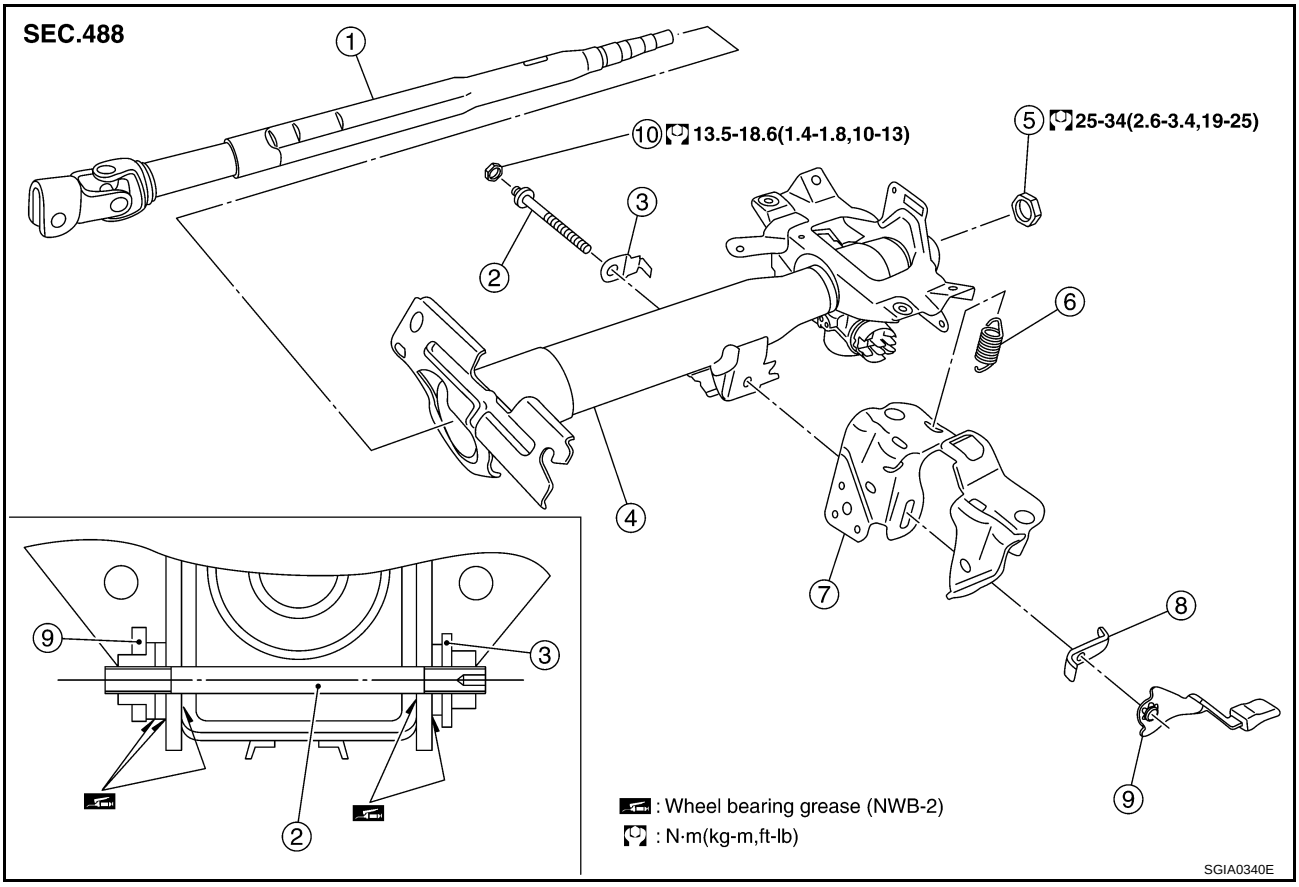
- Check if steering operation can turn to the end of the left and right smoothly.



Disassembly and Assembly

NGS0000D

COMPONENTS

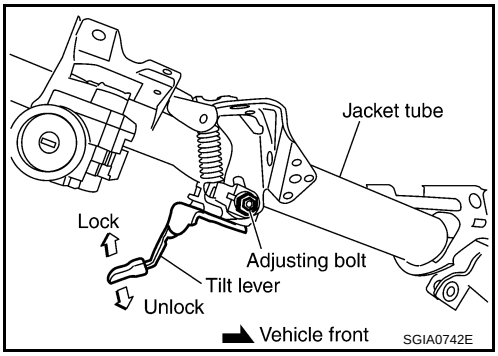


1. Steering column shaft
2. Adjusting bolt
3. Adjusting stopper
4. Jacket tube
5. Steering column shaft lock nut
6. Spring
7. Column mounting bracket
8. Tilt lever stopper
9. Tilt lever
10. Lock nut

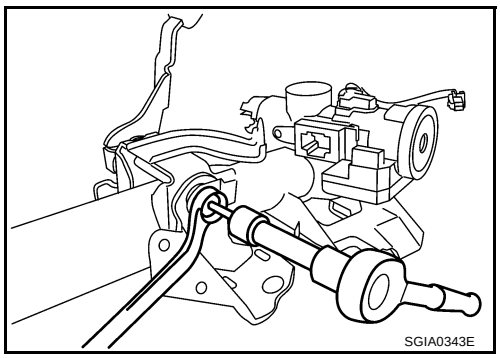
DISASSEMBLY

1. Remove steering column shaft lock nut, then remove steering column shaft from front side of jacket tube.
2. Remove tilt device from jacket tube.
3. Remove lock nut and adjusting stopper according to the following procedure.

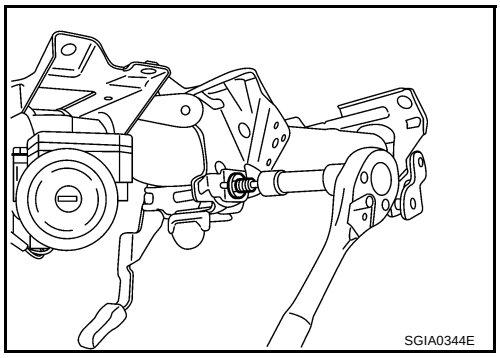
a. Turn tilt lever to the unlock side.
b. Remove spring from column mounting bracket.



c. Lock adjusting bolt, then remove lock nut.



d. Remove adjusting bolt, adjusting stopper, column mounting bracket, tilt lever stopper and tilt lever from jacket tube.



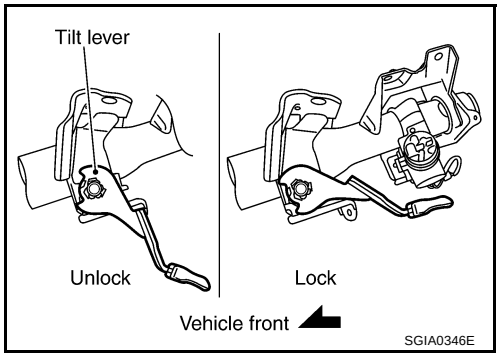
INSPECTION AFTER DISASSEMBLY

- Check if there is something wrong with steering column shaft and bearing. And then if they are damaged, replace with new one.
- Check if there is something wrong with the component of tilt device. And then if it is damaged, replace with new one.

ASSEMBLY

1. Install tilt device to jacket tube. Refer to PS-15, "Disassembly and Assembly" .

   NOTE:
   - Turn tilt lever to unlock side while at work to make it easier.
   - That can avoid column shaft's sudden descent when tilt lever is operated on vehicle.



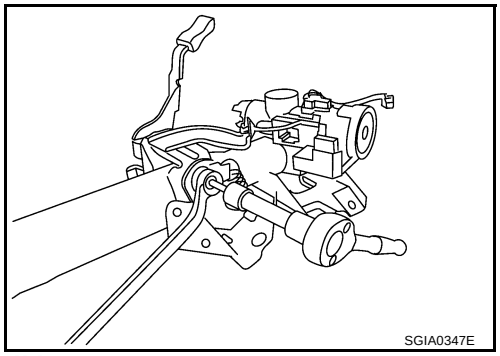
2. When tilt lever is in the locked position (operation range is about 40°), tighten lock nut at the specified torque to make tilt lever locked.

   Tightening torque:

   13.5 - 18.6 N·m (1.4 - 1.8 kg-m, 10 - 13 ft-lb)

3. Apply grease to the part shown in the figure of component. Refer to PS-15, "Disassembly and Assembly" .
4. Install steering column shaft to jacket tube, tighten steering column shaft lock nut at the specified torque.

   Tightening torque : 25 - 34 N·m (2.6 - 3.4 kg-m, 19 - 25 ft-lb)



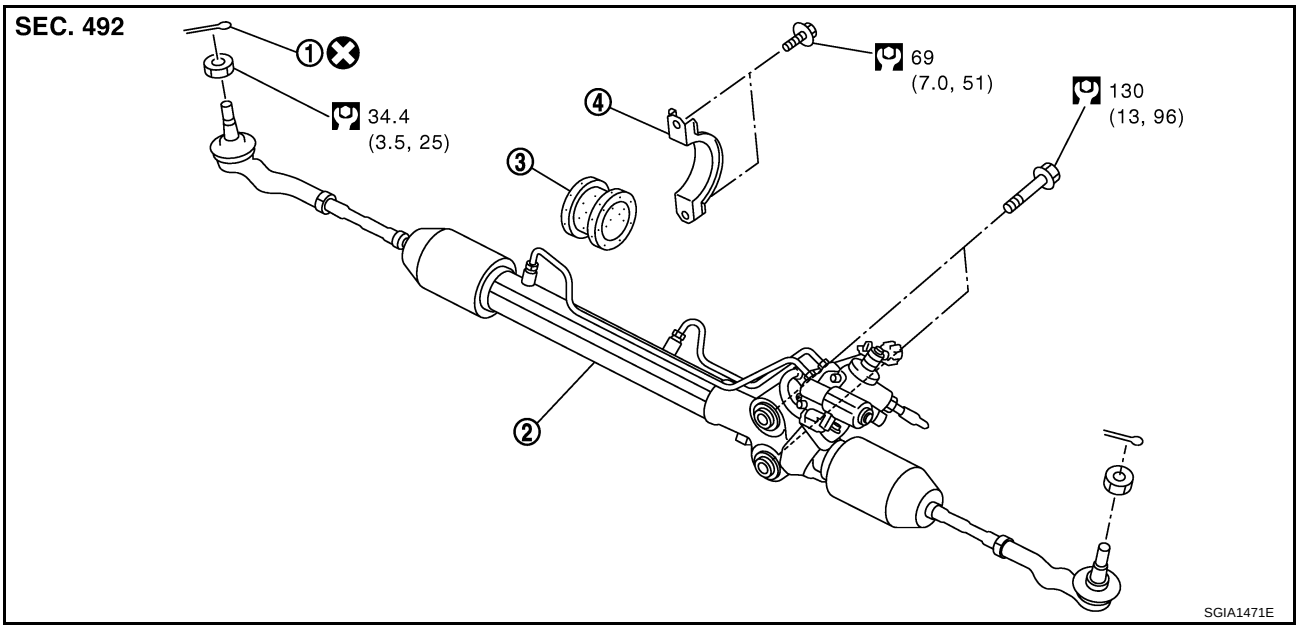
POWER STEERING GEAR AND LINKAGE

PFP:49001

Removal and Installation

NGS0000E

COMPONENTS



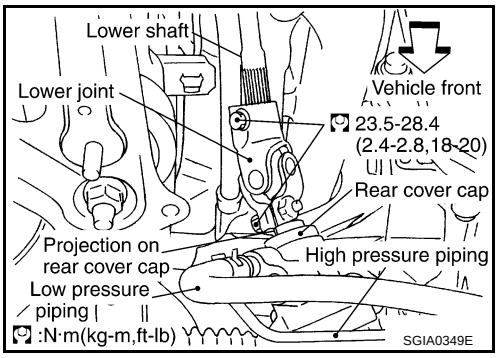
1. Cotter pin
2. Steering gear assembly
3. Rack mounting insulator
4. Rack mounting bracket

Refer to GI-11, "Components" , for the symbols in the figure.

CAUTION:
Spiral cable may snap due to steering operation if steering column is separated from steering gear assembly. Therefore fix steering wheel with a string to avoid turns.

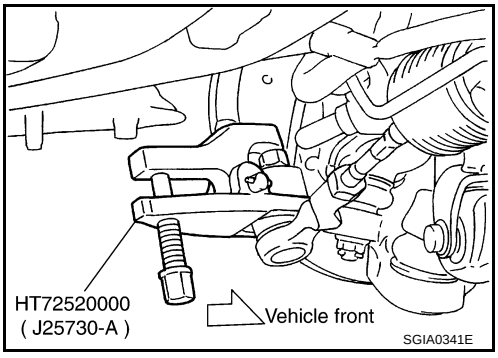
REMOVAL

1. Set wheels in the straight-ahead position.
2. Remove undercover and tires from vehicle with power tool.
3. Remove front crossbar. Refer to FSU-8, "Components" .
4. Confirm slit of lower joints fits with the projection on rear cover cap, furthermore marking position on steering gear assembly nearly fits with the projection on rear cover cap.
5. Remove cotter pin at steering outer socket, then loosen mounting nut.

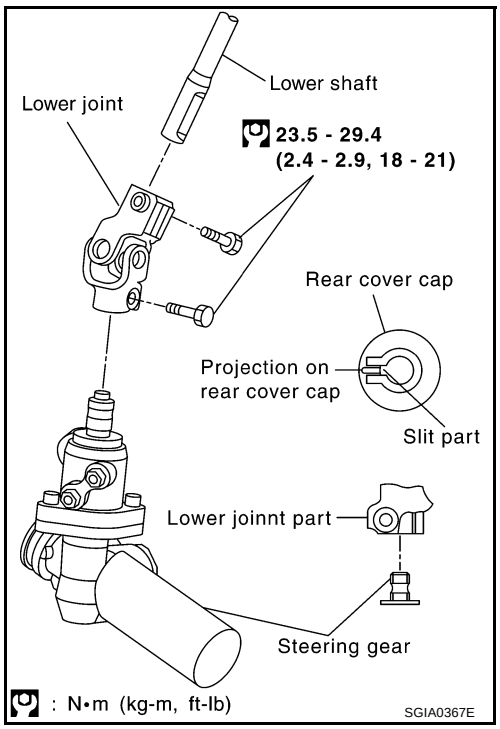


6. Use a ball joint remover (SST) to remove steering outer socket from steering knuckle. Be careful not to damage ball joint boot.

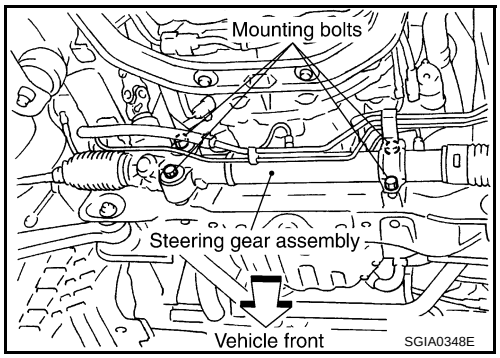
   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (SST) from coming off.
7. Remove oil pipings (high pressure side and low pressure side) from steering gear assembly, then drain fluid from pipings.



8. Loosen bolt on upper yoke of lower joint and remove bolt on lower yoke of joint, then slide lower joint into lower shaft. Separate steering gear assembly from lower shaft.
9. Tack bolt on upper yoke of lower joint, fix lower joint to lower shaft.



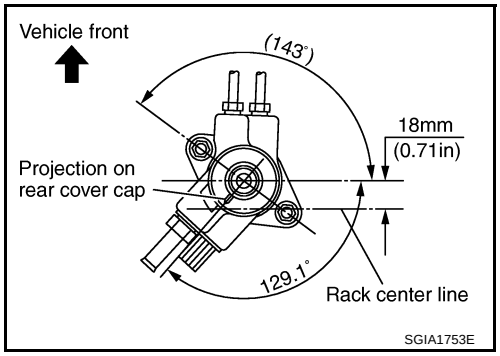
10. Remove the fixing bolt and remove steering gear assembly, rack mounting bracket and insulator from vehicle.



INSTALLATION

- Refer to PS-17, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- After removing/installing or replacing steering components, check wheel alignment. Refer to FSU-6, "Wheel Alignment Inspection" .
- When steering wheel is set in the straight ahead direction, confirm slit of lower joint fits with the projection on rear cover cap, furthermore marking position on steering gear assembly nearly fits with the projection on rear cover cap.
- After installation, bleed air from piping. Refer to PS-6, "Air Bleeding Hydraulic System" .



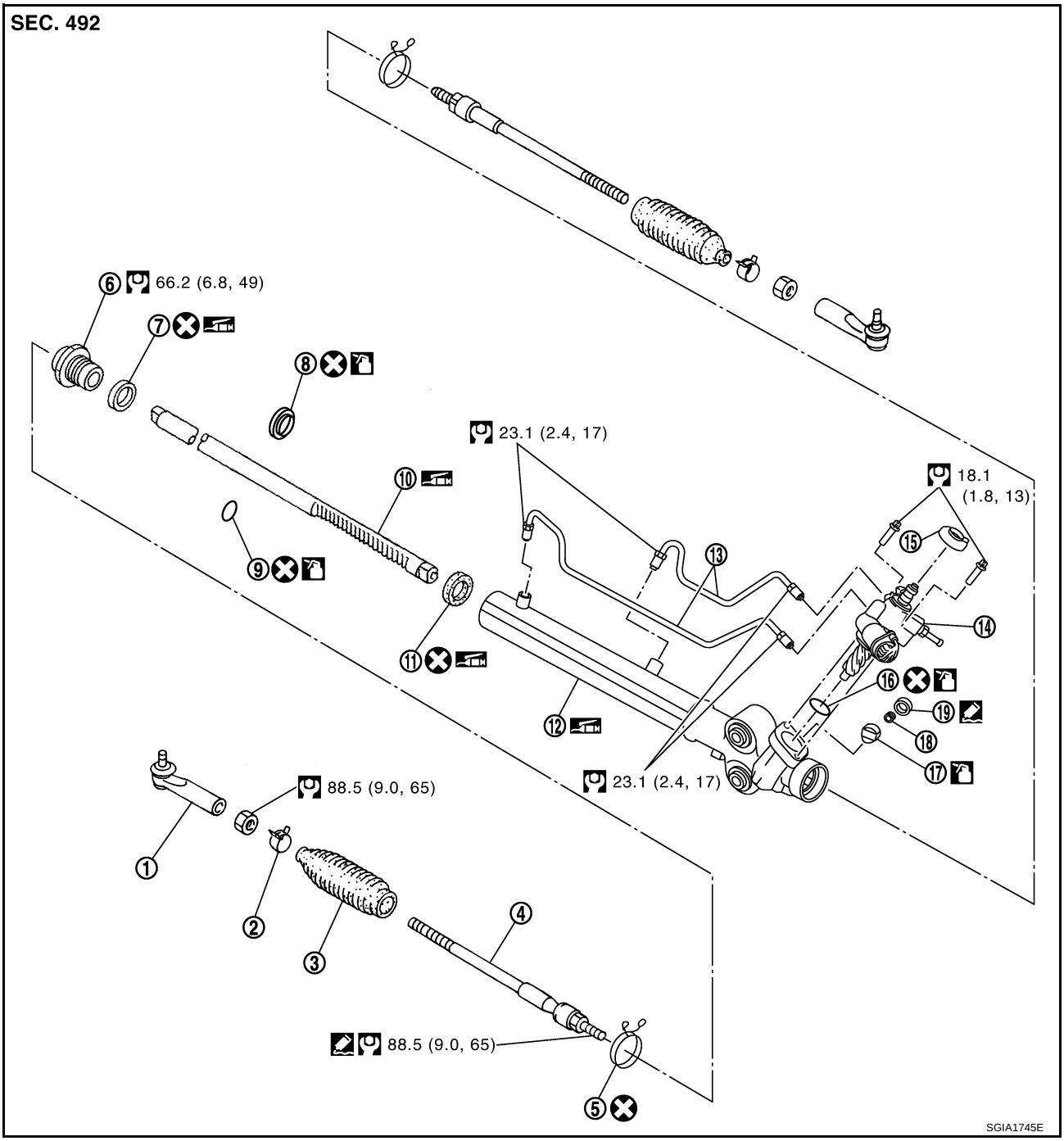
POWER STEERING GEAR

PFP:49001

Disassembly and Assembly

NGS000B1

COMPONENTS



1.	Outer socket	2.	Boot clamp	3.	Boot
4.	Inner socket	5.	Boot clamp	6.	End cover assembly
7.	Rack oil seal	8.	Rack Teflon ring	9.	O-ring A
10.	Rack assembly	11.	Rack oil seal	12.	Gear housing assembly
13.	Cylinder tube	14.	Gear-sub assembly	15.	Rear cover cap
16.	O-ring B	17.	Retainer	18.	Spring
19.	Adjusting screw				

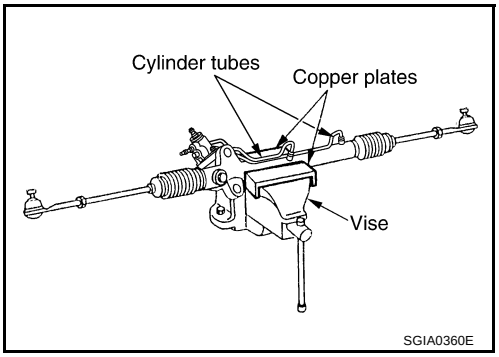
Refer to GI-11, "Components" , and the followings for the symbols in the figure.

: Apply Genuine Thread Locking Sealant, Three Bound 1111B or equivalent.

: Apply multi-purpose grease.
: Apply Genuine NISSAN PSF or equivalent.

CAUTION:

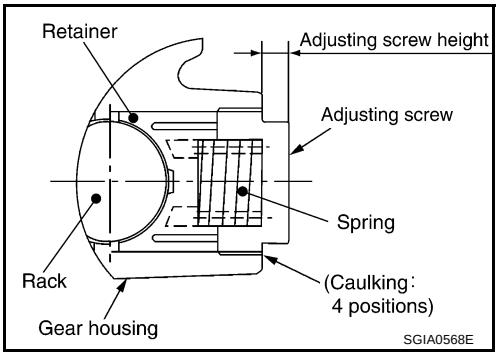
- **Secure steering gear assembly with a vise, using copper plates or something similar to prevent it from being damaged. Do not grip cylinder with a vise.**
- **Before performing disassembly, clean steering gear assembly with kerosene. Be careful not to bring any kerosene into contact with the discharge and return port connectors.**



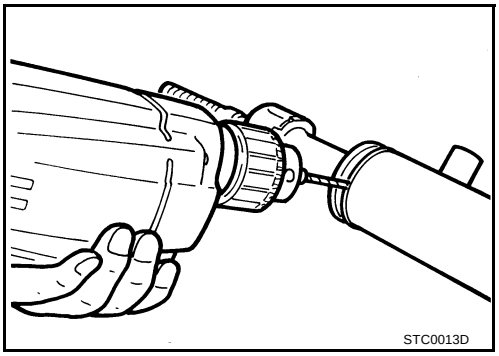
DISASSEMBLY

1. Remove cylinder tubes from gear housing assembly.
2. Remove rear cover cap from gear-sub assembly.
3. Measure adjusting screw height from gear housing assembly, then loosen adjusting screw.

   CAUTION:
   - **Do not turn adjusting screw more than twice.**
   - **Replace steering gear assembly when adjusting screw is removed or more than twice.**
4. Remove fixing bolts of gear-sub assembly, and then remove gear-sub assembly from gear housing assembly.
5. Remove O-ring B from gear housing assembly.
6. Loosen lock nut of outer socket, and remove outer socket.
7. Remove boot clamps of the small diameter side and the large diameter side, then remove boots.



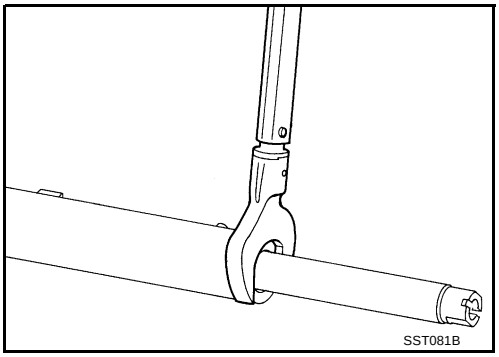
   CAUTION:
   On removing boots, be careful not to damage the inner socket and the gear housing assembly. If they are is damaged, change them to avoid oil leaks.
8. Drill out the clinching part of cylinder outer rim with a 3 mm (0.12 in) drill in 1.5 mm (0.059 in) depth.



9. Remove end cover assembly with a 42 mm (1.65 in) open head (suitable tool).

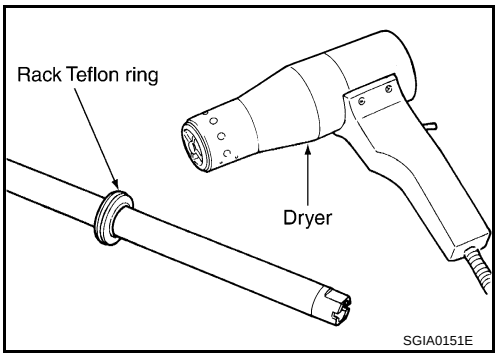
   CAUTION:
   Be careful not to damage rack. If it is damaged, replace rack. Otherwise, oil leaks may result.
10. Pull rack with rack oil seal out of gear housing assembly.

    CAUTION:
    Be careful not to damage cylinder. If it is damaged, replace gear housing assembly. Otherwise, oil leaks may result.



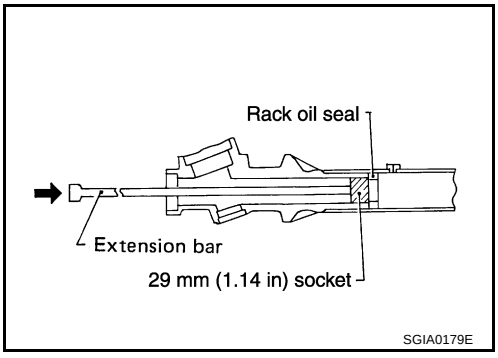
11. Heat rack Teflon ring to approximately 40°C (104°F) with a dryer, then remove it and O-ring A from rack assembly.

CAUTION:
Be careful not to damage rack. If it is damaged, change to a new one to avoid oil leaks.



12. Use a taped 29 mm (1.14 in) socket and an extension bar. Remove rack oil seal from gear housing assembly.

CAUTION:
Be careful not to damage gear housing assembly and cylinder inner wall. If it is damaged, gear housing assembly must be replaced. Otherwise, oil leaks will result.



INSPECTION AFTER DISASSEMBLY

Boot

Check boot for cracks and deformation. Replace it, if necessary.

Rack Assembly

Check rack for damage and wear. Replace it, if necessary.

Gear-sub Assembly

- Check pinion gear for damage or wear. Replace if necessary.
- Rotate pinion and check for torque variation or rattle. Replace if necessary.

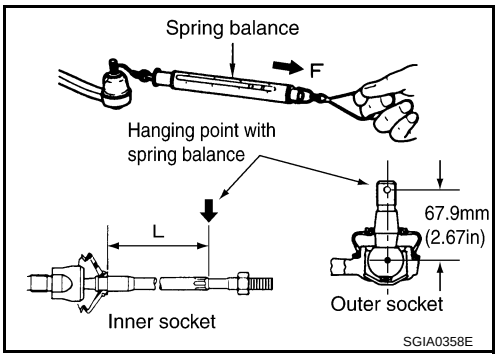
Gear Housing Assembly

Check gear housing assembly for damage and scratches (inner wall). Replace it, if necessary.

Outer Socket and Inner Socket

Swing Torque

- Hook a spring balance at the point shown in the figure. Confirm if the reading is within the specification. When ball stud and inner socket start moving the measured value must be within the specification. If the reading is outside the specification, replace socket.



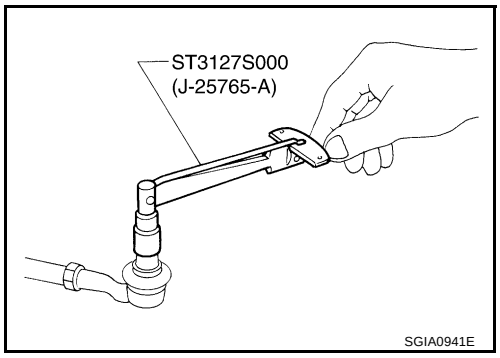
Specified value

Item	Outer socket	Inner socket
Measuring point	Cotter-pin hole of stud	shown as L: 48.5 mm (1.909 in)
Swing torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)	1.0 - 7.8 N·m (0.11 - 0.79 kg-m, 9 - 69 in-lb)
Measuring value	4.42 - 42.7 N (0.5 - 4.4 kg, 1 - 10 lb)	10 - 78 N (1 - 8 kg, 2 - 18 lb)

Rotating Torque

- Using a preload gauge (SST), check if reading is within the value specified below. If the value is outside the standard, replace outer sockets.

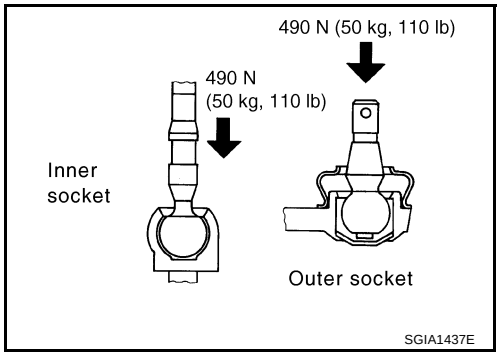
Rotating torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)



Axial End Play

- Apply load of 490 N (50 kg,110 lb) to ball stud axially. Use a dial-gauge to measure the amount of the movement that the stud makes. Check if the reading is within the specified below. If the value is outside the standard, replace outer and inner sockets.

Outer socket	0.5 mm (0.020 in) or less
Inner socket	0.2 mm (0.008 in) or less



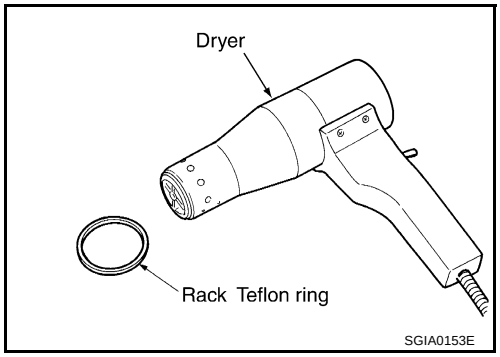
ASSEMBLY

1. Apply recommended fluid to O-ring A. Put an O-ring A into rack Teflon ring.

   NOTE:
   Do not reuse O-ring A.

2. Heat rack Teflon ring to approximately 40°C (104°F) with a dryer. Assemble it to mounting groove of rack.

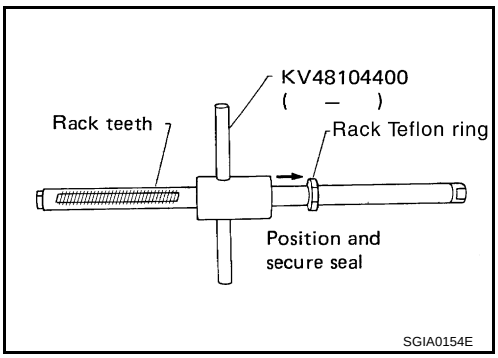
   NOTE:
   Do not reuse rack Teflon ring.

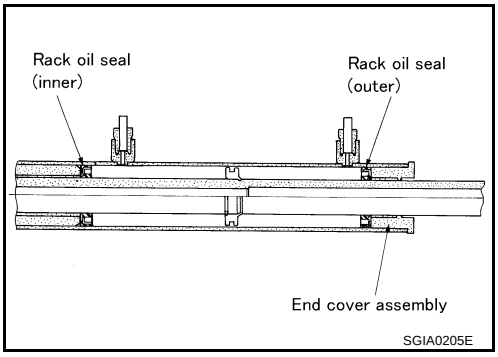


3. To fit rack Teflon ring on rack, use rack Teflon ring installation tool (SST) from tooth side. Compress rim of ring with the tool.
4. Apply Multi-purpose grease or equivalent to rack oil seal. Insert rack oil seal, then insert rack to gear housing assembly.

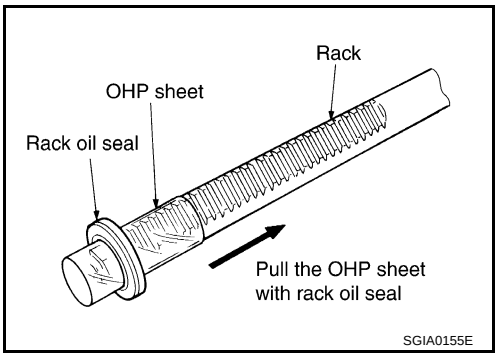
NOTE:
Do not reuse rack oil seal.

CAUTION:
- **When inserting rack, do not damage retainer sliding part. If it is damaged, replace gear housing assembly.**
- **When unstring rack, do not damage cylinder inner wall. If it is damaged, It may cause oil leaks. Replace gear housing assembly.**
- **Attach rack oil seal. Both inner lip and outer lip should face each other.**

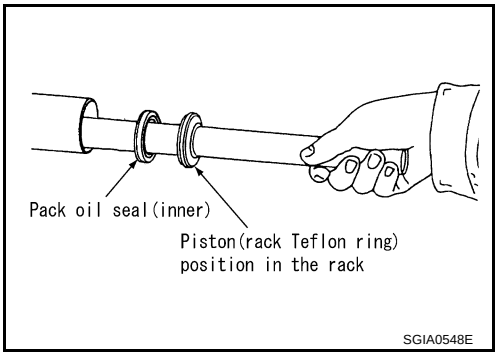




a. To avoid damaging inner rack oil seal, wrap an OHP sheet [approximately. 70 mm (2.76 in) × 100 mm (3.94 in)] around rack tooth. Place oil seal on sheet. Then, pull oil seal along with OHP sheet until they pass the toothed section of rack, then remove it.

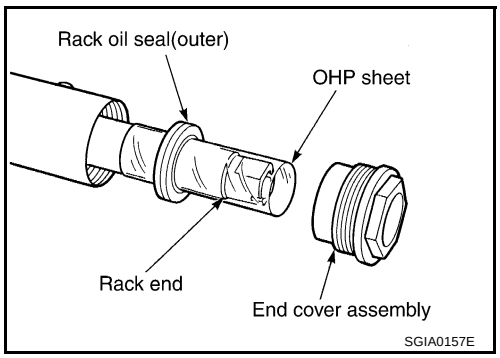


b. Insert rack oil seal (inner) to piston (rack Teflon ring) position and push retainer to adjust screw side with fingers lightly, and then make rack move in gear housing assembly, install rack oil seal (inner) to fit in with gear housing assembly.



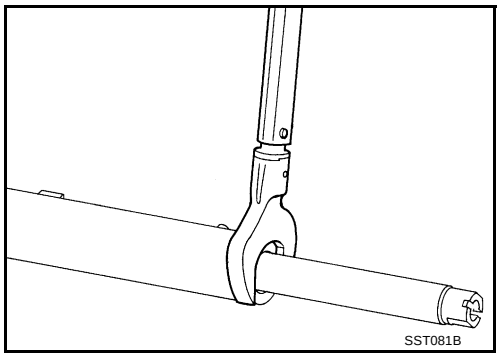
c. When installing outer rack oil seal, cover the end of rack with an OHP sheet [70 mm (2.76 in) × 100 mm (3.94 in)]. It will avoid damaging rack oil seal. Then place oil seal on sheet. Pull rack oil seal along with OHP sheet until they pass rack end. Then remove OHP sheet.

d. Install end cover assembly to rack, move it to gear housing assembly.



5. Using a 42 mm (1.65 in) open head (suitable tool), tighten end cover assembly at the specified torque.

CAUTION:
Do not damage rack surface. If it is damaged, it may cause oil leaks. Replace rack assembly.

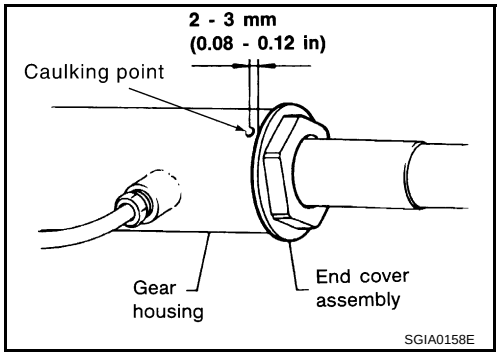


6. After tightening end cover assembly, caulk cylinder at one point as shown in the figure using a punch. This will prevent end cover from getting loose.

7. Apply recommended fluid to O-ring B. Install O-ring B to gear housing assembly.

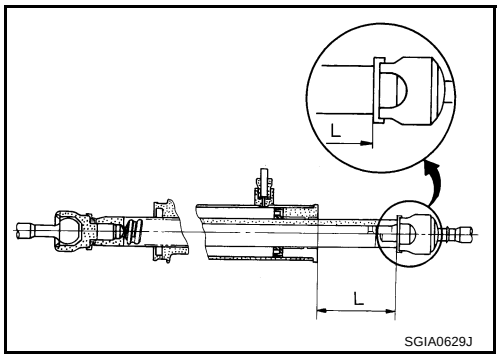
NOTE:
Do not reuse O-ring B.

8. Install gear-sub assembly to gear housing assembly.

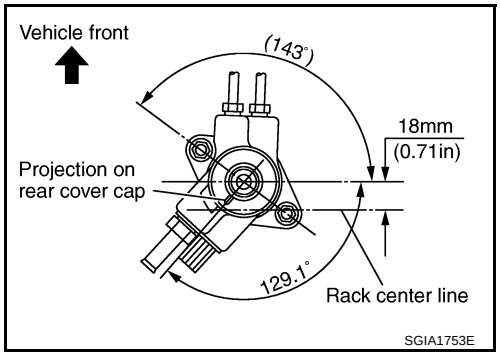


9. Decide neutral position of rack.

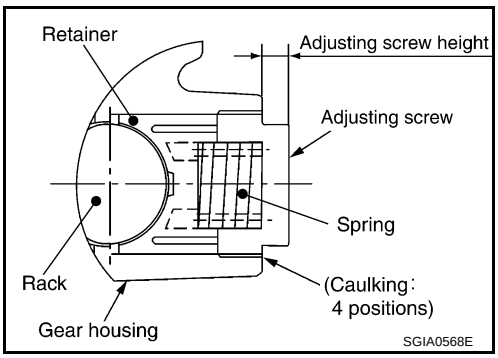
Rack stroke “L” : 64.5 mm (2.539 in)



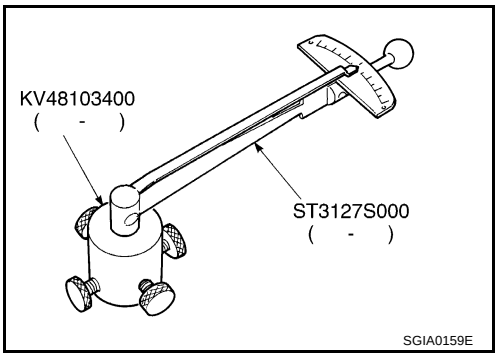
10. Install the projection part (Tip) of rear cover cap to gear-sub assembly as shown in the figure.



11. Apply thread locking adhesive (Three Bond 1111B or equivalent) to the thread of adjusting screw to the adjusting screw height from gear housing assembly. The adjusting screw height is the same as it was measured in the overhaul in advance.
12. Rotate pinion ten times whole range of rack so that parts get to fit with each other.



13. Measure pinion rotating torque within from –180° to + 180° make preload gauge (SST) and torque adapter (SST) in rack neutral position, then hold preload gauge (SST) at maximum torque.
14. After loosening adjusting screw once, tighten it again with torque of 4.9 - 5.9 N·m (0.50 - 0.60 kg-m, 44 - 52 in-lb). After that loosen it within from 20° to 40°.



15. Measure pinion rotating torque with torque adapter (SST) and preload gauge (SST), then confirm whether its reading is within the specified value. If the reading is not within the specified value, readjust screw angle with adjusting screw. Change gear assembly to new one, if the reading is still not within the specified value or the rotating torque of adjusting screw is less than 5 N·m (0.51kg-m, 44 in-lb)

Pinion rotation torque:

Around neutral position (within ±100°)

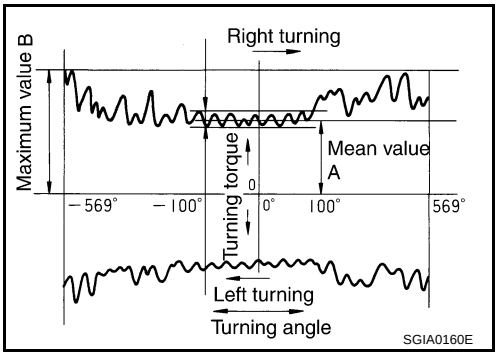
Average "A":

1.71 - 2.34 N·m (0.18 - 0.23 kg-m, 16 - 20 in-lb)

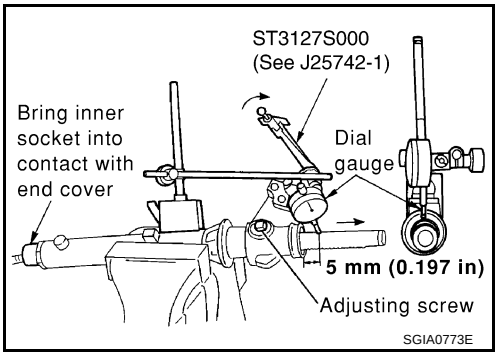
Other than above (more than ±100°)

Maximum variation "B":

2.3 N·m (0.23 kg-m, 20 in-lb)



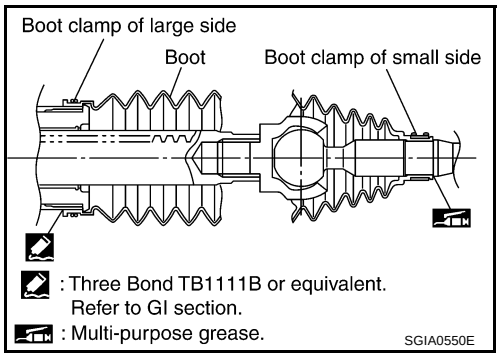
16. Turn pinion fully to the end of the left with tie-rods to rack.
17. Set dial gauge to rack as shown in the figure. Measure vertical movement of rack when pinion is turned counterclockwise with torque of 19.6 N·m (2.0 kg-m, 14 ft-lb). Check reading is within the specified value. If reading is outside of the specification, readjust screw angle with adjusting screw. If reading is still outside of specification, or if the rotating torque of adjusting screw is less than 5 N·m (0.51 kg-m, 44 in-lb), replace steering gear assembly.



Specified value		
Amount of vertical movement with rack	Less than 0.265 mm (0.0104 in)	
Measuring point	Axial direction of rack	5 mm (0.20 in) away from end of gear housing
	Radius direction of rack	Shaft direction of adjusting screw

18. Install large-diameter side of boot to gear housing assembly.
19. Install small-diameter side of boot to the mounting groove of inner socket boot.
20. Install boot clamp to the small-diameter side of boot.
21. Install boot clamp to the large-diameter side of boot.

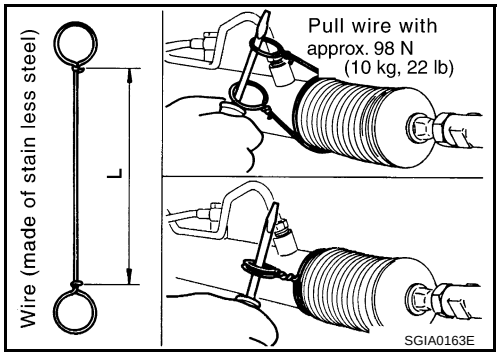
NOTE:
Do not reuse boot clamp.



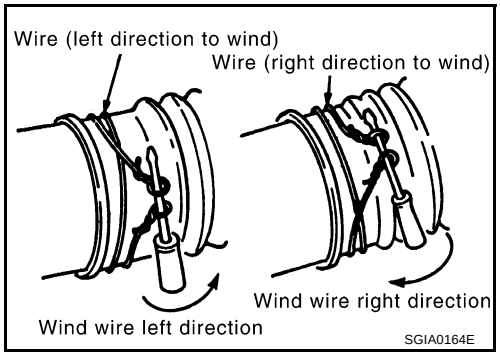
a. Tighten large-diameter side of RH/LH boot with boot clamp (stainless wire).

Wire length "L" : 370 mm (14.57 in)

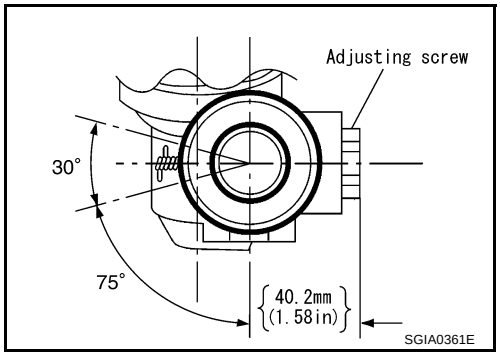
b. After wrapping clamp around boot groove for two turns, insert screwdriver in loop on both ends of wire. Twist 4 to 4.5 turns while pulling with a force of approx. 98 N (10 kg, 22 lb).



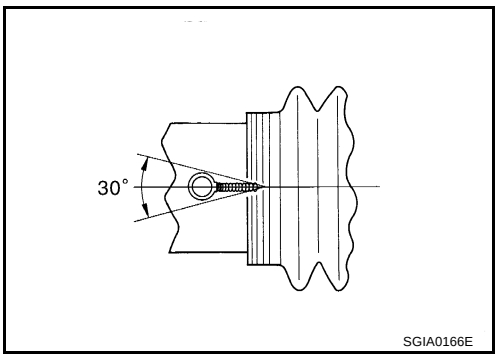
c. Twist boot clamp as shown in the figure, pay attention to relationship between winding and twisting directions.



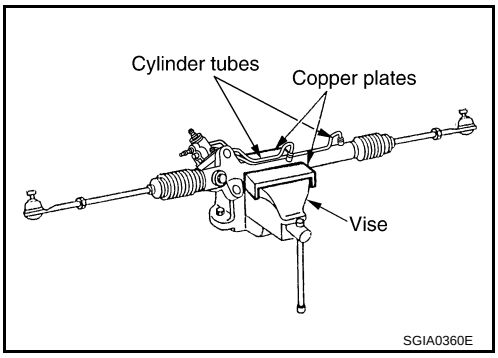
d. Confirm the twisted point with clamp faces in the opposite direction to adjusting screw within 30° as shown in the figure.



e. After twisting wire 4 to 4.5 turns, bend cut end of wire. Cut end of wire should not touch boot. Be sure wire end is at least 5 mm (0.20 in) away from clearance for tube.



22. Install cylinder tubes to gear housing assembly.

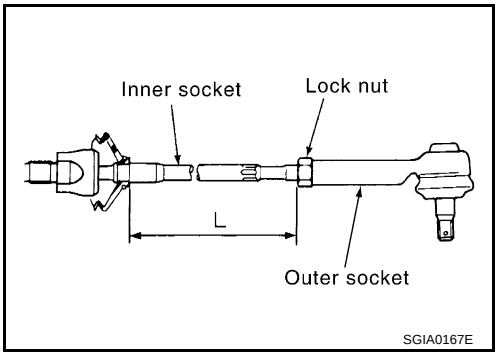


23. Tighten lightly inner socket in specified length “L”, then tighten lock nut at specified torque. Refer to PS-19, "COMPONENTS" . Reconfirm if inner socket length is within limit of specified length “L”.

Inner socket length “L” : 106.3 mm (4.19 in)

CAUTION:

Perform toe-in adjustment after this procedure. Length achieved after toe-in adjustment is not necessarily value given here.



POWER STEERING OIL PUMP

PFP:49110

On-Vehicle Inspection and Service

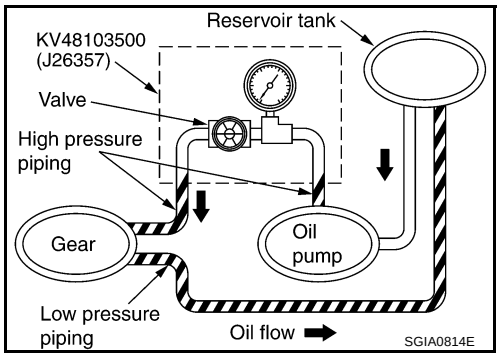
NGS0000H

CHECKING RELIEF OIL PRESSURE

CAUTION:

Before starting work, confirm belt tension is proper.

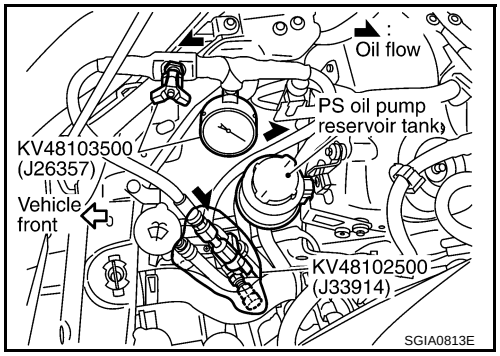
1. Connect oil pressure gauge (SST) and oil pressure gauge adapter (SST) between oil pump discharge connector and high pressure hose and then bleed air from the hydraulic circuit.



2. Start engine. Allow engine to run until tank temperature reaches 50 to 80°C (122 to 176°F).

   CAUTION:

   - **Warm up engine with shut-off valve fully opened. If engine is started with shut-off valve closed, fluid pressure in power steering pump increases to maximum. This will raise fluid temperature excessively.**
   - **Be careful not to contact hose with belt when engine is started.**



3. With engine at idle, close shut-off valve and read the relief oil pressure.

   Relief oil pressure:

   9,600 - 10,200 kPa (97.9 - 104 kg/cm^2 , 1,392 - 1,479 psi)

   CAUTION:

   Do not close shut-off valve of pressure gauge for more than 10 seconds.

4. After measurement, open shut-off valve slowly.
   - If relief oil pressure is outside the specification, disassemble and repair oil pump. Refer to PS-29, "Disassembly and Assembly" .
5. After inspection, disconnect oil pressure gauge (SST) and oil pressure gauge adapter (SST) from hydraulic circuit, connect oil pump discharge connector and high pressure hose. Add fluid and bleed air from hydraulic circuit thoroughly. Refer to PS-6, "Air Bleeding Hydraulic System" .

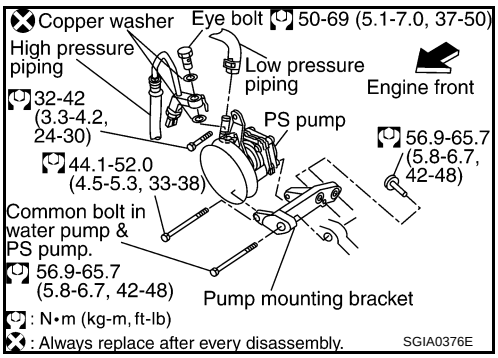
Removal and Installation

NGS0000I

REMOVAL

1. Remove engine cover.
2. Remove air cleaner box.
3. Drain water from radiator upper tank, then remove radiator upper hose.
4. Remove radiator fan shroud. Refer to CO-13, "Removal and Installation" .

5. Loosen idler pulley, then remove belt.
6. Drain power steering fluid from reservoir tank.
7. Remove piping of high pressure and low pressure (drain fluid from their pipings)
8. Remove bolt common to water pump and power steering pump.
9. Remove bolt then remove power steering pump.



INSTALLATION

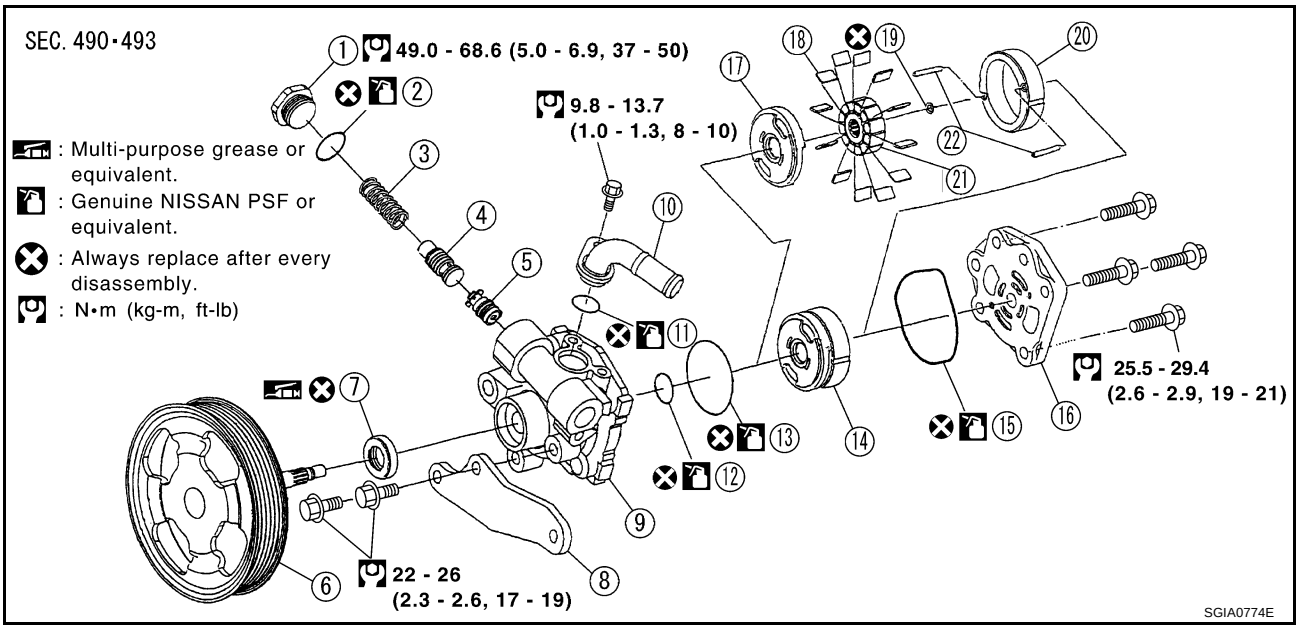
Refer to PS-33, "HYDRAULIC LINE" for tightening torque. Install in the reverse order of removal.

- After installation, adjust belt tension. Refer to EM-12, "DRIVE BELTS" .
- After installation, bleed air. Refer to PS-6, "Air Bleeding Hydraulic System" .

Disassembly and Assembly

NGS0000J

COMPONENTS

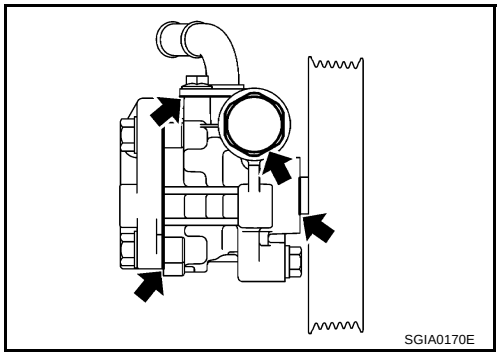


1. Plug
2. O-ring D
3. Flow control valve spring
4. Relief valve assembly
5. Flow control valve assembly
6. Shaft kit
7. Oil seal
8. Bracket
9. Body assembly
10. Suction connector assembly
11. O-ring E
12. O-ring C
13. O-ring B
14. Cartridge assembly
15. O-ring A
16. Cover assembly
17. Side plate
18. Vane
19. Rotor snap ring
20. Cam ring
21. Rotor
22. Dowel pin

INSPECTION BEFORE DISASSEMBLY

Disassemble power steering oil pump only if the following items are found.

- Oil leakage from oil pump
- Deformed or damaged pulley
- Poor performance



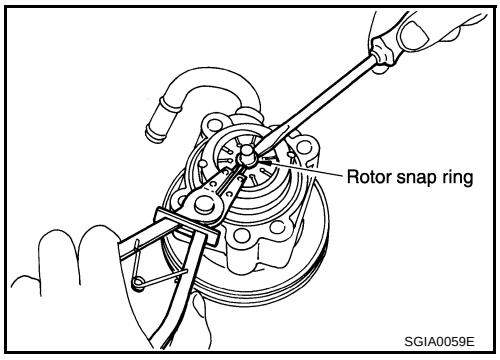
DISASSEMBLY

NOTE:
Fix oil pump in vise as the occasion demands.

CAUTION:
When retaining drive shaft in a vise, always use copper or aluminium plates between vise and shaft.

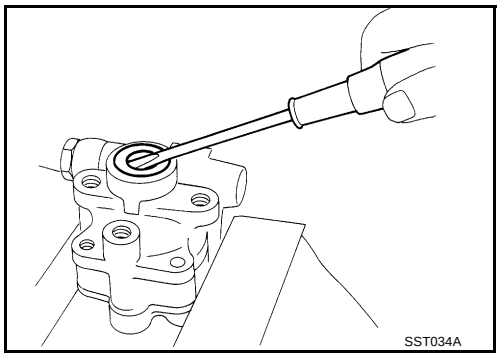
1. Unscrew two front bracket bolts and remove bracket from body assembly.
2. Unscrew four cover assembly bolts and remove cover assembly from body assembly.
3. Remove O-ring A from body assembly.
4. Remove rotor snap ring with snap ring pliers, and remove shaft kit from body assembly.

   CAUTION:
   When removing rotor snap ring, be careful not to damage pulley shaft of shaft kit.



5. Using a screwdriver, remove oil seal for body assembly.
6. Remove cam ring, rotor, vane, side plate, O-ring B and O-ring C from body assembly.
7. Remove plug, then remove O-ring D, flow control valve spring, relief valve assembly and flow control value assembly from body assembly.

   CAUTION:
   Be careful not to drop and deform relief valve assembly and flow control valve assembly.
8. Remove fixing bolt of suction connector assembly, then remove suction connector assembly and O-ring E from body assembly.



INSPECTION AFTER DISASSEMBLY

Body Assembly and Cover Assembly Inspection

- Check body assembly and cover assembly for damage. If any damage is found, replace with new part for cover assembly, and replace with new power steering pump assembly for body assembly.

Cartridge Assembly Inspection

- Check cam ring, side plate, rotor and vane for damage. If any damage is found, replace cartridge assembly with new one.

Relief Valve Assembly Inspection

- Check relief valve assembly for damage. If any damage is found, replace it with new one.

Flow Control Valve Assembly Inspection

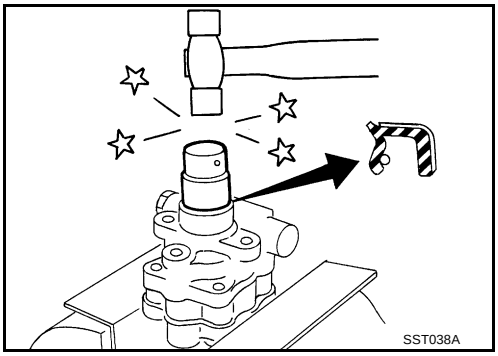
- Check flow control valve assembly for damage. If any damage is found, replace it with new one.

ASSEMBLY

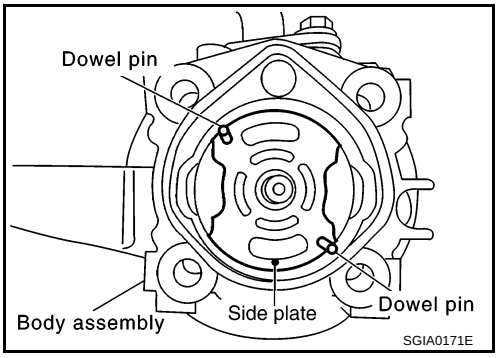
NOTE:
Fix oil pump in vise as occasion demands.

CAUTION:
When retaining drive shaft in a vise, always use copper or aluminium plates between vise and shaft.

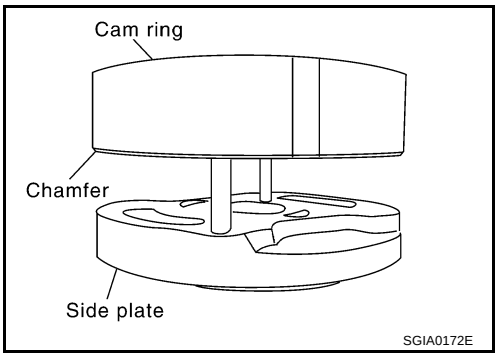
1. Apply a coat of Multi-purpose grease or equivalent to oil seal lip and to the circumference of oil seal. Using proper tool such as hand press machine, install it to the body assembly.
   NOTE:
   Do not reuse oil seal.
2. Install shaft kit to body assembly.
3. Apply recommended fluid to O-ring B and O-ring C, then install O-ring B and O-ring C to body assembly.
   NOTE:
   Do not reuse O-ring B and O-ring C.

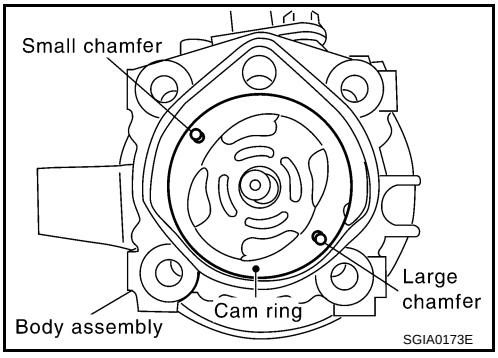


4. Set dowel pin at the illustration position (The position is the same regardless of right or left direction), and install side plate to body assembly.



5. Install cam ring on side plate as follows;
   - Turn chamfered edge side of cam ring to side plate as shown in the figure.
   - Position large chamfered side of cam ring as shown in the figure.

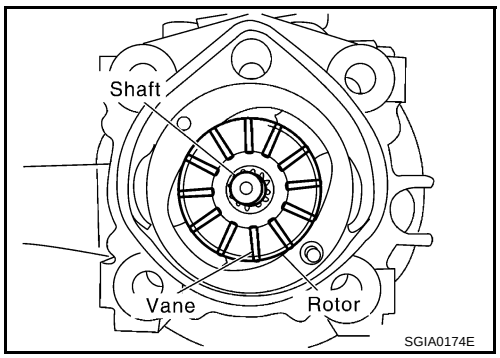




6. Install rotor to shaft of shaft kit (rotor direction is the same regardless of the front and back).
7. Install vane to rotor (vane direction is the same regardless of inside and outside).
8. Install rotor snap ring to shaft of shaft kit.

   NOTE:
   - Do not reuse rotor snap ring.

   CAUTION:
   Be careful not to damage rotor and pulley shaft.



9. Apply recommended fluid to O-ring A, then install O-ring A to body assembly.

   NOTE:
   Do not reuse O-ring A.
10. Attach cover assembly to body assembly and tighten fixing bolts diagonally at the specified torque.
11. Install flow control valve assembly, relief valve assembly and flow control valve spring to body assembly.
12. Apply recommended fluid to O-ring D and install to plug, then tighten plug at the specified torque.

    NOTE:
    Do not reuse O-ring D.
13. Apply recommended fluid to O-ring E and install to suction connector assembly, then install suction connector to body assembly.

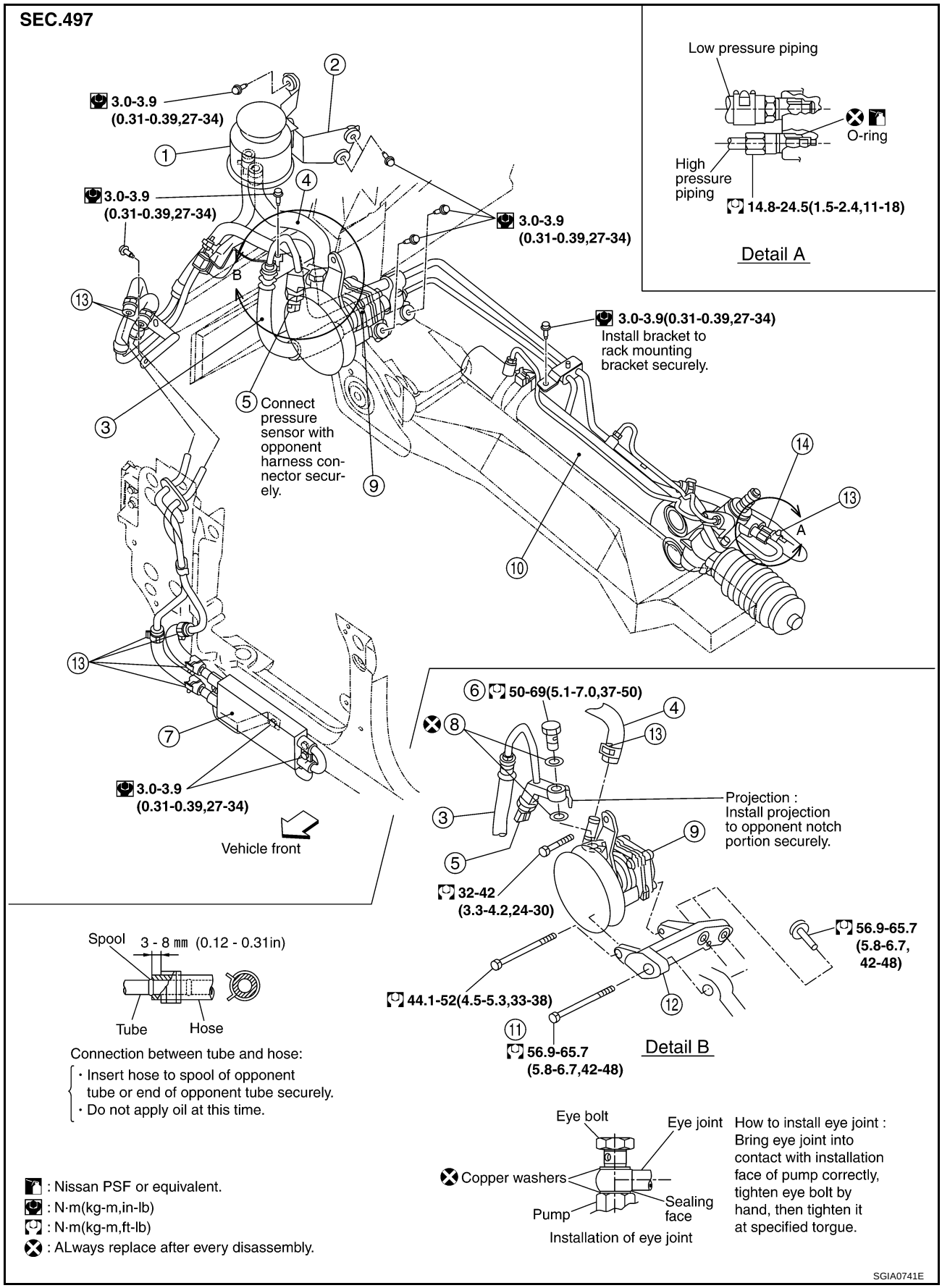
    NOTE:
    Do not reuse O-ring E.
14. Install bracket to body assembly, and tighten mounting bolts at the specified torque.

HYDRAULIC LINE

PFP:49721

Removal and Installation

NGS0000K



1. Reservoir tank
2. Reservoir tank bracket
3. Hose & tube assembly
4. Suction hose
5. Oil pressure sensor
6. Eye bolt
7. Oil cooler
8. Copper washer
9. Power steering oil pump
10. Steering gear assembly
11. Common bolt
12. Oil pump bracket
13. Clip

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Steering Wheel

NGS0000L

End play of the axle direction for steering wheel	0 mm (0 in)
Steering wheel play on the outer circumference	0 - 35 mm (0 - 1.38 in) or less

Steering Angle

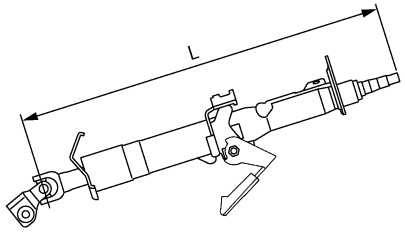
NGS0000M

Inner wheel Degree minute (Decimal degree)	Minimum	35° 55' (35.9°)
	Nominal	38° 55' (38.9°)
	Maximum	39° 55' (39.9°)
Outer wheel Degree minute (Decimal degree)	Nominal	30° 40' (30.7°)

Steering Column

NGS0000N

Steering column length “L”	548 mm (21.57 in)

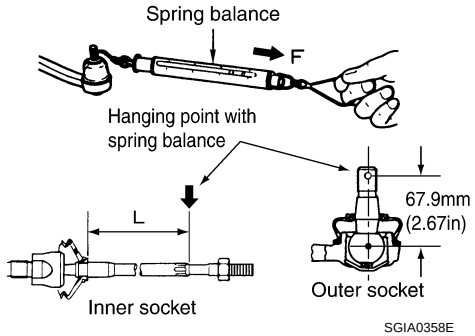


SGIA0306J

Steering Outer Socket and Inner Socket

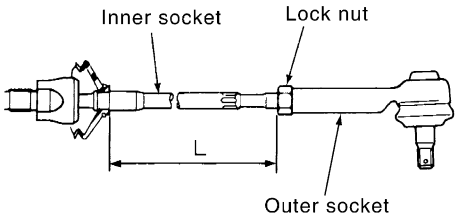
NGS0000O

Steering gear type		PR26AF
Outer socket ball joint outer socket	Swinging torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)
	Measurement on spring balance ● Measuring point: stud cotter pin hole	4.42 - 42.7 N (0.5 - 4.4 kg, 1 - 10 lb)
	Rotating torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)
	Axial end play	0.5 mm (0.020 in) or less
Inner socket ball joint inner socket	Swinging torque	1.0 - 7.8 N·m (0.11 - 0.79 kg-m, 9 - 69 in-lb)
	Measurement on spring balance ● Measuring point: L mark see below, L=48.5 mm (1.91 in).	10 - 78 N (1 - 8 kg, 2 - 18 lb)
	Axial end play	0.2 mm (0.008 in) or less



SGIA0358E

Inner socket length “L”	106.3 mm (4.19 in)

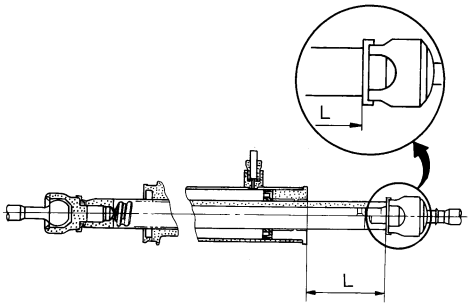


SGIA0167E

Steering Gear

NGS0000P

Steering gear model	PR26AF
Rack neutral position, dimension “L” (rack stroke)	64.5 mm (2.539 in)



SGIA0629J

Oil Pump

NGS0000Q

Oil pump relief hydraulic pressure	9,600 - 10,200 kPa (97.9 - 104 kg/cm^2 , 1,392 - 1,479 psi)

Steering Fluid

NGS0000R

Fluid capacity	Approx. 1.0 ℓ (1-1/8 US qt, 7/8 Imp qt)

SECTION RAX
REAR AXLE

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PRECAUTIONS

PFP:00001

Caution

NDS0000T

Observe the following precautions when disassembling and servicing drive shaft.

- Joint sub-assembly does not disassemble because it is non- overhaul parts.
- Perform work in a location which is as dust-free as possible.
- Before disassembling and servicing, clean the outside of parts.
- Prevention of the entry of foreign objects must be taken into account during disassembly of the service location.
- Disassembled parts must be carefully reassembled in the correct order. If work is interrupted, a clean cover must be placed over parts.
- Paper shop cloths must be used. Fabric shop cloths must not be used because of the danger of lint adhering to parts.
- Disassembled parts (except for rubber parts) should be cleaned with kerosene which shall be removed by blowing with air or wiping with paper shop cloths.

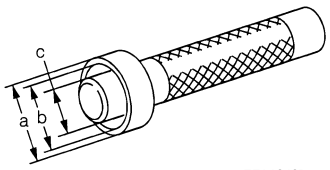
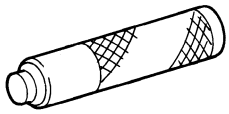
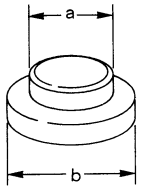
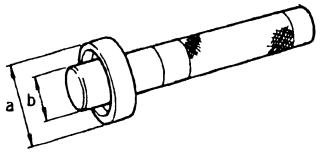
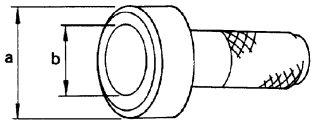
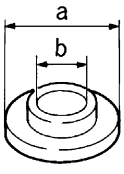
PREPARATION

PFP:00002

Special Service Tools

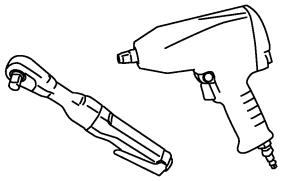
NDS0000U

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST33220000 (—) Drift a: 37 mm (1.46 in) dia. b: 31 mm (1.22 in) dia. c: 22 mm (0.87 in) dia.	 ZZA1046D	● Removing wheel hub ● Removing wheel bearing outer side inner race ● Inspection of wheel bearing rotating torque
ST33251000 (—)	 ZZA0982D	Installing wheel hub
ST35300000 (—) Drift a: 45 mm (1.77 in) dia. b: 59 mm (2.32 in) dia.	 ZZA0881D	● Installing wheel hub ● Inspection of wheel bearing rotating torque
KV40100900 (—) Drift a: 52 mm (2.05 in) dia. b: —	 ZZA0539D	Wheel bearing rotating torque inspection
KV38100500 (—) Drift a: 80 mm (3.15 in) dia. b: 60 mm (2.36 in) dia.	 ZZA0701D	Installing drive shaft plug
KV38102200 (—) Drift a: 90 mm (3.54 in) dia. b: 31 mm (1.22 in) dia.	 ZZA0920D	Installing drive shaft plug

Commercial Service Tools

NDS0000V

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NDS0000W

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			—	RAX-12	—	RAX-6	—	NVH in PR section.	NVH in RFD section.	NVH in RAX and RSU sections.	Refer to REAR AXLE in this chart.	NVH in WT section.	NVH in WT section.	Refer to DRIVE SHAFT in this chart.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Excessive joint angle	Joint sliding resistance	Imbalance	Improper installation, looseness	Parts interference	PROPELLER SHAFT	DIFFERENTIAL	REAR AXLE AND REAR SUSPENSION	REAR AXLE	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	DRIVE SHAFT	Noise	×	×				×	×	×	×	×	×		×	×
		Shake	×		×			×		×	×	×	×		×	×
	REAR AXLE	Noise				×	×	×	×	×		×	×	×	×	×
		Shake				×	×	×		×		×	×	×	×	×
		Vibration				×	×	×		×		×		×		×
		Shimmy				×	×			×		×	×		×	×
		Judder				×				×		×	×		×	×
		Poor quality ride or handling				×	×			×		×	×			

×: Applicable

WHEEL HUB

PFP:43202

On-Vehicle Inspection

NDS0000X

Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

WHEEL BEARING INSPECTION

- Move wheel hub in the axial direction by hand. Make sure there is no looseness of wheel bearing.

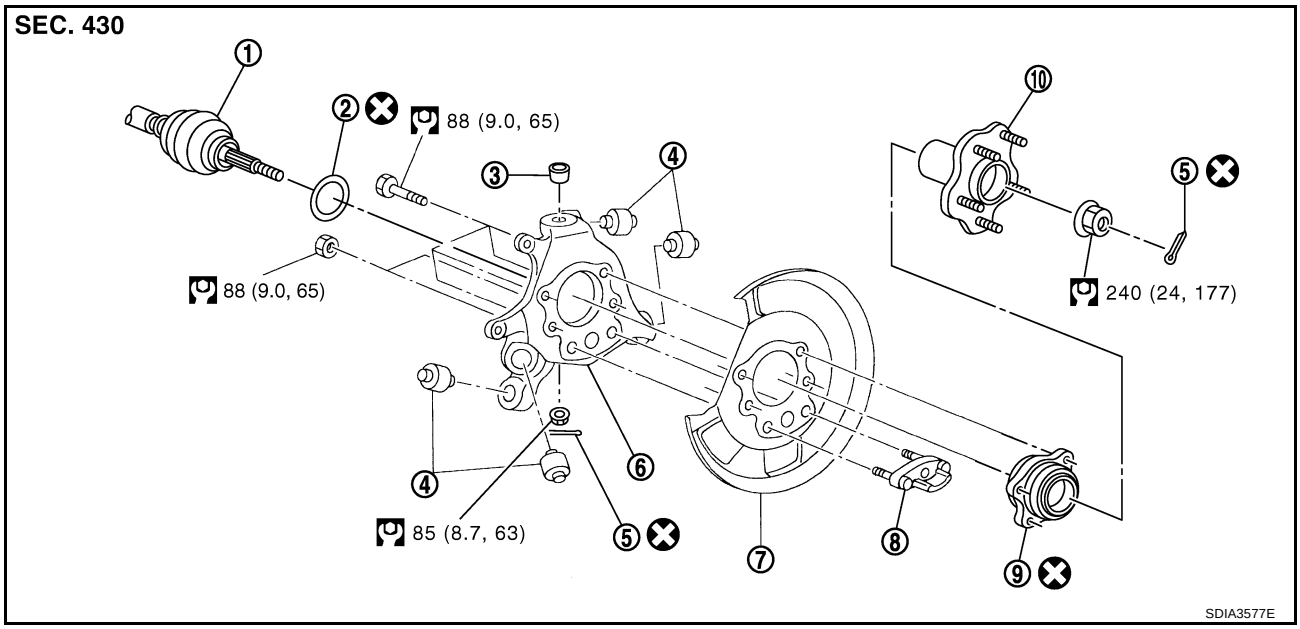
  Axial end play : 0.05 mm (0.002 in) or less

- Rotate wheel hub and make sure there is no unusual noise or other irregular conditions. If there are any irregular conditions, replace wheel bearings.

Removal and Installation

NDS0000Y

COMPONENT



1. Drive shaft
2. Dust shield
3. Ball seat
4. Bushing
5. Cotter pin
6. Axle housing
7. Back plate
8. Anchor block
9. Wheel bearing
10. Wheel hub

Refer to GI-11, "Components" , for the symbols in the figure.

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove cotter pin. Then remove lock nut from drive shaft.
3. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-39, "REAR DISC BRAKE" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
4. Remove disc rotor and remove parking cable and parking brake shoe from back plate. Refer to PB-4, "PARKING BRAKE CONTROL" , PB-5, "PARKING BRAKE SHOE" .
5. Remove fixing bolts and nuts in axle side of radius rod, front lower link with power tool.
6. Remove fixing bolt and nut in axle side of rear lower link with power tool. Then remove coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
7. Remove fixing bolt and nut in axle side of shock absorber with power tool.
8. Using a puller (suitable tool), remove axle from drive shaft.

   CAUTION:
   - **When removing axle, do not apply an excessive angle to drive shaft joint. Also be careful not to excessively extend slide joint.**

- **Do not allow drive shaft to hang down without support for counter shaft, wheel joints, and other parts.**

9. Remove suspension arm and cotter pin at axle, then loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove suspension arm from axle. Be careful not to damage ball joint boot.

CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.

INSPECTION AFTER REMOVAL

Ball Joint Inspection

- Check for boot breakage, axial looseness, and torque of suspension arm ball joint. Refer to RSU-11, "SUSPENSION ARM" .

INSTALLATION

- Refer to RAX-6, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

Disassembly and Assembly

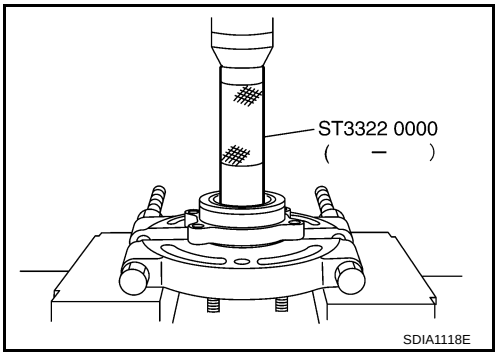
NDS0000Z

DISASSEMBLY

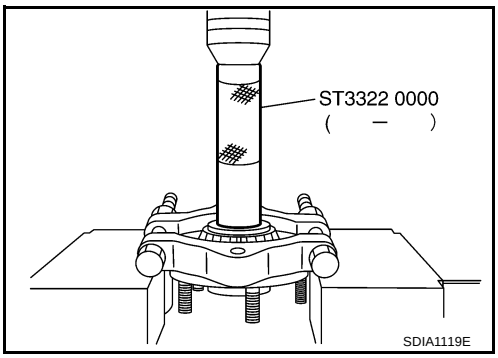
Wheel Bearing

CAUTION:
Do not disassemble if wheel bearing has no trouble.

1. Remove wheel bearing fixing bolts and anchor block fixing nuts, and remove wheel hub and bearing assembly, back plate and anchor block from axle.
2. Using a drift (SST) and a puller (suitable tool), press wheel hub out to remove from wheel bearing.

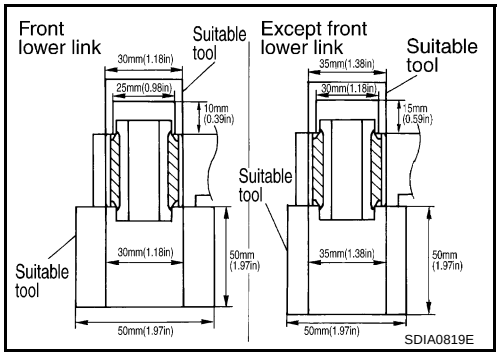


3. Using a drift (SST) and a puller (suitable tool), press wheel bearing outer side inner race out to remove from wheel hub.



Bushing

- Using a suitable drift, remove each bushing from axle.



INSPECTION AFTER DISASSEMBLY

Check for deformity, cracks and damage of each parts, replace if necessary.

Wheel Hub

- Inspect wheel hub for deformation, cracks, and other damage. If any irregular conditions are found, replace wheel hub.

Axle

- Inspect axle for deformation, cracks, and other damage. If any irregular conditions are found, replace axle.

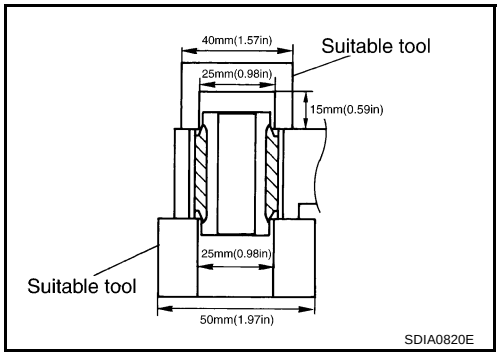
Back Plate

- Inspect back plate for deformation, cracks, and other damage. If any irregular conditions are found, replace back plate.

ASSEMBLY

Bushing

- Using a suitable drift to install each bushing onto axle.



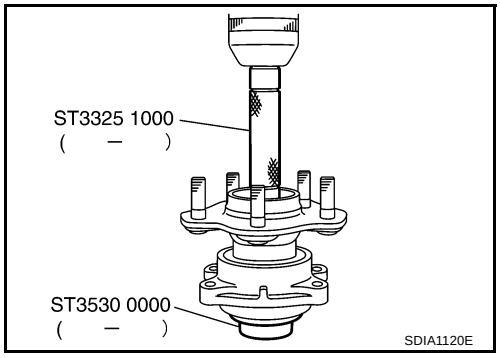
Wheel Bearing

1. Press fit a wheel hub into wheel bearing with a drift (SST).

   CAUTION:

   - **Press fit a drift (SST) while holding it against wheel bearing inner side inner race.**
   - **Wheel bearing cannot be reused. Do not attempt to reuse it.**

   NOTE:
   Final press load guideline 49,033 N (5,000 kg, 11,000 lb)
2. Install back plate and wheel hub and bearing assembly.
3. Install anchor block onto axle.



INSPECTION AFTER ASSEMBLY

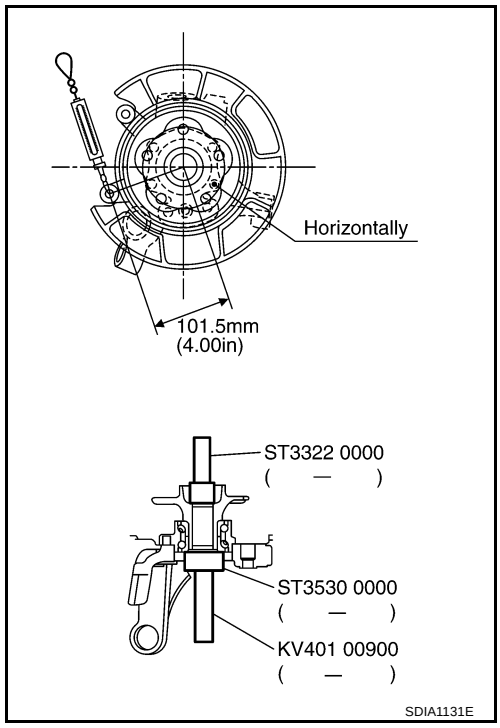
1. With wheel bearing pressed into axle housing, apply 49,033 N (5,000 kg, 11,000 lb) to wheel hub and rotate both clockwise and counterclockwise 10 times to minimize resistance.
2. Attach spring balance in the position shown in illustration and pull at a rate of 10 ± 2 rpm to measure rotating torque.

Rotating torque:

Less than 1.88 N·m (0.19 kg-m, 17 in-lb)

Spring balance reading:

Less than 18.5 N (1.89 kg, 4.16 lb)



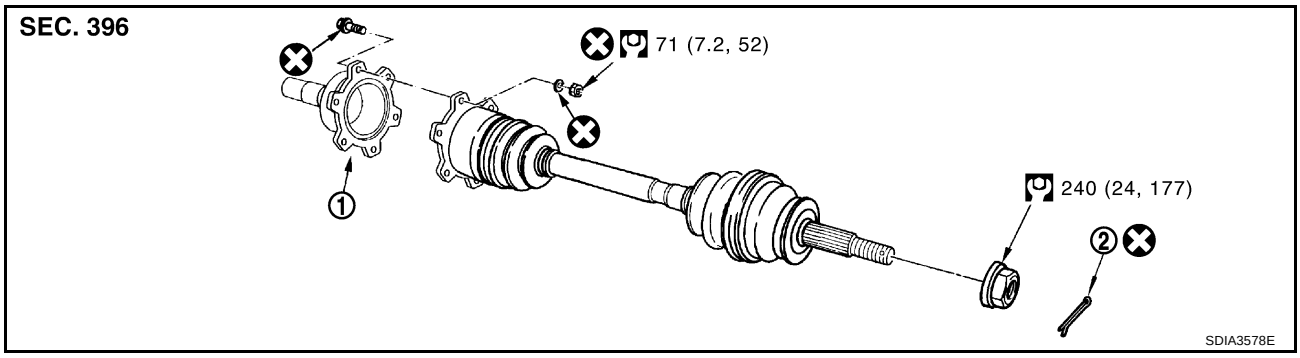
REAR DRIVE SHAFT

PFP:39600

Removal and Installation

NDS00010

COMPONENTS



1. Side flange
2. Cotter pin

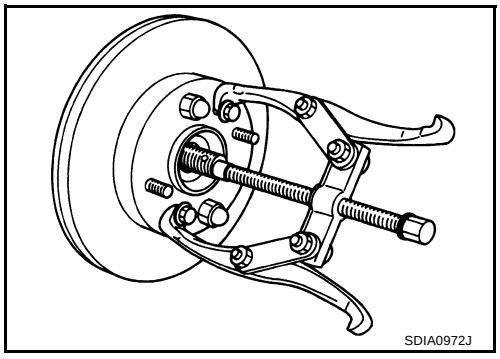
Refer to GI-11, "Components" , for the symbols in the figure.

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove cotter pin. Then remove lock nut from drive shaft.
3. Remove stabilizer connecting rod mounting bracket bolt and free stabilizer connecting rod.
4. Remove fixing nuts and bolts between side flange and drive shaft with power tool.
5. Using a puller (suitable tool), remove drive shaft from axle.

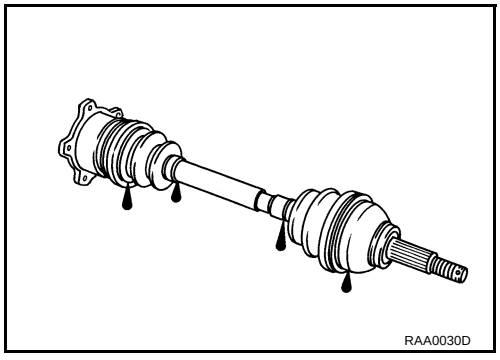
CAUTION:

- **When removing drive shaft, do not apply an excessive angle to drive shaft joint. Also be careful not to excessively extend slide joint.**



INSPECTION AFTER REMOVAL

- Move joint up/down, left/right, and in the axial direction. Check for any rough movement or significant looseness.
- Check boot for cracks or other damage, and also for grease leakage.
- If a trouble is found, disassemble drive shaft, and then replace with new one.



INSTALLATION

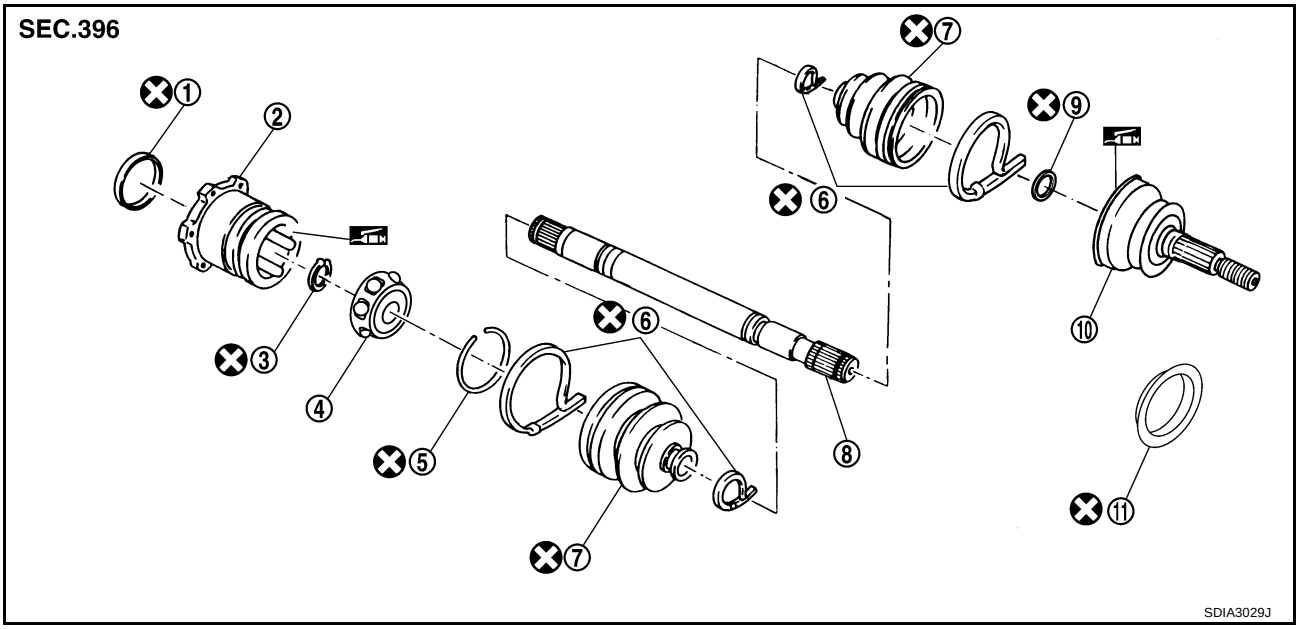
- Refer to RAX-10, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

Disassembly and Assembly

NDS00011

COMPONENTS



1. Plug	2. Housing	3. Snap ring
4. Ball cage/Steel ball/Inner race assembly	5. Stopper ring	6. Boot band
7. Boot	8. Shaft	9. Circular clip
10. Joint sub-assembly	11. Dust shield	

Refer to GI-11, "Components" and the followings for the symbols in the figure.

: Fill NISSAN genuine grease or equivalent.

DISASSEMBLY

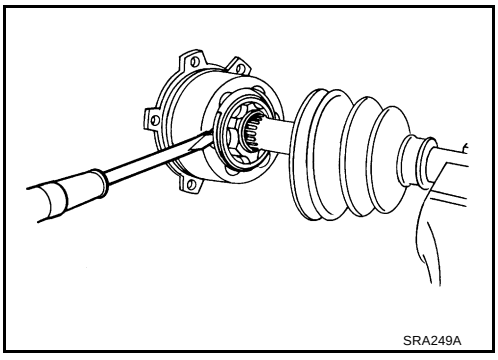
Final Drive Side

1. Press shaft in a vice.

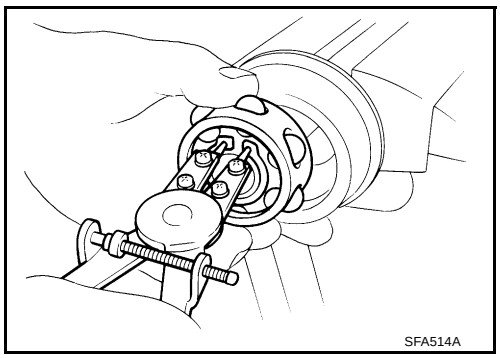
   CAUTION:

   When retaining drive shaft in a vice, always use copper or aluminum plates between vise and shaft.

2. Remove boot bands.
3. If plug needs to be removed, move boot to wheel side, and drive it out with a plastic hammer.
4. Remove stopper ring with a flat-bladed screwdriver, and pull out housing.



5. Remove snap ring, then remove ball cage/steel ball/inner race assembly from shaft.
6. Remove boot from shaft.
7. Remove old grease on housing with paper towels.

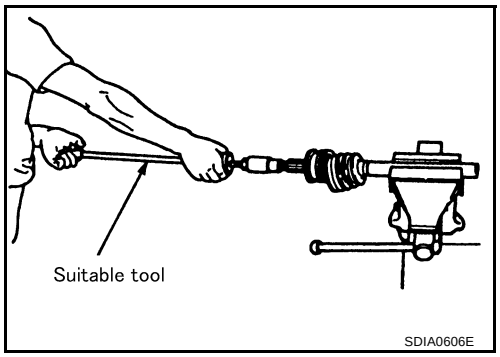

SFA514A

Wheel Side

1. Place shaft in a vice.

   CAUTION:
   When retaining drive shaft in a vice, always use copper or aluminum plates between vise and shaft.
2. Remove boot bands. Then remove boot from joint sub-assembly.
3. Screw a drive shaft puller 30 mm (1.18 in) or more into threaded part of joint sub-assembly. Pull joint sub-assembly out of shaft.

   CAUTION:
   - **If joint sub-assembly cannot be removed after five or more unsuccessful attempts, replace shaft and joint sub assembly as a set.**
   - **Align sliding hammer and drive shaft and remove them by pulling directly.**
4. Remove boot from shaft.
5. Remove circular clip from shaft.
6. While rotating ball cage, remove old grease on joint sub-assembly with paper towels.



SDIA0606E

INSPECTION AFTER DISASSEMBLY

Shaft

- Replace shaft if there is any runout, cracking, or other damage.

Joint sub-assembly (Wheel Side)

- Make sure there is no rough rotation or unusual axial looseness.
- Make sure there is no foreign material inside joint.
- Check joint sub-assembly for compression scars, cracks, fractures.

  CAUTION:
  If there are any irregular conditions of joint sub-assembly components, replace the entire joint sub-assembly.

Housing (Final Drive Side)

- Make sure there are compression scars, cracks, factures or unusual wear of ball rolling surface.
- Make sure there is no damage to shaft screws.
- Make sure there is no deformation of boot installation parts.

Ball Cage

- Make sure there are compression scars, cracks, factures of sliding surface.

Steel Ball

- Make sure there are compression scars, cracks, factures or unusual wear.

Inner Race

- Check ball sliding surface for compression scars, cracks or fractures.
- Make sure there is no damage to serrated part.

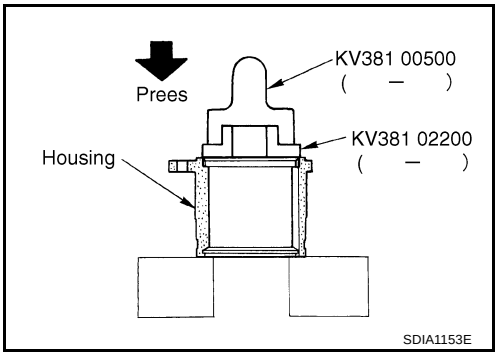
CAUTION:
If there are any irregular conditions in the component, replace with a new set of housing, ball cage, steel ball and inner race.

ASSEMBLY

Final Drive Side

1. If plug has been removed, use a drift (SST) to press in a new one.

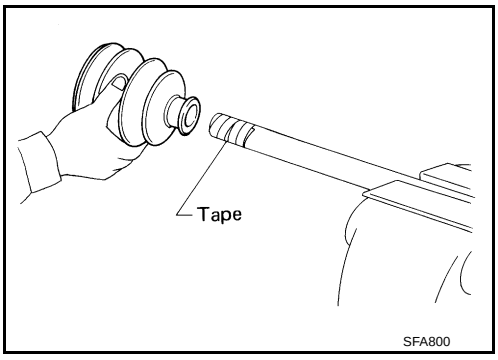
   NOTE:
   Discard old plug; replace with new one.



2. Wind serrated part of shaft with tape. Install boot band and boot to shaft. Be careful not to damage boot.

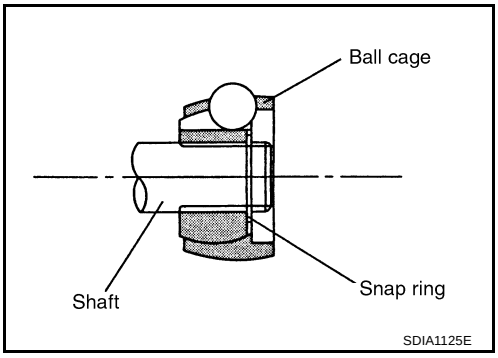
   NOTE:
   Discard old boot band and boot; replace with new one.

3. Remove protective tape wound around serrated part of shaft.



4. Install ball cage/steel ball/inner race assembly to shaft, and secure them tightly with a snap ring.

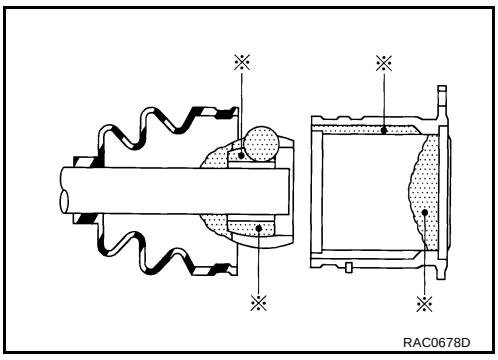
   NOTE:
   Discard old snap ring; replace with new one.



5. Insert the amount grease (NISSAN genuine grease or equivalent) onto housing (* point) to the quantity mentioned below, and install it to shaft.

   Grease amount : 124 – 134 g (4.37 – 4.73 oz)

6. Install stopper ring to housing.
7. After installed, pull shaft to check engagement between joint sub-assembly and stopper ring.

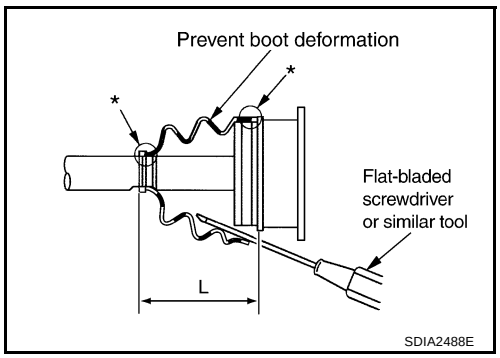


8. Install boot securely into grooves (indicated by * marks) shown in the figure.

   CAUTION:
   If there is grease on boot mounting surfaces (indicated by* marks) of shaft and housing, boot may come off. Remove all grease from surfaces.

9. Make sure boot installation length “L” is the length indicated below. Insert a flat-bladed screwdriver or similar tool into smaller side of boot. Bleed air from boot to prevent boot deformation.

   Boot installation Length “L ” : 93.9 mm (3.697 in)



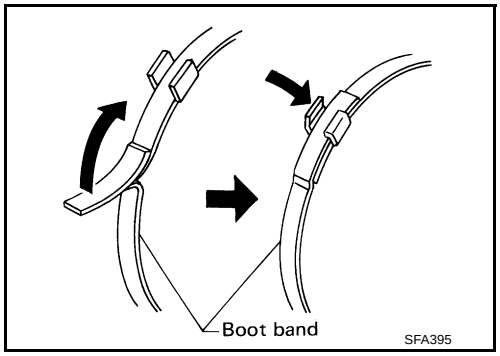
CAUTION:

- **Boot may break if boot installation length is less than standard value.**
- **Take care not to touch the tip of screwdriver to inside of boot.**

10. Secure big and small ends of boot with new boot bands as shown in the figure.

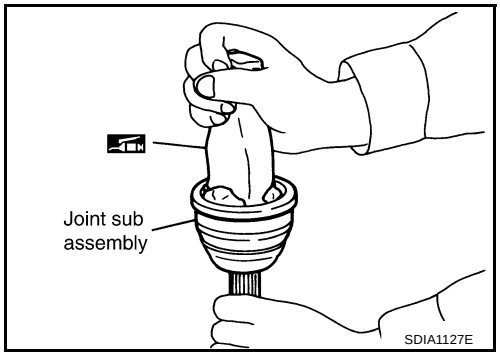
    NOTE:
    Discard old boot bands; replace with new ones.

11. After installing housing and shaft, rotate boot to check whether or not the actual position is correct. If boot position is not correct, secure boot with new boot band again.



Wheel Side

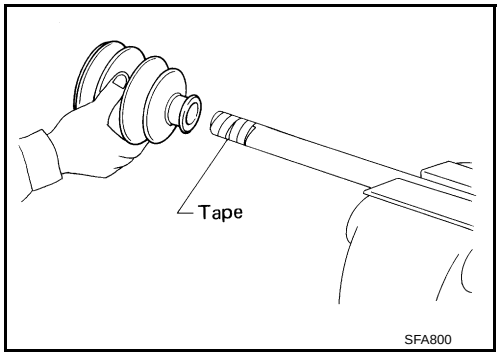
1. Insert the amount grease (NISSAN genuine grease or equivalent) into joint sub-assembly serration hole until grease begins to ooze from ball groove and serration hole. After insert grease, use a shop cloth to wipe off old grease that has oozed out.



2. Wind serrated part of shaft with tape. Install boot band and boot to shaft. Be careful not to damage boot.

   NOTE:
   Discard old boot band and boot; replace with each new one.

3. Remove protective tape wound around serrated part of shaft.

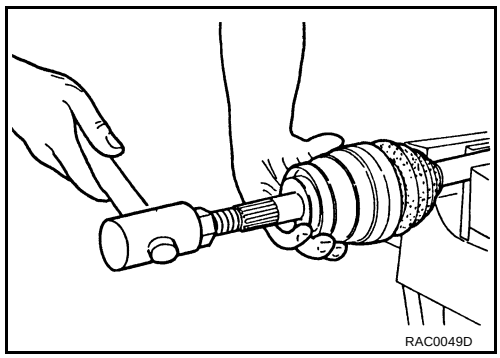


4. Attach circular clip to shaft. At this time, circular clip must fit securely into shaft groove. Attach nut to joint sub-assembly. Use a wooden hammer to press-fit.

   NOTE:
   Discard old circular clip; replace with new one.

5. Insert the amount grease (NISSAN genuine grease or equivalent) listed below into housing from large end of boot.

   Grease amount : 86 – 96 g (3.03 – 3.39 oz)

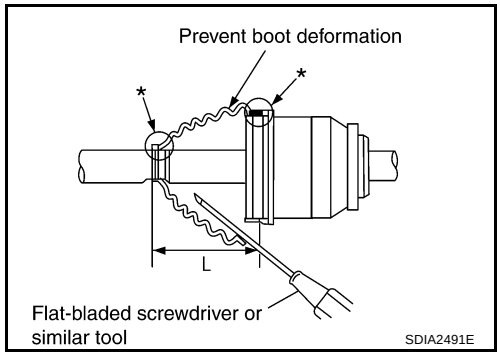


6. Install boot securely into grooves (indicated by * marks) shown in the figure.

   CAUTION:
   If there is grease on boot mounting surfaces (indicated by* marks) of shaft and housing, boot may come off. Remove all grease from surfaces.

7. Make sure boot installation length “L” is the length indicated below. Insert a flat-bladed screwdriver or similar tool into smaller side of boot. Bleed air from boot to prevent boot deformation.

   Boot installation length “L” : 97.0 mm (3.819 in)

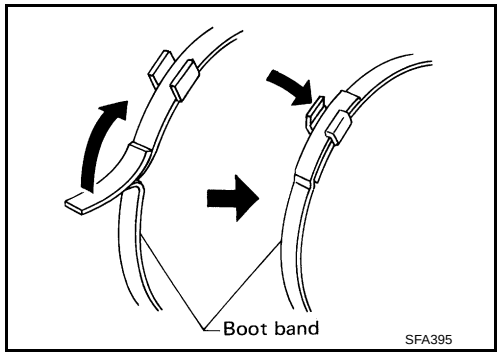


   CAUTION:
   - **Boot may brake if boot installation length is less than standard value.**
   - **Be careful that screwdriver tip does not contact inside surface of boot.**

8. Secure big and small ends of boot with new boot bands as shown in the figure.

   NOTE:
   Discard old boot bands; replace with new ones.

9. After installing joint sub-assembly and shaft, rotate boot to check whether or not the actual position is correct. If boot position is not correct, secure boot with new boot bands again.

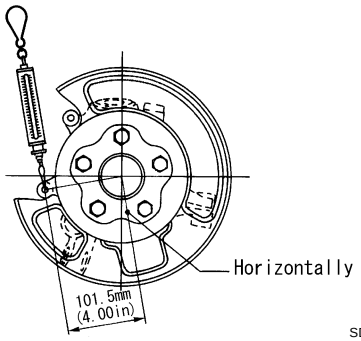


SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Bearing

NDS00012

Axial end play	0.05 mm (0.002 in) or less
Rotating torque	At a load of 49,033 N (5,000 kg, 11,000 lb) Less than 1.88 N·m (0.19 kg-m, 17 in-lb)
Measurement of spring balance	Less than 18.5 N (1.89 kg, 4.16 lb)
Measuring point (Brake caliper installation points)	 SDIA0801E

Drive Shaft

NDS00013

Joint	Wheel side	Final drive side
Grease quantity	86 – 96 g (3.03 – 3.39 oz)	124 – 134 g (4.37 – 4.73 oz)
Boots installed length	97.0 mm (3.819 in)	93.9 mm (3.697 in)

SECTION RF
ROOF

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00063

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NIS00064

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions

NIS00065

- Disconnect both battery cables in advance.
- Never tamper with or force air bag lid open, as this may adversely affect air bag performance.
- Be careful not to scratch pad and other parts.
- When removing or disassembling any part, be careful not to damage or deform it. Protect parts, which may get in the way with cloth.
- When removing parts with a screwdriver or other tool, protect parts by wrapping them with vinyl or tape.
- Keep removed parts protected with cloth.
- If a clip is deformed or damaged, replace it.
- If an unreusable part is removed, replace it with a new one.
- Tighten bolts and nuts firmly to the specified torque.
- After re-assembly has been completed, make sure each part functions correctly.
- Remove stains in the following way.

Water-soluble stains:
Dip a soft cloth in warm water, and then squeeze it tightly. After wiping the stain, wipe with a soft dry cloth.
Oil stain:
Dissolve a synthetic detergent in warm water (density of 2 to 3% or less), dip the cloth, then clean off the stain with the cloth. Next, dip the cloth in fresh water and squeeze it tightly. Then clean off the detergent completely. Then wipe the area with a soft dry cloth.
Do not use any organic solvent, such as thinner or benzine.

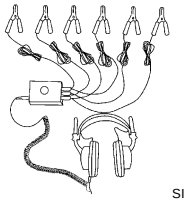
PREPARATION

PFP:00002

Special Service Tools

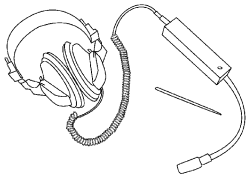
NIS00066

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS00067

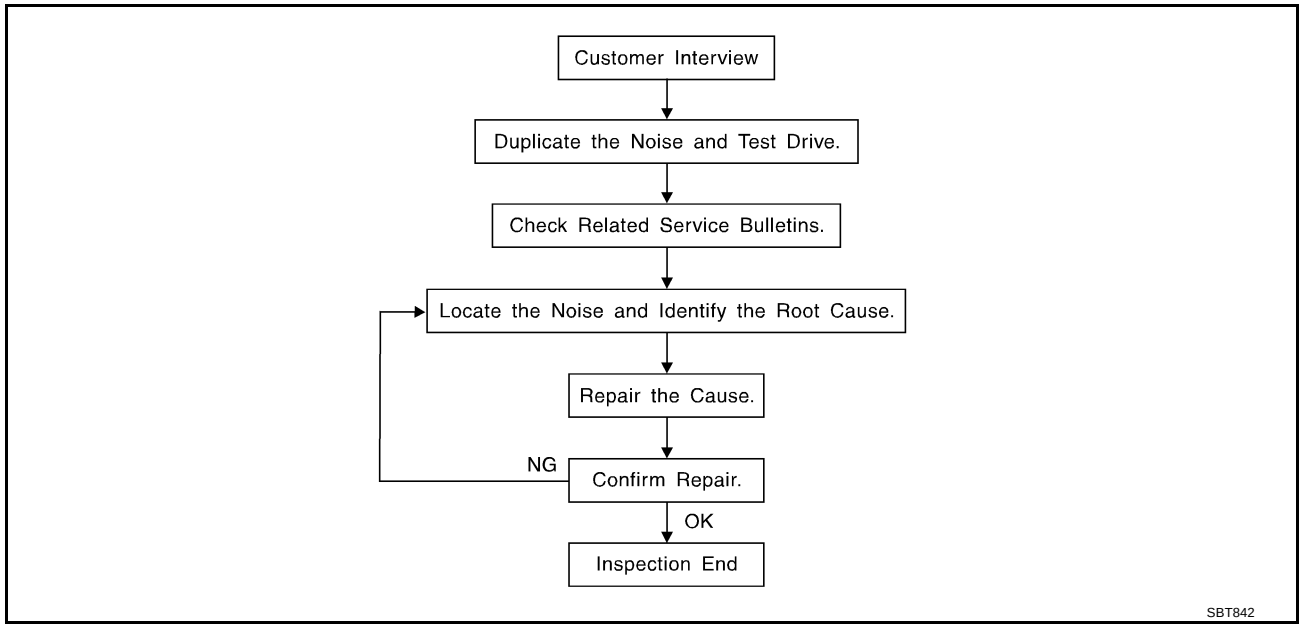
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS00298



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to RF-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to RF-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS00299

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint
   These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

   CAUTION:
   Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

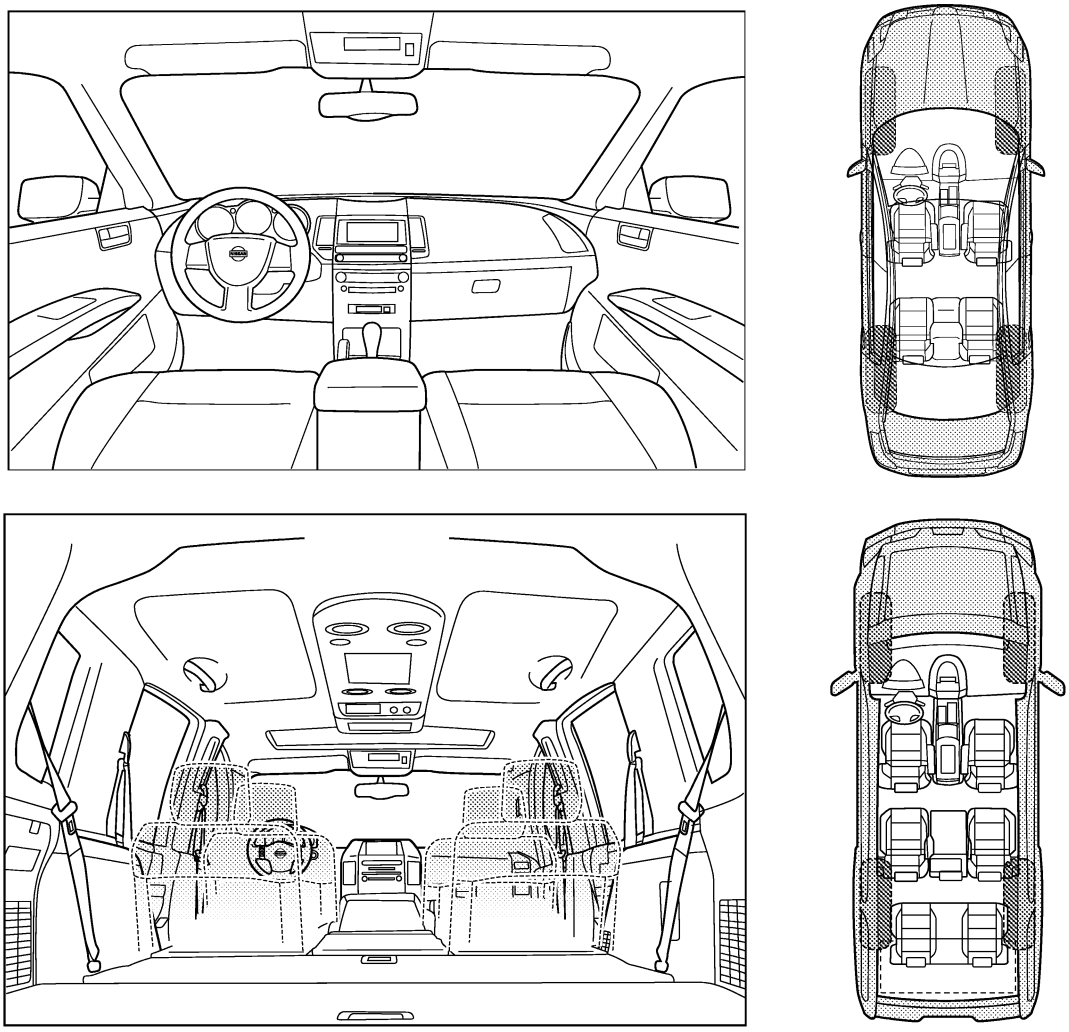
Diagnostic Worksheet

NIS0029A

SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

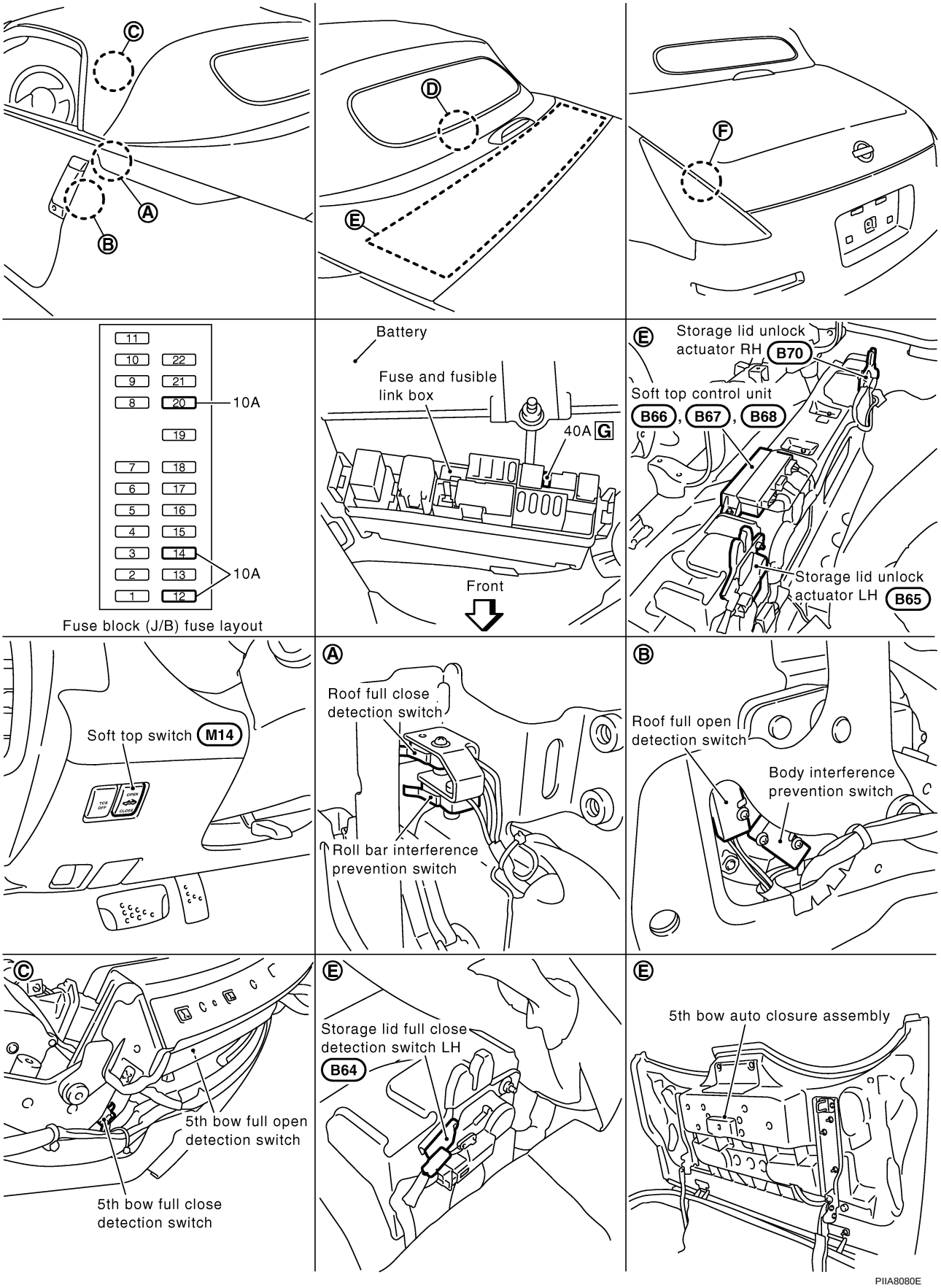
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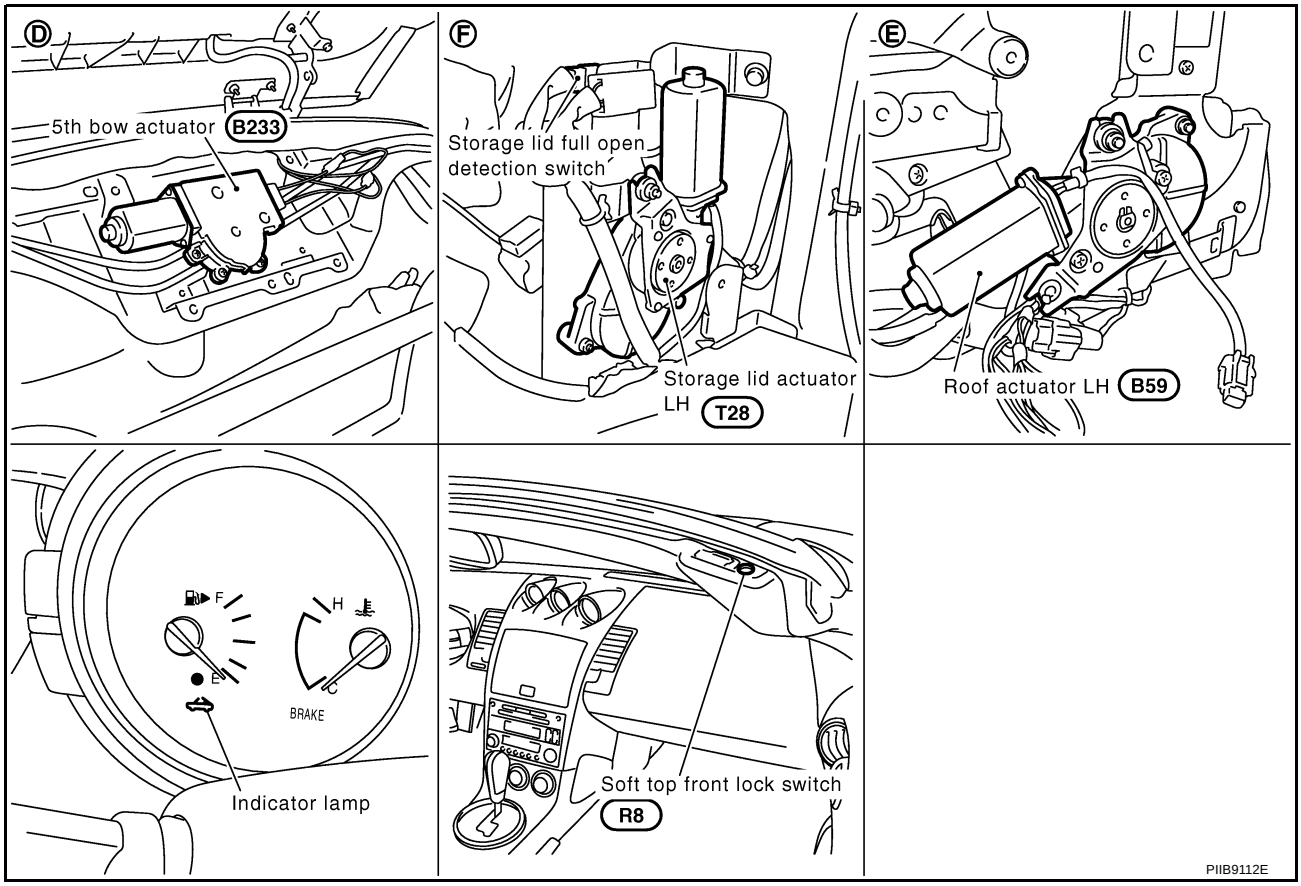
SOFT TOP

PFP:97002

Component Parts and Harness Connector Location

NIS0006B





Following Parts Are Built Into 5th Bow Auto Closure Assembly.

- 5th bow half-latch switch built in 5th bow lock assembly in storage lid.
- 5th bow full-latch switch built in 5th bow lock assembly in storage lid.
- 5th bow ending switch built in 5th bow lock assembly in storage lid.
- 5th bow unlock actuator.
- 5th bow closure motor.

NOTE:
Always replace following switches as a 5th bow lock assembly.

- 5th bow half-latch switch
- 5th bow full-latch switch
- 5th bow ending switch.

5th bow full open detection switch and 5th bow full close detection switch are built into 5th bow switch assembly located at plate rail RR. Replace above switches as a plate rail RR.

System Description

NIS0006C

An electronic soft top open/close system has been adopted that allows the soft top to be opened or closed using the soft top switch.
The following parts operate, linked with the operation of the soft top.

- When the soft top begins to operate, the passenger seat tilts forward. When operation is completed, it returns to its original position.
  (It does not move when the seat cancel switch is ON.)
- When the soft top begins to operate, both power windows activate to the fully-open position.
  (They do not activate to the fully-closed position after operation is completed.)
  Moreover, power window cannot be operated while soft top is operating.

When the soft top switch is released, soft top operation stops.

CONDITIONS FOR OPERATION

Operation is avairable when all of the conditions below are satisfied.

- Ignition switch is ON.
- The brake pedal is ON.
- Vehicle speed is 4 km/h (2 MPH) or less.
- Battery voltage is approximately 10 V or more.

CAUTION:
Run the engine when operating or inspecting the soft top to prevent battery dies.

CONDITIONS FOR STOPPING OPERATION

Operation of the soft top stops when the conditions below are satisfied while the soft top is operating.

- Any of the above operation conditions is no longer satisfied.
- The passenger side power seat is operated. (It does not move when seat cancel switch is ON.)

OUTLINE OF OPERATION

Refer to the illustrations for the positions of the soft top, and the conditions of switch and actuator operation.

OPERATION: FULL CLOSE → FULL OPEN

Refer to RF-19, "State Chart" .

- CONDITION: FULL CLOSE

Item	Condition
5th bow half-latch switch	: OFF
5th bow full-latch switch	: OFF
5th bow ending switch	: OFF
5th bow full open detection switch	: OFF
5th bow full close detection switch	: OFF
Storage lid full open detection switch	: OFF
Storage lid full close detection switch LH	: OFF
Storage lid full close detection switch RH	: OFF
Roof full open detection switch	: OFF
Roof full close detection switch	: OFF
Body interference prevention switch	: OFF
Roll bar interference prevention switch	: OFF

- CONDITION: OP 1
  When the soft top switch is pushed to OPEN, the indicator lamp illuminates, windows activate to the fully-open position and the passenger seat tilts forward by approximately 6 degrees by power window down request signal. When passenger seat tilts forward by approximately 6 degrees, seat back position signal is turned ON.

Item	Condition
Soft top switch	: OPEN (Until the operation ends)
Indicator lamp	: ON
Power window down request signal	: ON
Seat back position signal	: OFF → ON

- CONDITION: OP 2
  The 5th bow unlock actuator operates, releasing the 5th bow lock.

Item	Condition
5th bow unlock actuator	: ON

- CONDITION: OP 3
  The 5th bow actuator moves the 5th bow up.

Item	Condition
5th bow half-latch switch	: OFF → ON
5th bow actuator	: UP
5th bow unlock actuator	: ON → OFF

- CONDITION: OP 4
  The 5th bow is rising.

Item	Condition
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON
5th bow closure motor	: OPEN → STOP
5th bow full-latch switch	: OFF → ON
5th bow ending switch	: OFF → ON

- CONDITION: OP 5
  The 5th bow stops in the fully-open position. The storage lid unlock actuator operates, releasing the storage lid lock.

Item	Condition
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Storage lid unlock actuator (LH and RH)	: OFF→ON
Storage lid full close detection switch (RH)	: OFF → ON

- CONDITION: OP 6
  The storage lid actuator operates, raising the storage lid.

Item	Condition
Storage lid full close detection switch (LH)	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN
Storage lid unlock actuator (LH and RH)	: ON → OFF

- CONDITION: OP 7
  The storage lid stops in the fully-open position. The 5th bow actuator moves the 5th bow down.

Item	Condition
Storage lid full open detection switch	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN → STOP
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITION: OP 8
  The 5th bow actuator stops in the fully-closed position. The roof actuator operates (OPEN operation), opening the roof.

Item	Condition
5th bow full close detection switch	: ON → OFF
5th bow actuator	: DOWN → STOP
Roof actuator (LH and RH)	: OPEN
Roof full close detection switch	: OFF → ON

- CONDITION: OP 9
  While the roof is opening, the 5th bow actuator moves the 5th bow up.

Item	Condition
Roof actuator (LH and RH)	: OPEN
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON
Roll bar interference prevention switch	: OFF → ON

- CONDITION: OP 10
  While the roof is opening, the 5th bow stops in the fully-open position.

Item	Condition
Roof actuator (LH and RH)	: OPEN
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Body interference prevention switch	: OFF → ON

- CONDITION: OP 11
  The roof is stored and stops motion. The storage lid actuator operates (DOWN operation) to lower the storage lid.
  The passenger seat also returns to its original position.

Item	Condition
Roof full open detection switch	: OFF → ON
Roof actuator (LH and RH)	: OPEN → STOP
Storage lid actuator (LH and RH)	: CLOSE
Storage lid full open detection switch	: ON → OFF
Storage lid full close detection switch (LH)	: ON → OFF
Power window request signal	: OFF

- CONDITION: OP 12
  At the fully-closed position, the storage lid inverts and stops. The passenger seat tilts back. Opening operation is completed, and the indicator lamp turns OFF.

Item	Condition
Storage lid full close detection switch (RH)	: ON → OFF
Storage lid actuator (LH and RH)	: CLOSE → OPEN → STOP
Indicator lamp	: ON → OFF

OPERATION: FULL OPEN → FULL CLOSE

Refer to RF-21, "State Chart" .

- CONDITION: FULL OPEN

Item	Condition
5th bow half-latch switch	: ON
5th bow full-latch switch	: ON
5th bow ending switch	: ON
5th bow full open detection switch	: ON
5th bow full close detection switch	: ON
Storage lid full open detection switch	: OFF
Storage lid full close detection switch LH	: OFF
Storage lid full close detection switch RH	: OFF
Roof full open detection switch	: ON
Roof full close detection switch	: ON
Body interference prevention switch	: ON
Roll bar interference prevention switch	: ON

- CONDITION: CL 1
  When the soft top switch is pressed to the CLOSE side, the indicator lamp illuminates, storage lid unlock actuator also operates, releasing the storage lid lock.

Item	Condition
Soft top switch	: OLOSE (Until the operation ends)
Indicator lamp	: ON
Storage lid unlock actuator	: ON
Storage lid full close detection switch (RH)	: OFF → ON

- CONDITION: CL 2
  Windows activate to the fully-open position and the passenger seat tilts forward by approximately 6 degrees by power window down request signal. Storage lid actuator operates to raise the storage lid. When passenger seat tilts forward by approximately 6 degrees, seat back position signal is turned ON.

Item	Condition
Storage lid full close detection switch (LH)	: OFF → ON
Storage lid actuator (LH and RH)	: UP
Power window down request signal	: ON
Storage lid unlock actuator	: ON → OFF
Seat back position signal	: OFF → ON

- CONDITION: CL 3
  The storage lid stops at the fully-open position. The roof actuator operates (CLOSE operation) to close the roof.

Item	Condition
Storage lid full open detection switch	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN → STOP
Roof actuator (LH and RH)	: CLOSE
Roof full open detection switch	: ON → OFF
Body interference prevention switch	: ON → OFF

- CONDITION: CL 4
  While the roof is closing, the 5th bow actuator operates (DOWN operation) to lower the 5th bow.

Item	Condition
Roof actuator (LH and RH)	: CLOSE
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITOIN: CL 5
  The roof is closing, and 5th bow is lowering.

Item	Condition
Roof actuator (LH and RH)	: CLOSE
5th bow full close detection switch	: ON → OFF
5th bow actuator	: DOWN → STOP
Roll bar interference prevention switch	: ON → OFF

- CONDITION: CL 6
  The roof stops at the fully-closed position. The 5th bow actuator inverts, raising the 5th bow.

Item	Condition
Roof full close detection switch	: ON → OFF
Roof actuator (LH and RH)	: CLOSE → STOP
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON

- CONDITON: CL 7
  The 5th bow stops in the fully-open position. The storage lid actuator operates (DOWN operation) lower the storage lid.

Item	Condition
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Storage lid actuator (LH and RH)	: CLOSE
Storage lid full open detection switch	: ON → OFF
Storage lid full close detection switch (LH)	: ON → OFF

- CONDITION: CL 8
  The storage lid inverts and stops at the fully-closed position. The 5th bow actuator operates (DOWN operation) to lower the 5th bow.

Item	Condition
Storage lid full close detection switch (RH)	: ON → OFF
Storage lid actuator	: CLOSE → OPEN → STOP
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITION: CL 9
  The 5th bow is lowering.

Item	Condition
5th bow actuator	: DOWN
5th bow full close detection switch	: ON → OFF

- CONDITION: CL 10
  5th bow auto closure operates. The passenger seat tilts back. Closing operation is completed, soft top front lock is locked, and the indicator lamp turns OFF. The passenger seat also returns to its original position.

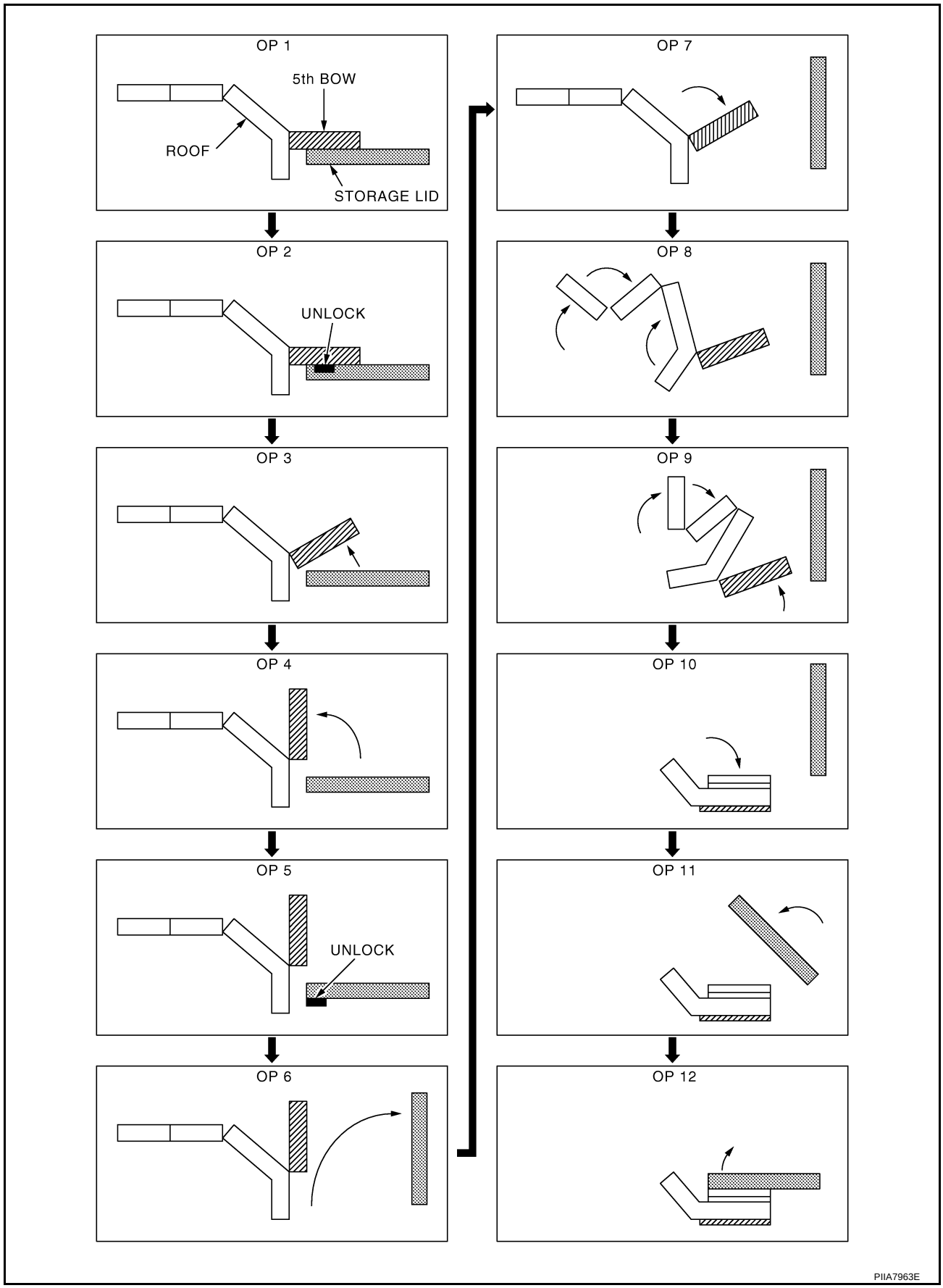
Item	Condition
5th bow actuator	: DOWN → STOP
5th bow half-latch switch	: ON → OFF
5th bow full-latch switch	: ON → OFF
5th bow ending switch	: ON → OFF
5th bow closure motor	: CLOSE → STOP
Power window request signal	: OFF
Indicator lamp	: ON → OFF

Operation Chart

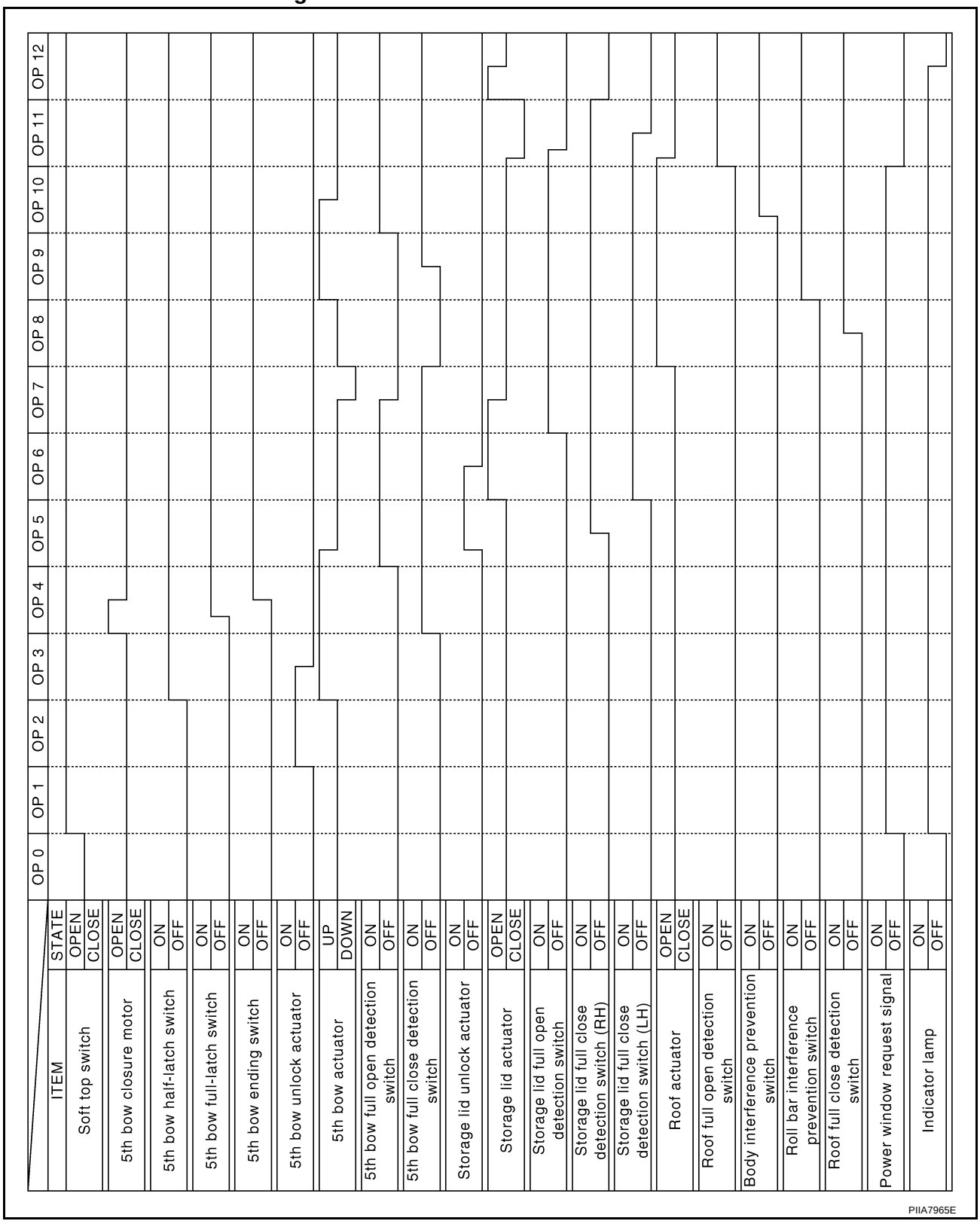
NIS0006D

CLOSE → OPEN

State Chart

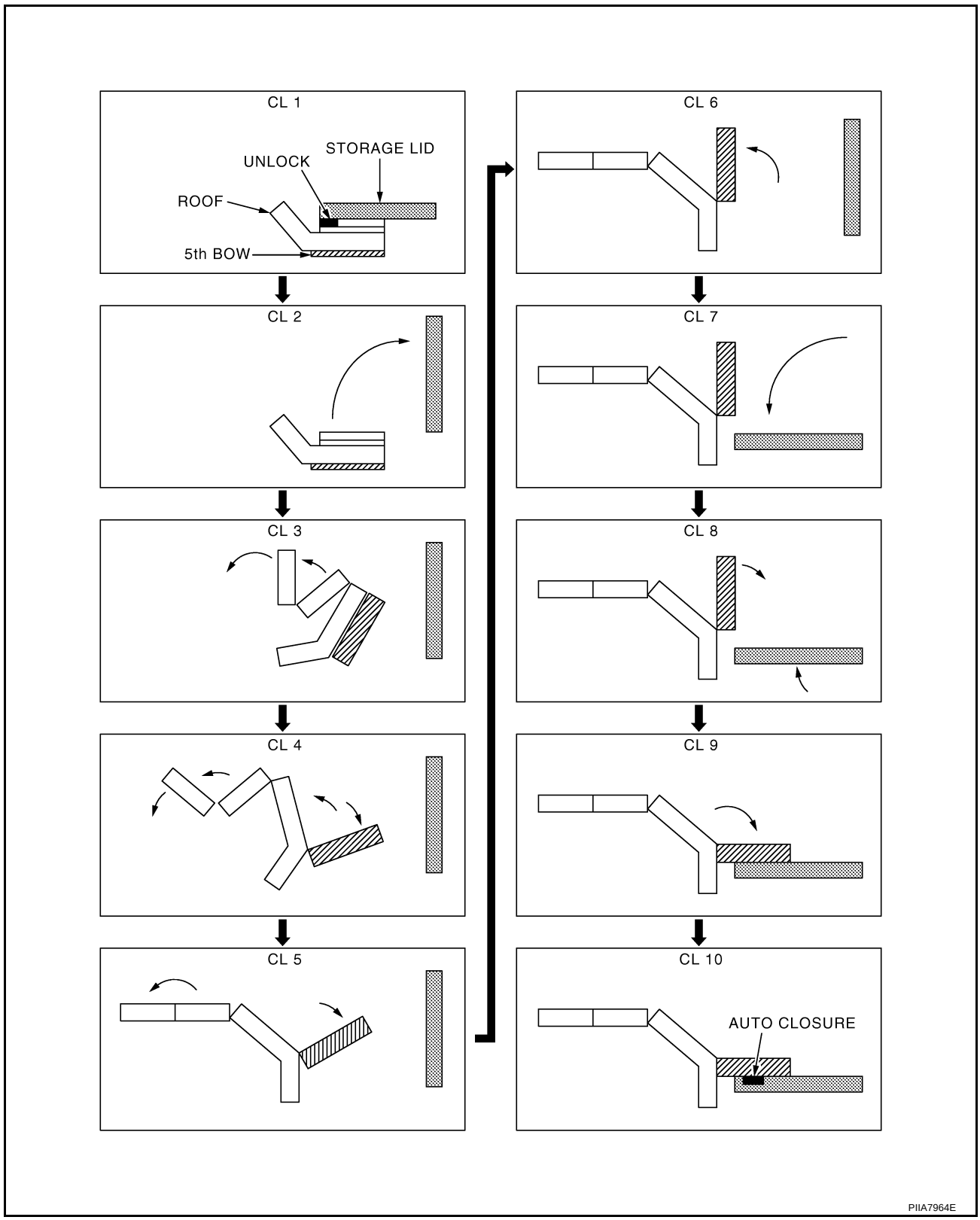


Each Switch and Actuator Signal Chart

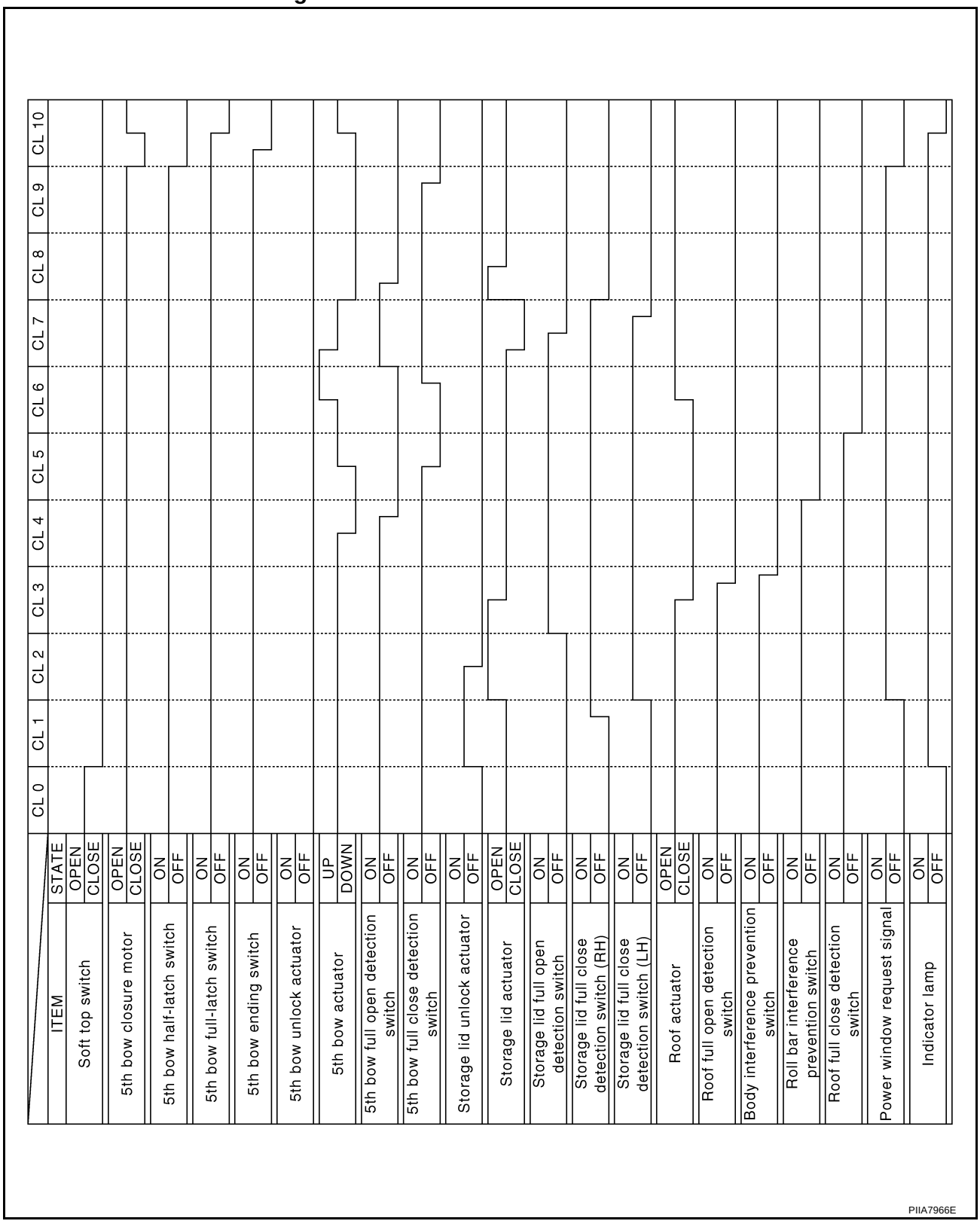


OPEN → CLOSE

State Chart



Each Switch and Actuator Signal Chart



Indicator Lamp

NIS0006E

The indicator lights, turns off or blinks according to the operating state.

Turns OFF : The open / close operation stops or completes or any switch is malfunctioning

Lights : The soft top is operating or the operation stops on the way

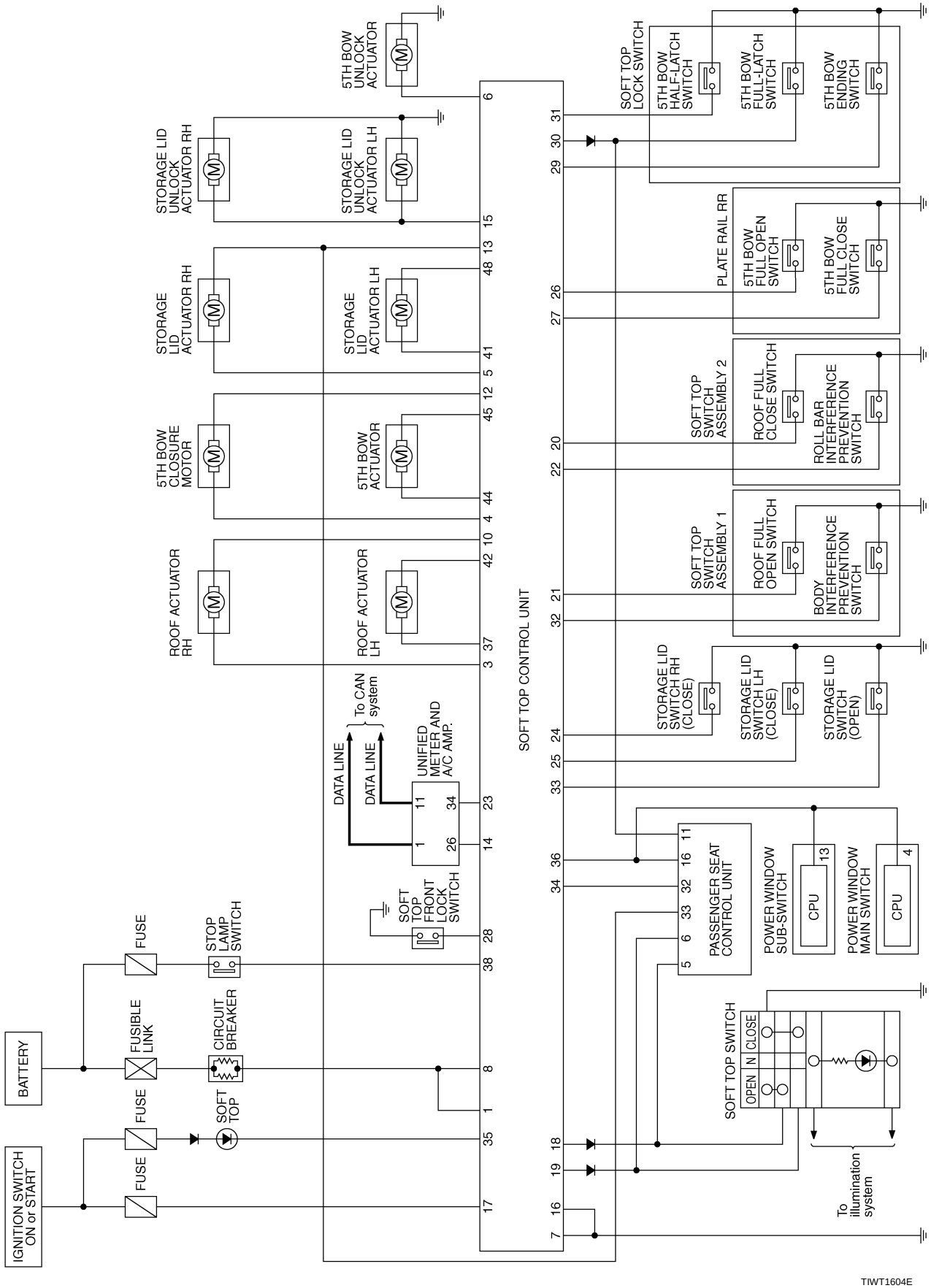
Blinks : The soft top cannot be operated, do not response or front lock is unlocked at the fully closed position

State of roof		The operation stops when the soft top is,		Operation
		full open or full close	in position on the way	
Operational condition		Turning off	Lighting	Lighting
Out of operational condition	When battery voltage decreases remarkably	Turning off	Lighting	Lighting
	Brake pedal is not depressed	Turning off	Lighting	Lighting
	Vehicle speed is 5 km/h (3 MPH) or more	Turning off	Lighting	Lighting
	Ignition switch: OFF	Turning off	Turning off*	Turning off*
Malfunction of	any switch of the system	Turning off	Lighting	Blinking
	soft top control unit	Blinking	Blinking	Blinking
	vehicle speed signal	Blinking	Blinking	Blinking

*: The soft top operates for approximately 30 seconds after turn ignition switch OFF.

Schematic

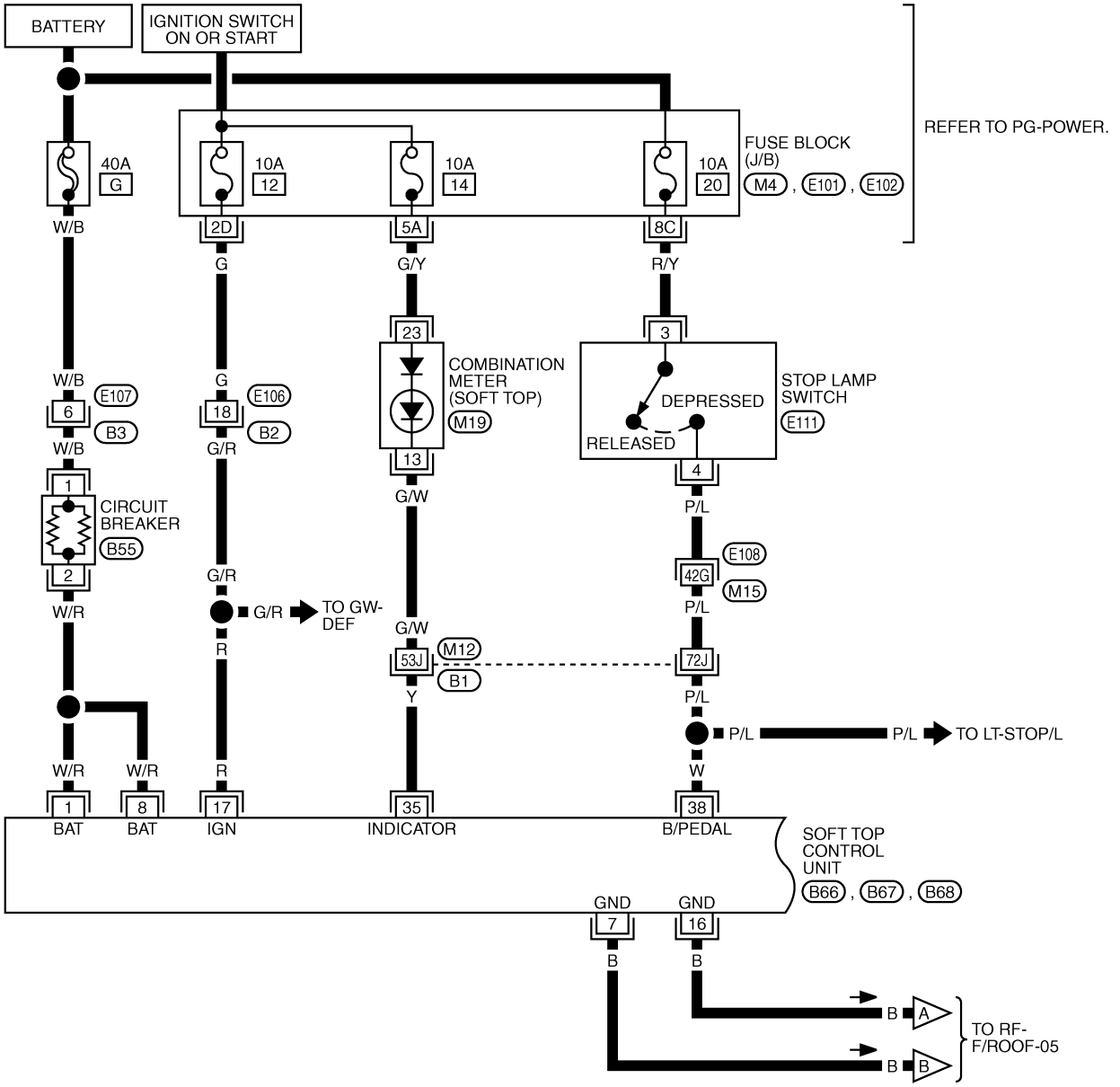
NIS0006F

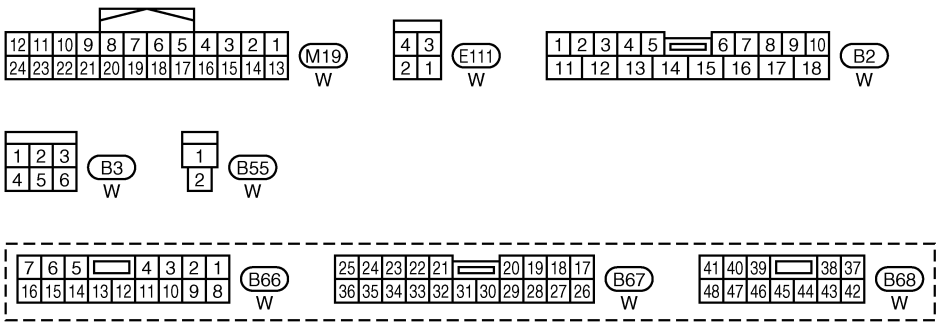


Wiring Diagram — F/ROOF —

NIS0006G

RF-F/ROOF-01

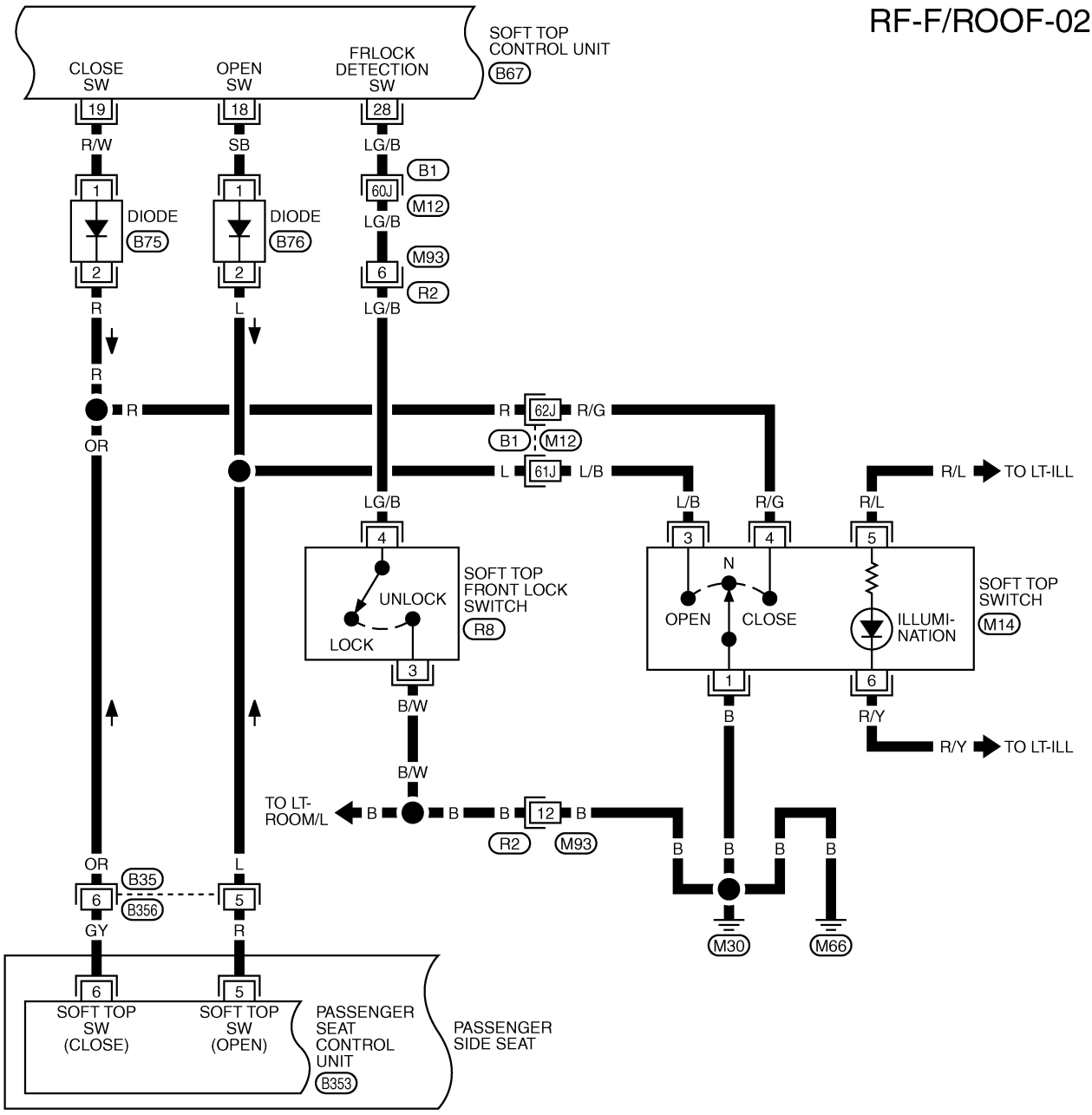


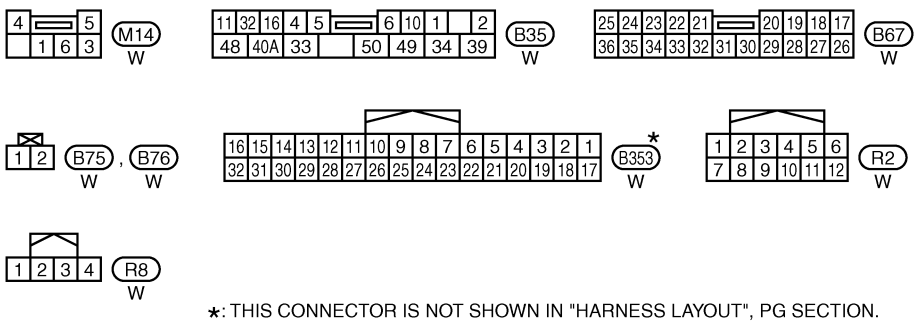


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E101 , E102 -FUSE BLOCK- JUNCTION BOX (J/B)

TIWT2281E

RF-F/ROOF-02





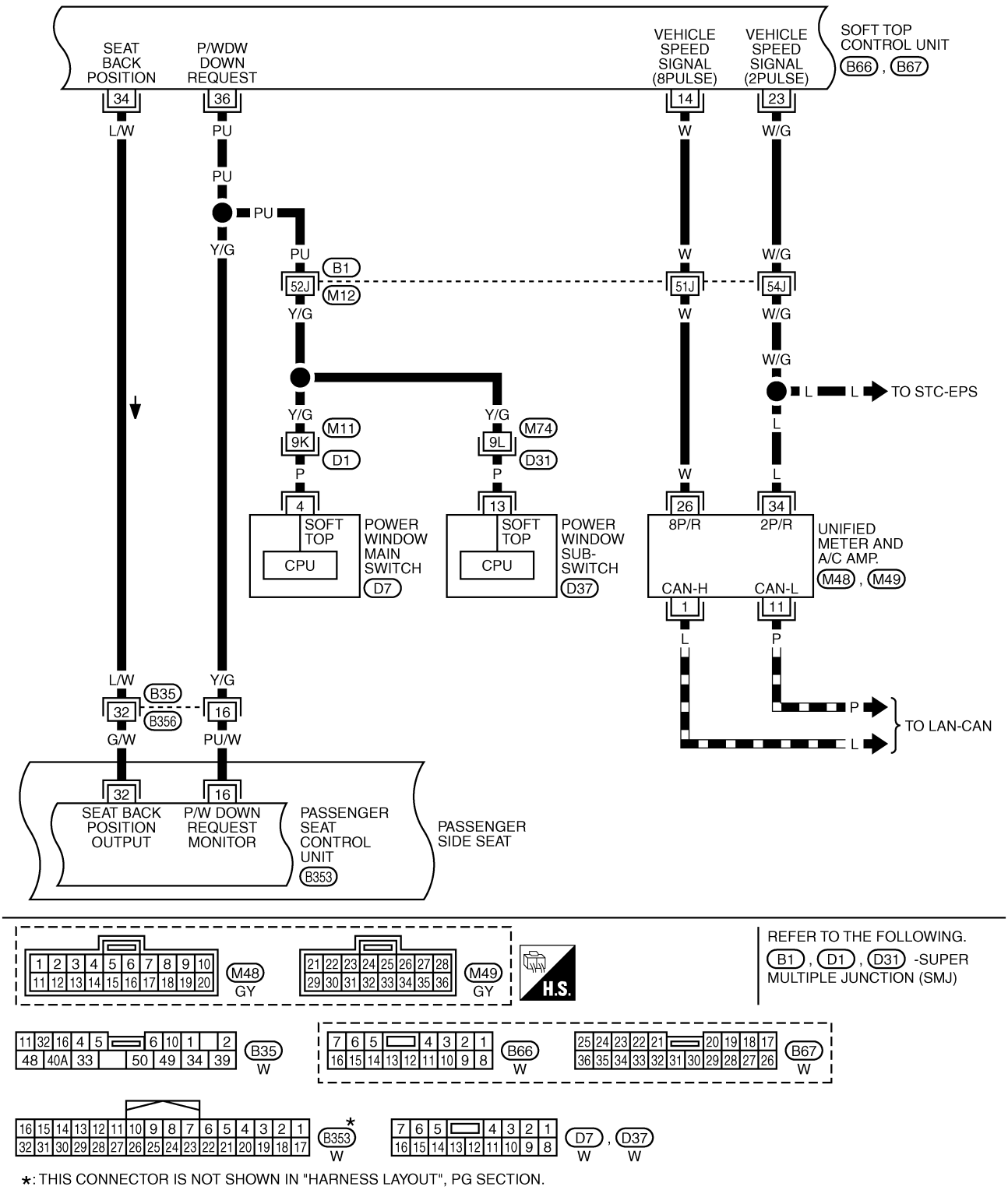
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT2282E

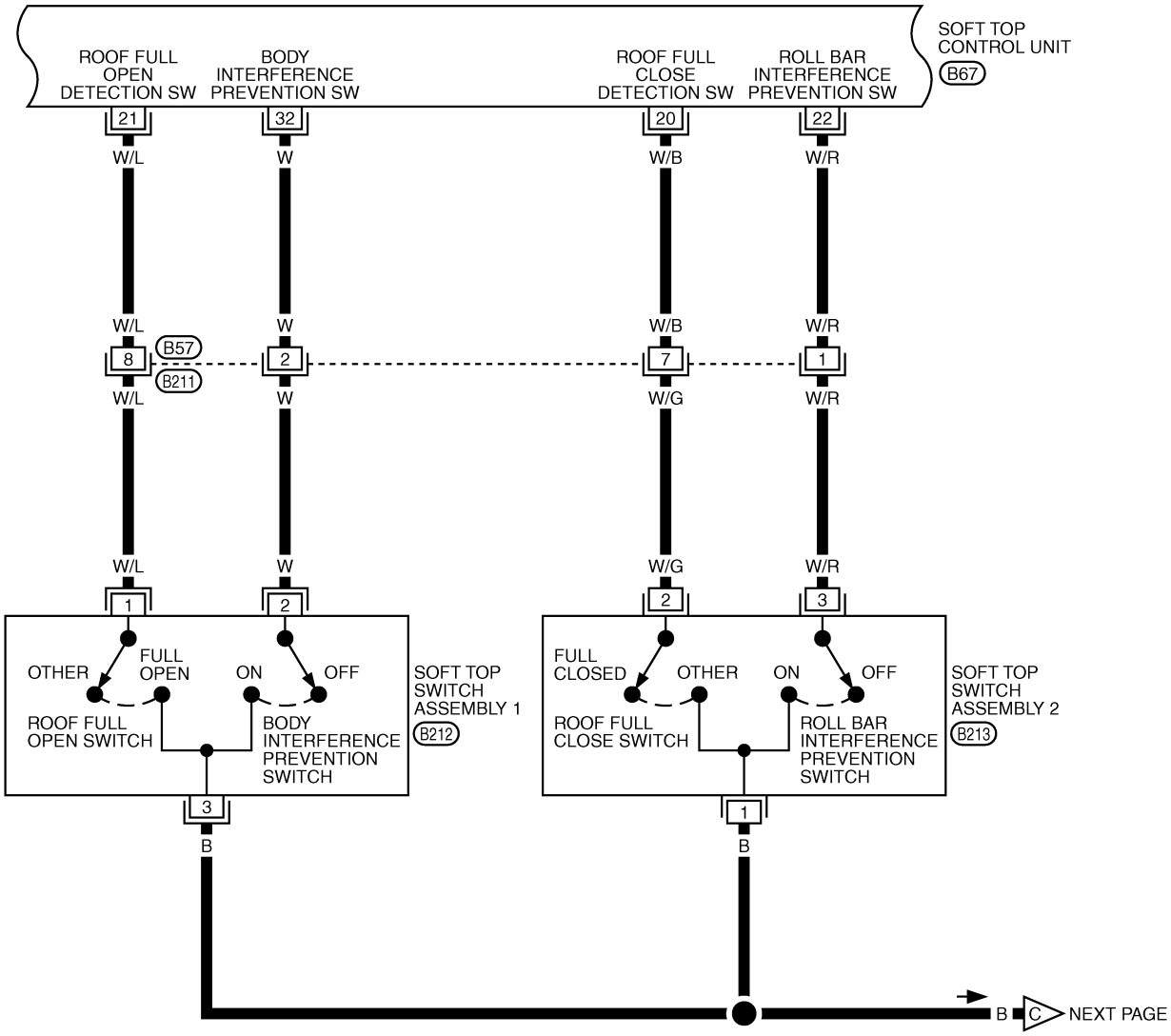
RF-F/ROOF-03

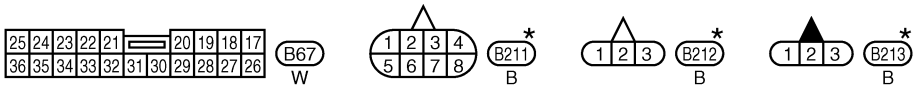
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TIWT1607E

RF-F/ROOF-04

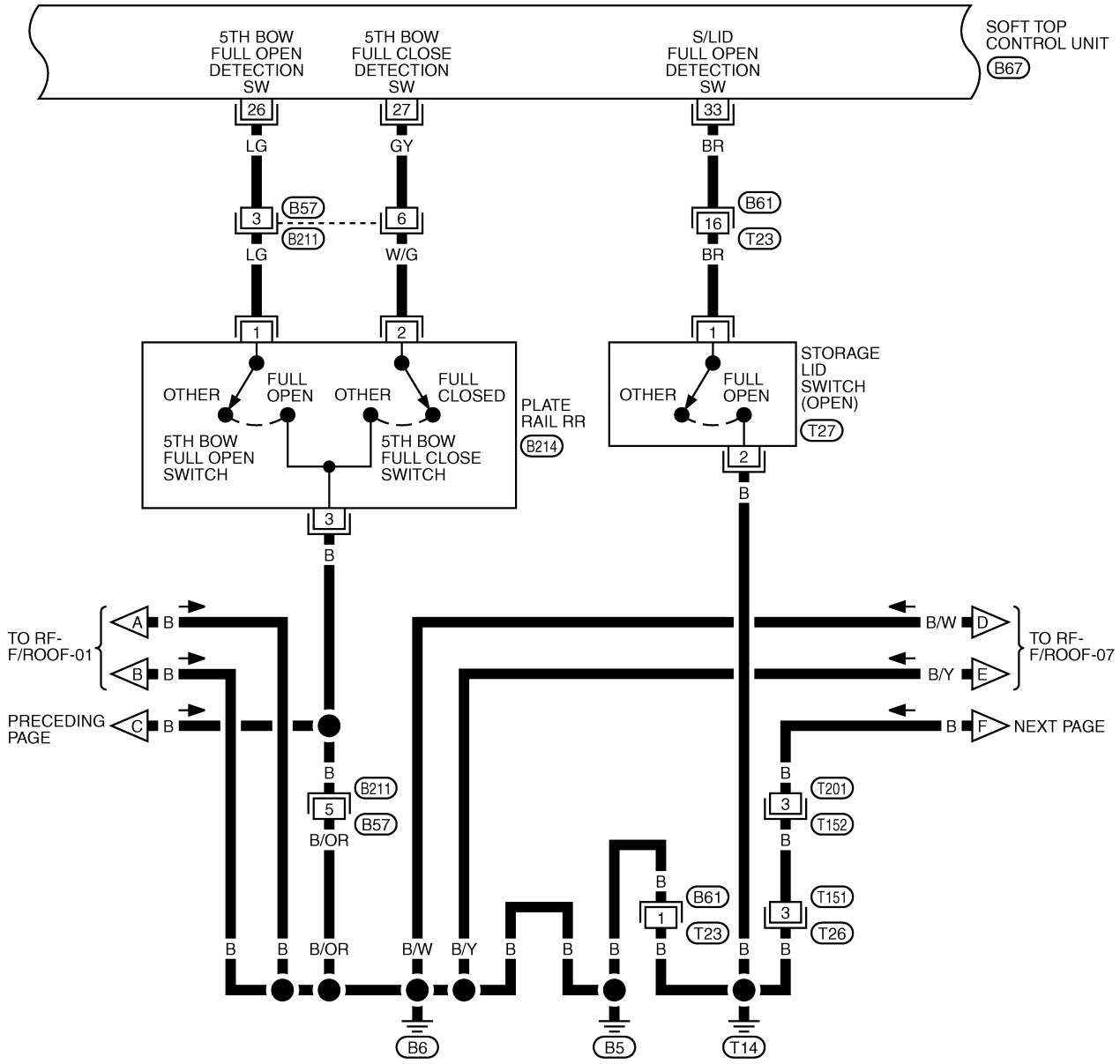


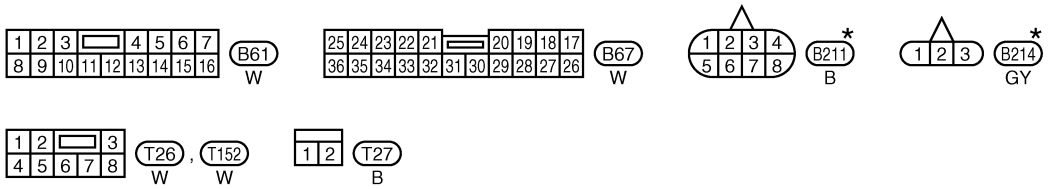


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0766E

RF-F/ROOF-05

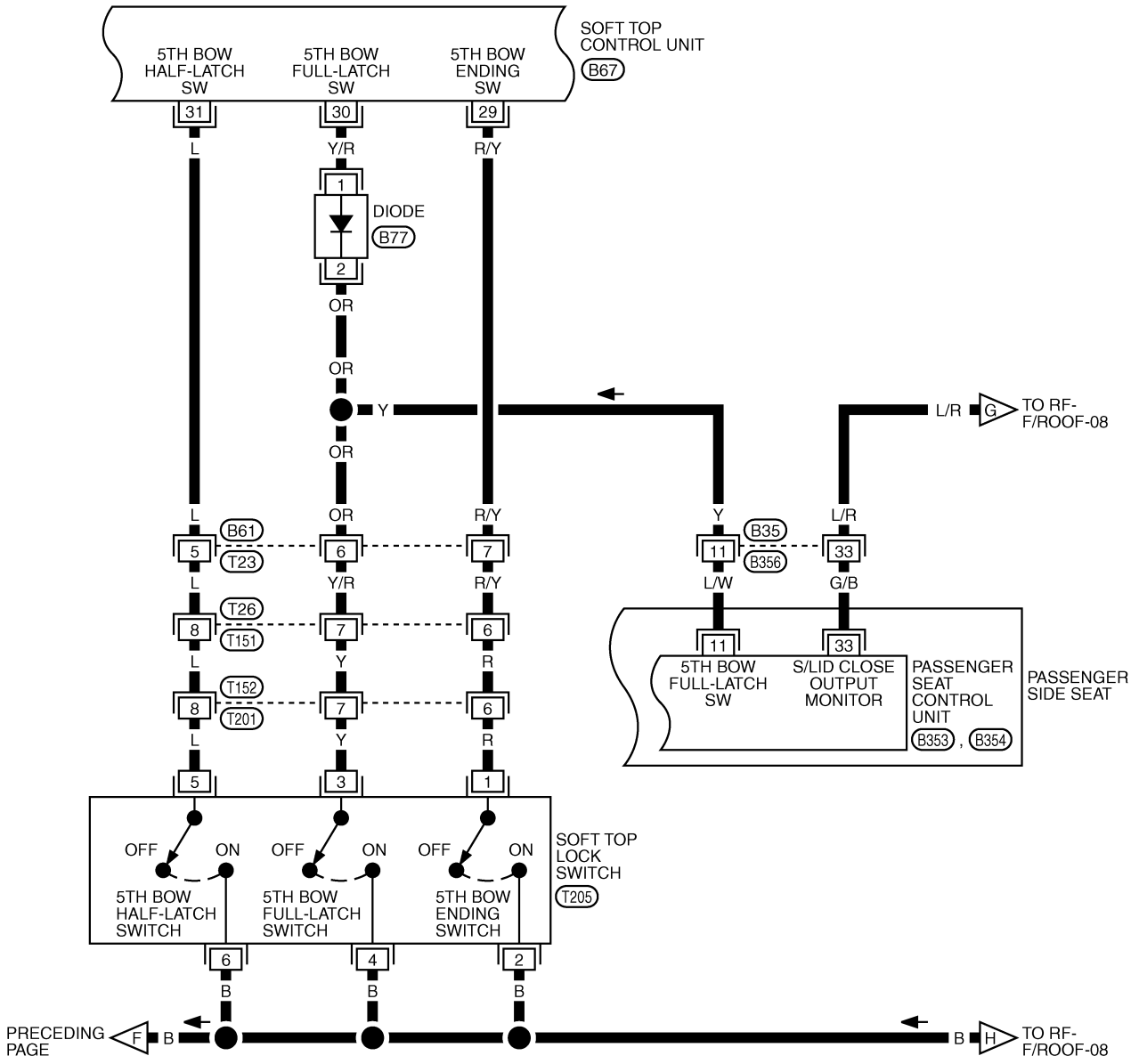


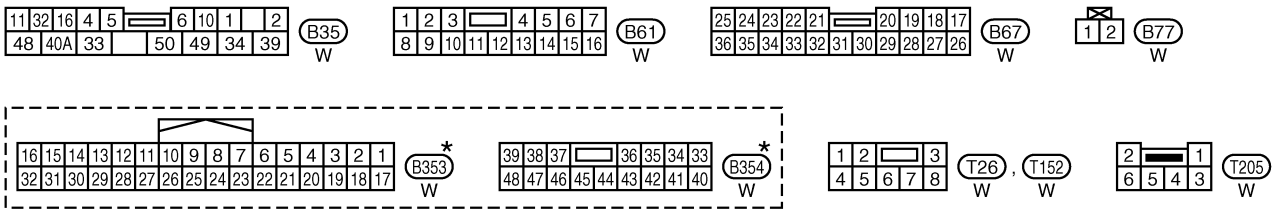


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT2283E

RF-F/ROOF-06

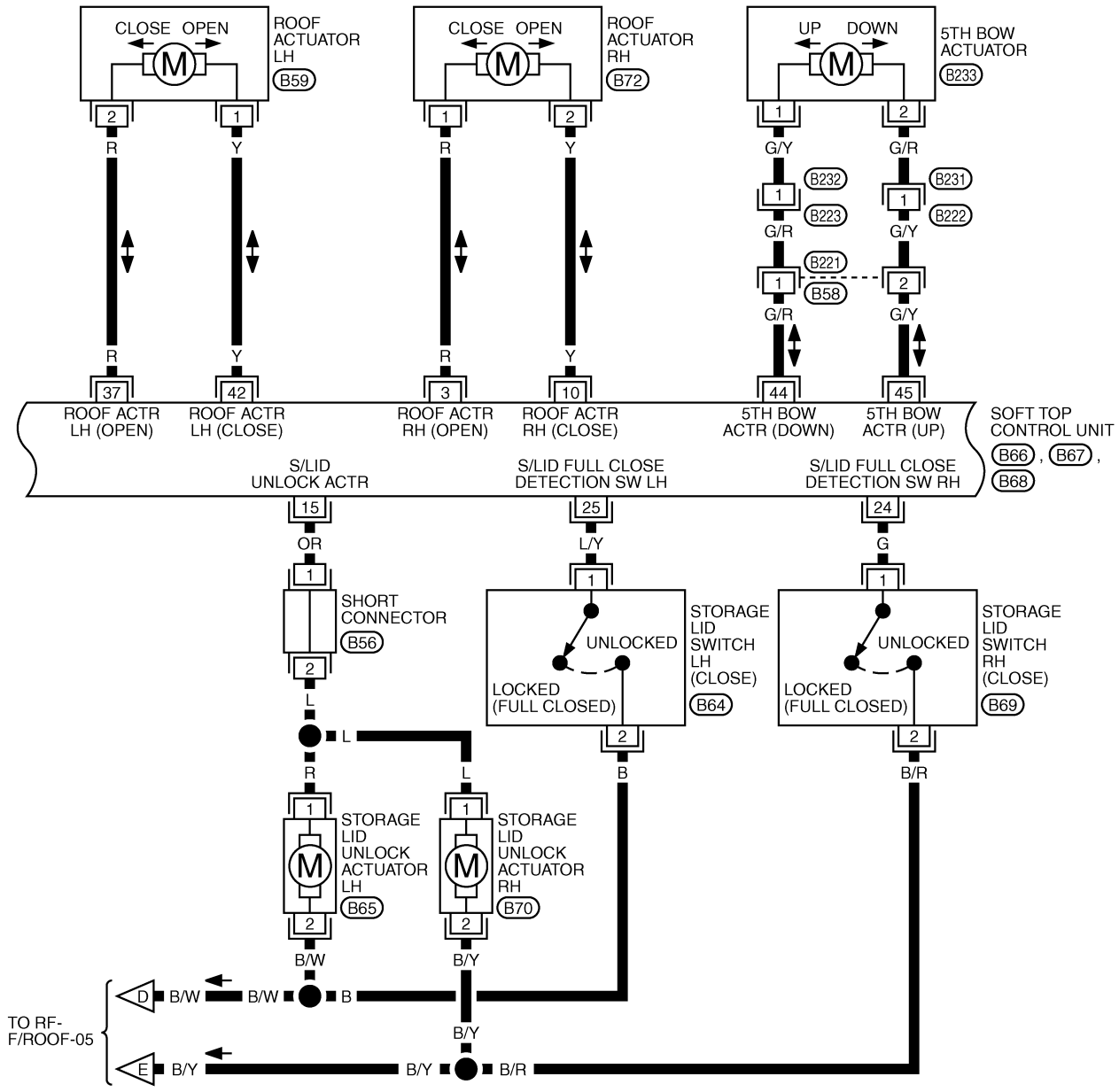


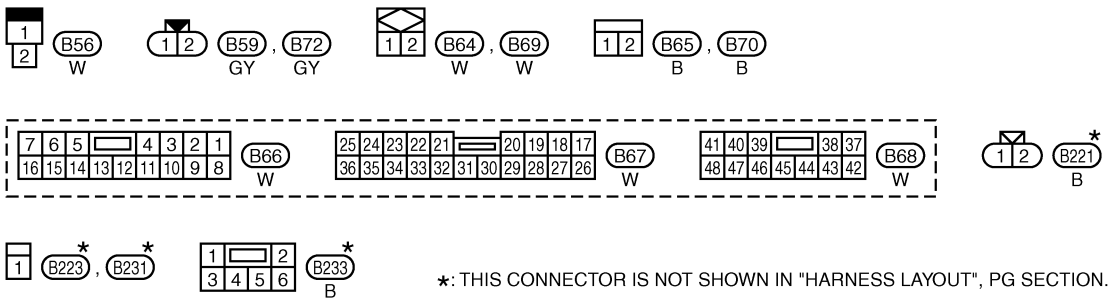


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT1791E

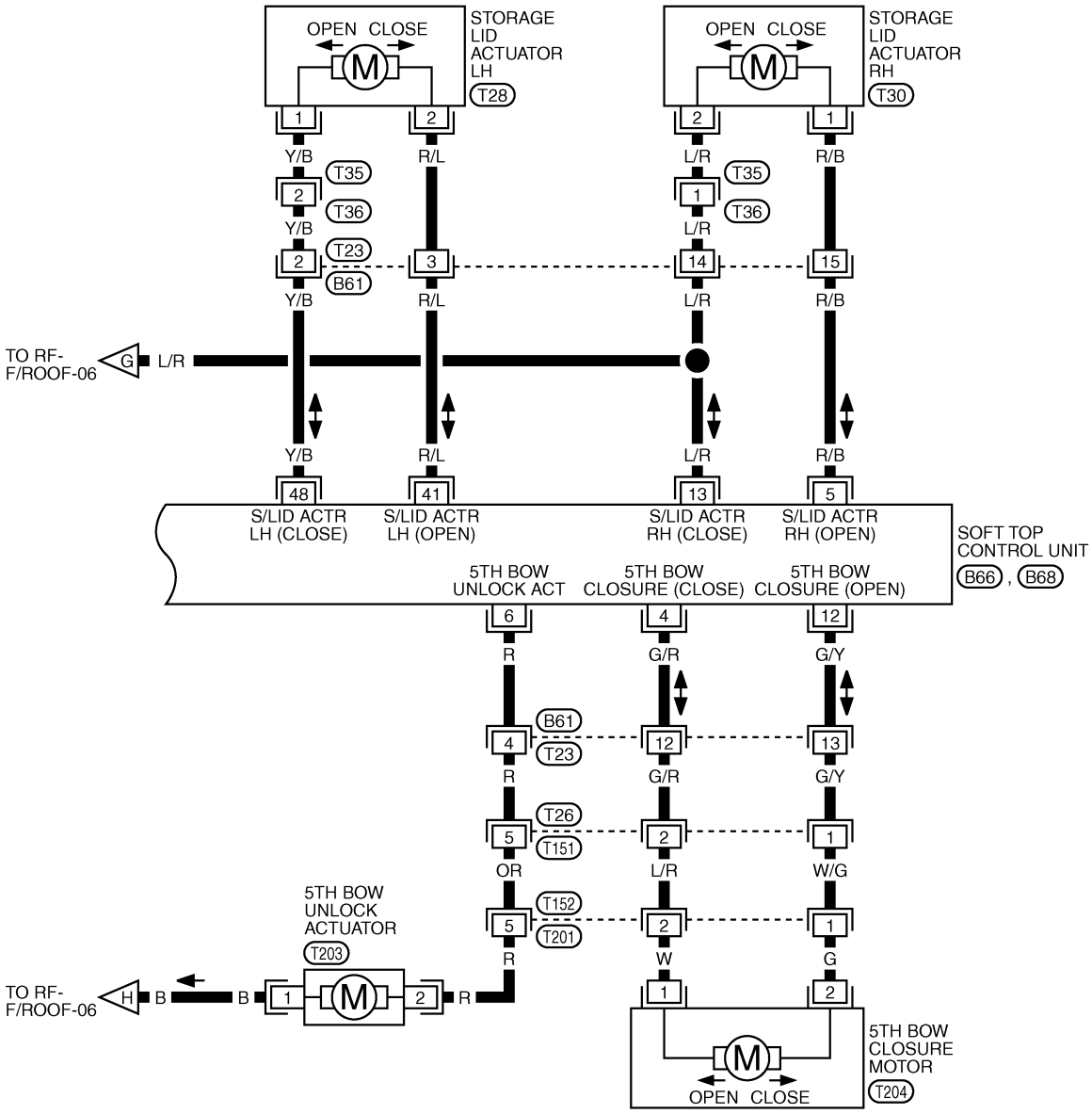
RF-F/ROOF-07

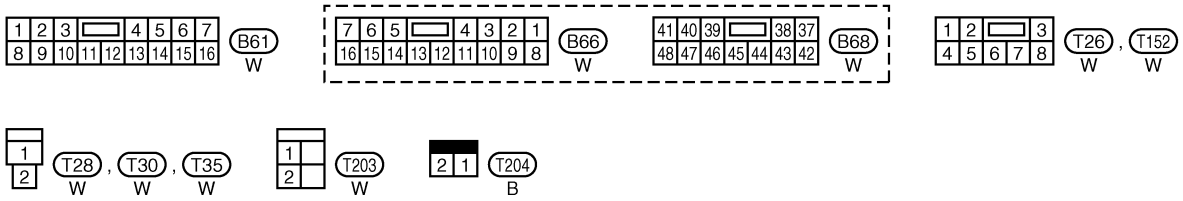




TIWT2284E

RF-F/ROOF-08





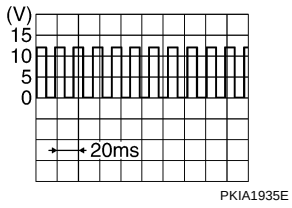
TIWT1608E

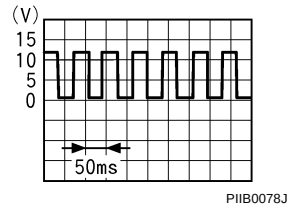
Terminal and Reference Value of Soft Top Control Unit

NIS0006H

CLOSE → OPEN OPERATION

The operation chart for roof position. Refer to RF-19, "State Chart" .

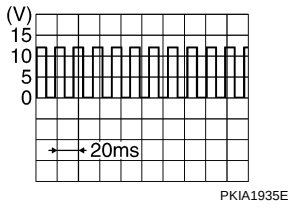
Terminal No.	Wire color	Description		Condition (Roof position: OP)	Value (V) (Approx.)
		Signal name	Input/ Output		
1	W/R	Battery power supply	Input	—	Battery voltage
3	R	Roof actuator RH (OPEN) signal	Output	OP8 → OP11	0 → Battery voltage → 0
				Other than above	0
4	G/R	5th bow closure motor (CLOSE) signal	Output	—	0
5	R/B	Storage lid actuator RH (OPEN) signal	Output	OP6 → OP7	0 → Battery voltage → 0
				OP12	
				Other than above	0
6	R	5th bow unlock actuator signal	Output	OP2 → OP3	0 → Battery voltage → 0
				Other than above	0
7	B	Ground	—	—	0
8	W/R	Battery power supply	Input	—	Battery voltage
10	Y	Roof actuator RH (CLOSE) signal	Output	—	0
12	G/Y	5th bow closure motor (OPEN) signal	Output	OP4	0 → Battery voltage → 0
				Other than above	0
13	L/R	Storage lid actuator RH (CLOSE) signal	Output	OP11 → OP12	0 → Battery voltage → 0
				Other than above	0
14	W	Speed signal (8 pulse)	Input/ Output	Speed meter operate [When vehicle speed is Approx. 40km/h (25 MPH)]	 PKIA1935E
15	OR	Storage lid unlock actuator LH and RH signal	Output	OP5 → OP6	0 → Battery voltage → 0
				Other than above	0
16	B	Ground	—	—	0
17	R	Ignition switch (ON or START)	Input	Ignition switch (ON or START position)	Battery voltage
18	SB	Soft top switch (OPEN) signal	Input	Soft top switch open operate	0
				Other than above	5
19	R/W	Soft top switch (CLOSE) signal	Input	Soft top switch close operate	0
				Other than above	5
20	W/B	Roof full close detection switch signal	Input	OP8	5 → 0
21	W/L	Roof full open detection switch signal	Input	OP11	5 → 0
22	W/R	Roll bar interference prevention switch signal	Input	OP9	5 → 0

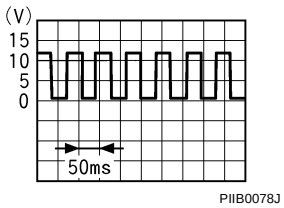
Terminal No.	Wire color	Description		Condition (Roof position: OP)		Value (V) (Approx.)
		Signal name	Input/ Output			
23	W/G	Speed signal (2 pulse)	Input/ Output	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]		 PIIB0078J
24	G	Storage lid full close detection switch (RH) signal	Input	OP5 → OP12		5 → 0 → 5
25	L/Y	Storage lid full close detection switch (LH) signal	Input	OP6 → OP11		5 → 0 → 5
26	LG	5th bow full open detection switch signal	Input	OP5 → OP7		5 → 0 → 5
				OP10		5 → 0
27	GY	5th bow full close detection switch signal	Input	OP4 → OP8		5 → 0 → 5
				OP9		5 → 0
28	LG/B	Soft top front lock detection switch signal	Input	Front lock	: Lock	5
					: Unlock	0
29	R/Y	5th bow ending switch signal	Input	OP4		5 → 0
30	Y/R	5th bow full-latch switch signal	Input	OP4		5 → 0
31	L	5th bow half-latch switch signal	Input	OP3		5 → 0
32	W	Body interference prevention switch signal	Input	OP10		5 → 0
33	BR	Storage lid full open detection switch signal	Input	OP7 → OP11		5 → 0 → 5
34	L/W	Seat back position signal	Input	When passenger seat inclines forward		0
				Other than above		5
35	Y	Indicator lamp signal	Input	OP1 → OP12		0
				Other than above		Battery voltage
36	PU	Power window down signal	Output	OP1→OP11		0
				Other than above		5
37	R	Roof actuator LH (OPEN) signal	Output	OP8 → OP11		0 → Battery voltage → 0
				Other than above		0
38	W	Brake pedal signal	Input	Brake pedal	: Depressed	Battery voltage
					: Released	0
41	R/L	Storage lid actuator LH (OPEN) signal	Output	OP6 → OP7		0 → Battery voltage → 0
				OP12		
				Other than above		0
42	Y	Roof actuator LH (CLOSE) signal	Output	—		0
44	G/R	5th bow actuator (DOWN) signal	Output	OP7 → OP8		0 → Battery voltage → 0
				Other than above		0
45	G/Y	5th bow actuator (UP) signal	Output	OP3 → OP5		0 → Battery voltage → 0
				OP9 → OP10		
				Other than above		0

Terminal No.	Wire color	Description: Signal name	Description: Input/Output	Condition (Roof position: OP)	Value (V) (Approx.)
48	Y/B	Storage lid actuator LH (CLOSE) signal	Output	OP11 → OP12	0 → Battery voltage → 0
				Other than above	0

OPEN → CLOSE OPERATION

The operation chart for roof position. Refer to RF-21, "State Chart" .

Terminal No.	Wire color	Description: Signal name	Description: Input/Output	Condition (Roof position: CL)	Value (V) (Approx.)
1	W/R	Battery power supply	Input	—	Battery voltage
3	R	Roof actuator RH (OPEN) signal	Output	—	0
4	G/R	5th bow closure motor (CLOSE) signal	Output	CL10	0 → Battery voltage → 0
				Other than above	0
5	R/B	Storage lid actuator RH (OPEN) signal	Output	CL2 → CL3	0 → Battery voltage → 0
				CL8	
				Other than above	0
6	R	5th bow unlock actuator signal	Output	—	0
7	B	Ground	—	—	0
8	W/R	Battery power supply	Input	—	Battery voltage
10	Y	Roof actuator RH (CLOSE) signal	Output	CL3 → CL6	0 → Battery voltage → 0
				Other than above	0
12	G/Y	5th bow closure motor (OPEN) signal	Output	—	0
13	L/R	Storage lid actuator RH (CLOSE) signal	Output	CL7 → CL8	0 → Battery voltage → 0
				Other than above	0
14	W	Speed signal (8 pulse)	Input/Output	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]	 PKIA1935E
15	OR	Storage lid unlock actuator LH and RH signal	Output	CL1 → CL2	0 → Battery voltage → 0
				Other than above	0
16	B	Ground	—	—	0
17	R	Ignition switch (ON or START)	Input	Ignition switch (ON or START position)	Battery voltage
18	SB	Soft top switch (OPEN) signal	Input	Soft top switch open operate	0
				Other than above	5
19	R/W	Soft top switch (CLOSE) signal	Input	Soft top switch close operate	0
				Other than above	5
20	W/B	Roof full close detection switch signal	Input	CL6	0 → 5
21	W/L	Roof full open detection switch signal	Input	CL3	0 → 5

Terminal No.	Wire color	Description		Condition (Roof position: CL)		Value (V) (Approx.)
		Signal name	Input/ Output			
22	W/R	Roll bar interference prevention switch signal	Input	CL5		0 → 5
23	W/G	Speed signal (2 pulse)	Input/ Output	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]		 PIIB0078J
24	G	Storage lid full close detection switch (RH) signal	Input	CL1 → CL8		5 → 0 → 5
25	L/Y	Storage lid full close detection switch (LH) signal	Input	CL2 → CL7		5 → 0 → 5
26	LG	5th bow full open detection switch signal	Input	CL4		0 → 5
				CL7		5 → 0
				CL8		0 → 5
27	GY	5th bow full close detection switch signal	Input	CL5 → CL6		0 → 5 → 0
				CL9		0 → 5
28	LG/B	Soft top front lock detection switch signal	Input	Front lock	: Lock	5
					: Unlock	0
29	R/Y	5th bow ending switch signal	Input	CL10		0 → 5
30	Y/R	5th bow full-latch switch signal	Input	CL10		0 → 5
31	L	5th bow half-latch switch signal	Input	CL9 → CL10		0 → 5
32	W	Body interference prevention switch signal	Input	CL3		0 → 5
33	BR	Storage lid full open detection switch signal	Input	CL3 → CL7		5 → 0 → 5
34	L/W	Seat back position signal	Input	When passenger seat inclines forward		0
				Other than above		5
35	Y	Indicator lamp signal	Input	CL1 → CL10		0
				Other than above		Battery voltage
36	PU	Power window down signal	Output	CL1 → CL10		0
				Other than above		5
37	R	Roof actuator LH (OPEN) signal	Output	—		0
38	W	Brake pedal signal	Input	Brake pedal	: Depressed	Battery voltage
					: Released	0
41	R/L	Storage lid actuator LH (OPEN) signal	Output	CL2 → CL3		0 → Battery voltage → 0
				CL8		
				Other than above		0
42	Y	Roof actuator LH (CLOSE) signal	Output	CL3 → CL6		0 → Battery voltage → 0
44	G/R	5th bow actuator (DOWN) signal	Output	CL4 → CL5		0 → Battery voltage → 0
				CL8 → CL10		
45	G/Y	5th bow actuator (UP) signal	Output	CL6 → CL7		0 → Battery voltage → 0

Terminal No.	Wire color	Description		Condition (Roof position: CL)	Value (V) (Approx.)
		Signal name	Input/ Output		
48	Y/B	Storage lid actuator LH (CLOSE) signal	Output	CL7 → CL8	0 → Battery voltage → 0
				Other than above	0

Work Flow

NIS0006I

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to RF-12, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to RF-37, "Trouble Diagnosis Chart by Symptom" .
4. Does soft top system operate normally? If Yes, GO TO 5. If No, GO TO 3.
5. INSPECTION END.

Trouble Diagnosis Chart by Symptom (CLOSE → OPEN)

NIS0006J

The operation chart for roof position. Refer to RF-19, "State Chart" .

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Roof does not operate	1. Check soft top control unit power supply	OP1	RF-40
	2. Check soft top switch (Open)	OP1	RF-40
	3. Check operation permission condition	OP1	RF-78
	4. Check each switch condition (Open operate)	Full close	RF-80
	5. Check seat back position signal	OP1	RF-83
	6. Check 5th bow unlock actuator (Open operate)	OP2	RF-44
	7. Check 5th bow half-latch switch (Open operate)	OP2	RF-44
	8. Check 5th bow actuator (Open operate)	OP3	RF-46
5th bow operation stops at full open position	1. Check 5th bow full close detection switch (Open operate)	OP4	RF-46
	2. Check 5th bow full open detection switch (Open operate)	OP5	RF-48
	3. Check storage lid unlock actuator (Open operate)	OP5	RF-49
	4. Check storage lid full close detection switch (LH and RH) (Open operate)	OP5.6	RF-50
	5. Check storage lid actuator (Open operate)	OP6	RF-52
Storage lid operation stops at full open position	Check storage lid full open detection switch (Open operate)	OP7	RF-53
Roof does not operate	Check roof actuator (Open operate)	OP8	RF-55
Roof stops on the way	Check roll bar interference prevention switch (Open operate)	OP8	RF-56
Storage lid operation stops at full open position after the roof is stored.	1. Check body interference prevention switch (Open operate)	OP10	RF-57
	2. Check roof full open detection switch	OP10	RF-58
Passenger side seat back does not operate.	1. Check passenger side seat cancel switch	OP1	SE-52
	2. Check passenger side seat operate signal 1	OP1	RF-82
Passenger side seat bock does not return to former state	Check passenger side seat operate signal 2	OP10	RF-83
Power window down does not operate.	Check power window harness	OP1	RF-82

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Both power window down and passenger seat are not operated.	Check power window down request signal	OP1	RF-81
Indicator lamp does not light. (soft top operates properly)	Check indicator lamp circuit	—	RF-85
Indicator lamp blinks when IGN SW: OFF → ON is done.	Replace soft top control unit	—	RF-86
Indicator lamp blinks when beginning to run.	Check speed signal	—	RF-84

(OPEN → CLOSE)

The operation chart for roof position. Refer to RF-21, "State Chart" .

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Roof does not operate	1. Check soft top control unit power supply	CL1	RF-40
	2. Check soft top switch (Close)	CL1	RF-42
	3. Check operation permission condition	CL1	RF-78
	4. Check each switch condition (Close operate)	Full open	RF-81
	5. Check seat back position signal	CL1	RF-83
	6. Check storage lid unlock actuator (Close operate)	CL1	RF-59
	7. Check storage lid full close detection switch (LH and RH) (Close operate)	CL1.2	RF-60
	8. Check storage lid actuator (Close operate)	CL2	RF-62
Storage lid operation stops at full open position	1. Check roof actuator (Close operate)	CL2	RF-66
	2. Check body interference prevention switch (Close operate)	CL3	RF-65
Roof stops on the way	1. Check storage lid full open detection switch (Close operate)	CL3	RF-63
	2. Check roof full close detection switch (Close operate)	CL5	RF-67
	3. Check 5th bow actuator (Close operate)	CL5	RF-69
Operation stops after 5th bow operates down	Check 5th bow full close detection switch (Close operate)	CL5	RF-69
Operation stops after 5th bow operates up	Check 5th bow full open detection switch (Close operate)	CL6	RF-71
Auto closure of 5th bow does not operate.	1. Check 5th bow half-latch switch	CL10	RF-72
	2. Check 5th bow full-latch switch	CL10	RF-73
	3. Check 5th bow ending switch	CL10	RF-75
	4. Check 5th bow closure motor	CL10	RF-76
Passenger side seat back does not operate.	1. Check passenger side seat cancel switch	CL1	SE-52
	2. Check passenger side seat operate signal 1	CL1	RF-82
Passenger side seat back does not return to former state	Check passenger side seat operate signal 3	CL10	RF-83
Power window down does not operate.	Check power window harness	CL1	RF-82
Both power window down and passenger seat are not operated.	Check power window down request signal	CL1	RF-81
Indicator lamp does not light. (soft top operates properly)	Check indicator lamp circuit	—	RF-85

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Indicator lamp blinks when IGN SW: OFF → ON is done.	Replace soft top control unit	—	RF-86
Indicator lamp blinks when beginning to run.	Check speed signal	—	RF-84
Indicator lamp blinks when soft top front lock is unlock at the fully closed position.	Check soft top front lock switch	Full close	RF-78

Check Soft Top Control Unit Power Supply (OP, CL)

NIS0006K

1. CHECK FUSE

- Check 10A fuse [No.12, located in the fuse block (J/B)]
- Check 40A fusible link (letter **G** located in the fuse and fusible link box.)

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

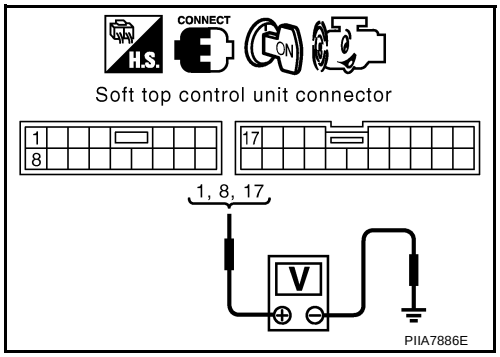
OK or NG

OK >> GO TO 2.
NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Start engine.
2. Check voltage between soft top control unit connector B66, 67 terminal 1, 8, 17 and ground.

1 (W/R) - Ground : Battery voltage
8 (W/R) - Ground : Battery voltage
17 (R) - Ground : Battery voltage



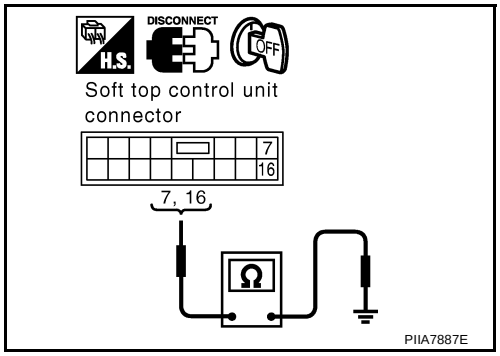
OK or NG

OK >> GO TO 3.
NG >> Check soft top control unit power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check continuity between soft top control unit connector B66 terminal 7, 16 and ground.

7 (B) - Ground : Continuity should exist.
16 (B) - Ground : Continuity should exist.



OK or NG

OK >> Power supply and ground circuit are OK.
NG >> Check soft top control unit ground circuit for open or short.

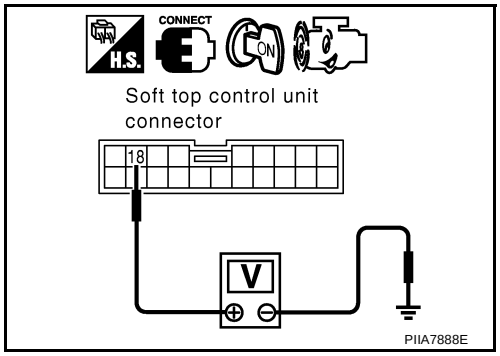
Check Soft Top Switch (OPEN)

NIS0006L

1. CHECK SOFT TOP OPEN SWITCH SIGNAL

1. Start engine.
2. Check soft top control unit connector and ground.

Connector	Terminal (Wire color)		Soft top switch Condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	18 (SB)	Ground	OPEN	0
			Other than above	5



OK or NG

OK >> Soft top switch (OPEN) is OK.
NG >> GO TO 2.

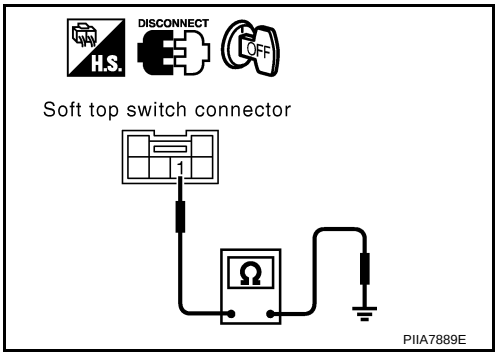
2. CHECK SOFT TOP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top switch connector.
3. Check continuity between soft top switch connector M14 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.



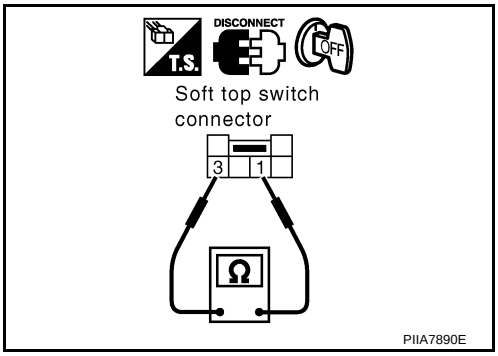
3. CHECK SOFT TOP SWITCH

Soft top switch operate, check continuity between soft top switch connector M14 terminal 1 and 3.

Connector	Terminal		Soft top switch Condition	Continuity
M14	1	3	OPEN	Yes
			Other than above	No

OK or NG

OK >> GO TO 4.
NG >> Replace soft top switch.



4. CHECK SOFT TOP SWITCH CIRCUIT

1. Check continuity between soft top control unit connector B67 terminal 18 and soft top switch connector M14 terminal 3.

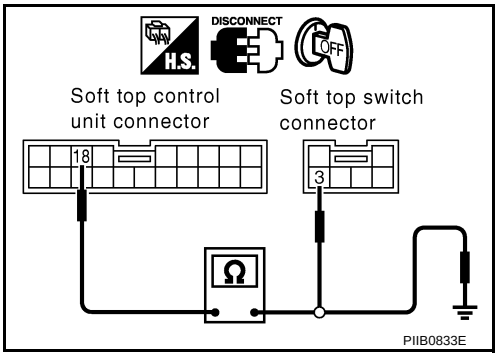
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	Continuity
	(+)		(-)	
B67	18 (SB)	M14	3 (L/B)	No
M14	3 (L/B)	B67	18 (SB)	Yes

2. Check continuity between soft top control unit connector B67 terminal 18 and ground.

18 (SB) - Ground : Continuity should not exist.

OK or NG

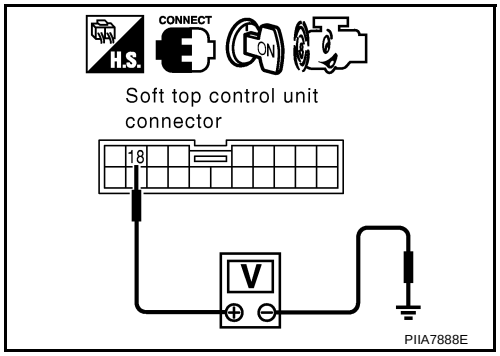
OK >> GO TO 5.
NG >> Repair or replace harness.



5. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 18 and ground.

18 (SB) - Ground : Approx. 5V



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace soft top control unit.

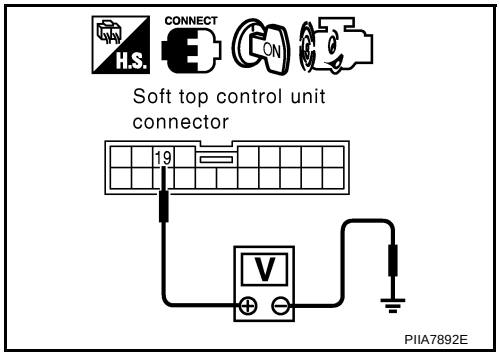
Check Soft Top Switch (CLOSE)

NIS0006M

1. CHECK SOFT TOP CLOSE SWITCH SIGNAL

1. Start engine.
2. Check soft top control unit connector and ground.

Connector	Terminal (Wire color)		Soft top switch Condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	19 (R/W)	Ground	CLOSE	0
			Other than above	5



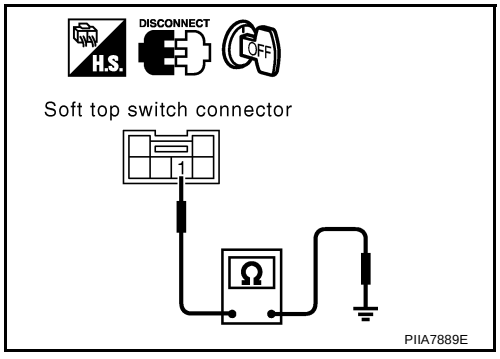
OK or NG

OK >> Soft top switch (CLOSE) is OK.
NG >> GO TO 2.

2. CHECK SOFT TOP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top switch connector.
3. Check continuity between soft top switch connector M14 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



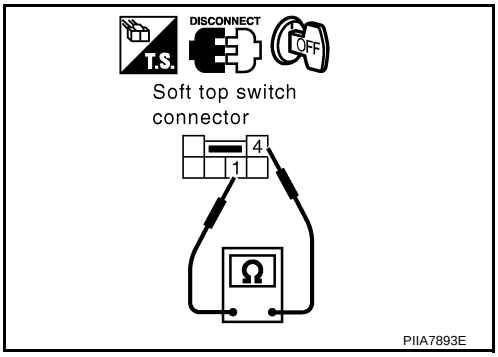
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP SWITCH

Soft top switch operate, check continuity between soft top switch connector M14 terminal 1 and 4.

Connector	Terminal		Soft top switch Condition	Continuity
M14	1	4	CLOSE	Yes
			Other than above	No



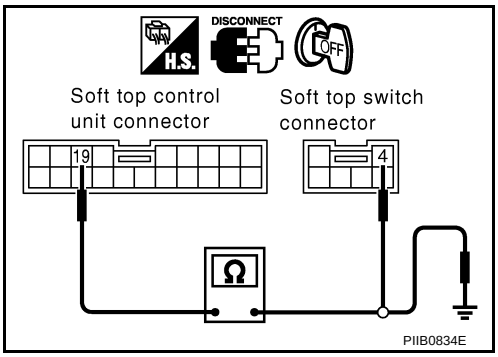
OK or NG

OK >> GO TO 4.
NG >> Replace soft top switch.

4. CHECK SOFT TOP SWITCH CIRCUIT

1. Check continuity between soft top control unit connector B67 terminal 19 and soft top switch connector M14 terminal 4.

Connector	Terminal (Wire color) (+)	Connector	Terminal (Wire color) (-)	Continuity
B67	19 (R/W)	M14	4 (R/G)	No
M14	4 (R/G)	B67	19 (R/W)	Yes



2. Check continuity between soft top control unit connector B67 terminal 19 and ground.

19 (R/W) - Ground : Continuity should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.

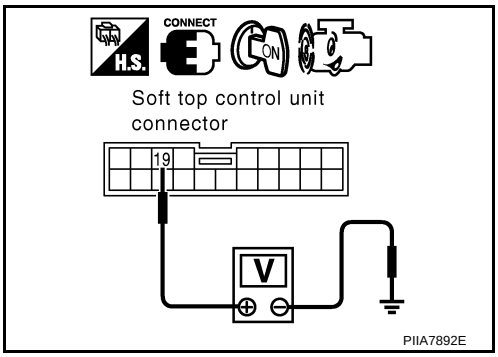
5. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 19 and ground.

19 (R/W) - Ground : Approx. 5V

OK or NG

OK >> Check condition of harness and connector.
NG >> Replace soft top control unit.



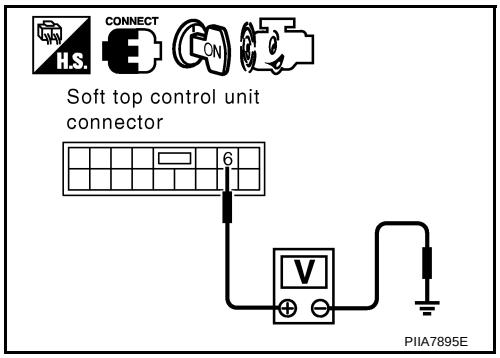
Check 5th Bow Unlock Actuator (Open Operate)

NIS0006N

1. CHECK 5TH BOW UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof Condition	Voltage (V) (Approx.)
	(+)	(-)		
B66	6 (R)	Ground	OP1 → OP2	0 → Battery voltage



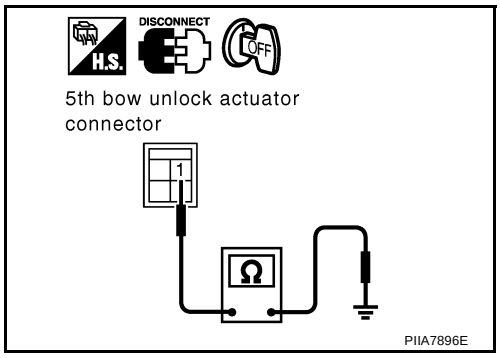
OK or NG

OK >> GO TO 2.
NG >> Replace soft top control unit.

2. CHECK 5TH BOW UNLOCK ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect 5th bow unlock actuator connector.
3. Check continuity between 5th bow unlock actuator connector T203 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



OK or NG

OK >> Replace 5th bow unlock actuator.
NG >> Repair or replace harness.

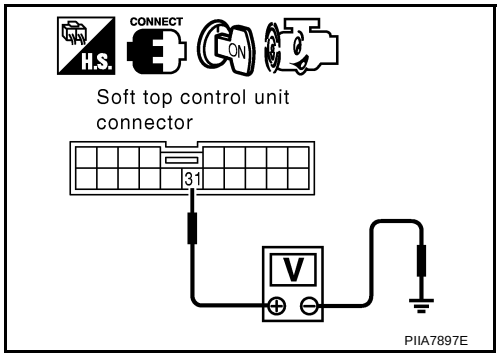
Check 5th Bow Half-Latch Switch (Open Operate)

NIS0006O

1. CHECK 5TH BOW HALF-LATCH SWITCH SIGNAL CHECK

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	31 (L)	Ground	OP2 → OP3	5 → 0



OK or NG

OK >> Soft top lock switch (5th bow half-latch switch) is OK.
NG >> GO TO 2.

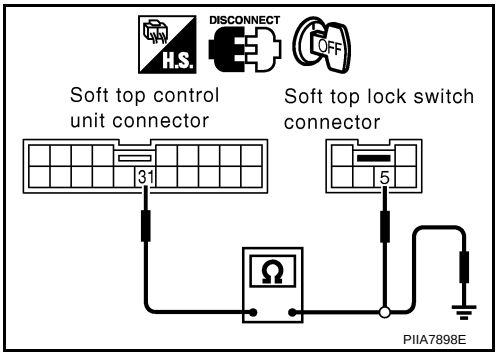
2. CHECK 5TH BOW HALF-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 31 and soft top lock switch connector T205 terminal 5.

31 (L) - 5 (L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Continuity should not exist.



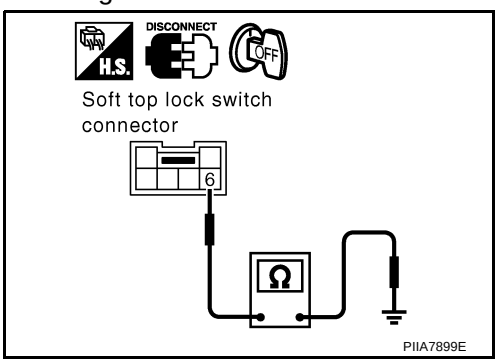
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 6 and ground.

6 (B) - Ground : Continuity should exist.



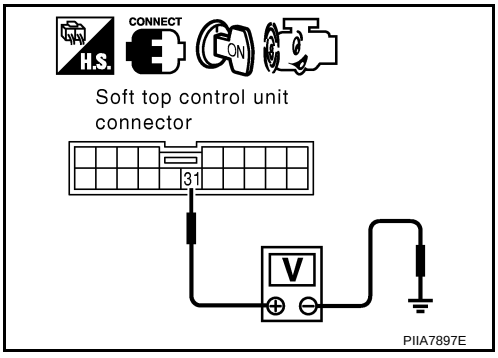
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Approx. 5V



OK or NG

OK >> Replace Soft top lock switch (5th bow lock assembly in storage lid).
NG >> Replace soft top control unit.

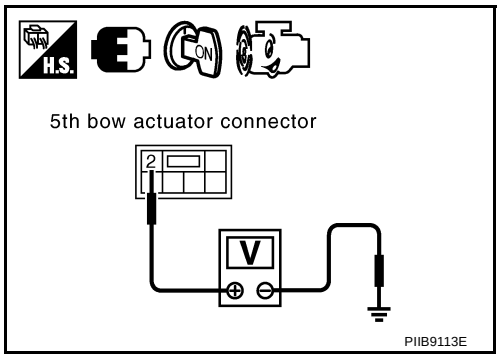
Check 5th Bow Actuator (Open Operate)

NIS0006P

1. CHECK 5TH BOW ACTUATOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between 5th bow actuator connector and ground.

Con-nector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B233	2 (G/R)	Ground	OP2 → OP3	0 → Battery voltage



OK or NG

OK >> Replace 5th bow actuator.
NG >> GO TO 2.

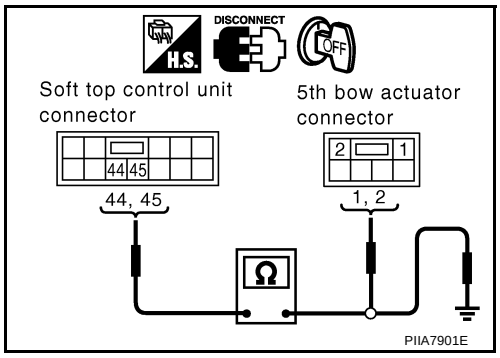
2. CHECK 5TH BOW ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow actuator connector.
3. Check continuity between soft top control unit connector B68 terminal 44, 45 and 5ht bow actuator connector B233 terminal 1, 2.

44 (G/R) - 1 (G/Y) : Continuity should exist.
45 (G/Y) - 2 (G/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B68 terminal 44, 45 and ground.

44 (G/R) - Ground : Continuity should not exist.
45 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

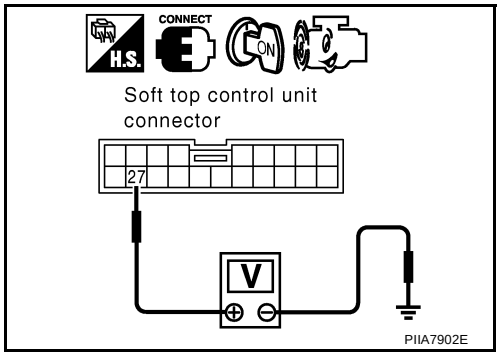
Check 5th Bow Full Close Detection Switch (Open Operate)

NIS0006Q

1. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	27 (GY)	Ground	OP3 → OP4	5 → 0



OK or NG

OK >> Plate rail RR (5th bow full close switch) is OK.
NG >> GO TO 2.

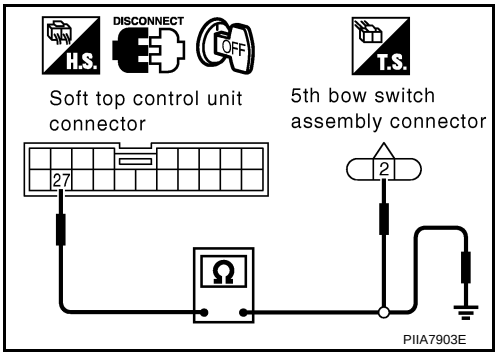
2. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 27 and 5th bow switch assembly connector B214 terminal 2.

27 (GY) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 27 and ground.

27 (GY) - Ground : Continuity should not exist.



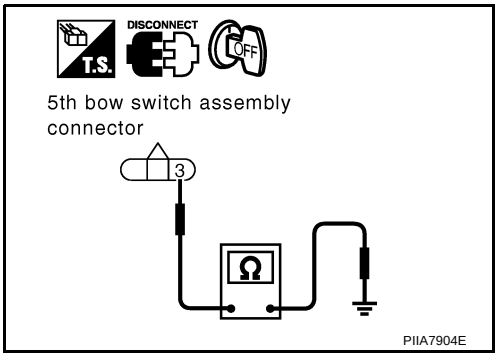
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



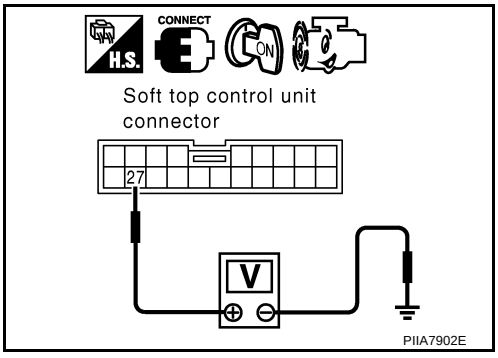
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 27 and ground.

27 (GY) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

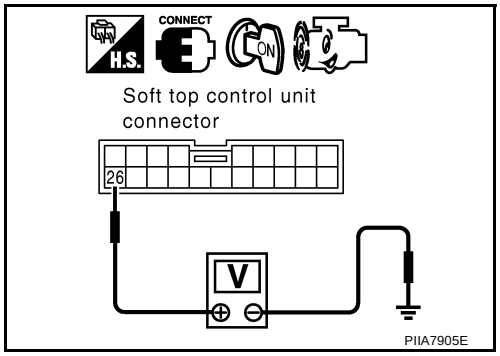
Check 5th Bow Full Open Detection Switch (Open Operate)

NIS0006R

1. CHECK 5TH BOW FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	26 (LG)	Ground	OP4 → OP5	5 → 0



OK or NG

OK >> Plate rail RR (5th bow full open switch) is OK.
NG >> GO TO 2.

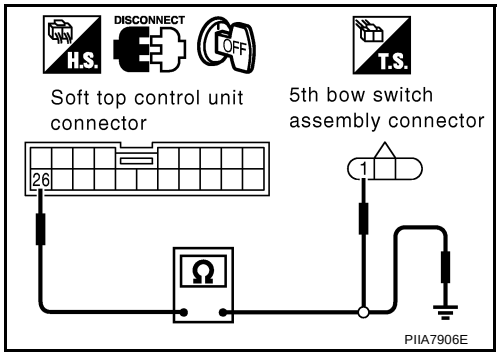
2. CHECK 5TH BOW FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 26 and 5th bow switch assembly connector B214 terminal 1.

26 (LG) - 1 (LG) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Continuity should not exist.



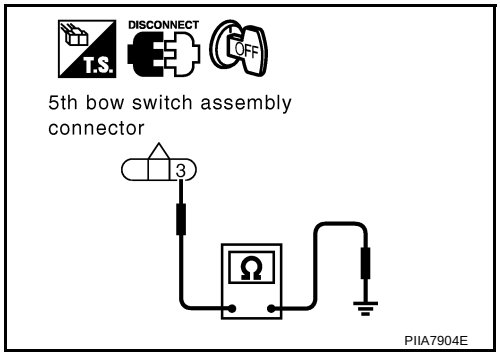
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



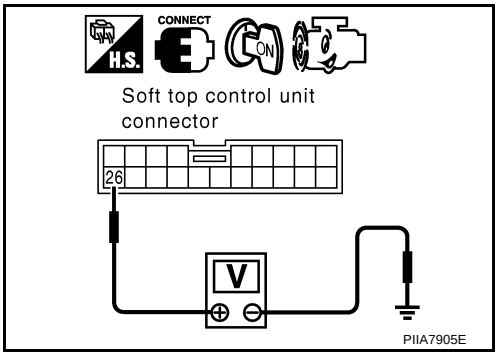
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

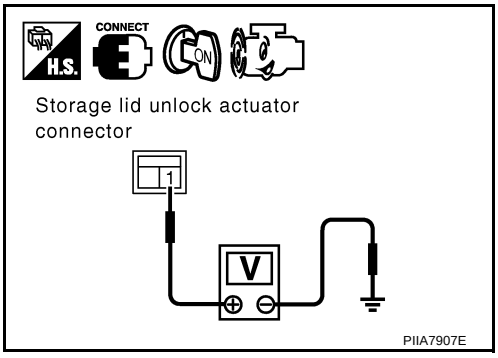
Check Storage Lid Unlock Actuator (Open Operate)

NIS0006S

1. CHECK STORAGE LID UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between storage lid unlock actuator (LH or RH) connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B65 (LH)	1 (R)	Ground	OP5 → OP6	0 → Battery voltage → 0
B70 (RH)	1 (L)			



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK STORAGE LID UNLOCK ACTUATOR CIRCUIT

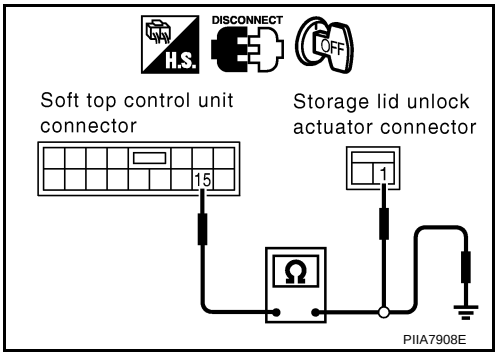
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid unlock actuator connector.
3. Check continuity between soft top control unit connector B66 terminal 15 and storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 1.

B65 (LH) 15 (OR) - 1 (R) : Continuity should exist.

B70 (RH) 15 (OR) - 1 (L) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 15 and ground.

15 (OR) - Ground : Continuity should not exist.



OK or NG

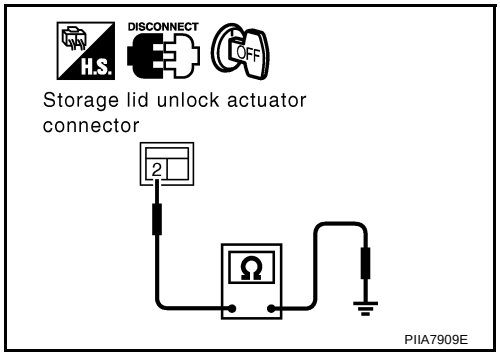
OK >> Replace soft top control unit.
NG >> Repair or replace harness.

3. CHECK STORAGE LID UNLOCK ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect storage lid unlock actuator connector.
3. Check continuity between storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 2 and ground.

B65 (LH) 2 (B/W) - Ground : Continuity should exist.

B70 (RH) 2 (B/Y) - Ground : Continuity should exist.



OK or NG

OK >> Replace malfunction storage lid unlock actuator (LH or RH).
NG >> Repair or replace harness.

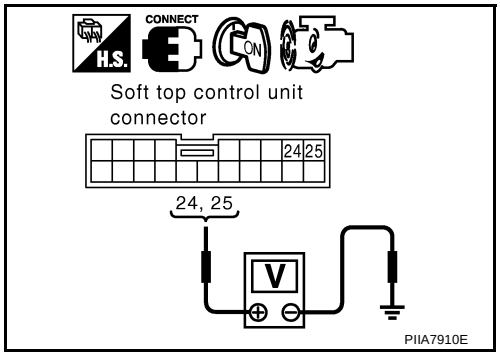
Check Storage Lid Full Close Detection Switch (Open Operate)

NIS0006T

1. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector		Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
		(+)	(-)		
B67	RH	24 (G)	Ground	OP5	5 → 0
	LH	25 (L/Y)		OP6	



OK or NG

OK >> Storage lid switch (LH & RH) (CLOSE) is OK.
NG >> GO TO 2.

2. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH CIRCUIT

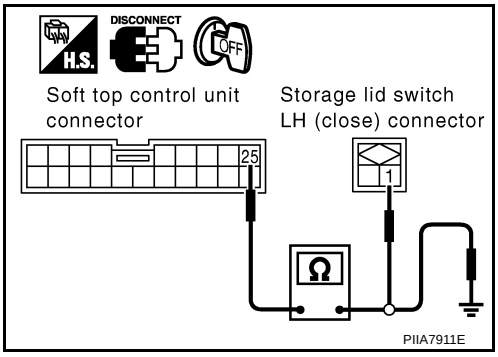
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (close) connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 25 and storage lid switch LH (close) connector B64 terminal 1.

25 (L/Y) - 1 (L/Y) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 25 and ground.

25 (L/Y) - Ground : Continuity should not exist.



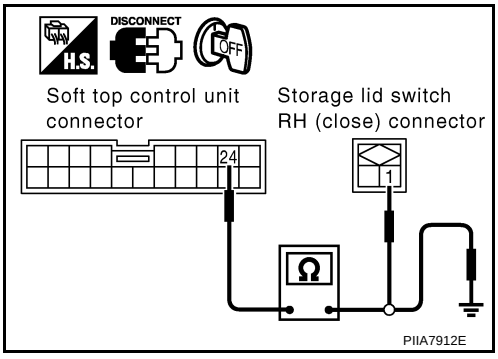
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 24 and storage lid switch RH (close) connector B69 terminal 1.

24 (G) - 1 (G) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 24 and ground.

24 (G) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

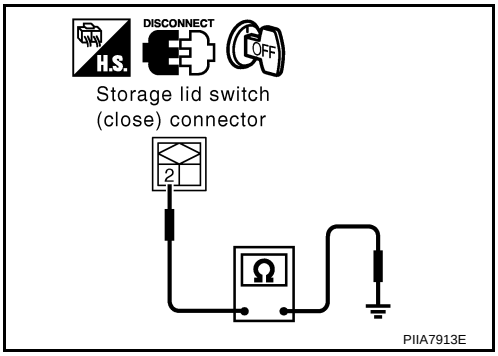
Check continuity between storage lid switch (close) connector B64 (LH), B69 (RH) terminal 2 and ground.

B64 (LH) 2 (B) - Ground : Continuity should exist.

B69 (RH) 2 (B/R) - Ground : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

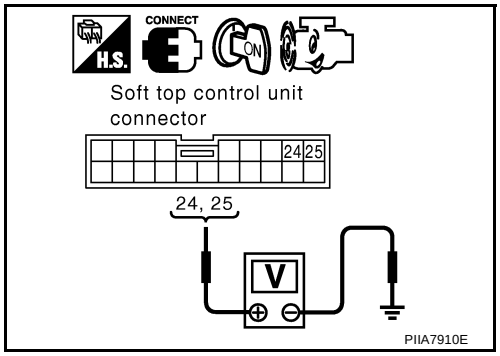


4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 24 (RH), 25 (LH) and ground.

24 (G) - Ground : Approx. 5V

25 (L/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace malfunction storage lid switch (LH or RH) (CLOSE).

NG >> Replace soft top control unit.

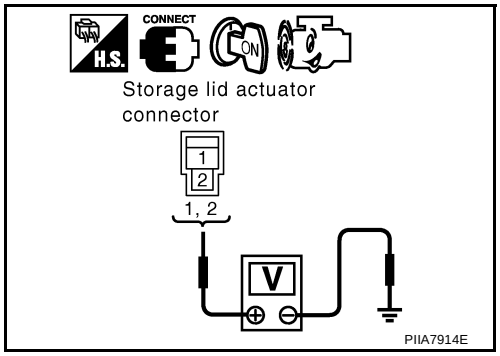
Check Storage Lid Actuator (Open Operate)

NIS0006U

1. CHECK STORAGE LID ACTUATOR (OPEN) SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between storage lid actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T28 (LH)	2 (R/L)	Ground	OP6 → OP7	0 → Battery voltage → 0
T30 (RH)	1 (R/B)			



OK or NG

OK >> Replace storage lid actuator (LH or RH).

NG >> GO TO 2.

2. CHECK STORAGE LID ACTUATOR CIRCUIT

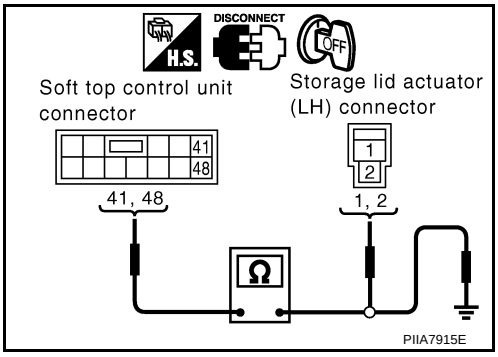
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid actuator connector.
3. Check the following.

- Continuity between soft top control unit connector B68 terminal 41, 48 and storage lid actuator (LH) connector T28 terminal 1, 2.

41 (R/L) - 2 (R/L) : Continuity should exist.
48 (Y/B) - 1 (Y/B) : Continuity should exist.

- Continuity between soft top control unit connector B68 terminal 41, 48 and ground.

41 (R/L) - Ground : Continuity should not exist.
48 (Y/B) - Ground : Continuity should not exist.



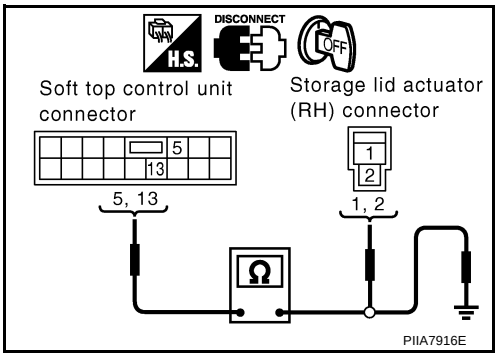
4. Check the following.

- Continuity between soft top control unit connector B66 terminal 5, 13 and storage lid actuator (RH) connector T30 terminal 1, 2.

5 (R/B) - 1 (R/B) : Continuity should exist.
13 (L/R) - 2 (L/R) : Continuity should exist.

- Continuity between soft top control unit connector B66 terminal 5, 13 and ground.

5 (R/B) - Ground : Continuity should not exist.
13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

Check Storage Lid Full Open Detection Switch (Open Operate)

NIS0006V

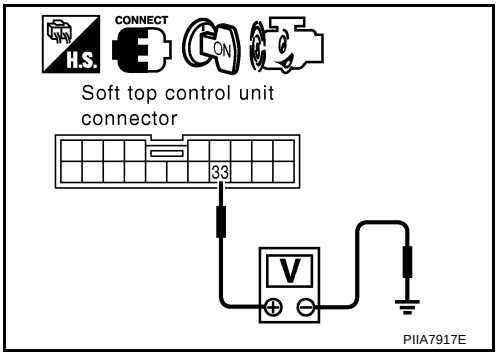
1. CHECK STORAGE LID FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	33 (BR)	Ground	OP6 → OP7	5 → 0

OK or NG

OK >> Storage lid switch (OPEN) is OK.
NG >> GO TO 2.



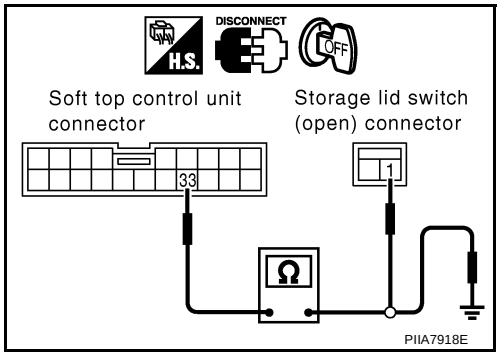
2. CHECK SOTORAGE LID FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (open) connector.
3. Check continuity between soft top control unit connector B67 terminal 33 and storage lid switch (open) connector T27 terminal 1.

33 (BR) - 1 (BR) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 33 and ground.

33 (BR) - Ground : Continuity should not exist.



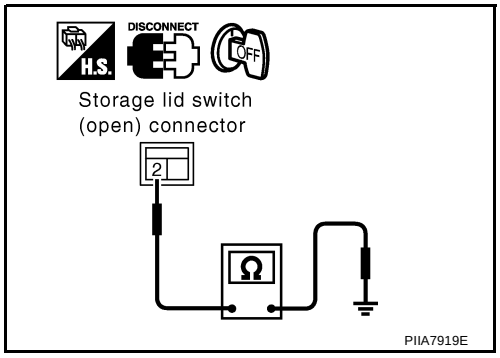
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (open) connector T27 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



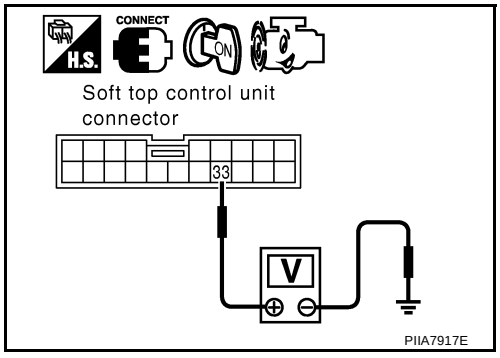
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 33 and ground.

33 (BR) - Ground : Approx. 5V



OK or NG

OK >> Replace storage lid switch (open).
NG >> Replace soft top control unit.

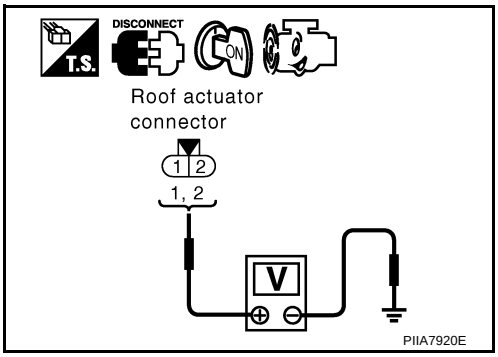
Check Roof Actuator (Open Operate)

NIS0006W

1. CHECK ROOF ACTUATOR (OPEN) SIGNAL

1. Turn ignition switch OFF.
2. Disconnect roof actuator connector.
3. Start engine.
4. Operate soft top switch (OPEN), check voltage between roof actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B59 (LH)	2 (R)	Ground	OP8 → OP11	0 → Battery voltage → 0
B72 (RH)	1 (R)			



OK or NG

OK >> Replace roof actuator (LH or RH).
NG >> GO TO 2.

2. CHECK ROOF ACTUATOR CIRCUIT

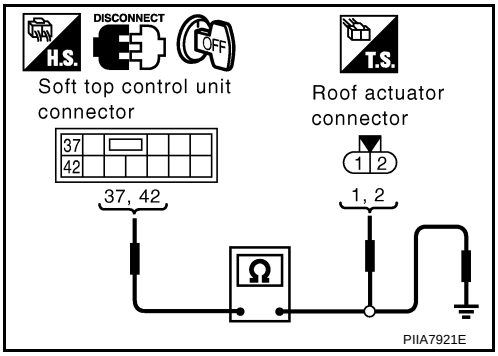
1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 37, 42 and roof actuator (LH) connector B59 terminal 1, 2.

37 (R) - 2 (R) : Continuity should exist.
42 (Y) - 1 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 37, 42 and ground.

37 (R) - Ground : Continuity should not exist.
42 (Y) - Ground : Continuity should not exist.



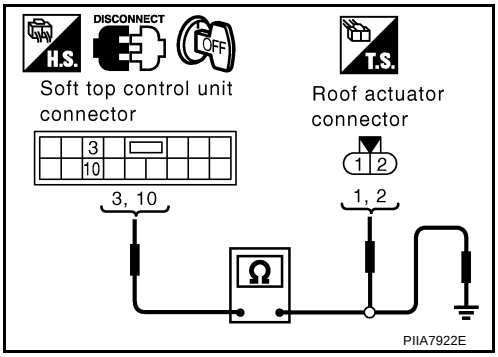
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 3, 10 and roof actuator (RH) connector B72 terminal 1, 2.

3 (R) - 1 (R) : Continuity should exist.
10 (Y) - 2 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 3, 10 and ground.

3 (R) - Ground : Continuity should not exist.
10 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

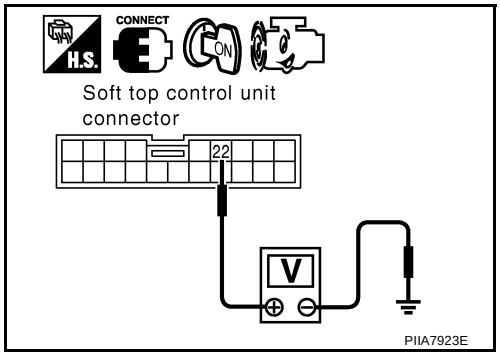
Check Roll Bar Interference Prevention Switch (Open Operate)

NIS0006X

1. CHECK ROLL BAR INTERFERENCE PREVENTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	22 (W/R)	Ground	OP8 → OP9	5 → 0



OK or NG

OK >> Soft top switch assembly 2 is OK.
NG >> GO TO 2.

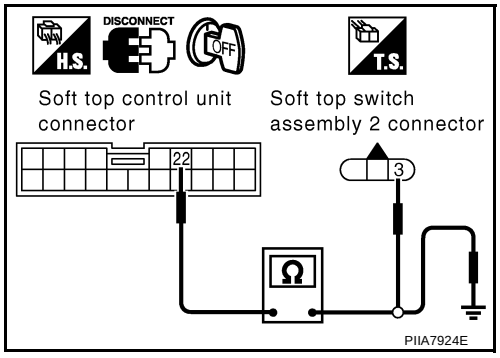
2. CHECK ROLL BAR INTERFERENCE PREVENTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 2 (roll bar interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 22 and soft top switch assembly 2 connector B213 terminal 3.

22 (W/R) - 3 (W/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 22 and ground.

22 (W/R) - Ground : Continuity should not exist.



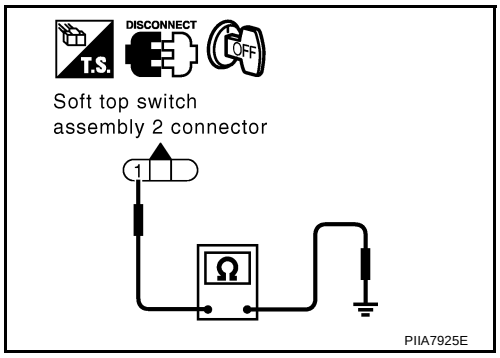
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK ROLL BAR INTERFERENCE PREVENTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 2 connector B213 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



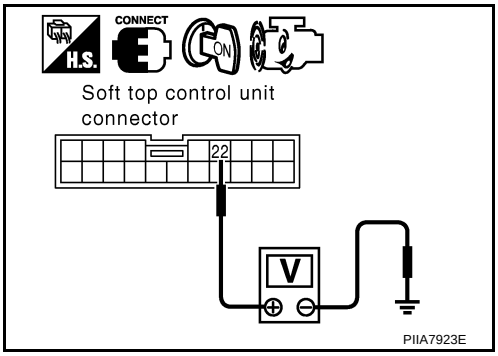
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 22 and ground.

22 (W/R) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 2.
NG >> Replace soft top control unit.

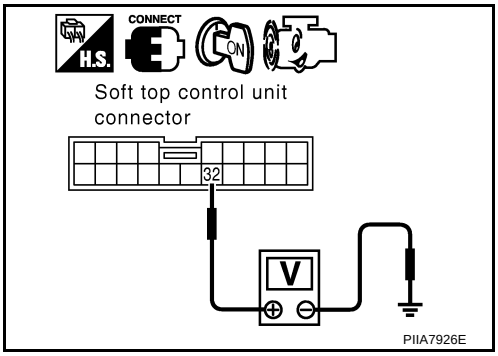
Check Body Interference Prevention Switch (Open Operate)

NIS0006Y

1. CHECK BODY INTERFERENCE PREVENTION SWITCH

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	32 (W)	Ground	OP10	5 → 0



OK or NG

OK >> Soft top switch assembly 1 is OK.
NG >> GO TO 2.

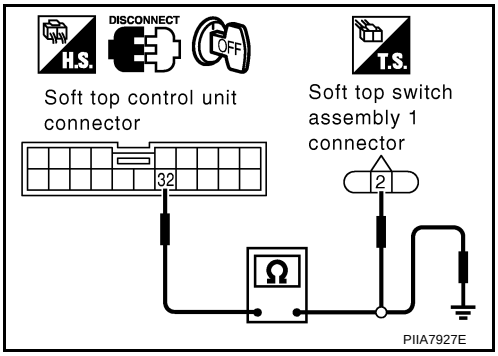
2. CHECK BODY INTERFERENCE PREVENTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 1 (body interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 32 and soft top switch assembly 1 connector B212 terminal 2.

32 (W) - 2 (W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Continuity should not exist.



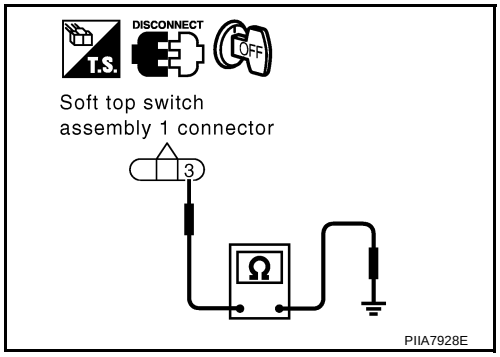
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK BODY INTERFERENCE PREVENTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 1 connector B212 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



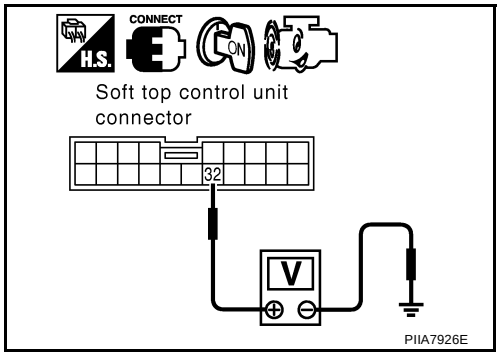
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
NG >> Replace soft top control unit.

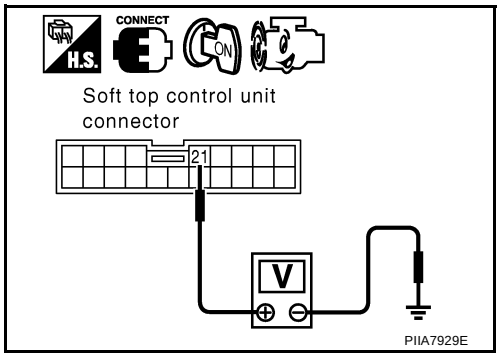
Check Roof Full Open Detection Switch (Open Operate)

NIS0006Z

1. CHECK ROOF FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	21 (W/L)	Ground	OP10 → OP11	5 → 0



OK or NG

OK >> Soft top switch assembly 1 (roof full open detection switch) is OK.
NG >> GO TO 2.

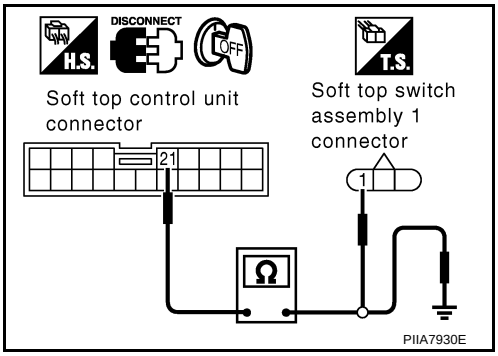
2. CHECK ROOF OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 1 connector.
3. Check continuity between soft top control unit connector B67 terminal 21 and soft top switch assembly 1 connector B212 terminal 1.

   21 (W/L) - 1 (W/L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 21 and ground.

   21 (W/L) - Ground : Continuity should not exist.



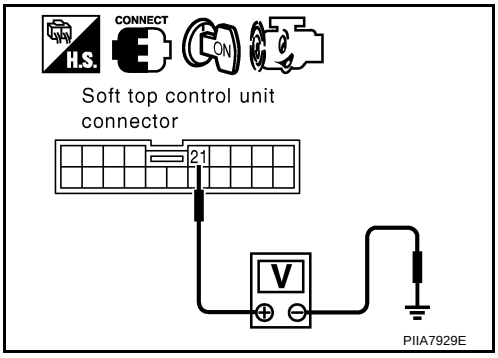
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 21 and ground.

   21 (W/L) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
>> Replace soft top control unit.

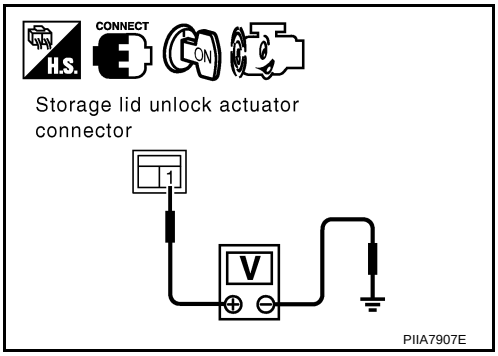
Check Storage Lid Unlock Actuator (Close Operate)

NIS00070

1. CHECK STORAGE LID UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between storage lid unlock actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B65 (LH)	1 (R)	Ground	CL1 → CL2	0 → Battery voltage → 0
B70 (RH)	1 (L)			



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

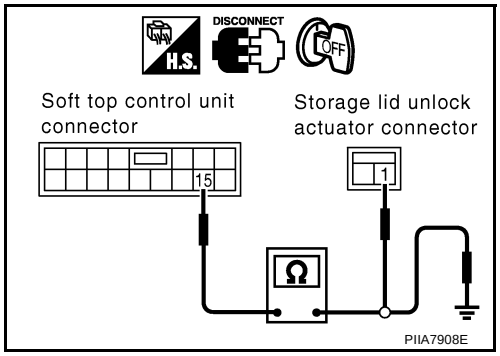
2. CHECK STORAGE LID UNLOCK ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid unlock actuator connector.
3. Check continuity between soft top control unit connector B66 terminal 15 and storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 1.

   B65 (LH) 15 (OR) - 1 (R) : Continuity should exist.

   B70 (RH) 15 (OR) - 1 (L) : Continuity should exist.
4. Check continuity between soft top control unit connector B66 terminal 15 and ground.

   15 (OR) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

3. CHECK STORAGE LID UNLOCK ACTUATOR GROUND CIRCUIT

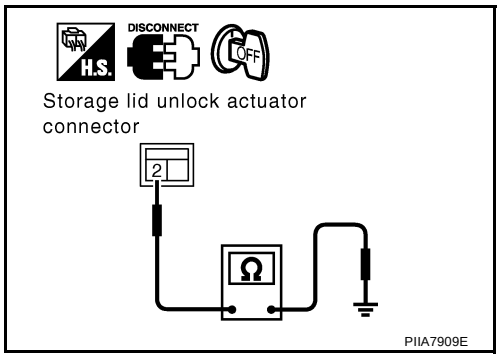
1. Turn ignition switch OFF.
2. Disconnect storage lid unlock actuator connector.
3. Check continuity between storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 2 and ground.

   B65 (LH) 2 (B) - Ground : Continuity should exist.

   B70 (RH) 2 (B/Y) - Ground : Continuity should exist.

OK or NG

OK >> Replace malfunction storage lid unlock actuator (LH or RH).
NG >> Repair or replace harness.



Check Storage Lid Full Close Detection Switch (Close Operate)

NIS00071

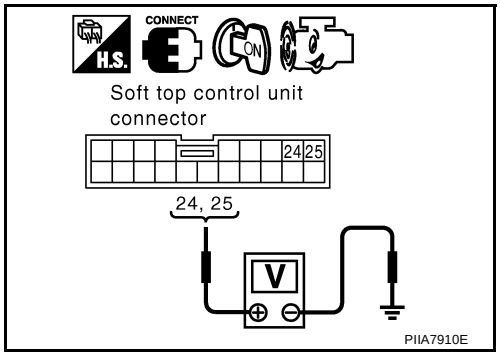
1. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	24 (G) for switch RH	Ground	CL1	5 → 0
	25 (L/Y) for switch LH		CL1 → CL2	

OK or NG

OK >> Storage lid switch (LH & RH) (CLOSE) is OK.
NG >> GO TO 2.



2. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH CIRCUIT

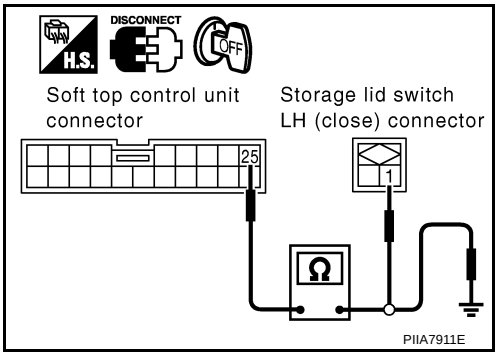
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (close) connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 25 and storage lid switch LH (close) connector B64 terminal 1.

25 (L/Y) - 1 (L/Y) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 25 and ground.

25 (L/Y) - Ground : Continuity should not exist.



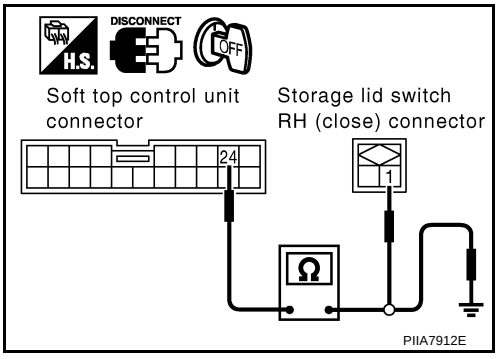
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 24 and storage lid switch RH (close) connector B69 terminal 1.

24 (G) - 1 (G) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 24 and ground.

24 (G) - Ground : Continuity should not exist.



OK or NG

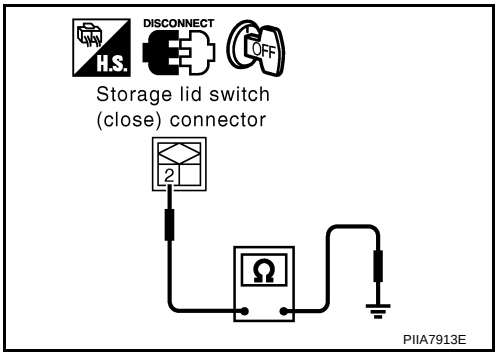
OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (close) connector B64 (LH), B69 (RH) terminal 2 and ground.

B64 (LH) 2 (B) - Ground : Continuity should exist.

B69 (RH) 2 (B/R) - Ground : Continuity should exist.



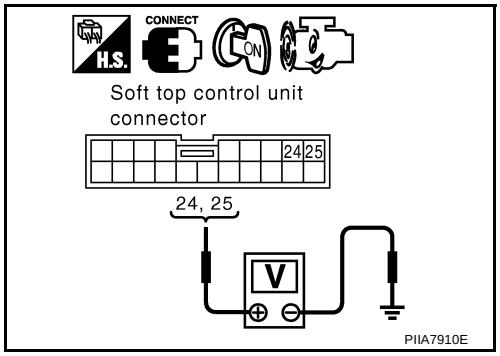
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP ROOF CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 24, 25 and ground.

24 (G) - Ground : Approx. 5V
25 (L/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace malfunction storage lid switch (LH or RH).
NG >> Replace soft top control unit.

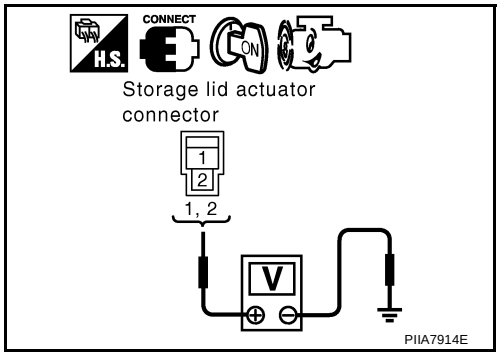
Check Storage Lid Actuator (Close Operate)

NIS00072

1. CHECK STORAGE LID ACTUATOR (CLOSE) SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between storage lid actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T28 (LH)	1 (Y/B)	Ground	CL2 → CL3	0 → Battery voltage → 0
T30 (RH)	2 (L/R)			



OK or NG

OK >> Replace storage lid actuator (LH or RH).
NG >> GO TO 2.

2. CHECK STORAGE LID ACTUATOR CIRCUIT

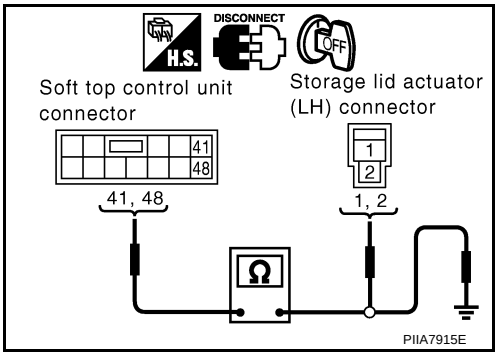
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid actuator connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 41, 48 and storage lid actuator (LH) connector T28 terminal 1, 2.

41 (R/L) - 2 (R/L) : Continuity should exist.
48 (Y/B) - 1 (Y/B) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 41, 48 and ground.

41 (R/L) - Ground : Continuity should not exist.
48 (Y/B) - Ground : Continuity should not exist.



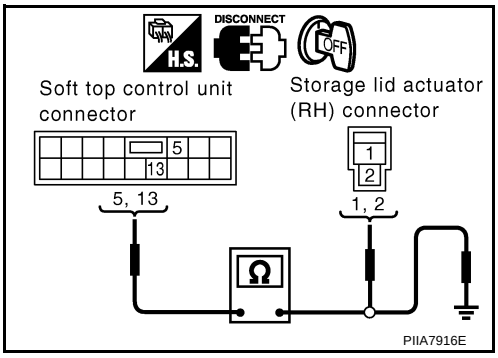
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 5, 13 and storage lid actuator (RH) connector T30 terminal 1, 2.

5 (R/B) - 1 (R/B) : Continuity should exist.
13 (L/R) - 2 (L/R) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 5, 13 and ground.

5 (R/B) - Ground : Continuity should not exist.
13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

Check Storage Lid Full Open Detection Switch (Close Operate)

NIS00073

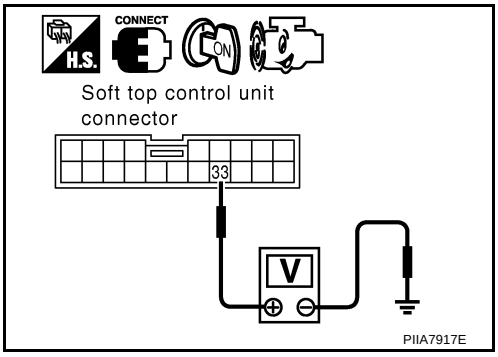
1. CHECK STORAGE LID FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	33 (BR)	Ground	CL2 → CL3	5 → 0

OK or NG

OK >> Storage lid switch (OPEN) (storage lid full open detection switch) is OK.
NG >> GO TO 2.



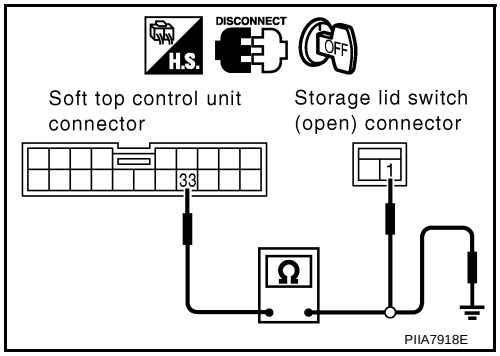
2. CHECK SOTORAGE LID FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (open) connector.
3. Check continuity between soft top control unit connector B67 terminal 33 and storage lid switch (open) connector T27 terminal 1.

33 (BR) - 1 (BR) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 33 and ground.

33 (BR) - Ground : Continuity should not exist.



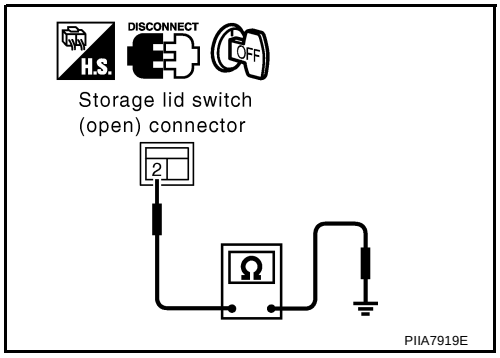
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (open) connector T27 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



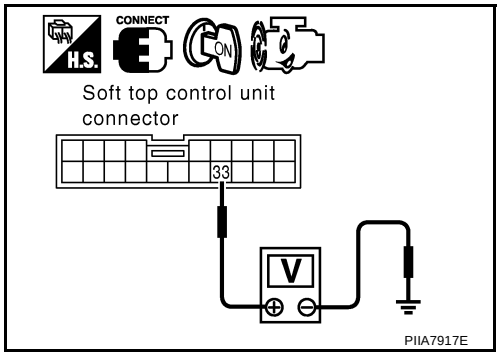
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 33 and ground.

33 (BR) - Ground : Approx. 5V



OK or NG

OK >> Replace storage lid switch (open).
NG >> Replace soft top control unit.

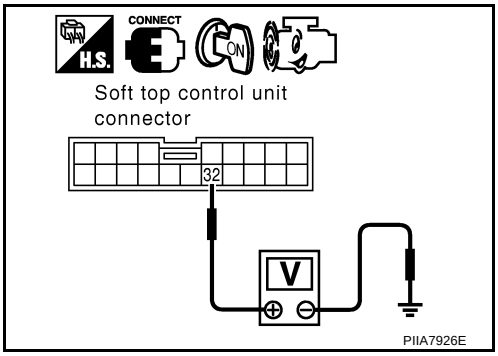
Check Body Interference Prevention Switch (Close Operate)

NIS00074

1. CHECK BODY INTERFERENCE PREVENTION SWITCH

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	32 (W)	Ground	CL3	0 → 5



OK or NG

OK >> Soft top switch assembly 1 (body interference prevention switch) is OK.
NG >> GO TO 2.

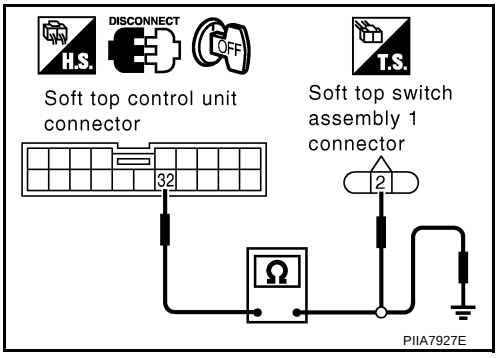
2. CHECK BODY INTERFERENCE PREVENTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 1 (body interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 32 and soft top switch assembly 1 connector B212 terminal 2.

32 (W) - 2 (W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Continuity should not exist.



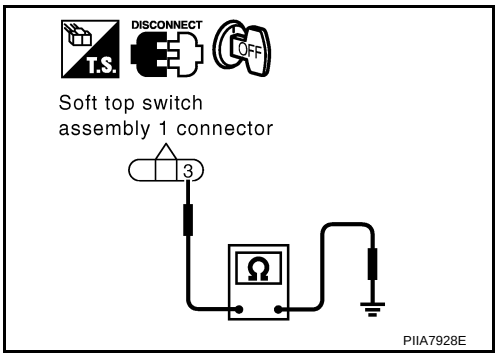
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK BODY INTERFERENCE PREVENTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 1 connector B212 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



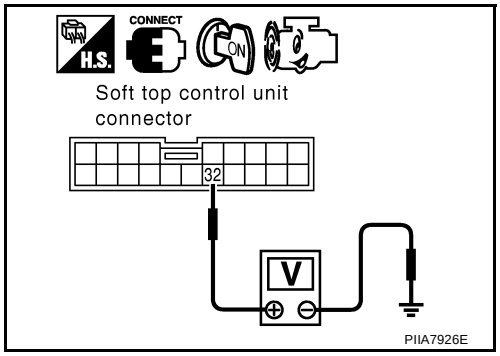
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
NG >> Replace soft top control unit.

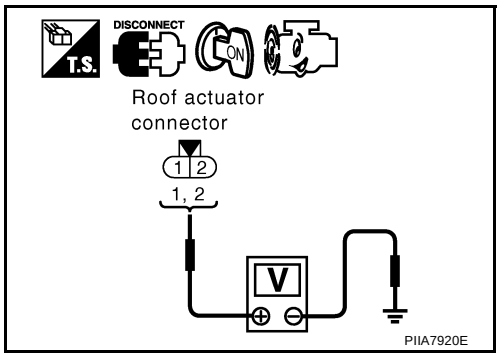
Check Roof Actuator (Close Operate)

NIS00075

1. CHECK ROOF ACTUATOR (CLOSE) SIGNAL

1. Turn ignition switch OFF.
2. Disconnect roof actuator connector.
3. Start engine.
4. Operate soft top switch (CLOSE), check voltage between roof actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B59 (LH)	1 (Y)	Ground	CL3 → CL6	0 → Battery voltage → 0
B72 (RH)	2 (Y)			



OK or NG

OK >> Replace roof actuator (LH or RH).
NG >> GO TO 2.

2. CHECK ROOF ACTUATOR CIRCUIT

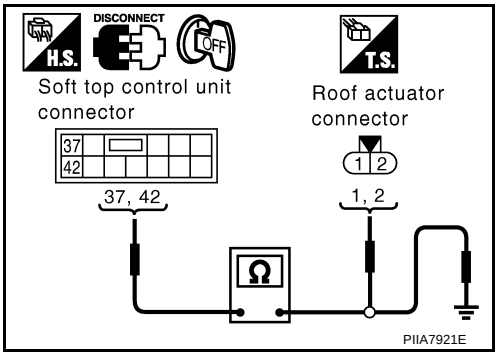
1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 37, 42 and roof actuator (LH) connector B59 terminal 1, 2.

37 (R) - 2 (R) : Continuity should exist.
42 (Y) - 1 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 37, 42 and ground.

37 (R) - Ground : Continuity should not exist.
42 (Y) - Ground : Continuity should not exist.



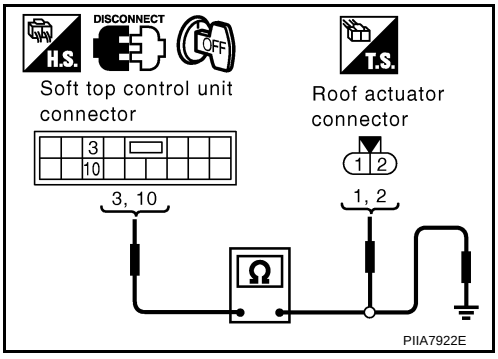
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 3, 10 and roof actuator (RH) connector B72 terminal 1, 2.

3 (R) - 1 (R) : Continuity should exist.
10 (Y) - 2 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 3, 10 and ground.

3 (R) - Ground : Continuity should not exist.
10 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

Check Roof Full Close Detection Switch

NIS00076

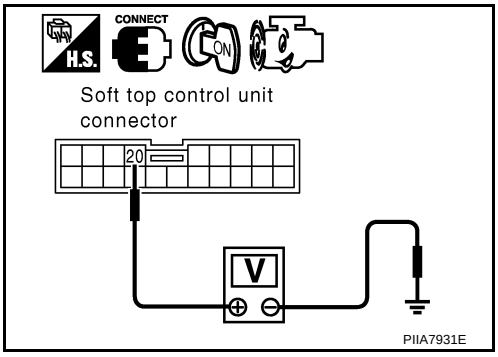
1. CHECK ROOF FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	CL5 → CL6	0 → 5

OK or NG

OK >> Soft top switch assembly 2 (roof full close detection switch) is OK.
NG >> GO TO 2.



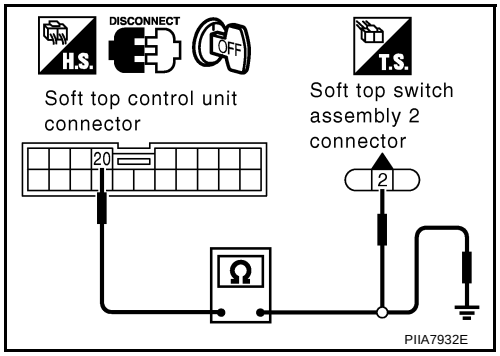
2. CHECK ROOF FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 2 (roof full close detection switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 20 and soft top switch assembly 2 connector B213 terminal 2.

20 (W/B) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 20 and ground.

20 (W/B) - Ground : Continuity should not exist.



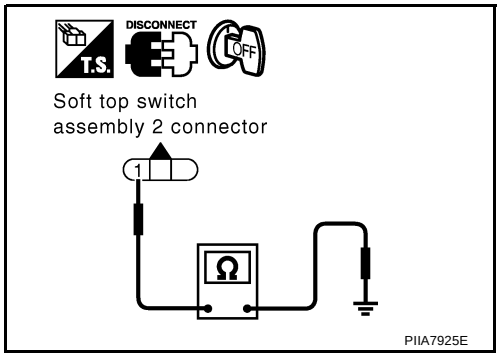
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK ROOF FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 2 connector B213 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



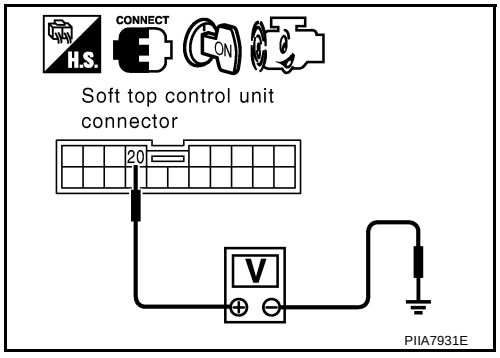
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 20 and ground.

20 (W/B) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 2.
NG >> Replace soft top control unit.

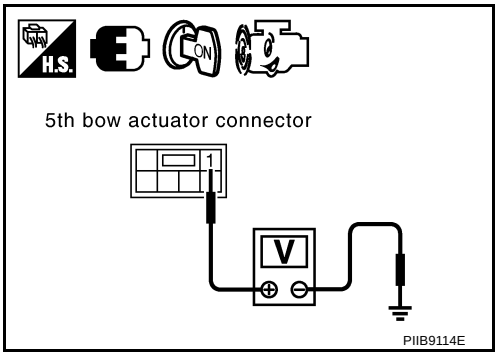
Check 5th Bow Actuator (Close Operate)

NIS00077

1. CHECK 5TH BOW ACTUATOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between 5th bow actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B233	1 (G/Y)	Ground	CL4 → CL5	0 → Battery voltage → 0



OK or NG

OK >> Replace 5th bow actuator.
NG >> GO TO 2.

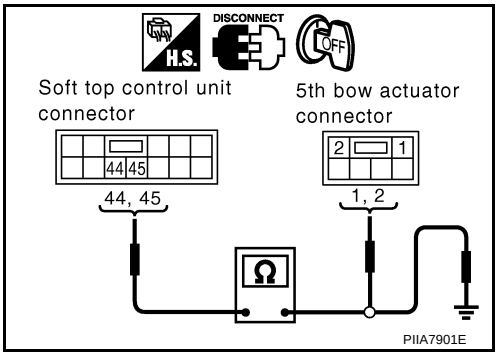
2. CHECK 5TH BOW ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow actuator connector.
3. Check continuity between soft top control unit connector B68 terminal 44, 45 and 5ht bow actuator connector B233 terminal 1, 2.

44 (G/R) - 1 (G/Y) : Continuity should exist.
45 (G/Y) - 2 (G/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B68 terminal 44, 45 and ground.

44 (G/R) - Ground : Continuity should not exist.
45 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

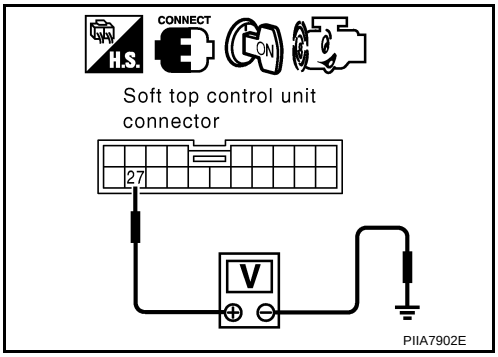
Check 5th Bow Full Close Detection Switch (Close Operate)

NIS00078

1. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	27 (GY)	Ground	CL5 → CL6	0 → 5 → 0



OK or NG

OK >> Plate rail RR (5th bow full close switch) is OK.
NG >> GO TO 2.

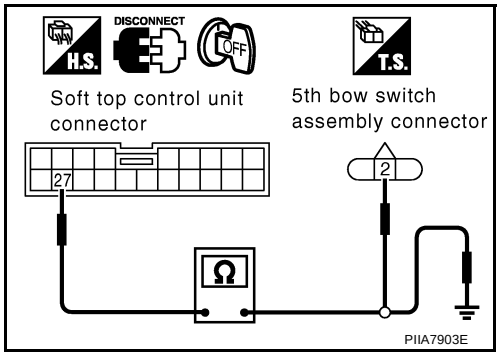
2. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 27 and 5th bow switch assembly connector B214 terminal 2.

27 (GY) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 27 and ground.

27 (GY) - Ground : Continuity should not exist.



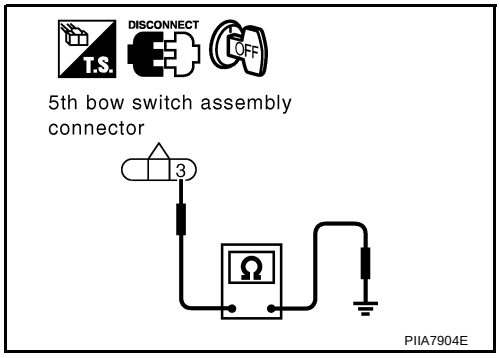
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



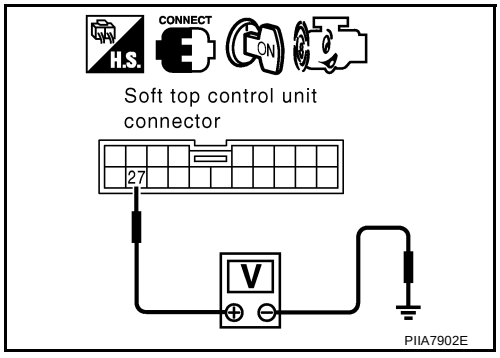
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 27 and ground.

27 (GY) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

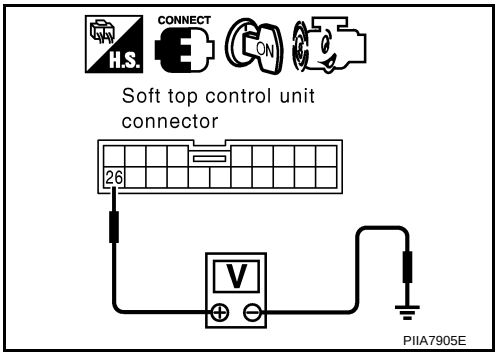
Check 5th Bow Full Open Detection Switch (Close Operate)

NIS00079

1. CHECK 5TH BOW FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	26 (LG)	Ground	CL6 → CL7	5 → 0



OK or NG

OK >> Plate rail RR (5th bow full open switch) is OK.
NG >> GO TO 2.

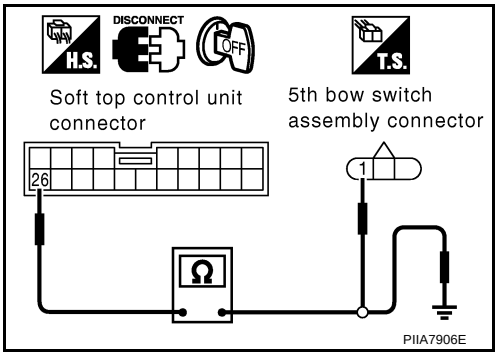
2. CHECK 5TH BOW FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly connector.
3. Check continuity between soft top control unit connector B67 terminal 26 and 5th bow switch assembly connector B214 terminal 1.

26 (LG) - 1 (LG) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Continuity should not exist.



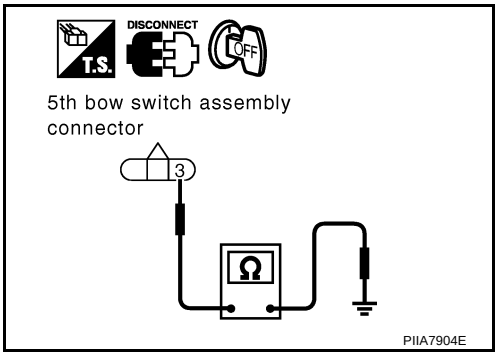
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



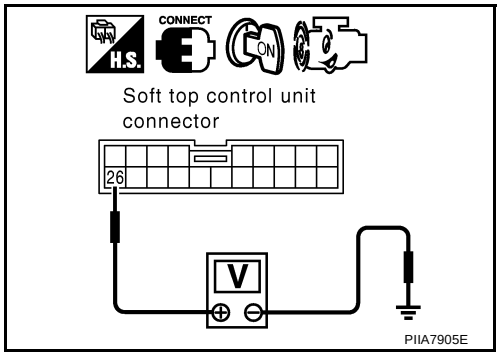
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

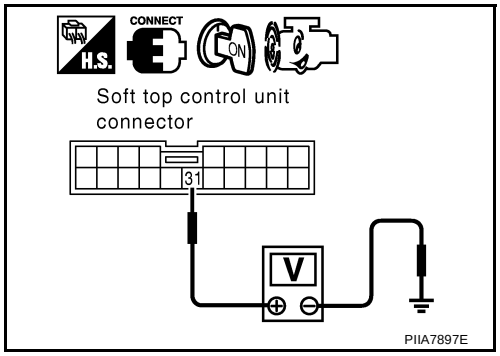
Check 5th Bow Half-Latch Switch (Close Operate)

NIS0007A

1. CHECK 5TH BOW HALF-LATCH SWITCH SIGNAL CHECK

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	31 (L)	Ground	CL9 → CL10	0 → 5



OK or NG

OK >> Soft top lock switch (5th bow half-latch switch) is OK.
NG >> GO TO 2.

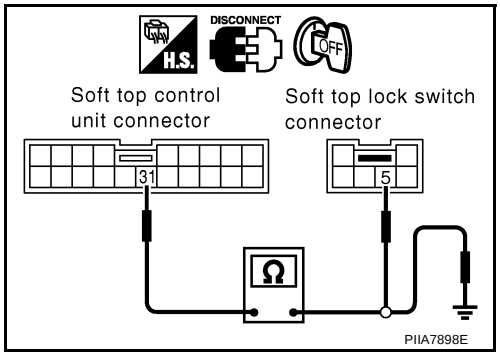
2. CHECK 5TH BOW HALF-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 31 and soft top lock switch connector T205 terminal 5.

31 (L) - 5 (L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Continuity should not exist.



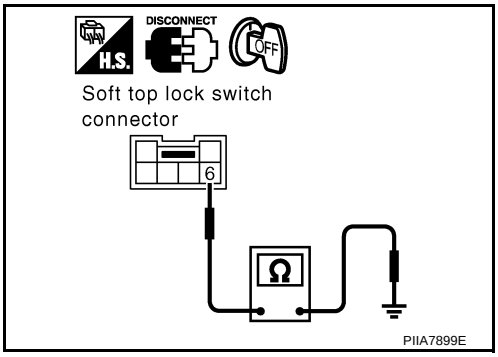
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 6 and ground.

6 (B) - Ground : Continuity should exist.



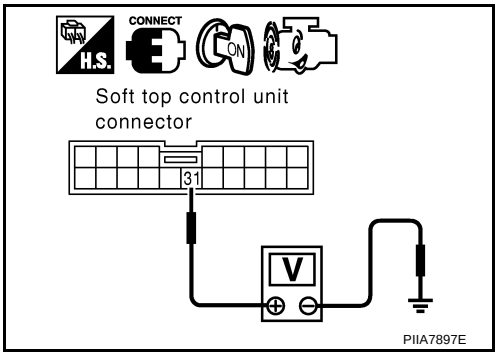
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Approx. 5V



OK or NG

OK >> Replace 5th bow lock assembly in storage lid.
NG >> Replace soft top control unit.

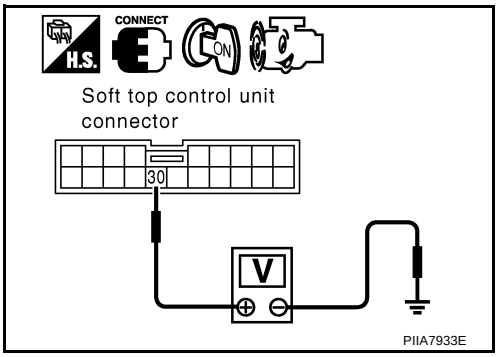
NIS0007B

Check 5th Bow Full-Latch Switch

1. CHECK 5TH BOW FULL-LATCH SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	30 (Y/R)	Ground	CL10	0 → 5



OK or NG

OK >> Soft top lock switch (5th bow full-latch switch) is OK.
NG >> GO TO 2.

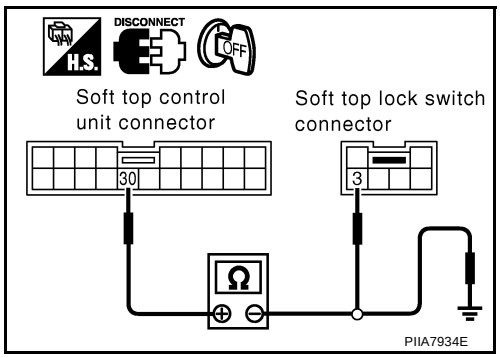
2. CHECK 5TH BOW FULL-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 30 and soft top lock switch connector T205 terminal 3.

30 (Y/R) - 3 (Y) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 30 and ground.

30 (Y/R) - Ground : Continuity should not exist.



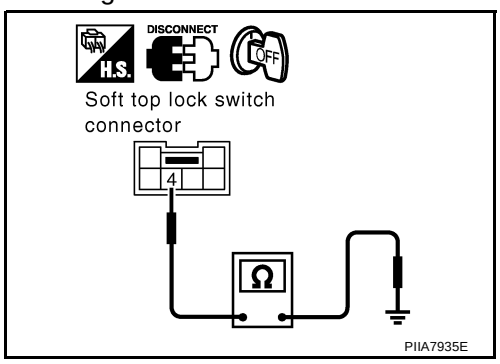
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 4 and ground.

4 (B) - Ground : Continuity should exist.



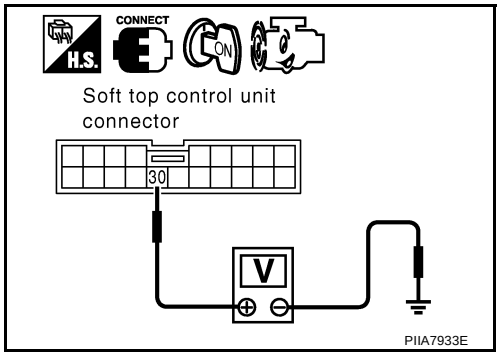
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 30 and ground.

30 (Y/R) - Ground : Approx. 5V



OK or NG

OK >> Replace 5th bow assembly in storage lid.
NG >> Replace soft top control unit.

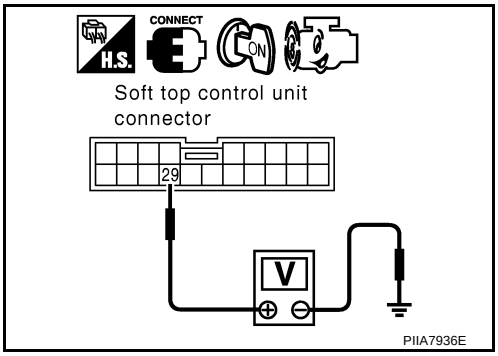
Check 5th Bow Ending Switch

NIS0007C

1. CHECK 5TH BOW ENDING SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	29 (R/Y)	Ground	CL10	0 → 5



OK or NG

OK >> Soft top lock switch (5th bow ending switch) is OK.
NG >> GO TO 2.

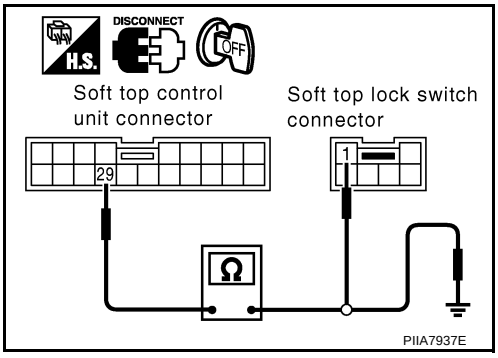
2. CHECK 5TH BOW ENDING CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 29 and soft top lock switch connector T205 terminal 1.

29 (R/Y) - 1 (R) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 29 and ground.

29 (R/Y) - Ground : Continuity should not exist.



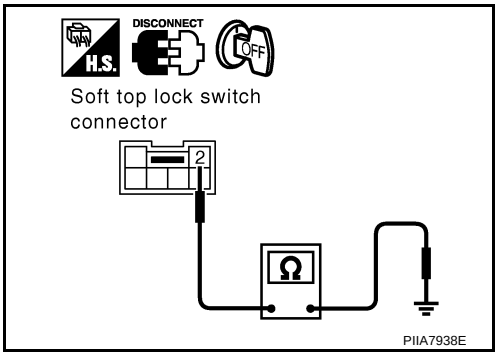
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW ENDING SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



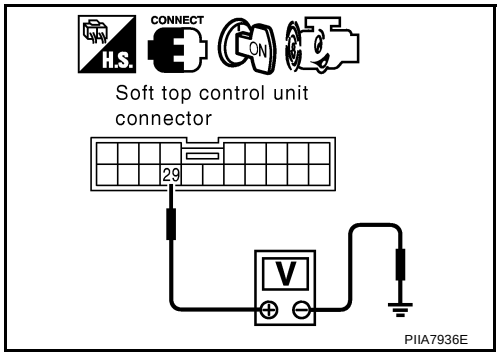
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 29 and ground.

29 (R/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top lock switch (5th bow lock assembly in storage lid).
NG >> Replace soft top control unit.

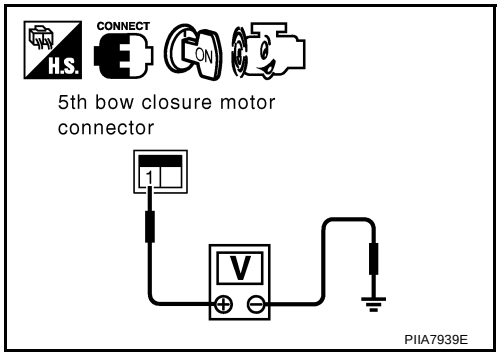
Check 5th Bow Closure Motor

NIS0007D

1. 5TH BOW CLOSURE MOTOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between 5th bow closure motor connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T204	1 (W)	Ground	CL9 → CL10	0 → Battery voltage → 0



OK or NG

OK >> Replace 5th bow closure motor.
NG >> GO TO 2.

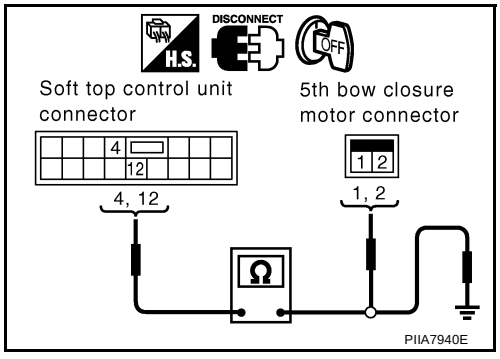
2. CHECK 5TH BOW CLOSURE MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow closure motor connector.
3. Check continuity between soft top control unit connector B66 terminal 4, 12 and 5th bow closure motor connector T204 terminal 1, 2.

4 (G/R) - 1 (W) : Continuity should exist.
12 (G/Y) - 2 (G) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 4, 12 and ground.

4 (G/R) - Ground : Continuity should not exist.
12 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

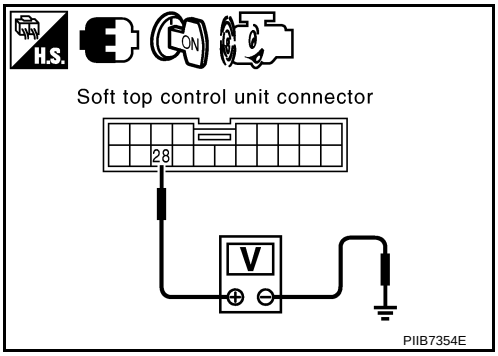
Check Soft Top Front Lock Switch

NIS001L7

1. SOFT TOP FRONT LOCK SWITCH SIGNAL

1. Start engine.
2. Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(-)			
B67	28 (LG/B)	Ground	Front lock	Lock	5
				Unlock	0



OK or NG

OK >> Soft top front lock switch is OK.
NG >> GO TO 2.

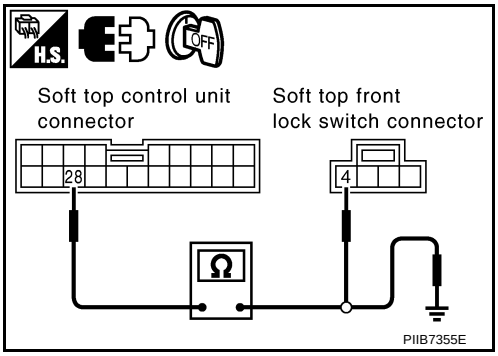
2. CHECK 5TH BOW ENDING CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top front lock switch connector.
3. Check continuity between soft top control unit connector B67 terminal 28 and soft top front lock switch connector R8 terminal 4.

28 (LG/B) - 4 (LG/B) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 28 and ground.

28 (LG/B) - Ground : Continuity should not exist.



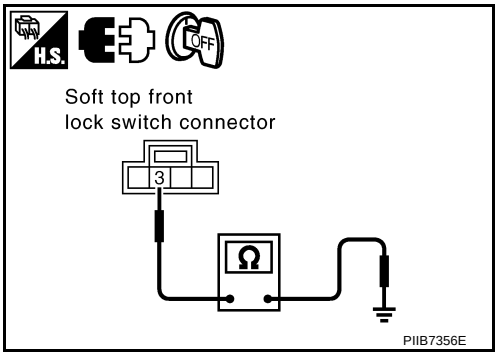
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP FRONT LOCK SWITCH GROUND CIRCUIT

Check continuity between soft top front lock switch connector R8 terminal 3 and ground.

3 (B/W) - Ground : Continuity should exist.



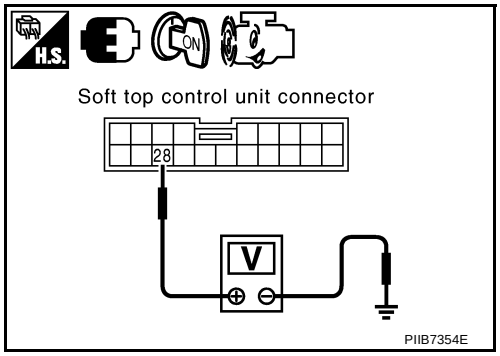
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 28 and ground.

28 (LG/B) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top front lock switch (front lock striker RH).
NG >> Replace soft top control unit.

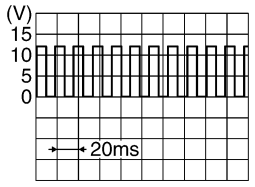
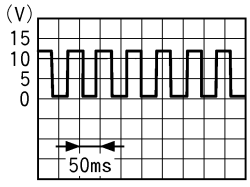
Check Operation Permission Condition

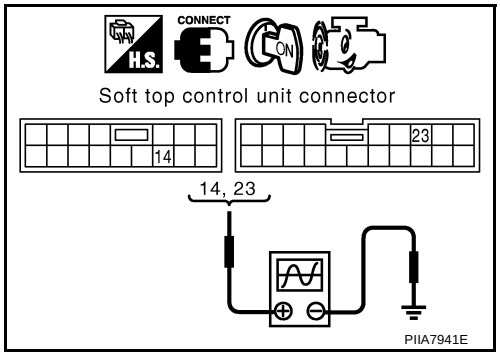
NIS0007E

First perform the “SELF-DIAG RESULT” in “BCM” with CONSULT-II, then perform the each trouble diagnosis of malfunction system indicated “SELF-DIAG RESULT” of “BCM”. Refer to BCS-15, "CONSULT-III Function (BCM)" .

1. CHECK VEHICLE SPEED SIGNAL

1. Start engine.
2. Check the signal between soft top control unit connector and ground with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value.)
B66	14 (W)	Ground	Speedometer operated [When vehicle speed is Approx. 40km/h (25MPH)]	 PKIA1935E
B67	23 (W/G)			 PIIB0078J



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK VEHICLE SPEED SIGNAL CIRCUIT

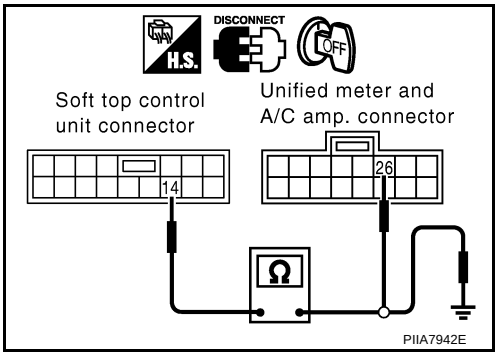
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and unified meter and A/C amp connector.
3. Check the following.

– Continuity between soft top control unit connector B66 terminal 14 and unified meter and A/C amp connector M49 terminal 26.

14 (W) - 26 (W) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 14 and ground.

14 (W) - Ground : Continuity should not exist.



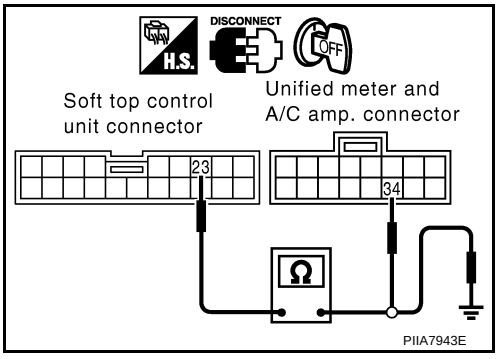
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 23 and unified meter and A/C amp connector M49 terminal 34.

23 (W/G) - 34 (L) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 23 and ground.

23 (W/G) - Ground : Continuity should not exist.



OK or NG

OK >> Check unified meter and A/C amp. Refer to DI-44, "System Description" .

NG >> Repair or replace harness.

3. CHECK FUSE

- Check 10A fuse [No.20, located in fuse block (J/B)].

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

OK or NG

OK >> GO TO 4.

NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

4. CHECK BRAKE PEDAL SIGNAL

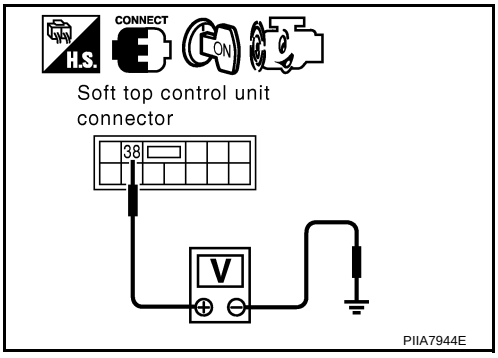
Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Brake pedal condition	Voltage (V) (Approx.)
	(+)	(-)		
B68	38 (W)	Ground	Depressed	Battery voltage
			Released	0

OK or NG

OK >> Stop lamp switch is OK.

NG >> GO TO 5.



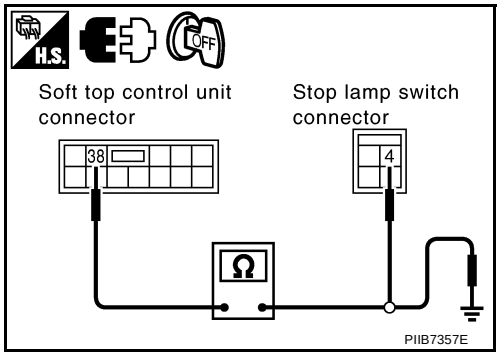
5. CHECK BRAKE PEDAL SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and stop lamp switch connector.
3. Continuity between soft top control unit connector B68 terminal 38 and stop lamp switch connector E111 terminal 4.

38 (W) - 4 (P/L) : Continuity should exist.

4. Continuity between soft top control unit connector B68 terminal 38 and ground.

38 (W) - Ground : Continuity should not exist.



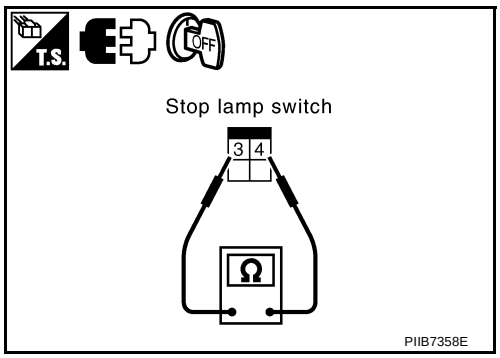
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness.

6. CHECK STOP LAMP SWITCH

Continuity between stop lamp switch connector E111 terminal 3 and 4.

Connector	Terminal		Brake pedal condition	Continuity
E111	3	4	Depressed	Yes
			Released	No



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace stop lamp switch.

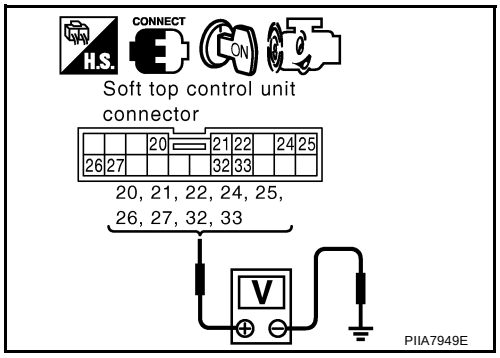
Check Each Switch Condition (Open Operate)

NIS0007F

1. CHECK EACH SWITCH SIGNAL

1. Start engine.
2. Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	Full closed	5
	21 (W/L)			
	22 (W/R)			
	24 (G)			
	25 (L/Y)			
	26 (LG)			
	27 (GY)			
	32 (W)			
	33 (BR)			



OK or NG

OK >> Each switch condition is OK.
NG >> Check malfunction switch.

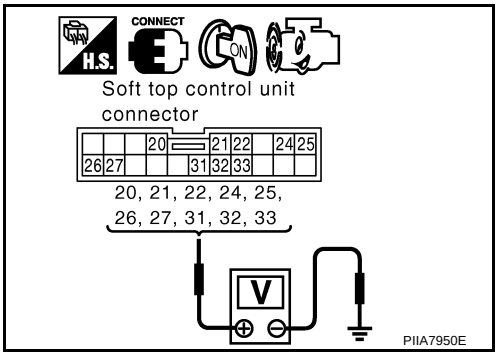
Check Each Switch Condition (Close Operate)

NIS0007G

1. CHECK EACH SWITCH SIGNAL

1. Start engine.
2. Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	Full opened	0
	21 (W/L)			
	22 (W/R)			
	24 (G)			5
	25 (L/Y)			
	26 (LG)			0
	27 (GY)			
	31 (L)			
	32 (W)			
	33 (P)			5



OK or NG

OK >> Each switch condition is OK.
NG >> Check malfunction switch.

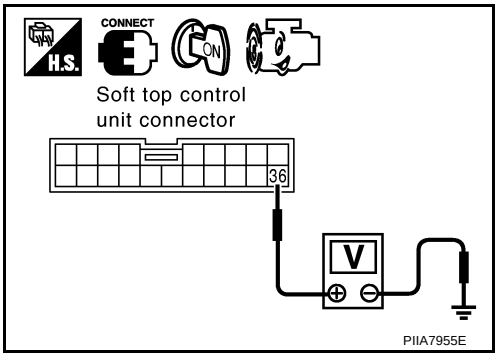
Check Power Window Down Request Signal

NIS0007H

1. CHECK POWER WINDOW REQUEST SIGNAL

1. Start engine.
2. Soft top switch operate, check voltage between soft top control unit connector and ground.

Con-nector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	36 (PU)	Ground	OP1 → OP11 (open operation)	5 → 0 → 5
			CL1 → CL10 (close operation)	



OK or NG

OK >> Check the condition of harness and connector.
NG >> Replace soft top control unit.

Check Power Window Harness

NIS0007I

1. CHECK POWER WINDOW CIRCUIT

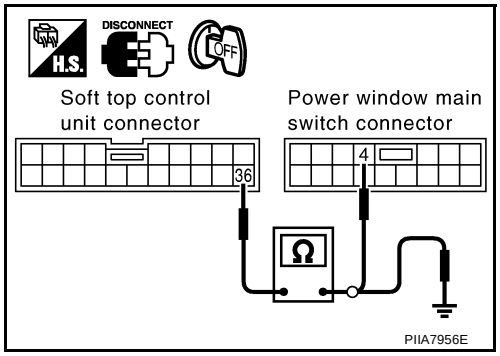
1. Turn ignition switch OFF.
2. Disconnect soft top control unit, power window main switch and power window sub-switch connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 36 and power window main switch connector D7 terminal 4.

36 (PU) - 4 (P) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 36 and ground.

36 (PU) - Ground : Continuity should not exist.



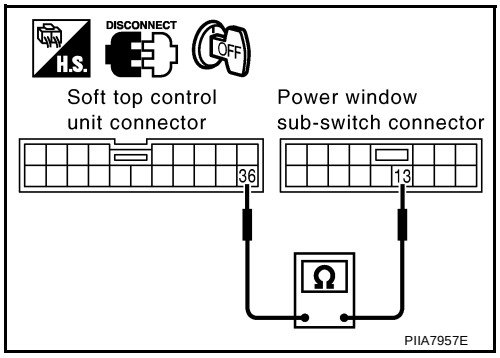
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 36 and power window sub-switch connector D37 terminal 13.

36 (PU) - 13 (P) : Continuity should exist.

OK or NG

OK >> Replace malfunction power window switch.
NG >> Repair or replace harness.



Check Passenger Side Seat Operate Signal 1

NIS0007J

1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and passenger side seat control unit connector.
3. Check continuity between soft top control unit connector B67 terminal 36 and passenger seat control unit connector B353 terminal 16.

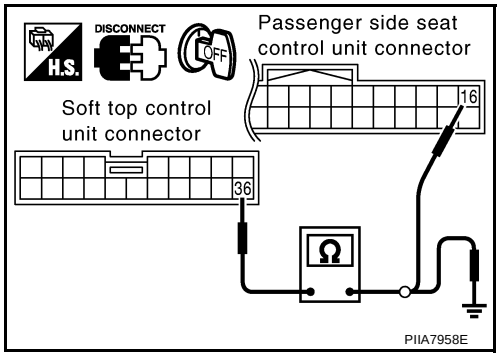
36 (PU) - 16 (PU/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 36 and ground.

36 (PU) - Ground : Continuity should not exist.

OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace harness.



Check Passenger Side Seat Operate Signal 2

NIS0007K

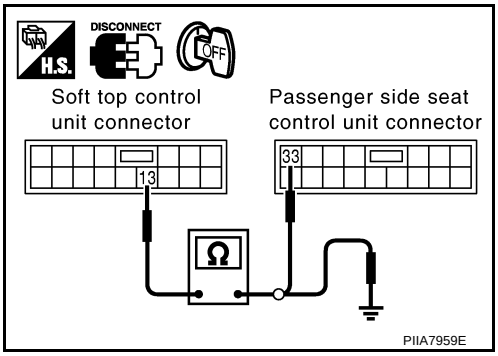
1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit, storage lid actuator RH and passenger seat control unit connector.
3. Check continuity between soft top control unit connector B66 terminal 13 and passenger seat control unit connector B354 terminal 33.

13 (L/R) - 33 (G/B) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 13 and ground.

13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace harness.

Check Passenger Side Seat Operate Signal 3

NIS0007L

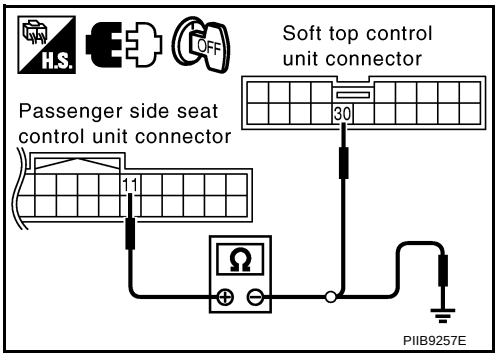
1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit, passenger seat control unit and soft top lock switch connector.
3. Check continuity between passenger seat control unit connector B353 terminal 11 and soft top control unit connector B67 terminal 30.

11 (L/W) - 30 (Y/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 30 and ground.

11 (L/W) - Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace harness.

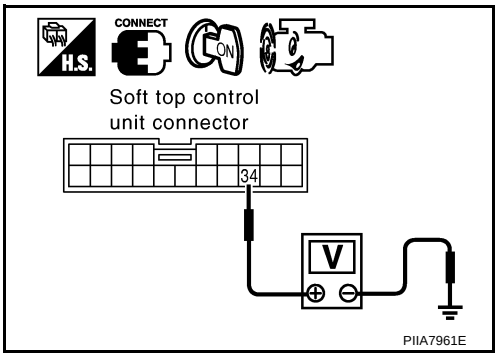
Check Seat Back Position Signal

NIS0007M

1. CHECK SEAT BACK POSITION SIGNAL

1. Start engine.
2. The thing whose seat cancel switch is OFF is confirmed.
3. Soft top switch operate, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Seat condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	34 (L/W)	Ground	When passenger seat inclines forward	5
			Other than above	0



OK or NG

OK >> Replace soft top control unit.
NG >> GO TO 2.

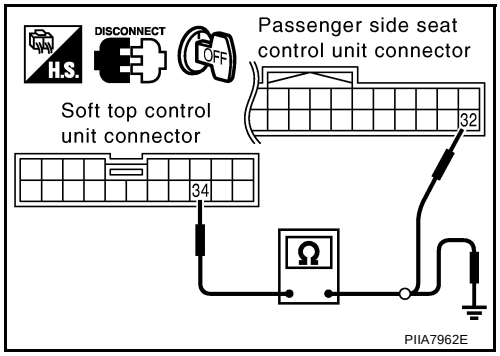
2. CHECK SEAT BACK POSITION SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and passenger seat control unit connector.
3. Check continuity between soft top control unit connector B67 terminal 34 and passenger seat control unit connector B353 terminal 32.

34 (L/W) - 32 (G/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 34 and ground.

34 (L/W) - Ground : Continuity should not exist.



OK or NG

OK >> Check passenger side seat. Refer to SE-37, "Trouble Diagnosis Symptom Chart" .

NG >> Repair or replace harness.

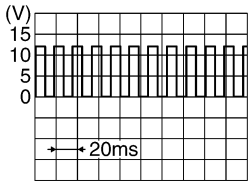
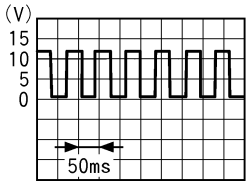
Check Speed Signal Circuit

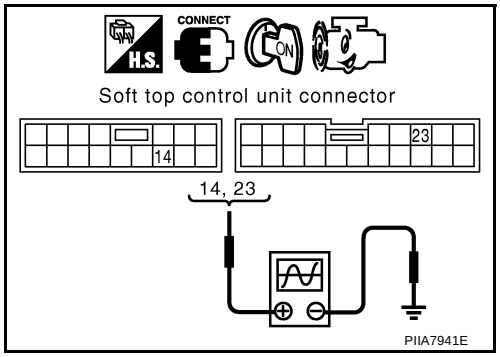
NIS0007N

First perform the “SELF-DIAG RESULT” in “BCM” with CONSULT-II, then perform the each trouble diagnosis of malfunction system indicated “SELF-DIAG RESULT” of “BCM”. Refer to BCS-15, "CONSULT-III Function (BCM)" .

1. CHECK VEHICLE SPEED SIGNAL

1. Start engine.
2. Check the signal between soft top control unit connector and ground with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value.)
B66	14 (W)	Ground	Speedometer operated [When vehicle speed is Approx. 40km/h (25MPH)]	 PKIA1935E
B67	23 (W/G)			 PIIB0078J



OK or NG

OK >> Replace soft top control unit.

NG >> GO TO 2.

2. CHECK VEHICLE SPEED SIGNAL CIRCUIT

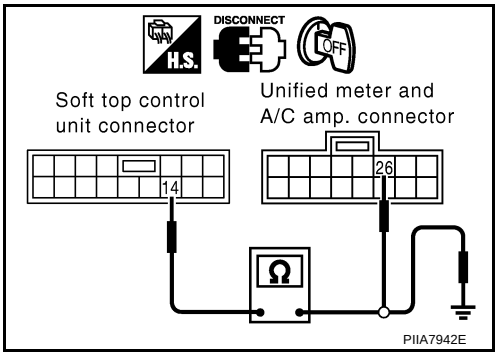
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and unified meter and A/C amp connector.
3. Check the following.

– Continuity between soft top control unit connector B66 terminal 14 and unified meter and A/C amp connector M49 terminal 26.

14 (W) - 26 (W) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 14 and ground.

14 (W) - Ground : Continuity should not exist.



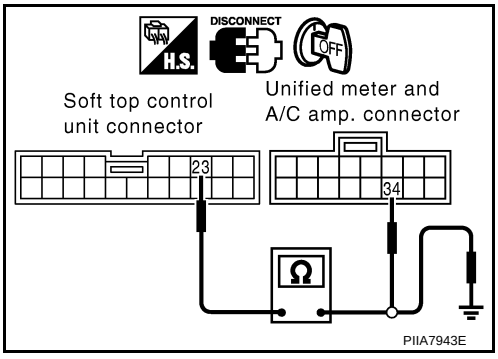
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 23 and unified meter and A/C amp connector M49 terminal 34.

23 (W/G) - 34 (L) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 23 and ground.

23 (W/G) - Ground : Continuity should not exist.



OK or NG

OK >> Check unified meter and A/C amp. Refer to DI-44, "System Description" .

NG >> Repair or replace harness.

Check Indicator Lamp Circuit

NIS0007O

1. CHECK FUSE

- Check 10A fuse [No.14, located in fuse block (J/B)]

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

OK or NG

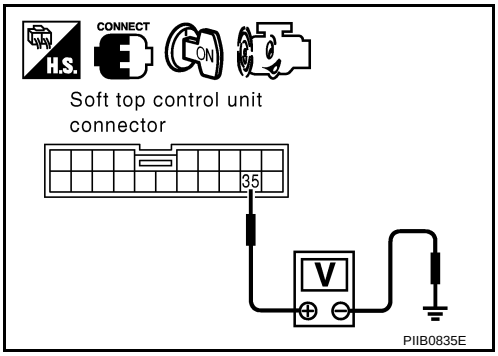
OK >> GO TO 2.

NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK INDICATOR LAMP SIGNAL

1. Start engine.
2. Soft top switch operate, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	35 (Y)	Ground	Full open or full close	Battery voltage
			Other than above	0



OK or NG

OK >> Check the condition of the harness and the connector.

NG - 1 >> If battery voltage: Replace soft top control unit.

NG - 2 >> If 0V: GO TO 3.

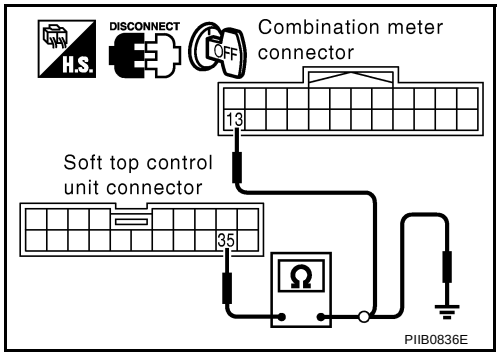
3. CHECK INDICATOR LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and combination meter connector.
3. Check continuity between soft top control unit connector B67 terminal 35 and combination meter connector M19 terminal 13.

35 (Y) – 13 (G/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 35 and ground.

35 (Y) – Ground : Continuity should not exist.



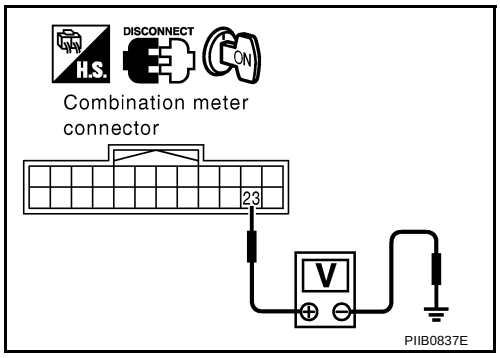
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK INDICATOR LAMP POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between combination meter connector M19 terminal 23 and ground.

23 (G/Y) – Ground : Battery voltage



OK or NG

OK >> Check the Condition of the Harness and the Connector.
- If OK: Replace combination meter.
- If NG: Repair or replace harness.

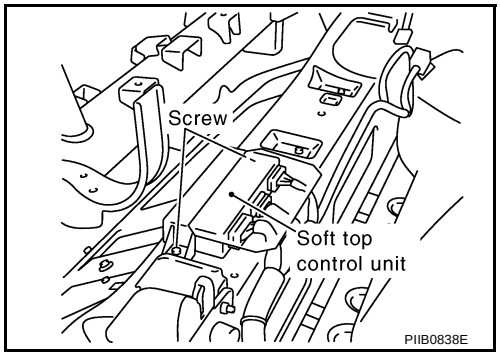
NG >> Repair or replace harness.

Removal and Installation of Soft Top Control Unit

NIS0007P

REMOVAL

1. Push the soft top switch on the close side to clear the soft top storage room, and release the buttom before strage lid starts closing.
2. Remove trim parts and turn the front side of storage room finisher. RF-126, "Removal and Installation of Storage Room Finisher"
3. Disconnect soft top control unit connector, remove the screw and soft top control unit.



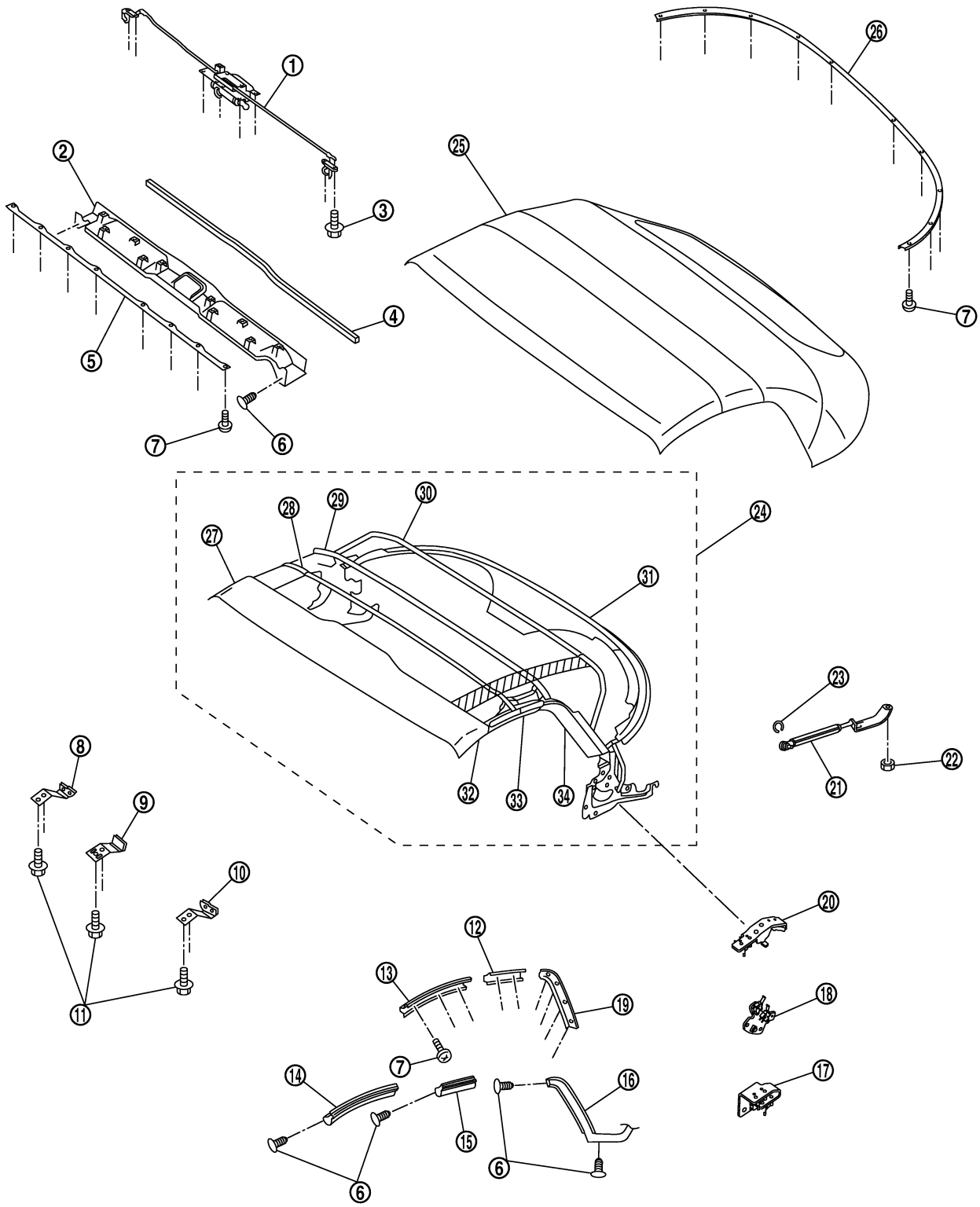
INSTALLATION

Installation in the reverse order of removal.

Component Parts Drawing

NIS0007Q

SEC. 737



PIIB1399E

1. Front lock
2. Front lock finisher
3. TORX bolt (T30)
4. Welt
5. Front center retainer
6. Clip
7. Screw
8. Front lock striker, RH
9. Front lock striker, center
10. Front lock striker, LH
11. Bolt
12. B link retainer
13. A link retainer
14. A link weather strip
15. B link weather-strip
16. C link and 5th bow weather strip
17. Soft top switch bracket 1
18. Soft top switch bracket 2
19. C link retainer
20. Plate rail RR bracket
21. 5th bow operating strut rod
22. Nut
23. Holder
24. Soft top frame
25. Soft top cover
26. 5th bow retainer
27. 1st bow
28. 2nd bow
29. 3rd bow
30. 4th bow
31. 5th bow
32. A link
33. B link
34. C link

Removal and Installation of Soft Top Assembly

NIS0007R

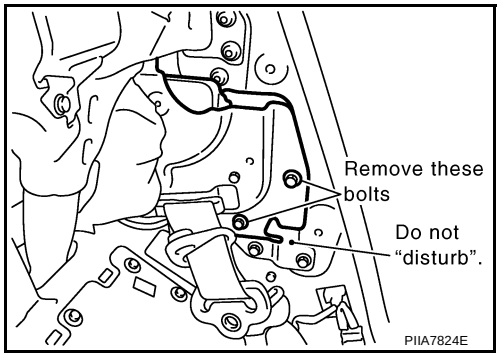
CAUTION:
Install fender cover to protect rear fender.

REMOVAL

1. Fully open storage lid with soft top retracting.
2. Remove seat belt sholder bolt. Refer to SB-6, "REMOVAL OF SEAT BELT RETRACTOR" .
3. Remove rear side finisher. Refer to EI-37, "REAR SIDE FINISHER" .
4. Remove back panel finisher. Refer to EI-42, "BACK PANEL FINISHER" .
5. Loosen bolts at soft top mounting bracket (front).

   CAUTION:
   Do not remove soft top mounting bracket (front) (body side).

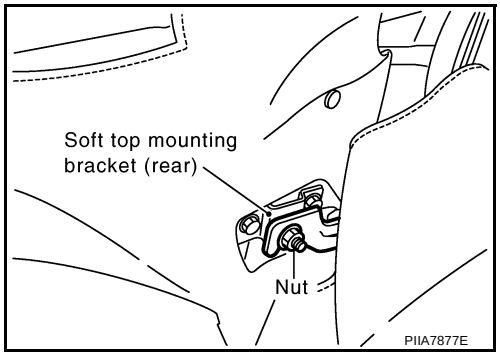
   Nut: 28.0 N·m (2.9 kg-m, 21 ft-lb)



6. Close soft top until 5th bow are raised and folded with C-link. Loosen nut at soft top mounting bracket (rear). Then fold (open) soft top assembly completely.

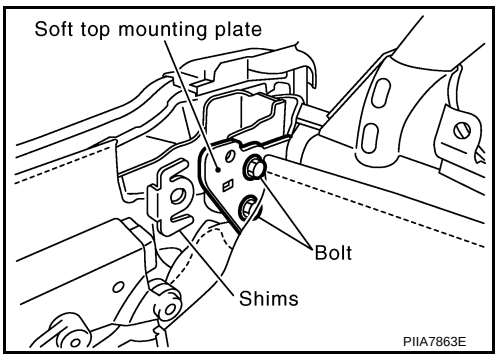
   CAUTION:
   Do not remove soft top mounting bracket (rear) (body side).

   Bolt: 28.0 N·m (2.9 kg-m, 21 ft-lb)



7. Remove back panel bracket.

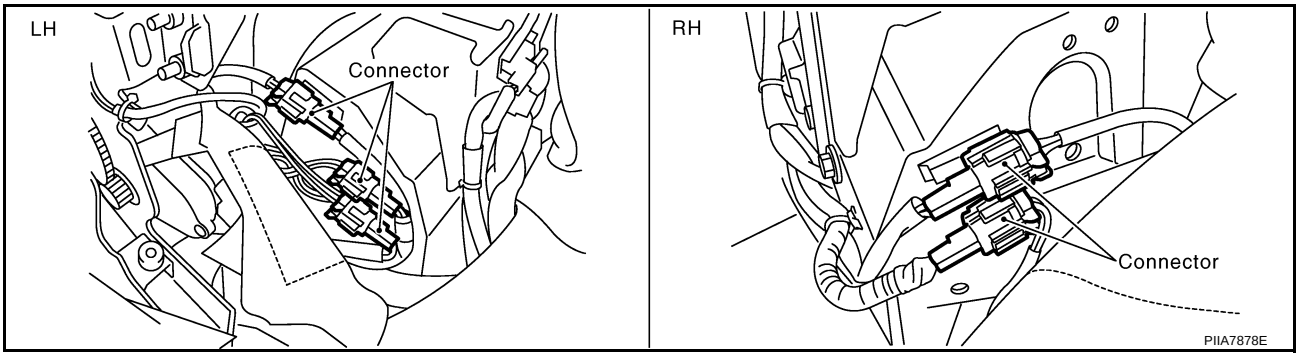
8. Remove bolts, at the soft top mounting plate and shims.



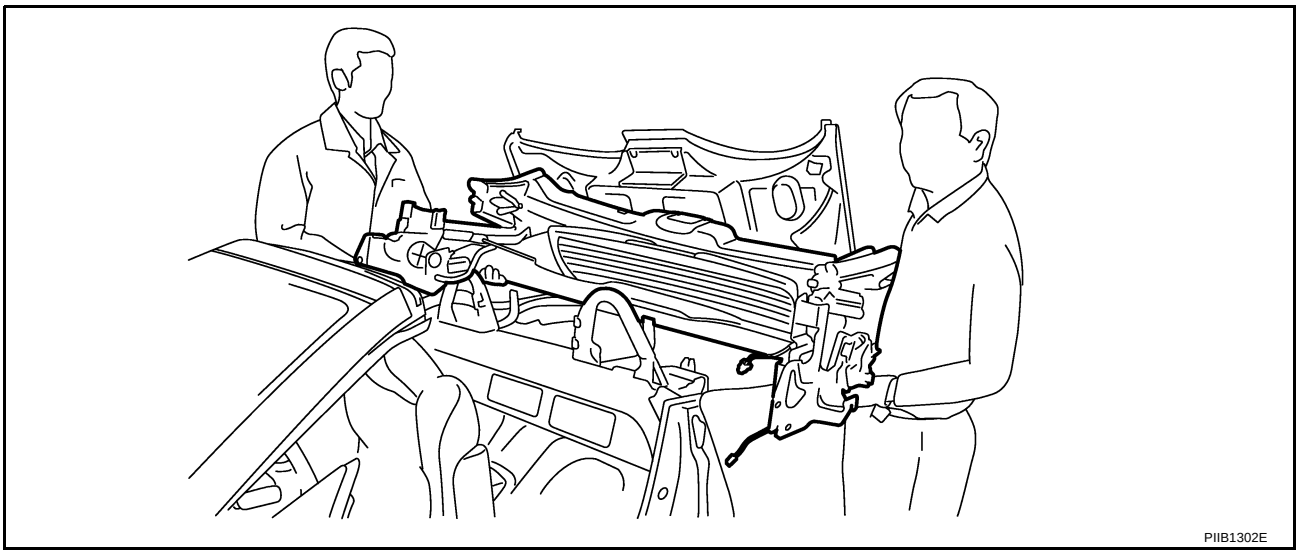
CAUTION:
Do not replace left and right shims with each one with different thickness.

Bolt: 28.0 N·m (2.9 kg-m, 21 ft-lb)

9. Disconnect harness connector.



10. Lift up soft top assembly from left and right, and then remove soft top assembly.



CAUTION:
2 workers are required for the heavy load of approximately 40 kg (89 lb).

INSTALLATION

Install in the reverse order of removal except the order of tightening bolts and nuts. (See note below.)

NOTE:
Before tighten soft top fixing bolts and nuts, make sure that soft top is sat on each pins from soft top mounting brackets without any gaps.
To sit soft top correctly, follow this order.

1. Push soft top assembly down when nuts at soft top mounting bracket (rear) is tighten.
2. Close soft top until the angle of A-link becomes vertical against ground, then tighten bolts at soft top mounting bracket (front).
3. Tighten bolts at soft top mounting plate with shims, then attach back panel bracket with bolts.

Removal and Installation of Soft Top Cover

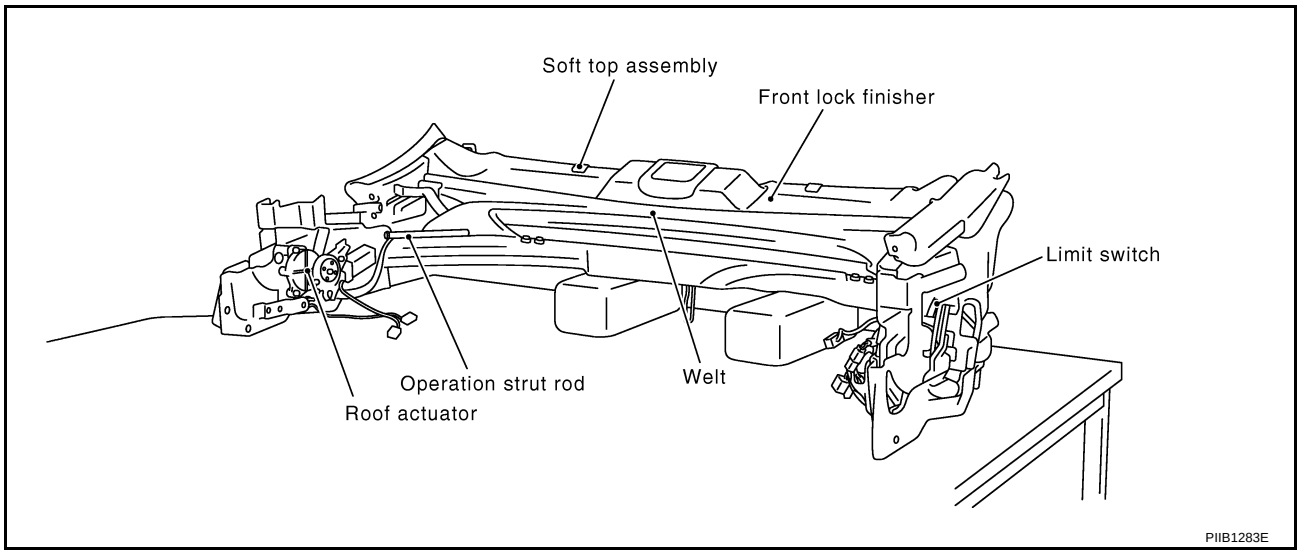
NIS0007S

REMOVAL

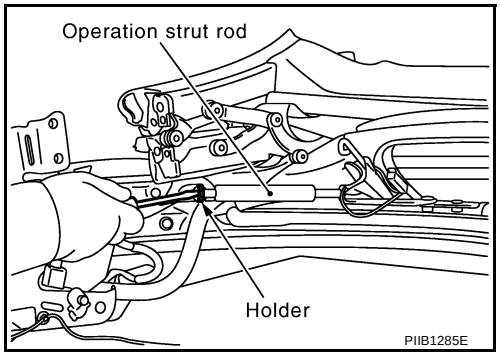
CAUTION:

- **Do not reuse used double-faced adhesive tape, nonwoven fabric, EPT seal, pad, etc.**
- **Be careful not to damage soft top assembly during removal. Do not place it upside-down so as to prevent cover from compression scars.**

1. Remove soft top assembly from the vehicle. Refer to RF-88, "Removal and Installation of Soft Top Assembly" .
2. Set up the soft top assembly on the table.



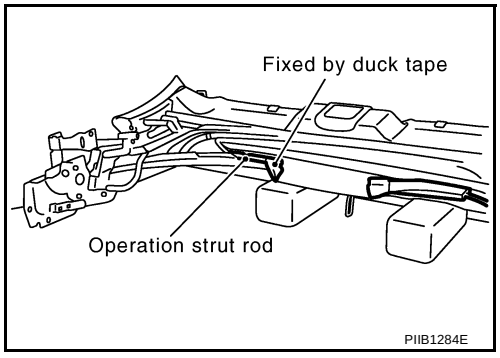
3. Remove roof actuator (RH/LH). Refer to RF-108, "Removal and Installation of Roof Actuator" .
4. Remove holder of 5th bow operation strut rods, and then remove 5th bow operation strut rods.



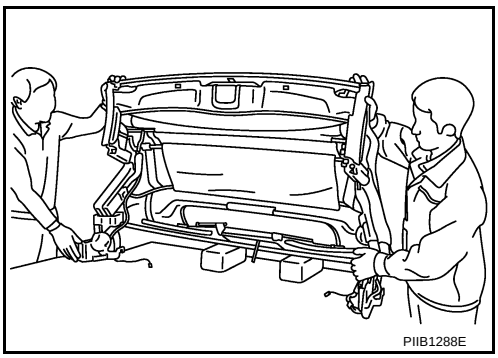
CAUTION:

- **When 5th bow operating strut rods are removed, 5th bow drops suddenly.**
  Perform operation while holding 5th bow.

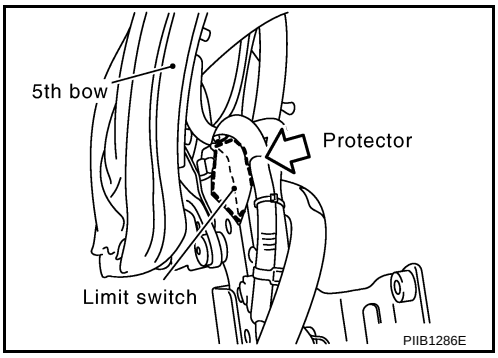
- **Temporarily fix 5th bow operating strut rods on 5th bow finisher after removal.**



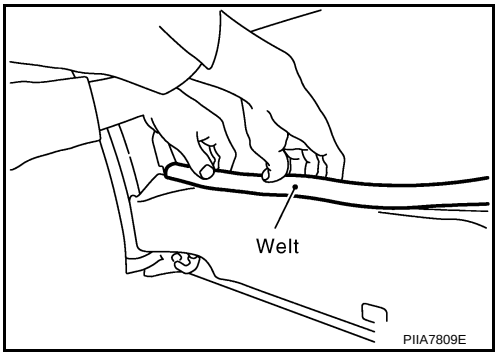
5. Open soft top assembly.



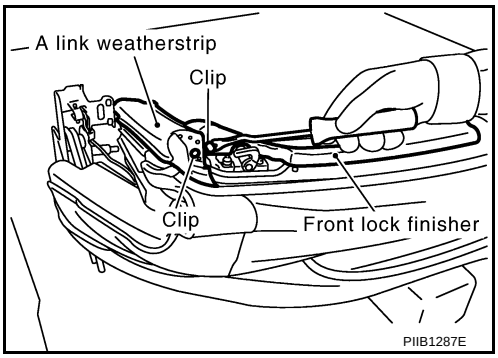
6. Protect the limit switch contact around the rotation axis of the 5th bow on the left side of soft top with tape.



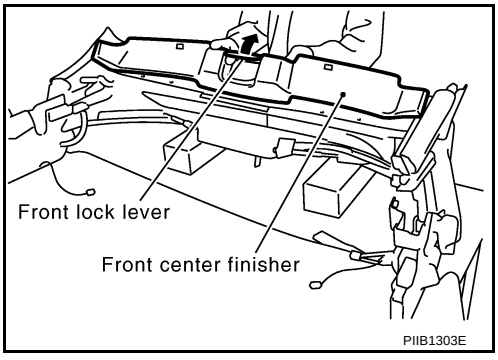
7. Remove welt on the rear end of front lock finisher.



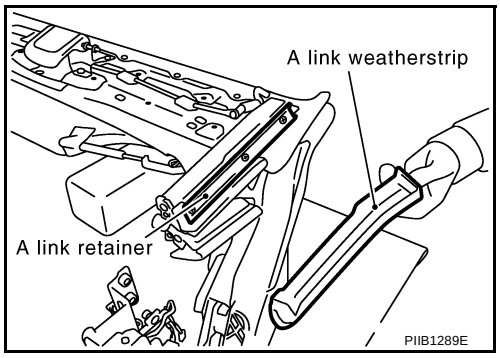
8. Remove left/right clips on the front end of front lock finisher.



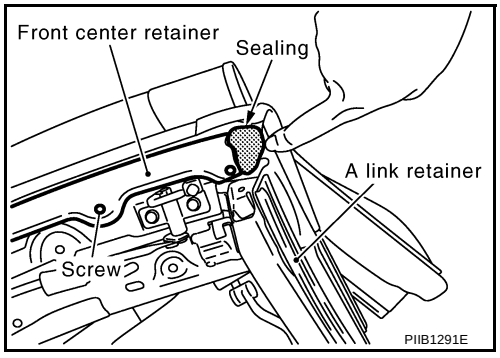
9. Pull up front lock lever, and then disengage clips to remove front lock finisher.



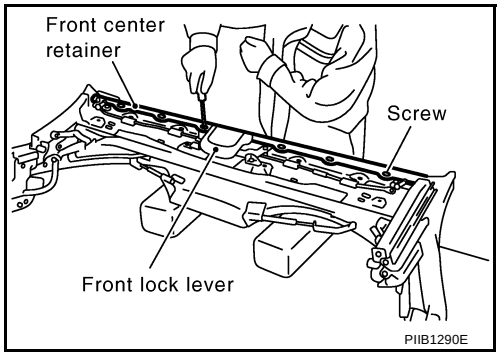
10. Remove clip, and then A link weather strip.



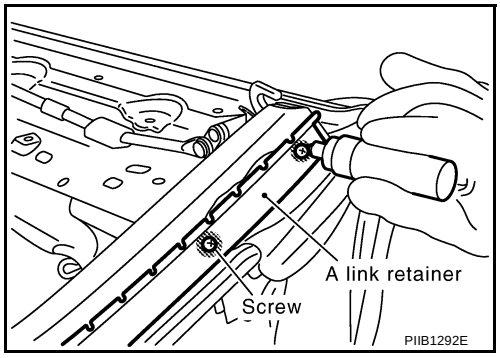
11. Peel a link sealing out.



12. Remove screws, and then remove front center retainer.

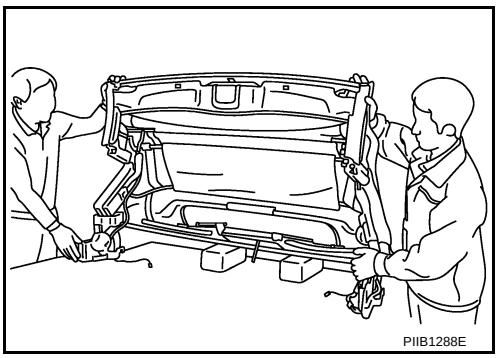


13. Put matching marks to installation position of A link retainer.

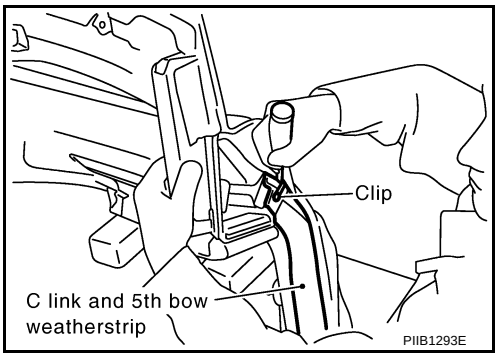


14. Remove screws, and then remove A link retainer.

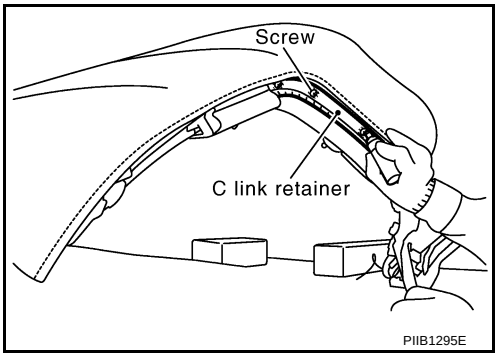
15. Open soft top about 90 degrees.



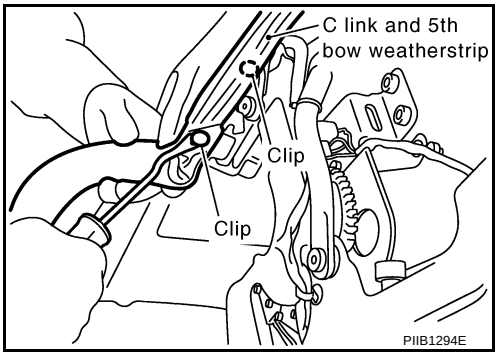
16. Remove clips on the top of C link and 5th bow weather strip.



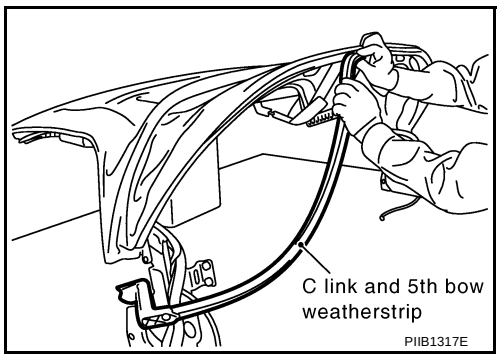
17. Fully open soft top.
18. Put matching marks to installation position on C link retainer.
19. Remove screws, and then remove C link retainer.



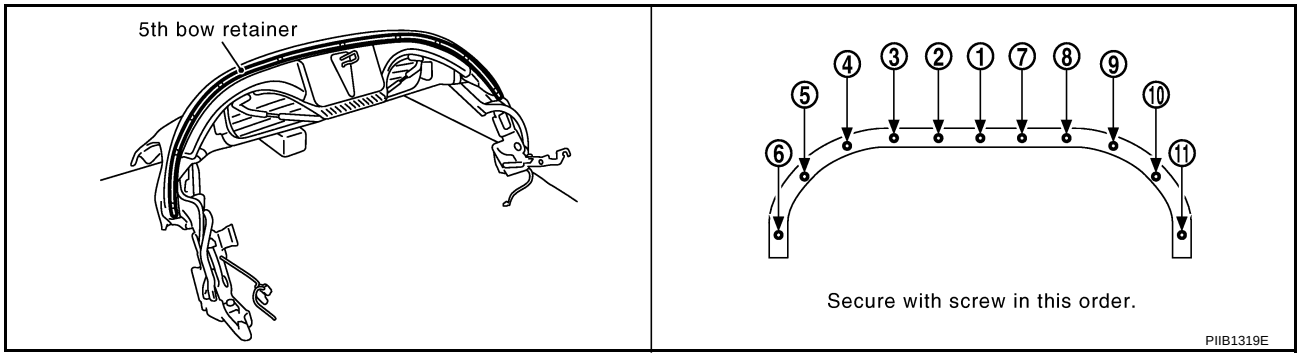
20. Remove clips on the bottom edge of C link and 5th bow weatherstrip.



21. Remove C link and 5th bow weather strip from 5th bow.



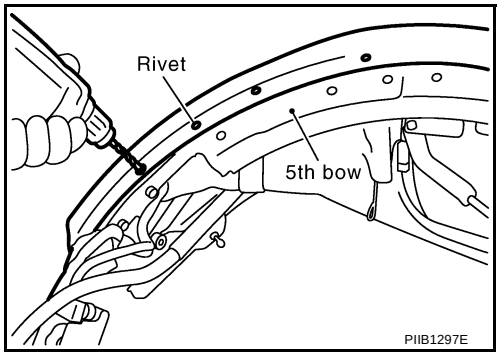
22. Remove screws, and then remove 5th bow retainer.

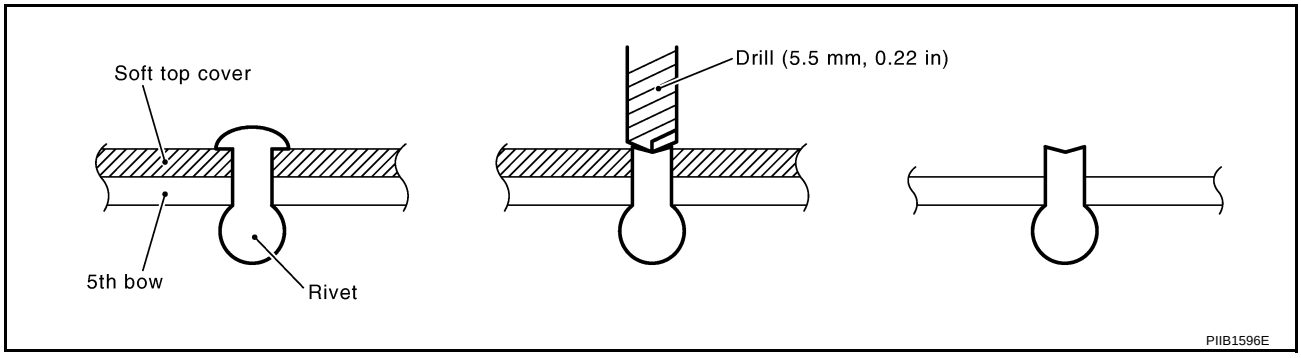


23. Shave rivets head of soft top cover 5th bow by using a drill.
[Drill bit diameter: 5.5 mm (0.22 in)]

CAUTION:

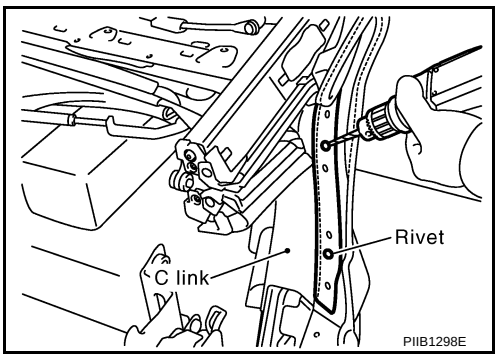
Do not attempt to remove rivets completely.





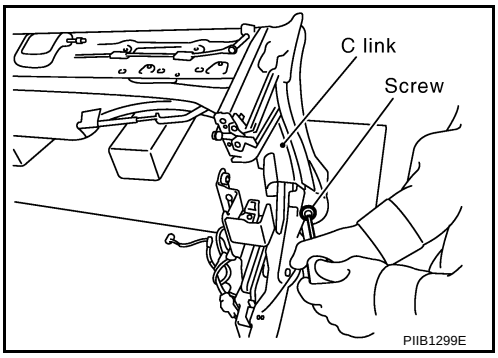
24. Close soft top, and then Shave rivets head and of C link by using a drill.
[Drill bit diameter: 5.5 mm (0.22 in)]

CAUTION:
Do not attempt to remove rivets completely.



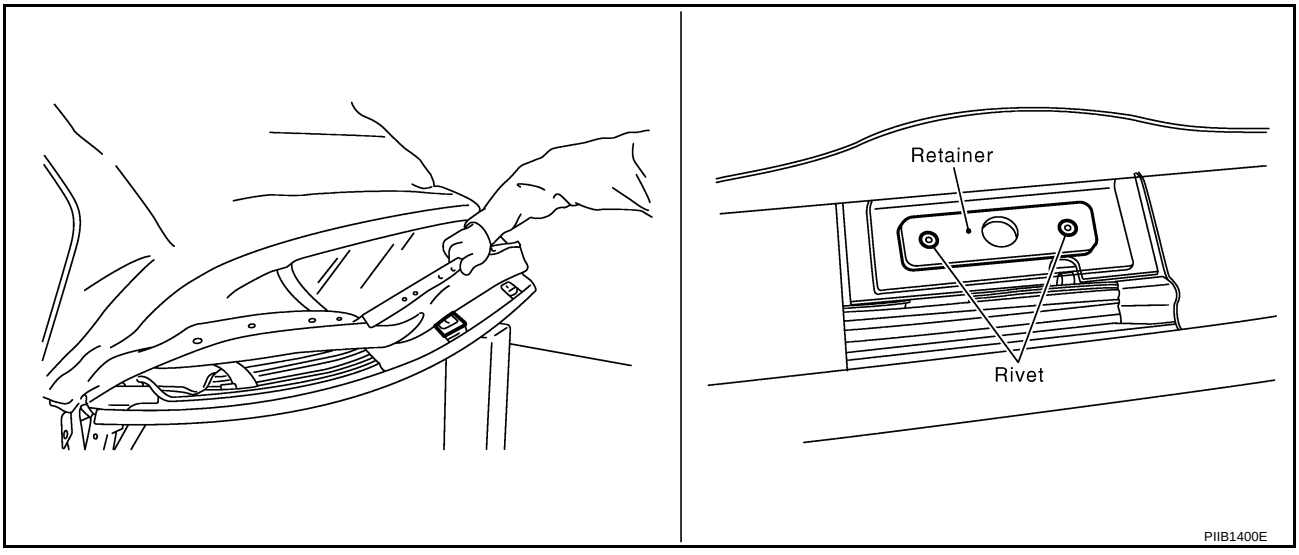
25. Cut EPT seal and remove screws on the bottom of C link.

NOTE:
Check the position when cutting EPT seal.

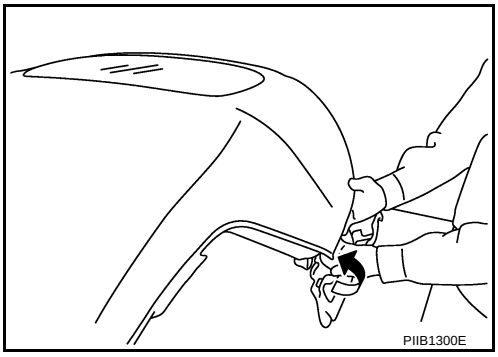


26. Pull up soft top cover from 5th bow finisher.
27. Shave rivets head of 5th bow finisher upper surface, and then remove rivets head and remove retainer.
[Drill bit diameter: 5.5 mm (0.22 in)]

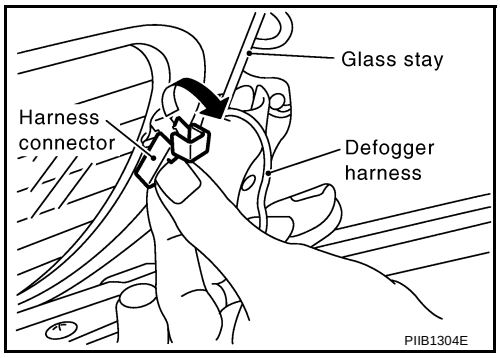
CAUTION:
- **Do not attempt to remove rivets completely.**
- **Be careful not to damage soft top when using a drill.**



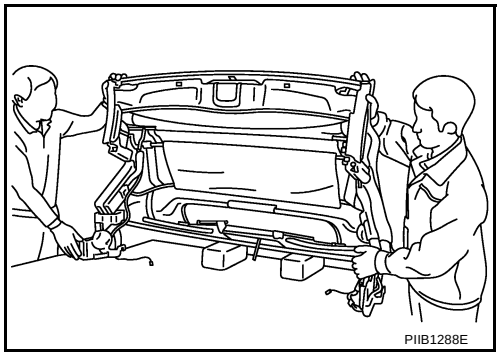
28. Pull up cover from the bottom of C link.



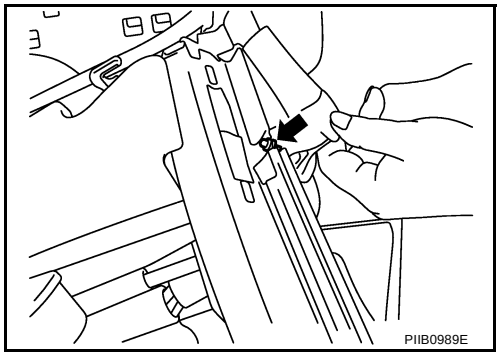
29. Open harness connector cover, and then disconnect defogger harness connector from terminal.



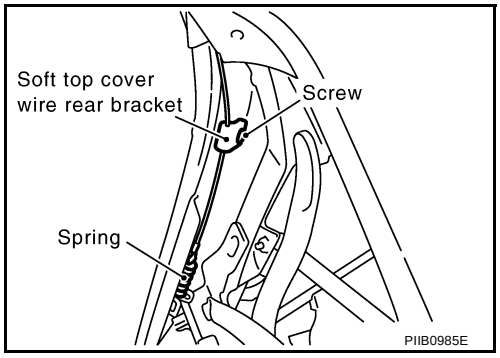
30. Open soft top about 90 degrees.



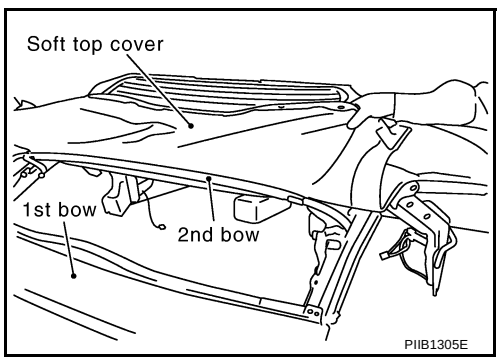
31. Remove soft top wire from A link.



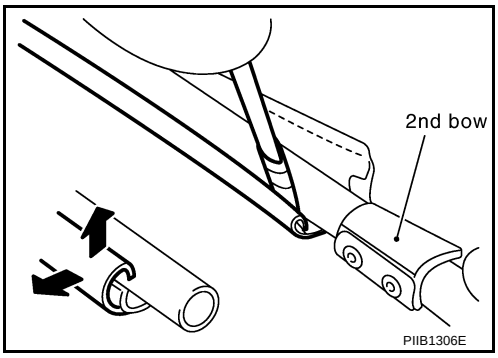
32. Remove soft top cover wire rear bracket from C link.
33. Remove spring from C link.



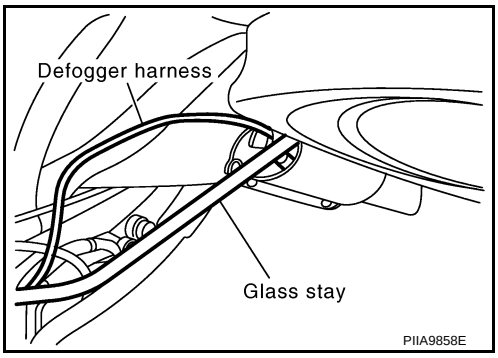
34. Pull out soft top cover frontward from 1st bow.



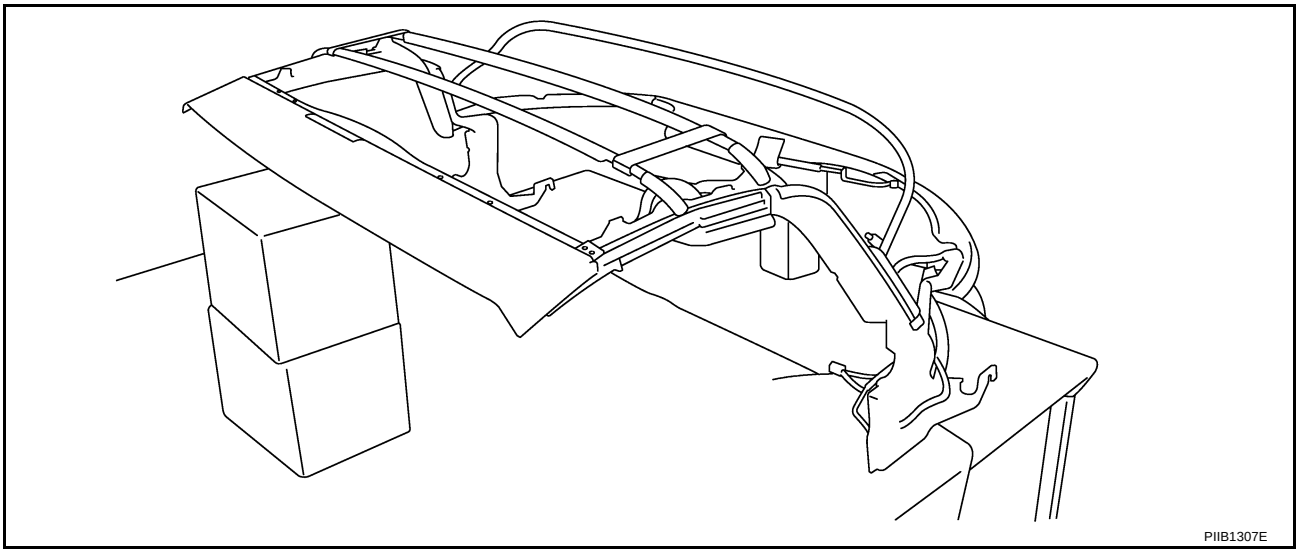
35. Pull up 2nd bow retainer by using a screwdriver, and then remove soft top cover from 2nd bow.



36. Pull up 3rd bow retainer by using a screwdriver, and then remove soft top cover from 3rd bow.
37. Pull out glass stay and defogger harness from sleeve on rear window glass side.



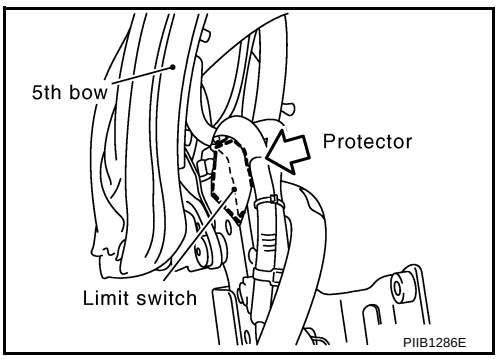
38. Pull out soft top cover from 4th bow and remove soft top cover completely from frame.



INSTALLATION

CAUTION:

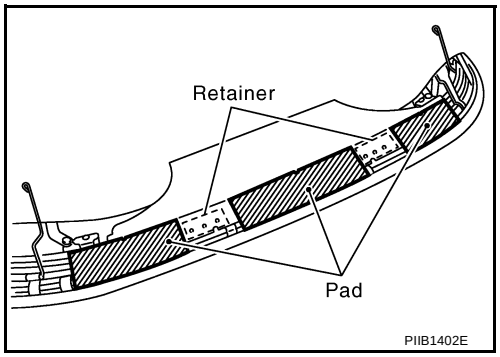
Make sure that the limit switch contact around the rotation axis of the 5th bow on the left side of soft top is protected with tape.



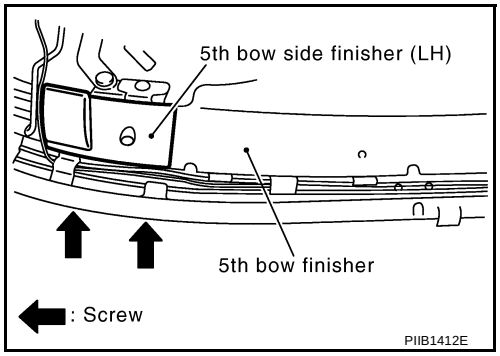
Preparation Work

1. Remove 5th bow finisher pads.

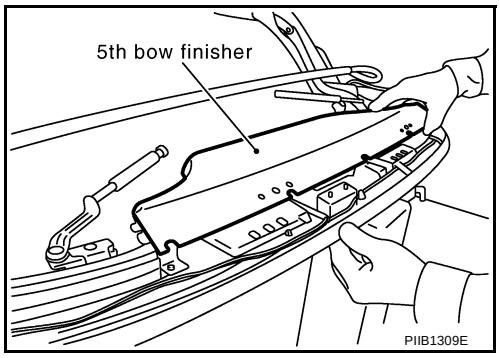
   NOTE:
   Put matching marks so as to check the position when installing.



2. Remove screws, and then remove 5th bow side finisher (RH/LH).

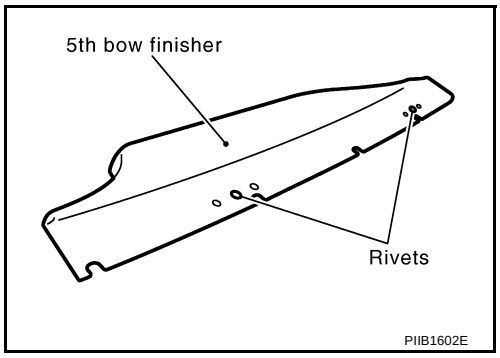


3. Remove clips, and then remove 5th bow finisher.



4. Remove rivets head of 5th bow finisher retainer.

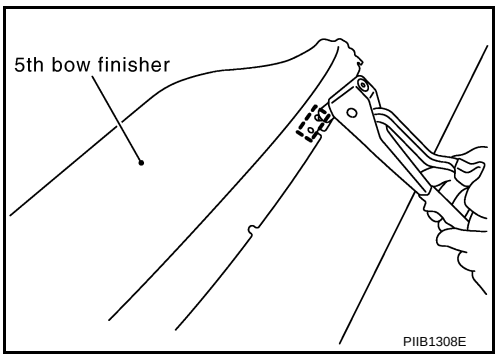
   CAUTION:
   Do not attempt to remove rivets completely.



5. Replace retainers under 5th bow finisher with a new part.

NOTE:

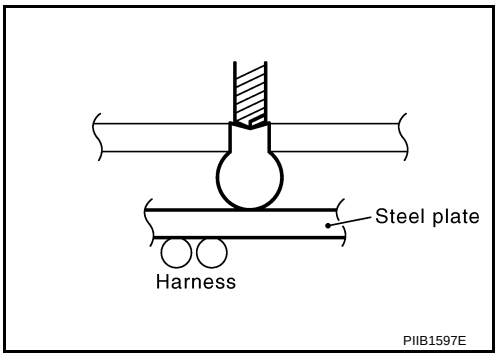
- Put new retainers under 5th bow finisher with rivet.
- Apply nonwoven fabric to retainer lower edge.



6. Remove remains of soft top cover mounting rivet from 5th bow and C link.

NOTE:

Put a steel plate between a rivet and harnesses on 5th bow for harness protection, when removing the remaining rivets by drill.

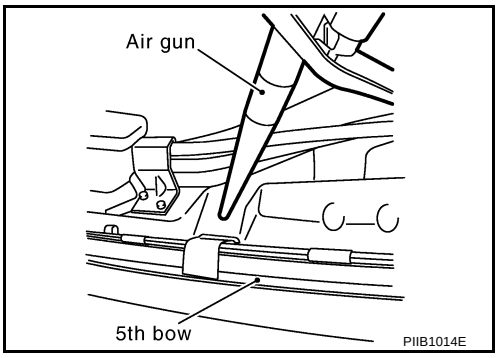


CAUTION:

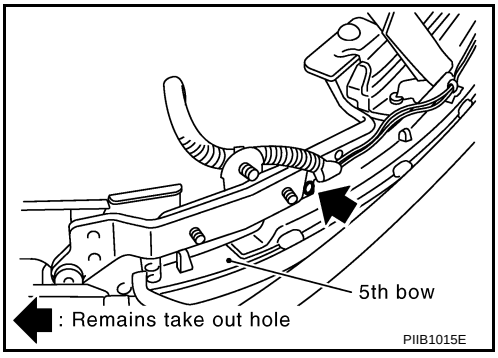
Take out the remains of rivets completely from 5th bow, other wise the remains cause noise.

NOTE:

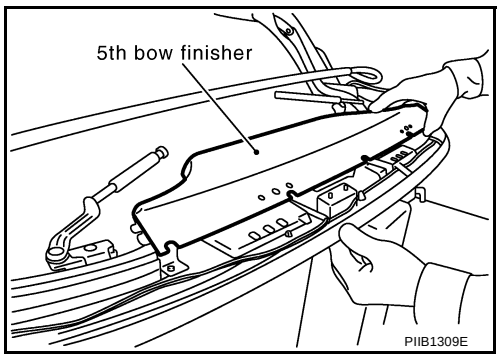
- Blow remains of rivet toward both ends of 5th bow with compressed air if they are in 5th bow.



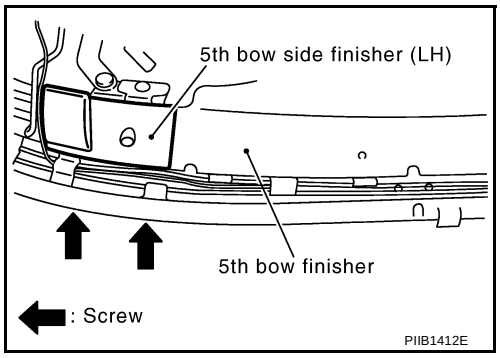
- Remove the remains drawn to both ends by the air blow from the gap.



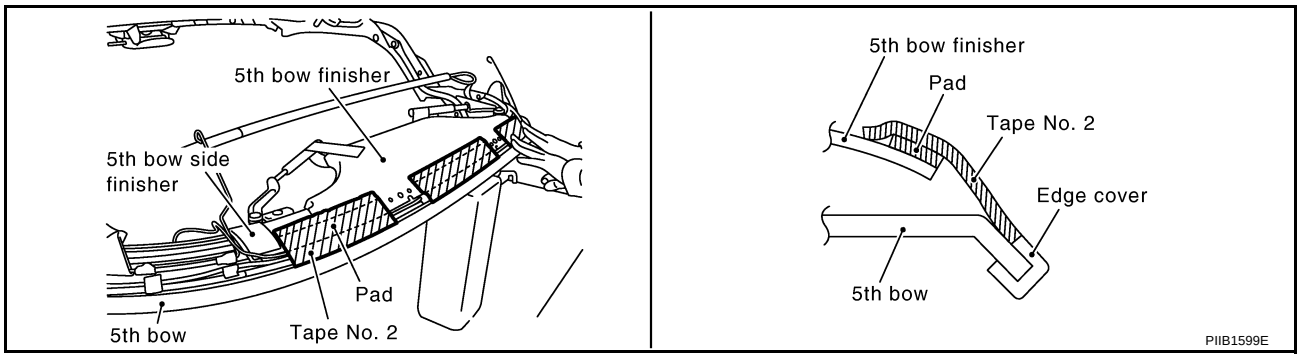
7. Install 5th bow finisher to 5th bow.



8. Install 5th bow side finisher (RH/LH) to 5th bow.



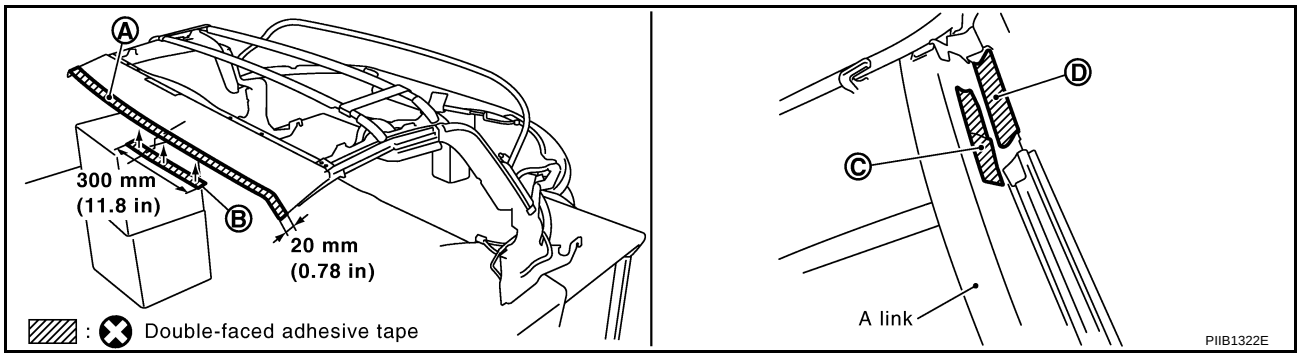
9. Install new pads and fabric tapes.



10. Secure 5th bow finisher harness with new nonwoven fabric if necessary.

Installation

1. Apply double faced adhesive tape for frame.



A: Upper side of 1st bow
B: Under side of 1st bow
C: Outer side of A link (between grommets)
D: Outer and under side of 1st bow edge

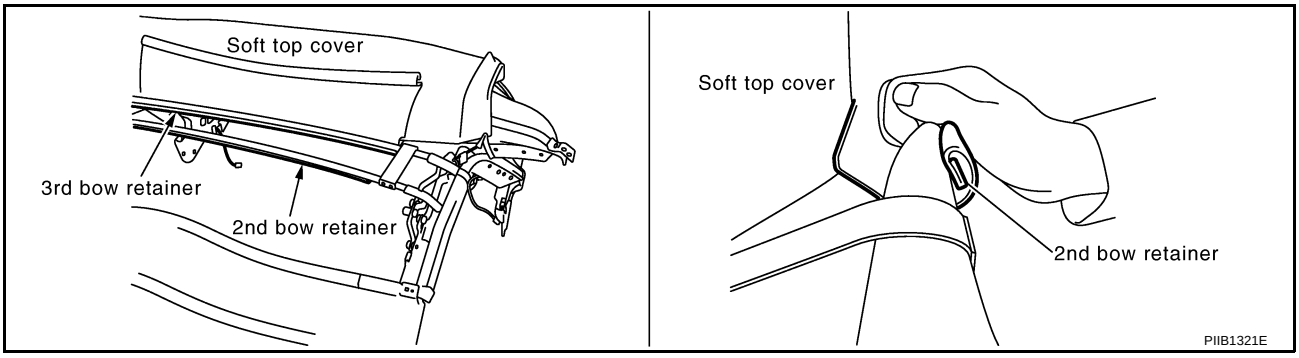
2. Put soft top cover on frame.

3. Put glass stays and defogger harnesses into sleeves on both side of rear window.

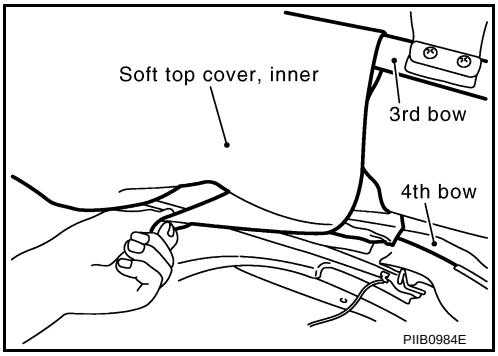
NOTE:

- Out side bag is for glass stay.
- Inside bag is for harness.

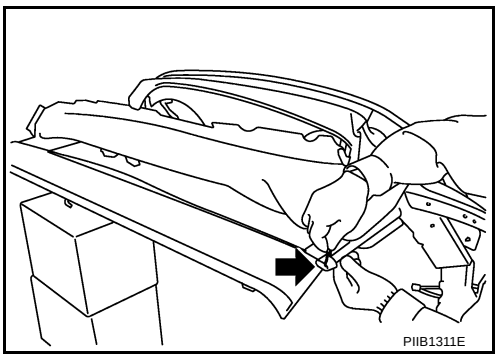
4. Hook soft top cover inner fabric edge to 3rd bow retainer and press retainer to hold securely.



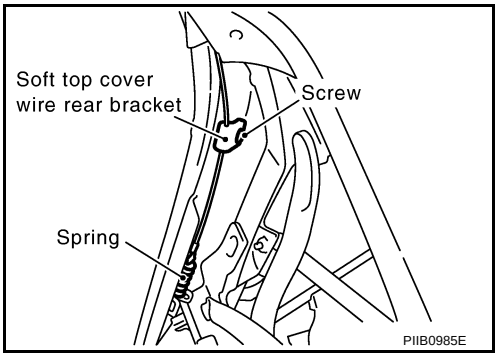
5. Hook soft top cover inner fabric edge to 2nd bow retainer and press retainer to hold securely.
6. Wrap soft top cover around 4th bow and fix soft top cover by velcro fastener.



7. Insert soft top cover wire to A link.

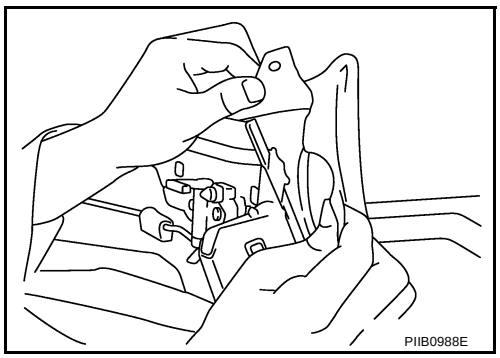


8. Tighten soft top cover wire rear bracket to C link with screw. (Face tension wire outside.)



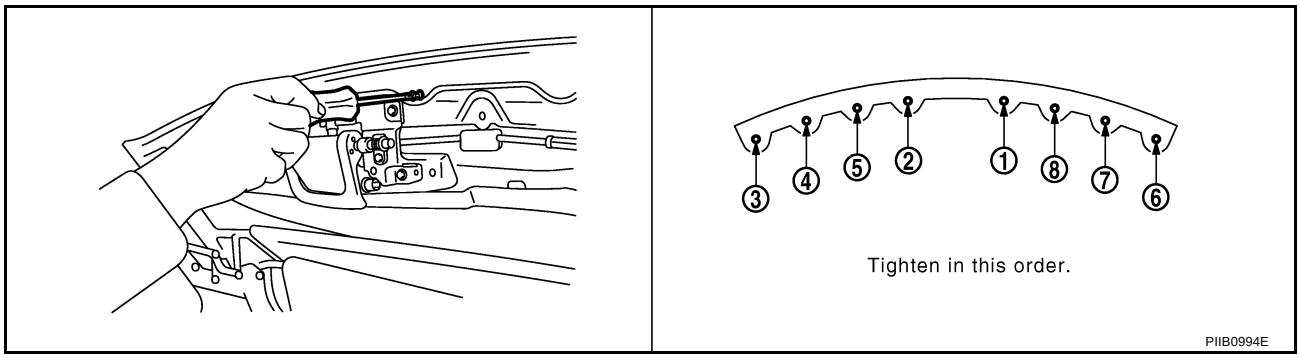
9. Hook soft top cover wire spring on C link and bend the hook of wire spring to prevent unhooking the hook.

10. Put soft top cover on 1st bow.



11. Align soft top cover hole and grommet hole at the 1st bow.

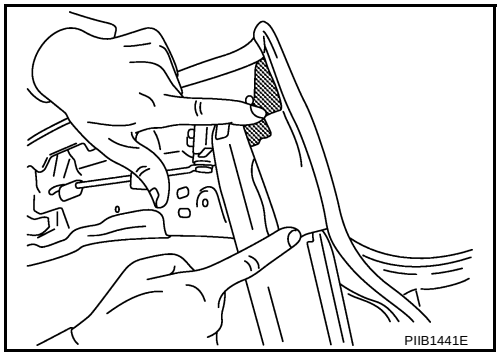
12. Tighten screws on 1st bow with front center retainer.



13. Apply EPT seal to A link installation position.

CAUTION:

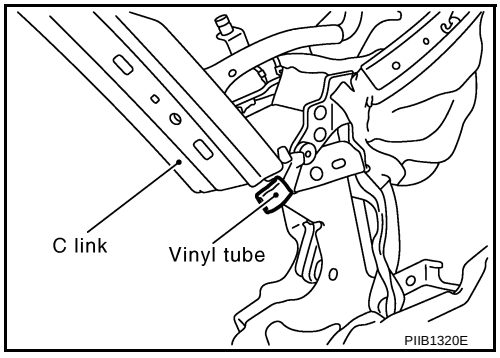
Install EPT seal to the original position.



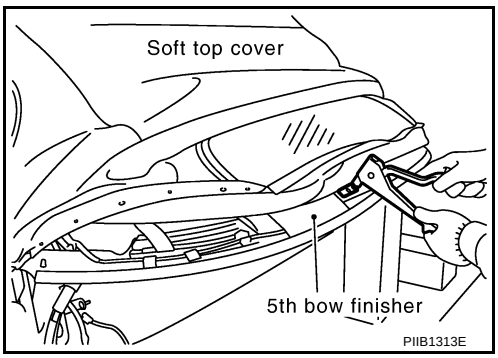
14. Put soft top cover on C link lower.

NOTE:

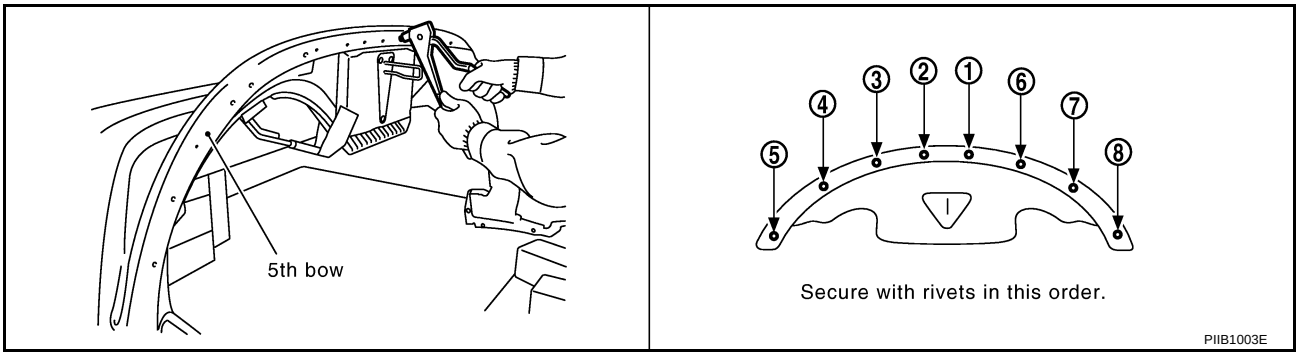
- Make sure that vinyl tube is on C link bottom end bracket.
- Be careful not to pull soft top cover with too much tension.



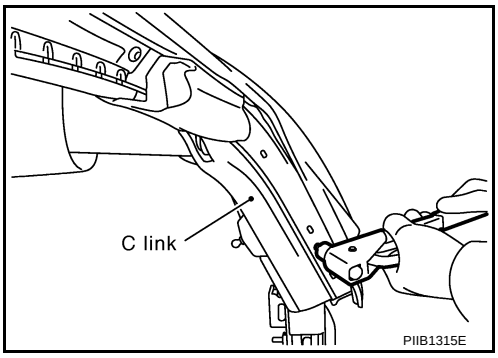
15. Open 5th bow then secure soft top cover to 5th bow finisher upper surface with rivet.



16. Close 5th bow then wrap soft top cover around 5th bow.
17. Secure soft top cover to 5th bow with rivet.



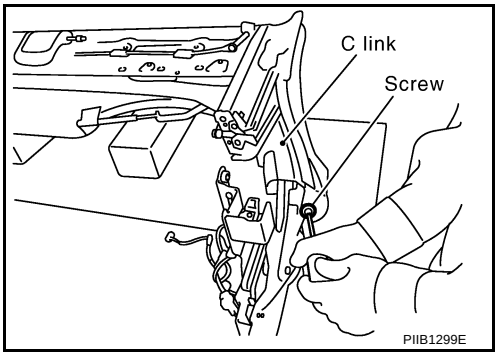
18. Secure soft top cover to C link with rivet.



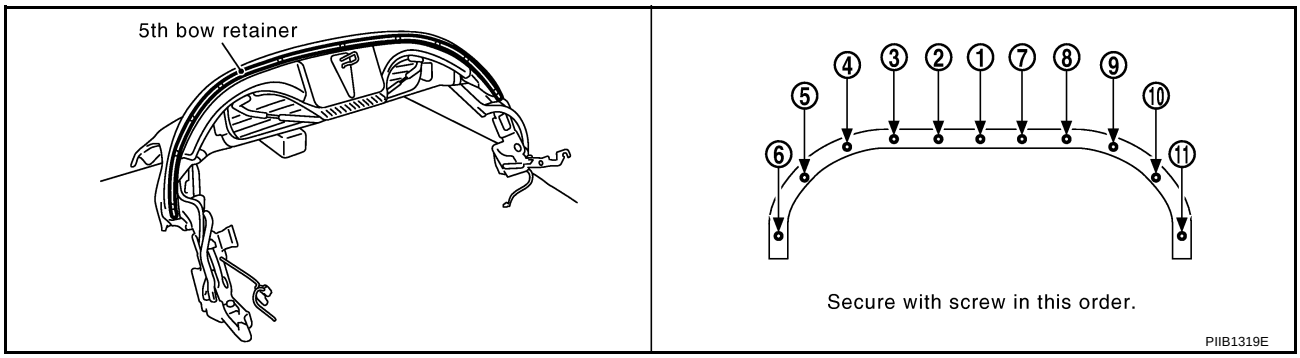
19. Align screw hole on soft top cover and the bottom of C link, and then tighten with screw.

NOTE:

- During tighten up the screw, insert a thin metal rod such as a nail [diameter: 4mm (0.16in)] to a clip hole near the screw to align holes of soft top cloth and its backing plastic plate, and C link frame.
- Tighten screw while holding soft top at certain angle for easy screw installation.



20. Close 5th bow then install 5th bow retainer with screws.

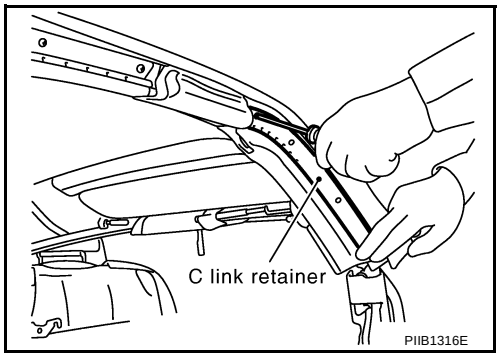


CAUTION:
Apply it to the original position.

NOTE:
During tighten up the screw, insert a thin metal rod such as a nail [diameter: 4mm (0.16in)] to a clip hole near the each end of 5th bow retainer to align holes of the retainer, soft top cloth and its backing plastic plate, and 5th bow.

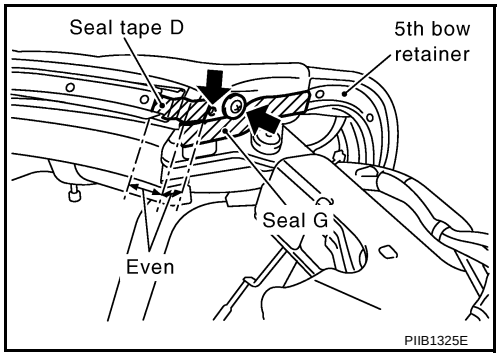
21. Install C link retainer with screws.

NOTE:
Align matching marks on the retainer to screw heads, when installing the retainer.



22. Apply seal to C link lower installation position.

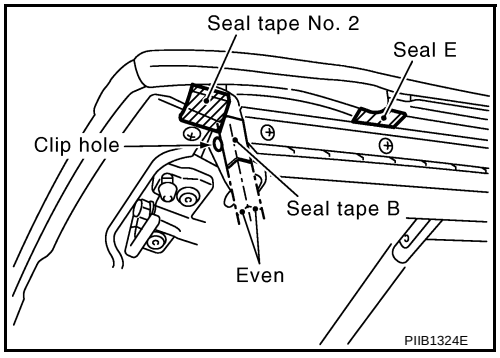
CAUTION:
Make sure not to cover clip hole and screw head.



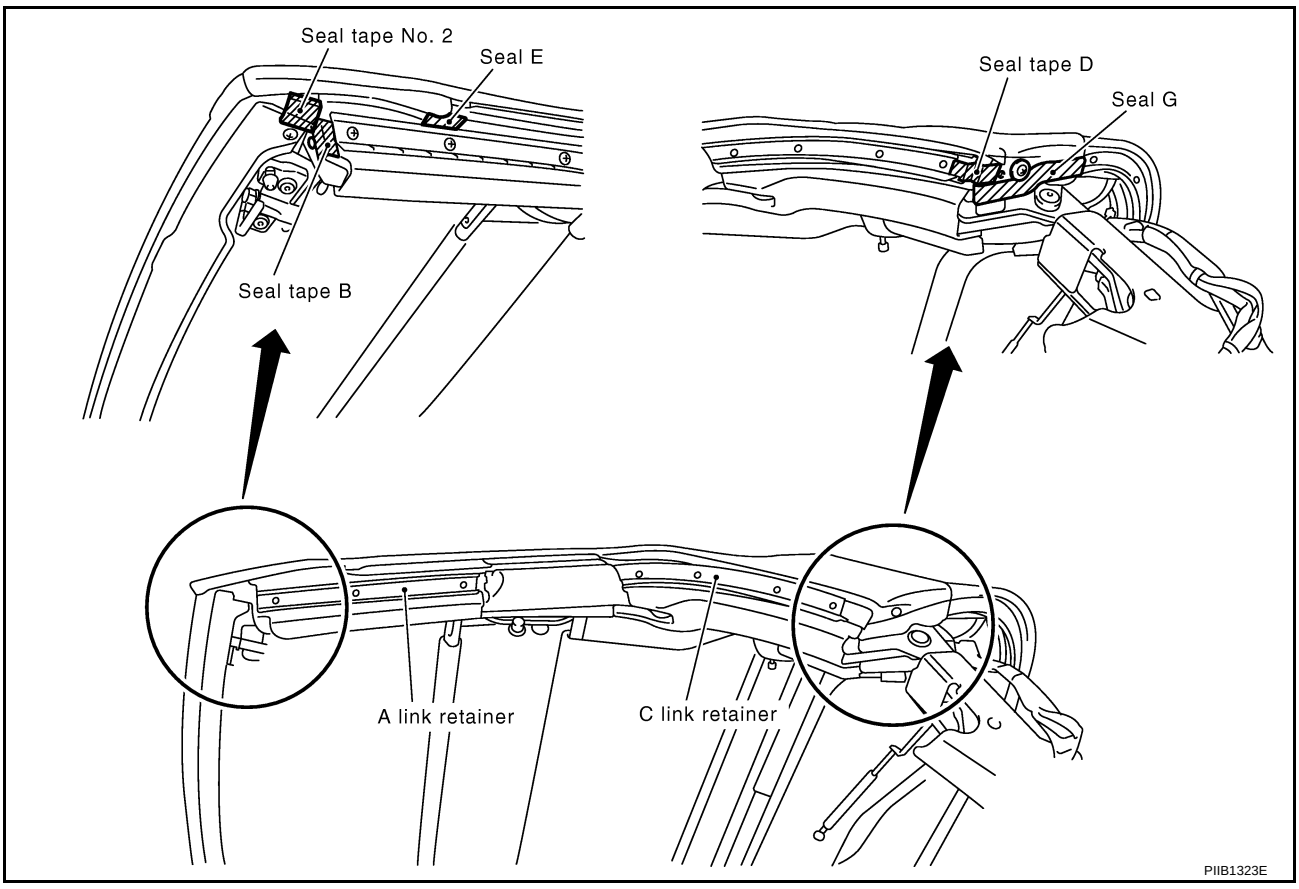
23. Install A link retainer with screws.

NOTE:
Align matching marks on the retainer to screw heads, when installing the retainer.

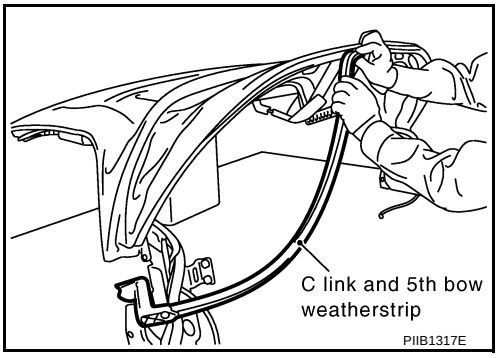
24. Apply seal E to A link installation position.



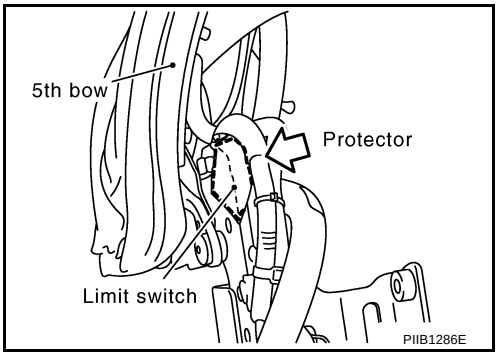
25. Recheck seals for A link and C link.



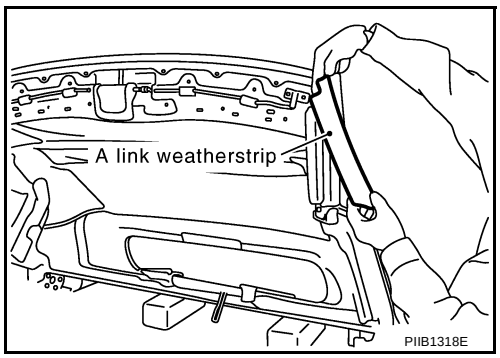
26. Install C link and 5th bow weather strip to 5th bow and C link.



27. Remove protection tape on the limit switch.



28. Install A link weather strip.



29. Install front lock finisher and welt after closing soft top.
30. Connect defogger harnesses at rear window.
31. Install 5th bow operating strut rods (RH/LH).
32. Install roof actuator (RH/LH). Refer to RF-108, "Removal and Installation of Roof Actuator" .
33. Install soft top assembly to vehicle. Refer to RF-88, "Removal and Installation of Soft Top Assembly" .
34. Check soft top open/close operation.
35. Check door glass contact. Refer to GW-53, "FITTING INSPECTION" .
36. Check for water leakage. Refer to RF-116, "Repairing Method for Water Leakage Around Doors" .

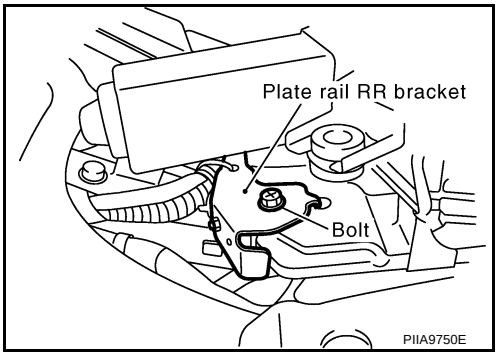
NOTE:
If there are wrinkles on the soft top cover, use a hair dryer to warm up the wrinkled area. Apply warm air from the hair dryer keeping the distance by 150 - 200 mm (5.9 - 7.8 in) and move the dryer to gently warm up soft top cover, for about 5 - 10 minutes until the wrinkle seems to be gone. Not to heat up soft top cover to much.

Removal and Installation of Switches

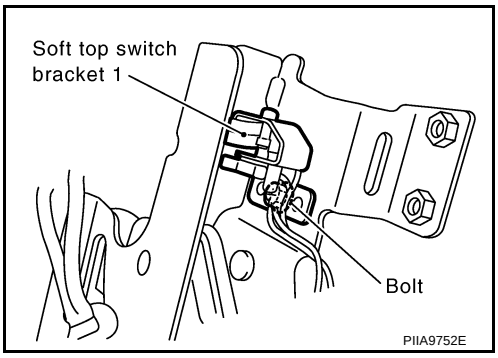
NIS0007T

REMOVAL

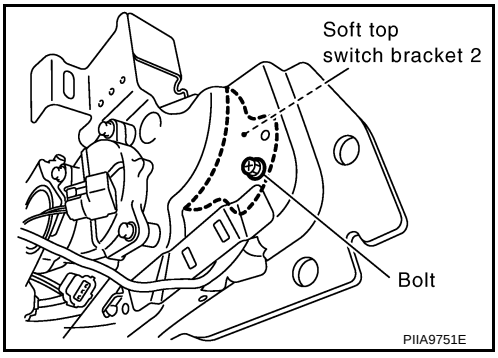
1. Uninstall soft top assembly from the vehicle. Remove roof actuator (RH/LH) from the soft top.
2. Remove harness tie wrap band at the left side of the soft top.
3. Remove limit switches with plate rail RR bracket by removing bolt.



4. Remove limit switches with soft top switch bracket1 by removing bolt.



5. Remove limit switches with soft top switch bracket 2 by removing bolt.



INSTALLATION

Install in the reverse order of removal.

NOTE:

Wire harnesses correctly to avoid following situation.

- Pinching harnesses by frame.
- Tangling harnesses by frame and links.
- Pulling harnesses between fixing point by harness clips.

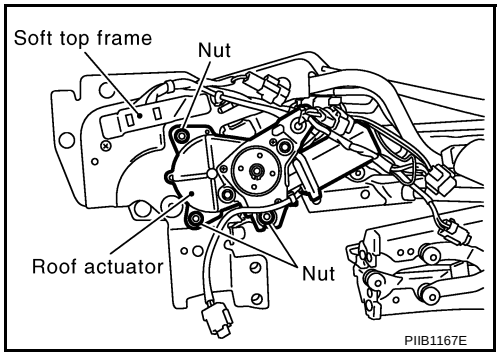
Removal and Installation of Roof Actuator

NIS0007U

REMOVAL

1. Remove soft top assembly. Refer to RF-88, "Removal and Installation of Soft Top Assembly" .
2. Remove nuts and then remove roof actuator (RH/LH).

   NOTE:
   If removal is difficult, rotate motor axis to remove them.



3. Disconnect soft top actuator harness connector.

INSTALLATION

Install in the reverse order of removal.

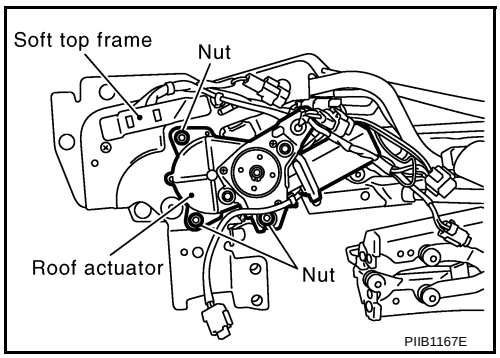
Removal and Installation of 5th Bow Drive Unit

NIS0007V

REMOVAL

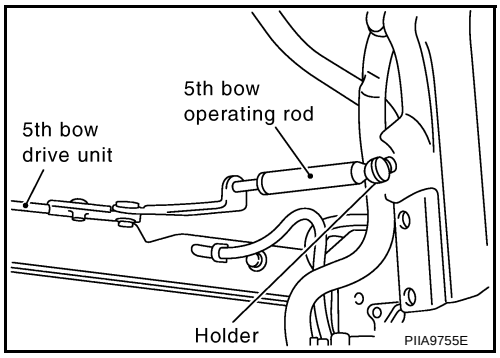
1. Uninstall soft top assembly from the vehicle.
2. Remove roof actuator (RH/LH) from the soft top.

   NOTE:
   If removal is difficult, rotate motor axis to remove them.



3. Disconnect 5th bow operating rod (RH/LH) at the frame side by pulling out the holder.

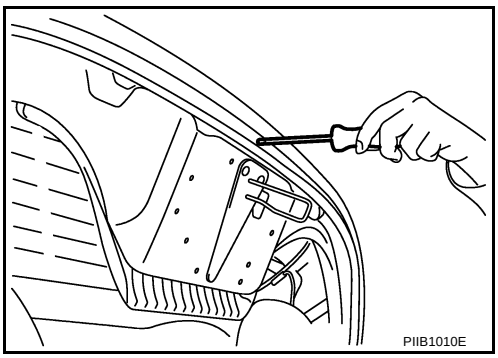
   NOTE:
   This step will make the 5th bow up and down motion easier.



4. Make sure that the limit switch contact around the rotation axis of the 5th bow on the left side of soft top is protected with tape.
5. Open the soft top manually, and put a stand under the 1st bow. Then fix the soft top not to move during this procedure.

   NOTE:
   Put a waste cloth between the front lock and the stand not to make any scratches to the soft top.
6. Remove the C link and 5th bow weather strip.

7. Remove the soft top cover retainer (5th bow retainer) from 5th bow by taking out screws.

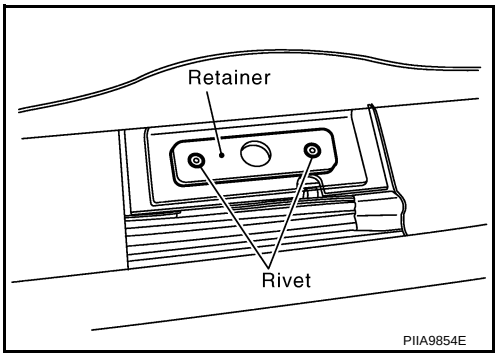


8. Drilling rivets attaching the soft top cover to 5th bow, then pull up the soft top cover bottom edge.

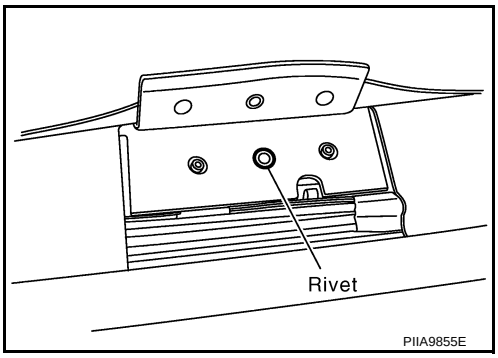
NOTE:
Use 4 mm (0.16 in) diameter drill bit to remove the rivet head. When drilling rivets, be careful not to damage the soft top cover.

9. Drilling rivets with retainers attaching with tags from the soft top cover, 5th bow finisher and the 5th bow.

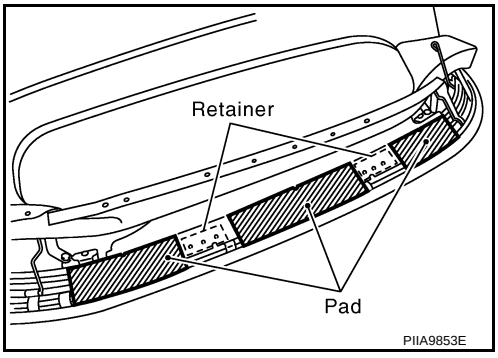
NOTE:
Use 4 mm (0.16 in) diameter drill bit to remove the rivet head. The soft top cover is separated from 5th bow.



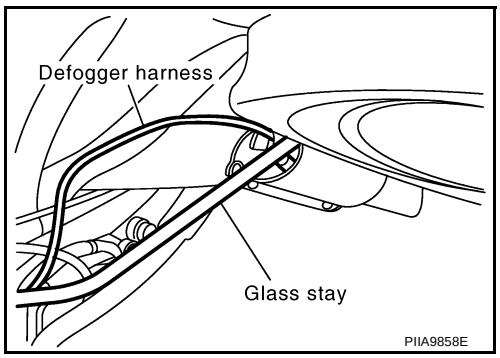
10. Drilling rivets under retainers by using 4 mm (0.16 in) diameter drill bit.



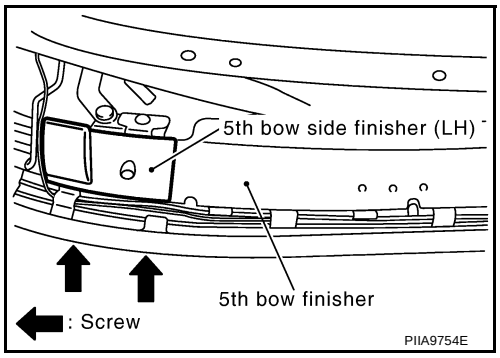
11. Remove pads from 5th bow finisher.



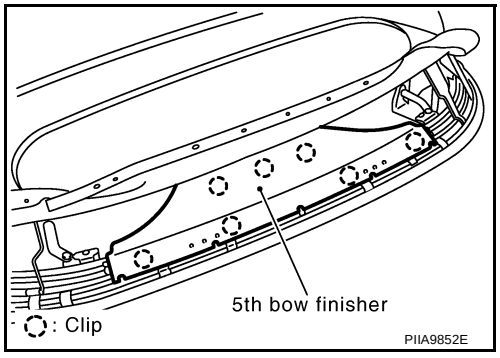
12. Roll the soft top cover bottom edge up, and disconnect defogger harness connector from the rear window glass.
13. Pull out glass stays from sleeves on each side of the rear window glass.



14. Remove 5th bow side finisher (RH/LH) by removing screws.

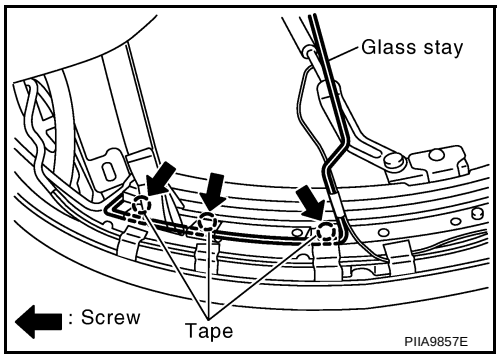


15. Remove 5th bow finisher by pulling the finisher up.

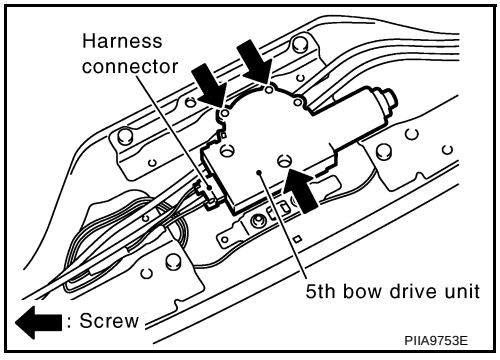


16. Remove glass stays from 5th bow by removing screws from the bottom of the 5th bow.

    NOTE:
    - When removing glass stays, support 5th bow to avoid a bend of glass stay. This bend may happen by the weight of the 5th bow and the tensile force of the tether from the soft top cover.
    - Be careful not to damage the 5th bow nor to be hurt by the falling 5th bow, because the 5th bow is heavy and moves freely after removing glass stays.



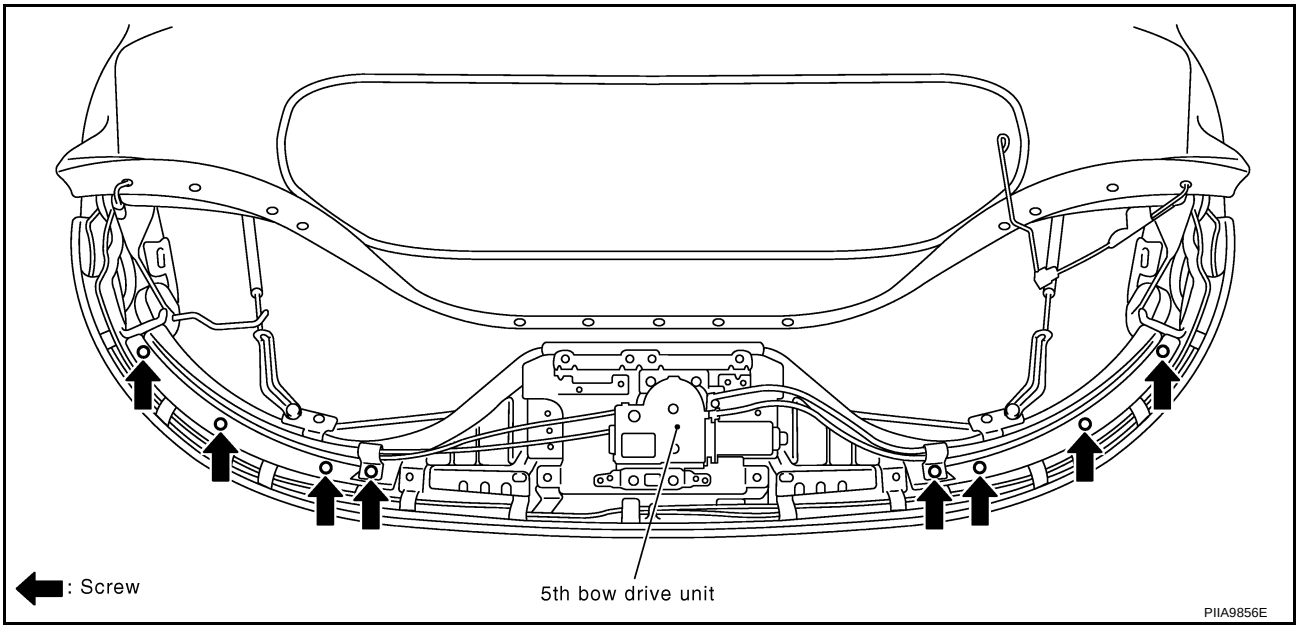
17. Disconnect 5th bow drive unit harness connector.



18. Remove 5th bow drive unit and rails together from 5th bow by removing screws.

NOTE:

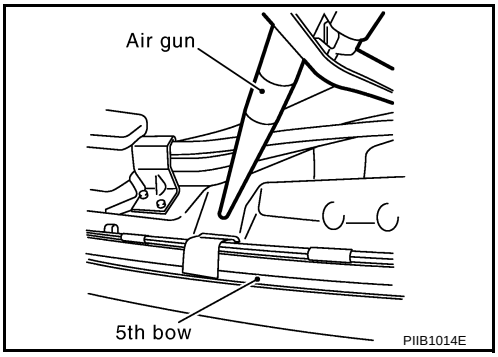
- After removing drive unit and rails, not to pull rails. Otherwise, the wire in the rail may be damaged.
- The screws are not reusable.



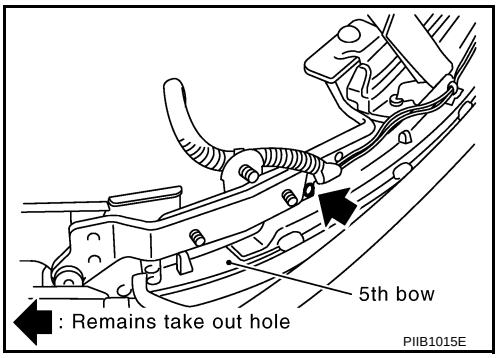
INSTALLATION

Preparation Work

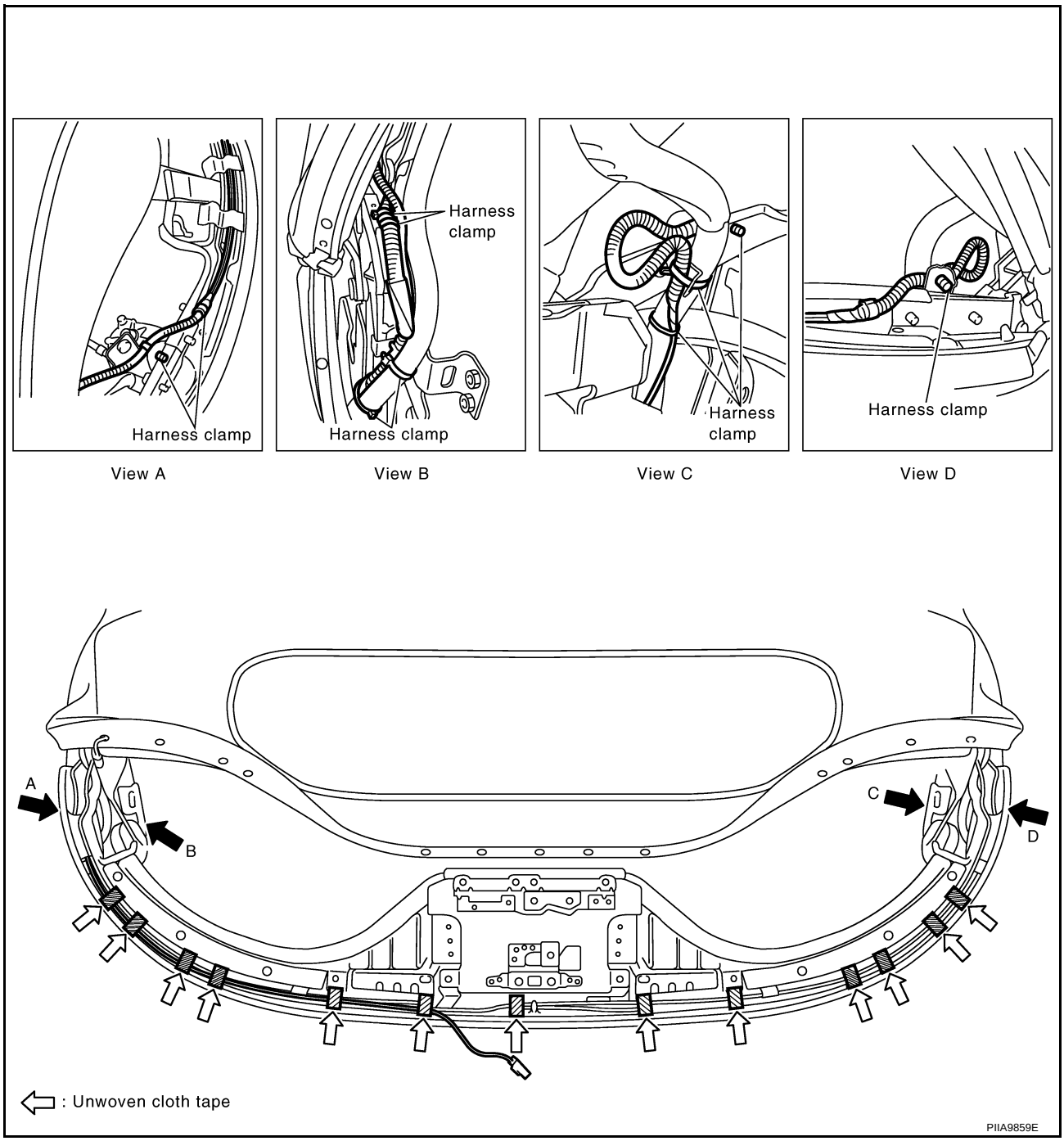
1. Blow remains of rivet toward both ends of 5th bow with compressed air if they are entering into 5th bow.

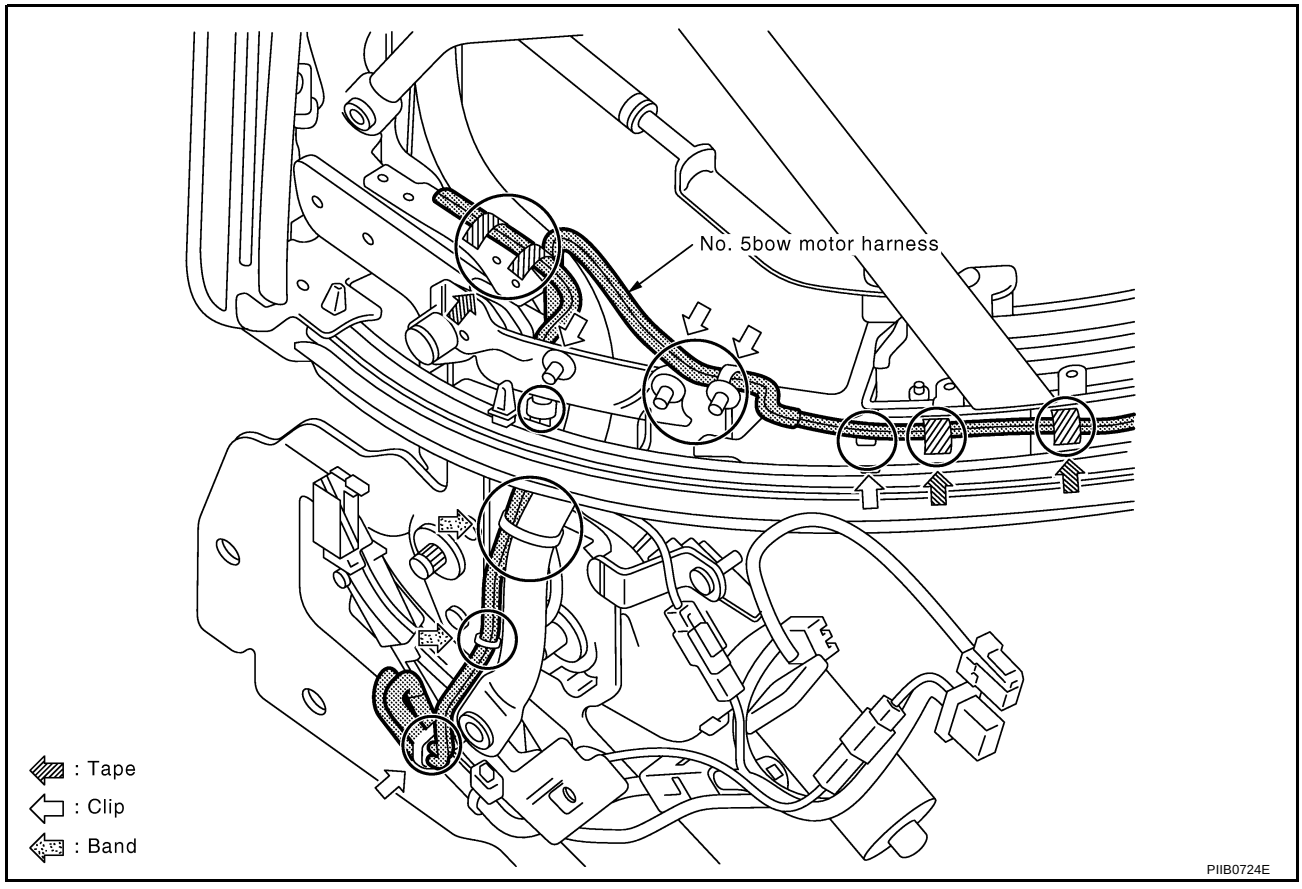


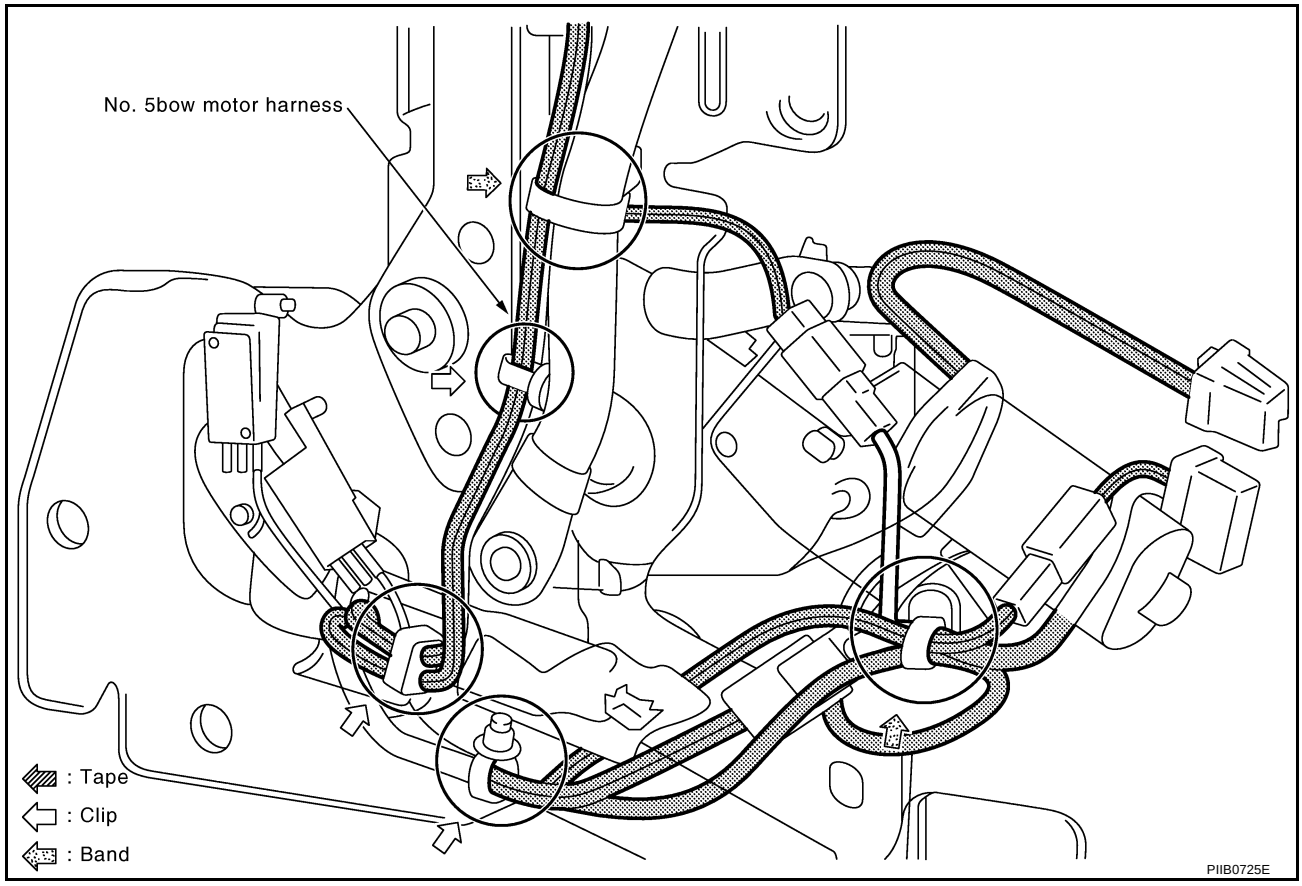
2. Remove the remains drawn to both ends by the air blow from the gap.

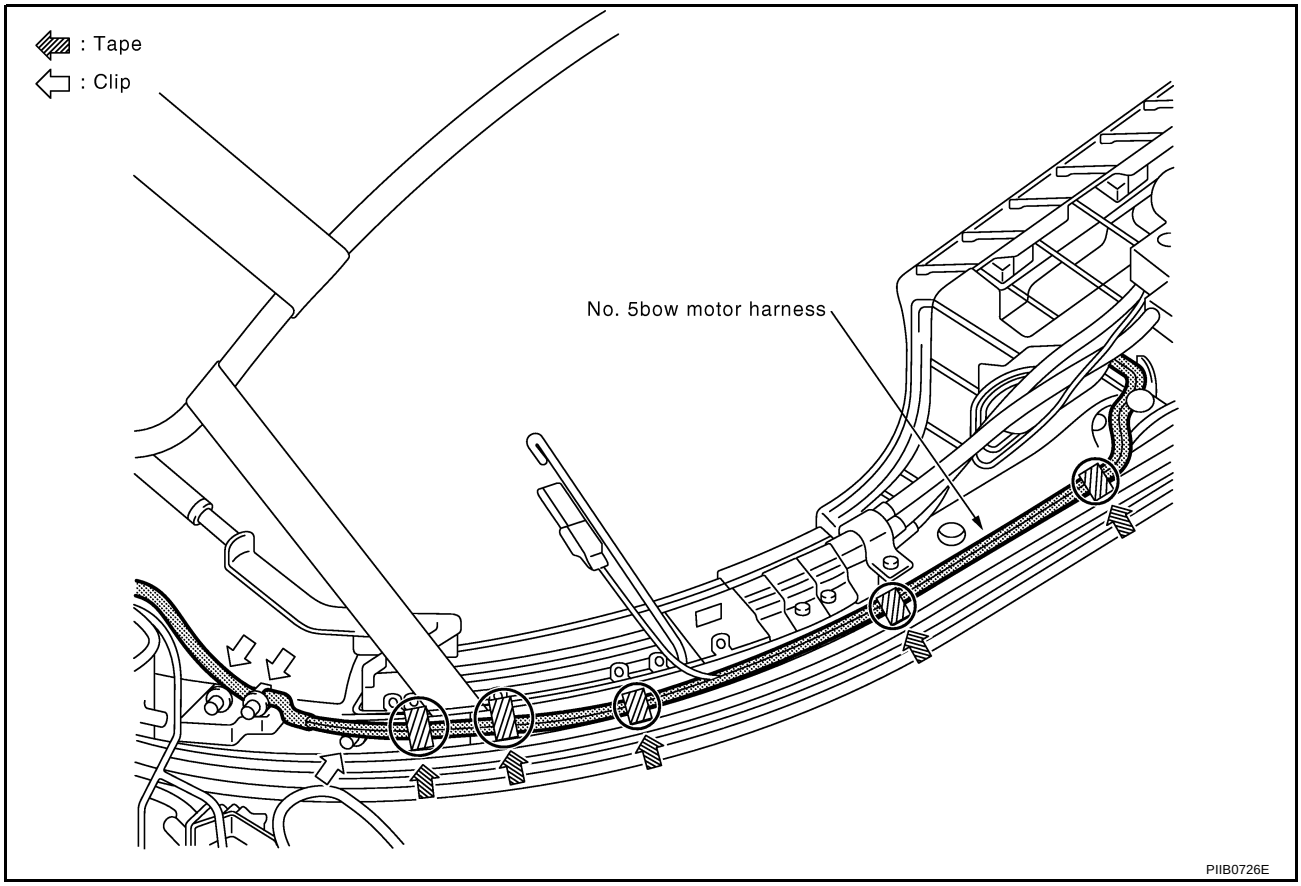


3. For fixing harness to 5th bow and Soft top frame, see next figure.



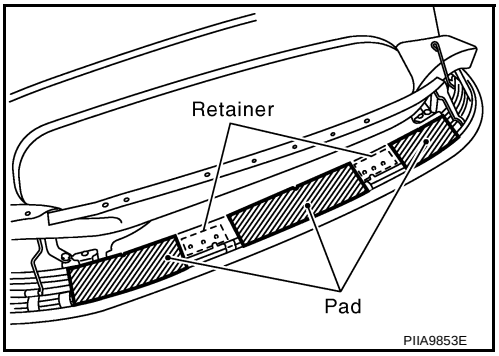

No. 5bow motor harness
: Tape
: Clip
: Band
PIIB0724E


No. 5bow motor harness
: Tape
: Clip
: Band
PIIB0725E



4. Replace rivet retainer on back of 5th bow finisher with a new one.
5. Secure 5th bow finisher with rivet, and then apply nonwoven fabric.
6. Install 5th bow finisher and 5th bow finisher (RH/LH).
7. Apply pad on 5th bow finisher.

   NOTE:
   Apply pad to the original position.



Installation

Install in the reverse order of removal.

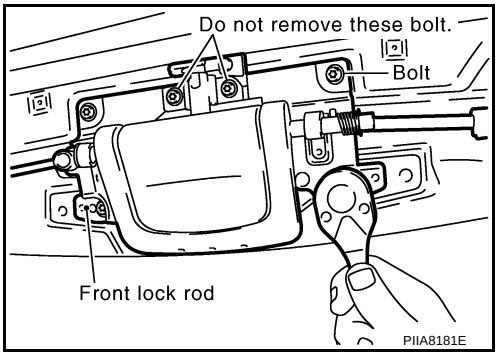
Removal and Installation of Front Lock

NIS0007W

REMOVAL

1. Remove welt and front finisher.
2. Remove bolts, and then remove front lock rod.

   CAUTION:
   Do not remove front lock hook, center bolts.



3. Remove bolts, and then remove front lock striker, LH, center, and RH.

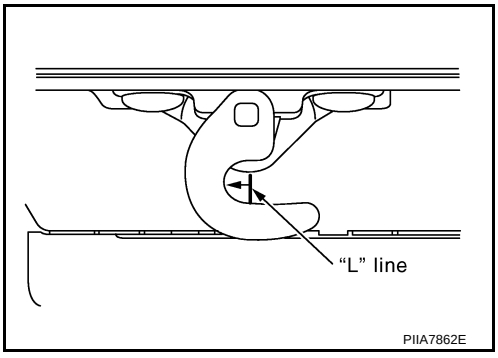
   NOTE:
   Paint matching marks for front lock assembly to check location for installation.

INSTALLATION

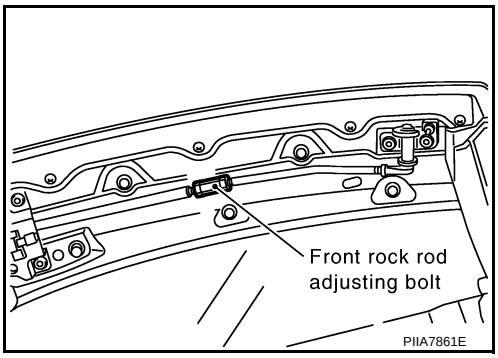
Install in the reverse order of removal.
Always adjust before installation. Refer to RF-115, "INSPECTION AND ADJUSTMENT" .

INSPECTION AND ADJUSTMENT

1. Apply super-check spray on a contact surface of 3 hooks which may touch with rods on the body. Fully close soft top, and then engage front lock.
2. Open soft top, and then make sure that the part, from which iron material is visible by peeling off super-check mark, exceeds “L” line.



3. Adjust hook contact length by adjusting front lock rod length using front lock rod adjust bolt if “L” line is not exceeded in front lock hook, RH and LH.

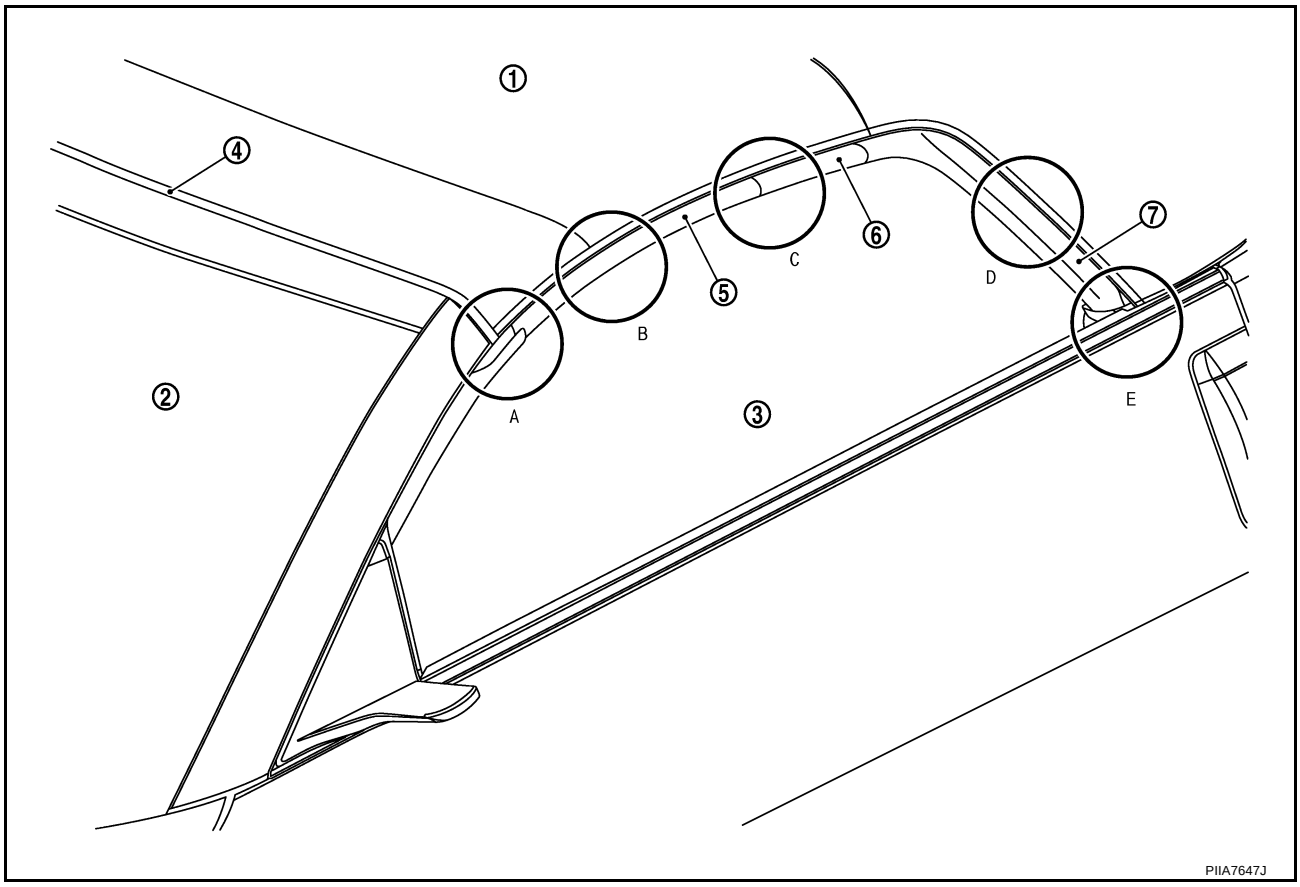


4. There is a part malfunction, if “L” line is not exceeded in front lock center hook. Replace front lock assembly.
5. Make sure that the super check mark exceeds the “L” line, and then measure the fully closed operating force while contacting push-pull gauge to the handle. Make sure that the operating force is 68.6 N (7 kg, 15.4 lb) or less, and then install it.

   NOTE:
   - Replace front lock assembly if the operating force is over the specified value.
   - Make sure that operating force when replacing front weather strip, center weather strip, and rear weather strip is 107.8 N (11 kg, 24.2 lb) or less.

Repairing Method for Water Leakage Around Doors

NIS0007X



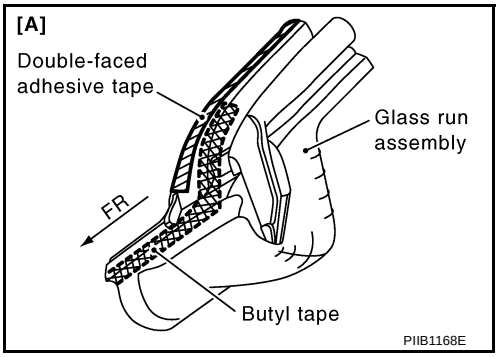
1. Soft top assembly
2. Windshield glass
3. Door glass
4. Glass run assembly
5. A link weather strip
6. B link weather strip
7. C link and 5th bow weather strip

WATER LEAKAGE FROM A

Water may be entering passenger room through back of front pillar.
Cause: Butyl tape on back of glass run assembly may be separating from roof panel.

Repair Procedure 1

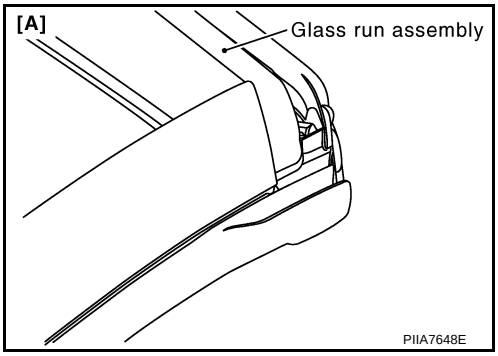
Apply butyl tape on back of glass run assembly again, and correct installing position.



Water may be entering through connection between front pillar and front edge of soft top.
Cause: There may be a gap between glass run assembly and weather strip of soft top.

Repair Procedure 2

Replace glass run assembly with a new one to eliminate the gap between glass run assembly and weather strip.



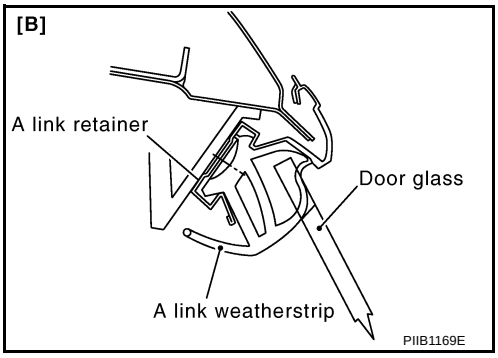
WATER LEAKAGE FROM B

Water may be entering through door glass upper inside edge.
Cause: There may be poor contact between A link weather strip of soft top and door glass.

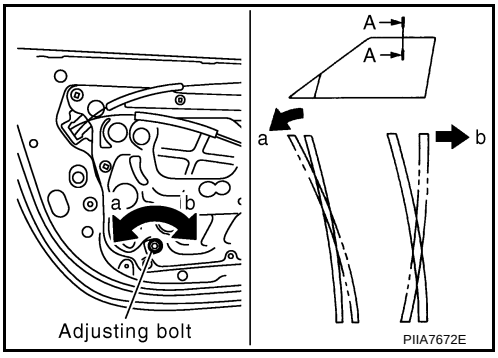
Repair Procedure 3

- Adjust door glass position frontward/backward or upward/downward against soft top assembly.
- Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

CAUTION:
Soft top assembly position may be incorrect when glass upper position is low even if door glass adjustment is performed. Perform soft top assembly adjustment, if necessary. Refer to GW-51, "FRONT DOOR GLASS AND REGULATOR" .



Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

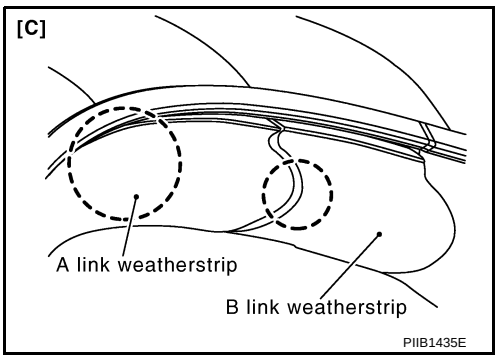


WATER LEAKAGE FROM C

Water may be entering through a joint between soft top weather strips.
Cause: There may be a step or a gap at the weather strips joint.

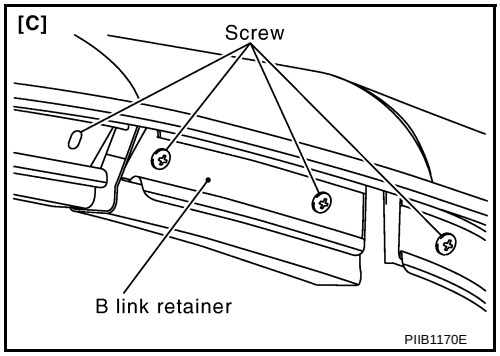
Repair Procedure 4

- Replace weather strip with a new one.
- If the step or the gap is not eliminated after replacing weather strip, then perform the following procedure.

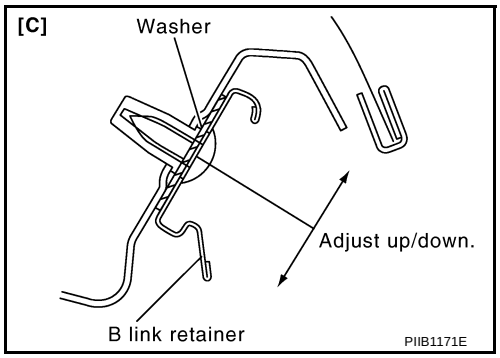


Repair Procedure 5

- Loosen retainer screws.
- Make fine upward/downward position adjustments to the B link retainer.
  (Move the B link retainer of a protruded weather strip downward for the adjustment.)



- Insert approximately 0.5 mm (0.02 in) washer into the back of the subsiding weather strip retainer, if the step is not eliminated after adjustment.



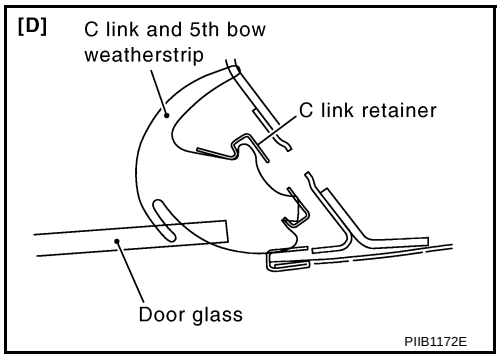
WATER LEAKAGE FROM D

Water may be entering through inside door glass rear.
Cause: There may be poor contact between Clink and 5th bow weather strip of soft top and door glass.

Repair Procedure 6

- Adjust door glass position frontward/backward or upward/downward against soft top.
- Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

CAUTION:
Soft top assembly position may be incorrect in the case of glass upper position is low even if door glass adjustment is performed. Perform soft top assembly adjustment if necessary. Refer to GW-51, "FRONT DOOR GLASS AND REGULATOR" .

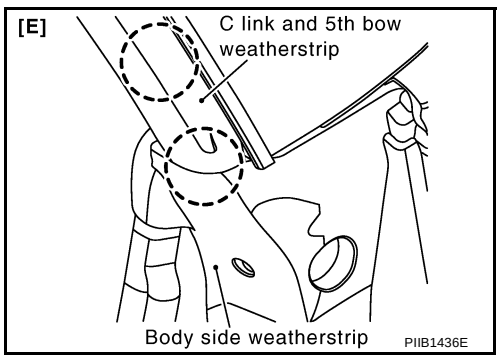


WATER LEAKAGE FROM E

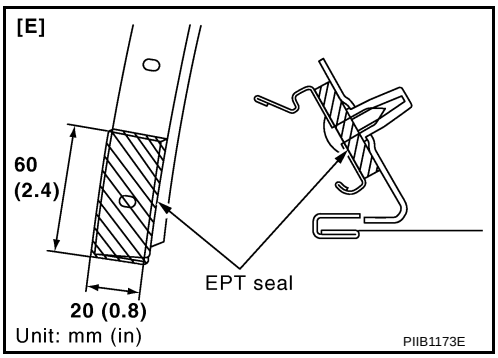
Water may be entering passenger room through weather strip joint.
Cause: There may be a step or a gap between C link and 5th bow weather strip side and body side of weatherstrip.

Repair Procedure 7

- Remove C link weather strip.
- Remove C link retainer.



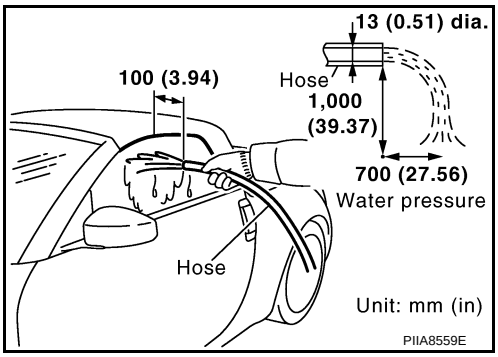
- Apply approximately 5 mm (0.2 in) thick EPT seal to retainer back surface.



WATER LEAKAGE TEST

Visually check for water leakage after repairing.

1. 2 workers are required. One worker checks inside the vehicle, and the other one washes with water.
2. Use 13 mm (0.51 in) diameter hose. Adjust water pressure by following method.
   Hold the hose horizontally, and release water at 1000 mm (39.37 in) height from ground. Adjust the distance, between the ground point just below the hose and the water dropping point, to reach 700 mm (27.56 in). (See the figure.)
3. Keeping the distance between the hose and the testing area by 100 mm (3.94 in), apply water along the area 3 times. During applying water, move the hose by 100 mm (3.94 in)/sec speed.



4. Visually check for water leakage.

Correspondence in Emergency

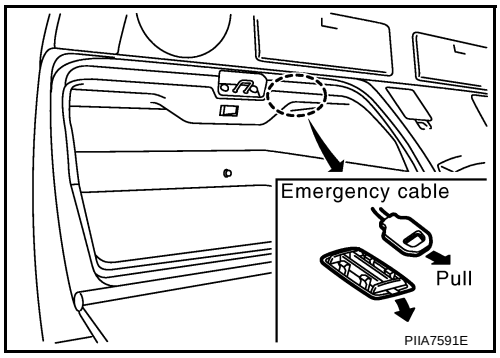
NIS0007Y

If the soft top cannot be operated electrically in the event of a discharged battery or any other system malfunction, the soft top needs to be closed manually or opened manually according to the following procedures.

MANUAL OPERATION (SOFT TOP FULLY OPEN ⇒ FULLY CLOSE)

1. Open The Trunk Lid

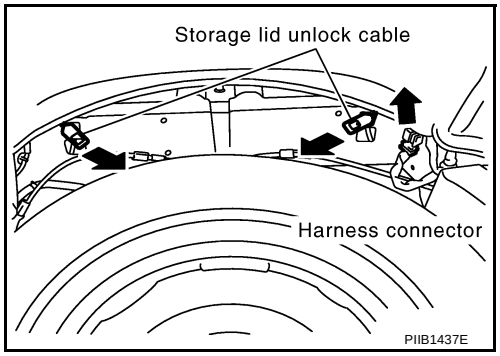
- Open the lid behind the passenger's seat (rear floor box).
- Remove cap of the emergency cable.
- Pull the emergency cable upper surface in the box.
- Open trunk lid.



2. Open The Storage Lid

- Remove floorboard inside of the trunk.
- Disconnect the storage lid motor harness connector upperward, which is located at the right hand side of the trunk.
- Pull down the storage lid lock release cable (right and left sides in the trunk).
- Confirm a clicking sound of lock release.
- Pull up the storage lid from the right and left sides of vehicle (two people are required).

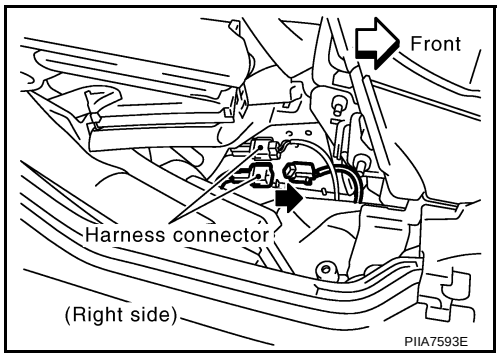
  CAUTION:
  The storage lid is extremely heavy. Pulling it up should be done by two people. Use Hex-wrench to rotate the axis of the gear, when the lid does not move.



3. Close The Soft Top

- Disconnect roof actuator harness connector right and left sides.

  CAUTION:
  2nd disconnect top of roof actuator harness connector right and first disconnect top of roof actuator harness connectors left sides.
- Pull up the soft top right and left sides of the vehicle slowly by hand (two people are required).
- Lock soft top front lock.



4. Close The Storage Lid

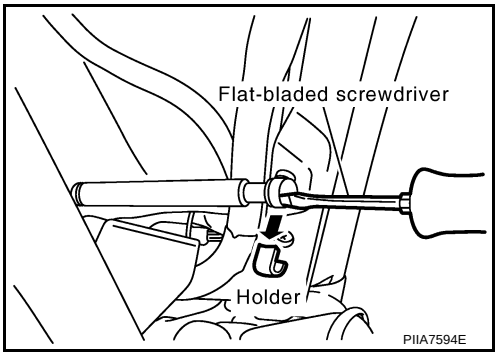
Push down soft top to body panel.

5. Lower The Soft Top 5th Bow

- Remove both operating rod of soft top 5th bow.

CAUTION:
Remove a holder of operating rod end.
Simultaneously hold soft top 5th bow by hand when removing the holder.

- Push in 5th bow to storage lid (do half lock).



CAUTION:
After closing the soft top manually according to the above procedures, have the soft top operation system checked and/or repaired by a NISSAN dealer as soon as possible.
Avoid leaving the vehicle outside for long periods or driving at high speed. As the rear of the soft top is not locked completely, this may allow wind and rain get into the vehicle.

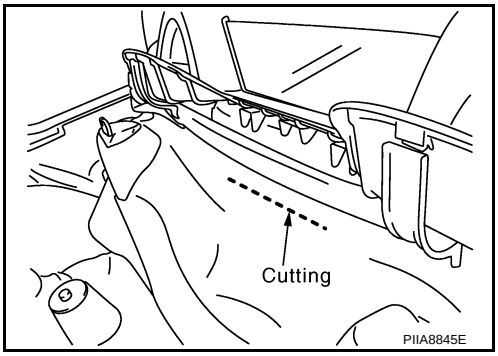
MANUAL OPERATION (SOFT TOP FULLY CLOSE ⇒ FULLY OPEN)

1. Remove The Luggage Floor Trim

Remove the rear floor box and luggage floor finisher upper. Refer to EI-41, "Removal and Installation (for Roadster Models)" .

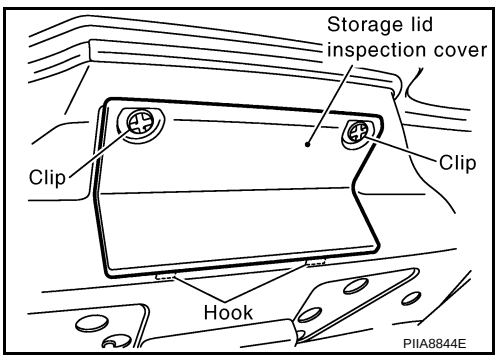
2. Cutting Storage Room Finisher

Cut storage room finisher from seat side.

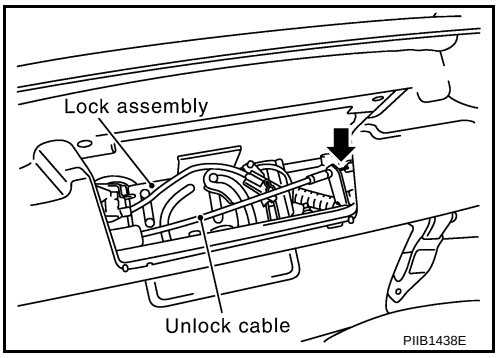


3. Unlock The Storage Lid

- Remove clip of inspection cover.



- Remove the storage lid inspection cover.
- Pull the unlock wire then unlock the soft top 5th bow.



4. Open The Soft Top 5th Bow

- Remove both shock absorber of soft top 5th bow.
- Open the soft top 5th bow (approximate 90 degrees)

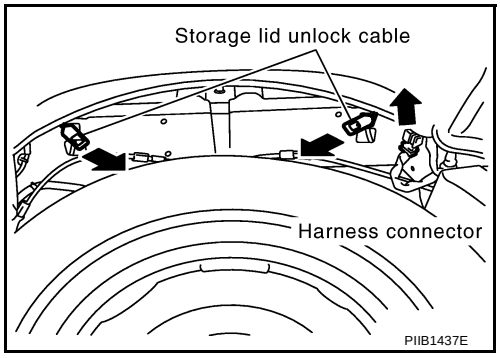
5. Open The Trunk Lid

- Pull the emergency cable.
- Open the trunk lid.

6. Open The Storage Lid

- Remove floorboard inside of the trunk.
- Disconnect the storage lid motor harness connector downward which is in the right hand side of the trunk.
- Pull down the storage lid lock release cable (right and left side of the trunk).
- Confirm a clicking sound of lock release.
- Pull up the storage lid from the right and left sides of vehicle (two people are required).

  CAUTION:
  The storage lid is extremely heavy. Pulling it up should be done by two people. Use Hex-wrench to rotate the axis of the gear, when storage lid does not move.



- Disconnect roof actuator harness connector right and left side (disconnect top of roof actuator harness connector right and left side).

7. Open The Soft Top

- Lower the soft top 5th bow.
- Unlock the front lock.
- Open the soft top right and left side of the vehicle slowly by hand (two person job).

8. Close The Storage Lid

NOTE:
If necessary.

9. Close The Trunk Lid

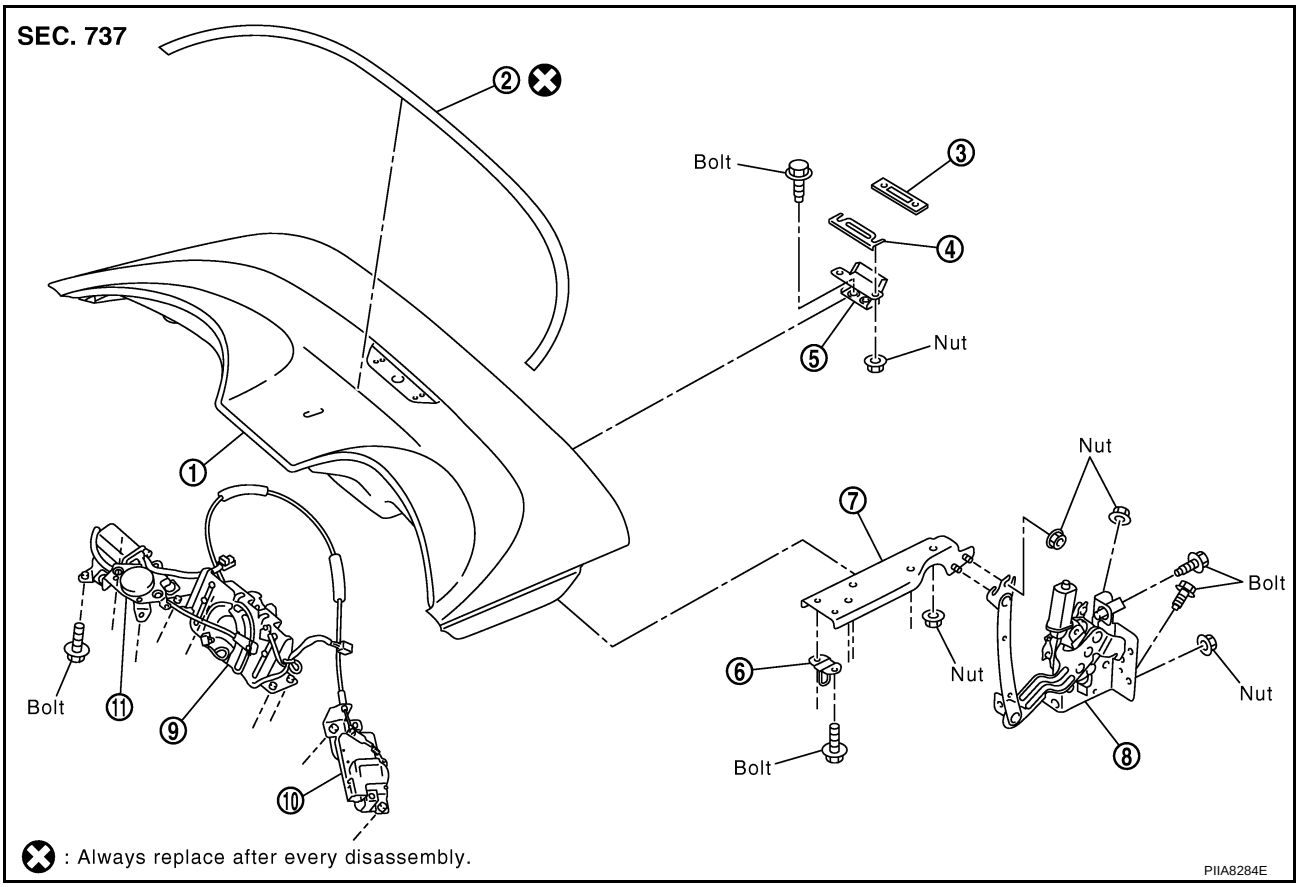
NOTE:
If necessary.

STORAGE LID

PFP:97002

Removal and Installation of Storage Lid Assembly

NIS0007Z



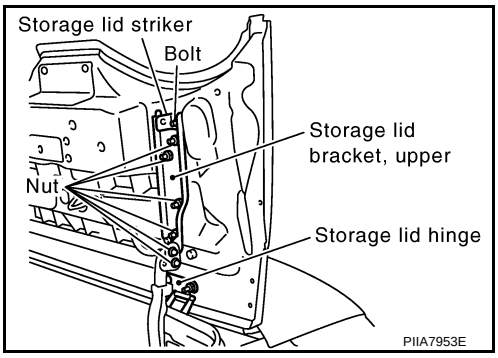
1. Storage lid	2. Storage outer protector	3. Spacer
4. Shim	5. Storage lid hinge	6. Storage lid striker
7. Storage lid upper bracket	8. Storage lid lower bracket	9. 5th bow lock
10. 5th bow unlock actuator	11. 5th bow closure motor	

REMOVAL

1. Disconnect storage lid actuator connector.
2. Remove bolts, and then remove storage lid striker.

   NOTE:
   - 2 or more workers are required.
   - Paint matching marks to check location for installation.
3. Remove nuts which is connecting the storage lid upper bracket and the storage lid lower bracket.

   NOTE:
   Paint matching marks to check location for installation.
4. Remove nuts of storage lid hinge, and then remove storage lid, spacers and shims.

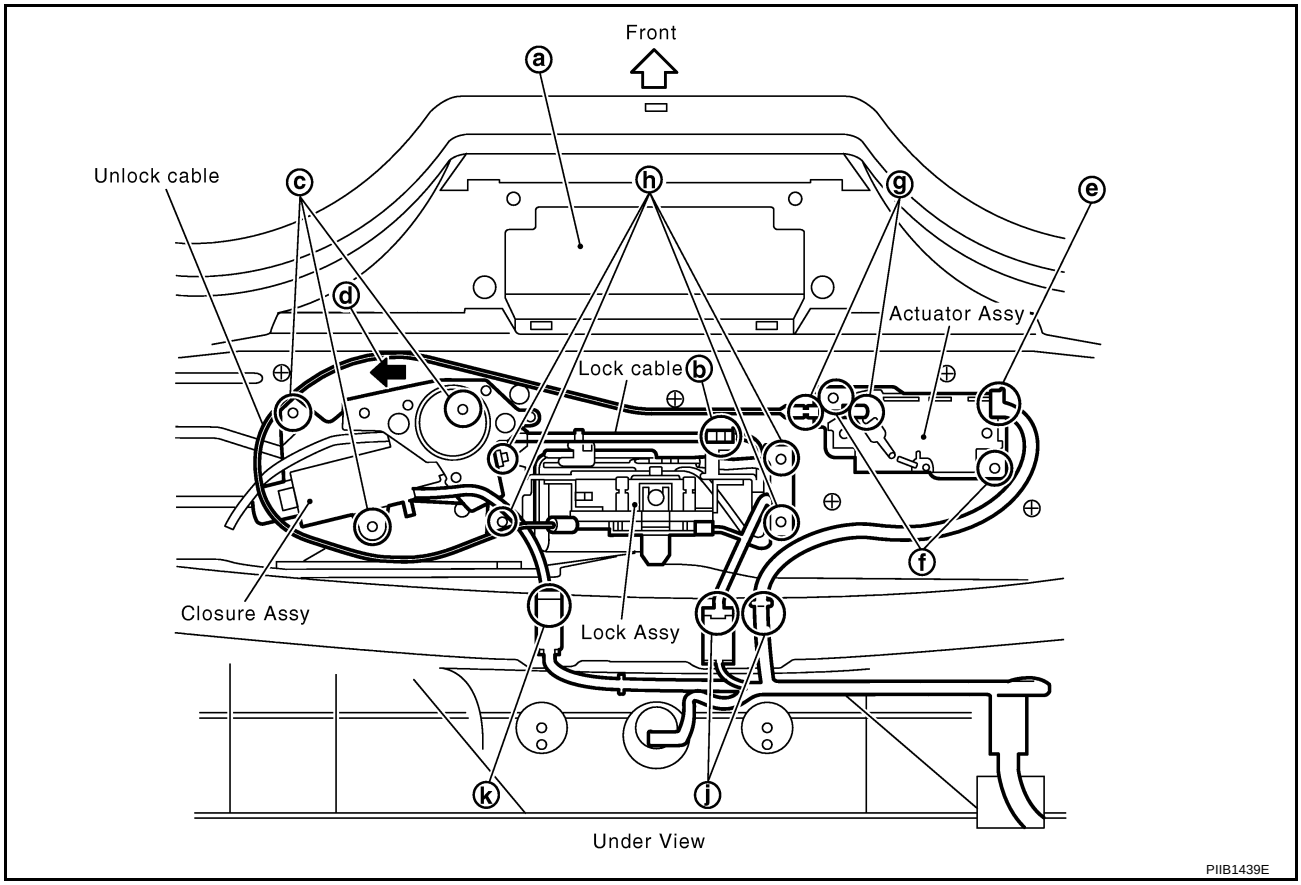


INSTALLATION

1. Install in the reverse order of removal.
2. Install storage lid, and then adjust fitting of lid.

Removal and Installation of Storage Lid Inside Unit

NIS00080



REMOVAL

NOTE:

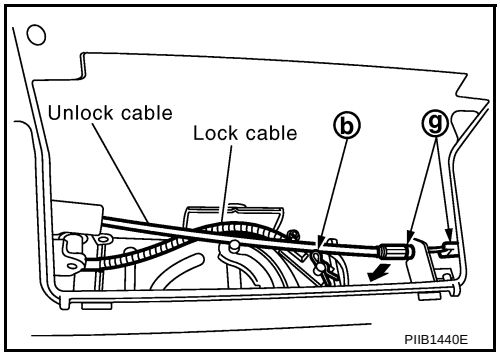
After installing Storage lid on the vehicle, an adjustment of Storage lid position is required in both closed and opened condition.

Put the removed storage lid on the floor or a work bench covered by waste clothes to prevent any scratches.

1. Remove storage lid inspection cover on the front side of Storage lid. (a in the figure)
2. Disconnect a wire from a lock assembly by pulling out a connection pin. (b in the figure)

   NOTE:

   The pin should be taken off by a small pliers not to fell into Storage lid. If the pin fell into Storage lid, then it is very difficult to take the pin out from the lid. And if the pin is left inside the lid, it may make an uncomfortable noise.



3. Remove closure mounting bolt from back of storage lid. (c in the figure)
4. Move closure toward outside of vehicle (because it interferes with unlock). (d in the figure)
5. Disconnect unlock actuator connector. (e in the figure)
6. Disconnect actuator side of unlock cable. (g in the figure)
7. Remove unlock actuator mounting bolt from back of storage lid, and then remove unlock actuator from inspection cover. (f in the figure)
8. Remove lock mounting bolt from back of storage lid, and then move entire lock toward rear of storage lid. (h in the figure)

9. Disconnect lock harness connector, and then remove lock from inspection cover. (j in the figure)
   NOTE:
   Turn lock catcher counterclockwise, and then face it to storage lid inspection hole side to remove because it interferes with storage lid when removing.
10. Disconnect closure harness connector, and then remove closure from inspection cover. (k in the figure)
11. Disconnect unlock actuator, lock, and closure harness connectors from inspection cover.
    (Push in harness connector clip tabs from back of storage lid using a screwdriver so as to remove.)

INSTALLATION

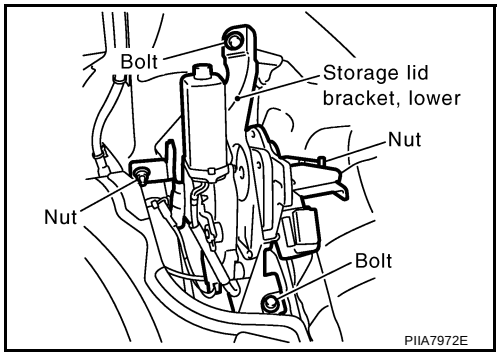
Install in the reverse order of removal.

Removal and Installation of Storage Lid Actuator

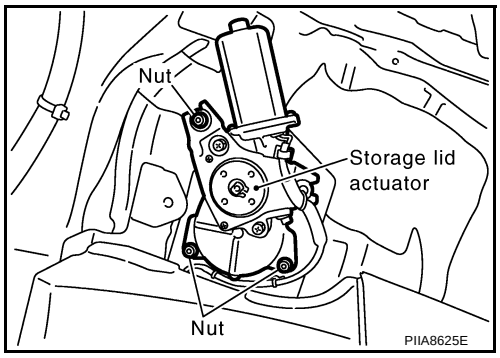
NIS00081

REMOVAL

1. Remove trank room trim.
2. Remove nuts and bolts, and then remove storage lid lower bracket.



3. Disconnect storage lid actuator harness connector.
4. Remove nuts and remove storage lid actuator from storage lid bracket, lower.

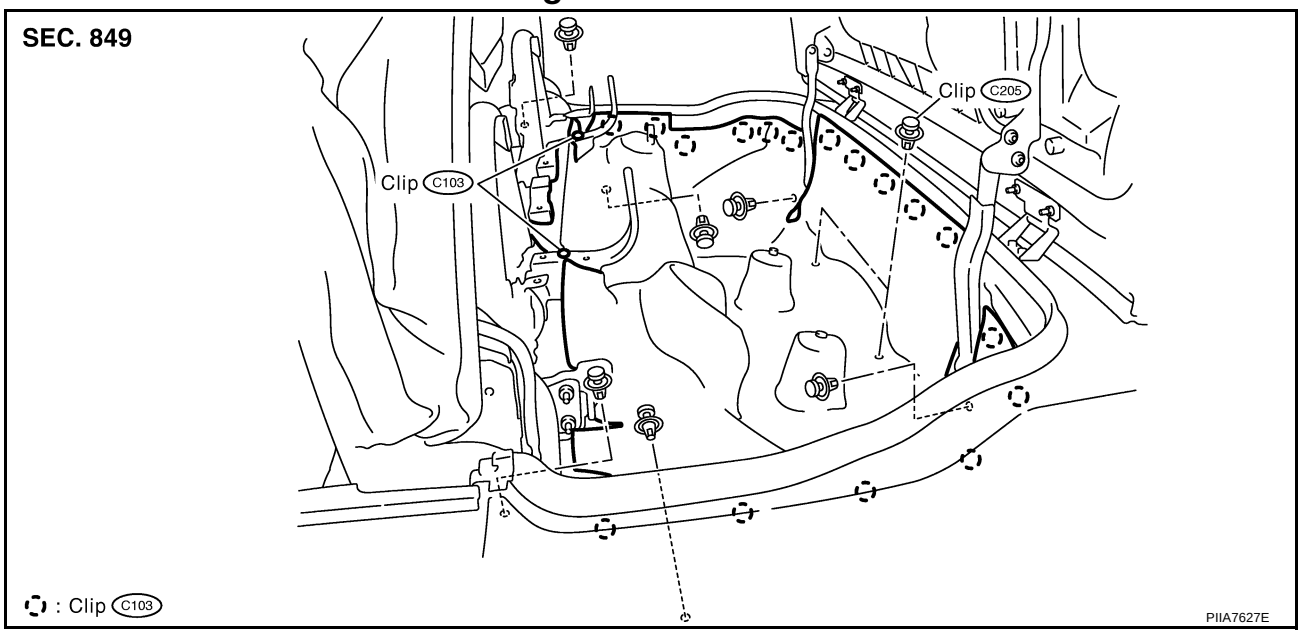


INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Storage Room Finisher

NIS00082



REMOVAL

1. Remove rear side finisher. Refer to EI-37, "REAR SIDE FINISHER" .
2. Remove bolts, and then soft top mounting bracket (front).
3. Remove bolts, and then soft top mounting bracket (rear).
4. Lift up soft top mounting bracket using a lever, and then remove storage room finisher clips.
5. Remove storage room finisher clips, and then remove rear side of storage room finisher.

6. Lift up back panel finisher clips using remover tools, and then remove front side of storage room finisher.

INSTALLATION

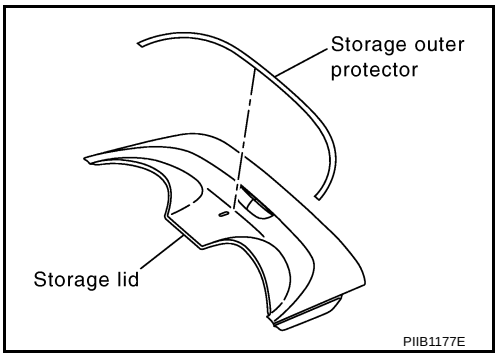
Install in the reverse order of removal.

Removal and Installation of Storage Outer Protector

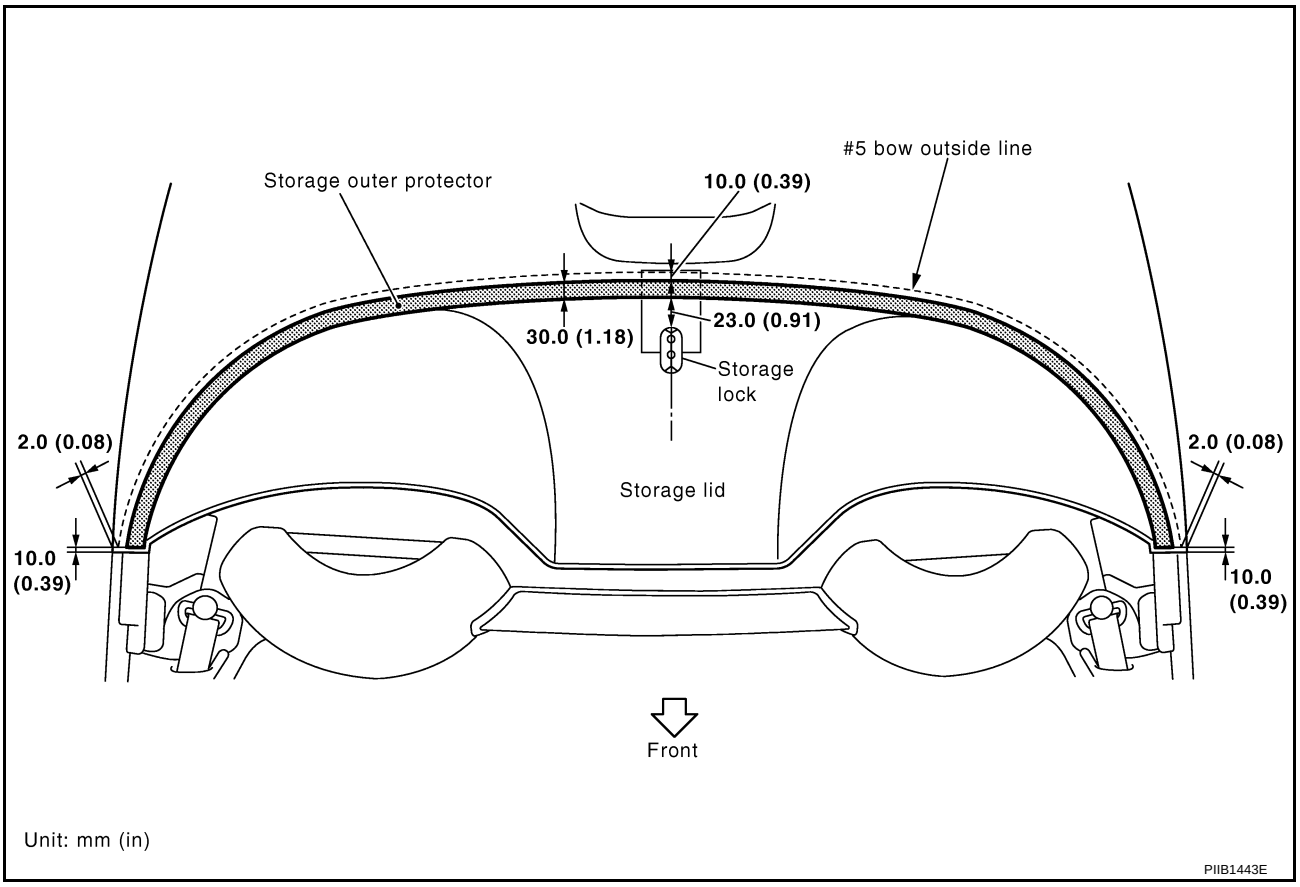
NIS00083

Note the following, and install in the reverse order of removal.

1. Heat the bonded area using a hair dryer, and then remove storage outer protector.
   NOTE:
   Do not reuse storage outer protector after removing.



2. Remove storage room finisher.



3. Clean Storage lid surface.
4. Close Soft top, and draw a line on a storage lid just behind the 5th bow out side edge by a water base marker pen.
5. Apply IPA solution (isopropyl alcohol : water = 1 : 1) on the lid, and set the storage outer protector position from one side. And do the same procedure to another side.
6. Apply left side storage lid outer aligning with left storage lid scribed line.
7. Apply right side storage lid outer aligning with right storage lid scribed line.

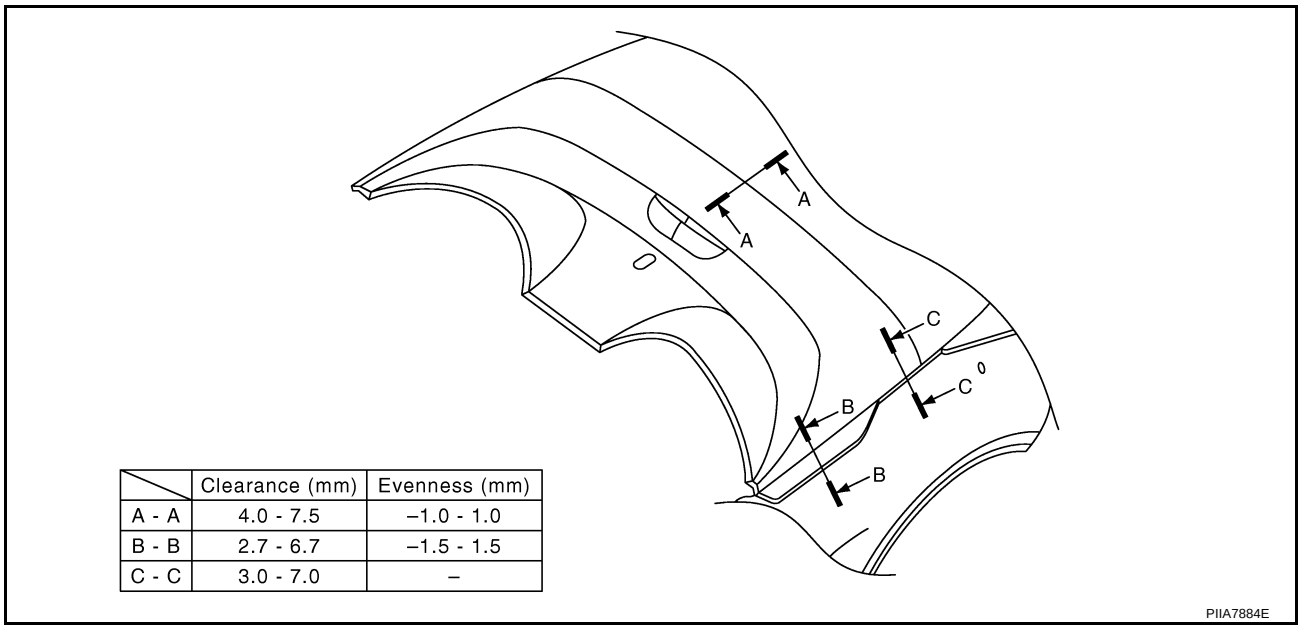
NOTE:
Not to put air or dust under the tape.
After applying the tape on the lid, peal off the protection film on the storage outer protector.

- Secure left, right, and front end of storage room finisher with remaining part when removing using double-faced adhesive tape.

Adjustment of Storage Lid

NIS00084

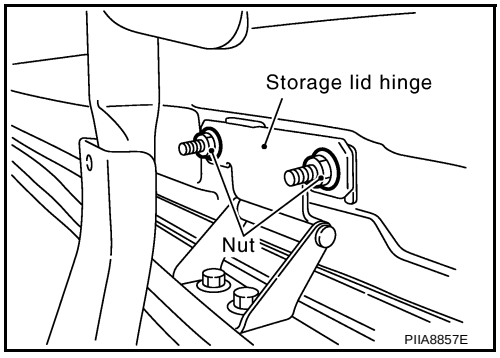
ADJUSTMENT IN FULLY CLOSED POSITION



	Clearance (mm)	Evenness (mm)
A - A	4.0 - 7.5	–1.0 - 1.0
B - B	2.7 - 6.7	–1.5 - 1.5
C - C	3.0 - 7.0	–

A-A Clearance Adjustment

Loosen nuts of storage lid hinge. Adjust storage lid until the clearance is within the specification.

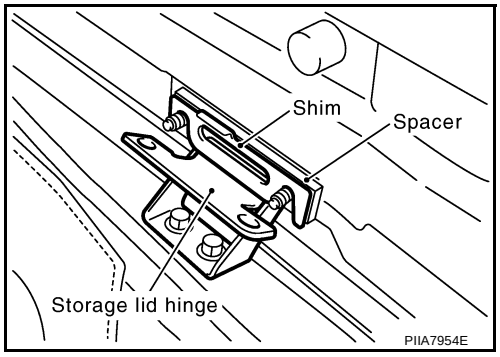


B-B Clearance Adjustment

Loosen nut of storage lid striker lock, and adjust it until the clearance is within the specification.

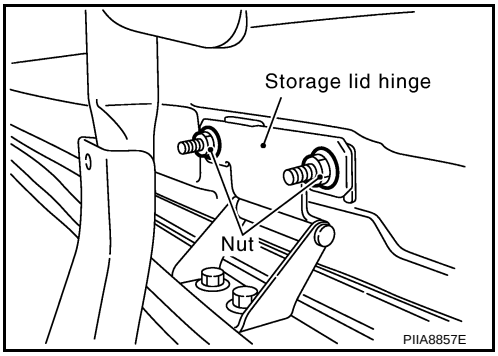
C-C Clearance Adjustment, A-A Evenness Adjustment

Loosen nuts of storage lid hinge. Adjust storage lid height by exchanging or adding shim until the evenness is within the specification.



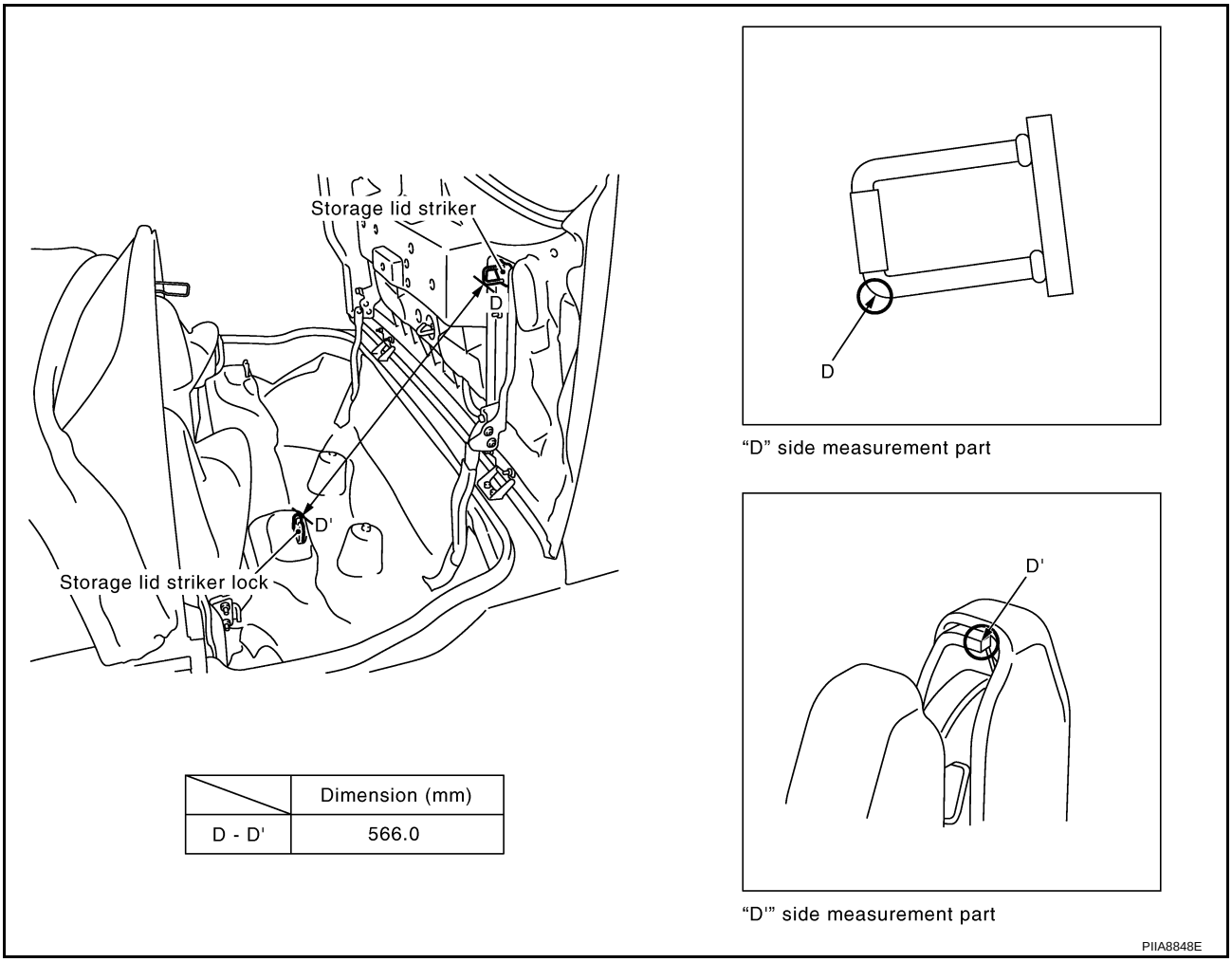
B-B Evenness Adjustment

Loosen nuts of storage lid hinge. Adjust the lid until the evenness is within the specification.



ADJUSTMENT IN FULLY OPENED POSITION

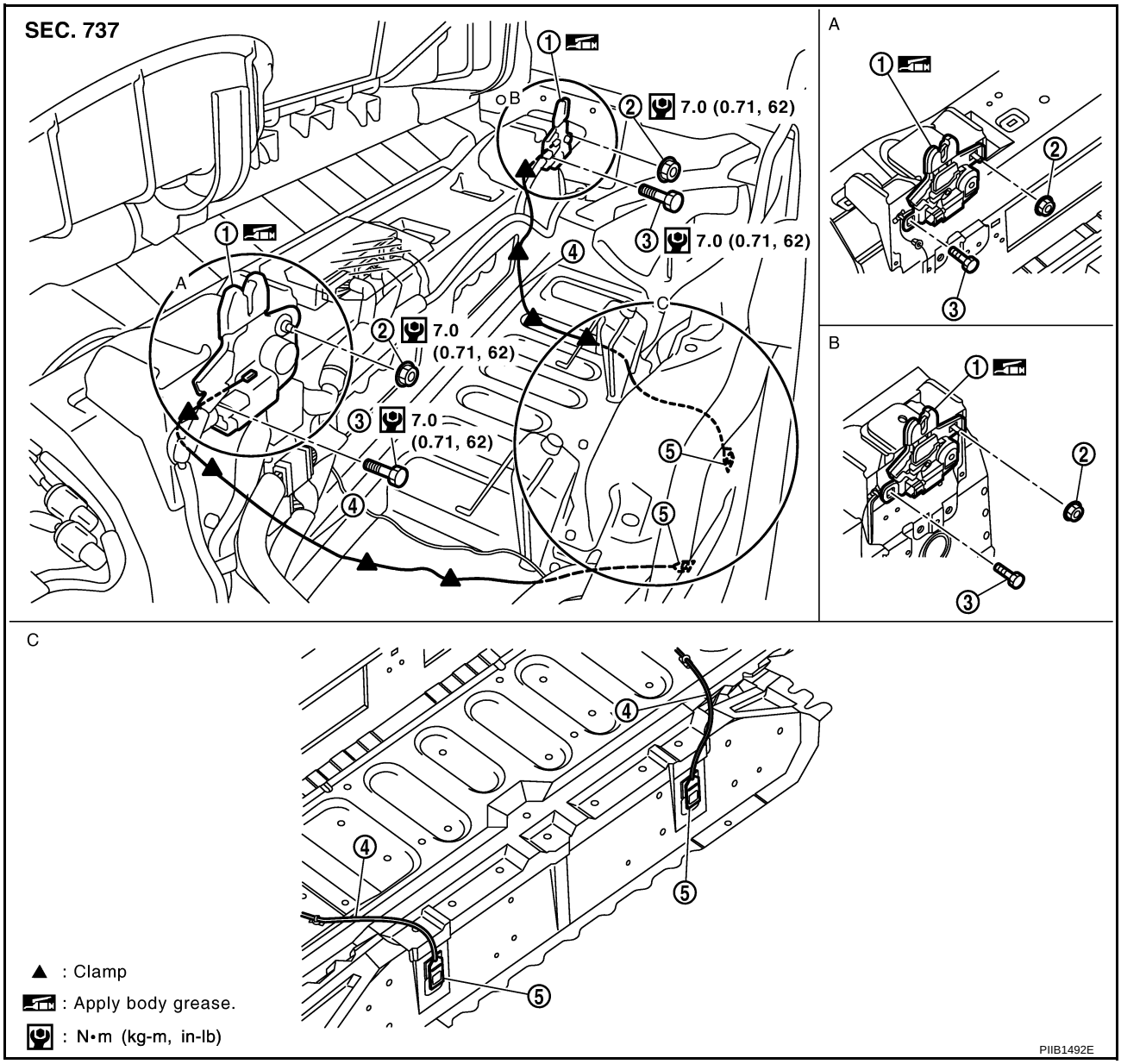
Adjust linkage position of storage lid striker and storage lid striker lock to specified dimension, by loosening nuts fixing storage lid bracket, upper and lower.



	Dimension (mm)
D - D'	566.0

Removal and Installation of Storage Lid Striker Lock & Storage Lid Emergency Opener Cable

NIS00085



1. Storage lid striker lock assembly
2. Nut
3. Bolt
4. Storage lid emergency opener cable
5. Storage lid emergency opener hook

REMOVAL

1. Remove storage room finisher. Refer to RF-126, "Removal and Installation of Storage Room Finisher" .
2. Remove trunk front finisher. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
3. Disconnect each clamp of storage lid emergency opener cable.
4. Disconnect each harness connector of storage lid lock assembly.
5. Remove storage lid lock mounting bolts, and then remove storage lid lock assembly.

INSTALLATION

Install in the reverse order of removal.

SECTION RFD
REAR FINAL DRIVE

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PRECAUTIONS

PFP:00001

Service Notice or Precautions

NDS00009

- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts when applied.
- Overhaul should be done in a clean work area, it is preferable to work in dustproof area.
- Before disassembly, using steam or white gasoline, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with a new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time when the unit is disassembled.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Clean and flush the parts sufficiently and blow-dry them.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mounting surface; then remove any moisture, oil, and foreign materials from the application and mounting surfaces.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or shop rags to prevent entering of lint.
- During assembly, observe the specified tightening torque, and apply new gear oil, petroleum jelly, or multi-purpose grease as specified for each vehicle, if necessary.

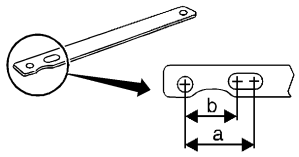
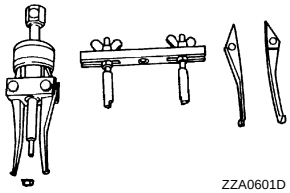
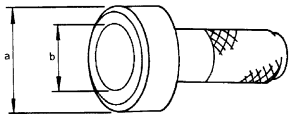
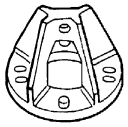
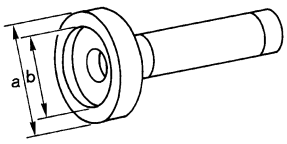
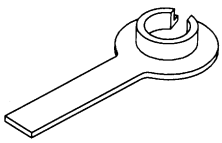
PREPARATION

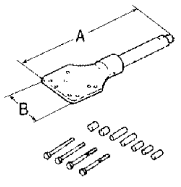
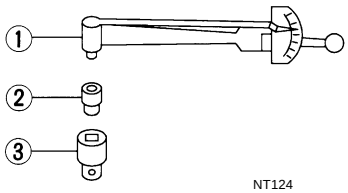
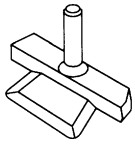
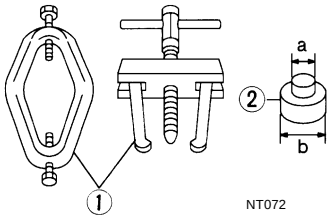
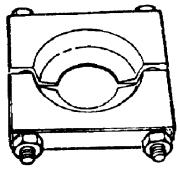
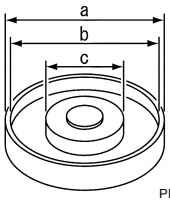
PFP:00002

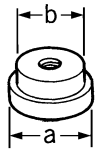
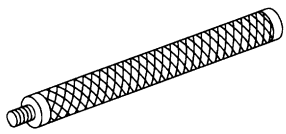
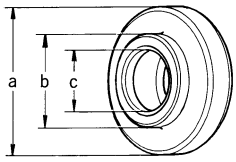
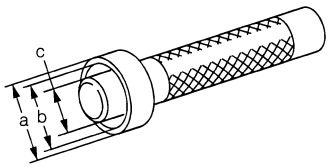
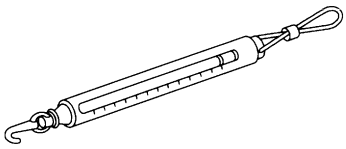
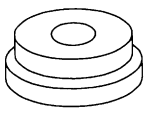
Special Service Tools

NDS0000A

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

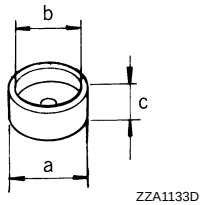
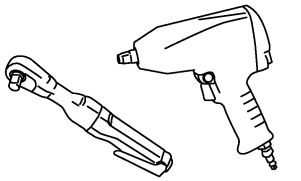
Tool number (Kent-Moore No.) Tool name		Description
KV40104000 (—) Flange wrench a: 85 mm (3.35 in) dia. b: 65 mm (2.56 in) dia.	 NT659	Removing and installing drive pinion lock nut
KV381054S0 (J-34286) Puller	 ZZA0601D	Removing front oil seal
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0811D	● Installing front oil seal ● Installing pinion rear bearing outer race
KV40104100 (—) Attachment	 ZZA0804D	Removing side flange
ST36230000 (J-25840-A) Sliding hammer	 ZZA0803D	Removing side flange
KV38100200 (J-26233) Drift a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.	 ZZA1143D	Installing side oil seal
KV38107900 (J-39352) Protector	 S-NT129	Installing side flange

Tool number (Kent-Moore No.) Tool name	Description
KV38100800 (J-25604-01) Attachment a: 541 mm (21.30 in) b: 200 mm (7.87 in)  SDIA0267E	Fixing unit assembly
ST3127S000 (J-25765-A) Preload gauge 1: GG91030000 (J-25765) Torque wrench 2: HT62940000 (—) Socket adapter (1/2″) 3: HT62900000 (—) Socket adapter (3/8″)  NT124	Measuring pinion bearing preload and total preload
KV10111100 (J-37228) Seal cutter  S-NT046	Removing rear cover
ST3306S001 (J-22888-D) Differential side bearing puller set 1: ST33051001 (J-22888-20) Puller 2: ST33061000 (J-8107-2) Base a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.  NT072	Removing and installing side bearing inner race
ST30031000 (J-22912-01) Replacer  ZZA0700D	Removing pinion rear bearing inner race
KV40105230 (—) Drift a: 92 mm (3.62 in) dia. b: 86 mm (3.39 in) dia. c: 45 mm (1.77 in) dia.  PDIA0591E	Installing pinion rear bearing outer race

Tool number (Kent-Moore No.) Tool name	Description
ST30613000 (J-25742-3) Drift a: 72 mm (2.83 in) dia. b: 48 mm (1.89 in) dia.  ZZA1000D	Installing pinion front bearing outer race
ST30611000 (J-25742-1) Drift bar  S-NT090	Installing pinion front bearing outer race (Use with ST30613000)
ST30901000 (J-26010-01) Drift a: 79 mm (3.11 in) dia. b: 45 mm (1.77 in) dia. c: 35.2 mm (1.386 in) dia.  ZZA0978D	Installing pinion rear bearing inner race
KV38100300 (J-25523) Drift a: 54 mm (2.13 in) dia. b: 46 mm (1.81 in) dia. c: 32 mm (1.26 in) dia.  ZZA1046D	Installing side bearing inner race
(J-8129) Spring gauge  NT127	Measuring turning torque
(J-34309) Differential shim selector tool  NT134	Adjusting bearing preload and pinion gear height
(J-25269-4) Side bearing disc (2 Req'd)  NT136	Selecting pinion height adjusting washer

Commercial Service Tools

NDS0000B

Tool name	Description
Spacer a: 60 mm (2.36 in) dia. b: 36 mm (1.42 in) dia. c: 30 mm (1.18 in)  ZZA1133D	Installing pinion front bearing inner race
Power tool  PBIC0190E	Loosening nuts and bolts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NDS0000C

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		Refer to RFD-28 (R200 2-pinion), RFD-48 (R200V LSD).	Refer to RFD-21 (R200 2-pinion), RFD-41 (R200V LSD).	Refer to RFD-28 (R200 2-pinion), RFD-48 (R200V LSD).	Refer to RFD-22 (R200 2-pinion), RFD-42 (R200V LSD).	Refer to RFD-23 (R200 2-pinion), RFD-43 (R200V LSD).	Refer to RFD-9 .	NVH in PR section	NVH in FAX, RAX, FSU and RSU sections	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in BR section	NVH in PS section
Possible cause and SUSPECTED PARTS		Gear tooth rough	Gear contact improper	Tooth surfaces worn	Backlash incorrect	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×

×: Applicable

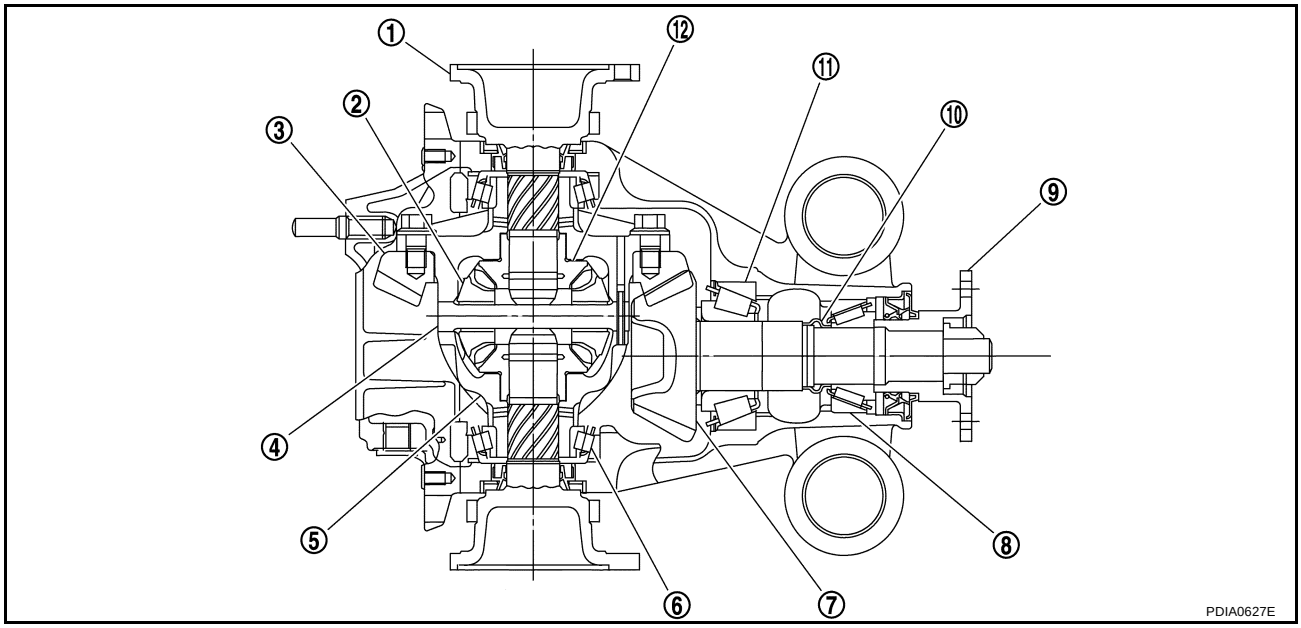
DESCRIPTION

PFP:00000

Cross-Sectional View

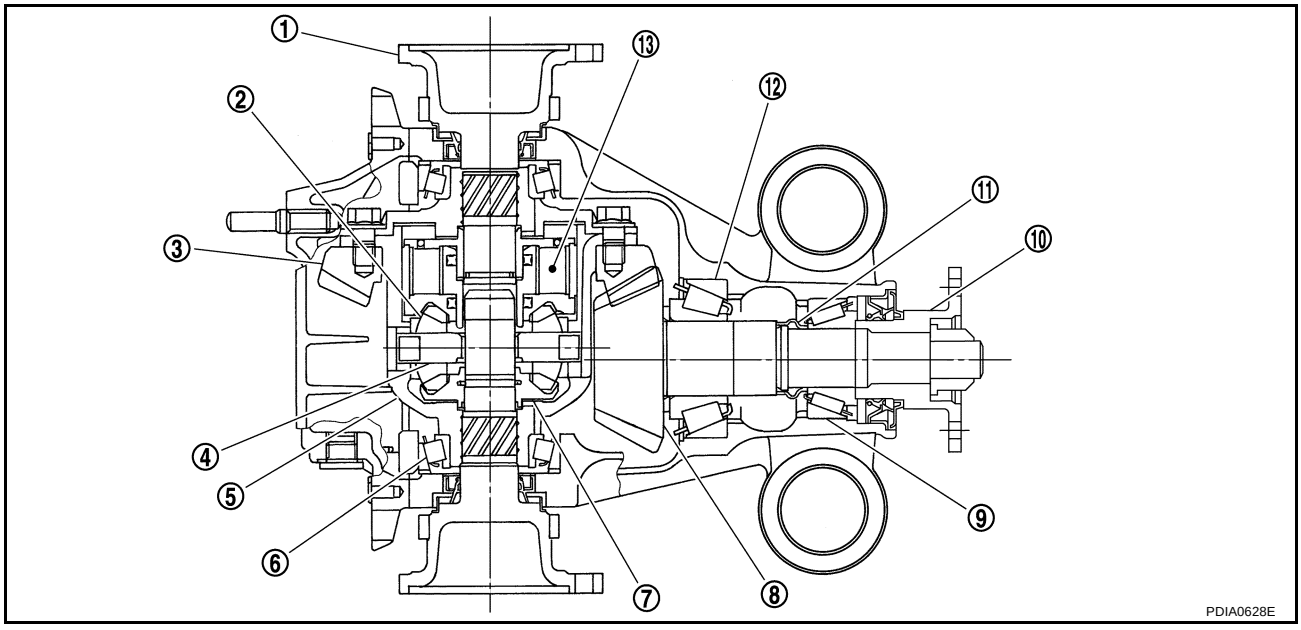
NDS0000D

R200 (2-pinion)



1. Side flange
2. Pinion mate gear
3. Drive gear
4. Pinion mate shaft
5. Differential case
6. Side bearing
7. Drive pinion
8. Pinion front bearing
9. Companion flange
10. Collapsible spacer
11. Pinion rear bearing
12. Side gear

R200V (LSD)



1. Side flange
2. Pinion mate gear
3. Drive gear
4. Pinion mate shaft
5. Differential case
6. Side bearing
7. Side gear
8. Drive pinion
9. Pinion front bearing
10. Companion flange
11. Collapsible spacer
12. Pinion rear bearing
13. Viscous coupling

DIFFERENTIAL GEAR OIL

PFP:KLD30

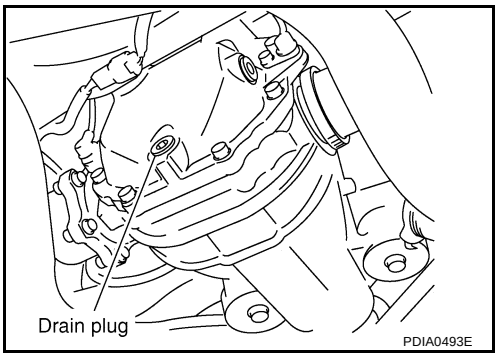
Changing Differential Gear Oil

NDS0000E

DRAINING

1. Stop engine.
2. Remove drain plug and drain gear oil.
3. Set a gasket on drain plug and install it to final drive assembly and tighten to the specified torque. Refer to RFD-19, "COMPONENTS" (R200 2-pinion) or RFD-39, "COMPONENTS" (R200V LSD).

   CAUTION:
   Do not reuse gasket.



FILLING

1. Remove filler plug. Fill with new gear oil until oil level reaches the specified level near filler plug mounting hole.

   Oil grade and Viscosity:

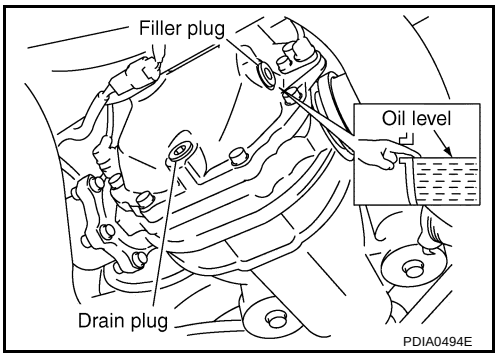
   Refer to MA-11, "Fluids and Lubricants" .

   Oil capacity:

   Approx. 1.4 ℓ (3 US pt, 2-1/2 Imp pt)

2. After refilling oil, check oil level. Set a gasket to filler plug, then install it to final drive assembly. Refer to RFD-19, "COMPONENTS" (R200 2-pinion) or RFD-39, "COMPONENTS" (R200V LSD).

   CAUTION:
   Do not reuse gasket.



Checking Differential Gear Oil

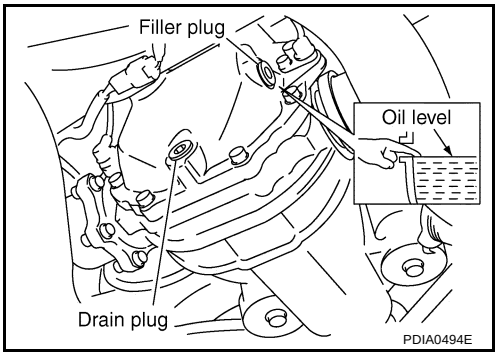
NDS0000F

OIL LEAKAGE AND OIL LEVEL

- Make sure that oil is not leaking from final drive assembly or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

  CAUTION:
  Do not start engine while checking oil level.
- Set a gasket on filler plug and install it on final drive assembly. Refer to RFD-19, "COMPONENTS" (R200 2-pinion) or RFD-39, "COMPONENTS" (R200V LSD).

  CAUTION:
  Do not reuse gasket.



FRONT OIL SEAL

PFP:38189

Removal and Installation

NDS0000G

CAUTION:

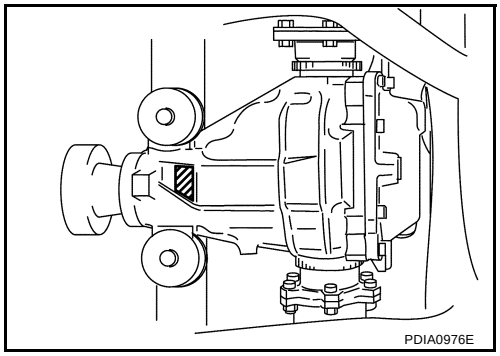
Verify identification stamp of replacement frequency put in the lower part of gear carrier to determine replacement for collapsible spacer when replacing front oil seal. Refer to RFD-10, "IDENTIFICATION STAMP OF REPLACEMENT FREQUENCY OF FRONT OIL SEAL" . If necessary collapsible spacer replacement, remove final drive assembly and disassemble it to replace front oil seal and collapsible spacer. Refer to RFD-17, "Removal and Installation" , RFD-19, "Disassembly and Assembly (R200 2-pinion)" and/or RFD-39, "Disassembly and Assembly (R200V LSD)" .

NOTE:

The reuse of collapsible spacer is prohibited in principle. However, it is reusable on a one-time basis only in cases when replacing front oil seal.

IDENTIFICATION STAMP OF REPLACEMENT FREQUENCY OF FRONT OIL SEAL

- The diagonally shaded area in the figure shows stamping point for replacement frequency of front oil seal.
- The following table shows if collapsible spacer replacement is needed before replacing front oil seal.
  When collapsible spacer replacement is required, disassemble final drive assembly to replace collapsible spacer and front oil seal. Refer to RFD-19, "Disassembly and Assembly (R200 2-pinion)" or RFD-39, "Disassembly and Assembly (R200V LSD)" .



Stamp	collapsible spacer replacement
No stamp	Not required
“0” or “0” on the far right of stamp	Required
“01” or “1” on the far right of stamp	Not required

CAUTION:

Be sure to make a stamping after replacing front oil seal.

- After replacing front oil seal, make a stamping on the stamping point in accordance with the table below in order to identify replacement frequency.

CAUTION:

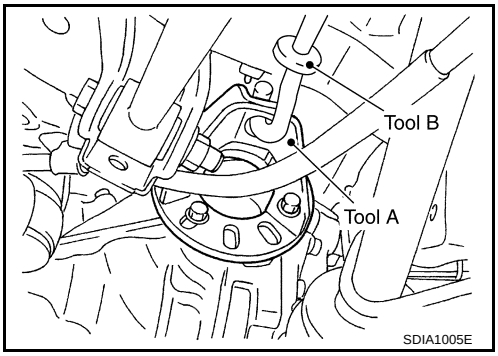
Stamping shall be made from left to right.

Stamp before stamping	Stamping on the far right	Stamping
No stamp	0	0
“0” (Front oil seal was replaced once.)	1	01
“01” (Collapsible spacer and front oil seal were replaced last time.)	0	010
“0” is on the far right. (Only front oil seal was replaced last time.)	1	...01
“1” is on the far right. (Collapsible spacer and front oil seal were replaced last time.)	0	...010

REMOVAL

1. Drain gear oil. Refer to RFD-9, "DRAINING" .
2. Make a judgment if a collapsible spacer replacement is required. Refer to RFD-10, "IDENTIFICATION STAMP OF REPLACEMENT FREQUENCY OF FRONT OIL SEAL" .
3. Remove rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).
4. Remove drive shaft from final drive. Then suspend it by wire etc. Refer to RAX-10, "Removal and Installation" .
5. Install attachment to side flange, and then pull out the side flange with the sliding hammer.

   Tool number **A: KV40104100 (—)**
   B: ST36230000 (J-25840-A)



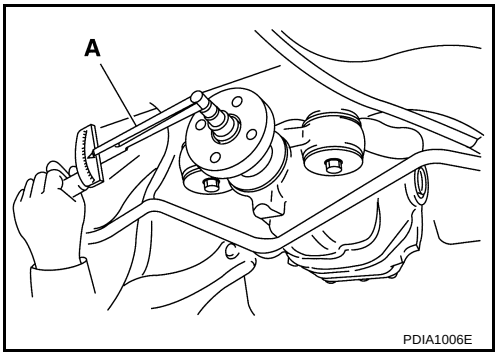
NOTE:

Model	Circular clip installation position	
	Right side	Left side
R200 (2-pinion)	Final drive side	
R200V (LSD)	Final drive side	Side flange side

6. Remove propeller shaft. Refer to PR-6, "Removal and Installation" .
7. Measure the total preload with the preload gauge.

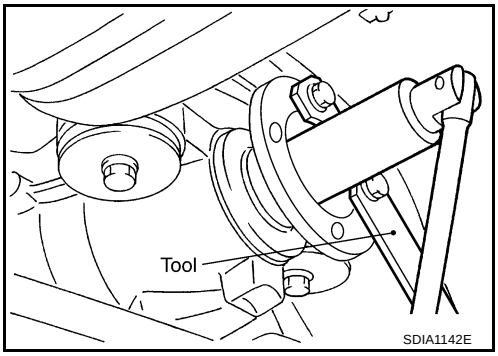
   Tool number **A: ST3127S000 (J-25765-A)**

   NOTE:
   Record the preload measurement.



8. Remove drive pinion lock nut using the flange wrench.

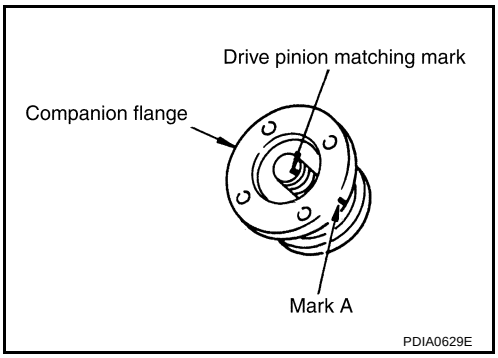
   Tool number **: KV40104000 (—)**



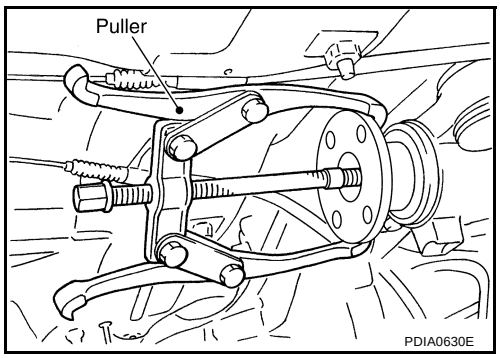
9. Put matching mark on the end of the drive pinion. The matching mark should be in line with the matching mark A on companion flange.

   CAUTION:
   For matching mark, use paint. Do not damage drive pinion.

   NOTE:
   The matching mark A on the final drive companion flange indicates the maximum vertical runout position.

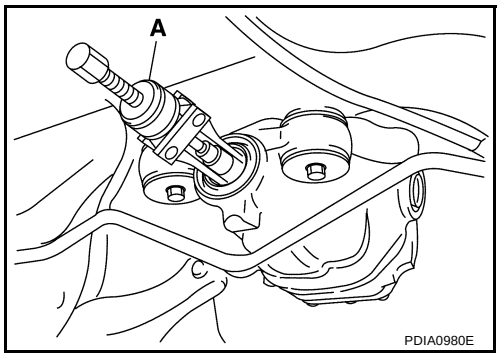


10. Remove companion flange using a puller.



11. Remove front oil seal using the puller.

Tool number A: KV381054S0 (J-34286)



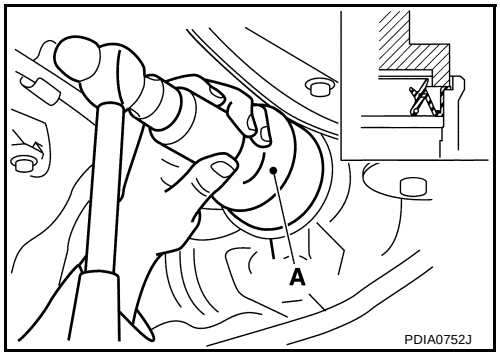
INSTALLATION

1. Apply multi-purpose grease to front oil seal lips.
2. Install front oil seal using the drift as shown in the figure.

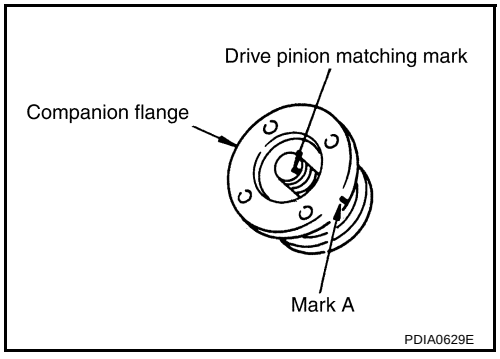
Tool number A: ST30720000 (J-25405)

CAUTION:

- **Do not reuse oil seal.**
- **Do not incline oil seal when installing.**



3. Align the matching mark of drive pinion with the matching mark of companion flange, and then install the companion flange.



4. Apply anti-corrosion oil to the thread and seat of new drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.

CAUTION:
Do not reuse drive pinion lock nut.

5. Tighten to drive pinion lock nut, while adjust total preload torque.

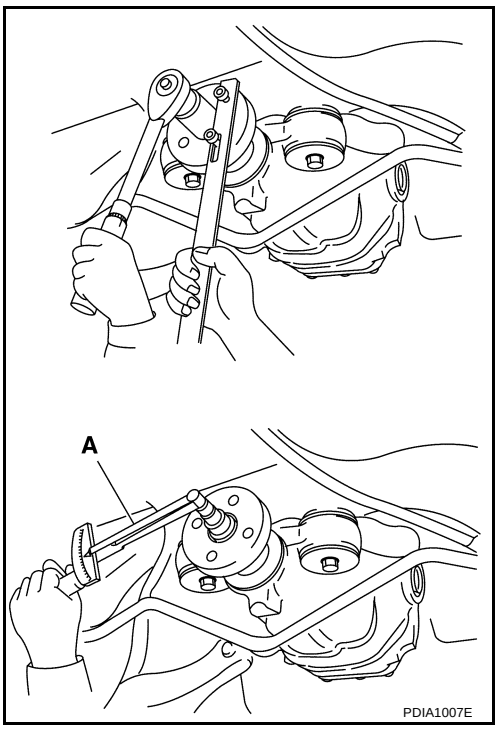
Tool number A: ST3127S000 (J-25765-A)

Drive pinion lock nut tightening torque:

147 – 323 N·m (15 – 32 kg-m, 109 – 238 ft-lb)

Total preload torque:

Total preload torque should equal the measurement taken during removal plus an additional 0.1 – 0.4 N·m (0.01 – 0.04 kg-m, 1 – 3 in-lb).



CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the preload torque.**

6. Make a stamping for identification of front oil seal replacement frequency. Refer to RFD-10, "IDENTIFICATION STAMP OF REPLACEMENT FREQUENCY OF FRONT OIL SEAL" .

CAUTION:
Be sure to make a stamping after replacing front oil seal.

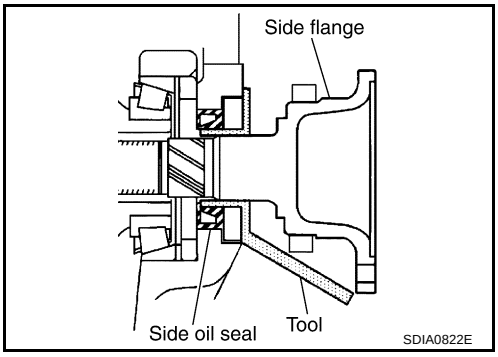
7. Install propeller shaft. Refer to PR-6, "Removal and Installation" .
8. Install side flange with the following procedure.

NOTE:
Install the RH side flange, then install the LH side flange. If LH side flange is installed first, the RH side flange comes out sometimes from the shock of installing the RH side flange. [For R200V (with LSD)]

a. Attach the protector to side oil seal.

Tool number : KV38107900 (J-39352)

b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.



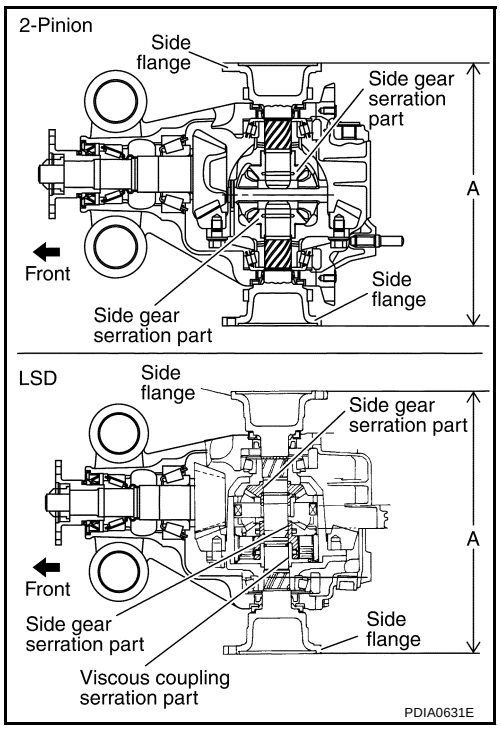
c. Put a suitable drift on the center of side flange, then drive it until sound changes.

NOTE:
When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

d. Confirm that the dimension of the side flange installation (Measurement A) in the figure comes into the following.

Measurement A: 326 – 328 mm (12.83 – 12.91 in)

9. Install drive shaft. Refer to RAX-10, "Removal and Installation" .
10. Install rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).
11. Refill gear oil to the final drive and check oil level. Refer to RFD-9, "FILLING" .
12. Check the final drive for oil leakage. Refer to RFD-9, "OIL LEAKAGE AND OIL LEVEL" .



SIDE OIL SEAL

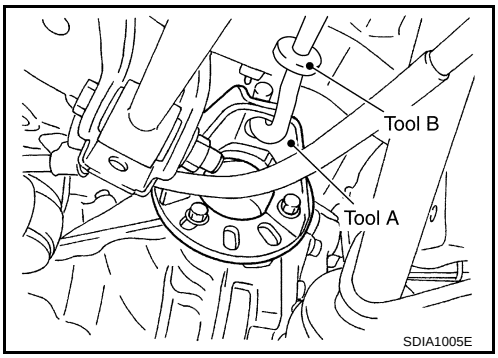
PFP:33142

Removal and Installation

NDS0000H

REMOVAL

1. Remove rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).
2. Remove drive shaft from final drive. Then suspend it by wire etc. Refer to RAX-10, "Removal and Installation" .
3. Install attachment to side flange, and then pull out the side flange with the sliding hammer.

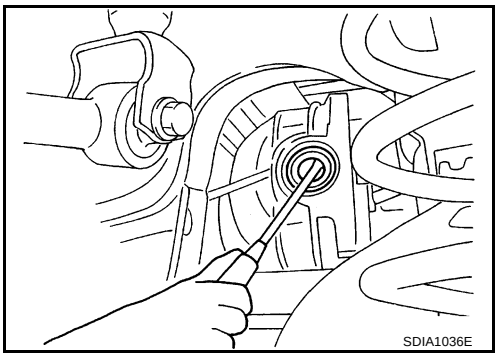


Tool number **A: KV40104100 (—)**
B: ST36230000 (J-25840-A)

NOTE:

Model	Circular clip installation position	
	Right side	Left side
R200 (2-pinion)	Final drive side	
R200V (LSD)	Final drive side	Side flange side

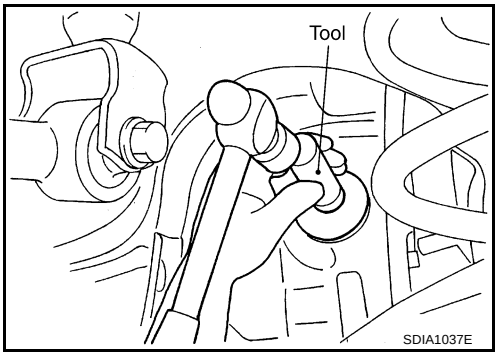
4. Remove side oil seal, using a flat-bladed screwdriver.



CAUTION:
Be careful not to damage gear carrier.

INSTALLATION

1. Apply multi-purpose grease to side oil seal lips.
2. Install side oil seal until it becomes flush with the case end, using the drift.



Tool number **: KV38100200 (J-26233)**

CAUTION:
- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**

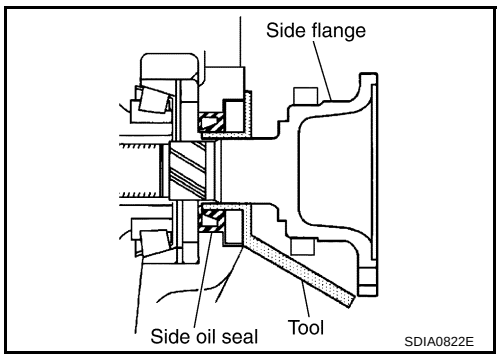
3. Install side flange with the following procedure.

NOTE:
Install the RH side flange, then install the LH side flange. If LH side flange is installed first, the RH side flange comes out sometimes from the shock of installing the RH side flange. [For R200V (with LSD)]

a. Attach the protector to side oil seal.

Tool number : KV38107900 (J-39352)

b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.

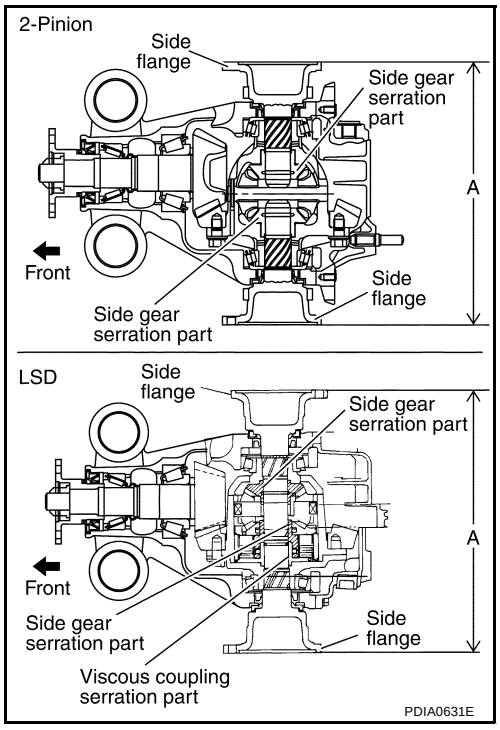


c. Put a suitable drift on the center of side flange, then drive it until sound changes.

NOTE:
When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

d. Confirm that the dimension of the side flange installation (Measurement A) in the figure comes into the following.

Measurement A: 326 - 328 mm (12.83 - 12.91 in)



4. Install drive shaft. Refer to RAX-10, "Removal and Installation" .
5. Install rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).

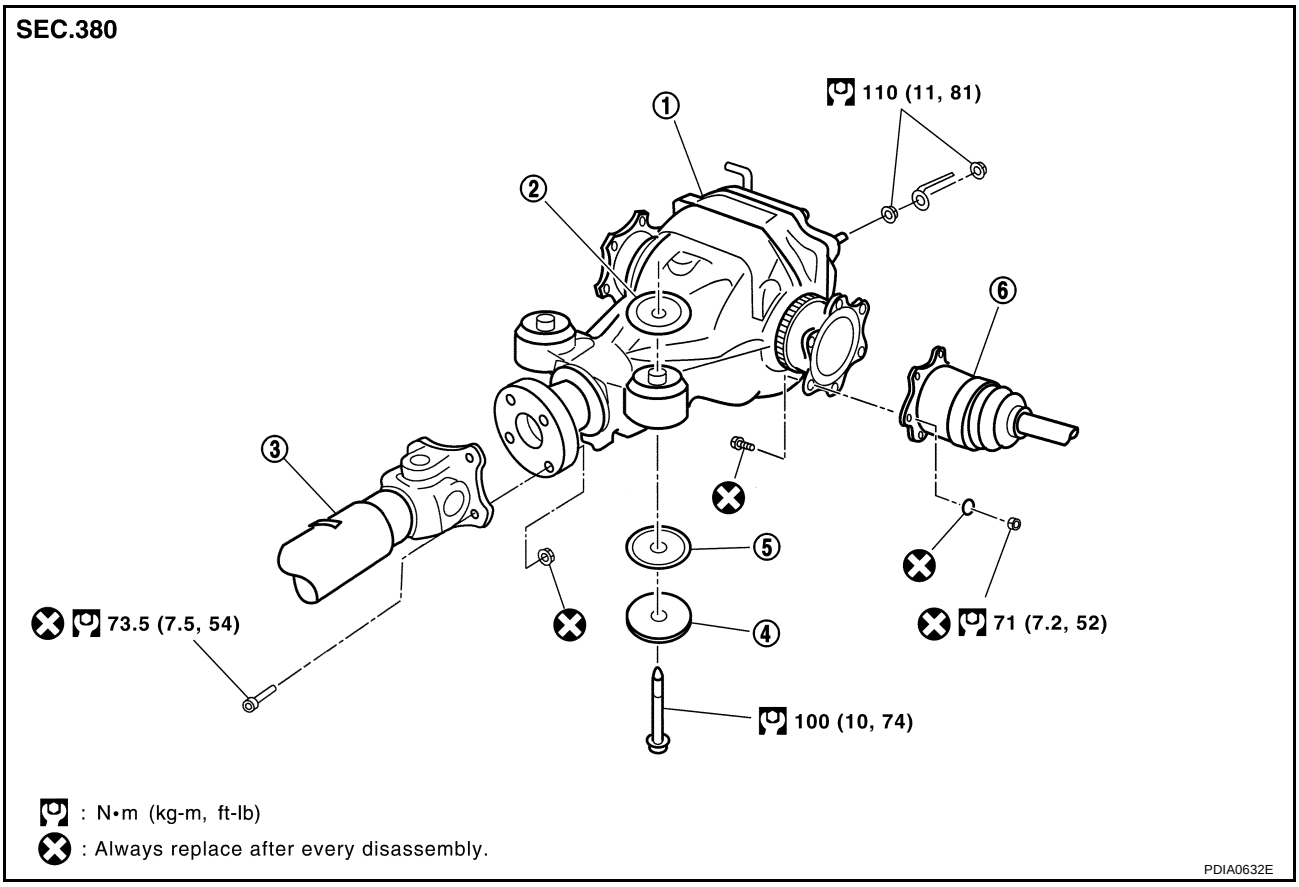
REAR FINAL DRIVE ASSEMBLY

PFP:38300

Removal and Installation

NDS0000I

COMPONENTS

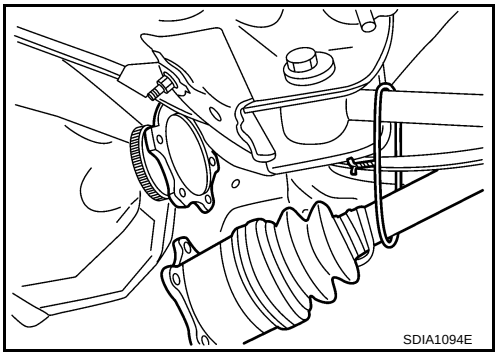


1. Rear final drive assembly
2. Upper stopper
3. Propeller shaft
4. Washer
5. Lower stopper
6. Drive shaft

REMOVAL

1. Remove propeller shaft from the final drive. Refer to PR-6, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
2. Remove rear stabilizer bar with a power tool. Refer to FSU-18, "STABILIZER BAR" .
3. Remove drive shaft from final drive. Then suspend it by wire etc. Refer to RAX-10, "REAR DRIVE SHAFT" .
4. Remove breather hose from the final drive.
5. Remove rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).

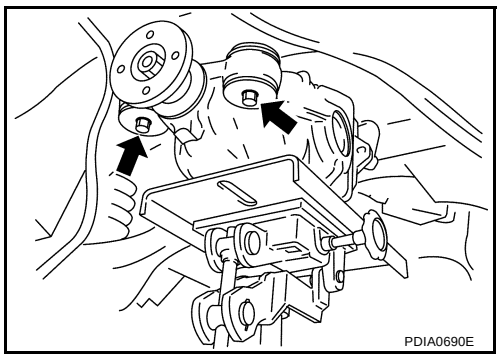


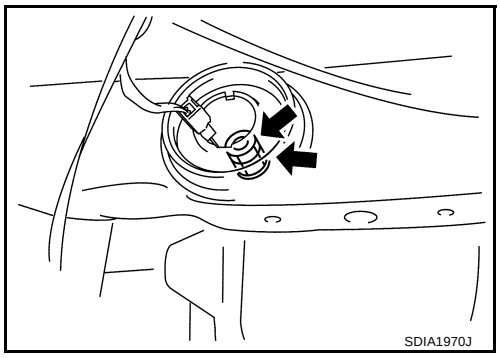
6. Set a suitable jack to rear final drive assembly.

CAUTION:
Do not place a suitable jack on the rear cover (aluminum case).

7. Remove the mounting bolts and nuts connecting to the suspension member, and remove rear final drive assembly.

CAUTION:
Secure rear final drive assembly to a suitable jack while removing it.





INSTALLATION

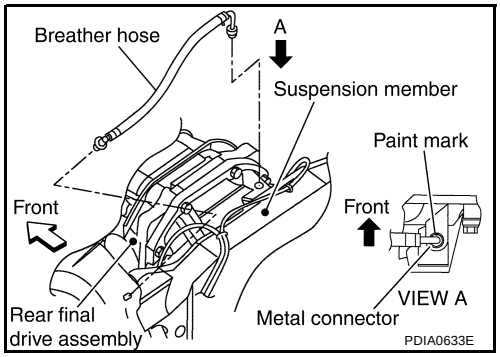
Note the following, and installation is in the reverse order of removal.

- Refer to RFD-19, "COMPONENTS" (R200 2-pinion) or RFD-39, "COMPONENTS" (R200V LSD) about each tightening torque.
- When installing breather hoses, refer to the figure.

CAUTION:
Make sure there are no pinched or restricted areas on the breather hose caused by bending or winding when installing it.

- For installation, the vehicle side end shall be inserted to suspension member. Install metal connector side of this hose to rear cover by inserting it with aiming painted marking to the front of vehicle.

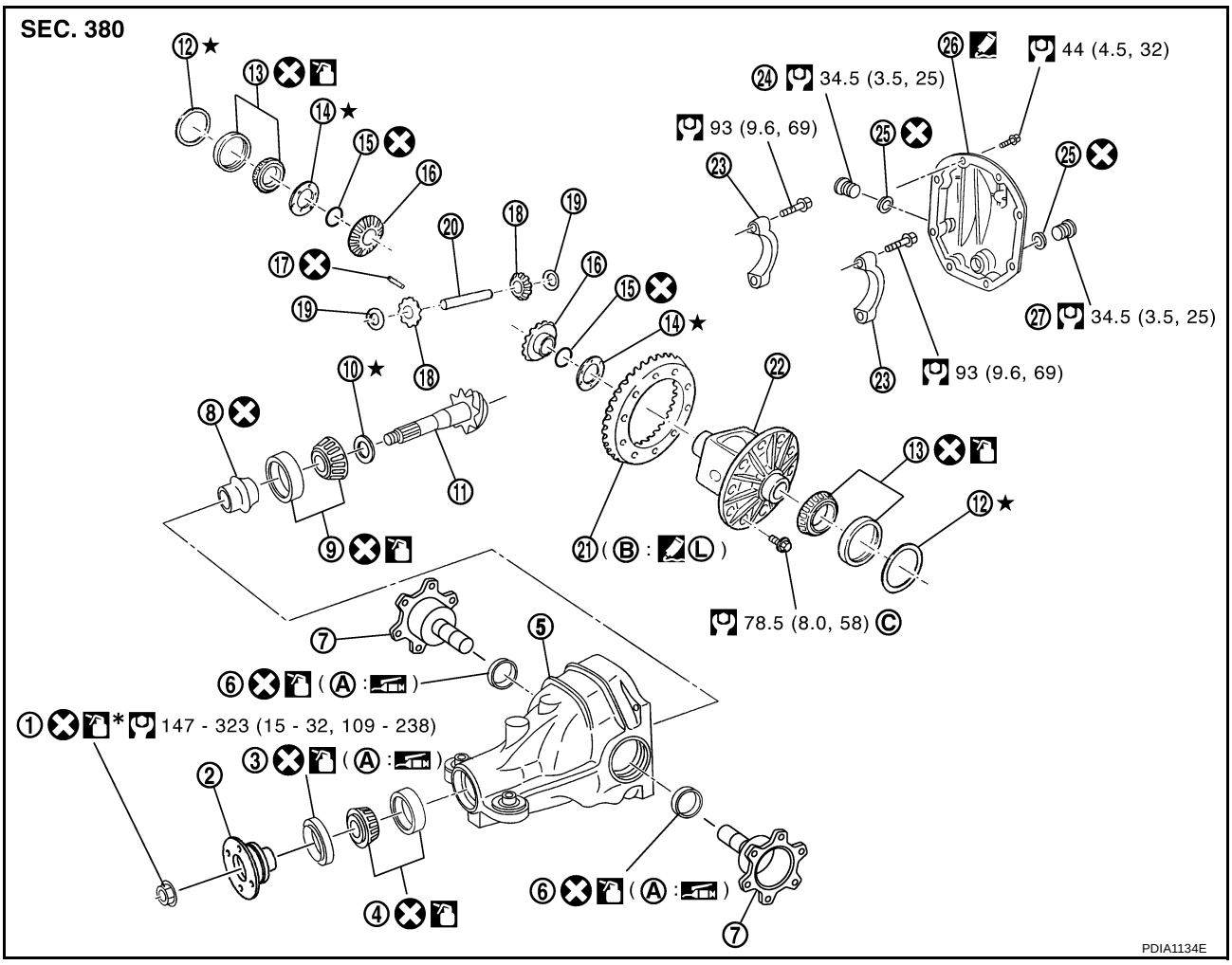
- When oil leaks while removing final drive assembly, check oil level after the installation. Refer to RFD-9, "Checking Differential Gear Oil" .



Disassembly and Assembly (R200 2-pinion)

NDS0000J

COMPONENTS



1.	Drive pinion lock nut	2.	Companion flange	3.	Front oil seal
4.	Pinion front bearing	5.	Gear carrier	6.	Side oil seal
7.	Side flange	8.	Collapsible spacer	9.	Pinion rear bearing
10.	Pinion height adjusting washer	11.	Drive pinion	12.	Side bearing adjusting washer
13.	Side bearing	14.	Side gear thrust washer	15.	Circular clip
16.	Side gear	17.	Lock pin	18.	Pinion mate gear
19.	Pinion mate thrust washer	20.	Pinion mate shaft	21.	Drive gear
22.	Differential case	23.	Bearing cap	24.	Filler plug
25.	Gasket	26.	Rear cover	27.	Drain plug

A: Oil seal lip

B: Screw hole

C: After tightening the bolts to the specified torque, tighten the bolts additionally by turning the bolts 31 to 36 degrees.

Refer to GI-11, "Components" and the followings for the symbols in the figure.

: Apply gear oil.

: Apply anti-corrosion oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

ASSEMBLY INSPECTION AND ADJUSTMENT

- Before inspection and adjustment, drain gear oil.

Total Preload Torque

1. Secure final drive assembly onto an attachment.

Tool number : KV38100800 (J-25604-01)

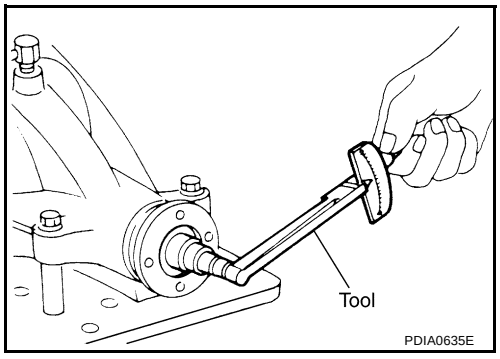
2. Remove side flanges.
3. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
4. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
5. Measure total preload with the preload gauge.

Tool number : ST3127S000 (J-25765-A)

Total preload torque:

2.85 – 3.75 N·m (0.29 – 0.38 kg-m, 26 – 33 in-lb)

NOTE:
Total preload torque = Pinion bearing preload torque + Side bearing preload torque



- If measured value is out of the specification, disassemble it to check and adjust each part. Adjust the pinion bearing preload and side bearing preload. Adjust the pinion bearing preload first, then adjust the side bearing preload.

When the preload torque is large

On pinion bearings: **Replace the collapsible spacer.**

On side bearings: **Use thinner side bearing adjusting washers by the same amount to each side. Refer to RFD-60, "Side Bearing Adjusting Washer" .**

When the preload is small

On pinion bearings: **Tighten the drive pinion lock nut.**

On side bearings: **Use thicker side bearing adjusting washers by the same amount to each side. Refer to RFD-60, "Side Bearing Adjusting Washer" .**

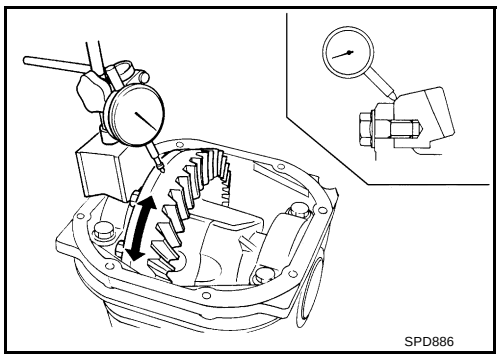
Drive Gear Runout

1. Remove rear cover. Refer to RFD-24, "Differential Assembly" .
2. Fit a dial indicator to the drive gear back face.
3. Rotate the drive gear to measure runout.

Runout limit: 0.05 mm (0.0020 in) or less

- If the runout is outside of the repair limit, check drive gear assembly condition; foreign material may be caught between drive gear and differential case, or differential case or drive gear may be deformed, etc.

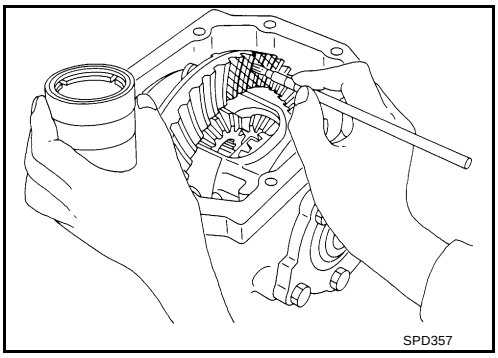
CAUTION:
Replace drive gear and drive pinion gear as a set.



Tooth Contact

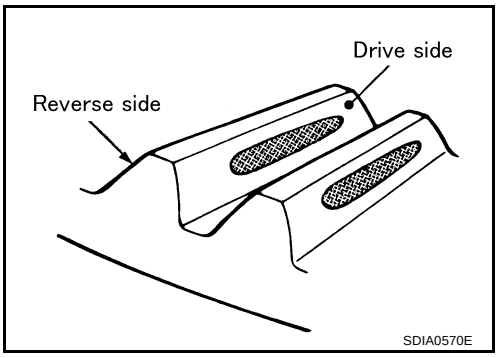
1. Remove rear cover. Refer to RFD-24, "Differential Assembly" .
2. Apply red lead to drive gear.

CAUTION:
Apply red lead to both the faces of 3 to 4 gears at 4 locations evenly spaced on drive gear.



3. Rotate drive gear back and forth several times, check drive pinion gear to drive gear tooth contact.

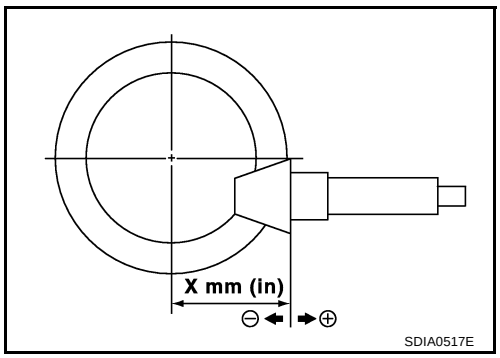
CAUTION:
Check tooth contact on drive side and reverse side.



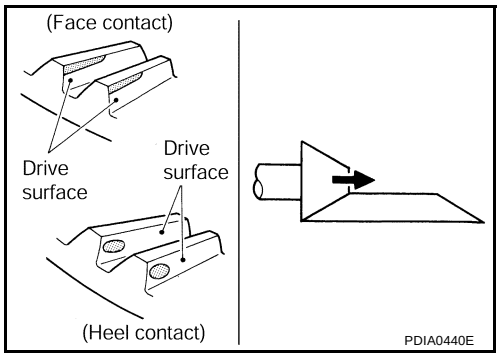
Tooth contact condition		Pinion height adjusting washer selection valve [mm (in)]		Adjustment (Yes/No)	Possible cause
Drive side	Back side				
Heel side Toe side	Toe side Heel side	Thicker ↑	+0.09 (+0.0035)	Yes	Occurrence of noise and scoring sound in all speed ranges.
			+0.06 (+0.0024)		Occurrence of noise when accelerating.
			+0.03 (+0.0012)	No	–
			0		
		Thinner ↓	-0.03 (-0.0012)		
			-0.06 (-0.0024)	Yes	Occurrence of noise at constant speed and decreasing speed.
			-0.09 (-0.0035)		Occurrence of noise and scoring sound in all speed ranges.

SDIA0207E

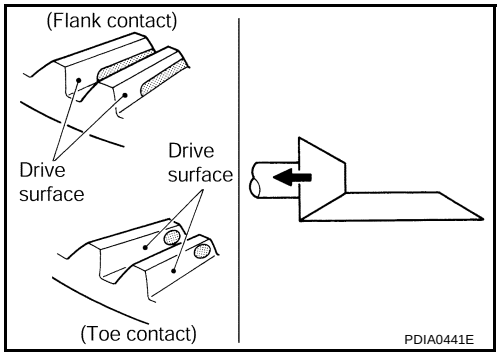
4. If tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).



- If the tooth contact is near the face (face contact), or near the heel (heel contact), thicken pinion height adjusting washers to move drive pinion closer to drive gear.
  Refer to RFD-60, "Pinion Height Adjusting Washer" .



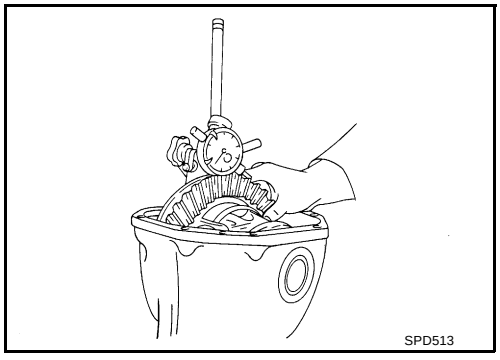
- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), thin pinion height adjusting washers to move drive pinion farther from drive gear.
  Refer to RFD-60, "Pinion Height Adjusting Washer" .



Backlash

1. Remove rear cover. Refer to RFD-24, "Differential Assembly" .
2. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash: 0.10 – 0.15 mm (0.0039 – 0.0059 in)



- If the backlash is outside of the specified value, change the thickness of side bearing adjusting washer.

When the backlash is large:

Make drive gear back side adjusting washer thicker, and drive gear tooth side adjusting washer thinner by the same amount. Refer to RFD-60, "Side Bearing Adjusting Washer" .

When the backlash is small:

Make drive gear back side adjusting washer thinner, and drive gear tooth side adjusting washer thicker by the same amount. Refer to RFD-60, "Side Bearing Adjusting Washer" .

CAUTION:

Do not change the total amount of washers as it will change the bearing preload.

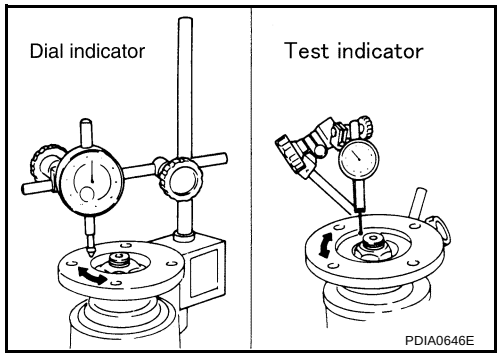
Companion Flange Runout

1. Fit a dial indicator onto the companion flange face (inner side of the propeller shaft mounting bolt holes).
2. Rotate the companion flange to check for runout.

Runout limit : 0.08 mm (0.0031 in)

3. Fit a test indicator to the inner side of the companion flange (socket diameter).
4. Rotate the companion flange to check for runout.

Runout limit : 0.08 mm (0.0031 in)



5. If the runout value is outside the repair limit, follow the procedure below to adjust.

a. Check for runout while changing the phase between companion flange and drive pinion gear by 90° step, and search for the position where the runout is the minimum.

b. If the runout value is still outside of the limit after the phase has been changed, possible cause will be an assembly malfunction of drive pinion and pinion bearing and malfunction of pinion bearing. Check for these items and repair if necessary.

c. If the runout value is still outside of the limit after the check and repair, replace companion flange.

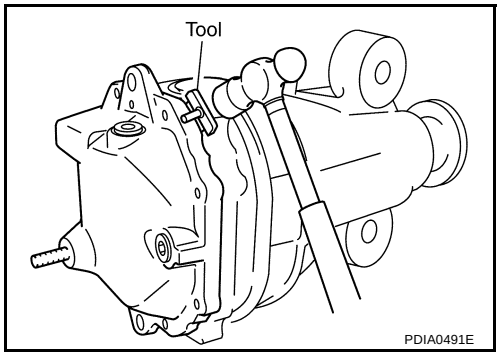
DISASSEMBLY

Differential Assembly

1. Drain gear oil, if necessary.
2. Remove side flange.
3. Remove rear cover mounting bolts.
4. Remove rear cover to insert the seal cutter between gear carrier and rear cover.

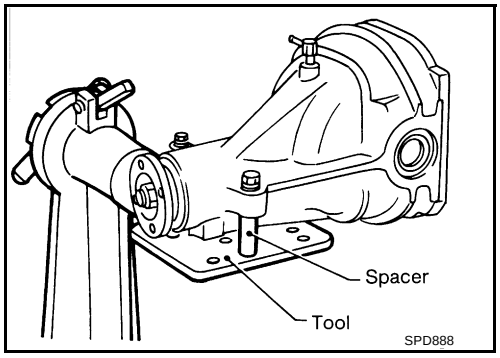
   Tool number : KV10111100 (J-37228)

   CAUTION:
   - **Be careful not to damage the mating surface.**
   - **Do not insert flat-bladed screwdriver, this way damage the mating surface.**



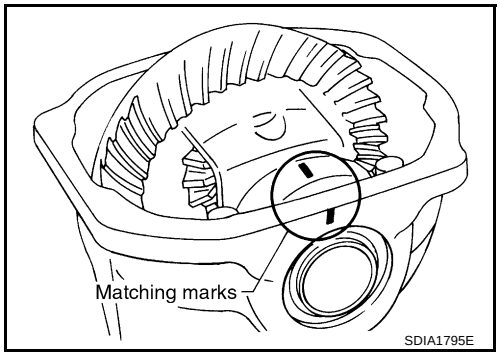
5. Using two 45 mm (1.77 in) spacers, mount carrier on the attachment.

   Tool number : KV38100800 (J-25604-01)

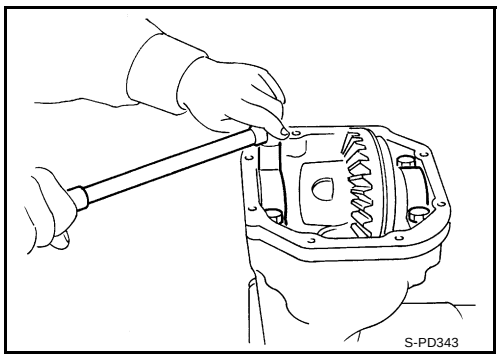


6. For proper reinstallation, paint matching marks on one side of the bearing cap.

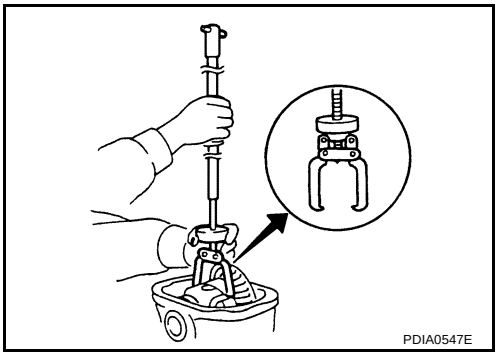
   CAUTION:
   - **For matching marks, use paint. Do not damage bearing caps and gear carrier.**
   - **Bearing caps are line-board during manufacture. The matching marks are used to reinstall them in their original positions.**



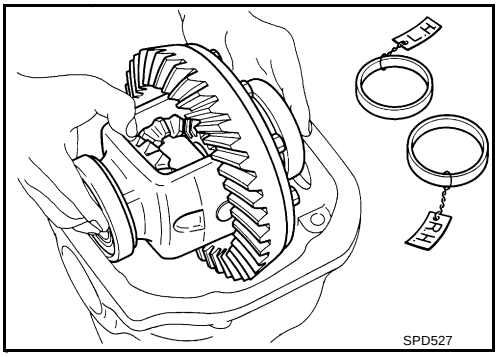
7. Remove bearing caps.



8. Lift differential case assembly out with a suitable tool.



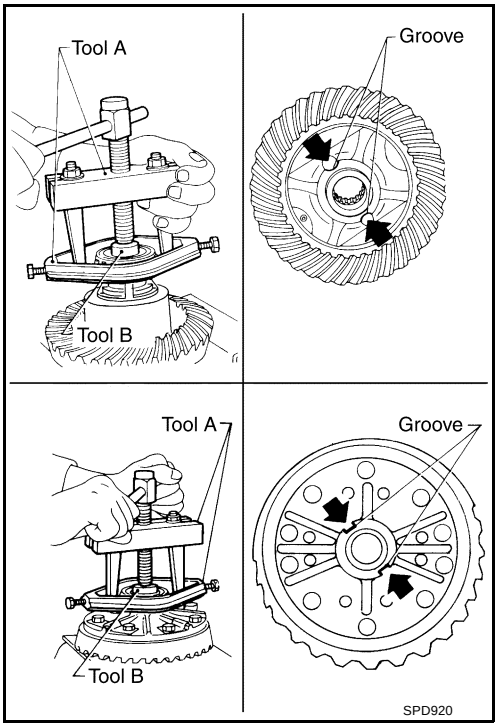
- Keep side bearing outer races together with inner race. Do not mix them up.
  Also, keep side bearing adjusting washers together with bearings.



9. Remove side bearing inner race.
   To prevent damage to bearing, engage puller jaws in groove.

   Tool number **A: ST33051001 (J-22888-20)**
   B: ST33061000 (J-8107-2)

   CAUTION:
   - **To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.**
   - **It is not necessary to remove side bearing inner race except it is replaced.**

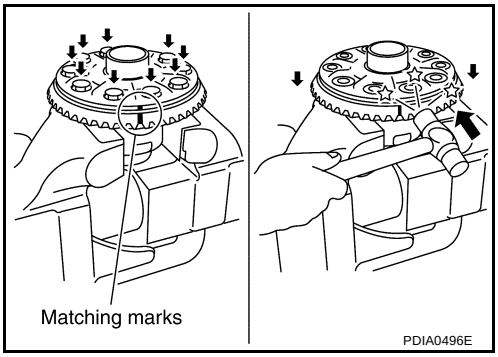


10. For proper reinstallation, paint matching marks on one differential case assembly.

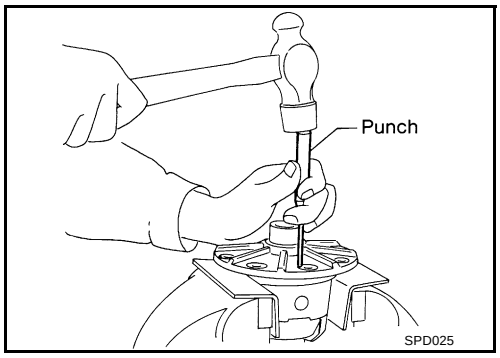
    CAUTION:
    For matching marks, use paint. Do not damage differential case and drive gear.

11. Remove drive gear mounting bolts.
12. Tap drive gear off differential case assembly with a soft hammer.

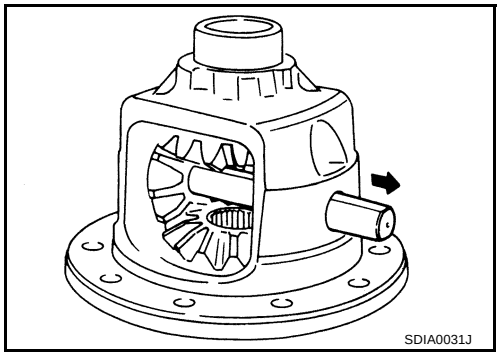
    CAUTION:
    Tap evenly all around to keep drive gear from bending.



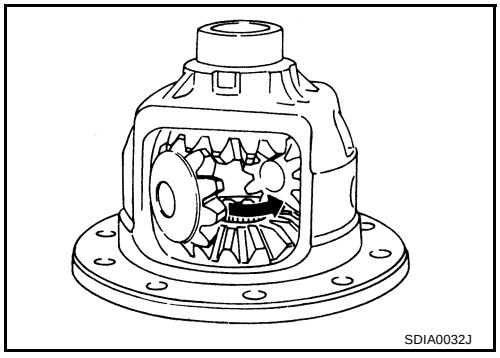
13. Remove lock pin of pinion mate shaft with a punch from drive gear side.



14. Remove pinion mate shaft.



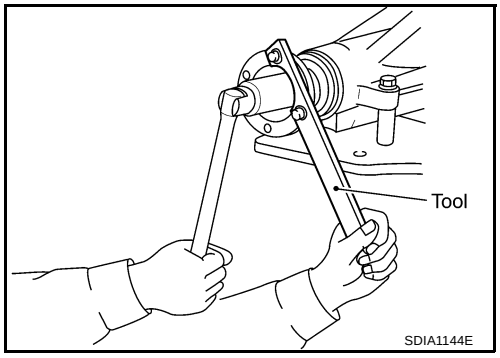
15. Turn pinion mate gear, then remove pinion mate gear, pinion mate thrust washer, side gear and side gear thrust washer from differential case.



Drive Pinion Assembly

1. Remove differential assembly. Refer to RFD-24, "Differential Assembly" .
2. Remove drive pinion lock nut with the flange wrench.

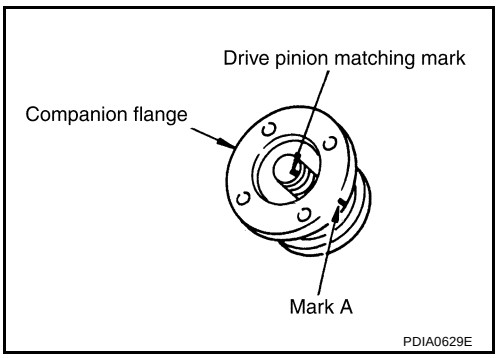
Tool number : KV40104000 (—)



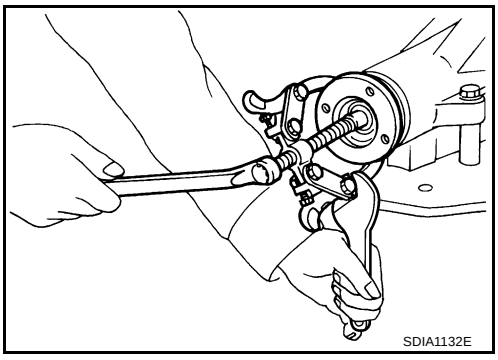
3. Put matching mark on the end of drive pinion. The matching mark should be in line with the matching mark A on companion flange.

CAUTION:
For matching mark, use paint. Do not damage companion flange and drive pinion.

NOTE:
The matching mark A on the final drive companion flange indicates the maximum vertical runout position.
When replacing companion flange, matching mark is not necessary.



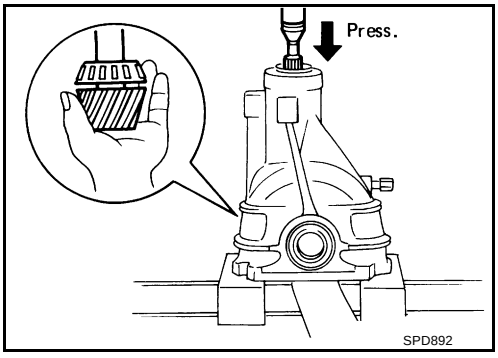
4. Remove companion flange using the suitable puller.



5. Press drive pinion assembly out of gear carrier.

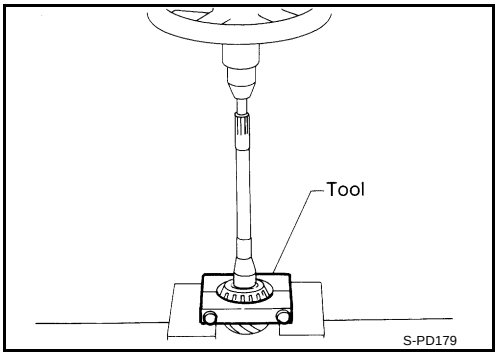
CAUTION:
Do not drop drive pinion assembly.

6. Remove front oil seal.
7. Remove side oil seal.
8. Remove pinion front bearing inner race.
9. Remove collapsible spacer.



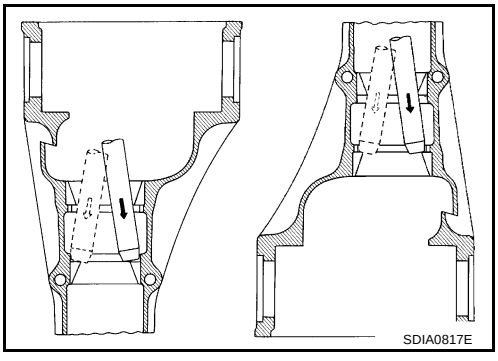
10. Remove pinion rear bearing inner race and drive pinion height adjusting washer with the replacer.

Tool number : ST30031000 (J-22912-01)



11. Tap pinion front/rear bearing outer races uniformly a brass rod or equivalent to removed.

CAUTION:
Be careful not to damage gear carrier.



INSPECTION AFTER DISASSEMBLY

Clean up the disassembled parts. Then, inspect if the parts are worn or damaged. If so, follow the measures below.

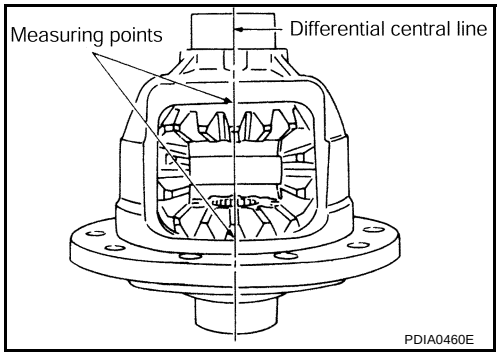
Content	Conditions and Measures
Hypoid gear	● If the gear teeth do not mesh or line-up correctly, determine the cause and adjust or replace as necessary. ● If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.
Bearing	● If any chipped (by friction), pitted, worn, rusted or scratched mark, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).
Side gear and Pinion mate gear	● If any cracks or damage on the surface of the tooth is found, replace. ● If any worn or chipped mark on the contact sides of the thrust washer is found, replace.
Side gear thrust washer and pinion mate thrust washer	● If it is chipped (by friction), damaged, or unusually worn, replace.
Oil seal	● Whenever disassembled, replace. ● If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.
Differential case	● If any wear or crack on the contact sides of the differential case is found, replace.
Companion flange	● If any chipped mark (about 0.1 mm, 0.004 in) or other damage on the contact sides of the lips of the companion flange is found, replace.

ADJUSTMENT AND SELECTION OF ADJUSTING WASHERS

Differential Side Gear Clearance

- Assemble the differential parts if they are disassembled. Refer to RFD-24, "Differential Assembly" .

1. Place differential case straight up so that side gear to be measured comes upward.



2. Using feeler gauge, measure the clearance between side gear back and differential case at 3 different points, while rotating side gear. Average the 3 readings, and then measure the clearance of the other side as well.

Side gear back clearance specification:

0.2 mm (0.008 in) or less.
(Each gear should rotate smoothly without excessive resistance during differential motion.)

CAUTION:
To prevent side gear from tilting, insert feeler gauges with the same thickness from both sides.

3. If the back clearance is outside the specification, use a thicker/thinner side gear thrust washer to adjust. Refer to RFD-60, "Side Gear Thrust Washer" .

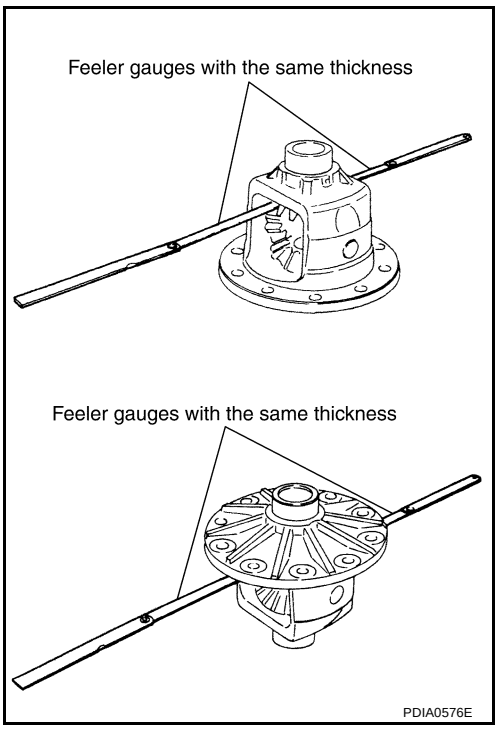
When the back clearance is large:

Use a thicker thrust washer.

When the back clearance is small:

Use a thinner thrust washer.

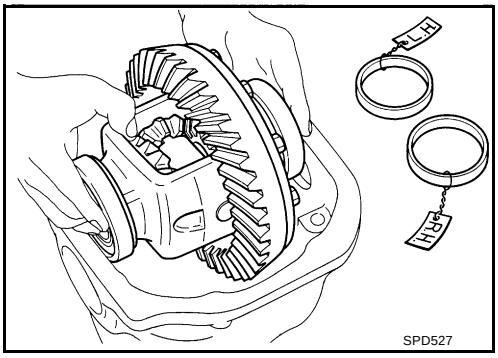
CAUTION:
Select a side gear thrust washer for right and left individually.



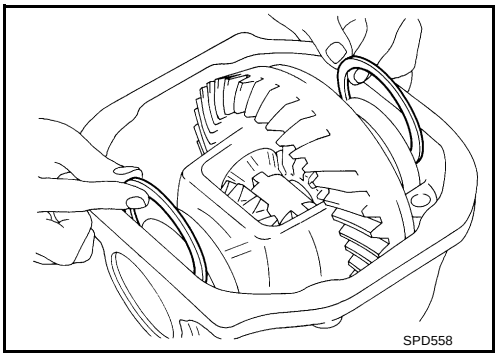
Side Bearing Preload

- Selecting carrier side bearing adjusting washers is required for successful completion of this procedure.

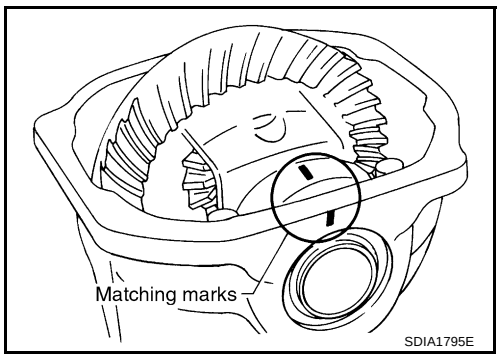
1. Make sure all parts are clean. Also, make sure the bearings are well lubricated with gear oil.
2. Place the differential case, with side bearings and bearing races installed, into gear carrier.



3. Insert left and right original side bearing adjusting washers in place between side bearings and gear carrier.



4. Install bearing caps in their correct locations and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-19, "COMPONENTS" .
5. Turn the carrier several times to seat the bearings.

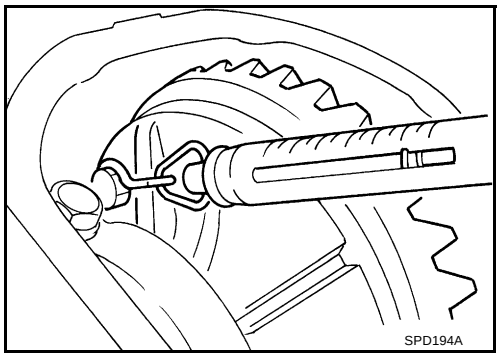


6. Measure the turning torque of the carrier at the drive gear mounting bolts with a spring gauge.

Tool number : — (J-8129)

Specification:

34.2 – 39.2 N (3.5 – 4.0 kg, 7.7 – 8.8 lb) of pulling force at the drive gear bolt



7. If the turning torque is outside the specification, use a thicker/ thinner side bearing adjusting washer to adjust. Refer to RFD-60, "Side Gear Thrust Washer" .

If the turning torque is less than the specified range:

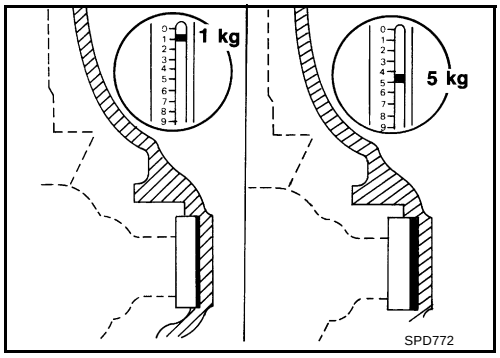
Use a thicker thrust washer.

If the turning torque is greater than the specification:

Use a thinner thrust washer.

CAUTION:

Select a side bearing adjusting washer for right and left individually.

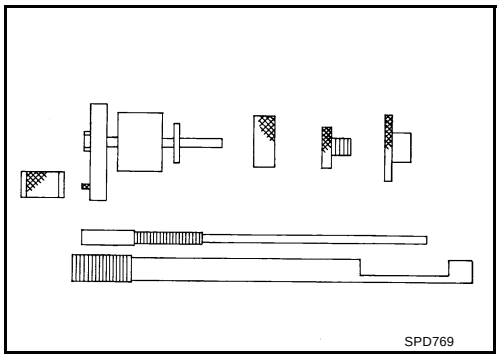


8. Record the total amount of washer thickness required for the correct carrier side bearing preload.

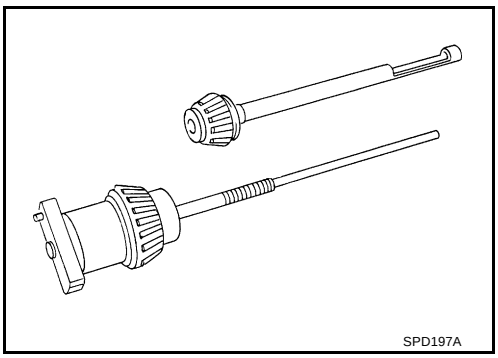
Pinion Gear Height

1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the differential shim selector tool.

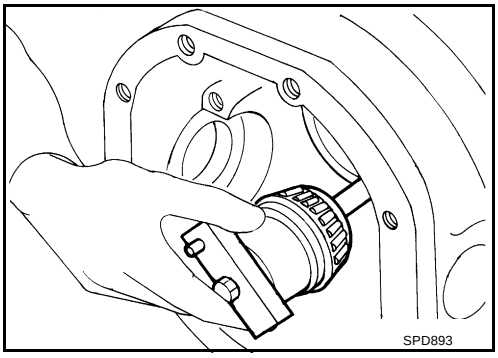
Tool number : — (J-34309)



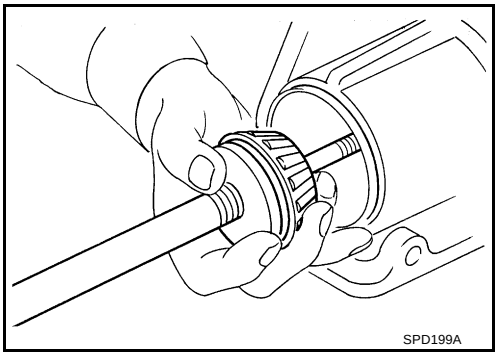
- **Pinion front bearing;** make sure the J-34309-3 pinion front bearing seat is secured tightly against the J-34309-2 gauge anvil. Then turn the pinion front bearing pilot, J-34309-5, to secure the bearing in its proper position.
- **Pinion rear bearing;** the pinion rear bearing pilot, J-34309-8, is used to center the pinion rear bearing only. The pinion rear bearing locking seat, J-34309-4, is used to lock the bearing to the assembly.
- **Installation of J-34309-9 and J-34309-16;** place a suitable 2.5 mm (0.098 in) thick plain washer between J-34309-9 and J-34309-16. Both surfaces of J-34309-9 and J-34309-16 must be parallel with a clearance of 2.5 mm (0.098 in).


SPD197A

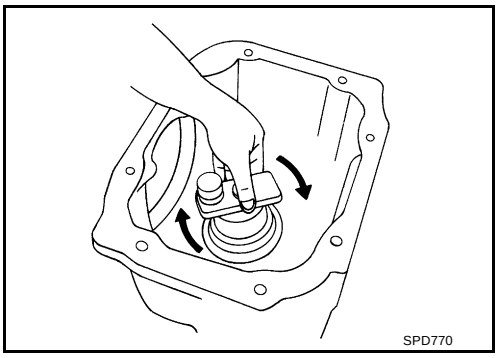
3. Install the pinion rear bearing inner race into gear carrier. Then place the pinion preload shim selector tool, J-34309-1, gauge screw assembly.


SPD893

4. Assemble the pinion front bearing inner race and the J-34309-2 gauge anvil. Assemble them together with the J-34309-1 gauge screw in gear carrier. Make sure that the pinion height gauge plate, J-34309-16, will turn a full 360 degrees. Tighten the two sections together by hand.


SPD199A

5. Turn the assembly several times to seat the bearings.

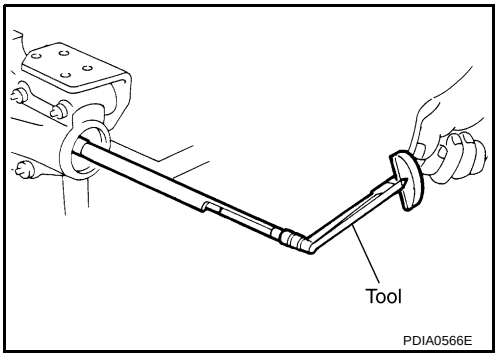

SPD770

6. Measure the turning torque at the end of the J-34309-2 gauge anvil using preload gauge.

Tool number : ST3127S000 (J-25765- A)

Turning torque specification:

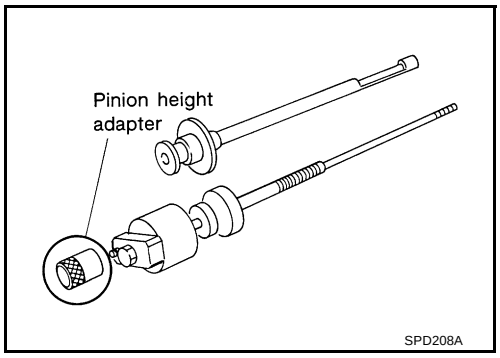
1.0 – 1.3 N·m (0.11 – 0.13 kg-m, 9 – 11 in-lb)



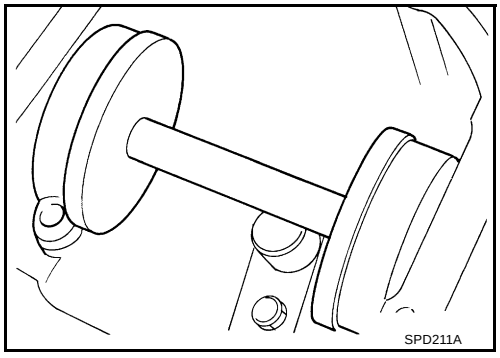
PDIA0566E

7. Place the J-34309-11 “R200A” pinion height adapter onto the gauge plate and tighten it by hand.

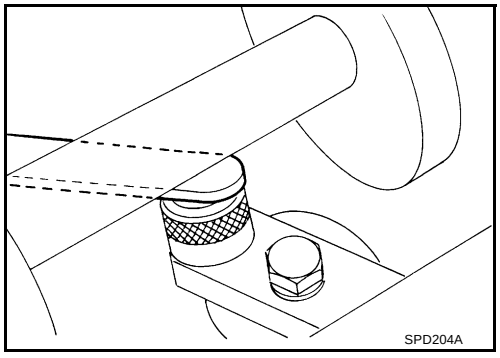
   CAUTION:
   Make sure all machined surfaces are clean.



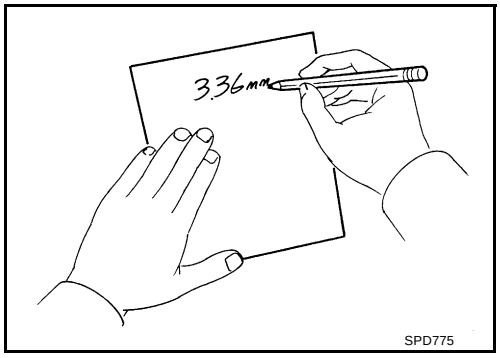
8. Position the side bearing discs, J-25269-4, and arbor firmly into the side bearing bores. Install the bearing caps and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-19, "COMPONENTS" .



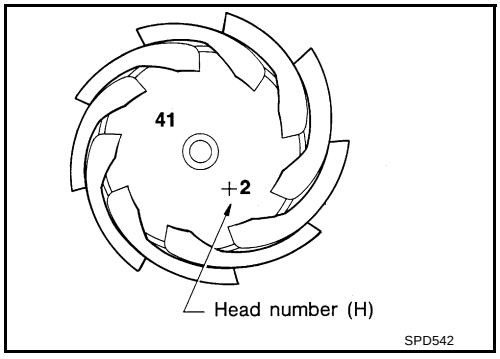
9. Select the correct standard pinion height adjusting washer thickness. Select by using a standard gauge of 3 mm (0.12 in) and your J-34309-101 feeler gauge. Measure the distance between the J-34309-11 pinion height adapter including the standard gauge and the arbor.



10. Write down exact measurement (the value of feeler gauge).

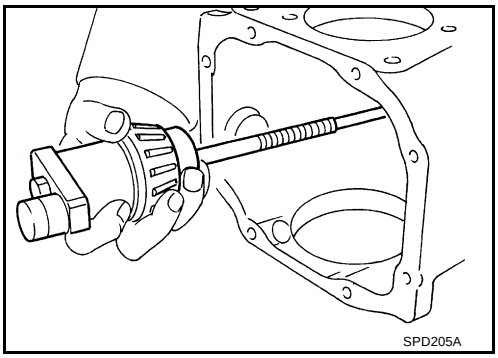


11. Correct the pinion height washer size by referring to the “pinion head number”.
    There are two numbers painted on the drive pinion. The first one refers to the drive pinion and drive gear as a matched set. This number should be the same as the number on the drive gear. The second number is the “pinion head height number”. It refers to the ideal pinion height from standard for quietest operation. Use the following chart to determine the correct pinion height washer.



Pinion head height number	Add or remove from the standard pinion height adjusting washer thickness measurement
- 6	Add 0.06 mm (0.0024 in)
- 5	Add 0.05 mm (0.0020 in)
- 4	Add 0.04 mm (0.0016 in)
- 3	Add 0.03 mm (0.0012 in)
- 2	Add 0.02 mm (0.0008 in)
- 1	Add 0.01 mm (0.0004 in)
0	Use the selected washer thickness
+1	Subtract 0.01 mm (0.0004 in)
+2	Subtract 0.02 mm (0.0008 in)
+3	Subtract 0.03 mm (0.0012 in)
+4	Subtract 0.04 mm (0.0016 in)
+5	Subtract 0.05 mm (0.0020 in)
+6	Subtract 0.06 mm (0.0024 in)

12. Select the correct pinion height adjusting washer. Refer to RFD-60, "Pinion Height Adjusting Washer" .
13. Remove the J-34309 differential shim selector tool from the final drive housing. Then disassemble to retrieve the pinion bearings.



ASSEMBLY

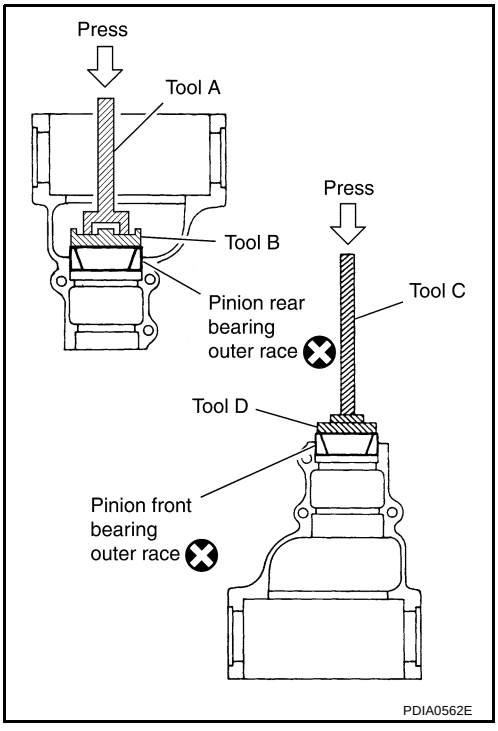
Drive Pinion Assembly

1. Install front and rear bearing outer races using drifts.

Tool number **A: ST30720000 (J-25405)**
B: KV40105230 (—)
C: ST30611000 (J-25742-1)
D: ST30613000 (J-25742-3)

CAUTION:
- **At first, using a hammer, tap bearing outer race until it becomes flat to gear carrier.**
- **Do not reuse pinion front and rear bearing outer race.**

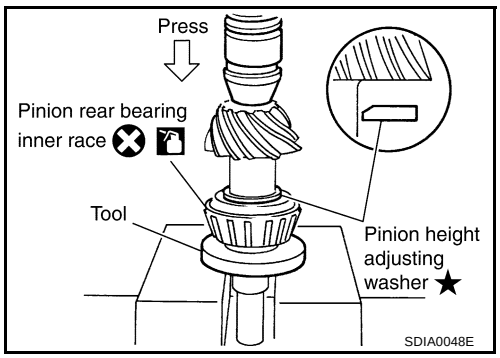
2. Select drive pinion height adjusting washer. Refer to RFD-60, "Pinion Height Adjusting Washer" .



3. Install selected drive pinion height adjusting washer to drive pinion. Press pinion rear bearing inner race to it, using drift.

   Tool number : ST30901000 (J-26010-01)

   CAUTION:
   - **Pay attention to the direction of pinion height adjusting washer. (Assemble as shown in the figure.)**
   - **Do not reuse pinion rear bearing inner race.**

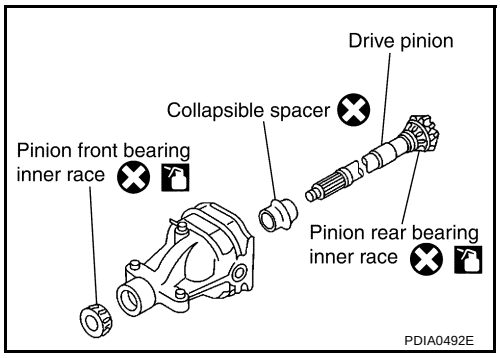


4. Assemble collapsible spacer to drive pinion.

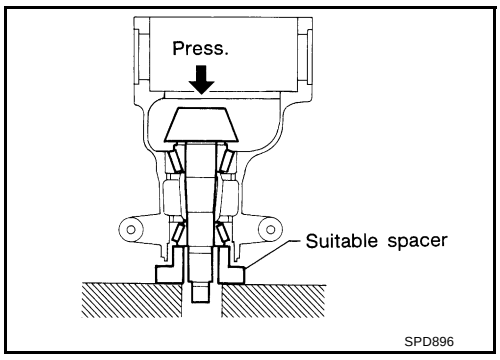
   CAUTION:
   Do not reuse collapsible spacer.

5. Apply gear oil to pinion rear bearing, and assemble drive pinion into gear carrier.
6. Apply gear oil to pinion front bearing, and assemble pinion front bearing inner race to drive pinion assembly.

   CAUTION:
   Do not reuse pinion front bearing inner race.



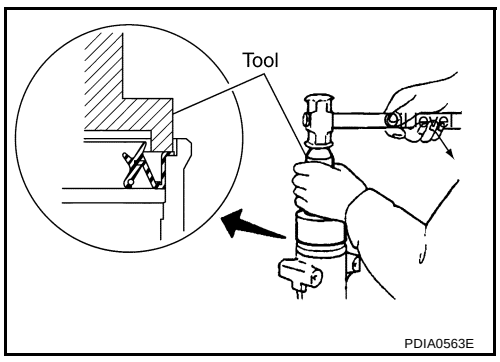
7. Using suitable spacer, press the pinion front bearing inner race to drive pinion as far as drive pinion nut can be tightened.



8. Using the drift, install front oil seal as shown in the figure.

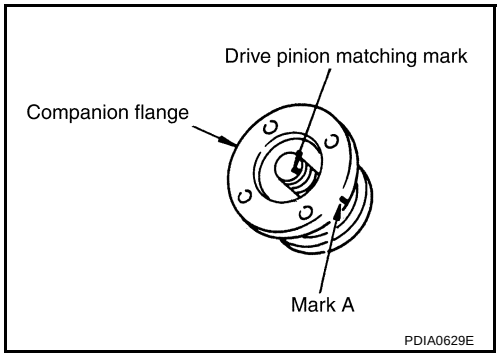
   Tool number : ST30720000 (J-25405)

   CAUTION:
   - **Do not reuse oil seal.**
   - **When installing, do not incline oil seal.**
   - **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**



9. Install companion flange.

   NOTE:
   When reusing drive pinion, align the matching mark of drive pinion with the matching mark A of companion flange, then install companion flange.



10. Apply anti-corrosion oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.

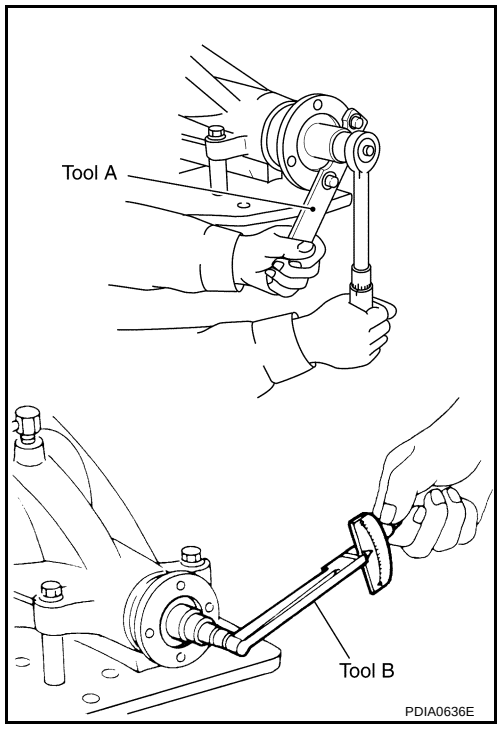
CAUTION:
Do not reuse drive pinion lock nut.

11. Adjust to the drive pinion lock nut tightening torque and pinion bearing preload torque.

Tool number **A: KV40104000 (—)**
B: ST3127S000 (J-25765-A)

Drive pinion lock nut tightening torque:
147 – 323 N·m (15 – 32 kg-m, 109 – 238 ft-lb)

Drive pinion bearing preload:
2.65 – 3.23 N·m (0.27 – 0.32 kg-m, 24 – 28 in-lb)



CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the preload torque.**
- **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.**

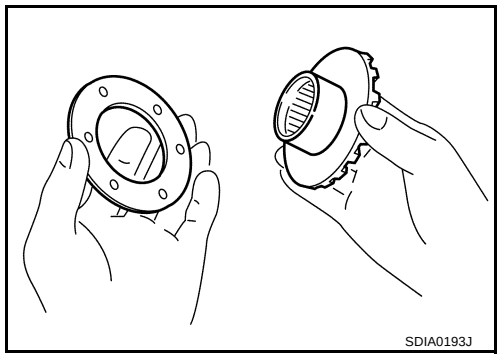
12. Install differential case assembly. Refer to RFD-35, "Differential Assembly" .

CAUTION:
Do not install rear cover yet.

13. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and companion flange runout. Refer to RFD-20, "Drive Gear Runout" , RFD-21, "Tooth Contact" , RFD-22, "Backlash" and RFD-23, "Companion Flange Runout" .
Recheck above items. Readjust the above description, if necessary.
14. Check total preload torque. Refer to RFD-20, "Total Preload Torque" .
15. Install rear cover. Refer to RFD-35, "Differential Assembly" .

Differential Assembly

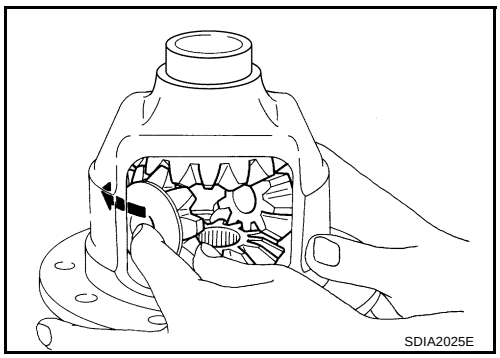
1. Install side gear thrust washers with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the side gears.



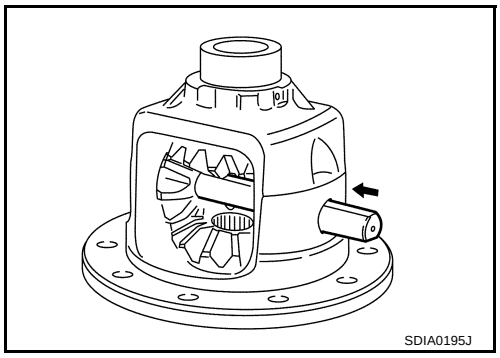
2. Install side gears and thrust washers into differential case.

CAUTION:
Make sure that the circular clip is installed to side gears.

3. Align 2 pinion mate gears in diagonally opposite positions, then rotate and install them into differential case after installing thrust washer to pinion mate gear.

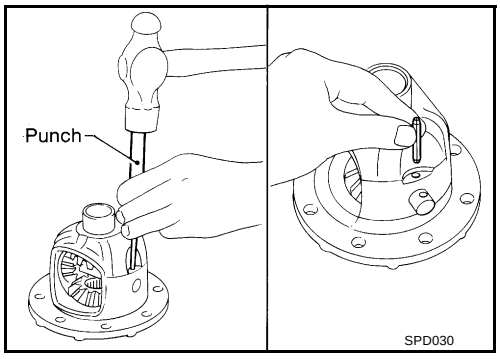


4. Align the lock pin holes on differential case with shaft, and install pinion mate shaft.
5. Measure side gear end play. If necessary, select the appropriate side gear thrust washers. Refer to RFD-59, "DIFFERENTIAL SIDE GEAR CLEARANCE" .

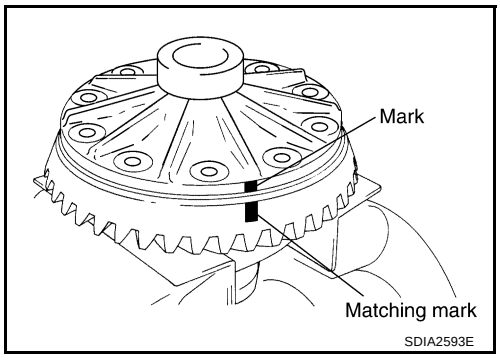


6. Drive a lock pin into pinion mate shaft, using a punch. Make sure lock pin is flush with differential case.

CAUTION:
Do not reuse lock pin.

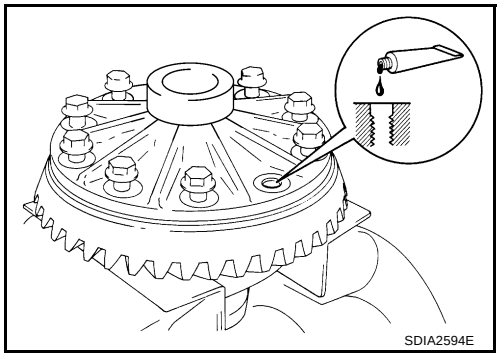


7. Align the matching mark of differential case with the mark of drive gear, then place drive gear.



8. Apply thread locking sealant into the thread hole of drive gear.
   - **Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

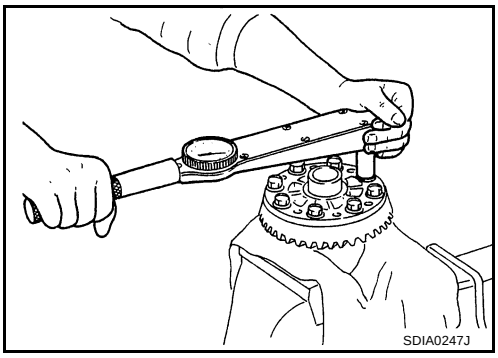
CAUTION:
Drive gear back and threaded holes shall be cleaned and degreased sufficiently.



9. Install drive gear on the mounting bolts, and then tighten to the specified torque. Refer to RFD-19, "COMPONENTS" .

CAUTION:

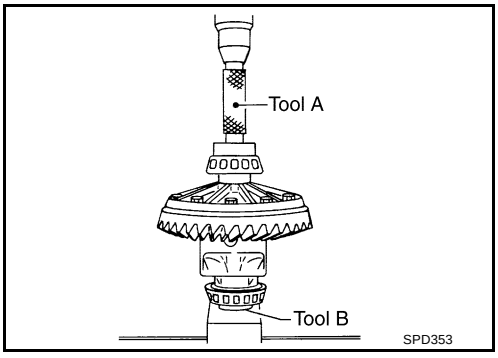
- **Tighten bolts in a crisscross fashion.**
- **After tightening the bolts to the specified torque, tighten the bolts additionally by turning the bolts 31 to 36 degrees.**



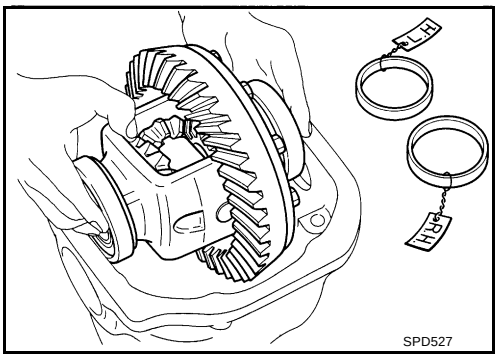
10. Press side bearing inner races to differential case, using the drift and the base.

Tool number **A: KV38100300 (J-25523)**
B: ST33061000 (J-8107-2)

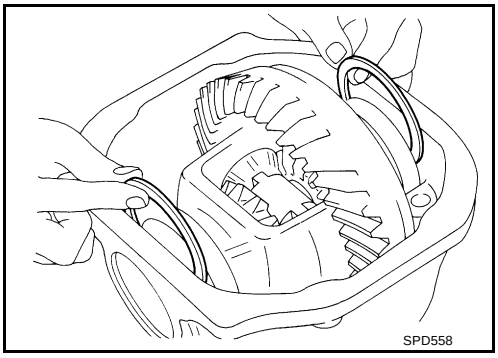
CAUTION:
Do not reuse side bearing inner race.



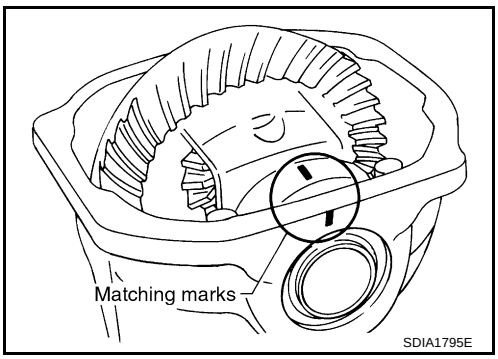
11. Install differential case assembly with side bearing outer races into gear carrier.
12. Measure side bearing preload. If necessary, select the appropriate side bearing adjusting washers. Refer to RFD-29, "Side Bearing Preload" .



13. Insert selected left and right side bearing adjusting washers in place between side bearings and gear carrier.

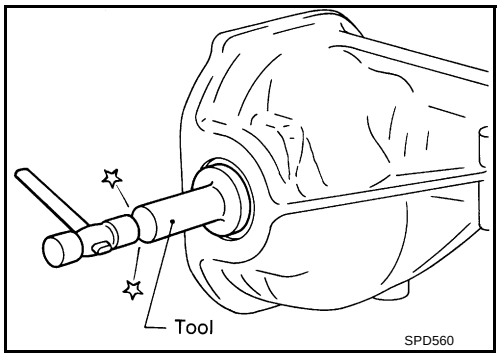


14. Align matching marks on bearing cap with that on gear carrier.
15. Install bearing caps and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-19, "COMPONENTS" .



16. Using the drift, drive side oil seals until it becomes flush with the case end.

Tool number : KV38100200 (J-26233)



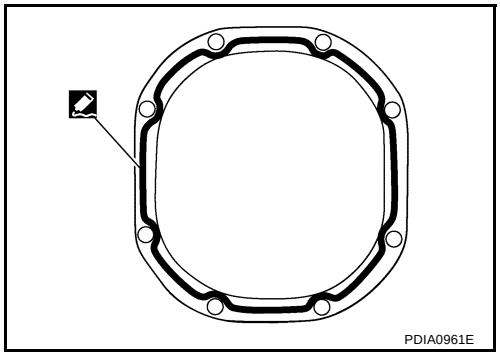
CAUTION:

- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**

17. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and total preload torque. Refer to RFD-20, "Drive Gear Runout" , RFD-21, "Tooth Contact" , RFD-22, "Backlash" and RFD-20, "Total Preload Torque" .
Recheck above items. Readjust the above description, if necessary.

18. Apply sealant to mating surface of rear cover.

- **Use Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**



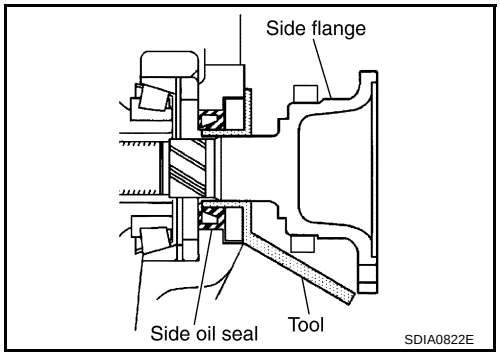
CAUTION:
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.

19. Install rear cover on gear carrier and tighten mounting bolts with the specified torque. Refer to RFD-19, "COMPONENTS" .

20. Install side flange with the following procedure.

a. Attach the protector to side oil seal.

Tool number : KV38107900 (J-39352)



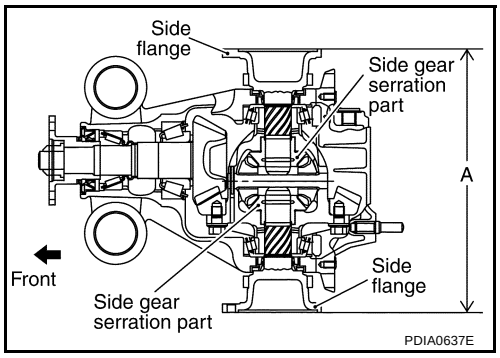
b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.

c. Put a suitable drift on the center of side flange, then drive it until sound changes.

NOTE:
When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

d. Confirm that the dimension of the side flange installation (Measurement A) in the figure comes into the following.

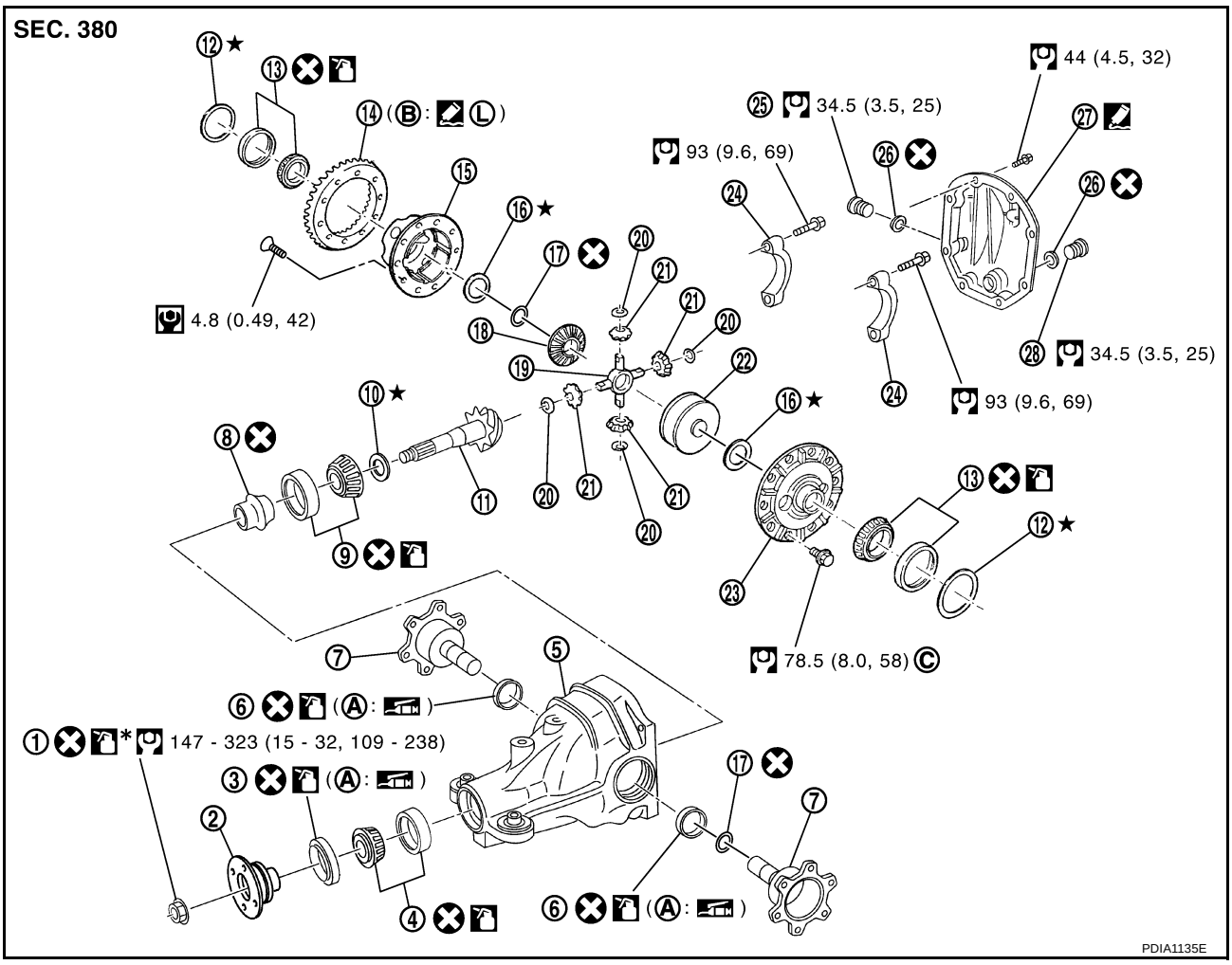
Measurement A: 326 – 328 mm (12.83 – 12.91 in)



Disassembly and Assembly (R200V LSD)

NDS0000K

COMPONENTS



1. Drive pinion lock nut
2. Companion flange
3. Front oil seal
4. Pinion front bearing
5. Gear carrier
6. Side oil seal
7. Side flange
8. Collapsible spacer
9. Pinion rear bearing
10. Pinion height adjusting washer
11. Drive pinion
12. Side bearing adjusting washer
13. Side bearing
14. Drive gear
15. Differential case B
16. Side gear thrust washer
17. Circular clip
18. Side gear
19. Pinion mate shaft
20. Pinion mate thrust washer
21. Pinion mate gear
22. Viscous coupling
23. Differential case A
24. Bearing cap
25. Filler plug
26. Gasket
27. Rear cover
28. Drain plug

A: Oil seal lip

B: Screw hole

C: After tightening the bolts to the specified torque, tighten the bolts additionally by turning the bolts 31 to 36 degrees.

Refer to GI-11, "Components" and the followings for the symbols in the figure.

: Apply gear oil.

*: Apply anti-corrosion oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

L: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

ASSEMBLY INSPECTION AND ADJUSTMENT

- Before inspection and adjustment, drain gear oil.

Total Preload Torque

1. Secure final drive assembly onto an attachment.

Tool number : KV38100800 (J-25604-01)

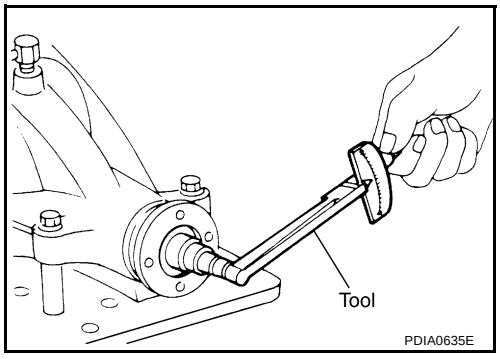
2. Remove side flanges.
3. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
4. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
5. Measure total preload with the preload gauge.

Tool number : ST3127S000 (J-25765-A)

Total preload torque:

2.85 – 3.75 N·m (0.29 – 0.38 kg-m, 26 – 33 in-lb)

NOTE:
Total preload torque = Pinion bearing preload torque + Side bearing preload torque



- If measured value is out of the specification, disassemble it to check and adjust each part. Adjust the pinion bearing preload and side bearing preload. Adjust the pinion bearing preload first, then adjust the side bearing preload.

When the preload torque is large

On pinion bearings: **Replace the collapsible spacer.**

On side bearings: **Use thinner side bearing adjusting washers by the same amount to each side. Refer to RFD-60, "Side Bearing Adjusting Washer" .**

When the preload is small

On pinion bearings: **Tighten the drive pinion lock nut.**

On side bearings: **Use thicker side bearing adjusting washers by the same amount to each side. Refer to RFD-60, "Side Bearing Adjusting Washer" .**

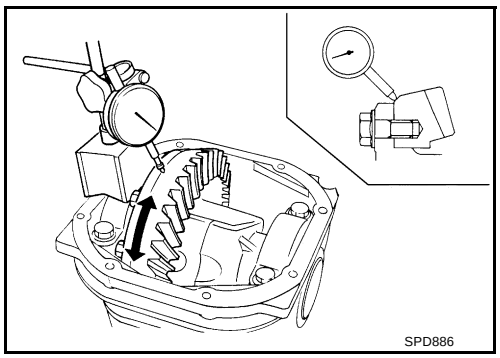
Drive Gear Runout

1. Remove rear cover. Refer to RFD-44, "Differential Assembly" .
2. Fit a dial indicator to the drive gear back face.
3. Rotate the drive gear to measure runout.

Runout limit: 0.05 mm (0.0020 in) or less

- If the runout is outside of the repair limit, check drive gear assembly condition; foreign material may be caught between drive gear and differential case, or differential case or drive gear may be deformed, etc.

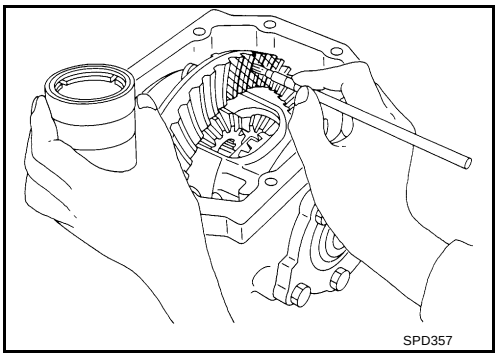
CAUTION:
Replace drive gear and drive pinion gear as a set.



Tooth Contact

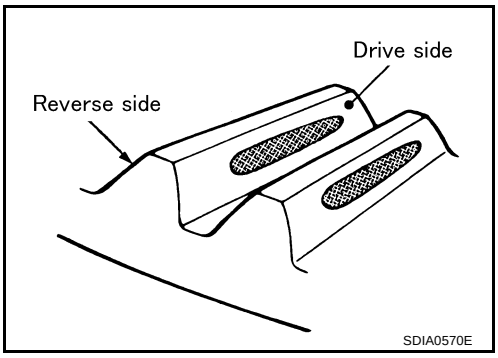
1. Remove rear cover. Refer to RFD-44, "Differential Assembly" .
2. Apply red lead to drive gear.

CAUTION:
Apply red lead to both the faces of 3 to 4 gears at 4 locations evenly spaced on drive gear.



3. Rotate drive gear back and forth several times, check drive pinion gear to drive gear tooth contact.

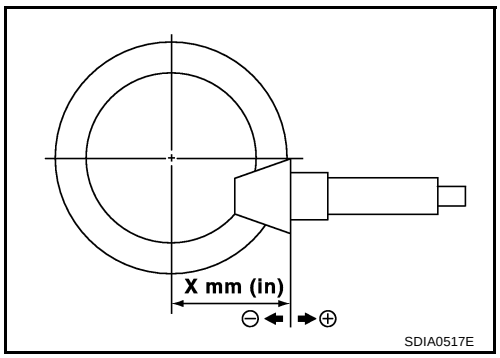
CAUTION:
Check tooth contact on drive side and reverse side.



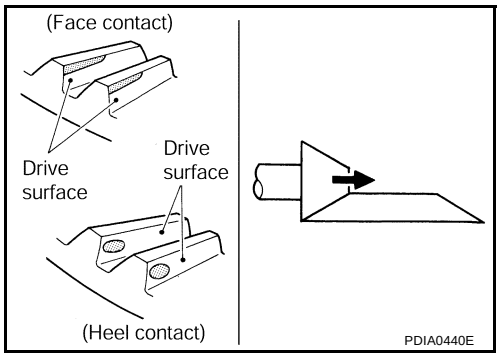
Tooth contact condition		Pinion height adjusting washer selection valve [mm (in)]		Adjustment (Yes/No)	Possible cause
Drive side	Back side				
Heel side Toe side	Toe side Heel side	Thicker ↑	+0.09 (+0.0035)	Yes	Occurrence of noise and scoring sound in all speed ranges.
			+0.06 (+0.0024)		Occurrence of noise when accelerating.
			+0.03 (+0.0012)	No	–
			0		
		Thinner ↓	-0.03 (-0.0012)		
			-0.06 (-0.0024)	Yes	Occurrence of noise at constant speed and decreasing speed.
			-0.09 (-0.0035)		Occurrence of noise and scoring sound in all speed ranges.

SDIA0207E

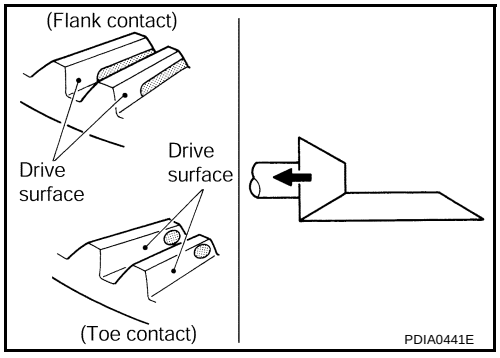
4. If tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).



- If the tooth contact is near the face (face contact), or near the heel (heel contact), thicken pinion height adjusting washers to move drive pinion closer to drive gear.
  Refer to RFD-60, "Pinion Height Adjusting Washer" .



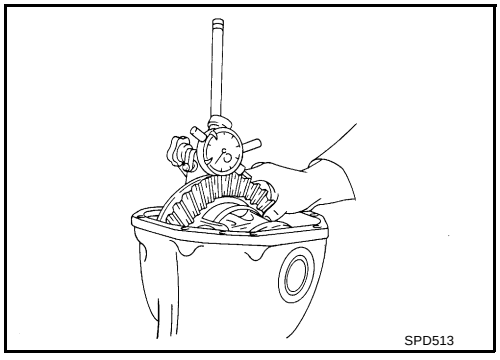
- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), thin pinion height adjusting washers to move drive pinion farther from drive gear.
  Refer to RFD-60, "Pinion Height Adjusting Washer" .



Backlash

1. Remove rear cover. Refer to RFD-44, "Differential Assembly" .
2. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash: 0.10 – 0.15 mm (0.0039 – 0.0059 in)



- If the backlash is outside of the specified value, change the thickness of side bearing adjusting washer.

When the backlash is large:

Make drive gear back side adjusting washer thicker, and drive gear tooth side adjusting washer thinner by the same amount. Refer to RFD-60, "Side Bearing Adjusting Washer" .

When the backlash is small:

Make drive gear back side adjusting washer thinner, and drive gear tooth side adjusting washer thicker by the same amount. Refer to RFD-60, "Side Bearing Adjusting Washer" .

CAUTION:

Do not change the total amount of washers as it will change the bearing preload.

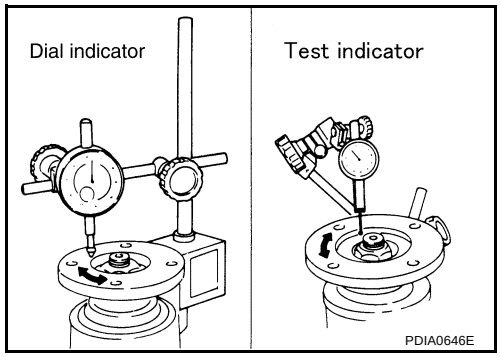
Companion Flange Runout

1. Fit a dial indicator onto the companion flange face (inner side of the propeller shaft mounting bolt holes).
2. Rotate the companion flange to check for runout.

Runout limit : 0.08 mm (0.0031 in)

3. Fit a test indicator to the inner side of the companion flange (socket diameter).
4. Rotate the companion flange to check for runout.

Runout limit : 0.08 mm (0.0031 in)



5. If the runout value is outside the repair limit, follow the procedure below to adjust.

a. Check for runout while changing the phase between companion flange and drive pinion gear by 90° step, and search for the position where the runout is the minimum.

b. If the runout value is still outside of the limit after the phase has been changed, possible cause will be an assembly malfunction of drive pinion and pinion bearing and malfunction of pinion bearing. Check for these items and repair if necessary.

c. If the runout value is still outside of the limit after the check and repair, replace companion flange.

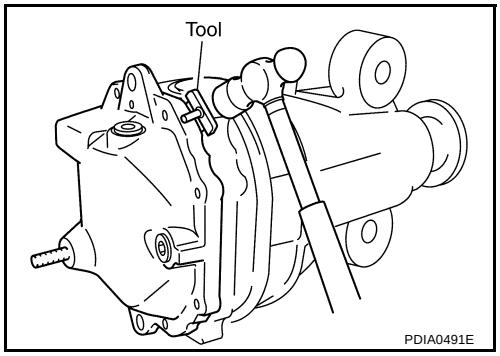
DISASSEMBLY

Differential Assembly

1. Drain gear oil, if necessary.
2. Remove side flange.
3. Remove rear cover mounting bolts.
4. Remove rear cover to insert the seal cutter between gear carrier and rear cover.

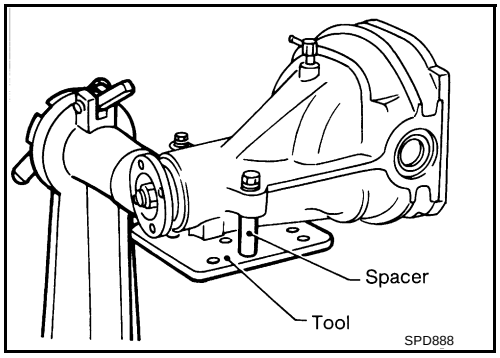
   Tool number : KV10111100 (J-37228)

   CAUTION:
   - **Be careful not to damage the mating surface.**
   - **Do not insert flat-bladed screwdriver, this way damage the mating surface.**



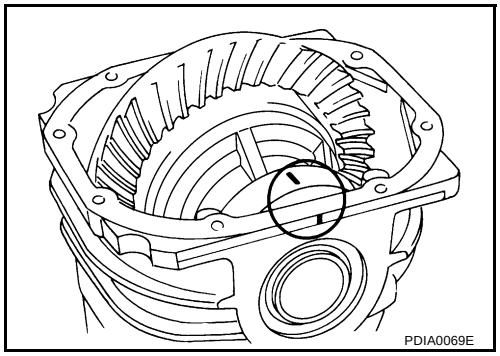
5. Using two 45 mm (1.77 in) spacers, mount carrier on the attachment.

   Tool number : KV38100800 (J-25604-01)

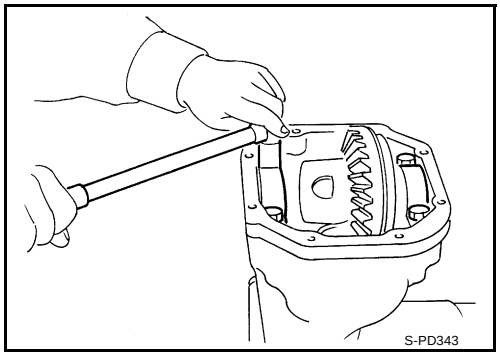


6. For proper reinstallation, paint matching marks on one side of the bearing cap.

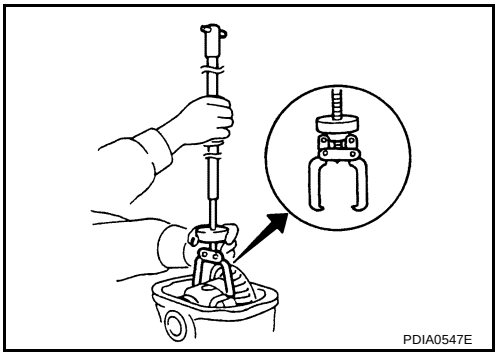
   CAUTION:
   - **For matching marks, use paint. Do not damage bearing caps and gear carrier.**
   - **Bearing caps are line-board during manufacture. The matching marks are used to reinstall them in their original positions.**



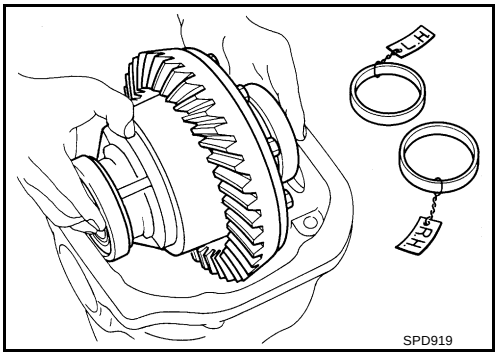
7. Remove bearing caps.



8. Lift differential case assembly out with a suitable tool.



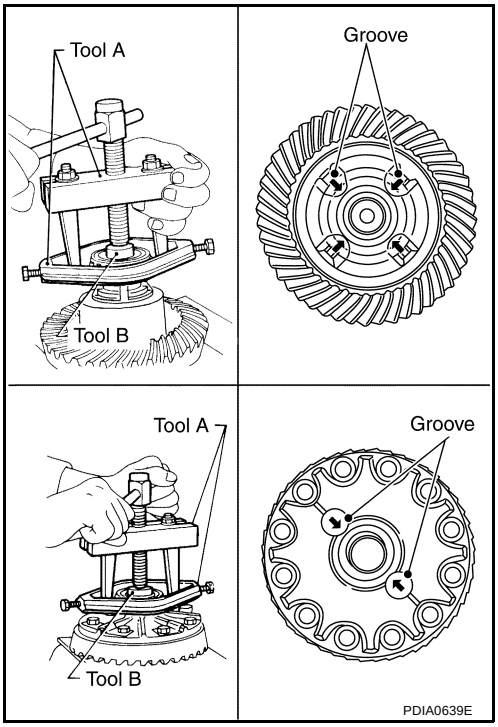
- Keep side bearing outer races together with inner race. Do not mix them up.
  Also, keep side bearing adjusting washers together with bearings.



9. Remove side bearing inner race.
   To prevent damage to bearing, engage puller jaws in groove.

   Tool number **A: ST33051001 (J-22888-20)**
   B: ST33061000 (J-8107-2)

   CAUTION:
   - **To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.**
   - **It is not necessary to remove side bearing inner race except it is replaced.**

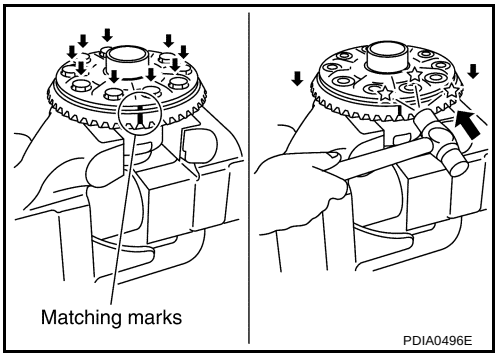


10. For proper reinstallation, paint matching marks on one differential case assembly.

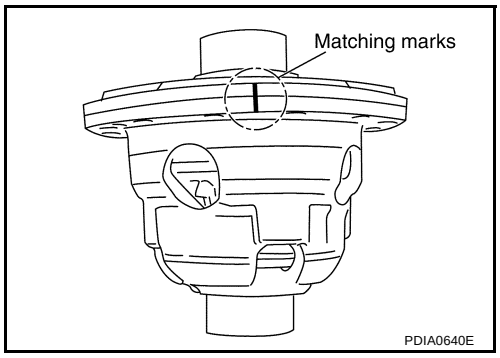
    CAUTION:
    For matching marks, use paint. Do not damage differential case and drive gear.

11. Remove drive gear mounting bolts.
12. Tap drive gear off differential case assembly with a soft hammer.

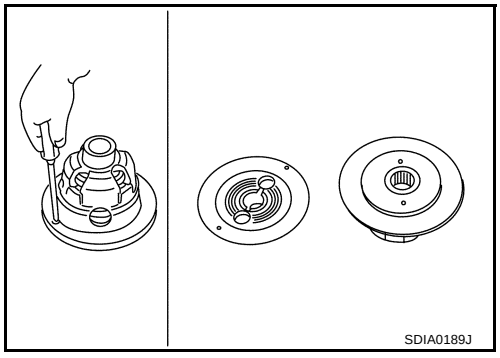
    CAUTION:
    Tap evenly all around to keep drive gear from bending.



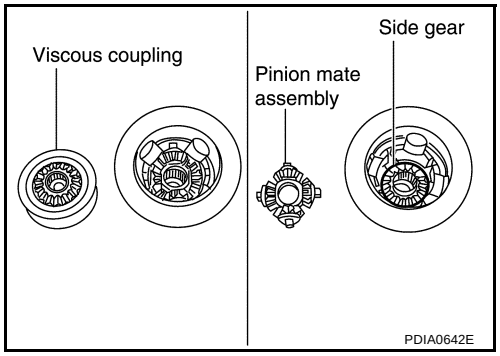
13. Put matching marks with paint.



14. Loosen screws on differential cases A and B.



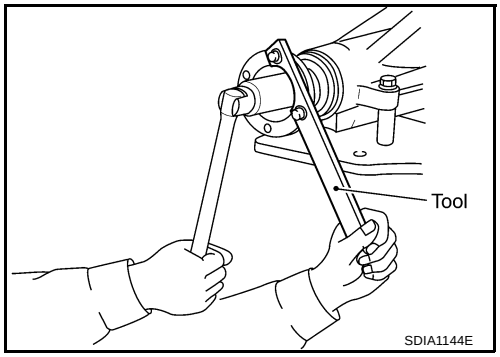
15. Separate differential case A and B, then remove viscous coupling, pinion mate gear, pinion mate thrust washer, side gear and side gear thrust washer from differential cases.



Drive Pinion Assembly

1. Remove differential assembly. Refer to RFD-44, "Differential Assembly" .
2. Remove drive pinion lock nut with the flange wrench.

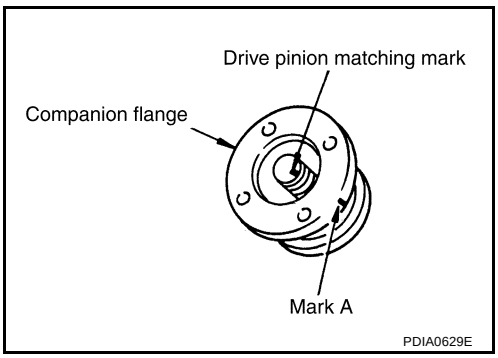
Tool number : KV40104000 (—)



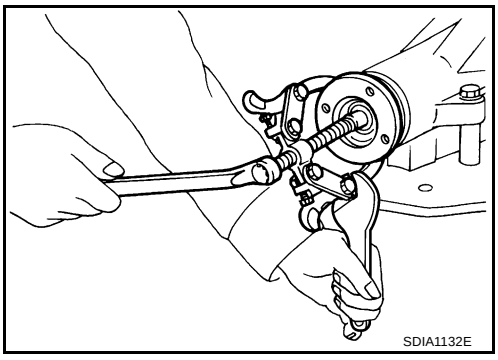
3. Put matching mark on the end of drive pinion. The matching mark should be in line with the matching mark A on companion flange.

CAUTION:
For matching mark, use paint. Do not damage companion flange and drive pinion.

NOTE:
The matching mark A on the final drive companion flange indicates the maximum vertical runout position.
When replacing companion flange, matching mark is not necessary.



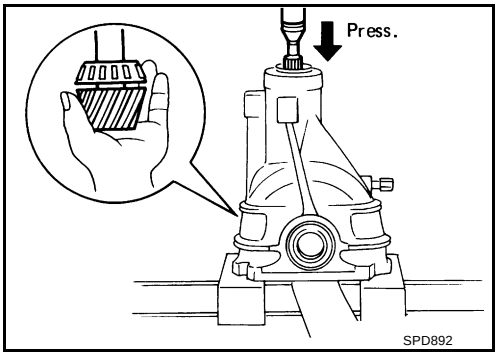
4. Remove companion flange using the suitable puller.



5. Press drive pinion assembly out of gear carrier.

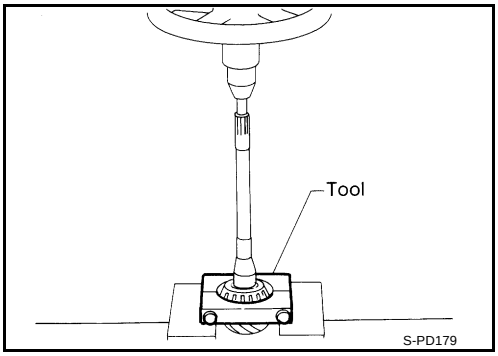
CAUTION:
Do not drop drive pinion assembly.

6. Remove front oil seal.
7. Remove side oil seal.
8. Remove pinion front bearing inner race.
9. Remove collapsible spacer.



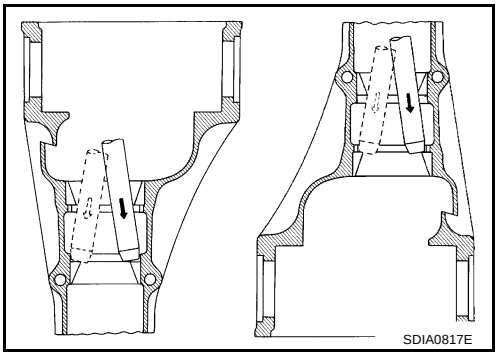
10. Remove pinion rear bearing inner race and drive pinion height adjusting washer with the replacer.

Tool number : ST30031000 (J-22912-01)



11. Tap pinion front/rear bearing outer races uniformly a brass rod or equivalent to removed.

CAUTION:
Be careful not to damage gear carrier.



INSPECTION AFTER DISASSEMBLY

Clean up the disassembled parts. Then, inspect if the parts are worn or damaged. If so, follow the measures below.

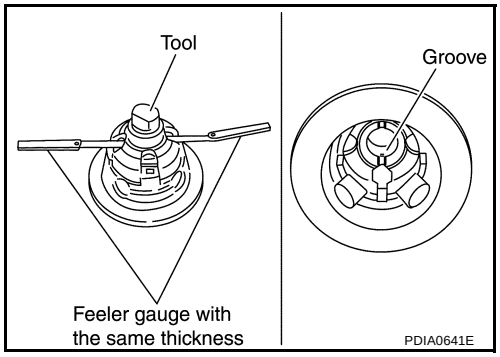
Content	Conditions and Measures
Hypoid gear	● If the gear teeth do not mesh or line-up correctly, determine the cause and adjust or replace as necessary. ● If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.
Bearing	● If any chipped (by friction), pitted, worn, rusted or scratched mark, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).
Side gear and Pinion mate gear	● If any cracks or damage on the surface of the tooth is found, replace. ● If any worn or chipped mark on the contact sides of the thrust washer is found, replace.
Side gear thrust washer and pinion mate thrust washer	● If it is chipped (by friction), damaged, or unusually worn, replace.
Oil seal	● Whenever disassembled, replace. ● If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.
Differential case	● If any wear or crack on the contact sides of the differential case is found, replace.
Companion flange	● If any chipped mark (about 0.1 mm, 0.004 in) or other damage on the contact sides of the lips of the companion flange is found, replace.

ADJUSTMENT AND SELECTION OF ADJUSTING WASHERS

Differential Side Gear Clearance

- Assemble the differential parts if they are disassembled. Refer to RFD-44, "Differential Assembly" .

1. Place differential assembly so that right side gear is on the upper side.
2. Measure the clearance between right side gear back and differential case using feeler gauge, while rotating right side gear with a suitable tool attached to splines.



Side gear back clearance specification:

0.15 mm (0.0059 in) or less.
(Each gear should rotate smoothly without excessive resistance during differential motion.)

CAUTION:

- **Do not place feeler gauge at groove side of differential case.**
- **To prevent side gear from tilting, insert feeler gauges with the same thickness from both sides.**

3. If the back clearance is outside the specification, use a thicker/thinner side gear thrust washer to adjust. Refer to RFD-60, "Side Gear Thrust Washer" .

When the back clearance is large:

Use a thicker thrust washer.

When the back clearance is small:

Use a thinner thrust washer.

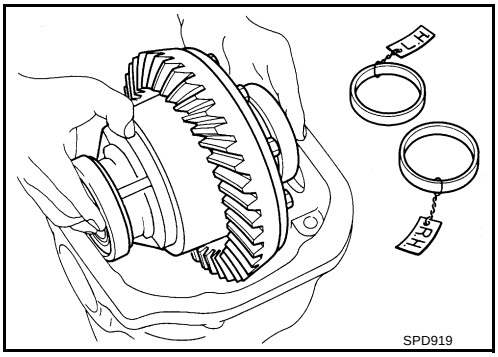
CAUTION:

- **Adjust the clearance with the left side gear thrust washer only.**
- **Only one side gear thrust washer can be selected.**

Side Bearing Preload

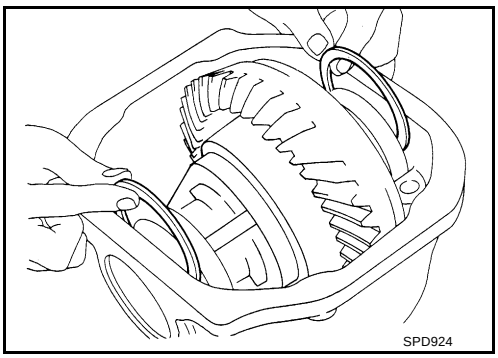
- Selecting carrier side bearing adjusting washers is required for successful completion of this procedure.

1. Make sure all parts are clean. Also, make sure the bearings are well lubricated with gear oil.
2. Place the differential case, with side bearings and bearing races installed, into gear carrier.

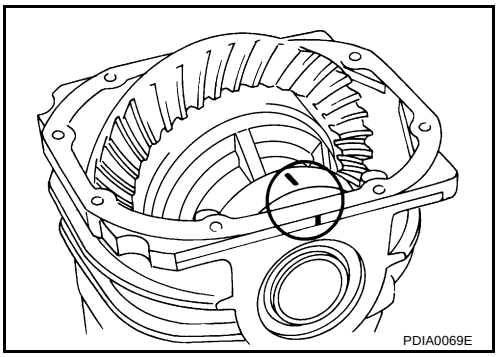


SPD919

3. Insert left and right original side bearing adjusting washers in place between side bearings and gear carrier.


SPD924

4. Install bearing caps in their correct locations and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-55, "Differential Assembly" .
5. Turn the carrier several times to seat the bearings.

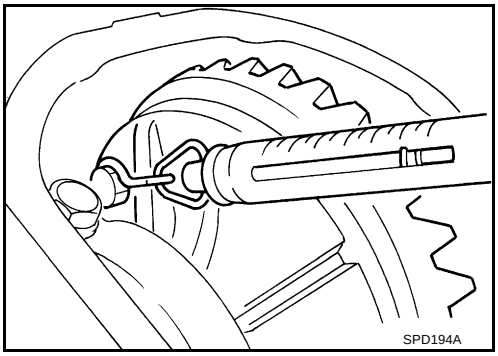

PDIA0069E

6. Measure the turning torque of the carrier at the drive gear mounting bolts with a spring gauge.

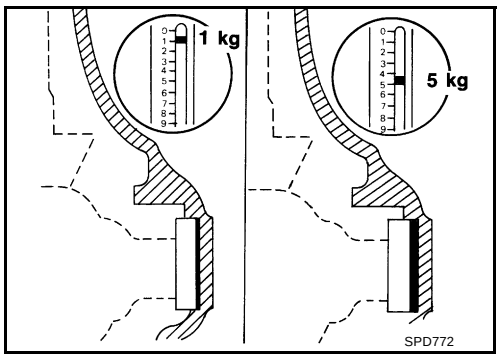
Tool number : — (J-8129)

Specification:

34.2 – 39.2 N (3.5 – 4.0 kg, 7.7 – 8.8 lb) of pulling force at the drive gear bolt


SPD194A

7. If the turning torque is outside the specification, use a thicker/ thinner side bearing adjusting washer to adjust. Refer to RFD-60, "Side Bearing Adjusting Washer" .



If the turning torque is less than the specified range:

Use a thicker thrust washer.

If the turning torque is greater than the specification:

Use a thinner thrust washer.

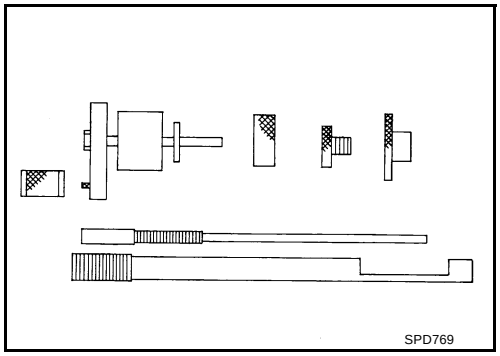
CAUTION:

Select a side bearing adjusting washer for right and left individually.

8. Record the total amount of washer thickness required for the correct carrier side bearing preload.

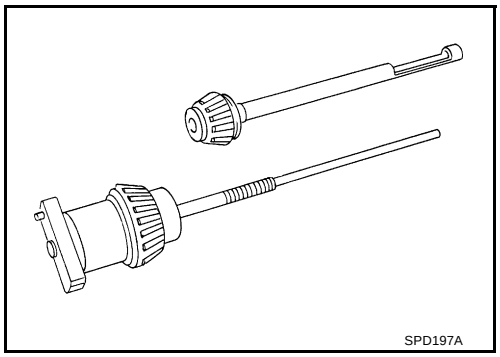
Pinion Gear Height

1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the differential shim selector tool.

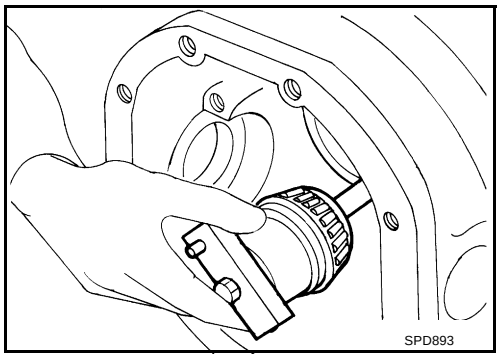


Tool number : — (J-34309)

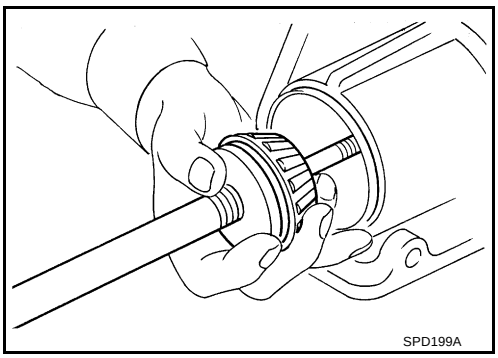
- **Pinion front bearing;** make sure the J-34309-3 pinion front bearing seat is secured tightly against the J-34309-2 gauge anvil. Then turn the pinion front bearing pilot, J-34309-5, to secure the bearing in its proper position.
- **Pinion rear bearing;** the pinion rear bearing pilot, J-34309-8, is used to center the pinion rear bearing only. The pinion rear bearing locking seat, J-34309-4, is used to lock the bearing to the assembly.
- **Installation of J-34309-9 and J-34309-16;** place a suitable 2.5 mm (0.098 in) thick plain washer between J-34309-9 and J-34309-16. Both surfaces of J-34309-9 and J-34309-16 must be parallel with a clearance of 2.5 mm (0.098 in).



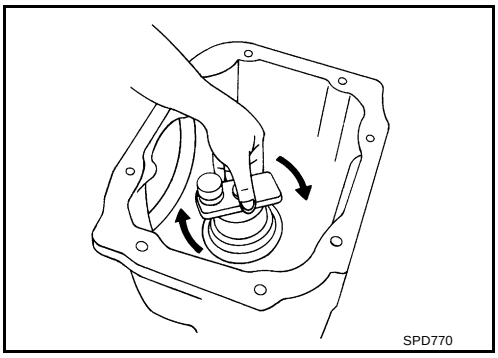
3. Install the pinion rear bearing inner race into gear carrier. Then place the pinion preload shim selector tool, J-34309-1, gauge screw assembly.



4. Assemble the pinion front bearing inner race and the J-34309-2 gauge anvil. Assemble them together with the J-34309-1 gauge screw in gear carrier. Make sure that the pinion height gauge plate, J-34309-16, will turn a full 360 degrees. Tighten the two sections together by hand.


SPD199A

5. Turn the assembly several times to seat the bearings.

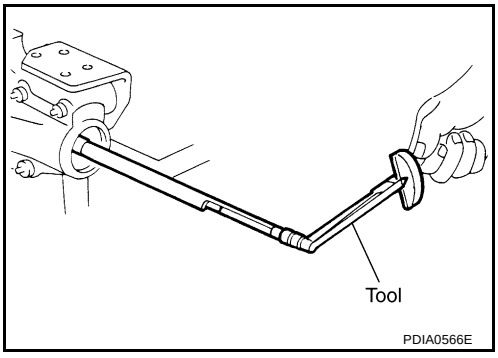

SPD770

6. Measure the turning torque at the end of the J-34309-2 gauge anvil using preload gauge.

Tool number : ST3127S000 (J-25765- A)

Turning torque specification:

1.0 – 1.3 N·m (0.11 – 0.13 kg-m, 9 – 11 in-lb)

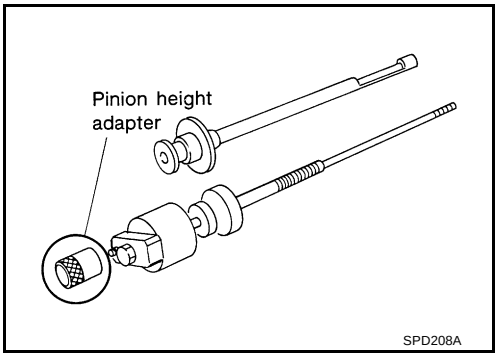


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7. Place the J-34309-11 “R200A” pinion height adapter onto the gauge plate and tighten it by hand.

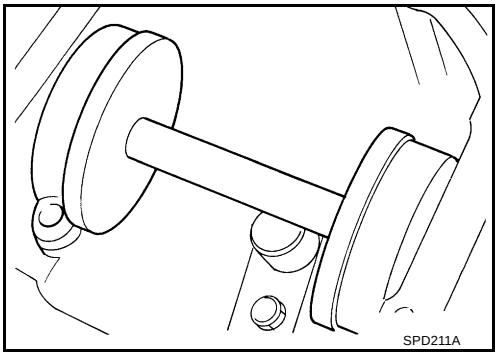
CAUTION:

Make sure all machined surfaces are clean.

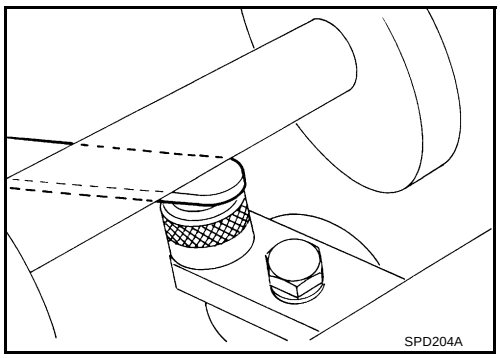


SPD208A

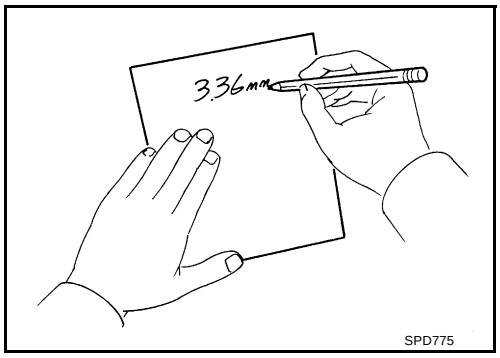
8. Position the side bearing discs, J-25269-4, and arbor firmly into the side bearing bores. Install the bearing caps and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-39, "COMPONENTS" .


SPD211A

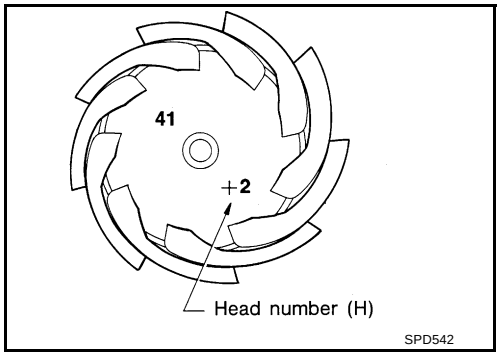
9. Select the correct standard pinion height adjusting washer thickness. Select by using a standard gauge of 3 mm (0.12 in) and your J-34309-101 feeler gauge. Measure the distance between the J-34309-11 pinion height adapter including the standard gauge and the arbor.



10. Write down exact measurement (the value of feeler gauge).



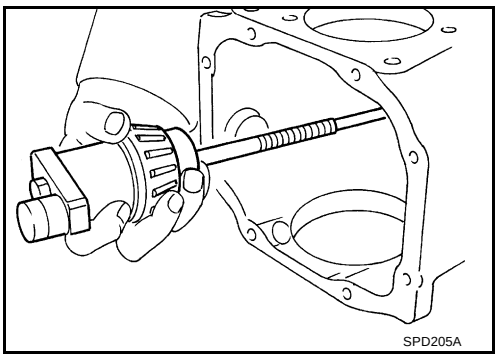
11. Correct the pinion height washer size by referring to the “pinion head number”.
There are two numbers painted on the drive pinion. The first one refers to the drive pinion and drive gear as a matched set. This number should be the same as the number on the drive gear. The second number is the “pinion head height number”. It refers to the ideal pinion height from standard for quietest operation. Use the following chart to determine the correct pinion height washer.



Pinion head height number	Add or remove from the standard pinion height adjusting washer thickness measurement
- 6	Add 0.06 mm (0.0024 in)
- 5	Add 0.05 mm (0.0020 in)
- 4	Add 0.04 mm (0.0016 in)
- 3	Add 0.03 mm (0.0012 in)
- 2	Add 0.02 mm (0.0008 in)
- 1	Add 0.01 mm (0.0004 in)
0	Use the selected washer thickness
+1	Subtract 0.01 mm (0.0004 in)
+2	Subtract 0.02 mm (0.0008 in)
+3	Subtract 0.03 mm (0.0012 in)
+4	Subtract 0.04 mm (0.0016 in)
+5	Subtract 0.05 mm (0.0020 in)
+6	Subtract 0.06 mm (0.0024 in)

12. Select the correct pinion height adjusting washer. Refer to RFD-60, "Pinion Height Adjusting Washer" .

13. Remove the J-34309 differential shim selector tool from the final drive housing. Then disassemble to retrieve the pinion bearings.



ASSEMBLY

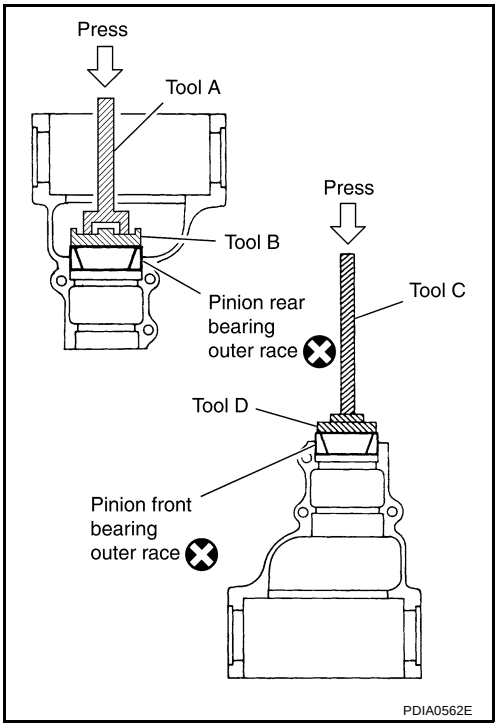
Drive Pinion Assembly

1. Install front and rear bearing outer races using drifts.

Tool number **A: ST30720000 (J-25405)**
B: KV40105230 (—)
C: ST30611000 (J-25742-1)
D: ST30613000 (J-25742-3)

CAUTION:
- **At first, using a hammer, tap bearing outer race until it becomes flat to gear carrier.**
- **Do not reuse pinion front and rear bearing outer race.**

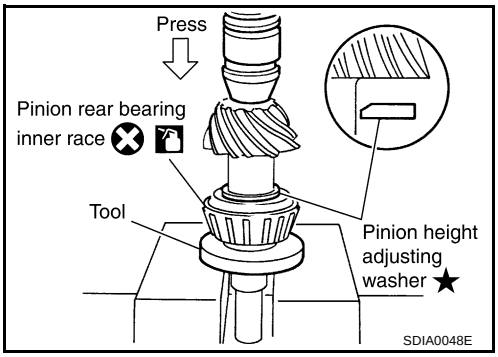
2. Select drive pinion height adjusting washer. Refer to RFD-50, "Pinion Gear Height" .



3. Install selected drive pinion height adjusting washer to drive pinion. Press pinion rear bearing inner race to it, using drift.

Tool number **: ST30901000 (J-26010-01)**

CAUTION:
- **Pay attention to the direction of pinion height adjusting washer. (Assemble as shown in the figure.)**
- **Do not reuse pinion rear bearing inner race.**

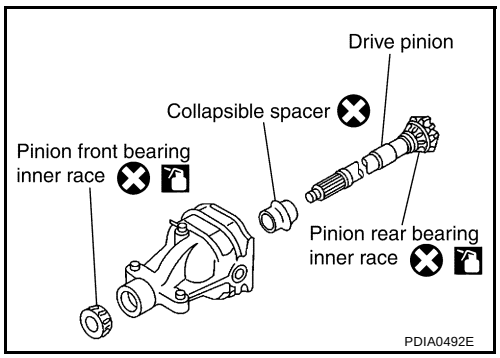


4. Assemble collapsible spacer to drive pinion.

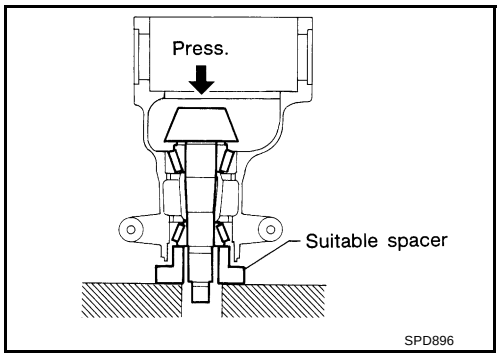
CAUTION:
Do not reuse collapsible spacer.

5. Apply gear oil to pinion rear bearing, and assemble drive pinion into gear carrier.
6. Apply gear oil to pinion front bearing, and assemble pinion front bearing inner race to drive pinion assembly.

CAUTION:
Do not reuse pinion front bearing inner race.



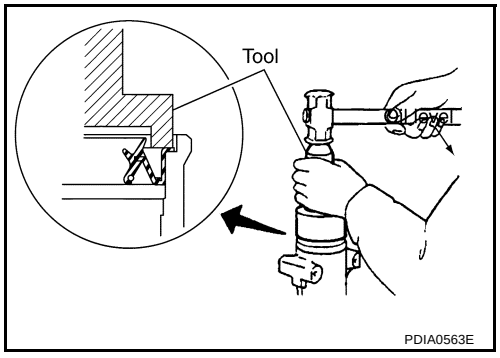
7. Using suitable spacer, press the pinion front bearing inner race to drive pinion as far as drive pinion nut can be tightened.



8. Using the drift, install front oil seal as shown in the figure.

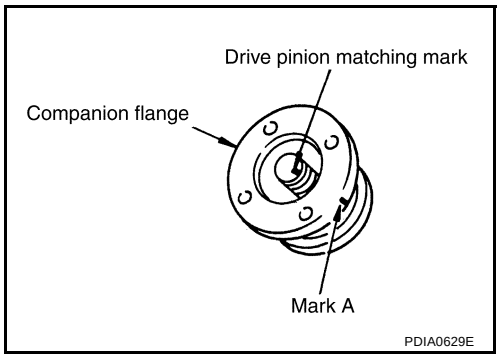
Tool number : ST30720000 (J-25405)

CAUTION:
- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**



9. Install companion flange.

NOTE:
When reusing drive pinion, align the matching mark of drive pinion with the matching mark A of companion flange, then install companion flange.



10. Apply anti-corrosion oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.

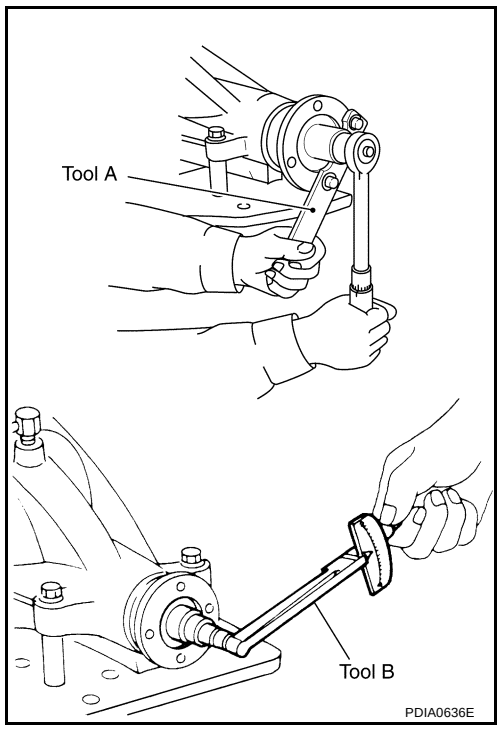
CAUTION:
Do not reuse drive pinion lock nut.

11. Adjust to the drive pinion lock nut tightening torque and pinion bearing preload torque.

Tool number **A: KV40104000 (—)**
B: ST3127S000 (J-25765-A)

Drive pinion lock nut tightening torque:
147 – 323 N·m (15 – 32 kg-m, 109 – 238 ft-lb)

Drive pinion bearing preload:
2.65 – 3.23 N·m (0.27 – 0.32 kg-m, 24 – 28 in-lb)



CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the preload torque.**
- **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.**

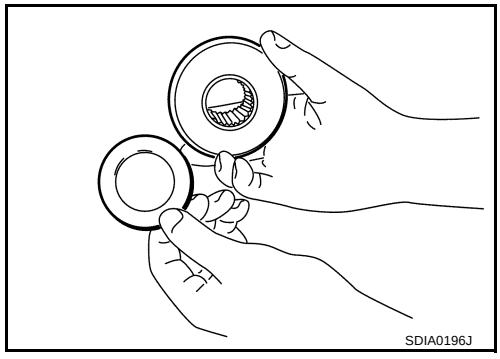
12. Install differential case assembly. Refer to RFD-44, "Differential Assembly" .

CAUTION:
Do not install rear cover yet.

13. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and companion flange runout. Refer to RFD-40, "Drive Gear Runout" , RFD-41, "Tooth Contact" , RFD-42, "Backlash" and RFD-43, "Companion Flange Runout" .
Recheck above items. Readjust the above description, if necessary.
14. Check total preload torque. Refer to RFD-40, "Total Preload Torque" .
15. Install rear cover. Refer toRFD-44, "Differential Assembly" .

Differential Assembly

1. Install side gear thrust washer with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the side gear.

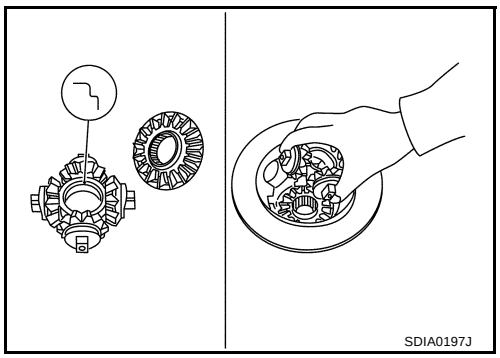


2. Install side gear and thrust washer into differential case B.

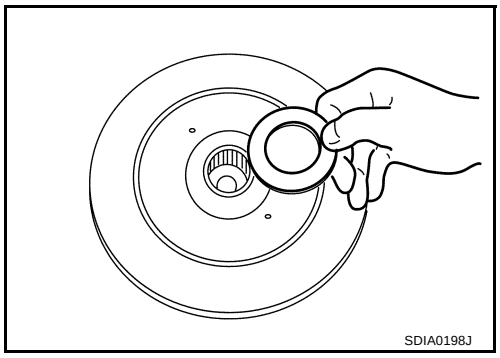
CAUTION:
Make sure that the circular clip is installed to side gear.

3. Install pinion mate assembly (pinion mate shaft, pinion mate gears and pinion mate thrust washers) into differential case B.

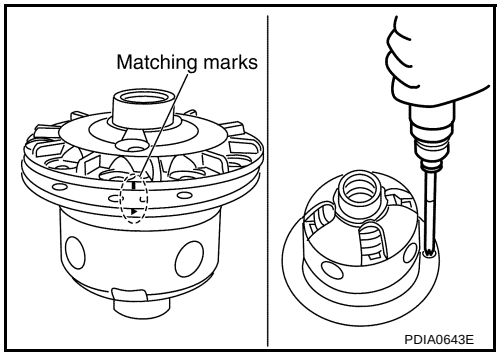
CAUTION:
The pinion mate shaft groove side shall be installed to side gear.


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4. Install viscous coupling into differential case B.
5. Install side gear thrust washer with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the viscous coupling.

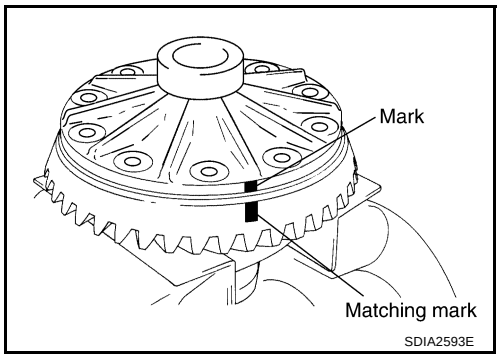

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6. Align the matching marks and install differential case A into differential case B.
7. Measure side gear end play. If necessary, select the appropriate side gear thrust washer. Refer to RFD-48, "Differential Side Gear Clearance" .



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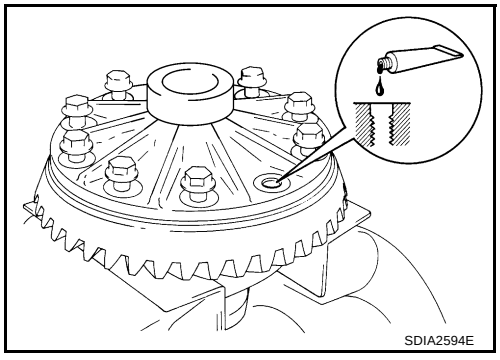
8. Align the matching mark of differential case with the mark of drive gear, then place drive gear.



SDIA2593E

9. Apply thread locking sealant into the thread hole of drive gear.
   - **Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

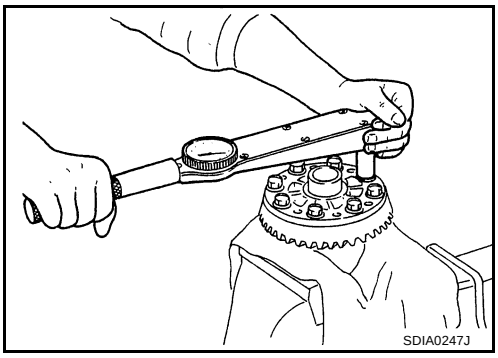
CAUTION:
Drive gear back and threaded holes shall be cleaned and degreased sufficiently.


SDIA2594E

10. Install drive gear on the mounting bolts, and then tighten to the specified torque. Refer to RFD-39, "COMPONENTS" .

CAUTION:

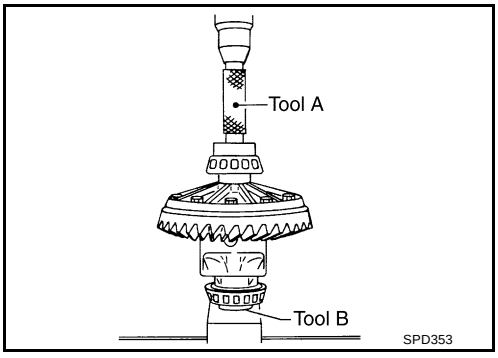
- **Tighten bolts in a crisscross fashion.**
- **After tightening the bolts to the specified torque, tighten the bolts additionally by turning the bolts 31 to 36 degrees.**



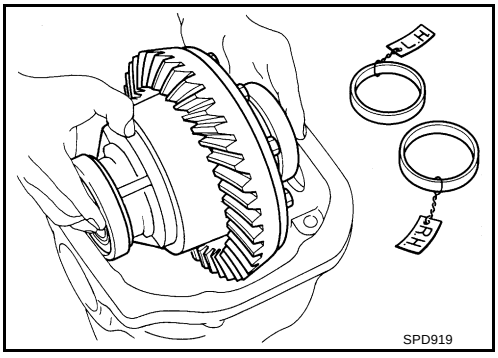
11. Press side bearing inner races to differential case, using the drift and the base.

Tool number **A: KV38100300 (J-25523)**
B: ST33061000 (J-8107-2)

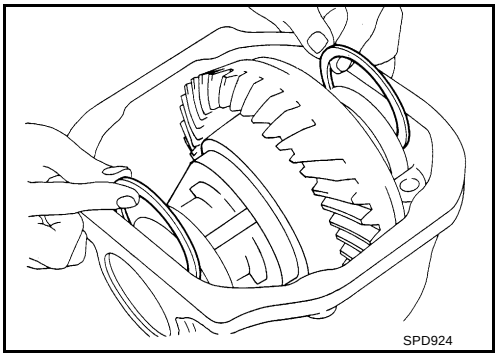
CAUTION:
Do not reuse side bearing inner race.



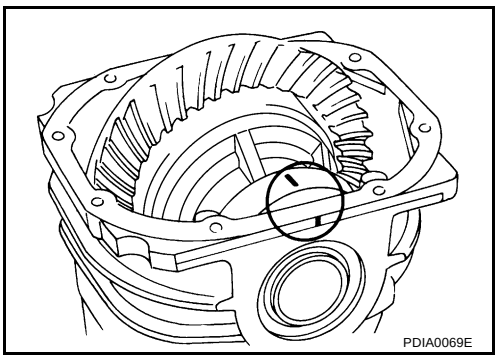
12. Install differential case assembly with side bearing outer races into gear carrier.
13. Measure side bearing preload. If necessary, select the appropriate side bearing adjusting washers. Refer to RFD-49, "Side Bearing Preload" .



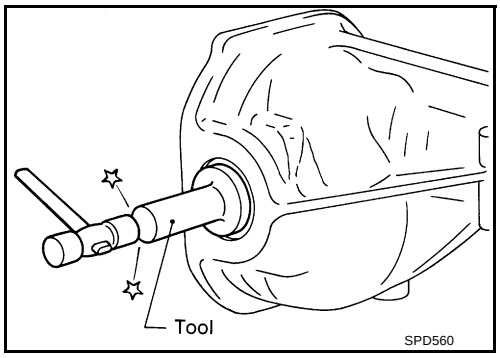
14. Insert selected left and right side bearing adjusting washers in place between side bearings and gear carrier.



15. Align matching marks on bearing cap with that on gear carrier.
16. Install bearing caps and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-39, "COMPONENTS" .



17. Using the drift, drive side oil seals until it becomes flush with the case end.



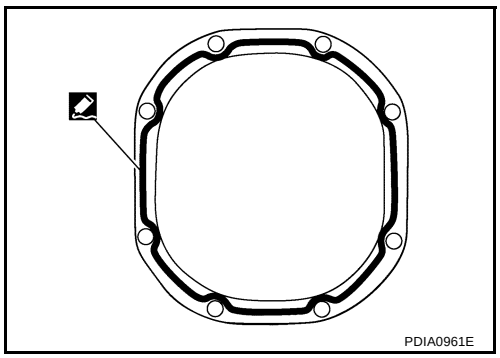
Tool number : KV38100200 (J-26233)

CAUTION:

- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**

18. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and total preload torque. Refer to RFD-40, "Drive Gear Runout" , RFD-41, "Tooth Contact" , RFD-42, "Backlash" and RFD-40, "Total Preload Torque" .
Recheck above items. Readjust the above description, if necessary.

19. Apply sealant to mating surface of rear cover.



- **Use Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

CAUTION:

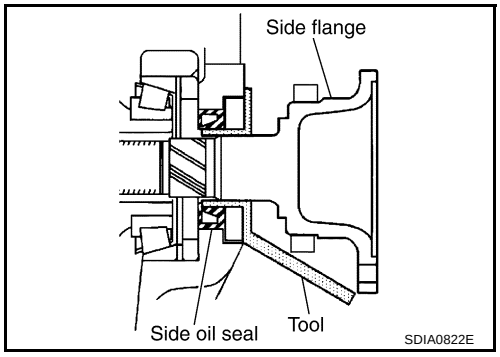
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.

20. Install rear cover on gear carrier and tighten mounting bolts with the specified torque. Refer to RFD-39, "COMPONENTS" .
21. Install side flange with the following procedure.

NOTE:

Install the RH side flange, then install the LH side flange. If LH side flange is installed first, the RH side flange comes out sometimes from the shock of installing the RH side flange.

a. Attach the protector to side oil seal.



Tool number : KV38107900 (J-39352)

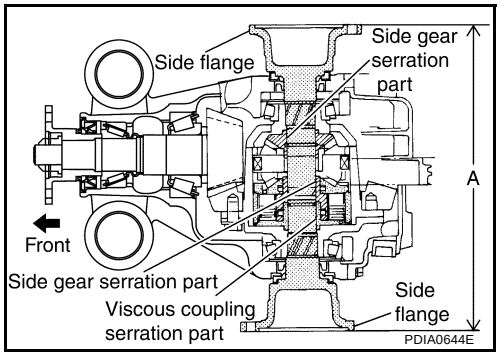
b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.

c. Put a suitable drift on the center of side flange, then drive it until sound changes.

NOTE:

When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

d. Confirm that the dimension of the side flange installation (Measurement A) in the figure comes into the following.



Measurement A: 326 – 328 mm (12.83 – 12.91 in)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NDS0000L

Applied model	VQ35DE	
	M/T	A/T
Final drive model	R200	R200V (With LSD)
Gear ratio	3.538	3.357
Number of teeth (Drive gear/Drive pinion)	46/13	47/14
Oil capacity (Approx.) ℓ (US pt, Imp pt)	1.4 (3, 2-1/2)	
Number of pinion gears	2	4
Drive pinion adjustment spacer type	Collapsible	

Inspection and Adjustment

NDS0000M

DRIVE GEAR RUNOUT

Item	Runout limit
Drive gear back face	0.05 mm (0.0020 in) or less

DIFFERENTIAL SIDE GEAR CLEARANCE

Item	Specification	
	R200	R200V (With LSD)
Side gear backlash (Clearance between side gear and differential case)	0.2 mm (0.008 in) or less (Each gear should rotate smoothly without excessive resistance during differential motion.)	0.15 mm (0.0059 in) or less (Each gear should rotate smoothly without excessive resistance during differential motion.)

PRELOAD TORQUE

Item	Specification
Pinion bearing (P_1)	2.65 – 3.23 N·m (0.27 – 0.32 kg-m, 24 – 28 in-lb)
Side bearing (P_2)	0.20 – 0.52 N·m(0.02 – 0.05 kg-m, 2 – 4 in-lb)
Side bearing to pinion bearing (Total preload) (Total preload = P_1 + P_2)	2.85 – 3.75 N·m(0.29 – 0.38 kg-m, 26 – 33 in-lb)

BACKLASH

Item	Specification
Drive gear to drive pinion gear	0.10 – 0.15 mm (0.0039 – 0.0059 in)

COMPANION FLANGE RUNOUT

Item	Runout limit
Companion flange face	0.08 mm (0.0031 in) or less
Inner side of the companion flange	0.08 mm (0.0031 in) or less

SELECTIVE PARTS

Side Gear Thrust Washer

Unit: mm (in)

R200		R200V			
Thickness	Part number*	Thickness	Part number*	Thickness	Part number*
0.75 (0.0295)	38424 EC000	0.80 (0.0315)	38424 40F60	1.16 (0.0457)	38424 40F72
0.78 (0.0307)	38424 EC001	0.83 (0.0327)	38424 40F61	1.19 (0.0469)	38424 40F73
0.81 (0.0319)	38424 EC002	0.86 (0.0339)	38424 40F62	1.22 (0.0480)	38424 40F74
0.84 (0.0331)	38424 EC003	0.89 (0.0350)	38424 40F63	1.25 (0.0492)	38424 40F75
0.87 (0.0343)	38424 EC004	0.92 (0.0362)	38424 40F64	1.28 (0.0504)	38424 40F76
0.90 (0.0350)	38424 EC005	0.95 (0.0374)	38424 40F65	1.31 (0.0516)	38424 40F77
0.93 (0.0366)	38424 EC006	0.98 (0.0386)	38424 40F66	1.34 (0.0528)	38424 40F78
		1.01 (0.0398)	38424 40F67	1.37 (0.0539)	38424 40F79
		1.04 (0.0409)	38424 40F68	1.40 (0.0551)	38424 40F80
		1.07 (0.0421)	38424 40F69	1.43 (0.0563)	38424 40F81
		1.10 (0.0433)	38424 40F70	1.46 (0.0575)	38424 40F82
		1.13 (0.0445)	38424 40F71	1.49 (0.0587)	38424 40F83

*: Always check with the Parts Department for the latest parts information.

Pinion Height Adjusting Washer

Unit: mm (in)

R200, R200V			
Thickness	Part number*	Thickness	Part number*
3.05 (0.1201)	38154 0C000	3.29 (0.1295)	38154 0C008
3.08 (0.1213)	38154 0C001	3.32 (0.1307)	38154 0C009
3.11 (0.1224)	38154 0C002	3.35 (0.1319)	38154 0C010
3.14 (0.1236)	38154 0C003	3.38 (0.1331)	38154 0C011
3.17 (0.1248)	38154 0C004	3.41 (0.1343)	38154 0C012
3.20 (0.1260)	38154 0C005	3.44 (0.1354)	38154 0C013
3.23 (0.1272)	38154 0C006	3.47 (0.1366)	38154 0C014
3.26 (0.1283)	38154 0C007	3.50(0.1378)	38154 0C015

*: Always check with the Parts Department for the latest parts information.

Side Bearing Adjusting Washer

Unit: mm (in)

R200, R200V			
Thickness	Part number*	Thickness	Part number*
2.00 (0.0787)	38453 N3100	2.35 (0.0925)	38453 N3107
2.05 (0.0807)	38453 N3101	2.40 (0.0945)	38453 N3108
2.10 (0.0827)	38453 N3102	2.45 (0.0965)	38453 N3109
2.15 (0.0846)	38453 N3103	2.50 (0.0984)	38453 N3110
2.20 (0.0866)	38453 N3104	2.55 (0.1004)	38453 N3111
2.25 (0.0886)	38453 N3105	2.60 (0.1024)	38453 N3112
2.30 (0.0906)	38453 N3106	2.65 (0.1043)	38453 N3113

*: Always check with the Parts Department for the latest parts information.

SECTION RSU
REAR SUSPENSION

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PRECAUTIONS

PFP:00001

Cautions

NES0000K

- When installing rubber bushings, final tightening must be carried out under unladen conditions with tires on ground. Oil will shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Caulking nuts are not reusable. Always use new ones when installing. Since new caulking nuts are pre-oiled, tighten as they are.

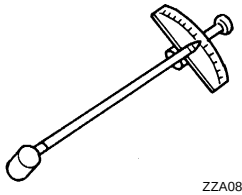
PREPARATION

PFP:00002

Special Service Tools

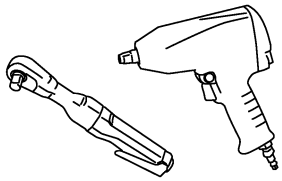
NES0000L

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST3127S000 (J-25765-A) Preload gauge  ZZA0806D	Measuring rotating torque of ball joint

Commercial Service Tools

NES0000M

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NES0000N

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			RSU-7	RSU-9	—	—	—	RSU-7	RSU-5	RSU-16	NVH in PR section.	NVH in RFD section.	NVH in RAX and RSU sections.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	REAR AXLE AND REAR SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	REAR SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×	×	×	×
		Shake	×	×	×	×		×			×		×	×	×	×	×	×
		Vibration	×	×	×	×	×				×		×	×		×		×
		Shimmy	×	×	×	×			×				×	×	×		×	×
		Judder	×	×	×								×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×			

×: Applicable

REAR SUSPENSION ASSEMBLY

PFP:55020

On-Vehicle Inspection

NES0000O

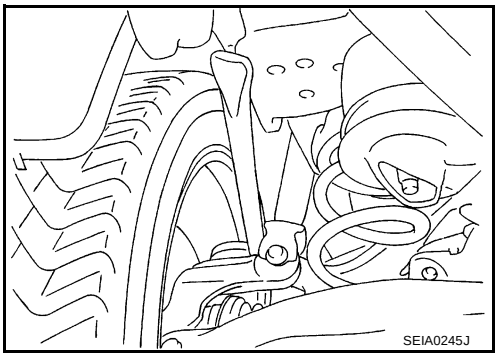
Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

INSPECTION OF SUSPENSION ARM BALL JOINT END PLAY

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between suspension arm and axle.

  Axial end play : 0 mm (0 in)

  CAUTION:
  Be careful not to damage ball joint boot.


SEIA0245J

SHOCK ABSORBER INSPECTION

- Check shock absorber for oil leakage, damage and replace if necessary.

Wheel Alignment Inspection

NES0000P

DESCRIPTION

- Measure wheel alignment under unladen conditions. “Unladen conditions” means that fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats in designated positions.

PRELIMINARY INSPECTION

- Check tires for improper air pressure and wear.
- Check road wheels for runout.
- Check wheel bearing axial end play.
- Check ball joint axial end play of suspension arm.
- Check shock absorber operation.
- Check each mounting point of axle and suspension for looseness and deformation.
- Check each link, arm and member for cracks, deformation, and other damage.
- Check vehicle posture.

GENERAL INFORMATION AND RECOMMENDATIONS

- A four-wheel thrust alignment should be performed.
  - This type of alignment is recommended for any NISSAN/INFINITI vehicle.
  - The four-wheel “thrust” process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
  - The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
  - The rack should be checked to ensure that it is level.
- Make sure the machine is properly calibrated.
  - Your alignment equipment should be regularly calibrated in order to give correct information.
  - Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

THE ALIGNMENT PROCESS

IMPORTANT:

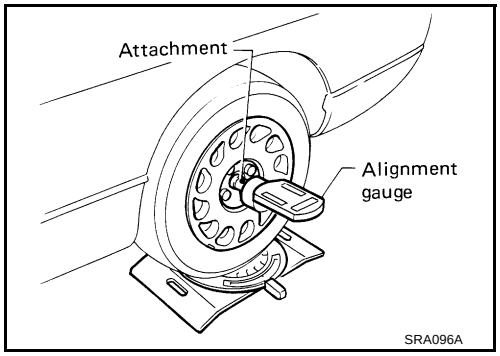
Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Do NOT use these indicators.**
  - The alignment specifications programmed into your machine that operate these indicators may not be correct.
  - This may result in an ERROR.
- Some newer alignment machines are equipped with an optional “Rolling Compensation” method to “compensate” the sensors (alignment targets or head units). **DO NOT use this “Rolling Compensation” method.**
  - Use the “Jacking Compensation Method”. After installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.
  - See Instructions in the alignment machine you're using for more information on this.

CAMBER INSPECTION

- Measure camber of both right and left wheels with a suitable alignment gauge and adjust in accordance with the following procedures.

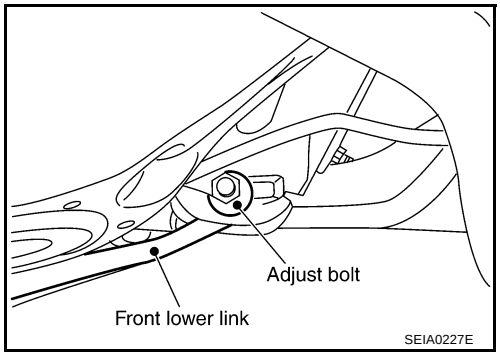
Camber **: Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .**



If outside the standard value, adjust with adjusting bolt in front lower link.

NOTE:

After adjusting camber, be sure to check toe-in.



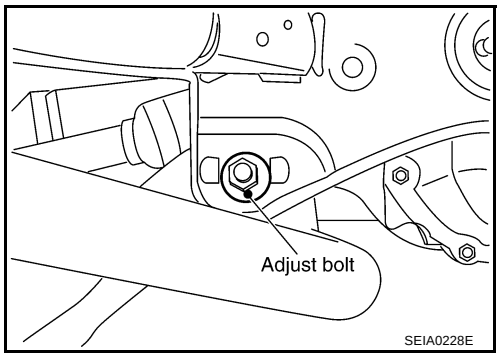
TOE-IN

If toe-in is not within the specification, adjust with adjusting bolt in rear lower link.

CAUTION:

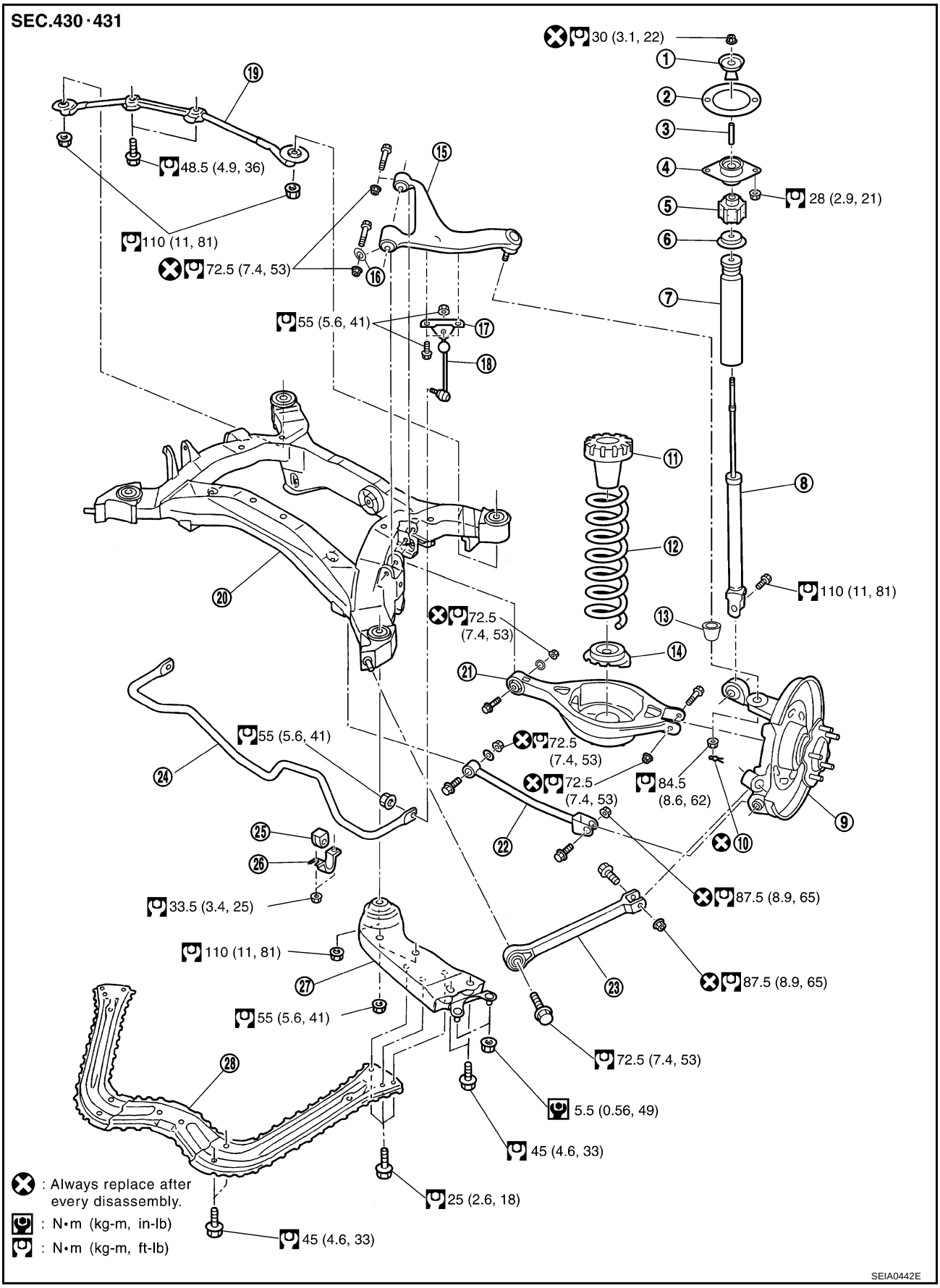
Be sure to adjust equally on RH and LH side with adjusting bolt.

If toe-in is not still within the specification, inspect and replace any damaged or worn rear suspension parts.



Components

NES0000Q



1. Bushing
2. Mounting seal
3. Distance tube
4. Mounting seal bracket
5. Bushing
6. Bound bumper cover
7. Bound bumper
8. Shock absorber
9. Axle
10. Cotter pin
11. Upper seat
12. Coil spring
13. Ball seat
14. Rubber seat
15. Suspension arm
16. Stopper rubber
17. Stabilizer connecting rod mounting bracket
18. Stabilizer connecting rod
19. Rear pin stay
20. Rear suspension member
21. Rear lower link
22. Front lower link
23. Radius rod
24. Stabilizer bar
25. Stabilizer bushing
26. Stabilizer clamp
27. Member stay
28. Tunnel stay

Removal and Installation

NES0000R

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-39, "REAR DISC BRAKE" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove stabilizer bar. Refer to RSU-16, "STABILIZER BAR" .
4. Remove rear exhaust tube. Refer to EX-3, "EXHAUST SYSTEM" .
5. Remove rear propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .
6. Separate attachment bolts between parking brake cable and vehicle and rear suspension member. Refer to PB-4, "PARKING BRAKE CONTROL" .
7. Remove wheel sensor from rear final drive.
8. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
9. Remove fixing bolt in upper side of mounting seal bracket. Refer to RSU-9, "SHOCK ABSORBER" .
10. Set jack under rear final drive.
11. Remove tunnel stay and member stay from vehicle.
12. Remove fixing bolts and nuts of rear pin stay and then remove rear pin stay from vehicle.
13. Gradually lowering jack, remove rear suspension assembly.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of installation position of links (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

SHOCK ABSORBER

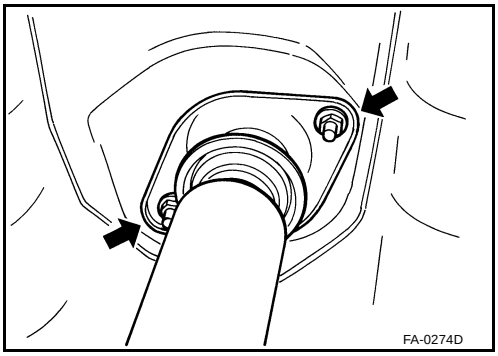
PFP:56210

Removal and Installation

NES0000S

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Remove fixing bolt in lower side of shock absorber assembly with power tool.
4. Remove mounting seal bracket fixing nuts of shock absorber upper side with power tool and remove shock absorber from vehicle.



INSPECTION AFTER REMOVAL

- Check shock absorber assembly for deformation, cracks, damage, and replace if necessary.
- Check piston rod for damage, uneven wear or distortion, and replace if necessary.
- Check welded and sealed areas for oil leakage, and replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber assembly lower side (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

Disassembly and Assembly

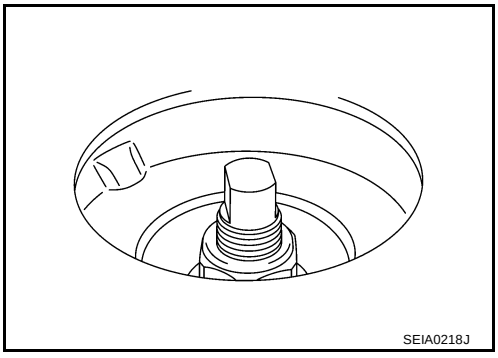
NES0000T

DISASSEMBLY

CAUTION:
Make sure piston rod on shock absorber is not damaged when removing components from shock absorber.

1. Remove mounting seal from mounting seal bracket.
2. Wrap a shop cloth around lower side of shock absorber and fix it in a vise.

   CAUTION:
   Do not set the cylindrical part of shock absorber in vise.
3. Secure piston rod tip so that piston rod does not turn, and remove piston rod lock nut.
4. Remove bushing (Upper side), distance tube, mounting seal bracket, bushing (Lower side), bound bumper cover and bound bumper from shock absorber.



INSPECTION AFTER DISASSEMBLY

Bound Bumper and Bushing

- Check bound bumper and bushing for cracks, deformation or other damage. Replace if necessary.

ASSEMBLY

- Refer to RSU-7, "Components" for tightening torque. Assembly in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

  CAUTION:
  Make sure piston rod on shock absorber is not damaged when attaching components to shock absorber.

SUSPENSION ARM

PFP:55501

Removal and Installation

NES0000U

REMOVAL

1. Remove tire with power tool.
2. Remove drive shaft. Refer to RAX-10, "REAR DRIVE SHAFT" .
3. Remove fixing nuts and bolts between suspension arm and rear suspension member.
4. Remove cotter pin of suspension arm ball joint, and loosen nut.
5. Use a ball joint remover (suitable tool) to remove suspension arm from axle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove suspension arm and stopper rubber from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check suspension arm and bushing for deformation, cracks or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks or damage, and also for grease leakage.

Ball Joint Inspection

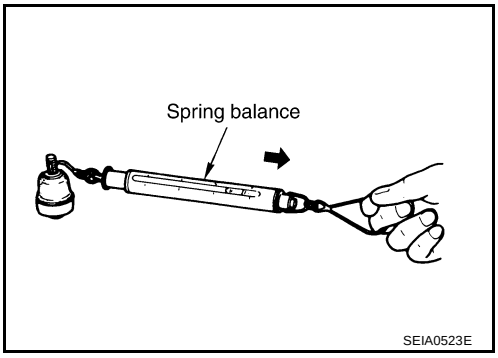
- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measuring, move ball joint at least ten times by hand to check for smooth movement.

- Hook spring balance at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.

  Swing torque:
  0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)
  Measured value of spring balance:
  8.06 - 54.8 N (0.83 - 5.5 kg, 1.81 - 12.32 lb)

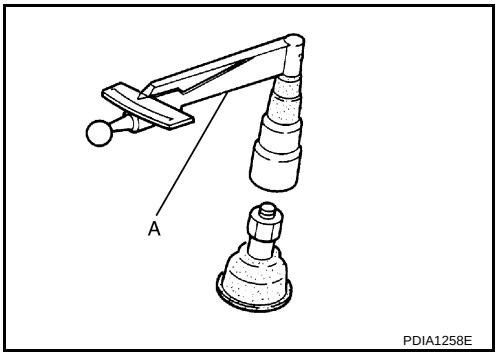


- If it is outside the specified range, replace suspension arm assembly.

Rotating Torque Inspection

- Attach mounting nut to ball stud. Make sure that sliding torque is within the specifications with a preload gauge.

  Tool number A: ST3127S000 (J-25765-A)
  Rotating torque:
  0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)



- If it is outside the specified range, replace suspension arm assembly.

Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

  Axial end play : 0 mm (0 in)
- If it is outside the specified range, replace suspension arm assembly.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of rear suspension member installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

RADIUS ROD

PFP:55110

Removal and Installation

NES0000V

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-39, "REAR DISC BRAKE" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove fixing bolt and nut in axle side of radius rod with power tool.
4. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
5. Remove fixing bolt in lower side of shock absorber with power tool.
6. Remove fixing bolt and nut in axle side of front lower link with power tool.
7. Remove fixing bolt in rear suspension member side of radius rod with power tool, then remove radius rod from vehicle.

INSPECTION AFTER REMOVAL

- Check radius rod and bushing for any deformation, cracks, or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

FRONT LOWER LINK

PFP:55110

Removal and Installation

NES0000W

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Remove fixing nut and bolt between front lower link and rear suspension member with power tool.
4. Remove fixing nut and bolt between front lower link and axle with power tool.
5. Remove front lower link from vehicle.

INSPECTION AFTER REMOVAL

- Check front lower link and bushing for any deformation, cracks, or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-7, "Components" .

REAR LOWER LINK & COIL SPRING

PFP:551B0

Removal and Installation

NES0000X

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Loosen fixing bolt and nut of rear lower link in side of suspension member, and then remove fixing bolt and nut in side of axle with power tool.
4. Slowly lower jack, then remove upper seat, coil spring and rubber sheet from rear lower link.
5. Remove fixing bolt and nut in side of rear suspension member to remove rear lower link with power tool.

INSPECTION AFTER REMOVAL

- Check rear lower link, bushing and coil spring for deformation, cracks, and damage. Replace rear lower link and coil spring if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

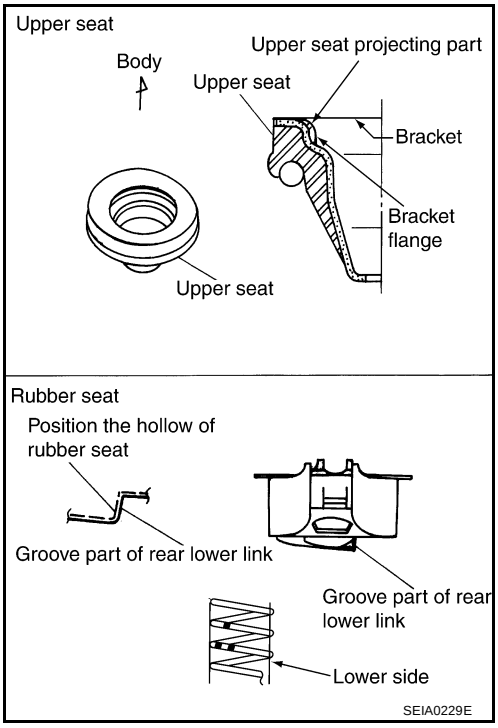
- Check that upper seat is attached as shown in the figure.

  NOTE:
  Insert bracket tabs (3) and the inside protrusion on upper seat into each other beforehand as shown in the figure.

- Match up rubber seat indentions and rear lower link grooves and attach.

  NOTE:
  Make sure spring is not up side down. The top and bottom are indicated by paint color.

- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .



STABILIZER BAR

PFP:56230

Removal and Installation

NES0000Y

REMOVAL

1. Remove fixing bolts and remove stabilizer connecting rod mount bracket from suspension arm.
2. Remove lower side fixing nut on stabilizer connecting rod and remove stabilizer connecting rod from stabilizer bar with power tool.
3. Remove fixing nut on stabilizer clamp and remove stabilizer from vehicle with power tool.

INSPECTION AFTER REMOVAL

- Check stabilizer bar, stabilizer bushings, stabilizer clamp, stabilizer connecting rod, stabilizer connecting rod mounting bracket for any deformation, crack or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

REAR SUSPENSION MEMBER

PFP:55501

Removal and Installation

NES0000Z

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-39, "REAR DISC BRAKE" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove rear exhaust tube. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove stabilizer bar. Refer to RSU-16, "STABILIZER BAR" .
5. Remove drive shaft. Refer toRAX-10, "REAR DRIVE SHAFT" .
6. Remove final drive. Refer to RFD-17, "REAR FINAL DRIVE ASSEMBLY" .
7. Separate the attachment between parking brake cable and vehicle and rear suspension member. Refer to PB-4, "PARKING BRAKE CONTROL" .
8. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
9. Remove fixing bolt in lower side of shock absorber.
10. Set jack under rear suspension member.
11. Remove fixing bolts and nuts tunnel stay and member stay from vehicle.
12. Remove fixing bolts and nuts of rear pin stay and then remove rear pin stay from vehicle.
13. Slowly lowering jack, then remove rear suspension member, suspension arm, radius rod, front lower link and axle from vehicle as a unit.
14. Remove fixing bolts and nuts, then remove suspension arm, front lower link, radius rod from rear suspension member.

INSPECTION AFTER REMOVAL

- Check rear suspension member for deformation, cracks, and other damage and replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" , for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of installation position of links (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Alignment (Unladen*)

NES00010

Camber Degree minute (Decimal degree)		Minimum	–2° 05′ (–2.08°)
		Nominal	–1° 35′ (–1.58°)
		Maximum	–1° 05′ (–1.08°)
Total toe-in	Distance	Minimum	1.1 mm (0.043 in)
		Nominal	1.9 mm (0.075 in)
		Maximum	2.7 mm (0.106 in)
	Angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0° 02′ 54″ (0.05°)
		Nominal	0° 04′ 54″ (0.08°)
		Maximum	0° 06′ 54″ (0.12°)

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

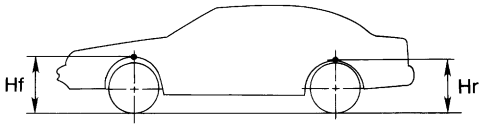
Ball Joint

NES00011

Axial end play	0 mm (0 in)
Swing torque	0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)
Measurement on spring balance (cotter pinhole position)	8.06 - 54.8 N (0.83 - 5.5 kg, 1.81 - 12.32 lb)
Rotating torque	0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)

Wheelarch Height (Unladen*)

NES00012



SFA818A

Applied model	225/45R18 (Front) 245/45R18 (Rear)		245/40R18 (Front) 265/35R19 (Rear)
	Coupe	Roadster	Coupe
Front (Hf)	683 mm (26.89 in)		683 mm (26.89 in)
Rear (Hr)	706 mm (27.80 in)	705 mm (27.76 in)	703 mm (27.68 in)

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

SECTION SB
SEAT BELTS

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NHS00001

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precaution for Seat Belt Service

NHS00002

CAUTION:

- **Before removing the seat belt pre-tensioner assembly, turn the ignition switch off, disconnect the both battery cables and wait at least 3 minutes.**
- **Do not use electrical test equipment for seat belt pre-tensioner connector.**
- **After replacing or reinstalling seat belt pre-tensioner assembly, or reconnecting front seat belt pre-tensioner connector, check the system function. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**
- **Do not use disassemble buckle or seat belt assembly.**
- **Replace anchor bolts if they are deformed or worn out.**
- **Never oil tongue and buckle.**
- **If any component of seat belt assembly is questionable, do not repair. Replace the whole seat belt assembly.**
- **If webbing is cut, frayed, or damaged, replace seat belt assembly.**
- **When replacing seat belt assembly, use a genuine NISSAN seat belt assembly.**

AFTER A COLLISION

WARNING:

Inspect all seat belt assemblies including retractors and attaching hardware after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.

Replace any seat belt assembly (including anchor bolts) if:

- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident. (i.e. torn webbing, bent retractor or guide).
- The seat belt attaching point was damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair as necessary before installing a new seat belt assembly.
- Anchor bolts are deformed or worn out.
- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

Precautions for Battery Service

NHS00003

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

SEAT BELTS

PFP:86884

System Description

NHS00004

SEAT BELT WARNING CHIME

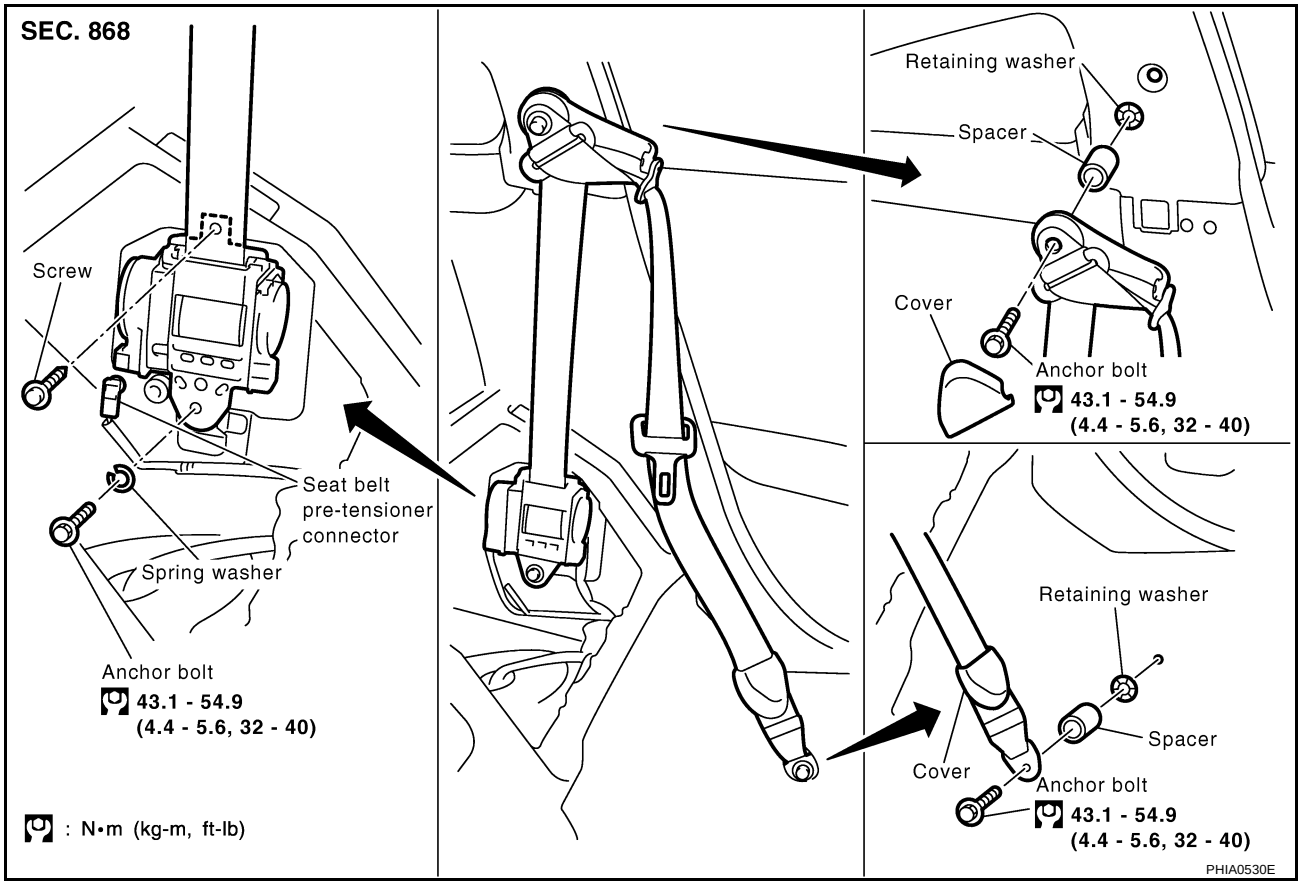
- With ignition switch turned ON and seat belt unfastened (seat belt switch ON), warning chime will sound for approximately 6 seconds.
- If warning chime does not sound. Refer to DI-88, "Seat Belt Buckle Switch (Driver Side) Signal Inspection" .

SEAT BELT WARNING LAMP

- Fasten driver's seat belt.
- The seat belt warning lamp should go out.
- If the seat belt warning lamp does not go out. Refer to DI-58, "Wiring Diagram — WARN —" .

Removal and Installation of Seat Belt (Coupe)

NHS00005



CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

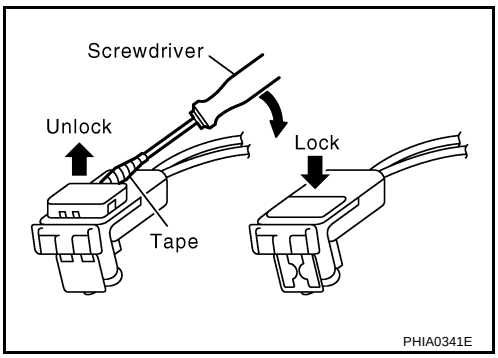
REMOVAL OF SEAT BELT RETRACTOR

1. Remove the shoulder anchor cover on the seat belt anchor.
2. Remove the anchor bolt.
3. Slide up outer anchor cover, and remove the anchor bolt.
4. Remove the rear side finisher and rear pillar finisher. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
5. Remove the center console. Refer to IP-10, "Component Parts Drawing" .
6. Remove the luggage floor finisher lower. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
7. Remove the woofer and woofer amp. (BOSE system) bracket mounting bolts. Refer to AV-49, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" .
8. Remove the rear floor box. Refer to EI-39, "Removal and Installation (for Coupe Models)" .

9. Disconnect the seat belt pre-tensioner connector.

CAUTION:

- **For installing/removing pre-tensioner seat belt connector, insert screwdriver wrapped in tape into notch, lift lock and remove connector.**
- **Install connector with lock raised, and push lock into connector.**



10. Remove the seat belt pre-tensioner retractor fixing screw and anchor bolt, and then remove the seat belt retractor.

INSTALLATION OF SEAT BELT RETRACTOR

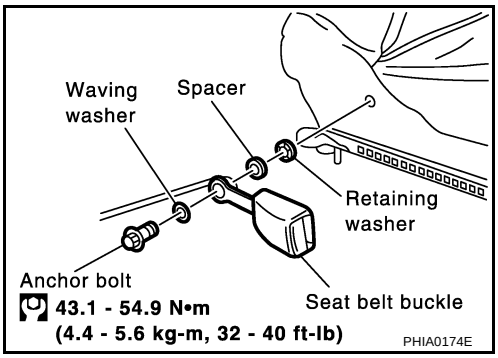
CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

Install in the reverse order of removal.

REMOVAL OF SEAT BELT BUCKLE

1. Remove the seat. Refer to SE-73, "REMOVAL" .
2. Remove the screws, and remove the seat cushion inner finisher.
3. Remove the anchor bolt, and remove the buckle.

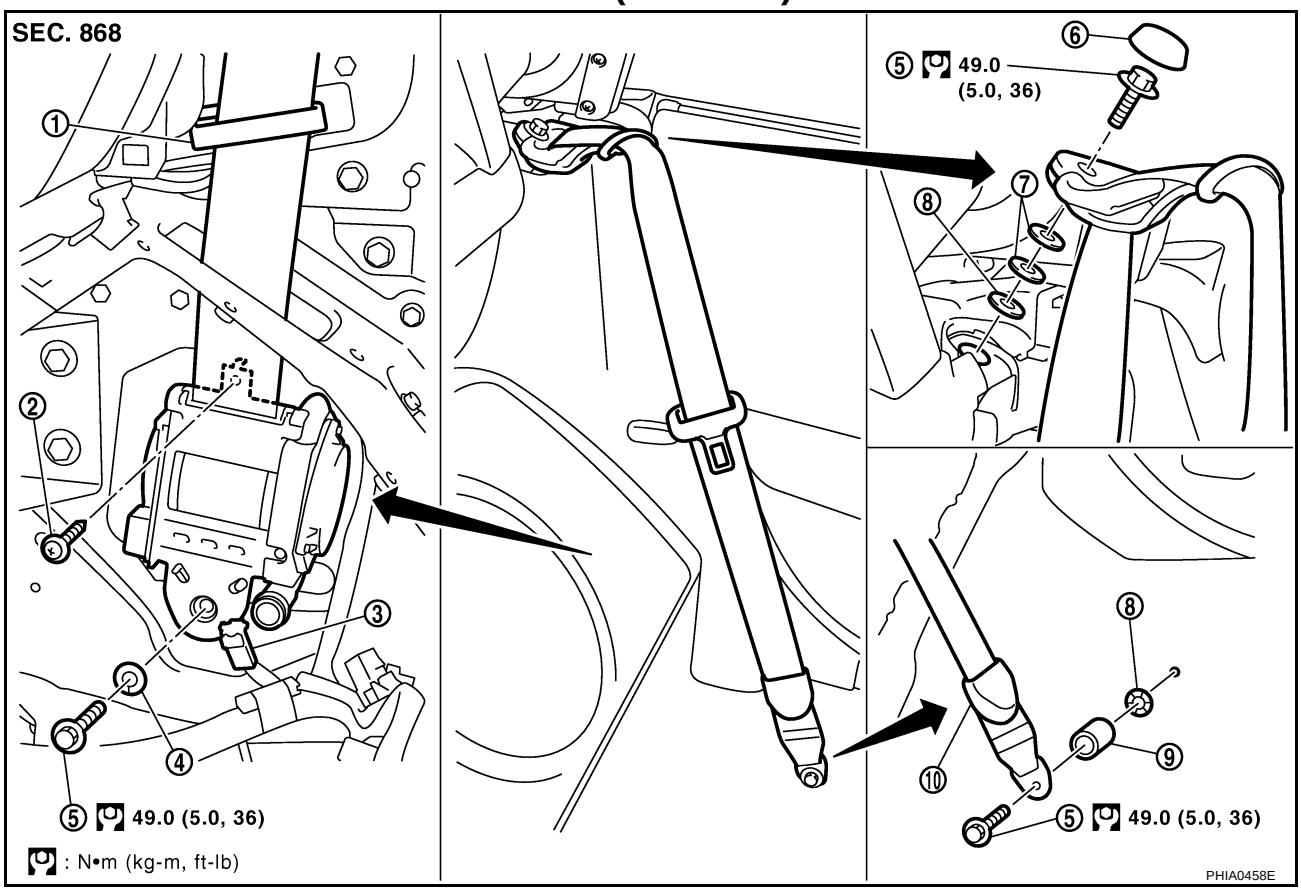


INSTALLATION OF SEAT BELT BUCKLE

Install in the reverse order of removal.

Removal and Installation of Seat Belt (Roadster)

NHS00006



1. Sash guide
2. Screw
3. Seat belt pre-tensioner connector
4. Spring washer
5. Anchor bolt
6. Shoulder anchor cover
7. Spacer
8. Retaining washer
9. Spacer
10. Outer anchor cover

CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

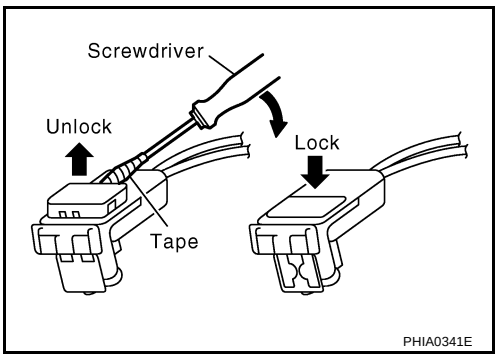
REMOVAL OF SEAT BELT RETRACTOR

1. Remove the shoulder anchor cover on the seat belt anchor.
2. Remove the anchor bolt.
3. Slide up outer anchor cover, and remove the anchor bolt.
4. Remove the rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
5. Remove the center console. Refer to IP-10, "Component Parts Drawing" .
6. Remove the luggage floor finisher lower. Refer to EI-41, "Removal and Installation (for Roadster Models)" .
7. Remove the woofer and woofer amp. (BOSE system) bracket mounting bolts. Refer to AV-49, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" .
8. Remove the rear floor box. Refer to EI-41, "Removal and Installation (for Roadster Models)" .

9. Disconnect the seat belt pre-tensioner connector.

CAUTION:

- **For installing/removing pre-tensioner seat belt connector, insert screwdriver wrapped in tape into notch, lift lock and remove connector.**
- **Install connector with lock raised, and push lock into connector.**



10. Remove the seat belt pre-tensioner retractor fixing screw and anchor bolt, and then remove the seat belt retractor.
11. Remove the sash guide and then remove the seat belt assembly.

INSTALLATION OF SEAT BELT RETRACTOR

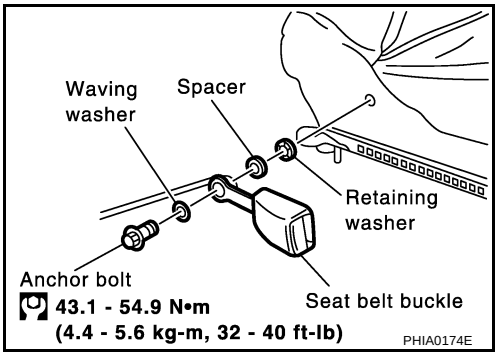
CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

Install in the reverse order of removal.

REMOVAL OF SEAT BELT BUCKLE

1. Remove the seat. Refer to SE-73, "REMOVAL" .
2. Remove the screws, and remove the seat cushion inner finisher.
3. Remove the anchor bolt, and remove the buckle.



INSTALLATION OF SEAT BELT BUCKLE

Install in the reverse order of removal.

Seat Belt Inspection

NHS00007

AFTER A COLLISION

WARNING:

Inspect all seat belt assemblies including retractors and attached hardware after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.

Replace any seat belt assembly (including anchor bolts) if:

- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident. (i.e. torn webbing, bent retractor or guide).
- The seat belt attaching point was damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair as necessary before installing a new seat belt assembly.
- Anchor bolts are deformed or worn out.
- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

PRELIMINARY CHECKS

1. Check the seat belt warning lamp/chime for proper operation as follows:

a. Switch ignition ON. The seat belt warning lamp should illuminate. Also, the seat belt warning chime should sound for about 6 seconds.

b. Fasten driver's seat belt. The seat belt warning lamp should go out and the chime (if sounding) should stop.

2. If the air bag warning lamp is blinking, conduct self-diagnosis using CONSULT-II, and confirm with air bag warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" .

3. Make sure that the seat belt retractor, seat belt anchor and buckle bolts are securely attached.

4. Check the shoulder seat belt guide for seats. Ensure guide swivels freely and that webbing lays flat and does not bind in guide. Ensure height adjuster operates properly and holds securely.

5. Check retractor operation:

a. Fully extend the seat belt webbing and check for twists, tears or other damage.

b. Allow the seat belt to retract. Ensure that webbing returns smoothly and completely into the retractor. If the seat belt does not return smoothly, wipe the inside of the loops with a clean paper cloth, because dirt built up in the loops of the upper anchors can cause the seat belts to retract slowly.

c. Fasten the seat belt. Check the seat belt returns smoothly and completely to the retractor. If the webbing does not return smoothly, the cause may be an accumulation of dust or dirt. Use the “SEAT BELT TAPE SET” and perform the following steps.

   Inspect the seat belt through-anchor:

   1. Pull the seat belt out to a length of 500 mm (19.69 in) or more.
   2. Use a clip or other device to the fix the seat belt at the rear side finisher webbing opening.
   3. Pass a thin wire through the through-anchor webbing opening. Hold both ends of the wire and pull taut while moving it up and down several times along the webbing opening surface to remove dirt.
   4. Any dirt that cannot be removed with the wire can be removed by cleaning the opening with a clean cloth.
   5. Apply tape at the point where the webbing contacts the through-anchor webbing opening.

      NOTE:
      Apply the tape so that there is no looseness or wrinkling.

   6. Remove the clip fixing the seat belt and make sure that the webbing returns smoothly.
   7. Repeat steps above as necessary to check the other seat belts.

SEAT BELT RETRACTOR ON-VEHICLE CHECK

Emergency Locking Retractors (ELR)

NOTE:
All seat belt retractors are of the Emergency Locking Retractors (ELR) type. In an emergency (sudden stop) the retractor will lock and prevent the webbing from extending any further.
Check the seat belt retractors using the following test(s) to determine if a retractor assembly is operating properly.

ELR Function Stationary Check

Grasp the shoulder webbing and pull forward quickly. The retractor should lock and prevent the belt from extending further.

ELR Function Moving Check

WARNING:
Perform the following test in a safe, open area clear of other vehicles and obstructions (for example, a large, empty parking lot). Road surface must be paved and dry. Do Not perform the following test on wet or gravel roads or on public streets and highways. This could result in an accident and serious personal injury. The driver and passenger must be prepared to brace themselves in the event the retractor does not lock.

1. Fasten driver's seat belt. Buckle a passenger into the seat for the belt that is to be tested.
2. Proceed to the designated safe area.
3. Drive the vehicle at approximately 16 km/h (10 MPH). Notify any passengers of a pending sudden stop. The driver and passenger must be prepared to brace themselves in the event the retractor does not lock. Apply brakes firmly and make a very hard stop.

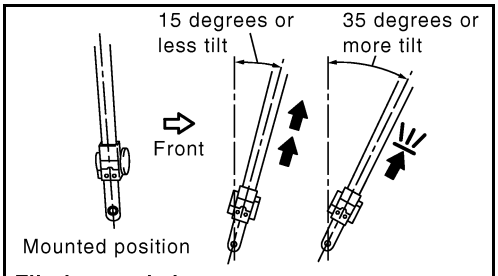
While stopping, seat belts should lock and not be extended. If the seat belt retractor assembly does not lock, perform the retractor off-vehicle check.

SEAT BELT RETRACTOR OFF-VEHICLE CHECK

1. Remove the seat belt retractor assembly.
2. Slowly pull out webbing while tilting the retractor assembly forward from the mounted position without twisting the retractor assembly as shown in the figure.

   15 degrees or less tilt : Webbing can be pulled out.
   35 degrees or more tilt : Webbing locks and cannot be pulled out.

   If NG, replace the retractor assembly.



Tilt the seat belt retractor forward from the mounted position without twisting the retractor.
PHIA0175E

SECTION SC
STARTING & CHARGING SYSTEM

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PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS00001

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS00002

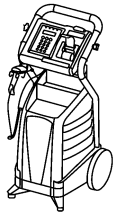
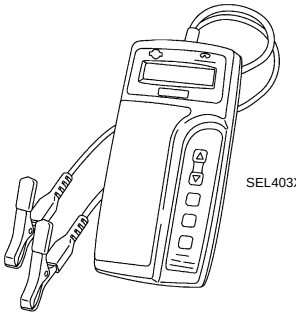
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

PREPARATION

PFP:00002

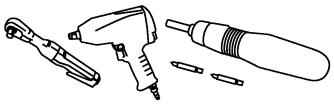
Special Service Tools

NKS00004

Tool number (Kent-Moore No.) Tool name	Description
— (J-48087) Battery Service Center  WKIA5280E	Tests battery. For operating instructions, refer to Technical Service Bulletin and Battery Service Center User Guide.
— (J-44373 Model MCR620) Starting/Charging System Tester  SEL403X	Tests starting and charging system. For operating instructions, refer to Technical Service Bulletin.

Commercial Service Tools

NKS0054Y

Tool name	Description
Power tool  PIIB1407E	Loosening bolts, nuts and screws

BATTERY

PFP:AYBGL

How to Handle Battery

NKS00006

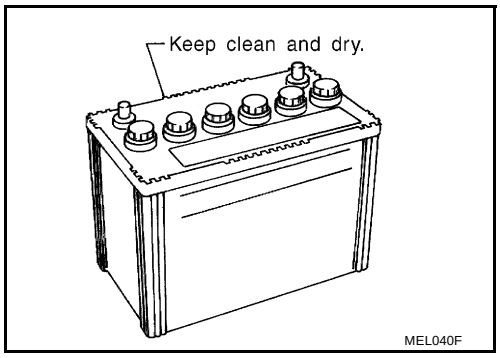
CAUTION:

- **If it becomes necessary to start the engine with a booster battery and jumper cables, use a 12-volt booster battery.**
- **After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.**

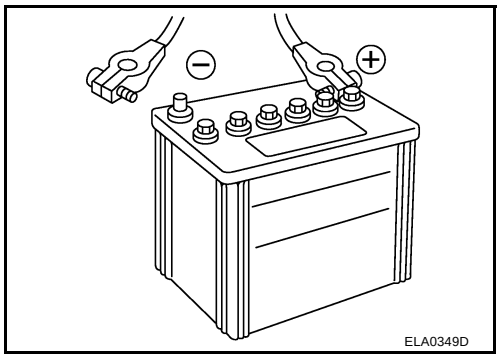
METHODS OF PREVENTING OVER-DISCHARGE

The following precautions must be taken to prevent over-discharging a battery.

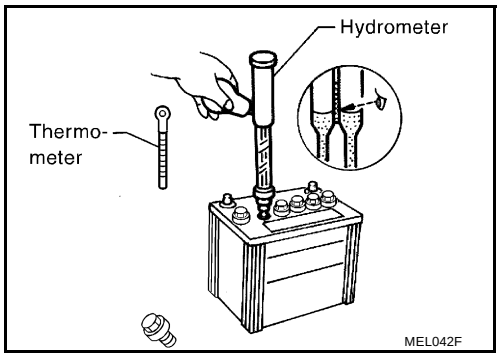
- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance, check the electrolyte level.
  This also applies to batteries designated as “low maintenance” and “maintenance-free”.



- When the vehicle is not going to be used over a long period of time, disconnect the battery cable from the negative terminal.



- Check the charge condition of the battery.
  Periodically check the specific gravity of the electrolyte. Keep a close check on charge condition to prevent over-discharge.

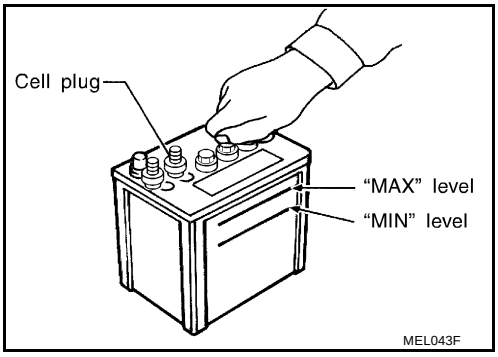


CHECKING ELECTROLYTE LEVEL

WARNING:

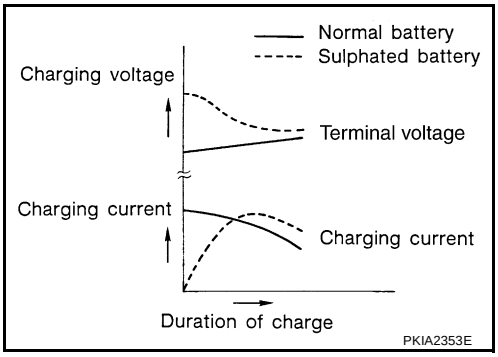
Never allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, never touch or rub your eyes until you have thoroughly washed your hands. If acid contacts eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.

- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.



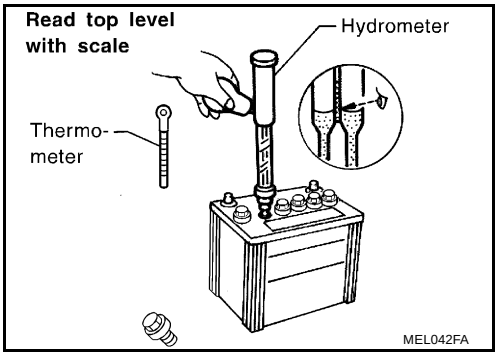
Sulphation

A battery will be completely discharged if it is left unattended for a long time and the specific gravity will become less than 1.100. This may result in sulphation on the cell plates.
To determine if a battery has been "sulphated", note its voltage and current when charging it. As shown in the figure, less current and higher voltage are observed in the initial stage of charging sulphated batteries.
A sulphated battery may sometimes be brought back into service by means of a long, slow charge, 12 hours or more, followed by a battery capacity test.



SPECIFIC GRAVITY CHECK

1. Read hydrometer and thermometer indications at eye level.
2. Use the chart below to correct your hydrometer reading according to electrolyte temperature.



Hydrometer Temperature Correction

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
71 (160)	0.032
66 (150)	0.028
60 (140)	0.024
54 (130)	0.020
49 (120)	0.016
43 (110)	0.012
38 (100)	0.008
32 (90)	0.004
27 (80)	0
21 (70)	–0.004

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
16 (60)	–0.008
10 (50)	–0.012
4 (40)	–0.016
–1 (30)	–0.020
–7 (20)	–0.024
–12 (10)	–0.028
–18 (0)	–0.032

Corrected specific gravity	Approximate charge condition
1.260 - 1.280	Fully charged
1.230 - 1.250	3/4 charged
1.200 - 1.220	1/2 charged
1.170 - 1.190	1/4 charged
1.140 - 1.160	Almost discharged
1.110 - 1.130	Completely discharged

CHARGING THE BATTERY

CAUTION:

- **Never “quick charge” a fully discharged battery.**
- **Keep the battery away from open flame while it is being charged.**
- **When connecting the charger, connect the leads first, then turn on the charger. Never turn on the charger first, as this may cause a spark.**
- **If battery electrolyte temperature rises above 55 °C (131 °F), stop charging. Always charge battery at a temperature below 55 °C (131 °F).**

Charging Rates

Amps	Time
50	1 hour
25	2 hours
10	5 hours
5	10 hours

Never charge at more than 50 ampere rate.

NOTE:

The ammeter reading on your battery charger will automatically decrease as the battery charges. This indicates that the voltage of the battery is increasing normally as the state of charge improves. The charging amps indicated above refer to initial charge rate.

- If, after charging, the specific gravity of any two cells varies more than 0.050, the battery should be replaced.

Trouble Diagnoses with Battery Service Center

NKS00007

For battery testing, use Battery Service Center (J-48087). For details and operating instructions, refer to Technical Service Bulletin and/or Battery Service Center User Guide.

Removal and Installation

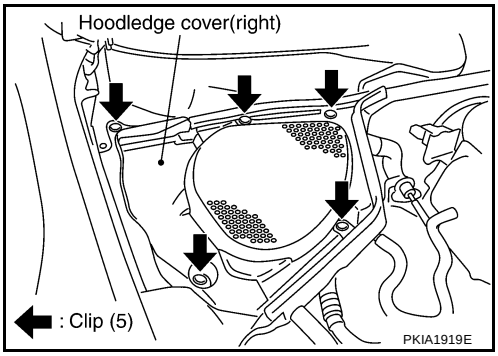
NKS00008

REMOVAL

CAUTION:

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

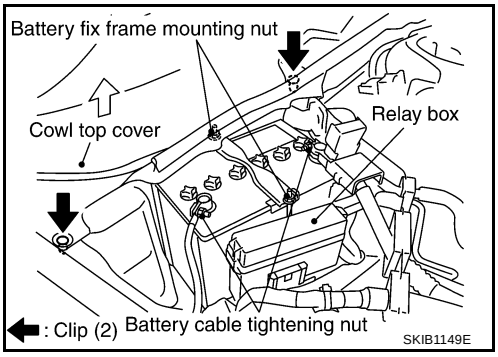
1. Remove hoodledge cover (right).



2. Disconnect both battery cables from terminals.

   CAUTION:

   When disconnecting, disconnect the battery cable from the negative terminal first.
3. Remove clips of cowl top cover (right) and it raises to the up side.
4. Remove battery fix frame mounting nuts and battery fix frame.
5. Remove relay box from bracket.
6. Remove battery.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

When connecting, connect the battery cable to positive terminal first.

Battery fix frame mounting nut

: 3.9 N·m (0.40 kg-m, 35 in-lb)

Battery cable tightening nut

: 5.4 N·m (0.55 kg-m, 48 in-lb)

STARTING SYSTEM

PFP:23300

System Description

NKS00009

M/T MODELS

Power is supplied at all times:

- through 40A fusible link (letter **M** , located in the fuse and fusible link block)
- to ignition switch terminal 1,
- through 10A fuse (No. 71, located in the IPDM E/R)
- to CPU of IPDM E/R,
- through 15A fuse (No. 78, located in the IPDM E/R)
- to CPU of IPDM E/R.

With the ignition switch in the ON or START position, power is supplied:

- to CPU of IPDM E/R, from battery direct
- through 10A fuse (No. 89, located in the IPDM E/R) and IPDM E/R terminal 25
- to clutch interlock switch terminal 1.

When the clutch pedal is depressed, power is supplied:

- through clutch interlock switch terminal 2
- to IPDM E/R terminal 53.

Ground is supplied:

- to IPDM E/R terminals 38, 50 and 60
- from grounds E17, E43 and B102 (with VDC, navigation system or telephone).
- from grounds E17, E43 and F152 (without VDC, navigation system and telephone).

Then starter relay is turn ON.
With the ignition switch in the START position, IPDM E/R is energized and power is supplied:

- from ignition switch terminal 5
- to IPDM E/R terminal 4 and
- through IPDM E/R terminal 3
- to starter motor terminal 1.

The starter motor plunger closes and provides a closed circuit between the battery and starter motor. The starter motor is grounded to the engine block. With power and ground supplied, cranking occurs and the engine starts.

A/T MODELS

Power is supplied at all times:

- through 40A fusible link (letter **M** , located in the fuse and fusible link block)
- to ignition switch terminal 1,
- through 10A fuse (No. 71, located in the IPDM E/R)
- to CPU of IPDM E/R,
- through 15A fuse (No. 78, located in the IPDM E/R)
- to CPU of IPDM E/R.

With the ignition switch in the ON or START position, power is supplied:

- to CPU of IPDM E/R, from battery direct.

When the selector lever in the “P” or “N” position, power is supplied:

- from A/T assembly (TCM) terminal 9
- to IPDM E/R terminal 53.

Ground is supplied:

- to IPDM E/R terminals 38, 50 and 60
- from grounds E17, E43 and B102 (with VDC, navigation system or telephone).
- from grounds E17, E43 and F152 (without VDC, navigation system and telephone).

Then starter relay is turn ON.
With the ignition switch in the START position, IPDM E/R is energized and power is supplied:

- from ignition switch terminal 5
- to IPDM E/R terminal 4 and
- through IPDM E/R terminal 3
- to starter motor terminal 1.

The starter motor plunger closes and provides a closed circuit between the battery and starter motor. The starter motor is grounded to the engine block. With power and ground supplied, cranking occurs and the engine starts.

Wiring Diagram — START —

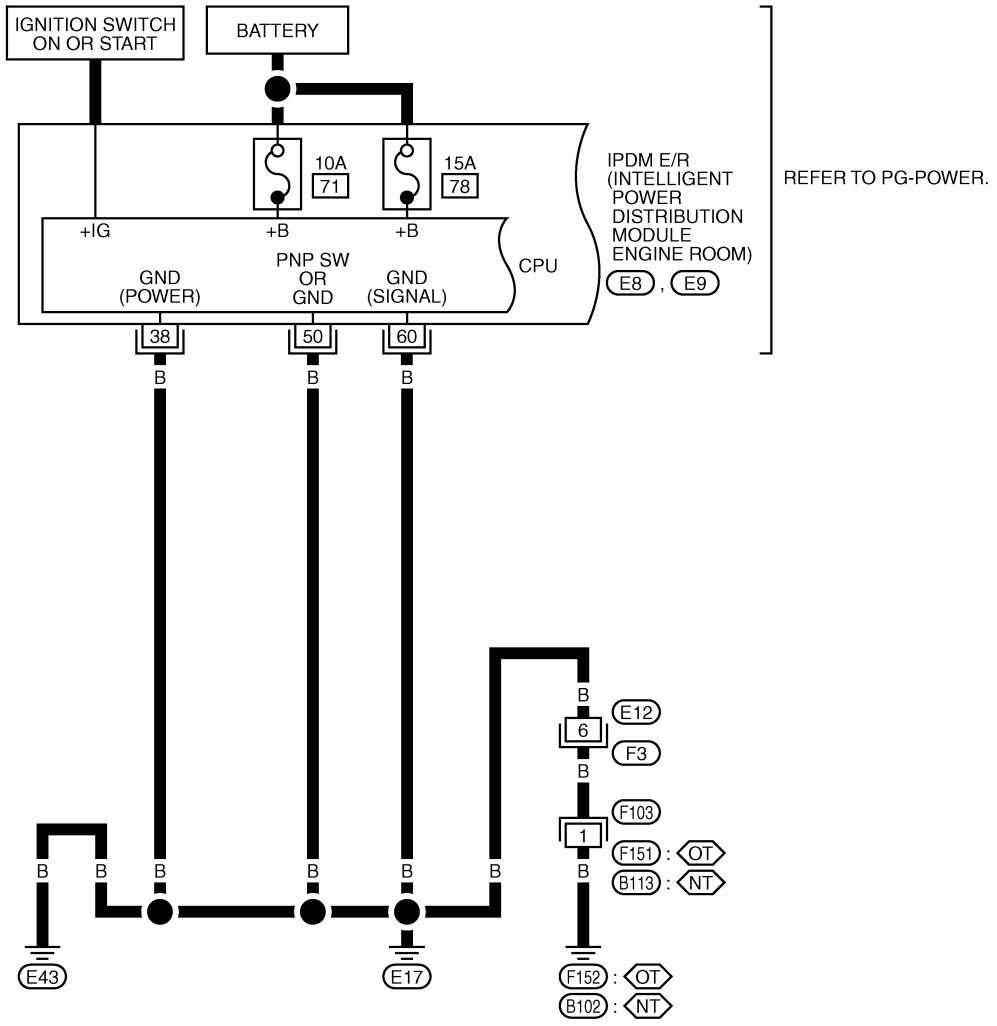
NKS0000A

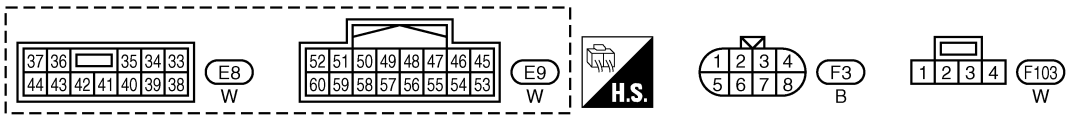
M/T MODELS

SC-START-01

NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE

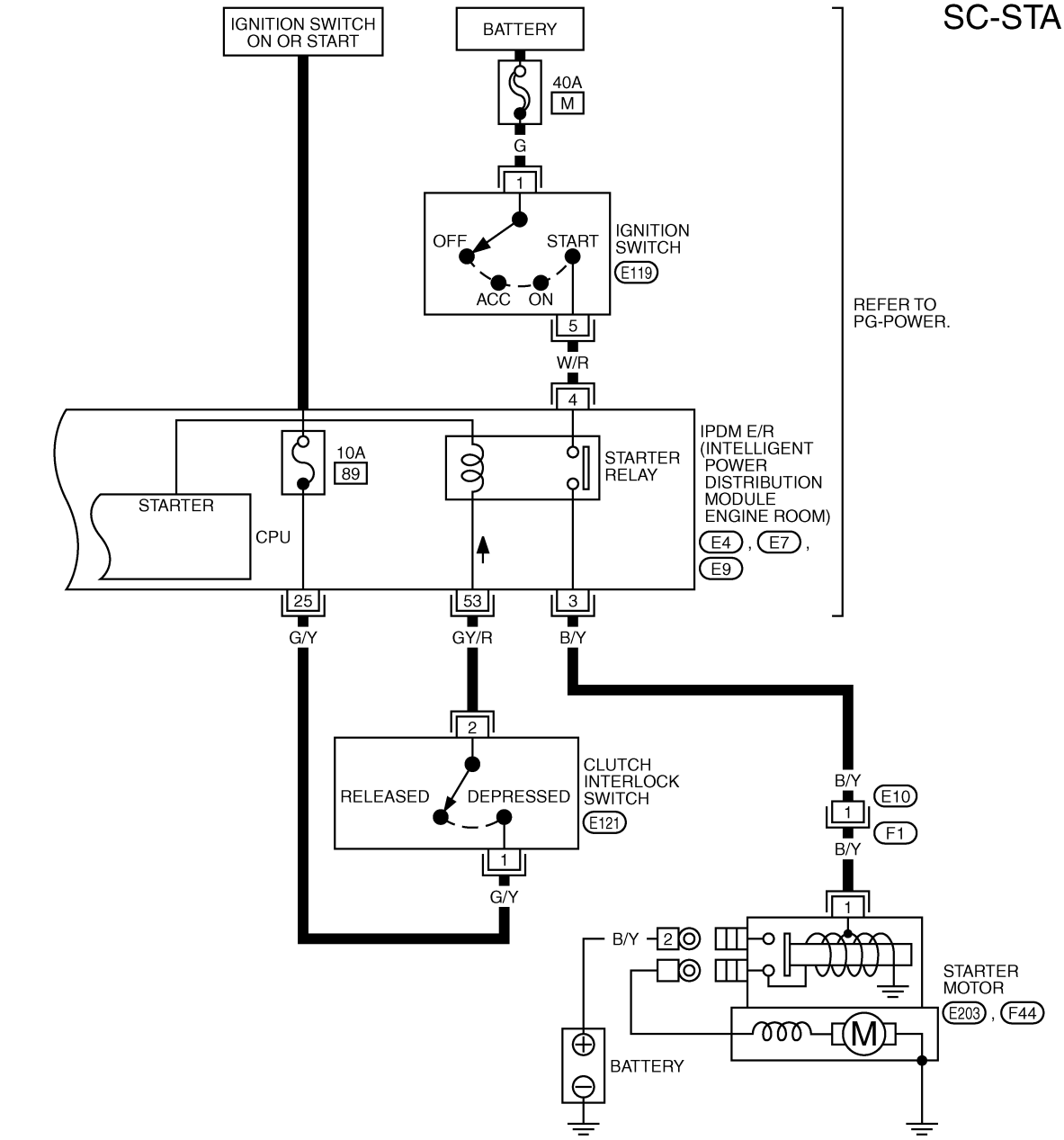
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE

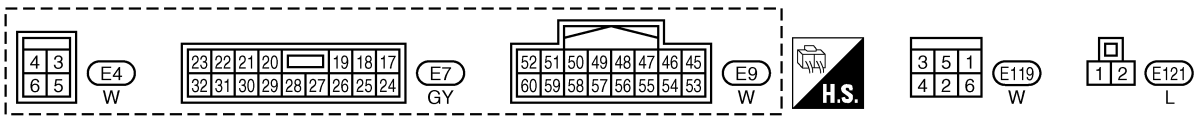


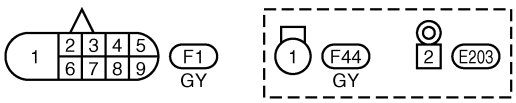


TKWT5715E

SC-START-02

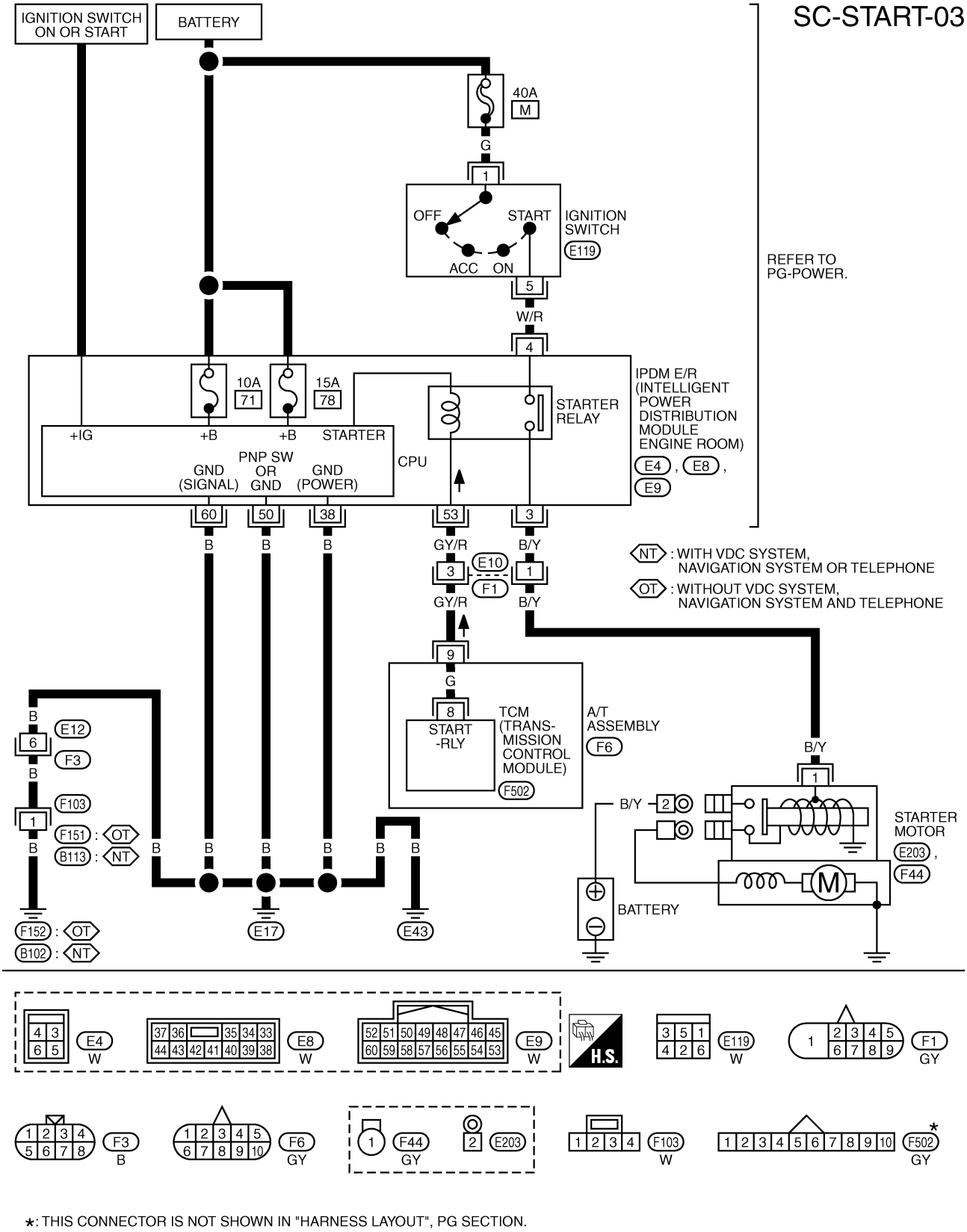






TKWT5716E

A/T MODELS



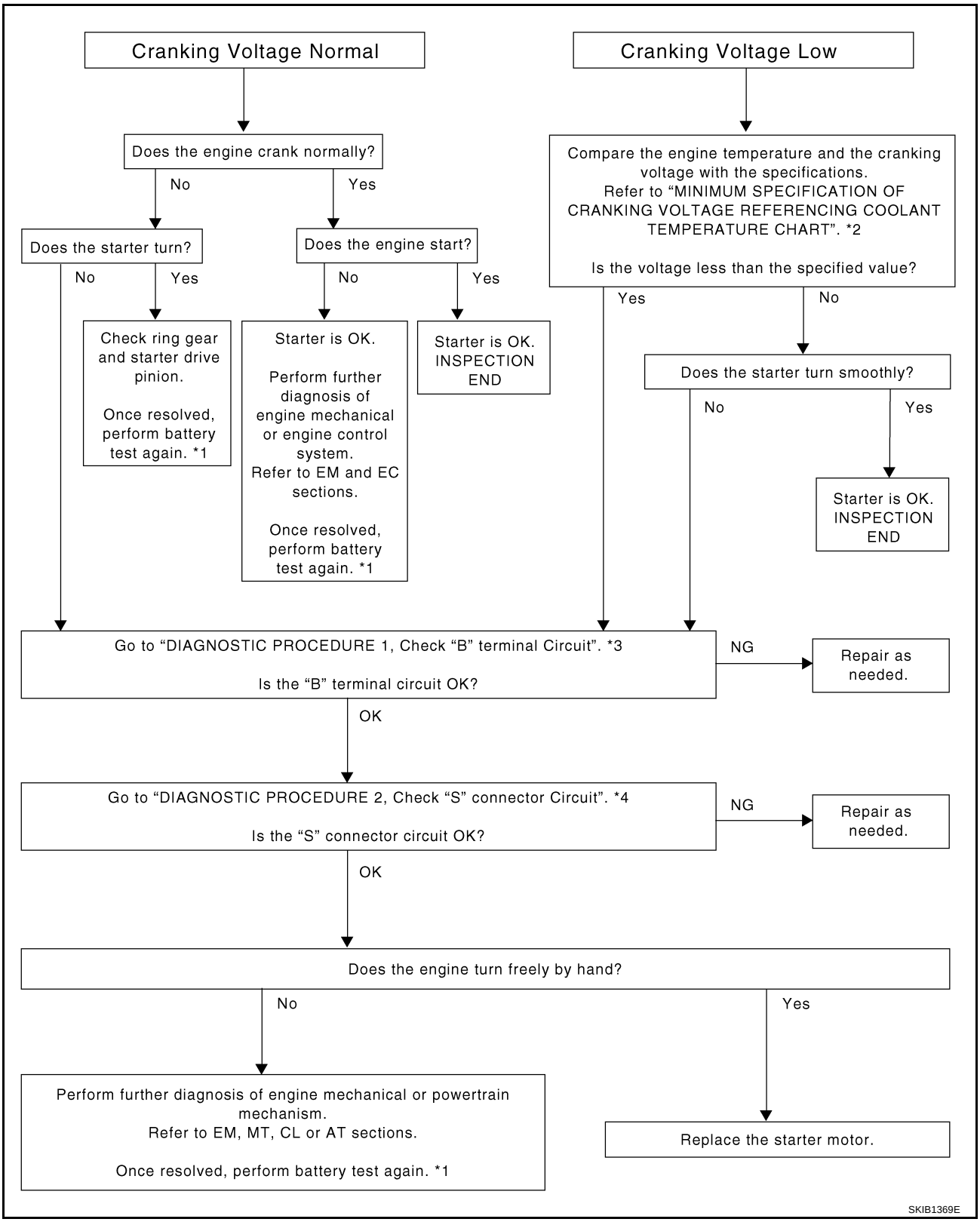
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5717E

Trouble Diagnoses with Starting/Charging System Tester (Starting)

NKS0000B

For starting system testing, use Starting/Charging System Tester (J-44373). For details and operating instructions, refer to Technical Service Bulletin.



*1 For battery testing, use Battery Service Center (J-48087). For details and operating instructions, refer to Technical Service Bulletin and/or Battery Service Center User Guide.

*2 SC-16, "MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE"

*3 SC-14, "Check “B” Terminal Circuit"

*4 SC-15, "Check “S” Connector Circuit"

DIAGNOSTIC PROCEDURE 1
Check “B” Terminal Circuit

CAUTION:

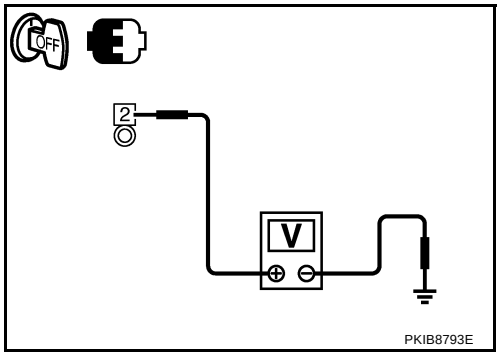
Perform diagnosis under the condition that engine cannot start by the following procedure.

1. **Remove fuel pump fuse.**
2. **Crank or start the engine (where possible) until the fuel pressure is released.**

1. CHECK “B” TERMINAL CIRCUIT

1. Turn ignition switch OFF.
2. Make sure that starter motor “B” terminal connection is clean and tight.
3. Check voltage between starter motor “B” terminal and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Starter motor “B” terminal	Terminal		
E203	2	Ground	Battery voltage



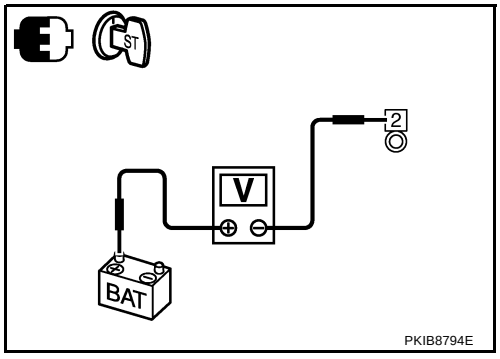
OK or NG

OK >> GO TO 2.
NG >> Check harness between battery and starter motor for open circuit.

2. CHECK BATTERY CABLE CONNECTION STATUS (VOLTAGE DROP TEST)

1. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
2. Check voltage between starter motor “B” terminal and battery positive terminal.

Terminals			Condition	Voltage (Approx.)
(+)	(–)			
	Starter motor “B” terminal	Terminal		
Battery positive terminal	E203	2	When the ignition switch is in START position	Less than 0.5 V

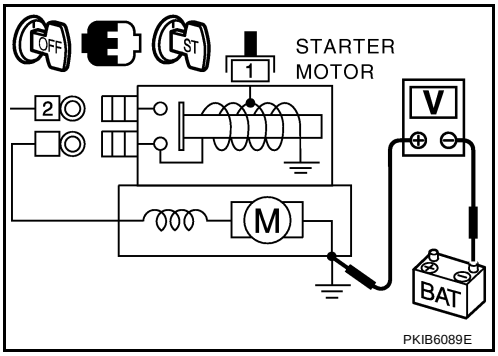


OK or NG

OK >> GO TO 3.
NG >> Check harness between the battery and the starter motor for poor continuity.

3. CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

1. Turn ignition switch OFF.
2. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
3. Check voltage between starter motor case and battery negative terminal.



Terminals		Condition	Voltage (Approx.)
(+)	(–)		
Starter motor case	Battery negative terminal	When the ignition switch is in START position	Less than 0.2 V

OK or NG

OK >> “B” terminal circuit is OK. Further inspection necessary. Refer to SC-13, "Trouble Diagnoses with Starting/Charging System Tester (Starting)" .

NG >> Check the starter motor case and ground for poor continuity.

DIAGNOSTIC PROCEDURE 2

Check “S” Connector Circuit

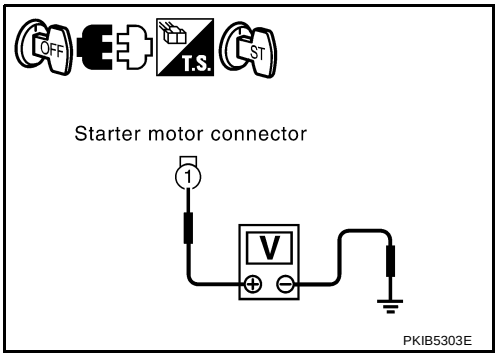
CAUTION:

Perform diagnosis under the condition that engine cannot start by the following procedure.

1. **Remove fuel pump fuse.**
2. **Crank or start the engine (where possible) until the fuel pressure is released.**

1. CHECK “S” CONNECTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector.
3. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
4. Check voltage between starter motor harness connector and ground.



Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Starter motor connector	Terminal			
F44	1	Ground	When the ignition switch is in START position	Battery voltage

OK or NG

OK >> “S” connector circuit is OK. Further inspection necessary. Refer to SC-13, "Trouble Diagnoses with Starting/Charging System Tester (Starting)" .

NG >> Check the following.

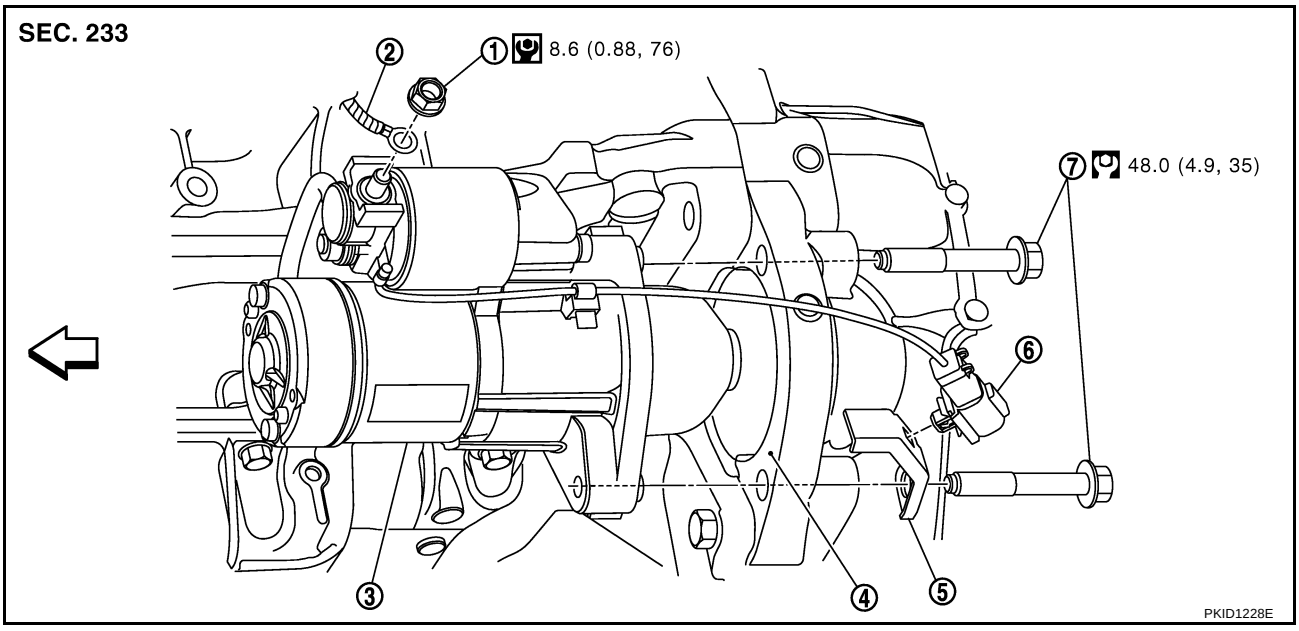
- 40A fusible link (letter **M** , located in fuse and fusible link block)
- Ignition switch
- Starter relay (within the IPDM E/R)
- Harness for open or short

MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE

Engine coolant temperature	Voltage [V]
–30 °C to –20 °C (–22 °F to –4 °F)	8.6
–19 °C to –10 °C (–2 °F to 14°F)	9.1
–9 °C to 0 °C (16 °F to 32 °F)	9.5
More than 1 °C (More than 34 °F)	9.9

Removal and Installation

NKS0000C



1. "B" terminal mounting nut
2. "B" terminal harness
3. Starter motor
4. Transmission case (M/T models) Converter housing (A/T models)
5. Harness clip bracket
6. "S" terminal connector
7. Starter motor mounting bolt

⇦: Vehicle front

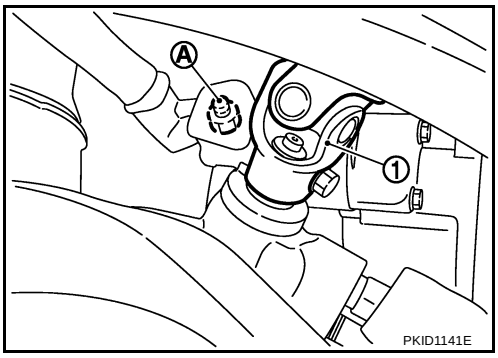
Refer to GI-11, "Components" for symbols not described on the above.

REMOVAL

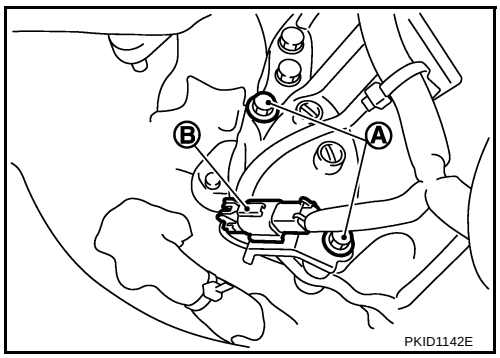
1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.

   CAUTION:

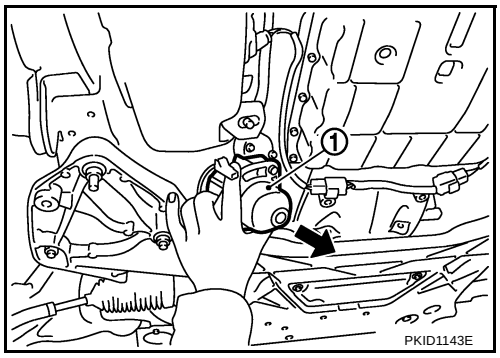
   Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.
2. Remove engine undercover, using power tools.
3. Disconnect steering lower joint (1), then remove it. Refer to PS-17, "REMOVAL" .
4. Remove "B" terminal mounting nut (A).



5. Disconnect “S” connector (B).
6. Remove starter motor mounting bolts (A) and harness connector clip bracket, using power tools.



7. Remove starter motor (1) downward from the vehicle.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

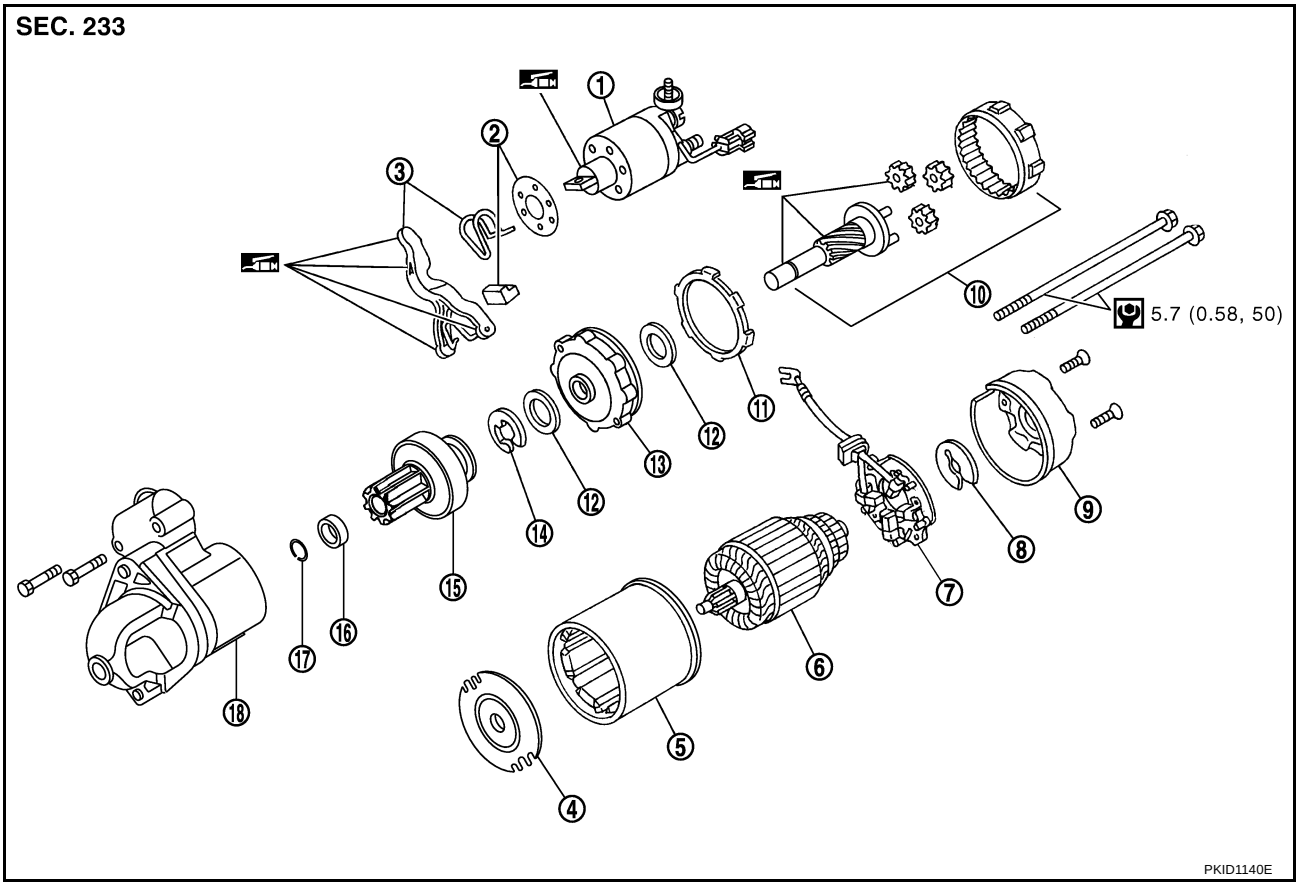
Be sure to tighten “B” terminal nut carefully.

Disassembly and Assembly

NKS0000D

TYPE: S114-928

SEC. 233



1. Magnetic switch assembly	2. Dust cover kit	3. Shift lever set
4. Center bracket (A)	5. Yoke assembly	6. Armature assembly
7. Brush holder assembly	8. Thrust washer	9. Rear cover assembly
10. Shaft gear assembly	11. Packing	12. Thrust washer
13. Center bracket (P)	14. E-ring	15. Pinion assembly
16. Pinion stopper	17. Pinion stopper clip	18. Gear case assembly

: High-temperature grease point

Refer to GI-11, "Components" for symbols not described on the above.

INSPECTION AFTER DISASSEMBLY

Pinion/Clutch Check

1. Inspect pinion teeth.
   - Replace pinion if teeth are worn or damaged. (Also check condition of ring gear teeth.)
2. Inspect reduction gear teeth.
   - Replace reduction gear if teeth are worn or damaged. (Also check condition of armature shaft gear teeth.)
3. Check to see if pinion locks in one direction and rotates smoothly in the opposite direction.
   - If it locks or rotates in both directions, or unusual resistance is evident, replace.

CHARGING SYSTEM

PFP:23100

System Description

NKS0000E

The alternator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC regulator.
Power is supplied at all times

- through 10A fuse (No. 36, located in the fuse and fusible link block)
- to alternator terminal 4 (“S” terminal).

“B” terminal supplies power to charge the battery and operate the vehicle's electrical system. Output voltage is controlled by the IC regulator at terminal 4 (“S” terminal) detecting the input voltage.
The charging circuit is protected by the 140A fusible link (letter **A** , located in the fusible link holder).
The alternator is grounded to the engine block.
With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminal 23 for the charge warning lamp.

Ground is supplied with power and ground supplied

- to terminal 17 of combination meter
- through alternator terminal 3 (“L” terminal)
- through case ground.

The charge warning lamp will illuminate. When the alternator is providing sufficient voltage with the engine running, the ground is opened and the charge warning lamp will go off.
If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

MALFUNCTION INDICATOR

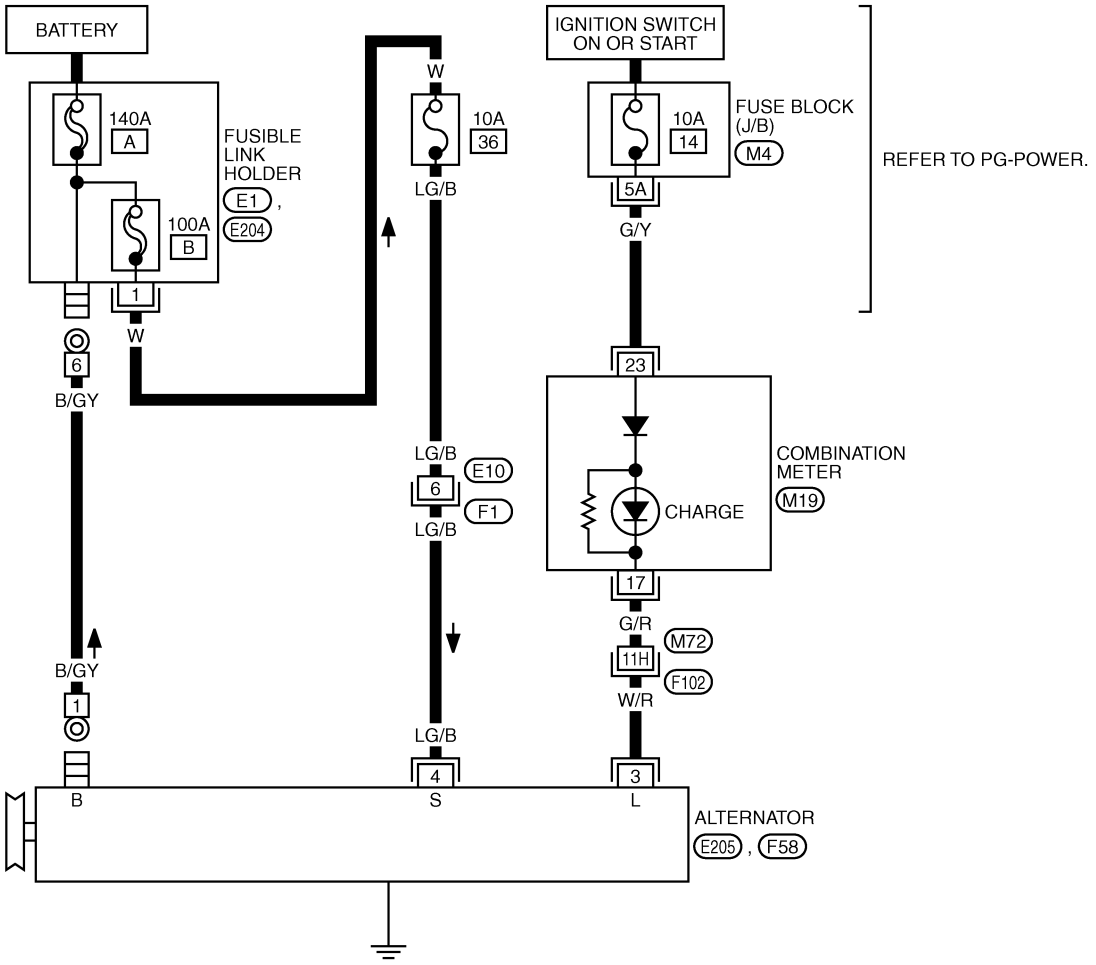
The IC regulator warning function activates to illuminate charge warning lamp, if any of the following symptoms occur while alternator is operating:

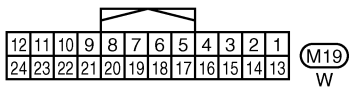
- Excessive voltage is produced.
- No voltage is produced.

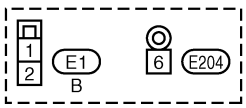
Wiring Diagram — CHARGE —

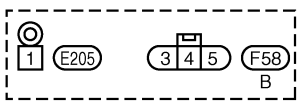
NKS0000F

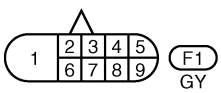
SC-CHARGE-01











REFER TO THE FOLLOWING.

F102 -SUPER MULTIPLE JUNCTION (SMJ)

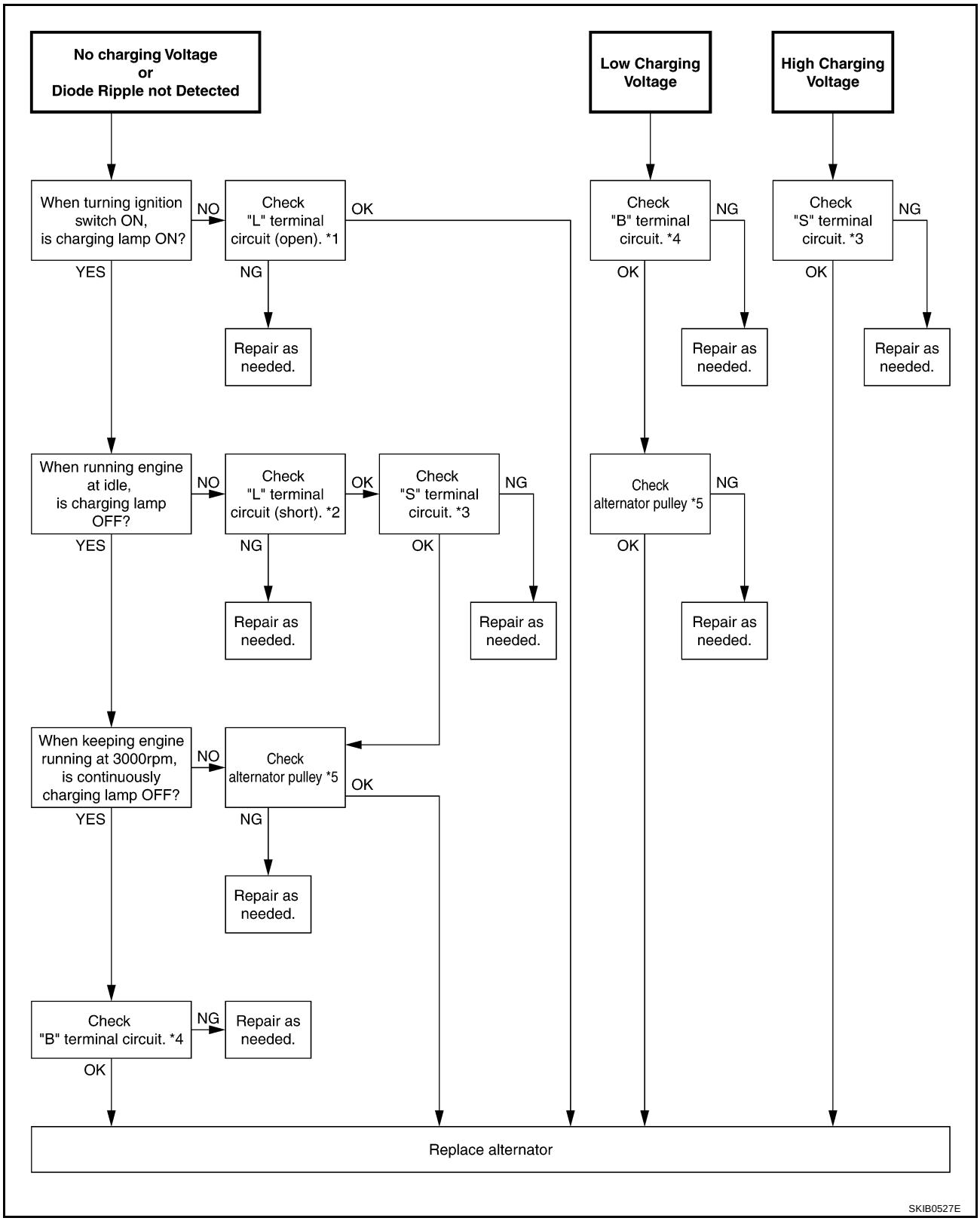
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5718E

Trouble Diagnoses with Starting/Charging System Tester (Charging)

NKS0000G

For charging system testing, use Starting/Charging System Tester (J-44373). For details and operating instructions, refer to Technical Service Bulletin.



*1 SC-23, "Check “L” Terminal Circuit (Open)"
*2 SC-24, "Check “L” Terminal Circuit (Short)"
*3 SC-24, "Check “S” Terminal Circuit"
*4 SC-24, "Check “B” Terminal Circuit"
*5 SC-27, "ALTERNATOR PULLEY INSPECTION"

PRELIMINARY INSPECTION

1. CHECK BATTERY TERMINALS CONNECTION

Check if battery terminals are clean and tight.

OK or NG

OK >> GO TO 2.
NG >> Repair battery terminals connection.

2. CHECK FUSE AND FUSIBLE LINK

Check for blown alternator and combination meter fuses and fusible links.

Unit	Power source (Power supply terminals)	Fuse and fusible link No.
Alternator	Battery (“S” terminal)	36, letter B, letter A
Combination meter	Ignition switch ON (“L” terminal)	14

OK or NG

OK >> GO TO 3.
NG >> Be sure eliminate cause of malfunction before installing new fuse and fusible link.

3. CHECK ALTERNATOR DRIVE BELT TENSION

Check alternator drive belt tension. Refer to EM-12, "Checking Drive Belts" .

OK or NG

OK >> INSPECTION END
NG >> Repair as needed.

DIAGNOSTIC PROCEDURE 1
Check “L” Terminal Circuit (Open)

1. CHECK “L” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check if “L” terminal is clean and tight.

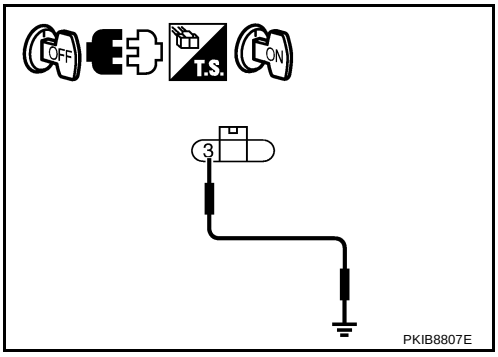
OK or NG

OK >> GO TO 2.
NG >> Repair “L” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2. CHECK “L” TERMINAL CIRCUIT (OPEN)

1. Disconnect alternator connector.
2. Apply ground to alternator harness connector terminal.
3. Check condition the charge warning lamp with the ignition switch in the ON position.

Alternator connector	Terminal	Ground	Condition	
			Ignition switch position	Charge warning lamp
F58	3		ON	illuminate



OK or NG

OK >> Go to SC-22, "Trouble Diagnoses with Starting/Charging System Tester (Charging)" .
NG >> Check the following.

- Harness for open between combination meter and alternator
- Harness for open between combination meter and fuse
- Charge warning lamp (Combination meter)

DIAGNOSTIC PROCEDURE 2
Check “L” Terminal Circuit (Short)

1. CHECK “L” TERMINAL CIRCUIT (SHORT)

1. Turn ignition switch OFF.
2. Disconnect alternator connector.
3. Turn ignition switch ON.

Charge warning lamp should light up?

YES >> Check the following.
- Harness for short between combination meter and alternator
- Charge warning lamp (Combination meter)

NO >> Go to SC-22, "Trouble Diagnoses with Starting/Charging System Tester (Charging)" .

DIAGNOSTIC PROCEDURE 3
Check “S” Terminal Circuit

1. CHECK “S” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check if “S” terminal is clean and tight.

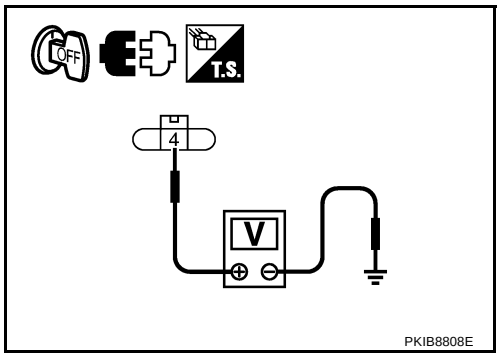
OK or NG

OK >> GO TO 2.
NG >> Repair “S” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2. CHECK “S” TERMINAL CIRCUIT

1. Disconnect alternator connector.
2. Check voltage between alternator harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator connector	Terminal		
F58	4	Ground	Battery voltage



OK or NG

OK >> Go to SC-22, "Trouble Diagnoses with Starting/Charging System Tester (Charging)" .
NG >> Harness for open between alternator and fuse.

DIAGNOSTIC PROCEDURE 4
Check “B” Terminal Circuit

1. CHECK “B” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check if “B” terminal is clean and tight.

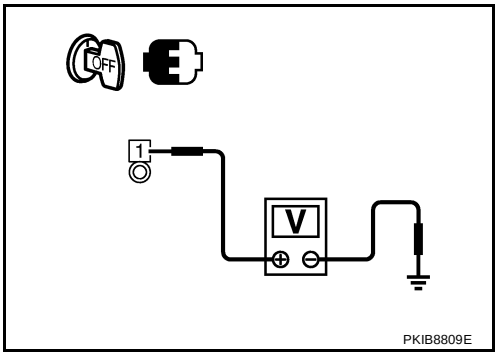
OK or NG

OK >> GO TO 2.
NG >> Repair “B” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2. CHECK “B” TERMINAL CIRCUIT

Check voltage between alternator “B” terminal and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator “B” terminal	Terminal		
E205	1	Ground	Battery voltage



OK or NG

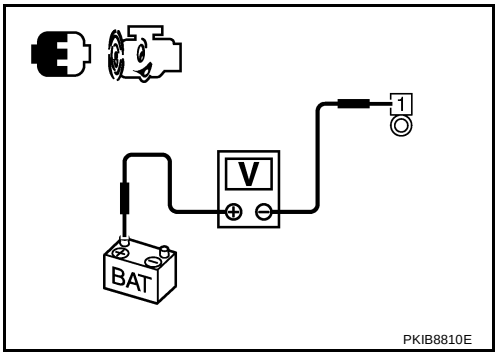
OK >> GO TO 3.

NG >> Check harness for open between alternator and fusible link.

3. CHECK “B” TERMINAL CONNECTION (VOLTAGE DROP TEST)

1. Start engine, then engine running at idle and warm.
2. Check voltage between battery positive terminal and alternator “B” terminal.

Terminals			Voltage (Approx.)
(+)	(–)		
	Alternator “B” terminal	Terminal	
Battery positive terminal	E205	1	Less than 0.2 V



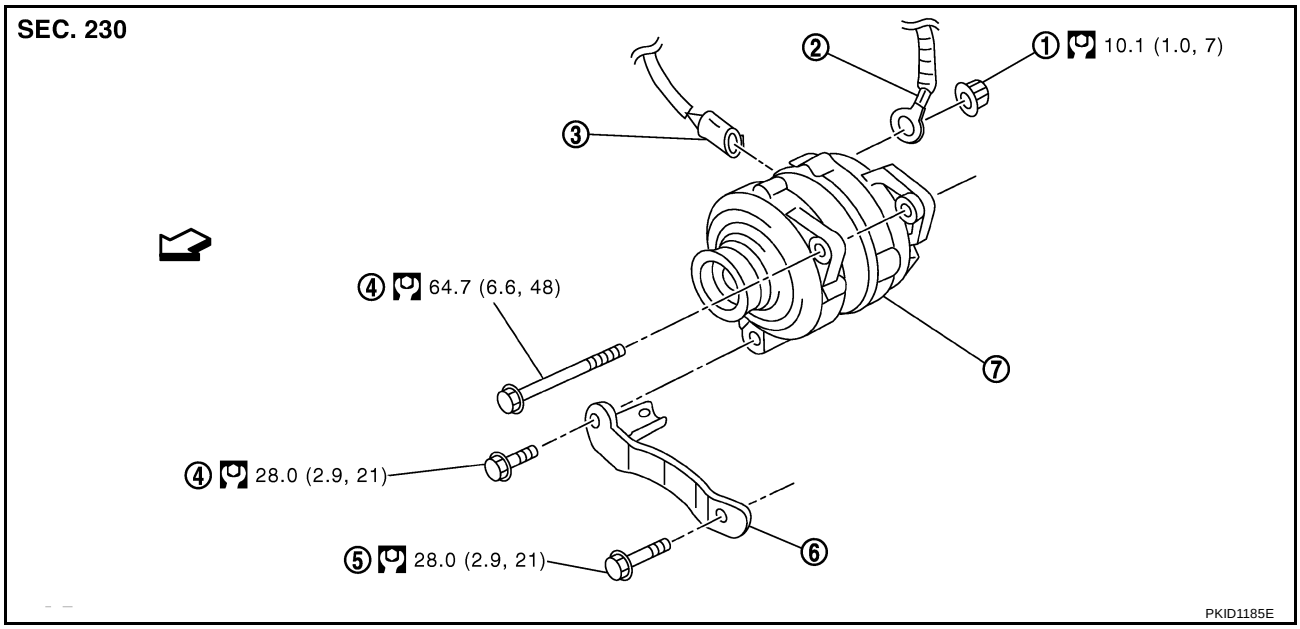
OK or NG

OK >> Go to SC-22, "Trouble Diagnoses with Starting/Charging System Tester (Charging)" .

NG >> Check harness between battery and alternator for poor continuity.

Removal and Installation

NKS0000H



1. "B" terminal mounting nut
2. "B" terminal harness
3. Alternator connector
4. Alternator mounting bolt
5. Alternator stay mounting bolt
6. Alternator stay
7. Alternator

⇦ :Vehicle front

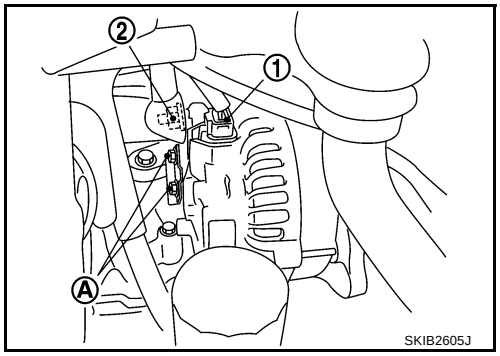
Refer to GI-11, "Components" for symbols not described on the above.

REMOVAL

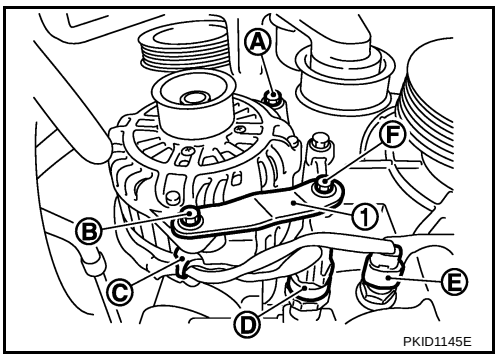
1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.

   CAUTION:

   Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.
2. Remove engine undercover, using power tools.
3. Remove air cleaner assembly and harness clip. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Remove radiator cooling fan assembly. Refer to CO-21, "COOLING FAN" .
5. Remove alternator and power steering oil pump belt. Refer to EM-12, "Removal and Installation" .
6. Disconnect alternator connector (1).
7. Remove "B" terminal mounting nut (2).
8. Remove the harness bracket bolts (A).



9. Remove oil pressure switch harness clip (C) from alternator stay (1).
10. Disconnect oil pressure switch connector (D) and oil temperature sensor connector (E).
11. Remove alternator mounting bolt (B) and alternator stay mounting bolt (F) using power tools, then remove alternator stay.
12. Remove alternator mounting bolt (A), using power tools.



13. Remove alternator assembly downward from the vehicle.

ALTERNATOR PULLEY INSPECTION

Perform the following.

- Make sure that alternator pulley does not rattle.
- Make sure that alternator pulley nut is tight.

Alternator pulley nut:

: 118 N·m (12.0 kg-m, 87 ft-lb)

INSTALLATION

Installation is the reverse order of removal.

- Install alternator, and check tension of belt. Refer to EM-12, "Checking Drive Belts" .

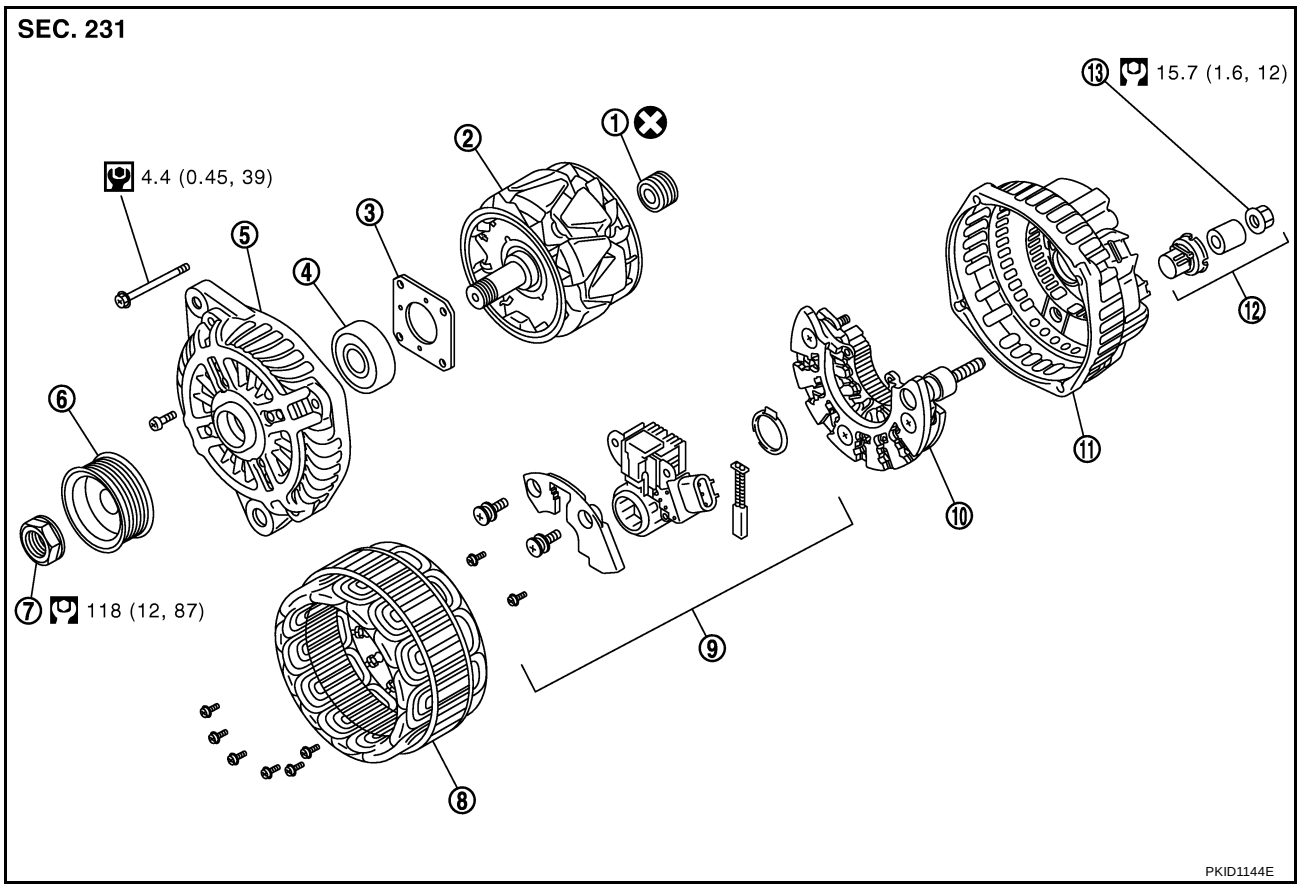
CAUTION:

Be sure to tighten “B” terminal nut carefully.

Disassembly and Assembly

NKS0000I

TYPE: A3TJ1991



1. Rear bearing
2. Rotor assembly
3. Retainer
4. Front bearing
5. Front bracket assembly
6. Pulley
7. Pulley nut
8. Stator assembly
9. IC voltage regulator assembly
10. Diode assembly
11. Rear bracket assembly
12. Terminal set
13. “B” terminal nut

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Battery

NKS0054Z

Type		80D23L
20 hour rate capacity	[V - Ah]	12 - 62
Cold cranking current (For reference value)	[A]	589

Starter

NKS00550

Type			S114-928
			HITACHI make
			Reduction gear type
System voltage		[V]	12
No-load	Terminal voltage	[V]	11
	Current	[A]	Less than 110
	Revolution	[rpm]	More than 2,700
Minimum diameter of commutator		[mm (in)]	28.0 (1.102)
Minimum length of brush		[mm (in)]	10.5 (0.413)
Brush spring tension		[N (kg, lb)]	16.2 (1.65, 3.6)
Clearance between bearing metal and armature shaft		[mm (in)]	Less than 0.2 (0.008)
Clearance between pinion front edge and pinion stopper		[mm (in)]	0.3 - 2.5 (0.012 - 0.098)

Alternator

NKS00551

Type		A3TJ1991
		MITSUBISHI make
Nominal rating	[V - A]	12 - 150
Ground polarity		Negative
Minimum revolution under no-load (When 13.5 V is applied)	[rpm]	Less than 1,300
Hot output current (When 13.5 V is applied)	[A/rpm]	More than 31/1,300 More than 122/2,500 More than 144/5,000
Regulated output voltage	[V]	14.1 - 14.7
Minimum length of brush	[mm (in)]	More than 5.00 (0.1969)
Brush spring pressure	[N (g, oz)]	4.1 - 5.3 (418 - 540, 14.8 - 19.1)
Slip ring minimum outer diameter	[mm (in)]	More than 22.1 (0.870)
Rotor (Field coil) resistance	[Ω]	1.7 - 2.0

SECTION SE
SEAT

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS0009B

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Service Notice

NIS0009C

- When removing or installing various parts, place a cloth or padding onto the vehicle body to prevent scratches.
- Handle trim, molding, instruments, grille, etc. carefully during removing or installing. Be careful not to oil or damage them.
- Apply sealing compound where necessary when installing parts.
- When applying sealing compound, be careful that the sealing compound does not protrude from parts.
- When replacing any metal parts (for example body outer panel, members, etc.), be sure to take rust prevention measures.

Precautions for Battery Service

NIS0009D

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Work

NIS0009E

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and keep them.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After re-installation is completed, be sure to check that each part works normally.
- Follow the steps below to clean components.

– Water soluble foul: Dip a soft cloth into lukewarm water, and wring the water out of the cloth to wipe the fouled area.
Then rub with a soft and dry cloth.

– Oily foul: Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%), and wipe the fouled area.
Then dip a cloth into fresh water, and wring the water out of the cloth to wipe the detergent off. Then rub with a soft and dry cloth.

- Do not use organic solvent such as thinner, benzene, alcohol, and gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

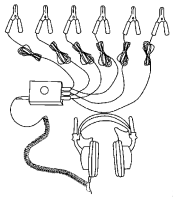
PREPARATION

PFP:00002

Special Service Tools

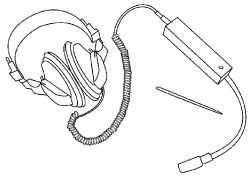
NIS0009F

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS0009G

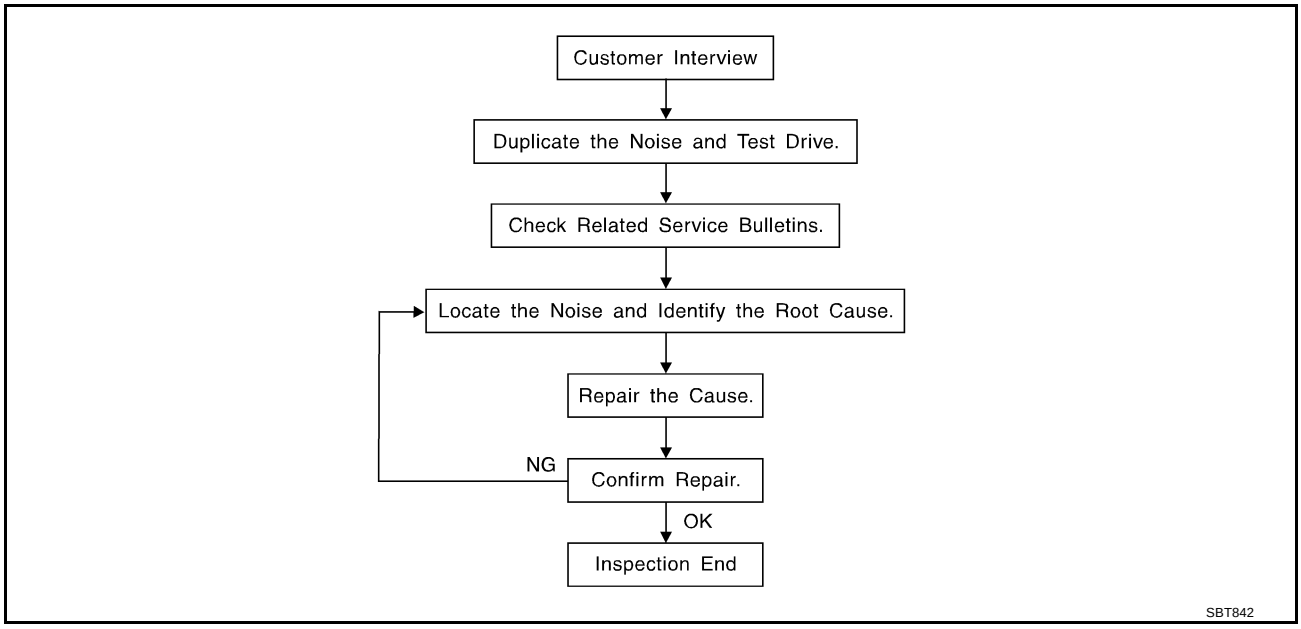
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS0029B



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to RF-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to RF-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS0029C

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint
   These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

   CAUTION:
   Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

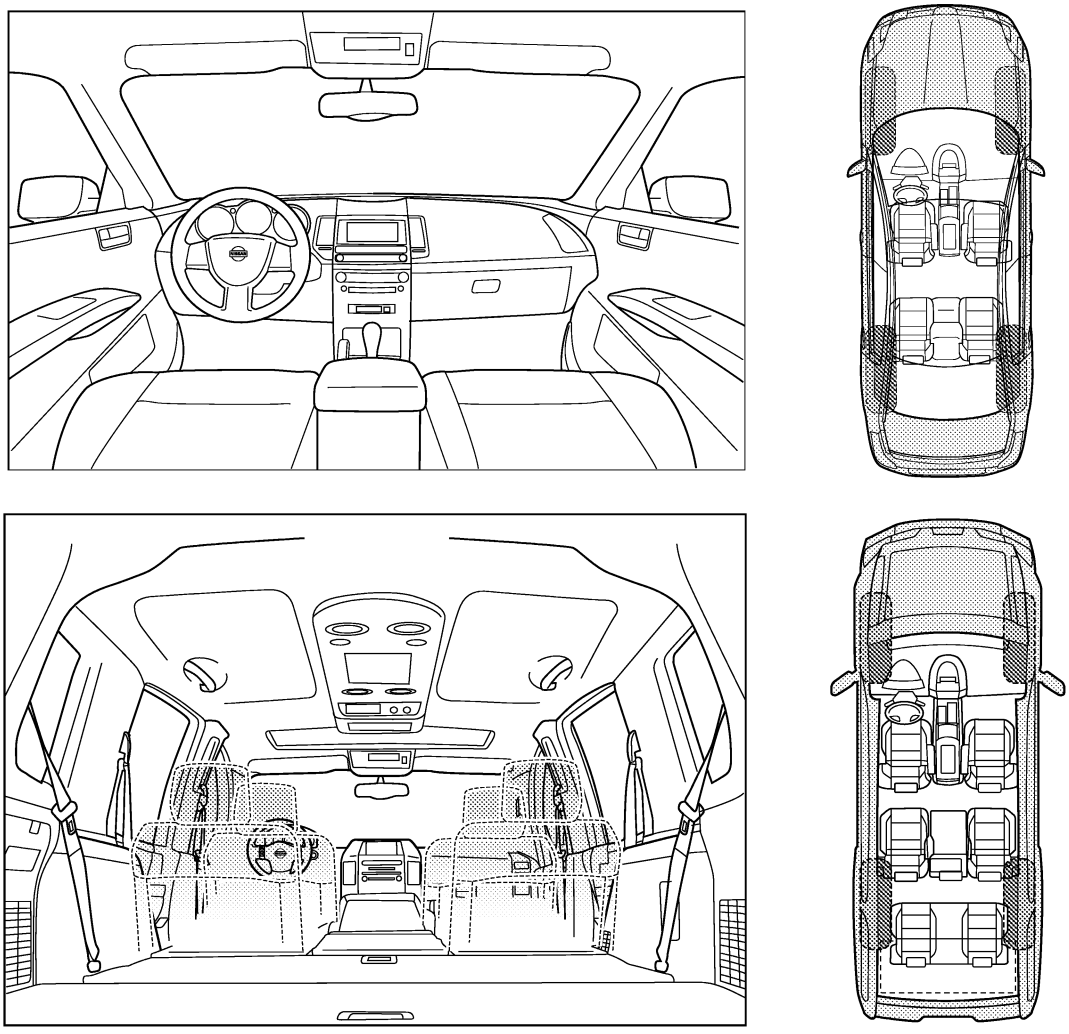
Diagnostic Worksheet

NIS0029D

SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

PIIB8742E

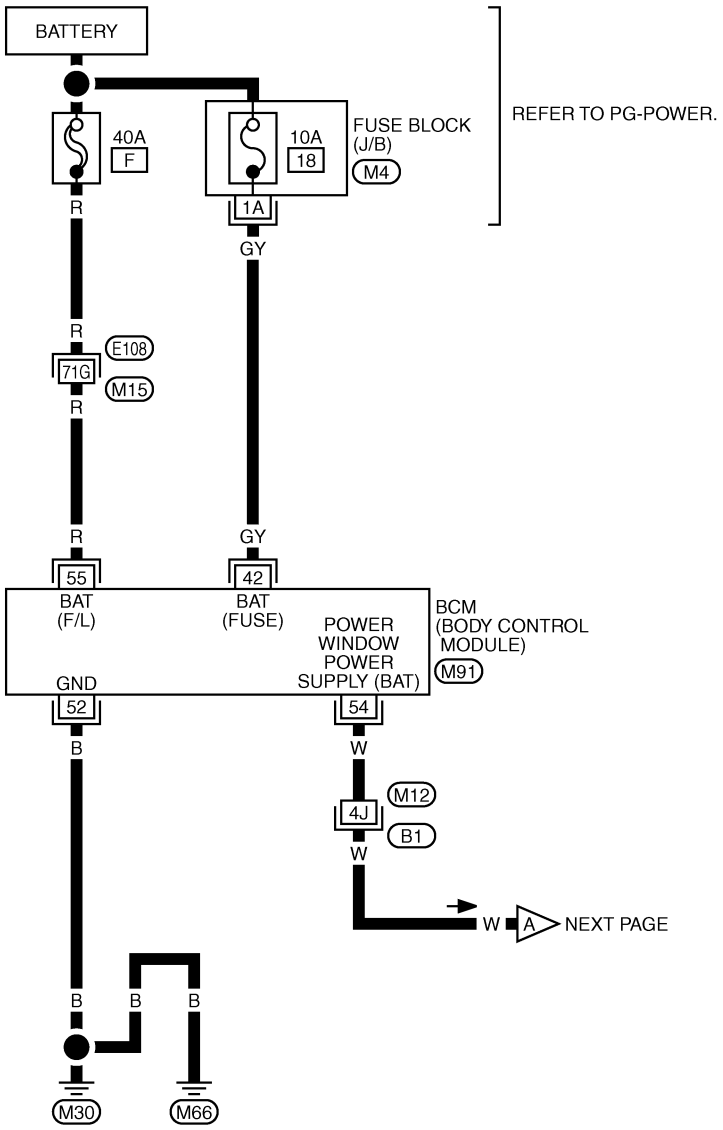
POWER SEAT/FOR COUPE

PFP:87016

Wiring Diagram–SEAT– /For Driver Seat

NIS0009K

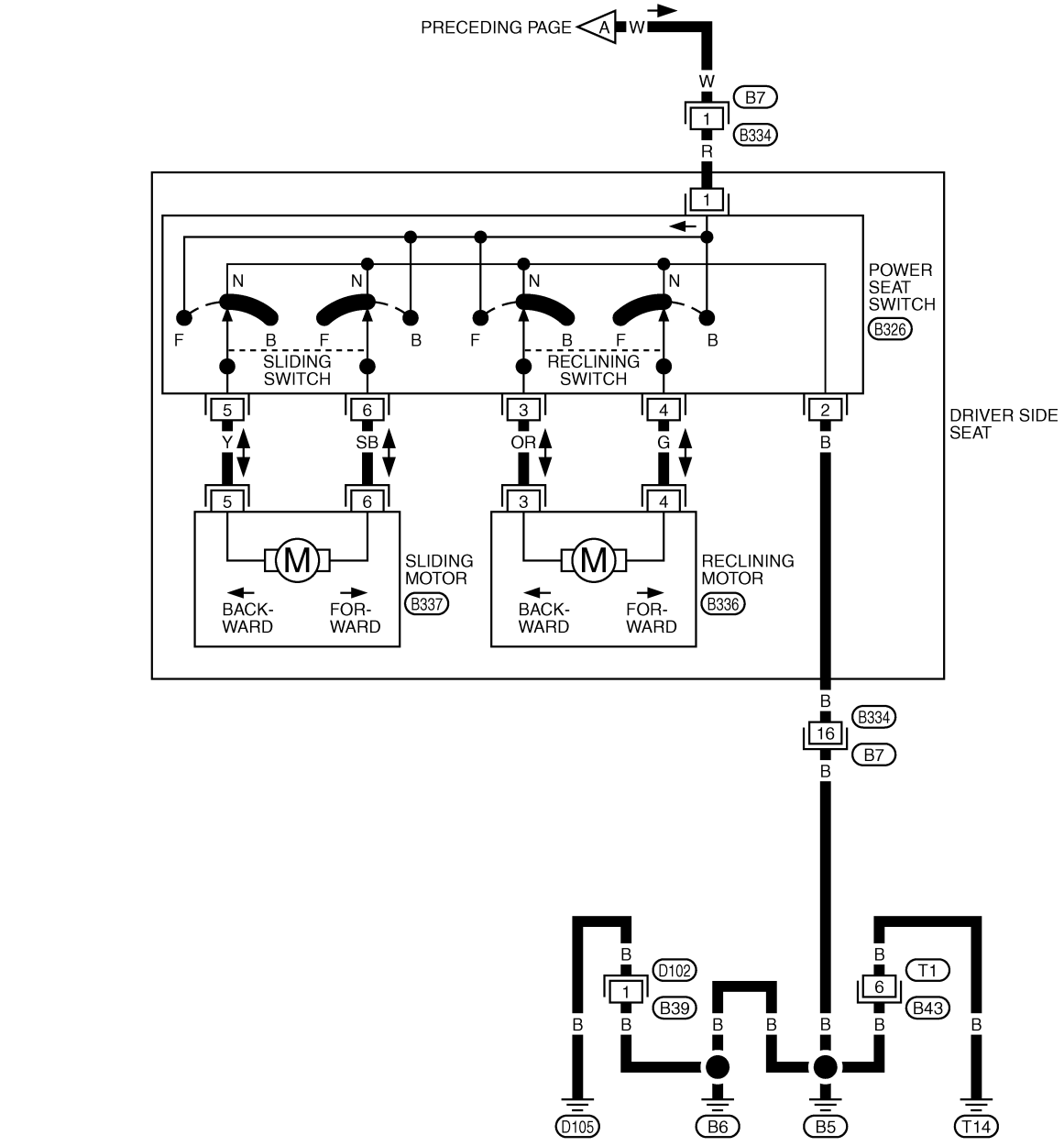
SE-SEAT-01

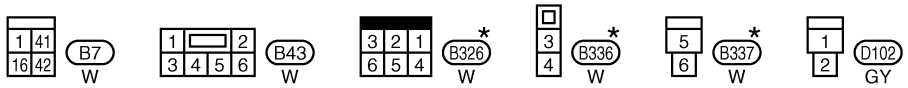


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M91 -ELECTRICAL UNITS

TIWT1611E

SE-SEAT-02



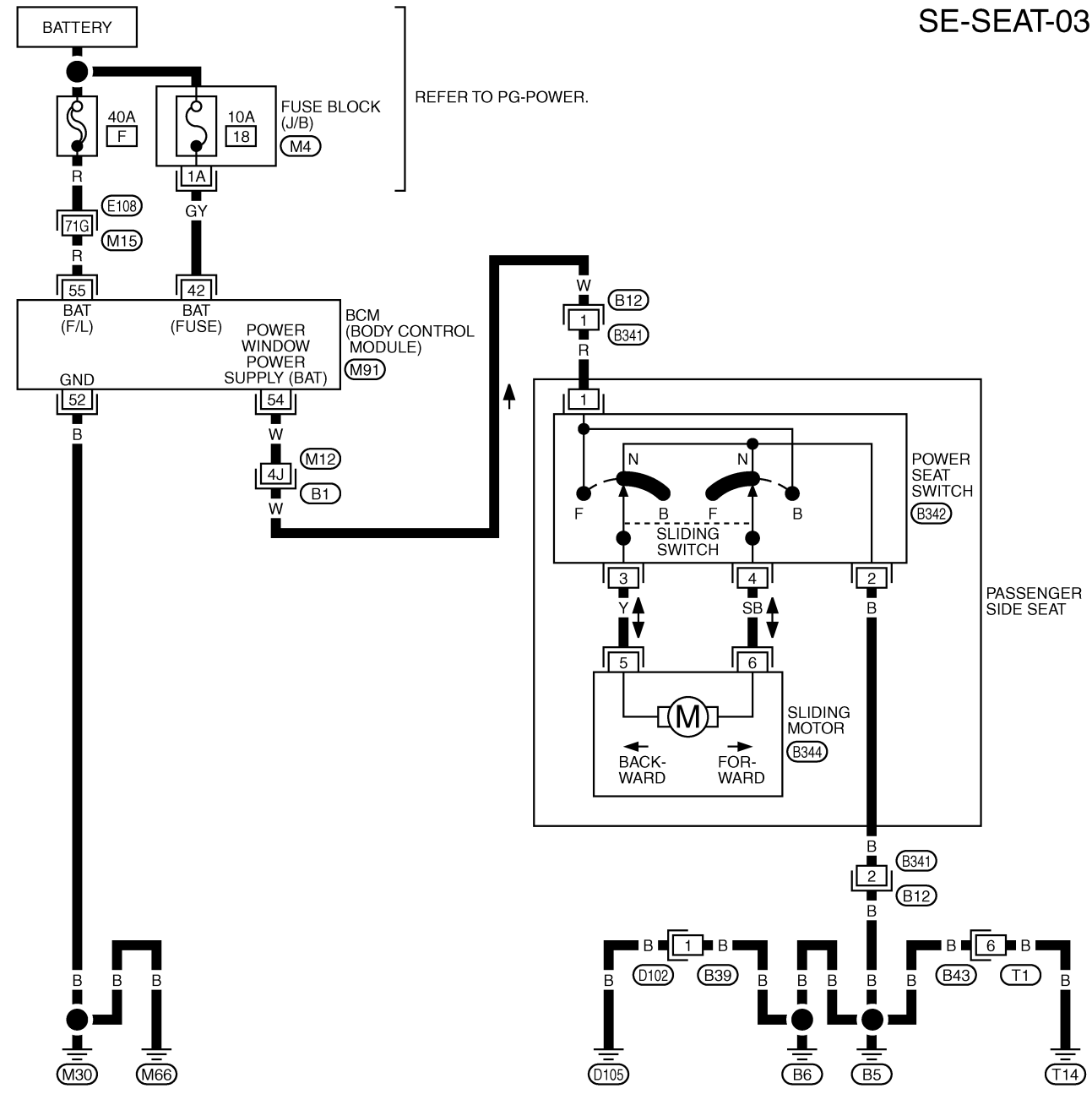


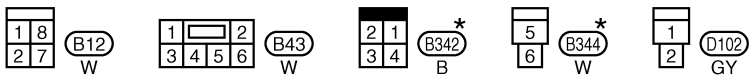
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0723E

Wiring Diagram–SEAT– /For Passenger Seat

NIS0009L





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M91 -ELECTRICAL UNITS

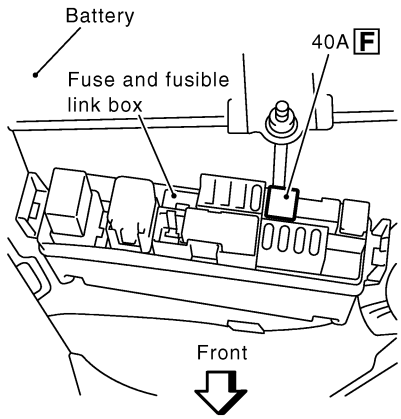
TIWT1612E

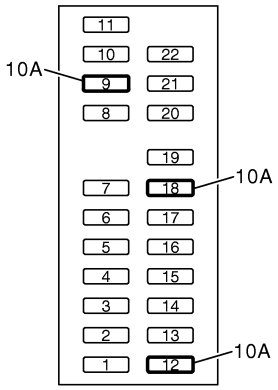
POWER SEAT/FOR ROADSTER

PFP:25565

Component Parts and Harness Connector Location

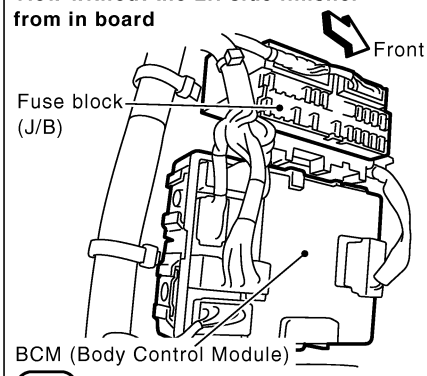
NIS0009M

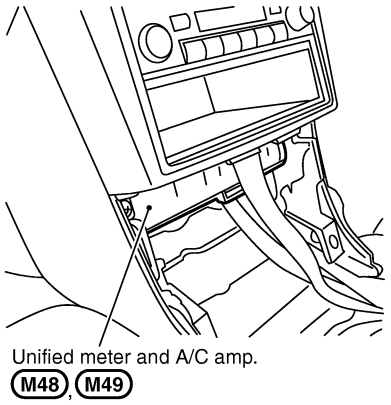


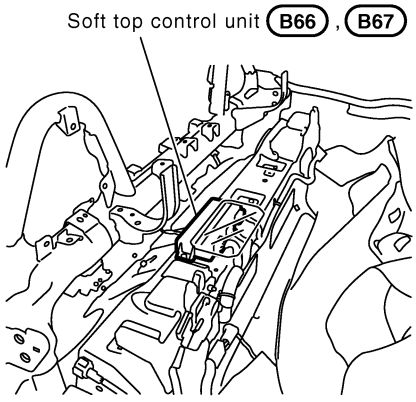


Fuse block (J/B) fuse layout

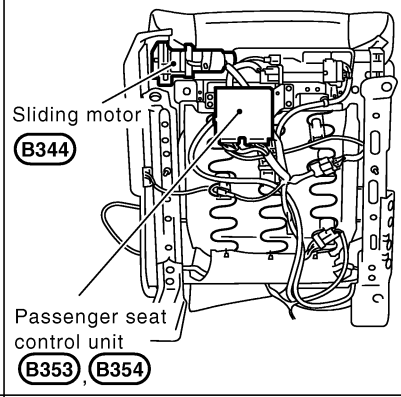
View without the LH side finisher from in board



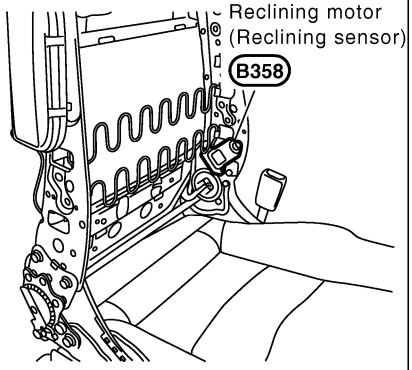


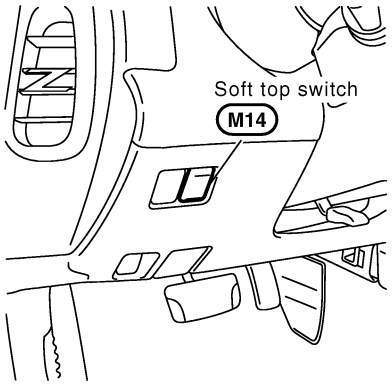


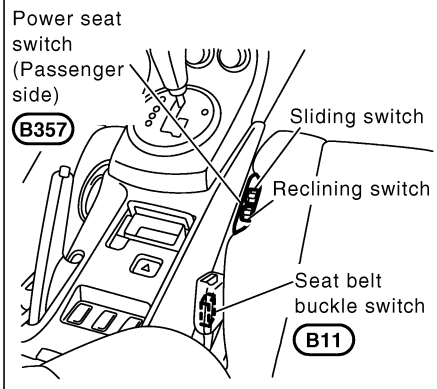
Bottom view of passenger seat



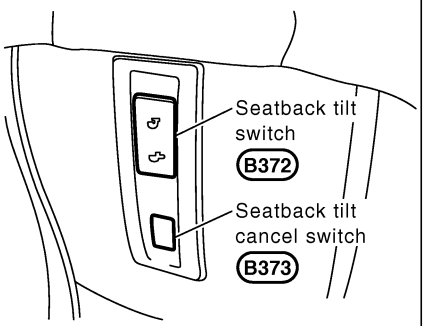
Front view of passenger side seatback without pad and trim removed



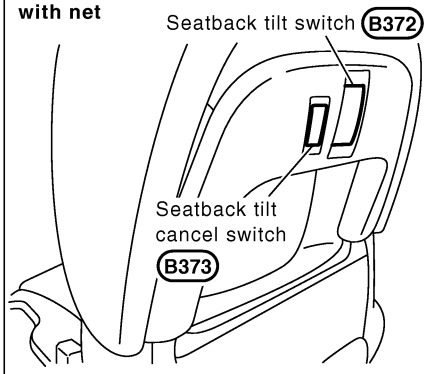


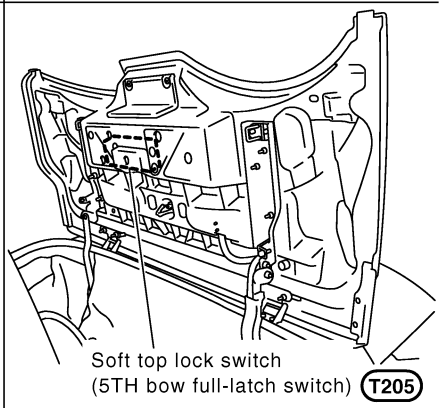


Rear view of passenger side seatback without net

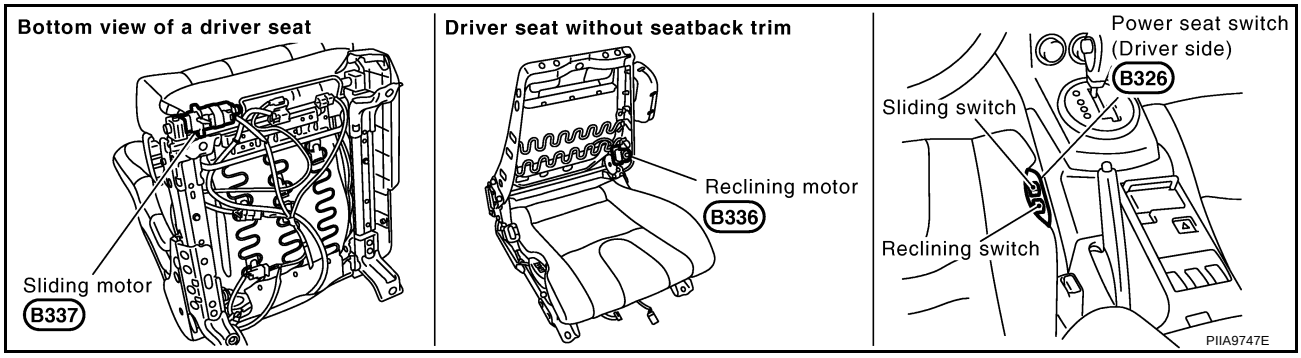


Rear view of passenger side seatback with net





PIIB7413E



System Description

NIS0009N

Power is supplied at all times,

- through 40A fusible link (letter **F** , located in the fusible link)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through BCM terminal 41,
- to passenger seat control unit terminal 34,
- through BCM terminal 54
- to driver side power seat switch terminal 1 and passenger seat control unit terminal 39.

When ignition switch in ON or START position,
power is supplied

- thought 10A fuse [No. 12, located in the fuse block (J/B)]
- to passenger seat control unit terminal 2.

When ignition switch in START position,
power is supplied

- thought 10A fuse [No. 9, located in the fuse block (J/B)]
- to passenger seat control unit terminal 1.

ground supplied

- to BCM terminal 52
- through body grounds M30 and M66,
- to passenger side seat control unit terminals 40, 48
- through body grounds B5, B6 and T14.

DRIVER SIDE SEAT OPERATION

When a driver side seat sliding switch is operated forward,
power is supplied

- through power seat switch terminal 5
- to sliding motor terminal 5.

Then ground is supplied

- to sliding motor terminal 6
- through power seat switch terminal 6
- through power seat switch terminal 2

The driver side seat moves forward.
When a driver side seat sliding switch is operated backward,
power is supplied

- through power seat switch terminal 6
- to sliding motor terminal 6.

Then ground is supplied

- to sliding motor terminal 5
- through power seat switch terminal 5

- through power seat switch terminal 2

The driver side seat moves backward.
When a driver side seat reclining switch is operated forward, power is supplied

- through power seat switch terminal 3
- to reclining motor terminal 3.

Then ground is supplied

- to reclining motor terminal 4
- through power seat switch terminal 4
- through power seat switch terminal 2

The driver side seat folds forward.
When a driver side seat reclining switch is operated backward, power is supplied

- through power seat switch terminal 4
- to reclining motor terminal 4.

Then ground is supplied

- to reclining motor terminal 3
- through power seat switch terminal 3
- through power seat switch terminal 2

The driver side seat reclines backward.

PASSENGER SIDE SEAT MANUAL OPERATION

When a passenger side seat sliding switch is operated forward, ground is supplied

- to passenger seat control unit terminal 14
- through power seat switch terminal 14
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 45
- to sliding motor terminal 45

Then ground is supplied

- to sliding motor terminal 37
- through passenger seat control unit terminal 37

The passenger side seat moves forward.
When a passenger side seat sliding switch is operated backward, ground is supplied

- to passenger seat control unit terminal 15
- through power seat switch terminal 15
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the backward signal, power is supplied simultaneously

- through passenger seat control unit terminal 37
- to sliding motor terminal 37

Then ground is supplied.

- to sliding motor terminal 45
- through passenger seat control unit terminal 45

The passenger side seat moves backward.
When a passenger side seat reclining switch is operated forward, ground is supplied

- to passenger seat control unit terminal 12
- through power seat switch terminal 12
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

The passenger side seat folds forward.
When a passenger side seat reclining switch is operated backward, ground is supplied

- to passenger seat control unit terminal 13
- through power seat switch terminal 13
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the backward signal, power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42

The passenger side seat reclines backward.

PASSENGER SEATBACK TILT FORWARD/BACKWARD OPERATION

When a passenger side seatback tilt switch is operated forward, ground is supplied

- to passenger seat control unit terminal 8
- through seatback tilt switch terminal 8
- through seatback tilt switch terminal 40
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds front most forward.
When a passenger side seatback tilt switch is operated backward, ground is supplied

- to passenger seat control unit terminal 9
- through seatback tilt switch terminal 9
- through seatback tilt switch terminal 40
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the backward signal, power is supplied simultaneously

- through passenger seat control unit terminal 35

- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

INTERLOCKING OPERATION OF THE PASSENGER SEAT WITH THE SOFT TOP

NOTE:
Refer to RF-12, "System Description" for detailed operation.

CLOSE → OPEN

When a soft top switch is operated to OPEN,
ground is supplied

- to passenger seat control unit terminal 5
- through soft top switch terminal 3
- through soft top switch terminal 1
- through body ground M30 and M66.

Then passenger seat control unit recognizes the soft top OPEN signal,
Soft top control unit transmits power window down signal to passenger seat control unit,

- through soft top control unit terminal 36
- to passenger seat control unit terminal 16.

When passenger seat control unit receives power window down signal and soft top OPEN signal,
power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds 6° forward.
When storage lid closed, soft top control unit transmits a storage lid close signal to passenger seat control unit,

- through soft top control unit terminal 13
- to passenger seat control unit terminal 33.

When passenger seat control unit receives storage lid close signal,
power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

OPEN → CLOSE

When a soft top switch is operated to CLOSE,
ground is supplied

- to passenger seat control unit terminal 6
- through soft top switch terminal 4
- through soft top switch terminal 1
- through body ground M30 and M66.

Then passenger seat control unit recognizes the soft top CLOSE signal,
soft top control unit transmits power window down signal to passenger seat control unit,

- through soft top control unit terminal 36
- to passenger seat control unit terminal 16.

When passenger seat control unit receives power window down signal and soft top CLOSE signal,

power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds 6° forward.
When soft top lock switch (5th bow full latch switch) is turned ON, soft top control unit transmits a soft top lock signal to passenger seat control unit,
ground is supplied

- to passenger seat control unit terminal 11
- through soft top lock switch (5th bow full latch switch) terminal 3
- through soft top lock switch (5th bow full latch switch) terminal 4
- through body ground B5, B6 and T14.

When passenger seat control unit receives soft top lock switch ON signal,
power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

PASSENGER SIDE RECLINING MOTOR OPERATION

When a passenger side seat reclining motor is operated,
signal is transmitted

- to passenger seat control unit terminal 3
- through reclining motor terminal 3
- through reclining motor terminal 41
- through passenger seat control unit terminal 41.

Then passenger seat control unit judges seatback angle by receiving reclining sensor signal.

SEATBACK TILT CANCEL SWITCH OPERATION

When a passenger side seatback tilt cancel switch is operated to CANCEL,
ground is supplied

- to passenger seat control unit terminal 7
- through seatback tilt cancel switch terminal 7
- through seatback tilt cancel switch terminal 40C
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the CANCEL signal.
When a “seatback tilt cancel switch” is operated to CANCEL, the automatic operation of a passenger seat is not performed.

MANUAL OPERATION

The seat positions can be adjusted by operating the sliding switch and reclining switch located on the side of both driver and passenger seat cushions.

AUTOMATIC OPERATION

Passenger Seatback Tilting Function

- When the seatback tilt switch on the rear side of the passenger seatback is operated to tilt forward, the seatback tilts forward to the front most position.
- To tilt the seatback backward or restore its position, push the seatback tilt switch on the tilt-backward direction. The seatback will be tilting backwards while the switch is operated. It can be moved backwards until it reaches to its start position.

Conditions For the Operation

When the following conditions are satisfied, the seatback tilts forward or backward by operating the seatback tilt switch.

Conditions	● Power seat switches (sliding and reclining) are OFF. ● The seat belt is not fastened. ● The vehicle speed is approximately 6 km/h or less. ● The soft top is not currently in operation.*1 ● The ignition switch is not in the START position. ● The seatback tilt cancel switch is in AUTO.

*1: The operation will be stopped only while the reclining motor is operating.

Conditions for Stopping the Operation

- Seatback tilting operation stops when any one of the conditions below is satisfied.

Conditions	● A power seat switch (sliding or reclining) is operated. ● The seat belt is fastened. ● The vehicle speed is approximately 7 km/h or more. ● The soft top is in operation. (Stops only tilt-forward operation.)*2 ● The seatback tilting switch is operated while the seatback is in operation. ● The ignition switch is turned to the START position. ● Reclining motor lock is detected.

*2: Operation will be stopped only while the reclining motor is operating.

NOTE:

If operation stops as a result of the conditions below, use the reclining switch to tilt the seat backward.

- A power seat switch (sliding or reclining) is operated.
- The seat belt is fastened.
- The seatback tilt cancel switch is turned to “CANCEL”.

Soft Top Interlocking Operation Function

- The seatback tilts forward by approximately 6° (tilt froward operation) when the soft top opens or closes.
- When open/close operation is completed, the seatback returns to the tilt start position (return operation).

Conditions for the Operation

When the soft top switch is pushed to OPEN or CLOSE, and all of the conditions below are satisfied, then the seatback operates, linked with the operation of the soft top.

Conditions	● The power seat switches (sliding and reclining) are OFF. ● The seatback tilt switch is OFF. ● The vehicle speed is 6 km/h or less. ● The ignition switch is ON. ● The seatback tilt cancel switch is turned to AUTO.

Conditions for the Pausing/Stopping Operation

Operation is paused or stopped if any of the conditions below are satisfied during soft top operation.

Stop conditions	● A power seat switch (sliding or reclining) is operated. ● Reclining motor lock is detected (return operation only). ● The seatback tilt switch is operated while the seatback is operating. ● The seatback tilt cancel switch is turned to CANCEL.
Pause condition	● The ignition switch is turned to the START position.

Seat Status Output Signal

- Depending on the seat status, the “passenger seat control unit” sends the seat status output signal to the “soft top control unit”.
- The “soft top control unit” controls the soft top open/close operation based on whether the seat status signal is ON or OFF. For details about soft top control, refer to RF-19, "Operation Chart" .

Seat status signal OFF→ ON condition	● When a seatback tilt forward motion has been completed. (as a process during a soft top interlocking operation) ● When a seatback tilt forward motion has been completed. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and a tilt forward / backward operation is under going, and if the seatback is tilted more than 6 degree from the start position of the tilt forward / backward operation. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and a tilt forward operation was under going, but the operation was stopped under some conditions, (See below *4.) and if the seatback is tilted more than 6 degree from the start position of the tilt forward operation. (after an automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and also the seatback tilt cancel switch is in “Cancel” position. ● When the ignition switch has been turned from “START” to “ON” position. (during a soft top interlocking operation. After an engine start operation, the soft top interlocking operation is accepted.)
Seat status signal ON→ OFF condition	● When a seatback tilt backward motion has been started. (as a process during a soft top interlocking operation) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, after a tilt forward operation has been finished. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, and a tilt forward / backward operation is under going, and if the seatback is tilted more than 6 degree from the start position of the tilt forward / backward operation. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, and a tilt forward operation was under going, but the operation was stopped under some conditions, (See below *4.) and if the seatback is still tilted more than 6 degree from the start position of the tilt forward operation. (after an automatic operation by using a seatback tilt switch.) ● When the ignition switch has been turned from “ON” to “START” position. (during a soft top interlocking operation. During an engine start operation, the soft top interlocking operation is paused.) ● When a seatback tilt forward motion has been started by the seatback tilt switch, just after the seatback tilt forward motion has been finished for a soft top interlocking operation. (for the seatback tilt switch operation during a soft top interlocking operation) ● When a seatback tilt forward motion has been started by the passenger seat reclining switch, just after the seatback tilt forward motion has been finished for a soft top interlocking operation. (for the seat reclining switch operation during a soft top interlocking operation)

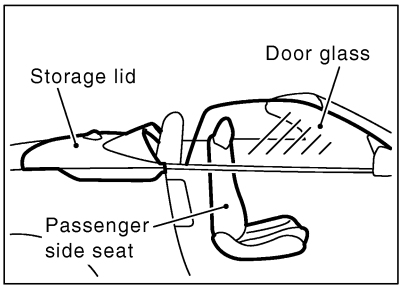
*3: After that, seat condition signal stays ON if cancel switch turns to AUTO.
The seat status signal turns ON only when power window DOWN signal input is ON.

*4: If tilt forward/backward operation stops as a result of the conditions below, the tilt start position does not change.

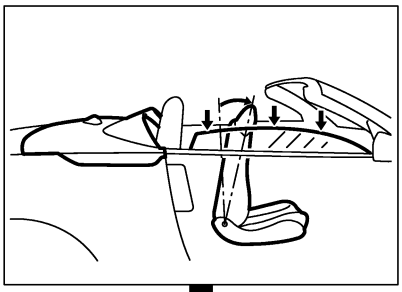
- The vehicle speed is approximately 7 km/h or more.
- The seatback tilt switch is operated while the seatback is operating.
- The ignition switch is turned to the START position.

Operation of the Passenger Seat Linked with the Soft Top

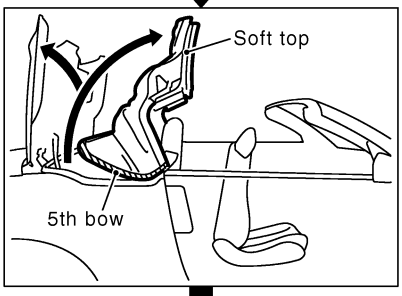
Passenger seat operation during soft top CLOSE operation



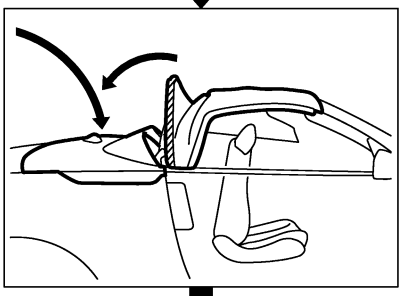
1. Passenger seatback tilts forward by approximately 6˚ as soon as windows go down, when soft top switch has been pushed on CLOSE.



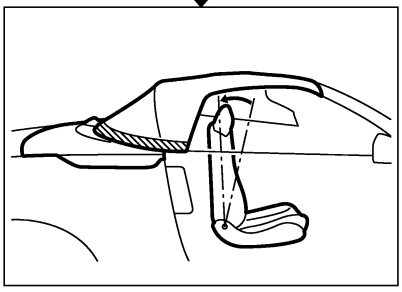
2. Soft top CLOSE operation starts as soon as the passenger seatback tilt forward operation completes.



3. Soft top continues the operation.

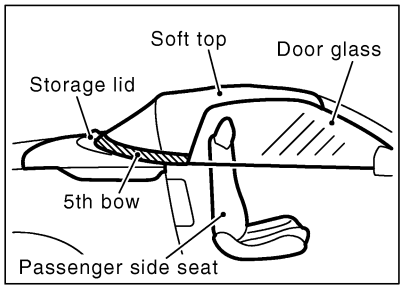


4. Passenger seatback goes back to the original position when 5th bow is closed.

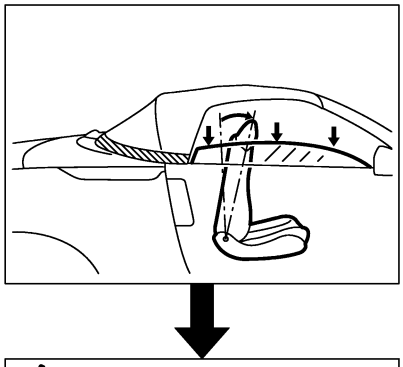


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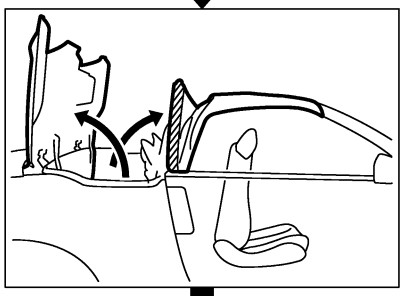
Passenger seat operation during soft top OPEN operation



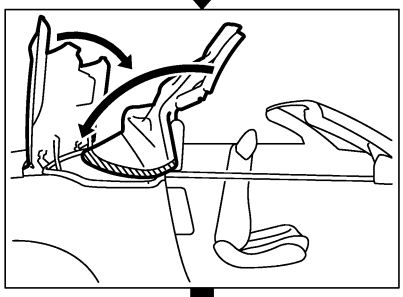
1. Passenger seatback tilts forward by approximately 6° as soon as windows go down, when soft top switch has been pushed on OPEN.



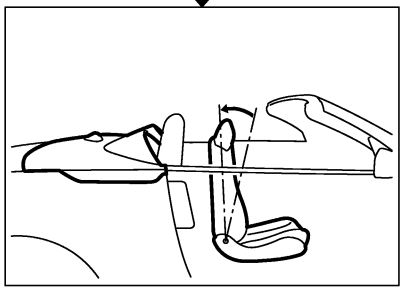
2. Soft top OPEN operation starts as soon as the passenger seatback tilt forward operation completes.



3. Soft top continues the operation.



4. Passenger seatback goes back to the original position when storage lid is closed.



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CANCEL FUNCTION

The seatback tilt cancel switch can be used to set following functions ON or OFF.

- The seatback tilt forward/backward function
- The soft top interlocking operation function

CAUTION:

- **If a child seat is installed, turn the seat tilt cancel switch OFF to disable the seatback tilt forward/backward function and the soft top interlock operation function.**

FAIL-SAFE MODE

If the power seat switch is not operated, nor the seat back tilt switch is not operated, nor the soft top interlocking operation is not under operation, and if the passenger seat control unit detects a motor operation power from the soft top control unit, the passenger seat control unit stops the motor by switching the motor power line to ground.

Operation location	● Sliding motor ● Reclining motor

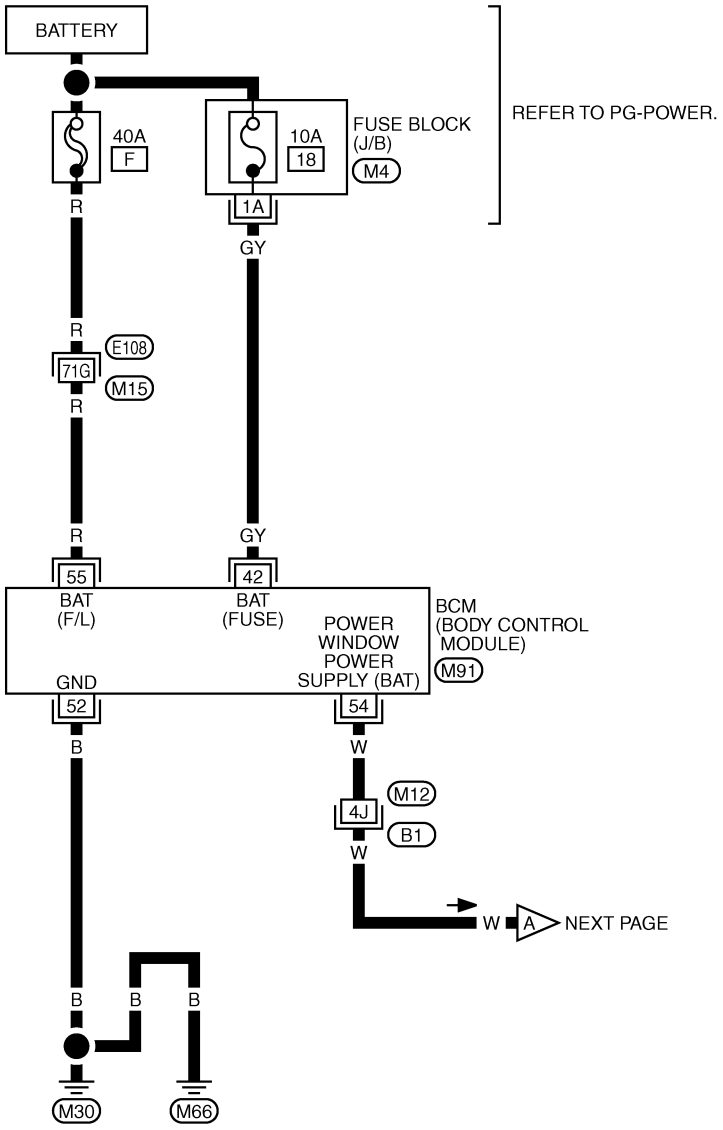
Canceling Fail-Safe Mode

- Disconnect and reconnect the battery terminal.
- Disconnect and reconnect the passenger seat control unit connector.

Wiring Diagram–SEAT– / For Driver Seat

NIS0009O

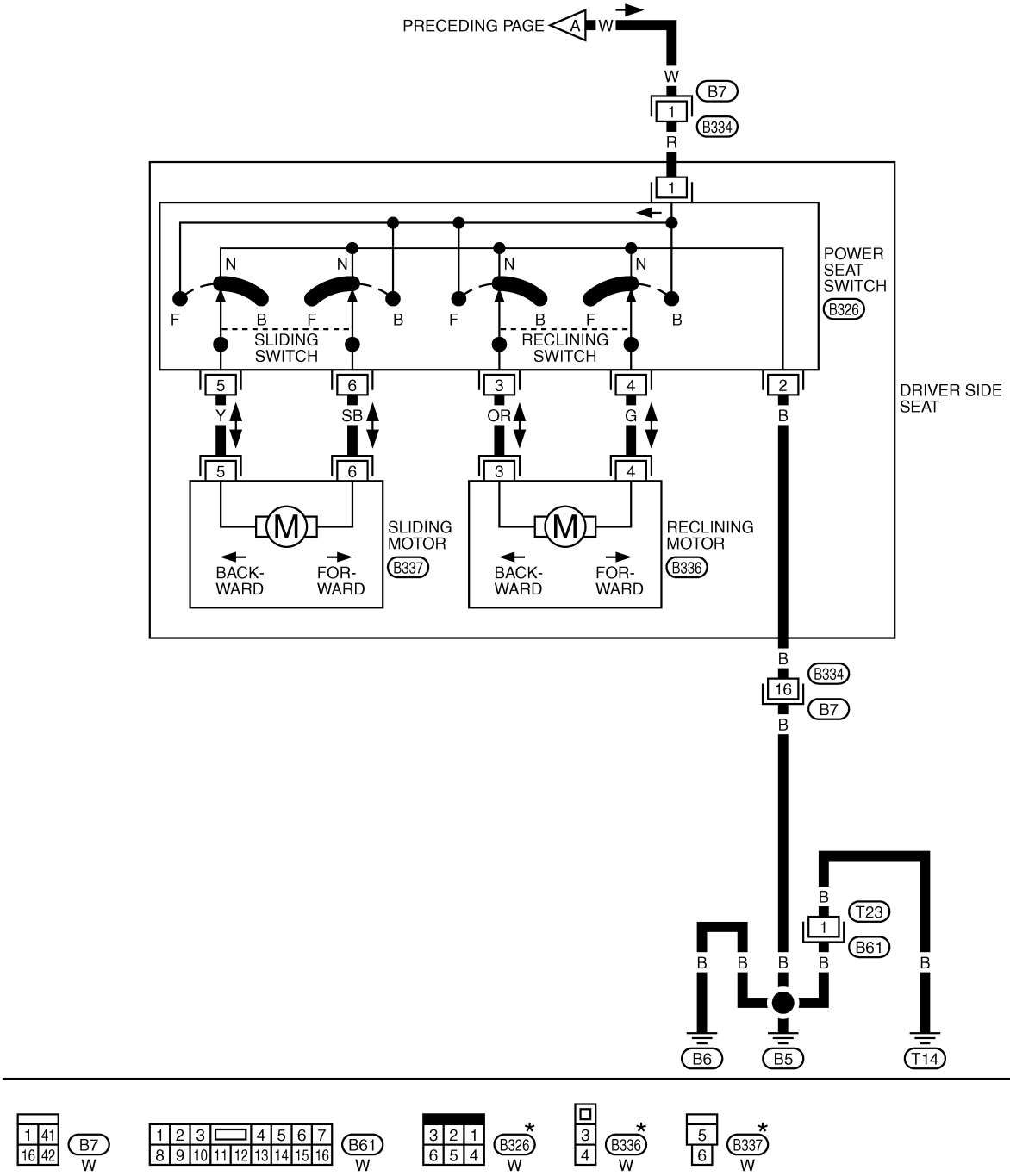
SE-SEAT-04



REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M91 -ELECTRICAL UNITS

TIWT1613E

SE-SEAT-05

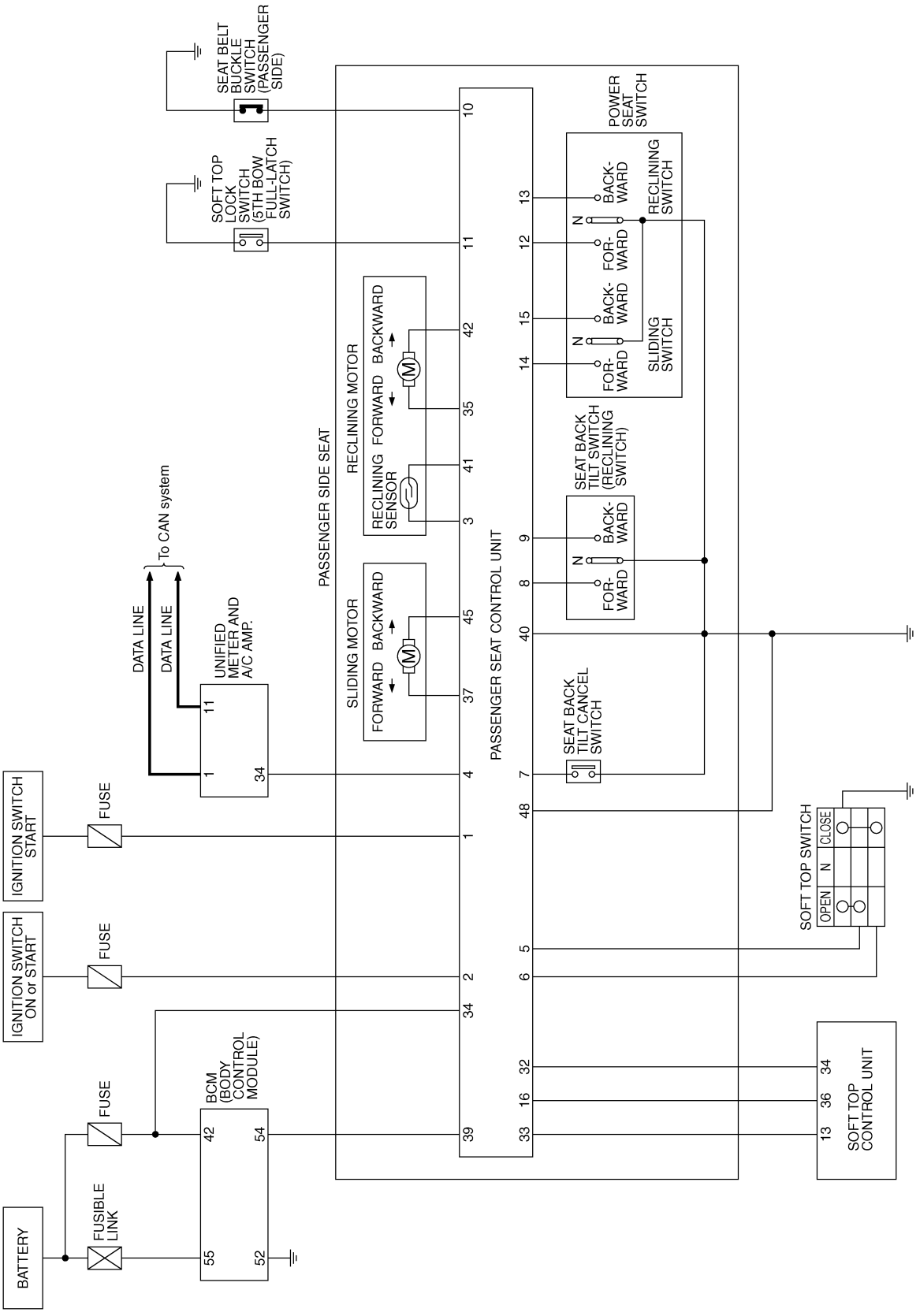


∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0774E

Schematic / For Passenger Seat

NIS0009P

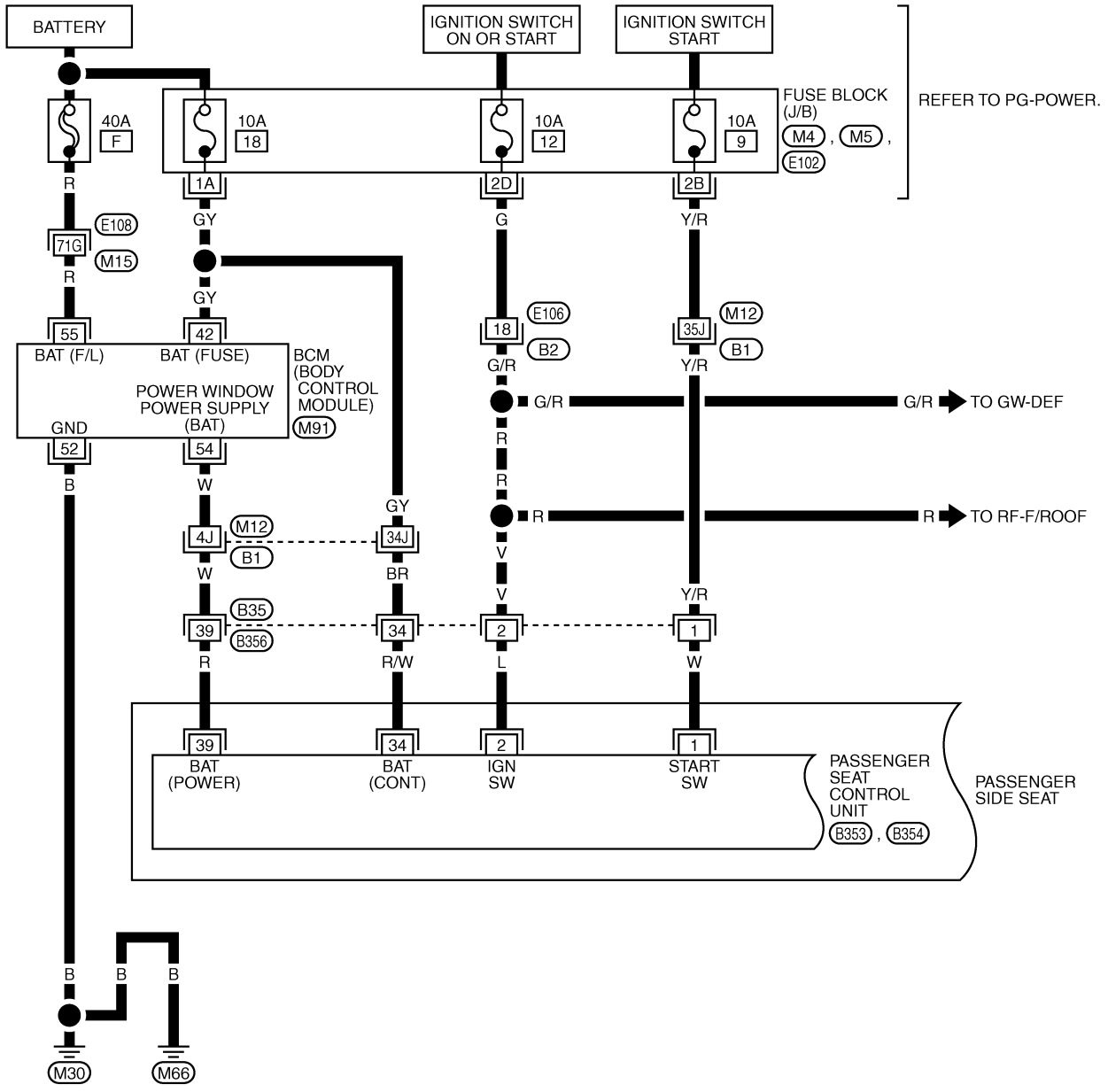


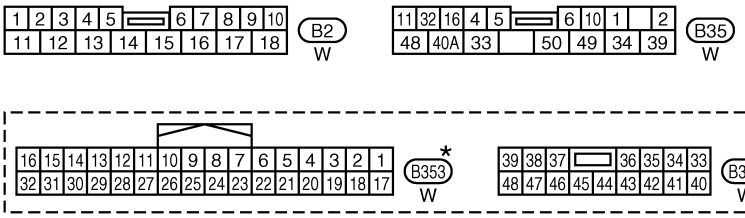
TIWT2287E

Wiring Diagram–SEAT– / For Passenger Seat

NIS0009Q

SE-SEAT-06





∗ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

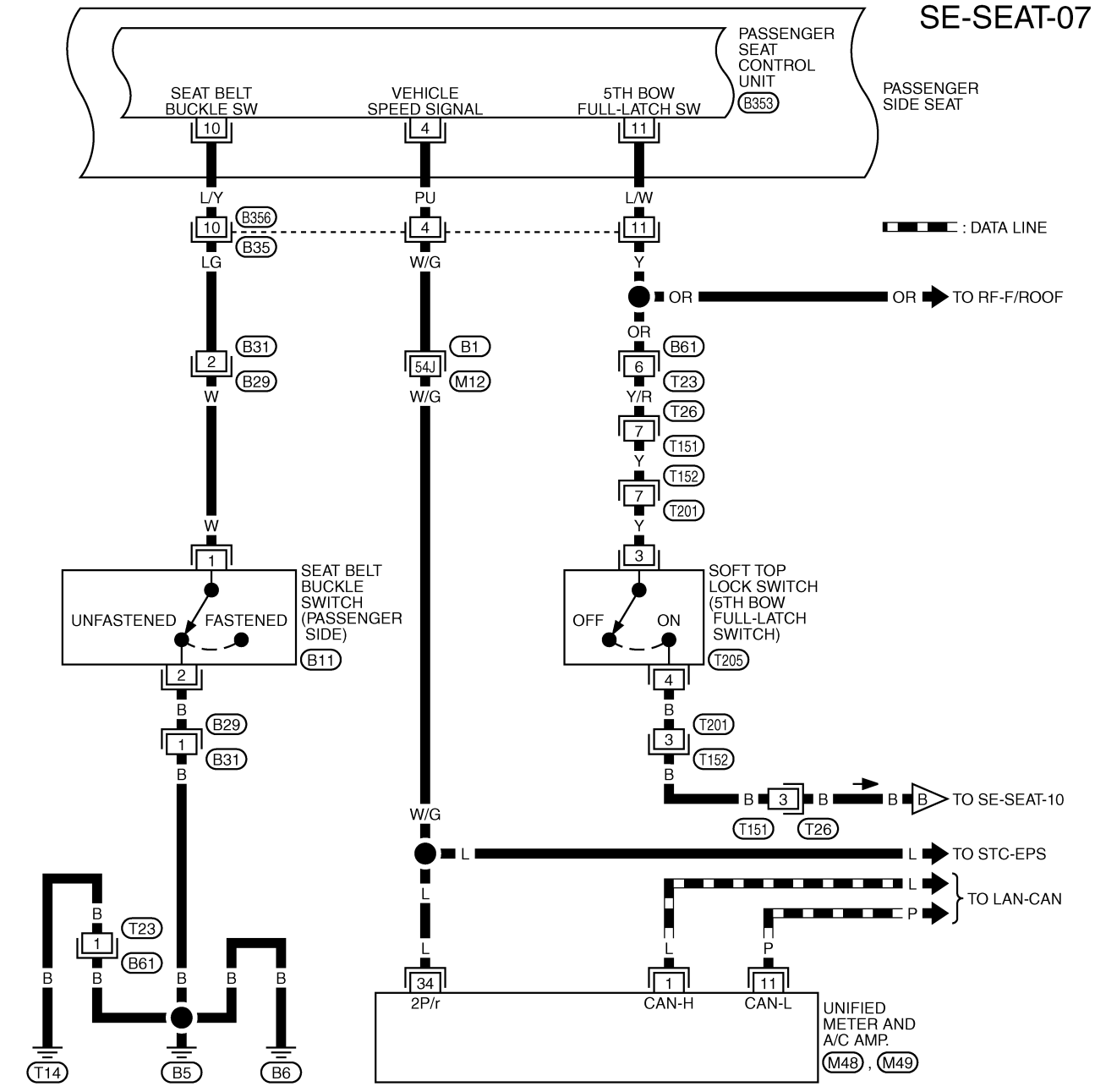
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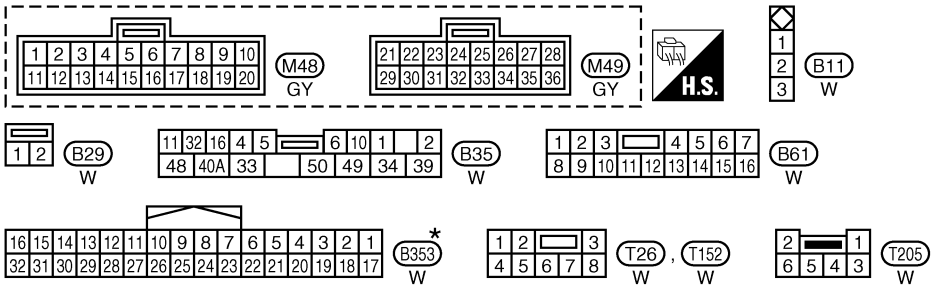
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , M5 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

M91 -ELECTRICAL UNITS

TIWT2288E



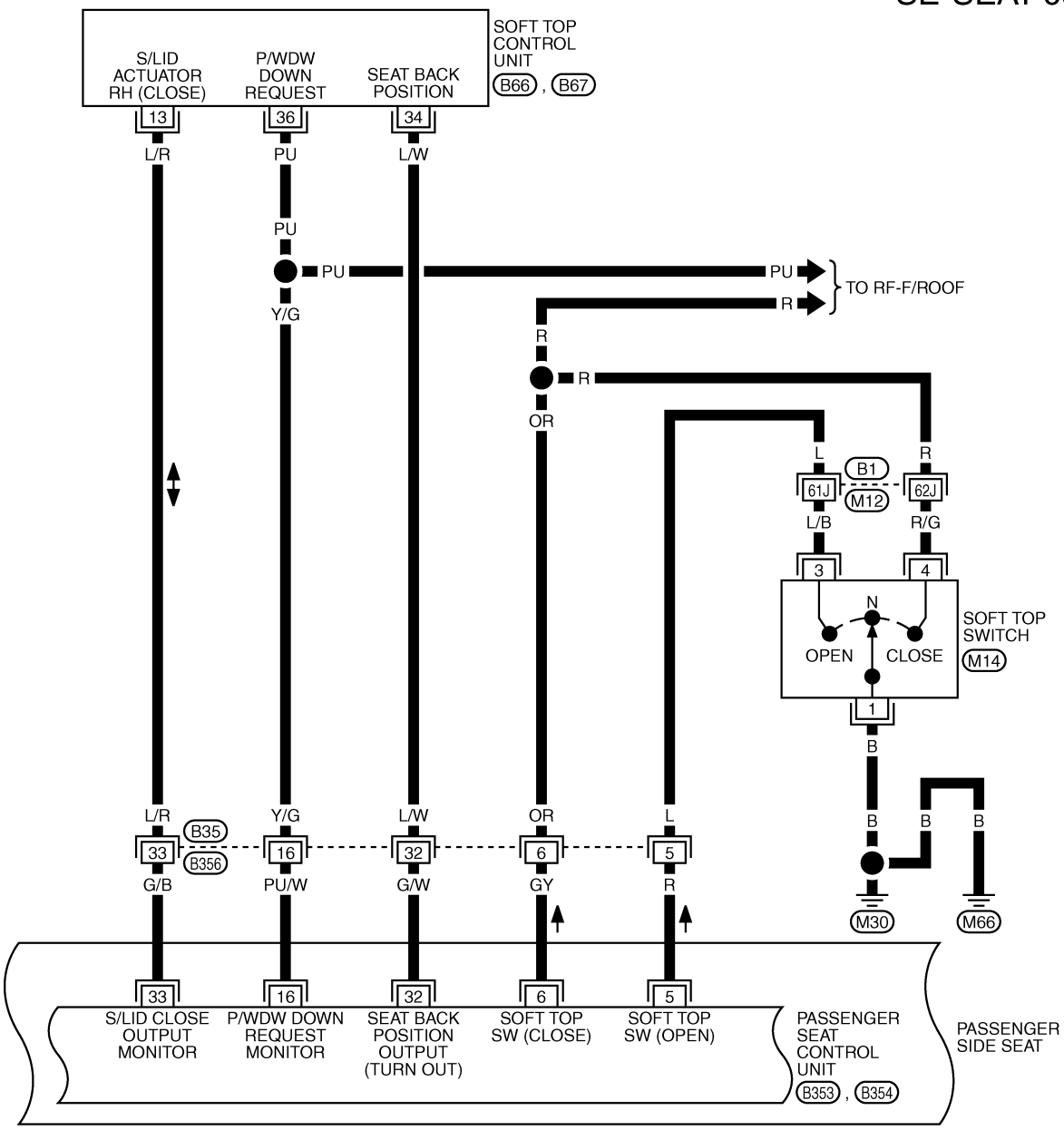


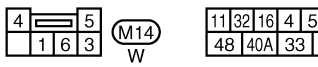
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

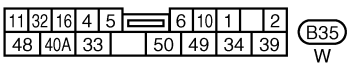
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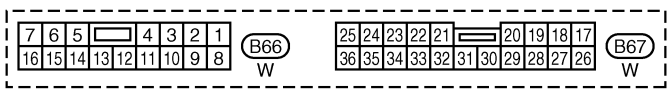
TIWT2213E

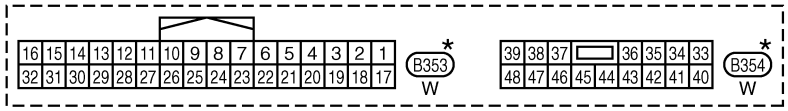
SE-SEAT-08









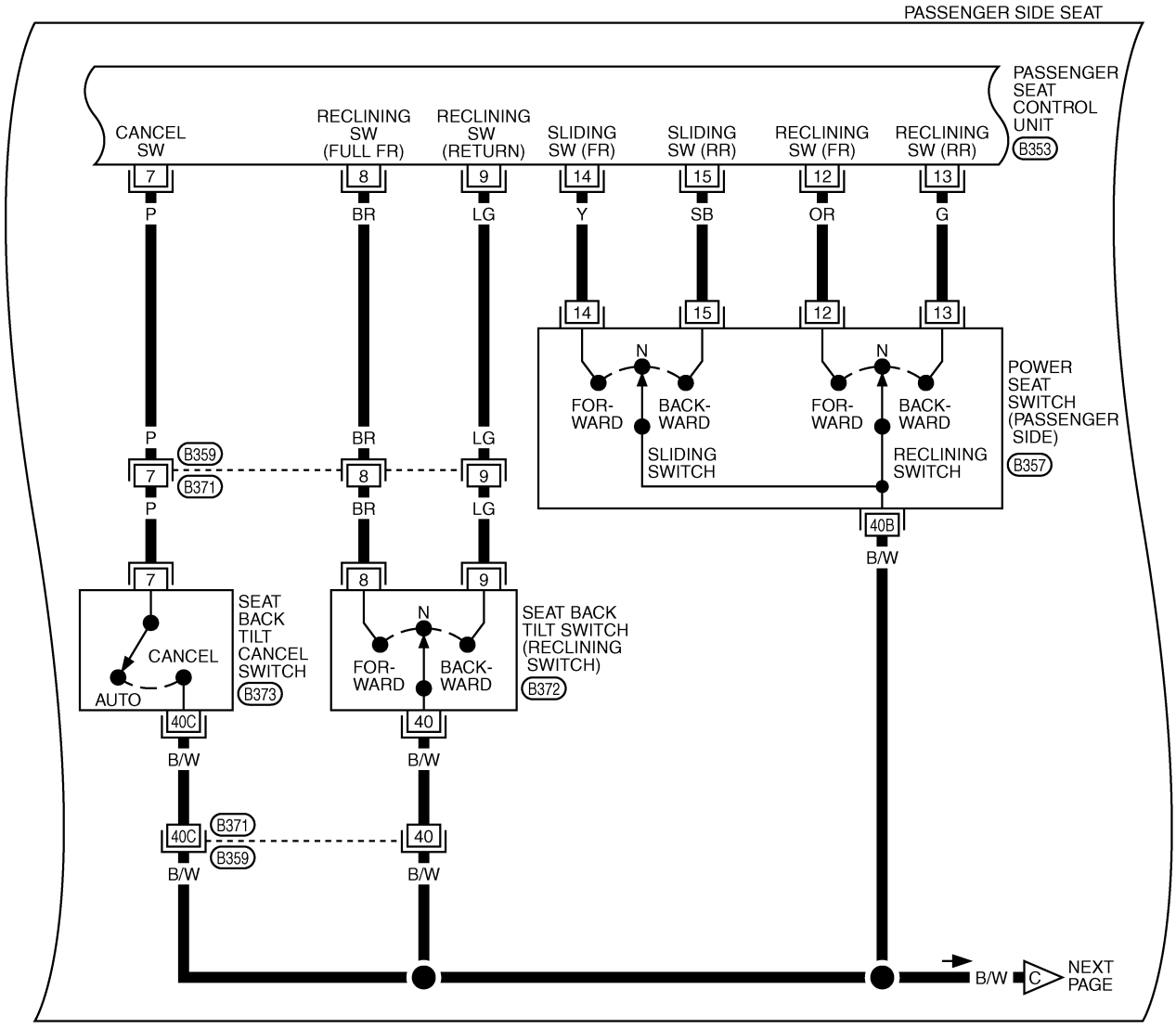


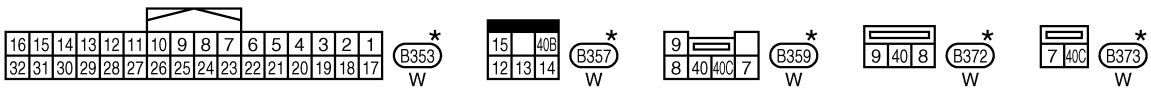
★ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT2289E

SE-SEAT-09

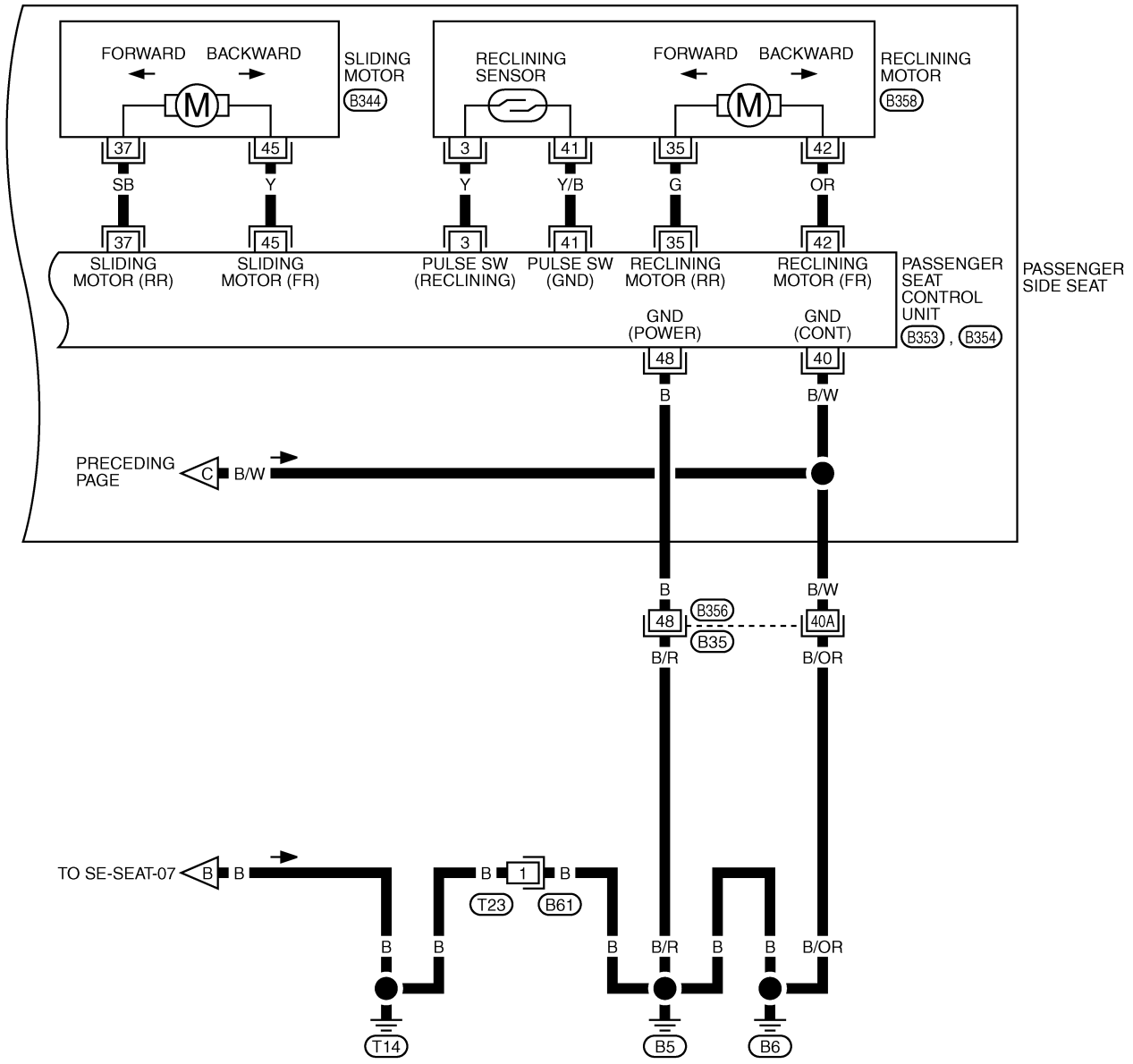


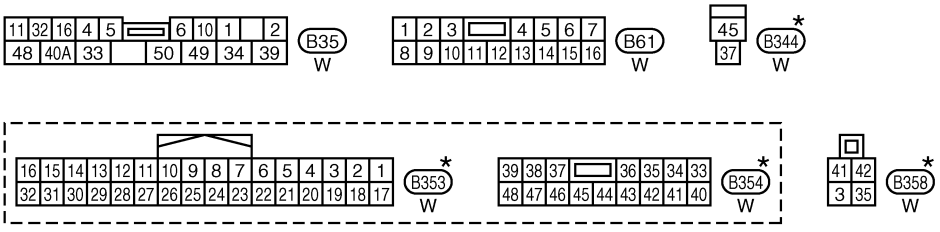


* : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0729E

SE-SEAT-10



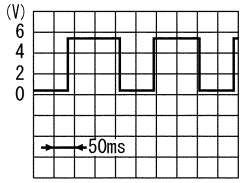
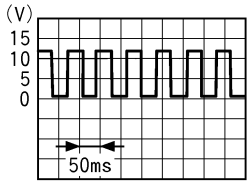


∗ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT2290E

Terminals and Reference Values of Passenger Seat Control Unit

NIS0009R

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
1	W	Ignition switch START power supply	Input	Ignition switch (START position)	Battery voltage
2	L	Ignition switch ON power supply	Input	Ignition switch (ON or START position)	Battery voltage
3	Y	Reclining sensor input signal	Input	When reclining motor is operated	 SIIA0692J
				Other than above	0 or 5
4	PU	Vehicle speed signal (2puls)	Input	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	 PIIB0078J
5	R	Soft top switch OPEN signal	Input	When soft top switch is turned to OPEN	0
				Other than above	Battery voltage
6	GY	Soft top switch CLOSE signal	Input	When soft top switch is turned to CLOSE	0
				Other than above	Battery voltage
7	P	Seatback tilt cancel switch signal	Input	When seatback tilt cancel switch is turned to AUTO	5
				When seatback tilt cancel switch is turned to CANCEL	0
8	BR	Seatback tilt switch FORWARD signal	Input	When seatback tilt switch is turned to FORWARD	0
				Other than above	Battery voltage
9	LG	Seatback tilt switch BACKWARD signal	Input	When seatback tilt switch is turned to BACKWARD	0
				Other than above	Battery voltage
10	L/Y	Seat belt buckle switch signal	Input	When seat belt is fastened (OFF)	5
				When seat belt is unfastened (ON)	0
11	L/W	Soft top lock switch (5th bow full latch switch) signal	Input	5th bow full latch switch: ON	0
				5th bow full latch switch: OFF	5
12	OR	Reclining switch FORWARD signal	Input	When power seat reclining switch is turned to FORWARD	0
				Other than above	Battery voltage

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
13	G	Reclining switch BACKWARD signal	Input	When power seat reclining switch is turned to BACKWARD	0
				Other than above	Battery voltage
14	Y	Sliding switch FORWARD signal	Input	When power seat sliding switch is turned to FORWARD	0
				Other than above	Battery voltage
15	SB	Sliding switch BACKWARD signal	Input	When power seat sliding switch is turned to BACKWARD	0
				Other than above	Battery voltage
16	PU/W	Power window down signal	Input	When soft top switch is turned to ON	0
				Other than above	5
32	G/W	Seatback position signal	Input	When the seatback is tilted by the interlocking operation with soft top	0
				Other than above	5
33	G/B	Storage lid actuator RH CLOSE signal	Input	When storage lid actuator is in a closed operation	Battery voltage
				Other than above	0
34	R/W	Battery power supply (control unit)	Input	—	Battery voltage
35	G	Reclining motor BACKWARD output	Output	Reclining switch backward operation (Motor operated)	Battery voltage
				Other than above	0
37	SB	Sliding motor BACKWARD output	Output	Sliding switch backward operation (Motor operated)	Battery voltage
				Other than above	0
39	R	Battery power supply (power)	Output	—	Battery voltage
40	B/W	Ground (control unit)	—	—	0
41	Y/B	Ground (sensor)	—	—	0
42	OR	Reclining motor FORWARD output	Output	Reclining switch forward operation (Motor operated)	Battery voltage
				Other than above	0
45	Y	Sliding motor FORWARD output	Output	Sliding switch forward operation (Motor operated)	Battery voltage
				Other than above	0
48	B	Ground (power)	—	—	0

Terminals and Reference Values of BCM

NIS0009S

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
42	GY	Battery power supply (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
54	W	Power window power supply output (driver side power seat switch and passenger seat control unit power supply)	Output	—	Battery voltage
55	R	Battery power supply (Fusible link)	Input	—	Battery voltage

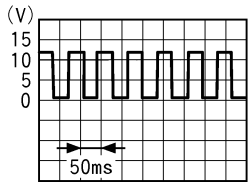
Terminals and Reference Values of Soft Top Control Unit

NIS0009T

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
13	L/R	Storage lid actuator RH CLOSE signal	Input	When storage lid actuator is in a closing operation	Battery voltage
				Other than above	0
34	L/W	Seatback position signal	Input	When the seatback is tilted by the interlocking operation with soft top	0
				Other than above	5
36	PU	Power window down signal	Input	When soft top switch is turned to ON	0
				Other than above	5

Terminals and Reference Values of Unified Meter and A/C Amp.

NIS0009U

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
1	L	CAN-H	Input/ Output	—	—
11	P	CAN-L	Input/ Output	—	—
34	L	Speed signal (2puls)	Input	Speedometer is in operation [When vehicle speed is approx. 40 km/h (25 MPH)]	 PIIB0078J

Work Flow

NIS0009V

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to SE-16, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to SE-37, "Trouble Diagnosis Symptom Chart" .
4. Does power seat system operate normally? If Yes, GO TO 5, If No, GO TO 3.
5. INSPECTION END.

Trouble Diagnosis Symptom Chart

NIS0009W

Always check the “WORK FLOW” before troubleshooting. Refer to SE-37, "Work Flow" .

Symptom	Diagnosis / service procedure		Refer to page
Power seat systems do not operate (Neither driver side seat nor passenger side seat operation can be performed).	Check BCM power supply and ground circuit		SE-38
Functions of a driver side power seat do not operate.	Check driver side power seat power supply and ground		SE-40
A part of driver side power seat system does not operate.	1.	Check driver side seat sliding motor circuit	SE-41
	2.	Check driver side seat reclining motor circuit	SE-42
All the passenger side power seat systems do not operate.	Check passenger seat control unit power supply and ground		SE-44
A passenger seat does not a sliding operation.	Check passenger side seat sliding motor circuit		SE-45

Symptom	Diagnosis / service procedure		Refer to page
A passenger seat does not carry out a reclining operation (Neither manual operation nor an automatic operation can be performed).	Check passenger side seat reclining motor circuit		SE-46
The automatic operation of a passenger seat can not be performed (a manual operation can be performed).	1.	Check passenger side seat reclining sensor circuit	SE-47
	2.	Check seatback tilt cancel switch circuit	SE-52
	3.	If the above systems are normal, replace passenger seat control unit.	SE-15
A passenger seat operates automatically when the vehicle is running.	Check vehicle speed signal		SE-57
Passenger seatback does not return during a soft top CLOSE operation.	Check soft top lock switch circuit		SE-55
Passenger seatback does not tilt forward and return during a soft top OPEN operation.	Check storage lid close signal circuit		SE-55
Passenger seatback does not tilt forward during a soft top CLOSE operation or OPEN operation.	1.	Check power window down request signal circuit	SE-54
	2.	Check soft top switch circuit	SE-53
	3.	If the above systems are normal, replace passenger seat control unit.	SE-15
Seat does not tilt when passenger seatback tilt switch is pushed (other functions operate normally).	1.	Check seatback tilt switch circuit	SE-51
	2.	Check seat belt buckle switch circuit	SE-56
	3.	If the above systems are normal, replace passenger seat control unit	SE-15
A part of passenger seat system does not operate (only manual).	1.	Check passenger side seat sliding switch circuit	SE-48
	2.	Check passenger side seat reclining switch circuit	SE-49
Passenger seatback dose not go back to the original position during a soft top CLOSE or OPEN operation.	Check passenger seat control unit ignition signal circuit		SE-44
The manual operation of a passenger seat cannot be performed (a automatic operation can be performed).	Check passenger side power seat ground circuit		SE-50

Check BCM Power Supply and Ground

NIS0009X

1. CHECK FUSE

- Check 40A fusible link (letter **F** located in the fuse and fusible link box).
- Check 10A fuse [No.18, located in the fuse block (J/B)]

NOTE:
Refer to SE-15, "Component Parts and Harness Connector Location" .

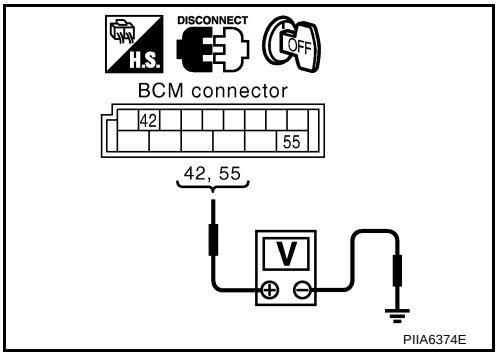
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK BCM POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector M91 terminal 42, 55 and ground.

42 (GY) - Ground : Battery voltage
55 (R) - Ground : Battery voltage



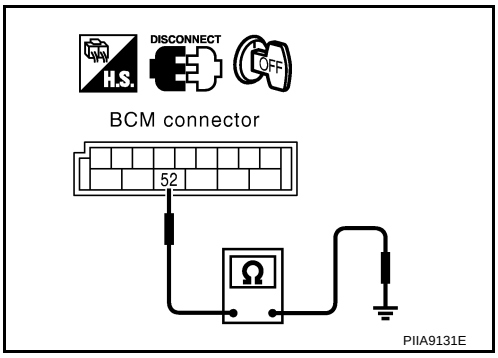
OK or NG

OK >> GO TO 3.
NG >> Repair or replace the harness between BCM and fusible link.

3. CHECK BCM GROUND CIRCUIT

Check continuity between BCM connector M91 terminal 52 and ground.

52 (B) - Ground : Continuity should exist.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace the harness between BCM and ground.

4. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Disconnect power seat switch and passenger seat control unit connector.
2. Check continuity between BCM connector M91 terminal 54 and power seat switch connector B326 terminal 1.

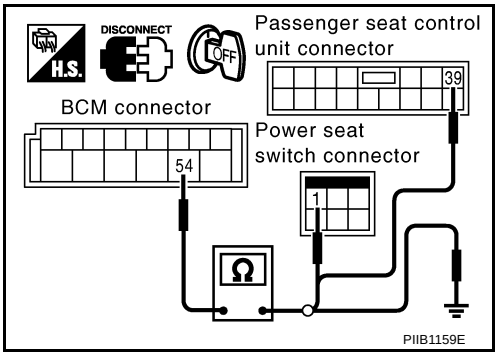
54 (W) - 1 (R) : Continuity should exist.

3. Check continuity between BCM connector M91 terminal 54 and passenger seat control unit connector B354 terminal 39.

54 (W) - 39 (R) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.



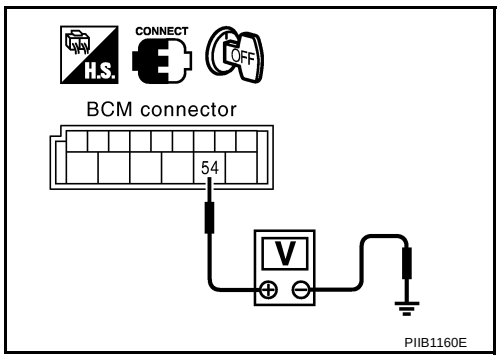
OK or NG

OK >> GO TO 5.
NG >> Replace harness between BCM and power seat switch or passenger seat control unit.

5. CHECK BCM OUTPUT POWER SUPPLY

1. Connect BCM connector.
2. Check voltage between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Battery voltage



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace BCM.

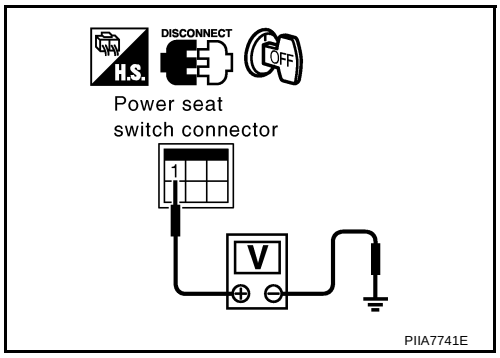
Check Driver Side Seat Power Supply and Ground

NIS0009Y

1. CHECK POWER SEAT SWITCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect power seat switch connector.
3. Check voltage between power seat switch connector B326 terminal 1 and ground.

1 (R) - Ground : Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

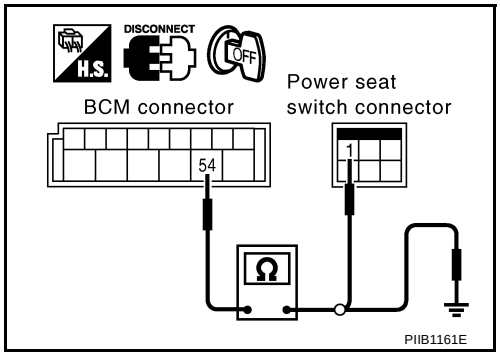
2. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Disconnect passenger seat control unit connector.
2. Check continuity between BCM connector M91 terminal 54 and power seat switch connector B326 terminal 1.

54 (W) - 1 (R) : Continuity should exist.

3. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.



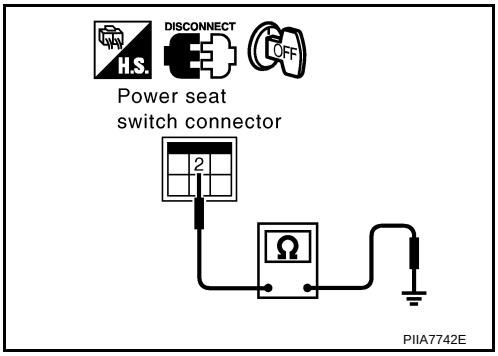
OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace harness between BCM and power seat switch.

3. CHECK POWER SEAT SWITCH GROUND CIRCUIT

Check continuity between power seat switch connector B326 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between power seat switch and ground.

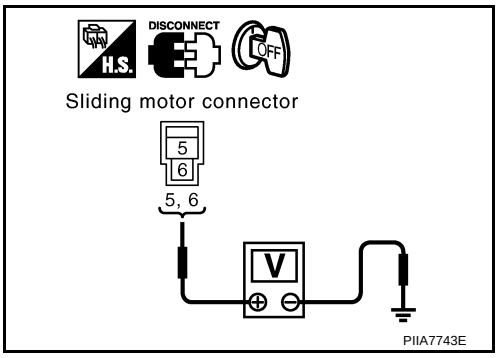
Check Driver Side Seat Sliding Motor Circuit

NIS0009Z

1. CHECK SLIDING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect sliding motor connector.
3. Sliding switch operate, check voltage between sliding motor connector and ground.

Connector	Terminal (Wire color)		Sliding switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B337	5 (Y)	Ground	FORWARD	Battery voltage
			Other than above	0
	6 (SB)		BACKWARD	Battery voltage
			Other than above	0



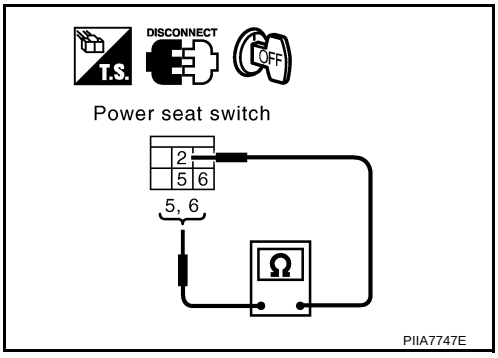
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK POWER SEAT SWITCH 1

1. Disconnect power seat switch connector.
2. Sliding switch operate, check continuity between power seat switch terminal 5, 6 and 2.

Terminals		Sliding switch condition	Continuity
5	2	BACKWARD	Yes
		Other than above	No
6		FORWARD	Yes
		Other than above	No



OK or NG

OK >> Replace sliding motor.
NG >> Replace power seat switch.

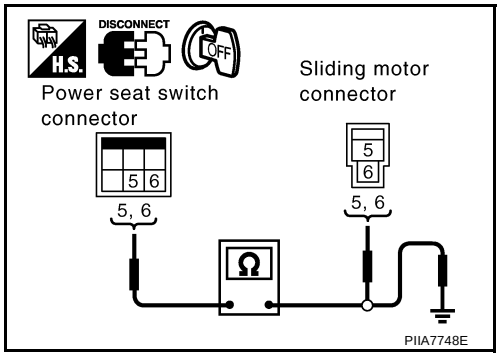
3. CHECK SLIDING MOTOR CIRCUIT HARNESS

1. Disconnect power seat switch connector.
2. Check continuity between power seat switch connector B326 terminal 5, 6 and sliding motor connector B337 terminal 5, 6.

5 (Y) - 5 (Y) : Continuity should exist.
6 (SB) - 6 (SB) : Continuity should exist.

3. Check continuity between power seat switch connector B326 terminal 5, 6 and ground.

5 (Y) - Ground : Continuity should not exist.
6 (SB) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between power seat switch and sliding motor.

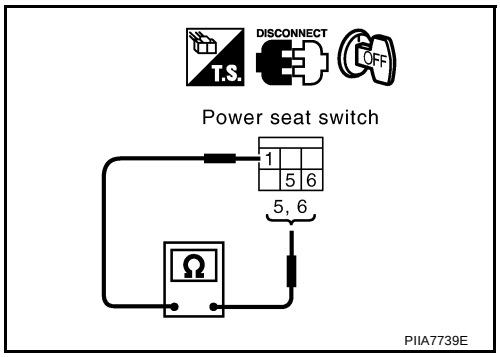
4. CHECK POWER SEAT SWITCH 2

Check continuity between power seat switch as follows.

Terminals		Sliding switch condition	Continuity
5	1	FORWARD	Yes
		Other than above	No
6		BACKWARD	Yes
		Other than above	No

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.



Check Driver Side Seat Reclining Motor Circuit

NIS000A0

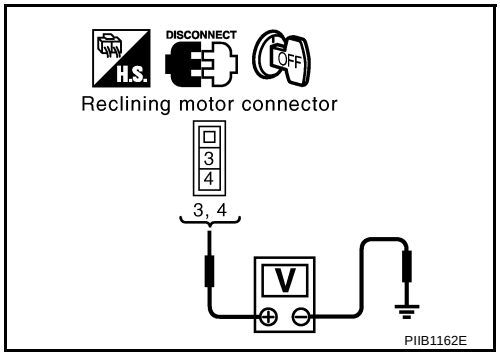
1. CHECK RECLINING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect reclining motor connector.
3. Reclining switch operate, check voltage between reclining motor connector and ground.

Connector	Terminal (Wire color)		Reclining switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B336	3 (OR)	Ground	FORWARD	Battery voltage
			Other than above	0
	4 (G)		BACKWARD	Battery voltage
			Other than above	0

OK or NG

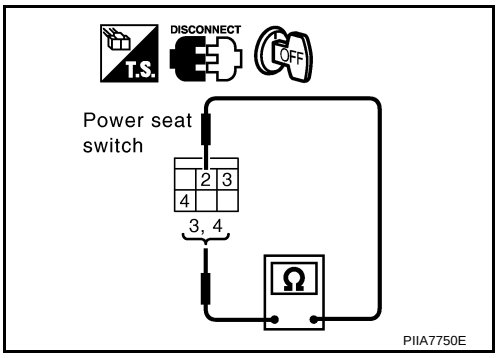
OK >> GO TO 2.
NG >> GO TO 3.



2. CHECK POWER SEAT SWITCH 1

1. Disconnect power seat switch connector.
2. Reclining switch operate, check continuity between power seat switch terminal 3, 4 and 2.

Terminals		Reclining switch condition	Continuity
3	2	FORWARD	Yes
		Other than above	No
4		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Replace reclining motor.
NG >> Replace power seat switch.

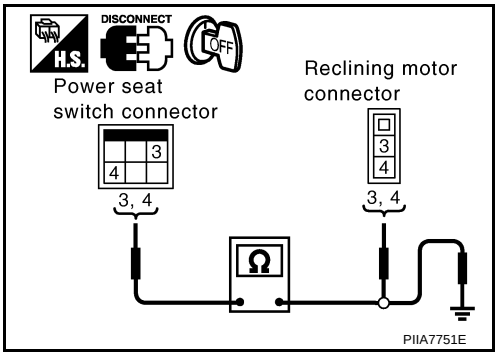
3. CHECK RECLINING MOTOR CIRCUIT HARNESS

1. Disconnect power seat switch connector.
2. Check continuity between power seat switch connector B326 terminal 3, 4 and reclining motor connector B336 terminal 3, 4.

3 (OR) - 3 (OR) : Continuity should exist.
4 (G) - 4 (G) : Continuity should exist.

3. Check continuity between power seat switch connector B326 terminal 3, 4 and ground.

3 (OR) - Ground : Continuity should not exist.
4 (G) - Ground : Continuity should not exist.



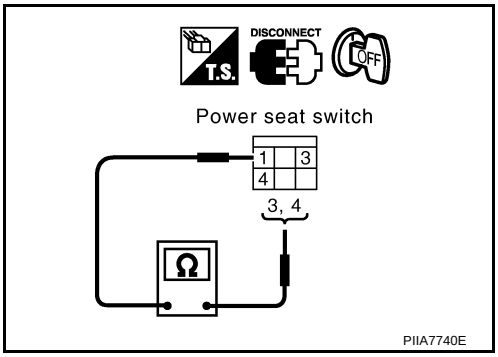
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between power seat switch and reclining motor.

4. CHECK POWER SEAT SWITCH 2

Reclining switch operate, check continuity between power seat switch as follows.

Terminals		Reclining switch condition	Continuity
3	1	FORWARD	Yes
		Other than above	No
4		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.

Check Passenger Seat Control Unit Power Supply and Ground

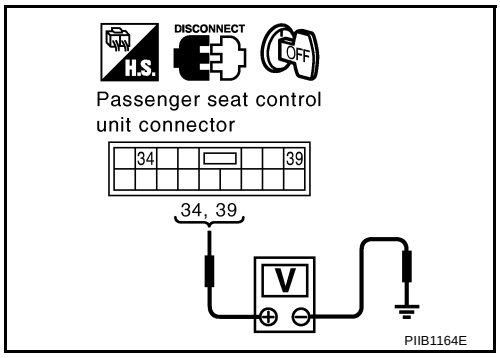
NIS000A1

1. CHECK PASSENGER SEAT CONTROL UNIT POWER SUPPLY

Check voltage between passenger seat control unit connector B354 terminal 34, 39 and ground.

34 (R/W) - Ground : Battery voltage.

39 (R) - Ground : Battery voltage.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> GO TO 2.

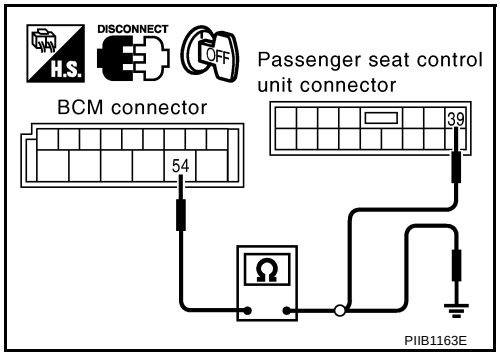
2. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and passenger seat control unit connector.
3. Check continuity between BCM connector M91 terminal 54 and passenger seat control unit connector B354 terminal 39.

54 (W) - 39 (R) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.



OK or NG

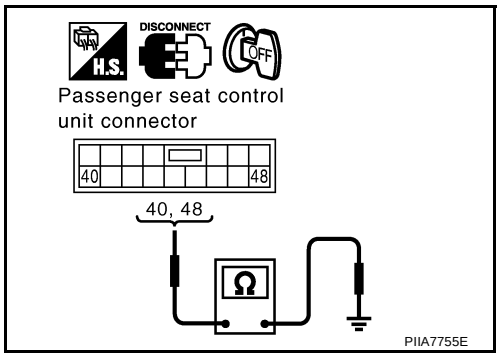
OK >> GO TO 3.
NG >> Repair or replace the harness between BCM and passenger seat control unit.

3. CHECK PASSENGER SEAT CONTROL UNIT GROUND CIRCUIT

Check continuity between passenger seat control unit connector B354 terminal 40, 48 and ground.

40 (B/W) - Ground : Continuity should exist.

48 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check the harness between power seat control unit and fuse block and the 10A fuse (#18).
NG >> Repair or replace the harness between passenger seat control unit and ground.

Check Passenger Seat Control Unit Ignition Signal Circuit

NIS000A2

1. CHECK FUSE

- Check 10A fuse [No.9, located in the fuse block (J/B)].
- Check 10A fuse [No.12, located in the fuse block (J/B)].

NOTE:
Refer to SE-15, "Component Parts and Harness Connector Location" .

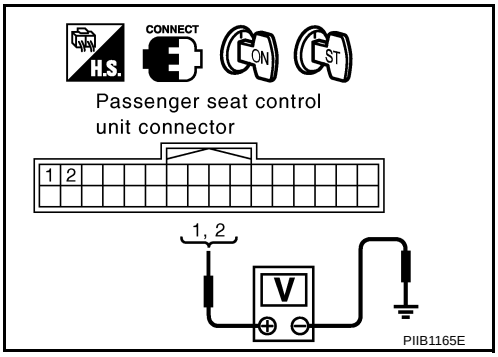
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK PASSENGER SEAT CONTROL UNIT POWER SUPPLY

Check voltage between passenger seat control unit and ground.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition		Voltage (V) (Approx.)
B353	1 (W)	Ground	Ignition switch	: START	Battery voltage
	2 (L)			: ON	



OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace the harness between passenger seat control unit and fuse block (J/B).

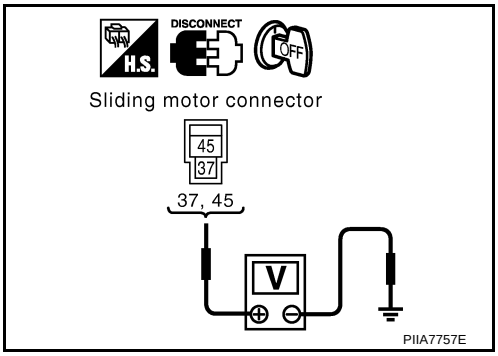
Check Passenger Side Seat Sliding Motor Circuit

NIS000A3

1. CHECK SLIDING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect sliding motor connector.
3. Sliding switch operated, check voltage between sliding motor connector and ground.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Sliding switch condition	Voltage (V) (Approx.)
B344	37 (SB)	Ground	BACKWARD	Battery voltage
			Other than above	0
	45 (Y)		FORWARD	Battery voltage
			Other than above	0



OK or NG

OK >> Replace sliding motor.
NG >> GO TO 2.

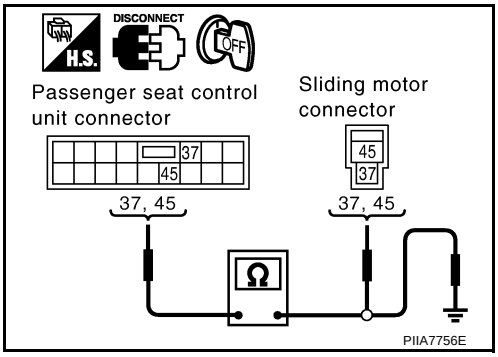
2. CHECK SLIDING MOTOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 37, 45 and sliding motor connector B344 terminal 37, 45.

37 (SB) - 37 (SB) : Continuity should exist.
45 (Y) - 45 (Y) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B354 terminal 37, 45 and ground.

37 (SB) - Ground : Continuity should not exist.
45 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and sliding motor.

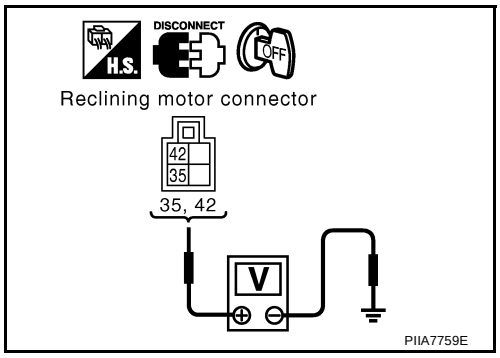
Check Passenger Side Seat Reclining Motor Circuit

NIS000A4

1. CHECK RECLINING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect reclining motor connector.
3. Reclining switch operated, check voltage between reclining motor and ground.

Connector	Terminal (Wire color)		Reclining switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B358	35 (G)	Ground	BACKWARD	Battery voltage
			Other than above	0
	42 (OR)		FORWARD	Battery voltage
			Other than above	0



OK or NG

OK >> Replace reclining motor.
NG >> GO TO 2.

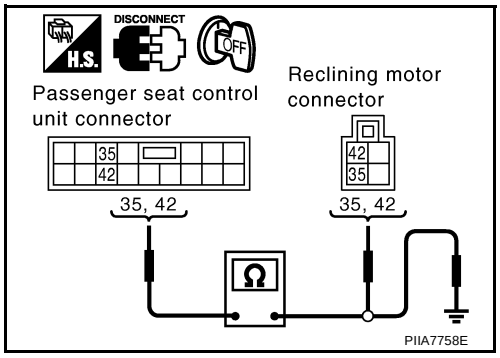
2. CHECK RECLINING MOTOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 35, 42 and reclining motor connector B358 terminal 35, 42.

35 (G) - 35 (G) : Continuity should exist.
42 (OR) - 42 (OR) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B354 terminal 35, 42 and ground.

35 (G) - Ground : Continuity should not exist.
42 (OR) - Ground : Continuity should not exist.



OK or NG

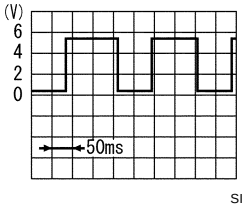
OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.

Check Passenger Side Seat Reclining Sensor Circuit

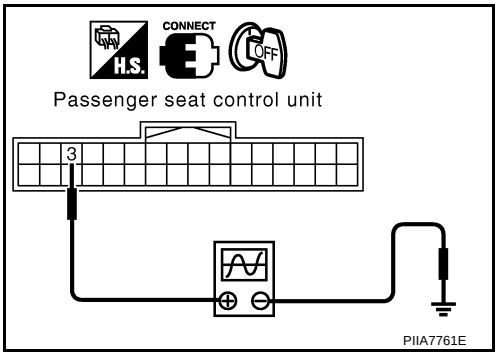
NIS000A5

1. CHECK RECLINING SENSOR OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Check signal between passenger seat control unit connector and ground, with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value)
B353	3 (Y)	Ground	When reclining motor is operated.	

SIIA0692J



PIIA7761E

OK or NG

OK >> Passenger side seat reclining motor circuit is OK.
NG1 >> When voltage waveform dose not appear with a constant voltage (approx. 5V), GO TO 3.
NG2 >> When voltage waveform dose not appear with a constant voltage (approx. 0V), GO TO 2.

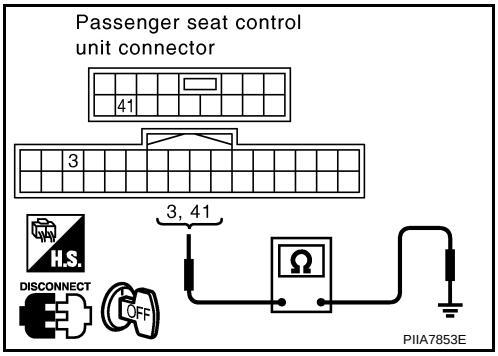
2. CHECK RECLINING SENSOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 3, 41 and ground.

3 (Y) - Ground : Continuity should not exist.
41 (Y/B) - Ground : Continuity should not exist.

OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.



PIIA7853E

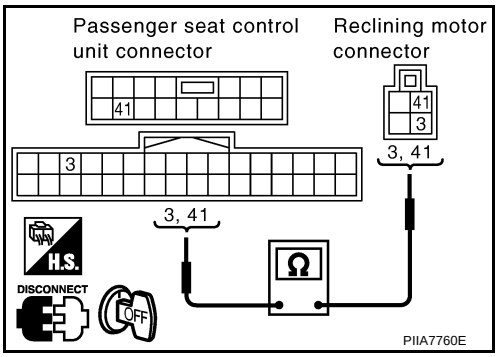
3. CHECK RECLINING SENSOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 3, 41 and reclining motor connector B358 terminal 3, 41.

3 (Y) - 3 (Y) : Continuity should exist.
41 (Y/B) - 41 (Y/B) : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.

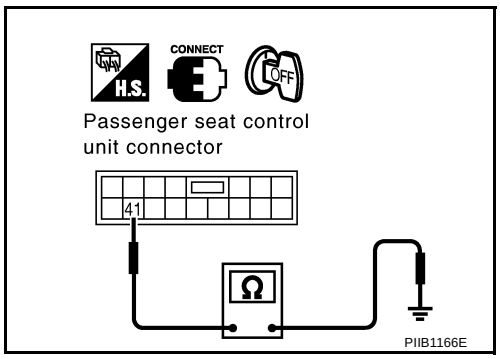


PIIA7760E

4. CHECK RECLINING SENSOR GROUND CIRCUIT

1. Connect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 41and ground.

41 (Y/B) - Ground : Continuity should exist.



OK or NG

OK >> Replace reclining motor.
NG >> Replace passenger seat control unit.

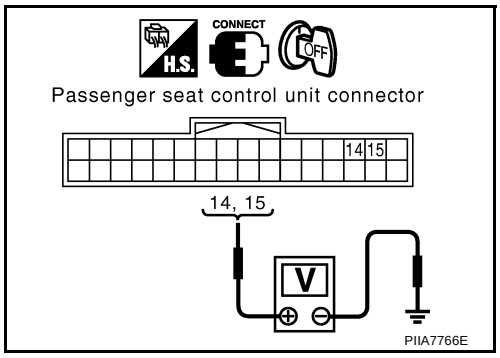
Check Passenger Side Seat Sliding Switch Circuit

NIS000A6

1. CHECK SLIDING SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Sliding switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Sliding switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	14 (Y)	Ground	FORWARD	0
			Other than above	Battery voltage
	15 (SB)		BACKWARD	0
			Other than above	Battery voltage



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

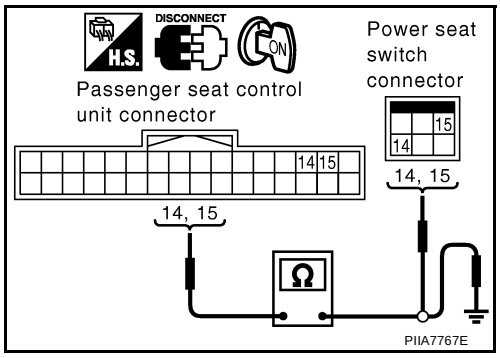
2. CHECK SLIDING SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and power seat switch connector.
2. Check continuity between passenger seat control unit connector B353 terminal 14, 15 and power seat switch connector B357 terminal 14, 15.

14 (Y) - 14 (Y) : Continuity should exist.
15 (SB) - 15 (SB) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 14, 15 and ground.

14 (Y) - Ground : Continuity should not exist.
15 (SB) - Ground : Continuity should not exist.



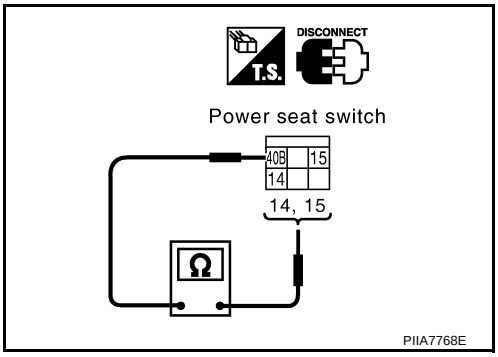
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and power seat switch.

3. CHECK POWER SEAT SWITCH

Sliding switch operated, check continuity between power seat switch terminal 14, 15 and 40B.

Terminals		Sliding switch condition	Continuity
14	40B	FORWARD	Yes
		Other than above	No
15		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.

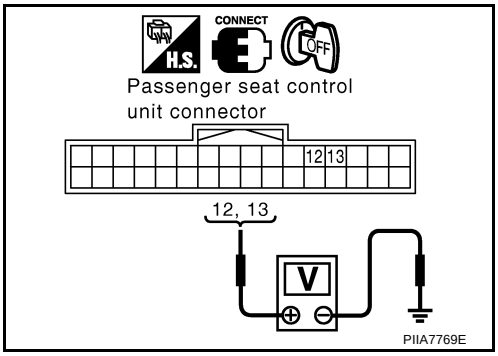
Check Passenger Side Seat Reclining Switch Circuit

NIS000A7

1. CHECK RECLINING SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Reclining switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Reclining switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	12 (OR)	Ground	FORWARD	0
			Other than above	Battery voltage
	13 (G)		BACKWARD	0
			Other than above	Battery voltage



OK or NG

OK >> Passenger side seat reclining switch circuit is OK.
NG >> GO TO 2.

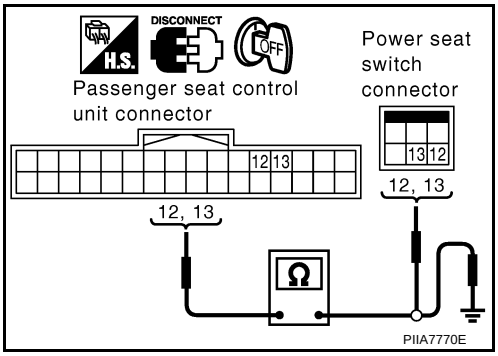
2. CHECK RECLINING SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and power seat switch connector.
2. Check continuity between passenger seat control unit connector B353 terminal 12, 13 and power seat switch connector B357 terminal 12, 13.

12 (OR) - 12 (OR) : Continuity should exist.
13 (G) - 13 (G) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 12, 13 and ground.

12 (OR) - Ground : Continuity should not exist.
13 (G) - Ground : Continuity should not exist.



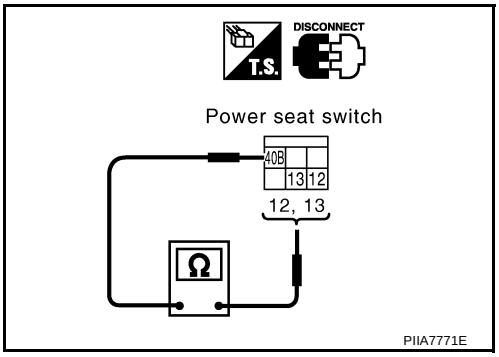
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and power seat switch.

3. CHECK POWER SEAT SWITCH

Reclining switch operated, check continuity between power seat switch terminal 12, 13 and 40B.

Terminals		Reclining switch condition	Continuity
12	40B	FORWARD	Yes
		Other than above	No
13		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.

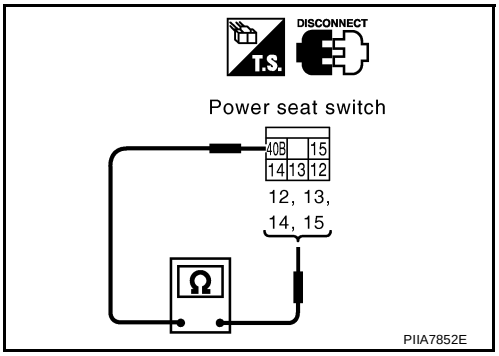
Check Passenger Side Power Seat Switch Ground Circuit

NIS000A8

1. CHECK POWER SEAT SWITCH

1. Turn ignition switch OFF.
2. Disconnect power seat switch connector.
3. Check continuity between power seat switch terminal 12, 13, 14, 15 and 40B.

Terminals		Condition	Continuity
12	40B	When reclining switch is turned to forward	Yes
		Other than above	No
13		When reclining switch is turned to backward	Yes
		Other than above	No
14		When sliding switch is turned to forward	Yes
		Other than above	No
15		When sliding switch is turned to backward	Yes
		Other than above	No



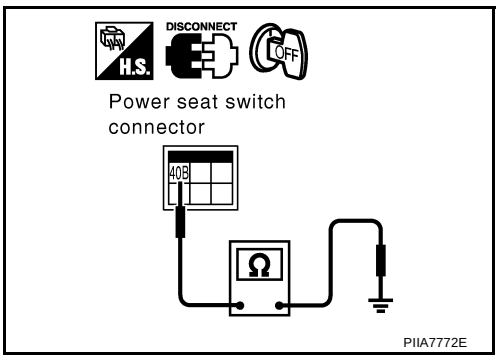
OK or NG

OK >> GO TO 2.
NG >> Replace power seat switch.

2. CHECK POWER SEAT SWITCH GROUND CIRCUIT

Check continuity between power seat switch connector B357 terminal 40B and ground.

40B (B/W) - Ground : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between power seat switch and ground.

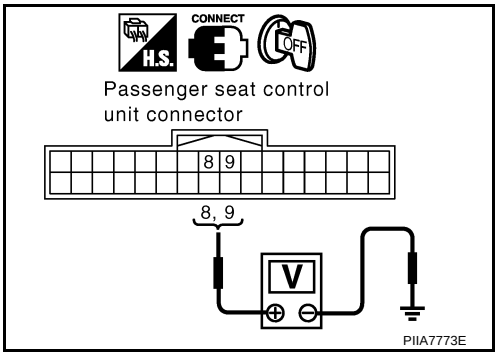
Check Seatback Tilt Switch Circuit

NIS000A9

1. CHECK SEATBACK TILT SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Seatback tilt switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Seatback tilt switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	8 (BR)	Ground	FORWARD	0
			Other than above.	Battery voltage
	9 (LG)		BACKWARD	0
			Other than above.	Battery voltage



OK or NG

OK >> Seatback tilt switch circuit is OK.
NG >> GO TO 2.

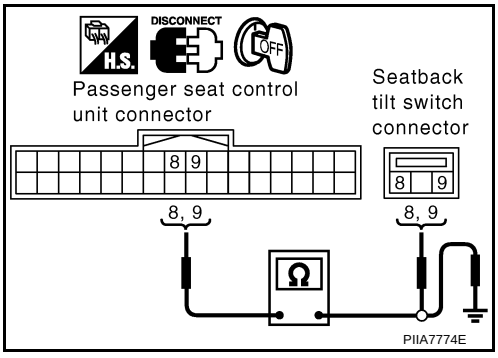
2. CHECK SEATBACK TILT SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and seatback tilt switch.
2. Check continuity between passenger seat control unit connector B353 terminal 8, 9 and seatback tilt switch connector B372 terminal 8, 9.

8 (BR) - 8 (BR) : Continuity should exist.
9 (LG) - 9 (LG) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 8, 9 and ground.

8 (BR) - Ground : Continuity should not exist.
9 (LG) - Ground : Continuity should not exist.



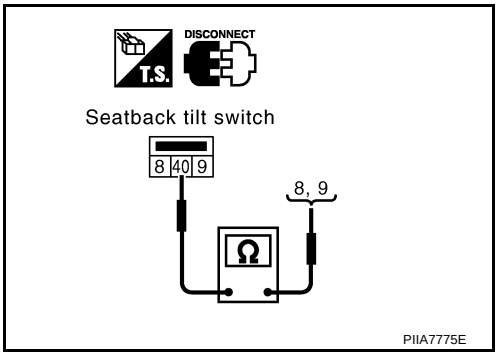
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seatback tilt switch.

3. CHECK SEATBACK TILT SWITCH

Seatback switch operated, check continuity between seatback tilt switch terminal 8, 9 and 40.

Terminals		Seatback switch condition	Continuity
8	40	FORWARD	Yes
		Other than above	No
9		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> GO TO 4.
NG >> Replace seatback tilt switch.

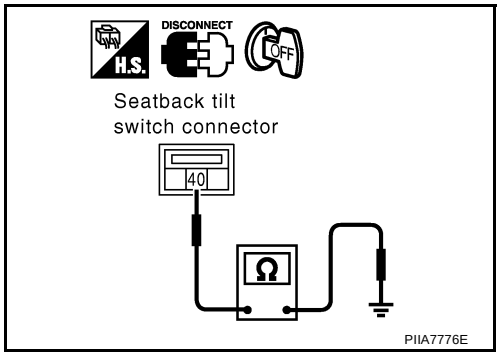
4. CHECK SEATBACK TILT SWITCH GROUND CIRCUIT

Check continuity between seatback tilt switch connector B372 terminal 40 and ground.

40 (B/W) - Ground : Continuity should exist.

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seatback tilt switch and ground.



Check Seatback Tilt Cancel Switch Circuit

NIS000AA

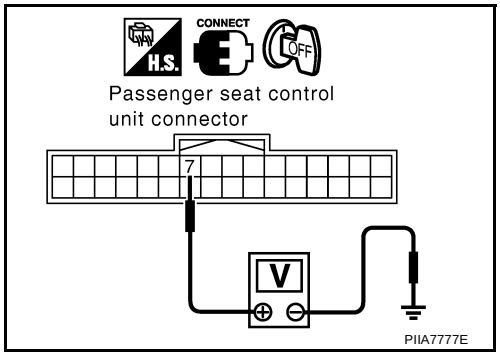
1. CHECK SEATBACK TILT CANCEL SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Seatback tilt cancel switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Seatback tilt cancel switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	7 (P)	Ground	CANCEL	0
			AUTO	5

OK or NG

OK >> Passenger seatback tilt cancel switch circuit is OK.
NG >> GO TO 2.



2. CHECK SEATBACK TILT CANCEL SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and seatback tilt cancel switch.
2. Check continuity between passenger seat control unit connector B353 terminal 7 and seatback tilt cancel switch connector B373 terminal 7.

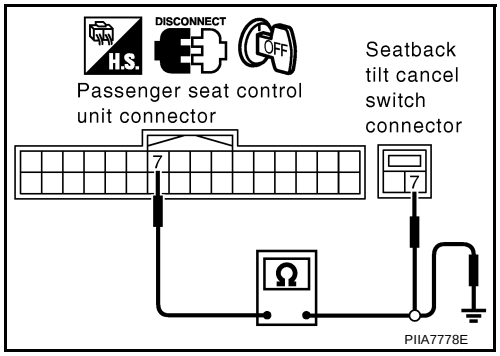
7 (P) - 7 (P) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 7 and ground.

7 (P) - Ground : Continuity should not exist.

OK or NG

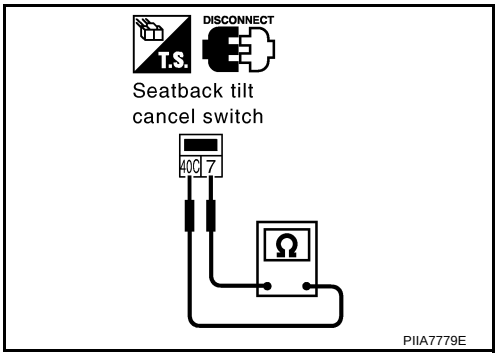
OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seatback tilt cancel switch.



3. CHECK SEATBACK TILT CANCEL SWITCH

Seatback tilt cancel switch operated, check continuity between seatback tilt cancel switch terminal 7 and 40C.

Terminals		Seatback tilt cancel switch condition	Continuity
7	40C	CANCEL	Yes
		AUTO	No



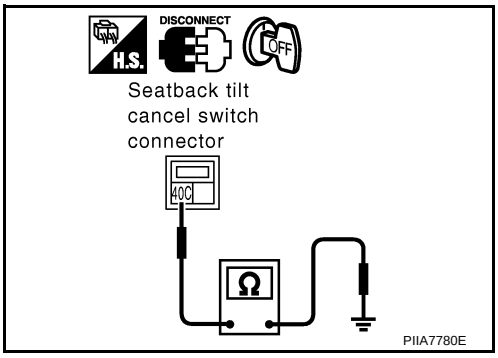
OK or NG

OK >> GO TO 4.
NG >> Replace seatback tilt cancel switch.

4. CHECK SEATBACK TILT CANCEL SWITCH GROUND CIRCUIT

Check continuity between seatback tilt cancel switch connector B373 terminal 40C and ground.

40C (B/W) - Ground : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seatback tilt cancel switch and ground.

Check Soft Top Switch Circuit

NIS000AB

1. CHECK SOFT TOP SYSTEM

Soft top is operated.

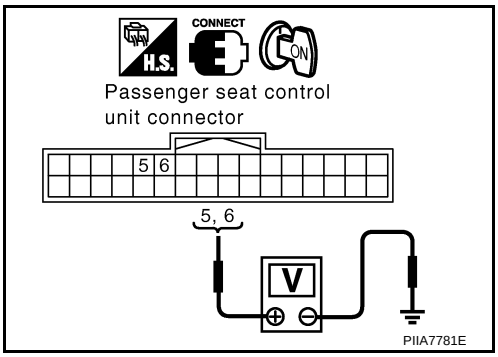
Operate normally?

Yes >> GO TO 2.
No >> Further inspection necessary. Refer to

2. CHECK SOFT TOP SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Soft top switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Soft top switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	5 (R)	Ground	OPEN*	0
			Other than above	Battery voltage
	6 (GY)		CLOSE*	0
			Other than above	Battery voltage



*: Turn ignition switch ON and depress brake pedal when soft top switch operates.

OK or NG

OK >> Soft top switch circuit is OK.
NG >> GO TO 3.

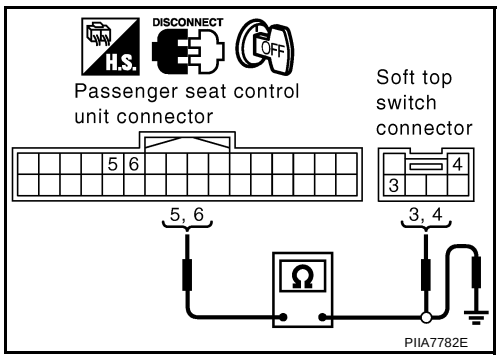
3. CHECK SOFT TOP SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and soft top switch.
2. Check continuity between passenger seat control unit connector B353 terminal 5, 6 and soft top switch connector M14 terminal 3, 4.

5 (R) - 3 (L/B) : Continuity should exist.
6 (GY) - 4 (R/G) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 5, 6 and ground.

5 (R) - Ground : Continuity should not exist.
6 (GY) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness between passenger seat control unit and soft top switch.

Check Power Window Down Request Signal Circuit

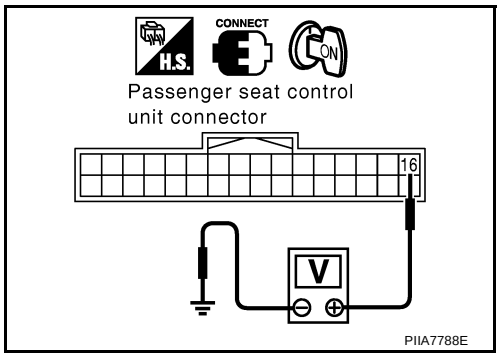
NIS000AC

1. CHECK POWER WINDOW DOWN REQUEST SUGNAL INPUT

1. Turn ignition switch ON.
2. Check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	16 (PU/W)	Ground	When soft top switch is turned to OPEN or CLOSE.*	0
			Other than above.	5

*: Turn ignition switch ON and depress brake pedal when soft top switch operates.



OK or NG

OK >> Power window down request signal circuit is OK.
NG >> GO TO 2.

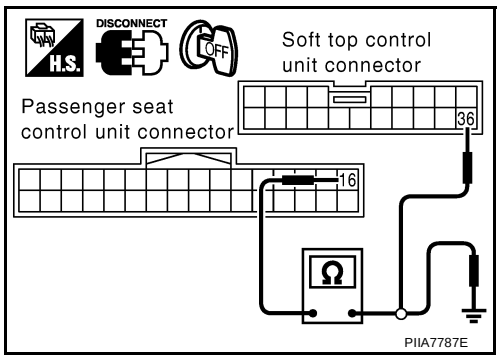
2. CHECK POWER WINDOW DOWN REQUEST SUGNAL CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and passenger seat control unit connector.
3. Check continuity between passenger seat control unit connector B353 terminal 16 and soft top control unit connector B67 terminal 36.

16 (PU/W) - 36 (PU) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 16 and ground.

16 (PU/W) - Ground : Continuity should not exist.



OK or NG

OK >> Power window down request signal circuit is OK. Further inspection is necessary. Refer to RF-81, "Check Power Window Down Request Signal" .
NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

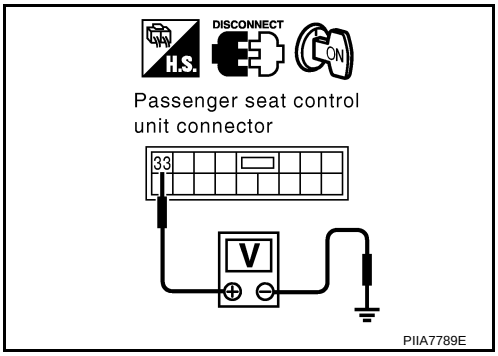
Check Storage Lid Close Signal Circuit

NIS000AD

1. CHECK STORAGE LID CLOSE SIGNAL

1. Turn ignition switch ON.
2. Soft top operates in OPEN, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	33 (G/B)	Ground	When storage lid is in a closing operation	Battery voltage
			Other than above.	0



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

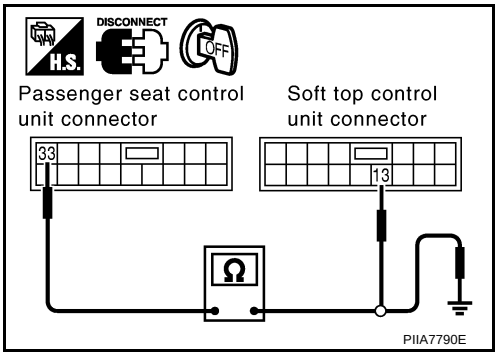
2. CHECK STORAGE LID CLOSE SIGNAL CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid actuator and passenger seat control unit connector.
3. Check continuity between passenger seat control unit connector B353 terminal 33 and soft top control unit connector B66 terminal 13.

33 (G/B) - 13 (L/R) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 33 and ground.

33 (G/B) - Ground : Continuity should not exist.



OK or NG

OK >> Storage lid close signal circuit is OK. Further inspection is necessary. Refer to RF-62, "Check Storage Lid Actuator (Close Operate)" .
NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

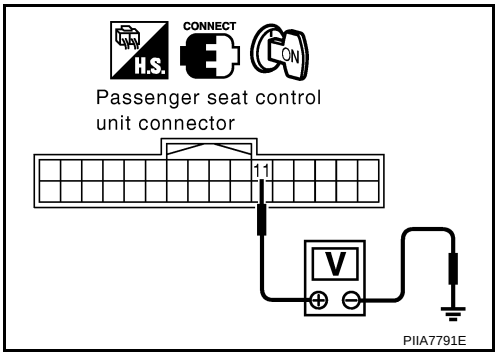
Check Soft Top Lock Switch Circuit

NIS000AE

1. CHECK SOFT TOP LOCK SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Soft top operates in CLOSE, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	11 (L/W)	Ground	5th bow full latch switch is turned to ON	0
			Other than above	5



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

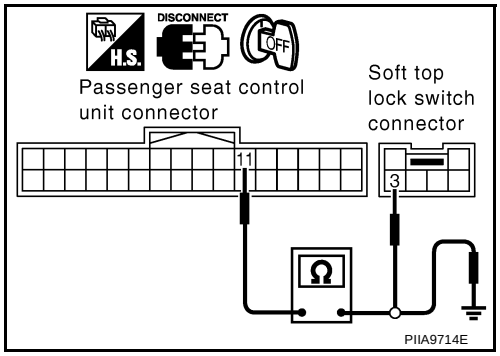
2. CHECK SOFT TOP LOCK SWITCH CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect passenger seat control unit and soft top lock switch connector.
3. Check continuity between passenger seat control unit connector B353 terminal 11 and soft top lock switch connector T205 terminal 3.

11 (L/W) - 3 (Y) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 11 and ground.

11 (L/W) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

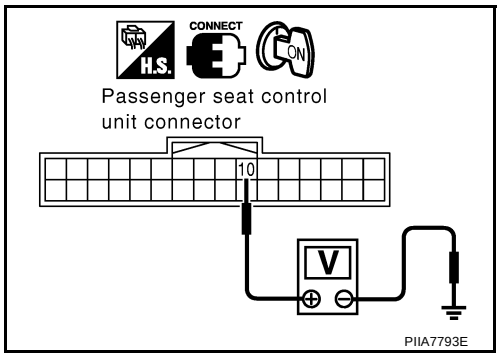
Check Seat Belt Buckle Switch Circuit

NIS000AF

1. CHECK SEAT BELT BUCKLE SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(-)			
B353	10 (L/Y)	Ground	Seat belt.	: Fastened	5
				: Unfastened	0



OK or NG

OK >> Seat belt buckle switch circuit is OK.
NG >> GO TO 2.

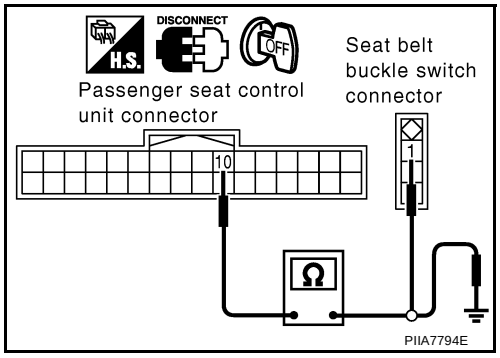
2. CHECK SEAT BELT BUCKLE SWITCH CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect passenger seat control unit connector and seat belt buckle switch connector.
3. Check continuity between passenger seat control unit connector B353 terminal 10 and seat belt buckle switch connector B11 terminal 1.

10 (L/Y) - 1 (W) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 10 and ground.

10 (L/Y) - Ground : Continuity should not exist.



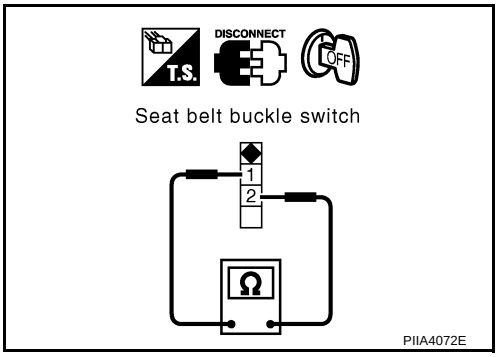
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seat belt buckle switch.

3. CHECK SEAT BELT BUCKLE SWITCH

Check continuity between seat belt buckle switch terminal 1 and 2.

Terminals		Condition		Continuity
1	2	Seat belt	: Fastened	No
			: Unfastened	Yes



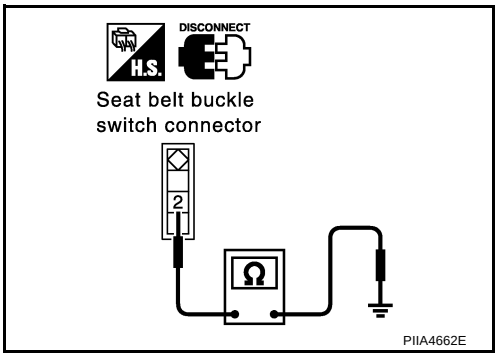
OK or NG

OK >> GO TO 4.
NG >> Replace seat belt buckle switch.

4. CHECK SEAT BELT BUCKLE SWITCH GROUND CIRCUIT

Check continuity between seat belt buckle switch connector B11 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

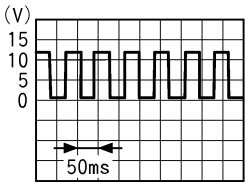
OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seat belt buckle switch and ground.

NIS000AG

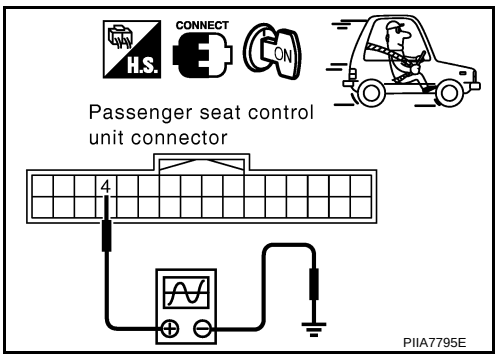
Check Vehicle Speed Signal

1. CHECK VEHICLE SPEED SIGNAL

1. Turn ignition switch ON.
2. Check signal between passenger seat control unit connector and body ground with oscilloscope.

Connector	Terminal (Wire color)		Condition	Signal (Reference value)
	(+)	(-)		
B353	4 (PU)	Ground	When vehicle speed is approx. 40 km/h (25 MPH)	

PIIB0078J



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

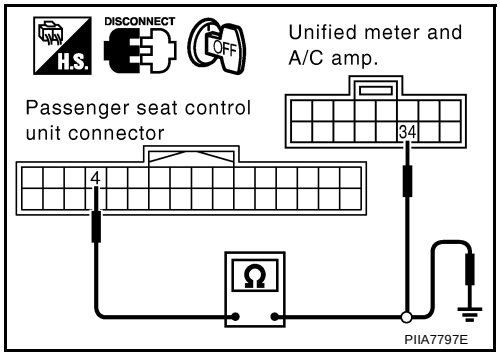
2. CHECK VEHICLE SPEED SIGNAL CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect passenger seat control unit connector and unified meter and A/C amp.
3. Check continuity between passenger seat control unit connector B353 terminal 4 and unified meter and A/C amp. connector M49 terminal 34.

4 (PU) - 34 (L) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 4 and ground.

4 (PU) - Ground : Continuity should not exist.



OK or NG

OK >> Vehicle speed signal circuit is OK. Further inspection is necessary. Refer to DI-18, "Vehicle Speed Signal Inspection" .

NG >> Repair or replace harness between passenger seat control unit and unified meter and A/C amp.

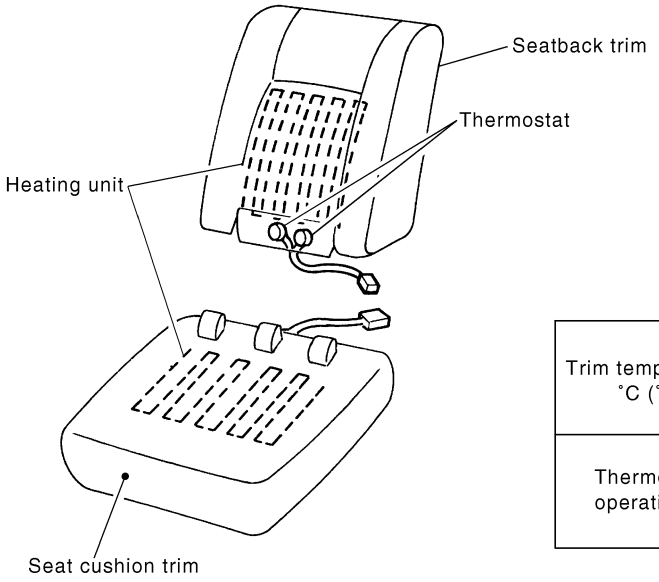
HEATED SEAT

PFP:87335

Description

NIS000AH

- When handling seat, be extremely careful not to scratch heating unit.
- To replace heating unit, seat trim and pad should be separated.
- Do not use any organic solvent, such as thinner, benzene, alcohol, etc. to clean trims.

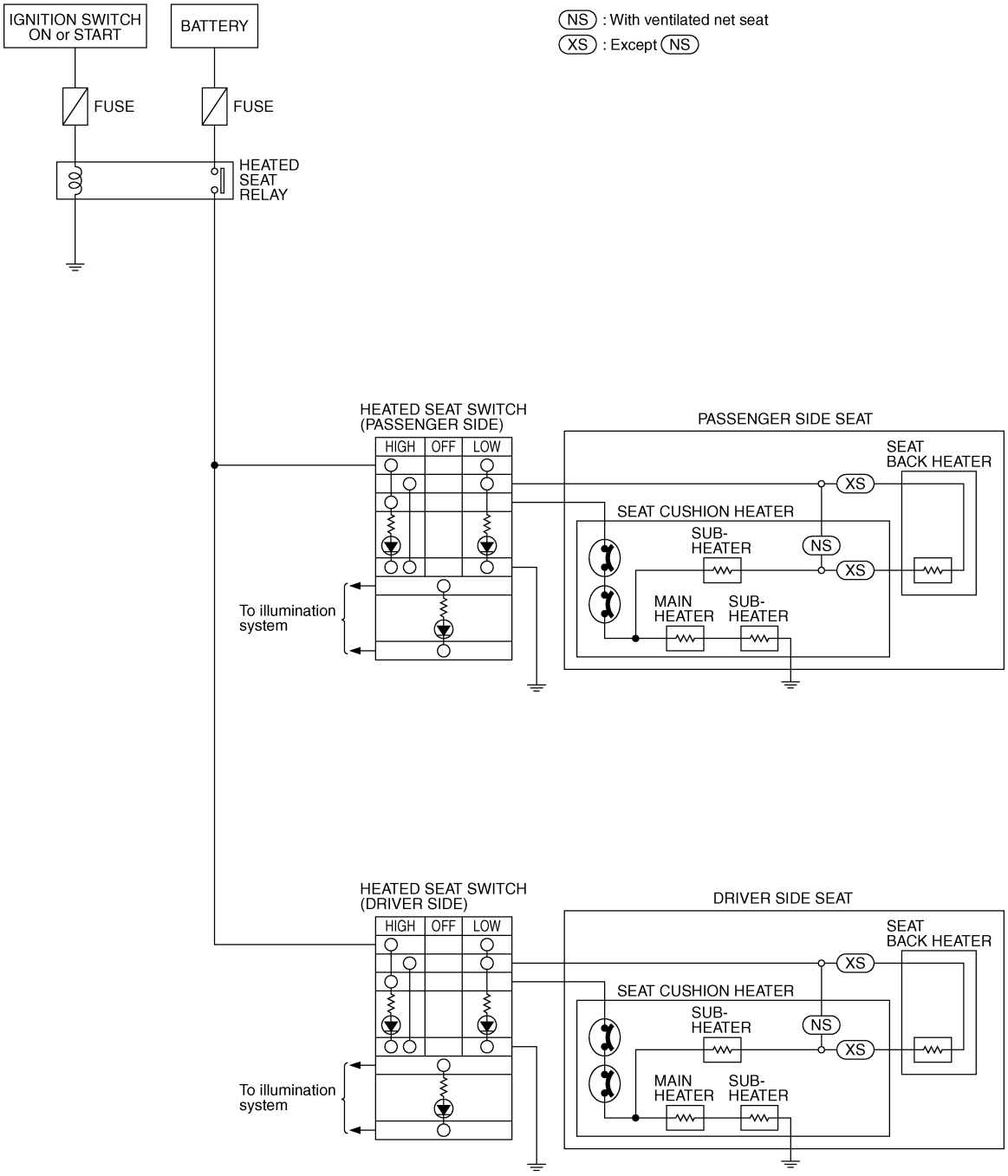


Trim temperature °C (°F)	Heating up to 35 - 45 (95 - 113)	Cooling down to 25 - 35 (77 - 95)
Thermostat operation	OFF	ON

PIIA9035E

Schematic

NIS000AI

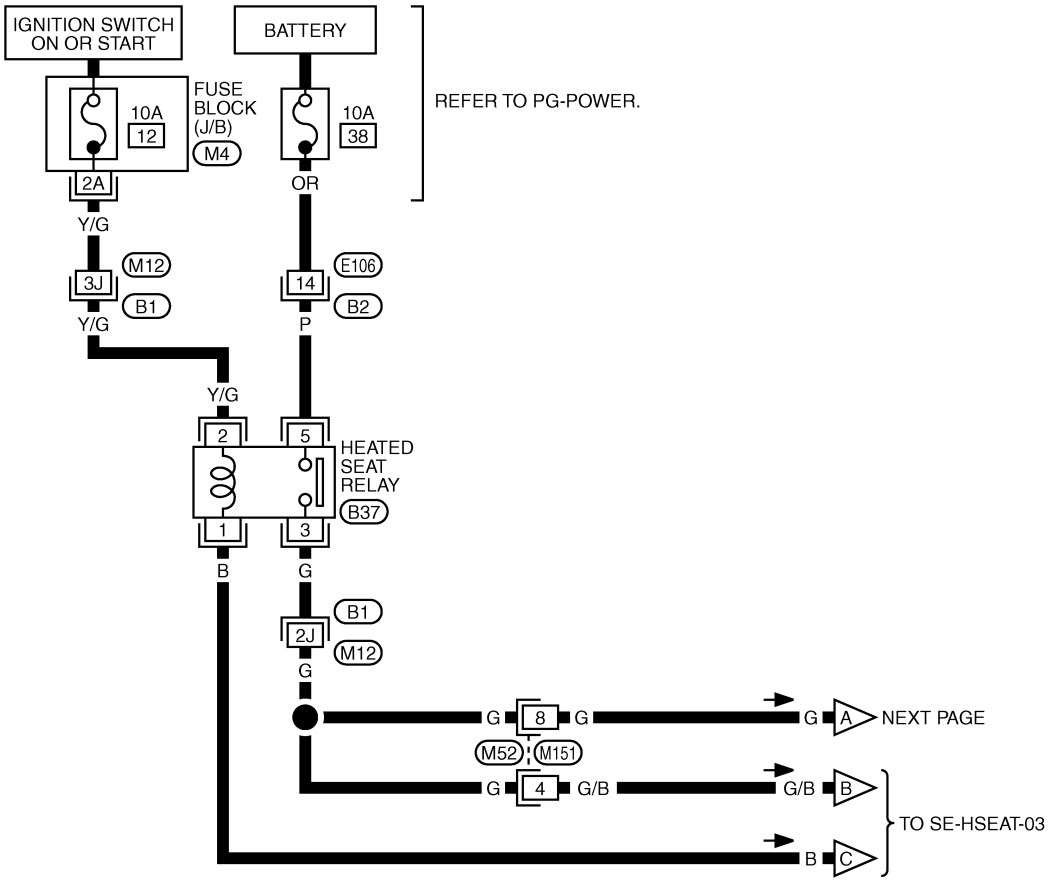


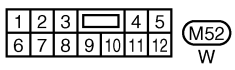
TIWT0517E

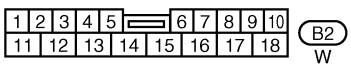
Wiring Diagram–HSEAT–/For Coupe

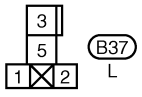
NIS000AJ

SE-HSEAT-01









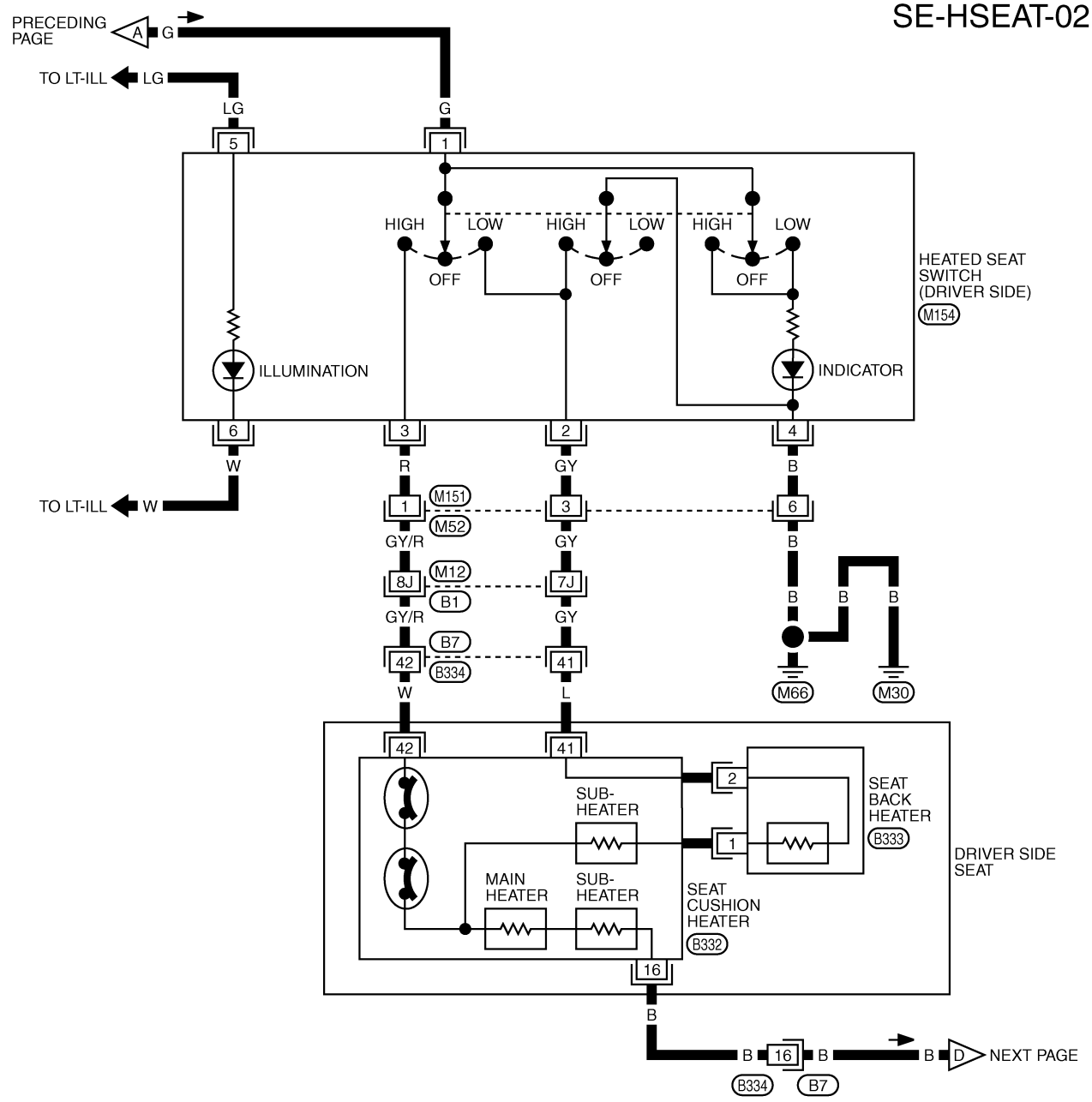
REFER TO THE FOLLOWING.

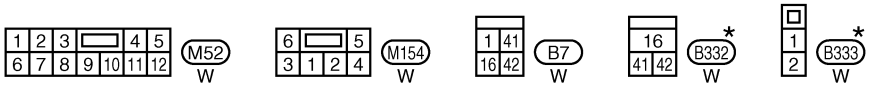
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT2291E

SE-HSEAT-02



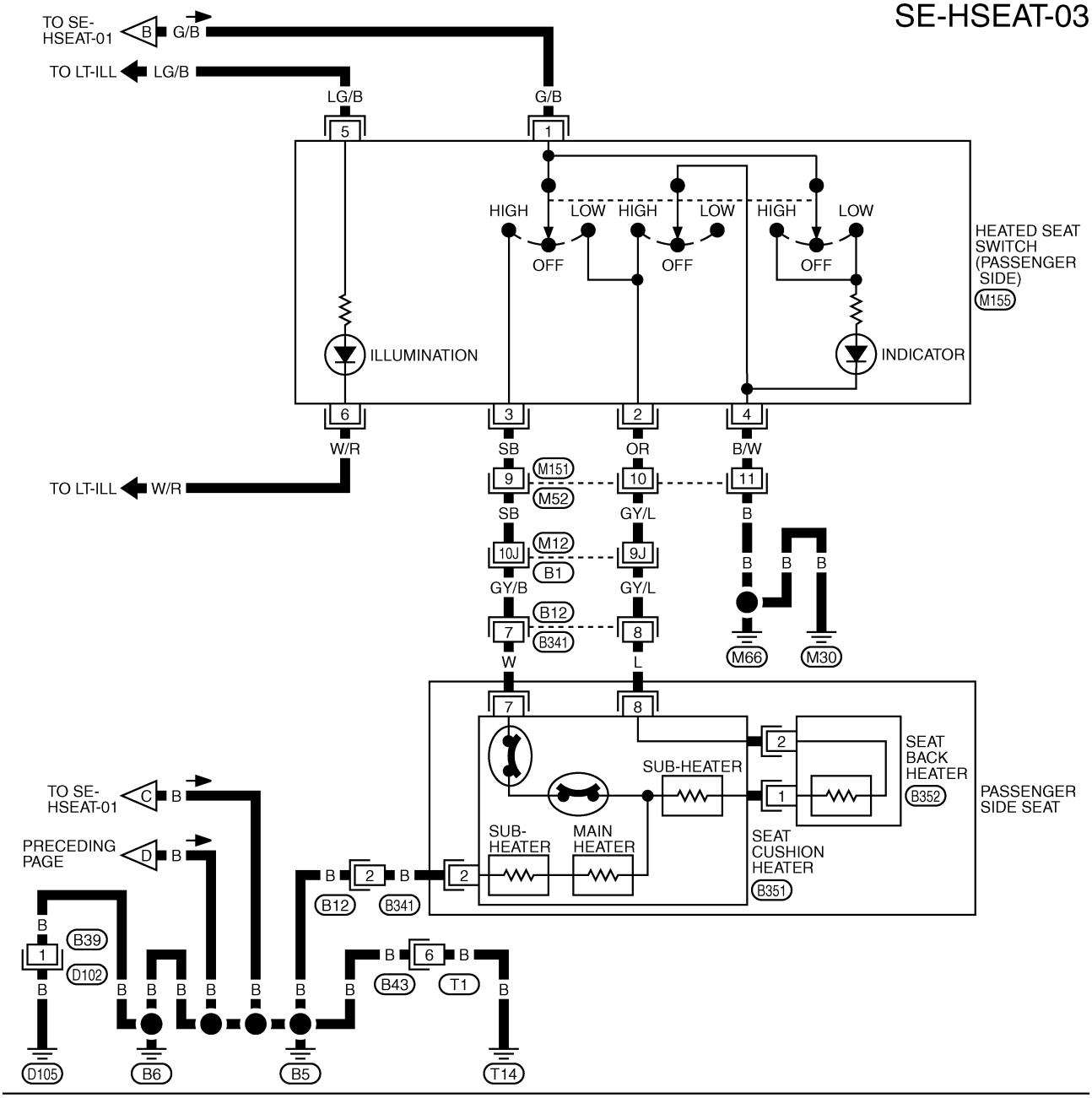


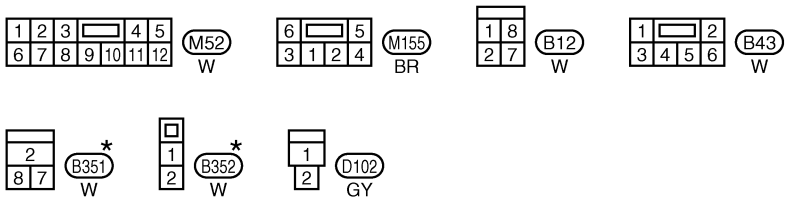
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT1619E

SE-HSEAT-03





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

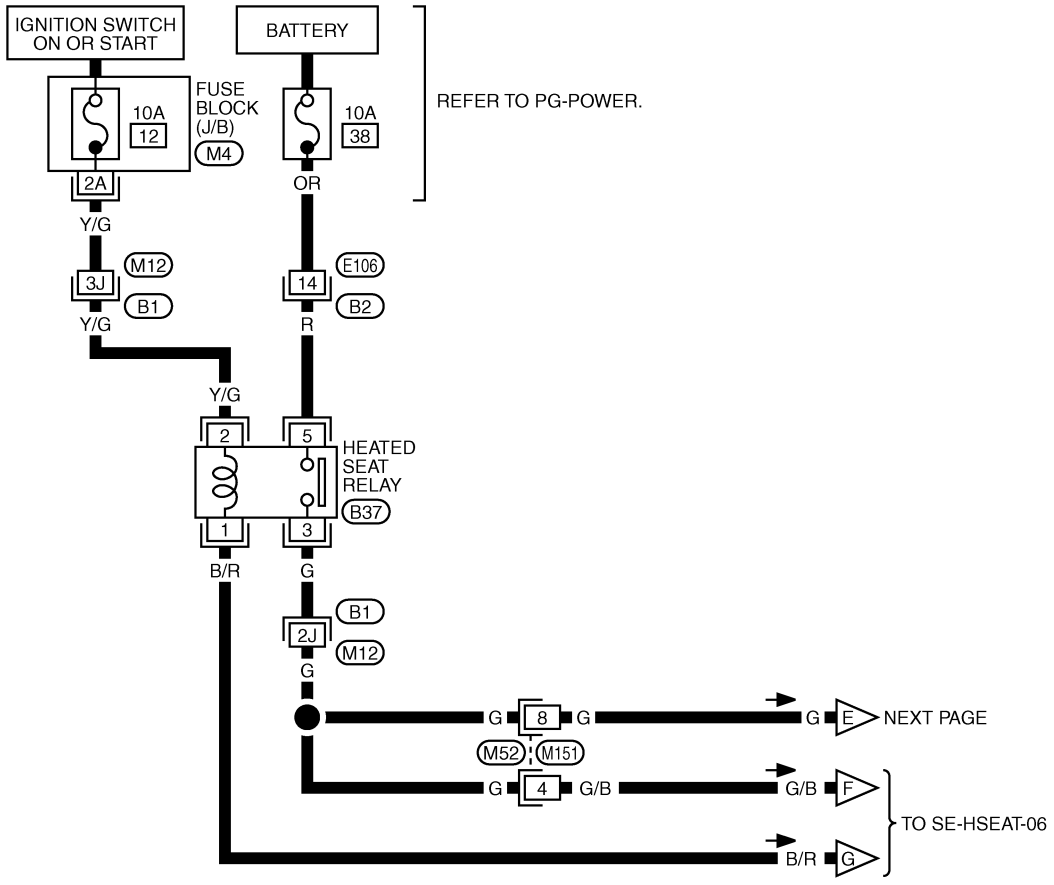
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

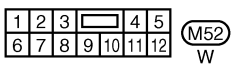
TIWT1620E

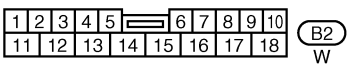
Wiring Diagram–HSEAT–/For Roadster–

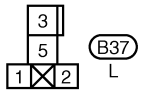
NIS000AK

SE-HSEAT-04









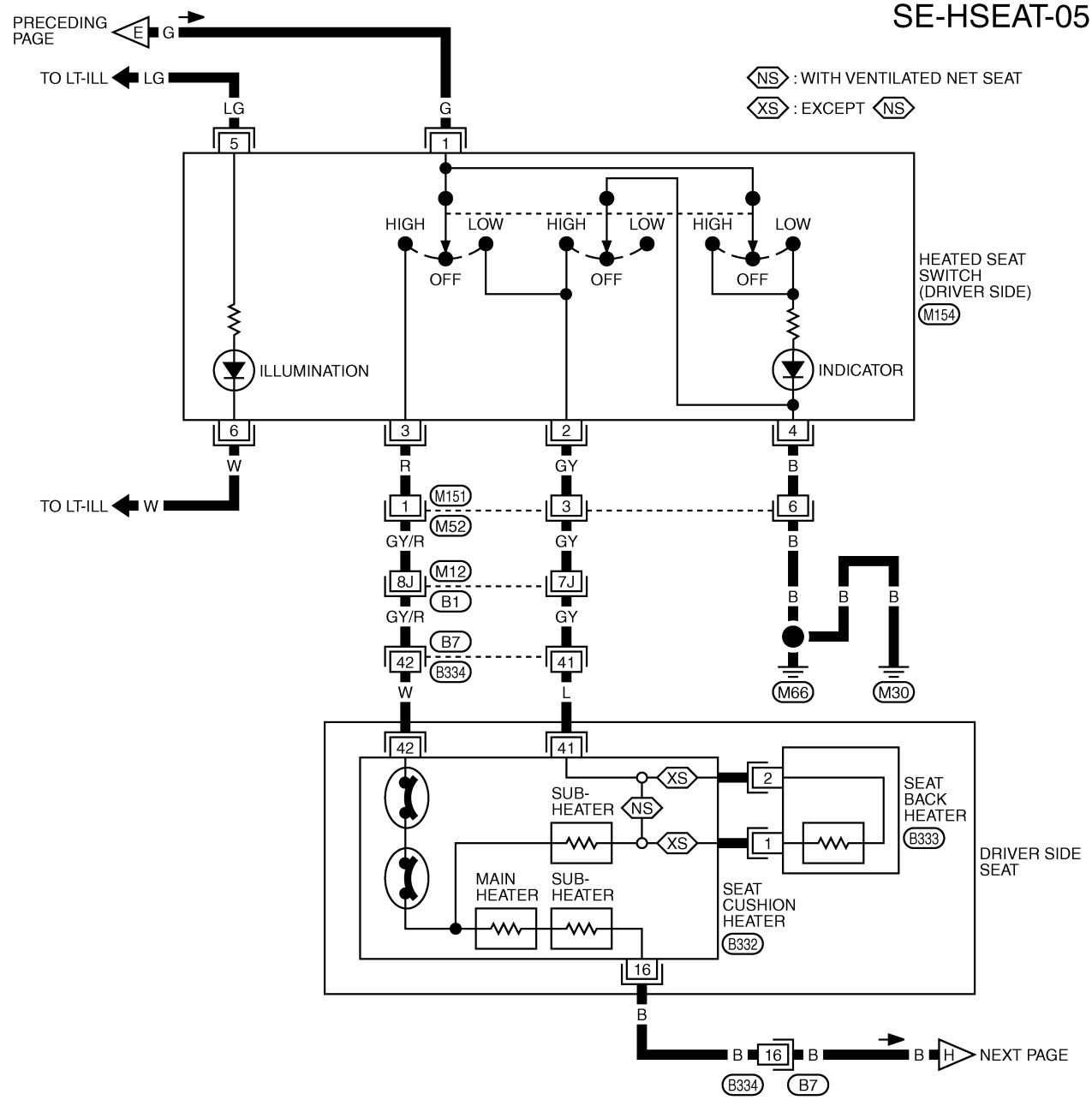
REFER TO THE FOLLOWING.

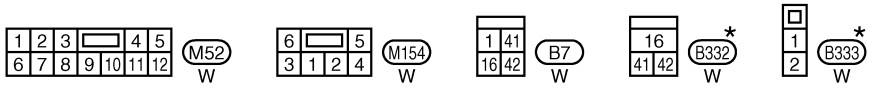
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT2292E

SE-HSEAT-05



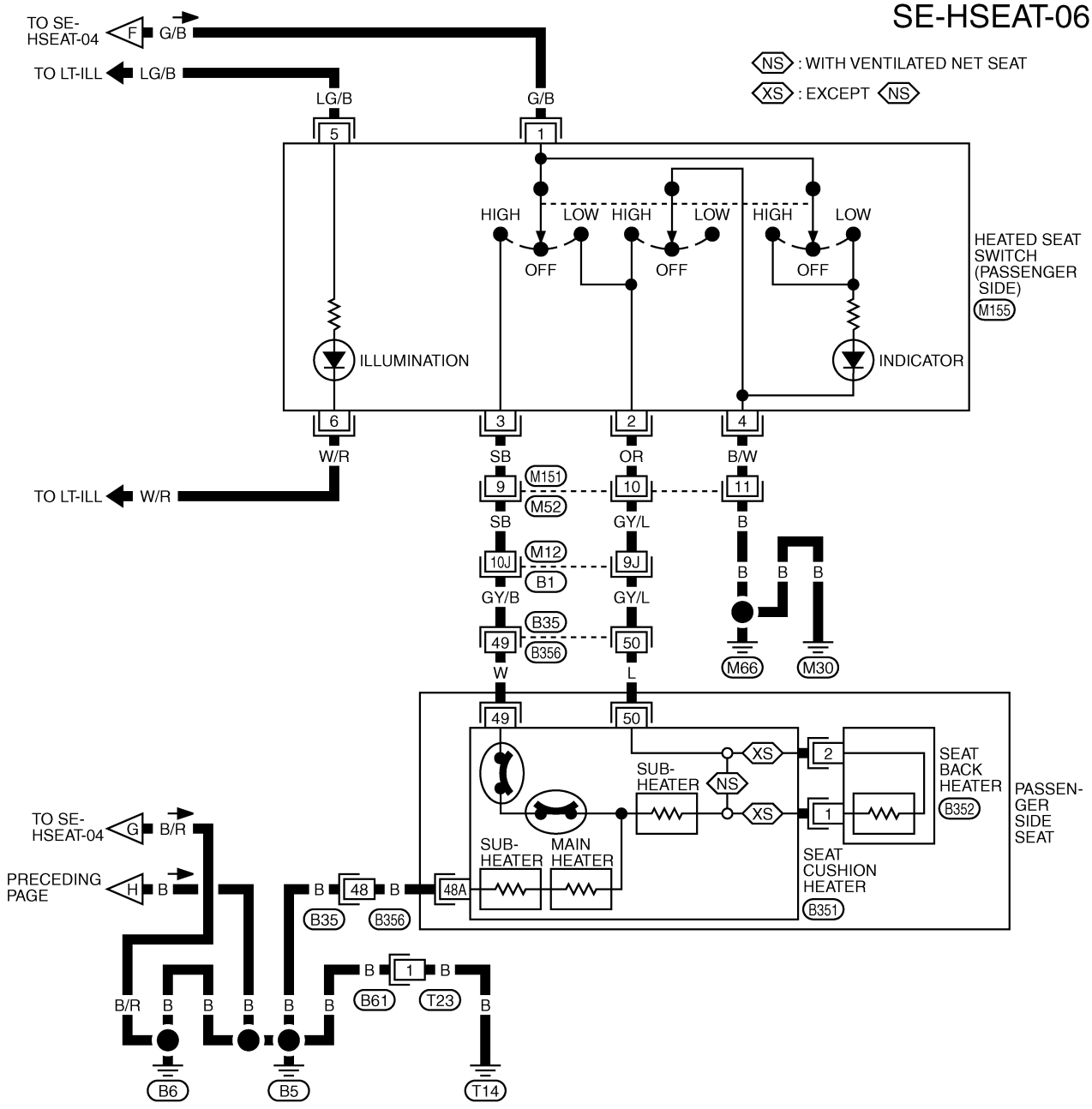


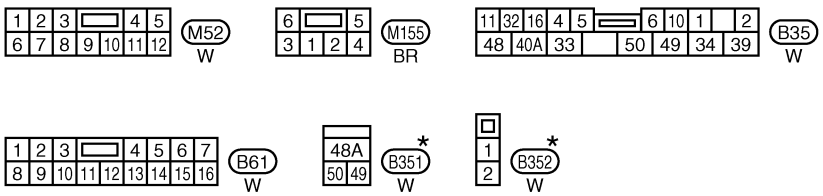
∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT1622E

SE-HSEAT-06





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT2293E

SEAT

PFP:87000

Removal and Installation

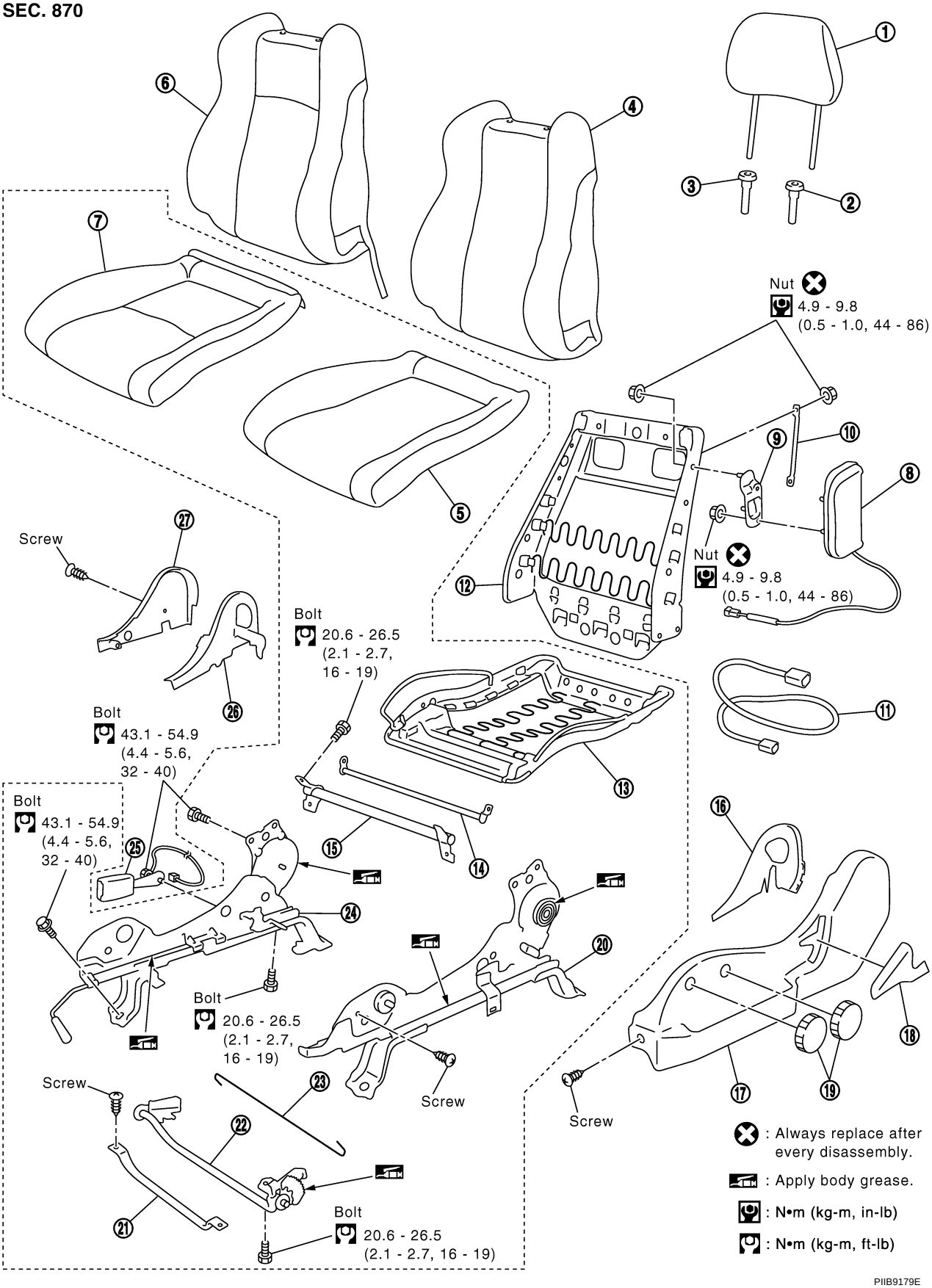
NIS000AL

CAUTION:

Do not disassembly the component parts of only front passenger seat in the dotted lines shown in the figure below.

MANUAL SEAT (COUPE)

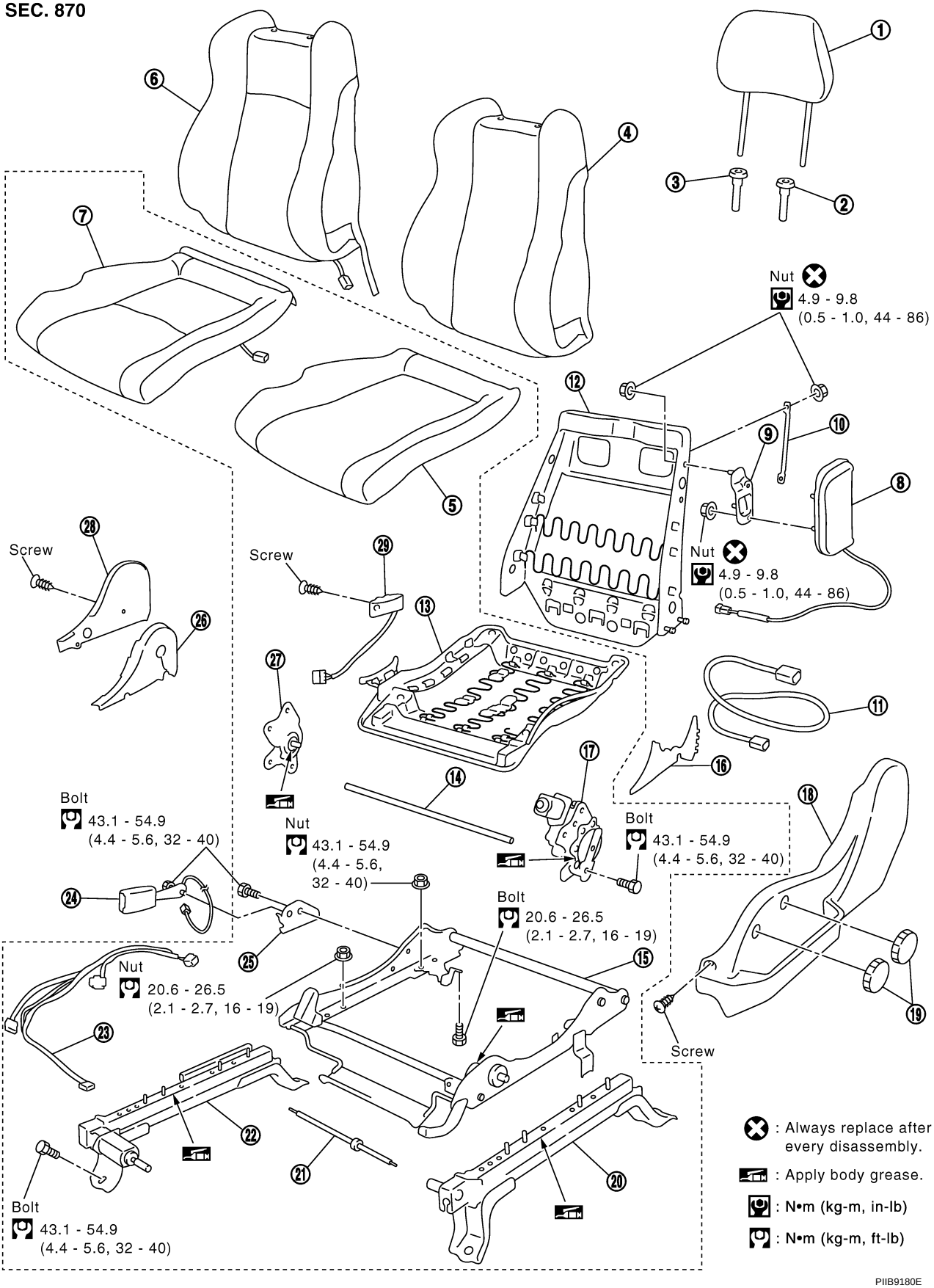
SEC. 870



1. Headrest
2. Headrest holder (locked)
3. Headrest holder (free)
4. Seatback pad
5. Seat cushion pad
6. Seatback trim
7. Seat cushion trim
8. Side air bag module
9. Side air bag module bracket
10. Inner cloth stay
11. Side air bag module harness
12. Seatback frame
13. Seat cushion frame
14. Connector rod
15. Rear gusset
16. Inner cover outer device
17. Seat cushion outer finisher
18. Reclining lever knob
19. Lifter dial
20. Sliding and reclining device outer
21. Front gusset
22. Seat thigh support adjuster
23. Wire pull
24. Sliding and reclining device inner
25. Seat belt buckle
26. Inner cover inner device
27. Seat cushion inner finisher

POWER SEAT

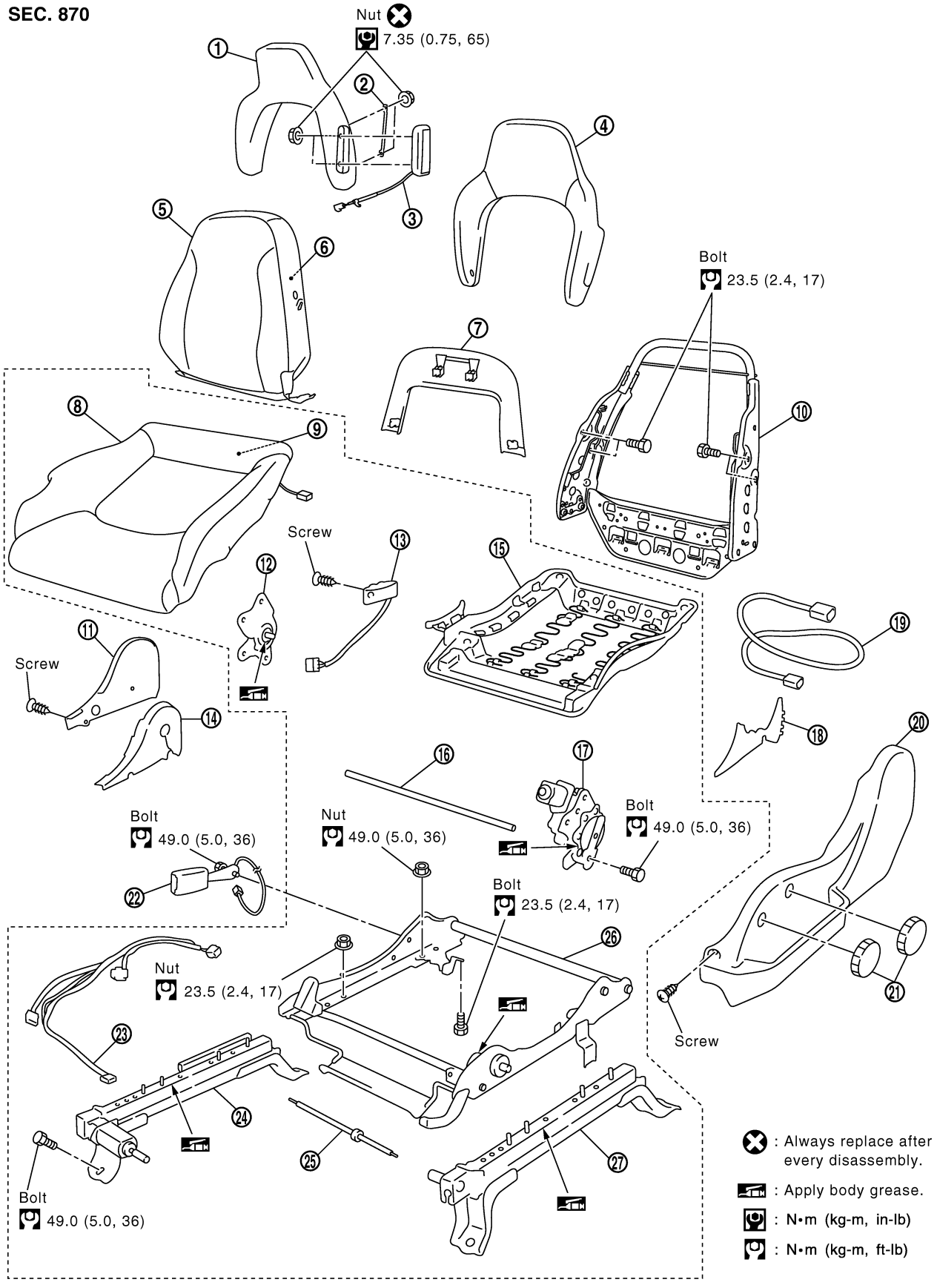
SEC. 870



1. Headrest
2. Headrest holder (locked)
3. Headrest holder (free)
4. Seatback pad
5. Seat cushion pad
6. Seatback trim
7. Seat cushion trim
8. Side air bag module
9. Side air bag module bracket
10. Inner cloth stay
11. Side air bag module harness
12. Seatback frame
13. Seat cushion frame
14. Reclining device rod
15. Seat thigh support adjuster assembly
16. Inner cover outer device
17. Reclining device outer
18. Seat cushion outer finisher
19. Lifter dial
20. Sliding outer assembly
21. Flexible wire
22. Sliding inner assembly
23. Power seat harness
24. Seat belt buckle
25. Seat belt buckle bracket
26. Inner cover inner device
27. Reclining device inner
28. Seat cushion inner finisher
29. Power seat switch

NET SEAT (ROADSTER)

SEC. 870



1. Seatback frame and pad upper
2. Inner cloth stay
3. Side air bag module
4. Seatback trim upper
5. Seatback trim lower
6. Seatback pad lower

7. Seatback garnish
8. Seat cushion trim
9. Seat cushion pad
10. Seatback frame
11. Seat cushion inner finisher
12. Reclining inner device
13. Power seat switch
14. Inner cover inner device
15. Seat cushion frame
16. Reclining device rod
17. Reclining outer device
18. Inner cover outer device
19. Side air bag module harness
20. Seat cushion outer finisher
21. Lifter dial
22. Seat belt buckle
23. Power seat harness
24. Sliding inner assembly
25. Flexible wire
26. Seat thigh support adjuster assembly
27. Sliding outer assembly

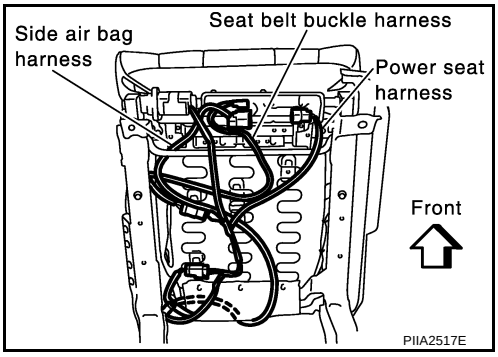
REMOVAL

When removing or installing the seat trim, carefully handle it to keep dirt out and avoid damage.

CAUTION:

- **Before removing the seat, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **When checking the power seat circuit for continuity using a circuit tester, do not confuse its connector with the side air bag module connector. Such an error may cause the air bag to deploy.**
- **Do not drop, tilt, or bump the side air bag module installing in the seat. Always handle it with care.**

1. Remove the front leg cover and rear leg cover (LH/RH).
2. Slide the seat until the body mounting bolts are visible and a tool can be inserted.
3. Remove mounting bolts from vehicle.
4. Disconnect both battery cables.
5. Disconnect harness connector from under seat cushion.
6. Remove fastening clips under seat cushion, and remove seats from vehicle.



INSTALLATION

Install in the reverse order of removal.

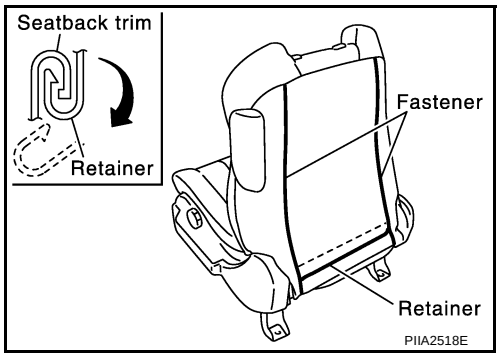
Disassembly and Assembly

NIS000AM

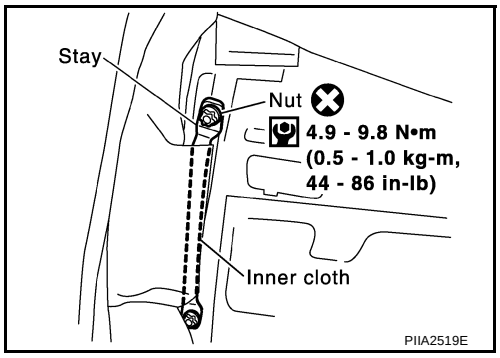
SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)

Disassembly

1. Open fastener on back of seatback, and remove retainer from seatback trim.

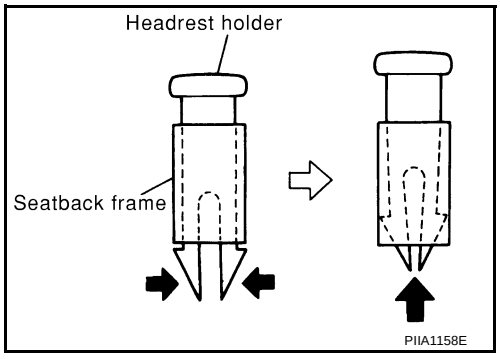


2. Remove the stay securing the inner cloth.



3. Squeeze and pull up headrest holder tabs to remove from seatback frame.

   NOTE:
   Before installing the headrest holder, check its orientation (front/rear and right/left).



4. Remove the seat heater harness connector. After removing the seatback trim and pad, remove the hog ring to separate the trim and pad.

   NOTE:
   Seatback heater unit is stitched into seatback trim. It cannot be separated (for heated seat models only).

Assembly

Assemble in the reverse order of disassembly.

REMOVAL OF SEATBACK ASSEMBLY

1. After completing the steps 1 of “SEATBACK TRIM AND PAD”, remove the harness connectors for the reclining motor (driver seat only).
2. Pull out the harness connector for the side air bag from the seat cushion.
3. Remove the reclining device mounting bolts on the seatback frame, and remove the seatback assembly.

   NOTE:
   When assembling the seatback frame, make sure that the reclining device are locked on both sides, and be sure to temporarily tighten the bolts, then tighten them finally.

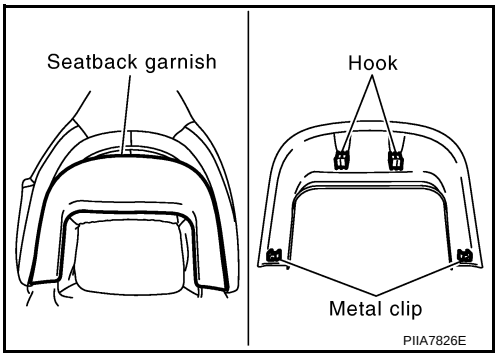
INSTALLATION OF SEATBACK ASSEMBLY

Install in the reverse order of removal.

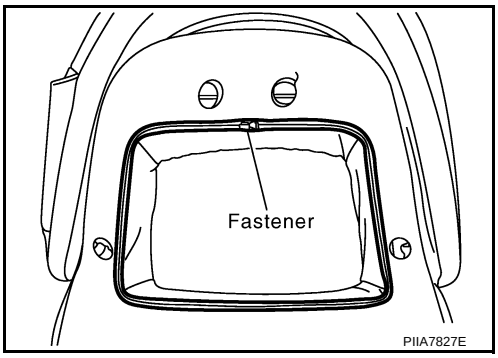
SEATBACK TRIM AND PAD (NET SEAT FOR ROADSTER)

Disassembly

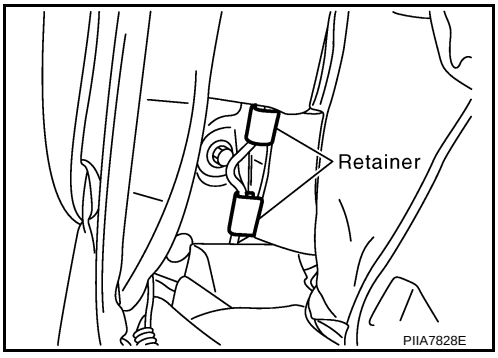
1. Remove the seatback garnish.



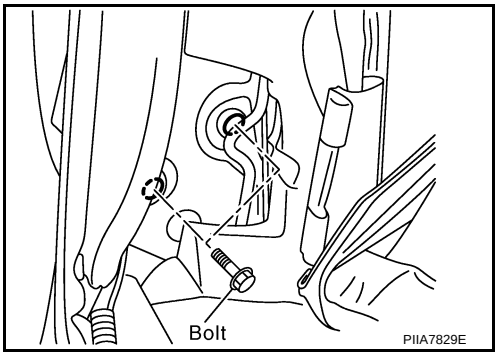
2. Open fastener on seatback lower.



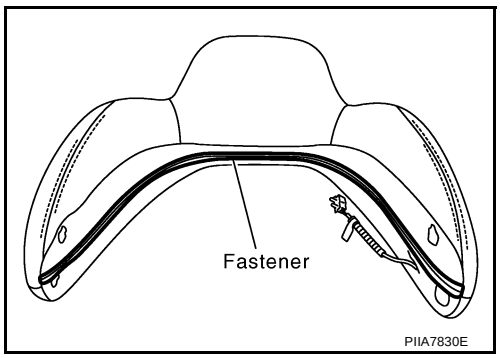
3. Remove the retainer.



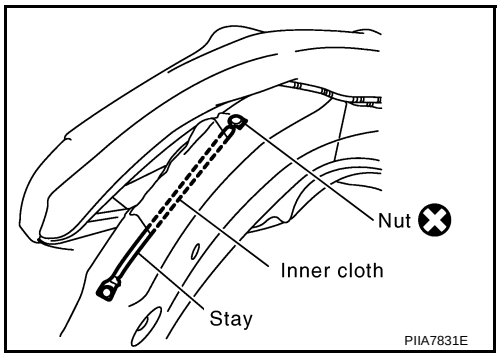
4. Disconnect side air bag connector.
5. Remove the seatback upper mounting bolts.



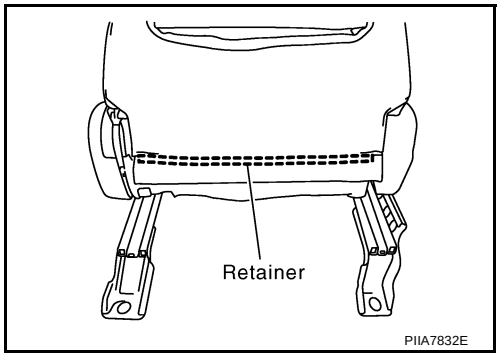
6. Open fastener on seatback upper.



7. Remove the stay securing the inner cloth.



8. Separate the seatback frame and pad upper and seatback trim upper.
9. Remove the retainer.



10. After removing the seatback trim and pad, remove the hog rings to separate the trim and pad.

Assembly

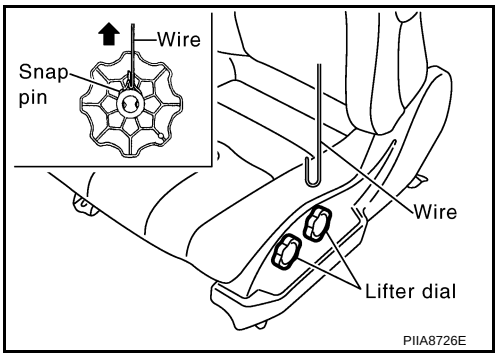
Assemble in the reverse order of disassembly.

SEAT CUSHION TRIM AND PAD (POWER SEAT AND NET SEAT)

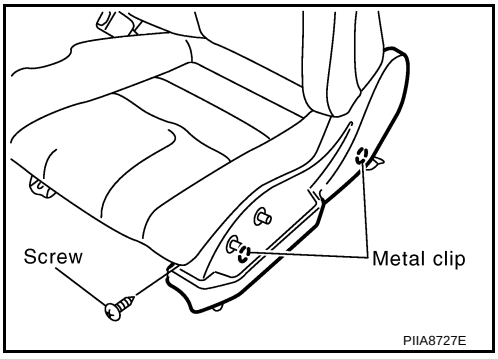
CAUTION:
Do not disassemble front passenger seat cushion assembly.
Always replace as an assembly.
For front passenger seat service parts, refer to the service part catalogue.

Disassembly

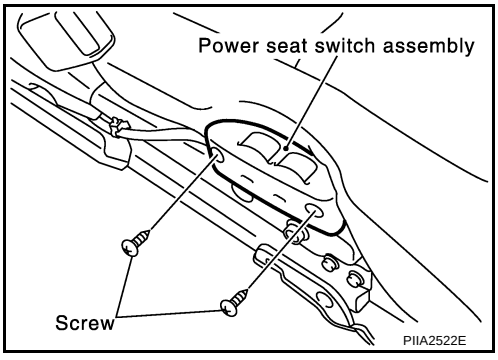
1. Hang snap ring on wire, and pull it up to remove. Remove Lifter dial.



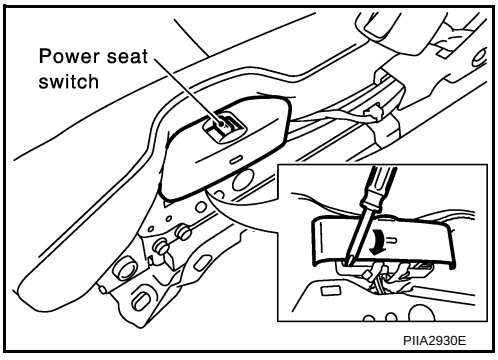
2. Unfasten the screw and metal clip and remove the seat cushion outer finisher.



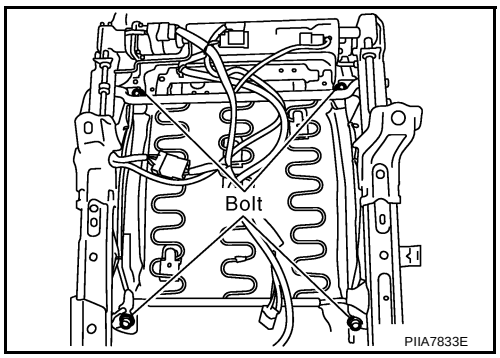
3. Unfasten screws and remove the power seat switch assembly.



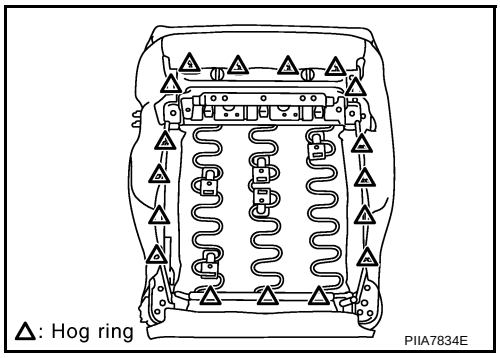
Insert a screwdriver in lower side of power seat switch and remove it (passenger seat for coupe).



4. Remove bolts on the under side of seat cushion.



5. Remove hog rings from under seat cushion frame.



6. Disconnect harness connector from seat cushion heater unit.
7. After removing the seat cushion trim and pad, remove the hog rings to separate the trim and pad.

NOTE:
Seat cushion heater unit is stitched into seat cushion trim. It cannot be separated.

Assembly

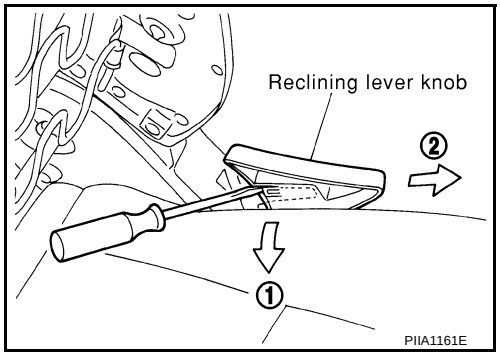
Assemble in the reverse order of disassembly.

SEAT CUSHION TRIM AND PAD (MANUAL SEAT FOR COUPE)

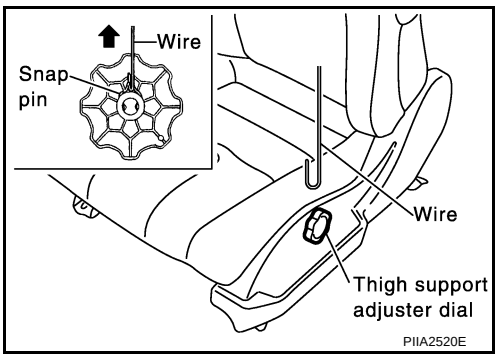
CAUTION:
Do not disassemble front passenger seat cushion assembly.
Always replace as an assembly.
For front passenger seat service parts, refer to the service part catalogue.

Disassembly

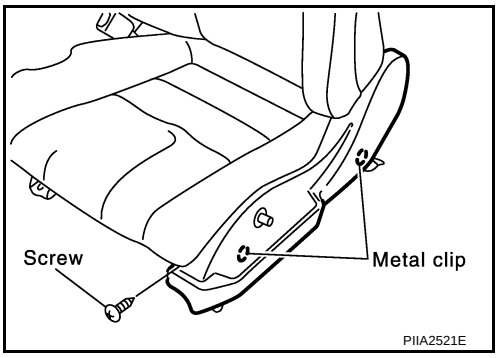
1. Pull up tabs of reclining lever from inside. Slide knob forward to remove.



2. Hang snap ring on wire, and pull it up to remove. Remove thigh support adjuster dial.



3. Unfasten the screw and metal clip and remove the seat cushion outer finisher.



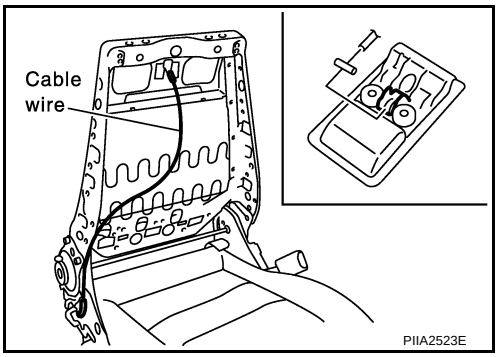
4. Remove bolts on the under side of seat cushion.
5. Remove hog rings from under seat cushion frame.
6. After removing the seat cushion trim and pad, remove the hog rings to separate the trim and pad.

Assembly

Assemble in the reverse order of disassembly.

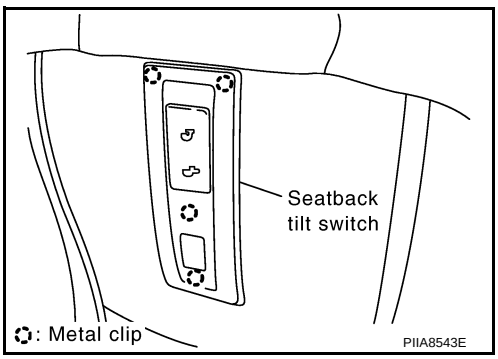
PASSENGER SIDE SEATBACK FORWARD RECLINING (COUPE)

1. Remove passenger side seatback trim and pad. Refer to SE-74, "SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)" .
2. Remove screw and fixing clip, then disconnect cable wire.



PASSENGER SIDE SEATBACK FORWARD RECLINING (ROADSTER)

1. Remove the seatback tilt switch.



2. Disconnect seatback tilt switch harness connector.

3. Remove passenger side seatback trim and pad. Refer to SE-74, "SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)" .

SECTION SRS

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NHS00008

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for SRS “AIR BAG” and “SEAT BELT PRE-TENSIONER” Service

NHS00009

- Do not use electrical test equipment to check SRS circuits unless instructed in this Service Manual.
- Before servicing the SRS, turn ignition switch OFF, and disconnect both battery cables. Then wait at least 3 minutes.
  For approximately 3 minutes after the cables are removed, it is still possible for the air bag and seat belt pre-tensioner to deploy. Therefore, do not work on any SRS connectors or wires until at least 3 minutes have passed.
- Diagnosis sensor unit must always be installed with their arrow marks “⇐” pointing towards the front of the vehicle for proper operation. Also check diagnosis sensor unit for cracks, deformations or rust before installation and replace if required.
- The spiral cable must be set to the neutral position since its rotations are limited. Do not attempt to turn steering wheel or column, if steering gear was disconnected from the column shaft.
- Handle air bag module carefully. Always put a driver air bag module with the pad side facing upward.
- Conduct self-diagnosis to check entire SRS for proper function after replacing any components.
- After an air bag deployemented, the front instrument panel assembly should be replaced if damaged.
- Always replace instrument panel pad following front passenger air bag deployment.

Precautions for Battery Service

NHS0000A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Occupant Classification System Precaution

NHS000A0

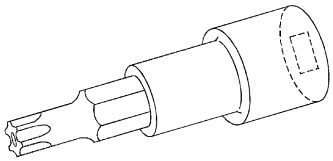
Replace occupant classification system control unit and passenger front seat cushion as an assembly.

PREPARATION

PFP:00002

Commercial Service Tools

NHS0000C

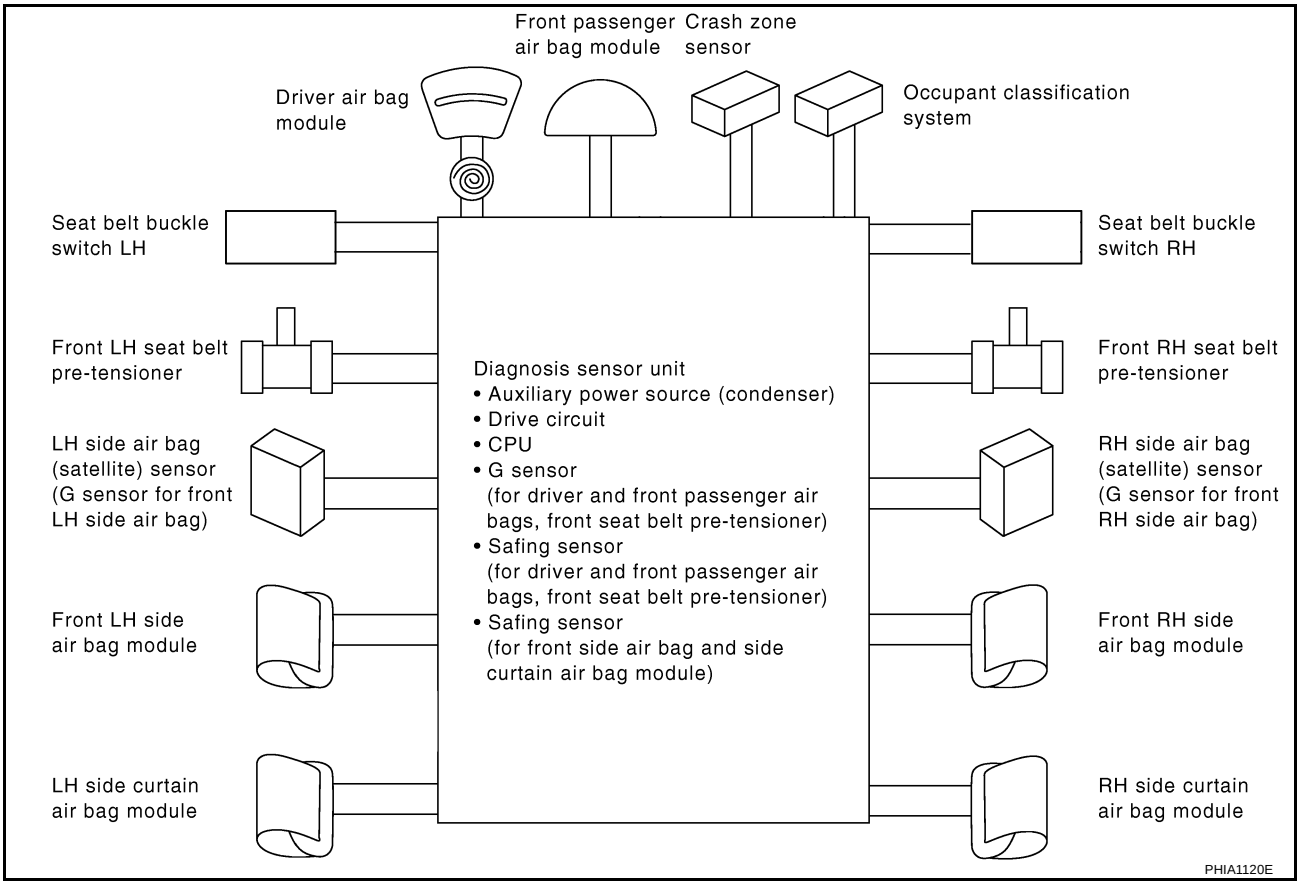
Tool name	Description
Tamper resistant TORX bit  S-NT757	Size: T30

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

PFP:28556

SRS Configuration

NHS0000D



The air bag deploys if the diagnosis sensor unit activates while the ignition switch is in the ON or START position.
The collision modes for which supplemental restraint systems are activated are different among the SRS systems. For example, the driver air bag module and front passenger air bag module are activated in a frontal collision but not in a side collision.
SRS configurations which are activated for some collision modes are as follows;

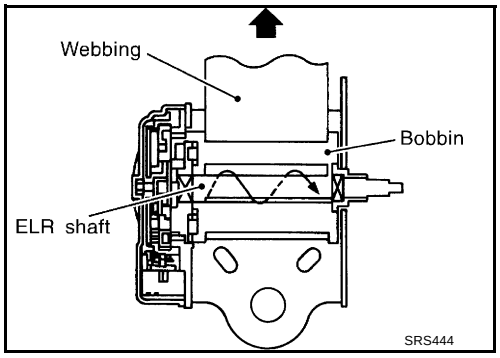
SRS configuration	Frontal collision	Left side collision	Right side collision
Driver air bag module	×	—	—
Front passenger air bag module	×	—	—
Front LH seat belt pre-tensioner	×	—	—
Front RH seat belt pre-tensioner	×	—	—
Front LH side air bag module	—	×	—
Front RH side air bag module	—	—	×
LH side curtain air bag module*	—	×	—
RH side curtain air bag module*	—	—	×

*: For Coupe

Front Seat Belt Pre-tensioner with Load Limiter

NHS0000E

The seat belt pre-tensioner system with load limiter is installed for both the driver's seat and the front passenger seat. It operates simultaneously with the SRS air bag system in the event of a frontal collision with an impact exceeding a specified level.
When the frontal collision with an impact exceeding a specified level occurs, seat belt slack resulting from clothing or other factors is immediately taken up by the pre-tensioner. Vehicle passengers are securely restrained.
When passengers in a vehicle are thrown forward in a collision and the restraining force of the seat belt exceeds a specified level, the load limiter permits the specified extension of the seat belt by the twisting of the ELR shaft, and a relaxation of the chest-area seat belt web tension while maintaining force.



Front Side Air Bag

NHS0000F

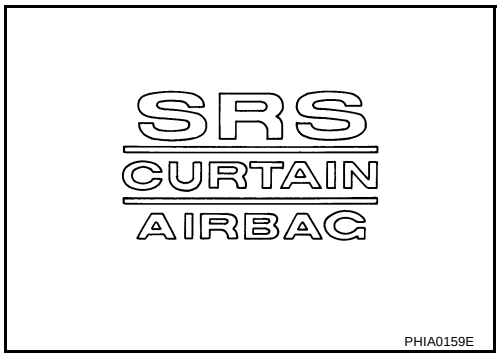
Front side air bag is built-in type.
The front seatbacks with built-in type side air bag have the labels as shown.



Side Curtain Air Bag/for Coupe

NHS0000G

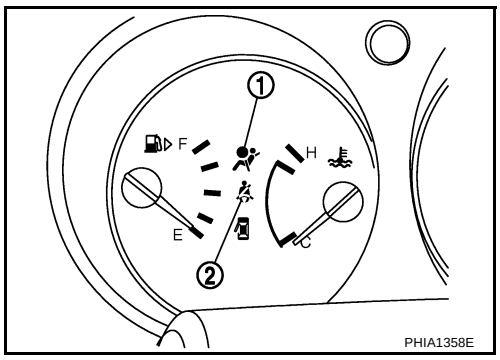
The side curtain air bags have the labels as shown.



Warning Lamp

NHS000A6

Air bag warning lamp : (1)
Seat belt warning lamp: (2)



Occupant Classification System (OCS)

NHS000A1

The occupant classification system identifies different size occupants, out of position occupants, and detects if child seat is present in the front passenger seat. The occupant classification system receives inputs from the occupant classification sensor (located inside the passenger seat cushion assembly) and belt tension sensor (part of the passenger front seat belt assembly and located at the belt anchor location). Depending on classification of passenger, the occupant classification system sends a signal to the diagnosis sensor unit. The diagnosis sensor unit uses this signal to determine full, partial, or non deployment of passenger front air bag in the event of a collision. Depending on the signal received, the diagnosis sensor unit can disable the passenger front air bag completely.

NOTE:
In case of customer concern, CONSULT-ll can be used to confirm the passenger air bag status (readiness).

Passenger Air Bag Status Condition

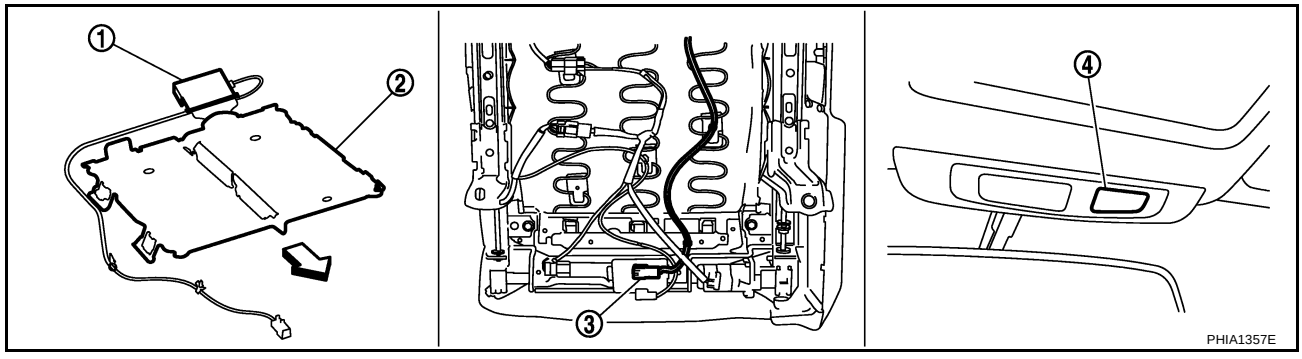
NHS000A2

Front Passenger Seat (Condition)	PASS AIR BAG OFF Indicator (Status)	Passenger Air Bag Status (Readiness)	CONSULT-lll Display
Seat occupied	OFF	Active (enabled)	ON
seat occupiedNOTE	ON	Deactivated (disabled)	OFF
Seat empty	OFF	Deactivated (disabled)	OFF

NOTE:
Passenger does not meet Ocuupant classification System specifications for passenger air bag activation.

Component Parts of Occupant Classification System

NHS000A3



1. Occupant classification system control unit
2. Seat sensor mat
3. Occupant classification system connector
4. Passenger air bag OFF Indicator (cut-off telltaile)

Passenger Seat belt Warning System

NHS000A4

SYSTEM DESCRIPTION
This system warns when passenger seat belt is not fasten.

This system is composed of the following items.

- Seat belt warning lamp.
- Seat belt buckle switch (passenger side).
- Air bag diagnosis sensor unit.
- Occupant classification system.

Seat belt warning lamp is used for both driver seat belt warning and passenger seat belt warning.
Seat belt warning lamp turns ON when all conditions below are met.

- Driver seat belt is fastened.
- Occupant is on passenger seat.
- Passenger seat belt is not fasten.

TROUBLE DIAGNOSIS

PFP:00004

Trouble Diagnosis Introduction

NHS0000H

CAUTION:

- **Do not use electrical test equipment on any circuit related to the SRS unless instructed in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**
- **Do not repair, splice or modify the SRS wiring harness. If the harness is damaged, replace it with a new one.**
- **Keep ground portion clean.**

DIAGNOSIS FUNCTION

The SRS self-diagnostic results can be read by using “AIR BAG” warning lamp and/or CONSULT-lll.
The User mode is exclusively prepared for the customer (driver). This mode warns the driver of a system malfunction through the operation of the “AIR BAG” warning lamp.
The Diagnosis mode allows the technician to locate and inspect the malfunctioning part.
The mode applications for the “AIR BAG” warning lamp and CONSULT-lll are as follows:

	User mode	Diagnosis mode	Display type
“AIR BAG” warning lamp	X	X	ON-OFF operation
CONSULT-III	—	X	Monitoring

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a malfunction. It is important to fully understand the symptoms or conditions for a customer complaint.

Information from Customer

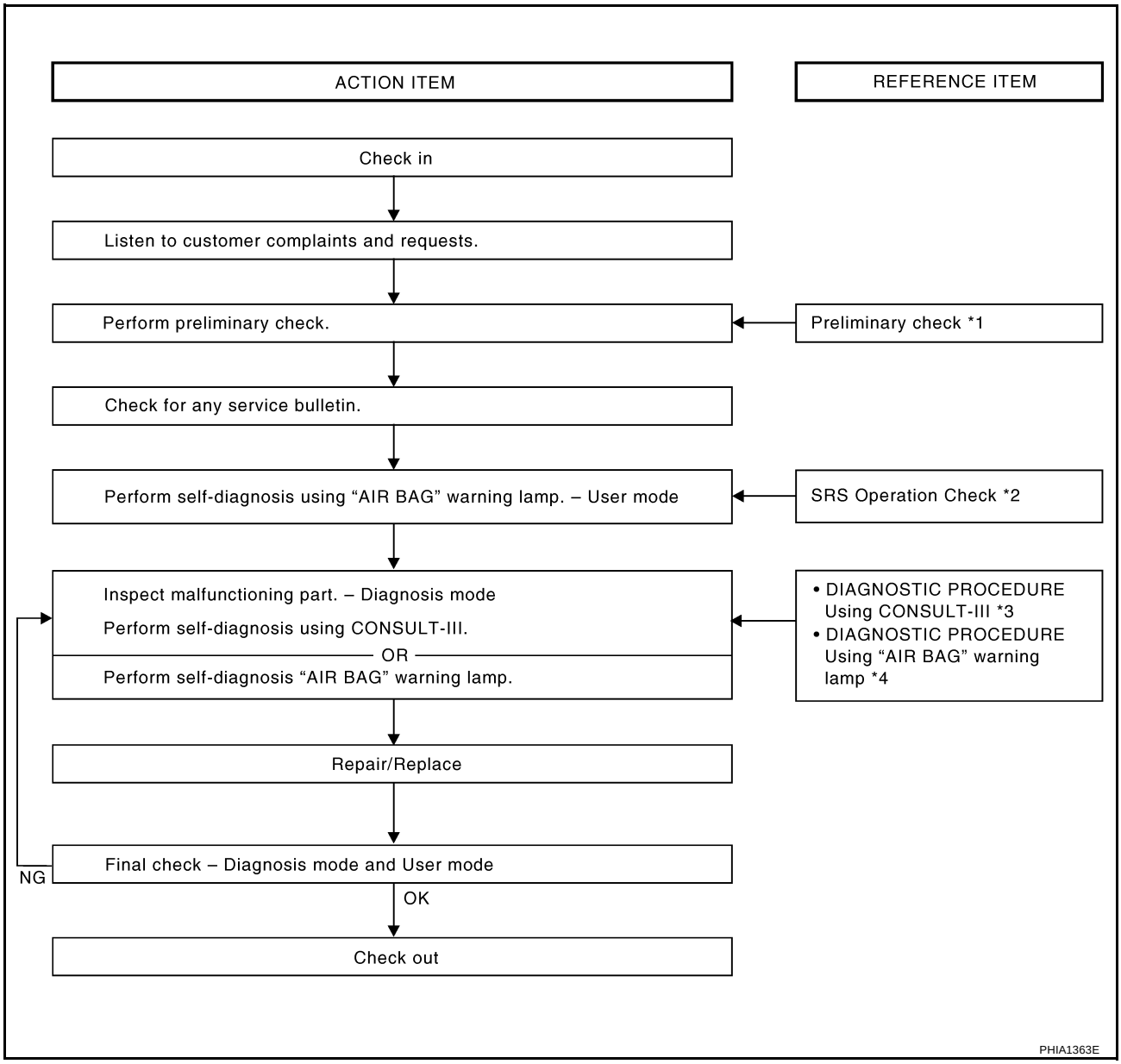
WHAT..... Vehicle model
WHEN..... Date, Frequencies
WHERE..... Road conditions
HOW..... Operating conditions, Symptoms

Preliminary Check

Make sure that the following parts are in good order.

- Battery (Refer to SC-4, "How to Handle Battery" .)
- Fuse (Refer to SRS-13, "Wiring Diagram — SRS —/For Coupe" or SRS-19, "Wiring Diagram — SRS —/For Roadster" .)
- System component-to-harness connections

WORK FLOW



*1: SRS-9, "Preliminary Check".

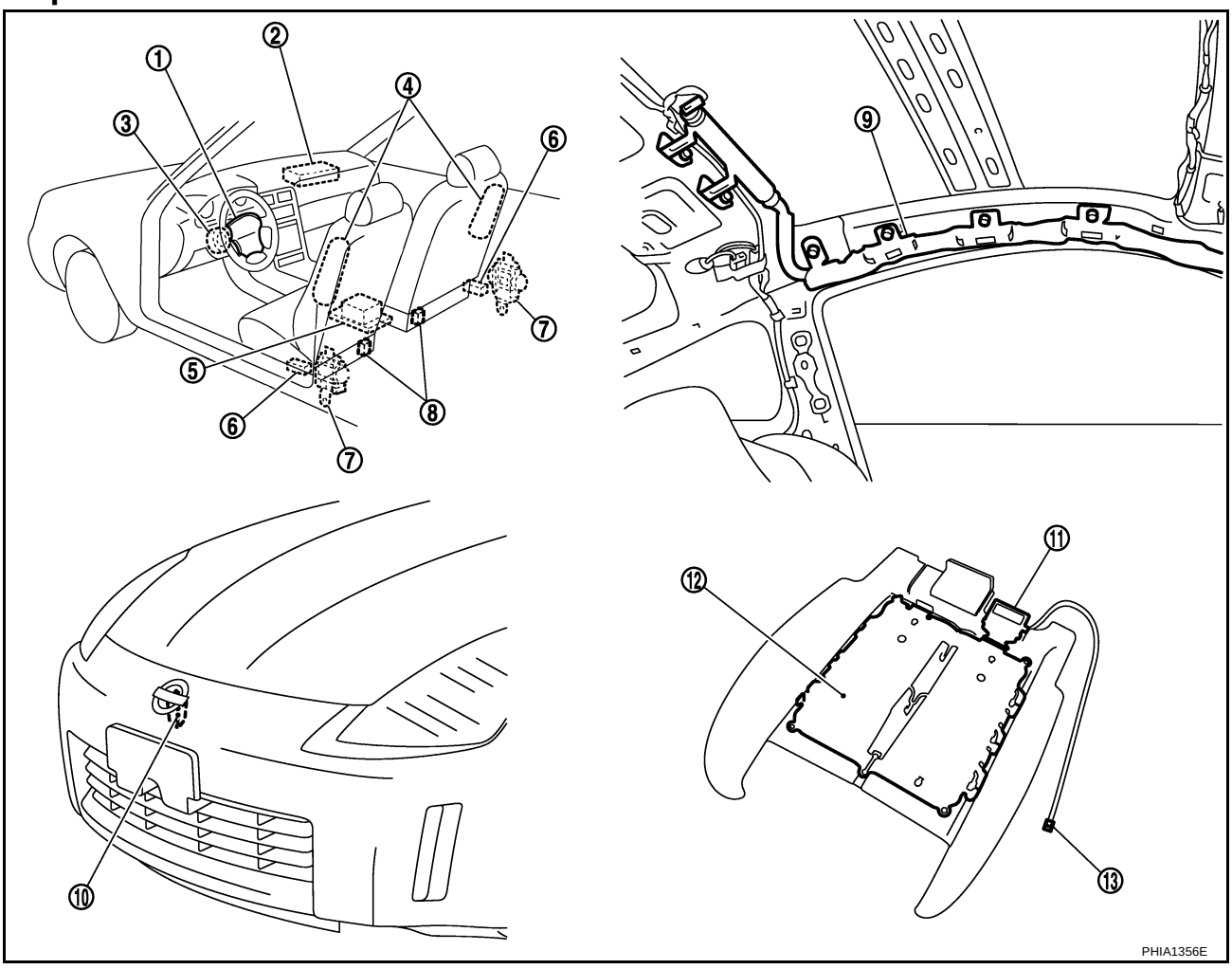
*2: SRS-27, "SRS Operation Check (USER MODE)".

*3: SRS-29, "Trouble Diagnosis with CONSULT-III".

*4: SRS-33, "Trouble Diagnosis without CONSULT-III".

Component Parts Location

NHS0000I

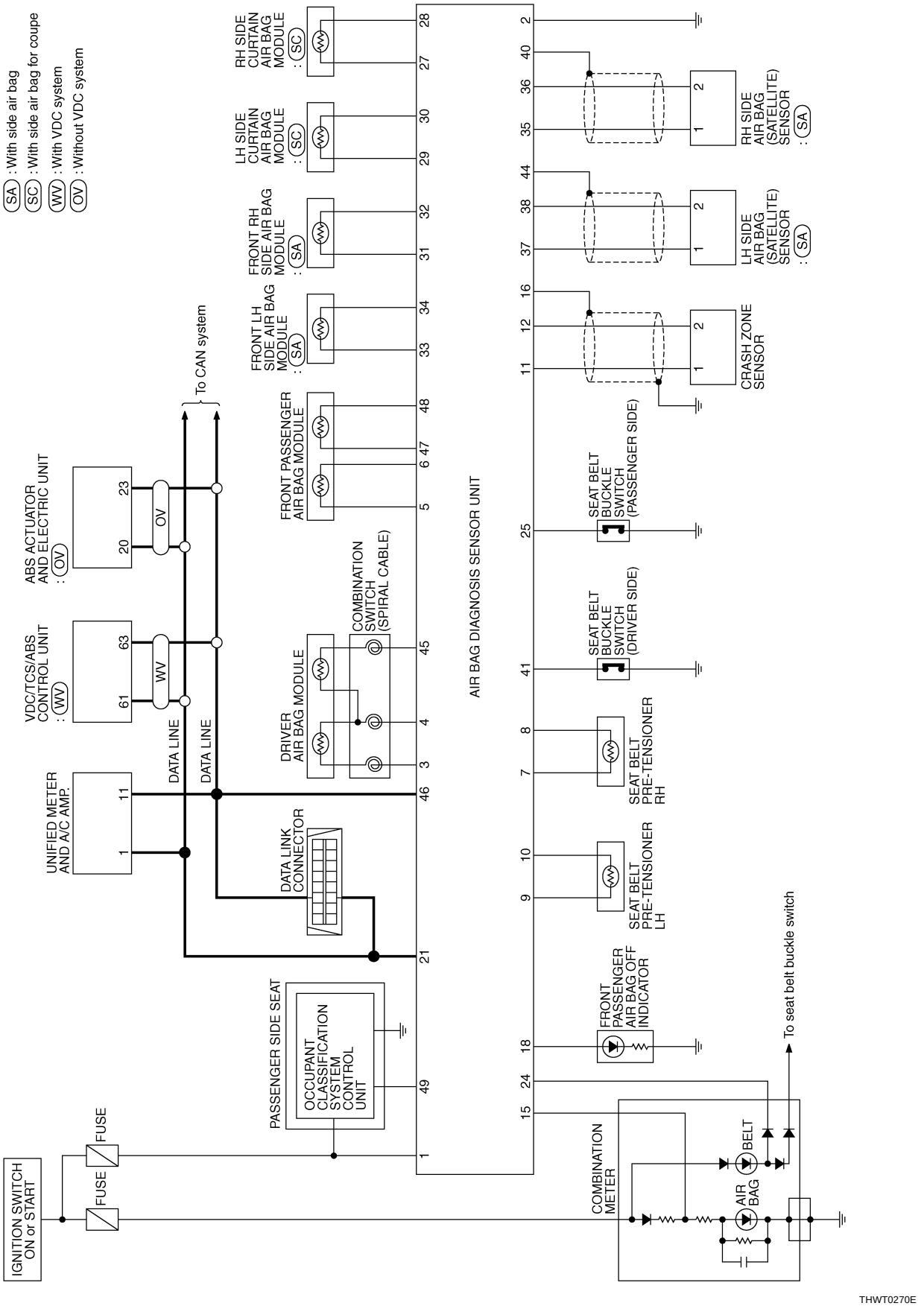


1.	Driver air bag module	2.	Front passenger air bag module	3.	Spiral cable
4.	Front side air bag module (LH/RH)	5.	Diagnosis sensor unit	6.	Side air bag (Satellite) sensor (LH/ RH)
7.	Seat belt pre-tensioner (LH/RH)	8.	Seat belt buckle switch (LH/ RH)	9.	Side curtain air bag module*
10.	Crash zone sensor	11.	Occupant classification system control unit	12.	Seat sensor mat
13.	Occupant classification system connector				

*: For Coupe

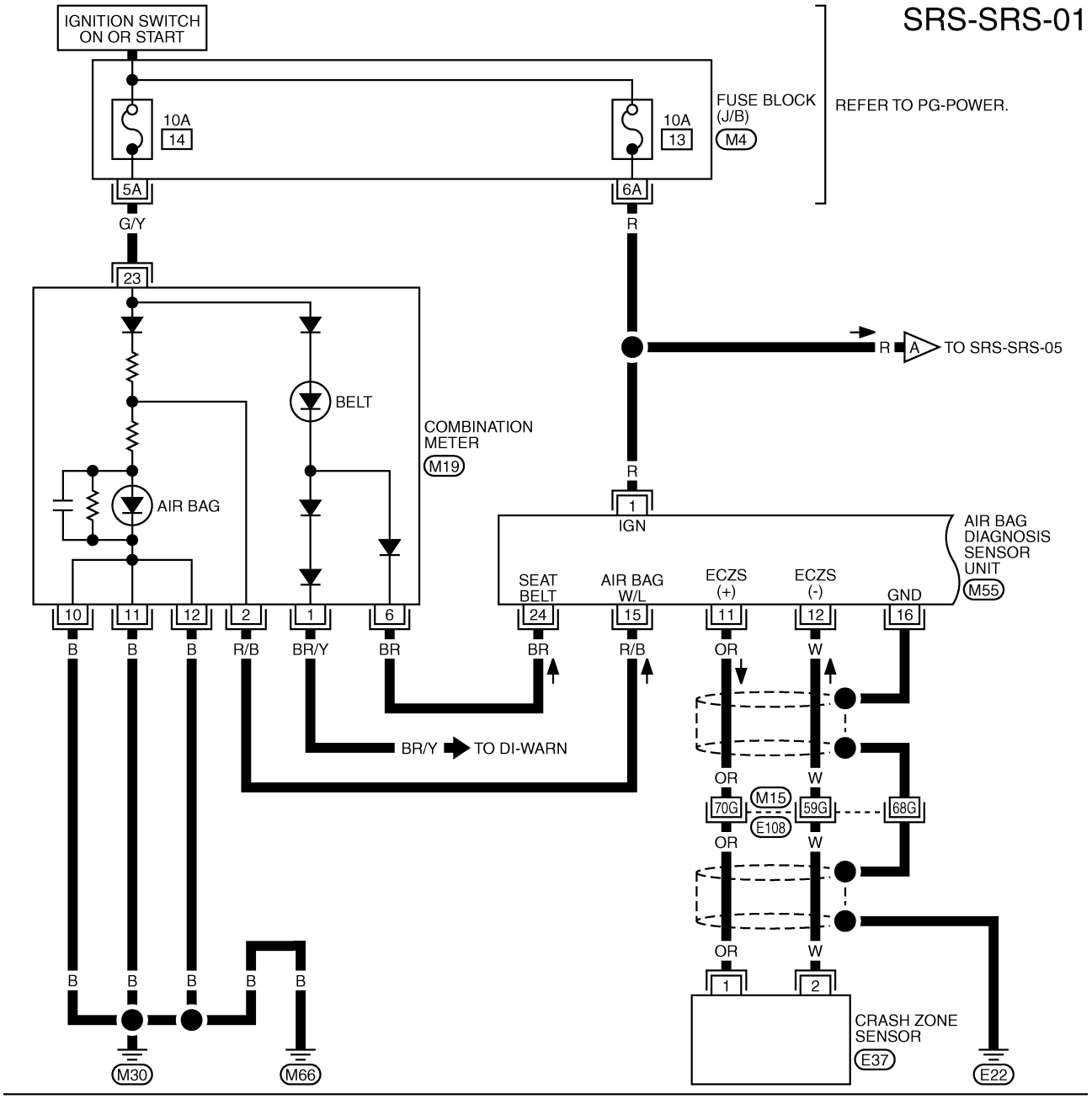
Schematic

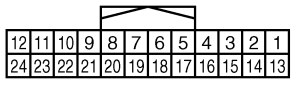
NHS0000J

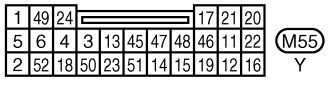


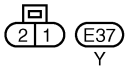
Wiring Diagram — SRS —/For Coupe

NHS0000K









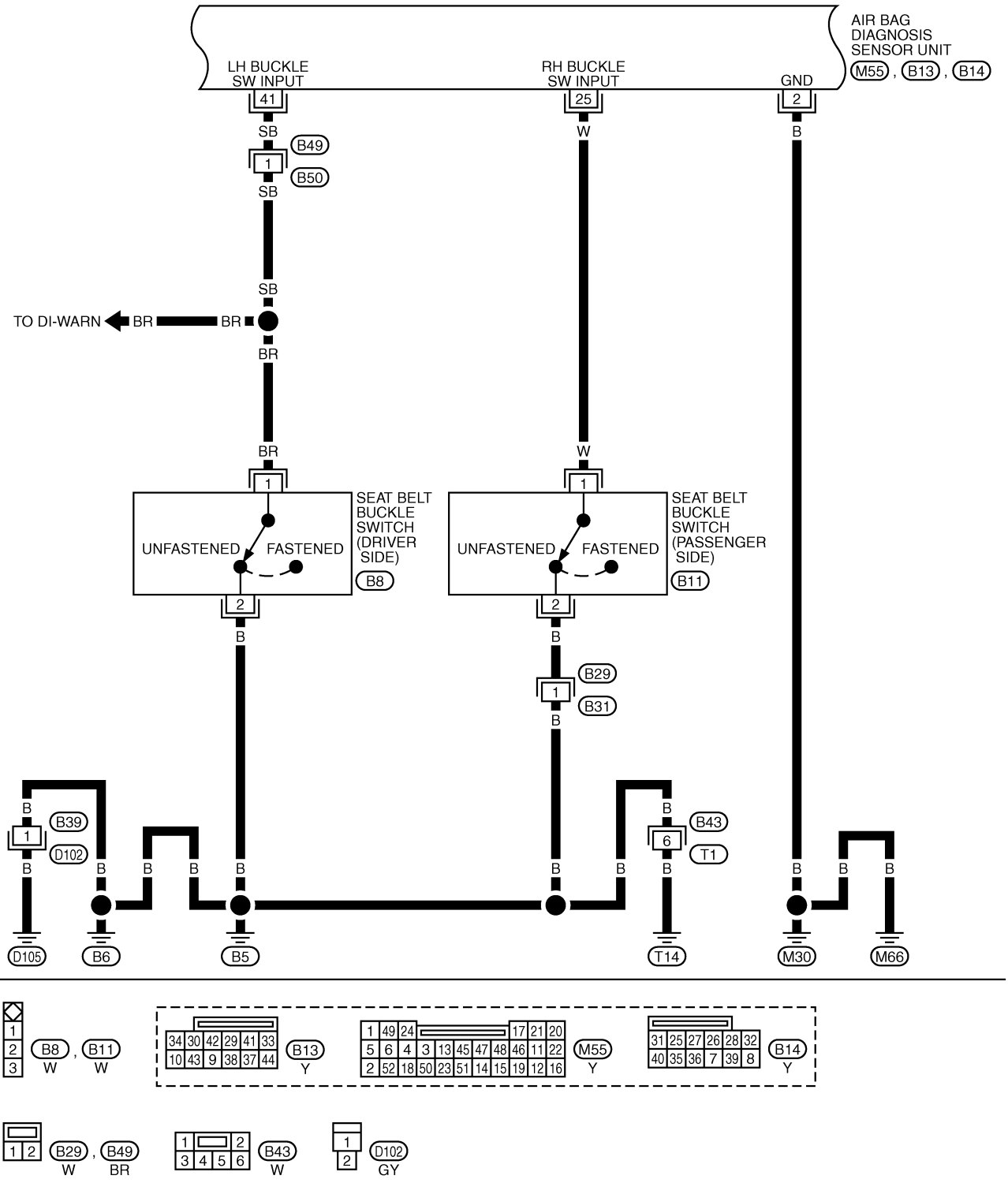
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

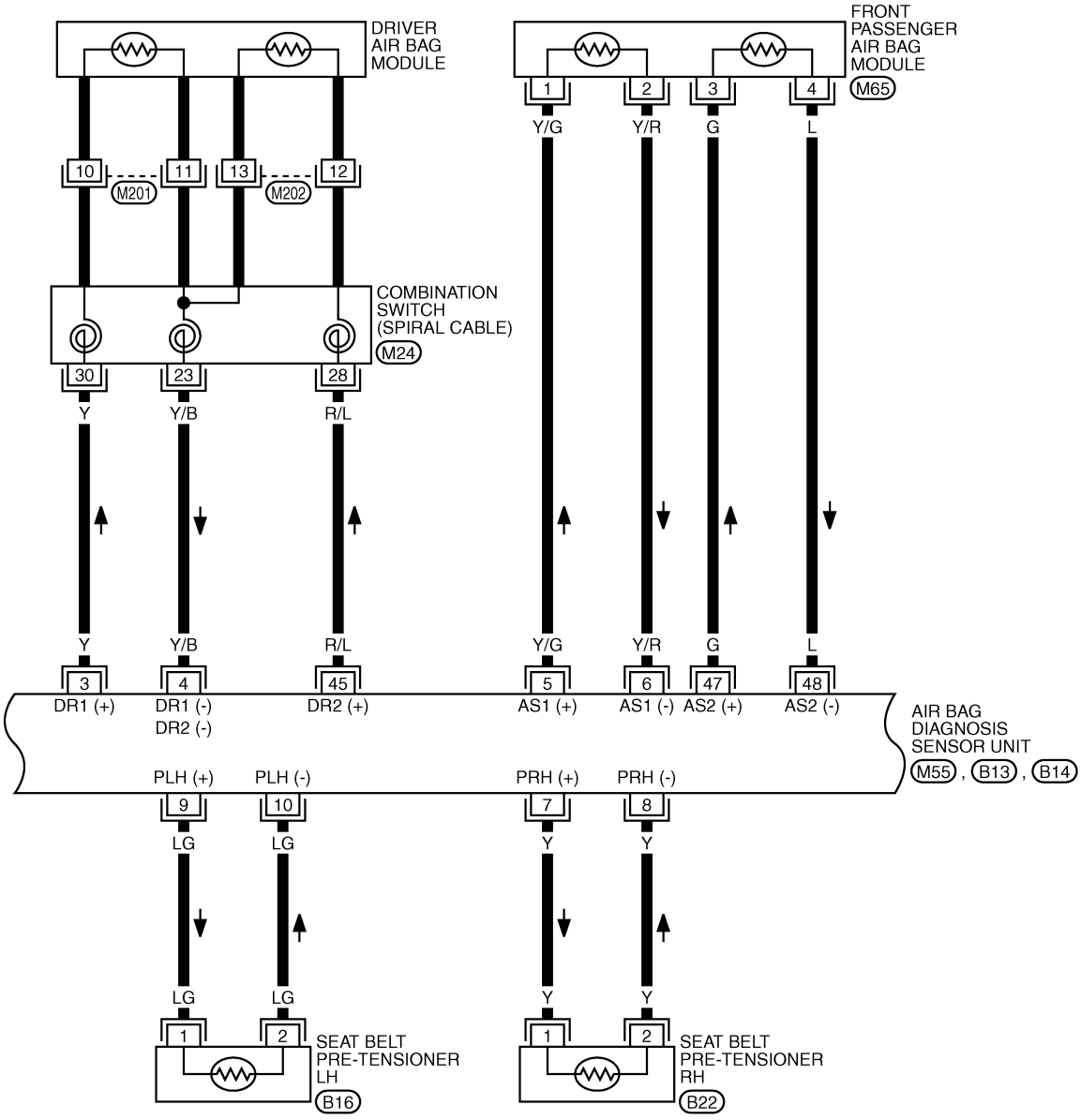
THWT0271E

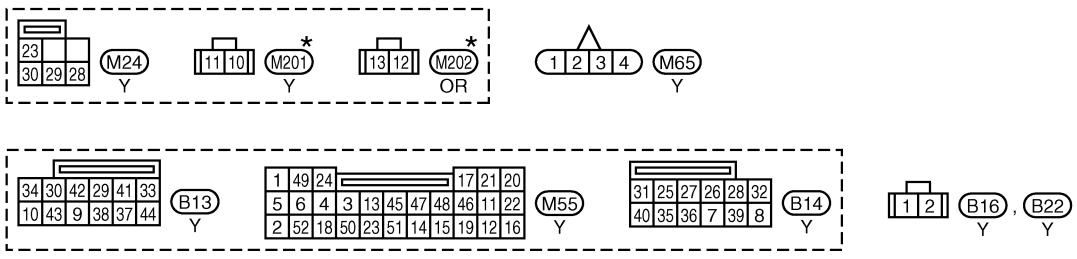
SRS-SRS-02



THWT0258E

SRS-SRS-03



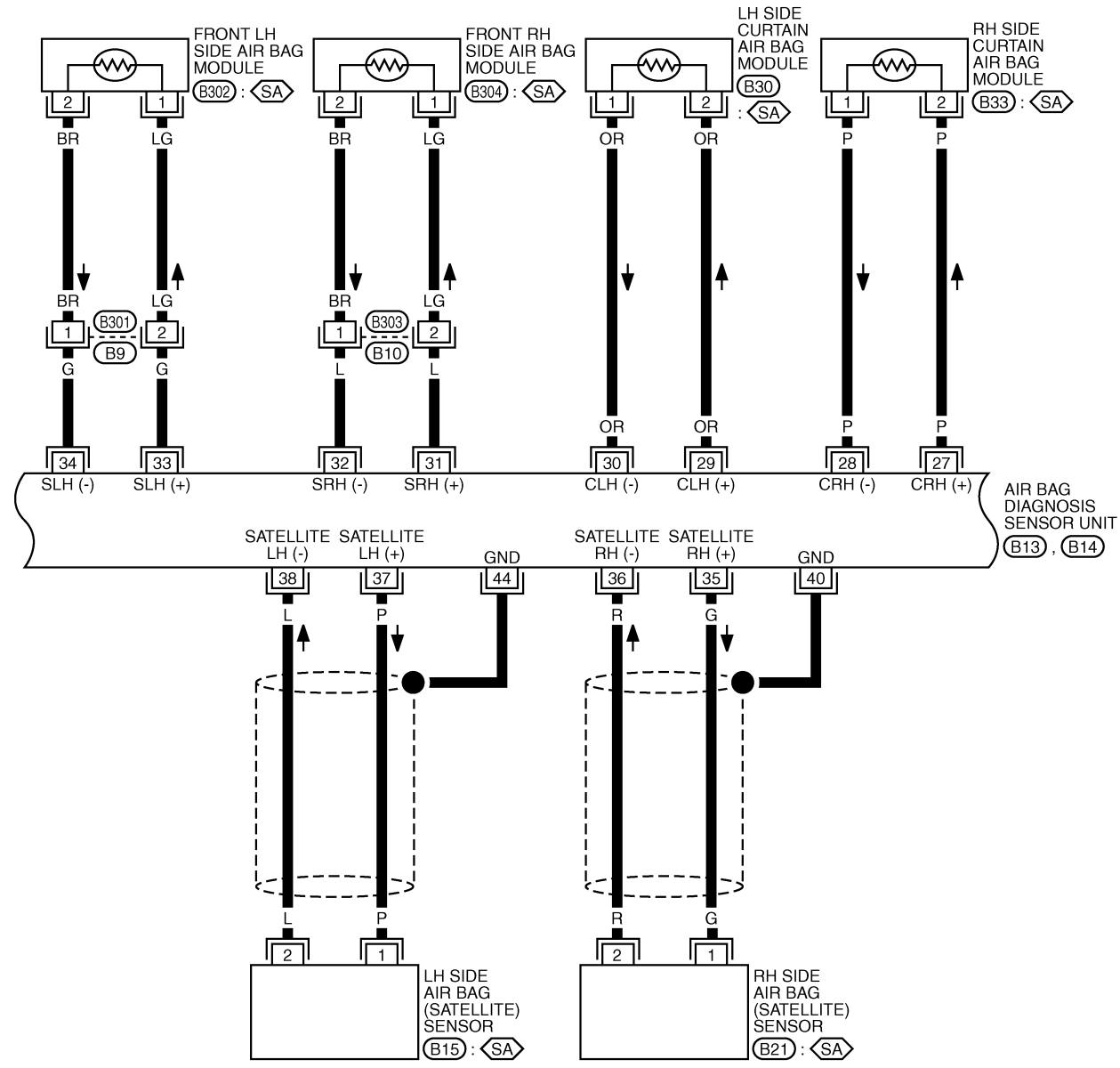


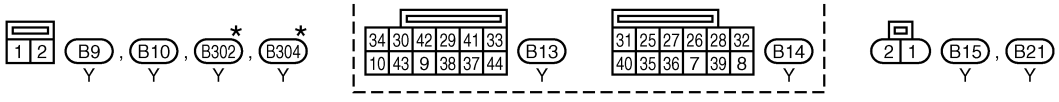
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

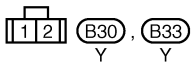
THWT0165E

SRS-SRS-04

SA : WITH SIDE AIR BAG



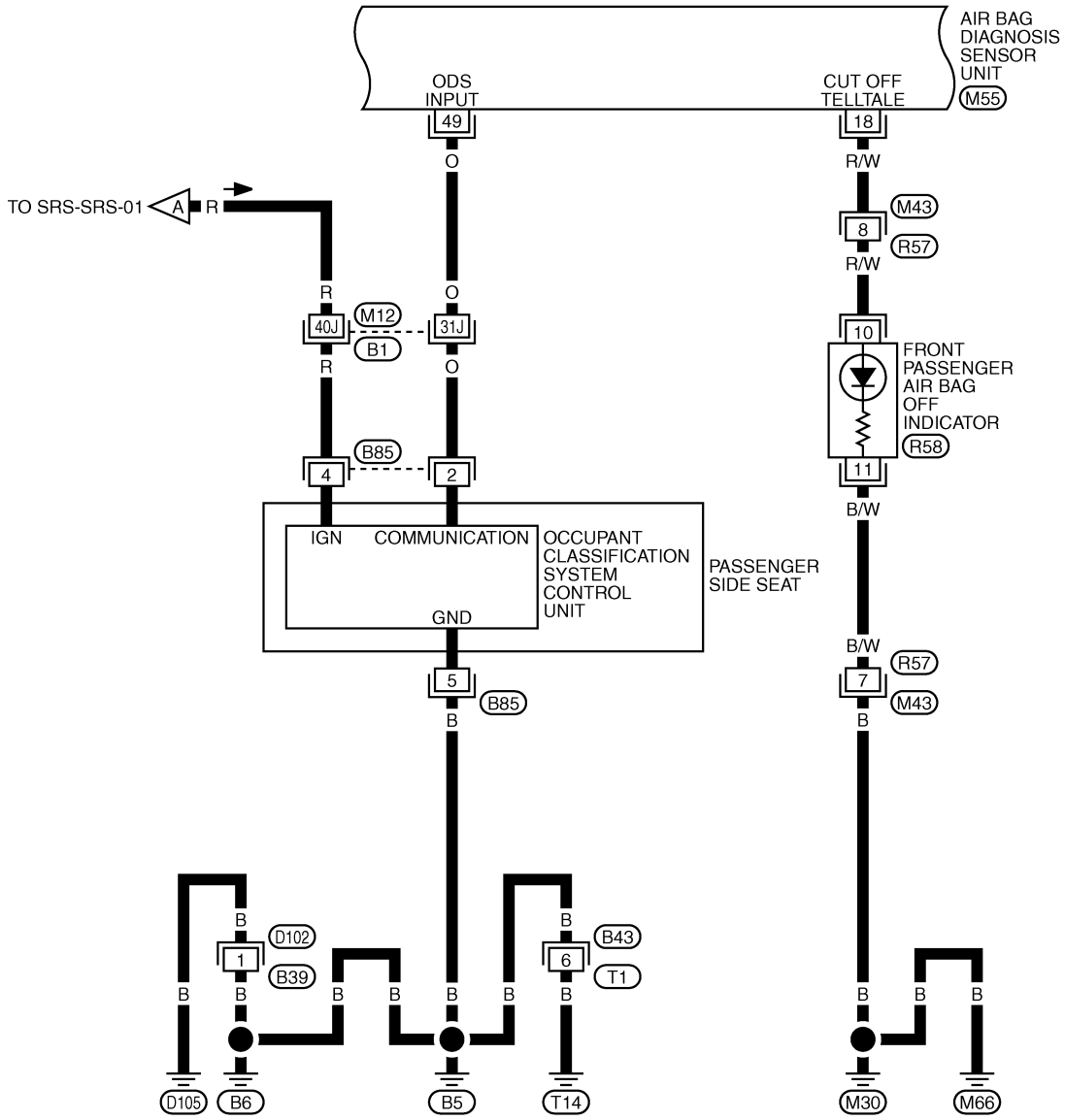


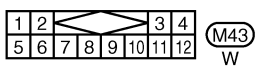


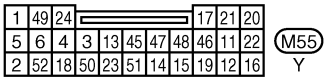
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

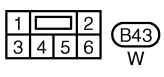
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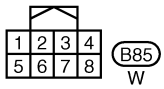
SRS-SRS-05

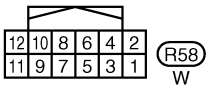


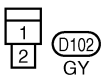










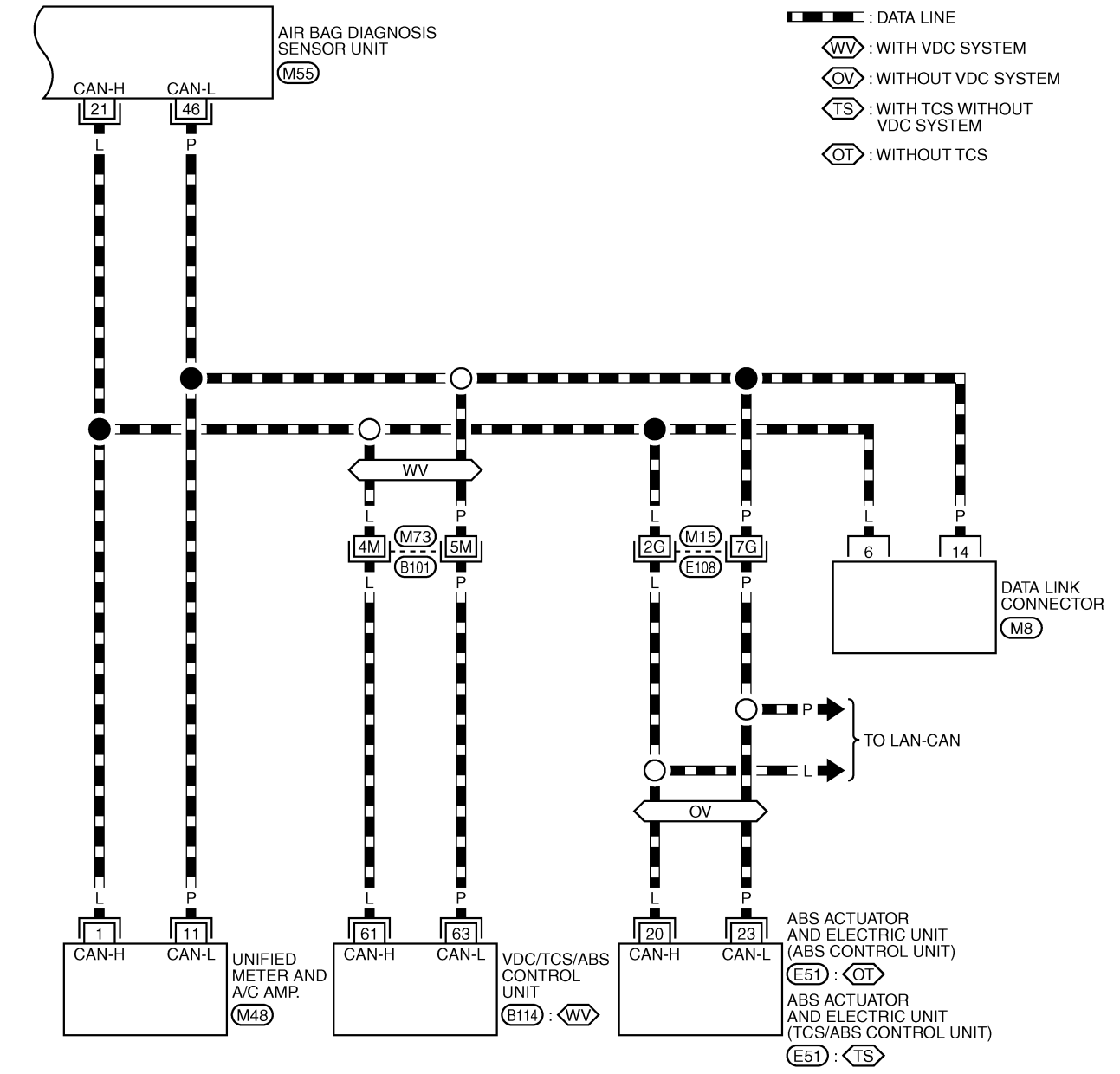


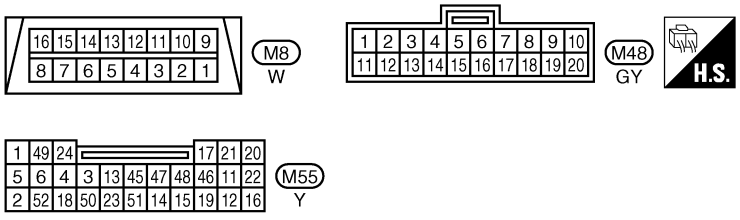
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

THWT0272E

SRS-SRS-06



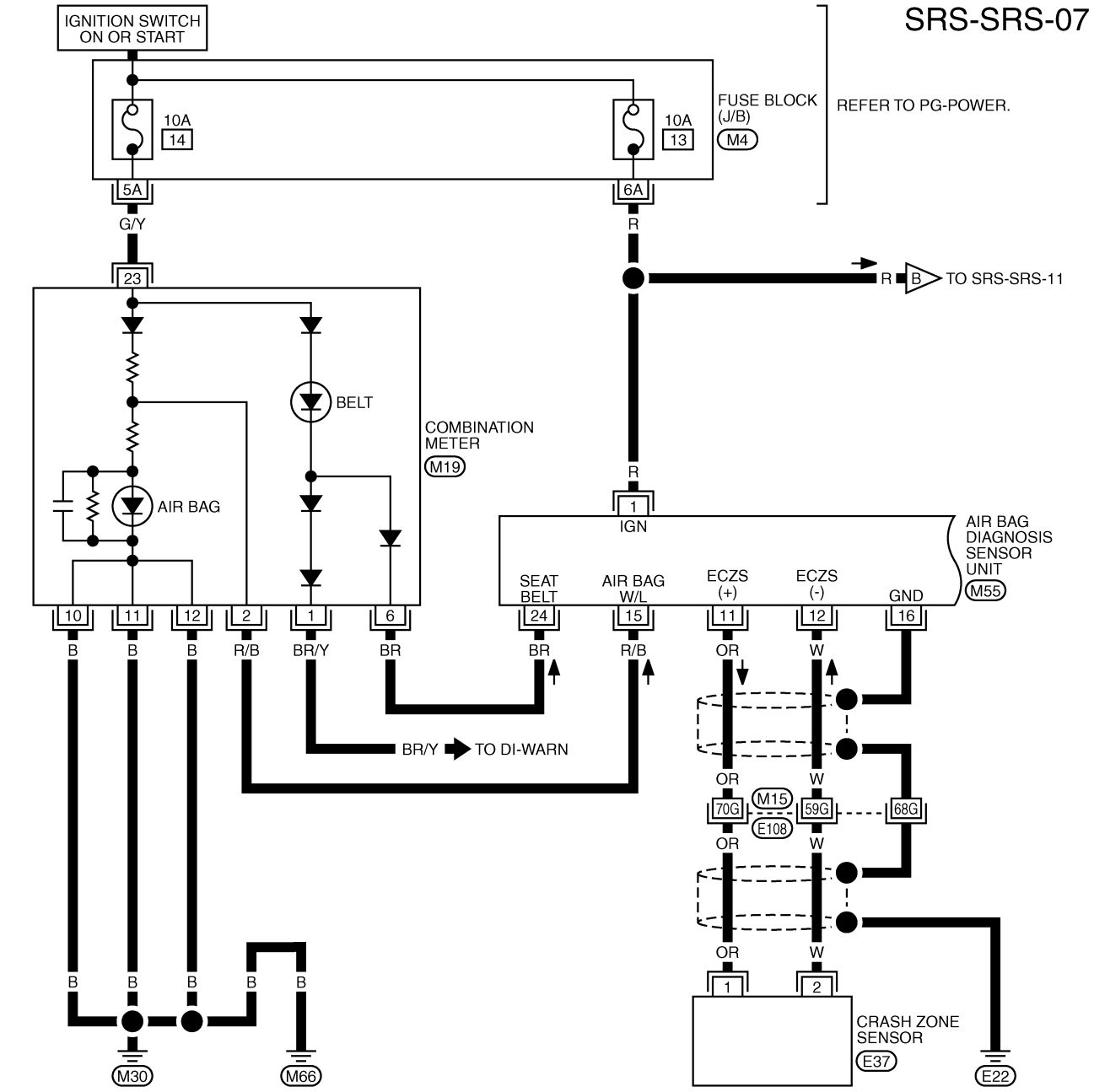


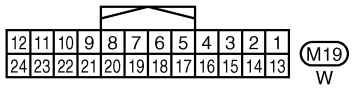
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E51 , B114 -ELECTRICAL UNITS

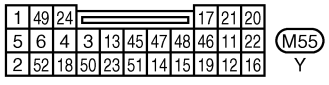
THWT0273E

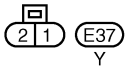
Wiring Diagram — SRS —/For Roadster

NHS0000L









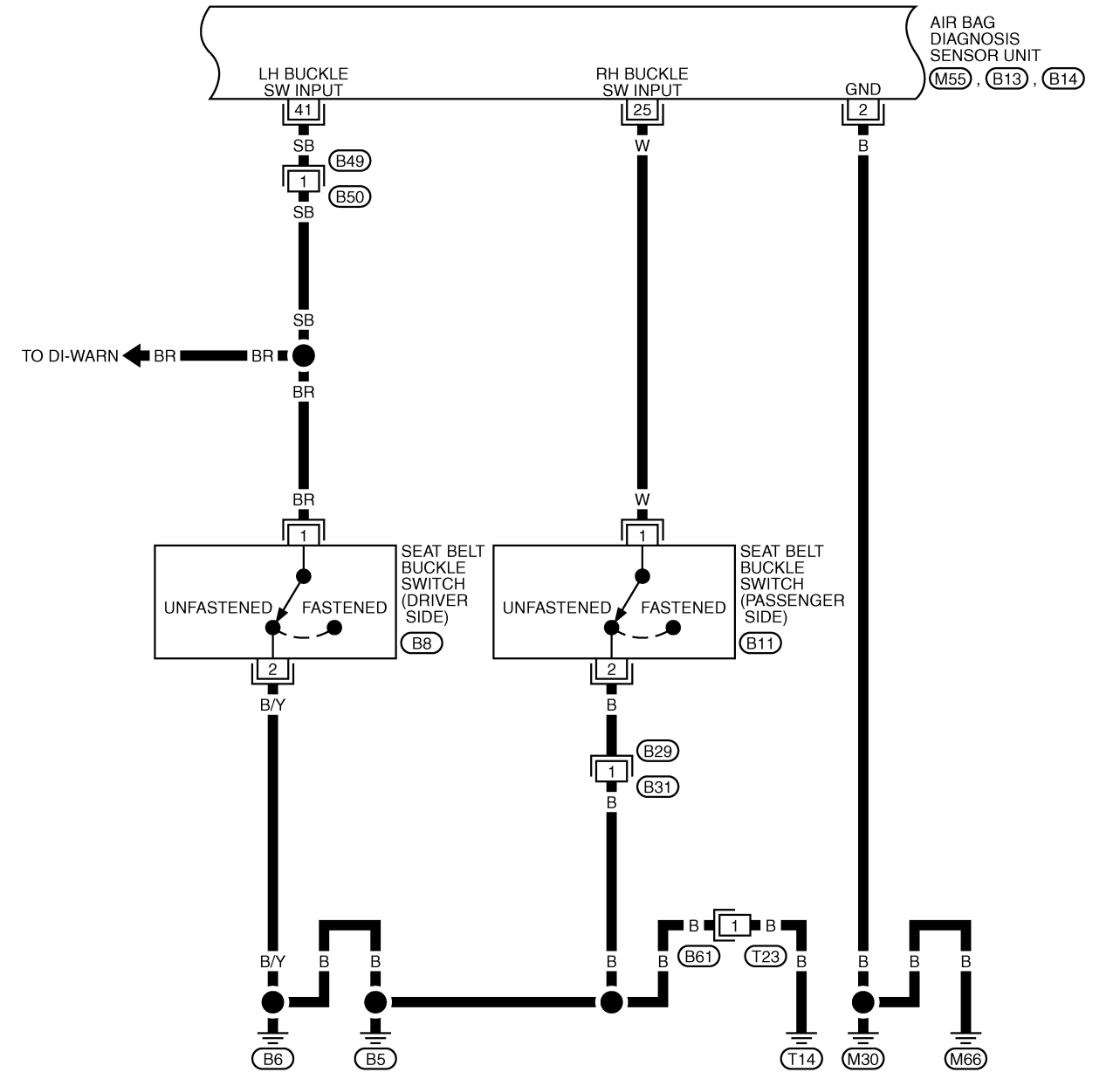
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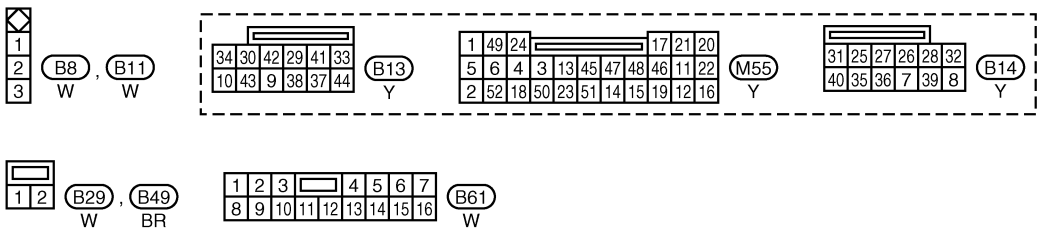
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

THWT0274E

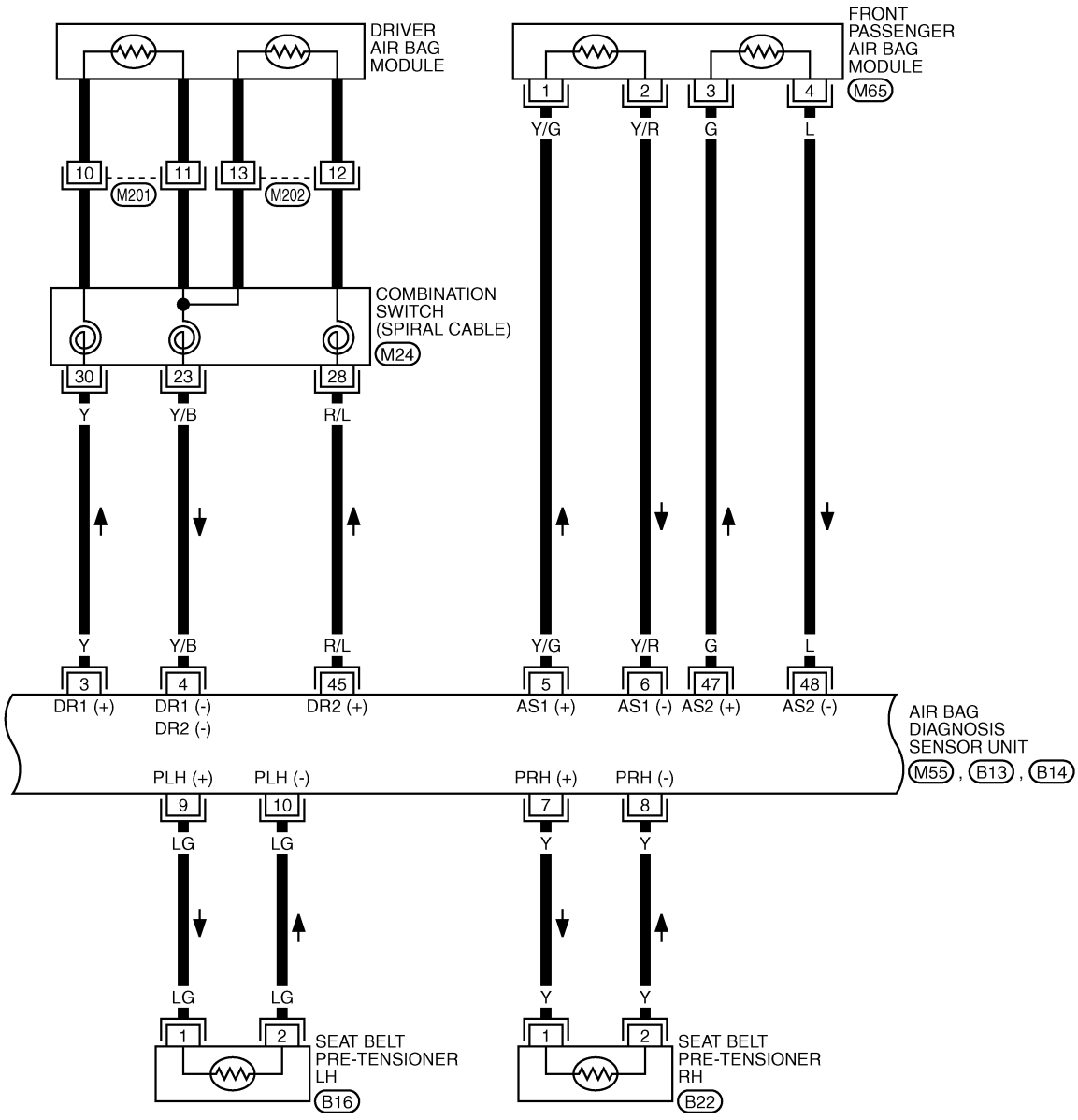
SRS-SRS-08

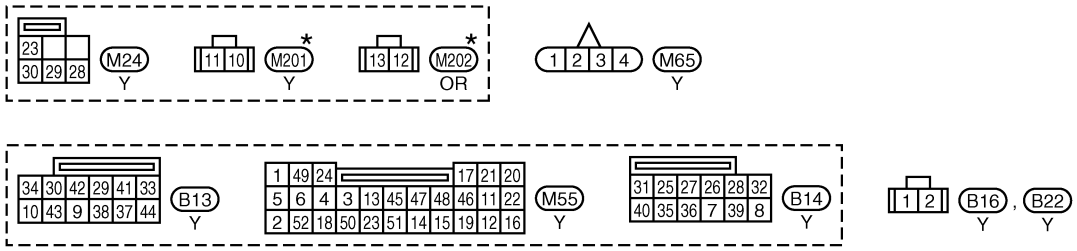




THWT0275E

SRS-SRS-09

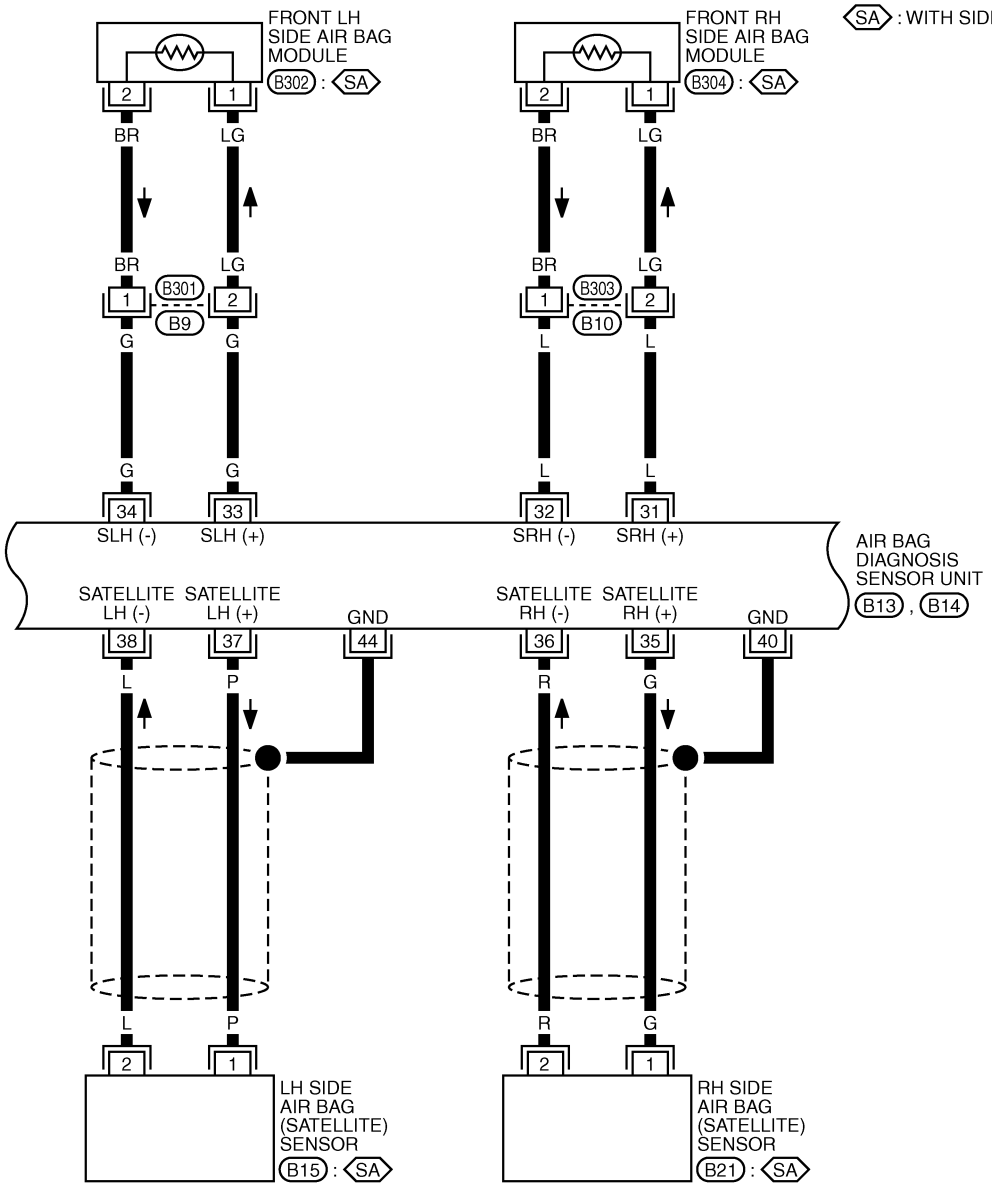


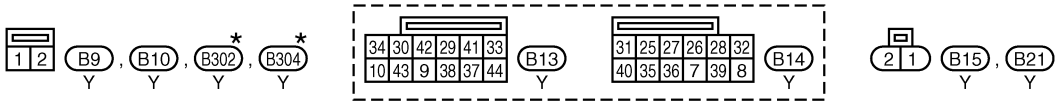


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

THWT0276E

SRS-SRS-10

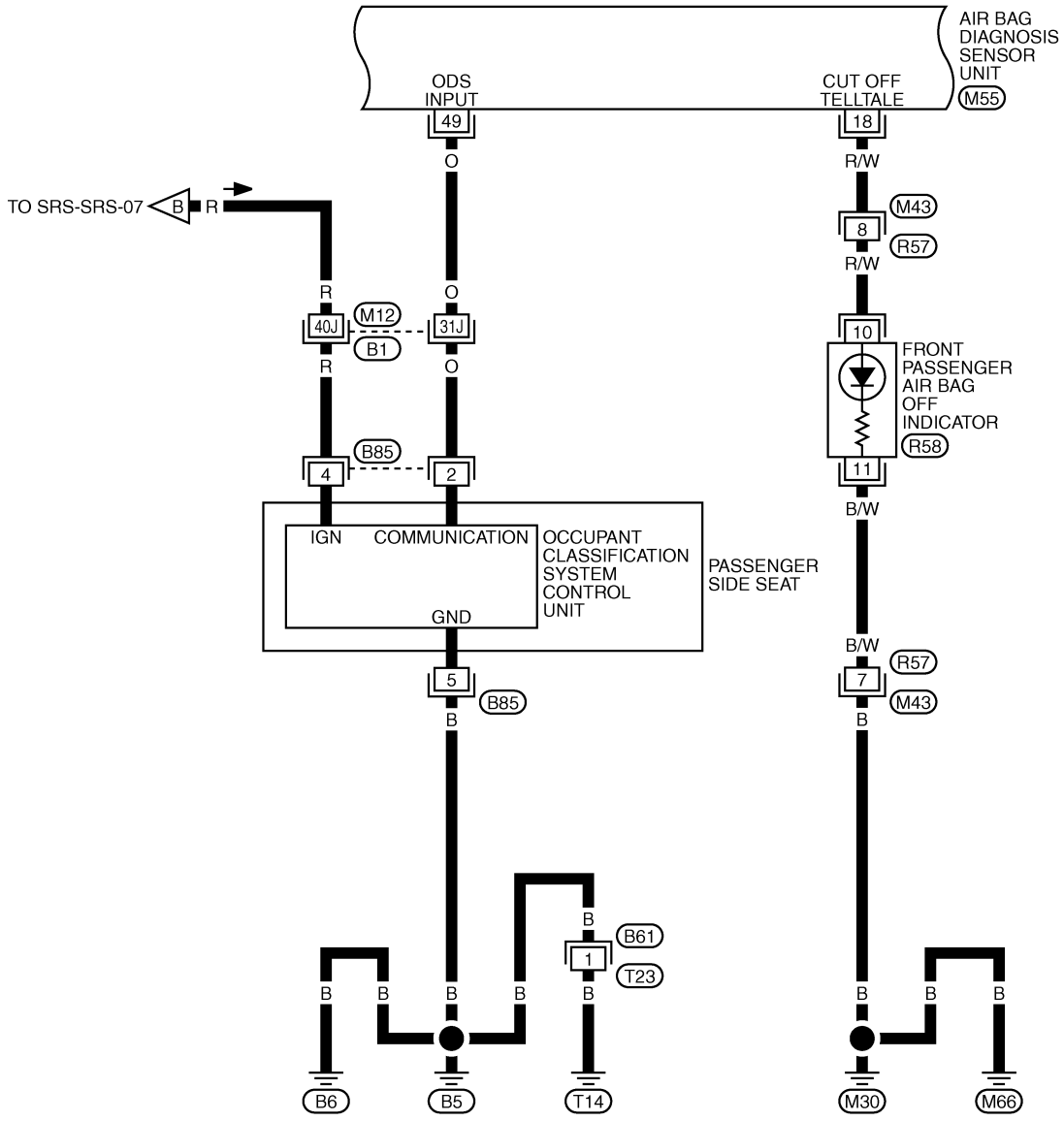


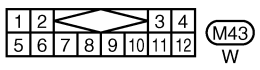


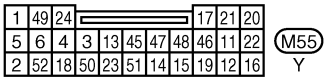
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

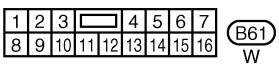
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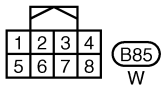
SRS-SRS-11

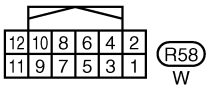










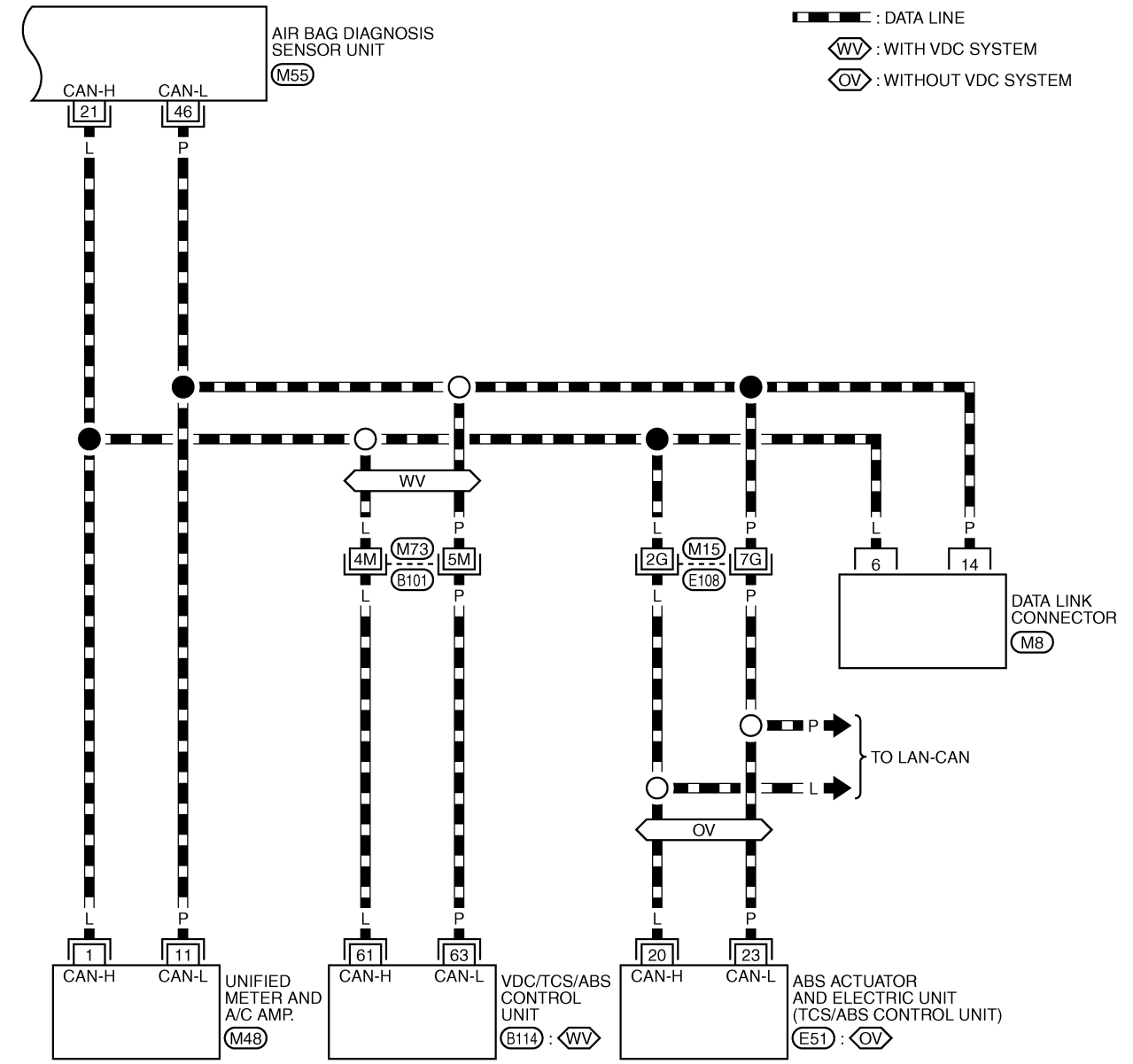


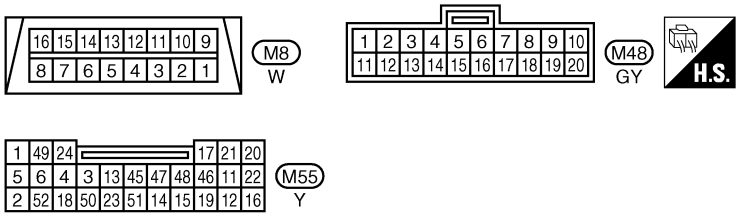
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

THWT0278E

SRS-SRS-12





REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E51 , B114 -ELECTRICAL UNITS

THWT0279E

CONSULT-lll Function

NHS0000M

DIAGNOSIS MODE FOR CONSULT-LLL

- “SELF-DIAG [CURRENT]”
  A current self-diagnostic results (also indicated by the number of warning lamp flashes in the Diagnosis mode) is displayed on the CONSULT-lll screen in real time. This refers to a malfunctioning part requiring repairs.
- “SELF-DIAG [PAST]”
  Self-diagnostic results previously stored in the memory are displayed on the CONSULT-lll screen. The stored results are not erased until memory erasing is performed.
- “TROUBLE DIAG RECORD”
  With TROUBLE DIAG RECORD, diagnostic results previously erased by a reset operation can be displayed on the CONSULT-lll screen.
- “ECU DISCRIMINATED NO.”
  The diagnosis sensor unit for each vehicle model is assigned with its own, individual classification number. This number will be displayed on the CONSULT-lll screen, as shown. When replacing the diagnosis sensor unit, refer to the part number for the compatibility. After installation, replacement with a correct unit can be checked by confirming this classification number on the CONSULT-lll screen.
  After repair, make sure the discriminated number of diagnosis sensor unit installed to vehicle are same. Refer to SRS-51, "ECU DISCRIMINATED NO." .

HOW TO CHANGE SELF-DIAGNOSIS MODE WITH CONSULT-LII

From User Mode to Diagnosis Mode

After selecting “AIR BAG” on the “SELECT SYSTEM” screen, User mode automatically changes to Diagnosis mode.

From Diagnosis Mode to User Mode

To return to User mode from Diagnosis mode, touch “BACK” key of CONSULT-lll until “SELECT SYSTEM” appears, then diagnosis mode automatically changes to User mode.

HOW TO ERASE SELF-DIAGNOSTIC RESULTS

- “SELF-DIAG [CURRENT]”
  A current self-diagnostic result is displayed on the CONSULT-lll screen in real time.
  After the malfunction is repaired completely, no malfunction is detected on “SELF-DIAG [CURRENT]”.
- “SELF-DIAG [PAST]”
  Return to the “SELF-DIAG [CURRENT]” CONSULT-lll screen by touching “BACK” key of CONSULT-lll and select “SELF-DIAG [CURRENT]” in SELECT DIAG MODE. Touch “ERASE” in “SELF-DIAG [CURRENT]” mode.

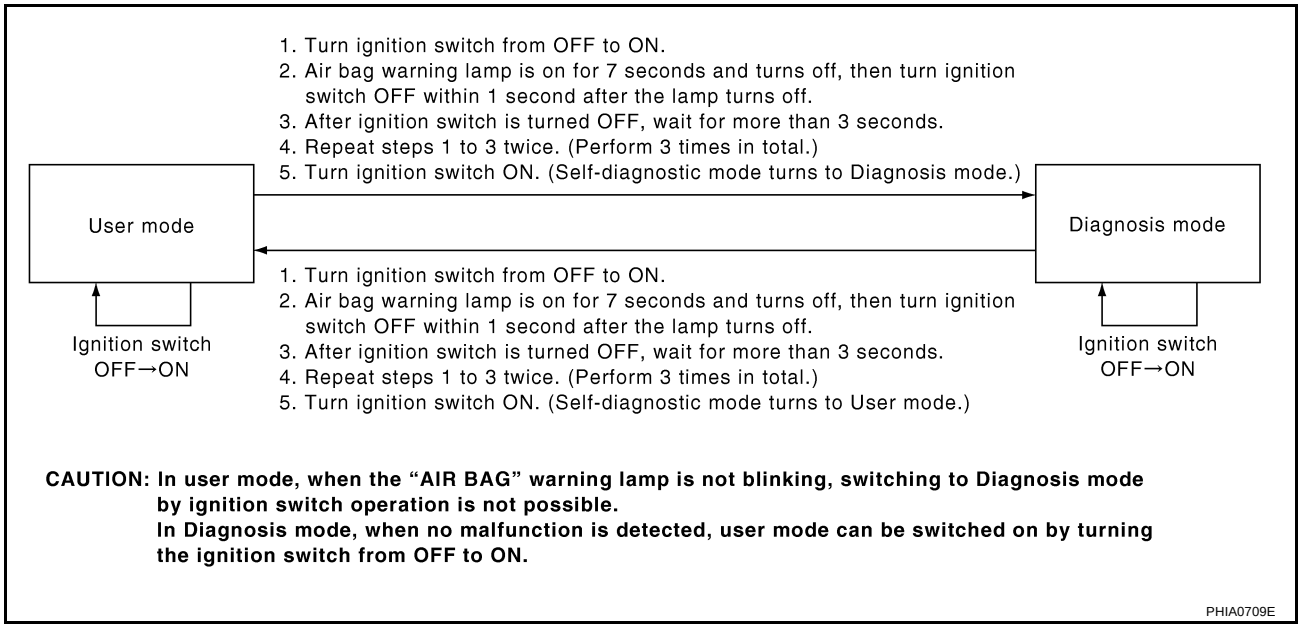
  NOTE:
  If the memory of the malfunction in “SELF-DIAG [PAST]” is not erased, the User mode shows the system malfunction by the operation of the warning lamp even if the malfunction is repaired completely.
- “TROUBLE DIAG RECORD”
  The memory of “TROUBLE DIAG RECORD” cannot be erased.

Self-Diagnosis Function (Without CONSULT-lll)

NHS0000N

- The reading of these results is accomplished “User mode” and “Diagnosis mode”.
- After a malfunction is repaired, turn ignition switch ON. Diagnosis mode returns to the User mode. At that time, the self-diagnostic result is cleared.

HOW TO CHANGE SELF-DIAGNOSTIC MODE WITHOUT CONSULT-LLL



HOW TO ERASE SELF-DIAGNOSTIC RESULTS

After a malfunction is repaired, turn the ignition switch OFF for at least one second, then back ON. Diagnosis mode returns to the User mode. At that time, the self-diagnostic results are cleared.

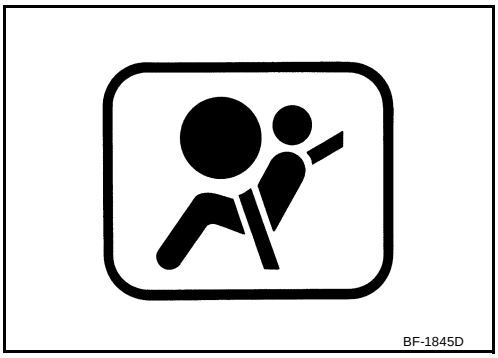
SRS Operation Check (USER MODE)

NHS0000O

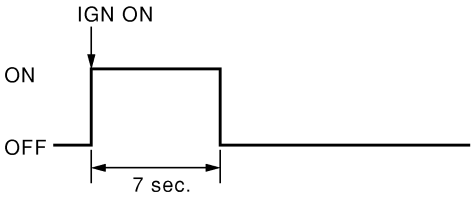
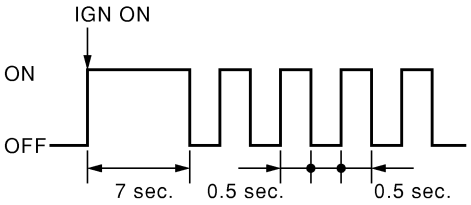
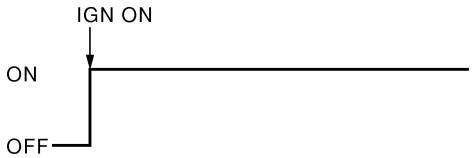
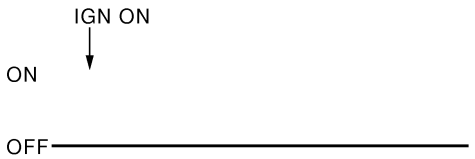
DIAGNOSTIC PROCEDURE

Checking Air Bag Operation by Using “AIR BAG” Warning Lamp—User Mode

1. Turn ignition switch from OFF to ON, and make sure that the air bag warning lamp blinks.
2. Compare the SRS air bag warning lamp blinking pattern with the examples.



Warning lamp examples

“AIR BAG” warning lamp operation-User mode-	SRS condition	Reference item
 SHIA0011E	● No malfunction is detected. ● No further action is necessary.	—
 SHIA0012E	● The system is malfunctioning and needs to be repaired as indicated.	Go to SRS-33, "WARNING LAMP FLASH CODE CHART" or SRS-29, "DTC No. Index (“SELF-DIAG [CURRENT]” “SELF-DIAG [PAST]” or TROUBLE DIAG RECORD)" .
 SHIA0013E	● Air bag is deployed. ● Seat belt pre-tensioner is deployed.	Go to SRS-53, "COLLISION DIAGNOSIS" .
	● Diagnosis sensor unit is malfunctioning. ● Air bag power supply circuit is malfunctioning. ● SRS air bag warning lamp circuit is malfunctioning.	Go to SRS-37, "Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn OFF" .
 SHIA0014E	● Diagnosis sensor unit is malfunctioning. ● Air bag warning lamp circuit is malfunctioning.	Go to SRS-38, "Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn ON" .

Trouble Diagnosis with CONSULT-III

NHS0000P

DIAGNOSTIC PROCEDURE

Diagnositic mode	Description
SELF-DIAG RESULT	The self-diagnosis result is displayed. (SELF-DIAG [CURRENT], [PAST], [RECORRD]). Refer to SRS-29, "DTC No. Index (“SELF-DIAG [CURRENT]” “SELF-DIAG [PAST]” or TROUBLE DIAG RECORD)" .
ECU DISCRIMINATED No.	The parts number of diagnosis sensor unit is displayed.

DTC No. Index (“SELF-DIAG [CURRENT]” “SELF-DIAG [PAST]” or TROUBLE DIAG RECORD)

Diagnostic item	Explanation		Repair order “Recheck SRS at each replacement”
NO DTC IS DETECTED.	When malfunction is indicated by the “AIR BAG” warning lamp in User mode.	● Low battery voltage (Less than 9V)	—
		● Self-diagnostic results “SELF-DIAG [PAST]” (previously stored in the memory) might not be erased after repair. ● Intermittent malfunction has been detected in the past.	● Go to SRS-25, "DIAGNOSIS MODE FOR CONSULT-III" .
	● No malfunction is detected.		—
DRIVER AIRBAG MODULE [OPEN] [B1054]	● Driver air bag module circuit is open (including the spiral cable).		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace driver air bag module. 4. Replace the spiral cable. 5. Replace the diagnosis sensor unit.
DRIVER AIRBAG MODULE [VB-SHORT] [B1055]	● Driver air bag module circuit is shorted to a power supply circuit (including the spiral cable).		
DRIVER AIRBAG MODULE [GND-SHORT] [B1056]	● Driver air bag module circuit is shorted to ground (including the spiral cable).		
DRIVER AIRBAG MODULE [SHORT] [B1057]	● Driver air bag module circuit is shorted between lines.		
ASSIST A/B MODULE [VB-SHORT] [B1070]	● Front passenger air bag module circuit is shorted to a power supply circuit.		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger air bag module. 4. Replace the diagnosis sensor unit.
ASSIST A/B MODULE [OPEN] [B1071]	● Front passenger air bag module circuit is open.		
ASSIST A/B MODULE [GND-SHORT] [B1072]	● Front passenger air bag module circuit is shorted to ground.		
ASSIST A/B MODULE [SHORT] [B1073]	● Front passenger air bag module circuit is shorted between lines.		
CRASH ZONE SEN [UNIT FAIL] [B1033] [B1034] CRASH ZONE SEN [COMM FAIL] [B1035] CRASH ZONE SEN [UNMATCH] [B1036]	● Crash zone sensor		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the crash zone sensor. 4. Replace the diagnosis sensor unit.

Diagnostic item	Explanation	Repair order "Recheck SRS at each replacement"
SIDE MODULE LH [OPEN] [B1134]	● Front LH side air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front LH setback assembly (front LH side air bag module). 4. Replace the diagnosis sensor unit.
SIDE MODULE LH [VB-SHORT] [B1135]	● Front LH side air bag module circuit is shorted to a power supply circuit.	
SIDE MODULE LH [GND-SHORT] [B1136]	● Front LH side air bag module circuit is shorted to ground.	
SIDE MODULE LH [SHORT] [B1137]	● Front LH side air bag module circuit is shorted between lines.	
SIDE MODULE RH [OPEN] [B1129]	● Front RH side air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front RH setback assembly (front RH side air bag module). 4. Replace the diagnosis sensor unit.
SIDE MODULE RH [VB-SHORT] [B1130]	● Front RH side air bag module circuit is shorted to some power supply circuit.	
SIDE MODULE RH [GND-SHORT] [B1131]	● Front RH side air bag module circuit is shorted to ground.	
SIDE MODULE RH [SHORT] [B1132]	● Front RH side air bag module circuit is shorted between lines.	
SATELLITE SENS LH [UNIT FAIL] [B1118] [B1119] SATELLITE SENS LH [COMM FAIL] [B1120] SATELLITE SENS LH [UNMATCH] [B1121]	● LH side air bag (Satellite) sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the LH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit.
SATELLITE SENS RH [UNIT FAIL] [B1113] [B1114] SATELLITE SENS RH [COMM FAIL] [B1115] SATELLITE SENS RH [UNMATCH] [B1116]	● RH side air bag (Satellite) sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the RH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit.
PRE-TEN FRONT LH [OPEN] [B1086]	● Front LH pre-tensioner circuit is open.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front LH seat belt. 4. Replace the diagnosis sensor unit.
PRE-TEN FRONT LH [VB-SHORT] [B1087]	● Front LH pre-tensioner circuit is shorted to a power supply circuit.	
PRE-TEN FRONT LH [GND-SHORT] [B1088]	● Front LH pre-tensioner circuit is shorted to ground.	
PRE-TEN FRONT LH [SHORT] [B1089]	● Front LH pre-tensioner circuit is shorted between lines.	

Diagnostic item	Explanation	Repair order "Recheck SRS at each replacement"
PRE-TEN FRONT RH [OPEN] [B1081]	● Front RH pre-tensioner circuit is shorted to a power supply circuit.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front RH seat belt. 4. Replace the diagnosis sensor unit.
PRE-TEN FRONT RH [VB-SHORT] [B1082]	● Front RH pre-tensioner is shorted to a power supply circuit.	
PRE-TEN FRONT RH [GND-SHORT] [B1083]	● Front RH pre-tensioner circuit is shorted to ground.	
PRE-TEN FRONT RH [SHORT] [B1084]	● Front RH pre-tensioner circuit is shorted between lines.	
CURTAIN MODULE LH* [OPEN] [B1150]	● LH side curtain air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace LH side curtain air bag module. 4. Replace the diagnosis sensor unit.
CURTAIN MODULE LH* [VB-SHORT] [B1151]	● LH side curtain air bag module circuit is shorted to some power supply circuits.	
CURTAIN MODULE LH* [GND-SHORT] [B1152]	● LH side curtain air bag module circuit is shorted to ground.	
CURTAIN MODULE LH* [SHORT] [B1153]	● LH side curtain air bag module circuit is shorted between lines.	
CURTAIN MODULE RH* [OPEN] [B1145]	● RH side curtain air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace RH side curtain air bag module. 4. Replace the diagnosis sensor unit.
CURTAIN MODULE RH* [VB-SHORT] [B1146]	● RH side curtain air bag module circuit is shorted to a power supply circuit.	
CURTAIN MODULE RH* [GND-SHORT] [B1147]	● RH side curtain air bag module circuit is shorted to ground.	
CURTAIN MODULE RH* [SHORT] [B1148]	● RH side curtain air bag module circuit is shorted between lines.	
CONTROL UNIT [B1001-B1015] [B1026-B1031] [B1042-B1047] [B1058-B1063] [B1074-B1079] [B1106-B1111] [B1122-B1127] [B1138-B1143] [B1202-B1207]	● Diagnosis sensor unit is malfunctioning.	● Replace the diagnosis sensor unit.
PASS A/B INDCTR CKT [B1023]	● Cutoff telltale circuit is open or shorted to grand or the circuits are shorted each other.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace cutoff telltale. 4. Replace the diagnosis sensor unit.

Diagnostic item	Explanation	Repair order “Recheck SRS at each replacement”
OCCUPANT SENS C/U [UNIT FAIL] [B1017] [B1020] [B1021]	● Trouble occurs in Occupant Classification System-CU.	● Replace passenger side seat cushion assembly.
OCCUPANT SENS C/U [COMM FAIL] [B1022]	● Trouble occurs in Occupant Classification System-CU, circuit of Occupant Classification System-CU—Diagnosis Sensor Unit or Diagnosis Sensor Unit.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace passenger side seat cushion assembly. 4. Replace the diagnosis sensor unit.
OCCUPANT SENS [UNIT FAIL] [B1018]	● Trouble occurs in Occupant Classification System-SENS.	● Replace passenger side seat cushion assembly.
FRONTAL COLLISION DETECTION [B1209]	● Seat belt pre-tensioner and front air bag are deployed.	● Go to SRS-53, "For Frontal Collision" .
SIDE COLLISION DETECTION [B1210]	● Side and curtain air bag is deployed.	● Go to SRS-55, "For Side Collision" .

*: For coupe

NOTE:
Follow the procedures in numerical order when repairing malfunctioning parts. Confirm whether malfunction is eliminated using air bag warning lamp or CONSULT-III each time repair is finished. If malfunction is still observed, proceed to the next step. When malfunction is eliminated, further repair work is not required.

Trouble Diagnosis without CONSULT-III

NHS0000Q

DIAGNOSTIC PROCEDURE

Inspecting SRS Malfunctioning Parts by Using “AIR BAG” Warning Lamp — Diagnosis Mode

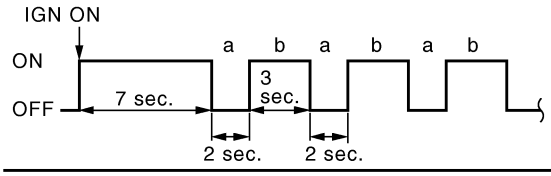
NOTE:
SRS will not enter Diagnosis mode if no malfunction is detected in User mode.

1. Turn ignition switch ON.
2. After “AIR BAG” warning lamp lights for 7 seconds, turn ignition switch OFF within 1 second.
3. Wait more than 3 seconds.
4. Repeat the steps 1 to 3 two times.
5. Turn ignition switch ON.

SRS is now in Diagnosis mode.
“AIR BAG” warning lamp operates in Diagnosis mode as follows:

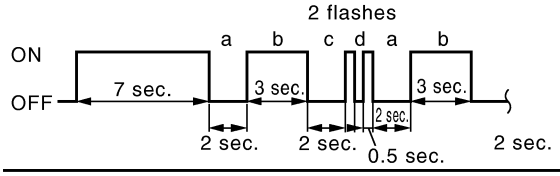
WARNING LAMP FLASH CODE CHART

<Diagnosis results (previously stored in the memory) might not be erased after repair or intermittent malfunctions have been detected in the past.>

Flash pattern	Repair order
a through b are repeated. 	1. Erase memory. (Once key switch is turned from OFF to ON, TROUBLE DIAG RECORD will be erased.)

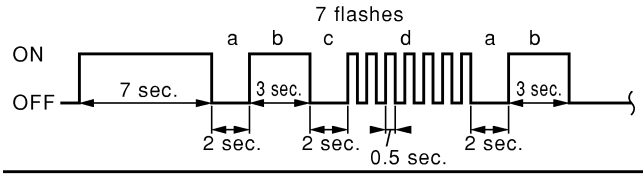
PHIA0532E

<Driver air bag module>

Flash pattern	Repair order
a through d are repeated. d: Two flashes indicate malfunctioning driver air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the spiral cable. 4. Replace the related harness.

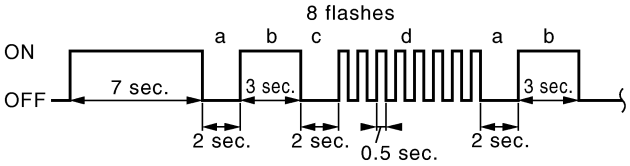
PHIA1233E

<Diagnosis sensor unit>

Flash pattern	Repair order
a through d are repeated. d: Seven flashes indicate malfunctioning diagnosis sensor unit circuit. 	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace the diagnosis sensor unit. 4. Replace the related harness.

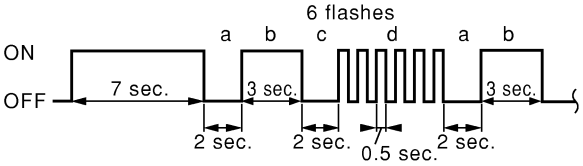
SHIA0028E

<Front passenger air bag module>

Flash pattern	Repair order
a through d are repeated. d: Eight flashes indicate malfunctioning front passenger air bag module circuit.  	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

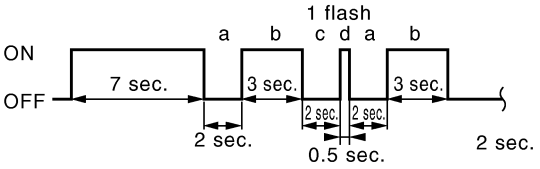
PHIA1234E

<Crash zone sensor>

Flash pattern	Repair order
a through d are repeated. d: Six flashes indicate malfunctioning crash zone sensor circuit.  	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the crash zone sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

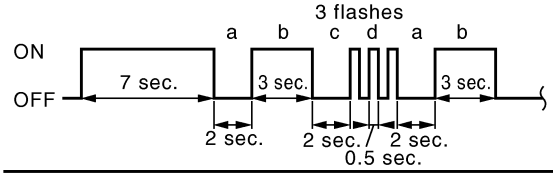
SHIA0083E

<Front RH seat belt pre-tensioner>

Flash pattern	Repair order
a through d are repeated. d: One flash indicates malfunctioning front RH seat belt pre-tensioner circuit.  	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

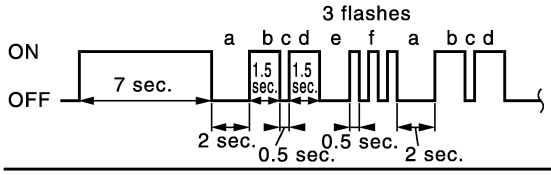
PHIA1235E

<Front LH seat belt pre-tensioner>

Flash pattern	Repair order
a through d are repeated. d: Three flashes indicate malfunctioning front LH seat belt pre-tensioner circuit.  	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

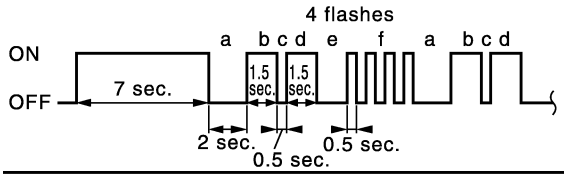
PHIA1236E

<RH side air bag (Satellite) sensor>

Flash pattern	Repair order
a through f are repeated. f: Three flashes indicate malfunctioning RH side air bag (Satellite) sensor circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the RH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

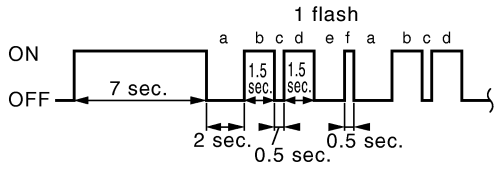
SHIA0032E

<LH side air bag (Satellite) sensor>

Flash pattern	Repair order
a through f are repeated. f: Four flashes indicate malfunctioning LH side air bag (Satellite) sensor. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the LH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

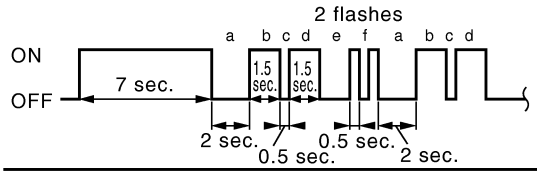
SHIA0033E

<Front RH side air bag module>

Flash pattern	Repair order
a through f are repeated. f: One flash indicates malfunctioning front RH side air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

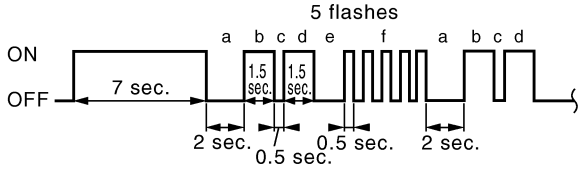
PHIA1237E

<Front LH side air bag module>

Flash pattern	Repair order
a through f are repeated. f: Two flashes indicate malfunctioning front LH side air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

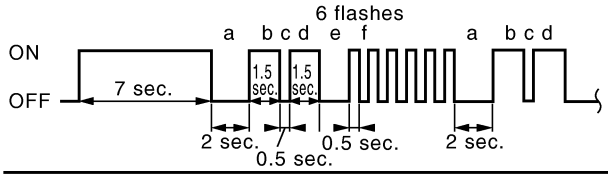
PHIA1238E

<RH side curtain air bag module>

Flash pattern	Repair order
a through f are repeated. f: Five flashes indicate malfunctioning RH side curtain air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

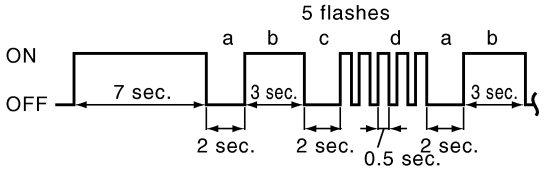
PHIA1240E

<LH side curtain air bag module>

Flash pattern	Repair order
a through f are repeated. f: Six flashes indicate malfunctioning LH side curtain air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

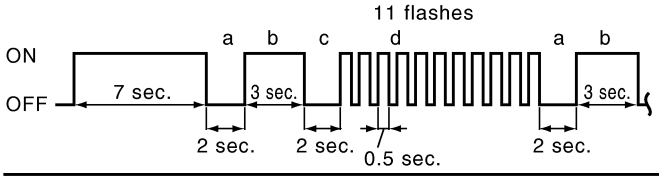
PHIA1241E

<Occupant classification system>

Flash pattern	Repair order
a through d are repeated. d: Five flashes indicate malfunctioning OCS control unit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger seat cushion and occupant classification system control unit as an assembly. 4. Replace the diagnosis sensor unit.

PHIA1242E

<Front passenger air bag off indicator>

Flash pattern	Repair order
a through d are repeated. d: Eleven flashes indicate malfunctioning front passenger air bag off indicator. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger air bag off indicator unit. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

PHIA1243E

Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn OFF

NHS0000R

DIAGNOSTIC PROCEDURE

1. CHECK THE DEPLOYMENT OF AIR BAG MODULE

Is air bag module deployed?

YES or NO

YES >> Refer to SRS-53, "COLLISION DIAGNOSIS" .
NO >> GO TO 2.

2. CHECK THE AIR BAG FUSE

Check 10A fuse [No.13, located in fuse block (J/B)].
Refer to PG-15, "Fuse" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK AIR BAG FUSE AGAIN

Replace “AIR BAG” fuse and turn ignition switch ON.

Does the “AIR BAG” fuse blow again?

YES >> Repair or replace main harness.
NO >> **INSPECTION END**

4. CHECK DIAGNOSIS SENSOR UNIT

With CONSULT-III

Is “AIR BAG” displayed on CONSULT-III?

YES or NO

YES >> GO TO 5.
NO >> Visually check the wiring harness connection of diagnosis sensor unit. If the harness connection check result is OK, replace diagnosis sensor unit.

5. CHECK HARNESS CONNECTION

Is harness connection between warning lamp and diagnosis sensor unit OK?

OK or NG

OK >> Replace diagnosis sensor unit.
NG >> Connect “AIR BAG” warning lamp and diagnosis sensor unit connector properly. If “AIR BAG” warning lamp still does not go off, replace harness.

Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn ON

NHS0000S

DIAGNOSTIC PROCEDURE

1. CHECK “METER” FUSE

Check 10A fuse [No.14, located in fuse block (J/B)].
Refer to PG-15, "Fuse" .

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK “METER” FUSE AGAIN

Replace 10A fuse [No.14, located in fuse block (J/B)] and turn ignition switch ON.

Does the meter fuse blow again?

YES >> Repair or replace the related harness.
NO >> **INSPECTION END**

3. CHECK HARNESS CONNECTION BETWEEN DIAGNOSIS SENSOR UNIT AND COMBINATION METER

Disconnect diagnosis sensor unit connector and turn ignition switch ON.
Does “AIR BAG” warning lamp turn ON?

YES or NO

YES >> Replace diagnosis sensor unit.
NO >> Replace combination meter assembly.

Trouble Diagnosis: Passenger Seat belt Warning System

NHS000A5

1. HECK THE SYSTEM 1

Check seat belt warning lamp function.

Seat belt warning lamp turns ON in the following conditions.

- Driver seat belt is fastened.
- Occupant is on passenger seat.
- Passenger seat belt is not fasten.

OK or NG

OK >> GO TO 2.
NG >> Check the followings.
- Harness between air bag diagnosis sensor unit and combination meter.
- Seat belt buckle switch (passenger side) circuit.
- Seat belt buckle switch (passenger side).
  If these are OK, replace air bag diagnosis sensor unit.

2. CHECK THE SYSTEM 2

Check seat belt warning lamp function.

Seat belt warning lamp turns OFF in the following conditions.

- Driver seat belt is fastened.
- Occupant is on passenger seat.
- Passenger seat belt is fastened.

OK or NG

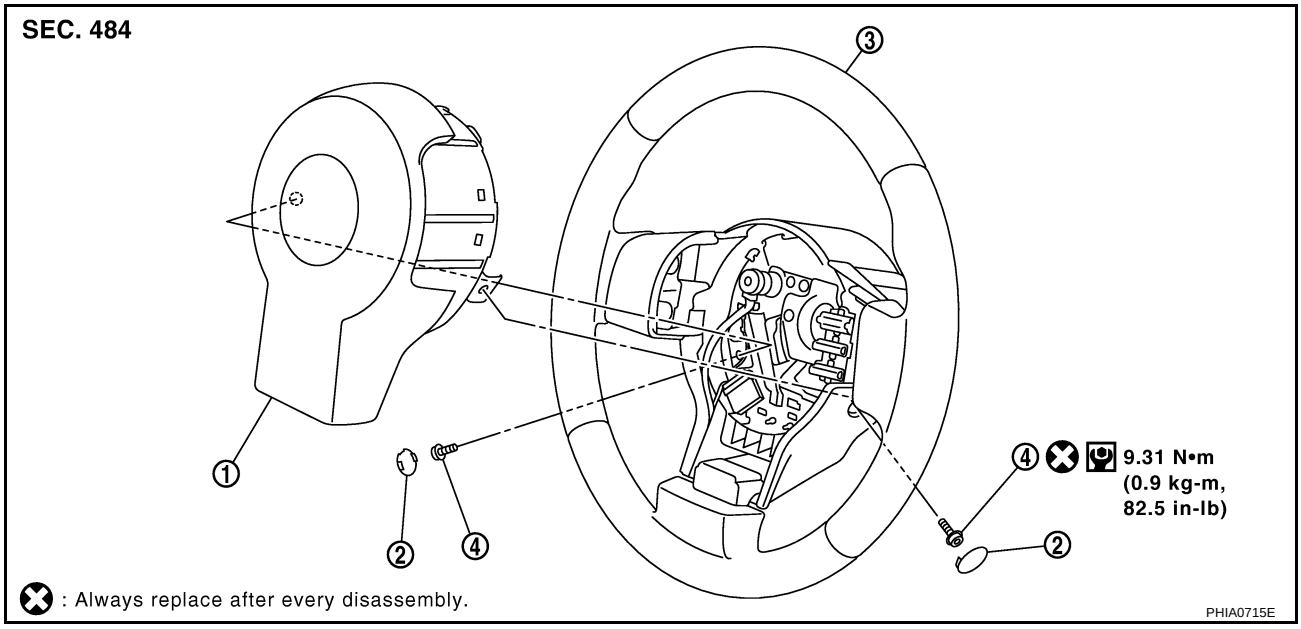
OK >> System is OK.
NG >> Check the followings.
- Sea tbelt buckle switch (passenger side) circuit.
- Seat belt buckle switch (passenger side).
  If these are OK, replace air bag diagnosis sensor unit.

DRIVER AIR BAG MODULE

PFP:K8510

Removal and Installation

NHS0000T



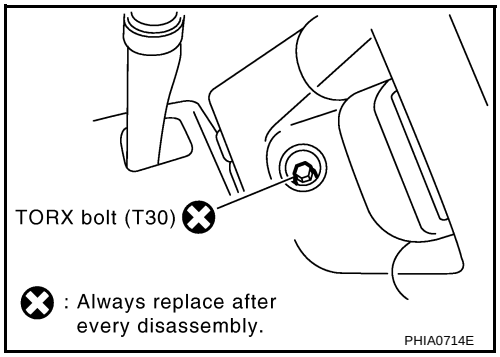
1. Driver air bag module
2. Side lid (RH/LH)
3. Steering wheel
4. TORX bolt (T30)

REMOVAL

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the side of driver air bag module.**
- **Do not use air tools or electric tools for servicing.**

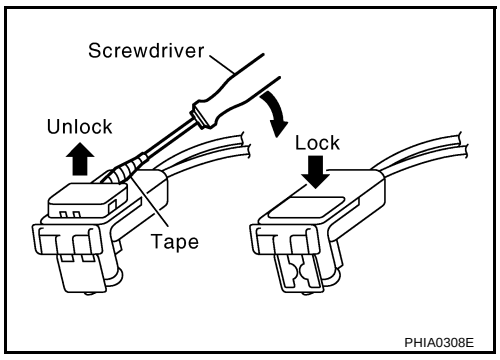
1. Remove the side lids (RH/LH).
2. Using Tamper resistant TORX bit (T30), remove the TORX bolts (T30) at right and left.



3. Disconnect the steering wheel switch sub-harness connector.
4. Disconnect the air bag harness connector, and remove the driver air bag module.

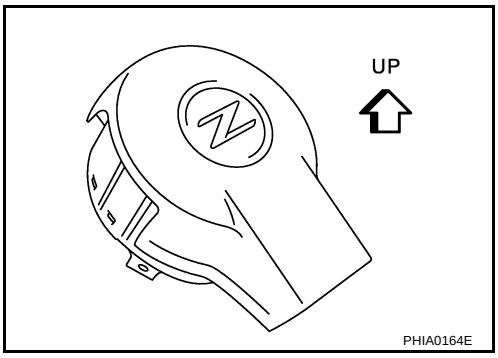
   CAUTION:

   - **For installing / removing driver air bag module connector, insert thin screwdriver wrapped in tape into notch, lift lock and remove connector.**
   - **Install connector with lock raised, and push lock into connector.**
   - **After installing the connector, make sure that the lock is pushed securely into it.**

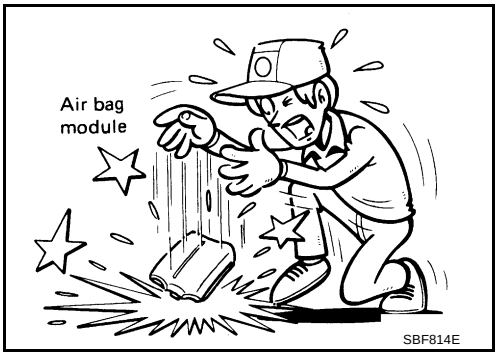


CAUTION:

- **Always work from the side of driver air bag module.**
- **Always place driver air bag module with pad side facing upward.**
- **Do not insert any foreign objects (screwdriver, etc.) into driver air bag module.**
- **Do not disassemble driver air bag module.**
- **Do not use old bolts after removal; replace with new bolts.**
- **Do not expose the driver air bag module to temperatures exceeding 90°C (194°F).**



- **Replace driver air bag module if it has been dropped or sustained an impact.**
- **Do not allow oil, grease or water to come in contact with the front passenger air bag module.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

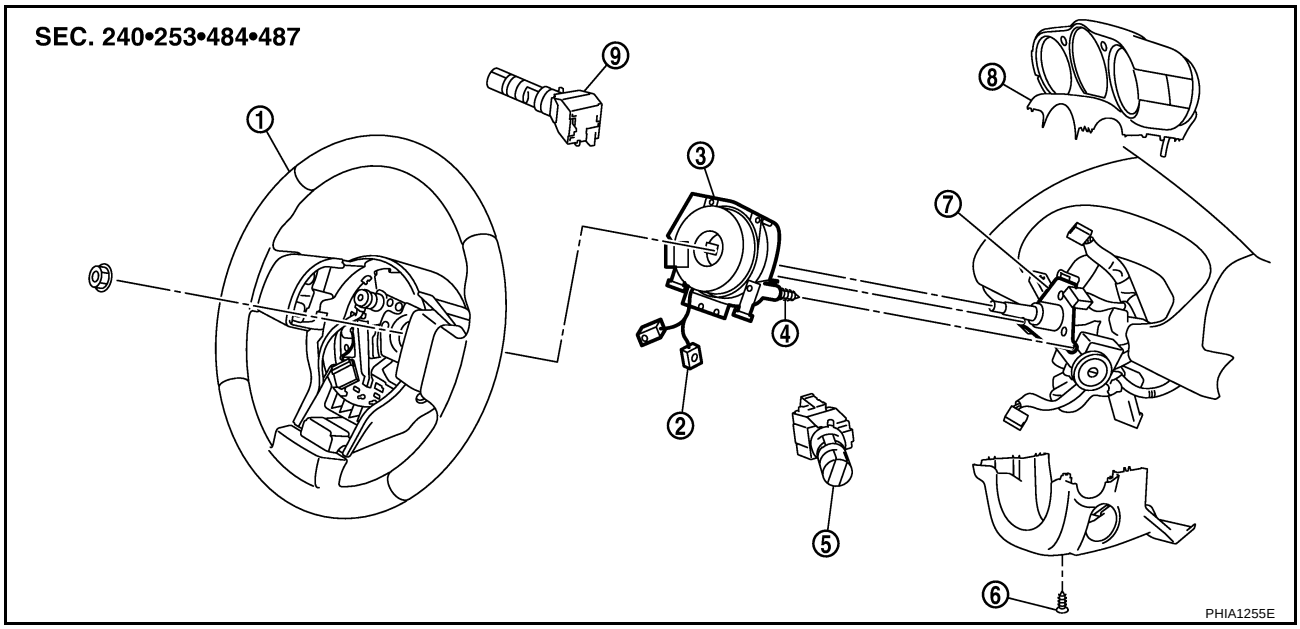
- **For installing the air bag module, tighten the TORX bolts (T30).**
- **After the work is completed, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

SPIRAL CABLE

PFP:25554

Removal and Installation

NHS0000U



1. Steering wheel	2. Driver air bag module connector	3. Spiral cable
4. Screw (Do not remove)	5. Wiper and washer switch	6. Screw
7. Sreering column assembly	8. Combination meter	9. Lighting and turn signal switch

REMOVAL

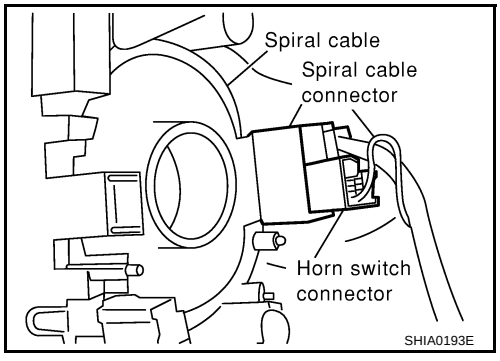
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

1. Remove driver air bag module. Refer to SRS-40, "Removal and Installation" .
2. Disconnect horn switch connector.
3. Set the steering wheel in the neutral position.
4. Remove steering wheel. Refer to PS-7, "STEERING WHEEL" .
5. Remove combination meter assembly. Refer to DI-24, "Removal and Installation for Combination Meter" .
6. Loosen the spiral cable fixing screws, and then remove the spiral cable.

   CAUTION:
   - **Do not disassemble spiral cable.**
   - **Do not apply lubricant to the spiral cable.**
7. Remove the horn switch connector and then remove spiral cable connector.

   CAUTION:
   Also, with the steering linkage disconnected the cable may snap by turning the steering wheel beyond the limited number of turns.

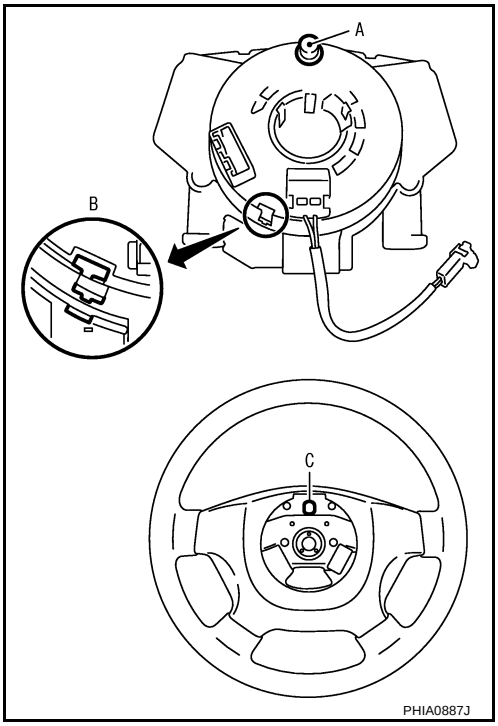


INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **The spiral cable may snap by steering operation if the cable is installed in an improper position.**
- **The neutral position is set as follows.**
  Turn quietly the spiral cable clockwise to the end position. Then turn it counterclockwise (about 2 and harf turns) and stop turning at the point on which the stopper insertion holes are in the same position.
  The service part is installed in the neutral position by the stopper and can be set without adjusting after the stopper is removed.
- **Do not turn the spiral cable rashly and also beyond the limit number of turns. (These will cause cable snap.)**
- **Adjust the spiral cable locating pin (showed as A inthe figure) to the steering wheel locating pin hole (showed as C in the figuer).**
- **Secure the air bag harness with the harness fixing hook.**
- **After the work is completed, make sure no system malfunction is detected by air bag warning lamp.**
- **In case that malfunction is detected by the air bag warning lamp, reset by the self-diagnosis function and delete the memory by CONSULT–III.**
- **In case that malfunction is still detected after the above operation, perform self-diagnosis to repair malfunctions. Refer to Refer to SRS-27, "SRS Operation Check (USER MODE)" .**



FRONT PASSENGER AIR BAG MODULE

PFP:K8515

Removal and Installation

NHS0000V

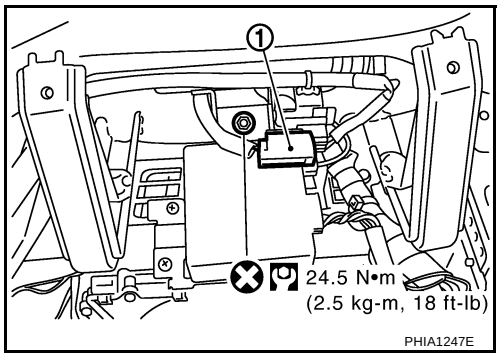
REMOVAL

CAUTION:

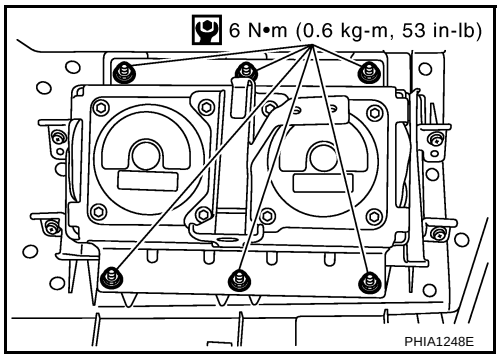
- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the side of or under front passenger air bag module.**
- **Do not use air tools or electric tools for servicing.**

1. Remove cluster lid C. Refer to IP-14, "(Q) Cluster Lid C" .
2. Remove instrument passenger panel lower and knee protector (RH). Refer to IP-13, "(L) Instrument Passenger Panel Lower" .
3. Disconnect passenger air bag module connector.

   Passenger air bag module connector : (1)

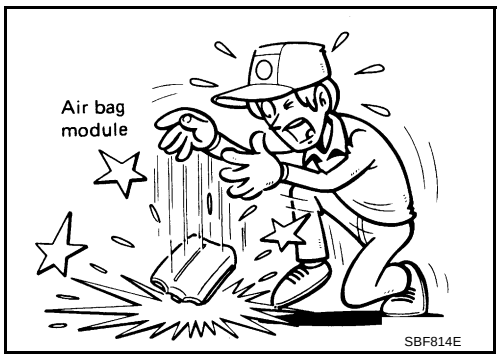


4. Remove hexagon bolt, and then remove instrument passenger panel upper assembly.
5. Remove fixing nuts, and then remove front passenger air bag module.



CAUTION:

- **Always place front passenger air bag module with caution label side facing upward.**
- **Do not insert any foreign objects (screwdriver, etc.) into front passenger air bag module.**
- **Do not disassemble front passenger air bag module.**
- **Do not use old bolts after removal; replace with new bolts.**
- **Replace front passenger air bag module if it has been dropped or sustained an impact.**
- **Do not expose the front passenger air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the front passenger air bag module.**
- **After front passenger air bag module inflates, the instrument panel assembly should be replaced.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

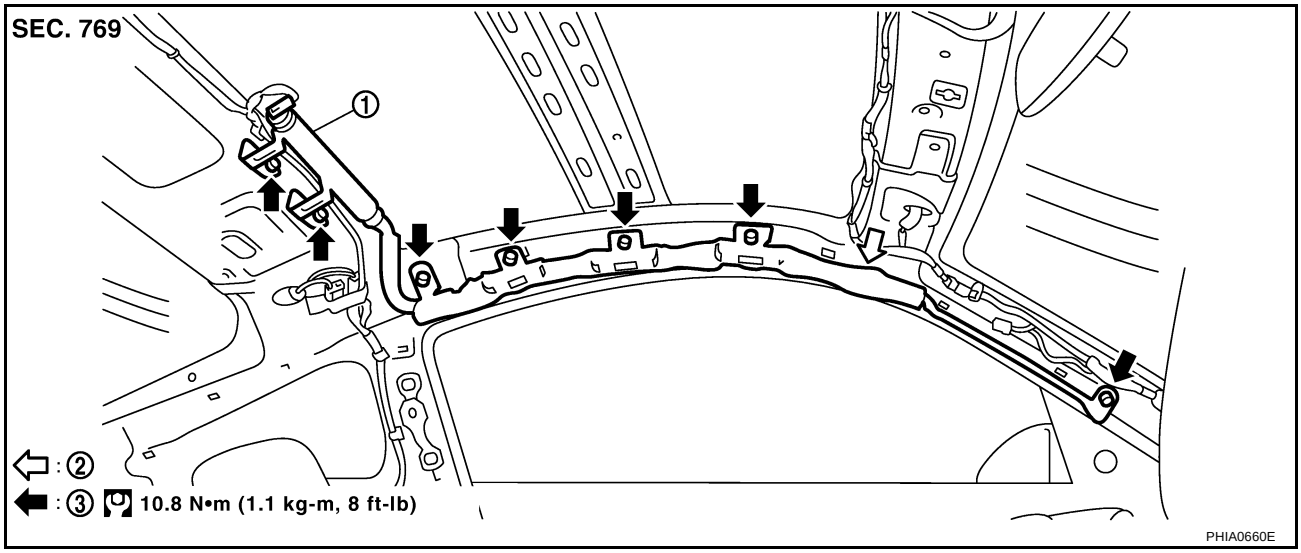
- **Always work from the side of or under front passenger air bag module.**
- **After the work is completed, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

SIDE CURTAIN AIR BAG MODULE (FOR COUPE)

PFP:985P0

Removal and Installation

NHS0000W



1. Side curtain air bag module
2. Clip
3. Bolt

REMOVAL

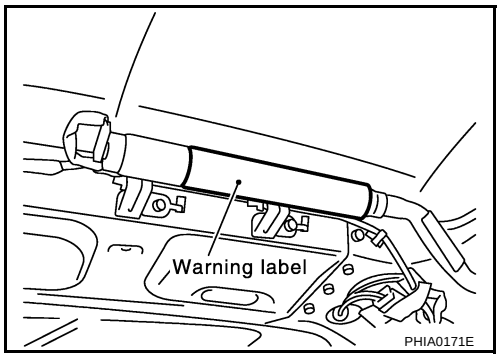
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

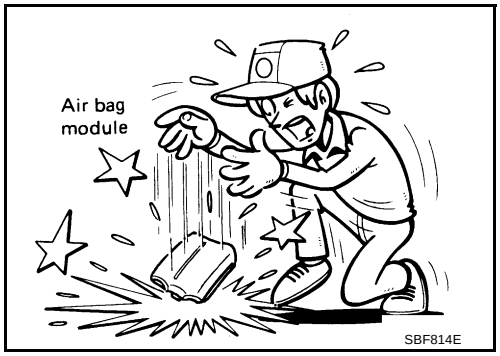
1. Remove headlining. Refer to EI-44, "Removal and Installation (for Coupe Models)" .
2. Disconnect side curtain air bag connector.
3. Remove side curtain air bag module fixing bolts and clip.
4. Remove the side curtain air bag module.

CAUTION:

- **Always place the side curtain air bag module with the warning label facing upward.**
- **Do not disassemble side curtain air bag module.**
- **Do not insert any foreign objects (screwdriver, etc.) into air bag module connector.**



- **Replace side curtain air bag module if it has been dropped or sustained an impact.**
- **Do not expose the air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the side curtain air bag module.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Always work from the side of the side curtain air bag module.**
- **After replacement of side curtain air bag module, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

CRASH ZONE SENSOR

PFP:98531

Removal and Installation

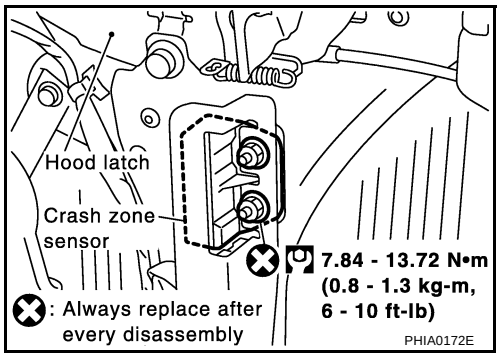
NHS0000X

REMOVAL

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

1. Remove crash zone sensor connector.
2. Remove crash zone sensor fixing nuts.



CAUTION:

- **Replace crash zone sensor if it has been dropped or sustained an impact.**
- **Do not disassemble crash zone sensor.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check crash zone sensor for proper installation.**
- **After the work is complete, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

SIDE AIR BAG (SATELLITE) SENSOR

PFP:98830

Removal and Installation

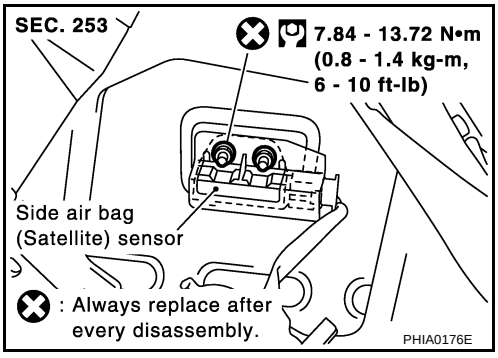
NHS0000Y

REMOVAL

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

1. Remove seat belt pre-tensioner. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" or SB-6, "Removal and Installation of Seat Belt (Roadster)" .
2. Remove side air bag (Satellite) sensor fixing nuts.
3. Remove the side air bag (Satellite) sensor connector.



CAUTION:

- **Do not use old nuts; replace with new ones.**
- **Check side air bag (Satellite) sensor to ensure it is free of deformities, dents, cracks or rust. If it shows any visible signs of damage, replace it with new one.**
- **Do not attempt to disassemble side air bag (Satellite) sensor.**
- **Replace side air bag (Satellite) sensor if it has been dropped or sustained an impact.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check side air bag (Satellite) sensor for proper installation.**
- **After replacement of side air bag (Satellite) sensor, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

FRONT SEAT BELT PRE-TENSIONER

PFP:86884

Removal and Installation

NHS0000Z

For removal and installation procedures, refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" or SB-6, "Removal and Installation of Seat Belt (Roadster)" .

DIAGNOSIS SENSOR UNIT

PFP:28556

Removal and Installation

NHS00010

REMOVAL

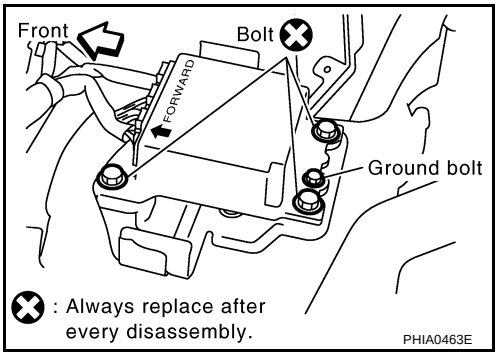
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

1. Disconnect each harness connector for the air bag module and seat belt pre-tensioner.
2. Remove center console. Refer to IP-11, "Removal and Installation" .
3. Disconnect diagnosis sensor unit connector.
4. Remove fixing bolts from the diagnosis sensor unit.

Hex bolt: 24.5 N·m (2.5 kg-m, 18 ft-lb)

Ground bolt: 6.9 N·m (0.7 kg-m, 61 in-lb)



CAUTION:

- **Do not use old bolts. Replace with new ones.**
- **Check diagnosis sensor unit bracket to ensure it is free of deformities, dents, cracks or rust. If it shows any visible signs of damage, replace with new one.**
- **Replace diagnosis sensor unit if it has been dropped or sustained an impact.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check the diagnosis sensor unit for proper installation.**
- **After replacement of diagnosis sensor unit, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

ECU DISCRIMINATED NO.

After replacing the diagnosis sensor unit, make sure that the diagnosis sensor unit identification is correct for the vehicle as equipped.

Model	Specification	ECU DISCRIMINATED No.
Coupe	Models with driver and passenger air bags and seat belt pre-tensioner	FAE6
	Models with driver and passenger air bags, seat belt pre-tensioner, side air bags and curtain air bags	FAE4
Roadster	Models with driver and passenger air bags and seat belt pre-tensioner	FAE7
	Models with driver and passenger air bags, seat belt pre-tensioner and side air bags	FAE5

OCCUPANT CLASSIFICATION SYSTEM CONTROL UNIT

PFP:98852

Removal and Installation

NHS000A7

The occupant classification system control unit, seat pressure sensor, and bladder are an integral part of the front passenger seat cushion and are replaced as an assembly. Refer to SE-67, "Removal and Installation" .

COLLISION DIAGNOSIS

PFP:00015

For Frontal Collision

NHS00011

To repair the SRS, perform the following steps.

When SRS (except the front side air bag and side curtain air bag modules) is activated in a collision:

1. Replace the diagnosis sensor unit.
2. Remove the air bag modules (except the front side air bag modules and side curtain air bag modules), crash zone sensor assembly, bracket and seat belt pre-tensioner assemblies.
3. Check the SRS components using the table below:

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

4. Install new air bag modules (except the front side air bag modules and side curtain air bag modules) crash zone sensor assembly, bracket and seat belt pre-tensioner assemblies.
5. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" for details. Ensure entire SRS operates properly.

When SRS is not activated in a collision:

1. Check the SRS components using the table below:

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

2. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" for details. Ensure entire SRS operates properly.

When only one front air bag module is activated in a collision:

1. Replace the following components:

– Diagnosis sensor unit

– Crash zone sensor

– Activated front air bag and seat belt pre-tensioner.

2. Check the other SRS components using the table below. (Refer to “SRS is NOT activated”.)

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

3. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" for details. Ensure entire SRS operates properly.

Only one front air bag may inflate a crash, depending on the crash severity and whether the front occupants are belted or unbelted. This does not indicate improper performance of the system. Perform self-diagnosis to make sure the entire SRS operates properly.

SRS INSPECTION (FOR FRONTAL COLLISION)

Part	SRS is activated	SRS is NOT activated
Driver airbag module	If the Driver airbag has deployed: REPLACE. Install with new fasteners.	If the Driver air bag has NOT been activated: [same text as in current manual]
Passenger front airbag module	If the Passenger front airbag has deployed: REPLACE. Install with new fasteners.	If the Passenger front air bag has NOT been activated: [same text as in current manual]
Crash zone sensor	If any of the front airbags or seat belt pre-tensionsers have been activated: REPLACE the crash zone sensor and bracket with new fasteners.	If the front airbags or seat belt pre-tensionsers have NOT been activated: [same text as in current manual]
Seat belt pre-tensioner assemblies	If the driver or passenger Seat belt pre-tensioner has been activated: REPLACE the seat belt pre-tensioner assemblies with new fasteners.	If the pre-tensioners have NOT been activated: [same text as in current manual]
Diagnosis sensor unit	If any of the SRS components have been activated: REPLACE the Diagnosis sensor unit. Install with new fasteners.	If none of the SRS components have been activated: [same text as in current manual]

Part	SRS is activated	SRS is NOT activated
Steering wheel	[same text as in current manual]	
Spiral cable	If the Driver airbag has deployed: REPLACE the spiral cable.	If the Driver airbag has not deployed: [same text as in current manual]
Harness and connectors	1. Check connectors for poor connection, damage, and terminals for deformities. 2. Check harness for binding, chafing, cuts, or deformities. 3. If no damage is found, reinstall the harness and connectors. 4. If damaged—REPLACE damaged section of harness. Do not repair, splice or modify any SRS harness.	
Instrument panel	1. Visually check instrument panel for damage. 2. If no damage is found, reinstall the instrument panel. 3. If damaged—REPLACE the instrument panel with bolts.	

For Side Collision

NHS00012

WHEN THE SIDE AIR BAG IS ACTIVATED IN THE SIDE COLLISION:

1. Replace the following components:
- All parts of front seatback (including front seatback frame) with front side air bag module (on the side on which front side air bag is activated)
- Curtain air bag module (on the side on which side curtain air bag is activated)
- Diagnosis sensor unit
- Satellite sensor (on the side on which side air bag and side curtain air bag is activated)
2. Check the SRS components and the related parts using the following table.
- Replace any SRS components and the related parts showing visible signs of damage (dents, cracks, deformation).
3. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" . Ensure entire SRS operates properly.

WHEN SRS IS NOT ACTIVATED IN THE SIDE COLLISION:

1. Check the SRS components and the related parts using the following table.
- Replace any SRS components and the related parts showing visible signs of damage (dents, cracks, deformation).
2. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" . Ensure entire SRS operates properly.

SRS INSPECTION (FOR SIDE COLLISION)

Part	Front side air bag and side curtain air bag is activated	Front side air bag and side curtain air bag is NOT activated
(LH or RH) side curtain air bag module*	REPLACE the side curtain air bag module. (Repair the center pillar inner, etc. before installing new one if damaged.)	1. Check for visible signs of damage (dents, tears, deformation) of the center pillar on the collision side. 2. If damaged— Remove the side curtain air bag module. 3. Check for visible signs of damaged (tears etc.) of the side curtain air bag module. 4. Check harness and connectors for damage, and terminals for deformities. 5. If no damage is found, reinstall the side curtain air bag module with new bolts. 6. If damaged—REPLACE the side curtain air bag module with new bolts.
Front (LH or RH) side air bag module	REPLACE all parts of seatback with deployed front side air bag module.	1. Check for visible signs of damage (dents, tears, deformation) of the seat back on the collision side. 2. Check harness and connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall the front seatback assembly. 4. If damaged—REPLACE the front seatback assembly.
(LH or RH) side air bag (Satellite) sensor	REPLACE the side air bag (Satellite) sensor on the collision side with new nuts. (Repair the center pillar inner, etc. before installing new one if damaged.)	1. Remove the side air bag (Satellite) sensor on the collision side. Check harness connectors for damage, terminals for deformities, and harness for binding. 2. Check for visible signs of damage (dents, cracks, deformation) of the side air bag (Satellite) sensor. 3. Install the side air bag (Satellite) sensor to check fit. 4. If no damage is found, reinstall the side sir bag (Satellite) sensor with new nuts. 5. If damaged—REPLACE the side air bag (Satellite) sensor with new nuts.
Diagnosis sensor unit	REPLACE the diagnosis sensor unit with the new bolts.	1. Check case and bracket for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall the diagnosis sensor unit with new bolts and ground bolt. 4. If damaged—REPLACE the diagnosis sensor unit with new bolts and ground bolt.

Part	Front side air bag and side curtain air bag is activated	Front side air bag and side curtain air bag is NOT activated
Seat belt pre-tensioner assembly	1. Check if the seat belt can be extended smoothly. If the seat belt cannot be extended smoothly, – Check for deformities of the center pillar inner. – If the center pillar inner has no damage, REPLACE the seat belt pre-tensioner assembly. 2. Remove the seat belt pre-tensioner assembly on the collision side. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 3. Check for visible signs of damage (dents, cracks, deformation) of the seat belt pre-tensioner assembly. 4. Check seat belt adjuster for damage. 5. If no damage is found, reinstall the seat belt pre-tensioner assembly. 6. If damaged—REPLACE the seat belt pre-tensioner assembly with new bolts.	
Seat with front side air bag	REPLACE all parts of front seatback (including front seatback frame)	1. Visually check the seat on the collision side. 2. Remove the seat on the collision side and check the following for damage and deformities. – Harness, connectors and terminals – Frame and recliner (for front and rear seat), and also adjuster and slides (for front seat) 3. If no damage is found, reinstall the seat. 4. If damaged—REPLACE the damaged seat parts using new bolts.
Center inner pillar	1. Check the center inner pillar on the collision side for damage (dents, cracks, deformation). 2. If damaged—REPAIR the center inner pillar.	
Trim/headlining*	1. Check for visible signs of damage (dents, cracks, deformation) of the interior trim on the collision side. 2. If damaged—REPLACE the damaged trim parts.	

*: For coupe

SECTION WT
ROAD WHEELS & TIRES

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SERVICE DATA AND SPECIFICATIONS (SDS) 39
Road Wheel 39
Tire 39
Tightening Torque 39

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NES000LO

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NES000LP

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Service Notice or Precautions

NES000LQ

- Low tire pressure warning lamp flashes 1min., then turns ON when occurring any malfunction except low tire pressure.
  Delete the memory with CONSULT-III, or register the ID to turn low tire pressure warning lamp OFF. Refer to WT-21, "ID Registration Procedure" .
- ID registration is required when replacing or rotating wheels. replacing transmitter or BCM. Refer to WT-21, "ID Registration Procedure" .
- Replace grommet seal, valve core and cap of the transmitter in TPMS every tire replacement by reaching wear limit of tire.

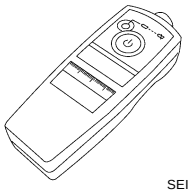
PREPARATION

PFP:00002

Special Service Tools

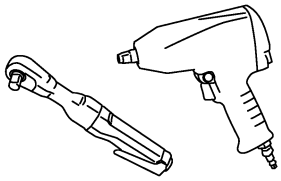
NES00014

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J-45295) Transmitter activation tool  SEIA0462E	ID registration

Commercial Service Tools

NES00015

Tool name	Description
Power tool  PBIC0190E	Removing wheel nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NES00016

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

			Reference page	FAX-4,FSU-5	WT-6	—	—	—	—	—	—	NVH in PR section.	NVH in RFD section.	NVH in FAX and FSU sections.	NVH in RAX and RSU sections.	Refer to TIRES in this chart.	Refer to ROAD WHEEL in this chart.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
			Possible cause and SUSPECTED PARTS	Improper installation, looseness	Out-of-round	Imbalance	Incorrect tire pressure	Uneven tire wear	Deformation or damage	Non-uniformity	Incorrect tire size	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	REAR AXLE AND REAR SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	TIRES	Noise		×	×	×	×	×	×	×		×	×	×	×		×	×	×	×
		Shake		×	×	×	×	×	×		×	×		×	×		×	×	×	×
		Vibration					×				×	×		×	×			×		×
		Shimmy		×	×	×	×	×	×	×	×			×	×		×		×	×
		Judder		×	×	×	×	×	×		×			×	×		×		×	×
		Poor quality ride or handling		×	×	×	×	×	×		×			×	×		×			
	ROAD WHEEL	Noise		×	×	×			×			×	×	×	×	×		×	×	×
		Shake		×	×	×			×			×		×	×	×		×	×	×
		Shimmy, judder		×	×	×			×					×	×	×			×	×
		Poor quality ride or handling		×	×	×			×					×	×	×				

×: Applicable

ROAD WHEEL

PFP:40300

Inspection

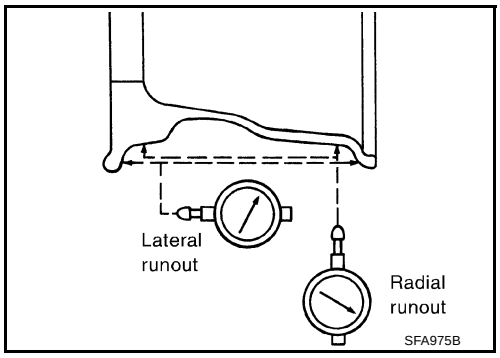
NES00017

ALUMINUM WHEEL

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.

a. Remove tire from aluminum wheel and mount on a tire balance machine.

b. Set dial indicator as shown in the figure.



Wheel runout (Dial indicator value):

Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

STEEL WHEEL

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.

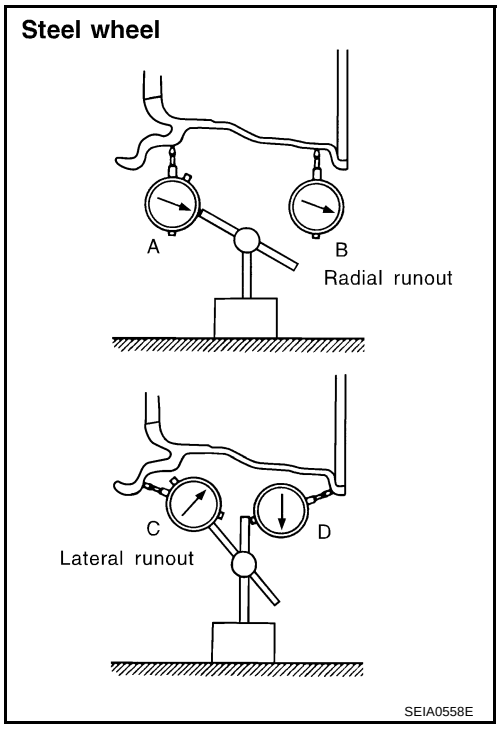
a. Remove tire from steel wheel and mount wheel on a tire balance machine.

b. Set two dial indicators as shown in the figure.

c. Set each dial indicator to 0.

d. Rotate wheel and check dial indicators at several points around the circumference of the wheel.

e. Calculate runout at each point as shown below.



Radial runout = (A+B)/2

Lateral runout = (C+D)/2

f. Select maximum positive runout value and the maximum negative value.
Add the two values to determine total runout.
In case a positive or negative value is not available, use the maximum value (negative or positive) for total runout.
If the total runout value exceeds the limit, replace steel wheel.

Wheel runout:

Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

ROAD WHEEL TIRE ASSEMBLY

PFP:40300

Balancing Wheels (Bonding Weight Type)

NES00018

REMOVAL

1. Remove inner and outer balance weights from the road wheel.

   CAUTION:
   Be careful not to scratch the road wheel during removal.

2. Using releasing agent, remove double-faced adhesive tape from the road wheel.

   CAUTION:
   - **Be careful not to scratch the road wheel during removal.**
   - **After removing double-faced adhesive tape, wipe clean traces of releasing agent from the road wheel.**

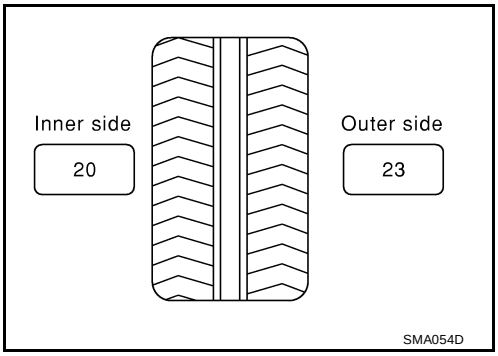
WHEEL BALANCE ADJUSTMENT

- If a tire balance machine has adhesion balance weight mode settings and drive-in weight mode setting, select and adjust a drive-in weight mode suitable for road wheels.

1. Set road wheel on wheel balancer using the center hole as a guide. Start the tire balance machine.
2. When inner and outer unbalance values are shown on the wheel balancer indicator, multiply outer unbalance value by 5/3 to determine balance weight that should be used. Select the outer balance weight with a value closest to the calculated value above and install it to the designated outer position of, or at the designated angle in relation to the road wheel.

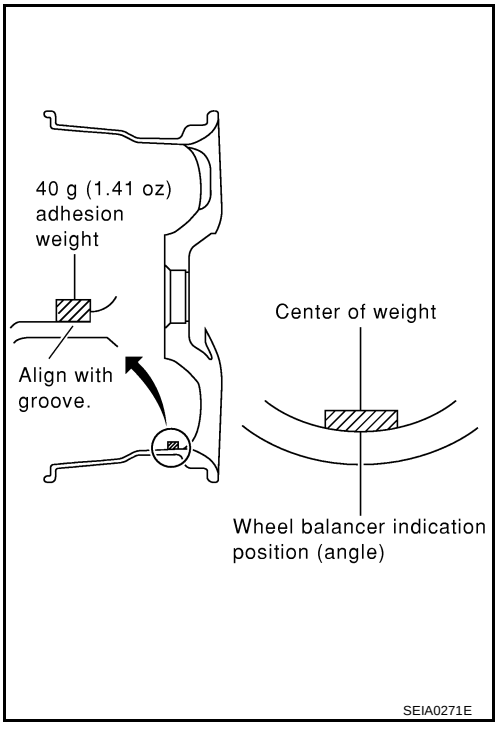
   CAUTION:
   - **Do not install the inner balance weight before installing the outer balance weight.**
   - **Before installing the balance weight, be sure to clean the mating surface of the road wheel.**

   Indicated unbalance value × 5/3 = balance weight to be installed
   Calculation example:
   23 g (0.81 oz) × 5/3 = 38.33 g (1.35 oz) = 40 g (1.41 oz) balance weight (closer to calculated balance weight value)
   Note that balance weight value must be closer to the calculated balance weight value.
   Example:
   37.4 = 35 g (1.23 oz)
   37.5 = 40 g (1.41 oz)



   a. Install balance weight in the position shown in the figure.
   b. When installing balance weight to road wheels, set it into the grooved area on the inner wall of the road wheel as shown in the figure so that the balance weight center is aligned with the tire balance machine indication position (angle).

   CAUTION:
   - **Always use genuine NISSAN adhesion balance weights.**
   - **Balance weights are unreusable; always replace with new ones.**
   - **Do not install more than three sheets of balance weight.**



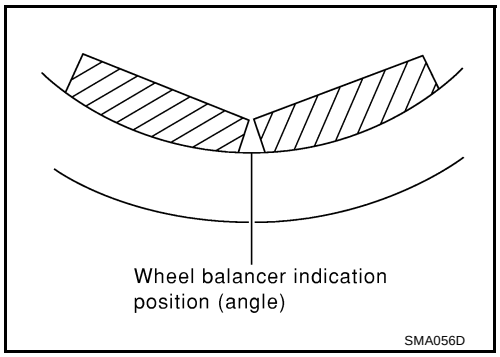
c. If calculated balance weight value exceeds 50 g (1.76 oz), install two balance weight sheets in line with each other (as shown in the figure).

CAUTION:
Do not install one balance weight sheet on top of another.

3. Start tire balance machine again.
4. Install drive-in balance weight on inner side of road wheel in the tire balance machine indication position (angle).

CAUTION:
Do not install more than two balance weights.

5. Start tire balance machine. Make sure that inner and outer residual unbalance values are 5 g (0.17 oz) each or below.
   - If either residual unbalance value exceeds 5 g (0.17 oz), repeat installation procedures.



Wheel balance (Maximum allowable unbalance):

Maximum allowable unbalance	Dynamic (At rim flange)	5 g (0.17 oz) (one side)
	Static (At rim flange)	10 g (0.35 oz)

Tire Rotation

NES00019

CAUTION:
- **Do not include the T-type spare tire when rotating the tires.**
- **Use NISSAN genuine wheel nuts for aluminum wheels.**

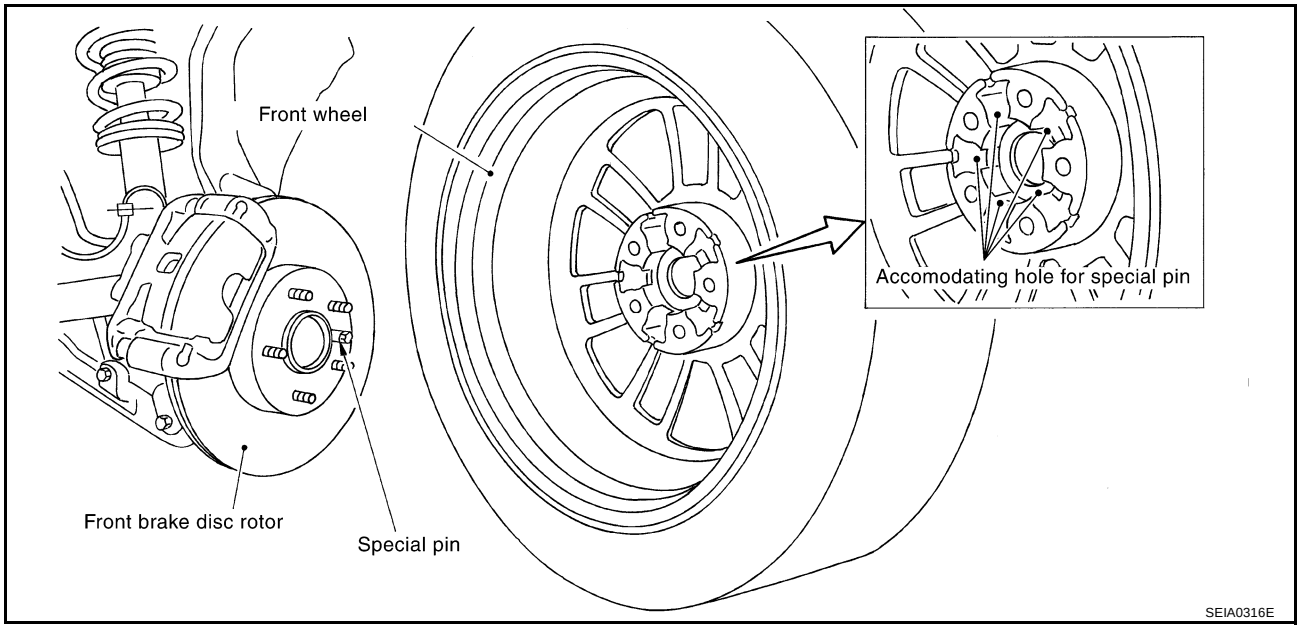
NOTE:
Tire cannot be rotated in vehicle, as front tire are different size from rear tire and the direction of wheel rotation is fixed in each tire.

DESCRIPTION

Safety Device Preventing from Being Incorrectly Installed

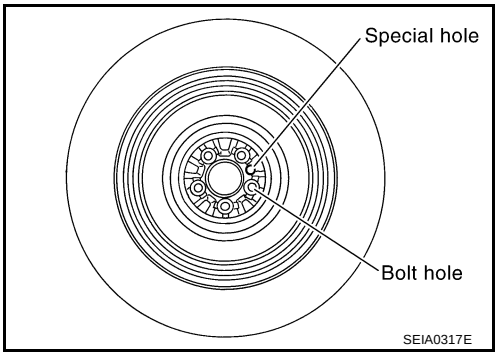
Front brake disc rotor and front wheel

- Front and rear wheel size for this model differs, therefore a special pin has been installed on the front brake disc rotor. To accommodate this pin a hole has been provided on the front wheel (the rear wheel does not have this hole.) and in some case the rear wheel is being mistakenly installed on the front.



T-type spare tire wheel

- T-type spare tire wheel for this model has a special hole designed to avoid the pin on front disc rotor.

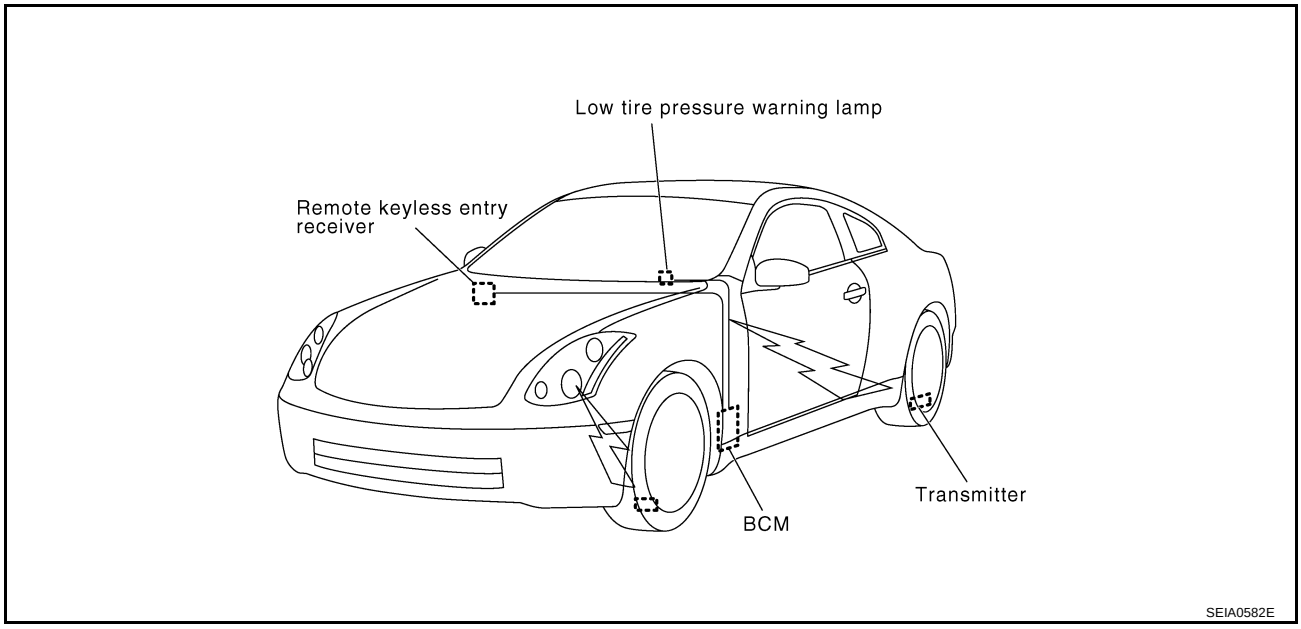


TIRE PRESSURE MONITORING SYSTEM

PFP:40300

System Components

NES0001A



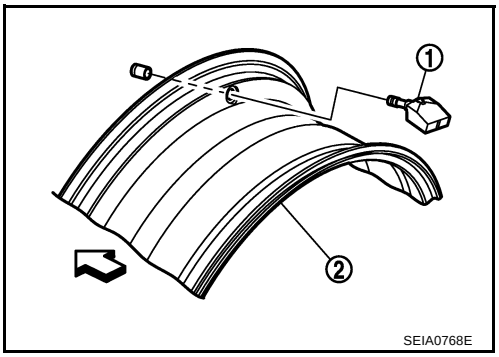
System Description

NES0001B

TRANSMITTER

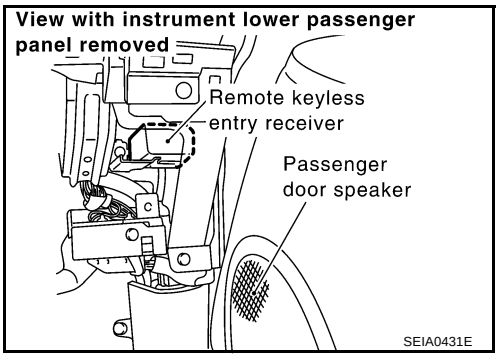
A sensor-transmitter (1) integrated with a valve is installed on a wheel (2), and transmits a detected air pressure signal in the form of a radio wave.

⇦ : Outside



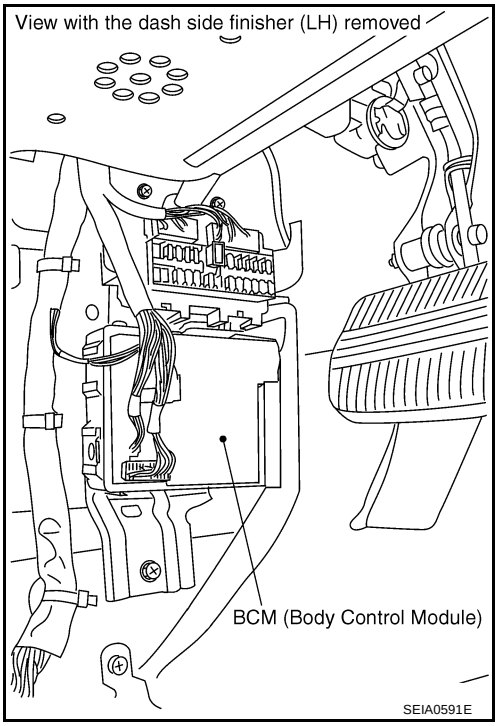
REMOTE KEYLESS ENTRY RECEIVER

The remote keyless entry receiver receives the air pressure signal transmitted by the transmitter in each wheel.



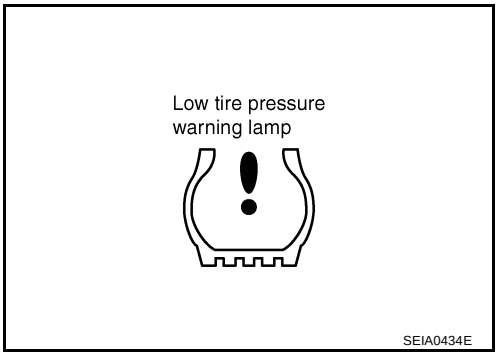
BCM (BODY CONTROL MODULE)

The BCM reads the air pressure signal received by the remote keyless entry receiver, and controls the low tire pressure warning lamp operations. It also has a judgement function to detect a system malfunction.



LOW TIRE PRESSURE WARNING LAMP

The combination meter receives tire pressure status from the BCM using CAN communication. When a low tire pressure condition is sensed by the BCM, the combination meter low tire pressure warning lamp are activated.



Low tire pressure warning lamp indication

Condition	Low tire pressure warning lamp
Less than 190 kPa (1.90 kg/cm^2 , 28 psi) [Note]	ON
Low tire pressure warning system malfunction [Other diagnostic item]	Warning lamp flashes 1 min, then turns ON.

NOTE:

Standard air pressure is for 240 kpa (2.4 kg/cm^2 , 35 psi) vehicles.

Can Communication

NES000A0

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-49, "CAN Communication Signal Chart" .

TROUBLE DIAGNOSIS

PFP:00004

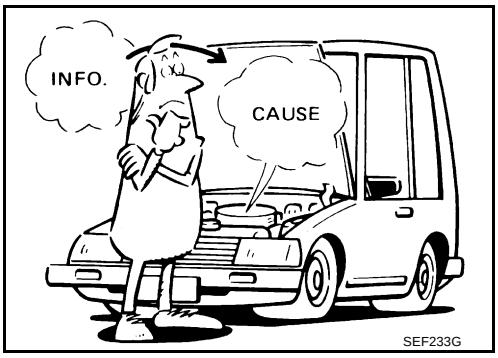
How to Perform Trouble Diagnosis

NES000AF

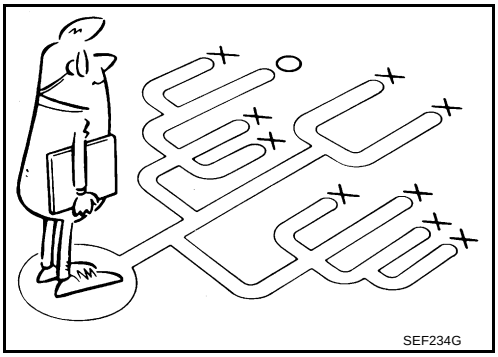
BASIC CONCEPT

- To perform trouble diagnosis, it is the most important to have understanding about vehicle systems (control and mechanism) thoroughly.
- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptoms, and understand them fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptoms by driving vehicle with customer.

  CAUTION:
  Customers are not professional. It is dangerous to make an easy guess like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.



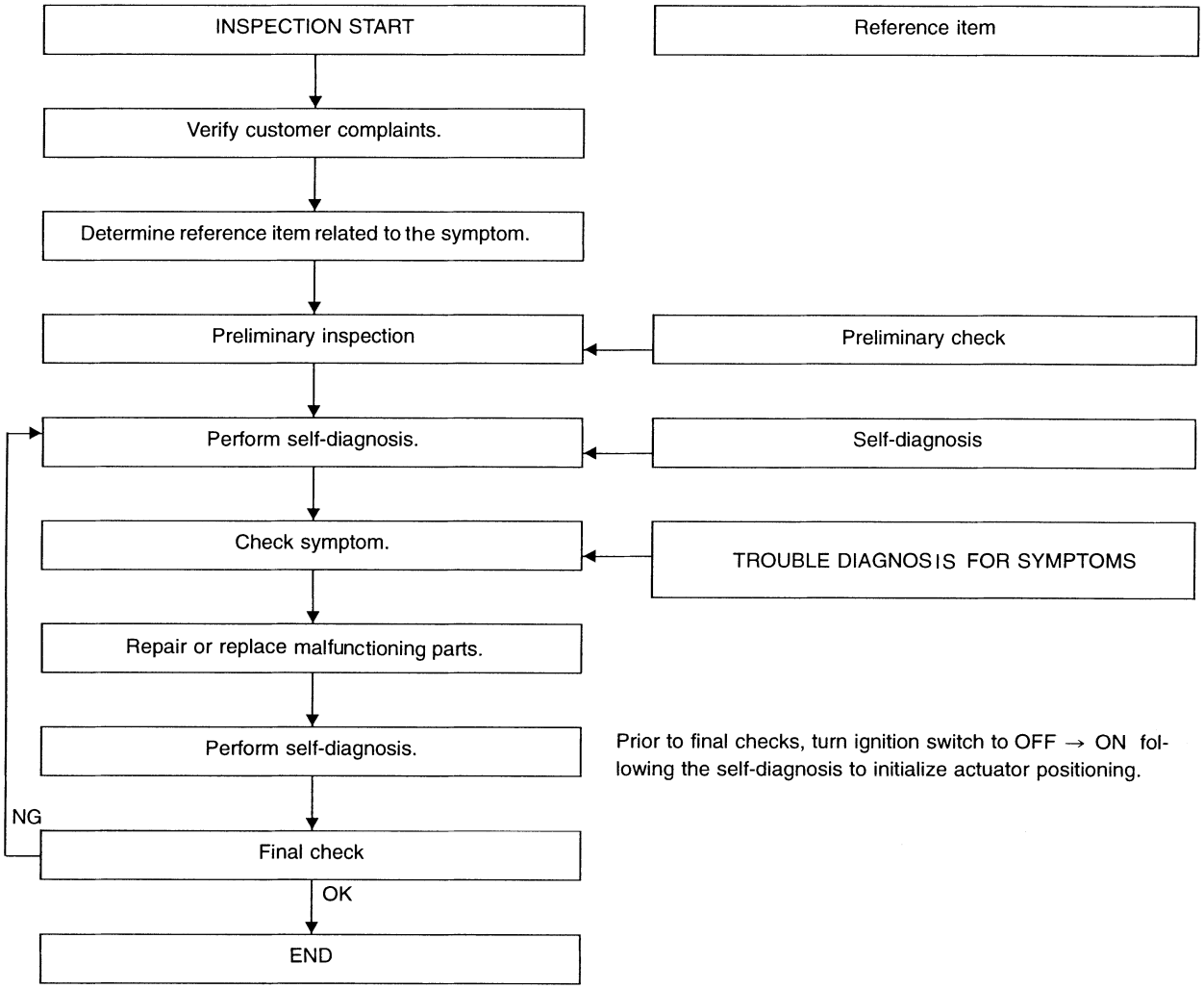
- It is essential to check symptoms right from the beginning in order to repair malfunctions completely.
  For intermittent malfunctions, reproduce symptoms based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairing without any symptom diagnosis, you cannot judge if malfunctions have actually been eliminated.
- After completing diagnosis, always erase diagnostic memory.
- For intermittent malfunctions, move harness or harness connector by hand. Then check for poor contact or reproduced open circuit.



INTRODUCTION

- Before troubleshooting, verify customer complaints.
- If a vehicle malfunction is difficult to reproduce, harnesses, harness connectors or terminals may be malfunctioning. Hold and shake these parts to make sure they are securely connected.
- When using a circuit tester to measure voltage or resistance of each circuit, be careful not to damage or deform connector terminals.

WORK FLOW

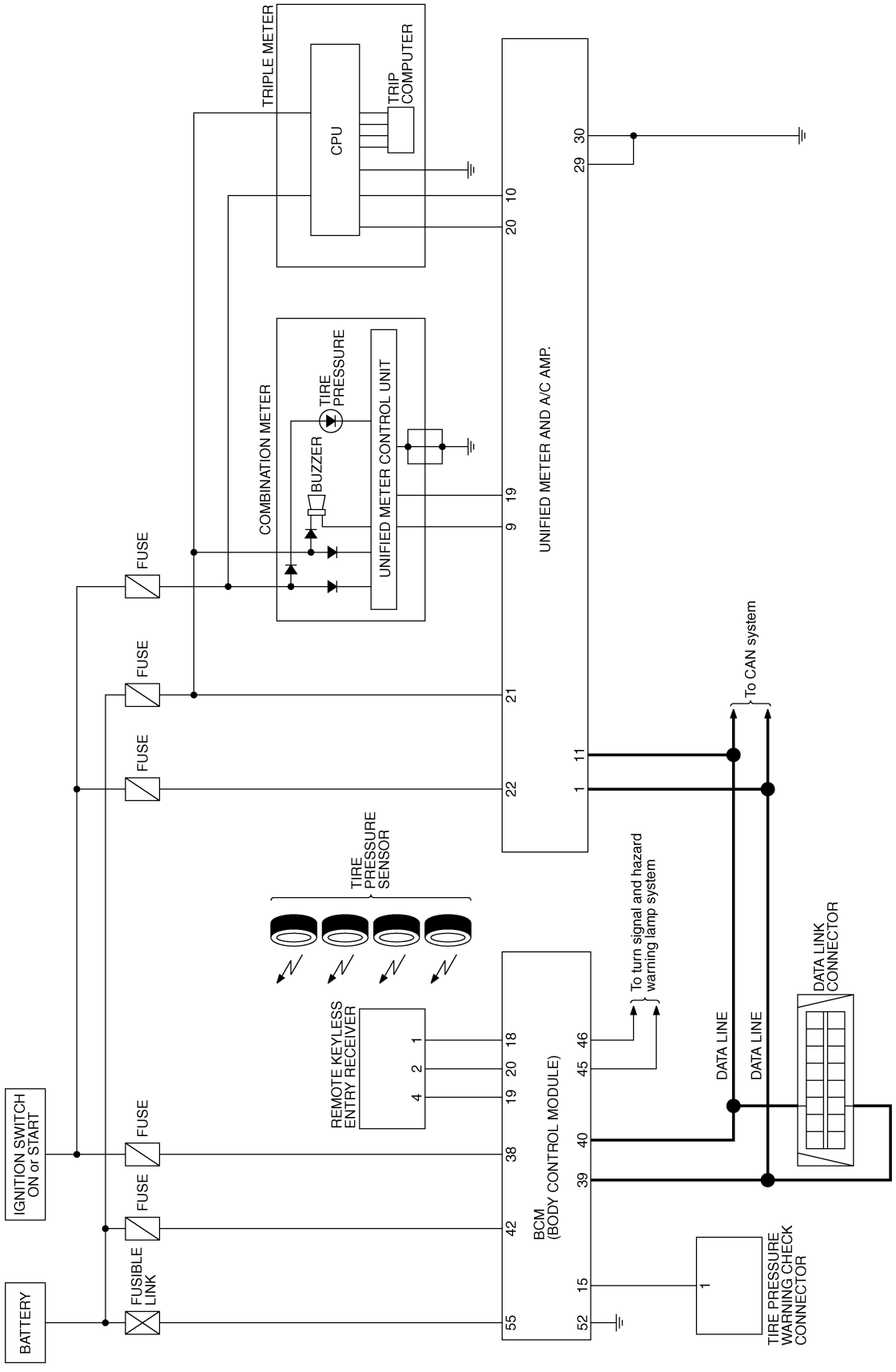


SEIA0100E

Preliminary check: WT-29 Self-diagnosis: WT-23 Trouble diagnosis for symptoms: WT-33

Schematic

NES0001D

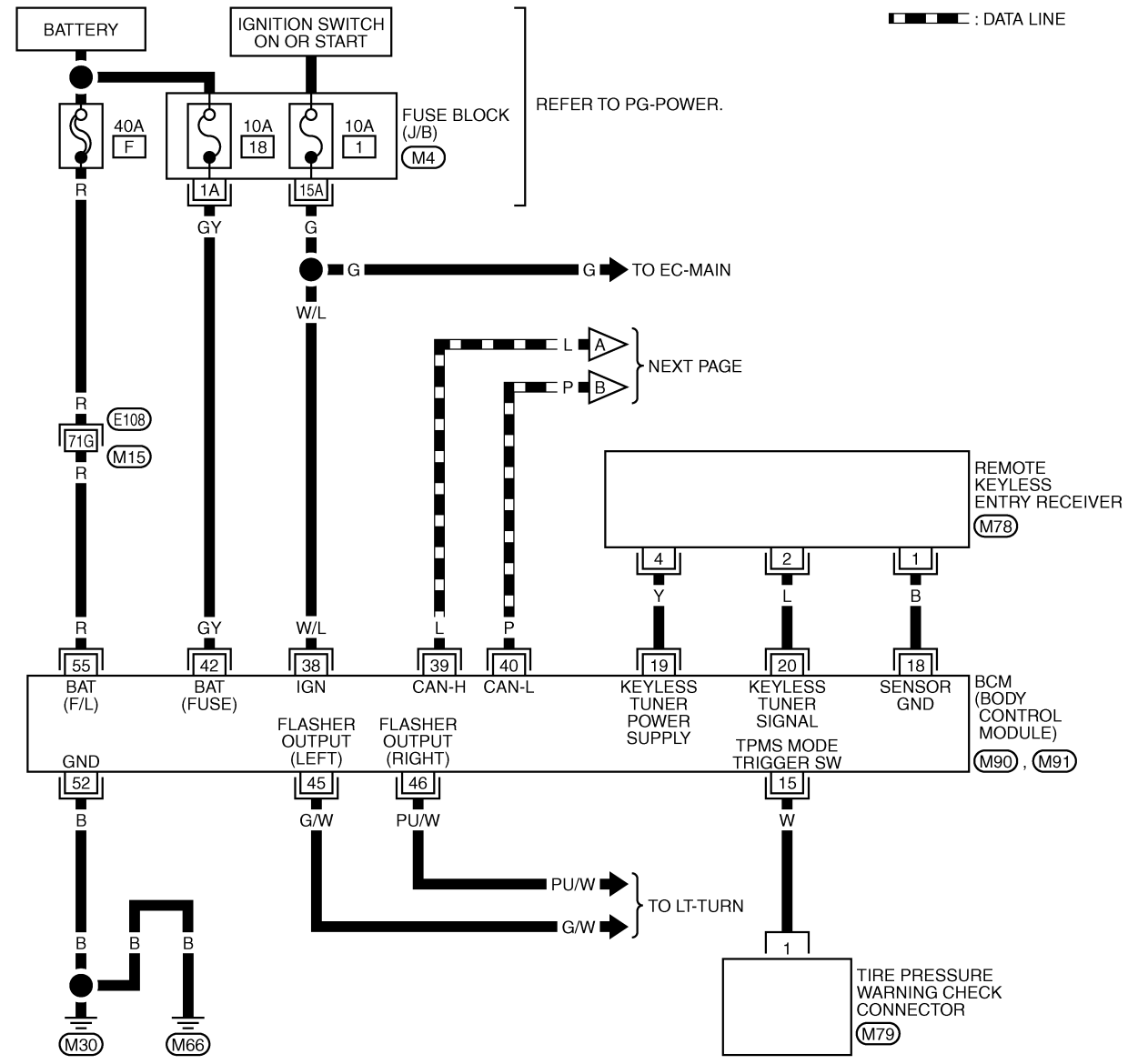


TEWT0020E

Wiring Diagram — T/WARN —

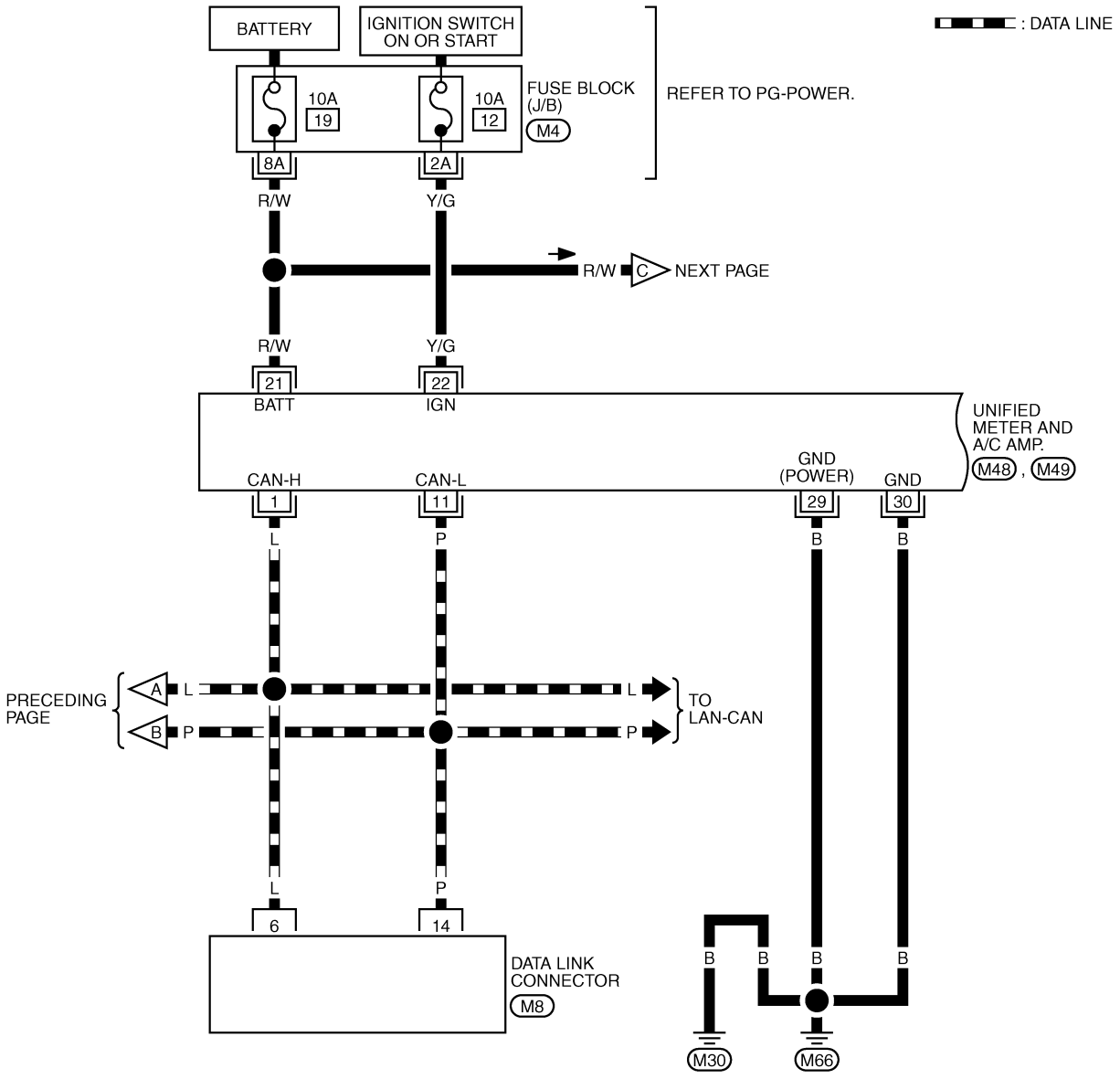
NES0001E

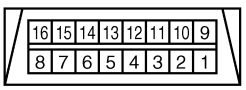
WT-T/WARN-01

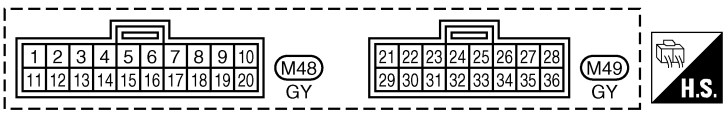


TEWT0056E

WT-T/WARN-02



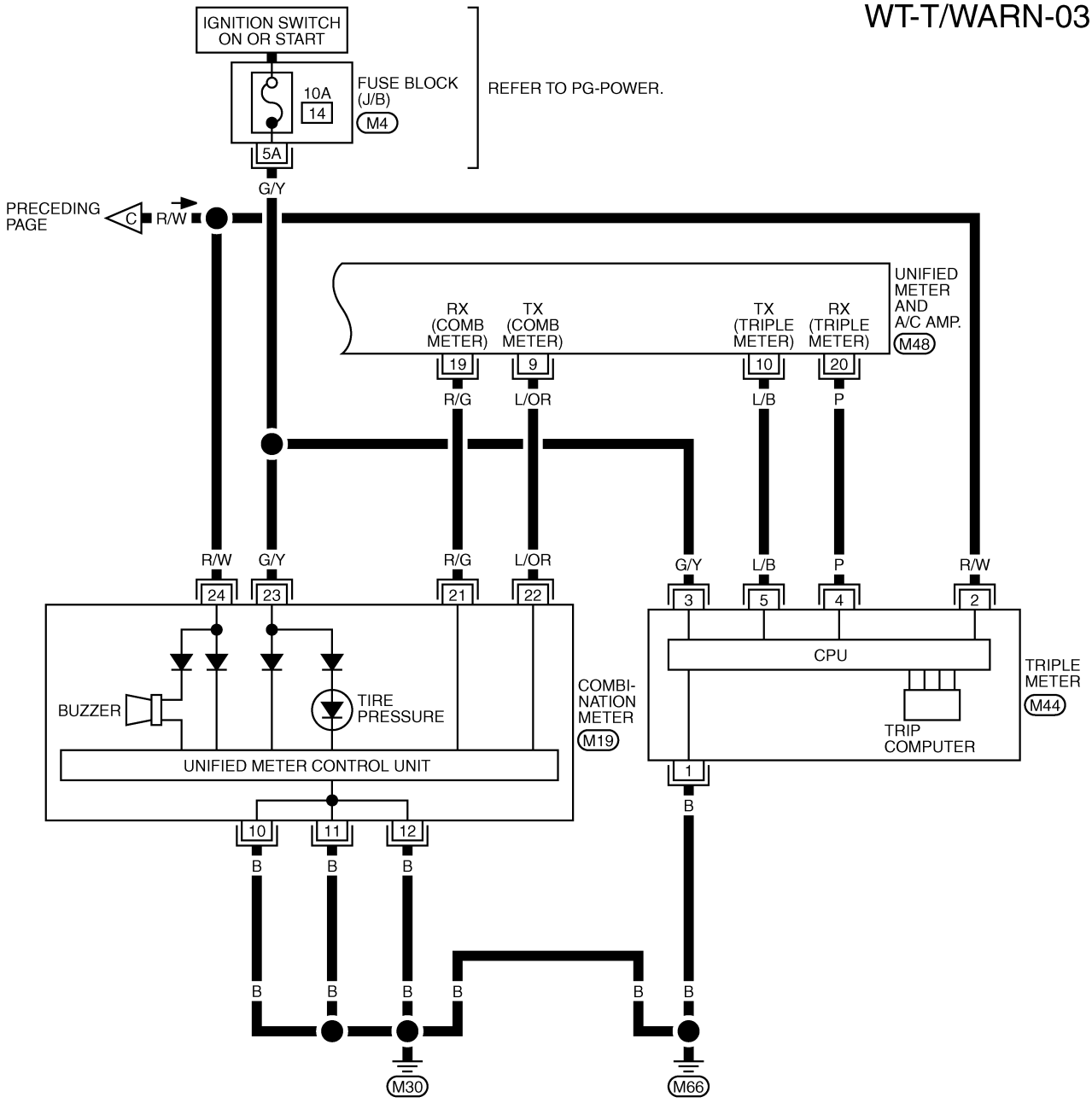


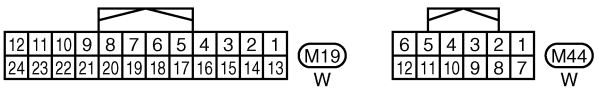


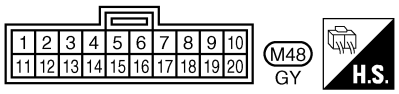
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TEWT0022E

WT-T/WARN-03







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TEWT0023E

Trouble Diagnosis Chart for Symptoms

NES000A1

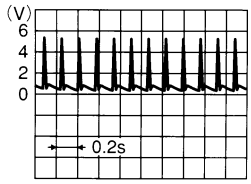
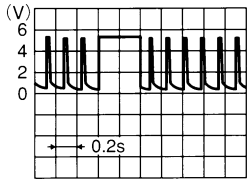
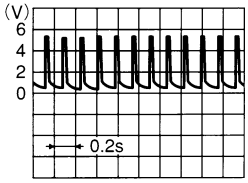
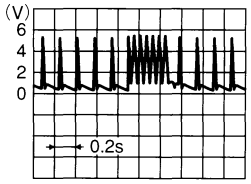
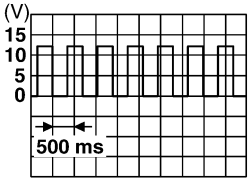
If low tire pressure warning lamp turns ON, perform self-diagnosis. Refer to WT-23, "SELF-DIAG RESULTS MODE" .

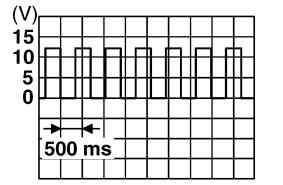
Symptom	Check item	Reference page
Warning lamp does not come on when ignition switch is turned on.	CAN communication line	WT-33
	Combination meter	
	BCM	
Warning lamp stays on when ignition switch is turned on.	ID registration	WT-33
	BCM connector or circuit	
	BCM	
Warning lamp blinks when ignition switch is turned on.	BCM connector or circuit	WT-35
	BCM	
Turn signal lamp blinks when ignition switch is turned on.	BCM connector or circuit	WT-36
	BCM	
ID registration can not be operated.	Transmitter	WT-36
	Remote keyless entry receiver connector or circuit	
	Remote keyless entry receiver	
	BCM connector or circuit	
	BCM	

Control Unit Input/Output Signal Standard

NES0001F

Standards using a circuit tester and oscilloscope

Terminal (Wire color)	Item	Condition	Voltage (V) Approx. value
15 (W)	Tire pressure warning check connector	Always	5V
18 (B)	Remote keyless entry receiver (Ground)	—	0V
19 (Y)	Remote keyless entry receiver (Power supply)	Stand-by	 OCC3879D
		Press any of the keyfob switches	 OCC3882D
20 (L)	Remote keyless entry receiver (Signal)	Stand-by	 OCC3881D
		Press any of the keyfob switches	 OCC3880D
38 (W/L)	Ignition switch	Ignition switch ON or START	Battery voltage (12V)
39 (L)	Data line (CAN H)	—	—
40 (P)	Data line (CAN L)	—	—
42 (GY)	Battery power supply (Fuse)	Always	Battery voltage (12V)
45 (G/W)	Turn signal (left)	● Ignition switch ON ● Combination switch is turn left ON	 SKIA3009J

Terminal (Wire color)	Item	Condition	Voltage (V) Approx. value
46 (PU/W)	Turn signal (right)	● Ignition switch ON ● Combination switch is turn right ON	 SKIA3009J
52 (B)	GND	—	0V
55 (R)	Battery power supply (F/L)	Always	Battery voltage (12V)

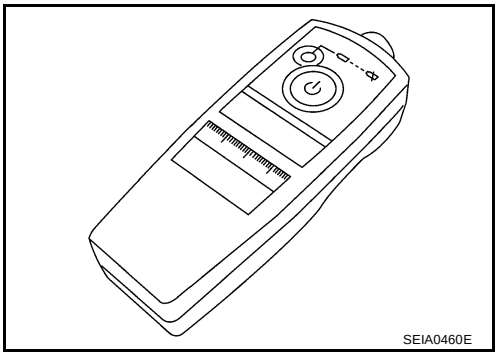
ID Registration Procedure

NES0001G

ID REGISTRATION WITH ACTIVATION TOOL

This procedure must be done after replacing or rotating wheels, replacing transmitter or BCM.

1. Select “AIR PRESSURE MONITOR” on “SELECT WORK ITEM”.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen, and select “ID REGIST”.
3. With the activation tool (J-45295) pushed against the front-left transmitter position of the tire air valve, press the button then keep 5 seconds.
4. Register the IDs in order from FR LH, FR RH, RR RH to RR LH. When ID registration of each wheel has been completed, a buzzer sounds and turn signal lamp (LH/ RH) blinks.


SEIA0460E

Activation tire position		Buzzer	Turn signal lamp	CONSULT-III
1	Front LH	Once	2 times flashing	“Red” ↓ “Green”
2	Front RH	2 times		
3	Rear RH	3 times		
4	Rear LH	4 times		

5. After completing all ID registrations, press “END” to complete the procedure.

NOTE:
Be sure to register the IDs in order from FR LH, FR RH, RR RH, to RR LH, or the self-diagnostic results display will not function properly.

ID REGISTRATION WITHOUT ACTIVATION TOOL

This procedure must be done after replacing or rotating wheels, replacing transmitter or BCM.

1. Select “AIR PRESSURE MONITOR” on “SELECT WORK ITEM”.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen, and select “ID REGIST”.
3. Adjust the tire pressure to the values shown in the table below for ID registration, and drive the vehicle at 40 km/h (25 MPH) or more for a few minutes.

Tire position	Tire pressure kPa (kg/cm^2 , psi)
Front – Left	240 (2.4, 34)
Front – Right	220 (2.2, 31)
Rear – Right	200 (2.0, 29)
Rear – Left	180 (1.8, 26)

4. After completing all ID registrations, press “END” to complete the procedure.

Activation tire position	CONSULT-III
Front LH	“Red” ↓ “Green”
Front RH	
Rear RH	
Rear LH	

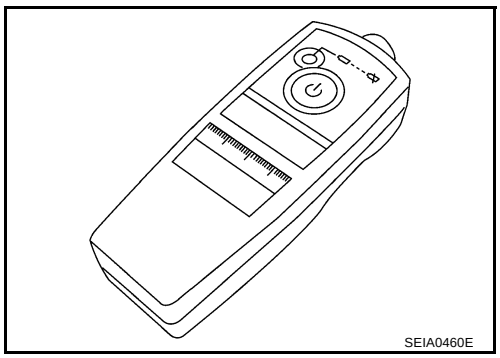
5. Inflate all tires to proper pressure. Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

Transmitter Wake Up Operation

NES0001H

WITH ACTIVATION TOOL

1. With the activation tool (J-45295) pushed against the front-left transmitter, press the button for 5 seconds.
   - When ignition switch ON, as the low tire pressure warning lamp blinks per the follow diagram, the respective transmitter then must be woken up.



Warning lamp blinking timing	Need to activation tire position
ON / OFF: a, b — a : 0.3sec, b : 1.3sec	Front LH
ON / OFF: a, a, a, b — a : 0.3sec, b : 1.3sec	Front RH
ON / OFF: a, a, a, a, b — a : 0.3sec, b : 1.3sec	Rear RH
ON / OFF: a, a, a, a, a, b — a : 0.3sec, b : 1.3sec	Rear LH
ON / OFF: a, b — a : 2sec, b : 0.2sec	All tire

SEIA0378E

2. Register the ID of wheel that warning lamp flashes. When wake up of registered wheel has been completed, turn signal lamp flashes two times.
3. After completing wake up of all transmitters, make sure low tire pressure warning lamp goes out.

CONSULT-III Function (BCM)

NES000DL

CONSULT-III MAIN FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis part	Mode	Function
Air pressure monitor	Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
	Self-diagnostic results	Self-diagnostic results can be read and erased quickly.
	Data monitor	Input/Output data in the control unit can be read.
	Active test	Diagnostic Test Mode in with CONSULT-III drives some actuators apart from the control unit (BCM) and also shifts some parameters in a specified range.

WORK SUPPORT MODE

ID Read

The registered ID number is displayed.

ID Regist

Refer to WT-21, "ID Registration Procedure" .

SELF-DIAG RESULTS MODE

Display Item List

DTC	Diagnostic item	Diagnostic item is detected when …	Check items
C1704	FLAT_TIRE_FL	Front-left tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	—
C1705	FLAT_TIRE_FR	Front-right tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
C1706	FLAT_TIRE_RR	Rear-right tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
C1707	FLAT_TIRE_RL	Rear-left tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
C1708	[NO_DATA]_FL	Data from front-left transmitter cannot be received.	WT-30
C1709	[NO_DATA]_FR	Data from front-right transmitter cannot be received.	
C1710	[NO_DATA]_RR	Data from rear-right transmitter cannot be received.	
C1711	[NO_DATA]_RL	Data from rear-left transmitter cannot be received.	
C1712	[CHECKSUM_ERR]_FL	Checksum data from front-left transmitter is malfunctioning.	WT-30
C1713	[CHECKSUM_ERR]_FR	Checksum data from front-right transmitter is malfunctioning.	
C1714	[CHECKSUM_ERR]_RR	Checksum data from rear-right transmitter is malfunctioning.	
C1715	[CHECKSUM_ERR]_RL	Checksum data from rear-left transmitter is malfunctioning.	
C1716	[PRESSDATA_ERR]_FL	Air pressure data from front-left transmitter is malfunctioning.	WT-31
C1717	[PRESSDATA_ERR]_FR	Air pressure data from front-right transmitter is malfunctioning.	
C1718	[PRESSDATA_ERR]_RR	Air pressure data from rear-right transmitter is malfunctioning.	
C1719	[PRESSDATA_ERR]_RL	Air pressure data from rear-left transmitter is malfunctioning.	
C1720	[CODE_ERROR]_FL	Function code data from front-left transmitter is malfunctioning.	WT-30
C1721	[CODE_ERROR]_FR	Function code data from front-right transmitter is malfunctioning.	
C1722	[CODE_ERROR]_RR	Function code data from rear-right transmitter is malfunctioning.	
C1723	[CODE_ERROR]_RL	Function code data from rear-left transmitter is malfunctioning.	
C1724	[BATT_VOLT_LOW]_FL	Battery voltage of front-left transmitter drops.	WT-30
C1725	[BATT_VOLT_LOW]_FR	Battery voltage of front-right transmitter drops.	
C1726	[BATT_VOLT_LOW]_RR	Battery voltage of rear-right transmitter drops.	
C1727	[BATT_VOLT_LOW]_RL	Battery voltage of rear-left transmitter drops.	
C1729	VHCL_SPEED_SIG_ERR	Vehicle speed signal is error.	WT-32

NOTE:
Before performing the self-diagnosis, be sure to register the ID, or else the actual malfunction location may be different from that displayed on CONSULT-III.

DATA MONITOR MODE

Display Item List

Monitor item (Unit)	Remarks
VEHICLE SPEED [km/h] or [mph]	Vehicle speed is displayed.
AIR PRESS FL [kpa] or [psi]	Tire pressure is displayed.
AIR PRESS FR [kPa] or [psi]	Tire pressure is displayed.
AIR PRESS RR [kpa] or [psi]	Tire pressure is displayed.
AIR PRESS RL [kpa] or [psi]	Tire pressure is displayed.
ID REGST FL 1 [DONE/YET]	Registration ID is displayed.
ID REGST FR 1 [DONE/YET]	Registration ID is displayed.
ID REGST RR 1 [DONE/YET]	Registration ID is displayed.
ID REGST RL 1 [DONE/YET]	Registration ID is displayed.
WARNING LAMP [ON/OFF]	Control status of low tire pressure warning lamp is displayed.
BUZZER [ON/OFF]	Buzzer in combination meter is displayed.

ACTIVE TEST MODE

NOTE:

Before performing the self-diagnosis, be sure to register the ID, or else the actual malfunction location may be different from that displayed on CONSULT-III.

TEST ITEM LIST

Test item	Content
FLASHER	This test is able to check to make sure that each turn signal lamp turns on.
HORN	This test is able to check to make sure that the horn sounds.
WARNING LAMP	This test is able to check to make sure that the warning lamp turns on.
ID REGIST WARNING	This test is able to check to make sure that the buzzer sounds or the warning lamp turns on.
FLAT TIRE WARNING	This test is able to check to make sure that the buzzer sounds or the warning lamp turns on.

Diagnosis Procedure with Warning Lamp Function (Without CONSULT-III)

NES000A4

DESCRIPTION

During driving, the low tire pressure warning system receives the signal transmitted from the transmitter installed in each wheel. The control unit (BCM) of this system has pressure judgement and trouble diagnosis functions.

FUNCTION

When the low tire pressure warning system detects low inflation pressure or another unusual symptom, the warning lamps in the combination meter comes on. To start the self-diagnostic results mode, ground terminal of the tire pressure warning check connector. The malfunction location is indicated by the warning lamp flashing. Refer to PG-41, "HARNESS" .

MALFUNCTION CODE CHART

Code (warning lamp blinks)	Diagnosis item	Reference
15	Front-left tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	—
16	Front-right tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
17	Rear-right tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
18	Rear-left tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
21	Transmitter no data (front - left)	WT-30
22	Transmitter no data (front - right)	
23	Transmitter no data (rear - right)	
24	Transmitter no data (rear - left)	
31	Transmitter checksum error (front - left)	WT-30
32	Transmitter checksum error (front - right)	
33	Transmitter checksum error (rear - right)	
34	Transmitter checksum error (rear - left)	
35	Transmitter pressure data error (front - left)	WT-31
36	Transmitter pressure data error (front - right)	
37	Transmitter pressure data error (rear - right)	
38	Transmitter pressure data error (rear - left)	
41	Transmitter function code error (front - left)	WT-30
42	Transmitter function code error (front - right)	
43	Transmitter function code error (rear - right)	
44	Transmitter function code error (rear - left)	
45	Transmitter battery voltage low (front - left)	WT-30
46	Transmitter battery voltage low (front - right)	
47	Transmitter battery voltage low (rear - right)	
48	Transmitter battery voltage low (rear - left)	
52	Vehicle speed signal	WT-32

LOW TIRE PRESSURE WARNING LAMP SYMPTOM CHART

Diagnosis Item	Symptom (Ignition switch ON)	Low tire pressure warning lamp	Cause	Action
Low tire pressure warning lamp	Warning light comes on immediately and turns off after 1 second.	 ON 1 sec > stays OFF SEIA0592E	All wheel transmitters are “activated” (working).	None (system OK)
	Warning light blinks on for 2 seconds, then turns off for 0.2 seconds-repeats.	 Blinks: ON 2 sec > OFF 0.2 sec SEIA0593E	All wheel transmitters are not activated.	Activate all wheel transmitters. Refer to WT-22, "Transmitter Wake Up Operation" .
	Warning light blinks 1 time.	 Blinks 1 time ON 0.3 sec > OFF 1.0 sec PEIA0073E	Front LH wheel transmitter is not activated.	Activate front LH wheel transmitter. Refer to WT-22, "Transmitter Wake Up Operation" .
	Warning light blinks 2 times.	 Blinks 2 times ON 0.3 sec > OFF 0.3 sec SEIA0595E	Front RH wheel transmitter is not activated.	Activate front RH wheel transmitter. Refer to WT-22, "Transmitter Wake Up Operation" .
	Warning light blinks 3 times.	 Blinks 3 times ON 0.3 sec > OFF 0.3 sec SEIA0596E	Rear RH wheel transmitter is not activated.	Activate rear RH wheel transmitter. Refer to WT-22, "Transmitter Wake Up Operation" .

Diagnosis Item	Symptom (Ignition switch ON)	Low tire pressure warning lamp	Cause	Action
Low tire pressure warning lamp	Warning light blinks 4 times.	 Blinks 4 times ON 0.3 sec > OFF 0.3 sec SEIA0597E	Rear LH wheel transmitter is not activated.	Activate rear LH wheel transmitter. Refer to WT-22, "Transmitter Wake Up Operation" .
	Warning light comes on and does not turn off.	 Comes ON and stays ON SEIA0598E	Tire pressure is low.	Check tire pressure with CONSULT-III. Refer to WT-24, "DATA MONITOR MODE" .
			The fuse for combination meter from battery is pulled out.	Check the fuse for combination meter from battery. Install or replace (if needed).
			BCM connector pulled out.	Check BCM connector. Reconnect if needed.
			Low tire pressure or tire pressure monitoring system malfunction.	● Perform CONSULT-III Self- Diagnosis. Refer to WT-23, "SELF-DIAG RESULTS MODE" . – Perform ID Registration if needed. Refer to WT-21, "ID Registration Procedure" .
Turn signal lamp	Turn signal lamp does not flash 2 times or horn does not sound after transmitter activation.	—	1. Tool J-45295 (special service tool) battery low. 2. Ignition OFF during activation. 3. Tool J-45295 (special service tool) not positioned correctly. 4. Transmitters already activated.	1. Install new battery. 2. Make sure ignition is ON during activation. 3. Position tool correctly during activation. 4. None

NOTE:
If more than one wheel transmitter is NOT activated, the warning light blinking patterns for those wheels will combine. (Example: one blink/OFF/three blinks = Rear LH and Rear RH transmitters are not activated.)

Preliminary Check

NES0001K

BASIC INSPECTION

1. CHECK ALL TIRE PRESSURES

- Check all tire pressures. Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

OK or NG

OK >> GO TO 2.
NG >> Adjust tire pressure to specified value.

2. CHECK LOW TIRE PRESSURE WARNING LAMP ACTIVATION

- Check low tire pressure warning lamp activation.

Dose low tire pressure warning lamp activate for 1 second when ignition switch is turned “ON”?

YES >> GO TO 3.
NO >> Check fuse and combination meter.

3. CHECK CONNECTOR

1. Disconnect BCM harness connectors M90 and M91.
2. Check terminals for damage or loose connection.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK ACTIVATION TOOL

- Check activation tool battery.

OK or NG

OK >> Perform self-diagnosis.
NG >> Replace activation tool battery.

TROUBLE DIAGNOSIS FOR SELF-DIAGNOSTIC ITEMS

PFP:00000

Transmitter or Control Unit (BCM)

NES0001M

MALFUNCTION CODE NO. 21, 22, 23 OR 24

1. CHECK CONTROL UNIT

- Drive for several minutes. Check all tire pressures with CONSULT-III “DATA MONITOR”.

Are all tire pressures displayed 0 kPa?

YES >> GO TO 2.
NO >> GO TO 3.

2. CHECK REMOTE KEYLESS ENTRY RECEIVER CONNECTOR

1. Disconnect remote keyless entry receiver harness connector M78.
2. Check terminals for damage or loose connection.
3. Reconnect harness connector.

OK or NG

OK >> Replace BCM refer to BCS-17, "Removal and Installation of BCM" , then GO TO 3.
NG >> Repair or replace remote keyless entry receiver harness connector.

3. ID REGISTRATION

- Perform ID registration of all transmitters.

Is there any tire that ID cannot be registered to?

YES >> Replace transmitter of the tire, then GO TO 5.
NO >> GO TO 4.

4. VEHICLE DRIVING

- Drive at a speed of 40 km/h (25 MPH) or more for several minutes without stopping.
  Check all tire pressures with CONSULT-III “DATA MONITOR” within 15 minutes after vehicle speed becomes 17 km/h (11 MPH).

Does “DATA MONITOR” display tire pressure as normal without any warning lamp?

YES >> INSPECTION END
NO >> GO TO 5.

5. ID REGISTRATION AND VEHICLE DRIVING

1. Perform ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tire pressures with CONSULT-III “DATA MONITOR” within 5 minutes.

Does “DATA MONITOR” display tire pressure as normal without any warning lamp?

YES >> INSPECTION END
NO >> GO TO the inspection applicable to DTC.

Transmitter - 1

NES0001N

MALFUNCTION CODE NO. 31, 32, 33, 34, 41, 42, 43, 44, 45, 46, 47 OR 48

1. ID REGISTRATION (CORRECTION OF TRANSMITTER LOCATION)

1. Perform ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes.

>> GO TO 2.

2. REPLACE TRANSMITTER

1. Check low tire pressure warning condition again, and replace malfunctioning transmitter.
2. Perform ID registration of all transmitters.

Can ID registration of all transmitters be completed?

YES >> GO TO 3.
NO >> GO TO the inspection 1. Refer to WT-30, "Transmitter or Control Unit (BCM)" .

3. VEHICLE DRIVING

- Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tire pressures with CONSULT-III “DATA MONITOR” within 5 minutes.

Does “DATA MONITOR” display tire pressure as normal without any warning lamp?

YES >> INSPECTION END
NO >> Replace malfunctioning transmitter, and perform “Step 3” again.

Transmitter - 2

NES0001O

MALFUNCTION CODE NO. 35, 36, 37 OR 38

1. CHECK ALL TIRE PRESSURE

- Check all tire pressures. Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

Are there any tires whose pressure is “64 psi” or more?

YES >> Adjust tire pressure to specified value.
NO >> GO TO 2.

2. VEHICLE DRIVING

1. Perform ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for several minutes without stopping.
   Check all tire pressures with CONSULT-III “DATA MONITOR” within 15 minutes after vehicle speed becomes 17 km/h (11 MPH).

>> Replace transmitter with new one if “DATA MONITOR” displays 64 psi or more. Then GO TO 3.

3. ID REGISTRATION AND VEHICLE DRIVING

1. Perform ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tire pressures with CONSULT-III “DATA MONITOR” within 5 minutes.

Does “DATA MONITOR” display tire pressure as normal without any warning lamp?

YES >> INSPECTION END
NO >> GO TO the inspection applicable to DTC.

Vehicle Speed Signal

NES0001P

MALFUNCTION CODE NO. 52

1. CHECK SELF-DIAGNOSTIC RESULTS

1. Perform “CONSULT-III Start procedure”.
2. Touch “BCM” on “SELECT SYSTEM” screen.
3. Touch “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
4. Check display contents in self-diagnostic results.

Is the “CAN COMM CIRCUIT” displayed in the self-diagnosis display?

YES >> Perform trouble diagnosis for CAN communication system.
NO >> Check combination meter. Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Warning Lamp Does Not Come On When Ignition Switch Is Turned On

NES0001Q

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

1. Perform “CONSULT-III Start Procedure”.
2. Touch “BCM” on “SELECT SYSTEM” screen.
3. Touch “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
4. Check display contents in self-diagnostic results.

Is the “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Perform trouble diagnosis for CAN communication system.
NO >> GO TO 2.

2. CHECK COMBINATION METER

Check combination meter function.

OK or NG

OK >> GO TO 3.
NG >> Check combination meter. Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

3. CHECK LOW TIRE PRESSURE WARNING LAMP

1. Turn ignition switch OFF.
2. Disconnect BCM harness connectors M90 and M91.

Does the warning lamp activate?

YES >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NO >> Check combination meter and repair or replace.

Warning Lamp Stays On When Ignition Switch Is Turned On

NES0001R

DIAGNOSTIC PROCEDURE

1. PERFORM SELF-DIAGNOSIS

1. Turn ignition switch ON. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “AIR PRESSURE MONITOR” with CONSULT-III.
3. Touch “ERASE”.
4. Turn ignition switch OFF.
5. Start engine.

Does low tire pressure warning lamp turn OFF?

YES >> INSPECTION END
NO >> GO TO 2.

2. PERFORM ID REGISTRATION

Perform ID registration all transmitters. Refer to WT-21, "ID Registration Procedure" .

Does low tire pressure warning lamp turn OFF?

YES >> INSPECTION END
NO >> GO TO 3.

3. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect BCM harness connectors M90 and M91.
3. Check terminals for damage or loose connections.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

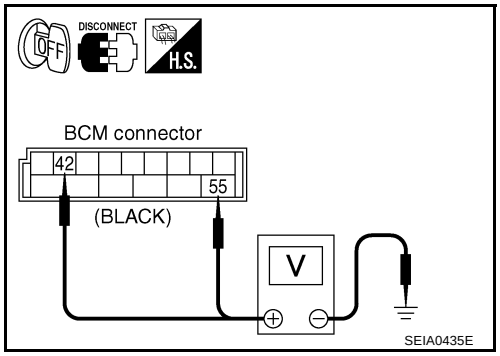
4. CHECK POWER SUPPLY CIRCUIT (BATTERY)

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Check voltage between BCM harness connector M91 terminals 42, 55 and ground.

Connector	Terminal	Voltage (Approx.)
M91	42 - Ground	Battery voltage
	55 - Ground	

OK or NG

OK >> GO TO 5.
NG >> Check BCM power supply circuit for open or short.



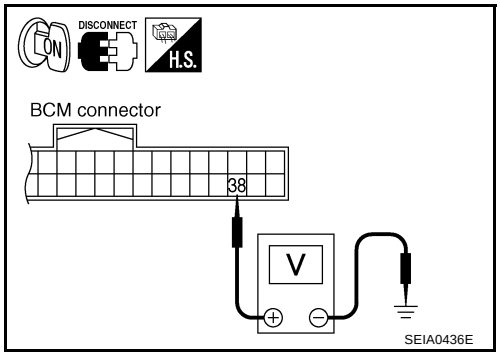
5. CHECK POWER SUPPLY CIRCUIT (IGN)

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Turn ignition switch ON.
4. Check voltage between BCM harness connector M90 terminal 38 and ground.

Connector	Terminal	Voltage (Approx.)
M90	38 - Ground	Battery voltage

OK or NG

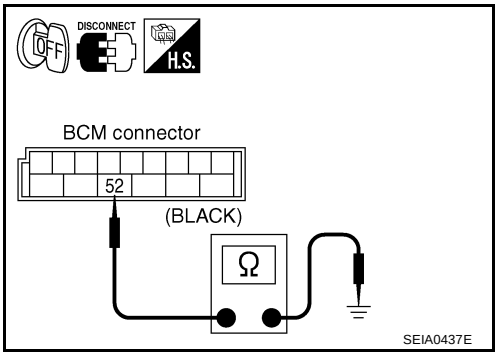
OK >> GO TO 6.
NG >> Check BCM power supply circuit for open or short.



6. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Check continuity between BCM harness connector M91 terminal 52 and ground.

Continuity should exist.



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair or replace BCM ground circuit.

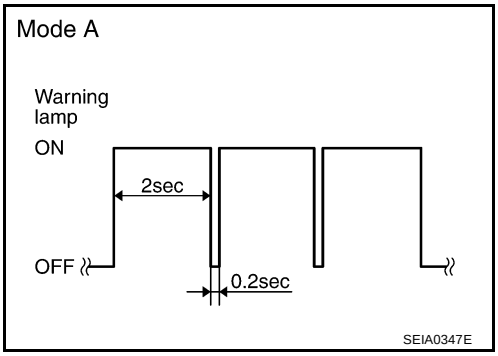
Warning Lamp Blinks When Ignition Switch Is Turned On

NES0001S

NOTE:
If warning lamp blinks below, the system is normal.

Blink Mode A

- This mode shows transmitter status is OFF-mode.
  Perform transmitter wake up operation. Refer to WT-22, "Transmitter Wake Up Operation" .



DIAGNOSTIC PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector M90.
3. Check terminals for damage or loose connections.

OK or NG

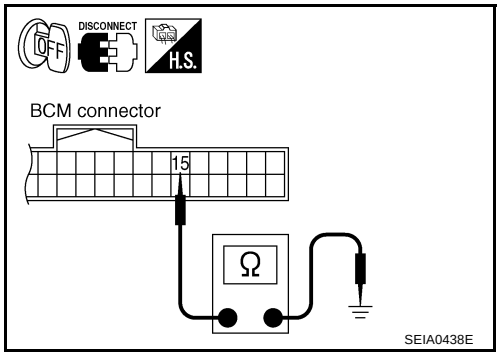
OK >> GO TO 2.

NG >> Repair or replace damaged parts.

2. CHECK TIRE PRESSURE WARNING CHECK SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Check continuity between BCM harness connector M90 terminal 15 and ground.

Continuity should exist.



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair or replace harness connector.

Turn Signal Lamp Blinks When Ignition Switch Is Turned On

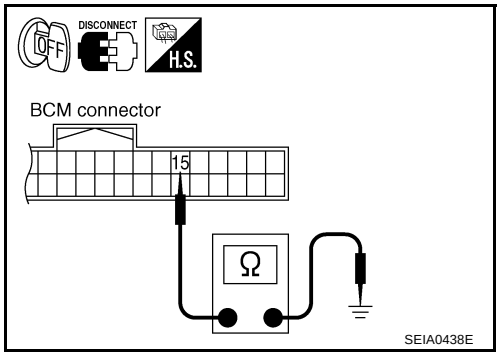
NES0001T

DIAGNOSTIC PROCEDURE

1. CHECK TIRE PRESSURE WARNING CHECK SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Check continuity between BCM harness connector M90 terminal 15 and ground.

Continuity should exist.



OK or NG

OK >> Check turn signal lamp operation. Refer to LT-65, "TURN SIGNAL AND HAZARD WARNING LAMPS" .

NG >> Repair or replace harness connector.

ID Registration Can Not Be Completed

NES0001U

DIAGNOSTIC PROCEDURE

1. ID REGISTRATION (ALL)

- Perform ID registration of all transmitters.

Can ID registration of all transmitters be completed?

YES >> INSPECTION END

NO >> GO TO WT-30, "TROUBLE DIAGNOSIS FOR SELF-DIAGNOSTIC ITEMS" .

REMOVAL AND INSTALLATION

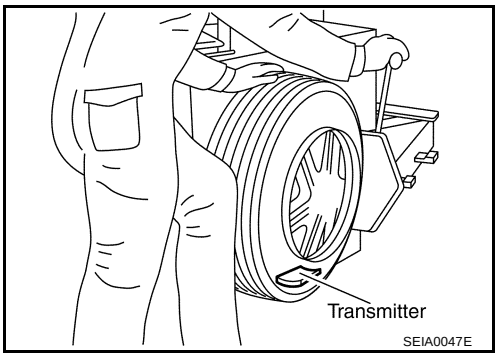
PFP:00000

Transmitter

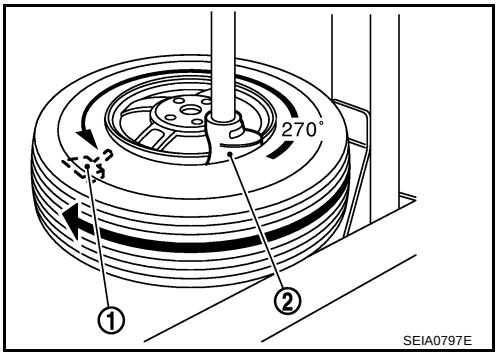
NES0001V

REMOVAL

1. Deflate tire. Unscrew transmitter retaining nut and allow transmitter to fall into tire.
2. Gently bounce tire so that transmitter falls to bottom of tire. Place on tire changing machine and break both tire beads ensuring that the transmitter remains at the bottom of the tire.

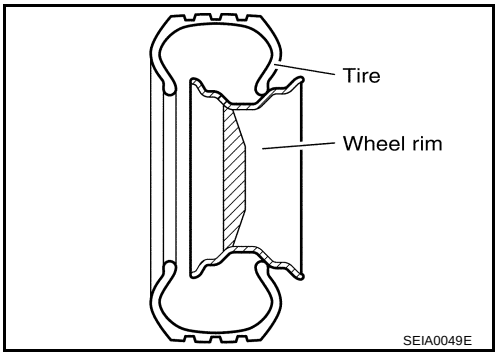


3. Turn tire so that valve hole is at bottom and bounce so that transmitter (1) is near valve hole. Carefully lift tire onto turntable and position valve hole (and transmitter) 270 degree from mounting/dismounting head (2).
4. Lubricate tire well and remove first side of the tire. Reach inside the tire and remove the transmitter.



INSTALLATION

1. Put first side of tire onto rim.

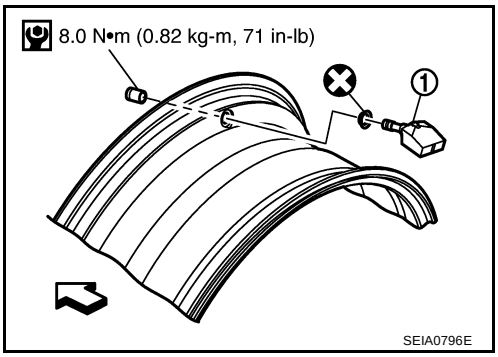


2. Mount transmitter (1) on rim and tighten nut.

CAUTION:

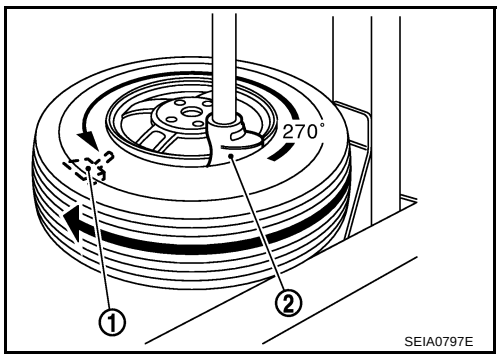
Speed for tightening nut should be less than 10 rpm.

⇦ : Outside



3. Place wheel on turntable of tire machine. Ensure that transmitter (1) is 270 degree from mounting head (2) when second side of tire is fitted.

   NOTE:
   Do not touch transmitter at mounting head.



4. Lubricate tire well and fit second side of tire as normal. Ensure that tire does not rotate relative to rim.
5. Inflate tire and fit to appropriate wheel position.

REMOTE KEYLESS ENTRY RECEIVER

Removal

1. Remove the front kicking plate LH. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove the dash side finisher LH. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove the instrument lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove the glove box assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Disconnect keyless entry receiver connector.

Installation

Install in the reverse order of removal.

BCM (BODY CONTROL MODULE)

Removal

Remove the BCM. Refer to BCS-17, "Removal and Installation of BCM" .

Installation

Install in the reverse order of removal.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Road Wheel

NES0001W

Kind of wheel		Aluminum	Steel (for tenporary tire)
Maximum radial runout limit	Lateral deflection	Less than 0.3 mm (0.012 in)	Less than 1.5 mm (0.059 in)
	Vertical deflection		
Maximum Allowable unbalance	Dynamic (At rim flange)	Less than 5g (0.14 oz) (one side)	
	Static (At rim flange)	Less than 10g (0.35 oz)	

Unit: mm (in)

Wheel size	Offset
18 × 8JJ	30 (1.18)
18 × 8 1/2JJ	33 (1.30)
18 × 9JJ	30 (1.18)
19 × 10JJ	30 (1.18)
17 × 4T	30 (1.18)

Tire

NES0001X

Unit: kPa (kg/cm^2 , psi)

Tire size	Air pressure			
	Front		Rear	
	Coupe	Roadster	Coupe	Roadster
225/45R18 91W	240 (2.4, 35)		—	
245/40R18 93W			—	
245/45R18 96W	—		240 (2.4, 35)	
265/35R19 94W	—			
T145/80 D17	420 (4.2, 60)			

Tightening Torque

NES0001Y

Wheel nut	108 N·m (11 kg-m, 80 ft-lb)

SECTION WW
WIPER, WASHER & HORN

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PRECAUTION

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS00544

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

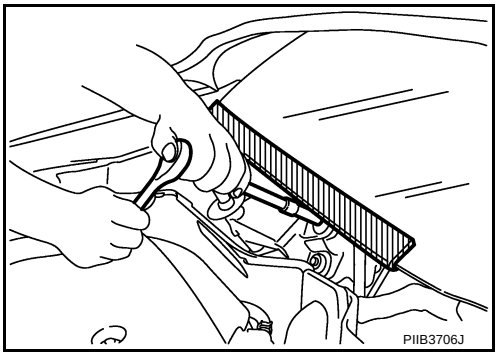
WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Procedures without Cowl Top Cover

NKS00545

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Battery Service

NKS00546

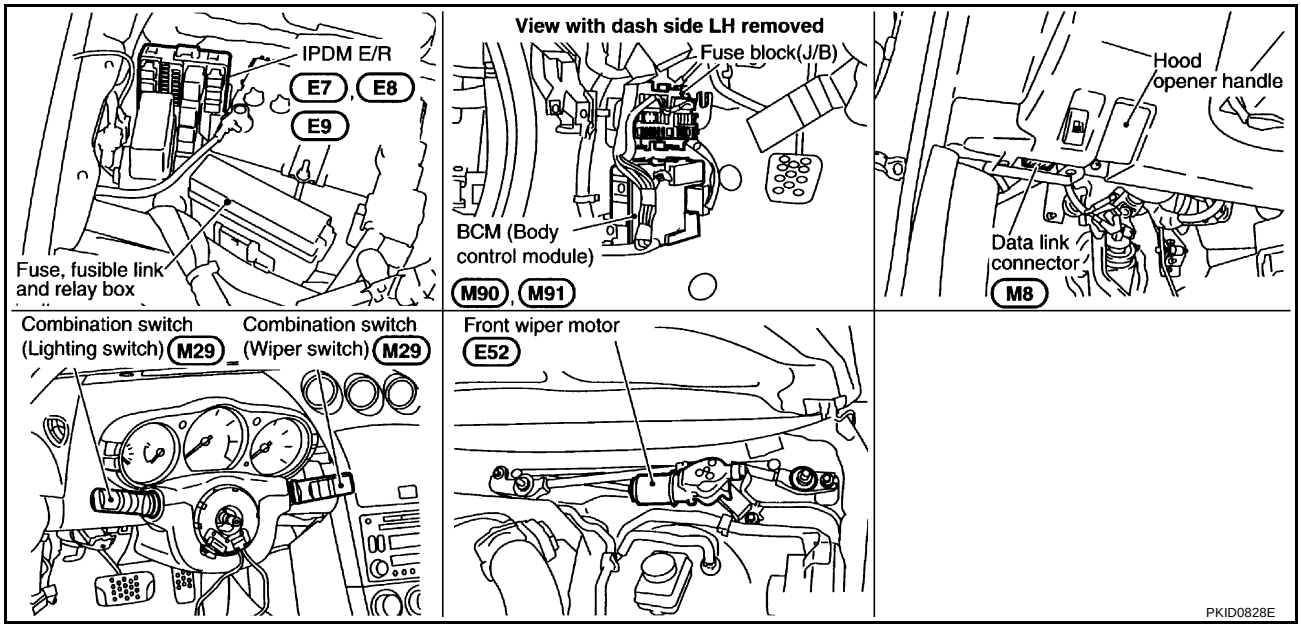
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

FRONT WIPER AND WASHER SYSTEM

PFP:28810

Components Parts and Harness Connector Location

NKS0051Z



System Description

NKS00520

- All front wiper relays (HI, LO) are included in IPDM E/R (intelligent power distribution module engine room).
- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM (body control module) when switch is turned ON.
- BCM controls front wiper LO, HI, and INT (intermittent) operation.
- IPDM E/R operates wiper motor according to CAN communication signals from BCM.

OUT LINE

Power is supplied at all times

- to ignition relay, located in IPDM E/R, from battery direct
- through 40 A fusible link [letter F, located in fuse, fusible link and relay box]
- to BCM terminal 55,
- through 10 A fuse [No.18 located in fuse block (J/B)]
- to BCM terminal 42,
- through 30 A fuse [No.73 located in IPDM E/R]
- to front wiper relay, located in IPDM E/R,
- through 15 A fuse [No.78 located in IPDM E/R]
- to CPU (central processing unit) located in IPDM E/R,
- through 10 A fuse [No.71 located in IPDM E/R]
- to CPU located in IPDM E/R.

When ignition switch is in ON or START position, power is supplied

- to ignition relay, located in IPDM E/R,
- through 10 A fuse [No.1 located in fuse block (J/B)]
- to BCM terminal 38,
- through ignition relay, located in IPDM E/R
- to front wiper relay, located in IPDM E/R
- to front wiper high relay, located in IPDM E/R
- to CPU located in IPDM E/R,
- through 10 A fuse [No.84 located in IPDM E/R]
- through IPDM E/R terminal 44

- to front washer pump terminal 2.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone),
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to combination switch terminal 12
- through grounds M30 and M66.

LOW SPEED WIPER OPERATION

When the front wiper switch is in low position, BCM detects low speed wiper ON signal by BCM wiper switch reading function.
BCM sends front wiper request signal (LOW) with CAN communication line

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When the IPDM E/R receives front wiper request signal (LOW), it turns ON front wiper relay, located in the IPDM E/R, power is supplied

- to front wiper motor terminal 3
- through IPDM E/R terminal 21 and front wiper high relay and front wiper relay.

Ground is supplied

- to front wiper motor terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone),
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With power and ground is supplied, front wiper motor operates at low speed.

HIGH SPEED WIPER OPERATION

When the front wiper switch is in high position, BCM detects high speed wiper ON signal by BCM wiper switch reading function.
BCM sends front wiper request signal (HI) with CAN communication line

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When the IPDM E/R receives front wiper request signal (HI), it turns ON front wiper relay, located in IPDM E/R, power is supplied

- to front wiper motor terminal 2
- through IPDM E/R terminal 31 and front wiper high relay and front wiper relay.

Ground is supplied

- to front wiper motor terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone),
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With power and ground is supplied, front wiper motor operates at high speed.

INTERMITTENT OPERATION

Front wiper intermittent operation delay interval is determined from a combination of 3 switches (intermittent operation dial position 1, 2, and 3) and vehicle speed signal.
After each intermittent operation delay interval, BCM sends front wiper request signal to IPDM E/R.

Wiper Dial Position Setting

Wiper dial position	Intermittent operation interval	Combination switch		
		Intermittent operation dial position 1	Intermittent operation dial position 2	Intermittent operation dial position 3
1	Short	ON	ON	ON
2		ON	ON	OFF
3		ON	OFF	OFF
4	↑ ↓	OFF	OFF	OFF
5		OFF	OFF	ON
6		OFF	ON	ON
7	Long	OFF	ON	OFF

Example: For wiper dial position 1
Using combination switch reading function, BCM detects ON/OFF status of intermittent operation dial positions 1, 2, and 3.
When combination switch status is as listed below, BCM determines that it is wiper dial position 1.

- Intermittent operation dial position 1: ON (Continuity exists between combination switch output 3 and input 1.)
- Intermittent operation dial position 2: ON (Continuity exists between combination switch output 5 and input 1.)
- Intermittent operation dial position 3: ON (Continuity exists between combination switch output 4 and input 2.)

BCM determines front wiper intermittent operation delay interval from wiper dial position 1 and vehicle speed, and sends wiper request signal (INT) to IPDM E/R.

AUTO STOP OPERATION

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach windshield base.
When the wiper arms are not located at base of windshield with wiper switch OFF, ground is provided

- from IPDM E/R terminal 21
- to front wiper motor terminal 3, in order to continue wiper motor operation at low speed

When the wiper arms reach base of windshield, front wiper motor terminals 1 and 4 are connected, and ground is supplied

- to IPDM E/R terminal 32
- through front wiper motor terminals 1 and 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone),
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

Then the IPDM E/R sends auto stop operation signal to BCM with CAN communication.
When the BCM receives auto stop operation signal, BCM sends wiper stop signal to IPDM E/R with CAN communication line. IPDM E/R stops wiper motor. Wiper motor will then stop wiper arms at the STOP position.

WASHER OPERATION

When the wiper switch is in front wiper washer position, BCM detect front wiper washer signal by BCM wiper switch reading function (Refer to WW-7, "COMBINATION SWITCH READING FUNCTION").
Combination switch ground is supplied

- to front washer pump terminal 1
- through combination switch terminal 11
- to combination switch terminal 12
- through grounds M30 and M66.

With ground is supplied, front washer pump is operated.
When the BCM detects that front washer pump has operated for 0.4 seconds or longer, BCM operates front wiper motor for low speed.
When the BCM detects washer switch is OFF, low speed operation cycles approximately 2 times and stops.

MIST OPERATION

When the wiper switch is turned to the mist position, wiper low speed operation cycles once and then stops.
For additional information about wiper operation under this condition, refer to WW-5, "LOW SPEED WIPER OPERATION" .
If switch is held in mist position, low speed operation continues.

FAIL-SAFE FUNCTION

If an abnormality occurs in CAN communications, IPDM E/R holds the condition just before fail-safe status is initiated until ignition switch is turned off. (If wipers were operating in LO just before the initiation of fail-safe status, they continue to operate in LO until ignition switch is turned OFF)

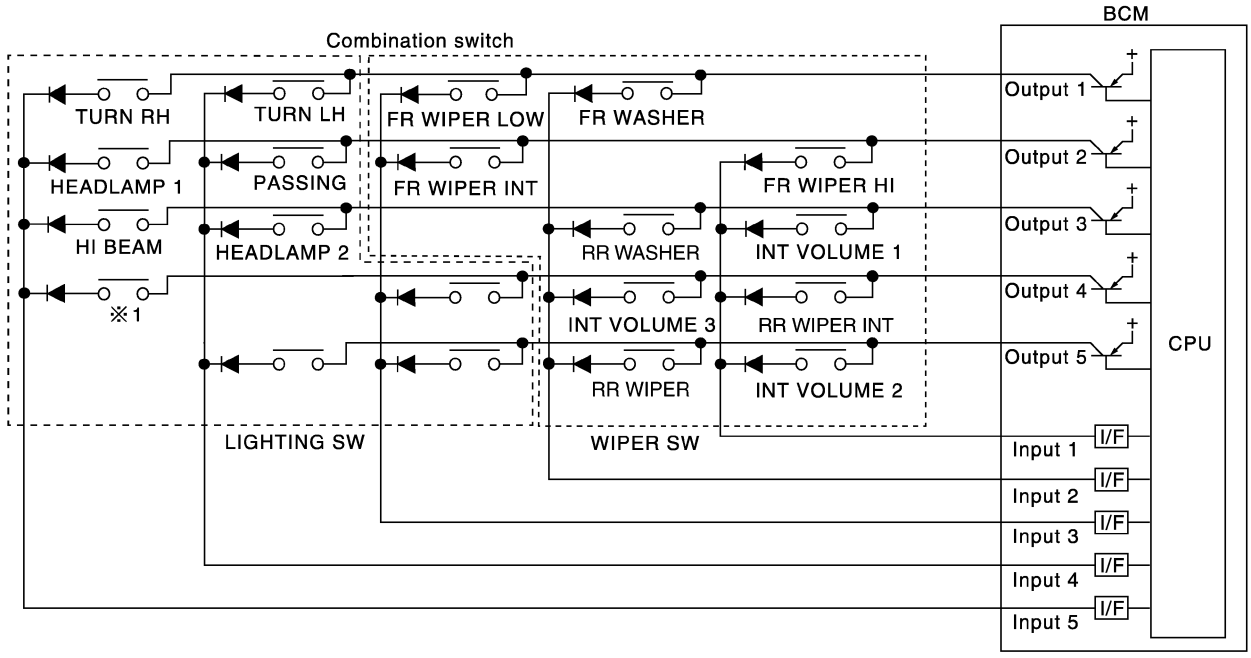
COMBINATION SWITCH READING FUNCTION

Description

- BCM reads combination switch (wiper) status, and controls related systems such as headlamps and wipers, according to the results.
- BCM reads information of a maximum of 20 switches by combining five output terminals (OUTPUT 1 - 5) and five input terminals (INPUT 1 - 5).

Operation Description

- BCM activates transistors of output terminals (OUTPUT 1 - 5) periodically, and allows current to flow in turn.
- If any (1 or more) switches are turned ON, circuit of output terminals (OUTPUT 1 - 5) and input terminals (INPUT 1 - 5) becomes active.
- At this time, transistors of output terminals (OUTPUT 1 - 5) are activated to allow current to flow. When voltage of input terminals (INPUT 1 - 5) corresponding to that switch changes, interface in BCM detects voltage change, and BCM determines that switch is ON.



※1 : LIGHTING SWITCH 1ST POSITION

PKIC4861E

BCM - Operation Table of Combination Switches

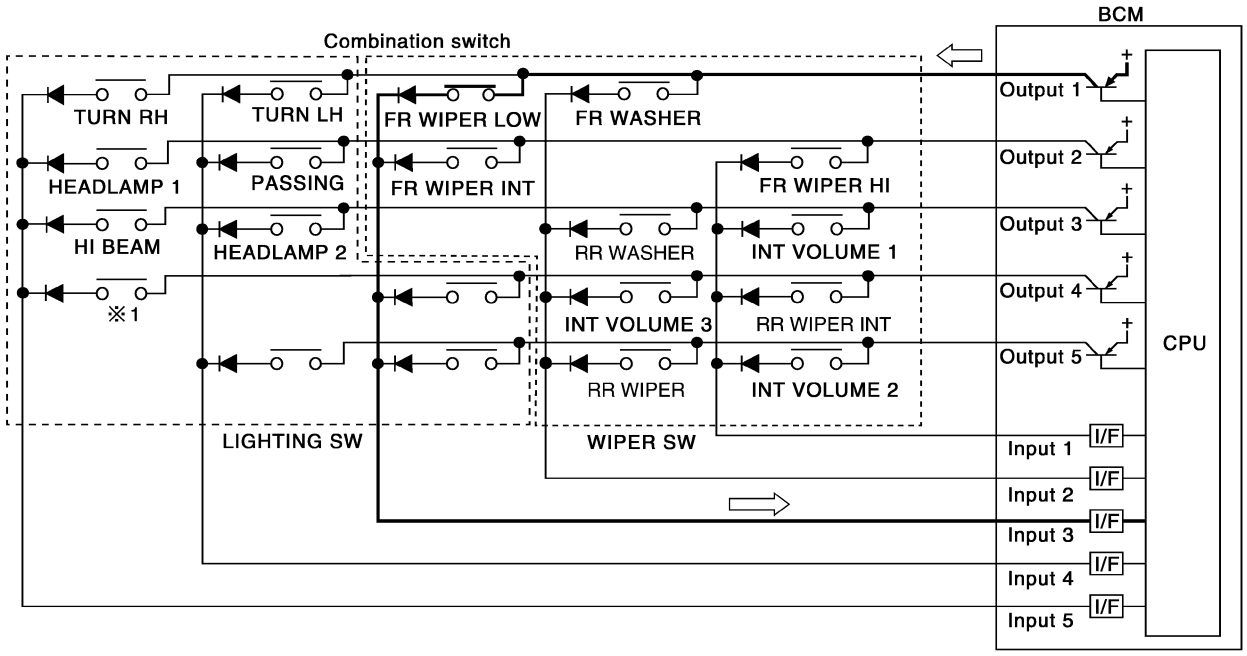
BCM reads operation status of combination switch using combinations shown in table below.

	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	—	—	FR WIPER HI ON	FR WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	RR WIPER INT ON	RR WIPER INT OFF	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	—	—	RR WASHER ON	RR WASHER OFF	INT VOLUME 3 ON	INT VOLUME 3 OFF	RR WIPER ON	RR WIPER OFF
COMB SW INPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	—	—	—	—	—	—
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	—	—	—	—
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1st) ON	LIGHTING SW (1st) OFF	—	—

PKIC4963E

Sample Operation: (When Wiper Switch Turned to LOW Position)

- When wiper switch is turned to LOW position, front wiper LOW contact in combination switch turns ON. At this time if OUTPUT 1 transistor is activated, BCM detects that voltage changes in INPUT 3.
- When BCM detects that voltage changes in INPUT 3 while OUTPUT 1 transistor is ON, it judges that front wiper switch is in LOW position. Then BCM sends front wiper request signal (LO) to IPDM E/R using CAN communication.
- If BCM detects that voltage changes in INPUT 3 when OUTPUT 1 transistor is activated again, it recognizes that wiper switch is still in LOW position.



※1 : LIGHTING SWITCH 1ST POSITION

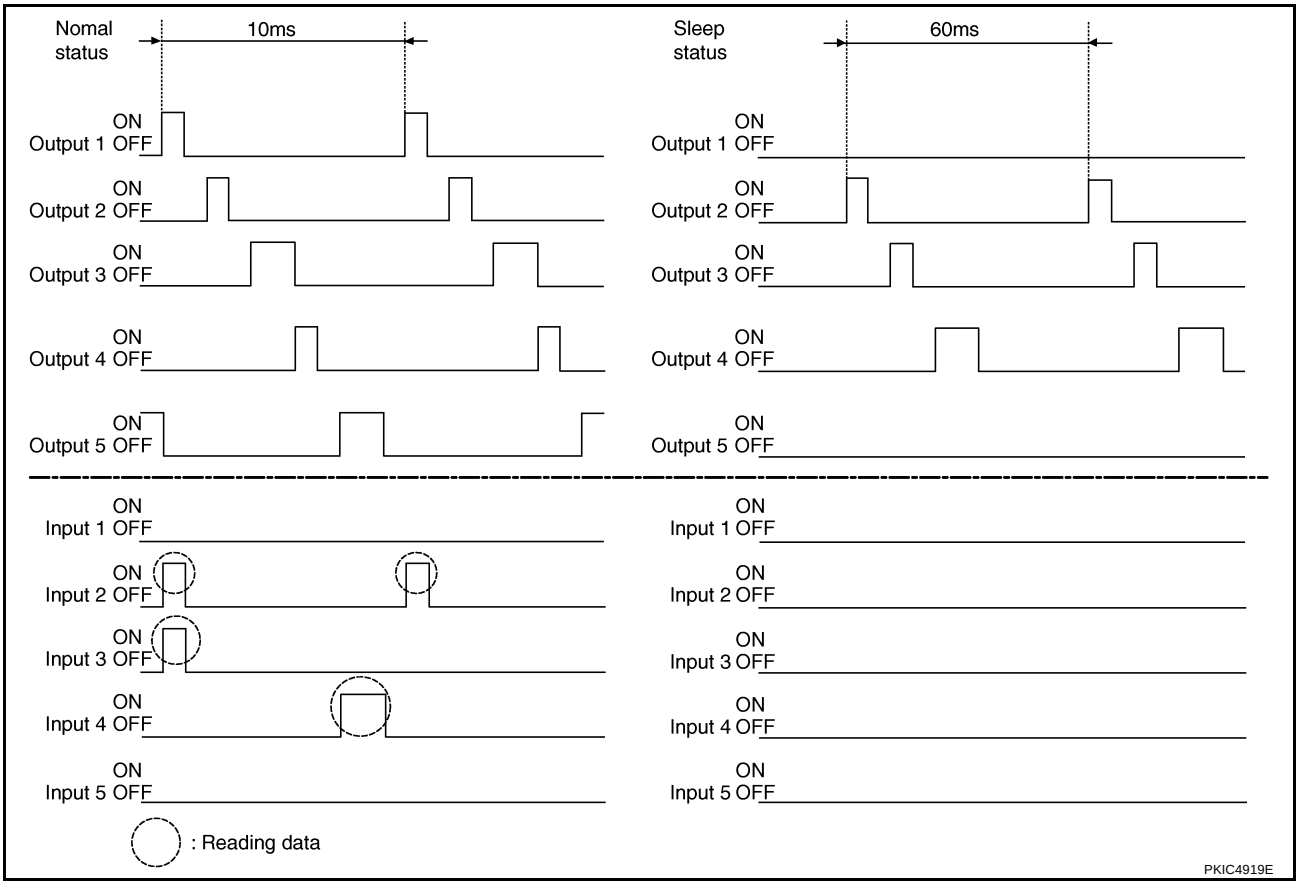
PKIC4862E

NOTE:
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore after switch is turned ON, electrical loads are activated with time delay. But this time delay is so short that it cannot be detected by human senses.

Operation Mode

The combination switch reading function has the operation modes shown below.

1. Normal status
- When BCM is not in sleep status, OUTPUT terminals (1 - 5) each turn ON-OFF every 10 ms.
2. Sleep status
- When BCM is in sleep status BCM enters low power mode. OUTPUT (1 - 5) turn ON-OFF every 60 ms, and only input from light switch system is accepted.



CAN Communication System Description

NKS00521

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

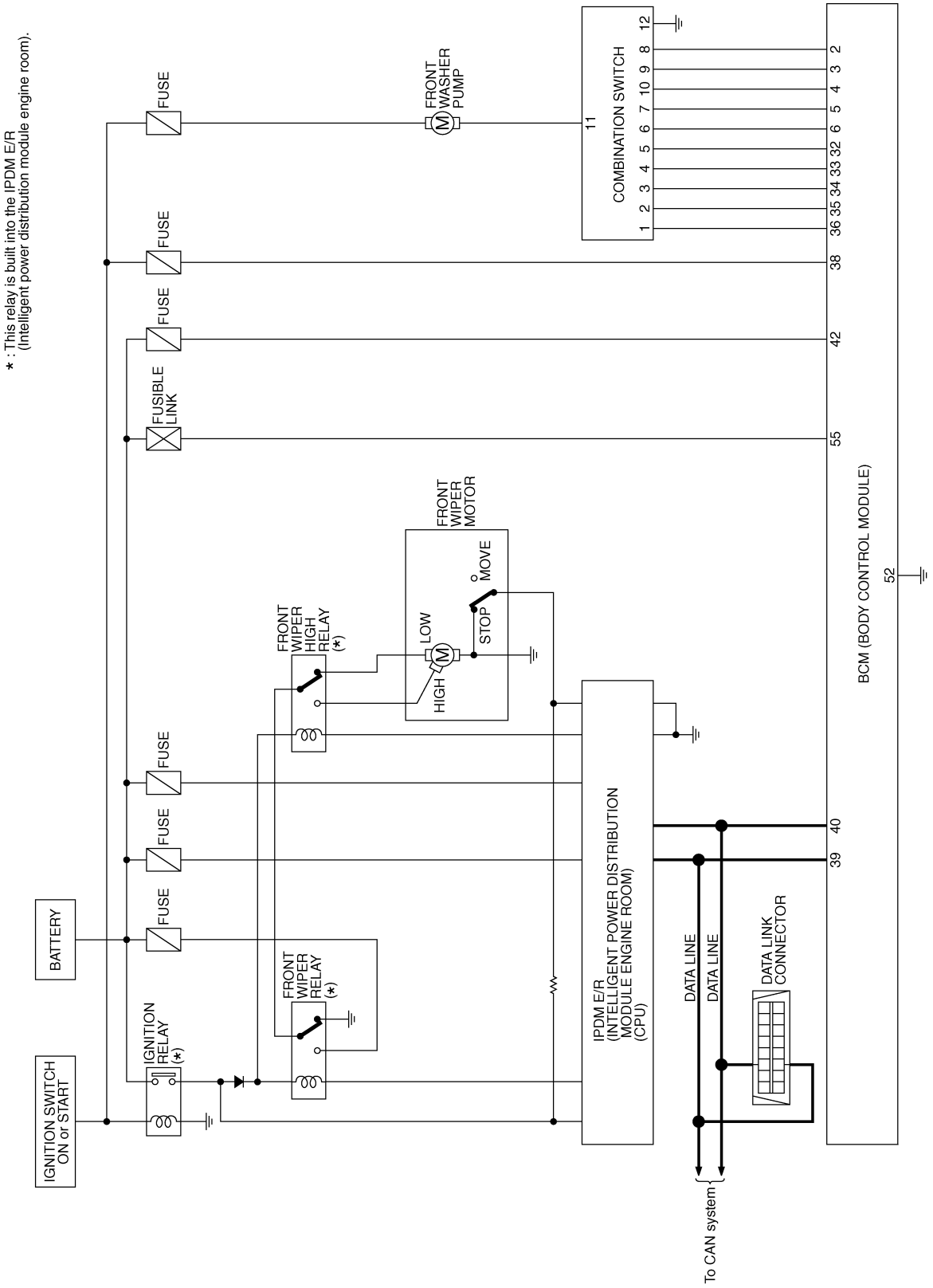
CAN Communication Unit

NKS00522

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

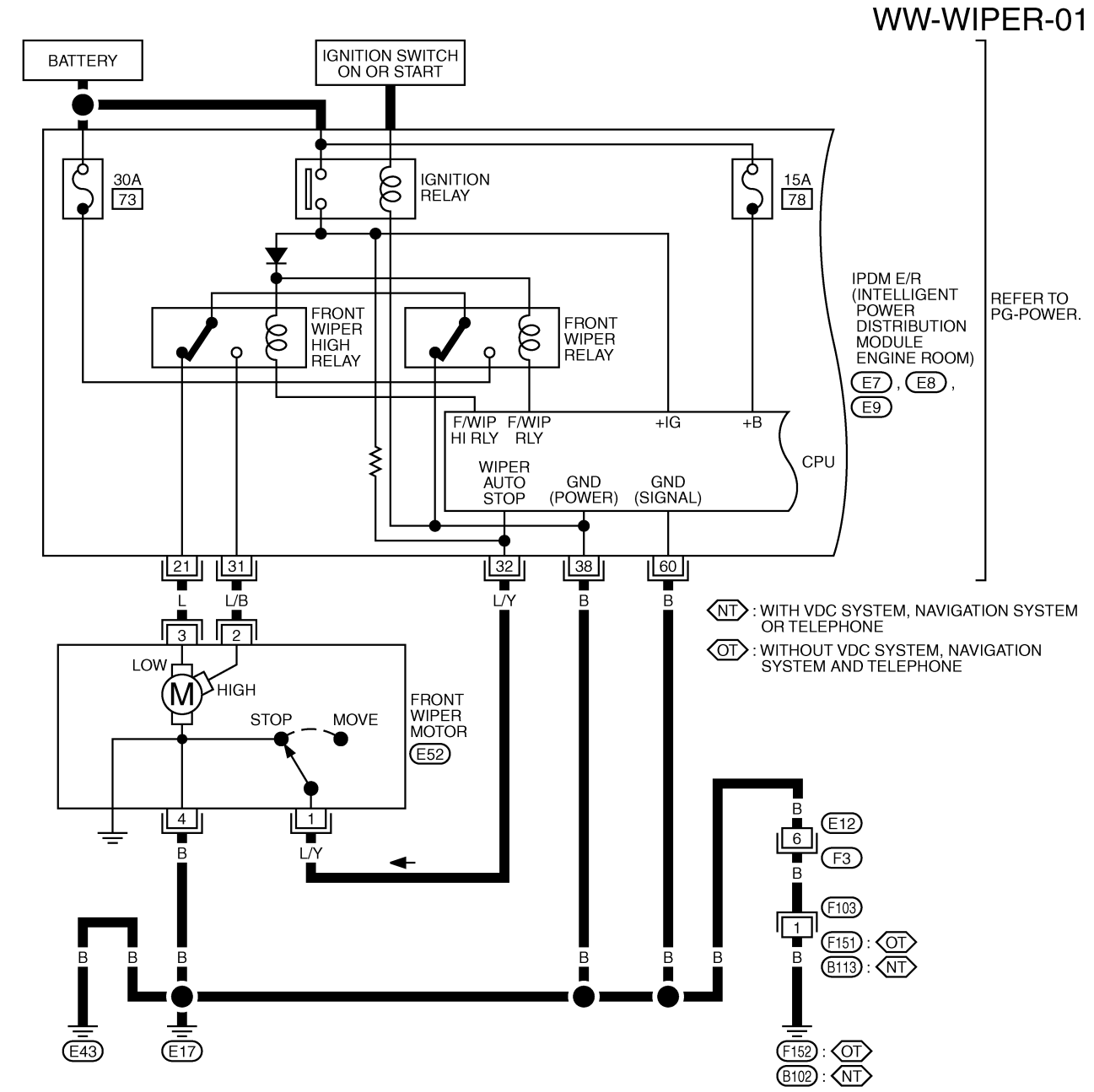
NKS00523

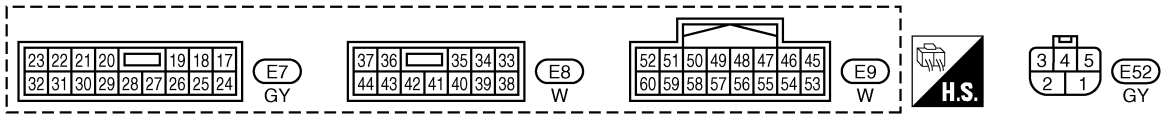


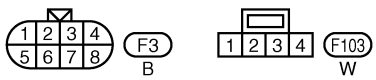
TKWT4003E

Wiring Diagram — WIPER —

NKS00524

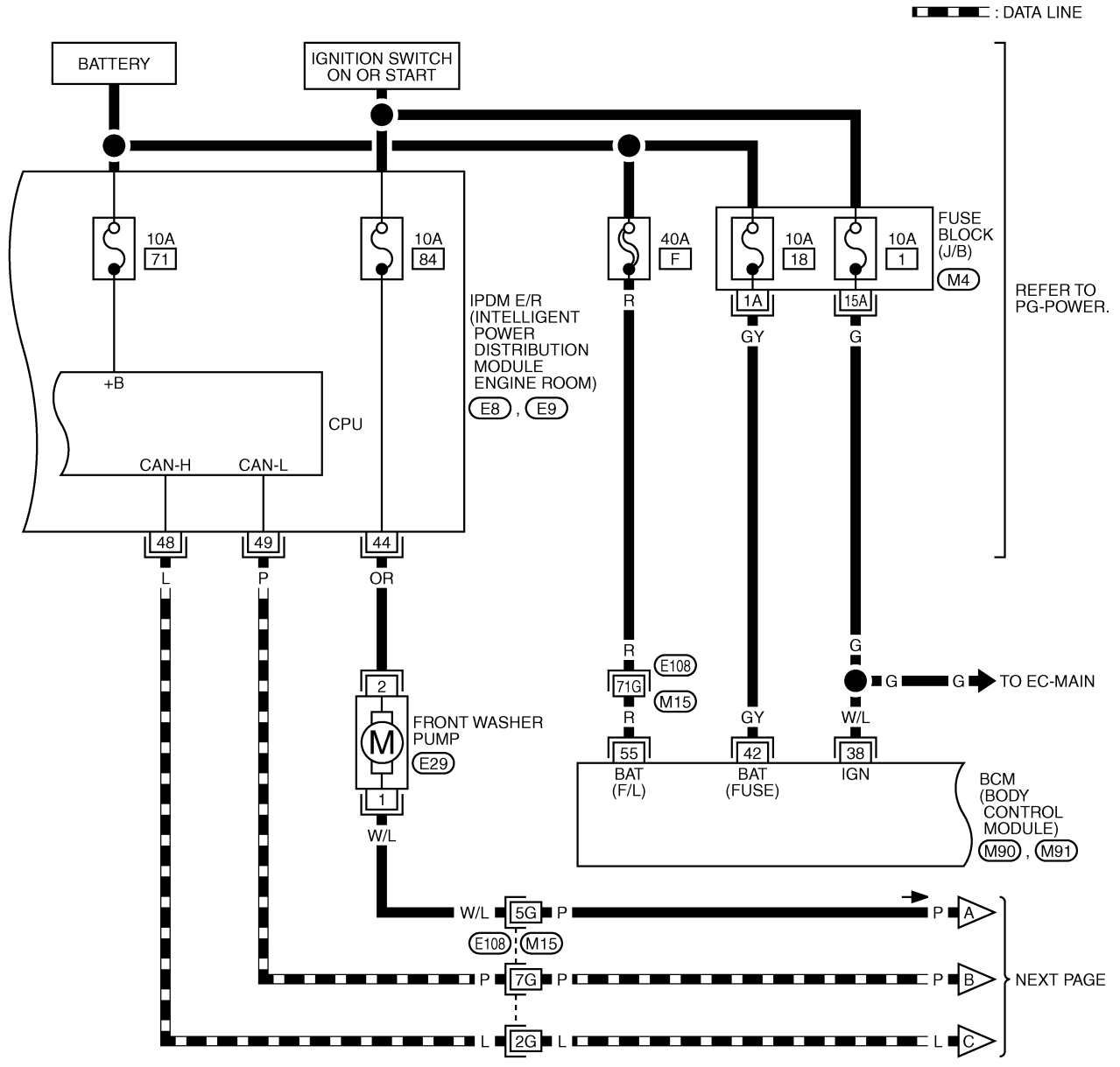


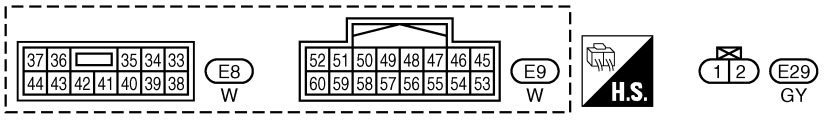




TKWT5737E

WW-WIPER-02





REFER TO THE FOLLOWING.

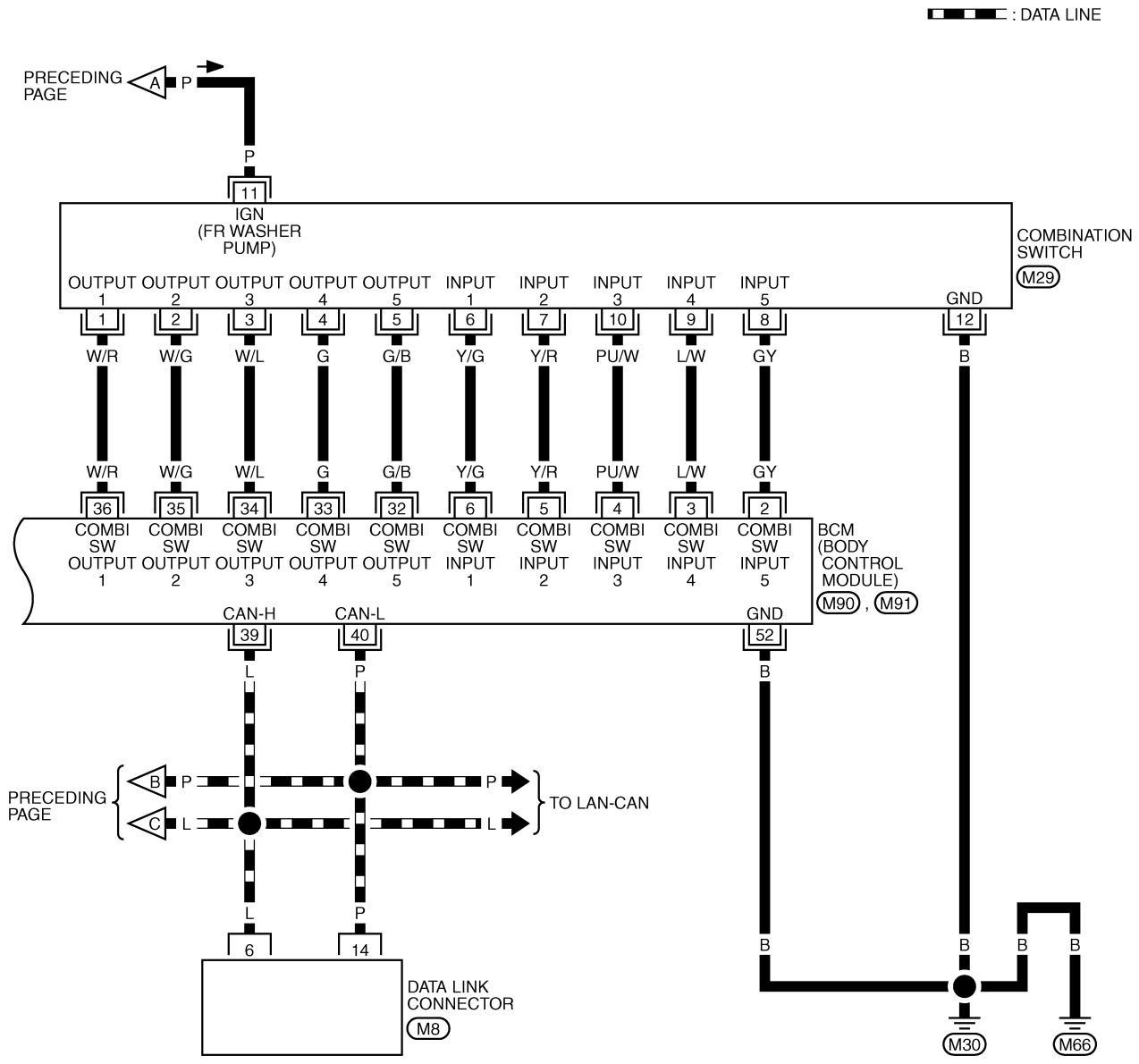
E108 -SUPER MULTIPLE JUNCTION (SMJ)

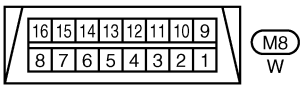
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

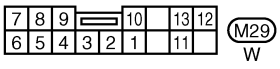
M90 , M91 -ELECTRICAL UNITS

TKWT5738E

WW-WIPER-03







REFER TO THE FOLLOWING.
M90 , M91 -ELECTRICAL UNITS

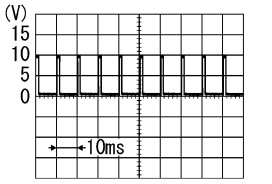
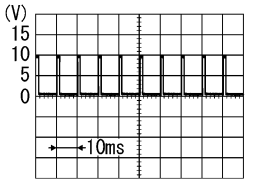
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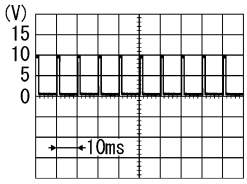
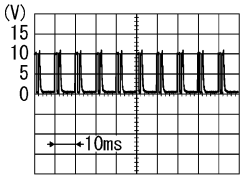
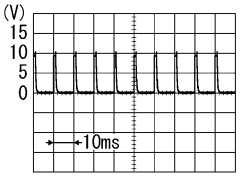
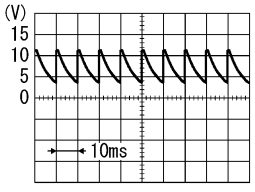
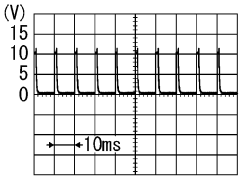
Terminals and Reference Values for BCM

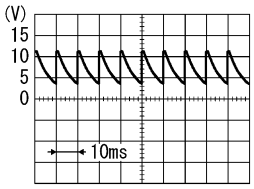
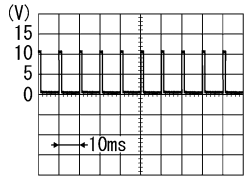
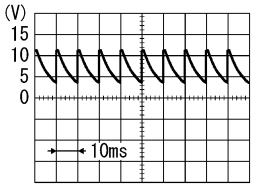
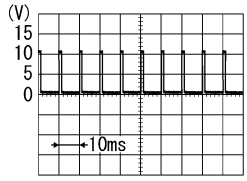
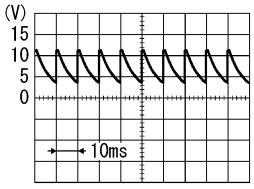
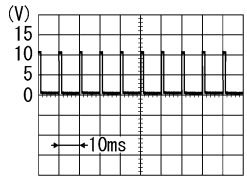
NKS00525

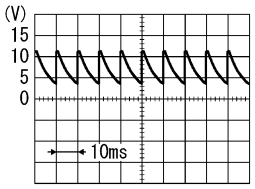
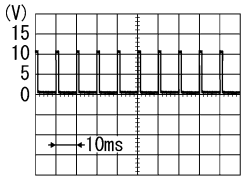
CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to WW-19, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Front wiper switch MIST ● Front wiper switch INT ● Front wiper switch LO	 PKIB4959J Approx. 1.0 V
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	Approx. 0 V
					Any of the conditions below ● Front washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4959J Approx. 1.0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
6	Y/G	Combination switch input 1	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	Approx. 0 V
					Any of the conditions below ● Front wiper switch HI ● Wiper intermittent dial position 3	 PKIB4959J Approx. 1.0 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2	 PKIB4952J Approx. 1.7 V
					Any of the conditions below ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4955J Approx. 0.8 V
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4956J Approx. 1.0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 3	 PKIB4958J Approx. 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Front wiper switch INT ● Front wiper switch HI	 PKIB4958J Approx. 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
36	W/R	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Front wiper switch MIST ● Front wiper switch LO ● Front washer switch	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	GY	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	R	Battery power supply	OFF	—		Battery voltage

Terminals and Reference Values for IPDM E/R

NKS00526

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
21	L	Low speed signal	ON	Wiper switch	OFF	Approx. 0 V
					LOW	Battery voltage
31	L/B	High speed signal	ON	Wiper switch	OFF	Approx. 0 V
					HI	Battery voltage
32	L/Y	Wiper auto stop signal	ON	Wiper operating		Battery voltage
				Wiper stopped		Approx. 0 V
38	B	Ground	ON	—		Approx. 0 V
44	OR	Washer pump power supply	ON	—		Battery voltage
48	L	CAN – H	—	—		—
49	P	CAN – L	—	—		—
60	B	Ground	ON	—		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS00527

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-4, "System Description" .
3. Perform preliminary check. Refer to WW-18, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does the front wiper and washer operate normally? If YES, GO TO 6. If NO, GO TO 4.

6. INSPECTION END

Preliminary Check

NKS00528

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
Front washer pump	Ignition switch ON or START	84
Front wiper motor, front wiper relay, front wiper HI relay	Battery	73
BCM	Battery	F
		18
	Ignition switch ON or START	1

Refer to WW-11, "Wiring Diagram — WIPER —" .

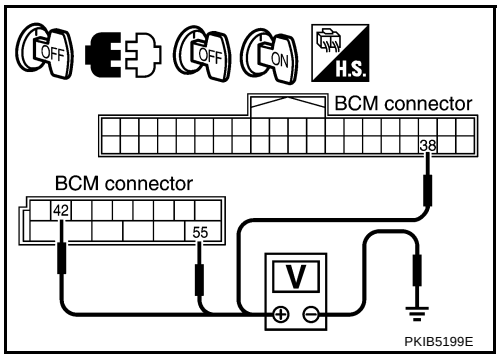
OK or NG

OK >> GO TO 2

NG >> If fuse is blown, be sure to eliminate the cause of malfunction before installing new fuse, Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector terminal and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M90	38	Ground	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

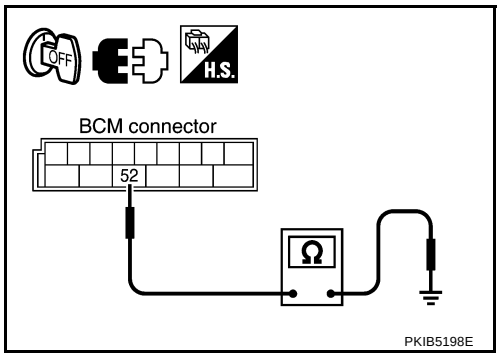
Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.



CONSULT-III Function (BCM)

NKS00529

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis position	Diagnosis mode	Description
WIPER	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Device operation can be checked by applying a drive signal to device.
BCM	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT

Display Item List

Item	Description	CONSULT-III	Factory setting
WIPER SPEED SETTING	Vehicle speed sousing type wiper control mode can be changed in this mode. Vehicle speed sousing type wiper control mode between two ON/OFF.	ON	—
		OFF	×

NOTE:
Regarding wiper speed setting, if the BCM set value is initialized by the use of CONSULT-III work support, then set it individually to OFF after the initialization because it is automatically set to ON by initializing CONSULT-III.

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from ignition switch signal.
IGN SW CAN	“ON/OFF”	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from CAN communication signal.
FR WIPER HI	“ON/OFF”	Displays “FRONT WIPER HI (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER LOW	“ON/OFF”	Displays “FRONT WIPER LOW (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER INT	“ON/OFF”	Displays “FRONT WIPER INT (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WASHER SW	“ON/OFF”	Displays “FRONT WASHER Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
INT VOLUME	“1 - 7”	Displays intermittent operation dial position setting (1 - 7) as judged from wiper switch signal.
FR WIPER STOP	“ON/OFF”	Displays “Stopped (ON)/Operating (OFF)” status as judged from auto-stop signal.
VEHICLE SPEED	“km/h”	Displays vehicle speed status as judged from vehicle speed signal.
RR WIPER ON NOTE 1	“ON/OFF”	Displays “Rear Wiper ON (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT NOTE 1	“ON/OFF”	Displays “Rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW NOTE 1	“ON/OFF”	Displays “Rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER STOP NOTE 1	“ON/OFF”	Displays “Rear Wiper Stop (ON)/Other (OFF)” status, as judged from wiper switch signal.
RR WIPER STP2 NOTE 2	“OFF”	—

NOTE:
1. Coupe models
2. This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Display on CONSULT-III screen	Description
Front wiper output	FR WIPER	With a certain operation (OFF, HI, LO, INT), front wiper can be operated.
Rear wiper output NOTE	RR WIPER	Rear wiper can be operated by ON–OFF operation.

NOTE:
Coupe models

CONSULT-III Function (IPDM E/R)

NKS0052A

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis Mode	Description
SELF–DIAG RESULTS	Refer to PG-18, "SELF-DIAG RESULTS" .
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

DATA MONITOR

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR wiper request	FR WIP REQ	STOP/LOW/HI	×	×	×	Signal status input from BCM
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	×	×	×	Output status of IPDM E/R
Wiper protection	WIP PROT	OFF/Block	×	×	×	Control status of IPDM E/R

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Display Item List

Test item	CONSULT-III screen display	Description
Front wiper (HI, LO) output	FR WIPER	With a certain operation (OFF, HI ON, LO ON), front wiper relay (and/or front wiper high relay) can be operated.

Front Wiper Does Not Operate

NKS0052B

CAUTION:

During IPDM E/R fail-safe control, front wipers may not operate. Refer to PG-16, "CAN COMMUNICATION LINE CONTROL" in "PG IPDM E/R" to make sure that it is not in fail-safe status.

1. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper LO and HI operation.

IPDM E/R AUTO ACTIVE TEST

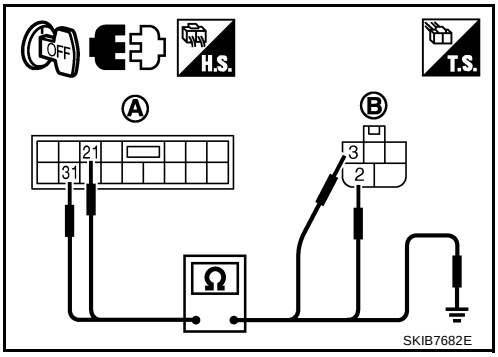
1. Start up auto active test. Refer to PG-20, "Auto Active Test" .
2. With operating the test item, check that front wiper LO and HI operation.

Does front wiper operate normally?

YES >> GO TO 5.
NO >> GO TO 2.

2. CHECK FRONT WIPER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	21	E52	3	Yes
	31		2	

4. Check continuity between IPDM E/R harness connector (A) and Ground.

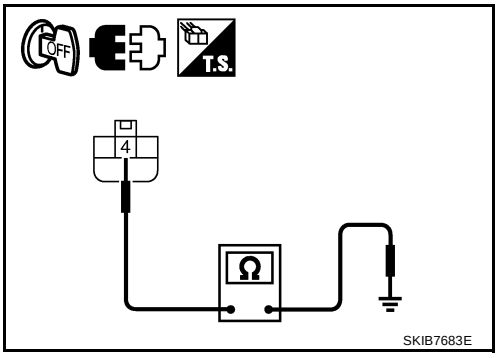
A		Ground	Continuity
Connector	Terminal		
E7	21		No
	31		

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between front wiper motor harness connector and ground.



Front wiper motor connector	Terminal	Ground	Continuity
E52	4		Yes

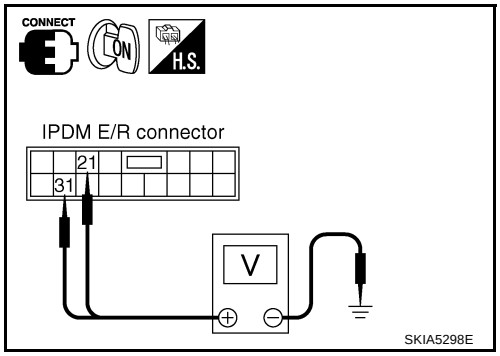
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK IPDM E/R

CONSULT-III ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select "FRONT WIPER" of IPDM E/R active test item.
3. With operating the test item, check voltage between IPDM E/R harness connector and ground.



Terminals			Condition	Voltage (Approx.)
(+)		(-)		
IPDM E/R connector	Terminal			
E7	21	Ground	Stopped	0 V
			LO operation	Battery voltage
	31		Stopped	0 V
			HI operation	Battery voltage

IPDM E/R AUTO ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-20, "Auto Active Test" .
3. With operating the test item, check voltage between IPDM E/R harness connector and ground.

Terminals			Condition	Voltage (Approx.)
(+)		(-)		
IPDM E/R connector	Terminal			
E7	21	Ground	Stopped	0 V
			LO operation	Battery voltage
	31		Stopped	0 V
			HI operation	Battery voltage

OK or NG

OK >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .
NG >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

5. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select “FR WIPER INT”, “FR WIPER LOW”, and “FR WIPER HI” of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

6. CHECKING CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

Perform self-diagnosis for “BCM” with CONSULT-III.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
CAN COMM CIRCUIT>> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

Front Wiper Does Not Return to Stop Position

NKS0052C

1. CHECK FRONT WIPER STOP SIGNAL

With CONSULT-III

1. Select "WIP AUTO STOP" of IPDM E/R data monitor item.
2. Make sure that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper operation.

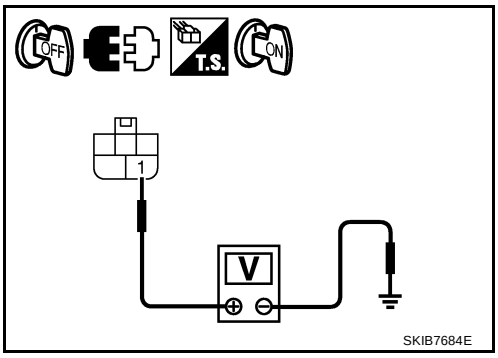
GO TO 2

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> GO TO 2.

2. CHECK IPDM E/R

1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Turn ignition switch ON.
4. Check voltage between front wiper motor harness connector and ground.



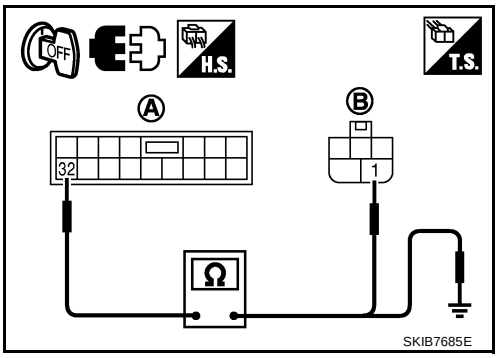
Terminals			Voltage (Approx.)
(+)		(-)	
Front wiper motor connector	Terminal	Ground	
E52	1		Battery voltage

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK FRONT WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	32	E52	1	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

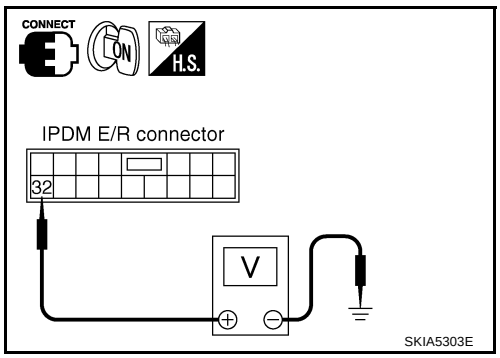
A		Ground	Continuity
Connector	Terminal		
E7	32		Yes

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

4. CHECK IPDM E/R

1. Connect IPDM E/R connector and front wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R harness connector and ground while front wiper motor is stopped and while it is operating.



Terminal			Condition	Voltage (Approx.)
(+)		(-)		
IPDM E/R connector	Terminal			
E7	32	Ground	Wiper stopped	0 V
			Wiper operating	Battery voltage

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .

Only Front Wiper Low Does Not Operate

NKS0052D

1. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper LO operation.

IPDM E/R AUTO ACTIVE TEST

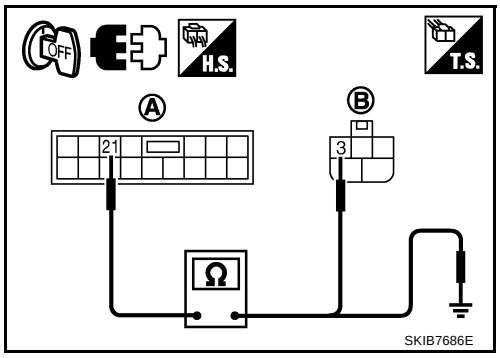
1. Start up auto active test. Refer to PG-20, "Auto Active Test" .
2. With operating the test item, check that front wiper LO operation.

Does front wiper operate normally?

YES >> Refer to LT-92, "Combination Switch Inspection" .
NO >> GO TO 2.

2. CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	21	E52	3	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
E7	21		No

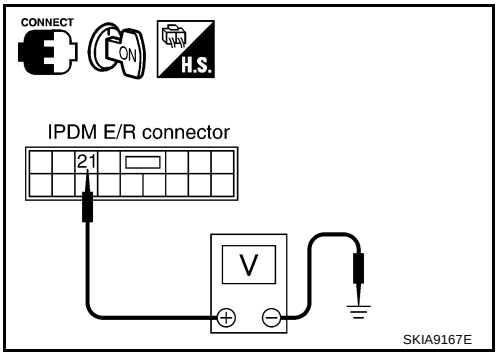
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IPDM E/R

CONSULT-III ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select "FRONT WIPER" of IPDM E/R active test item.
3. With operating the test item, check that front wiper LO operation.



Terminals			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal	Ground	
E7	21		Battery voltage

IPDM E/R AUTO ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-20, "Auto Active Test" .
3. With operating the test item, check that front wiper LO operation.

Terminals			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal	Ground	
E7	21		Battery voltage

OK or NG

OK >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .

NG >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

Only Front Wiper Hi Does Not Operate

NKS0052E

1. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper HI operation.

IPDM E/R AUTO ACTIVE TEST

1. Start up auto active test. Refer to PG-20, "Auto Active Test"
2. With operating the test item, check that front wiper HI operation.

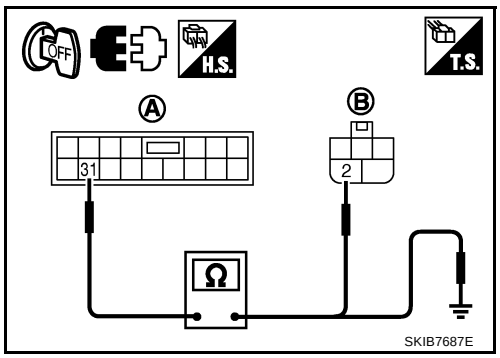
Does front wiper operate normally?

YES >> Refer to LT-92, "Combination Switch Inspection" .

NO >> GO TO 2.

2. CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	31	E52	2	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
E7	31		No

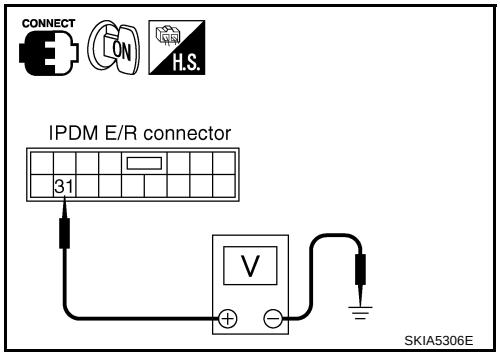
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IPDM E/R

CONSULT-III ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select "FRONT WIPER" of IPDM E/R active test item.
3. With operating the test item, check voltage between IPDM E/R harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal	Ground	
E7	31		Battery voltage

IPDM E/R AUTO ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-20, "Auto Active Test" .
3. With operating the test item, check voltage between IPDM E/R harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal	Ground	
E7	31		Battery voltage

OK or NG

OK >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .
NG >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

Only Front Wiper Intermittent Does Not Operate

NKS0052F

1. CHECK COMBINATION SWITCH

CONSULT-III DATA MONITOR

1. Select "FR WIPER INT" of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check combination switch (wiper switch) Refer to LT-92, "Combination Switch Inspection" .

Front Wiper Interval Time Is Not Controlled by Vehicle Speed

NKS0052G

1. CHECK FUNCTION OF COMBINATION METER

Confirm that speedometer operates normally.

Does front wiper operate normally?

YES >> GO TO 2.
NO >> Combination meter vehicle speed system malfunction. Refer to DI-18, "Vehicle Speed Signal Inspection" .

2. CHECK CAN COMMUNICATION BETWEEN BCM AND COMBINATION METER

Perform self-diagnosis for “BCM” with CONSULT-III.

Displayed self-diagnosis results

NO DTC>>Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
CAN COMM CIRCUIT>>Check CAN communication line of BCM. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

Front Wiper Intermittent Operation Switch Position Cannot Be Adjusted

NKS0052H

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select "INT VOLUME" of BCM data monitor item.
2. Make sure that “INT VOLUME”, changes in order form 1 to 7 according to wiper switch operation.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

Wiper Does Not Wipe When Front Washer Operates

NKS0052I

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select "FR WASHER SW" of BCM data monitor item.
2. Make sure that “FR WASHER SW” turn ON-OFF according to front wiper switch operation.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check front wiper switch. Refer to LT-92, "Combination Switch Inspection" .

After Front Wiper Operate for 10 Seconds, They Stop for 20 Seconds, and After Repeating the Operations Five Times, They Become Inoperative

NKS0052J

CAUTION:

- **When auto-stop signal has not varied for 10 seconds or longer while IPDM E/R is operating front wipers, IPDM E/R considers that front wipers are locked, and stops wiper output. That causes this symptom.**
- **This status can be checked by “DATA MONITOR” of “IPDM E/R” on which “WIPER PROTECTION” item shows “BLOCK”.**

1. CHECK WIPER MOTOR SIGNAL

CONSULT-III DATA MONITOR

1. Select "WIP AUTO STOP" of BCM data monitor item.
2. make sure that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper operation.

GO TO 2

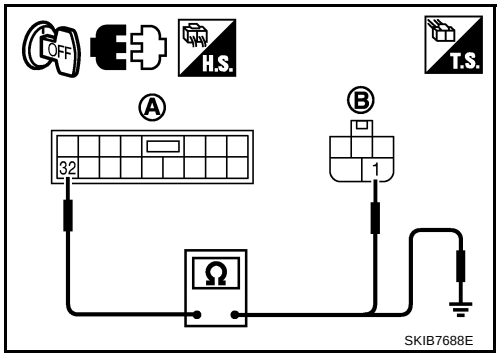
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> GO TO 2.

2. CHECK WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	32	E52	1	Yes



4. Check continuity between IPDM E/R harness connector (A) and ground.

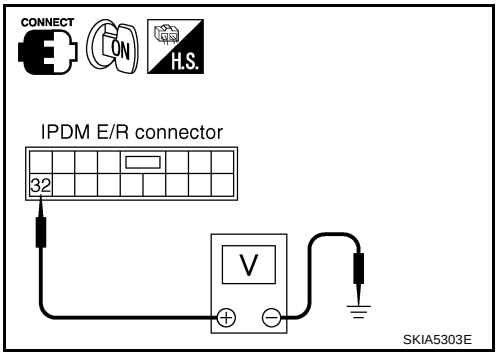
A		Ground	Continuity
Connector	Terminal		
E7	32		No

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK FRONT WIPER MOTOR

1. Connect IPDM E/R connector and front wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R harness connector and ground while front wiper motor is stopped and while it is operating.



Terminal			Condition	Voltage (Approx.)
(+)		(-)		
IPDM E/R connector	Terminal			
E7	32	Ground	Wiper stopped	0 V
			Wiper operating	Battery voltage

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .

Front Wiper Does Not Stop

NKS0052K

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select “FR WIPER INT”, “FR WIPER LOW”, “FR WIPER HI”, and “FR WASHER SW” of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location

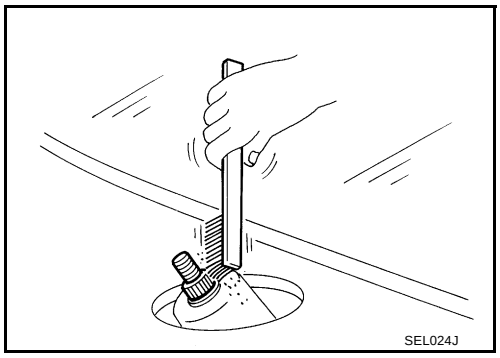
NKS0052L

REMOVAL

1. Turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).
2. Remove washer tube from washer tube joint.
3. Open hood, remove front wiper arm caps, and remove front wiper arm nuts.
4. Raise front wiper arms, and remove front wiper arms from vehicle.

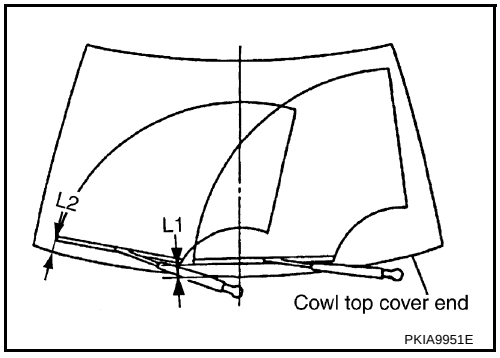
INSTALLATION

1. Clean up the pivot area as shown in the figure. This will reduce possibility of front wiper arm looseness.
2. Prior to front wiper arms installation, turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).



3. Lift the blade up and then set it down onto windshield glass surface to set the blade center to clearance “L1” & “L2” immediately.
4. Tighten front wiper arm nuts to specified torque.

Front wiper arm nuts : 23.6 N·m (2.4 kg-m, 18 ft-lb)



5. Install washer tube from washer tube joint.
6. Spray washer fluid. Turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).
7. Make sure that wiper blades stop within clearance “L1” & “L2”.

Clearance “L1” : 63.9 ± 7.5 mm (2.516 ± 0.295 in)
Clearance “L2” : 32.0 ± 6.5 mm (1.260 ± 0.256 in)

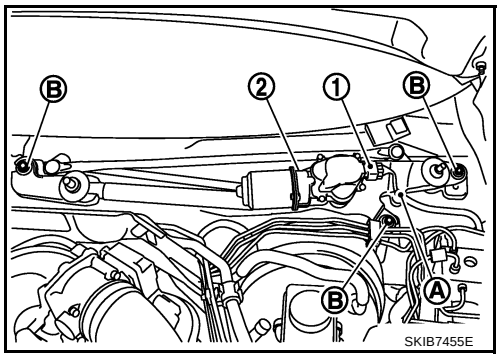
8. Install front wiper arm caps.

Removal and Installation of Front Wiper Drive Assembly

NKS0052M

REMOVAL

1. Remove front wiper arms. Refer to WW-30, "REMOVAL" .
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
3. Disconnect wiper motor connector (1) and remove connector clip (A).
4. Remove front wiper drive assembly mounting bolts (B), and remove front wiper drive assembly (2) from the vehicle.



INSTALLATION

1. Install front wiper drive assembly to the vehicle.

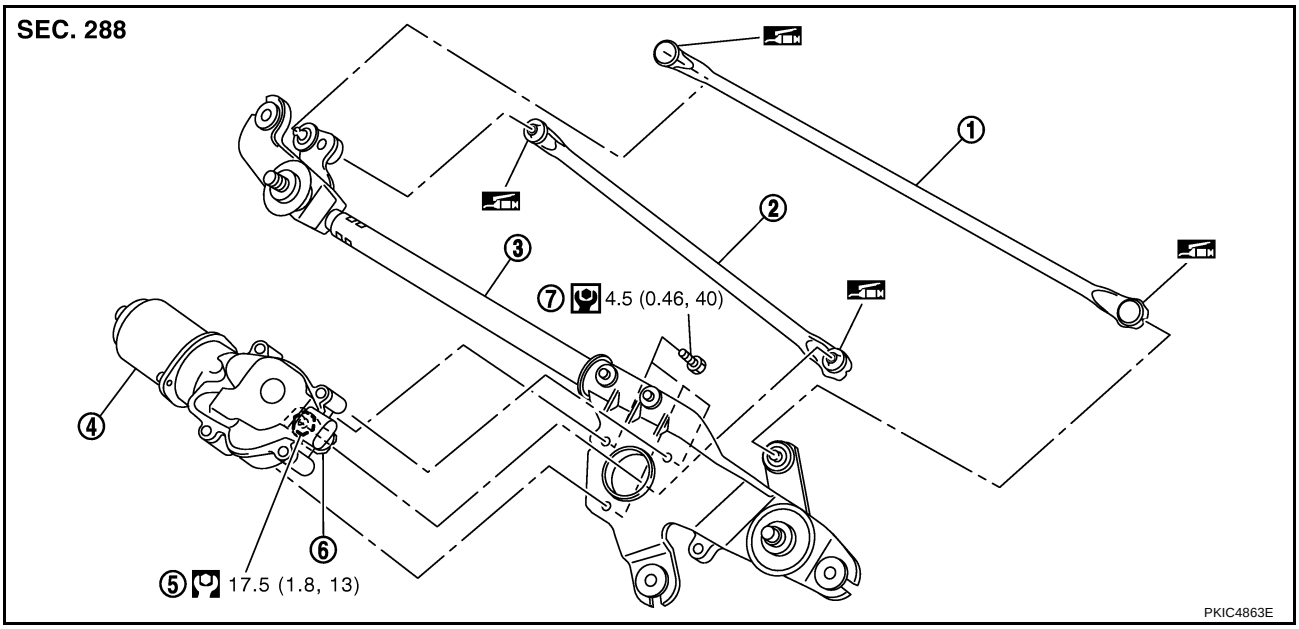
Front wiper drive assembly mounting bolts : 4.5 N·m (0.46 kg-m, 40 in-lb)

2. Connect wiper motor connector. Turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).
3. Install connector clips to the wiper frame, and install cowl top cover. Refer to EI-20, "COWL TOP" .

4. Install front wiper arms and arm caps. Refer to WW-30, "INSTALLATION" .

Disassembly and Assembly Front Wiper Motor and Linkage

NKS0052N



1. Wiper linkage 1
2. Wiper linkage 2
3. Motor frame
4. Wiper motor
5. Motor arm nut
6. Motor arm
7. Wiper motor mounting bolt

:N·m (kg-m, in-lb)

:N·m (kg-m, ft-lb)

:Should be lubricated with grease

DISASSEMBLY

1. Remove wiper linkages from wiper motor and motor frame.
2. Remove wiper motor mounting bolts, and remove wiper motor from wiper frame.

CAUTION:

Be careful not to bend wiper linkages nor to damage the resin part of ball joint when removing wiper linkages.

ASSEMBLY

1. Connect wiper motor connector. Turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).
2. Disconnect wiper motor connector.
3. Install wiper motor to wiper frame.

Wiper motor mounting bolts : 4.5 N·m (0.46 kg-m, 40 in-lb)

4. Install wiper linkages to wiper frame and wiper motor.

CAUTION:

- **Never drop the wiper motor nor cause it to interfere with other parts.**
- **Check joint of motor arm and wiper linkages (at retainer) for grease conditions. Apply grease if necessary.**

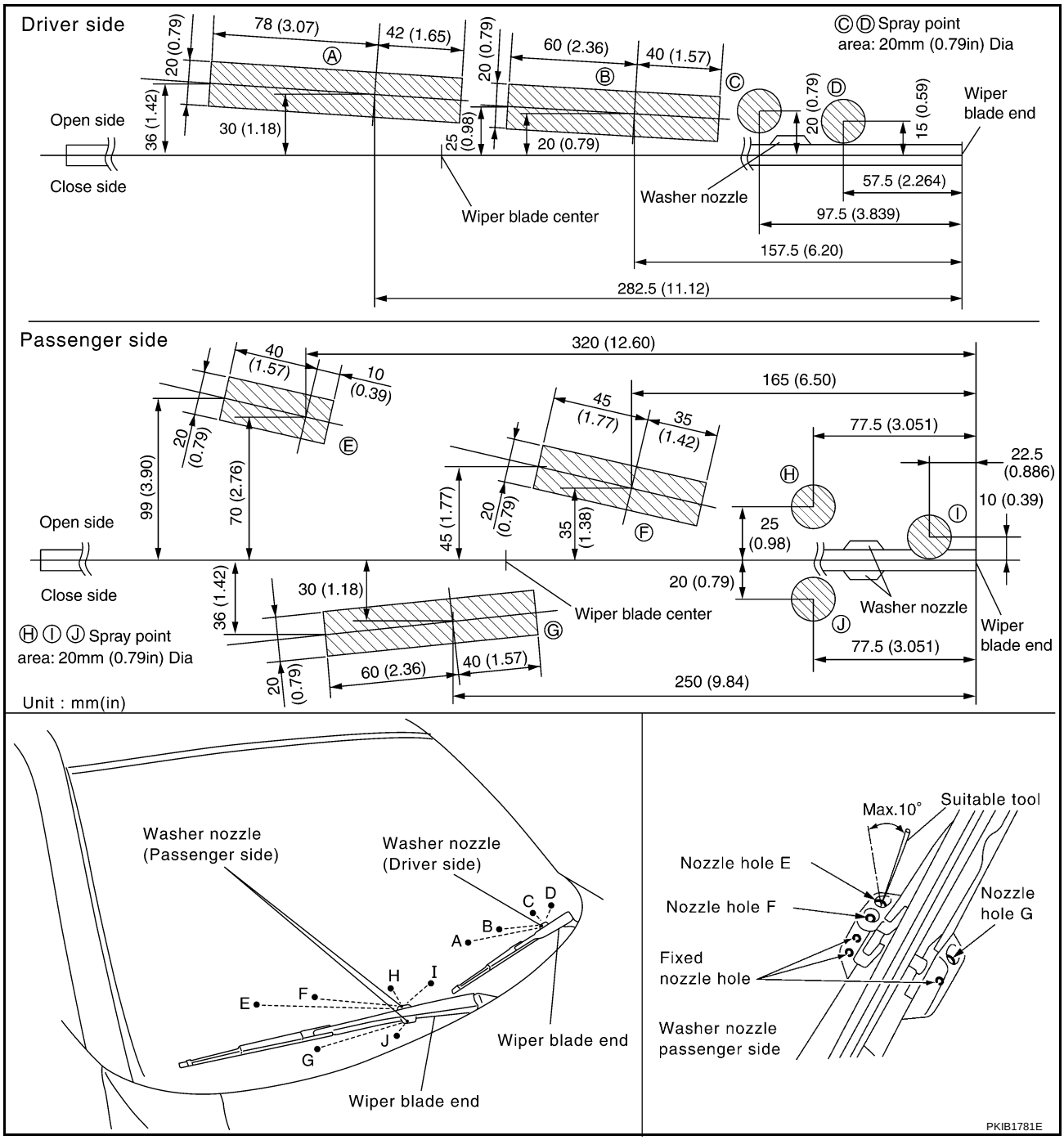
Washer Nozzle Adjustment

NKS0052O

1. When wiper blade position is in auto stop condition, remove front wiper motor connector to ensure front wiper arms do not move.
2. Adjust each nozzle position (A, B, E, F, and G) so that spray positions are in the range of shaded parts.

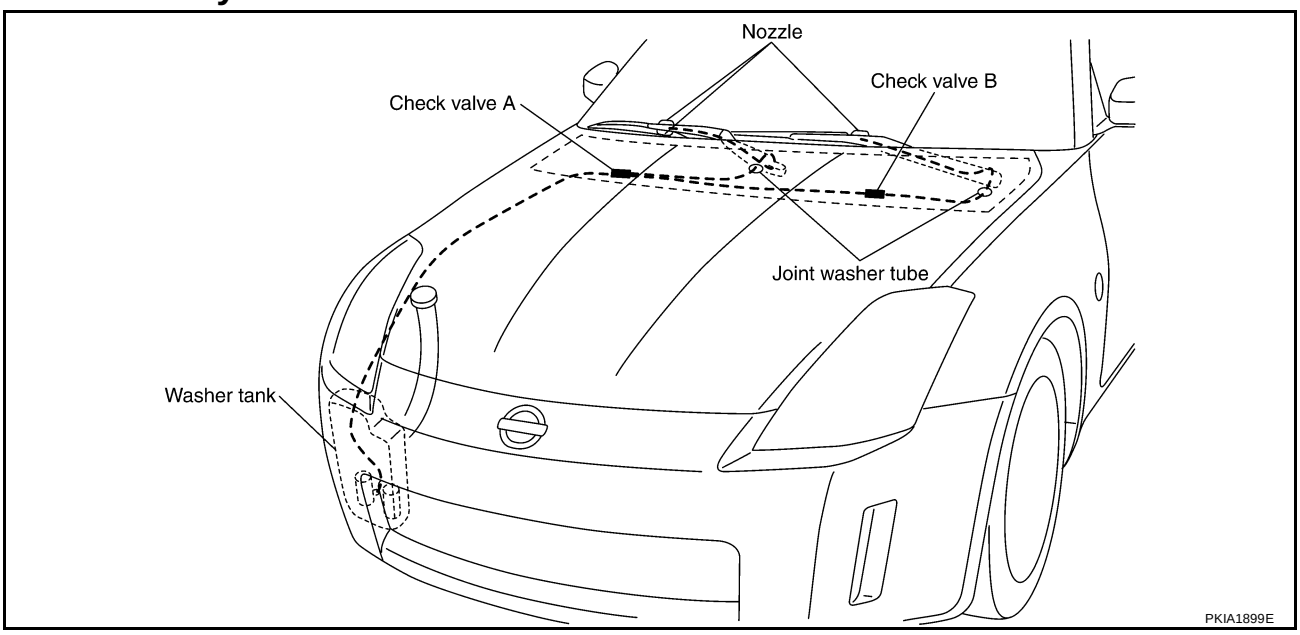
CAUTION:

Only washer nozzles (A, B, E, F, and G) can be adjusted. Washer nozzles (C, D, H, I, and J) cannot be adjusted because of fixed nozzles.



Washer Tube Layout

NKS0052P



Removal and Installation of Front Washer Nozzle

NKS0052Q

Replace wiper arm assembly. Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .

CAUTION:

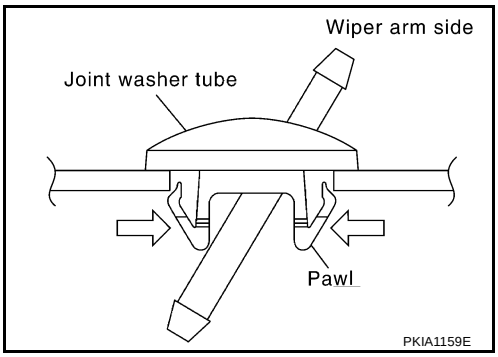
Never remove/install washer nozzle from wiper arm assembly.

Removal and Installation of Front Washer Tube Joint

NKS0052R

REMOVAL

1. Remove upwards while pressing pawls on reverse side.
2. Remove washer tube.



INSTALLATION

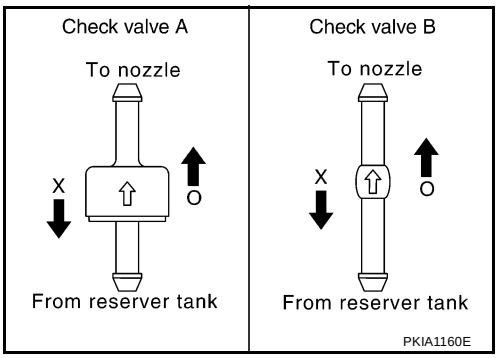
Installation is the reverse order of removal.

Inspection for Washer Nozzle

NKS0052S

CHECK VALVE INSPECTION

Blow air in the injection direction, and check that air flows only one way. Make sure that the reverse direction (inhale) is not possible.



Inspection of Front Wiper and Washer Switch Circuit

NKS0052T

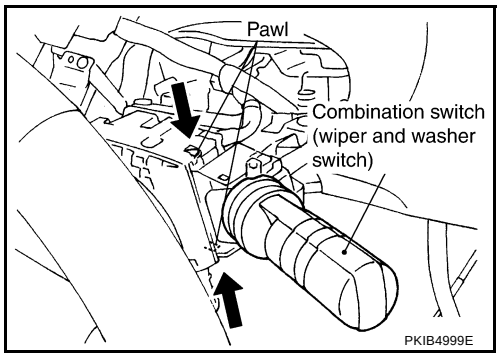
Refer to LT-92, "Combination Switch Inspection" .

Removal and Installation of Front Wiper and Washer Switch

NKS0052U

REMOVAL

1. Remove steering column lower cover and combination meter. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect wiper and washer switch connector.
3. Pull wiper and washer switch toward the passenger door while pressing pawls in direction shown by the arrow (⬅) in the figure, and remove it from the base.



INSTALLATION

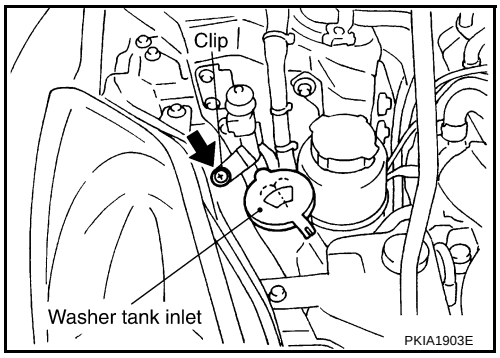
Installation is the reverse order of removal.

Removal and Installation of Washer Tank

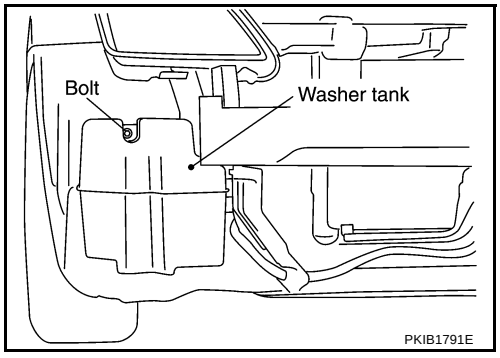
NKS0052V

REMOVAL

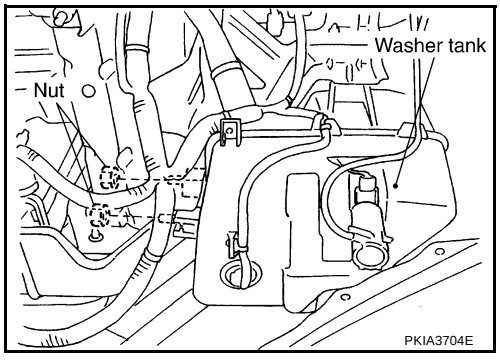
1. Remove clip and pull out washer tank inlet.



2. Remove under cover.
3. Remove fender protector. Refer to EI-21, "FENDER PROTECTOR" .
4. Remove front bumper fascia. Refer to EI-14, "FRONT BUMPER" .
5. Disconnect washer pump connector.
6. Remove washer tank mounting bolt and nuts.



7. Remove washer tube, and remove washer tank from the vehicle.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

After installation, add water up to the upper level of washer tank inlet, and check for water leaks.

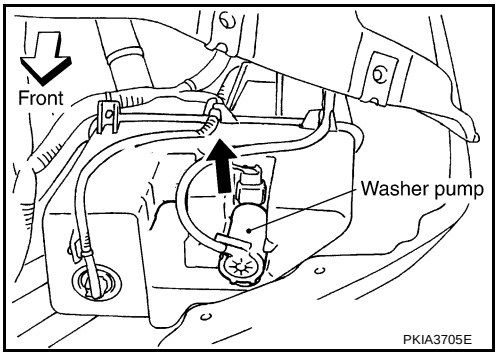
Washer tank mounting bolt and nuts : 5.7 N·m (0.58 kg-m, 50 in-lb)

Removal and Installation of Washer Pump

NKS0052W

REMOVAL

1. Remove fender protector. Refer to EI-21, "FENDER PROTECTOR" .
2. Disconnect washer pump connector and remove washer tube.
3. Pull out washer pump in direction shown by the arrow (⬅) in the figure. Remove washer pump from washer tank.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

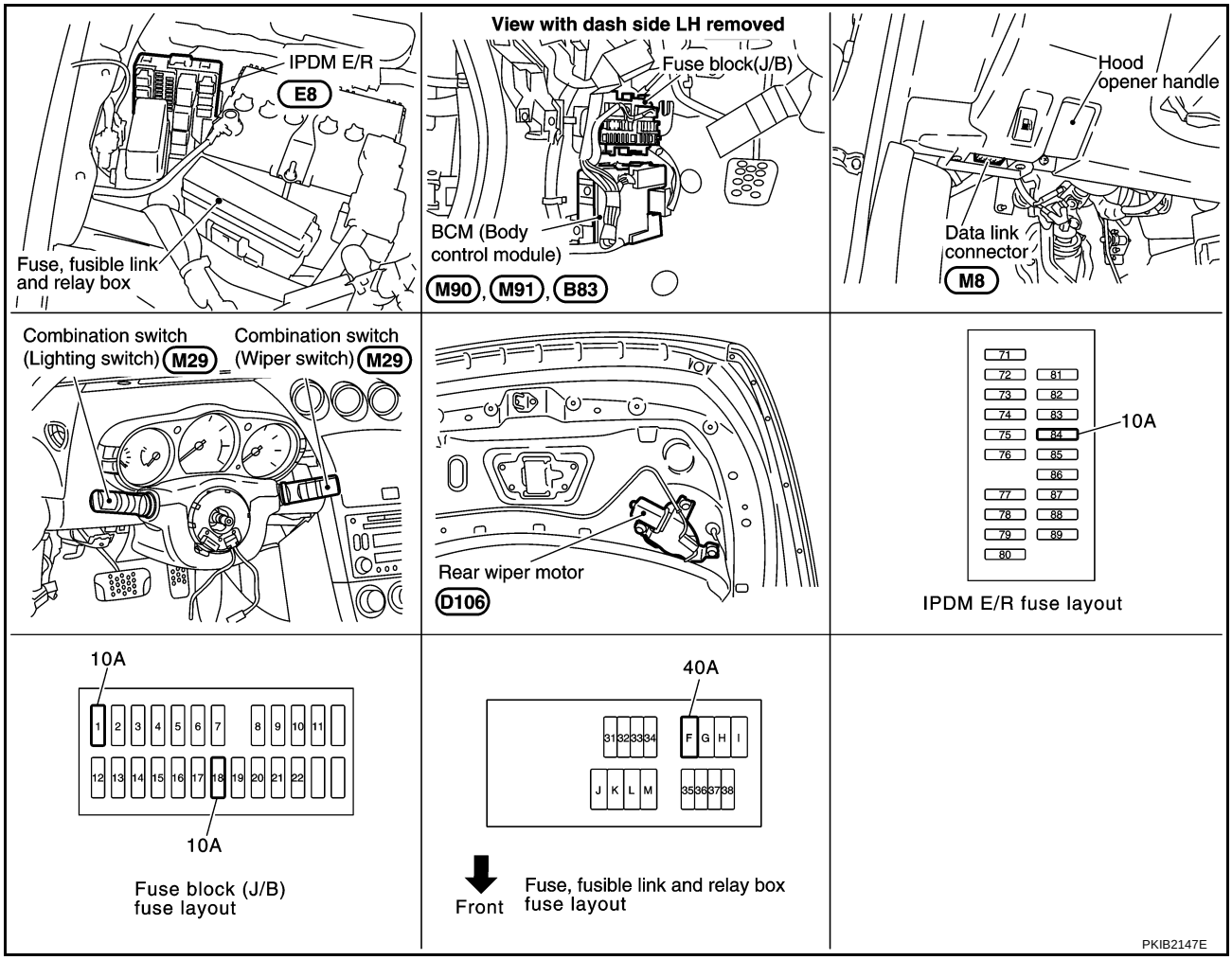
When installing washer pump, there should be no packing twists, etc.

REAR WIPER AND WASHER SYSTEM

PFP:28710

Components Parts and Harness Connector Location

NKS0052X



System Description

NKS0052Y

- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM when switch is turned ON.
- BCM (body control module) controls rear wiper ON and INT (intermittent) operation.

OUT LINE

Power is supplied at all times

- through 40 A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55,
- through 10 A fuse [No. 18, located in fuse block (J/B)]
- to BCM terminal 42.

When ignition switch is in ON or START position, power is supplied

- through 10 A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10 A fuse (No. 84, located in IPDM E/R)
- through IPDM E/R terminal 44
- to rear washer pump terminal 2.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,

- to combination switch terminal 12
- through grounds M30 and M66.

Rear Wiper Operation

When wiper switch is in rear wiper ON position, BCM detect rear wiper ON signal by BCM wiper switch reading function.
BCM operate rear wiper motor, power is supplied

- through BCM terminal 70
- to rear wiper motor 4.

Ground is supplied

- to rear wiper motor terminal 1
- through grounds B5, B6, D105 and T14.

With power and ground is supplied, rear wiper operates.

Intermittent Operation

The rear wiper motor operates wiper arms at low speed approximately every 7 seconds.
When wiper switch is in rear wiper INT position, BCM detect rear wiper INT signal by BCM wiper switch reading function. (Refer to WW-7, "COMBINATION SWITCH READING FUNCTION")
BCM operate rear wiper motor, power is supplied

- through BCM terminal 70
- to rear wiper motor 4.

Ground is supplied

- to rear wiper motor terminal 1
- through grounds B5, B6, D105 and T14.

With power and ground is supplied, rear wiper operates at intermittent.

Auto Stop Operation

With rear wiper switch turned OFF, rear wiper motor will continue to operate until wiper arm reaches rear wiper stopper.
Then wiper motor turns the other way and wiper arm moves once until wiper arm reaches stopper.

Washer Operation

When wiper switch is in rear wiper washer position, BCM detect rear wiper washer signal by BCM wiper switch reading function (Refer to WW-7, "COMBINATION SWITCH READING FUNCTION"), and combination switch (wiper switch) ground is supplied

- to rear washer pump terminal 1
- through combination switch terminal 13
- to combination switch terminal 12
- through grounds M30 and M66.

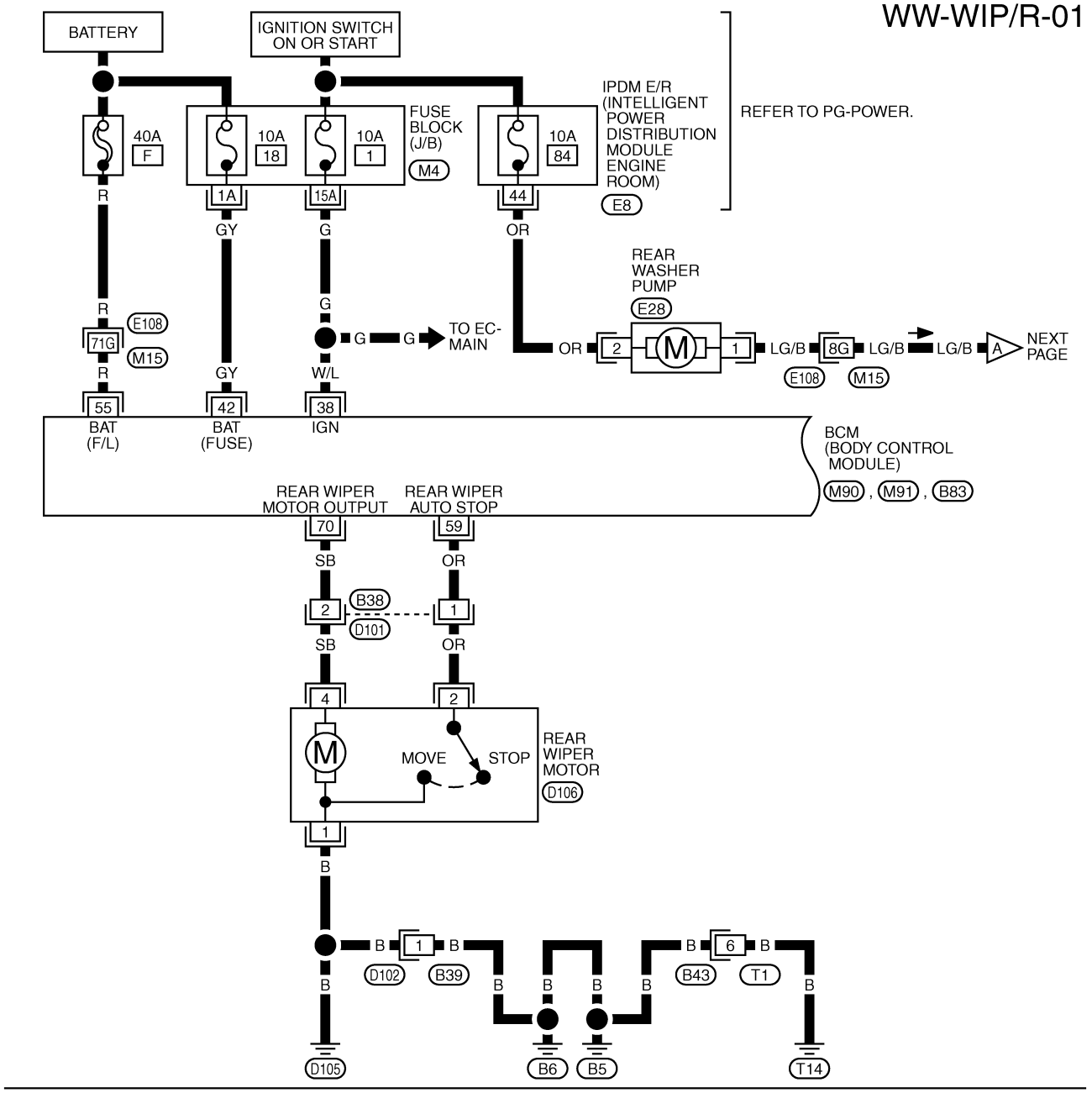
With ground is supplied, rear washer pump is operated.
When BCM detects that rear washer pump has operated for 0.4 seconds or longer, BCM operates rear wiper motor low speed.
When BCM detects washer switch is OFF, low speed operation cycles approximately 3 times and then stops.

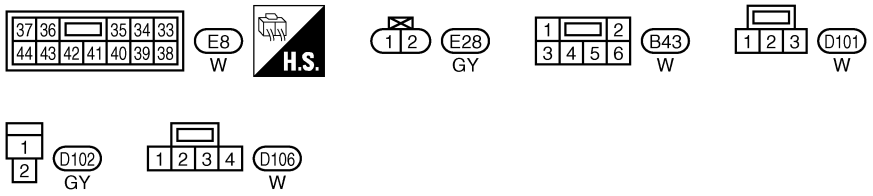
BCM WIPER SWITCH READING FUNCTION

Refer to WW-7, "COMBINATION SWITCH READING FUNCTION" .

Wiring Diagram — WIP/ R —

NKS0052Z





REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

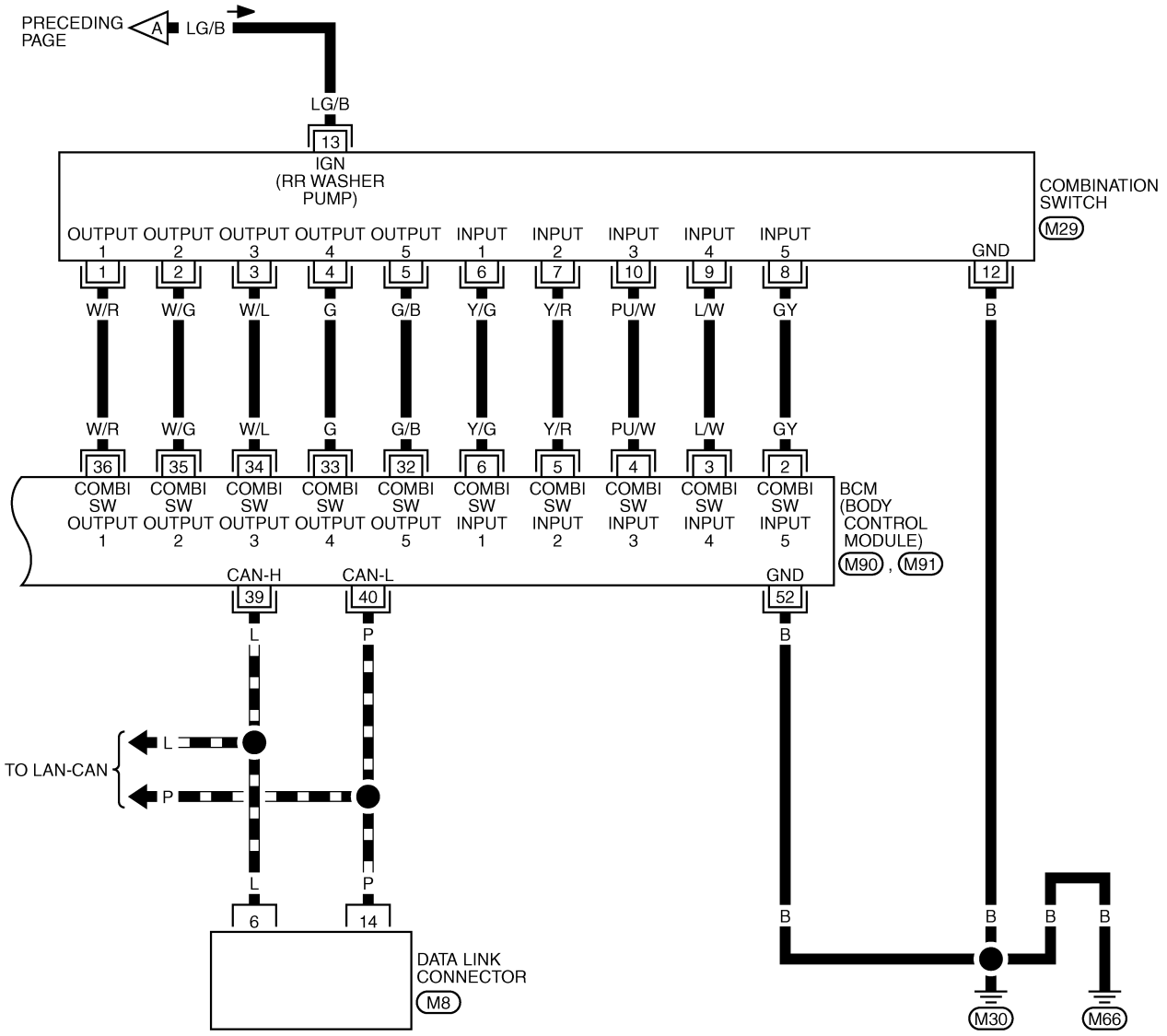
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

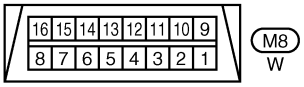
M90 , M91 , B83 -ELECTRICAL UNITS

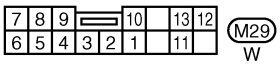
TKWT5739E

WW-WIP/R-02

: DATA LINE







REFER TO THE FOLLOWING.
M90 , M91 -ELECTRICAL UNITS

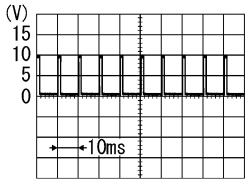
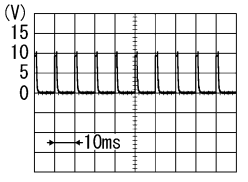
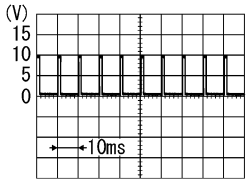
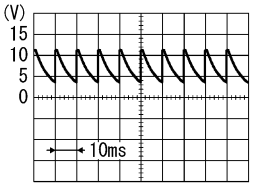
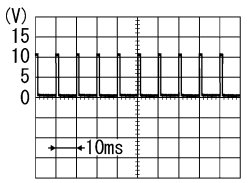
TKWT4008E

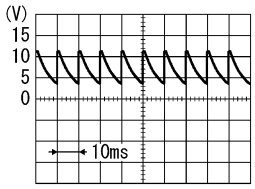
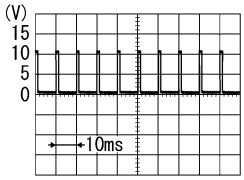
Terminals and Reference Values for BCM

NKS00530

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to WW-43, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Rear washer switch	 PKIB4959J Approx. 1.0 V
					Rear wiper switch ON	 PKIB4955J Approx. 0.8 v
6	Y/G	Combination switch input 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Rear wiper switch INT	 PKIB4959J Approx. 1.0 V
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Rear wiper switch INT	 PKIB4958J Approx. 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Rear washer switch	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	GY	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	R	Battery power supply	OFF	—		Battery voltage
59	OR	Rear wiper auto stop signal	ON	Rear wiper operates		Approx. 0 V
				Rear wiper does not operate		Battery voltage
70	SB	Rear wiper motor output signal	ON	Rear wiper operates		Battery voltage
				Rear wiper does not operate		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS00531

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-36, "System Description" .
3. Perform preliminary check. Refer to WW-42, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does rear wiper and washer operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS00532

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
Rear washer pump	Ignition ON or START	84
BCM	Ignition ON or START	1
	Battery	F
		18

Refer to WW-38, "Wiring Diagram — WIP/ R —" .

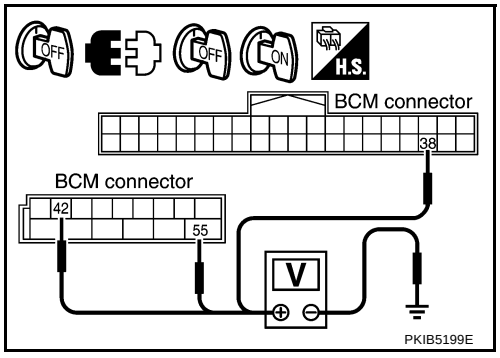
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M90	38	Ground	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

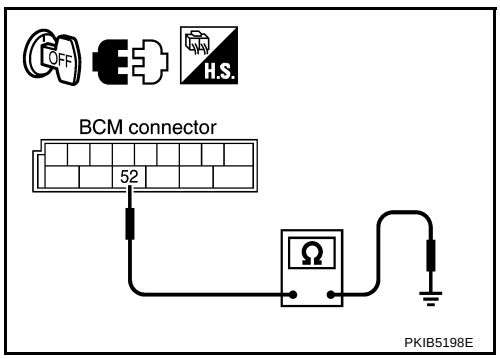
OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM and ground.



BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.

CONSULT-III Function (BCM)

NKS00533

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis position	Diagnosis mode	Description
WIPER	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Device operation can be checked by applying a drive signal to device.

DATA MONITOR
Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from ignition switch signal.
IGN SW CAN	“ON/OFF”	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from CAN communication signal.
FR WIPER HI	“ON/OFF”	Displays “FRONT WIPER HI (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER LOW	“ON/OFF”	Displays “FRONT WIPER LOW (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER INT	“ON/OFF”	Displays “FRONT WIPER INT (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WASHER SW	“ON/OFF”	Displays “FRONT WASHER Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
INT VOLUME	“1 - 7”	Displays intermittent operation dial position setting (1 - 7) as judged from wiper switch signal.
FR WIPER STOP	“ON/OFF”	Displays “Stopped (ON)/Operating (OFF)” status as judged from auto-stop signal.
VEHICLE SPEED	“km/h”	Displays vehicle speed status as judged from vehicle speed signal.
RR WIPER ON NOTE 1	“ON/OFF”	Displays “Rear Wiper ON (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT NOTE 1	“ON/OFF”	Displays “Rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW NOTE 1	“ON/OFF”	Displays “Rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER STOP NOTE 1	“ON/OFF”	Displays “Rear Wiper Stop (ON)/Other (OFF)” status, as judged from wiper switch signal.
RR WIPER STP2 NOTE 2	“OFF”	—

NOTE:
1. Coupe models
2. This item is displayed, but cannot be monitored.

ACTIVE TEST
Display Item List

Test item	Display on CONSULTIII screen	Description
Front wiper output	FR WIPER	With a certain operation (OFF, HI, LO, INT), front wiper can be operated.
Rear wiper output NOTE	RR WIPER	Rear wiper can be operated by any ON–OFF operation

NOTE:
Coupe models

Rear Wiper Does Not Operate

NKS00534

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select "RR WIPER ON" of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

2. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "REAR WIPER" of BCM active test item.
2. With operating the test item, check that rear wiper operation.

GO TO 3

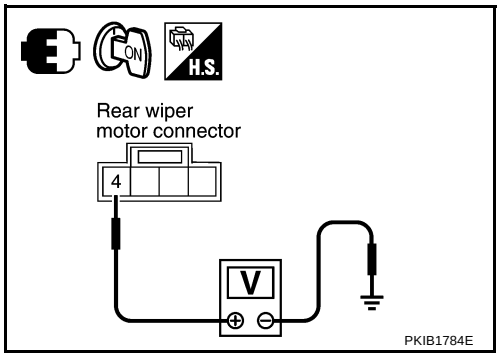
Does rear wiper operate normally?

YES >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NO >> GO TO 3.

3. CHECK BCM

With rear wiper switch ON, check voltage between rear wiper motor harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(-)	
Rear wiper motor connector	Terminal	Ground	
D106	4		Battery voltage



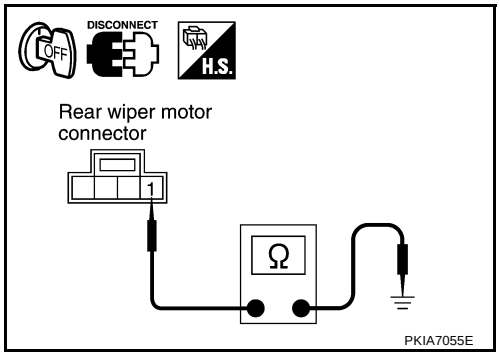
OK or NG

OK >> GO TO 4.
NG >> GO TO 5.

4. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect rear wiper motor connector.
3. Check continuity between rear wiper motor harness connector and ground.

Rear wiper motor connector	Terminal	Ground	Continuity
D106	1		Yes

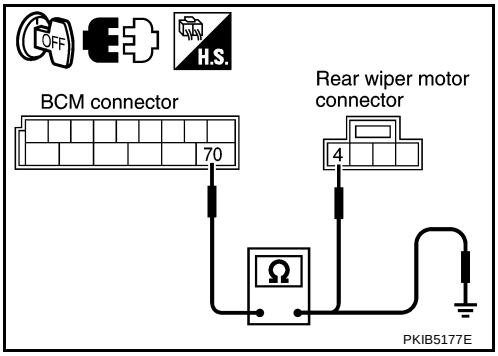


OK or NG

OK >> Replace rear wiper motor. Refer to WW-47, "Removal and Installation of Rear Wiper Motor" .
NG >> Repair harness or connector.

5. CHECK REAR WIPER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and rear wiper motor connector.
3. Check continuity between BCM harness connector and rear wiper motor harness connector.



BCM		Rear wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
B83	70	D106	4	Yes

4. Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
B83	70		No

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

Rear Wiper Does Not Return to Stop Position

NKS00535

1. CHECK REAR WIPER MOTOR CIRCUIT

With CONSULT-III

1. Select "RR WIPER STOP" of BCM data monitor item.
2. Make sure that “RR WIPER STOP”, turn ON-OFF linked with rear wiper switch operation.

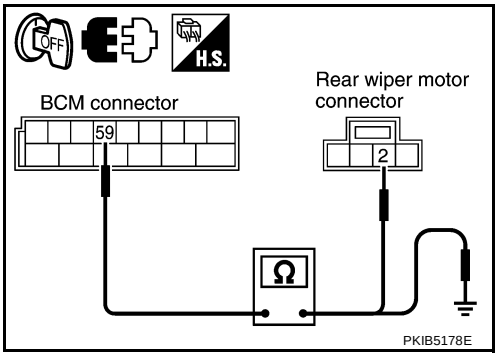
GO TO 2

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 2.

2. CHECK REAR WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and rear wiper motor connector.
3. Check continuity between BCM harness connector and rear wiper motor harness connector.

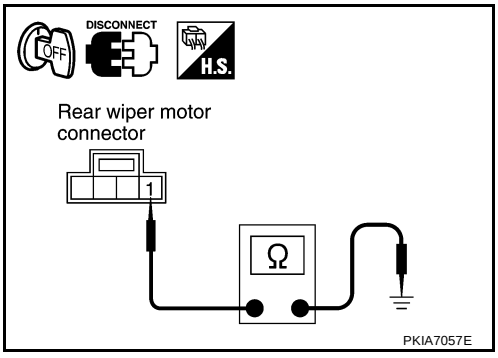


BCM		Rear wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
B83	59	D106	2	Yes

4. Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
B83	59		No

5. Check continuity between rear wiper motor harness connector and ground.



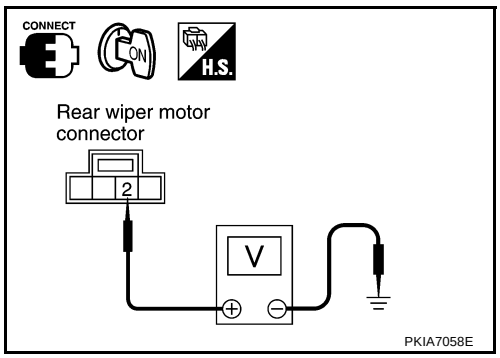
Rear wiper motor connector	Terminal	Ground	Continuity
D106	1		Yes

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK REAR WIPER MOTOR SIGNAL

1. Connect BCM connector and rear wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between rear wiper motor harness connector terminal and ground while rear wiper motor is stopped and while it is operating.



Terminals			Condition	Voltage (Approx.)
(+)		(-)		
Rear wiper motor connector	Terminal			
D106	2	Ground	Wiper stopped	Battery voltage
			Wiper operating	0 V

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace rear wiper motor. Refer to BCS-17, "Removal and Installation of BCM" .

Only Rear Wiper ON Does Not Operate

NKS00536

Refer to LT-92, "Combination Switch Inspection" .

Only Rear Wiper INT Does Not Operate

NKS00537

Refer to LT-92, "Combination Switch Inspection" .

Wiper Does Not Wipe When Rear Washer Operates

NKS00538

Refer to LT-92, "Combination Switch Inspection" .

Rear Wiper Does Not Stop

NKS00539

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

With CONSULT-III

1. Select “BCM” on CONSULT-III, and select “WIPER” on “SELECT TEST ITEM” screen.
2. Select “DATA MONITOR” on “SELECT DIAG MODE” screen. Make sure that “RR WIPER INT”, “RR WIPER ON”, and “RR WASHER SW” turn ON-OFF according to wiper switch operation.

Without CONSULT-III

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

Removal and Installation of Rear Wiper Arm, Adjustment of Wiper Arms Stop Location

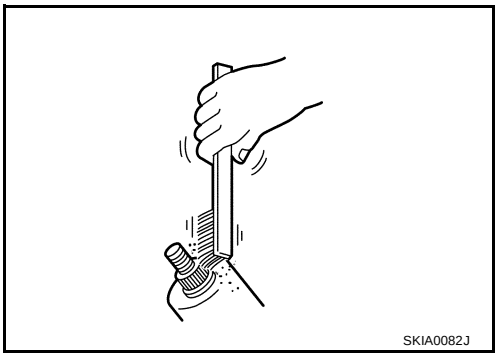
NKS0053A

REMOVAL

1. Turn rear wiper switch ON to operate wiper motor, and then turn rear wiper switch OFF (auto stop).
2. Remove rear wiper arm cap, and remove rear wiper arm nut.
3. Raise rear wiper arm, and remove rear wiper arm from the vehicle.

INSTALLATION

1. Clean up the pivot area as shown in the figure. This will reduce possibility of rear wiper arm nut looseness.
2. Prior to rear wiper arm installation, turn rear wiper switch ON to operate wiper motor, and then turn rear wiper switch OFF (auto stop).



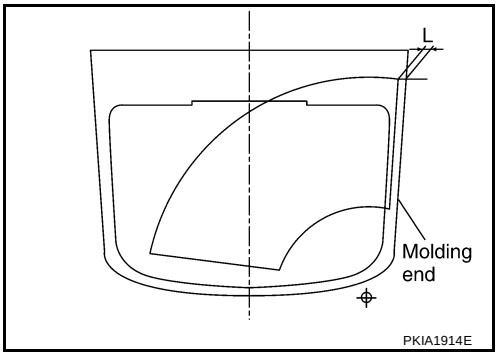
3. Lift the blade up and then set it down onto windshield glass surface to set the blade center to clearance “L” immediately.
4. Tighten wiper arm nuts to specified torque.

Rear wiper arm nut : 15.2 N·m (1.6 kg-m, 11 ft-lb)

5. Spray washer fluid. Turn rear wiper switch ON to operate wiper motor, and then turn rear wiper switch OFF (auto stop).
6. Make sure that wiper blade stop within clearance “L”.

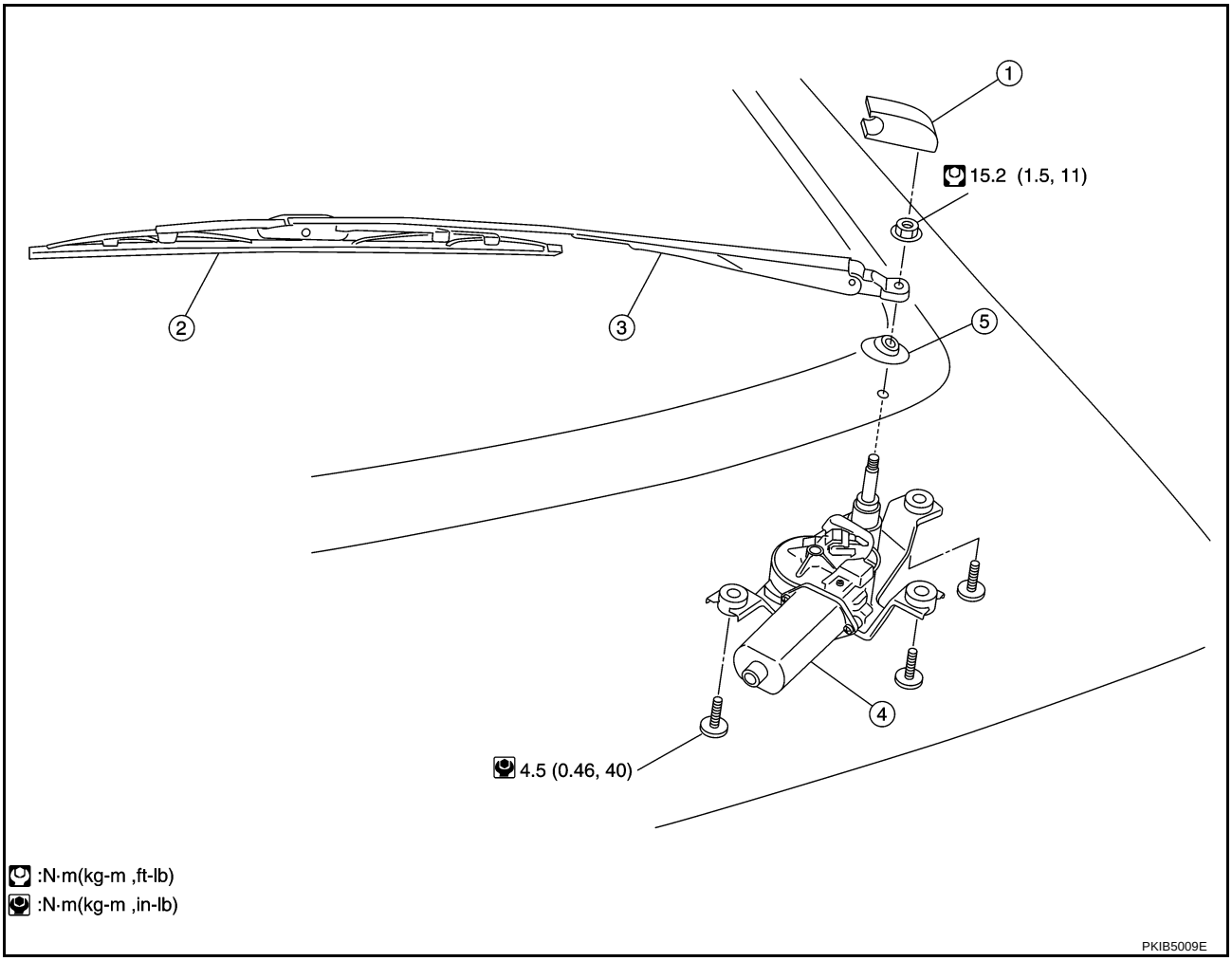
Clearance “L” : 30 ± 7.5 mm (1.181 ± 0.295 in)

7. Install rear wiper arm caps.



Removal and Installation of Rear Wiper Motor

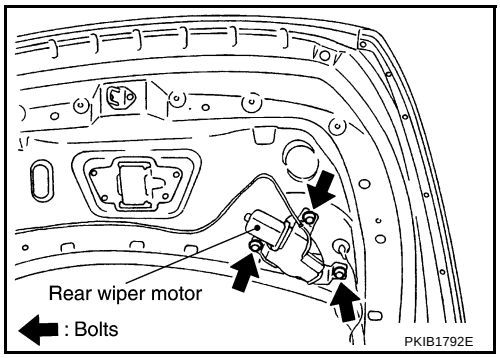
NKS0053B



1. Cover wiper arm
2. Wiper blade
3. Wiper arm
4. Rear wiper motor
5. Pivot cap

REMOVAL

1. Remove rear wiper arm. Refer to WW-46, "REMOVAL" .
2. Remove pivot cap.
3. Remove back door finisher lower. Refer to EI-48, "BACK DOOR FINISHER" .
4. Disconnect rear wiper motor connector.
5. Remove rear wiper motor mounting bolts and remove rear wiper motor from the vehicle.



INSTALLATION

1. Install rear wiper motor to the vehicle.

Rear wiper motor mounting bolts : 4.5 N·m (0.46 kg-m, 40 in-lb)

2. Install pivot cap.
3. Connect rear wiper motor connector. Turn rear wiper switch ON to operate wiper motor, and then turn rear wiper switch OFF (auto stop).
4. Install back door finisher lower. Refer to EI-48, "BACK DOOR FINISHER" .
5. Install rear wiper arm and arm cap. Refer to WW-47, "INSTALLATION" .

CAUTION:

Never drop the rear wiper motor nor cause it to interfere with other parts.

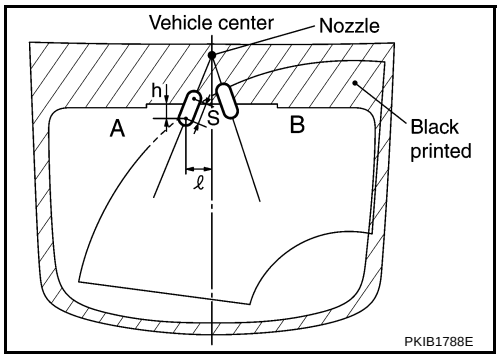
Washer Nozzle Adjustment

NKS0053C

Adjust spray position as shown in the figure.

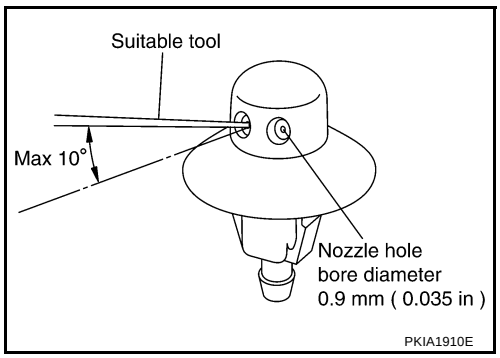
Unit: mm (in)

Spray position	h (height)	ℓ (width)	S	Diameter (spray position range)
A	30 (1.18)	73 (2.87)	50 (1.97)	30
B	12 (0.47)	50 (1.97)	50 (1.97)	30



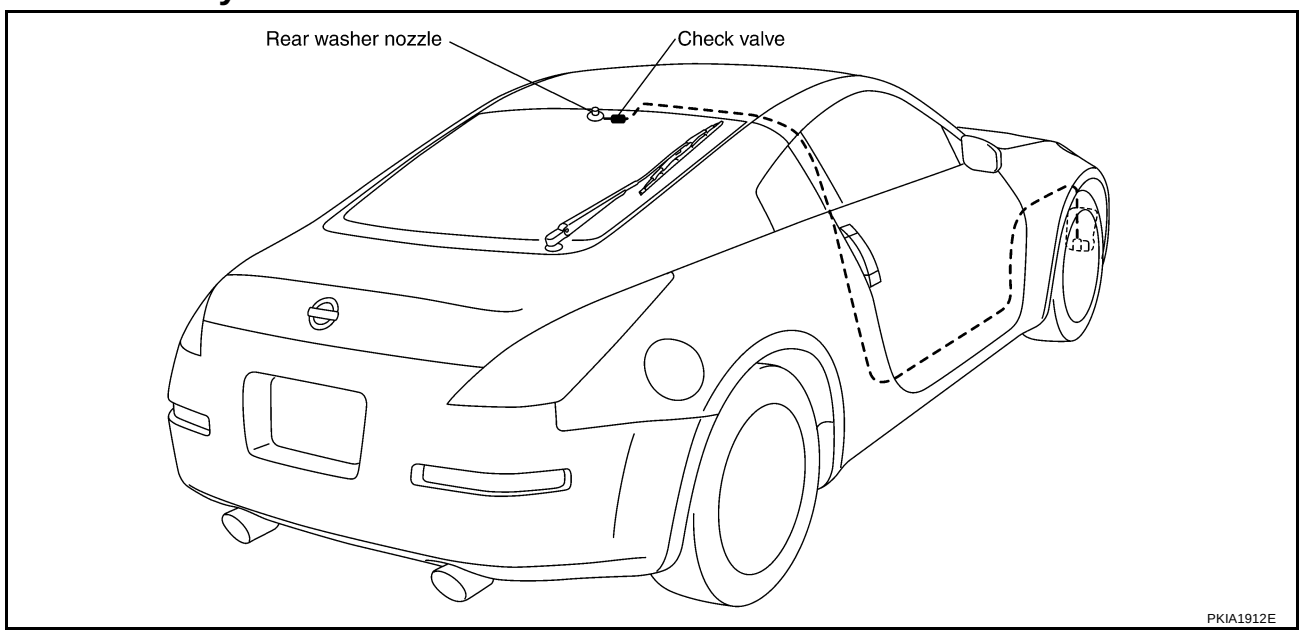
Adjust washer nozzle with suitable tool as shown in the figure.

Adjustable range : ±10° (In any direction)



Washer Tube Layout

NKS0053D

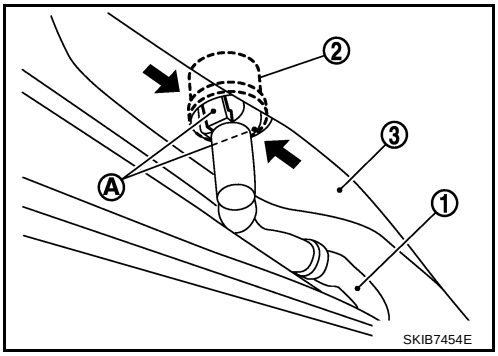


Removal and Installation of Rear Washer Nozzle

NKS0053E

REMOVAL

1. Remove washer tube(1).
2. While pressing pawl (A) on the reverse side of rear washer nozzle (2), remove rear washer nozzle (2) from back door (3).



INSTALLATION

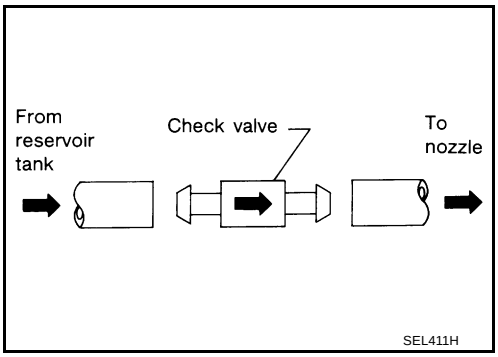
Installation is the reverse order of removal. Adjust nozzle spray location. Refer to WW-48, "Washer Nozzle Adjustment" .

Inspection for Washer Nozzle

NKS0053F

CHECK VALVE INSPECTION

A check valve is provided in washer fluid line. Be careful not to connect check valve to washer tube in the wrong direction.



Inspection of Rear Wiper and Washer Switch Circuit

NKS0053G

Refer to WW-34, "Removal and Installation of Front Wiper and Washer Switch" .

Removal and Installation of Rear Wiper and Washer Switch

NKS0053H

Refer to WW-34, "Removal and Installation of Front Wiper and Washer Switch" .

Removal and Installation of Washer Tank

NKS0053I

Refer to WW-34, "Removal and Installation of Washer Tank" .

Removal and Installation of Washer Pump

NKS0053J

Refer to WW-35, "Removal and Installation of Washer Pump" .

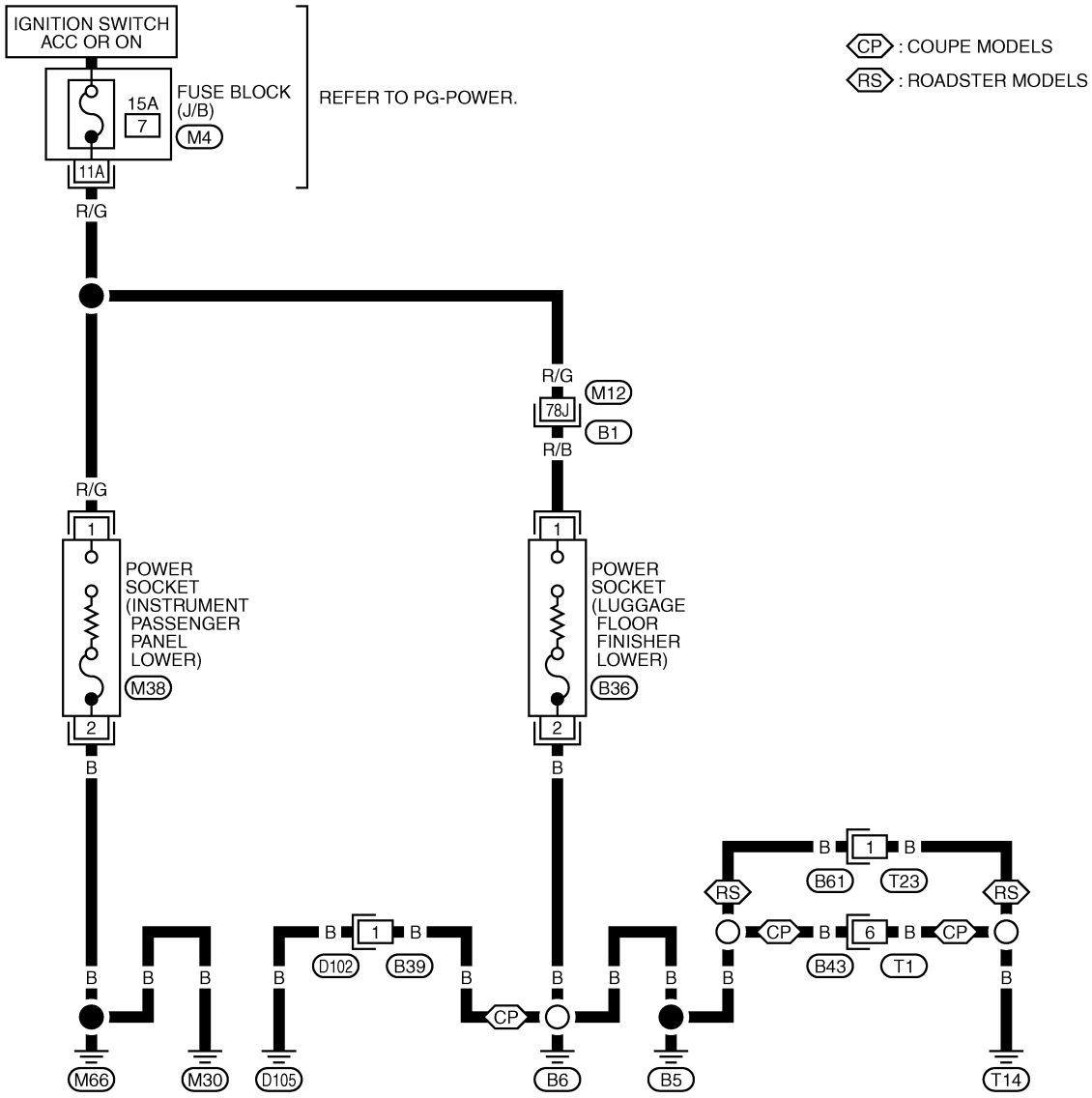
POWER SOCKET

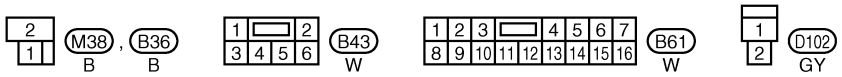
PFP:253A2

Wiring Diagram — P/SCKT —

NKS0053K

WW-P/SCKT-01





REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

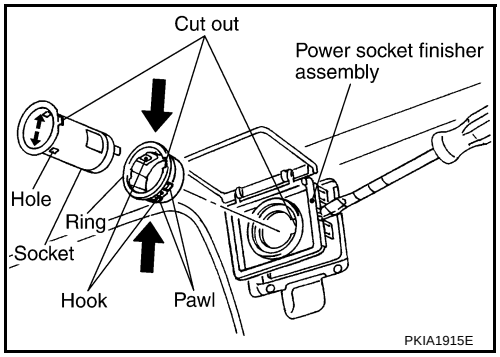
TKWT5740E

Removal and Installation (Luggage Floor Finisher Lower)

NKS0053L

REMOVAL

1. Remove power socket finisher assembly using a clip driver or a suitable tool.
2. Disconnect power socket connector.
3. Remove inner socket from ring. While pressing hook on ring out from square hole.
4. Remove ring from power socket finisher while pressing pawls.



INSTALLATION

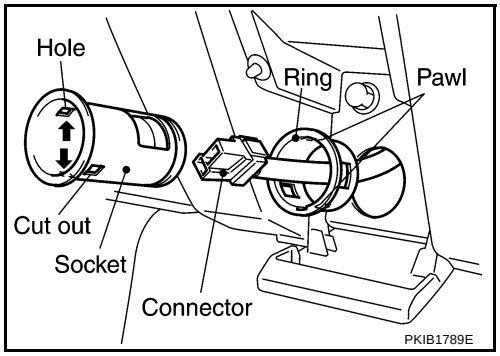
Installation is the reverse order of removal.

Removal and Installation (Instrument Passenger Panel Lower)

NKS0053M

REMOVAL

1. Remove socket using a clip driver or a suitable tool that pressing pawls in socket hole.
2. Disconnect power socket connector.
3. Remove ring from instrument passenger panel lower.



INSTALLATION

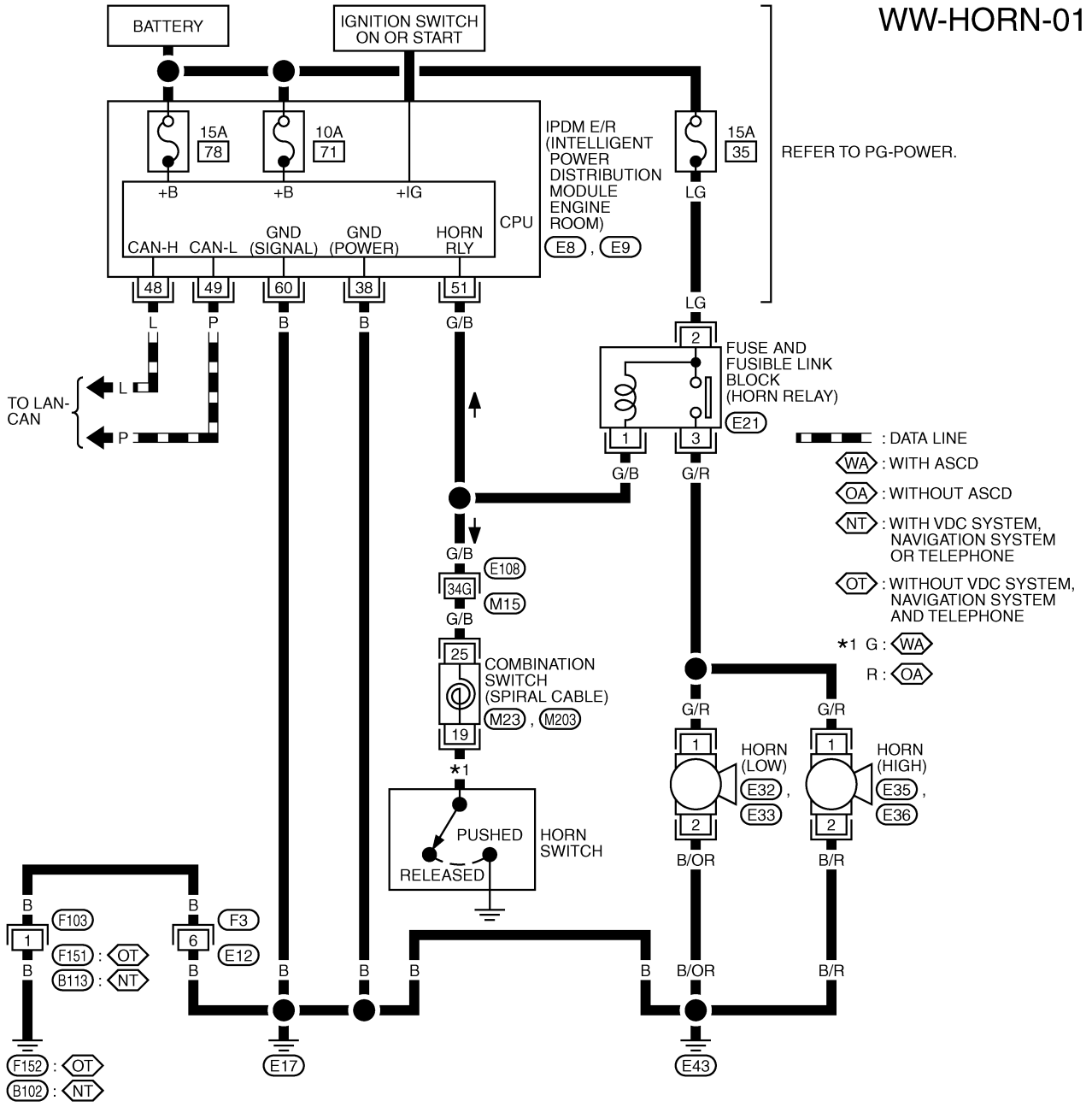
Installation is the reverse order of removal.

HORN

PFP:25610

Wiring Diagram — HORN —

NKS0053N



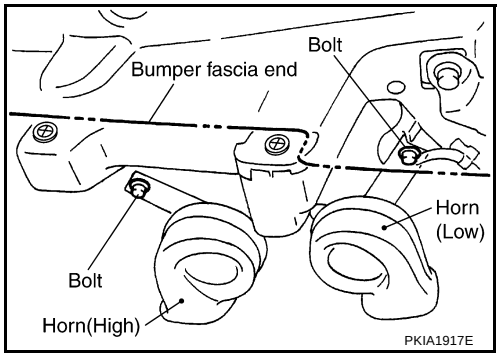
TKWT5741E

Removal and Installation

NKS0053O

REMOVAL

1. Disconnect all horn connectors.
2. Remove horn mounting bolt and remove horn from vehicle.



INSTALLATION

Tighten horn bolt to specified torque.

Horn mounting bolt : 5.7 N·m (0.58 kg-m, 50 in-lb)

SECTION ACS
AUTO CRUISE CONTROL SYSTEM

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AUTOMATIC SPEED CONTROL DEVICE (ASCD).... 2
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AUTOMATIC SPEED CONTROL DEVICE (ASCD)

PFP:18930

Description

NKS000DY

Regarding the information for ASCD system, refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" .

SECTION AT
AUTOMATIC TRANSMISSION

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INDEX FOR DTC

PFP:00024

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NCS00017

NOTE:
If DTC "U1000 CAN COMM CIRCUIT" is displayed with other DTCs, first perform the trouble diagnosis for "DTC U1000 CAN COMMUNICATION LINE". Refer to AT-94 .

Items (CONSULT-III screen terms)	DTC		Reference page
	OBD-II	Except OBD-II	
	CONSULT-III GST*1	CONSULT-III only "TRANSMISSION"	
A/T 1ST E/BRAKING	—	P1731	AT-143
A/T 1ST GR FNCTN	P0731	P0731	AT-115
A/T 2ND GR FNCTN	P0732	P0732	AT-117
A/T 3RD GR FNCTN	P0733	P0733	AT-119
A/T 4TH GR FNCTN	P0734	P0734	AT-121
A/T 5TH GR FNCTN	P0735	P0735	AT-123
A/T INTERLOCK	P1730	P1730	AT-141
A/T TCC S/V FNCTN	P0744*2	P0744	AT-127
ATF TEMP SEN/CIRC	P0710	P1710	AT-134
CAN COMM CIRCUIT	U1000	U1000	AT-94
D/C SOLENOID/CIRC	P1762	P1762	AT-149
ENGINE SPEED SIG	P0725	P0725	AT-113
FR/B SOLENOID/CIRC	P1757	P1757	AT-147
HLR/C SOL/CIRC	P1767	P1767	AT-151
I/C SOLENOID/CIRC	P1752	P1752	AT-145
L/PRESS SOL/CIRC	P0745	P0745	AT-129
LC/B SOLENOID/CIRC	P1772	P1772	AT-153
LC/B SOLENOID FNCT	P1774*2	P1774	AT-155
MANU MODE SW/CIRC	—	P1815	AT-157
PNP SW/CIRC	P0705	P0705	AT-102
STARTER RELAY/CIRC	—	P0615	AT-97
TCC SOLENOID/CIRC	P0740	P0740	AT-125
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VEH SPD SEN/CIR AT	P0720	P0720	AT-108

- *1: These numbers are precribed by SAE J2012.
- *2: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

DTC No. Index

NCS00018

NOTE:
If DTC "U1000 CAN COMM CIRCUIT" is displayed with other DTCs, first perform the trouble diagnosis for "DTC U1000 CAN COMMUNICATION LINE". Refer to AT-94 .

DTC		Items (CONSULT-III screen terms)	Reference page
OBD-II	Except OBD-II		
CONSULT-III GST*1	CONSULT-III only "TRANSMISSION"		
—	P0615	STARTER RELAY/CIRC	AT-97
P0700	P0700	TCM	AT-101
P0705	P0705	PNP SW/CIRC	AT-102
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P0720	P0720	VEH SPD SEN/CIR AT	AT-108
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P0732	P0732	A/T 2ND GR FNCTN	AT-117
P0733	P0733	A/T 3RD GR FNCTN	AT-119
P0734	P0734	A/T 4TH GR FNCTN	AT-121
P0735	P0735	A/T 5TH GR FNCTN	AT-123
P0740	P0740	TCC SOLENOID/CIRC	AT-125
P0744*2	P0744	A/T TCC S/V FNCTN	AT-127
P0745	P0745	L/PRESS SOL/CIRC	AT-129
P1705	P1705	TP SEN/CIRC A/T	AT-131
—	P1721	VEH SPD SE/CIR-MTR	AT-139
P1730	P1730	A/T INTERLOCK	AT-141
—	P1731	A/T 1ST E/BRAKING	AT-143
P1752	P1752	I/C SOLENOID/CIRC	AT-145
P1757	P1757	FR/B SOLENOID/CIRC	AT-147
P1762	P1762	D/C SOLENOID/CIRC	AT-149
P1767	P1767	HLR/C SOL/CIRC	AT-151
P1772	P1772	LC/B SOLENOID/CIRC	AT-153
P1774*2	P1774	LC/B SOLENOID FNCT	AT-155
—	P1815	MANU MODE SW/CIRC	AT-157
U1000	U1000	CAN COMM CIRCUIT	AT-94

- *1: These numbers are precribed by SAE J2012.
- *2: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NCS00019

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NCS0001A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for On Board Diagnostic (OBD) System of A/T and Engine

NCS0001B

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

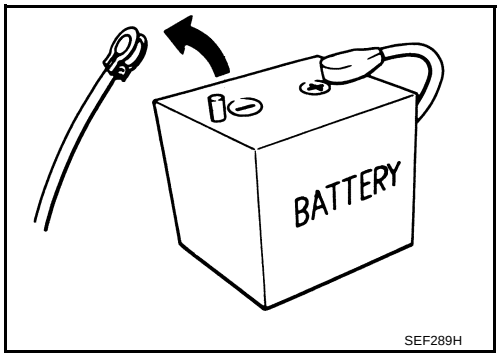
CAUTION:

- **Be sure to turn the ignition switch OFF and disconnect the battery cable from the negative terminal before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. Will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to an open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Be sure to route and secure the harnesses properly after work. Interference of the harness with a bracket, etc. May cause the MIL to light up due to a short circuit.**
- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to a malfunction of the EGR system or fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the TCM and ECM before returning the vehicle to the customer.**

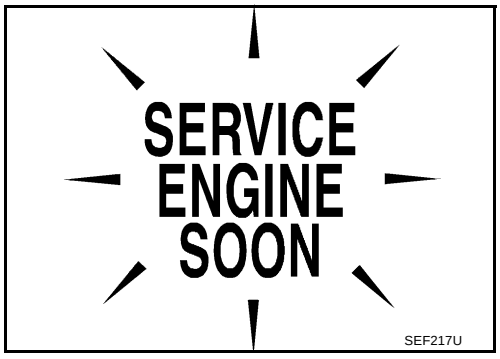
Precautions

NCS0001C

- **Before connecting or disconnecting the A/T assembly harness connector, turn ignition switch OFF and disconnect the battery cable from the negative terminal. Because battery voltage is applied to TCM even if ignition switch is turned OFF.**



- **After performing each TROUBLE DIAGNOSIS, perform "DTC Confirmation Procedure".**
  If the repair is completed the DTC should not be displayed in the "DTC Confirmation Procedure".



- Always use the specified brand of ATF. Refer to MA-11, "Fluids and Lubricants" .
- Use lint-free paper not cloth rags during work.
- After replacing the ATF, dispose of the waste oil using the methods prescribed by law, ordinance, etc.
- Before proceeding with disassembly, thoroughly clean the outside of the A/T. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free paper or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the A/T.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the A/T is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Clean or replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to AT-9, "ATF COOLER SERVICE" .
- After overhaul, refill the A/T with new ATF.
- When the A/T drain plug is removed, only some of the ATF is drained. Old ATF will remain in torque converter and ATF cooling system.
  Always follow the procedures under "Changing A/T Fluid" in the AT section when changing A/T fluid. Refer to AT-12, "Changing A/T Fluid" , AT-12, "Checking A/T Fluid" .

Service Notice or Precautions

NCS0001D

ATF COOLER SERVICE

If ATF contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T fluid cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. For A/T fluid cooler cleaning procedure, refer to AT-14, "A/T Fluid Cooler Cleaning" . For radiator replacement, refer to CO-13, "RADIATOR" .

OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the TCM in combination with the ECM. The results can be read through the blinking pattern of the A/T CHECK indicator or the malfunction indicator lamp (MIL). Refer to the table on AT-86, "SELF-DIAGNOSTIC RESULT MODE" for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and TCM memories.
  Always perform the procedure on AT-38, "HOW TO ERASE DTC" to complete the repair and avoid unnecessary blinking of the MIL.

For details of OBD-II, refer to EC-47, "ON BOARD DIAGNOSTIC (OBD) SYSTEM" .

- **Certain systems and components, especially those related to OBD, may use the new style slide-locking type harness connector. For description and how to disconnect, refer to PG-76, "HARNESS CONNECTOR" .**

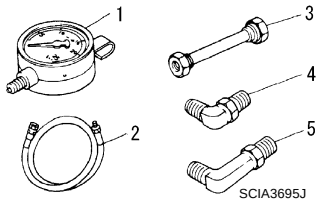
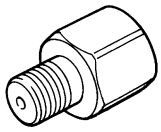
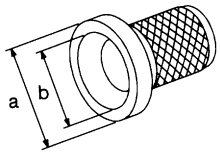
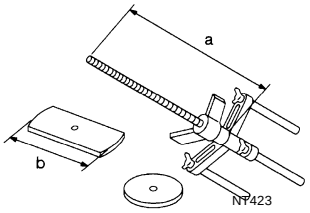
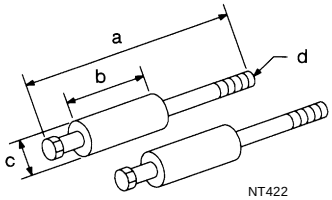
PREPARATION

PFP:00002

Special Service Tools

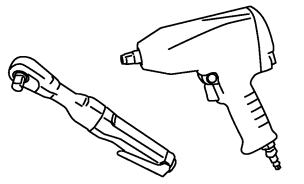
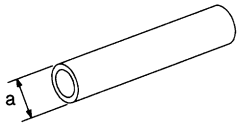
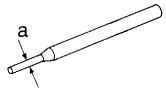
NCS0001F

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST2505S001 (J-34301-C) Oil pressure gauge set 1. ST25051001 (—) Oil pressure gauge 2. ST25052000 (—) Hose 3. ST25053000 (—) Joint pipe 4. ST25054000 (—) Adapter 5. ST25055000 (—) Adapter  SCIA3695J	Measuring line pressure
KV31103600 (J-45674) Joint pipe adapter (With ST25054000)  ZZA1227D	Measuring line pressure
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.  NT086	● Installing rear oil seal ● Installing oil pump housing oil seal
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor a: 320 mm (12.60 in) b: 174 mm (6.85 in)  NT423	Installing reverse brake return spring retainer
ST25850000 (J-25721-A) Sliding hammer a: 179 mm (7.05 in) b: 70 mm (2.76 in) c: 40 mm (1.57 in) d: M12X1.75P  NT422	Remove oil pump assembly

Commercial Service Tools

NCS0001G

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
Drift a: 22 mm (0.87 in) dia.  NT083	Installing manual shaft oil seals
Pin punch a: 4 mm (0.16 in) dia.  NT410	Removing retaining pin

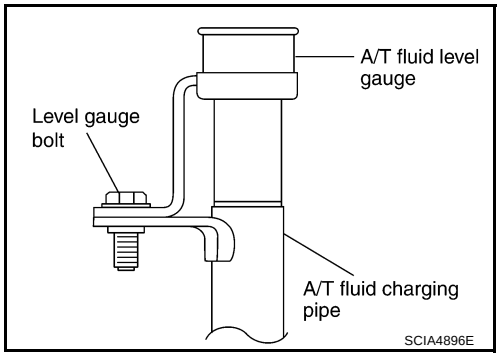
A/T FLUID

PFP:KLE40

Changing A/T Fluid

NCS0001H

1. Warm up ATF.
2. Stop engine.
3. Loosen the level gauge bolt.
4. Drain ATF from drain plug and refill with new ATF. Always refill same volume with drained ATF.
   - To replace the ATF, pour in new ATF at the A/T fluid charging pipe with the engine idling and at the same time drain the old ATF from the radiator cooler hose return side.
   - When the color of the ATF coming out is about the same as the color of the new ATF, the replacement is complete. The amount of new ATF to use should be 30 to 50% increase of the stipulated amount.



ATF: **Genuine NISSAN Matic J ATF**

Fluid capacity: **10.3 ℓ (10-7/8 US qt, 9-1/8 Imp qt)**

CAUTION:

- **Use only Genuine NISSAN Matic J ATF. Do not mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the NISSAN new vehicle limited warranty.**
- **When filling ATF, take care not to splash heat generating parts such as exhaust with ATF.**
- **Do not reuse drain plug gasket.**

Drain plug:

: 34 N·m (3.5 kg-m, 25 ft-lb)

5. Run engine at idle speed for 5 minutes.
6. Check A/T fluid level and condition. Refer to AT-12, "Checking A/T Fluid" . If ATF is still dirty, repeat step 2. through 5.
7. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
8. Tighten the level gauge bolt.

Level gauge bolt:

: 5.1 N·m (0.52 kg-m, 45 in-lb)

Checking A/T Fluid

NCS0001I

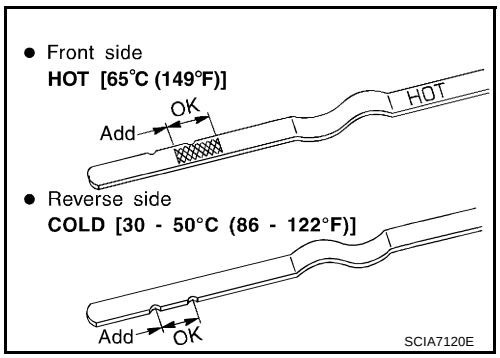
1. Warm up engine.
2. Check for A/T fluid leakage.
3. Loosen the level gauge bolt.
4. Before driving, A/T fluid level can be checked at A/T fluid temperatures of 30 to 50°C (86 to 122°F) using “COLD” range on A/T fluid level gauge as follows.

a. Park vehicle on level surface and set parking brake.

b. Start engine and move selector lever through each gear position. Leave selector lever in “P” position.

c. Check A/T fluid level with engine idling.

d. Remove A/T fluid level gauge and wipe clean with lint-free paper.



CAUTION:

When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.

e. Re-insert A/T fluid level gauge into A/T fluid charging pipe as far as it will go.

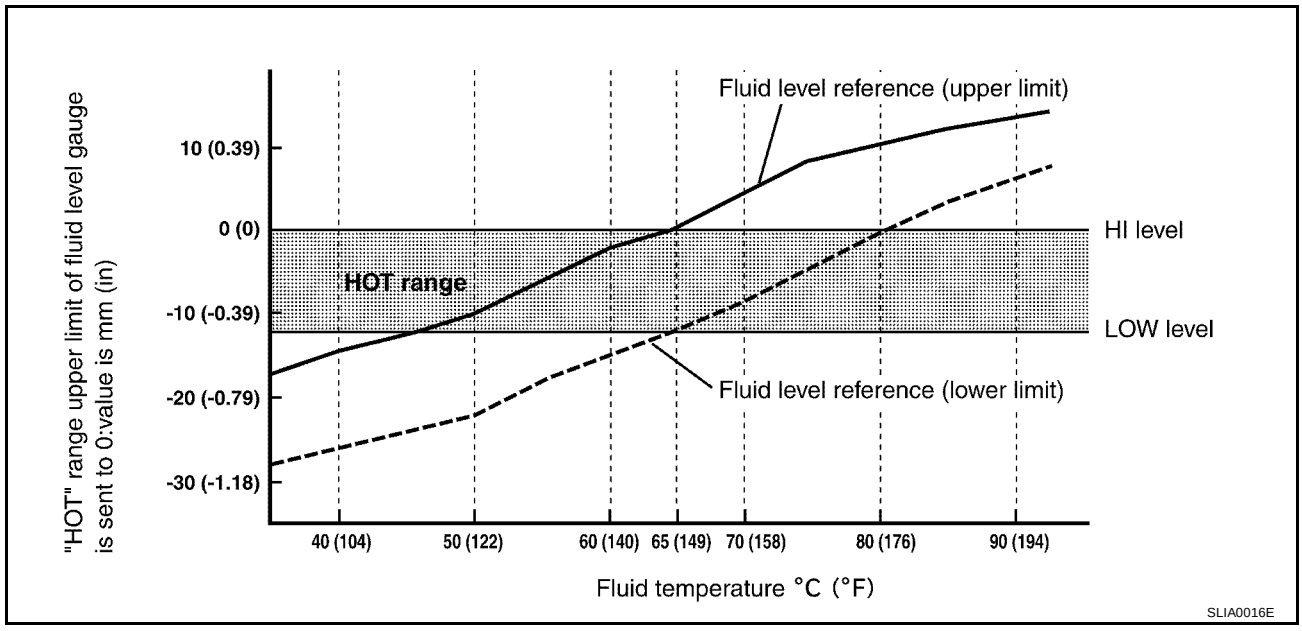
CAUTION:
To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions.

f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add ATF to the A/T fluid charging pipe.

CAUTION:
Do not overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.
6. Make the A/T fluid temperature approximately 65°C (149°F).

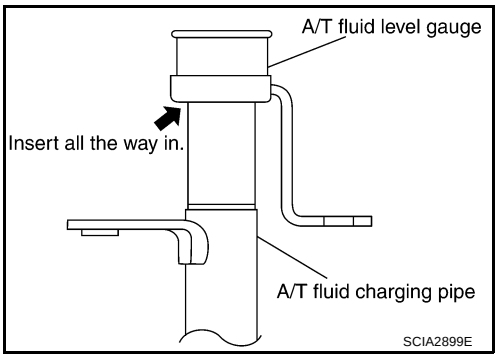
NOTE:
A/T fluid level will be greatly affected by temperature as shown in the figure. Therefore, be certain to perform operation while checking data with CONSULT-III.



a. Select “DATA MONITOR”.
b. Read out the value of “ATF TEMP 1”.

7. Re-check A/T fluid level at A/T fluid temperatures of approximately 65°C (149°F) using “HOT” range on A/T fluid level gauge.

CAUTION:
- **When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.**
- **To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge rotated from the normal attachment conditions as shown.**

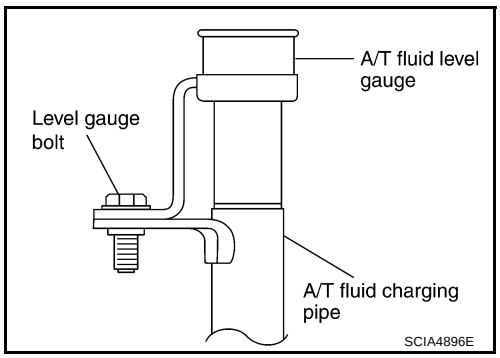


8. Check A/T fluid condition.
   - If ATF is very dark or smells burned, check operation of A/T. Flush cooling system after repair of A/T.
   - If ATF contains frictional material (clutches, bands, etc.), replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to CO-13, "RADIATOR" and AT-14, "A/T Fluid Cooler Cleaning" .
9. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.

10. Tighten level gauge bolt.

Level gauge bolt:

: 5.1 N·m (0.52 kg-m, 45 in-lb)



A/T Fluid Cooler Cleaning

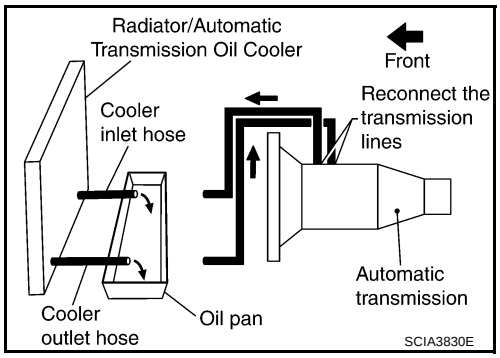
NCS0001J

Whenever an A/T is replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned. Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of ATF. In either case, malfunction of the newly serviced A/T may result.
Debris, if present, may build up as ATF enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

A/T FLUID COOLER CLEANING PROCEDURE

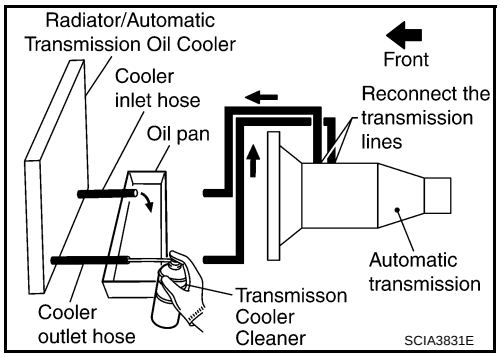
1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Identify the inlet and outlet A/T fluid cooler hoses.
3. Disconnect the A/T fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.

   NOTE:
   Replace the cooler hoses if rubber material from the hose remains on the tube fitting.
4. Allow any ATF that remains in the cooler hoses to drain into the oil pan.



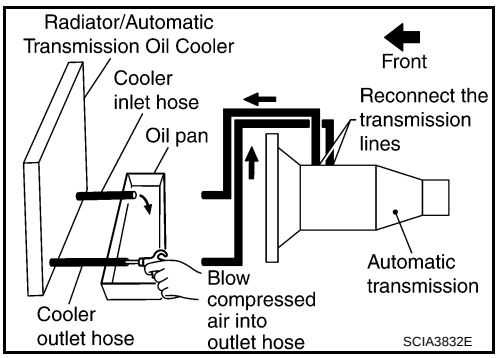
5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Do not breath vapors or spray mist.**



6. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.

7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the air gun tip and of the cooler outlet hose.
9. Blow compressed air regulated to 5 to 9 kg/cm^2 (70 to 130 psi) through the cooler outlet hose for 10 seconds to force out any remaining ATF.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the A/T fluid cooler steel lines to the A/T.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the A/T by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.



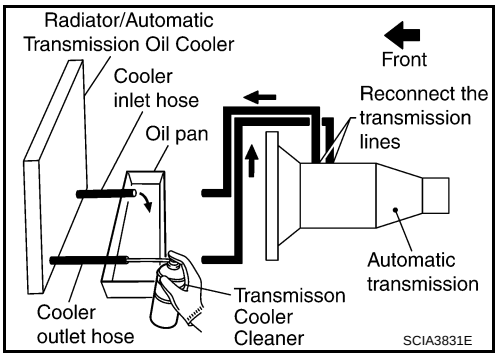
14. Blow compressed air regulated to 5 to 9 kg/cm^2 (70 to 130 psi) through each steel line from the cooler side back toward the A/T for 10 seconds to force out any remaining ATF.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform AT-15, "A/T FLUID COOLER DIAGNOSIS PROCEDURE" .

A/T FLUID COOLER DIAGNOSIS PROCEDURE

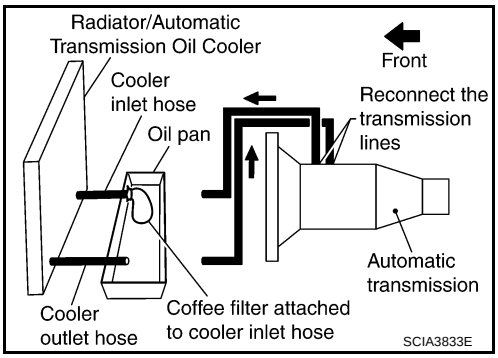
NOTE:
Insufficient cleaning of the cooler inlet hose exterior may lead to inaccurate debris identification.

1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Clean the exterior and tip of the cooler inlet hose.
3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

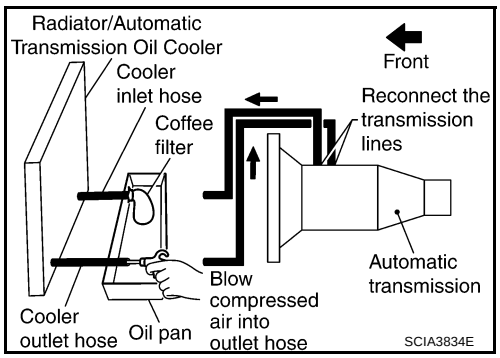
   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Do not breath vapors or spray mist.**



4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.
5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



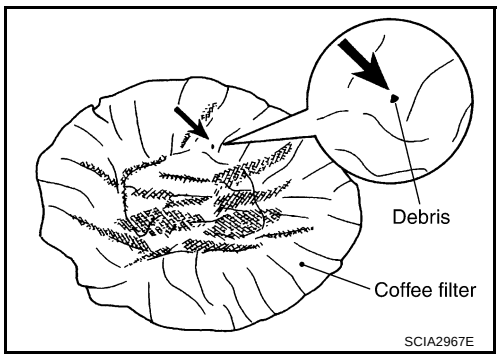
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 to 9 kg/cm^2 (70 to 130 psi) through the cooler outlet hose to force any remaining ATF into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform AT-16, "A/T FLUID COOLER INSPECTION PROCEDURE" .



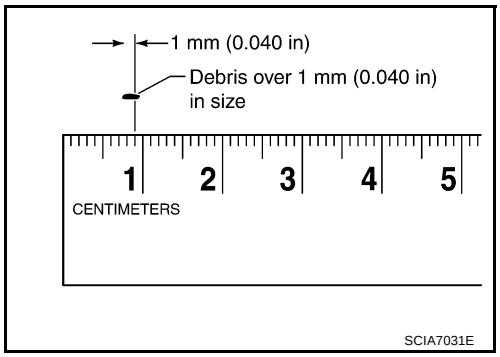
A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

a. If small metal debris less than 1 mm (0.04 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.



b. If one or more pieces of debris are found that are over 1 mm (0.04 in) in size and/or peeled clutch facing material is found in the coffee filter, the A/T fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to CO-13, "RADIATOR" and CO-17, "RADIATOR (ALUMINUM TYPE)" .



A/T FLUID COOLER FINAL INSPECTION

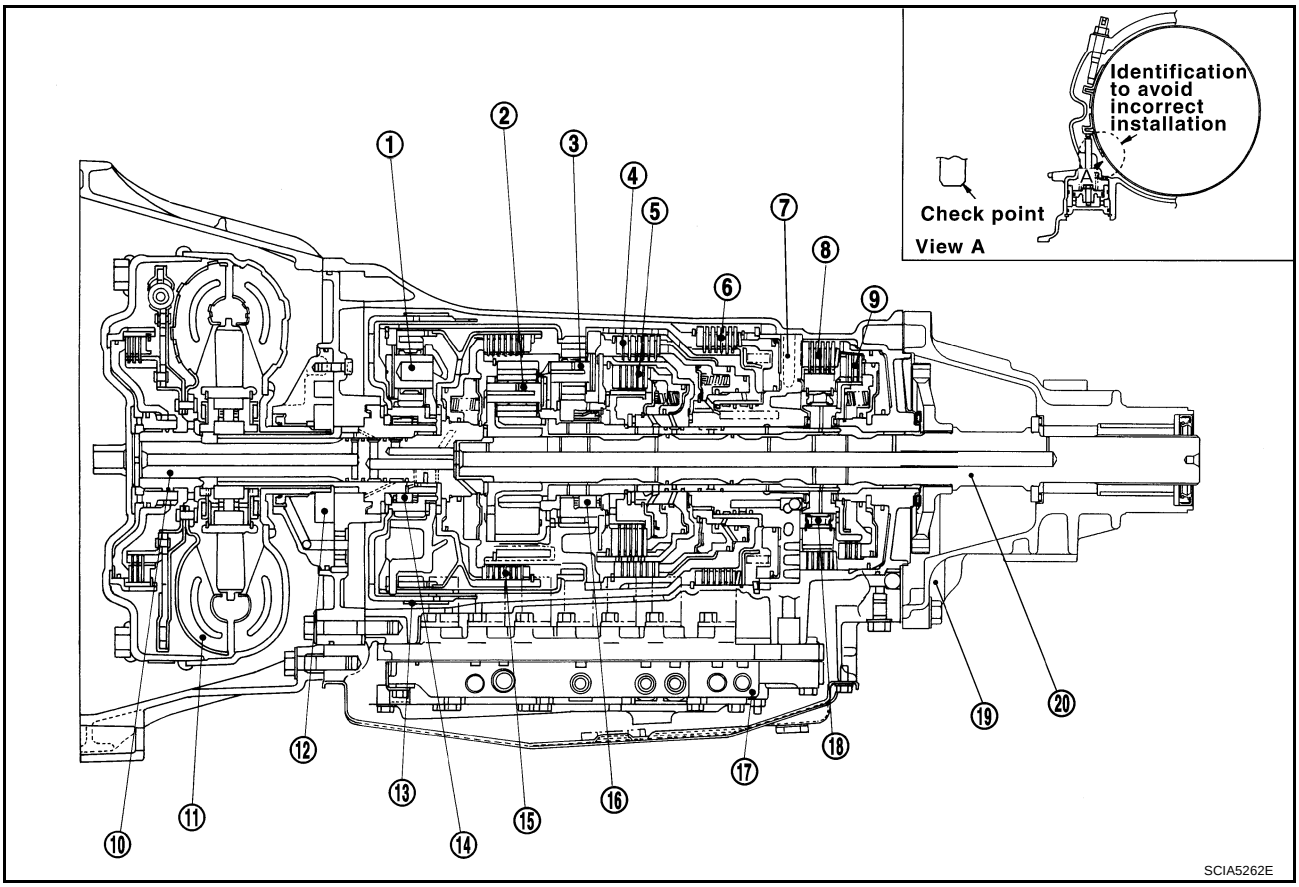
After performing all procedures, ensure that all remaining oil is cleaned from all components.

A/T CONTROL SYSTEM

PFP:31036

Cross-sectional View

NCS0001K



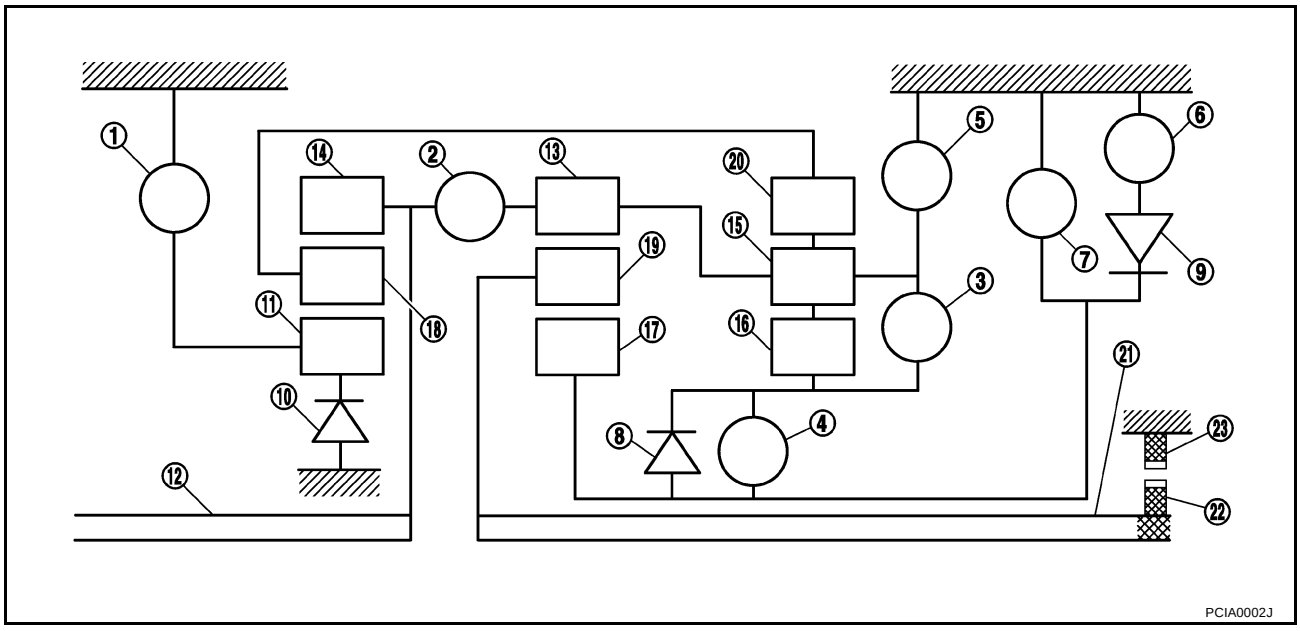
1. Front planetary gear	2. Mid planetary gear	3. Rear planetary gear
4. Direct clutch	5. High and low reverse clutch	6. Reverse brake
7. Drum support	8. Forward brake	9. Low coast brake
10. Input shaft	11. Torque converter	12. Oil pump
13. Front brake	14. 3rd one-way clutch	15. Input clutch
16. 1st one-way clutch	17. Control valve with TCM	18. Forward one-way clutch
19. Rear extension	20. Output shaft	

Shift Mechanism

NCS0001L

The A/T uses compact triple planetary gear systems to improve power transmission efficiency, simplify construction and reduce weight.
It also employs an optimum shift control and super wide gear ratios. They improve starting performance and acceleration during medium and high-speed operation.

CONSTRUCTION



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

FUNCTION OF CLUTCH AND BRAKE

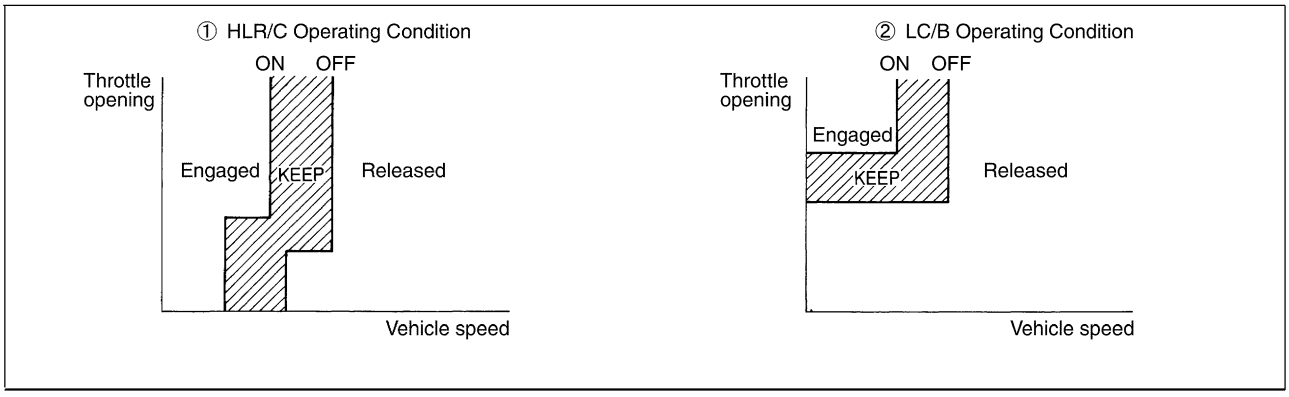
Name of the Part	Abbreviation	Function
Front brake (1)	FR/B	Fastens the front sun gear (11).
Input clutch (2)	I/C	Connects the input shaft (12), the front internal gear (14) and the mid internal gear (13).
Direct clutch (3)	D/C	Connects the rear carrier (15) and the rear sun gear (16).
High and low reverse clutch (4)	HLR/C	Connects the mid sun gear (17) and the rear sun gear (16).
Reverse brake (5)	R/B	Fastens the rear carrier (15).
Forward brake (6)	Fwd/B	Fastens the mid sun gear (17).
Low coast brake (7)	LC/B	Fastens the mid sun gear (17).
1st one-way clutch (8)	1st OWC	Allows the rear sun gear (16) to turn freely forward relative to the mid sun gear (17) but fastens it for reverse rotation.
Forward one-way clutch (9)	Fwd OWC	Allows the mid sun gear (17) to turn freely in the forward direction but fastens it for reverse rotation.
3rd one-way clutch (10)	3rd OWC	Allows the front sun gear (11) to turn freely in the forward direction but fastens it for reverse rotation.

CLUTCH AND BAND CHART

Shift position		I/C	HLR/C	D/C	R/B	FR/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC	Remarks
P			△			△						PARK POSITION
R			○		○	○			◎		◎	REVERSE POSITION
N			△			△						NEUTRAL POSITION
D	1st		△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2↔3↔4↔5
	2nd			○		△		○		◎	◎	
	3rd		○	○		○		△	◇		◎	
	4th	○	○	○				△	◇			
	5th	○	○			○		△	◇		◇	
M5	5th	○	○			○		△	◇		◇	Locks* (held stationary) in 5th gear
M4	4th	○	○	○				△	◇			Locks* (held stationary) in 4th gear
M3	3rd		○	○		○		△	◇		◎	Locks* (held stationary) in 3rd gear
M2	2nd			○		○	○	○		◎	◎	Locks* (held stationary) in 2nd gear
M1	1st		○			○	○	○	◎	◎	◎	Locks* (held stationary) in 1st gear

*: Down shift automatically according to the vehicle speed.

○ — Operates
◎ — Operates during "progressive" acceleration.
◇ — Operates and affects power transmission while coasting.
△ — Line pressure is applied but does not affect power transmission.
△ * — Operates under conditions shown in illustration ①.
△ ** — Operates under conditions shown in illustration ②. Delay control is applied during D (4,3,2,1) → N shift.



SCIA6962E

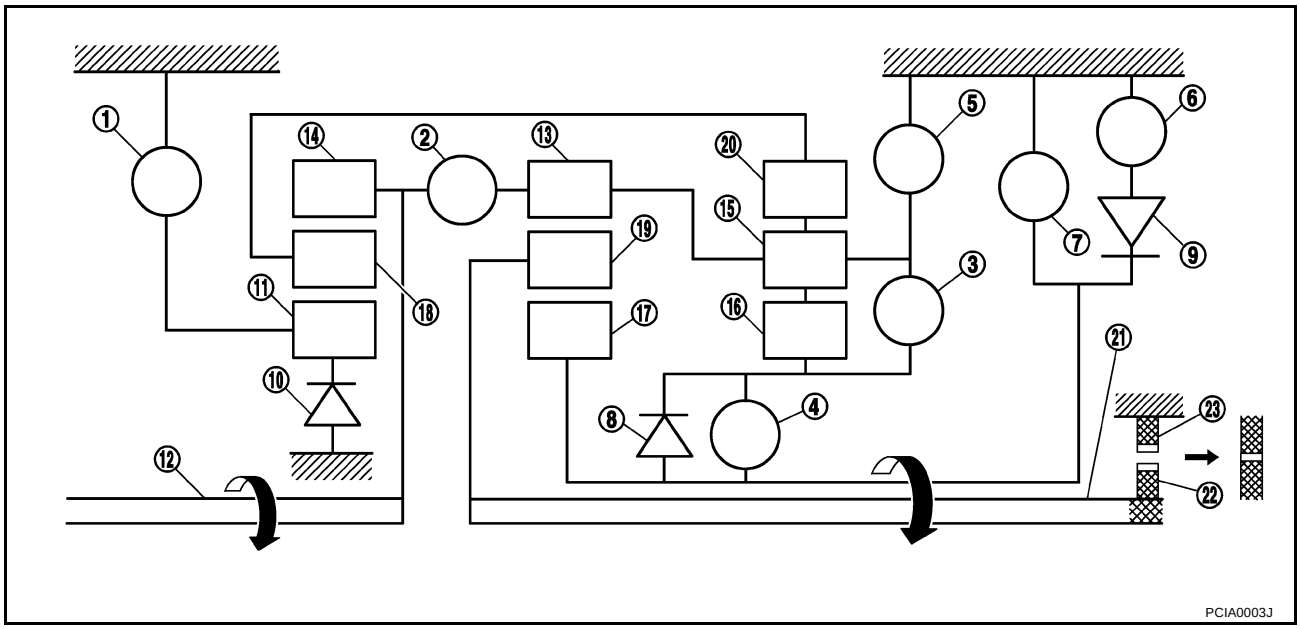
POWER TRANSMISSION

“N” Position

Since both the forward brake and the reverse brake are released, torque from the input shaft drive is not transmitted to the output shaft.

“P” Position

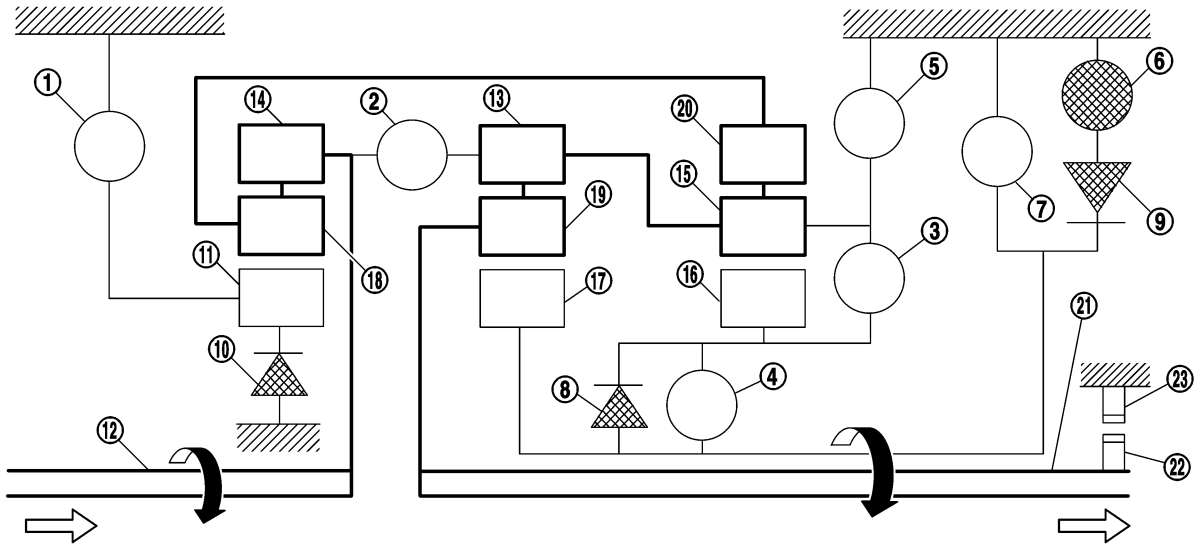
- The same as for the “N” position, both the forward brake and the reverse brake are released, so torque from the input shaft drive is not transmitted to the output shaft.
- The parking pawl linked with the selector lever meshes with the parking gear and fastens the output shaft mechanically.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“D1 ” Position

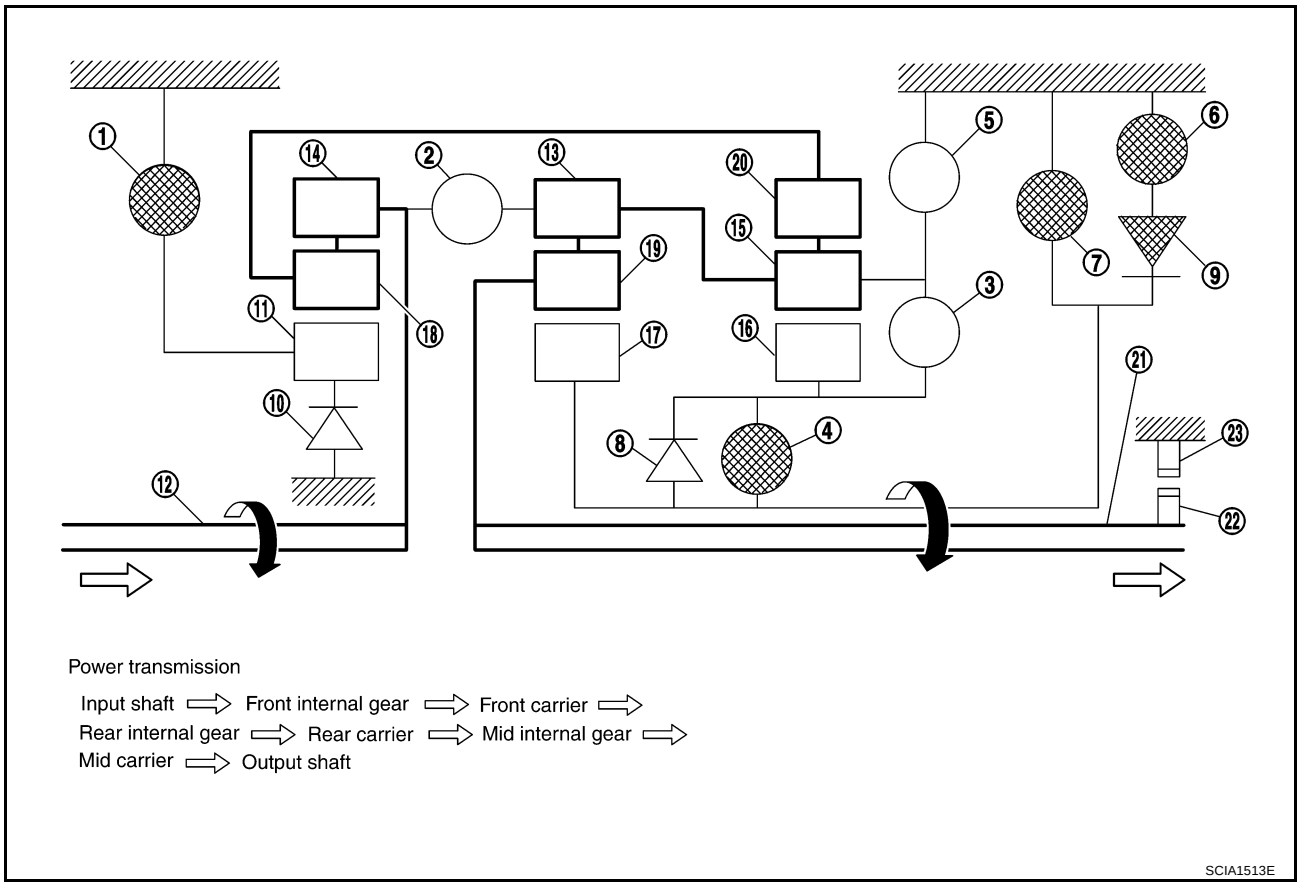
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 1st one-way clutch regulates reverse rotation of the rear sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and the engine brake is not activated.



1. Front brake	2. Input clutch	3. Direct clutch
4. High and low reverse clutch	5. Reverse brake	6. Forward brake
7. Low coast brake	8. 1st one-way clutch	9. Forward one-way clutch
10. 3rd one-way clutch	11. Front sun gear	12. Input shaft
13. Mid internal gear	14. Front internal gear	15. Rear carrier
16. Rear sun gear	17. Mid sun gear	18. Front carrier
19. Mid carrier	20. Rear internal gear	21. Output shaft
22. Parking gear	23. Parking pawl	

"M1 " Position

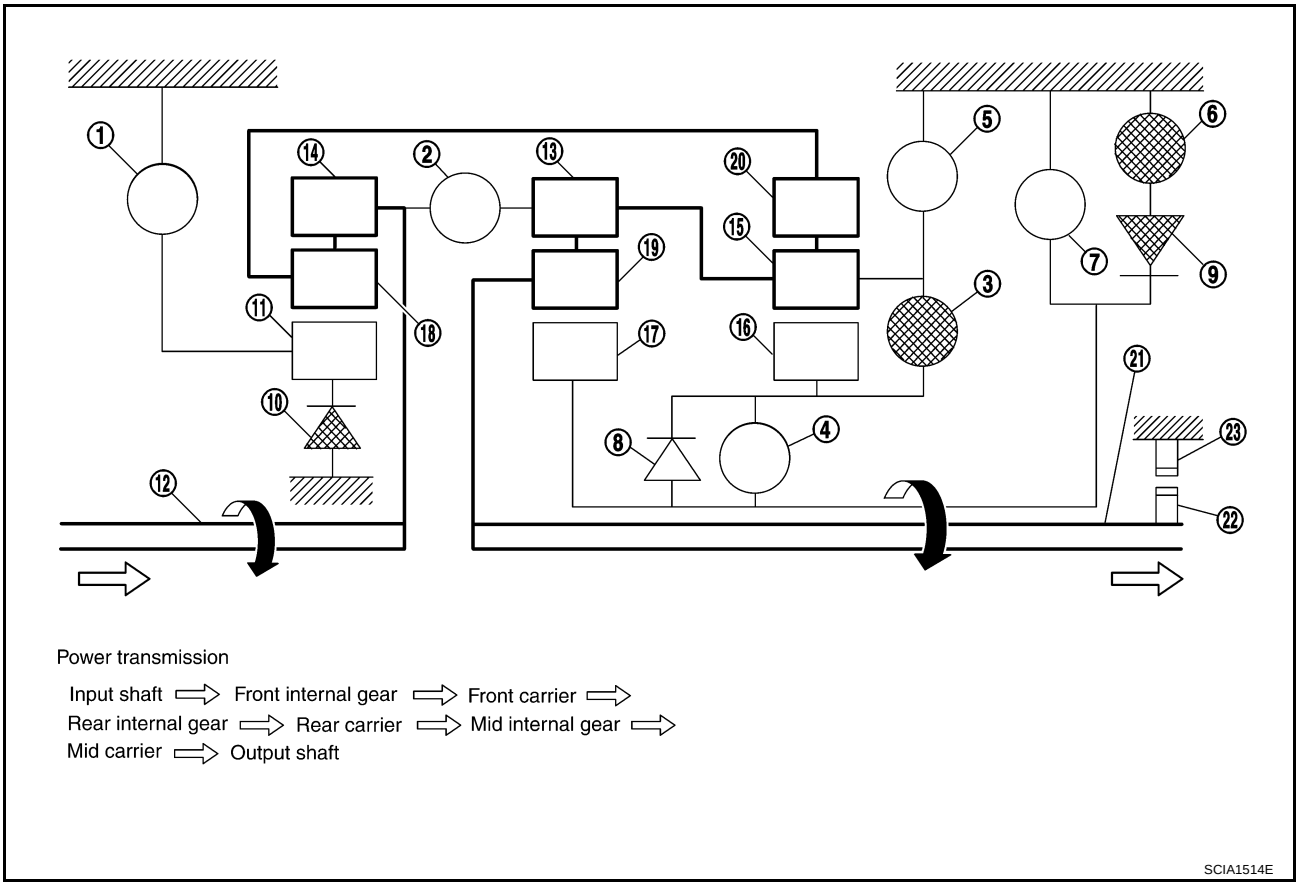
- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- High and low reverse clutch connects the rear sun gear and the mid sun gear.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

"D2 " Position

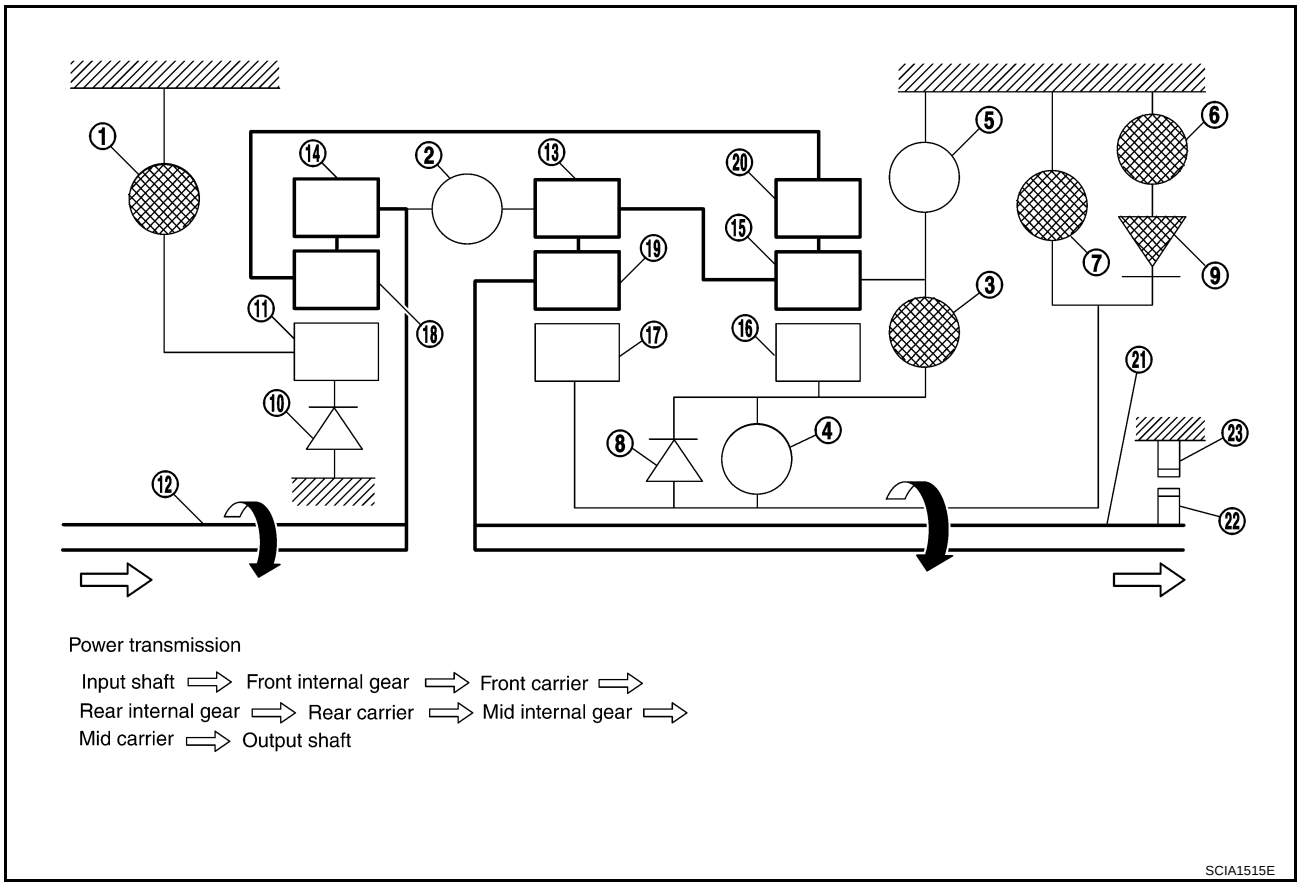
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and engine brake is not activated.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

"M2 " Position

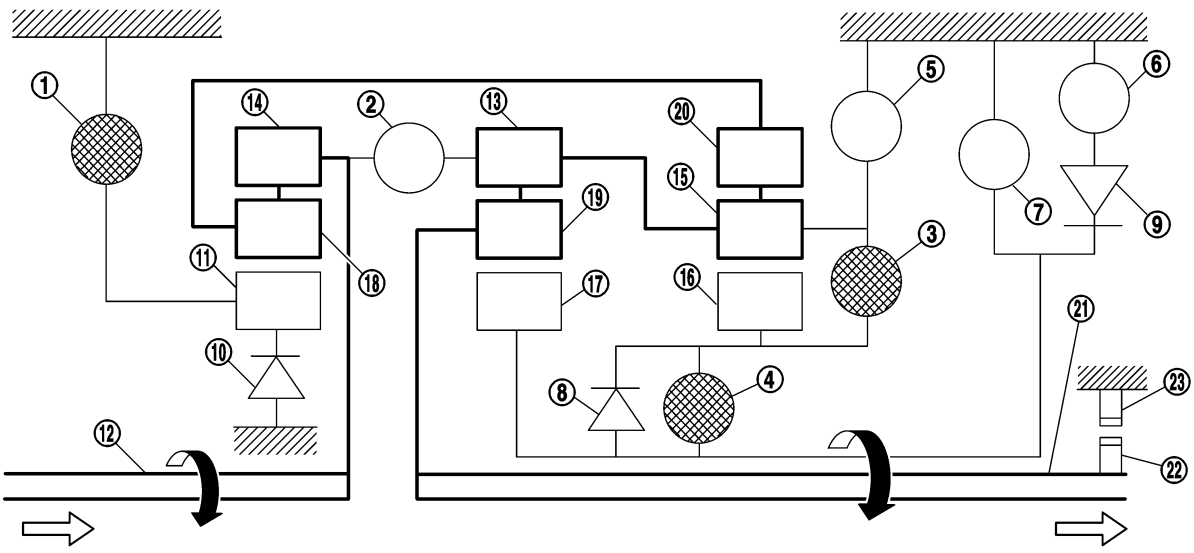
- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

"D3 " and "M3 " Positions

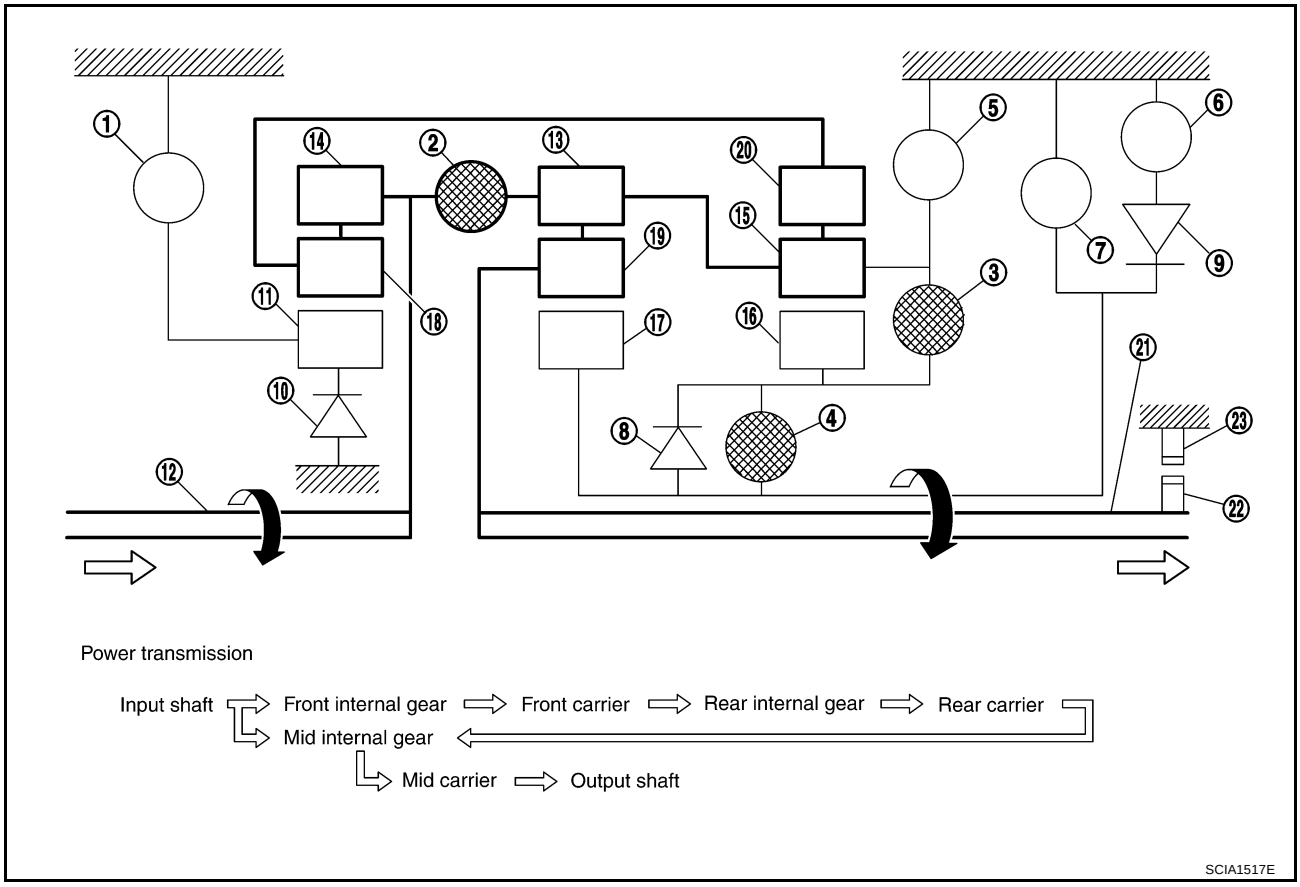
- The front brake fastens the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



1. Front brake	2. Input clutch	3. Direct clutch
4. High and low reverse clutch	5. Reverse brake	6. Forward brake
7. Low coast brake	8. 1st one-way clutch	9. Forward one-way clutch
10. 3rd one-way clutch	11. Front sun gear	12. Input shaft
13. Mid internal gear	14. Front internal gear	15. Rear carrier
16. Rear sun gear	17. Mid sun gear	18. Front carrier
19. Mid carrier	20. Rear internal gear	21. Output shaft
22. Parking gear	23. Parking pawl	

"D4 " and "M4 " Positions

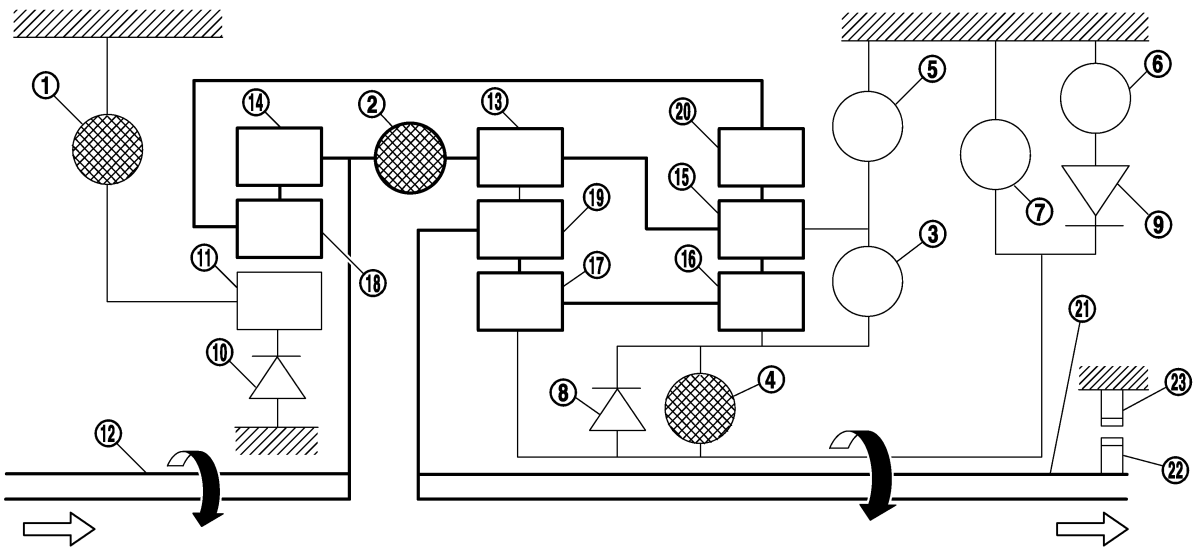
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The drive power is conveyed to the front internal gear, mid internal gear, and rear carrier and the three planetary gears rotate forward as one unit.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“D5 ” and “M5 ” Positions

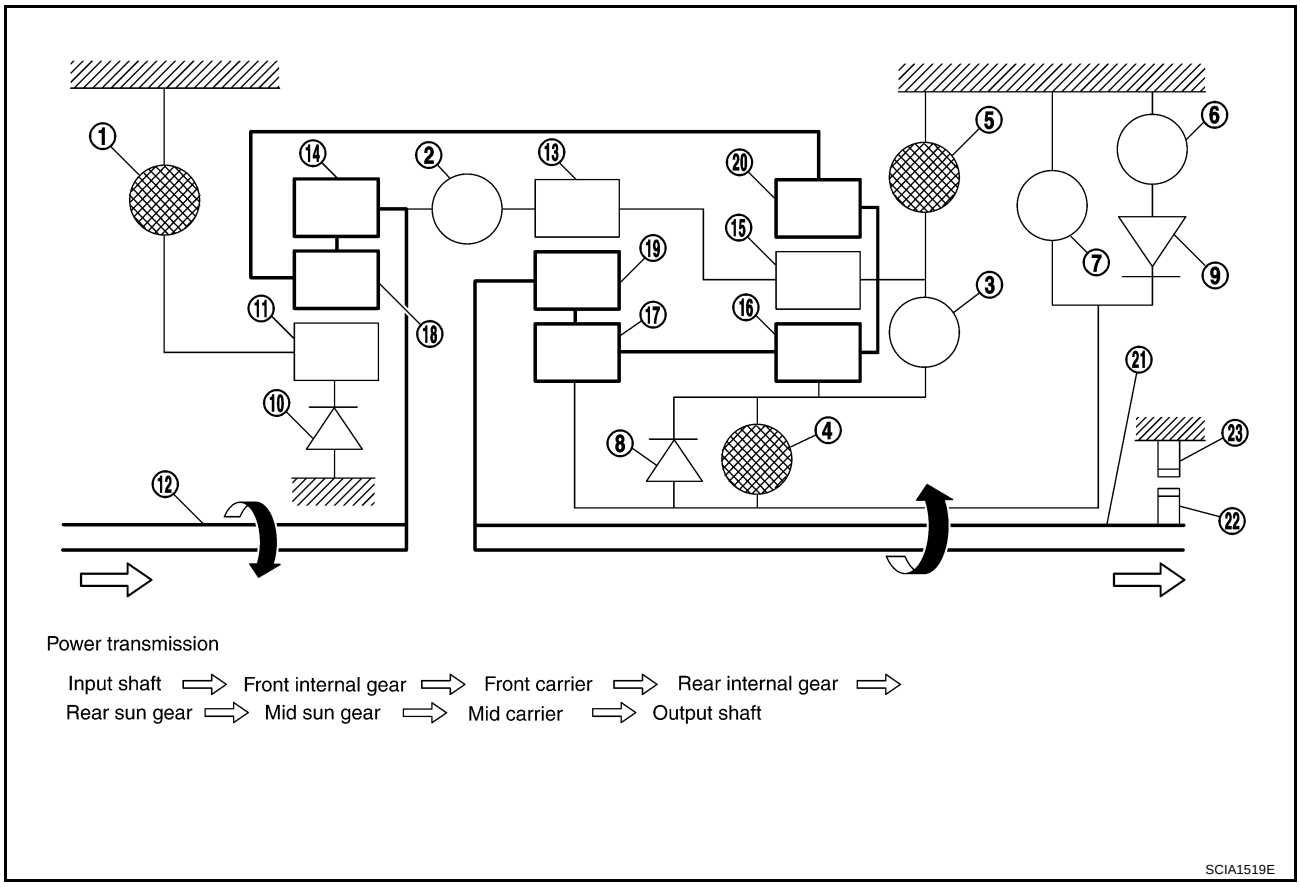
- The front brake fastens the front sun gear.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

“R” Position

- The front brake fastens the front sun gear.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The reverse brake fastens the rear carrier.



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Front carrier
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pawl

TCM Function

NCS0001M

The function of the TCM is to:

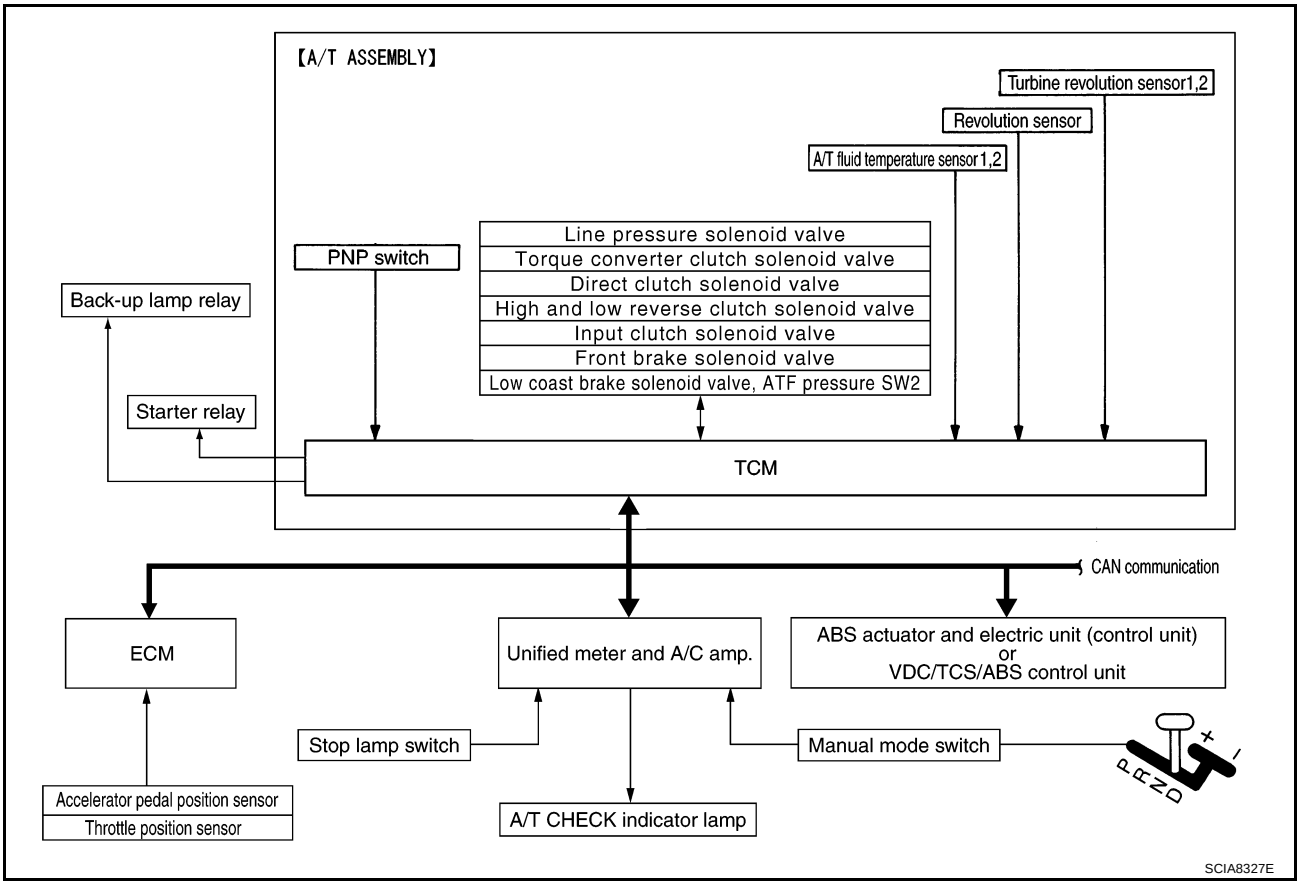
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

CONTROL SYSTEM OUTLINE

The A/T senses vehicle operating conditions through various sensors or signals. It always controls the optimum shift position and reduces shifting and lock-up shocks.

SENSORS (or SIGNALS)		TCM		ACTUATORS
PNP switch Accelerator pedal position signal Closed throttle position signal Wide open throttle position signal Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed signal Manual mode switch signal Stop lamp switch signal Turbine revolution sensor ATF pressure switch	⇒	Shift control Line pressure control Lock-up control Engine brake control Timing control Fail-safe control Self-diagnosis CONSULT-III communication line Duet-EA control CAN system	⇒	Input clutch solenoid valve Direct clutch solenoid valve Front brake solenoid valve High and low reverse clutch solenoid valve Low coast brake solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve A/T CHECK indicator lamp Starter relay Back-up lamp relay

CONTROL SYSTEM DIAGRAM



CAN Communication

NCS0001N

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-48, "CAN System Specification Chart" .

Input/Output Signal of TCM

NCS0001O

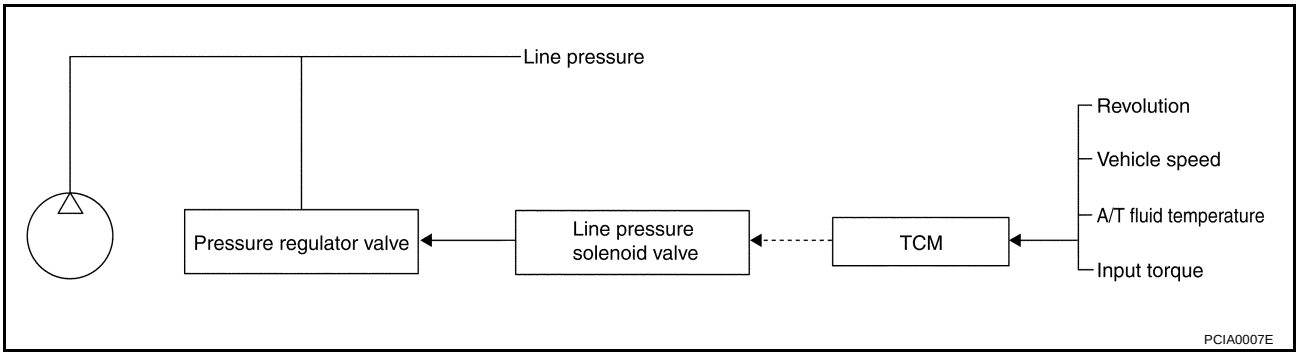
Control item			Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function(*3)	Self-diagnostics function
Input	Accelerator pedal position signal(*5)		X	X	X	X	X	X	X
	Vehicle speed sensor A/T (revolution sensor)		X	X	X	X	X	X	X
	Vehicle speed sensor MTR(*1)(*5)							X	
	Closed throttle position signal(*5)			X(*2)	X	X		X	X(*4)
	Wide open throttle position signal(*5)							X	X(*4)
	Turbine revolution sensor 1			X		X	X	X	X
	Turbine revolution sensor 2 (for 4th speed only)			X		X	X	X	X
	Engine speed signals(*5)		X	X	X	X	X	X	X
	Stop lamp switch signal(*5)			X	X	X			X(*4)
	A/T fluid temperature sensors 1, 2		X	X	X	X		X	X
	ASCD	Operation signal(*5)		X	X	X			
		Overdrive cancel signal(*5)		X					
Output	Direct clutch solenoid			X	X			X	X
	Input clutch solenoid			X	X			X	X
	High and low reverse clutch solenoid			X	X			X	X
	Front brake solenoid			X	X			X	X
	Low coast brake solenoid (ATF pressure switch 2)			X	X		X	X	X
	Line pressure solenoid		X	X	X	X	X	X	X
	TCC solenoid					X		X	X
	Self-diagnostics table(*6)								X
	Starter relay							X	X

- *1: Spare for vehicle speed sensor A/T (revolution sensor)
- *2: Spare for accelerator pedal position signal
- *3: If these input and output signals are different, the TCM triggers the fail-safe function.
- *4: Used as a condition for starting self-diagnostics; if self-diagnostics are not started, it is judged that there is some kind of error.
- *5: Input by CAN communications
- *6: Output by CAN communications

Line Pressure Control

NCS0001P

- When an input torque signal equivalent to the engine drive force is sent from the ECM to the TCM, the TCM controls the line pressure solenoid.
- This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the oil pump to the line pressure most appropriate to the driving state.

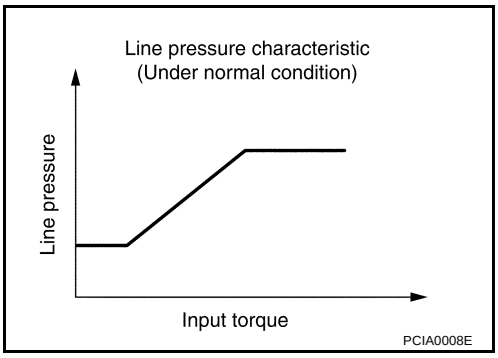


LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

- The TCM has stored in memory a number of patterns for the optimum line pressure characteristic for the driving state.
- In order to obtain the most appropriate line pressure characteristic to meet the current driving state, the TCM controls the line pressure solenoid current valve and thus controls the line pressure.

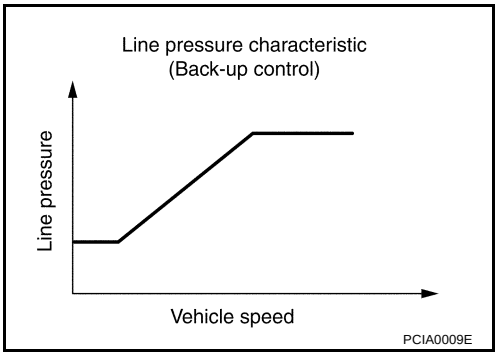
Normal Control

Each clutch is adjusted to the necessary pressure to match the engine drive force.



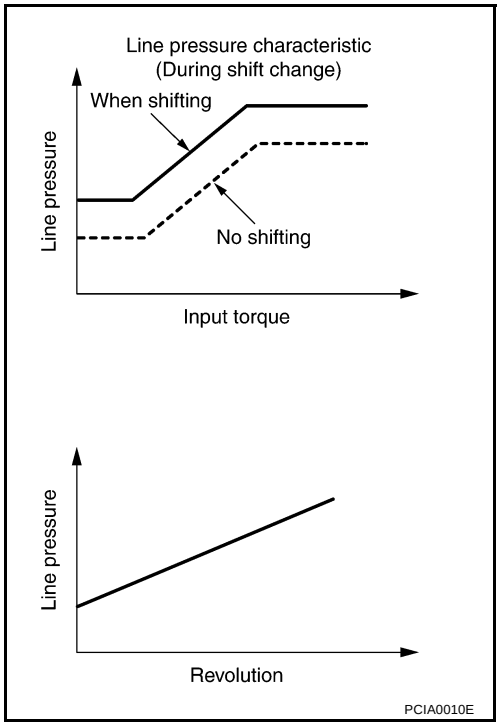
Back-up Control (Engine Brake)

When the select operation is performed during driving and the A/T is shifted down, the line pressure is set according to the vehicle speed.



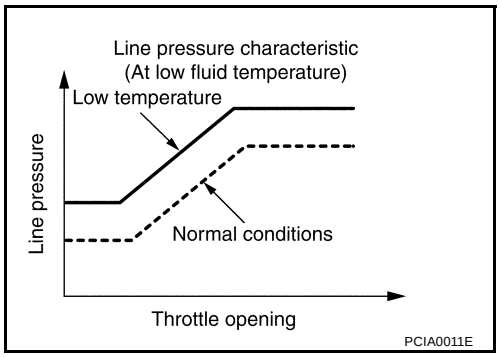
During Shift Change

The necessary and adequate line pressure for shift change is set. For this reason, line pressure pattern setting corresponds to input torque and gearshift selection. Also, line pressure characteristic is set according to engine speed, during engine brake operation.



At Low Fluid Temperature

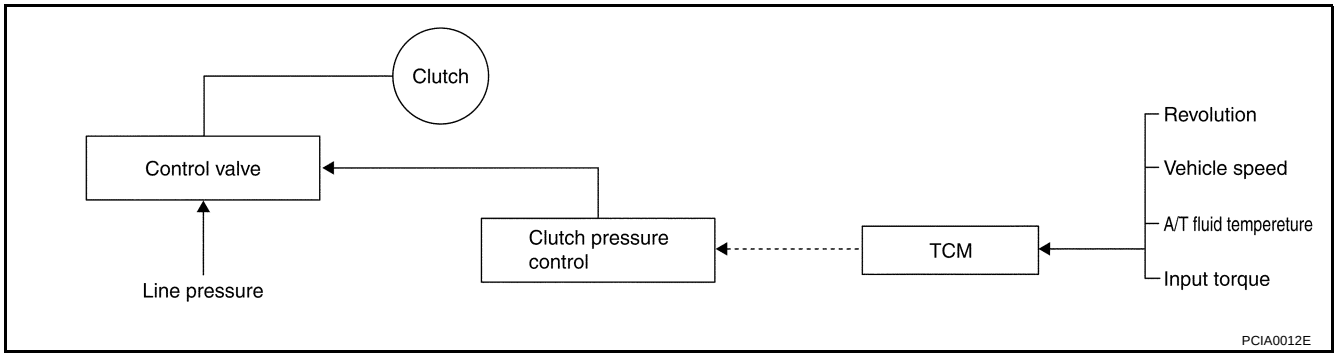
When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



Shift Control

NCS0001Q

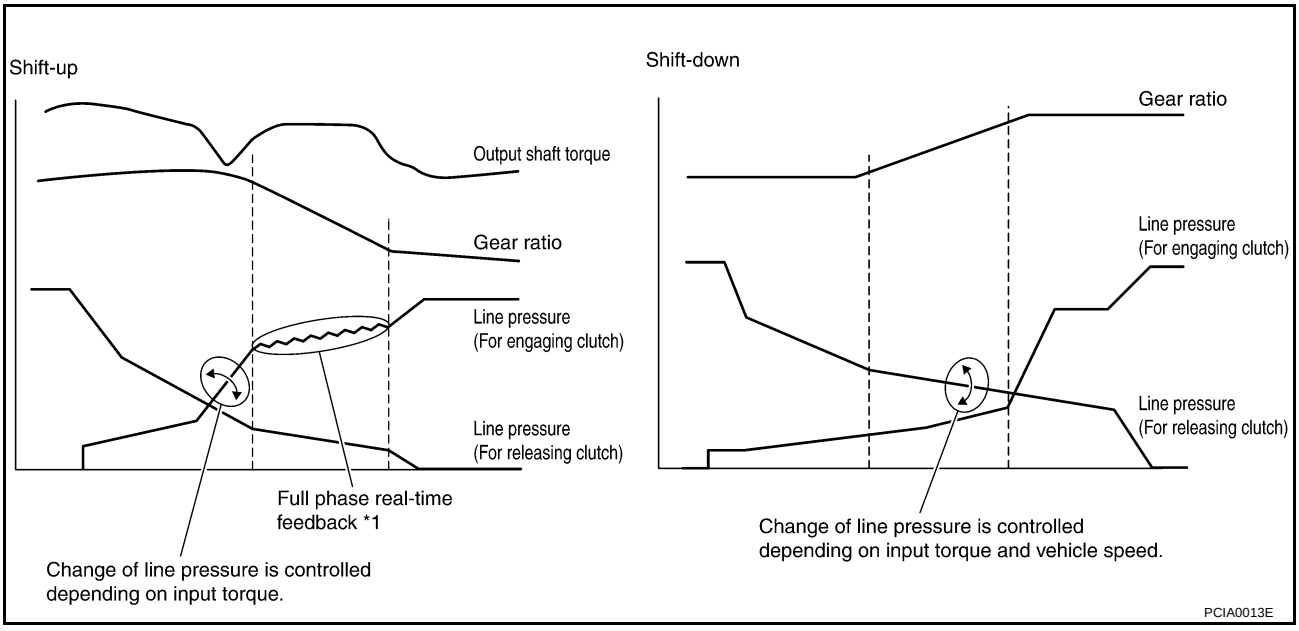
The clutch pressure control solenoid is controlled by the signals from the switches and sensors. Thus, the clutch pressure is adjusted to be appropriate to the engine load state and vehicle driving state. It becomes possible to finely control the clutch hydraulic pressure with high precision and a smoother shift change characteristic is attained.



NORMAL SHIFT CONTROL

The clutch is controlled with the optimum timing and oil pressure by the engine speed, engine torque information, etc.

Shift Change System Diagram



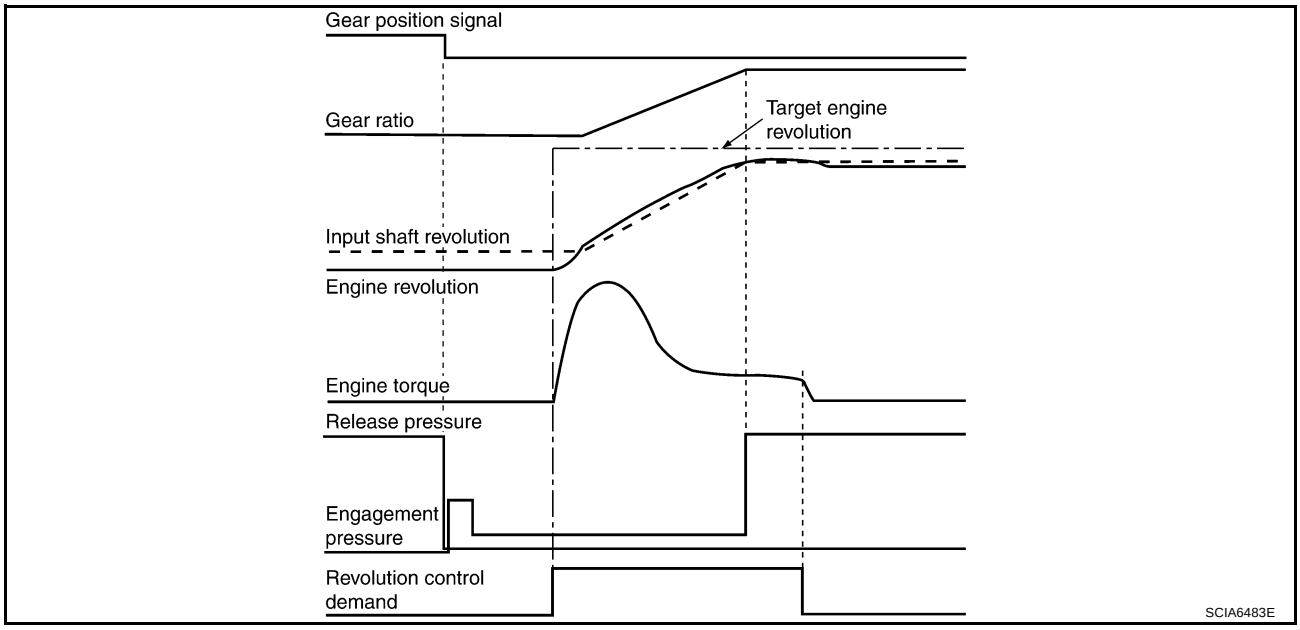
*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure at real-time to achieve the best gear ratio.

BLIPPING CONTROL

This system makes transmission clutch engage readily by controlling (synchronizing) engine revolution according to the (calculation of) engine revolution after shifting down.

- "BLIPPING CONTROL" functions.
  - When downshifting by accelerator pedal depression at "D" position.
  - When downshifting under the manual mode.
- TCM selects "BLIPPING CONTROL" or "NORMAL SHIFT CONTROL" according to the gear position, the select lever position, the engine torque and the speed when accelerating by pedal depression.
- Revolution control demand signal is transmitted from TCM to ECM under "BLIPPING CONTROL".
- TCM synchronizes engine revolution according to the revolution control demand signal.

Shift Change System Diagram



Lock-up Control

NCS0001R

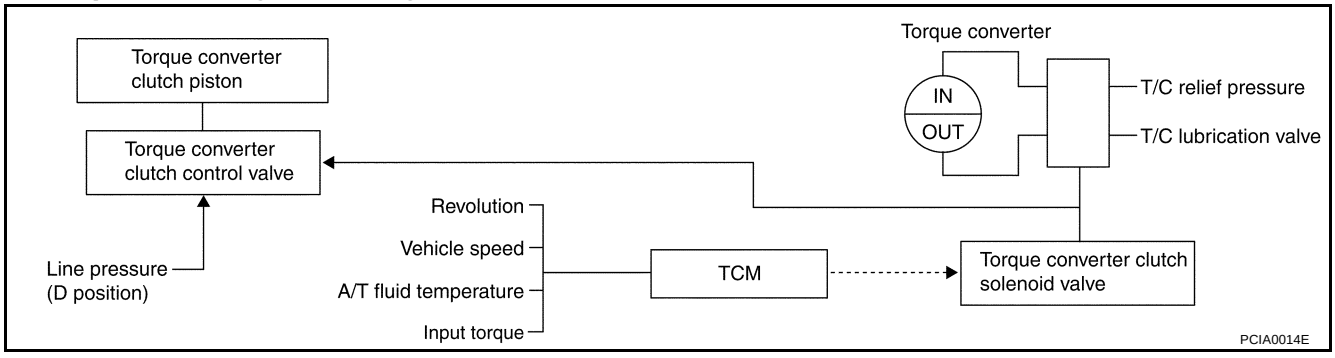
The torque converter clutch piston in the torque converter is engaged to eliminate torque converter slip to increase power transmission efficiency.
The torque converter clutch control valve operation is controlled by the torque converter clutch solenoid valve, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

Lock-up operation condition table

selector lever	"D" position		"M" position			
Gear position	5	4	5	4	3	2
Lock-up	×	–	×	×	×	×
Slip lock-up	×	×	–	–	–	–

TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

Lock-up Control System Diagram



Lock-up Released

In the lock-up released state, the torque converter clutch control valve is set into the unlocked state by the torque converter clutch solenoid and the lock-up apply pressure is drained.
In this way, the torque converter clutch piston is not coupled.

Lock-up Applied

In the lock-up applied state, the torque converter clutch control valve is set into the locked state by the torque converter clutch solenoid and lock-up apply pressure is generated.
In this way, the torque converter clutch piston is pressed and coupled.

SMOOTH LOCK-UP CONTROL

When shifting from the lock-up released state to the lock-up applied state, the current output to the torque converter clutch solenoid is controlled with the TCM. In this way, when shifting to the lock-up applied state, the torque converter clutch is temporarily set to the half-clutched state to reduce the shock.

Half-clutched State

The current output from the TCM to the torque converter clutch solenoid is varied to gradually increase the torque converter clutch solenoid pressure.
In this way, the lock-up apply pressure gradually rises and while the torque converter clutch piston is put into half-clutched status, the torque converter clutch piston operating pressure is increased and the coupling is completed smoothly.

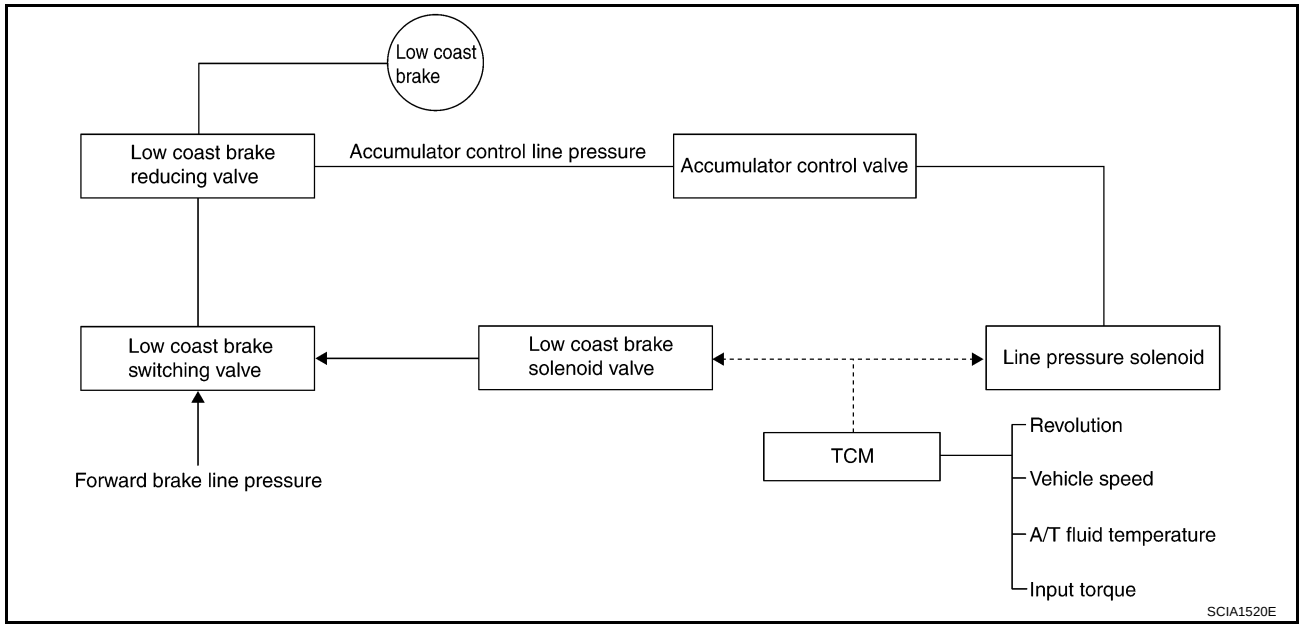
Slip Lock-up Control

In the slip region, the torque converter clutch solenoid current is controlled with the TCM to put it into the half-clutched state. This absorbs the engine torque fluctuation and lock-up operates from low speed.
This raises the fuel efficiency for 4th and 5th gears at both low speed and when the accelerator has a low degree of opening.

Engine Brake Control

NCS0001S

- The forward one-way clutch transmits the drive force from the engine to the rear wheels. But the reverse drive from the rear wheels is not transmitted to the engine because the one-way clutch is idling.
  Therefore, the low coast brake solenoid is operated to prevent the forward one-way clutch from idling and the engine brake is operated in the same manner as conventionally.



- The operation of the low coast brake solenoid switches the low coast brake switching valve and controls the coupling and releasing of the low coast brake.
  The low coast brake reducing valve controls the low coast brake coupling force.

Control Valve

NCS0001T

FUNCTION OF CONTROL VALVE

Name	Function
Torque converter regulator valve	In order to prevent the pressure supplied to the torque converter from being excessive, the line pressure is adjusted to the optimum pressure (torque converter operating pressure).
Pressure regulator valve Pressure regulator plug Pressure regulator sleeve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.
Front brake control valve	When the front brake is coupled, adjusts the line pressure to the optimum pressure (front brake pressure) and supplies it to the front brake. (In 1st, 2nd, 3rd, and 5th gears, adjusts the clutch pressure.)

Name	Function
Accumulator control valve	Adjusts the pressure (accumulator control pressure) acting on the accumulator piston and low coast reducing valve to the pressure appropriate to the driving state.
Pilot valve A	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for line pressure control, shift change control, and lock-up control.
Pilot valve B	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for shift change control.
Low coast brake switching valve	During engine braking, supplies the line pressure to the low coast brake reducing valve.
Low coast brake reducing valve	When the low coast brake is coupled, adjusts the line pressure to the optimum pressure (low coast brake pressure) and supplies it to the low coast brake.
N-R accumulator	Produces the stabilizing pressure for when N-R is selected.
Direct clutch piston switching valve	Operates in 4th gear and switches the direct clutch coupling capacity.
High and low reverse clutch control valve	When the high and low reverse clutch is coupled, adjusts the line pressure to the optimum pressure (high and low reverse clutch pressure) and supplies it to the high and low reverse clutch. (In 1st, 3rd, 4th and 5th gears, adjusts the clutch pressure.)
Input clutch control valve	When the input clutch is coupled, adjusts the line pressure to the optimum pressure (input clutch pressure) and supplies it to the input clutch. (In 4th and 5th gears, adjusts the clutch pressure.)
Direct clutch control valve	When the direct clutch is coupled, adjusts the line pressure to the optimum pressure (direct clutch pressure) and supplies it to the direct clutch. (In 2nd, 3rd, and 4th gears, adjusts the clutch pressure.)
TCC control valve TCC control plug TCC control sleeve	Switches the lock-up to operating or released. Also, by performing the lock-up operation transiently, lock-up smoothly.
Torque converter lubrication valve	Operates during lock-up to switch the torque converter, cooling, and lubrication system oil passage.
Cool bypass valve	Allows excess oil to bypass cooler circuit without being fed into it.
Line pressure relief valve	Discharges excess oil from line pressure circuit.
N-D accumulator	Produces the stabilizing pressure for when N-D is selected.
Manual valve	Sends line pressure to each circuit according to the select position. The circuits to which the line pressure is not sent drain.

FUNCTION OF ATF PRESSURE SWITCH

Name	Function
ATF pressure switch 2 (LC/B)	Detects any malfunction in the low coast brake hydraulic pressure. When it detects any malfunction, it puts the system into fail-safe mode.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

NCS0001U

The A/T system has two self-diagnostic systems.
The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.
The second is the TCM original self-diagnosis indicated by the A/T CHECK indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For detail, refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

OBD-II Function for A/T System

NCS0001V

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system. One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.
The MIL automatically illuminates in “One or Two Trip Detection Logic” when a malfunction is sensed in relation to A/T system parts.

One or Two Trip Detection Logic of OBD-II

NCS0001W

ONE TRIP DETECTION LOGIC

If a malfunction is sensed during the first test drive, the MIL will illuminate and the malfunction will be stored in the ECM memory as a DTC. The TCM is not provided with such a memory function.

TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — 1st trip
If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — 2nd trip
The “Trip” in the “One or Two Trip Detection Logic” means a driving mode in which self-diagnosis is performed during vehicle operation.

OBD-II Diagnostic Trouble Code (DTC)

NCS0001X

HOW TO READ DTC AND 1ST TRIP DTC

DTC and 1st trip DTC can be read by the following methods.
(with CONSULT-III or GST GST) CONSULT-III or GST (Generic Scan Tool) Examples: P0705, P0720 etc.
These DTC are prescribed by SAE J2012.
(CONSULT-III also displays the malfunctioning component or system.)

- **1st trip DTC No. is the same as DTC No.**
- **Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST, they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal.**
  CONSULT-III can identify them as shown below, therefore, CONSULT-III (if available) is recommended.

Freeze Frame Data and 1st Trip Freeze Frame Data

The ECM has a memory function, which stores the driving condition such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed and vehicle speed at the moment the ECM detects a malfunction.
Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST. For detail, refer to EC-116, "CONSULT-III Function (ENGINE)" .
Only one set of freeze frame data (either 1st trip freeze frame data of freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175
2		Except the above items (Includes A/T related items)
3	1st trip freeze frame data	

Both 1st trip freeze frame data and freeze frame data (along with the DTC) are cleared when the ECM memory is erased.

HOW TO ERASE DTC

The diagnostic trouble code can be erased by CONSULT-III, GST or ECM DIAGNOSTIC TEST MODE as described following.

- **If the battery cable is disconnected, the diagnostic trouble code will be lost within 24 hours.**
- **When you erase the DTC, using CONSULT-III or GST is easier and quicker than switching the mode selector on the ECM.**

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to EC-48, "Emission-related Diagnostic Information" .

- **Diagnostic trouble codes (DTC)**
- **1st trip diagnostic trouble codes (1st trip DTC)**
- **Freeze frame data**
- **1st trip freeze frame data**
- **System readiness test (SRT) codes**
- **Test values**

HOW TO ERASE DTC (WITH CONSULT-III)

1. The emission related diagnostic information in the TCM and ECM can be erased by selecting “ALL Erase” in the “Description” of “FINAL CHECK” mode with CONSULT-III.

HOW TO ERASE DTC (WITH GST)

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-92, "OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Select Mode 4 with GST (Generic Scan Tool). For details, refer to EC-125, "Generic Scan Tool (GST) Function" .

HOW TO ERASE DTC (NO TOOLS)

The A/T CHECK indicator lamp is located on the instrument panel.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Perform “OBD-II SELF-DIAGNOSTIC PROCEDURE (No tools)”. Refer to EC-61, "How to Erase DTC" .

Malfunction Indicator Lamp (MIL)

NCS0001Y

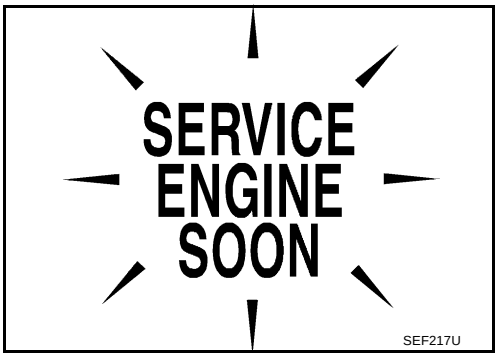
DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check.

- If the MIL does not light up, refer to DI-56, "WARNING LAMPS" , or see EC-716, "MIL AND DATA LINK CONNECTOR" .

2. When the engine is started, the MIL should go off.
   If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



SEF217U

TROUBLE DIAGNOSIS

PFP:00004

DTC Inspection Priority Chart

NCS0001Z

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:
If DTC "U1000 CAN COMM CIRCUIT" is displayed with other DTCs, first perform the trouble diagnosis for "DTC U1000 CAN COMMUNICATION LINE". Refer to AT-94 .

Priority	Detected items (DTC)
1	U1000 CAN communication line
2	Except above

Fail-safe

NCS00020

The TCM has an electrical fail-safe mode. This mode makes it possible to operate even if there is a an error in a main electronic control input/output signal circuit.
In fail-safe mode, even if the selector lever is "D" or "M" mode, the A/T is fixed in 2nd, 4th or 5th (depending on the breakdown position), so the customer should feel "slipping" or "poor acceleration".
Even when the electronic circuits are normal, under special conditions (for example, when slamming on the brake with the wheels spinning drastically and stopping the tire rotation), the A/T can go into fail-safe mode. If this happens, switch OFF the ignition switch for 10 seconds, then switch it ON again to return to the normal shift pattern. Therefore, the customer's vehicle has returned to normal, so handle according to the AT-43, "WORK FLOW" .

FAIL-SAFE FUNCTION

If any malfunction occurs in a sensor or solenoid, this function controls the A/T to mark driving possible.

Vehicle Speed Sensor A/T

Signals are input from two systems - from vehicle speed sensor A/T (revolution sensor) installed on the A/T and from combination meter so normal driving is possible even if there is a malfunction in one of the systems. And if vehicle speed sensor A/T (revolution sensor) has unusual cases, 5th gear and manual mode are prohibited.

Accelerator Pedal Position Sensor

If there is a malfunction in one of the systems, the accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. And if there are malfunctions in tow systems, the engine speed is fixed by ECM to a pre-determined engine speed to make driving possible.

Throttle Position Sensor

If there is a malfunction in one of the systems, the accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. And if there are malfunctions in tow systems, the accelerator opening angle is controlled by the idle signal sent from the ECM which is based on input indicating either idle condition or off-idle condition (pre-determined accelerator opening) in order to make driving possible.

PNP Switch

In the unlikely event that a malfunction signal enters the TCM, the position indicator is switched OFF, the starter relay is switched OFF (starter starting is disabled), the back-up lamp relay switched OFF (back-up lamp is OFF) and the position is fixed to the "D" position to make driving possible.

Starter Relay

The starter relay is switched OFF. (Starter starting is disabled.)

A/T Interlock

- If there is an A/T interlock judgment malfunction, the transmission is fixed in 2nd gear to make driving possible.

  NOTE:
  When the vehicle is driven fixed in 2nd gear a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.

- When interlock is detected at the 3rd gear or more, it is locked at the 2nd gear.

A/T 1st Engine Braking

When there is an A/T first gear engine brake judgment malfunction, the low coast brake solenoid is switched OFF to avoid the engine brake operation.

Line Pressure Solenoid

The solenoid is switched OFF and the line pressure is set to the maximum hydraulic pressure to make driving possible.

Torque Converter Clutch Solenoid

The solenoid is switched OFF to release the lock-up.

Low Coast Brake Solenoid

When a malfunction (electrical or functional) occurs, in order to make driving possible, if the solenoid is ON, the A/T is held in 2nd gear; if the solenoid is OFF, the A/T is held in 4th gear. (Engine brake is not applied in 1st and 2nd gear.)

Input Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

Direct Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

Front Brake Solenoid

If a malfunction (electrical or functional) occurs with the solenoid ON, in order to make driving possible, the A/T is held in 5th gear; if the solenoid is OFF, 4th gear.

High and Low Reverse Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

Turbine Revolution Sensor 1 or 2

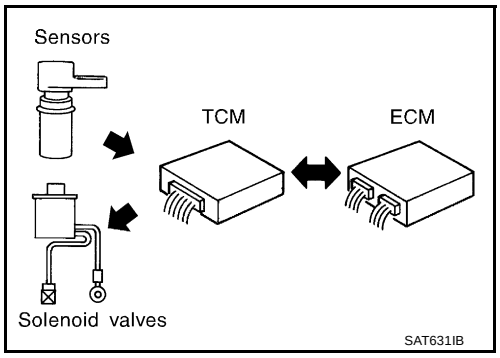
The control is the same as if there were no turbine revolution sensors, 5th gear and manual mode are prohibited.

How to Perform Trouble Diagnosis for Quick and Accurate Repair

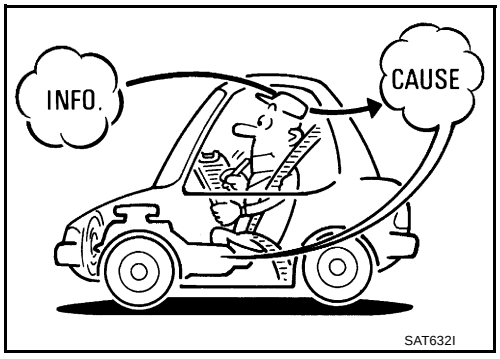
NCS00021

INTRODUCTION

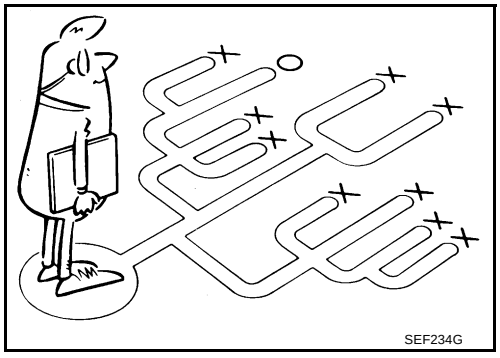
The TCM receives a signal from the vehicle speed sensor, accelerator pedal position sensor (throttle position sensor) or PNP switch and provides shift control or lock-up control via A/T solenoid valves.
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.
Input and output signals must always be correct and stable in the operation of the A/T system. The A/T system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.



It is much more difficult to diagnose a error that occurs intermittently rather than continuously. Most intermittent errors are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.
A visual check only may not find the cause of the errors. A road test with CONSULT-III (or GST) or a circuit tester connected should be performed. Follow the AT-43, "WORK FLOW" .



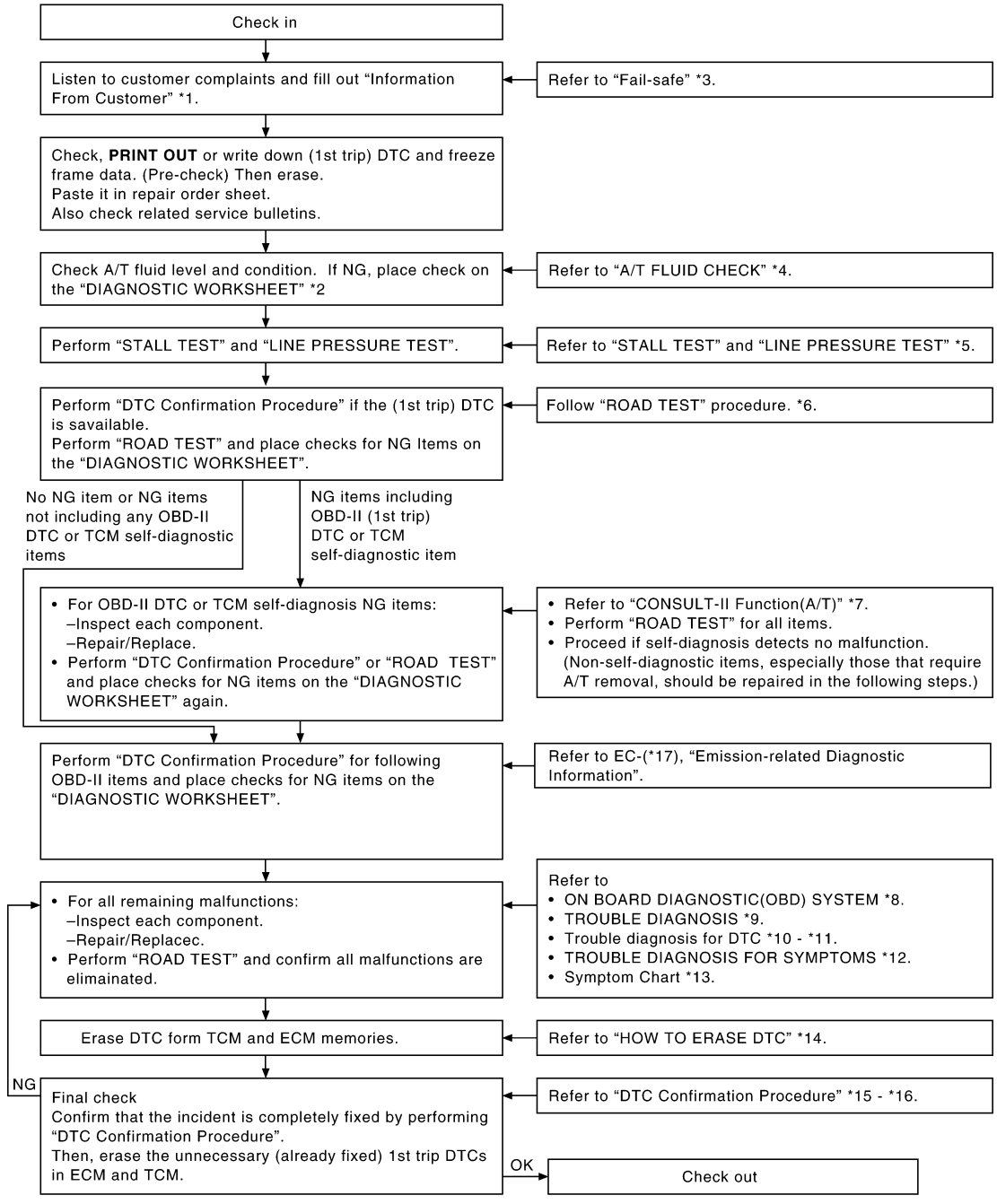
Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such errors, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A “DIAGNOSTIC WORKSHEET” as shown on the example (Refer to AT-44) should be used.
Start your diagnosis by looking for “conventional” errors first. This will help troubleshoot driveability errors on an electronically controlled engine vehicle.
Also check related Service bulletins.



WORK FLOW

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a malfunction. It is important to fully understand the symptoms or conditions for a customer complaint.
Make good use of the two sheets provided, AT-44, "Information from Customer" and AT-44, "Diagnostic Worksheet Chart" , to perform the best troubleshooting possible.

Work Flow Chart



SCIA7037E

*1. AT-44 *2. AT-44 *3. AT-40
*4. AT-49 *5. AT-49, AT-50 *6. AT-52
*7. AT-84 *8. AT-37 *9. AT-40
*10. AT-94 *11. AT-157 *12. AT-169
*13. AT-59 *14. AT-38 *15. AT-94
*16. AT-157 *17. EC-48

DIAGNOSTIC WORKSHEET

Information from Customer

KEY POINTS

- **WHAT**..... Vehicle & A/T model
- **WHEN**..... Date, Frequencies
- **WHERE**..... Road conditions
- **HOW**..... Operating conditions, Symptoms

Customer name MR/MS	Model & Year	VIN
Trans. Model	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	❑ Continuous ❑ Intermittent (times a day)	
Symptoms	❑ Vehicle does not move. (❑ Any position ❑ Particular position)	
	❑ No up-shift (❑ 1st → 2nd ❑ 2nd → 3rd ❑ 3rd → 4th ❑ 4th → 5th)	
	❑ No down-shift (❑ 5th → 4th ❑ 4th → 3rd ❑ 3rd → 2nd ❑ 2nd → 1st)	
	❑ Lock-up malfunction	
	❑ Shift point too high or too low.	
	❑ Shift shock or slip (❑ N → D ❑ Lock-up ❑ Any drive position)	
	❑ Noise or vibration	
	❑ No kick down	
	❑ No pattern select	
	❑ Others ( )	
A/T CHECK indicator lamp	❑ Continuously lit	❑ Not lit
Malfunction indicator lamp (MIL)	❑ Continuously lit	❑ Not lit

Diagnostic Worksheet Chart

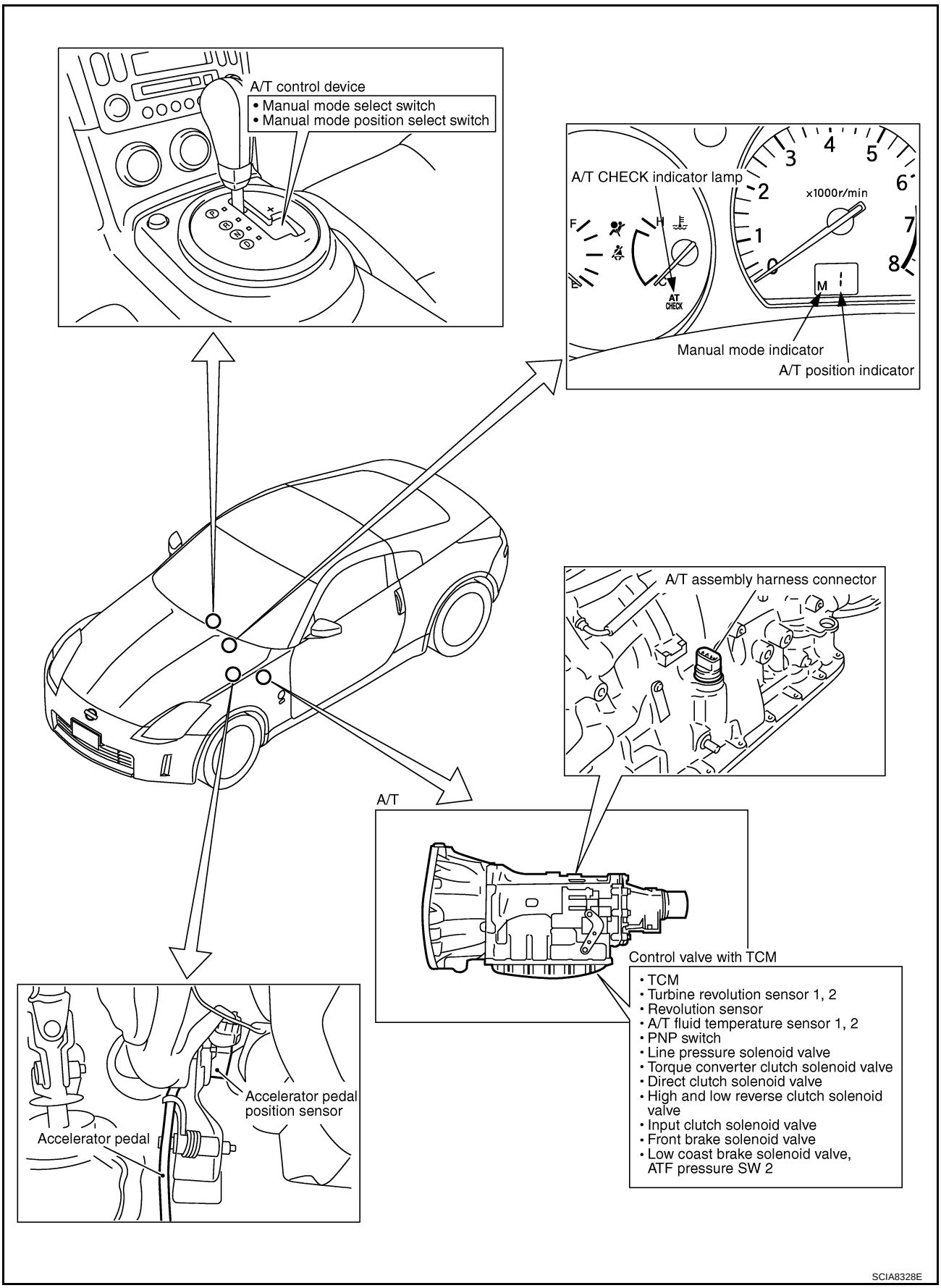
1	❑ Read the item on cautions concerning fail-safe and understand the customer's complaint.			AT-40
2	❑ A/T fluid inspection			AT-49
		❑ Leak (Repair leak location.) ❑ State ❑ Amount		
3	❑ Stall test and line pressure test			AT-49, AT-50
		❑ Stall test		
			❑ Torque converter one-way clutch ❑ Front brake ❑ High and low reverse clutch ❑ Low coast brake ❑ Forward brake ❑ Reverse brake ❑ Forward one-way clutch	❑ 1st one-way clutch ❑ 3rd one-way clutch ❑ Engine ❑ Line pressure low ❑ Except for input clutch and direct clutch, clutches and brakes OK
		❑ Line pressure inspection - Suspected part:		

4	❑ Perform all road tests and enter checks in required inspection items.			AT-52
	4-1.	Check before engine is started		AT-53
		❑ AT-172, "A/T Check Indicator Lamp Does Not Come On" ❑ Perform self-diagnostics. Enter checks for detected items. AT-86 , AT-92		
			❑ AT-94, "DTC U1000 CAN COMMUNICATION LINE" ❑ AT-97, "DTC P0615 START SIGNAL CIRCUIT" ❑ AT-101, "DTC P0700 TCM" ❑ AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" ❑ AT-106, "DTC P0717 TURBINE REVOLUTION SENSOR" ❑ AT-108, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" ❑ AT-113, "DTC P0725 ENGINE SPEED SIGNAL" ❑ AT-115, "DTC P0731 A/T 1ST GEAR FUNCTION" ❑ AT-117, "DTC P0732 A/T 2ND GEAR FUNCTION" ❑ AT-119, "DTC P0733 A/T 3RD GEAR FUNCTION" ❑ AT-121, "DTC P0734 A/T 4TH GEAR FUNCTION" ❑ AT-123, "DTC P0735 A/T 5TH GEAR FUNCTION" ❑ AT-125, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" ❑ AT-127, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)" ❑ AT-129, "DTC P0745 LINE PRESSURE SOLENOID VALVE" ❑ AT-131, "DTC P1705 THROTTLE POSITION SENSOR" ❑ AT-134, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" ❑ AT-139, "DTC P1721 VEHICLE SPEED SENSOR MTR" ❑ AT-141, "DTC P1730 A/T INTERLOCK" ❑ AT-143, "DTC P1731 A/T 1ST ENGINE BRAKING" ❑ AT-145, "DTC P1752 INPUT CLUTCH SOLENOID VALVE" ❑ AT-147, "DTC P1757 FRONT BRAKE SOLENOID VALVE" ❑ AT-149, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" ❑ AT-151, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" ❑ AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" ❑ AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" ❑ AT-157, "DTC P1815 MANUAL MODE SWITCH"	
	4-2.	Check at Idle		AT-53
		❑ AT-173, "Engine Cannot Be Started in “P” or “N” Position" ❑ AT-173, "In “P” Position, Vehicle Moves When Pushed" ❑ AT-174, "In “N” Position, Vehicle Moves" ❑ AT-175, "Large Shock (“N” to “D” Position)" ❑ AT-177, "Vehicle Does Not Creep Backward in “R” Position" ❑ AT-179, "Vehicle Does Not Creep Forward in “D” Position"		
	4-3.	Cruise test		AT-55
		Part 1		
		❑ AT-181, "Vehicle Cannot Be Started from D_1" ❑ AT-183, "A/T Does Not Shift: $D_1 \rightarrow D_2$" ❑ AT-185, "A/T Does Not Shift: $D_2 \rightarrow D_3$" ❑ AT-187, "A/T Does Not Shift: $D_3 \rightarrow D_4$" ❑ AT-189, "A/T Does Not Shift: $D_4 \rightarrow D_5$" ❑ AT-191, "A/T Does Not Lock-up" ❑ AT-193, "A/T Does Not Hold Lock-up Condition" ❑ AT-194, "Lock-up Is Not Released" ❑ AT-195, "Engine Speed Does Not Return to Idle"		

		Part 2		AT-57
		❏ AT-181, "Vehicle Cannot Be Started from D1" ❏ AT-183, "A/T Does Not Shift: D1 → D2" ❏ AT-185, "A/T Does Not Shift: D2 → D3" ❏ AT-187, "A/T Does Not Shift: D3 → D4"		
		Part 3		AT-58
		❏ AT-196, "Cannot Be Changed to Manual Mode" ❏ AT-196, "A/T Does Not Shift: 5th Gear → 4th Gear" ❏ AT-198, "A/T Does Not Shift: 4th Gear → 3rd Gear" ❏ AT-199, "A/T Does Not Shift: 3rd Gear → 2nd Gear" ❏ AT-201, "A/T Does Not Shift: 2nd Gear → 1st Gear" ❏ AT-202, "Vehicle Does Not Decelerate by Engine Brake" ❏ Perform self-diagnostics. Enter checks for detected items. AT-86 , AT-92		
4	4-3.		❏ AT-94, "DTC U1000 CAN COMMUNICATION LINE" ❏ AT-97, "DTC P0615 START SIGNAL CIRCUIT" ❏ AT-101, "DTC P0700 TCM" ❏ AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" ❏ AT-106, "DTC P0717 TURBINE REVOLUTION SENSOR" ❏ AT-108, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" ❏ AT-113, "DTC P0725 ENGINE SPEED SIGNAL" ❏ AT-115, "DTC P0731 A/T 1ST GEAR FUNCTION" ❏ AT-117, "DTC P0732 A/T 2ND GEAR FUNCTION" ❏ AT-119, "DTC P0733 A/T 3RD GEAR FUNCTION" ❏ AT-121, "DTC P0734 A/T 4TH GEAR FUNCTION" ❏ AT-123, "DTC P0735 A/T 5TH GEAR FUNCTION" ❏ AT-125, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" ❏ AT-127, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)" ❏ AT-129, "DTC P0745 LINE PRESSURE SOLENOID VALVE" ❏ AT-131, "DTC P1705 THROTTLE POSITION SENSOR" ❏ AT-134, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" ❏ AT-139, "DTC P1721 VEHICLE SPEED SENSOR MTR" ❏ AT-141, "DTC P1730 A/T INTERLOCK" ❏ AT-143, "DTC P1731 A/T 1ST ENGINE BRAKING" ❏ AT-145, "DTC P1752 INPUT CLUTCH SOLENOID VALVE" ❏ AT-147, "DTC P1757 FRONT BRAKE SOLENOID VALVE" ❏ AT-149, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" ❏ AT-151, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" ❏ AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" ❏ AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" ❏ AT-157, "DTC P1815 MANUAL MODE SWITCH"	
5	❏ Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunctioning parts.			
6	❏ Perform all road tests and enter the checks again for the required items.			AT-52
7	❏ For any remaining NG items, perform the “diagnostics procedure” and repair or replace the malfunctioning parts. See the chart for diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)			AT-59
8	❏ Erase the results of the self-diagnostics from TCM and ECM.			AT-93, AT-38

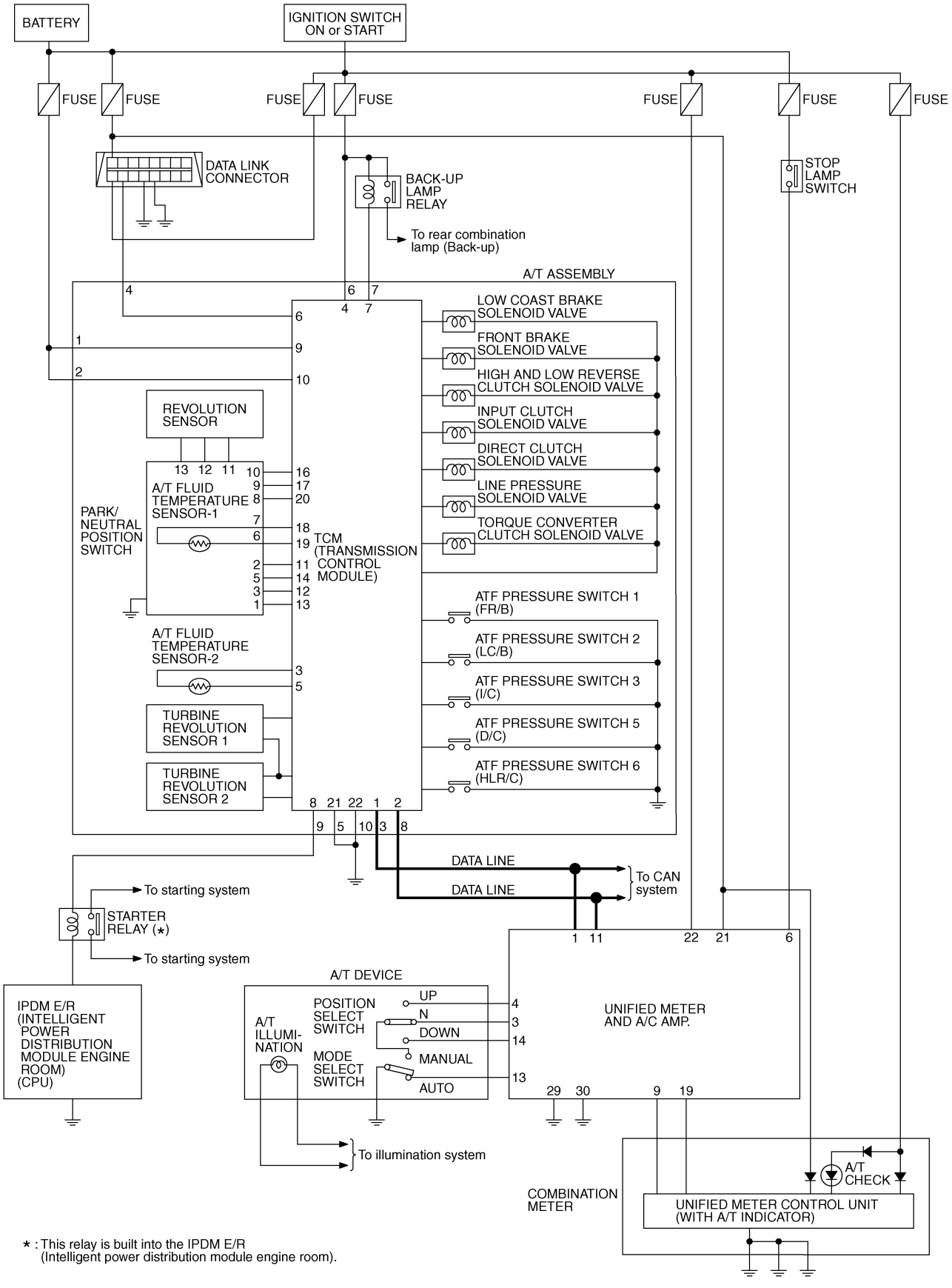
A/T Electrical Parts Location

NCS00022



Circuit Diagram

NCS00023



Inspections Before Trouble Diagnosis

NCS00024

A/T FLUID CHECK

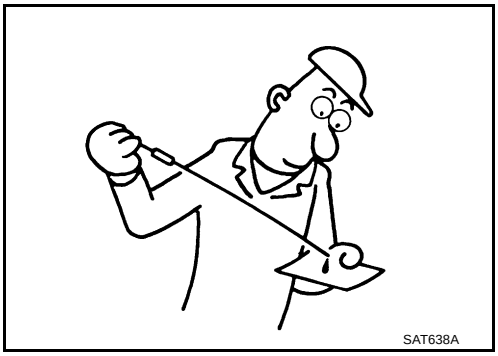
A/T Fluid Leakage and A/T Fluid Level Check

Inspect for A/T fluid leakage and check the A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

A/T Fluid Condition Check

Inspect the A/T fluid condition.

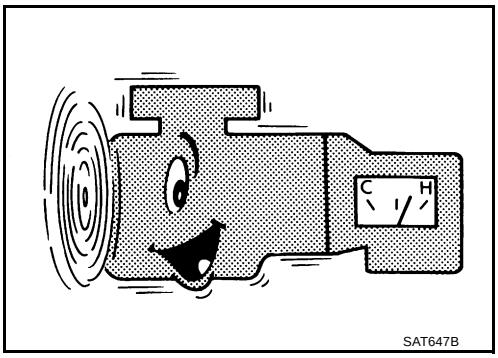
Fluid condition	Conceivable Cause	Required Operation
Varnished (viscous varnish state)	Clutch, brake scorched	Replace the ATF and check the A/T main unit and the vehicle for malfunctions (wire harnesses, cooler pipes, etc.)
Milky white or cloudy	Water in the fluid	Replace the ATF and check for places where water is getting in.
Large amount of metal powder mixed in	Unusual wear of sliding parts within A/T	Replace the ATF and check for improper operation of the A/T.


SAT638A

STALL TEST

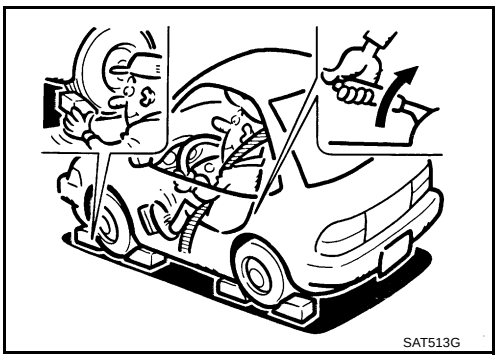
Stall Test Procedure

1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Inspect the amount of ATF. Replenish if necessary.



SAT647B

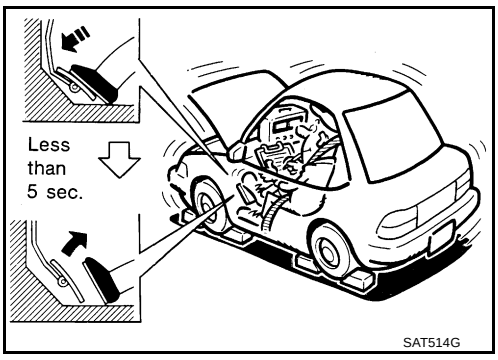
3. Securely engage the parking brake so that the tires do not turn.
4. Engine start, apply foot brake, and place selector lever in “D” position.


SAT513G

5. While holding down the foot brake, gradually press down accelerator pedal.
6. Quickly read off the stall speed, then quickly remove your foot from accelerator pedal.

CAUTION:
Do not hold down accelerator pedal for more than 5 seconds during this test.

Stall speed: 2,700 – 3,000 rpm



SAT514G

7. Move selector lever to “N” position.

8. Cool down the ATF.

CAUTION:
Run the engine at idle for at least one minute.

9. Repeat steps 5 through 8 with selector lever in “R” position.

Judgment Stall Test

	Selector lever position		Expected problem location
	“D” and “M”	“R”	
Stall speed	H	O	● Forward brake ● Forward one-way clutch ● 1st one-way clutch ● 3rd one-way clutch
	O	H	● Reverse brake
	L	L	● Engine and torque converter one-way clutch
	H	H	● Line pressure low

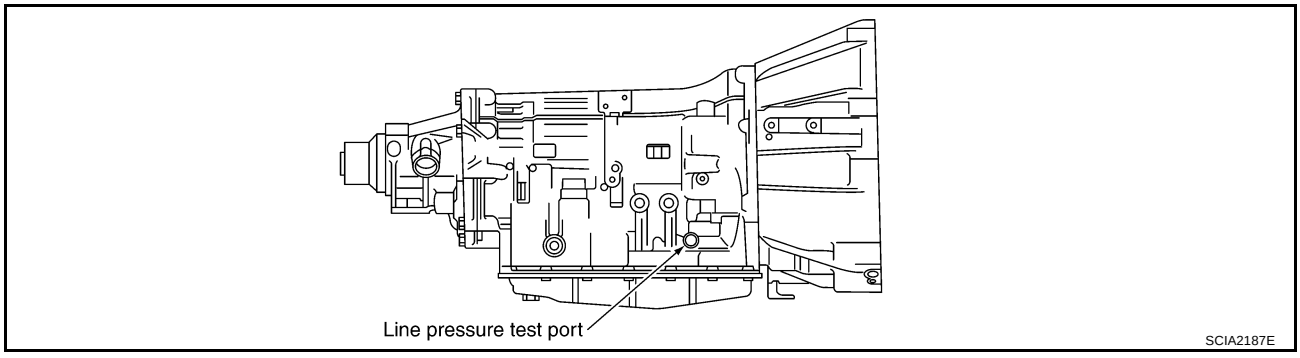
O: Stall speed within standard value position
H: Stall speed higher than standard value
L: Stall speed lower than standard value

Stall Test Standard Value Position

Does not shift-up “D” or “M” position 1 → 2	Slipping in 2nd, 3rd or 4th gear	Direct clutch slippage
Does not shift-up “D” or “M” position 2 → 3	Slipping in 3rd, 4th or 5th gear	High and low reverse clutch slippage
Does not shift-up “D” or “M” position 3 → 4	Slipping in 4th or 5th gear	Input clutch slippage
Does not shift-up “D” or “M” position 4 → 5	Slipping in 5th gear	Front brake slippage

LINE PRESSURE TEST

Line Pressure Test Port



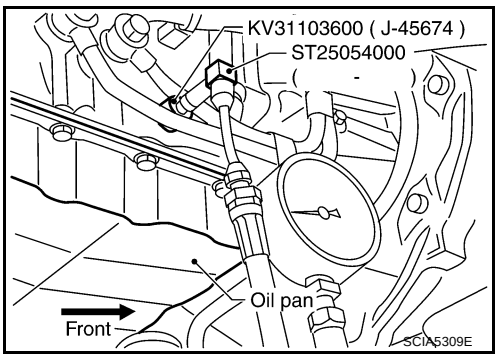
Line Pressure Test Procedure

1. Inspect the amount of engine oil and replenish if necessary.
2. Drive the car for about 10 minutes to warm it up so that the ATF reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of ATF and replenish if necessary.

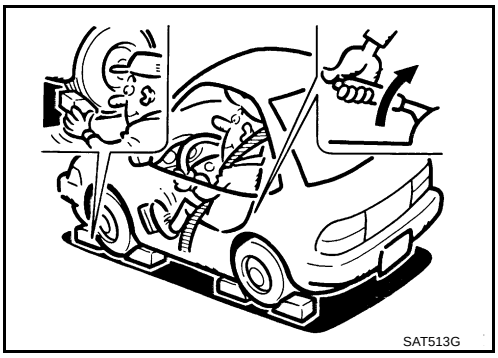
NOTE:
The A/T fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.

3. After warming up remove the oil pressure detection plug and install the oil pressure gauge [ST2505S001(J-34301-C)].

CAUTION:
When using the oil pressure gauge, be sure to use O- ring attached to the oil pressure detection plug.



4. Securely engage the parking brake so that the tires do not turn.

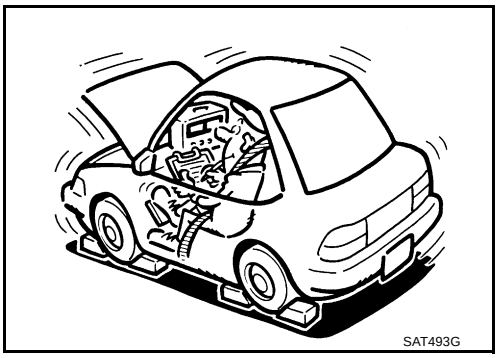


5. Start the engine, then measure the line pressure at both idle and the stall speed.

CAUTION:
- **Keep brake pedal pressed all the way down during measurement.**
- **When measuring the line pressure at the stall speed, refer to AT-49, "STALL TEST" .**

6. After the measurements are complete, install the oil pressure detection plug and tighten to the specified torque. Refer to AT-246, "Components" .

CAUTION:
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



Line Pressure

Engine speed	Line pressure kPa (kg/cm^2 , psi)	
	"R" position	"D" and "M" positions
At idle speed	425 – 465 (4.3 – 4.7, 62 – 67)	379 – 428 (3.9 – 4.4, 55 – 62)
At stall speed	1,605 – 1,950 (16.4 – 19.9, 233 – 283)	1,310 – 1,500 (13.4 – 15.3, 190 – 218)

Judgment of Line Pressure Test

Judgment		Possible cause
Idle speed	Low for all positions (“P”, “R”, “N”, “D”, “M”)	Possible causes include malfunctions in the pressure supply system and low oil pump output. For example ● Oil pump wear ● Pressure regulator valve or plug sticking or spring fatigue ● Oil strainer ⇒ oil pump ⇒ pressure regulator valve passage oil leak ● Engine idle speed too low
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.
	High	Possible causes include a sensor malfunction or malfunction in the line pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● A/T fluid temperature sensor malfunction ● Line pressure solenoid malfunction (sticking in OFF state, filter clog, cut line) ● Pressure regulator valve or plug sticking
Stall speed	Line pressure does not rise higher than the line pressure for idle.	Possible causes include a sensor malfunction or malfunction in the pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● TCM breakdown ● Line pressure solenoid malfunction (shorting, sticking in ON state) ● Pressure regulator valve or plug sticking ● Pilot valve sticking or pilot filter clogged
	The pressure rises, but does not enter the standard position.	Possible causes include malfunctions in the pressure supply system and malfunction in the pressure adjustment function. For example ● Accelerator pedal position signal malfunction ● Line pressure solenoid malfunction (sticking, filter clog) ● Pressure regulator valve or plug sticking ● Pilot valve sticking or pilot filter clogged
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.

ROAD TEST

Description

- The road test inspects overall performance of A/T and analyzes possible malfunction causes.
- The road test is performed in the following three stages.

1. Check before engine is started. Refer to AT-53, "Check Before Engine is Started" .
2. Check at idle. Refer to AT-53, "Check at Idle" .
3. Cruise test

- Inspect all the items from Part 1 to Part 3. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" and AT-58, "Cruise Test — Part 3" .

- Before beginning the road test, check the test procedure and inspection items.
- Test all inspection items until the symptom is uncovered. Diagnose NG items when all road tests are complete.

Check Before Engine is Started

NCS00025

1. CHECK A/T CHECK INDICATOR LAMP

1. Park vehicle on level surface.
2. Move selector lever to “P” position.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON. (Do not start engine.)

Does A/T CHECK indicator lamp light up for about 2 seconds?

YES >> 1. Turn ignition switch OFF.
2. Perform self-diagnostics and record all NG items on the AT-44, "DIAGNOSTIC WORKSHEET" . Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .
3. Go to AT-53, "Check at Idle" .

NO >> Stop the road test and go to AT-172, "A/T Check Indicator Lamp Does Not Come On" .

Check at Idle

NCS00026

1. CHECK STARTING THE ENGINE

1. Park vehicle on level surface.
2. Move selector lever to “P” or “N” position.
3. Turn ignition switch OFF.
4. Start engine.

Does the engine start?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-173, "Engine Cannot Be Started in “P” or “N” Position" .

2. CHECK STARTING THE ENGINE

1. Turn ignition switch ON. (Do not start engine.)
2. Move selector lever in “D”, “M” or “R” position.
3. Start engine.

Does the engine start in each position?

YES >> Stop the road test and go to AT-173, "Engine Cannot Be Started in “P” or “N” Position" .
NO >> GO TO 3.

3. CHECK “P” POSITION FUNCTIONS

1. Move selector lever to “P” position.
2. Turn ignition switch OFF.
3. Release the parking brake.
4. Push the vehicle forward or backward.
5. Engage the parking brake.

When you push the vehicle with disengaging the parking brake, does it move?

YES >> Enter a check mark at AT-173, "In “P” Position, Vehicle Moves When Pushed" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.
NO >> GO TO 4.

4. CHECK “N” POSITION FUNCTIONS

1. Start engine.
2. Move selector lever to “N” position.
3. Release the parking brake.

Does vehicle move forward or backward?

YES >> Enter a check mark at AT-174, "In “N” Position, Vehicle Moves" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.
NO >> GO TO 5.

5. CHECK SHIFT SHOCK

1. Engage the brake.
2. Move selector lever to “D” position.

When the A/T is shifted from “N” to “D”, is there an excessive shock?

YES >> Enter a check mark at AT-175, "Large Shock (“N” to “D” Position)" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.
NO >> GO TO 6.

6. CHECK “R” POSITION FUNCTIONS

1. Engage the brake.
2. Move selector lever to “R” position.
3. Release the brake for 4 to 5 seconds.

Does the vehicle creep backward?

YES >> GO TO 7.
NO >> Enter a check mark at AT-177, "Vehicle Does Not Creep Backward in “R” Position" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

7. CHECK “D” POSITION FUNCTIONS

Inspect whether the vehicle creep forward when the A/T is put into the “D” position.

Does the vehicle creep forward in the “D” position?

YES >> Go to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" and AT-58, "Cruise Test — Part 3" .
NO >> Enter a check mark at AT-179, "Vehicle Does Not Creep Forward in “D” Position" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test. Go to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" and AT-58, "Cruise Test — Part 3" .

Cruise Test — Part 1

NCS00027

1. CHECK STARTING OUT FROM D_1

1. Drive the vehicle for about 10 minutes to warm up the engine oil and ATF.
   Appropriate temperature for the ATF: 50 to 80°C (122 to 176°F)
2. Park the vehicle on a level surface.
3. Move selector lever to “P” position.
4. Start engine.
5. Move selector lever to “D” position.
6. Press the accelerator pedal about half-way down to accelerate the vehicle.

With CONSULT-III

Read the gear position. Refer to AT-88, "DATA MONITOR MODE" .

Starts from D_1 ?

YES >> GO TO 2.
NO >> Enter a check mark at AT-181, "Vehicle Cannot Be Started from D1" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

2. CHECK SHIFT-UP $D_1 \rightarrow D_2$

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up ($D_1 \rightarrow D_2$) at the appropriate speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position, and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up $D_1 \rightarrow D_2$ at the correct speed?

YES >> GO TO 3.
NO >> Enter a check mark at AT-183, "A/T Does Not Shift: D1 → D2" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

3. CHECK SHIFT-UP $D_2 \rightarrow D_3$

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up ($D_2 \rightarrow D_3$) at the appropriate speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position, and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up $D_2 \rightarrow D_3$ at the correct speed?

YES >> GO TO 4.
NO >> Enter a check mark at AT-185, "A/T Does Not Shift: D2 → D3" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

4. CHECK SHIFT-UP $D_3 \rightarrow D_4$

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up ($D_3 \rightarrow D_4$) at the appropriate speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position, and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up $D_3 \rightarrow D_4$ at the correct speed?

YES >> GO TO 5.
NO >> Enter a check mark at AT-187, "A/T Does Not Shift: D3 → D4" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

5. CHECK SHIFT-UP $D_4 \rightarrow D_5$

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up ($D_4 \rightarrow D_5$) at the appropriate speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position, and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up $D_4 \rightarrow D_5$ at the correct speed?

YES >> GO TO 6.

NO >> Enter a check mark at AT-189, "A/T Does Not Shift: $D_4 \rightarrow D_5$" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

6. CHECK LOCK-UP

When releasing accelerator pedal (closed throttle position signal: OFF) from D_5 , check lock-up from D_5 to L/U. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Select “TCC SOLENOID” with the “MAIN SIGNALS” mode for “A/T”. Refer to AT-84, "CONSULT-III REFERENCE VALUE" .

Does it lock-up?

YES >> GO TO 7.

NO >> Enter a check mark at AT-191, "A/T Does Not Lock-up" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

7. CHECK LOCK-UP HOLD

Check hold lock-up.

With CONSULT-III

Select “TCC SOLENOID” with the “MAIN SIGNALS” mode for “A/T”. Refer to AT-84, "CONSULT-III REFERENCE VALUE" .

Does it maintain lock-up status?

YES >> GO TO 8.

NO >> Enter a check mark at AT-193, "A/T Does Not Hold Lock-up Condition" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

8. CHECK LOCK-UP RELEASE

Check lock-up cancellation by depressing brake pedal lightly to decelerate.

With CONSULT-III

Select “TCC SOLENOID” with the “MAIN SIGNALS” mode for “A/T”. Refer to AT-84, "CONSULT-III REFERENCE VALUE" .

Does lock-up cancel?

YES >> GO TO 9.

NO >> Enter a check mark at AT-194, "Lock-up Is Not Released" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

9. CHECK SHIFT-DOWN $D_5 \rightarrow D_4$

Decelerate by pressing lightly on the brake pedal.

With CONSULT-III

Read the gear position and engine speed. AT-88, "DATA MONITOR MODE" .

When the A/T shift-down $D_5 \rightarrow D_4$, does the engine speed drop smoothly back to idle?

YES >> 1. Stop the vehicle.
2. Go to AT-57, "Cruise Test — Part 2" .

NO >> Enter a check mark at AT-195, "Engine Speed Does Not Return to Idle" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test. Go to AT-57, "Cruise Test — Part 2" .

Cruise Test — Part 2

NCS00028

1. CHECK STARTING FROM D1

1. Move selector lever into “D” position.
2. Accelerate at half throttle.

With CONSULT-III

Read the gear position. Refer to AT-88, "DATA MONITOR MODE" .

Does it start from D1?

YES >> GO TO 2.

NO >> Enter a check mark at AT-181, "Vehicle Cannot Be Started from D1" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

2. CHECK SHIFT-UP D1 → D2

Press the accelerator pedal down all the way and inspect whether or not the A/T shifts up (D1 → D2) at the correct speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up D1 → D2 at the correct speed?

YES >> GO TO 3.

NO >> Enter a check mark at AT-183, "A/T Does Not Shift: D1 → D2" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

3. CHECK SHIFT UP D2 → D3

Press the accelerator pedal down all the way and inspect whether or not the A/T shifts up (D2 → D3) at the correct speed. Refer to AT-58, "Vehicle Speed at When Gears Shifting Occurs" .

With CONSULT-III

Read the gear position, throttle position and vehicle speed. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up D2 → D3 at the correct speed?

YES >> GO TO 4.

NO >> Enter a check mark at AT-185, "A/T Does Not Shift: D2 → D3" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

4. CHECK SHIFT-UP D3 → D4 AND ENGINE BRAKE

When the A/T changes speed D3 → D4 , return the accelerator pedal.

With CONSULT-III

Read the gear position. Refer to AT-88, "DATA MONITOR MODE" .

Does the A/T shift-up D3 → D4 and apply the engine brake?

YES >> 1. Stop the vehicle.
2. Go to AT-58, "Cruise Test — Part 3" .

NO >> Enter a check mark at AT-187, "A/T Does Not Shift: D3 → D4" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test. Go to AT-58, "Cruise Test — Part 3" .

Cruise Test — Part 3

NCS00029

1. MANUAL MODE FUNCTION

Move to manual mode from “D” position.

Does it switch to manual mode?

YES >> GO TO 2.

NO >> Continue road test and add check mark to AT-196, "Cannot Be Changed to Manual Mode" on the AT-44, "DIAGNOSTIC WORKSHEET" .

2. CHECK SHIFT-DOWN

During manual mode driving, is downshift from $M_5 \rightarrow M_4 \rightarrow M_3 \rightarrow M_2 \rightarrow M_1$ performed?

With CONSULT-III

Read the gear position. Refer to AT-88, "DATA MONITOR MODE" .

Is downshifting correctly performed?

YES >> GO TO 2.

NO >> Enter a check mark at “A/T Does Not Shift” at the corresponding position (5th → 4th, 4th → 3rd, 3rd → 2nd, 2nd → 1st) on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue the road test.

3. CHECK ENGINE BRAKE

Check engine brake.

Does engine braking effectively reduce speed in M_1 position?

YES >> 1. Stop the vehicle.
2. Perform self-diagnostics. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

NO >> Enter a check mark at AT-202, "Vehicle Does Not Decelerate by Engine Brake" on the AT-44, "DIAGNOSTIC WORKSHEET" , then continue trouble diagnosis.

Vehicle Speed at When Gears Shifting Occurs

NCS0002A

Throttle position	Vehicle speed km/h (MPH)							
	$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_5 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	50 – 54 (31 – 34)	97 – 105 (60 – 65)	154 – 164 (96 – 102)	224 – 234 (139 – 145)	220 – 230 (137 – 143)	145 – 155 (90 – 96)	86 – 94 (53 – 58)	39 – 43 (24 – 27)
Half throttle	29 – 33 (18 – 21)	63 – 69 (39 – 43)	100 – 108 (62 – 67)	136 – 144 (85 – 89)	88 – 96 (55 – 60)	64 – 72 (40 – 45)	28 – 34 (17 – 21)	9 – 13 (6 – 8)

- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed at Which Lock-up Occurs/Releases

NCS0002B

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	62 – 70 (39 – 44)	59 – 67 (37 – 42)
Half throttle	136 – 144 (85 – 89)	88 – 96 (55 – 60)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 4/8 of the full opening.

Symptom Chart

NCS0002C

- **The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.**
- **Overhaul and inspect inside the A/T only if A/T fluid condition is NG. Refer to** AT-49, "A/T Fluid Condition Check".

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
1	Shift Shock	Large shock. (“N” → “D” position) Refer to AT-175, "Large Shock (“N” to “D” Position)" .	ON vehicle	1. Engine idle speed	EC-76
				2. Engine speed signal	AT-113
				3. Accelerator pedal position sensor	AT-131
				4. A/T position	AT-206
				5. A/T fluid temperature sensor	AT-134
				6. Front brake solenoid valve	AT-147
				7. CAN communication line	AT-94
				8. A/T fluid level and state	AT-49
				9. Line pressure test	AT-50
				10. Control valve with TCM	AT-215
			OFF vehicle	11. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
2		Shock is too large when changing D_1 → D_2 or M_1 → M_2 .	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Direct clutch solenoid valve	AT-149
				4. CAN communication line	AT-94
				5. Engine speed signal	AT-113
				6. Turbine revolution sensor	AT-106
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. Direct clutch	AT-288
3		Shock is too large when changing D_2 → D_3 or M_2 → M_3 .	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. High and low reverse clutch solenoid valve	AT-151
				4. CAN communication line	AT-94
				5. Engine speed signal	AT-113
				6. Turbine revolution sensor	AT-106
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. High and low reverse clutch	AT-286

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
4	Shift Shock	Shock is too large when changing D3 → D4 or M3 → M4 .	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Input clutch solenoid valve	AT-145
				4. CAN communication line	AT-94
				5. Engine speed signal	AT-113
				6. Turbine revolution sensor	AT-106
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. Input clutch	AT-276
5		Shock is too large when changing D4 → D5 or M4 → M5 .	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Front brake solenoid valve	AT-147
				4. CAN communication line	AT-94
				5. Engine speed signal	AT-113
				6. Turbine revolution sensor	AT-106
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. Front brake (brake band)	AT-255
				11. Input clutch	AT-276
6		Shock is too large for downshift when accelerator pedal is pressed.	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. CAN communication line	AT-94
				4. Engine speed signal	AT-113
				5. Turbine revolution sensor	AT-106
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				7. A/T fluid level and state	AT-49
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Front brake (brake band)	AT-255
				10. Input clutch	AT-276
				11. High and low reverse clutch	AT-286
				12. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
7	Shift Shock	Shock is too large for upshift when accelerator pedal is released.	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Engine speed signal	AT-113
				4. CAN communication line	AT-94
				5. Turbine revolution sensor	AT-106
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				7. A/T fluid level and state	AT-49
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Front brake (brake band)	AT-255
				10. Input clutch	AT-276
				11. High and low reverse clutch	AT-286
				12. Direct clutch	AT-288
8		Shock is too large for lock-up.	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. Engine speed signal	AT-113
				4. CAN communication line	AT-94
				5. Turbine revolution sensor	AT-106
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				7. Torque converter clutch solenoid valve	AT-125
				8. A/T fluid level and state	AT-49
				9. Control valve with TCM	AT-215
			OFF vehicle	10. Torque converter	AT-255
9		Shock is too large during engine brake.	ON vehicle	1. Accelerator pedal position sensor	AT-131
				2. A/T position	AT-206
				3. CAN communication line	AT-94
				4. A/T fluid level and state	AT-49
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Front brake (brake band)	AT-255
				7. Input clutch	AT-276
				8. High and low reverse clutch	AT-286
				9. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
10	No Up Shift	Gear does not change from $D_1 \rightarrow D_2$ or from $M_1 \rightarrow M_2$. Refer to AT-183, "A/T Does Not Shift: $D_1 \rightarrow D_2$".	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Direct clutch	AT-288
11		Gear does not change from $D_2 \rightarrow D_3$ or from $M_2 \rightarrow M_3$. Refer to AT-185, "A/T Does Not Shift: $D_2 \rightarrow D_3$".	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. High and low reverse clutch solenoid valve	AT-151
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. High and low reverse clutch	AT-286
12		Gear does not change from $D_3 \rightarrow D_4$ or from $M_3 \rightarrow M_4$. Refer to AT-187, "A/T Does Not Shift: $D_3 \rightarrow D_4$".	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Front brake solenoid valve	AT-147
				5. Line pressure test	AT-50
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Input clutch	AT-276
13		Gear does not change from $D_4 \rightarrow D_5$ or from $M_4 \rightarrow M_5$. Refer to AT-189, "A/T Does Not Shift: $D_4 \rightarrow D_5$".	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Direct clutch solenoid valve	AT-149
				5. Turbine revolution sensor	AT-106
				6. Line pressure test	AT-50
				7. CAN communication line	AT-94
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Front brake (brake band)	AT-255
				10. Input clutch	AT-276

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
14	No Down Shift	In “D” or “M” position, does not downshift to 4th gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Direct clutch solenoid valve	AT-149
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Front brake (brake band)	AT-255
				9. Input clutch	AT-276
15		In “D” or “M” position, does not downshift to 3rd gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Front brake solenoid valve	AT-147
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Input clutch	AT-276
16		In “D” or “M” position, does not downshift to 2nd gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. High and low reverse clutch solenoid valve	AT-151
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. High and low reverse clutch	AT-286
17		In “D” or “M” position, does not downshift to 1st gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
18	Slips/Will Not Engage	When “D” or “M” position, remains in 1st gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. 3rd one-way clutch	AT-274
				8. 1st one-way clutch	AT-281
				9. Gear system	AT-246
				10. Reverse brake	AT-255
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
19		When “D” or “M” position, remains in 2nd gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108 , AT-139
				3. Low coast brake solenoid valve	AT-153
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. 3rd one-way clutch	AT-274
				8. Gear system	AT-246
				9. Direct clutch	AT-288
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
20		When “D” or “M” position, remains in 3rd gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Line pressure test	AT-50
				4. CAN communication line	AT-94
				5. Control valve with TCM	AT-215
			OFF vehicle	6. 3rd one-way clutch	AT-274
				7. Gear system	AT-246
				8. High and low reverse clutch	AT-286
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
21	Slips/Will Not Engage	When “D” or “M” position, remains in 4th gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Direct clutch solenoid valve	AT-149
				5. High and low reverse clutch solenoid valve	AT-151
				6. Low coast brake solenoid valve	AT-153
				7. Front brake solenoid valve	AT-147
				8. Line pressure test	AT-50
				9. CAN communication line	AT-94
				10. Control valve with TCM	AT-215
			OFF vehicle	11. Input clutch	AT-276
				12. Gear system	AT-246
				13. High and low reverse clutch	AT-286
				14. Direct clutch	AT-288
22		When “D” or “M” position, remains in 5th gear.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Line pressure test	AT-50
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276
				9. Gear system	AT-246
				10. High and low reverse clutch	AT-286

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
23	Slips/Will Not Engage	Vehicle cannot be started from D_1 . Refer to AT-181, "Vehicle Cannot Be Started from D_1" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Accelerator pedal position sensor	AT-131
				3. Line pressure test	AT-50
				4. CAN communication line	AT-94
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Torque converter	AT-255
				7. Oil pump assembly	AT-271
				8. 3rd one-way clutch	AT-274
				9. 1st one-way clutch	AT-281
				10. Gear system	AT-246
				11. Reverse brake	AT-255
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
24		Does not lock-up. Refer to AT-191, "A/T Does Not Lock-up" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Engine speed signal	AT-113
				4. Turbine revolution sensor	AT-106
				5. Torque converter clutch solenoid valve	AT-125
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
25		Does not hold lock-up condition. Refer to AT-193, "A/T Does Not Hold Lock-up Condition" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Engine speed signal	AT-113
				4. Turbine revolution sensor	AT-106
				5. Torque converter clutch solenoid valve	AT-125
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
26	Slips/Will Not Engage	Lock-up is not released. Refer to AT-194, "Lock-up Is Not Released" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Engine speed signal	AT-113
				4. Turbine revolution sensor	AT-106
				5. Torque converter clutch solenoid valve	AT-125
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
27		No shock at all or the clutch slips when vehicle changes speed $D_1 \rightarrow D_2$ or $M_1 \rightarrow M_2$.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. Gear system	AT-246
				11. Direct clutch	AT-288
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
28	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed $D_2 \rightarrow D_3$ or $M_2 \rightarrow M_3$.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. High and low reverse clutch solenoid valve	AT-151
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. Gear system	AT-246
				11. High and low reverse clutch	AT-286
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
29		No shock at all or the clutch slips when vehicle changes speed $D_3 \rightarrow D_4$ or $M_3 \rightarrow M_4$.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Front brake solenoid valve	AT-147
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. Input clutch	AT-276
				11. Gear system	AT-246
				12. High and low reverse clutch	AT-286
				13. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
30	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed $D_4 \rightarrow D_5$ or $M_4 \rightarrow M_5$.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Direct clutch solenoid valve	AT-149
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. Front brake (brake band)	AT-255
				11. Input clutch	AT-276
				12. Gear system	AT-246
				13. High and low reverse clutch	AT-286
31		When you press the accelerator pedal and shift speed $D_5 \rightarrow D_4$ or $M_5 \rightarrow M_4$ the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Front brake solenoid valve	AT-147
				4. Direct clutch solenoid valve	AT-149
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. Input clutch	AT-276
				11. Gear system	AT-246
				12. High and low reverse clutch	AT-286
				13. Direct clutch	AT-288

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
32	Slips/Will Not Engage	When you press the accelerator pedal and shift speed D4 → D3 or M4 → M3 the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Input clutch solenoid valve	AT-145
				4. Front brake solenoid valve	AT-147
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. 3rd one-way clutch	AT-274
				11. Gear system	AT-246
				12. High and low reverse clutch	AT-286
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
33		When you press the accelerator pedal and shift speed D3 → D2 or M3 → M2 the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. High and low reverse clutch solenoid valve	AT-151
				4. Direct clutch solenoid valve	AT-149
				5. CAN communication line	AT-94
				6. Line pressure test	AT-50
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. 3rd one-way clutch	AT-274
				11. Gear system	AT-246
				12. Direct clutch	AT-288
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
34	Slips/Will Not Engage	When you press the accelerator pedal and shift speed $D_2 \rightarrow D_1$ or $M_2 \rightarrow M_1$ the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				3. Direct clutch solenoid valve	AT-149
				4. CAN communication line	AT-94
				5. Line pressure test	AT-50
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. 1st one-way clutch	AT-281
				11. Gear system	AT-246
				12. Reverse brake	AT-255
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
35		With selector lever in “D” position, acceleration is extremely poor.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. PNP switch	AT-102
				6. A/T position	AT-206
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271
				10. 1st one-way clutch	AT-281
				11. Gear system	AT-246
				12. Reverse brake	AT-255
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
36	Slips/Will Not Engage	With selector lever in “R” position, acceleration is extremely poor.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. High and low reverse clutch solenoid valve	AT-151
				5. CAN communication line	AT-94
				6. PNP switch	AT-102
				7. A/T position	AT-206
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Gear system	AT-246
				10. Output shaft	AT-255
				11. Reverse brake	AT-255
37		While starting off by accelerating in 1st, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Torque converter	AT-255
				7. Oil pump assembly	AT-271
				8. 3rd one-way clutch	AT-274
				9. 1st one-way clutch	AT-281
				10. Gear system	AT-246
				11. Reverse brake	AT-255
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
38	Slips/Will Not Engage	While accelerating in 2nd, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Direct clutch solenoid valve	AT-149
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. Gear system	AT-246
				11. Direct clutch	AT-288
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
39		While accelerating in 3rd, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. High and low reverse clutch solenoid valve	AT-151
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. 3rd one-way clutch	AT-274
				10. Gear system	AT-246
				11. High and low reverse clutch	AT-286
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
40	Slips/Will Not Engage	While accelerating in 4th, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Input clutch solenoid valve	AT-145
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. Input clutch	AT-276
				10. Gear system	AT-246
				11. High and low reverse clutch	AT-286
				12. Direct clutch	AT-288
41		While accelerating in 5th, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Front brake solenoid valve	AT-147
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. Front brake (brake band)	AT-255
				10. Input clutch	AT-276
				11. Gear system	AT-246
				12. High and low reverse clutch	AT-286
42		Slips at lock-up.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Engine speed signal	AT-113
				4. Turbine revolution sensor	AT-106
				5. Torque converter clutch solenoid valve	AT-125
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Torque converter	AT-255
				9. Oil pump assembly	AT-271

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
43	Slips/Will Not Engage	No creep at all. Refer to AT-177, "Vehicle Does Not Creep Backward in “R” Position" , AT-179, "Vehicle Does Not Creep Forward in “D” Position" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. Direct clutch solenoid valve	AT-149
				5. PNP switch	AT-102
				6. CAN communication line	AT-94
				7. A/T position	AT-206
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Torque converter	AT-255
				10. Oil pump assembly	AT-271
				11. 1st one-way clutch	AT-281
				12. Gear system	AT-246
				13. Reverse brake	AT-255
				14. Direct clutch	AT-288
				15. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				16. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
44		Vehicle cannot run in all positions.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. PNP switch	AT-102
				4. A/T position	AT-206
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Oil pump assembly	AT-271
				7. Gear system	AT-246
				8. Output shaft	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
45	Slips/Will Not Engage	With selector lever in “D” position, driving is not possible.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. PNP switch	AT-102
				4. A/T position	AT-206
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Torque converter	AT-255
				7. Oil pump assembly	AT-271
				8. 1st one-way clutch	AT-281
				9. Gear system	AT-246
				10. Reverse brake	AT-255
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
46		With selector lever in “R” position, driving is not possible.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. PNP switch	AT-102
				4. A/T position	AT-206
				5. Control valve with TCM	AT-215
			OFF vehicle	6. Gear system	AT-246
				7. Output shaft	AT-255
				8. Reverse brake	AT-255
47	Does Not Change	Does not change $M_5 \rightarrow M_4$. Refer to AT-196, "A/T Does Not Shift: 5th Gear → 4th Gear" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
48		Does not change $M_4 \rightarrow M_3$. Refer to AT-198, "A/T Does Not Shift: 4th Gear → 3rd Gear" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
49	Does Not Change	Does not change M_3 → M_2 . Refer to AT-199, "A/T Does Not Shift: 3rd Gear → 2nd Gear" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276
				9. High and low reverse clutch	AT-286
50		Does not change M_2 → M_1 . Refer to AT-201, "A/T Does Not Shift: 2nd Gear → 1st Gear" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Input clutch	AT-276
				8. High and low reverse clutch	AT-286
				9. Direct clutch	AT-288
51		Cannot be changed to manual mode. Refer to AT-196, "Cannot Be Changed to Manual Mode" .	ON vehicle	1. Manual mode switch	AT-157
				2. Turbine revolution sensor	AT-106
				3. CAN communication line	AT-94
52	Others	Shift point is high in “D” position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				2. Accelerator pedal position sensor	AT-131
				3. CAN communication line	AT-94
				4. A/T fluid temperature sensor	AT-134
				5. Control valve with TCM	AT-215
53		Shift point is low in “D” position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				2. Accelerator pedal position sensor	AT-131
				3. CAN communication line	AT-94
				4. Control valve with TCM	AT-215

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
54	Others	Judder occurs during lock-up.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. Turbine revolution sensor	AT-106
				4. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				5. Accelerator pedal position sensor	AT-131
				6. CAN communication line	AT-94
				7. Torque converter clutch solenoid valve	AT-125
				8. Control valve with TCM	AT-215
			OFF vehicle	9. Torque converter	AT-255
55		Strange noise in “R” position.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. CAN communication line	AT-94
				4. Control valve with TCM	AT-215
			OFF vehicle	5. Torque converter	AT-255
				6. Oil pump assembly	AT-271
				7. Gear system	AT-246
				8. High and low reverse clutch	AT-286
				9. Reverse brake	AT-255
56		Strange noise in “N” position.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. CAN communication line	AT-94
				4. Control valve with TCM	AT-215
			OFF vehicle	5. Torque converter	AT-255
				6. Oil pump assembly	AT-271
				7. Gear system	AT-246
57		Strange noise in “D” position.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. CAN communication line	AT-94
				4. Control valve with TCM	AT-215
			OFF vehicle	5. Torque converter	AT-255
				6. Oil pump assembly	AT-271
				7. Gear system	AT-246
				8. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
58	Others	Vehicle does not decelerate by engine brake. Refer to AT-202, "Vehicle Does Not Decelerate by Engine Brake" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Input clutch	AT-276
				8. High and low reverse clutch	AT-286
				9. Direct clutch	AT-288
59		Engine brake does not work $M_5 \rightarrow M_4$.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
60		Engine brake does not work $M_4 \rightarrow M_3$.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276
61		Engine brake does not work $M_3 \rightarrow M_2$.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Front brake (brake band)	AT-255
				8. Input clutch	AT-276
				9. High and low reverse clutch	AT-286

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
62	Others	Engine brake does not work $M_2 \rightarrow M_1$.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Manual mode switch	AT-157
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Input clutch	AT-276
				8. High and low reverse clutch	AT-286
				9. Direct clutch	AT-288
63		Maximum speed low.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Line pressure test	AT-50
				3. Accelerator pedal position sensor	AT-131
				4. CAN communication line	AT-94
				5. Direct clutch solenoid valve	AT-149
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
				8. Oil pump assembly	AT-271
				9. Input clutch	AT-276
				10. Gear system	AT-246
				11. High and low reverse clutch	AT-286
				12. Direct clutch	AT-288
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				14 Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
64		Extremely large creep.	ON vehicle	1. Engine idle speed	EC-76
				2. CAN communication line	AT-94
			OFF vehicle	3. Torque converter	AT-255
65		With selector lever in “P” position, vehicle does not enter parking condition or, with selector lever in another position, parking condition is not cancelled.	ON vehicle	1. PNP switch	AT-102
				2. A/T position	AT-206
				3. Parking pawl components	AT-246
66		Vehicle runs with A/T in “P” position.	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Control valve with TCM	AT-215
				5. Parking pawl components	AT-246
			OFF vehicle	6. Gear system	AT-246

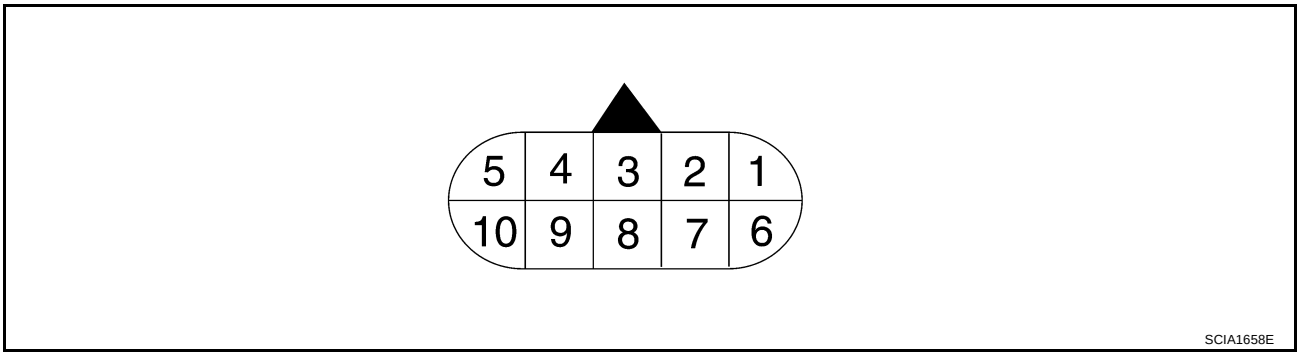
No.	Items	Symptom	Condition	Diagnostic Item	Reference page
67	Others	Vehicle runs with A/T in “N” position. Refer to AT-174, "In “N” Position, Vehicle Moves" .	ON vehicle	1. PNP switch	AT-102
				2. A/T fluid level and state	AT-49
				3. A/T position	AT-206
				4. Control valve with TCM	AT-215
			OFF vehicle	5. Input clutch	AT-276
				6. Gear system	AT-246
				7. Direct clutch	AT-288
				8. Reverse brake	AT-255
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
				10. Low coast brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-17, "Cross-sectional View" .)	AT-255
68		Engine does not start in “N” or “P” position. Refer to AT-173, "Engine Cannot Be Started in “P” or “N” Position" .	ON vehicle	1. Ignition switch and starter	PG-4, SC-8
				2. A/T position	AT-206
				3. PNP switch	AT-102
69		Engine starts in positions other than “N” or “P”.	ON vehicle	1. Ignition switch and starter	PG-4, SC-8
				2. A/T position	AT-206
				3. PNP switch	AT-102
70		Engine stall.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. Turbine revolution sensor	AT-106
				4. Torque converter clutch solenoid valve	AT-125
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255
71		Engine stalls when selector lever shifted “N” → “D”, “R”.	ON vehicle	1. A/T fluid level and state	AT-49
				2. Engine speed signal	AT-113
				3. Turbine revolution sensor	AT-106
				4. Torque converter clutch solenoid valve	AT-125
				5. CAN communication line	AT-94
				6. Control valve with TCM	AT-215
			OFF vehicle	7. Torque converter	AT-255

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
72	Others	Engine speed does not return to idle. Refer to AT-195, "Engine Speed Does Not Return to Idle" .	ON vehicle	1. A/T fluid level and state	AT-49
				2. Direct clutch solenoid valve	AT-149
				3. Front brake solenoid valve	AT-147
				4. Accelerator pedal position sensor	AT-131
				5. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-108, AT-139
				6. CAN communication line	AT-94
				7. Control valve with TCM	AT-215
			OFF vehicle	8. Front brake (brake band)	AT-255
				9. Direct clutch	AT-288

TCM Input/Output Signal Reference Values

NCS0002D

A/T ASSEMBLY HARNESS CONNECTOR TERMINAL LAYOUT



TCM INSPECTION TABLE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
1	G	Power supply (Memory back-up)	Always		Battery voltage
2	G	Power supply (Memory back-up)	Always		Battery voltage
3	L	CAN-H	—		—
4	PU/W	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.		—
5	B	Ground	Always		0 V
6	Y/R	Power supply		—	Battery voltage
				—	0 V
7	Y	Back-up lamp relay		Selector lever in “R” position.	0 V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	—		—
9	GY/R	Starter relay		Selector lever in “N” and “P” positions.	Battery voltage
				Selector lever in other positions.	0 V
10	B	Ground	Always		0 V

CONSULT-III Function (TRANSMISSION)

NCS0002E

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

FUNCTION

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.
Data monitor	Input/Output data in the ECU can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.
Function test	Performed by CONSULT-III instead of a technician to determine whether each system is “OK” or “NG”.
DTC work support	Select the operating condition to confirm Diagnosis Trouble Codes.
ECU part number	TCM part number can be read.

CONSULT-III REFERENCE VALUE

NOTICE:

1. The CONSULT-III electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid).
   Check for time difference between actual shift timing and the CONSULT-III display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
2. Shift schedule (which implies gear position) displayed on CONSULT-III and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:

- Actual shift schedule has more or less tolerance or allowance,
- Shift schedule indicated in Service Manual refers to the point where shifts start, and
- Gear position displayed on CONSULT-III indicates the point where shifts are completed.

3. Display of solenoid valves on CONSULT-III changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).

Item name	Condition	Display value (Approx.)
ATF TEMP SE 1	0°C (32° F) – 20°C (68°F) – 80°C (176°F)	3.3 – 2.7 – 0.9 V
ATF TEMP SE 2		3.3 – 2.5 – 0.7 V
ATF TEMP 1	Ignition switch ON	Measured ATF temperature is displayed.
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A
SLCT LVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.
VEHICLE SPEED	During driving	Approximately matches the speedometer reading.
ENGINE SPEED	Engine running	Closely matches the tachometer reading.
LINE PRES SOL	During driving	0.2 – 0.6 A
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 – 0.05 A
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 – 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 – 0.05 A
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 – 0.05 A
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 – 0.05 A
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF
GEAR	During driving	1, 2, 3, 4, 5

SELF-DIAGNOSTIC RESULT MODE

After performing self-diagnosis, place check marks for results on the AT-44, "DIAGNOSTIC WORKSHEET" . Reference pages are provided following the items.

Display Items List

X: Applicable, —: Not applicable

Items (CONSULT-III screen terms)	Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)	Reference page
		"TRANSMISSION" with CONSULT-III	MIL*1, "ENGINE" with CONSULT-III or GST	
CAN COMM CIRCUIT	When TCM is not transmitting or receiving CAN communication signal for 2 seconds or more.	U1000	U1000	AT-94
STARTER RELAY/ CIRC	If this signal is ON other than in "P" or "N" position, this is judged to be a malfunction. (And if it is OFF in "P" or "N" position, this too is judged to be a malfunction.)	P0615	—	AT-97
TCM	TCM is malfunctioning	P0700	P0700	AT-101
PNP SW/CIRC	● PNP switch 1–4 signals input with impossible pattern. ● "P" position is detected from "N" position without any other position being detected in between.	P0705	P0705	AT-102
TURBINE REV S/CIRC	● TCM does not receive the proper voltage signal from the sensor. ● TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.	P0717	P0717	AT-106
VEH SPD SEN/CIR AT	● Signal from vehicle speed sensor A/T (Revolution sensor) not input due to cut line or the like. ● Unexpected signal input during running. ● After ignition switch is turned ON, unexpected signal input from vehicle speed sensor MTR before the vehicle starts moving.	P0720	P0720	AT-108
ENGINE SPEED SIG	TCM does not receive the CAN communication signal from the ECM.	P0725	P0725	AT-113
A/T 1ST GR FNCTN	A/T cannot shift to 1st gear	P0731	P0731	AT-115
A/T 2ND GR FNCTN	A/T cannot shift to 2nd gear	P0732	P0732	AT-117
A/T 3RD GR FNCTN	A/T cannot shift to 3rd gear	P0733	P0733	AT-119
A/T 4TH GR FNCTN	A/T cannot shift to 4th gear	P0734	P0734	AT-121
A/T 5TH GR FNCTN	A/T cannot shift to 5th gear	P0735	P0735	AT-123
TCC SOLENOID/CIRC	Normal voltage not applied to solenoid due to cut line, short, or the like.	P0740	P0740	AT-125
A/T TCC S/V FNCTN	● A/T cannot perform lock-up even if electrical circuit is good. ● TCM detects as irregular by comparing difference value with slip rotation.	P0744	P0744*2	AT-127
L/PRESS SOL/CIRC	● Normal voltage not applied to solenoid due to cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P0745	P0745	AT-129
TP SEN/CIRC A/T	TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.	P1705	P1705	AT-131
ATF TEMP SEN/CIRC	During running, the A/T fluid temperature sensor signal voltage is excessively high or low.	P1710	P0710	AT-134

Items (CONSULT-III screen terms)	Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)	Reference page
		"TRANSMISSION" with CONSULT-III	MIL[*1], "ENGINE" with CONSULT-III or GST	
VEH SPD SE/CIR-MTR	● Signal (CAN communication) from vehicle speed sensor MTR not input due to cut line or the like. ● Unexpected signal input during running.	P1721	—	AT-139
A/T INTERLOCK	Except during shift change, the gear position and ATF pressure switch states are monitored and comparative judgment made.	P1730	P1730	AT-141
A/T 1ST E/BRAKING	Each ATF pressure switch and solenoid current is monitored and if a pattern is detected having engine braking 1st gear other than in the M_1 position, a malfunction is detected.	P1731	—	AT-143
I/C SOLENOID/CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P1752	P1752	AT-145
FR/B SOLENOID/CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P1757	P1757	AT-147
D/C SOLENOID/CIRC	● Normal voltage not applied to solenoid due to cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P1762	P1762	AT-149
HLR/C SOL/CIRC	● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. ● TCM detects as irregular by comparing target value with monitor value.	P1767	P1767	AT-151
LC/B SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like.	P1772	P1772	AT-153
LC/B SOLENOID FNCT	● TCM detects an improper voltage drop when it tries to operate the solenoid valve. ● Condition of ATF pressure switch 2 is different from monitor value, and relation between gear position and actual gear ratio is irregular.	P1774	P1774[*2]	AT-155
MANU MODE SW/ CIRC	When an impossible pattern of switch signals is detected, a malfunction is detected.	P1815	—	AT-157
NO DTC IS DETECTED FURTHER TESTING MAY BE REQUIRED	No NG item has been detected.	X	X	—

- [*1]: Refer to AT-39, "Malfunction Indicator Lamp (MIL)" .
- [*2]: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

DATA MONITOR MODE
Display Items List

X: Standard, —: Not applicable, ▼: Option

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/S SE-A/T (km/h)	X	X	▼	Revolution sensor
VHCL/S SE-MTR (km/h)	X	—	▼	
ACCELE POSI (0.0/8)	X	—	▼	Accelerator pedal position signal
THROTTLE POSI (0.0/8)	X	X	▼	Degree of opening for accelerator recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
CLSD THL POS (ON/OFF)	X	—	▼	Signal input with CAN communications.
W/O THL POS (ON/OFF)	X	—	▼	
BRAKE SW (ON/OFF)	X	—	▼	Stop lamp switch
GEAR	—	X	▼	Gear position recognized by the TCM updated after gear-shifting.
ENGINE SPEED (rpm)	X	X	▼	
TURBINE REV (rpm)	X	X	▼	
OUTPUT REV (rpm)	X	X	▼	
GEAR RATIO	—	X	▼	
TC SLIP SPEED (rpm)	—	X	▼	Difference between engine speed and torque converter input shaft speed.
F SUN GR REV (rpm)	—	—	▼	
F CARR GR REV (rpm)	—	—	▼	
ATF TEMP SE 1 (V)	X	—	▼	
ATF TEMP SE 2 (V)	X	—	▼	
ATF TEMP 1 (°C)	—	X	▼	
ATF TEMP 2 (°C)	—	X	▼	
BATTERY VOLT (V)	X	—	▼	
ATF PRES SW 1 (ON/OFF)	X	X	▼	(for FR/B solenoid)
ATF PRES SW 2 (ON/OFF)	X	X	▼	(for LC/B solenoid)
ATF PRES SW 3 (ON/OFF)	X	X	▼	(for I/C solenoid)
ATF PRES SW 5 (ON/OFF)	X	X	▼	(for D/C solenoid)
ATF PRES SW 6 (ON/OFF)	X	X	▼	(for HLR/C solenoid)
PNP SW 1 (ON/OFF)	X	—	▼	
PNP SW 2 (ON/OFF)	X	—	▼	
PNP SW 3 (ON/OFF)	X	—	▼	
PNP SW 4 (ON/OFF)	X	—	▼	
1 POSITION SW (ON/OFF)	X	—	▼	

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
SLCT LVR POSI	—	X	▼	Selector lever position is recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
OD CONT SW (ON/OFF)	X	—	▼	Not mounted but displayed.
POWERSHIFT SW (ON/OFF)	X	—	▼	
HOLD SW (ON/OFF)	X	—	▼	
MANU MODE SW (ON/OFF)	X	—	▼	
NON M-MODE SW (ON/OFF)	X	—	▼	
UP SW LEVER (ON/OFF)	X	—	▼	
DOWN SW LEVER (ON/OFF)	X	—	▼	
SFT UP ST SW (ON/OFF)	—	—	▼	Not mounted but displayed.
SFT DWN ST SW (ON/OFF)	—	—	▼	
ASCD-OD CUT (ON/OFF)	—	—	▼	
ASCD-CRUISE (ON/OFF)	—	—	▼	
ABS SIGNAL (ON/OFF)	—	—	▼	
ACC OD CUT (ON/OFF)	—	—	▼	Not mounted but displayed
ACC SIGNAL (ON/OFF)	—	—	▼	
TCS GR/P KEEP (ON/OFF)	—	—	▼	
TCS SIGNAL 2 (ON/OFF)	—	—	▼	
TCS SIGNAL 1 (ON/OFF)	—	—	▼	
TCC SOLENOID (A)	—	X	▼	
LINE PRES SOL (A)	—	X	▼	
I/C SOLENOID (A)	—	X	▼	
FR/B SOLENOID (A)	—	X	▼	
D/C SOLENOID (A)	—	X	▼	
HLR/C SOL (A)	—	X	▼	
ON OFF SOL (ON/OFF)	—	—	▼	LC/B solenoid
TCC SOL MON (A)	—	—	▼	
L/P SOL MON (A)	—	—	▼	
I/C SL MON (A)	—	—	▼	
FR/B SOL MON (A)	—	—	▼	
D/C SOL MON (A)	—	—	▼	
HLR/C SOL MON (A)	—	—	▼	
ON OFF SOL MON (ON/OFF)	—	—	▼	LC/B solenoid
P POSI IND (ON/OFF)	—	—	▼	
R POSI IND (ON/OFF)	—	—	▼	

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
N POSI IND (ON/OFF)	—	—	▼	
D POSI IND (ON/OFF)	—	—	▼	
4TH POSI IND (ON/OFF)	—	—	▼	
3RD POSI IND (ON/OFF)	—	—	▼	
2ND POSI IND (ON/OFF)	—	—	▼	
1ST POSI IND (ON/OFF)	—	—	▼	
MANU MODE IND (ON/OFF)	—	—	▼	
POWER M LAMP (ON/OFF)	—	—	▼	
F-SAFE IND/L (ON/OFF)	—	—	▼	
ATF WARN LAMP (ON/OFF)	—	—	▼	Not mounted but displayed.
BACK-UP LAMP (ON/OFF)	—	—	▼	
STARTER RELAY (ON/OFF)	—	—	▼	
PNP SW3 MON (ON/OFF)	—	—	▼	
C/V CLB ID1	—	—	▼	
C/V CLB ID2	—	—	▼	
C/V CLB ID3	—	—	▼	
UNIT CLB ID1	—	—	▼	
UNIT CLB ID2	—	—	▼	
UNIT CLB ID3	—	—	▼	
TRGT GR RATIO	—	—	▼	
TRGT PRES TCC (kPa)	—	—	▼	
TRGT PRES L/P (kPa)	—	—	▼	
TRGT PRES I/C (kPa)	—	—	▼	
TRGT PRE FR/B (kPa)	—	—	▼	
TRGT PRES D/C (kPa)	—	—	▼	
TRG PRE HLR/C (kPa)	—	—	▼	
SHIFT PATTERN	—	—	▼	
DRV CST JUDGE	—	—	▼	
START RLY MON	—	—	▼	
NEXT GR POSI	—	—	▼	
SHIFT MODE	—	—	▼	
MANU GR POSI	—	—	▼	
VEHICLE SPEED (km/h)	—	X	▼	Vehicle speed recognized by the TCM.
Voltage (V)	—	—	▼	Displays the value measured by the voltage probe.

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Frequency (Hz)	—	—	▼	The value measured by the pulse probe is displayed.
DUTY-HI (high) (%)	—	—	▼	
DUTY-LOW (low) (%)	—	—	▼	
PLS WIDTH-HI (ms)	—	—	▼	
PLS WIDTH-LOW (ms)	—	—	▼	

DTC WORK SUPPORT MODE

Display Items List

DTC work support item	Description	Check item
1ST GR FUNCTN P0731	Following items for “1st gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	● Input clutch solenoid valve ● Front brake solenoid valve ● Direct clutch solenoid valve ● High and low reverse clutch solenoid valve ● Each clutch ● Hydraulic control circuit
2ND GR FUNCTN P0732	Following items for “2nd gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	
3RD GR FUNCTN P0733	Following items for “3rd gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	
4TH GR FUNCTN P0734	Following items for “4th gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	
5TH GR FUNCTN P0735	Following items for “5th gear function” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being performed or not) ● Self-diagnostic results (OK or NG)	

Diagnostic Procedure Without CONSULT-III

NCS0002F

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to EC-125, "Generic Scan Tool (GST) Function" .

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to EC-62, "Malfunction Indicator Lamp (MIL)" .

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Description

When the ignition switch is turned ON, the indicator lamp lights up 2 seconds. As a method for locating the suspect circuit, when the self-diagnostics start signal is input, the memory for the malfunction location is output and A/T CHECK indicator lamp flashes to display the corresponding DTC.

Diagnostic Procedure

1. CHECK A/T CHECK INDICATOR LAMP

1. Start the engine with selector lever in “P” position. Warm engine to normal operating temperature.
2. Turn ignition switch ON and OFF at least twice, then leave it in the OFF position.
3. Wait 10 seconds.
4. Turn ignition switch ON. (Do not start engine.)

Does A/T CHECK indicator lamp come on for about 2 seconds?

YES >> GO TO 2.
NO >> Go to AT-172, "A/T Check Indicator Lamp Does Not Come On" .

2. JUDGMENT PROCEDURE

1. Turn ignition switch OFF.
2. Keep pressing shift lock release button.
3. Move selector lever from “P” to “D” position.
4. Release accelerator pedal. (Set the closed throttle position signal ON.)
5. Depress brake pedal. (Stop lamp switch signal ON.)
6. Turn ignition switch ON. (Do not start engine.)
7. Wait 3 seconds.
8. Move the selector lever to the manual shift gate side. (Manual mode switch ON.)
9. Release brake pedal. (Stop lamp switch signal OFF.)
10. Move the selector lever to “D” position. (Manual mode switch OFF.)
11. Depress brake pedal. (Stop lamp switch signal ON.)
12. Release brake pedal. (Stop lamp switch signal OFF.)
13. Depress accelerator pedal fully and release it.

>> GO TO 3.

3. CHECK SELF-DIAGNOSIS CODE

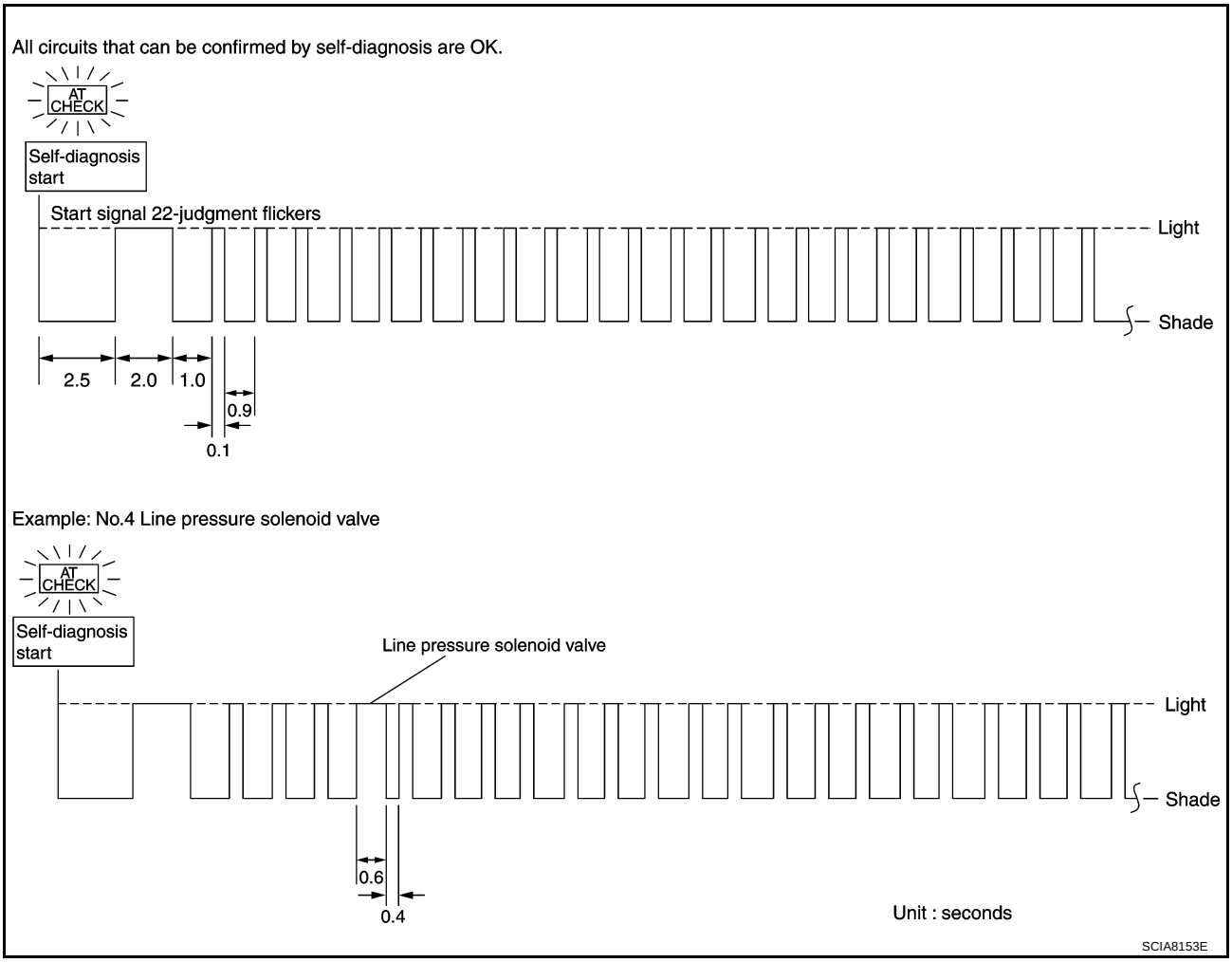
Check A/T CHECK indicator lamp. Refer to AT-93, "Judgment Self-diagnosis Code" .
If the system does not go into self-diagnostics. Refer to AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-157, "DTC P1815 MANUAL MODE SWITCH" , AT-166, "CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT" , AT-167, "BRAKE SIGNAL CIRCUIT" .

>> **DIAGNOSIS END**

Judgment Self-diagnosis Code

If there is a malfunction, the lamp lights up for the time corresponding to the suspect circuit.

No.	Malfunctioning item	No.	Malfunctioning item
1	Revolution sensor AT-108	12	A/T interlock AT-141
2	Direct clutch solenoid valve AT-149	13	A/T 1st engine braking AT-143
3	Torque converter clutch solenoid valve AT-125	14	Start signal AT-97
4	Line pressure solenoid valve AT-129	15	Accelerator pedal position sensor AT-131
5	Input clutch solenoid valve AT-145	16	Engine speed signal AT-113
6	Front brake solenoid valve AT-147	17	CAN communication line AT-94
7	Low coast brake solenoid valve AT-153 , AT-155	18	1st gear function AT-115
8	High and low reverse clutch solenoid valve AT-151	19	2nd gear function AT-117
9	PNP switch AT-102	20	3rd gear function AT-119
10	A/T fluid temperature sensor AT-134	21	4th gear function AT-121
11	Turbine revolution sensor AT-106	22	5th gear function AT-123



Erase Self-diagnosis

- In order to make it easier to find the cause of hard-to-duplicate malfunctions, malfunction information is stored into the control unit as necessary during use by the user. This memory is not erased no matter how many times the ignition switch is turned ON and OFF.
- However, this information is erased by turning ignition switch OFF after performing self-diagnostics or by erasing the memory using the CONSULT-III.

DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

NCS0002G

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent malfunction detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

NCS0002H

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “U1000 CAN COMM CIRCUIT” with CONSULT-III or 17th judgment flicker without CONSULT-III is detected when TCM cannot communicate to other control units.

Possible Cause

NCS0002I

Harness or connectors
(CAN communication line is open or shorted.)

DTC Confirmation Procedure

NCS0002J

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine and wait for at least 6 seconds.
4. If DTC is detected, go to AT-96, "Diagnostic Procedure" .

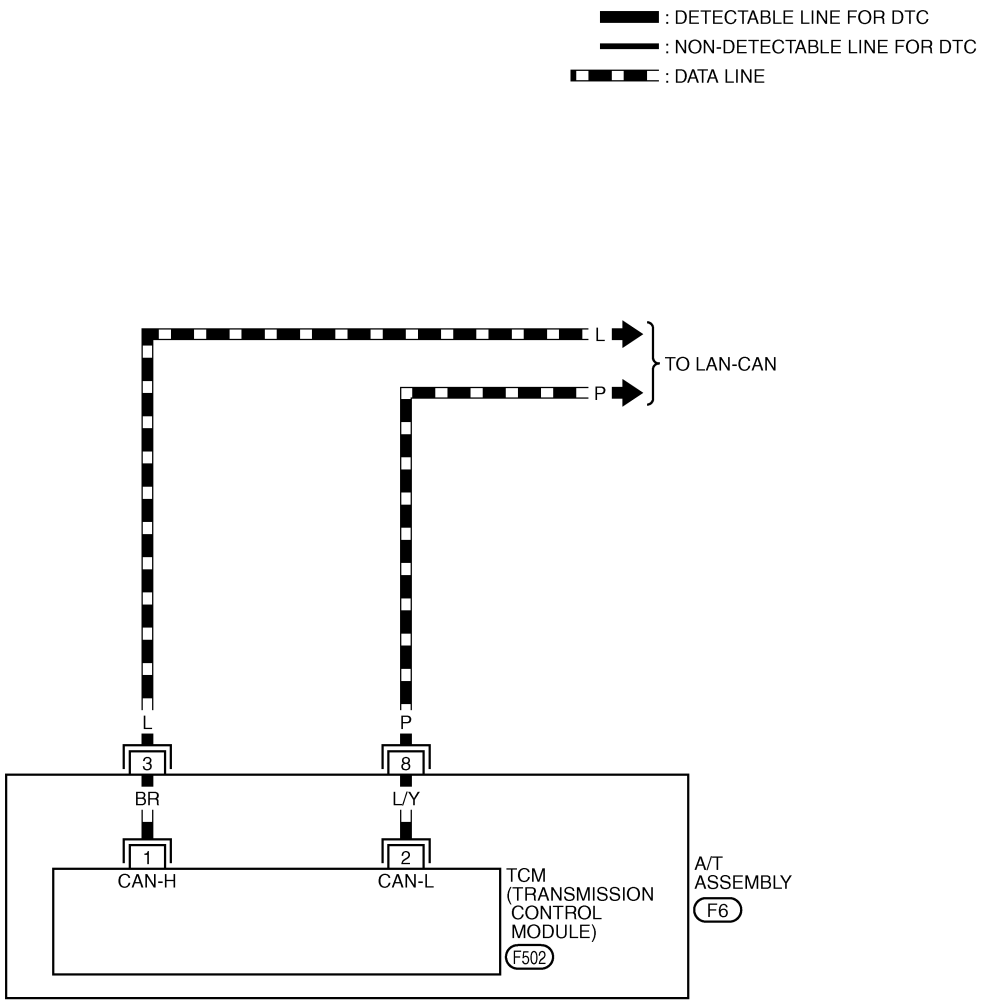
WITH GST

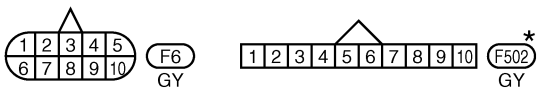
Follow the procedure “WITH CONSULT-III”.

Wiring Diagram — AT — CAN

NCS0002K

AT-CAN-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0259E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	—	—
8	P	CAN-L	—	—

Diagnostic Procedure

NCS0002L

1. CHECK CAN COMMUNICATION CIRCUIT

With CONSULT-III

1. Turn ignition switch ON and start engine.
2. Select “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.

Is any malfunction of the “CAN COMM CIRCUIT” indicated?

YES >> Print out CONSULT-III screen, GO TO LAN section. Refer to LAN-48, "CAN System Specification Chart" .

NO >> **INSPECTION END**

DTC P0615 START SIGNAL CIRCUIT

PFP:25230

Description

NCS0002M

Prohibits cranking other at “P” or “N” position.

CONSULT-III Reference Value

NCS0002N

Item name	Condition	Display value
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF

On Board Diagnosis Logic

NCS0002O

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0615 STARTER RELAY/CIRC” with CONSULT-III or 14th judgment flicker without CONSULT-III is detected when starter relay is switched ON other than at “P” or “N” position. (Or when switched OFF at “P” or “N” position.)

Possible Cause

NCS0002P

- Harness or connectors
  (Starter relay and TCM circuit is open or shorted.)
- Starter relay circuit

DTC Confirmation Procedure

NCS0002Q

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

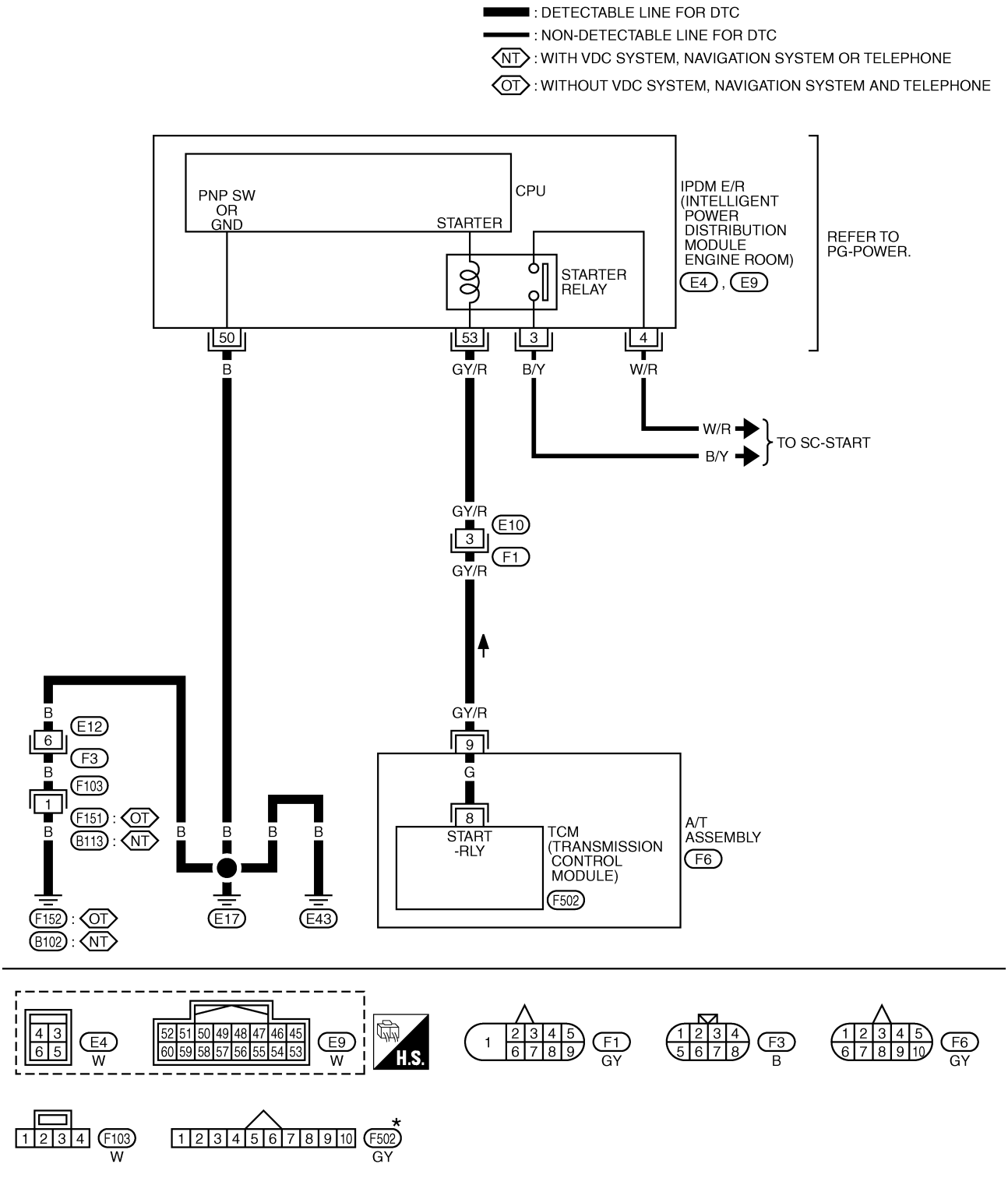
WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine.
5. Vehicle start for at least 2 consecutive seconds.
6. If DTC is detected, go to AT-99, "Diagnostic Procedure" .

Wiring Diagram — AT — STSIG

NCS0002R

AT-STSIG-01



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWT0438E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
9	GY/R	Starter relay		Selector lever in “N” and “P” positions.	Battery voltage
				Selector lever in other positions.	0 V

Diagnostic Procedure

NCS0002S

1. CHECK STARTER RELAY

With CONSULT-III

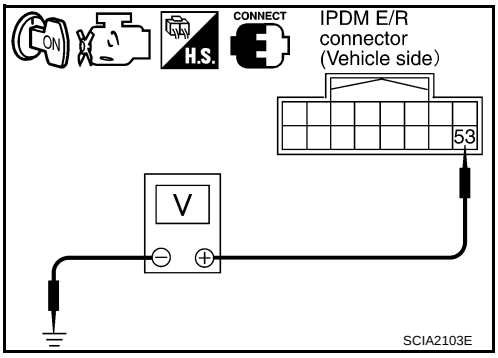
1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “STARTER RELAY” ON/OFF.

Item name	Condition	Display value
STARTER RELAY	Selector lever in “N” and “P” positions.	ON
	Selector lever in other positions.	OFF

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between the IPDM E/R connector and ground.

Item	Connector	Terminal	Shift position	Voltage (Approx.)
Starter relay	E9	53 – Ground	“N”, “P”	Battery voltage
			Other positions	0 V



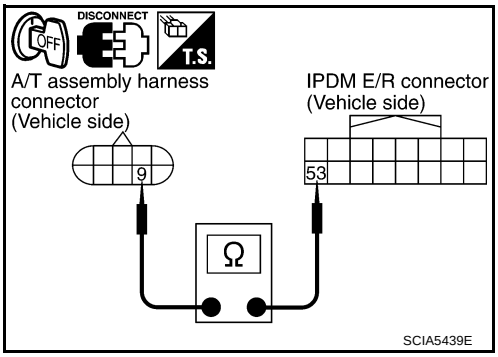
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK HARNESS BETWEEN A/T ASSEMBLY HARNESS CONNECTOR AND IPDM E/R CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector and IPDM E/R connector.
3. Check continuity between A/T assembly harness connector and IPDM E/R connector.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	9	Yes
IPDM E/R connector	E9	53	



4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

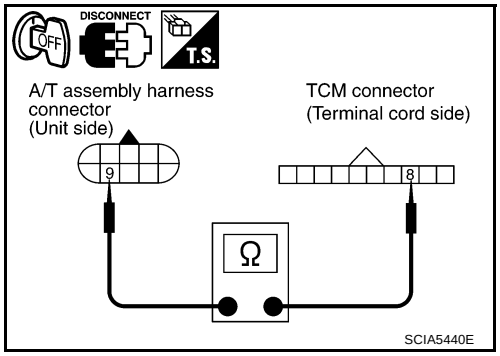
OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK TERMINAL CORD ASSEMBLY

1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminal and TCM connector terminal.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	9	Yes
TCM connector	F502	8	



4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

4. DETECT MALFUNCTIONING ITEM

Check the following.

- Starter relay, Refer to SC-8, "STARTING SYSTEM" .
- IPDM E/R, Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

5. CHECK DTC

Perform AT-97, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0700 TCM

PFP:31036

Description

NCS0002T

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls A/T.

On Board Diagnosis Logic

NCS0002U

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0700 TCM” with CONSULT-III is detected when TCM is malfunctioning.

Possible Cause

NCS0002V

TCM.

DTC Confirmation Procedure

NCS0002W

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine.
5. Run engine for at least 2 consecutive seconds at idle speed.
6. If DTC is detected, go to AT-101, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0002X

1. CHECK DTC

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “ERASE”.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Perform AT-101, "DTC Confirmation Procedure" .

Is the “TCM” displayed again?

YES >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NO >> **INSPECTION END**

DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

Description

NCS0002Y

- PNP switch includes a transmission range switch.
- The transmission range switch detects the selector lever position and sends a signal to the TCM.

CONSULT-III Reference Value

NCS0002Z

Item name	Condition	Display value
SLCT LVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D

On Board Diagnosis Logic

NCS00030

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0705 PNP SW/CIRC” with CONSULT-III or 9th judgment flicker without CONSULT-III is detected under the following conditions.

– When TCM does not receive the correct voltage signal from PNP switch 1, 2, 3 and 4 based on the gear position.

– When no other position but “P” position is detected from “N” position.

Possible Cause

NCS00031

- Harness or connectors
  PNP switch 1, 2, 3, 4 and TCM circuit is open or shorted.
- PNP switch 1, 2, 3 and 4

DTC Confirmation Procedure

NCS00032

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   ACCELE POSI: More than 1.0/8
6. If DTC is detected, go to AT-104, "Diagnostic Procedure" .

WITH GST

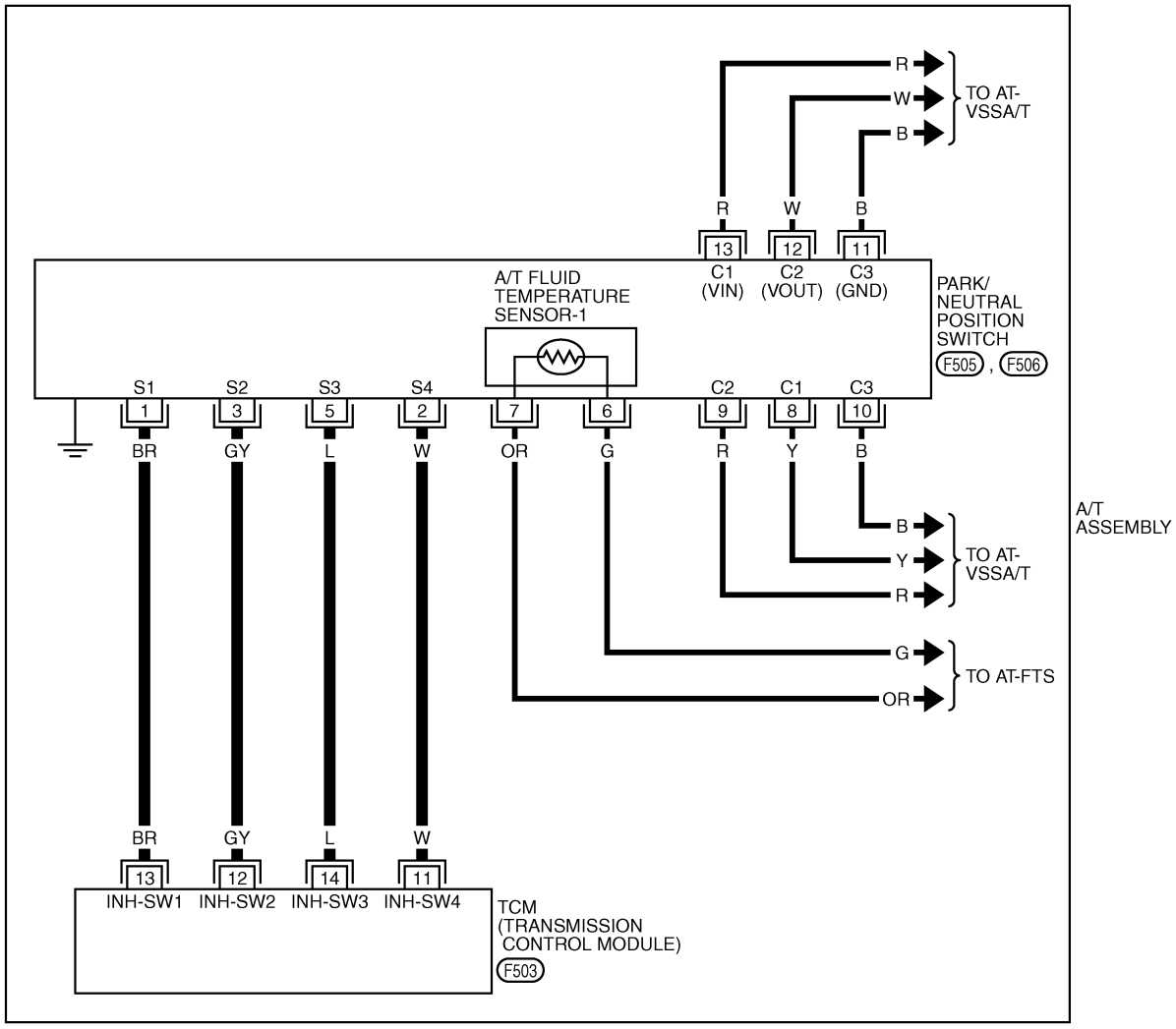
Follow the procedure “WITH CONSULT-III”.

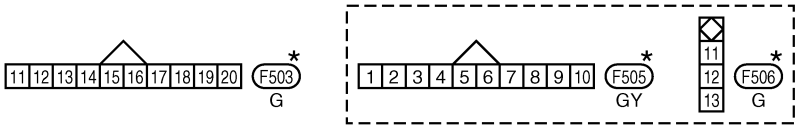
Wiring Diagram — AT — PNP/SW

NCS00033

AT-PNP/SW-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0248E

Diagnostic Procedure

NCS00034

1. CHECK PNP SW CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Check if correct selector lever position (N/P, R or D) is displayed as selector lever is moved into each position.

Item name	Condition	Display value
SLCT LVR POSI	Selector lever in “N” and “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D

OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

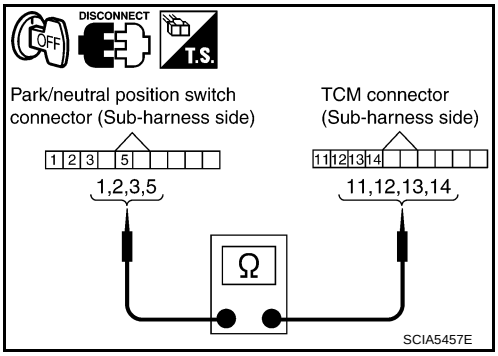
Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.



Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	1	Yes
TCM connector	F503	13	
Park/neutral position switch connector	F505	2	Yes
TCM connector	F503	11	
Park/neutral position switch connector	F505	3	Yes
TCM connector	F503	12	
Park/neutral position switch connector	F505	5	Yes
TCM connector	F503	14	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. CHECK DTC

Perform AT-102, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

DTC P0717 TURBINE REVOLUTION SENSOR

PFP:31935

Description

NCS0019V

The turbine revolution sensor detects input shaft rpm (revolutions per minute). It is located on the input side of the A/T. Monitors revolution of sensor 1 and sensor 2 for non-standard conditions.

CONSULT-III Reference Value

NCS0019W

Item name	Condition	Display value
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.

On Board Diagnosis Logic

NCS0019X

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0717 TURBINE REV S/CIRC” with CONSULT-III or 11th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - When TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.

Possible Cause

NCS0019Y

- Harness or connectors
  (Sensor circuit is open or shorted.)
- Turbine revolution sensor 1 and/or 2

DTC Confirmation Procedure

NCS0019Z

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI”, “ENGINE SPEED”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-A/T: 40 km/h (25 MPH) or more
   ACCELE POSI: More than 0.5/8
   ENGINE SPEED: 1,500 rpm or more
   SLCT LVR POSI: “D” position
   GEAR (Turbine revolution sensor 1): “4” or “5” position
   GEAR (Turbine revolution sensor 2): All positions
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected, go to AT-107, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS001A0

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Vehicle start and read out the value of “TURBINE REV”.

Item name	Condition	Display value
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-106, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)

PFP:32702

Description

NCS00035

The revolution sensor detects the revolution of the parking gear and emits a pulse signal. The pulse signal is sent to the TCM which converts it into vehicle speed.

CONSULT-III Reference Value

NCS00036

Item name	Condition	Display value
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.

On Board Diagnosis Logic

NCS00037

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0720 VEH SPD SEN/CIR AT” with CONSULT-III or 1st judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - After ignition switch is turned ON, irregular signal input from vehicle speed sensor MTR before the vehicle starts moving.

Possible Cause

NCS00038

- Harness or connectors
  (Sensor circuit is open or shorted.)
- Revolution sensor
- Vehicle speed sensor MTR

DTC Confirmation Procedure

NCS00039

CAUTION:

- **Always drive vehicle at a safe speed.**
- **Be careful not to rev engine into the red zone on the tachometer.**

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Drive vehicle and check for an increase of “VHCL/S SE-A/T” value in response to “VHCL/S SE-MTR” value.
   If the check result is NG, go to AT-111, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
5. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI”, “ENGINE SPEED” and “SLCT LVR POSI”.
6. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-A/T: 30 km/h (19 MPH) or more
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
   If the check result is NG, go to AT-111, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
7. Maintain the following conditions for at least 5 consecutive seconds.
   ENGINE SPEED: 3,500 rpm or more
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position

Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

8. If DTC is detected, go to AT-111, "Diagnostic Procedure" .

WITH GST

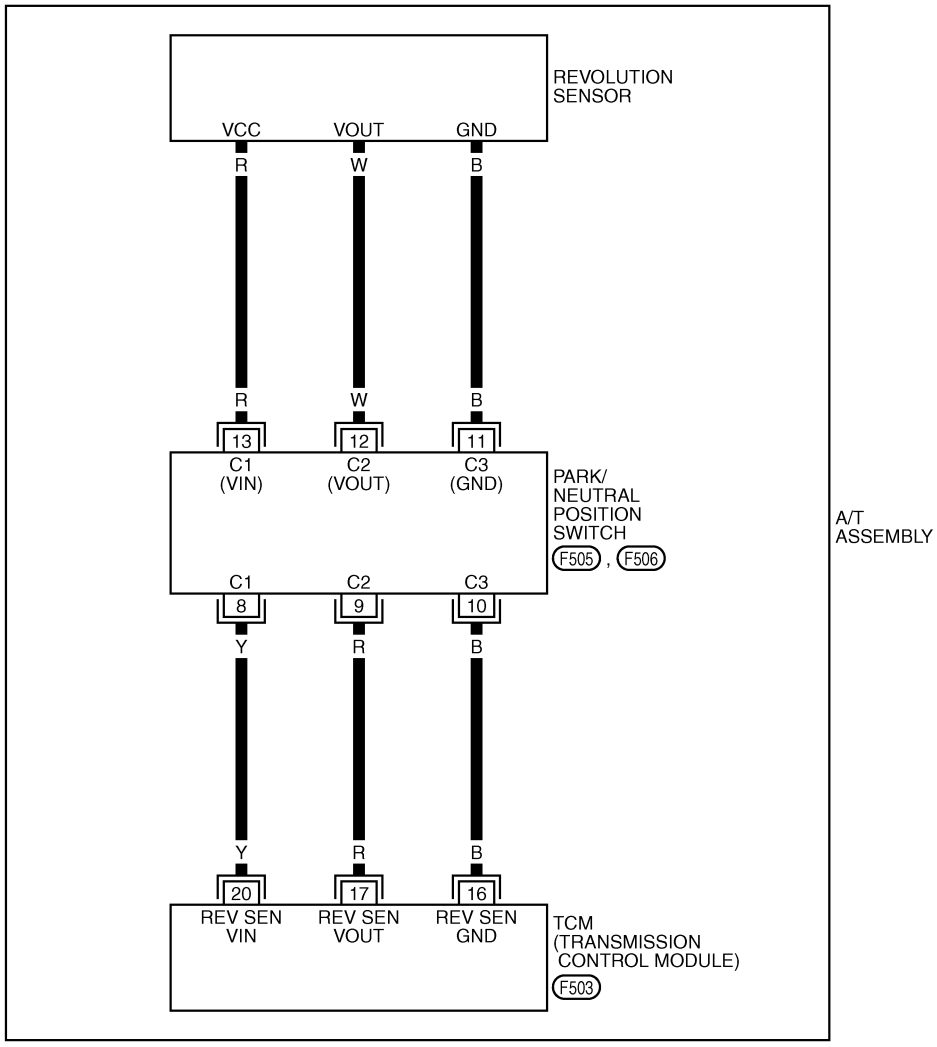
Follow the procedure “WITH CONSULT-III”.

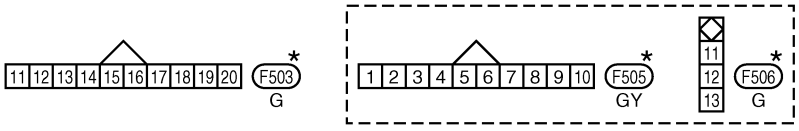
Wiring Diagram — AT — VSSA/T

NCS0003A

AT-VSSA/T-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0249E

Diagnostic Procedure

NCS0003B

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “VHCL/S SE-A/T” while driving. Check the value changes according to driving speed.

Item name	Condition	Display value
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.

OK or NG

OK >> GO TO 6.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

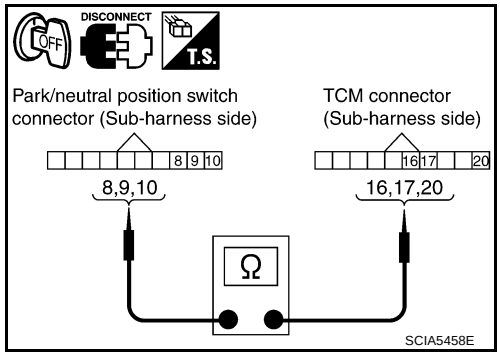
Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.



Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	8	Yes
TCM connector	F503	20	
Park/neutral position switch connector	F505	9	Yes
TCM connector	F503	17	
Park/neutral position switch connector	F505	10	Yes
TCM connector	F503	16	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> GO TO 5.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. REPLACE THE REVOLUTION SENSOR AND CHECK DTC

1. Replace revolution sensor. Refer to AT-235, "Revolution Sensor" .
2. Perform AT-108, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

6. CHECK DTC

Perform AT-108, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0725 ENGINE SPEED SIGNAL

PFP:24825

Description

NCS0003C

The engine speed signal is sent from the ECM to the TCM.

CONSULT-III Reference Value

NCS0003D

Item name	Condition	Display value
ENGINE SPEED	Engine running	Closely matches the tachometer reading.

On Board Diagnosis Logic

NCS0003E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0725 ENGINE SPEED SIG” with CONSULT-III or 16th judgment flicker without CONSULT-III is detected when TCM does not receive the ignition signal from ECM during engine cranking or running.

Possible Cause

NCS0003F

Harness or connectors
(ECM to TCM circuit is open or shorted.)

DTC Confirmation Procedure

NCS0003G

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI” and “SLCT LVR POSI”.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 10 consecutive seconds.
   VHCL/S SE-A/T: 10 km/h (6 MPH) or more
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position
5. If DTC is detected, go to AT-114, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0003H

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK DTC WITH TCM

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. While monitoring engine speed, check for engine speed change corresponding to wide-open throttle position signal.

Item name	Condition	Display value
ENGINE SPEED	Engine running	Closely matches the tachometer reading.

OK or NG

OK >> GO TO 3.
NG >> Check the ignition signal circuit. Refer to EC-698, "IGNITION SIGNAL" .

3. CHECK DTC

Perform AT-113, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 4.

4. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P0731 A/T 1ST GEAR FUNCTION

PFP:31940

Description

NCS001SB

This malfunction is detected when the A/T does not shift into 1st gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SC

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0731 A/T 1ST GR FNCTN” with CONSULT-III or 18th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SD

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001SE

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “1ST GR FNCTN P0731” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “1” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0731 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go to AT-116, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

– Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001SF

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-115, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

Description

NCS001SG

This malfunction is detected when the A/T does not shift into 2nd gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SH

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0732 A/T 2ND GR FNCTN” with CONSULT-III or 19th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SI

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001SJ

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “2ND GR FNCTN P0732” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “2” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0732 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go to AT-118, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

– Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001T0

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-117, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

Description

NCS001SL

This malfunction is detected when the A/T does not shift into 3rd gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SM

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0733 A/T 3RD GR FNCTN” with CONSULT-III or 20th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SN

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001SO

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “3RD GR FNCTN P0733” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “3” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0732 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go to AT-120, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

– Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001T1

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-119, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

Description

NCS001SQ

This malfunction is detected when the A/T does not shift into 4th gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SR

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0734 A/T 4TH GR FNCTN” with CONSULT-III or 21th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SS

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001ST

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “4TH GR FNCTN P0734” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “4” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0734 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go toAT-122, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

- Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001T2

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-121, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0735 A/T 5TH GEAR FUNCTION

PFP:31940

Description

NCS001SV

This malfunction is detected when the A/T does not shift into 5th gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

NCS001SW

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0735 A/T 5TH GR FNCTN” with CONSULT-III or 22th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

NCS001SX

- Harness or connectors
  (Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

NCS001SY

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
   ATF TEMP 1: 20°C – 140°C
   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “5TH GR FNCTN P0735” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   ACCELE POSI: 0.6/8 or more
   ENGINE SPEED: TURBINE REV – 50 rpm or more
   TURBINE REV: 300 rpm or more
   GEAR: “5” position
   MANU MODE SW: ON
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0735 is shown, refer to “AT-86, "Display Items List" ”.
   If “COMPLETED RESULT NG” is detected, go to AT-124, "Diagnostic Procedure" .
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.

– Touch “OK” to complete the inspection when normally shifted from the 1st to 5th gear.
– Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to AT-52, "ROAD TEST" .

– Perform AT-86, "SELF-DIAGNOSTIC RESULT MODE" when not shifted from the 1st to 5th gear. (Neither “OK” nor “NG” are indicated.)

Diagnostic Procedure

NCS001T3

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Perform AT-123, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-52, "ROAD TEST" .

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

Description

NCS0003I

- Torque converter clutch solenoid valve is activated, with the gear in D_4 , D_5 , M_2 , M_3 , M_4 and M_5 by the TCM in response to signals sent from the vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Torque converter clutch piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1.0/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

CONSULT-III Reference Value

NCS0003J

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

On Board Diagnosis Logic

NCS0003K

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0740 TCC SOLENOID/CIRC” with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0003L

- Torque converter clutch solenoid valve
- Harness or connectors
  (Solenoid circuit is open or shorted.)

DTC Confirmation Procedure

NCS0003M

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI” and “SLCT LVR POSI”.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-A/T: 80 km/h (50 MPH) or more
   ACCELE POSI: 0.5/8 – 1.0/8
   SLCT LVR POSI: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected go to AT-126, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0003N

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “TCC SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-125, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)

PFP:31940

Description

NCS0003O

This malfunction is detected when the A/T does not shift into 5th gear position or the torque converter clutch does not lock-up as instructed by the TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

CONSULT-III Reference Value

NCS0003P

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

On Board Diagnosis Logic

NCS0003Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0744 A/T TCC S/V FNCTN” with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.
  - When A/T cannot perform lock-up even if electrical circuit is good.
  - When TCM detects as irregular by comparing difference value with slip rotation.

Possible Cause

NCS0003R

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Torque converter clutch solenoid valve
- Hydraulic control circuit

DTC Confirmation Procedure

NCS0003S

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start engine.
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle and maintain the following conditions for at least 30 consecutive seconds.
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position
   TCC SOLENOID: 0.4 – 0.6 A
   VEHICLE SPEED: 80 km/h (50 MPH) or more
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected, go to AT-128, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0003T

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “TCC SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-127, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P0745 LINE PRESSURE SOLENOID VALVE

PFP:31940

Description

NCS0003U

The line pressure solenoid valve regulates oil pump discharge pressure to suit the driving condition in response to a signal sent from the TCM.

CONSULT-III Reference Value

NCS0003V

Item name	Condition	Display value (Approx.)
LINE PRES SOL	During driving	0.2 – 0.6 A

On Board Diagnosis Logic

NCS0003W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0745 L/PRESS SOL/CIRC” with CONSULT-III or 4th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0003X

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Line pressure solenoid valve

DTC Confirmation Procedure

NCS0003Y

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine and wait at least 5 seconds.
5. If DTC is detected, go to “AT-130, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0003Z

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “LINE PRES SOL” while driving.

Item name	Condition	Display value (Approx.)
LINE PRES SOL	During driving	0.2 – 0.6 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-129, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1705 THROTTLE POSITION SENSOR

PFP:22620

Description

NCS0004A

Electric throttle control actuator consists of throttle control motor, accelerator pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the ECM, and ECM sends signals to TCM with CAN communication.

CONSULT-III Reference Value

NCS0004B

Item name	Condition	Display value (Approx.)
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8

On Board Diagnosis Logic

NCS0004C

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1705 TP SEN/CIRC A/T” with CONSULT-III or 15th judgment flicker without CONSULT-III is detected when TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.

Possible Cause

NCS0004D

Harness or connectors
(Sensor circuit is open or shorted.)

DTC Confirmation Procedure

NCS0004E

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine and let it idle for 1 second.
5. If DTC is detected, go to AT-132, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0004F

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK DTC WITH TCM

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Depress accelerator pedal and read out the value of “ACCELE POSI”.

Item name	Condition	Display value (Approx.)
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8

4. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-III. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE"

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK DTC WITH ECM

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” mode for “ENGINE” with CONSULT-III. Refer to EC-116, "CONSULT-III Function (ENGINE)" .

OK or NG

OK >> GO TO 4.
NG >> Check the DTC detected item. Refer to EC-116, "CONSULT-III Function (ENGINE)" .
- If CAN communication line is detected, go to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .

4. CHECK DTC

Perform AT-131, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Repair or replace damaged parts.

DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31940

Description

NCS0004G

The A/T fluid temperature sensor detects the A/T fluid temperature and sends a signal to the TCM.

CONSULT-III Reference Value

NCS0004H

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 1	0 (32) – 20 (68) – 80 (176)	3.3 – 2.7 – 0.9 V
ATF TEMP SE 2		3.3 – 2.5 – 0.7 V

On Board Diagnosis Logic

NCS0004I

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1710 (A/T), P0710 (ENGINE) ATF TEMP SEN/CIRC” with CONSULT-III or 10th judgment flicker without CONSULT-III is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

NCS0004J

- Harness or connectors
  (Sensor circuit is open or shorted.)
- A/T fluid temperature sensors 1 and/or 2

DTC Confirmation Procedure

NCS0004K

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI” and “SLCT LVR POSI”.
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)
   VHCL/S SE-A/T: 10 km/h (6 MPH) or more
   ACCELE POSI: More than 1.0/8
   SLCT LVR POSI: “D” position
4. If DTC is detected, go to AT-136, "Diagnostic Procedure" .

WITH GST

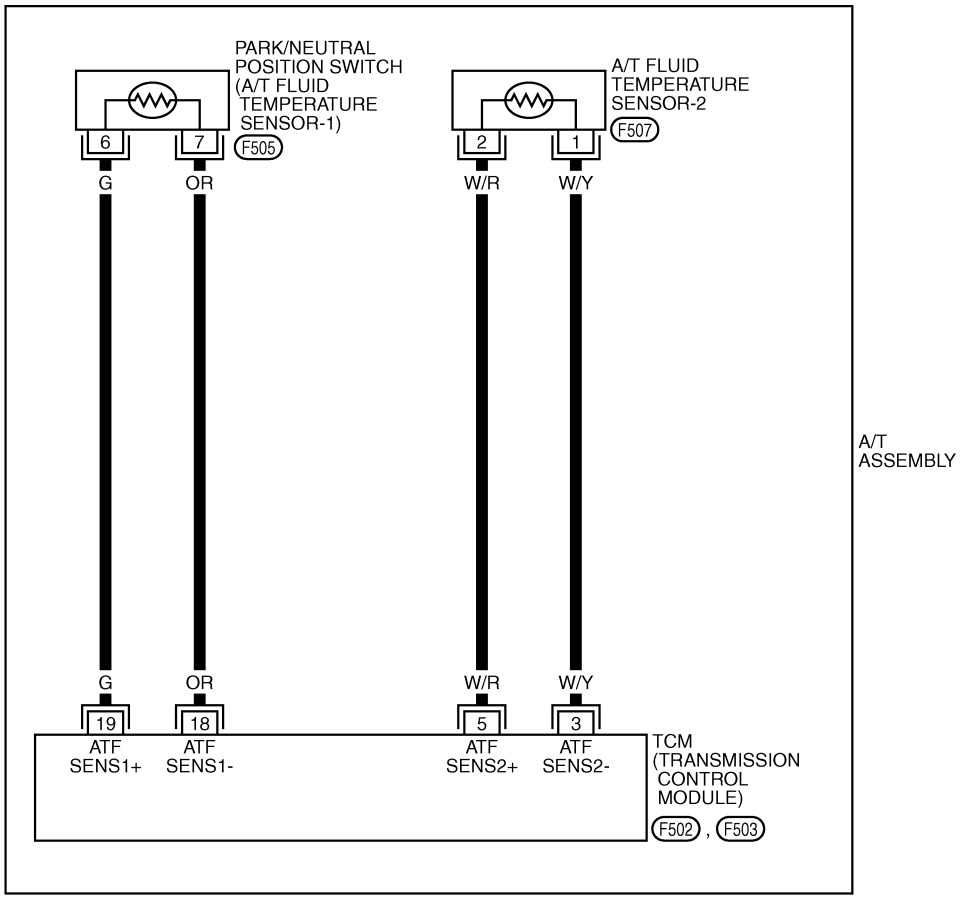
Follow the procedure “WITH CONSULT-III”.

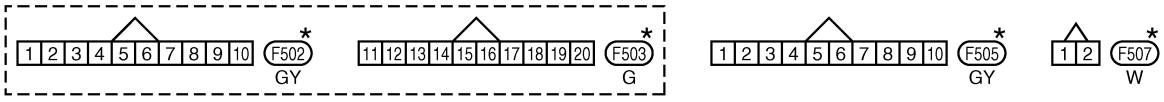
Wiring Diagram — AT — FTS

NCS0004L

AT-FTS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWT0374E

Diagnostic Procedure

NCS0004M

1. CHECK A/T FLUID TEMPERATURE SENSOR 1 SIGNAL

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out the value of “ATF TEMP SE 1”.

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 1	0 (32) – 20 (68) – 80 (176)	3.3 – 2.7 – 0.9 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK A/T FLUID TEMPERATURE SENSOR 2 SIGNAL

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out the value of “ATF TEMP SE 2”.

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 2	0 (32) – 20 (68) – 80 (176)	3.3 – 2.5 – 0.7 V

OK or NG

OK >> GO TO 8.
NG >> GO TO 5.

3. CHECK A/T FLUID TEMPERATURE SENSOR 1

Check A/T fluid temperature sensor 1. Refer to AT-138, "A/T FLUID TEMPERATURE SENSOR 1" .

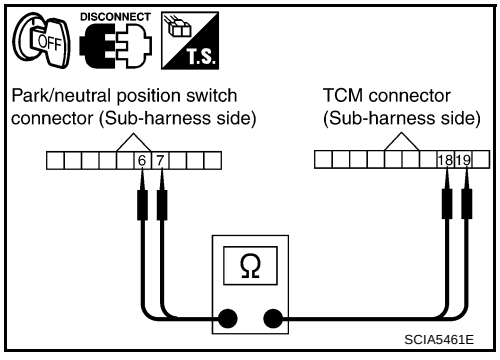
OK or NG

OK >> GO TO 4.
NG >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

4. CHECK SUB-HARNESS

1. Disconnect park/neutral position switch connector and TCM connector.
2. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	6	Yes
TCM connector	F503	19	
Park/neutral position switch connector	F505	7	Yes
TCM connector	F503	18	



3. If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5. CHECK A/T FLUID TEMPERATURE SENSOR 2

Check A/T fluid temperature sensor 2. Refer to AT-138, "A/T FLUID TEMPERATURE SENSOR 2" .

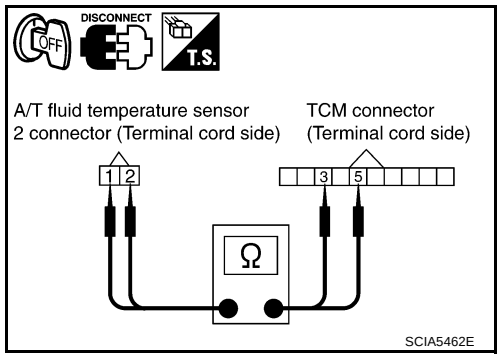
OK or NG

OK >> GO TO 6.
NG >> Replace A/T fluid temperature sensor 2. Refer to AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .

6. CHECK TERMINAL CORD ASSEMBLY

1. Disconnect A/T fluid temperature sensor 2 connector and TCM connector.
2. Check continuity between A/T fluid temperature sensor 2 connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T fluid temperature sensor 2 connector	F507	1	Yes
TCM connector	F502	3	
A/T fluid temperature sensor 2 connector	F507	2	Yes
TCM connector	F502	5	



3. If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

7. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

1. Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .
2. Reinstall any part removed.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

8. CHECK DTC

Perform AT-134, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 1.

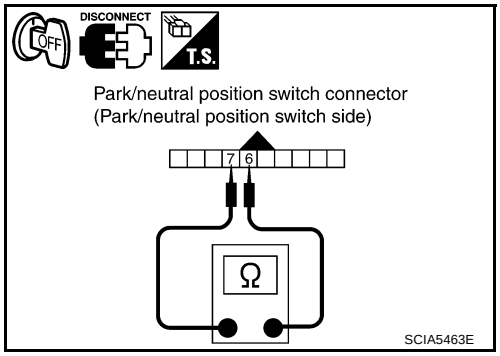
Component Inspection

NCS0004N

A/T FLUID TEMPERATURE SENSOR 1

1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check resistance between terminals.

Name	Connector	Terminal	Temperature °C (°F)	Resistance (Approx.)
A/T fluid temperature sensor 1	F505	6 – 7	0 (32)	15 kΩ
			20 (68)	6.5 kΩ
			80 (176)	0.9 kΩ

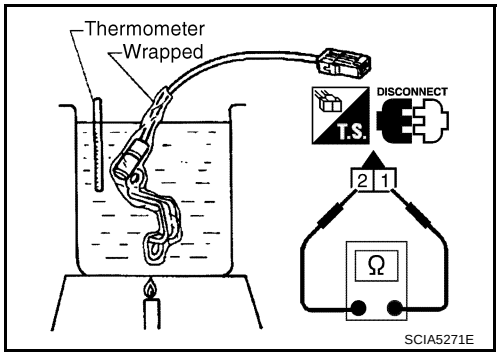


3. If NG, replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

A/T FLUID TEMPERATURE SENSOR 2

1. Remove A/T fluid temperature sensor 2. Refer to AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .
2. Check resistance between terminals.

Name	Connector	Terminal	Temperature °C (°F)	Resistance (Approx.)
A/T fluid temperature sensor 2	F507	1 – 2	0 (32)	10 kΩ
			20 (68)	4 kΩ
			80 (176)	0.5 kΩ



3. If NG, replace A/T fluid temperature sensor 2. Refer to AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION" .

DTC P1721 VEHICLE SPEED SENSOR MTR

PFP:24814

Description

NCS0004U

The vehicle speed sensor·MTR signal is transmitted from combination meter to TCM by CAN communication line. The signal functions as an auxiliary device to revolution sensor when it is malfunctioning. The TCM will then use the vehicle speed sensor·MTR signal.

CONSULT-III Reference Value

NCS0004V

Item name	Condition	Display value
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.

On Board Diagnosis Logic

NCS0004W

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1721 VEH SPD SE/CIR-MTR” with CONSULT-III is detected when TCM does not receive the proper vehicle speed sensor MTR signal (input by CAN communication) from unified meter and A/C amp.

Possible Cause

NCS0004X

Harness or connectors
(Sensor circuit is open or shorted.)

DTC Confirmation Procedure

NCS0004Y

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-MTR: 30 km/h (19 MPH) or more
   ACCELE POSI: 1.0/8 or less
5. If DTC is detected, go to AT-140, "Diagnostic Procedure" .

Diagnostic Procedure

NCS0004Z

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is malfunction in the CAN communication indicated in the result?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK INPUT SIGNAL

With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle and read out the value of “VHCL/S SE-MTR”.

Item name	Condition	Display value
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK UNIFIED METER AND A/C AMP.

Check unified meter and A/C amp. Refer to DI-44, "UNIFIED METER AND A/C AMP" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-139, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P1730 A/T INTERLOCK

PFP:00000

Description

NCS00050

Fail-safe function to detect interlock conditions.

On Board Diagnosis Logic

NCS00051

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1730 A/T INTERLOCK” with CONSULT-III or 12th judgment flicker without CONSULT-III is detected when TCM does not receive the proper voltage signal from the sensor and switch.
- TCM monitors and compares gear position and conditions of each ATF pressure switch when gear is steady.

Possible Cause

NCS00052

- Harness or connectors
  (Solenoid and switch circuit is open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

DTC Confirmation Procedure

NCS00053

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   SLCT LVR POSI: “D” position
6. If DTC is detected, go to AT-142, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Judgment of A/T Interlock

NCS00054

- When A/T Interlock is judged to be malfunctioning, the vehicle should be fixed in 2nd gear, and should be set in a condition in which it can travel.

  NOTE:
  When the vehicle is driven fixed in 2nd gear, a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.
- When interlock is detected at the 3rd gear or more, it is locked at the 2nd gear.

Diagnostic Procedure

NCS00055

1. SELF-DIAGNOSIS

With CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Select “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.

Without CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Perform self-diagnosis. Refer to AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG

OK >> GO TO 2.
NG >> Check low coast brake solenoid valve circuit and function. Refer to AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" , AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" .

2. CHECK DTC

Perform AT-141, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

DTC P1731 A/T 1ST ENGINE BRAKING

PFP:00000

Description

NCS00056

Fail-safe function to prevent sudden decrease in speed by engine brake other than at M1 position.

CONSULT-III Reference Value

NCS00057

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

NCS00058

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1731 A/T 1ST E/BRAKING” with CONSULT-III or 13th judgment flicker without CONSULT-III is detected under the following conditions.

– When TCM does not receive the proper voltage signal from the sensor.

– When TCM monitors each ATF pressure switch and solenoid monitor value, and detects as irregular when engine brake of 1st gear acts other than at M1 position.

Possible Cause

NCS00059

- Harness or connectors
  (The sensor circuit is open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

DTC Confirmation Procedure

NCS0005A

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously preformed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ENGINE SPEED”, “MANU MODE SW” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   ENGINE SPEED: 1,200 rpm
   MANU MODE SW: ON
   GEAR: “1” position
6. If DTC is detected, go to AT-144, "Diagnostic Procedure" .

Diagnostic Procedure

NCS0005B

1. CHECK INPUT SIGNALS

With CONSULT-III

1. Start engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle in the “M” position (1st gear), and confirm the ON/OFF actuation of “ATF PRES SW 2” and “ON OFF SOL”.

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-143, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1752 INPUT CLUTCH SOLENOID VALVE

PFP:31940

Description

NCS0005C

Input clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS0005D

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 – 0.05 A

On Board Diagnosis Logic

NCS0005E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1752 I/C SOLENOID/CIRC” with CONSULT-III or 5th judgment flicker CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0005F

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Input clutch solenoid valve

DTC Confirmation Procedure

NCS0005G

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 – 2.0/8
   SLCT LVR POSI: “D” position
   GEAR: “3” ⇒ “4” (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
6. If DTC is detected go to “AT-146, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0005H

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “I/C SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Input clutch engaged. Refer to AT-19 .	0 – 0.05 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-145, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1757 FRONT BRAKE SOLENOID VALVE

PFP:31940

Description

NCS0005O

Front brake solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS0005P

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 – 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 – 0.05 A

On Board Diagnosis Logic

NCS0005Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1757 FR/B SOLENOID/CIRC” with CONSULT-III or 6th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0005R

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Front brake solenoid valve

DTC Confirmation Procedure

NCS0005S

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before preforming the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 – 2.0/8
   SLCT LVR POSI: “D” position
   GEAR: “3” ⇒ “4” (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
6. If DTC is detected go to AT-148, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0005T

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “FR/B SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-19 .	0.6 – 0.8 A
	Front brake disengaged. Refer to AT-19 .	0 – 0.05 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-147, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1762 DIRECT CLUTCH SOLENOID VALVE

PFP:31940

Description

NCS00060

Direct clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS00061

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 – 0.05 A

On Board Diagnosis Logic

NCS00062

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1762 D/C SOLENOID/CIRC” with CONSULT-III or 2nd judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS00063

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Direct clutch solenoid valve

DTC Confirmation Procedure

NCS00064

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 – 2.0/8
   SLCT LVR POSI: “D” position
   GEAR: “1” ⇒ “2” (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
6. If DTC is detected, go to AT-150, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS00065

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “D/C SOLENOID” while driving.

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	Direct clutch engaged. Refer to AT-19 .	0 – 0.05 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-149, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

PFP:31940

Description

NCS0006C

High and low reverse clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS0006D

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 – 0.05 A

On Board Diagnosis Logic

NCS0006E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1767 HLR/C SOL/CIRC” with CONSULT-III or 8th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

NCS0006F

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- High and low reverse clutch solenoid valve

DTC Confirmation Procedure

NCS0006G

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POSI: 1.5/8 – 2.0/8
   SLCT LVR POSI: “D” position
   GEAR: “2” ⇒ “3” (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
6. If DTC is detected, go to AT-152, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0006H

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “HLR/C SOL” while driving.

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-19 .	0.6 – 0.8 A
	High and low reverse clutch engaged. Refer to AT-19 .	0 – 0.05 A

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK TCM

Perform AT-151, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1772 LOW COAST BRAKE SOLENOID VALVE

PFP:31940

Description

NCS0006O

Low coast brake solenoid valve is turned ON or OFF by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value

NCS0006P

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

NCS0006Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1772 LC/B SOLENOID/CIRC” with CONSULT-III or 7th judgment flicker without CONSULT-III is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

NCS0006R

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- Low coast brake solenoid valve

DTC Confirmation Procedure

NCS0006S

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “MANU MODE SW” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   MANU MODE SW: ON
   GEAR: “1” or “2” (LC/B ON/OFF)
6. If DTC is detected, go to AT-154, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0006T

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “ON OFF SOL” while driving.

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-153, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

PFP:31940

Description

NCS0006U

- Low coast brake solenoid valve is turned ON or OFF by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-III Reference Value

NCS0006V

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

On Board Diagnosis Logic

NCS0006W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1774 LC/B SOLENOID FNCT” with CONSULT-III or 7th judgment flicker without CONSULT-III is detected under the following conditions.

– When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 2 is irregular during depressing accelerator pedal (Other than during shift change)

– When TCM detects that relation between gear position and condition of ATF pressure switch 2 is irregular during releasing accelerator pedal (Other than during shift change)

Possible Cause

NCS0006X

- Harness or connectors
  (The solenoid and switch circuits are open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

DTC Confirmation Procedure

NCS0006Y

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
   MANU MODE SW: ON
   GEAR: “1” or “2” (LC/B ON/OFF)
3. Perform step 2 again.
4. Turn ignition switch OFF, then perform step 1 to 3 again.
5. Check “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.
   If DTC (P1774) is detected, refer to AT-156, "Diagnostic Procedure" .
   If DTC (P1772) is detected, go to AT-154, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnostic Procedure

NCS0006Z

1. CHECK INPUT SIGNALS

With CONSULT-III

1. Start engine.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle in the manual mode (“1” or “2” gear), and confirm the ON/OFF actuation of the “ATF PRES SW 2” and “ON OFF SOL”.

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-19 .	ON
	Low coast brake disengaged. Refer to AT-19 .	OFF

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-155, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

DTC P1815 MANUAL MODE SWITCH

PFP:34901

Description

NCS00070

Manual mode switch is installed in A/T device. It sends manual mode switch, shift up and shift down switch signals to TCM.
TCM sends the switch signals to unified meter and A/C amp. By CAN communication line. Then manual mode switch position is indicated on the A/T position indicator. For inspection, refer to AT-168, "A/T INDICATOR CIRCUIT" .

CONSULT-III Reference Value in Data Monitor Mode

NCS00071

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF

On Board Diagnosis Logic

NCS00072

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1815 MANU MODE SW/CIRC” with CONSULT-III is detected when TCM monitors Manual mode, Non manual mode, Up or Down switch signal, and detects as irregular when impossible input pattern occurs 1 second or more.

Possible Cause

NCS00073

- Harness or connectors
  (These switches circuit is open or shorted.)
- Manual mode select switch (Into control device)
- Manual mode position select switch (Into control device)

DTC Confirmation Procedure

NCS00074

CAUTION:
Always drive vehicle at a safe speed.

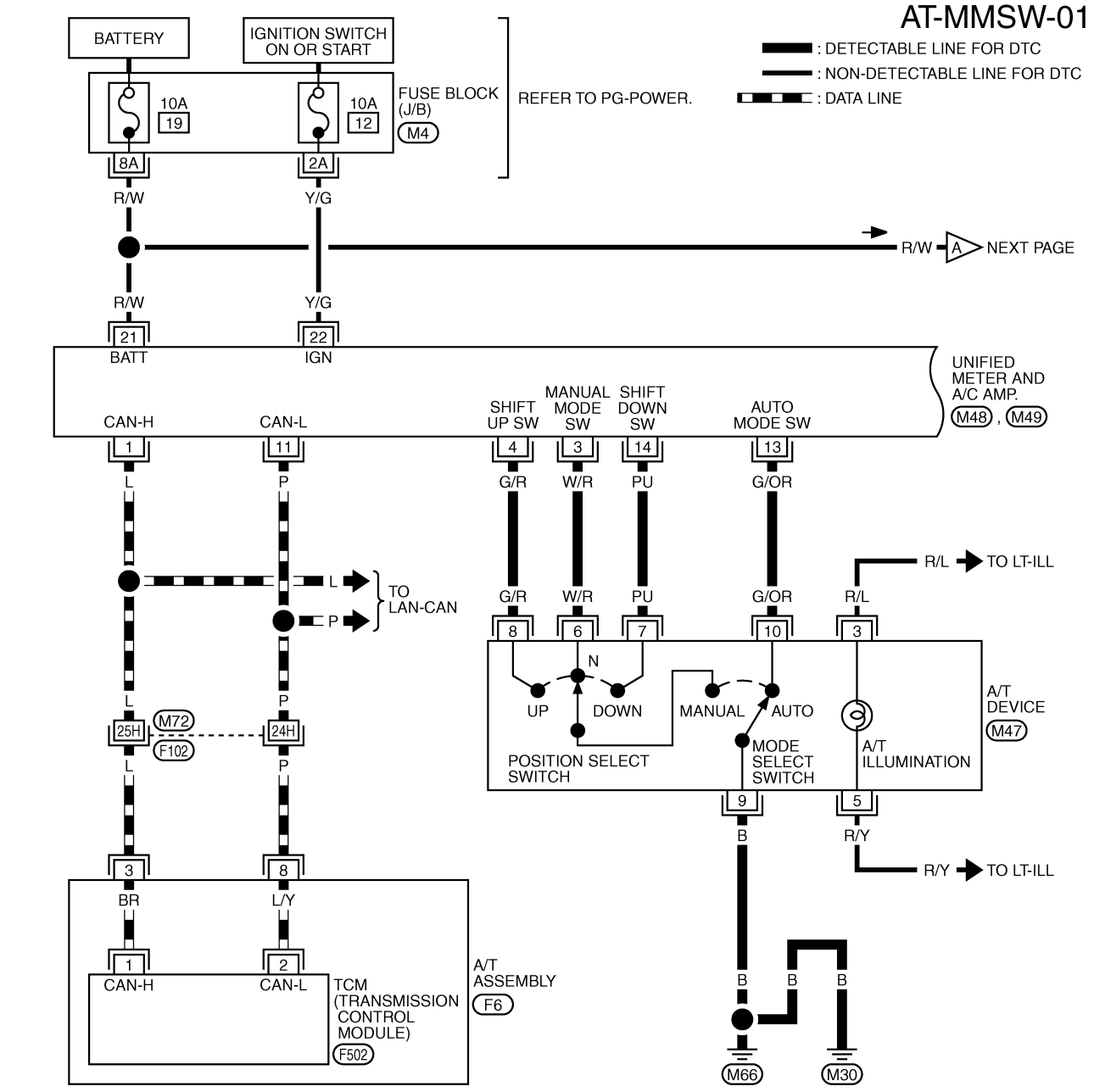
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

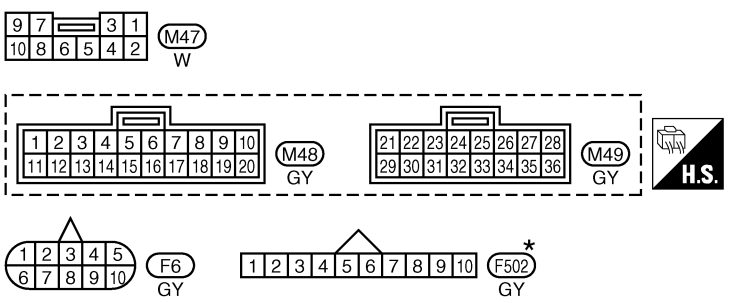
WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Move selector lever to “M” position.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   MANU MODE SW: ON
6. If DTC is detected, go to AT-160, "Diagnostic Procedure" .

Wiring Diagram — AT — MMSW

NCS00075





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

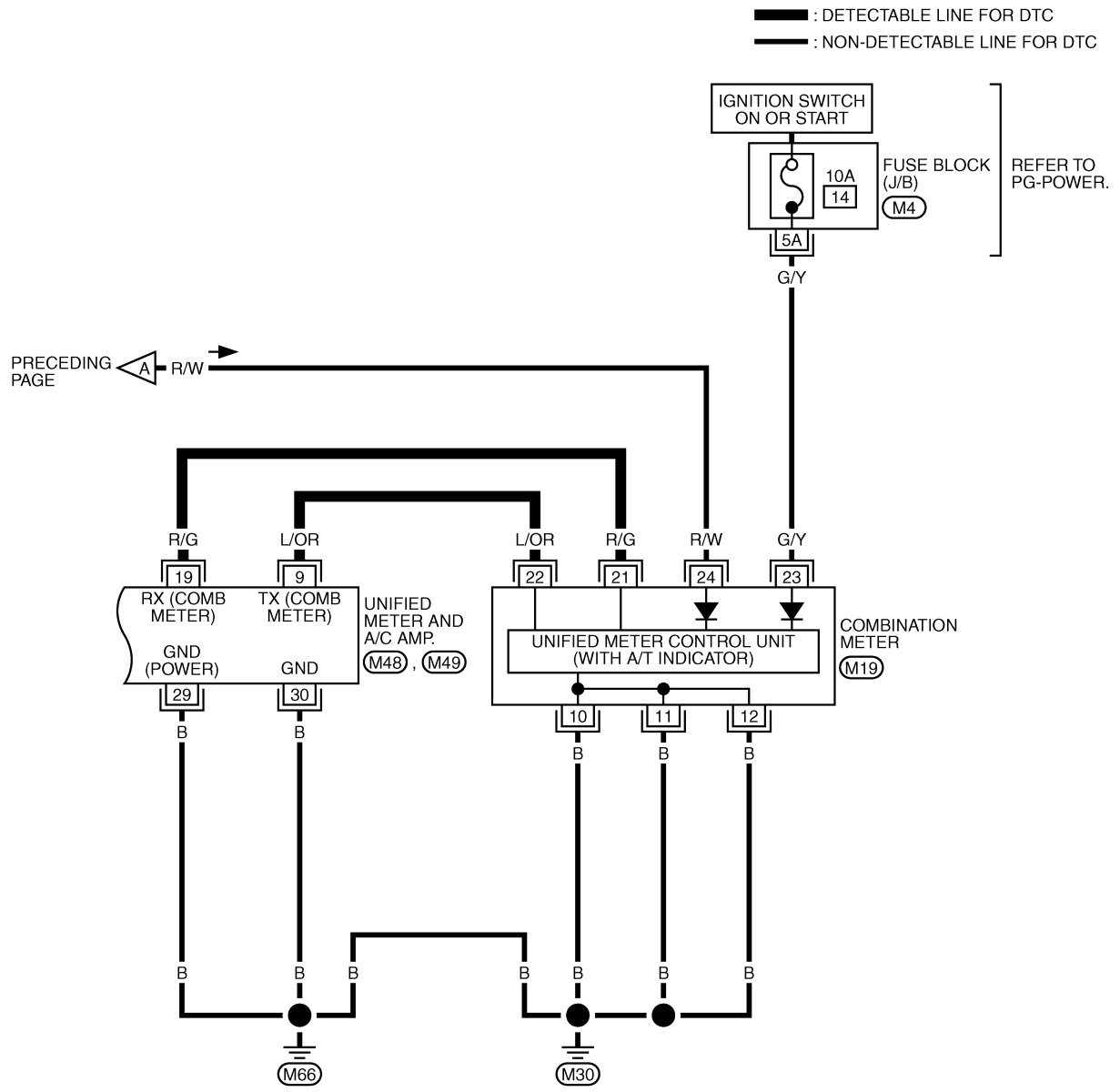
REFER TO THE FOLLOWING.

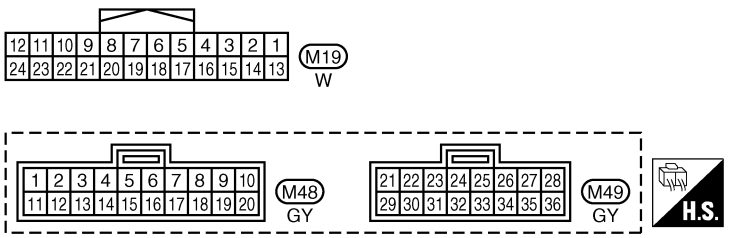
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0439E

AT-MMSW-02





REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWM0263E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	—	—
8	P	CAN-L	—	—

Diagnostic Procedure

NCS00076

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK MANUAL MODE SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out ON/OFF switching action of “MANU MODE SW”, “NON M-MODE SW”, “UP SW LEVER”, “DOWN SW LEVER”.

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	selector lever: +side	ON
	Other than the above	OFF
DOWN SW LEVER	selector lever: -side	ON
	Other than the above	OFF

Without CONSULT-III

Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1st ⇔ 5th gear).

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following.

- Manual mode switch. Refer to AT-161, "Component Inspection" .
- Pin terminals for damage or loose connection with harness connector.
- Open circuit or short to ground or short to power in harness or connector for A/T device (manual mode switch).
- Unified meter and A/C amp. Refer to DI-44, "UNIFIED METER AND A/C AMP" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-157, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
NG >> Repair or replace damaged parts.

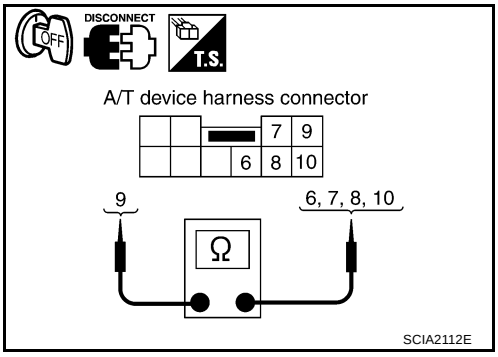
Component Inspection

NCS00077

MANUAL MODE SWITCH

Check continuity between terminals.

Item	Position	Connector	Terminal	Continuity
Manual mode select switch	Auto	M47	9 – 10	Yes
	Manual		6 – 9	
Manual mode position select switch	UP		8 – 9	
	DOWN		7 – 9	



MAIN POWER SUPPLY AND GROUND CIRCUIT

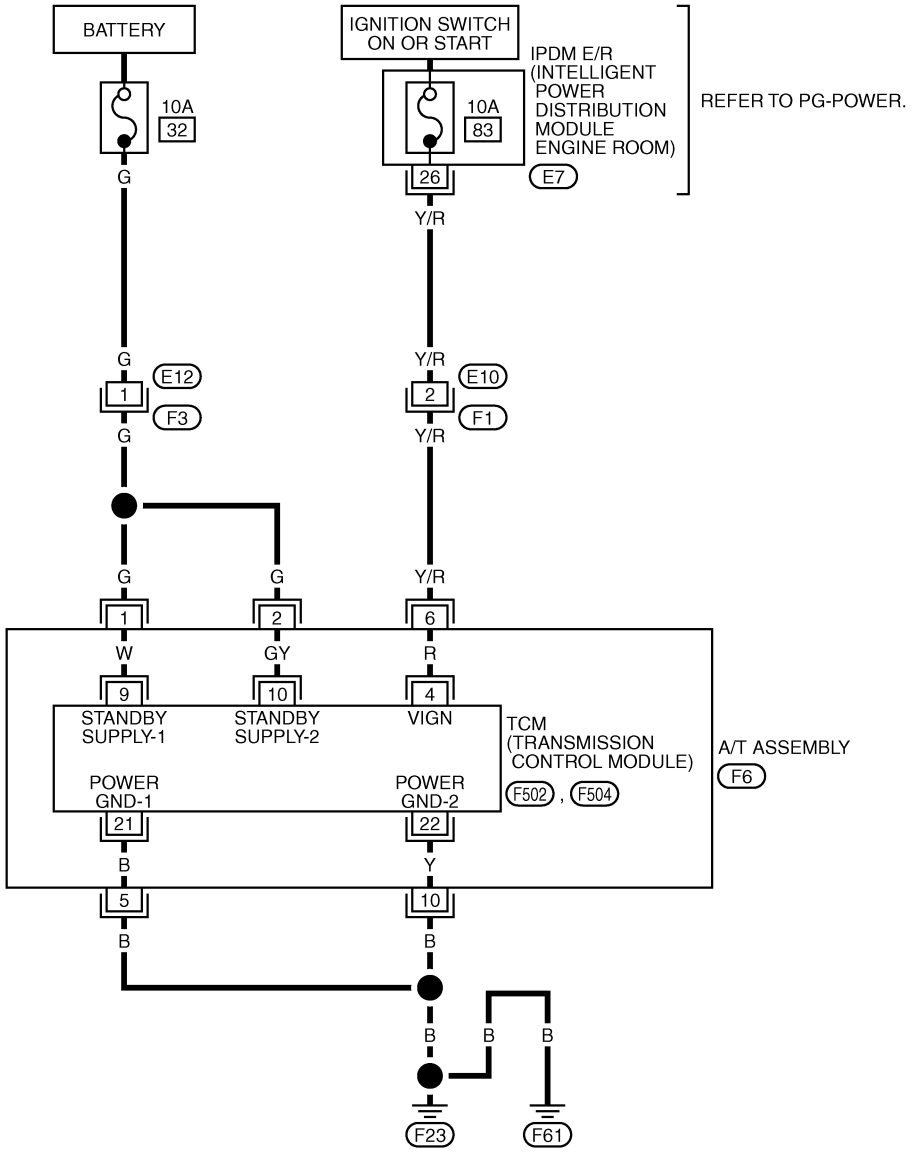
PFP:00100

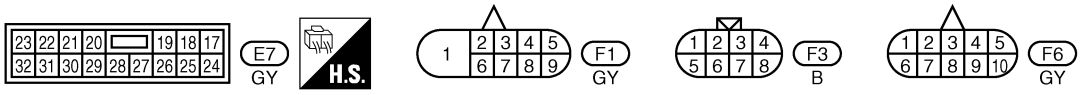
Wiring Diagram — AT — MAIN

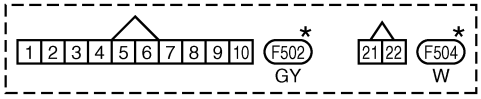
NCS0007W

AT-MAIN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC







*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWT0440E

TCM terminals and data are reference value. Measured between each terminal and ground.

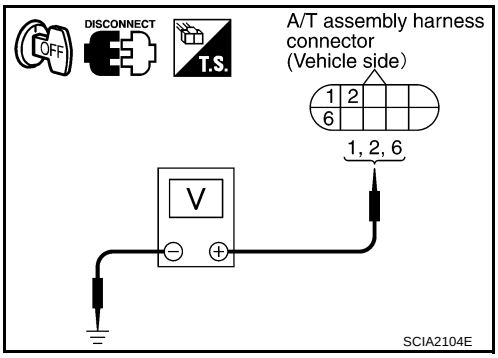
Terminal	Wire color	Item	Condition		Data (Approx.)
1	G	Power supply (Memory back-up)	Always		Battery voltage
2	G	Power supply (Memory back-up)	Always		Battery voltage
5	B	Ground	Always		0 V
6	Y/R	Power supply		—	Battery voltage
				—	0 V
10	B	Ground	Always		0 V

Diagnostic Procedure

NCS0007X

1. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check voltage between A/T assembly harness connector and ground.



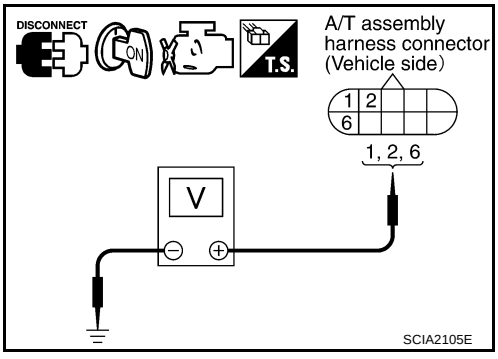
Item	Connector	Terminal	Voltage (Approx.)
TCM	F6	1 – Ground	Battery voltage
		2 – Ground	
		6 – Ground	0 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK TCM POWER SOURCE STEP 2

1. Disconnect A/T assembly harness connector.
2. Turn ignition switch ON.
3. Check voltage between A/T assembly harness connector and ground.



Item	Connector	Terminal	Voltage (Approx.)
TCM	F6	1 – Ground	Battery voltage
		2 – Ground	
		6 – Ground	

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between battery and A/T assembly harness connector terminals 1, 2
- Harness for short or open between ignition switch and A/T assembly harness connector terminal 6
- 10 A fuse (No. 32, located in the fuse and fusible link block) and 10 A fuse (No. 83, located in the IPDM E/R)
- Ignition switch, Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

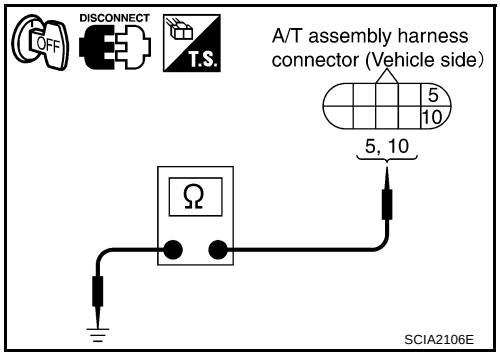
OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check continuity between A/T assembly harness connector terminals and ground.

Item	Connector	Terminal	Continuity
TCM	F6	5, 10 – Ground	Yes



If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

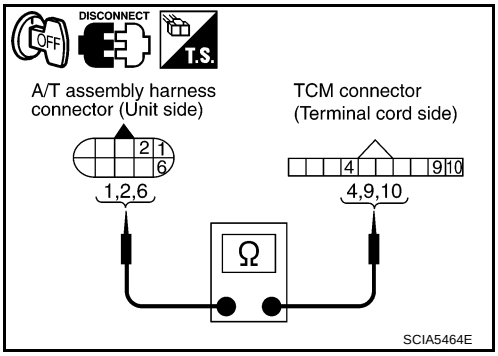
OK or NG

OK >> **INSPECTION END**
NG-1 >> Self-diagnosis does not activate: GO TO 7.
NG-2 >> DTC is displayed: Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

7. CHECK TERMINAL CORD ASSEMBLY

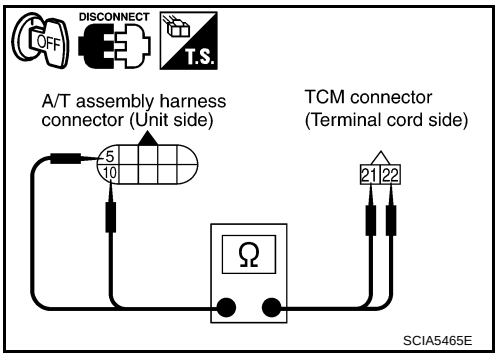
1. Remove control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	1	Yes
TCM connector	F502	9	
A/T assembly harness connector	F6	2	Yes
TCM connector	F502	10	
A/T assembly harness connector	F6	6	Yes
TCM connector	F502	4	



4. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	5	Yes
TCM connector	F504	21	
A/T assembly harness connector	F6	10	Yes
TCM connector	F504	22	



5. If OK, check harness for short to ground and short to power.

OK or NG

OK >> Replace control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .

NG >> Replace open circuit or short to ground and short to power in harness or connectors.

CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT

PFP:18002

CONSULT-III Reference Value

NCS0007Y

Item name	Condition	Display value
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF

Diagnostic Procedure

NCS0007Z

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK THROTTLE POSITION SIGNAL CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Depress accelerator pedal and read out the value of “CLSD THL POS” and “W/O THL POS”.

Accelerator Pedal Operation	Monitor Item	
	CLSD THL POS	W/O THL POS
Released	ON	OFF
Fully depressed	OFF	ON

OK or NG

OK >> **INSPECTION END**
NG >> Check the following. If NG, repair or replace damaged parts.

- Perform self-diagnosis for “ENGINE” with CONSULT-III. Refer to EC-116, "CONSULT-III Function (ENGINE)" .
- Open circuit or short to ground or short to power in harness or connectors.
- Pin terminals for damage or loose connection with harness connector.

BRAKE SIGNAL CIRCUIT

PFP:25320

CONSULT-III Reference Value

NCS00080

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

Diagnostic Procedure

NCS00081

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK STOP LAMP SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out ON/OFF switching action of the “BRAKE SW”.

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

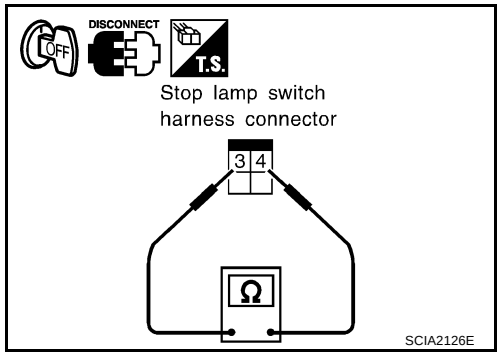
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK STOP LAMP SWITCH

Check continuity between stop lamp switch harness connector E111 terminals 3 and 4. Refer to AT-169, "Wiring Diagram — AT — NON-DTC" .

Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No



Check stop lamp switch after adjusting brake pedal — refer to BR-7, "BRAKE PEDAL" .

OK or NG

OK >> Check the following. If NG, repair or replace damaged parts.
- Harness for short or open between battery and stop lamp switch.
- Harness for short or open between stop lamp switch and unified meter and A/C amp.
- 10 A fuse (No. 20, located in fuse block).

NG >> Repair or replace the stop lamp switch.

A/T INDICATOR CIRCUIT

PFP:24810

Description

NCS00082

The TCM sends the switch signals to unified meter and A/C amp. By CAN communication line. Then manual mode switch position is indicated on the A/T position indicator.

CONSULT-III Reference Value

NCS00083

Item name	Condition	Display value
GEAR	During driving	1, 2, 3, 4, 5

Diagnostic Procedure

NCS00084

1. CHECK INPUT SIGNALS

With CONSULT-III

1. Start engine.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and read out the value of “GEAR”.
3. Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1st ⇔ 5th gear).

OK or NG

OK >> **INSPECTION END**
NG >> Check the following.

A/T INDICATOR SYMPTOM CHART

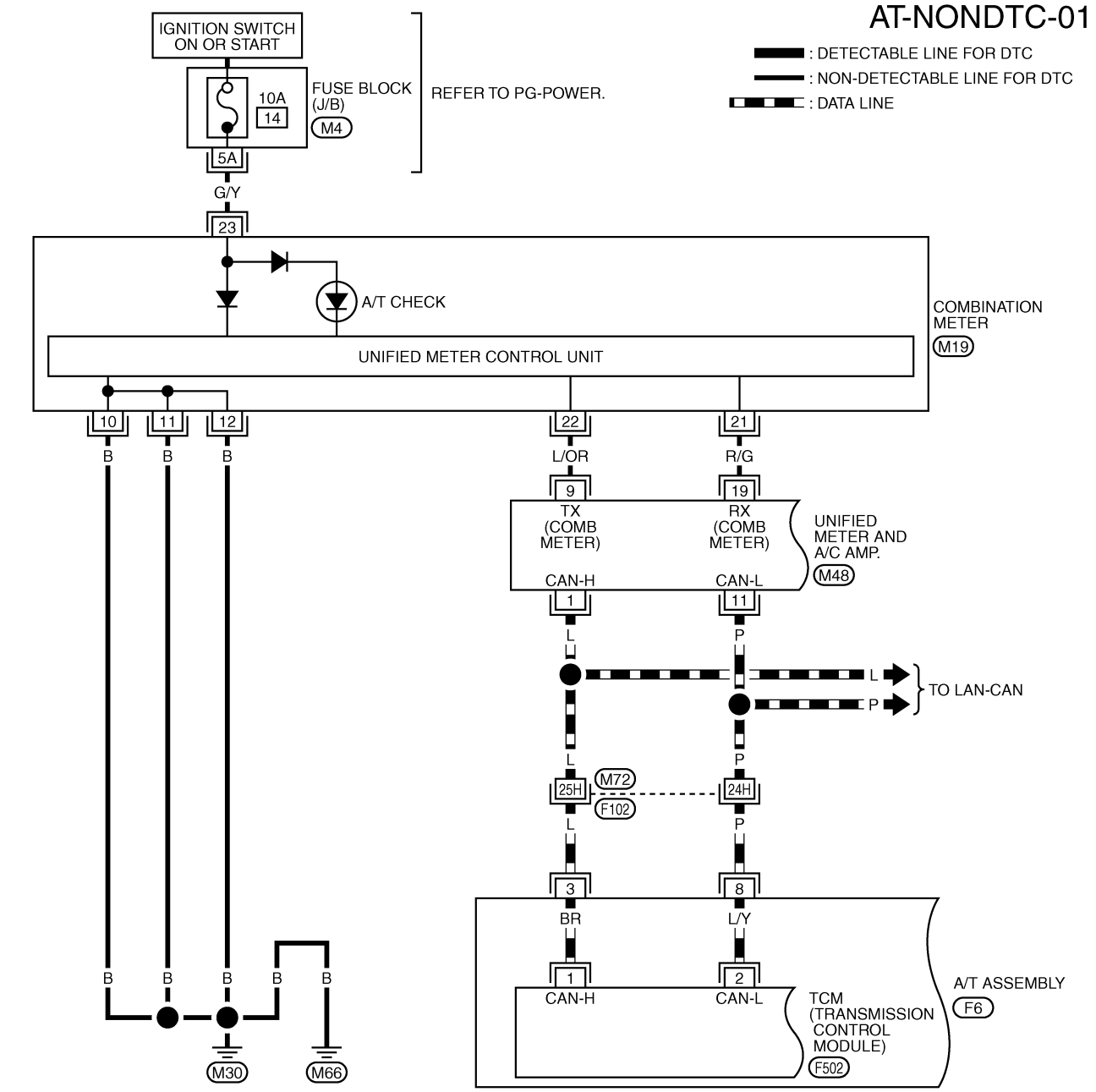
Items	Presumed Location of Trouble
The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). The A/T position indicator is not indicated.	Manual mode switch Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" . A/T main system (Fail-safe function actuated) ● Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .
The actual gear position changes, but the A/T position indicator is not indicated.	Perform the self-diagnosis function. ● Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .
The actual gear position and the indication on the A/T position indicator do not coincide.	Perform the self-diagnosis function. ● Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" .
Only a specific position or positions is/are not indicated on the A/T position indicator.	Check the unified meter and A/C amp. ● Refer to DI-4, "COMBINATION METERS" .

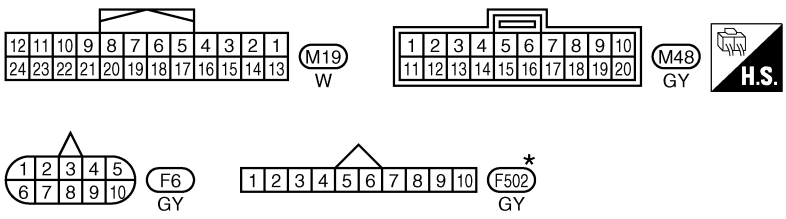
TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Wiring Diagram — AT — NONDTC

NCS00085





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

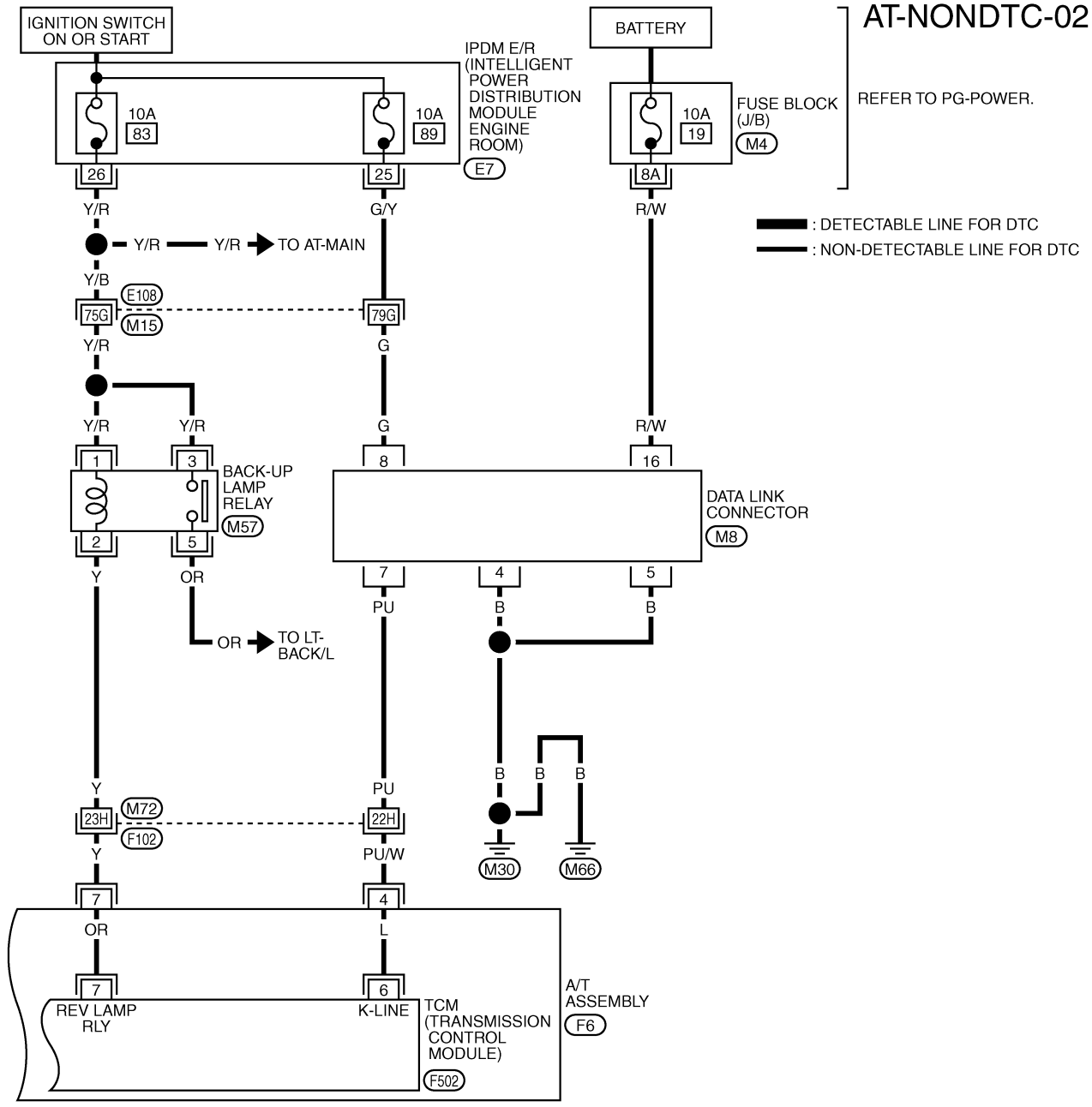
REFER TO THE FOLLOWING.

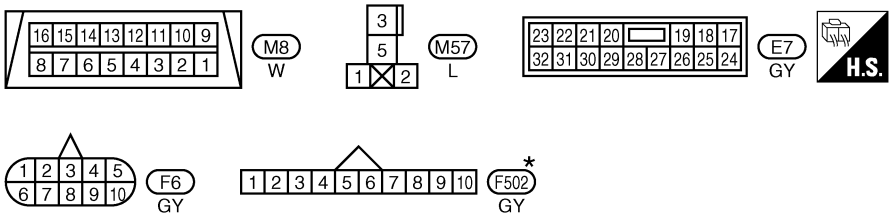
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0441E

AT-NONDTC-02





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

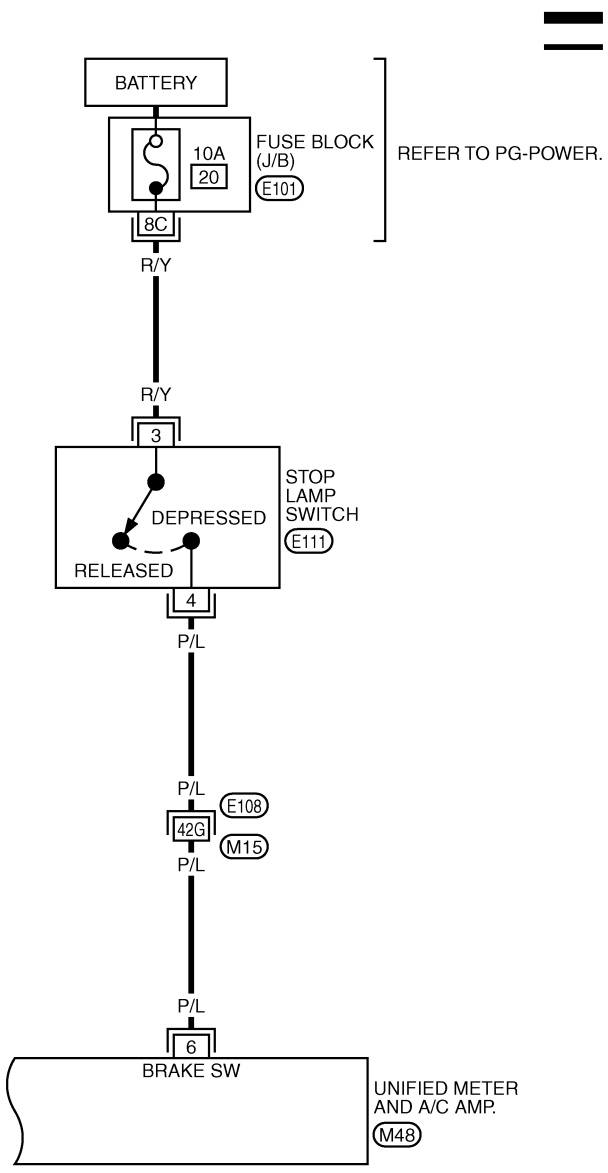
REFER TO THE FOLLOWING.

E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0442E

AT-NONDTC-03





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0378E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
3	L	CAN-H	—		—
4	PU/W	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.		—
7	Y	Back-up lamp relay		Selector lever in “R” position.	0 V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	—		—

A/T Check Indicator Lamp Does Not Come On

NCS00086

SYMPTOM:

A/T CHECK indicator lamp does not come on for about 2 seconds when turning ignition switch to ON.

DIAGNOSTIC PROCEDURE

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is a malfunction in the CAN communication indicated in the results?

YES >> Check CAN communication line. Refer to AT-94, "DTC U1000 CAN COMMUNICATION LINE" .
NO >> GO TO 2.

2. CHECK A/T CHECK INDICATOR LAMP CIRCUIT

Check combination meter. Refer to DI-4, "COMBINATION METERS" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Engine Cannot Be Started in “P” or “N” Position

NCS00087

SYMPTOM:

- **Engine cannot be started with selector lever in “P” or “N” position.**
- **Engine can be started with selector lever in “D” or “R” position.**

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

3. CHECK STARTING SYSTEM

Check starting system. Refer to SC-8, "STARTING SYSTEM" .

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

In “P” Position, Vehicle Moves When Pushed

NCS00088

SYMPTOM:

Even though the selector lever is set in the “P” position, the parking mechanism is not actuated, allowing the vehicle to be moved when it is pushed.

DIAGNOSTIC PROCEDURE

1. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 2.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

2. CHECK PARKING COMPONENTS

Check parking components. Refer to AT-227, "Parking Components" .

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

In “N” Position, Vehicle Moves

NCS00089

SYMPTOM:

Vehicle moves forward or backward when selecting “N” position.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

4. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 5.

NG >> Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 67).

5. CHECK SYMPTOM

Check again. Refer to AT-53, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

Large Shock (“N” to “D” Position)

NCS0008A

SYMPTOM:

A noticeable shock occurs when the selector lever is shifted from the “N” to “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. ENGINE IDLE SPEED

Check engine idle speed. Refer to EC-76, "Idle Speed and Ignition Timing Check" .

OK or NG

OK >> GO TO 3.

NG >> Adjust engine idle speed. Refer to EC-76, "Idle Speed and Ignition Timing Check" .

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 5.

NG >> Refill ATF.

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 8.

NG - 1 >> Line pressure high: GO TO 6.

NG - 2 >> Line pressure low: GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

– Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 1).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-53, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Vehicle Does Not Creep Backward in “R” Position

NCS0008B

SYMPTOM:

The vehicle does not creep in the “R” position. Or an extreme lack of acceleration is observed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

4. CHECK STALL TEST

Check stall revolution with selector lever in “M” and “R” positions.
Refer to AT-49, "STALL TEST" .

OK or NG

OK >> GO TO 6.

OK in “M” position, NG in “R” position>>GO TO 5.

NG in both “M” and “R” positions>>GO TO 8.

5. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
2. Check the following.

- Reverse brake. Refer to AT-255, "Disassembly" .

OK or NG

OK >> GO TO 9.

NG >> Repair or replace damaged parts.

6. CHECK LINE PRESSURE

Check line pressure with the engine idling. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 9.

NG - 1 >> Line pressure high. GO TO 7.

NG - 2 >> Line pressure low. GO TO 8.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

8. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 13.

10. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

11. CHECK SYMPTOM

Check again. Refer to AT-53, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 12.

12. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

13. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

Vehicle Does Not Creep Forward in “D” Position

NCS0008C

SYMPTOM:

Vehicle does not creep forward when selecting “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.
NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK STALL TEST

Check stall revolution with selector lever in “D” position. Refer to AT-49, "STALL TEST" .

OK or NG

OK >> GO TO 5.
NG >> GO TO 7.

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high. GO TO 6.
NG - 2 >> Line pressure low. GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 43).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-53, "Check at Idle" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

12. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 43).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

Vehicle Cannot Be Started from D1

NCS0008D

SYMPTOM:

Vehicle cannot be started from D1 on cruise test - Part 1.

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps in “R” position.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-177, "Vehicle Does Not Creep Backward in “R” Position" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III"

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK ACCELERATOR POSITION SENSOR

Check accelerator pedal position sensor. Refer to AT-131, "DTC P1705 THROTTLE POSITION SENSOR"

OK or NG

OK >> GO TO 4.
NG >> Repair or replace accelerator pedal position sensor.

4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 5.
NG >> Refill ATF.

5. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high. GO TO 6.
NG - 2 >> Line pressure low. GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 23).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

12. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 23).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_1 \rightarrow D_2$

NCS0008E

SYMPTOM:

The vehicle does not shift-up from the D_1 to D_2 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-179, "Vehicle Does Not Creep Forward in “D” Position" , AT-181, "Vehicle Cannot Be Started from D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following items:

– Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 10).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 10).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_2 \rightarrow D_3$

NCS0008F

SYMPTOM:

The vehicle does not shift-up from D_2 to D_3 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-179, "Vehicle Does Not Creep Forward in “D” Position" , AT-181, "Vehicle Cannot Be Started from D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 11).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 11).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_3 \rightarrow D_4$

NCS0008G

SYMPTOM:

The vehicle does not shift-up from the D_3 to D_4 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-179, "Vehicle Does Not Creep Forward in “D” Position" , AT-181, "Vehicle Cannot Be Started from D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 12).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" , AT-57, "Cruise Test — Part 2" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 12).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_4 \rightarrow D_5$

NCS0008H

SYMPTOM:

- **The vehicle does not shift-up from the D_4 to D_5 gear at the specified speed.**
- **The vehicle does not shift-up from the D_4 to D_5 gear unless A/T is warmed up.**

DIAGNOSTIC PROCEDURE

1. CHECK SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-179, "Vehicle Does Not Creep Forward in “D” Position" , AT-181, "Vehicle Cannot Be Started from D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

– Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 13).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

11. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 13).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Lock-up

NCS0008I

SYMPTOM:

A/T does not lock-up at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-50, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 6.

NG - 1 >> Line pressure high. GO TO 4.

NG - 2 >> Line pressure low. GO TO 5.

4. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Disassemble A/T. Refer to AT-255, "DISASSEMBLY" .
3. Check the following.

- Oil pump assembly. Refer to AT-271, "Oil Pump" .
- Power train system. Refer to AT-255, "DISASSEMBLY" .
- Transmission case. Refer to AT-255, "DISASSEMBLY" .

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 7.
NG >> GO TO 10.

7. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 24).

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

10. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 24).

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

A/T Does Not Hold Lock-up Condition

NCS0008J

SYMPTOM:

The lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 4.

NG >> GO TO 7.

4. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 25).

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 25).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

Lock-up Is Not Released

NCS0008K

SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Engine Speed Does Not Return to Idle

NCS0008L

SYMPTOM:

When a shift-down is performed, the engine speed does not smoothly return to the idling speed.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III"

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 3.

3. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 7.

4. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 72).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK SYMPTOM

Check again. Refer to AT-55, "Cruise Test — Part 1" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 72).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

Cannot Be Changed to Manual Mode

NCS0008M

SYMPTOM:

Does not change to manual mode when manual shift gate is used.

DIAGNOSTIC PROCEDURE

1. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> **INSPECTION END**

A/T Does Not Shift: 5th Gear → 4th Gear

NCS0008N

SYMPTOM:

When shifted from M_5 to M_4 position in manual mode, does not downshift from 5th to 4th gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 47).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 47).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 4th Gear → 3rd Gear

NCS0008O

SYMPTOM:

When shifted from M4 to M3 position in manual mode, does not downshift from 4th to 3rd gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.

NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 48).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 48).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 3rd Gear → 2nd Gear

NCS0008P

SYMPTOM:

When shifted from M_3 to M_2 position in manual mode, does not downshift from 3rd to 2nd gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-86, "SELF-DIAGNOSTIC RESULT MODE" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 49).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 49).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: 2nd Gear → 1st Gear

NCS0008Q

SYMPTOM:

When shifted from M_2 to M_1 position in manual mode, does not downshift from 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.

NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.

NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 50).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 50).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

Vehicle Does Not Decelerate by Engine Brake

NCS0008R

SYMPTOM:

No engine brake is applied when the gear is shifted from the 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-92, "Diagnostic Procedure Without CONSULT-III" .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to AT-86, "SELF-DIAGNOSTIC RESULT MODE" , AT-93, "Judgment Self-diagnosis Code" .
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-206, "Adjustment of A/T Position" .

4. MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-157, "DTC P1815 MANUAL MODE SWITCH" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2" .
2. Check A/T fluid condition. Refer to AT-49, "A/T Fluid Condition Check" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 58).

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-58, "Cruise Test — Part 3" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-83, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-59, "Symptom Chart" (Symptom No. 58).

OK or NG

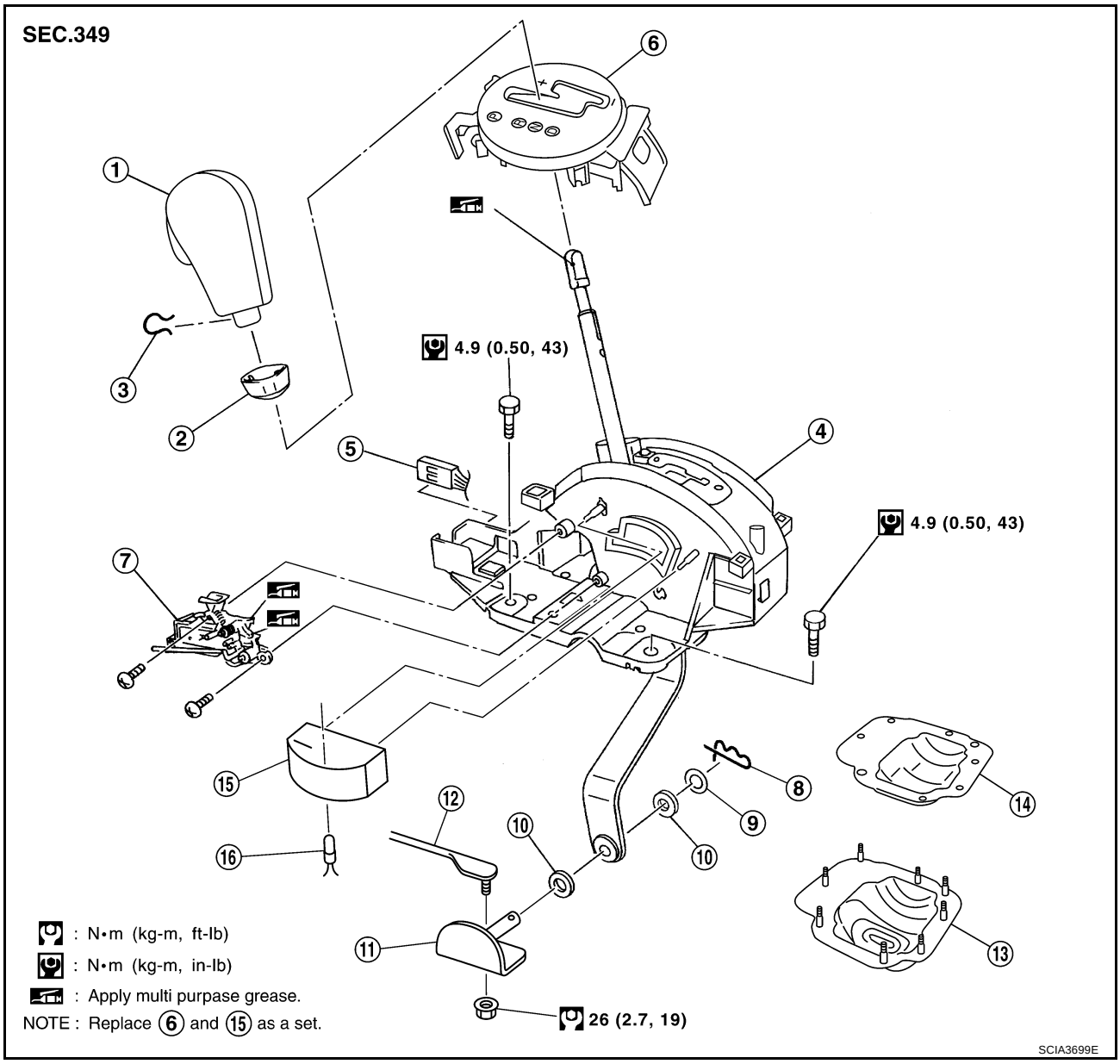
OK >> GO TO 7.
NG >> Repair or replace damaged parts.

SHIFT CONTROL SYSTEM

PFP:34901

Control Device Removal and Installation

NCS0008S



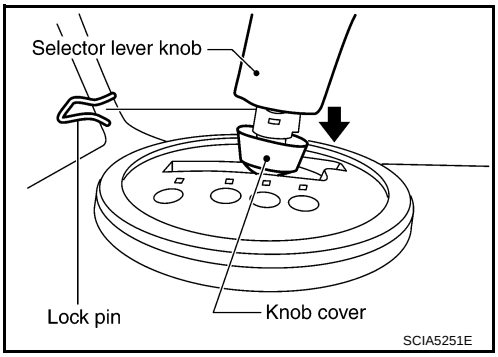
1. Selector lever knob	2. Knob cover	3. Lock pin
4. Control device assembly	5. A/T device harness connector	6. Position indicator plate
7. Shift lock solenoid and park position switch assembly	8. Snap pin	9. Conical washer
10. Plain washer	11. Bracket	12. Control rod
13. Dust cover	14. Dust cover plate	15. Bulb case
16. Position lamp		

REMOVAL

CAUTION:

Make sure that parking brake is applied before removal/installation.

1. Disconnect lower lever of control device and control rod.
2. Remove knob cover below selector lever downward.
3. Pull lock pin out of selector lever knob.
4. Remove selector lever knob.
5. Remove console finisher (A/T ring) and console finisher (A/T). Refer to IP-10, "Component Parts Drawing" .
6. Remove center console. Refer to IP-10, "Component Parts Drawing" .
7. Remove key interlock cable from control device. Refer to AT-213, "Removal and Installation" .
8. Disconnect A/T device harness connector.
9. Remove control device assembly.



CAUTION:

Do not impact, or damage propeller shaft tube.

INSTALLATION

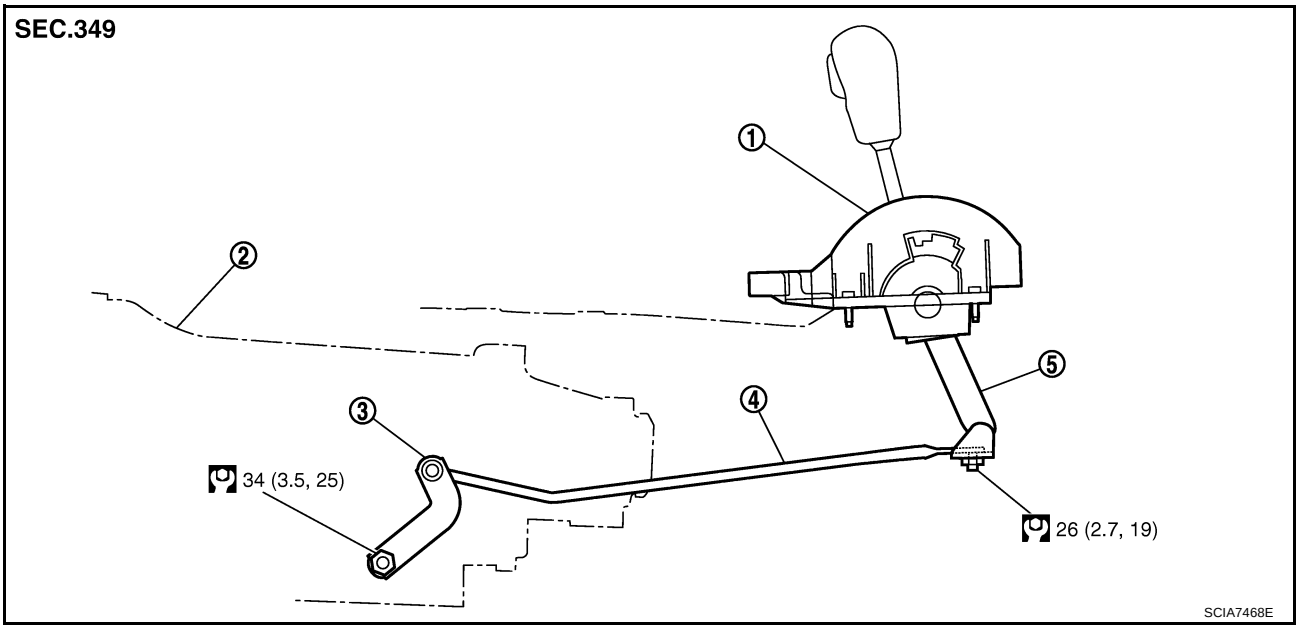
Note the following, and install in the reverse order of removal.

- After installation is completed, adjust and check A/T position. Refer to AT-206, "Adjustment of A/T Position" , AT-206, "Checking of A/T Position" .

Control Rod Removal and Installation

NCS0008T

CONTROL ROD COMPONENTS

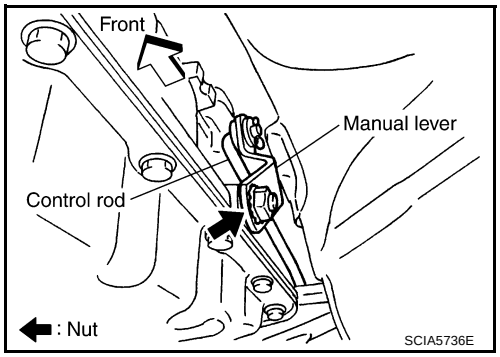


1. Control device assembly
2. A/T
3. Manual lever
4. Control rod
5. Lower lever

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

REMOVAL

1. Disconnect lower lever of control device and control rod.
2. Remove manual lever from A/T.
3. Remove control rod from vehicle.



INSTALLATION

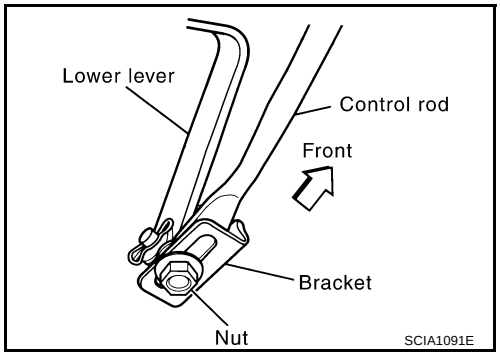
Note the following, and install in the reverse order of removal.

- After installation is completed, adjust and check A/T position. Refer to AT-206, "Adjustment of A/T Position" and AT-206, "Checking of A/T Position" .

Adjustment of A/T Position

NCS0008U

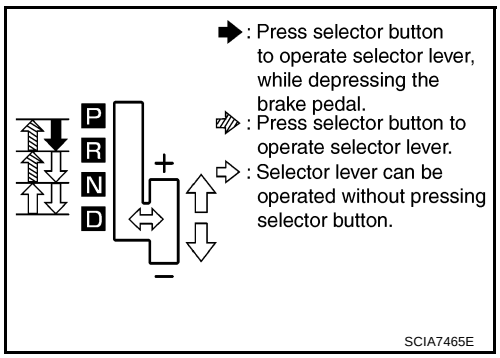
1. Loosen nut of control rod.
2. Place PNP switch and selector lever in “P” position.
3. While pressing lower lever toward rear of vehicle (in “P” position direction), tighten nut to the specified torque. Refer toAT-205, "CONTROL ROD COMPONENTS"



Checking of A/T Position

NCS0008V

1. Place selector lever in “P” position, and turn ignition switch ON.
2. Make sure that selector lever can be shifted to other than “P” position when brake pedal is depressed. Also make sure that selector lever can be shifted from “P” position only when brake pedal is depressed.
3. Move the selector lever and check for excessive effort, sticking, noise or rattle.
4. Confirm the selector lever stops at each position with the feel of engagement when it is moved through all the positions. Check whether or not the actual position the selector lever is in matches the position shown by the shift position indicator and the transmission body.
5. The method of operating the lever to individual positions correctly should be as shown in the figure.
6. When selector button is pressed in “P”, “R”, or “N” position without applying forward/backward force to selector lever, check button operation for sticking.
7. Confirm the back-up lamps illuminate only when lever is placed in the “R” position. Confirm the back-up lamps does not illuminate when selector lever is pushed against “R” position in the “P” or “N” position.
8. Confirm the engine can only be started with the selector lever in the “P” and “N” positions. (With selector lever in the “P” position, engine can be started even when selector lever is moved forward and backward.)
9. Make sure that transmission is locked completely in “P” position.
10. When selector lever is set to manual shift gate, make sure that manual mode is displayed on combination meter.
    Shift selector lever to “+” and “-” sides, and check that set shift position changes.



A/T SHIFT LOCK SYSTEM

PFP:34950

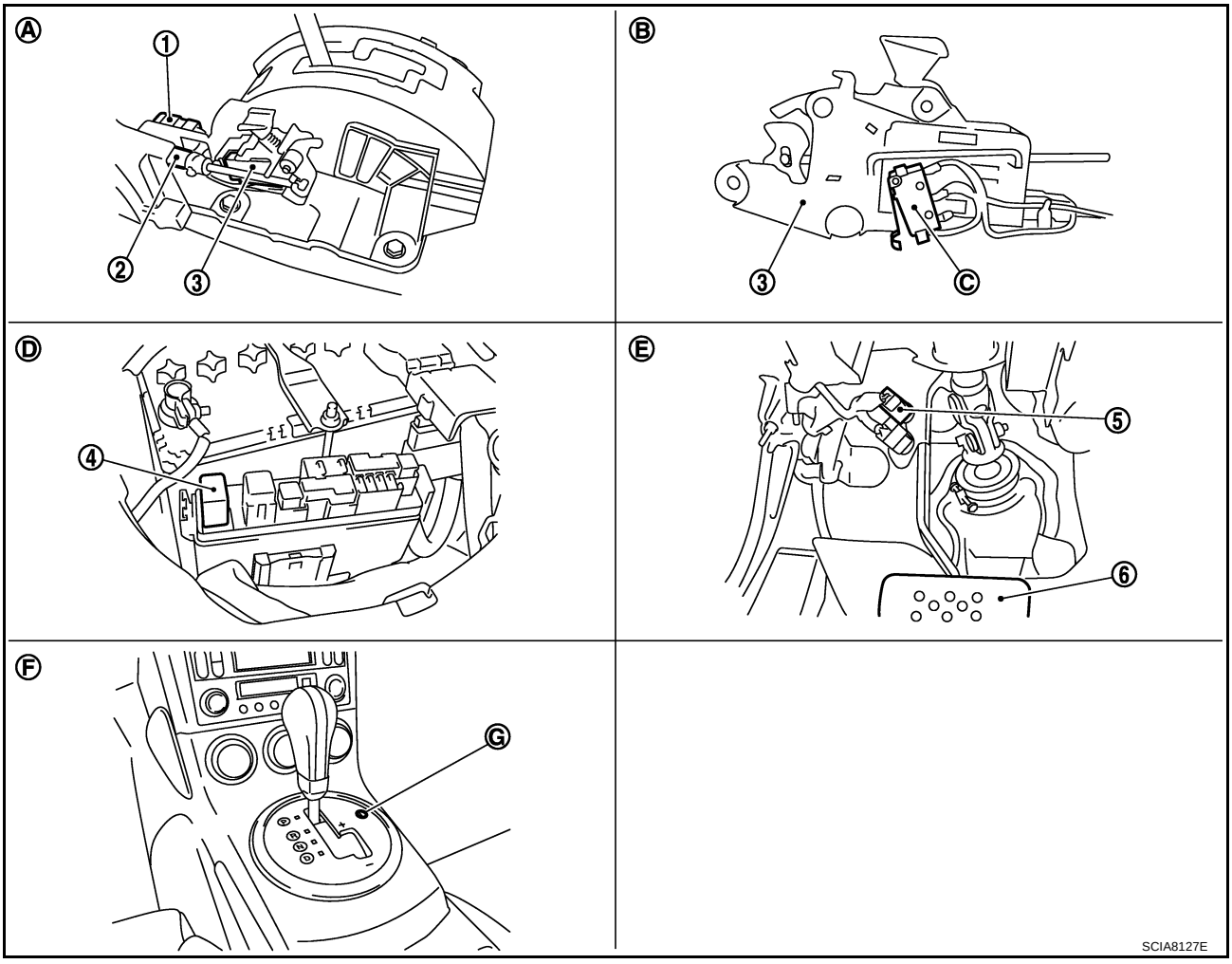
Description

NCS0008W

- The mechanical key interlock mechanism also operates as a shift lock:
  With the ignition switch turned to ON, the selector lever cannot be shifted from “P” position to any other position unless the brake pedal is depressed.
  With the key removed, the selector lever cannot be shifted from “P” position to any other position.
  The key cannot be removed unless the selector lever is placed in “P” position.
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder.

Shift Lock System Electrical Parts Location

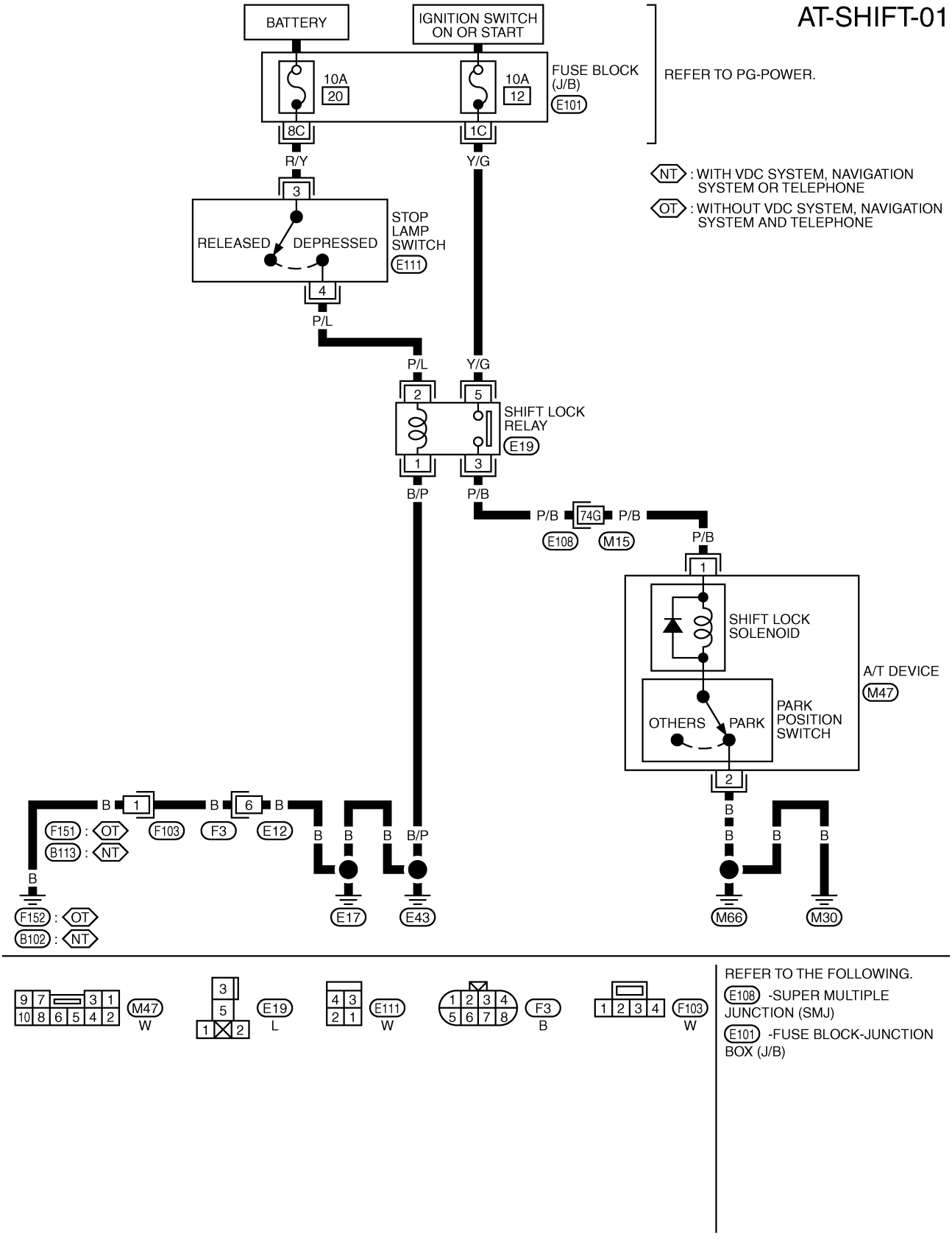
NCS001RP



1. A/T device harness connector
2. Key inter lock cable
3. Shift lock solenoid
4. Shift lock relay
5. Stop lamp switch
6. Brake pedal
A. Control device assembly
B. Shift lock solenoid, revers side
C. Park position switch
D. Fuse, fusible link and relay box
E. Brake pedal, upper
F. A/T console finisher
G. Shift lock release button

Wiring Diagram — AT — SHIFT

NCS0008Y



TCWT0443E

Diagnostic Procedure

NCS0008Z

SYMPTOM 1:

- **Selector lever cannot be moved from “P” position with key in ON position and brake pedal applied.**
- **Selector lever can be moved from “P” position with key in ON position and brake pedal released.**
- **Selector lever can be moved from “P” position when key is removed from key cylinder.**

SYMPTOM 2:

- **Ignition key cannot be removed when selector lever is set to “P” position.**
- **Ignition key can be removed when selector lever is set to any position except “P” position.**

1. CHECK KEY INTERLOCK CABLE

Check the key interlock cable for damage.

OK or NG

OK >> GO TO 2.
NG >> Replace key interlock cable. Refer to AT-212, "KEY INTERLOCK CABLE" .

2. CHECK SELECTOR LEVER POSITION

Check the selector lever position for damage. Refer to AT-206, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.
NG >> Check selector lever. Refer to AT-206, "Adjustment of A/T Position" .

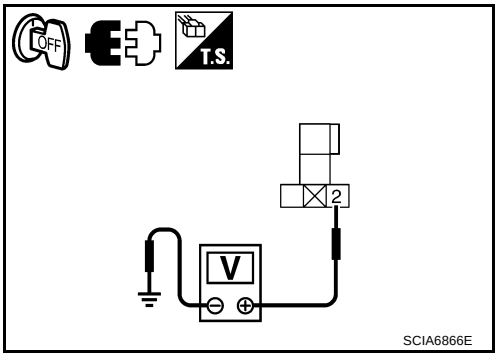
3. CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check voltage between shift lock relay E19 terminal 2 and ground.

Voltage

Brake pedal depressed: Battery voltage

Brake pedal released: 0 V



OK or NG

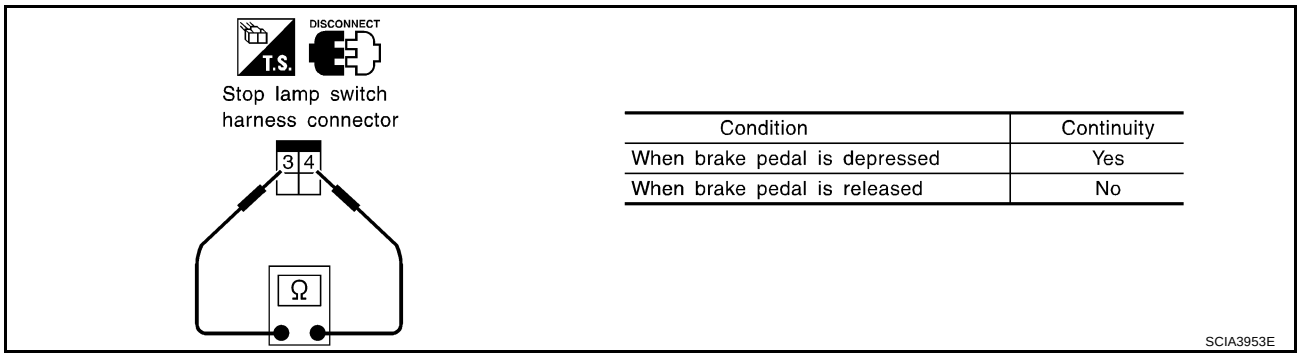
OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between battery and stop lamp switch harness connector E111 terminal 3.
- Harness for short or open between stop lamp switch harness connector E111 terminal 4 and shift lock relay E19 terminal 2.
- 10 A fuse [No. 20, located in the fuse block (J/B)].
- Stop lamp switch.

– Check continuity between stop lamp switch harness connector E111 terminals 3 and 4.



Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal — refer to BR-7, "BRAKE PEDAL".

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

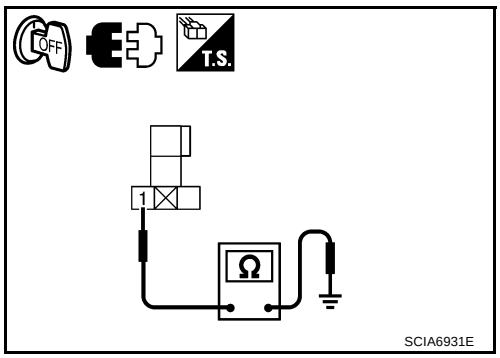
5. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check continuity between shift lock relay E19 terminal 1 and ground.

CAUTION:
Connect test probe (BLACK) to shift lock relay, and test probe (RED) to ground.

Continuity should exist.

If OK, check harness for short to ground and short to power.



OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

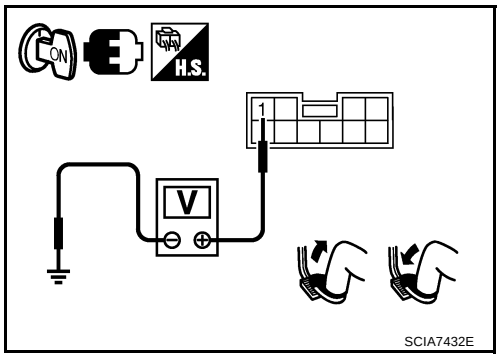
6. CHECK INPUT SIGNAL A/T DEVICE

1. Turn ignition switch ON.
2. Selector lever is set in “P” position.
3. Check voltage between A/T device harness connector M47 terminal 1 and ground.

Voltage

Brake pedal depressed: Battery voltage

Brake pedal released: 0 V



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

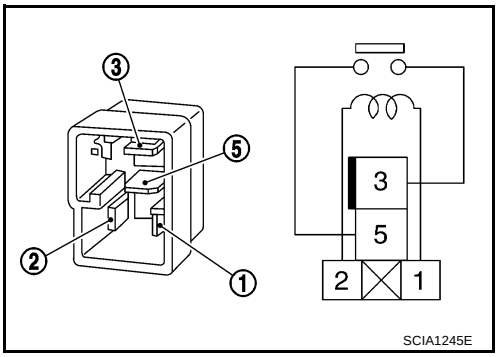
7. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between ignition switch and shift lock relay E19 terminal 5.
- Harness for short or open between shift lock relay E19 terminal 3 and A/T device harness connector M47 terminal 1.
- 10 A fuse [No. 12, located in the fuse block (J/B)].
- Ignition switch (Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT").
- Shift lock relay.

– Check continuity between shift lock relay E19 terminal 3 and 5.

Condition	Continuity
12V direct current supply between terminal 1 and 2	Yes
OFF	No



OK or NG

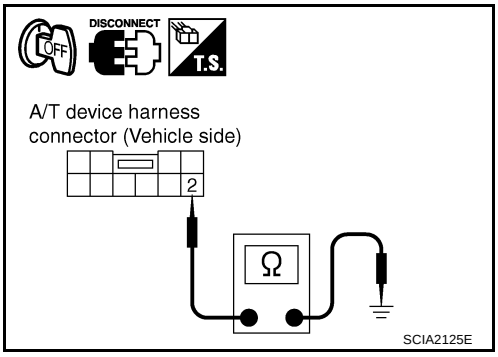
OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T device harness connector.
3. Check continuity between A/T device harness connector M47 terminal 2 and ground.

Continuity should exist.

If OK, check harness for short to ground and short to power.



OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK SHIFT LOCK SOLENOID AND PARK POSITION SWITCH

1. Connect A/T device harness connector.
2. Turn ignition switch ON.
3. Selector lever is set in “P” position.
4. Check operation.

Condition	Brake pedal	Operation
When ignition switch is turned to “ON” position and selector lever is set in “P” position.	Depressed	Yes
	Released	No

OK or NG

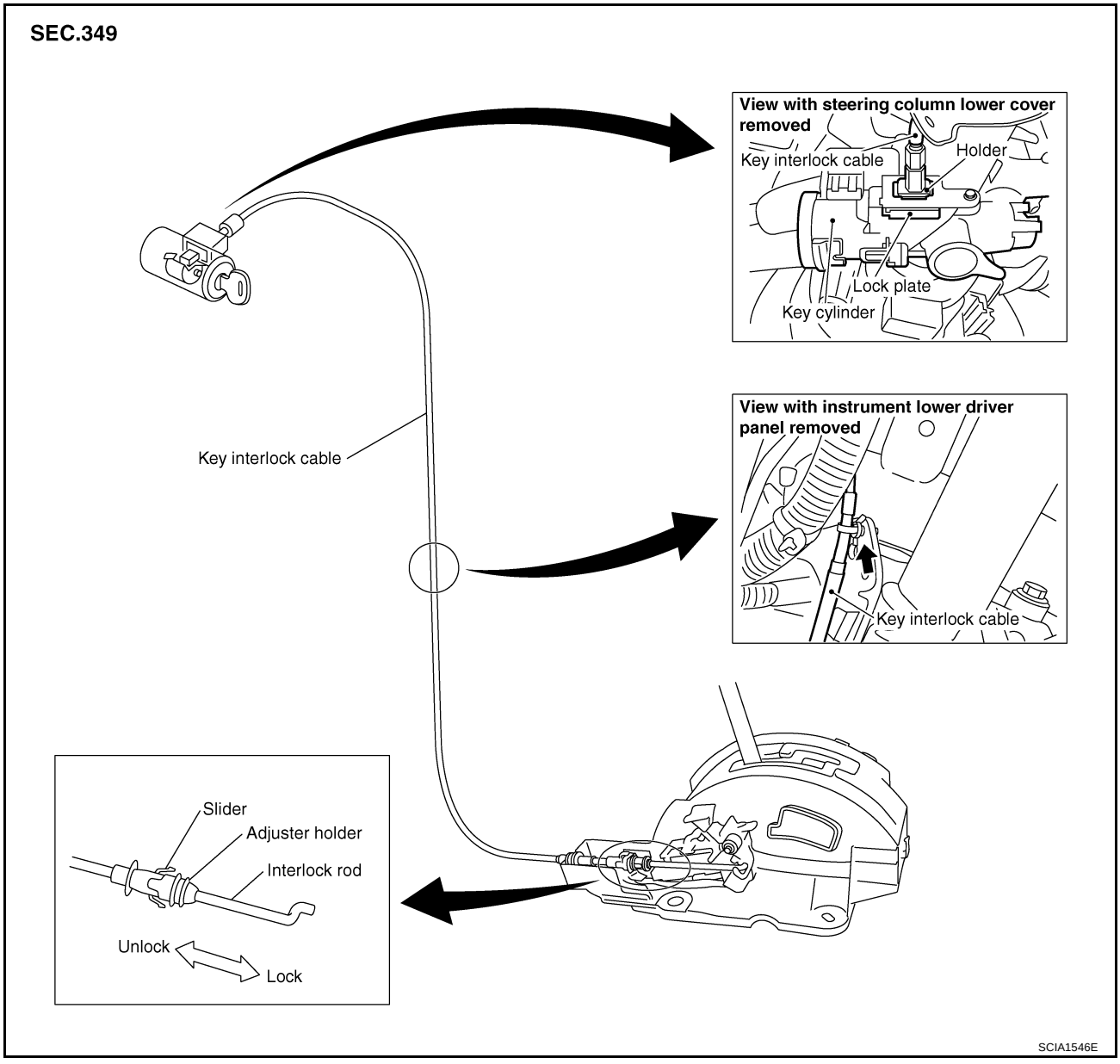
OK >> **INSPECTION END**.
NG >> Repair or replace damaged parts.

KEY INTERLOCK CABLE

PFP:34908

Components

NCS00090



CAUTION:

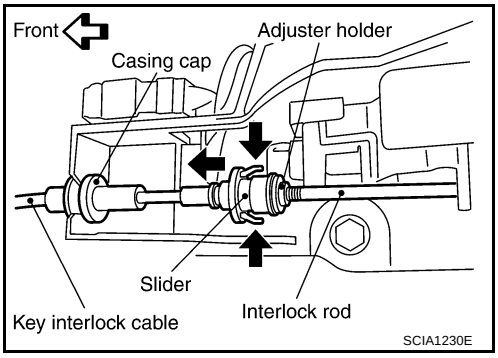
- **Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.**
- **After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions. If casing cap be removed with an external load of less than 39.2 N (4.0 kg, 8.8 lb), replace key interlock cable with new one.**

Removal and Installation

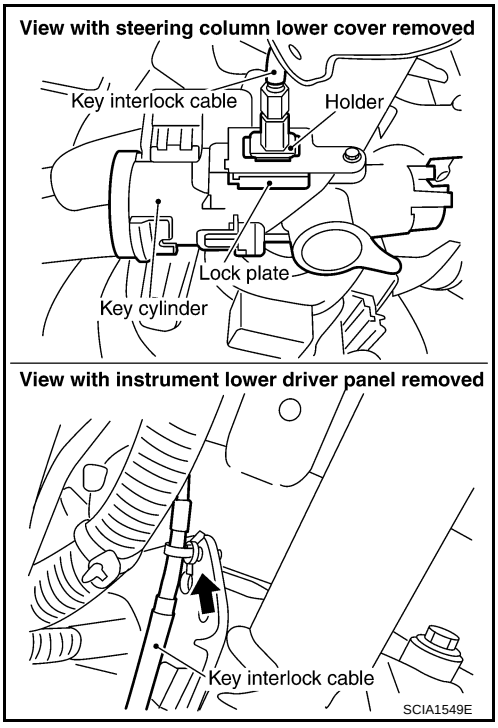
NCS00091

REMOVAL

1. Unlock slider by squeezing lock tabs on slider from adjuster holder.
2. Remove casing cap from bracket of control device assembly and remove interlock rod from adjuster holder.



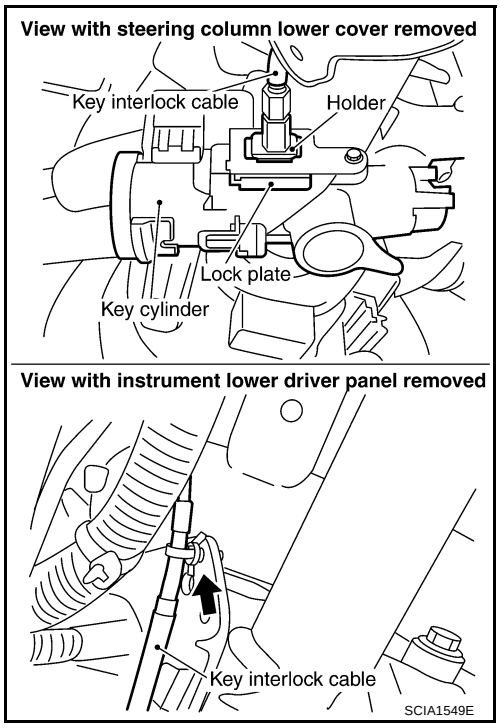
3. Remove lock plate from key cylinder.
4. Remove holder from key cylinder and remove key interlock cable.



INSTALLATION

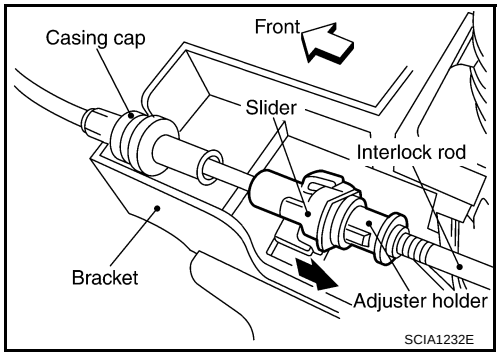
1. Set holder of key interlock cable to key cylinder and install lock plate.

   CAUTION:
   Do not reuse the lock plate
2. Clamp key interlock cable and fix to key interlock cable with band.
3. Turn ignition key to lock position.
4. Set selector lever to “P” position.



5. Insert interlock rod into adjuster holder.
6. Install casing cap to bracket.
7. Move slider in order to fix adjuster holder to interlock rod.

   CAUTION:
   Do not touch any parts except slider. Do not add any force to slider except force toward slider.



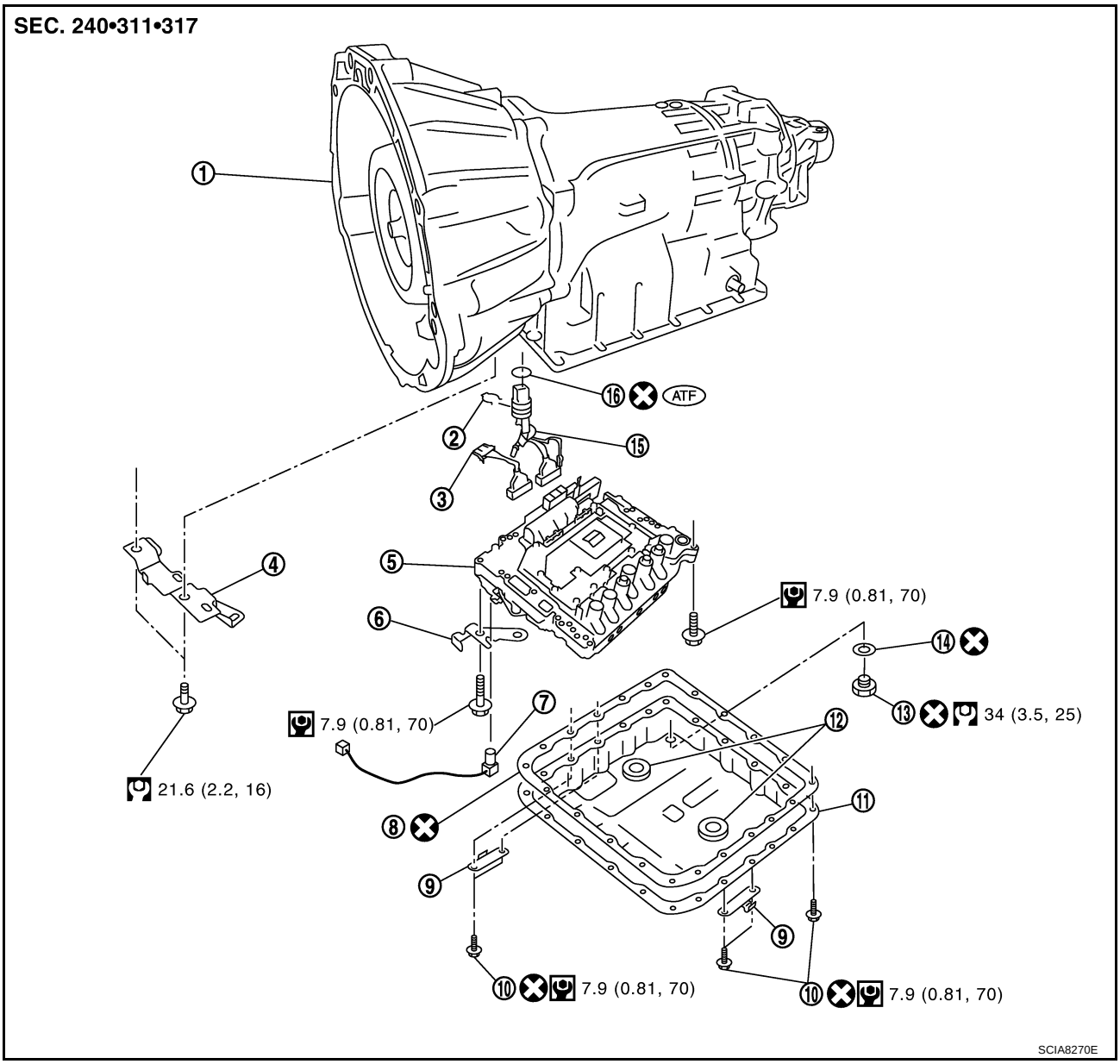
ON-VEHICLE SERVICE

PFP:00000

Control Valve with TCM and A/T Fluid Temperature Sensor 2

NCS00092

COMPONENTS



1. A/T	2. Snap ring	3. Sub-harness
4. Bracket	5. Control valve with TCM	6. Bracket
7. A/T fluid temperature sensor 2	8. Oil pan gasket	9. Clip
10. Oil pan mounting bolt	11. Oil pan	12. Magnet
13. Drain plug	14. Drain plug gasket	15. Terminal cord assembly
16. O-ring		

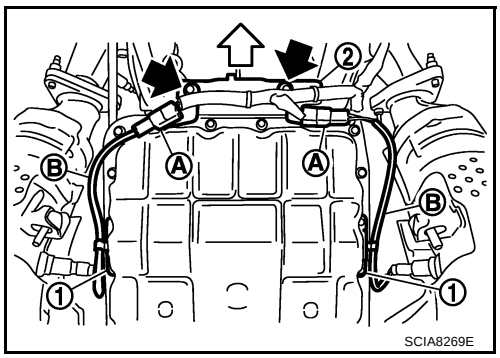
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

CONTROL VALVE WITH TCM ASSEMBLY REMOVAL AND INSTALLATION

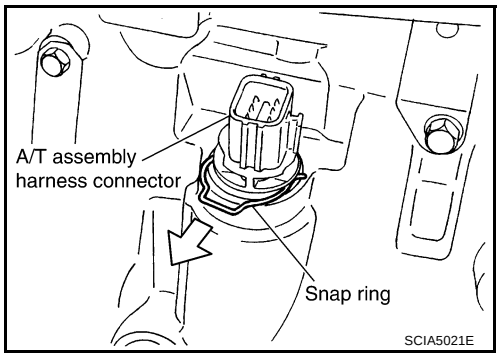
Removal

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .

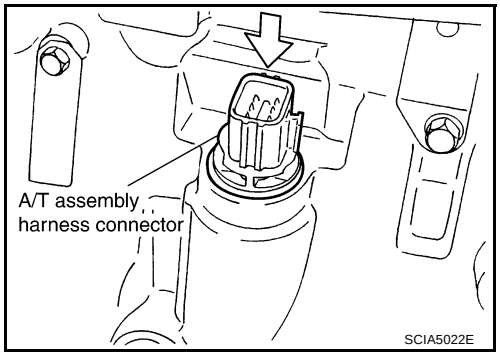
4. Disconnect heated oxygen sensor 2 harness connectors (A).
   - ⇦: Vehicle front
   - ⬅: Bolt
5. Remove heated oxygen sensor 2 harness (B) from clips (1).
6. Remove bracket (2) from transmission assembly.
7. Disconnect A/T assembly harness connector.



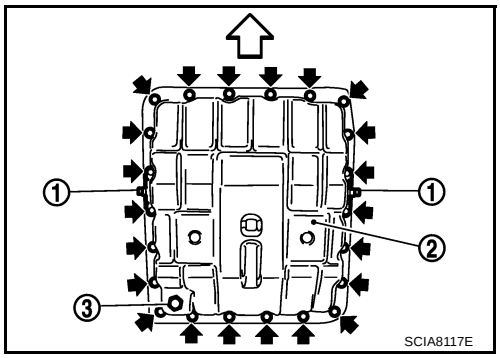
8. Remove snap ring from A/T assembly harness connector.



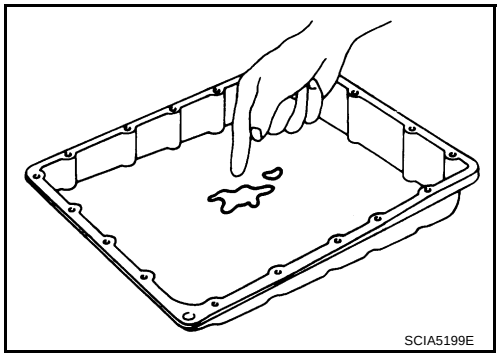
9. Push A/T assembly harness connector.
   CAUTION:
   Be careful not to damage connector.



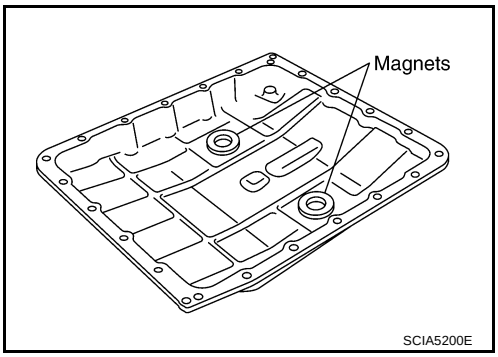
10. Remove clips (1), oil pan (2) and oil pan gasket.
    - ⇦: Vehicle front
    - ⬅: Oil pan mounting bolt
    - Drain bolt (3)



11. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
    - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**



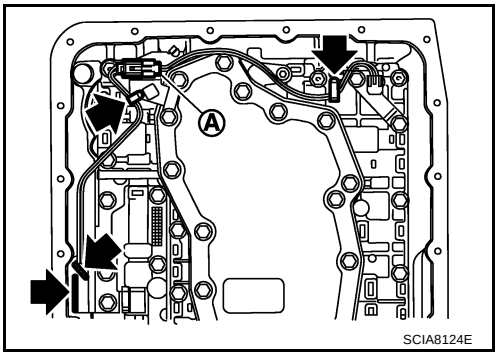
12. Remove magnets from oil pan.



13. Disconnect A/T fluid temperature sensor 2 connector (A).

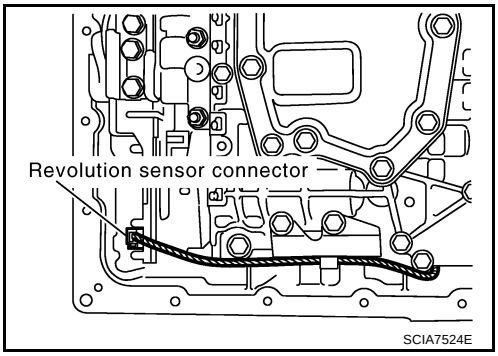
CAUTION:
Be careful not to damage connector.

14. Straighten terminal clips (⬅) to free terminal cord assembly and A/T fluid temperature sensor 2 harness.

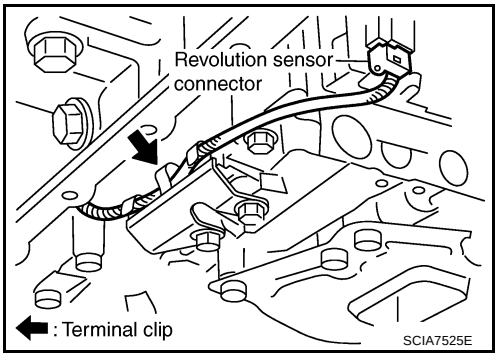


15. Disconnect revolution sensor connector.

CAUTION:
Be careful not to damage connector.

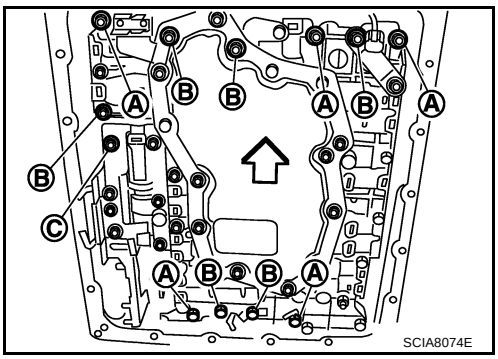


16. Straighten terminal clip to free revolution sensor harness.



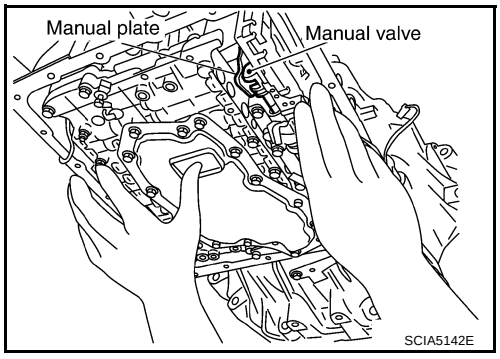
17. Remove bolts (A), (B) and (C) from control valve with TCM.
    - ⇦: Vehicle front

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1

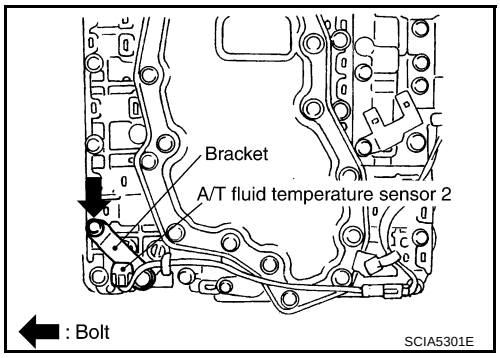


18. Remove control valve with TCM from transmission case.

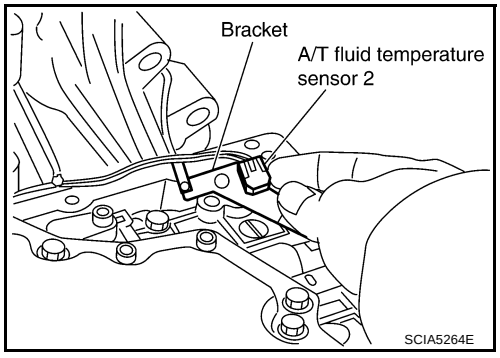
CAUTION:
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



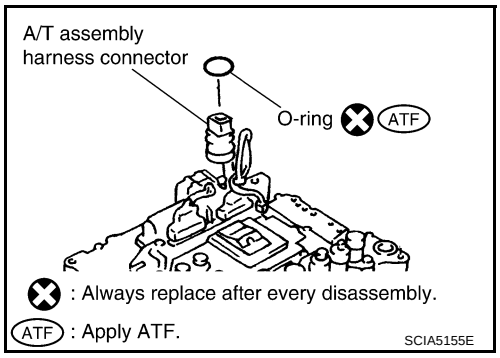
19. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



20. Remove bracket from A/T fluid temperature sensor 2.

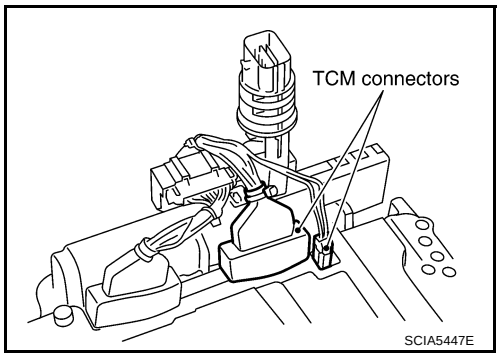


21. Remove O-ring from A/T assembly harness connector.

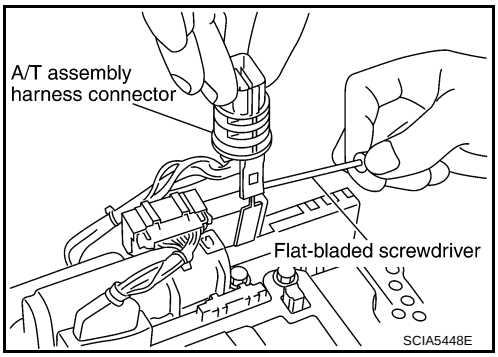


22. Disconnect TCM connectors.

CAUTION:
Be careful not to damage connectors.

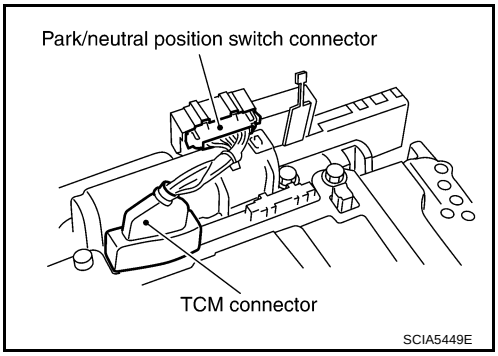


23. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.



24. Disconnect TCM connector and park/neutral position switch connector.

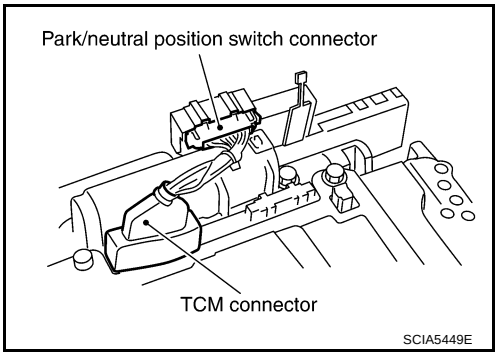
CAUTION:
Be careful not to damage connectors.



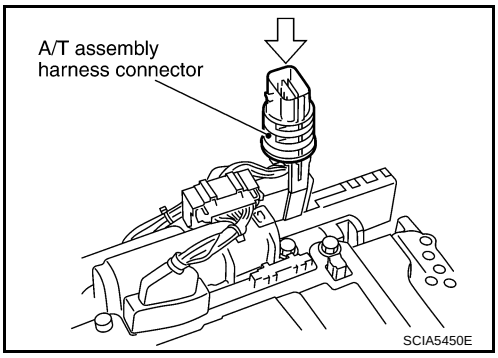
Installation

CAUTION:
After completing installation, check A/T fluid leakage and A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

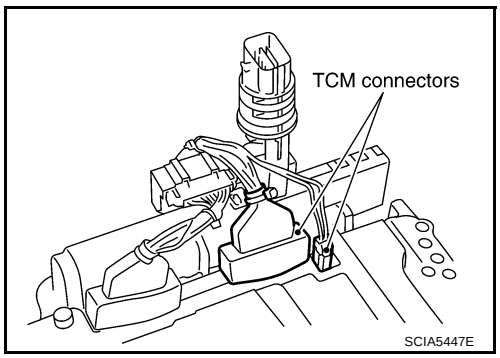
1. Connect TCM connector and park/neutral position switch connector.



2. Install A/T assembly harness connector from control valve with TCM.



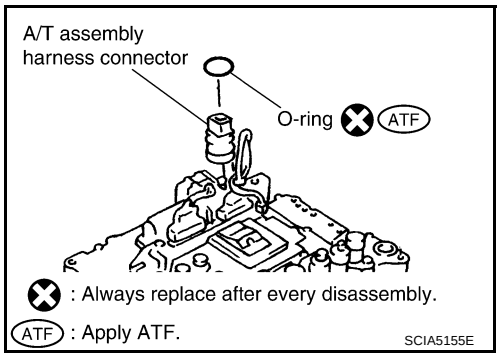
3. Connect TCM connectors.



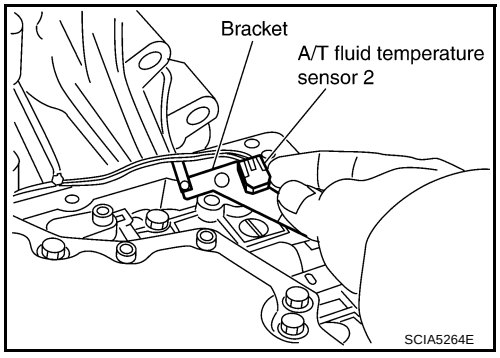
4. Install O-ring in A/T assembly harness connector.

CAUTION:

- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



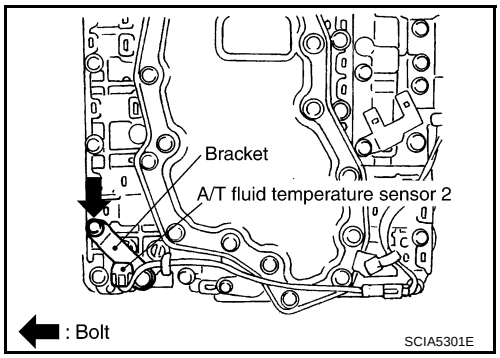
5. Install A/T fluid temperature sensor 2 to bracket.



6. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to AT-215, "COMPONENTS" .

CAUTION:

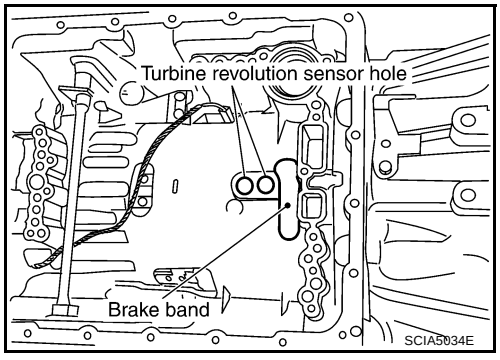
Adjust bolt hole of bracket to bolt hole of control valve with TCM.



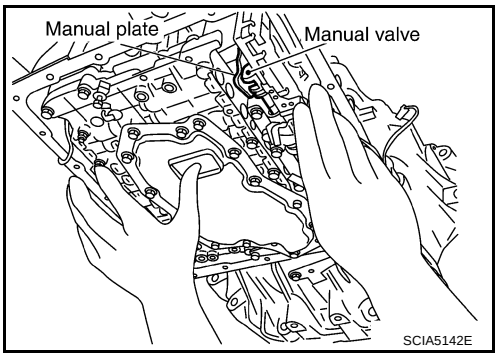
7. Install control valve with TCM in transmission case.

CAUTION:

- **Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.**
- **Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.**
- **Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.**

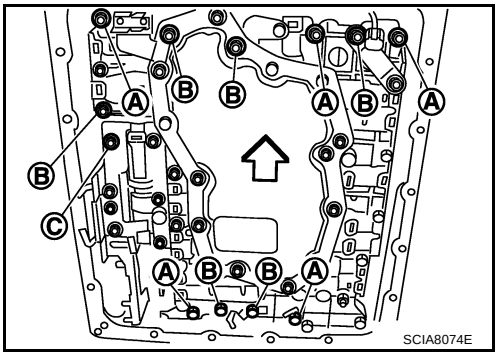


- **Assemble it so that manual valve cutout is engaged with manual plate projection.**

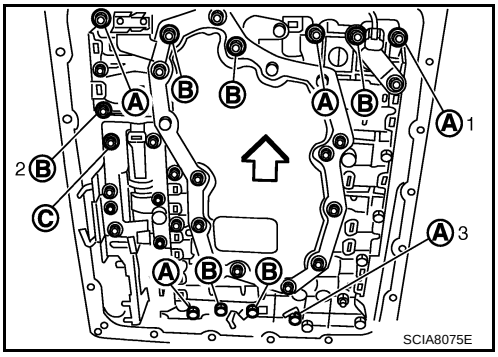


8. Install bolts (A), (B) and (C) in control valve with TCM.
   - ⇦: Vehicle front

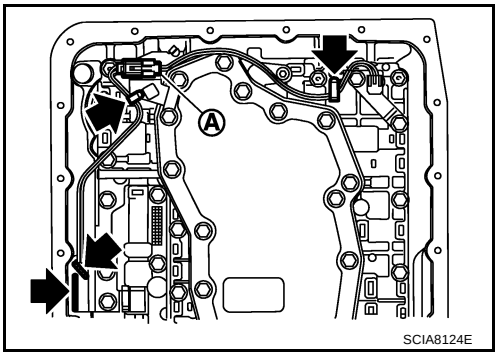
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



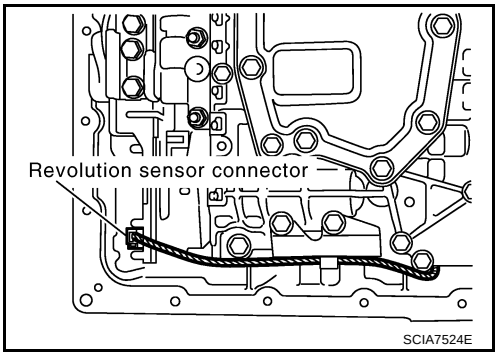
9. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts, and then tighten control valve with TCM mounting bolts to the specified torque. Refer to AT-215, "COMPONENTS" .
   - ⇦: Vehicle front



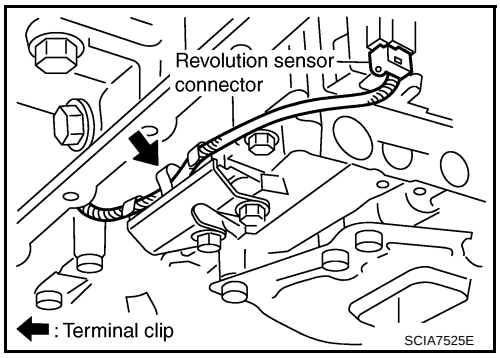
10. Connect A/T fluid temperature sensor 2 connector (A).
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips (⬅).



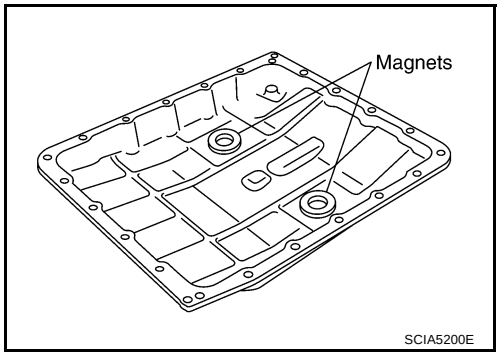
12. Connect revolution sensor connector.



13. Securely fasten revolution sensor harness with terminal clip.



14. Install magnets in oil pan.



15. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

CAUTION:

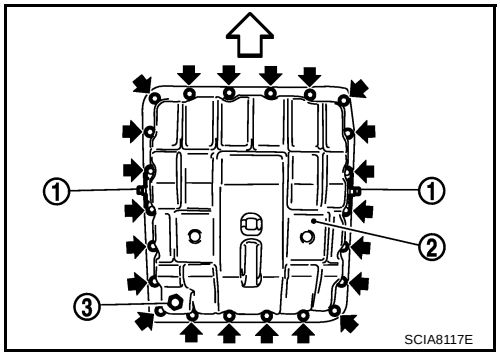
- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

- ⇦: Vehicle front
- ⬅: Oil pan mounting bolt

CAUTION:

- **Install it so that drain plug (3) comes to the position as shown in the figure.**
- **Be careful not to pinch harness.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**



c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-215, "COMPONENTS" .

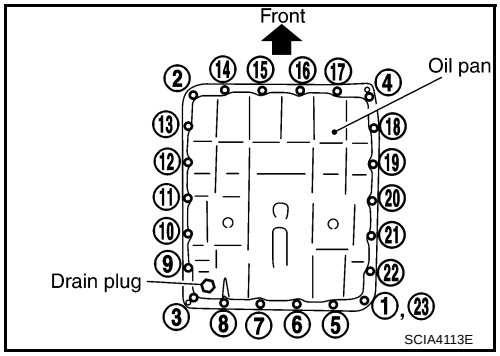
CAUTION:

Do not reuse oil pan mounting bolts.

16. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-215, "COMPONENTS" .

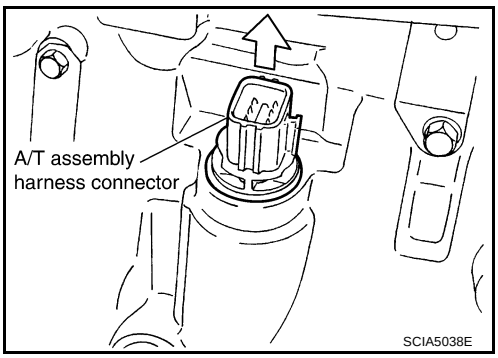
CAUTION:

Do not reuse drain plug gasket.

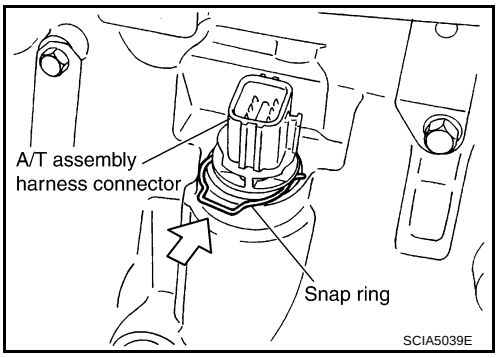


17. Pull up A/T assembly harness connector.

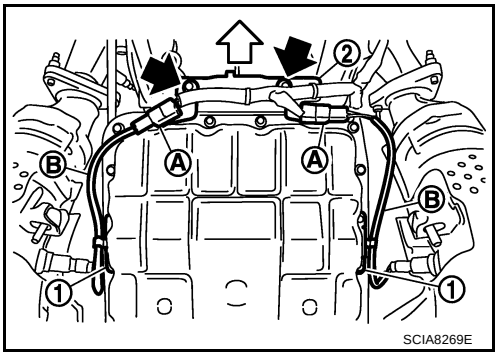
CAUTION:
Be careful not to damage connector.



18. Install snap ring to A/T assembly harness connector.
19. Connect A/T assembly harness connector.



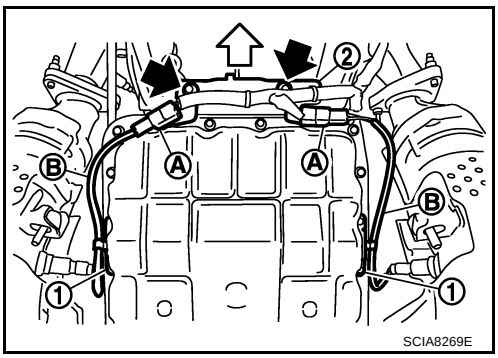
20. Install bracket (2) from transmission assembly. Refer to AT-215, "COMPONENTS" .
    - ⇦: Vehicle front
    - ⬅: Bolt
21. Install heated oxygen sensor 2 harness (B) from clips (1).
22. Connect heated oxygen sensor 2 harness connectors (A).
23. Install exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .
24. Pour ATF into A/T assembly. Refer to AT-12, "Changing A/T Fluid" .
25. Connect the battery cable to the negative terminal.



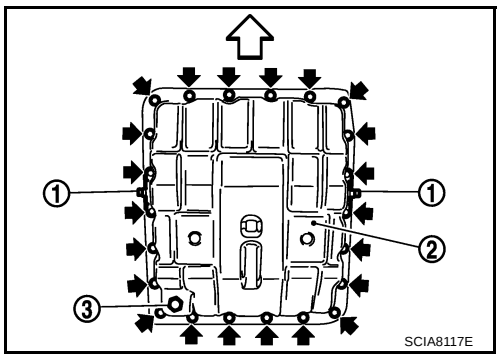
A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION

Removal

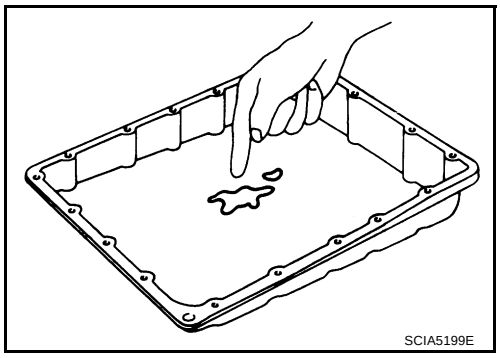
1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .
4. Disconnect heated oxygen sensor 2 harness connectors (A).
    - ⇦: Vehicle front
    - ⬅: Bolt
5. Remove heated oxygen sensor 2 harness (B) from clips (1).
6. Remove bracket (2) from transmission assembly.



7. Remove clips (1), oil pan (2) and oil pan gasket.
   - ⇦: Vehicle front
   - ⬅: Oil pan mounting bolt
   - Drain plug (3)



8. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**

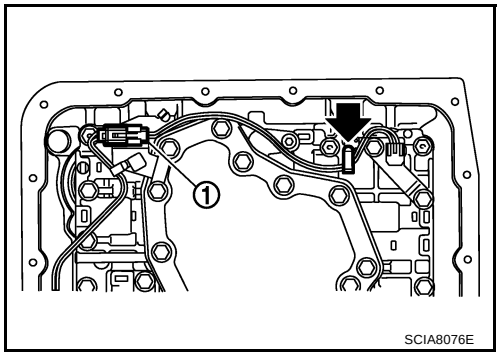


9. Disconnect A/T fluid temperature sensor 2 connector (1).

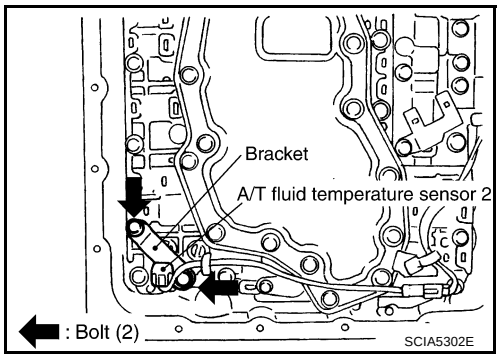
   CAUTION:

   Be careful not to damage connector.

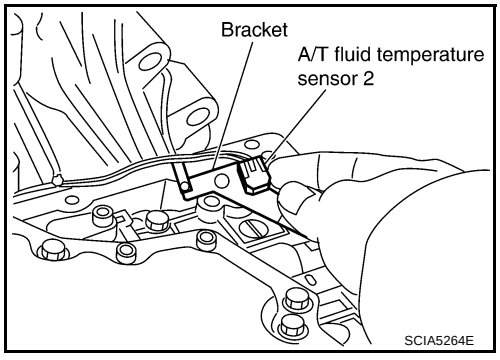
10. Straighten terminal clip (⬅) to free A/T fluid temperature sensor 2 harness.



11. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



12. Remove bracket from A/T fluid temperature sensor 2.

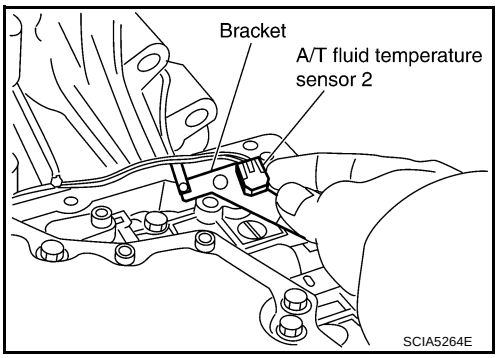


Installation

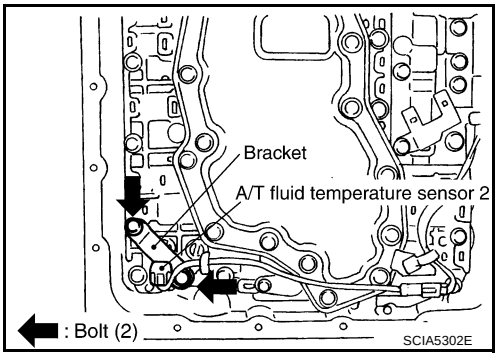
CAUTION:

After completing installation, check A/T fluid leakage and A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

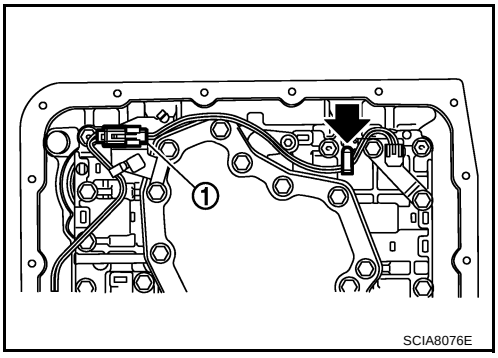
1. Install A/T fluid temperature sensor 2 to bracket.



2. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to AT-215, "COMPONENTS" .



3. Connect A/T fluid temperature sensor 2 connector (1).
4. Securely fasten A/T fluid temperature sensor 2 harness with terminal clip (⬅).



5. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

CAUTION:

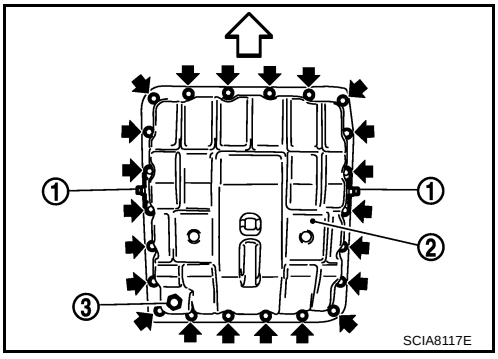
- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

- ⇦: Vehicle front
- ⬅: Oil pan mounting bolt

CAUTION:

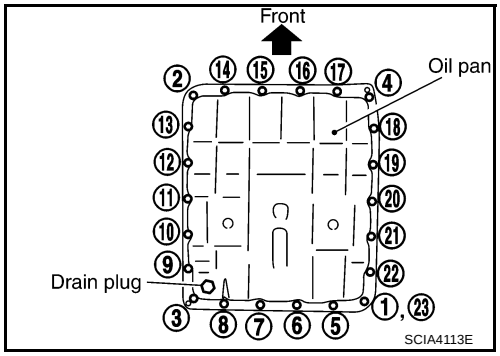
- **Install it so that drain plug (3) comes to the position as shown in the figure.**
- **Be careful not to pinch harness.**



- **Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-215, "COMPONENTS" .

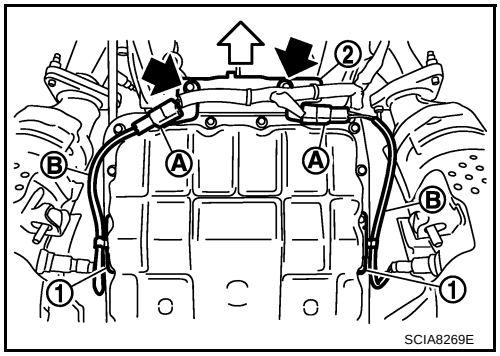
CAUTION:
Do not reuse oil pan mounting bolts.



6. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-215, "COMPONENTS" .

CAUTION:
Do not reuse drain plug gasket.

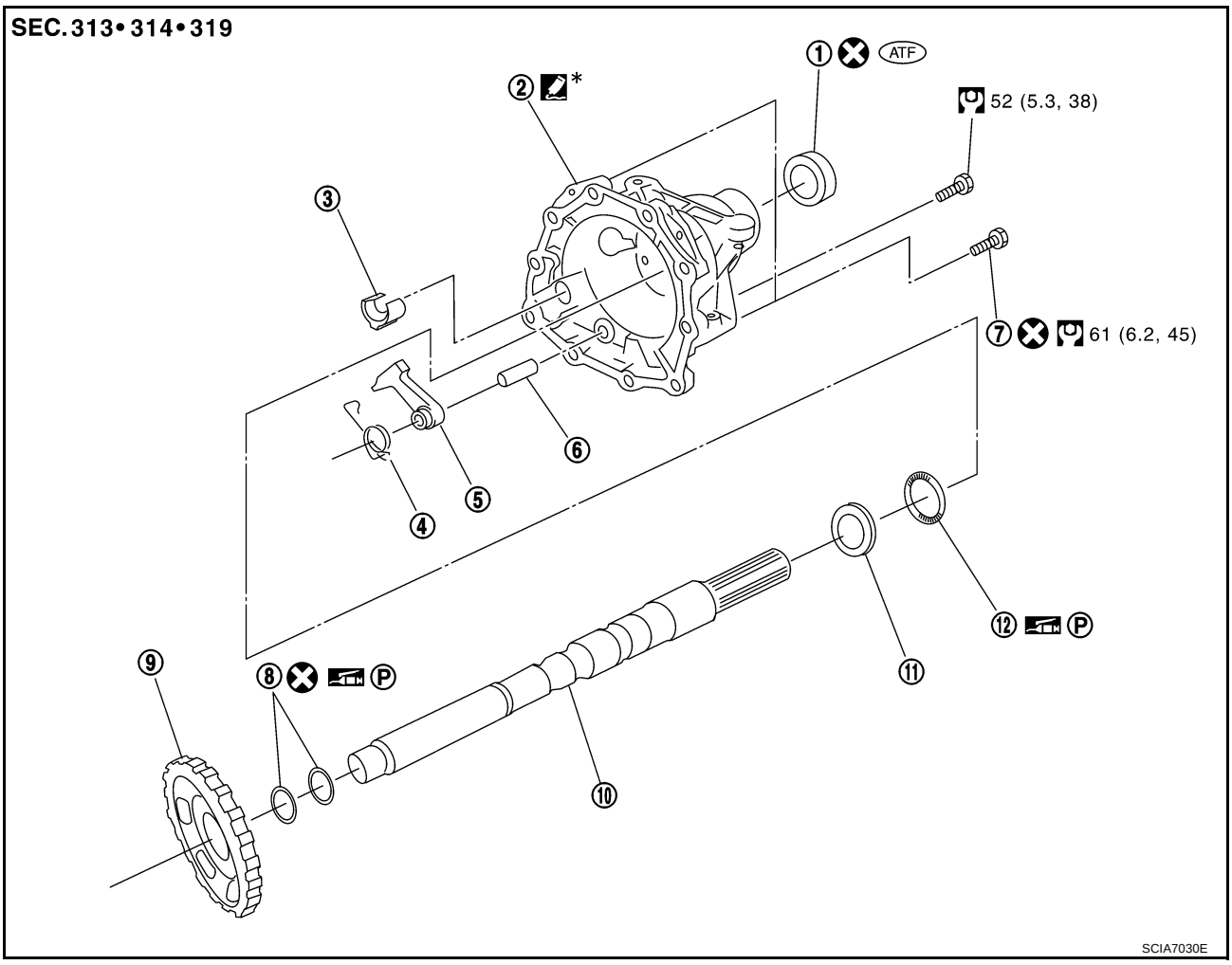
7. Install bracket (2) from transmission assembly. Refer to AT-215, "COMPONENTS" .
   - ⇦: Vehicle front
   - ⬅: Bolt
8. Install heated oxygen sensor 2 harness (B) from clips (1).
9. Connect heated oxygen sensor 2 harness connectors (A).
10. Install exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .
11. Pour ATF into A/T assembly. Refer to AT-12, "Changing A/T Fluid" .
12. Connect the battery cable to the negative terminal.



Parking Components

NCS00093

COMPONENTS



1.	Rear oil seal	2.	Rear extension	3.	Parking actuator support
4.	Return spring	5.	Parking pawl	6.	Pawl shaft
7.	Self-sealing bolt	8.	Seal ring	9.	Parking gear
10.	Output shaft	11.	Bearing race	12.	Needle bearing

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

However, refer to the following for others.

: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

REMOVAL

1. Drain ATF through drain hole.
2. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
3. Remove rear propeller shaft. Refer to PR-6, "Removal and Installation" .

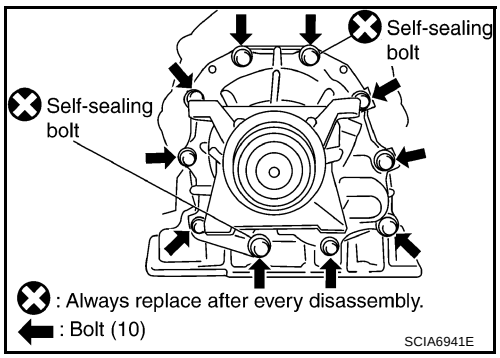
   CAUTION:

   Do not impact or damage propeller shaft tube.
4. Remove control rod. Refer to AT-205, "Control Rod Removal and Installation" .
5. Support A/T assembly with a transmission jack.

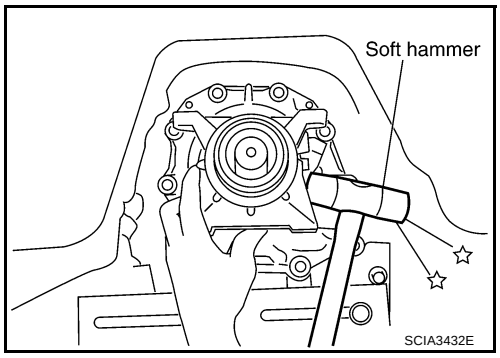
   CAUTION:

   When setting transmission jack, be careful not to allow it to collide against drain plug.
6. Remove rear engine mounting member with power tool. Refer to AT-242, "Removal and Installation" .

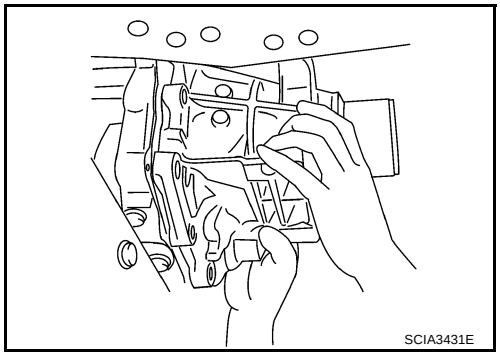
7. Remove tightening bolts for rear extension assembly and transmission case.



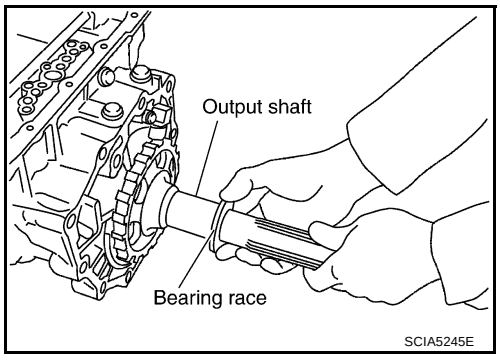
8. Tap rear extension assembly with soft hammer.



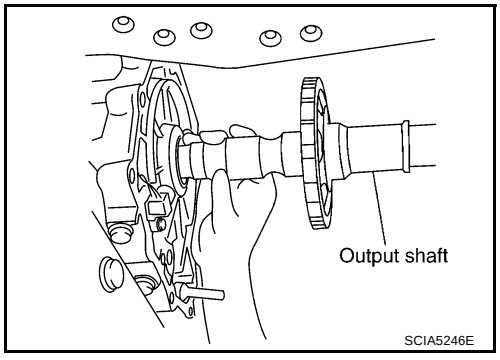
9. Remove rear extension assembly from transmission case. (With needle bearing.)



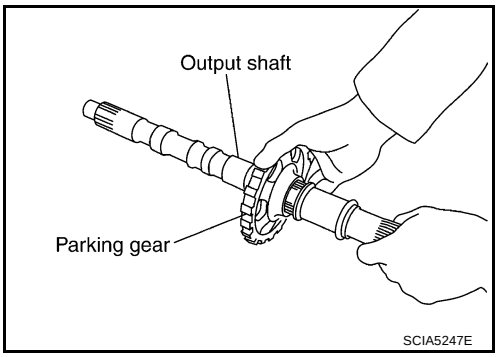
10. Remove bearing race from output shaft.



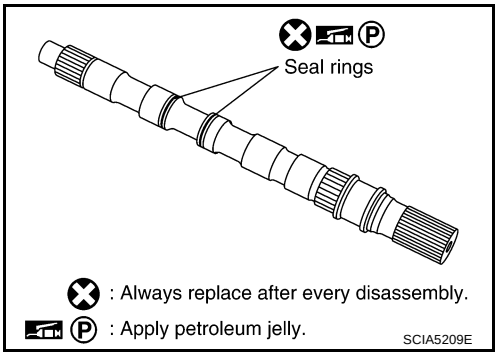
11. Remove output shaft from transmission case by rotating left/right.



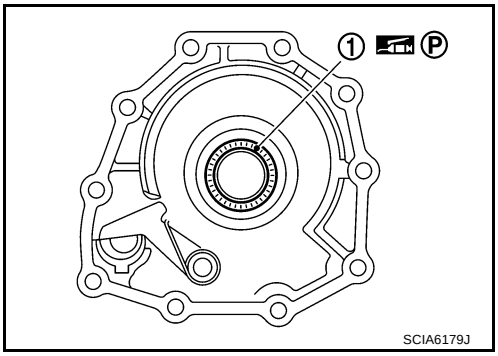
12. Remove parking gear from output shaft.



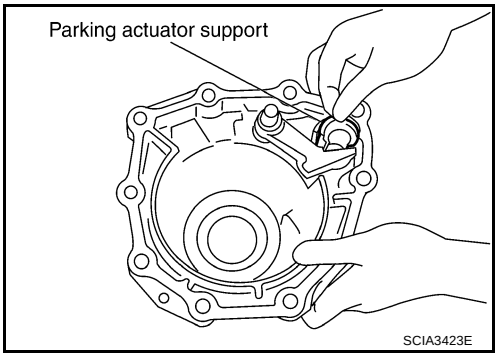
13. Remove seal rings from output shaft.



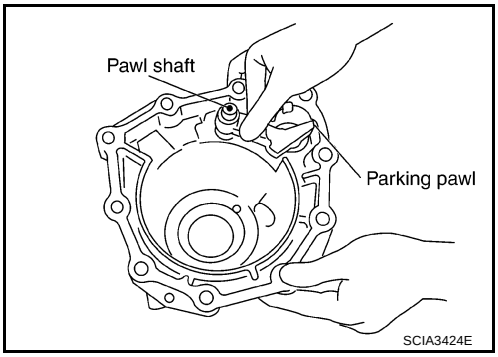
14. Remove needle bearing (1) from rear extension.



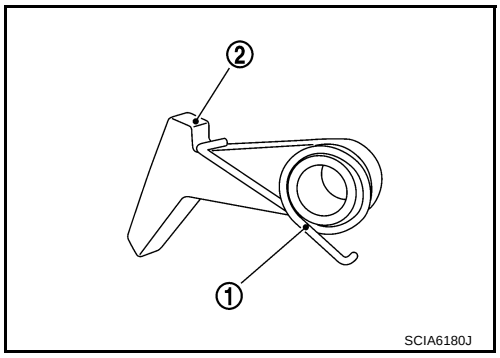
15. Remove parking actuator support from rear extension.



16. Remove parking pawl (with return spring) and pawl shaft from rear extension.



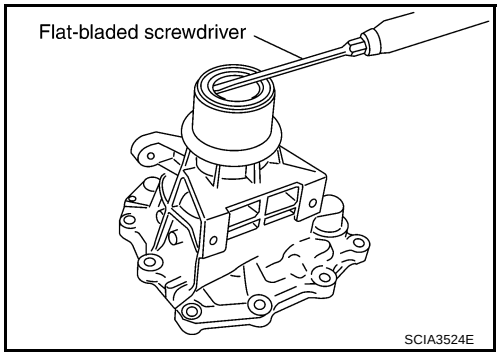
17. Remove return spring (1) from parking pawl (2).



18. Remove rear oil seal from rear extension.

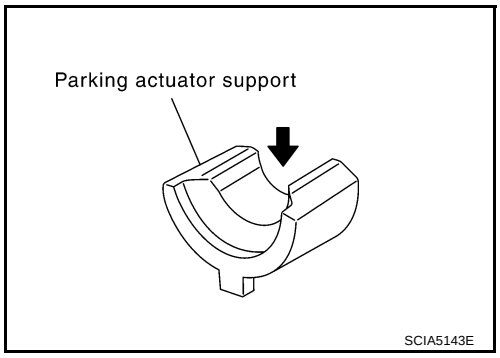
CAUTION:

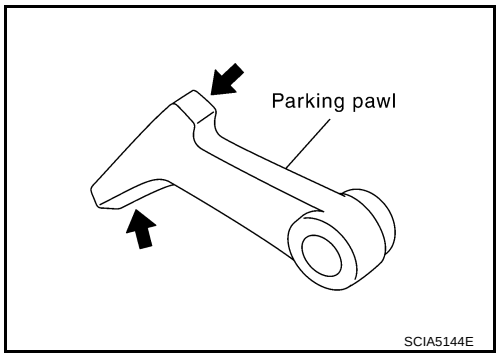
Be careful not to scratch rear extension.



INSPECTION

- If the contact surface on parking actuator support, parking pawl, etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



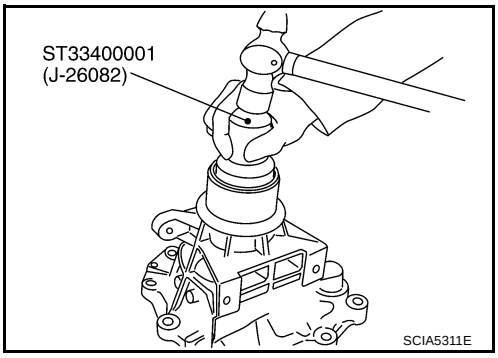


INSTALLATION

CAUTION:

After completing installation, check A/T position, A/T fluid leakage and A/T fluid level. Refer to AT-206, "Checking of A/T Position" , AT-12, "Checking A/T Fluid" .

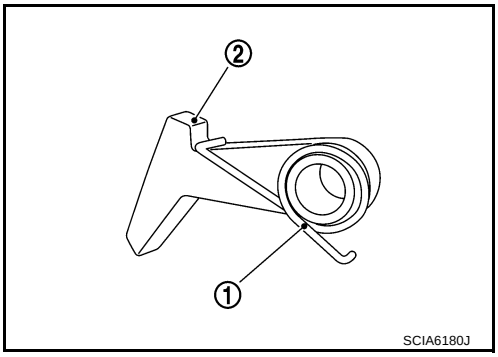
1. As shown in the figure, use a drift to drive rear oil seal into the rear extension until it is flush.



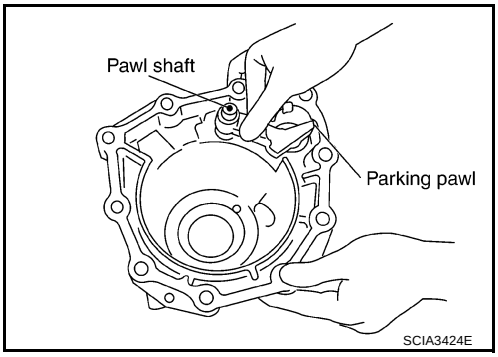
CAUTION:

- **Do not reuse rear oil seal.**
- **Apply ATF to rear oil seal.**

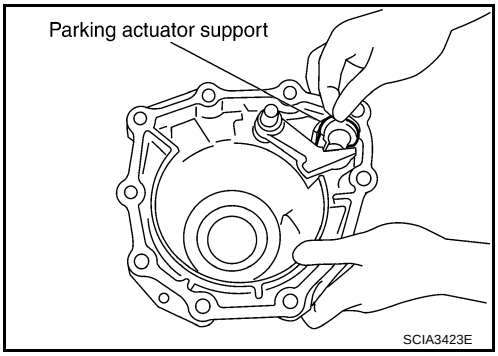
2. Install return spring (1) to parking pawl (2).



3. Install parking pawl (with return spring) and pawl shaft to rear extension.



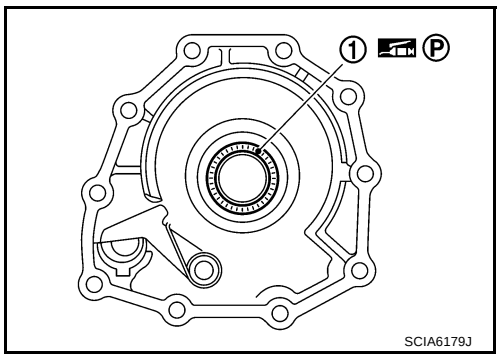
4. Install parking actuator support to rear extension.



5. Install needle bearing (1) to rear extension.

CAUTION:

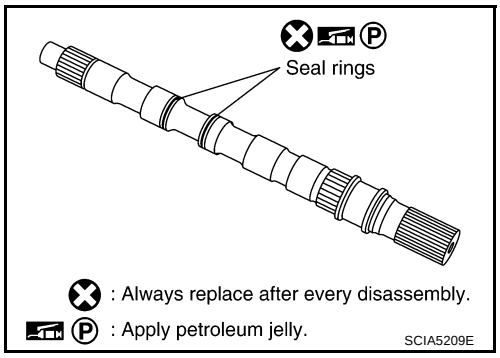
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



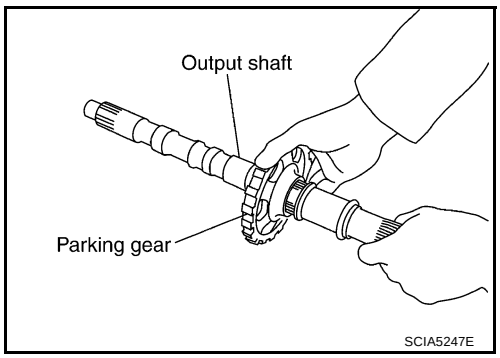
6. Install seal rings in output shaft.

CAUTION:

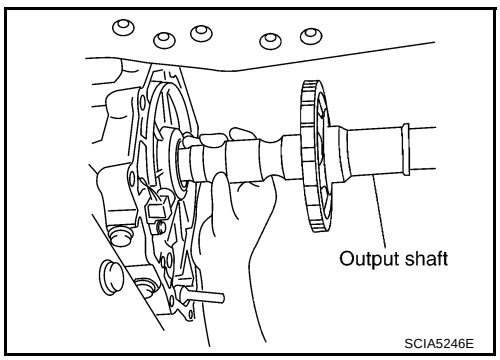
- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



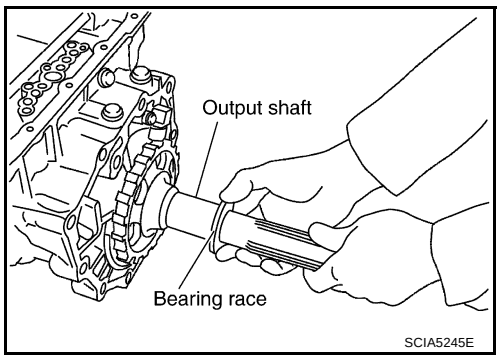
7. Install parking gear to output shaft.



8. Install output shaft to transmission case.

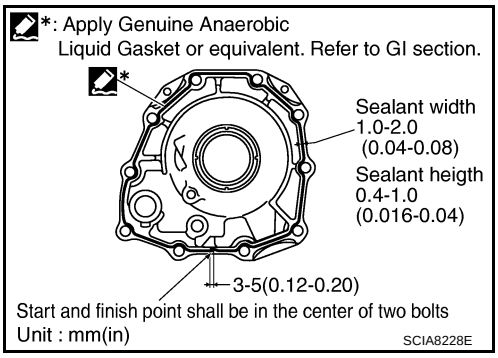


9. Install bearing race to output shaft.



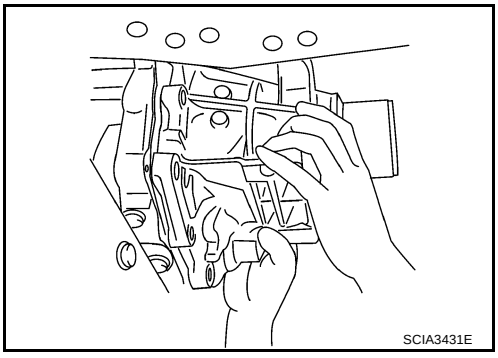
10. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in the figure.

CAUTION:
Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



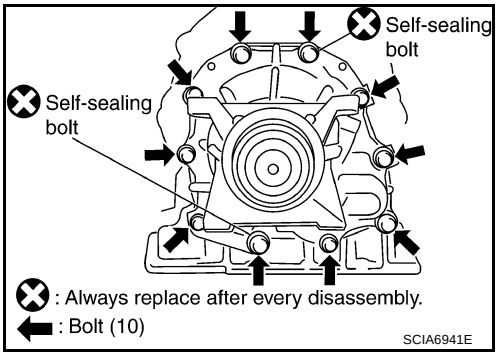
11. Install rear extension assembly to transmission case. (With needle bearing.)

CAUTION:
Insert the tip of parking rod between parking pawl and parking actuator support when assembling rear extension assembly.



12. Tighten rear extension assembly mounting bolts to the specified torque. Refer to AT-227, "COMPONENTS" .

CAUTION:
Do not reuse self-sealing bolts.



13. Install rear engine mounting member. Refer to AT-242, "Removal and Installation" .
14. Install control rod. Refer to AT-205, "Control Rod Removal and Installation" .
15. Install rear propeller shaft. Refer to PR-6, "Removal and Installation" .

CAUTION:
Do not impact or damage propeller shaft tube.

16. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .
17. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-215, "COMPONENTS" .

CAUTION:
Do not reuse drain plug gasket.

18. Pour ATF into A/T assembly. Refer to AT-12, "Changing A/T Fluid" .

Rear Oil Seal

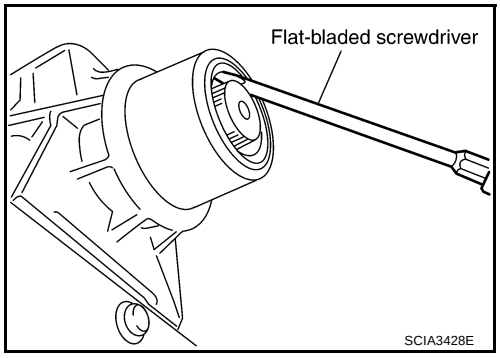
NCS00094

REMOVAL

1. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
2. Remove rear propeller shaft. Refer to PR-6, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
3. Remove rear oil seal using a flat-bladed screwdriver.

   CAUTION:
   Be careful not to scratch rear extension assembly.



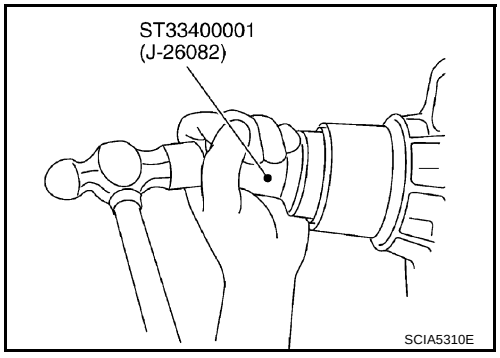
INSTALLATION

CAUTION:
After completing installation, check A/T fluid leakage and A/T fluid level. Refer to AT-12, "Checking A/T Fluid" .

1. As shown in the figure, use the drift to drive rear oil seal into rear extension assembly until it is flush.

   CAUTION:
   - **Do not reuse rear oil seal.**
   - **Apply ATF to rear oil seal.**
2. Install rear propeller shaft. Refer to PR-6, "Removal and Installation" .

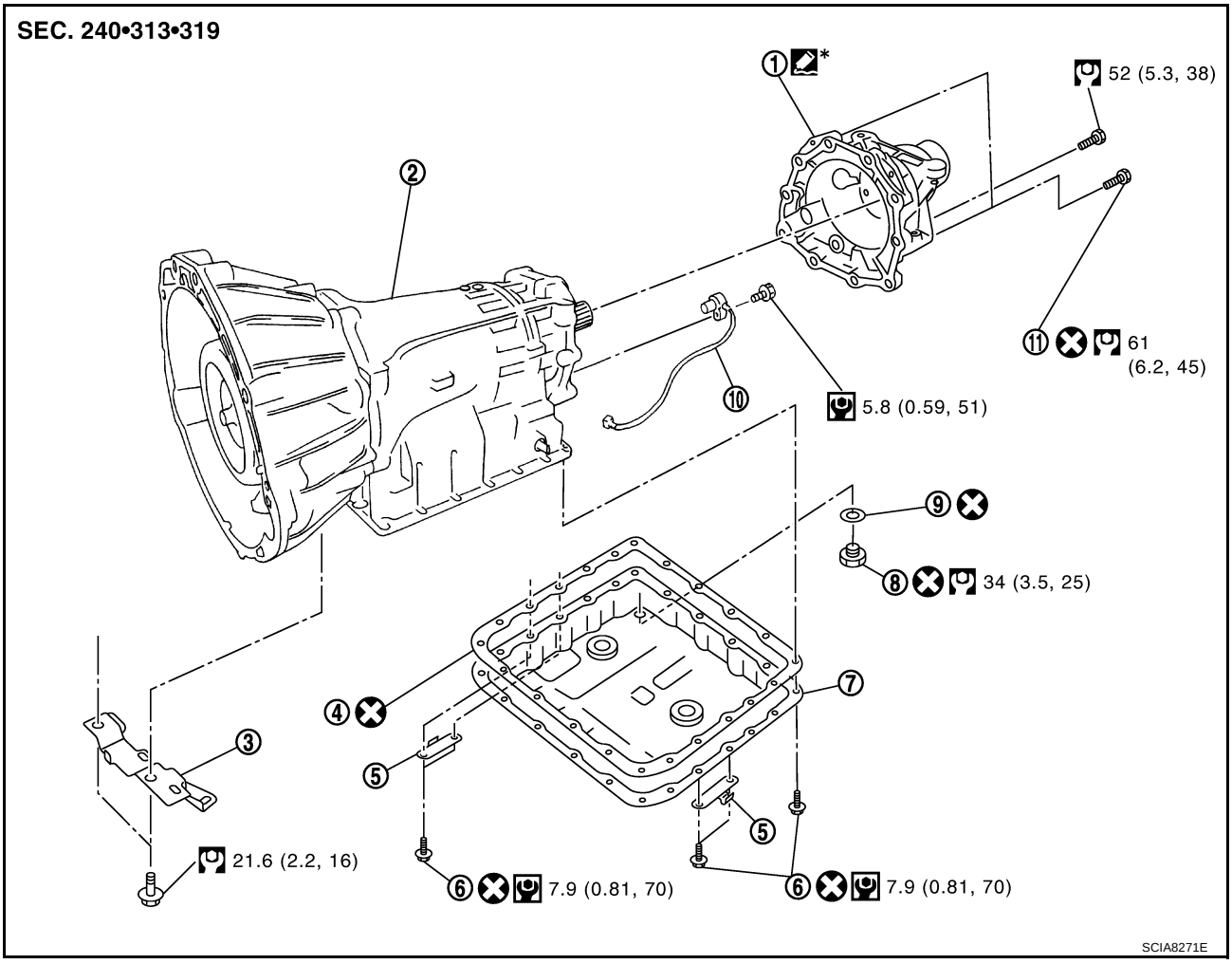
   CAUTION:
   Do not impact or damage propeller shaft tube.
3. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .



Revolution Sensor

NCS00095

COMPONENTS



1. Rear extension	2. A/T	3. Bracket
4. Oil pan gasket	5. Clip	6. Oil pan mounting bolt
7. Oil pan	8. Drain plug	9. Drain plug gasket
10. Revolution sensor	11. Self-sealing bolt	

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

However, refer to the following for others.

: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

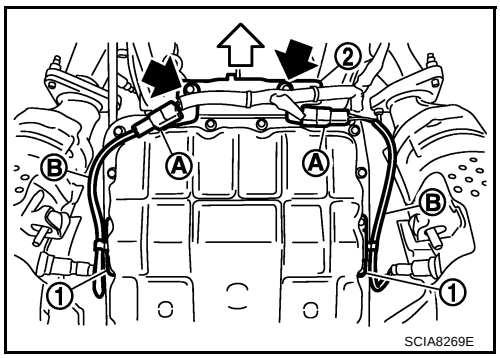
REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
4. Remove rear propeller shaft. Refer to PR-6, "Removal and Installation" .

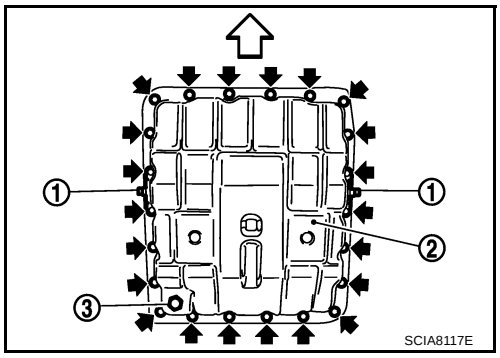
   CAUTION:

   Do not impact or damage propeller shaft tube.
5. Remove control rod. Refer to AT-205, "Control Rod Removal and Installation" .
6. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .

7. Disconnect heated oxygen sensor 2 harness connectors (A).
   - ⇦: Vehicle front
   - ⬅: Bolt
8. Remove heated oxygen sensor 2 harness (B) from clips (1).
9. Remove bracket (2) from transmission assembly.

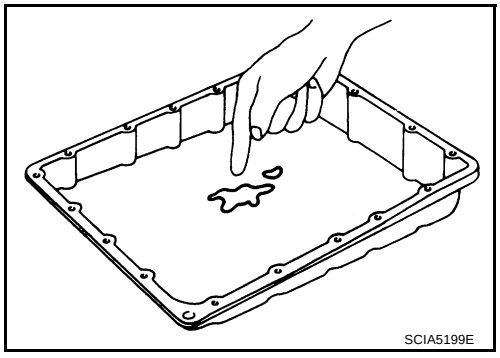


10. Remove clip (1), oil pan (2) and oil pan gasket.
    - ⇦: Vehicle front
    - ⬅: Oil pan mounting bolt
    - Drain plug (3)

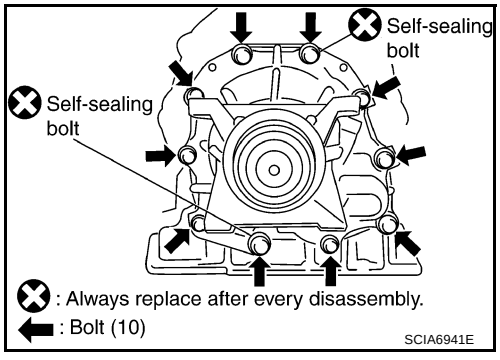


11. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
    - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**
12. Support transmission assembly with a transmission jack.

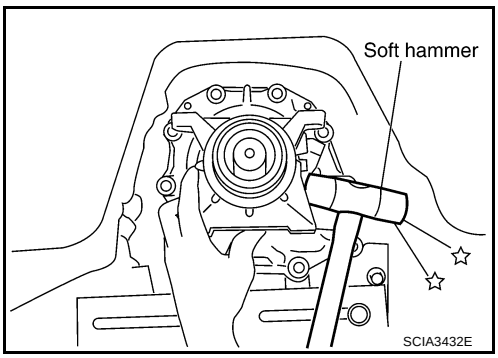
    CAUTION:
    When setting transmission jack, place wooden blocks to prevent from damaging control valve with TCM and transmission case.



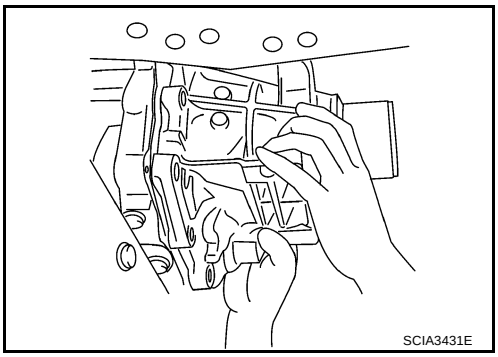
13. Remove rear engine mounting member with power tool. Refer to AT-242, "Removal and Installation" .
14. Remove tightening bolts for rear extension assembly and transmission case.



15. Tap rear extension assembly with soft hammer.



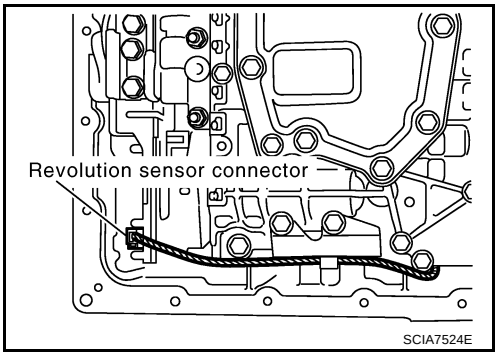
16. Remove rear extension assembly from transmission case. (With needle bearing.)



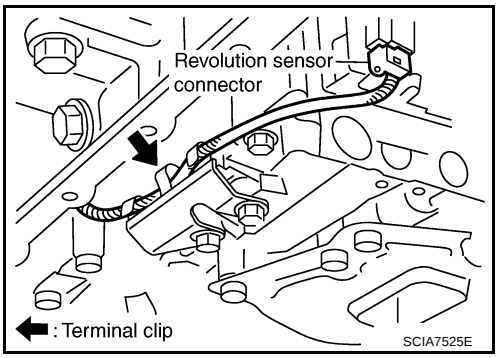
17. Disconnect revolution sensor connector.

CAUTION:

Be careful not to damage connector.



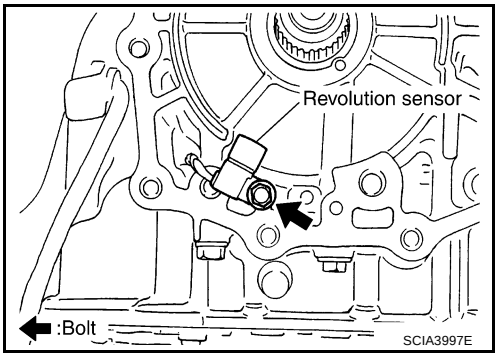
18. Straighten terminal clip to free revolution sensor harness.



19. Remove revolution sensor from transmission case.

CAUTION:

- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

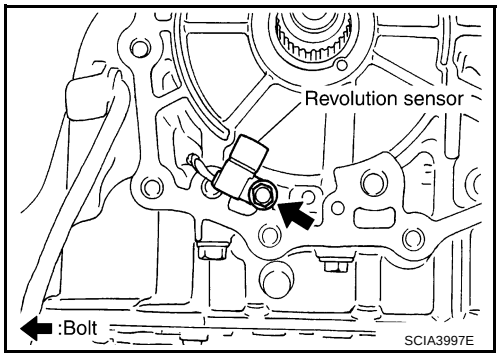


INSTALLATION

CAUTION:

After completing installation, check A/T position, A/T fluid leakage and A/T fluid level. Refer to AT-206, "Checking of A/T Position" , AT-12, "Checking A/T Fluid" .

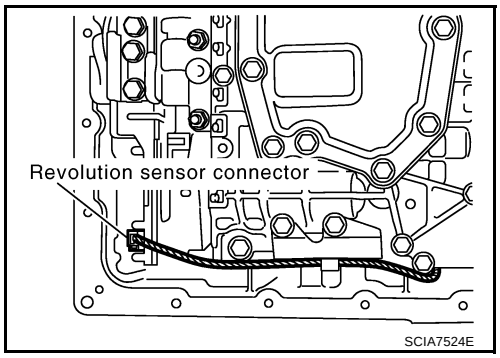
1. Install revolution sensor in transmission case, and then tighten a revolution sensor mounting blot to the specified torque. Refer to AT-235, "COMPONENTS" .



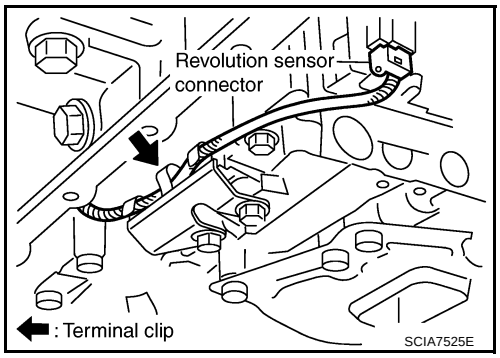
CAUTION:

- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

2. Connect revolution sensor connector.



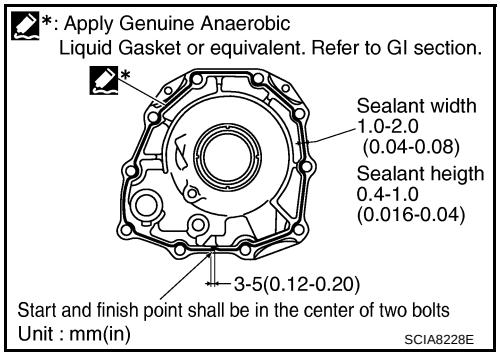
3. Securely fasten revolution sensor harness with clip.



4. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in illustration.

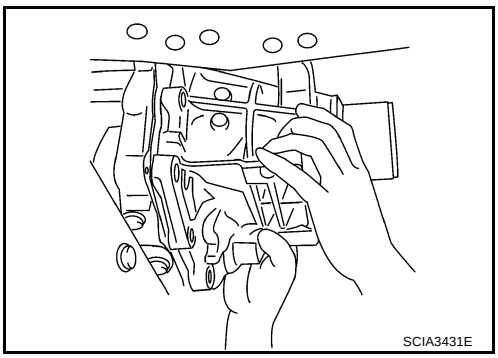
CAUTION:

Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



5. Install rear extension assembly to transmission case. (With needle bearing.)

CAUTION:
Insert the tip of parking rod between parking pawl and parking actuator support when assembling rear extension assembly.



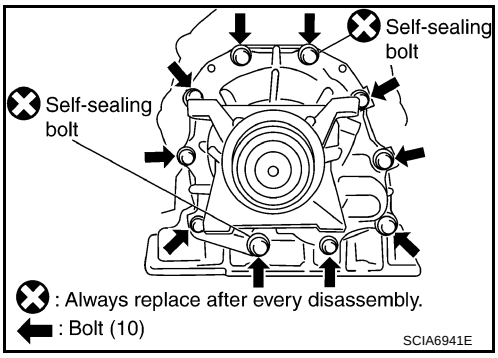
6. Tighten rear extension assembly mounting bolts to the specified torque. Refer to AT-235, "COMPONENTS" .

CAUTION:
Do not reuse self-sealing bolts.

7. Install rear engine mounting member. Refer to AT-242, "Removal and Installation" .
8. Install oil pan to transmission case.

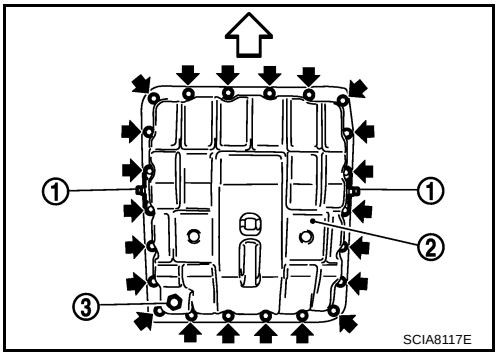
a. Install oil pan gasket to oil pan.

CAUTION:
- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**



b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.
- ⇦: Vehicle front
- ⬅: Oil pan mounting bolt

CAUTION:
- **Install it so that drain plug (3) comes to the position as shown in the figure.**
- **Be careful not to pinch harness.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

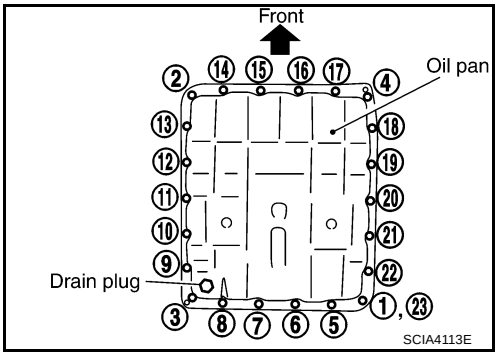


c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-235, "COMPONENTS" .

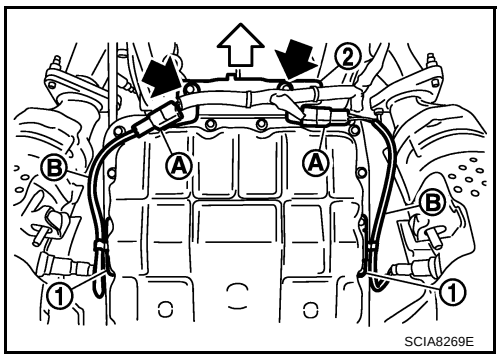
CAUTION:
Do not reuse oil pan mounting bolts.

9. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-235, "COMPONENTS" .

CAUTION:
Do not reuse drain plug gasket.



10. Install bracket (2) from transmission assembly. Refer to AT-215, "COMPONENTS" .
    - ⇦: Vehicle front
    - ⬅: Bolt
11. Install heated oxygen sensor 2 harness (B) from clips (1).
12. Connect heated oxygen sensor 2 harness connectors (A).
13. Install exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .
14. Install control rod. Refer to AT-205, "Control Rod Removal and Installation" .



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15. Install rear propeller shaft. Refer to PR-6, "Removal and Installation" .

    CAUTION:
    Do not impact or damage propeller shaft tube.
16. Install exhaust front tube and center muffler. Refer to EX-3, "Removal and Installation" .
17. Pour ATF into A/T assembly. Refer to AT-12, "Changing A/T Fluid" .
18. Connect the battery cable to the negative terminal.

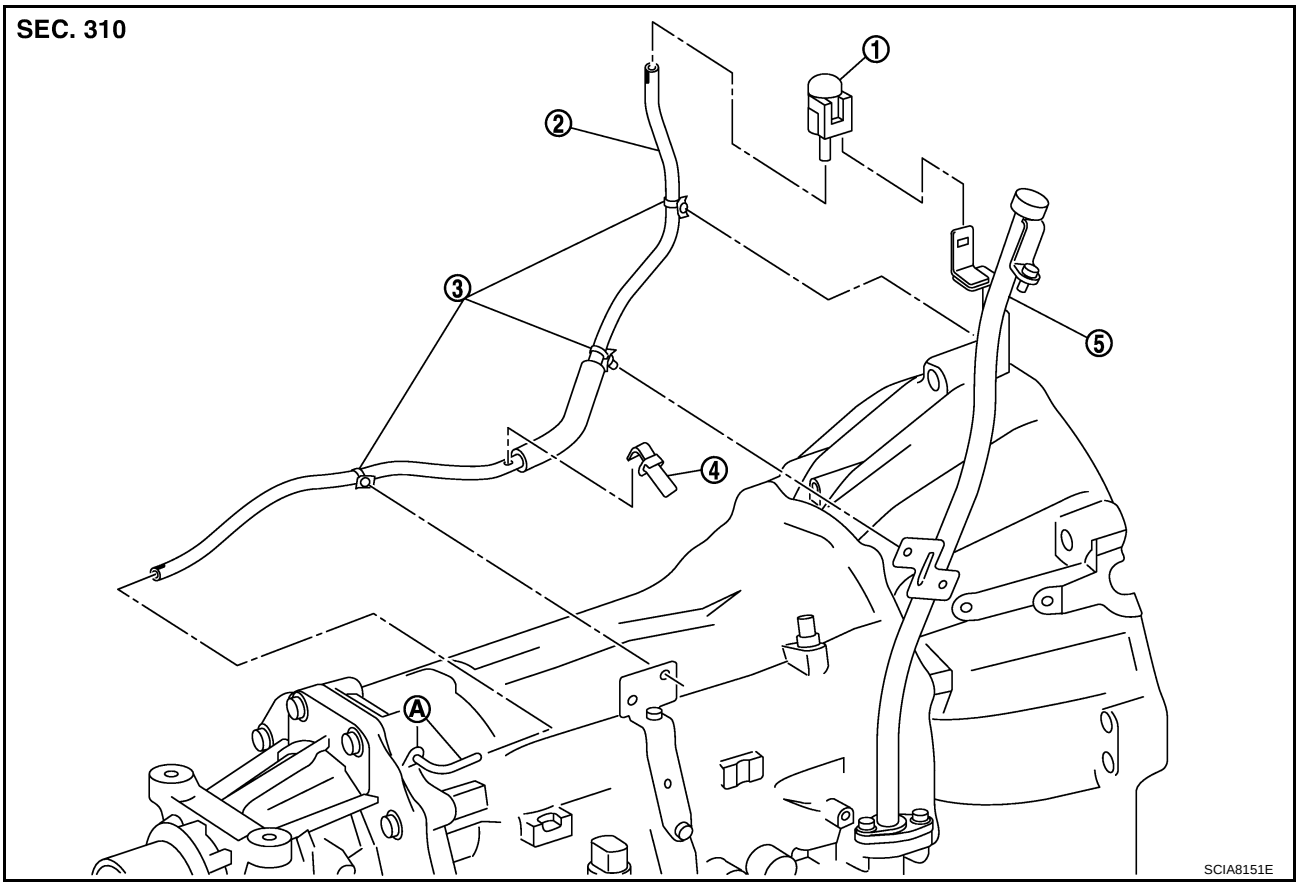
AIR BREATHER HOSE

PFP:31098

Removal and Installation

NCS00096

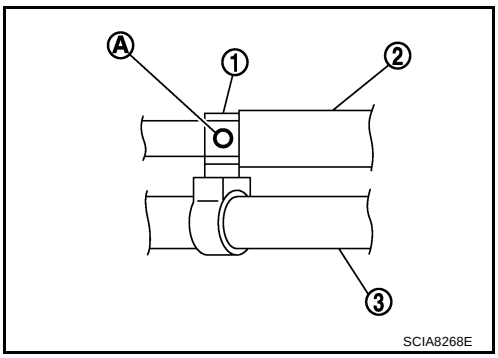
Refer to the figure below for air breather hose removal and installation procedure.



1. Air breather box
2. Air breather hose
3. Clip
4. Clip
5. A/T fluid charging pipe
A. Air breather tube

CAUTION:

- **When installing an air breather hose, do not to crush or block by folding or bending the hose.**
- **When inserting air breather hose to air breather tube, be sure to insert it fully until its end reaches the tube bend R portion.**
- **Install A/T air breather hose to air breather tube so that the paint mark is facing upward.**
- **Ensure clips are securely installed to brackets when installing A/T breather hose to brackets.**
- **When inserting air breather hose to air breather box, be sure to insert it fully until its end reaches the stop.**
- **Install A/T air breather hose to air breather box so that the paint mark is facing backward.**
- **Install clip (1) at the paint mark (A).**
  - **Air breather hose (2)**
  - **Harness (3)**

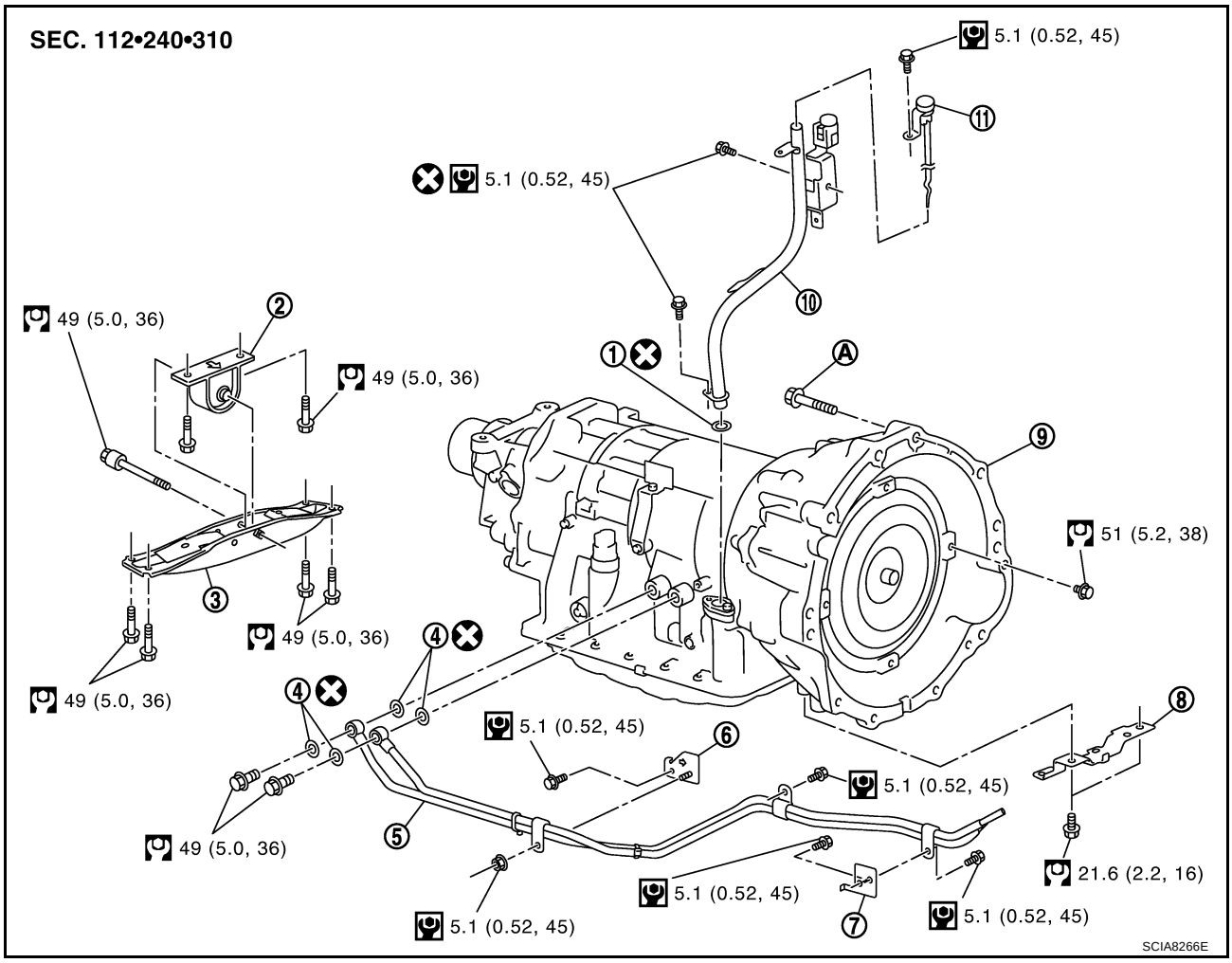


TRANSMISSION ASSEMBLY

PFP:31020

Removal and Installation

NCS00097



1. O-ring	2. Engine mounting insulator (rear)	3. Rear engine mounting member
4. Copper washer	5. Fluid cooler tube	6. Bracket
7. Bracket	8. Bracket	9. A/T assembly
10. A/T fluid charging pipe	11. A/T fluid level gauge	

A. For tightening torque, refer to AT-244, "INSTALLATION" .

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

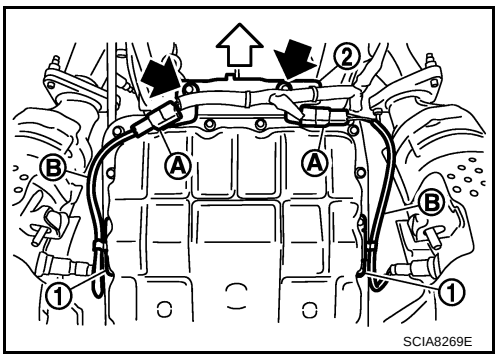
REMOVAL

CAUTION:

- **When removing A/T assembly from engine assembly, first remove crankshaft position sensor (POS) from A/T assembly.**
- **Be careful not to damage sensor edge.**

1. Disconnect the battery cable from the negative terminal.
2. Remove tower bar with power tool. Refer to FSU-20, "Removal and Installation" .
3. Remove engine under covers with power tool.
4. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .

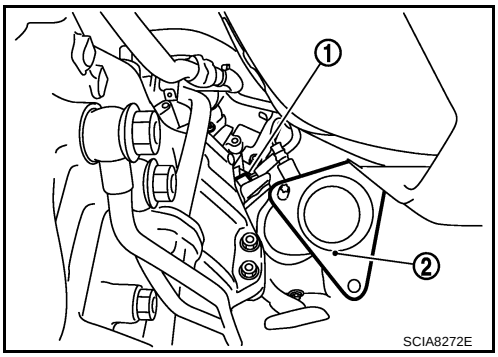
5. Disconnect heated oxygen sensor 2 harness connectors (A).
   - ⇦: Vehicle front
   - ⬅: Bolt
6. Remove heated oxygen sensor 2 harness (B) from clips (1).
7. Remove bracket (2) from transmission assembly.
8. Remove front cross bar with power tool. Refer to FSU-8, "Components" .
9. Remove exhaust front tube and center muffler with power tool. Refer to EX-3, "Removal and Installation" .
10. Remove three way catalyst (right bank) and three way catalyst (left bank). Refer to EM-22, "Removal and Installation" .



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11. Remove crankshaft position sensor (POS) (1). Refer to EM-26, "Removal and Installation" .
    - Three way catalyst (right bank) (2)

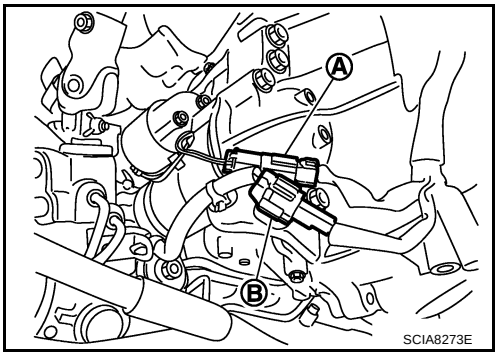
    CAUTION:
    - **Do not subject it to impact by dropping or hitting it.**
    - **Do not disassemble.**
    - **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
    - **Do not place in an area affected by magnetism.**



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12. Remove rear propeller shaft. Refer to PR-6, "Removal and Installation" .

    CAUTION:
    Do not impact, or damage propeller shaft tube.
13. Remove control rod. Refer to AT-205, "Control Rod Removal and Installation" .
14. Disconnect the following:
    - A/T assembly harness connector
    - S terminal connector (A)
    - EPS solenoid valve harness connector (B)
15. Remove starter motor with power tool. Refer to SC-17, "Removal and Installation" .
16. Remove A/T fluid level gauge.
17. Remove A/T fluid charging pipe
18. Remove O-ring from A/T fluid charging pipe.
19. Remove fluid cooler tube according to the following procedure.



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a. Remove mounting nuts of the engine mounting insulator (LH) and engine mounting insulator (RH) on the undersurface of the vehicle. Refer to EM-101, "Removal and Installation" .
b. Push engine assembly upward from the vehicle with transmission jack to create clearance for removing fluid cooler tube.

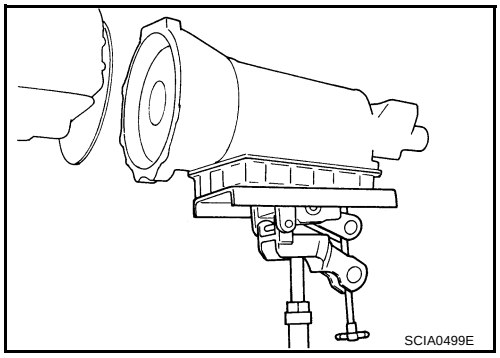
   CAUTION:
   Be careful with hoses and harness when pushing up the engine assembly.
c. Remove fluid cooler tube.

20. Plug up openings such as A/T fluid charging pipe hole, etc.
21. Remove rear plate cover from converter housing. Refer to EM-26, "Removal and Installation" .
22. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.

    CAUTION:
    When turning crankshaft, turn it clockwise as viewed from the front of the engine.
23. Support A/T assembly with a transmission jack.

    CAUTION:
    When setting the transmission jack, be careful not to allow it to collide against the drain plug.
24. Remove rear engine mounting member with power tool. Refer to AT-242, "Removal and Installation" .

25. Remove engine mounting insulator (rear) with power tool. Refer to AT-242, "Removal and Installation" .
26. Remove bolts fixing A/T assembly to engine assembly with power tool.
27. Remove A/T assembly from vehicle with a transmission jack.
    - **Secure torque converter to prevent it from dropping.**
    - **Secure A/T assembly to a transmission jack.**
28. Remove air breather hose. Refer to AT-241, "Removal and Installation" .

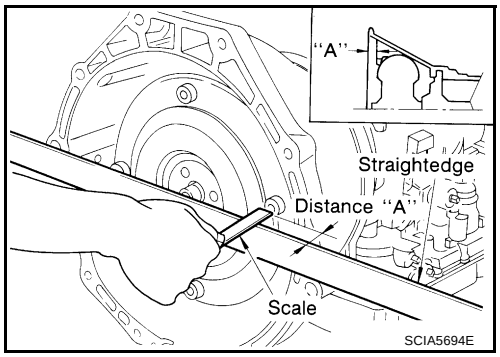


INSPECTION

Installation and Inspection of Torque Converter

- After inserting a torque converter to a A/T, be sure to check distance “A” to ensure it is within the reference value limit.

Distance “A”: 25.0 mm (0.98 in) or more

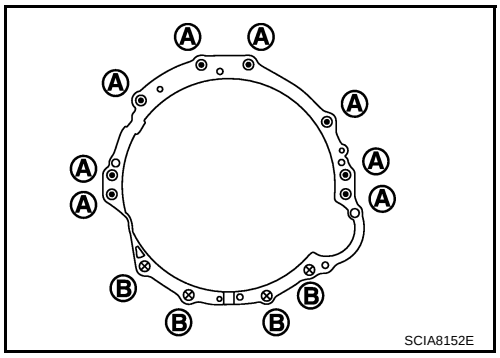


INSTALLATION

Install the removed parts in the reverse order of the removal, while paying attention to the following work.

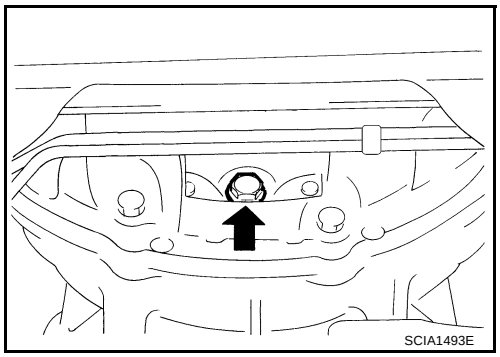
- When installing A/T assembly to the engine assembly, attach the fixing bolts in accordance with the following standard.
  - ⊗: Engine to transmission
  - ⦿: Transmission to engine

Bolt symbol	A	B
Number of bolts	8	4
Bolt length mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)	46.6 (4.8, 34)



- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then tighten the bolts with the specified torque.

: 51 N·m (5.2 kg-m, 38 ft-lb)



CAUTION:

- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for torque converter after fixing crankshaft pulley bolts, be sure to confirm the tightening torque of crankshaft pulley mounting bolts. Refer to EM-53, "TIMING CHAIN" .**
- **After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.**
- Install crankshaft position sensor (POS). Refer to EM-26, "Removal and Installation" .

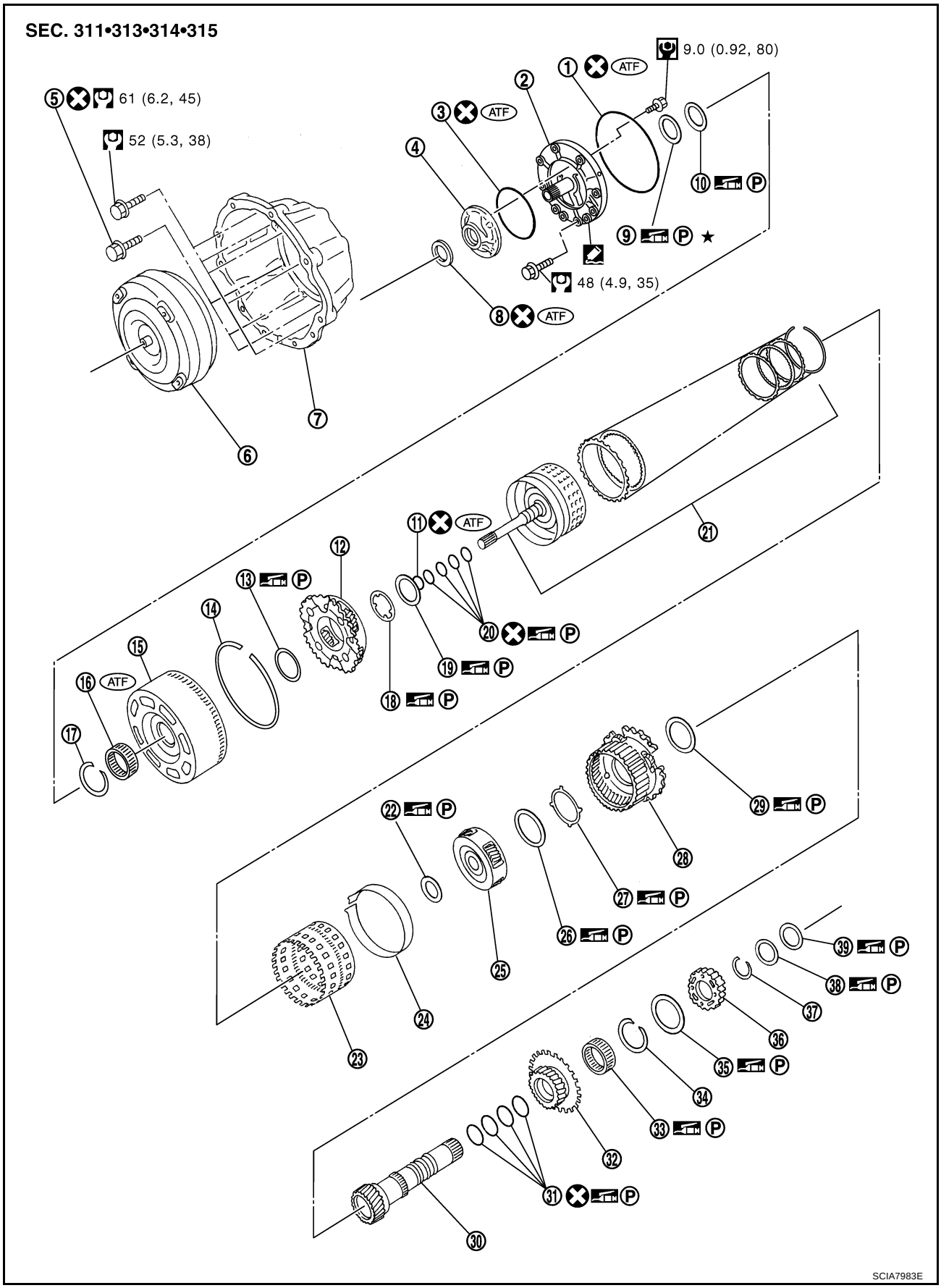
- After completing installation, check A/T fluid leakage, A/T fluid level and A/T position. Refer to AT-12, "Checking A/T Fluid" , AT-206, "Checking of A/T Position" .

OVERHAUL

PFP:00000

Components

NCS00098



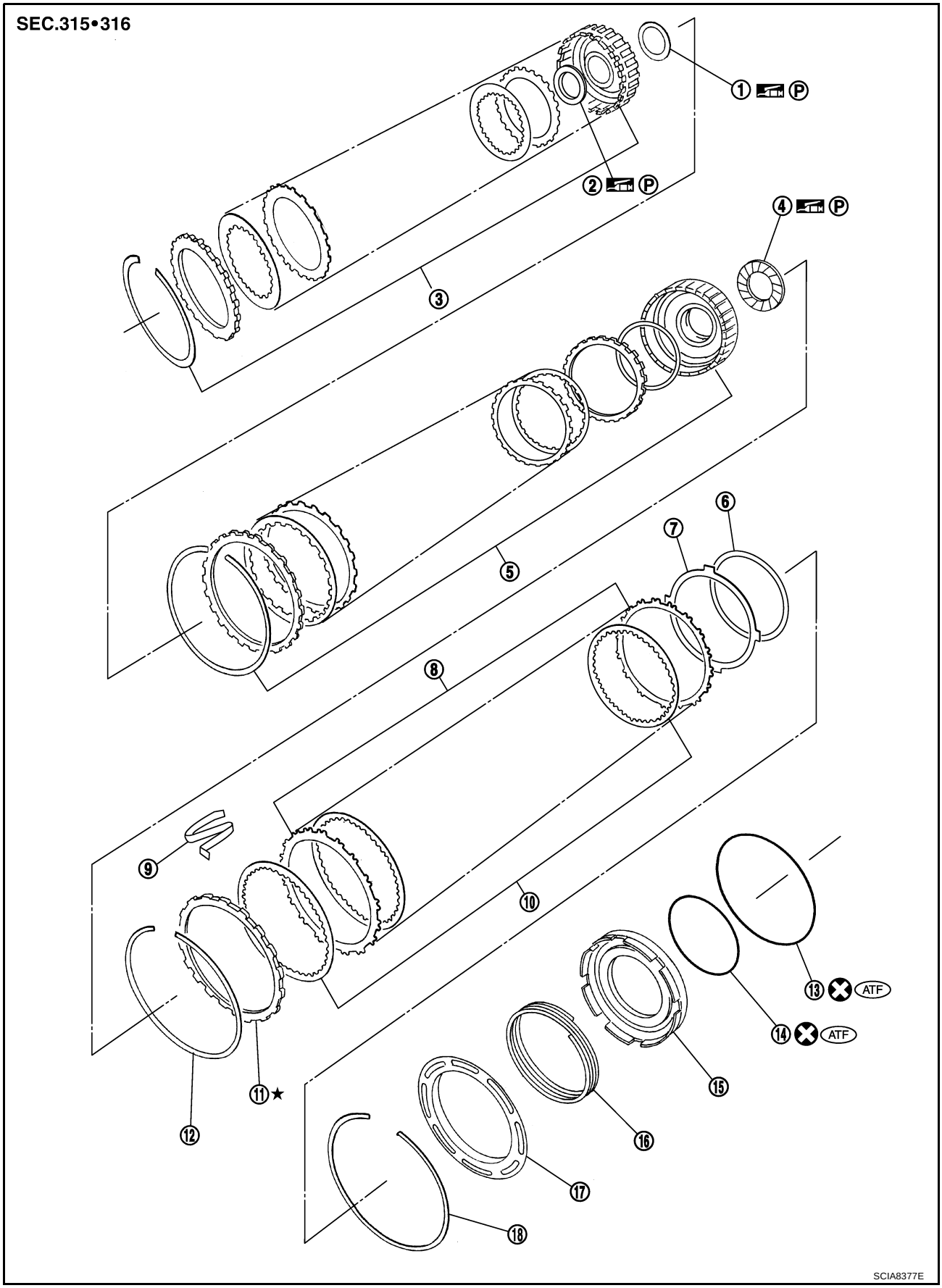
1. O-ring	2. Oil pump cover	3. O-ring
4. Oil pump housing	5. Self-sealing bolt	6. Torque converter
7. Converter housing	8. Oil pump housing oil seal	9. Bearing race
10. Needle bearing	11. O-ring	12. Front carrier assembly
13. Needle bearing	14. Snap ring	15. Front sun gear
16. 3rd one-way clutch	17. Snap ring	18. Bearing race
19. Needle bearing	20. Seal ring	21. Input clutch assembly
22. Needle bearing	23. Rear internal gear	24. Brake band
25. Mid carrier assembly	26. Needle bearing	27. Bearing race
28. Rear carrier assembly	29. Needle bearing	30. Mid sun gear
31. Seal ring	32. Rear sun gear	33. 1st one-way clutch
34. Snap ring	35. Needle bearing	36. High and low reverse clutch hub
37. Snap ring	38. Bearing race	39. Needle bearing

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

However, refer to the following for others.

: Apply Genuine RTV silicone sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

SEC.315•316

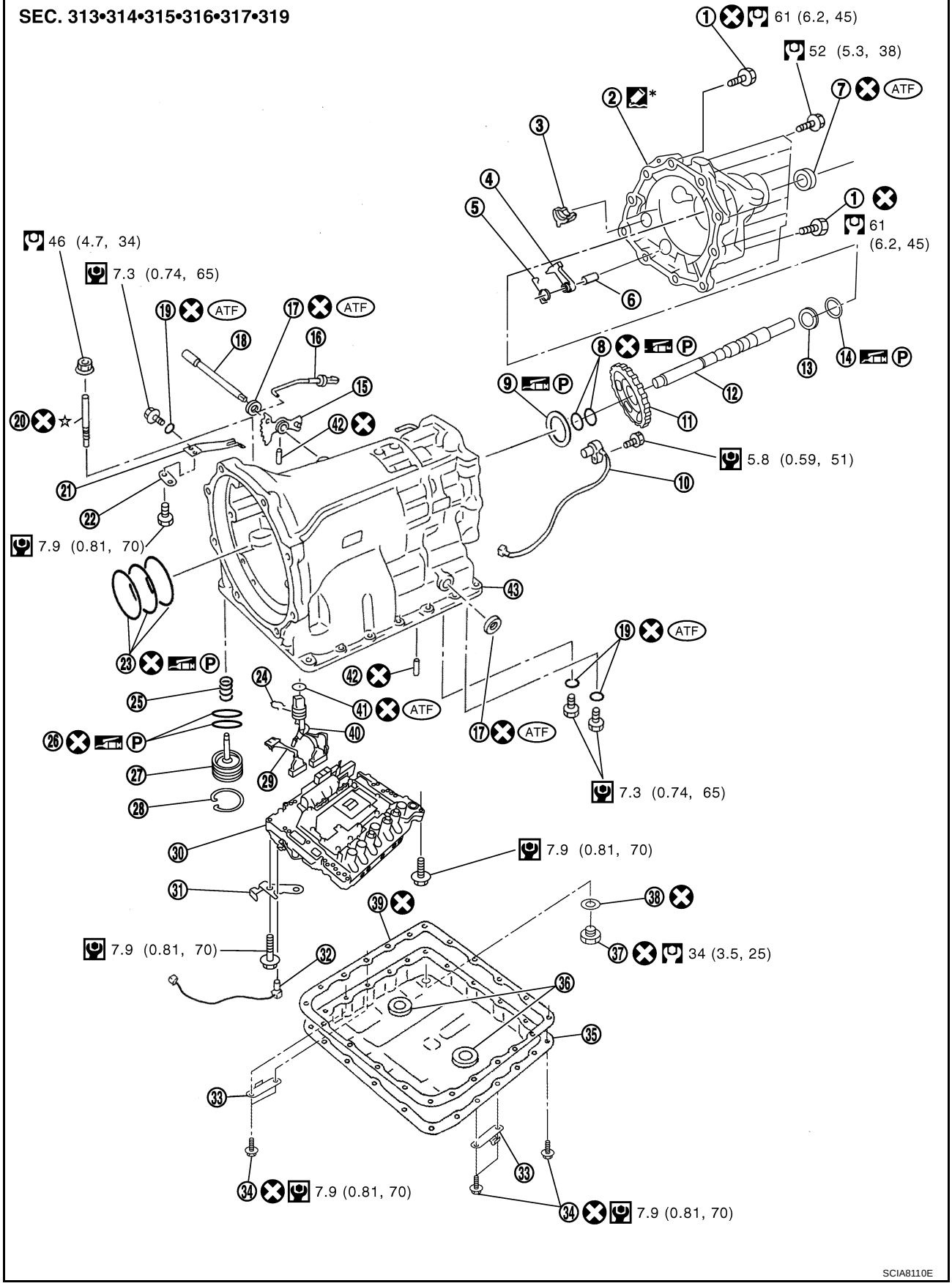


1. Needle bearing
2. Bearing race
3. High and low reverse clutch assembly
4. Needle bearing
5. Direct clutch assembly
6. Reverse brake dish plate
7. Reverse brake dish plate
8. Reverse brake driven plate
9. N-spring

10. Reverse brake drive plate	11. Reverse brake retaining plate	12. Snap ring
13. D-ring	14. D-ring	15. Reverse brake piston
16. Return spring	17. Spring retainer	18. Snap ring

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

SEC. 313•314•315•316•317•319



1. Self-sealing bolt
2. Rear extension
3. Parking actuator support
4. Parking pawl
5. Return spring
6. Pawl shaft
7. Rear oil seal
8. Seal ring
9. Needle bearing

10. Revolution sensor	11. Parking gear	12. Output shaft
13. Bearing race	14. Needle bearing	15. Manual plate
16. Parking rod	17. Manual shaft oil seal	18. Manual shaft
19. O-ring	20. Band servo anchor end pin	21. Detent spring
22. Spacer	23. Seal ring	24. Snap ring
25. Return spring	26. O-ring	27. Servo assembly
28. Snap ring	29. Sub-harness	30. Control valve with TCM
31. Bracket	32. A/T fluid temperature sensor 2	33. Clip
34. Oil pan mounting bolt	35. Oil pan	36. Magnet
37. Drain plug	38. Drain plug gasket	39. Oil pan gasket
40. Terminal cord assembly	41. O-ring	42. Retaining pin
43. Transmission case		

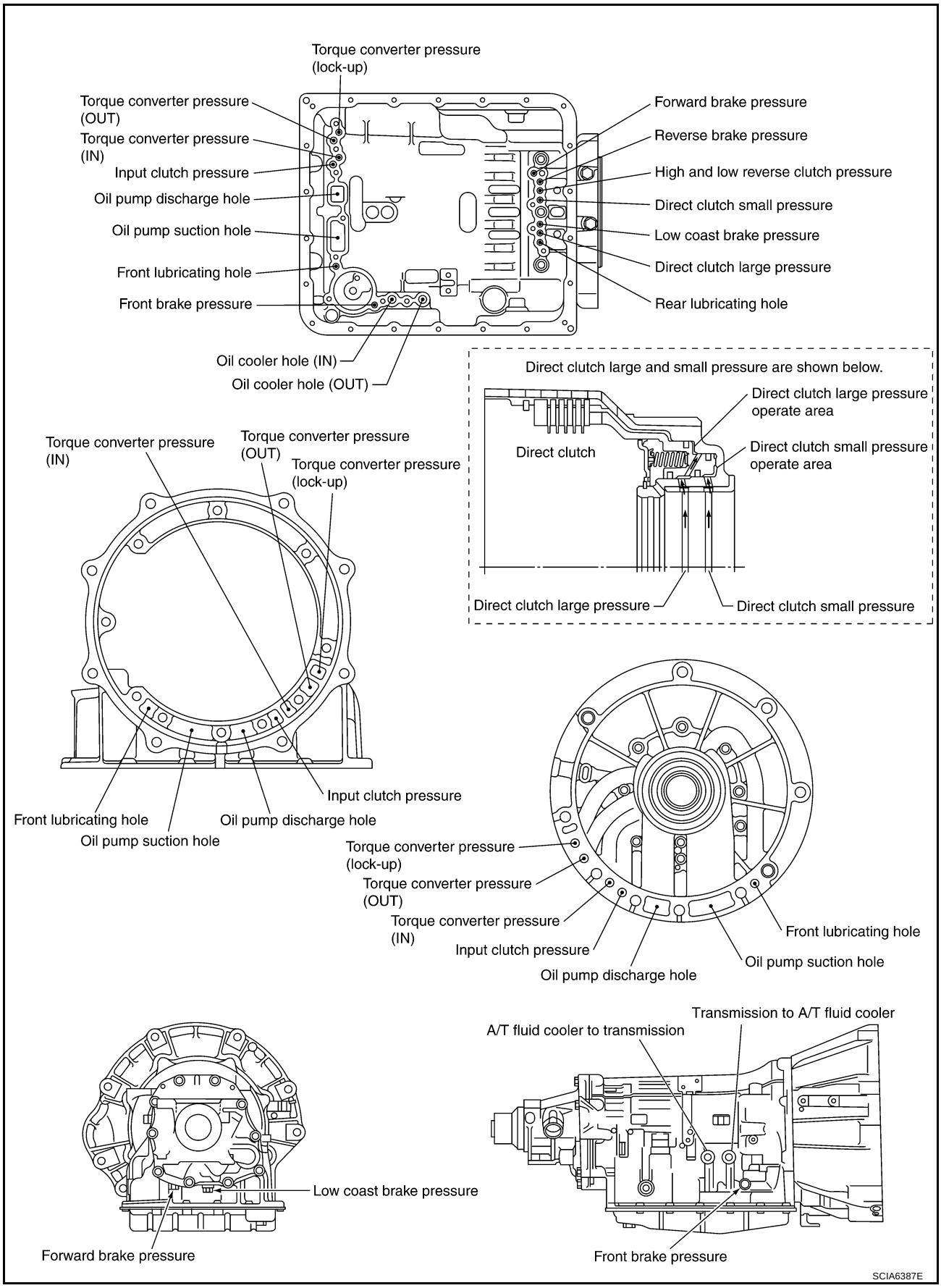
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

However, refer to the following for others.

* : Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

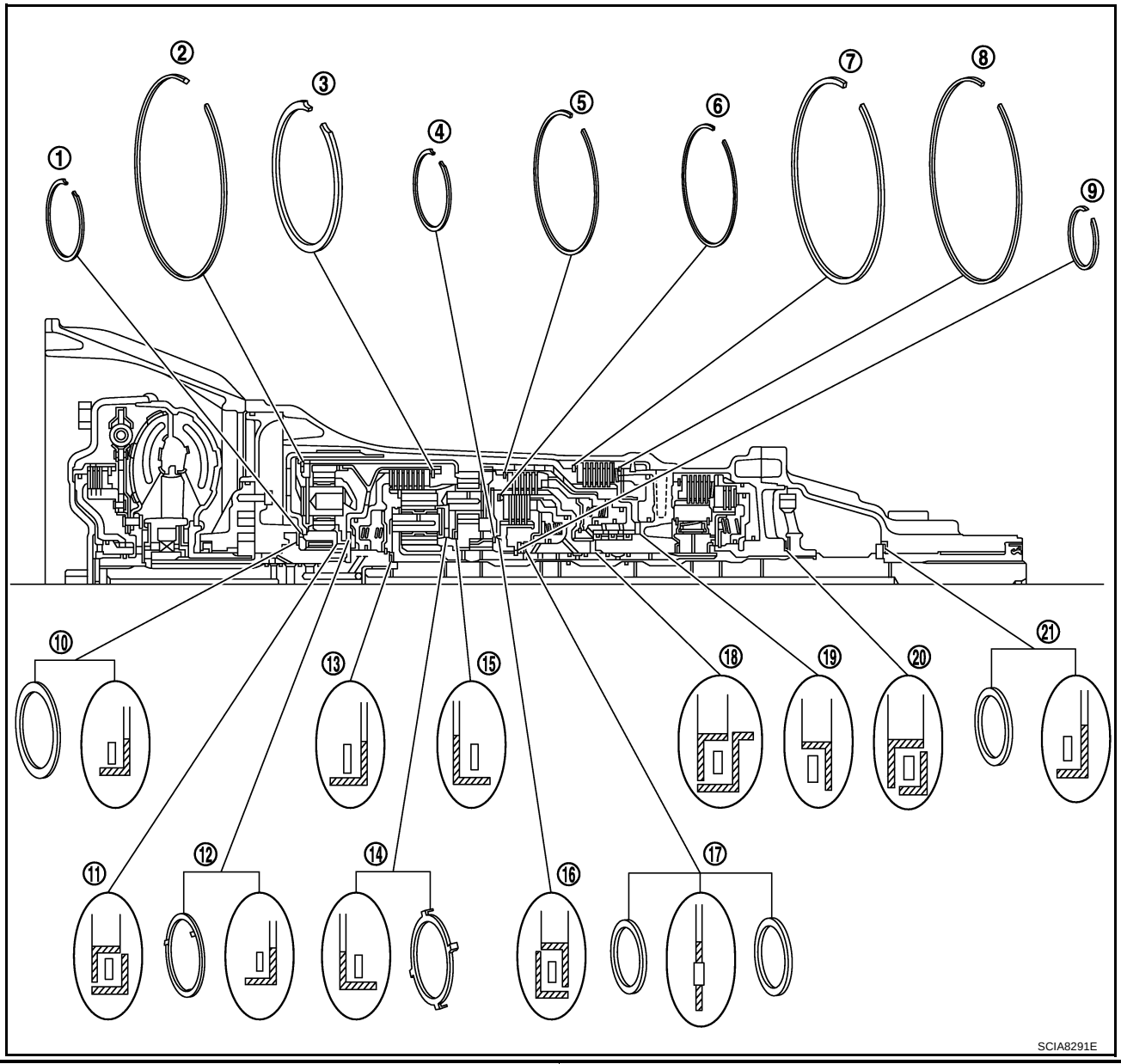
Oil Channel

NCS00099



Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

NCS0009A



Snap ring		Needle bearing	
Item number	Outer diameter mm (in)	Item number	Outer diameter mm (in)
1	67.5 (2.657)	10	80 (3.15)
2	182.4 (7.181)	11	77 (3.03)
3	171.5 (6.751)	12	77 (3.03)
4	70.5 (2.775)	13	47 (1.85)
5	169 (6.653)	14	84 (3.31)
6	134.3 (5.287)	15	84 (3.31)
7	180.5 (7.106)	16	92 (3.62)
8	181 (7.125)	17	60 (2.36)
9	48.4 (1.905)	18	63 (2.48)
—	—	19	92 (3.62)

Snap ring		Needle bearing	
Item number	Outer diameter mm (in)	Item number	Outer diameter mm (in)
—	—	20	65 (2.56)
—	—	21	60 (2.36)

DISASSEMBLY

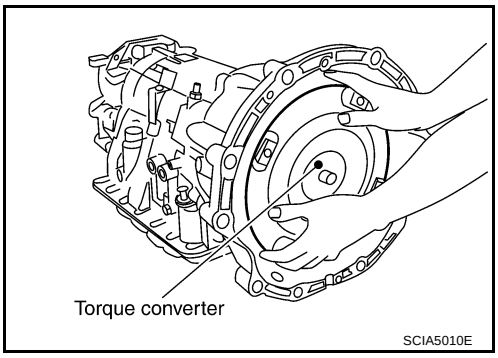
PFP:31020

Disassembly

NCS0009B

CAUTION:
Do not disassemble parts behind Drum Support. Refer to AT-17, "Cross-sectional View" .

1. Drain ATF through drain hole.
2. Remove torque converter by holding it firmly and turing while pulling straight out.

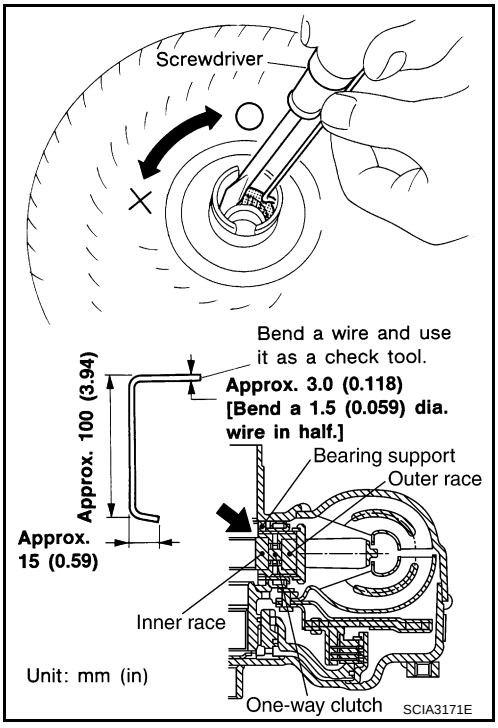


3. Check torque converter one-way clutch using check tool as shown at figure.

a. Insert check tool into the groove of bearing support built into one-way clutch outer race.

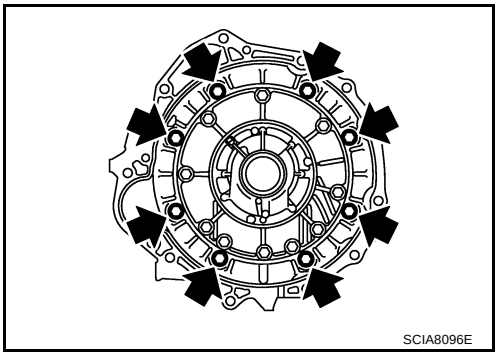
b. When fixing bearing support with check tool, rotate one- way clutch spline using screwdriver.

c. Check that inner race rotates clockwise only. If not, replace torque converter assembly.

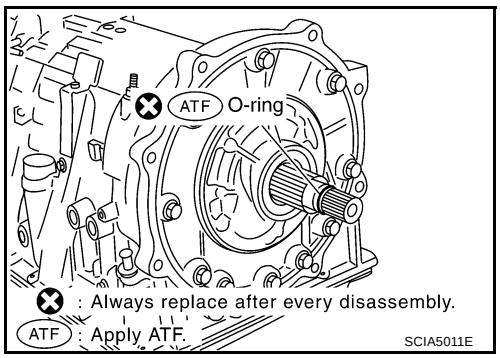


4. Remove tightening bolts (⬅) for converter housing and transmission case.
5. Remove converter housing from transmission case.

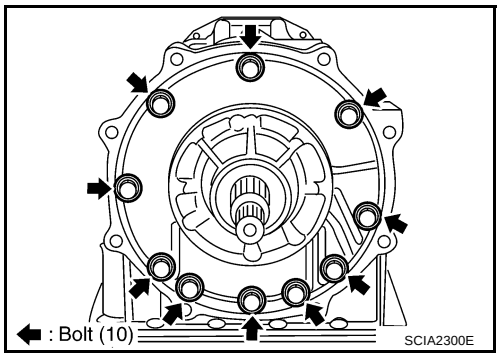
CAUTION:
Be careful not to scratch converter housing.



6. Remove O-ring from input clutch assembly.



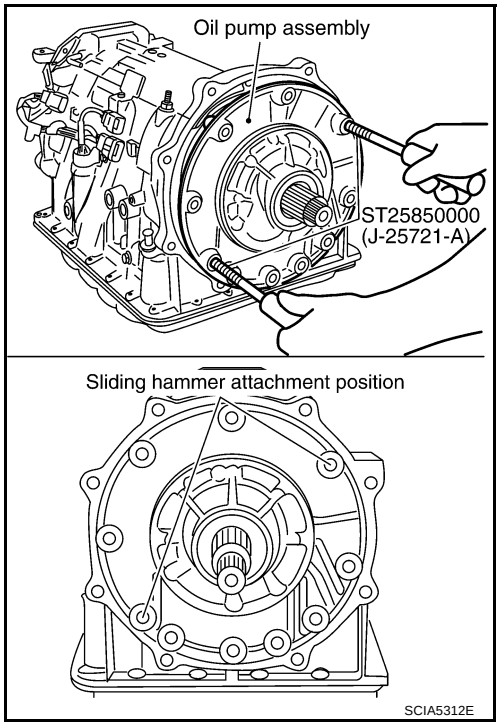
7. Remove tightening bolts for oil pump assembly and transmission case.



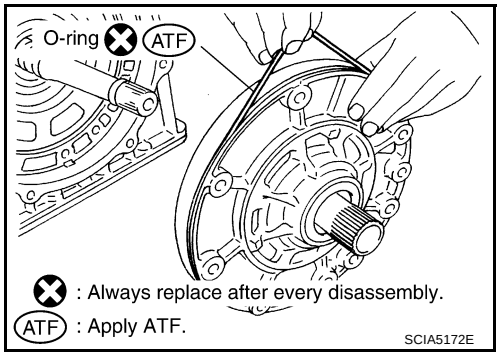
8. Attach the sliding hammers to oil pump assembly and extract it evenly from transmission case.

CAUTION:

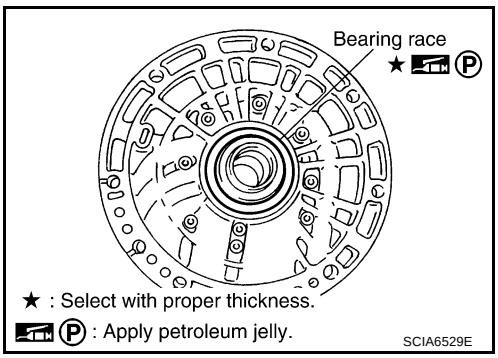
- **Fully tighten sliding hammer screw.**
- **Make sure that bearing race is installed to the oil pump assembly edge surface.**



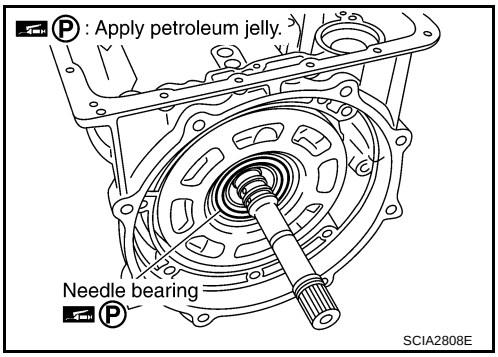
9. Remove O-ring from oil pump assembly.



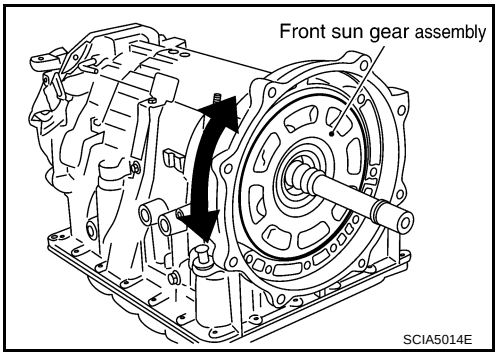
10. Remove bearing race from oil pump assembly.



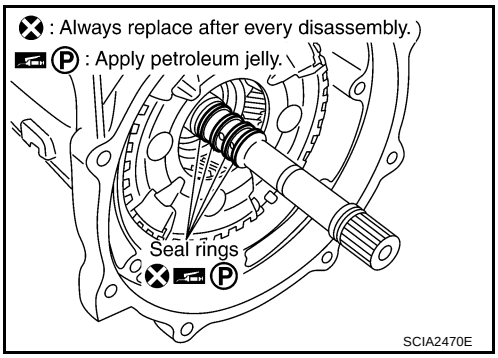
11. Remove needle bearing from front sun gear.



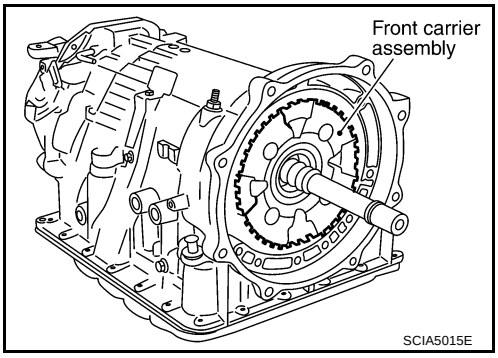
12. Remove front sun gear assembly from front carrier assembly.
NOTE:
Remove front sun gear by rotating left/right.



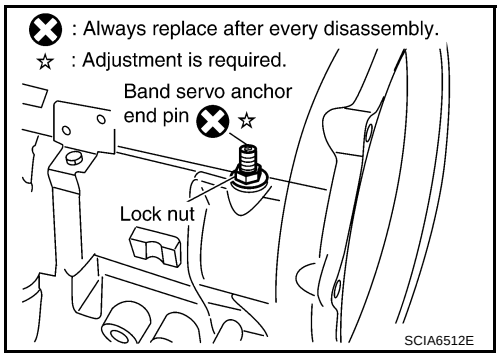
13. Remove seal rings from input clutch assembly.



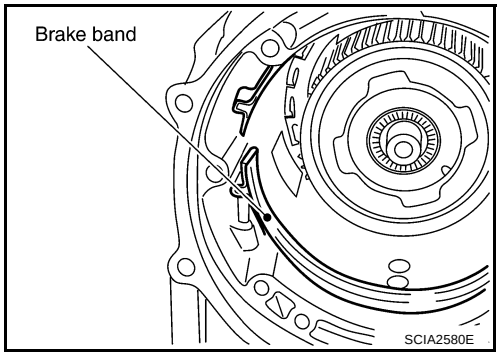
14. Remove front carrier assembly from rear carrier assembly. (With input clutch assembly and rear internal gear.)
CAUTION:
Be careful to remove it with needle bearing.



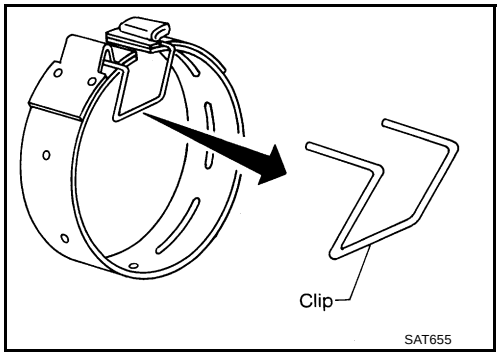
15. Loosen lock nut and remove band servo anchor end pin from transmission case.



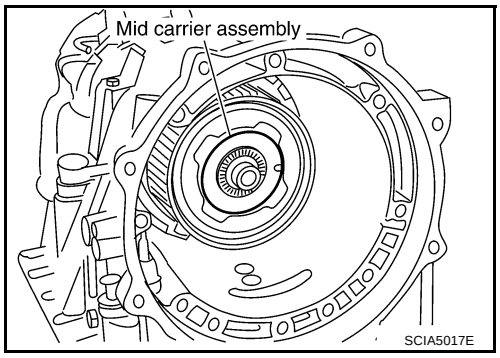
16. Remove brake band from transmission case.



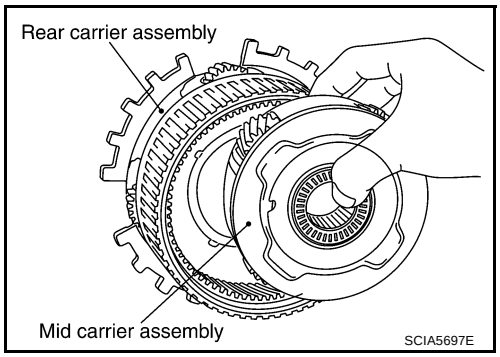
- **To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at right.**
  Leave the clip in position after removing the brake band.
- **Check brake band facing for damage, cracks, wear or burns.**



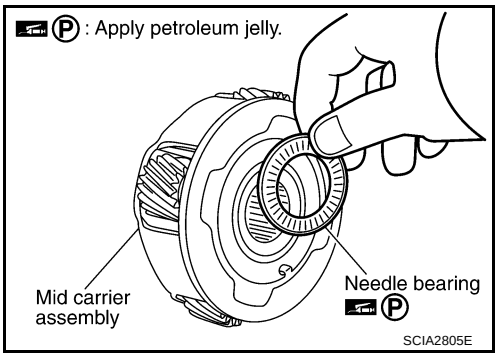
17. Remove mid carrier assembly and rear carrier assembly as a unit.



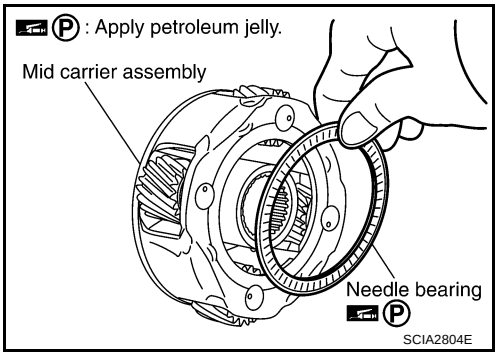
18. Remove mid carrier assembly from rear carrier assembly.



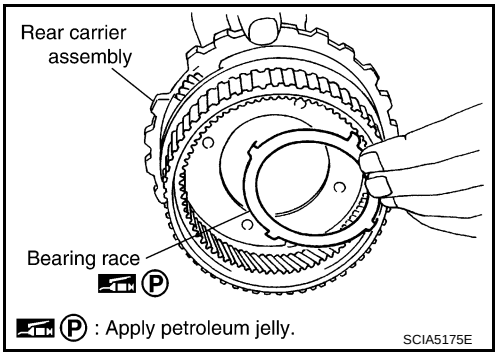
19. Remove needle bearing (front side) from mid carrier assembly.



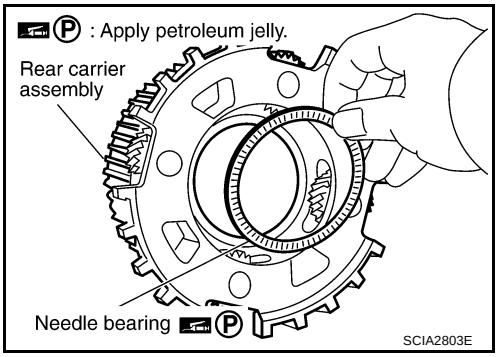
20. Remove needle bearing (rear side) from mid carrier assembly.



21. Remove bearing race from rear carrier assembly.



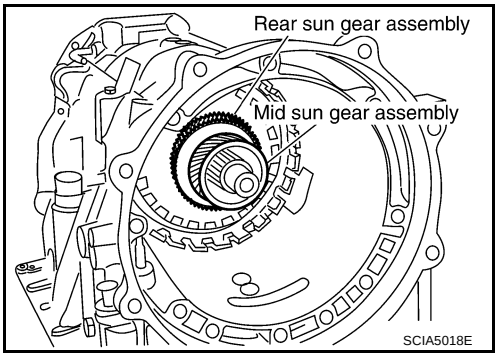
22. Remove needle bearing from rear carrier assembly.



23. Remove mid sun gear assembly, rear sun gear assembly and high and low reverse clutch hub as a unit.

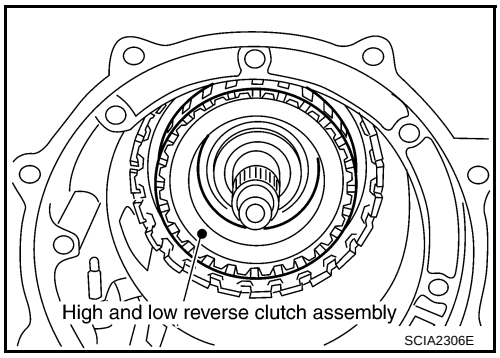
CAUTION:

Be careful to remove then with bearing race and needle bearing.

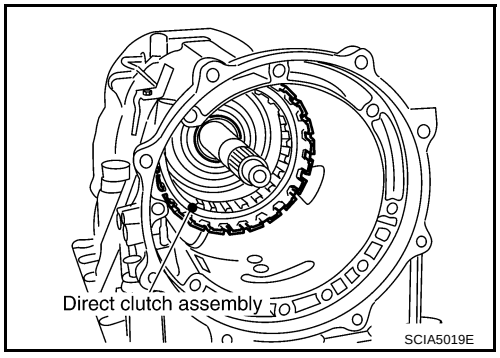


24. Remove high and low reverse clutch assembly from direct clutch assembly.

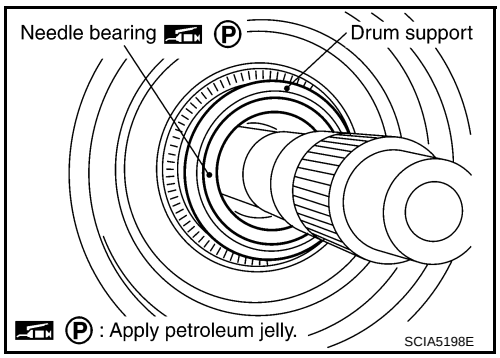
CAUTION:
Make sure that needle bearing is installed to high and low reverse clutch assembly edge surface.



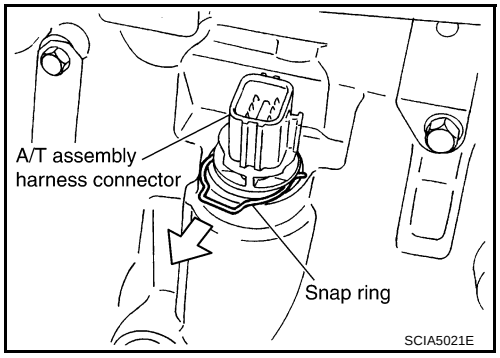
25. Remove direct clutch assembly from reverse brake.



26. Remove needle bearing from drum support.

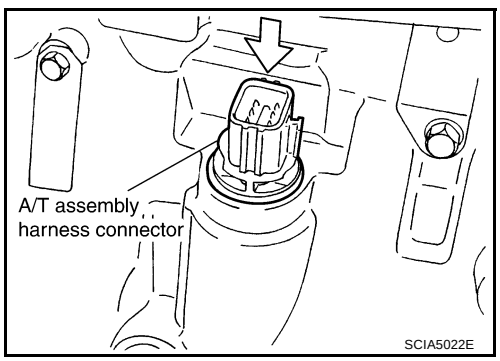


27. Remove snap ring from A/T assembly harness connector.

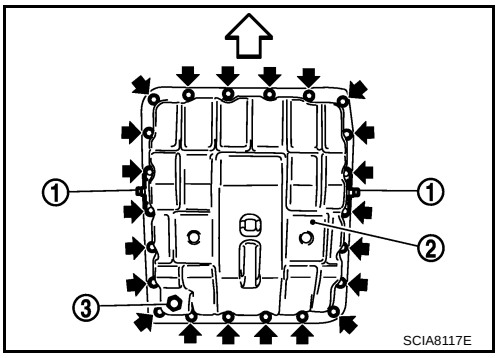


28. Push A/T assembly harness connector.

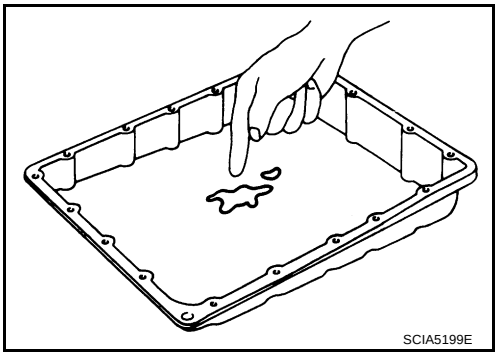
CAUTION:
Be careful not to damage connector.



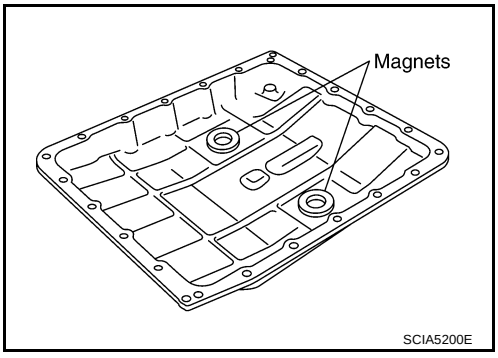
29. Remove clips (1), oil pan (2) and oil pan gasket.
    - ⇦: Front
    - ⬅: Oil pan mounting bolt
    - Drain bolt (3)



30. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
    - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-14, "A/T Fluid Cooler Cleaning".**



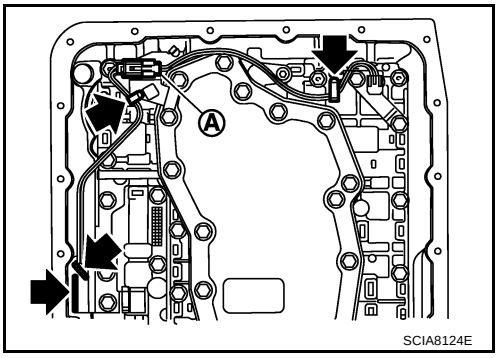
31. Remove magnets from oil pan.



32. Disconnect A/T fluid temperature sensor 2 connector (A).

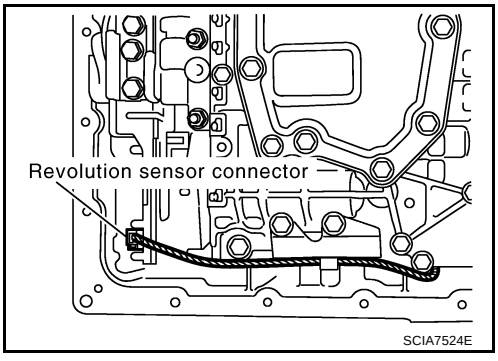
    CAUTION:
    Be careful not to damage connector.

33. Straighten terminal clips (⬅) to free terminal cord assembly and A/T fluid temperature sensor 2 harness.

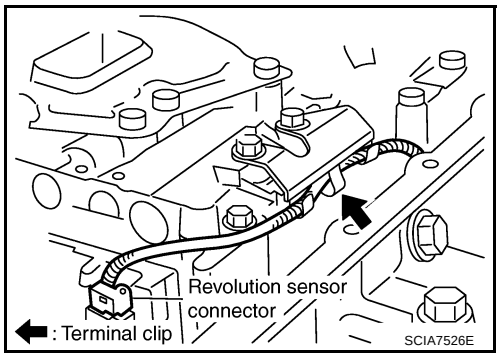


34. Disconnect revolution sensor connector.

    CAUTION:
    Be careful not to damage connector.

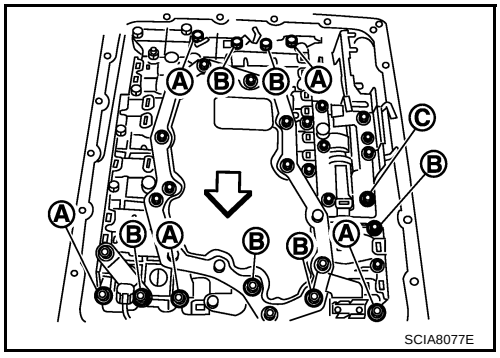


35. Straighten terminal clip to free revolution sensor harness.



36. Remove bolts (A), (B) and (C) from control valve with TCM.
    - ⇦: Front

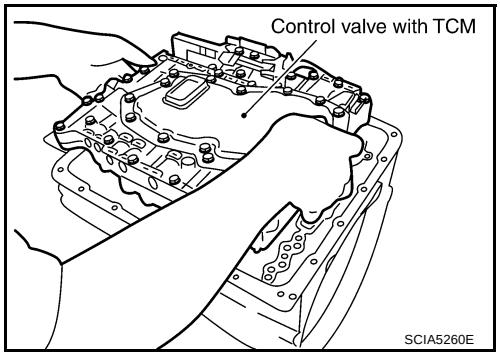
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



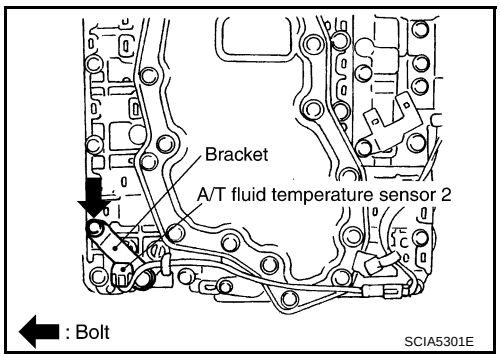
37. Remove control valve with TCM from transmission case.

    CAUTION:

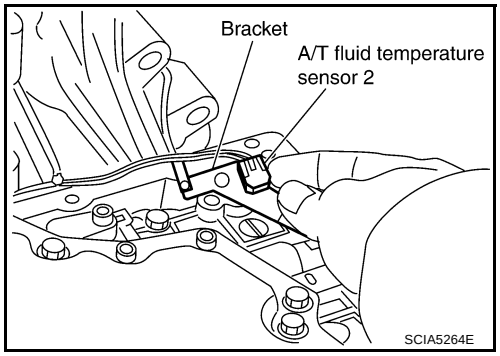
    When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



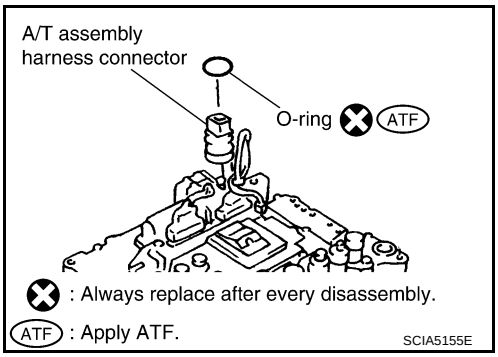
38. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



39. Remove bracket from A/T fluid temperature sensor 2.

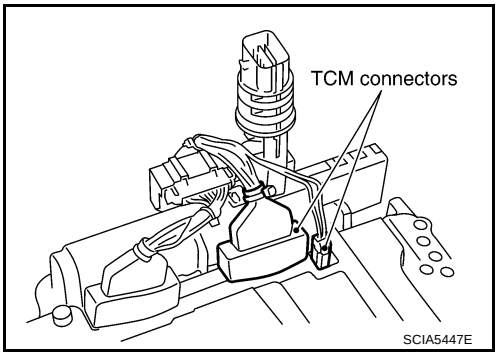


40. Remove O-ring from A/T assembly harness connector.

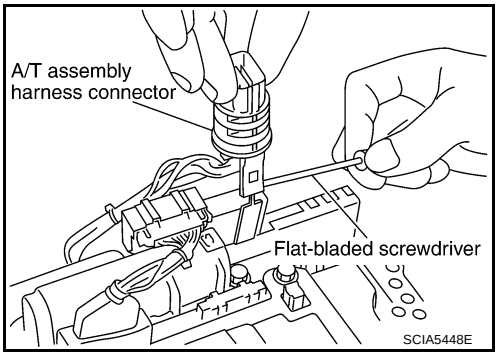


41. Disconnect TCM connectors.

CAUTION:
Be careful not to damage connectors.

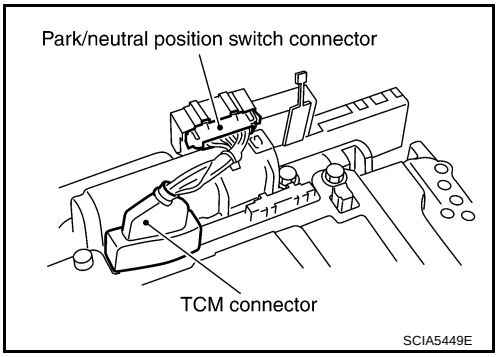


42. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.

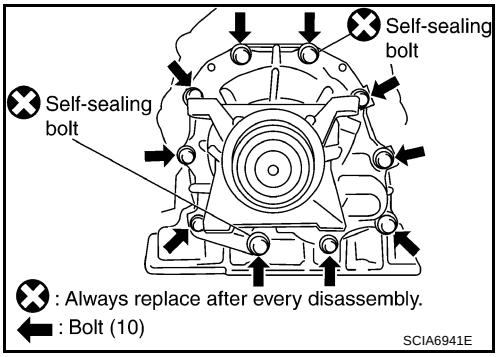


43. Disconnect TCM connector and park/neutral position switch connector.

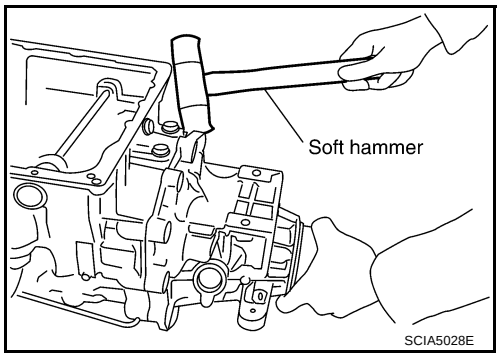
CAUTION:
Be careful not to damage connectors.



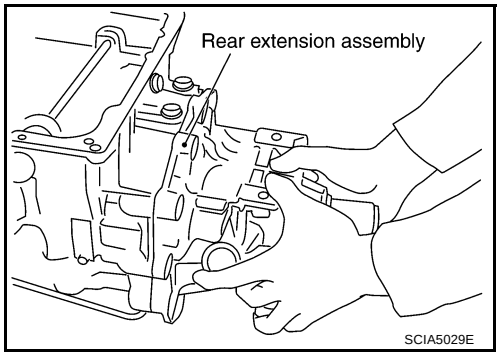
44. Remove tightening bolts for rear extension assembly and transmission case.



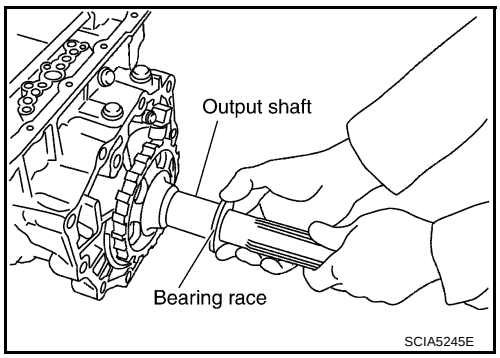
45. Tap rear extension assembly with soft hammer.



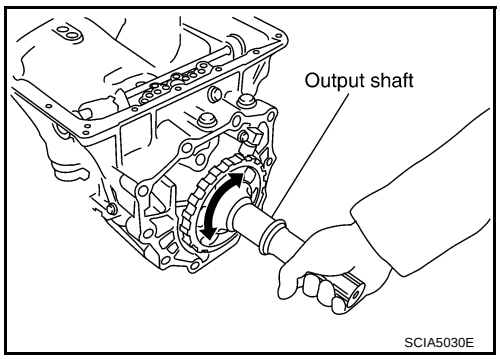
46. Remove rear extension assembly from transmission case. (With needle bearing)



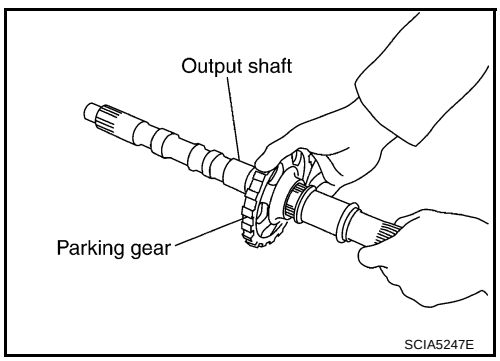
47. Remove bearing race from output shaft.



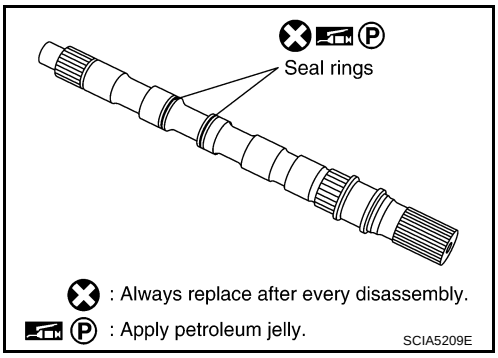
48. Remove output shaft from transmission case by rotating left/right.



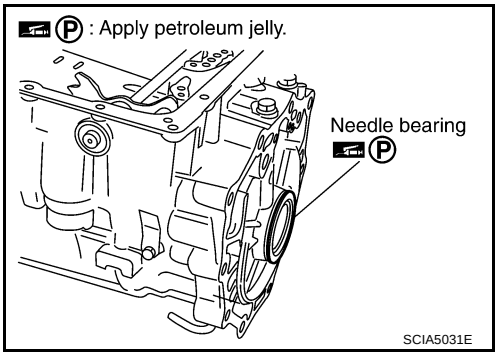
49. Remove parking gear from output shaft.



50. Remove seal rings from output shaft.



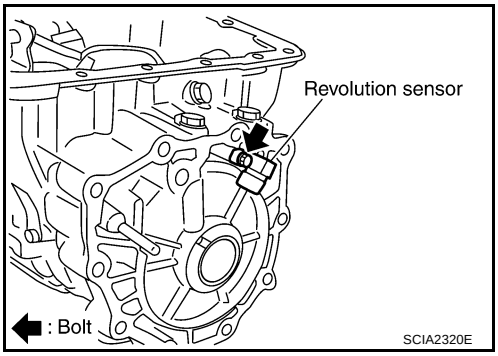
51. Remove needle bearing from transmission case.



52. Remove revolution sensor from transmission case.

CAUTION:

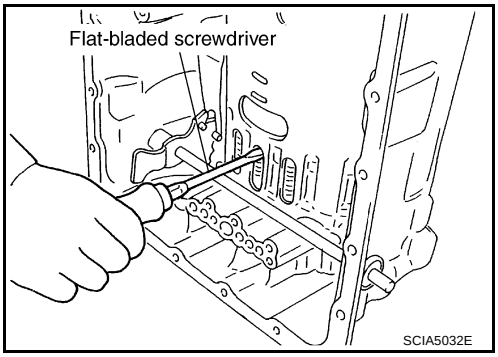
- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**



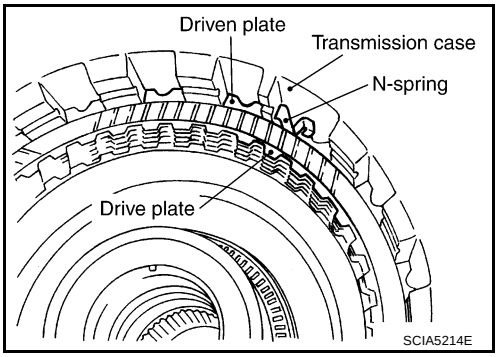
53. Remove reverse brake snap ring (fixing plate) using 2 flat-bladed screwdrivers.

NOTE:
Press out snap ring from transmission case oil pan side gap using a flat-bladed screwdriver, and remove it using another screwdriver.

54. Remove reverse brake retaining plate from transmission case.
    - Check facing for burns, cracks or damage. If necessary, replace the plate.



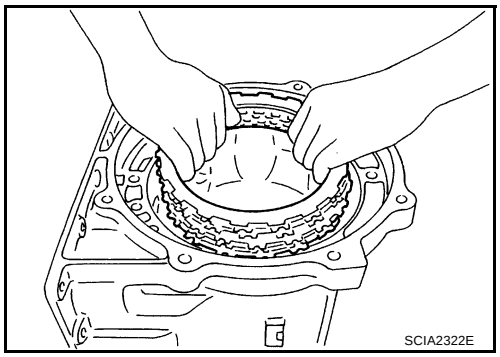
55. Remove N-spring from transmission case.



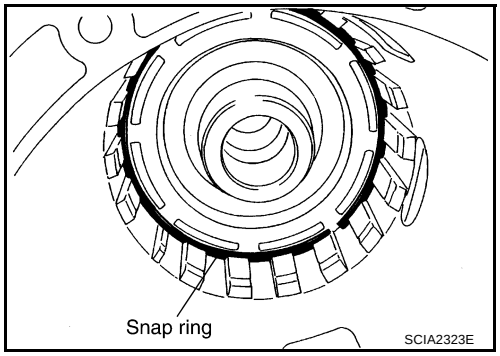
56. Remove reverse brake drive plates, driven plates and dish plates from transmission case.

CAUTION:

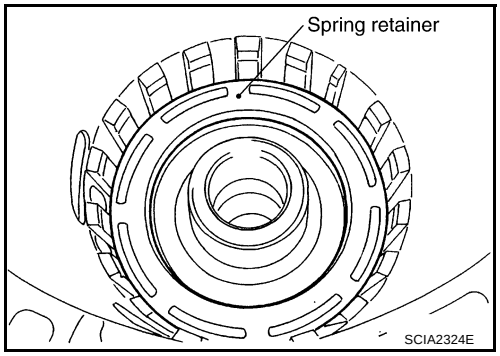
Be careful to remove it with N-spring.



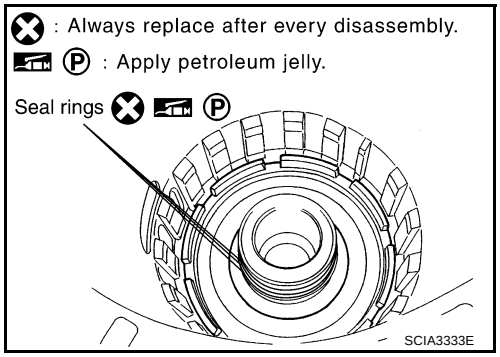
57. Remove snap ring (fixing spring retainer) using a flat-bladed screwdriver.



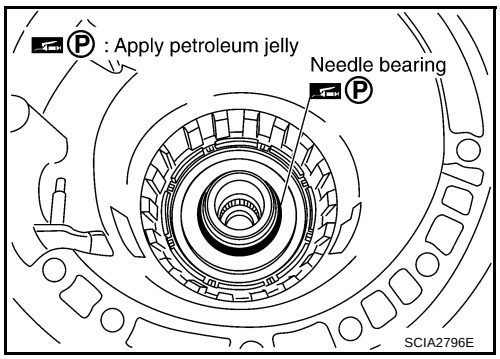
58. Remove spring retainer and return spring from transmission case.



59. Remove seal rings from drum support.



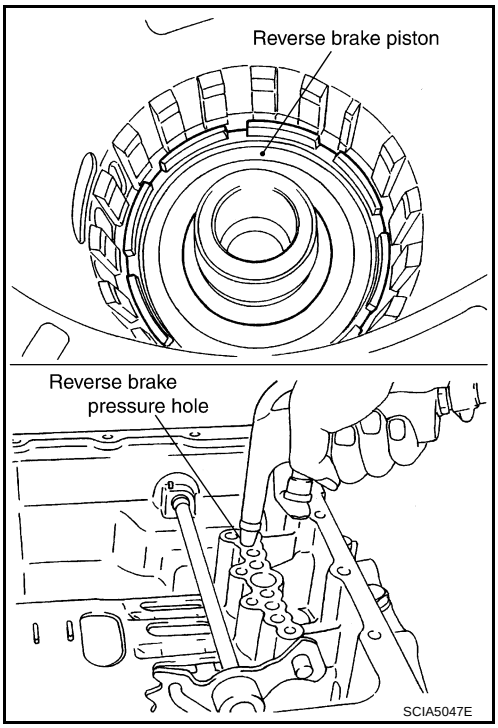
60. Remove needle bearing from drum support edge surface.



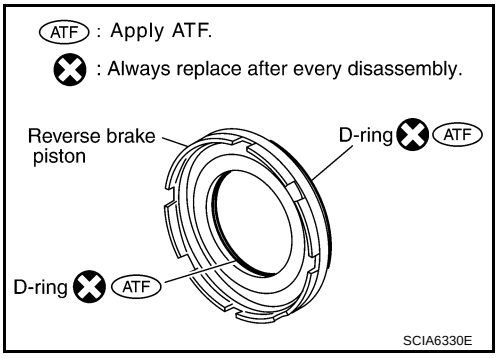
61. Remove reverse brake piston from transmission case with compressed air. Refer to AT-252, "Oil Channel" .

CAUTION:

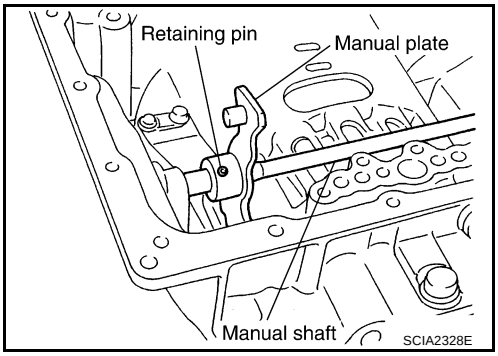
Care should be taken not to abruptly blow air. It makes pistons incline, as the result, it becomes hard to disassemble the pistons.



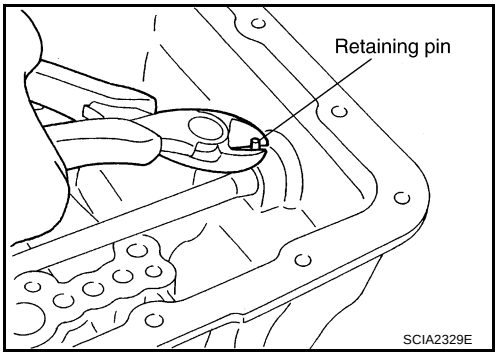
62. Remove D-rings from reverse brake piston.



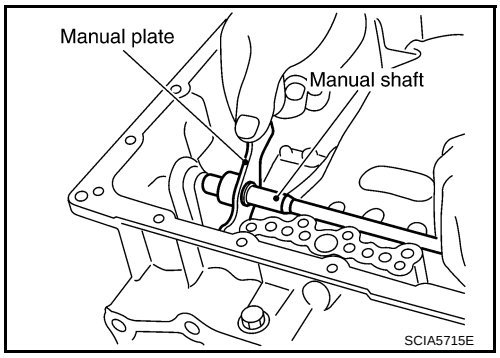
63. Use a pin punch [4 mm (0.16 in) dia. commercial service tool] to knock out retaining pin.



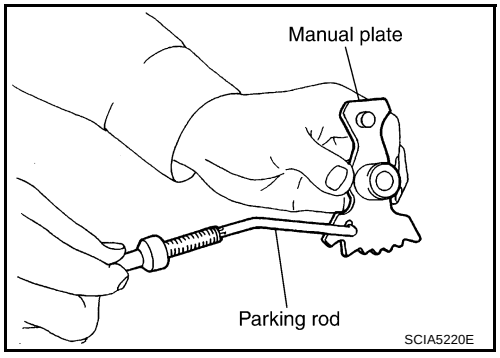
64. Remove manual shaft retaining pin using pair of nippers.



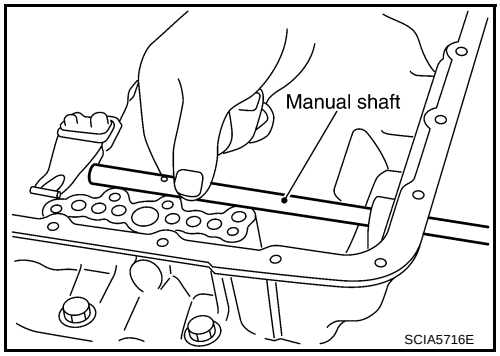
65. Remove manual plate (with parking rod) from manual shaft.



66. Remove parking rod from manual plate.



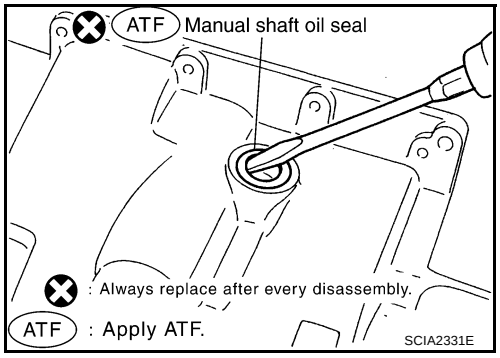
67. Remove manual shaft from transmission case.



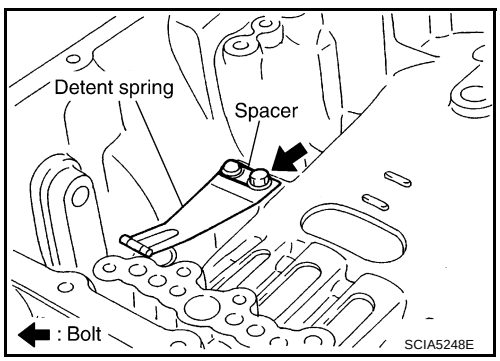
68. Remove manual shaft oil seals using a flat-bladed screwdriver.

CAUTION:

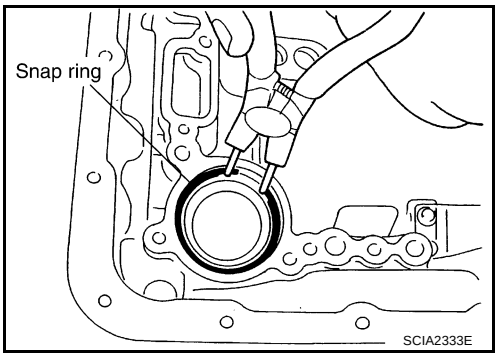
Be careful not to scratch transmission case.



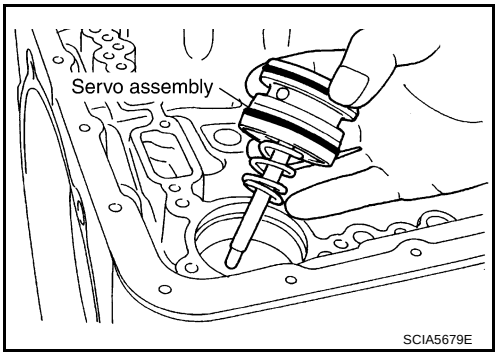
69. Remove detent spring and spacer from transmission case.



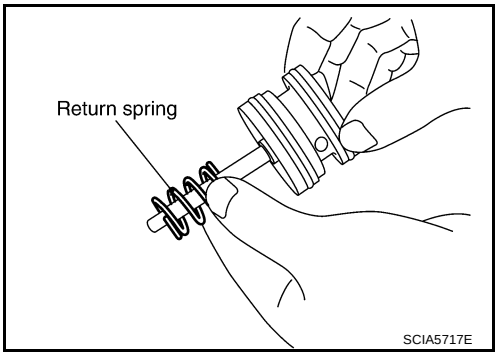
70. Remove snap ring from transmission case using pair of snap ring pliers.



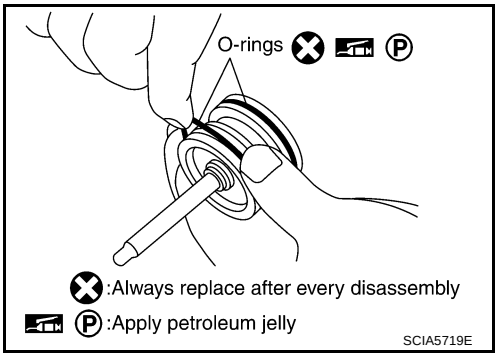
71. Remove servo assembly (with return spring) from transmission case.



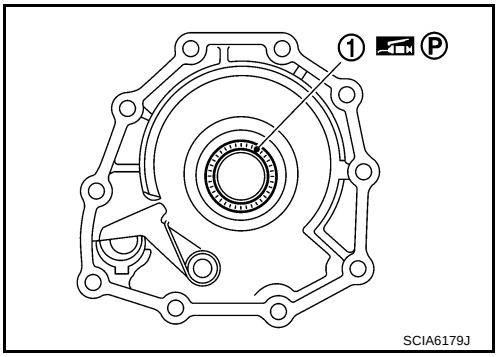
72. Remove return spring from servo assembly.



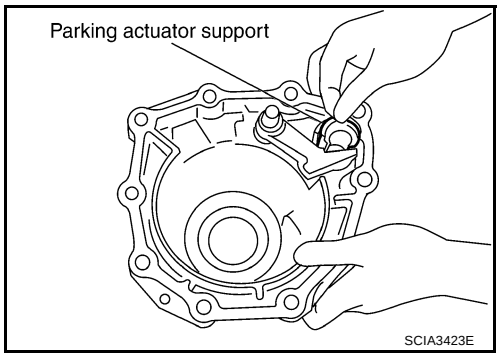
73. Remove O-rings from servo assembly.



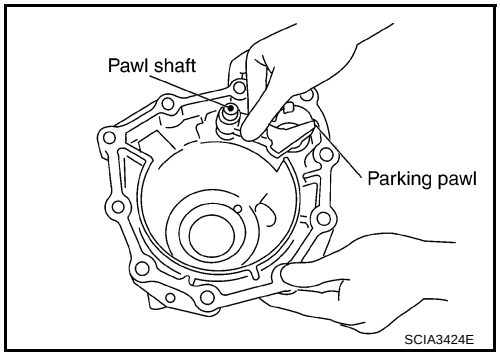
74. Remove needle bearing (1) from rear extension.



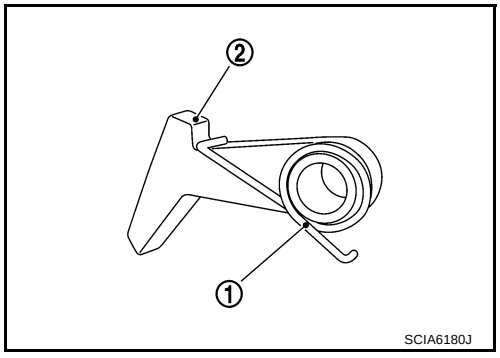
75. Remove parking actuator support from rear extension.



76. Remove parking pawl (with return spring) and pawl shaft from rear extension.



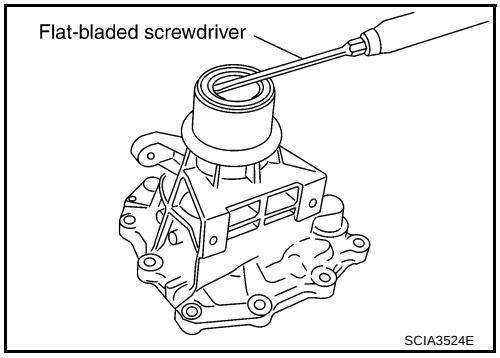
77. Remove return spring (1) from parking pawl (2).



78. Remove rear oil seal from rear extension.

CAUTION:

Be careful not to scratch rear extension.



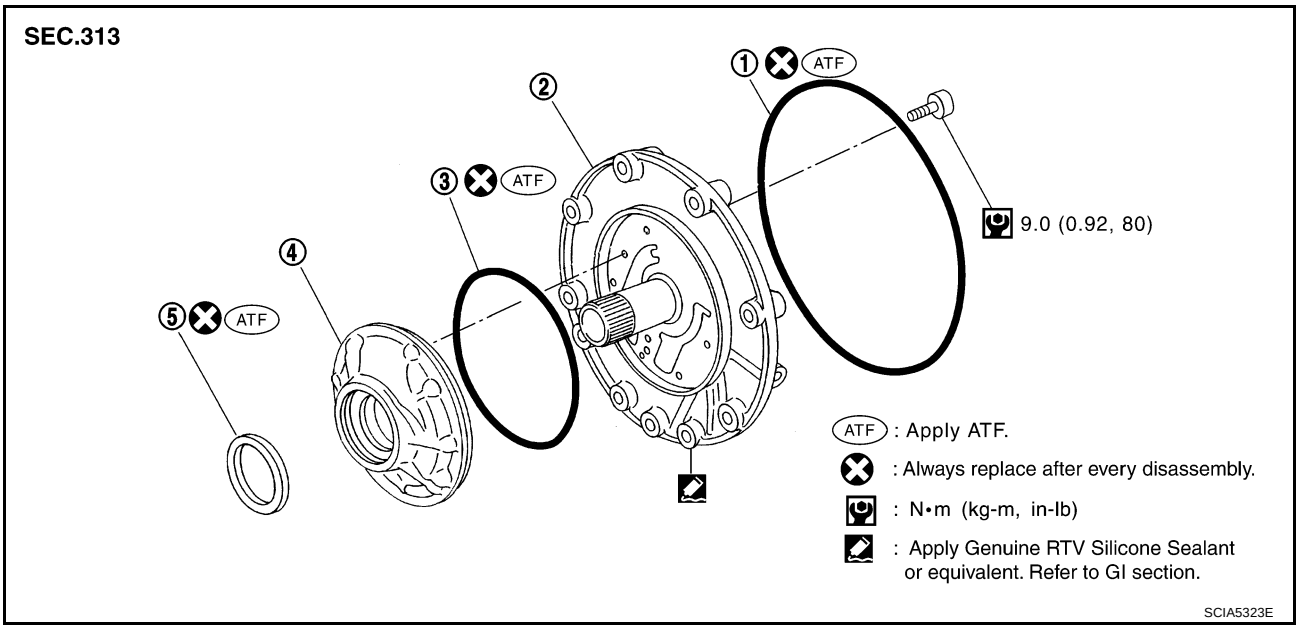
REPAIR FOR COMPONENT PARTS

PFP:00000

Oil Pump

NCS0009C

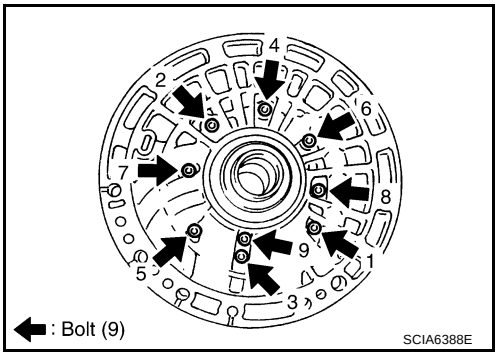
COMPONENTS



1. O-ring
2. Oil pump cover
3. O-ring
4. Oil pump housing
5. Oil pump housing oil seal

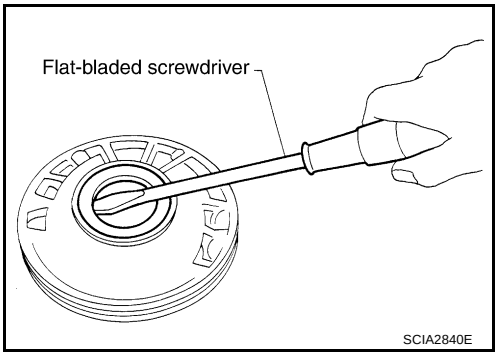
DISASSEMBLY

1. Remove oil pump housing from oil pump cover.

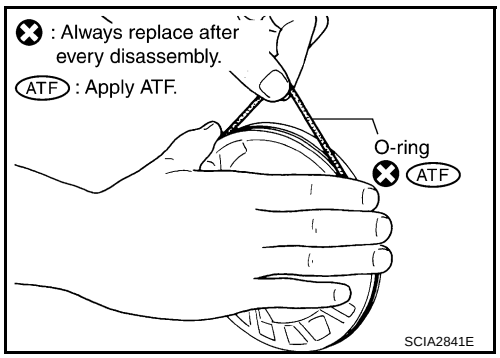


2. Remove oil pump housing oil seal using a flat-bladed screwdriver.

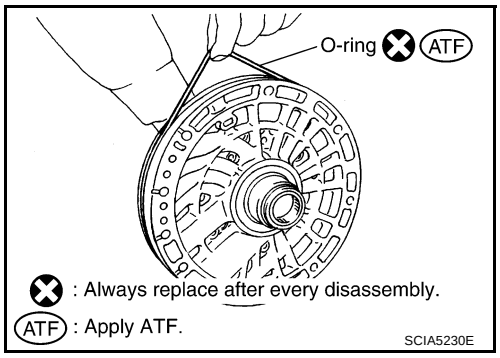
CAUTION:
Be careful not to scratch oil pump housing.



3. Remove O-ring from oil pump housing.



4. Remove O-ring from oil pump cover.

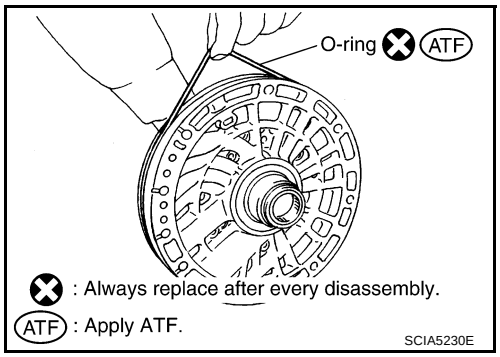


ASSEMBLY

1. Install O-ring to oil pump cover.

CAUTION:

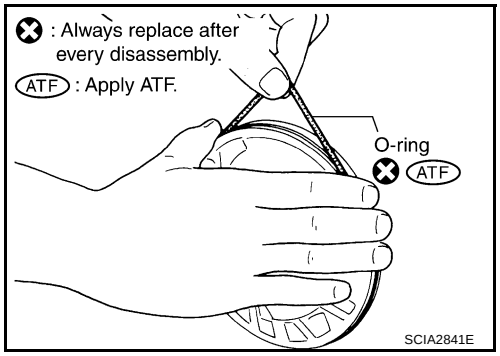
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



2. Install O-ring to oil pump housing.

CAUTION:

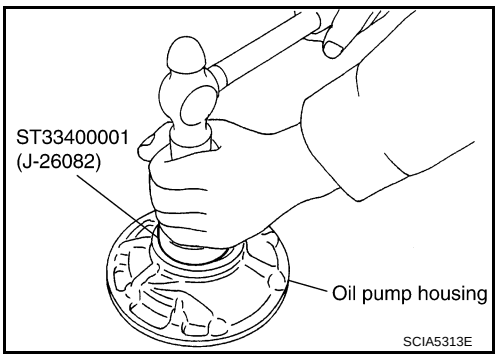
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



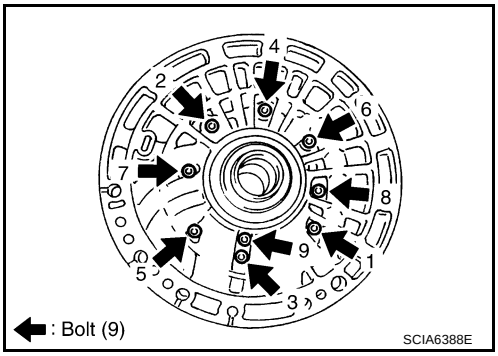
3. Install oil pump housing oil seal to the oil pump housing until it is flush using the drift.

CAUTION:

- **Do not reuse oil seal.**
- **Apply ATF to oil seal.**



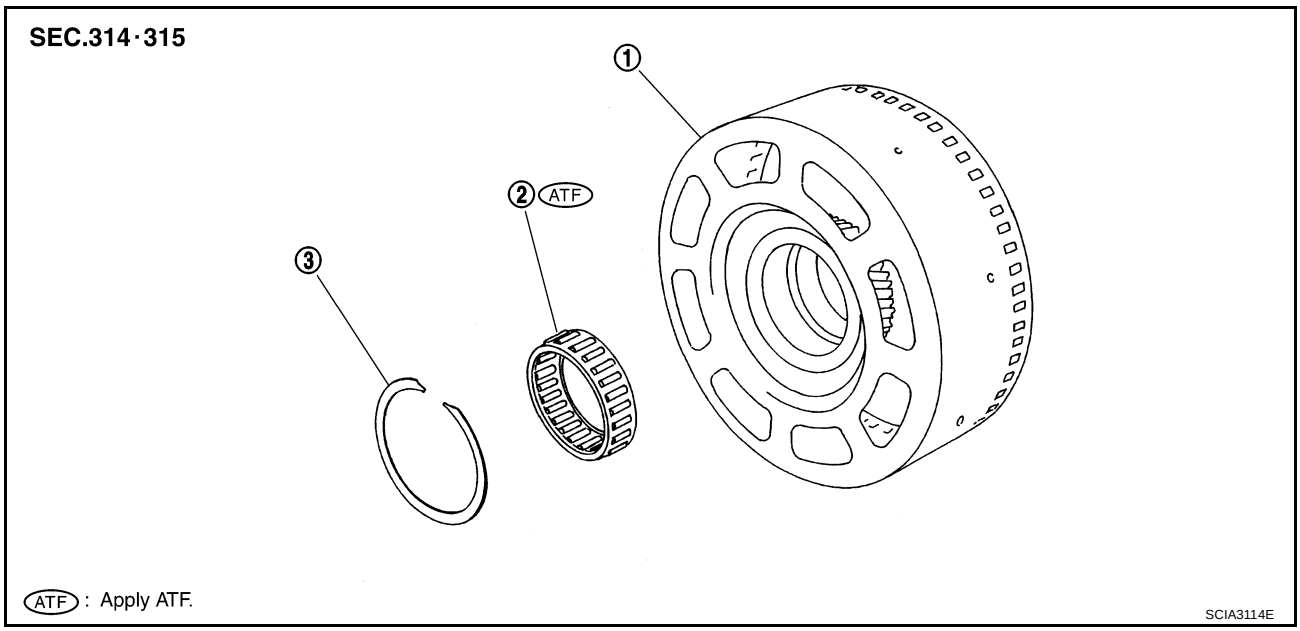
4. Install oil pump housing to oil pump cover.
5. Tighten bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-271, "COMPONENTS" .



Front Sun Gear, 3rd One-way Clutch

NCS0009D

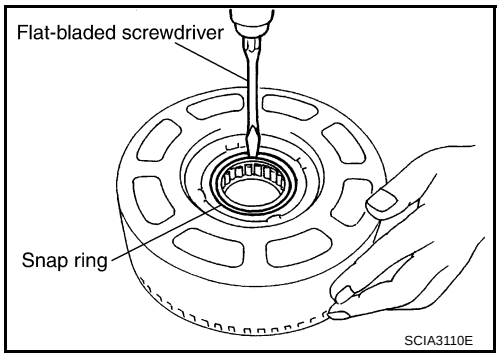
COMPONENTS



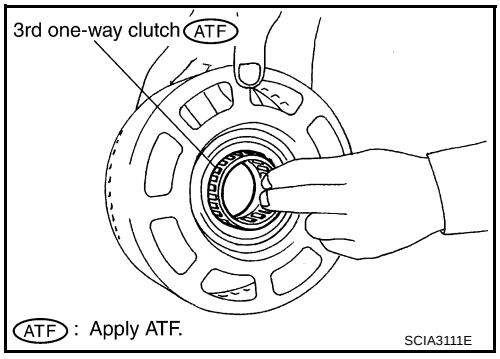
1. Front sun gear
2. 3rd one-way clutch
3. Snap ring

DISASSEMBLY

1. Remove snap ring from front sun gear using a flat-bladed screwdriver.



2. Remove 3rd one-way clutch from front sun gear.



INSPECTION

3rd One-way Clutch

- Check frictional surface for wear or damage.

CAUTION:
If necessary, replace 3rd one-way clutch.

Front Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace snap ring.

Front Sun Gear

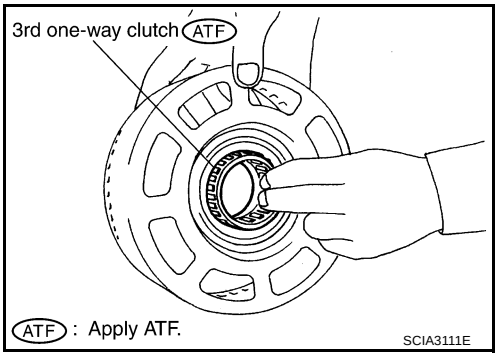
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace front sun gear.

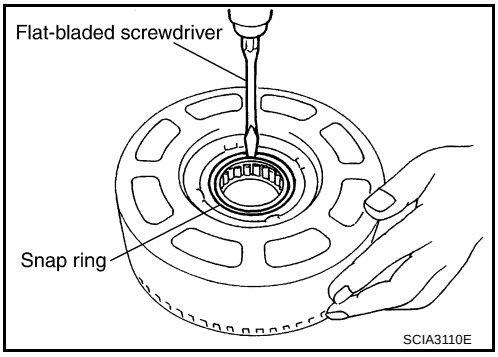
ASSEMBLY

1. Install 3rd one-way clutch in front sun gear.

CAUTION:
Apply ATF to 3rd one-way clutch.



2. Install snap ring in front sun gear using a flat-bladed screwdriver.

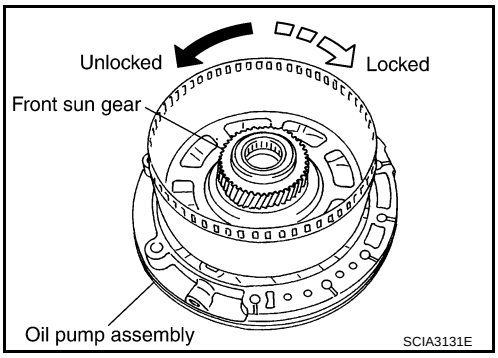


3. Check operation of 3rd one-way clutch.

a. Hold oil pump assembly and turn front sun gear.

b. Check 3rd one-way clutch for correct locking and unlocking directions.

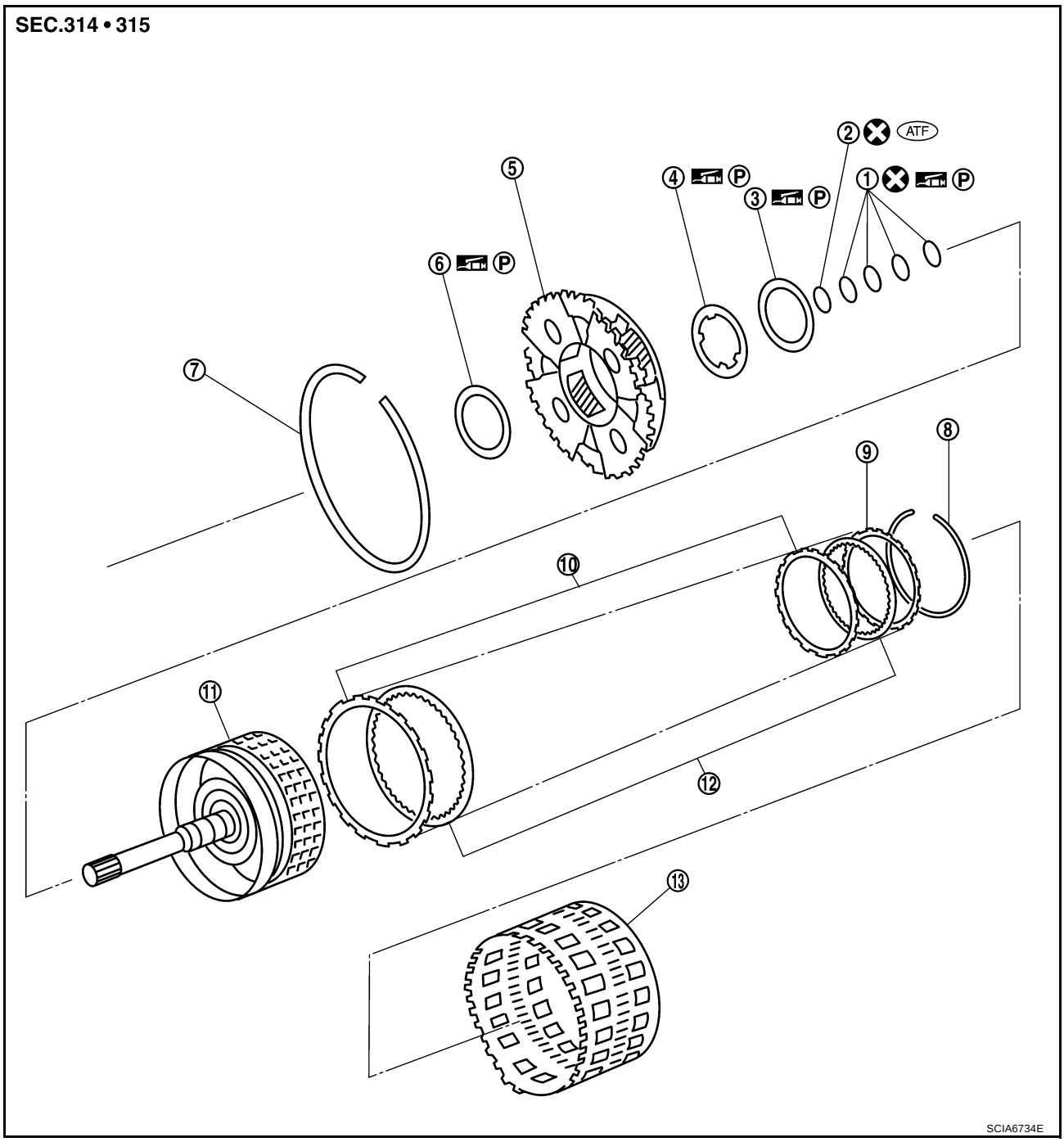
CAUTION:
If not as shown in the figure, check installation direction of 3rd one-way clutch.



Front Carrier, Input Clutch, Rear Internal Gear

NCS0009E

COMPONENTS

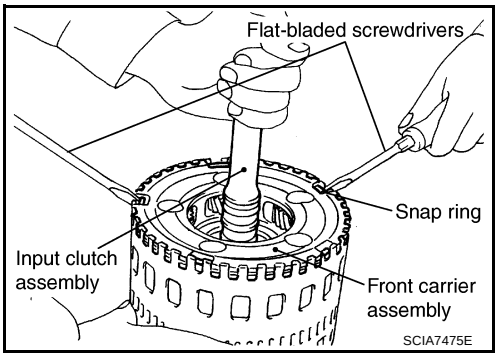


1. Seal ring
2. O-ring
3. Needle bearing
4. Bearing race
5. Front carrier assembly
6. Needle bearing
7. Snap ring
8. Snap ring
9. Retaining plate
10. Driven plate
11. Input clutch drum
12. Drive plate
13. Rear internal gear

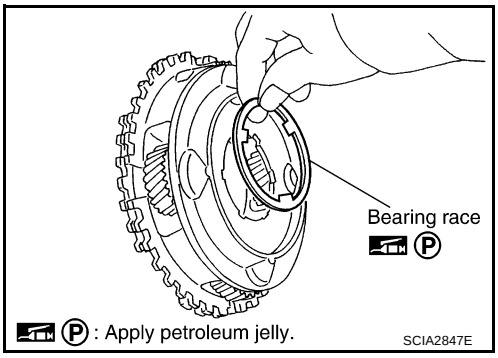
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-11, "Components" .

DISASSEMBLY

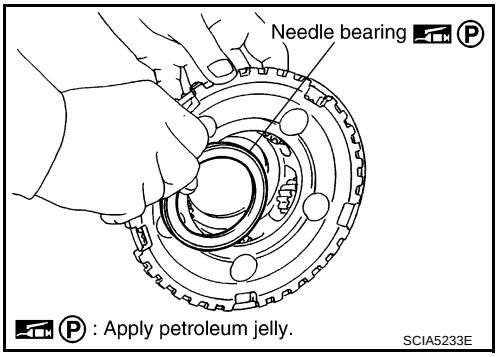
1. Compress snap ring using 2 flat-bladed screwdrivers.
2. Remove front carrier assembly and input clutch assembly from rear internal gear.
3. Remove front carrier assembly from input clutch assembly.



a. Remove bearing race from front carrier assembly.

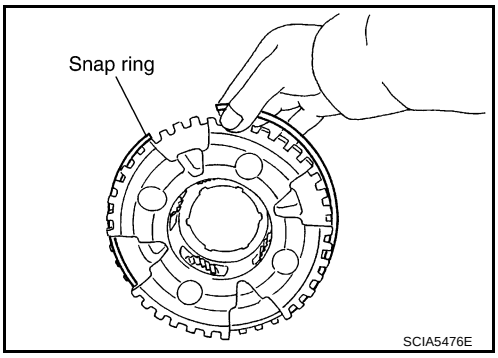


b. Remove needle bearing from front carrier assembly.



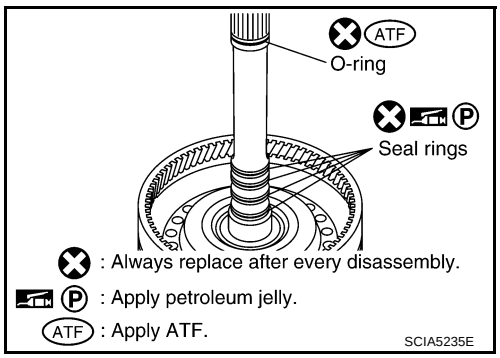
c. Remove snap ring from front carrier assembly.

CAUTION:
Do not expand snap ring excessively.

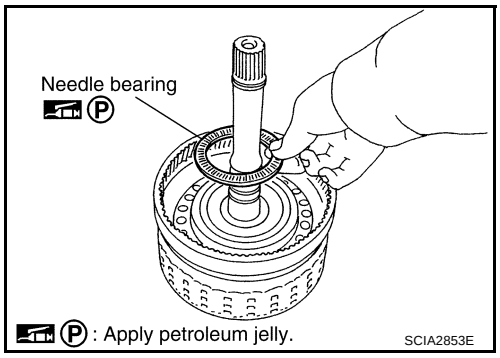


4. Disassemble input clutch assembly.

a. Remove O-ring and seal rings from input clutch assembly.

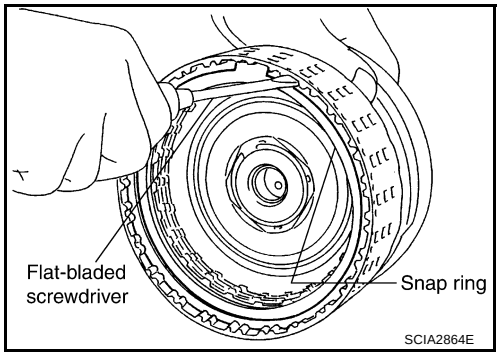


b. Remove needle bearing from input clutch assembly.



c. Remove snap ring from input clutch drum using a flat-bladed screwdriver.

d. Remove retaining plate, drive plates and driven plates from input clutch drum.



INSPECTION

Front Carrier Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace snap ring.

Input Clutch Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace input clutch assembly.

Input Clutch Drum

- Check for deformation, fatigue or damage or burns.

CAUTION:
If necessary, replace input clutch assembly.

Input Clutch Drive Plates

- Check facing for burns, cracks or damage.

CAUTION:
If necessary, replace input clutch assembly.

Input Clutch Retaining Plate and Driven Plates

- Check facing for burns, cracks or damage.

CAUTION:
If necessary, replace input clutch assembly.

Front Carrier

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace front carrier assembly.

Rear Internal Gear

- Check for deformation, fatigue or damage.

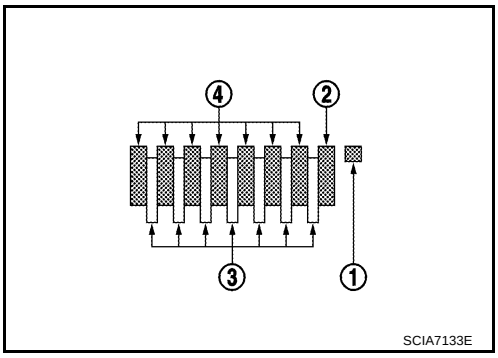
CAUTION:
If necessary, replace rear internal gear.

ASSEMBLY

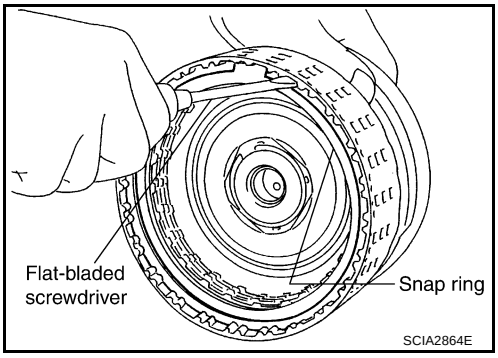
1. Install input clutch.

a. Install driven plates, drive plates and retaining plate in input clutch drum.
   - Snap ring (1)
   - Retaining plate (2)
   - Drive plate (3)
   - Driven plate (4)
   - Drive plate/Driven plate: 7/7

   CAUTION:
   Take care with order of plates.

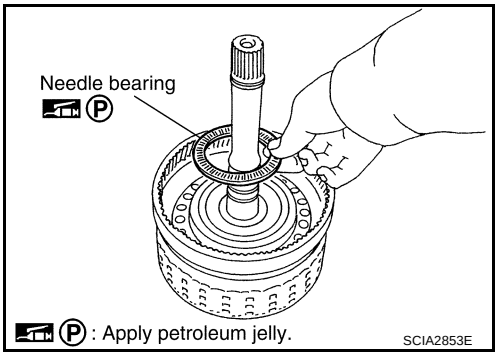


b. Install snap ring in input clutch drum using a flat-bladed screwdriver.



c. Install needle bearing in input clutch assembly.

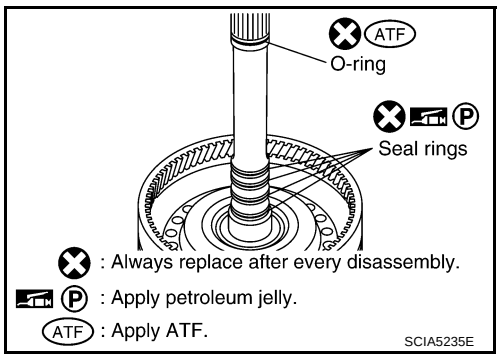
   CAUTION:
   - **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
   - **Apply petroleum jelly to needle bearing.**



d. Install O-ring and seal rings in input clutch assembly.

CAUTION:

- **Do not reuse O-ring and seal rings.**
- **Apply ATF to O-ring.**
- **Apply petroleum jelly to seal rings.**

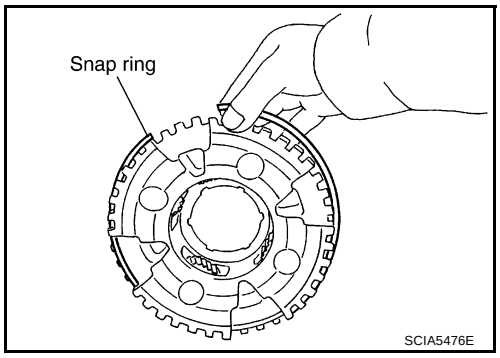


2. Install front carrier assembly.

a. Install snap ring to front carrier assembly.

CAUTION:

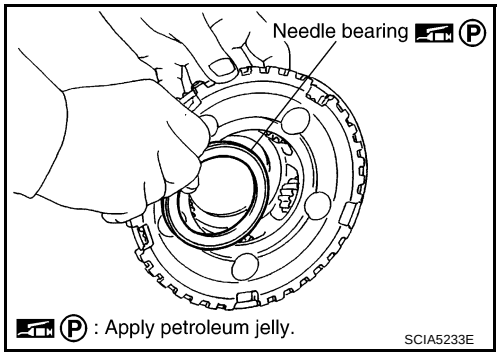
Do not expand snap ring excessively.



b. Install needle bearing in front carrier assembly.

CAUTION:

- **Take care with the direction of needle bearing. Refer to** **AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"** .
- **Apply petroleum jelly to needle bearing.**

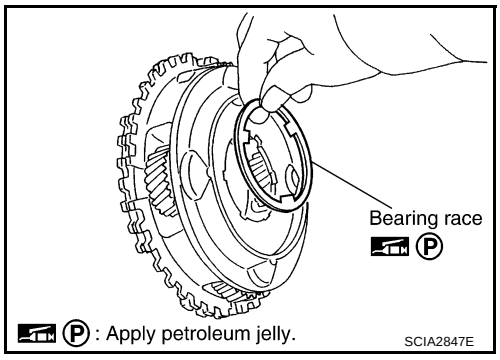


c. Install bearing race in front carrier assembly.

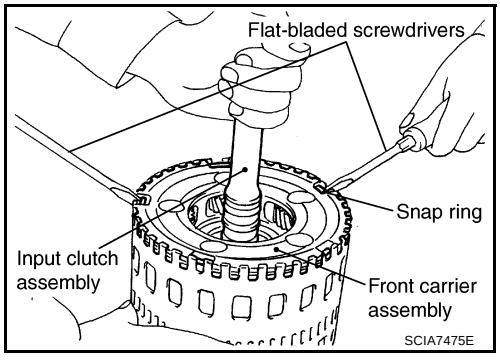
CAUTION:

Apply petroleum jelly to bearing race.

d. Install front carrier assembly to input clutch assembly.



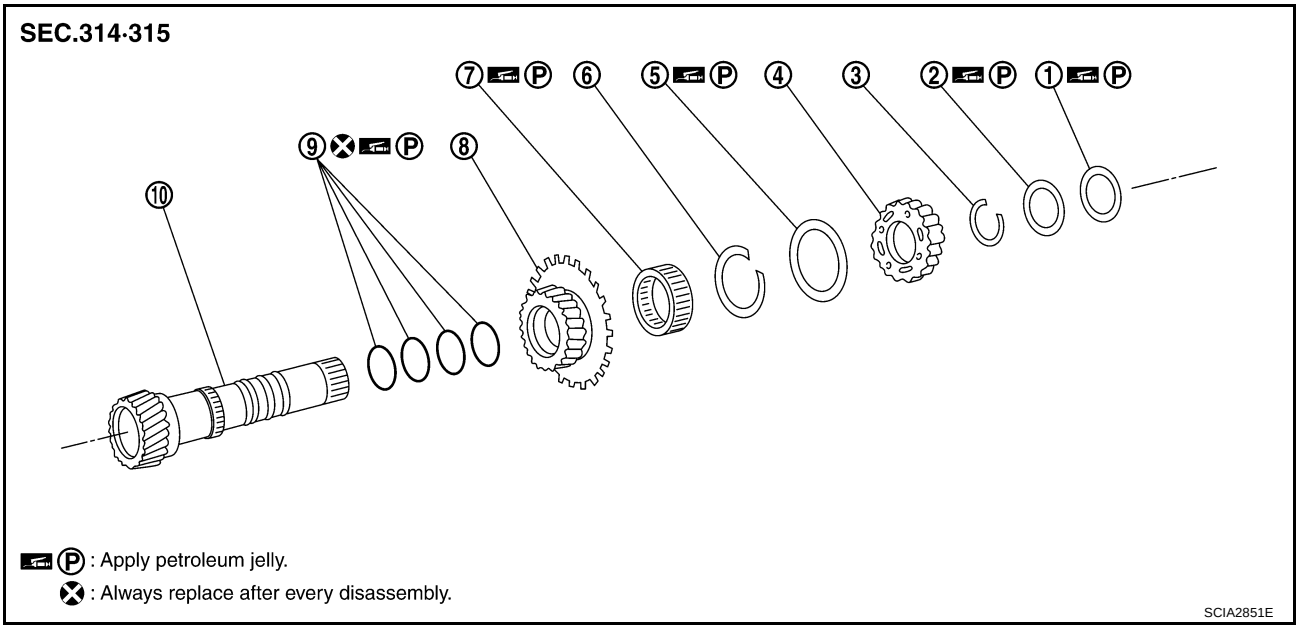
3. Compress snap ring using 2 flat-bladed screwdrivers.
4. Install front carrier assembly and input clutch assembly to rear internal gear.



Mid Sun Gear, Rear Sun Gear, High and Low Reverse Clutch Hub

NCS0009F

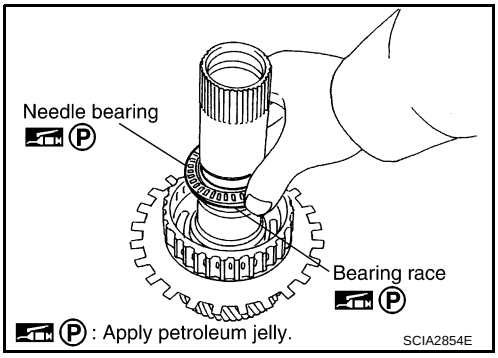
COMPONENTS



1. Needle bearing
2. Bearing race
3. Snap ring
4. High and low reverse clutch hub
5. Needle bearing
6. Snap ring
7. 1st one-way clutch
8. Rear sun gear
9. Seal ring
10. Mid sun gear

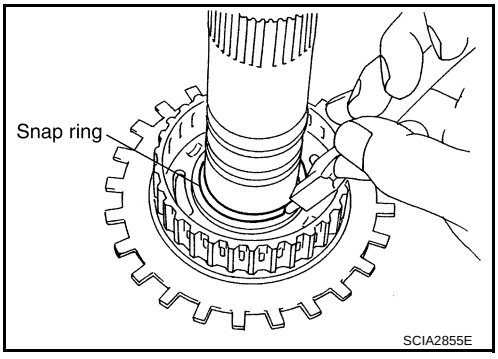
DISASSEMBLY

1. Remove needle bearing and bearing race from high and low reverse clutch hub.

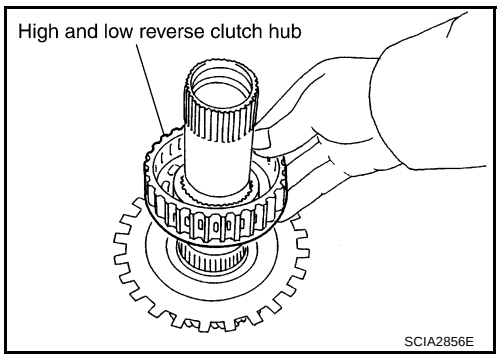


2. Remove snap ring from mid sun gear assembly using pair of snap ring pliers.

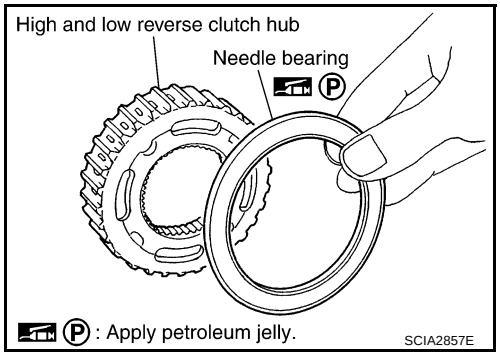
CAUTION:
Do not expand snap ring excessively.



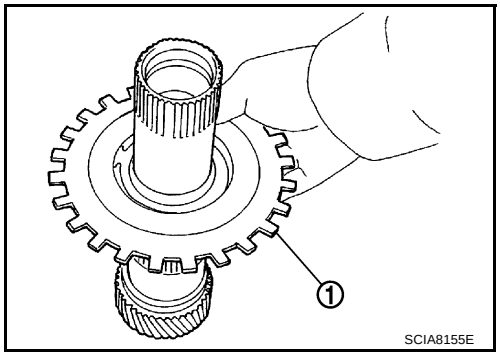
3. Remove high and low reverse clutch hub from mid sun gear assembly.



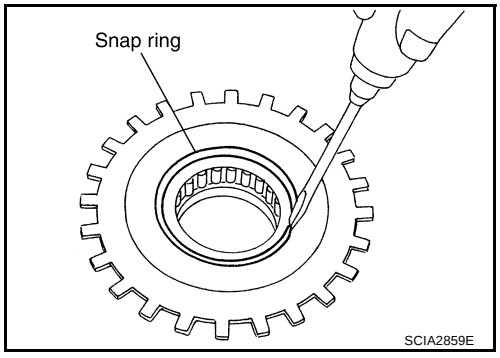
a. Remove needle bearing from high and low reverse clutch hub.



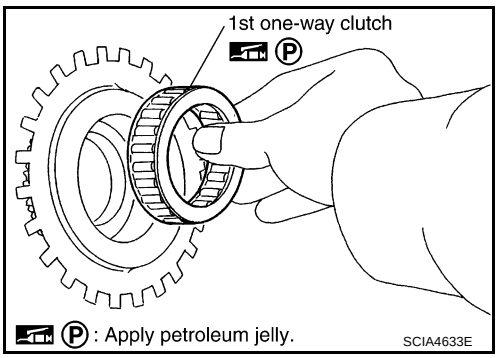
4. Remove rear sun gear assembly (1) from mid sun gear assembly.



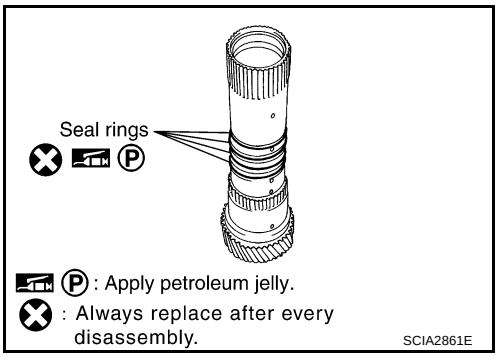
a. Remove snap ring from rear sun gear using a flat-bladed screwdriver.



b. Remove 1st one-way clutch from rear sun gear.



5. Remove seal rings from mid sun gear.



INSPECTION

High and Low Reverse Clutch Hub Snap Ring, Rear Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace snap ring.

1st One-way Clutch

- Check frictional surface for wear or damage.

CAUTION:
If necessary, replace 1st one-way clutch.

Mid Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace mid sun gear.

Rear Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace rear sun gear.

High and Low Reverse Clutch Hub

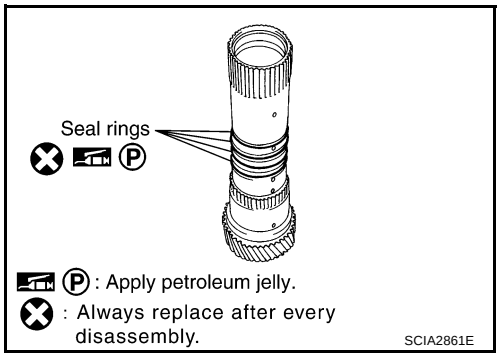
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace high and low reverse clutch hub.

ASSEMBLY

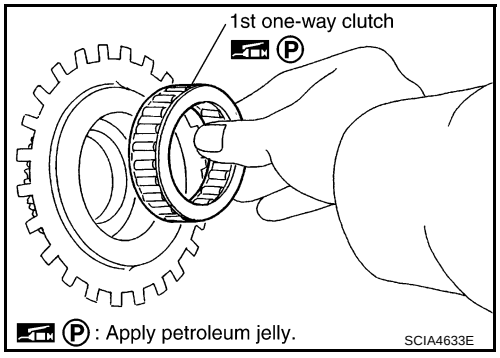
1. Install seal rings to mid sun gear.

CAUTION:
- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**

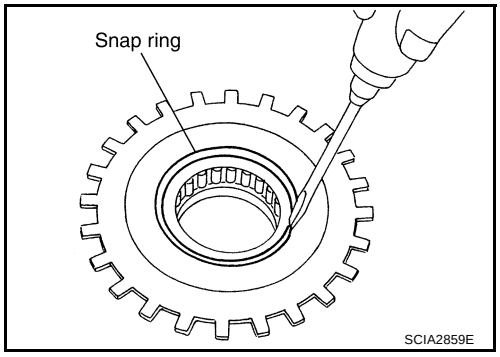


2. Install 1st one-way clutch to rear sun gear.

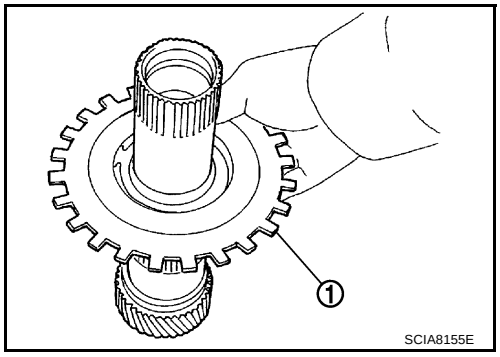
CAUTION:
Apply petroleum jelly to 1st one-way clutch.



3. Install snap ring to rear sun gear using a flat-bladed screwdriver.



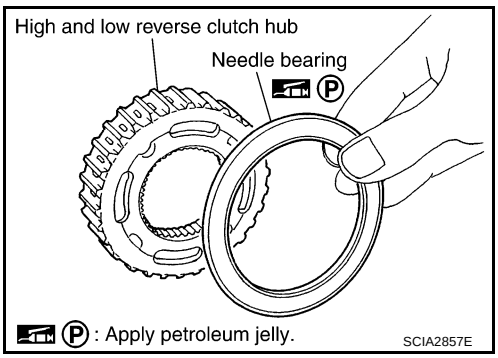
4. Install rear sun gear assembly (1) to mid sun gear assembly.



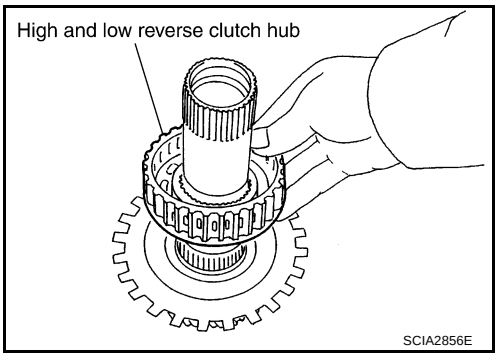
5. Install needle bearing to high and low reverse clutch hub.

CAUTION:

- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



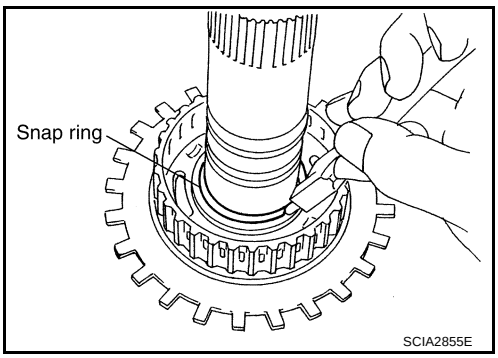
6. Install high and low reverse clutch hub to mid sun gear assembly.



7. Install snap ring to mid sun gear assembly using pair of snap ring pliers.

CAUTION:

Do not expand snap ring excessively.



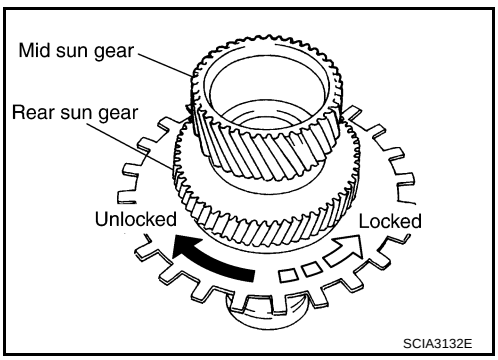
8. Check operation of 1st one-way clutch.

a. Hold mid sun gear and turn rear sun gear.

b. Check 1st one-way clutch for correct locking and unlocking directions.

CAUTION:

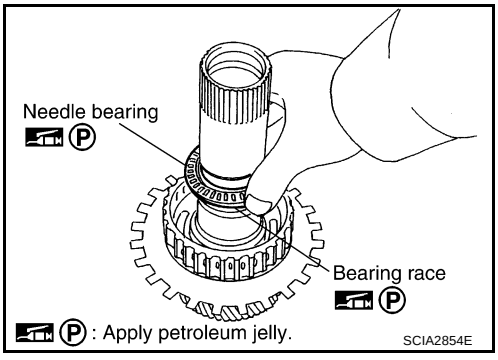
If not as shown in illustration, check installation direction of 1st one-way clutch.



9. Install bearing race and needle bearing to high and low reverse clutch hub.

CAUTION:

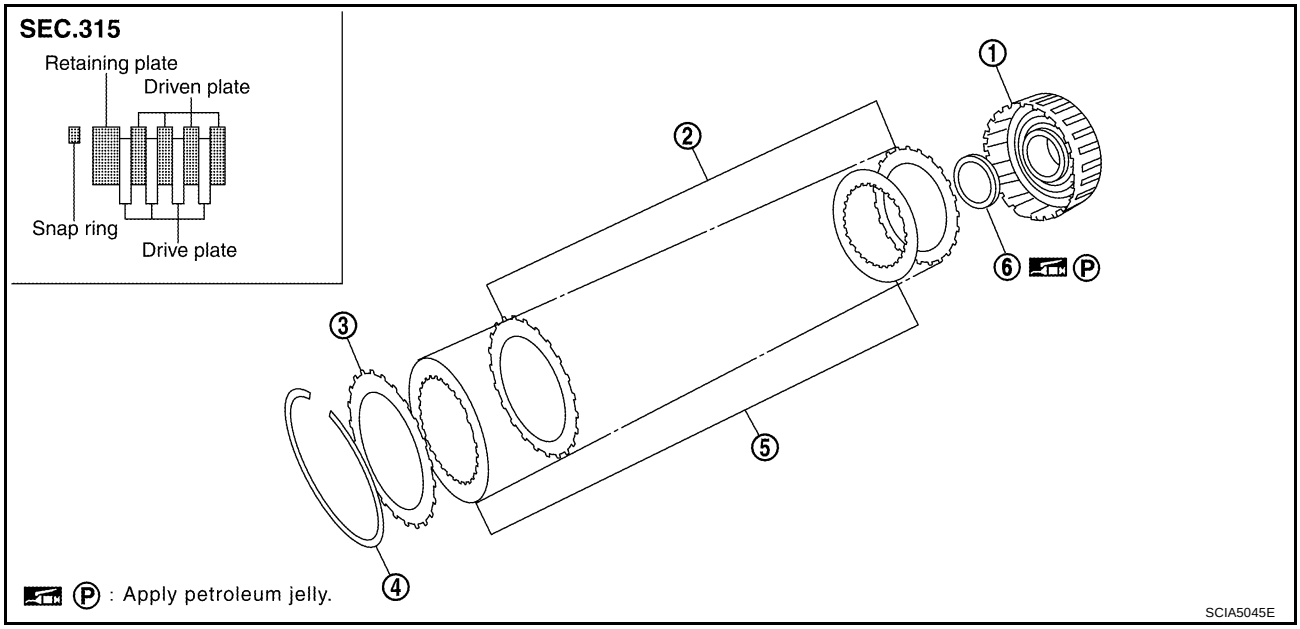
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



High and Low Reverse Clutch

NCS0009G

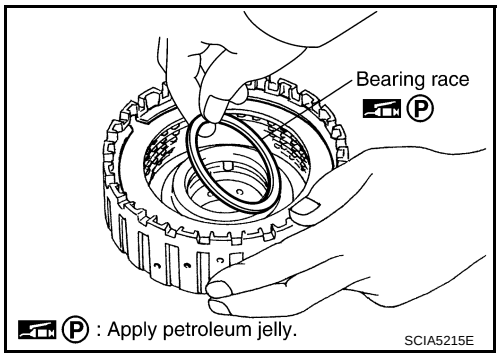
COMPONENTS



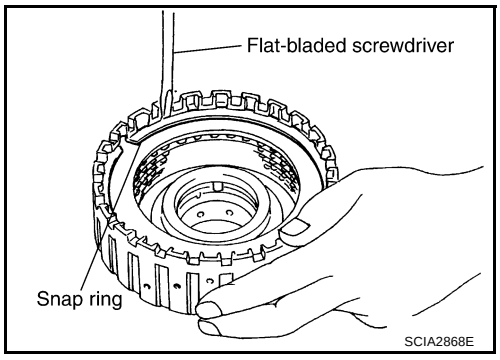
1. High and low reverse clutch drum
2. Driven plate
3. Retaining plate
4. Snap ring
5. Drive plate
6. Bearing race

DISASSEMBLY

1. Remove bearing race from high and low reverse clutch drum.



2. Remove snap ring from high and low reverse clutch drum using a flat-bladed screwdriver.
3. Remove retaining plate, drive plates and driven plates from high and low reverse clutch drum.



INSPECTION

Check the following, and replace high and low reverse clutch assembly if necessary.

High and Low Reverse Clutch Snap Ring

- Check for deformation, fatigue or damage.

High and Low Reverse Clutch Drive Plates

- Check facing for burns, cracks or damage.

High and Low Reverse Clutch Retaining Plate and Driven Plates

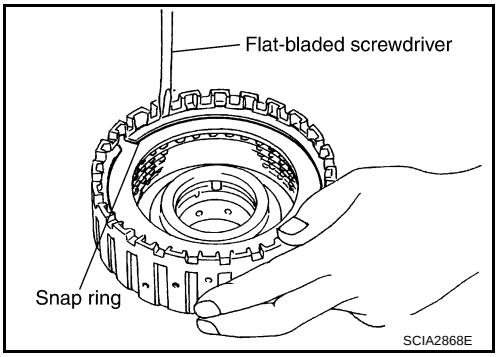
- Check facing for burns, cracks or damage.

ASSEMBLY

1. Install driven plates, drive plates and retaining plate in high and low reverse clutch drum.

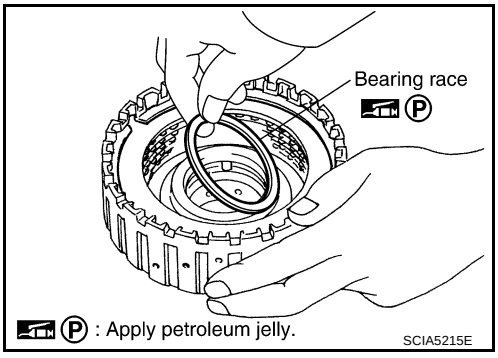
   CAUTION:
   Take care with order of plates.

2. Install snap ring in high and low reverse clutch drum using a flat-bladed screwdriver.



3. Install bearing race to high and low reverse clutch drum.

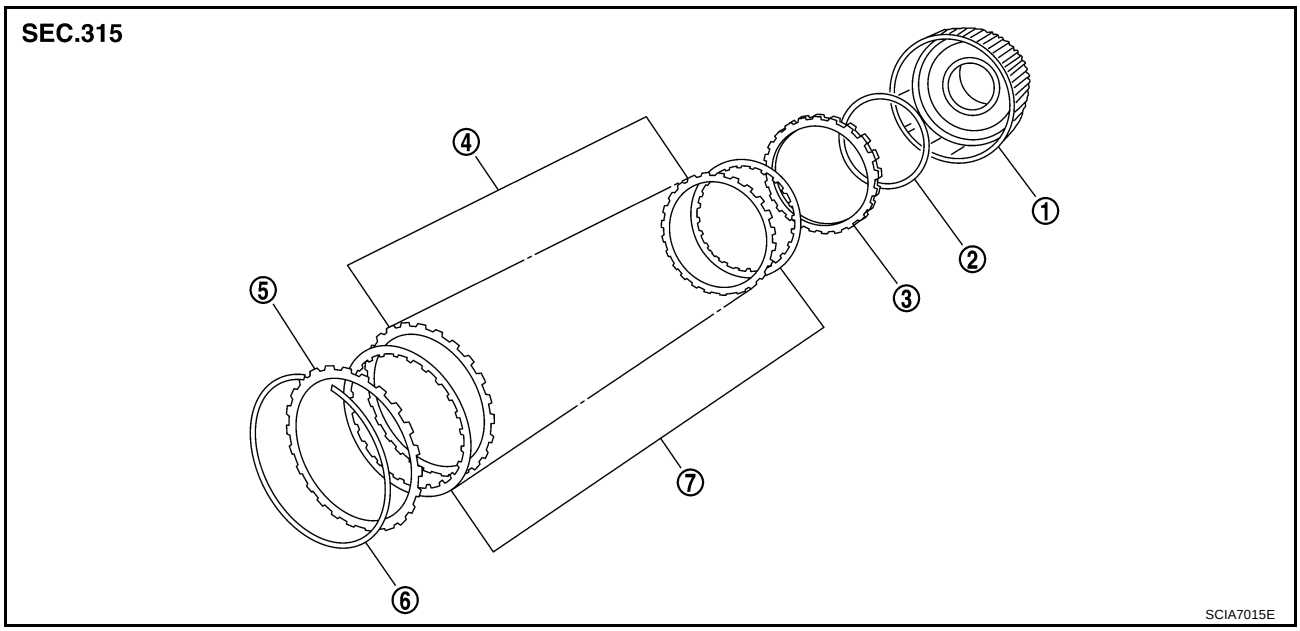
   CAUTION:
   Apply petroleum jelly to bearing race.



Direct Clutch

NCS0009H

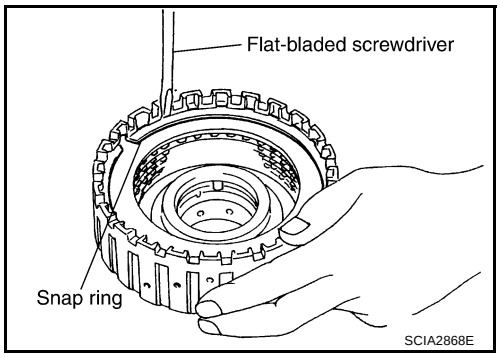
COMPONENTS



1. Direct clutch drum
2. Dish plate
3. Retaining plate
4. Driven plate
5. Retaining plate
6. Snap ring
7. Drive plate

DISASSEMBLY

1. Remove snap ring from direct clutch drum using a flat-bladed screwdriver.
2. Remove retaining plates, drive plates, driven plates and dish plate from direct clutch drum.



INSPECTION

Check the following, and replace direct clutch assembly if necessary.

Direct Clutch Snap Ring

- Check for deformation, fatigue or damage.

Direct Clutch Drive Plates

- Check facing for burns, cracks or damage.

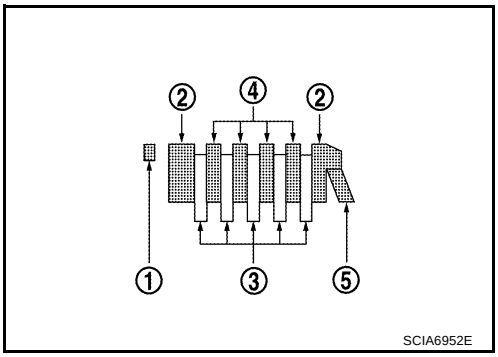
Direct Clutch Retaining Plate, Driven Plates and Dish Plate

- Check facing for burns, cracks or damage.

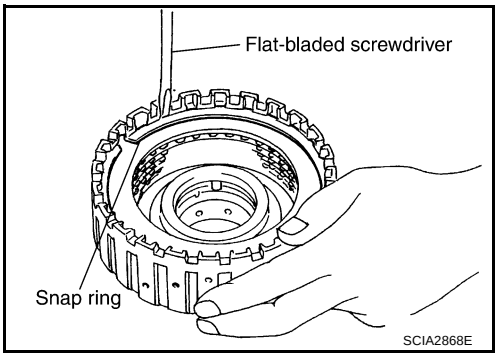
ASSEMBLY

1. Install dish plate, retaining paltes, driven plates and drive plates in direct clutch drum.
   - Snap ring (1)
   - Retaining plate (2)
   - Drive plate (3)
   - Driven plate (4)
   - Dish plate (5)
   - Drive plate/Driven plate: 5/4

   CAUTION:
   Take care with order of plates.



2. Install snap ring in direct clutch drum using a flat-bladed screwdriver.



ASSEMBLY

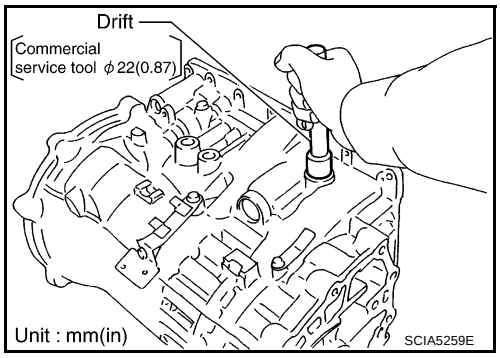
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Assembly (1)

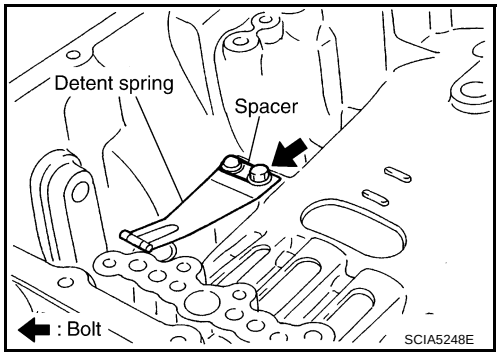
NCS0009I

1. As shown in the right figure, use a drift [commercial service tool: 22 mm (0.87 in) dia.] to drive manual shaft oil seals into transmission case until it is flush.

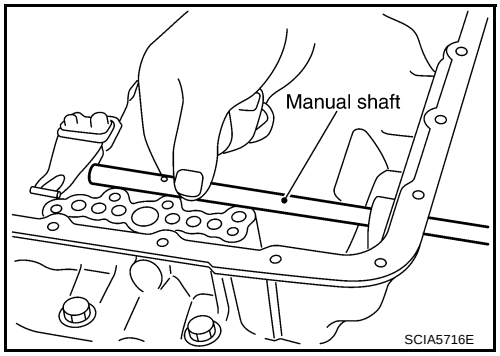
   CAUTION:
   - **Do not reuse manual shaft oil seals.**
   - **Apply ATF to manual shaft oil seals.**



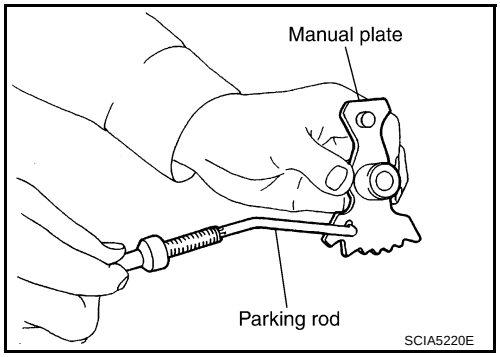
2. Install detent spring and spacer to transmission case, and then tighten mounting bolt to the specified torque. Refer to AT-246, "Components" .



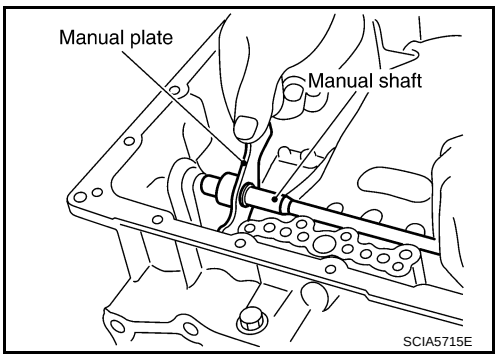
3. Install manual shaft to transmission case.



4. Install parking rod to manual plate.



5. Install manual plate (with parking rod) to manual shaft.



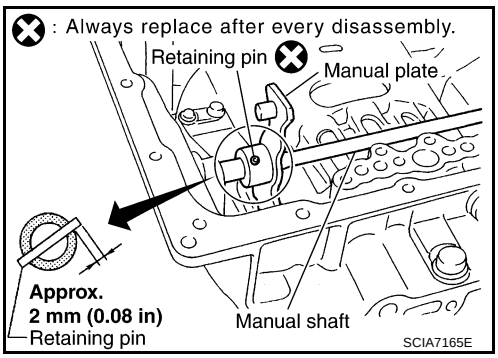
6. Install retaining pin into manual plate and manual shaft.

a. Fit pinhole of manual plate to pinhole of manual shaft with a pin punch.

b. Tap retaining pin into manual plate using a hammer.

CAUTION:

- **Do not reuse retaining pin.**
- **Drive retaining pin to 2±0.5 mm (0.08±0.020 in) over manual plate.**



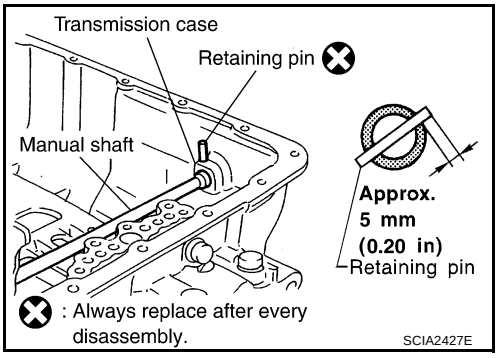
7. Install retaining pin into transmission case and manual shaft.

a. Fit pinhole of transmission case to pinhole of manual shaft with a pin punch.

b. Tap the retaining pin into transmission case using a hammer.

CAUTION:

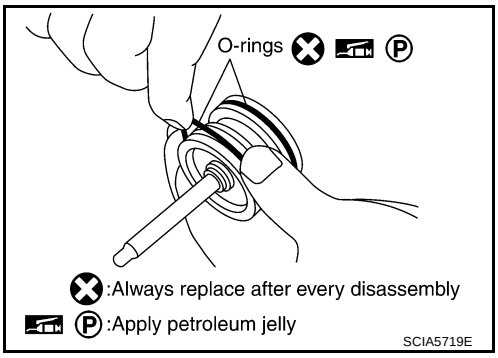
- **Do not reuse retaining pin.**
- **Drive retaining pin to 5±1 mm (0.20±0.04 in) over transmission case.**



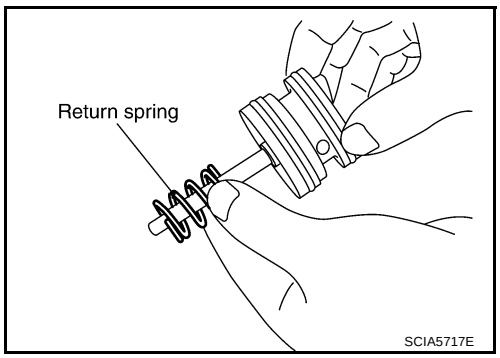
8. Install O-rings to servo assembly.

CAUTION:

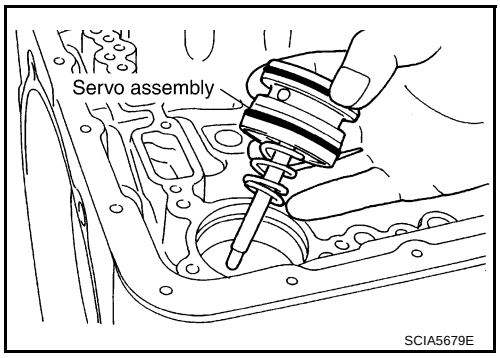
- **Do not reuse O-rings.**
- **Apply petroleum jelly to O-rings.**



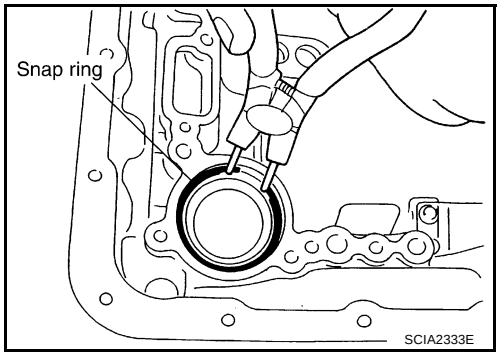
9. Install return spring to servo assembly.



10. Install servo assembly in transmission case.



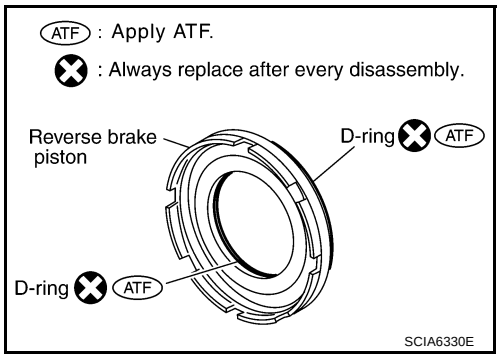
11. Install snap ring to transmission case using pair of snap ring pliers.



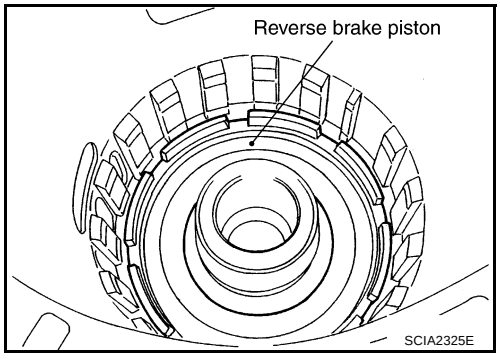
12. Install D-rings in reverse brake piston.

CAUTION:

- **Do not reuse D-rings.**
- **Apply ATF to D-rings.**



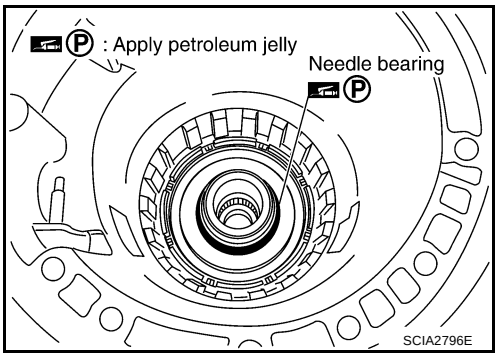
13. Install reverse brake piston in transmission case.



14. Install needle bearing to drum support edge surface.

CAUTION:

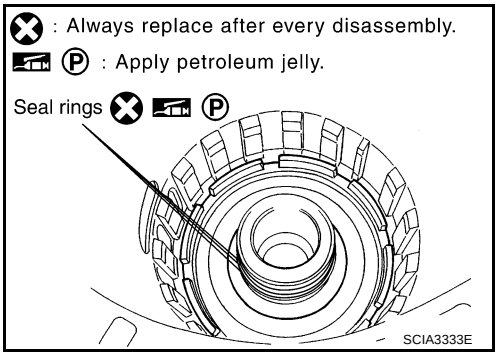
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



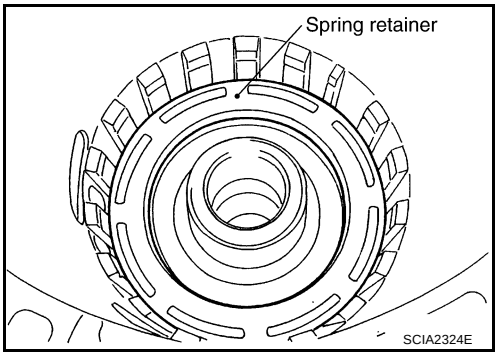
15. Install seal rings to drum support.

CAUTION:

- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



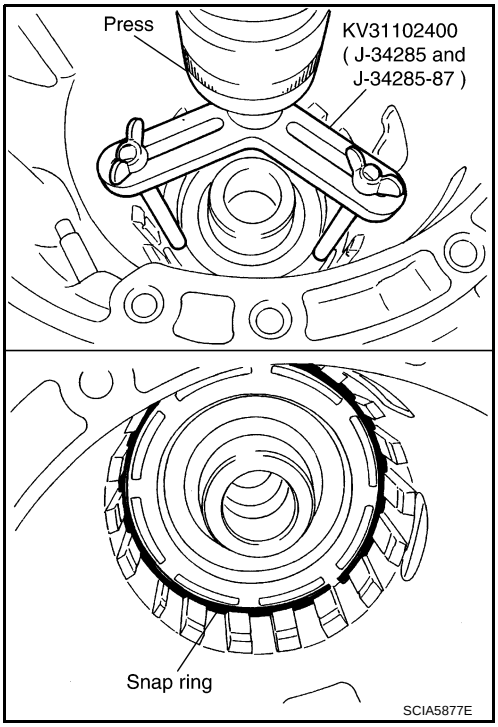
16. Install return spring and spring retainer in transmission case.



17. Set the SST on spring retainer and install snap ring (fixing spring retainer) in transmission case while compressing return spring.

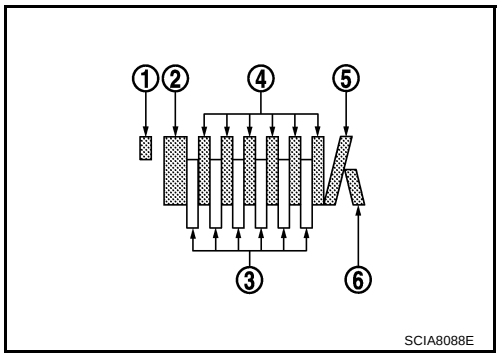
CAUTION:

Securely assemble them using a flat-bladed screwdriver so that snap ring tension is slightly weak.

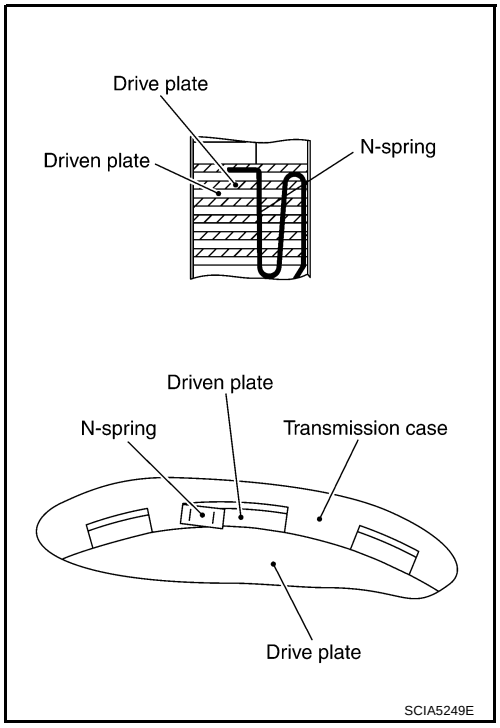


18. Install reverse brake retaining plate, drive plates, driven plates and dish plates in transmission case.
    - Snap ring (1)
    - Retaining plate (2)
    - Drive plate (3)
    - Driven plate (4)
    - Dish plate (5)
    - Dish plate (6)
    - Driveplate/Driven plate: 6/6

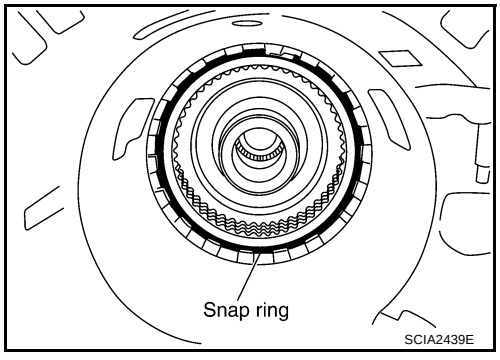
    CAUTION:
    Take care with order of plates.



19. Assemble N-spring.
20. Install reverse brake retaining plate in transmission case.



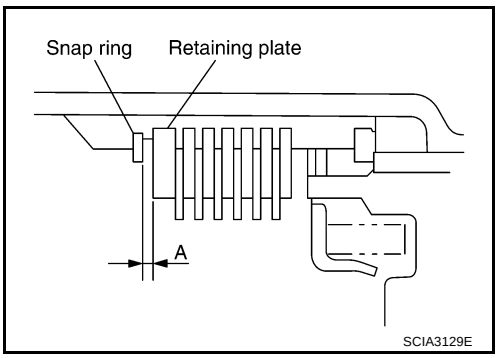
21. Install snap ring in transmission case.



22. Measure clearance between retaining plate and snap ring. If not within specified clearance, select proper retaining plate. Refer to “Parts Information” for retaining plate selection.

Specified clearance “A”:

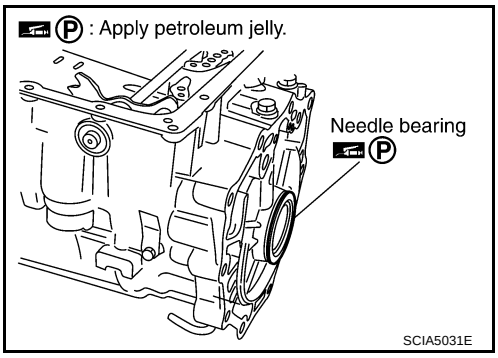
Refer to AT-312, "Reverse Brake" .



23. Install needle bearing to transmission case.

CAUTION:

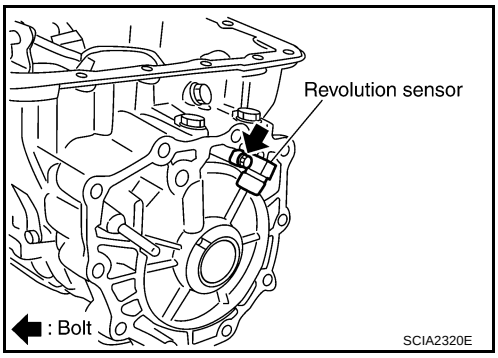
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



24. Install revolution sensor to transmission case, and then tighten mounting bolt to the specified torque. Refer to AT-246, "Components" .

CAUTION:

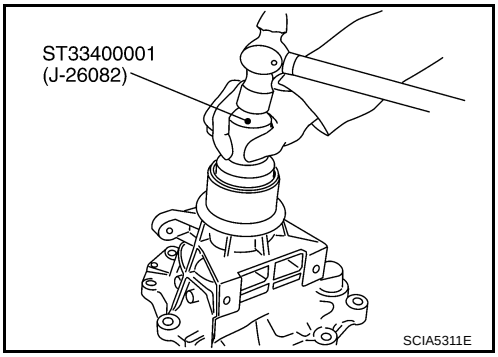
- **Do not subject it to impact by dropping or hitting it.**
- **Do not disassemble.**
- **Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**



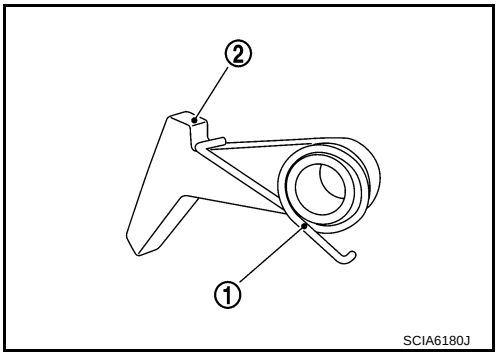
25. As shown in the figure, drive rear oil seal into rear extension until it is flush using a drift.

CAUTION:

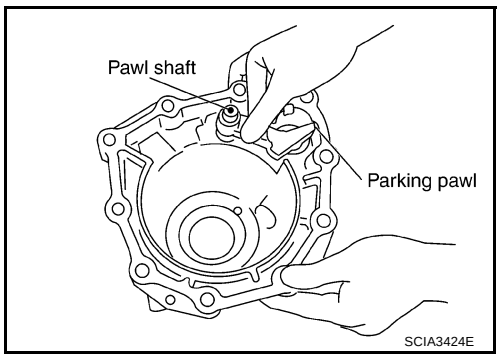
- **Do not reuse rear oil seal.**
- **Apply ATF to rear oil seal.**



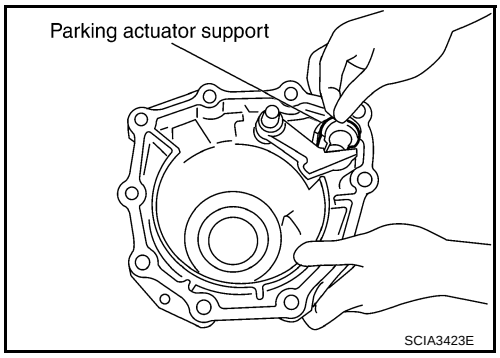
26. Install return spring (1) to parking pawl (2).



27. Install parking pawl (with return spring) and pawl shaft to rear extension.



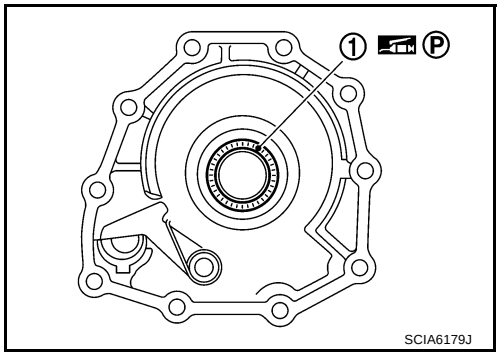
28. Install parking actuator support to rear extension.



29. Install needle bearing (1) to rear extension.

CAUTION:

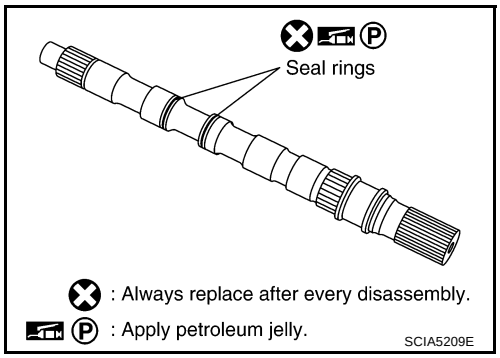
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



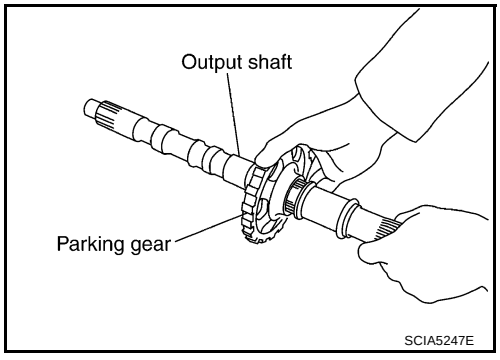
30. Install seal rings to output shaft.

CAUTION:

- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**

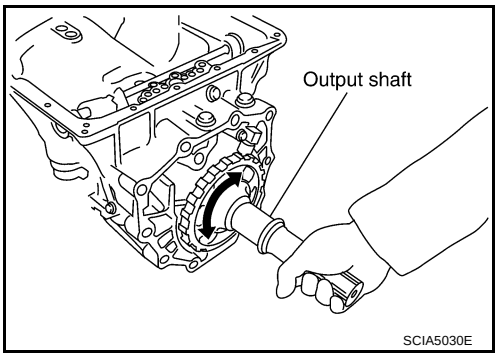


31. Install parking gear to output shaft.

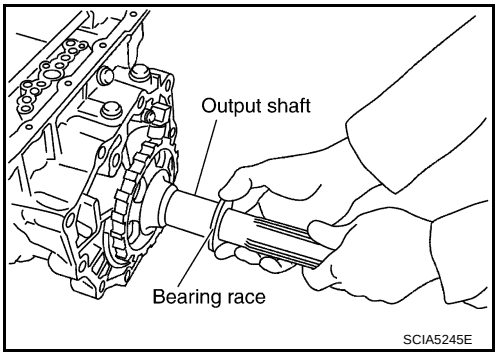


32. Install output shaft in transmission case.

CAUTION:
Be careful not to mistake front for rear because both sides looks similar. (Thinner end is front side.)

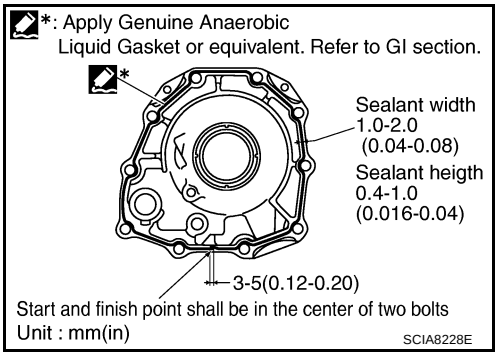


33. Install bearing race to output shaft.



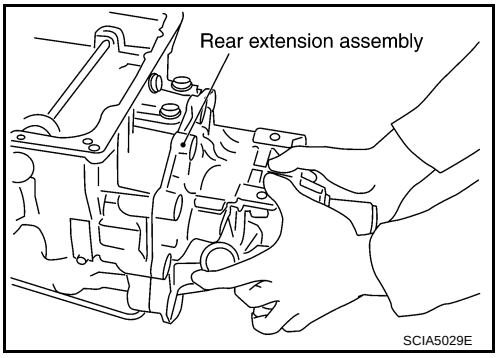
34. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .) to rear extension assembly as shown in the figure.

CAUTION:
Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



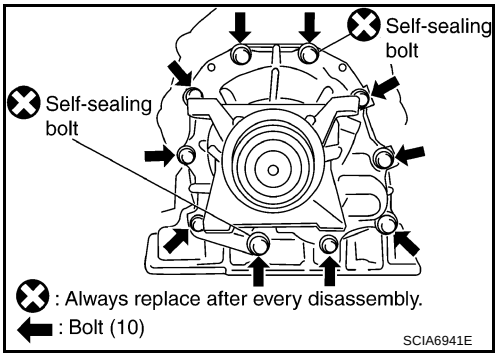
35. Install rear extension assembly to transmission case.

CAUTION:
Insert the tip of parking rod between parking pawl and the parking actuator support when assembling rear extension assembly.



36. Tighten rear extension assembly mounting bolts to the specified torque. Refer to AT-246, "Components" .

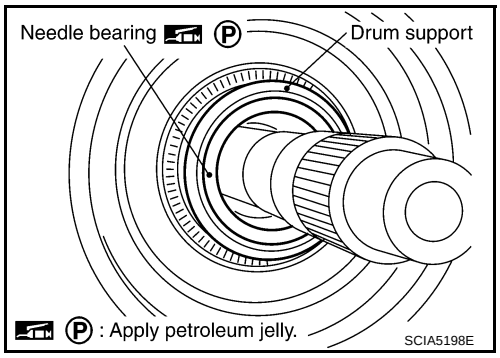
CAUTION:
Do not reuse self-sealing bolts.



37. Install needle bearing in drum support.

CAUTION:

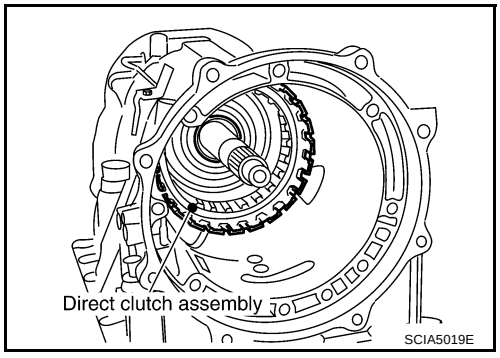
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



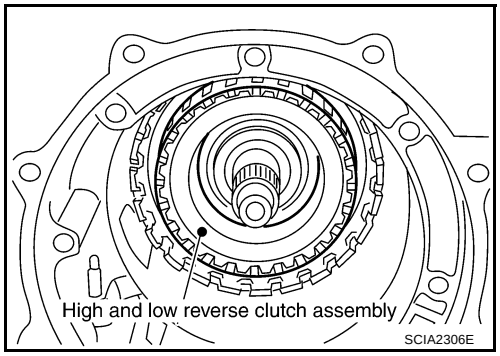
38. Install direct clutch assembly in reverse brake.

CAUTION:

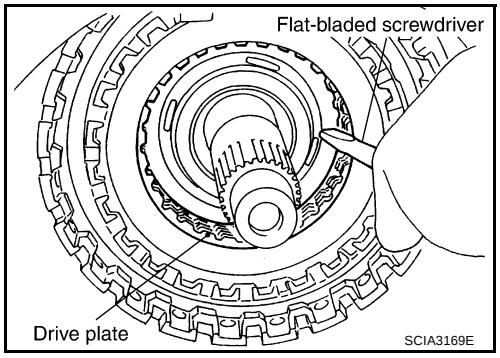
Make sure that drum support edge surface and direct clutch inner boss edge surface come to almost same place.



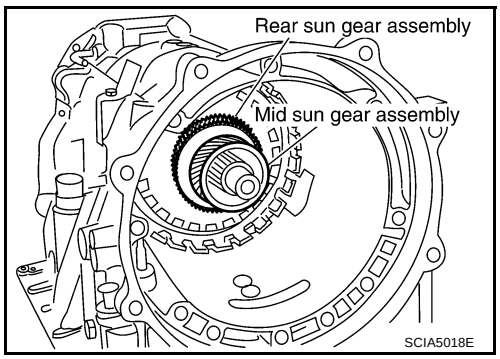
39. Install high and low reverse clutch assembly in direct clutch.



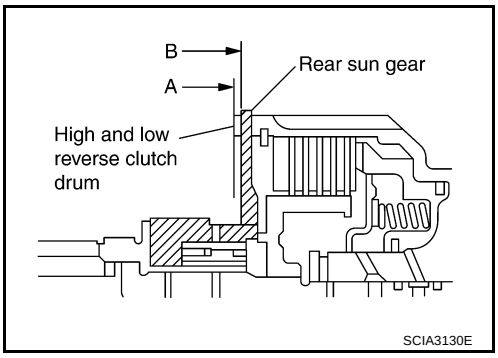
40. Align drive plate using a flat-bladed screwdriver.



41. Install high and low reverse clutch hub, mid sun gear assembly and rear sun gear assembly as a unit.

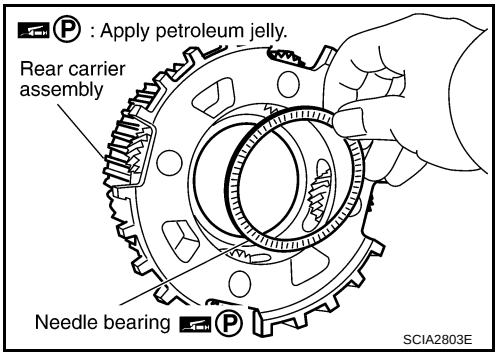


CAUTION:
Make sure that portion “A” of high and low reverse clutch drum protrudes approximately 2 mm (0.08 in) beyond portion “B” of rear sun gear.



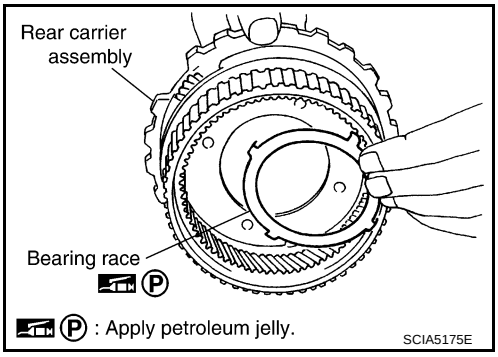
42. Install needle bearing in rear carrier assembly.

CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**

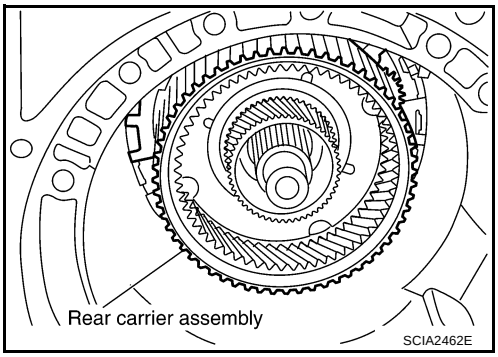


43. Install bearing race in rear carrier assembly.

CAUTION:
Apply petroleum jelly to bearing race.



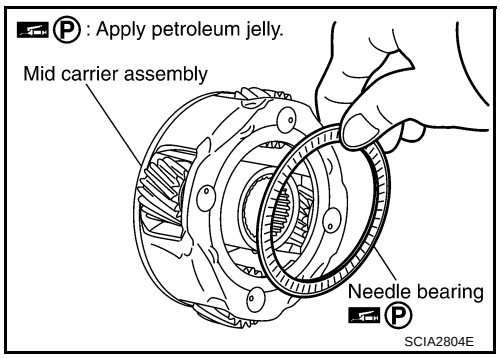
44. Install rear carrier assembly in direct clutch drum.



45. Install needle bearing (rear side) to mid carrier assembly.

CAUTION:

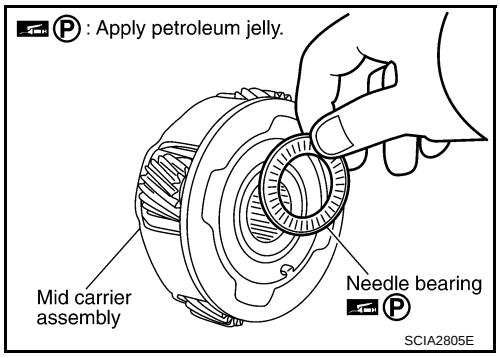
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



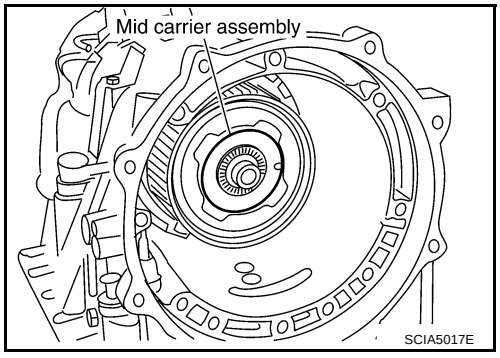
46. Install needle bearing (front side) to mid carrier assembly.

CAUTION:

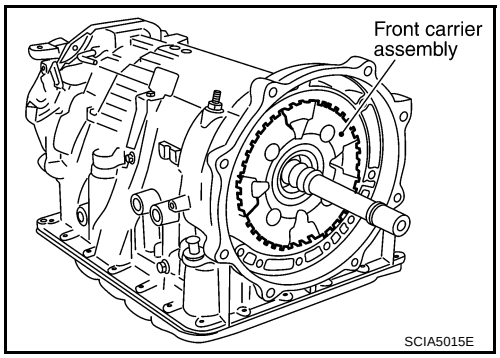
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



47. Install mid carrier assembly in rear carrier assembly.



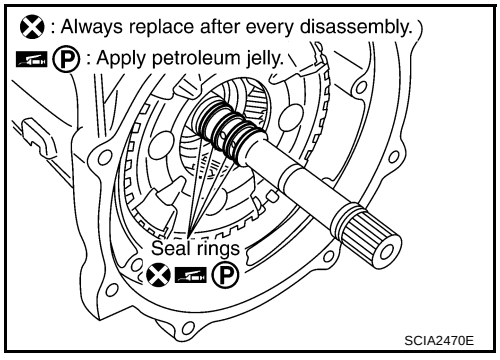
48. Install front carrier assembly, input clutch assembly and rear internal gear as a unit.



49. Install seal rings in input clutch assembly.

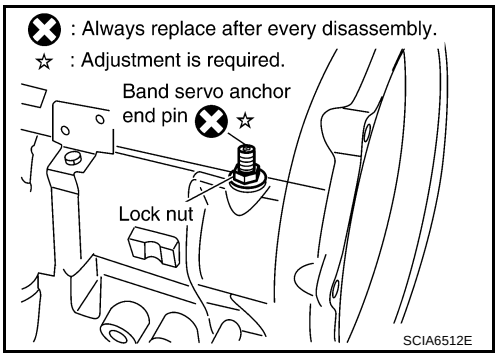
CAUTION:

- **Do not reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



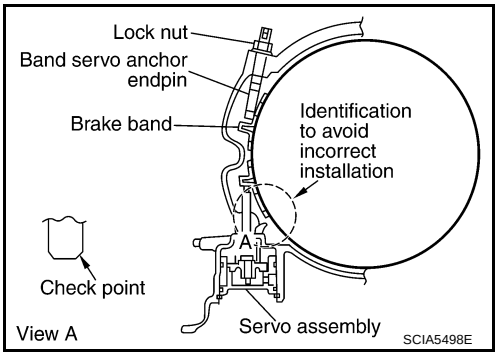
50. Install band servo anchor end pin and lock nut in transmission case.

CAUTION:
Do not reuse band servo anchor end pin.



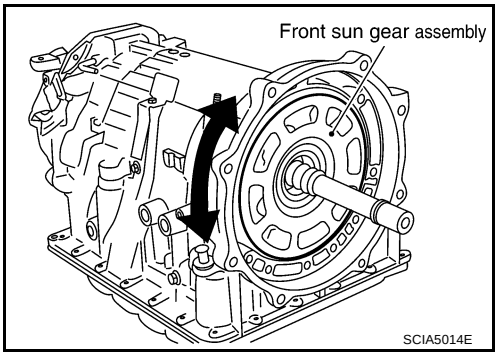
51. Install brake band in transmission case.

CAUTION:
Assemble it so that identification to avoid incorrect installation faces servo side.



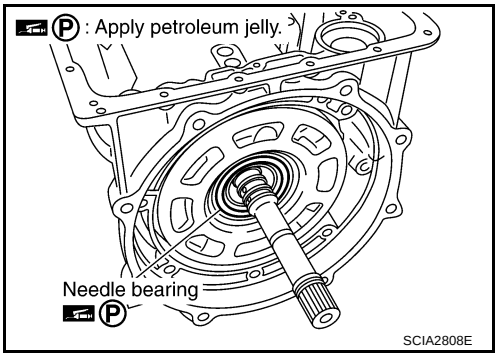
52. Install front sun gear to front carrier assembly.

CAUTION:
Apply ATF to front sun gear bearing and 3rd one-way clutch end bearing.

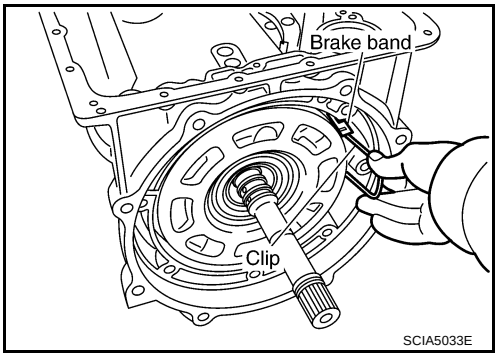


53. Install needle bearing to front sun gear.

CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings" .**
- **Apply petroleum jelly to needle bearing.**



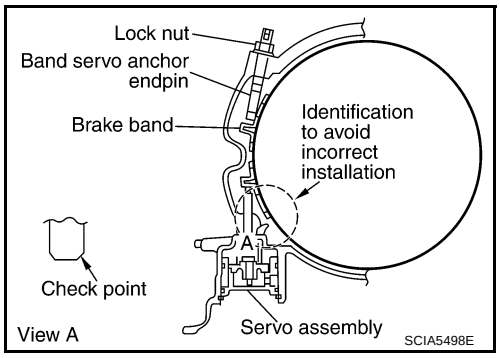
54. Adjust brake band tilting using a clip so that brake band contacts front sun gear drum evenly.



55. Adjust brake band.
a. Loosen lock nut.
b. Tighten band servo anchor end pin to the specified torque.

: 5.0 N·m (0.51 kg-m, 44 in-lb)

c. Back of band servo anchor end pin three turns.
d. Holding band servo anchor end pin, tighten lock nut to the specified torque. Refer to AT-246, "Components" .

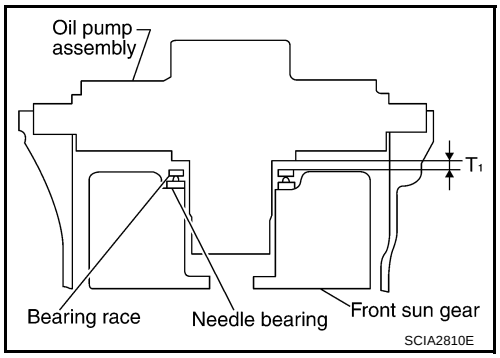


NCS0009J

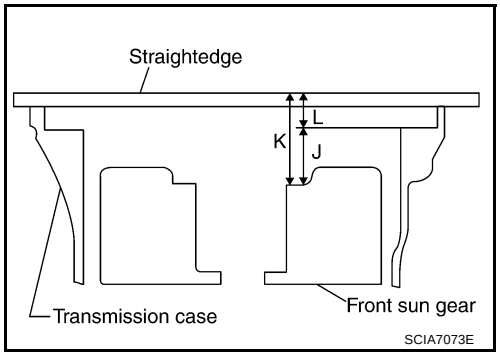
Adjustment

TOTAL END PLAY

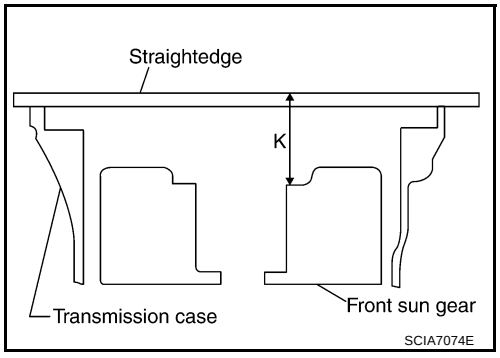
- Measure clearance between front sun gear and bearing race for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.



1. Measure dimensions “K” and “L” and then calculate dimension “J”.



a. Measure dimension “K”.

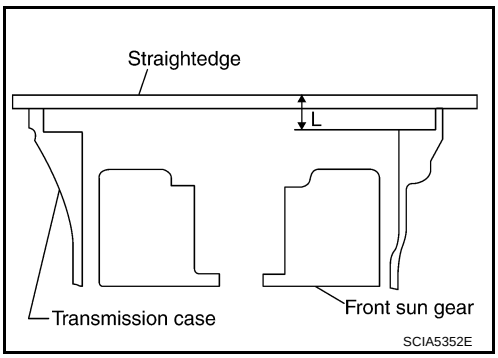


b. Measure dimension “L”.

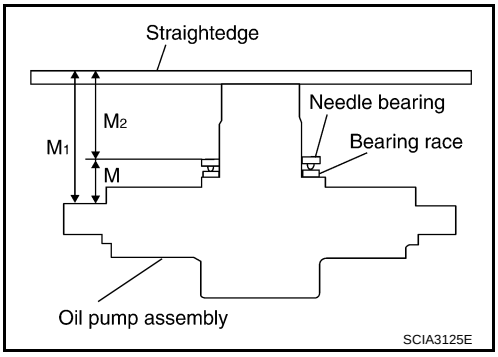
c. Calculate dimension “J”.

“J”: Distance between oil pump fitting surface of transmission case and needle bearing mating surface of front sun gear.

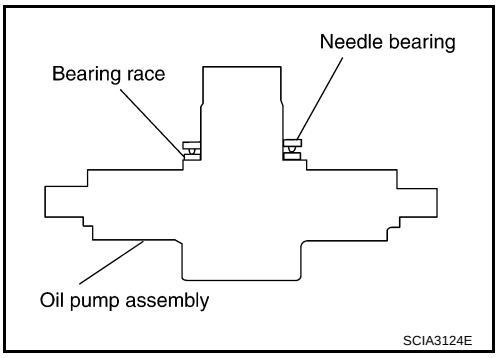
J = K – L



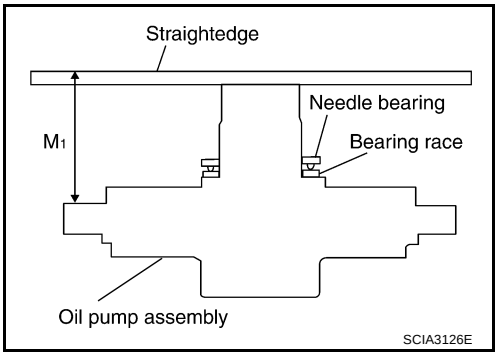
2. Measure dimensions “M_1 ” and “M_2 ” and then calculate dimension “M”.



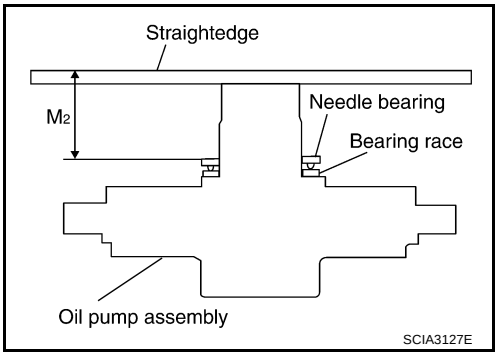
a. Place bearing race and needle bearing on oil pump assembly.



b. Measure dimension “M_1 ”.



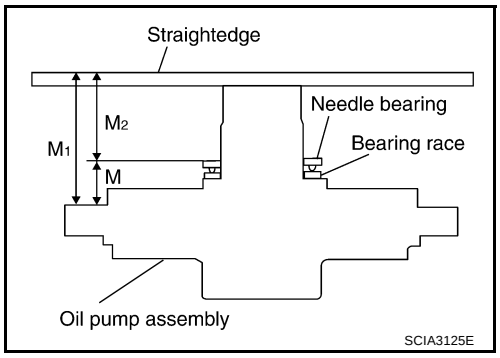
c. Measure dimension “M_2 ”.



d. Calculate dimension “M”.

“M”: Distance between transmission case fitting surface of oil pump and needle bearing on oil pump.

$M = M_1 - M_2$



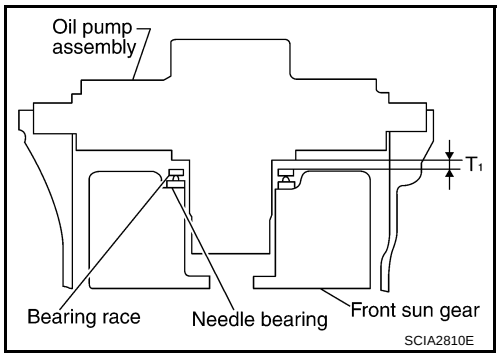
3. Adjust total end play “T_1”.

$T_1 = J - M$

Total end play “T_1”:

Refer to AT-312, "Total End Play" .

- Select proper thickness of bearing race so that total end play is within specifications. Refer to “Parts Information” for bearing race selection.



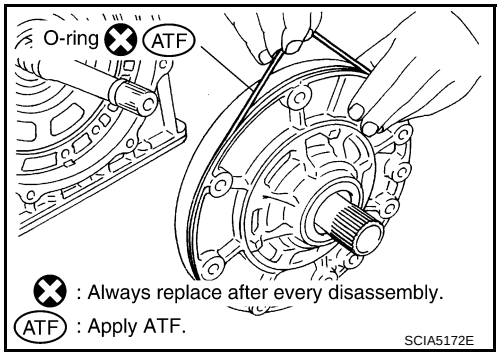
Assembly (2)

NCS0009K

1. Install O-ring to oil pump assembly.

CAUTION:

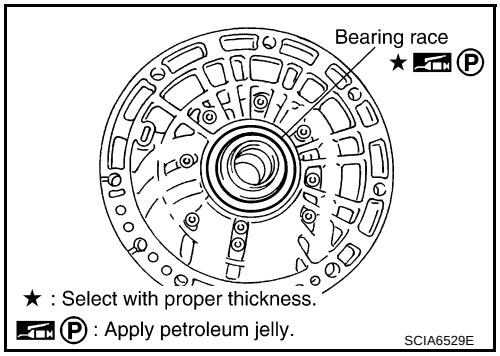
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**



2. Install bearing race to oil pump assembly.

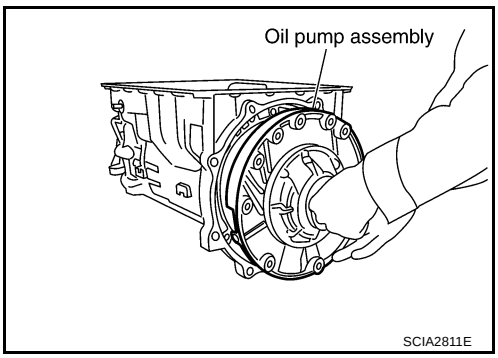
CAUTION:

Apply petroleum jelly to bearing race.



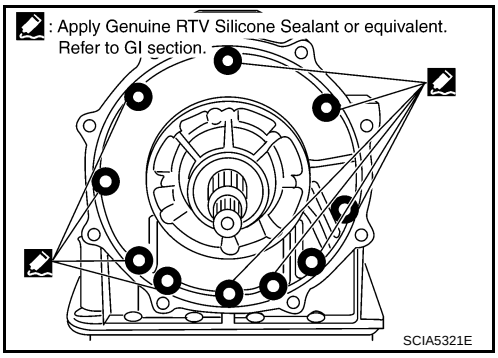
3. Install oil pump assembly in transmission case.

CAUTION:
Apply ATF to oil pump bearing.



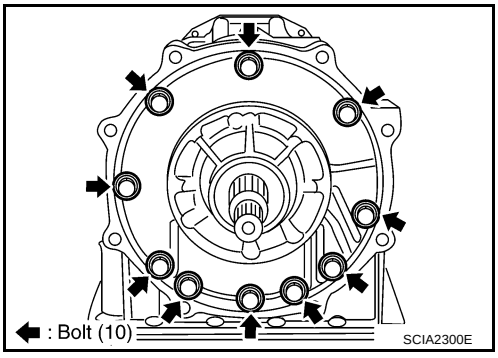
4. Apply recommended sealant (Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .) to oil pump assembly as shown in the figure.

CAUTION:
Completely remove all moisture, oil and old sealant, etc. from the oil pump mounting bolts and oil pump mounting bolt mounting surfaces.



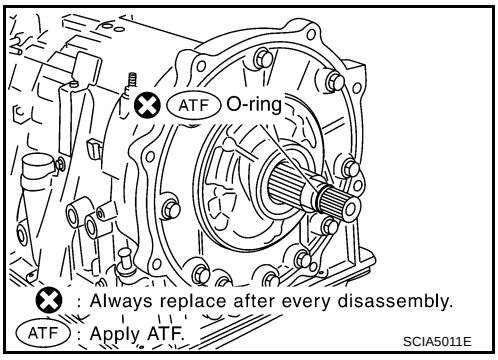
5. Tighten oil pump mounting bolts to the specified torque. Refer to AT-246, "Components" .

CAUTION:
Apply ATF to oil pump bushing.



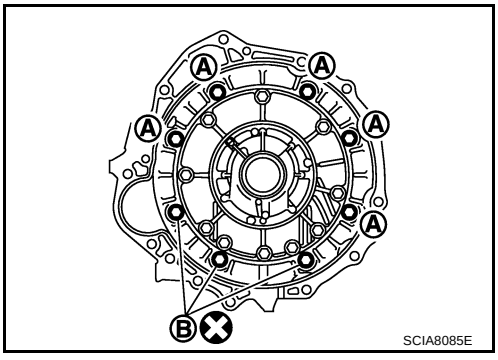
6. Install O-ring to input clutch assembly.

CAUTION:
- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**

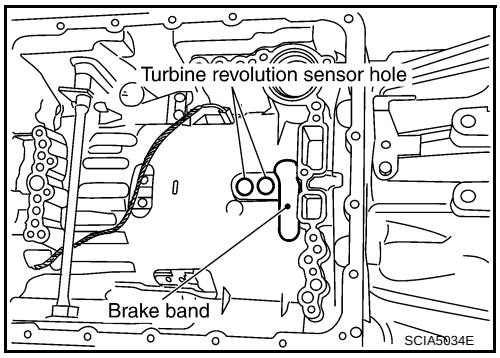


7. Install converter housing to transmission case, and then tighten converter housing bolts (A) and self-sealing bolts (B) to the specified torque. Refer to AT-246, "Components" .

CAUTION:
Do not reuse self-sealing bolts (B).

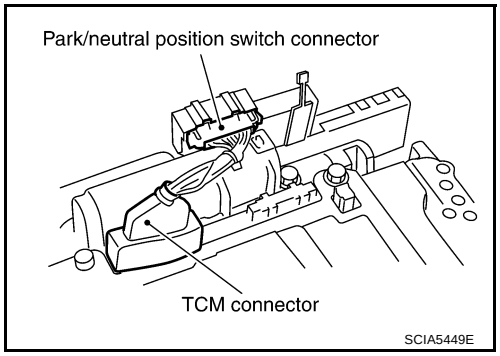


8. Make sure that brake band does not close turbine revolution sensor hole.

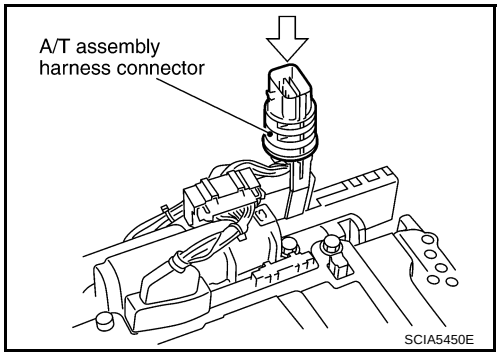


9. Install control valve with TCM.

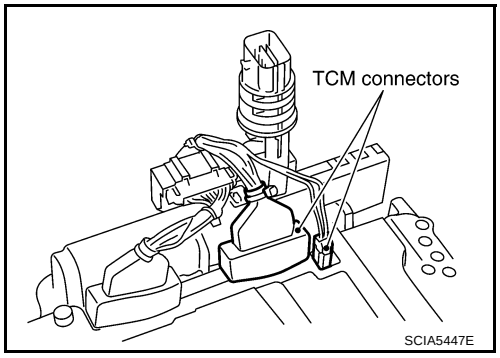
a. Connect TCM connector and park/neutral position switch connector.



b. Install A/T assembly harness connector from control valve with TCM.



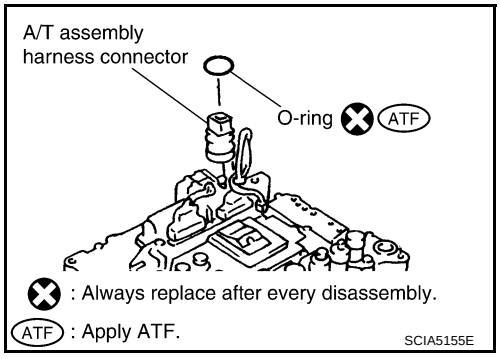
c. Connect TCM connectors.



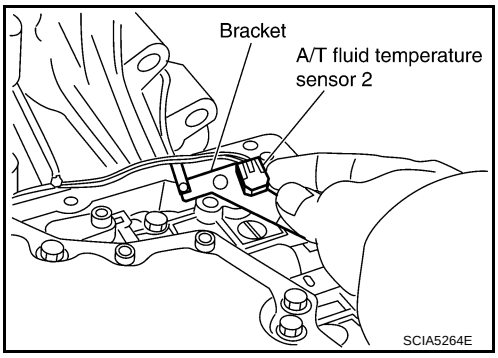
d. Install O-ring to A/T assembly harness connector.

CAUTION:

- **Do not reuse O-ring.**
- **Apply ATF to O-ring.**

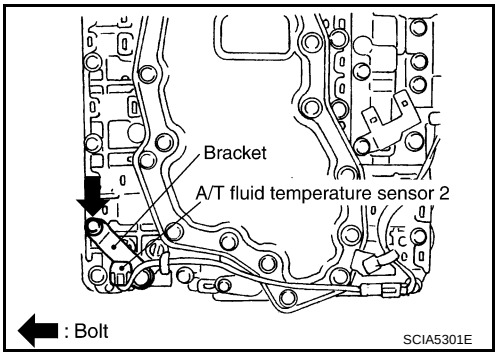


e. Install A/T fluid temperature sensor 2 to bracket.



f. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten mounting bolt to the specified torque. Refer to AT-246, "Components" .

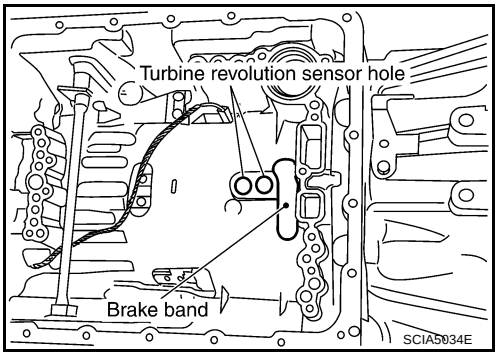
CAUTION:
Adjust bolt hole of bracket to bolt hole of control valve with TCM.



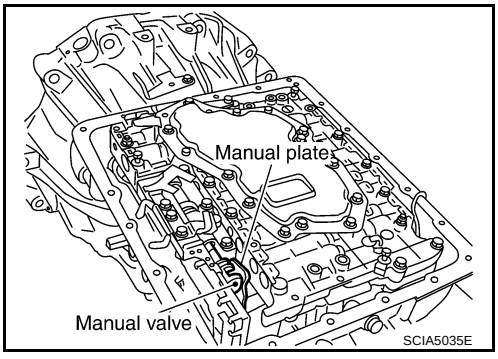
g. Install control valve with TCM in transmission case.

CAUTION:

- **Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.**
- **Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.**
- **Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.**

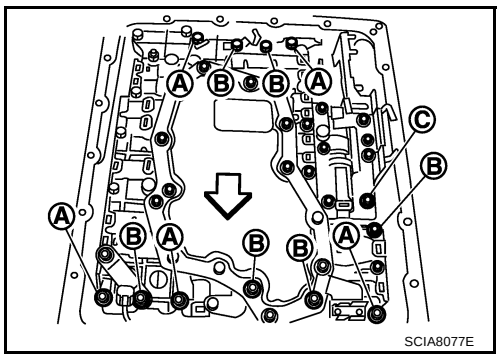


- **Assemble it so that manual valve cutout is engaged with manual plate projection.**

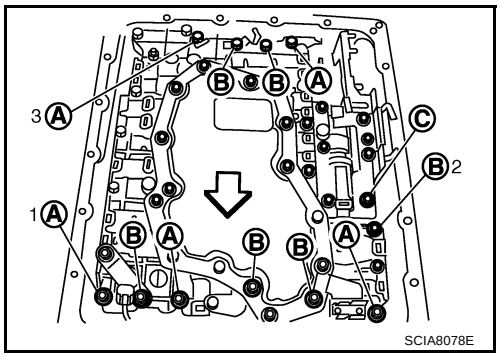


h. Install bolts (A), (B) and (C) to control valve with TCM.
- ⇦: Front

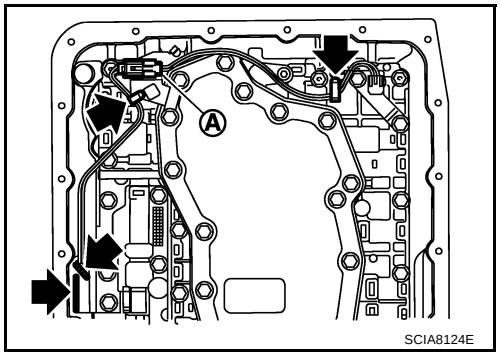
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



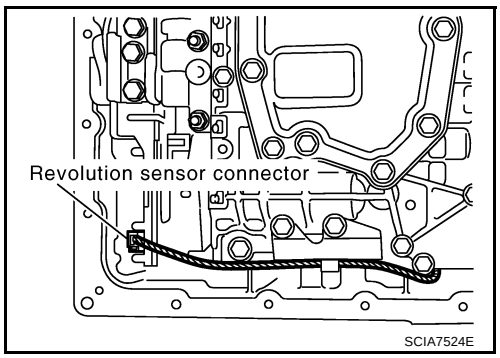
i. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts to the specified torque. Refer to AT-246, "Components" .
- ⇦: Front



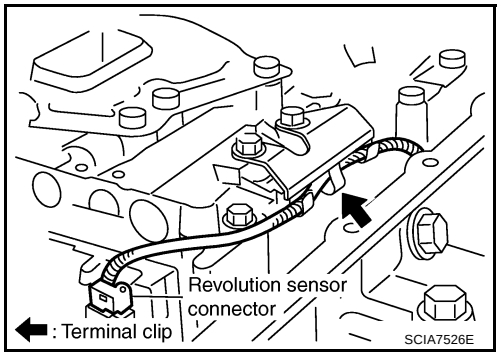
10. Connect A/T fluid temperature sensor 2 connector (A).
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips (⬅).



12. Connect revolution sensor connector.

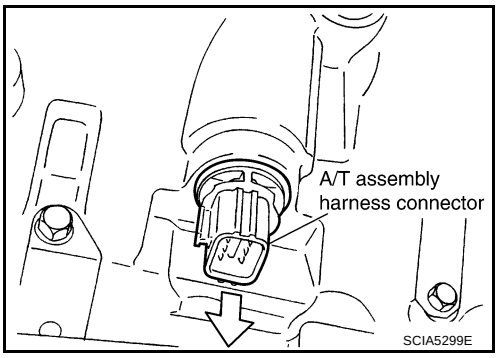


13. Securely fasten revolution sensor harness with terminal clip.

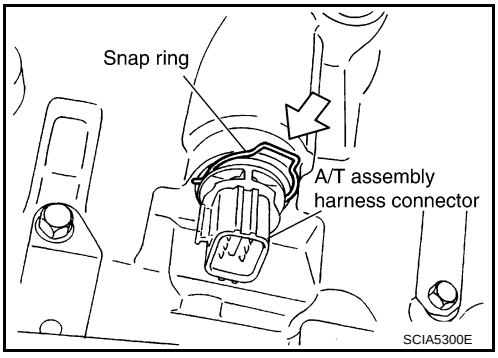


14. Pull down A/T assembly harness connector.

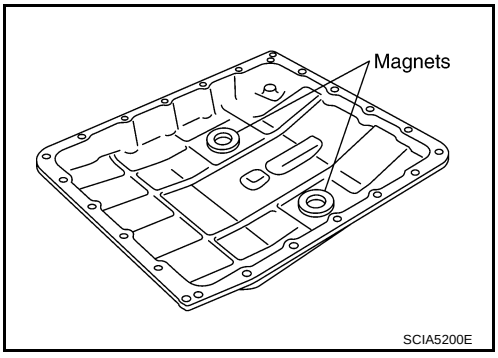
CAUTION:
Be careful not to damage connector.



15. Install snap ring to A/T assembly harness connector.



16. Install magnets in oil pan.



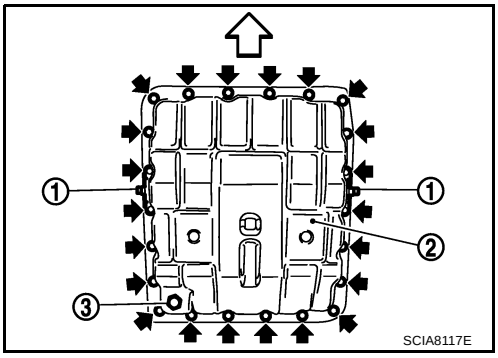
17. Install oil pan to transmission case.

a. Install oil pan gasket to oil pan.

CAUTION:
- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.
- ⇦: Front
- ⬅: Oil pan mounting bolt

CAUTION:
- **Install it so that drain plug (3) comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

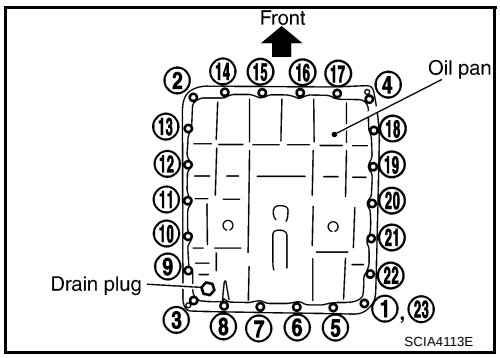


c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to AT-246, "Components" .

CAUTION:
Do not reuse oil pan mounting bolts.

18. Install drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to AT-246, "Components" .

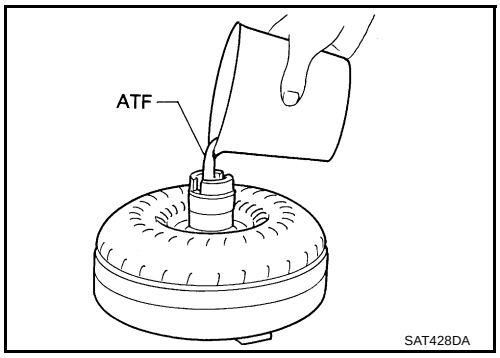
CAUTION:
Do not reuse drain plug gasket.



19. Install torque converter.

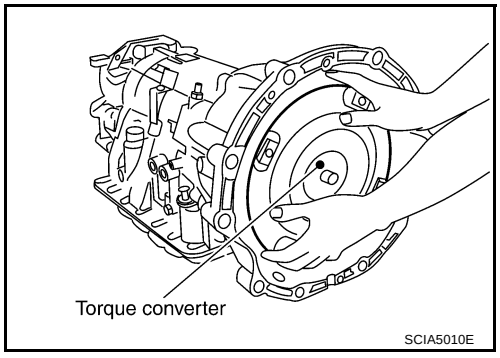
a. Pour ATF into torque converter.

- **Approximately 2 liter (2-1/8 US qt, 1-3/4 Imp qt) of ATF is required for a new torque converter.**
- **When reusing old torque converter, add the same amount of ATF as was drained.**



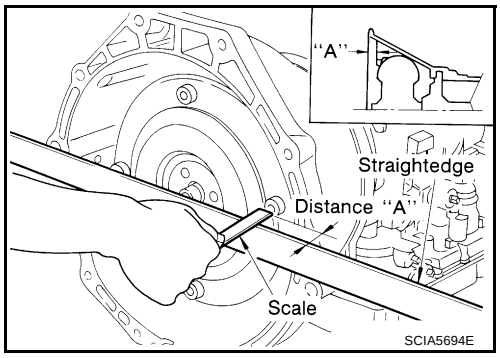
b. Install torque converter while aligning notches of torque converter with notches of oil pump.

CAUTION:
Install torque converter while rotating it.



c. Measure distance “A” to check that torque converter is in proper position.

Distance “A”: 25.0 mm (0.98 in) or more



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NCS0009L

Applied model		VQ35HR engine
Automatic transmission model		RE5R05A
Transmission model code number		98X5B
Stall torque ratio		1.74 : 1
Transmission gear ratio	1st	3.842
	2nd	2.353
	3rd	1.529
	4th	1.000
	5th	0.839
	Reverse	2.765
Recommended fluid		Genuine NISSAN Matic J ATF*1
Fluid capacity		10.3 liter (10-7/8 US qt, 9-1/8 Imp qt)*2

CAUTION:

- **Use only Genuine NISSAN Matic J ATF. Do not mix with other fluid.**
- **Using A/T fluid other than Genuine NISSAN Matic J ATF will cause deterioration driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.**

- *1: Refer to MA-11, "Fluids and Lubricants" .
- *2: The fluid capacity is the reference value. Check the fluid level with A/T fluid level gauge.

Vehicle Speed at Which Gear Shifting Occurs

NCS0009M

Throttle position	Vehicle speed km/h (MPH)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
Full throttle	50 – 54 (31 – 34)	97 – 105 (60 – 65)	154 – 164 (96 – 102)	224 – 234 (139 – 145)	220 – 230 (137 – 143)	145 – 155 (90 – 96)	86 – 94 (53 – 58)	39 – 43 (24 – 27)
Half throttle	29 – 33 (18 – 21)	63 – 69 (39 – 43)	100 – 108 (62 – 67)	136 – 144 (85 – 89)	88 – 96 (55 – 60)	64 – 72 (40 – 45)	28 – 34 (17 – 21)	9 – 13 (6 – 8)

- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed at Which Lock-up Occurs/Releases

NCS0009N

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	62 – 70 (39 – 44)	59 – 67 (37 – 42)
Half throttle	136 – 144 (85 – 89)	88 – 96 (55 – 60)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 4/8 of the full opening.

Stall Speed

NCS0009O

Stall speed	2,700 – 3,000 rpm

Line Pressure

NCS0009P

Engine speed	Line pressure kPa (kg/cm^2 , psi)	
	“R” position	“D” and “M” positions
At idle speed	425 – 465 (4.3 – 4.7, 62 – 67)	379 – 428 (3.9 – 4.4, 55 – 62)
At stall speed	1,605 – 1,950 (16.4 – 19.9, 233 – 283)	1,310 – 1,500 (13.4 – 15.3, 190 – 218)

A/T Fluid Temperature Sensor

NCS0009Q

Name	Condition	CONSULT-III "DATA MONITOR" (Approx.)	Resistance (Approx.)
A/T fluid temperature sensor 1	0°C (32°F)	3.3 V	15 kΩ
	20°C (68°F)	2.7 V	6.5 kΩ
	80°C (176°F)	0.9 V	0.9 kΩ
A/T fluid temperature sensor 2	0°C (32°F)	3.3 V	10 kΩ
	20°C (68°F)	2.5 V	4 kΩ
	80°C (176°F)	0.7 V	0.5 kΩ

Turbine Revolution Sensor

NCS0009R

Name	Condition	Data (Approx.)
Turbine revolution sensor 1	When running at 50 km/h (31 MPH) in 4th speed with the closed throttle position signal OFF.	1.3 kHz
Turbine revolution sensor 2	When moving at 20 km/h (12 MPH) in 1st speed with the closed throttle position signal OFF.	

Vehicle Speed Sensor A/T (Revolution Sensor)

NCS0009S

Name	Condition	Data (Approx.)
Revolution sensor	When moving at 20 km/h (12 MPH).	185 Hz

Reverse Brake

NCS0009T

Model code number		98X5B
Number of drive plates		6
Number of driven plates		6
Clearance mm (in)	Standard	0.7 – 1.1 (0.028 – 0.043)

Total End Play

NCS0009U

Total end play mm (in)	0.25 – 0.55 (0.0098 – 0.0217)

SECTION ATC
AUTOMATIC AIR CONDITIONER

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NJS000D2

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

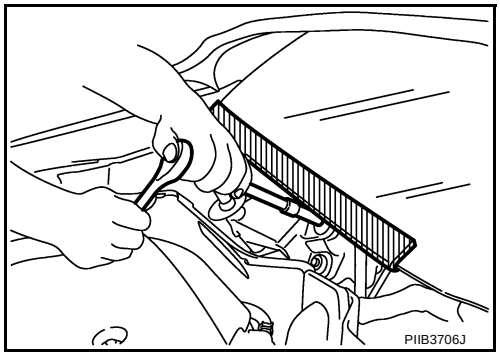
NJS000D3

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NJS000CP

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Working with HFC-134a (R-134a)

NJS00003

CAUTION:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor malfunction is likely to occur, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
  - **When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
  - **When installing refrigerant components to a vehicle, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
  - **Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.**
  - **Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.**

CONTAMINATED REFRIGERANT

If a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle, take appropriate steps shown below:

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- In case of repairing, recover the refrigerant using only **dedicated equipment and containers. Never recover contaminated refrigerant into the existing service equipment.** If the facility does not have dedicated recovery equipment, contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact Nissan Customer Affairs for further assistance.

General Refrigerant Precautions

NJS00004

WARNING:

- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment], or J-2209 [HFC-134a (R-134a) recovery equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Never store or heat refrigerant containers above 52°C (126°F).**
- **Never heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Never intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Never pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

Precautions for Refrigerant Connection

NJS00006

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

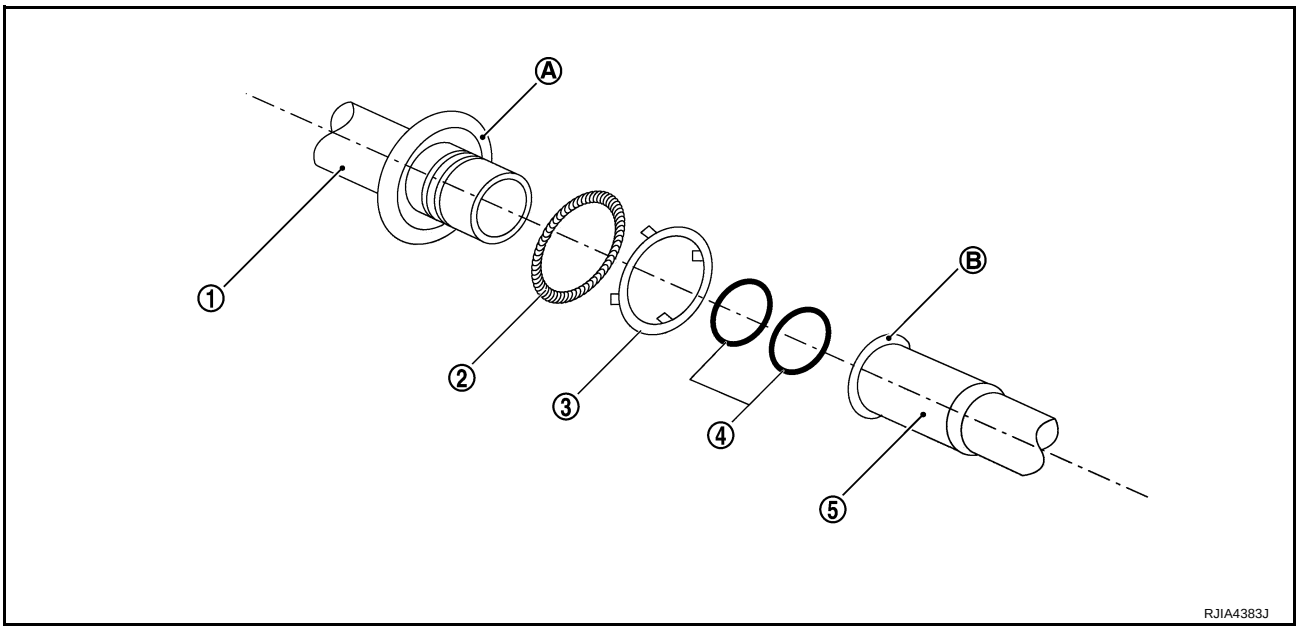
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

ABOUT ONE-TOUCH JOINT

Description

- One-touch joints are pipe joints which do not require tools during piping connection.
- Unlike conventional connection methods using union nuts and flanges, controlling tightening torque at connection point is not necessary.
- When removing a pipe joint, use a disconnector.

COMPONENT PARTS



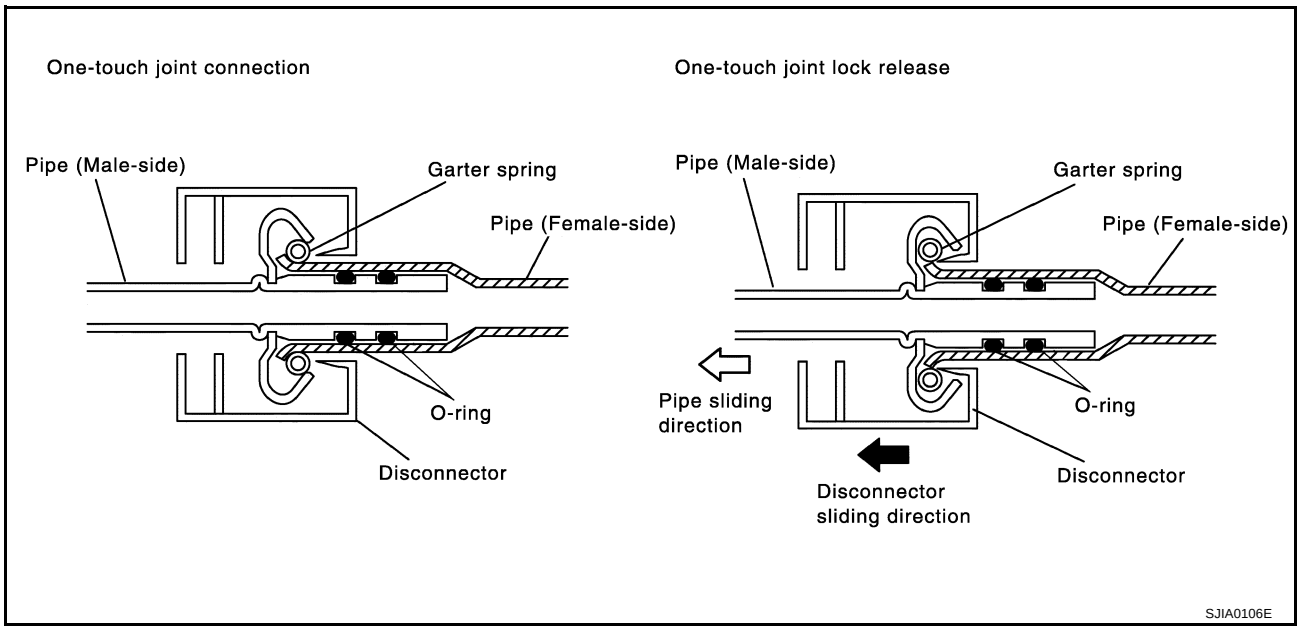
FUNCTIONS OF COMPONENT PARTS

1	Pipe (Male-side)	● Retains O-rings (4). ● Retains garter spring (2) in cage (A).
2	Garter spring	Anchors female-side piping (5).
3	Indicator ring	When connection is made properly, this is ejected from male-side piping (1). (This part is no longer necessary after connection.)
4	O-ring	Seals connection point. (Not reusable)
5	Pipe (Female-side)	● Seals connection by compressing O-rings (4). ● Anchors piping connection using flare (B) and garter spring (2).

NOTE:

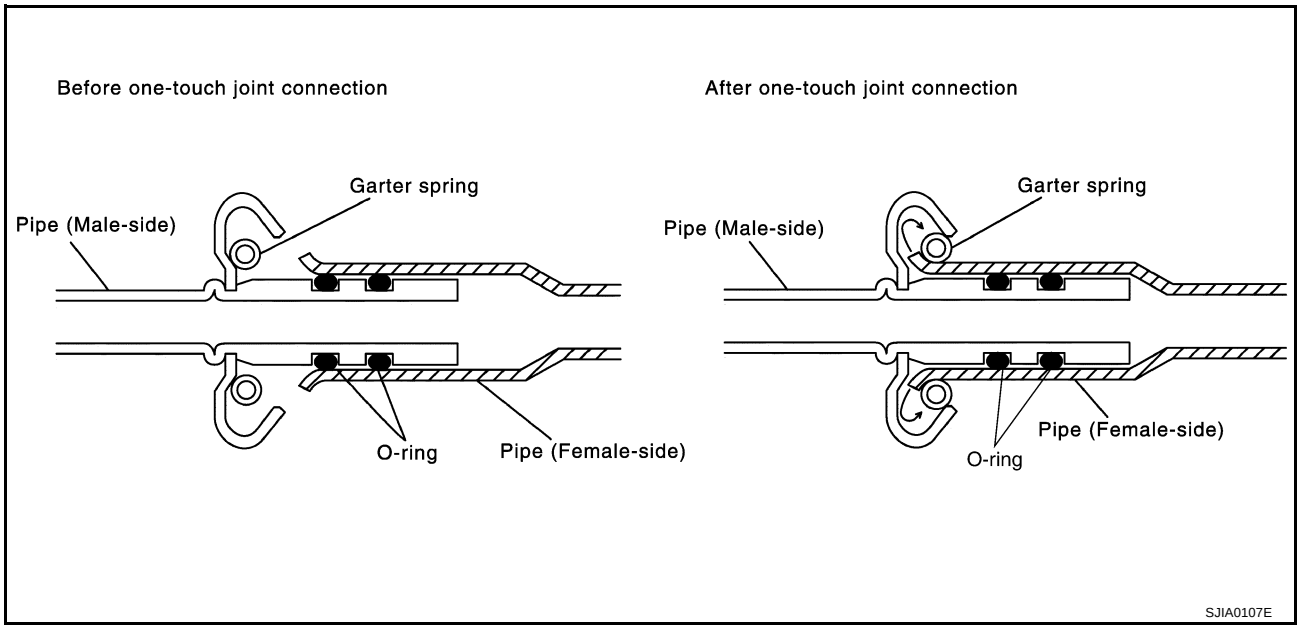
- Garter spring (2) cannot be removed from cage (A) of male-side piping.
- Indicator ring (3) remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

REMOVAL



1. Clean piping connection point, and set a disconnector.
2. Slide disconnector in axial direction of piping, and stretch garter spring with tapered point of disconnector.
3. Slide disconnector farther so that inside diameter of garter spring becomes larger than outside diameter of female-side piping flare. Then male-side piping can be disconnected.

INSTALLATION



1. Clean piping connection points, and insert male-side piping into female-side piping.
2. Push inserted male-side piping harder so that female-side piping flare stretches garter spring.
3. If inside diameter of garter spring becomes larger than outside diameter of female-side piping flare, garter spring seats on flare. Then, it fits in between male-side piping cage and female-side piping flare to anchor piping connection point.

   NOTE:
   When garter spring seats on flare, and fits in between male-side piping cage and female-side piping flare, it clicks.

   CAUTION:
   - **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
   - **Insert piping securely until a click is heard.**

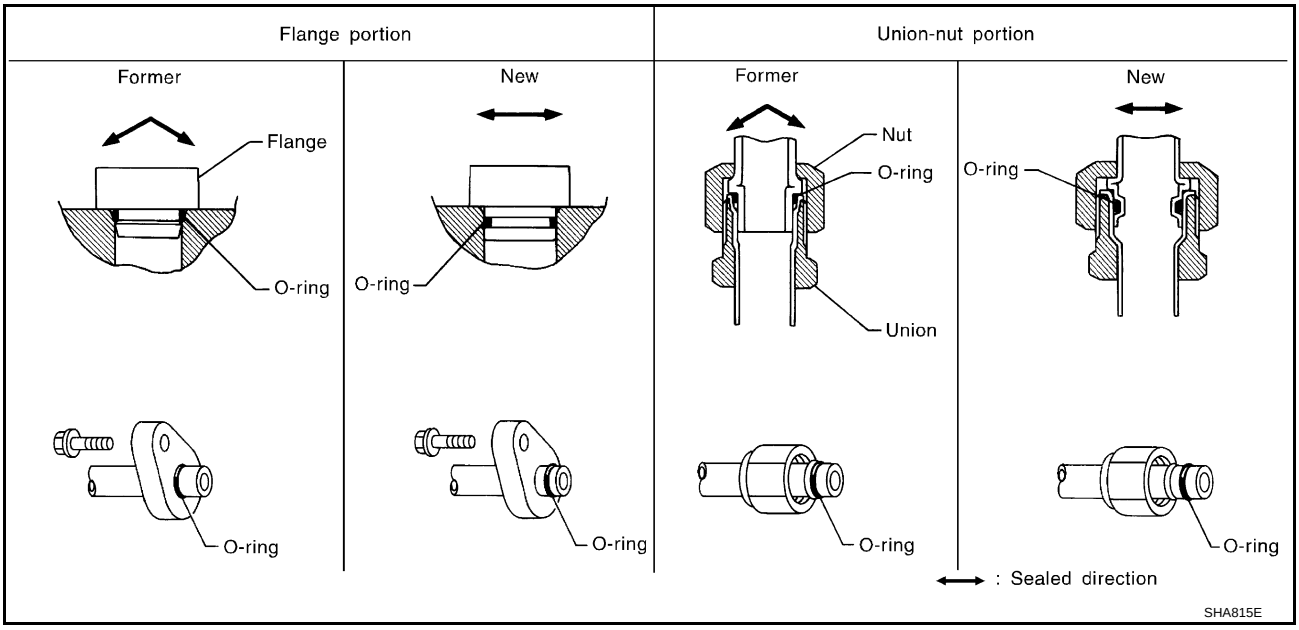
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**

NOTE:
One-touch joint connection is used in points below.

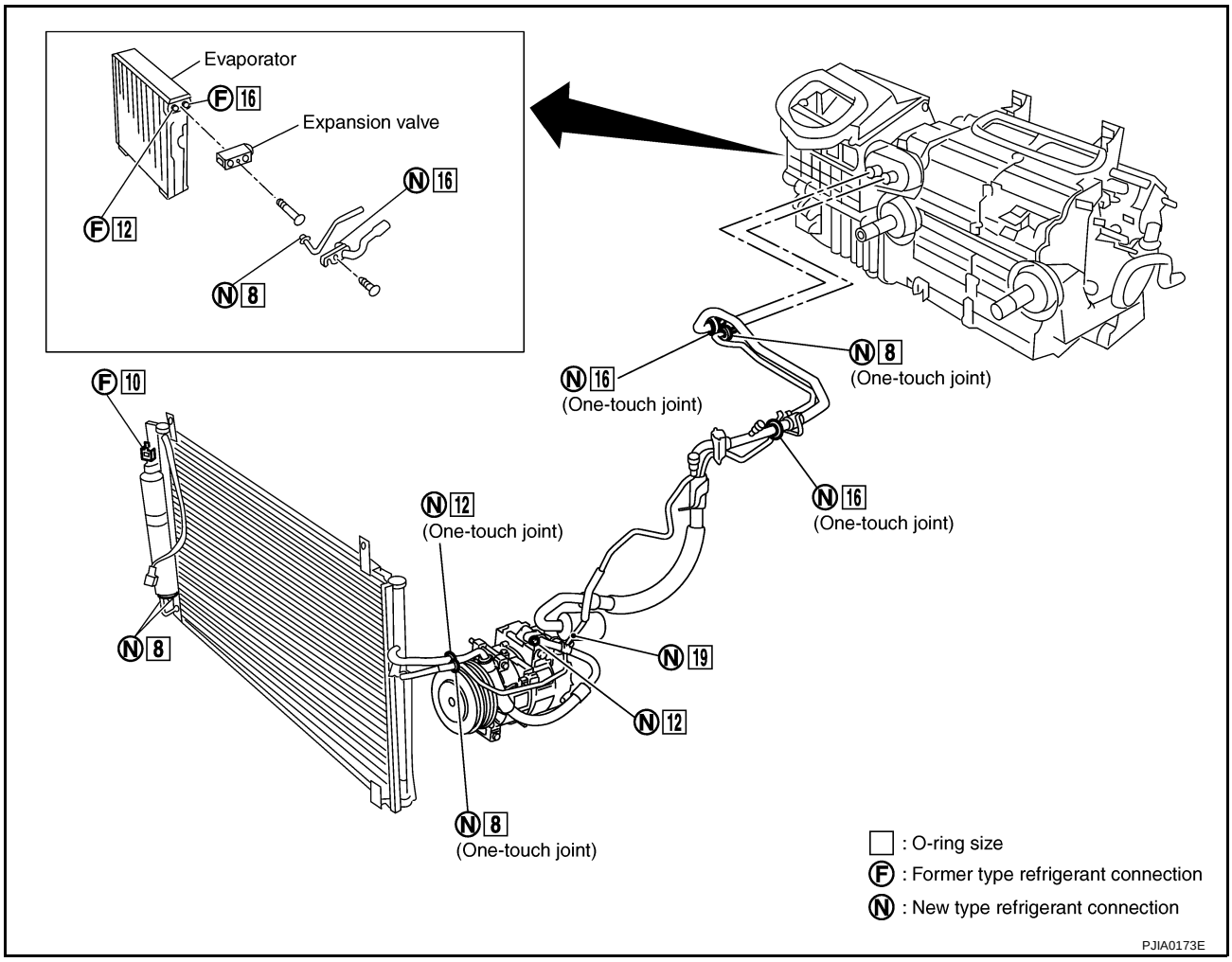
- Low-pressure pipe 2 to low-pressure pipe 1 (O-ring size: 16)
- Low-pressure pipe 2 to low-pressure flexible hose (O-ring size: 16)
- High-pressure flexible hose to condenser (O-ring size: 12)
- High-pressure pipe 1 to high-pressure pipe 2 (O-ring size: 8)
- High-pressure pipe 1 to condenser (O-ring size: 8)

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the possibility of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.
- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.



O-RING AND REFRIGERANT CONNECTION



CAUTION:

The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant may leak at the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low-pressure pipe 2 to low-pressure pipe 1 (One-touch joint)		92473 N8221	2	16
	Low-pressure pipe 2 to low-pressure flexible hose (One-touch joint)		92473 N8221	2	16
	High-pressure pipe 1 to high-pressure pipe 2 (One-touch joint)		92471 N8221	2	8
	Condenser to high-pressure flexible hose (One-touch joint)		92472 N8221	2	12
	Condenser to high-pressure pipe 1 (One-touch joint)		92471 N8221	2	8
	Low-pressure pipe 1 to expansion valve		92473 N8210	1	16
	High-pressure pipe 2 to expansion valve		92471 N8210	1	8
	Compressor to low-pressure flexible hose		92474 N8210	1	19
	Compressor to high-pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser pipe	Inlet	92471 N8210	1	8
		Outlet		1	

Connection type	Piping connection point		Part number	QTY	O-ring size
Former	Refrigerant pressure sensor to liquid tank		J2476 89956	1	10
	Expansion valve to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16

WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

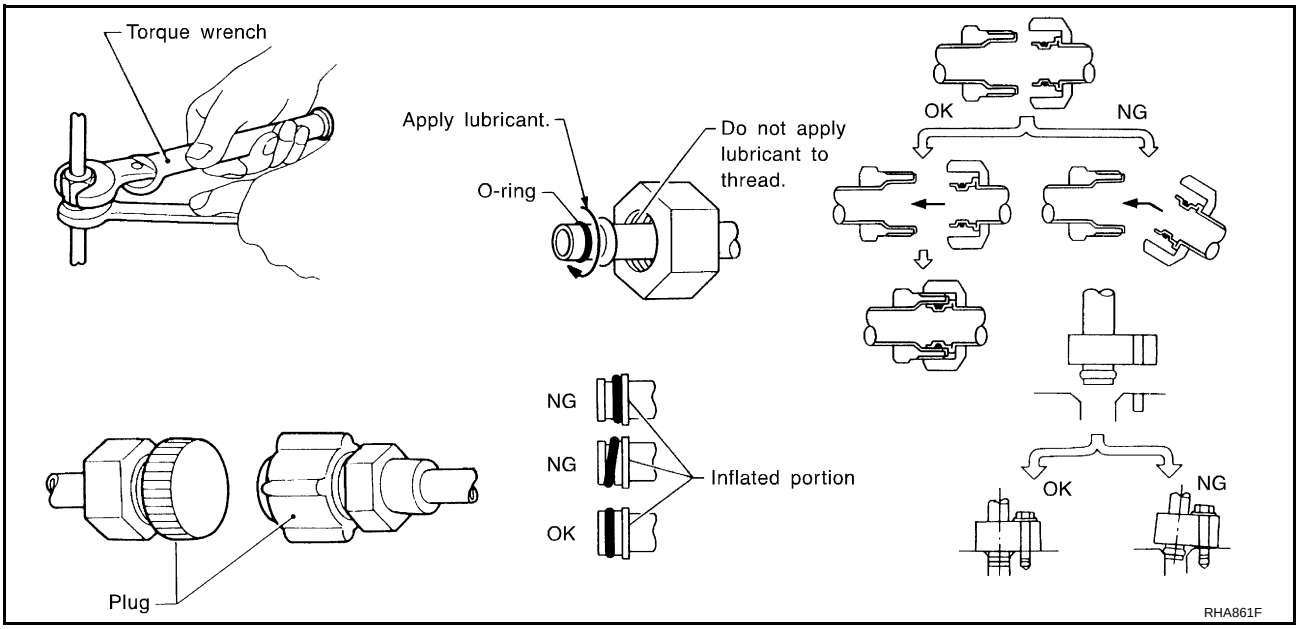
CAUTION:

When replacing or cleaning refrigerant cycle components, observe the following.

- **When the compressor is removed, store it in the same way at it is when mounted on the car. Failure to do so will cause lubricant to enter the low-pressure chamber.**
- **When connecting tubes, always use a torque wrench and a back-up wrench.**
- **After disconnecting tubes, immediately plug all openings to prevent entry of dust and moisture.**
- **When installing an air conditioner in the vehicle, connect the pipes at the final stage of the operation. Never remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Always replace used O-rings.**
- **When connecting tubes, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.**

Name : Nissan A/C system Oil Type S

- **O-ring must be closely attached to the groove of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until a click can be heard, then tighten the nut or bolt by hand. Make sure that the O-ring is installed to tube correctly.**
- **After connecting line, perform leak test and make sure that there is no leakage from connections. When the refrigerant leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.**



Precautions for Servicing Compressor

NJS00007

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same way at it is when mounted on the car.**
- **When replacing or repairing compressor, follow “Maintenance of Lubricant Quantity in Compressor” exactly. Refer to ATC-21, "Maintenance of Lubricant Quantity in Compressor" .**
- **Keep friction surfaces between clutch and pulley clean. If the surface is contaminated with lubricant, wipe it off by using a clean waste cloth moistened with thinner.**
- **After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.**
- **After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.**

Precautions for Service Equipment

NJS00008

RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer’s instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRICAL LEAK DETECTOR

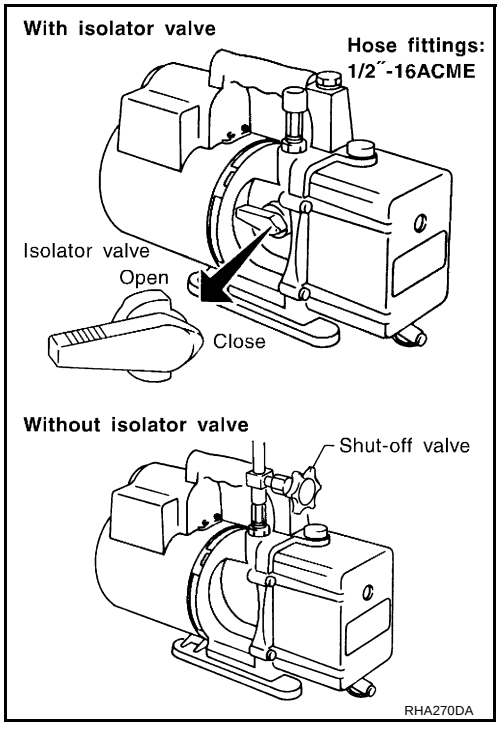
Be certain to follow the manufacturer’s instructions for tester operation and tester maintenance.

VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as follows.

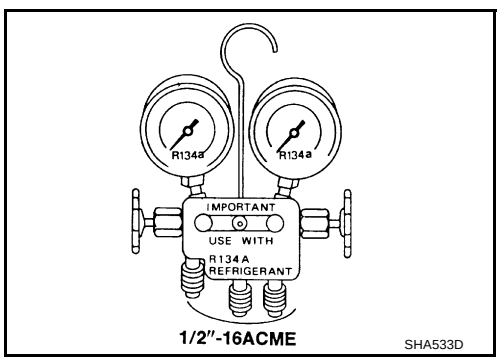
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has an automatic shut-off valve, disconnect the hose from the pump. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under no vacuum condition. Such valves may restrict the pump’s ability to pull a deep vacuum and are not recommended.



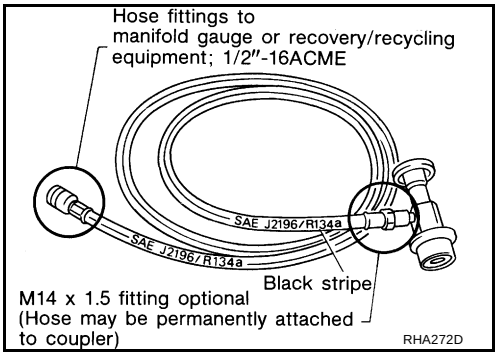
MANIFOLD GAUGE SET

Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.



SERVICE HOSES

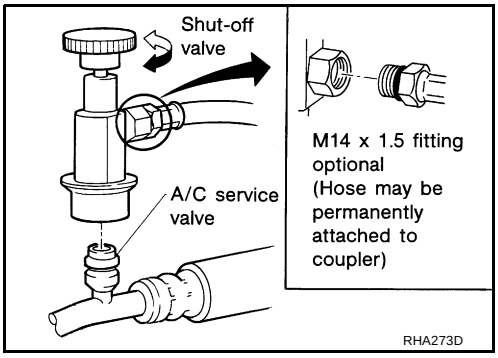
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut -off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

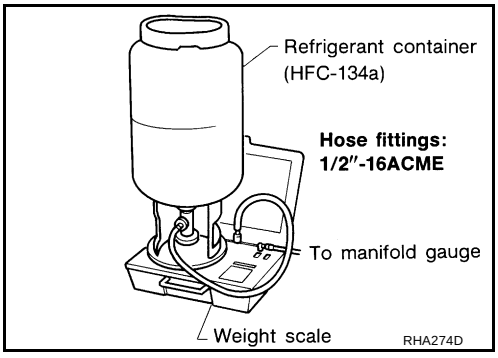
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2″-16 ACME.



CHARGING CYLINDER

Using a charging cylinder is not recommended. Refrigerant may be vented into air from cylinder's top valve when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electrical scale or of quality recycle/recharge equipment.

Precautions for Leak Detection Dye

NJS00009

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leaks.
- For the purpose of safety and customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.
- Never allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- Never spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Never use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Never use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C system, or A/C system damage may result.
- The fluorescent properties of the dye will remain for three years or a little over unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:
Vehicles with factory installed fluorescent dye have a green label.
Vehicles without factory installed fluorescent dye have a blue label.

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have the identification label on the front side of hood.

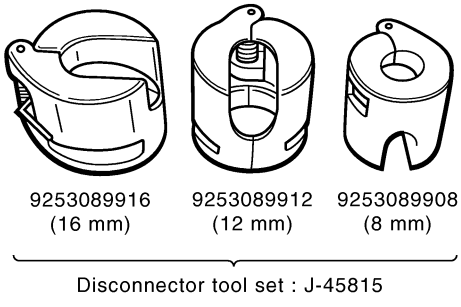
PREPARATION

PFP:00002

Special Service Tools

NJS0000B

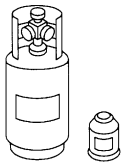
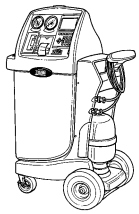
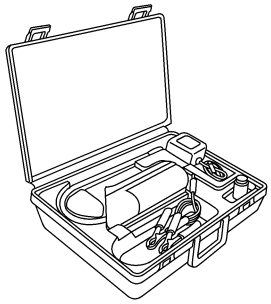
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

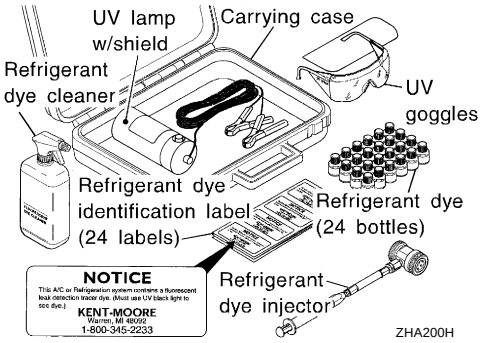
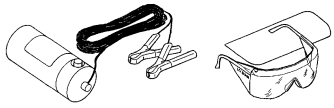
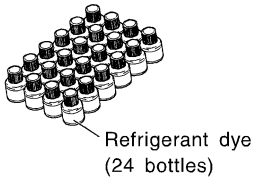
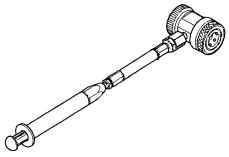
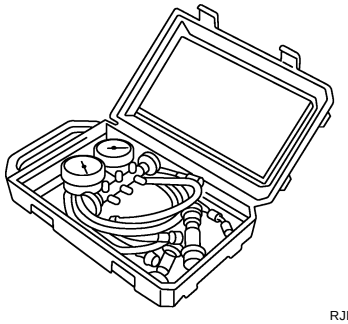
Tool number (Kent-Moore No.) Tool name		Description
9253089908 (for high-pressure pipe 1) (-) 9253089912 (for high-pressure flexible hose) (-) 9253089916 (for low-pressure pipe 1 and low-pressure flexible hose) (-) Disconnector tool set (J-45815)		Disconnect one-touch joint connection

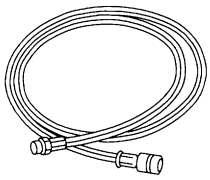
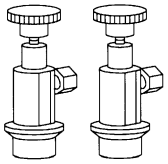
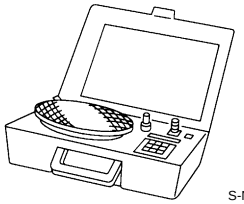
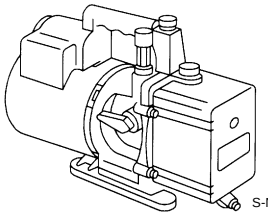
HFC-134a (R-134a) Service Tools and Equipment

NJS0000C

Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
Never use adapters that convert one size fitting to another: refrigerant/lubricant contamination occurs and compressor malfunction may result.

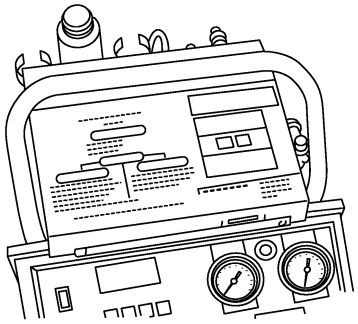
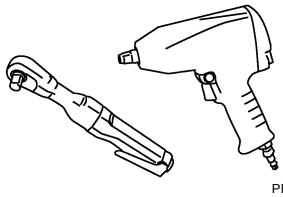
Tool number (Kent-Moore No.) Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2″-16 ACME
Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz)
(ACR2005-NI) ACR5 A/C Service Center	 WJIA0293E	Function: Refrigerant recovery, recycling and recharging
(J-41995) Electrical A/C leak detector	 AHA281A	Power supply: DC 12 V (Battery terminal)

Tool number (Kent-Moore No.) Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner	 ZHA200H	Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles	 SHA438F	Power supply: DC 12 V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)	 SHA439F	Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle	 SHA440F	For injecting 1/4 ounce of fluorescent leak detection dye into A/C system
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: ● The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size ● 1/2″-16 ACME

Tool number (Kent-Moore No.) Tool name		Description
Service hoses ● High-pressure side hose (J-39501-72) ● Low-pressure side hose (J-39502-72) ● Utility hose (J-39476-72)	 S-NT201	Hose color: ● Low hose: Blue with black stripe ● High hose: Red with black stripe ● Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: ● 1/2″-16 ACME
Service couplers ● High-pressure side coupler (J-39500-20) ● Low-pressure side coupler (J-39500-24)	 S-NT202	Hose fitting to service hose: M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale	 S-NT200	For measuring of refrigerant Fitting size: Thread size 1/2″-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)	 S-NT203	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size ● 1/2″-16 ACME

Commercial Service Tools

NJS0000D

Tool name		Description
Refrigerant identifier equipment	 RJIA0197E	Checking for refrigerant purity and system contamination
Power tool	 PBIC0190E	For loosening bolts and nuts

REFRIGERATION SYSTEM

PFP:KA990

Refrigerant Cycle

NJS0000E

REFRIGERANT FLOW

The refrigerant flows from the compressor, through the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation in the evaporator is controlled by an externally equalized expansion valve, located inside the evaporator case.

FREEZE PROTECTION

To prevent evaporator frozen up, the evaporator air temperature is monitored, and the voltage signal to the unified meter and A/C amp. will make the A/C relay go OFF and stop the compressor.

Refrigerant System Protection

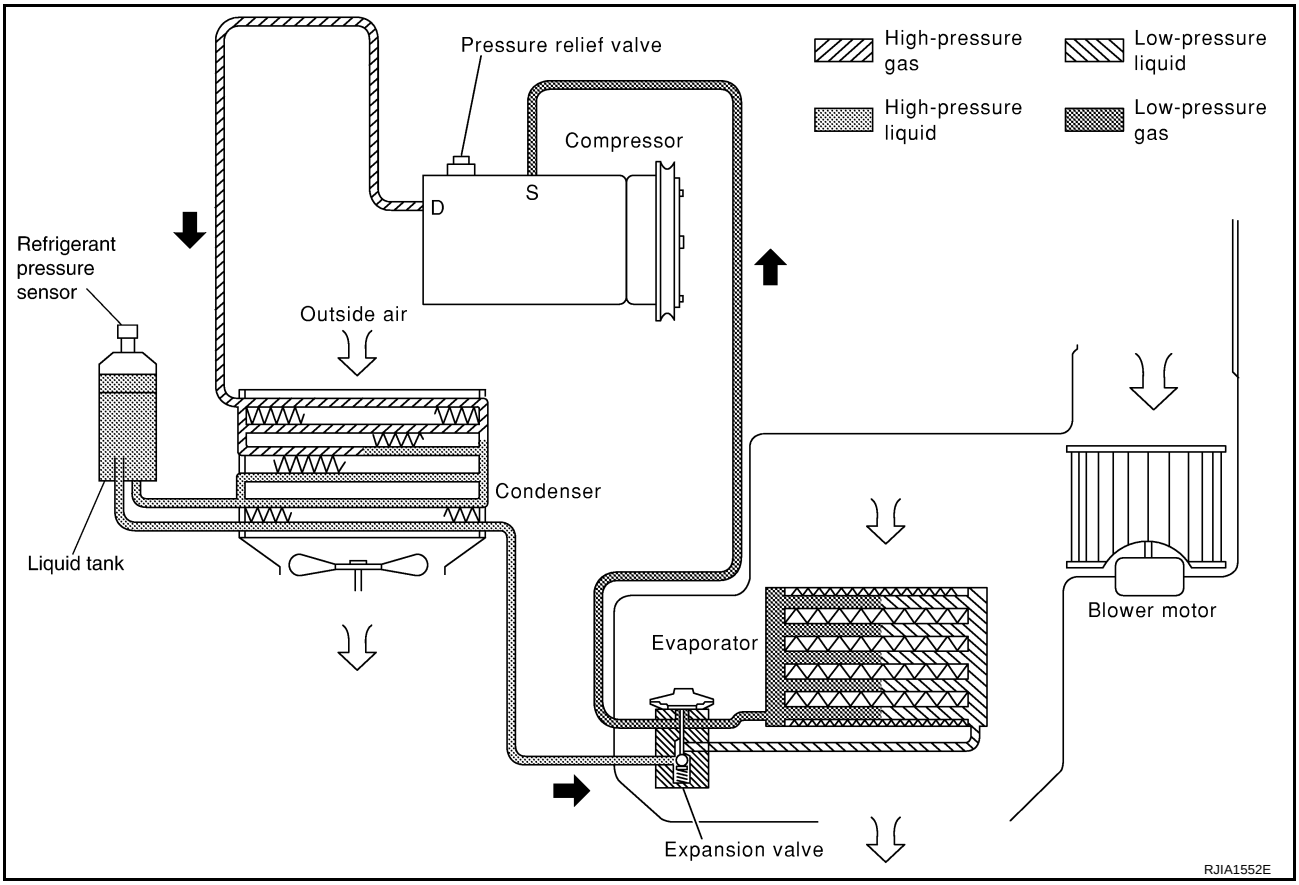
NJS0000F

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the liquid tank. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm^2 , 398 psi), or below about 134 kPa (1.4 kg/cm^2 , 19 psi).

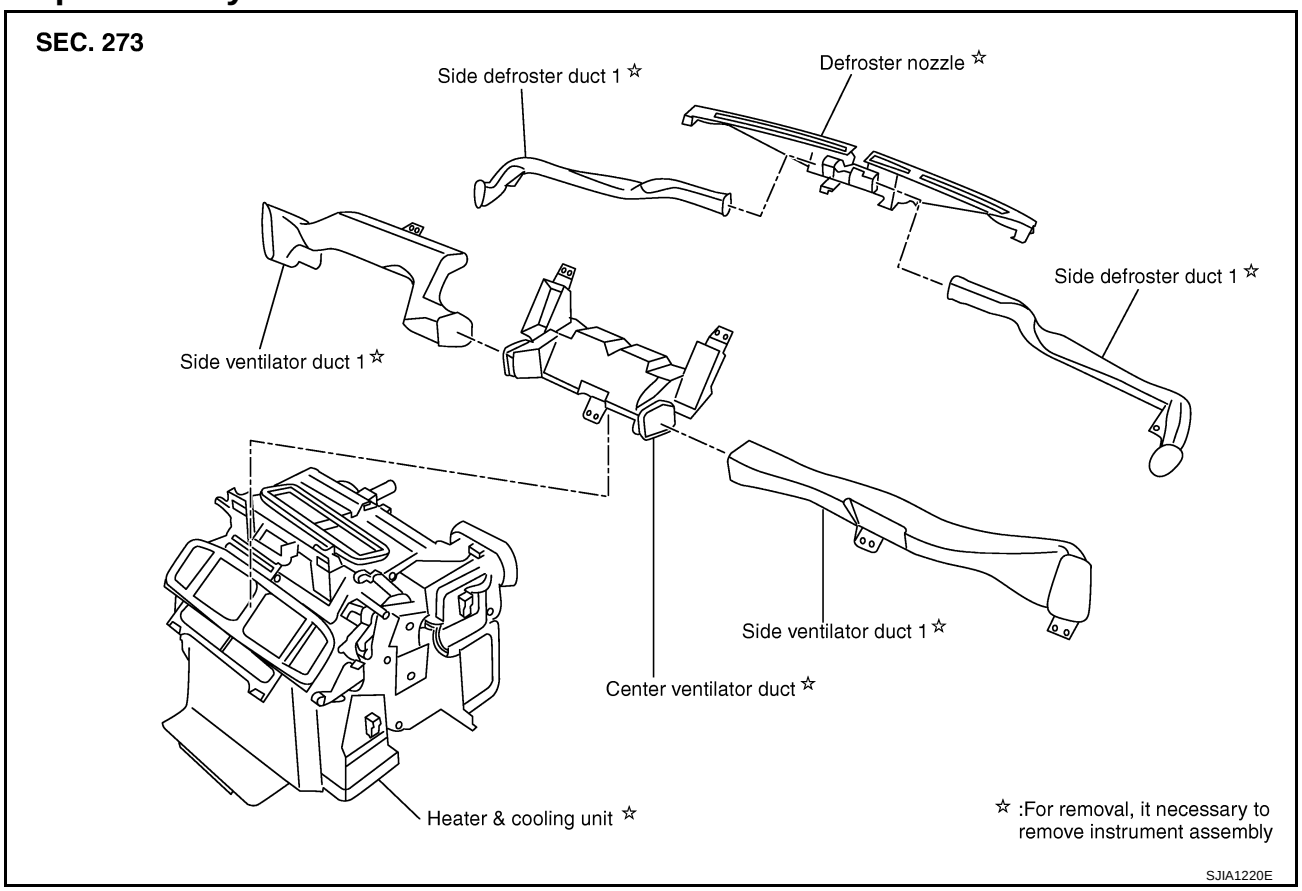
PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3,600 kPa (36.7 kg/cm^2 , 522 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



Component Layout

NJS0000H



LUBRICANT

PFP:KLG00

Maintenance of Lubricant Quantity in Compressor

NJS0000I

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.
If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

Name : Nissan A/C System Oil Type S

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1. CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:
If excessive lubricant leakage is noted, never perform the lubricant return operation.

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

1. Start the engine, and set to the following conditions:
   - Engine speed: Idling to 1,200 rpm
   - A/C switch: ON
   - Blower speed: Max. position
   - Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
   - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop the engine.

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> GO TO ATC-23, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT" .
NO >> GO TO ATC-22, "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR" .

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.
Amount of lubricant to be added:

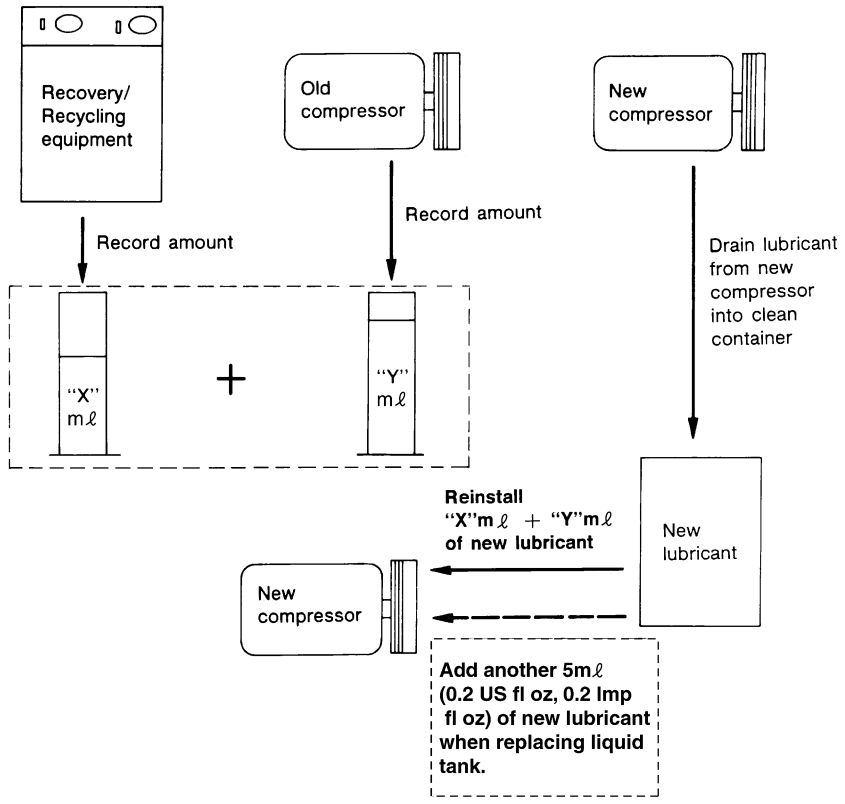
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*1: If the refrigerant leak is small, no addition of lubricant is needed.

LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

1. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-5, "CONTAMINATED REFRIGERANT" .
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-5, "CONTAMINATED REFRIGERANT" .
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.
   Do not add this 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement



RJIA3578E

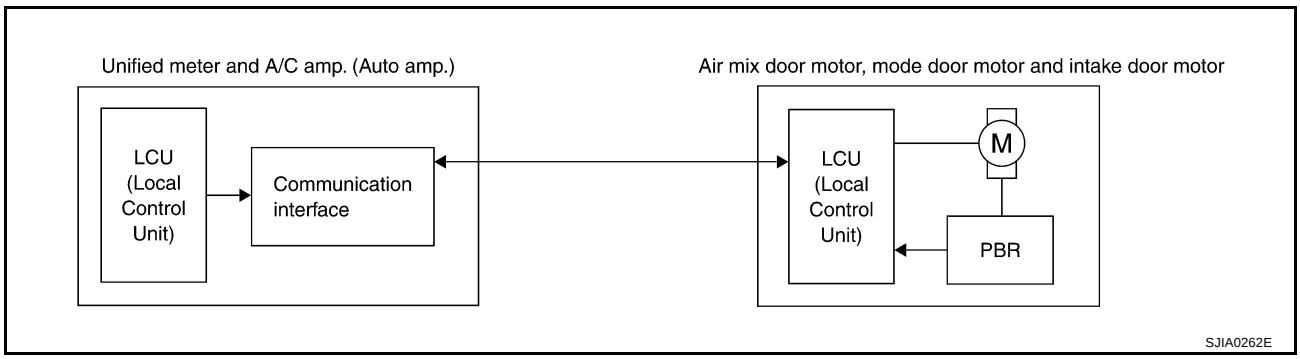
AIR CONDITIONER CONTROL

PFP:27500

Description of Air Conditioner LAN Control System

NJS0000J

The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motor and intake door motor.
A configuration of these components is shown in the figure below.

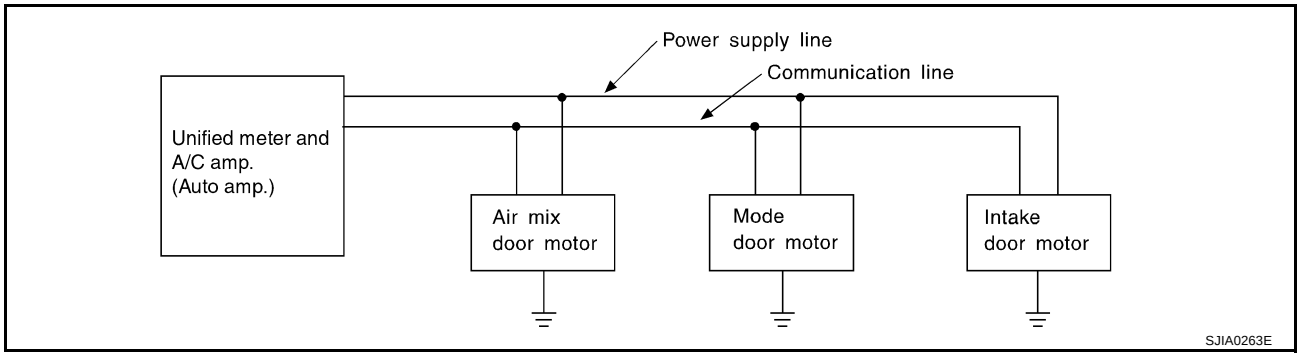


System Construction

NJS0000K

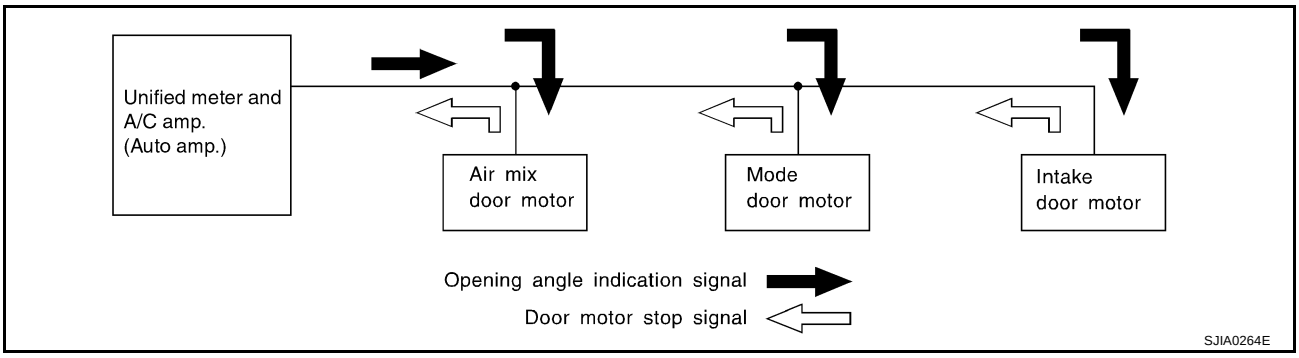
A small network is constructed between unified meter and A/C amp., air mix door motor, mode door motor and intake door motor. The unified meter and A/C amp. and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of each door motor.
Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the unified meter and A/C amp. and each door motor.
The following functions are contained in LCUs built into the air mix door motor, the mode door motor and the intake door motor.

- Address
- Motor opening angle signal
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



OPERATION

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends mode door, air mix door and intake door opening angle data to the mode door motor LCU, air mix door motor LCU and intake door motor LCU.
The mode door motor, air mix door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors is compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the unified meter and A/C amp.



TRANSMISSION DATA AND TRANSMISSION ORDER

Unified meter and A/C amp. data is transmitted consecutively to each of the door motors following the form shown in figure below.

Start:

Initial compulsory signal sent to each of the door motors.

Address:

Data sent from the unified meter and A/C amp. are selected according to data-based decisions made by the air mix door motor, mode door motor and intake door motor.
If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data have no error, door control begins.
If an error exists, the received data are rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.

Opening Angle:

Data that shows the indicated door opening angle of each door motor.

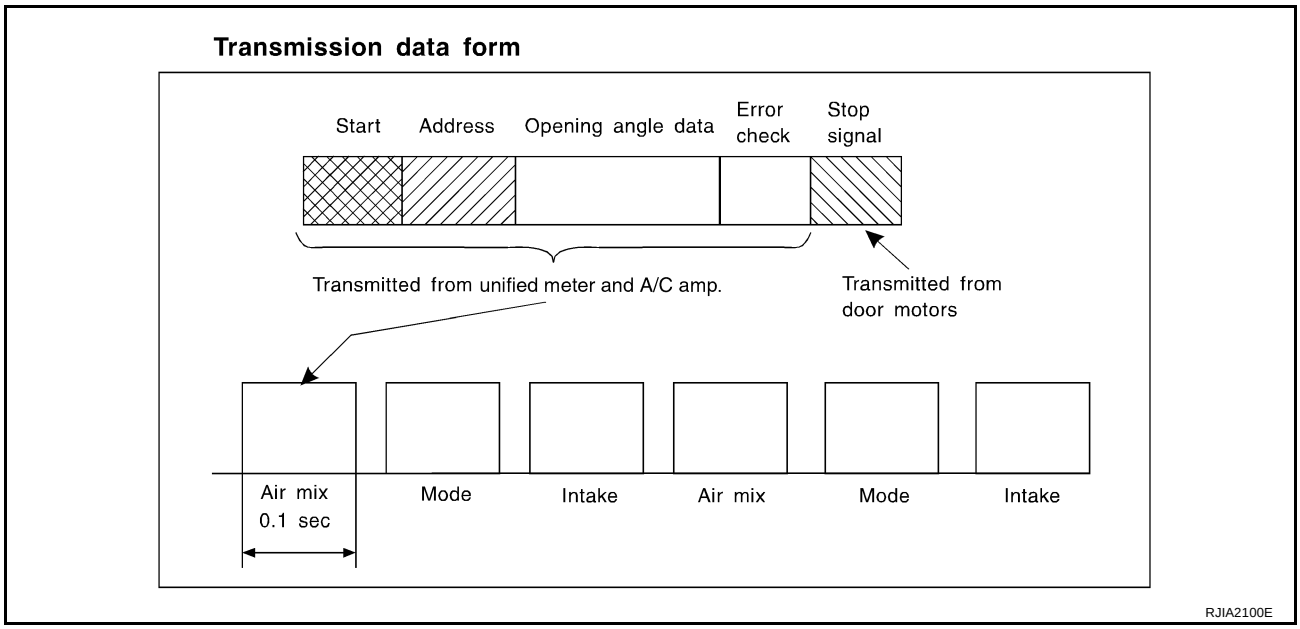
Error Check:

In this procedure, transmitted and received data are checked for errors. Error data are then compiled. The error check prevents corrupted data from being used by the air mix door motor, the mode door motor and the intake door motor. Error data can be related to the following symptoms.

- Malfunction of electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

Stop Signal:

At the end of each transmission, a stop operation, in-operation, or internal malfunction message is delivered to the unified meter and A/C amp. This completes one data transmission and control cycle.



AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

The air mix door is automatically controlled so that in-vehicle temperature is maintained at a predetermined value by the temperature setting, ambient temperature, in-vehicle temperature and amount of sunload.

FAN SPEED CONTROL

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
With FAN control dial set to AUTO, the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

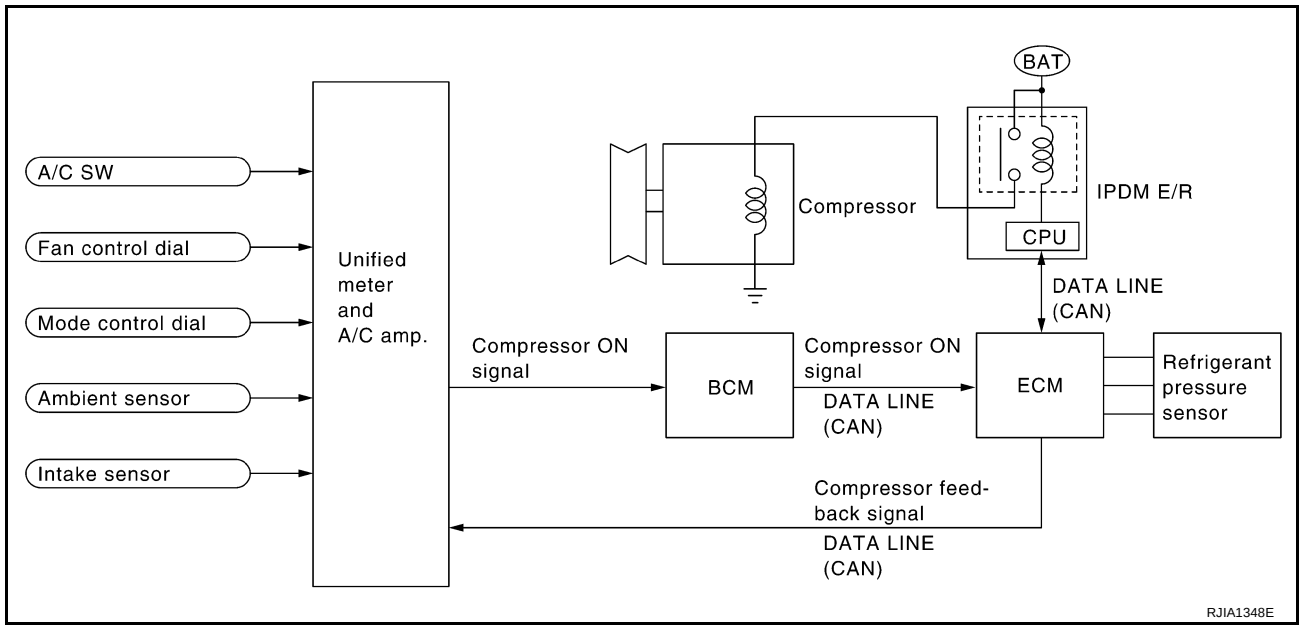
INTAKE DOOR CONTROL

The intake doors are automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON/OFF operation of the compressor.

MODE DOOR CONTROL

The mode door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

MAGNET CLUTCH CONTROL



When A/C switch is pressed, turn fan control dial to ON or set mode control dial to D/F, D/F2 or DEF position, unified meter and A/C amp. transmits compressor ON signal to BCM.
BCM sends compressor ON signal to ECM, via CAN communication.
ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant-pressure sensor signal, throttle angle, etc.). If it judges compressor can be turned ON, it sends compressor ON signal to IPDM E/R, via CAN communication.
Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.
When sending compressor ON signal to IPDM E/R via CAN communication line, ECM simultaneously sends compressor feedback signal to unified meter and A/C amp. via CAN communication line.
Unified meter and A/C amp., then, uses input compressor feedback signal to control air inlet.

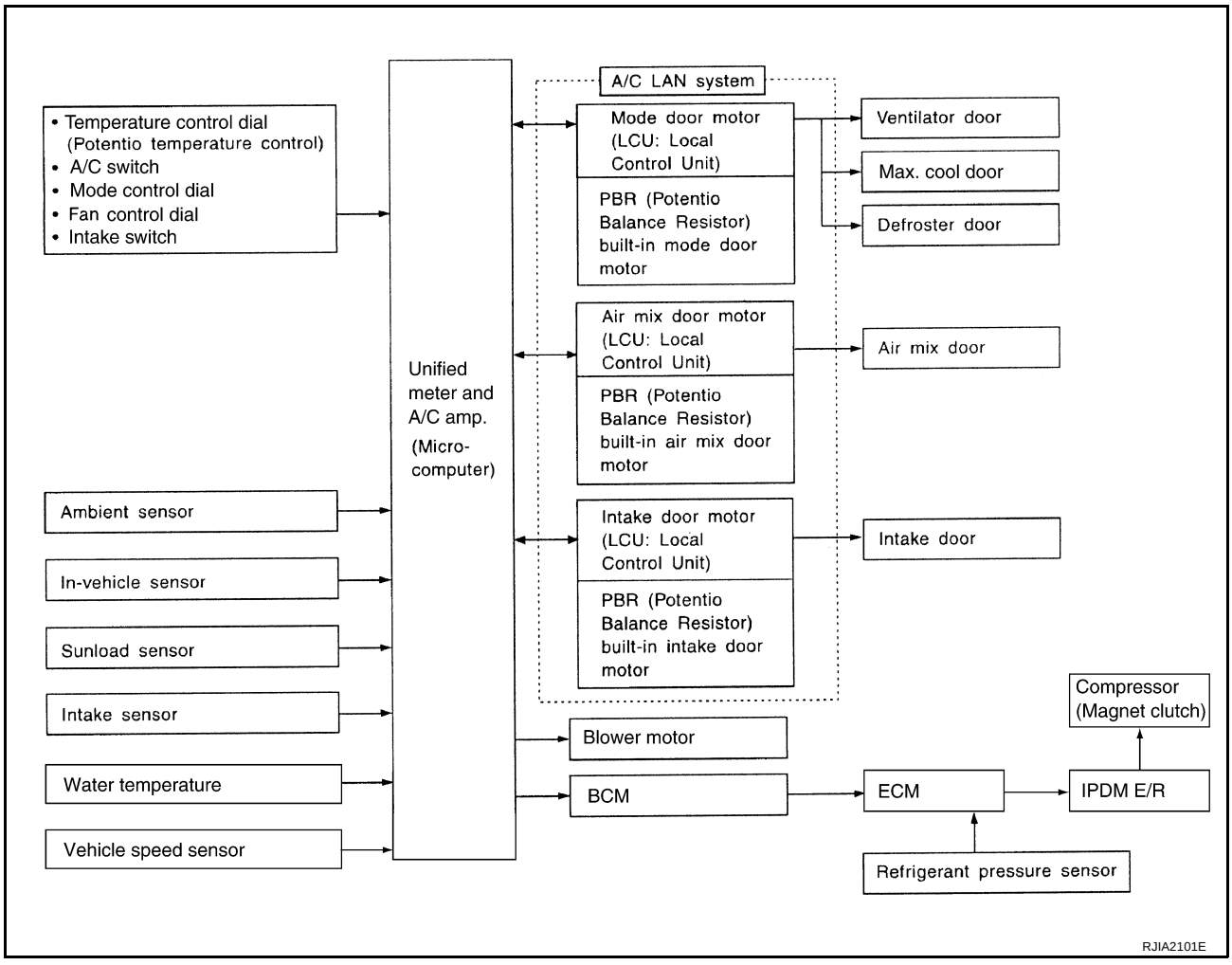
SELF-DIAGNOSIS SYSTEM

The self-diagnosis system is built into the unified meter and A/C amp. to quickly locate the cause of malfunctions.

Description of Control System

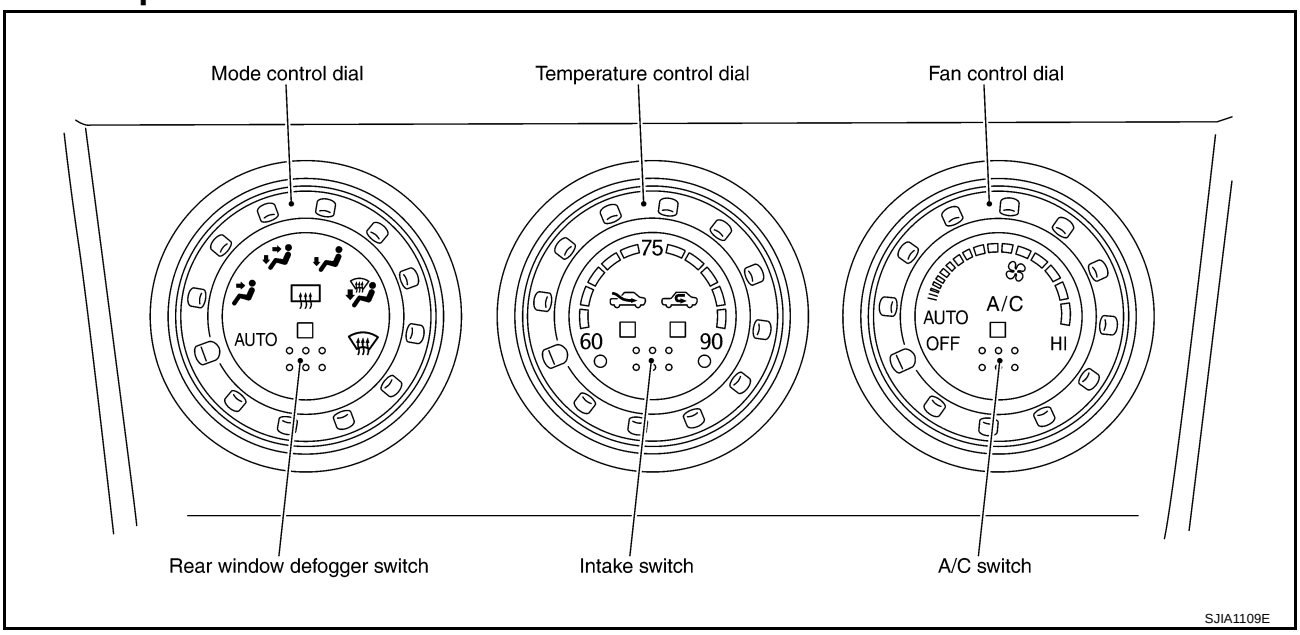
NJS0000L

The control system consists of input sensors, switches, unified meter and A/C amp. (microcomputer) and outputs. The relationship of these components is shown in the figure below:



Control Operation

NJS0000M



MODE CONTROL DIAL

The air discharge outlets are controlled with this dial.
Mode doors are set to the defrost position with this dial. Also, intake doors are set to the outside air position.
When shifting mode control dial to D/F, D/F2 or DEF position under the following conditions, compressor is turned ON. (A/C LED ON)

- FAN: ON
- A/C: OFF

TEMPERATURE CONTROL DIAL (POTENTIO TEMPERATURE CONTROL)

The set temperature is increased or decreased with this dial.

FAN CONTROL DIAL

The blower speed is automatically or manually controlled with this dial. Twenty-five speeds are available for manual control.
Shifting fan control dial to AUTO, compressor is turned ON automatically.

REAR WINDOW DEFOGGER SWITCH

When illumination is ON, rear window is defogged.

INTAKE SWITCH

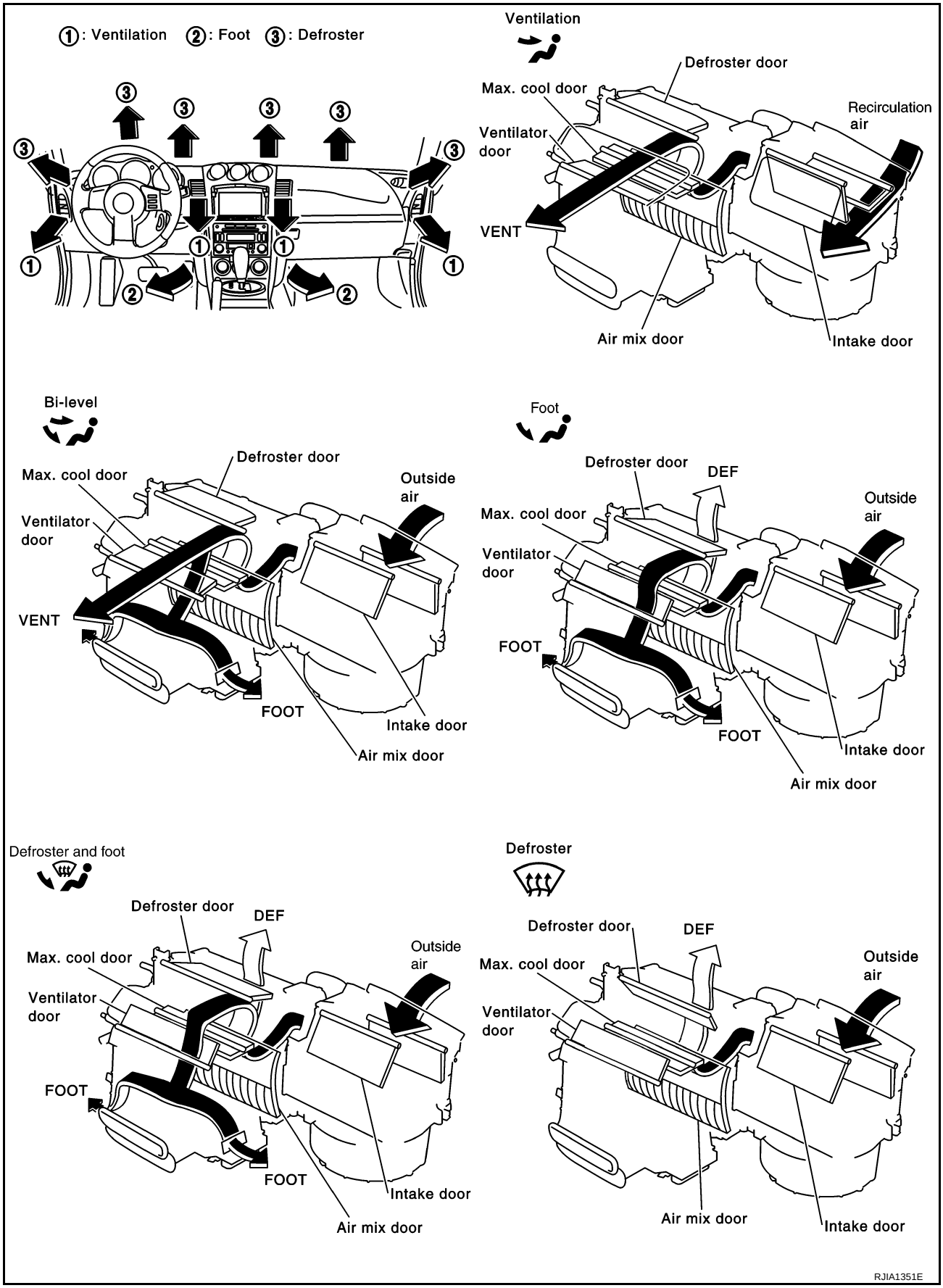
- When intake switch is ON, REC LED turns ON, and air inlet is fixed to REC.
- When press intake switch again, FRE LED turns ON, and air inlet is fixed to FRE.
- When intake switch is pressed for approximately 1.5 seconds or longer, REC and FRE LEDs blink twice. Then, automatic control mode is entered. Inlet status is displayed even during automatic control.
- When FRE LED is turned ON, shifting mode control dial to D/F, D/F2 or DEF, or when compressor is turned from ON to OFF, intake switch is automatically turned OFF (fixed to FRE mode). REC mode can be re-entered by pressing intake switch again, and then compressor is turned ON. (Except D/F, D/F2 or DEF position)

A/C SWITCH

Compressor is ON or OFF with this switch.
(Pressing the A/C switch when the fan control dial is ON, will turn OFF the A/C switch and compressor.)

Discharge Air Flow

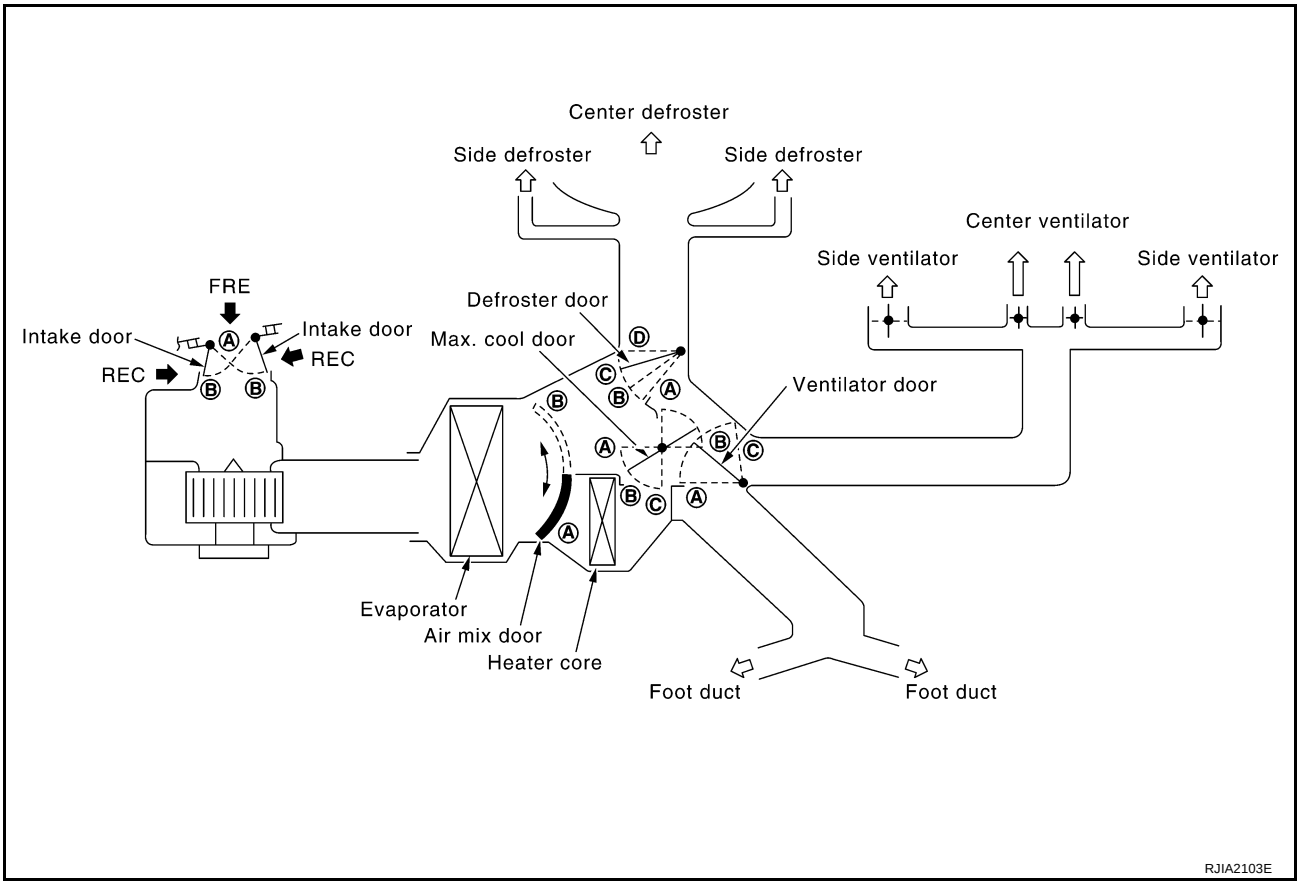
NJS0000N



System Description

NJS0000O

SWITCHES AND THEIR CONTROL FUNCTION



Door \ Position or switch	MODE control dial						Intake SW		Temperature control dial		
	VENT	B/L	FOOT	D/F	DEF	AUTO					
						—			18°C (60°F)	⇔	32°C (90°F)
Ventilator door	Ⓐ	Ⓑ	Ⓒ	Ⓒ	Ⓒ	AUTO	—		—		
Max. cool door	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓒ		—		—		
Defroster door	Ⓓ	Ⓓ	Ⓓ or Ⓒ *1	Ⓑ	Ⓐ		—		—		
Intake door	—			Ⓑ	Ⓑ	—	Ⓐ *2	Ⓑ *2	—		
Air mix door	—			—	—	—	—		Ⓐ	AUTO	Ⓑ

*1: This position is selected only when the mode door is automatically controlled.
*2: Inlet status is displayed during automatic control.

SJIA1884E

CAN Communication System Description

NJS0000P

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

CONSULT-III Function (BCM)

NJS0000Q

CONSULT-III can display each diagnosis item using the diagnosis test modes shown following.

System part	Check item, diagnosis mode	Description
BCM	Data monitor	Displays BCM input data in real time.

DATA MONITOR

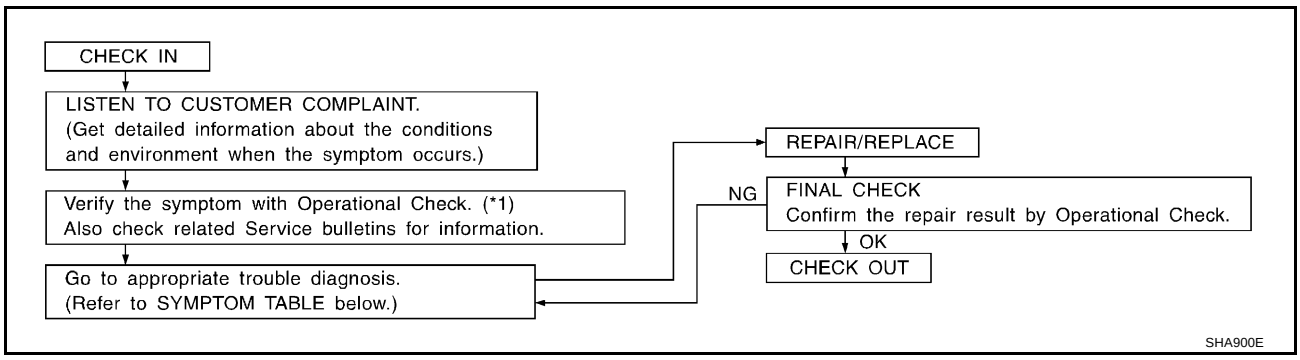
Display Item List

Monitor Item	Condition		Value/Status
IGNITION SW	Ignition switch OFF → ON		OFF → ON
HEATER FAN SW	Ignition switch ON	Blower fan motor switch ON	ON
		Blower fan motor switch OFF	OFF
AIR COND SIG	Ignition switch ON	Compressor ON	ON
		Compressor ON	OFF
AC PRESS SEN	● Engine is running ● Warm-up condition ● Both A/C switch and blower fan motor switch: ON (Compressor operates)		1.0 - 4.0 V

How to Perform Trouble Diagnosis for Quick and Accurate Repair

NJS0000R

WORK FLOW



*1 ATC-53, "Operational Check"

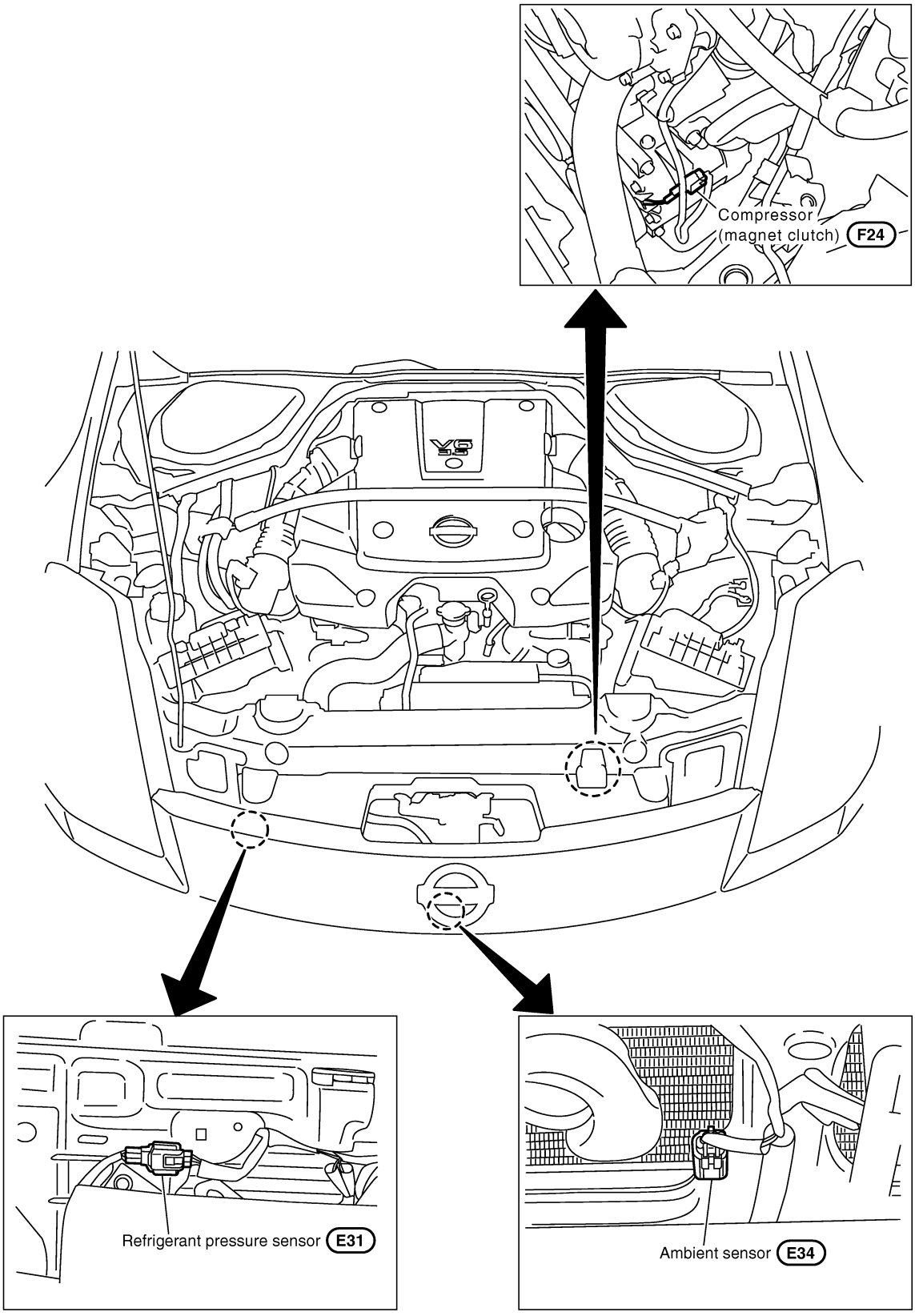
SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C system.	ATC-54, "Power Supply and Ground Circuit for Auto Amp."
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	ATC-60, "Mode Door Motor Circuit"
Mode door motor does not operate normally.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	ATC-63, "Air Mix Door Motor Circuit"
Air mix door motor does not operate normally.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	ATC-66, "Intake Door Motor Circuit"
Intake door motor does not operate normally.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	ATC-69, "Blower Motor Circuit"
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	ATC-74, "Magnet Clutch Circuit"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	ATC-81, "Insufficient Cooling"
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	ATC-89, "Insufficient Heating"
Noise	Go to Trouble Diagnosis Procedure for Noise.	ATC-90, "Noise"
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	ATC-91, "Self-diagnosis"

Component Parts and Harness Connector Location

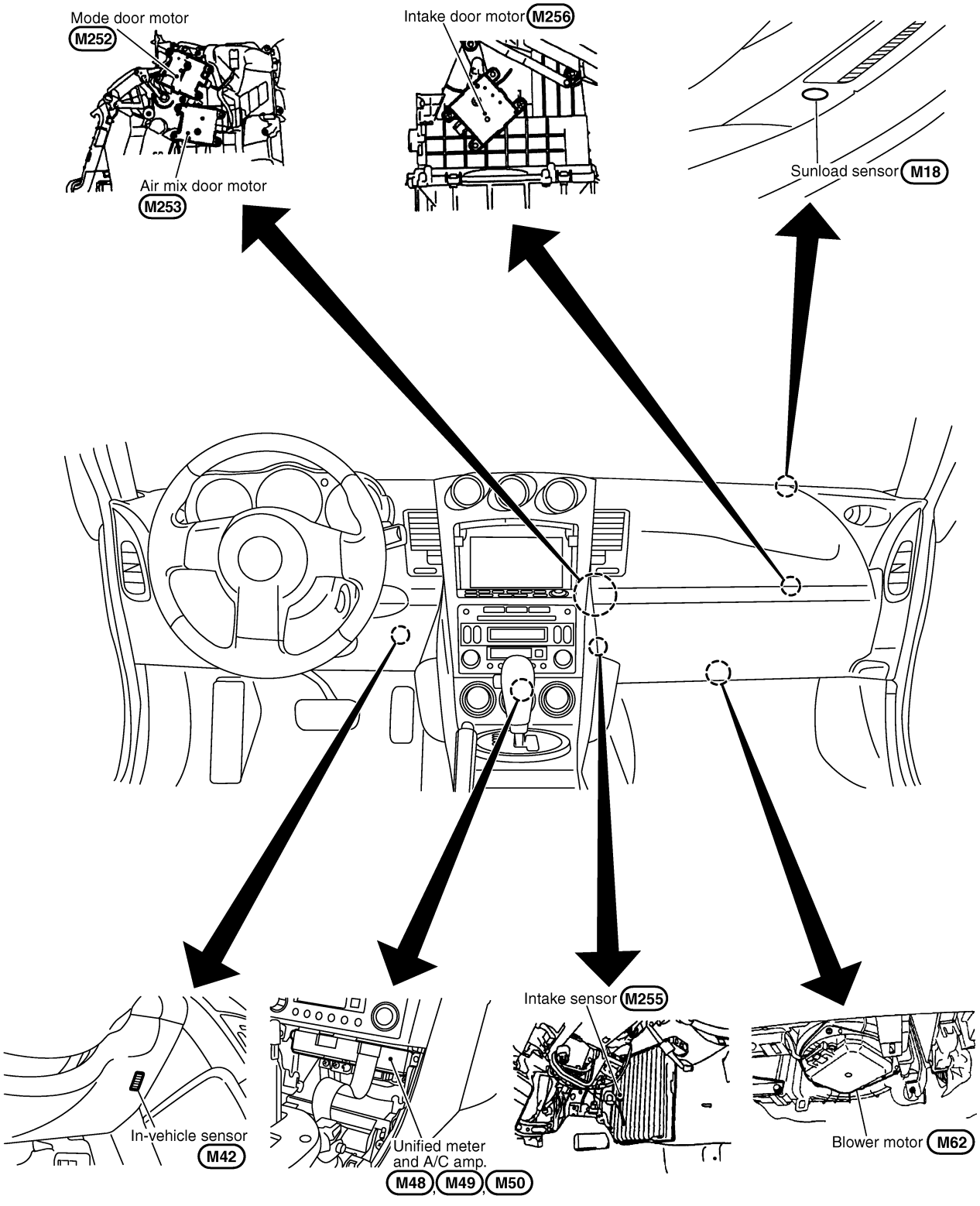
NJS0000S

ENGINE COMPARTMENT



PJIA0175E

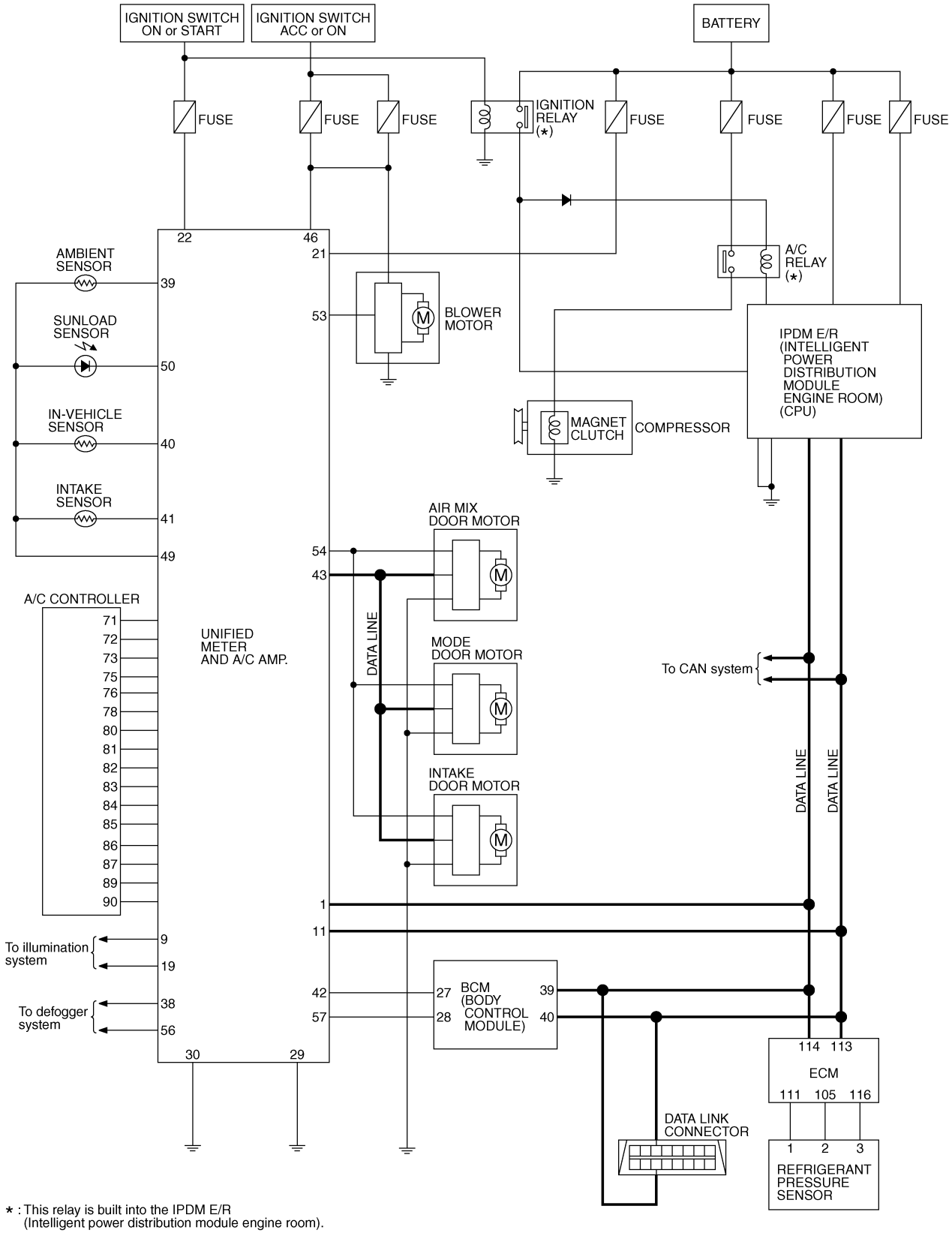
PASSENGER COMPARTMENT



PJIA0167E

Schematic

NJS0000T

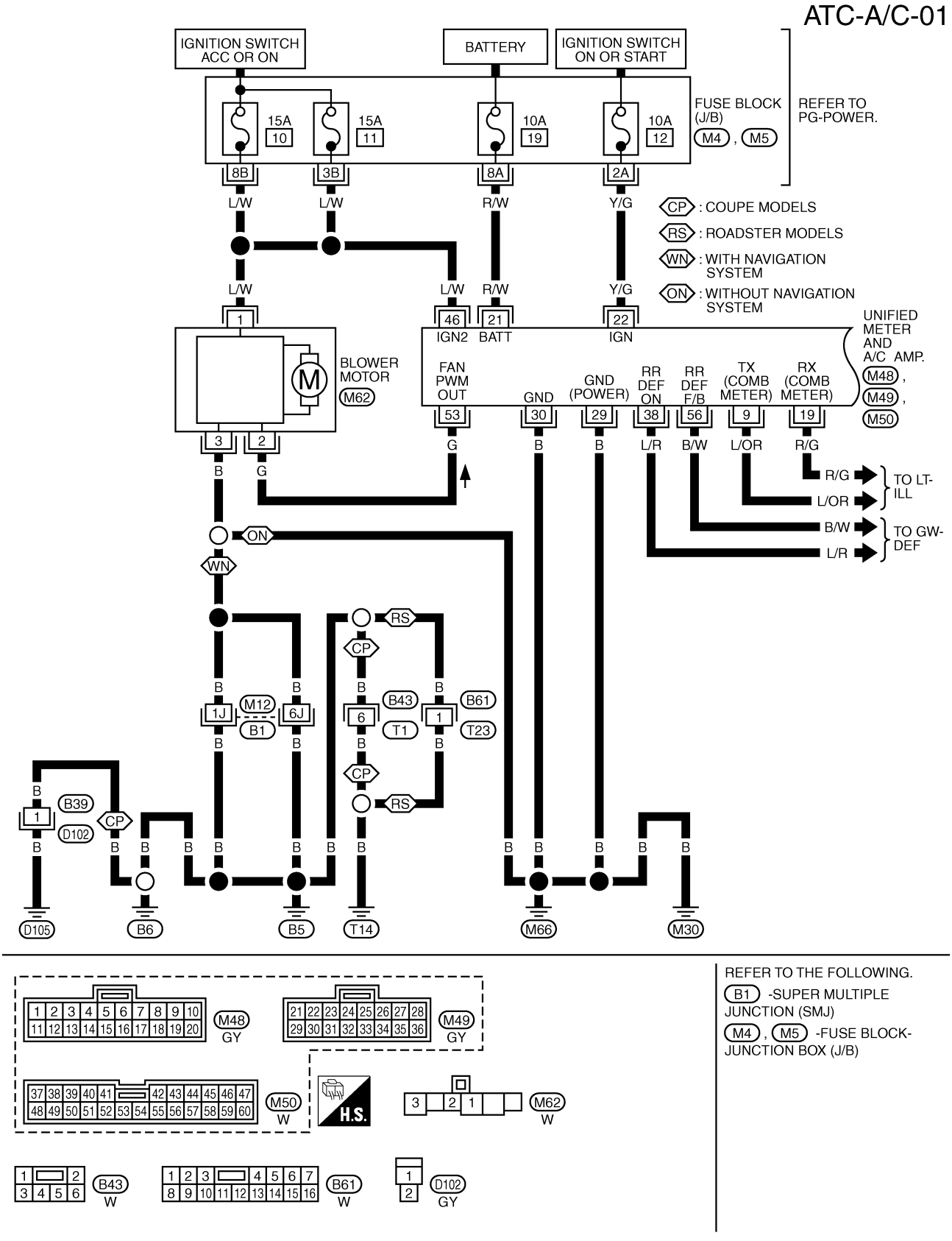


* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

TJWT0259E

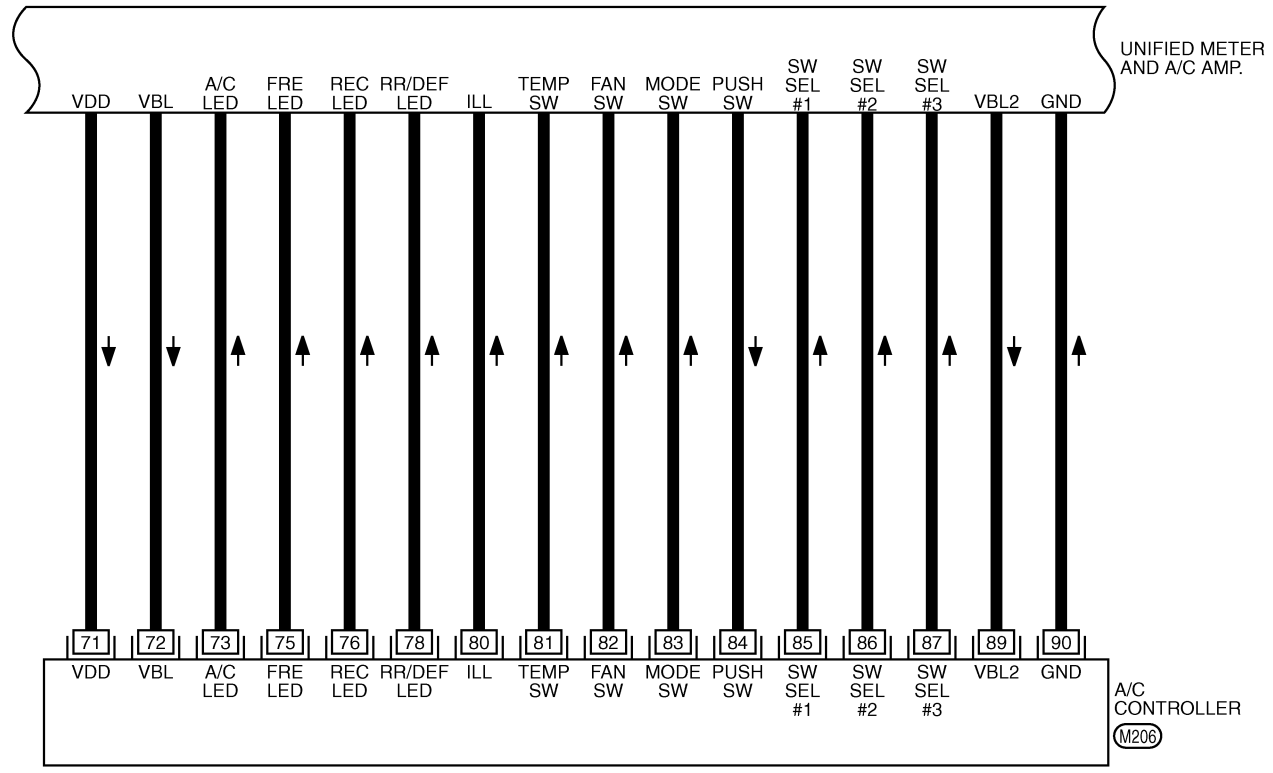
Wiring Diagram — A/C —

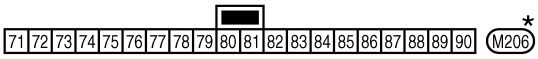
NJS0000U



TJWT0092E

ATC-A/C-02

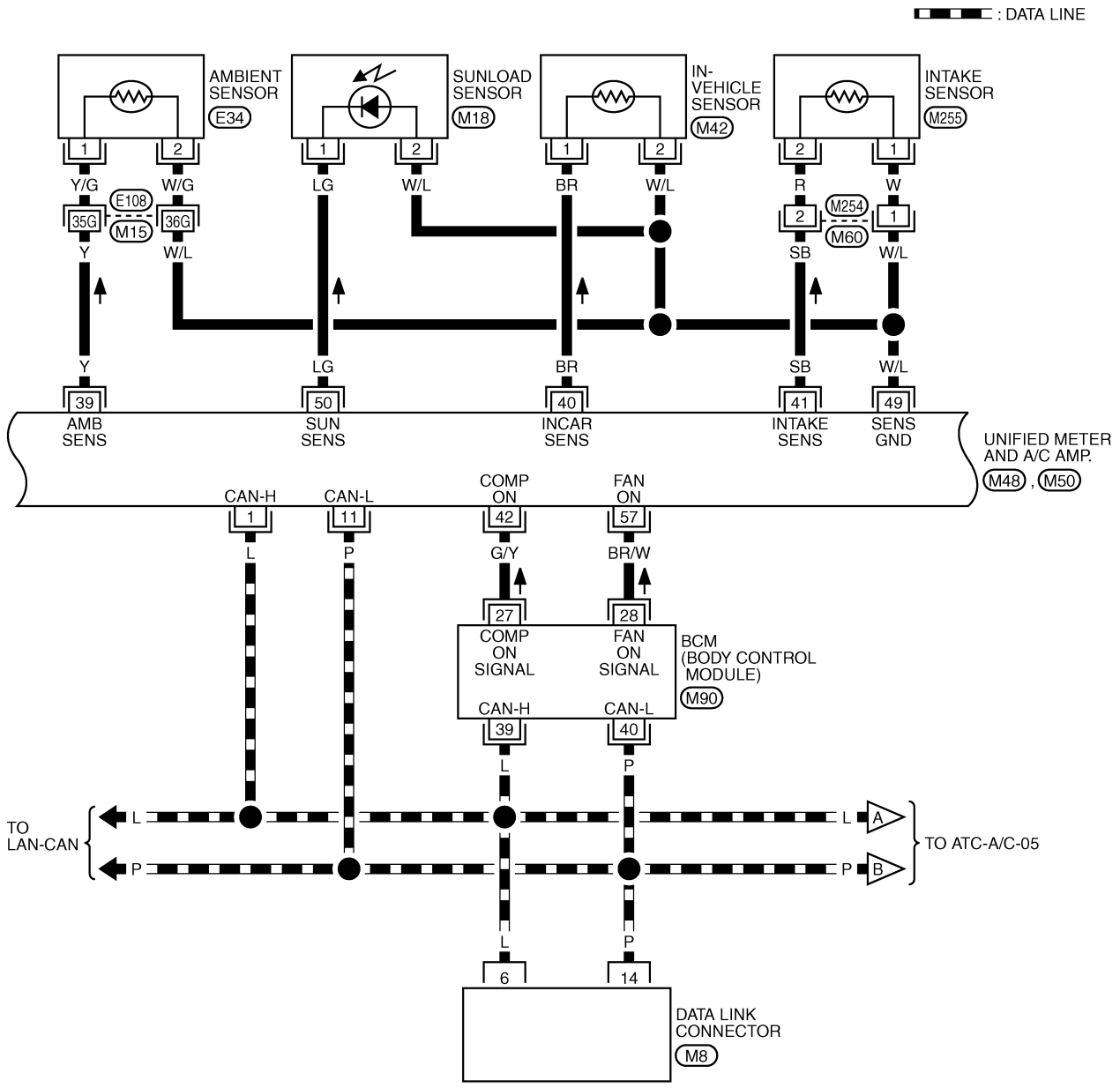


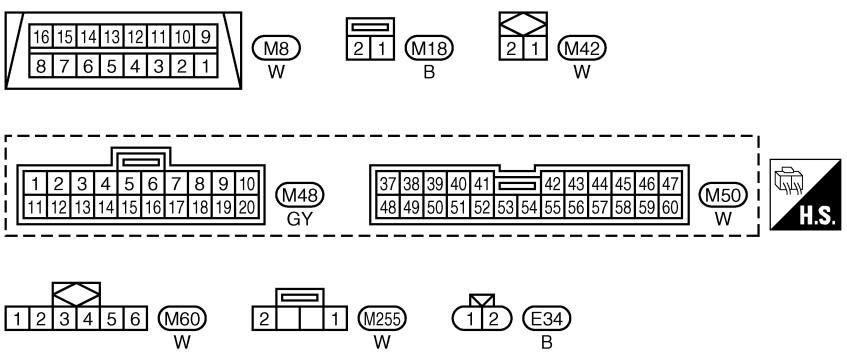


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TJWT0169E

ATC-A/C-03





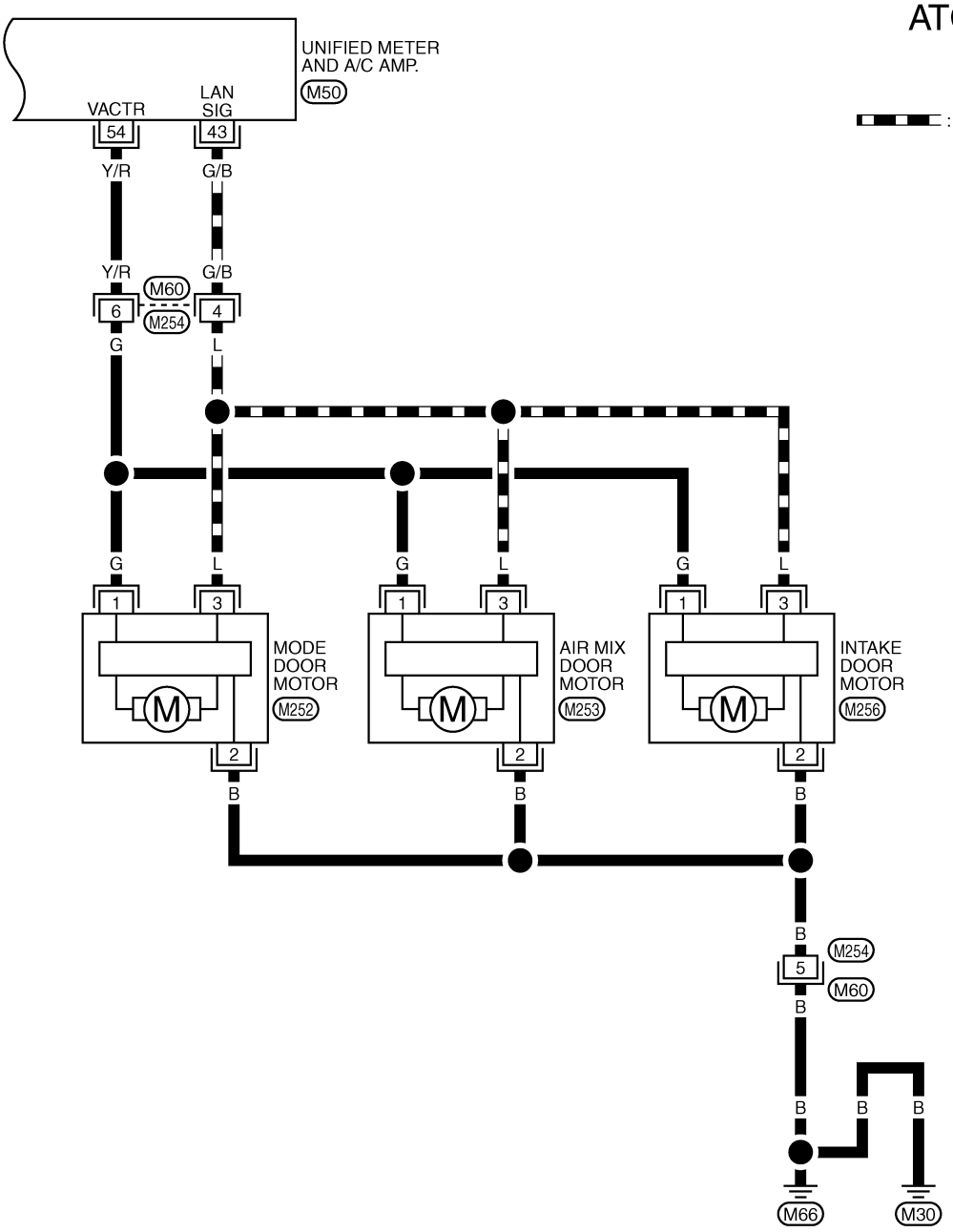
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M90 -ELECTRICAL UNITS

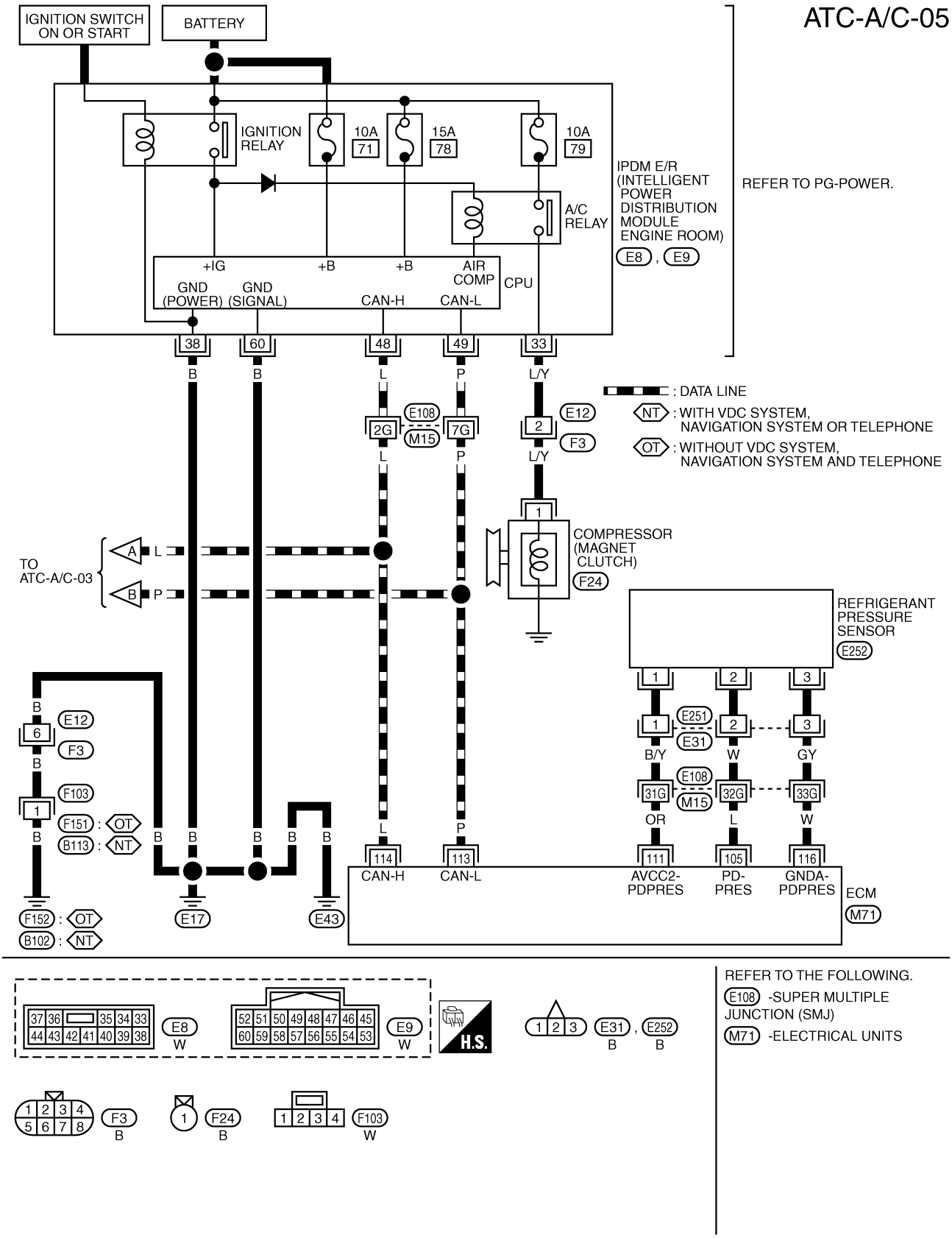
TJWT0260E

ATC-A/C-04





TJWT0171E

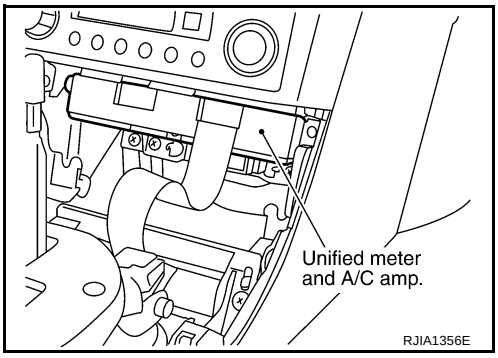

ATC-A/C-05
IGNITION SWITCH ON OR START
BATTERY
IGNITION RELAY
10A 71
15A 78
10A 79
A/C RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E8 , E9
REFER TO PG-POWER.
+IG
+B
+B
AIR COMP
CPU
GND (POWER)
GND (SIGNAL)
CAN-H
CAN-L
38
60
48
49
33
B
B
L
P
L/Y
: DATA LINE
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
E108
2G
M15
7G
E12
2
F3
TO ATC-A/C-03
A
B
L
P
COMPRESSOR (MAGNET CLUTCH)
F24
REFRIGERANT PRESSURE SENSOR
E252
E251
E31
B/Y
W
GY
31G
32G
33G
OR
L
W
E12
6
F3
F103
F151 : OT
B113 : NT
F152 : OT
B102 : NT
E17
E43
114
113
111
105
116
CAN-H
CAN-L
AVCC2-PDPRES
PD-PRES
GNDA-PDPRES
ECM
M71
E8
W
E9
W
H.S.
E31 , E252
B
B
F3
B
F24
B
F103
W
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M71 -ELECTRICAL UNITS

TJWT0261E

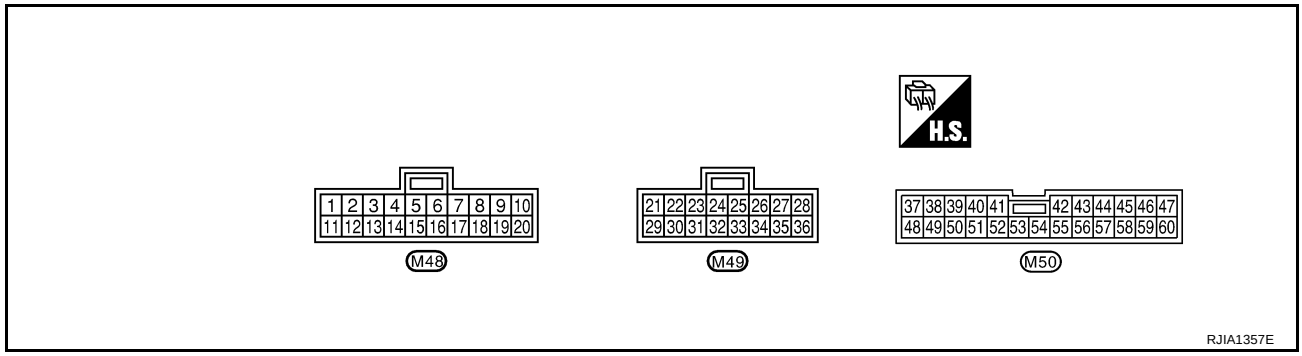
Auto Amp. Terminals and Reference Value

NJS0000V

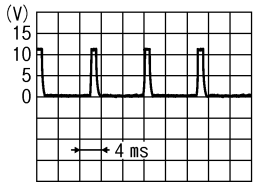
Measure voltage between each terminal and ground by referring terminals and reference value for unified meter and A/C amp.

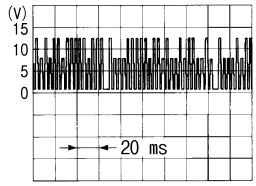
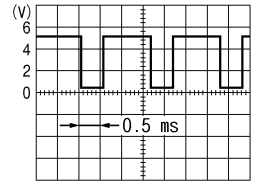


PIN CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUE FOR UNIFIED METER AND A/C AMP.

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
1	L	CAN-H	—	—	—
9	L/OR	Multiplex communication signal (TX)	—	—	—
11	P	CAN-L	—	—	—
19	R/G	Multiplex communication signal (RX)	—	—	—
21	R/W	Power supply from BATT	OFF	—	Battery voltage
22	Y/G	Power supply from IGN	ON	—	Battery voltage
29	B	Ground (Power)	ON	—	Approx. 0
30	B	Ground	ON	—	Approx. 0
38	L/R	Rear window defogger ON signal	ON	Rear window defogger switch is depressed.	Approx. 0
				Rear window defogger switch is released.	Approx. 12
39	Y	Ambient sensor	—	—	—
40	BR	In-vehicle sensor	—	—	—
41	SB	Intake sensor	—	—	—
42	G/Y	Compressor ON signal	ON	A/C switch: ON (Blower motor operates.)	Approx. 0
				A/C switch: OFF	

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
43	G/B	A/C LAN signal	ON	—	 SJIA1453J
46	L/W	Power supply from IGN2	ACC or ON	—	Battery voltage
49	W/L	Sensor ground	ON	—	Approx. 0
50	LG	Sunload sensor	—	—	—
53	G	Blower motor control signal	ON	Blower speed: 1st speed (manual)	 SJIA1454J
54	Y/R	Power supply for each door motor	ON	—	Battery voltage
56	B/W	Rear window defogger feedback signal	ON	Rear window defogger switch: ON	Approx. 12
				Rear window defogger switch: OFF	Approx. 0
57	BR/W	Blower motor ON signal	ON	Fan control dial: ON (A/C system operates)	Approx. 0
				Fan control dial: OFF	Approx. 5

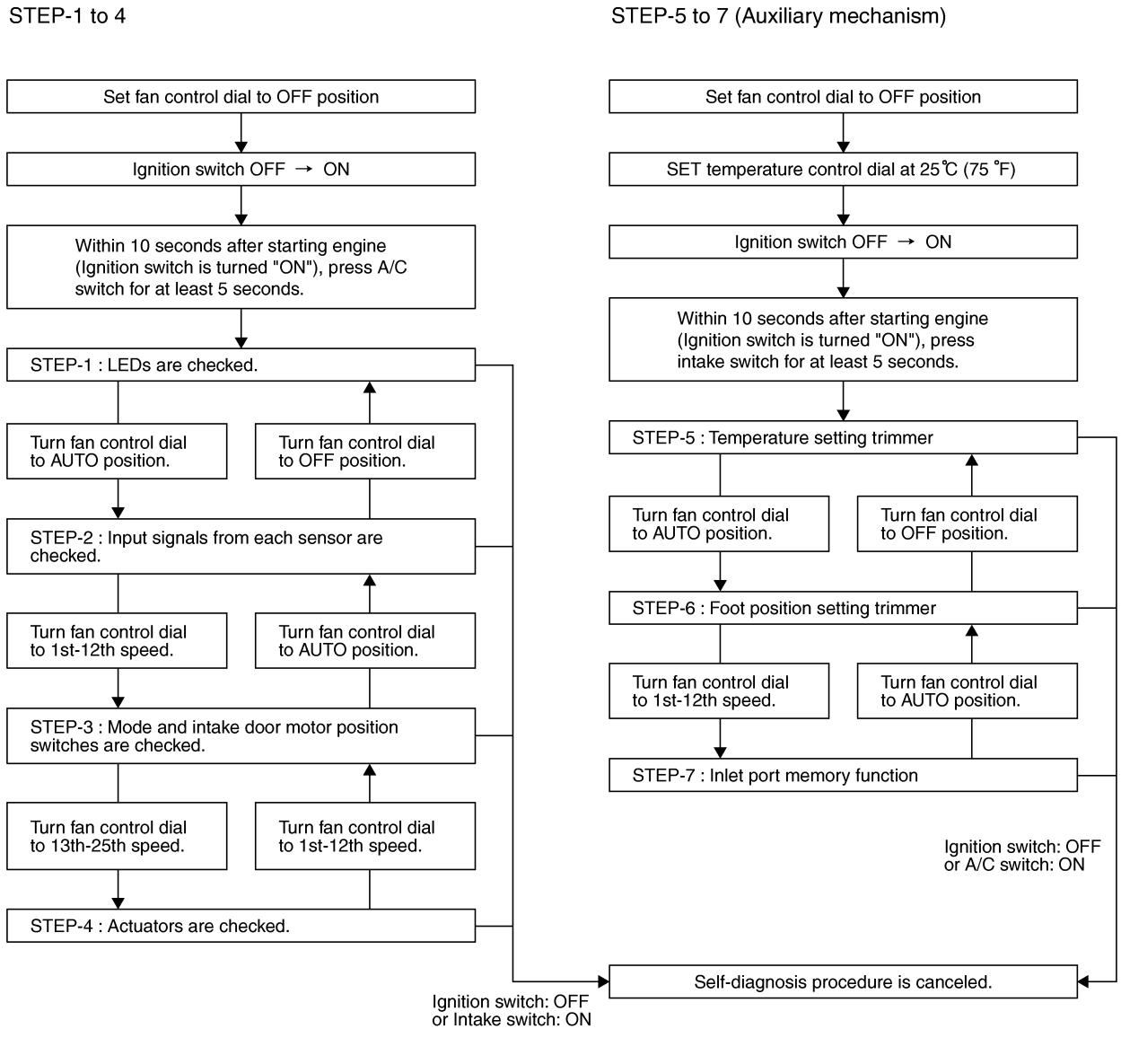
Self-diagnosis Function

NJS0000W

DESCRIPTION

The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line.
Self-diagnosis is STEP-1 to 7. There are two ways of changing method during self-diagnosis.

- Switching to self-diagnosis STEP-1 to 4.
  Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch from OFF to ON) and pressing A/C switch for at least 5 seconds. The A/C switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing intake switch or turning the ignition switch OFF. Shifting to the next step is accomplished by means of turning fan control dial, as required.
- Switching to self-diagnosis STEP-5 to 7 (Auxiliary mechanism).
  Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch from OFF to ON) and pressing intake switch for at least 5 seconds. The intake switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing A/C switch or turning the ignition switch OFF. Shifting to the next step is accomplished by means of turning fan control dial, as required.



SJIA1139E

FUNCTION CONFIRMATION PROCEDURE

1. SET IN SELF-DIAGNOSIS MODE (STEP-1 TO 4)

1. Set the fan control dial to OFF position.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press A/C switch for at least 5 seconds.

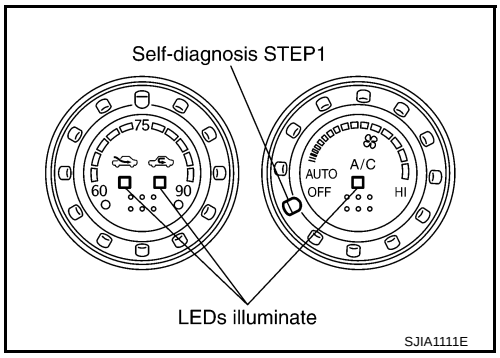
NOTE:
If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. To avoid this, start engine before performing this diagnosis.

>> GO TO 2.

2. STEP-1: LEDS ARE CHECKED

Check intake and A/C switch LEDs illumination.

OK >> GO TO 3.
NG >> Refer to ATC-91, "Self-diagnosis" .

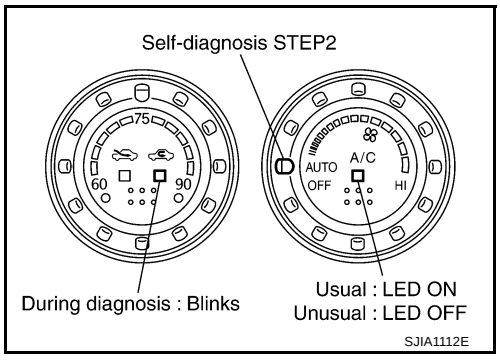


3. CHECK TO ADVANCE SELF-DIAGNOSIS STEP-2

1. Turn fan control dial to AUTO position.
   NOTE:
   When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.
2. Check A/C switch LED illumination.

Advance to self-diagnosis STEP-2?

YES >> GO TO 4.
NO >> Replace A/C controller. (Fan control dial is malfunctioning.)



4. CHECK TO RETURN SELF-DIAGNOSIS STEP-1

Turn fan control dial to OFF position.

Return to self-diagnosis STEP-1?

YES >> GO TO 5.
NO >> Replace A/C controller. (Fan control dial is malfunctioning.)

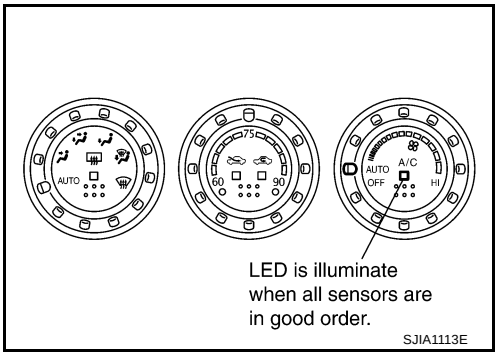
5. STEP-2: SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT

1. Turn fan control dial to AUTO position.
2. Turn mode control dial to AUTO position.

   NOTE:
   When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.
3. Check A/C switch LED is illuminate.

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.



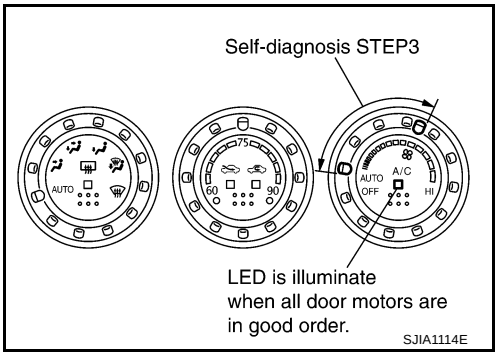
6. STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

1. Turn fan control dial to 1st - 12th speed.

   NOTE:
   When switched to STEP-3, LED of REC position blinks for approximately 50 seconds.
2. Check A/C switch LED is illuminate.

OK or NG

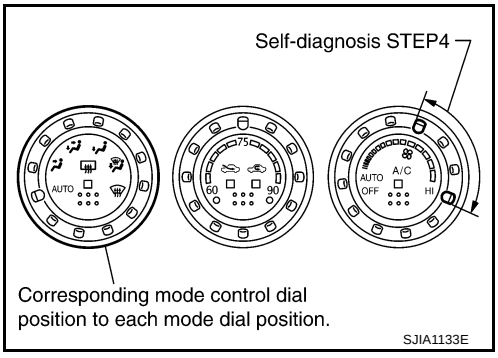
OK >> GO TO 7.
NG >> GO TO 10.



7. STEP-4: OPERATION OF EACH ACTUATOR IS CHECKED

1. Turn fan control dial to 13th - 25th speed.
2. Change operation status of air conditioner by changing mode control dial position.

>> GO TO 8.



8. CHECK ACTUATORS

Refer to the following chart and confirm discharge air flow, air temperature, blower motor duty ratio and compressor operation.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

RJIA2110E

STEP-No. *1	STEP-41	STEP-42	STEP-43	STEP-44	STEP-45	STEP-46
Mode control dial position	AUTO	VENT	B/L	FOOT or FOOT2	D/F or D/F2	DEF
Mode door position	VENT	VENT2	B/L	FOOT *2	D/F	DEF
Intake door position	REC	REC	REC	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT
Blower motor duty ratio	25%	25%	41%	57%	75%	91%
Compressor	ON	ON	OFF	OFF	ON	ON

Checks must be made visually, by listening the sound, or by touching air outlets with hand, etc. for improper operation.

*1: STEP-No. 41 to 46 are for differentiation and will not be displayed.

*2: FOOT position during automatic control. Refer to ATC-51, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER" .

OK or NG

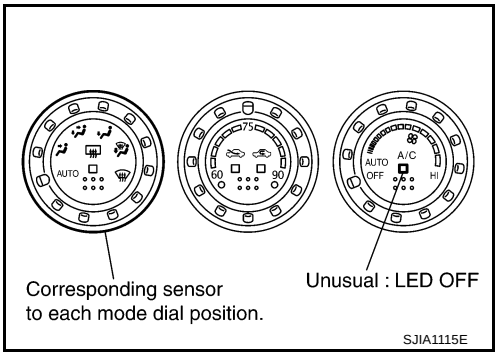
OK >> 1. Turn ignition switch OFF or intake switch ON.
2. INSPECTION END

NG >>
- Air outlet does not change.
  Go to Mode Door Motor Circuit. Refer to ATC-60, "Mode Door Motor Circuit" .
- Intake door does not change.
  Go to Intake Door Motor Circuit. Refer to ATC-66, "Intake Door Motor Circuit" .
- Discharge air temperature does not change.
  Go to Air Mix Door Motor Circuit. Refer to ATC-63, "Air Mix Door Motor Circuit" .
- Blower motor operation is malfunctioning.
  Go to Blower Motor Circuit. Refer to ATC-69, "Blower Motor Circuit" .
- Magnet clutch does not engage.
  Go to Magnet Clutch Circuit. Refer to ATC-74, "Magnet Clutch Circuit" .

9. CHECK MALFUNCTIONING SENSOR AND DOOR MOTOR

Refer to the following chart.
*1: Perform self-diagnosis STEP-2 under sunshine.
When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise LED of A/C switch will not indicate despite that sunload sensor is functioning properly.

NOTE:
When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.



Mode control dial position	Unusual	Malfunctioning sensor and door motor (Including circuits)	Reference page
VENT	A/C LED: OFF	Ambient sensor	*2
B/L		In-vehicle sensor	*3
FOOT or FOOT2		Sunload sensor *1	*4
D/F or D/F2		Intake sensor	*5
DEF		Air mix door motor (LCU) PBR	*6

*2: ATC-92, "DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR" .
*3: ATC-95, "DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR" .
*4: ATC-97, "DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR" .
*5: ATC-100, "DIAGNOSIS PROCEDURE FOR INTAKE SENSOR" .
*6: ATC-65, "DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR PBR" .

>> INSPECTION END

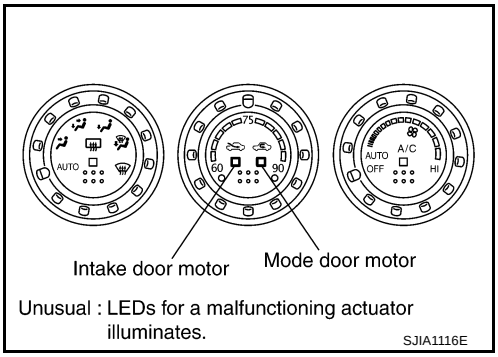
10. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode and/or intake door motor PBR(s) is/are malfunctioning.

NOTE:
When switched to STEP-3, LED of REC position blinks for approximately 50 seconds.

Unusual	Mode or intake door position	Reference page
REC LED: ON	Mode door motor	*1
FRE LED: ON	Intake door motor	*2

*1: ATC-62, "DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR" .
*2: ATC-68, "DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR" .



>> INSPECTION END

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

The trimmer compensates for differences in range of ±3°C (±6°F) between temperature setting (temperature control dial position) and temperature felt by customer.

Operating procedures for this trimmer are as follows:

1. Set fan control dial to OFF.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
4. When intake switch is pressed, temperature shifts in following order: 0°C (0°F)→ 1°C (2°F)→ 2°C (4°F)→ 3°C (6°F)→ –3°C (–6°F)→ –2°C (–4°F)→ –1°C (–2°F)→ return to 0°C (0°F).

Setting temperature	LED status of each switch		
	FRE	REC	A/C
–3°C (–6°F)	ON	ON	ON
–2°C (–4°F)	ON	ON	OFF
–1°C (–2°F)	ON	OFF	ON
0°C (0°F) (Initial setting)	OFF	OFF	OFF
1°C (2°F)	OFF	OFF	ON
2°C (4°F)	OFF	ON	OFF
3°C (6°F)	OFF	ON	ON

When battery cable is disconnected or battery voltage is below 9 V, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e. 0°C (0°F).

AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER

Wind distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as follows:

1. Set fan control dial to AUTO.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
4. Press intake switch as desired.

Type	Discharge air flow			
	Automatically controls the mode door		Manually controls the mode door	
	FOOT	DEF	FOOT	DEF
Type-A (initial setting)	76%	24%	100%	—
Type-B	76%	24%	100%	—
Type-C	100%	—	100%	—
Type-D	100%	—	100%	—

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Type	LED status of each switch		
	FRE	REC	A/C
Type-A (Initial setting)	OFF	OFF	ON
Type-B	OFF	ON	OFF
Type-C	OFF	ON	ON
Type-D	ON	OFF	OFF

When battery cable is disconnected or battery voltage is below 9 V, trimmer operation is canceled. Wind distribution ratio set becomes that of initial condition.

AUXILIARY MECHANISM: INLET PORT MEMORY FUNCTION

When ignition switch is turned from OFF to ON, inlet port memory function at manual mode can be set.

Operating procedures for this trimmer are as follows:

1. Set fan control dial to 1st - 12th speed.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
4. Press intake switch as desired.

LED status of FRE position	LED status of REC position	Setting status		Setting changeover method
		FRE	REC	
OFF	OFF	AUTO control	AUTO control	Intake SW: ON
OFF	ON	AUTO control (Initial setting)	Manual REC status is memorized. (Initial setting)	
ON	ON	Manual FRE status is memorized.	AUTO control	
ON	OFF	Manual FRE status is memorized.	Manual REC status is memorized.	

When battery cable is disconnected or battery voltage is below 9 V, memory function is canceled. Memory function set becomes that of initial condition.

Operational Check

NJS0000X

The purpose of the operational check is to check if the individual system operates properly.

Conditions : Engine running at normal operating temperature

CHECKING BLOWER

1. Turn fan control dial to 1st speed. Blower should operate on low speed.
2. Turn fan control dial to 2nd speed, and continue checking blower speed until all speeds are checked.
3. Leave blower on max. speed.

If NG, go to trouble diagnosis procedure for ATC-69, "Blower Motor Circuit" .
If OK, continue the check.

CHECKING DISCHARGE AIR

1. Turn mode control dial to each position.
2. Confirm that discharge air comes out according to the air distribution table. Refer to ATC-30, "Discharge Air Flow" .

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

RJIA2110E

Intake door position is checked in the next step.
If NG, go to trouble diagnosis procedure for ATC-60, "Mode Door Motor Circuit" .
If OK, continue the check.

NOTE:
Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when the D/F, D/F2 or DEF position are selected.

CHECKING INTAKE DOOR

1. Press intake switch. Recirculation LED should illuminate.
2. Press intake switch again. Fresh LED should illuminate.
3. Listen for intake door position change. (Slight change of blower sound can be heard.)

If NG, go to trouble diagnosis procedure for ATC-66, "Intake Door Motor Circuit" .
If OK, continue the check.

CHECKING TEMPERATURE DECREASE

1. Turn temperature control dial until 18°C (60°F).
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-81, "Insufficient Cooling" .
If OK, continue the check.

CHECKING TEMPERATURE INCREASE

1. Turn temperature control dial until 32°C (90°F).
2. Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-89, "Insufficient Heating" .
If OK, continue the check.

CHECKING A/C SWITCH

Turn fan control dial to AUTO position. (Compressor is turned ON automatically.)

- Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)

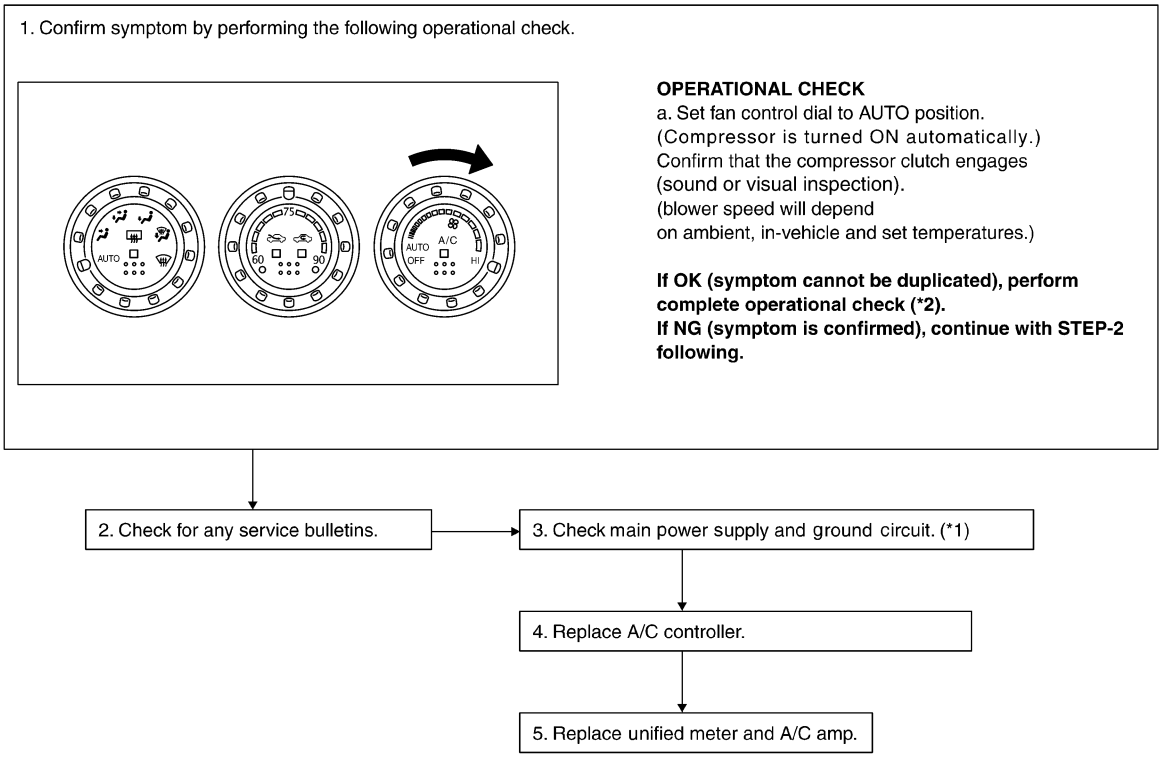
If NG, go to trouble diagnosis procedure for ATC-54, "Power Supply and Ground Circuit for Auto Amp." , then if necessary, trouble diagnosis procedure for ATC-74, "Magnet Clutch Circuit" .
If all operational checks are OK (symptom cannot be duplicated), go to Incident Simulation Tests in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to ATC-34, "SYMPTOM TABLE" and perform applicable trouble diagnosis procedures.

Power Supply and Ground Circuit for Auto Amp.

NJS0000Y

SYMPTOM: A/C system does not come on.

INSPECTION FLOW



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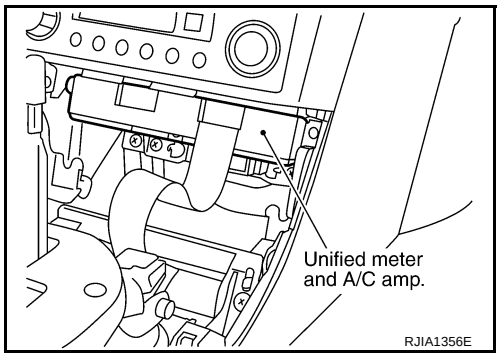
*1 ATC-55, "DIAGNOSIS PROCEDURE FOR A/C SYSTEM"

*2 ATC-53, "Operational Check"

COMPONENT DESCRIPTION

Unified Meter and A/C amp. (Automatic Amplifier)

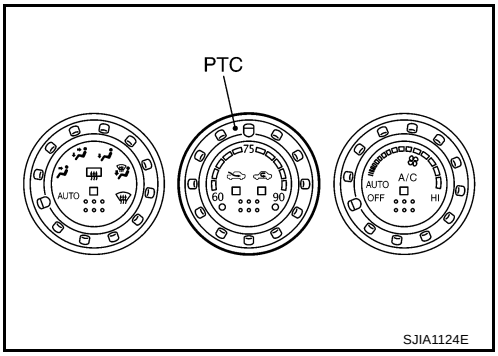
The unified meter and A/C amp. has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, blower motor and compressor are then controlled.
When the various switches and temperature control dial are operated, data is input to the unified meter and A/C amp. from the A/C controller using multiplex communication.
Self-diagnosis functions are also built into unified meter and A/C amp. to provide quick check of malfunctions in the auto air conditioner system.



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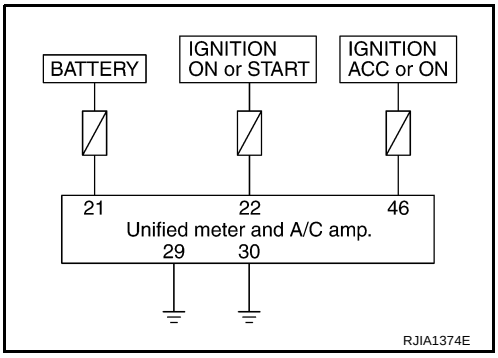
Potentio Temperature Control (PTC)

The PTC is built into the A/C controller. It can be set at an interval of 1°C (2.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by turning the temperature control dial.



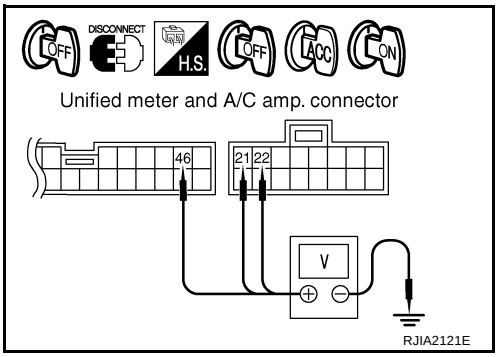
DIAGNOSIS PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Disconnect unified meter connector and A/C amp. connector.
2. Check voltage between unified meter and A/C amp. harness connector M49 terminal 21 and 22, unified meter and A/C amp. harness connector M50 terminal 46 and ground.



Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Unified meter and A/C amp. connector	Terminal No.				
M49	21	Ground	Battery voltage	Battery voltage	Battery voltage
M49	22		Approx. 0 V	Approx. 0 V	Battery voltage
M50	46		Approx. 0 V	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check 10A and 15A fuses [Nos. 10, 11, 12 and 19, located in the fuse block (J/B)]. Refer to PG-85, "FUSE BLOCK - JUNCTION BOX (J/B)" .

- If fuses are OK, check harness for open circuit. Repair or replace if necessary.
- If fuses are NG, check harness for short circuit and replace fuse.

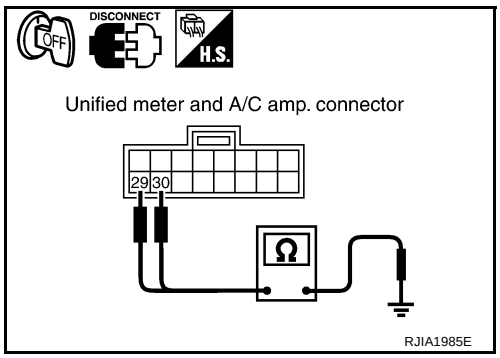
2. CHECK GROUND CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Check continuity between unified meter and A/C amp. harness connector M49 terminal 29, 30 and ground.

29, 30 – Ground : Continuity should exist.

OK or NG

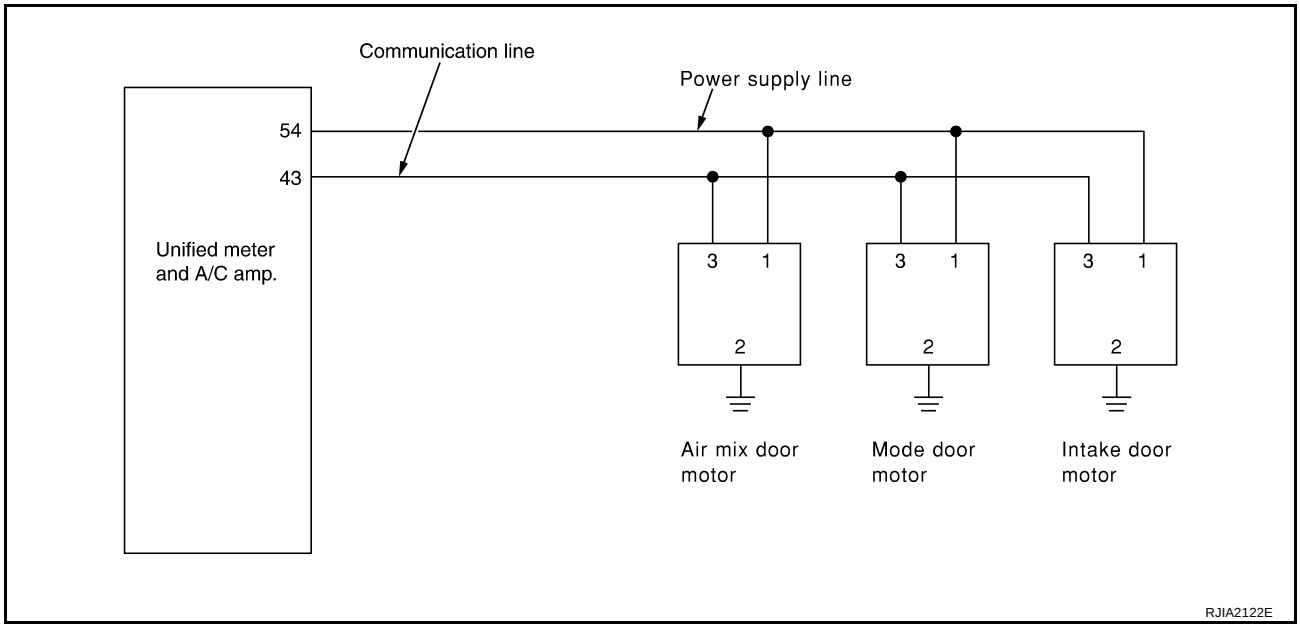
OK >> Replace unified meter and A/C amp.
NG >> Repair harness or connector.



LAN System Circuit

NJS0000Z

SYMPTOM: Mode door motor, intake door motor and/or air mix door motor does not operate normally.



DIAGNOSIS PROCEDURE FOR LAN CIRCUIT

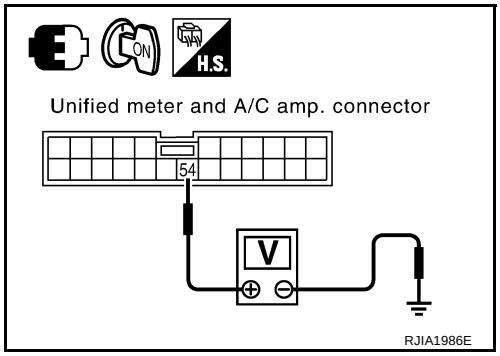
1. CHECK POWER SUPPLY FOR UNIFIED METER AND A/C AMP.

1. Turn ignition switch ON.
2. Check voltage between unified meter and A/C amp. harness connector M50 terminal 54 and ground.

54 – Ground : Battery voltage

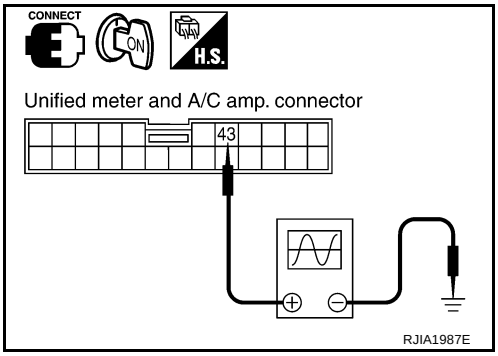
OK or NG

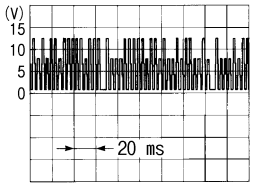
OK >> GO TO 2.
NG >> Replace unified meter and A/C amp.



2. CHECK SIGNAL FOR UNIFIED METER AND A/C AMP.

Confirm A/C LAN signal between unified meter and A/C amp. harness connector M50 terminal 43 and ground using an oscilloscope.



Terminals			Voltage
(+)		(–)	
Unified meter and A/C amp. connector	Terminal No.		
M50	43	Ground	

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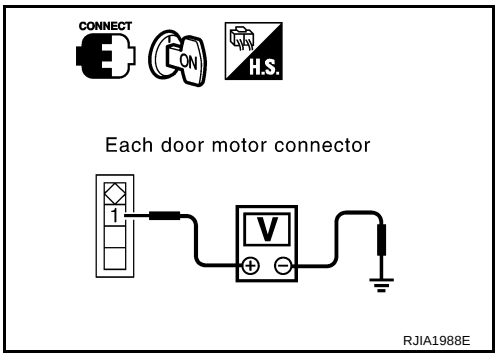
OK or NG

OK >> GO TO 3.
NG >> Replace unified meter and A/C amp.

3. CHECK POWER SUPPLY FOR EACH DOOR MOTOR

Check voltage between each door motor harness connector terminal 1 and ground.

1 – Ground : Battery voltage

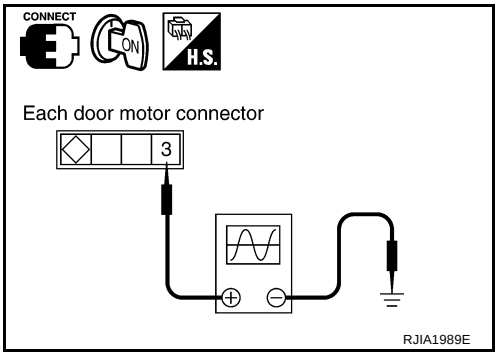


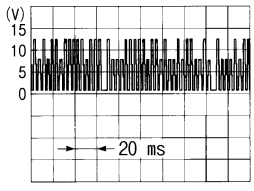
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK SIGNAL FOR EACH DOOR MOTOR

Confirm A/C LAN signal between each door motor harness connector terminal 3 and ground using an oscilloscope.



Door motor	Terminals			Voltage
	(+)		(–)	
	Connector	Terminal No.		
Mode	M252	3	Ground	
Air mix	M253	3		
Intake	M256	3		

SJIA1453J

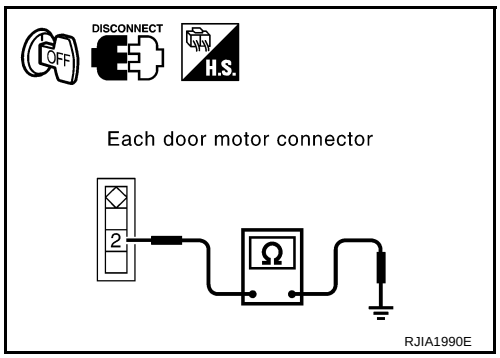
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect each door motor connector.
3. Check continuity between each door motor harness connector terminal 2 and ground.

2 – Ground : Continuity should exist.



OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK MOTOR OPERATION

1. Reconnect each door motor connector.
2. Turn ignition switch ON.
3. Confirm operation of each door motor.

OK or NG

OK >> Return to operate normally.
- Poor contact in motor connector

NG >> Does not operate normally.
- GO TO 7.

7. CHECK AIR MIX DOOR MOTOR AND INTAKE DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect mode door motor, air mix door motor and intake door motor connector.
3. Reconnect air mix door motor and intake door motor connector.
4. Turn ignition switch ON.
5. Confirm operation of air mix door motor and intake door motor.

OK or NG

OK >> Air mix door motor and intake door motor operate normally.
- Replace mode door motor.

NG >> Air mix door motor and intake door motor does not operate normally.
- GO TO 8.

8. CHECK MODE DOOR MOTOR AND INTAKE DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect air mix door motor connector.
3. Reconnect mode door motor connector.
4. Turn ignition switch ON.
5. Confirm operation of mode door motor and intake door motor.

OK or NG

OK >> Mode door motor and intake door motor operate normally.
- Replace air mix door motor.

NG >> Mode door motor and intake door motor does not operate normally.
- GO TO 9.

9. CHECK MODE DOOR MOTOR AND AIR MIX DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector.
3. Reconnect air mix door motor connector.
4. Turn ignition switch ON.
5. Confirm operation of mode door motor and air mix door motor.

OK or NG

OK >> Mode door motor and air mix door motor operate normally.
- Replace intake door motor.

NG >> Mode door motor and air mix door motor does not operate normally.
- Replace unified meter and A/C amp.

Mode Door Motor Circuit

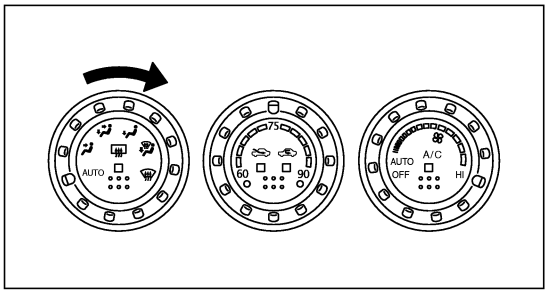
NJS00010

SYMPTOM

- Air outlet does not change.
- Mode door motor does not operate normally.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air

a.Turn mode control dial to each position.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

b. Confirm that discharge air comes out according to the air distribution table at left.
Refer to “Discharge Air Flow” (*1).

- **If OK (symptom cannot be duplicated), perform complete operational check (*2).**
  If NG (symptom is confirmed), continue with STEP-2 following.
- **Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when D/F, D/F2 or DEF is selected.**

2. Check for any service bulletins.

4. Perform self-diagnosis STEP-2. (*4)
- OK → 3. Perform self-diagnosis STEP-1. (*3)
- NG → Go to appropriate malfunctioning sensor circuit. (*9)

OK

5. Perform self-diagnosis STEP-3. (*4)
- NG → Go to DIAGNOSIS PROCEDURE FOR LAN SYSTEM CIRCUIT. (*10)

OK

6. Perform self-diagnosis STEP-4. (*4)
- NG → Check mode door control linkage. (*11)
  - NG → Repair or adjust control linkage.

OK **[Cause cannot be confirmed by self-diagnosis.]**

7. Check ambient sensor circuit. (*5)

OK

8. Check in-vehicle sensor circuit. (*6)

OK

9. Check sunload sensor circuit. (*7)

OK

10. Check intake sensor circuit. (*13)

OK

11. Check air mix door motor PBR circuit. (*8)

OK → If the symptom still exists, perform a complete operational check (*2) and check for other symptoms.
[Refer to symptom table, (*12).]
Dose another symptom exist?
- YES → Go to Trouble Diagnosis for related symptoms. **[Another symptom exists.]**
- NO → Replace unified meter and A/C amp.

INSPECTION END

SJIA1850E

*1 ATC-30, "Discharge Air Flow"
*2 ATC-53, "Operational Check"
*3 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*4 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*5 ATC-92, "Ambient Sensor Circuit"
*6 ATC-94, "In-vehicle Sensor Circuit"
*7 ATC-97, "Sunload Sensor Circuit"
*8 ATC-65, "Air Mix Door Motor PBR Circuit"
*9 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.

*10 ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT"
*11 ATC-116, "MODE DOOR MOTOR"
*12 ATC-34, "SYMPTOM TABLE"
*13 ATC-100, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

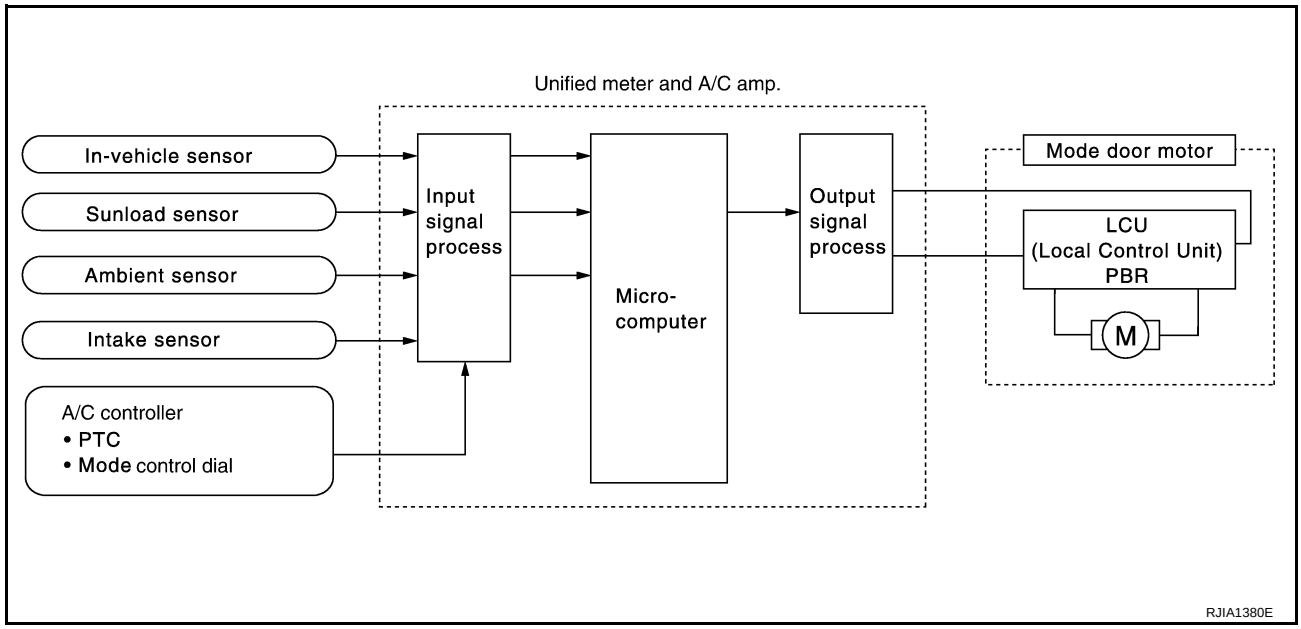
Component Parts

Mode door control system components are:

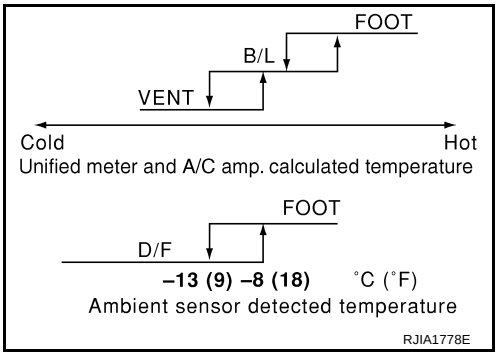
- Unified meter and A/C amp.
- Mode door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.
The air mix door motor, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the unified meter and A/C amp.



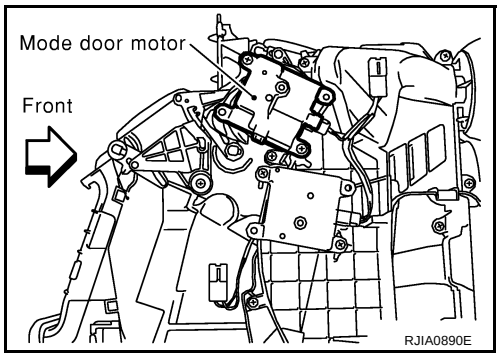
Mode Door Control Specification



COMPONENT DESCRIPTION

Mode Door Motor

The mode door motor is attached to the heater & cooling unit assembly. It rotates so that air is discharged from the outlet set by the unified meter and A/C amp. Motor rotation is conveyed to a link which activates the mode door.



DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR

SYMPTOM: Mode door motor does not operate normally.
Perform diagnosis procedure. Refer to ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Air Mix Door Motor Circuit

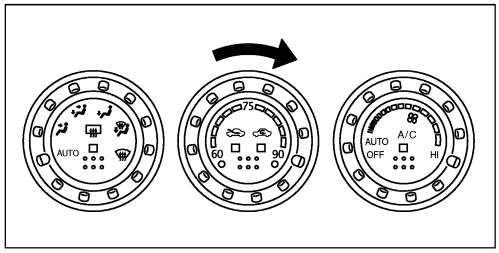
NJS00011

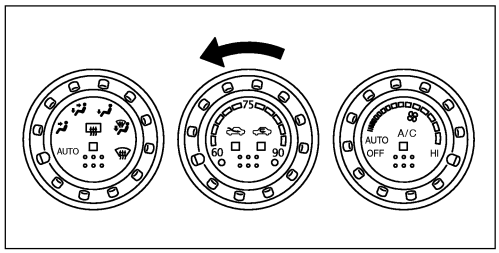
SYMPTOM

- Discharge air temperature does not change.
- Air mix door motor does not operate normally.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.





OPERATIONAL CHECK

Temperature increase

a. Turn temperature control dial clockwise until 32°C (90°F).
b. Check for hot air at discharge air outlets.

Temperature decrease

a. Turn temperature control dial counterclockwise until 18°C (60°F).
b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*9).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*1)
OK
4. Perform self-diagnosis STEP-2. (*12)
NG → Go to appropriate malfunctioning sensor circuit. (*6)
OK
5. Perform self-diagnosis STEP-4. (*12)
OK **[Cause cannot be confirmed by self-diagnosis.]**
6. Check ambient sensor circuit. (*2)
OK
7. Check in-vehicle sensor circuit. (*3)
OK
8. Check sunload sensor circuit. (*4)
OK
9. Check intake sensor circuit. (*11)
OK
10. Check air mix door motor PBR circuit. (*5)
OK
If the symptom still exists, perform a complete operational check (*9) and check for other symptoms. [Refer to symptom table, (*10).] Does another symptom exist?
YES → Go to Trouble Diagnosis for related symptom.
Another symptom exists.
NO
Replace unified meter and A/C amp. → INSPECTION END

NG → Go to LAN system circuit. (*7)
OK
Check air mix door motor. (*8)
NG
Replace air mix door motor.

SJIA1126E

*1 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-92, "Ambient Sensor Circuit"
*3 ATC-94, "In-vehicle Sensor Circuit"
*4 ATC-97, "Sunload Sensor Circuit"
*5 ATC-65, "Air Mix Door Motor PBR Circuit"
*6 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*7 ATC-56, "LAN System Circuit"
*8 ATC-65, "Air Mix Door Motor"
*9 ATC-53, "Operational Check"
*10 ATC-34, "SYMPTOM TABLE"
*11 ATC-100, "Intake Sensor Circuit"
*12 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.

SYSTEM DESCRIPTION

Component Parts

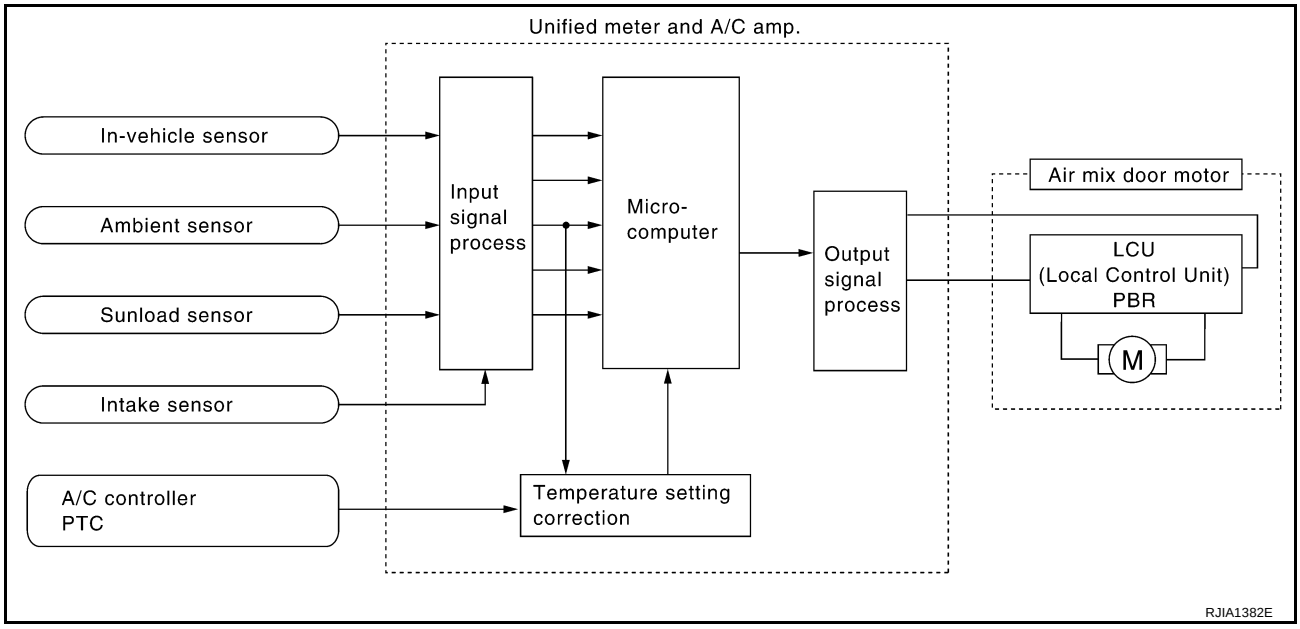
Air mix door control system components are:

- Unified meter and A/C amp.
- Air mix door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

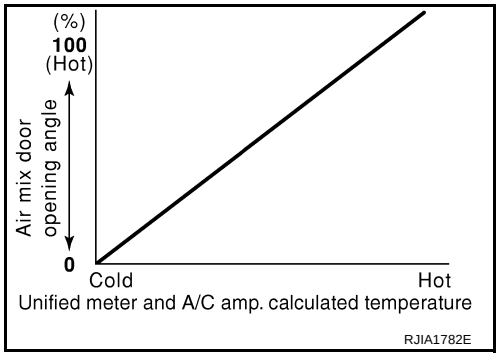
System Operation

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.

The air mix door motor, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the unified meter and A/C amp.



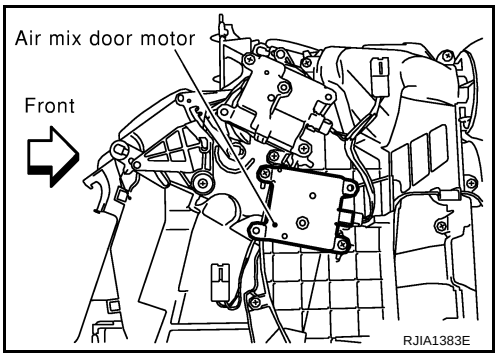
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motor is attached to the heater & cooling unit assembly. It rotates so that the air mix door is opened or closed to a position set by the unified meter and A/C amp. Motor rotation is then sent conveyed through a shaft and the air mix door position feedback is then sent to the unified meter and A/C amp. by PBR built-in air mix door motor.



DIAGNOSIS PROCEDURE FOR AIR MIX DOOR

SYMPTOM: Discharge air temperature does not change.
Perform diagnosis procedure. Refer to ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Air Mix Door Motor PBR Circuit

NJS00012

SYMPTOM

- Discharge air temperature does not change.
- PBR circuit is open or shorted.

DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR PBR

Perform diagnosis procedure. Refer to ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

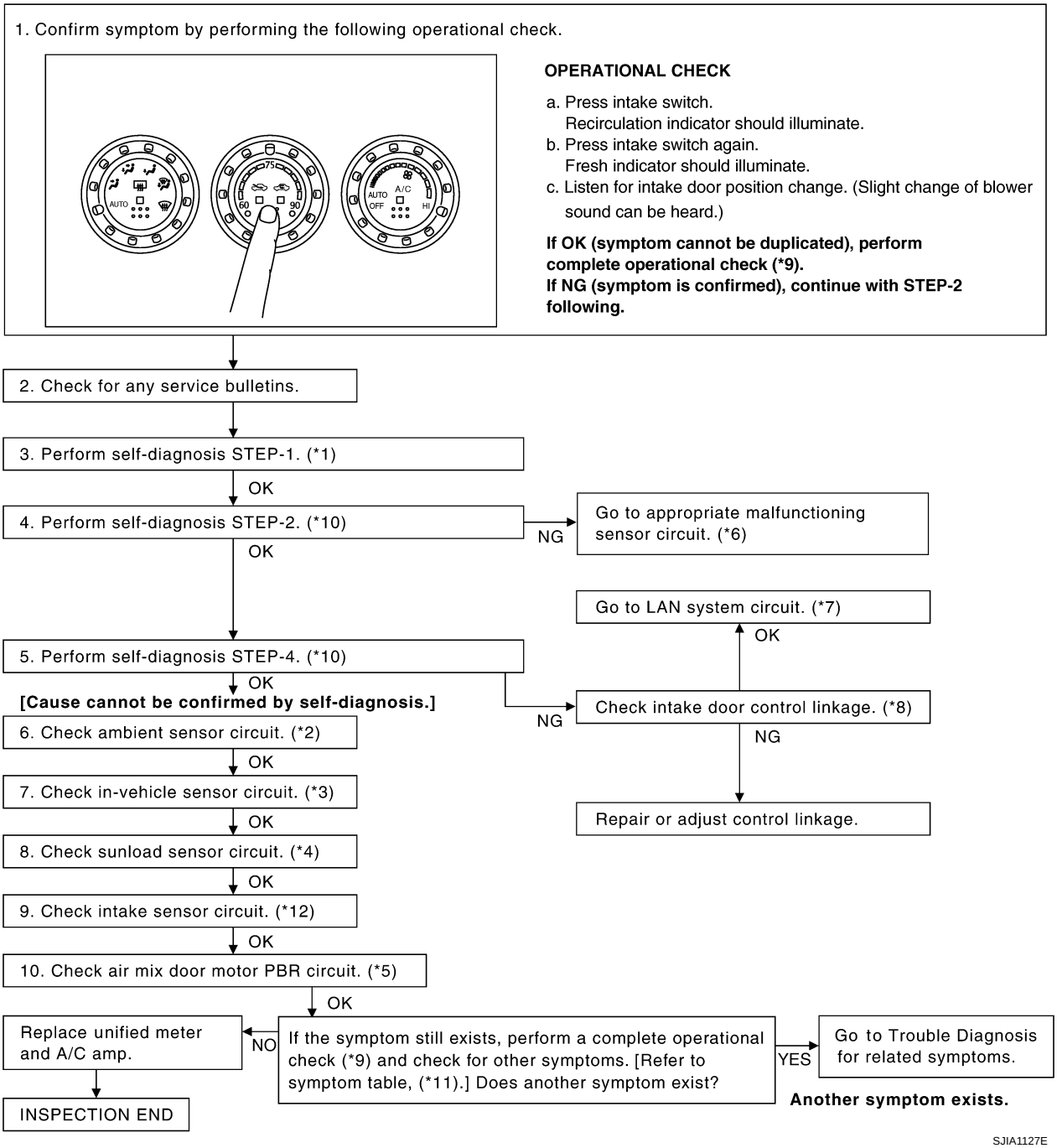
Intake Door Motor Circuit

NJS00013

SYMPTOM

- Intake door does not change.
- Intake door motor does not operate normally.

INSPECTION FLOW



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*1	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2	ATC-92, "Ambient Sensor Circuit"	*3	ATC-94, "In-vehicle Sensor Circuit"
*4	ATC-97, "Sunload Sensor Circuit"	*5	ATC-65, "Air Mix Door Motor PBR Circuit"	*6	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*7	ATC-56, "LAN System Circuit"	*8	ATC-111, "INTAKE DOOR MOTOR"	*9	ATC-53, "Operational Check"
*10	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*11	ATC-34, "SYMPTOM TABLE"	*12	ATC-100, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

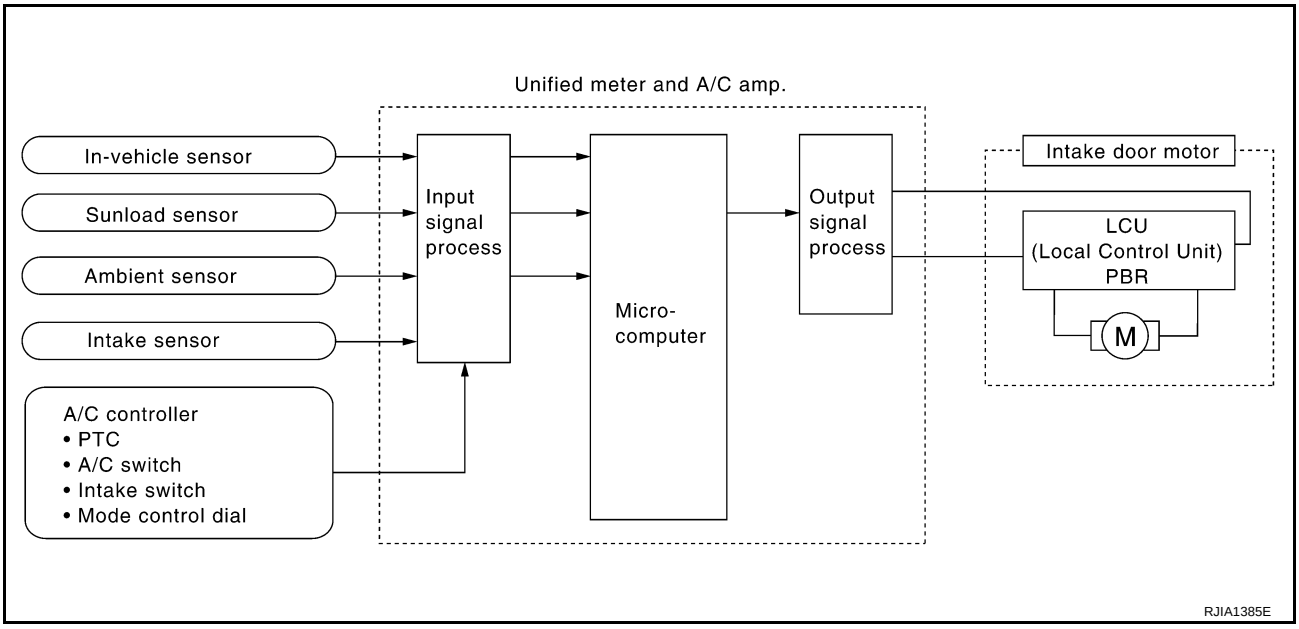
Component Parts

Intake door control system components are:

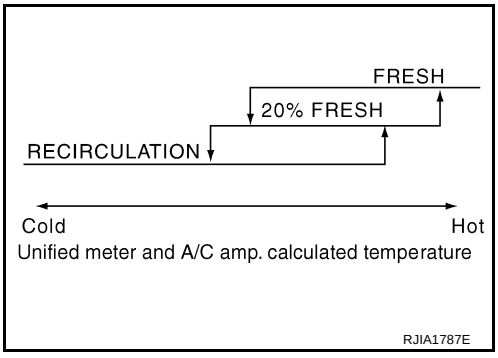
- Unified meter and A/C amp.
- Intake door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The intake door control determines intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When setting mode control dial to D/F, D/F2 or DEF position, fan control dial OFF position, the unified meter and A/C amp. sets the intake door at the FRE position.



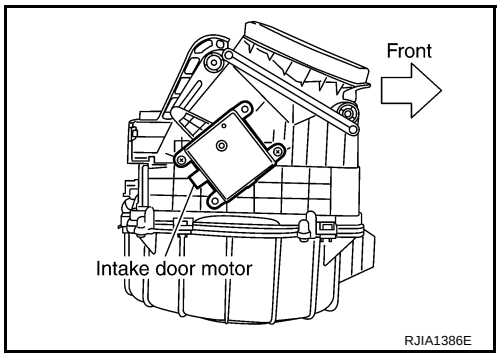
Intake Door Control Specification



COMPONENT DESCRIPTION

Intake Door Motor

The intake door motor is attached to the blower unit. It rotates so that air is drawn from inlets set by the unified meter and A/C amp. Motor rotation is conveyed to a lever which activates the intake door.



DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR

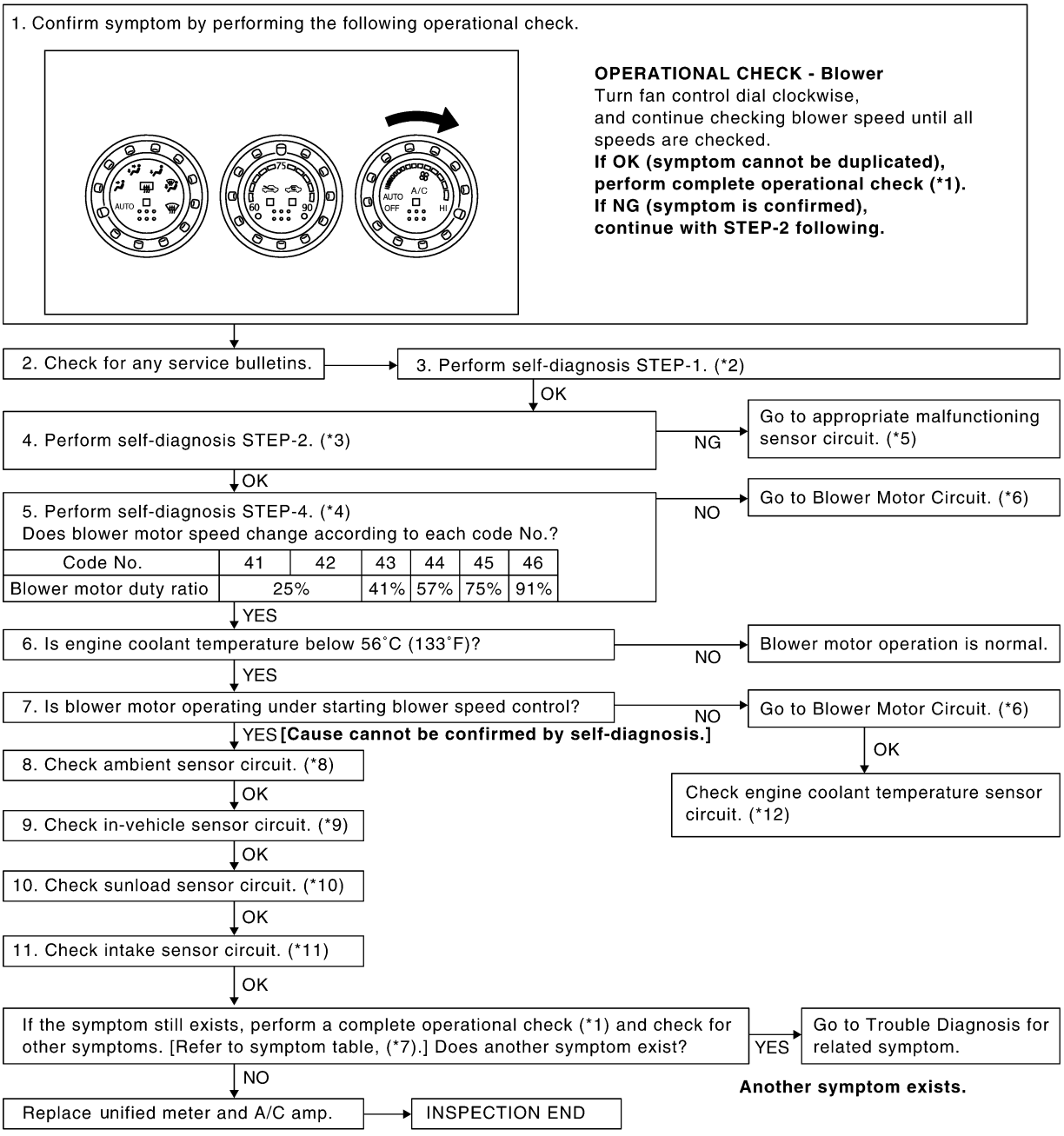
SYMPTOM: Intake door motor does not operate normally.
Perform diagnosis procedure. Refer to ATC-56, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Blower Motor Circuit

NJS00014

SYMPTOM: Blower motor operation is malfunctioning.

INSPECTION FLOW



SJIA1128E

*1	ATC-53, "Operational Check"	*2	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*3	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5.
*4	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 7.	*5	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.	*6	ATC-71, "DIAGNOSIS PROCEDURE FOR BLOWER MOTOR"
*7	ATC-34, "SYMPTOM TABLE"	*8	ATC-92, "Ambient Sensor Circuit"	*9	ATC-94, "In-vehicle Sensor Circuit"
*10	ATC-97, "Sunload Sensor Circuit"	*11	ATC-100, "Intake Sensor Circuit"	*12	EC-223, "DTC P0117, P0118 ECT SENSOR"

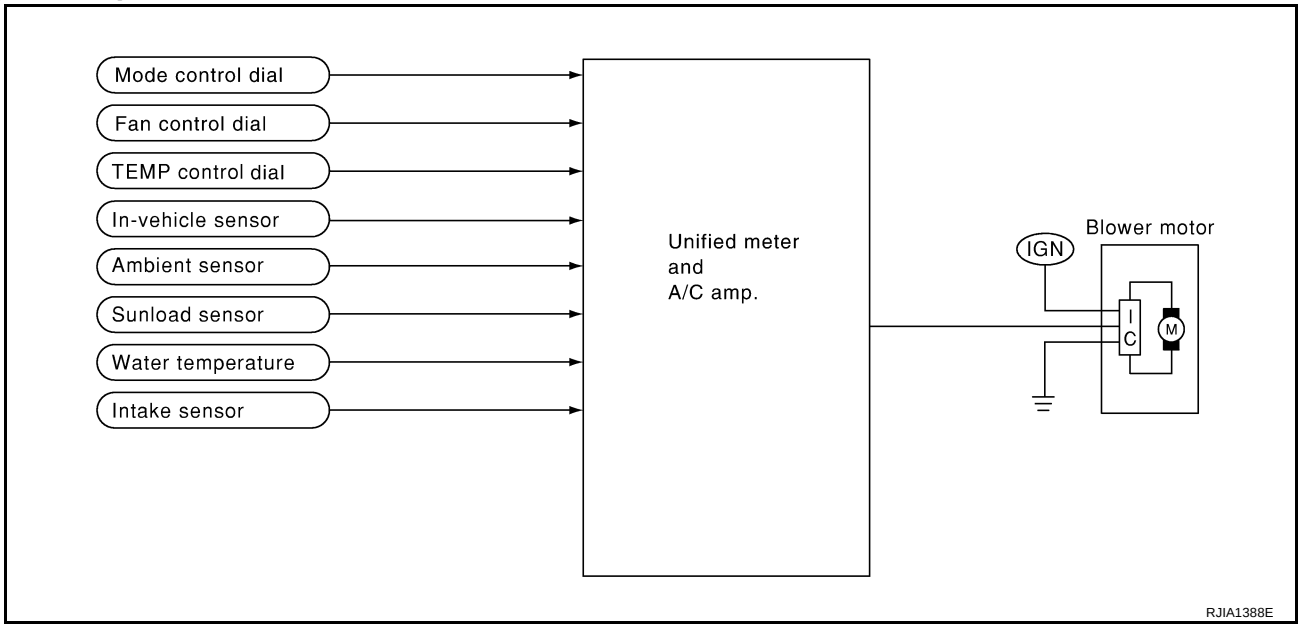
SYSTEM DESCRIPTION

Component Parts

Fan speed control system components are:

- Unified meter and A/C amp.
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation



Automatic Mode

In the automatic mode, the blower motor speed is calculated by the unified meter and A/C amp. based on the input from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor.
When the air flow is increased, the duty ratio of the blower motor's drive signal is changed at 8%/sec. to prevent a sudden increase in air flow.
In addition to manual air flow control and the usual automatic air flow control, starting air flow control, low water temperature starting control and high passenger compartment temperature starting control are available.

Starting Fan Speed Control

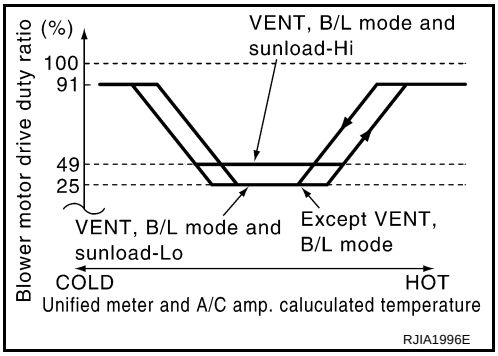
Start up from COLD SOAK Condition (Automatic mode)
In a cold start up condition where the engine coolant temperature is below 56°C (133°F), the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.
In the most extreme case (very low ambient) the blower starting delay will be 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 56°C (133°F), and then the blower speed will increase to the objective speed.
Start up from usual or HOT SOAK Condition (Automatic mode)
The blower will begin operation momentarily after the fan control dial to AUTO position. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

Blower Speed Compensation

Sunload

When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of low or no sunload, the blower speed is at duty ratio 25%. During high sunload conditions, the unified meter and A/C amp. raise the blower speed.(duty ratio 49%).

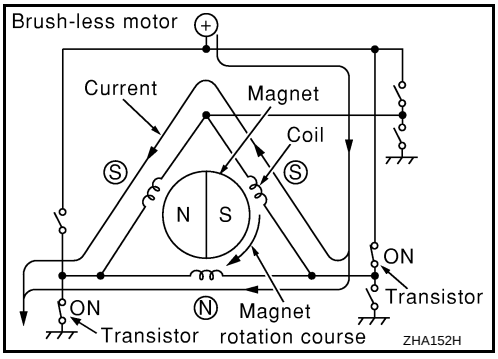
Fan Speed Control Specification



COMPONENT DESCRIPTION

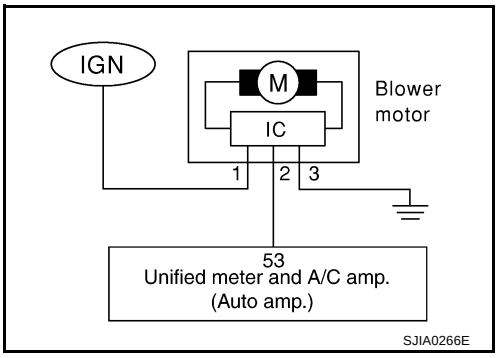
Brush-less Motor

The blower motor utilizes a brush-less motor with a rotating magnet. Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.



DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

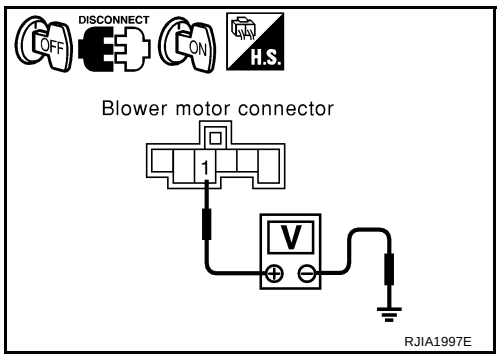
SYMPTOM: Blower motor operation is malfunctioning.



1. CHECK POWER SUPPLY FOR BLOWER MOTOR

1. Disconnect blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between blower motor harness connector M62 terminal 1 and ground.

1 – Ground : Battery voltage



OK or NG

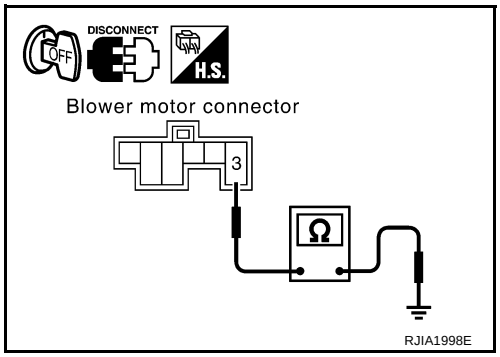
OK >> GO TO 2.
NG >> Check power supply circuit and 15A fuses [Nos. 10 and 11, located in the fuse block (J/B)]. Refer to PG-85, "FUSE BLOCK - JUNCTION BOX (J/B)" .

- If fuse are OK, check harness for open circuit. Repair or replace if necessary.
- If fuse are NG, check harness for short circuit and replace fuse.

2. CHECK GROUND CIRCUIT FOR BLOWER MOTOR

1. Turn ignition switch OFF.
2. Check continuity between blower motor harness connector M62 terminal 3 and ground.

3 – Ground : Continuity should exist.



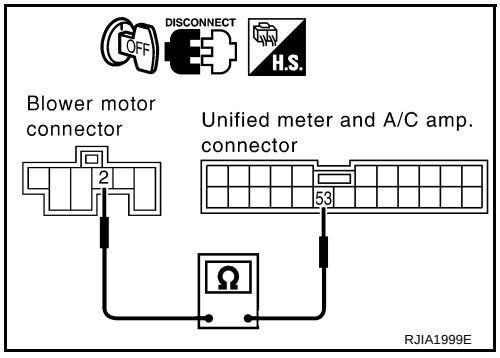
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND UNIFIED METER AND A/C AMP.

1. Disconnect unified meter connector and A/C amp. connector.
2. Check continuity between blower motor harness connector M62 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 53.

2 – 53 : Continuity should exist.

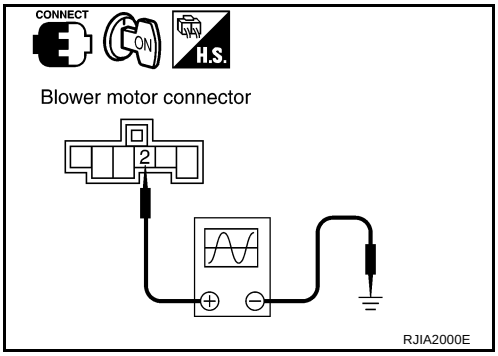


OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Reconnect blower motor connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Change the fan speed from Lo to Hi, and check the duty ratios between blower motor harness connector M62 terminal 2 and ground by using an oscilloscope. Normal terminal 2 drive signal duty ratios are shown in the table below.



Blower fan speed	1st	5th	10th	15th	20th	25th
Blower motor connector M62 Terminal No. 2 (Oscilloscope)	T1 Approx. 1.6 ms	T2 Approx. 1.6 ms	T3 Approx. 1.6 ms	T4 Approx. 1.6 ms	T5 Approx. 1.6 ms	T6 Approx. 1.6 ms
Duty ratio	Approx. 25%	Approx. 37%	Approx. 47%	Approx. 57%	Approx. 71%	Approx. 91%

NOTE: Duty ratio = $\frac{Tx}{\text{Approx. 1.6 ms}}$ x 100 (%)

RJIA1390E

OK or NG

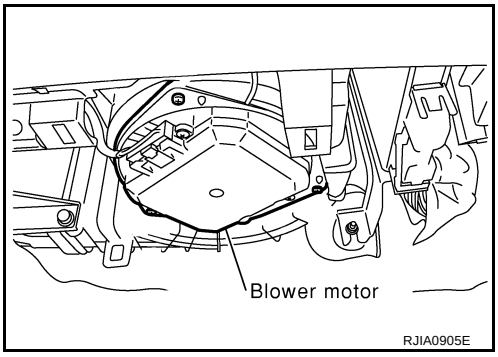
OK >> Replace blower motor after confirming the fan air flow does not change.
NG >> Replace unified meter and A/C amp.

COMPONENT INSPECTION

Blower Motor

Confirm smooth rotation of the blower motor.

- Ensure that there are no foreign particles inside the blower unit.

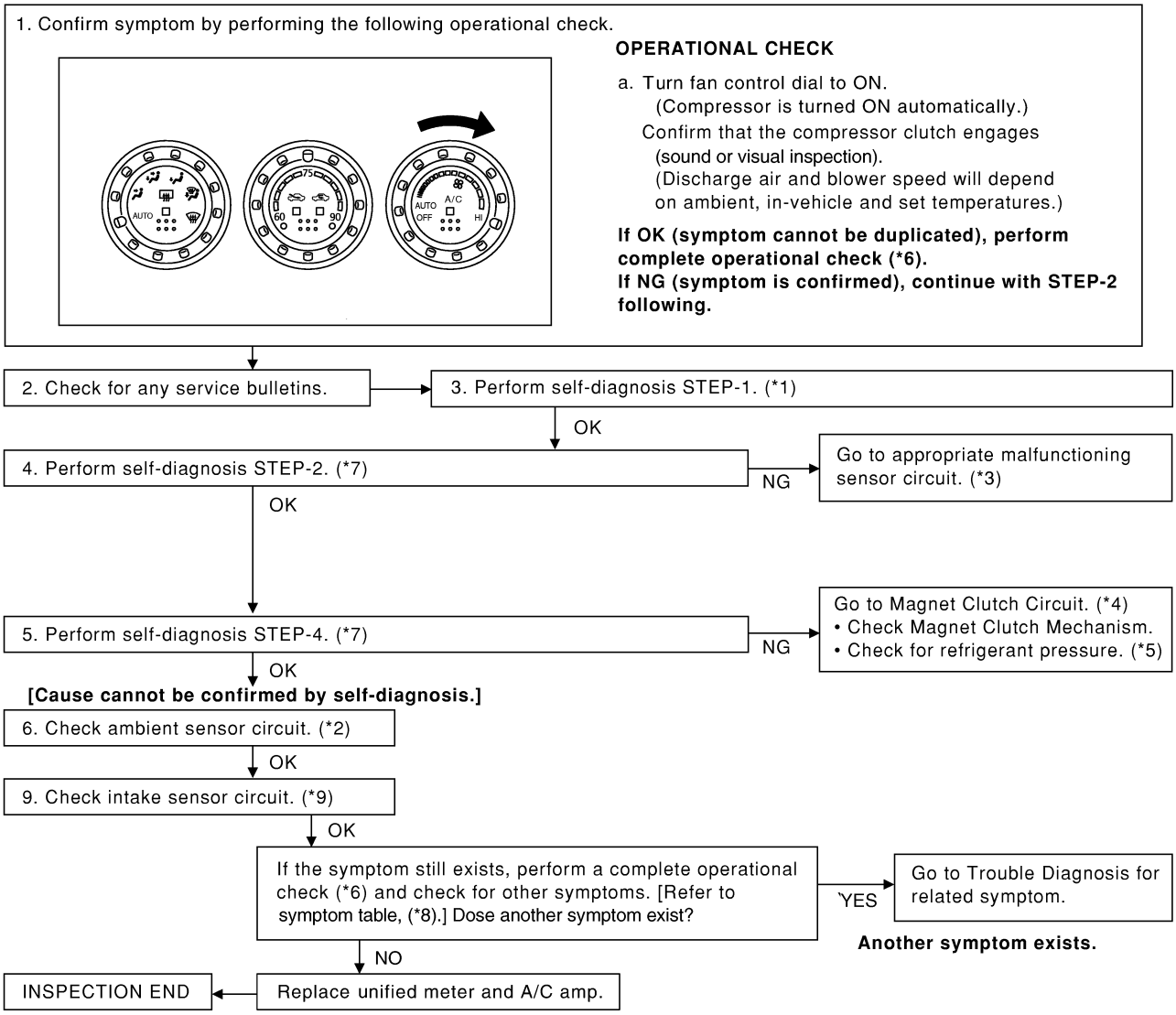


Magnet Clutch Circuit

NJS00015

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW



SJIA1129E

*1 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2 ATC-92, "Ambient Sensor Circuit"	*3 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*4 ATC-75, "DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH"	*5 ATC-86, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"	*6 ATC-53, "Operational Check"
*7 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*8 ATC-34, "SYMPTOM TABLE"	*9 ATC-100, "Intake Sensor Circuit"

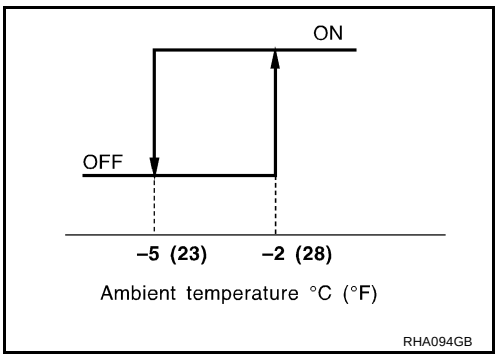
SYSTEM DESCRIPTION

Unified meter and A/C amp. controls compressor operation by ambient temperature, intake air temperature and signal from ECM.

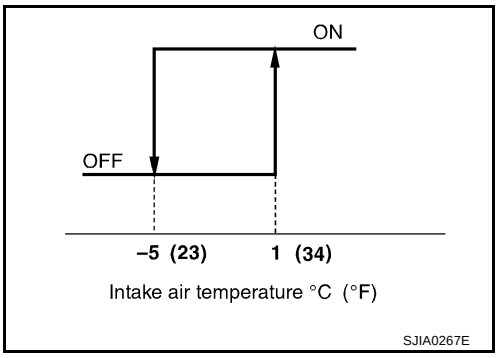
Low Temperature Protection Control

Unified meter and A/C amp. will turn compressor ON or OFF as determined by a signal detected by ambient sensor and intake sensor.

When ambient temperature is higher than –2°C (28°F), the compressor turns ON. The compressor turns OFF when ambient temperature is lower than –5°C (23°F).

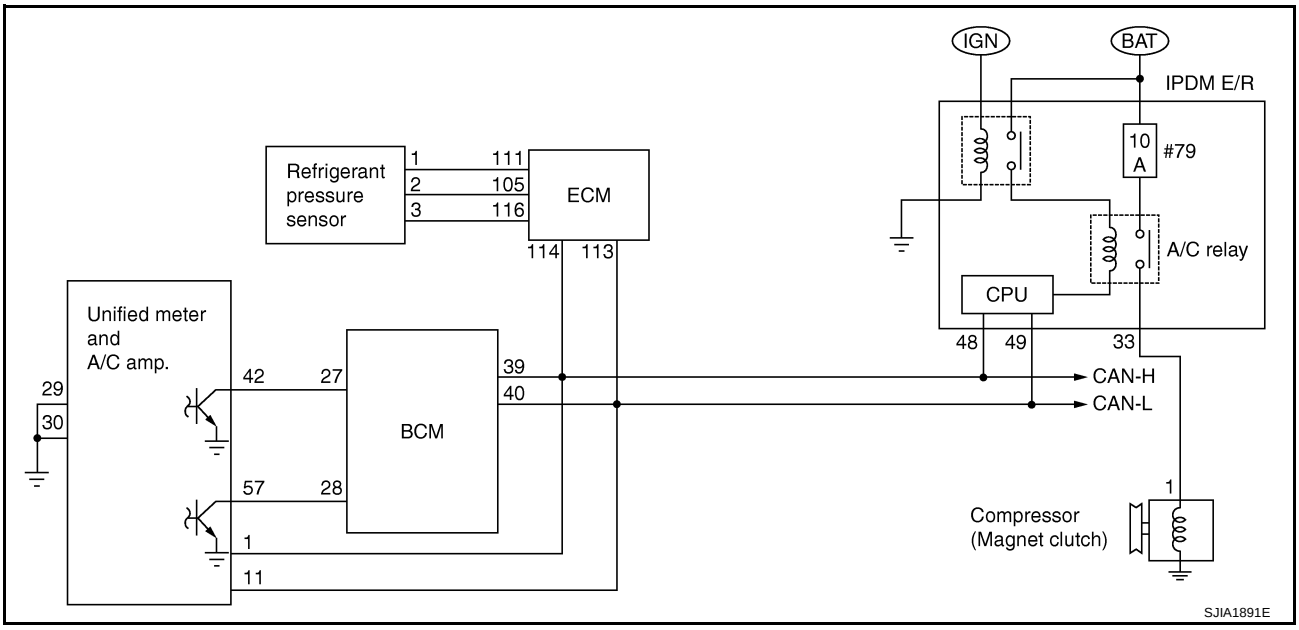


When intake air temperature is higher than 1°C (34°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than –5°C (23°F).



DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. CHECK AMBIENT SENSOR CIRCUIT AND INTAKE SENSOR CIRCUIT

Check ambient sensor and intake sensor. Refer to ATC-46, "FUNCTION CONFIRMATION PROCEDURE" , see No. 9.

OK or NG

OK >> GO TO 2.

NG >>
- Malfunctioning ambient sensor: Refer to ATC-92, "Ambient Sensor Circuit" .
- Malfunctioning intake sensor: Refer to ATC-100, "Intake Sensor Circuit" .

2. PERFORM AUTO ACTIVE TEST

Refer to PG-20, "Auto Active Test" .

Dose the magnet clutch operate?

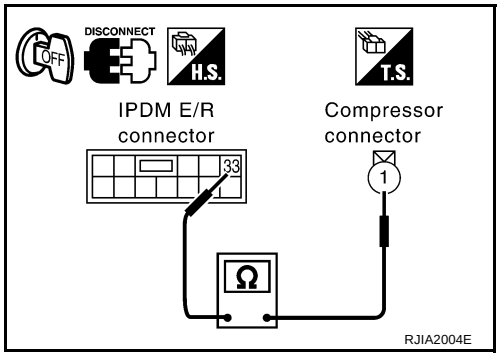
YES >>
- WITH CONSULT-III: GO TO 5.
- WITHOUT CONSULT-III: GO TO 6.

NO >> Check 10A fuse (No. 79, located in IPDM E/R), and GO TO 3. Refer to PG-23, "IPDM E/R Terminal Arrangement" .

3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor connector.
3. Check continuity between IPDM E/R harness connector E8 terminal 33 and compressor harness connector F24 terminal 1.

33 – 1 : Continuity should exist.



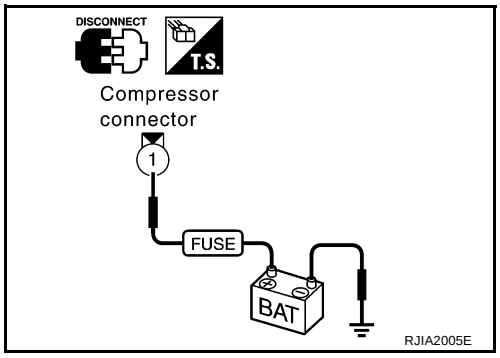
OK or NG

OK >> GO TO 4.

NG >> Repair harness or connector.

4. CHECK MAGNET CLUTCH CIRCUIT

Check for operation sound when applying battery voltage direct current to terminal.



OK or NG

OK >> 1. Replace IPDM E/R.
2. Go to self-diagnosis procedure ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and preform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.

NG >> 1. Replace magnet clutch.
2. Go to self-diagnosis procedure ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and preform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.

5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to ATC-33, "CONSULT-III Function (BCM)" .

A/C SW ON : AIR COND SIG ON

A/C SW OFF : AIR COND SIG OFF

OK or NG

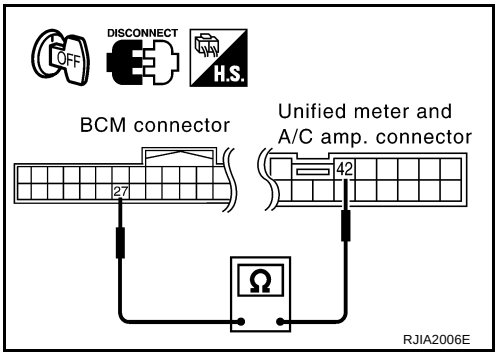
OK >> GO TO 8.

NG >> GO TO 6.

6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M90 terminal 27 and unified meter and A/C amp. harness connector M50 terminal 42.

27 – 42 : Continuity should exist.

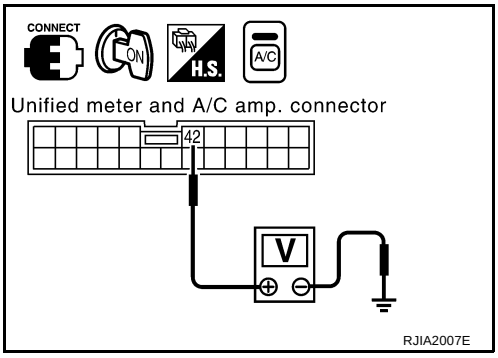


OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M50 terminal 42 and ground.



Terminals			Condition	Voltage
(+)		(–)		
Unified meter and A/C amp. connector	Terminal No.			
M50	42	Ground	A/C switch: ON (Blower motor operates.)	Approx. 0 V
			A/C switch: OFF	Approx. 5 V

OK or NG

OK >> GO TO 8.
NG-1 >> If the voltage is approx. 5 V when A/C switch is ON: Replace unified meter and A/C amp.
NG-2 >> If the voltage is approx. 0 V when A/C switch is OFF: Replace BCM.

8. CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-III

1. Start the engine.
2. Check voltage of refrigerant pressure sensor. Refer to EC-127, "CONSULT-III Reference Value in Data Monitor" .

WITHOUT CONSULT-III

1. Start the engine.
2. Check voltage between ECM harness connector M71 terminal 105 and ground.

Terminals			Condition	Voltage
(+)		(–)		
ECM connector	Terminal No.			
M71	105	Ground	A/C switch: ON (Blower motor operates.)	Approx. 1.0 - 4.0 V

OK or NG

OK >> ● WITH CONSULT-III: GO TO 9.
● WITHOUT CONSULT-III: GO TO 10.

NG >> Refer to EC-710, "REFRIGERANT PRESSURE SENSOR" .

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to ATC-33, "CONSULT-III Function (BCM)" .

FAN SW ON : HEATER FAN SW ON
FAN SW OFF : HEATER FAN SW OFF

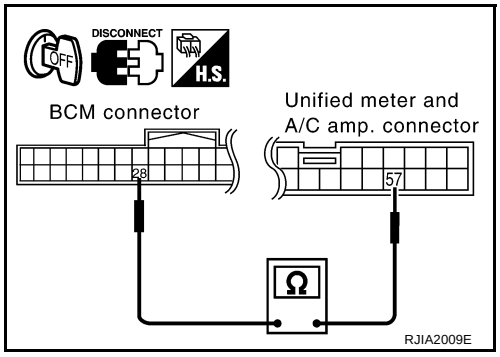
OK or NG

OK >> GO TO 12.
NG >> GO TO 10.

10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M90 terminal 28 and unified meter and A/C amp. harness connector M50 terminal 57.

28 – 57 : Continuity should exist.

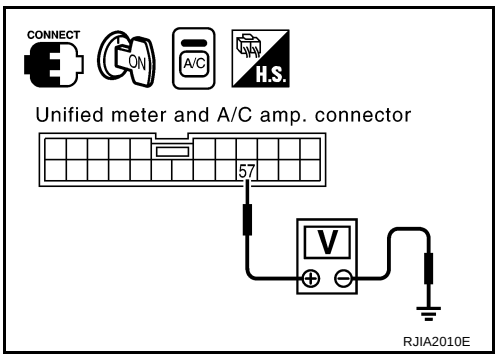


OK or NG

OK >> GO TO 11.
NG >> Repair harness or connector.

11. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (FAN ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M50 terminal 57 and ground.



Terminals			Condition	Voltage
(+)		(–)		
Unified meter and A/C amp. connector	Terminal No.			
M50	57	Ground	Fan control dial: ON (Blower motor operates.)	Approx. 0 V
			Fan control dial: OFF	Approx. 5 V

OK or NG

OK >> GO TO 12.
NG-1 >> If the voltage is approx. 5 V when blower motor is ON: Replace unified meter and A/C amp.
NG-2 >> If the voltage is approx. 0 V when blower motor is OFF: Replace BCM.

12. CHECK CAN COMMUNICATION

Check CAN communication. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

- BCM – ECM
- ECM – IPDM E/R
- ECM – Unified meter and A/C amp.

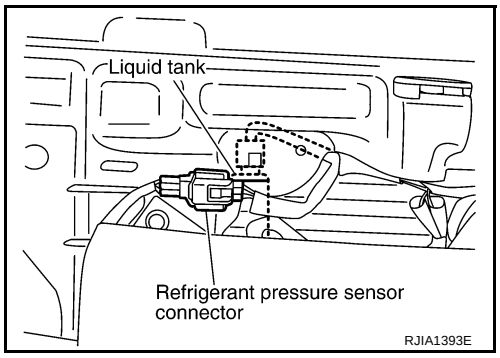
OK or NG

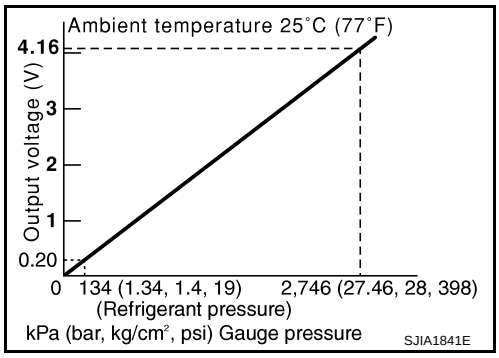
OK >> Replace ECM.
NG >> Repair or replace malfunctioning part(s).

COMPONENT INSPECTION

Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the liquid tank.
Make sure that the A/C refrigerant pressure and the sensor output voltage are within the specified range as shown in the A/C operating condition figure. Refer to EC-710, "REFRIGERANT PRESSURE SENSOR" .





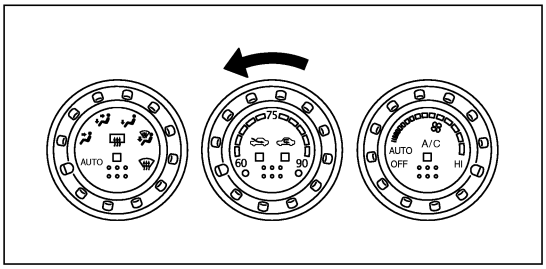
Insufficient Cooling

NJS00016

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature decrease

a. Turn temperature control dial counterclockwise until 18°C (60°F).

b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)

OK

4. Perform self-diagnosis STEP-2. (*11)

NG → Go to appropriate malfunctioning sensor circuit. (*5)

OK

5. Perform self-diagnosis STEP-4. (*11)

NG → **Go to appropriate malfunctioning items.**
- Check LAN system circuit. (*6)
- Check blower motor circuit. (*7)
- Check magnet clutch circuit. (*8)

OK

6. Check compressor belt tension. Refer to (*13), “Checking Drive Belts”.

NG → Adjust or replace compressor belt.

OK

7. Check air mix door operation. (*2)

NG → Replace air mix door motor.

OK

8. Check cooling fan motor operation.

NG → Refer to (*14), “System Description”.

OK

9. Before connectiong Recovery / Recycling Recharging equipment to vehicle, check Recovery / Recycling Recharging equipment gauges.
No refrigerant pressure should be displayed.
If NG, recover refrigerant from equipment lines.

OK

10. Confirm refrigerant purity in supply tank using Recovery / Recycling Recharging equipment with refrigerant identifire.

NG → Refer to Contaminated refrigerant. (*12)

OK

11. Connect Recovery / Recycling Recharging equipment to vehicle. Confirm refrigerant purity in vehicle A/C system using Recovery / Recycling Recharging equipment with refrigerant identifire.

NG

OK

12. Check for evaporator core freeze up.

NG (Freeze up.) → Perform performance test diagnosis. Refer to (*9)

(Does not freeze up.)

OK

13. Check refrigeration cycle pressure with manifold gauge connected. Refer to (*3).

NG

OK

14. Check ducts for air leaks.

NG → Replair air leaks.

OK

15. Perform temperature setting trimmer. (*4)
(1) Set up AUXILIARY MECHANISM mode in self-diagnosis.
(2) Turn temperature dial counterclockwise as desired.

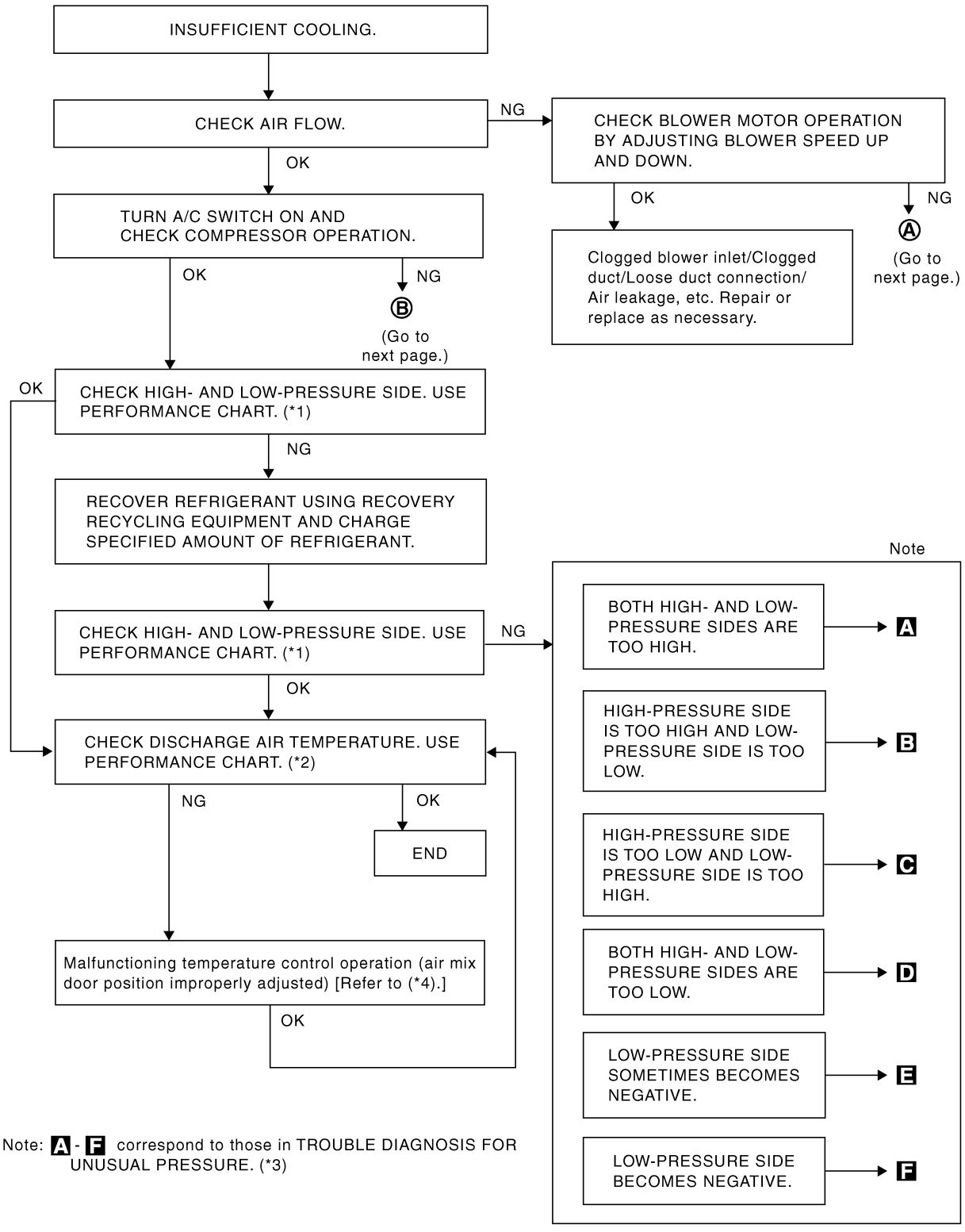
OK

INSPECTION END

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*1	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2	ATC-63, "Air Mix Door Motor Circuit"	*3	ATC-85, "Test Reading"
*4	ATC-50, "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"	*5	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.	*6	ATC-56, "LAN System Circuit"
*7	ATC-69, "Blower Motor Circuit"	*8	ATC-74, "Magnet Clutch Circuit"	*9	ATC-83, "PERFORMANCE TEST DIAGNOSIS"
*10	ATC-53, "Operational Check"	*11	ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*12	ATC-5, "CONTAMINATED REFRIGERANT"
*13	EM-12, "Checking Drive Belts"	*14	EC-543, "SYSTEM DESCRIPTION"		

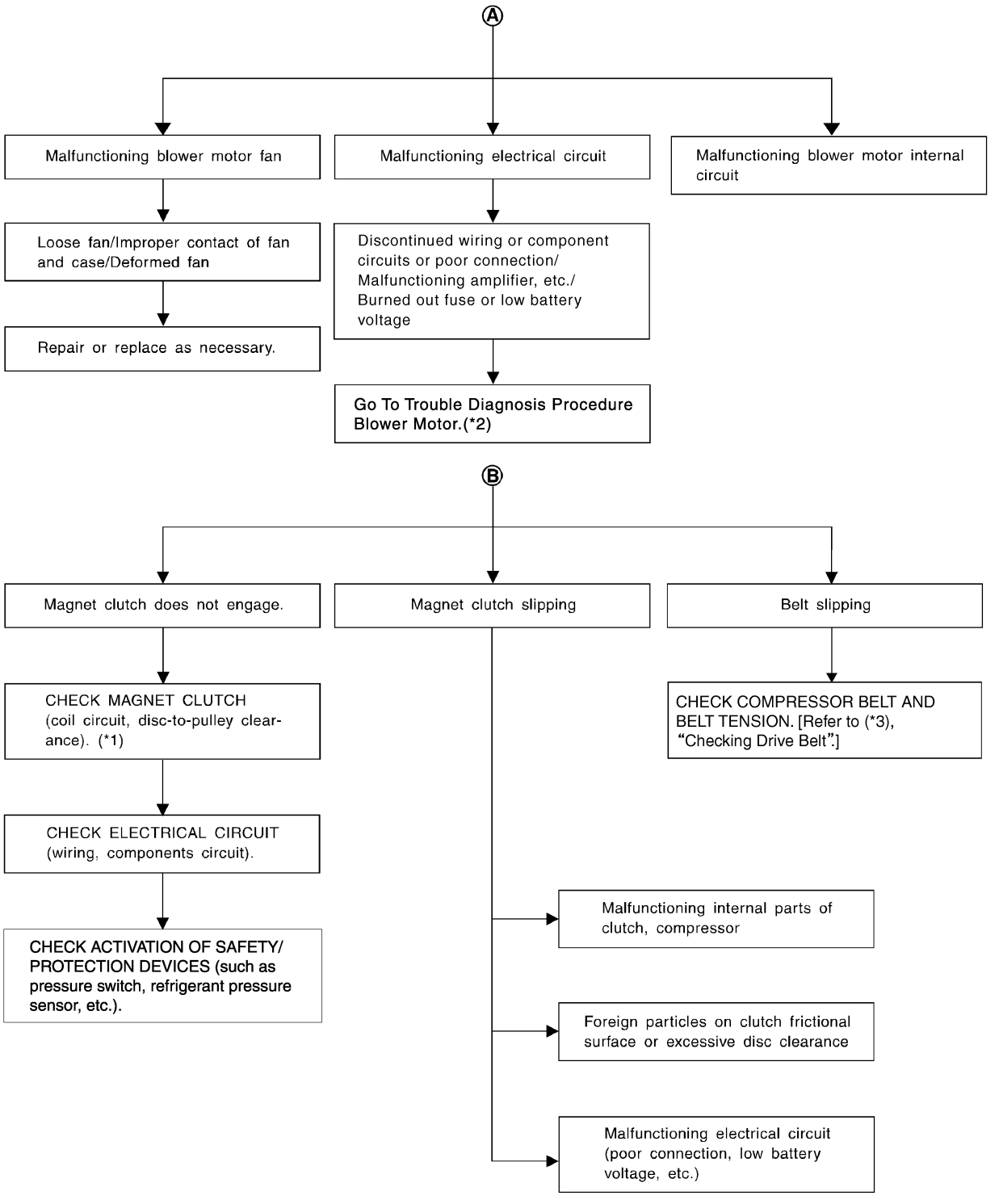
PERFORMANCE TEST DIAGNOSIS



SJIA1226E

*1 ATC-85, "PERFORMANCE CHART" *2 ATC-85, "PERFORMANCE CHART" *3 ATC-86, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"

*4 ATC-63, "Air Mix Door Motor Circuit"



SJIA1642E

*1 ATC-125, "Removal and Installation of Compressor" *2 ATC-69, "Blower Motor Circuit" *3 EM-12, "Checking Drive Belts"

PERFORMANCE CHART

Test Condition

Testing must be performed as follows:

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door windows	Open
Hood	Open
TEMP.	Max. COLD
Mode control dial	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

Test Reading

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	6.1 - 8.7 (43 - 48)
	25 (77)	8.5 - 11.5 (47 - 53)
60 - 70	20 (68)	8.7 - 11.1 (48 - 52)
	25 (77)	11.5 - 14.5 (53 - 58)

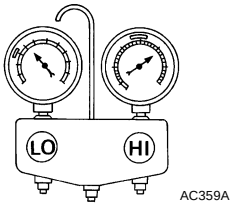
Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm^2 , psi)	Low-pressure (Suction side) kPa (kg/cm^2 , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	850 - 1,050 (8.67 - 10.71, 123.3 - 152.3)	180 - 230 (1.84 - 2.35, 26.1 - 33.4)
	25 (77)	1,020 - 1,260 (10.40 - 12.85, 147.9 - 182.7)	190 - 240 (1.94 - 2.45, 27.6 - 34.8)
	30 (86)	1,150 - 1,410 (11.73 - 14.38, 166.8 - 204.5)	210 - 250 (2.14 - 2.55, 30.5 - 36.3)
	35 (95)	1,240 - 1,510 (12.65 - 15.40, 179.8 - 219.0)	220 - 270 (2.24 - 2.75, 31.9 - 39.2)

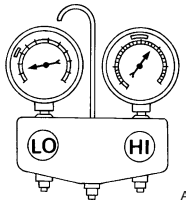
TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

Whenever system's high and/or low side pressure(s) is/are unusual, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table).

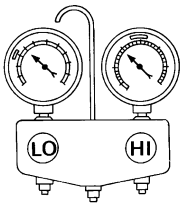
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	● Clean condenser. ● Check and repair cooling fan as necessary.
	● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2 , 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	● An area of the low-pressure pipe is colder than areas near the evaporator outlet. ● Low-pressure pipe is sometimes covered with frost.	● Excessive liquid refrigerant on low-pressure side. ● Excessive refrigerant discharge flow. ● Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment.	Replace expansion valve.

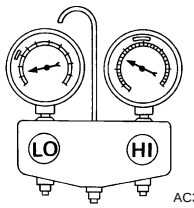
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	● Check and repair or replace malfunctioning parts. ● Check lubricant for contamination.

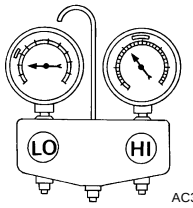
High-pressure Side is Too Low and Low-pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC356A	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

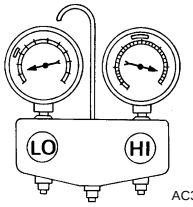
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	● There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. ● Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	● Replace liquid tank. ● Check lubricant for contamination.
	● Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. ● Expansion valve inlet is frosted. ● Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Expansion valve and liquid tank are warm or slightly cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant for leaks. Refer to ATC-138, "Checking for Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	● Remove foreign particles by using compressed air. ● Replace expansion valve. ● Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	● Check intake sensor circuit. Refer to ATC-100, "Intake Sensor Circuit" . ● Replace compressor. ● Repair evaporator fins. ● Replace evaporator. ● Refer to ATC-69, "Blower Motor Circuit" .

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	● Air conditioning system does not function and does not cyclically cool the compartment air. ● The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative.  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or wet with dew.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles. ● If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. ● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). ● If either of the above methods cannot correct the malfunction, replace expansion valve. ● Replace liquid tank. ● Check lubricant for contamination.

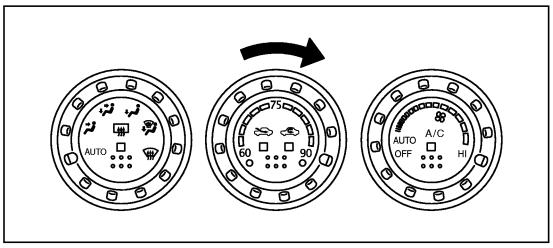
Insufficient Heating

NJS00017

SYMPTOM: Insufficient heating

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature increase

a. Turn temperature control dial clockwise until 32˚C (90˚F) .

b. Check for hot air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*1).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*2)

OK

4. Perform self-diagnosis STEP-2. (*3)

NG: Go to appropriate malfunctioning sensor circuit. (*5)

OK

5. Perform self-diagnosis STEP-4. (*3)

NG: **Go to appropriate malfunctioning items.**
- Check LAN system circuit. (*6)
- Check blower motor circuit. (*7)

OK

6. Check the following:
- Engine coolant level [Refer to (*10), “Changing Engine Coolant”.]
- Hoses for leaks or kinks.
- Radiator cap. [Refer to (*11), “Checking Radiator cap”.]
- Air in cooling system.

NG: Repair/replace as necessary.

OK

7. Check air mix door operation. Refer to (*4).

NG: Go to Air Mix Door Motor Circuit. (*8)

OK

8. Check ducts for air leaks.

NG: Repair leaks.

OK

9. Check the heater inlet and outlet hose temperatures by touching.

Hot inlet
Warm outlet

Check engine coolant temperature sensor (*9).

NG

Check heater hoses for proper installation.

NG: Repair or replace as necessary. Retest.

OK

Both hoses warm

OK

Back flush heater core, drain and refill coolant.
[Refer to (*10), “Changing Engine Coolant”.] Retest.

Hot inlet
Warm outlet

System OK

Both hoses warm

Replace heater core. Refill engine coolant.
[Refer to (*10), “Changing Engine Coolant”.] Retest.

Hot inlet
Warm outlet

SJIA1131E

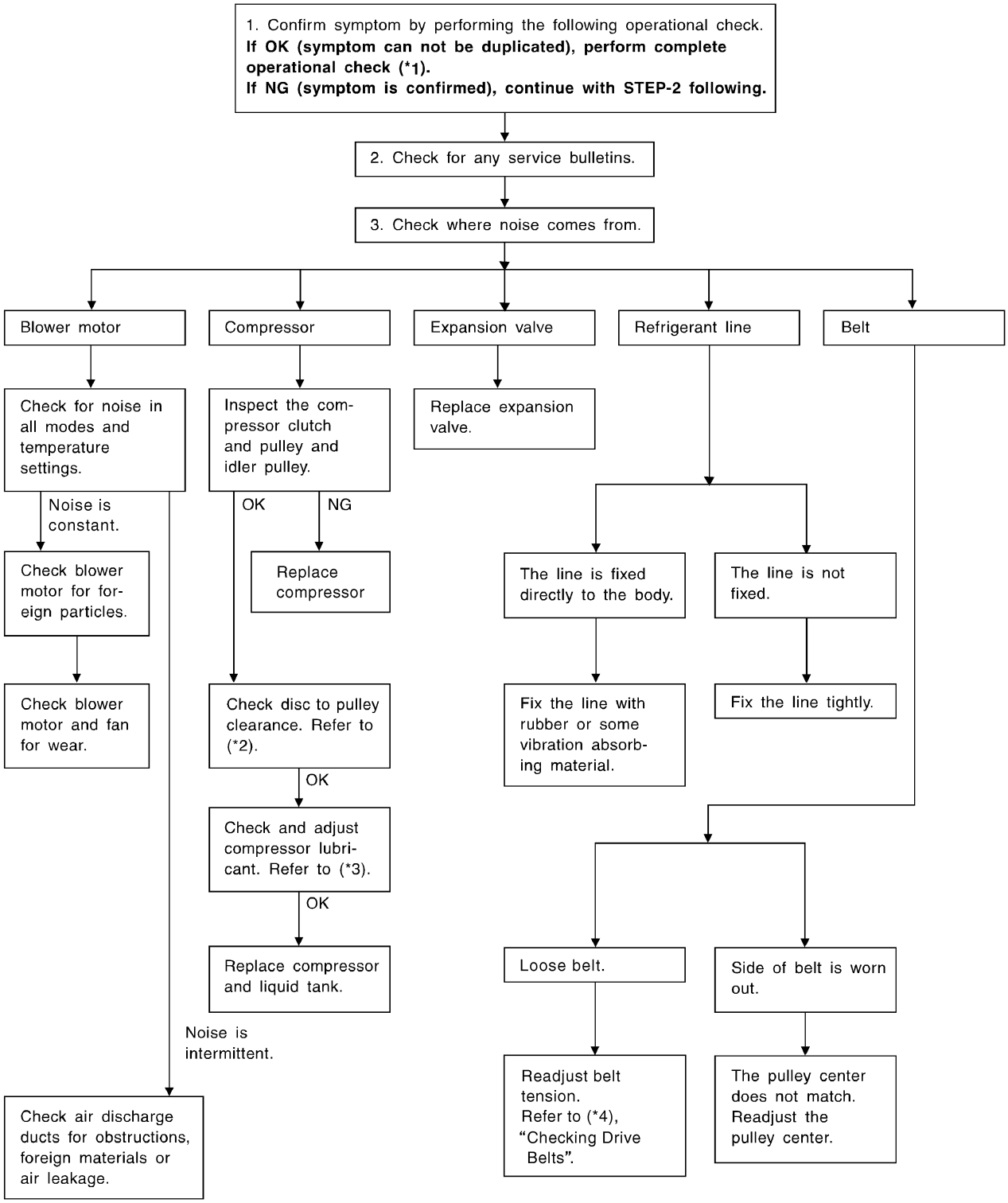
*1 ATC-53, "Operational Check"
*2 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*3 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*4 ATC-63, "Air Mix Door Motor Circuit"
*5 ATC-46, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*6 ATC-56, "LAN System Circuit"
*7 ATC-69, "Blower Motor Circuit"
*8 ATC-63, "Air Mix Door Motor Circuit"
*9 EC-223, "DTC P0117, P0118 ECT SENSOR"
*10 CO-10, "Changing Engine Coolant"
*11 CO-15, "Checking Radiator Cap"

Noise

NJS00018

SYMPTOM: Noise

INSPECTION FLOW



SJIA0843E

*1 ATC-53, "Operational Check"

*2 ATC-126, "Check Disc to Pulley Clearance"

*3 ATC-21, "Maintenance of Lubricant Quantity in Compressor"

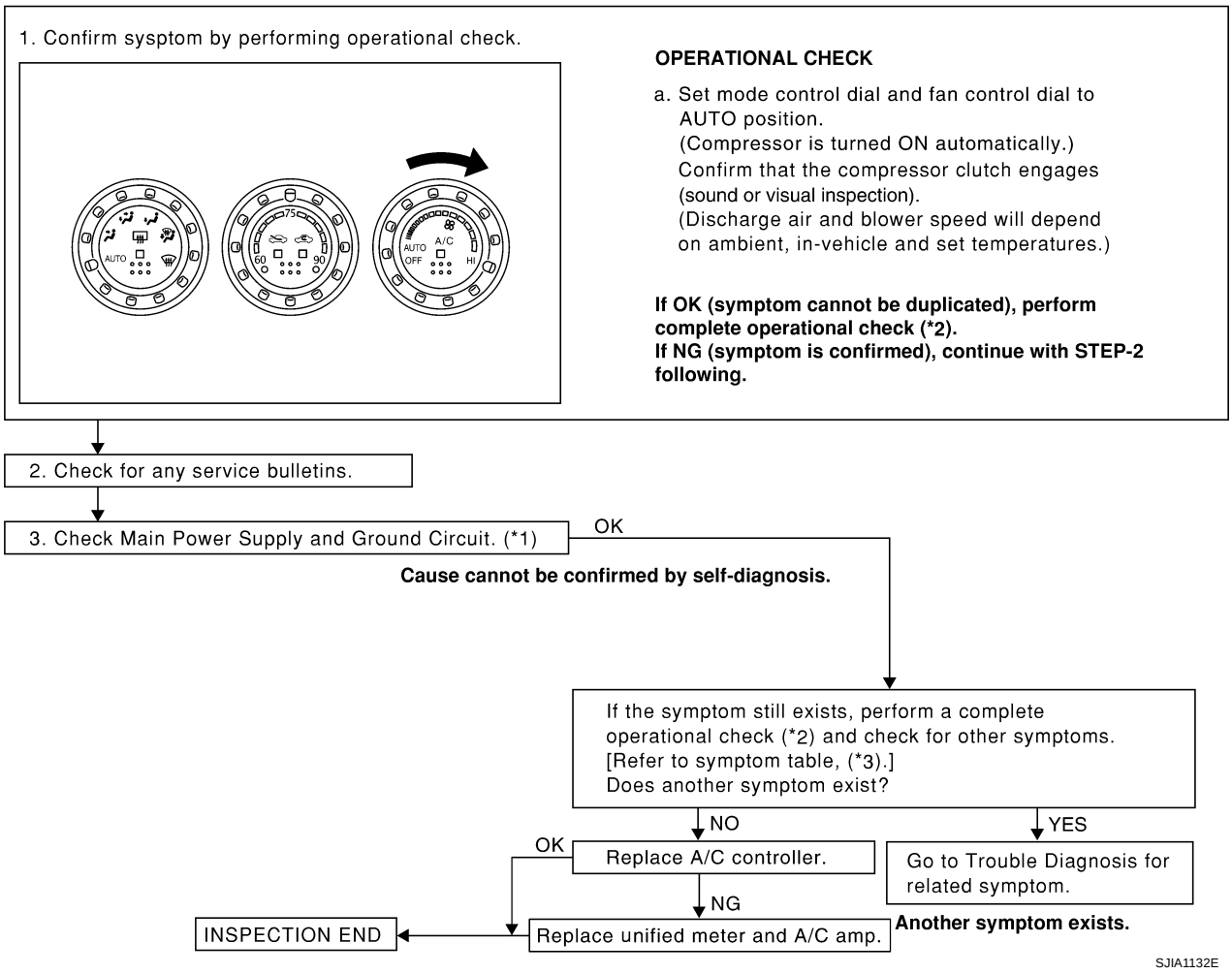
*4 EM-12, "Checking Drive Belts"

Self-diagnosis

NJS00019

SYMPTOM: Self-diagnosis cannot be performed.

INSPECTION FLOW



*1 ATC-54, "Power Supply and Ground Circuit for Auto Amp." *2 ATC-53, "Operational Check" *3 ATC-34, "SYMPTOM TABLE"

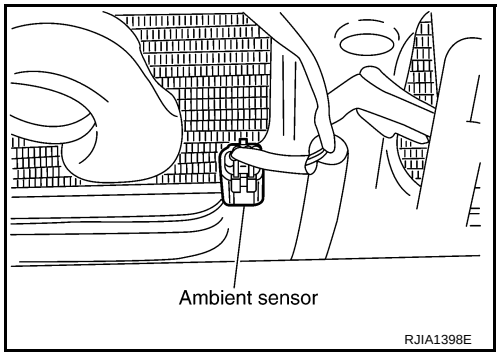
Ambient Sensor Circuit

NJS0001A

COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor is attached on the hood lock stay. It detects ambient temperature and converts it into a resistance value which is then input into the unified meter and A/C amp.



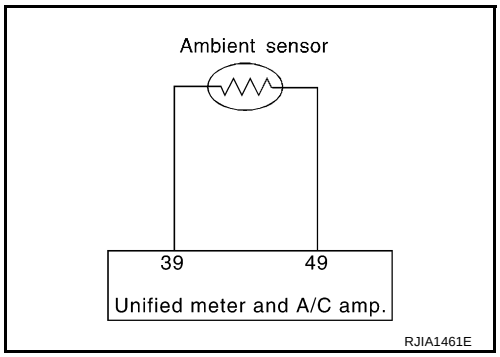
AMBIENT TEMPERATURE INPUT PROCESS

The unified meter and A/C amp. includes a processing circuit for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the unified meter and A/C amp. function. It only allows the unified meter and A/C amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds.

As an example, consider stopping for a few minutes after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front bumper area, location of the ambient sensor.

DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR

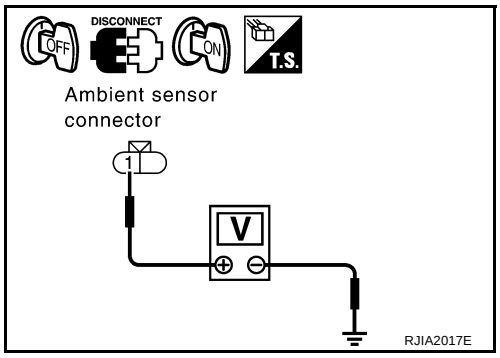
SYMPTOM: Ambient sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E34 terminal 1 and ground.

1 – Ground : Approx. 5 V



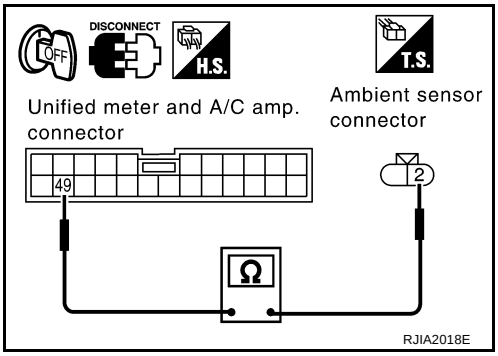
OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 49.

2 – 49 : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK AMBIENT SENSOR

Refer to ATC-94, "Ambient Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace ambient sensor.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

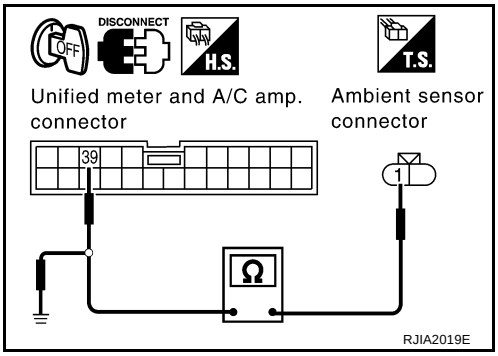
4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 39.

1 – 39 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E34 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

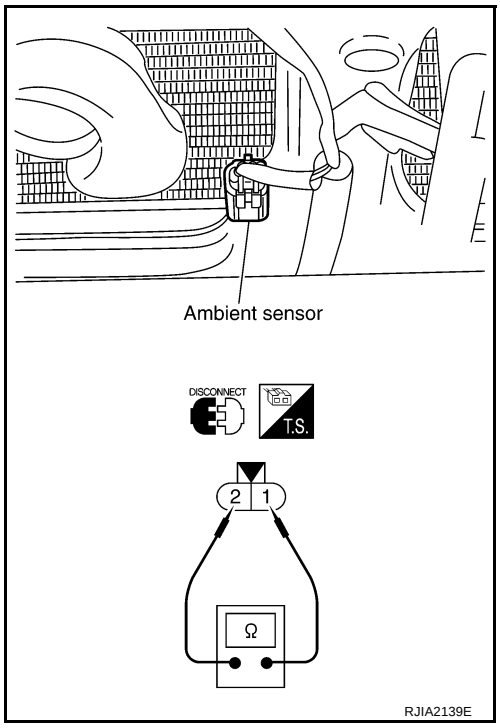
NG >> Repair harness or connector.

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor connector E34, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



If NG, replace ambient sensor.

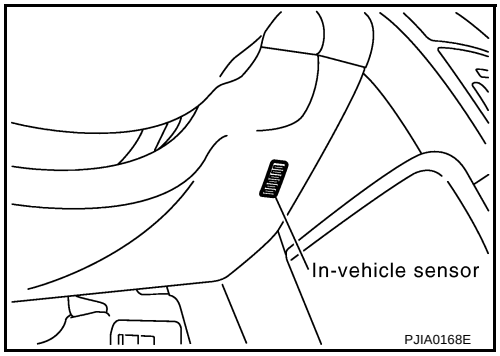
In-vehicle Sensor Circuit

NJS0001B

COMPONENT DESCRIPTION

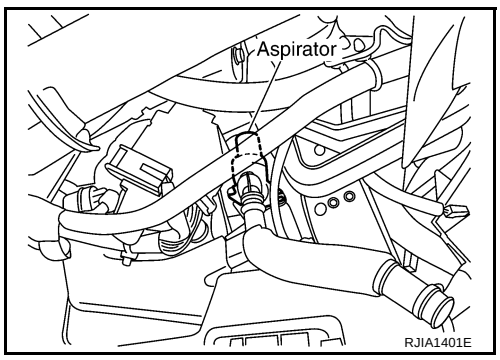
In-vehicle Sensor

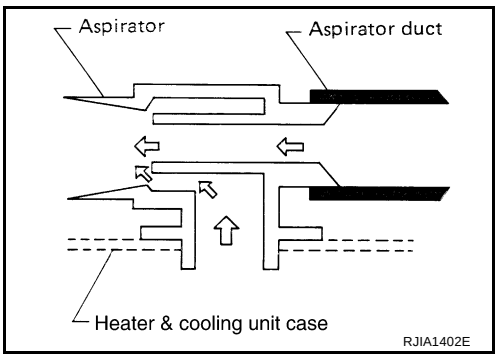
The in-vehicle sensor is located on instrument driver panel lower. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the unified meter and A/C amp.



Aspirator

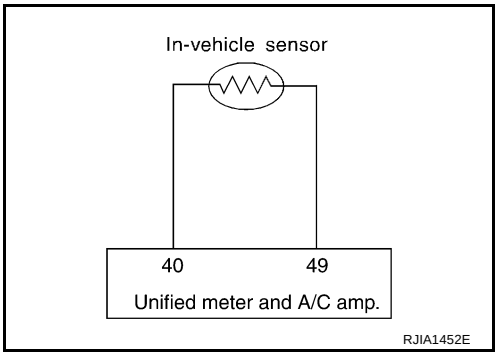
The aspirator is located on driver's side of heater & cooling unit assembly. It produces vacuum pressure due to air discharged from the heater & cooling unit assembly, continuously taking compartment air in the aspirator.





DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



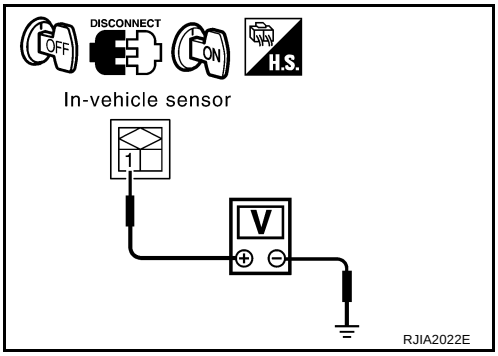
1. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector M42 terminal 1 and ground.

1 – Ground : Approx. 5 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.



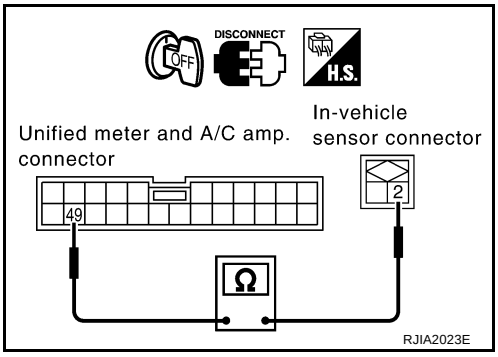
2. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 49.

2 – 49 : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. CHECK IN-VEHICLE SENSOR

Refer to ATC-96, "In-vehicle Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace in-vehicle sensor.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

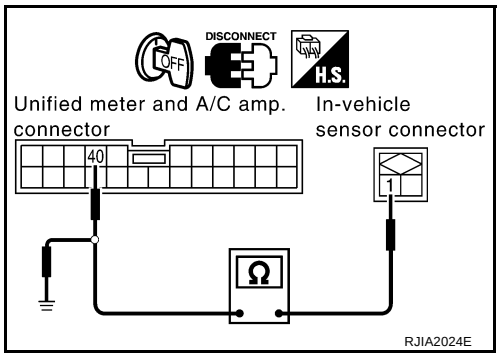
4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 40.

1 – 40 : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M42 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

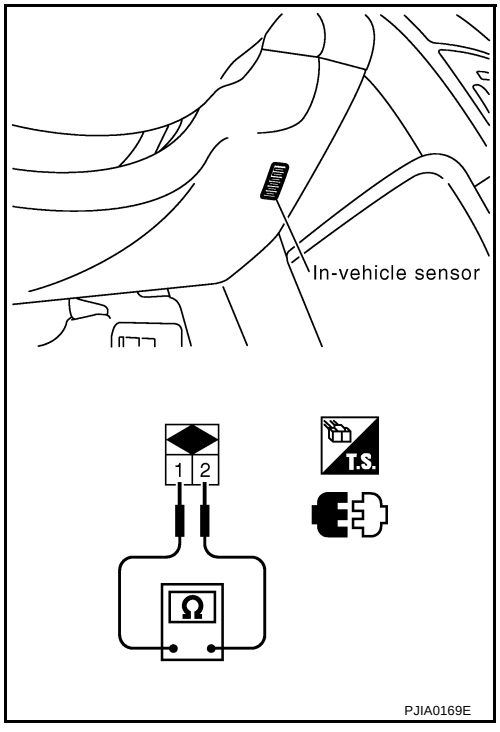
NG >> Repair harness or connector.

COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M42, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



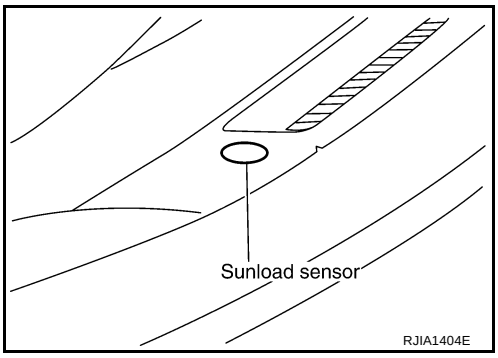
If NG, replace in-vehicle sensor.

Sunload Sensor Circuit

NJS0001C

COMPONENT DESCRIPTION

The sunload sensor is located on the passenger's side defroster grille. It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the unified meter and A/C amp.



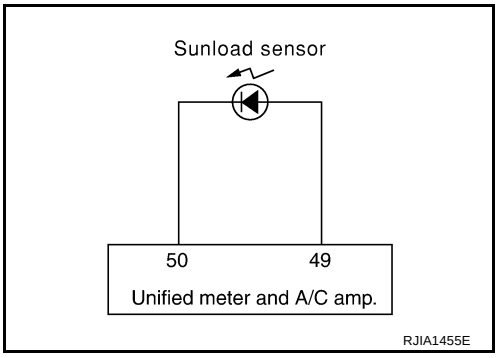
SUNLOAD INPUT PROCESS

The unified meter and A/C amp. also includes a processing circuit which averages the variations in detected sunload over a period of time. This prevents drastic swings in the ATC system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the ATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.

DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR

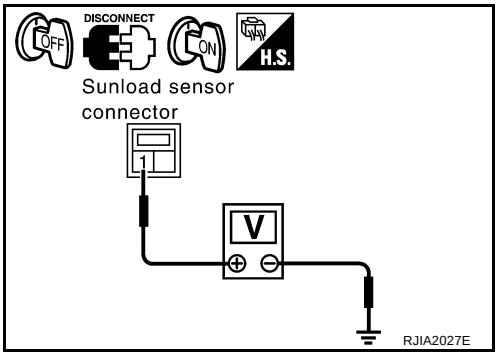
SYMPTOM: Sunload sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector M18 terminal 1 and ground.

1 – Ground : Approx. 5 V



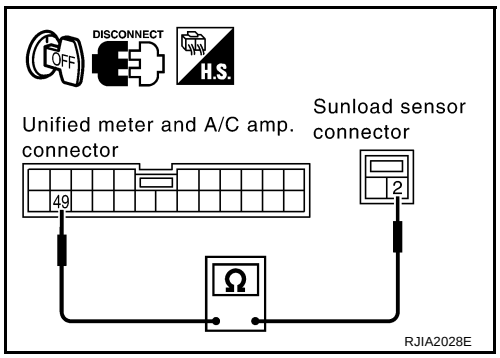
OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 49.

2 – 49 : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and unified meter and A/C amp. connector.
2. Refer to ATC-99, "Sunload Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace sunload sensor.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

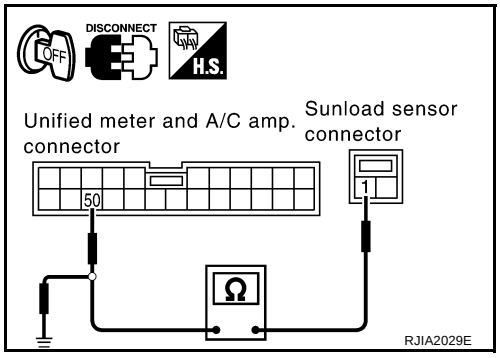
4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 50.

1 – 50 : Continuity should exist.

4. Check continuity between sunload sensor harness connector M18 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

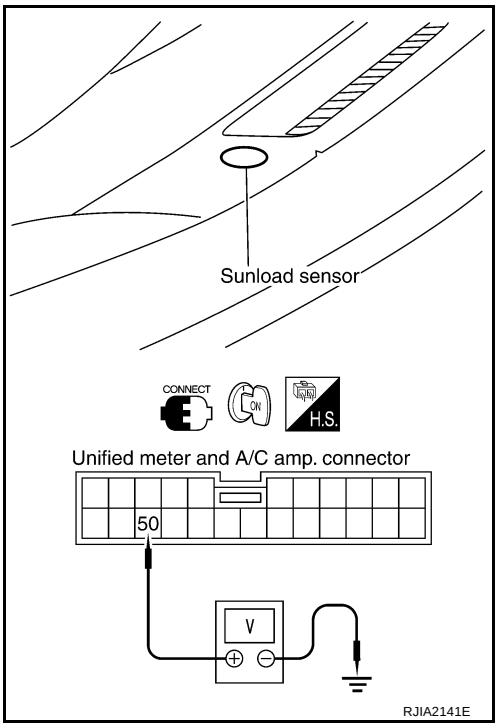
OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> Repair harness or connector.

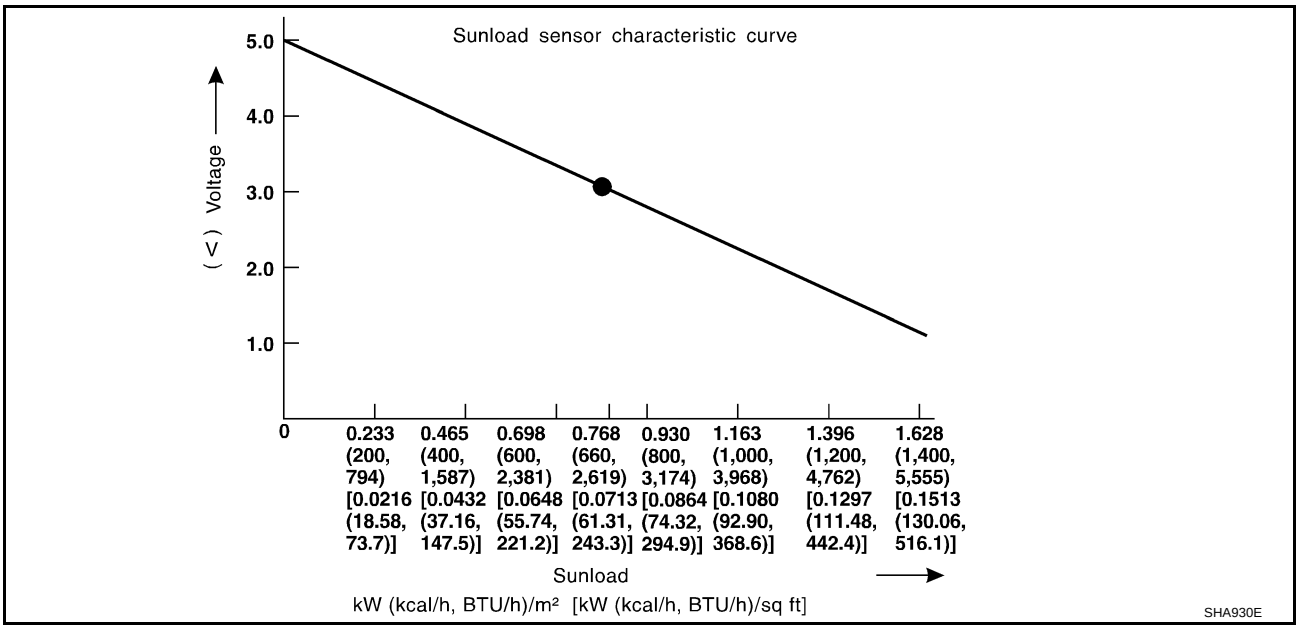
COMPONENT INSPECTION

Sunload Sensor

Measure voltage between unified meter and A/C amp. harness connector M50 terminal 50 and ground.



- When checking sunload sensor, select a place where sunshine directly on it.



If NG, replace sunload sensor.

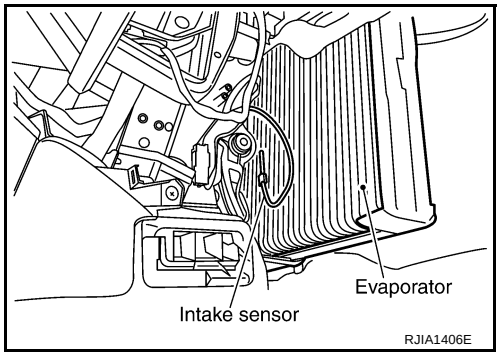
Intake Sensor Circuit

NJS0001D

COMPONENT DESCRIPTION

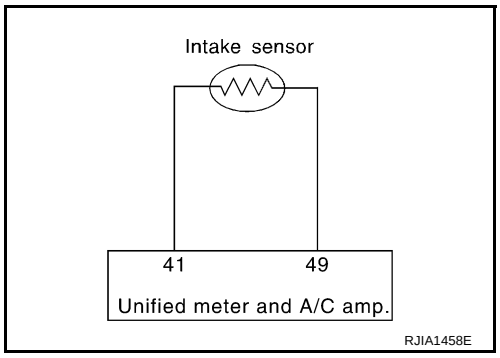
Intake Sensor

The intake sensor is located on the heater & cooling unit assembly. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the unified meter and A/C amp.



DIAGNOSIS PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



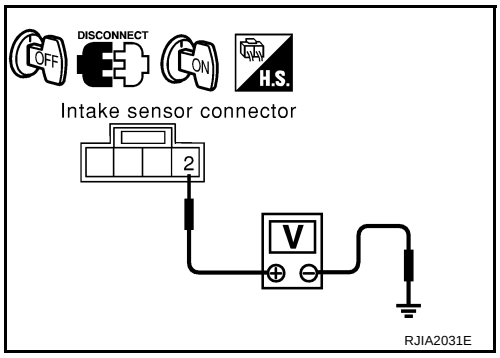
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M255 terminal 2 and ground.

2 – Ground : Approx. 5 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.



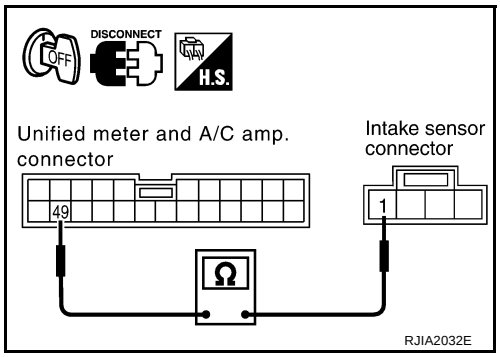
2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M255 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 49.

1 – 49 : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. CHECK INTAKE SENSOR

Refer to ATC-101, "Intake Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace intake sensor.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

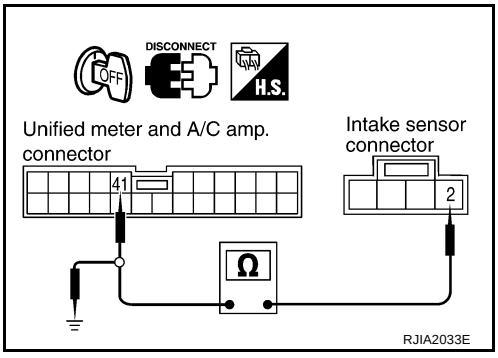
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M255 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 41.

2 – 41 : Continuity should exist.

4. Check continuity between intake sensor harness connector M255 terminal 2 and ground.

2 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-46, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> Repair harness or connector.

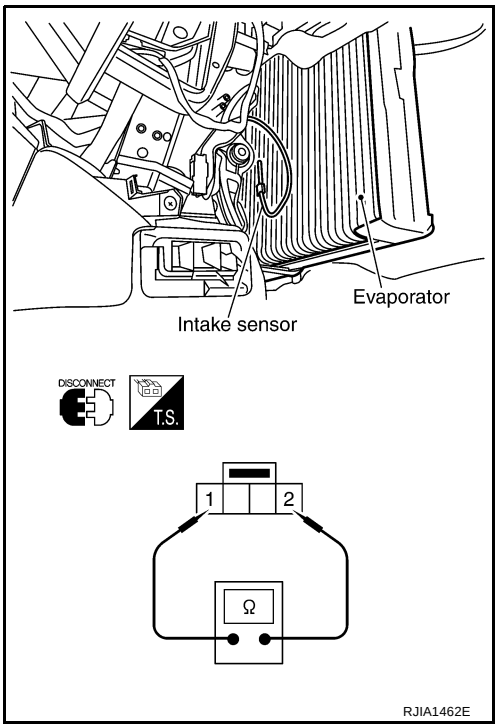
COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector M255, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.34
–10 (14)	9.62
–5 (23)	7.56
0 (32)	6.00
5 (41)	4.80
10 (50)	3.87
15 (59)	3.15
20 (68)	2.57
25 (77)	2.12
30 (86)	1.76
35 (95)	1.47
40 (104)	1.23
45 (113)	1.04

If NG, replace intake sensor.



A/C CONTROLLER

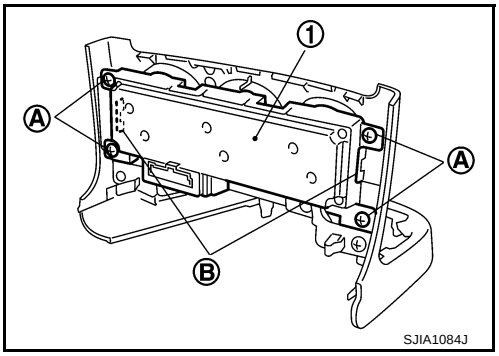
PFP:27500

Removal and Installation

NJS0001E

REMOVAL

1. Remove console finisher (A/T) or console boot (M/T). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws (A) and clips (B), and then remove A/C controller (1) from console finisher (A/T) or console boot (M/T).

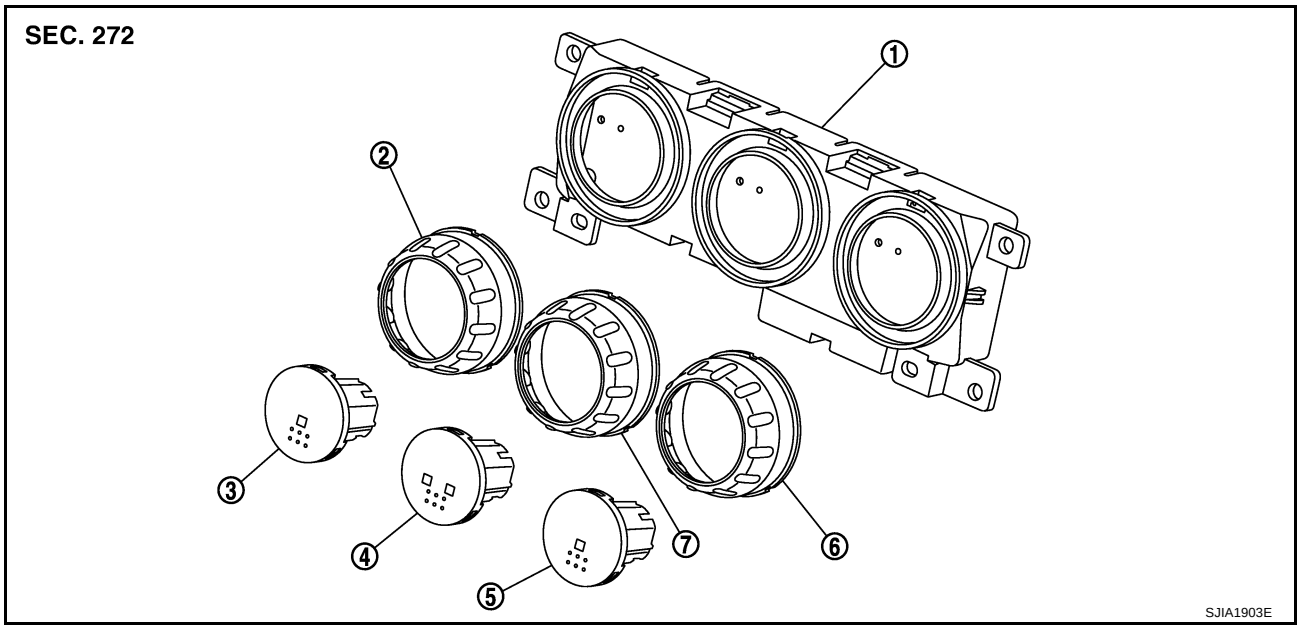


INSTALLATION

Installation is basically the reverse order of removal.

Disassembly and Assembly

NJS000CT



1. A/C controller assembly
2. Mode control dial
3. Rear window defogger switch
4. Intake switch
5. A/C switch
6. Fan control dial
7. Temperature control dial

NOTE:

When disassembling controller, wind gummed tape around each dial assembly and pull out the dial assembly together with switch from the A/C controller assembly.

AUTO AMP

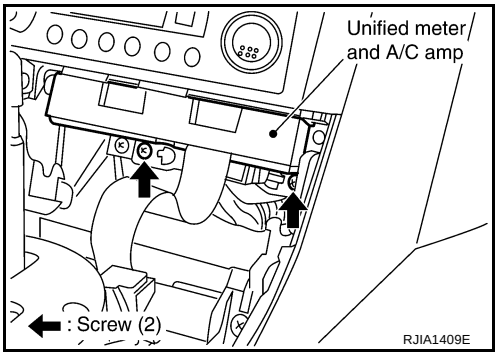
PFP:27760

Removal and Installation of Unified Meter and A/C Amp.

NJS0001F

REMOVAL

1. Remove console finisher (A/T) or console boot (M/T). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws, and then remove unified meter and A/C amp.



INSTALLATION

Installation is basically the reverse order of removal.

AMBIENT SENSOR

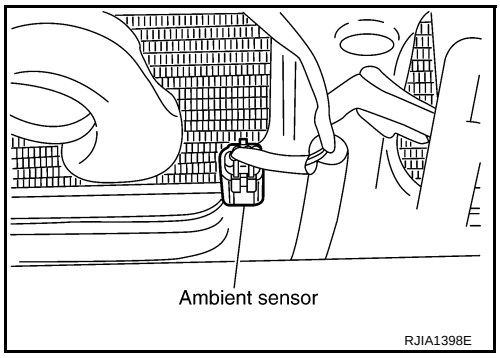
PFP:27722

Removal and Installation

NJS0001G

REMOVAL

1. Disconnect ambient sensor connector.
2. Remove ambient sensor.



INSTALLATION

Installation is basically the reverse order of removal.

IN-VEHICLE SENSOR

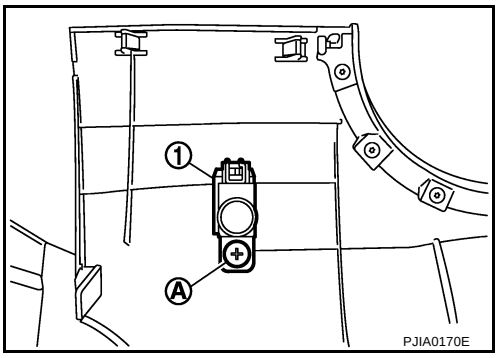
PFP:27720

Removal and Installation

NJS0001H

REMOVAL

1. Remove instrument driver panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screw (A), and then remove in-vehicle sensor (1).



INSTALLATION

Installation is basically the reverse order of removal.

SUNLOAD SENSOR

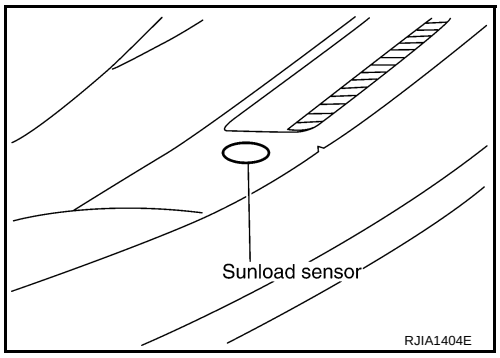
PFP:27721

Removal and Installation

NJS0001I

REMOVAL

1. Pull out sunload sensor from instrument panel.
2. Disconnect sunload sensor connector, and then remove sunload sensor.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE SENSOR

PFP:27723

Removal and Installation

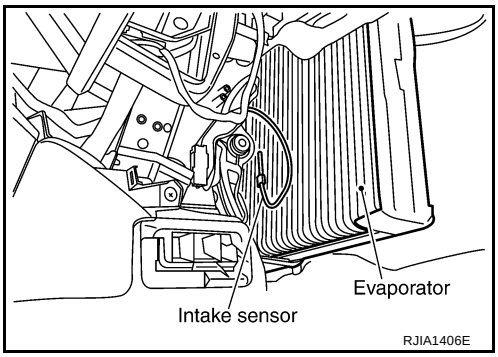
NJS0001J

REMOVAL

1. Remove low-pressure pipe 1 and high-pressure pipe 2. Refer to ATC-131, "Removal and Installation of Low-pressure Pipe 1 and High-pressure Pipe 2" .

   CAUTION:
   Cap or wrap the joint of evaporator, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with suitable material such as vinyl tape to avoid the entry of air.

2. Slide evaporator to passenger side, and then remove intake sensor.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

BLOWER UNIT

PFP:27200

Removal and Installation

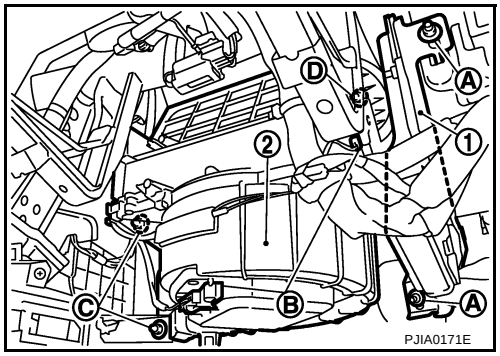
NJS0001K

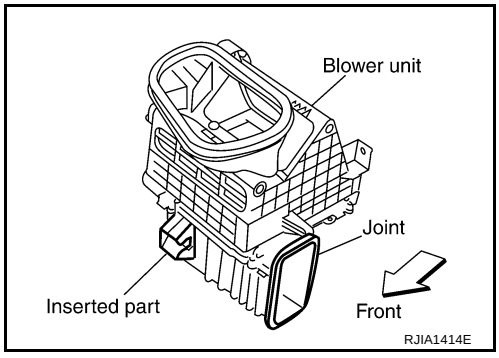
REMOVAL

1. Remove remote keyless entry receiver. Refer to BL-92, "Removal and Installation of Remote Keyless Entry Receiver" .
2. Remove mounting nuts (A), and then remove ECM (1) with bracket attached.
3. Disconnect intake door motor and blower motor connector (B).
4. Remove mounting screws (C) and bolt (D), and then remove blower unit (2).

CAUTION:

Move blower unit rightward, and remove location pin (1 part) and joint. Then remove blower unit downward.





INSTALLATION

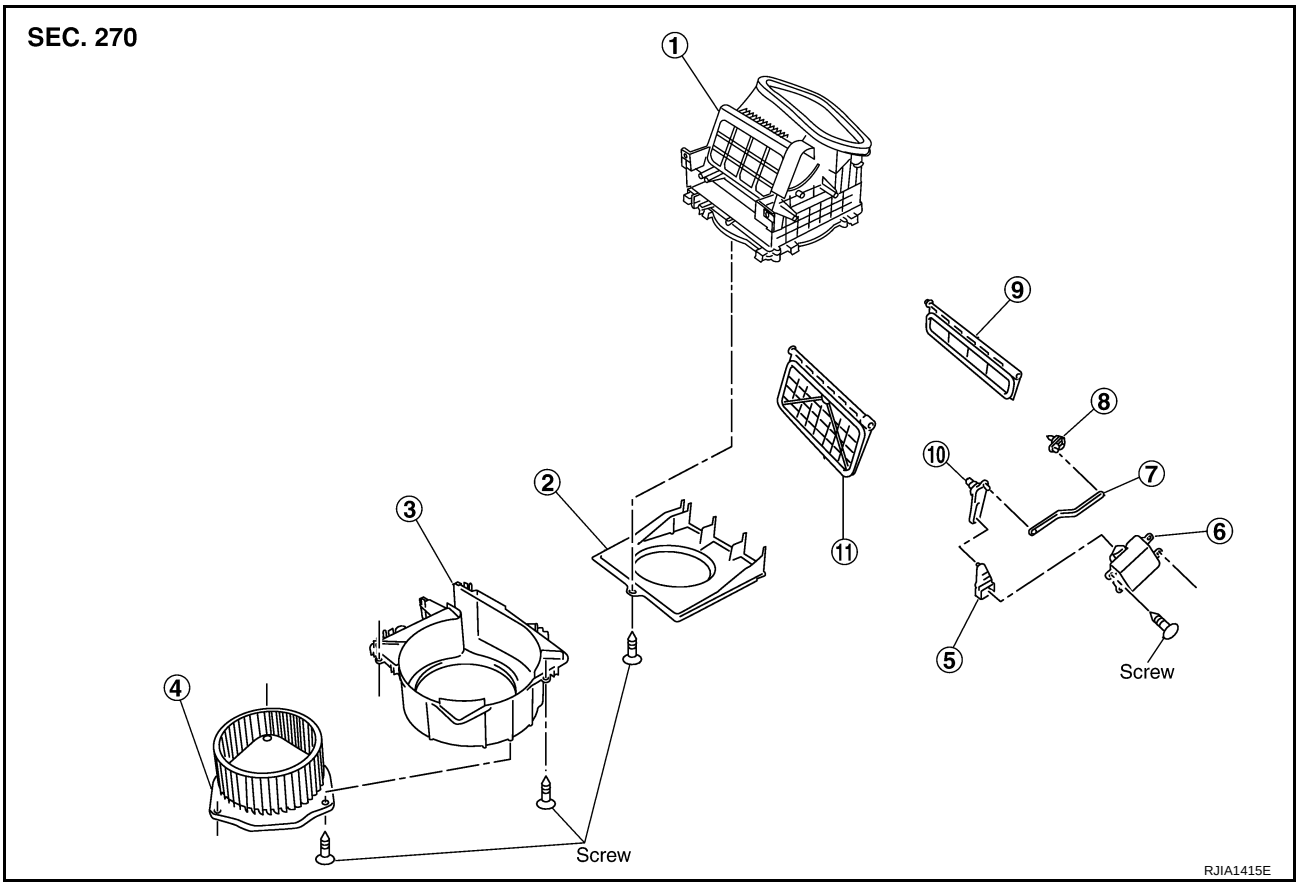
Installation is basically the reverse order of removal.

CAUTION:

Make sure location pin (1 part) and joint are securely inserted.

Disassembly and Assembly

NJS0001L



1. Intake upper case
2. Intake bell mouth
3. Intake lower case
4. Blower motor assembly
5. Intake door lever 2
6. Intake door motor
7. Intake door link
8. Intake door lever 3
9. Intake door 2
10. Intake door lever 1
11. Intake door 1

BLOWER MOTOR

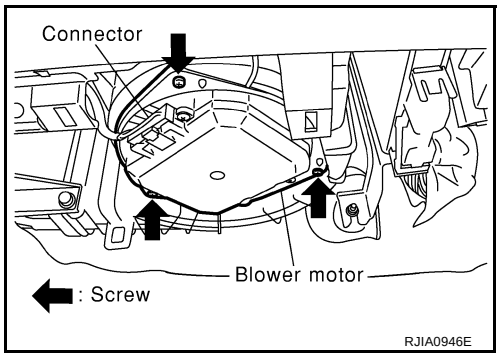
PFP:27226

Removal and Installation

NJS0001M

REMOVAL

1. Remove instrument passenger panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect blower motor connector.
3. Remove mounting screws, and then remove blower motor.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE DOOR MOTOR

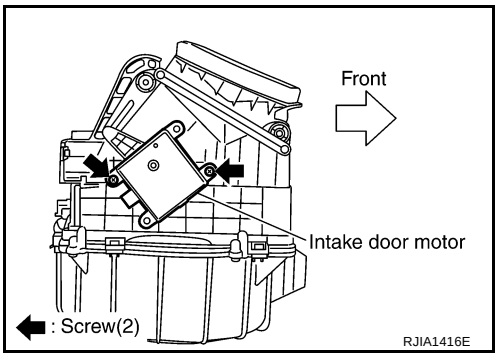
PFP:27730

Removal and Installation

NJS0001N

REMOVAL

1. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
2. Remove mounting screws, and then remove intake door motor from blower unit.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER & COOLING UNIT ASSEMBLY

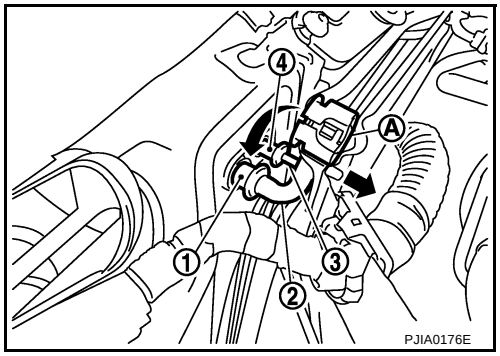
PFP:27110

Removal and Installation

NJS0001O

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Drain coolant from cooling system. Refer to CO-10, "Changing Engine Coolant" .
3. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
4. Disconnect one-touch joint between low-pressure pipe 1 (1) and low-pressure pipe 2 (2) with disconnector (SST: 9253089916) (A).

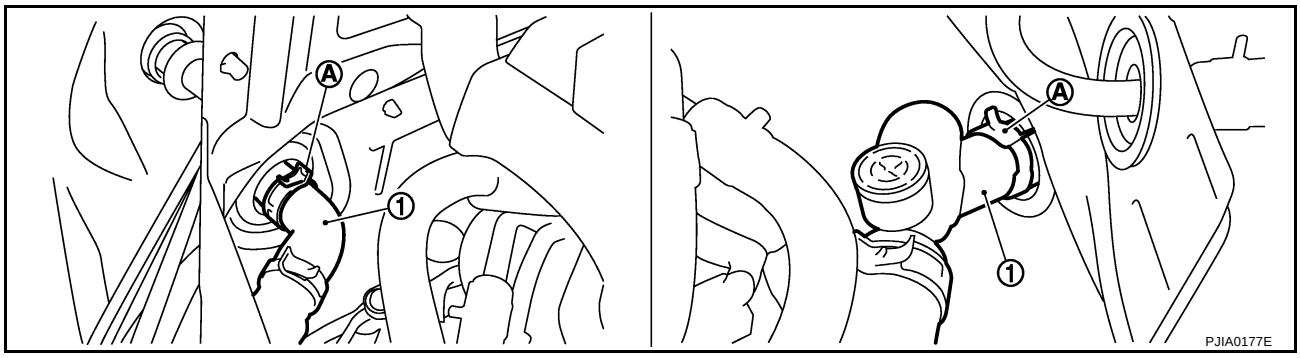


CAUTION:
Cap or wrap the joint of low-pressure pipe 1 and low-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.

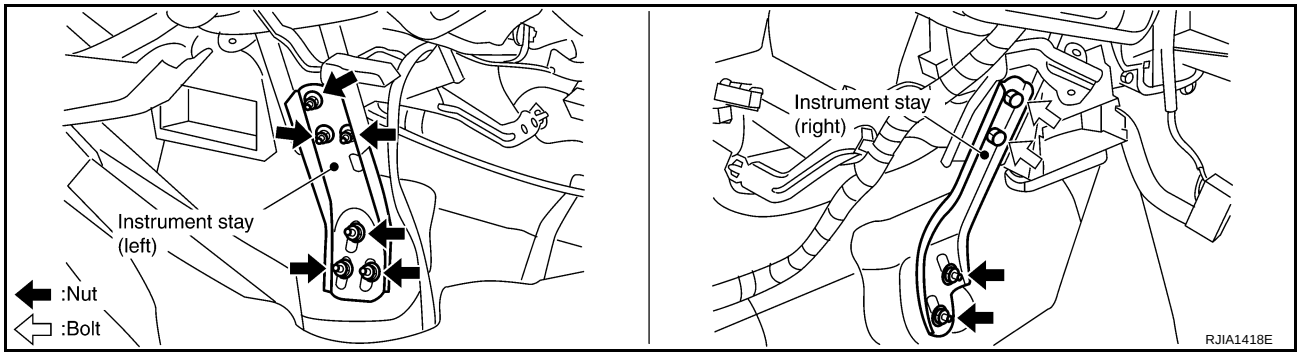
5. Disconnect one-touch-joint between high-pressure pipe 1 (3) and high-pressure pipe 2 (4) with disconnector (SST: 9253089908) (A).

CAUTION:
Cap or wrap the joint of high-pressure pipe 1 and high-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.

6. Remove clamps (A), and then disconnect two heater hoses (1) from heater core.

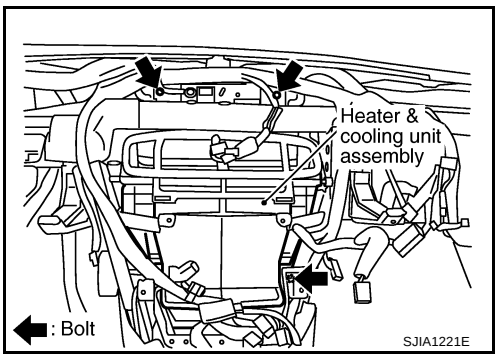


7. Remove instrument panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
8. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
9. Remove clips of vehicle harness from steering member.
10. Remove mounting nuts and bolts, and then remove instrument stays (left and right).

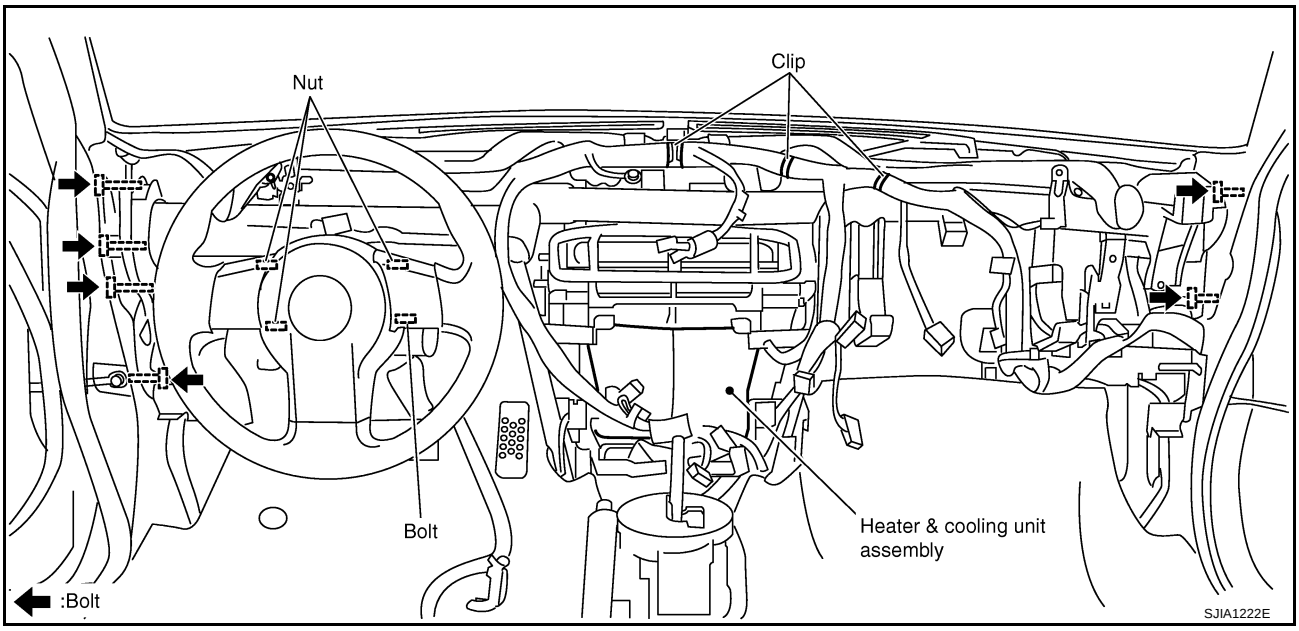


11. Remove defroster nozzle and ventilator ducts. Refer to ATC-121, "Removal of Defroster Nozzle, Ducts and Ventilator Ducts" .

12. Remove mounting bolts from heater & cooling unit assembly.



13. Remove steering column assembly mounting nuts and bolt.
14. Remove steering member mounting bolts, and then remove steering member.



15. Remove heater & cooling unit assembly.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 2 and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

NOTE:

- When filling radiator with coolant, refer to CO-10, "Changing Engine Coolant" .
- Recharge the refrigerant.

Heater & cooling unit assembly mounting bolts

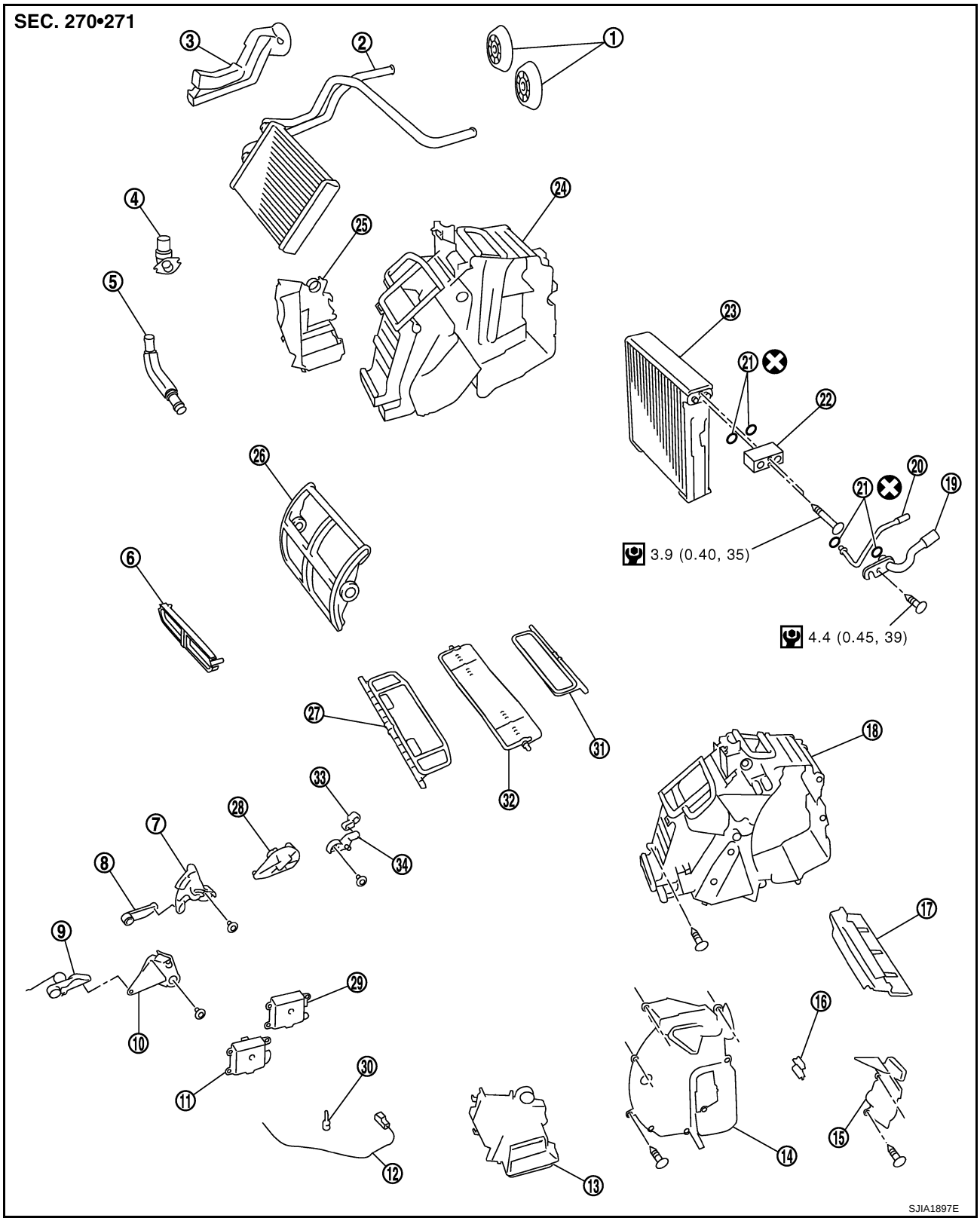
: 6.9 N·m (0.7 kg-m, 61 in-lb)

Steering member and steering column assembly mounting nuts and bolt

: 12 N·m (1.2 kg-m, 9 ft-lb)

Disassembly and Assembly

NJS0001P



1. Heater pipe grommet
2. Heater core
3. Heater pipe cover
4. Aspirator
5. Aspirator duct
6. Rear foot cover
7. Max. cool door link
8. Max. cool door lever
9. Ventilator door lever
10. Ventilator door link
11. Air mix door motor
12. Intake sensor
13. Foot duct (right)
14. Evaporator cover
15. Evaporator cover adapter
16. Heater pipe bracket
17. Insulator
18. Heater case (right)

19. Low-pressure pipe 1
20. High-pressure pipe 2
21. O-ring
22. Expansion valve
23. Evaporator
24. Heater case (left)
25. Foot duct (left)
26. Air mix door (slide door)
27. Ventilator door
28. Side link
29. Mode door motor
30. Intake sensor bracket
31. Defroster door
32. Max. cool door
33. Defroster door lever
34. Defroster door link

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

MODE DOOR MOTOR

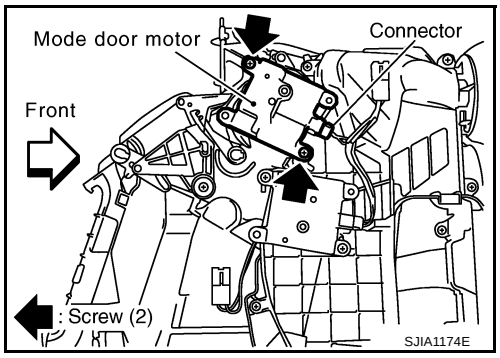
PFP:27731

Removal and Installation

NJS0001Q

REMOVAL

1. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
2. Remove mounting screws from mode door motor.
3. Disconnect connector, and then remove mode door motor.



INSTALLATION

Installation is basically the reverse order of removal.

AIR MIX DOOR MOTOR

PFP:27732

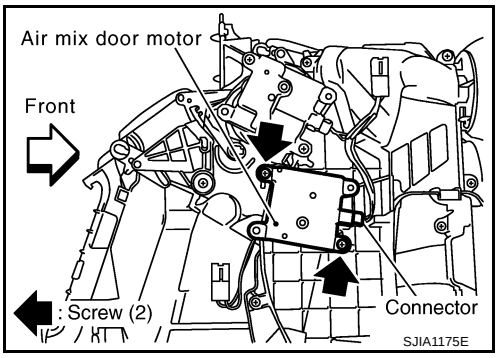
Removal and Installation

NJS0001R

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.

   CAUTION:
   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
4. Disconnect air mix door motor connector.
5. Remove mounting screws, and then remove air mix door motor.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER CORE

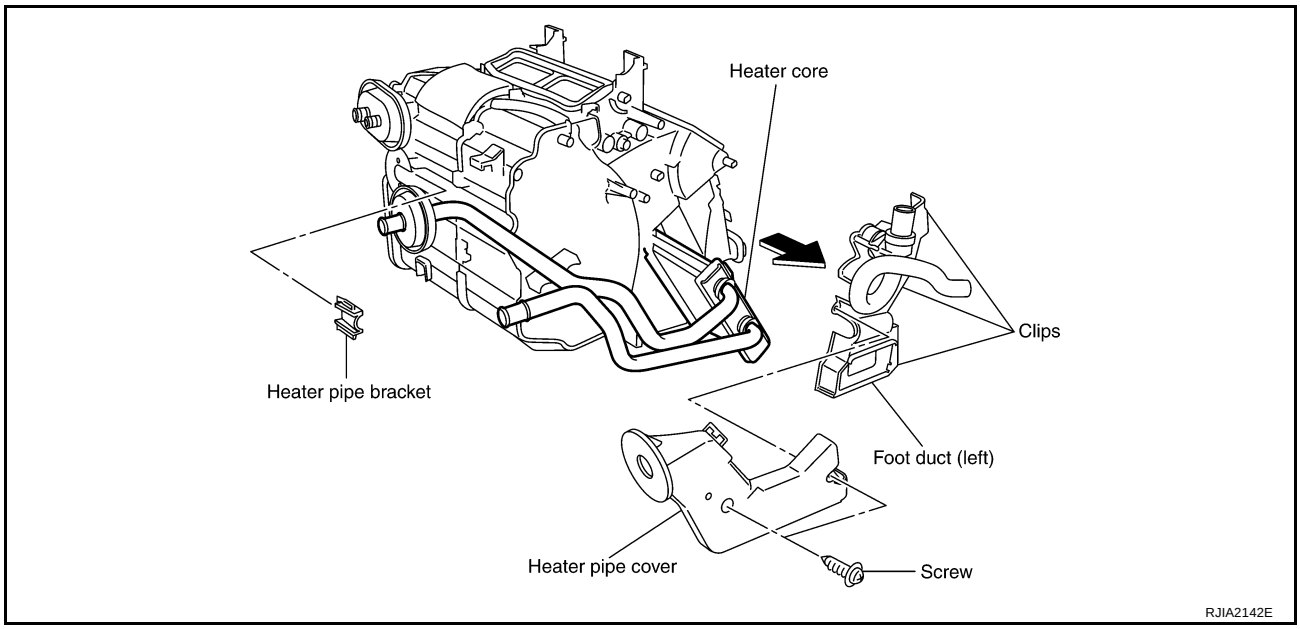
PFP:27140

Removal and Installation

NJS0001S

REMOVAL

1. Remove heater & cooling unit assembly. Refer to ATC-112, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove foot duct (left). Refer to ATC-122, "Removal of Foot Ducts" .



3. Remove mounting screws, and then remove heater pipe cover.
4. Remove heater pipe bracket and heater pipe grommet.
5. Slide heater core to leftward.

INSTALLATION

Installation is basically the reverse order of removal.

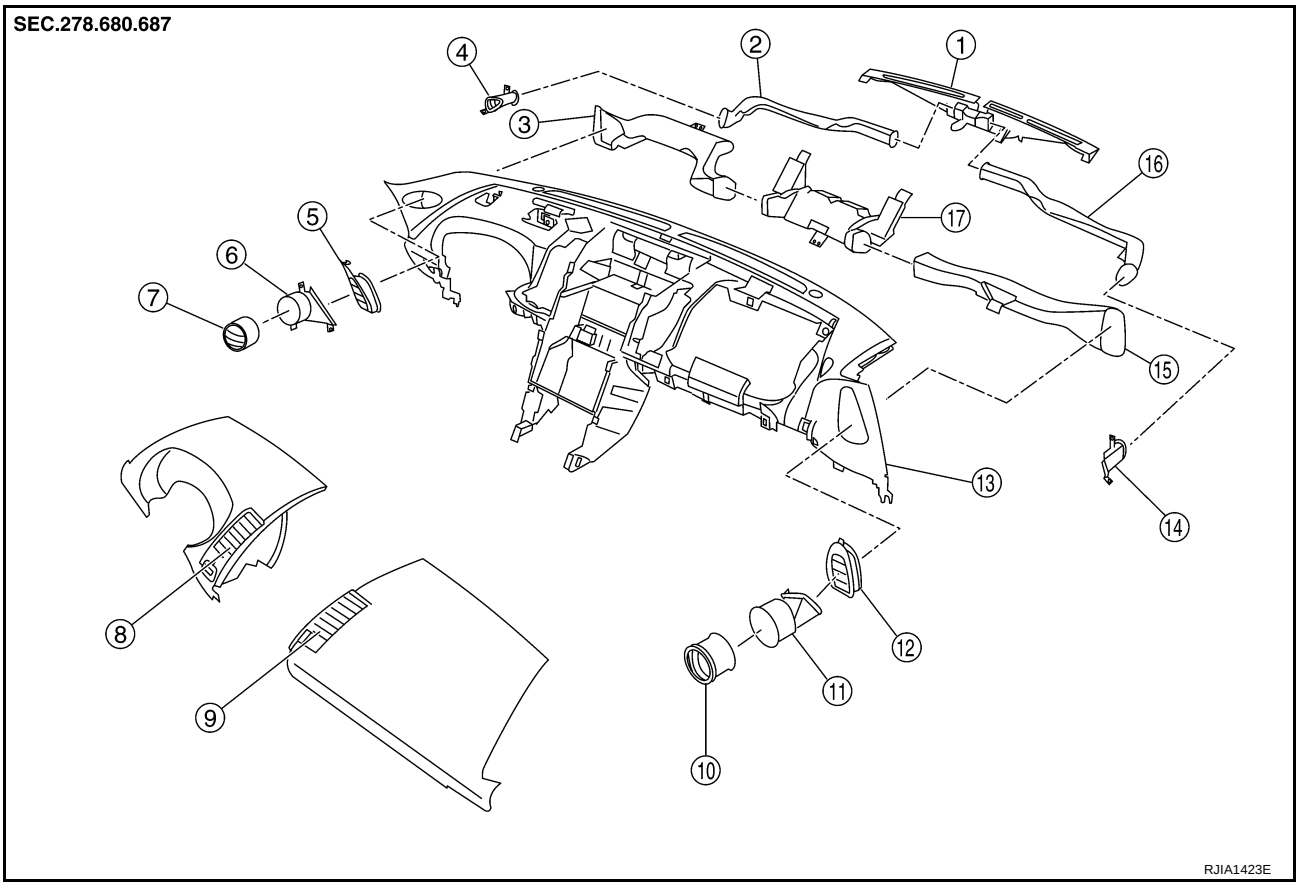
DUCTS AND GRILLES

PFP:27860

Removal and Installation

NJS0001T

COMPONENT LAYOUT

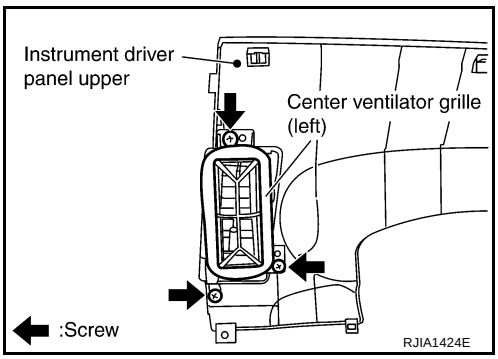


1. Defroster nozzle
2. Side defroster duct 1 (left)
3. Side ventilator duct 1 (left)
4. Side defroster duct 2 (left)
5. Instrument side finisher (left)
6. Side ventilator duct 2 (left)
7. Side ventilator grille (left)
8. Center ventilator grille (left)
9. Center ventilator grille (right)
10. Side ventilator grille (right)
11. Side ventilator duct 2 (right)
12. Instrument side finisher (right)
13. Instrument panel
14. Side defroster duct 2 (right)
15. Side ventilator duct 1 (right)
16. Side defroster duct 1 (right)
17. Center ventilator duct

REMOVAL

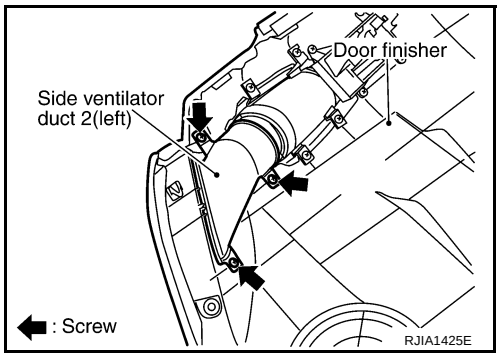
Removal of Center Ventilator Grilles

1. Remove instrument driver and passenger panel upper. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws, and then remove center ventilator grilles.

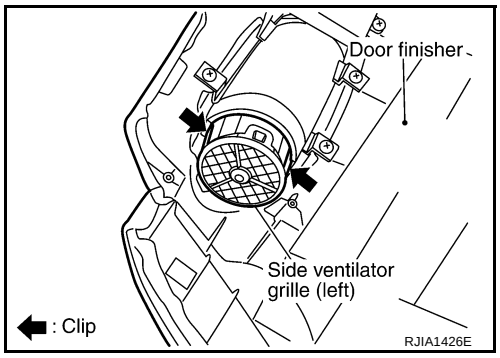


Removal of Side Ventilator Duct 2 and Grilles

1. Remove door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Remove mounting screws, and then remove side ventilator duct 2 (left and right).

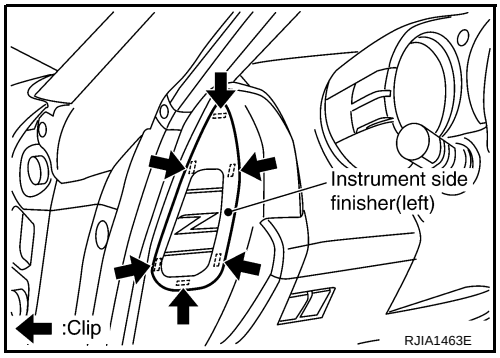


3. Remove mounting clips, and then remove side ventilator grilles (left and right).



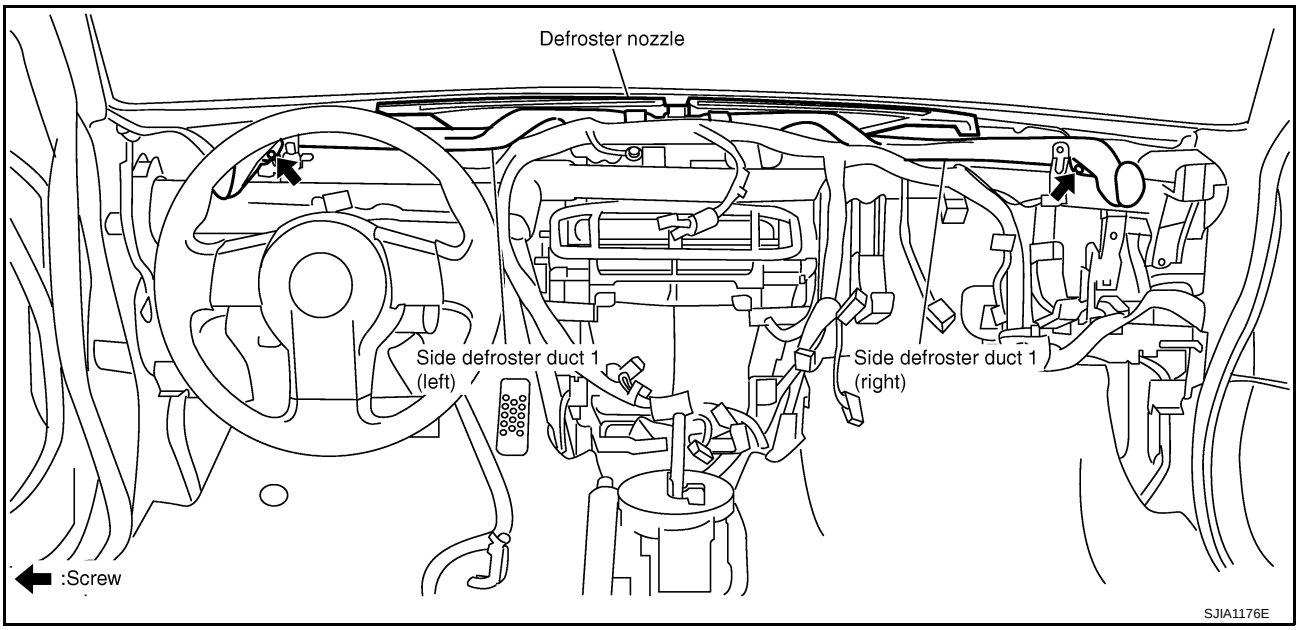
Removal of Instrument Side Finishers

Remove mounting clips, and then remove instrument side finishers (left and right).

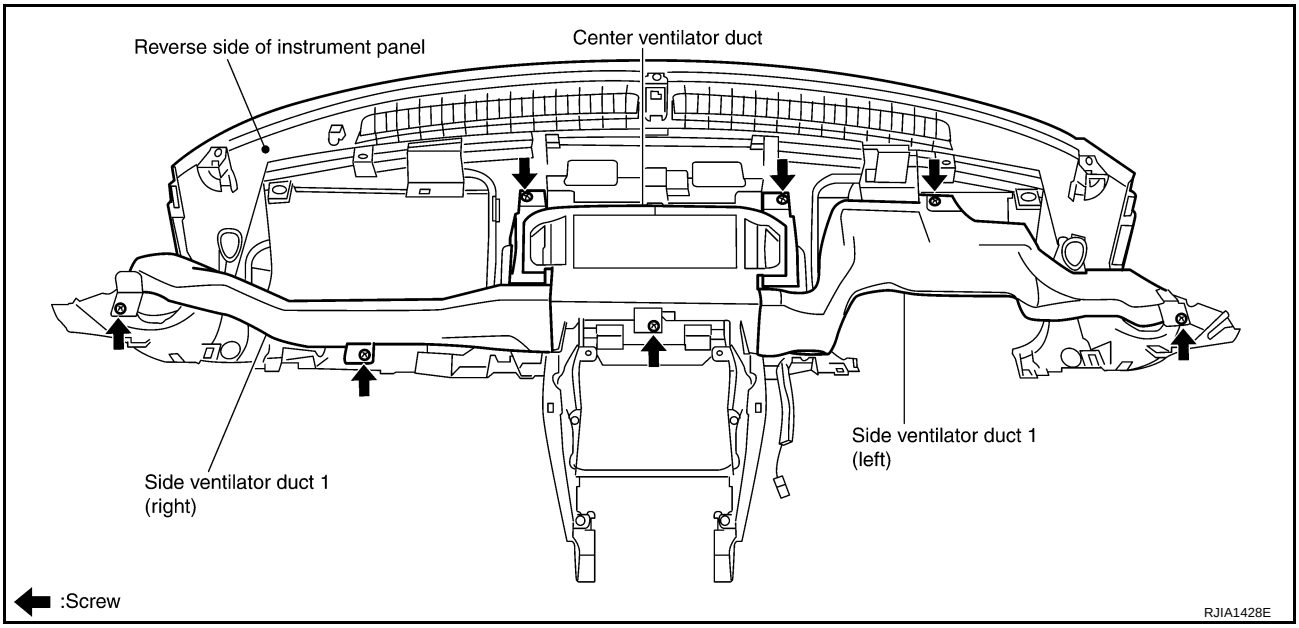


Removal of Defroster Nozzle, Ducts and Ventilator Ducts

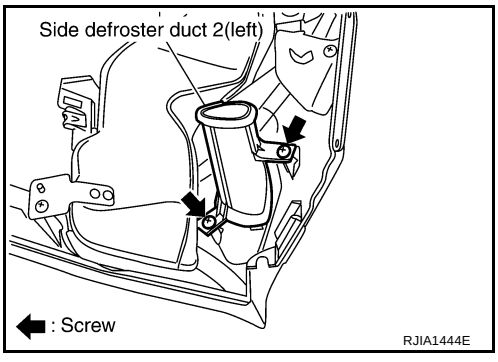
1. Remove instrument panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws, and then remove side defroster duct 1 (left and right).
3. Remove steering member, and then remove defroster nozzle.



4. Remove mounting screws, and then remove side ventilator duct 1 (left and right) and center ventilator duct from instrument panel.

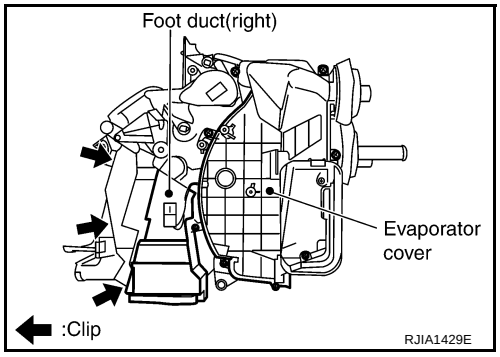


5. Remove mounting screws, and then remove side defroster duct 2 (left and right).



Removal of Foot Ducts

1. Remove heater & cooling unit assembly. Refer to ATC-112, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove evaporator cover, and then remove foot duct (right).
3. Remove aspirator and heater pipe cover.
4. Remove mounting clips, and then remove foot duct (left).



INSTALLATION

Installation is basically the reverse order of removal.

REFRIGERANT LINES

PFP:92600

HFC-134a (R-134a) Service Procedure

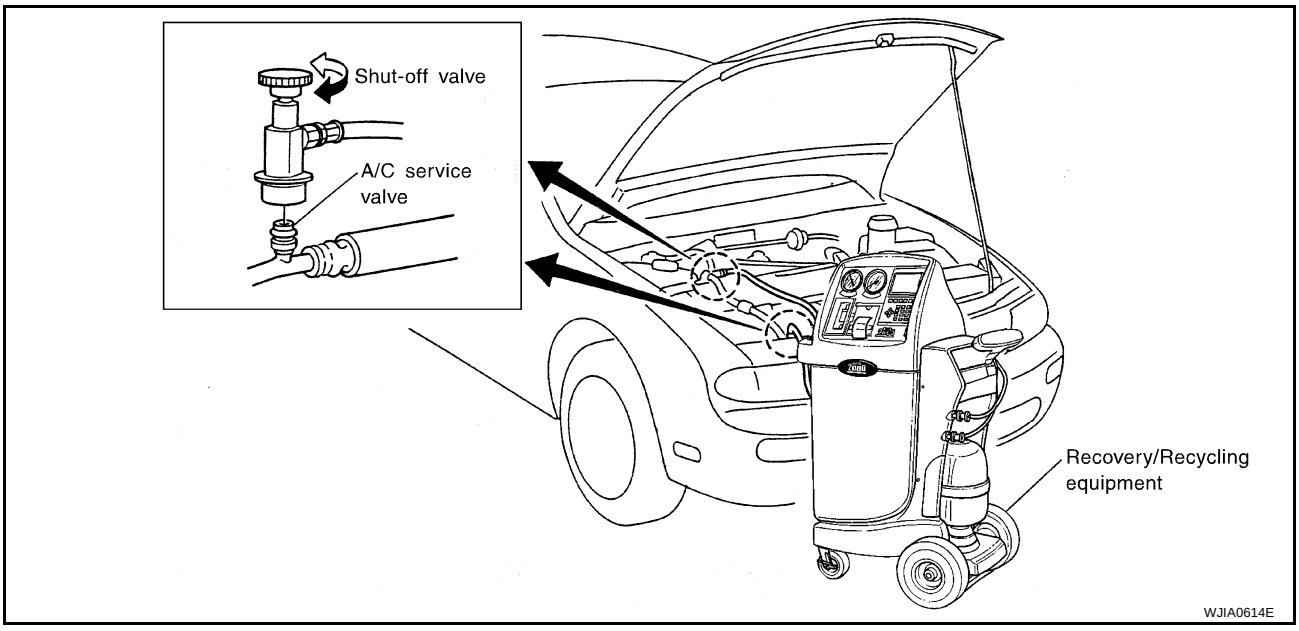
NJS0001U

SETTING OF SERVICE TOOLS AND EQUIPMENT

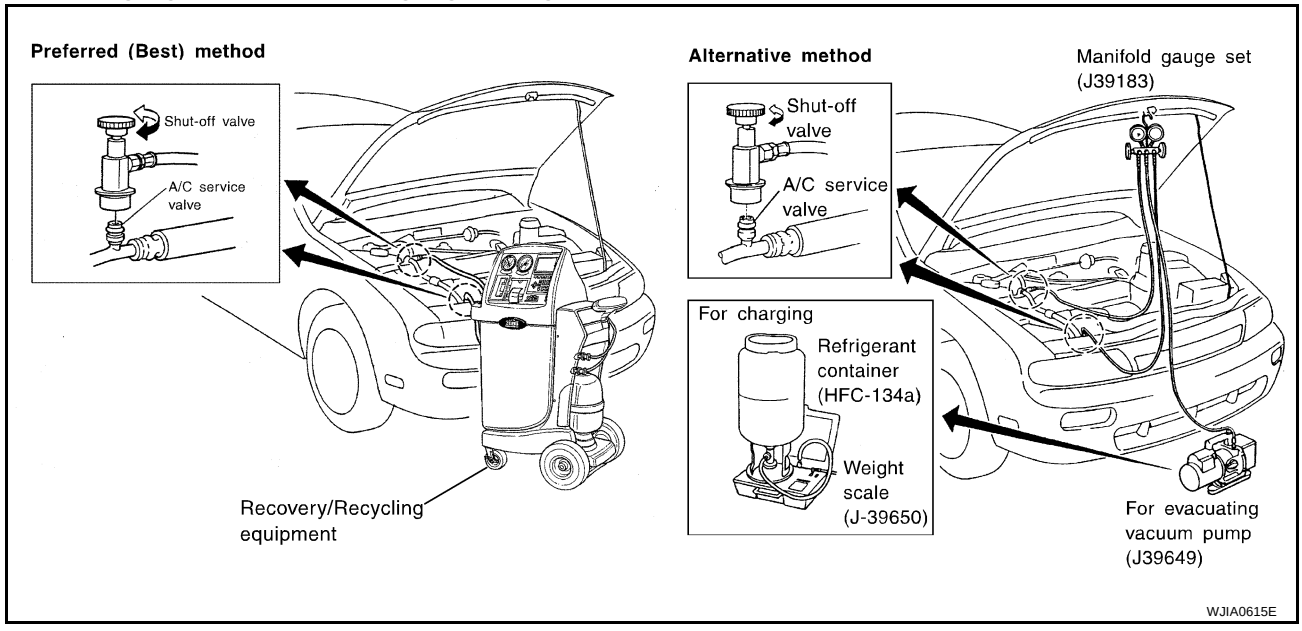
Discharging Refrigerant

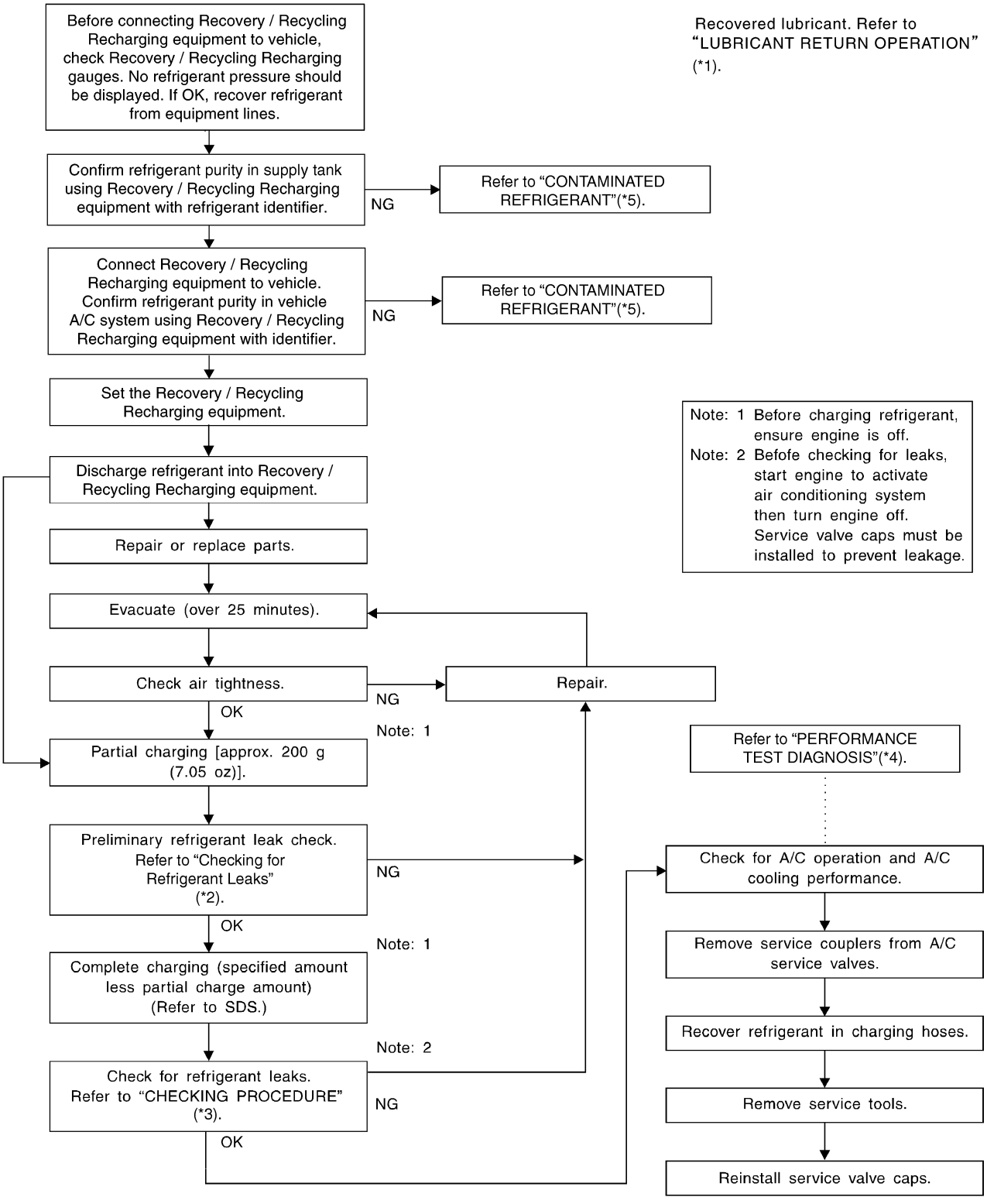
WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment] or J-2209 [HFC-134a (R-134a) recovery equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.



Evacuating System and Charging Refrigerant





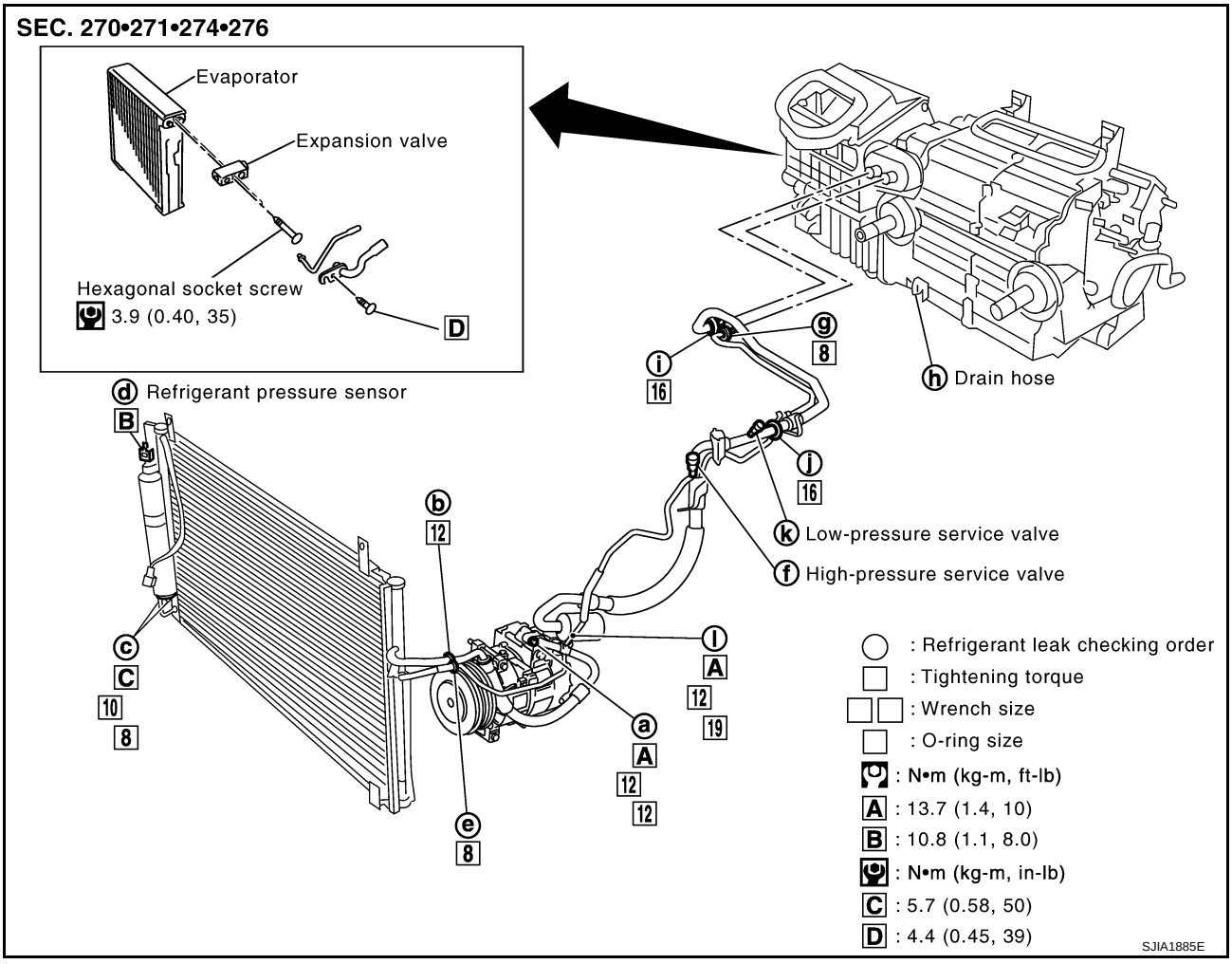
SJIA1275E

*1 ATC-21, "LUBRICANT RETURN OPERATION"
*2 ATC-138, "Checking for Refrigerant Leaks"
*3 ATC-140, "CHECKING PROCEDURE"
*4 ATC-83, "PERFORMANCE TEST DIAGNOSIS"
*5 ATC-5, "CONTAMINATED REFRIGERANT"

Components

NJS0001V

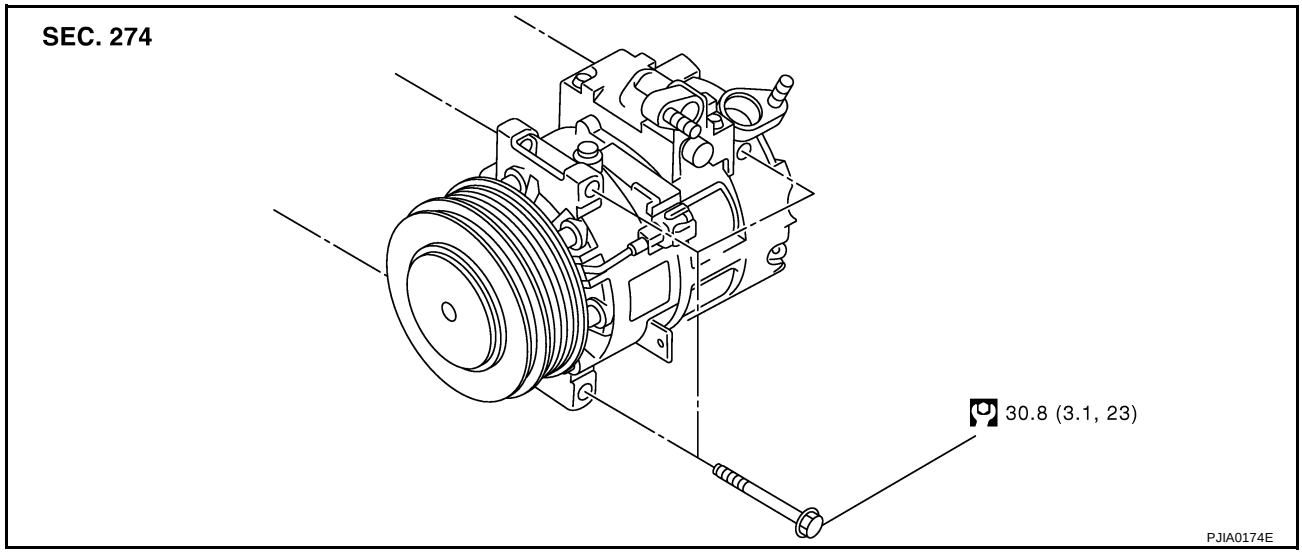
Refer to ATC-7, "Precautions for Refrigerant Connection" .



Removal and Installation of Compressor

NJS0001W

REMOVAL



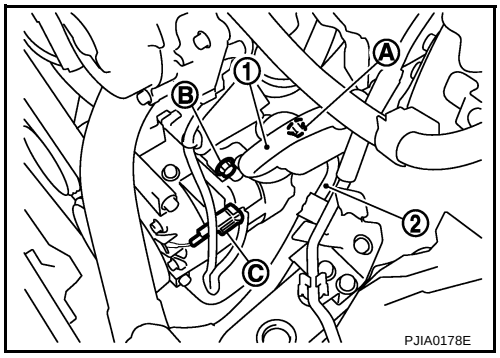
: N·m (kg-m, ft-lb)

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove tower bar. Refer to FSU-20, "TOWER BAR" .

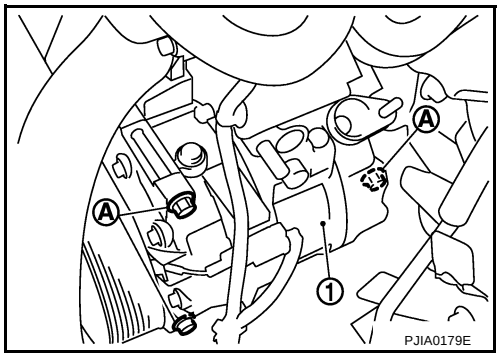
3. Remove engine cover (1), (2). Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
4. Remove air cleaner case (LH) and air duct (LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
5. Remove mounting nuts (A) from low-pressure flexible hose (1).
6. Remove mounting nuts (B) from high-pressure flexible hose (2).

CAUTION:
Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

7. Disconnect compressor connector (C).
8. Remove drive belt. Refer to EM-12, "DRIVE BELTS" .



9. Remove mounting bolts (A) from compressor, using power tools.
10. Remove compressor (1) upward of vehicle.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

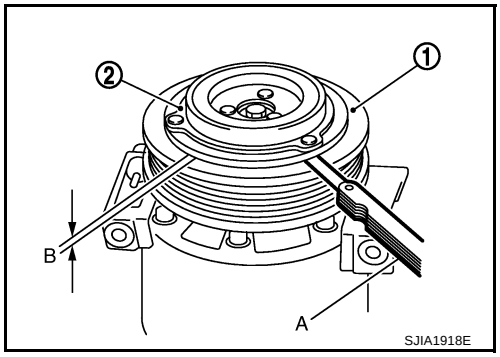
Check Disc to Pulley Clearance

NJS000IE

Check the clearance (B) between pulley assembly (1) and clutch disc (2) around the entire periphery with feeler gauge (A).

Disc to pulley clearance : 0.30 - 0.60 mm (0.012 - 0.024 in)

If specified clearance is not obtained, replace compressor.

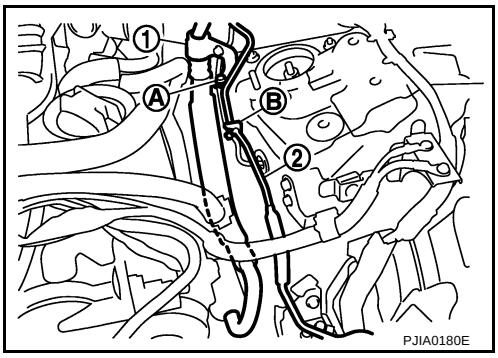


Removal and Installation of Low-pressure Flexible Hose and Pipe 2

NJS0001Y

REMOVAL

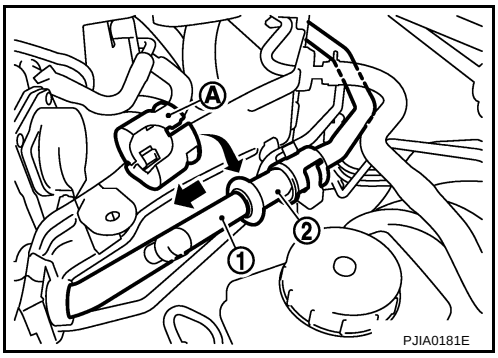
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
3. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
4. Remove engine cover (1), (2). Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
5. Remove air cleaner case (LH) and air duct (LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
6. Remove mounting bolt (A) from low-pressure flexible hose bracket (1).
7. Remove high-pressure pipe 1 (2) from vehicle clip (B).



8. Disconnect one-touch joint between low-pressure flexible hose (1) and low-pressure pipe 2 (2) with disconnector (SST: 9253089916) (A).

CAUTION:

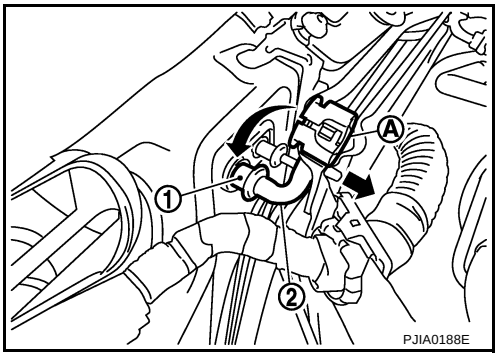
Cap or wrap the joint of low-pressure flexible hose and low-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.



9. Disconnect one-touch joint between low-pressure pipe 1 (1) and low-pressure pipe 2 (2) with disconnector (SST: 9253089916) (A).

CAUTION:

Cap or wrap the joint of low-pressure pipe 1 and low-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.

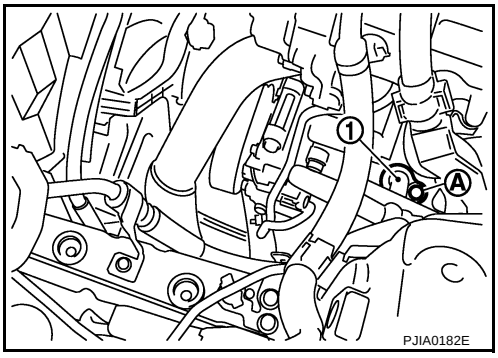


10. Remove mounting nut (A) from low-pressure flexible hose (1). (Compressor side)

CAUTION:

Cap or wrap the joint of compressor and low-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

11. Remove low-pressure flexible hose.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

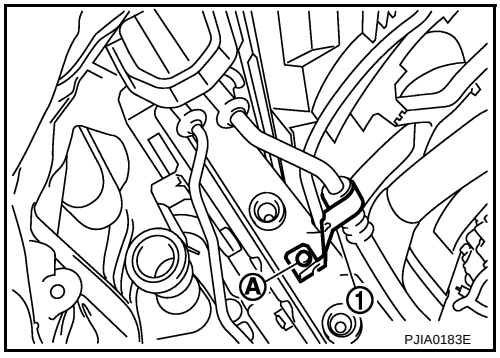
: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of High-pressure Flexible Hose

NJS0001Z

REMOVAL

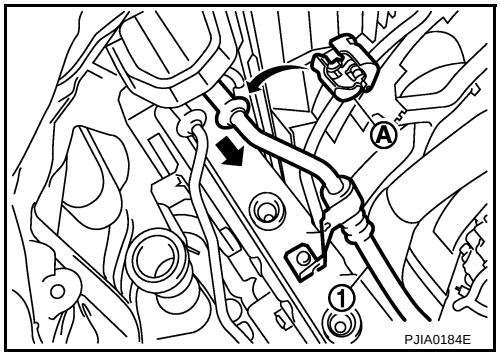
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
3. Remove engine cover (1), (2). Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
4. Remove air cleaner case (LH) and air duct (LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
5. Remove mounting bolt (A) from high-pressure flexible hose bracket (1).



6. Disconnect one-touch joint between high-pressure flexible hose (1) and condenser with disconnector (SST: 9253089912) (A).

   CAUTION:

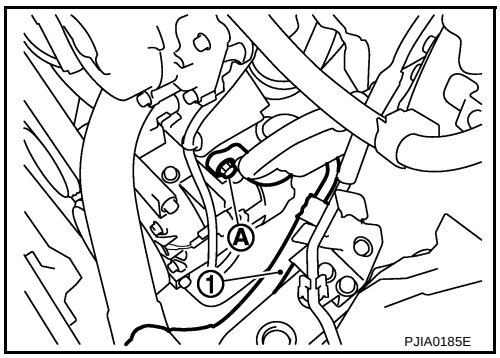
   Cap or wrap the joint of high-pressure flexible hose and condenser with suitable material such as vinyl tape to avoid the entry of air.



7. Remove mounting nut (A) from high-pressure flexible hose (1), and then remove high-pressure flexible hose.

   CAUTION:

   Cap or wrap the joint of high-pressure flexible hose and compressor with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

High-pressure flexible hose bracket mounting bolt

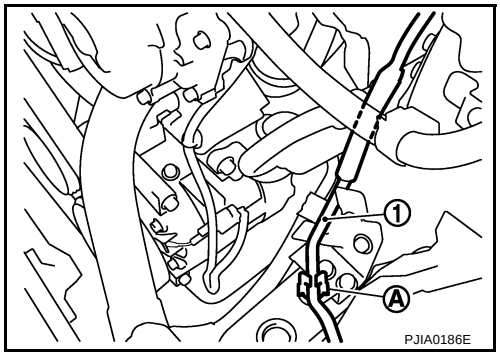
: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of High-pressure Pipe 1 (Engine Compartment)

NJS00020

REMOVAL

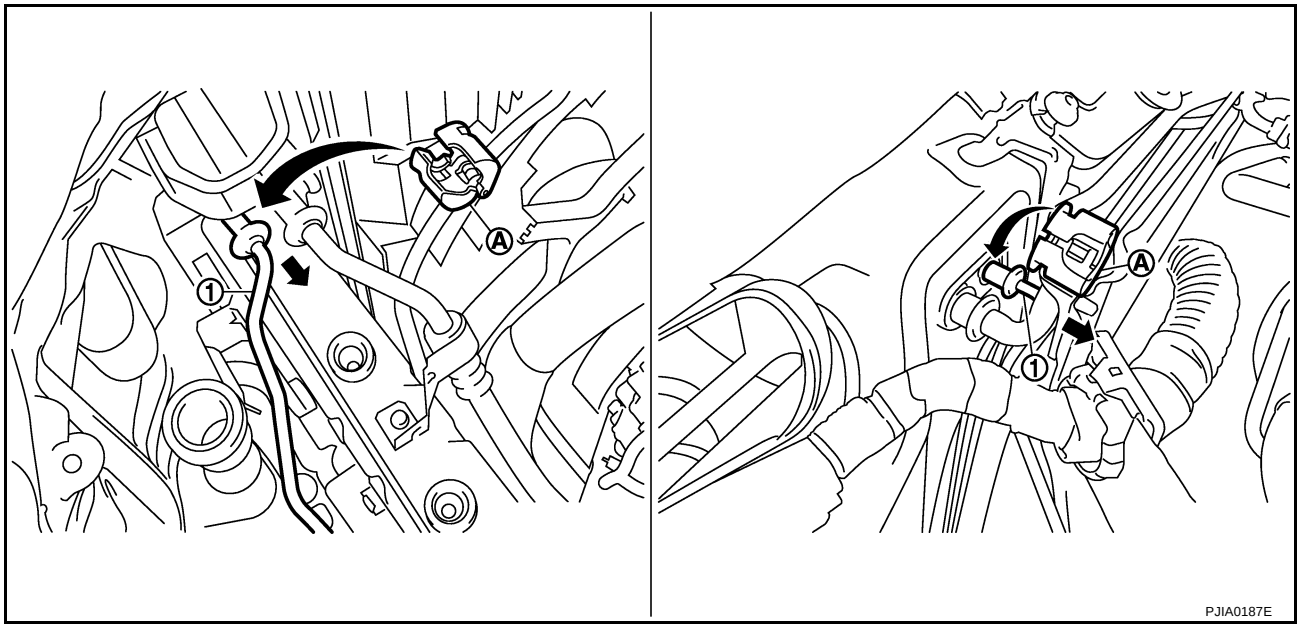
1. Remove low-pressure flexible hose and pipe 2. Refer to ATC-127, "Removal and Installation of Low-pressure Flexible Hose and Pipe 2" .
2. Remove high-pressure pipe 1 (1) from vehicle clip (A).



3. Disconnect one-touch joint between high-pressure pipe 1 (1) and condenser with disconnector (SST: 9253089908) (A).

CAUTION:

Cap or wrap the joint of condenser and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



4. Disconnect one-touch joint between high-pressure pipe 1 (1) and high-pressure pipe 2 with disconnector (SST: 9253089908) (A).

CAUTION:

Cap or wrap the joint of high-pressure pipe 1 and 2 with suitable material such as vinyl tape to avoid the entry of air.

5. Remove high-pressure pipe 1.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**

- **When recharging refrigerant, check for leaks.**

High-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

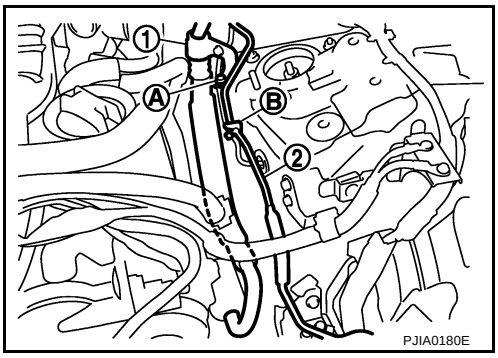
Removal and Installation of Low-pressure Pipe 1 and High-pressure Pipe 2

NJS00021

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and passenger window, and then disconnect the battery cable from the negative terminal.

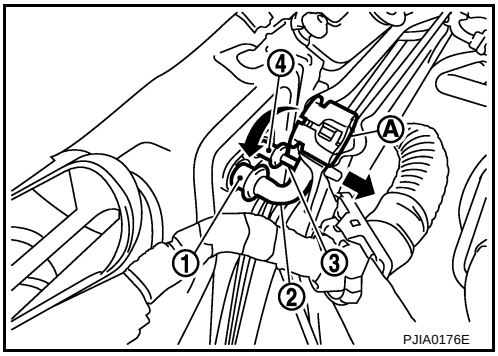
   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
4. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
5. Remove mounting bolt (A) from low-pressure flexible hose bracket (1).
6. Remove high-pressure pipe 1 (2) from vehicle clip (B).



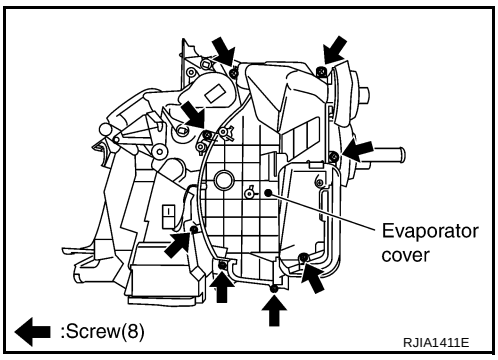
7. Disconnect one-touch joint between low-pressure pipe 1 (1) and low-pressure pipe 2 (2) with disconnector (SST: 9253089916) (A).

   CAUTION:
   Cap or wrap the joint of low-pressure pipe 1 and low-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.
8. Disconnect one-touch joint between high-pressure pipe 1 (3) and high-pressure pipe 2 (4) with disconnector (SST: 9253089908) (A).

   CAUTION:
   Cap or wrap the joint of high-pressure pipe 1 and high-pressure pipe 2 with suitable material such as vinyl tape to avoid the entry of air.

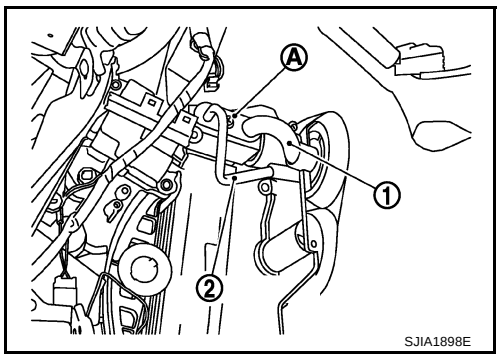


9. Remove instrument passenger panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
10. Remove blower unit. Refer to ATC-108, "BLOWER UNIT" .
11. Remove air mix door motor and mode door motor. Refer to ATC-117, "AIR MIX DOOR MOTOR" and ATC-116, "MODE DOOR MOTOR" .
12. Remove mounting screws, and then remove evaporator cover.



13. Remove mounting bolt (A), and then remove low-pressure pipe 1 (1) and high-pressure pipe 2 (2).

CAUTION:
Cap or wrap the joint of evaporator, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of Liquid Tank

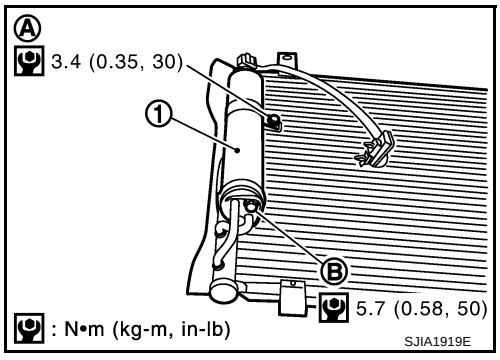
NJS00022

REMOVAL

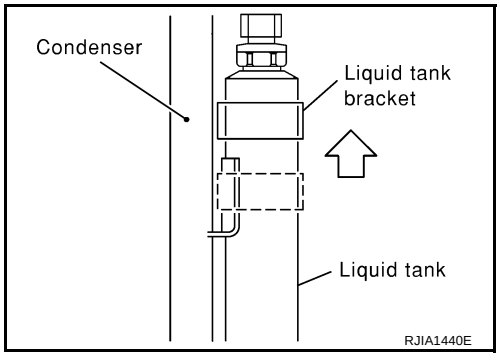
1. Remove condenser. Refer to ATC-133, "Removal and Installation of Condenser" .
2. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.

CAUTION:
Be sure to clean carefully.

3. Remove mounting bolts (A), (B) from liquid tank (1).



4. Lift liquid tank bracket upward. Remove liquid tank bracket from protruding part of condenser.
5. Slide liquid tank upward, and then remove liquid tank.

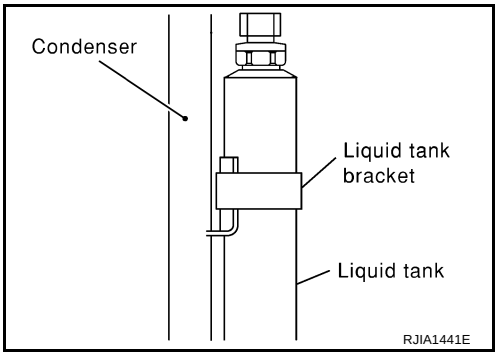


INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Make sure liquid tank bracket is securely installed at protrusion of condenser.**
- **Make sure liquid tank bracket does not move to a position below center of liquid tank.**
- **Replace O-rings of condenser pipe with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

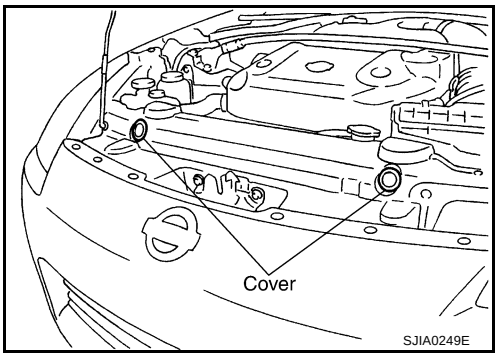


Removal and Installation of Condenser

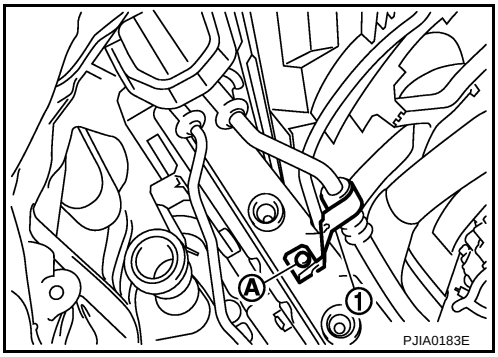
NJS00023

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Drain engine coolant. Refer to CO-10, "Changing Engine Coolant" .
3. Remove cover for condenser mounting bolt.



4. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
5. Remove engine cover (1), (2). Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
6. Remove air cleaner case (LH) and air duct (LH). Refer to and EM-15, "AIR CLEANER AND AIR DUCT" .
7. Remove radiator fan shroud after removing radiator upper hose.
8. Remove mounting bolt for condenser.
9. Remove mounting bolt (A) from high-pressure flexible hose bracket (1).



10. Disconnect one-touch joint between high-pressure flexible hose (1) and condenser with disconnector (SST: 9253089912).

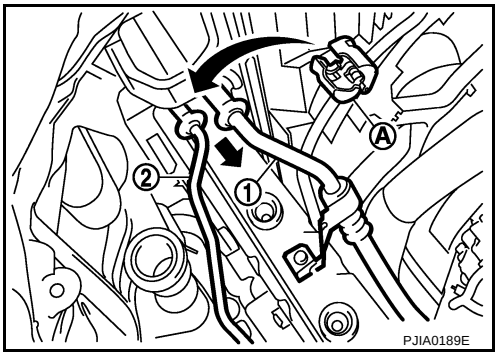
    CAUTION:

    Cap or wrap the high-pressure flexible hose and condenser with suitable material such as vinyl tape to avoid the entry of air.

    Disconnect one-touch joint between high-pressure pipe 1 (2) and condenser with disconnector (SST: 9253089908).

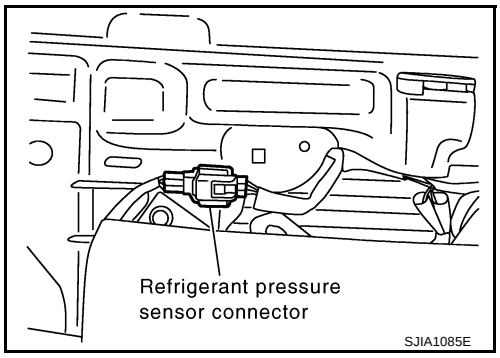
    CAUTION:

    Cap or wrap the joint of high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.

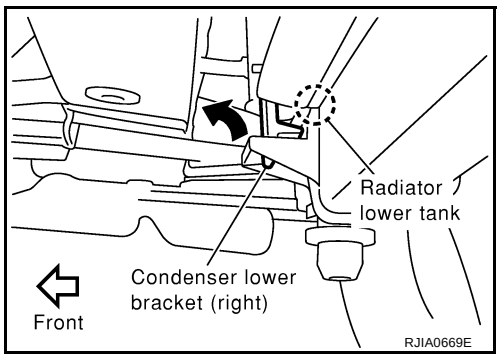


11. Remove radiator upper mount, move radiator and condenser to the engine side.

12. Disconnect refrigerant pressure sensor connector.



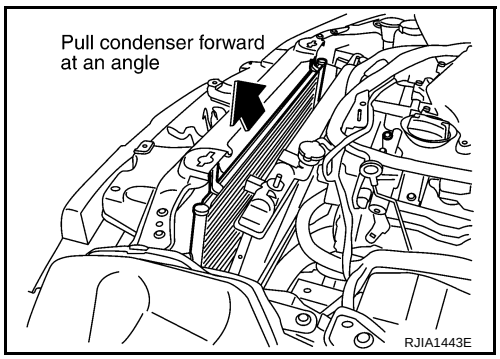
13. Lift condenser up slightly and tilt it toward front of vehicle. (This is because condenser lower bracket is on bottom of radiator tank.)



14. Pull condenser forward at an angle. Remove condenser from radiator.

CAUTION:

Be careful not to damage core surface of the condenser and the radiator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure flexible hose and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Condenser mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

High-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

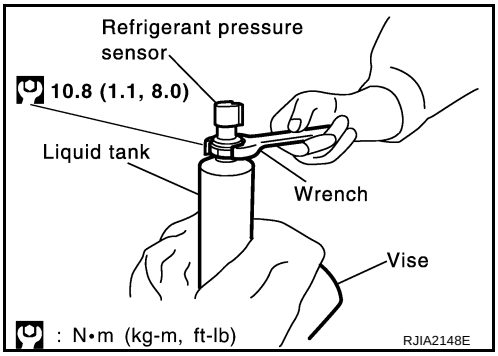
Removal and Installation of Refrigerant Pressure Sensor

NJS00024

REMOVAL

1. Remove liquid tank. Refer to ATC-132, "Removal and Installation of Liquid Tank" .
2. Using a vise, secure liquid tank, and then remove refrigerant pressure sensor.

CAUTION:
When working, be careful not to damage condenser.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Apply compressor oil to the O-ring of the refrigerant pressure sensor when installing it.**
- **When recharging refrigerant, check for leaks.**

Removal and Installation of Evaporator

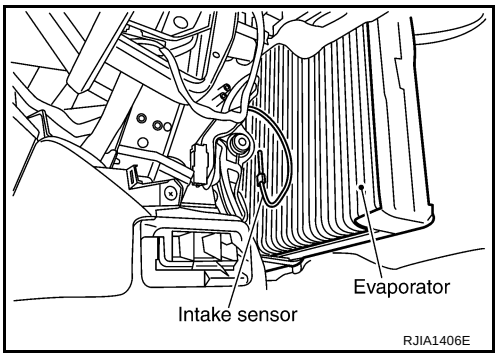
NJS00025

REMOVAL

1. Remove low-pressure pipe 1 and high-pressure pipe 2. Refer to ATC-131, "Removal and Installation of Low-pressure Pipe 1 and High-pressure Pipe 2" .

CAUTION:
Cap or wrap the joint of evaporator, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with suitable material such as vinyl tape to avoid the entry of air.

2. Slide evaporator, and then remove it from heater & cooling unit assembly.
3. Remove intake sensor from evaporator, and then remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

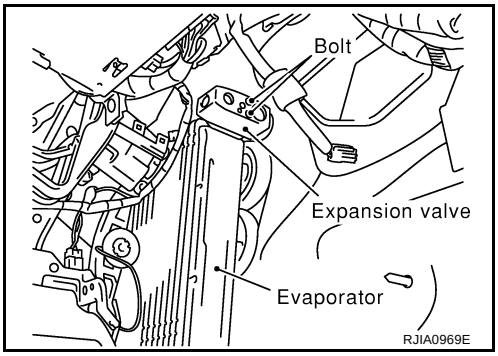
Removal and Installation of Expansion Valve

NJS00026

REMOVAL

1. Remove low-pressure pipe 1 and high-pressure pipe 2. Refer to ATC-131, "Removal and Installation of Low-pressure Pipe 1 and High-pressure Pipe 2" .
2. Remove mounting bolts, and then remove expansion valve.

CAUTION:
Cap or wrap the joint of evaporator with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of evaporator, expansion valve, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to them when installing them.**
- **O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).**
- **When recharging refrigerant, check for leaks.**

Checking for Refrigerant Leaks

NJS00027

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electrical leak detector or fluorescent dye leak detector (SST: J-42220).
If dye is observed, confirm the leak with an electrical leak detector. It is possible a prior leak was repaired and not properly cleaned.
When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.
When searching for refrigerant leaks using an electrical leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:
Moving the electrical leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

Checking System for Leaks Using the Fluorescent Leak Detector

NJS00028

1. Check A/C system for leaks using the UV lamp and safety goggles (SST: J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner (SST: J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electrical leak detector.

NOTE:
Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.
Clean with a dry cloth or blow off with shop air.
Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

Dye Injection

NJS00029

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm^2 , 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (SST: J-41459).
3. Connect the injector tool to the A/C low-pressure side service valve.
4. Start the engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool (SST: J-41459) (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service valve.

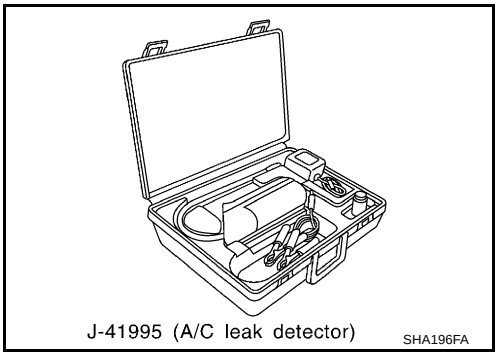
   CAUTION:
   Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.
7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.
8. Attach a blue label as necessary.

Electrical Leak Detector

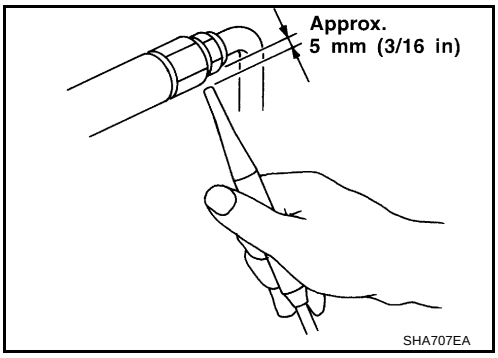
NJS0002A

PRECAUTIONS FOR HANDLING LEAK DETECTOR

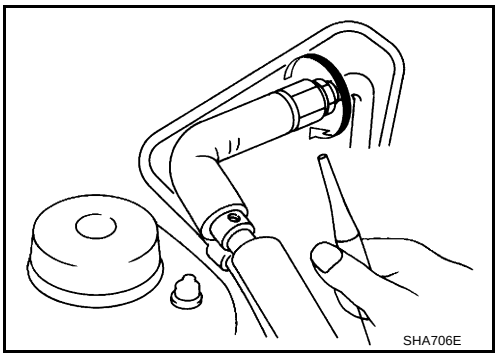
When performing a refrigerant leak check, use an A/C electrical leak detector (SST) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



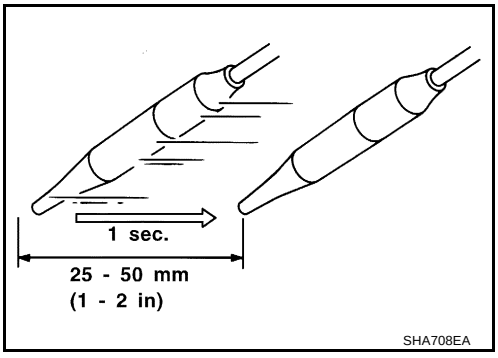
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Stop the engine.
2. Connect a suitable A/C manifold gauge set (SST:J-39183) to the A/C service valves.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm^2 , 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

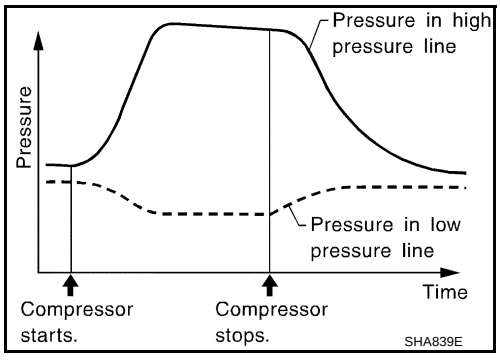
   NOTE:
   At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm^2 , 50 psi).
4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet g) to the low-pressure side (evaporator drain hose h to shaft seal l). Refer to ATC-125, "Components" . Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.

   Compressor
   Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.
   Condenser
   Check the fitting of high-pressure flexible hose and pipe.
   Liquid tank
   Check the fitting of refrigerant connection.
   Service valves
   Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

   NOTE:
   After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.
   Cooling unit (Evaporator)
   With engine OFF, turn blower fan on “High” for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer’s recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.
   Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.
5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
   If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;

a. A/C switch: ON
b. MODE door position: VENT (Ventilation)
c. Intake door position: Recirculation
d. Temperature setting: Max. cold
e. Fan speed: High

9. Run engine at 1,500 rpm for at least 2 minutes.
10. Stop the engine and perform leak check again following steps 4 through 6 above.
    Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.



11. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery/recycling recharging equipment. Repair the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Perform A/C performance test to ensure system works properly.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Compressor

NJS0002B

Model		VALEO THERMAL SYSTEMS JAPAN make DCS-17IC
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Max.	171 (10.4)
Cylinder bore × stroke mm (in)		32 (1.26) × 30.5 (1.20)
Direction of rotation		Clockwise (viewed from drive end)
Drive belt		Poly V

Lubricant

NJS0002C

Model		VALEO THERMAL SYSTEMS JAPAN make DCS-17IC
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity m ℓ (US fl oz, lmp fl oz)	Total in system	150 (5.07, 5.3)
	Compressor (Service part) charging amount	150 (5.07, 5.3)

Refrigerant

NJS0002D

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.55 (1.21)

Engine Idling Speed

NJS0002E

Refer to EC-718, "Idle Speed and Ignition Timing" .

Belt Tension

NJS0002F

Refer to EM-12, "DRIVE BELTS" .

SECTION AV

AUDIO VISUAL, NAVIGATION & TELEPHONE SYSTEM

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Wiring Diagram — H/PHONE — 104
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Self-Diagnosis Function 111
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ERROR ITEM (ERROR NAME) 113
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INSTALLATION 115

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS000C3

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS000C4

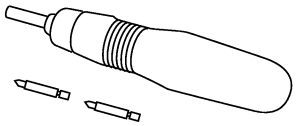
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

PREPARATION

PFP:00002

Commercial Service Tools

NKS000C6

Tool name	Description
Power tool  PBIC0191E	Loosening bolts and nuts

AUDIO

PFP:28111

System Description

NKS000C7

BASE SYSTEM

For Audio System operation information, refer to Owner's Manual.
Power is supplied at all times

- through 15 A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6.

With the ignition switch in the ACC or ON position, power is supplied

- through 10 A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10.

Ground is supplied through the case of the audio unit.
When audio switch is pressed, audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to terminals 1 and 2 of driver door speaker and passenger door speaker
- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side).

When one of steering switch is pressed to volume up, seek up, or mode ON, resistance in steering switch circuit changes depending on which button is pressed.
When one of steering switch is pressed to volume down, seek down, or power ON, resistance in steering switch circuit changes depending on which button is pressed.

BOSE SYSTEM (COUPE MODELS)

CD auto changer (built into audio unit) operation is controlled by audio unit.
Refer to owner's manual for the system operation.
Power is supplied at all times

- through 15 A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6
- to BOSE speaker amp. terminal 11
- to satellite radio tuner terminal 32,
- through 15 A fuse [No. 17, located in the fuse block (J/B)]
- to woofer amp. terminal 8.

With the ignition switch in the ACC or ON position, power is supplied

- through 10 A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10
- to satellite radio tuner terminal 36,
- through audio unit terminal 12
- to BOSE speaker amp. terminal 41,
- through BOSE speaker amp. terminal 32
- to woofer amp. terminal 6.

Ground is supplied through the case of the audio unit.
Ground is also supplied

- to BOSE speaker amp. terminal 27
- to woofer amp. terminal 7
- through body grounds B5, B6, D105 and T14.

When audio switch is pressed, audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to BOSE speaker amp. terminals 33, 34, 35, 36, 37, 38, 39 and 40.

Audio signals are amplified by the BOSE speaker amp.
The amplified audio signals are supplied

- through BOSE speaker amp. terminals 12, 19, 20, 21, 22, 23, 24, 25, 26 and 28
- to terminals 1 and 2 of driver door speaker and passenger door speaker

- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side)
- to terminals 1 and 2 of woofer amp.

Audio signals are amplified by the woofer amp.
The amplified audio signals are supplied

- through woofer amp. terminals 3 and 4
- to terminals 1 and 2 of woofer.

When one of steering switch is pressed to volume up, seek up, or mode ON, resistance in steering switch circuit changes depending on which button is pressed.
When one of steering switch is pressed to volume down, seek down, or power ON, resistance in steering switch circuit changes depending on which button is pressed.

BOSE SYSTEM (ROADSTER MODELS)

CD auto changer (built into audio unit) operation is controlled by audio unit.
Refer to owner's manual for the system operation.
Power is supplied at all times

- through 15 A fuse [No. 37, located in the fuse and fusible link box]
- to audio unit terminal 6
- to BOSE speaker amp. terminal 11,
- through 15 A fuse [No. 17, located in the fuse block (J/B)]
- to woofer amp. terminal 8.

With the ignition switch in the ACC or ON position, power is supplied

- through 10 A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10,
- through audio unit terminal 12
- to BOSE speaker amp. terminal 41,
- through BOSE speaker amp. terminal 32
- to woofer amp. terminal 6.

Ground is supplied through the case of the audio unit.
Ground is also supplied

- to BOSE speaker amp. terminal 27
- to woofer amp. terminal 7
- through body grounds B5, B6 and T14.

When audio switch is pressed, audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to BOSE speaker amp. terminals 33, 34, 35, 36, 37, 38, 39 and 40.

Audio signals are amplified by the BOSE speaker amp.
The amplified audio signals are supplied

- through BOSE speaker amp. terminals 12, 19, 20, 21, 22, 23, 24, 25, 26 and 28
- to terminals 1 and 2 of driver door speaker and passenger door speaker
- to terminals 1 and 2 of rear speaker LH and RH
- to terminals 1 and 2 of tweeter (driver side) and tweeter (passenger side)
- to terminals 1 and 2 of woofer amp.

Audio signals are amplified by the woofer amp.
The amplified audio signals are supplied

- through woofer amp. terminals 3 and 4
- to terminals 1 and 2 of woofer.

When one of steering switch is pressed to volume up, seek up, or mode ON, resistance in steering switch circuit changes depending on which button is pressed.
When one of steering switch is pressed to volume down, seek down, or power ON, resistance in steering switch circuit changes depending on which button is pressed.

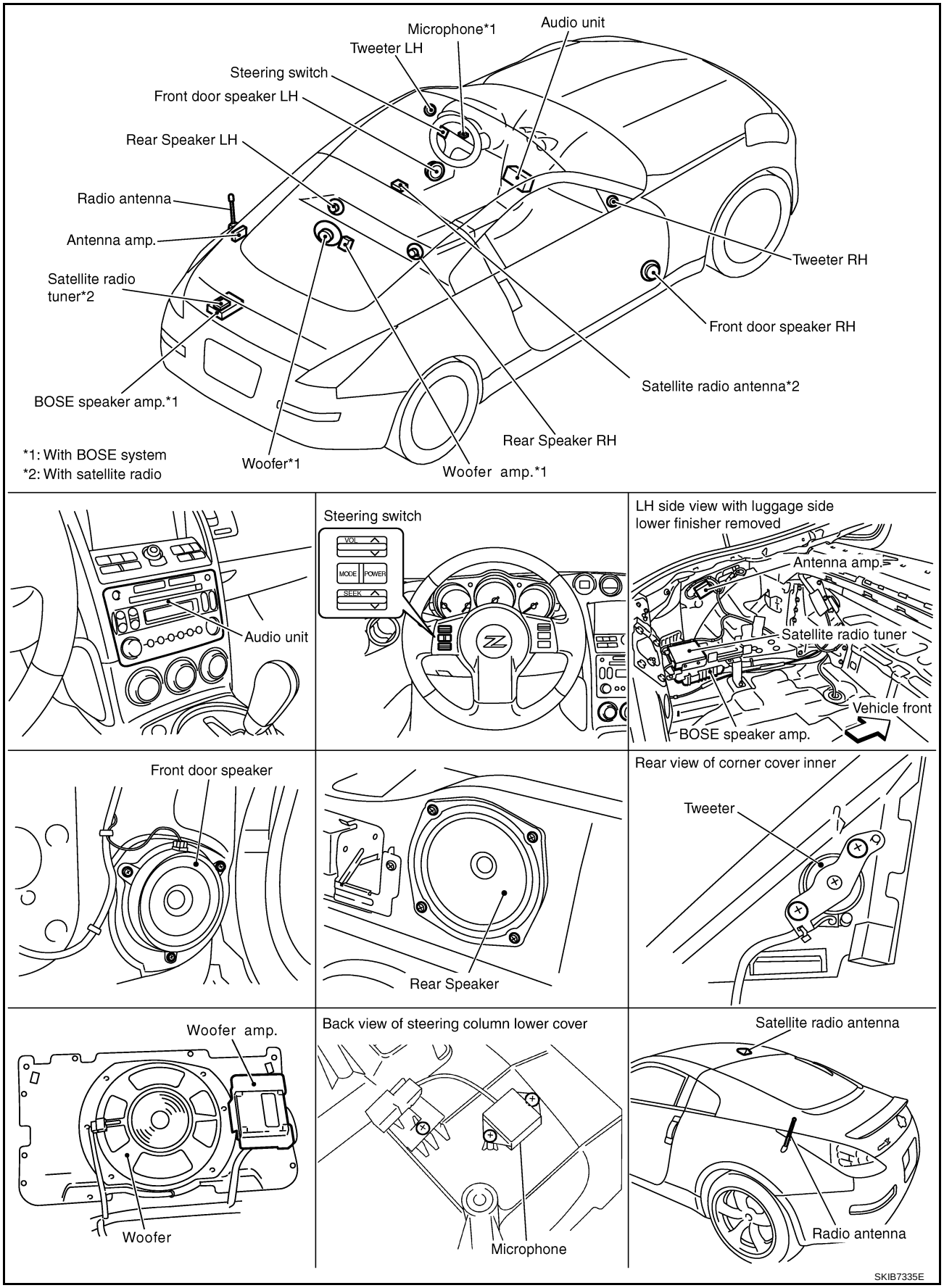
AudioPilot® System

AudioPilot® is the sound improving system that picks up by a microphone under the steering any noises or the sound of music coming into the vehicle, and that uses the BOSE speaker amp. to revise the frequency feature of music in real time in response to the frequency feature of the noise while driving and listening to music.

- If low frequency area noise from vehicle is loud, it adjusts low frequency element of music to be bigger than vehicle noise.
- If high frequency area noise from vehicle is loud, it adjusts high frequency element of music to be bigger than vehicle noise.
- If vehicle noise is smaller than the setting volume, correction is not performed.

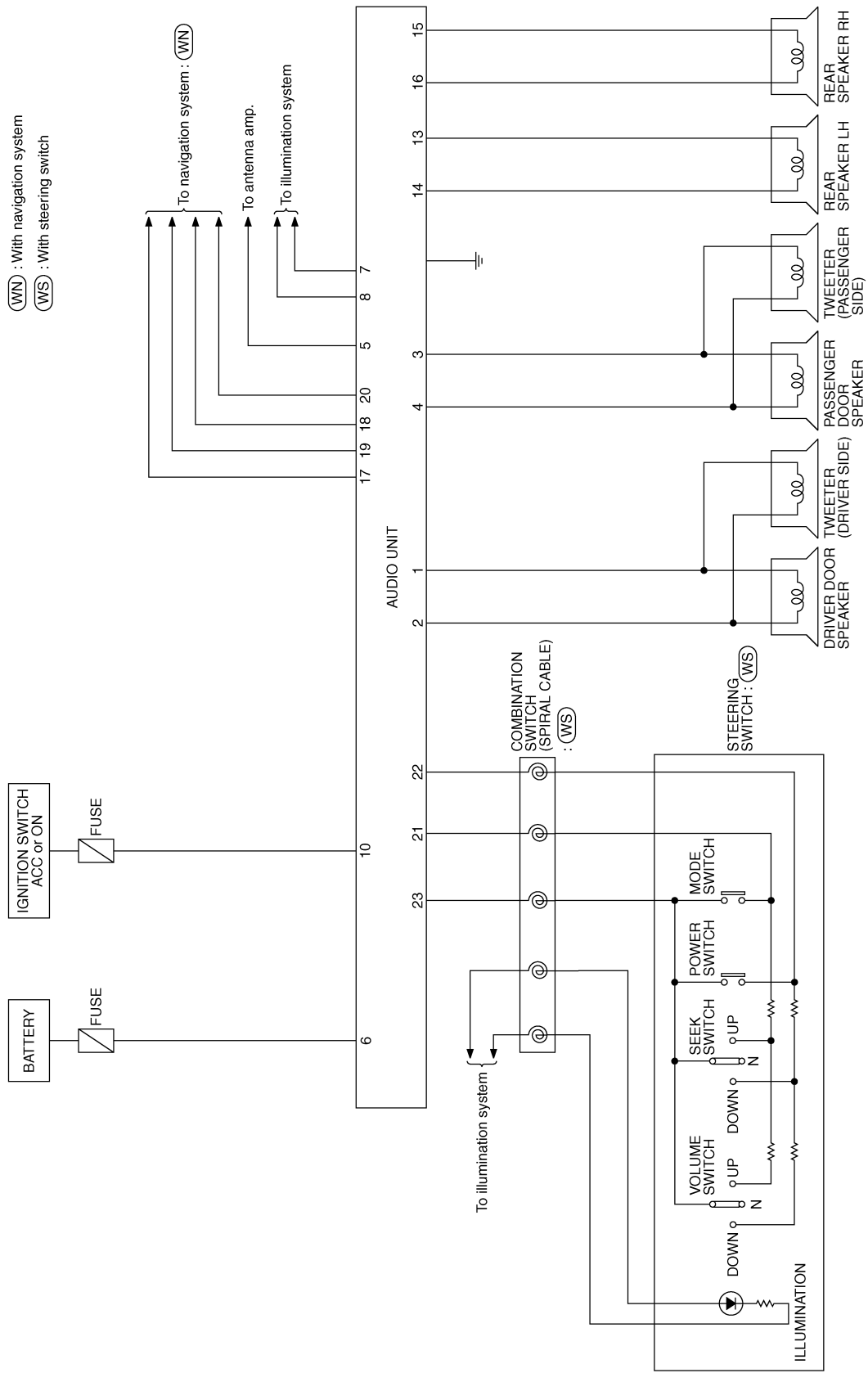
Component Parts Location

NKS000C8



Schematic / Base System

NKS000C9

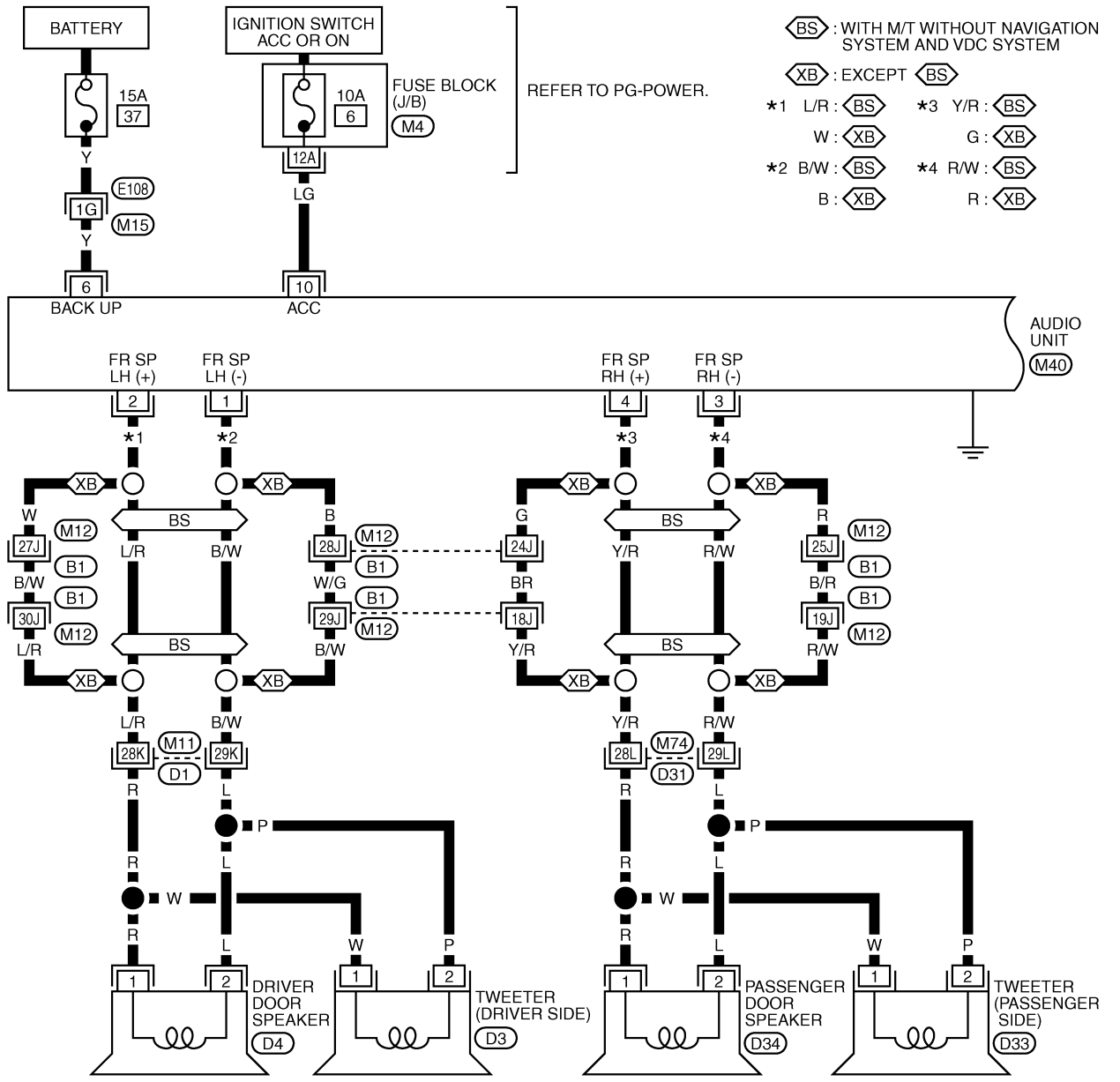


TKWT4061E

Wiring Diagram — AUDIO — / Base System

NKS000CA

AV-AUDIO-01



BS : WITH M/T WITHOUT NAVIGATION SYSTEM AND VDC SYSTEM

XB : EXCEPT BS

*1 L/R : BS, W : XB

*2 B/W : BS, B : XB

*3 Y/R : BS, G : XB

*4 R/W : BS, R : XB

M40 W

D3 BR, D33 BR

D4 W, D34 W

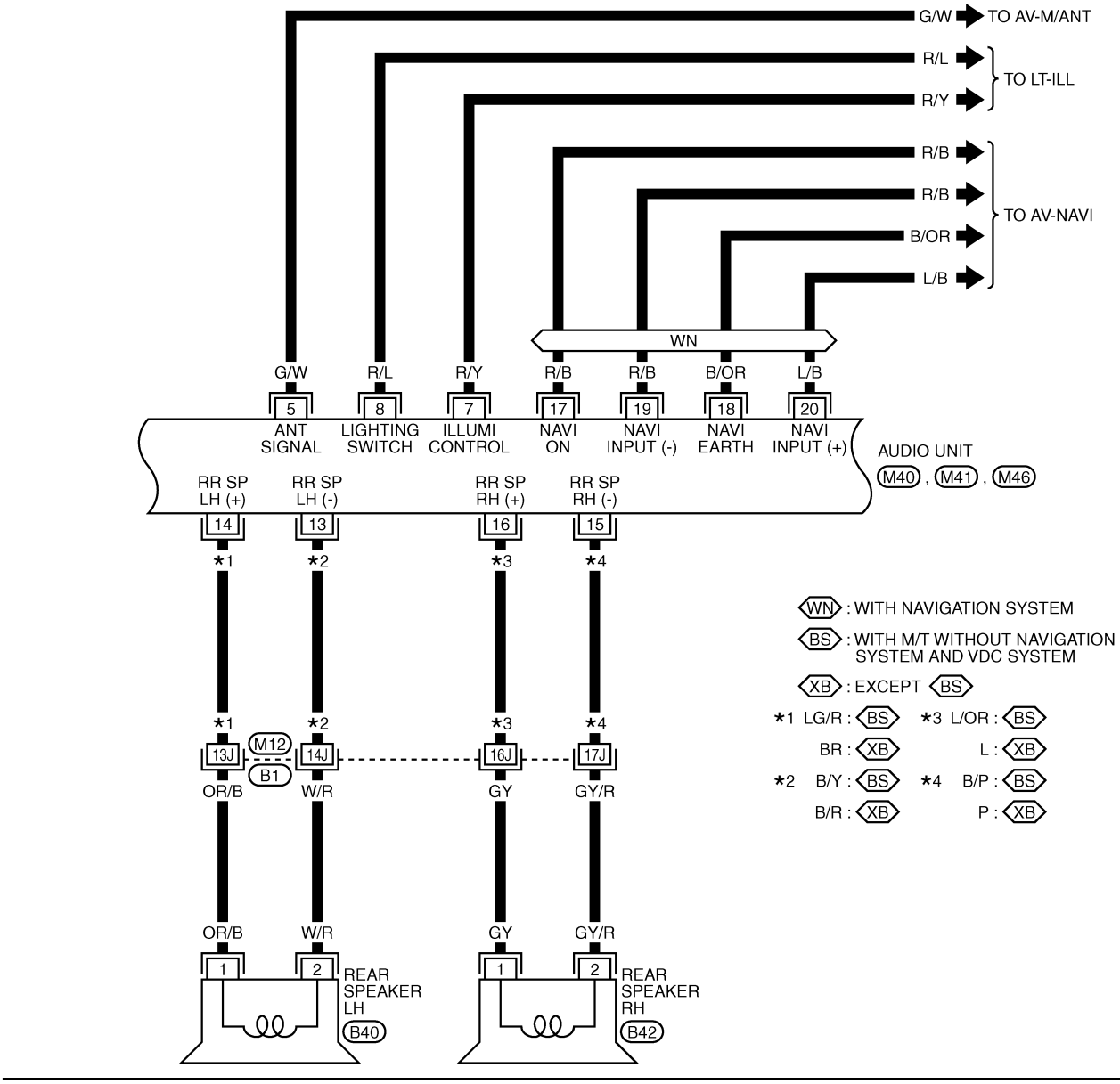
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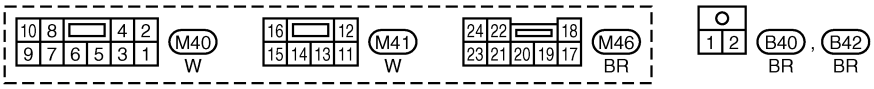
E108, B1, D1, D31 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5785E

AV-AUDIO-02



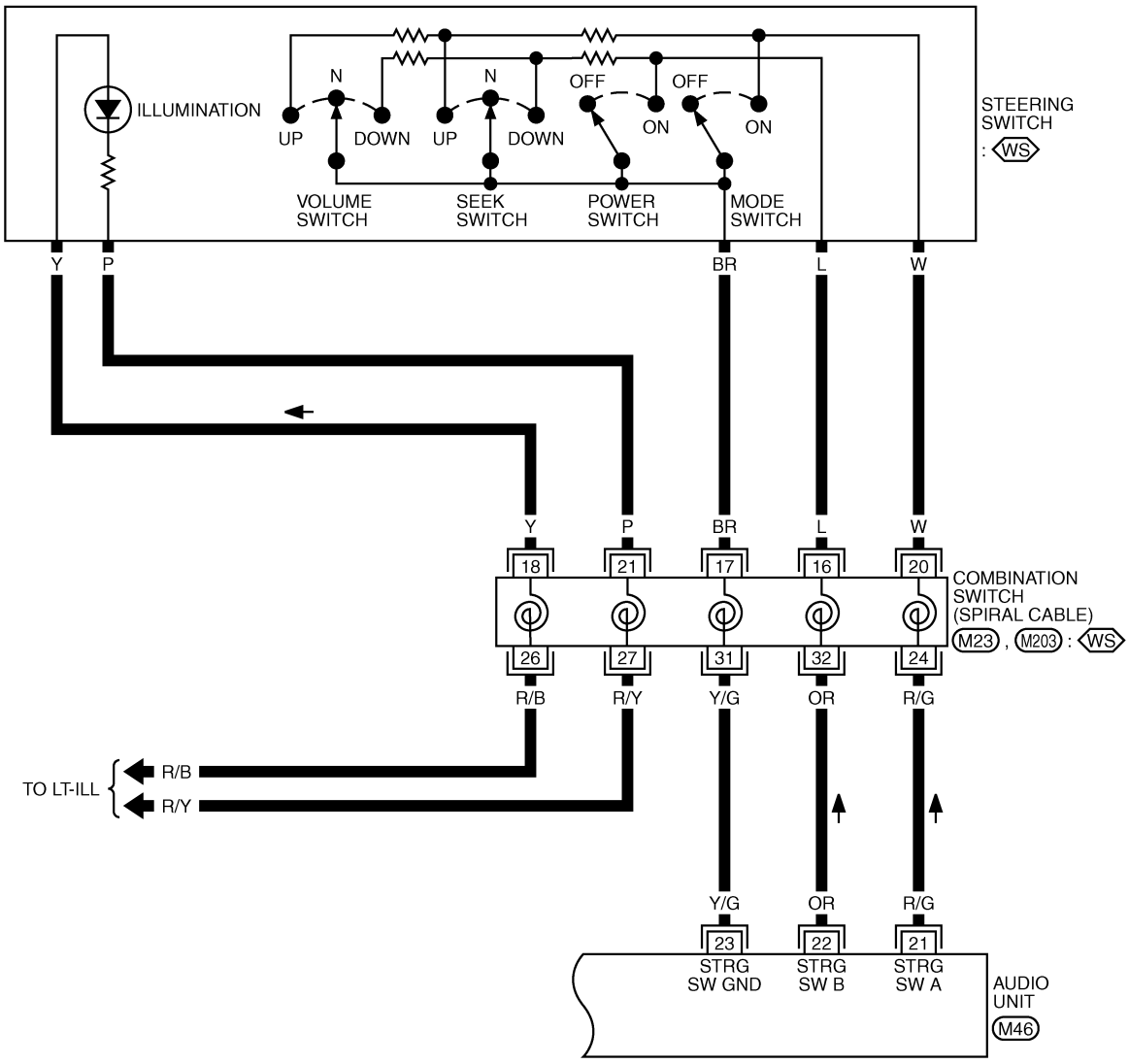


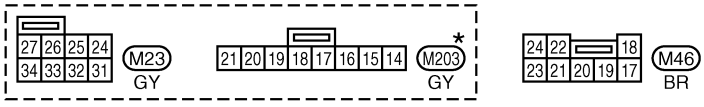
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5648E

AV-AUDIO-03

WS : WITH STEERING SWITCH



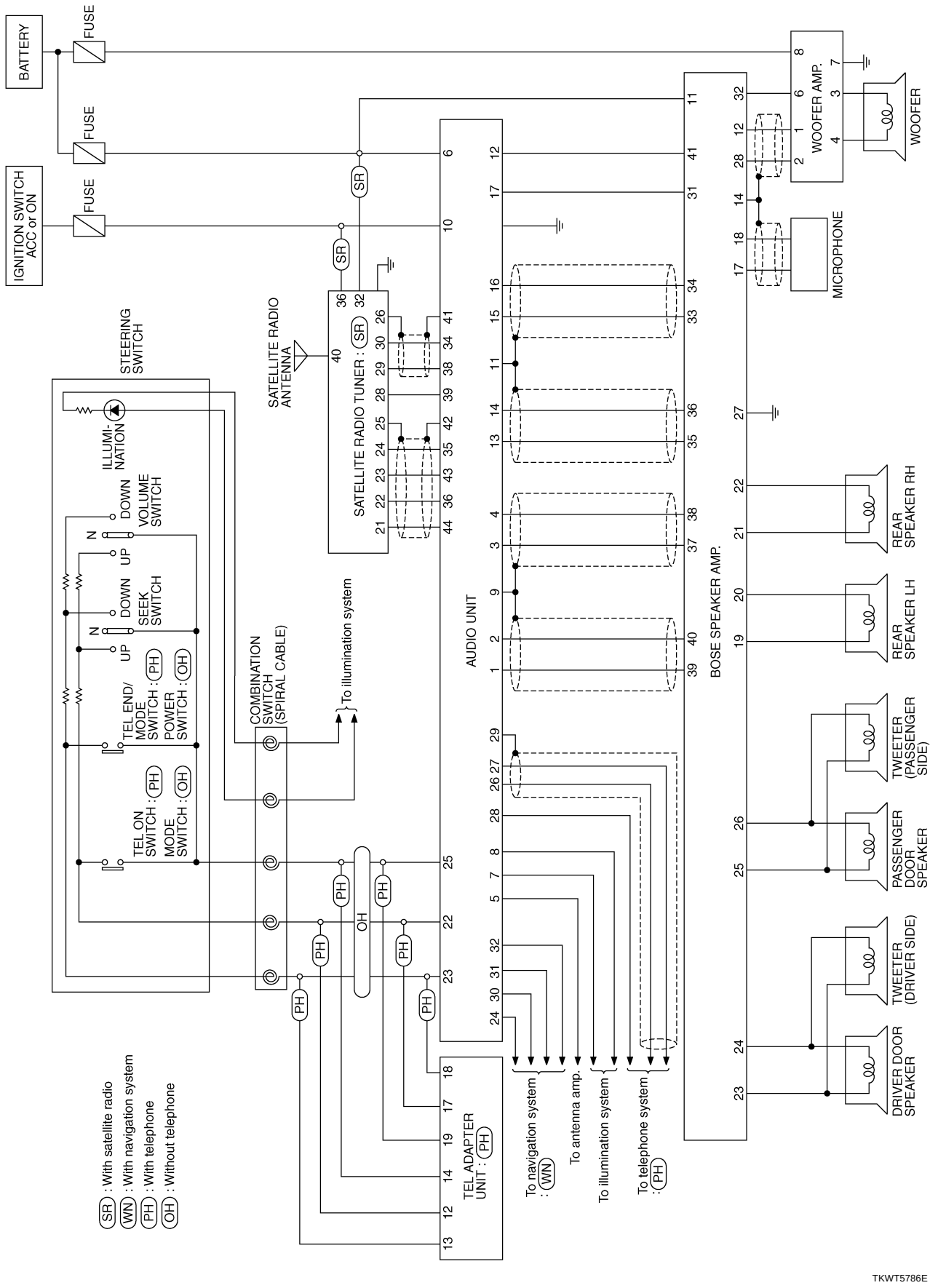


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5649E

Schematic / BOSE System

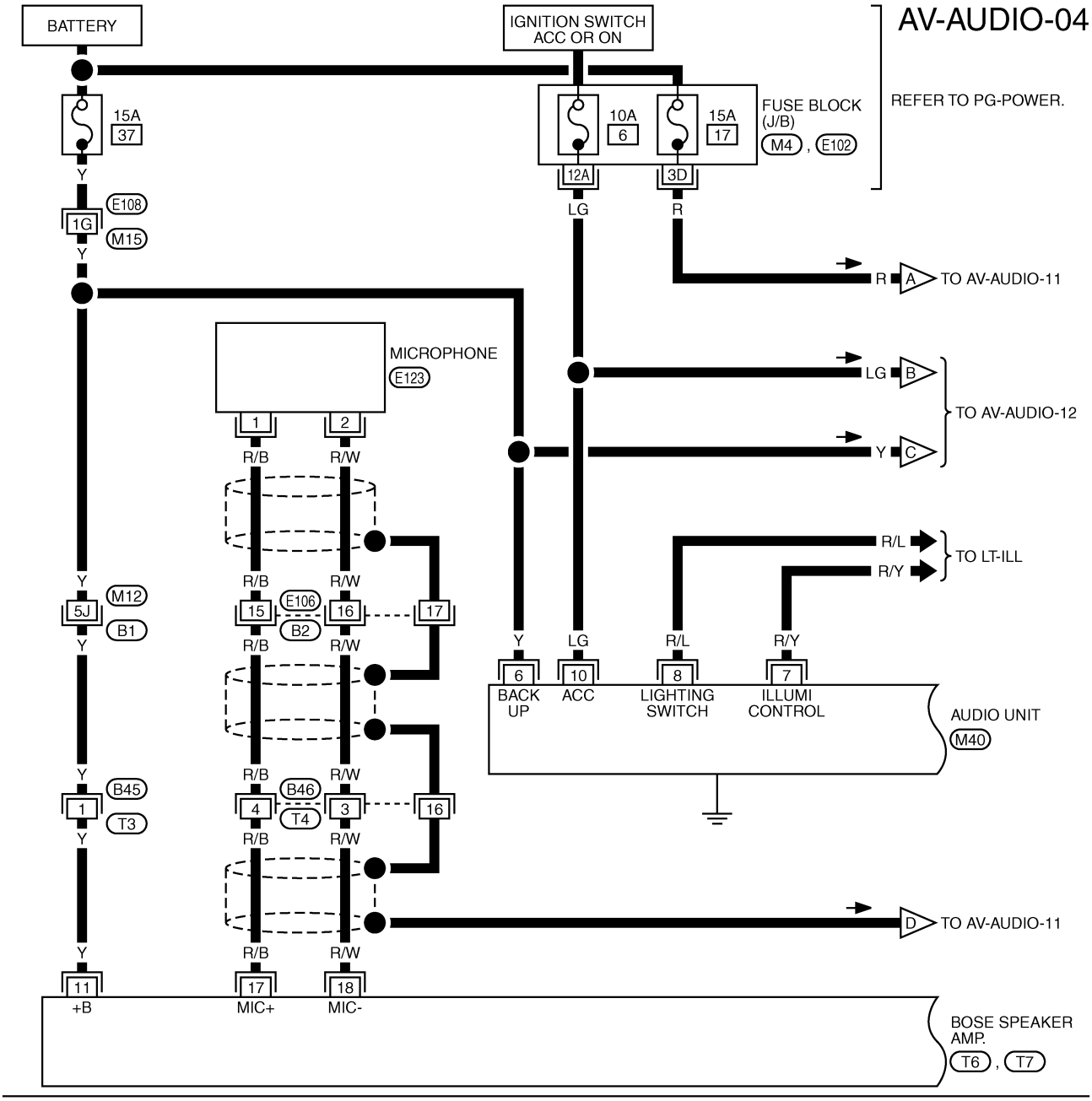
NKS002B6

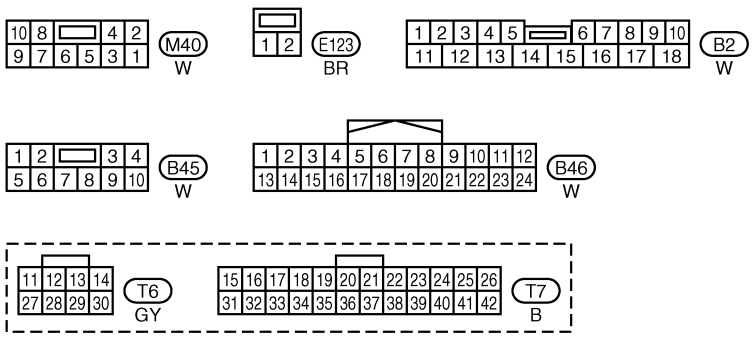


TKWT5786E

Wiring Diagram — AUDIO — / BOSE System (Coupe Models)

NKS004SV





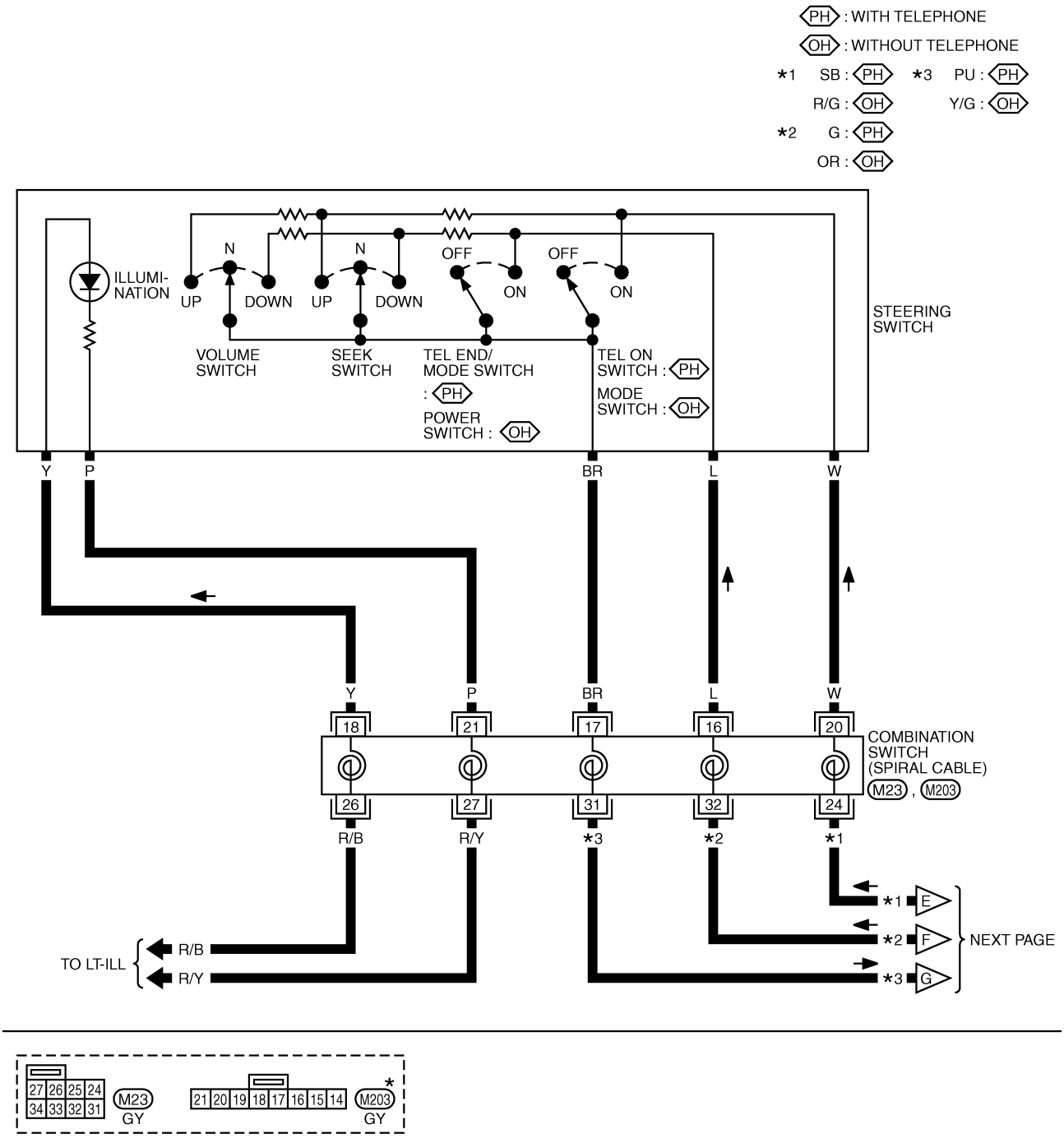
REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5787E

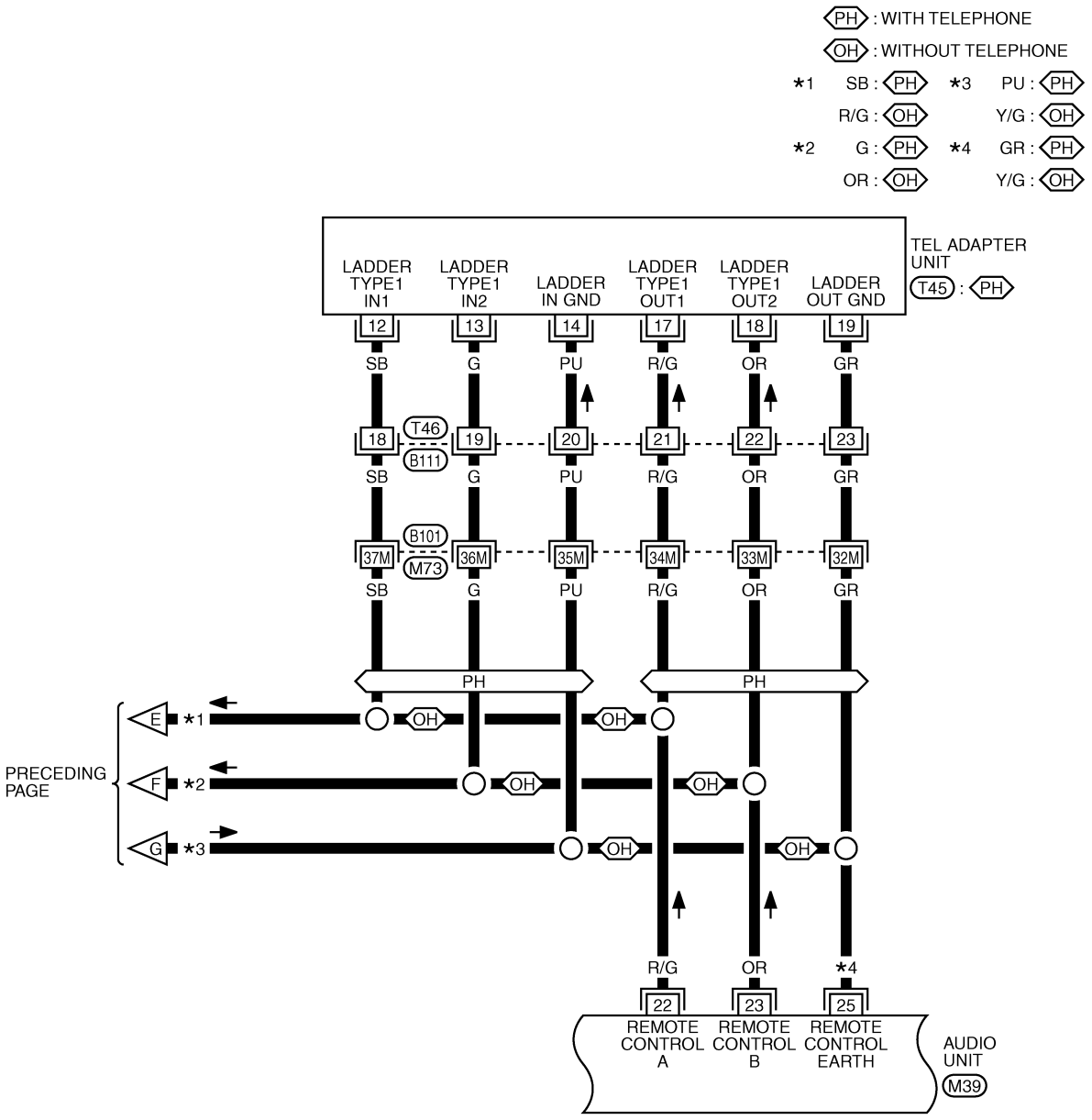
AV-AUDIO-05

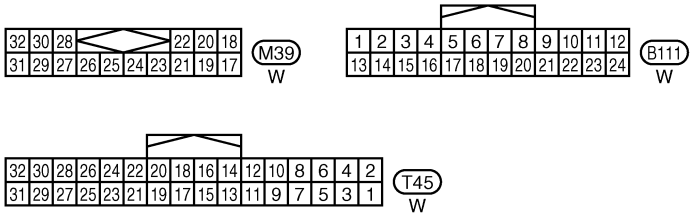


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5788E

AV-AUDIO-06



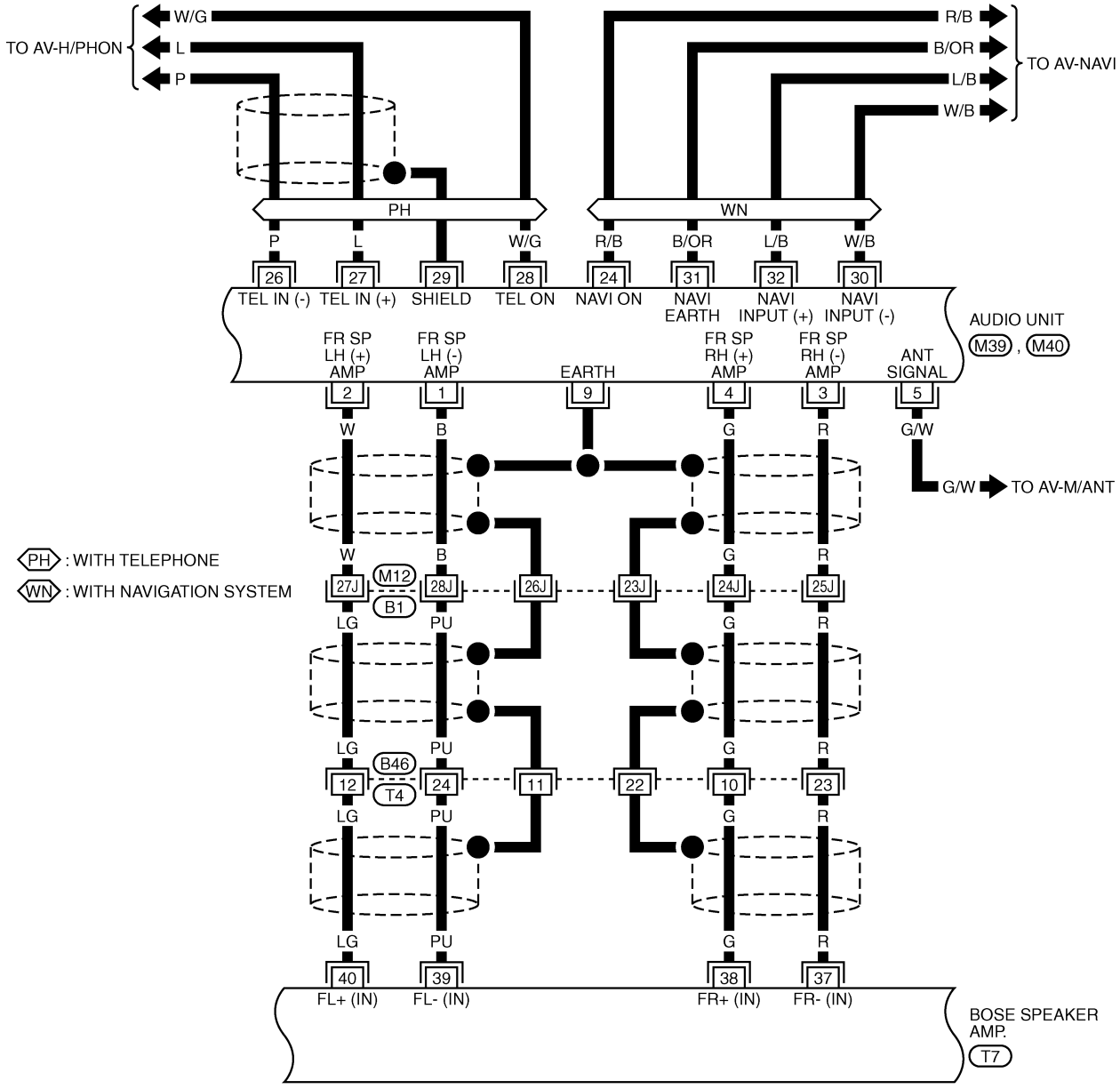


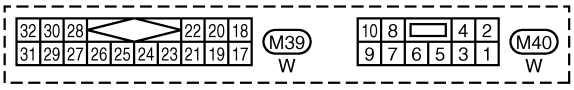
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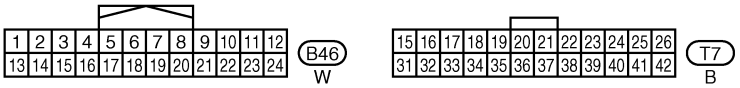
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5789E

AV-AUDIO-07





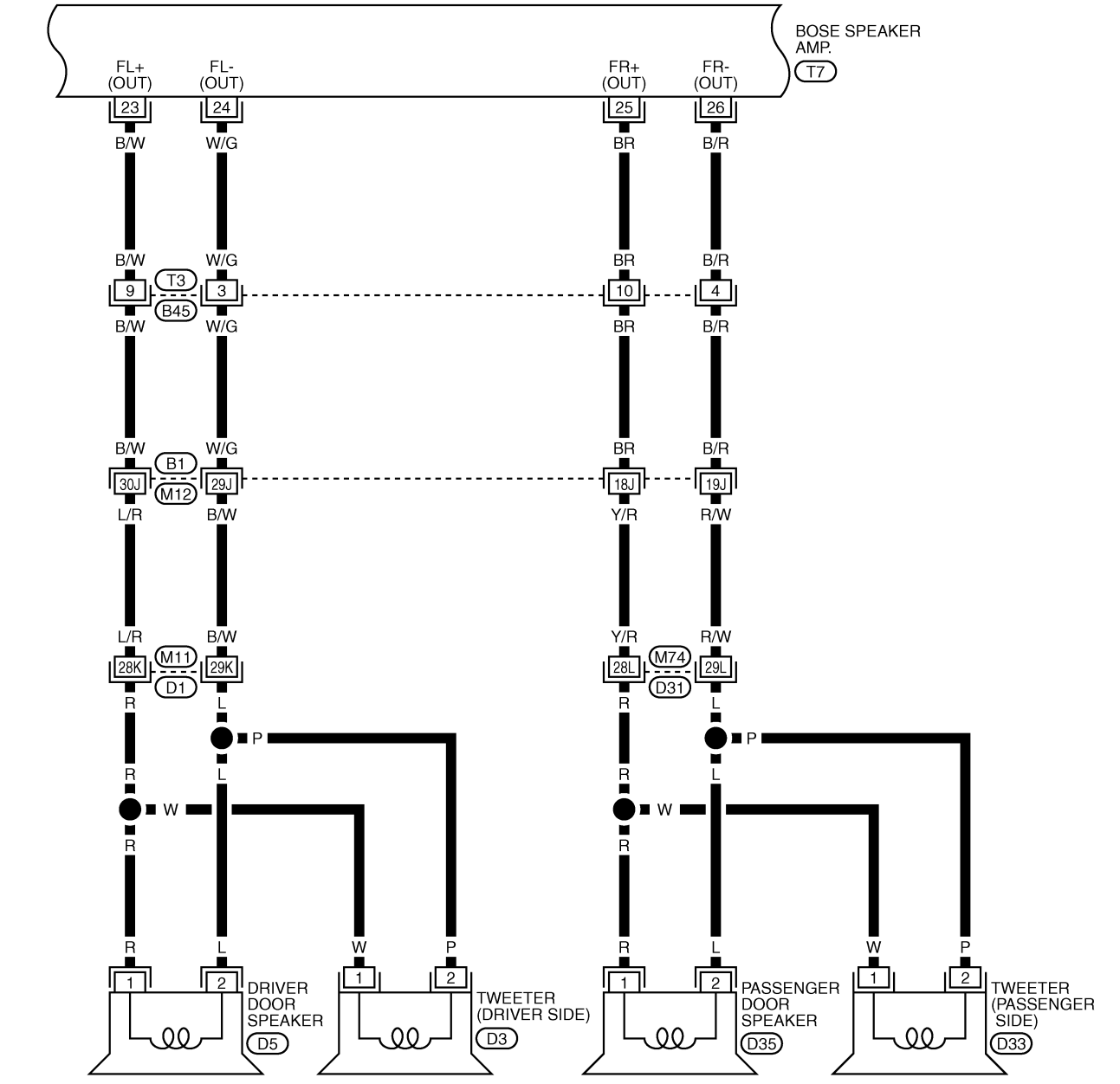


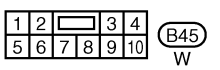
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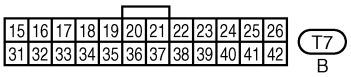
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5790E

AV-AUDIO-08







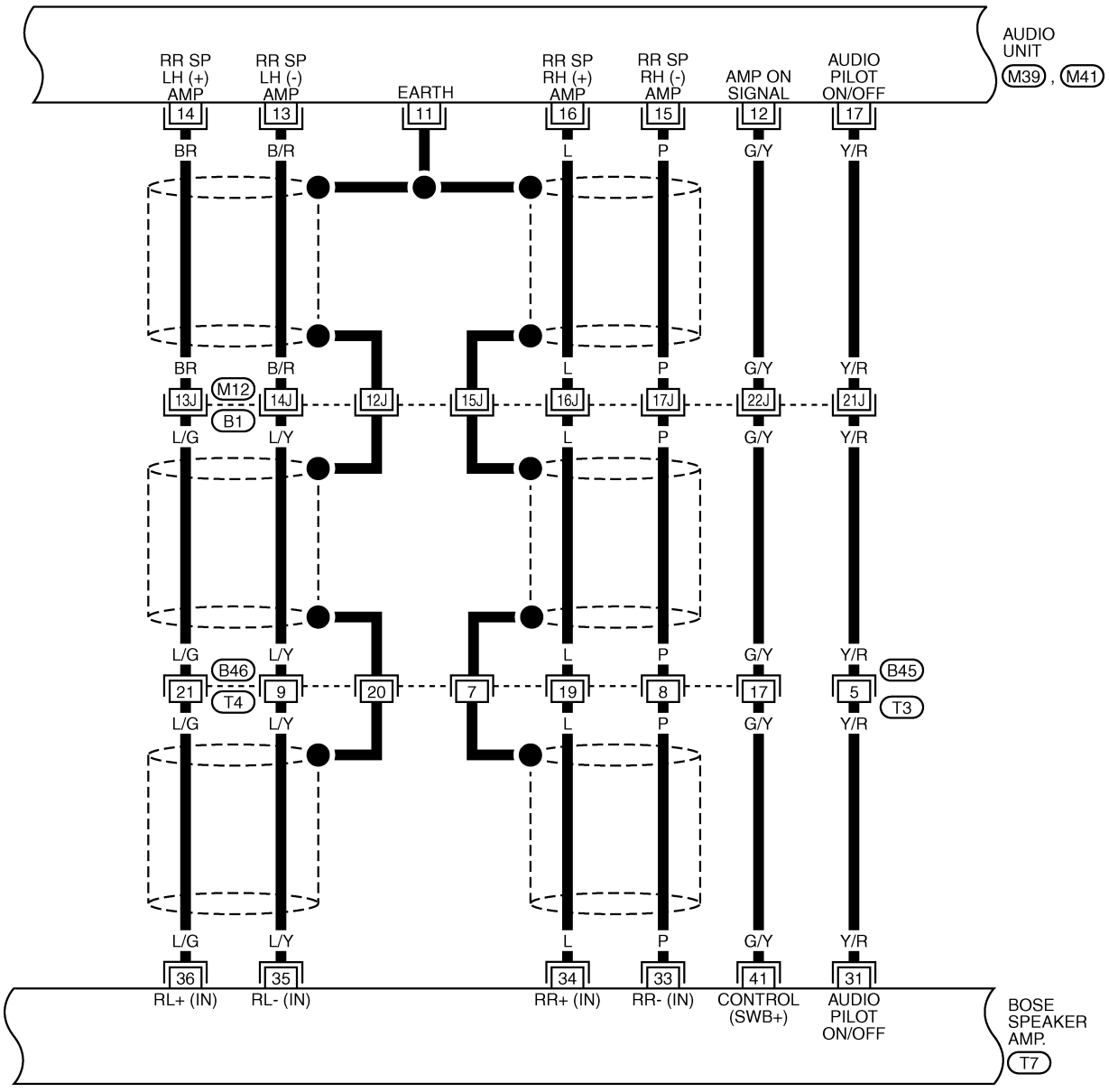


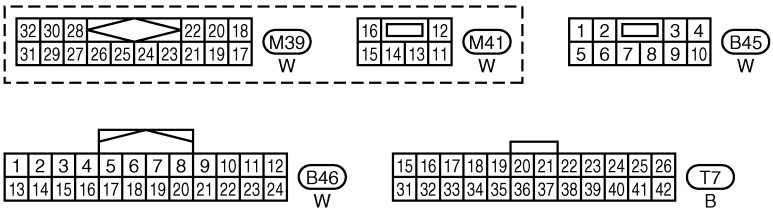


REFER TO THE FOLLOWING.
B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5791E

AV-AUDIO-09



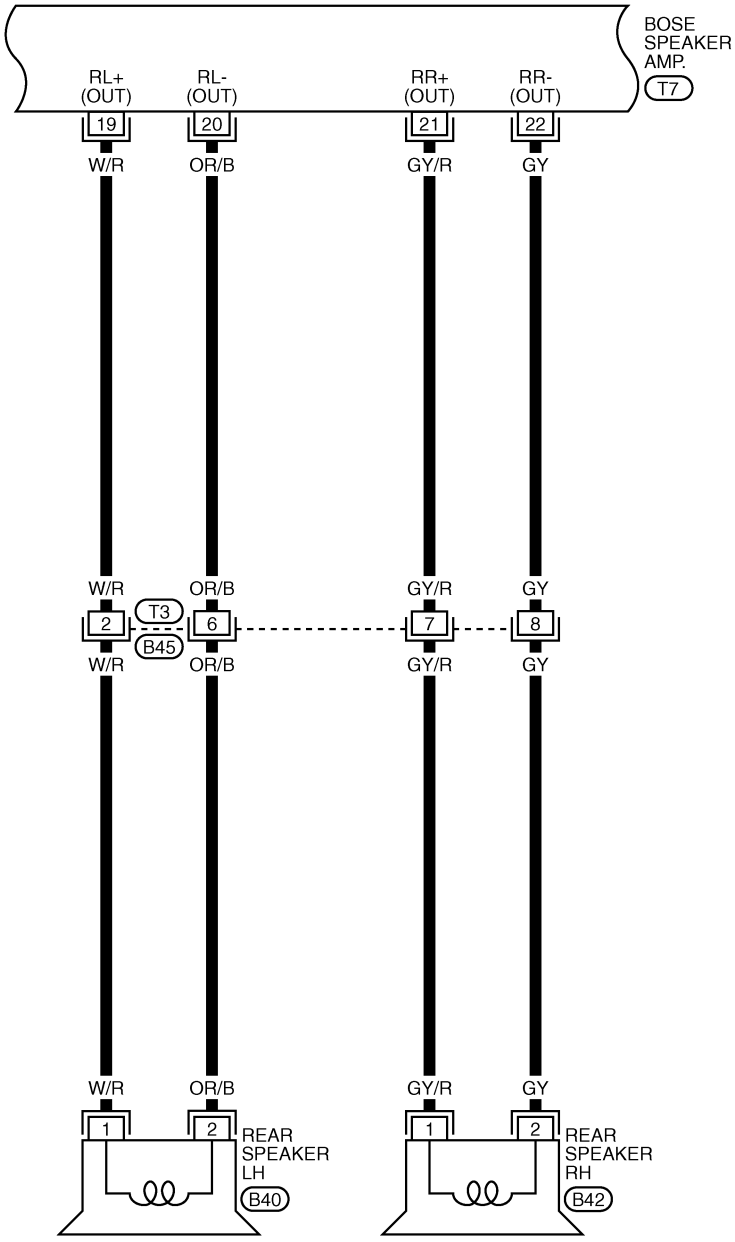


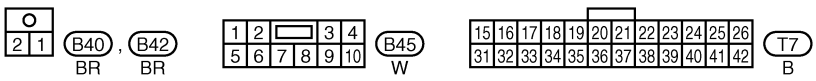
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5792E

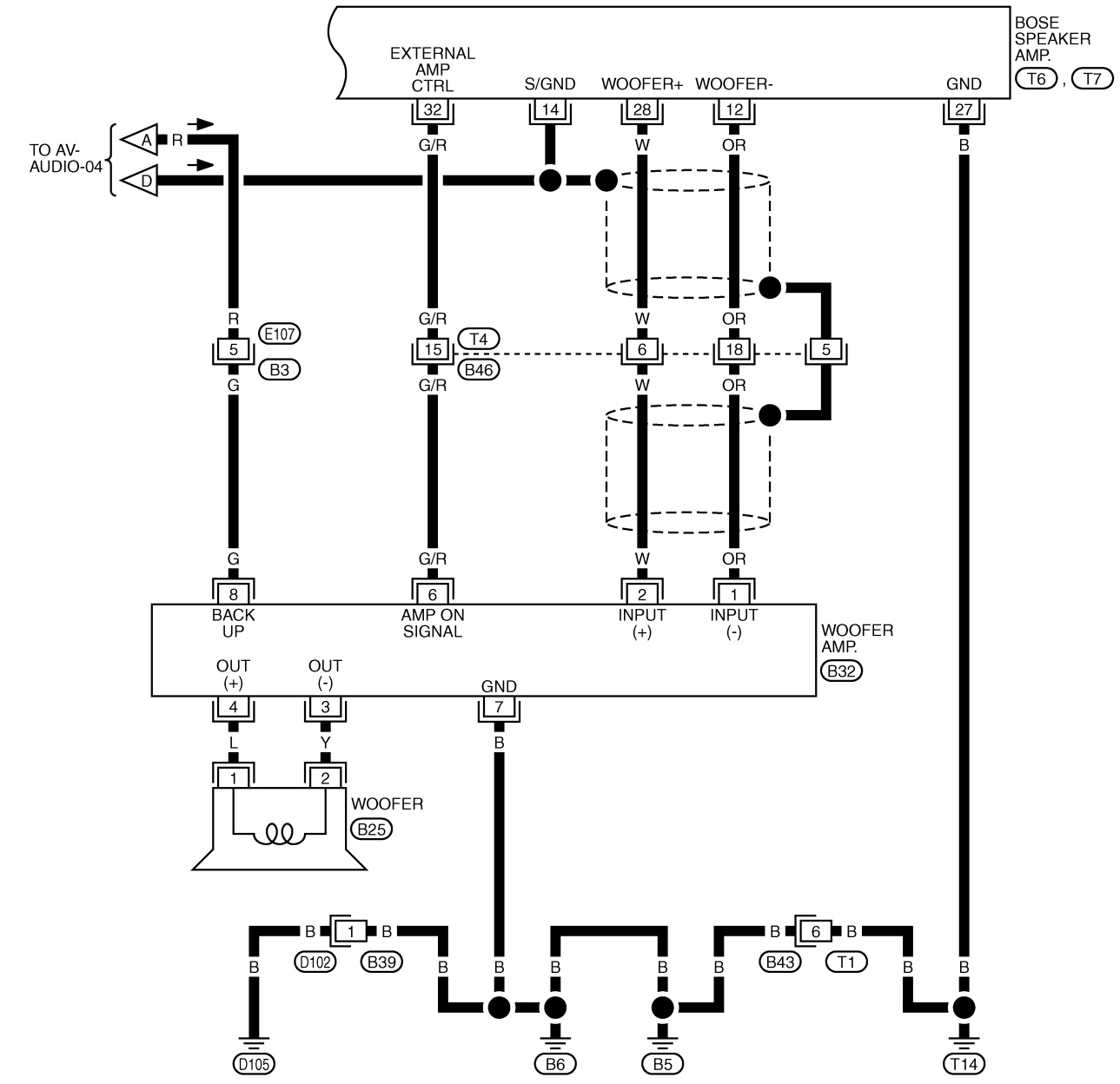
AV-AUDIO-10

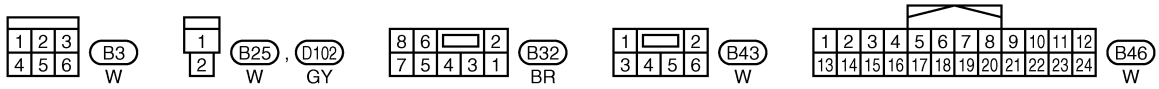


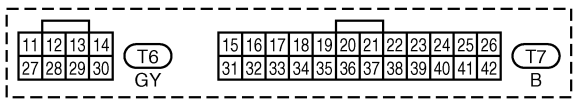


TKWT5793E

AV-AUDIO-11



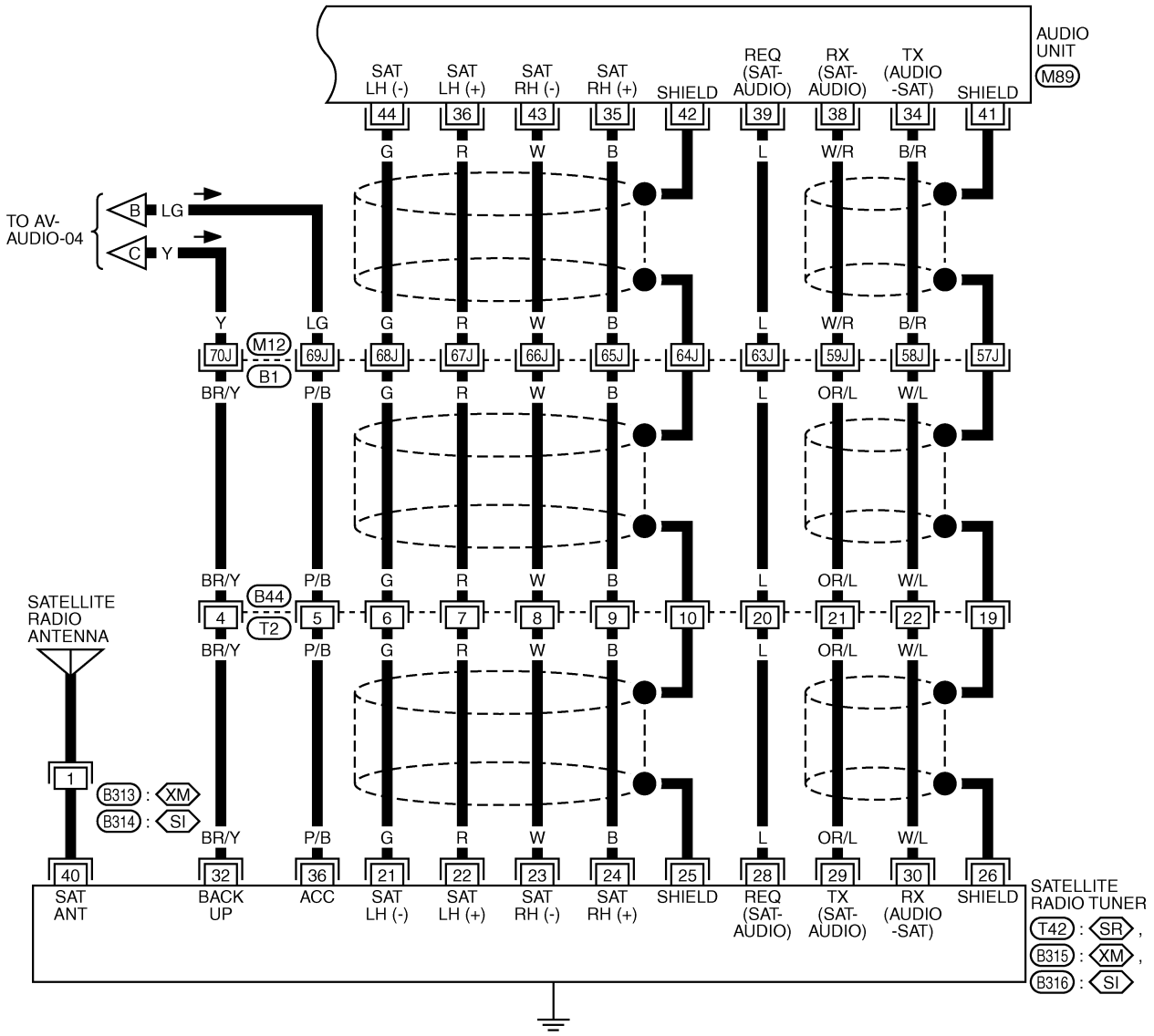


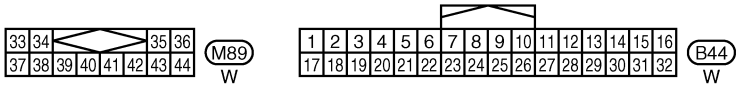


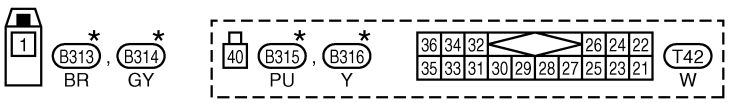
TKWT5794E

AV-AUDIO-12

SR : WITH SATELLITE RADIO
XM : WITH SATELLITE RADIO (XM)
SI : WITH SATELLITE RADIO (SIRIUS)







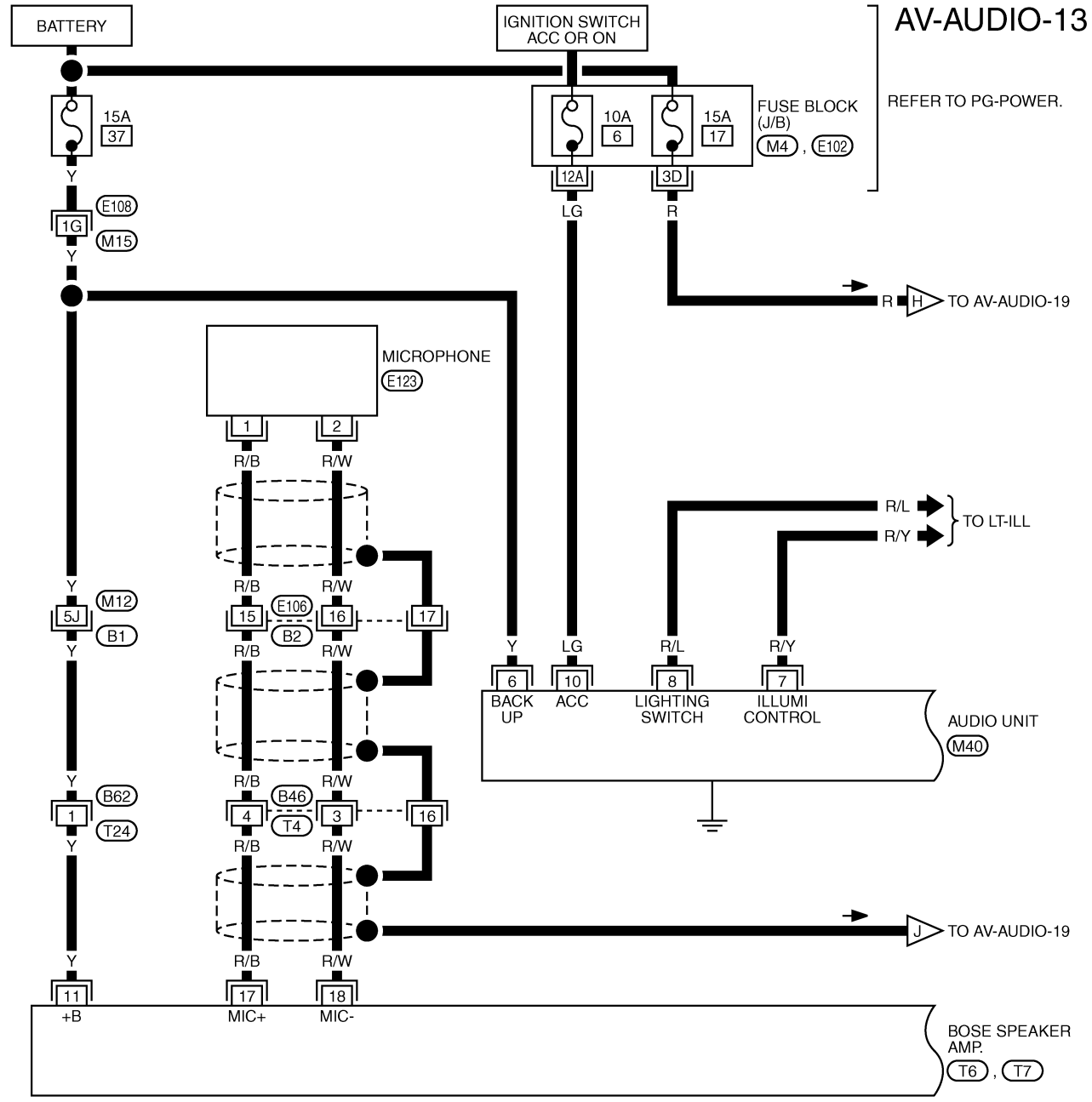
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

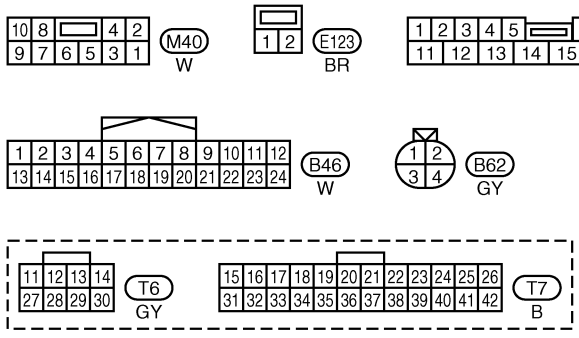
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5795E

Wiring Diagram — AUDIO — / BOSE System (Roadster Models)

NKS004SW



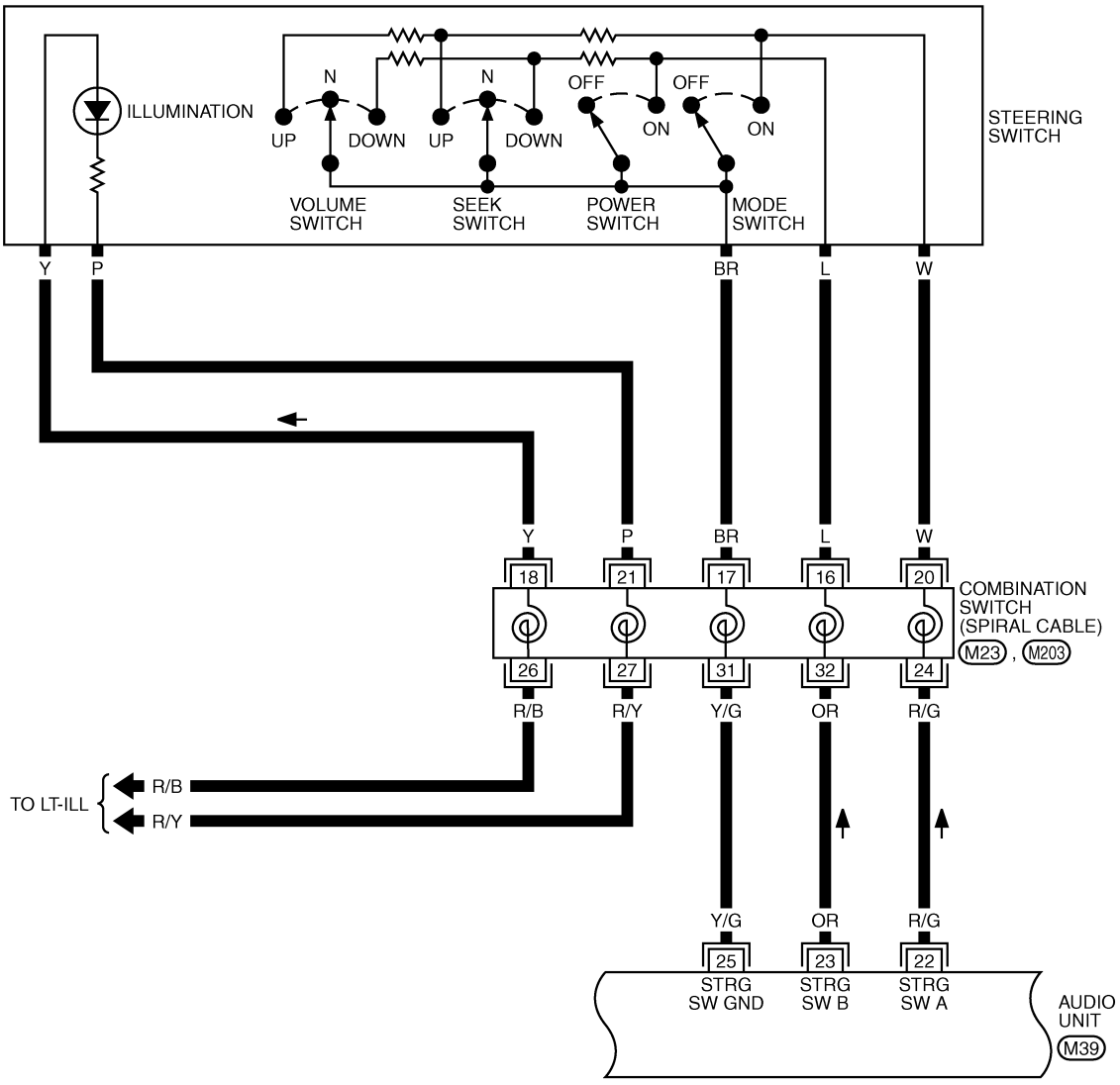


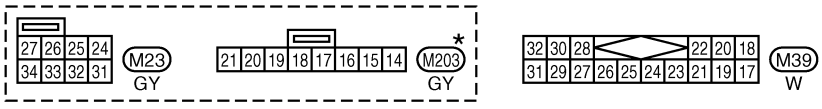
REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5796E



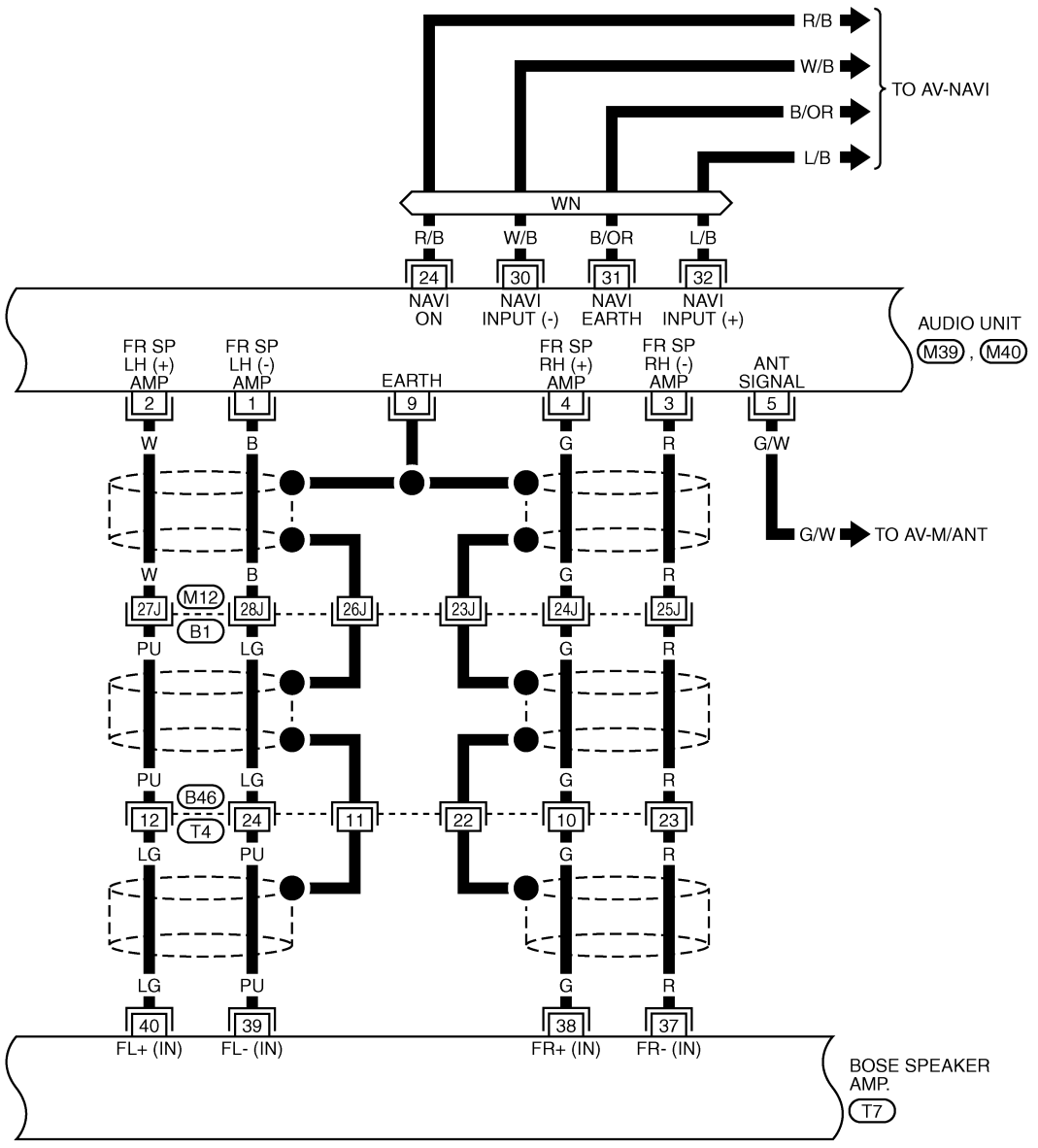


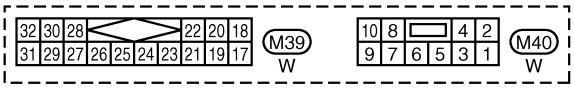
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

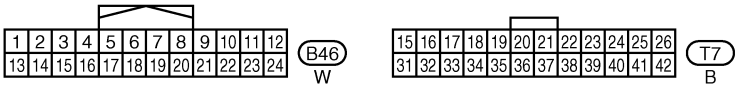
TKWT5797E

AV-AUDIO-15

WN : WITH NAVIGATION SYSTEM



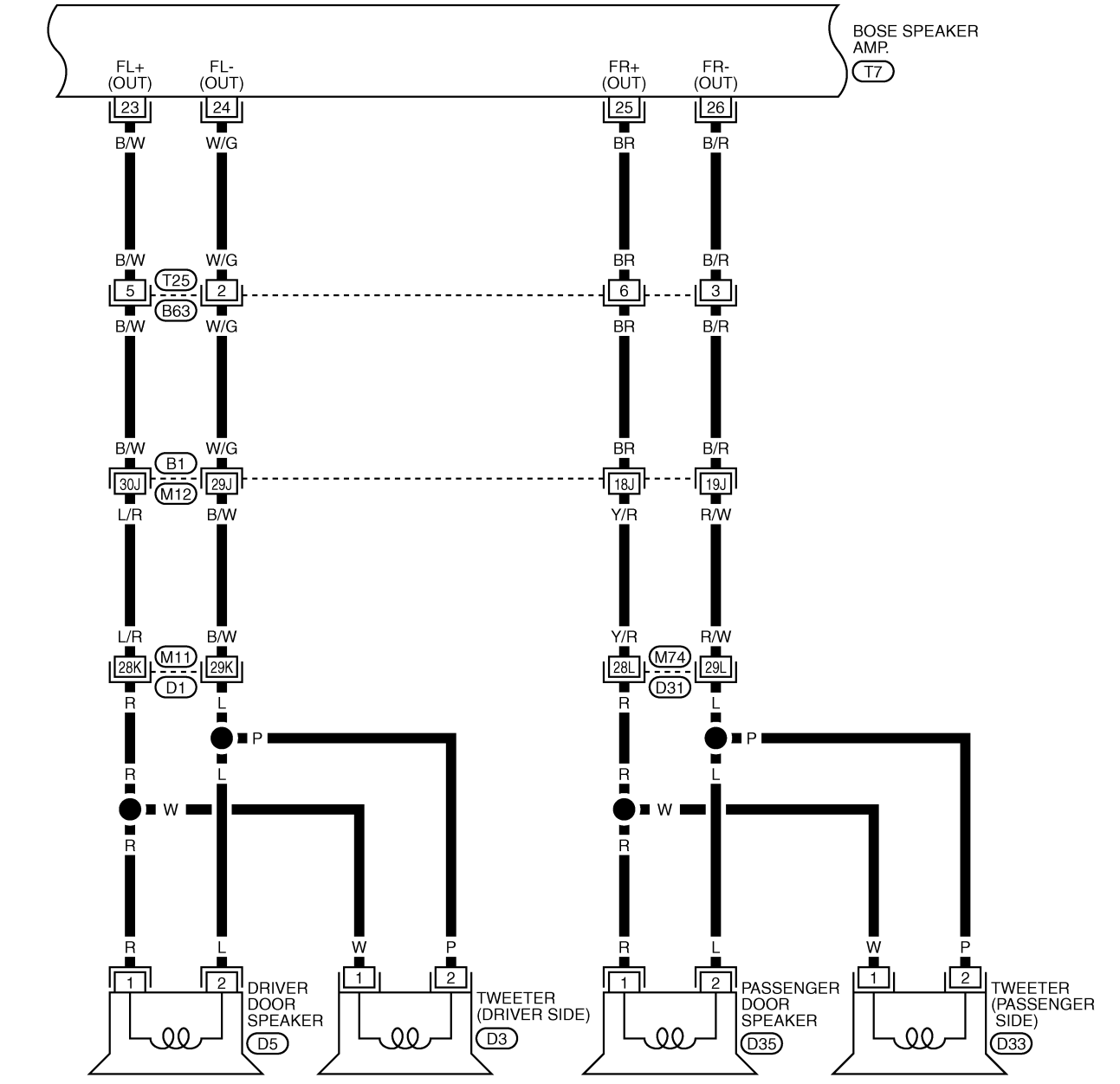


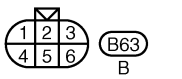


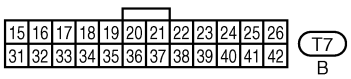
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

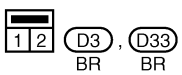
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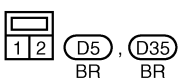
AV-AUDIO-16







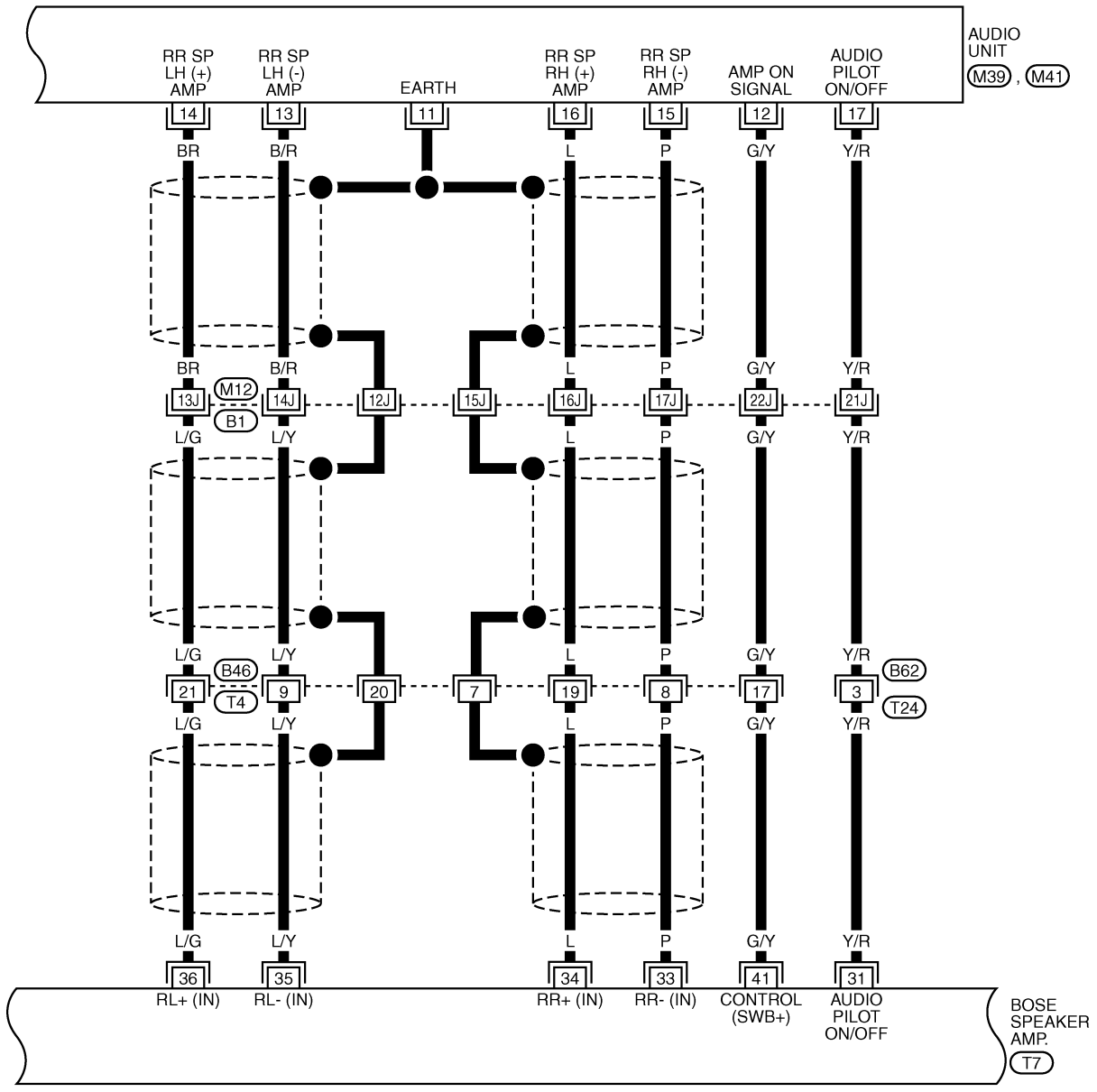


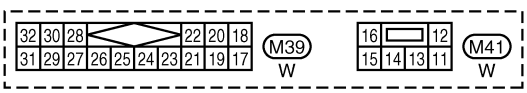


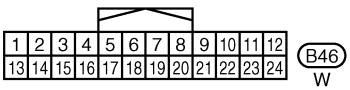
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B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

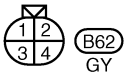
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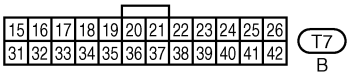
AV-AUDIO-17







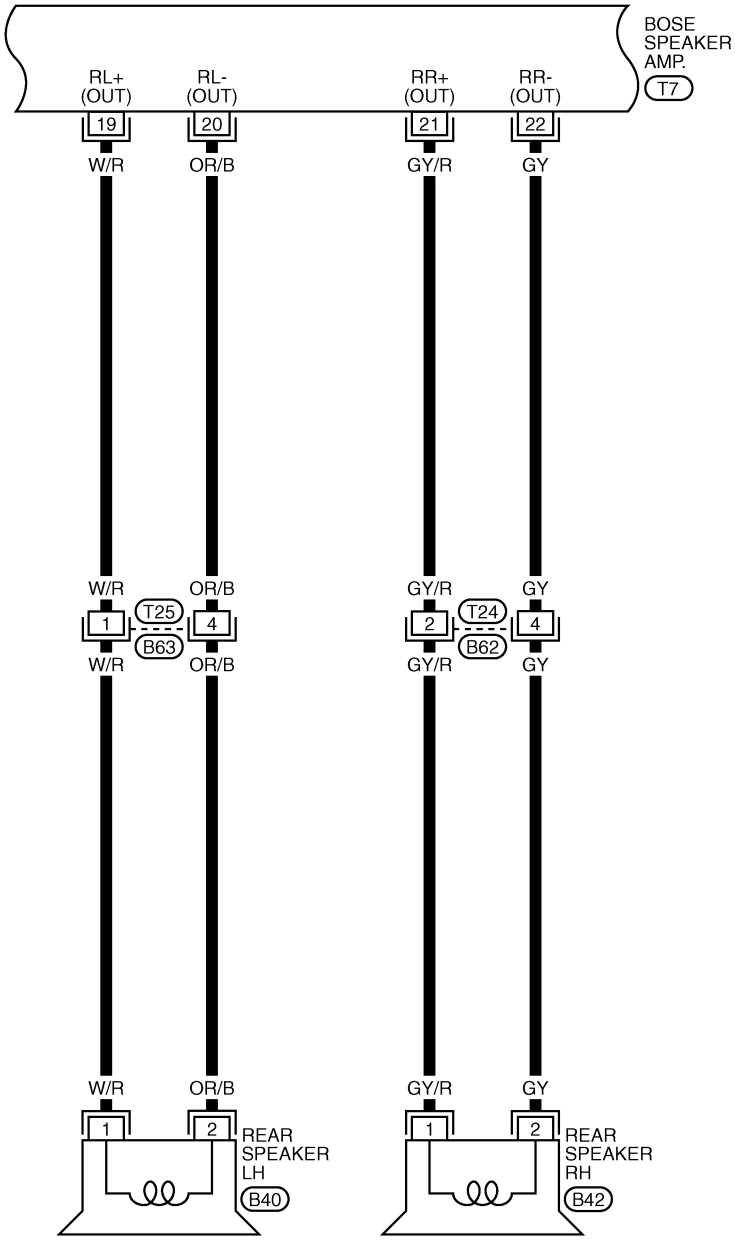


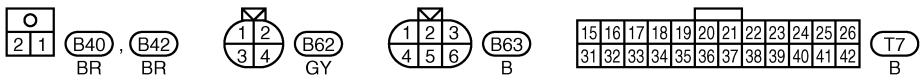


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TKWT5800E

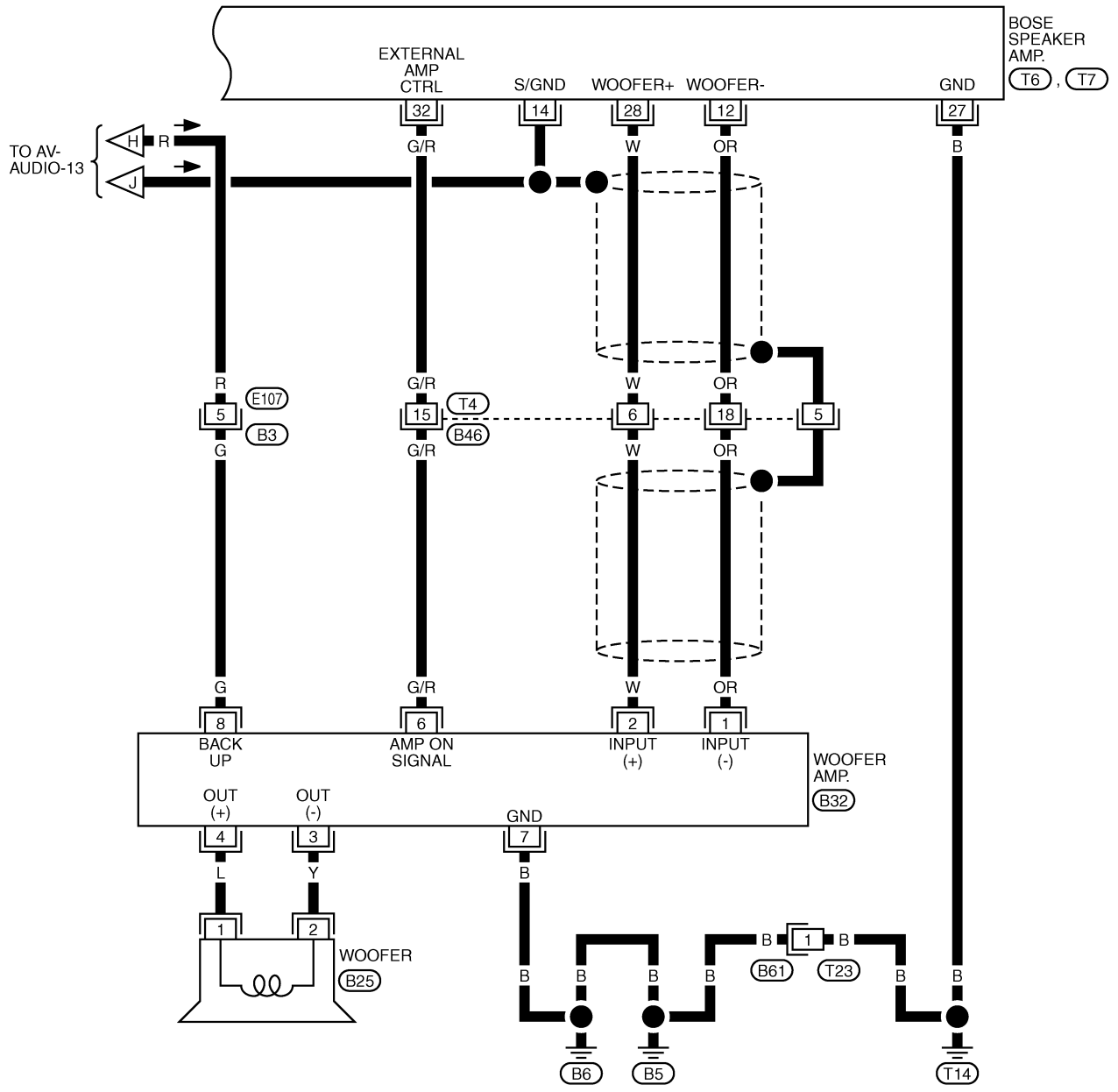
AV-AUDIO-18

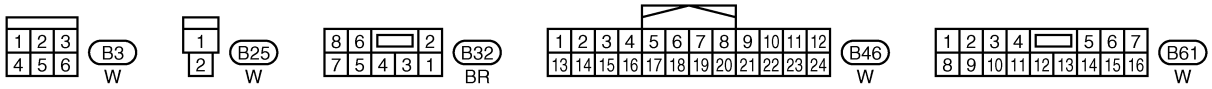


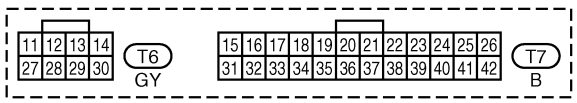


TKWT5801E

AV-AUDIO-19



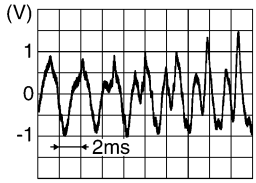
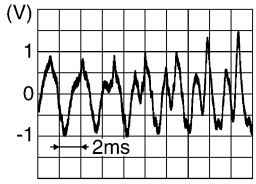
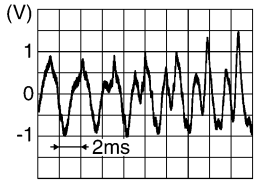
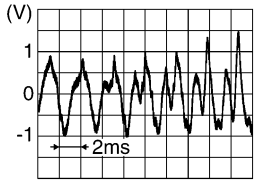
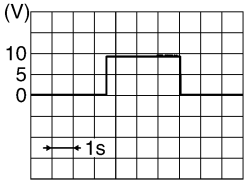


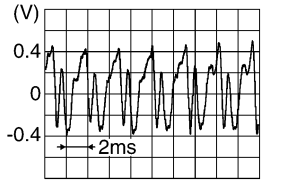


TKWT5802E

Terminals and Reference Value for Audio Unit / Base System

NKS002B9

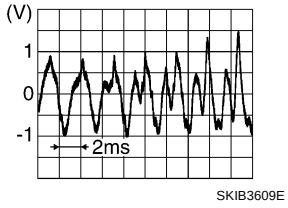
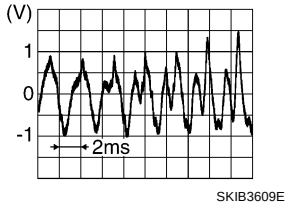
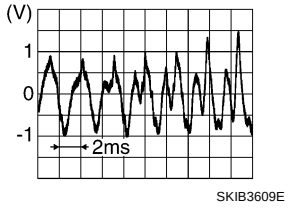
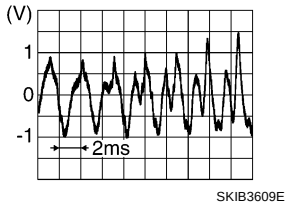
Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value
2 (L/R)*1 (W)*2	1 (B/W)*1 (B)*2	Audio signal front LH	Output	ON	Receive audio signal	 SKIB3609E
4 (Y/R)*1 (G)*2	3 (R/W)*1 (R)*2	Audio signal front RH	Output	ON	Receive audio signal	 SKIB3609E
5 (G/W)	Ground	Antenna amp. ON signal	Output	ON	—	Approx. 12 V
6 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
7 (R/Y)	Ground	Illumination control signal	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12 V
8 (R/L)	Ground	Lighting switch signal	Input	ON	Lighting switch ON	Approx. 12 V
					Lighting switch OFF	Approx. 0 V
10 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
14 (LG/R)*1 (BR)*2	13 (B/Y)*1 (B/R)*2	Audio signal rear LH	Output	ON	Receive audio signal	 SKIB3609E
16 (L/OR)*1 (L)*2	15 (B/P)*1 (P)*2	Audio signal rear RH	Output	ON	Receive audio signal	 SKIB3609E
17 (R/B)	18 (B/OR)	Voice guidance ON signal*3	Input	ON	Press “VOICE” button	 SKIB0232E

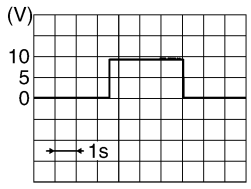
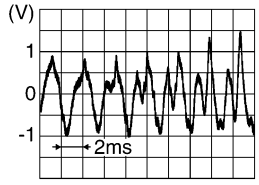
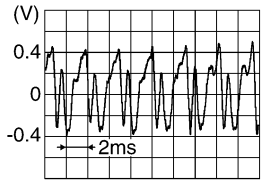
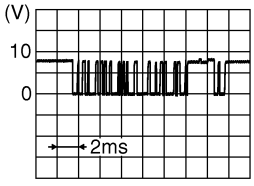
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
20 (L/B)	19 (R/B)	Voice guidance signal*3	Input	ON	Press “VOICE” button	 SKIB3597E
21 (R/G)	23 (Y/G)	Remote control signal A	Input	ON	Press and hold MODE switch	Approx. 0 V
					Press and hold SEEK UP switch	Approx. 1.7 V
					Press and hold VOLUME UP switch	Approx. 3.3 V
					Except for above	Approx. 5 V
22 (OR)	23 (Y/G)	Remote control signal B	Input	ON	Press and hold POWER switch	Approx. 0 V
					Press and hold SEEK DOWN switch	Approx. 1.7 V
					Press and hold VOLUME DOWN switch	Approx. 3.3 V
					Except for above	Approx. 5 V
23 (Y/G)	Ground	Remote control ground	—	ON	—	Approx. 0 V

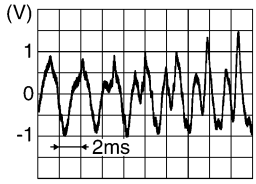
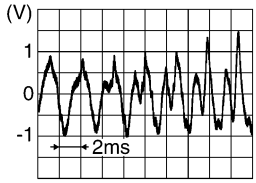
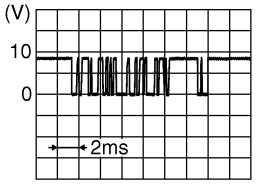
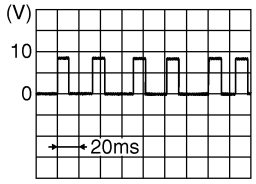
- *1: With M/T without navigation system and VDC system
- *2: Except *1
- *3: With navigation system

Terminals and Reference Value for Audio Unit / BOSE System

NKS002BA

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
2 (W)	1 (B)	Audio signal front LH	Output	ON	Receive audio signal	 SKIB3609E
4 (G)	3 (R)	Audio signal front RH	Output	ON	Receive audio signal	 SKIB3609E
5 (G/W)	Ground	Antenna amp. ON signal	Output	ON	—	Approx. 12 V
6 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
7 (R/Y)	Ground	Illumination control signal	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12 V
8 (R/L)	Ground	Lighting switch signal	Input	ON	Lighting switch ON	Approx. 12 V
					Lighting switch OFF	Approx. 0 V
9	—	Shield	—	—	—	—
10 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
11	—	Shield	—	—	—	—
12 (G/Y)	Ground	BOSE speaker amp. ON signal	Output	ON	—	Approx. 12 V
14 (BR)	13 (B/R)	Audio signal rear LH	Output	ON	Receive audio signal	 SKIB3609E
16 (L)	15 (P)	Audio signal rear RH	Output	ON	Receive audio signal	 SKIB3609E
17 (Y/R)	Ground	AudioPilot® ON/OFF signal	Output	ON	AudioPilot® OFF	Approx. 7.5 V
					AudioPilot® ON	Approx. 0 V

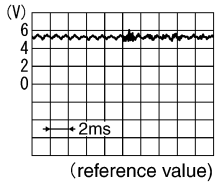
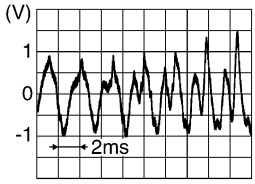
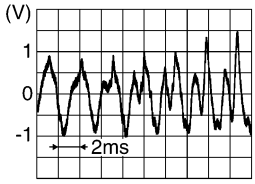
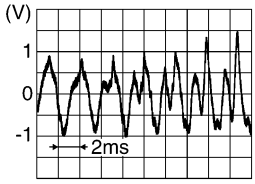
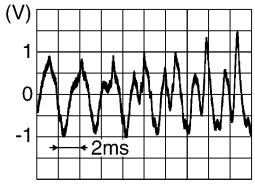
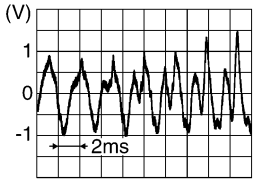
Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value
22 (R/G)	25 (GR)*1 (Y/G)*2	Remote control signal A	Input	ON	Press and hold MODE switch	Approx. 0 V
					Press and hold SEEK UP switch	Approx. 1.7 V
					Press and hold VOLUME UP switch	Approx. 3.3 V
					Except for above	Approx. 5 V
23 (OR)	25 (GR)*1 (Y/G)*2	Remote control signal B	Input	ON	Press and hold POWER switch	Approx. 0 V
					Press and hold SEEK DOWN switch	Approx. 1.7 V
					Press and hold VOLUME DOWN switch	Approx. 3.3 V
					Except for above	Approx. 5 V
24 (R/B)	31 (B/OR)	Voice guidance ON signal*3	Input	ON	Press “VOICE” button	 SKIB0232E
25 (GR)*1 (Y/G)*2	Ground	Remote control ground	—	ON	—	Approx. 0 V
27 (L)	26 (P)	TEL voice signal*1	Input	ON	Receiving the party's voice while using the hands-free phone system.	 SKIB3609E
28 (W/G)	Ground	TEL ON signal*1	Input	ON	When using hands-free phone system	Approx. 0 V
					Except while using hands-free phone system	Approx. 5 V
29	—	Shield*1	—	—	—	—
32 (L/B)	30 (W/B)	Voice guidance signal*3	Input	ON	Press “VOICE” button	 SKIB3597E
34 (B/R)	Ground	Communication signal Tx (AUDIO-SAT)*4	Output	ON	When setting to satellite radio mode	 SKIB7336E

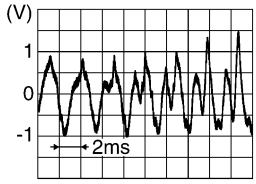
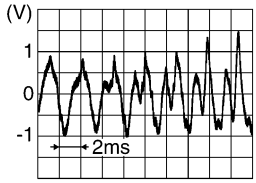
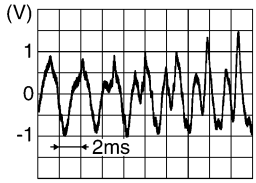
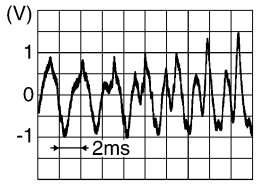
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
35 (B)	43 (W)	Satellite radio audio signal RH*4	Input	ON	Receive satellite radio audio signal	 SKIB3609E
36 (R)	44 (G)	Satellite radio audio signal LH*4	Input	ON	Receive satellite radio audio signal	 SKIB3609E
38 (W/R)	Ground	Communication signal Rx (SAT-AUDIO)*4	Input	ON	When setting to satellite radio mode	 SKIB7337E
39 (L)	Ground	Communication signal REQ (SAT-AUDIO)*4	Input	ON	When setting to satellite radio mode	 SKIB7338E
41	—	Shield*4	—	—	—	—
42	—	Shield*4	—	—	—	—

- *1: With telephone system
- *2: Without telephone system
- *3: With navigation system
- *4: With satellite radio

Terminals and Reference Value for BOSE Speaker Amp.

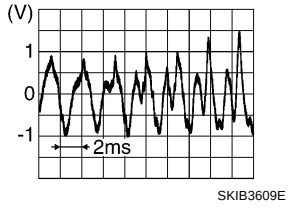
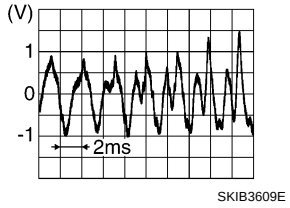
NKS002BB

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
11 (Y)	Ground	Battery power supply	Input	ON	—	Battery voltage
14	—	Shield	—	—	—	—
17 (R/B)	18 (R/W)	Microphone signal	Input	ON	When inputting some sounds (voice, etc.) toward the microphone	 (reference value) PKIA2104E
19 (W/R)	20 (OR/B)	Audio signal rear LH	Output	ON	Receive audio signal	 SKIB3609E
21 (GY/R)	22 (GY)	Audio signal rear RH	Output	ON	Receive audio signal	 SKIB3609E
23 (B/W)	24 (W/G)	Audio signal front LH	Output	ON	Receive audio signal	 SKIB3609E
25 (BR)	26 (B/R)	Audio signal front RH	Output	ON	Receive audio signal	 SKIB3609E
27 (B)	Ground	Ground	—	ON	—	Approx. 0 V
28 (W)	12 (OR)	Audio signal woofer	Output	ON	Receive audio signal	 SKIB3609E
31 (Y/R)	Ground	AudioPilot® ON/OFF signal	Input	ON	AudioPilot® OFF	Approx. 7.5 V
					AudioPilot® ON	Approx. 0 V
32 (G/R)	Ground	Woofer amp. ON signal	Output	ON	—	Approx. 12 V

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
34 (L)	33 (P)	Audio signal rear RH	Input	ON	Receive audio signal	 SKIB3609E
36 (L/G)	35 (L/Y)	Audio signal rear LH	Input	ON	Receive audio signal	 SKIB3609E
38 (G)	37 (R)	Audio signal front RH	Input	ON	Receive audio signal	 SKIB3609E
40 (LG)	39 (PU)	Audio signal front LH	Input	ON	Receive audio signal	 SKIB3609E
41 (G/Y)	Ground	BOSE speaker amp. ON signal	Input	ON	—	Approx. 12 V

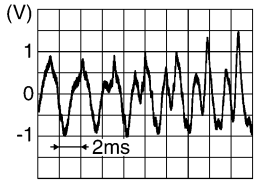
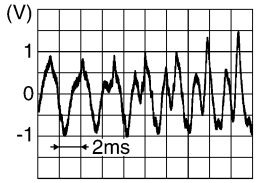
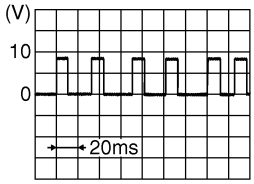
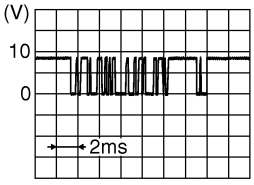
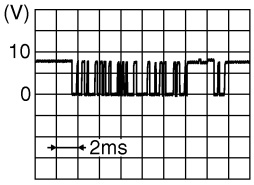
Terminals and Reference Value for Woofer Amp.

NKS002BC

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
2 (W)	1 (OR)	Audio signal woofer	Input	ON	Receive audio signal	 SKIB3609E
4 (L)	3 (Y)	Audio signal woofer	Output	ON	Receive audio signal	 SKIB3609E
6 (G/R)	Ground	Woofer amp. ON signal	Input	ON	—	Approx. 12 V
7 (B)	Ground	Ground	—	ON	—	Approx. 0 V
8 (G)	Ground	Battery power supply	Input	OFF	—	Battery voltage

Terminals and Reference Value for Satellite Radio Tuner

NKS002EC

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
22 (R)	21 (G)	Satellite radio audio signal LH	Output	ON	Receive satellite radio audio signal	 SKIB3609E
24 (B)	23 (W)	Satellite radio audio signal RH	Output	ON	Receive satellite radio audio signal	 SKIB3609E
25	—	Shield	—	—	—	—
26	—	Shield	—	—	—	—
28 (L)	Ground	Communication signal REQ (SAT-AUDIO)	Output	ON	When setting to satellite radio mode	 SKIB7338E
29 (OR/L)	Ground	Communication signal Tx (SAT-AUDIO)	Output	ON	When setting to satellite radio mode	 SKIB7337E
30 (W/L)	Ground	Communication signal Rx (AUDIO-SAT)	Input	ON	When setting to satellite radio mode	 SKIB7336E
32 (BR/Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
36 (P/B)	Ground	ACC power supply	Input	ACC	—	Battery voltage
40	—	Satellite radio antenna	—	—	—	—

Trouble Diagnosis

NKS002ED

- The majority of the audio malfunctions are the result of outside causes (bad CD, electromagnetic interference, etc.). Check the symptoms below to diagnose the malfunction.
- The vehicle itself can be a source of noise if noise prevention parts or electrical equipment is malfunctioning. Check if noise is caused and/or changed by engine speed, ignition switch turned to each position, and operation of each piece of electrical equipment, and then determine the cause.
- Refer to "SERVICE BULLETIN NTB04-119" for the diagnosis of satellite radio.

Symptom	Possible malfunction location
Audio system does not work properly.	● Audio unit power supply circuit ● Audio unit
No sound can be heard from all speakers.	**Base system** ● Audio unit
	BOSE system ● BOSE speaker amp. power supply and ground circuit ● BOSE speaker amp. ON signal circuit ● Audio unit ● BOSE speaker amp.
No sound can be heard from one or several speakers.	**Base system** ● Audio signal circuit between audio unit and speaker ● Speaker ● Tweeter ● Audio unit
	BOSE system ● Audio signal circuit between audio unit and BOSE speaker amp. ● Audio signal circuit between BOSE speaker amp. and speaker ● Speaker ● Tweeter ● Audio unit ● BOSE speaker amp.
No sound can be heard from woofer.	● Woofer amp. power supply and ground circuit ● Woofer amp. ON signal circuit ● Audio signal circuit between BOSE speaker amp. and woofer ● Audio signal circuit between woofer amp. and woofer ● Woofer ● Woofer amp. ● BOSE speaker amp.
No sound can be heard from radio or noise is caught.	● Antenna amp. ON signal circuit ● Antenna feeder ● Antenna ● Antenna amp. ● Audio unit
None of the steering switch operations work	● TEL adapter unit control signal 1 circuit ● Steering switch signal ground circuit

NOTE:
Noise resulting from variations in field strength, such as fading noise and multi-path noise, or external noise from trains and other sources. It is not a malfunction.

- Fading noise: This noise occurs because of variations in the field strength in a narrow range due to mountains or buildings blocking the signal.

- Multi-path noise: This noise results from a time difference between the broadcast waves directly from the station arriving at the antenna and the waves reflected by mountains or buildings.

Power Supply Circuit Inspection

NKS002BF

1. CHECK FUSE

Make sure that the following fuses of the audio unit, BOSE speaker amp. and woofer amp. are not blown.

Unit	Signal	Fuse No.
Audio unit	Battery power supply	37
	Ignition switch ACC or ON	6
BOSE speaker amp.	Battery power supply	37
Woofer amp.	Battery power supply	17

OK or NG

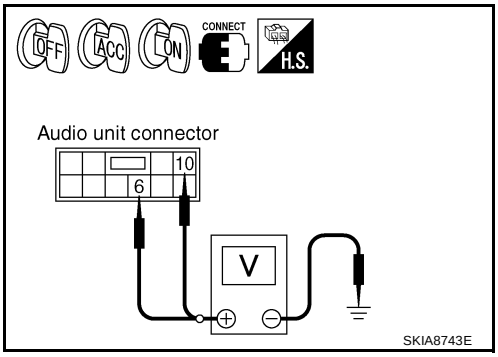
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

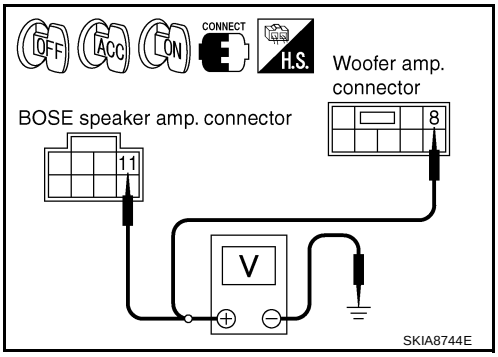
1. Check voltage between audio unit harness connector terminals and ground.

Unit	Terminals (+) Connector	Terminals (+) Terminal	Terminals (–)	OFF	ACC	ON
Audio unit	M40	6	Ground	Battery voltage	Battery voltage	Battery voltage
		10	Ground	0 V	Battery voltage	Battery voltage



2. Check voltage between BOSE speaker amp., woofer amp. harness connector terminals and ground (BOSE system).

Unit	Terminals (+) Connector	Terminals (+) Terminal	Terminals (–)	OFF	ACC	ON
BOSE speaker amp.	T6	11	Ground	Battery voltage	Battery voltage	Battery voltage
Woofer amp.	B32	8				



OK or NG

OK >> ● INSPECTION END (Base system)
● GO TO 3 (BOSE system).

NG >> Repair harness or connector.

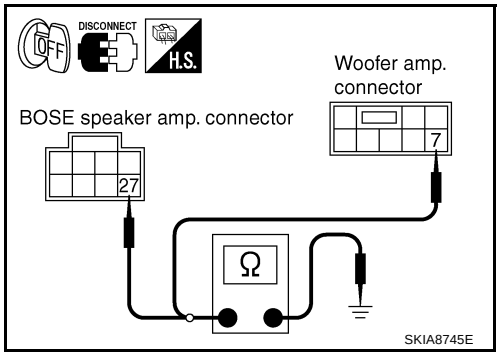
3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BOSE speaker amp. and woofer amp. connectors.
3. Check continuity between BOSE speaker amp. harness connector T6 terminal 27 and ground.

27 – Ground : Continuity should exist.

4. Check continuity between woofer amp. harness connector B32 terminal 7 and ground.

7 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

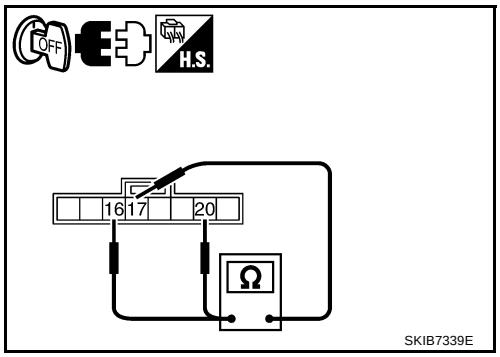
Steering Switch Does Not Operate

NKS002EE

1. CHECK STEERING SWITCH RESISTANCE

1. Turn ignition switch OFF.
2. Disconnect combination switch (spiral cable) connector.
3. Check resistance between steering switch harness connector M203 terminals.

Terminal		Signal name	Condition	Resistance (Ω)
16	17	Power	Press and hold POWER switch.	Approx. 0
		Seek down	Press and hold SEEK DOWN switch.	Approx. 165
		Volume down	Press and hold VOLUME DOWN switch.	Approx. 652
20		Mode	Press and hold MODE switch.	Approx. 0
		Seek up	Press and hold SEEK UP switch.	Approx. 165
		Volume up	Press and hold VOLUME UP switch.	Approx. 652



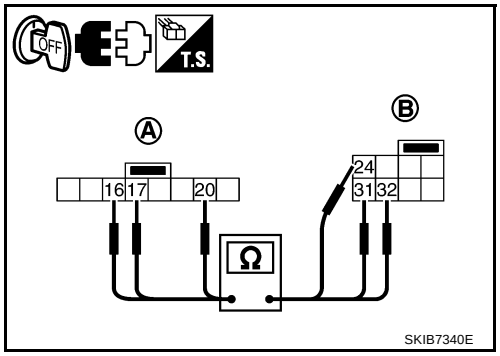
OK or NG

OK >> GO TO 2.
NG >> Replace steering switch.

2. CHECK SPIRAL CABLE

1. Disconnect combination switch (spiral cable) connector.
2. Check continuity between combination switch (spiral cable) connector (A) terminals 16, 17, 20 and connector (B) terminals 32, 31, 24.

16 – 32 : Continuity should exist.
17 – 31 : Continuity should exist.
20 – 24 : Continuity should exist.



OK or NG

OK >> GO TO 3.
NG >> Replace spiral cable.

3. CHECK HARNESS

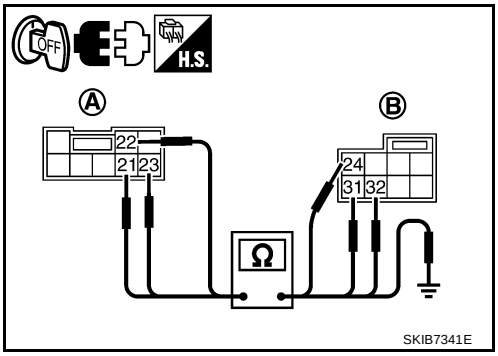
Base system

1. Disconnect audio unit connector.
2. Check continuity between audio unit harness connector (A) M46 terminals 21, 22, 23 and combination switch (spiral cable) harness connector (B) M23 terminals 24, 32, 31.

   21 – 24 : Continuity should exist.
   22 – 32 : Continuity should exist.
   23 – 31 : Continuity should exist.

3. Check continuity between audio unit harness connector (A) M46 terminals 21, 22 and ground.

   21, 22 – Ground : Continuity should not exist.



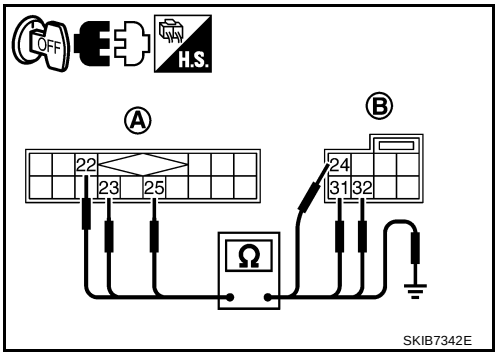
BOSE system

1. Disconnect audio unit connector.
2. Check continuity between audio unit harness connector (A) M39 terminals 22, 23, 25 and combination switch (spiral cable) harness connector (B) M23 terminals 24, 32, 31.

   22 – 24 : Continuity should exist.
   23 – 32 : Continuity should exist.
   25 – 31 : Continuity should exist.

3. Check continuity between audio unit harness connector (A) M39 terminals 22, 23 and ground.

   22, 23 – Ground : Continuity should not exist.



OK or NG

OK >> Replace audio unit.
NG >> Repair harness or connector.

AudioPilot® Does Not Work

NKS002BG

1. CHECK AUDIO UNIT

Check AudioPilot® turns ON.

OK or NG

OK >> GO TO 2.
NG >> Turn AudioPilot® ON.

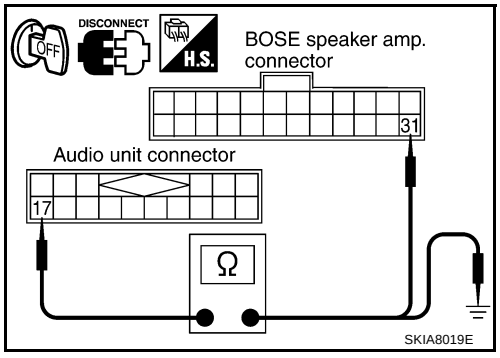
2. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect audio unit and BOSE speaker amp. connectors.
3. Check continuity between audio unit harness connector M39 terminal 17 and BOSE speaker amp. harness connector T7 terminal 31.

17 – 31 : Continuity should exist.

4. Check continuity between audio unit harness connector M39 terminal 17 and ground.

17 – Ground : Continuity should not exist.



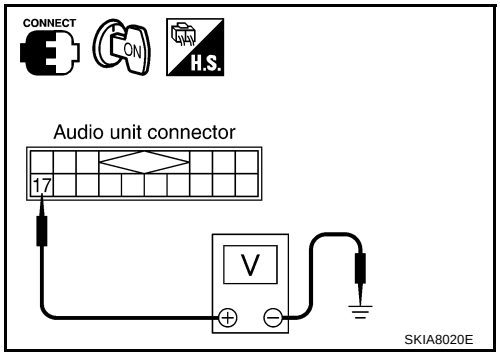
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK AUDIOPILOT® SIGNAL

1. Connect audio unit and BOSE speaker amp. connectors.
2. Turn ignition switch ON.
3. Check voltage between audio unit harness connector terminals and ground.

Terminals			Condition	Voltage
(+)		(–)		
Connector	Terminal			
M39	17	Ground	AudioPilot® OFF	Approx. 7.5 V
			AudioPilot® ON	Approx. 0 V



OK or NG

OK >> GO TO 4.
NG >> Replace audio unit.

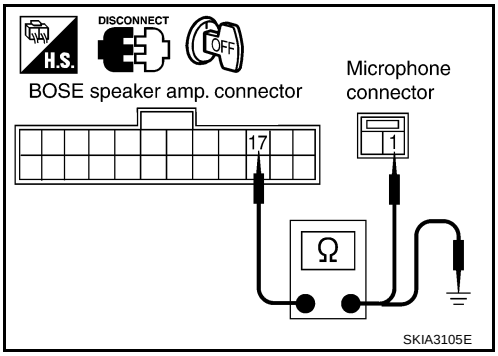
4. CHECK HARNESS

1. Turn ignition switch OFF
2. Disconnect BOSE speaker amp. and microphone connectors.
3. Check continuity between BOSE speaker amp. harness connector T7 terminal 17 and microphone harness connector E123 terminal 1.

17 – 1 : Continuity should exist.

4. Check continuity between BOSE speaker amp. harness connector T7 terminal 17 and ground.

17 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

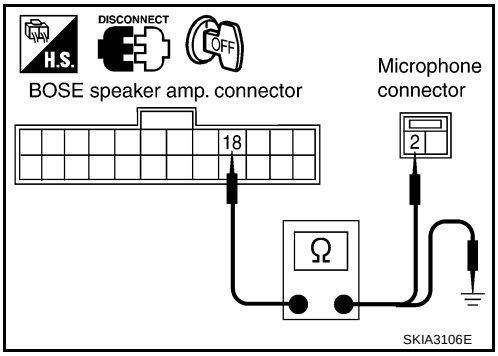
5. CHECK HARNESS

1. Check continuity between BOSE speaker amp. harness connector T7 terminal 18 and microphone harness connector E123 terminal 2.

18 – 2 : Continuity should exist.

2. Check continuity between BOSE speaker amp. harness connector T7 terminal 18 and ground.

18 – Ground : Continuity should not exist.



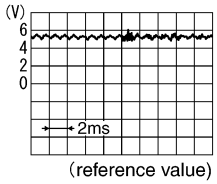
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

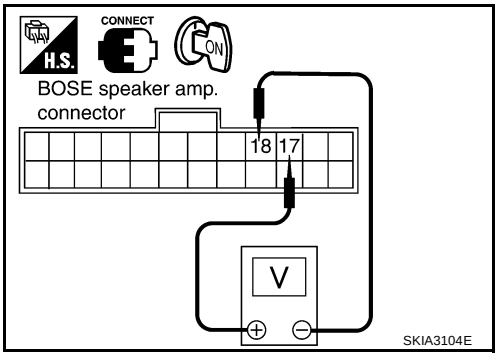
6. CHECK MICROPHONE SIGNAL

1. Connect BOSE speaker amp. and microphone connectors.
2. Turn ignition switch ON.
3. Check voltage waveform between BOSE speaker amp. harness connector T7 terminal 17 and 18 using oscilloscope, when inputting some sounds (voice, etc.) toward the microphone.

17 – 18:



PKIA2104E



Does the voltage waveform change with sounds?

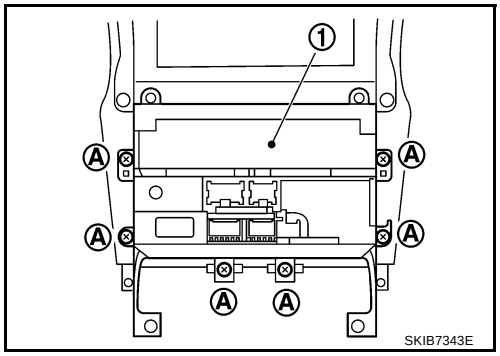
YES >> Replace BOSE speaker amp.
NO >> Replace microphone.

Removal and Installation of Audio Unit (Base system)

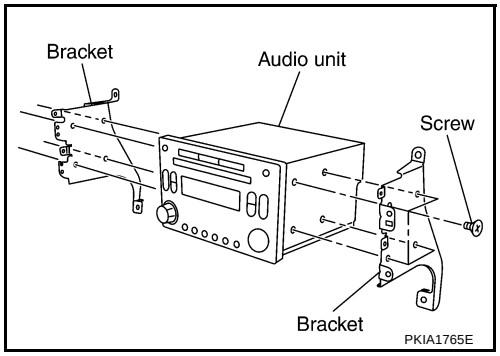
NKS002BH

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (A), and remove audio unit (1).



3. Remove screws (8), and remove bracket.



INSTALLATION

Installation is the reverse order of removal.

Locking CD Auto Changer Mechanism (Audio unit of BOSE system)

NKS002BI

CAUTION:

- **Prior to removing a malfunctioning CD auto changer unit (Audio unit of BOSE system) that will be shipped for repair, the changer mechanism MUST BE LOCKED to prevent the mechanism from being damaged during shipping.**
- **If a CD is jammed or unable to be removed from the unit, do NOT lock the changer mechanism. If the unit is to be shipped for repair, carefully package the unit to prevent vibration and shock.**

DAMPER LOCK PROCEDURE

1. Eject and remove any CDs from the audio unit (BOSE system).
2. Turn ignition switch OFF. Wait until audio unit (BOSE system) display is off and mechanism stops moving (mechanism sound stops).
3. Press any one of the disc selection buttons once. When a display shows on the audio unit (BOSE system), press the same disc selection button again within 5 seconds.
   - The changer mechanism will lock itself within 10 seconds.
4. After mechanism stops moving (mechanism sound stops), open the driver and passenger window, and then disconnect negative battery cable.

CAUTION:

After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

NOTE:

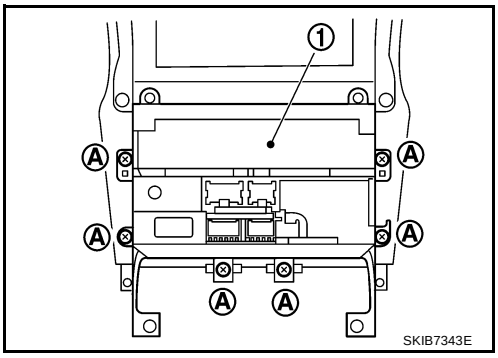
After installing a new or remanufactured audio unit (BOSE system), switching the audio unit (BOSE system) ON will automatically unlock the mechanism. A special unlocking procedure is not required.

Removal and Installation of Audio Unit (BOSE system)

NKS002BJ

REMOVAL

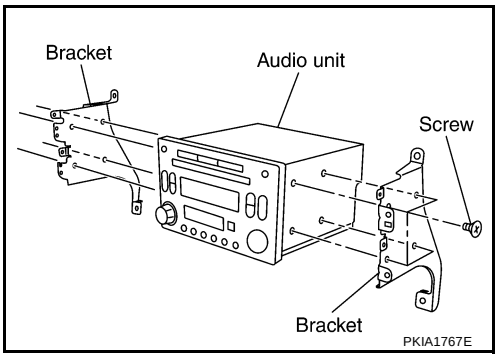
1. Perform damper lock operation. Refer to AV-46, "Locking CD Auto Changer Mechanism (Audio unit of BOSE system)" .
2. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. Remove screws (A), and remove audio unit (1).



4. Remove screws (8), and remove bracket.

CAUTION:

- **When carrying audio unit body, do not touch internal mechanism access from cassette tape slot.**
- **Be careful not to allow foreign matter from cassette tape slot.**



INSTALLATION

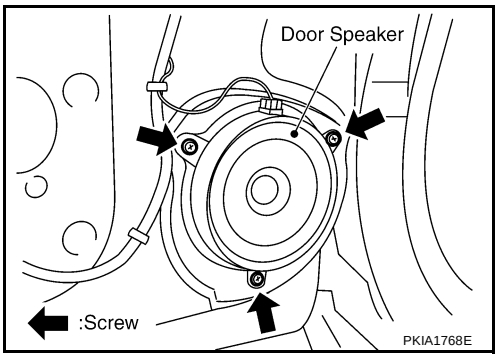
Installation is the reverse order of removal.

Removal and Installation of Door Speaker

NKS002BK

REMOVAL

1. Remove door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove screws (3), and remove door speaker.



INSTALLATION

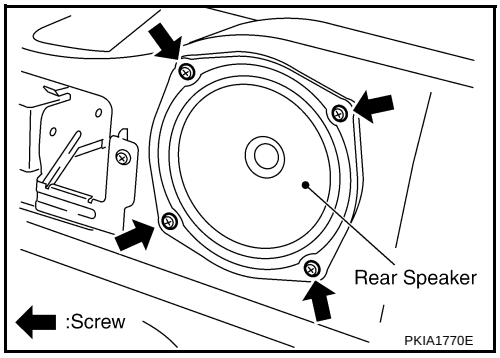
Installation is the reverse order of removal.

Removal and Installation of Rear Speaker

NKS002BL

REMOVAL

1. Remove luggage floor finisher upper (front) (Coupe models), or luggage floor finisher upper (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove screws (4), and remove rear speaker.



INSTALLATION

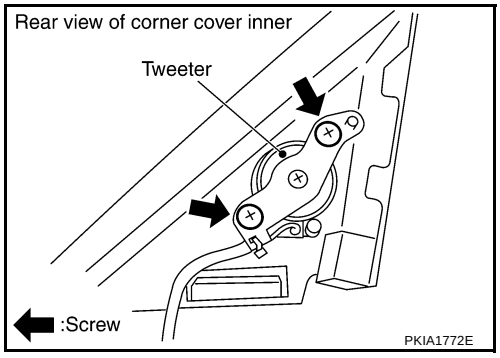
Installation is the reverse order of removal.

Removal and Installation of Tweeter

NKS002BM

REMOVAL

1. Remove corner cover inner. Refer to GW-81, "Removal and Installation" .
2. Remove screws (2), and remove tweeter from corner cover inner.



INSTALLATION

Installation is the reverse order of removal.

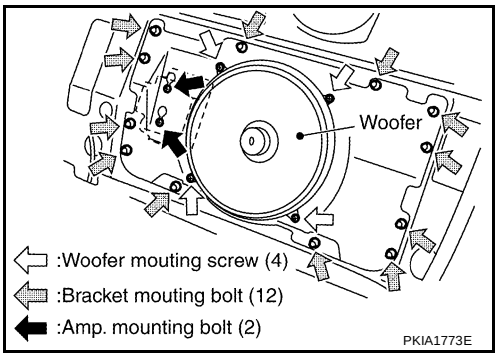
Removal and Installation of Woofer and Woofer Amp. (BOSE System)

NKS002BN

REMOVAL

Woofer Assembly

1. Remove luggage floor finisher lower. Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove woofer mounting screws (4), and remove woofer.
3. Remove bracket mounting bolts (12), and remove bracket.
4. Remove woofer amp. mounting bolts (2), and remove woofer amp. from bracket.



Woofer or Woofer Amp. Only

1. Remove luggage floor finisher mask. Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove woofer mounting screws (4), and remove woofer.
3. Remove woofer amp. mounting bolts (2), and remove woofer amp. from bracket.

INSTALLATION

Installation is the reverse order of removal, taking care of the following point.

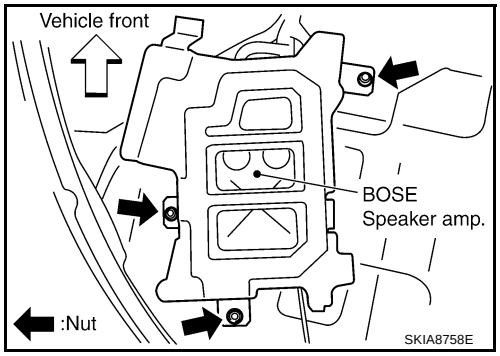
Bracket mounting bolt : **9 N·m (0.92 kg-m, 80 in-lb)**

Removal and Installation of BOSE Speaker Amp.

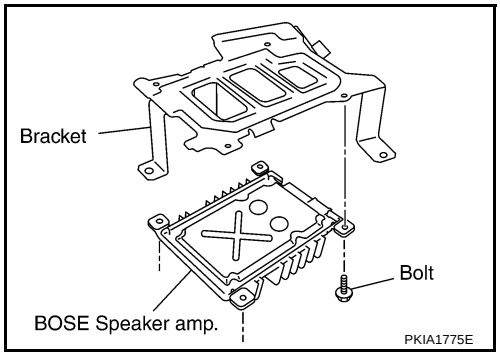
NKS002BO

REMOVAL

1. Remove trunk side box. Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
2. Remove luggage floor carpet and spare tire cover (Coupe models), or trunk floor carpet and spare tire cover (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
3. Remove nuts (3), and remove BOSE speaker amp. from trunk room floor.



4. Remove bolts (4), and remove bracket.



INSTALLATION

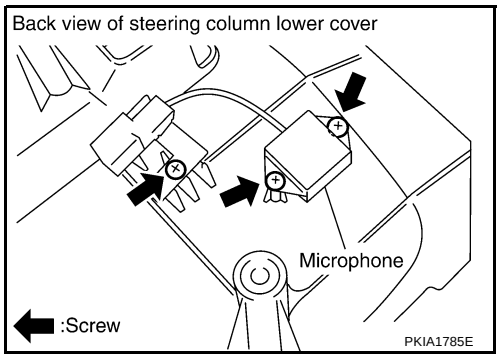
Installation is the reverse order of removal.

Removal and Installation of Microphone

NKS002BP

REMOVAL

1. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (3), and remove microphone.



INSTALLATION

Installation is the reverse order of removal.

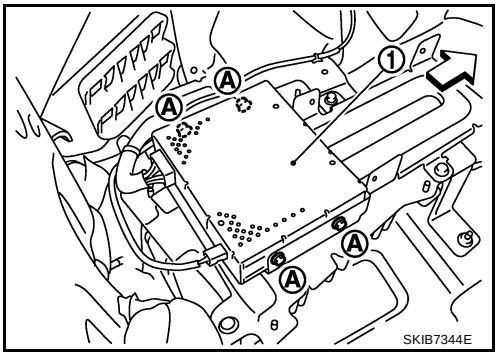
Removal and Installation of Satellite Radio Tuner

NKS002EF

REMOVAL

⇦: Vehicle front

1. Remove trunk side box. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
2. Remove luggage floor carpet and spare tire cover. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Remove screws (A), and remove satellite radio tuner (1).



INSTALLATION

Installation is the reverse order of removal.

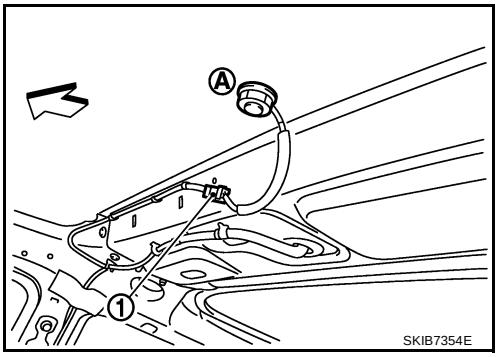
Removal and Installation of Satellite Radio Antenna

NKS002EL

REMOVAL

⇦: Vehicle front

1. Remove headlining. Refer to EI-44, "Removal and Installation (for Coupe Models)" .
2. Remove nut (A), and then disconnect connector (1).
3. Remove satellite radio antenna.



INSTALLATION

Installation is the reverse order of removal.

Roof antenna mounting nut : 6.0 N·m (0.61 kg-m, 53 in-lb)

ANTENNA

PFP:28200

System Description

NKS002EG

With the ignition switch in ACC or ON, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to audio unit terminal 10.

Ground is supplied through the case of the antenna amp.
When the radio switch is turned ON, antenna signal is supplied

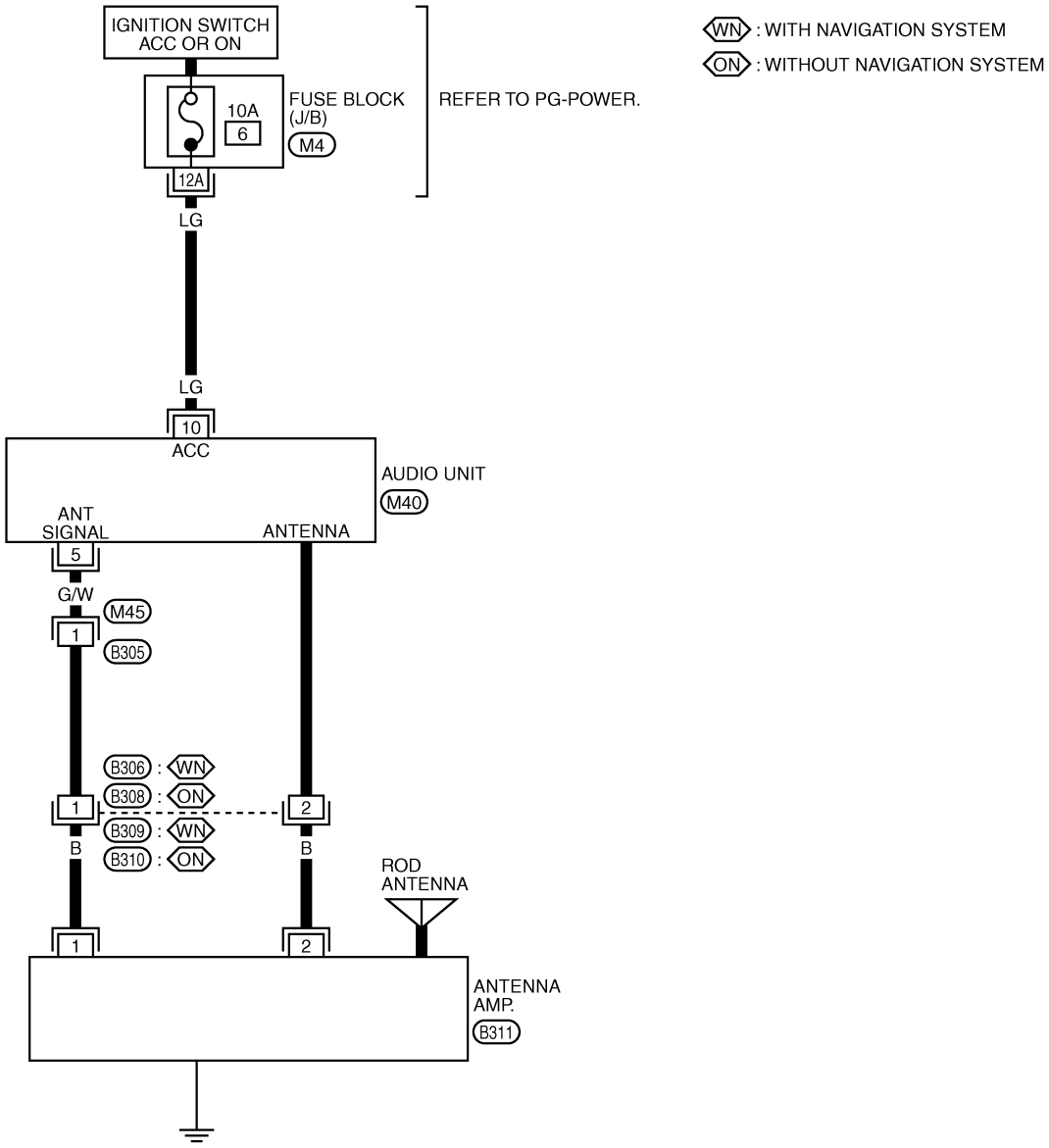
- through audio unit terminal 5
- to antenna amp. terminal 1.

Then the antenna amp. is activated.
Antenna signals amplified by the antenna amp. are supplied to the audio unit.

Wiring Diagram — M/ANT —

NKS002EH

AV-M/ANT-01





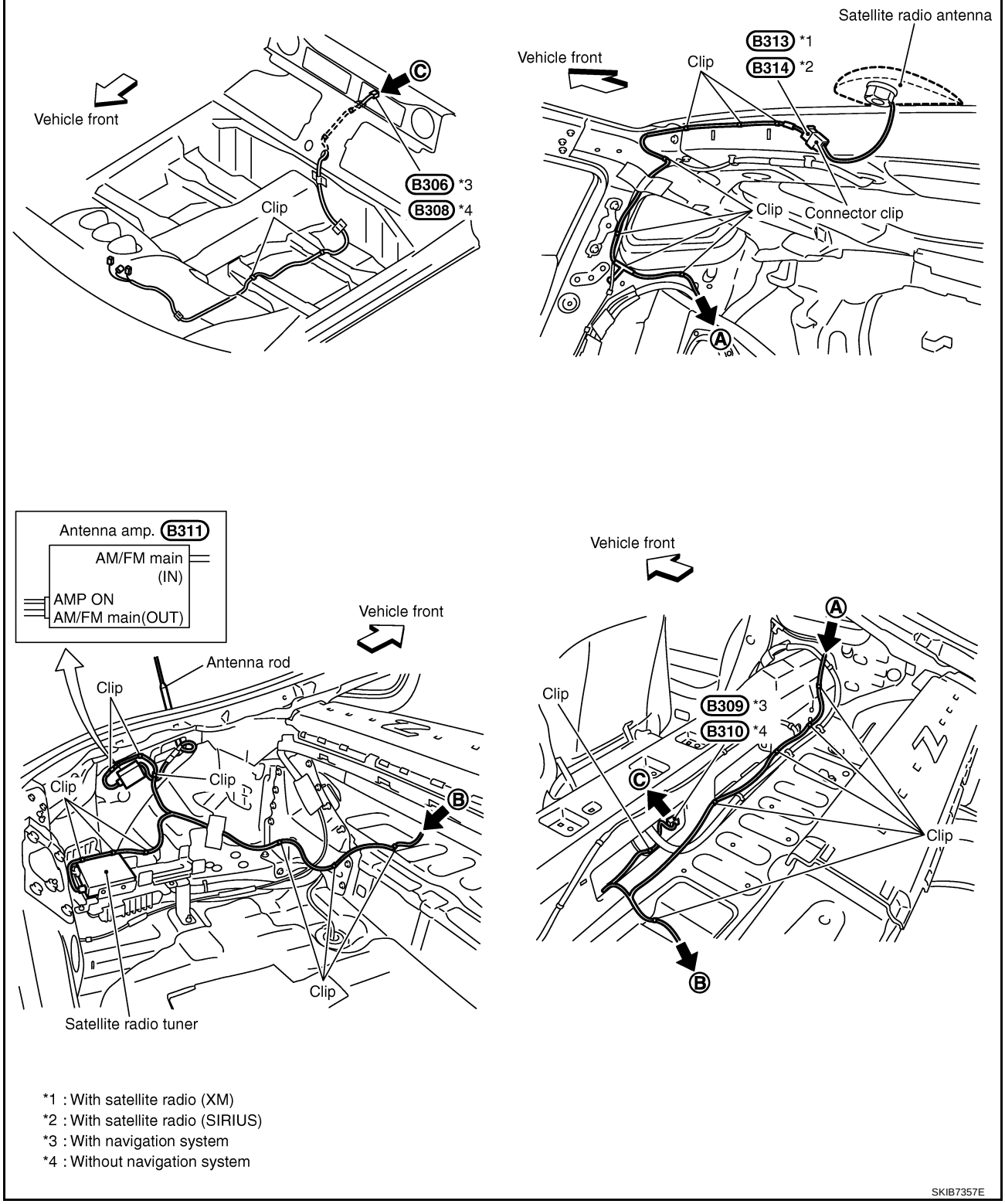
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT0509E

Location of Antenna

NKS002EI

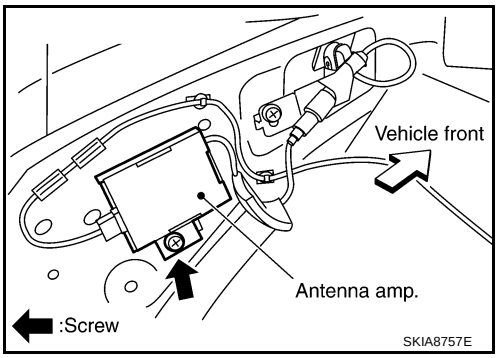


Removal and Installation of Antenna Amp.

NKS002EJ

REMOVAL

1. Remove luggage side finisher lower (LH) (Coupe models), or trunk front finisher (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
2. Remove luggage floor carpet and spare tire cover (Coupe models), or trunk floor carpet and spare tire cover (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
3. Remove screw (1), and remove antenna amp.

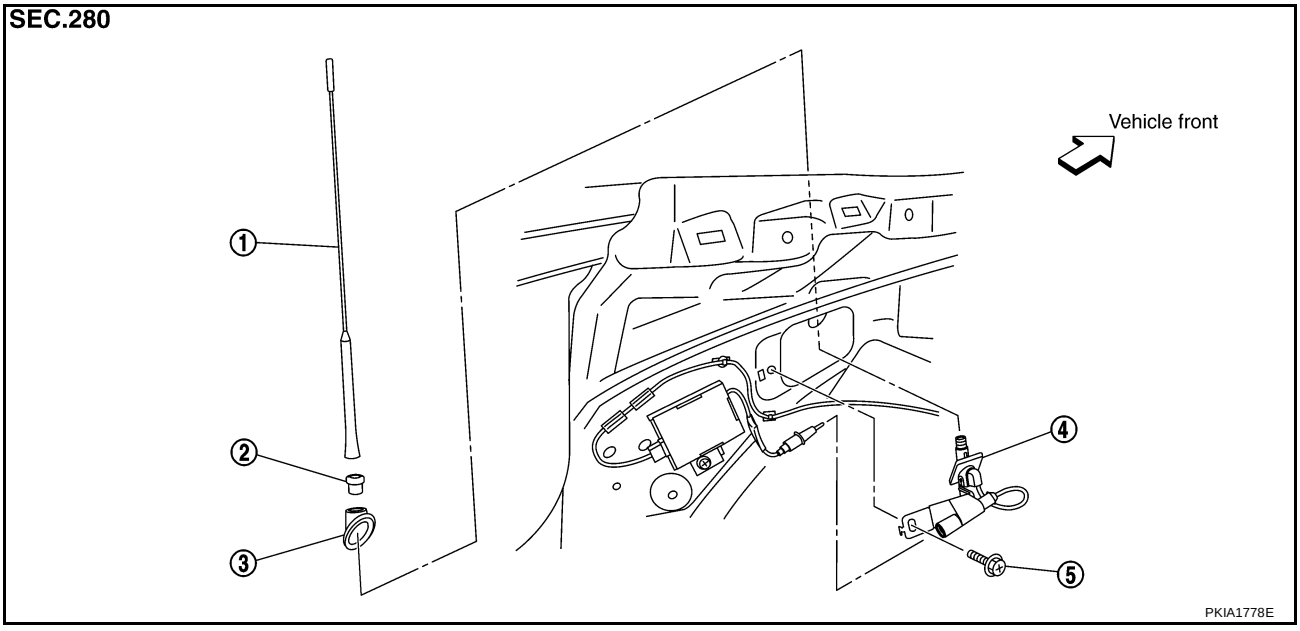


INSTALLATION

Installation is the reverse order of removal.

Removal and Installation of Antenna

NKS002EK



1. Antenna rod
2. Antenna nut
3. Antenna base
4. Antenna assembly
5. Screw

REMOVAL

1. Remove luggage side finisher lower (LH) (Coupe models), or trunk front finisher (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-49, "Removal and Installation (for Roadstar Models)" .
2. Remove antenna rod and remove antenna nut.
3. Disconnect antenna amp. plug.
4. Remove screw and remove antenna assembly.
5. Remove antenna base.

INSTALLATION

Installation is the reverse order of removal.

Removal and Installation of Satellite Radio Antenna

NKS002KG

Refer to AV-51, "Removal and Installation of Satellite Radio Antenna" .

NAVIGATION SYSTEM

PFP:25915

System Description

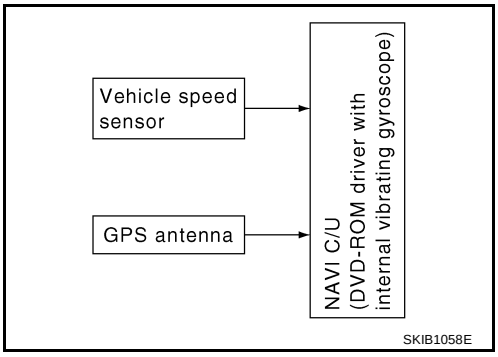
NKS000CX

For Navigation System operation information, refer to Navigation System Owner's Manual.

LOCATION DETECTION PRINCIPLE

The navigation system periodically calculates the vehicle's current position according to the following three signals:

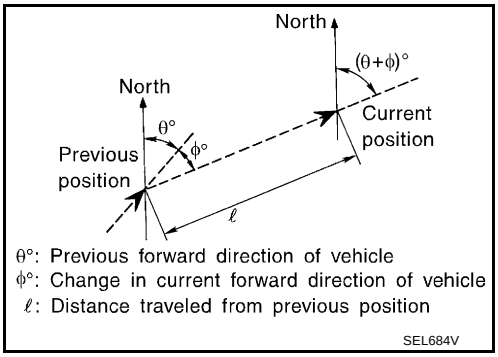
- Travel distance of the vehicle as determined by the vehicle speed sensor
- Turning angle of the vehicle as determined by the gyroscope (angular velocity sensor)
- Direction of vehicle travel as determined by the GPS antenna (GPS information)



The current position of the vehicle is then identified by comparing the calculated vehicle position with map data read from the DVD-ROM, which is stored in the DVD-ROM drive (map-matching), and indicated on the screen as a current-location mark. More accurate data is judged and used by comparing vehicle position detection results found by the GPS with the result by map-matching.

The current vehicle position will be calculated by detecting the distance the vehicle moved from the previous calculation point and its direction.

- Travel distance
  Travel distance calculations are based on the vehicle speed sensor input signal. Therefore, the calculation may become incorrect as the tires wear down. To prevent this, an automatic distance correction function has been adopted.
- Travel direction
  Change in the travel direction of the vehicle is calculated by a gyroscope (angular velocity sensor) and a GPS antenna (GPS information). They have both advantages and disadvantages.



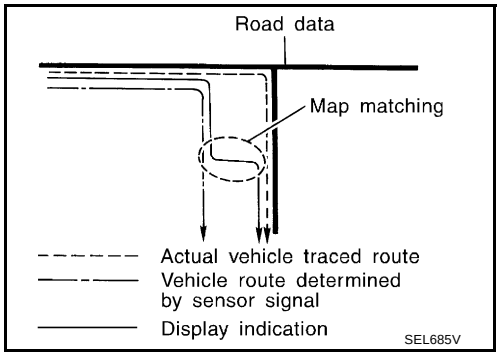
Type	Advantage	Disadvantage
Gyroscope (angular velocity sensor)	Can detect the vehicle's turning angle quite accurately.	Direction errors may accumulate when vehicle is driven for long distances without stopping.
GPS antenna (GPS information)	Can detect the vehicle's travel direction (North/South/East/West).	Correct direction cannot be detected when vehicle speed is low.

More accurate traveling direction is detected because priorities are set for the signals from these two devices according to the situation.

MAP-MATCHING

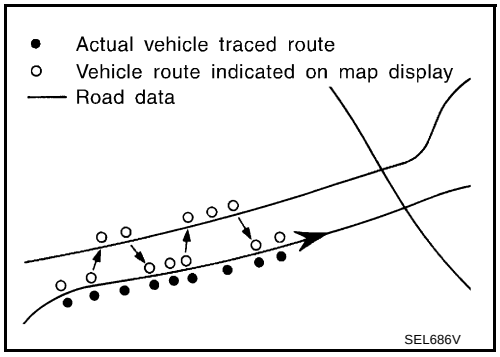
Map-matching compares a current location detected by the method in the “Location Detection Principle” with a road map data from DVD-ROM stored in DVD-ROM drive.

NOTE:
The road map data is based on data stored in the DVD-ROM.

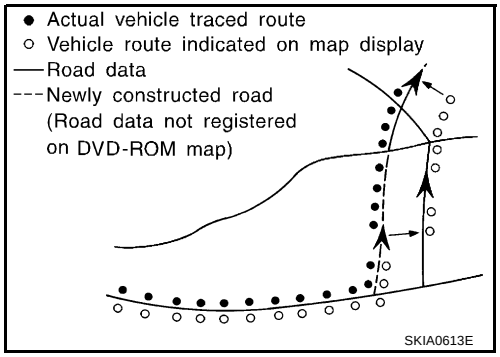


The vehicle position may not be corrected under the following circumstances and after driving for a certain time when GPS information is difficult to receive. In this case, the current-location mark on the display must be corrected manually.

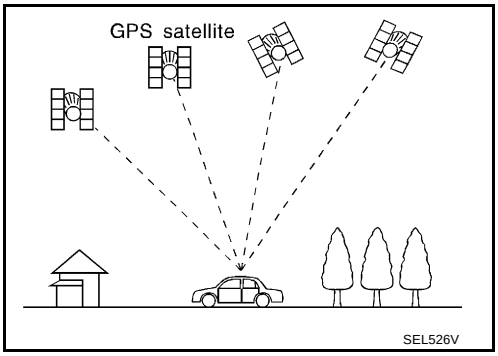
- In map-matching, alternative routes to reach the destination will be shown and prioritized, after the road on which the vehicle is currently driven has been judged and the current-location mark has been repositioned.
  If there is an error in distance and/or direction, alternative routes will be shown in different order of priority, and the incorrect road can be avoided.
  If two roads are running in parallel, they are of the same priority. Therefore, the current-location mark may appear on either of them alternately, depending on maneuvering of the steering wheel and configuration of the road.



- Map-matching does not function correctly when a road on which the vehicle is driving is new and not recorded in the DVD-ROM, or when road pattern stored in the map data and the actual road pattern are different due to repair.
  When driving on a road not present in the map, the map-matching function may find another road and position the current-location mark on it. Then, when the correct road is detected, the current-location mark may change to it.
- Effective range for comparing the vehicle position and travel direction calculated by the distance and direction with the road data read from the DVD-ROM is limited. Therefore, when there is an excessive gap between current vehicle position and the position on the map, correction by map-matching is not possible.



GPS (GLOBAL POSITIONING SYSTEM)



GPS (Global Positioning System) was developed for and is controlled by the US Department of Defense. The system utilizes GPS satellites (NAVSTAR), sending out radio waves while flying on an orbit around the earth at an altitude of approximately 21,000 km (13,100 miles).

The GPS receiver calculates the vehicle's position in three dimensions (latitude/longitude/altitude) according to the time lag of the radio waves received from four or more GPS satellites (three-dimensional positioning). If radio waves were received only from three GPS satellites, the GPS receiver calculates the vehicle's position in two dimensions (latitude/longitude), and utilize the altitude data calculated previously with radio waves from four or more GPS satellites (two-dimensional positioning).

Position correction by GPS is not available while the vehicle is stopped.

Accuracy of GPS will deteriorate under the following conditions:

- In two-dimensional positioning, GPS accuracy will deteriorate when altitude of the vehicle position changes.
- The accuracy can be even lower depending on the arrangement of the GPS satellites utilized for the positioning.
- Position detection is not possible when vehicle is in an area where radio waves from the GPS satellite do not reach, such as in a tunnel, parking lot in a building, and under an elevated highway. Radio waves from the GPS satellites may not be received when some object is located over the GPS antenna.

NOTE:

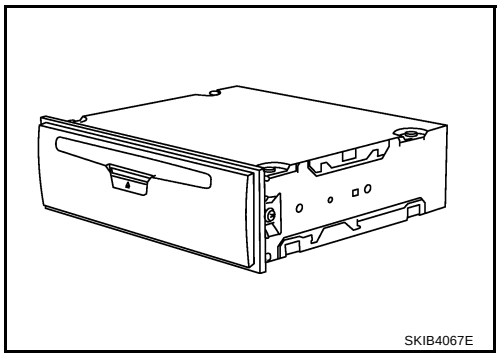
- Even a high-precision three dimensional positioning, the detection result has an error about 10 m (30ft).
- Because the signals of GPS satellite is controlled by the Tracking and Control Center in the United States, the accuracy may be degraded lower intentionally or the radio waves may stop.

Component Description

NKS002QA

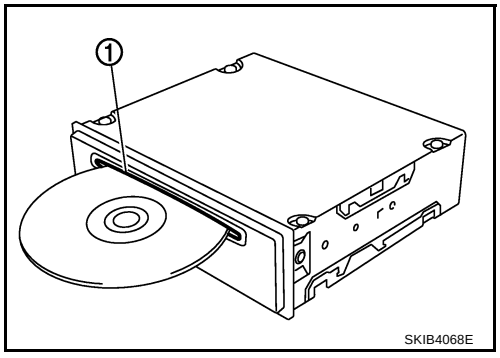
NAVI CONTROL UNIT

- NAVI control unit connects to the display unit and NAVI switch with communication lines.
- The gyro (angular speed sensor) and the DVD-ROM drive are built-in units that control the navigation functions.
- Signals are received from the gyro, the vehicle speed sensor, and the GPS antenna. Vehicle location is determined by combining these data with the data contained in the DVD-ROM map. Locations information is shown on display unit.
- NAVI control unit outputs ON signal and voice guidance signal to audio unit.


SKIB4067E

DVD-ROM Drive

Maps, traffic control regulations, and other pertinent information can be easily read from the DVD-ROM (1).



SKIB4068E

DVD-ROM

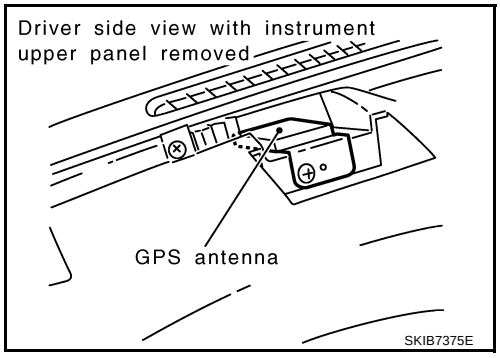
- The DVD-ROM has maps, traffic control regulations, and other pertinent information.
- To improve DVD-ROM map matching and route determination functions, the DVD-ROM uses an exclusive Nissan format. Therefore, the use of a DVD-ROM provided by other manufacturers cannot be used.

Gyro (Angular Speed Sensor)

- The oscillator gyro sensor is used to detect changes in vehicle steering angle.
- The gyro is built into the NAVI control unit.

GPS ANTENNA

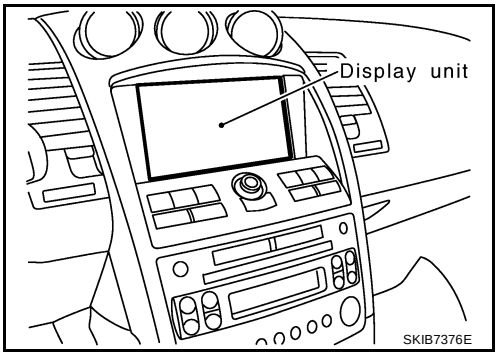
The GPS antenna receives and amplifies the radio waves from the GPS satellites, and then transmits the GPS signal to NAVI control unit.



SKIB7375E

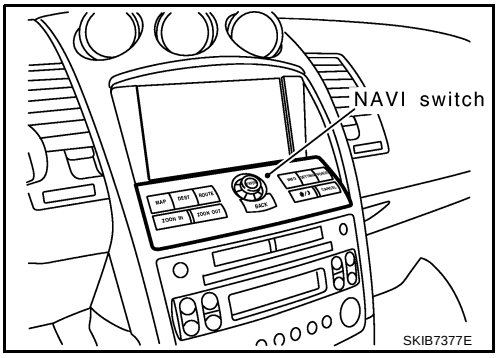
DISPLAY UNIT

- Display unit connects to the NAVI control unit and NAVI switch with communication lines.
- Display unit receives RGB image signal from NAVI control unit, and RGB image is displayed.



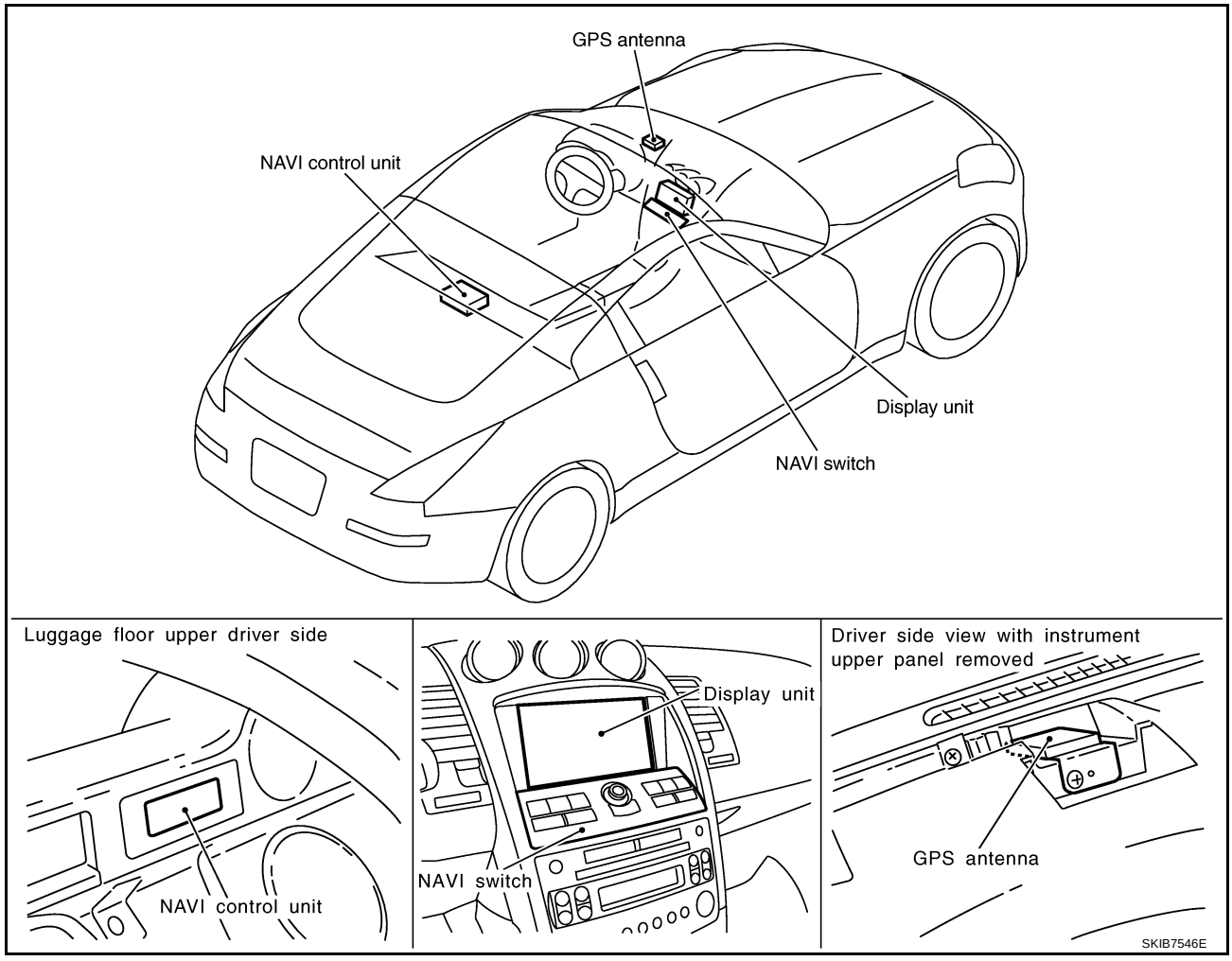
NAVI SWITCH

- NAVI switch connects to the display unit and NAVI control unit with communication lines.
- Operation signal from NAVI switch is transmitted to NAVI control unit through display unit.



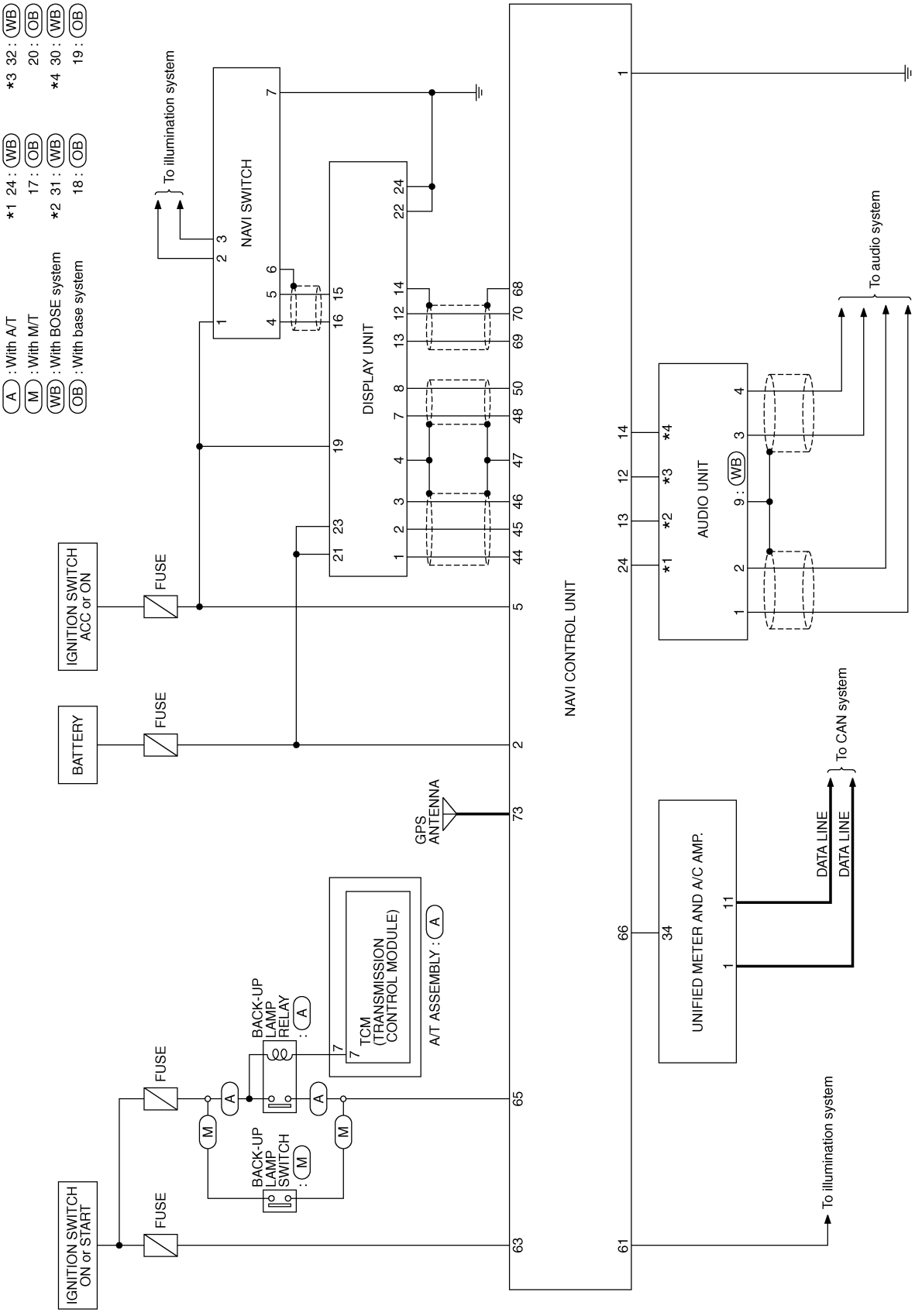
Component Parts Location

NKS000CZ



Schematic

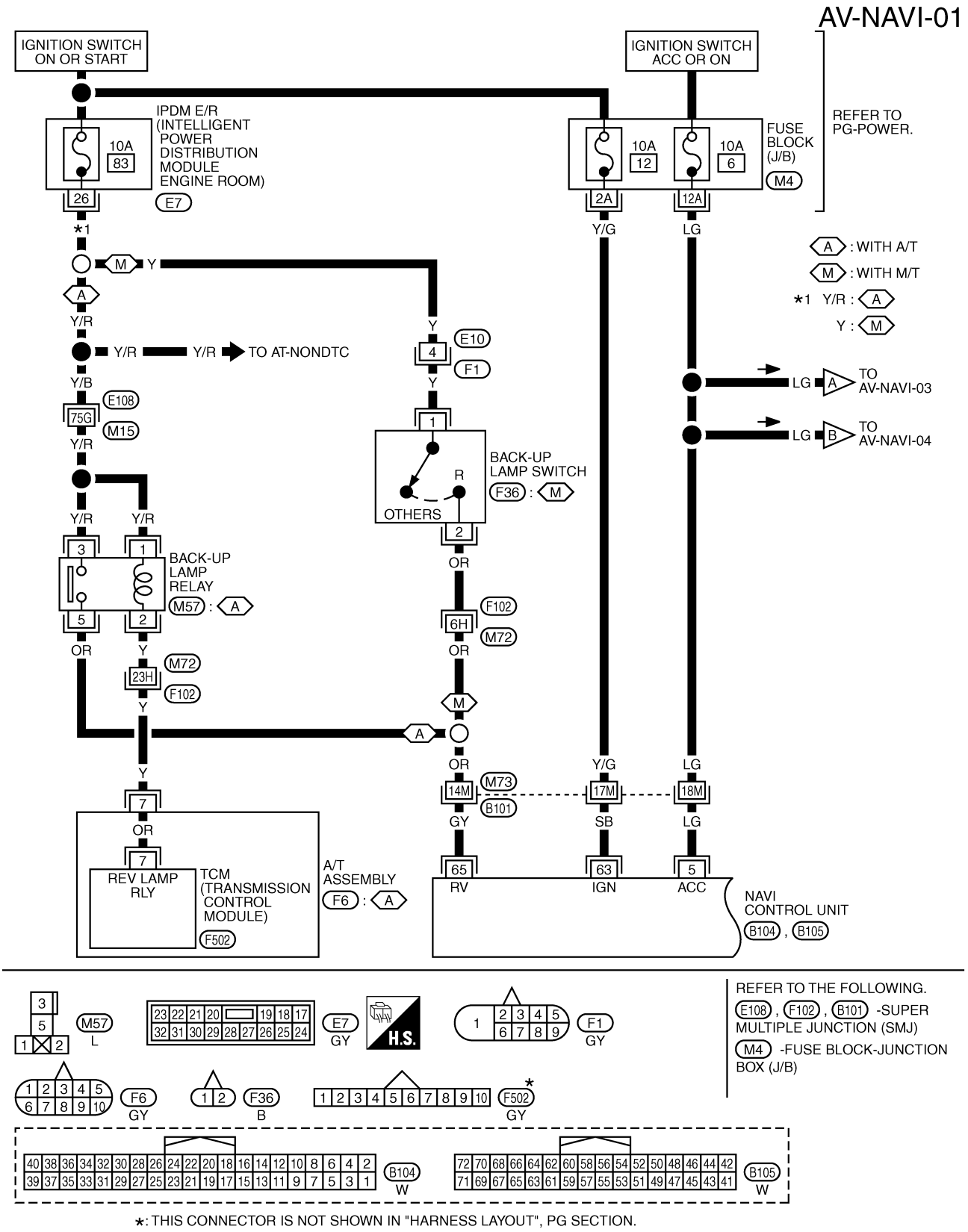
NKS000D0



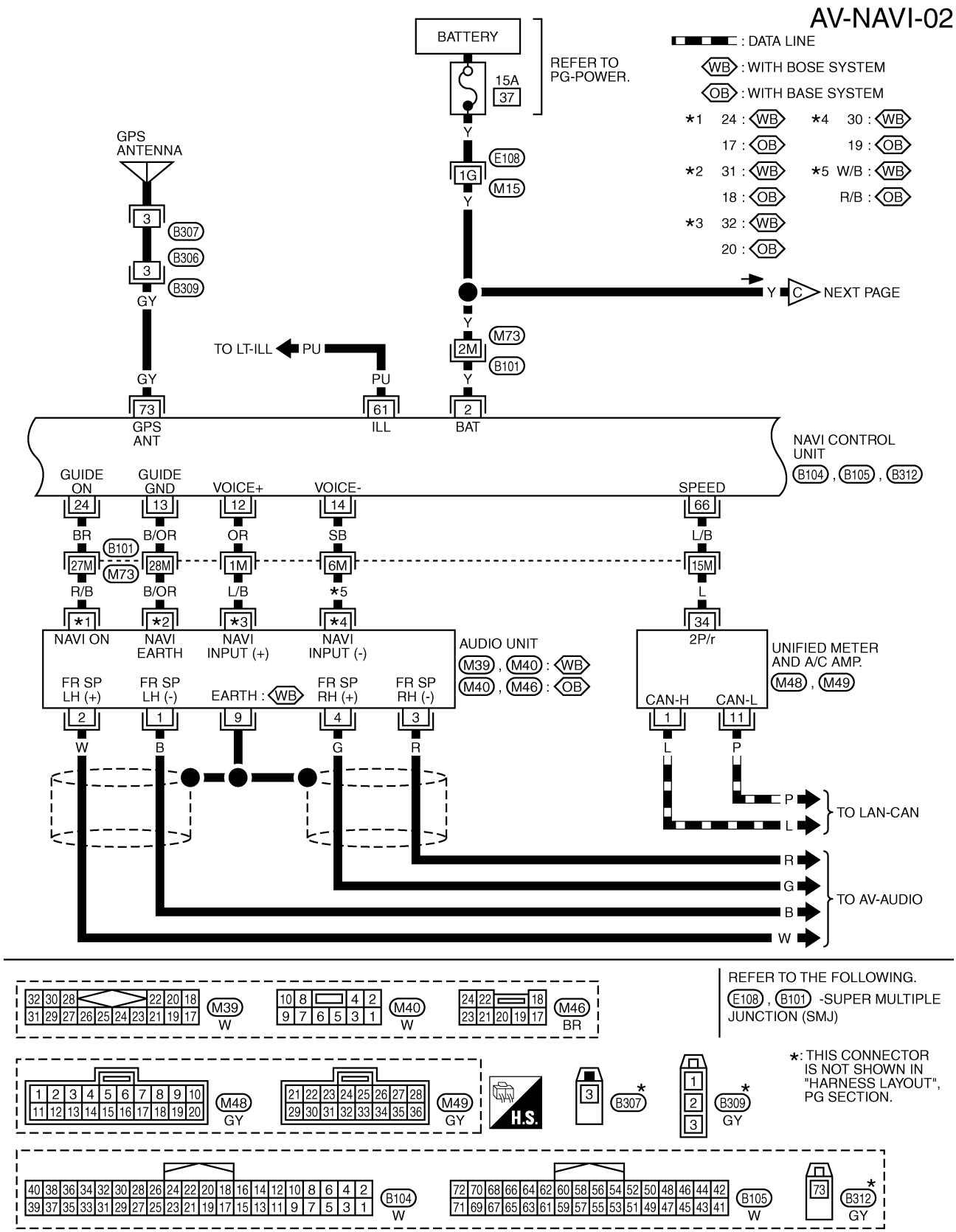
TKWT4081E

Wiring Diagram — NAVI —

NKS004RZ

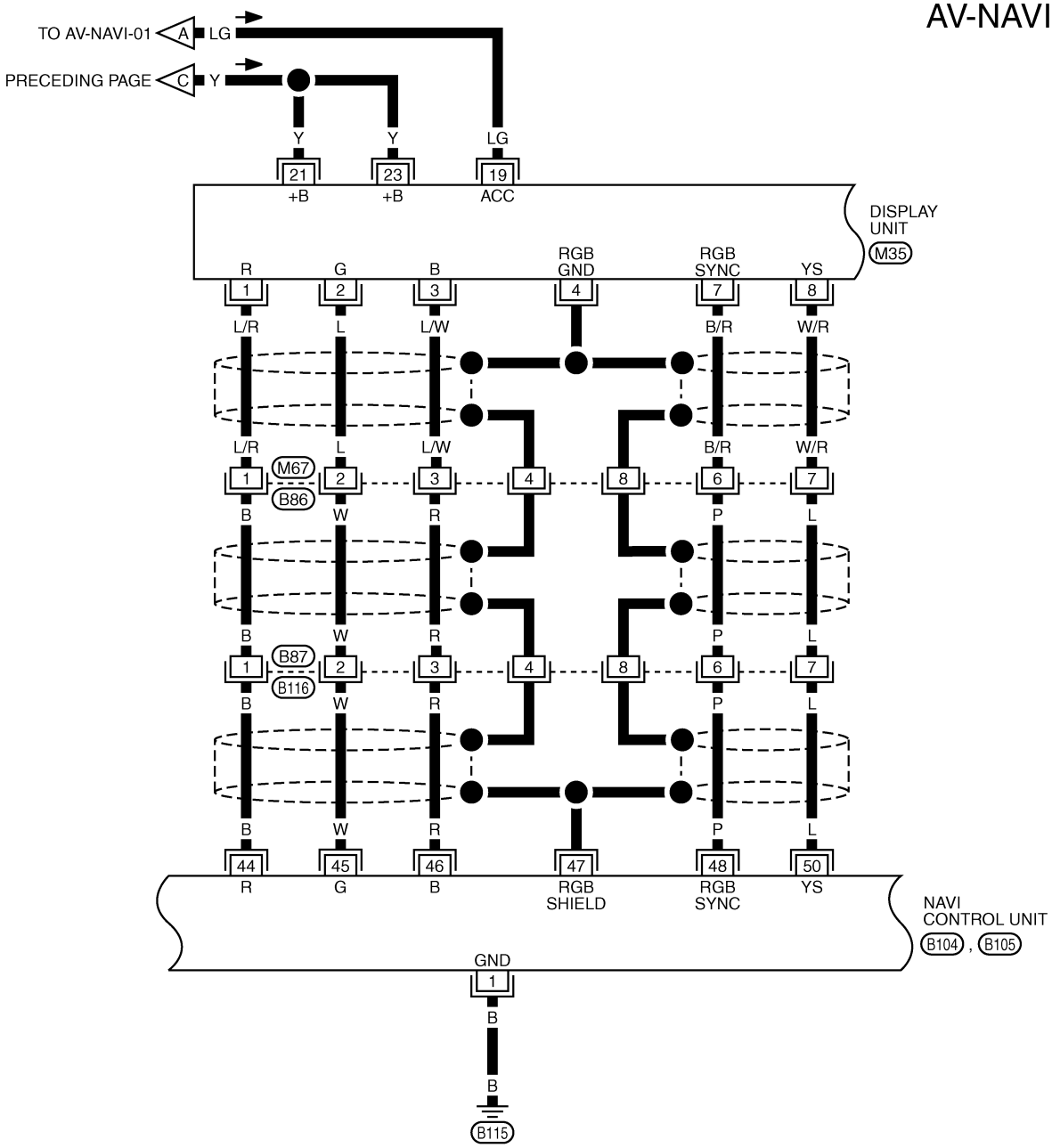


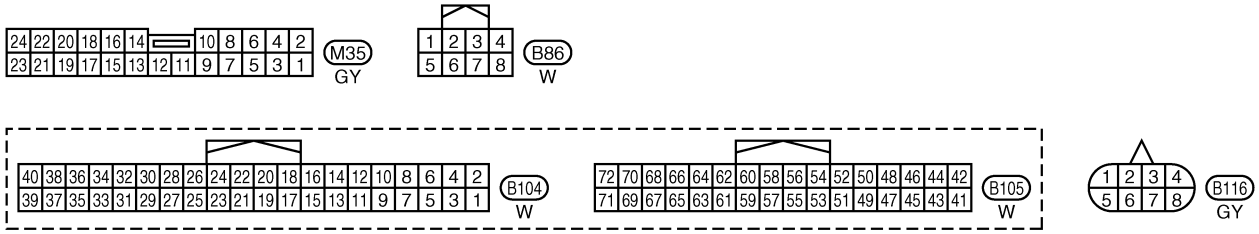
TKWT5803E


AV-NAVI-02
: DATA LINE
WB : WITH BOSE SYSTEM
OB : WITH BASE SYSTEM
*1 24 : WB 17 : OB
*2 31 : WB 18 : OB
*3 32 : WB 20 : OB
*4 30 : WB 19 : OB
*5 W/B : WB R/B : OB
BATTERY
15A 37
REFER TO PG-POWER.
GPS ANTENNA
E108
1G
M15
B307
B306
B309
NEXT PAGE
TO LT-ILL
PU
M73
2M
B101
GPS ANT
ILL
BAT
NAVI CONTROL UNIT
B104 , B105 , B312
GUIDE ON
GUIDE GND
VOICE+
VOICE-
SPEED
B101
M73
NAVI ON
NAVI EARTH
NAVI INPUT (+)
NAVI INPUT (-)
AUDIO UNIT
M39 , M40 : WB
M40 , M46 : OB
FR SP LH (+)
FR SP LH (-)
EARTH : WB
FR SP RH (+)
FR SP RH (-)
2P/r
UNIFIED METER AND A/C AMP.
M48 , M49
CAN-H
CAN-L
TO LAN-CAN
TO AV-AUDIO
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.
M39 W
M40 W
M46 BR
M48 GY
M49 GY
H.S.
B307
B309 GY
B104 W
B105 W
B312 GY

TKWT5629E

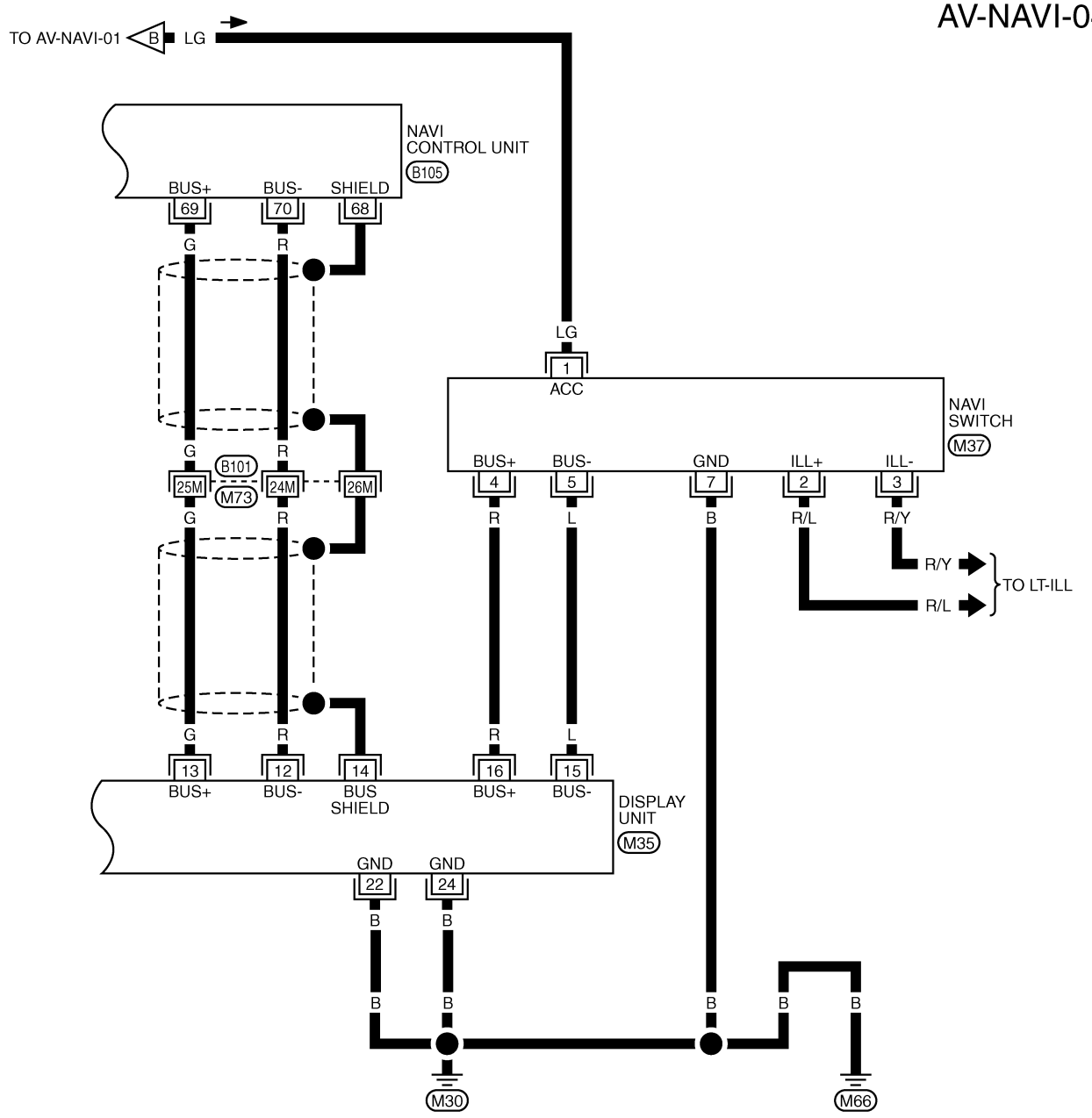
AV-NAVI-03

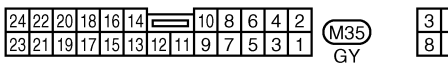


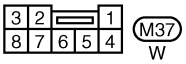


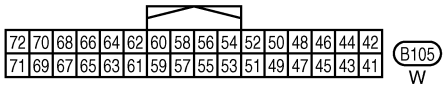
TKWT5804E

AV-NAVI-04







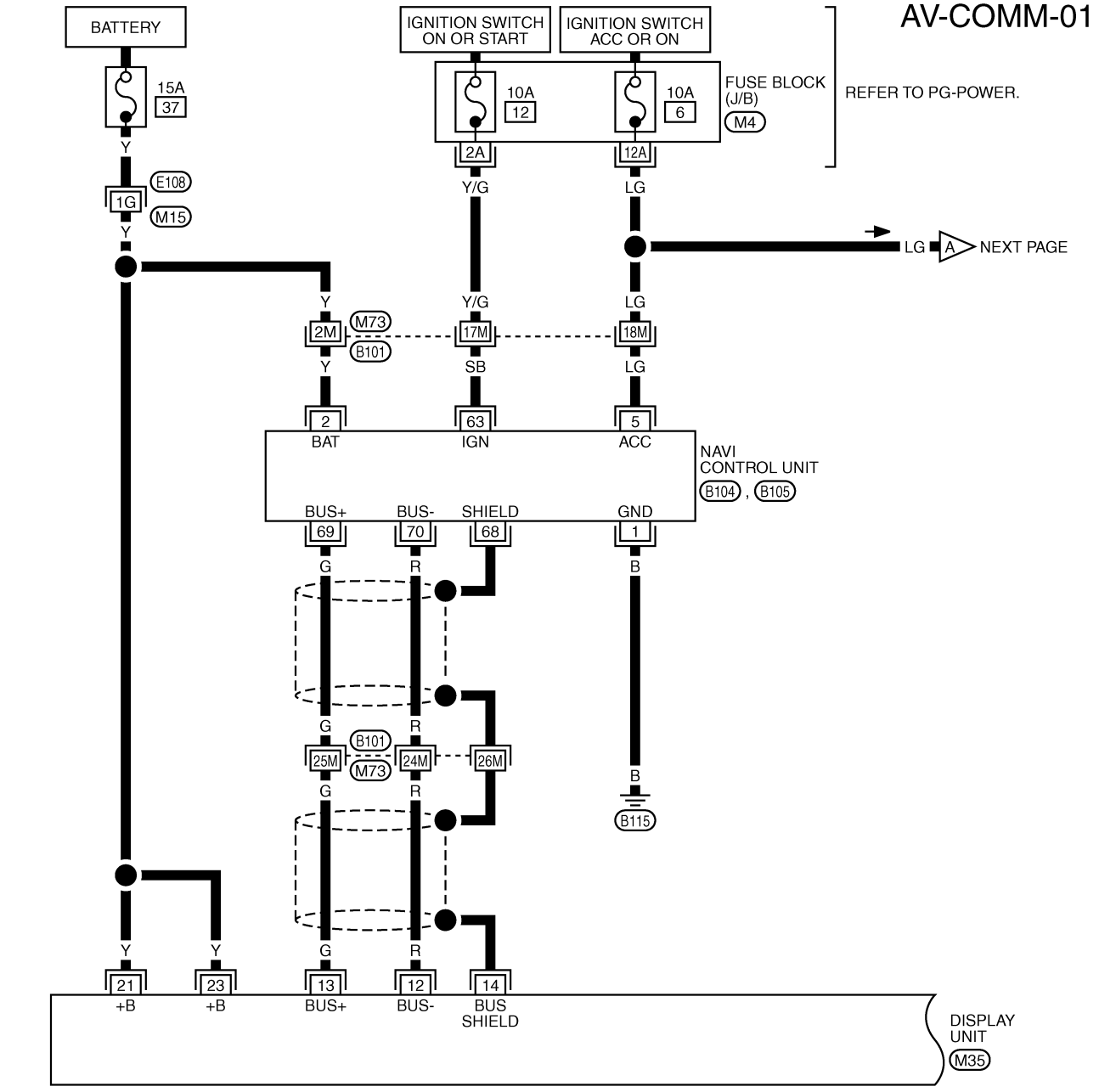


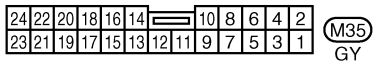
REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5631E

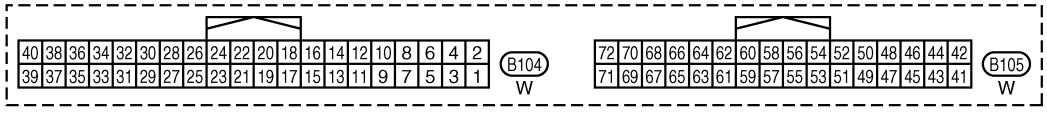
Wiring Diagram — COMM —

NKS004S0



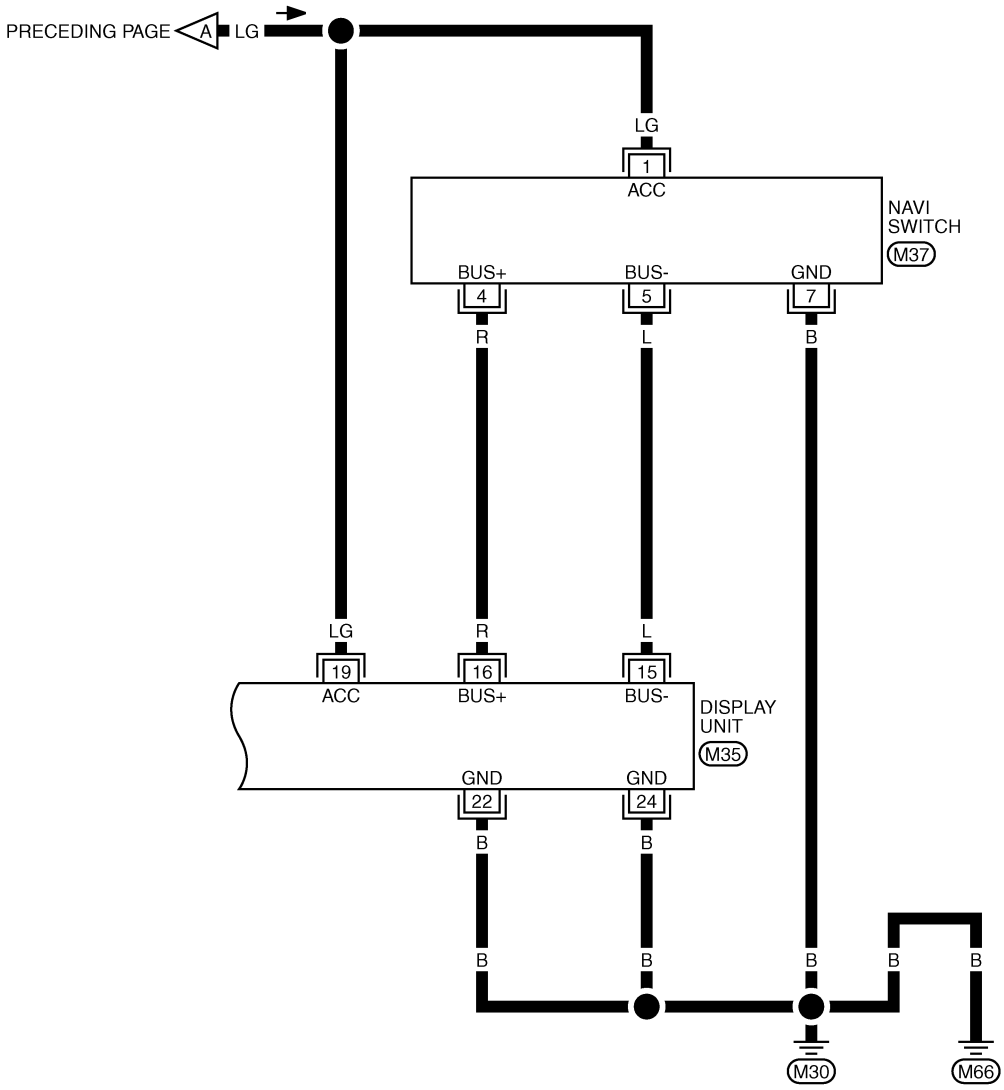


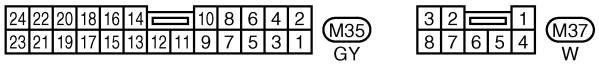
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)



TKWT5632E

AV-COMM-02

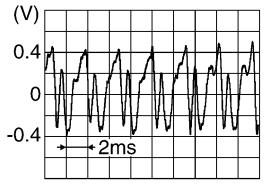
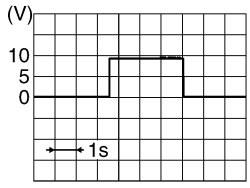
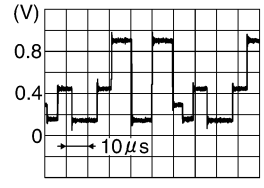
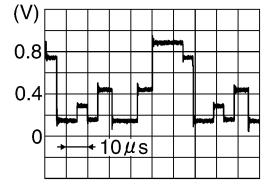
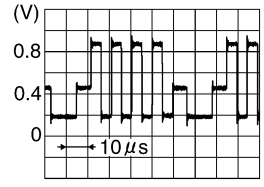
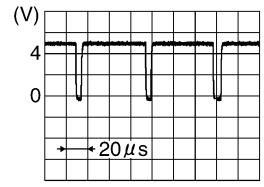


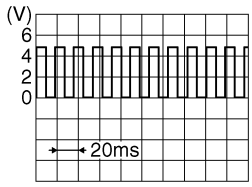
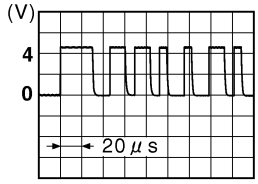
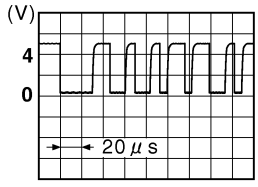


TKWT5633E

Terminals and Reference Value for NAVI Control Unit

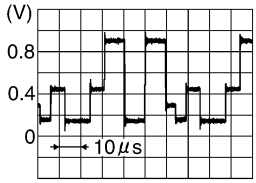
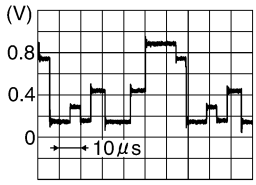
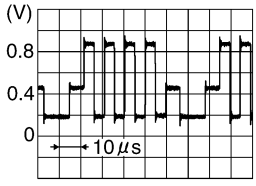
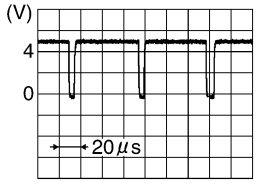
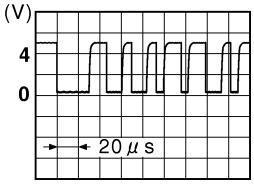
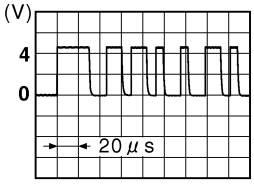
NKS000D3

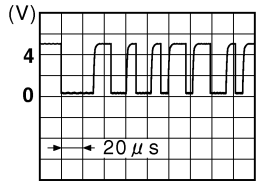
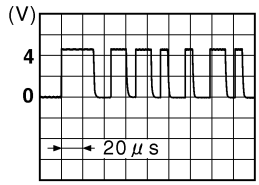
Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
1 (B)	Ground	Ground	—	ON	—	Approx. 0 V
2 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
5 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
12 (OR)	14 (SB)	Voice guidance signal	Output	ON	Press “VOICE” button	 SKIB3597E
24 (BR)	13 (B/OR)	Voice guidance ON signal	Output	ON	Press “VOICE” button	 SKIB0232E
44 (B)	Ground	RGB signal (R: red)	Output	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7360E
45 (W)	Ground	RGB signal (G: green)	Output	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7361E
46 (R)	Ground	RGB signal (B: blue)	Output	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7362E
47	—	Shield	—	—	—	—
48 (P)	Ground	RGB synchronizing signal	Output	ON	—	 SKIB3603E
50 (L)	Ground	RGB area (YS) signal	Output	ON	—	Approx. 5 V

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
61 (PU)	Ground	Illumination signal	Input	ON	Lighting switch ON	Approx. 12 V
					Lighting switch OFF	Approx. 0 V
63 (SB)	Ground	Ignition signal	Input	ON	—	Battery voltage
65 (GY)	Ground	Reverse signal	Input	ON	Select R position	Approx. 12 V
					Other position	Approx. 0 V
66 (L/B)	Ground	Vehicle speed signal (2-pulse)	Input	ON	When vehicle speed is approx. 40 km/h (25 MPH)	 SKIA6649J
68	—	Shield	—	—	—	—
69 (G)	Ground	Communication signal (+)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7378E
70 (R)	Ground	Communication signal (–)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7379E
73 (GY)	Ground	GPS signal	Input	ON	Connector is not connected	Approx. 5 V

Terminals and Reference Value for Display Unit

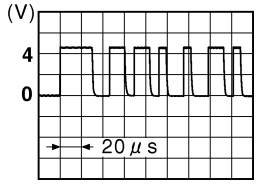
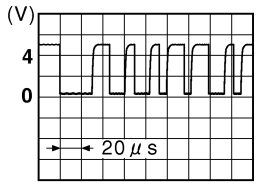
NKS000D4

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
1 (L/R)	Ground	RGB signal (R: red)	Input	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7360E
2 (L)	Ground	RGB signal (G: green)	Input	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7361E
3 (L/W)	Ground	RGB signal (B: blue)	Input	ON	Start Confirmation/Adjustment mode, and then display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen	 SKIB7362E
4	—	Shield	—	—	—	—
7 (B/R)	Ground	RGB synchronizing signal	Input	ON	—	 SKIB3603E
8 (W/R)	Ground	RGB area (YS) signal	Input	ON	—	Approx. 5 V
12 (R)	Ground	Communication signal (–)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7379E
13 (G)	Ground	Communication signal (+)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7378E
14	—	Shield	—	—	—	—

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
15 (L)	Ground	Communication signal (–)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7379E
16 (R)	Ground	Communication signal (+)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7378E
19 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
21 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
22 (B)	Ground	Ground	—	ON	—	Approx. 0 V
23 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
24 (B)	Ground	Ground	—	ON	—	Approx. 0 V

Terminals and Reference Value for NAVI Switch

NKS000D5

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
(+)	(–)			Ignition switch	Operation	
1 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
2 (R/L)	Ground	Illumination signal	Input	ON	Lighting switch ON	Approx. 12 V
					Lighting switch OFF	Approx. 0 V
3 (R/Y)	Ground	Illumination control signal	Input	ON	Illumination control switch is operated by lighting switch in ON position	Changes between approx. 0 and approx. 12 V
4 (R)	Ground	Communication signal (+)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7378E
5 (L)	Ground	Communication signal (–)	Input/ Output	ON	Operate navigation system with NAVI switch	 SKIB7379E
7 (B)	Ground	Ground	—	ON	—	Approx. 0 V

Special Note for Trouble Diagnosis

NKS002JP

Prior to perform trouble diagnosis, make sure there are no corresponding description in the “Example of Symptoms Possible No Malfunction”. Refer to AV-95, "Example of Symptoms Possible No Malfunction" .

On Board Self-Diagnosis Function

NKS000D6

DESCRIPTION

- Trouble diagnosis function of navigation system has a Self Diagnosis mode by automatic operation and a Confirmation/Adjustment mode by manual operation.
- Self Diagnosis mode checks for connections between the units constituting this system, analyzes each individual unit at the same time, and displays the results on the display unit.
- Confirmation/Adjustment mode displays trouble diagnosis that require an operation and a judgment by a human (auto-decision can not be performed by the system), confirmation of preset value, and an error history.

DIAGNOSIS ITEM

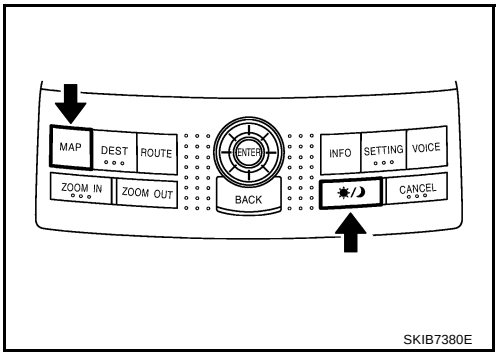
Mode			Description
Self Diagnosis			● NAVI control unit diagnosis (DVD-ROM drive will not be diagnosed when no DVD-ROM is in it.). ● Analyzes connection between the NAVI control unit and the GPS antenna, connection between the NAVI control unit and each unit, and operation of each unit.
Confirmation/ Adjustment	Display Diagnosis		Color tone and shading of the screen can be checked by the display of a color bar and a gray scale.
	Vehicle Signals		Diagnosis of signals that are input to NAVI control unit can be performed for Vehicle speed, Lights, Ignition and Reverse.
	Navigation	Steering Angle Adjustment	This mode is used to correct difference between actual turning angle of a vehicle and turning angle of the vehicle mark on the display.
		Speed Calibration	Under ordinary conditions, the navigation system distance measuring function will automatically compensate for minute decreases in wheel and tire diameter caused by tire wear or low-pressure. Speed Calibration can immediately restore system accuracy in cases such as when distance calibration is needed because of the use of tire chains.
	Error History		Malfunctions that occurred in the past are displayed, along with the number of times each has occurred. Time and location when/where the errors occurred are also displayed.
	Delete Unit Connection Log		Erase the connection history of unit and error history.

Self Diagnosis Mode

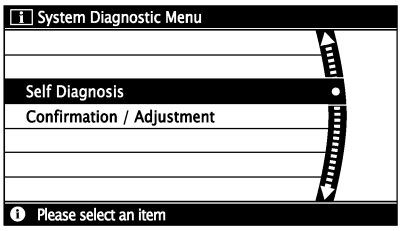
NKS000D7

OPERATION PROCEDURE

1. Start the engine.
2. Press and hold “MAP” and “☀/☽” buttons simultaneously for 5 seconds or more.
   - Shifting from current screen to previous screen is performed by pressing “BACK” button.

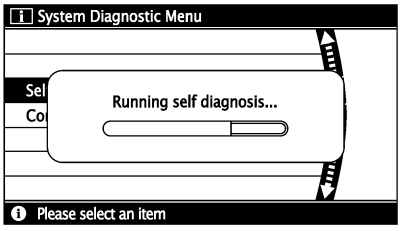


3. The initial trouble diagnosis screen will be shown, and items “Self Diagnosis” and “Confirmation/Adjustment” will become selective.



SKIB6971E

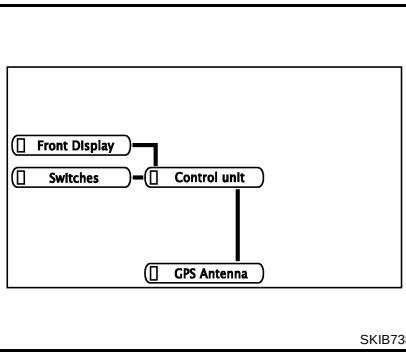
4. Perform self-diagnosis by selecting the “Self Diagnosis”.
   - Self-diagnosis screen is displayed, and then self-diagnosis starts.
   - The bar graph visible below self-diagnosis screen displays progress of the diagnosis.



SKIB6972E

5. On the diagnosis results screen, each unit name and connection line will be colored according to the diagnosis result, as follows.

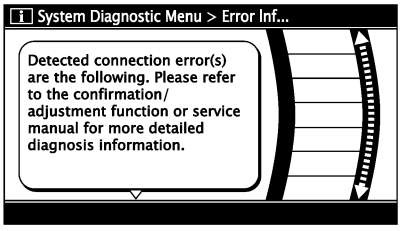
Diagnosis results	Unit	Connection line
Normal	Green	Green
Connection malfunction	Gray	Yellow
DVD-ROM drive undiagnosed	Gray	Green
DVD-ROM and DVD-ROM drive malfunction	Yellow	Green
Unit returned an error	Red	Green



SKIB7381E

NOTE:
- Control unit = NAVI control unit
- Switches = NAVI switch
- Only Control unit (NAVI control unit) is displayed in red.
- If multiple malfunctions occur at the same time for a single unit, the screen switch colors are determined according to the following order of priority: red > yellow > gray.

6. Select a switch on the diagnosis results screen, and comments for the diagnosis results will be shown.

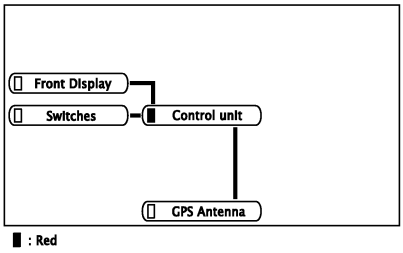
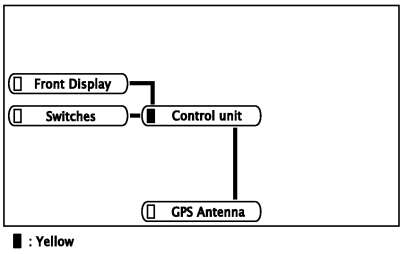
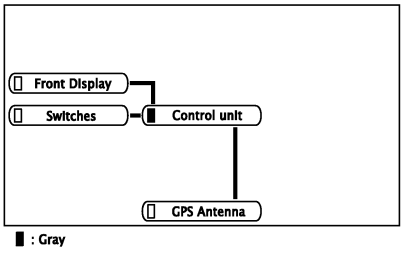
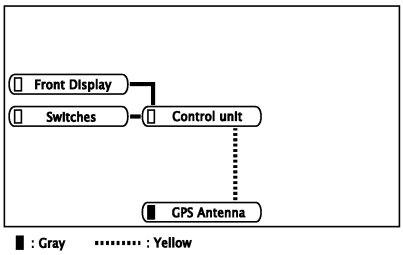


SKIB3659E

SELF-DIAGNOSIS RESULT

Check the applicable display in the following table, and then repair the malfunctioning parts.

Quick Reference Table

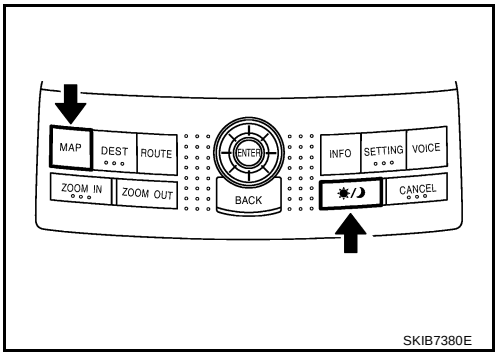
Self-diagnosis result screen	Possible cause	Action to take
 SKIB7382E	NAVI control unit malfunction is detected	Replace NAVI control unit Refer to AV-98, "Removal and Installation of NAVI Control Unit"
 SKIB7383E	● Malfunction is detected on DVD-ROM drive pickup lens in NAVI control unit ● There is dirt and damage on the DVD-ROM	1. Check if the inserted DVD-ROM is specified for this navigation system, and the DVD-ROM is dirty, scratched or warped. 2. If the results from the above checkup show no malfunction, insert the same DVD-ROM, and then restart self-diagnosis. 3. If self-diagnosis results still show any malfunction, replace NAVI control unit.
 SKIB7384E	DVD-ROM not inserted is detected	Insert DVD-ROM
 SKIB7385E	GPS antenna connection malfunction is detected	1. Check if GPS antenna feeder line is snapped or pinched. 2. If the results from the above checkup show no malfunction, replace GPS antenna, and then restart self-diagnosis. 3. If self-diagnosis results still show any malfunction, replace NAVI control unit.

Confirmation/Adjustment Mode

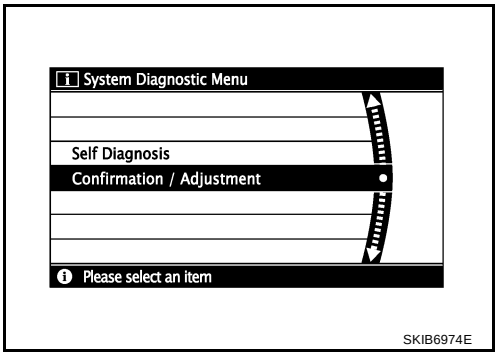
NKS000D8

OPERATION PROCEDURE

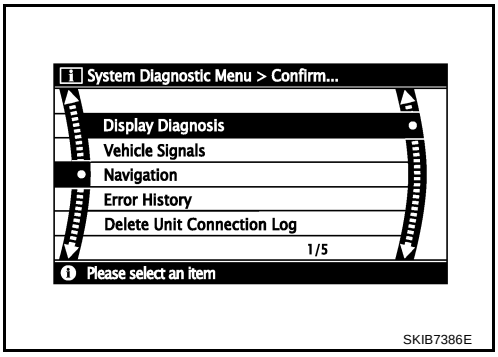
1. Start the engine.
2. Press and hold “MAP” and “☀/☽” buttons simultaneously for 5 seconds or more.
   - Shifting from current screen to previous screen is performed by pressing “BACK” button.



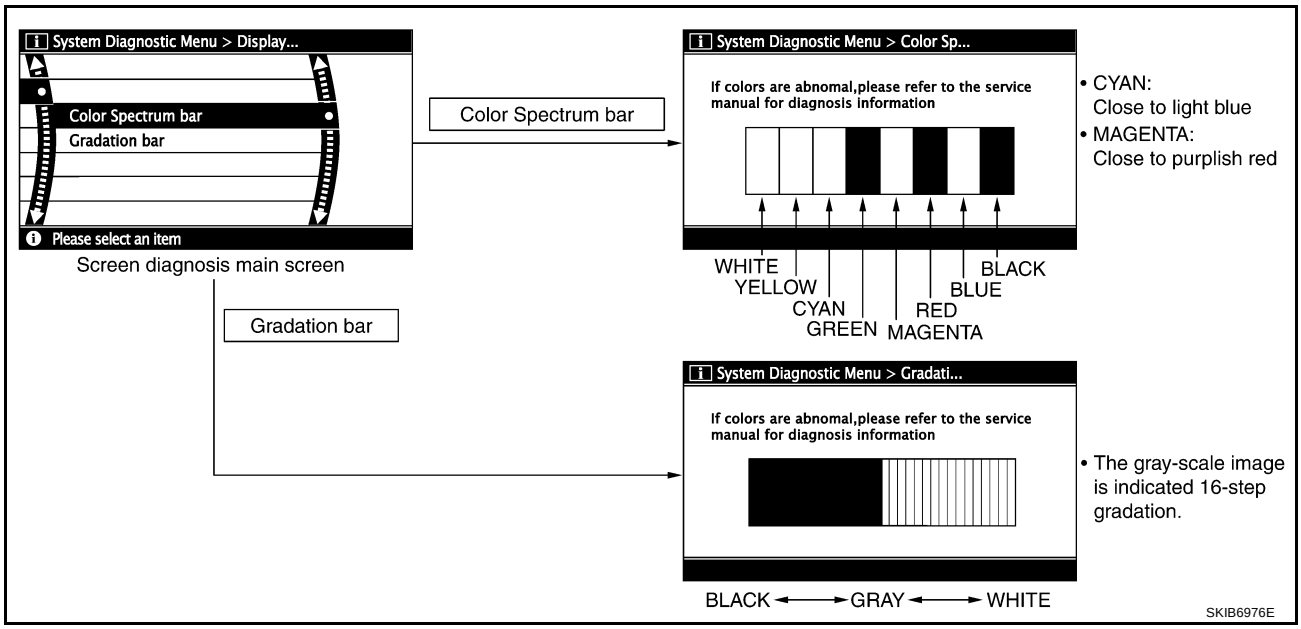
3. The initial trouble diagnosis screen will be shown, and items “Self Diagnosis” and “Confirmation/Adjustment” will become selective.
4. Select “Confirmation/Adjustment”.



5. Each diagnosis is shown by selecting each screen switch on Confirmation/Adjustment screen.



DISPLAY DIAGNOSIS

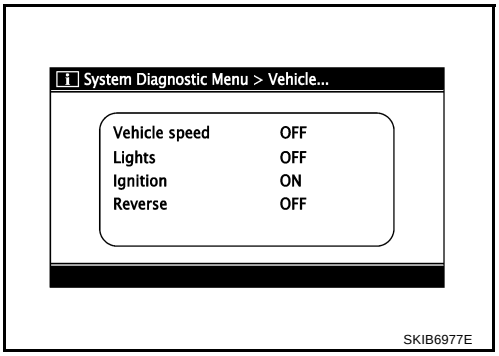


- If RGB signal is malfunctioning, the tint of the color bar display is as follows.

R (red) signal error : Light blue (Cyan) tint
G (green) signal error : Purple (Magenta) tint
B (blue) signal error : Yellow tint

VEHICLE SIGNALS

A comparison check can be made of each actual vehicle signal and the signals recognized by the NAVI control unit.



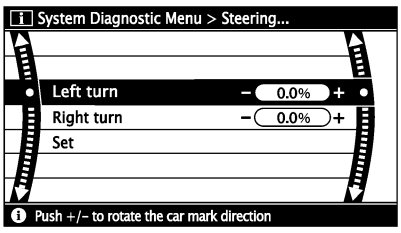
Diagnosis item	Display	Condition	Remarks
Vehicle speed	ON	When vehicle speed is more than 0 km/h (0 MPH)	Changes in indication may be delayed. This is normal.
	OFF	When vehicle speed is 0 km/h (0 MPH)	
	—	Ignition switch in ACC position	
Lights	ON	Lighting switch ON	—
	OFF	Lighting switch OFF	
Ignition	ON	Ignition switch ON	—
	OFF	Ignition switch ACC position	
Reverse	ON	Selector lever in R position	Changes in indication may be delayed. This is normal.
	OFF	Selector lever in any position other than R position	
	—	Ignition switch in ACC position	

NOTE:
If ignition signal is NG, each vehicle signal of vehicle speed and reverse is not displayed.

NAVIGATION

Steering Angle Adjustment

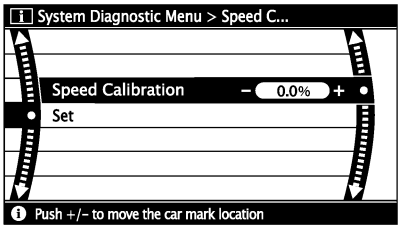
The steering angle output value detected by the gyroscope can be adjusted.



SKIB3684E

Speed Calibration

Usually the automatic distance correction function adjusts the malfunction in distance caused by the tires wearing down or the tire pressure change. If prompt adjustment is necessary when the tire chains are installed etc., perform this procedure.

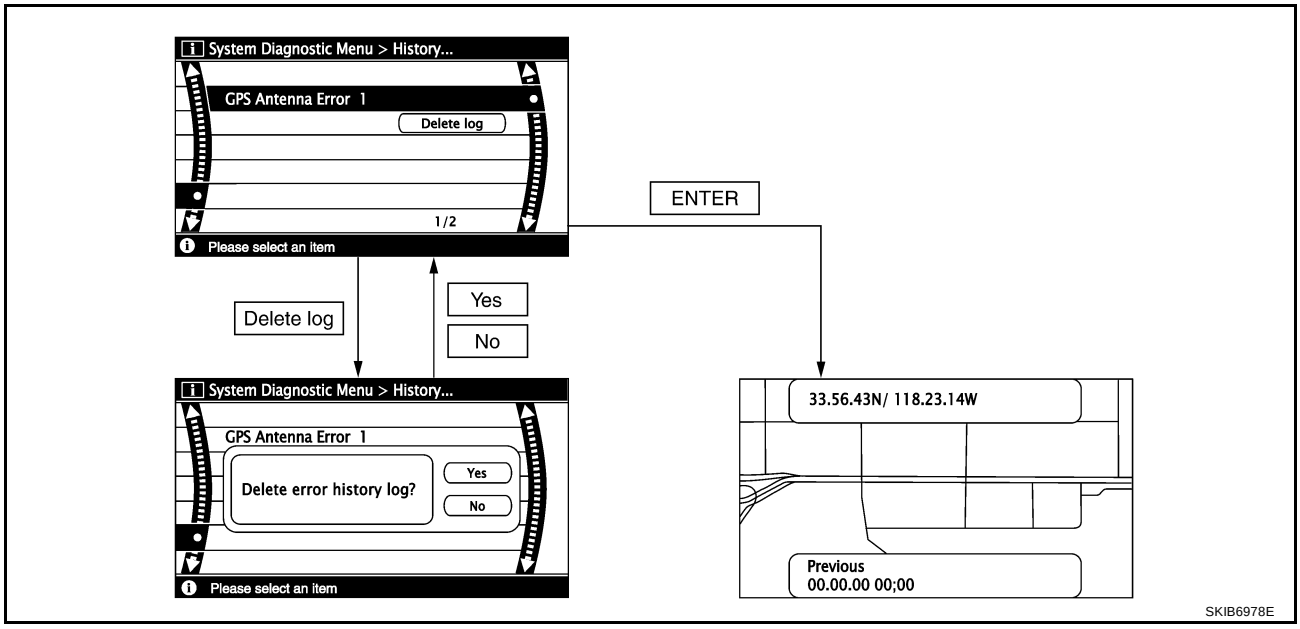


SKIB3685E

ERROR HISTORY

Diagnosis results of self-diagnosis depend on if any error occurred during the time after selecting “Self Diagnosis” until self-diagnosis results is displayed.
Meanwhile, when an error occurs before selecting “Self Diagnosis”, and if an error does not occur until self-diagnosis results is displayed, a diagnosis result is judged as normal.
Consequently, a diagnosis needs to be performed with “Error History” for the past error that is not available with self-diagnosis.
“Error History” displays the time and place of the most recent occurrence of that error. However, take note of the following points.

- Correct time of the error occurrence may not be displayed when the GPS antenna substrate within the NAVI control unit has malfunctioned.
- Place of the error occurrence is represented by the position of the vehicle mark at the time when the error occurred. If the vehicle mark has deviated from the correct position, then the place of the error occurrence may not be located correctly.
- When the ignition switch is turned ON if the error is detected, the counter increases 1. Even if it is normal when the ignition switch is turned ON the next time, the counter does not decrease.
- The upper limit of the counter is 50. 51 or more is displayed as 50. It can be reset to 0 by “Delete log” switch.



Diagnosis by Error History

- When having a difficulty on the investigation of cause due to multiple errors with a reproducible malfunction, turn ON the ignition switch from OFF mode after making a memo of the item and number of time (or delete “Error History”). Check “Error History” again after the malfunction was reproduced, and then perform diagnosis focusing on the item of which number of time increased.
- DVD-ROM error history may be restored because DVD-ROM cannot be temporarily read. (Driving on rough road etc.) Then, erase the error history. (This is not a malfunction.) Perform service in “Action to take” if error history are repeatedly indicated again.

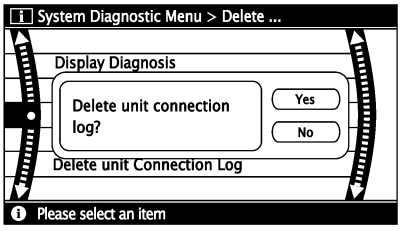
Error item	Possible cause	Action to take
GPS Antenna Error	GPS antenna connection malfunction is detected	1. Start self-diagnosis, and make sure of the result. 2. If any error is found, GO TO 3. If any error is not found, delete the error history and end the diagnosis. (This is not a malfunction.) 3. Check if GPS antenna feeder line is snapped or pinched. 4. If the results from the above checkup show no malfunction, replace GPS antenna, and then restart self-diagnosis. 5. If self-diagnosis results still show any malfunction, replace NAVI control unit.
FLASH-ROM Error Of Control Unit	NAVI control unit malfunction is detected	1. Start self-diagnosis, and make sure of the result. 2. If any error is found, replace NAVI control unit. Refer to AV-98, "Removal and Installation of NAVI Control Unit" . If any error is not found, delete the error history and end the diagnosis. (This is not a malfunction.)
Connection Of Gyro		
GPS Communication Error	GPS malfunction is detected	If the symptoms such as the GPS receipt malfunction occur, intermittent malfunction caused by strong radio interference may be detected. If the malfunction always occurs, replace NAVI control unit.
GPS ROM Error		
GPS RAM Error		
GPS RTC Error		
DVD-ROM Mechanism not Detected	● Malfunction is detected on DVD-ROM drive pickup lens in NAVI control unit ● There is dirt and damage on the DVD-ROM	1. Check if the inserted DVD-ROM is specified for this navigation system, and the DVD-ROM is dirty, scratched or warped. 2. If the results from the above checkup show no malfunction, insert the same DVD-ROM, and then restart self-diagnosis. 3. If self-diagnosis results still show any malfunction, replace NAVI control unit.
DVD-ROM Communication Error		
DVD-ROM Mechanism Error		
DVD-ROM Focus Error		
DVD-ROM TOC Error		
DVD-ROM Disc Error		
DVD-ROM Seek Error		
DVD-ROM Error Correction Error		
DVD-ROM Read Error		
DVD-ROM Data Transfer Error		
DVD-ROM Data Error		
DVD-ROM Loading / Eject Error		
DVD-ROM Time-out		

Error item	Possible cause	Action to take
Front Display Connection Error	Display unit power supply and ground circuit malfunction is detected	1. Delete the error history, and turn OFF ignition switch. 2. Turn ON ignition switch, and make sure of the error history. 3. If the error item listed left is displayed again, GO TO 4. If the error item is not displayed, end the diagnosis. (This is not a malfunction.) 4. Check display unit power supply and ground circuit. 5. If the results from the above checkup show no malfunction, replace display unit.

Error item	Possible cause	Action to take
Switches Connection Error	● NAVI switch power supply and ground circuit malfunction is detected ● Malfunction is detected on communication signal between display unit and NAVI switch ● Malfunction is detected on communication signal between NAVI control unit and display unit	1. Delete the error history, and turn OFF ignition switch. 2. Turn ON ignition switch, and make sure of the error history. 3. If the error item listed left is displayed again, GO TO 4. If the error item is not displayed, end the diagnosis. (This is not a malfunction.) 4. Check NAVI switch power supply and ground circuit. 5. Check communication circuit between display unit and NAVI switch. 6. Check communication circuit between NAVI control unit and display unit. 7. If the results from the above checkup show no malfunction, replace NAVI switch, display unit, or NAVI control unit, and then start self-diagnosis. 8. If self-diagnosis results still show any malfunction, replace one of the two units that is not replaced yet. 9. If self-diagnosis results still show any malfunction, replace the other unit.
● Front Display Connection Error ● Switches Connection Error	● Malfunction is detected on communication signal between NAVI control unit and display unit ● Malfunction is detected on communication signal between display unit and NAVI switch	1. Delete the error history, and turn OFF ignition switch. 2. Turn ON ignition switch, and make sure of the error history. 3. If the error item listed left is displayed again, GO TO 4. If the error item is not displayed, end the diagnosis. (This is not a malfunction.) 4. Check communication circuit between NAVI control unit and display unit. 5. Check communication circuit between display unit and NAVI switch. 6. If the results from the above checkup show no malfunction, replace NAVI switch, display unit, or NAVI control unit, and then start self-diagnosis. 7. If self-diagnosis results still show any malfunction, replace one of the two units that is not replaced yet. 8. If self-diagnosis results still show any malfunction, replace the other unit.

DELETE UNIT CONNECTION LOG

Erase the connection history of unit and error history that is recorded in NAVI control unit (clear the connection history of the removed unit).



SKIB6979E

All Images Are Not Displayed

NKS000DI

Symptom: RGB image such as a map screen is not displayed.

1. CHECK CONDITION

Check if brightness of screen changes when ☀/☽ button on NAVI switch is turned on after turning on ignition switch.

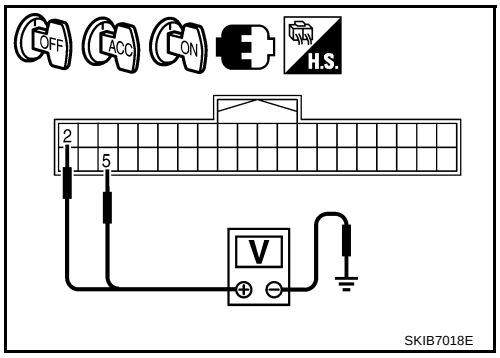
Does brightness of screen change?

YES >> GO TO 5.
NO >> GO TO 2.

2. CHECK NAVI CONTROL UNIT POWER SUPPLY AND GROUND CIRCUIT

1. Check voltage between NAVI control unit harness connector terminals and ground.

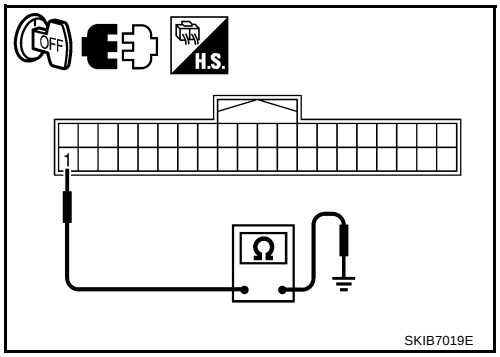
Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal				
B104	2	Ground	Battery voltage	Battery voltage	Battery voltage
	5		0 V	Battery voltage	Battery voltage



SKIB7018E

2. Turn ignition switch OFF.
3. Disconnect NAVI control unit connector.
4. Check continuity between NAVI control unit harness connector B104 terminal 1 and ground.

1 – Ground : Continuity should exist.



SKIB7019E

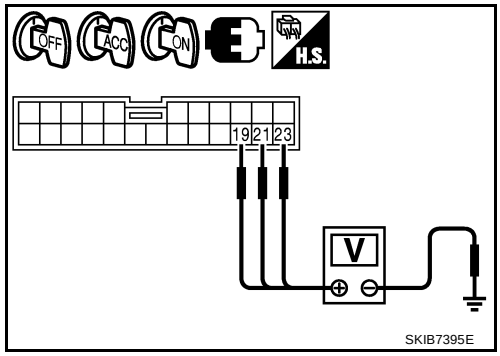
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK DISPLAY UNIT POWER SUPPLY AND GROUND CIRCUIT

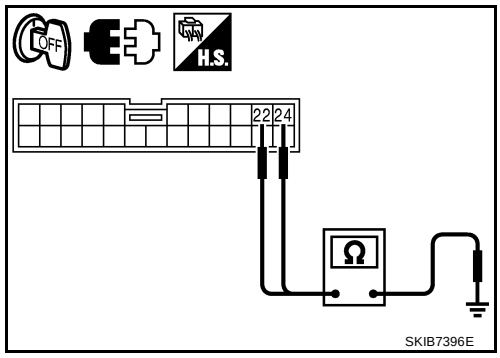
1. Check voltage between display unit harness connector terminals and ground.

Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal				
M35	21, 23	Ground	Battery voltage	Battery voltage	Battery voltage
	19		0 V	Battery voltage	Battery voltage



2. Turn ignition switch OFF.
3. Disconnect display unit connector.
4. Check continuity between display unit harness connector M35 terminals 22, 24 and ground.

22, 24 – Ground : Continuity should exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK NAVI CONTROL UNIT AND DISPLAY UNIT

1. Replace NAVI control unit or display unit.
2. Turn ignition switch ON.
3. Check if an image is displayed on the screen.

Is an image displayed on the screen?

YES >> INSPECTION END
NO >> Replace the other unit.

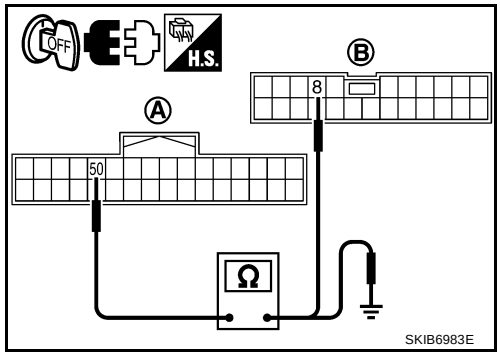
5. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and display unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B105 terminal 50 and display unit harness connector (B) M35 terminal 8.

50 – 8 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B105 terminal 50 and ground.

50 – Ground : Continuity should not exist.



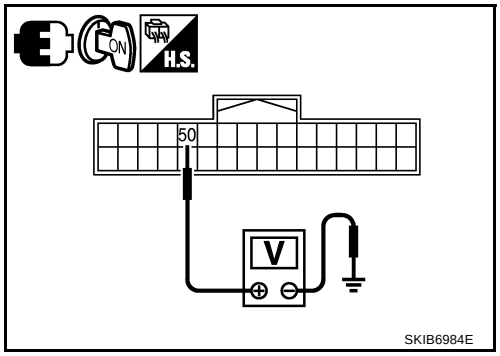
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK RGB AREA (YS) SIGNAL

1. Connect NAVI control unit and display unit connectors.
2. Turn ignition switch ON.
3. Check voltage between NAVI control unit harness connector B105 terminal 50 and ground.

50 – Ground : Approx. 5 V



OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

Navigation System Is Not Operated by NAVI Switch

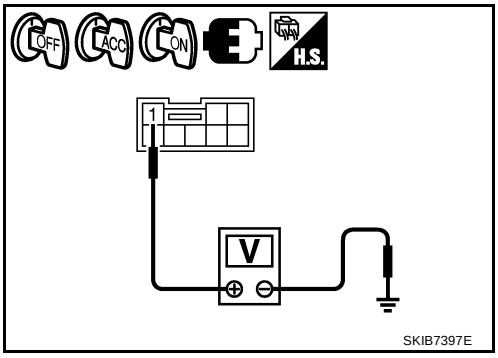
NKS000DJ

Symptom: Initial screen (NISSAN screen) or warning screen is displayed after ignition switch turns ON. But NAVI switch does not work.

1. CHECK NAVI SWITCH POWER SUPPLY AND GROUND CIRCUIT

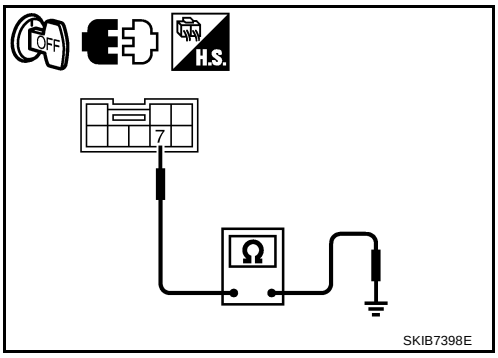
1. Check voltage between NAVI switch harness connector terminal and ground.

Terminals			OFF	ACC	ON
(+)		(–)			
Connector	Terminal				
M37	1	Ground	0 V	Battery voltage	Battery voltage



2. Turn ignition switch OFF.
3. Disconnect NAVI switch connector.
4. Check continuity between NAVI switch harness connector M37 terminal 7 and ground.

7 – Ground : Continuity should exist.



OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

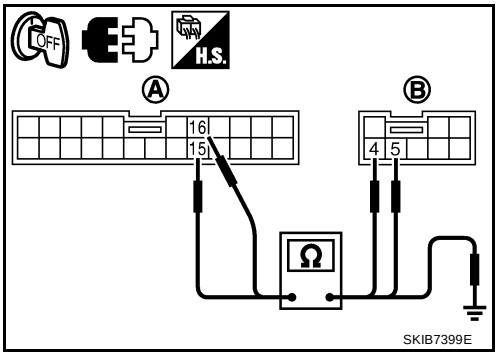
2. CHECK HARNESS

1. Disconnect display unit connector.
2. Check continuity between display unit harness connector (A) M35 terminals 15, 16 and NAVI switch harness connector (B) M37 terminals 5, 4.

15 – 5 : Continuity should exist.
16 – 4 : Continuity should exist.

3. Check continuity between display unit harness connector (A) M35 terminals 15, 16 and ground.

15, 16 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

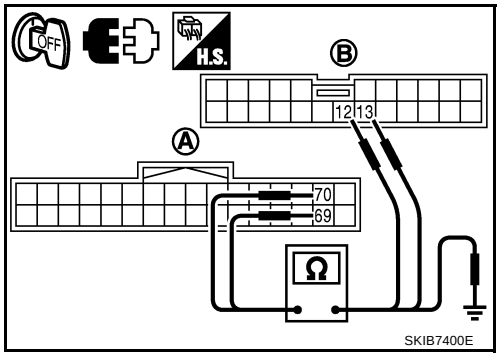
3. CHECK HARNESS

1. Disconnect NAVI control unit connector.
2. Check continuity between NAVI control unit harness connector (A) B105 terminals 69, 70 and display unit harness connector (B) M35 terminals 13, 12.

69 – 13 : Continuity should exist.
70 – 12 : Continuity should exist.

3. Check continuity between NAVI control unit harness connector (A) B105 terminals 69, 70 and ground.

69, 70 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK NAVI SWITCH, DISPLAY UNIT AND NAVI CONTROL UNIT

1. Replace NAVI switch, display unit, or NAVI control unit.
2. Make sure that navigation system can be operated by NAVI switch.

OK or NG

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK NAVI SWITCH, DISPLAY UNIT AND NAVI CONTROL UNIT

1. Replace one of the two units that is not replaced yet.
2. Make sure that navigation system can be operated by NAVI switch.

OK or NG

OK >> INSPECTION END
NG >> Replace the other unit.

Tint Is Strange for The RGB Image

NKS000DL

Symptom: Tint of RGB image is strange.

1. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and display unit connectors.
3. Check the malfunctioning circuit according to the symptoms.

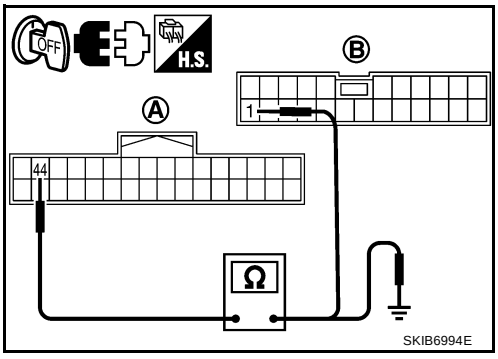
- **Light blue (Cyan) tinged screen**

Check continuity between NAVI control unit harness connector (A) B105 terminal 44 and display unit harness connector (B) M35 terminal 1.

44 – 1 : Continuity should exist.

Check continuity between NAVI control unit harness connector (A) B105 terminal 44 and ground.

44 – Ground : Continuity should not exist.



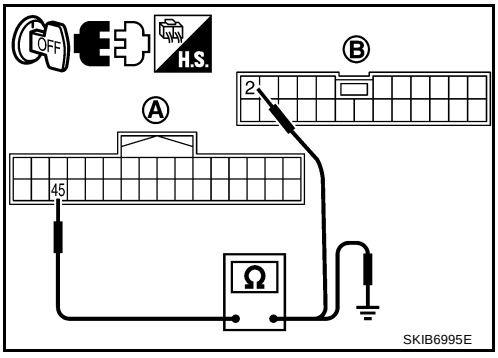
- **Purple (Magenta) tinged screen**

Check continuity between NAVI control unit harness connector (A) B105 terminal 45 and display unit harness connector (B) M35 terminal 2.

45 – 2 : Continuity should exist.

Check continuity between NAVI control unit harness connector (A) B105 terminal 45 and ground.

45 – Ground : Continuity should not exist.



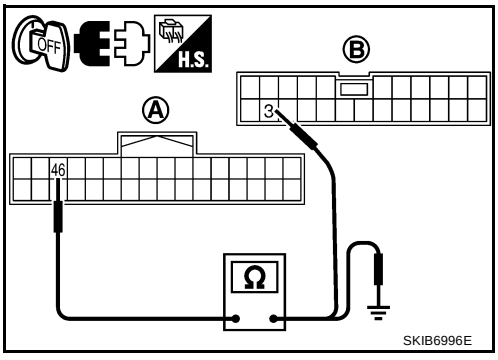
- **Yellow tinged screen**

Check continuity between NAVI control unit harness connector (A) B105 terminal 46 and display unit harness connector (B) M35 terminal 3.

46 – 3 : Continuity should exist.

Check continuity between NAVI control unit harness connector (A) B105 terminal 46 and ground.

46 – Ground : Continuity should not exist.



OK or NG

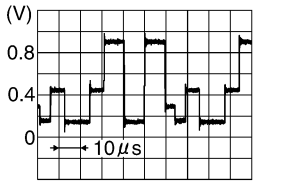
OK >> GO TO 2.
NG >> Repair harness or connector.

2. CHECK RGB SIGNAL

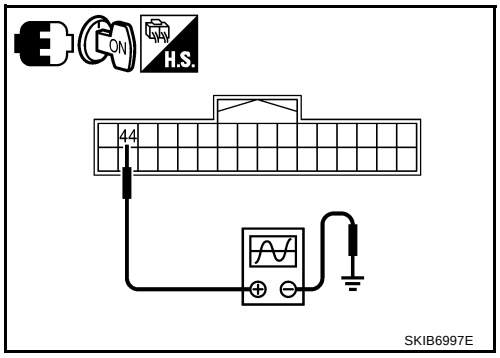
1. Connect NAVI control unit and display unit connectors.
2. Turn ignition switch ON.
3. Start Confirmation/Adjustment mode. Refer to AV-77, "Confirmation/Adjustment Mode" .
4. Display color bar by selecting “Color Spectrum bar” on Display Diagnosis screen. Refer to AV-78, "DISPLAY DIAGNOSIS" .
5. Check the malfunctioning circuit according to the symptoms.

- **Light blue (Cyan) tinged screen**
  Check voltage waveform between NAVI control unit harness connector B105 terminal 44 and ground using oscilloscope.

44 – Ground:



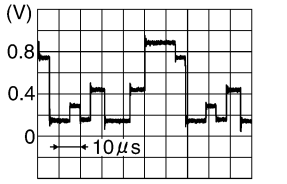
SKIB7360E



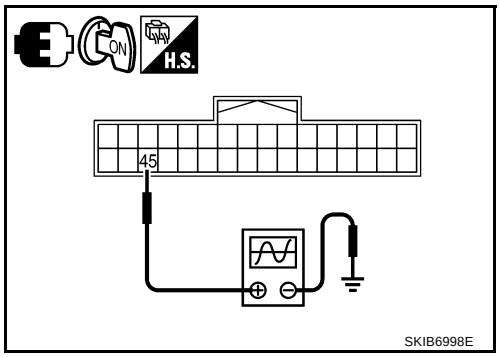
SKIB6997E

- **Purple (Magenta) tinged screen**
  Check voltage waveform between NAVI control unit harness connector B105 terminal 45 and ground using or oscilloscope.

45 – Ground:



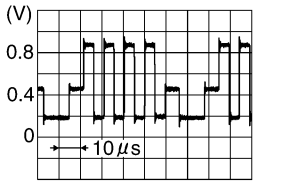
SKIB7361E



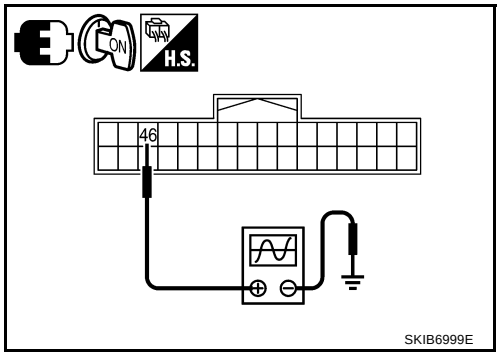
SKIB6998E

- **Yellow tinged screen**
  Check voltage waveform between NAVI control unit harness connector B105 terminal 46 and ground using oscilloscope.

46 – Ground:



SKIB7362E



SKIB6999E

OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

RGB Image Is Rolling

NKS000DM

Symptom: RGB image such as a map screen is rolling.

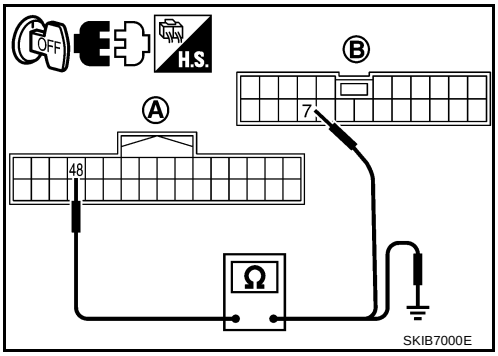
1. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and display unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B105 terminal 48 and display unit harness connector (B) M35 terminal 7.

48 – 7 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B105 terminal 48 and ground.

48 – Ground : Continuity should not exist.



SKIB7000E

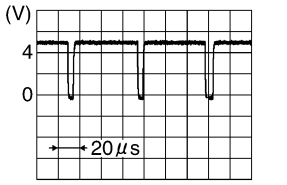
OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

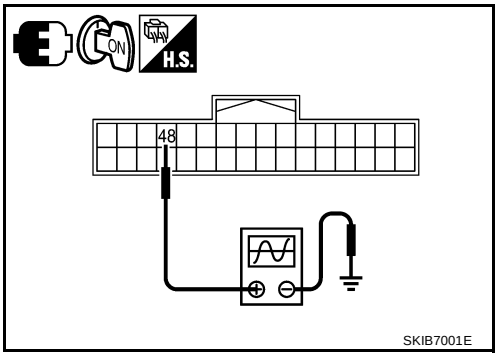
2. CHECK RGB SYNCHRONIZING SIGNAL

1. Connect NAVI control unit and display unit connectors.
2. Turn ignition switch ON.
3. Check voltage waveform between NAVI control unit harness connector B105 terminal 48 and ground using oscilloscope.

48 – Ground:



SKIB3603E



SKIB7001E

OK or NG

OK >> Replace display unit.
NG >> Replace NAVI control unit.

Voice Guidance Is Not Heard

NKS000DN

Symptom: Voice guidance does not sound at route guidance.

1. CHECK CONDITION

Turn audio system ON, and check if any sound can be heard from front door speaker.

OK or NG

OK >> GO TO 2.
NG >> Refer to AV-39, "Trouble Diagnosis" and repair malfunctioning part.

2. CHECK CONDITION

Turn audio system ON, and check if front door speaker is muted when pressing “VOICE” button during sounding from front door speaker.

Is front door speaker muted?

YES >> GO TO 3.
NO >> GO TO 5.

3. CHECK HARNESS

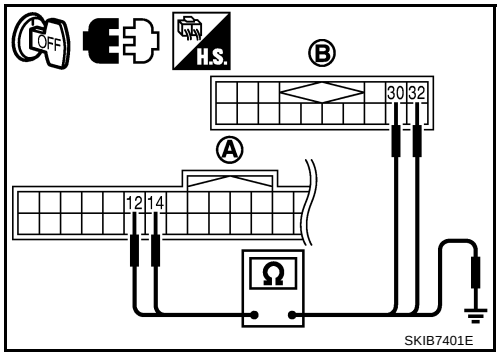
With BOSE system

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and audio unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B104 terminals 12, 14 and audio unit harness connector (B) M39 terminals 32, 30.

   12 – 32 : Continuity should exist.
   14 – 30 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B104 terminals 12, 14 and ground.

   12, 14 – Ground : Continuity should not exist.



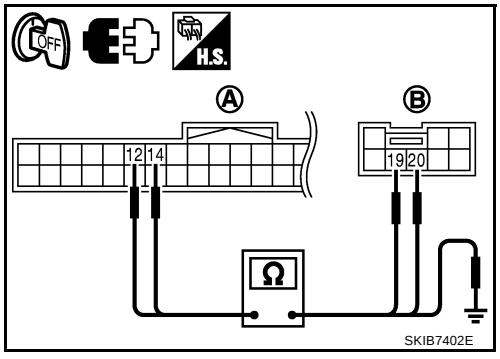
With base system

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and audio unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B104 terminals 12, 14 and audio unit harness connector (B) M46 terminals 20, 19.

   12 – 20 : Continuity should exist.
   14 – 19 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B104 terminals 12, 14 and ground.

   12, 14 – Ground : Continuity should not exist.

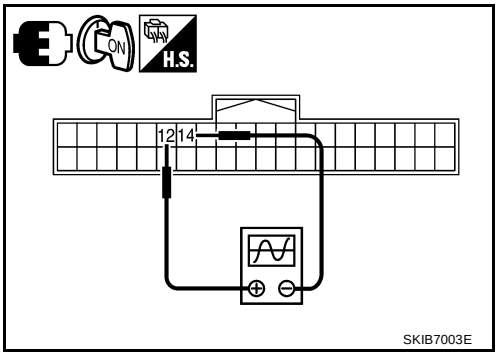


OK or NG

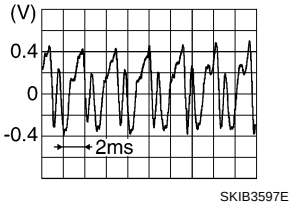
OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK VOICE GUIDANCE SIGNAL

1. Connect NAVI control unit and audio unit connectors.
2. Turn ignition switch ON.
3. When pressing “VOICE” button, check voltage waveform between NAVI control unit harness connector B104 terminals 12 and 14 using or oscilloscope.



12 – 14:



OK or NG

OK >> Replace audio unit.
NG >> Replace NAVI control unit.

5. CHECK HARNESS

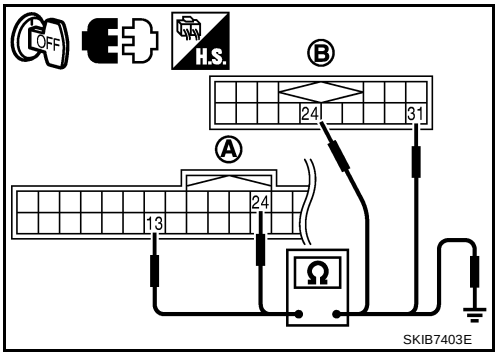
With BOSE system

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and audio unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B104 terminals 13, 24 and audio unit harness connector (B) M39 terminals 31, 24.

13 – 31 : Continuity should exist.
24 – 24 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B104 terminal 24 and ground.

24 – Ground : Continuity should not exist.



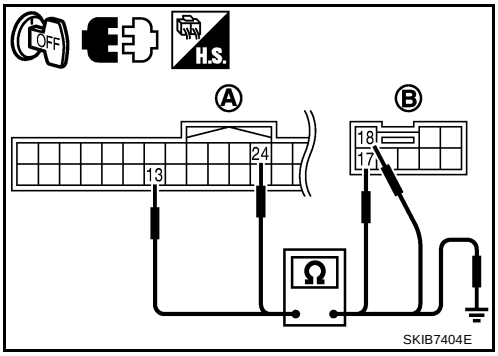
With base system

1. Turn ignition switch OFF.
2. Disconnect NAVI control unit and audio unit connectors.
3. Check continuity between NAVI control unit harness connector (A) B104 terminals 13, 24 and audio unit harness connector (B) M46 terminals 18, 17.

13 – 18 : Continuity should exist.
24 – 17 : Continuity should exist.

4. Check continuity between NAVI control unit harness connector (A) B104 terminal 24 and ground.

24 – Ground : Continuity should not exist.



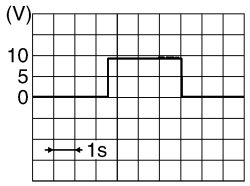
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

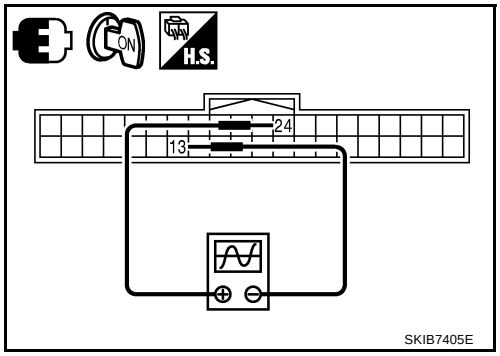
6. CHECK VOICE GUIDANCE ON SIGNAL

1. Connect NAVI control unit and audio unit connectors.
2. Turn ignition switch ON.
3. When pressing “VOICE” button, check voltage waveform between NAVI control unit harness connector B104 terminals 24 and 13 using oscilloscope.

24 – 13:



SKIB0232E



SKIB7405E

OK or NG

OK >> Replace audio unit.
NG >> Replace NAVI control unit.

Vehicle Mark Is Not Displayed Properly

NKS000DO

Symptom: Vehicle mark is not displayed at the vehicle driving position properly.

1. NAVIGATION SYSTEM ADJUSTMENT

1. Select “Navigation” in Confirmation/Adjustment mode, and adjust items, “Steering Angle Adjustment” and “Speed Calibration”. Refer to AV-79, "NAVIGATION" .
2. Check symptom with driving.

Is any malfunction observed?

YES >> GO TO 2.
NO >> INSPECTION END

2. SELF-DIAGNOSIS

Start self-diagnosis, and check any malfunction related to GPS. Refer to AV-74, "Self Diagnosis Mode" .

Is any malfunction related to GPS observed?

YES >> Repair malfunctioning part by diagnosis results.
NO >> GO TO 3.

3. CHECK VEHICLE SIGNAL

Select “Vehicle Signals” in Confirmation/Adjustment mode, and check the vehicle speed signal and reverse signal inputting to NAVI control unit. Refer to AV-78, "VEHICLE SIGNALS" .

OK or NG

OK >> Limit of position detection capacity.
NG >>
- Check NAVI control unit vehicle speed signal circuit, and repair malfunctioning part.
- Check NAVI control unit reverse signal circuit, and repair malfunctioning part.

Example of Symptoms Possible No Malfunction

NKS002JQ

For Navigation System operation information, refer to Navigation System Owner's Manual.

BASIC OPERATIONS

Symptom	Possible cause	Possible solution
No image is displayed.	The brightness is at the lowest setting.	Adjust the brightness of the display.
	The display is turned off.	Press and hold the ☀/☽ button to turn on the display.
No voice guidance is available. or The volume is too high or too low.	The volume is not set correctly, or it is turned off.	Adjust the volume of voice guidance.
No map is displayed on the screen.	The DVD-ROM is not inserted, or it is inserted upside down.	Insert the DVD-ROM correctly.
	A screen other than map screen is displayed.	Press the “MAP” button.
	The pickup lens of the DVD unit is dirty.	The pickup lens can become dirty depending on how you use the vehicle. Contact a NISSAN dealer or qualified workshop for pickup lens cleaning.
The screen is too dim. The movement is slow.	The temperature in the interior of the vehicle is low.	Wait until the interior of the vehicle has warmed up.
Some pixels in the display are darker or brighter than others.	This condition is an inherent characteristic of liquid crystal displays.	This is not a malfunction.
Some menu items cannot be selected.	Some menu items become unavailable while the vehicle is driven.	Park the vehicle in a safe location, then operate the navigation system.

NOTE:

Locations stored in the Address Book and other memory functions may be lost if the vehicle's battery is disconnected or is discharged. If this occurs, service the vehicle's battery as necessary and re-enter the information in the Address Book.

VEHICLE MARKS

Symptom	Possible cause	Possible solution
Names of roads and locations differ between plan view and BIRD-VIEW™ .	This is because the quantity of the displayed information is reduced so that the screen does not become difficult to read. There is also a chance that names of the roads or locations may be displayed several times, and the names appearing on the screen may be different because of a processing procedure.	This is not a malfunction.
The vehicle mark is not displayed in the correct position.	The vehicle was transported after the ignition switch was turned off, for example, by a ferry or car transporter.	Drive the vehicle for a while on a road where GPS signals can be received.
	The position and direction of the vehicle mark may be incorrect depending on the driving environments and the levels of positioning accuracy of the navigation system.	This is not a malfunction. Drive the vehicle for a while to automatically correct the position and direction of the vehicle mark.
When the vehicle is travelling on a new road, the vehicle mark is located on another road nearby.	The system automatically places the vehicle mark on the nearest available road, because the new road is not stored in the map data.	Updated road information will be included in the next version of the DVD-ROM.
The screen does not switch to the night screen even after turning on the headlights.	The daytime screen was set the last time the headlights were turned on.	Set the screen to the night screen mode using ☀/☽ button when you turn on the headlights.
The map does not scroll even when the vehicle is moving.	The current location map screen is not displayed.	Press the “MAP” button.
The vehicle mark is not displayed.	The current location map screen is not displayed.	Press the “MAP” button.

Symptom	Possible cause	Possible solution
The GPS indicator on the screen remains gray.	GPS signals cannot be received depending on the vehicle location, such as in a parking garage, on a road that has numerous tall buildings, etc.	Drive on an open, straight road for a while.
	A sufficient amount of GPS satellites is not available.	Please wait for the satellites to move to locations available for your navigation system.
The location of the vehicle mark is misaligned from the actual position.	When using tire chains or replacing the tires, speed calculations based on the speed sensor may be incorrect.	Drive the vehicle for a while [at approximately 30 km/h (19 MPH) for about 30 minutes] to automatically correct the vehicle's mark position. If this does not correct the vehicle mark position, contact a NISSAN dealer or qualified workshop.
	The map data has a mistake or is incomplete (the vehicle mark position is always misaligned in the same area).	Updated road information will be included in the next version of the DVD-ROM.

DVD-ROM

Symptom	Possible cause	Possible solution
The message “Error” appears.	The DVD-ROM is dirty or partially damaged.	Check the DVD-ROM and wipe it clean with a soft cloth.
		In you see any damage, replace the DVD-ROM.

ROUTE CALCULATION AND VISUAL GUIDANCE

Symptom	Possible cause	Possible solution
In the auto re-route calculation, waypoints are not included.	Waypoints that you have already passed are not included in the auto re-route calculation.	If you want to go to that waypoint again, you need to edit the route.
Route information is not displayed.	Route calculation has not yet been performed.	Set the destination and perform route calculation.
	You are not driving on the suggested route.	Drive on the suggested route.
	Route guidance is set to off.	Turn on the route guidance.
The auto re-route calculation (or detour calculation) suggests the same route as the one previously suggested.	Route calculations took priority conditions into consideration, but the same route was calculated.	This is not a malfunction.
A waypoint cannot be added.	Five waypoints are already set on the route, including the ones that you have already passed.	A maximum of 5 waypoints can be set on the route. If you want to go to 6 or more waypoints, perform route calculations several times, as necessary.
The suggested route is not displayed.	Roads near the destination cannot be calculated.	Reset the destination to a main or ordinary road, and recalculate the route.
	The starting point and destination are too close.	Set a more distant destination.
	The starting point and destination are too far away.	Divide your trip by selecting one or two intermediate destinations, and perform a global route calculation based on multiple route calculations.
	There are time restricted roads (day of week, time) near the current vehicle location or destination.	Set [Use Time Restricted Roads] to off.
The part of the route that you have already passed is deleted.	A route is managed by sections between waypoints. If you passed the first waypoint, the section between the starting point and the waypoint is deleted. (It may not be deleted depending on the area.)	This is not a malfunction.

Symptom	Possible cause	Possible solution
An indirect route is suggested.	If there are restrictions (such as one-way streets) on roads close to the starting point or destination, the system may suggest an indirect route.	Adjust the location of the starting point or destination.
	The system may suggest an indirect route because route calculation does not take into consideration some areas such as narrow streets (grey roads).	Reset the destination to a main or ordinary road, and recalculate the route.
The landmark information does not correspond to the actual information.	This may be caused by insufficient or incorrect data on the DVD-ROM.	Updated information will be included in the next version of the DVD-ROM.
The suggested route does not exactly connect with the starting point, waypoints, or destination.	There is no data for route calculation closer to these locations.	Set the starting point, waypoints and destination on a main road, and perform route calculation.

VOICE GUIDANCE

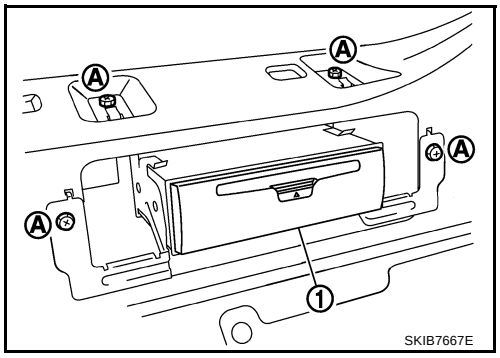
Symptom	Possible cause	Possible solution
Voice guidance is not available.	Voice guidance is only available at certain intersections marked with . In some cases, voice guidance is not available even when the vehicle should make a turn.	This is not malfunction.
	The vehicle has deviated from the suggested route.	Go back to the suggested route or request route calculation again.
	Voice guidance is set to off.	Turn on the voice guidance.
	Route guidance is set to off.	Turn on the route guidance.
The guidance content does not correspond to the actual condition.	The content of voice guidance may vary, depending on the types of intersections where turns are made.	Follow all traffic rules and regulations.

Removal and Installation of NAVI Control Unit

NKS000DT

REMOVAL

1. Remove luggage floor finisher upper (front) (Coupe models), or luggage floor finisher upper (Roadster models). Refer to EI-39, "Removal and Installation (for Coupe Models)" , or EI-41, "Removal and Installation (for Roadster Models)" .
2. Remove screws (A), and remove NAVI control unit (1).
3. Remove NAVI control unit from bracket.



INSTALLATION

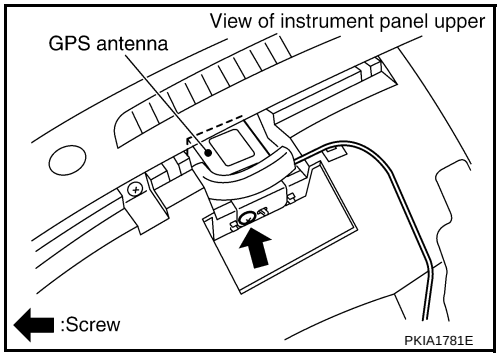
Installation is the reverse order of removal.

Removal and Installation of GPS Antenna

NKS000DU

REMOVAL

1. Remove instrument driver panel upper. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screw (1), and remove GPS antenna.



INSTALLATION

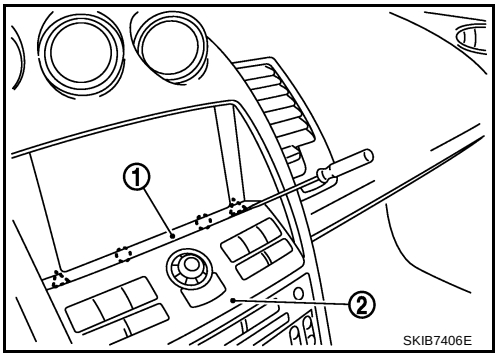
Installation is the reverse order of removal.

Removal and Installation of NAVI Switch

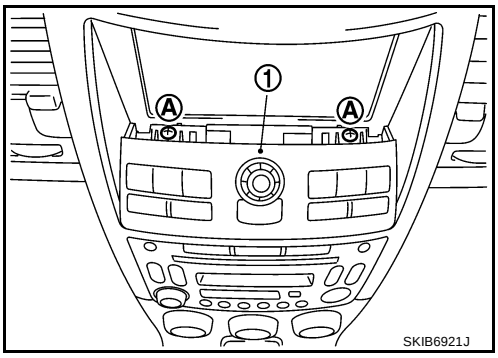
NKS000DV

REMOVAL

1. Insert cloth-covered driver into gaps between mask (1) and NAVI switch (2), and remove mask (1).



2. Remove screws (A), and remove NAVI switch (1).



INSTALLATION

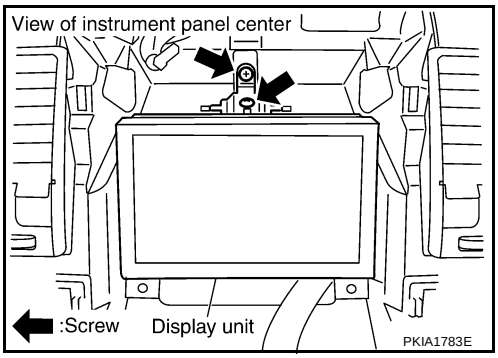
Installation is the reverse order of removal.

Removal and Installation of Display Unit

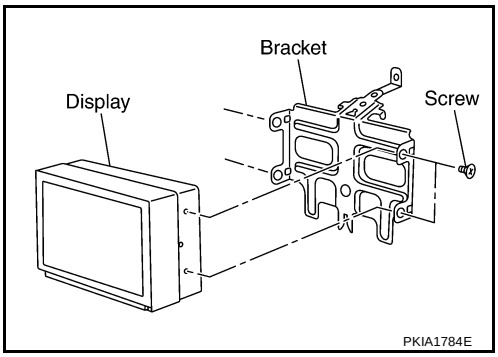
NKS000DW

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (2), and remove display unit.



3. Remove screws (4), and remove bracket.



INSTALLATION

Installation is the reverse order of removal.

TELEPHONE

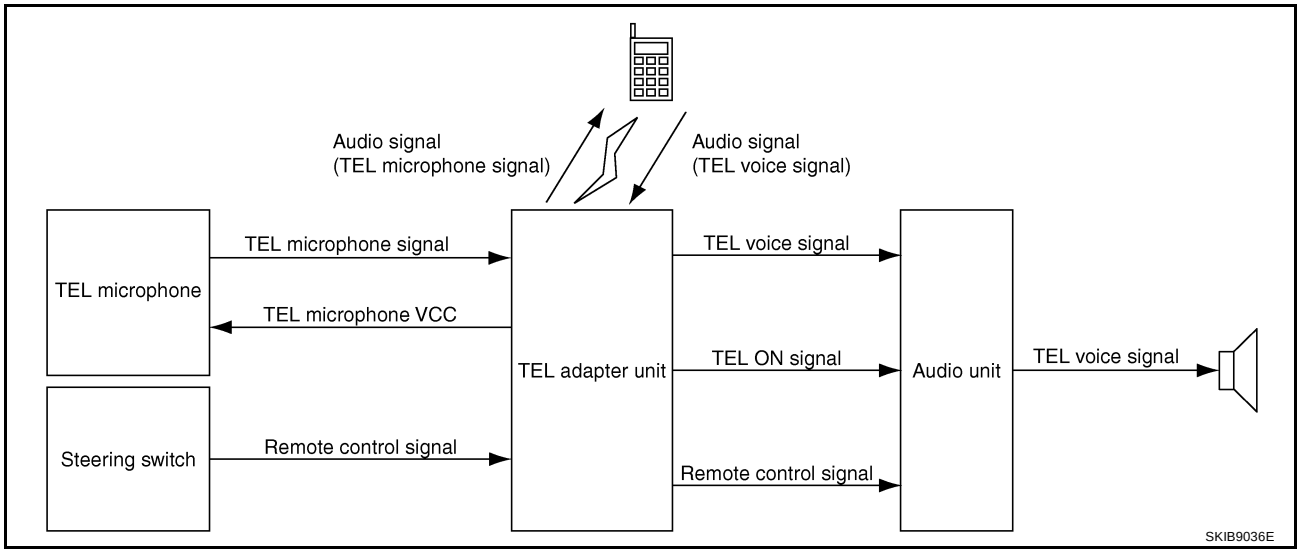
PFP:28342

System Description

NKS0056C

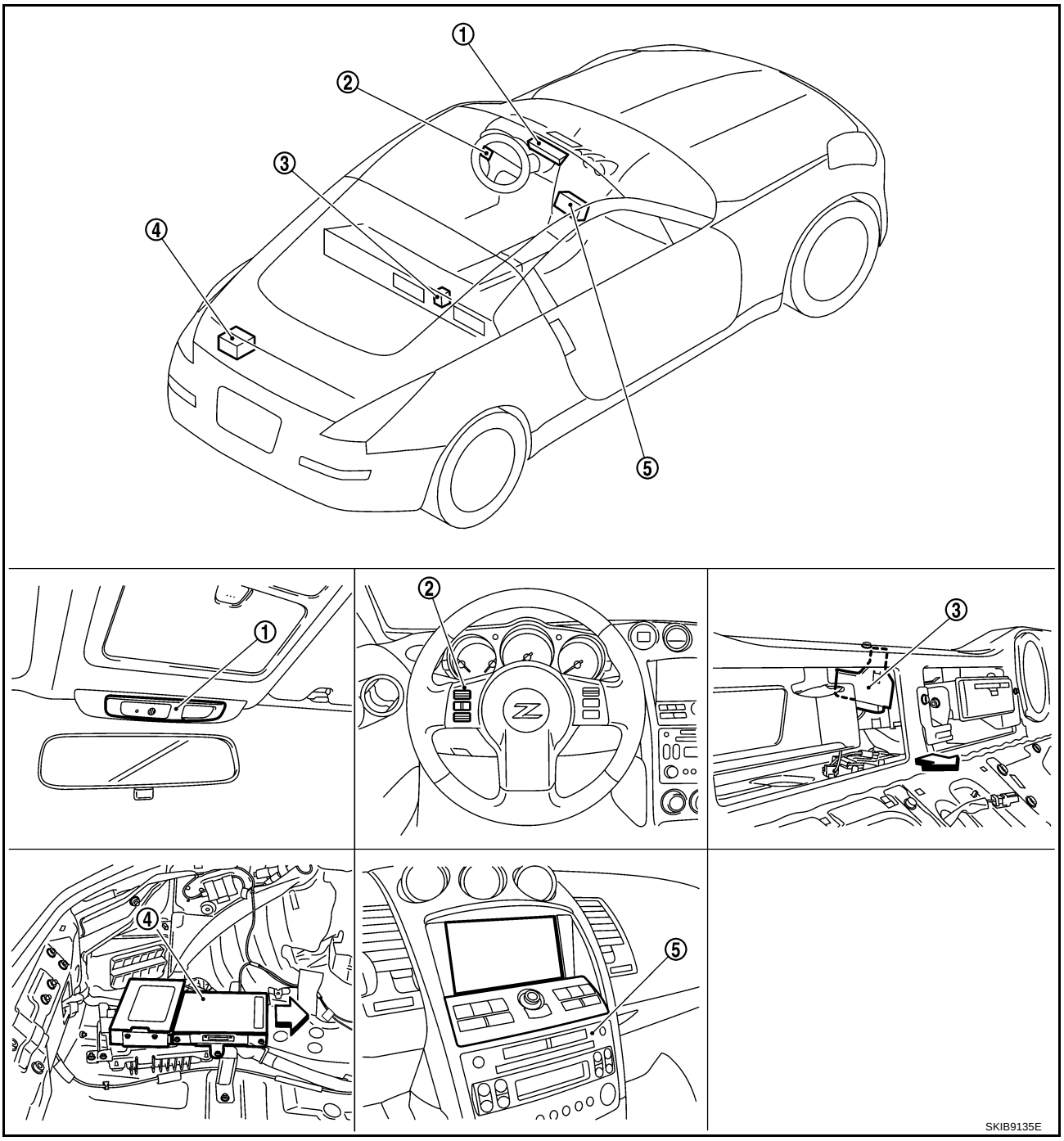
HANDS-FREE PHONE SYSTEM

- For Hands-free phone system operation information, refer to Owner's Manual.
- TEL adapter unit has Bluetooth® module. It can perform wireless hands-free telephone calls using a cellular phone in vehicle compartment.
- 5 or less cellular phones can be registered into the TEL adapter unit.
- Hands-free phone mode starts by transmitting steering switch signal to TEL adapter unit when pressing button.
- Hands-free phone mode ends by transmitting steering switch signal to TEL adapter unit when pressing MODE button.
- When uttering to the TEL microphone, TEL microphone signal (audio signal) is transmitted from the TEL microphone to the TEL adapter unit and transmitted to the cellular phone with the Bluetooth® communication.
- Audio signals from a party at the other end are transmitted from the cellular phone to the TEL adapter unit with the Bluetooth® communication, and transmitted from the TEL adapter unit to the audio unit, then the party's voice is output from the front door speaker.
- Audio unit switches the voice from front speaker RH to TEL voice when receiving TEL ON signal from TEL adapter unit.



Component Parts Location

NKS0056D

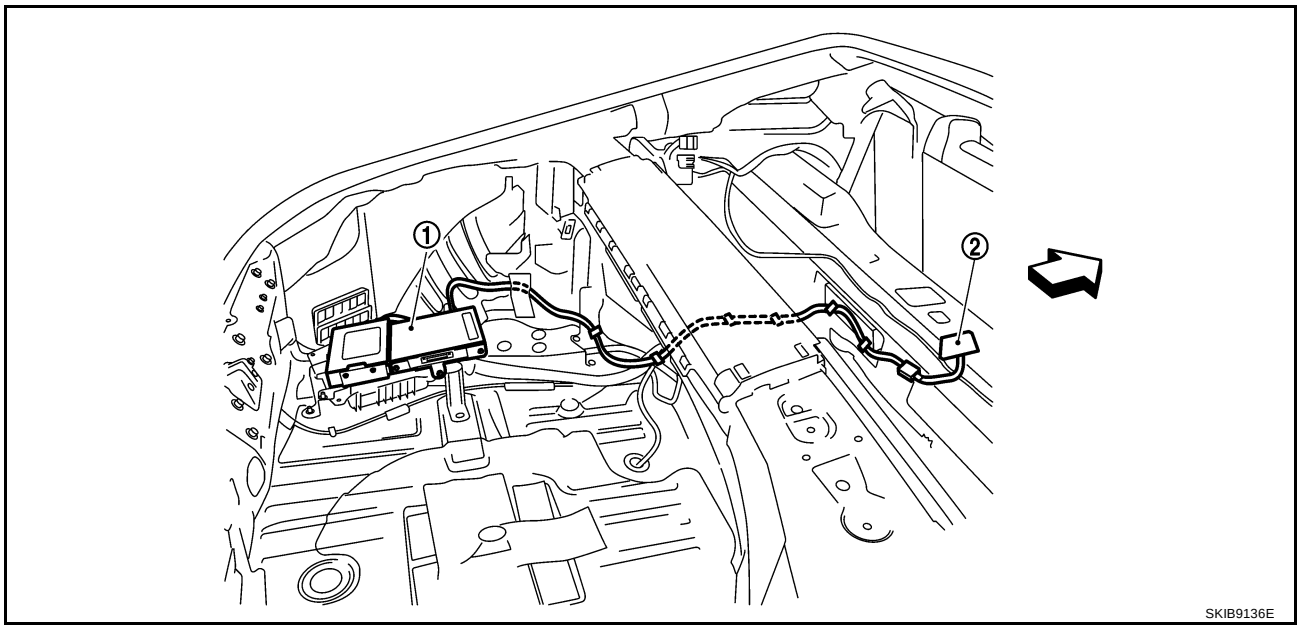


1. TEL microphone
2. Steering switch
3. TEL antenna
4. TEL adapter unit
5. Audio unit

⇦ : Vehicle front

Location of TEL Antenna

NKS0056E

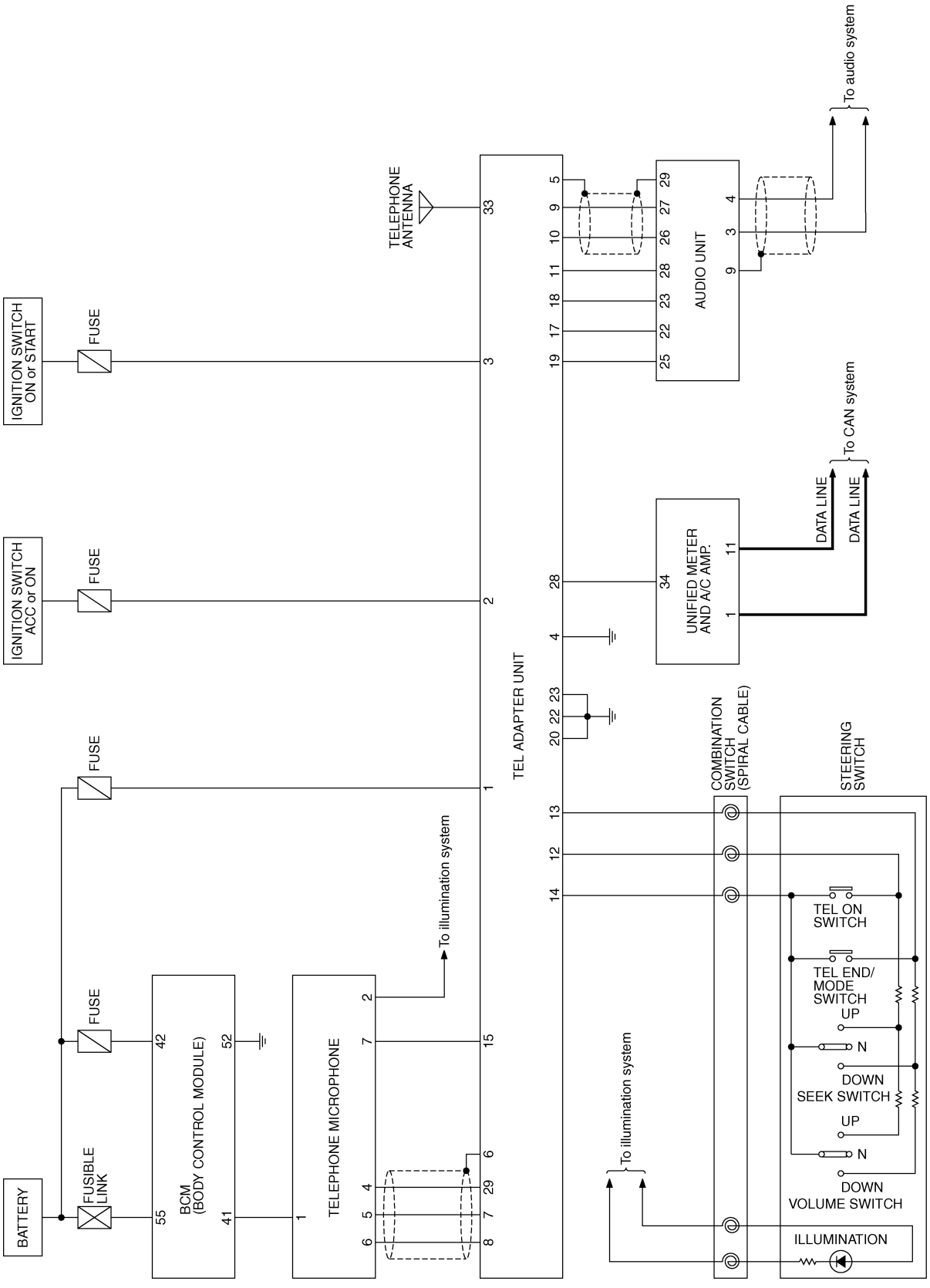


1. TEL adapter unit
2. TEL antenna

⇦ : Vehicle front

Schematic

NKS0056F

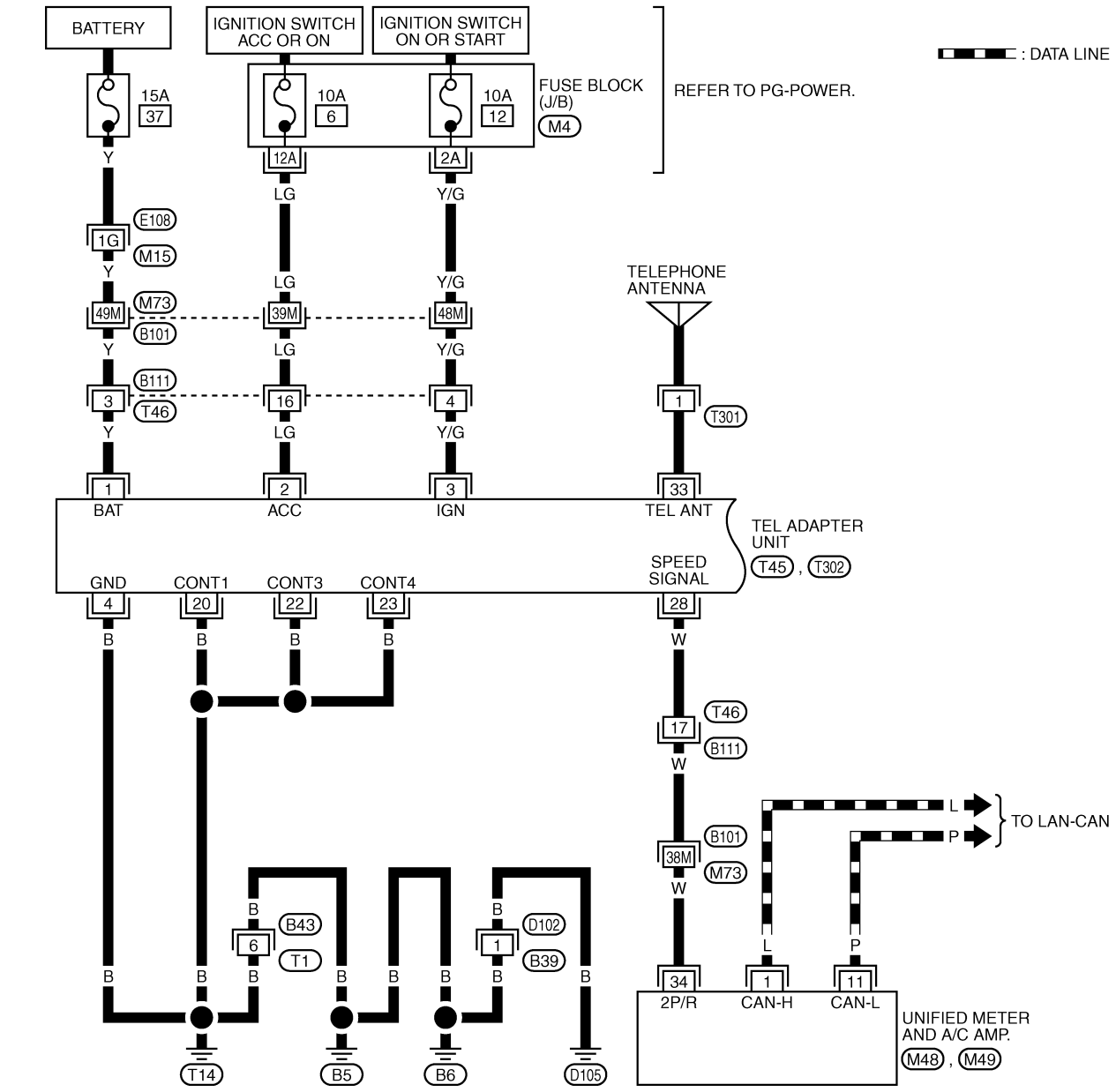


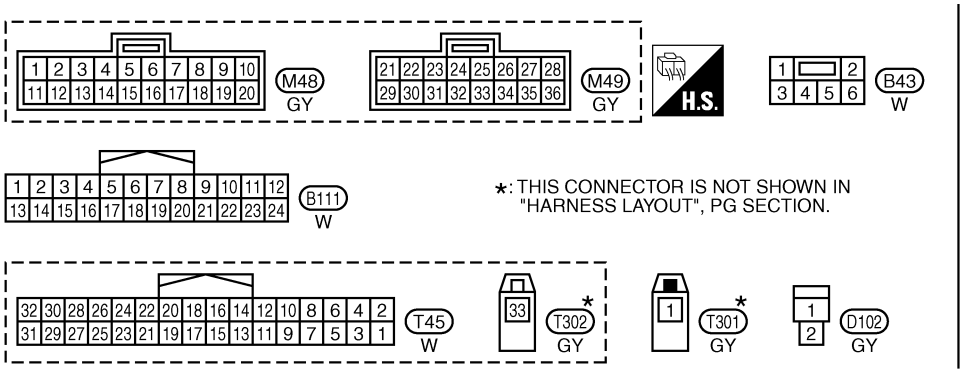
TKWT5806E

Wiring Diagram — H/PHONE —

NKS0056G

AV-H/PHON-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

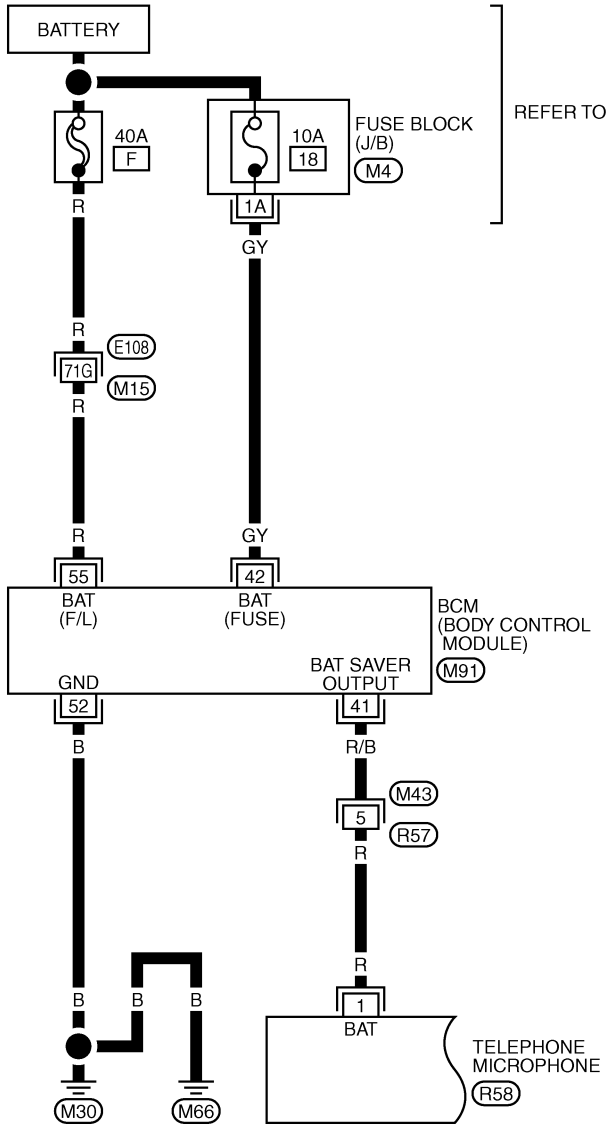
REFER TO THE FOLLOWING.

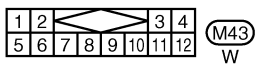
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

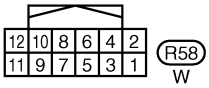
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5807E

AV-H/PHON-02



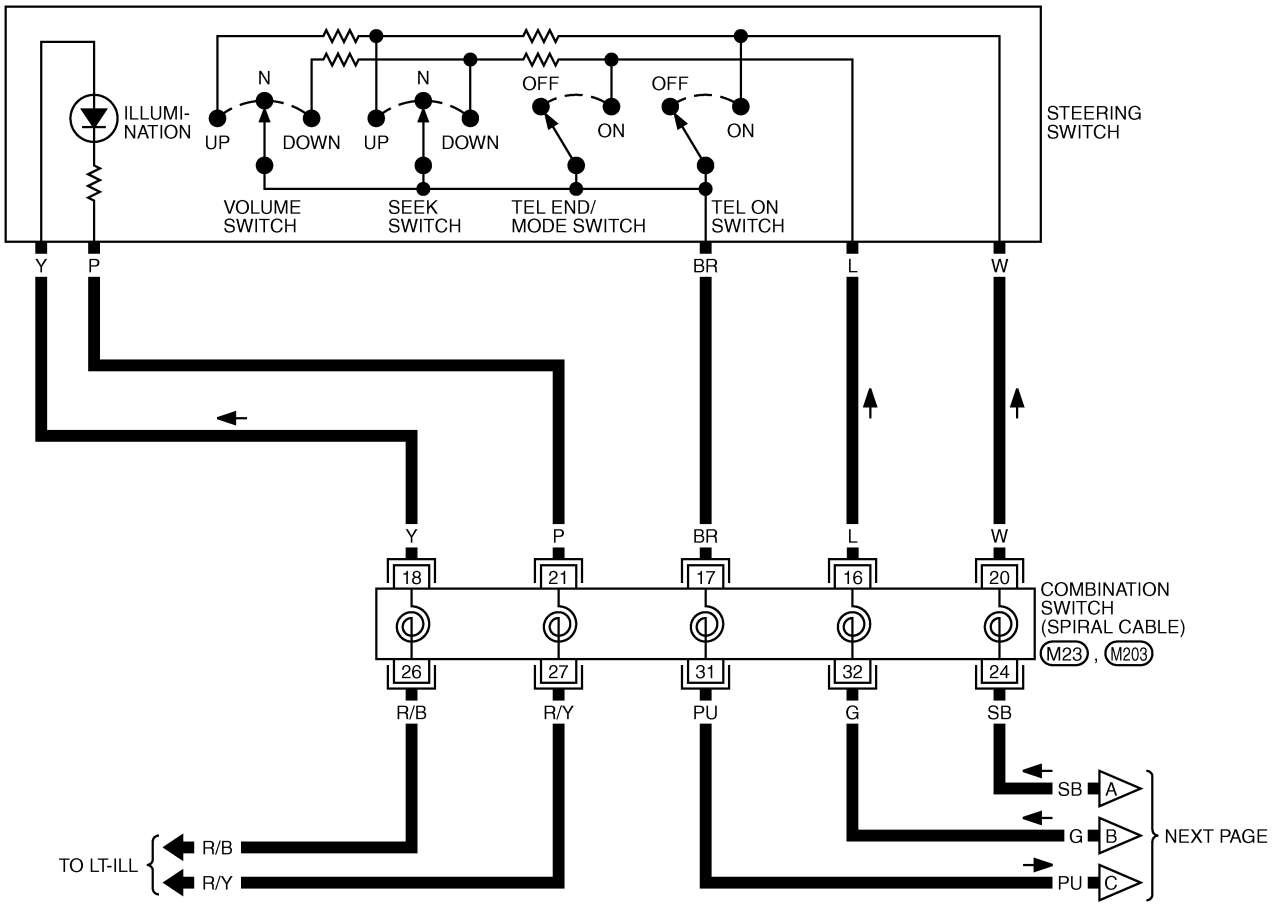


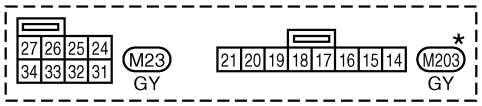


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M91 -ELECTRICAL UNITS

TKWT5551E

AV-H/PHON-03

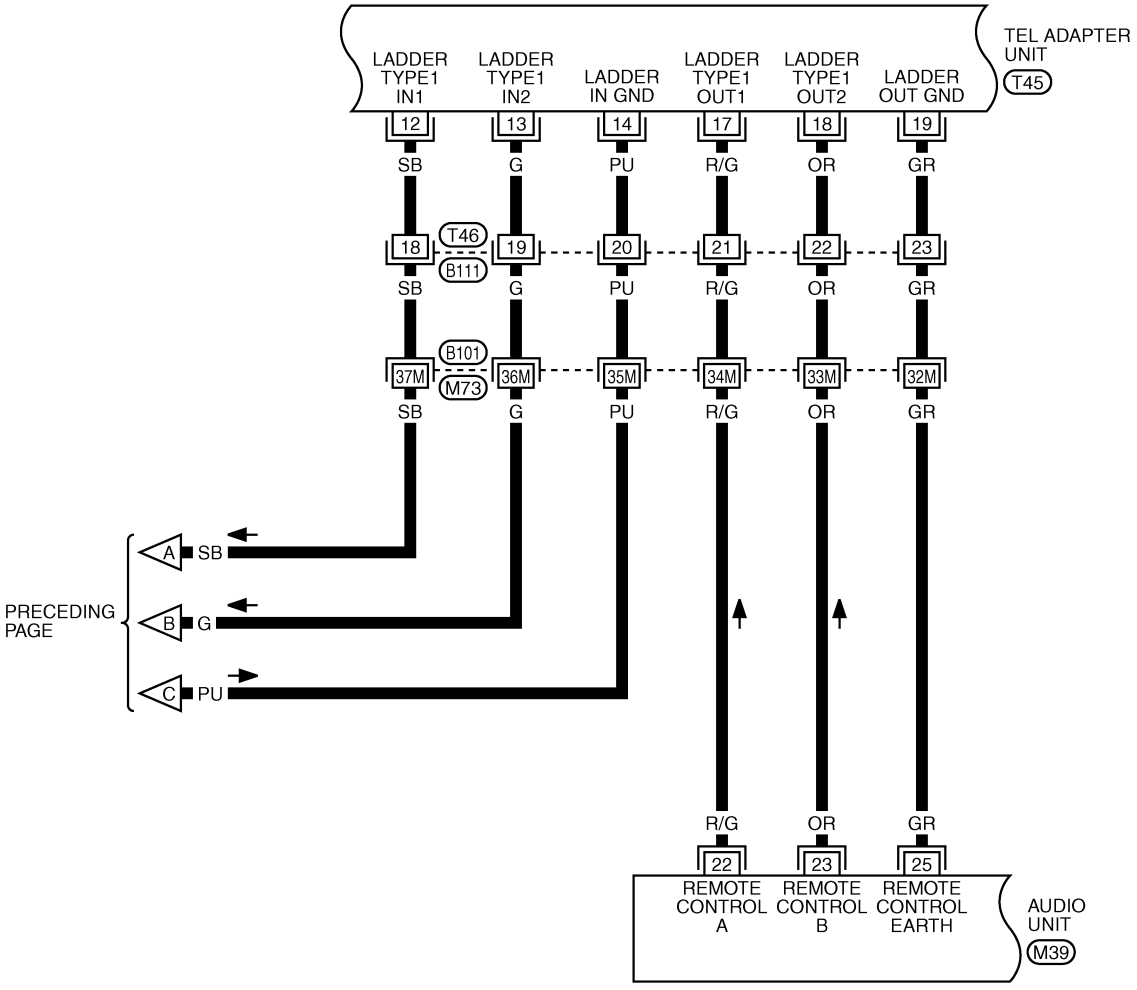


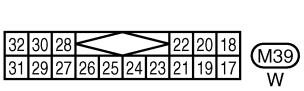


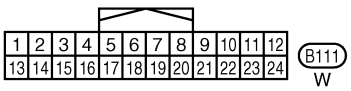
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

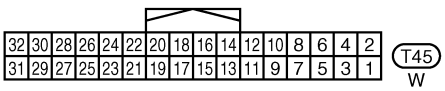
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AV-H/PHON-04





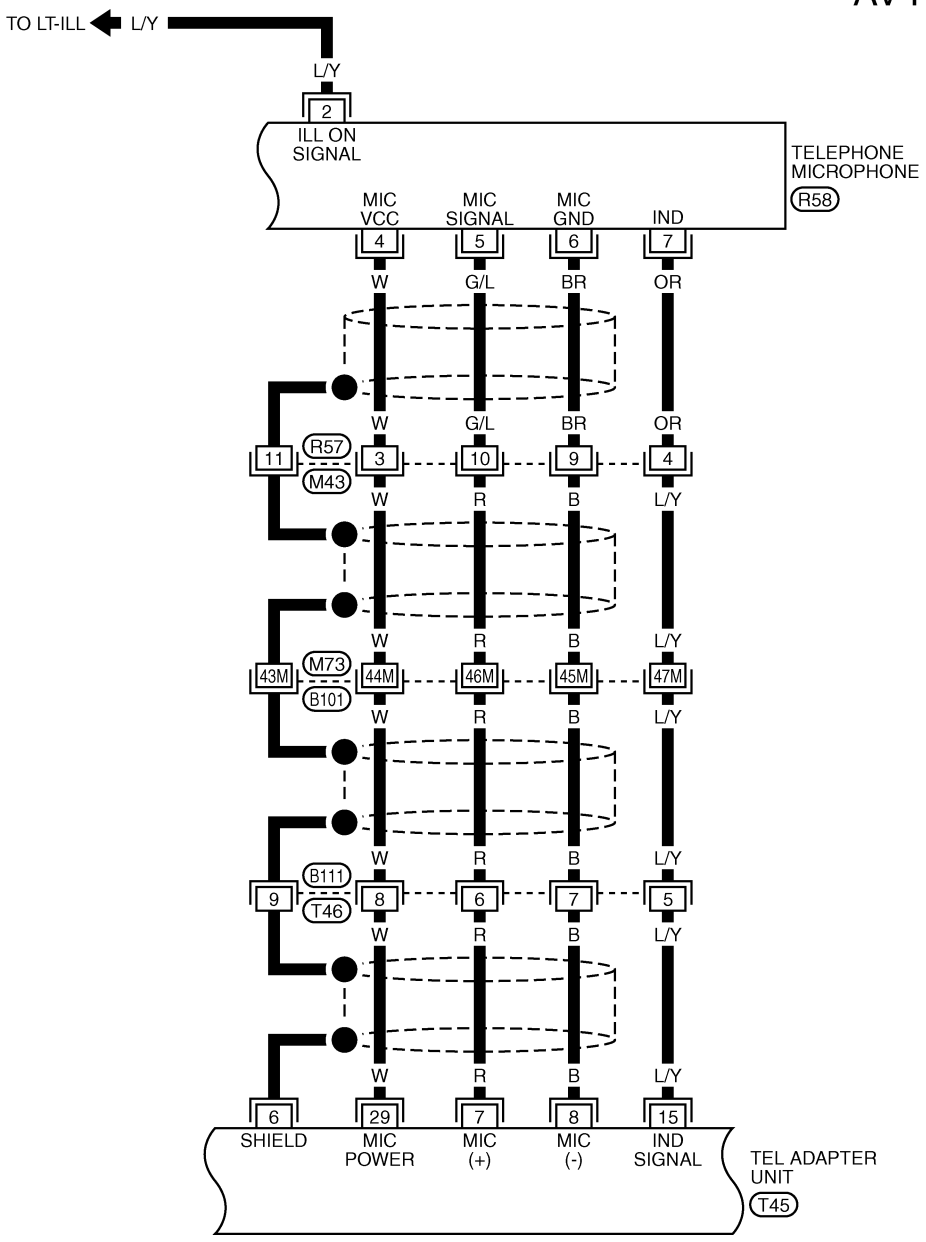


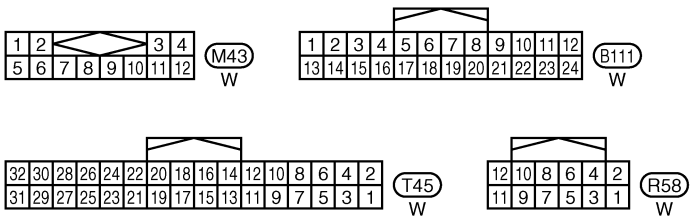


REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

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AV-H/PHON-05



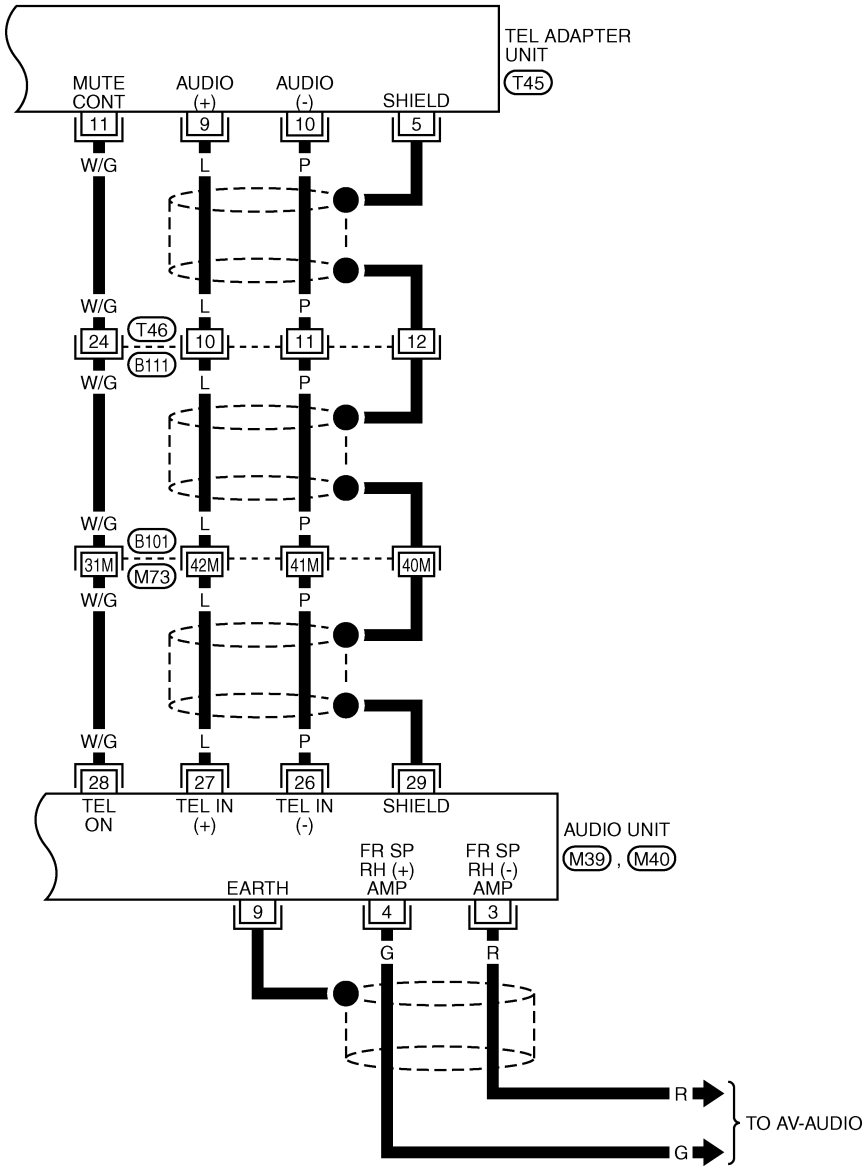


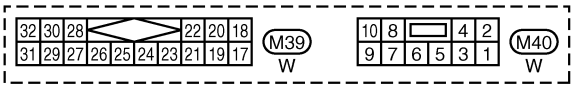
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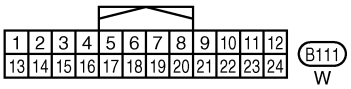
B101 -SUPER MULTIPLE JUNCTION (SMJ)

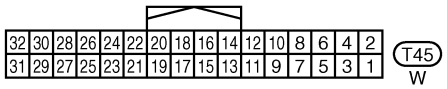
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AV-H/PHON-06







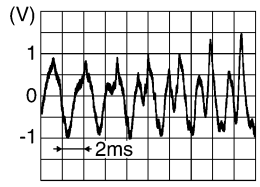
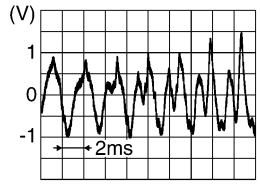


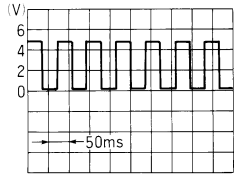
REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5809E

Terminals and Reference Value for TEL Adapter Unit

NKS0056H

Terminal (Wire color)		Item	Signal input/ output	Condition		Reference value
+	–			Ignition switch	Operation	
1 (Y)	Ground	Battery power supply	Input	OFF	—	Battery voltage
2 (LG)	Ground	ACC power supply	Input	ACC	—	Battery voltage
3 (Y/G)	Ground	Ignition signal	Input	ON	—	Battery voltage
4 (B)	Ground	Ground	—	ON	—	Approx. 0 V
5	—	Shield	—	—	—	—
6	—	Shield	—	—	—	—
7 (R)	8 (B)	TEL microphone signal	Input	ON	Uttering in front of the microphone while using the hands-free phone system.	 SKIB3609E
9 (L)	10 (P)	TEL voice signal	Output	ON	Receiving the party's voice while using the hands-free phone system.	 SKIB3609E
11 (W/G)	Ground	TEL ON signal	Output	ON	While using hands-free phone system	Approx. 0 V
					Except while using hands-free phone system	Approx. 5 V
12 (SB)	14 (PU)	Remote control signal A	Input	ON	Press and hold switch	Approx. 0 V
					Press and hold SEEK UP switch	Approx. 1.7 V
					Press and hold VOLUME UP switch	Approx. 3.3 V
					Except for above	Approx. 5 V
13 (G)	14 (PU)	Remote control signal B	Input	ON	Press and hold MODE switch	Approx. 0 V
					Press and hold SEEK DOWN switch	Approx. 1.7 V
					Press and hold VOLUME DOWN switch	Approx. 3.3 V
					Except for above	Approx. 5 V
14 (PU)	Ground	Remote cntrol signal ground	—	ON	—	Approx. 0 V
15 (L/Y)	Ground	Indicator signal	Output	ON	Microphone indicator ON	Approx. 1 V
					Microphone indicator OFF	Approx. 10 V
17 (R/G)	19 (GR)	Remote control signal A	Output	ON	Press and hold SEEK UP switch	Approx. 1.7 V
					Press and hold VOLUME UP switch	Approx. 3.3 V
					Except for above	Approx. 5 V

Terminal (Wire color) +	Terminal (Wire color) –	Item	Signal input/ output	Condition: Ignition switch	Condition: Operation	Reference value
18 (OR)	19 (GR)	Remote control signal B	Output	ON	Press and hold MODE switch	Approx. 0 V (Audio mode)
						Approx. 5 V (TEL mode)
					Press and hold SEEK DOWN switch	Approx. 1.7 V
					Press and hold VOLUME DOWN switch	Approx. 3.3 V
					Except for above	Approx. 5 V
19 (GR)	Ground	Remote control signal ground	—	ON	—	Approx. 0 V
20 (B)	Ground	Control signal 1	—	ON	—	Approx. 0 V
22 (B)	Ground	Control signal 3	—	ON	—	Approx. 0 V
23 (B)	Ground	Control signal 4	—	ON	—	Approx. 0 V
28 (W)	Ground	Vehicle speed signal (2-pulse)	Input	ON	When vehicle speed is approx. 40 km/h (25 MPH)	**NOTE:** Maximum voltage may be 12 V due to specifications (connected units).  ELF1080D
29 (W)	Ground	TEL Microphone VCC	Output	ON	—	Approx. 5 V
33	—	TEL antenna signal	Input	ON	Not connected to Bluetooth® antenna connector	Approx. 3 V

Self-Diagnosis Function

NKS0056J

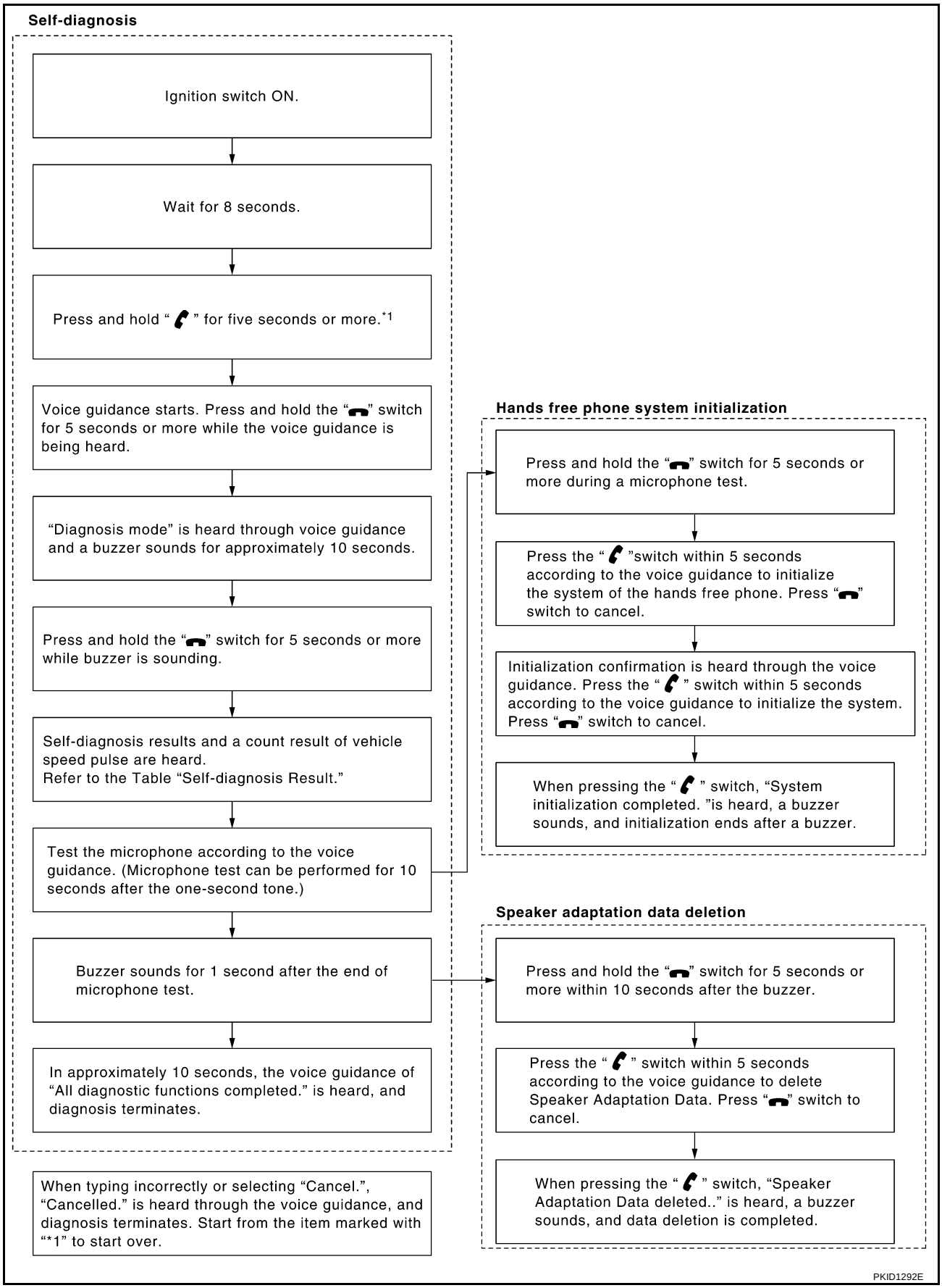
- During on board diagnosis the diagnosis function of TEL adapter unit starts with the operation of the steering switch and performs the diagnosis when ignition switch ACC.
- The on board diagnosis has 3 modes: the self-diagnosis mode that performs the trouble diagnosis, the speaker adaptation data deleting mode and the hands free phone system initialization mode.

NOTE:

- Perform the diagnosis with the vehicle stopped.
- Perform STEP 2 if necessary.

STEP	Mode	Contents
STEP 1	Self-diagnosis	The self-diagnosis mode perform the following. ● Diagnosis of TEL adapter unit, Bluetooth antenna and steering switch. ● Vehicle speed pulse count. ● Microphone test. Then reads out the results with the sound.
STEP 2	Speaker adaptation data deleting	The speaker adaptation data deleting mode can delete the speaker adaptation data.
	Hands free phone system initialization	Hands free phone system initialization mode can perform the initialization of hands free phone system.

DIAGNOSIS FUNCTION OPERATION PROCEDURE



ERROR ITEM (ERROR NAME)

Error name	Detection condition	Trouble-shooting method
There are no failure records to report	System is normal	—
Internal error	Error inside TEL adapter unit	Replace TEL adapter unit.
Bluetooth® antenna open	Open in the Bluetooth® antenna is detected	Check the Bluetooth® antenna feeder for open.
Bluetooth® antenna short	Short in the Bluetooth® antenna is detected	Check the Bluetooth® antenna feeder for short.
Bluetooth® antenna unplugged	Disconnected Bluetooth® antenna	Check the connection Bluetooth® antenna.
Phone button stuck	Stuck switch	Check the steering switch. Refer to AV-115, "Component Inspection" .
Phone end button stuck	Stuck MODE switch	

Error Count

- Error count is read out simultaneously when reading out the error name.
- The errors are read out continuously when some errors occur at the same time.
- The error count guides “0” when the error occurs. The next time it counts up “1” if it is normal with the ignition switch ON.
- It continues the count up unless the initialization of hands free phone system is performed.

VEHICLE SPEED SIGNAL

- Check the input status of the vehicle speed pulse count after ignition switch turns ON.
- The guidance announces the type of error name and then the vehicle speed pulse count.

MICROPHONE TEST

Input the voice spoken into the microphone to the speaker, and checks the microphone function.

Symptom Chart

NKS0056K

Indicator status	Symptom	Check item	Diagnosis procedure
ON (Normal)	Voice is not heard on the other end.	—	● Check the TEL microphone signal circuit between TEL adapter unit to the TEL microphone. ● Check the TEL microphone power supply circuit between TEL adapter unit to the microphone.
	Voice guidance does not activate, or the volume of voice guidance is too low when pressing switch. (“PHONE” is indicated on LCD screen of the audio unit)	—	Check TEL voice signal circuit between TEL adapter unit to the audio unit.
	Voice guidance does not activate, when pressing switch. (“PHONE” is not indicated on LCD screen of the audio unit)	Dial the cellular phone. The front speaker RH outputs a dial tone.	1. Check “VOLUME UP” and “SEEK UP” switches function. 2. Replace steering switch, if “VOLUME UP” and “SEEK UP” switches function is normal. If not, go to 3. 3. Check if remote control signal A circuit between steering switch and TEL adapter unit is not open or short. 4. Check voltage of remote control signal A between steering switch and TEL adapter unit when operating steering switch.
		Dial the cellular phone. The front speaker RH does not outputs a dial tone.	1. Check TEL ON signal circuit. Go to the next step if normal. 2. Disconnect TEL adapter unit connector. Measure audio unit #28 terminal voltage. Replace TEL adapter unit if the voltage approx. 5 V. Replace audio unit if the voltage approx. 0 V.
	None of the steering switch operations work.	—	● Check control signal 1circuit. ● Check steering switch signal ground circuit.
OFF	Bluetooth® communication does not perform.	The indicator blinks for approx. 5 sec. when pressing switch.	Perform the error history mode with self-diagnosis. Refer to AV-111, "Self-Diagnosis Function" .
		The indicator continue turning OFF when pressing switch.	Check TEL adapter unit power supply, and ground circuit.

Component Inspection

NKS0056L

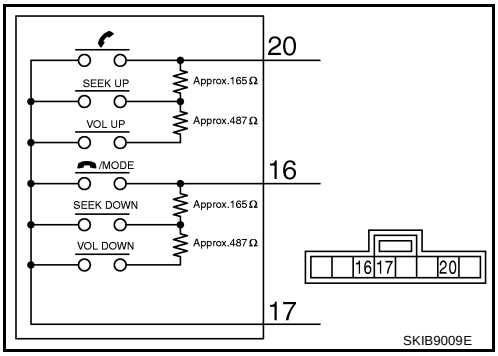
STEERING SWITCH

20 – 17

switch ON	: Approx. 0 Ω
“SEEK UP” switch ON	: Approx. 165 Ω
“VOLUME UP” switch ON	: Approx. 652 Ω

16 – 17

MODE switch ON	: Approx. 0 Ω
“SEEK DOWN” switch ON	: Approx. 165 Ω
“VOLUME DOWN” switch ON	: Approx. 652 Ω

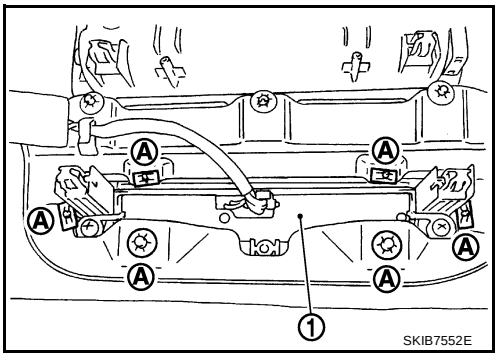


Removal and Installation of Telephone Microphone

NKS0056M

REMOVAL

1. Remove headlining. Refer toEI-44, "Removal and Installation (for Coupe Models)" .
2. Remove mount pin (A), and remove telephone microphone(1).



INSTALLATION

Installation is the reverse order of removal.

SECTION BCS
BODY CONTROL SYSTEM

CONTENTS

PRECAUTIONS 2
Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER” 2
Precautions for Battery Service 2
BCM (BODY CONTROL MODULE) 3
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BCM FUNCTION 3
COMBINATION SWITCH READING FUNCTION 3
CAN COMMUNICATION CONTROL 6
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SYSTEMS CONTROLLED BY BCM DIRECTLY 8
SYSTEMS CONTROLLED BY BCM AND IPDM E/R 8
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MAJOR COMPONENTS AND CONTROL SYSTEM 9
CAN Communication System Description 10
CAN Communication Unit 10
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COUPE MODELS 11
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ITEMS OF EACH PART 15
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REMOVAL 17
INSTALLATION 17

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS0009L

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS0009M

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

BCM (BODY CONTROL MODULE)

PFP:284B2

System Description

NKS0009N

BCM (Body Control Module) controls the operation of various electrical units installed in the vehicle.

BCM FUNCTION

BCM has combination switch reading function for reading the operation of combination switches (light, wiper, washer and turn signal) in addition to a function for controlling the operation of various electrical components. Also it has an interface function allowing it to receive signals from the unified meter and A/C amp., and send signals to ECM using CAN communication.

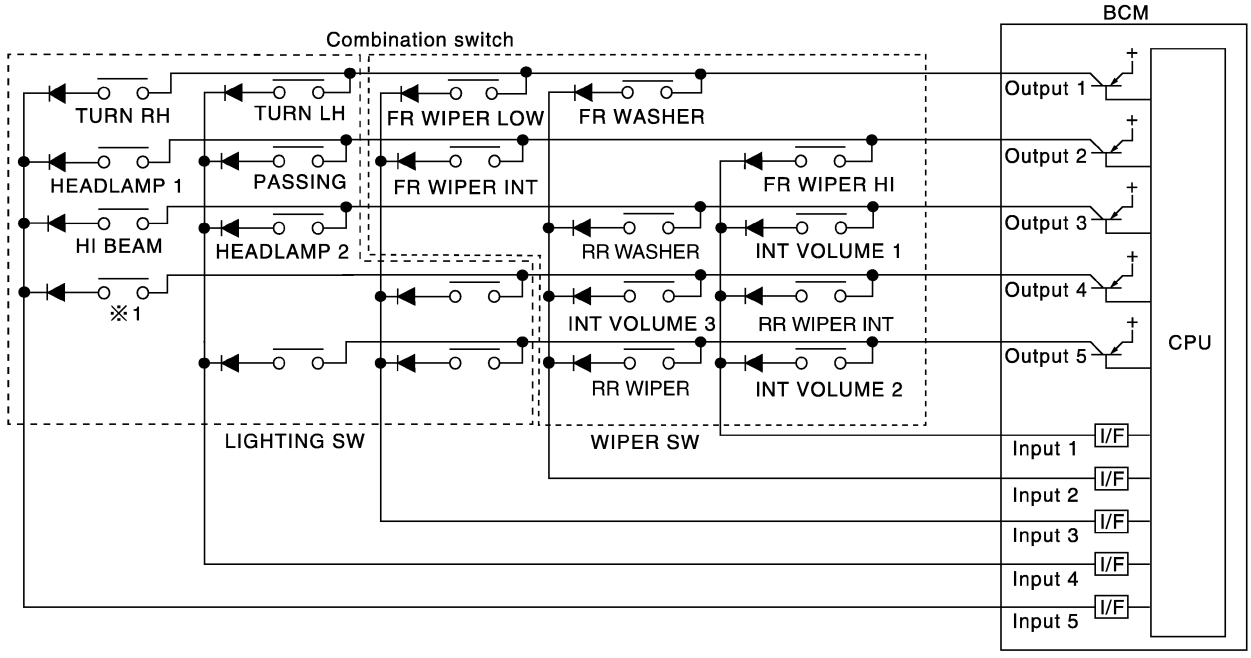
COMBINATION SWITCH READING FUNCTION

Description

- BCM reads combination switch (lighting switch, wiper switch) status, and controls various electrical component, according to the results.
- BCM reads information of a maximum of 20 switches by combining five output terminals (OUTPUT 1 - 5) and five input terminals (INPUT 1 - 5).

Operation Description

- BCM activates transistors of output terminals (OUTPUT 1 - 5) periodically and, allows current to flow in turn.
- If any (1 or more) switches are turned ON, circuit of output terminals (OUTPUT 1 - 5) and input terminals (INPUT 1 - 5) becomes active.
- At this time, transistors of output terminals (OUTPUT 1 - 5) are activated to allow current to flow. When voltage of input terminals (INPUT 1 - 5) corresponding to that switch changes, interface in BCM detects voltage change, and BCM determines that switch is ON.



※1 : LIGHTING SWITCH 1ST POSITION

PKIC4861E

Operation Table of BCM and Combination Switches

BCM reads operation status of combination switch using combinations shown in table below.

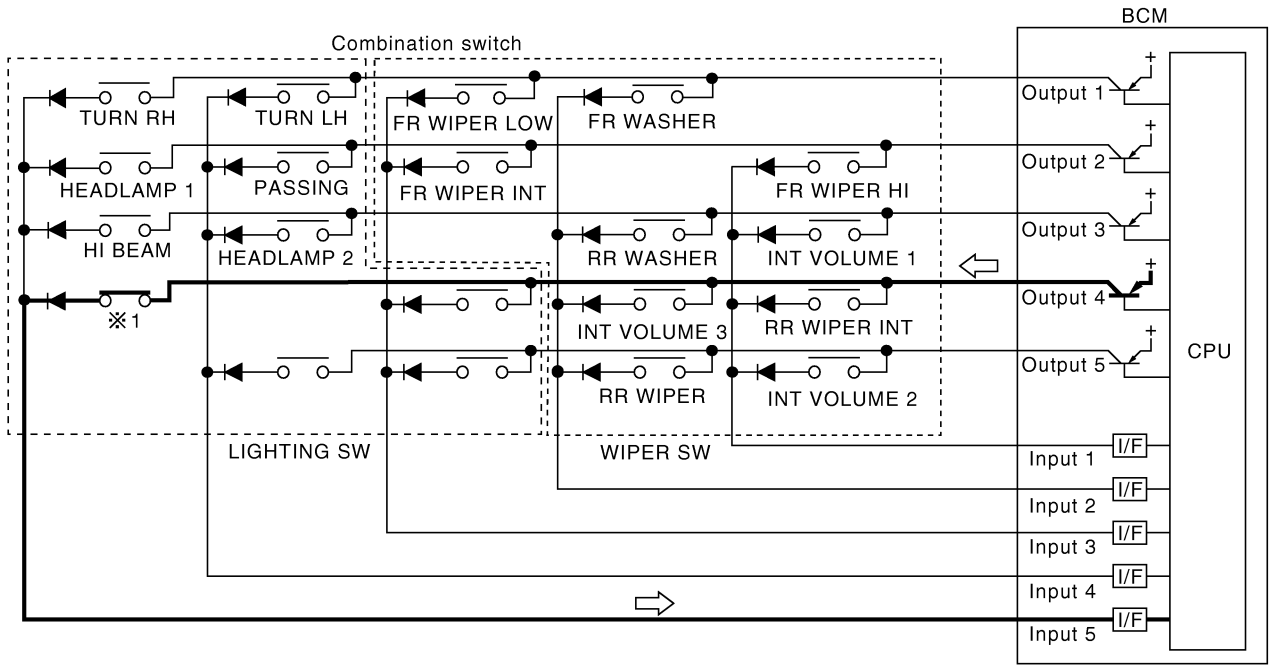
	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	—	—	FR WIPER HI ON	FR WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	RR WIPER INT ON	RR WIPER INT OFF	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	—	—	RR WASHER ON	RR WASHER OFF	INT VOLUME 3 ON	INT VOLUME 3 OFF	RR WIPER ON	RR WIPER OFF
COMB SW INPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	—	—	—	—	—	—
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	—	—	—	—
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1st) ON	LIGHTING SW (1st) OFF	—	—

PKIC4963E

NOTE:
Headlamp system has a dual circuit.

Sample Operation (When lighting switch 1ST position is turned ON)

- When lighting switch 1ST position is turned ON, contact in combination switch turns ON. At this time if OUTPUT 4 transistor is activated, BCM detects that voltage changes in INPUT 5.
- When OUTPUT 4 transistor is ON, BCM detects that voltage changes in INPUT 5, and judges that lighting switch 1ST position is ON. Then BCM sends lighting switch (1ST position) ON signal to IPDM E/R using CAN communication.
- When OUTPUT 4 transistor is activated again, BCM detects that voltage changes in INPUT 5, and recognizes that lighting switch 1ST position is continuously ON.



※1 : LIGHTING SWITCH 1ST POSITION

SKIB7456E

NOTE:
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore after switch is turned ON, electrical loads are activated with time delay. But this time delay is so short that it cannot be detected by human senses.

Operation Mode

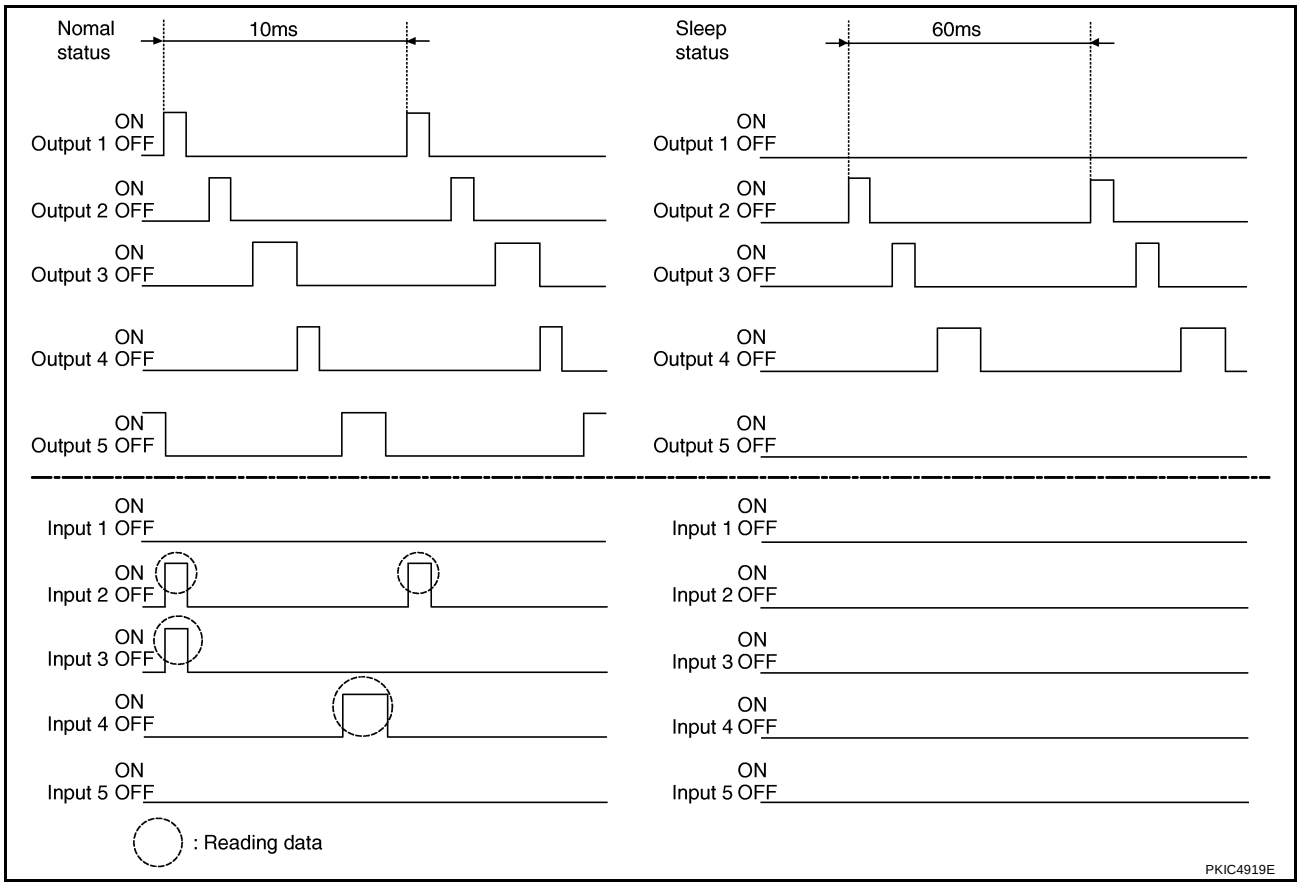
The combination switch reading function has the operation modes shown below.

1. Normal mode

– When BCM is not in sleep mode, OUTPUT terminals (1 - 5) each turn ON-OFF every 10 ms.

2. Sleep mode

– When BCM is in sleep mode BCM enters low power mode. OUTPUT (1 - 5) turn ON-OFF every 60 ms, and only input from light switch system is accepted.



CAN COMMUNICATION CONTROL

CAN communication allows a high rate of information transmission through the two communication lines (CAN L line, CAN H line) connecting the various control units in the system. Each control unit transmits/receives data but selectively reads required data only. For details of signals that are transmitted/received by BCM via CAN communication, refer to LAN-48, "CAN System Specification Chart" .

BCM STATUS CONTROL

BCM changes its status depending on the operation status in order to save power consumption.

1. CAN communication status
   - With ignition switch ON, CAN communicates with other control units normally.
   - Control by BCM is being operated properly.
   - When ignition switch is OFF, switching to sleep mode is possible.
   - Even when ignition switch is OFF, if CAN communication with IPDM E/R and combination meter is active, CAN communication status is active.
2. Sleep transient status
   - This status shuts down CAN communication when ignition switch is turned OFF.
   - It transmits sleep request signal to IPDM E/R and combination meter.
   - Two seconds after CAN communication of all control units stops, sleep transient status switches to CAN communication inactive status.
3. CAN communication inactive status
   - With ignition switch OFF, CAN communication is not active.
   - With ignition switch OFF, control performed only by BCM is active.
   - Three seconds after CAN communication of all control units stops, CAN communication inactive status switches to sleep status.
4. Sleep status
   - BCM is activated with low power mode.
   - CAN communication is not active.
   - When CAN communication operation is detected, it switches to CAN communication status.
   - When a state of the following switches changes, it switches to CAN communication state.
   - Key switch (ACC, ON)
   - Hazard switch
   - Door lock/unlock switch
   - Front door switch (driver side, passenger side)
   - Back door opener switch (coupe models)
   - Trunk lid opener switch (roadster models)
   - Combination switch (passing, lighting switch 1ST position)
   - Key fob (lock/unlock signal)
   - Key cylinder switch
   - When control performed only by BCM is required by switch, it shifts to CAN communication inactive mode.
   - Status of combination switch reading function is changed.

SYSTEMS CONTROLLED BY BCM DIRECTLY

System	Reference
Power door lock system	BL-21, "POWER DOOR LOCK SYSTEM"
Remote keyless entry system	BL-59, "REMOTE KEYLESS ENTRY SYSTEM"
Power window system NOTE 1	GW-18, "POWER WINDOW SYSTEM"
Power seat NOTE 1	SE-12, "POWER SEAT/FOR COUPE" or SE-15, "POWER SEAT/FOR ROADSTER"
Interior room lamp	LT-128, "INTERIOR ROOM LAMP"
Rear wiper and washer system NOTE 2	WW-36, "REAR WIPER AND WASHER SYSTEM"

NOTE:

1. Power supply only. No system control.
2. Coupe models

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

System	Reference
Panic alarm	BL-59, "REMOTE KEYLESS ENTRY SYSTEM"
Theft warning	BL-125, "VEHICLE SECURITY (THEFT WARNING) SYSTEM"
NVIS (NATS)	BL-150, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)"
Headlamp (For USA)	LT-5, "HEADLAMP (FOR USA)"
● Headlamp (For Canada) ● Daytime light system	LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -"
● Parking, license plate and tail lamps ● Battery saver control	LT-103, "PARKING, LICENSE PLATE AND TAIL LAMPS"
Front wiper and washer system	WW-4, "FRONT WIPER AND WASHER SYSTEM"
Rear window defogger	GW-56, "REAR WINDOW DEFOGGER"

SYSTEMS CONTROLLED BY BCM AND COMBINATION METER

System	Reference
Warning chime	DI-71, "WARNING CHIME"
Turn signal and hazard warning lamps	LT-65, "TURN SIGNAL AND HAZARD WARNING LAMPS"
Low tire pressure warning system	WT-10, "TIRE PRESSURE MONITORING SYSTEM"

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote control entry system	● Remote keyless entry receiver ● Key switch ● All-door switch	● All-door locking actuator ● Turn signal lamp (LH, RH)
Power door lock system	● Power window main switch (door lock and unlock switch) ● Power window sub switch (passenger side) (door lock and unlock switch)	All-door locking actuator
Power supply (IGN) to power window	Ignition power supply	Power window system
Power supply (BAT) to power window and power seat	Battery power supply	Power window system and power seat
Panic alarm	● Key switch ● Remote keyless entry receiver	IPDM E/R
Theft warning system	● All-door switch ● Remote keyless entry receiver ● Power window main switch (door lock and unlock switch)	● IPDM E/R ● Security indicator lamp
Exterior lamp battery saver control	● Ignition switch ● Combination switch	IPDM E/R
Headlamp	Combination switch	IPDM E/R
Daytime light system	● Engine status signal ● Ignition switch ● Combination switch ● Parking brake signal	IPDM E/R
Tail lamp	Combination switch	IPDM E/R
Turn signal lamp	● Combination switch ● Ignition switch	● Turn signal lamp ● Combination meter
Hazard lamp	Hazard switch	● Turn signal lamp ● Combination meter
Room lamp timer	● Key switch ● Remote keyless entry receiver ● Power window main switch (door lock and unlock switch) ● All-door switch	● Interior room lamp ● Map lamp ● Key hole illumination
Interior lamp battery saver control	● Ignition switch ● Remote keyless entry receiver ● All-door switch	BCM
Key warning chime	● Key switch ● Front door switch driver side	Combination meter (warning buzzer)
Light warning chime	● Combination switch ● Ignition switch ● Front door switch driver side	Combination meter (warning buzzer)
Seat belt warning chime	● Combination meter [Seat belt buckle (driver side) switch] ● Ignition switch	Combination meter (warning buzzer)
Front wiper and washer system	● Combination switch ● Combination meter ● Ignition switch	IPDM E/R

System	Input	Output
Rear wiper and washer system NOTE	● Combination switch ● Ignition switch	Rear wiper motor
Rear window defogger	● Rear window defogger switch ● Ignition switch	IPDM E/R
A/C switch signal	Unified meter and A/C amp.	ECM
Blower fan switch signal	Unified meter and A/C amp.	ECM
Low tire pressure warning system	Remote keyless entry receiver	Combination meter

NOTE:
Coupe models

CAN Communication System Description

NKS0009O

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicles are equipped with many electronic control units and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

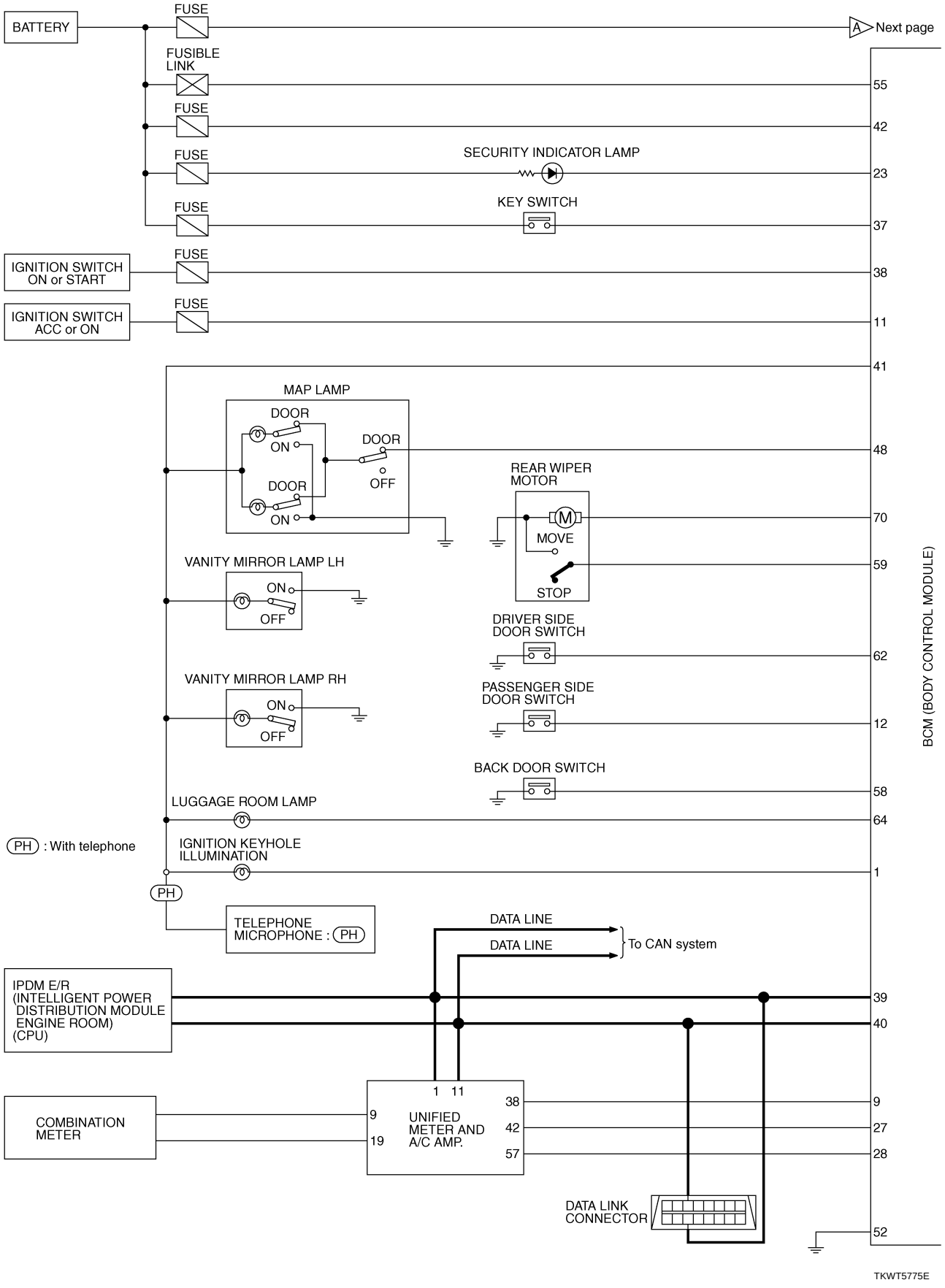
NKS0009P

Refer to LAN-48, "CAN System Specification Chart" .

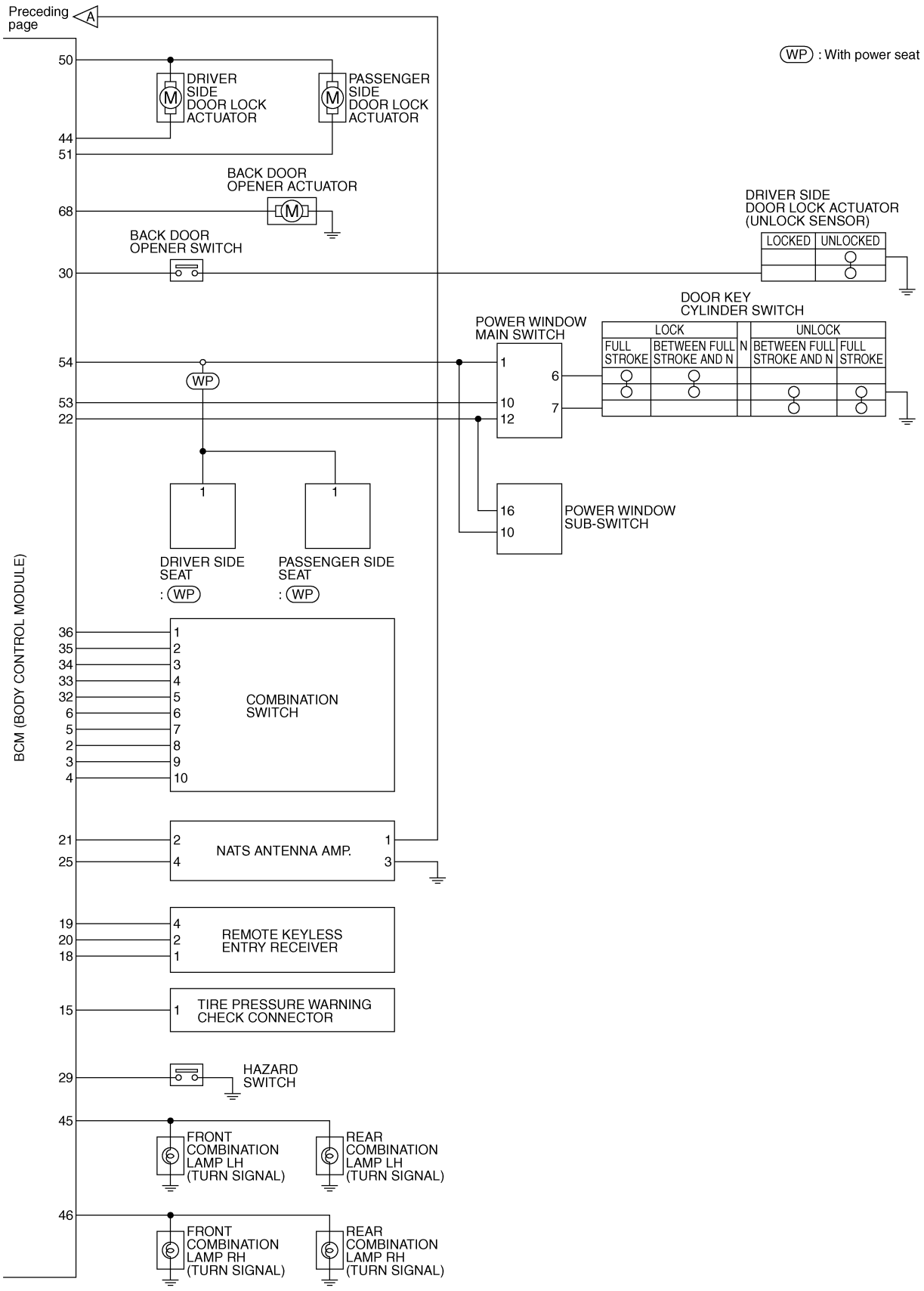
Schematic

NKS0009Q

COUPE MODELS

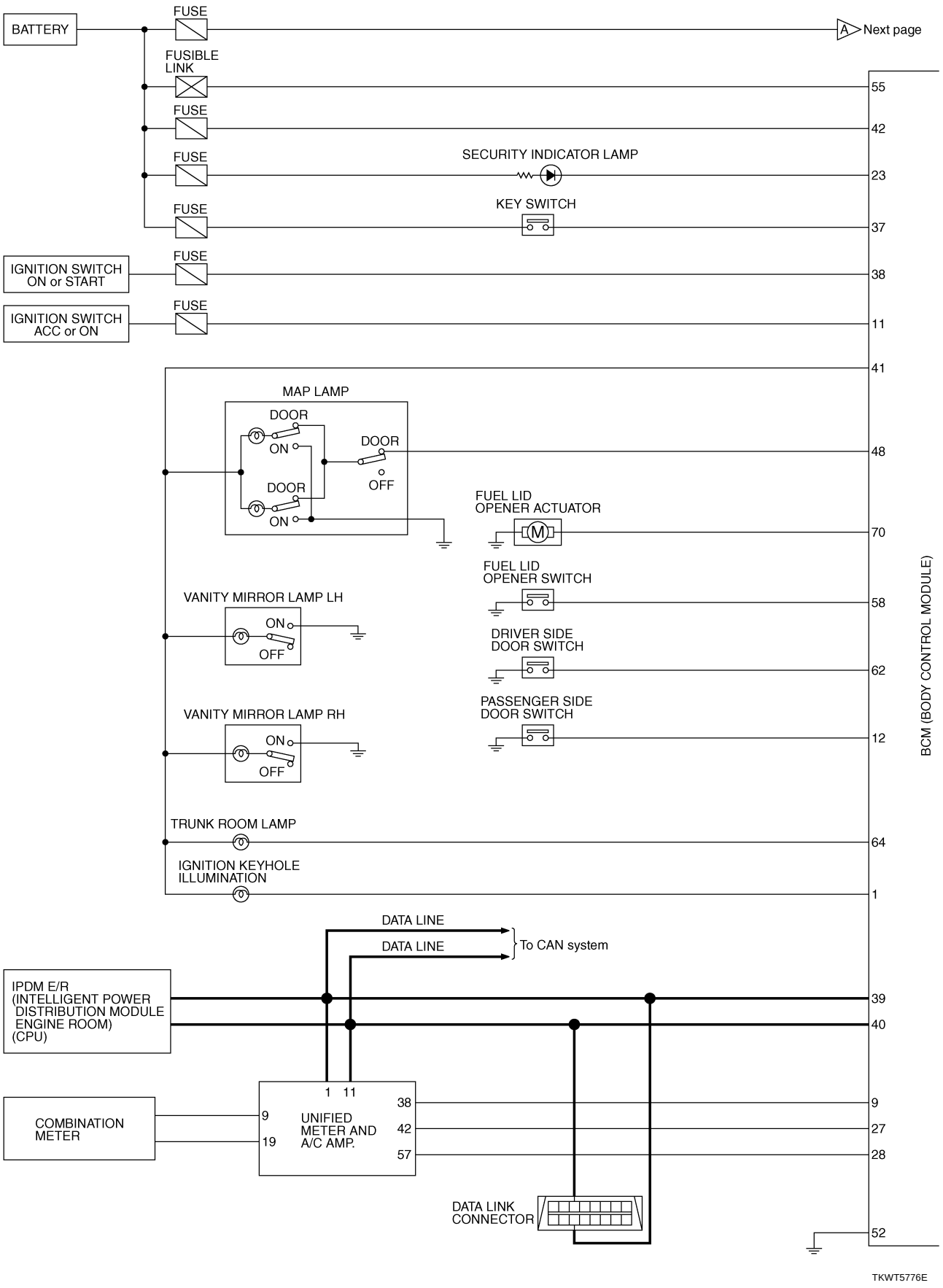


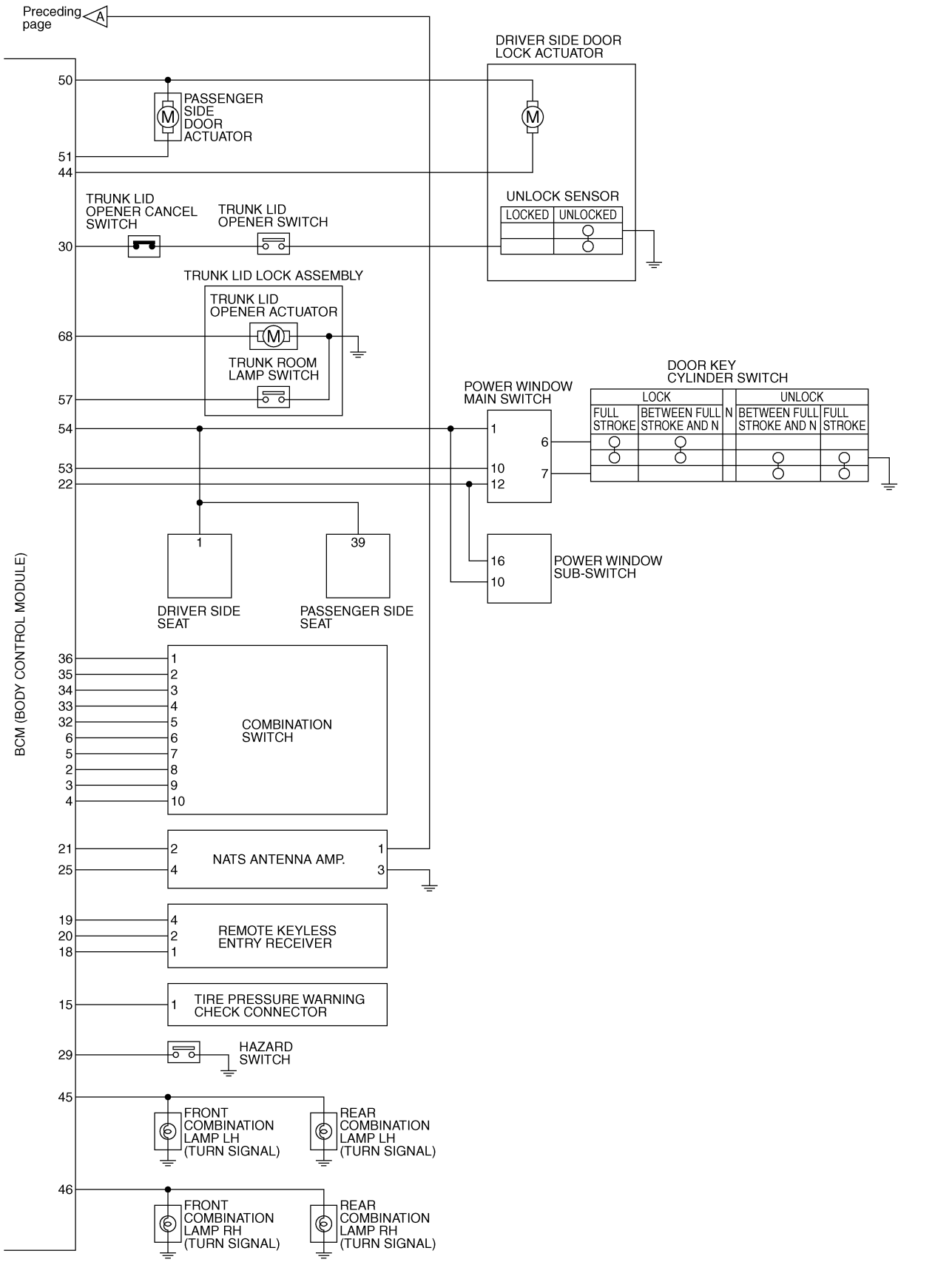
TKWT5775E


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UNLOCKED
DOOR KEY CYLINDER SWITCH
LOCK
UNLOCK
FULL STROKE
BETWEEN FULL STROKE AND N
N
BETWEEN FULL STROKE AND N
FULL STROKE
POWER WINDOW MAIN SWITCH
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WP
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1
6
10
7
12
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REAR COMBINATION LAMP RH (TURN SIGNAL)

TKWT4014E

ROADSTER MODELS




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REAR COMBINATION LAMP RH (TURN SIGNAL)

TKWT5777E

CONSULT-III Function (BCM)

NKS0009R

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnostic test item	Check item, diagnostic test mode	Content
Inspection by part	WORK SUPPORT	Changes setting of each function.
	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	DATA MONITOR	Displays the input data of BCM in real time.
	ACTIVE TEST	Gives a drive signal to a load to check the operation.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
	ECU PART NUMBER	BCM part number can be read.

ITEMS OF EACH PART

NOTE:
CONSULT-III displays systems equipped in the vehicle.

×: Applicable

System and item	CONSULT-III display	Diagnostic test mode (Inspection by part)						
		WORK SUPPORT	SELF–DIAG RESULTS	DATA MONITOR	CAN DIAG SUPPORT MNTR	ACTIVE TEST	ECU PART NUMBER	CONFIGURATION
BCM	BCM	×	×		×		×	× NOTE
Power door lock system	DOOR LOCK	×		×		×		
Rear window defogger	REAR DEFOGGER			×		×		
Warning chime	BUZZER			×		×		
Room lamp timer	INT LAMP	×		×		×		
Remotecontrol entry system	MULTI REMOTE ENT	×		×		×		
Headlamp	HEAD LAMP	×		×		×		
Wiper	WIPER	×		×		×		
Turn signal lamp Hazard lamp	FLASHER			×		×		
Blower fan switch signal A/C switch signal	AIR CONDITONER			×				
Combination switch	COMB SW			×				
NVIS	IMMU			×		×		
Interior lamp battery saver	BATTERY SAVER	×		×		×		
Trunk lid	TRUNK			×		×		
Vehicle security system	THEFT ALM	×		×		×		
Retained power control	RETAINED PWR	×		×		×		
Oil pressure switch	SIGNAL BUFFER			× NOTE		×		
Low tire pressure warning system	AIR PRESSURE MONITOR	×	×	×		×		
Panic alarm system	PANIC ALARM					×		

NOTE:
This item is displayed, but should not be used.

WORK SUPPORT

Display Item List

Item	Description
RESET SETTING VALUE	Return a value set with WORK SUPPORT of each system to a default value in factory shipment.

CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)

NKS0009S

1. SELF-DIAGNOSIS RESULT CHECK

CONSULT-III display code	Diagnosis item
U1000	INITIAL DIAG
	TRANSMIT DIAG
	ECM
	IPDM E/R
	METER / M&A

Contents displayed

No malfunction>>INSPECTION END

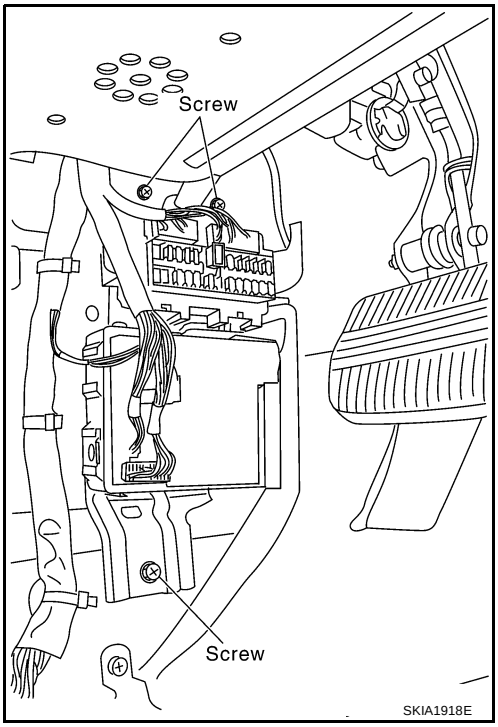
Malfunction in CAN communication system>>After printing the monitor items, go to “CAN System”. Refer to LAN-48, "CAN System Specification Chart" .

Removal and Installation of BCM

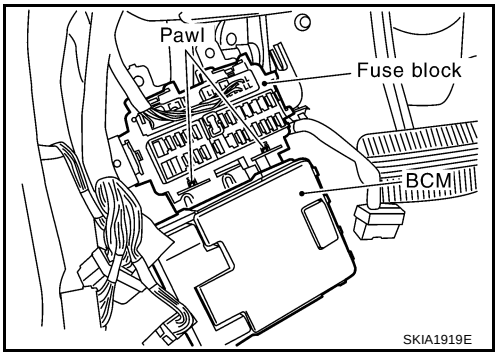
NKS0009T

REMOVAL

1. Remove the dash side finisher (LH). Refer to EI-35, "BODY SIDE TRIM" .
2. Disconnect BCM connector.
3. Remove bracket mounting screws to remove BCM and fuse block with bracket.



4. Raise the pawl of fuse block and remove bracket from fuse block to remove BCM.



INSTALLATION

Installation is the reverse order of removal.

NOTE:

When replacing BCM perform initialization of NATS system and registration of all NATS ignition key IDs.

SECTION BL

BODY, LOCK & SECURITY SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00001

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NIS00002

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Work

NIS00003

- After removing and installing the opening/closing parts, be sure to carry out fitting adjustments to check their operation.
- Check the lubrication level, damage, and wear of each part. If necessary, grease or replace it.

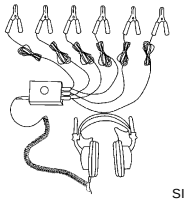
PREPARATION

PFP:00002

Special Service Tools

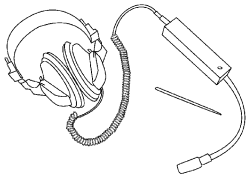
NIS00005

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J-39570) Chassis ear  SIIA0993E	Locating the noise
(J-43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS00006

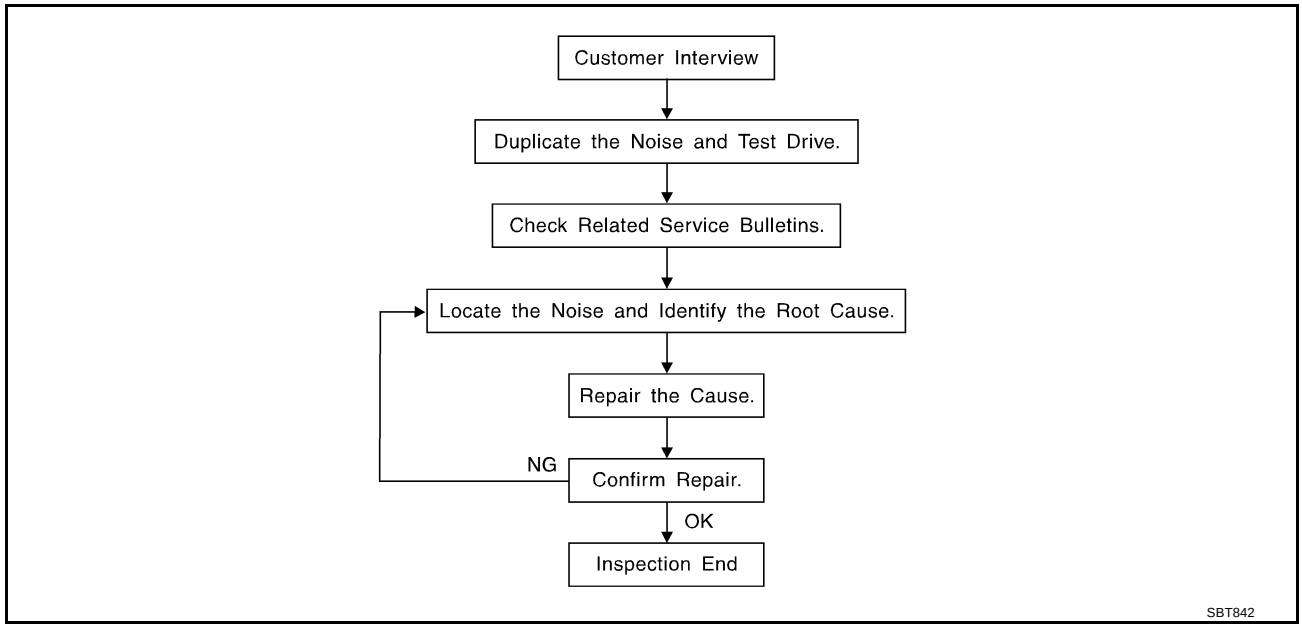
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS00007



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to BL-11, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to BL-9, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS00008

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

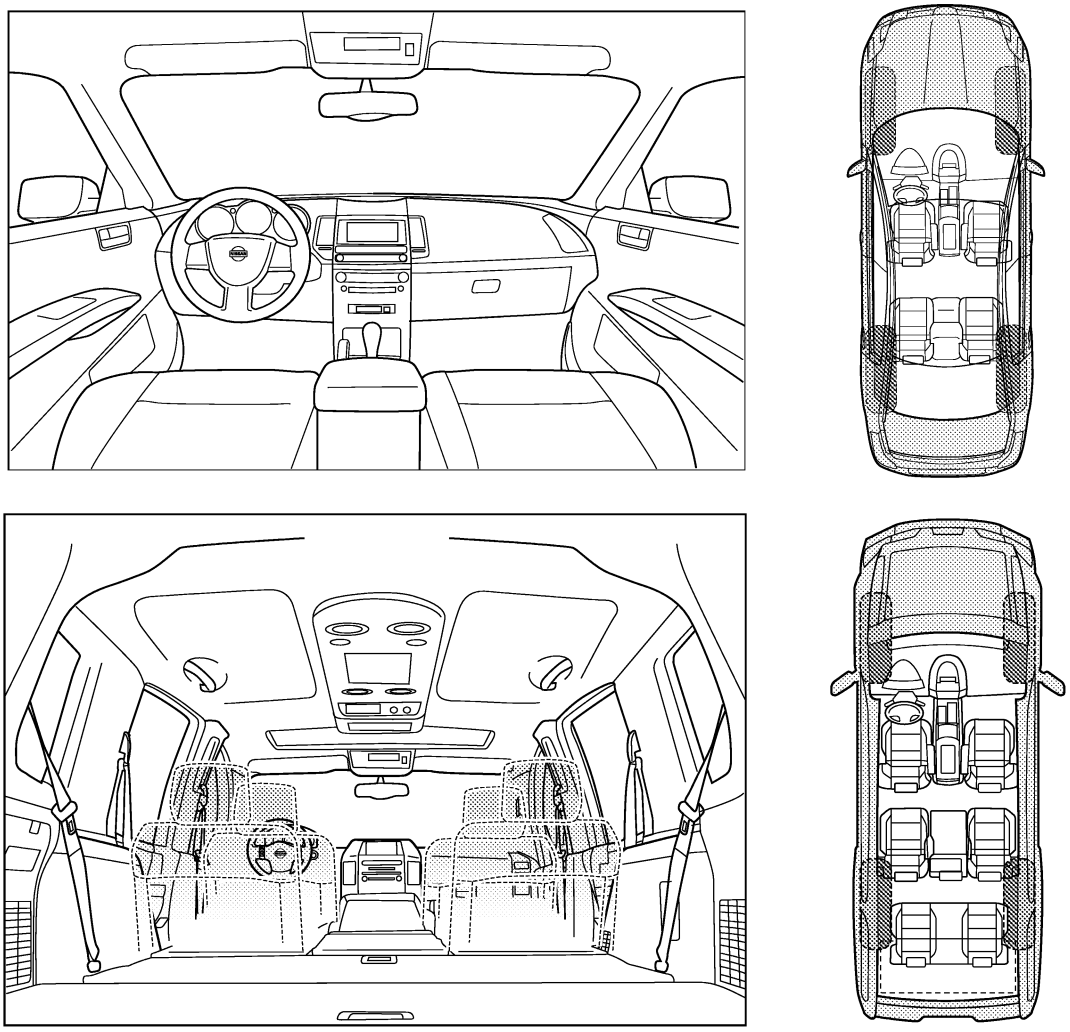
Diagnostic Worksheet

NIS00009

SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

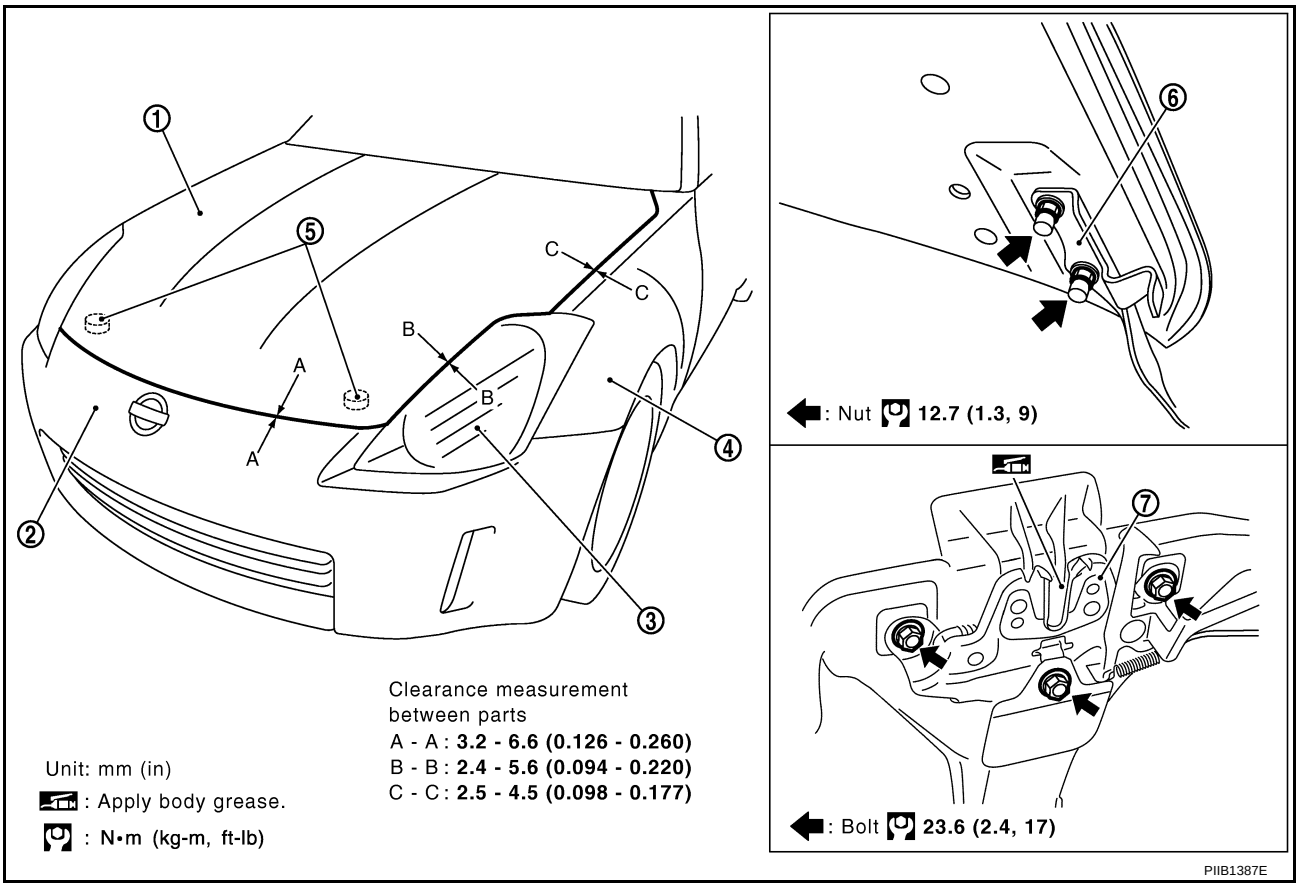
PIIB8742E

HOOD

PFP:F5100

Fitting Adjustment

NIS0000A



1. Hood assembly
2. Front bumper
3. Head lamp
4. Front fender
5. Bumper rubber
6. Hood hinge
7. Hood lock assembly

LONGITUDINAL AND LATERAL CLEARANCE ADJUSTMENT

1. Remove hood lock assembly, loosen the hood hinge nuts and close the hood.
2. Adjust the lateral and longitudinal clearance, and open the hood to tighten the hood hinge mounting bolts to the specified torque.
3. Install the hood lock temporarily, and align the hood striker and hood lock so that the centers of hood striker and hood lock become vertical viewed from the front, by moving the hood lock laterally.
4. Tighten hood lock assembly mounting bolts to the specified torque.

CAUTION:

Adjust right/left clearance between hood and each part to the following specification.

Hood and head lamp (B–B) : Less than 2.0 mm (0.08 in)

Hood and fender (C–C) : Less than 1.0 mm (0.04 in)

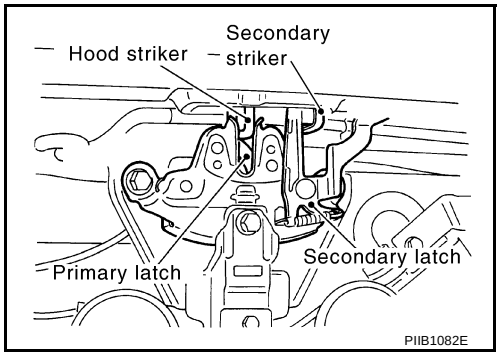
FRONT END HEIGHT ADJUSTMENT

1. Remove the hood lock and adjust the height by rotating the bumper rubber until the hood becomes 1 to1.5 mm (0.04 to 0.059 in) lower than the fender.
2. Temporarily tighten the hood lock assembly, and position it by engaging it with the hood striker. Check the hood lock and hood striker for looseness, and tighten the hood lock assembly mounting bolts to the specified torque.

SURFACE HEIGHT ADJUSTMENT

1. Remove hood lock assembly, and adjust the surface height difference of hood and fender according to the fitting standard dimension, by rotating RH and LH bumper rubbers.
2. Install hood lock temporarily, and move hood lock laterally until the centers of striker and lock become vertical when viewed from the front.
3. Make sure that the hood lock secondary latch is properly engaged with the secondary striker with hood's own weight.
4. Make sure that the hood lock primary latch is securely engaged with the hood striker with hood's own weight by dropping hood from approx. 200 mm (7.87 in) height.

   CAUTION:
   Do not drop hood from a height of 300 mm (11.81 in) or more.
5. Move hood lockup and down until striker smoothly engages the lock when the hood is closed.
6. When pulling the hood opener lever gently, make sure that front end of the hood rises by approximately 20 mm (0.79 in) and that hood striker and hood lock primary latch is disengaged. Also make sure that hood opener returns to the original position.
7. After adjustment, tighten lock bolts to the specified torque.

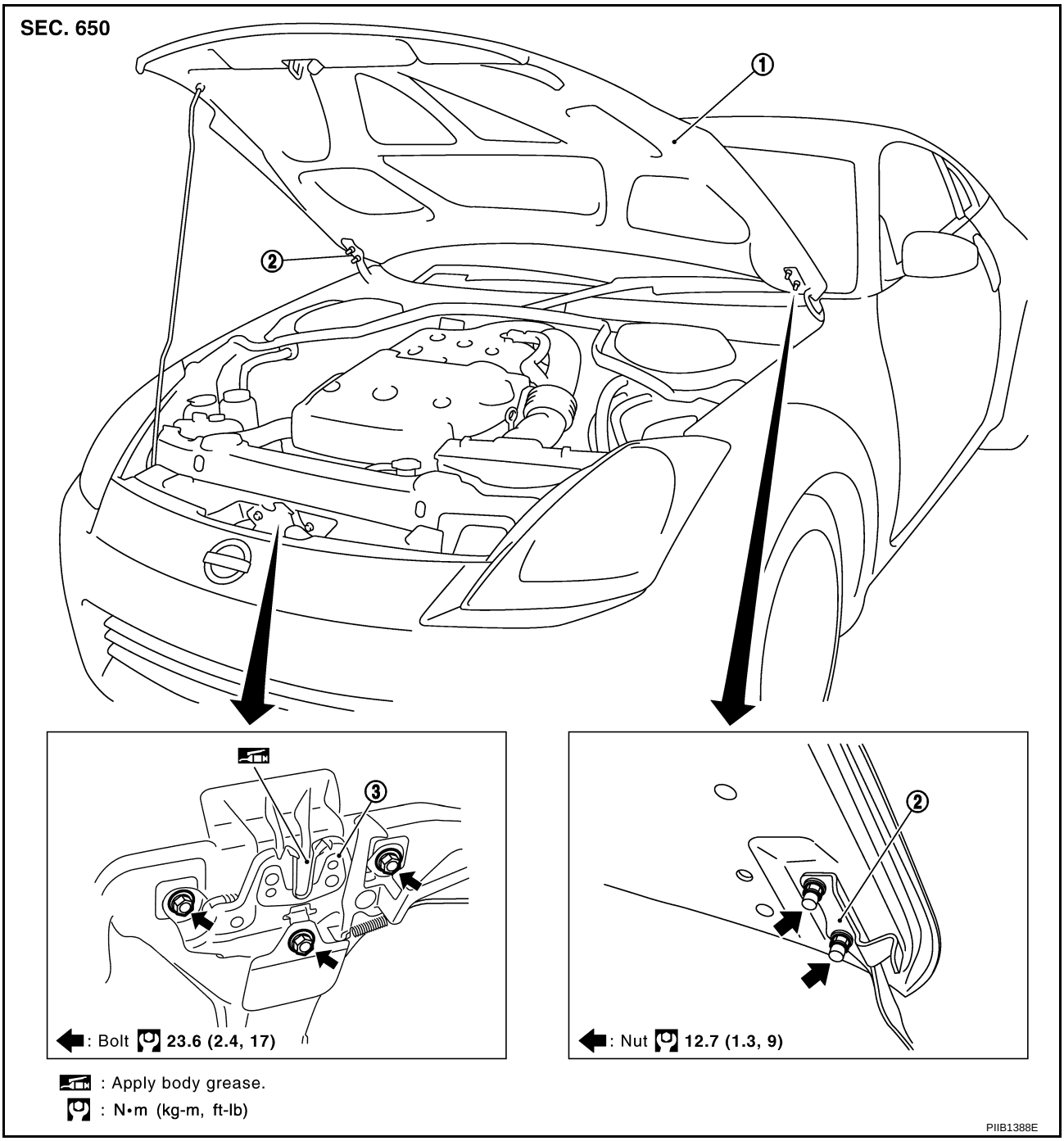


CAUTION:
Adjust evenness between hood and fender to the following specification.

Hood and fender (C–C) : 0 ± 1.0 mm (0 ± 0.04 in)

Removal and Installation of Hood Assembly

NIS0000B



1. Hood assembly
2. Hood hinge
3. Hood lock assembly

REMOVAL

Remove the hinge mounting nuts on the hood to remove the hood assembly.

CAUTION:

Operate with two workers, because of its heavy weight.

INSTALLATION

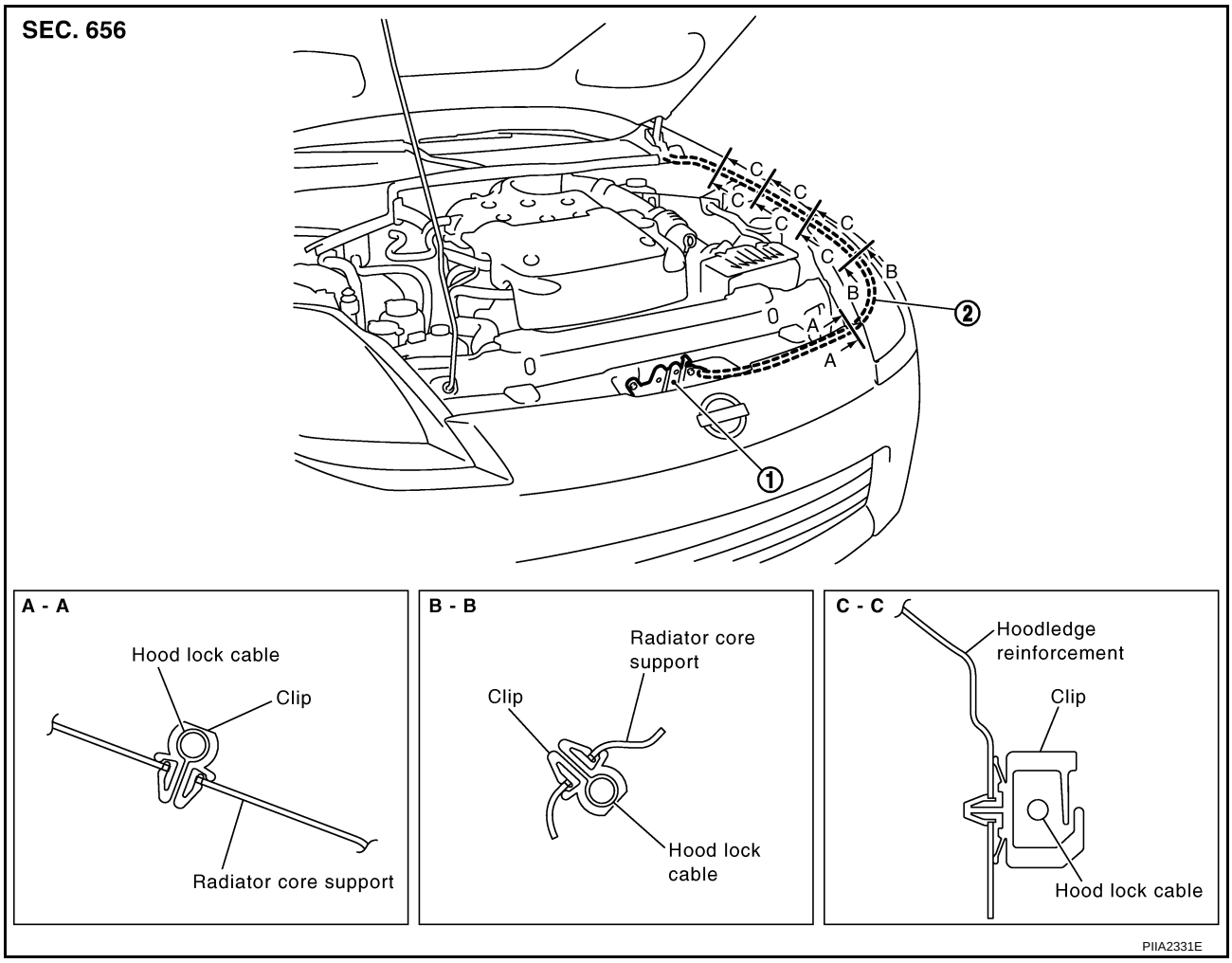
Install in the reverse order of removal.

CAUTION:

- **Before installing hood hinge, apply anticorrosive agent onto the mounting surface of the vehicle body.**
- **After installing, perform hood fitting adjustment. Refer to BL-13, "Fitting Adjustment" .**

Removal and Installation of Hood Lock Control

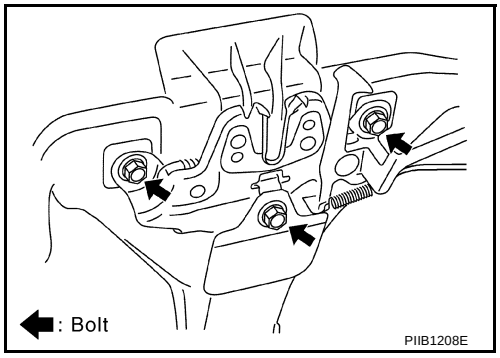
NIS0000C



1. Hood lock assembly
2. Hood lock cable

REMOVAL

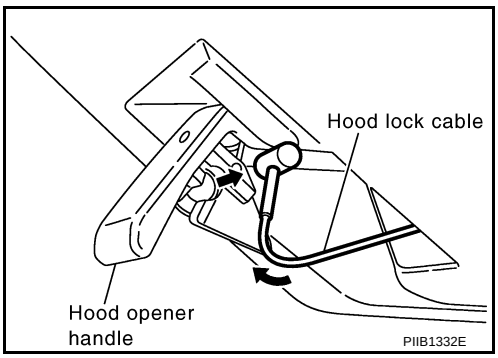
1. Remove the fender protector (LH). Refer to EI-21, "FENDER PROTECTOR" .
2. Remove the hood lock assembly.



3. Remove the dash side finisher. Refer to IP-10, "Component Parts Drawing" .
4. Remove hood lock cable and unclip it from portion of radiator core support.

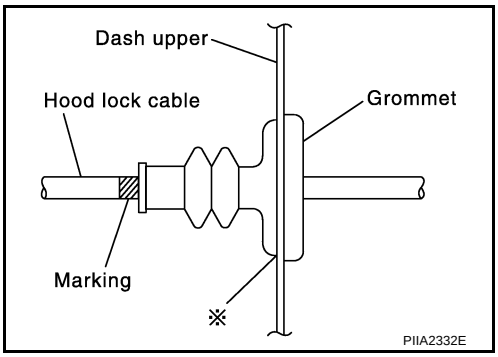
5. While pulling the hood lock cable, remove hood lock cable connected to hood opener handle.
6. Remove grommet on dash board, and pull hood lock cable toward passenger compartment.

CAUTION:
While pulling, be careful not to damage (peeling) the outside of the hood lock cable.

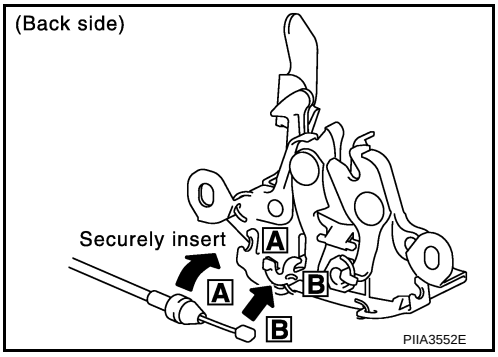


INSTALLATION

1. Pull the hood lock cable through the panel hole to the engine compartment. Be careful not to bend the cable too much, keeping the radius 100 mm (3.94 in) or more.
2. Check that the cable is not offset from the positioning grommet, and push the grommet into the panel hole securely.
3. Apply the sealant to the grommet (at * mark) properly.
4. Install while pulling hood lock cable.



5. Install the hood lock cable securely to the hood lock.
6. Install hood lock assembly.
7. After installing, check the hood lock adjustment and hood opener operation.

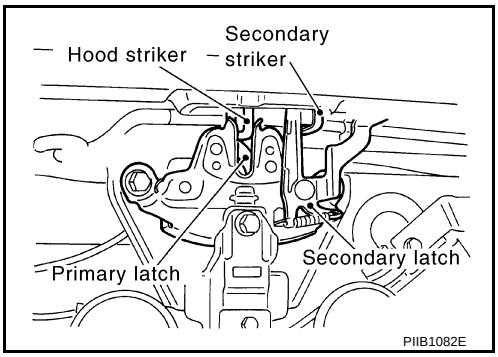


Hood Lock Control Inspection

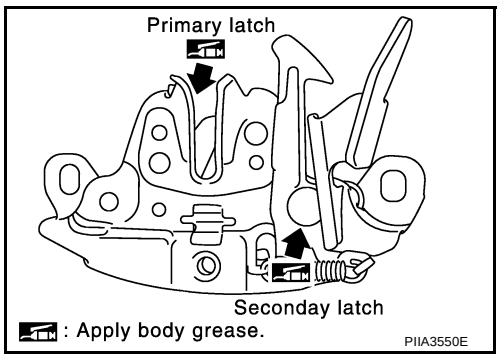
NIS0000D

CAUTION:
If the hood lock cable is bent or deformed, replace it.

1. Check that the secondary latch is properly engaged with the secondary striker with hood's own weight by dropping it from approx. 200 mm (7.87 in) height.
2. While operating the hood opener, carefully check that the front end of the hood is raised by approx. 20 mm (0.79 in). Also check that the hood opener returns to the original position.



3. Check the hood lock lubrication condition. If necessary, apply “body grease” to the points shown in the figure.

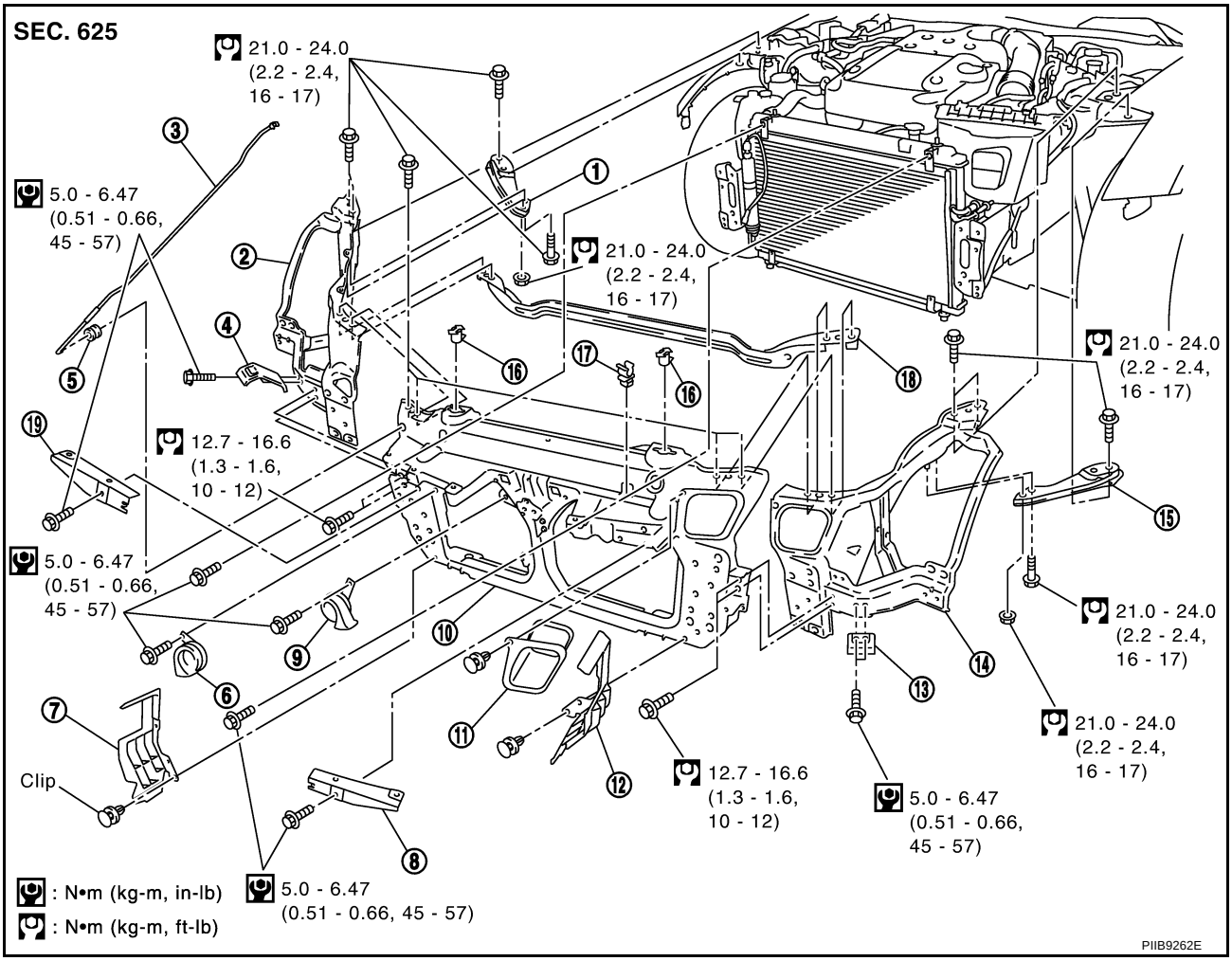


RADIATOR CORE SUPPORT

PFP:62500

Removal and Installation

NIS0000E

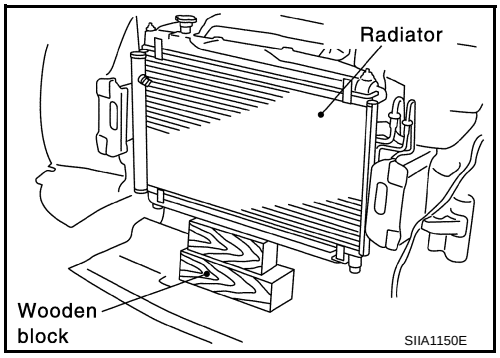


1.	Radiator core support side stay (RH)	2.	Radiator core support side (RH)	3.	Hood stay
4.	Bumper retainer (RH)	5.	Grommet	6.	Horn (High)
7.	Air guide (RH)	8.	Bumper fascia stay radiator core support center (LH)	9.	Horn (Low)
10.	Radiator core support center	11.	Air duct	12.	Air guide (LH)
13.	Bumper retainer (LH)	14.	Radiator core support side (LH)	15.	Radiator core support side stay (LH)
16.	Radiator upper bracket	17.	Hood rod clamp	18.	Radiator core support bar
19.	Bumper fascia stay radiator core support center (RH)				

REMOVAL

1. Remove hood assembly. Refer to BL-15, "Removal and Installation of Hood Assembly" .
2. Remove front bumper. Refer to EI-14, "Removal and Installation" .
3. Remove head lamp (LH/RH). Refer to LT-29, "Removal and Installation" .
4. Remove hood lock assembly, and then hood lock cable. Refer to BL-16, "Removal and Installation of Hood Lock Control" .
5. Remove washer tank. Refer to WW-34, "Removal and Installation of Washer Tank" .
6. Remove crash zone sensor. Refer to SRS-48, "Removal and Installation" .
7. Remove washer tank inlet clip. Refer to WW-34, "Removal and Installation of Washer Tank" .
8. Remove the oil cooler. Refer to PS-33, "HYDRAULIC LINE" .
9. Remove ambient sensor. Refer to ATC-104, "Removal and Installation" .

10. Remove horn connectors.
11. Remove mounting harness clip on radiator core support center and side to separate the harness.
12. Remove radiator upper bracket, and radiator core support side and radiator core support hood ledge stay bolts. Remove radiator core support center and side together. Remove bolts with power tool.



CAUTION:
Put a wooden block under the radiator assembly to prevent the radiator assembly from falling.

13. Remove radiator core support center and side together.
14. After removing radiator core support center and side together, the following parts are separated.
    - Remove the hood stay, grommet and hood rod clamp
    - Horn (High/Low)
    - Air duct
    - Air guide (LH/RH)
    - Bumper fascia stay radiator core support center (LH/RH)
    - Bumper retainer (LH/RH)
    - Radiator core support side and radiator core support side bar
    - Radiator core support side hood ledge stay (LH/RH)

INSTALLATION

Install in the reverse order of removal.

CAUTION:
After installing, check the hood lock adjustment and hood opener operation. Refer to BL-13, "Fitting Adjustment" .

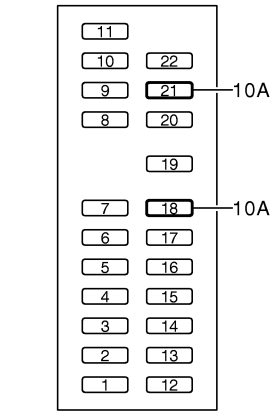
POWER DOOR LOCK SYSTEM

PFP:24814

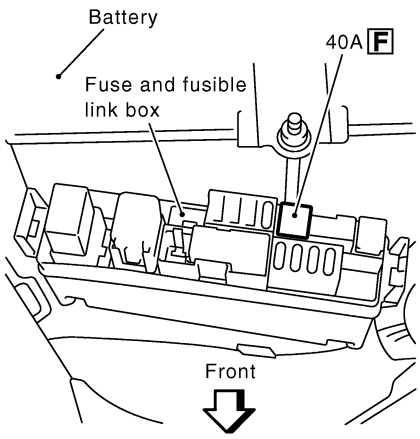
Component Parts and Harness Connector Location

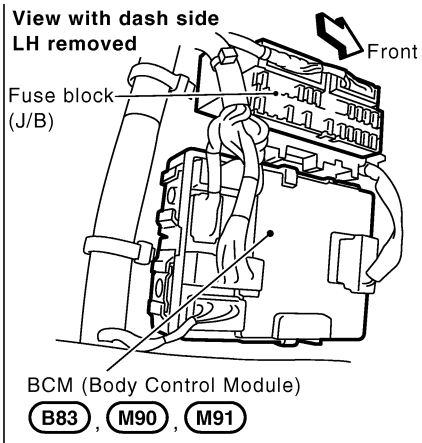
NIS0000F

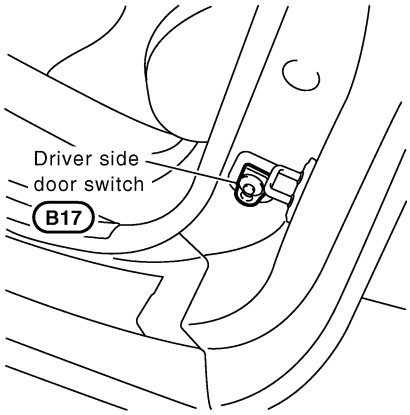
FOR COUPE

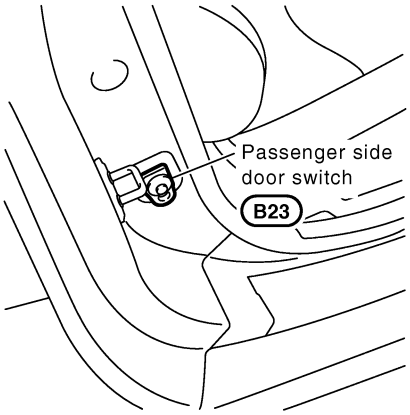


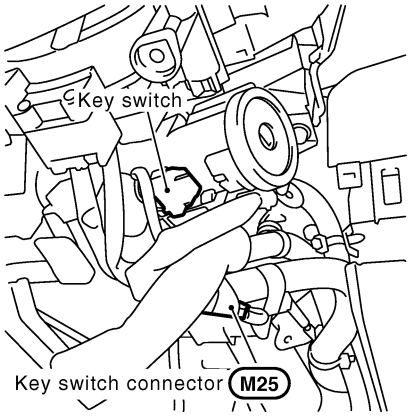
Fuse block (J/B) fuse layout

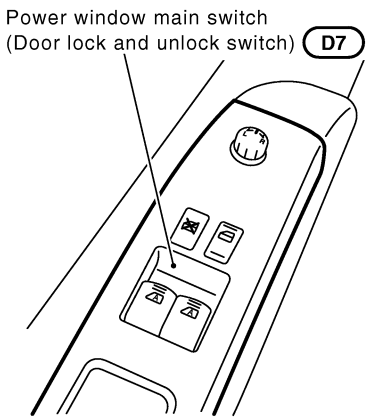


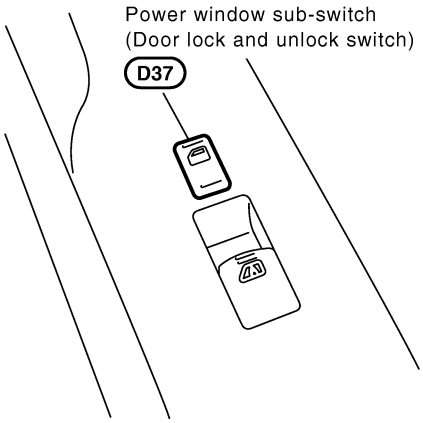


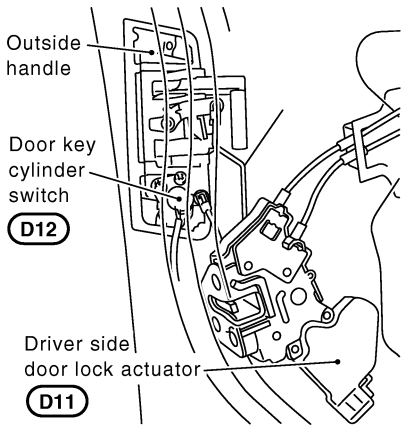


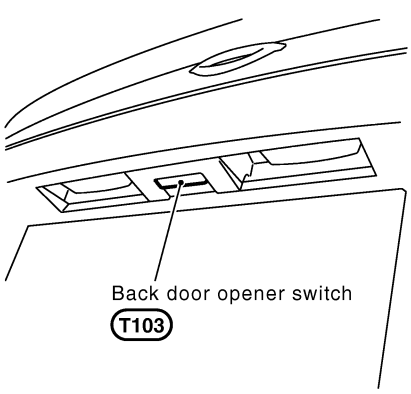


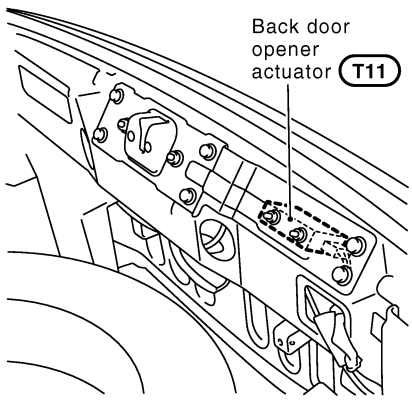


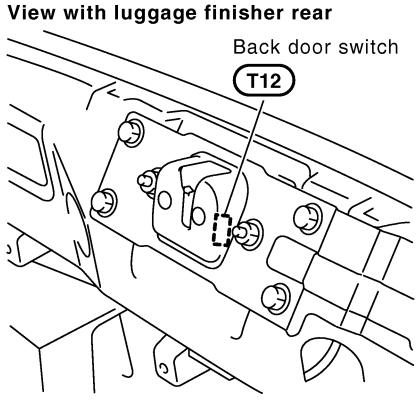






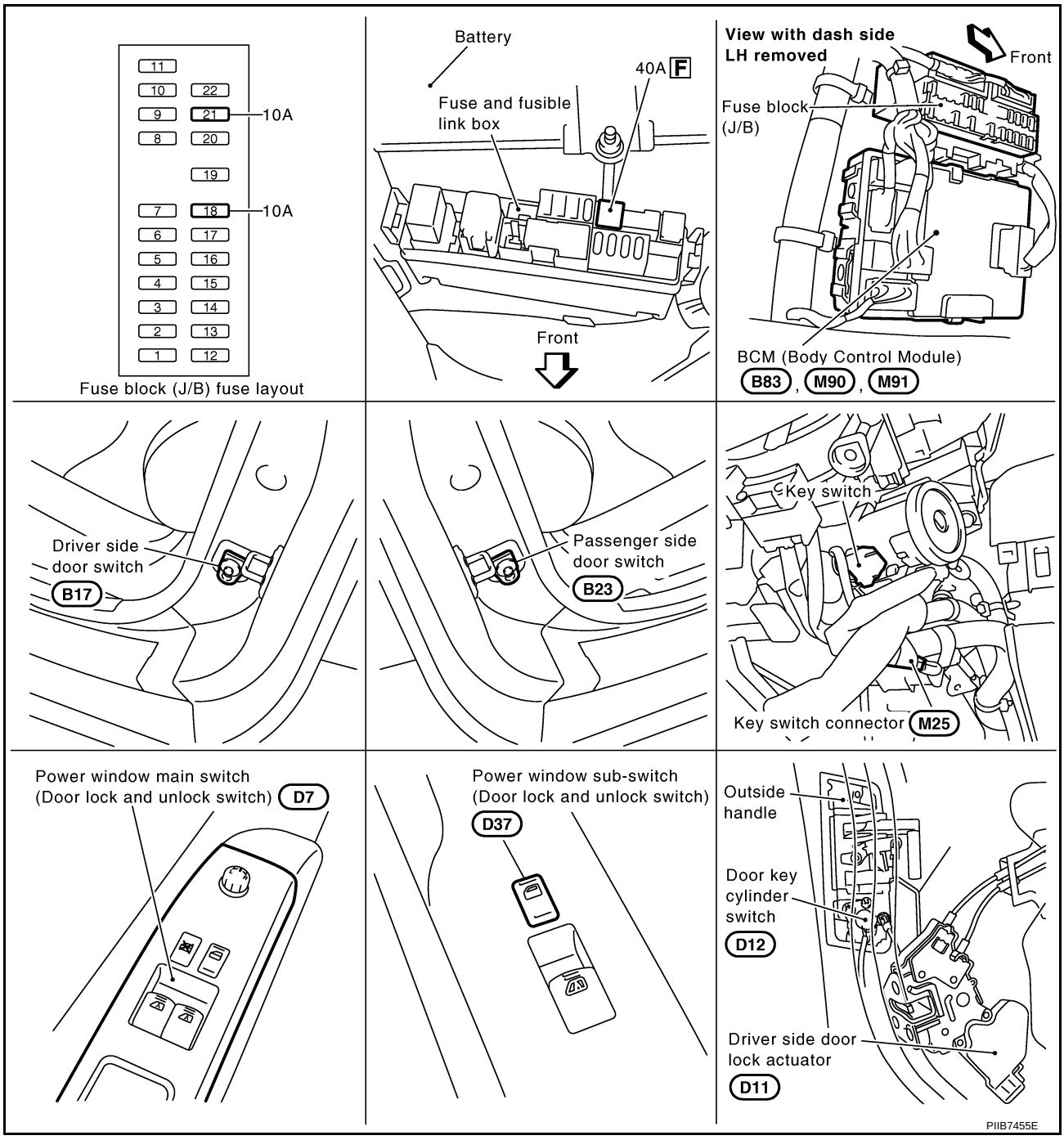






PIIB7454E

FOR ROADSTER



System Description

NIS0000G

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No.21, located in the fuse block (J/B)]
- to key switch terminal 2.

When ignition key inserted, power is supplied

- through key switch terminal 1
- to BCM terminal 37.

Ground is supplied

- to terminal 52 of BCM
- through body grounds M30 and M66.

When the door is locked or unlocked with power window main switch (door lock and unlock switch), ground is supplied

- to power window main switch (door lock and unlock switch) terminal 15
- through body grounds M30 and M66.

Power window main switch (door lock and unlock switch) operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12.
- to BCM terminal 22

When the door is locked or unlocked with power window sub-switch (door lock and unlock switch), ground is supplied

- to power window sub-switch (door lock and unlock switch) terminal 11
- through body grounds M30 and M66.

Power window sub-switch (door lock and unlock switch) operation signal is supplied

- through power window sub-switch (door lock and unlock switch) terminal 16.
- to BCM terminal 22

When the door is locked with door key cylinder switch, ground is supplied

- to power window main switch (door lock and unlock switch) terminal 6
- through door key cylinder switch terminals 3 and 2 and
- through body grounds M30 and M66.

Door key cylinder switch operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

When the door is unlocked with door key cylinder switch, ground is supplied

- to power window main switch (door lock and unlock switch) terminal 7
- through door key cylinder switch terminals 1 and 2 and
- through body grounds M30 and M66.

Door key cylinder switch operation signal is supplied

- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

BCM is connected to power window main switch (door lock and unlock switch) and power window sub-switch (door lock and unlock switch) as serial link.

POWER WINDOW SERIAL LINK

Power window main switch, power window sub-switch and BCM transmit and receive the signal by power window serial link.
The under mentioned signal is transmitted from power window main switch to BCM.

- Door lock and unlock switch signal.

The under mentioned signal is transmitted from power window sub-switch to BCM.

- Door lock and unlock switch signal.

OUTLINE

Functions available by operating the door lock and unlock switches on driver's door and passenger's door

- With the locking operation of door lock and unlock switch, door lock actuators of driver's and passenger's doors are locked.
- With the unlocking operation of door lock and unlock switch, door lock actuators of driver's and passenger's doors are unlocked.

Functions available by operating the key cylinder switch

- With the locking operation of door key cylinder, door lock actuators of all doors are locked.
- When door key cylinder is unlocked, door lock actuator (driver side) is unlocked.
- When door key cylinder is unlocked for the second time within 5 seconds after the first unlock operation, door lock actuators on driver's and passenger's doors are unlocked.

Unlock mode can be changed by using CONSULT-III “WORK SUPPORT” mode in “DOOR LOCK-UNLOCK SET”.
Refer to BL-35, "WORK SUPPORT" .

Key reminder door system

When door lock and unlock switch is operated to lock doors with ignition key put in key cylinder and driver's and passenger's door open, driver and passenger door lock actuators are locked and then unlocked.

Back door opener operation/For coupe

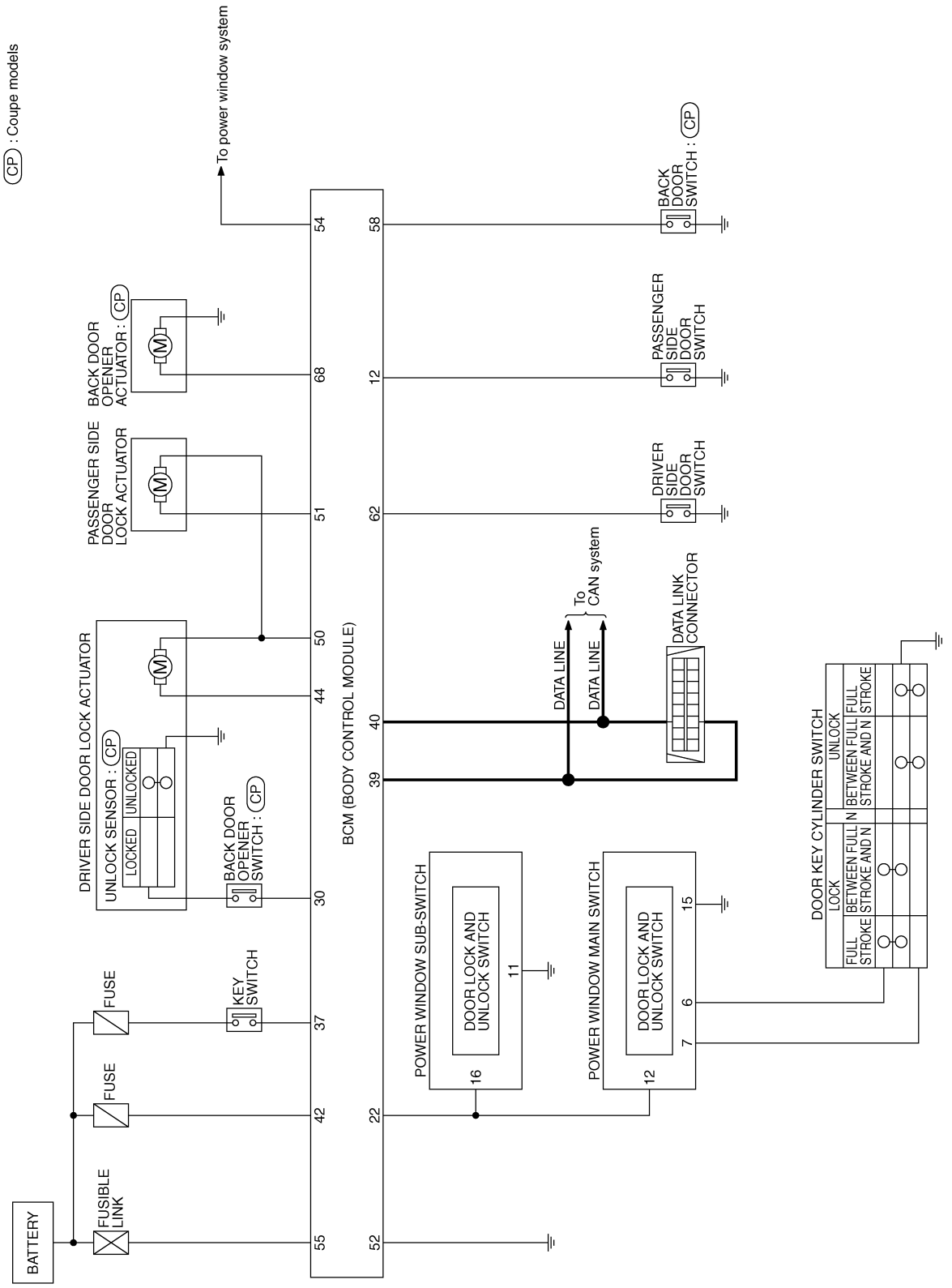
When back door opener switch is ON with driver's door unlocked,
ground is supplied

- to BCM terminal 68
- through back door opener actuator terminals 1 and 2 and
- through body grounds B5, B6, D105 and T14

Then back door opener actuator opens back door.

Schematic

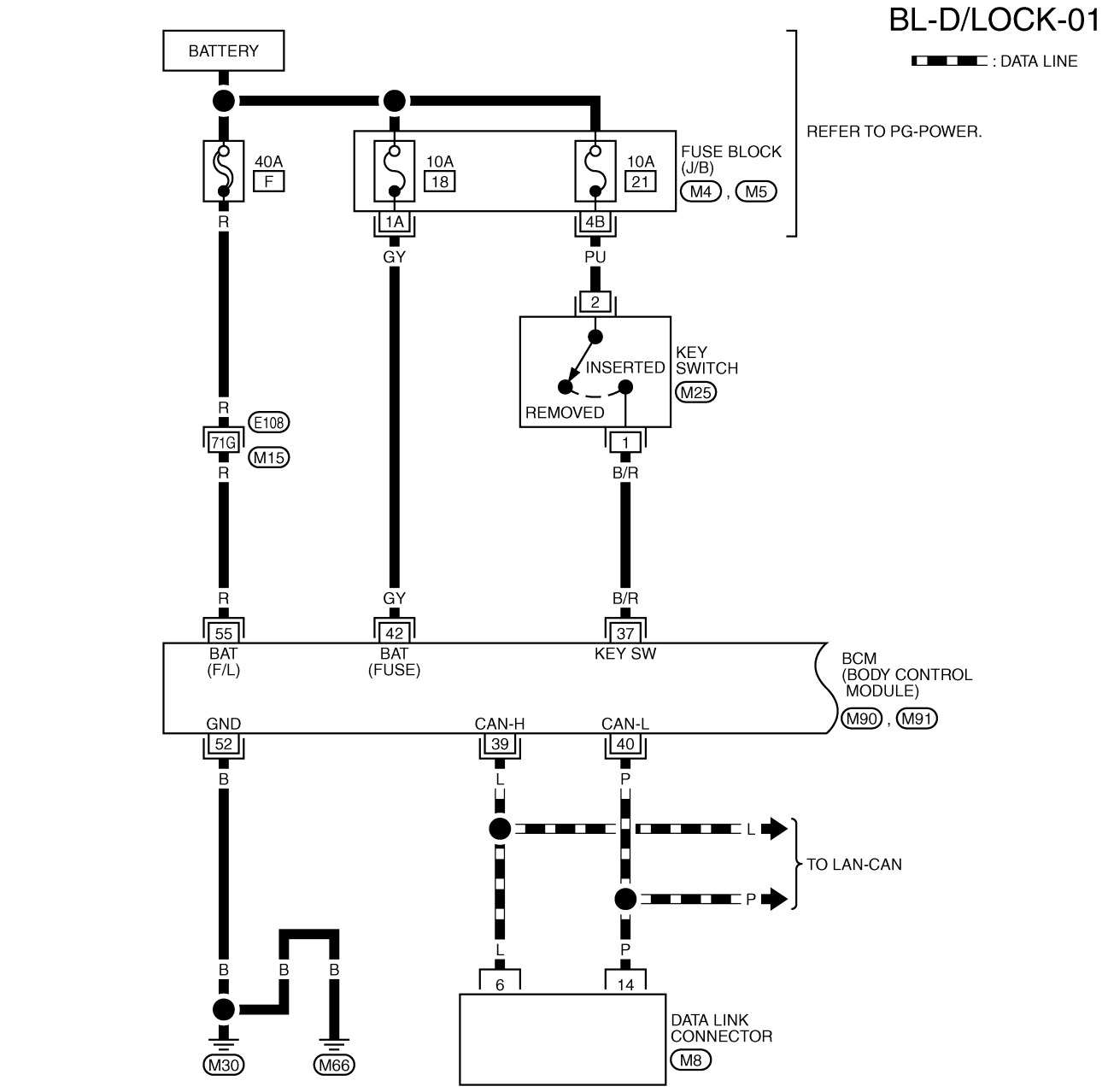
NIS0000H



TIWT0949E

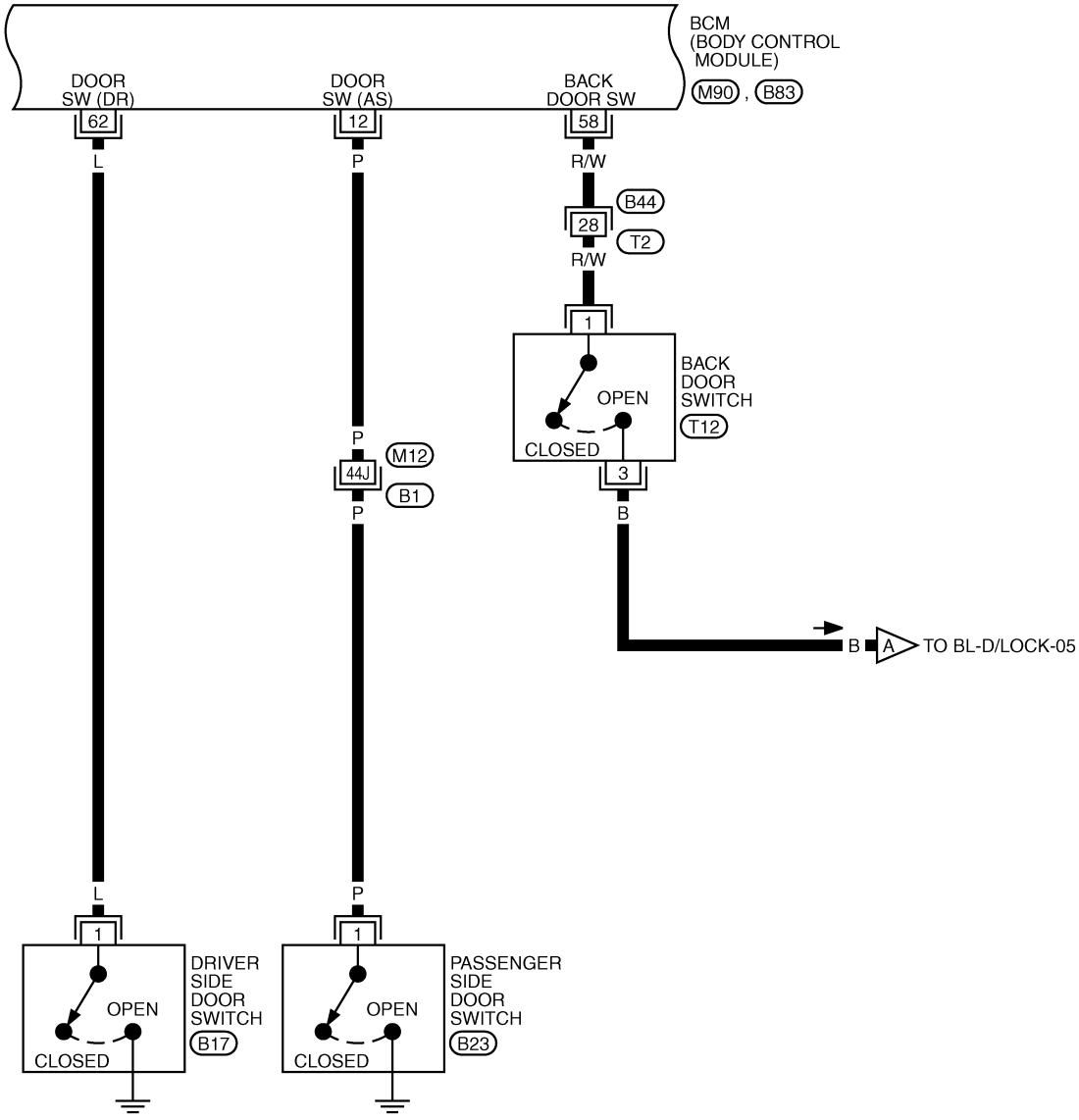
Wiring Diagram — D/LOCK — /For Coupe

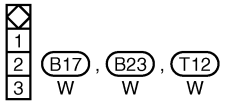
NIS0000I

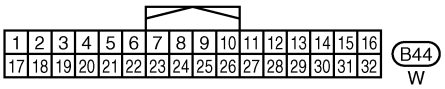


TIWT1566E

BL-D/LOCK-02



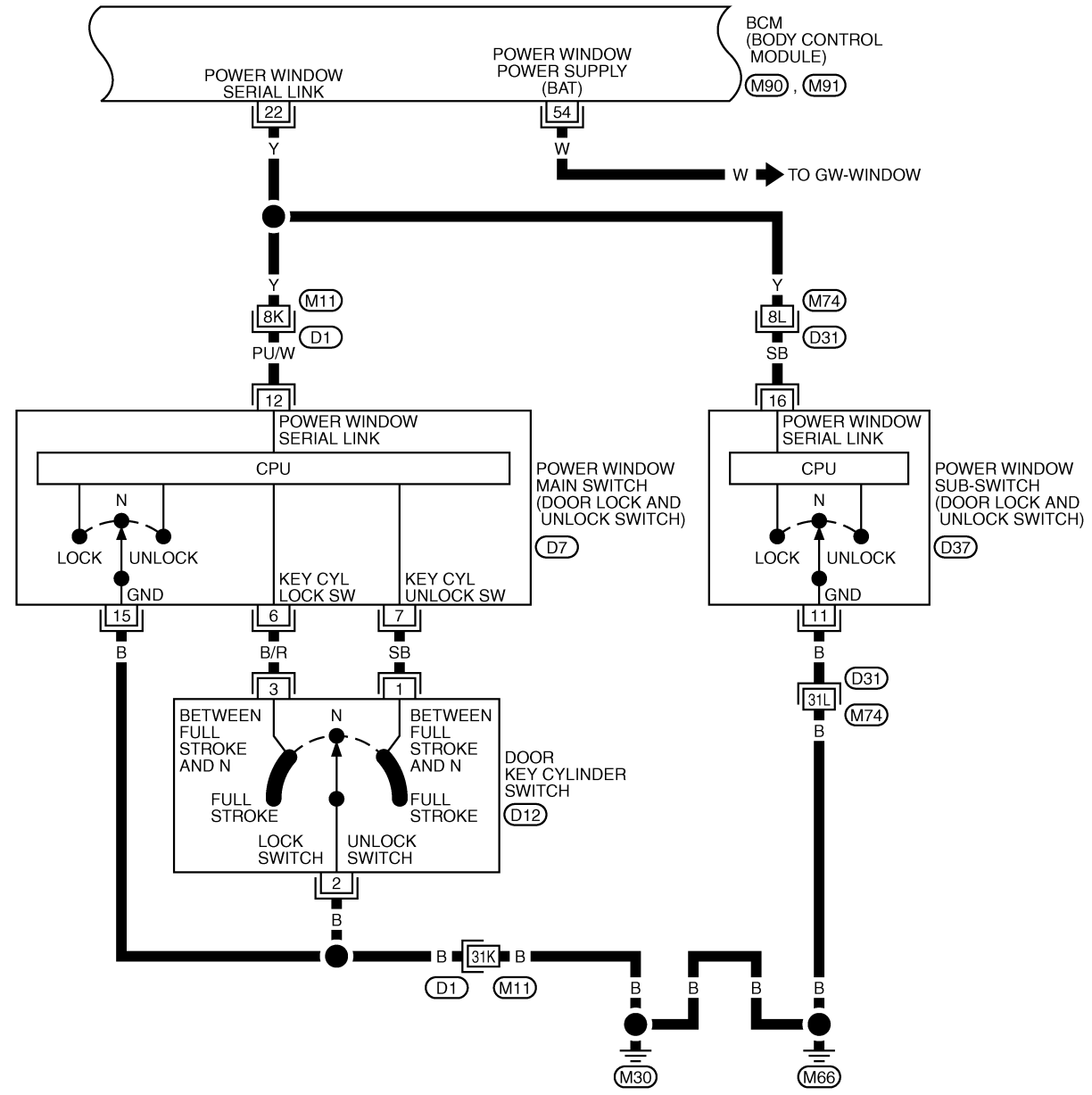


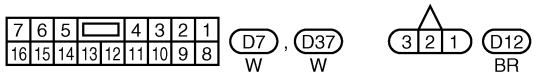


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

TIWT1567E

BL-D/LOCK-03





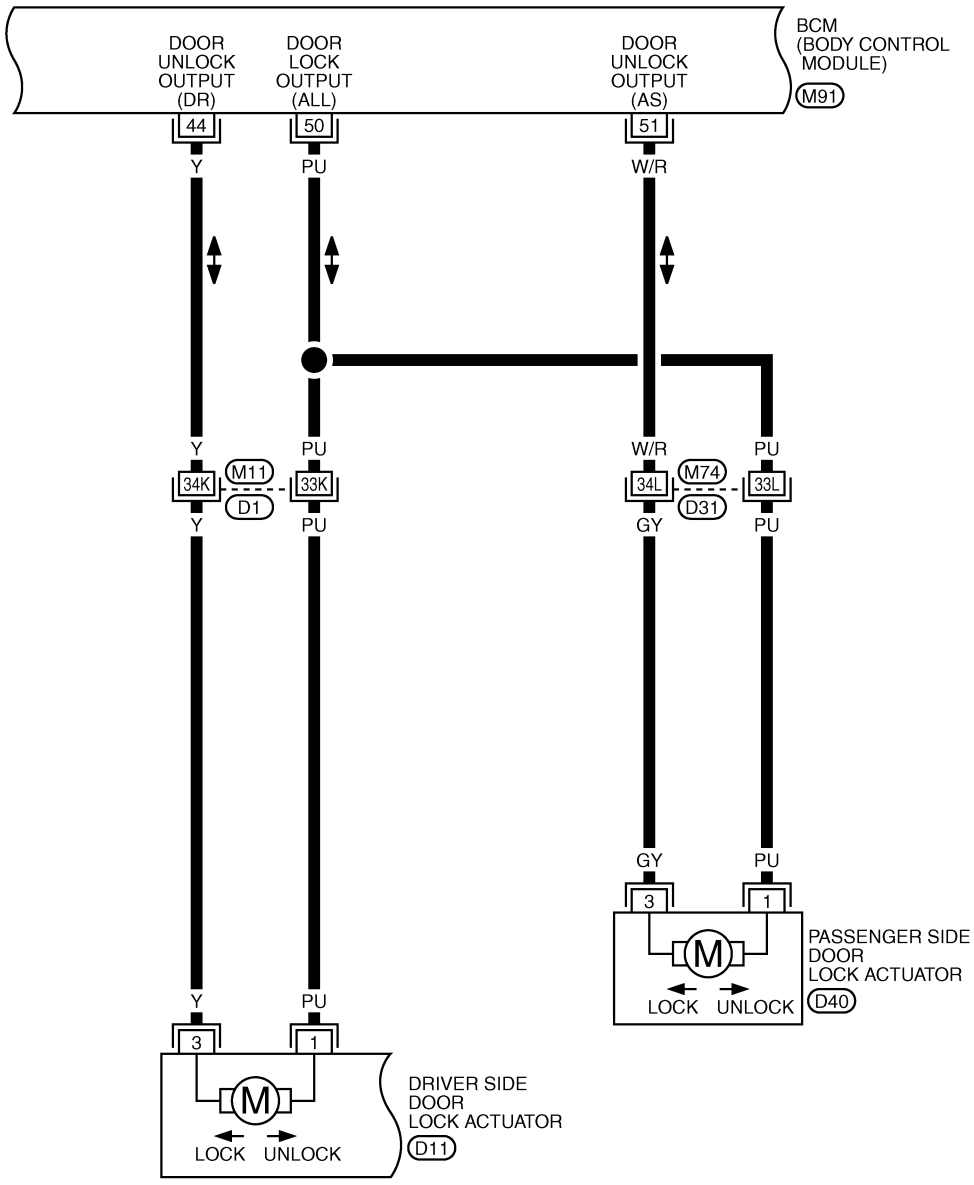
REFER TO THE FOLLOWING.

D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M90 , M91 -ELECTRICAL UNITS

TIWT1568E

BL-D/LOCK-04

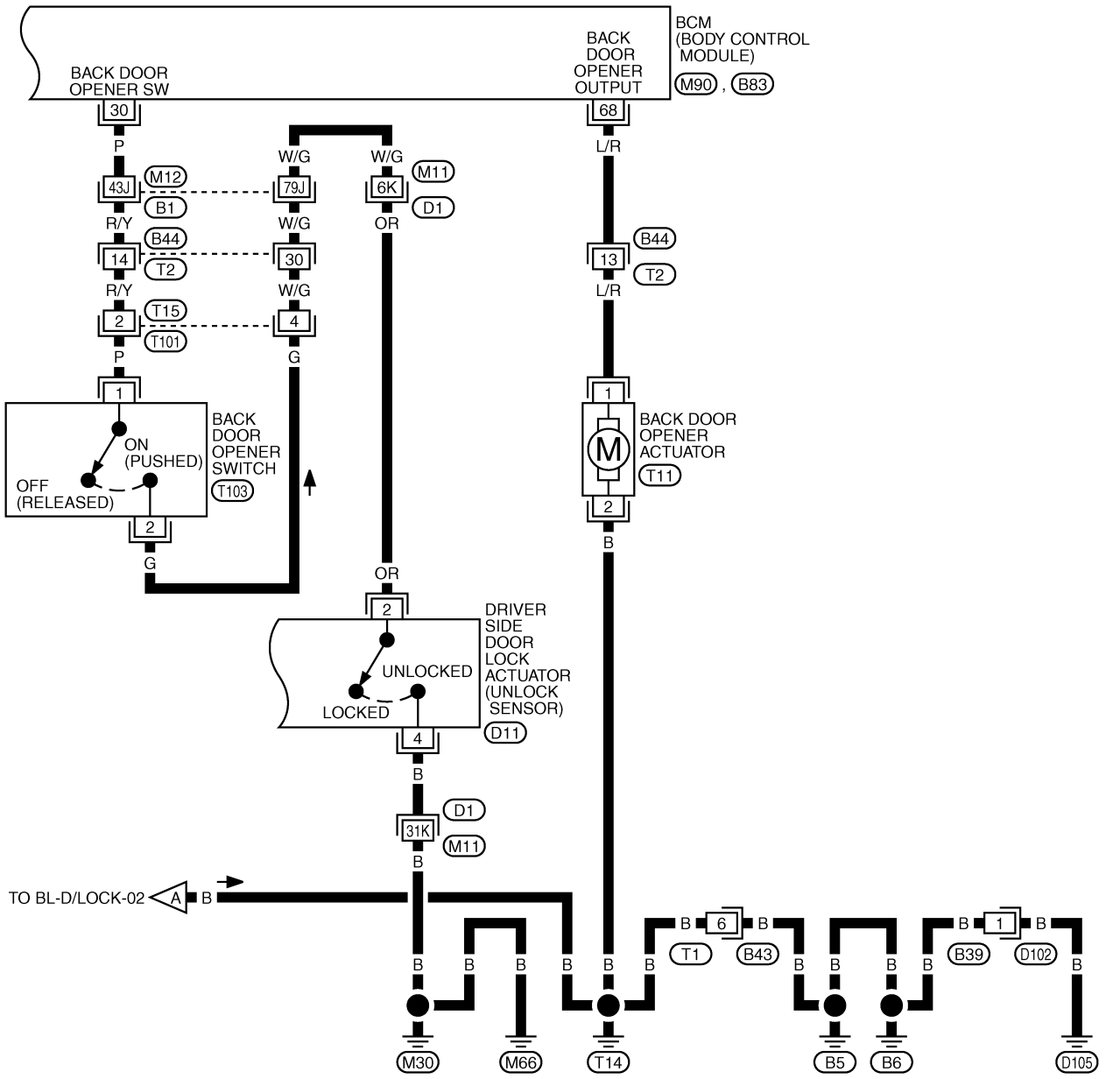


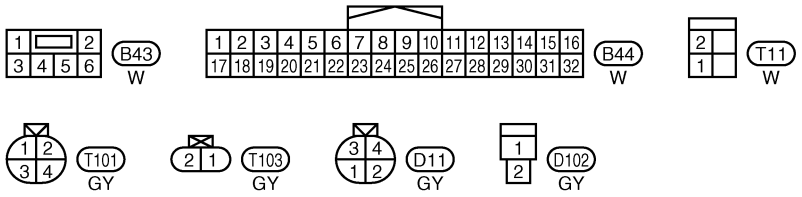


REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M91 -ELECTRICAL UNITS

TIWT1569E

BL-D/LOCK-05





REFER TO THE FOLLOWING.

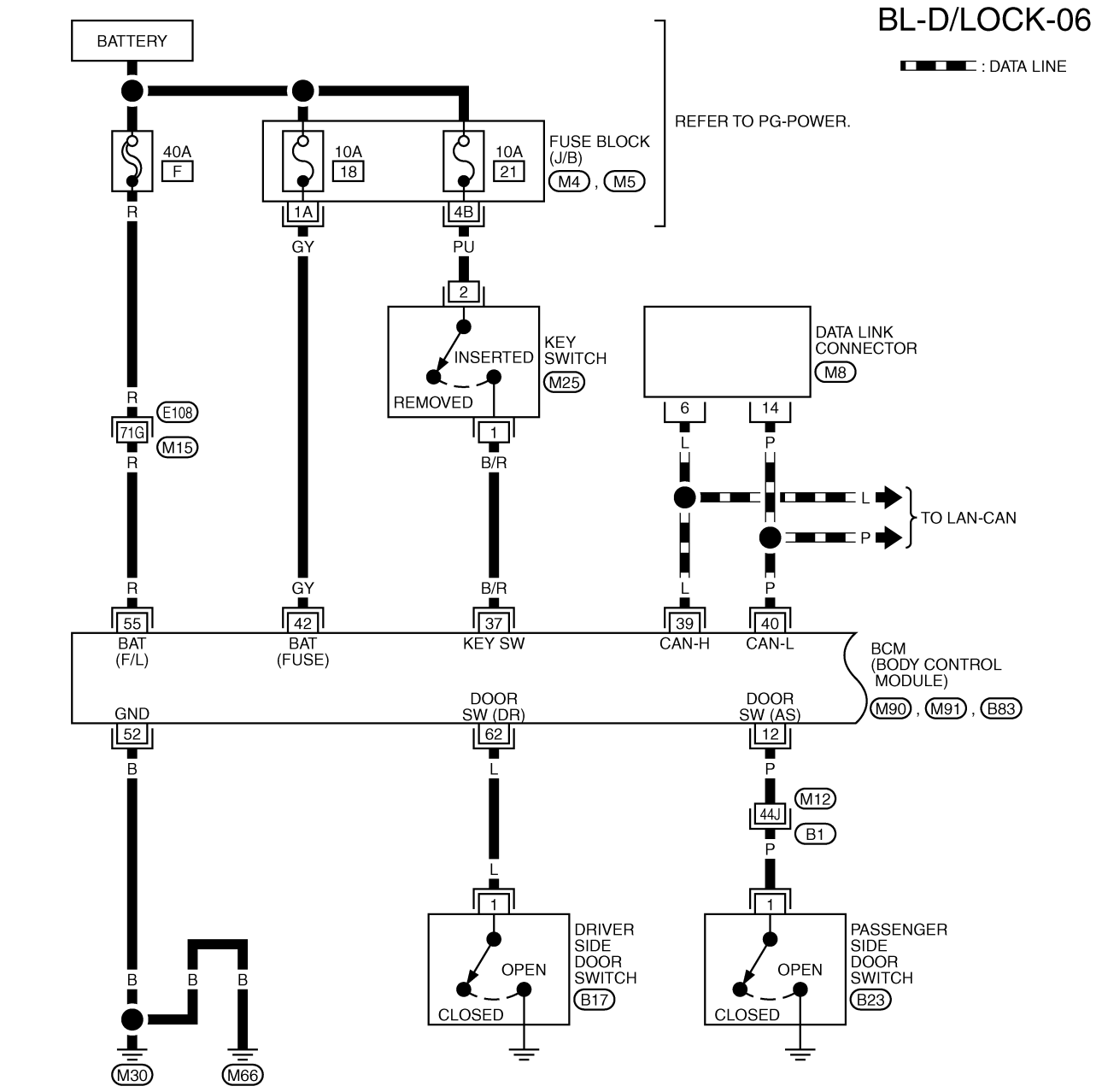
B1 , D1 -SUPER MULTIPLE JUNCTION (SMJ)

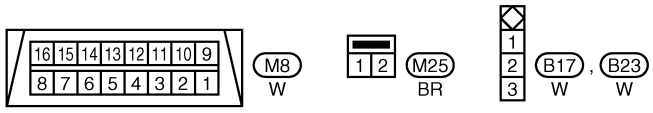
M90 , B83 -ELECTRICAL UNITS

TIWT2262E

Wiring Diagram — D/LOCK — /For Roadster

NIS0000J

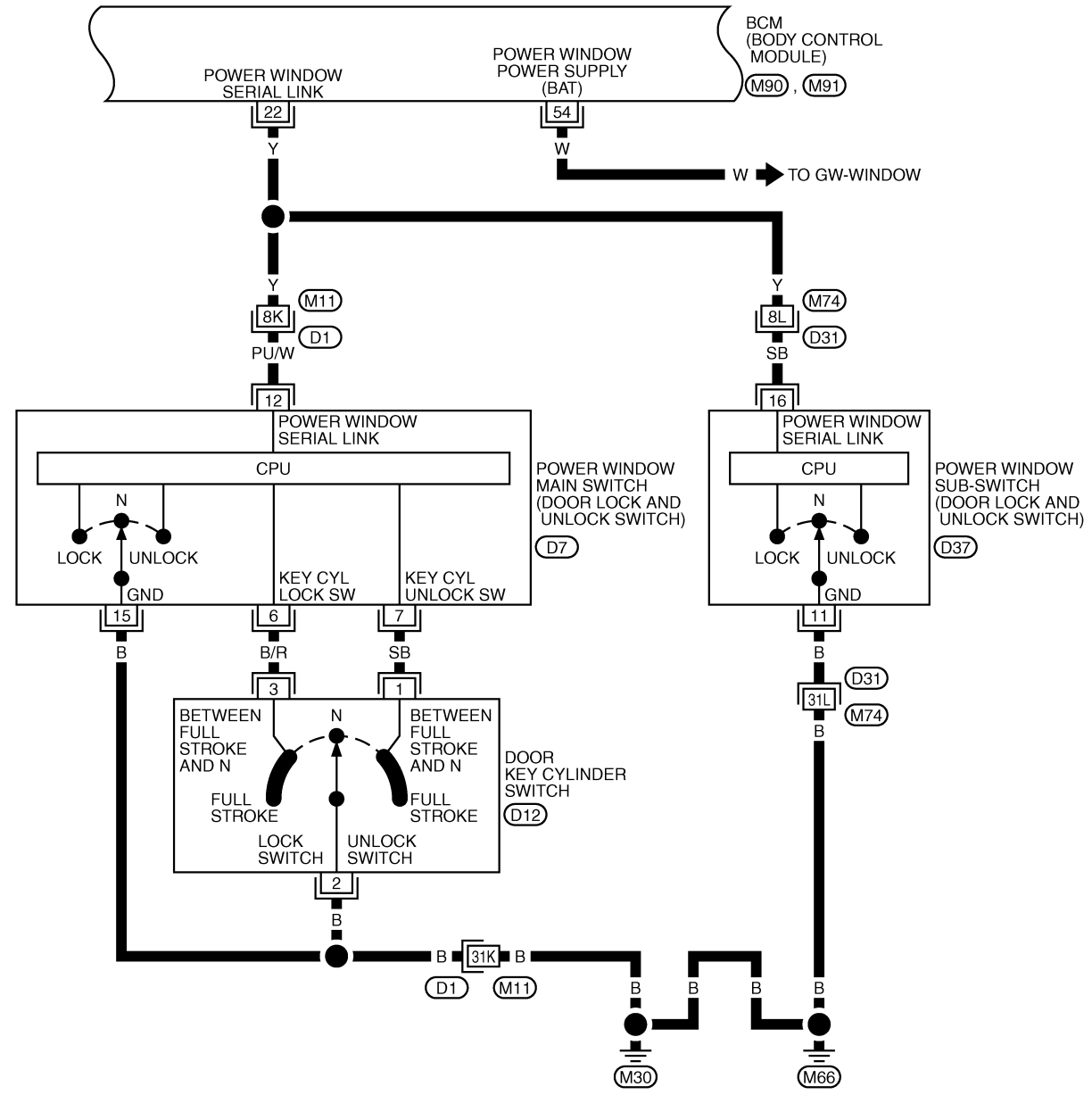


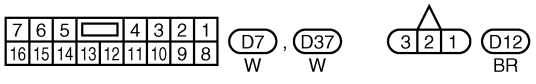


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT1571E

BL-D/LOCK-07





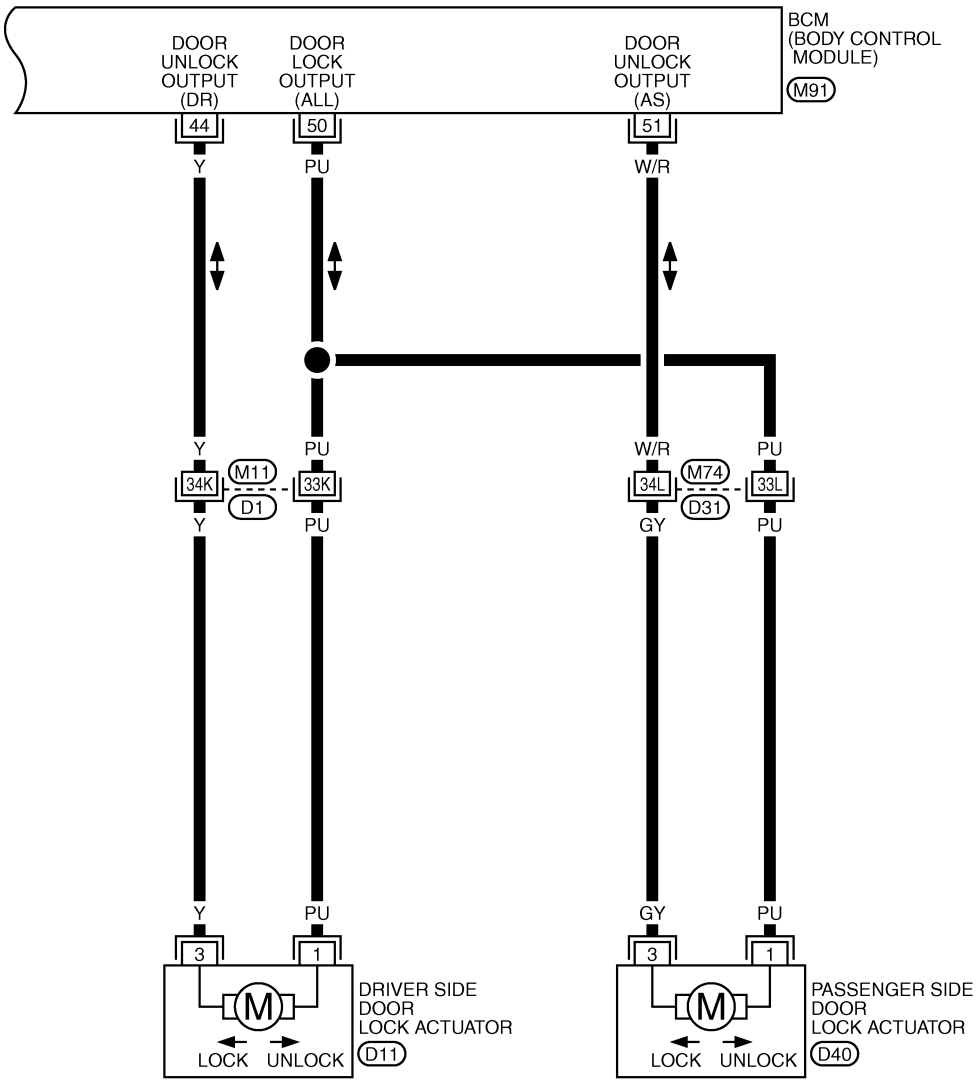
REFER TO THE FOLLOWING.

D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M90 , M91 -ELECTRICAL UNITS

TIWT1572E

BL-D/LOCK-08



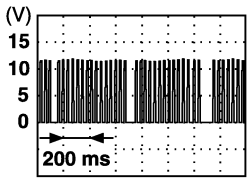


REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M91 -ELECTRICAL UNITS

TIWT1573E

Terminals and Reference Value for BCM

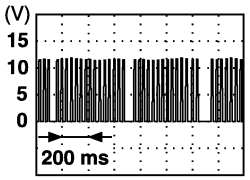
NIS0000K

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx.)
12	P	Passenger side door switch	Input	ON (Open) → OFF (Closed)	0 → 5
22	Y	Power window switch serial link	Input/ Output	—	 PIIA2344J
30	P	Back door opener switch	Input	Press the back door opener switch when driver side door is unlocked	5 → 0
37	B/R	Ignition key switch (insert)	Input	ON (Key inserted) → OFF (Key removed from IGN key cylinder)	Battery voltage → 0
39	L	CAN-H	Input/ Output	—	—
40	P	CAN-L	Input/ Output	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
44	Y	Driver side door lock actuator (unlock)	Output	Door lock / unlock switch (Free → Unlock)	0 → Battery voltage → 0
50	PU	All door lock actuator (lock)	Output	Door lock / unlock switch (Free → Lock)	0 → Battery voltage → 0
51	W/R	Passenger side door lock actuator (unlock)	Output	Door lock / unlock switch (Free → Unlock)	0 → Battery voltage → 0
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage
58	R/W	Back door switch	Input	ON (Open) → OFF (Closed)	0 → Battery voltage *
62	L	Driver side door switch	Input	ON (Open) → OFF (Closed)	0 → 5
68	L/R	Back door opener output	Output	Press the back door opener switch when driver side door is unlocked	0 → Battery voltage

*When interior lamp battery saver control is in OFF: Approx. 5V

Terminal and Reference Value for Power Window Main Switch

NIS0000L

Terminal	Wire color	Item	Condition	Voltage (V) (Approx.)
6	B/R	Key cylinder switch lock signal	Key position (Neutral → Locked)	5 → 0
7	SB	Key cylinder switch unlock signal	Key position (Neutral → Unlocked)	5 → 0
12	PU/W	Power window switch serial link	—	 PIIA2344J
15	B	Ground	—	0

Work Flow

NIS0000M

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to BL-23, "System Description" .
3. Does power door lock system operate normally? If Yes, GO TO 6, If No, GO TO 4.
4. INSPECTION END.

CONSULT-III Function (BCM)

NIS0000N

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis part	Inspection item, self-diagnosis mode	Content
Door lock	Work support	Changes the setting for each function.
	Data monitor	Displays BCM input data on real-time basis.
	Active test	Sends drive signals to door lock actuator to perform operation check.

WORK SUPPORT

Work item	Description
DOOR LOCK-UNLOCK SET	Select unlock mode can be changed in this mode. Selects ON-OFF of select unlock mode.
ANTI-LOCK OUT SET	Key reminder door mode can be changed in this mode. Selects ON-OFF of key reminder door mode.

DATA MONITOR

Monitor item “operation”		Content
KEY ON SW	“ON/OFF”	Indicates [ON/OFF] condition of key switch.
LOCK SW DR/AS	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from lock/unlock switch of driver and passenger side.
UNLK SW DR/AS	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from lock/unlock switch of driver and passenger side.
KEY CYL LK-SW	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from key cylinder.
KEY CYL UN-SW	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from key cylinder.
LK BUTTON/SIG	“ON/OFF”	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	“ON/OFF”	Indicates [ON/OFF] condition of unlock signal from key fob.
IGN ON SW	“ON/OFF”	Indicates [ON/OFF] condition of ignition switch.
DOOR SW-DR	“ON/OFF”	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	“ON/OFF”	Indicates [ON/OFF] condition of passenger side door switch.
BACK DOOR SW*1	“ON/OFF”	Indicates [ON/OFF] condition of back door switch.
TRNK OPN MNTR*2	“ON/OFF”	Indicates [ON/OFF] condition of trunk lid opener switch.

*1: For Coupe
*2: For Roadster

ACTIVE TEST

Test item	Content
ALL D/LK MTR	This test is able to check all door lock actuators lock operation. These actuators lock when “ON” on CONSULT-III screen is touched.
DR D/UN MTR	This test is able to check driver side door lock actuator unlock operation. This actuator unlock when “ON” on CONSULT-III screen is touched.
NON DR D/UN	This test is able to check door lock actuators (except driver side door lock actuator) unlock operation. These actuator unlock when “ON” on CONSULT-III screen is touched.

Trouble Diagnoses Symptom Chart

NIS0000O

Symptom	Diagnoses service procedure	Reference to page
Key reminder door system does not operate properly.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check key switch (Insert) .	BL-40
	3. Check door switch .	BL-38
	4. Replace BCM.	BCS-17
Power door lock does not operate by door lock and unlock switch on power window main switch or power window sub-switch.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check door lock and unlock switch .	BL-42
	3. Check driver side door lock actuator .	BL-45
	4. Check passenger side door lock actuator .	BL-46
	5. Replace BCM	BCS-17
Driver side door lock actuator does not operate.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check driver side door lock actuator .	BL-45
Passenger side door lock actuator does not operate.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check passenger side door lock actuator .	BL-46
Power door lock does not operate by door key cylinder operation, but operates by door lock and unlock switch.	1. Check power supply and ground circuit of BCM.	BL-37
	2. Check door key cylinder switch .	BL-47
	3. Replace power window main switch.	—
Back door opener does not operate.	1. Check power supply and ground of BCM.	BL-37
	2. Check back door opener switch .	BL-48
	3. Check back door opener actuator .	BL-50

Check Power Supply and Ground Circuit of BCM

NIS0000P

CHECK FUSE

1. FUSE INSPECTION

1. Turn ignition switch OFF.
2. Check the following.

- 40A fusible link (letter **F** , located in the fuse and fusible link box)
- 10A fuse [No.18, located in the fuse block (J/B)]

NOTE:
Refer to BL-21, "Component Parts and Harness Connector Location" .

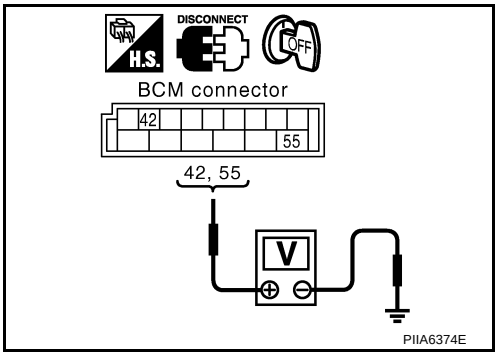
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector M91 terminal 42, 55 and ground.

42 (GY) - Ground : Battery voltage
55 (R) – Ground : Battery voltage



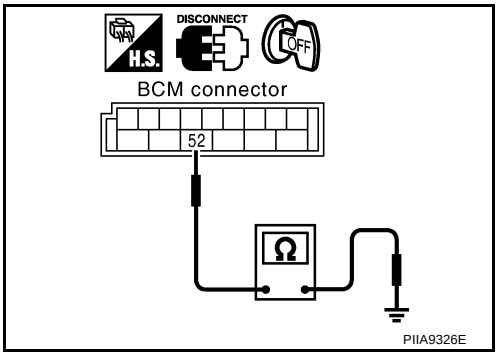
OK or NG

OK >> GO TO 3.
NG >> Check BCM power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector M91 terminal 52 and ground.

52 (B) – Ground Continuity should exist.



OK or NG

OK >> Power supply and ground circuit is OK.
NG >> Check BCM ground circuit for open or short.

Check Door Switch

NIS0000Q

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

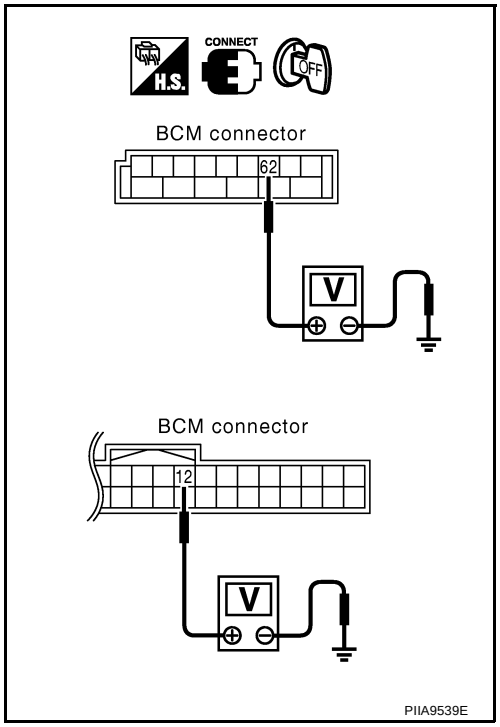
Check door switches (“DOOR SW-AS” and “DOOR SW-DR”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Item	Terminals			Condition of door switch	Voltage (V) (Approx.)
	Connector	(+) Terminal (Wire color)	(–)		
Driver side door switch	B83	62 (L)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK.
NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23, terminals 1 and BCM harness connector B83 terminals 62 (driver side) or M90 terminal 12 (passenger side).

Driver side door

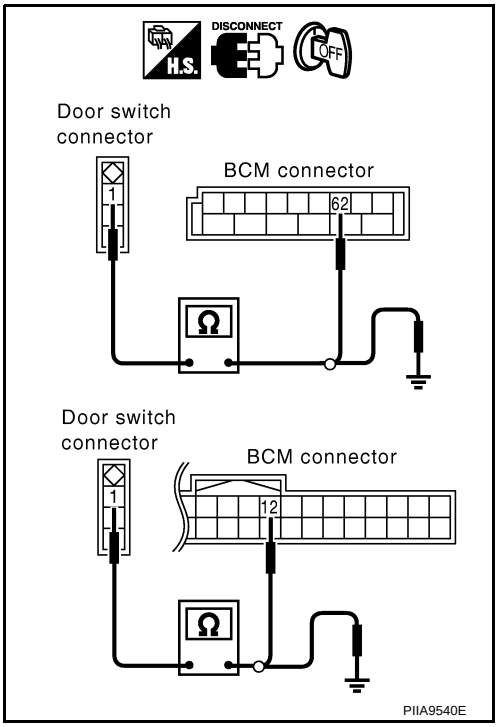
1 (L) – 62 (L) : Continuity should exist.

Passenger door

1 (P) – 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23, terminals 1 and ground.

1 (L or P) – Ground : Continuity should not exist.



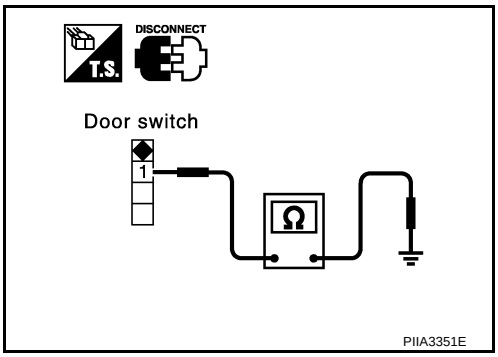
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK DOOR SWITCH

Check continuity between door switch harness connector B17 (driver side) or B23 (passenger side) terminal 1 and ground.

Terminal (Wire color)		Door switch	Continuity
1 (L or P)	Ground	Pushed	No
		Released	Yes



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace malfunction door switch.

Check Key Switch (insert)

NIS0000R

1. CHECK KEY SWITCH INPUT SIGNAL

With CONSULT-III

Check ignition key cylinder switch “KEY ON SW” in “DATE MONITOR” mode with CONSULT-II

- When key is inserted in ignition key cylinder

  KEY ON SW :ON

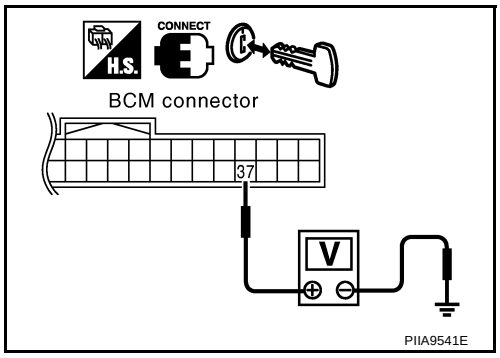
- When key is removed in ignition key cylinder

  KEY ON SW :OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
M90	37 (B/R)	Ground	Key is inserted	Battery voltage
			Key is removed	0



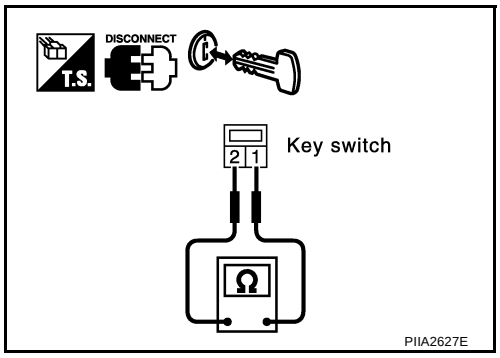
OK or NG

OK >> Key switch is OK.
NG >> GO TO 2.

2. CHECK KEY SWITCH (INSERT)

1. Turn ignition switch OFF.
2. Disconnect key switch connector.
3. Check continuity between key switch terminals 1 and 2.

Connector	Terminals		Condition	Continuity
M25	1	2	Key is inserted in ignition key cylinder	Yes
			Key is removed from ignition key cylinder	No



OK or NG

OK >> GO TO 3.
NG >> Replace key switch.

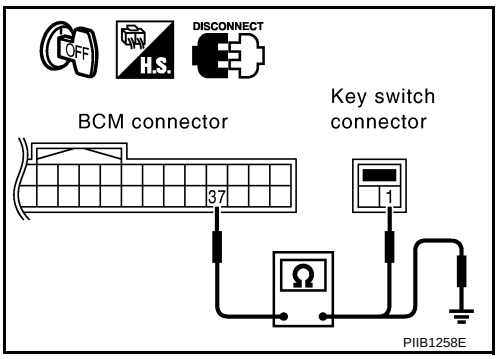
3. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 and key switch harness connector M25 terminal 1.

37 (B/R) - 1 (B/R) : Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 and ground.

37 (B/R) - Ground : Continuity should not exist.



OK or NG

OK >> Check the following.
- 10A fuse [No.21, located in the fuse block (J/B)]
- Harness for open or short between key switch and fuse

NG >> Repair harness or connector.

Check Door Lock and Unlock Switch

NIS0000S

1. CHECK POWER WINDOW OPERATION

Does power window system operate normally?

YES or NO?

YES >> GO TO 2
NO >> Refer to GW-30, "Trouble Diagnoses Symptom Chart" .

2. CHECK DOOR LOCK AND UNLOCK SWITCH OUTPUT SIGNAL

With CONSULT-III

Check door lock and unlock switch (“LOCK SW DR/AS”, “UNLK SW DR/AS”) in DATA MONITOR mode with CONSULT-II. Refer to BL-35, "DATA MONITOR" .

- When door lock and unlock switch is turned to LOCK

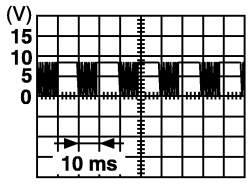
  CDL LOCK SW :ON

- When door lock and unlock switch is turned to UNLOCK

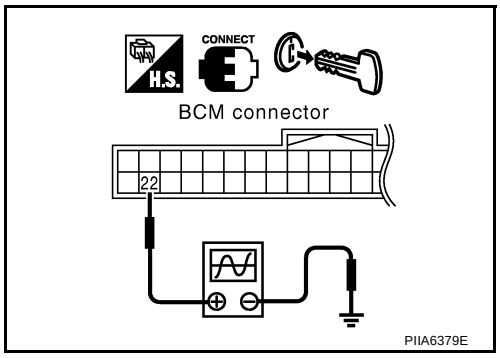
  CDL UNLOCK SW :ON

Without CONSULT-III

1. Remove key from ignition switch, and close the doors of driver side and passenger side.
2. Check the signal between BCM connector and ground with oscilloscope when door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.
3. Make sure signals which are shown in the figure below can be detected during 10 second just after door lock and unlock switch (driver side or passenger side) is turned “LOCK” or “UNLOCK”.

Connector	Terminal (Wire color)		Signal (Reference value)
	(+)	(–)	
M90	22 (Y)	Ground	

PIIA1297E



PIIA6379E

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK BCM OUTPUT SIGNAL

Check power window serial link (“POWER WINDOW DOWN”) in “ACTIVE TEST” mode with CONSULT-III. Refer to BL-74, "Active Test" .
When “ACTIVE TEST” is executed, the window of driver side and passenger side are go down.

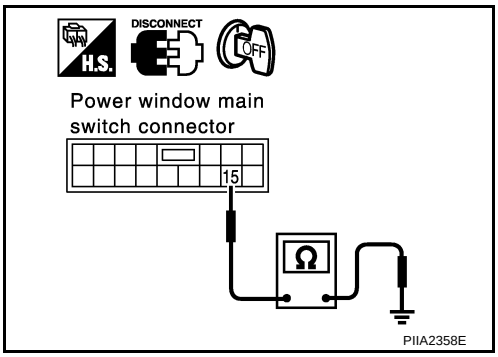
OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace BCM.

4. CHECK DOOR LOCK AND UNLOCK SWITCH GROUND CIRCUIT

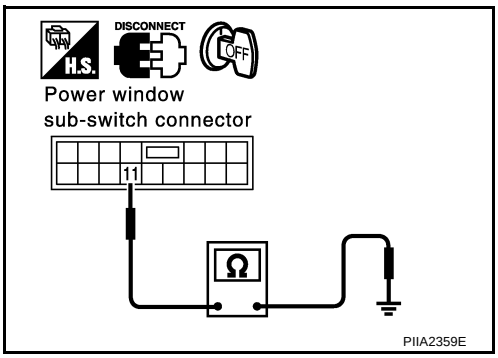
1. Turn ignition switch OFF.
2. Disconnect power window main switch (door lock and unlock switch) and power window sub-switch (door lock and unlock switch) connector.
3. Check continuity between power window main switch (door lock and unlock switch) harness connector D7 terminal 15 and ground.

15 (B) – Ground : Continuity should exist.



4. Check continuity between power window sub-switch (door lock and unlock switch) harness connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



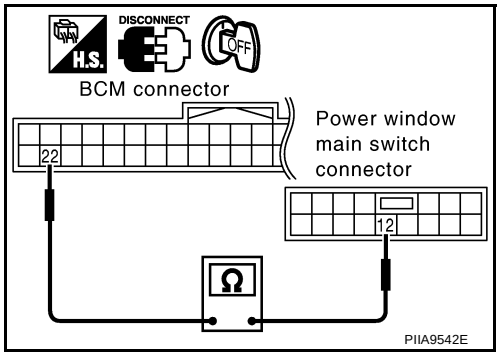
OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.

5. CHECK POWER WINDOW SERIAL LINK CIRCUIT

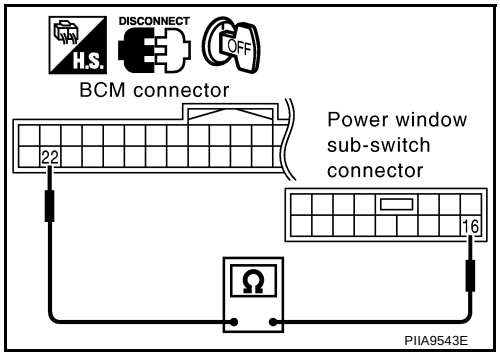
1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 22 and power window main switch (door lock and unlock switch) harness connector D7 terminal 12.

22 (Y) – 12 (PU/W) **: Continuity should exist.**



3. Check continuity between BCM harness connector M90 terminal 22 and power window sub-switch (door lock and unlock switch) harness connector D37 terminal 16.

22 (Y) – 16 (SB) **: Continuity should exist.**



OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.

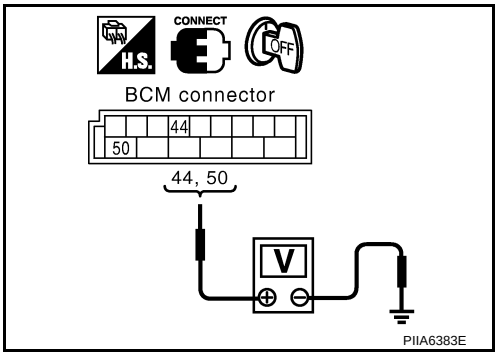
Check Driver Side Door Lock Actuator

NIS0000T

1. CHECK DOOR LOCK ACTUATOR SIGNAL

1. Turn ignition switch OFF.
2. Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M91	44 (Y)	Ground	Driver door lock/unlock switch is turned to UNLOCK.	0 → Battery voltage → 0
	50 (PU)		Driver door lock/unlock switch is turned to LOCK.	0 → Battery voltage → 0



OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

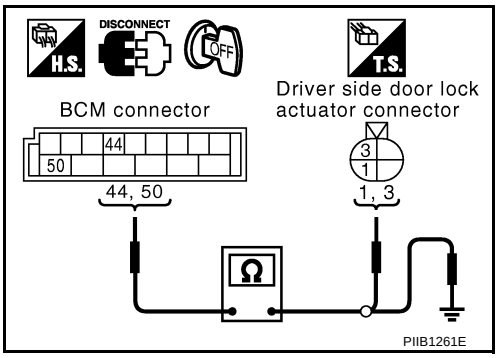
2. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M91 terminals 44, 50 and driver side door lock actuator harness connector D11 terminals 1, 3.

44 (Y) – 3 (Y) : Continuity should exist.
50 (PU) – 1 (PU) : Continuity should exist.

3. Check continuity between BCM harness connector M91 terminals 44, 50 and ground.

44 (Y) – Ground : Continuity should not exist.
50 (PU) – Ground : Continuity should not exist.



OK or NG

OK >> Replace driver side door lock actuator.
NG >> Repair or replace harness between BCM and driver side door lock actuator.

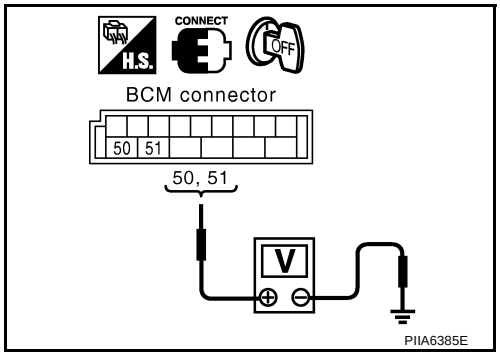
Check Passenger Side Door Lock Actuator

NIS0000U

1. CHECK DOOR LOCK ACTUATOR SIGNAL

1. Turn ignition switch OFF.
2. Check voltage between passenger side door lock actuator connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M91	50 (PU)	Ground	Door lock/unlock switch is turned to LOCK.	0 → Battery voltage → 0
	51 (W/R)		Door lock/unlock switch is turned to UNLOCK.	0 → Battery voltage → 0



OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

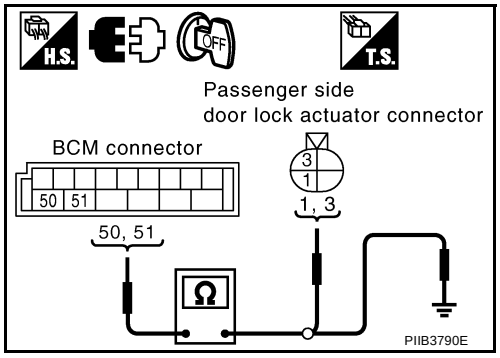
2. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M91 terminals 50, 51 and passenger side door lock actuator harness connector D40 terminals 1, 3.

50 (PU) – 1 (PU) : Continuity should exist.
51 (W/R) – 3 (GY) : Continuity should exist.

3. Check continuity between BCM harness connector M91 terminals 50, 51 and ground.

50 (PU) – Ground : Continuity should not exist.
51 (W/R) – Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger side door lock actuator.
NG >> Repair or replace harness between BCM and passenger side door lock actuator.

Check Door Key Cylinder Switch

NIS0000V

1. CHECK DOOR KEY CYLINDER SWITCH INPUT SIGNAL

With CONSULT-III

- Check door key cylinder switch (“KEY CYL LK SW”) in “DATA MONITOR” mode with CONSULT-III.

  “KEY CYL LK-SW” should be “ON” when key inserted in door key cylinder is turned to lock.

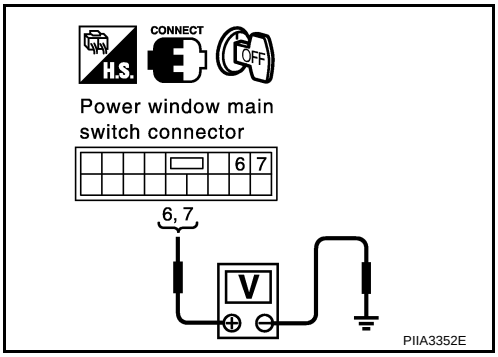
- Check door key cylinder switch (“KEY CYL UN-SW”) in “DATA MONITOR” mode with CONSULT-III.

  “KEY CYL UN-SW” should be “ON” when key inserted in door key cylinder is turned to unlock.

Without CONSULT-III

Check voltage between power window main switch (door lock and unlock switch) connector and ground.

Connector	Terminals (+)	Terminals (–)	Key position	Voltage (V) (Approx.)
D7	6 (B/R)	Ground	Neutral/Unlock	5
			Lock	0
	7 (SB)		Neutral/Lock	5
			Unlock	0



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.

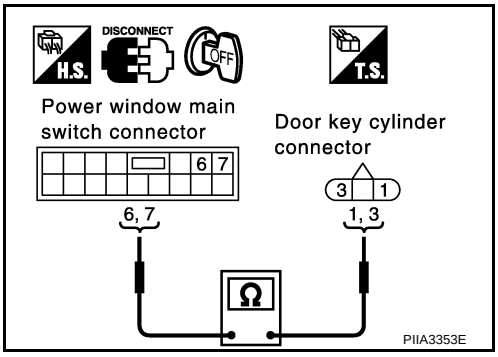
NG >> GO TO 2.

2. CHECK DOOR KEY CYLINDER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch (door lock and unlock switch) and door key cylinder switch connector.
3. Check continuity between power window main switch (door lock and unlock switch) harness connector D7 terminals 6, 7 and door key cylinder switch harness connector D12 terminals 1, 3.

6 (B/R) – 3 (B/R) : Continuity should exist.

7 (SB) – 1 (SB) : Continuity should exist.



OK or NG

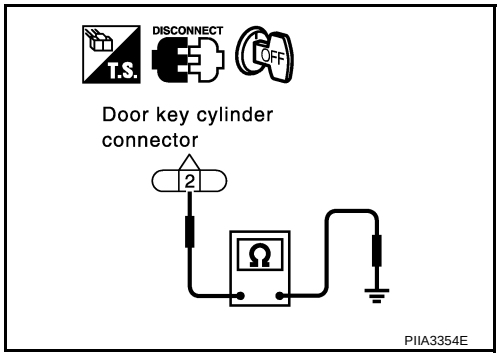
OK >> GO TO 3.

NG >> Repair or replace harness between power window main switch and door key cylinder switch.

3. CHECK DOOR KEY CYLINDER SWITCH GROUND CIRCUIT

Check continuity between door key cylinder switch harness connector D12 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



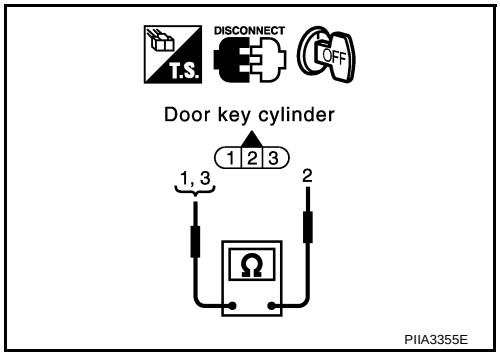
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK DOOR KEY CYLINDER SWITCH

Check continuity between door key cylinder switch terminals 1, 3 and 2.

Connector	Terminals		Key position	Continuity
D12	1	2	Neutral/Lock	No
			Unlock	Yes
	3		Neutral/Unlock	No
			Lock	Yes



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace door key cylinder switch.

Check Back Door Opener Switch

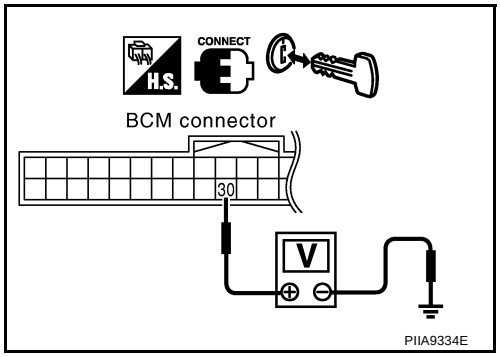
NIS0000W

1. CHECK BACK DOOR OPENER SIGNAL

Check voltage between BCM connector and ground.
Press back door opener switch when driver side door is unlocked.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Back door opener switch ON	0
			Back door opener switch OFF	Battery voltage*

*: When interior lamp battery saver control is in OFF position. →Approx.5V



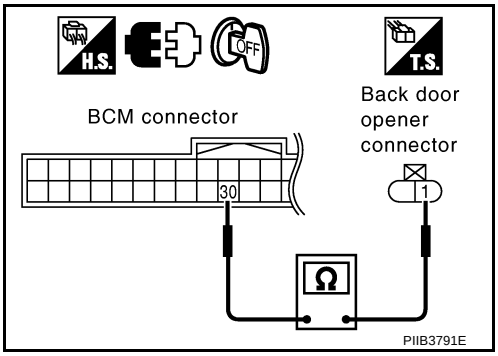
OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

2. CHECK BACK DOOR OPENER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door opener switch connector.
3. Check continuity between BCM harness connector M90 terminal 30 and back door opener switch harness connector T103 terminal 1.

30 (P) – 1 (P) **: Continuity should exist.**



OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between BCM and back door opener switch.

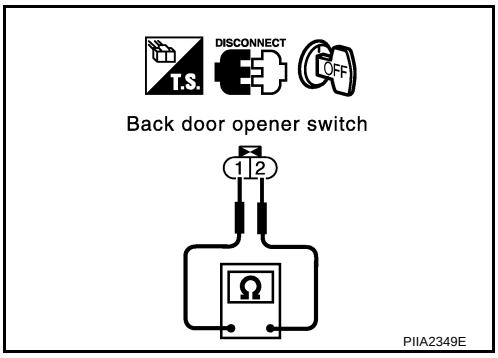
3. CHECK BACK DOOR OPENER SWITCH

Check continuity between back door opener switch terminals 1 and 2.

Connector	Terminals		Condition	Continuity
T103	1	2	Back door opener switch: ON	Yes
			Back door opener switch: OFF	No

OK or NG

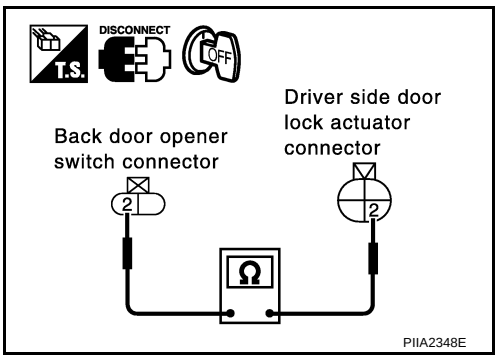
OK >> GO TO 4.
NG >> Replace back door opener switch.



4. CHECK DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between back door opener switch harness connector T103 terminal 2 and driver side door lock actuator harness connector D11 terminal 2.

2 (G) – 2 (OR) **: Continuity should exist.**



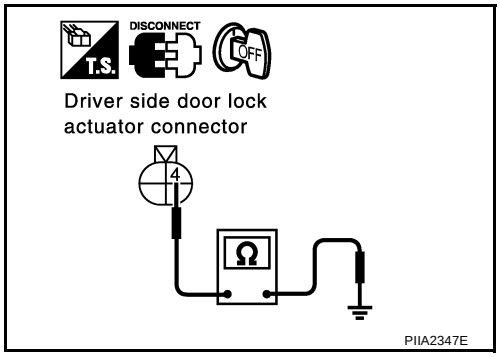
OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness between back door opener switch and driver side door lock actuator.

5. CHECK DOOR LOCK ACTUATOR GROUND CIRCUIT

Check continuity between driver side door lock actuator harness connector D11 terminal 4 and ground.

4 (B) – Ground : Continuity should exist.



OK or NG

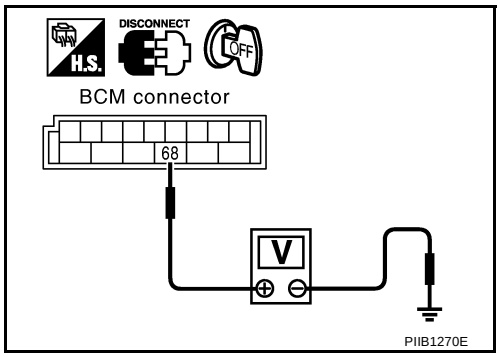
OK >> Replace driver side door lock actuator.
NG >> Repair or replace harness.

Check Back Door Opener Actuator

NIS0000X

1. CHECK BACK DOOR OPENER ACTUATOR SIGNAL

Check voltage between BCM connector and ground.
Press the back door opener switch when driver side door is unlocked.



Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
B83	68 (L/R)	Ground	Back door opener switch ON	Battery voltage
			Back door opener switch OFF	0

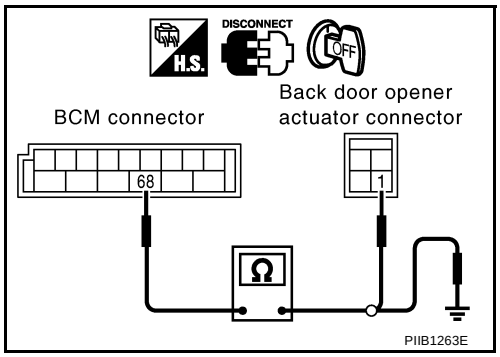
OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

2. CHECK BACK DOOR OPENER ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door opener actuator connector.
3. Check continuity between BCM harness connector B83 terminal 68 and back door opener actuator harness connector T11 terminal 1.

68 (L/R) – 1 (L/R) : Continuity should exist.



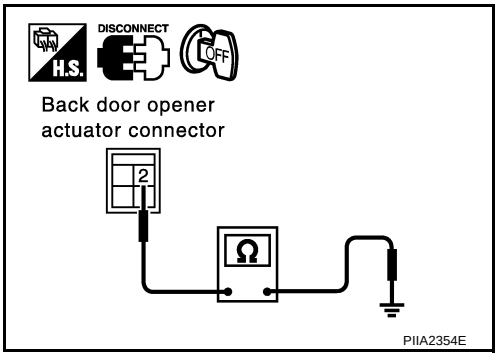
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between BCM and back door opener actuator.

3. CHECK BACK DOOR OPENER ACTUATOR GROUND CIRCUIT

Check continuity between back door opener actuator harness connector T11 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



OK or NG

OK >> Replace back door opener actuator.
NG >> Repair or replace.

FUEL FILLER LID OPENER

PFP:78820

System Description/For RoadSter

NIS0000Y

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

When ignition switch ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

FUEL LID OPEN OPERATION

When fuel lid opener switch is ON (pushed), ground is supplied

- to BCM terminal 58
- through fuel lid opener switch terminals 1 and 2, and
- through body grounds M30 and M66.

And power is supplied

- to BCM terminal 70
- through fuel lid opener actuator terminals 1 and 2, and
- through body grounds B5, B6, and T14.

Then fuel lid opener actuator opens fuel lid.

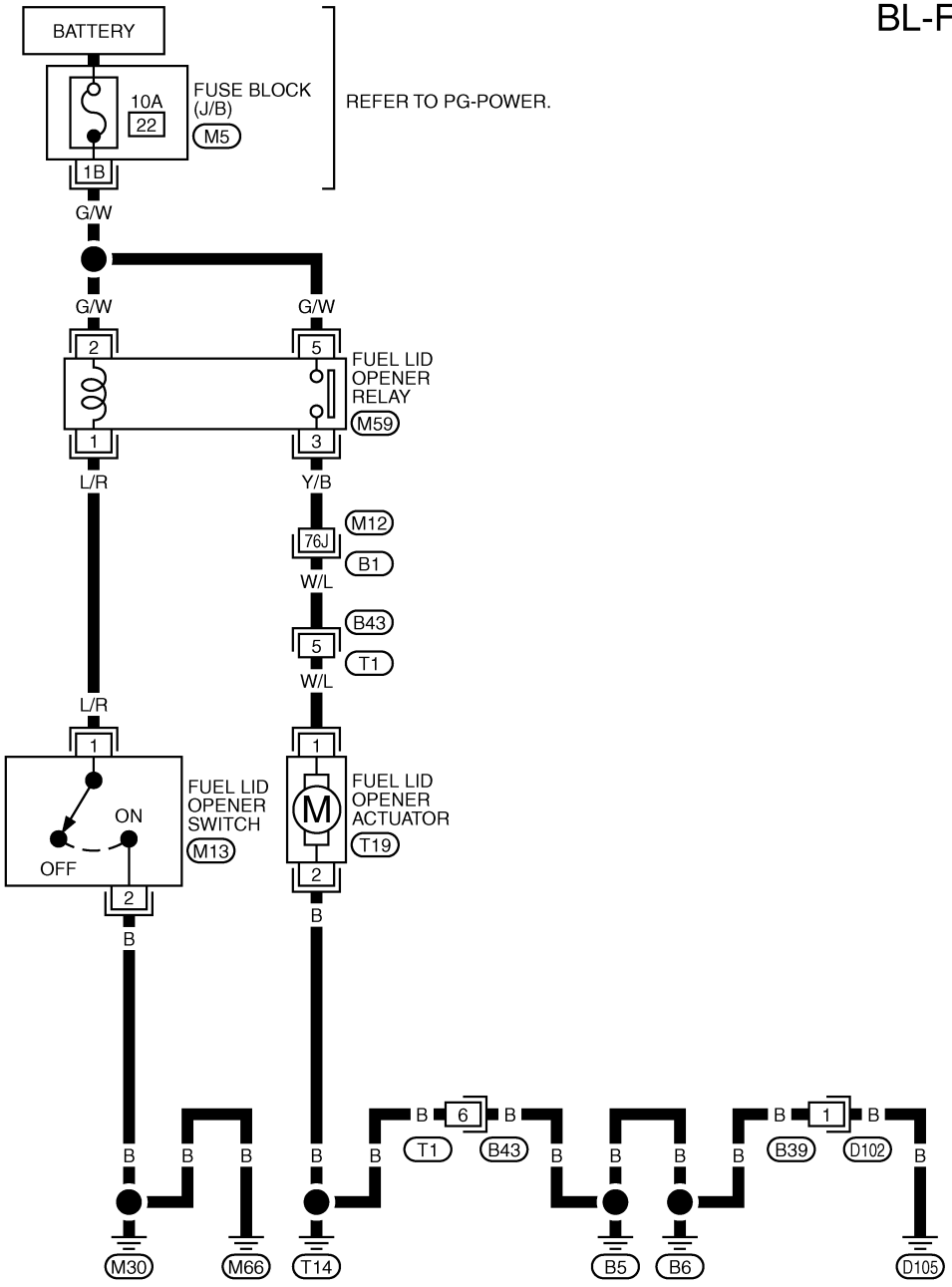
FUEL LID OPENER CANCEL OPERATION

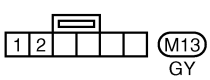
Fuel lid cannot open when vehicle condition is in arm or alarm phase.

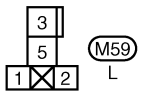
Wiring Diagram — F/LID — /For Coupe

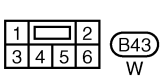
NIS0000Z

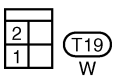
BL-F/LID-01

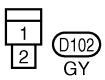












REFER TO THE FOLLOWING.

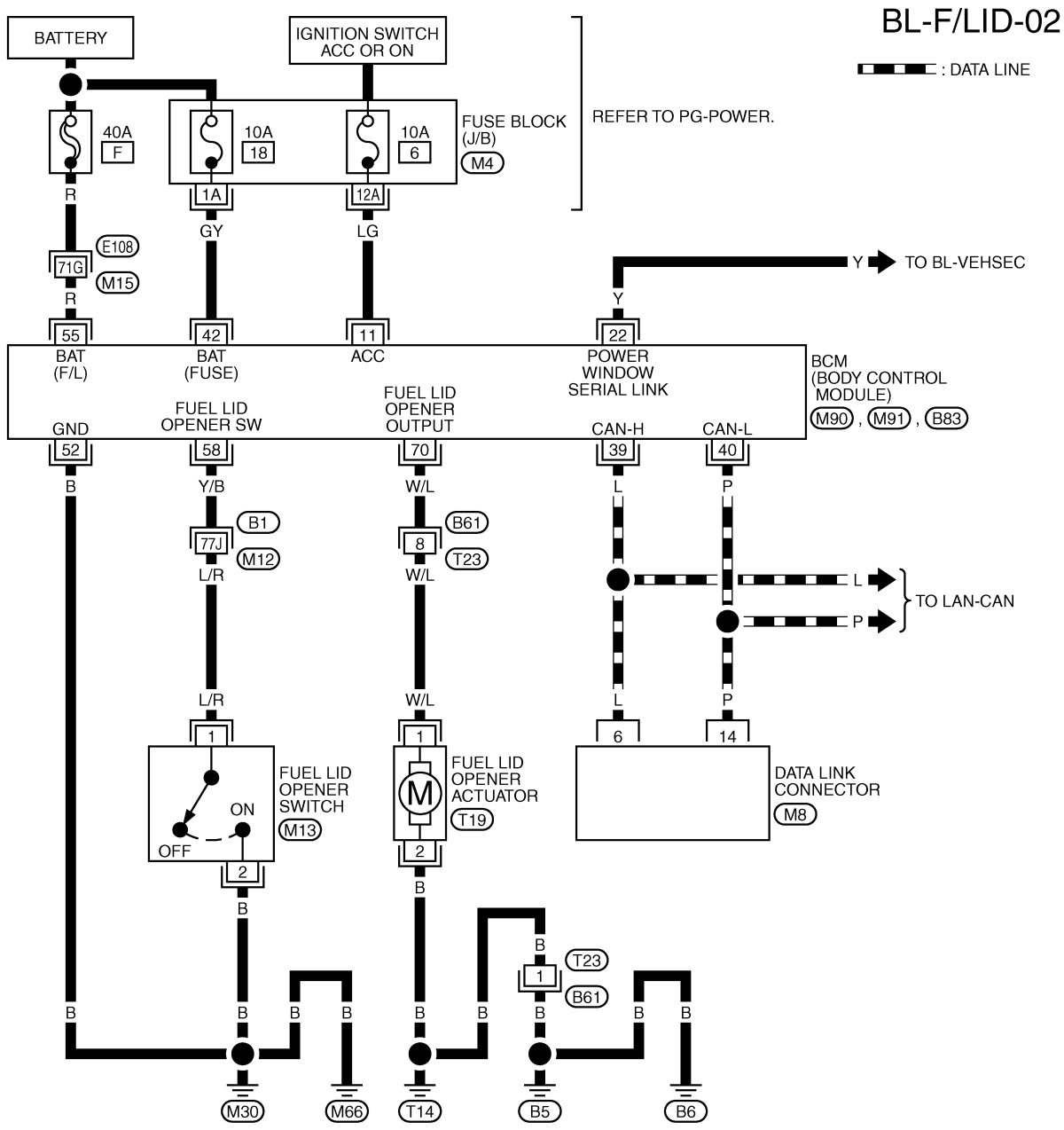
B1 -SUPER MULTIPLE JUNCTION (SMJ)

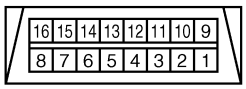
M5 -FUSE BLOCK-JUNCTION BOX (J/B)

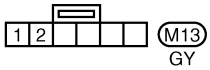
TIWT1574E

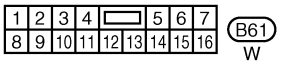
Wiring Diagram — F/LID — / For Roadster

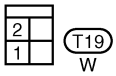
NIS00010











REFER TO THE FOLLOWING.
E108, B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91, B83 -ELECTRICAL UNIT

TIWT1575E

CONSULT-III Function (BCM)/For Roadster

NIS00011

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis part	Inspection item, self-diagnosis mode	Content
Fuel lid	Data monitor	Displays BCM input data on real-time basis.
	Active test	Sends drive signals to fuel lid opener actuator to perform operation check.

DATA MONITOR

Monitor item “operation”	Content
F/LID OPN SW	Indicates [ON/OFF] condition of fuel lid opener switch.

ACTIVE TEST

Test item	Content
FUEL LID OPEN	This test is able to check fuel lid opener actuator unlock operation. This actuator unlocks when “ON” on CONSULT-III screen is touched.

Terminals and Reference Value for BCM/For Roadster

NIS00012

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage [V] (Approx.)
11	LG	Ignition switch (ACC)	Input	Ignition switch (ACC or ON)	Battery voltage
39	L	CAN-H	Input	—	—
40	P	CAN-L	Input	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage
58	Y/B	Fuel lid opener switch	Input	Fuel lid opener switch is ON	0
				Fuel lid opener switch is OFF	Battery voltage
70	W/L	Fuel lid opener release output signal	Output	Fuel lid opener switch is ON	0
				Fuel lid opener switch is OFF	Battery voltage (For 0.5s)

Trouble Diagnosis/For Roadster

NIS00013

FUEL LID DOSE NOT OPEN WITH FUEL LID OPENER SWITCH

1. VEHICLE CONDITION

Check vehicle security system.

Arm phase or alarm phase?

Yes or No

Yes >> Cancel arm phase or alarm phase condition.
No >> GO TO 2.

2. CHECK FUEL LID OPEN INPUT SIGNAL

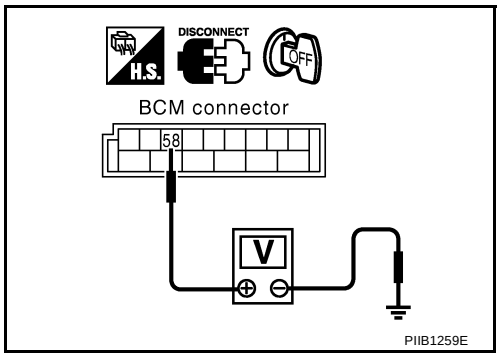
With CONSULT-III

Check door switches (“F/LID OPN SW”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
F/LID OPN SW	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

1. Turn ignition switch OFF.
2. Check voltage between BCM and ground.



Connector	Terminal (Wire color)		Condition	Voltage [V] (Approx.)
	(+)	(–)		
B83	58 (Y/B)	Ground	Fuel lid opener switch ON	0
			Fuel lid opener switch OFF	Battery voltage

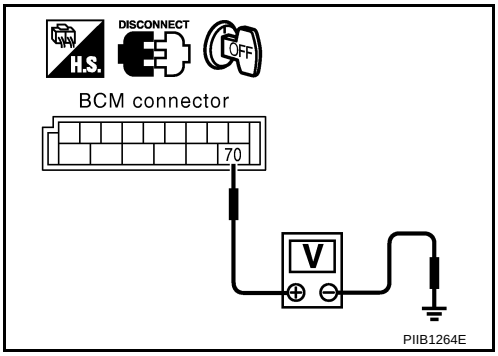
OK or NG

OK >> GO TO 3.
NG >> GO TO 6.

3. CHECK FUEL LID OPEN OUTPUT SIGNAL

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage [V] (Approx.)
	(+)	(–)		
B83	70 (W/L)	Ground	Fuel lid opener switch ON	Battery voltage (for 0.5s)
			Fuel lid opener switch OFF	0



OK or NG

OK >> GO TO 4.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

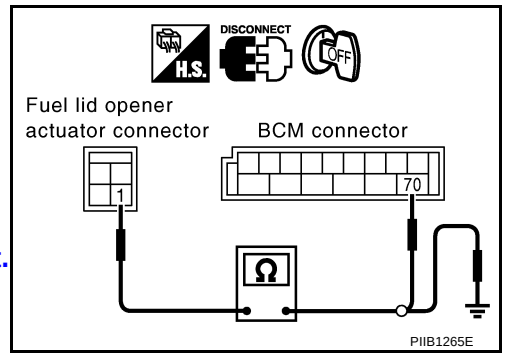
4. CHECK FUEL LID OPENER ACTUATOR CIRCUIT

1. Disconnect BCM connector and fuel lid opener actuator connector.
2. Check continuity between BCM harness connector B83 terminal 70 and fuel lid opener actuator harness connector T19 terminal 1.

70 (W/L) - 1 (W/L) : Continuity should exist.

3. Check continuity between fuel lid opener actuator harness connector T19 terminal 1 and ground.

1 (W/L) - ground : Continuity should not exist.



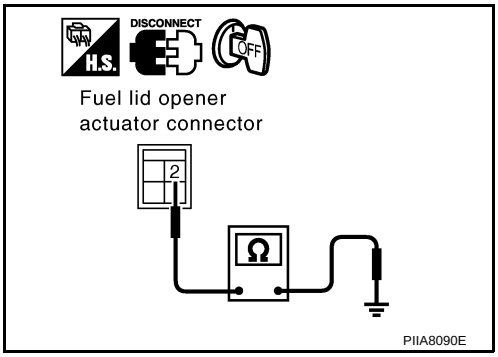
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK FUEL LID OPENER ACTUATOR GROUND CIRCUIT

Check continuity between fuel lid opener actuator harness connector T19 terminal 2 and ground.

2 (B) - ground : Continuity should exist.



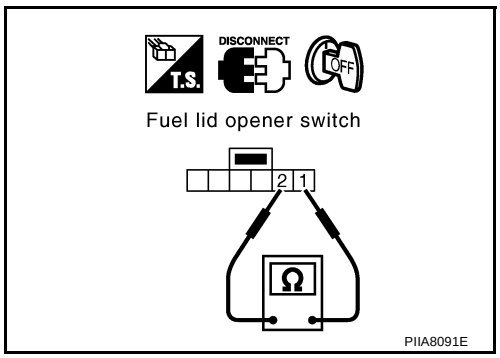
OK or NG

OK >> Replace fuel lid opener actuator.
NG >> Repair harness or connector.

6. CHECK FUEL LID OPENER SWITCH

1. Disconnect fuel lid opener switch
2. Check continuity between fuel lid opener switch harness connector M13 terminals 1 and 2.

Connector	Terminals		Fuel lid opener switch condition	Continuity
M13	1	2	ON (Pushed)	Yes
			OFF (Released)	No



OK or NG

OK >> GO TO 7.
NG >> Replace fuel lid opener switch.

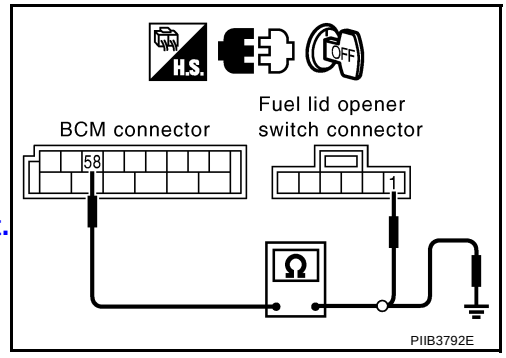
7. CHECK FUEL LID OPENER SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector B83 terminal 58 and fuel lid opener switch harness connector M13 terminal 1.

58 (Y/B) - 1 (L/R) : Continuity should exist.

3. Check continuity between BCM harness connector B83 terminal 58 (Y/B) and ground.

58 (Y/B) - ground : Continuity should not exist.



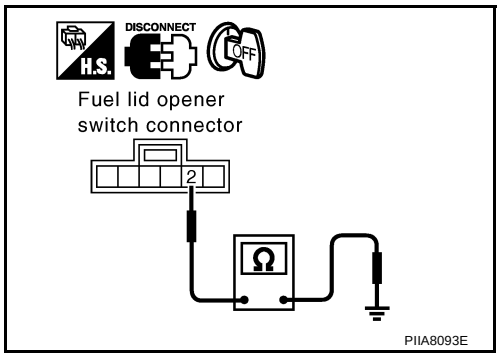
OK or NG

OK >> GO TO 8.
NG >> Repair harness or connector.

8. CHECK FUEL LID OPENERE SWITCH GROUND CIRCUIT

Check continuity between fuel lid opener switch harness connector M13 terminal 2 and ground.

2 (B) - ground : Continuity should exist.



OK or NG

OK >> Replace fuel lid opener switch.
NG >> Repair harness or connector.

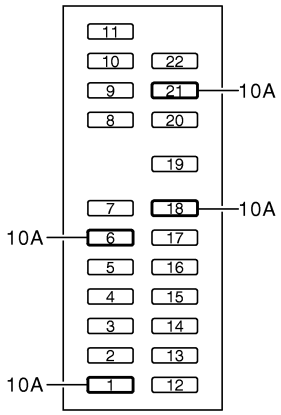
REMOTE KEYLESS ENTRY SYSTEM

PFP:28596

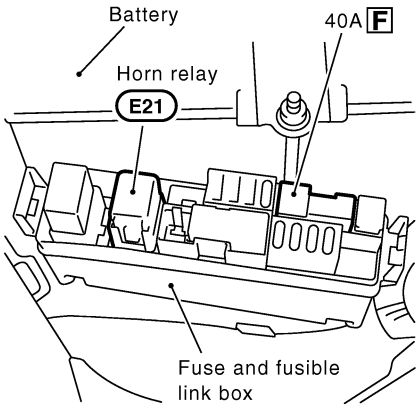
Component Parts and Harness Connector Location

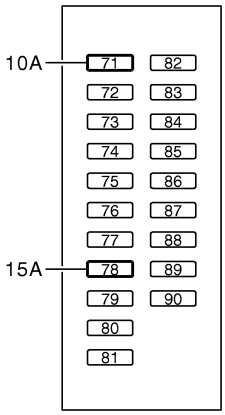
NIS00014

FOR COUPE



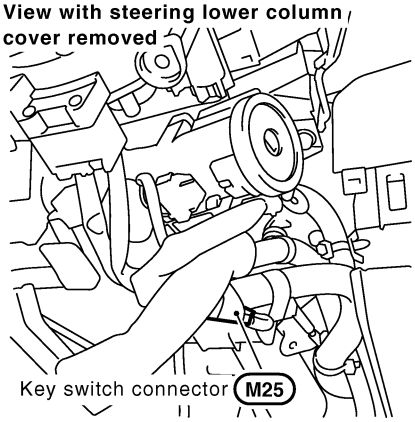
Fuse block (J/B) fuse layout



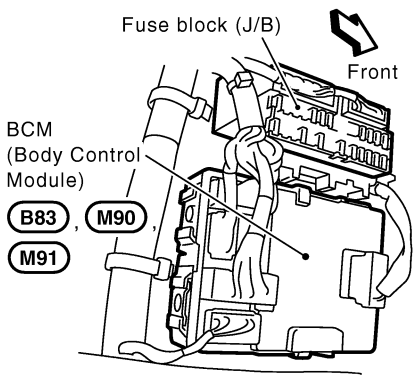


IPDM E/R fuse layout

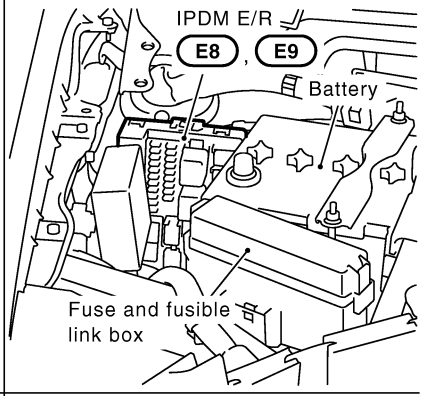
View with steering lower column cover removed

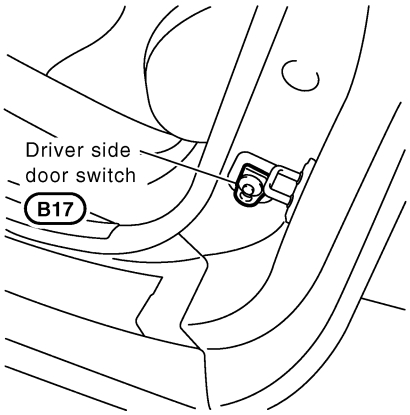


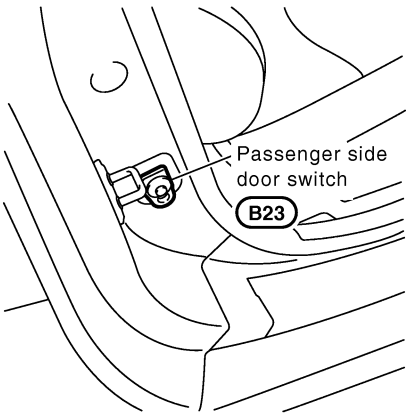
View with dash side LH removed



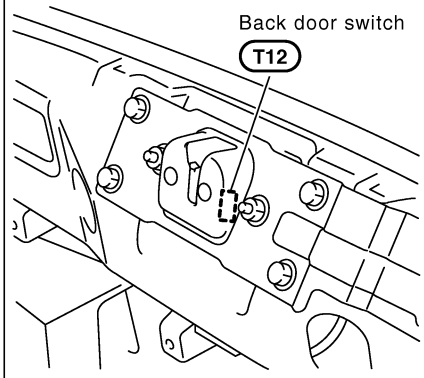
View with cowl top removed

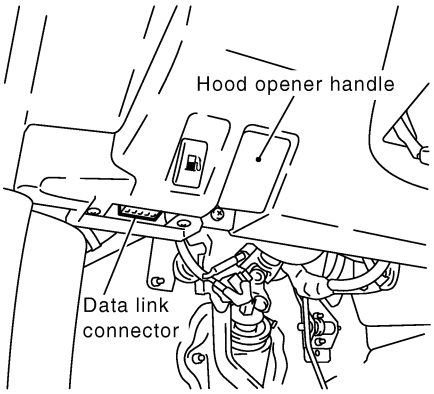




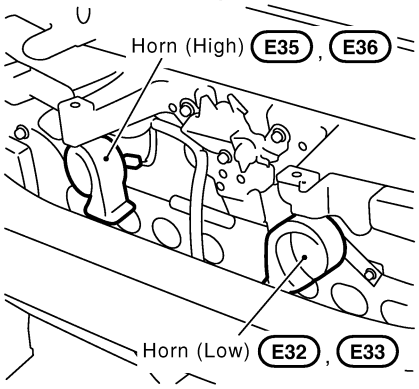


View with luggage finisher rear

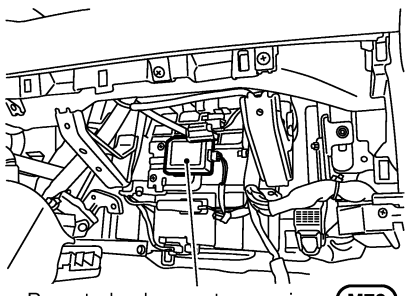




View with front bumper removed

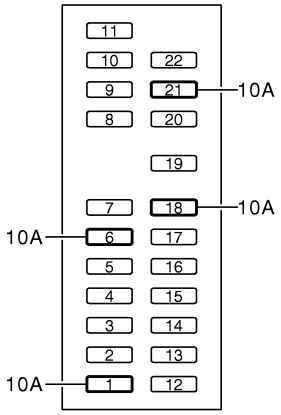


View with instrument passenger panel lower removed

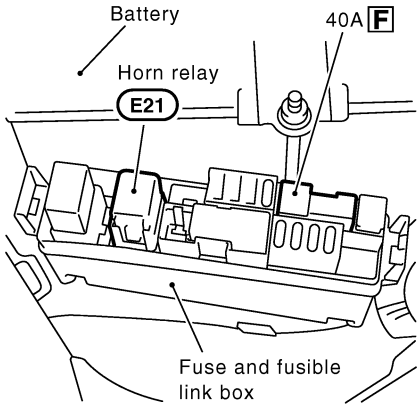


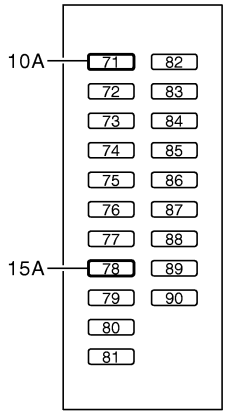
PIIB7456E

FOR ROADSTER



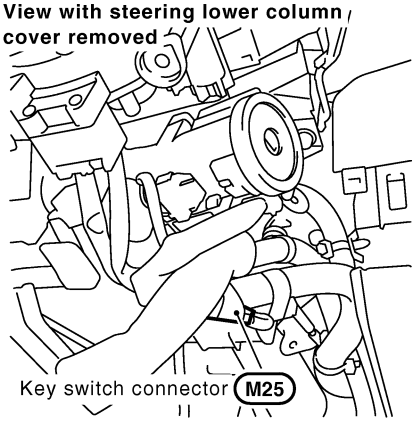
Fuse block (J/B) fuse layout



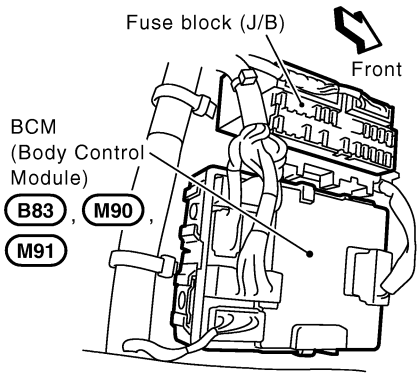


IPDM E/R fuse layout

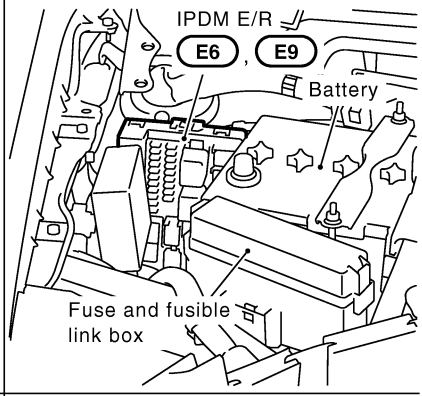
View with steering lower column cover removed

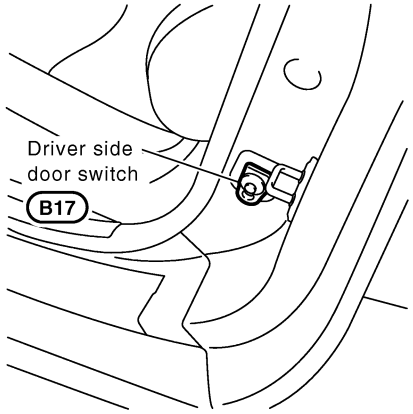


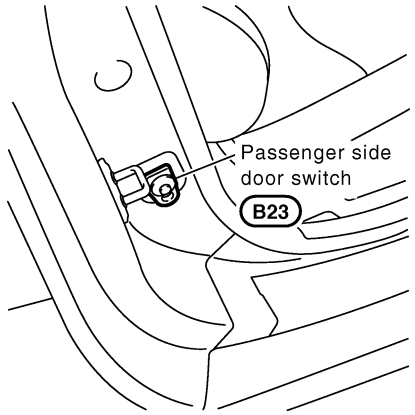
View with dash side LH removed



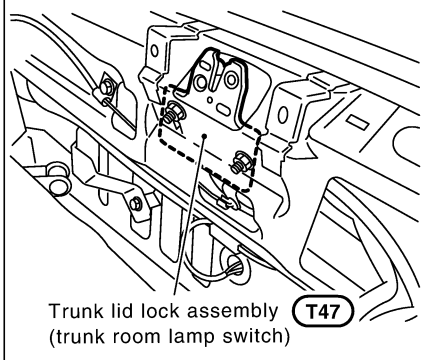
View with cowl top removed

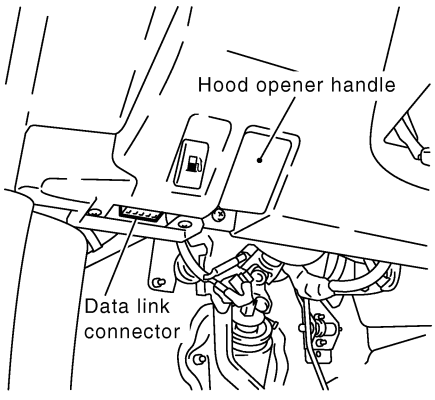




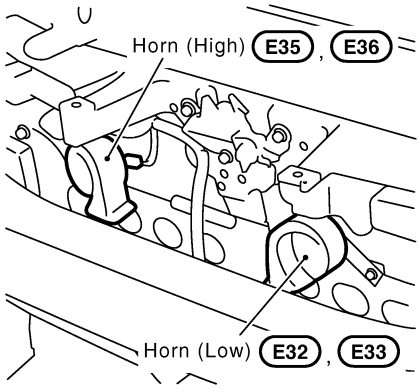


View with luggage finisher lower (center) removed

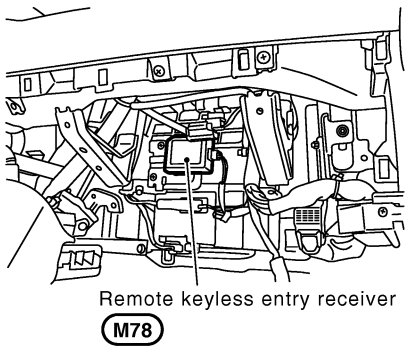




View with front bumper removed



View with instrument passenger panel lower removed



PIIB9172E

System Description

NIS00015

INPUTS

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No. 21, located in the fuse block (J/B)]
- to key switch terminal 2.

When the ignition switch is ON or START position, power is supplied

- through 10A fuse [No.1, located in the fuse block (J/B)]
- to BCM terminal 38.

When the ignition switch is ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

When the driver side door switch is ON (door is OPEN), ground is supplied

- to BCM terminal 62
- through driver side door switch terminal 1 and
- through driver door switch case ground.

When the passenger side door switch is ON (door is OPEN), ground is supplied

- to BCM terminal 12
- through passenger side door switch terminal 1 and
- through passenger side door switch case ground.

When the back door switch (For coupe models) is ON (door is OPEN), ground is supplied

- to BCM terminal 58
- through the back door switch terminals 1 and 3 and
- through body grounds B5, B6, D105 and T14.

When the trunk lid lock assembly (trunk room lamp switch) (For roadster models) is ON (trunk is OPEN), ground is supplied

- to BCM terminal 57
- through the trunk room lamp switch terminals 3 and 1 and
- through body grounds B5,B6 and T14.

When the key switch is ON (key is inserted in ignition key cylinder), power is supplied

- through key switch terminals 2 and 1
- to BCM terminal 37.

Key fob signal is inputted to remote keyless entry receiver (the antenna of the system is built in remote keyless entry receiver).
Remote keyless entry receiver sends keyfob signal

- to BCM terminal 20
- from remote keyless entry receiver terminal 2.

The remote keyless entry system controls operation of the

- power door lock
- hazard and horn reminder
- auto door lock
- interior lamp and step lamp
- panic alarm

- back door opener (For coupe)
- trunk lid opener (For roadster)
- keyless power window down (open)

OPERATION PROCEDURE

Power Door Lock Operation

BCM receives a LOCK signal from key fob. BCM locks all doors receiving of LOCK signal from key fob.
When an UNLOCK signal is sent from key fob once, driver's door will be unlocked.
Then, if an UNLOCK signal is sent from key fob again within 5 seconds, all other doors will be unlocked.

Hazard Reminder

When the doors are locked or unlocked by key fob, power is supplied to hazard warning lamp and it flashes as follows

- LOCK operation: C mode (flash twice) or S mode (flash twice)
- UNLOCK operation: C mode (flash once) or S mode (does not flash)

Horn Reminder

BCM output to IPDM E/R for horn reminder signal as DATA LINE (CAN H line and CAN L line).
The horn reminder has C mode (horn chirp mode) and S mode (non-horn chirp mode).

Operating function of hazard and horn reminder

	C mode		S mode	
Remote controller operation	Lock	Unlock	Lock	Unlock
Hazard warning lamp flash	Twice	Once	Twice	—
Horn sound	Once	—	—	—

Hazard and horn reminder does not operate if any door switch is ON (any door is OPEN).

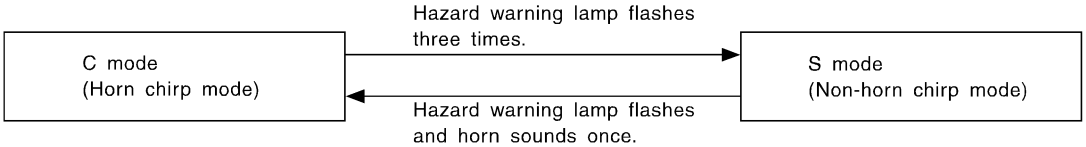
How to change hazard and horn reminder mode

With CONSULT-III

Hazard and horn reminder can be changed using “WORK SUPPORT” mode in “MULTI ANSWER BACK SET”.
Refer to BL-73, "Work Support" .

Without CONSULT-III

When LOCK and UNLOCK signals are sent from the key fob for more than 2 seconds at the same time, the hazard and horn reminder mode is changed and hazard warning lamp flashes and horn sounds as follows:



SEL153WA

Auto Door Lock Operation

Auto lock function signal is sent for operation when any of the following signals are not sent within 1 minute after the unlock signal is sent from the key fob:

- when door switch is turned ON for open.
- when the key switch is turned ON.
- when the lock signal is sent from the key fob.

Auto door lock mode can be changed using “WORK SUPPORT” mode in “AUTO LOCK SET”.
Refer to BL-73, "Work Support" .

Interior Lamp and Step Lamp Operation

When the following conditions come:

- condition of interior lamp switch is DOOR position;
- door switch OFF (when all the doors are closed);

Remote keyless entry system turns on interior lamp (for 30 seconds) with input of UNLOCK signal from key fob.
For detailed description, refer to LT-130, "MAP LAMP TIMER OPERATION" .

Panic Alarm Operation

When key switch is OFF (when ignition key is not inserted in key cylinder), BCM turns on and off horn and headlamp intermittently with input of PANIC ALARM signal from key fob.
The alarm automatically turns off after 25 seconds or when BCM receives any signal from key fob.
For detailed description, refer to BL-128, "PANIC ALARM OPERATION" .

Back Door Operation/For Coupe

When a BACK DOOR OPEN signal is sent with key OFF (ignition key removed from key cylinder) from key fob, power is supplied through BCM terminal 19.
When power and ground are supplied, back door opener actuator opens back door.

Trunk Opener Operation/For Roadster

When a TRUNK OPEN signal is sent with key OFF (ignition key removed from key cylinder) from key fob, power is supplied through BCM terminal 19.
When power and ground are supplied, trunk lid opener actuator opens trunk.

Keyless Power Window Down (open) Operation

When key fob unlock switch is turned ON with ignition switch OFF, and key fob unlock switch is detected to be on continuously for 3 seconds, the driver's door and passenger's door power windows are simultaneously opened.
Power window is operated to open and the operation continues as long as the key fob unlock switch is pressed.

CAN Communication System Description

NIS00016

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

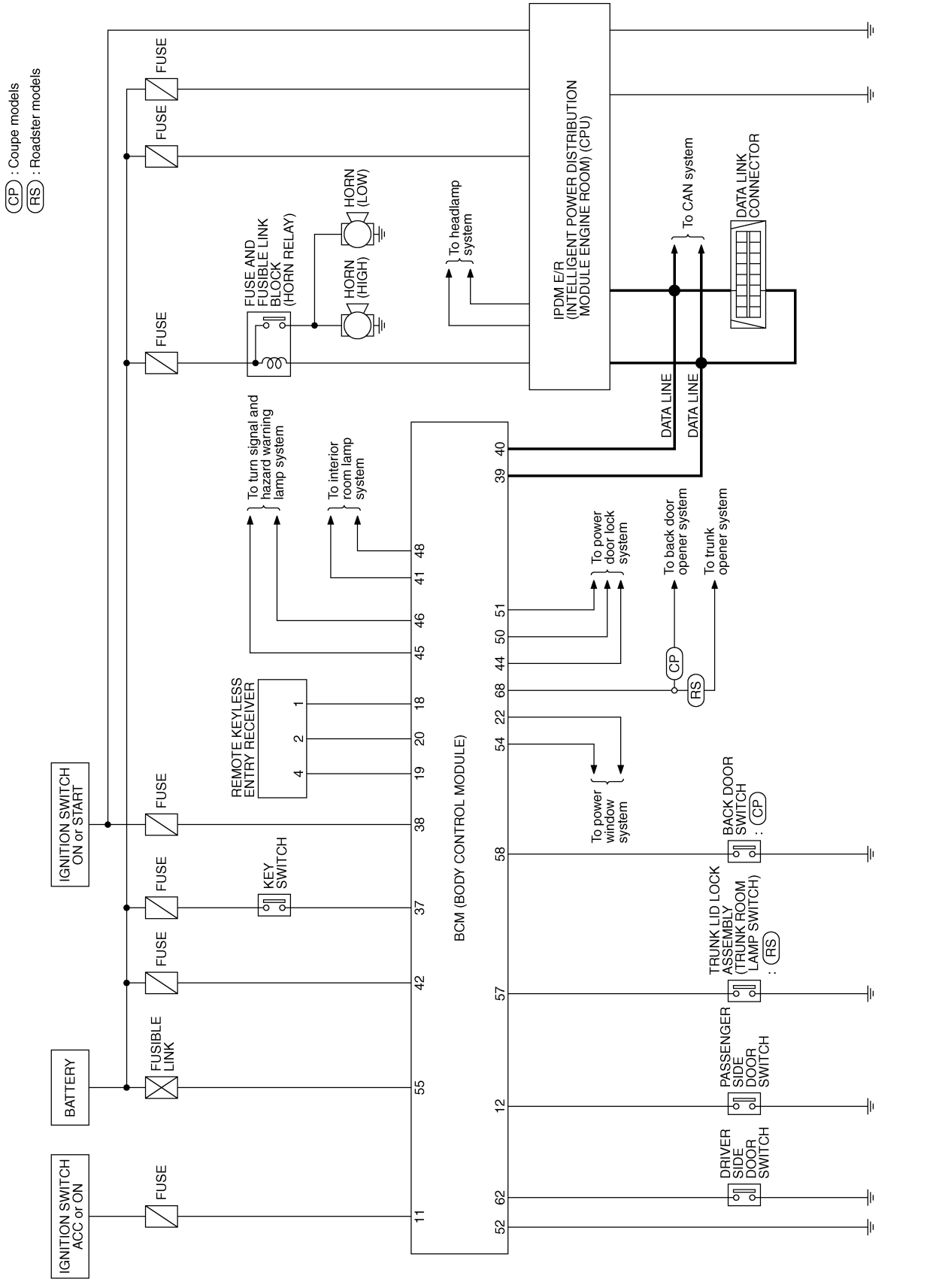
CAN Communication Unit

NIS00017

Refer to LAN-4, "CAN Communication System"

Schematic

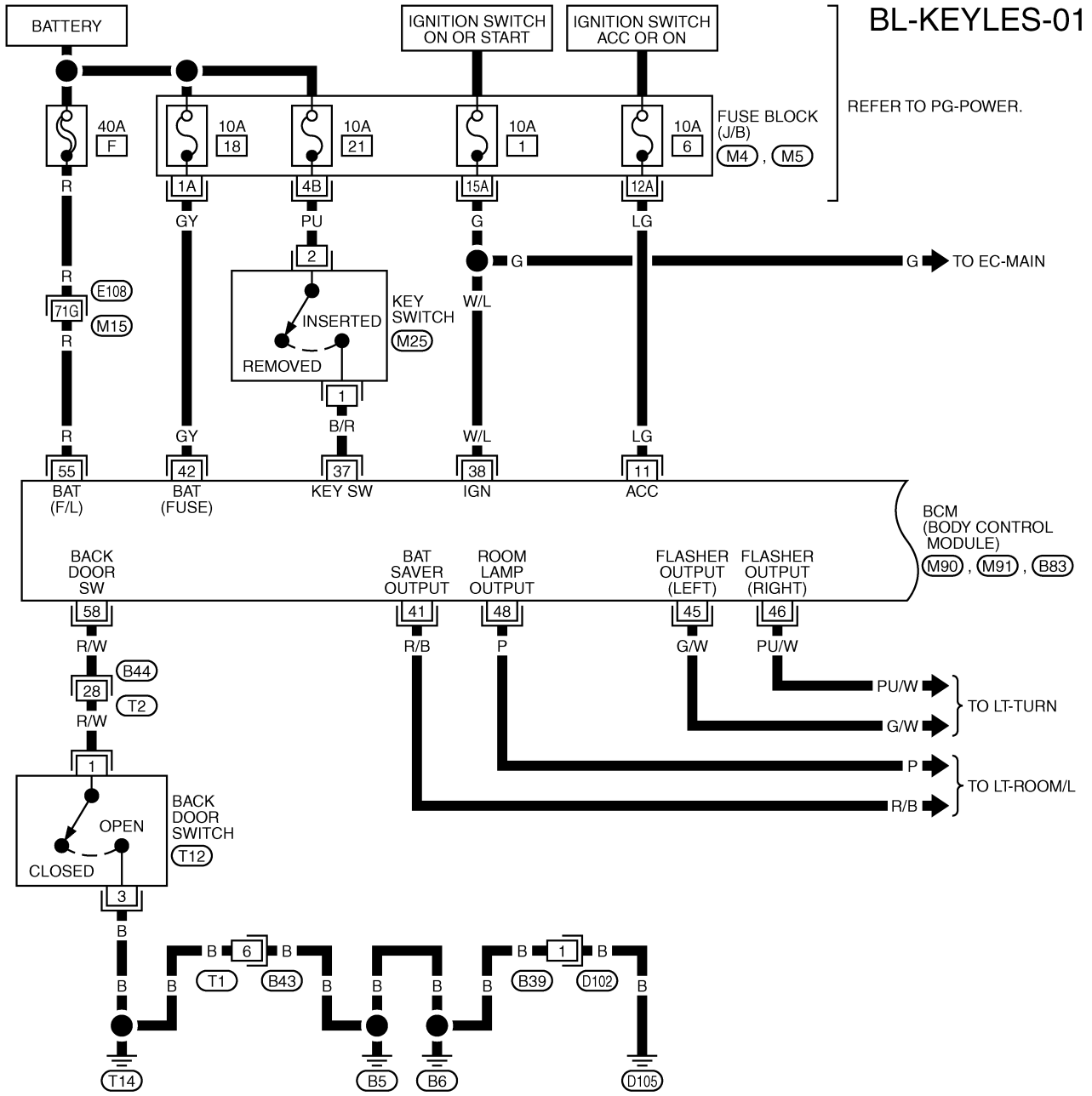
NIS00018

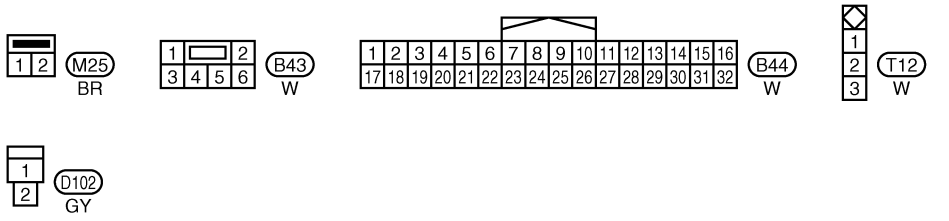


TIWT2193E

Wiring Diagram — KEYLES — /For Coupe

NIS00019

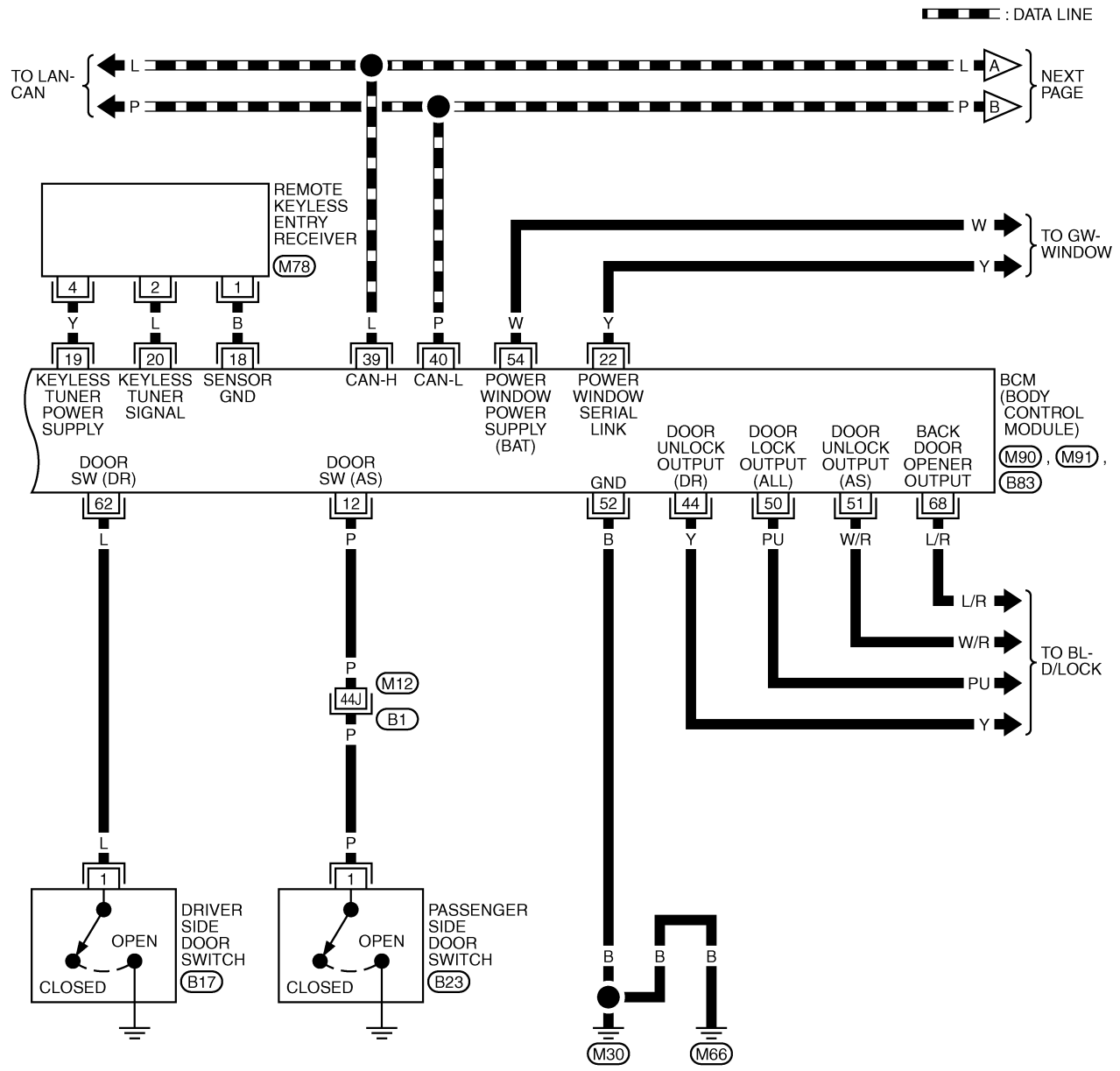


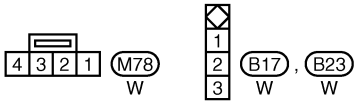


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TIWT2263E

BL-KEYLES-02

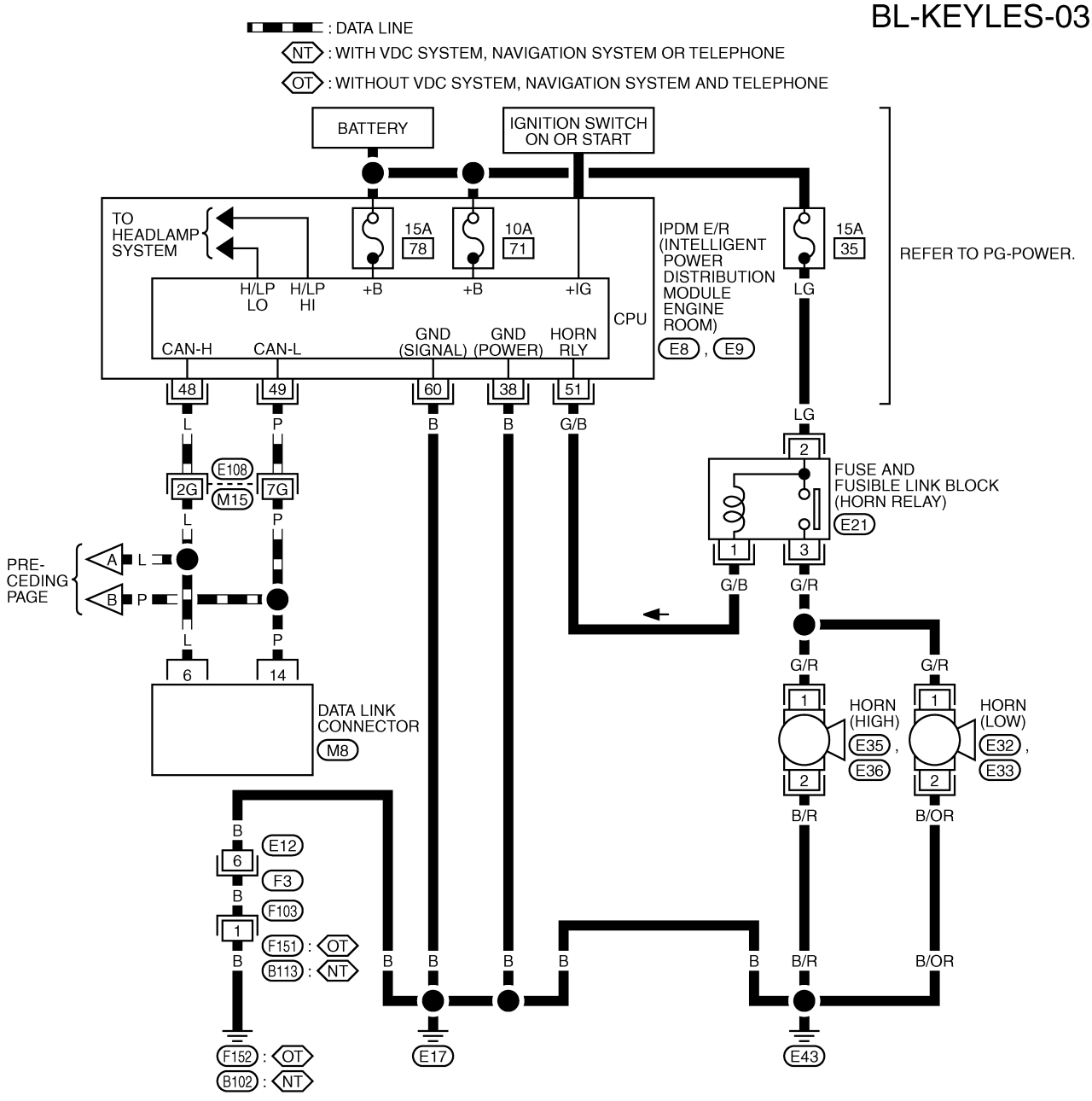


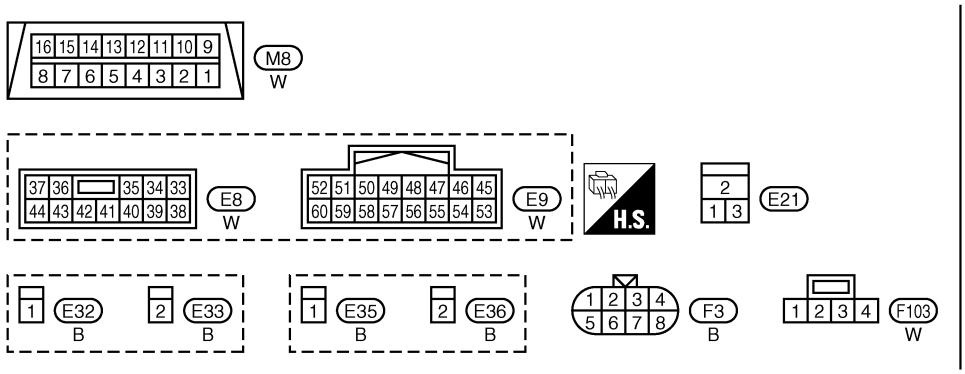


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 , B83
-ELECTRICAL UNITS

TIWT1577E

BL-KEYLES-03





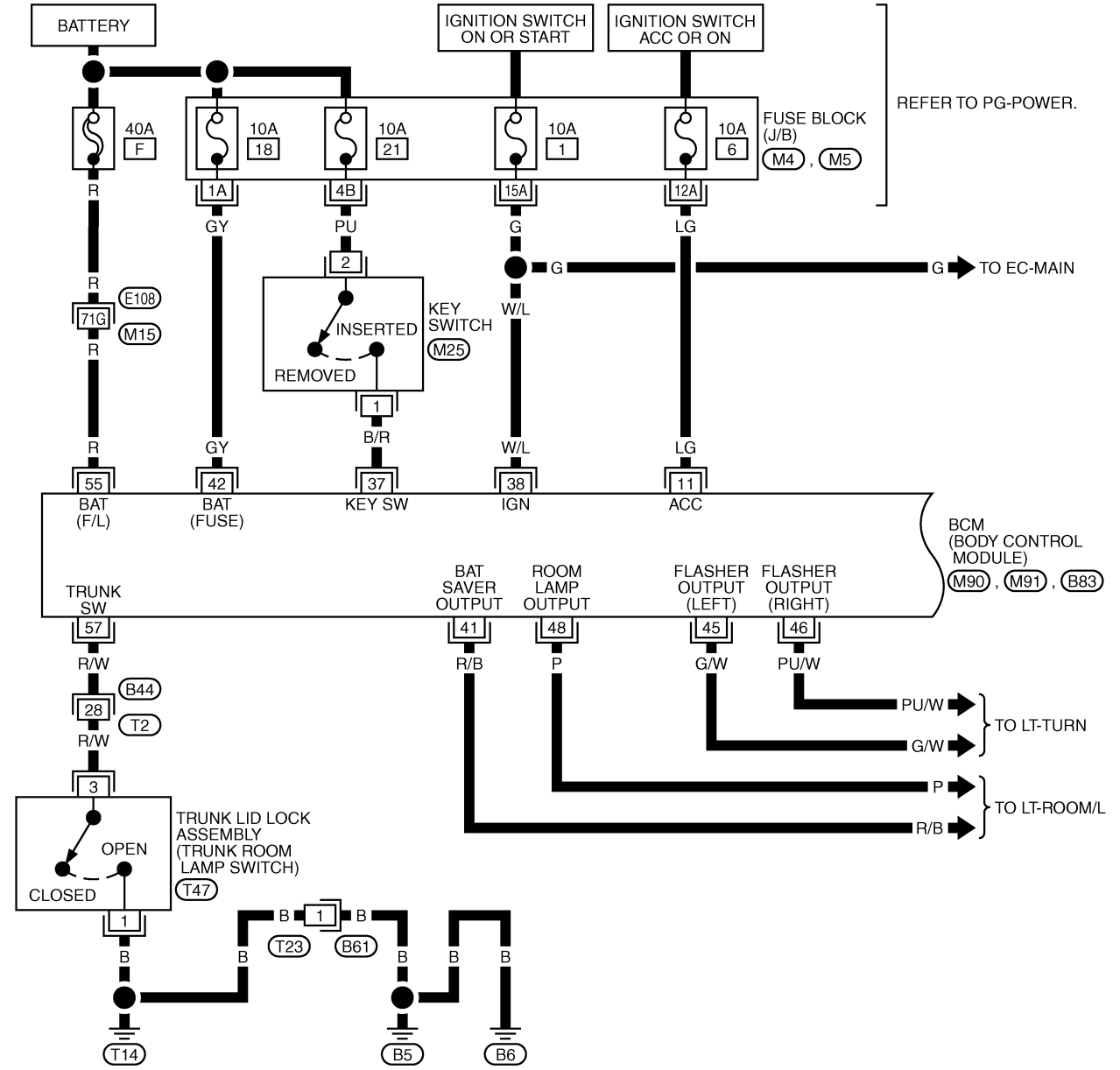
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

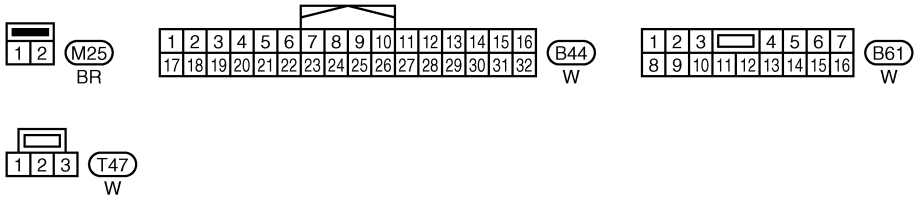
TIWT2264E

Wiring Diagram — KEYLES — /For Roadster

NIS0001A

BL-KEYLES-04





REFER TO THE FOLLOWING.

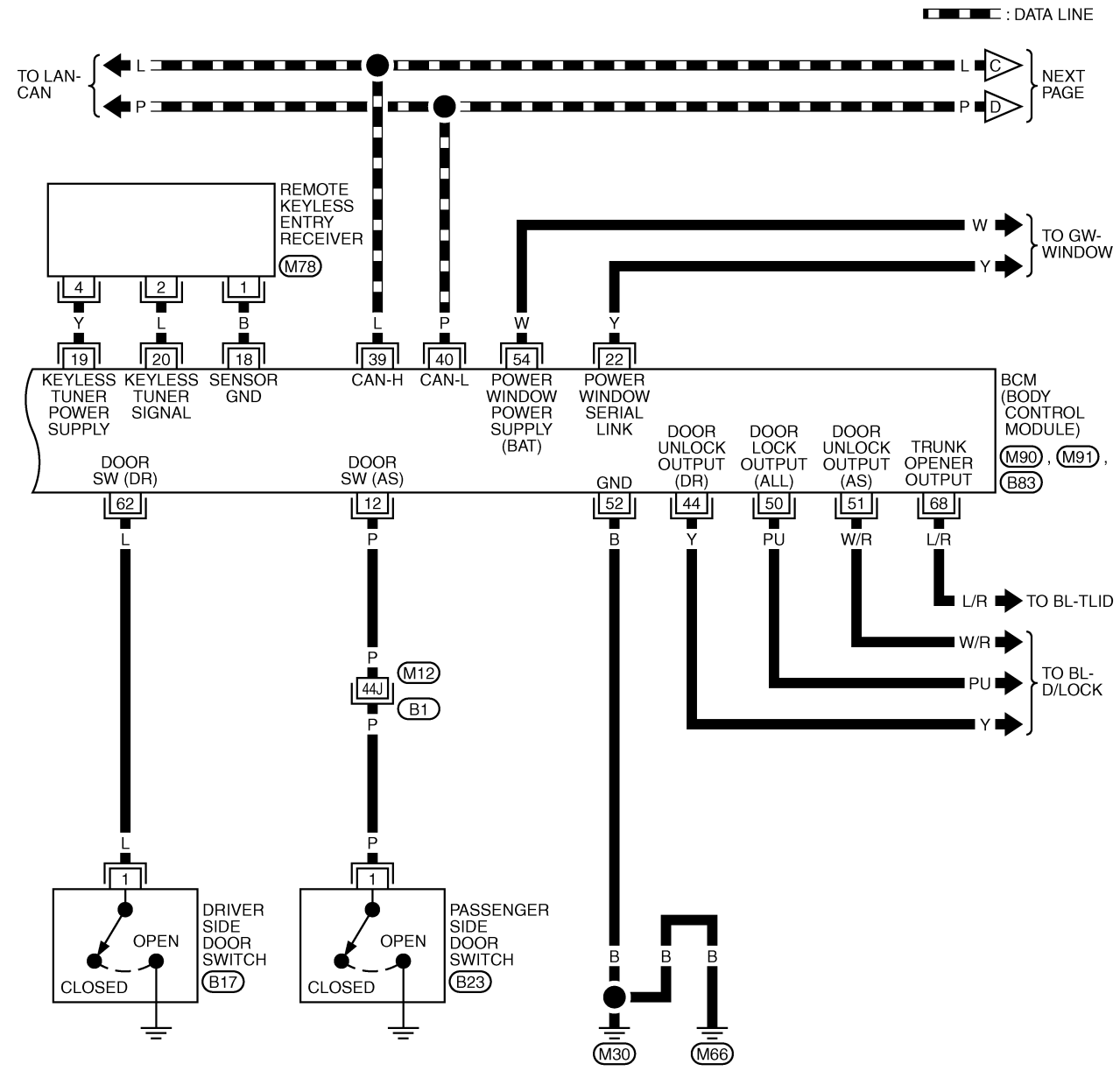
E108 -SUPER MULTIPLE JUNCTION (SMJ)

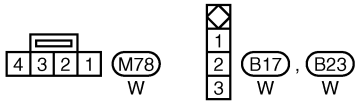
M4, M5 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91, B83 -ELECTRICAL UNITS

TIWT2265E

BL-KEYLES-05

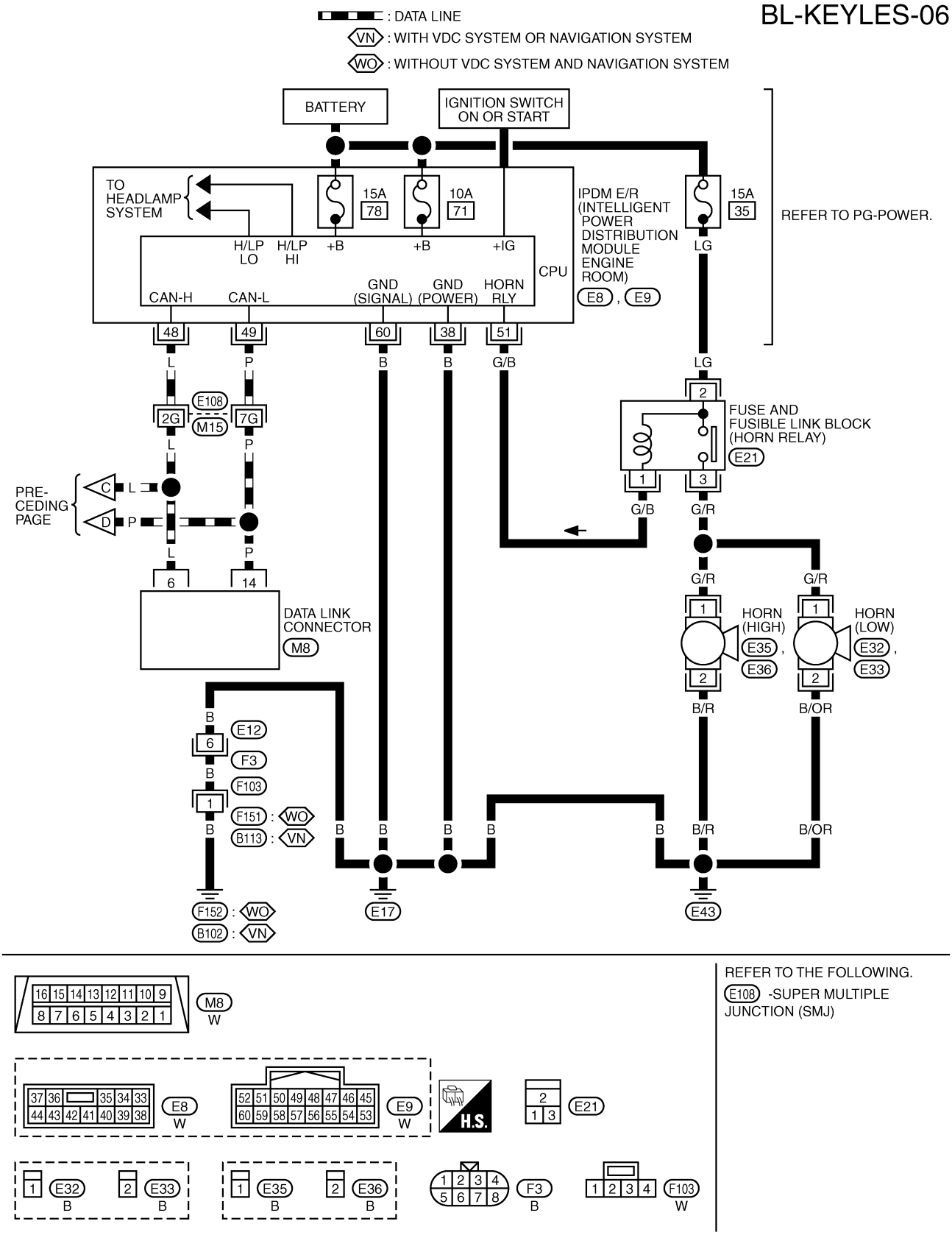




REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90, M91, B83
-ELECTRICAL UNITS

TIWT1580E

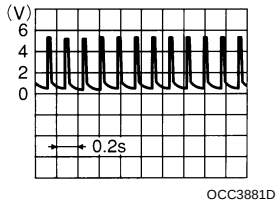
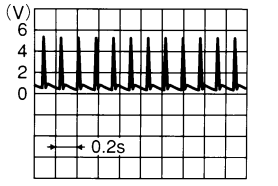
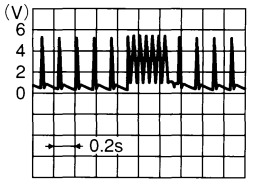
BL-KEYLES-06



TIWT2266E

Terminals and Reference Value for BCM

NIS0001B

Terminal	Wire color	Item	Signal input/ output	Condition	Voltage (V) (Approx.)
11	LG	Ignition switch (ACC)	Input	Ignition switch (ACC or ON position)	Battery voltage
12	P	Passenger side door switch	Input	ON (Open) → OFF (Closed)	0 → 5
18	B	Remote keyless entry receiver (Ground)	—	—	0
19	Y	Remote keyless entry receiver (Power supply)	Output	Key is inserted in IGN key cylinder	0
				All door closed	 OCC3881D
20	L	Remote keyless entry receiver (Signal)	Input	Key is inserted in IGN key cylinder	0
				Waiting (All door closed)	 OCC3879D
				When signal is received (All door closed)	 OCC3880D
37	B/R	Key switch (Insert)	Input	ON (Key inserted) → OFF (Key removed from IGN key cylinder)	Battery voltage → 0
38	W/L	Ignition switch (ON)	Input	Ignition switch (ON or START position)	Battery voltage
39	L	CAN – H	Input/ Output	—	—
40	P	CAN – L	Input/ Output	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage
57	R/W	Trunk lid lock assembly (trunk room lamp switch)*2	Input	ON (Open) → OFF (Closed)	0 → Battery voltage*1
58	R/W	Back door switch	Input		
62	L	Driver side door switch	Input	ON (Open) → OFF (Closed)	0 → 5

*1: When interior lamp battery saver control is in OFF: Approx 5V.
*2: For roadster.

Terminals and Reference Value for IPDM E/R

NIS0001C

Terminal	Wire color	Item	Signal input/output	Condition	Voltage (V) (Approx.)
38	B	Ground	—	—	0
48	L	CAN – H	Input/ Output	—	0
49	P	CAN – L	Input/ Output	—	0
51	G/B	Horn relay	Input	When door lock is operated using key fob* (ON → OFF)	Battery voltage → 0
60	B	Ground	—	—	0

*: In the state that horn reminder operates.

CONSULT-III Function (BCM)

NIS0001D

- CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis position	Inspection items and diagnosis mode	Description
MULTI REMOTE ENT	Data monitor	Displays the input remote keyless entry system data to BCM on real–time basis.
	Active test	Sends a drive signal to check the operation.
	Work support	Changes the setting for each function.

*:Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

CONSULT-III Application Items for BCM

NIS0001F

"MULTI REMOTE CONTENT"

Work Support

Test Item	Description
REMO CONT ID CONFIR	It can be checked whether key fob ID code is registered or not in this mode.
REMO CONT ID REGIST	Key fob ID code can be registered.
REMO CONT ID ERASUR	Key fob ID code can be erased.
MULTI ANSWER BACK SET	Hazard and horn reminder mode can be changed in this mode. The reminder mode will be changed when "MODE SET" on CONSULT-III screen is touched.
AUTO LOCK SET	Auto locking function mode can be changed in this mode. The function mode will be changed when "MODE SET" on CONSULT-III screen is touched.
PANIC ALRM SET	Panic alarm operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-III screen is touched.
TRUNK OPEN SET	Back door opener operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-III screen is touched.
	Trunk lid opener operation mode can be changed in this mode. The operation mode will be changed when "MODE SET" on CONSULT-III screen is touched.
PW DOWN SET	Keyless power window down (open) operation mode can be changed in this mode. The operation mode will be changed when"MODE SET" on CONSULT-III screen is touched.

Hazard and horn reminder mode

	ON (C mode)		OFF (S mode)		MODE 3		MODE 4		MODE 5		MODE 6	
Key fob operation	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock	Lock	Unlock
Hazard warning lamp flash	Twice	Once	Twice	—	—	—	Twice	Once	Twice	—	—	Once
Horn sound	Once	—	—	—	—	—	—	—	Once	—	Once	—

Auto door lock operation mode

	MODE 1	MODE 2	MODE 3
Auto locking function	1 minutes	Nothing	5 minutes

Panic alarm operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Back door open operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Trunk lid open operation mode (Roadster models)

	MODE 1	MODE 2	MODE 3
Key fob operation	0.5 seconds	Nothing	1.5 seconds

Power window down (open) operation mode

	MODE 1	MODE 2	MODE 3
Key fob operation	3 seconds	Nothing	5 seconds

Data Monitor

Monitored Item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch in ON position.
ACC ON SW	Indicates [ON/OFF] condition of ignition switch in ACC position.

Monitored Item	Description
KEY ON SW	Indicates [ON/OFF] condition of key switch.
DOOR SW-DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	Indicates [ON/OFF] condition of passenger side door switch.
BACK DOOR SW	Indicates [ON/OFF] condition of back door switch (For Coupe).
LOCK SW DR/AS	Indicates [ON/OFF] condition of lock signal from lock/unlock switch.
UNLK SW DR/AS	Indicates [ON/OFF] condition of unlock signal from lock/unlock switch.
KEY CYL LK SW	Indicates [ON/OFF] condition of lock signal from door key cylinder switch.
LK BUTTON/SIG	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	Indicates [ON/OFF] condition of unlock signal from key fob.
PANIC BTN	Indicates [ON/OFF] condition of panic signal from key fob.
TRUNK OPNR SW	Indicates [ON/OFF] condition of trunk room lamp switch (For Roadster).
TRUNK BTN/SIG	Indicates [ON/OFF] condition of back door open signal from key fob.
	Indicates [ON/OFF] condition of trunk open signal from key fob. (For Roadster)
TRUNK OPN MNTR	Indicates [ON/OFF] condition of trunk lid opener switch. (For Roadster)
UN BUTTON ON	Indicates [ON/OFF] condition of unlock signal from key fob.
LK/UN BTN ON	Indicates [ON/OFF] condition of lock/unlock signal at the same time from key fob.
DOOR SW-RR	This is displayed even when it is not equipped.

Active Test

Test Item	Description
INT LAMP	This test is able to check interior lamp operation. The interior lamp is turned on when “ON” on CONSULT-III screen is touched.
IGN ILLUM	This is displayed even when it is not equipped.
TRUNK/BACK DOOR	This test is able to check back door (For Coupe) or trunk lid (For Roadster) opener actuator operation. The back door (For Coupe) or trunk (For Roadster) is unlocked when “ON” on CONSULT-III screen is touched.
HORN	This test is able to check panic alarm and horn reminder operations. The horn activate for 0.02 seconds after “ON” on CONSULT-III screen is touched.
HEAD LAMP(HI)	This test is able to check headlamps panic alarm operation. The headlamp illuminates for 0.5 seconds after “ON” on CONSULT-III screen is touched.
POWER WINDOW DOWN	This test is able to check power window open operation. The front power windows activate for 10 seconds after “ON” or CONSULT-III screen is touched.
FLASHER RIGHT	This test is able to check hazard reminder operation. The right hazard lamp turns on when “ON” on CONSULT-III screen is touched.
FLASHER LEFT	This test is able to check hazard reminder operation. The left hazard lamp turns on when “ON” on CONSULT-III screen is touched.
FLASHER RIGHT (CAN)	This test is able to check hazard reminder operation. The right hazard indicator lamp turns on when “ON” on CONSULT-III screen is touched.
FLASHER LEFT (CAN)	This test is able to check hazard reminder operation. The left hazard indicator lamp turns on when “ON” on CONSULT-III screen is touched.

CONSULT-III Application Items for IPDM E/R

NIS0001H

DATA MONITOR

Monitored Item	Description
HORN CHIRP	Indicates [ON/OFF] condition of horn function by IPDM E/R.

ACTIVE TEST

Test Item	Description
HORN	This test is able to check horn operation. Horn activates when “ON” on CONSULT-III screen is touched.

Work Flow

NIS0001I

1. Check the trouble symptom and customer's requests.
2. Understand outline of system. Refer to BL-61, "System Description" .
3. Confirm that power door lock system operates normally. Refer to BL-21, "POWER DOOR LOCK SYSTEM" .
4. Refer to trouble diagnosis chart by symptom, repair or replace any malfunctioning parts. Refer to BL-75, "Trouble Diagnosis Chart by Symptom" .
5. Inspection end.

Trouble Diagnosis Chart by Symptom

NIS0001J

NOTE:

- Always check the “Work Flow” before troubleshooting. Refer to BL-75, "Work Flow" .
- Always check key fob battery before replacing key fob.
- The panic alarm operation, back door or trunk lid (Roadster models) opener operation and keyless power window down operation of remote keyless entry system do not activate with the ignition key inserted in the ignition key cylinder.

Symptom	Diagnoses/service procedure	Reference page
All functions of remote keyless entry system do not operate.	1. Check key fob battery and function	BL-77
	2. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-III is OK, key fob is not malfunctioning.	BL-89
	3. Check remote keyless entry receiver	BL-85
	4. Replace BCM	BCS-17
The new ID of key fob cannot be entered without CONSULT-III.	1. Check key fob battery and function	BL-77
	2. Check key switch	BL-84
	3. Check door switch	BL-79
	4. Check ACC switch	BL-78
	5. Check door lock and unlock switch	BL-42
	6. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-III is OK, key fob is not malfunctioning.	BL-89
	7. Replace BCM	BCS-17
Door lock or unlock does not work.	1. Check door lock operation	BL-23
	2. Check key fob battery and function	BL-77
	3. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-III is OK, key fob is not malfunctioning.	BL-89
	4. Replace BCM	BCS-17
Back door does not open when back door opener button is continuously pressed.	1. Check back door opener operation	BL-23
	2. Check back door open operation mode	BL-73
	3. Check key fob battery and function	BL-77
	4. Check key switch	BL-84
	5. Replace BCM	BCS-17

Symptom	Diagnoses/service procedure	Reference page
Trunk does not open when trunk opener button is continuously pressed. (Roadster models)	1. Check trunk opener operation	BL-114
	2. Check trunk open operation mode	BL-73
	3. Check key fob battery and function	BL-77
	4. Check key switch	BL-84
	5. Replace BCM	BCS-17
Hazard reminder does not activate properly when pressing lock or unlock button of key fob.	1. Check hazard reminder mode * *: Hazard reminder can be activated or deactivated. First check the hazard reminder setting.	BL-73
	2. Check hazard warning lamp function with hazard switch.	LT-66
	3. Check door switch	BL-79
	4. Replace BCM	BCS-17
Horn reminder does not activate properly when pressing lock button of key fob.	1. Check horn reminder mode * *: Horn reminder can be activated or deactivated. First check the horn chirp setting.	BL-73
	2. Check horn chirp function with horn switch.	BL-88
	3. Check door switch	BL-79
	4. Check IPDM E/R operation	BL-85
	5. Replace BCM	BCS-17
Interior lamp and step lamp operation do not activate properly.	1. Check interior lamp and step lamp operation	BL-88
	2. Check door switch	BL-79
	3. Replace BCM	BCS-17
Panic alarm (horn and headlamp) does not activate when panic alarm button is continuously pressed.	1. Check panic alarm mode * *: Panic alarm can be activated or deactivated. First check the Panic alarm setting.	BL-73
	2. Check key fob battery and function	BL-77
	3. Check headlamp alarm	BL-88
	4. Check horn chirp function with horn switch.	BL-88
	5. Check IPDM E/R operation	BL-85
	6. Check key switch	BL-84
	7. Replace key fob. Refer to ID Code Entry Procedure. **NOTE:** If the result of key fob function check with CONSULT-III is OK, key fob is not malfunctioning.	BL-89
	8. Replace BCM	BCS-17
Auto door lock operation does not activate properly. (All other remote keyless entry system function is OK.)	1. Check auto door lock operation mode * *: Auto door lock operation can be activated or deactivated. First check the auto door lock operation setting.	BL-73
	2. Replace BCM	BCS-17
Keyless power window down (open) operation does not activate properly. (All other remote keyless entry system function is OK.)	1. Check power window down operation mode * *: Power window down operation can be activated or deactivated. First check the power window down setting.	BL-73
	2. Check power window function	GW-19
	3. Replace BCM	BCS-17

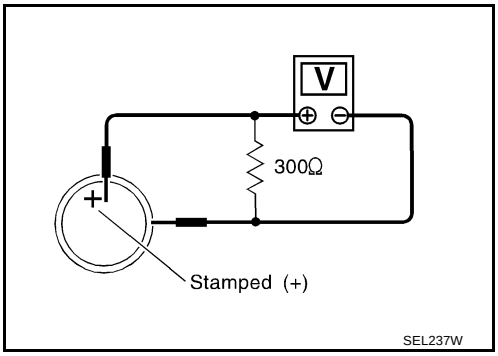
Check Key Fob Battery and Function

NIS0001K

1. CHECK KEY FOB BATTERY

1. Remove key fob battery. Refer to BL-91, "Key Fob Battery Replacement" .
2. Measure voltage between battery positive and negative terminals.

Voltage : 2.5 - 3.0V



NOTE:
Key fob does not function if battery is not set correctly.

OK or NG

OK >> GO TO 2
NG >> Replace battery.

2. CHECK KEY FOB FUNCTION

With CONSULT-III

Check key fob function in “DATA MONITOR” mode with CONSULT-III.
When pushing each button of key fob, the corresponding monitor item should be turned as follows.

Condition	Monitor item	
Pushing LOCK	KEYLESS LOCK	: ON
Pushing UNLOCK	KEYLESS UNLOCK	: ON
Keep pushing UNLOCK	RKE KEEP UNLK	: ON*
	*: “RKE KEEP UNLK” turns to ON 3 seconds after UNLOCK button keeps pushing.	
Pushing TRUNK	KEYLESS TRUNK	: ON
Pushing PANIC	KEYLESS PANIC	: ON
Pushing LOCK and UNLOCK at the same time	RKE LCK - UNLCK	: ON

OK or NG

OK >> Key fob is OK.
NG >> Replace key fob.

Check ACC Switch

NIS0001L

1. CHECK ACC SWITCH

With CONSULT-III

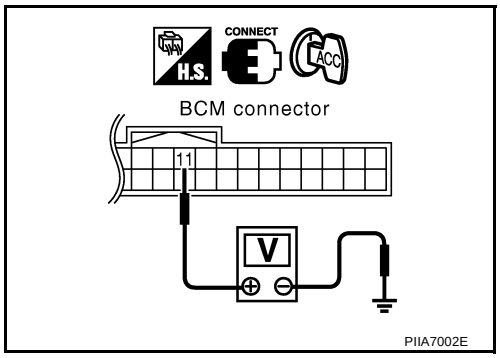
Check ACC switch (“ACC ON SW”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
ACC ON SW	Ignition switch position is ACC or ON	: ON
	Ignition switch position is OFF	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Item	Con-nector	Terminals (Wire color)		Condition	Voltage [V] (Approx.)
		(+)	(–)		
Ignition switch	M90	11 (LG)	Ground	ACC or ON	Battery voltage
				OFF	0



OK or NG

OK >> ACC switch is OK.

NG >> Check the following.

- 10A fuse [No. 6, located in fuse block (J/B)]
- Harness for open or short between BCM and fuse

Check Door Switch

NIS0001M

DRIVER SIDE DOOR SWITCH AND PASSENGER SIDE DOOR SWITCH CHECK

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

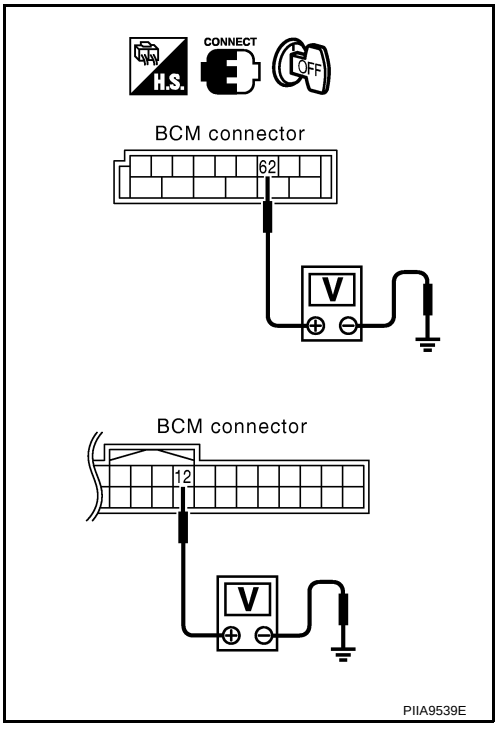
Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Item	Con-nector	Terminals (Wire color)		Condition	Voltage [V] (Approx.)
		(+)	(–)		
Driver side door switch	B83	62 (L)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK.

NG >> GO TO 2.

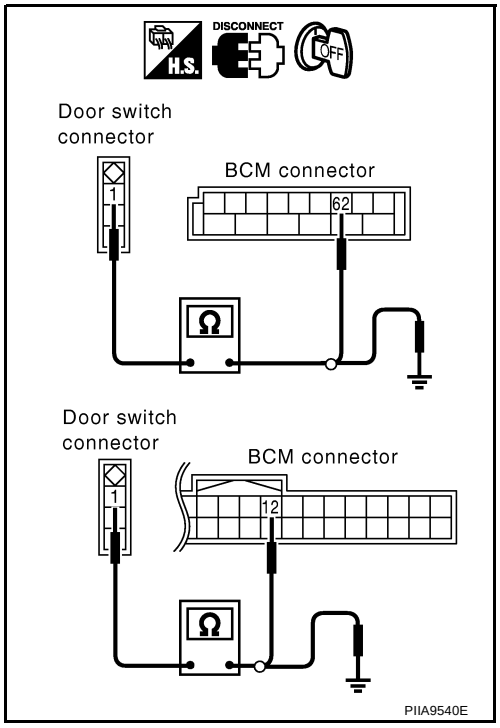
2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23 terminal 1 and BCM harness connector B83 terminal 62 (driver side) or M90 terminal 12 (passenger side).

Driver side door
1 (L) - 62 (L) : Continuity should exist.
Passenger side door
1 (P) - 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23 terminal 1and ground.

Driver side door switch
1 (L) - Ground : Continuity should not exist.
Passenger side door switch
1(P) - Ground : Continuity should not exist.



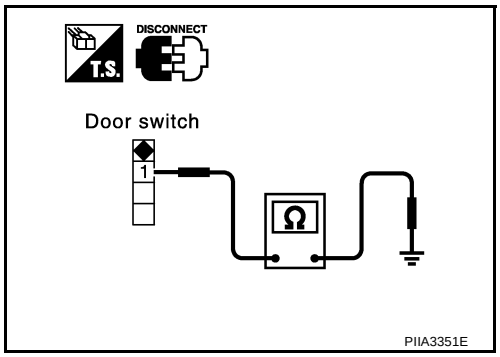
OK or NG
OK >> GO TO 3.
NG >> Repair or replace door switch harness.

3. CHECK DOOR SWITCH

Check continuity between door switch B17 (driver side) or B23 (passenger side) terminal 1 and ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Ground part of door switch	Pushed (close)	No
		Released (open)	Yes

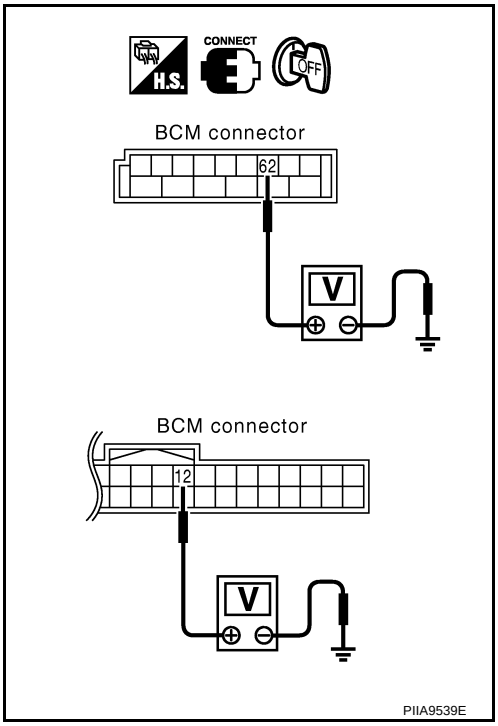
OK or NG
OK >> GO TO 4.
NG >> Replace door switch.



4. CHECK DOOR SWITCH INPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM harness connectors B83 (driver side), M90 (passenger side) terminals 62, 12 and ground.

62 (L) – Ground : Approx. 5V
12 (P) – Ground : Approx. 5V



OK or NG

OK >> Check harness connection.
NG >> Replace BCM.

CHECK BACK DOOR SWITCH /FOR COUPE

1. CHECK BACK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

Check back door switch (“BACK DOOR SW”) in “DATA MONITOR” mode with CONSULT-III.

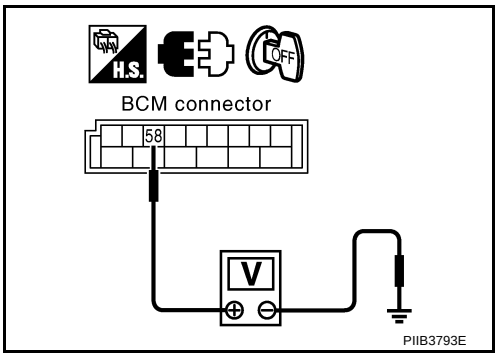
Monitor item	Condition	
BACK DOOR SW	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

1. Turn ignition switch OFF.
2. Check voltage between BCM connector and ground.

Connector	Terminals (Wire color)		Condition of back door switch	Voltage [V] (Approx.)
	(+)	(–)		
B83	58 (R/W)	Ground	Open	0
			Close	Battery voltage*

* : When interior lamp battery saver control is in OFF. → Approx. 5V



OK or NG

OK >> Back door switch circuit is OK.
NG >> GO TO 2.

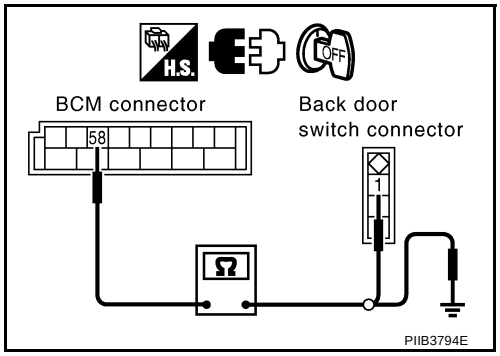
2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect back door switch and BCM connector.
3. Check continuity between BCM harness connector B83 terminal 58 and back door switch harness connector T12 terminal 1.

58 (R/W) - 1 (R/W) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 58 and ground.

58 (R/W) - Ground : Continuity should not exist.



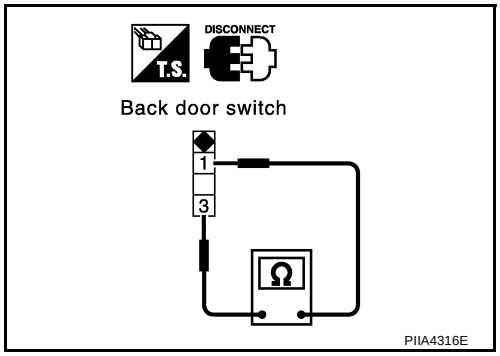
OK or NG

OK >> GO TO 3.
NG >> Repair or replace back door switch harness.

3. CHECK BACK DOOR SWITCH

Check continuity between back door switch terminals 1 and 3.

Connector	Terminal		Condition of back door switch	Continuity
T12	1	3	Open position	Yes
			Closed position	No



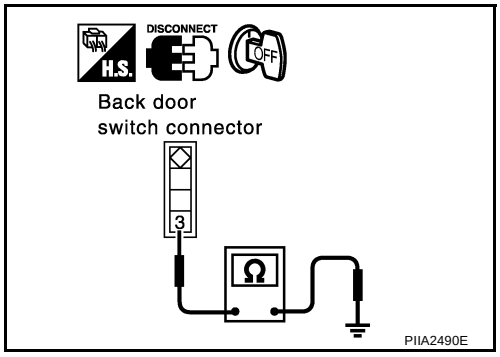
OK or NG

OK >> GO TO 4.
NG >> Replace back door switch.

4. CHECK BACK DOOR SWITCH GROUND CIRCUIT

Check continuity between door switch harness connector T12 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check harness connection.
NG >> Repair or replace back door switch harness.

Check Trunk Lid Lock Assembly (Trunk Room Lamp Switch) / For Roadster

NIS0001N

1. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) INPUT SIGNAL

With CONSULT-III

Check trunk lid opener switch (“TRUNK OPN MNTR”) in “DATA MONITOR” mode with CONSULT-III.

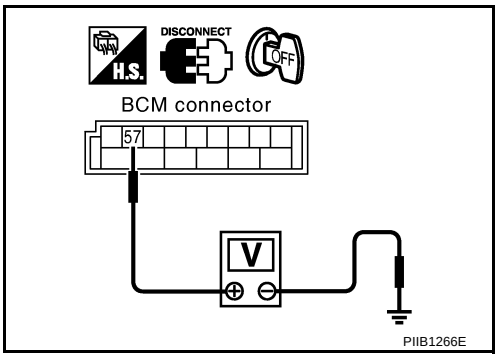
Monitor item	Condition	
TRNK OPN MNTR	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Con-nector	Terminals (Wire color)		Condition of trunk lid lock assembly (trunk room lamp switch)	Voltage [V] (Approx.)
	(+)	(–)		
B83	57 (R/W)	Ground	Open	0
			Close	Battery voltage*

*: When interior lamp battery saver control is in OFF. → Approx. 5V.



OK or NG

OK >> Trunk room lamp switch is OK.
NG >> GO TO 2.

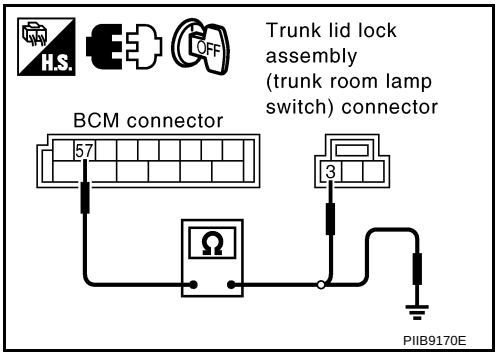
2. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect trunk lid lock assembly (trunk room lamp switch) and BCM connector.
3. Check continuity between BCM harness connector B83 terminal 57 and trunk lid lock assembly (trunk room lamp switch) harness connector T47 terminal 3.

   57 (R/W) - 3 (R/W) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 57 and ground.

   57 (R/W) - Ground : Continuity should not exist.



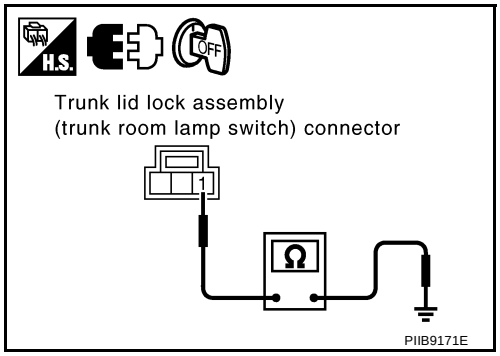
OK or NG

OK >> GO TO 3.
NG >> Repair or replace trunk lid lock assembly (trunk room lamp switch) harness.

3. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect trunk lid lock assembly (trunk room lamp switch) connector.
3. Check continuity between trunk lid lock assembly (trunk room lamp switch) connector T47 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check trunk lid lock assembly (trunk room lamp switch).
NG >> Repair or replace trunk lid lock assembly (trunk room lamp switch) harness.

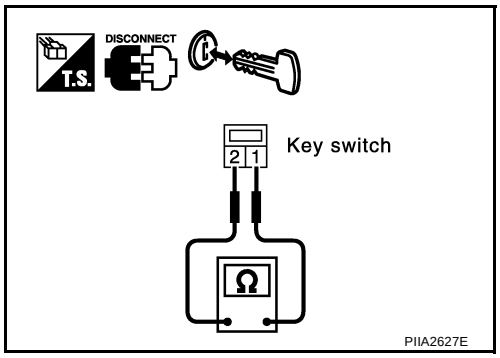
Check Key Switch

NIS0001O

1. CHECK KEY SWITCH

Check continuity key switch terminals 1 and 2.

Connector	Terminals		Condition of key switch	Continuity
M25	1	2	Inserted	Yes
			Removed	No



OK or NG

OK >> GO TO 3.
NG >> Replace key switch.

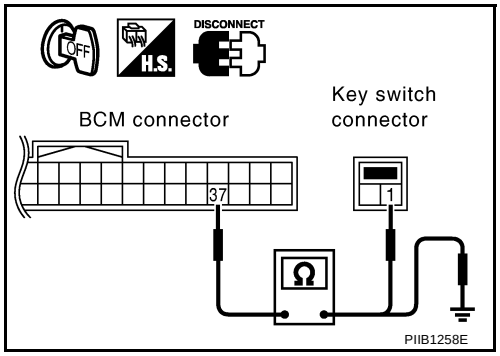
2. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 and key switch harness connector M25 terminal 1.

37 (B/R) - 1 (B/R) : Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 and ground.

37 (B/R) - Ground : Continuity should not exist.



OK or NG

OK >> Check the following.
- 10A fuse [No.21, located in the fuse block (J/B)]
- Harness for open or short between key switch and fuse

NG >> Repair or replace harness.

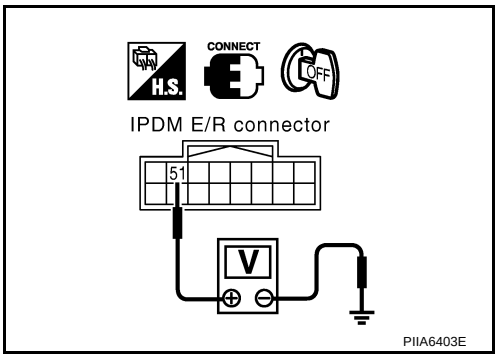
Check IPDM E/R Operation

NIS0001P

1. CHECK IPDM E/R INPUT SIGNAL

Check voltage between IPDM E/R connector E9 terminal 51 and ground.

51 (G/B) – Ground : Battery voltage



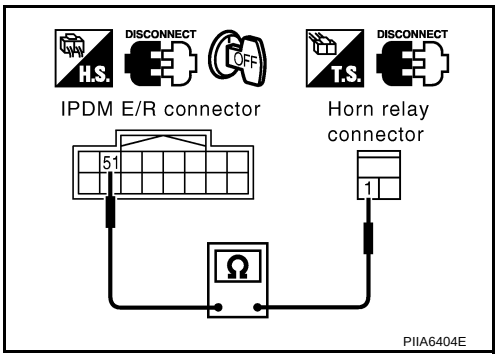
OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 2.

2. CHECK IPDM E/R CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R and horn relay connector.
3. Check continuity between IPDM E/R harness connector E9 terminal 51 and horn relay harness connector E21 terminal 1.

1 (G/B) - 51(G/B) : Continuity should exist.



OK or NG

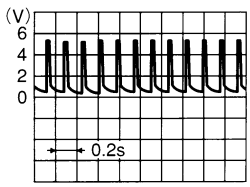
OK >> Check harness connection.
NG >> Repair or replace harness.

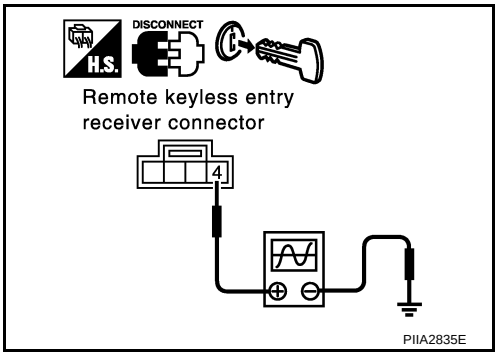
Check Remote Keyless Entry Receiver

NIS0001Q

1. CHECK MULTI-REMOTE CONTROL RECEIVER INPUT VOLTAGE

1. Remove key from ignition key cylinder.
2. Check signal between remote keyless entry receiver connector and ground with oscilloscope.

Con-nector	Terminal (Wire color) (+)	Terminal (Wire color) (–)	Condition	Signal (Reference value)
M78	4 (Y)	Ground	Key is inserted in IGN key cylinder	0
			All door closed	



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

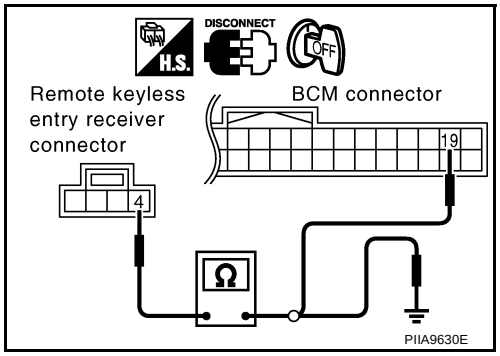
2. CHECK REMOTE KEYLESS ENTRY RECEIVER HARNESS

1. Turn ignition switch OFF.
2. Disconnect remote keyless entry receiver and BCM connector.
3. Check continuity between remote keyless entry receiver connector M78 terminal 4 and BCM connector M90 terminal 19.

4 (Y) - 19 (Y) : Continuity should exist.

4. Check continuity between remote keyless entry receiver connector M78 terminal 4 and ground.

4 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Check harness connection.
NG >> Repair or replace the harness.

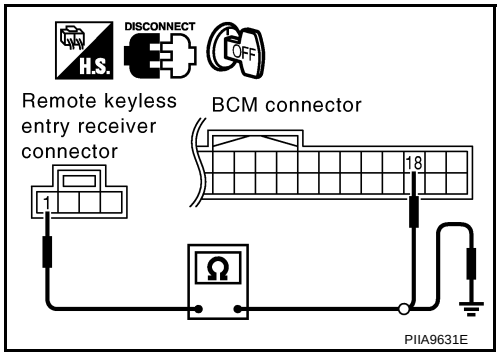
3. CHECK REMOTE KEYLESS ENTRY RECEIVER

1. Turn ignition switch OFF.
2. Check continuity between remote keyless entry receiver connector M78 terminal 1 and BCM connector M90 terminal 18.

1 (B) - 18 (B) : Continuity should exist.

3. Check continuity between remote keyless entry receiver connector M78 terminal 1 and ground.

1 (B) - Ground : Continuity should not exist.

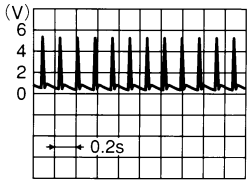
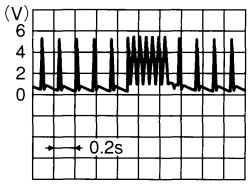


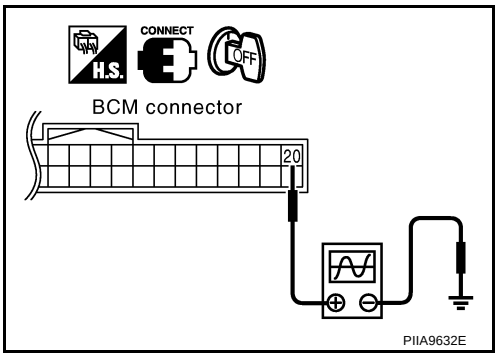
OK or NG

OK >> GO TO 4.
NG >> Repair or replace the harness.

4. CHECK REMOTE KEYLESS ENTRY RECEIVER OUTPUT SIGNAL

1. Connect remote keyless entry receiver connector.
2. Check signal BCM connector and ground with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (–)	Condition	Signal (Reference value)
M90	20 (L)	Ground	Key is inserted in IGN key cylinder	0
			Waiting (All door closed)	 OCC3879D
			When signal is received (All door closed)	 OCC3880D



OK or NG

OK >> Replace BCM.
NG >> GO TO 5.

5. CHECK REMOTE KEYLESS ENTRY RECEIVER HARNESS

1. Disconnect remote keyless receiver and BCM connector.
2. Check continuity between remote keyless entry receiver connector M78 terminal 2 and BCM connector M90 terminal 20.

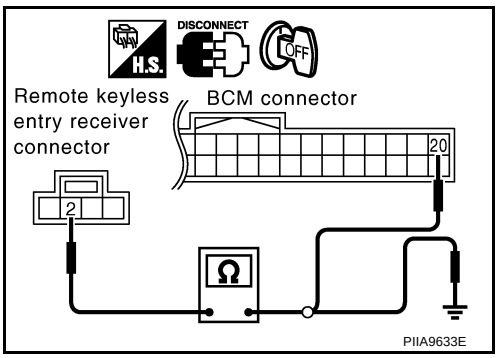
2 (L) - 20 (L) : Continuity should exist.

3. Check continuity between remote keyless entry receiver connector M78 terminal 2 and ground.

2 (L) - Ground : Continuity should not exist.

OK or NG

OK >> Replace remote keyless entry receiver.
NG >> Repair or replace the harness.



Check Horn Function

NIS0001R

First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-III, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

1. CHECK HORN OPERATION

Check if horn sounds with horn switch.

Does horn operate?

Yes >> Horn circuit is OK.
No >> Check horn circuit. Refer to WW-53, "Wiring Diagram — HORN —" .

Check Headlamp Alarm

NIS0001S

First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-III, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

1. CHECK HEADLAMP OPERATION

Does headlamp come on when turning lighting switch “ON”.

YES or NO

Yes >> Headlamp alarm circuit is OK.
No >> Check headlamp system. Refer to LT-5, "HEADLAMP (FOR USA)" , LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -" ,.

Check Interior Lamp Operation

NIS0001T

1. CHECK ILLUMINATION OPERATION

When interior lamp switch is in “DOOR” position, open the door (driver side or passenger side).

Interior lamp should illuminate.

OK or NG

OK >> Interior lamp circuit is OK.
NG >> Check interior lamp circuit. Refer to LT-128, "INTERIOR ROOM LAMP" .

ID Code Entry Procedure

NIS0001U

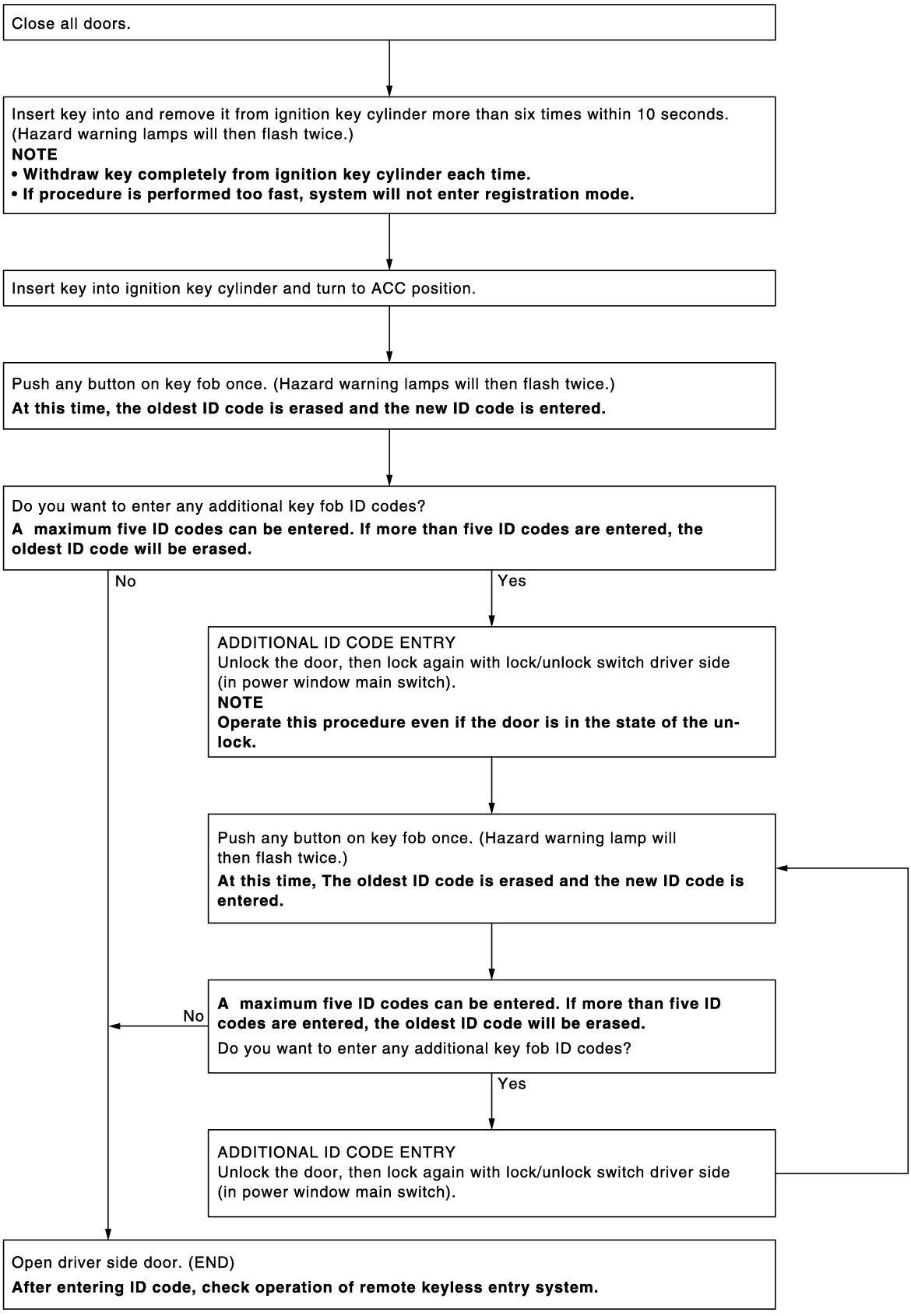
KEY FOB ID SETUP WITH CONSULT-III

NOTE:
If a key fob is lost, the ID code of the lost key fob must be erased to prevent unauthorized use. When the ID code of a lost key fob is not known, all controller ID codes should be erased. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.

1. Touch “WORK SUPPORT”.

2. The items shown on the figure can be set up.
   - “REMO CONT ID REGIST”
     Use this mode to register a key fob ID code.
     NOTE:
     Register the ID code when key fob or BCM is replaced, or when additional key fob is required.
   - “REMO CONT ID ERASUR”
     Use this mode to erase a key fob ID code.
   - “REMO CONT ID CONFIR”
     Use this mode to confirm if a key fob ID code is registered or not.

KEY FOB ID SETUP WITHOUT CONSULT-III



PIIA2839E

NOTE:

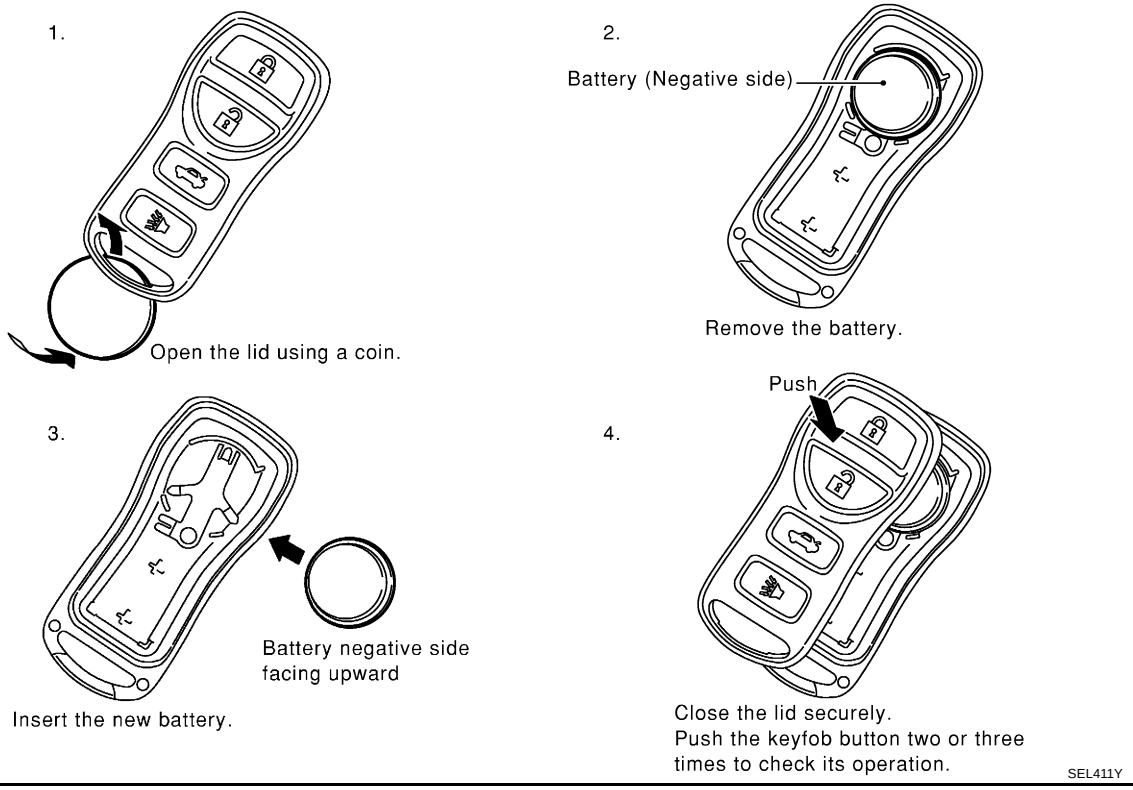
- If a key fob is lost, the ID code of the lost key fob must be erased to prevent unauthorized use. A specific ID code can be erased with CONSULT-III. However, when the ID code of a lost key fob is not known, all controller ID codes should be erased. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.
  To erase all ID codes in memory, register one ID code (key fob) five times. After all ID codes are erased, the ID codes of all remaining and/or new key fobs must be re-registered.
- When registering an additional key fob, the existing ID codes in memory may or may not be erased. If five ID codes are stored in memory, when an additional code is registered, only the oldest code is erased. If less than five ID codes are stored in memory, when an additional ID code is registered, the new ID code is added and no ID codes are erased.
- If you need to activate more than two additional new key fobs, repeat the procedure “Additional ID code entry” for each new key fob.
- Entry of maximum five ID codes is allowed. When more than five ID codes are entered, the oldest ID code will be erased.
- Even if same ID code that is already in the memory is input, the same ID code can be entered. The code is counted as an additional code.

Key Fob Battery Replacement

NIS0001V

NOTE:

- Be careful not to touch the circuit board or battery terminal.
- The keyfob is water-resistant. However, if it does get wet, immediately wipe it dry.

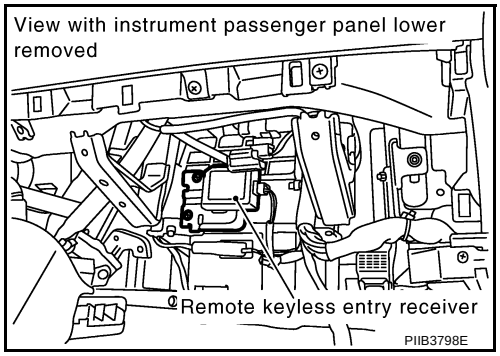


Removal and Installation of Remote Keyless Entry Receiver

NIS0001W

REMOVAL

1. Remove the instrument passenger panel lower. Refer to IP-13, "(L) Instrument Passenger Panel Lower" .
2. Remove the screw and remote keyless entry receiver connector.
3. Remove the remote keyless entry receiver.



INSTALLATION

Install in the reverse order of removal.

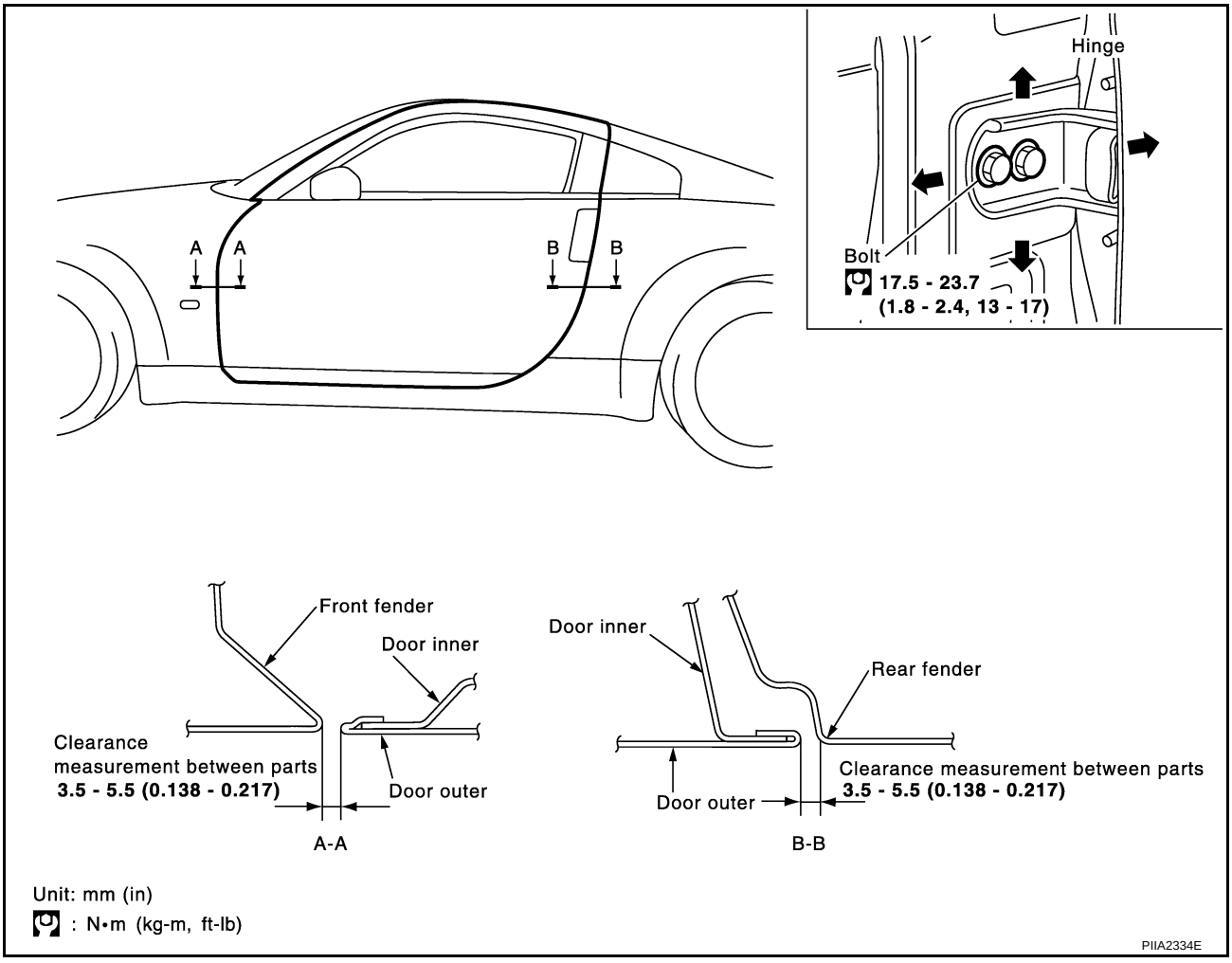
DOOR

PFP:80100

Fitting Adjustment

NIS0001X

COUPE



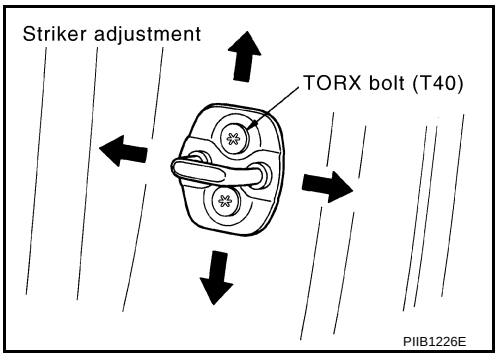
DOOR

Longitudinal clearance and surface height adjustment at front end

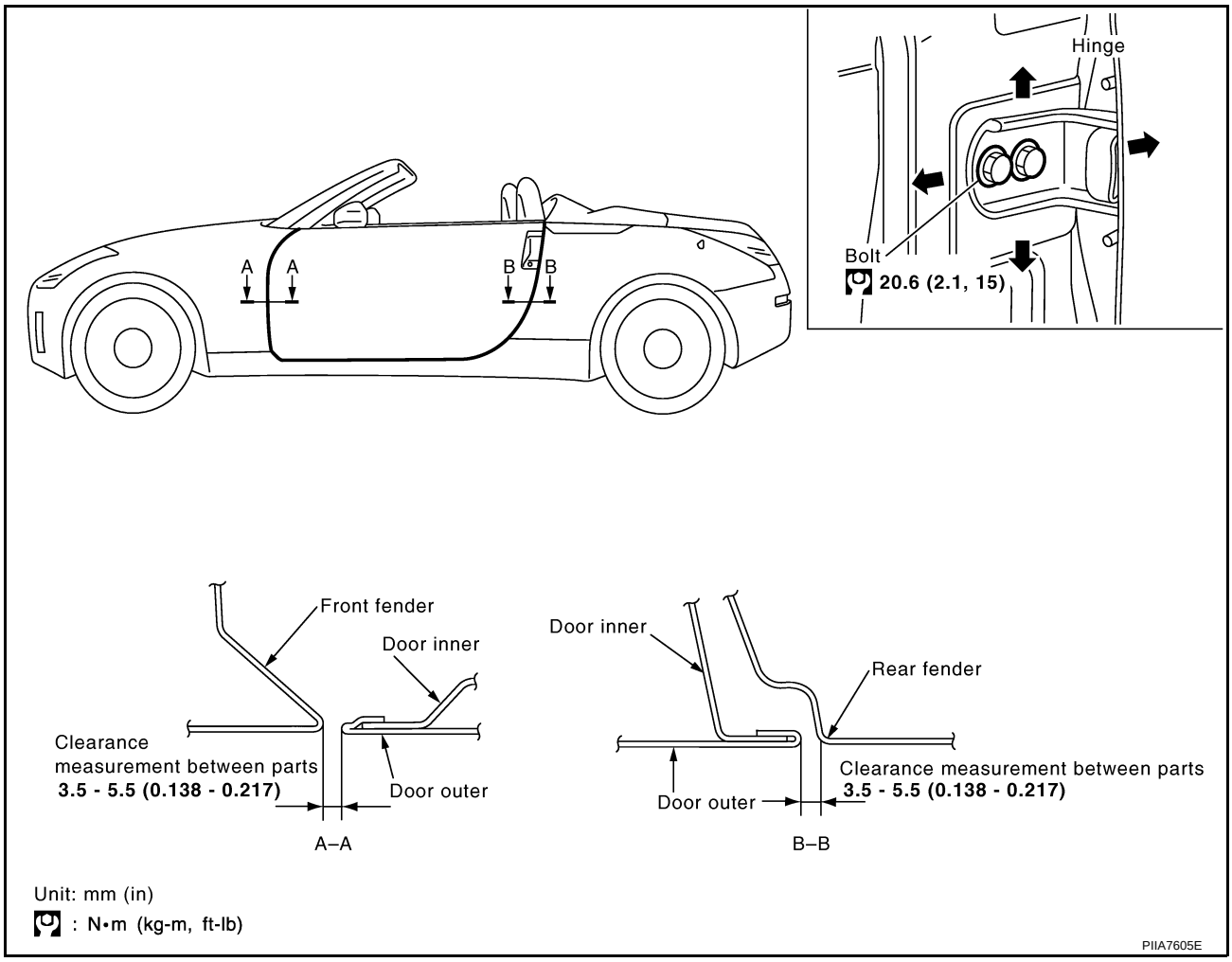
1. Remove the fender protector. Refer to EI-21, "FENDER PROTECTOR" .
2. Loosen the hinge mounting bolts. Raise the door at rear end to adjust.

STRIKER ADJUSTMENT

Adjust the striker so that it becomes parallel with the lock insertion direction.



ROADSTER



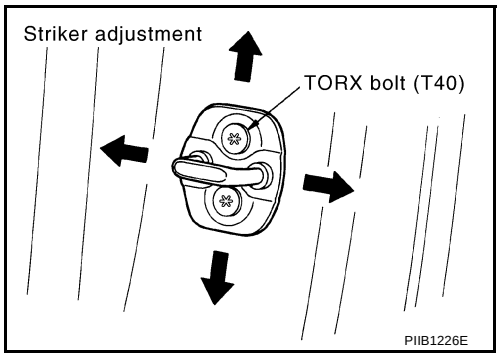
DOOR

Longitudinal clearance and surface height adjustment at front end

1. Remove the fender protector. Refer to EI-21, "FENDER PROTECTOR" .
2. Loosen the hinge mounting bolts. Raise the door at rear end to adjust.

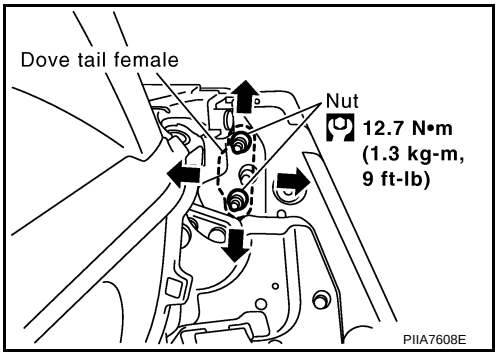
STRIKER ADJUSTMENT

Adjust the striker so that it becomes parallel with the lock insertion direction.



DOVE TAIL FEMALE ADJUSTMENT (ROADSTER)

Adjust the dove tail female so that it becomes parallel with the lock insertion direction.



Removal and Installation

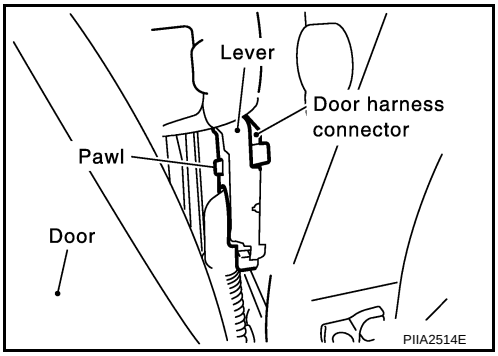
NIS0001Y

CAUTION:

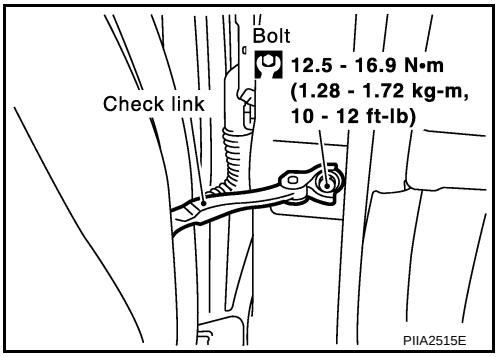
- **When removing and installing the door assembly, support the door with a jack and cloth to protect the door and body.**
- **When removing and installing door assembly, be sure to perform the fitting adjustment Refer to BL-93, "Fitting Adjustment" .**
- **Operate with two workers, because of its heavy weight.**
- **Check the hinge rotating part for poor lubrication. If necessary, apply “body grease”.**
- **After installing, check operation.**
- **Apply sealant and coat with the same body color paint to door hinge installation part and mounting nuts.**

REMOVAL

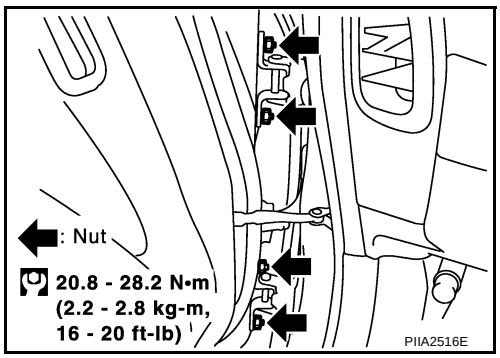
1. Pull the lever and remove the door harness connector while removing tabs of door harness connector.



2. Remove the mounting bolts of the check link on the vehicle.



3. Remove the door-side hinge mounting nuts, and remove the door assembly.



INSTALLATION

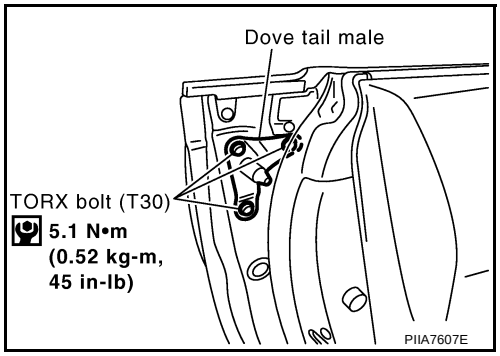
Install in the reverse order of removal.

Removal and Installation of Dove Tail Male & Female (Roadster)

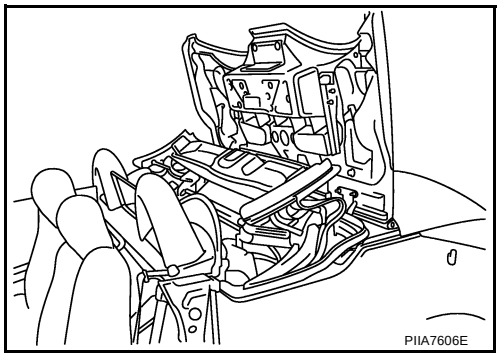
NIS0001Z

REMOVAL

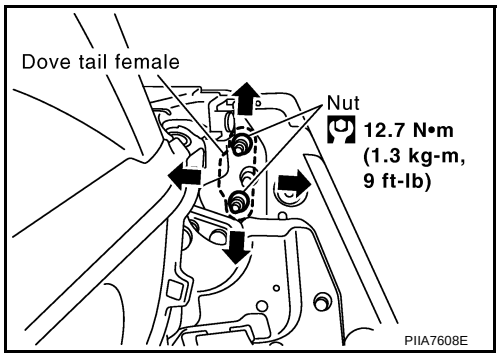
1. Remove the TORX bolts (T30) of dove tail male.



2. Soft top assembly locate like a figure.
3. Remove the body side welt. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Remove the body side weatherstrip. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
5. Remove the rear side finisher and kicking plate inner. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
6. Remove the shoulder anchor. Refer to SB-6, "Removal and Installation of Seat Belt (Roadster)" .
7. Remove the rear side trim. Refer to EI-37, "Removal and Installation (for Roadster Models)" .



8. Remove the dove tail female mounting nuts. Remove the dove tail female.

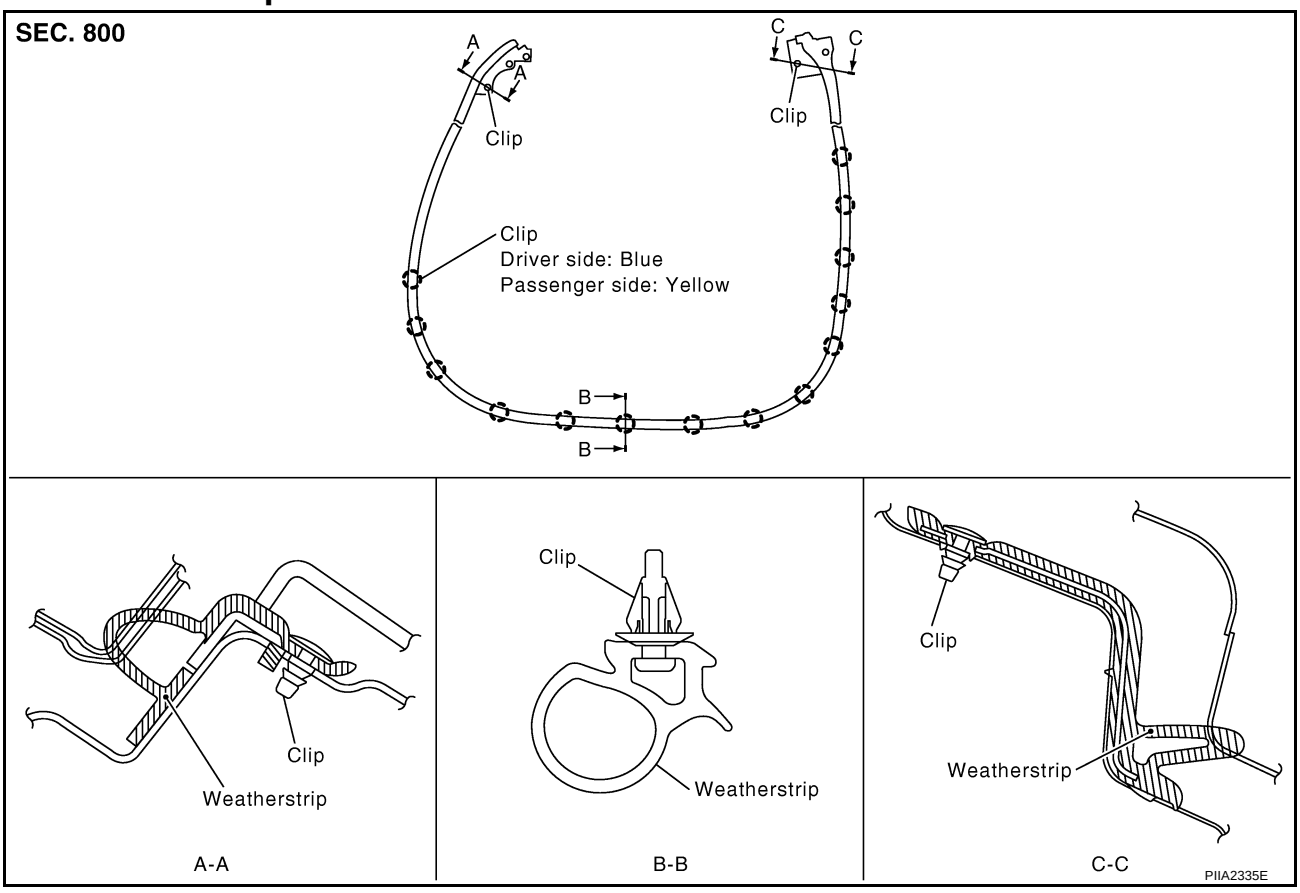


INSTALLATION

Install in the reverse order of removal.

Door Weatherstrip

NIS00020



REMOVAL

Remove the weatherstrip clips and remove weatherstrip.

INSTALLATION

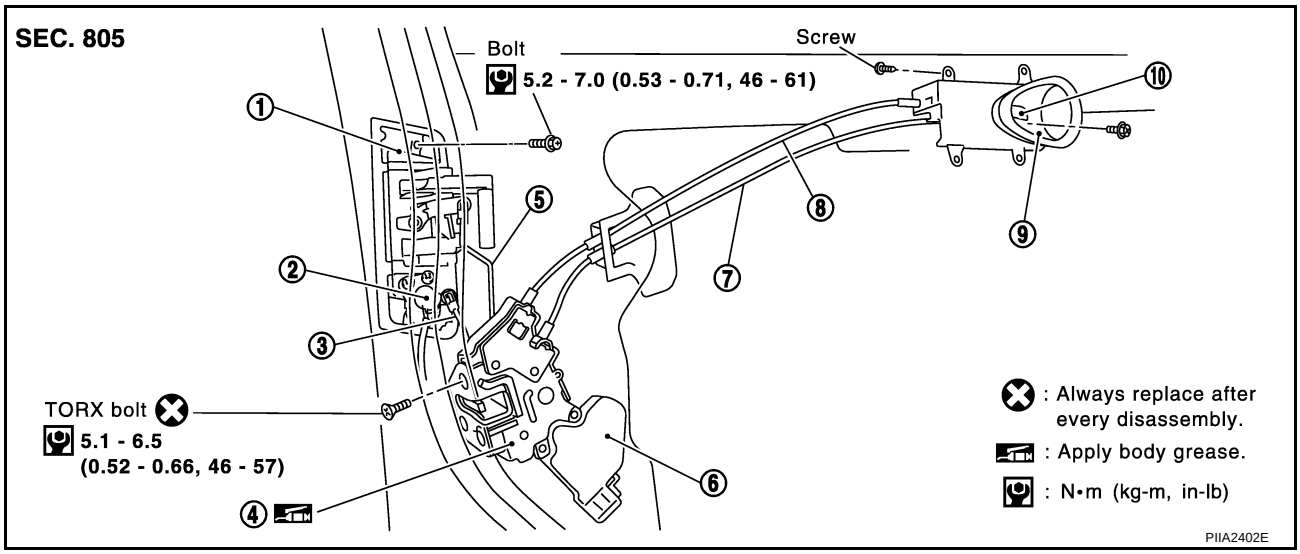
Install in the reverse order of removal.

DOOR LOCK

PFP:80502

Component Structure

NIS00021



1. Outside handle
2. Key cylinder (driver side only)
3. Key lock rod (driver side only)
4. Door lock assembly
5. Outside handle rod
6. Door lock actuator
7. Lock knob cable
8. Inside handle cable
9. Inside handle
10. Lock knob

Inspection and Adjustment

NIS00022

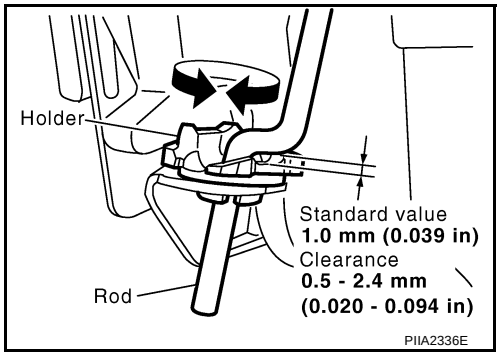
1. Remove the door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove the door window and door module assembly. Refer to GW-51, "Removal and Installation" .

EXTERIOR HANDLE ROD ADJUSTMENT

Rotate the bushing to adjust so that the clearance between the bushing and rod becomes as shown in the figure.

CAUTION:

Be careful not to make the clearance 0 mm (0 in) or the rod will be pressed continuously.

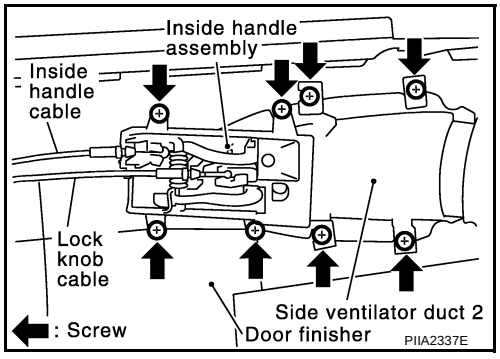


Removal and Installation

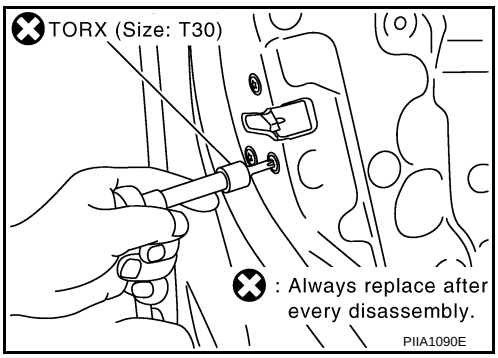
NIS00023

REMOVAL

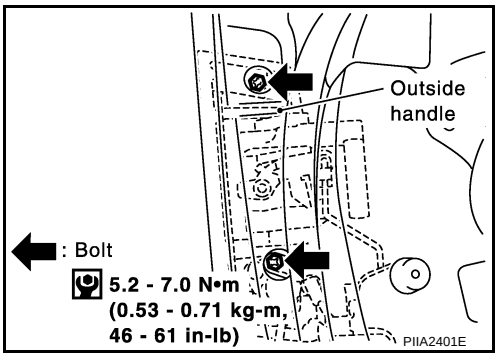
1. Remove the door finisher. Refer to EI-33, "Removal and Installation" .
2. Remove the door window and door module assembly. Refer to GW-51, "Removal and Installation" .
3. Disconnect the inside handle cable and locking knob cable from the back side of the door finisher.



4. Reach to separate the key cylinder (driver side only) rod and outside handle rod connection (on the handle).
5. Disconnect the door lock actuator connector.
6. Remove the mounting screws (TORX T30), remove the door lock assembly.



7. Remove the outside handle mounting bolts, remove the outside handle.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **To install each rod, be sure to rotate the rod holder until a click is felt.**
- **After installing, check operation.**
- **After installing, perform fitting adjustment. Refer to BL-93, "Fitting Adjustment" .**

Disassembly and Assembly

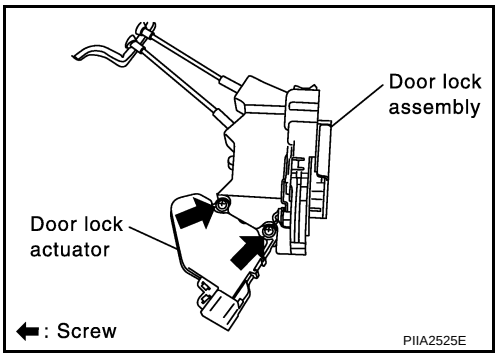
NIS00024

DISASSEMBLY

CAUTION:

Be sure to remove or install the actuator with the door lock assembly removed.

1. Remove the mounting screws, and remove the actuator from the door lock assembly.
2. Pull the actuator straight downward to separate it from the door lock assembly.



ASSEMBLY

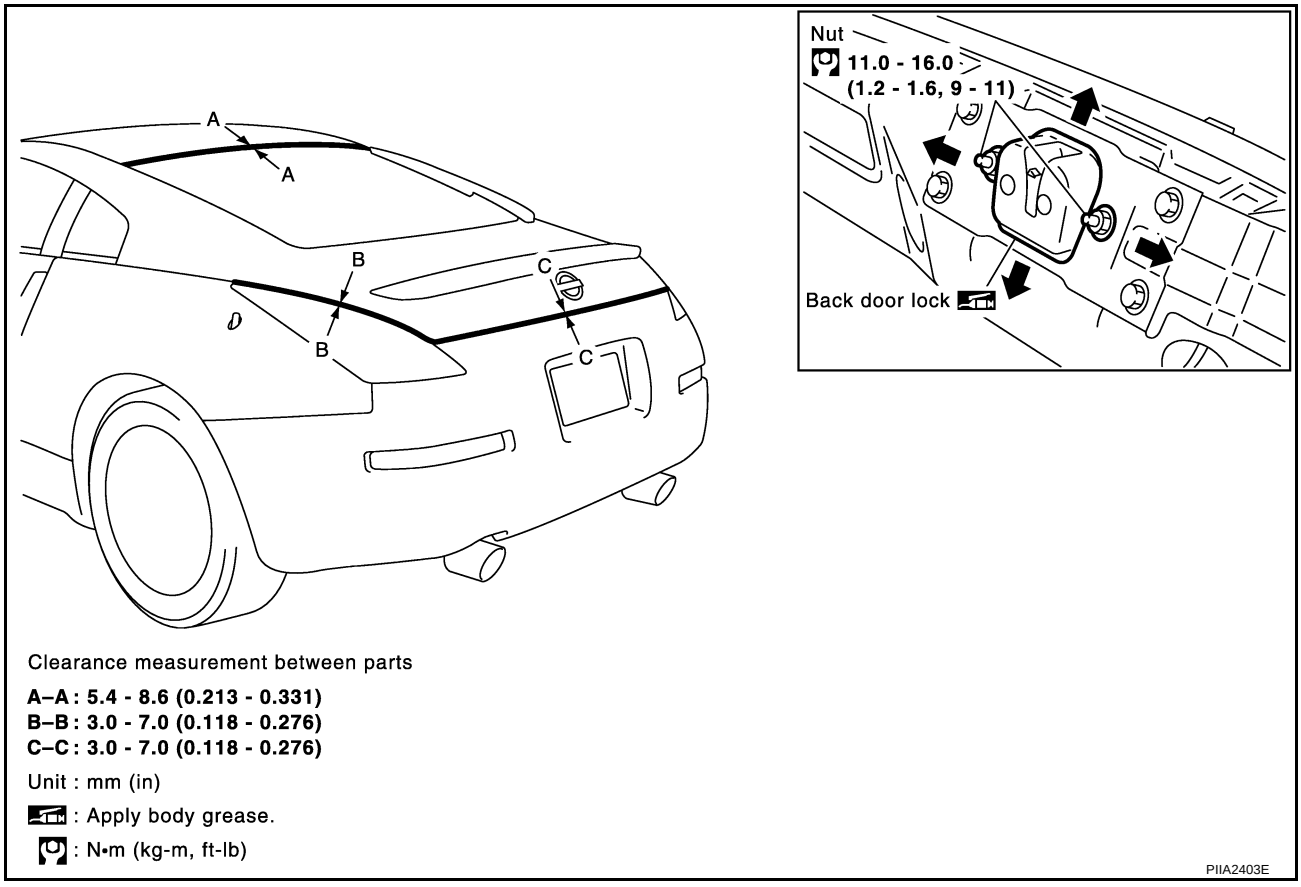
1. Align the actuator pivot with the cutout on the knob lever of the door lock assembly, then assemble the actuator.
2. Move the knob lever and the actuator pivot toward the lock-on direction, and check that it engages securely.

BACK DOOR

PFP:90100

Fitting Adjustment

NIS00025



Clearance measurement between parts

A–A : 5.4 - 8.6 (0.213 - 0.331)
B–B : 3.0 - 7.0 (0.118 - 0.276)
C–C : 3.0 - 7.0 (0.118 - 0.276)

Unit : mm (in)

: Apply body grease.

: N•m (kg-m, ft-lb)

PIIA2403E

VERTICAL/LATERAL CLEARANCE ADJUSTMENT

1. Remove back door weatherstrip. Refer to BL-103, "Removal and Installation of Back Door Weatherstrip" .
2. Remove the luggage finisher lower (center). Refer to EI-40, "LUGGAGE FLOOR TRIM" .
3. Loosen the back door lock mounting bolts. Raise the back door lock to the top position, and temporarily tighten the back door lock mounting bolt at the position.
4. Close the back door lightly and adjust the surface height, then open the back door to finally tighten the back door lock mounting bolts to the specified torque.

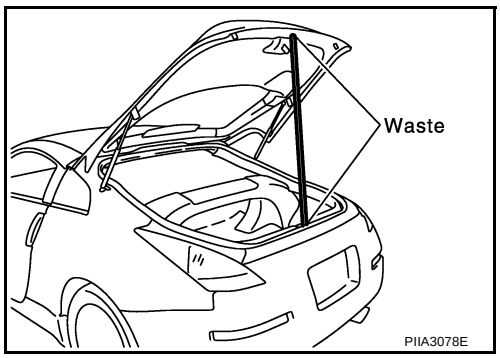
Back Door Assembly

NIS00026

REMOVAL

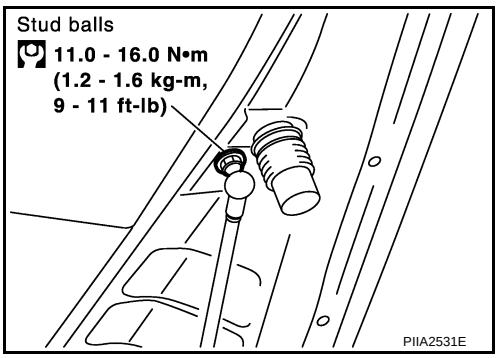
1. Remove the headlining. Refer to EI-44, "Removal and Installation (for Coupe Models)" .
2. Disconnect each harness connector, which is out to body from back door.
3. Support the back door striker with a proper material to prevent it from falling.

   WARNING:
   Body injury may occur if no supporting rod is holding the back door open when removing the damper stay.

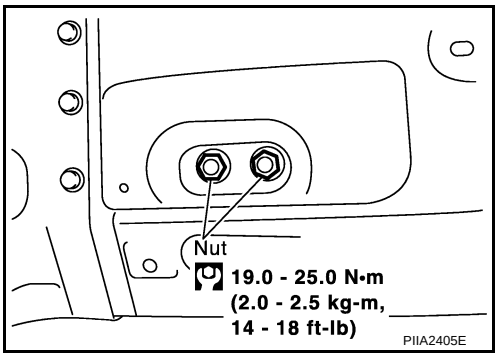


PIIA3078E

4. Remove stud balls on back door.



5. Remove hinge mount nuts of the body and remove back door assembly.



INSTALLATION

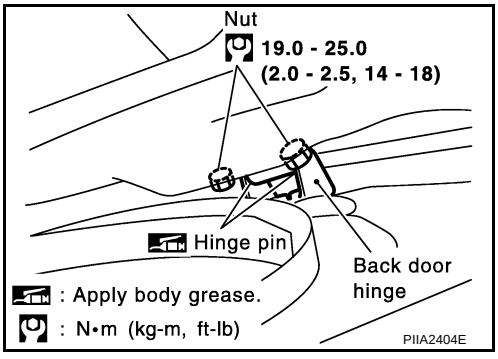
Install in the reverse order of removal.

CAUTION:

- **After installing, check operation.**
- **After installing, perform fitting adjustment.**

INSPECTION

1. Check hinges for the following items.
   - Malfunction noise or door closing and opening effort
   - Component wear or damage
2. Apply body grease to the rotating part of the hinge.

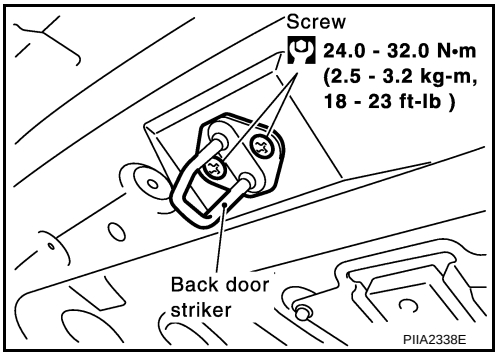


Removal and Installation of Back Door Striker

NIS00027

REMOVAL

1. Remove back door finisher lower. Refer to EI-48, "BACK DOOR FINISHER" .
2. Remove mounting screws, and remove striker from the vehicle.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

After installing, perform fitting adjustment.

Removal and Installation of Back Door Stay

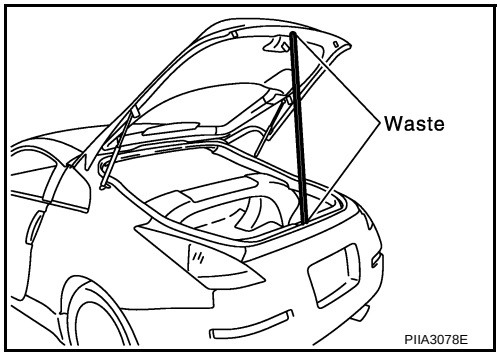
NIS00028

REMOVAL

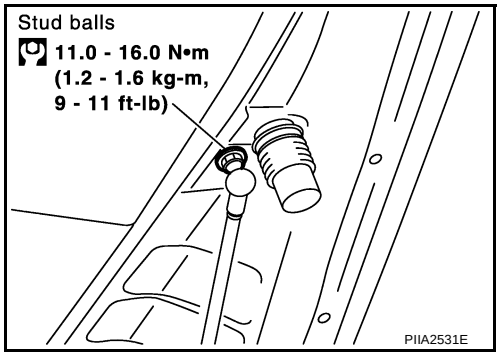
1. Support the back door striker with a proper material to prevent it from falling.

   WARNING:

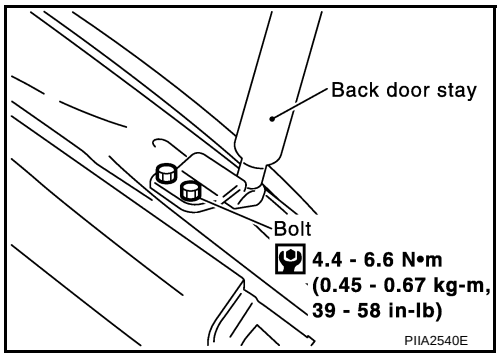
   Body injury may occur if no supporting rod is holding the back door open when removing the damper stay.



2. Remove stud balls on back door.



3. Remove back door stay assembly (gas stay) bracket adjusting nuts and remove back door stay assembly.



INSTALLATION

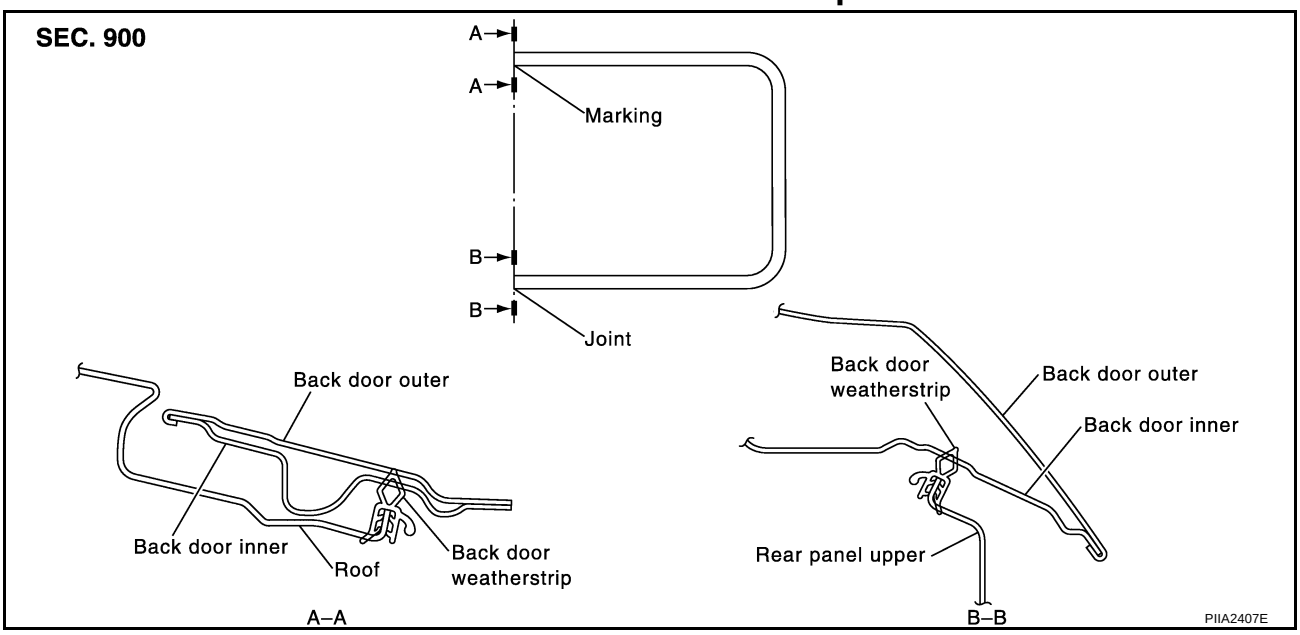
Install in the reverse order of removal.

CAUTION:

After installing, check operation.

Removal and Installation of Back Door Weatherstrip

NIS00029



REMOVAL

Pull up and remove engagement with body from weatherstrip joint.

CAUTION:

After removal, do not pull strongly on the weatherstrip.

INSTALLATION

Install in the reverse order of removal.

1. Working from the upper section, align weatherstrip mark with vehicle center position mark and install weatherstrip onto the vehicle.
2. For the lower section, align the weatherstrip seam with center of the striker.
3. After installation, pull the weatherstrip gently to ensure that there is no loose section.

   NOTE:
   Make sure the weatherstrip is fit tightly at each corner and back door rear plate.

BACK DOOR LOCK

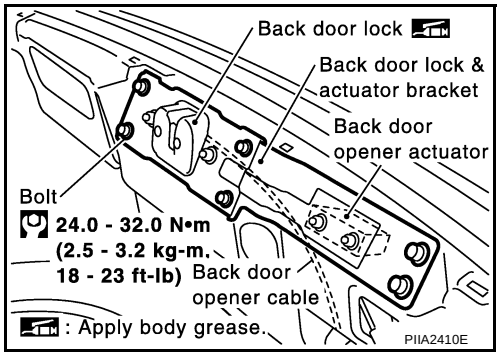
PFP:90504

Removal and Installation of Back Door Lock & Back Door Opener Actuator

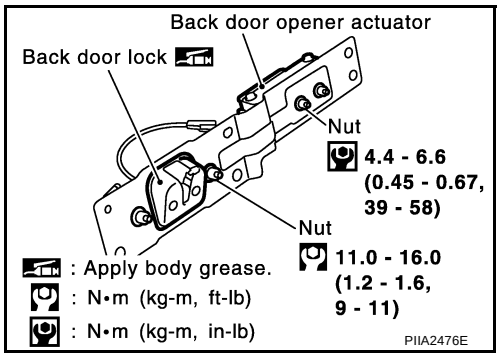
NIS0002A

REMOVAL

1. Remove back door weatherstrip. Refer to BL-103, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower (center). Refer to EI-40, "LUGGAGE FLOOR TRIM" .
3. Disconnect the connector and the clip of the back door opener.
4. Remove the mounting bolts.



5. Disconnect the connector of the back door opener actuator and back door opener cable, remove the bracket.
6. Remove the mounting nuts, remove back door lock and back door opener actuator.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **After installing, check operation.**
- **After installing, perform fitting adjustment. Refer to BL-100, "Fitting Adjustment" .**

INSPECTION

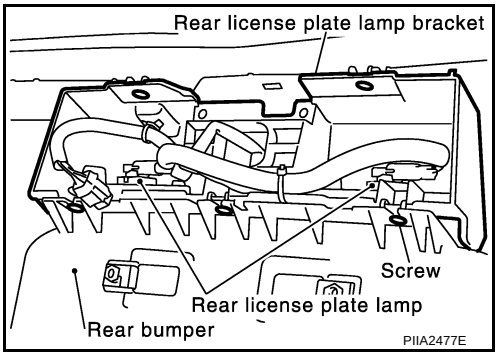
1. Check back door lock for the following items.
   - Malfunction noise or door closing and opening effort
   - Component wear or damage
2. Apply body grease to the rotating part of the back door lock.

Removal and Installation of Back Door Opener Switch (External)

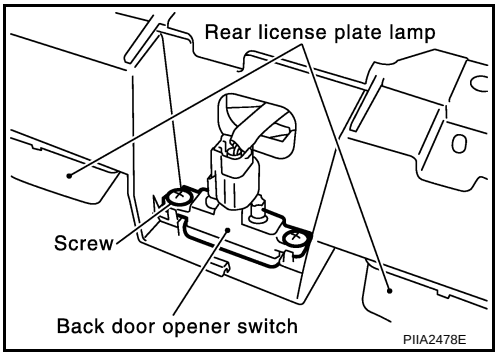
NIS0002B

REMOVAL

1. Remove rear bumper fascia assembly. Refer to EI-17, "Removal and Installation" .
2. Remove the mounting screws of the license plate bracket.



3. Remove the mounting screws and connector of the back door opener switch.

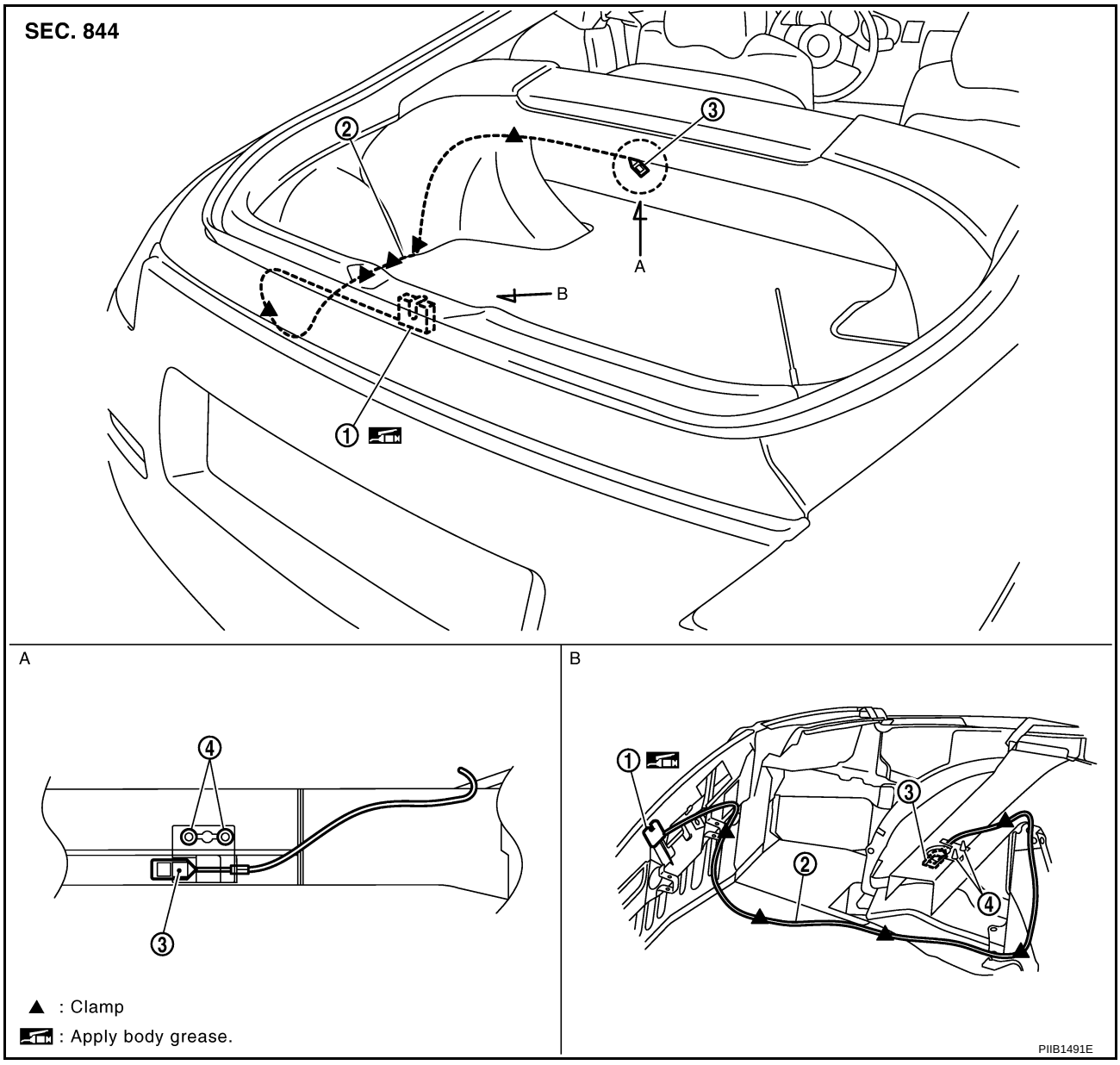


INSTALLATION

1. Install in the reverse order of removal.
2. After installing, check the operation.

Removal and Installation of Back Door Emergency Opener Cable

NIS0002C



1. Back door lock assembly
2. Back door emergency opener cable
3. hook
4. Clip

REMOVAL

1. Remove back door weather strip. Refer to BL-103, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower (center), luggage side finisher lower (LH), luggage side finisher upper (LH), trunk side box, luggage floor carpet, strut cover rear, strut cover lower (center), and strut cover lower (LH). Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Disconnect back door emergency opener cable from back door lock.
4. Disconnect back door emergency opener cable from back door emergency opener cable clamp, and then remove back door emergency opener cable.

INSTALLATION

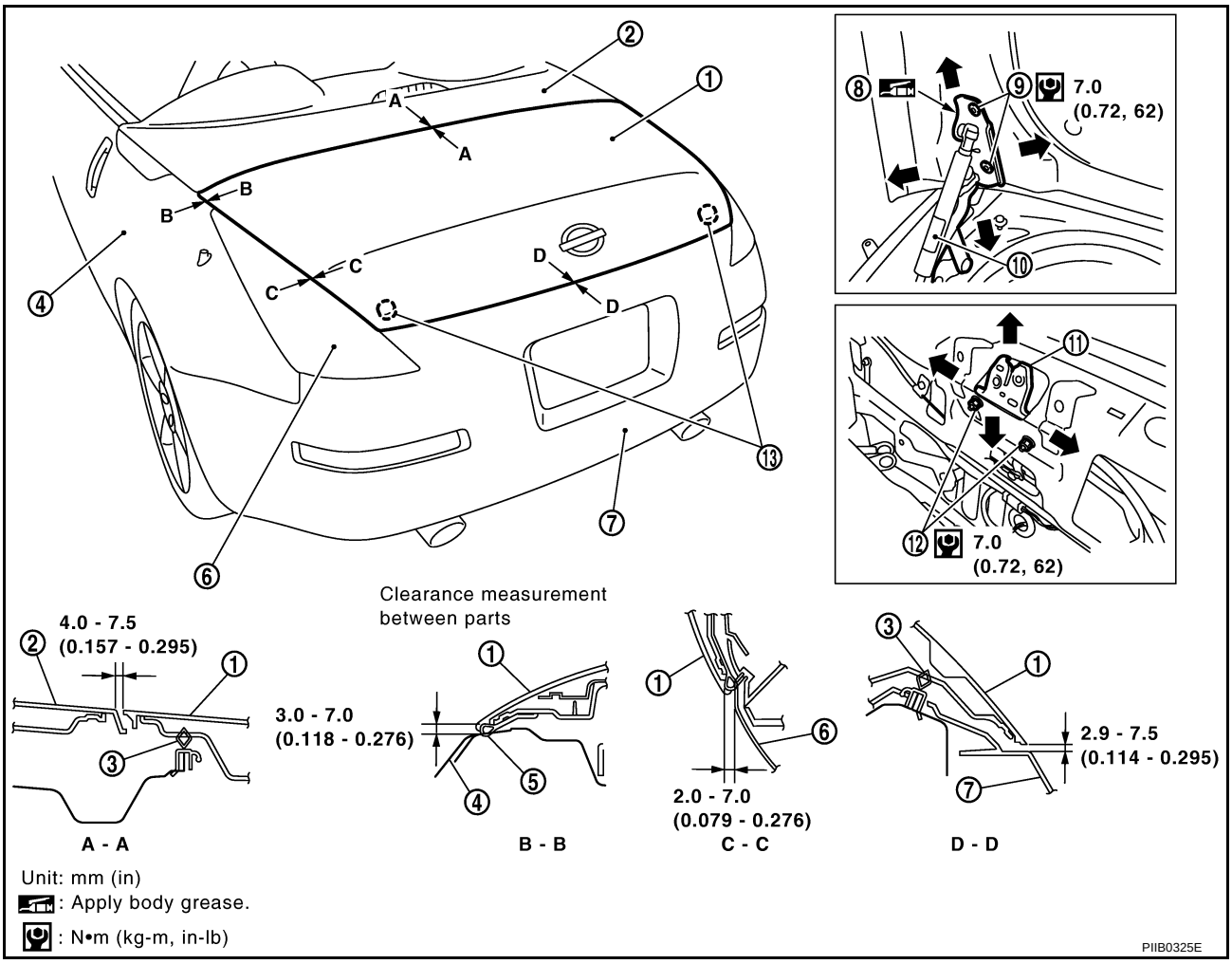
1. Install in the reverse order of removal.
2. After installing, check the operation.

TRUNK LID

PFP:H4300

Fitting Adjustment

NIS0002D



1. Trunk lid assembly
2. Storage lid
3. Trunk lid weatherstrip
4. Rear fender
5. Trunk lid moulding
6. Rear combination lamp
7. Rear bumper fascia
8. Trunk lid hinge
9. TORX bolt (T30)
10. Trunk lid stay
11. Trunk lid lock assembly
12. Nut
13. Bumper rubber

LONGITUDINAL AND LATERAL CLEARANCE ADJUSTMENT

1. Remove trunk rear finisher. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
2. Loosen trunk lid hinge mounting bolts, and remove trunk lid lock. And then, close trunk lid.
3. Tighten trunk lid hinge mounting bolts to the specified torque after adjusting lateral clearance and clearance to storage lid and rear bumper fascia.
4. Position trunk lid lock and engage trunk lid striker. Check trunk lid striker and trunk lid lock for looseness.
5. Tighten trunk lid mounting bolts to the specified torque.

SURFACE HEIGHT ADJUSTMENT

1. Remove trunk rear finisher. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER"
2. Remove trunk lid lock. Rotate bumper rubber to adjust height between trunk lid and bumper fascia.
3. Position trunk lid lock and engage trunk lid striker. Check trunk lid striker and trunk lid lock for looseness. Tighten trunk lid mounting bolts to the specified torque.
4. Adjust lateral clearance and surface height between trunk lid and other parts so that they are within the following dimensional difference.

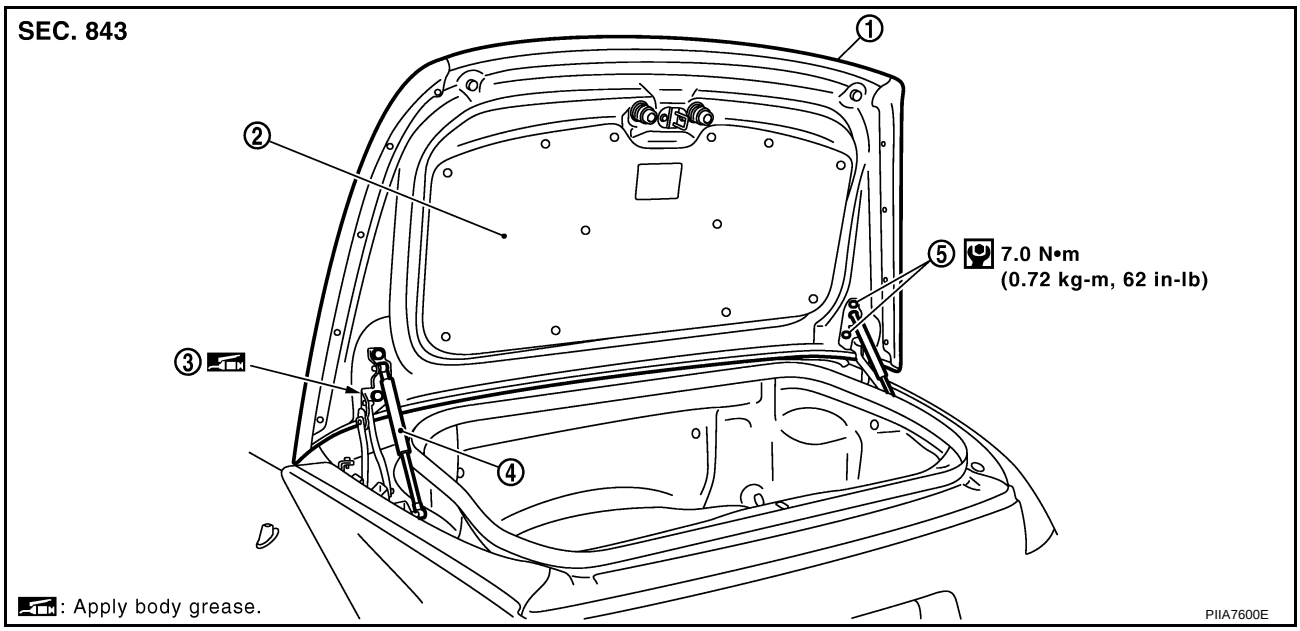
CAUTION:

Adjust evenness between trunk lid and each part to the following specification.

Trunk lid and storage lid (A–A) : 0 ± 1.0 mm (0 ± 0.04 in)
Trunk lid and rear bumper fascia (D–D) : 0.85 ± 2.1 mm (0.0335 ± 0.083 in)

Removal and Installation of Trunk Lid Assembly

NIS0002E

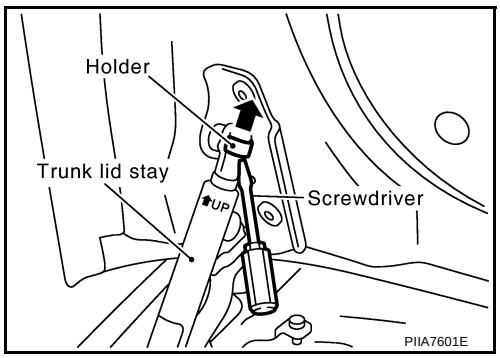


1. Trunk lid assembly
2. Trunk lid insulator
3. Trunk lid hinge
4. Trunk lid stay
5. TORX bolt (T30)

CAUTION:
Operate with two workers, because of its heavy weight.

REMOVAL

1. Screwdriver into the gap and remove holder.
2. Remove trunk lid stay (gas stay).
3. Remove the trunk lid hinge bolts, trunk lid assembly side and remove the trunk lid assembly.



INSTALLATION

Note the following, and install in the reverse order of removal.
Install holder to trunk lid stay, and then push it into trunk lid hinge (stud ball) when installing trunk lid stay.

CAUTION:

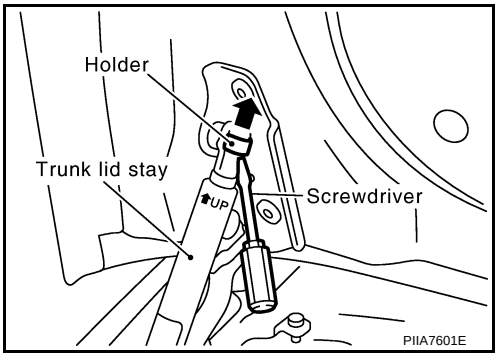
- **Check trunk lid open/close operation after installation**
- **Apply sealant and coat with the same body color paint to trunk lid hinge installation part and mounting bolts.**

Removal and Installation of Trunk Lid Stay

NIS0002F

REMOVAL

1. Screwdriver into the gap and remove holder.
2. Remove trunk lid stay.



INSTALLATION

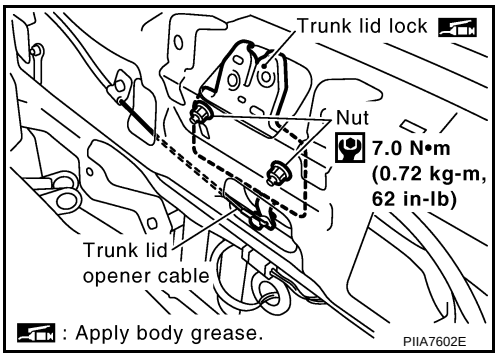
1. Note the following, and install in the reverse order of removal.
   Install holder to trunk lid stay, and then push it into trunk lid hinge (stud ball) when installing trunk lid stay.
2. After installation, check the operation.

Removal and Installation of Trunk Lid Lock Assembly

NIS0002G

REMOVAL

1. Remove the trunk lid weatherstrip. Refer to BL-113, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk lid release lever. Refer to EI-49, "Removal and Installation (for Roadstar Models)" .
3. Remove the trunk lid finisher. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
4. Disconnect the release lever cable and trunk lid opener cable from the clip.
5. After removing the harness connector, remove the mounting bolts, and remove the trunk lid lock.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

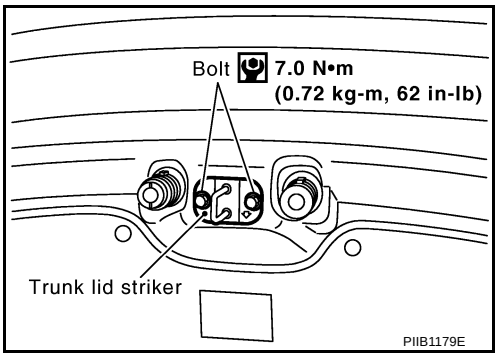
- **After installing, close the trunk lid height. Perform the lock and surface height adjustment. Refer to BL-107, "Fitting Adjustment" .**
- **After installing, check the operation.**

Removal and Installation of Trunk Lid Striker

NIS0002H

REMOVAL

Remove the mounting bolts, then remove the striker from the trunk lock support.

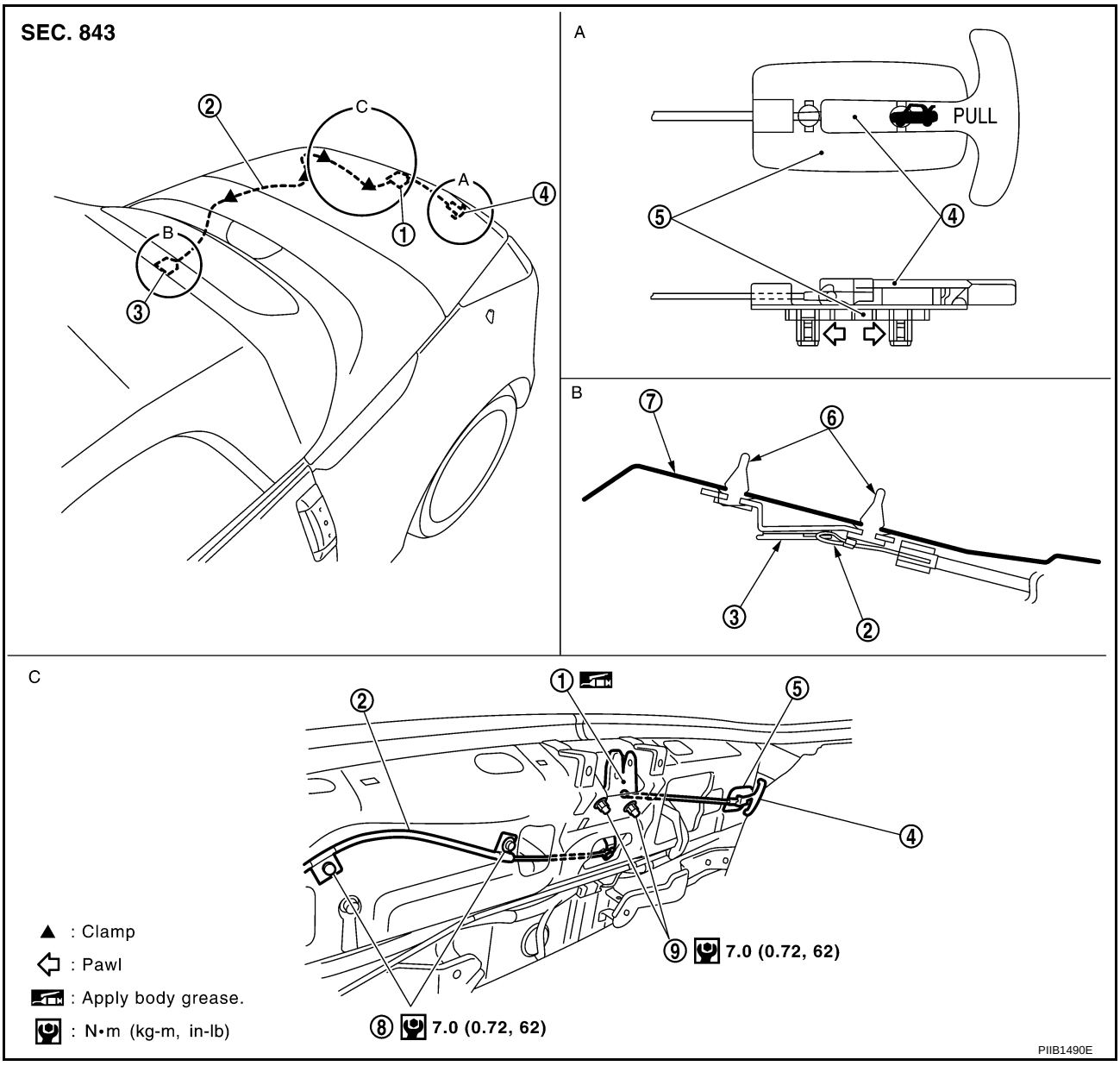


INSTALLATION

1. Install in the reverse order of removal.
2. After installing, close the trunk lid height. Perform the lock and surface height adjustment. Refer to BL-107, "Fitting Adjustment" .
3. After installation, check the operation.

Removal and Installation of Trunk Lid Emergency Opener Cable

NIS0002I



1. Trunk lid lock assembly	2. Trunk lid emergency opener cable	3. Trunk lid emergency opener cable hook
4. Trunk lid emergency opener lever (secondary)	5. Trunk lid emergency opener lever holder	6. Clip
7. Panel	8. Bolt	9. Nut

REMOVAL

1. Remove trunk lid weatherstrip. Refer to BL-113, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk floor carpet, spare tire cover, trunk rear finisher, trunk front finisher, and trunk side box. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
3. Remove floor box lid. Refer to EI-41, "Removal and Installation (for Roadster Models)" .
4. Disconnect trunk lid emergency opener cable from trunk lid lock.
5. Disconnect each clamp of trunk lid emergency opener cable.

INSTALLATION

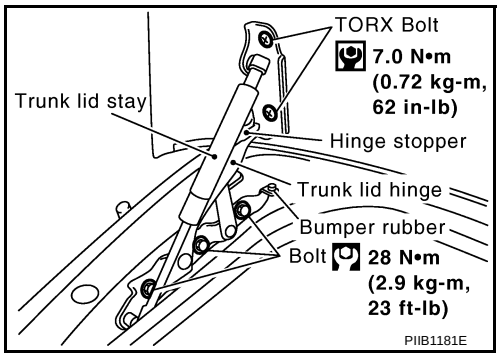
Install in the reverse order of removal.

Removal and Installation of Trunk Lid Hinge

NIS0002J

REMOVAL

1. Remove trunk lid stay. Refer to BL-109, "Removal and Installation of Trunk Lid Stay" .
2. Remove trunk lid assembly. Refer to BL-108, "Removal and Installation of Trunk Lid Assembly" .
3. Remove trunk lid hinge mounting bolts, and then remove trunk lid hinge.



INSTALLATION

1. Position trunk lid hinge to body side. Temporarily tighten front side bolt and rear side bolt in this order, and then tighten them to the specified torque.
2. Install trunk lid to trunk lid hinge.
3. Install trunk lid stay.

CAUTION:

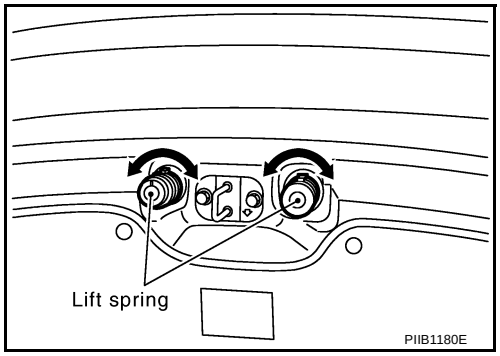
- **Before installing trunk lid hinge, apply anticorrosive agent onto the mounting surface of the vehicle body.**
- **After installation, perform trunk lid fitting adjustment. Refer to BL-107, "Fitting Adjustment" .**
- **Check trunk lid open/close operation after installation.**
- **Apply sealant and the same body color paint to trunk lid hinge and mounting bolts to cover broken seal area.**

Removal and Installation of Lift Spring

NIS0002K

REMOVAL

Rotate lift spring bottom clockwise/counterclockwise by approximately 90 deg, and then remove lift spring.

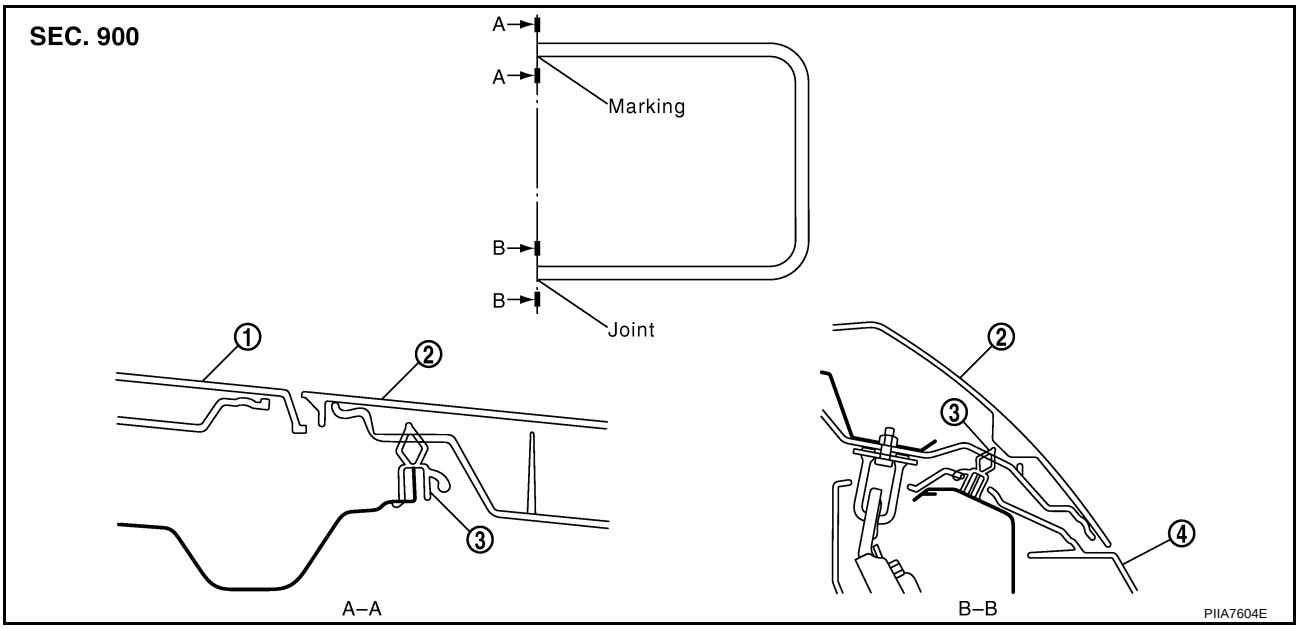


INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Trunk Lid Weatherstrip

NIS0002L



1. Storage lid
2. Trunk lid assembly
3. Trunk lid weatherstrip
4. Rear bumper fascia

REMOVAL

Pull up and remove engagement with body from weatherstrip joint.

CAUTION:

After removal, do not pull strongly on the weatherstrip.

INSTALLATION

Install in the reverse order of removal.

1. Install the weatherstrip from the front with the vehicle center mark aligned to the weatherstrip mark.
2. At rear side, align the weatherstrip seam to the center of the striker.
3. After installing, pull the weatherstrip lightly to check for looseness.

   CAUTION:

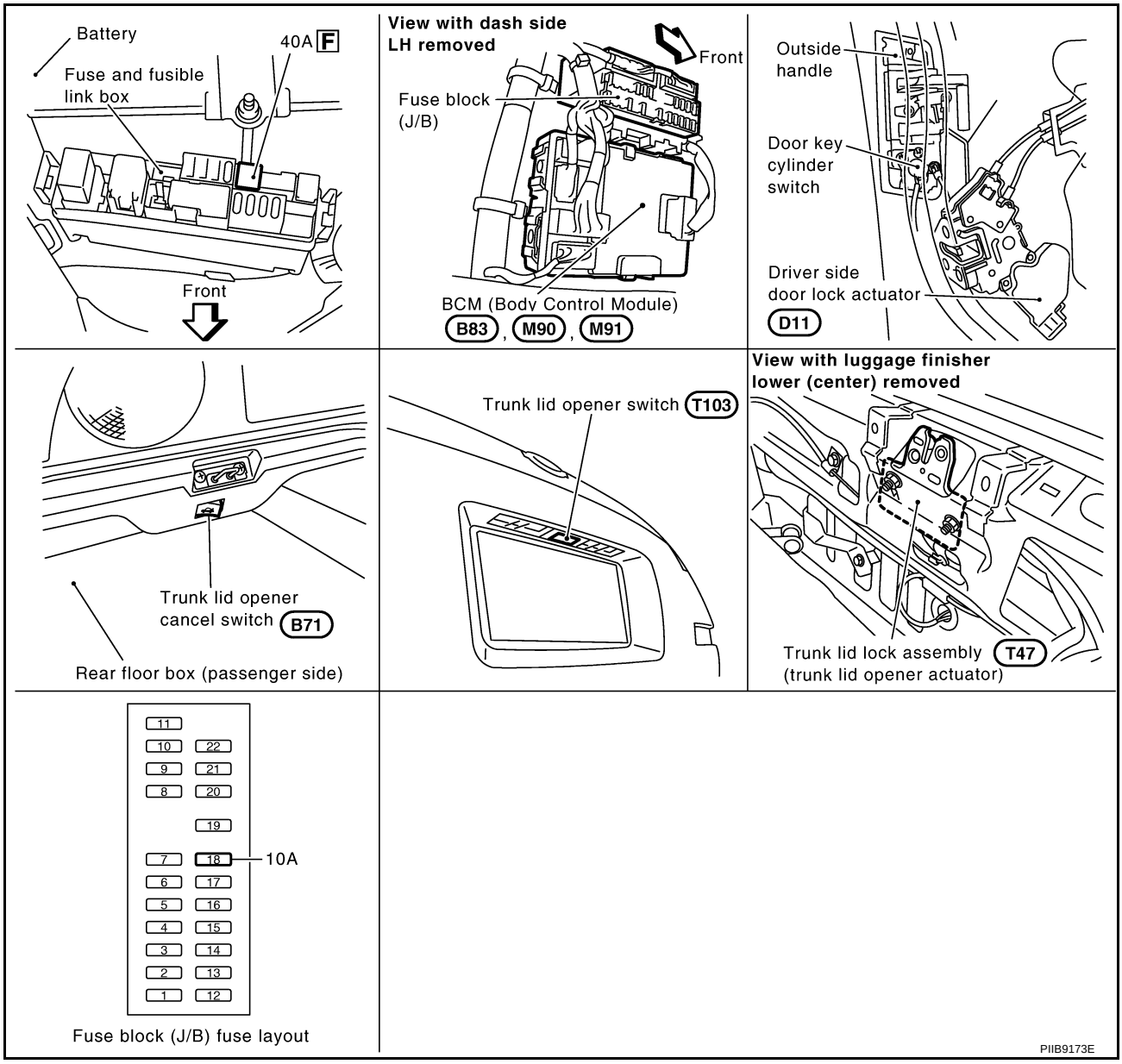
   The weatherstrip should fit tightly onto the corners and trunk lid rear plate.

TRUNK LID OPENER

PFP:84640

Component Parts and Harness Connector Location

NIS0002M



System Description

NIS0002N

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

Ground is supplied

- to BCM terminal 52
- through body grounds M30 and M66.

When trunk lid opener switch is ON (pushed) with trunk lid opener cancel switch is ON and driver's door unlocked, ground is supplied

- to BCM terminal 30
- through trunk lid opener cancel switch terminals 1 and 2,
- through trunk lid opener switch terminals 1 and 2,

- through driver side door lock actuator (unlock sensor) terminals 2 and 4,
- through grounds M30 and M66.

And power is supplied

- to BCM terminal 68
- through trunk lid lock assembly (trunk lid opener actuator) terminals 2 and 1
- through grounds B5, B6 and T14.

Then trunk lid lock assembly (trunk lid opener actuator) opens trunk.

TRUNK LID OPENER CANCEL OPERATION

When trunk lid opener cancel switch is OFF (CANCEL), it cannot open trunk with trunk lid opener switch.

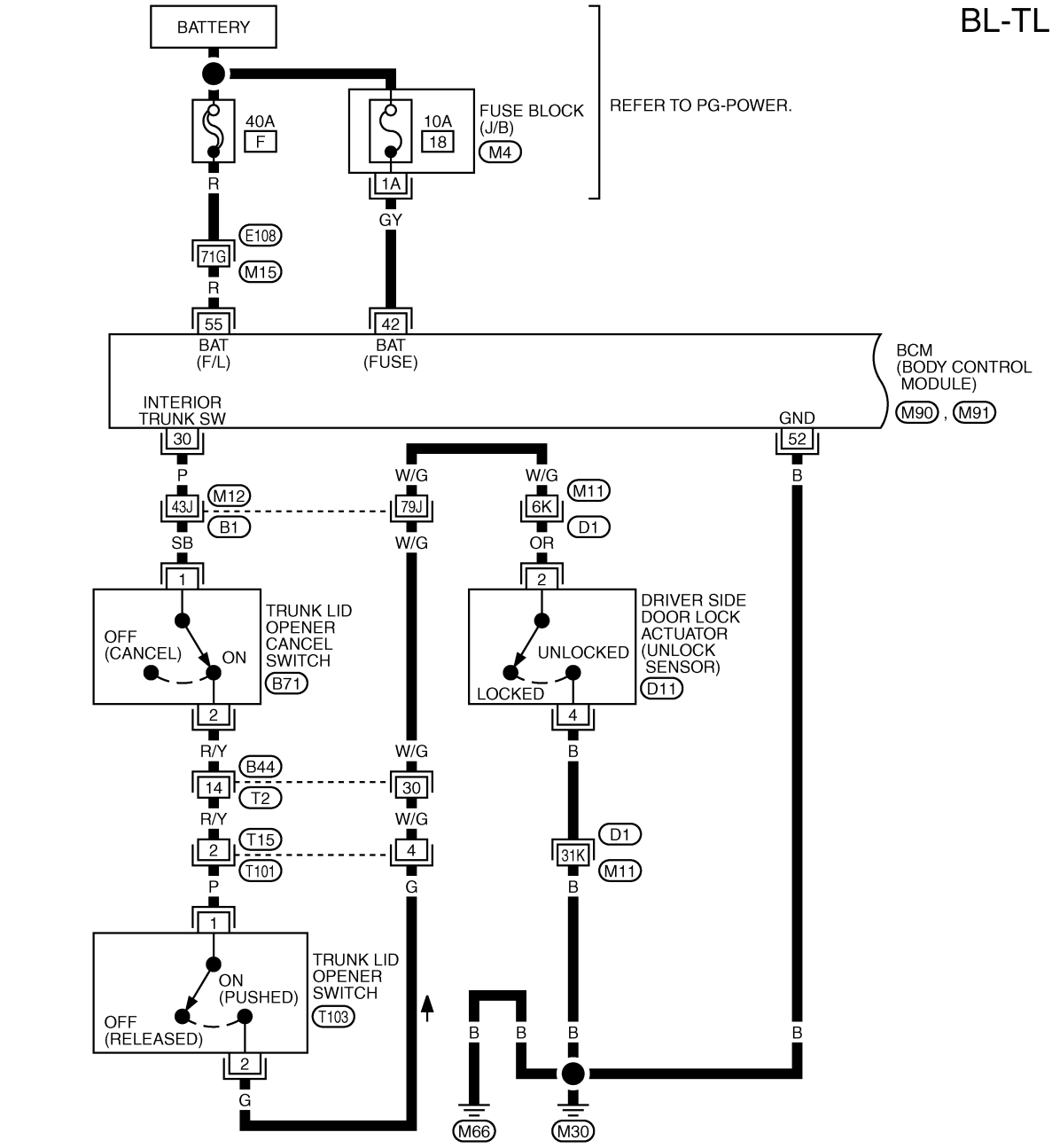
TRUNK OPENER OPERATION WITH KEY FOB

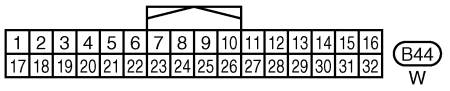
Open the trunk with key fob. Refer to BL-63, "Trunk Opener Operation/For Roadster" .

Wiring Diagram—T/LID—

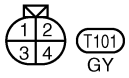
NIS0002O

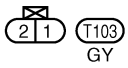
BL-TLID-01









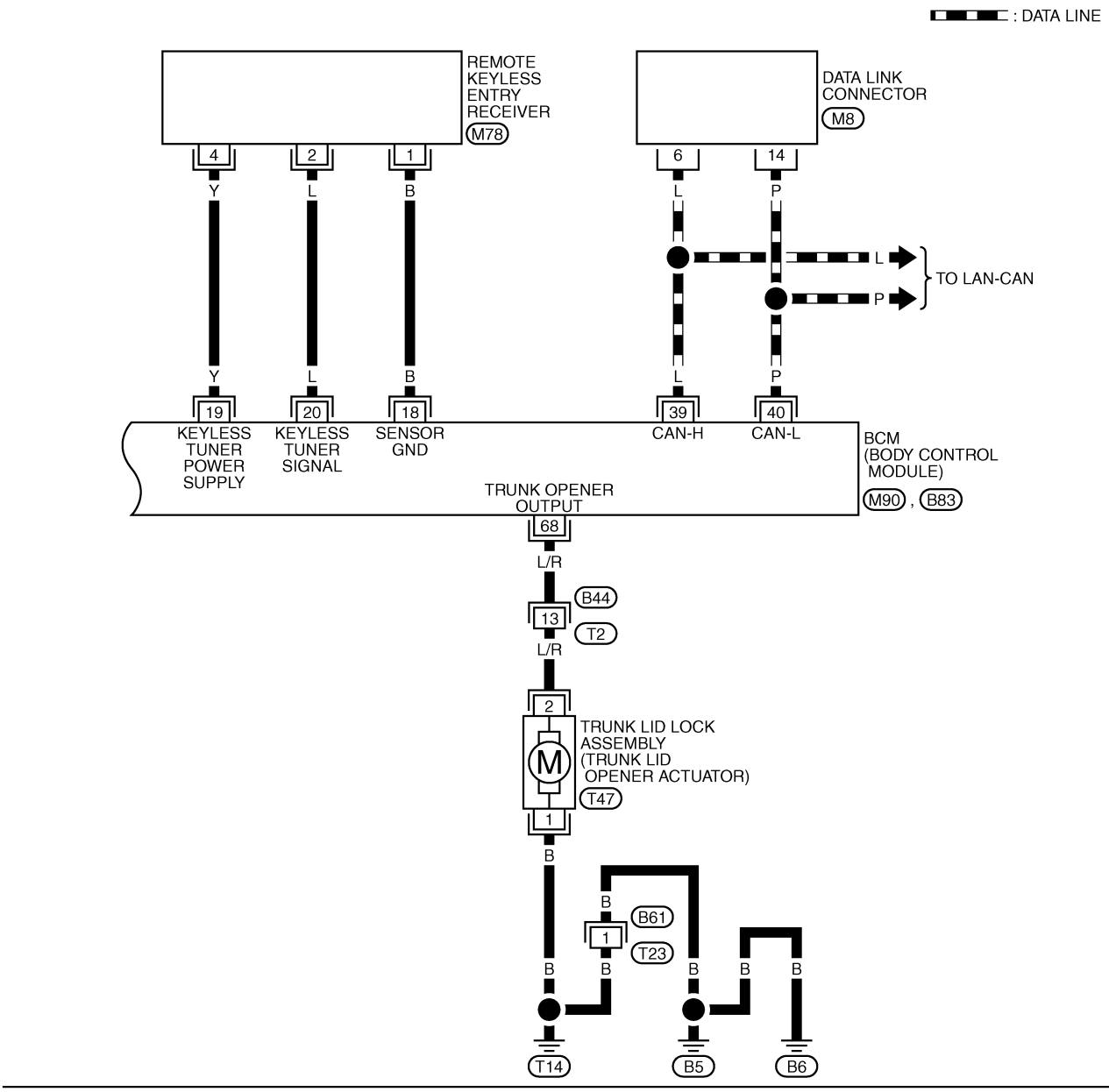


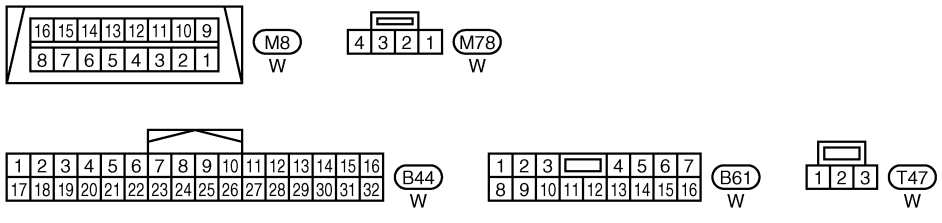


REFER TO THE FOLLOWING.
E108 , B1 , D1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 -ELECTRICAL UNITS

TIWT2267E

BL-TLID-02



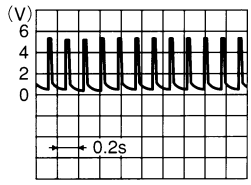
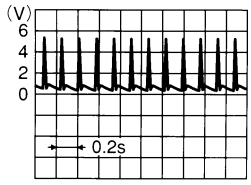
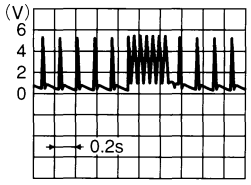


REFER TO THE FOLLOWING.
M90 , B83 -ELECTRICAL UNITS

TIWT2198E

Terminals and Reference Value for BCM

NIS0002P

Terminal	Wire color	Item	Signal input/output	Condition		Voltage (V) (Approx.)
18	B	Remote keyless entry receiver (Ground)	—	—		0
19	Y	Remote keyless entry receiver (Power supply)	Output	Key is inserted in IGN key cylinder		0
				All door closed		 OCC3881D
20	L	Remote keyless entry receiver (Signal)	Input	Key is inserted in IGN key cylinder		0
				Waiting (All door closed)		 OCC3879D
				When signal is received (All door closed)		 OCC3880D
30	P	Trunk lid opener switch	Input	Trunk lid opener cancel switch is ON	Trunk lid opener switch is ON	0
					Trunk lid opener switch is OFF	5
				Driver side door is locked	Trunk lid opener cancel switch is OFF	5
39	L	CAN – H	Input/Output	—		—
40	P	CAN – L	Input/Output	—		—
42	GY	Ignition switch (ON)	Input	Ignition switch ON or START position		Battery voltage
52	B	Ground	—	—		0
55	R	Power source (Fusible link)	Input	—		Battery voltage
68	L/R	Trunk lid opener release output signal	Output	Closed (OFF) → Opened (ON)		0 → Battery voltage

CONSULT-III Function (BCM)

NIS0002Q

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis part	Inspection item, self-diagnosis mode	Content
Trunk	DATA MONITOR	Displays the input data of BCM in real time basis.
	ACTIVE TEST	Give a drive signals to load to check the operation check.

ACTIVE TEST

Test item	Content
TRUNK/BACK DOOR	This test is able to check trunk lid opener actuator unlock operation. This actuator unlocks when “ON” on CONSULT-III screen is touched.

Trouble Diagnosis

NIS0002R

TRUNK DOSE NOT OPEN WITH TRUNK LID OPENER SWITCH

1. CHECK TRUNK LID OPENER CANCEL SWITCH

Check trunk lid opener cancel switch position.

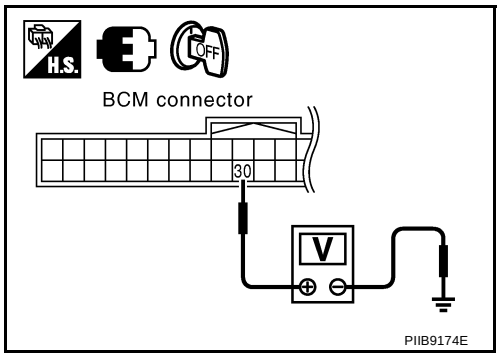
Is trunk lid opener cancel switch in ON position?

Yes or No

Yes >> GO TO 2.
No >> Turn on trunk lid opener cancel switch.

2. CHECK TRUNK LID OPEN INPUT SIGNAL

1. Remove Key from ignition key cylinder.
2. Unlock driver side door.
3. Check voltage between BCM and ground.



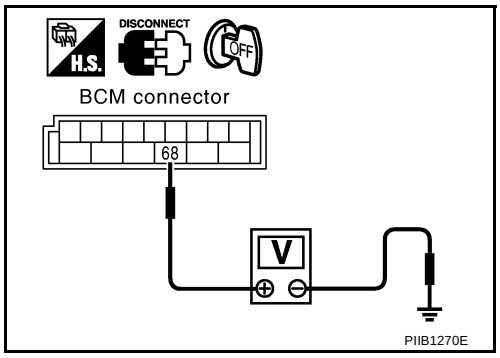
Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Trunk lid opener switch ON	0
			Trunk lid opener switch OFF	5

OK or NG

OK >> GO TO 3.
NG >> GO TO 6.

3. CHECK TRUNK LID OPEN OUTPUT SIGNAL

Check voltage between BCM and ground.



Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
B83	68 (L/R)	Ground	Trunk lid opener switch ON	Battery voltage
			Trunk lid opener switch OFF	0

OK or NG

OK >> GO TO 4.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

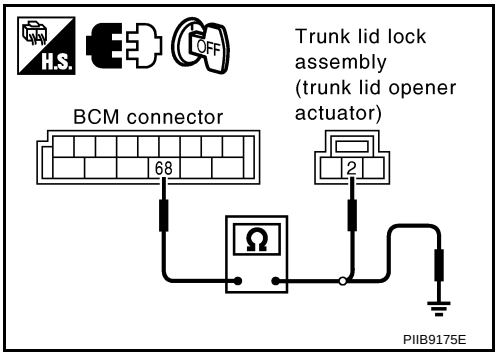
4. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK LID OPENER ACTUATOR) CIRCUIT

1. Disconnect BCM connector and trunk lid lock assembly (trunk lid opener actuator) connector.
2. Check continuity between BCM harness connector B83 terminal 68 and trunk lid lock assembly (trunk lid opener actuator) harness connector T47 terminal 2.

68 (L/R) - 2 (L/R) : Continuity should exist.

3. Check continuity between BCM harness connector B83 terminal 68 and ground.

68 (L/R) - ground : Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

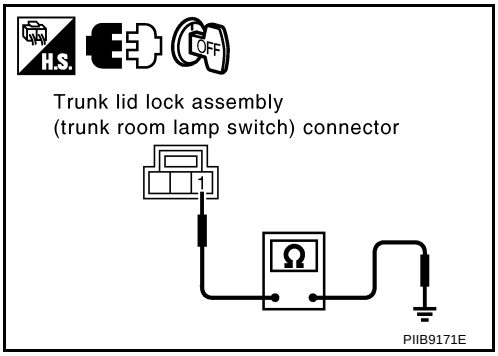
5. CHECKTRUNK LID LOCK ASSEMBLY (TRUNK LID OPENER ACTUATOR) GROUND CIRCUIT

Check continuity between trunk lid lock assembly (trunk lid opener actuator) harness connector T47 terminal 1 and ground.

1 (B) - ground : Continuity should exist.

OK or NG

OK >> Replace trunk lid lock assembly (trunk lid opener actuator).
NG >> Repair harness or connector.



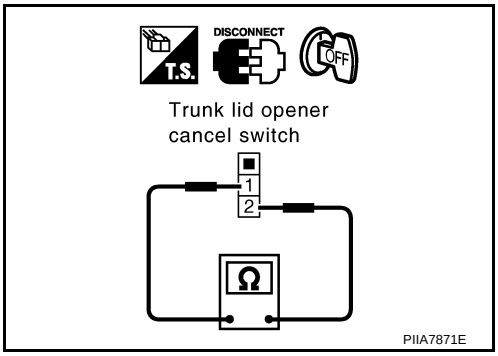
6. CHECK TRUNK LID OPENER CANCEL SWITCH

1. Disconnect trunk lid opener cancel switch.
2. Check continuity between trunk lid opener cancel switch harness connector B71 terminals 1 and 2.

Terminals		Trunk lid opener cancel switch condition	Continuity
1	2	ON	Yes
		OFF	No

OK or NG

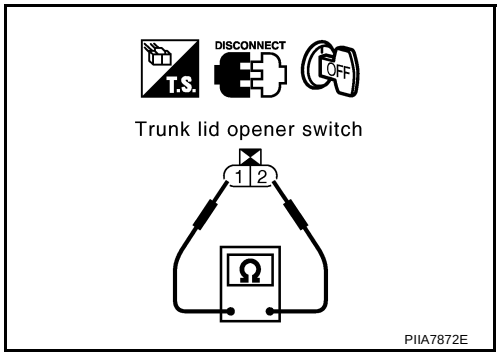
OK >> GO TO 7.
NG >> Replace trunk lid opener cancel switch.



7. CHECK TRUNK LID OPENER SWITCH

1. Disconnect trunk lid opener switch
2. Check continuity between trunk lid opener switch harness connector T103 terminals 1 and 2.

Terminals		Trunk lid opener switch condition	Continuity
1	2	ON (Pushed)	Yes
		OFF (Released)	No



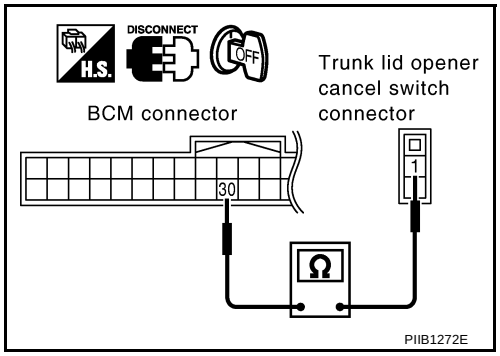
OK or NG

OK >> GO TO 8.
NG >> Replace trunk lid opener switch.

8. CHECK TRUNK LID OPENER CANCEL SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 30 and trunk lid opener cancel switch harness connector B71 terminal 1.

30 (P) - 1 (SB) : Continuity should exist.



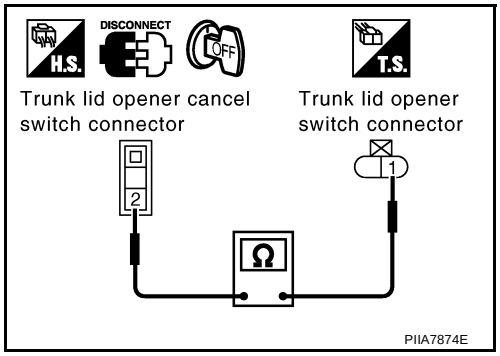
OK or NG

OK >> GO TO 9.
NG >> Repair harness or connector.

9. CHECK TRUNK LID OPENER SWITCH CIRCUIT

Check continuity between trunk lid opener cancel switch harness connector B71 terminal 2 and trunk lid opener switch harness connector T103 terminal 1.

2 (R/Y) - 1 (P) : Continuity should exist.



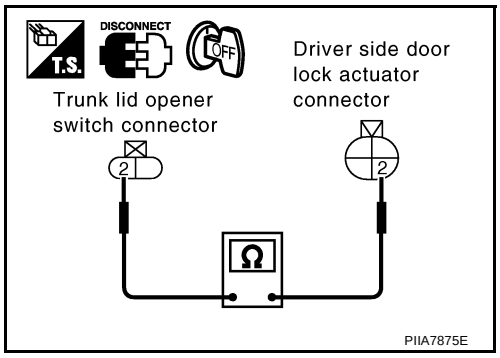
OK or NG

OK >> GO TO 10.
NG >> Repair harness or connector.

10. CHECK DRIVER SIDE DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between trunk lid opener switch harness connector T103 terminal 2 and driver side door lock actuator switch harness connector D11 terminal 2.

2 (G) - 2 (OR) : Continuity should exist.



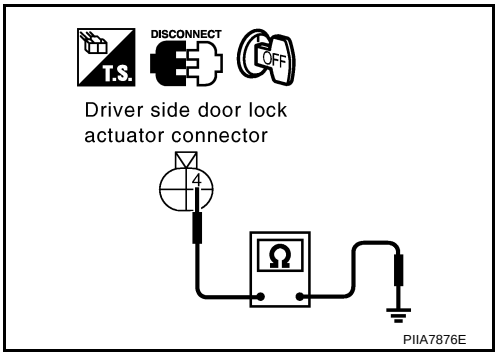
OK or NG

OK >> GO TO 11.
NG >> Repair harness or connector.

11. CHECK DRIVER SIDE DOOR LOCK ACTUATOR GROUND CIRCUIT

Check continuity between driver side door lock actuator switch harness connector D11 terminal 4 and ground.

4 (B) - ground : Continuity should exist.



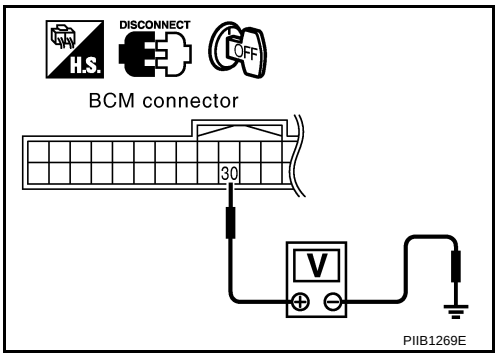
OK or NG

OK >> Replace driver side door lock actuator.
NG >> Repair harness or connector.

TRUNK DOSE NOT CLOSE

1. CHECK TRUNK LID OPEN INPUT SIGNAL

1. Remove Key from ignition key cylinder.
2. Turn on trunk lid opener cancel switch.
3. Unlock driver side door.
4. Check voltage between BCM and ground.



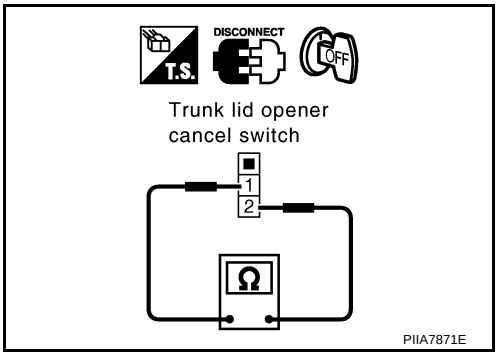
Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(–)		
M90	30 (P)	Ground	Trunk lid opener switch ON	0
			Trunk lid opener switch OFF	5

OK or NG

OK >> GO TO 2.
NG >> Replace BCM.

2. CHECK TRUNK LID OPENER CANCEL SWITCH

1. Disconnect trunk lid opener cancel switch.
2. Check continuity between trunk lid opener cancel switch harness connector B71 terminals 1 and 2.



Terminals		Trunk lid opener cancel switch condition	Continuity
1	2	ON	Yes
		OFF	No

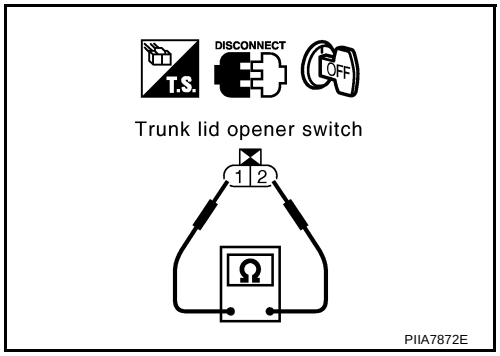
OK or NG

OK >> GO TO 3.
NG >> Replace trunk lid opener cancel switch.

3. CHECK TRUNK LID OPENER SWITCH

1. Disconnect trunk lid opener switch
2. Check continuity between trunk lid opener switch harness connector T103 terminals 1 and 2.

Terminals		Trunk lid opener switch condition	Continuity
1	2	ON (Pushed)	Yes
		OFF (Released)	No



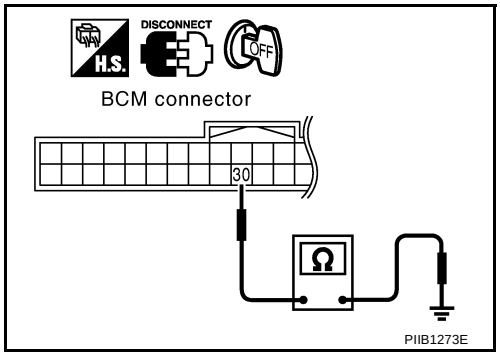
OK or NG

OK >> GO TO 4.
NG >> Replace trunk lid opener switch.

4. CHECK TRUNK LID OPENER CANCEL SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 30 and ground.

30 (P) - ground : Continuity should not exist.



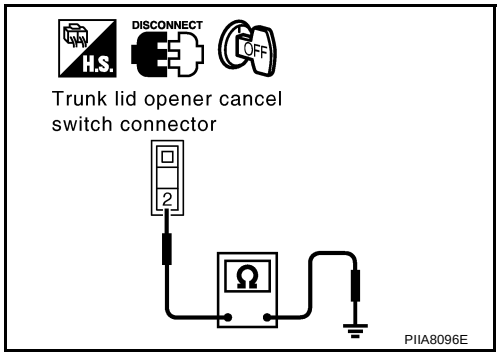
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK TRUNK LID OPENER SWITCH CIRCUIT

Check continuity between trunk lid opener cancel switch harness connector B71 terminal 2 and ground.

2 (R/Y) - ground : Continuity should not exist.



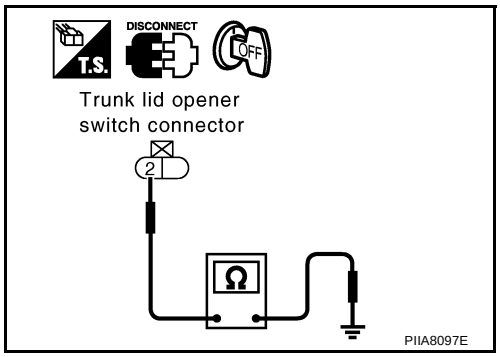
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK DRIVER SIDE DOOR LOCK ACTUATOR CIRCUIT

1. Disconnect driver side door lock actuator connector.
2. Check continuity between trunk lid opener switch harness connector T103 terminal 2 and ground.

2 (G) - ground : Continuity should not exist.



OK or NG

OK >> Replace BCM.
NG >> Repair harness or connector.

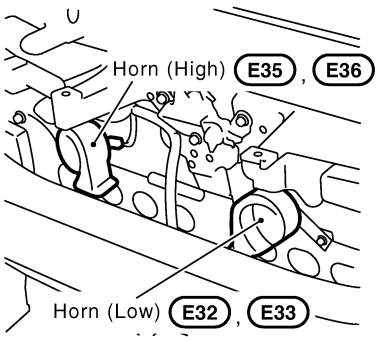
VEHICLE SECURITY (THEFT WARNING) SYSTEM

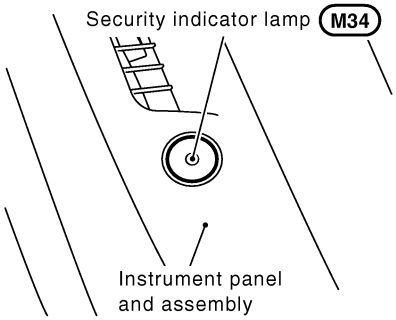
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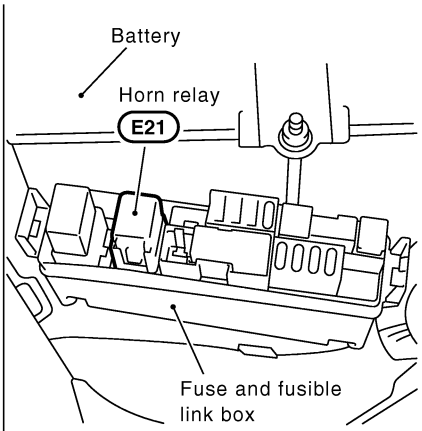
Component Parts and Harness Connector Location

NIS0002S

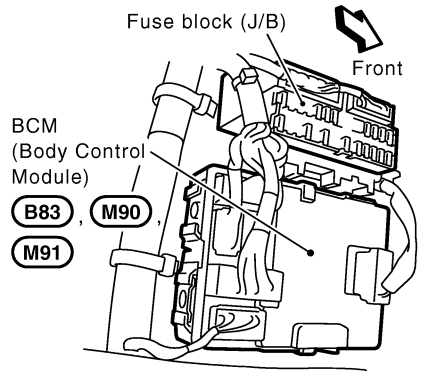
View with front bumper removed



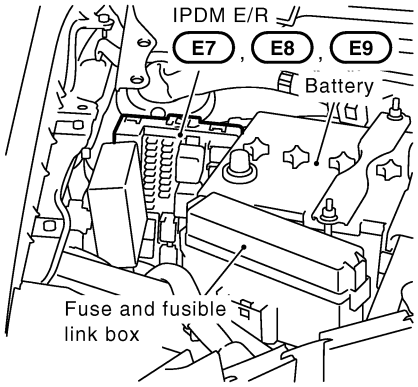


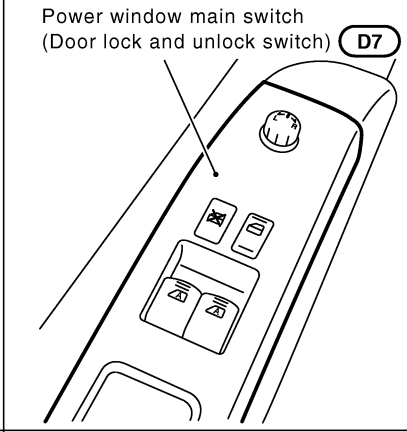


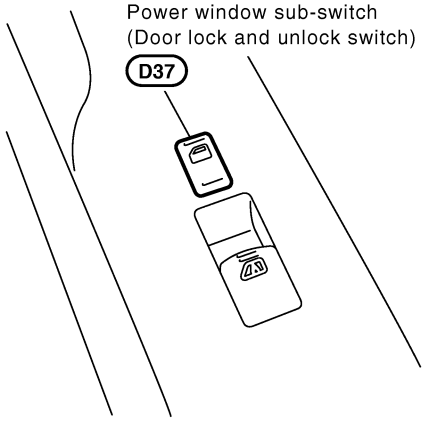
View with dash side LH removed



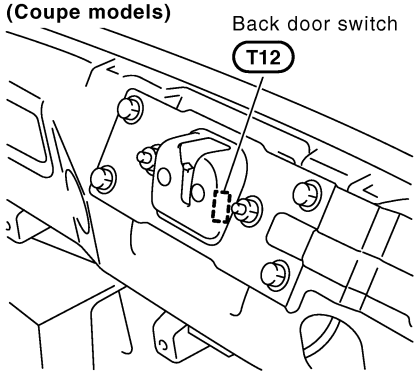
View with cowl top removed

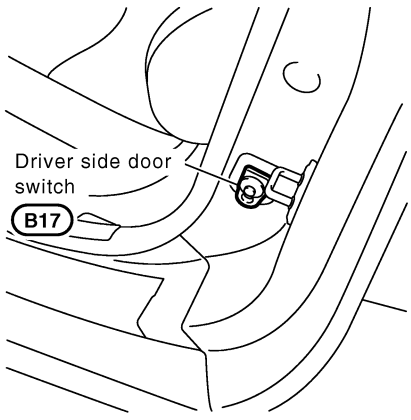


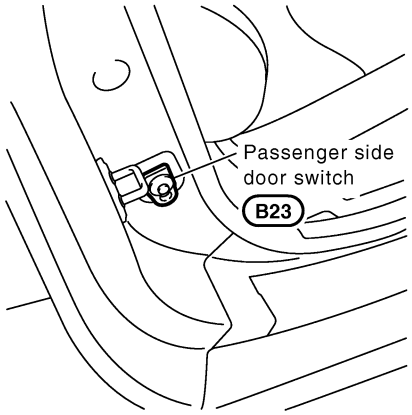




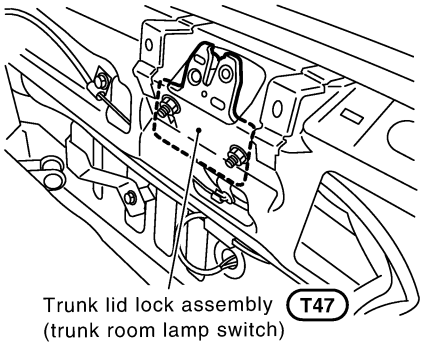
View with luggage finisher rear (Coupe models)







View with luggage finisher lower (center) removed



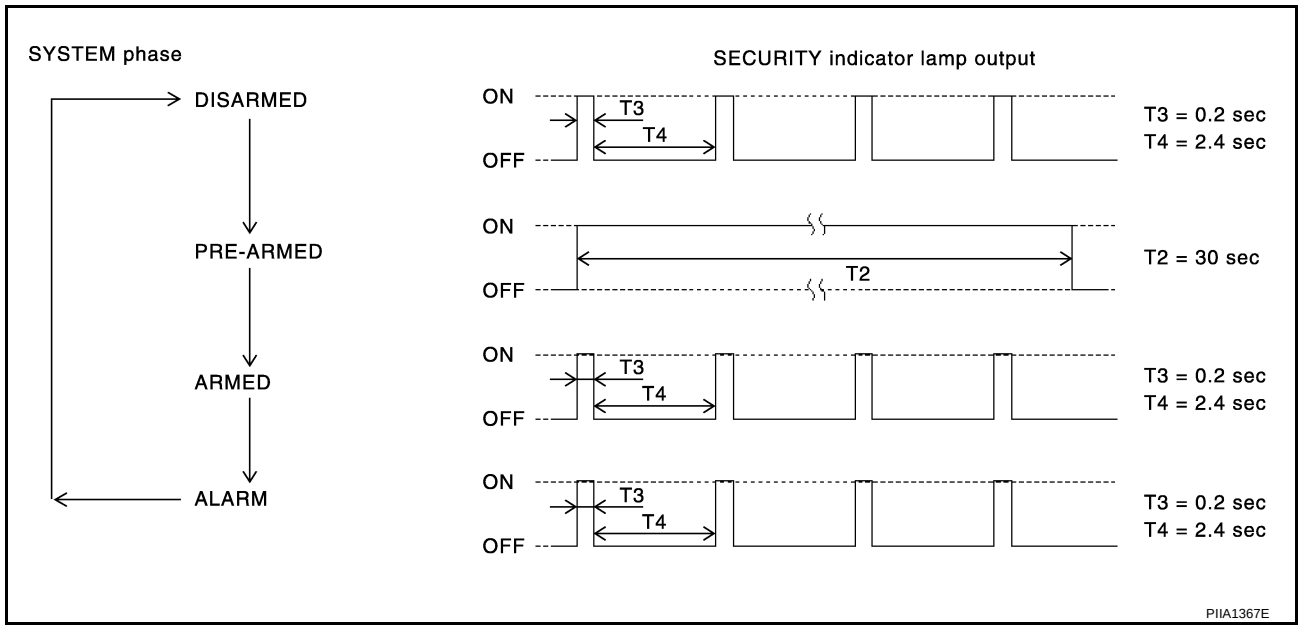
PIIB9256E

System Description

NIS0002T

DESCRIPTION

Operation Flow



Setting the vehicle security system

Initial condition

- Ignition switch is in OFF position.

Disarmed phase

- When hood, doors, back door (for Coupe) or trunk (for Roadster) is open, the vehicle security system is set in the disarmed phase on the assumption that the owner is inside or near the vehicle.
- When the vehicle security system is in the disarmed phase, the security indicator lamp blinks every 2.4 seconds.

Pre-armed phase and armed phase

When the following operation 1 or 2 is performed, the vehicle security system turns into the “pre-armed” phase. (The security indicator lamp illuminates.)

1. BCM receives LOCK signal from door key cylinder switch or key fob after all doors and back door (for Coupe) or trunk (for Roadster) are closed.
2. All doors and back door (for Coupe) or trunk (for Roadster) are closed after doors are locked by key or door lock and unlock switch.
   The security indicator lamp illuminates for 30 seconds. Then, the system automatically shifts into the “armed” phase.

Canceling the set vehicle security system

When one of the following operations is performed, the armed phase is canceled.

1. Unlock the doors with the key or the key fob.
2. Open the back door (for Coupe) or trunk (for Roadster) with the key fob.
3. Turn ignition switch to “ON” or “ACC” position.

Canceling the alarm operation of the vehicle security system

When one of the following operations is performed, the alarm operation is canceled.

- Unlock the door with the key or key fob.
- Open the trunk (for Roadster) with the key fob.

Activating the alarm operation of the vehicle security system

Make sure the system is in the armed phase. (The security indicator lamp blinks every 2.4 seconds.)
When the following operation 1 or 2 is performed, the system sounds the horns and flashes the headlamps for about 50 seconds.

1. Any door or trunk (for Roadster) is opened during armed phase.

2. Disconnecting and connecting the battery connector before canceling armed phase.

POWER SUPPLY AND GROUND

Power is supplied at all times

- through 10A fuse [No.19, located in the fuse block (J/B)]
- to security indicator lamp terminal 1.

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42.

With the ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied.

- to BCM terminal 52
- through body grounds M30 and M66.

INITIAL CONDITION TO ACTIVATE THE SYSTEM

The operation of the vehicle security system is controlled by the doors and trunk (for Roadster).
To activate the vehicle security system, BCM must receive signals indicating the doors and trunk (for Roadster) are closed and the doors are locked by key or key fob.
When a door is open, BCM terminals 12, 65 receives a ground signal from each door switch.
When driver side door is unlocked by power window main switch (door lock and unlock switch), BCM terminal 22 receives a signal from terminal 12 of power window main switch.
When passenger side door is unlocked by power window sub-switch (door lock and unlock switch), BCM terminal 22 receives a signal from terminal 16 of power window sub-switch.
The IPDM E/R then sends a signal to the BCM via CAN communication line.
When the back door (for Coupe) or trunk (for Roadster) is open, BCM terminal 57 (for Roadster) or 58 (for Coupe) receives a ground signal

- from terminal 1 of the back door switch (for Coupe) or terminal 3 of trunk lid lock assembly (trunk room lamp switch) (for Roadster)
- through body grounds B5, B6,T14, D105 (for Coupe) or B5, B6, T14 (for Roadster).

VEHICLE SECURITY SYSTEM ALARM OPERATION

The vehicle security system is triggered by

- opening a driver or passenger side door
- opening the back door (for Coupe)
- opening the trunk (for Roadster)
- detection of battery disconnect and connect.

The vehicle security system will be triggered once the system is in armed phase,
When BCM receives a ground signal at terminals 12, 62 (door switch), 57 (trunk room lamp switch) or 58 (back door switch).
Power is supplied at all times

- to horn relay terminal 2
- through 15A fuse (No. 35, located in the fuse and fusible link box).

When the vehicle security system is triggered, ground is supplied intermittently to both headlamp relay and horn relay.
When both headlamp relay (with built-in IPDM E/R) and horn relay are energized and then power is supplied to headlamps (high beam and low beam) and horns (HIGH and LOW).
The headlamps flash and the horn sounds intermittently.
The alarm automatically turns off after 50 seconds, but will reactivate if the vehicle is tampered with again.

VEHICLE SECURITY SYSTEM DEACTIVATION

To deactivate the vehicle security system, a door must be unlocked or back door (for Coupe) or trunk (for Roadster) must be opened with the key or key fob.

When the key is used to unlock a door, BCM terminal 22 receives signal

- from terminal 12 of the power window main switch (door lock and unlock switch).

When the BCM receives either above signal or unlock signal from key fob, the vehicle security system is deactivated. (Disarmed phase)

PANIC ALARM OPERATION

Remote keyless entry system may or may not operate vehicle security system (horn and headlamps) as required.
When the panic alarm button on the keyfob is triggered, ground is supplied intermittently to both headlamp relay and horn relay.
When both headlamp relay (with built-in IPDM E/R) and horn relay are energized and then power is supplied to headlamps (high beam and low beam) and horns (HIGH and LOW).
The headlamp flashes and the horn sounds intermittently.
The alarm automatically turns off after 25 seconds or when BCM receives any signal from key fob.

CAN Communication System Description

NIS0002U

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

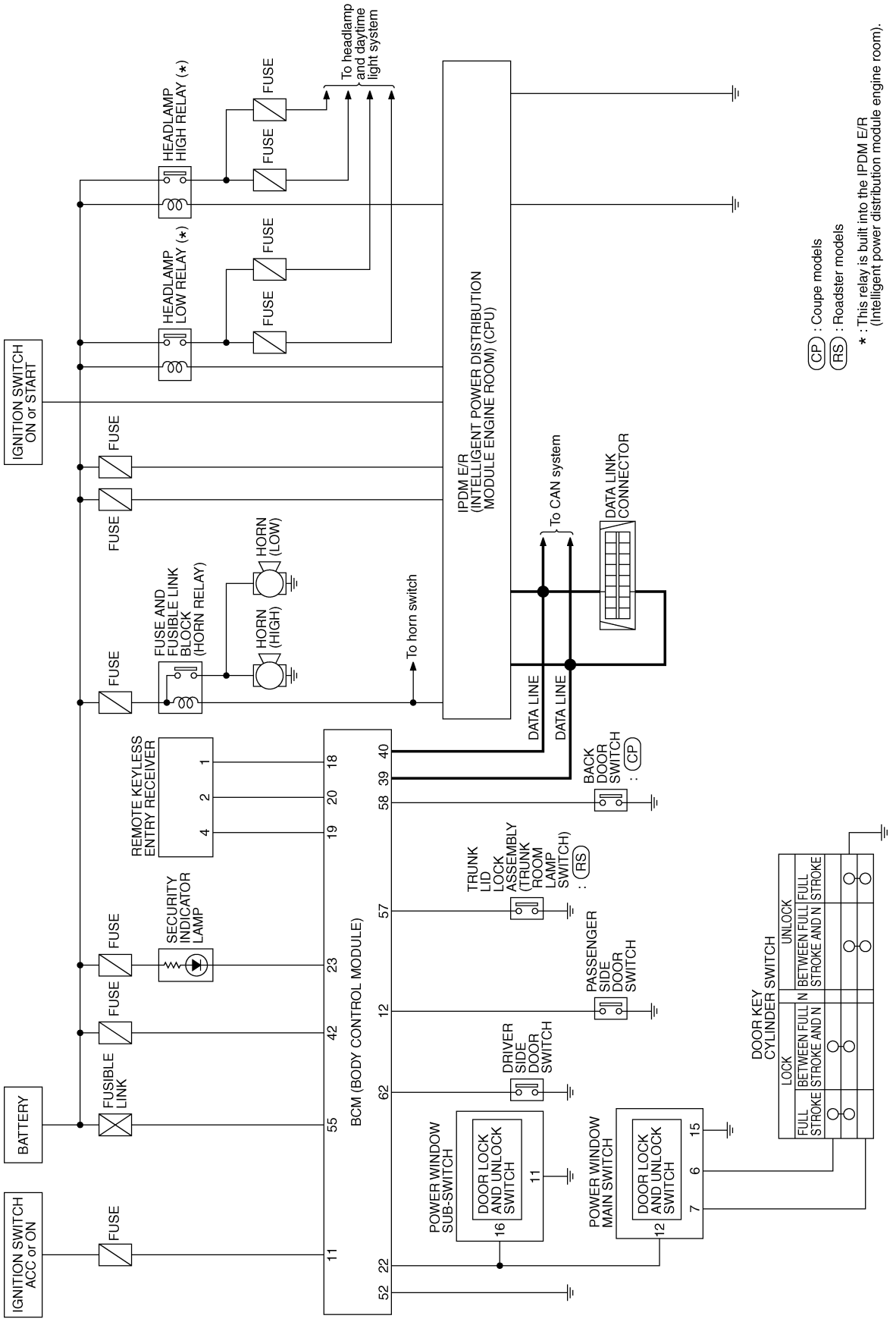
CAN Communication Unit

NIS0002V

Refer to LAN-4, "CAN Communication System" .

Schematic

NIS0002W

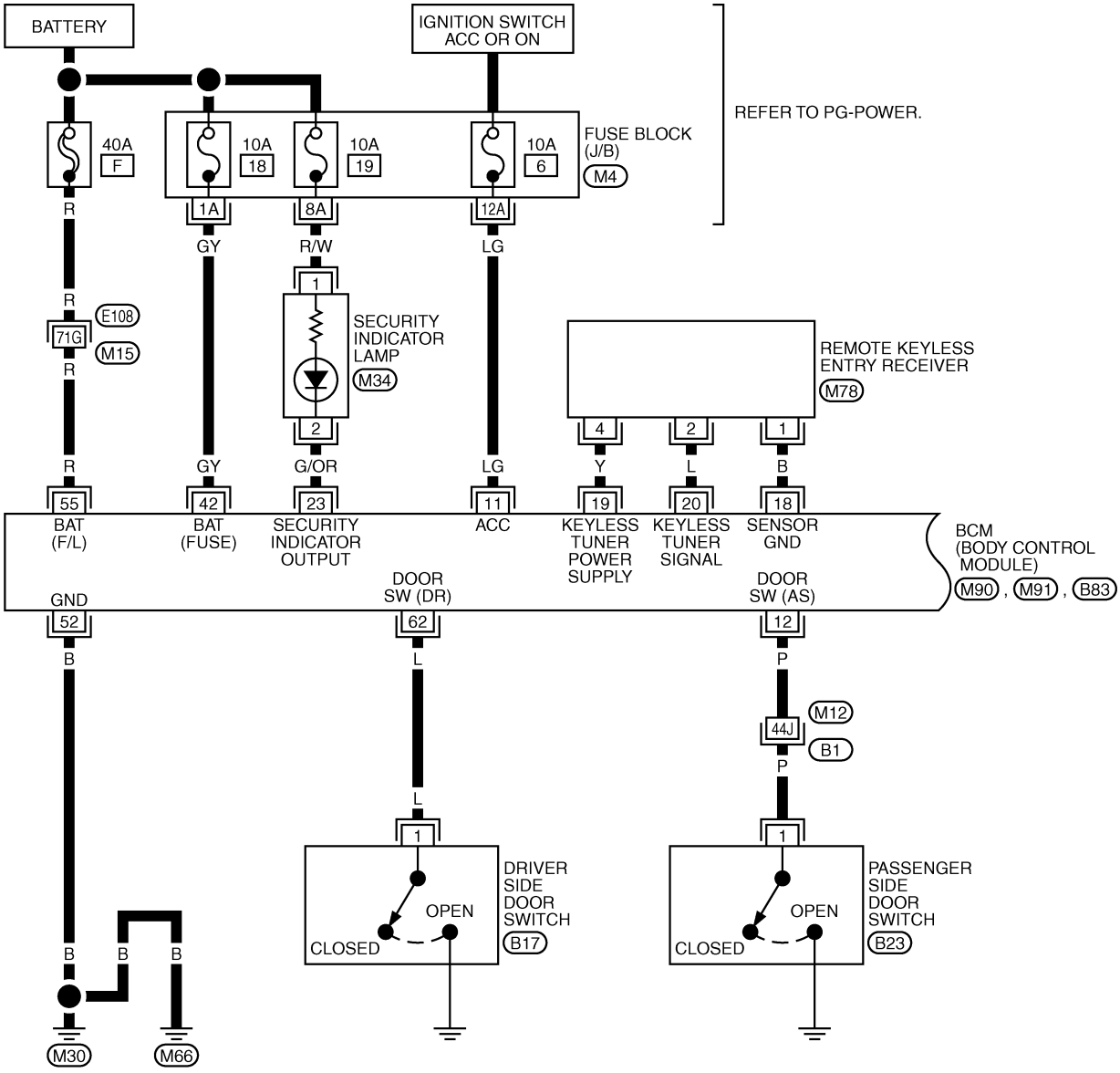


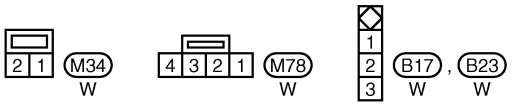
TIWT2268E

Wiring Diagram — VEHSEC —

NIS0002X

BL-VEHSEC-01





REFER TO THE FOLLOWING.

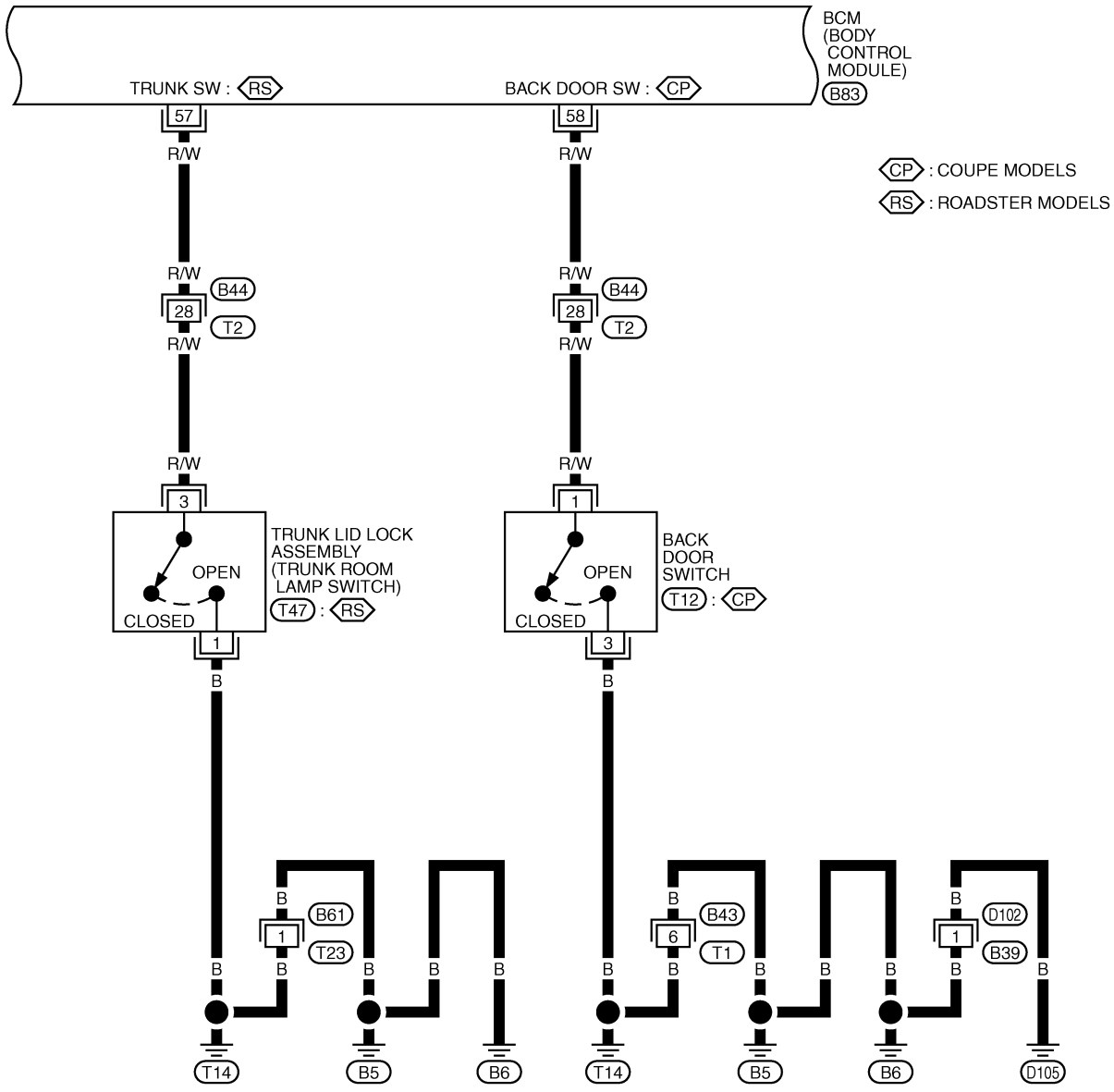
E108, B1 -SUPER MULTIPLE JUNCTION (SMJ)

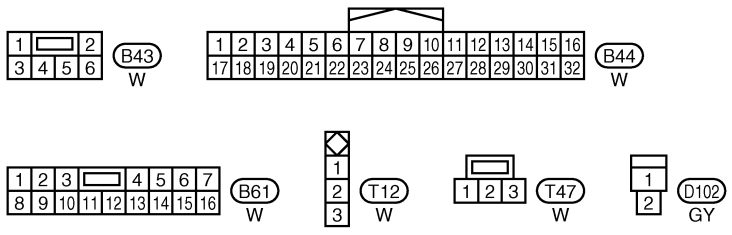
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91, B83 -ELECTRICAL UNITS

TIWT1584E

BL-VEHSEC-02

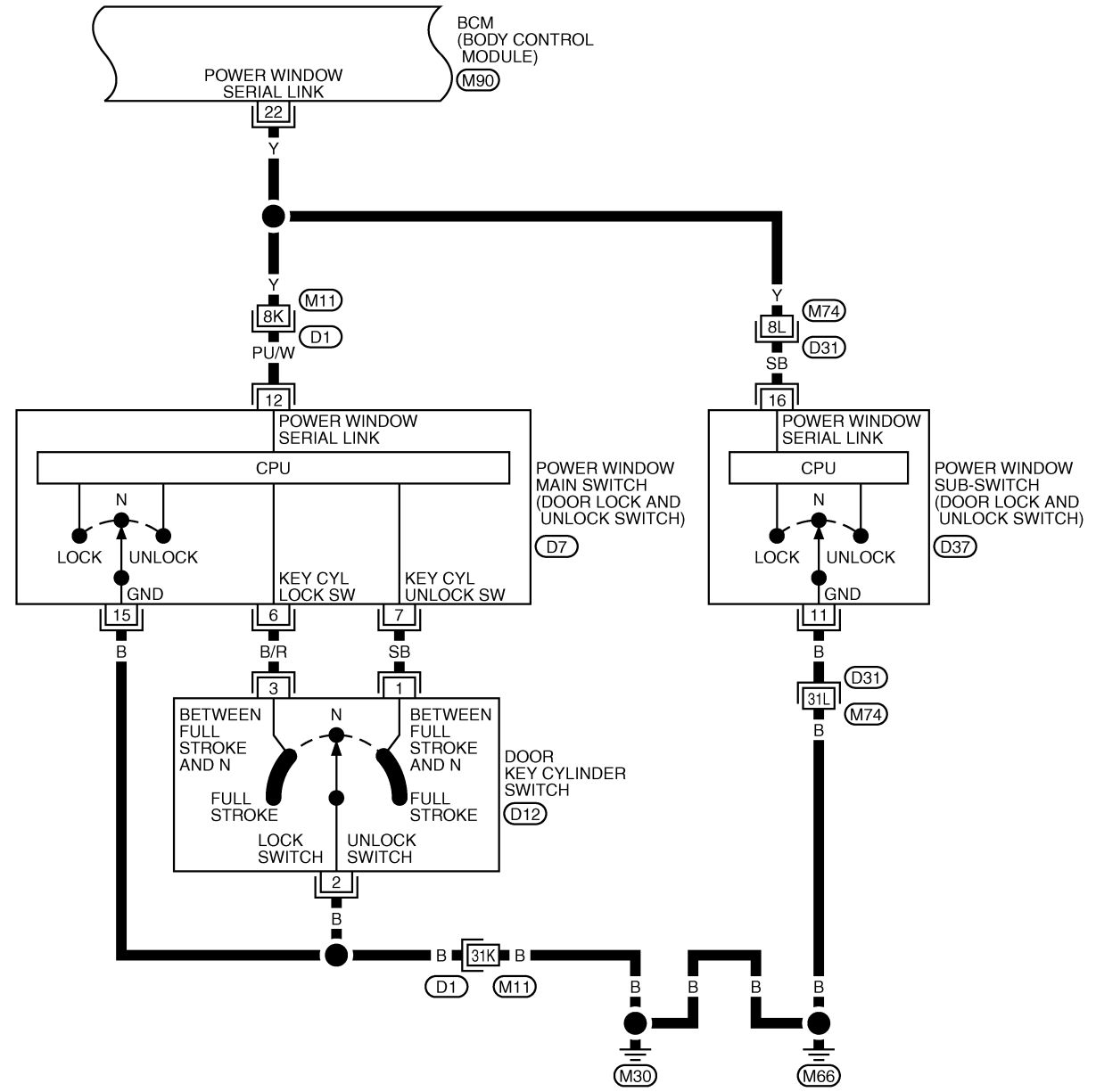


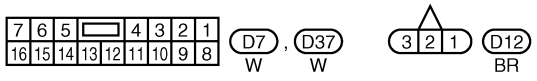


REFER TO THE FOLLOWING.
B83 -ELECTRICAL UNITS

TIWT2200E

BL-VEHSEC-03





REFER TO THE FOLLOWING.

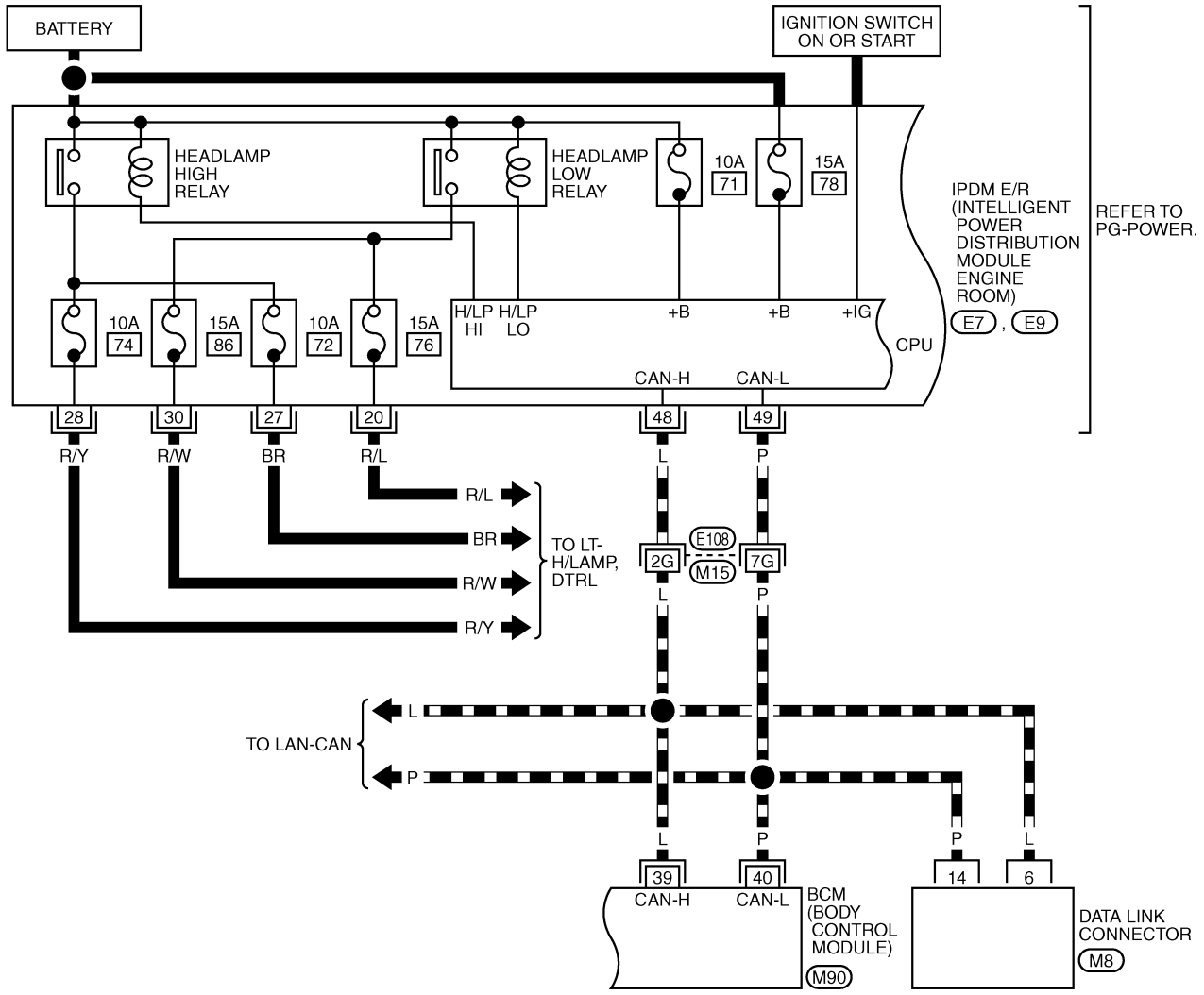
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

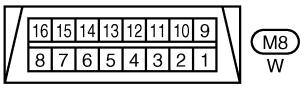
M90 -ELECTRICAL UNITS

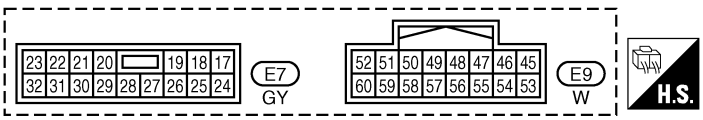
TIWT1586E

BL-VEHSEC-04

: DATA LINE







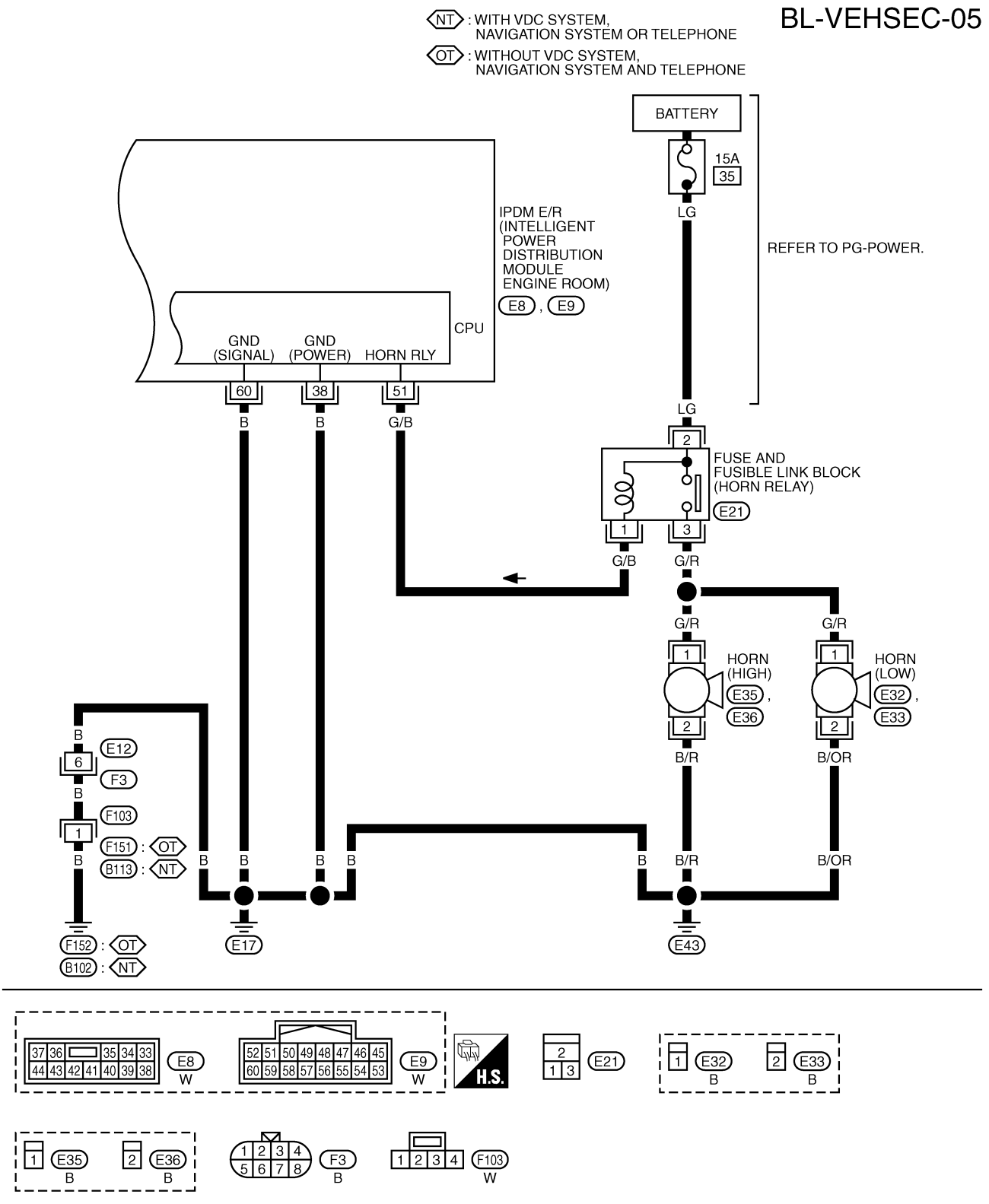
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M90 -ELECTRICAL UNITS

TIWT2269E

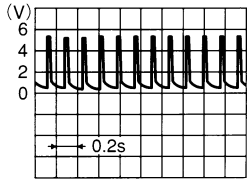
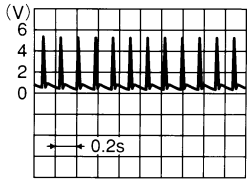
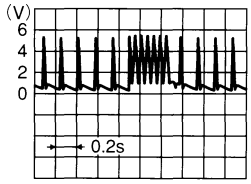
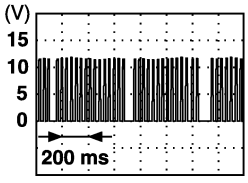
BL-VEHSEC-05



TIWT2270E

Terminals and Reference Value for BCM

NIS0002Y

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx.)
11	LG	Ignition switch (ACC)	Input	Ignition switch (ACC or ON)	Battery voltage
12	P	Passenger side door switch	Input	ON (Open) → OFF (Closed)	0 → 5
18	B	Remote keyless entry receiver (Ground)	—	—	0
19	Y	Remote keyless entry receiver (Power supply)	Output	Key is inserted is IGN key cylinder	0
				All door closed	 OCC3881D
20	L	Remote keyless entry receiver (Signal)	Input	Key is inserted is IGN key cylinder	0
				Stand-by	 OCC3879D
				When remote keyless entry receiver receives signal from keyfob	 OCC3880D
22	Y	Power window switch (Serial link)	Input/ Output	Driver side door and passenger side door are closed. (Each door switch is OFF)	 PIIA2344J
23	G/OR	Security indicator lamp	Output	Goes off → Illuminates (Every 2.4 seconds)	Battery voltage → 0
39	L	CAN-H	Input/ Output	—	—
40	P	CAN-L	Input/ Output	—	—
42	GY	Ignition switch (ON)	Input	Ignition switch (ON or START)	Battery voltage
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage
57	R	Trunk room lamp switch (For Roadster)	Input	ON (Open) → OFF (Closed)	0 → Battery voltage*1
58	R/W	Back door switch (For Coupe)	Input		
62	L	Driver side door switch	Input	ON (Open) → OFF (Closed)	0 → 5

*1: When interior lamp battery saver control is in OFF: Approx.5V.

Terminals and Reference Value for IPDM E/R

NIS0002Z

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage [V] (Approx.)
38	B	Ground	—	—	0
48	L	CAN-H	Input/ Output	—	—
49	P	CAN-L	Input/ Output	—	—
51	G/B	Horn relay	Output	ON → OFF	0 → Battery voltage
60	B	Ground	—	—	0

CONSULT-III Function (BCM)

NIS00030

CONSULT-III APPLICATION ITEM

Work Support

Test Item	Description
SECURITY ALARM SET	This mode is able to confirm and change security alarm ON-OFF setting.
THEFT ALM TRG	The switch which triggered vehicle security alarm is recorded. This mode is able to confirm and erase the record of vehicle security alarm. The trigger data can be erased by touching “CLEAR” on CONSULT-III screen.

Data Monitor

Monitored Item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
ACC ON SW	Indicates [ON/OFF] condition of ignition switch in ACC position.
KEY CYL LK SW	Indicates [ON/OFF] condition of lock signal from key cylinder switch.
KEY CYL UN SW	Indicates [ON/OFF] condition of unlock signal from key cylinder switch.
DOOR SW-DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW-AS	Indicates [ON/OFF] condition of passenger side door switch.
BACK DOOR SW	Indicates [ON/OFF] condition of back door switch.
TRUNK OPNR SW	Indicates [ON/OFF] condition of trunk room lamp switch. (Roadster models)
TRUNK OPN MNTR	This is displayed even when it is not equipped. Indicates [ON/OFF] condition of trunk lid opener switch. (Roadster models)
TRUNK KEY SW	This is displayed even when it is not equipped.
DOOR SW-RR	This is displayed even when it is not equipped.
HOOD SW	Indicates [ON/OFF] condition of hood switch.
LOCK SW DR/AS	Indicates [ON/OFF] condition of lock signal from driver and passenger side door lock/unlock switch.
UNLK SW DR/AS	Indicates [ON/OFF] condition of unlock signal from driver and passenger side door lock/unlock switch.
LK BUTTON/SIG	Indicates [ON/OFF] condition of lock signal from key fob.
UN BUTTON/SIG	Indicates [ON/OFF] condition of unlock signal from key fob.
TRUNK BTN/SIG	Indicate [ON/OFF] condition of back door open signal from key fob (for Coupe). Indicates [ON/OFF] condition of trunk open signal from key fob (for Roadster).

Active Test

Test Item	Description
THEFT IND	This test is able to check security indicator lamp operation. The lamp will be turned on when “ON” on CONSULT-III screen is touched.

Test Item	Description
HORN	This test is able to check vehicle security horn (horn alarm) operation. The horns will be activated for 0.5 seconds after “ON” on CONSULT-III screen is touched.
HEAD LAMP	This test is able to check vehicle security lamp (headlamp alarm) operation. The headlamps will be activated for 0.5 seconds after “ON” on CONSULT-III screen is touched.

CONSULT-III Function (IPDM E/R)

NIS00031

CONSULT-III APPLICATION ITEM

Data Monitor

Monitored Item	Description
HL LO REQ	Indicates [ON/OFF] condition of headlamp low beam.
HL HI REQ	Indicates [ON/OFF] condition of headlamp high beam.
HOOD SW	Indicates [ON/OFF] condition of hood switch.
THFT HRN REQ	Indicates [ON/OFF] condition of horn relay.

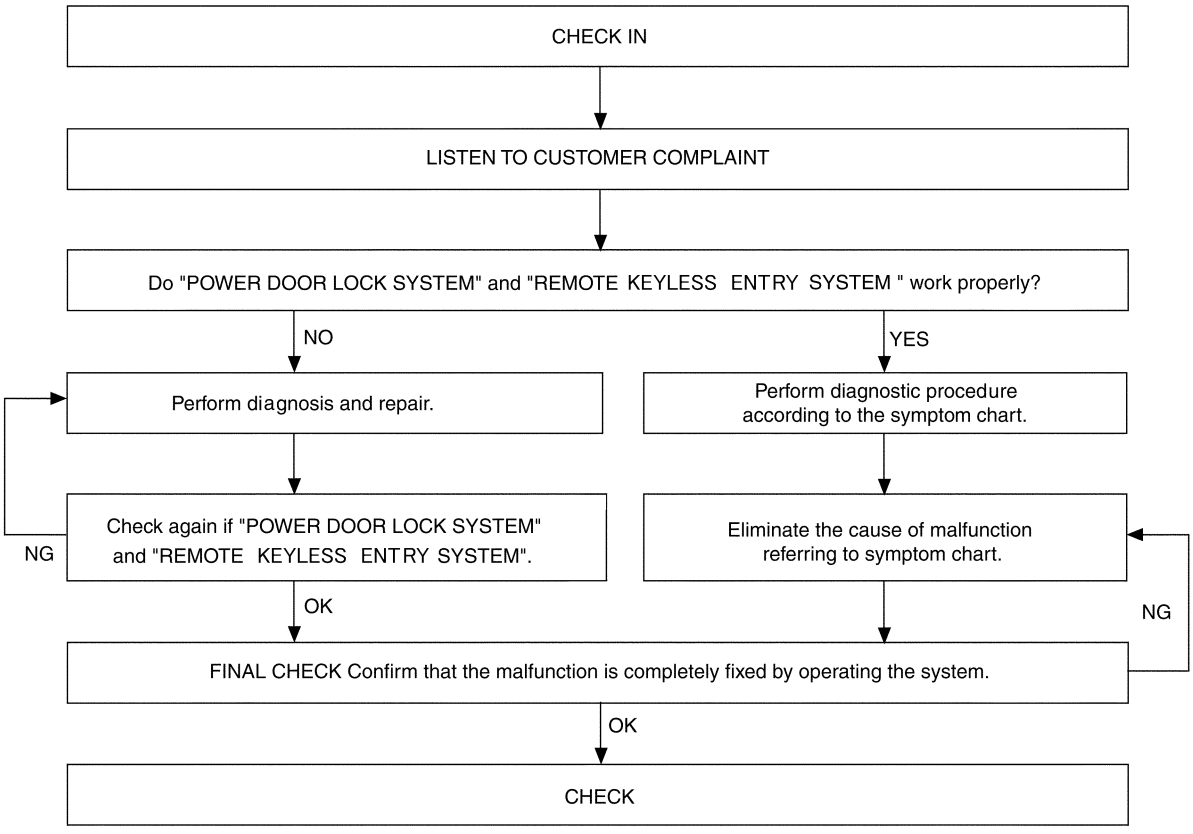
Active Test

Test Item	Description
LAMPS	This test is able to check theft warning lamp (headlamp alarm) operation. The headlamps will be activated for 0.5 seconds after “ON” on CONSULT-III screen is touched.
HORN	This test is able to check theft warning horn (horn alarm) operation. The horns will be activated for 0.5 seconds after “ON” on CONSULT-III screen is touched.

Trouble Diagnosis

NIS00032

WORK FLOW



LIIA0123E

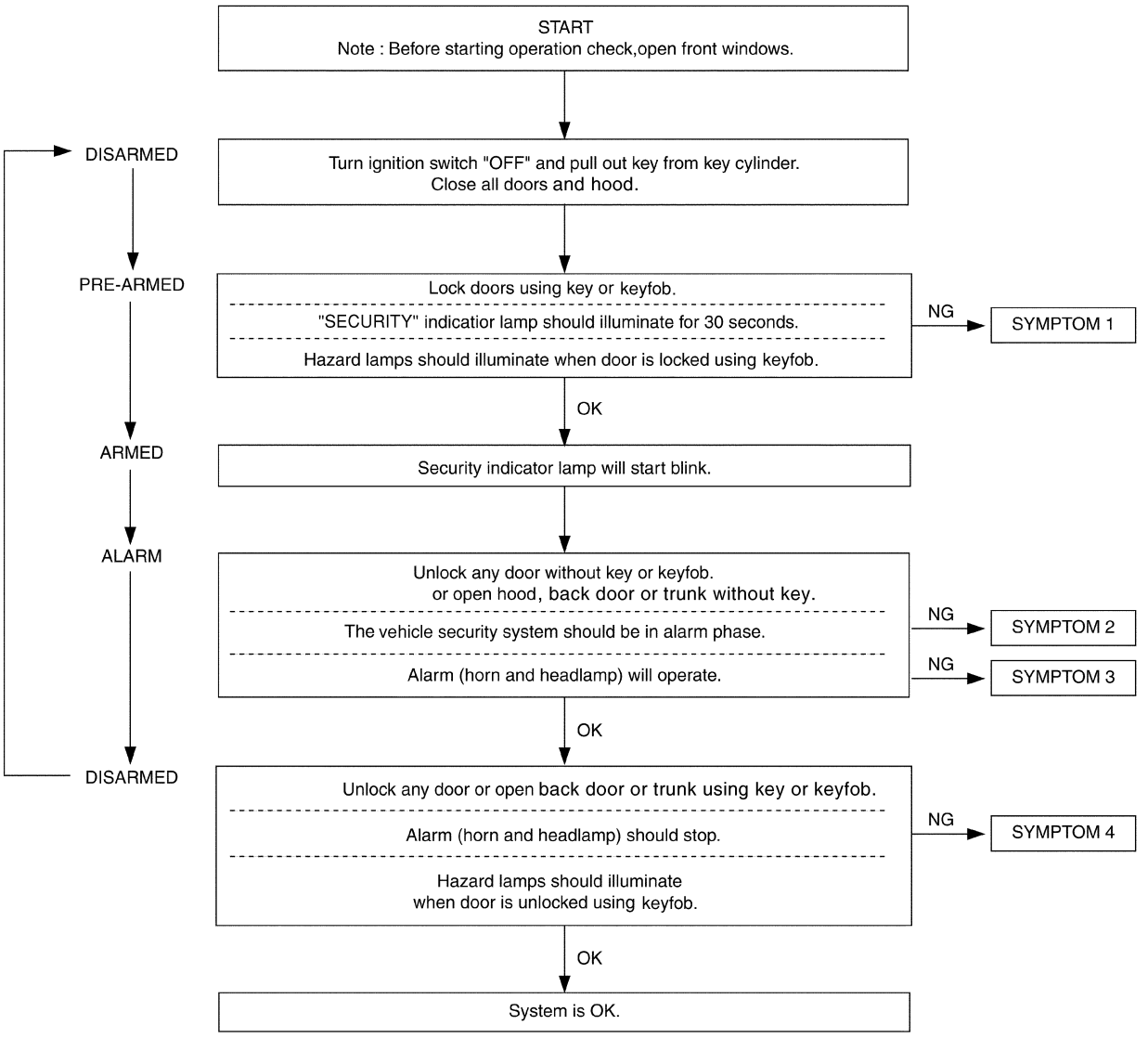
- “POWER DOOR LOCK SYSTEM” Diagnosis; refer to BL-35, "Work Flow" .

- “REMOTE KEYLESS ENTRY” Diagnosis; refer to BL-75, "Work Flow" .

Preliminary Check

NIS00033

The system operation is canceled by turning ignition switch to “ACC” at any step between START and ARMED in the following flow chart.



PIIA8954E

After performing preliminary check, go to symptom chart. Refer to BL-140, "Symptom Chart" .

Symptom Chart

NIS00034

PROCEDURE / SYMPTOM			Diagnostic procedure	Reference page
1	Vehicle security system cannot be set by ….	Door switch	Diagnostic Procedure 1 (Check door, hood, back door switch or trunk room lamp switch)	BL-141
		Lock/unlock switch	Diagnostic Procedure 6 (Check door lock/unlock switch)	BL-149
		Door outside key	Diagnostic Procedure 3 (Check door key cylinder switch)	BL-147
		Key fob	Check remote keyless entry system function.	BL-61
		BCM	If the above systems are “OK”, replace BCM.	BCS-17
	Security indicator does not turn “ON”.		Diagnostic Procedure 2 (Check security indicator lamp)	BL-146
			If the above systems are “OK”, replace BCM.	BCS-17
2	*1 Vehicle security system does not alarm when ….	Any door is opened.	Diagnostic Procedure 1 (Check door, hood and trunk room lamp switch)	BL-141
			If the above systems are “OK”, replace BCM.	BCS-17
3	Vehicle security alarm does not activate.	Horn alarm	Diagnostic Procedure 4 (Check vehicle security horn alarm)	BL-148
			If the above systems are “OK”, replace BCM.	BCS-17
		Headlamp alarm	Diagnostic Procedure 5 (Check vehicle security headlamp alarm)	BL-148
			If the above systems are “OK”, replace BCM.	BCS-17
4	Vehicle security system cannot be canceled by ….	Door outside key	Diagnostic Procedure 3 (Check door key cylinder switch)	BL-147
		Key fob	Check remote keyless entry system function.	BL-61
			If the above systems are “OK”, replace BCM.	BCS-17

*1: Make sure the system is in the armed phase.

Diagnostic Procedure 1

NIS00035

1 – 1 CHECK DOOR SWITCH

Check driver side door switch and passenger side door switch

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

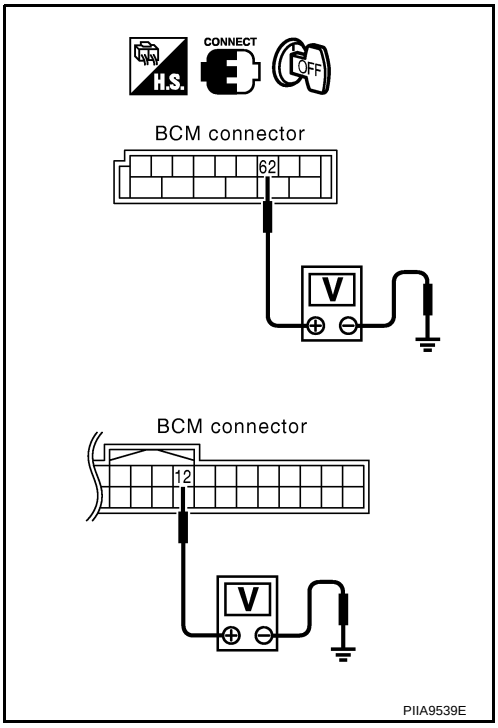
Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Item	Con-nector	Terminal (Wire color)		Condi-tion of door switch	Voltage [V] (Approx.)
		(+)	(–)		
Driver side door switch	B83	62 (L)	Ground	Open	0
				Close	5
Passenger side door switch	M90	12 (P)		Open	0
				Close	5



OK or NG

OK >> Door switch is OK, and go to the following

- BL-143, "1 – 2 CHECK BACK DOOR SWITCH (COUPE)"
- BL-145, "1 – 3 CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) (ROADSTER)"

NG >> GO TO 2.

2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between door switch harness connector B17, B23 terminal 1 and BCM harness connector B83 terminal 62 (driver side) or M90 terminal 12 (passenger side).

Driver side door

1 (L) - 62 (L) : Continuity should exist.

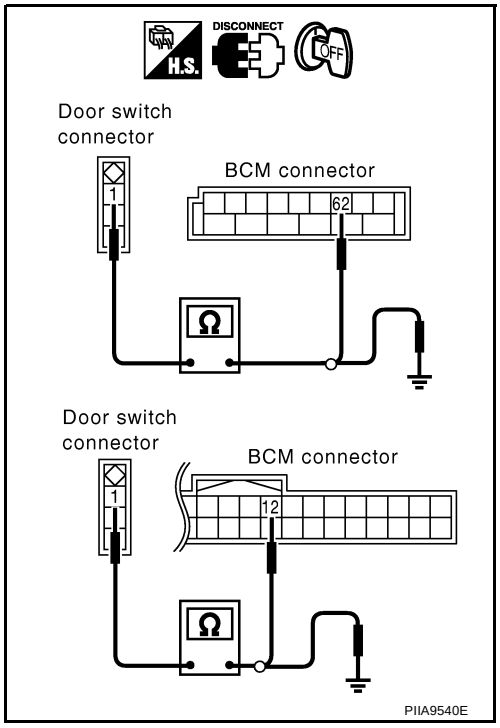
Passenger side door

1 (P) - 12 (P) : Continuity should exist.

4. Check continuity between door switch harness connector B17, B23 terminal 1 and ground.

Each door switch

1 (W or P) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace door switch harness.

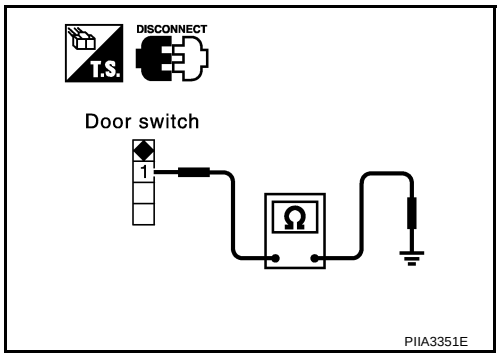
3. CHECK DOOR SWITCH

Check continuity between door switch B17 (driver side) or B23 (passenger side) terminal 1 and ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Ground part of door switch	Pushed	No
		Released	Yes

OK or NG

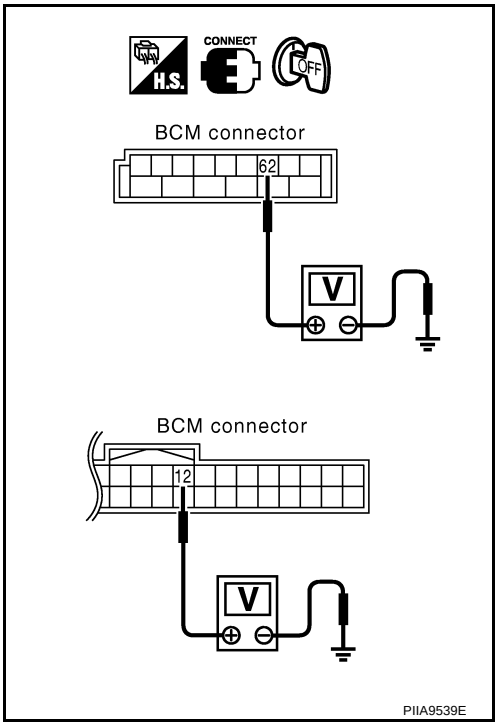
OK >> GO TO 4.
NG >> Replace door switch.



4. CHECK DOOR SWITCH INPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM harness connectors B83 (driver side), M90 (passenger side) terminals 62, 12 and ground.

62 (L) – Ground : Approx. 5V
12 (P) – Ground : Approx. 5V



OK or NG

OK >> Check harness connection.
NG >> Replace BCM.

1 – 2 CHECK BACK DOOR SWITCH (COUPE)

1. CHECK BACK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

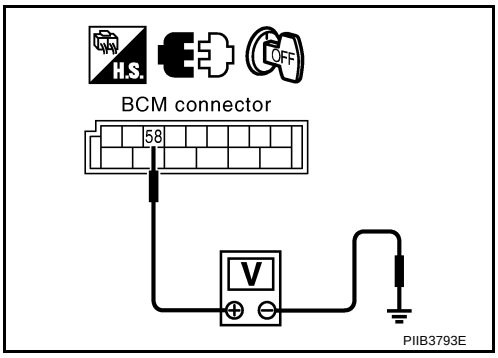
Check back door switch (“BACK DOOR SW”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
BACK DOOR SW	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition of back door switch	Voltage [V] (Approx.)
	(+)	(–)		
M83	58 (R/W)	Ground	Open	0
			Close	Buttery voltage



OK or NG

OK >> Back door switch is OK.
NG >> GO TO 2.

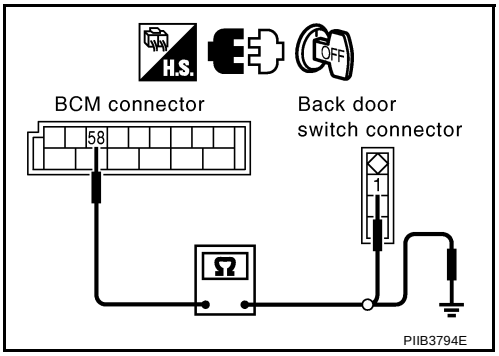
2. CHECK BACK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and back door switch connectors.
3. Check continuity between BCM harness connector B83 terminal 58 and back door switch harness connector T12 terminal 1.

58 (R/W) - 1 (R/W) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 58 and ground.

58 (R/W) - Ground : Continuity should not exist.



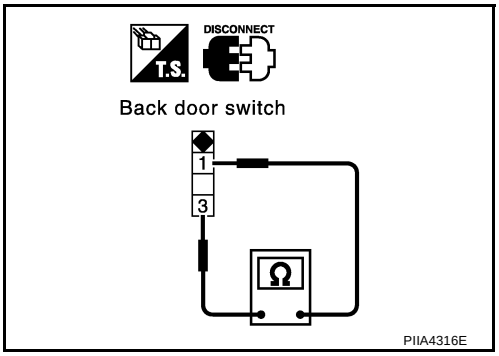
OK or NG

OK >> GO TO 3.
NG >> Repair or replace back door switch harness.

3. CHECK BACK DOOR SWITCH

Check continuity between door switch terminals 1 and 3.

Terminal		Condition of back door switch	Continuity
1	3	Open position	Yes
		Closed position	No



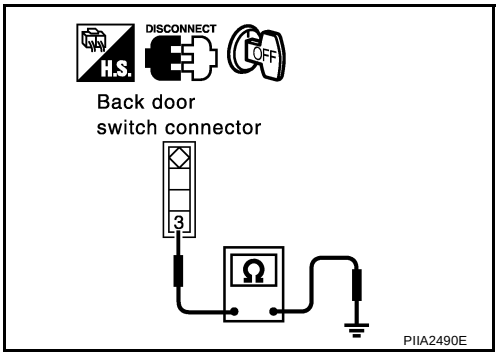
OK or NG

OK >> GO TO 4.
NG >> Replace back door switch.

4. CHECK BACK DOOR SWITCH GROUND CIRCUIT

Check continuity between back door switch harness connector T12 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



OK or NG

OK >> Back door switch circuit is OK.
NG >> Repair or replace harness.

1 – 3 CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) (ROADSTER)

1. CHECK TRUNK ROOM LAMP SWITCH INPUT SIGNAL

With CONSULT-III

Check trunk lid opener switch (“TRUNK OPN MNTR”) in “DATA MONITOR” mode with CONSULT-III.

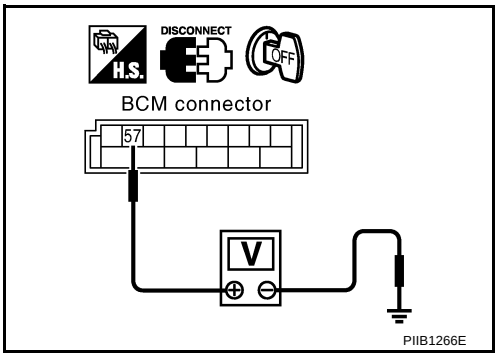
Monitor item	Condition	
TRNK OPN MNTR	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

Check voltage between BCM connector and ground.

Connector	Terminal (Wire color)		Condition of trunk room lamp switch	Voltage [V] (Approx.)
	(+)	(–)		
B83	57 (R/W)	Ground	Open	0
			Close	Battery voltage*

*: When interior lamp battery saver control is in OFF. → Approx 5V.



OK or NG

OK >> Trunk room lamp switch is OK .
NG >> GO TO 2.

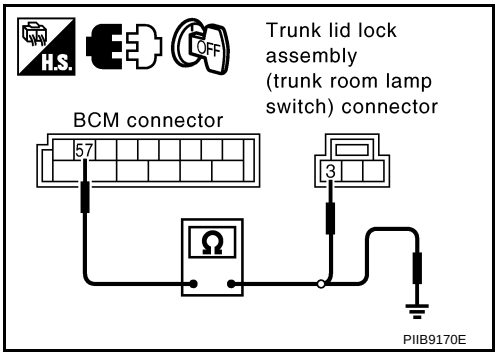
2. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect trunk lid lock assembly (trunk room lamp switch) and BCM connector.
3. Check continuity between trunk lid lock assembly (trunk room lamp switch) harness connector T47 terminal 3 and BCM harness connector B83 terminal 57.

   57 (R/W) - 3 (R/W) : Continuity should exist.

4. Check continuity between BCM harness connector B83 terminal 57 and ground.

   57 (R/W) - Ground : Continuity should not exist.



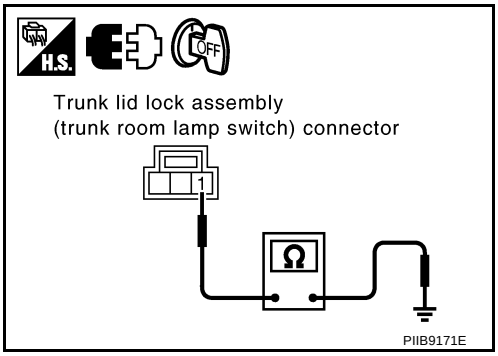
OK or NG

OK >> GO TO 3.
NG >> Replace trunk lid lock assembly (trunk room lamp switch) harness.

3. CHECK TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between trunk lid lock assembly (trunk room lamp switch) harness connector T47 terminal 1 and ground.

   1 (B) - Ground : Continuity should exist.



OK or NG

OK >> Trunk lid lock assembly (trunk room lamp switch) is OK.
NG >> Repair or replace trunk lid lock assembly (trunk room lamp switch) harness.

Diagnostic Procedure 2

NIS00036

CHECK SECURITY INDICATOR LAMP

1. SECURITY INDICATOR LAMP ACTIVE TEST

With CONSULT-III

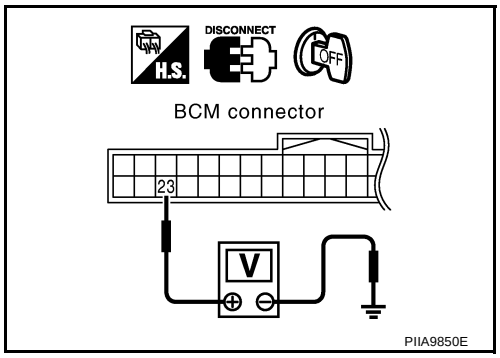
Check “THEFT IND” in “ACTIVE TEST” mode with CONSULT-III.

Perform operation shown on display.
Indicator lamp should illuminate.

Without CONSULT-III

1. Disconnect BCM connector.
2. Check voltage between BCM connector M90 terminal 23 and ground.

23 (G/OR) - Ground : Battery voltage



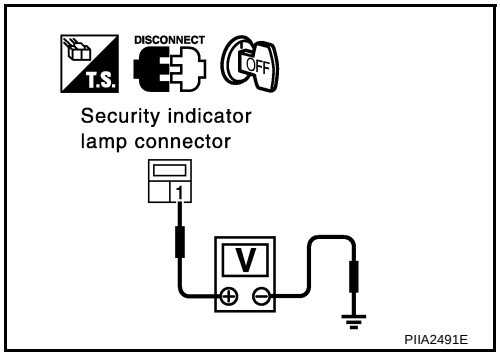
OK or NG

OK >> Security indicator lamp is OK.
NG >> GO TO 2.

2. CHECK POWER SUPPLY CIRCUIT FOR SECURITY INDICATOR LAMP

1. Disconnect security indicator lamp connector.
2. Check voltage between security indicator lamp connector M34 terminal 1 and ground.

1 (R/W) - Ground : Battery voltage



OK or NG

OK >> GO TO 3.
NG >> Check the following.

- 10A fuse [No. 19, located in fuse block (J/B)]
- Harness for open or short between security indicator lamp and fuse

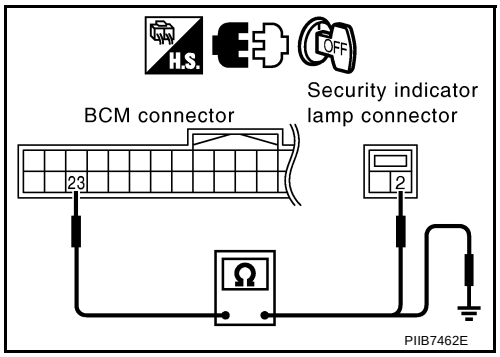
3. CHECK SECURITY INDICATOR LAMP CIRCUIT

1. Check continuity between BCM harness connector M90 terminal 23 and security indicator lamp harness connector M34 terminal 2.

23 (G/OR) - 2 (G/OR) : Continuity should exist.

2. Check continuity between BCM harness connector M90 terminal 23 and ground.

23 (G/OR) - Ground : Continuity should not exist.



OK or NG

OK >> Check indicator lamp condition.
NG >> Repair harness or connector.

Diagnostic Procedure 3

NIS00037

CHECK DOOR KEY CYLINDER SWITCH

1. CHECK DOOR KEY CYLINDER SWITCH DRIVER SIDE OPERATION

Do doors lock/unlock when using the key?

YES or NO

YES >> Door key cylinder switch operation is OK.
NO >> Check door key cylinder switch circuit. Refer to BL-47, "Check Door Key Cylinder Switch" .

Diagnostic Procedure 4

NIS00038

CHECK VEHICLE SECURITY HORN ALARM

First perform the “SELF-DIAG RESULTS” of “BCM” with CONSULT-III, then perform the trouble diagnosis of malfunction system indicated in “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

1. CHECK HORN OPERATION

Check if horn sounds with horn switch.

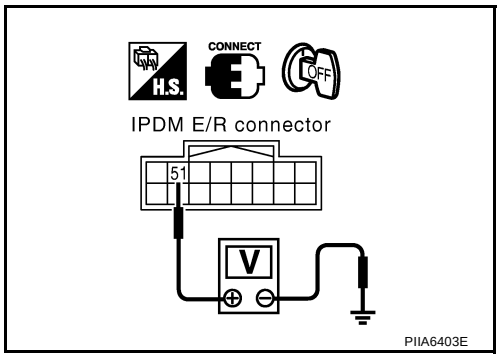
Does horn operate?

YES >> GO TO 2.
NO >> Check horn circuit. Refer to WW-53, "HORN" .

2. CHECK IPDM E/R INPUT SIGNAL

Check voltage between IPDM E/R connector E9 terminal 51 and ground.

51 (G/B) – Ground : Battery voltage.



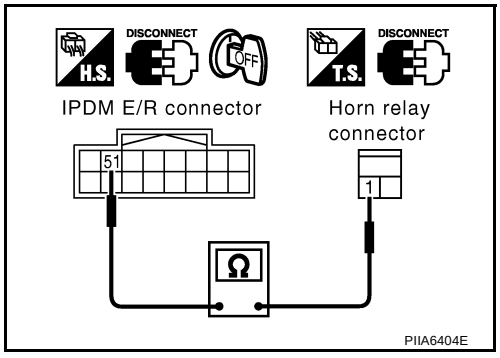
OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 3.

3. CHECK HORN RERAY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R and horn relay connector.
3. Check continuity between IPDM E/R harness connector E9 terminal 51 and horn relay harness connector E21 terminal 1.

1 (G/B) - 51(G/B) : Continuity should exist.



OK or NG

OK >> Horn circuit is OK.
NG >> Repair or replace harness.

Diagnostic Procedure 5

NIS00039

CHECK VEHICLE SECURITY HEADLAMP ALARM

1. CHECK HEAD LAMP OPERATION

Does headlamp come on when turning lighting switch “ON”?

YES or NO

YES >> Headlamp alarm circuit is OK.
NO >> Check headlamp system. Refer to,,, LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -"LT-5, "HEADLAMP (FOR USA)" .

Diagnostic Procedure 6

NIS0003A

CHECK DOOR LOCK AND UNLOCK SWITCH

1. CHECK DOOR LOCK AND UNLOCK SWITCH INPUT SIGNAL

Does doors lock/unlock when using power window main switch (door lock and unlock switch) or power window sub-switch (door lock and unlock switch)?

YES or NO?

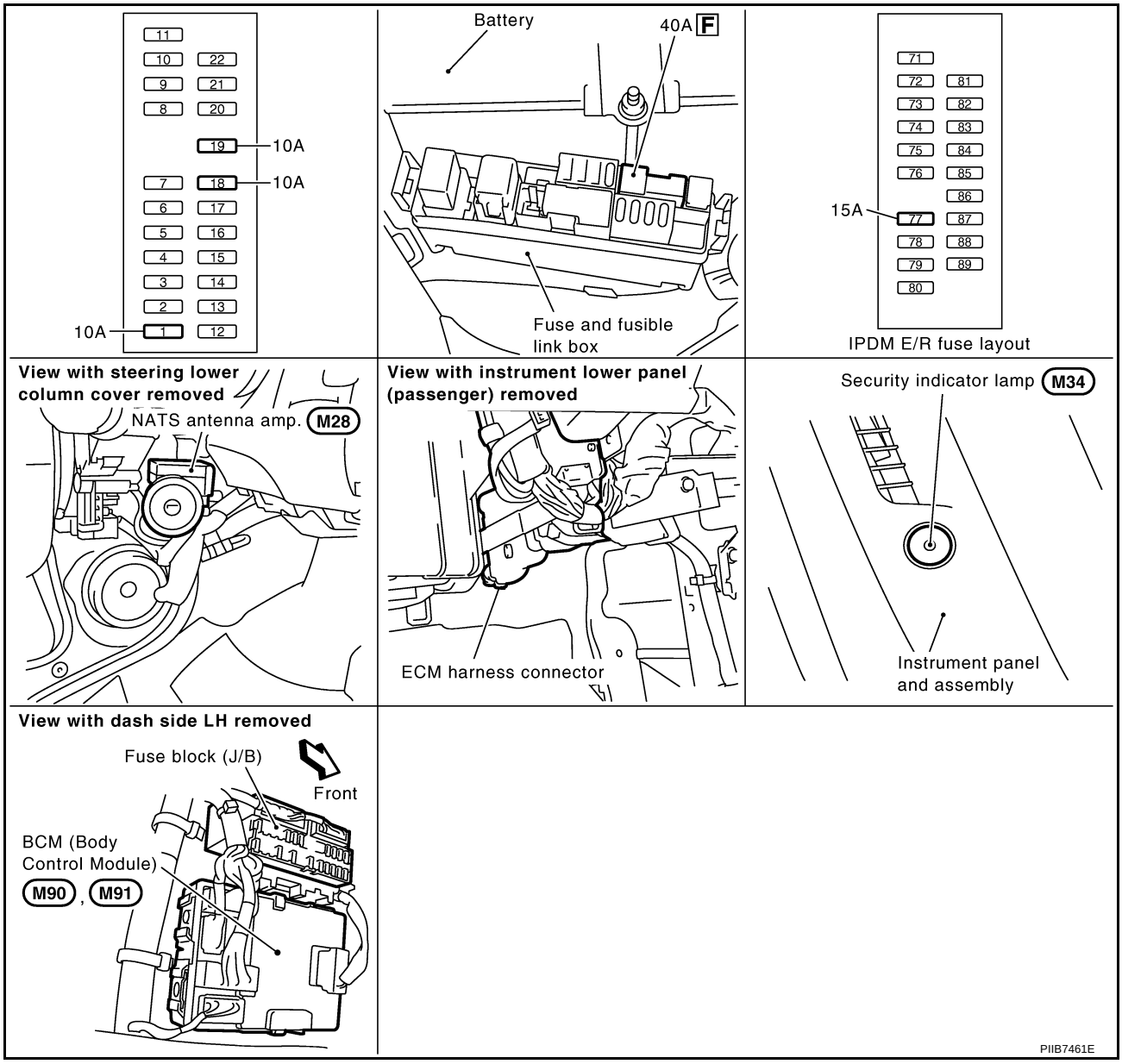
YES >> Door lock and unlock switch is OK.
NO >> Refer to BL-42, "Check Door Lock and Unlock Switch" .

NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)

PFP:25386

Component Parts and Harness Connector Location

NIS0003B



NOTE:

If customer reports a “No start” condition, request ALL KEYS to be brought to an NISSAN dealer in case of a NVIS (NATS) malfunction.

System Description

NIS0003C

NVIS (Nissan Vehicle Immobilizer System-NATS) has the following immobilizer functions:

- Since only NVIS (NATS) ignition keys, whose ID Nos. have been registered into the ECM and BCM, allow the engine to run, a vehicle operation without a key registered in NVIS (NATS) is prevented by NVIS (NATS).
  That is to say, NVIS (NATS) will immobilize the engine if someone tries to start it without the registered key of NVIS (NATS).
- All of the originally supplied ignition key IDs (except for card plate key) have been registered in NVIS (NATS).
  If requested by the vehicle owner, a maximum of five key IDs can be registered into the NVIS (NATS) components.
- The security indicator blinks when the ignition switch is in “OFF” or “ACC” position. Therefore, NVIS (NATS) warns outsiders that the vehicle is equipped with the anti-theft system.
- When NVIS (NATS) detects trouble, the security indicator lamp lights up while ignition key is in the “ON” position.
- NVIS (NATS) trouble diagnoses, system initialization and additional registration of other NVIS (NATS) ignition key IDs must be carried out using CONSULT-III hardware and CONSULT-III NVIS (NATS) software.
  When NVIS (NATS) initialization has been completed, the ID of the inserted ignition key is automatically registered in NVIS (NATS). Then, if necessary, additional registration of other NVIS (NATS) ignition key IDs can be carried out.
  Regarding the procedures of NVIS (NATS) initialization and NVIS (NATS) ignition key ID registration, refer to CONSULT-III Operation Manual NATS-IVIS/NVIS.
- **When servicing a malfunction of the NVIS (NATS) (indicated by lighting up of Security Indicator Lamp) or registering another NVIS (NATS) ignition key ID No., it may be necessary to re-register original key identification. Therefore, be sure to receive ALL KEYS from vehicle owner.**

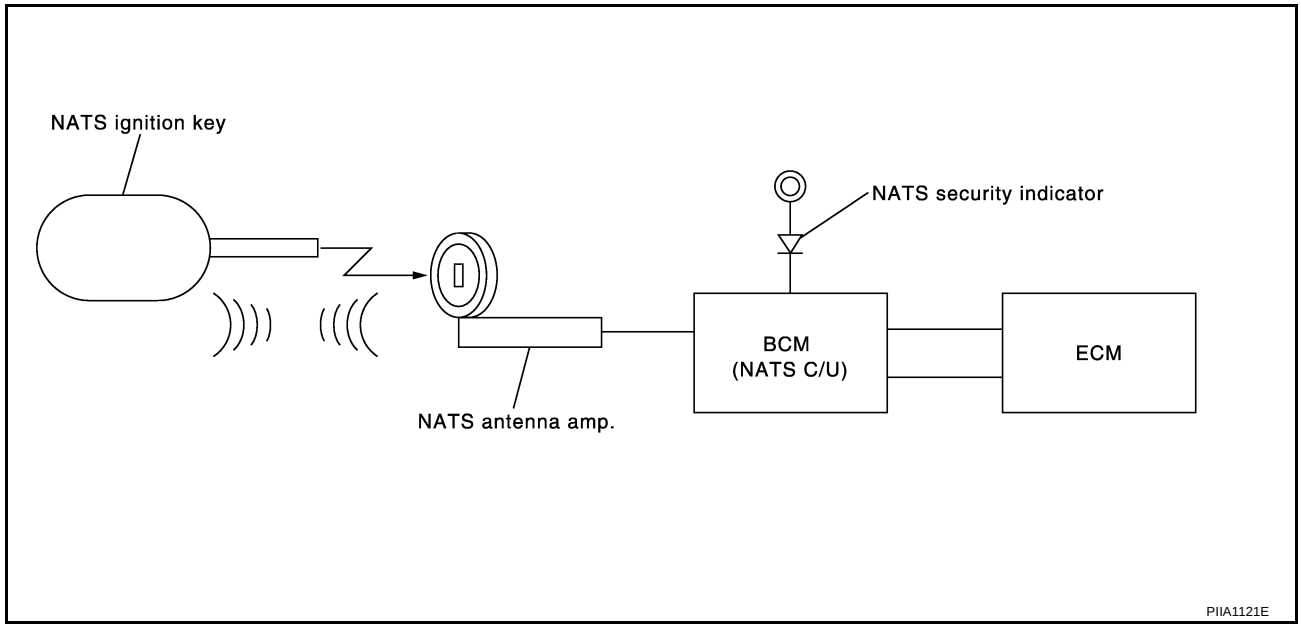
System Composition

NIS0003D

The immobilizer function of the NVIS (NATS) consists of the following:

- NATS ignition key
- NATS antenna amp. located in the ignition key cylinder
- BCM
- Engine control module (ECM)
- Security indicator

NOTE:
The communication between ECM and BCM uses the CAN communication system.



ECM Re-communicating Function

NIS0003E

Performing following procedure can automatically perform re-communication of ECM and BCM, but only when the ECM has been replaced with a new one (*1).
*1: New one means a virgin ECM which has never been energized on-board.
(In this step, initialization procedure by CONSULT-III is not necessary)

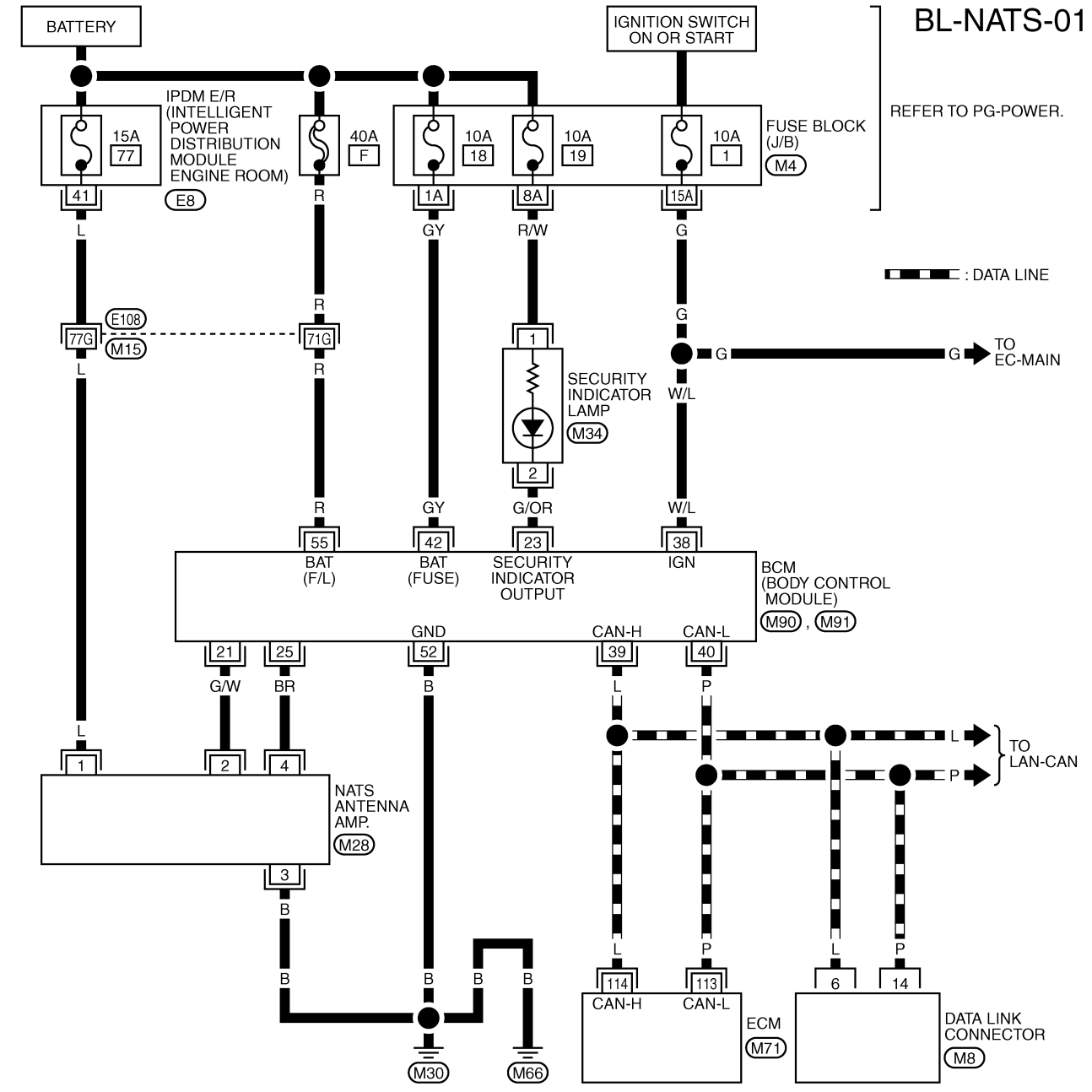
NOTE:

- **When registering new Key IDs or replacing the ECM other than brand new, refer to CONSULT-III Operation Manual NATS-IVIS/NVIS.**
- **If multiple keys are attached to the key holder, separate them before work.**
- **Distinguish keys with unregistered key ID from those with registered ID.**

1. Install ECM.
2. Using a registered key (*2), turn ignition switch to “ON”.
   *2: To perform this step, use the key (except for card plate key) that has been used before performing ECM replacement.
3. Maintain ignition switch in “ON” position for at least 5 seconds.
4. Turn ignition switch to “OFF”.
5. Start engine.
   If engine can be started, procedure is completed.
   If engine cannot be started, refer to CONSULT-III Operation Manual NATS-IVIS/NVIS and initialize control unit.

Wiring Diagram — NATS —

NIS0003F



TIWT2271E

Terminals and Reference Value for BCM

NIS0003G

Terminal	Wire color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx.)
21	G/W	NATS antenna amp.	Input/ Output	Ignition switch (OFF → ON)	Just after turning ignition switch “ON”: Pointer of tester should move.
23	G/OR	Security indicator lamp	Output	Goes OFF → illuminates (Every 2.4 seconds)	Battery voltage → 0
25	BR	NATS antenna amp.	Input/ Output	Ignition switch (OFF → ON)	Just after turning ignition switch “ON”: Pointer of tester should move.
38	W/L	Ignition switch (ON)	Input	Ignition switch (ON or START)	Battery voltage
39	L	CAN-H	Input/ Output	—	—
40	P	CAN-L	Input/ Output	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0
55	R	Power source (Fusible link)	Input	—	Battery voltage

CONSULT-III

NIS0003H

CONSULT-III INSPECTION PROCEDURE

Refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

CONSULT-III DIAGNOSTIC TEST MODE FUNCTION

CONSULT-III DIAGNOSTIC TEST MODE	Description
C/U INITIALIZATION	When replacing any of the following components, C/U initialization and re-registration of all NATS ignition keys are necessary. [(NATS ignition key BCM/ ECM)

NOTE:

- When any initialization is performed, all ID previously registered will be erased and all NATS ignition keys must be registered again.

NVIS (NATS) SELF-DIAGNOSTIC RESULTS ITEM CHART

Detected items [NVIS (NATS) program card screen terms]	P No. Code (Self-diagnostic result of “ENGINE”)	Malfunction is detected when.....	Reference page
CHAIN OF ECM-IMMU [P1612]	NATS MALFUNCTION P1612	Communication impossible between ECM and BCM In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.	Refer to BL-158, "Diagnostic Procedure 1" .
DIFFERENCE OF KEY [P1615]	NATS MALFUNCTION P1615	BCM can receive the key ID signal but the result of ID verification between key ID and BCM is NG.	Refer to BL-159, "Diagnostic Procedure 2" .
CHAIN OF IMMU-KEY [P1614]	NATS MALFUNCTION P1614	BCM cannot receive the key ID signal.	Refer to BL-160, "Diagnostic Procedure 3" .

Detected items [NVIS (NATS) program card screen terms]	P No. Code (Self-diagnostic result of “ENGINE”)	Malfunction is detected when.....	Reference page
ID DISCORD, IMM-ECM [P1611]	NATS MALFUNCTION P1611	The result of ID verification between BCM and ECM is NG. System initialization is required.	Refer to BL-161, "Diagnostic Procedure 4" .
LOCK MODE [P1610]	NATS MALFUNCTION P1610	When the starting operation is carried out five or more times consecutively under the following conditions, NVIS (NATS) will shift the mode to one which prevents the engine from being started. ● Unregistered ignition key is used. ● BCM or ECM’s malfunctioning.	Refer to BL-165, "Diagnostic Procedure 6" .
DON'T ERASE BEFORE CHECKING ENG DIAG	—	All engine trouble codes except NVIS (NATS) trouble code has been detected in ECM.	Refer to BL-155, "Work Flow" .

Work Flow

NIS002B3

1. LISTEN TO CUSTOMER COMPLAINT OR REQUEST

Get symptoms or listen to customer complaints or request.

NOTE:
In case of request for NVIS (NATS) system repair, the key ID re-registration might be necessary. Keep all the ignition keys before work for the re-registration.

Key ID registration request>>Register ignition key by referring to CONSULT-III Operation Manual NATS-IVIS/NVIS.
Request for malfunction repair.>>GO TO 2.

2. CONFIRM SELF DIAGNOSIS 1

Start CONSULT-III with ignition switch in ON position and confirm “SELF DIAG RESULT” with “ENGINE”.

Is DTC detected?

No malfunction>>GO TO 3.
If the codes detected are between the interval P1610 to P1615.>> Refer to BL-154, "NVIS (NATS) SELF-DIAGNOSTIC RESULTS ITEM CHART" .
If the codes detected are between the interval P1610 to P1615 and others.>> GO TO 4.

3. CHECK SECURITY INDICATOR FUNCTION

Check that security indicator for lighting up fulfill the two conditions below.

- Security indicator lights off when ignition switch is ON position.
- Security indicator blinks when ignition switch is in any position except ON.

Lighting up condition is normal.>>Inspection END.
Lighting up condition is malfunctioning.>>Perform security indicator Inspection. Refer to BL-163, "Diagnostic Procedure 5" .

4. TROUBLE DIAGNOSIS

Perform by priority the trouble diagnosis for the codes which are not included in the interval P1610 to P1615.

Is DTC detected?

No malfunction>>Inspection END.
If the codes detected are between the interval P1610 to P1615.>>BL-154, "NVIS (NATS) SELF-DIAGNOSTIC RESULTS ITEM CHART".

Trouble Diagnoses

NIS0003J

SYMPTOM MATRIX CHART 1

Self-diagnosis related item

SYMPTOM	Displayed “SELF-DIAG RESULTS” on CONSULT-III screen.	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
● Security indicator lighting up* ● Engine cannot be started	CHAIN OF ECM-IMMU [P1612]	PROCEDURE 1 (BL-158)	In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.	—
			Open circuit in battery voltage line of BCM circuit	C1
			Open circuit in ignition line of BCM circuit	C2
			Open circuit in ground line of BCM circuit	C3
			Open or short circuit between BCM and ECM communication line	C4
			ECM	B
			BCM	A
	DIFFERENCE OF KEY [P1615]	PROCEDURE 2 (BL-159)	Unregistered key	D
			BCM	A
	CHAIN OF IMMU-KEY [P1614]	PROCEDURE 3 (BL-160)	Malfunction of key ID chip	E5
			Communication line between ANT/ AMP and BCM: Open circuit or short circuit of battery voltage line or ground line	E1
				E2
			Open circuit in power source line of ANT/ AMP circuit	E3
			Open circuit in ground line of ANT/ AMP circuit	E4
			NATS antenna amp.	E6
			BCM	A
	ID DISCORD, IMM-ECM [P1611]	PROCEDURE 4 (BL-161)	System initialization has not yet been completed.	F
			ECM	B

SYMPTOM	Displayed “SELF-DIAG RESULTS” on CONSULT-III screen.	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
● Security indicator lighting up* ● Engine cannot be started	LOCK MODE [P1610]	PROCEDURE 6 (BL-165)	LOCK MODE	When the starting operation is carried out five or more times consecutively under the following conditions, NVIS (NATS) will shift the mode to one which prevents the engine from being started. ● Unregistered ignition key is used. ● BCM or ECM’s malfunctioning.
Security indicator lighting up*	DON'T ERASE BEFORE CHECKING ENG DIAG	WORK FLOW (BL-155)	Engine trouble data and NVIS (NATS) trouble data have been detected in ECM	—

*: When NVIS (NATS) detects trouble, the security indicator lights up while ignition key is in the “ON” position.

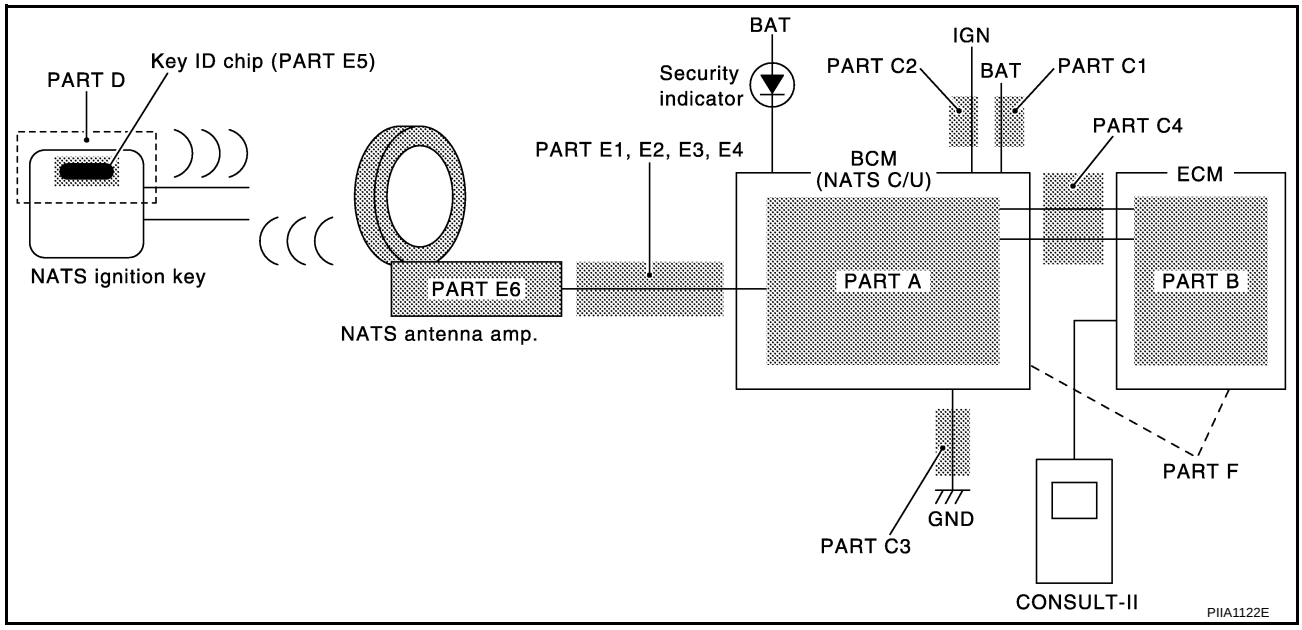
SYMPTOM MATRIX CHART 2

Non self-diagnosis related item

SYMPTOM	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON SYSTEM DIAGRAM
Security indicator does not light up*.	PROCEDURE 5 (BL-163)	Security indictor.	—
		Open circuit between Fuse and BCM	—
		BCM	A

*: CONSULT-III self-diagnostic results display screen “no malfunction is detected”.

DIAGNOSTIC SYSTEM DIAGRAM



Diagnostic Procedure 1

NIS0003K

Self-diagnostic results:
“CHAIN OF ECM-IMMU” displayed on CONSULT-III screen
First perform the “SELF-DIAG RESULTS” in “BCM” with CONSULT-III, then perform the trouble diagnosis of malfunction system indicated “SELF-DIAG RESULTS” of “BCM”. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “CHAIN OF ECM-IMMU” displayed on CONSULT-III screen.

NOTE:
In rare case, “CHAIN OF ECM-IMMU” might be stored during key registration procedure, even if the system is not malfunctioning.

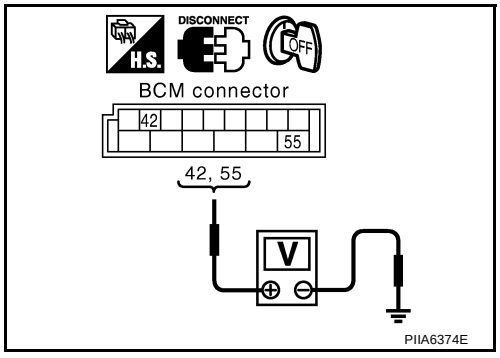
Is CONSULT-III screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. CHECK POWER SUPPLY CIRCUIT FOR BCM

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector M91 terminal 42, 55 and ground with CONSULT-III or tester.

42 (GY) - Ground : Battery voltage
55 (R) - Ground : Battery voltage



OK or NG

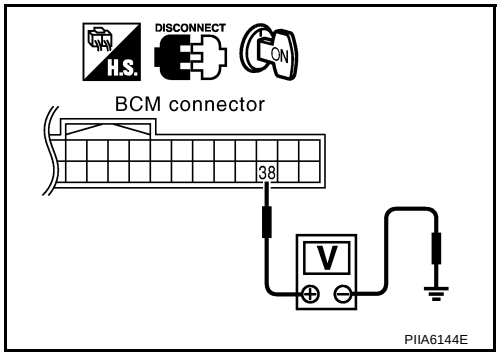
OK >> GO TO 3.
NG >> Check the following.

- 40A fusible link (letter **F** , located in fuse and fusible link box)
- 10A fuse [No.18, located in the fuse block (J/B)]
- Harness for open or short between fusible link and BCM. **Ref. Part No. C1**
- Harness for open or short between fuse and BCM. **Ref. Part No. C1**

3. CHECK IGN SW. ON SIGNAL

1. Turn ignition switch ON.
2. Check voltage between BCM harness connector M90 terminal 38 and ground with CONSULT-III or tester.

38 (W/L) - Ground : Battery voltage



OK or NG

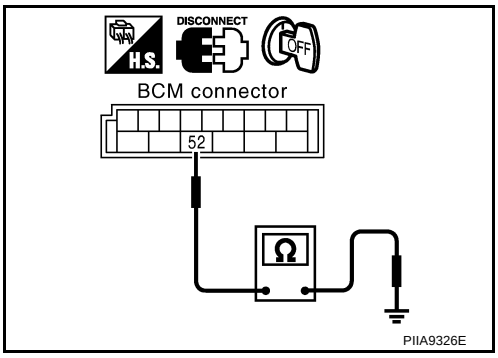
OK >> GO TO 4.
NG >> Check the following.

- 10A fuse [No. 1, located in the fuse block (J/B)]
- Harness for open or short between fuse and BCM. **Ref. part No. C2**

4. CHECK GROUND CIRCUIT FOR BCM

1. Turn ignition OFF.
2. Check continuity between BCM harness connector M91 terminal 52 and ground.

52 (B) - Ground : Continuity should exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness. **Ref. part No. C3**

5. REPLACE BCM

1. Replace BCM **Ref. part No. A**
2. Perform initialization with CONSULT-III.
   For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

Does the engine start?

Yes >> BCM is malfunctioning.
- Replace BCM. **Ref. part No. A**
- Perform initialization with CONSULT-III.
- For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

No >> ECM is malfunctioning.
- Replace ECM. **Ref. part No. B**
- Perform initialization or re-communicating function.
- For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.
- For re-communicating function, refer to BL-152, "ECM Re-communicating Function" .

Diagnostic Procedure 2

NIS0003L

Self-diagnostic results:
“DIFFERENCE OF KEY” displayed on CONSULT-III screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “DIFFERENCE OF KEY” displayed on CONSULT-III screen.

Is CONSULT-III screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. PERFORM INITIALIZATION WITH CONSULT-III

Perform initialization with CONSULT-III. Re-register all NATS ignition key IDs.
For initialization and registration of NATS ignition key IDs, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-III shows message on the screen.

Can the system be initialized and can the engine be started with re-registered NATS ignition key?

Yes >> Ignition key ID was unregistered. **Ref. part No. D**
No >> BCM is malfunctioning.
- Replace BCM. **Ref. part No. A**
- Perform initialization with CONSULT-III.
- For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

Diagnostic Procedure 3

NIS0003M

Self-diagnostic results:
“CHAIN OF IMMU-KEY” displayed on CONSULT-III screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “CHAIN OF IMMU-KEY” displayed on CONSULT-III screen.

Is CONSULT-III screen displayed as shown in figure?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. CHECK NATS ANTENNA AMP. INSTALLATION

Check NATS antenna amp. installation. Refer to BL-166, "How to Replace NATS Antenna Amp." .

OK or NG

OK >> GO TO 3.
NG >> Reinstall NATS antenna amp. correctly.

3. CHECK NVIS (NATS) IGNITION KEY ID CHIP

Start engine with another registered NATS ignition key.

Does the engine start?

Yes >> Ignition key ID chip is malfunctioning.
- Replace the ignition key. **Ref. part No, E5**
- Perform initialization with CONSULT-III.
  For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

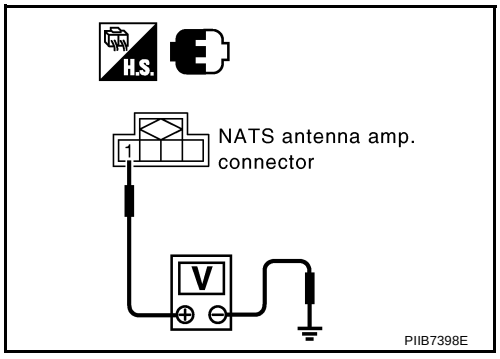
No >> GO TO 4.

4. CHECK POWER SUPPLY FOR NATS ANTENNA AMP.

1. Turn ignition switch “ON”.
2. Check voltage between NATS antenna amp. harness connector M28 terminal 1 and ground with CONSULT-III or tester.

Just after turning ignition switch “ON”

Voltage: Approx. 5V (For 3 seconds)



OK or NG

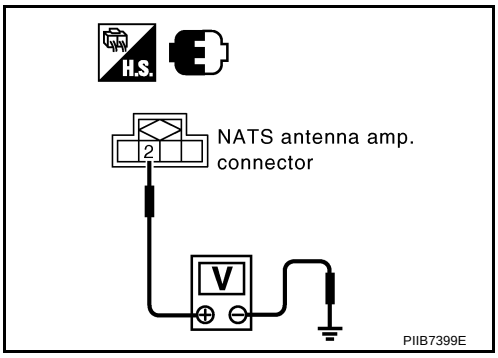
OK >> GO TO 5.
NG >>
- Check harness for open or short between NATS antenna amp. and BCM.

NOTE:
If harness is OK, replace BCM, perform initialization with CONSULT-III. For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

5. CHECK NATS ANTENNA AMP. SIGNAL LINE- 1

Check voltage between NATS antenna amp. harness connector M28 terminal 2 and ground with analogue tester.

Before turning ignition switch "ON"
Voltage: 0V
Just after turning ignition switch "ON"
: Pointer of tester should move.



OK or NG

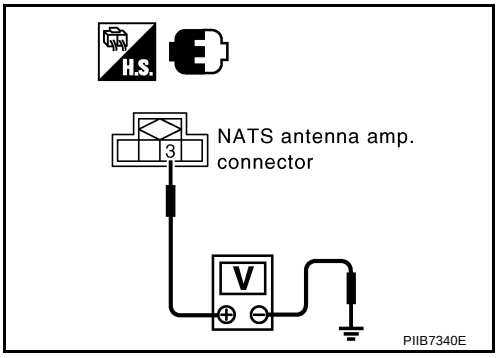
OK >> GO TO 6.
NG >> ● Check harness for open or short between NATS antenna amp. and BCM.

NOTE:
If harness is OK, replace BCM, perform initialization with CONSULT-III. For initialization, refer to "CONSULT-III Operation Manual NATS-IVIS/NVIS".

6. CHECK NATS ANTENNA AMP. SIGNAL LINE- 2

Check voltage between NATS antenna amp. harness connector M28 terminal 3 and ground with analogue tester.

Before turning ignition switch "ON"
Voltage: 0V
Just after turning ignition switch "ON"
: Pointer of tester should move.



OK or NG

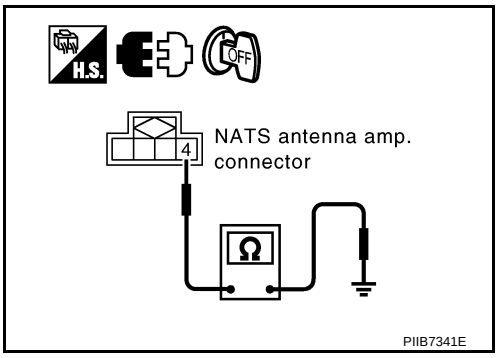
OK >> GO TO 7.
NG >> ● Check harness for open or short between NATS antenna amp. and BCM.

NOTE:
If harness is OK, replace BCM, perform initialization with CONSULT-III. For initialization, refer to "CONSULT-III Operation Manual NATS-IVIS/NVIS".

7. CHECK NATS ANTENNA AMP. GROUND LINE CIRCUIT

1. Turn ignition switch "OFF".
2. Check continuity between NATS antenna amp. connector harness M28 terminal 4 and ground.

4 (BR) – Ground : Continuity should exist.



OK or NG

OK >> NATS antenna amp. is malfunctioning. **Ref. part No. E6**
NG >> Replace NATS antenna amp.

● Check harness for open or short between NATS antenna amp. and BCM.

NOTE:
If harness is OK, replace BCM, perform initialization with CONSULT-III. For initialization, refer to "CONSULT-III Operation Manual NATS-IVIS/NVIS".

Diagnostic Procedure 4

NIS0003N

Self-diagnostic results:
"ID DISCORD, IMM-ECM" displayed on CONSULT-III screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “ID DISCORD, IMM-ECM” displayed on CONSULT-III screen.

NOTE:
“ID DISCORD IMM-ECM”:
Registered ID of BCM is in discord with that of ECM.

Is CONSULT-III screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. PERFORM INITIALIZATION WITH CONSULT-III

Perform initialization with CONSULT-III. Re-register all NATS ignition key IDs.
For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-III shows message on the screen.

Can the system be initialized?

Yes >> Start engine. (END)
- (System initialization had not been completed. **Ref. part No. F**)

No >> ECM is malfunctioning.
- Replace ECM. **Ref. part No. B**
- Perform initialization with CONSULT-III.
  For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

Diagnostic Procedure 5

NIS0003O

“SECURITY INDICATOR LAMP DOES NOT LIGHT UP”

1. CHECK FUSE

- Check 10A fuse [No.19, located in the fuse block (J/B)]

  NOTE:
  Refer to BL-150, "Component Parts and Harness Connector Location" .

OK or NG

OK >> GO TO 2.
NG >> Replace fuse.

2. CHECK SECURITY INDICATOR LAMP

1. Install 10A fuse.
2. Start engine and turn ignition switch OFF.
3. Check the security indicator lamp lights up.

Security indicator lamp should light up.

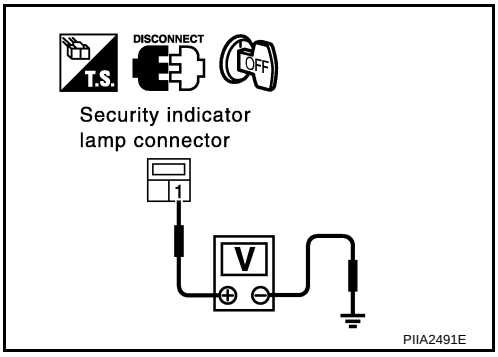
OK or NG

OK >> Inspection END.
NG >> GO TO 3.

3. CHECK SECURITY INDICATOR LAMP POWER SUPPLY CIRCUIT

1. Disconnect security indicator lamp connector.
2. Check voltage between security indicator lamp harness connector M34 terminal 1 and ground.

1 (R/W) – Ground : Battery voltage should exist.



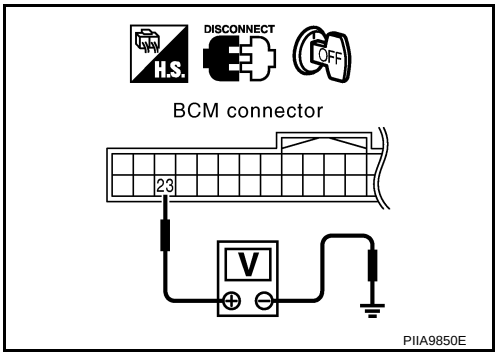
OK or NG

OK >> GO TO 4.
NG >> Check harness for open or short between fuse and security indicator lamp.

4. CHECK BCM FUNCTION

1. Connect security indicator lamp connector.
2. Disconnect BCM (NATS connector.
3. Check voltage between BCM harness connector M90 terminal 23 and ground.

23 (G/OR) – Ground : Battery voltage



OK or NG

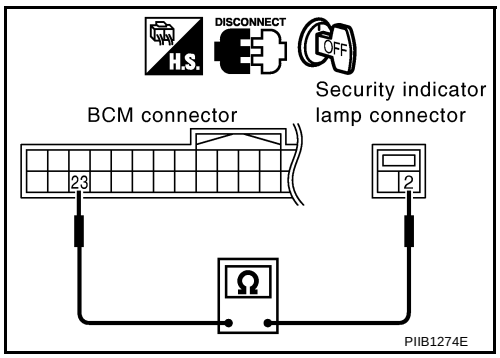
OK >> BCM is malfunctioning.
- Replace BCM.
  Ref. part No. A
- Perform initialization with CONSULT-III.
- For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NG >> GO TO 5.

5. CHECK SECURITY INDICATOR LAMP CIRCUIT

1. Check continuity between BCM harness connector M90 terminal 23 and security indicator lamp harness connector M34 terminal 2.

23 (G/OR) - 2 (G/OR) : Continuity should exist.



OK or NG

OK >> Check indicator lamp condition.
NG >> Repair harness or connector.

Diagnostic Procedure 6

NIS0003P

Self-diagnostic results:
“LOCK MODE” displayed on CONSULT-III screen

1. CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS “LOCK MODE” is displayed on CONSULT-III screen.

Is CONSULT-III screen displayed as above?

Yes >> GO TO 2.
No >> GO TO BL-156, "SYMPTOM MATRIX CHART 1" .

2. ESCAPE FROM LOCK MODE

1. Turn ignition switch OFF.
2. Turn ignition switch ON with registered key. (Do not start engine.) Wait 5 seconds.
3. Return the key to OFF position. Wait 5 seconds.
4. Repeat steps 2 and 3 twice (total of three cycles).
5. Start the engine.

Does engine start?

Yes >> System is OK (Now system is escaped from “LOCK MODE”).
No >> GO TO 3.

3. PERFORM INITIALIZATION WITH CONSULT-III

Perform initialization with CONSULT-III.
For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-III shows the message on the screen.

Can the system be initialized?

Yes >> System is OK.
No >> GO TO 4.

4. PERFORM INITIALIZATION WITH CONSULT-III AGAIN

1. Replace BCM.
2. Perform initialization with CONSULT-III.
   For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

NOTE:
If the initialization is not completed or malfunctions, CONSULT-III shows the message on the screen.

Can the system be initialized?

Yes >> System is OK. (BCM is malfunctioning. **Ref. part No. A**)
No >> ECM is malfunctioning.

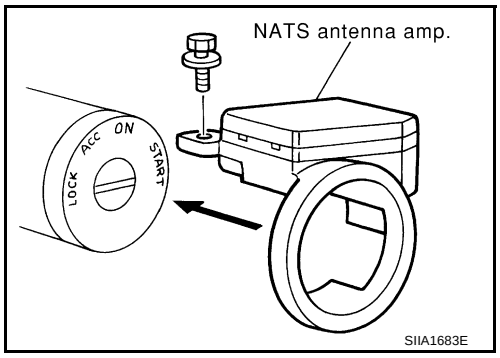
- Replace ECM. **Ref. part No. B**
- Perform initialization with CONSULT-III.
  For initialization, refer to “CONSULT-III Operation Manual NATS-IVIS/NVIS”.

How to Replace NATS Antenna Amp.

NIS0003Q

NOTE:

- **If NATS antenna amp. is not installed correctly, NVIS (NATS) system will not operate properly and SELF-DIAG RESULTS on CONSULT-III screen will show “LOCK MODE” or “CHAIN OF IMMU-KEY”.**
- **Initialization is not necessary only when NATS antenna amp. is replaced with a new one.**



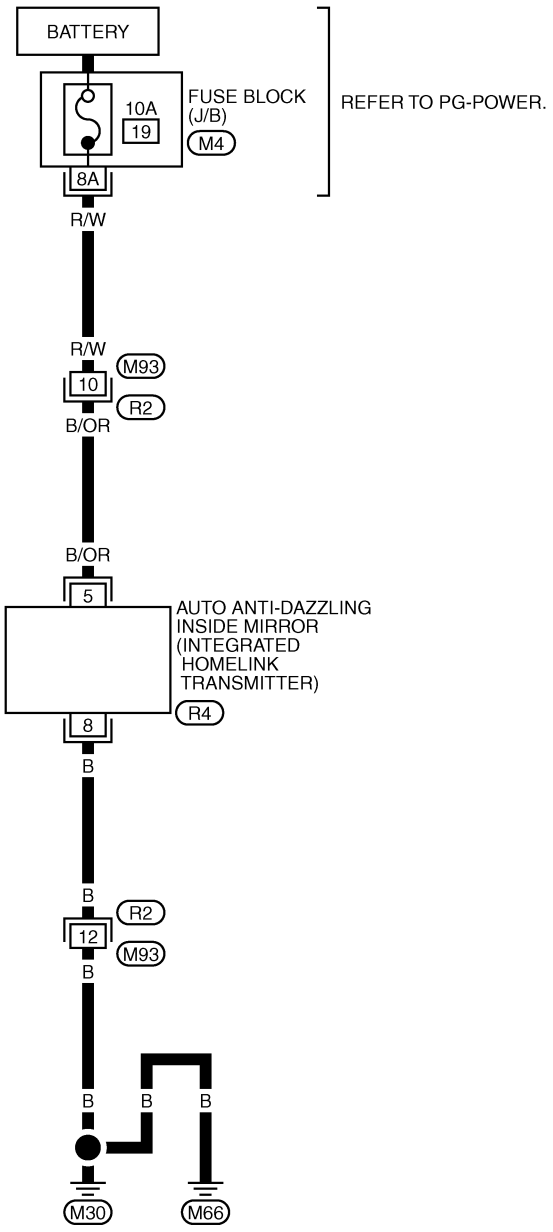
INTEGRATED HOMELINK TRANSMITTER

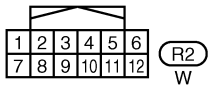
PFP:96401

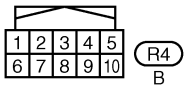
Wiring Diagram — TRNSCV —

NIS0003R

BL-TRNSCV-01







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT2272E

Trouble Diagnoses

NIS0003S

DIAGNOSTIC PROCEDURE

SYMPTOM: Transmitter does not activate receiver.

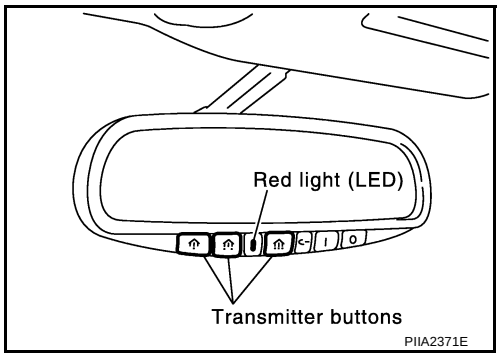
Before conducting the procedure given below, make sure that system receiver (garage door opener, etc.) operates with original, hand-held transmitter. If NG, receiver or hand-held transmitter is malfunctioning, not vehicle related.

1. CHECK ILLUMINATION

1. Turn ignition switch “OFF”.
2. Does red light (LED) of transmitter illuminate when any transmitter button is pressed?

YES or NO

YES >> GO TO 2.
NO >> GO TO 3.



2. CHECK TRANSMITTER

Check transmitter with Tool*.
*:For details, refer to Technical Service Bulletin.

OK or NG

OK >> Receiver or hand-held transmitter malfunction, not vehicle related.
NG >> Replace inside mirror assembly.

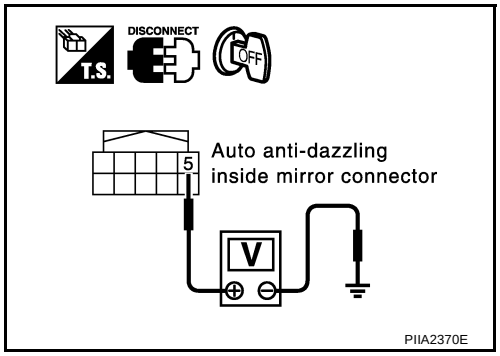
3. CHECK POWER SUPPLY

1. Disconnect transmitter connector.
2. Turn ignition switch “OFF”.
3. Check voltage between auto anti-dazzling inside mirror (integrated homelink transmitter) connector R4 terminal 5 and ground.

5 (B/OR) – Ground : Battery voltage

OK or NG

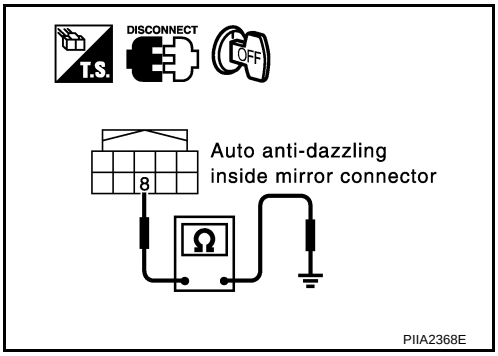
OK >> GO TO 4.
NG >>
- Check 10A fuse. [No. 19 located in the fuse block (J/B)]
- Harness for open or short between fuse and anti-dazzling inside mirror (integrated homelink transmitter).



4. CHECK GROUND CIRCUIT

Check continuity between anti-dazzling inside mirror (integrated homelink transmitter) connector R4 terminal 8 and ground.

8 (B) – Ground : Continuity should exist.



OK or NG

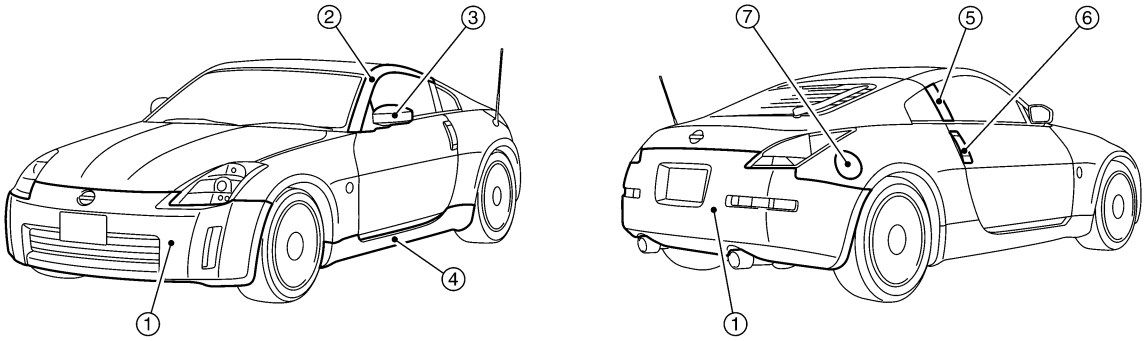
OK >> Replace inside mirror assembly.
NG >> Harness for open or short between anti-dazzling inside mirror (integrated homelink transmitter) body ground.

BODY REPAIR

PFP:60100

Body Exterior Paint Color (Coupe)

NIS0003T



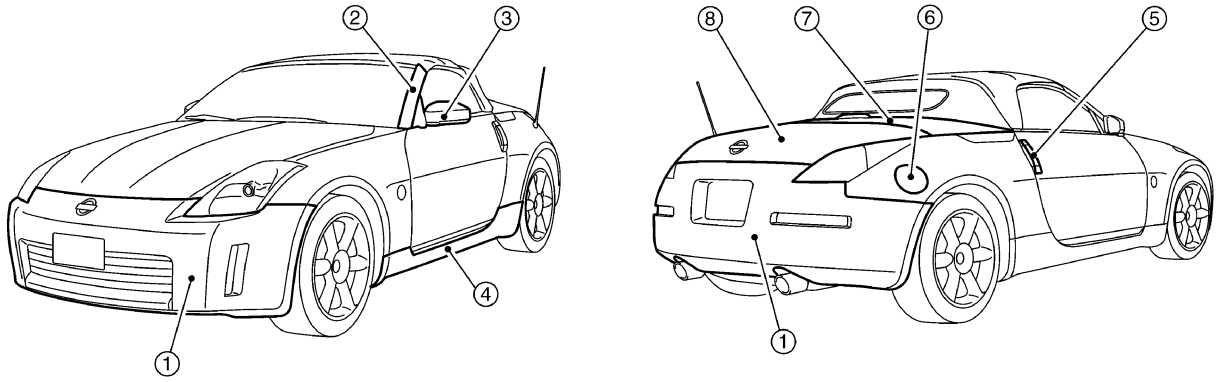
SIIA1975E

Component			Color code	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
			Description	Orange	Red	Blue	Black	Silver	Red Purple	White	Silver
			Paint type	2P	2S	CPM	2P	M	RP	3P	M
			Hard clear coat	-	X	X	X	-	X	-	-
1	Bumper fascia		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
2	Front pillar finisher		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
3	Door outside mirror	Case	Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
		Base	Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
4	Center mud-guard		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
5	Door sash		Black	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88	GROSS 88
6	Door outside handle and escutcheon		Velour chromium-plate	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p
7	Fuel filler lid		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2

2S: Solid + Clear, M: Metallic, 2P: 2-Coat pearl, 3P: 3-Coat pearl, CPM: Clear pearl metallic, RP: Multi flex color

Body Exterior Paint Color (Roadster)

NIS0003U



SIIA2295E

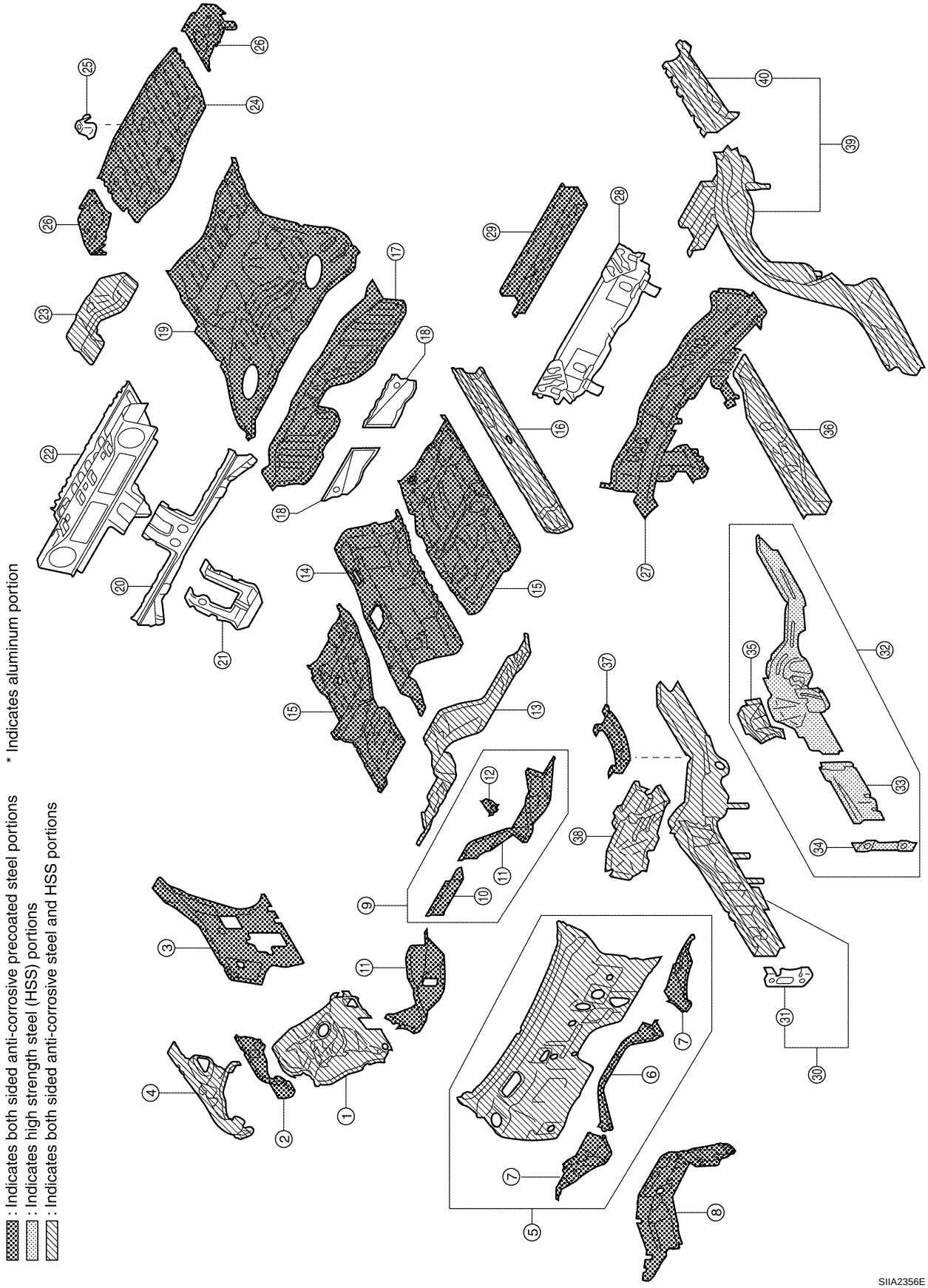
Component			Color code	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
			Description	Orange	Red	Blue	Black	Silver	Red Purple	White	Silver
			Paint type	2P	2S	CPM	2P	M	RP	3P	M
			Hard clear coat	-	X	X	X	-	X	-	-
1	Bumper fascia		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
2	Front pillar finisher		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
3	Door outside mirror	Case	Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
		Base	Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
4	Center mud-guard		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
5	Door outside handle and escutcheon		Velour chro-mium-plate	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p	Cr2p
6	Fuel filler lid		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
7	Storage lid		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2
8	Trunk lid		Body color	BA17	BAX6	BB17	BG41	BK23	BL40	BQX1	BWV2

2S: Solid + Clear, M: Metallic, 2P: 2-Coat pearl, 3P: 3-Coat pearl, CPM: Clear pearl metallic, RP: Multi flex color

Body Component Parts (Coupe)

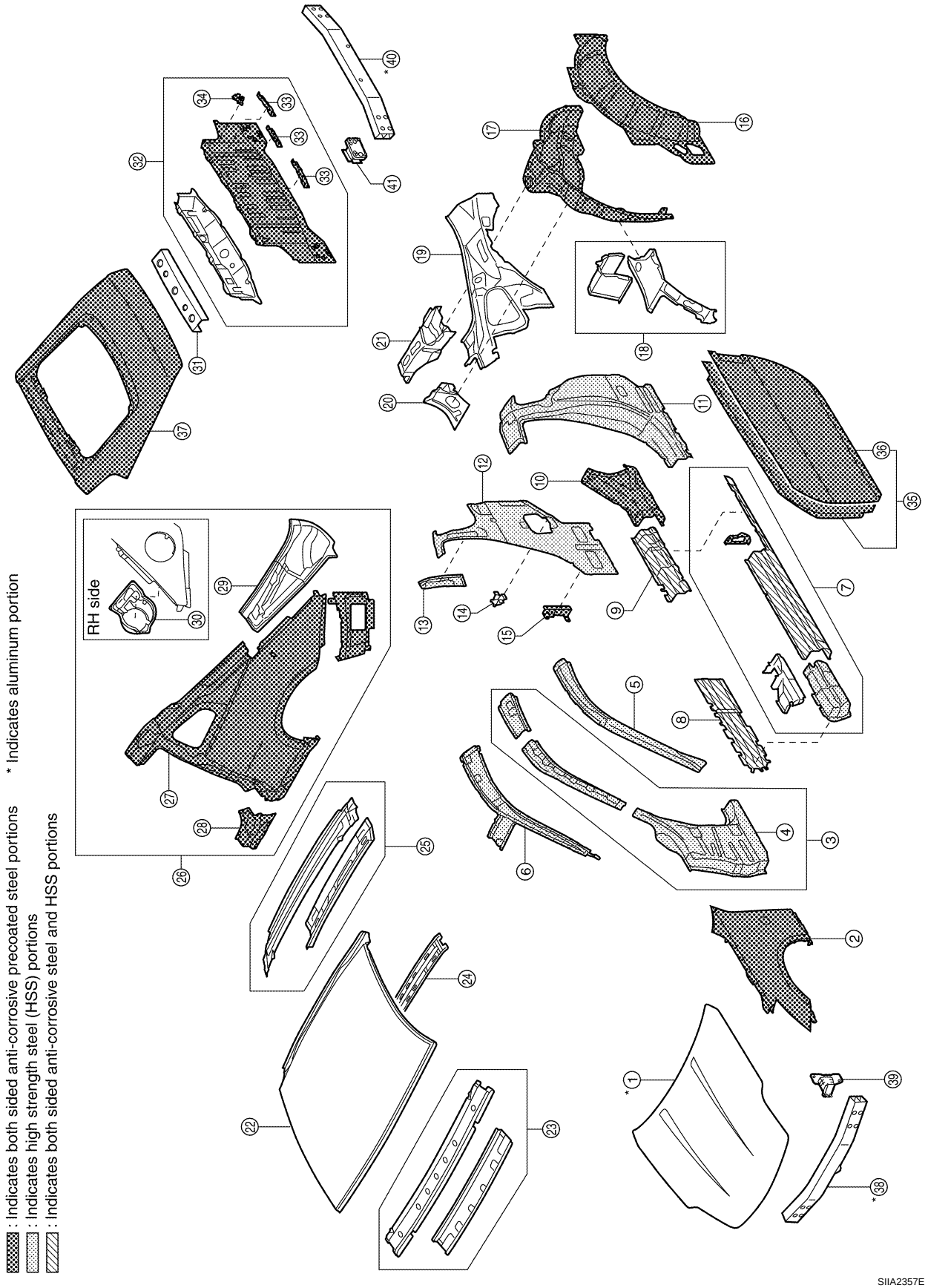
NIS0003V

UNDERBODY COMPONENT PARTS



1. Front strut housing (RH&LH)
2. Upper front hoodledge (RH&LH)
3. Upper rear hoodledge (RH&LH)
4. Hoodledge reinforcement (RH&LH)
5. Upper dash assembly
6. Lower dash crossmember center reinforcement
7. Lower dash crossmember reinforcement
8. Cowl top
9. Lower dash crossmember assembly
10. Front crossmember center
11. Lower dash crossmember
12. Steering column mounting reinforcement
13. Lower dash
14. Front floor center
15. Front floor
16. Inner sill (RH&LH)
17. Rear seat crossmember reinforcement assembly
18. Rear floor gusset
19. Rear floor front
20. Rear step upper panel assembly
21. Rear step lower panel assembly
22. Inside step panel
23. Rear floor seat belt anchor reinforcement
24. Rear floor rear
25. Spare tire clamp bracket
26. Rear floor side
27. Rear seat crossmember
28. 2ND rear crossmember
29. Rear center crossmember assembly
30. Front side member assembly (RH&LH)
31. Inner front towing hook bracket (RH&LH)
32. Front side member closing plate assembly (RH&LH)
33. Front side member front closing plate (RH&LH)
34. Outer front towing hook bracket (RH&LH)
35. Front side member center closing plate (RH&LH)
36. Front side member rear extension (RH&LH)
37. Front side member rear reinforcement (RH&LH)
38. Front side member outrigger assembly (RH&LH)
39. Rear side member assembly (RH&LH)
40. Rear side member extension (RH&LH)

BODY COMPONENT PARTS



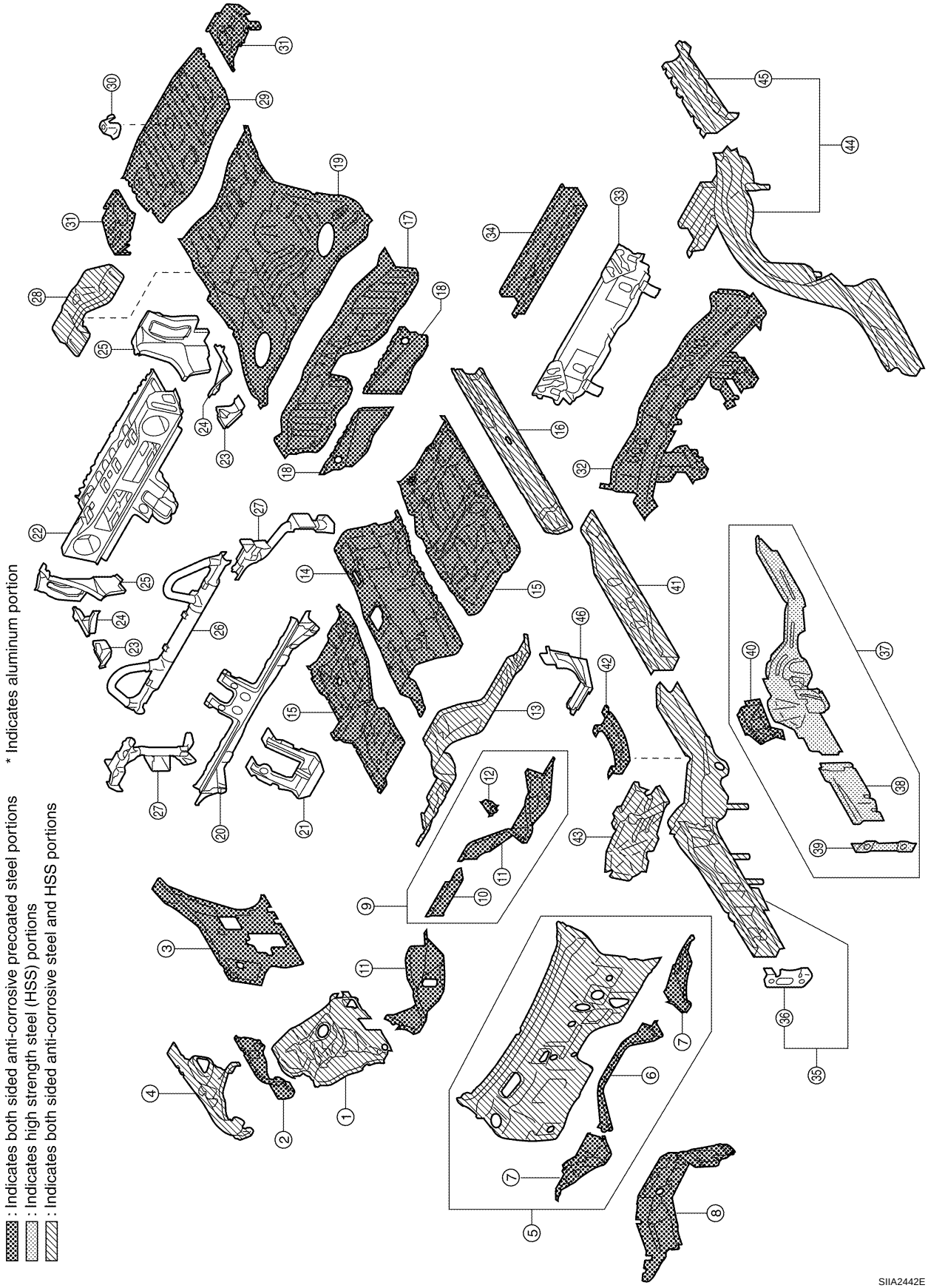
1. Hood
2. Front fender (RH&LH)

3. Front pillar reinforcement assembly (RH&LH)
4. Front pillar hinge brace (RH&LH)
5. Outer front pillar (RH&LH)
6. Inner side roof rail (RH&LH)
7. Outer sill reinforcement assembly (RH&LH)
8. Lower front pillar reinforcement (RH&LH)
9. Lower center pillar bulkhead assembly (RH&LH)
10. Outer rear wheel house extension (RH&LH)
11. Outer lock pillar reinforcement (RH&LH)
12. Inner lock pillar assembly (RH&LH)
13. Inner lock pillar reinforcement (RH&LH)
14. Seat belt anchor assembly (RH&LH)
15. Outer sill brace (RH&LH)
16. Outer rear wheel house (RH&LH)
17. Inner rear wheel house (RH&LH)
18. Inner rear pillar joint (RH&LH)
19. Inner rear pillar (RH&LH)
20. Seat back support (RH&LH)
21. Side parcel shelf (RH&LH)
22. Roof
23. Front roof rail assembly
24. Roof bow No.1
25. Rear roof rail assembly
26. Rear fender assembly (RH&LH)
27. Rear fender (RH&LH)
28. Outer sill extension (RH&LH)
29. Rear fender corner (RH&LH)
30. Fuel filler lid base
31. Parcel shelf
32. Rear panel assembly
33. Rear bumper fascia bracket
34. Rear bumper fascia center bracket (RH&LH)
35. Front door assembly (RH&LH)
36. Outer front door panel (RH&LH)
37. Back door
38. Front bumper reinforcement
39. Front bumper stay (RH&LH)
40. Rear bumper reinforcement
41. Rear bumper stay (RH&LH)

Body Component Parts (Roadster)

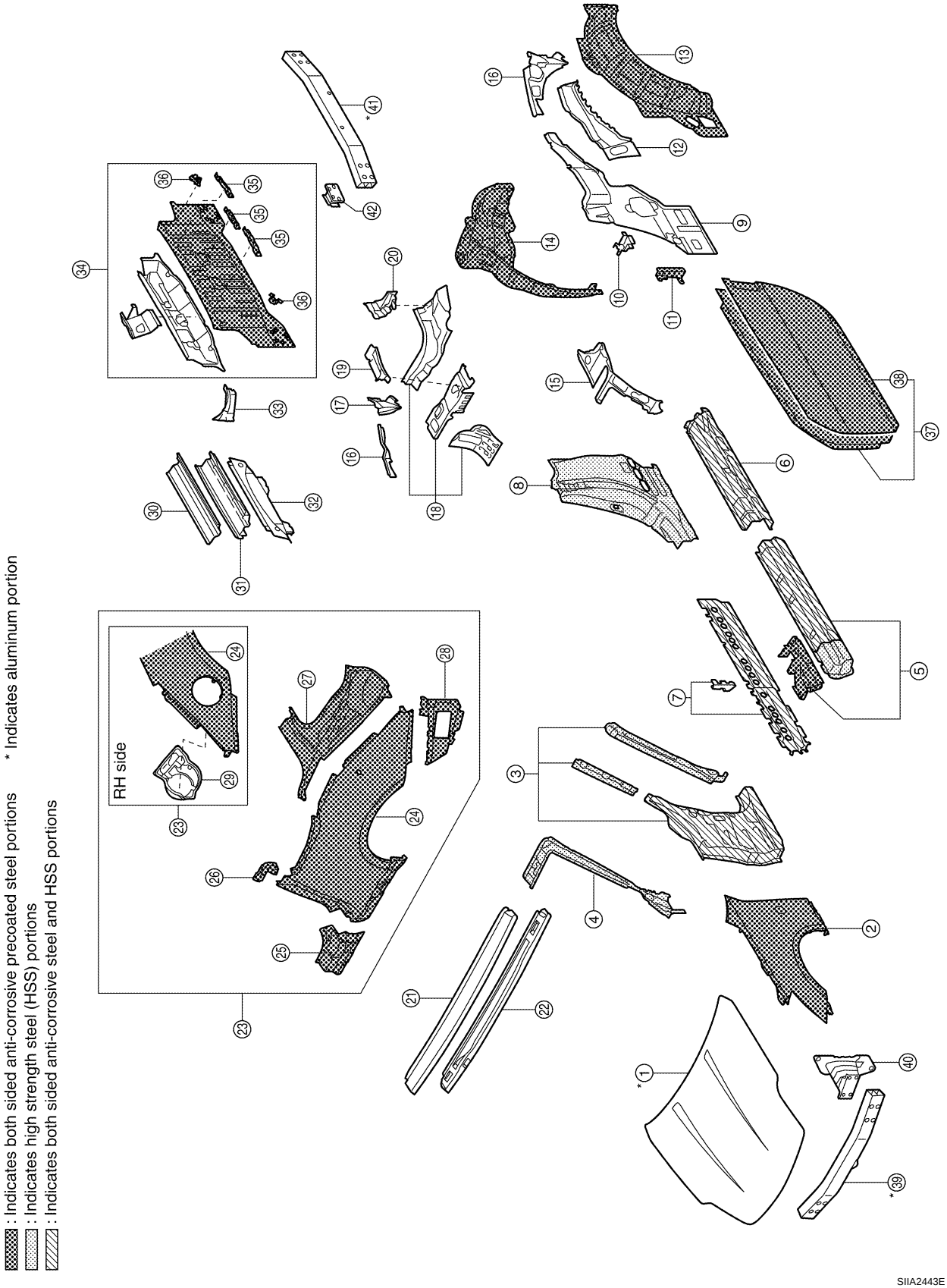
NIS0003W

UNDERBODY COMPONENT PARTS



1. Front strut housing (RH&LH)
2. Upper front hoodledge (RH&LH)
3. Upper rear hoodledge (RH&LH)
4. Hoodledge reinforcement (RH&LH)
5. Upper dash assembly
6. Lower dash crossmember center reinforcement
7. Lower dash crossmember reinforcement
8. Cowl top
9. Lower dash crossmember assembly
10. Front crossmember center
11. Lower dash crossmember A
12. Steering column mounting reinforcement
13. Lower dash
14. Front floor center
15. Front floor
16. Inner sill (RH&LH)
17. Rear seat crossmember reinforcement assembly
18. Rear floor gusset
19. Rear floor front
20. Rear step upper panel assembly
21. Rear step lower panel assembly
22. Inside step panel
23. Guard frame gusset
24. Rear side member connector
25. Inner rear wheelhouse connector
26. Guard frame assembly
27. Inside guard frame post
28. Rear floor seat belt anchor reinforcement
29. Rear floor rear
30. Spare tire clamp bracket
31. Rear floor side
32. Rear seat crossmember
33. 2ND rear crossmember
34. Rear center crossmember assembly
35. Front side member assembly (RH&LH)
36. Inner front towing hook bracket (RH&LH)
37. Front side member closing plate assembly (RH&LH)
38. Front side member front closing plate (RH&LH)
39. Outer front towing hook bracket (RH&LH)
40. Front side member center closing plate (RH&LH)
41. Front side member rear extension (RH&LH)
42. Front side member rear reinforcement (RH&LH)
43. Front side member outrigger assembly (RH&LH)
44. Rear side member assembly (RH&LH)
45. Rear side member extension (RH&LH)
46. Lower dash crossmember B

BODY COMPONENT PARTS



1. Hood
2. Front fender (RH&LH)
3. Outer front pillar assembly (RH&LH)
4. Inner side roof rail (RH&LH)
5. Outer front sill reinforcement assembly (RH&LH)
6. Outer rear sill reinforcement assembly (RH&LH)
7. Lower front pillar reinforcement assembly (RH&LH)
8. Outer lock pillar reinforcement (RH&LH)
9. Inner rear pillar (RH&LH)
10. Seat belt anchor assembly (RH&LH)
11. Outer sill brace (RH&LH)
12. Rear side waist reinforcement (RH&LH)
13. Outer rear wheel house (RH&LH)
14. Inner rear wheel house (RH&LH)
15. Rear pillar joint (RH&LH)
16. Lower inner rear pillar
17. Lower rear pillar rear (RH)
18. Side parcel shelf assembly (RH&LH)
19. Side parcel shelf (RH&LH)
20. Rear pillar gusset (RH&LH)
21. Outer front roof rail
22. Inner front roof rail
23. Rear fender assembly
24. Rear fender
25. Outer sill extension (RH&LH)
26. Rear fender extension A (RH&LH)
27. Rear fender extension B (RH&LH)
28. Rear fender extension C (RH&LH)
29. Fuel filler lid base
30. Rear waist
31. Parcel shelf
32. Seat back support
33. Rear panel bracket reinforcement (RH&LH)
34. Rear panel assembly
35. Center rear bumper fascia bracket
36. Rear bumper fascia bracket
37. Front door assembly (RH&LH)
38. Outer front door panel (RH&LH)
39. Front bumper reinforcement
40. Front bumper stay (RH&LH)
41. Rear bumper reinforcement
42. Rear bumper stay (RH&LH)

Corrosion Protection

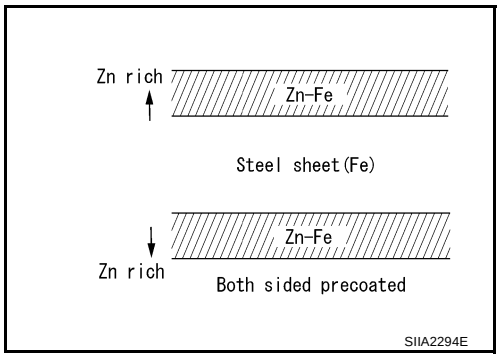
NIS0003X

DESCRIPTION

To provide improved corrosion prevention, the following anti-corrosive measures have been implemented in NISSAN production plants. When repairing or replacing body panels, it is necessary to use the same anti-corrosive measures.

Anti-corrosive precoated steel (Galvannealed steel)

To improve repairability and corrosion resistance, a new type of anti-corrosive precoated steel sheet has been adopted replacing conventional zinc-coated steel sheet.
Galvannealed steel is electroplated and heated to form Zinc-iron alloy, which provides excellent and long term corrosion resistance with cationic electrodeposition primer.



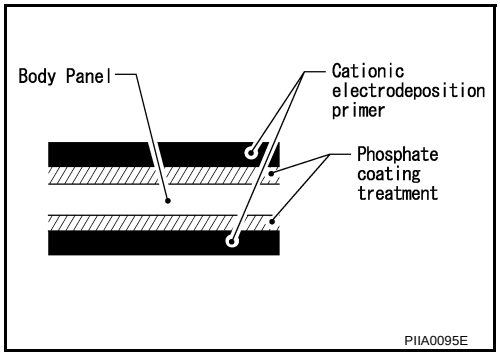
Nissan Genuine Service Parts are fabricated from galvannealed steel. Therefore, it is recommended that GENUINE NISSAN PARTS or equivalent be used for panel replacement to maintain the anti-corrosive performance built into the vehicle at the factory.

Phosphate coating treatment and cationic electrodeposition primer

A phosphate coating treatment and a cationic electrodeposition primer, which provide excellent corrosion protection, are employed on all body components.

CAUTION:

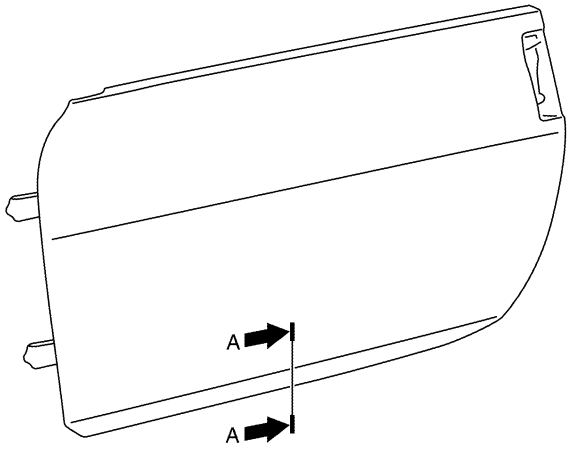
Confine paint removal during welding operations to an absolute minimum.



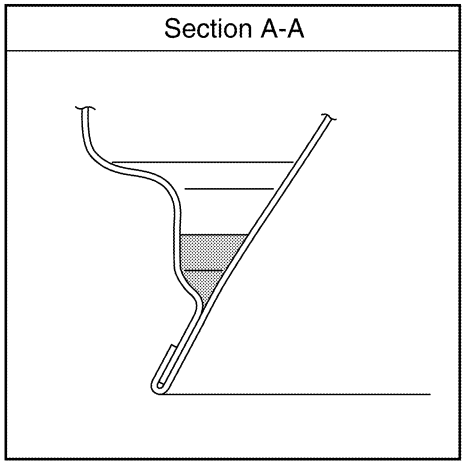
Nissan Genuine Service Parts are also treated in the same manner. Therefore, it is recommended that GENUINE NISSAN PARTS or equivalent be used for panel replacement to maintain anti-corrosive performance built into the vehicle at the factory.

ANTI-CORROSIVE WAX

To improve corrosion resistance, anti-corrosive wax is applied inside the body sill and inside other closed sections. Accordingly, when replacing these parts, be sure to apply anti-corrosive wax to the appropriate areas of the new parts. Select an excellent anti-corrosive wax which will penetrate after application and has a long shelf life.



: Indicates anti-corrosive wax coated portions.



SIIA1979E

UNDERCOATING

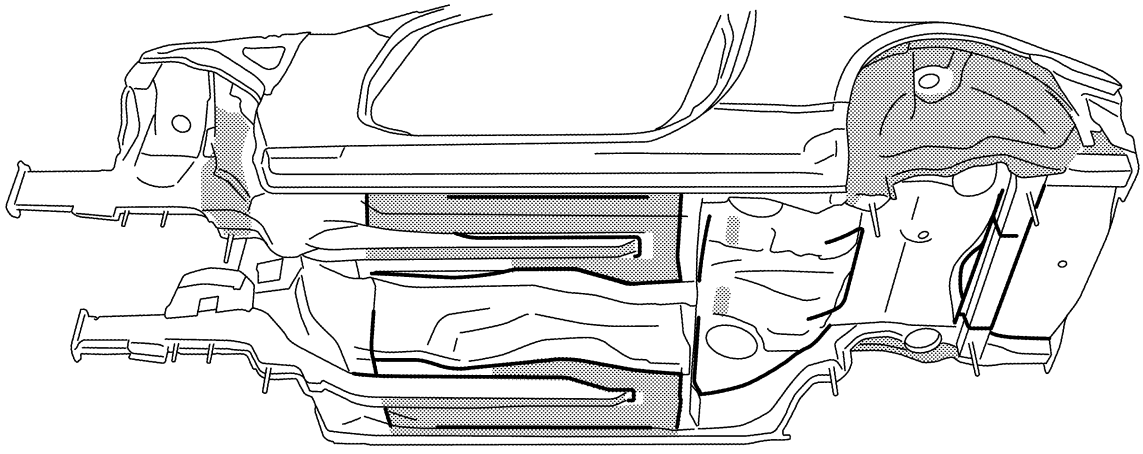
The underside of the floor and wheelhouse are undercoated to prevent rust, vibration, noise and stone chipping. Therefore, when such a panel is replaced or repaired, apply undercoating to that part. Use an undercoating which is rust preventive, soundproof, vibration-proof, shock-resistant, adhesive, and durable.

Precautions in undercoating

1. Do not apply undercoating to any place unless specified (such as the areas above the muffler and three way catalyst which are subjected to heat).
2. Do not undercoat the exhaust pipe or other parts which become hot.
3. Do not undercoat rotating parts.
4. Apply bitumen wax after applying undercoating.
5. After putting seal on the vehicle, put undercoating on it.

: Indicates undercoated portions.

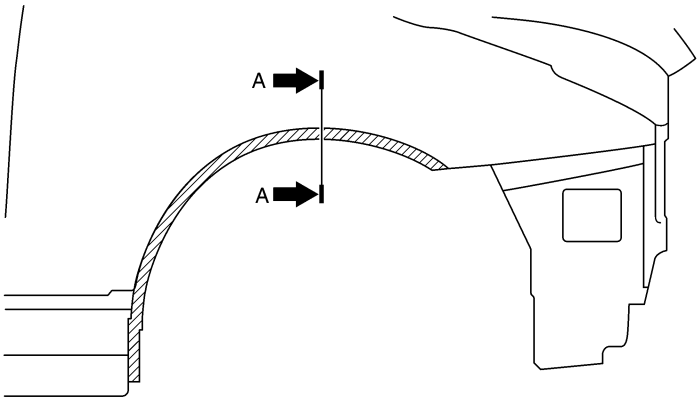
: Indicates sealed portions.



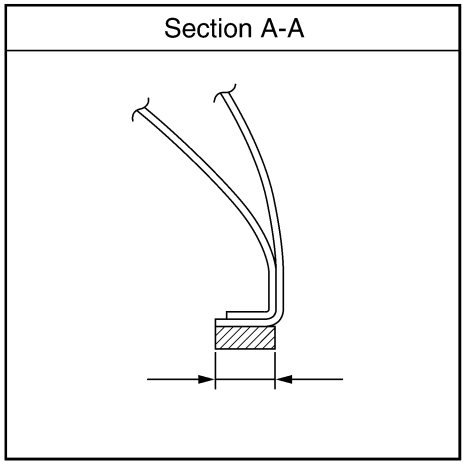
SIIA2298E

STONE GUARD COAT

To prevent damage caused by stones, the lower outer body panel (fender, door, etc.) have an additional layer of Stone Guard Coating over the ED primer coating. When replacing or repairing these panels, apply Stone Guard coating to the same portions as before. Use a coating which is rust preventive, durable, shock-resistant and has a long shelf life.



: Indicates stone guard coated portions.



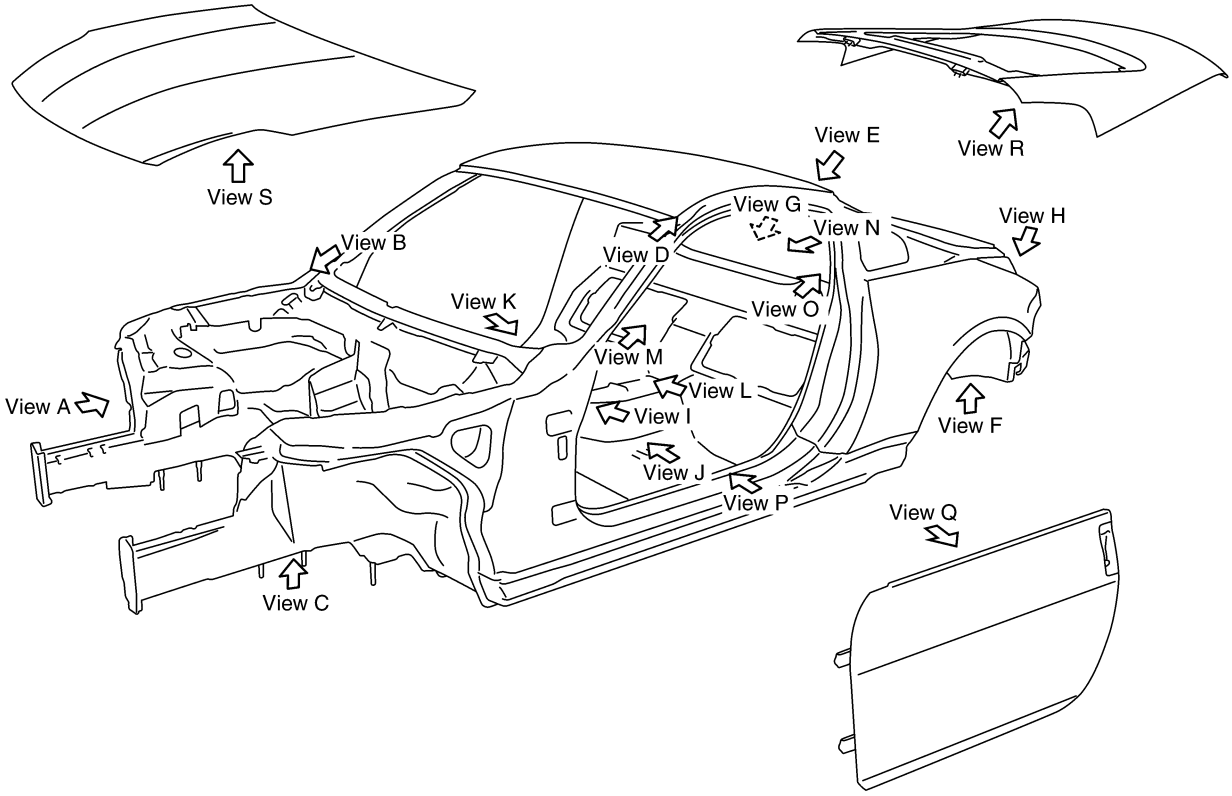
SIIA2299E

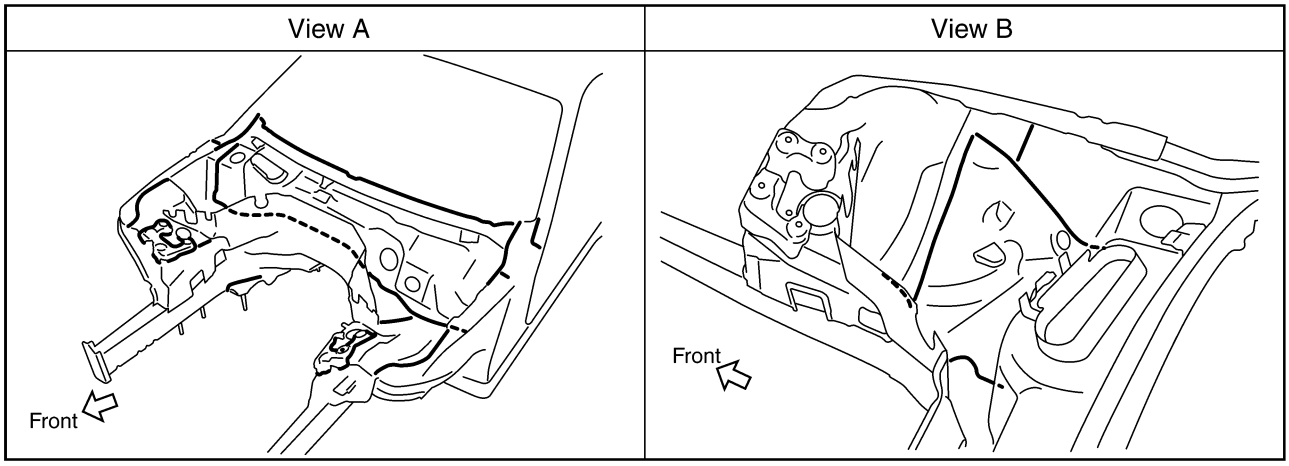
Body Sealing (Coupe)

NIS0003Y

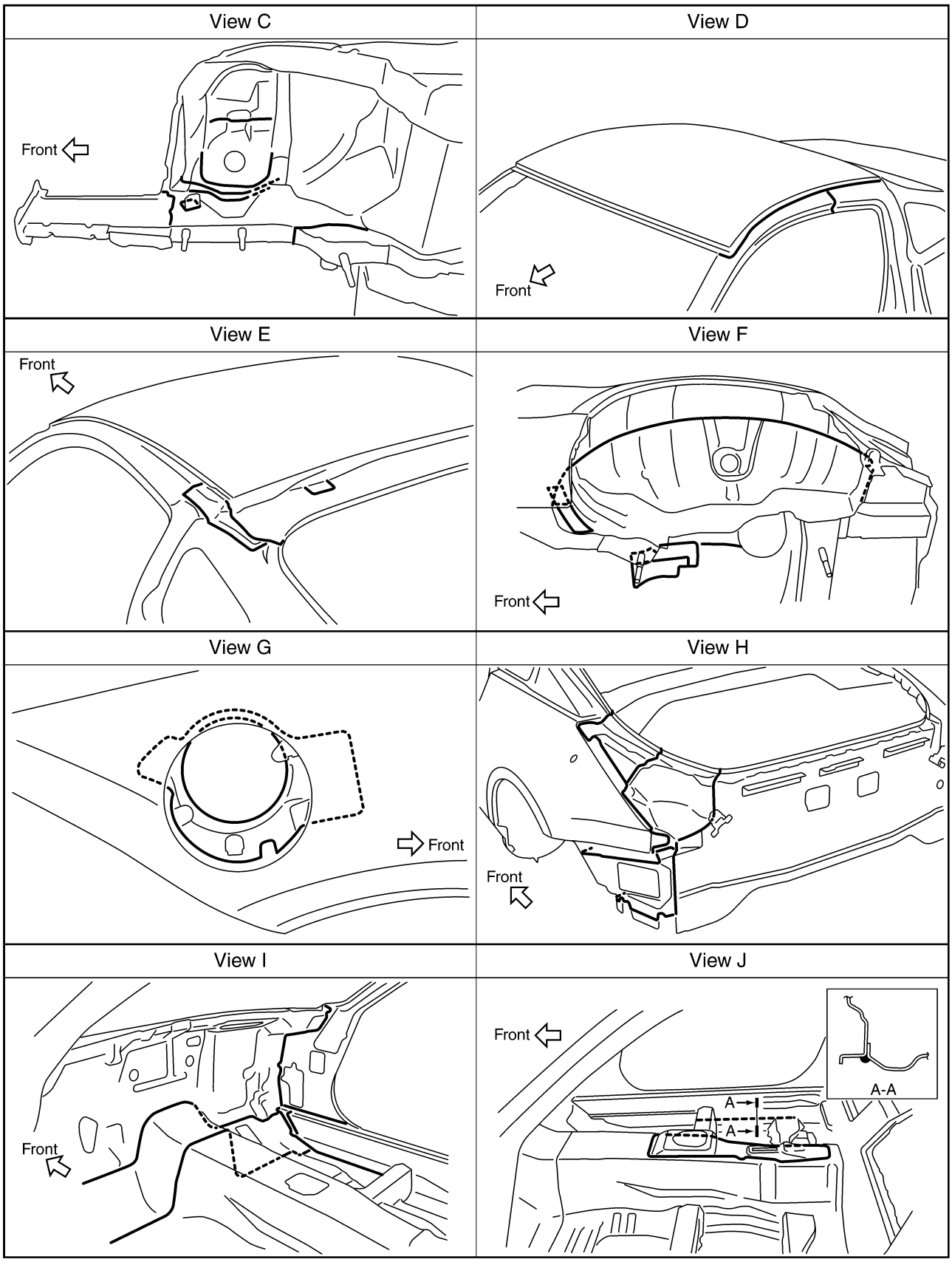
DESCRIPTION

The following figure shows the areas which are sealed at the factory. Sealant which has been applied to these areas should be smooth and free from cuts or gaps. Care should be taken not to apply an excess amount of sealant and not to allow other unaffected parts to come into contact with the sealant.



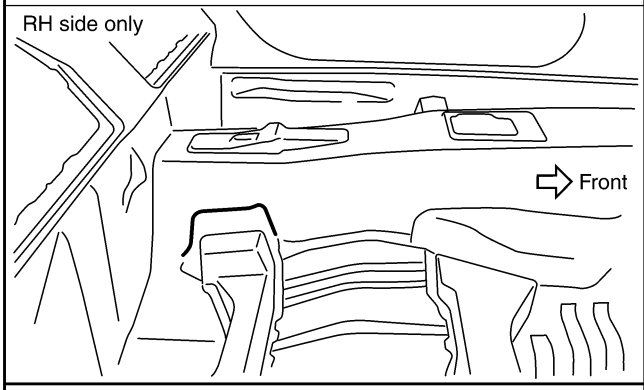


SIIA1976E

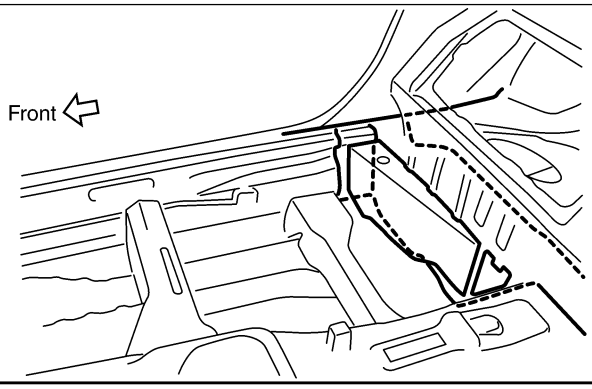

View C
Front
View D
Front
View E
Front
View F
Front
View G
Front
View H
Front
View I
Front
View J
Front
A-A
A
A

SIIA1977E

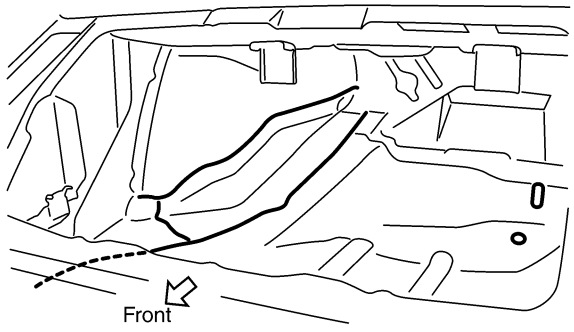
View K



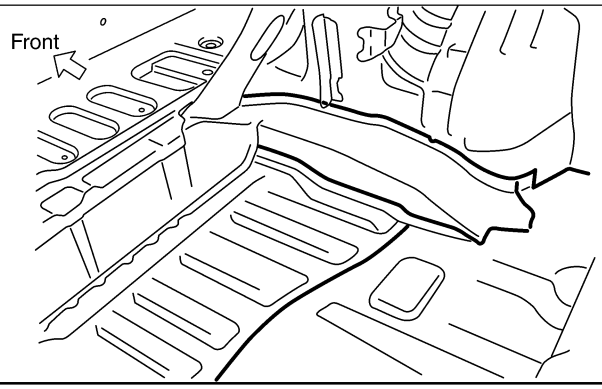
View L



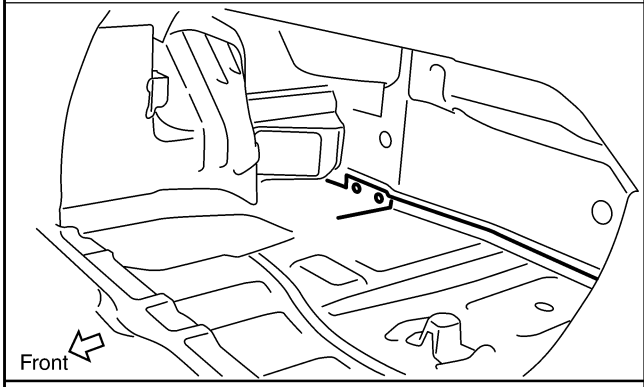
View M



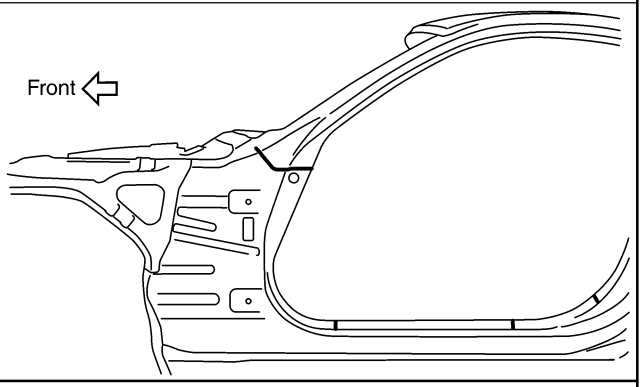
View N



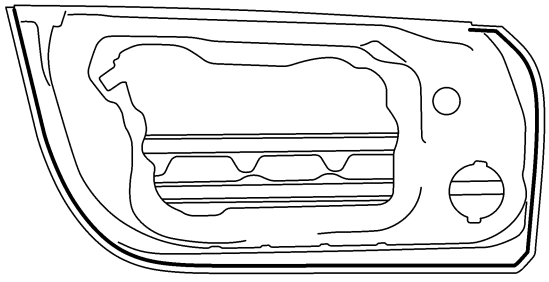
View O



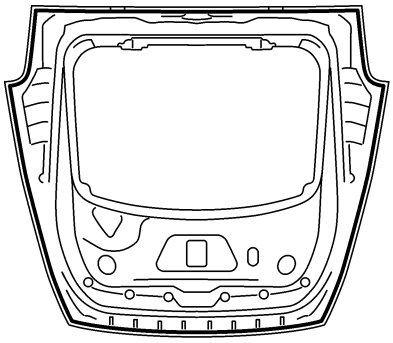
View P



View Q

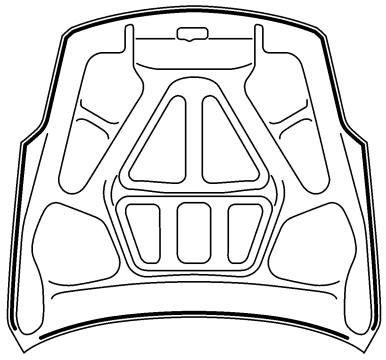


View R



SIIA1978E

View S



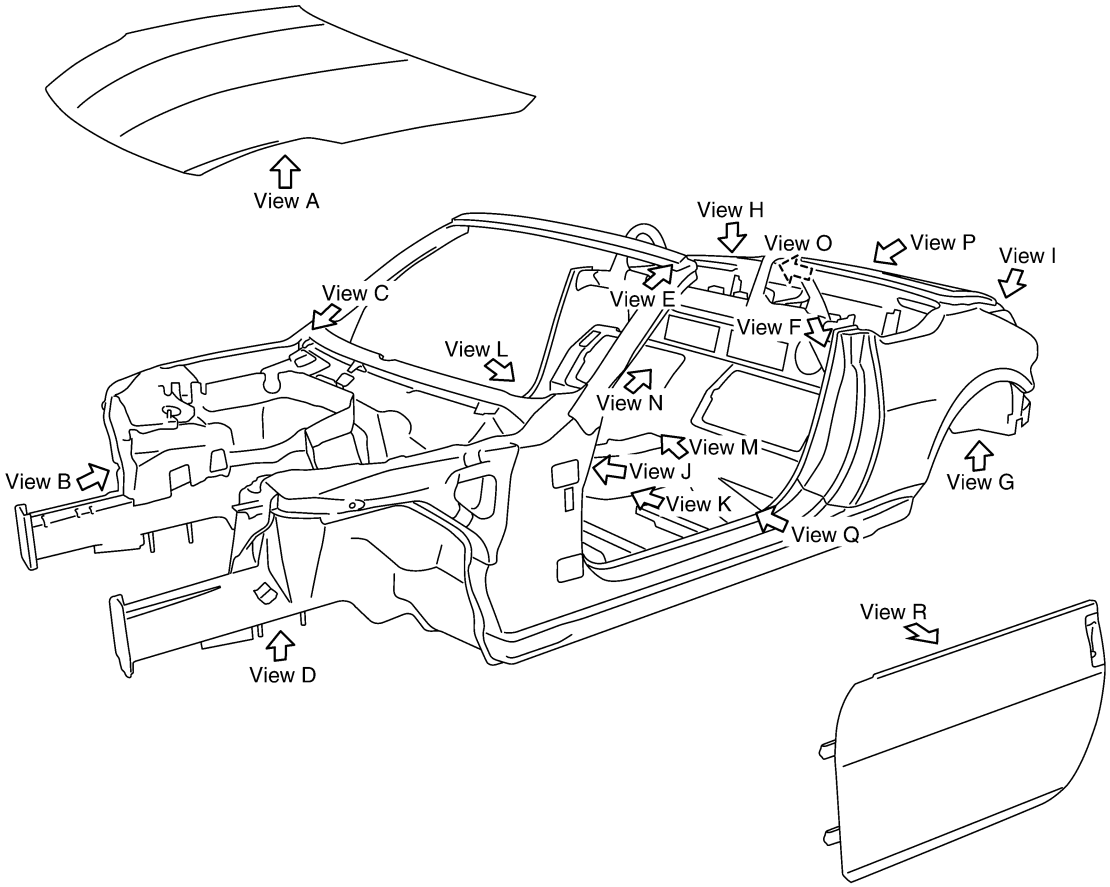
SIIA2335E

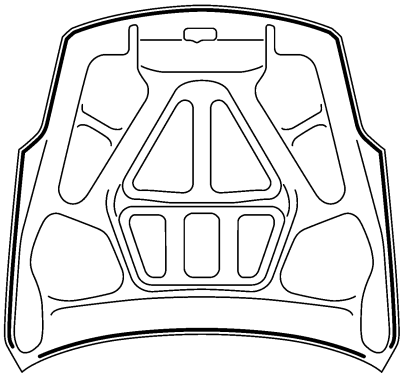
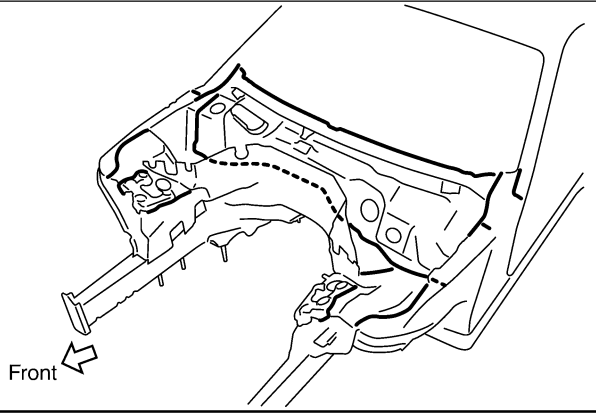
Body Sealing (Roadster)

NIS0003Z

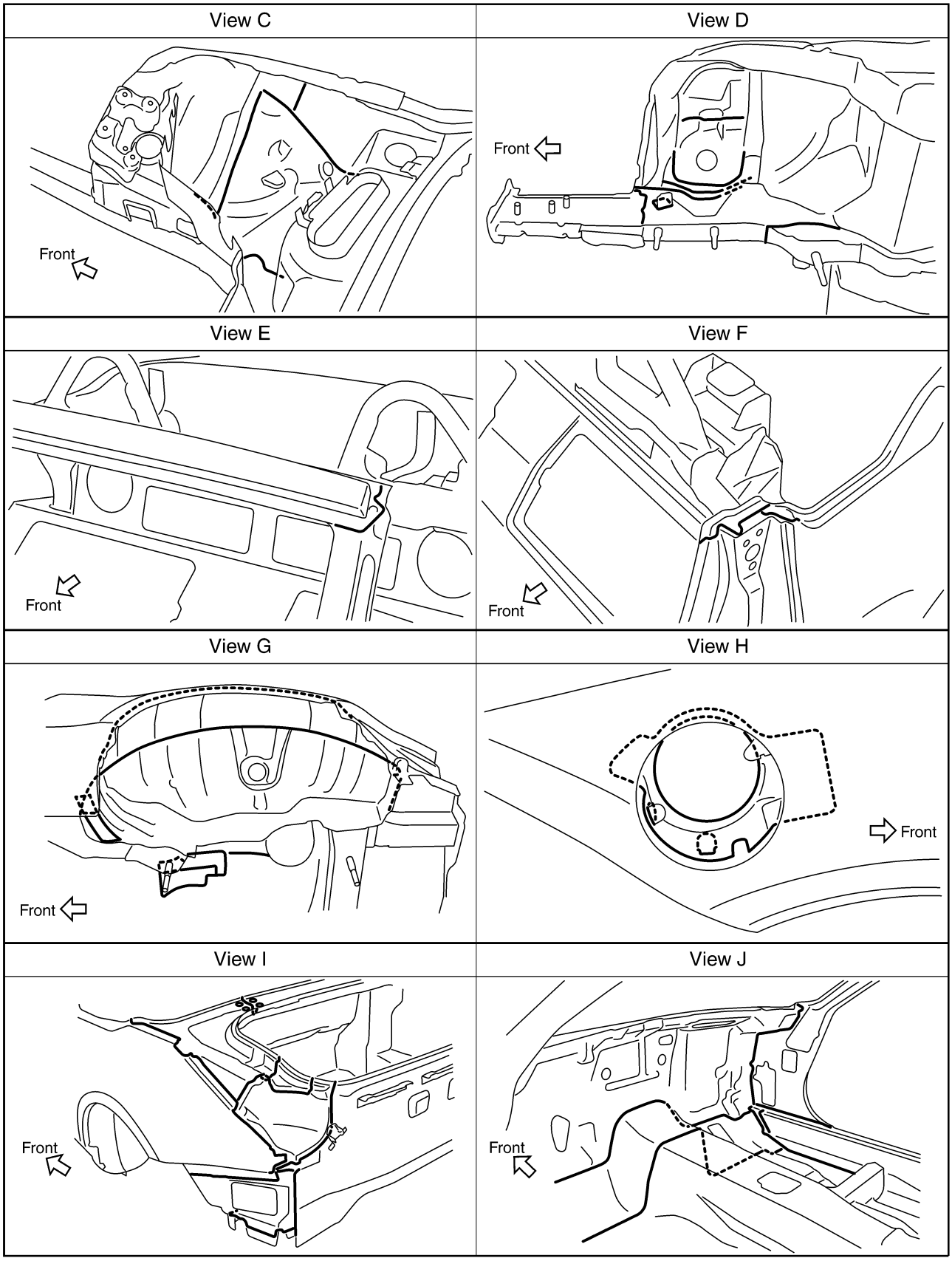
DESCRIPTION

The following figure shows the areas which are sealed at the factory. Sealant which has been applied to these areas should be smooth and free from cuts or gaps. Care should be taken not to apply an excess amount of sealant and not to allow other unaffected parts to come into contact with the sealant.

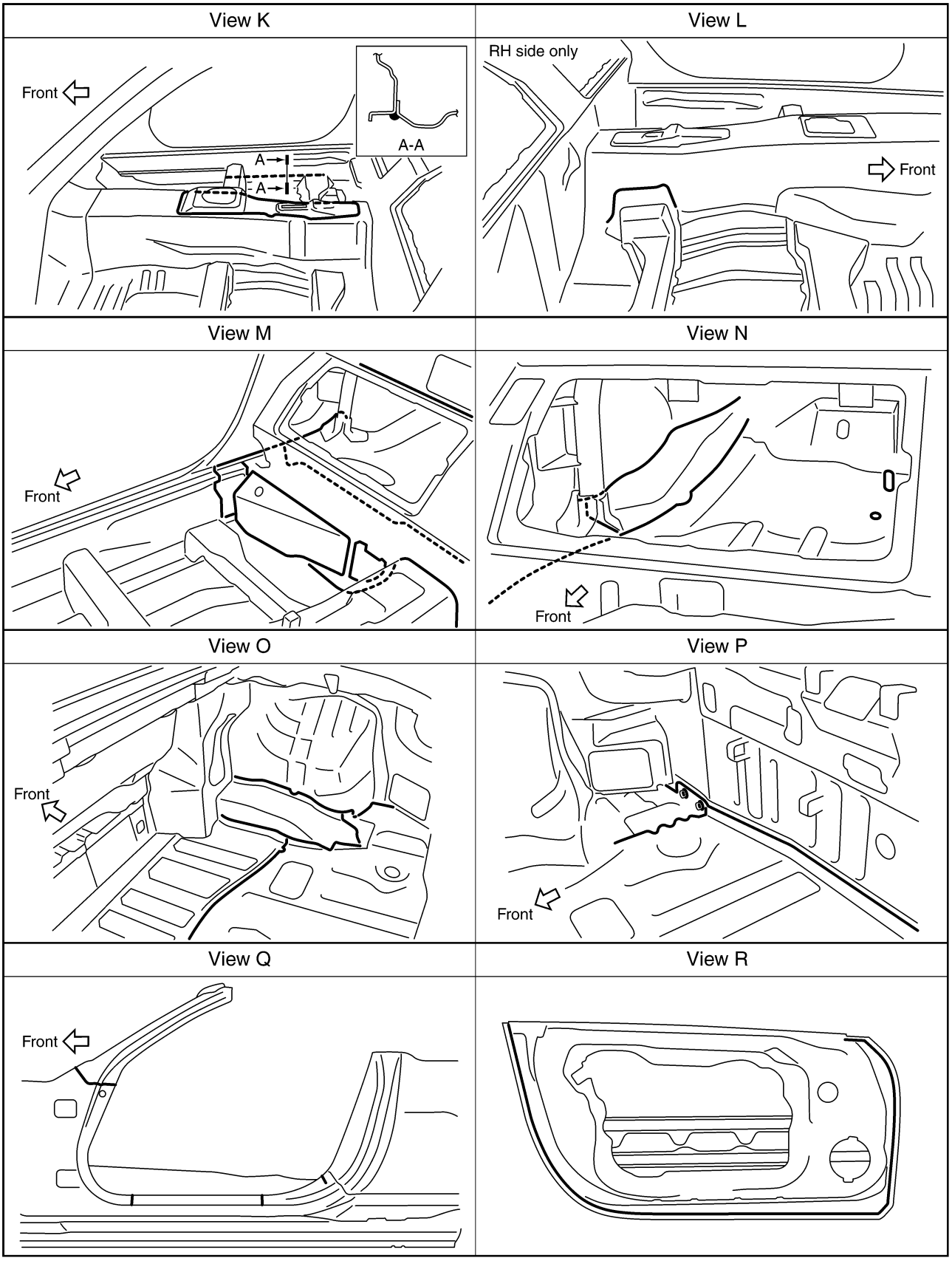


View A	View B
	

SIIA2300E


View C
Front
View D
Front
View E
Front
View F
Front
View G
Front
View H
Front
View I
Front
View J
Front

SIIA2301E

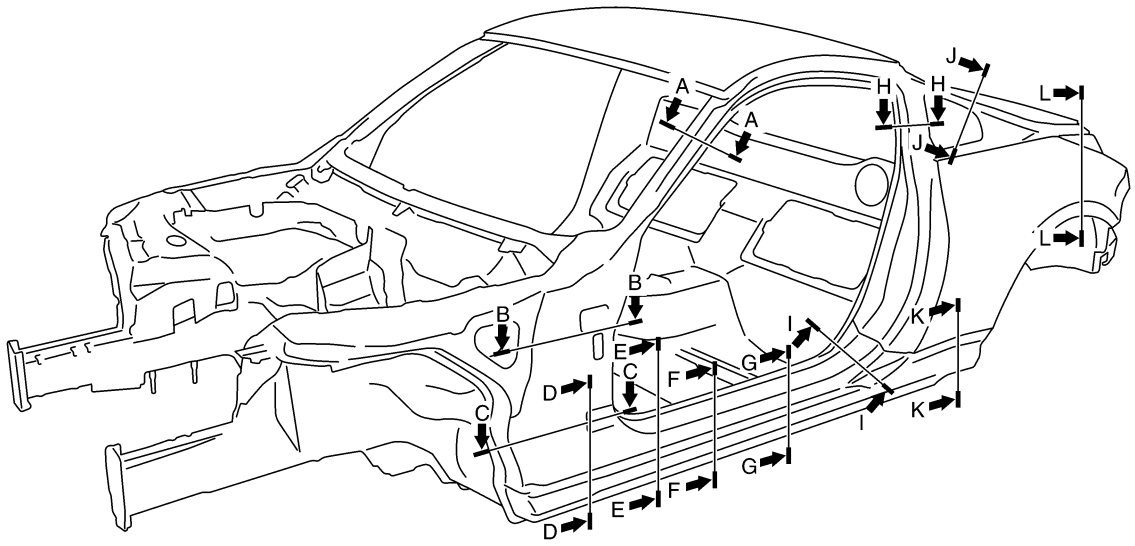

View K
Front
A-A
A
A
View L
RH side only
Front
View M
Front
View N
Front
View O
Front
View P
Front
View Q
Front
View R

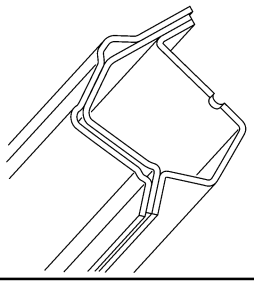
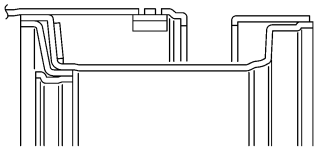
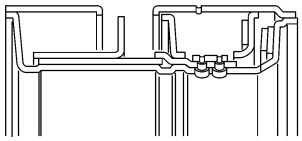
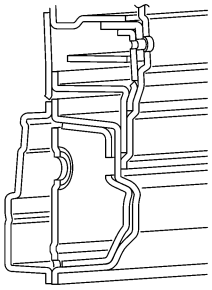
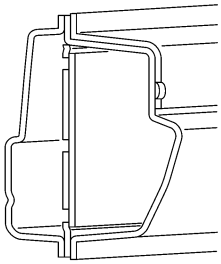
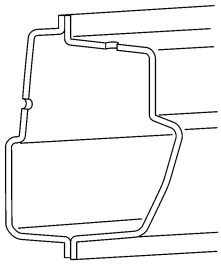
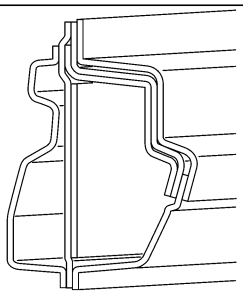
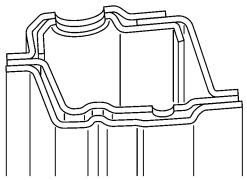
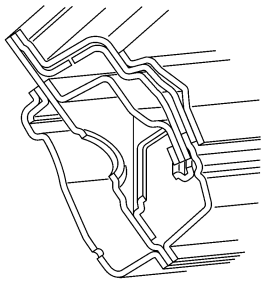
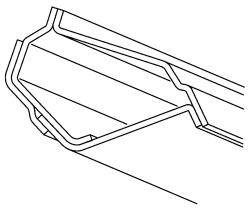
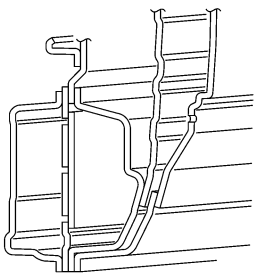
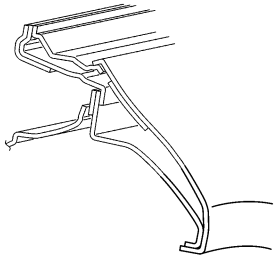
SIIA2302E

Body Construction (Coupe)

NIS00040

BODY CONSTRUCTION



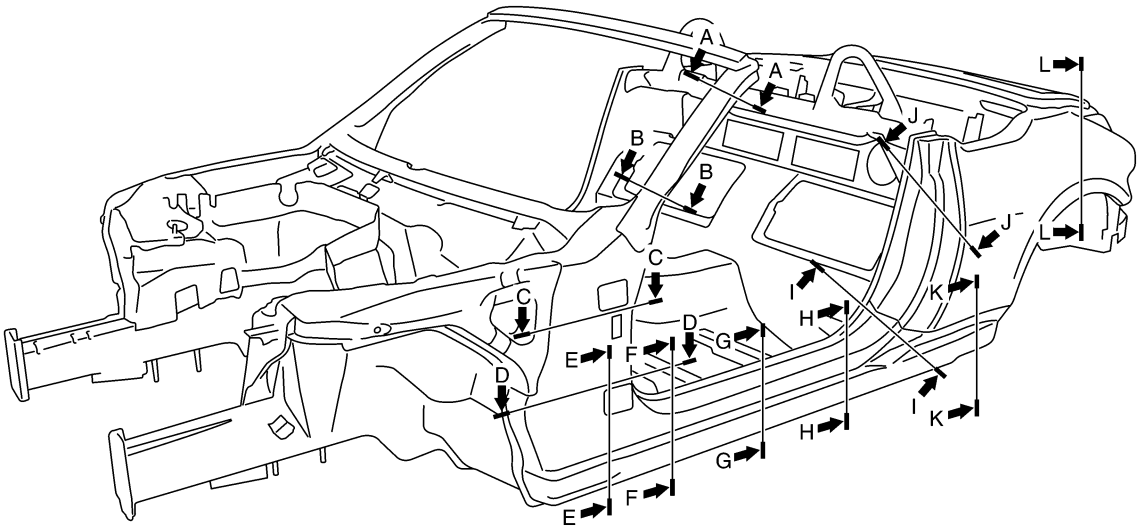
Section A-A	Section B-B	Section C-C	Section D-D
			
Section E-E	**Section F-F**	**Section G-G**	**Section H-H**
			
Section I-I	**Section J-J**	**Section K-K**	**Section L-L**
			

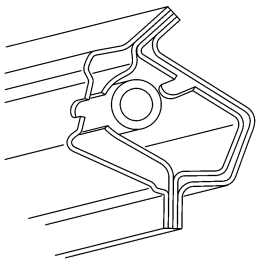
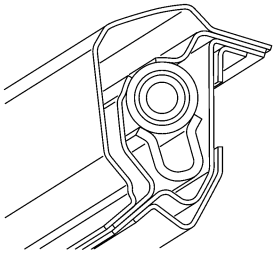
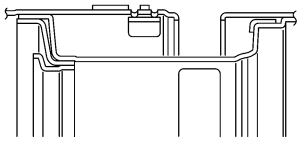
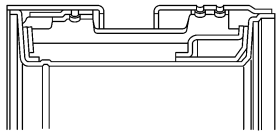
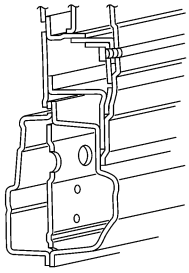
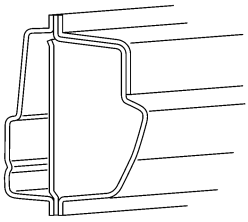
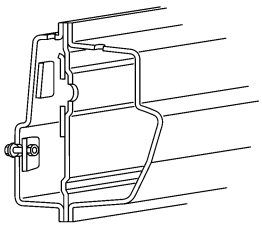
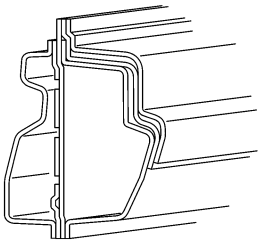
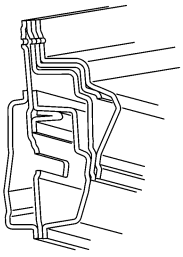
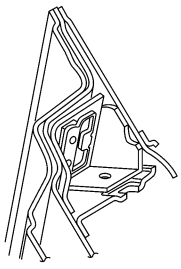
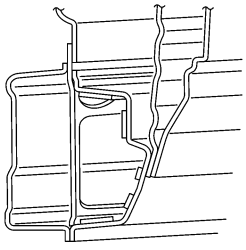
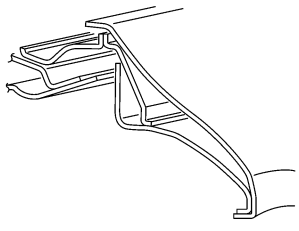
SIIA2362E

Body Construction (Roadster)

NIS00041

BODY CONSTRUCTION



Section A-A	Section B-B	Section C-C	Section D-D
			
Section E-E	**Section F-F**	**Section G-G**	**Section H-H**
			
Section I-I	**Section J-J**	**Section K-K**	**Section L-L**
			

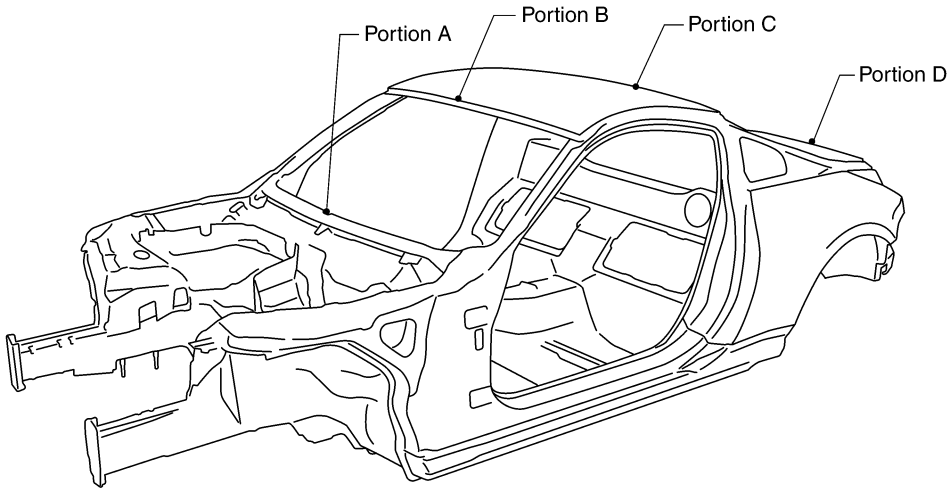
SIIA2303E

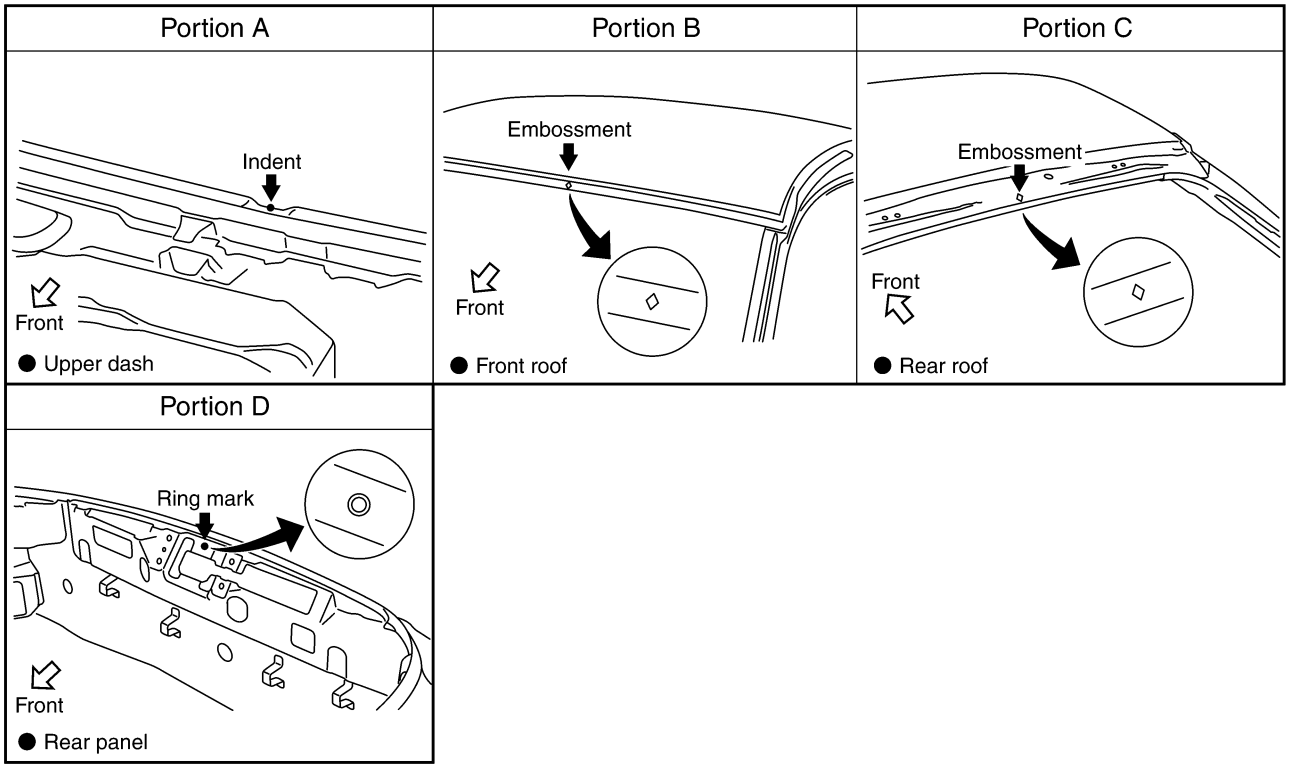
Body Alignment (Coupe)

NIS00042

BODY CENTER MARKS (COUPE)

A mark has been placed on each part of the body to indicate the vehicle center. When repairing parts damaged by an accident which might affect the vehicle frame (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

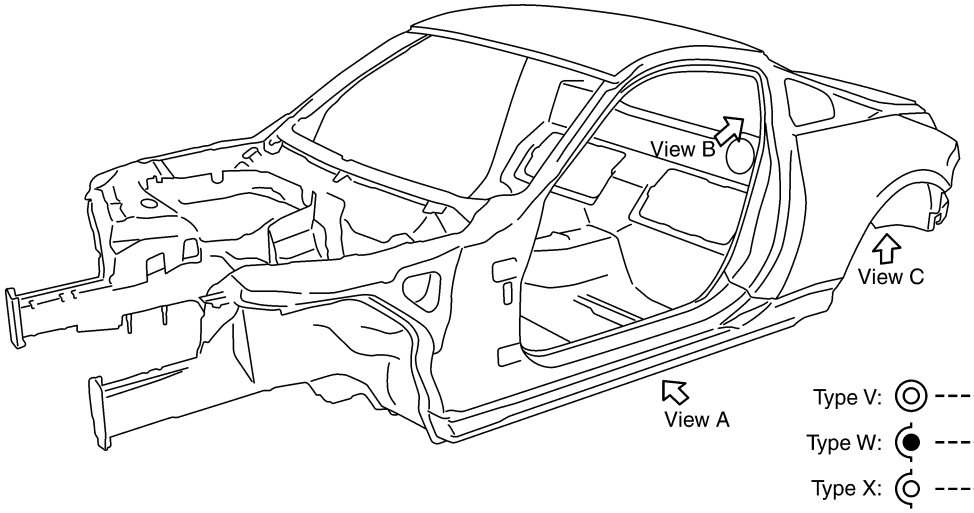


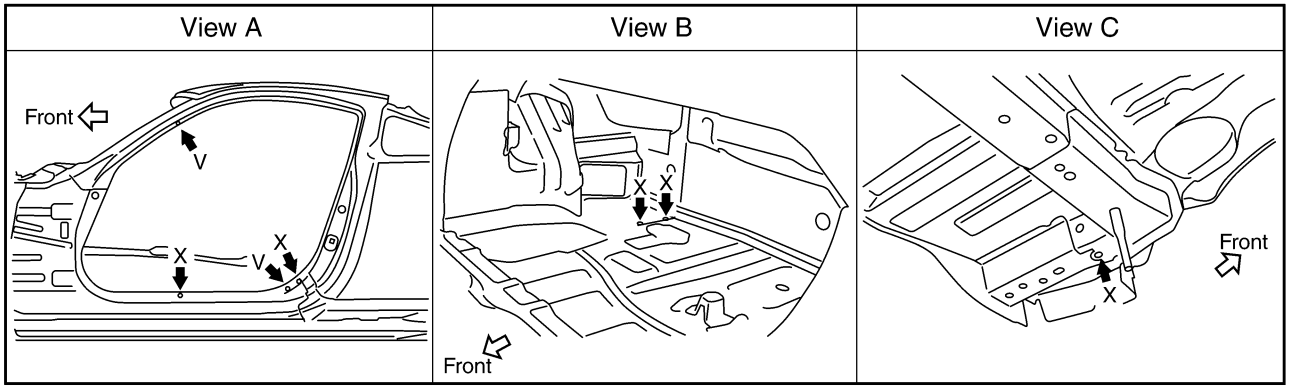


SIIA1974E

PANEL PARTS MATCHING MARKS (COUPE)

A mark has been placed on each body panel to indicate the parts matching positions. When repairing parts damaged by an accident which might affect the vehicle structure (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

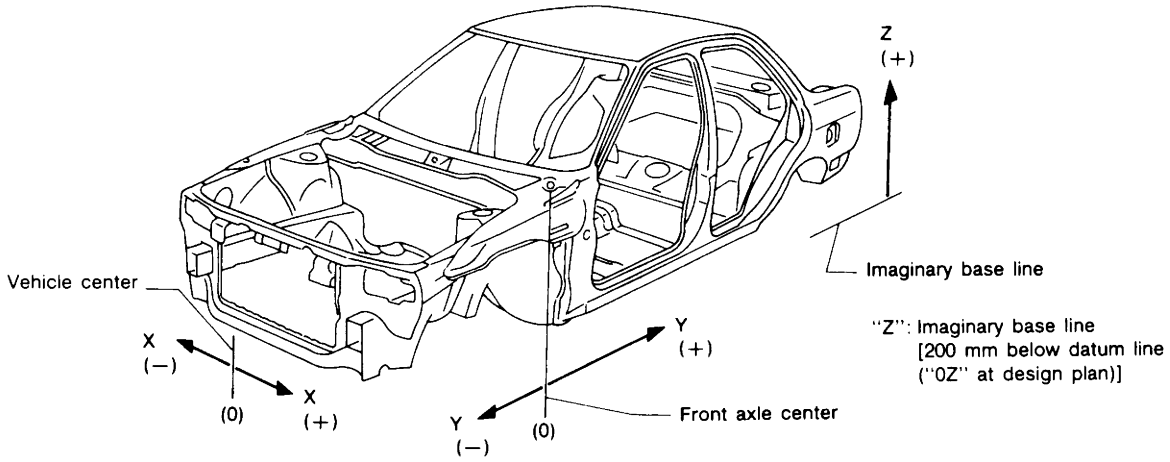




SIIA1981E

DESCRIPTION

- All dimensions indicated in the figures are actual.
- When using a tracking gauge, adjust both pointers to equal length. Then check the pointers and gauge itself to make sure there is no free play.
- When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
- Measurements should be taken at the center of the mounting holes.
- An asterisk (*) following the value at the measuring point indicates that the measuring point on the other side is symmetrically the same value.
- The coordinates of the measurement points are the distances measured from the standard line of ″X″, ″Y″ and ″Z″.

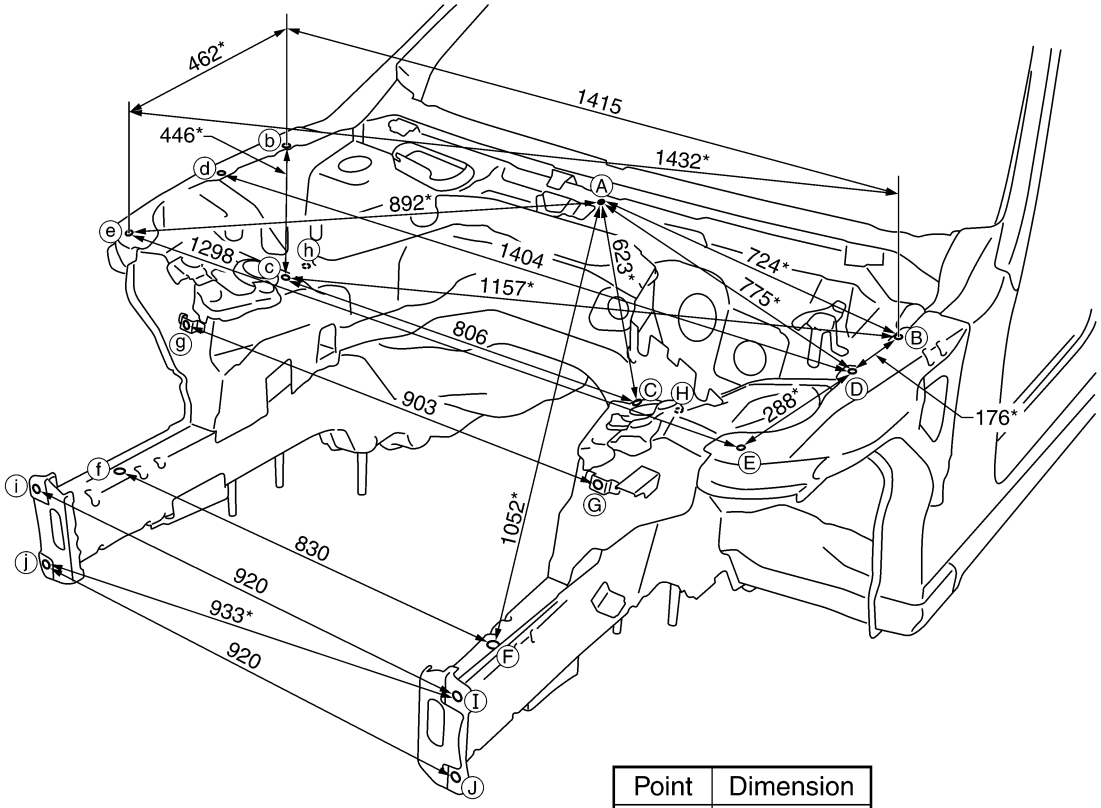


ENGINE COMPARTMENT

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm

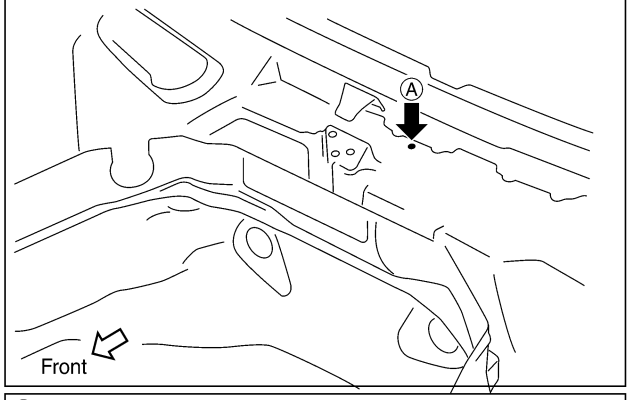


Point	Dimension
Ⓒ~ⓖ	883*
Ⓗ~ⓗ	903

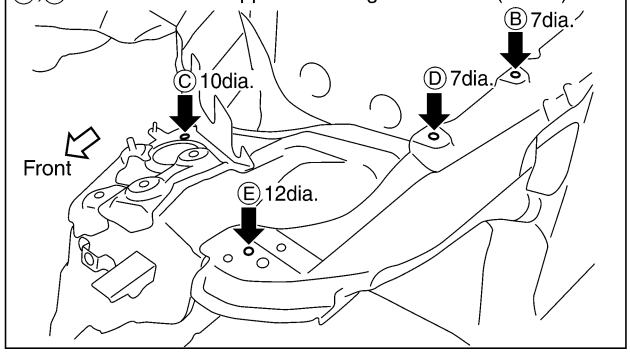
SIIA2306E

Measurement points

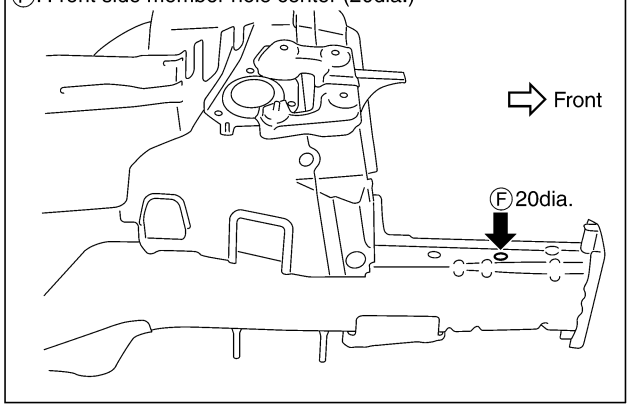
Ⓐ : Upper dash positioning mark center of center positioning mark



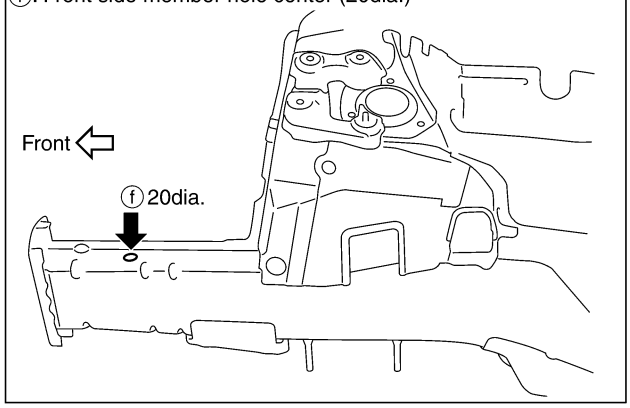
Ⓑ,ⓑ,Ⓓ,ⓓ : Front fender installing hole center (7dia.)
Ⓒ,ⓒ : Front strut installing hole center (10dia.)
Ⓔ,ⓔ : Radiator core support installing hole center (12dia.)



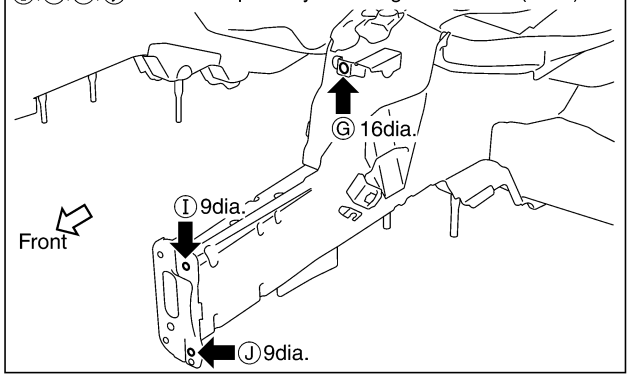
Ⓕ: Front side member hole center (20dia.)



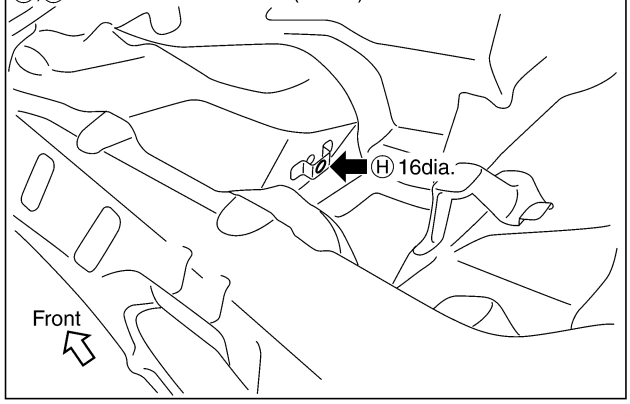
ⓕ: Front side member hole center (20dia.)



Ⓖ,ⓖ : Nut holder hole center (16dia.)
Ⓘ,ⓘ,Ⓙ,ⓙ : Front bumper stay installing hole center (9dia.)



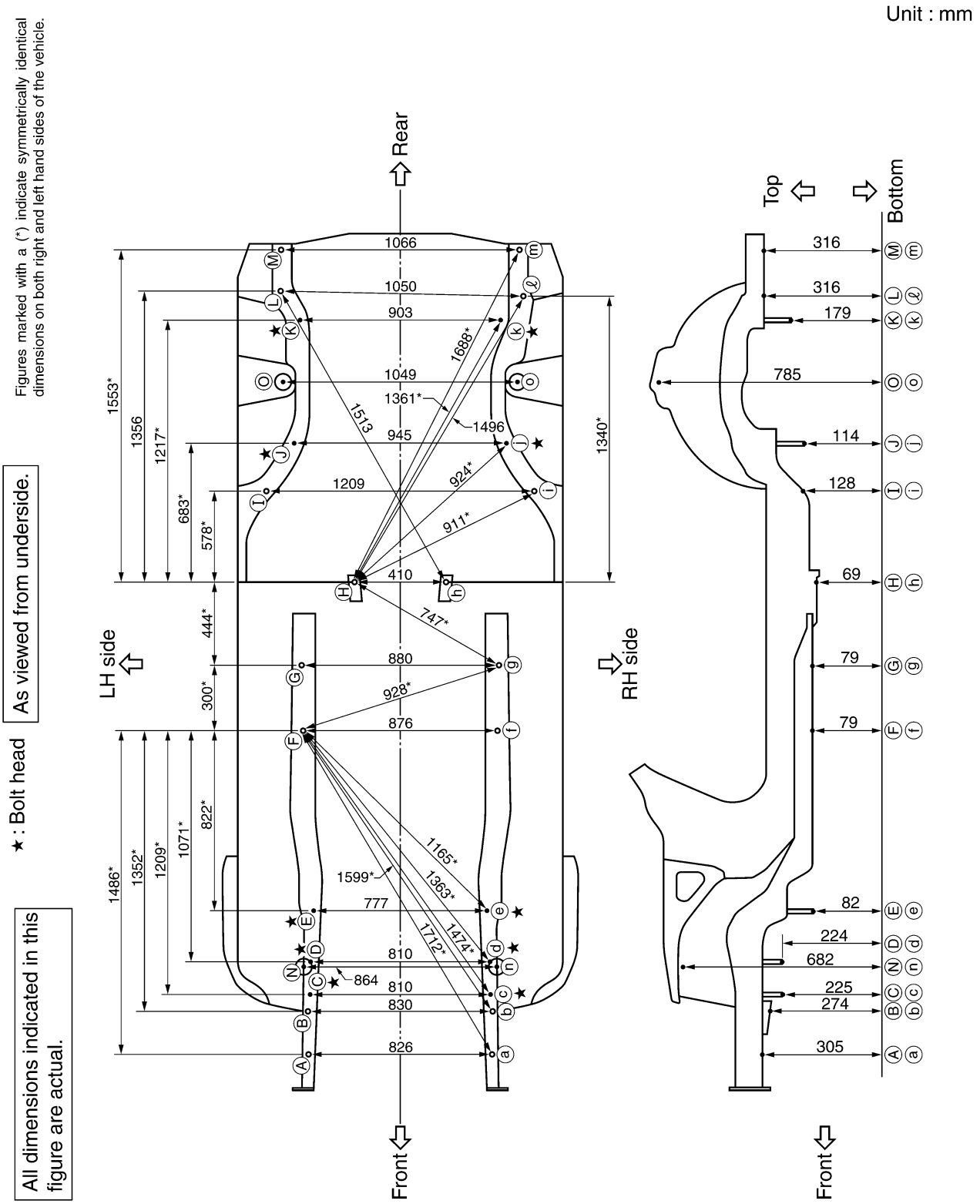
Ⓗ,ⓗ: Nut holder hole center (16dia.)



SIIA2307E

UNDERBODY
Measurement

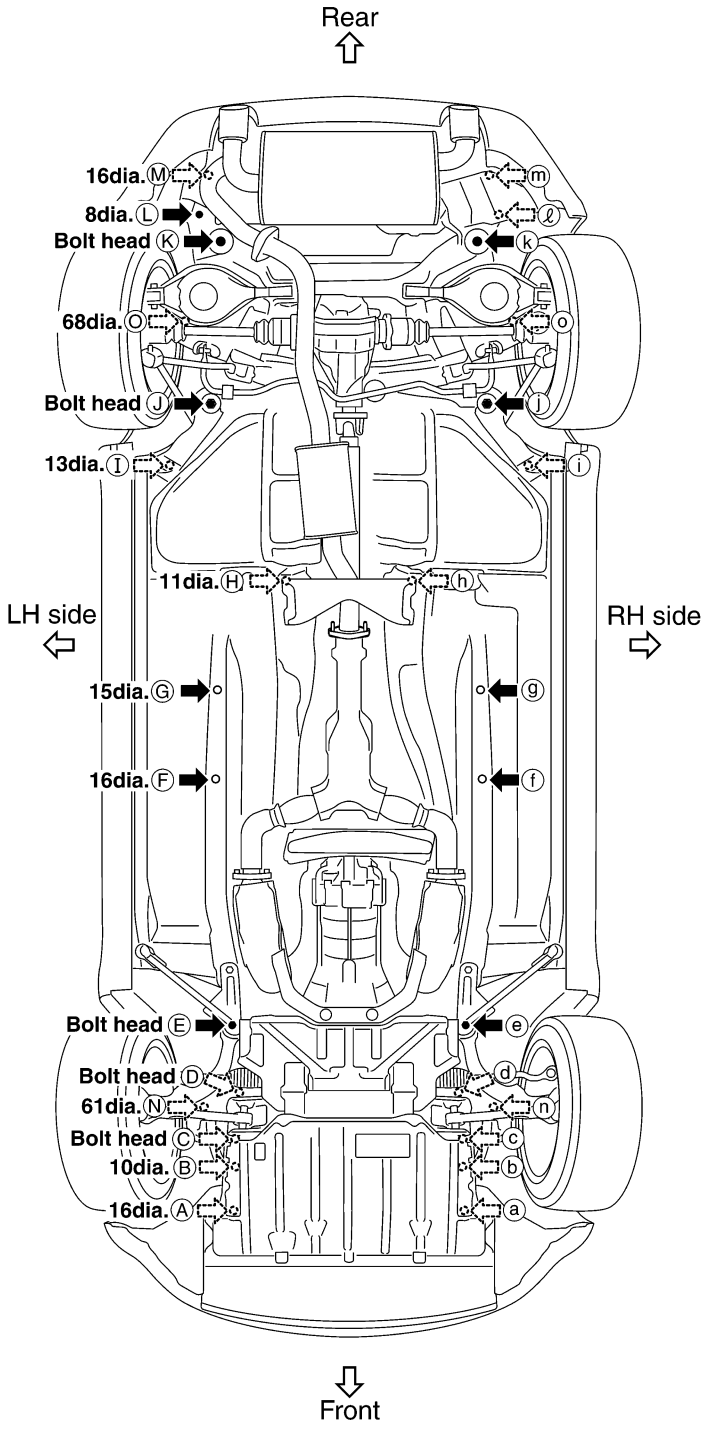
Unit : mm



Measurement points

Unit : mm

As viewed from underside.



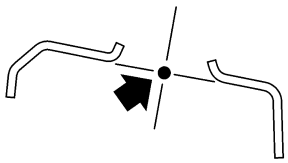
Coordinates:

Ⓐ,ⓐ	Ⓘ,ⓘ
X:413	**X:605**
Y:-368	**Y:2191**
Z:305	**Z:128**
Ⓑ,ⓑ	Ⓙ,ⓙ
X:415	**X:473**
Y:-238	**Y:2404**
Z:274	**Z:114**
Ⓒ,ⓒ	Ⓚ,ⓚ
X:405	**X:452**
Y:-100	**Y:2964**
Z:225	**Z:179**
Ⓓ,ⓓ	Ⓛ
X:405	**X:550**
Y:39	**Y:3065**
Z:224	**Z:316**
Ⓔ,ⓔ	ⓛ
X:388	**X:-500**
Y:279	**Y:3073**
Z:82	**Z:316**
Ⓕ,ⓕ	Ⓜ,ⓜ
X:438	**X:533**
Y:1100	**Y:3275**
Z:79	**Z:316**
Ⓖ,ⓖ	
X:440	
Y:1400	
Z:79	
Ⓗ,ⓗ	
X:205	
Y:1777	
Z:69	

Front and rear strut tower centers

Coordinates:

Ⓝ,ⓝ
X:432
Y:28
Z:682



Ⓞ,ⓞ
X:524
Y:2682
Z:785

Front: Ⓝ,ⓝ **61dia.**
Rear: Ⓞ,ⓞ **68dia.**

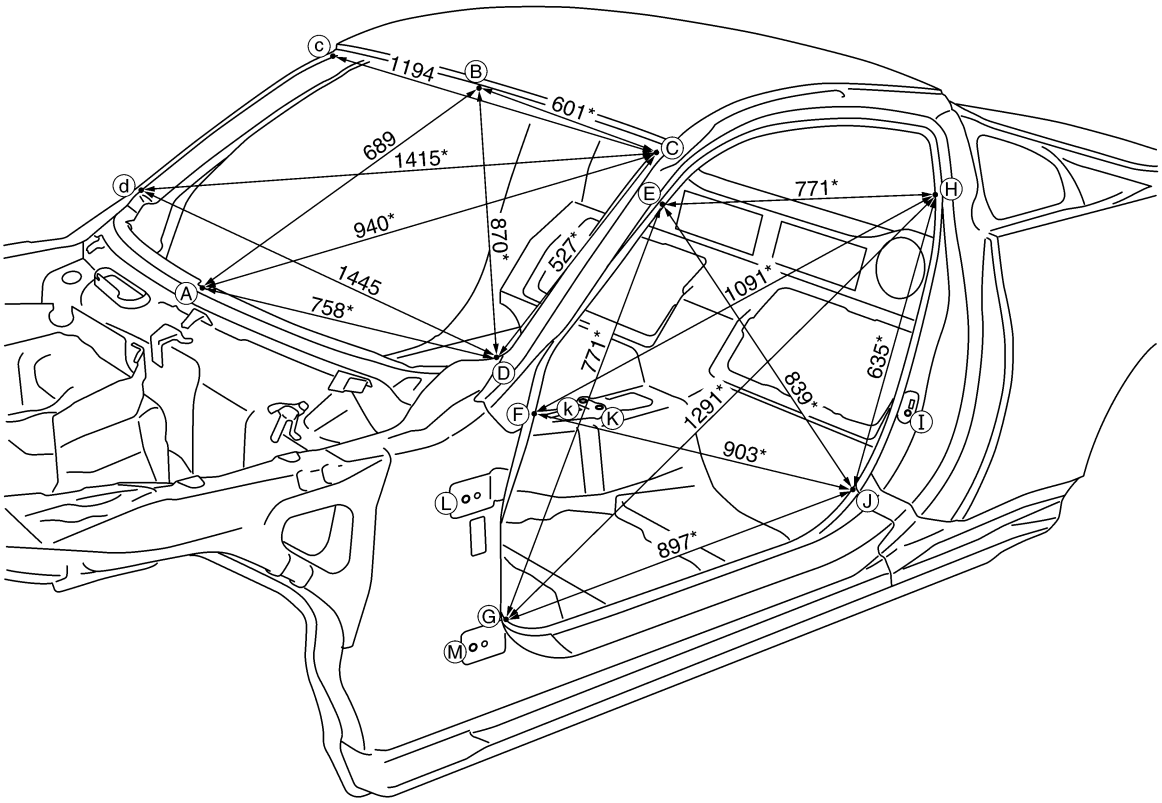
SIIA2348E

PASSENGER COMPARTMENT (COUPE)

Measurement

Unit : mm

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

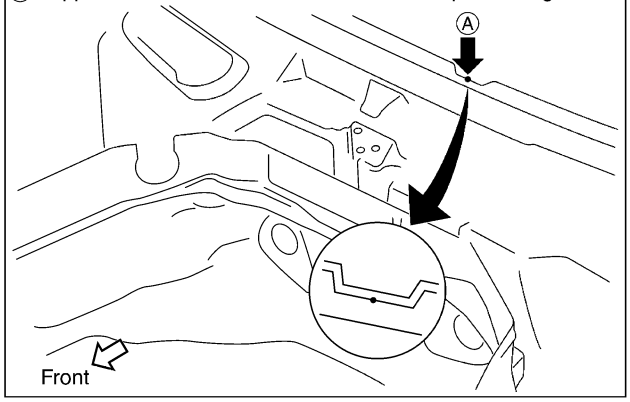


Point	Dimension	Point	Dimension	Point	Dimension
Ⓔ~ⓔ	1,317	Ⓖ~ⓗ	1,909*	Ⓚ~Ⓕ	1,052*
Ⓔ~ⓖ	1,583*	Ⓖ~ⓙ	1,707*	Ⓚ~Ⓖ	1,043*
Ⓔ~ⓗ	1,546*	Ⓗ~ⓗ	1,363	Ⓚ~Ⓗ	956*
Ⓔ~ⓙ	1,618*	Ⓗ~ⓙ	1,543*	Ⓚ~Ⓙ	715*
Ⓕ~ⓕ	1,440	Ⓙ~ⓙ	1,452	Ⓛ~Ⓘ	1,178*
Ⓖ~ⓖ	1,452	Ⓚ~Ⓔ	993*	Ⓜ~Ⓘ	1,181*

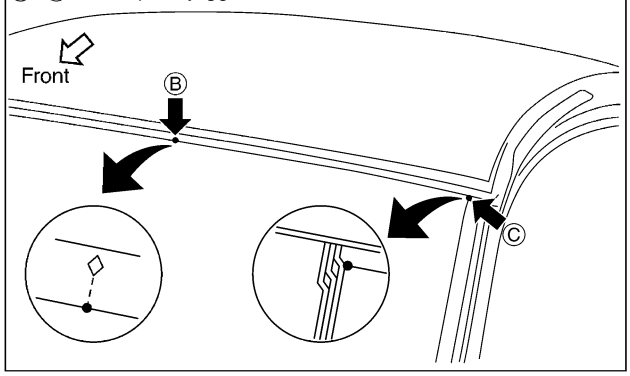
SIIA1988E

Measurement points

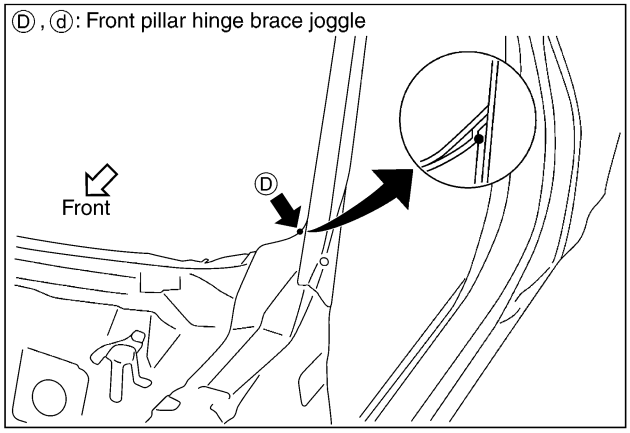
Ⓐ : Upper dash crossmember indent of center positioning mark



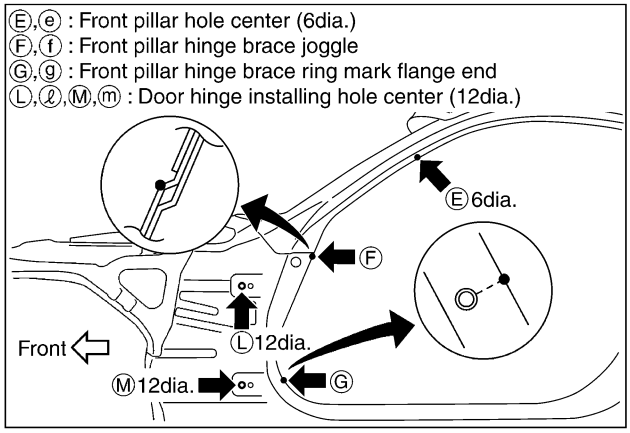
Ⓑ : Front roof flange end of center positioning mark
Ⓒ , ⓒ : Front pillar joggle



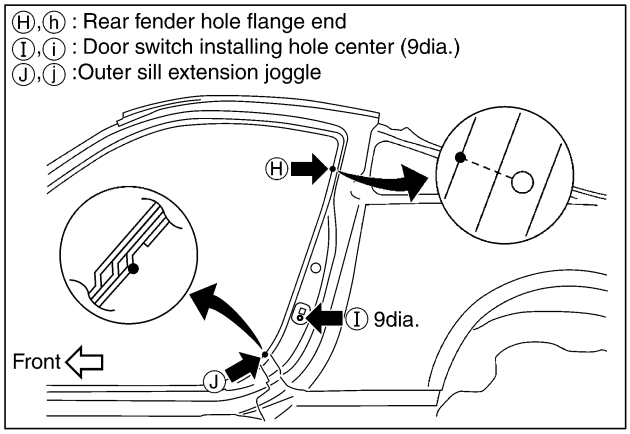
Ⓓ , ⓓ : Front pillar hinge brace joggle



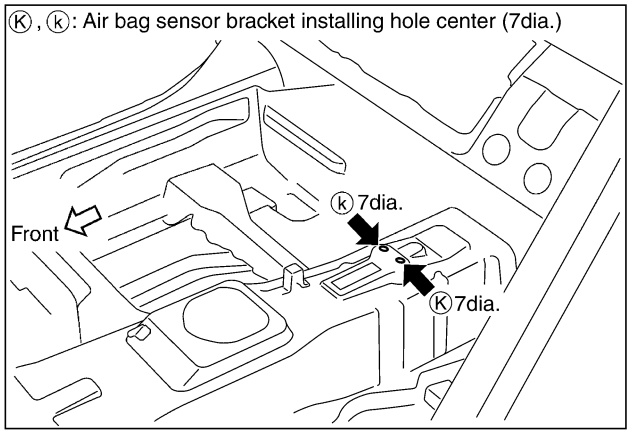
Ⓔ,ⓔ : Front pillar hole center (6dia.)
Ⓕ,ⓕ : Front pillar hinge brace joggle
Ⓖ,ⓖ : Front pillar hinge brace ring mark flange end
Ⓛ,ⓛ,Ⓜ,ⓜ : Door hinge installing hole center (12dia.)



Ⓗ,ⓗ : Rear fender hole flange end
Ⓘ,ⓘ : Door switch installing hole center (9dia.)
Ⓙ,ⓙ :Outer sill extension joggle



Ⓚ , ⓚ : Air bag sensor bracket installing hole center (7dia.)



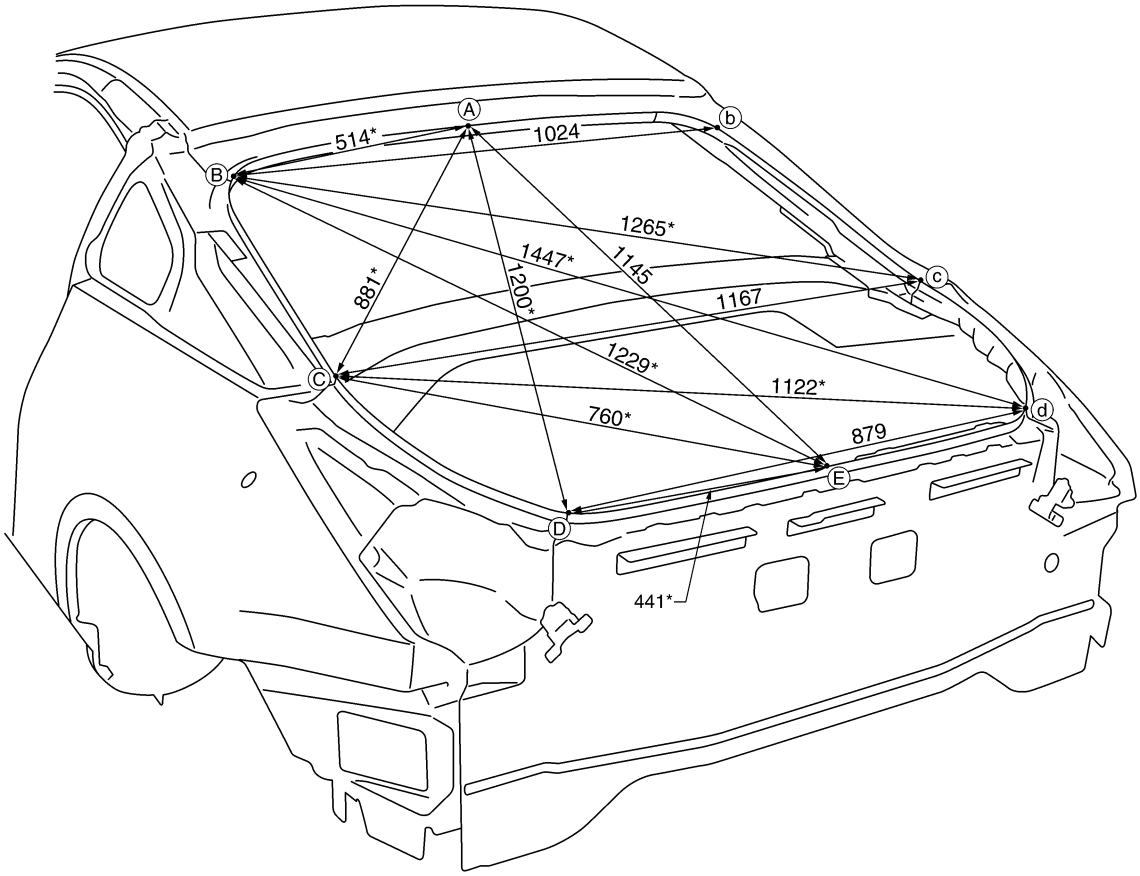
SIIA2351E

REAR BODY (COUPE)

Measurement

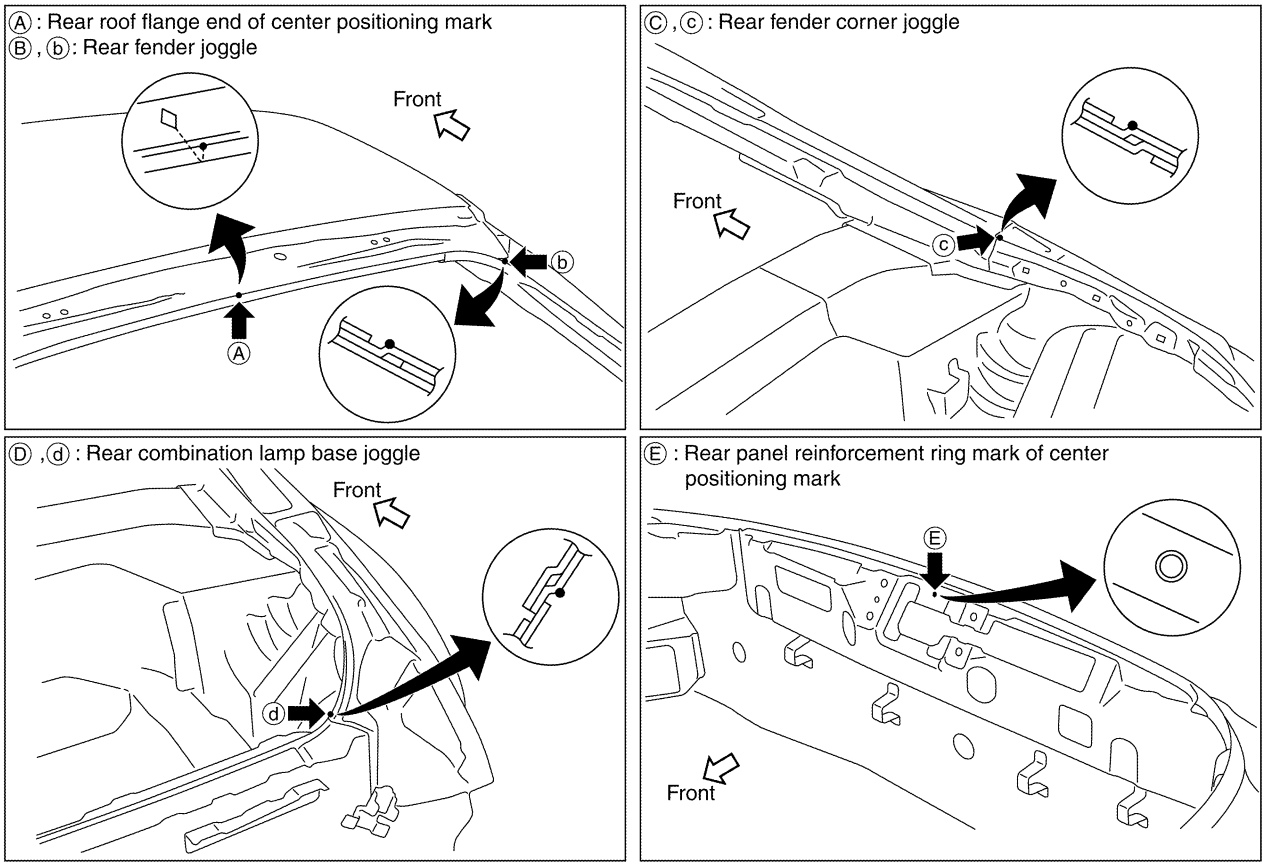
Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm



SIIA1990E

Measurement points



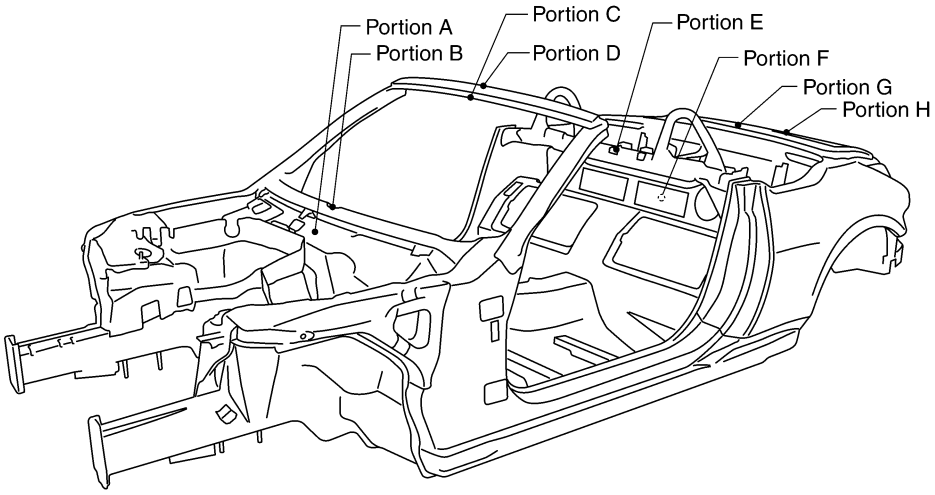
SIIA1991E

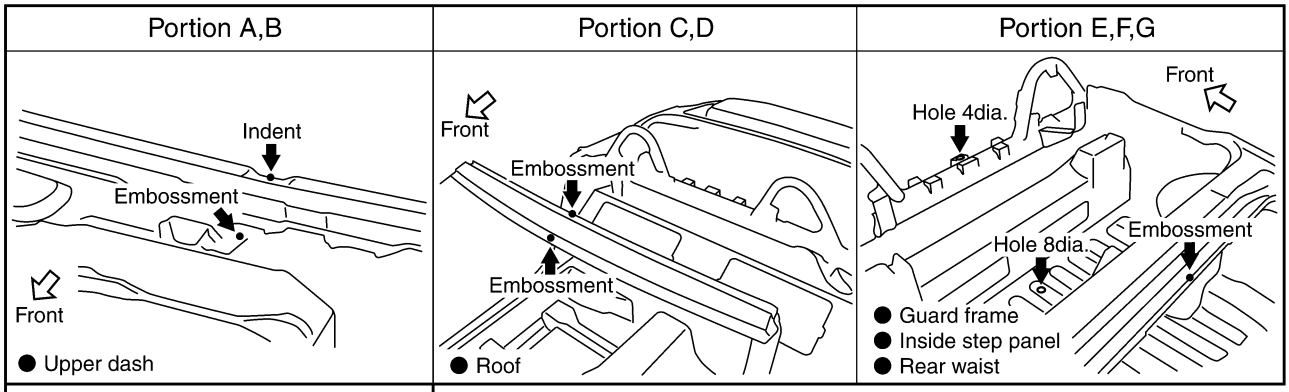
Body Alignment (Roadster)

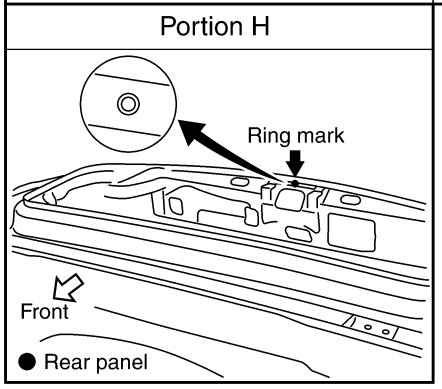
NIS00043

BODY CENTER MARKS (ROADSTER)

A mark has been placed on each part of the body to indicate the vehicle center. When repairing parts damaged by an accident which might affect the vehicle frame (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.



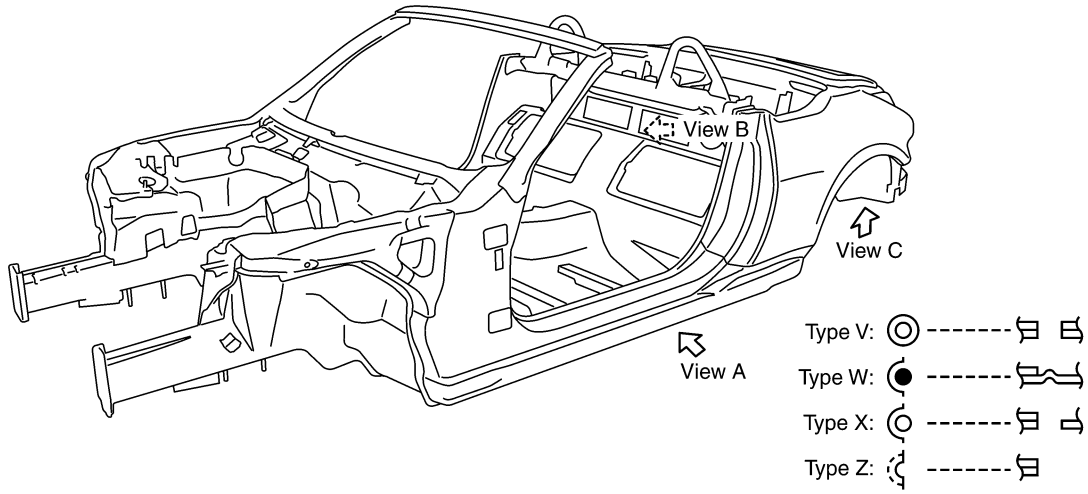


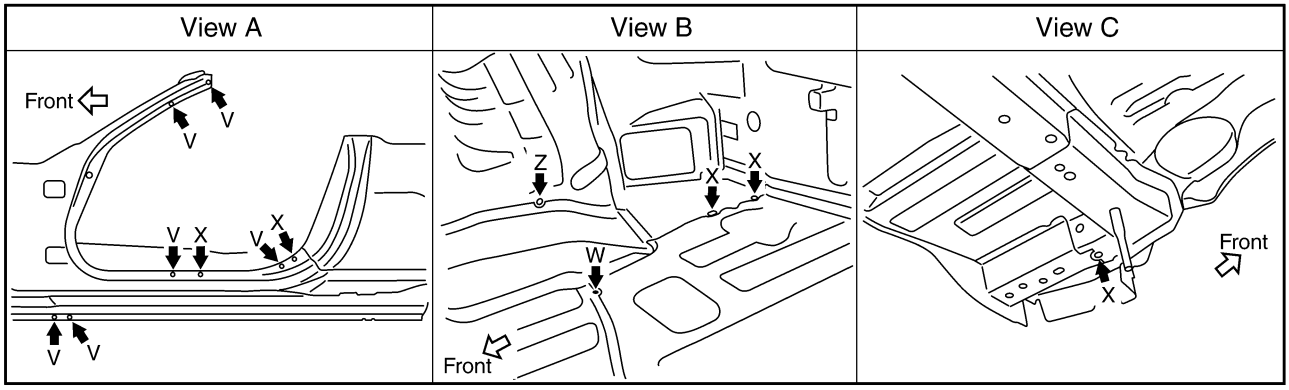


SIIA2304E

PANEL PARTS MATCHING MARKS (ROADSTER)

A mark has been placed on each body panel to indicate the parts matching positions. When repairing parts damaged by an accident which might affect the vehicle structure (members, pillars, etc.), more accurate and effective repair will be possible by using these marks together with body alignment specifications.

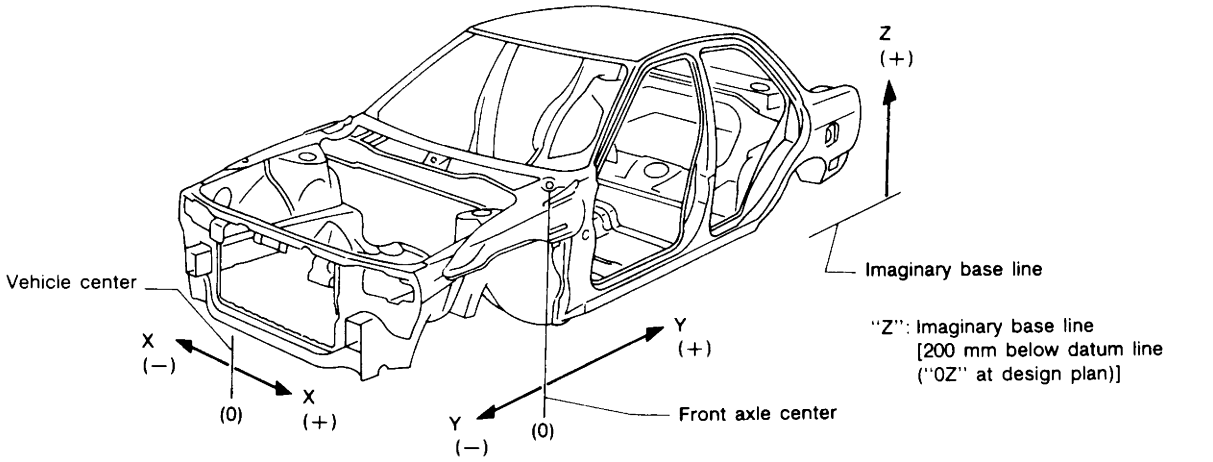




SIIA2305E

DESCRIPTION

- All dimensions indicated in the figures are actual.
- When using a tracking gauge, adjust both pointers to equal length. Then check the pointers and gauge itself to make sure there is no free play.
- When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
- Measurements should be taken at the center of the mounting holes.
- An asterisk (*) following the value at the measuring point indicates that the measuring point on the other side is symmetrically the same value.
- The coordinates of the measurement points are the distances measured from the standard line of ″X″, ″Y″ and ″Z″.

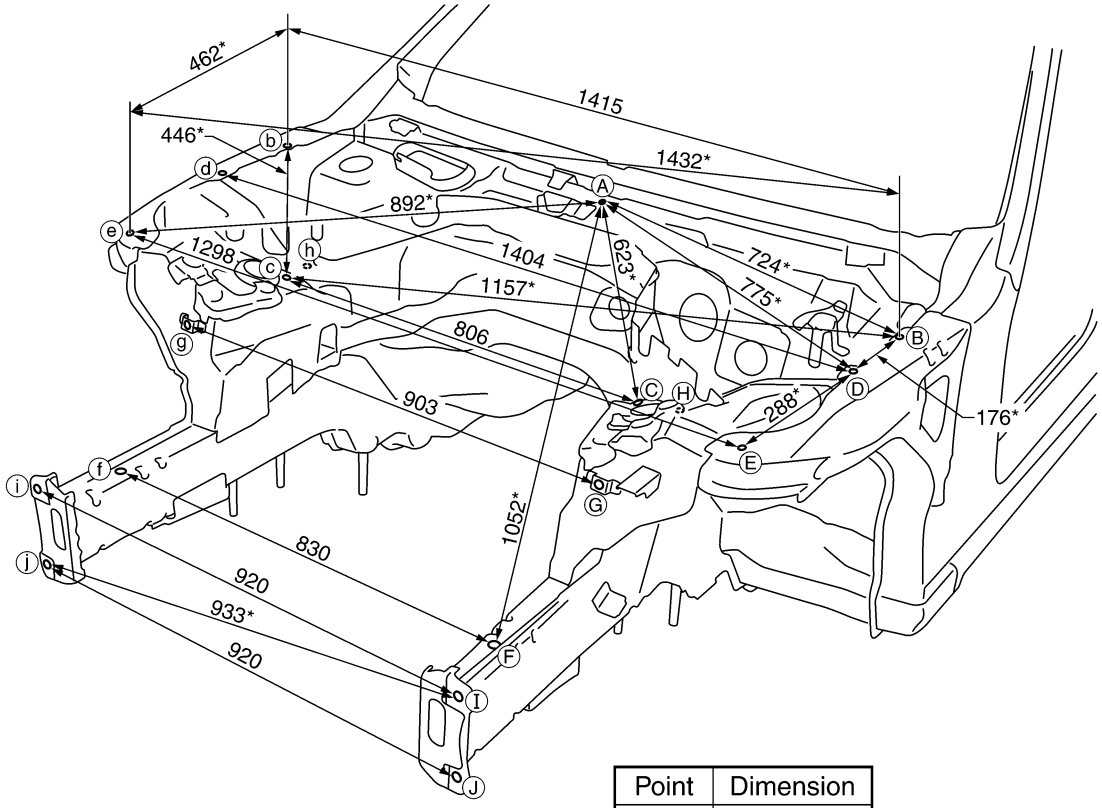


ENGINE COMPARTMENT

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Unit : mm

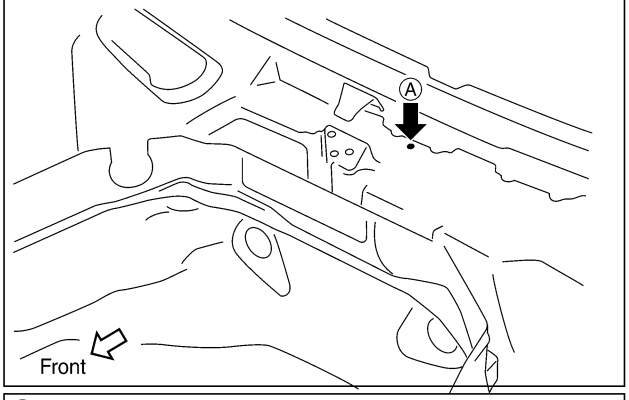


Point	Dimension
Ⓒ~ⓖ	883*
Ⓗ~ⓗ	903

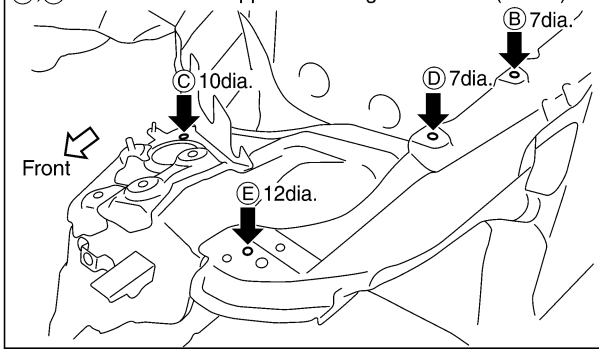
SIIA2306E

Measurement Points

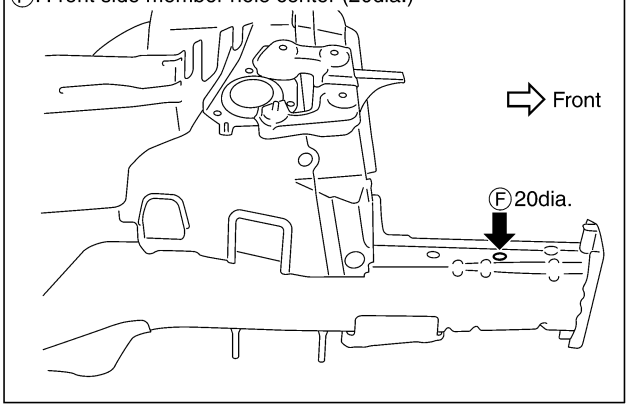
Ⓐ : Upper dash positioning mark center of center positioning mark



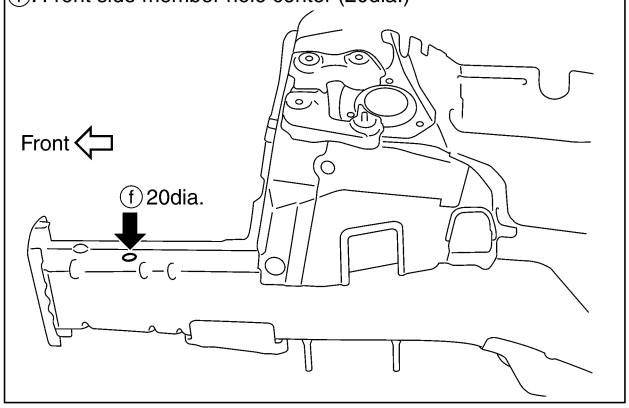
Ⓑ,ⓑ,Ⓓ,ⓓ : Front fender installing hole center (7dia.)
Ⓒ,ⓒ : Front strut installing hole center (10dia.)
Ⓔ,ⓔ : Radiator core support installing hole center (12dia.)



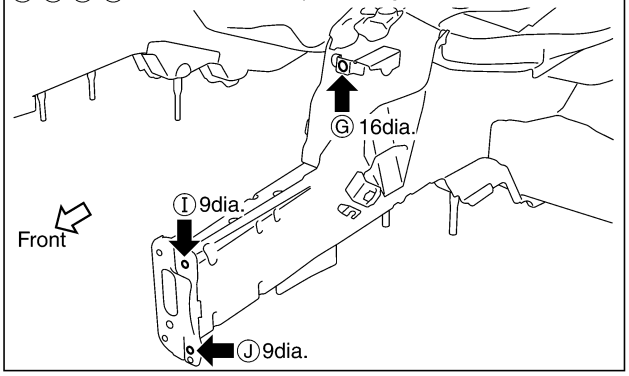
Ⓕ: Front side member hole center (20dia.)



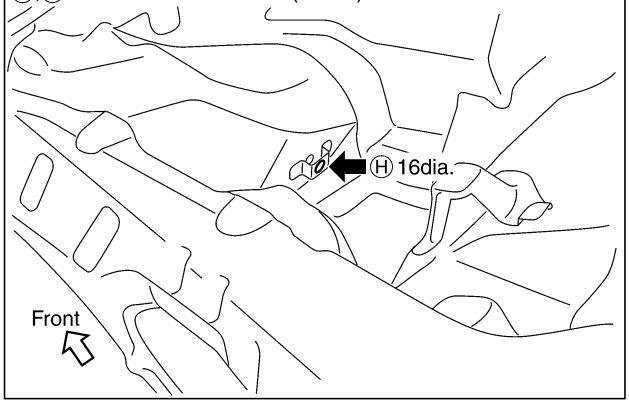
ⓕ: Front side member hole center (20dia.)



Ⓖ,ⓖ : Nut holder hole center (16dia.)
Ⓘ,ⓘ,Ⓙ,ⓙ : Front bumper stay installing hole center (9dia.)



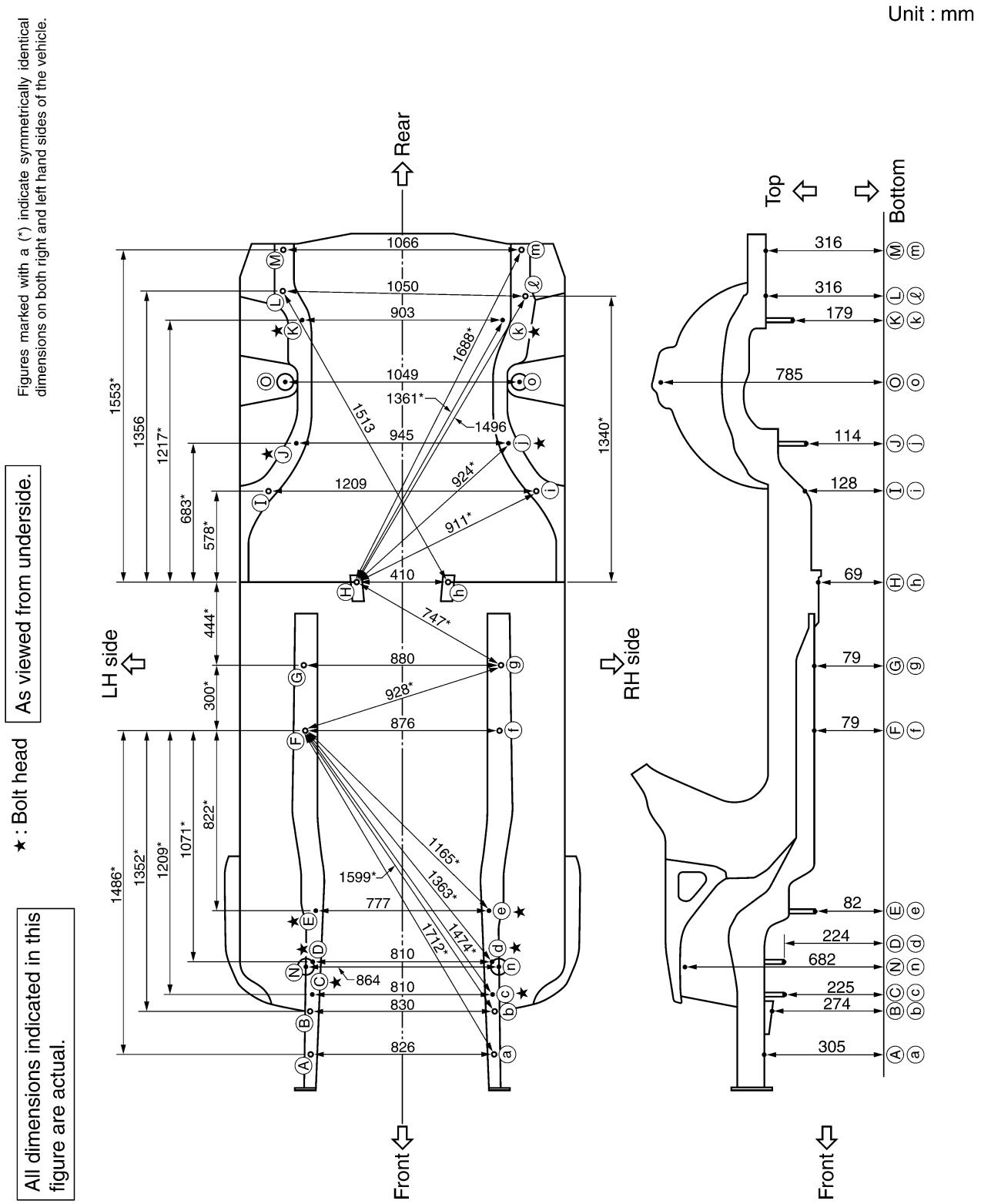
Ⓗ,ⓗ: Nut holder hole center (16dia.)



SIIA2307E

UNDERBODY
Measurement

Unit : mm

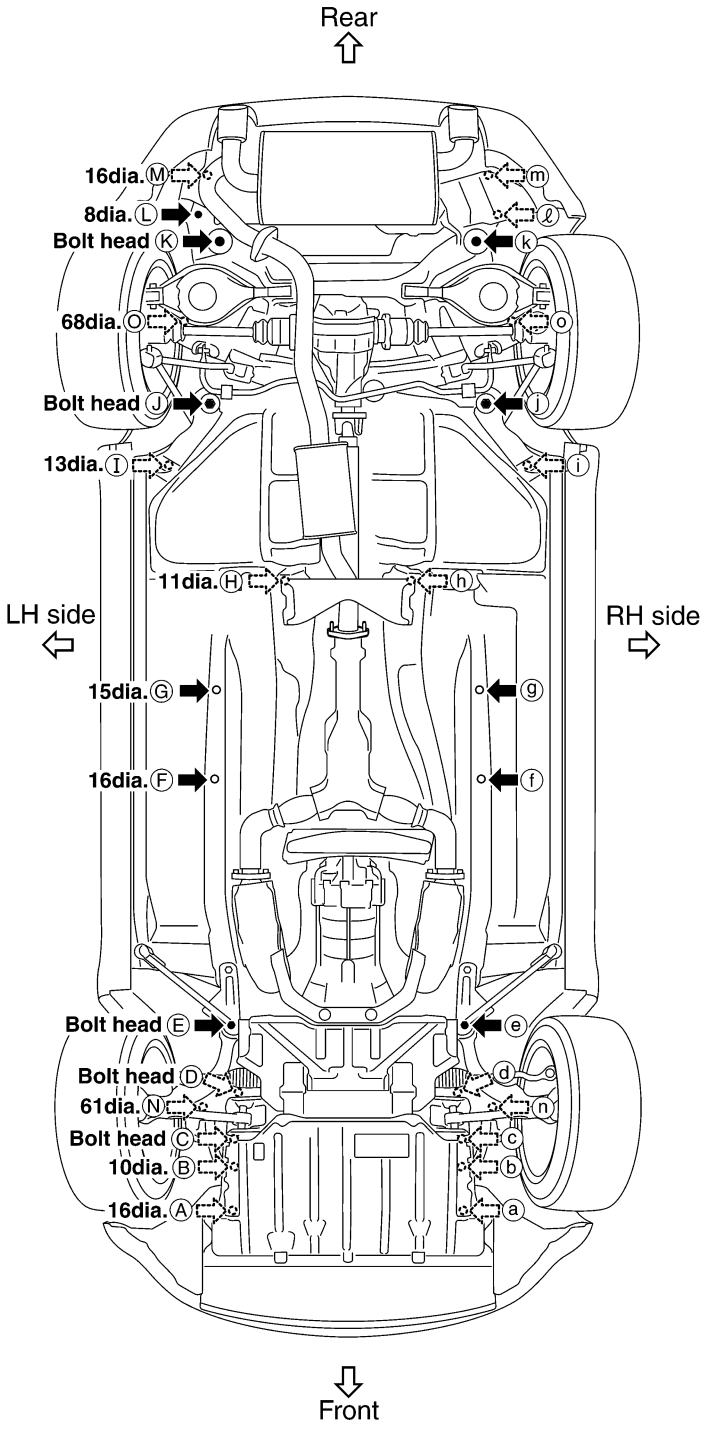


SIIA2347E

Measurement Points

Unit : mm

As viewed from underside.



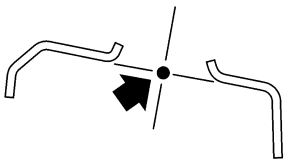
Coordinates:

Ⓐ,ⓐ	Ⓘ,ⓘ
X:413	**X:605**
Y:-368	**Y:2191**
Z:305	**Z:128**
Ⓑ,ⓑ	Ⓙ,ⓙ
X:415	**X:473**
Y:-238	**Y:2404**
Z:274	**Z:114**
Ⓒ,ⓒ	Ⓚ,ⓚ
X:405	**X:452**
Y:-100	**Y:2964**
Z:225	**Z:179**
Ⓓ,ⓓ	Ⓛ
X:405	**X:550**
Y:39	**Y:3065**
Z:224	**Z:316**
Ⓔ,ⓔ	ⓛ
X:388	**X:-500**
Y:279	**Y:3073**
Z:82	**Z:316**
Ⓕ,ⓕ	Ⓜ,ⓜ
X:438	**X:533**
Y:1100	**Y:3275**
Z:79	**Z:316**
Ⓖ,ⓖ	
X:440	
Y:1400	
Z:79	
Ⓗ,ⓗ	
X:205	
Y:1777	
Z:69	

Front and rear strut tower centers

Coordinates:

Ⓝ,ⓝ
X:432
Y:28
Z:682



Ⓞ,ⓞ
X:524
Y:2682
Z:785

Front: Ⓝ,ⓝ **61dia.**
Rear: Ⓞ,ⓞ **68dia.**

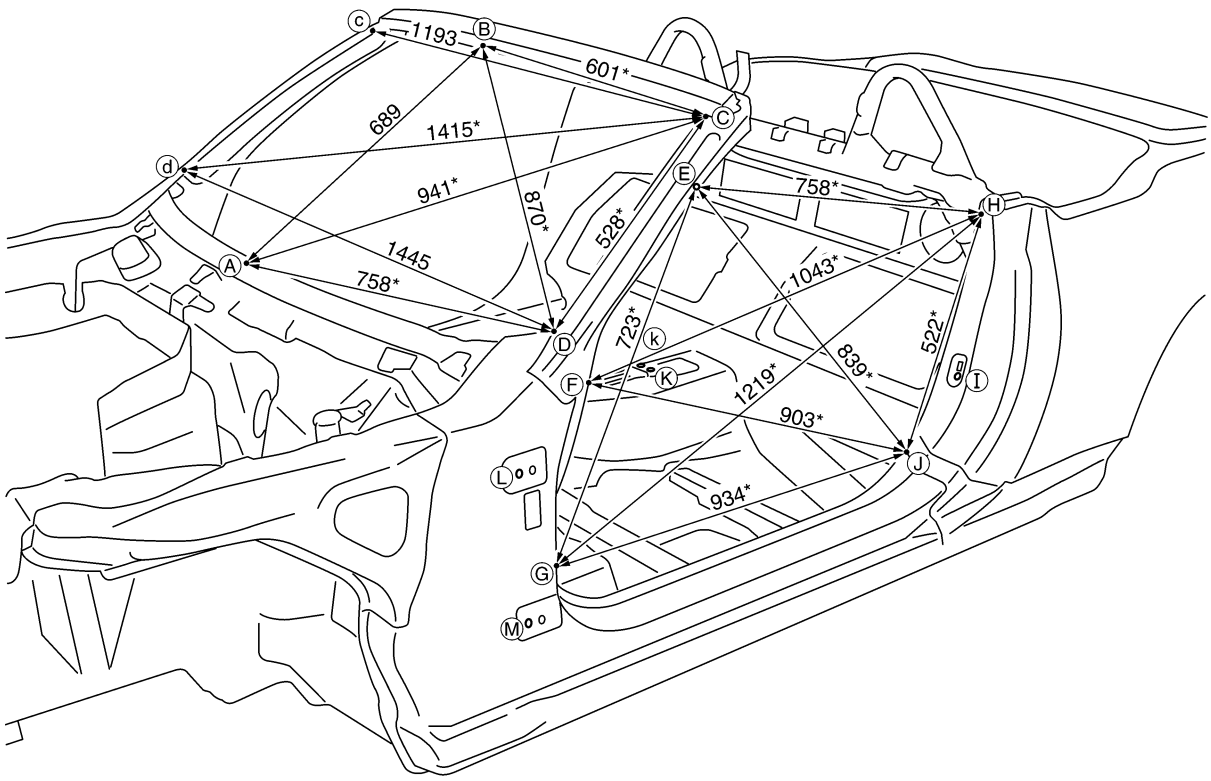
SIIA2348E

PASSENGER COMPARTMENT (ROADSTER)

Measurement

Unit : mm

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

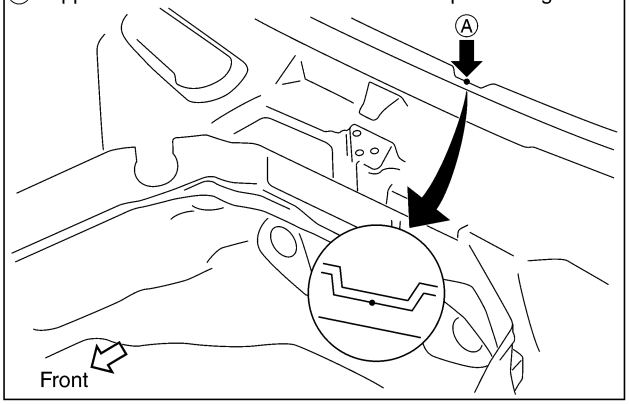


Point	Dimension	Point	Dimension	Point	Dimension
Ⓔ~ⓔ	1,317	Ⓖ~ⓗ	1,882*	Ⓚ~Ⓕ	1,052*
Ⓔ~ⓖ	1,561*	Ⓖ~ⓙ	1,727*	Ⓚ~Ⓖ	1,071*
Ⓔ~ⓗ	1,563*	Ⓗ~ⓗ	1,417	Ⓚ~Ⓗ	902*
Ⓔ~ⓙ	1,618*	Ⓗ~ⓙ	1,527*	Ⓚ~Ⓙ	715*
Ⓕ~ⓕ	1,440	Ⓙ~ⓙ	1,452	Ⓛ~Ⓘ	1,178*
Ⓖ~ⓖ	1,452	Ⓚ~Ⓔ	993*	Ⓜ~Ⓘ	1,181*

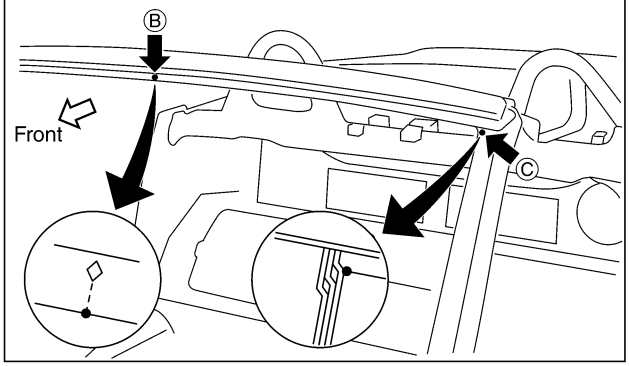
SIIA2308E

Measurement Points

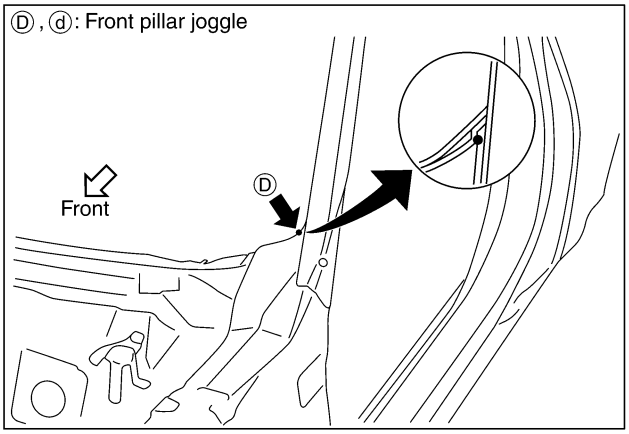
Ⓐ : Upper dash crossmember indent of center positioning mark



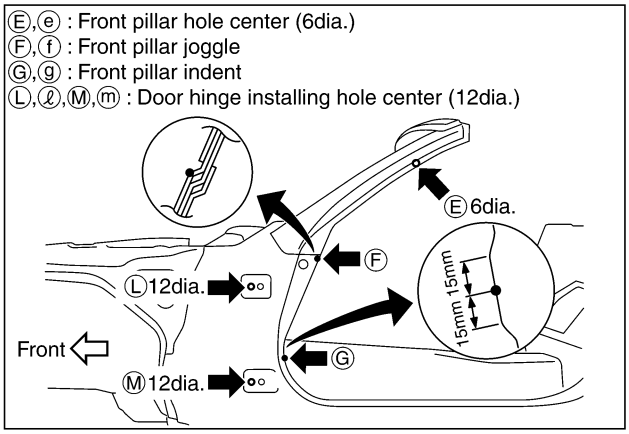
Ⓑ : Outer front roof rail flange end of center positioning mark
Ⓒ , ⓒ : Front pillar joggle



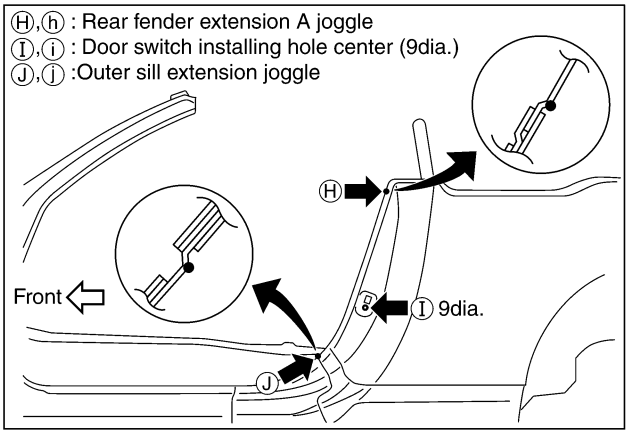
Ⓓ , ⓓ : Front pillar joggle



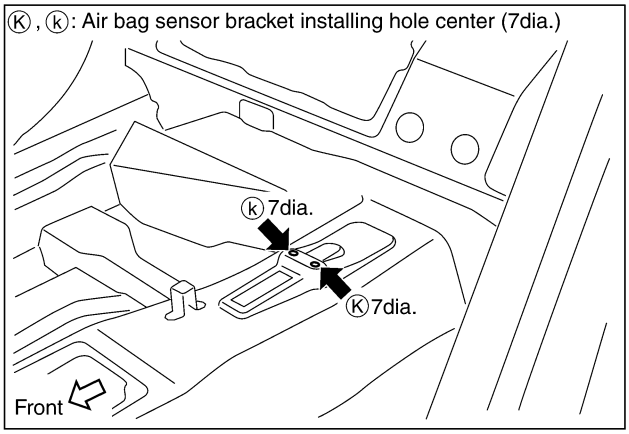
Ⓔ,ⓔ : Front pillar hole center (6dia.)
Ⓕ,ⓕ : Front pillar joggle
Ⓖ,ⓖ : Front pillar indent
Ⓛ,ⓛ,Ⓜ,ⓜ : Door hinge installing hole center (12dia.)



Ⓗ,ⓗ : Rear fender extension A joggle
Ⓘ,ⓘ : Door switch installing hole center (9dia.)
Ⓙ,ⓙ :Outer sill extension joggle



Ⓚ , ⓚ : Air bag sensor bracket installing hole center (7dia.)

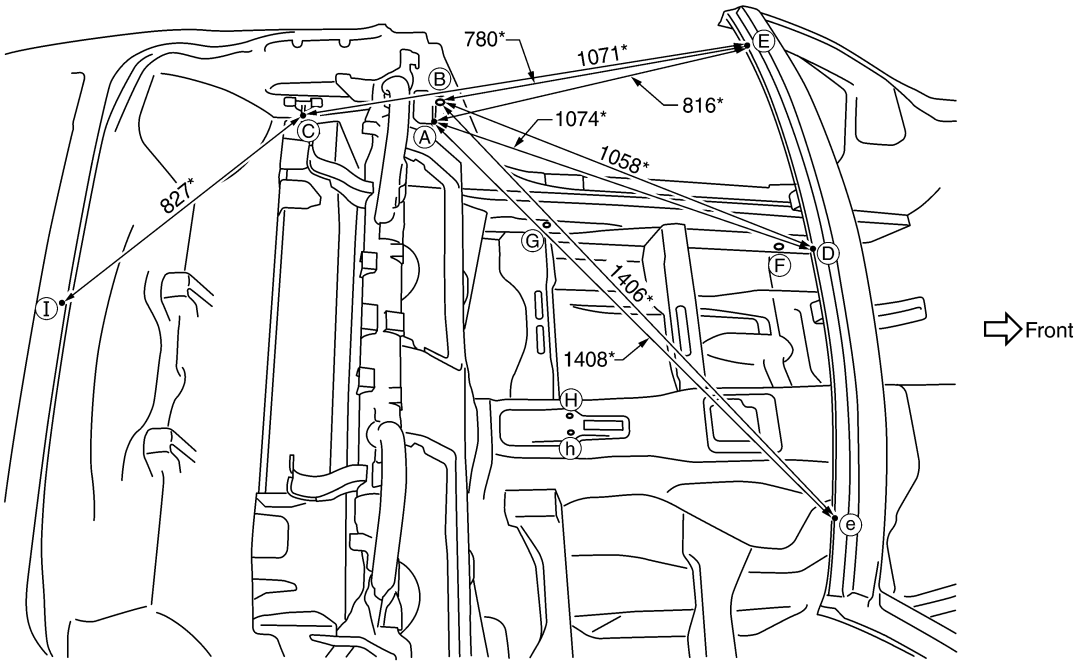


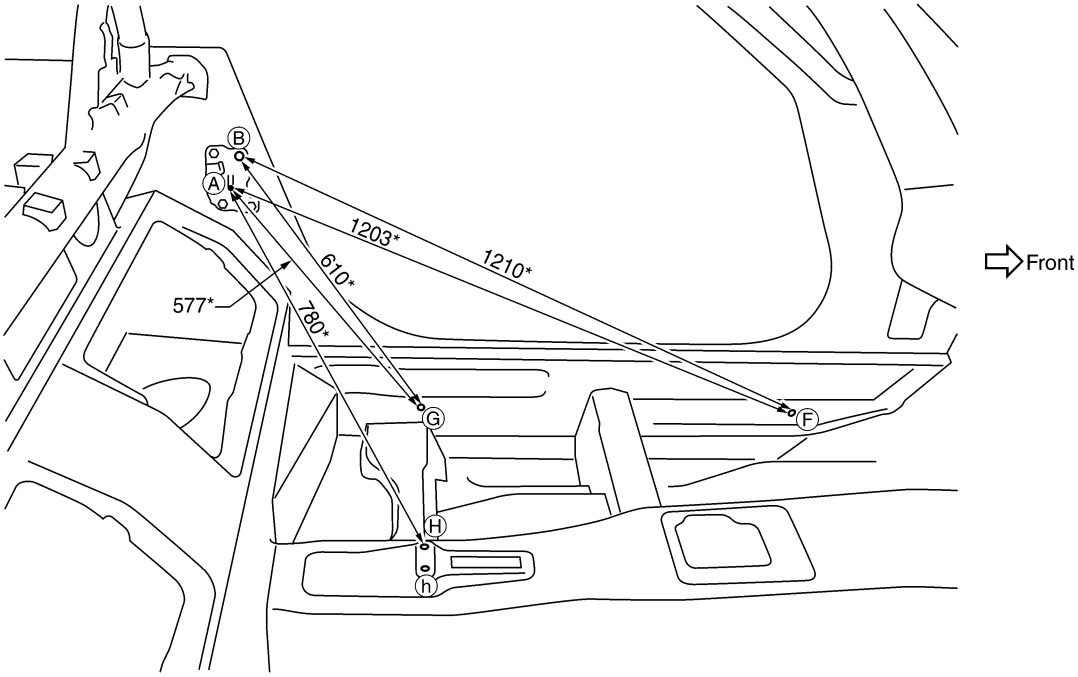
SIIA2444E

SOFT TOP MOUNTING BRACKET (ROADSTER)

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.



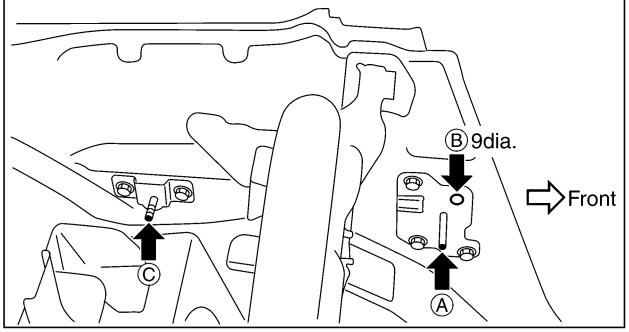


Point	Dimension
Ⓐ~ⓐ	1,344

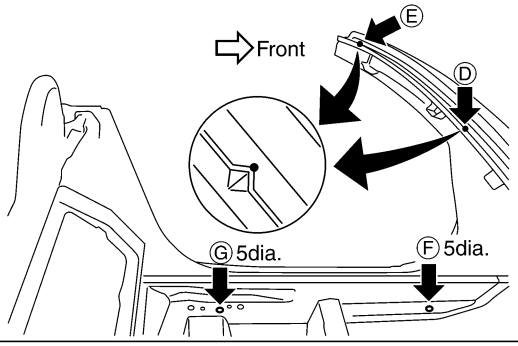
SIIA2325E

Measurement Points

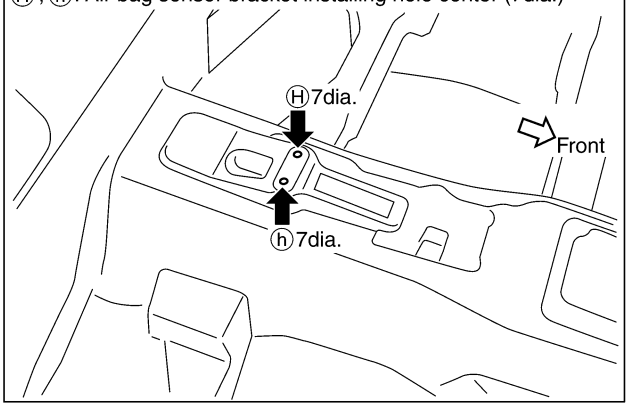
Ⓐ, ⓐ: Soft top unit installing pin top
Ⓑ, ⓑ: Soft top unit installing hole center (9dia.)
Ⓒ, ⓒ: Soft top unit installing bolt top



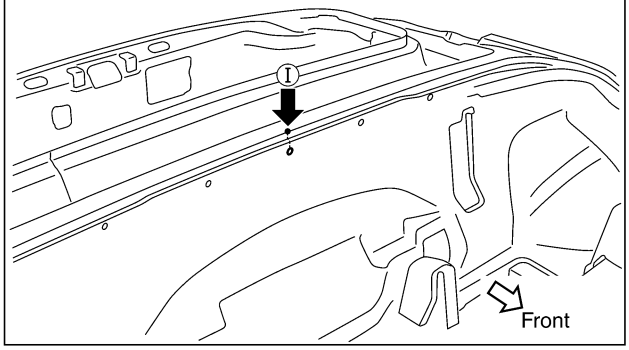
Ⓓ: Outer front roof rail embossment of center positioning mark
Ⓔ, ⓔ: Outer front roof rail embossment
Ⓕ, ⓕ, Ⓖ, ⓖ: Inner sill hole center (5dia.)



Ⓗ, ⓗ: Air bag sensor bracket installing hole center (7dia.)



Ⓘ: Rear waist & parcel shelf panel flange end of center positioning mark



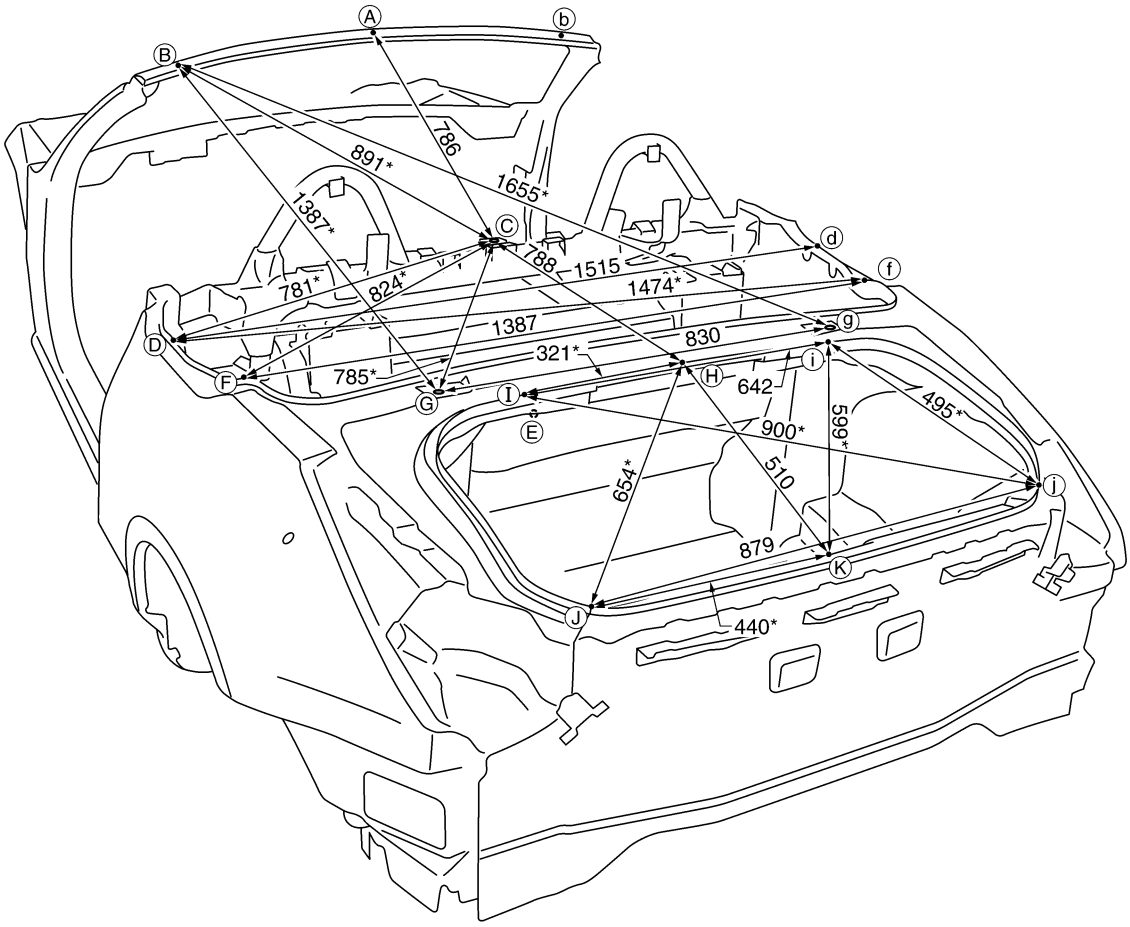
SIIA2445E

REAR BODY (ROADSTER)

Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

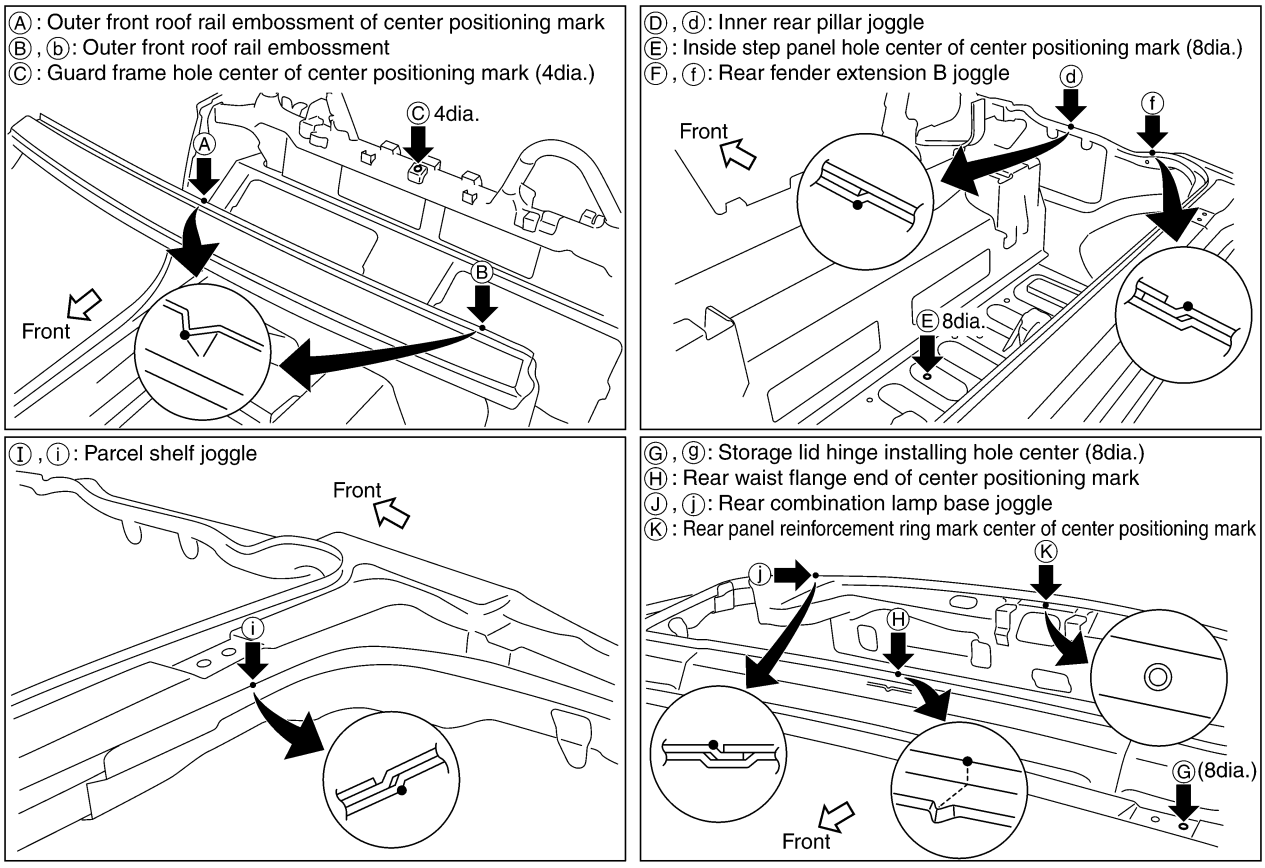
Unit : mm



Point	Dimension
Ⓔ~Ⓓ	821*
Ⓔ~Ⓕ	767*
Ⓔ~Ⓖ	622*
Ⓔ~Ⓗ	580

SIIA2310E

Measurement Points



SIIA2446E

Handling Precautions For Plastics (Coupe)

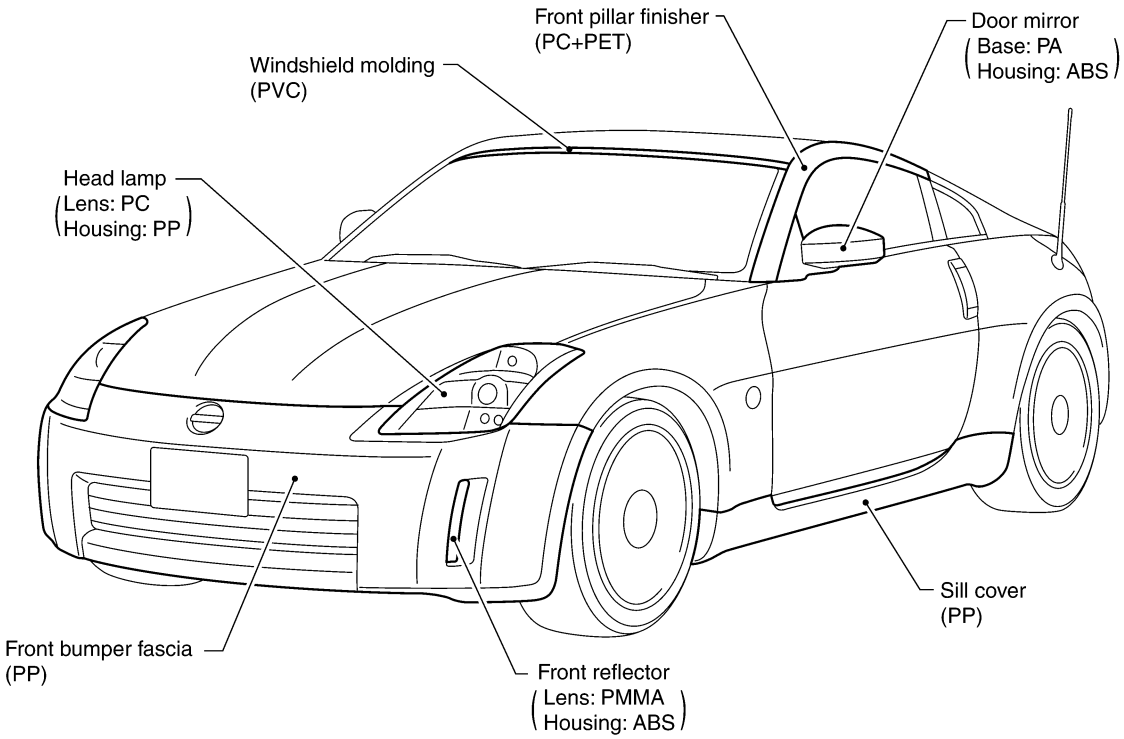
NIS00044

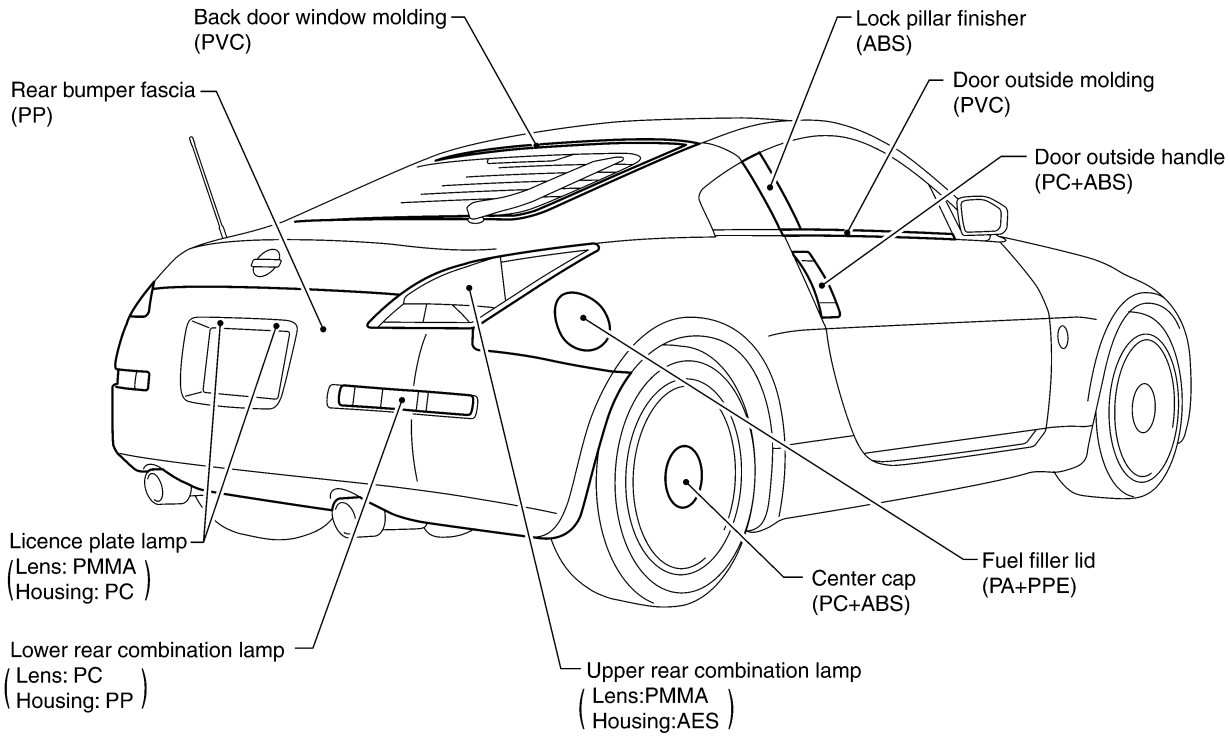
HANDLING PRECAUTIONS FOR PLASTICS

Abbre-viation	Material name	Heat resisting temperature °C(°F)	Resistance to gasoline and solvents	Other cautions
PE	Polyethylene	60(140)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PVC	Poly Vinyl Chloride	80(176)	Same as above.	Poison gas is emitted when burned.
EPM/ EPDM	Ethylene Propylene (Diene) copolymer	80(176)	Same as above.	Flammable
PP	Polypropylene	90(194)	Same as above.	Flammable, avoid battery acid.
UP	Unsaturated Polyester	90(194)	Same as above.	Flammable
PS	Polystyrene	80(176)	Avoid solvents.	Flammable
ABS	Acrylonitrile Butadiene Styrene	80(176)	Avoid gasoline and solvents.	
AES	Acrylonitrile Ethylene Styrene	80(176)	Same as above.	
PMMA	Poly Methyl Methacrylate	85(185)	Same as above.	
EVAC	Ethylene Vinyl Acetate	90(194)	Same as above.	
ASA	Acrylonitrile Styrene Acrylate	100(222)	Same as above.	Flammable
PPE	Poly Phenylene Ether	110(230)	Same as above.	
PC	Polycarbonate	120(248)	Same as above.	
PAR	Polyarylate	180(356)	Same as above.	
PUR	Polyurethane	90(194)	Same as above.	
POM	Poly Oxymethylene	120(248)	Same as above.	Avoid battery acid.
PBT+ PC	Poly Butylene Terephthalate + Polycarbonate	120(248)	Same as above.	Flammable
PA	Polyamide	140(284)	Same as above.	Avoid immersing in water.
PBT	Poly Butylene Terephthalate	140(284)	Same as above.	
PET	Polyester	180(356)	Same as above.	
PEI	Polyetherimide	200(392)	Same as above.	

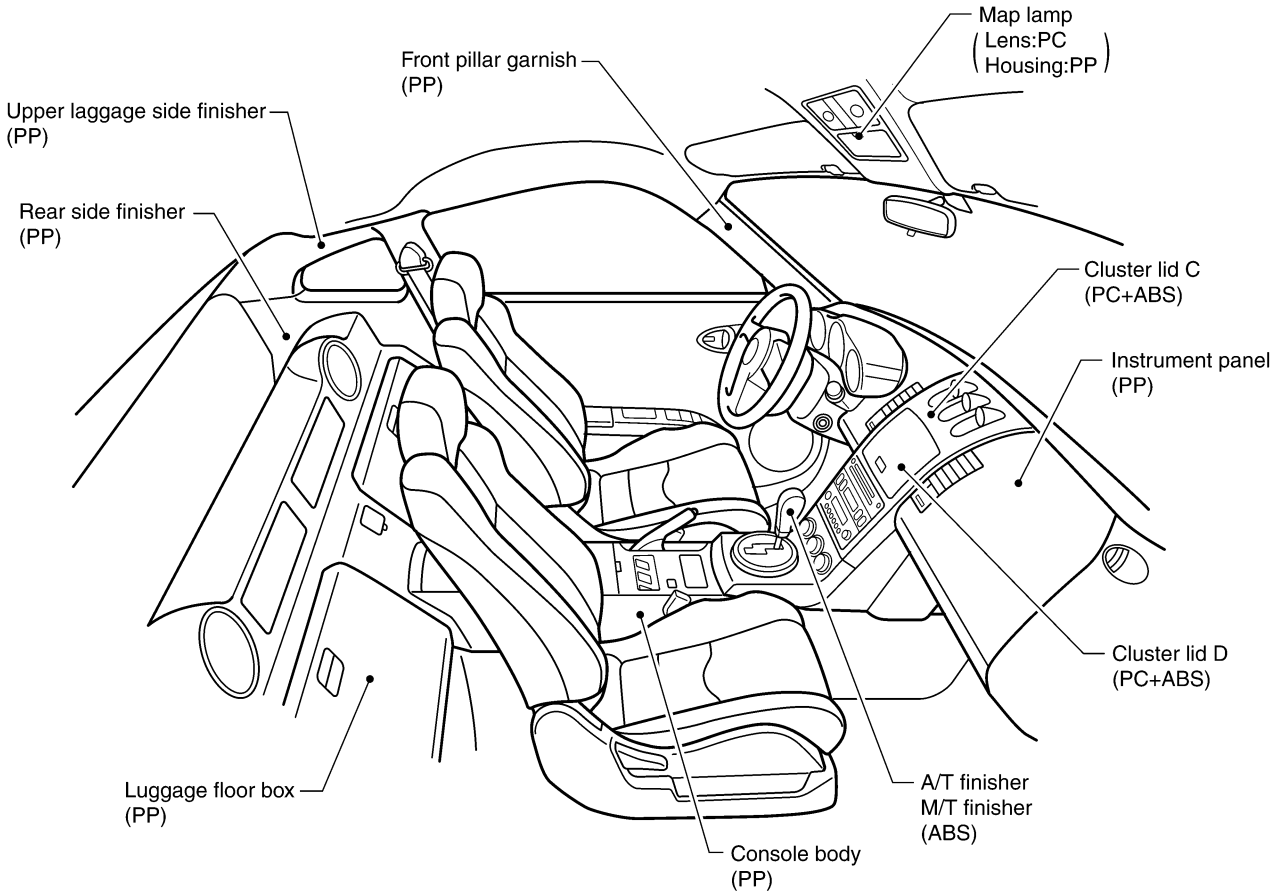
1. When repairing and painting a portion of the body adjacent to plastic parts, consider their characteristics (influence of heat and solvent) and remove them if necessary or take suitable measures to protect them.
2. Plastic parts should be repaired and painted using methods suiting the materials' characteristics.

LOCATION OF PLASTIC PARTS (COUPE)





SIIA2360E


Map lamp
Lens:PC
Housing:PP
Front pillar garnish
(PP)
Upper laggage side finisher
(PP)
Rear side finisher
(PP)
Cluster lid C
(PC+ABS)
Instrument panel
(PP)
Cluster lid D
(PC+ABS)
A/T finisher
M/T finisher
(ABS)
Luggage floor box
(PP)
Console body
(PP)

SIIA1983E

Handling Precautions For Plastics (Roadster)

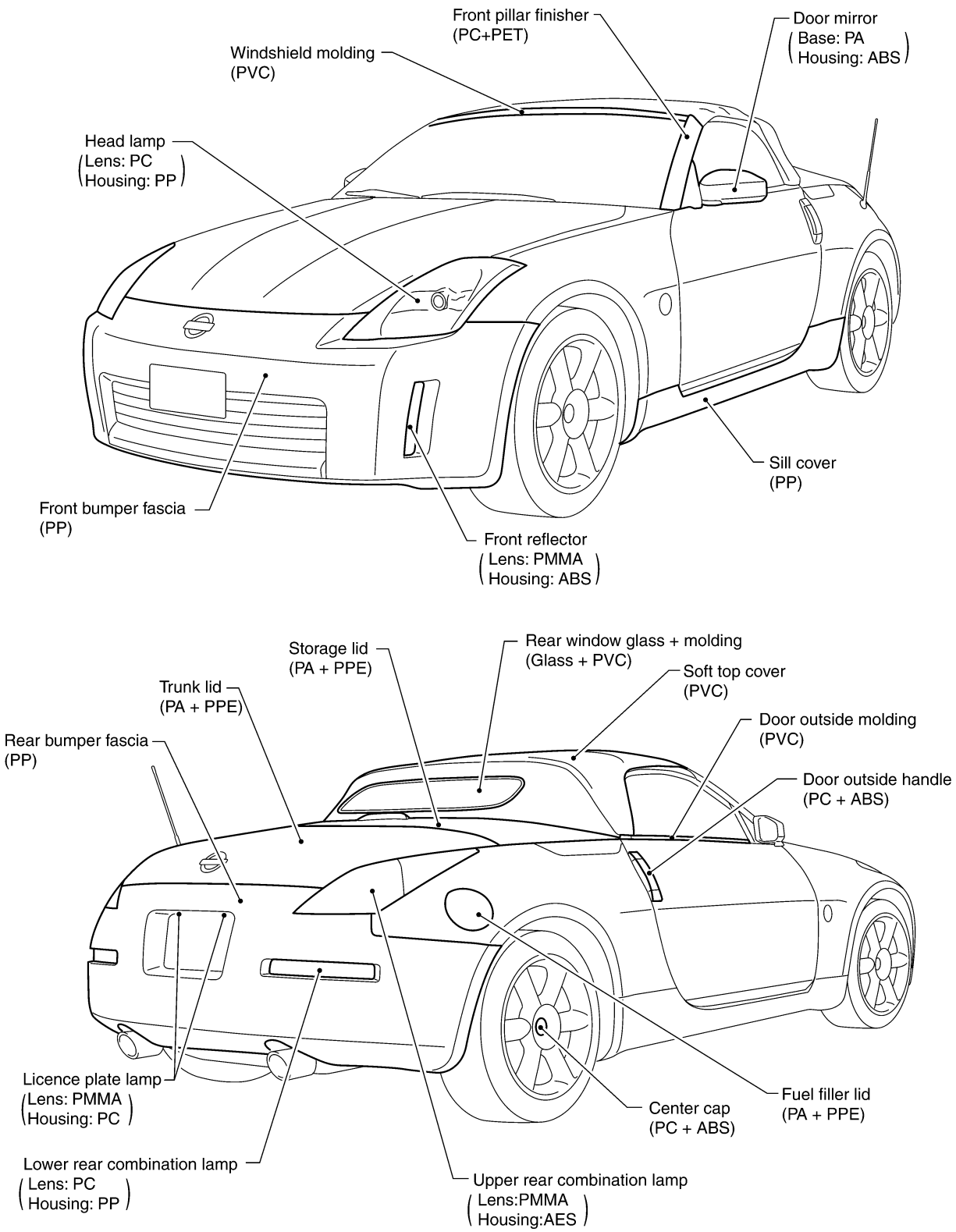
NIS00045

HANDLING PRECAUTIONS FOR PLASTICS

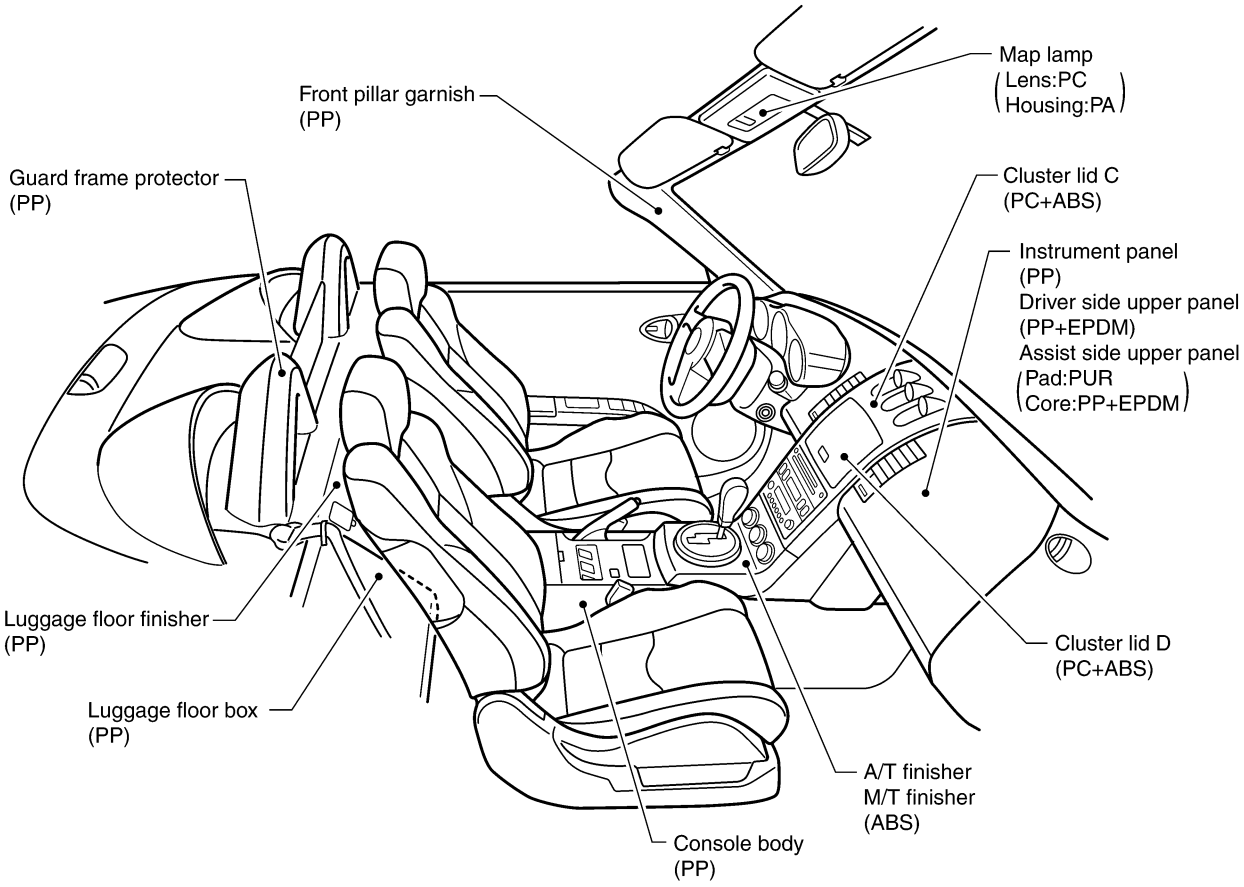
Abbre-viation	Material name	Heat resisting temperature °C(°F)	Resistance to gasoline and solvents	Other cautions
PE	Polyethylene	60(140)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PVC	Poly Vinyl Chloride	80(176)	Same as above.	Poison gas is emitted when burned.
EPM/ EPDM	Ethylene Propylene (Diene) copolymer	80(176)	Same as above.	Flammable
PP	Polypropylene	90(194)	Same as above.	Flammable, avoid battery acid.
UP	Unsaturated Polyester	90(194)	Same as above.	Flammable
PS	Polystyrene	80(176)	Avoid solvents.	Flammable
ABS	Acrylonitrile Butadiene Styrene	80(176)	Avoid gasoline and solvents.	
AES	Acrylonitrile Ethylene Styrene	80(176)	Same as above.	
PMMA	Poly Methyl Methacrylate	85(185)	Same as above.	
EVAC	Ethylene Vinyl Acetate	90(194)	Same as above.	
ASA	Acrylonitrile Styrene Acrylate	100(222)	Same as above.	Flammable
PPE	Poly Phenylene Ether	110(230)	Same as above.	
PC	Polycarbonate	120(248)	Same as above.	
PAR	Polyarylate	180(356)	Same as above.	
PUR	Polyurethane	90(194)	Same as above.	
POM	Poly Oxymethylene	120(248)	Same as above.	Avoid battery acid.
PBT+ PC	Poly Butylene Terephthalate + Polycarbonate	120(248)	Same as above.	Flammable
PA	Polyamide	140(284)	Same as above.	Avoid immersing in water.
PBT	Poly Butylene Terephthalate	140(284)	Same as above.	
PET	Polyester	180(356)	Same as above.	
PEI	Polyetherimide	200(392)	Same as above.	

1. When repairing and painting a portion of the body adjacent to plastic parts, consider their characteristics (influence of heat and solvent) and remove them if necessary or take suitable measures to protect them.
2. Plastic parts should be repaired and painted using methods suiting the materials' characteristics.

LOCATION OF PLASTIC PARTS (ROADSTER)



SIIA2361E


Map lamp
(Lens:PC
Housing:PA)
Front pillar garnish
(PP)
Guard frame protector
(PP)
Cluster lid C
(PC+ABS)
Instrument panel
(PP)
Driver side upper panel
(PP+EPDM)
Assist side upper panel
(Pad:PUR
Core:PP+EPDM)
Luggage floor finisher
(PP)
Cluster lid D
(PC+ABS)
Luggage floor box
(PP)
A/T finisher
M/T finisher
(ABS)
Console body
(PP)
SIIA2447E

Precautions In Repairing High Strength Steel

NIS00046

High strength steel is used for body panels in order to reduce vehicle weight.
Accordingly, precautions in repairing automotive bodies made of high strength steel are described below:

HIGH STRENGTH STEEL (HSS) USED IN NISSAN VEHICLES

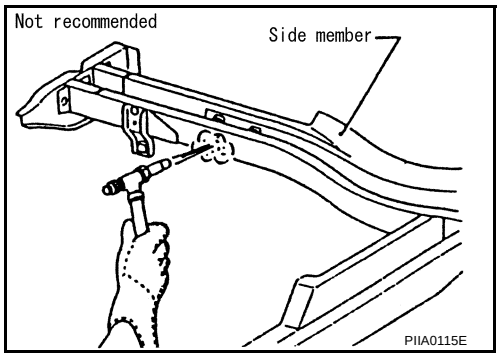
Tensile strength	Nissan/Infiniti designation	Major applicable parts
373 N/mm^2 (38kg/mm^2 ,54klb/sq in)	SP130	● Front & rear side member assembly ● Hoodledge assembly ● Upper dash ● Body side ● Other reinforcements
785-981 N/mm^2 (80-100kg/mm^2 ,114-142klb/sq in)	SP150	● Front door guard beam

SP130 is the most commonly used HSS.

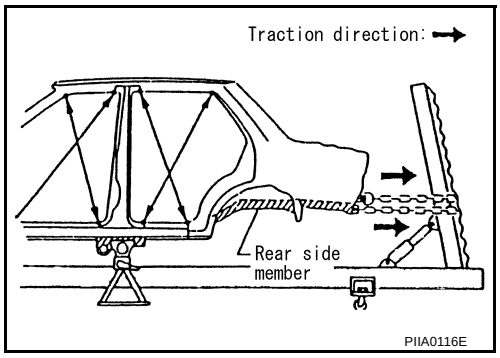
Read the following precautions when repairing HSS:

1. Additional points to consider

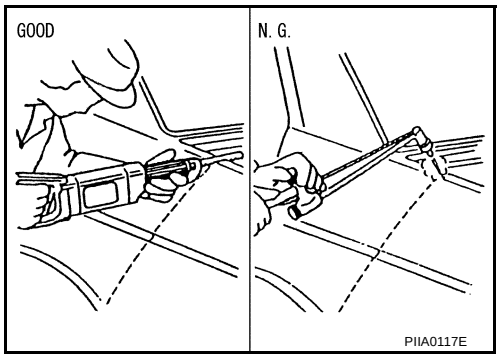
- The repair of reinforcements (such as side members) by heating is not recommended since it may weaken the component. When heating is unavoidable, do not heat HSS parts above 550°C (1,022°F).
  Verify heating temperature with a thermometer.
  (Crayon-type and other similar type thermometer are appropriate.)



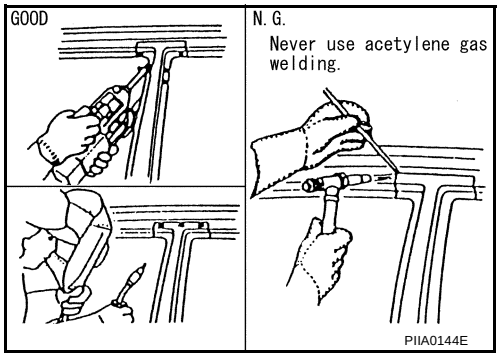
- When straightening body panels, use caution in pulling any HSS panel. Because HSS is very strong, pulling may cause deformation in adjacent portions of the body. In this case, increase the number of measuring points, and carefully pull the HSS panel.



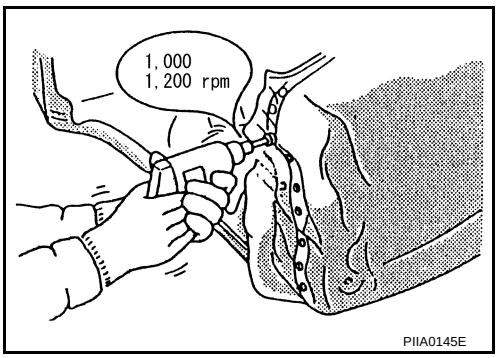
- When cutting HSS panels, avoid gas (torch) cutting if possible. Instead, use a saw to avoid weakening surrounding areas due to heat. If gas (torch) cutting is unavoidable, allow a minimum margin of 50 mm (1.97in).



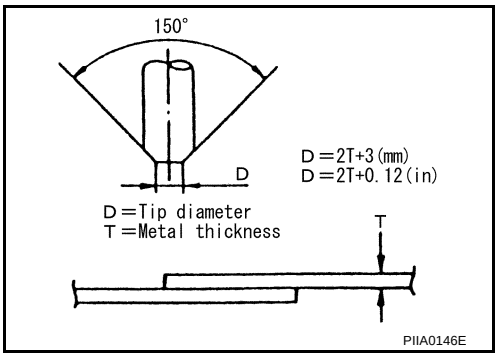
- When welding HSS panels, use spot welding whenever possible in order to minimize weakening surrounding areas due to heat.
  If spot welding is impossible, use M.I.G. welding. Do not use gas (torch) welding because it is inferior in welding strength.



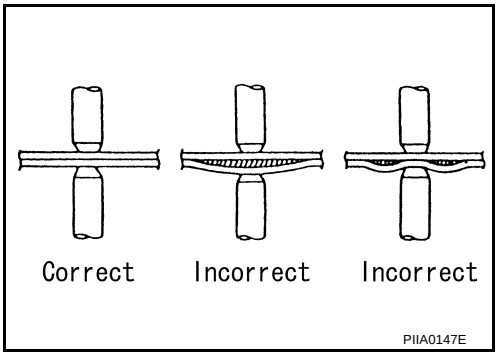
- The spot weld on HSS panels is harder than that of an ordinary steel panel.
  Therefore, when cutting spot welds on a HSS panel, use a low speed high torque drill (1,000 to 1,200 rpm) to increase drill bit durability and facilitate the operation.



2. Precautions in spot welding HSS
   This work should be performed under standard working conditions. Always note the following when spot welding HSS:
   - The electrode tip diameter must be sized properly according to the metal thickness.



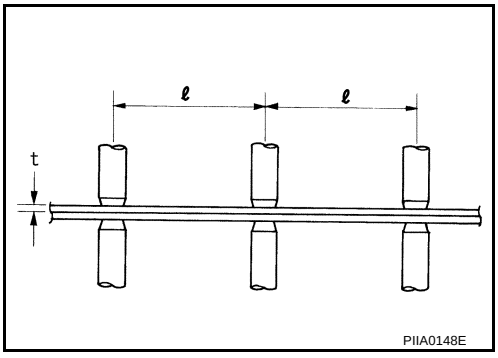
   - The panel surfaces must fit flush to each other, leaving no gaps.



   - Follow the specifications for the proper welding pitch.

Unit:mm

Thickness (t)	Minimum pitch (l)
0.6 (0.024)	10 (0.39) or over
0.8 (0.031)	12 (0.47) or over
1.0 (0.039)	18 (0.71) or over
1.2 (0.047)	20 (0.79) or over
1.6 (0.063)	27 (1.06) or over
1.8 (0.071)	31 (1.22) or over



Replacement Operations (Coupe)

NIS00047

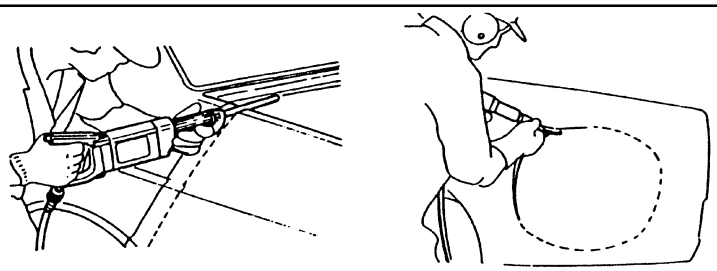
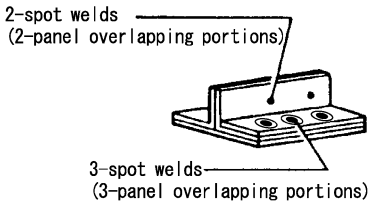
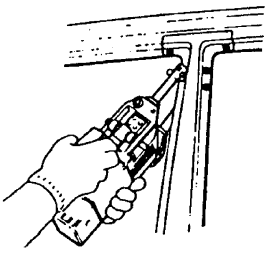
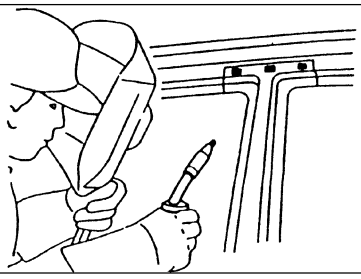
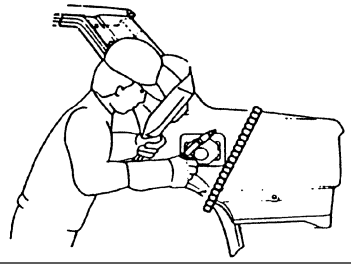
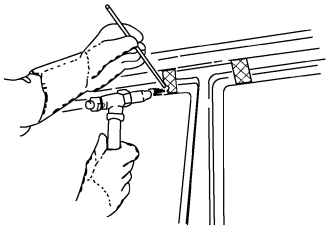
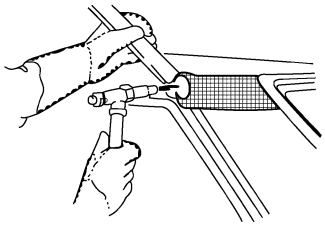
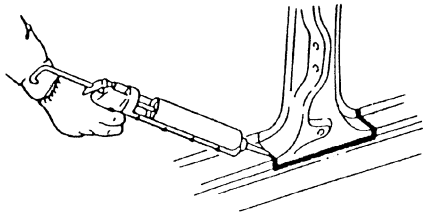
DESCRIPTION

This section is prepared for technicians who have attained a high level of skill and experience in repairing collision-damaged vehicles and also use modern service tools and equipment. Persons unfamiliar with body repair techniques should not attempt to repair collision-damaged vehicles by using this section.

Technicians are also encouraged to read Body Repair Manual (Fundamentals) in order to ensure that the original functions and quality of the vehicle can be maintained. The Body Repair Manual (Fundamentals) contains additional information, including cautions and warning, that are not including in this manual. Technicians should refer to both manuals to ensure proper repairs.

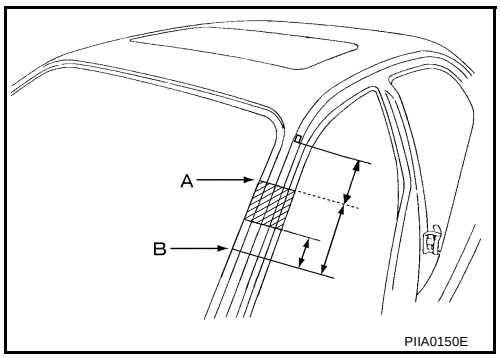
Please note that these information are prepared for worldwide usage, and as such, certain procedures might not apply in some regions or countries.

The symbols used in this section for cutting and welding / brazing operations are shown below.

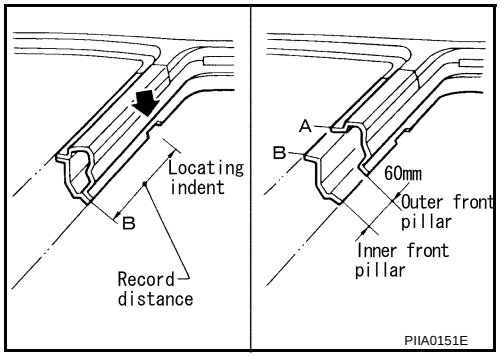
Saw cut or air chisel cut	
Spot weld 2-spot welds	 
Spot weld 3-spot welds	
MIG plug weld	 
MIG seam weld/ Point weld	
Brazing	
Soldering	
Sealing	

PIIA0149E

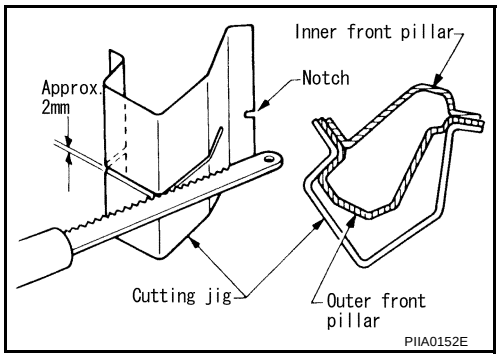
- Front pillar butt joint can be determined anywhere within shaded area as shown in the figure. The best location for the butt joint is at position A due to the construction of the vehicle. Refer to the front pillar section.



- Determine cutting position and record distance from the locating indent. Use this distance when cutting the service part. Cut outer front pillar over 60 mm above inner front pillar cut position.

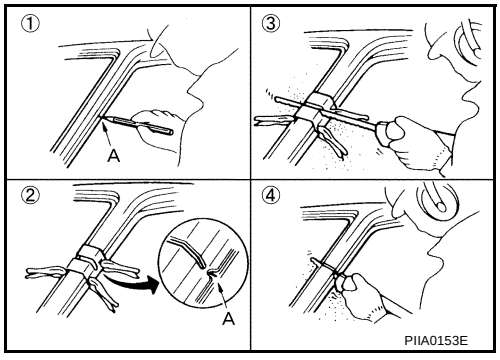


- Prepare a cutting jig to make outer pillar easier to cut. Also, this will permit service part to be accurately cut at joint position.



- An example of cutting operation using a cutting jig is as follows.

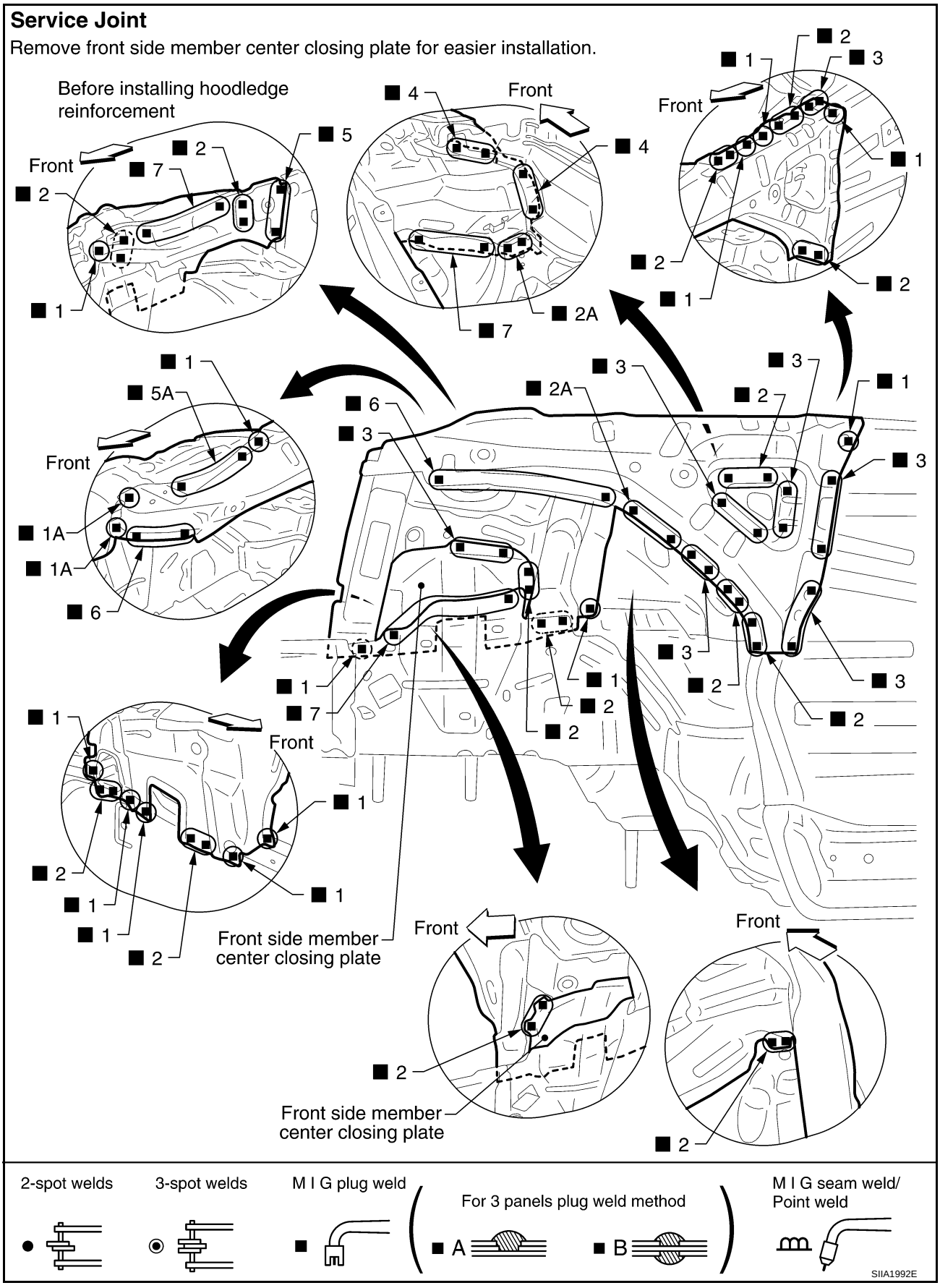
1. Mark cutting lines.
   A: Cut position of outer pillar
   B: Cut position of inner pillar
2. Align cutting line with notch on jig. Clamp jig to pillar.
3. Cut outer pillar along groove of jig. (At position A)
4. Remove jig and cut remaining portions.
5. Cut inner pillar at position B in same manner.



HOODLEDGE (COUPE)

Service Joint

Remove front side member center closing plate for easier installation.

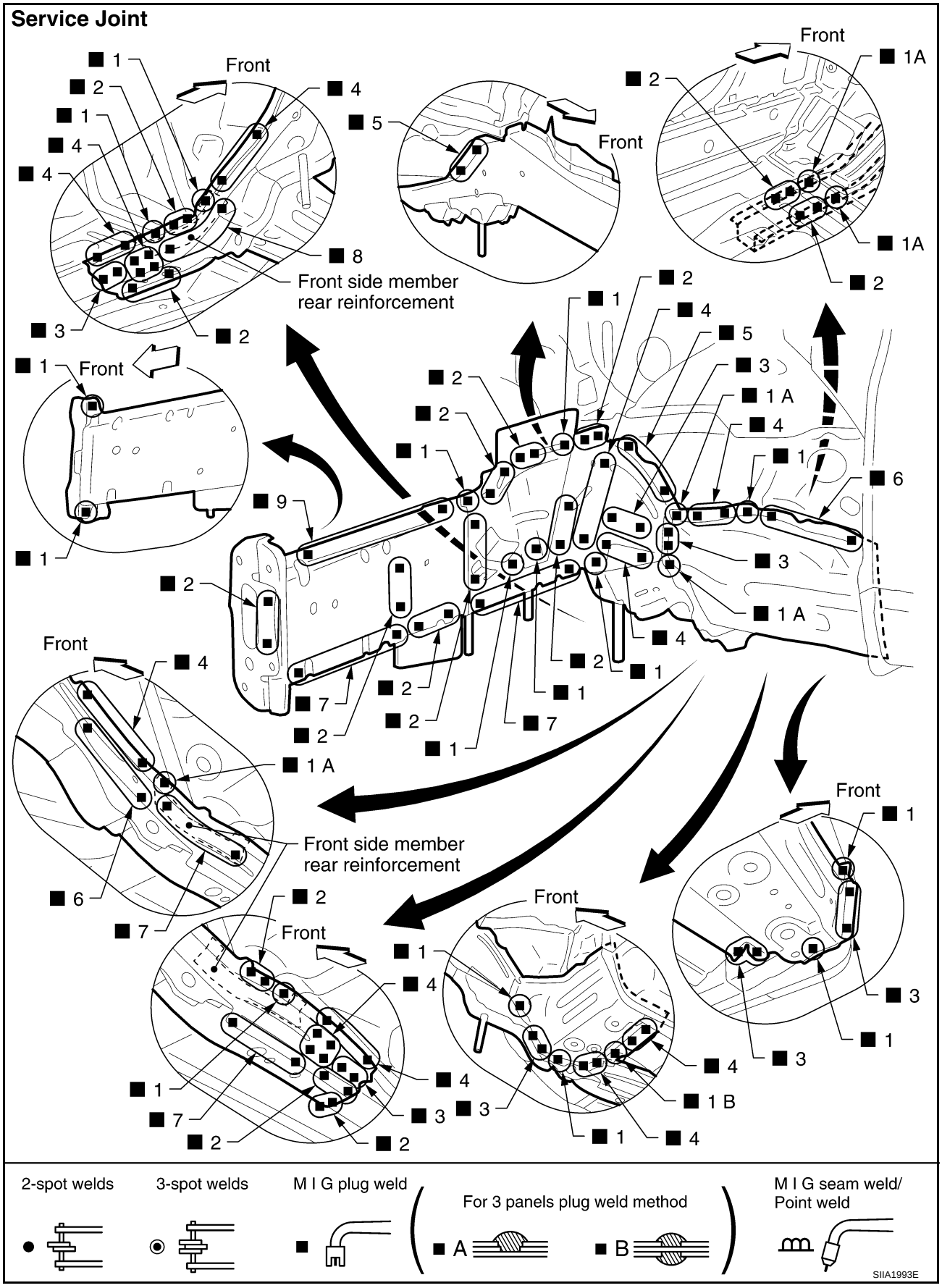


Change parts

- Front strut housing (LH)
- Upper front hoodledge (LH)
- Hoodledge reinforcement (LH)

FRONT SIDE MEMBER (COUPE)

- Work after hoodledge has been removed.



Change parts

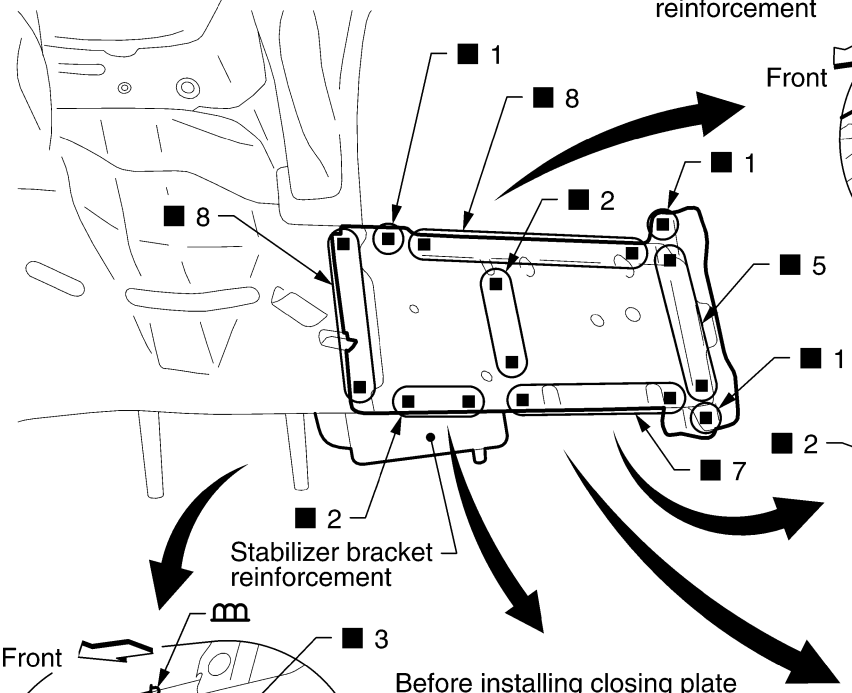
- Front side member assembly (LH)
- Front side member outrigger assembly (LH)
- Front side member closing plate assembly (LH)
- Front side member rear reinforcement (LH)

FRONT SIDE MEMBER (PARTIAL REPLACEMENT) (COUPE)

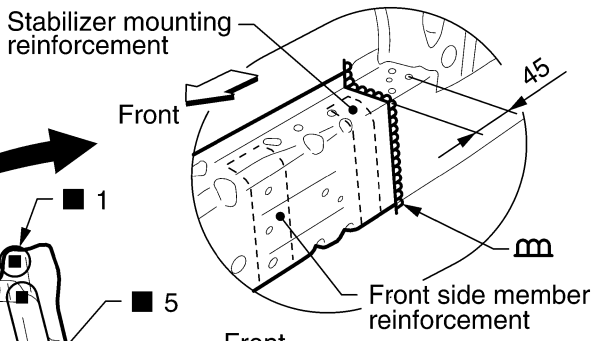
Service Joint

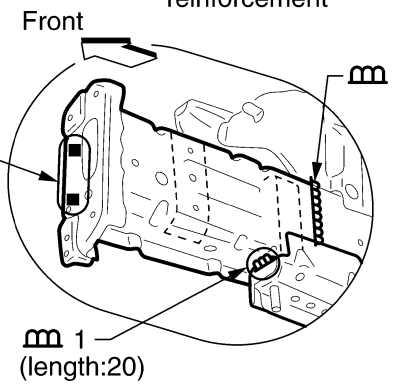
(This figure shows right front side member)

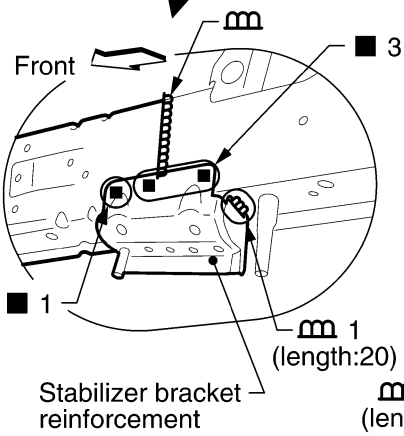
Remove stabilizer bracket reinforcement for easier installation.



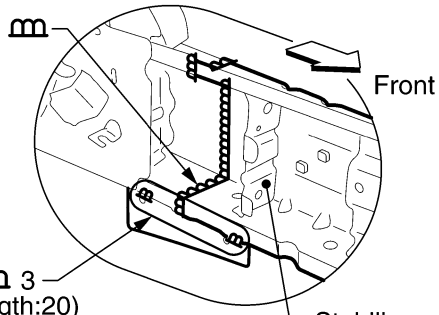
Before installing stabilizer bracket reinforcement



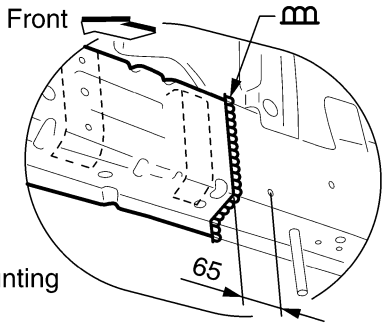




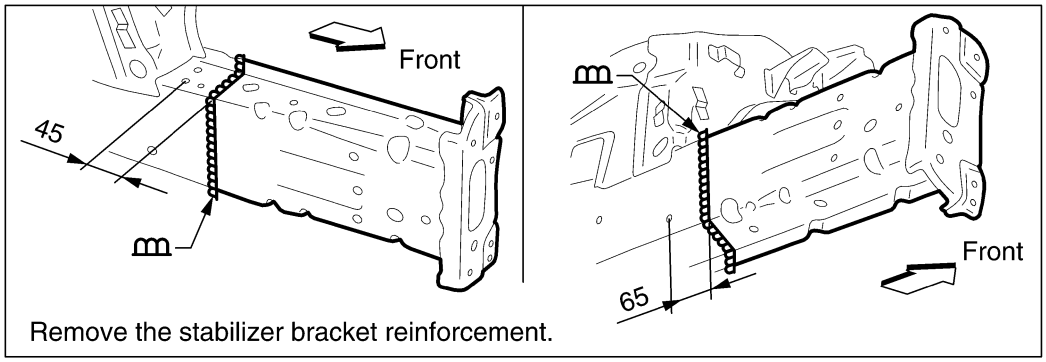
Before installing closing plate



Before installing stabilizer bracket reinforcement



・Left front side member cut portion.



Remove the stabilizer bracket reinforcement.

Unit:mm

2-spot welds ● 3-spot welds ◉ M I G plug weld ■ For 3 panels plug weld method ■ A ■ B M I G seam weld/ Point weld

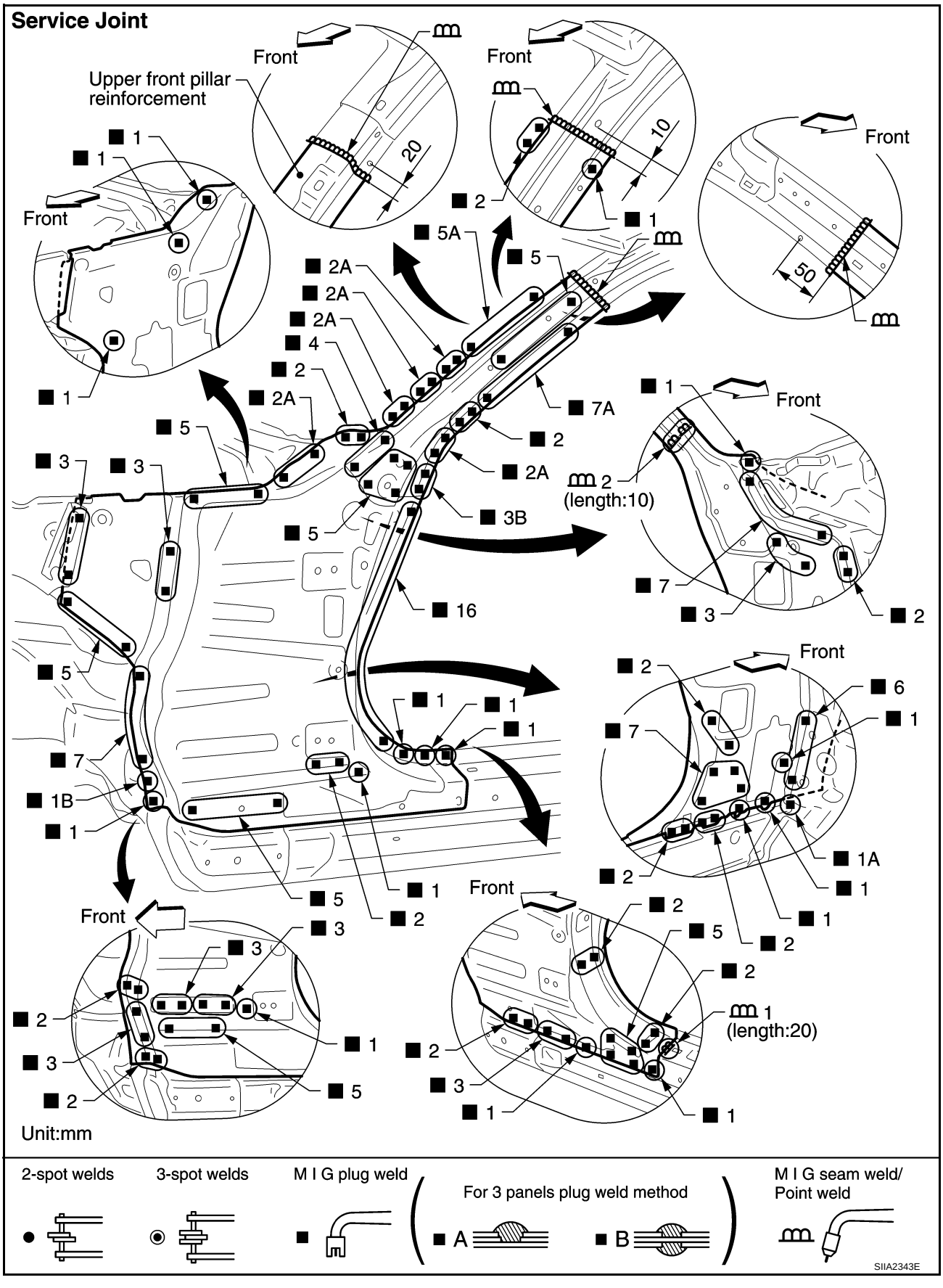
SIIA1994E

Change parts

- Front side member assembly (RH)
- Front side member front closing plate (RH)
- Outer front towing hook bracket (RH)

FRONT PILLAR (COUPE)

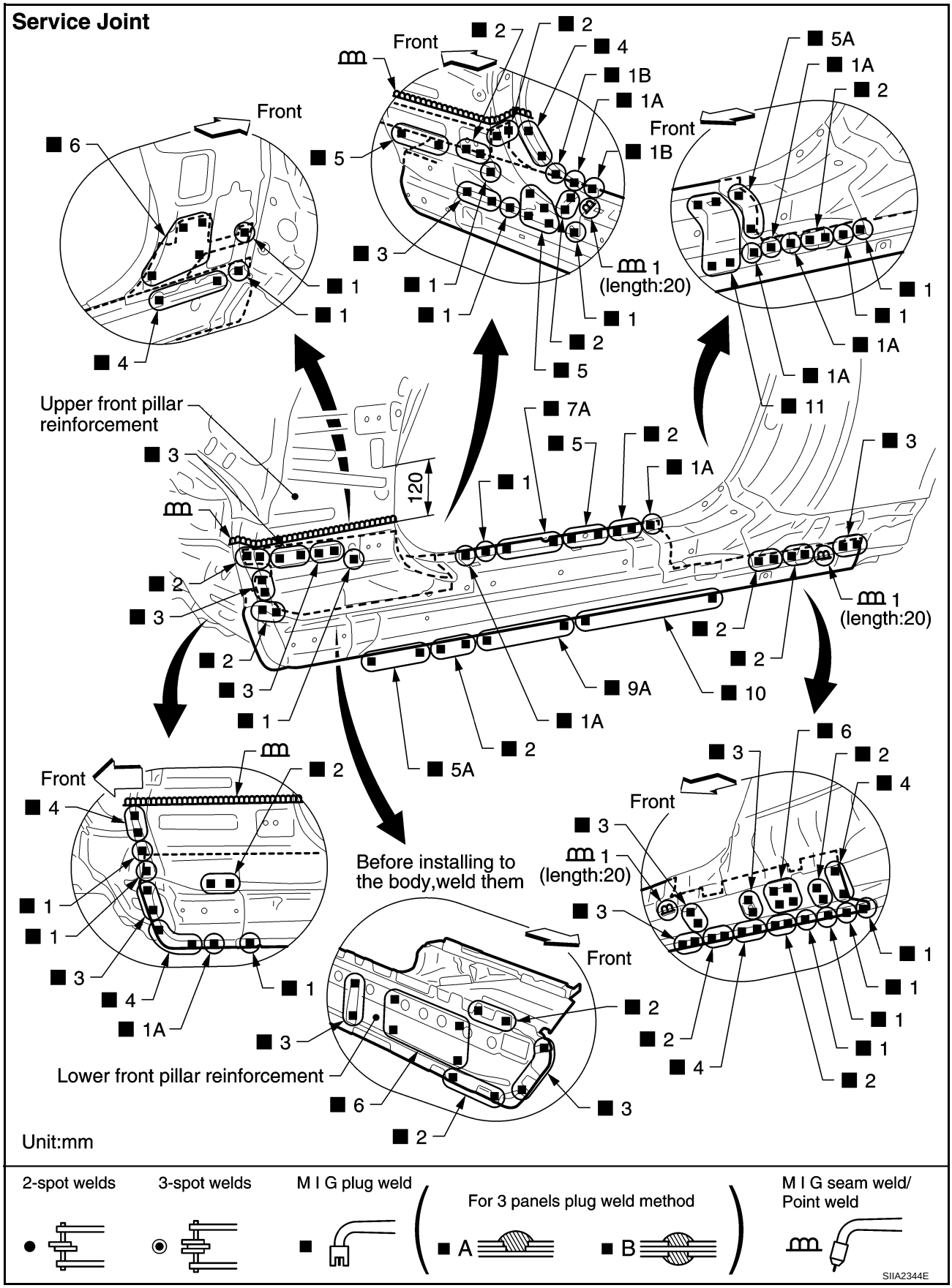
- Work after hoodledge reinforcement has been removed.



Change parts

- Front pillar reinforcement assembly (LH)
- Outer front pillar (LH)
- Inner side roof rail (LH)
- Upper rear hoodledge (LH)

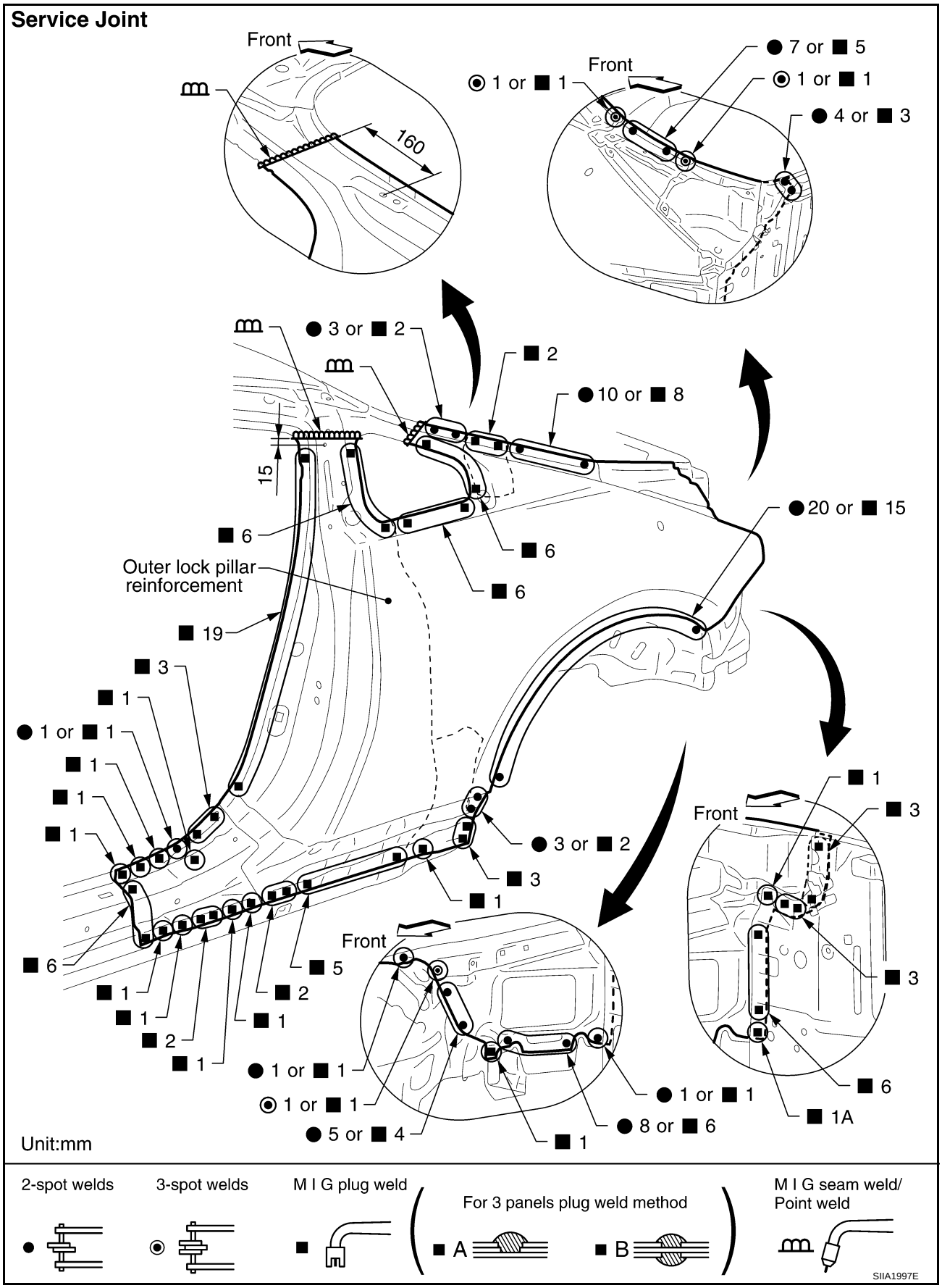
OUTER SILL (COUPE)



Change parts

- Outer sill reinforcement assembly (LH)
- Lower front pillar reinforcement (LH)

REAR FENDER (COUPE)



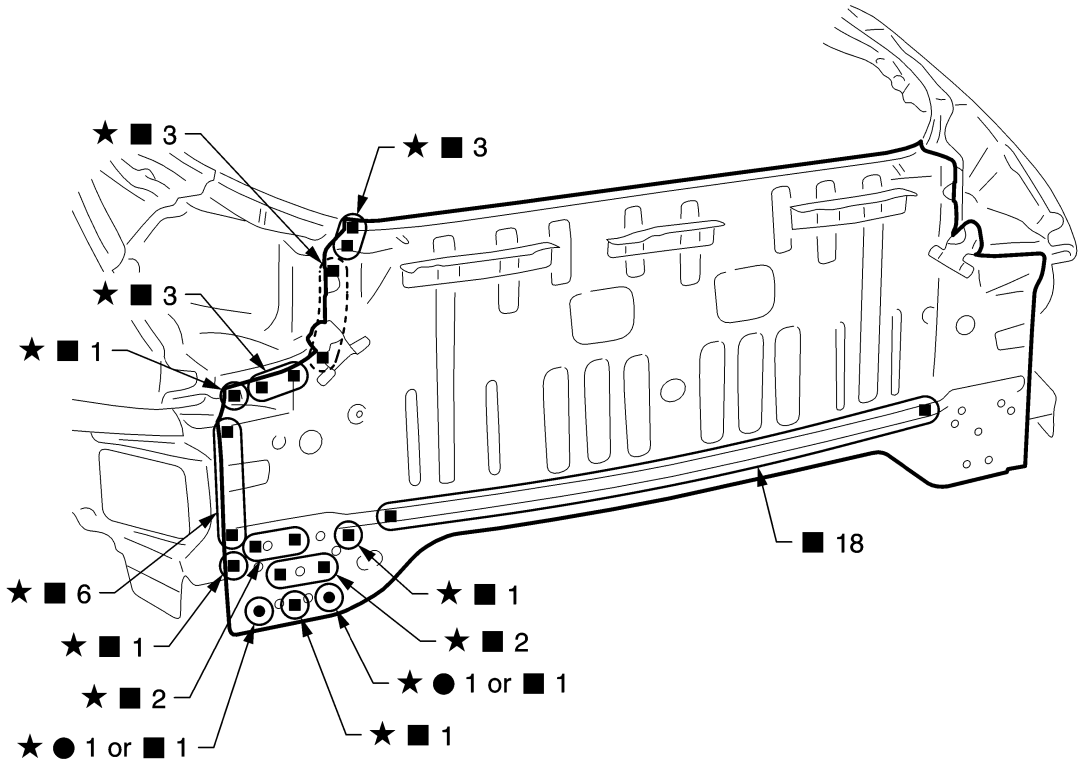
Change parts

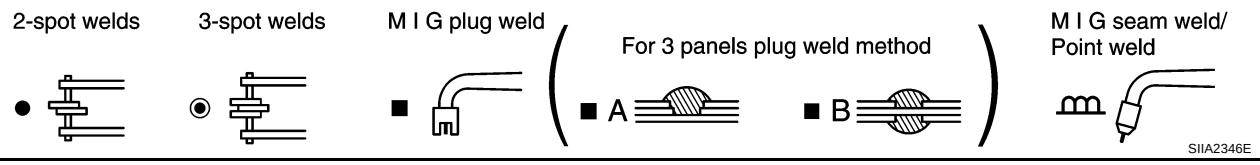
- Rear fender assembly (LH)

REAR PANEL (COUPE)

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.





Change parts

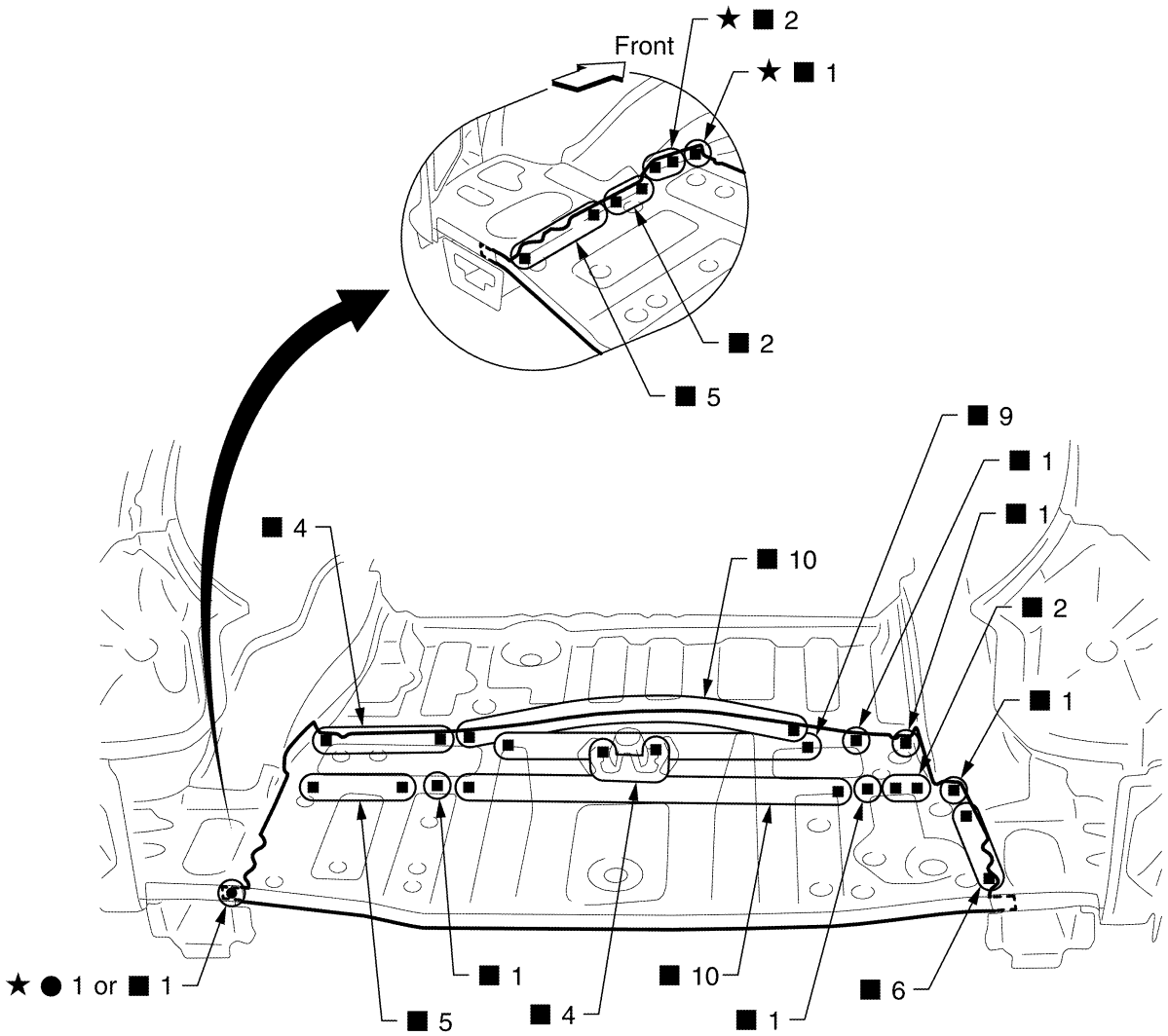
- ● Rear panel assembly

REAR FLOOR REAR (COUPE)

- Work after rear panel assembly has been removed.

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.



2-spot welds ● | 3-spot welds ◉ | M I G plug weld ■ | For 3 panels plug weld method ■ A ■ B | M I G seam weld/ Point weld

SIIA1999E

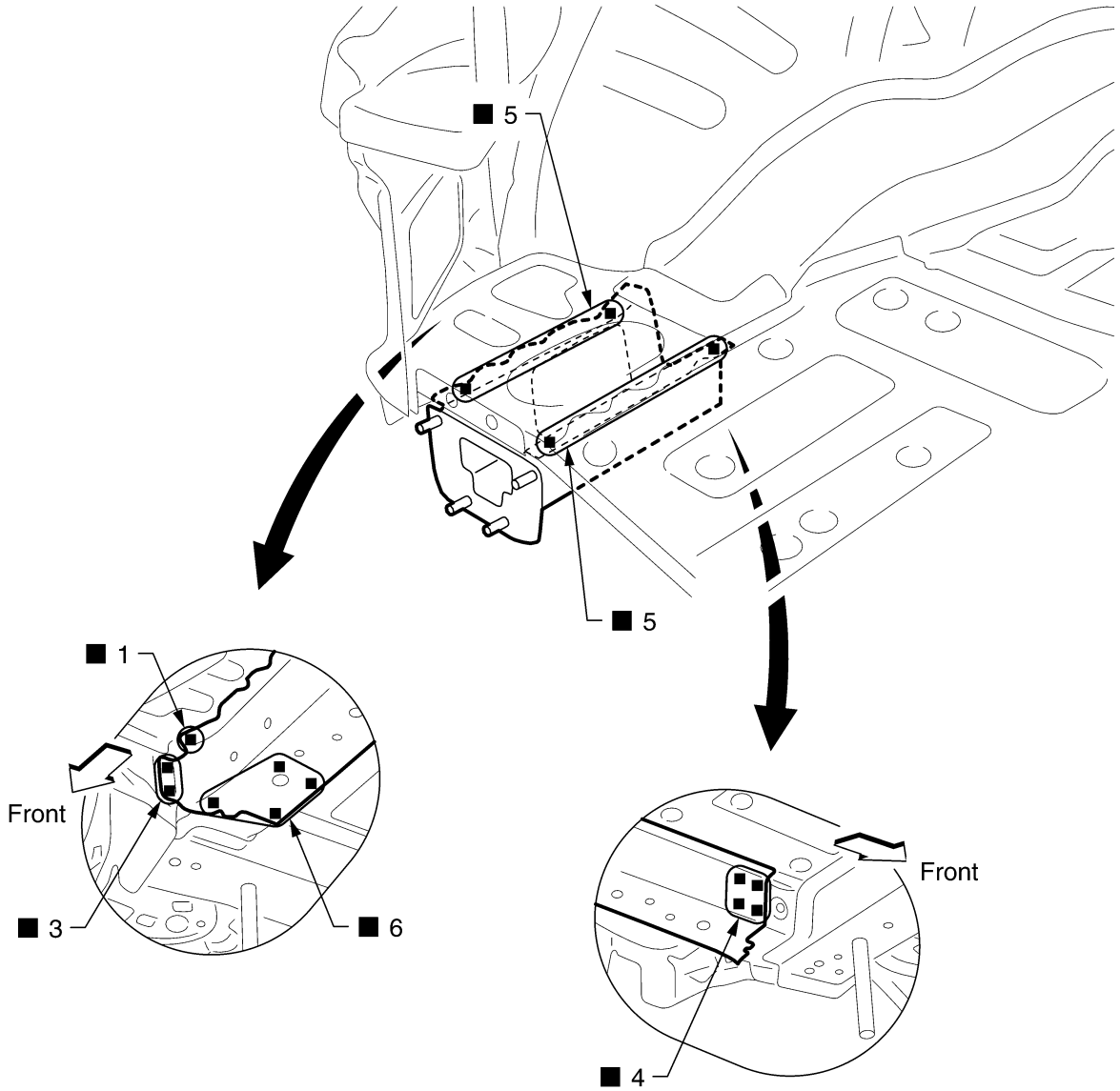
Change parts

- Rear floor rear
- Spare tire clamp bracket

REAR SIDE MEMBER EXTENSION (COUPE)

- Work after rear panel assembly has been removed.

Service Joint



2-spot welds ● 3-spot welds ◉ M I G plug weld ■ (For 3 panels plug weld method ■ A ■ B) M I G seam weld/ Point weld

SIIA2000E

Change parts

- Rear side member extension (LH)

Replacement Operations (Roadster)

NIS00048

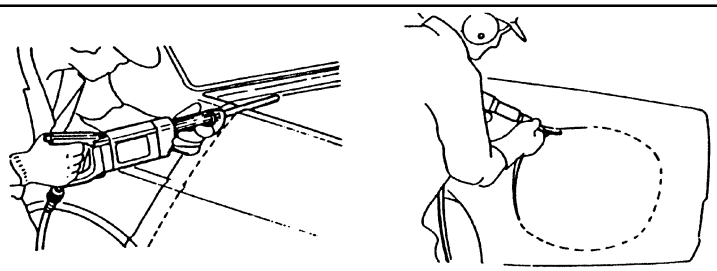
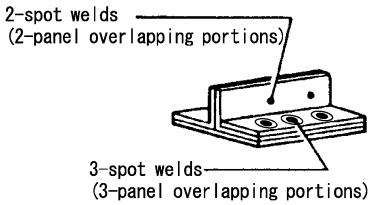
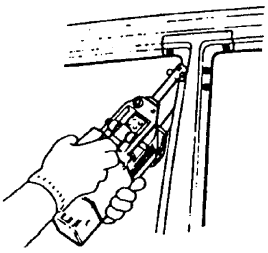
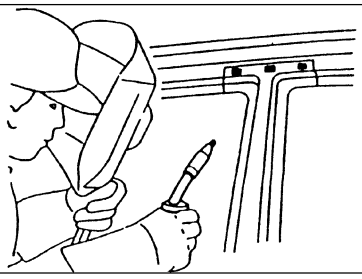
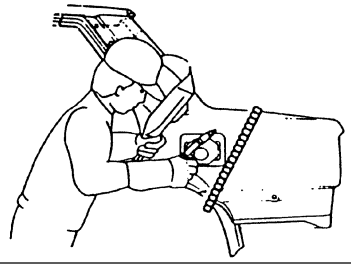
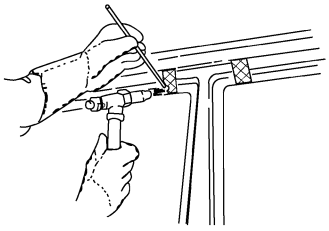
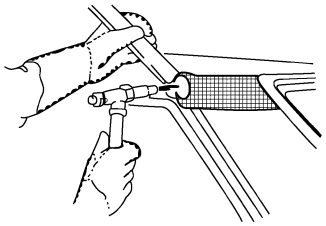
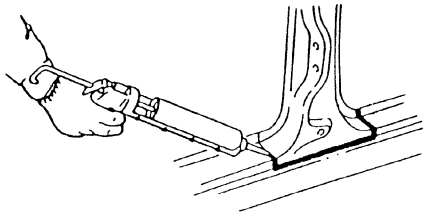
DESCRIPTION

This section is prepared for technicians who have attained a high level of skill and experience in repairing collision-damaged vehicles and also use modern service tools and equipment. Persons unfamiliar with body repair techniques should not attempt to repair collision-damaged vehicles by using this section.

Technicians are also encouraged to read Body Repair Manual (Fundamentals) in order to ensure that the original functions and quality of the vehicle can be maintained. The Body Repair Manual (Fundamentals) contains additional information, including cautions and warning, that are not including in this manual. Technicians should refer to both manuals to ensure proper repairs.

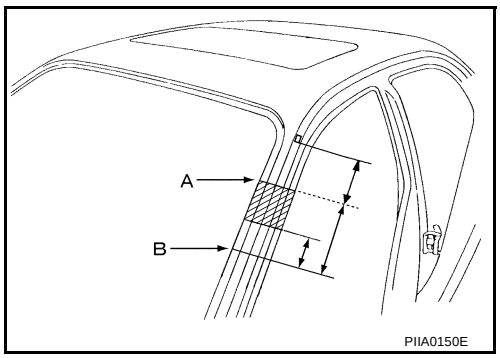
Please note that these information are prepared for worldwide usage, and as such, certain procedures might not apply in some regions or countries.

The symbols used in this section for cutting and welding / brazing operations are shown below.

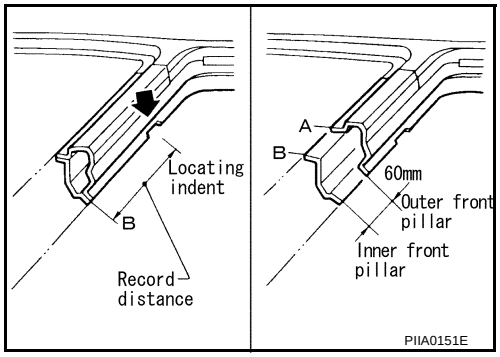
Saw cut or air chisel cut	
Spot weld 2-spot welds	 
Spot weld 3-spot welds	
MIG plug weld	 
MIG seam weld/ Point weld	
Brazing	
Soldering	
Sealing	

PIIA0149E

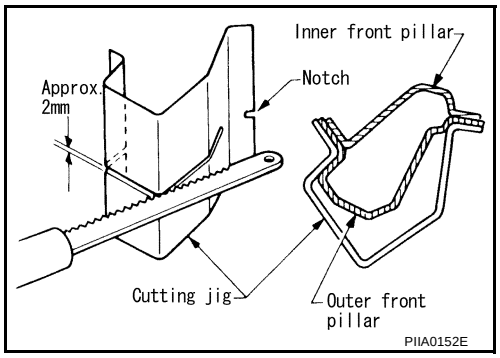
- Front pillar butt joint can be determined anywhere within shaded area as shown in the figure. The best location for the butt joint is at position A due to the construction of the vehicle. Refer to the front pillar section.



- Determine cutting position and record distance from the locating indent. Use this distance when cutting the service part. Cut outer front pillar over 60 mm above inner front pillar cut position.

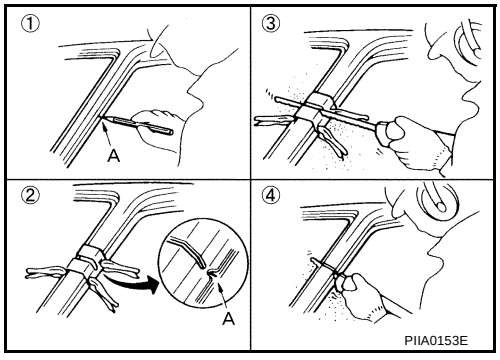


- Prepare a cutting jig to make outer pillar easier to cut. Also, this will permit service part to be accurately cut at joint position.

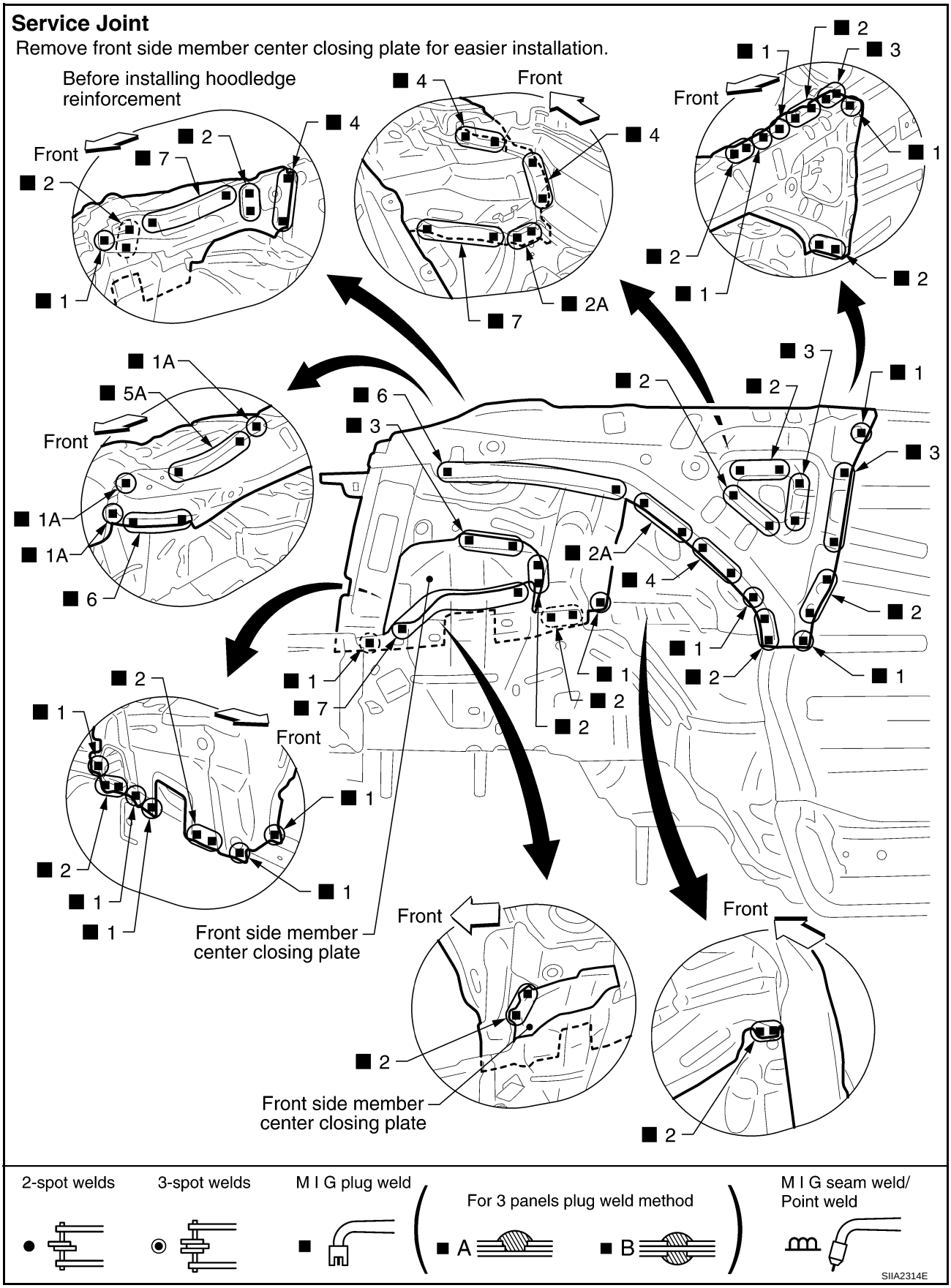


- An example of cutting operation using a cutting jig is as follows.

1. Mark cutting lines.
   A: Cut position of outer pillar
   B: Cut position of inner pillar
2. Align cutting line with notch on jig. Clamp jig to pillar.
3. Cut outer pillar along groove of jig. (At position A)
4. Remove jig and cut remaining portions.
5. Cut inner pillar at position B in same manner.



HOODLEDGE (ROADSTER)

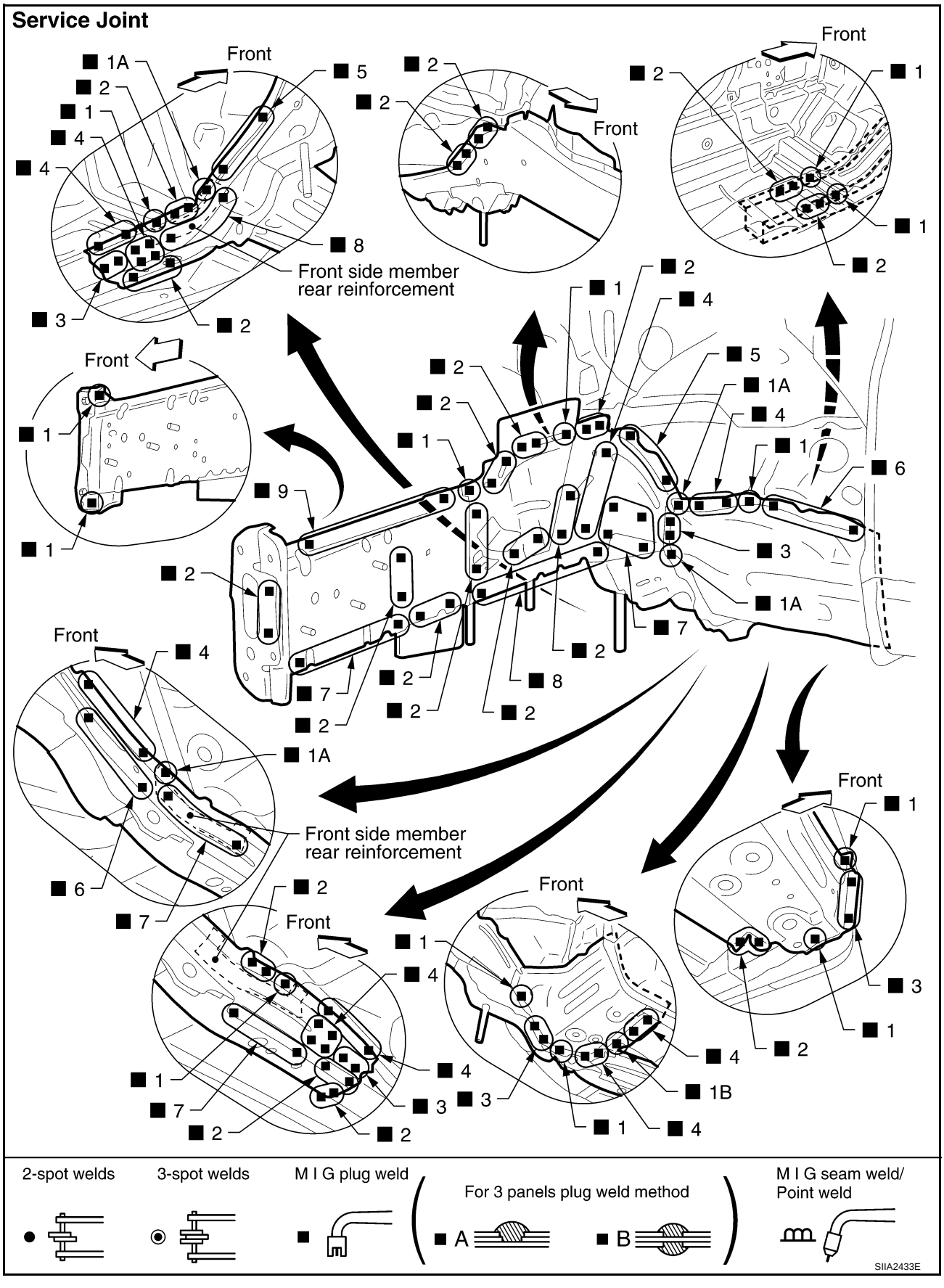


Change parts

- Front strut housing (LH)
- Upper front hoodledge (LH)
- Hoodledge reinforcement (LH)

FRONT SIDE MEMBER (ROADSTER)

- Work after hoodledge has been removed.



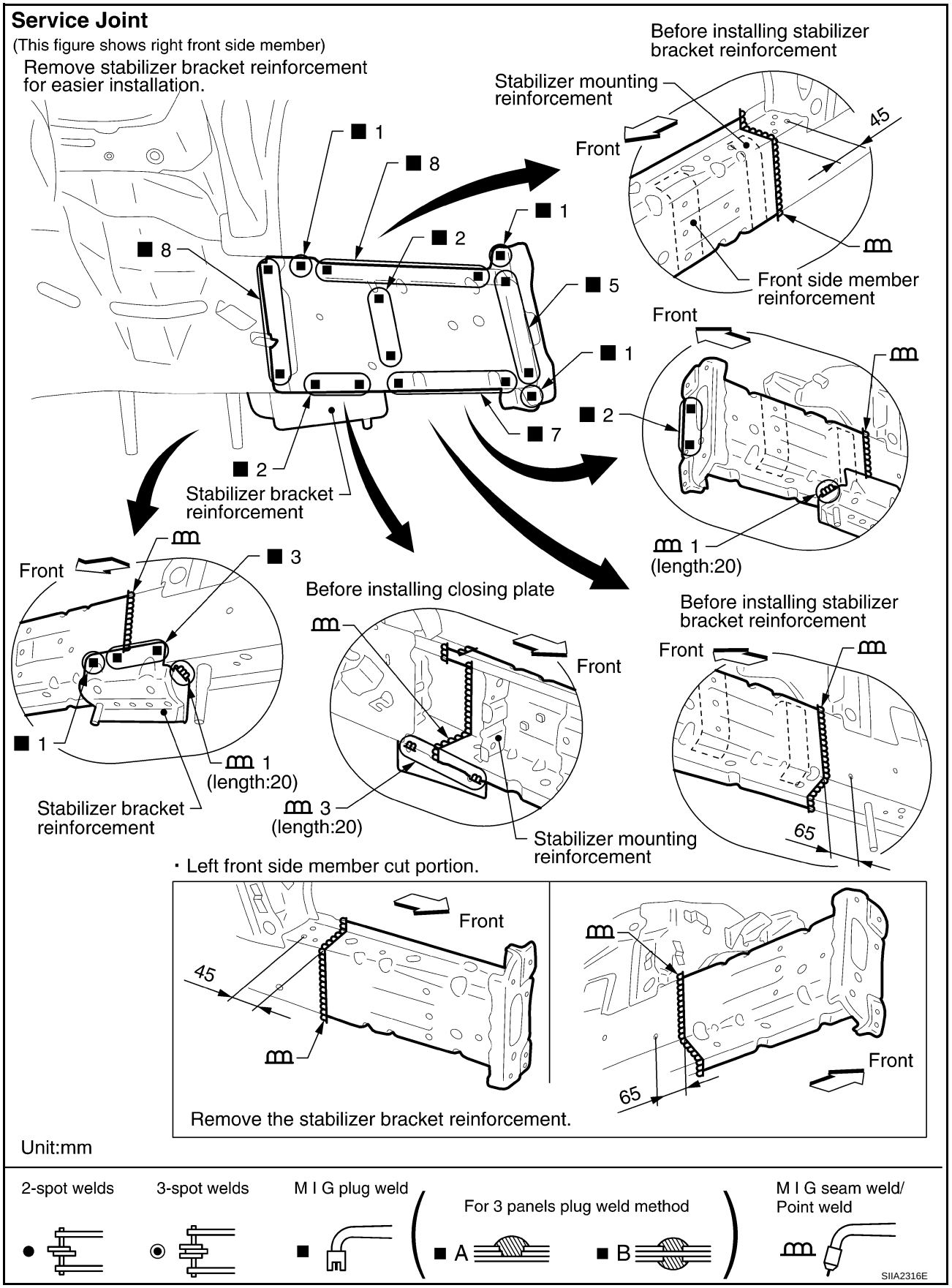
Change parts

- Front side member assembly (LH)
- Front side member outrigger assembly (LH)
- Front side member closing plate assembly (LH)
- Front side member rear reinforcement (LH)

FRONT SIDE MEMBER (PARTIAL REPLACEMENT) (ROADSTER)

Service Joint

(This figure shows right front side member)

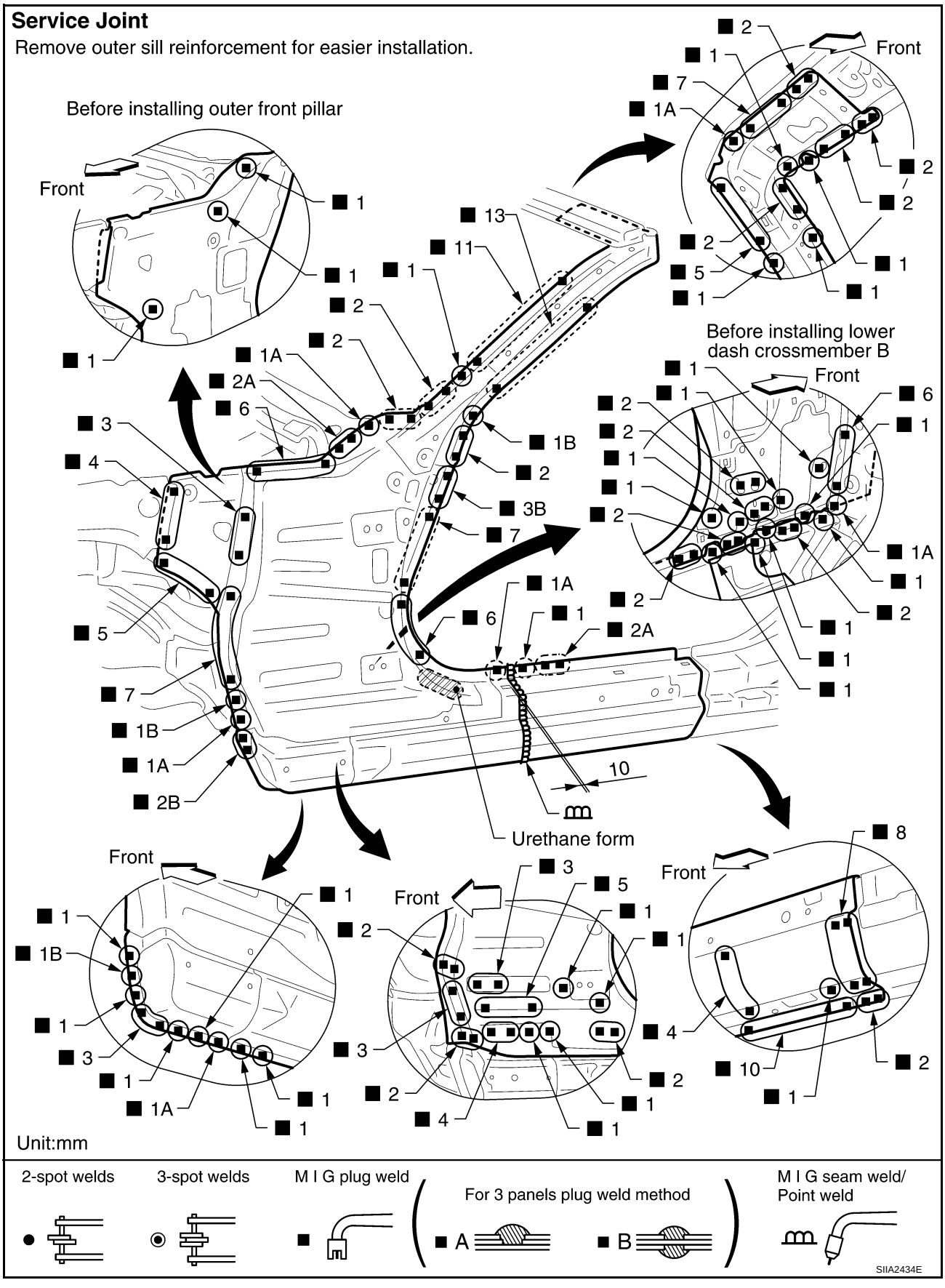


Change parts

- Front side member assembly (RH)
- Front side member front closing plate (RH)
- Outer front towing hook bracket (RH)

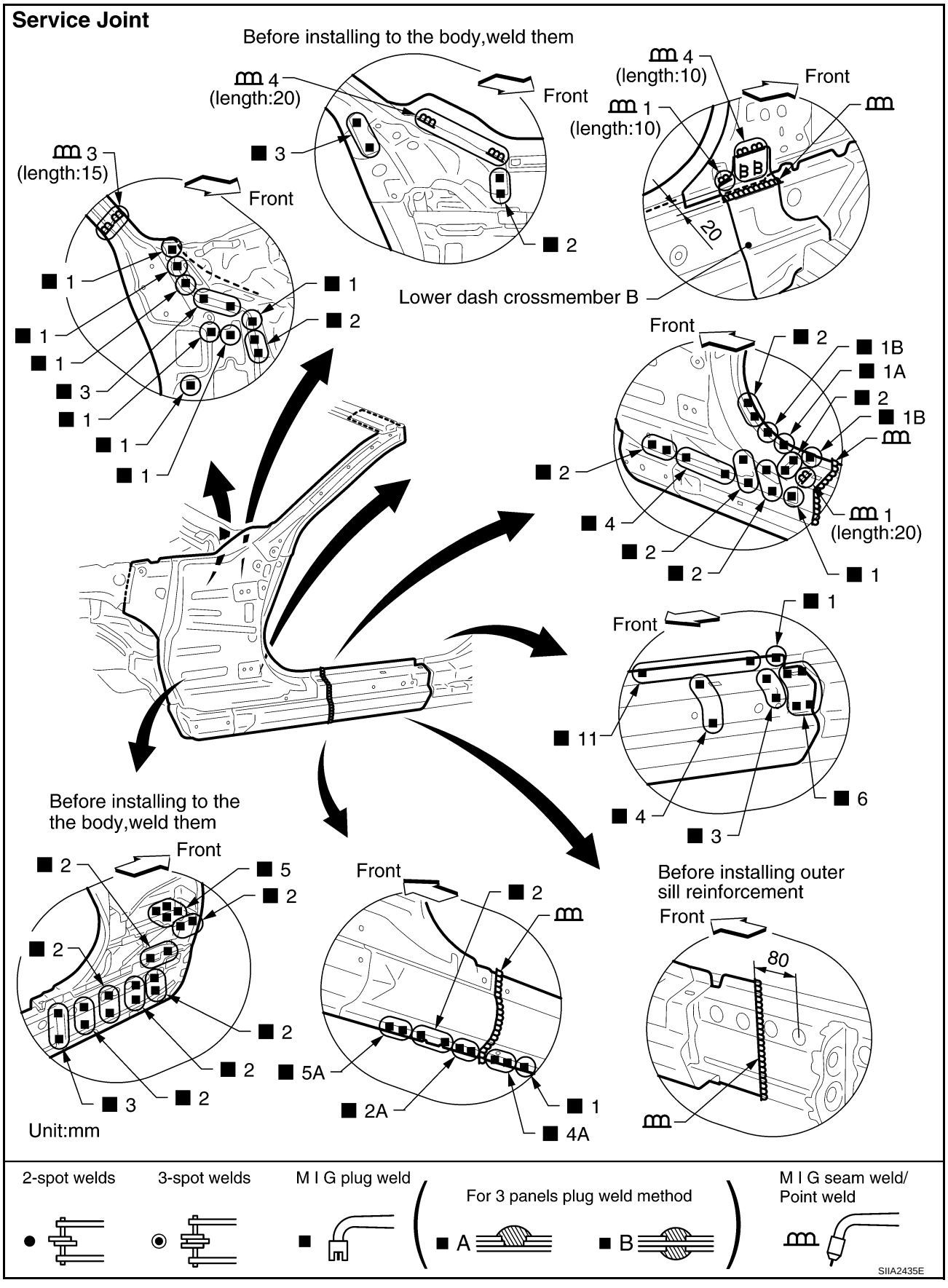
FRONT PILLAR (ROADSTER)

- Work after hoodledge reinforcement has been removed.



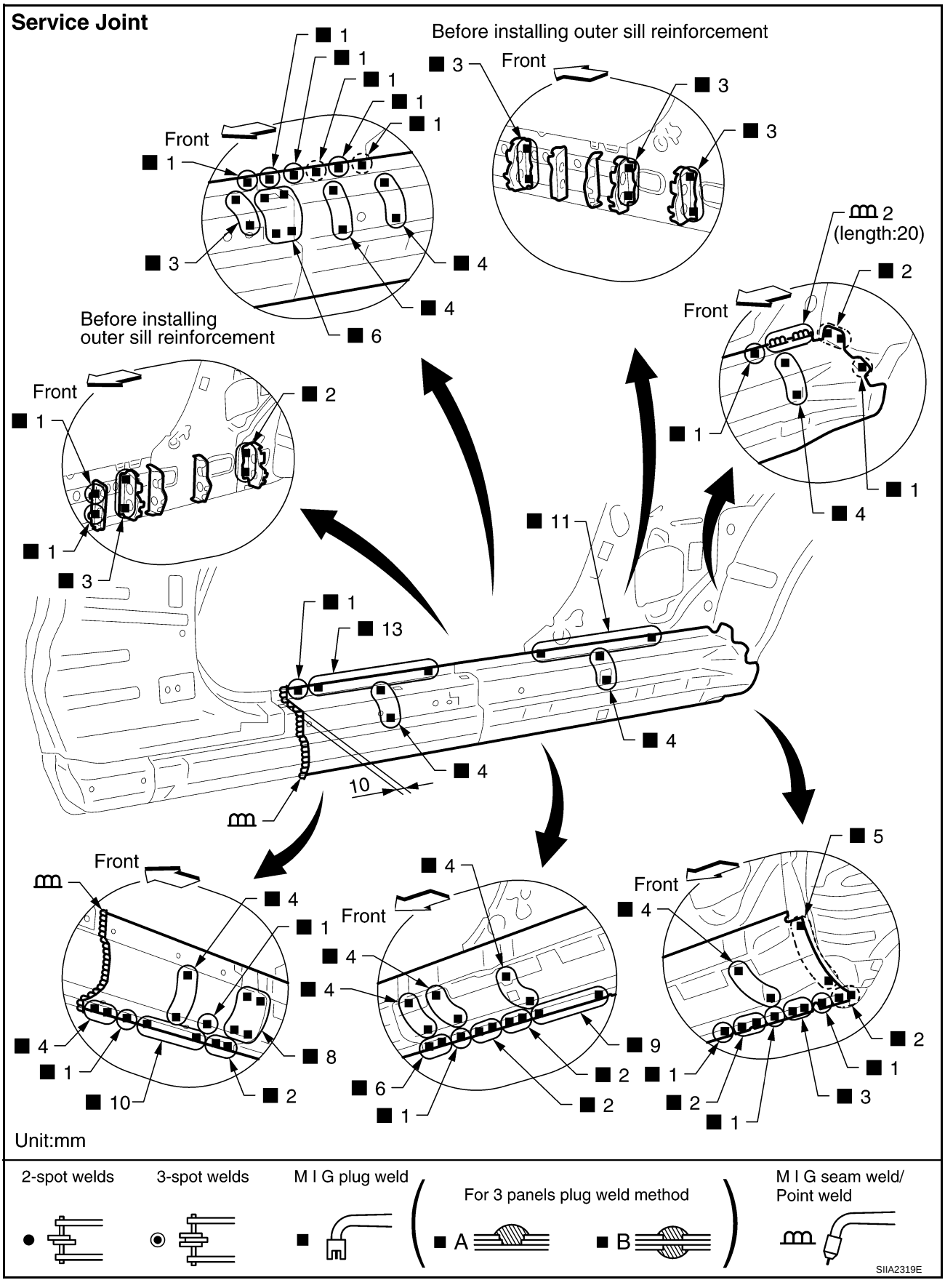
Change parts

- Outer front pillar assembly (LH)
- Outer front sill reinforcement assembly (LH)
- Inner side roof rail (LH)
- Upper rear hoodledge (LH)
- Lower front pillar reinforcement assembly (LH)



OUTER SILL (ROADSTER)

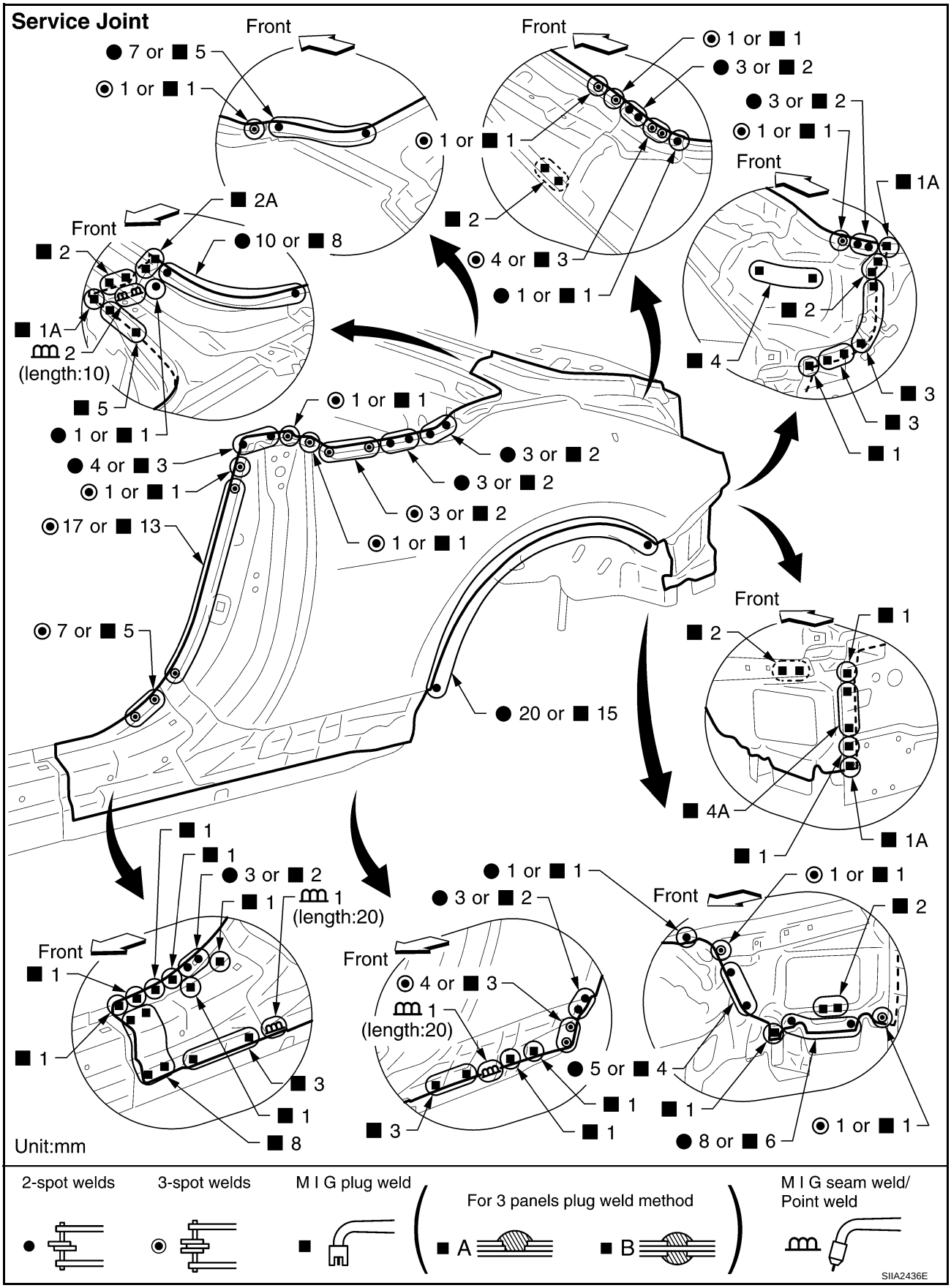
- Work after rear fender, lock pillar reinforcement and rear side waist reinforcement have been removed.



Change parts

- Outer front sill reinforcement assembly (LH)
- Outer rear sill reinforcement assembly (LH)

REAR FENDER (ROADSTER)



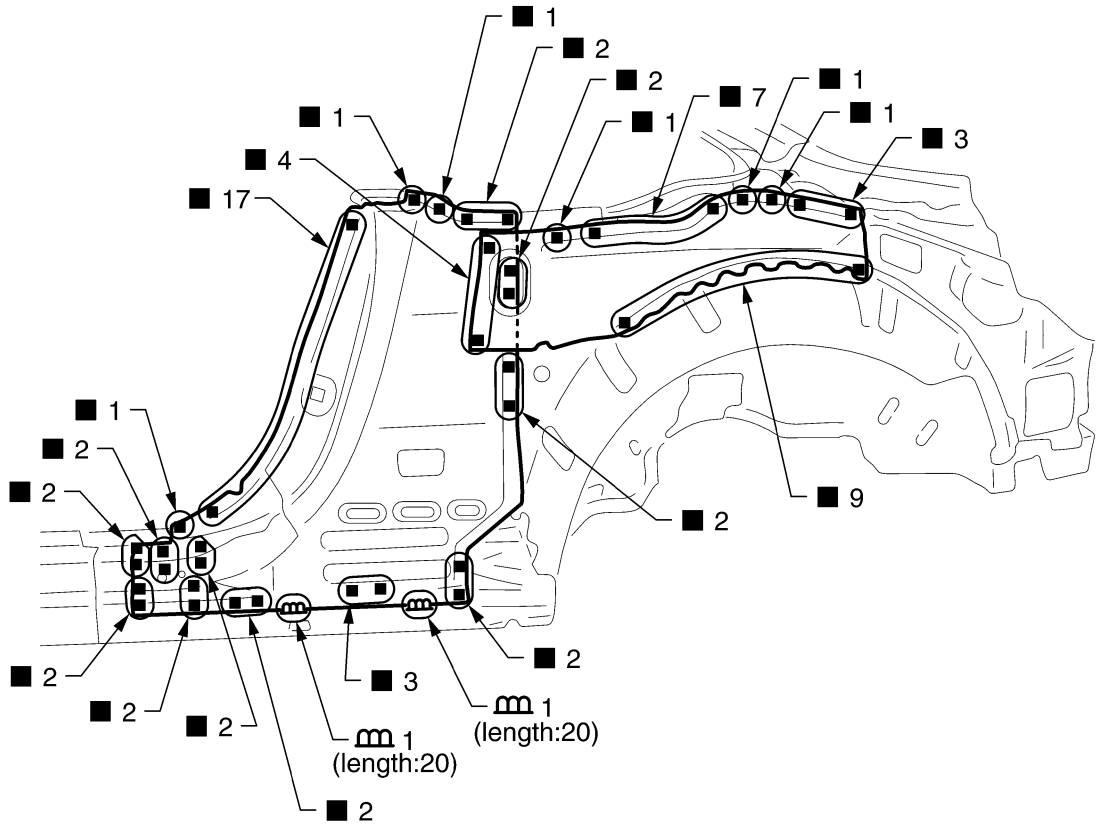
Change parts

- Rear fender assembly (LH)

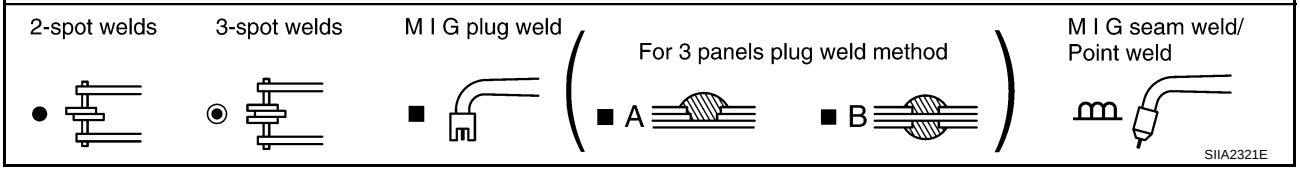
LOCK PILLAR REINFORCEMENT (ROADSTER)

- Work after rear fender has been removed.

Service Joint



Unit:mm



Change parts

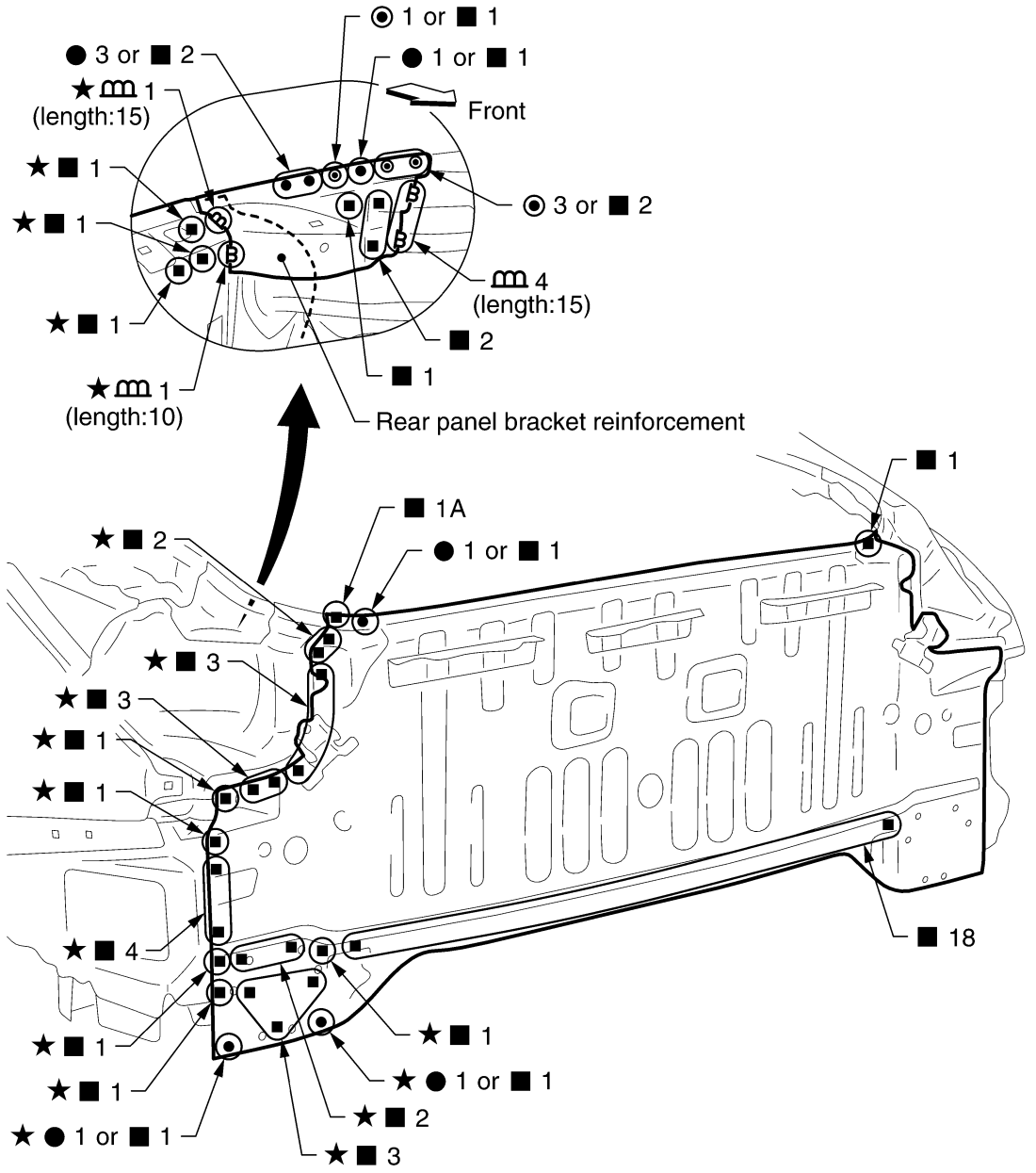
- Outer lock pillar reinforcement (LH)
- Rear side waist reinforcement (LH)

REAR PANEL (ROADSTER)

Service Joint

Remove rear panel bracket reinforcement for easier installation.

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.



Unit:mm

2-spot welds ● | 3-spot welds ◉ | M I G plug weld ■ | For 3 panels plug weld method ■ A ■ B | M I G seam weld/ Point weld

SIIA2322E

Change parts

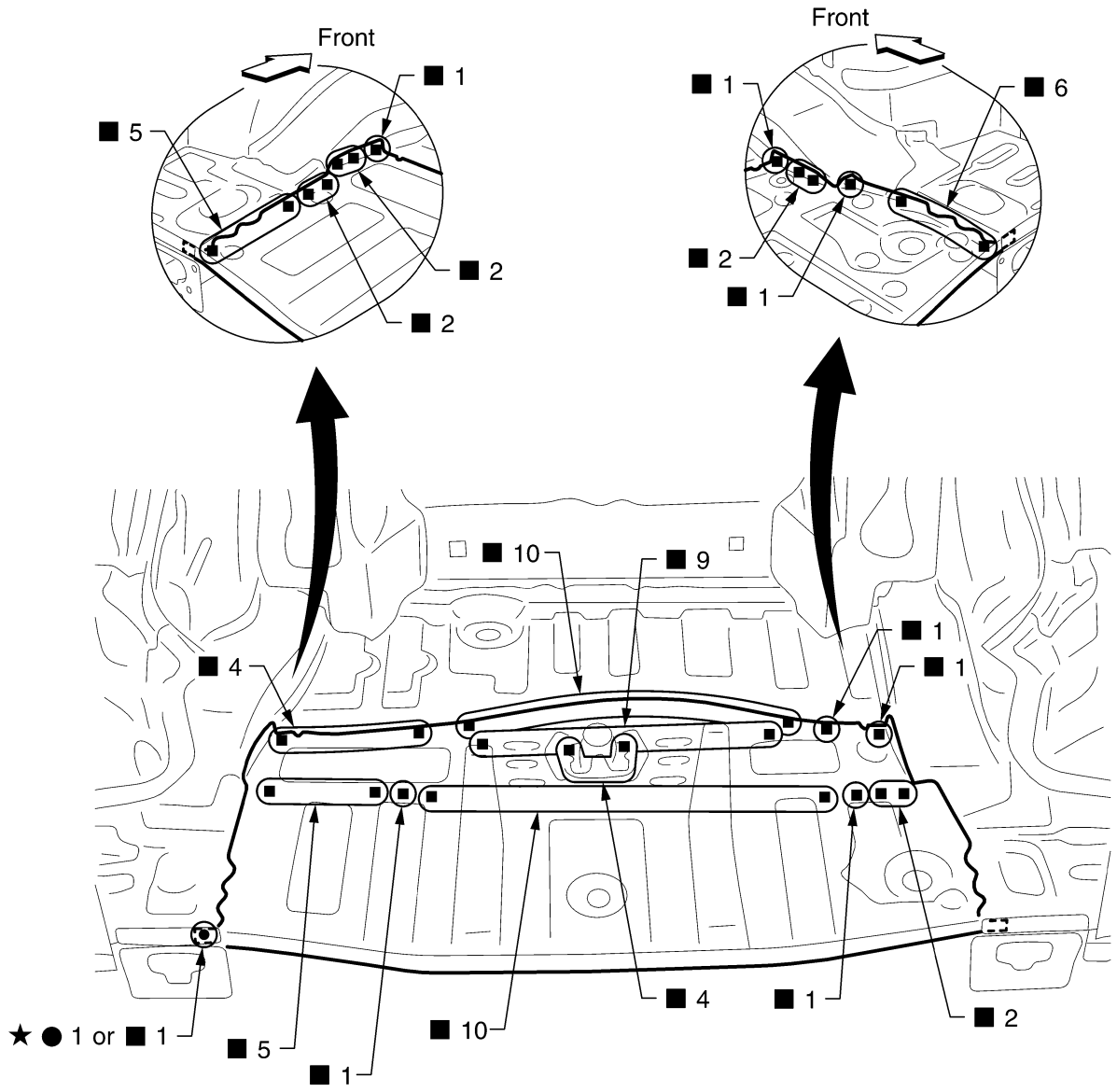
- Rear panel assembly

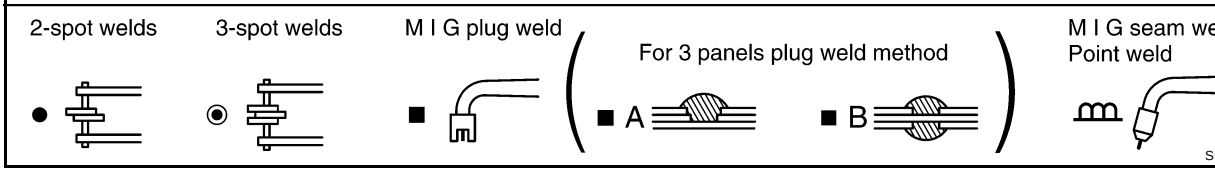
REAR FLOOR REAR (ROADSTER)

- Work after rear panel assembly has been removed.

Service Joint

★ indicates that there is an equivalent welding portion with the same dimensions on the opposite side.





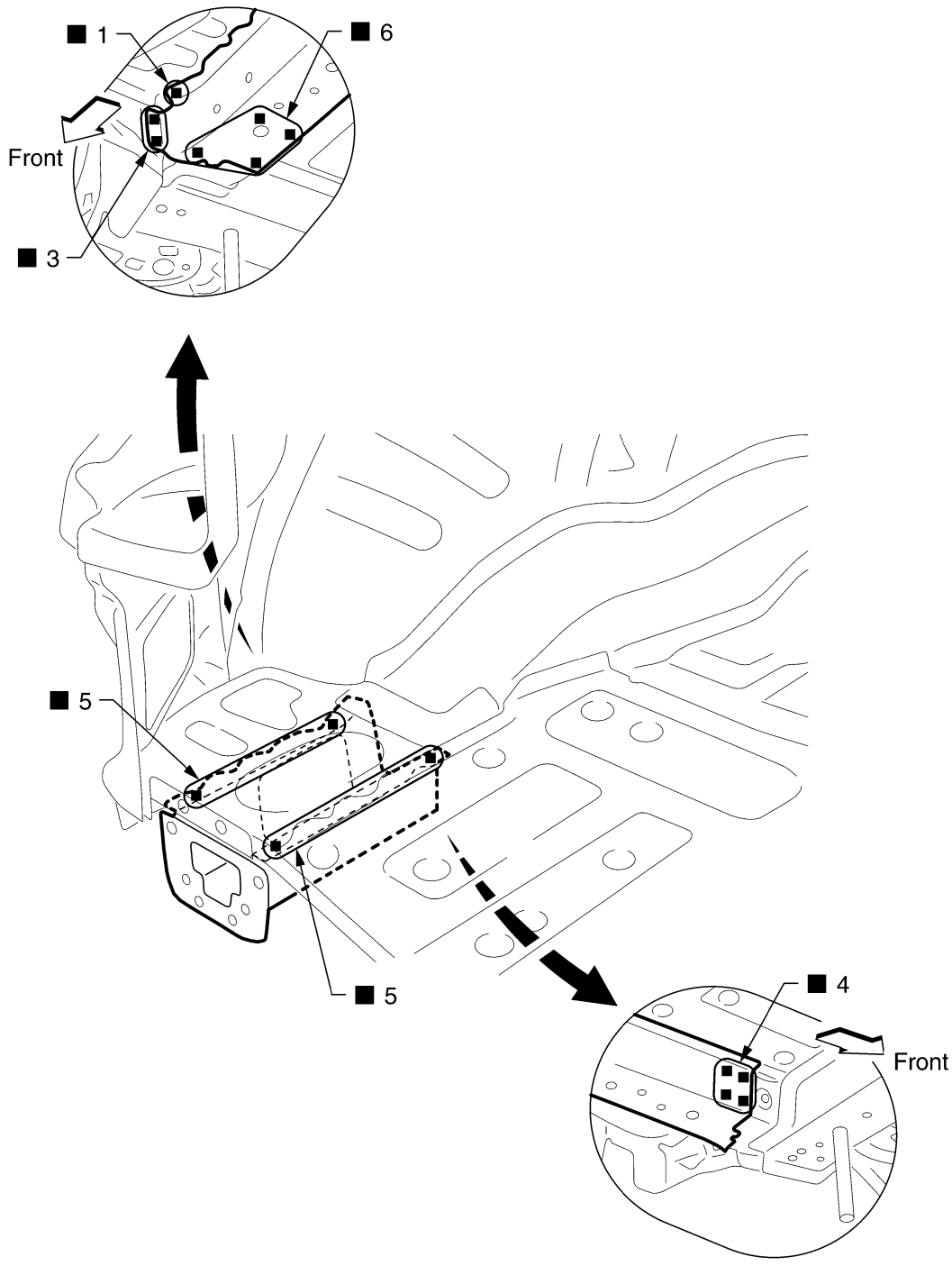
Change parts

- Rear floor rear
- Spare tire clamp bracket

REAR SIDE MEMBER EXTENSION (ROADSTER)

- Work after rear panel assembly has been removed.

Service Joint



Change parts

- Rear side member extension (LH)

SECTION BR
BRAKE SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NFS00001

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

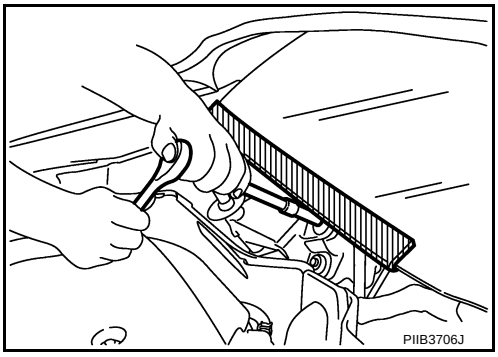
NFS00002

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NFS000HT

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.

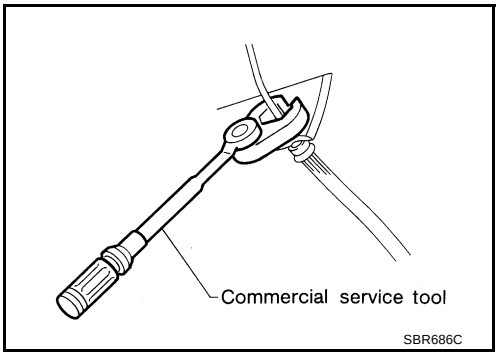


Precautions for Brake System

NFS00003

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-11, "Fluids and Lubricants" .
- Do not reuse drained brake fluid.
- Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Do not use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.

- Use flare nut crowfoot and torque wrench when removing and installing brake tube.
- When installing brake piping, be sure to check torque.
- Before working, turn the ignition switch OFF and disconnect the connectors of ABS actuator and control unit or the battery negative terminal.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage.
  Refer to BR-38, "Brake Burnishing Procedure" .



WARNING:

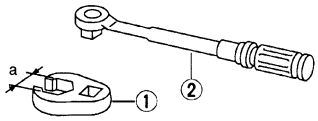
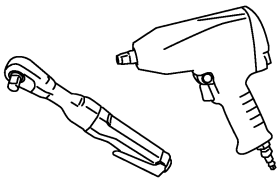
Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

PREPARATION

PFP:00002

Commercial Service Tools

NFS00004

Tool name		Description
1. Flare nut crowfoot a:10 mm (0.39 in)/12mm(0.47 in) 2. Torque wrench	 S-NT360	Installing each brake piping
Power tool	 PBIC0190E	Loosening bolts and nuts
Pin punch Tip diameter: 4 mm (0.16 in) dia	 ZZA0515D	Removing and installing reservoir tank pin

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NFS00005

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			BR-29, BR-31, BR-42, BR-45	BR-26, BR-39	BR-27, BR-40	—	—	BR-35, BR-37, BR-48, BR-50	—	—	—	BR-35, BR-37, BR-48, BR-50	—	NVH in PR section	NHV in RFD section	NVH in FAX, RAX and FSU, RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in PS section
Possible cause and SUSPECTED PARTS			Pads - damaged	Pads - uneven wear	Shims damaged	Rotor imbalance	Rotor damage	Rotor runout	Rotor deformation	Rotor deflection	Rotor rust	Rotor thickness variation	Drum out of round	PROPELLER SHAFT	DIFFERENTIAL	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	STEERING
Symptom	BRAKE	Noise	×	×	×									×	×	×	×	×	×	×
		Shake				×								×		×	×	×	×	×
		Shimmy, Judder				×	×	×	×	×	×	×	×			×	×	×		×

×: Applicable

BRAKE PEDAL

PFP:46501

Inspection and Adjustment

NFS00006

PLAY AND CLEARANCE BETWEEN THE BRAKE PEDAL AND FLOOR PANEL WITH PEDAL DEPRESSED

1. Check the brake pedal free height from the dash lower panel (1).
2. Adjust the height referring to the following specifications.

Brake pedal height "H_1 " (from dash lower panel top surface)

M/T models : 153.2 – 163.2 mm (6.03 – 6.43 in)

A/T models : 161.5 – 171.5 mm (6.36 – 6.75 in)

Depressed pedal height "H_2 " [under a force of 490 N (50 kg, 110 lb) with the engine running]

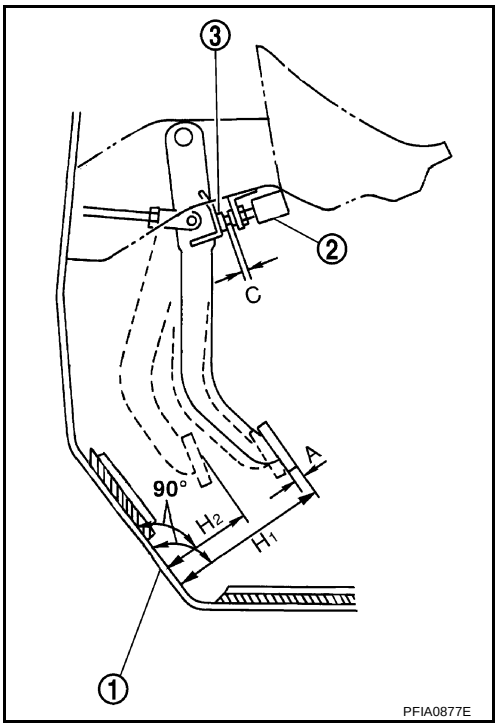
M/T models : More than 90 mm (3.54 in)

A/T models : More than 95 mm (3.74 in)

Clearance "C " between threaded end of the stop lamp switch/ASCD cancel switch (2) and stopper rubber (3).

: 0.74 – 1.96 mm (0.0291 – 0.0772 in)

Pedal play "A" : 3 – 11 mm (0.12 – 0.43 in)



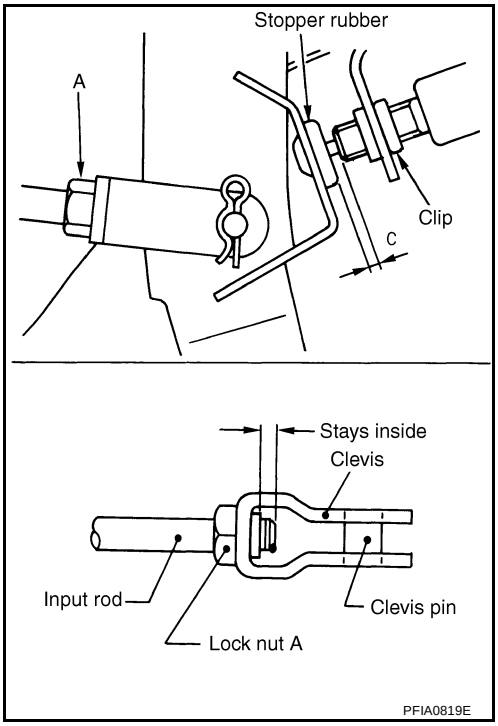
ADJUSTMENT

1. Loosen the stop lamp switch and ASCD cancel switch by rotating it counterclockwise by 45°.
2. Loosen the lock nut (A) on the input rod, then rotate the input rod to set the pedal to the specified height, and tighten the lock nut (A) to the specified torque. Refer to BR-23, "Components" .

   CAUTION:
   Check that the threaded end of the input rod stays inside the clevis.
3. With the pedal pulled and held by hand, press the stop lamp switch and ASCD cancel switch until its threaded end contacts the stopper rubber.
4. With the threaded end of the stop lamp switch contacting the stopper rubber and ASCD cancel switch, rotate the switch clockwise by 45° to secure.

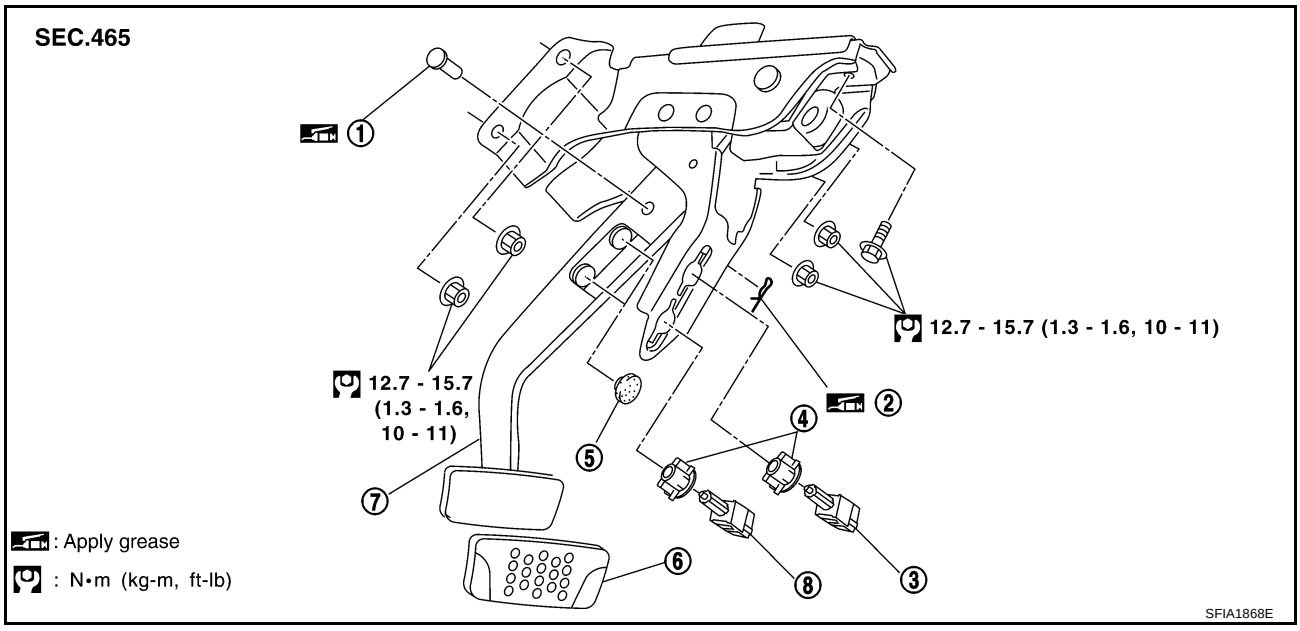
   CAUTION:
   Make sure that the clearance "C" between the stopper rubber and threaded end of the stop lamp switch and ASCD cancel switch is within the standard.
5. Check the pedal play.

   CAUTION:
   Make sure that the stop lamps go off when the pedal is released.
6. Start the engine to check the brake pedal's depressed height.



Components

NFS000IF



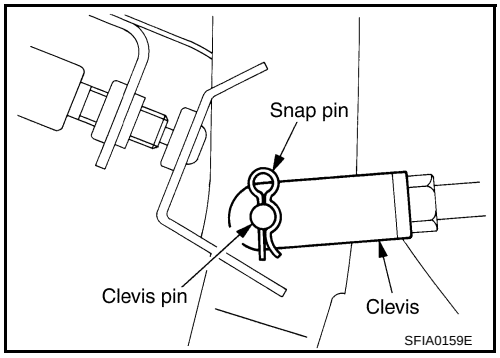
1. Clevis pin
2. Snap pin
3. Stop lamp switch
4. Clip
5. Stopper rubber
6. Pedal pad
7. Brake pedal assembly
8. ASCD cancel switch

Removal and Installation

NFS00007

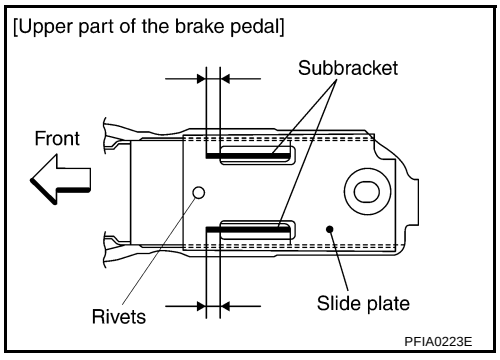
REMOVAL

1. Remove instrument driver lower panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove the steering column. Refer to PS-10, "STEERING COLUMN" .
3. Remove the stop lamp switch and ASCD cancel switch from the pedal assembly.
4. Remove the snap pin and clevis pin from the brake booster clevis.
5. Remove the mounting nuts and bolt from the bracket, and remove the pedal assembly from the vehicle.

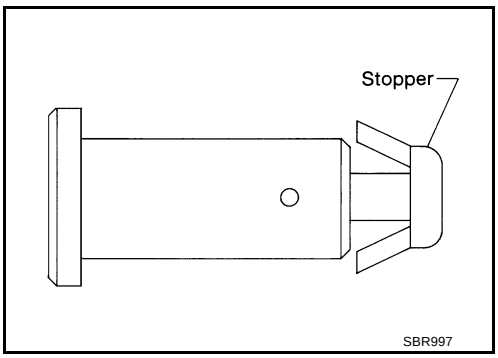


INSPECTION AFTER REMOVAL

- Check that the rivets in the upper part of the brake pedal are not deformed.
- Make sure the sub bracket and the slide plate are at least 5.0 – 6.0 mm (0.197 – 0.236 in) apart.



- Check the brake pedal for bend, damage, and cracks on the welded parts. Replace the applicable part if a failure is detected.
- Check the clevis pin and resin stopper for damage and deformation. If a failure is detected, replace the clevis pin.



INSTALLATION

Paying attention to the following items, install in the reverse order of removal.

- After installing the brake pedal assembly to the vehicle, adjust the brake pedal.

BRAKE FLUID

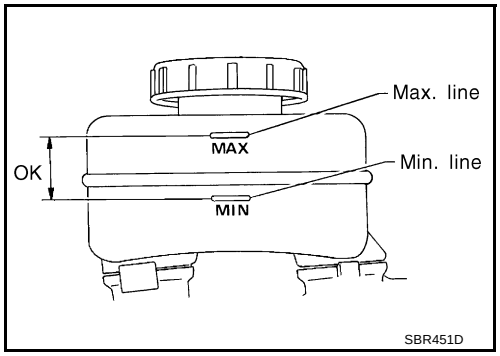
PFP:KN100

On-Vehicle Inspection

NFS00008

LEVEL CHECK

- Check that the fluid level in the reservoir tank is within the standard (between MAX and MIN lines).
- Visually check around the reservoir tank for fluid leaks.
- If fluid level is excessively low, check brake system for leaks.
- If warning lamp remains illuminated after parking lever is released, check brake system for fluid leakage.



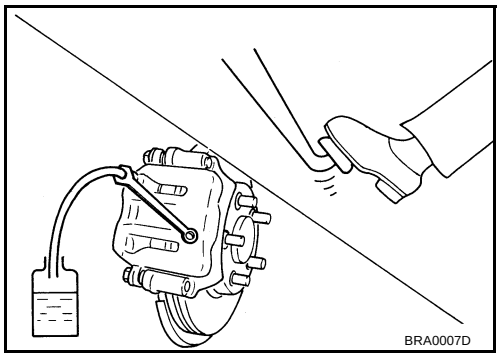
Drain and Refill

NFS00009

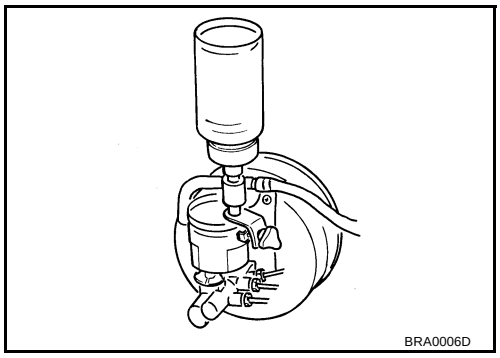
CAUTION:

- **Refill with new brake fluid “DOT3”.**
- **Do not reuse drained brake fluid.**
- **Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.**

1. Connect a vinyl tube to bleed valve.
2. Depress the brake pedal, loosen the bleed valve, and gradually remove the brake fluid.
3. Before working, turn the ignition switch OFF and disconnect the connectors of ABS actuator and control unit or battery negative terminal.



4. Make sure there is no foreign material in the reservoir tank, and refill with new brake fluid.
5. Rest foot on brake pedal. Loosen bleed valve. Slowly depress pedal until it stops. Tighten bleed valve. Release brake pedal. Repeat this process a few times, then pause to add new brake fluid to master cylinder. Continue until new brake fluid flows out. Bleed Air. Refer to BR-11, "Bleeding Brake System" .



Bleeding Brake System

NFS0000A

CAUTION:

While bleeding, pay attention to master cylinder fluid level.

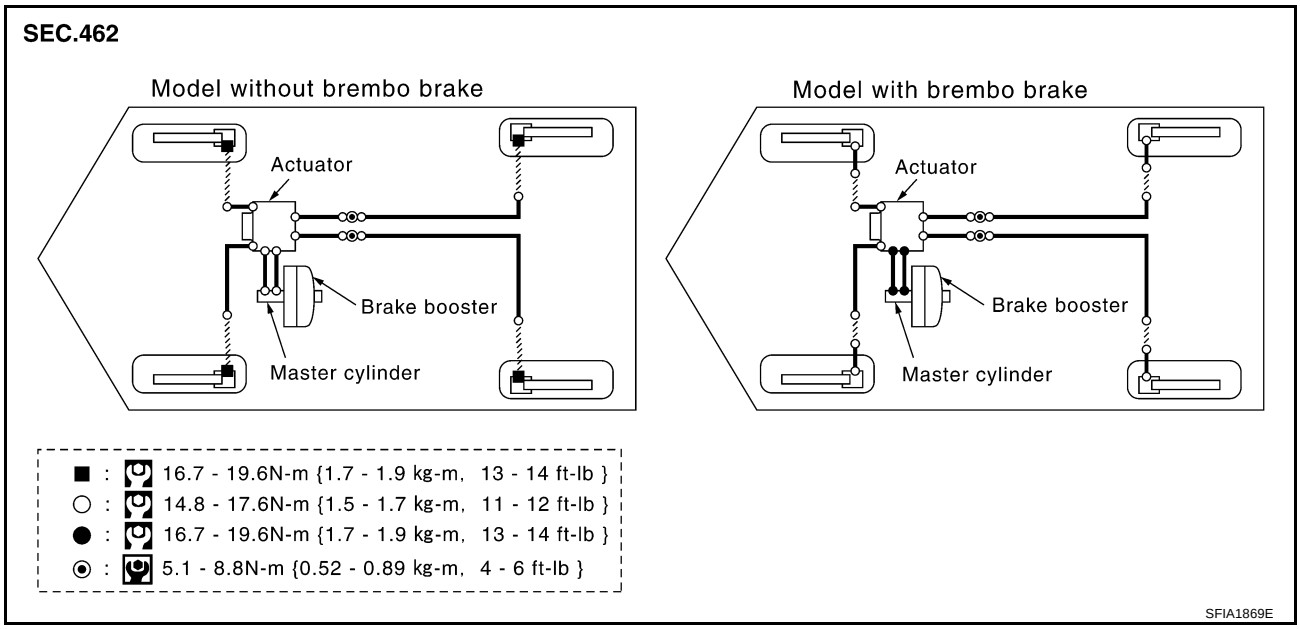
1. Before working, turn the ignition switch OFF and disconnect the connectors of ABS actuator and control unit or battery negative terminal.
2. Connect a vinyl tube to the rear right bleed valve.
3. Fully depress brake pedal 4 to 5 times.
4. With the brake pedal depressed, loosen the bleed valve to let the air out, and then tighten it immediately.
5. Repeat steps 3, 4 until no more air comes out.
6. Tighten the bleed valve to the specified torque. Refer to BR-27, "Components" (Front) and BR-40, "Components" (Rear).
7. In steps 2 to 6 below, with the master cylinder reservoir tank filled at least half way, bleed air from the front left, rear left, and front right tires, in that order.

BRAKE TUBE AND HOSE

PFP:46300

Hydraulic Circuit

NFS0000B



CAUTION:

- **Make sure it does not twist or break when being attached.**
- **Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.**
- **The brake tube is an important safety part. If a brake fluid leak is detected, always disassemble the parts. Replace applicable part with a new one, if necessary.**
- **Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.**
- **Do not bend or twist brake hose sharply, or strongly pull it.**
- **When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.**
- **Refill with new brake fluid " DOT 3 ".**
- **Do not reuse drained brake fluid.**

Removal and Installation of the Front Brake Tube and Brake Hose (Other than Brembo Calipers)

NFS0000C

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove union bolt and remove the brake hose from the caliper assembly.
4. Remove the lock plate and nut, and remove the brake hose from the vehicle.

INSTALLATION

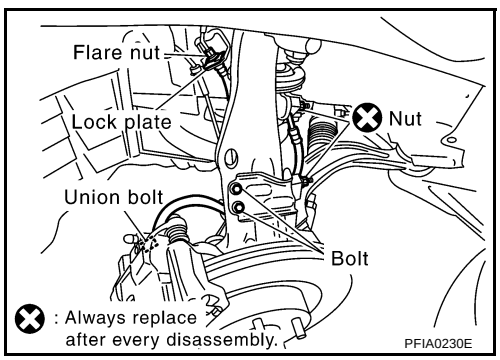
1. Attach the brake hose to the vehicle and tighten the nut to the specified torque.

   : 19.6 – 23.5 N·m (2.0 – 2.3 kg-m, 15 – 17 ft-lb)

   NOTE:
   When removed bracket attaching the bolt is tightened with provisions torque.

   : 10.8 – 15.6 N·m (1.1 – 1.5 kg-m, 8 – 11 ft-lb)

2. Install brake hose by aligning with the protrusion on caliper assembly, and tighten union bolts to the specified torque.



: 16.7 – 19.6 N·m (1.7 – 1.9 kg-m, 13 – 14 ft-lb)

CAUTION:
Do not reuse the copper washer.

3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure it to the bracket with the lock plate.
4. Using a flare nut crowfoot and torque wrench, tighten the flare nut to the specified torque.

: 14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)

5. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Removal and Installation of the Front Brake Tube and Brake Hose (With Brembo Calipers)

NFS0000D

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Using a flare nut wrench, remove the brake tube from the brake hose.
3. Using a flare nut wrench, remove the caliper-side brake tube from the brake hose.
4. Remove the lock plate and nut, and remove the brake hose from the vehicle.

INSTALLATION

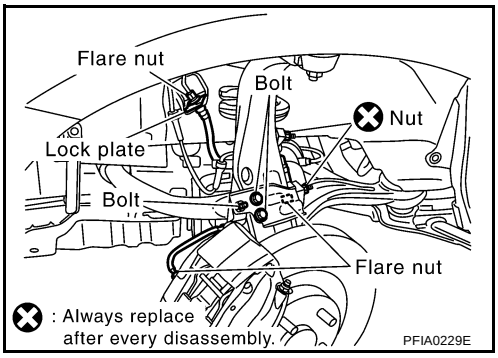
1. Attach the brake hose to the vehicle and tighten the nut to the specified torque.

Nut : 19.6 – 23.5 N·m (2.0 – 2.3 kg-m, 15 – 17 ft-lb)

Bolt : 10.8 – 15.6 N·m (1.1 – 1.5 kg-m, 8 – 11 ft-lb)

2. Attach the caliper-side brake tube to the brake hose, partially tighten the flare nut as far as possible by hand, then tighten it to the specified torque with flare nut crowfoot and torque wrench.

: 14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)



3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure to the bracket with the lock plate.
4. Using a flare nut crowfoot and torque wrench, tighten the flare nut to the specified torque with flare nut torque.

: 14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)

5. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Removal and Installation of the Rear Brake Tube and Brake Hose (Other than Brembo Calipers)

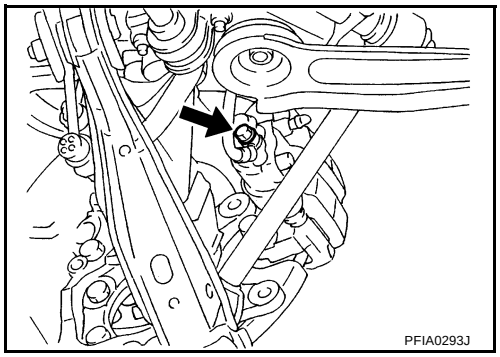
NFS0000E

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Using a flare nut wrench, remove brake tube from brake hose.
3. Remove union bolts, and then remove brake hose from the caliper assembly.
4. Remove the lock plate and then remove the brake hose from the vehicle.

INSTALLATION

1. Attach the brake hose L-pin to the caliper assembly positioning hole and tighten the union bolt to the specified torque.



: **16.7 – 19.6 N·m (1.7 – 1.9 kg-m, 13 – 14 ft-lb)**

CAUTION:
Do not reuse the copper washer.

2. After securing the brake hose to the vehicle with the lock plate, partially tighten the brake tube flare nut as far as possible by hand and then tighten to the specified torque with flare nut crow-foot and torque wrench.

: **14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)**

3. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Removal and Installation of the Rear Brake Tube and Brake Hose (With Brembo Calipers)

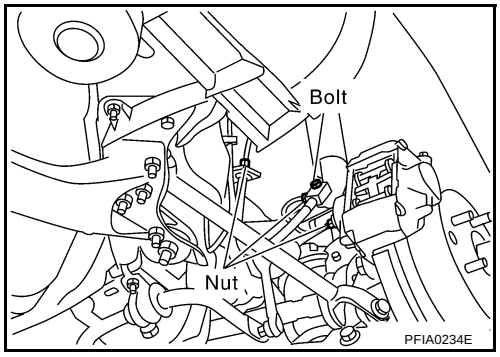
NFS0000F

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Using a flare nut wrench, remove the brake tube from the brake hose.
3. Using a flare nut wrench, remove the caliper-side brake tube from the brake hose.
4. Remove the lock plate and bolt, and remove the brake hose from the vehicle.

INSTALLATION

1. Attach the brake hose to the vehicle and tighten the bolt to the specified torque.



: **19.6 – 22.5 N·m (2.0 – 2.2 kg-m, 15 – 16 ft-lb)**

2. Attach the caliper-side brake tube to brake hose, partially tighten the flare nut as far as possible by hand, then tighten it to the specified torque with flare nut crowfoot and torque wrench.

: **14.8 – 17.6 N·m (1.5 – 1.7kg-m, 11 – 12 ft-lb)**

3. Attach the brake hose to the brake tube, partially tighten the flare nut as far as possible by hand, then secure to the bracket with the lock plate.
4. Using a flare nut crowfoot and torque wrench, tighten the flare nut to the specified torque.

: **14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)**

5. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Inspection after Installation

NFS0000G

CAUTION:
If a leak is detected at the connections, retighten it or, if necessary, replace the damaged part.

1. Check hose, tube, and connections for fluid leaks, damage, twist, deformation, contact with other parts, and loose connections.
2. While depressing pedal under a force of 785 N (80 kg, 177 lb) with engine running for approximately 5 seconds, check for fluid leakage from each part.

BRAKE MASTER CYLINDER

PFP:46010

On-Vehicle Inspection

NFS0000H

LEAK INSPECTION

- Check for leaking in the master cylinder installation surface, the reservoir tank installation surface, and the brake tube connections.

Removal and Installation

NFS0000I

CAUTION:

Do not let brake fluid come in contact with painted surfaces on the body. This might damage the paint, so if it does come in contact, immediately wipe area and wash off with water.

REMOVAL

1. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
2. Remove the fluid surface sensor harness connector.
3. Using a flare nut wrench, disconnect master cylinder assembly and brake tube.
4. Remove the master cylinder assembly nut and remove the master cylinder assembly from the vehicle. Refer to BR-24, "Removal and Installation" .

INSTALLATION

CAUTION:

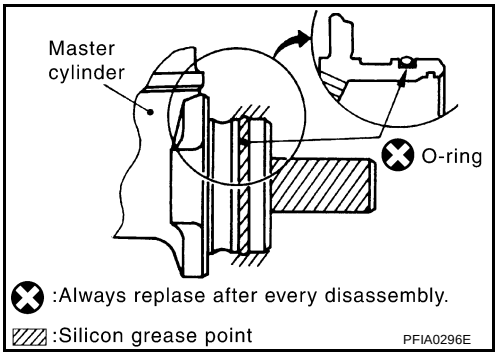
- **Refill with new brake fluid “DOT3”.**
- **Do not reuse drained brake fluid.**

1. Attach the master cylinder assembly to the brake booster assembly and tighten the nut to the specified torque. BR-23, "Components" .

   CAUTION:

   Vehicles equipped with VDC require particular attention when conducting the following installation.

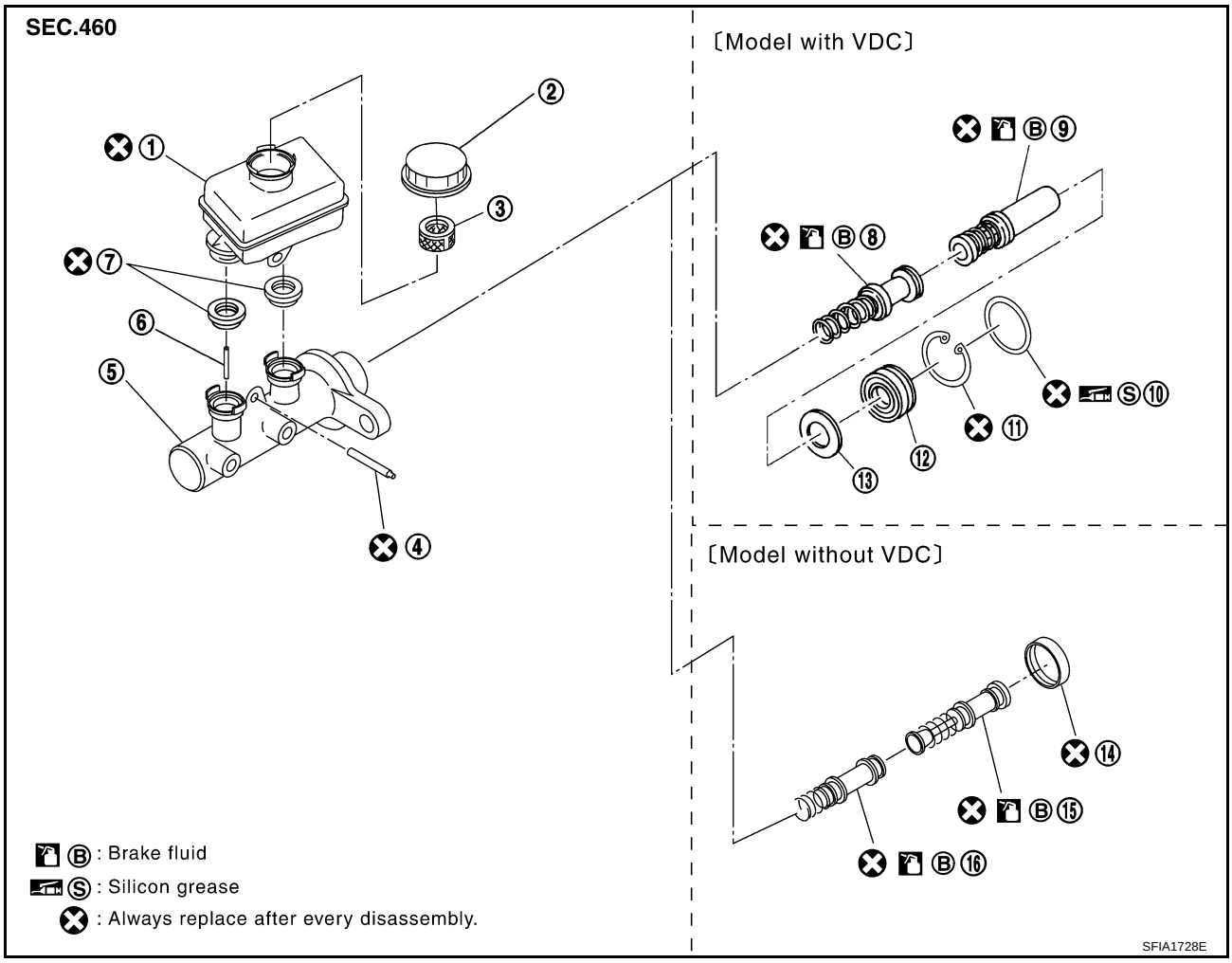
   - **Make sure the sliding surface of the primary piston rod is not damaged, and that no foreign matter become attached.**
   - **Do not reuse the O-ring on the rear end of the master cylinder as it is a non-reusable part.**
   - **Apply the silicon grease in the inner kit to and around the O-ring at the rear end of the master cylinder and to the inside of the booster.**



2. Install brake tube to master cylinder assembly and temporarily tighten flare nuts by hand.
3. Tighten the brake tube flare nut to the specified torque with flare nut crowfoot and torque wrench. Refer to BR-12, "Hydraulic Circuit" .
4. Refill brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

Components

NFS0000J



1. Reservoir tank
2. Reservoir cap
3. Oil strainer
4. Pin
5. Cylinder body
6. Piston stopper
7. Grommet
8. Secondary piston assembly
9. Primary piston assembly
10. O-ring
11. Snap ring
12. Guide assembly
13. Plate
14. Stopper cap
15. Primary piston assembly
16. Secondary piston assembly

Disassembly and Assembly

NFS0000K

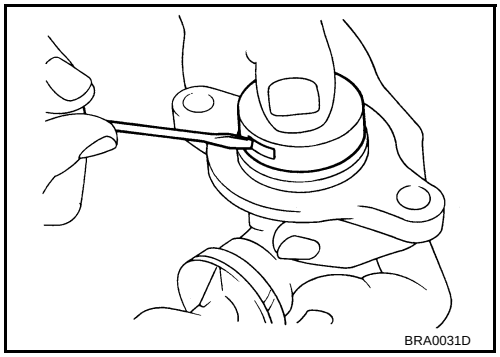
MODELS WITHOUT VDC

Disassembly

CAUTION:

Only remove the reservoir tank when absolutely necessary.

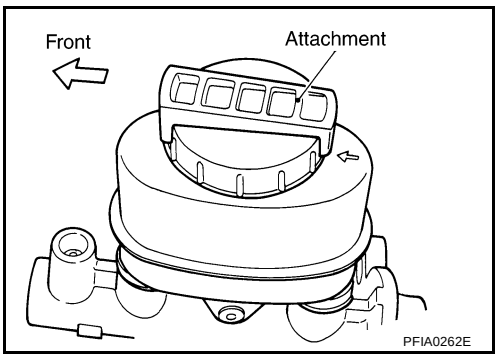
1. Using a flat-bladed screwdriver as shown in the figure, lift up the tabs on the stopper cap and remove it from the master cylinder. The piston inside the master cylinder might pop out when this is done, so hold the stopper cap down at the same time.



2. Attach the attachment in the inner kit to the reservoir cap as shown in the figure.

CAUTION:

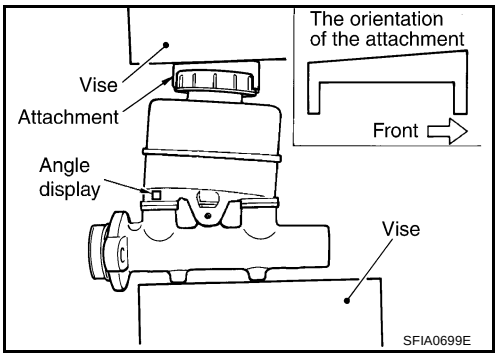
When attaching the attachment to the reservoir cap, make sure it is pointing in the right direction.



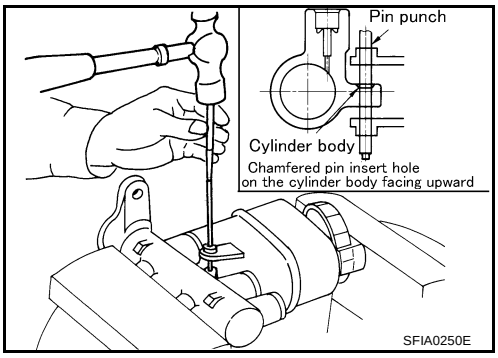
3. Place the side of the cylinder body with chamfering around the pin insertion hole facing up, and secure the master cylinder assembly with a vise.

CAUTION:

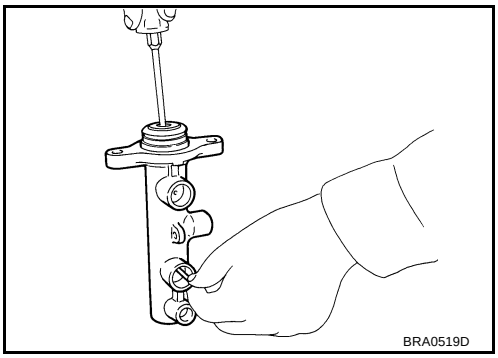
- **Tighten without letting the pin securing the reservoir tank and cylinder body come in contact with the pin insertion hole of the reservoir tank.**
- **When securing the master cylinder assembly with the vise, be sure not to over-tighten.**
- **When securing in a vise, use copper plates or cloth to protect the flange.**



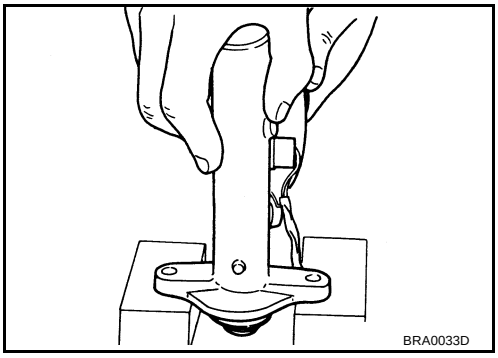
4. Using a pin punch [commercial service tool: diameter approx. 4 mm (0.16 in)], remove mounting pin on the reservoir tank.
5. Remove master cylinder assembly from the vise.
6. Remove reservoir tank and grommet from cylinder body.



7. Using a Phillips flat-bladed screwdriver, push in the primary piston and remove the piston stopper from the cylinder body secondary-side tank boss hole.
8. Carefully pull the primary piston assembly straight out to prevent cylinder inner wall from being damaged.



9. Tap flange using a soft block such as wood, and carefully pull the secondary piston assembly straight out to prevent cylinder inner wall from being damaged.



Inspection after Disassembly

Master cylinder

- Check that there is no damage, friction, rusting, or pinholes on the cylinder inner wall, and replace if there are any non-standard conditions.

Assembly

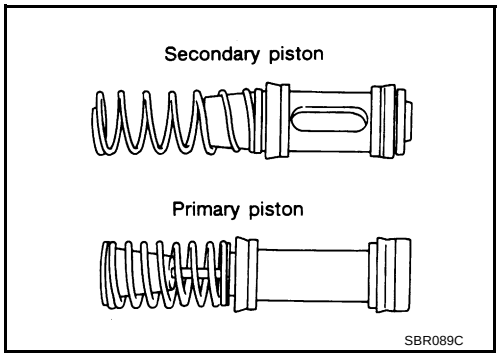
CAUTION:

- **Do not use mineral oils such as kerosene, gasoline during the cleaning and assembly process.**
- **Make sure there is no foreign matter such as dirt or dust attached to the inner cylinder walls, the piston, or the cap seal, and use care to avoid damaging parts with the assembly tools.**
- **Do not drop parts. If a part is dropped, do not use it.**

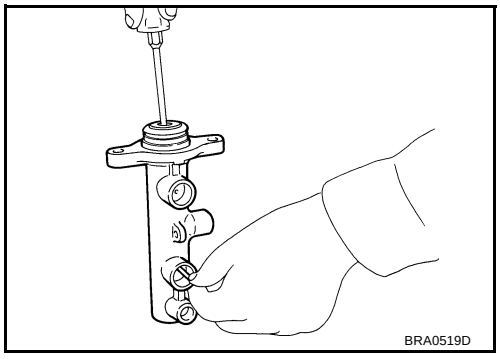
1. Apply brake fluid to cylinder inner wall body and contact surface of the piston assembly.
2. Insert the secondary piston assembly and primary piston assembly into cylinder body in this order.

   CAUTION:

   - **Do not reuse the primary and secondary piston assemblies.**
   - **Be sure to replace the assembly without disassembling the new inner kit.**
   - **Pay attention to the orientation of the piston cup, and insert straight to prevent the cup from being caught by cylinder inner wall.**



3. Perform a visual inspection of the secondary piston slit through the tank boss hole on the secondary-side of the cylinder body, and install the piston stopper.



4. Holding down the piston with the stopper cap, push the stopper cap tabs so they are firmly into the cylinder grooves, then attach the stopper cap.

   CAUTION:

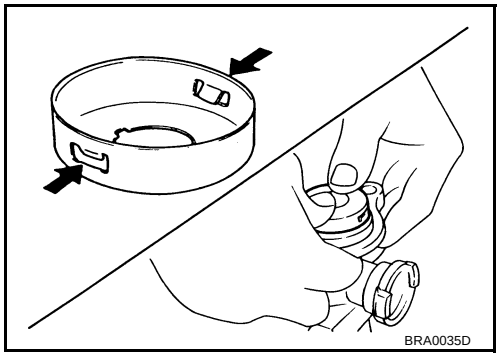
   Do not reuse the stopper cap.

5. Apply brake fluid the grommet and attach to the cylinder body.

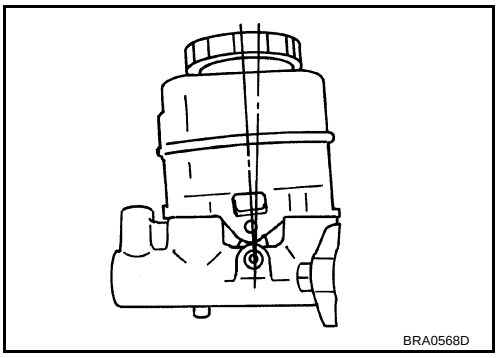
   CAUTION:

   Do not reuse the grommet.

6. Attach the attachment in the inner kit to the reservoir cap as described in disassembly step 2.
7. Master cylinder assembly is fixed in the vise as described in disassembly step 3.

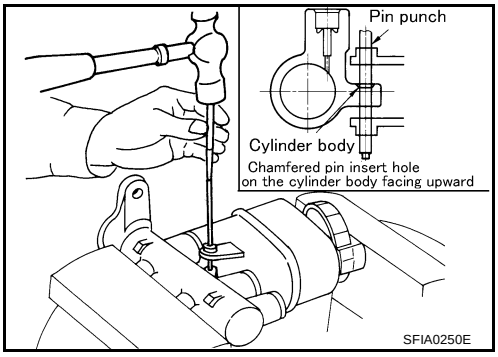


NOTE:
Attach the reservoir tank in the orientation shown in the figure.



8. Using a pin punch [commercial service tool: diameter Approx. 4 mm (0.16 in)], attach the reservoir tank mounting pin so that the attachment side and the opposite side are identical.

CAUTION:
Do not reuse reservoir tank and mounting pin.



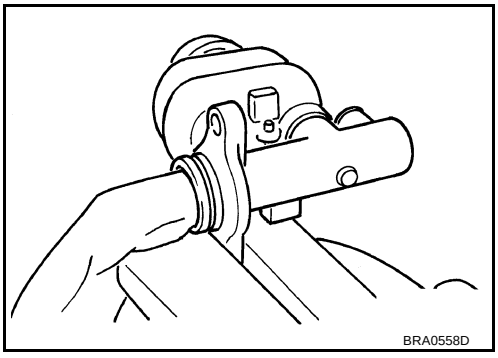
MODELS WITH VDC

Disassembly

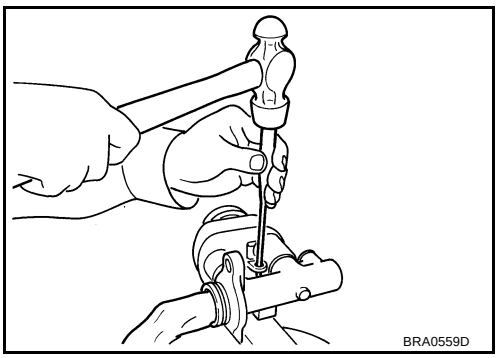
CAUTION:
- **While working, cover the primary piston rod with cloth to prevent it from being damaged.**
- **Only remove the reservoir tank when absolutely necessary.**

1. Place the side of the cylinder body with chamfering around the pin insertion hole up, and secure the cylinder body flange section with a vise as shown in the figure.

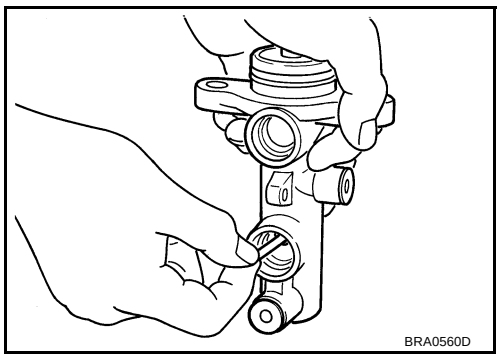
CAUTION:
When securing in a vise, use copper plates or cloth to protect the flange.



2. Using a pin punch [commercial service tool: diameter Approx 4 mm (0.16 in)], remove the reservoir tank mounting pin.
3. Remove master cylinder assembly from the vise.
4. Remove reservoir tank and grommet from cylinder body.

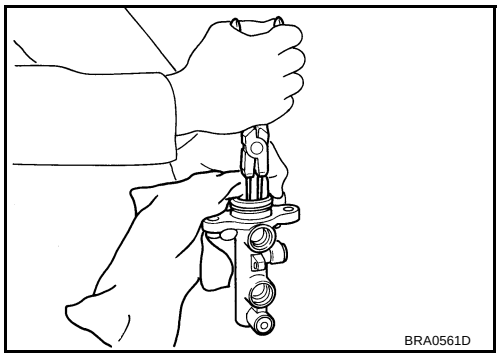


5. Push in the primary piston and remove the piston stopper from the cylinder body secondary-side tank boss hole.

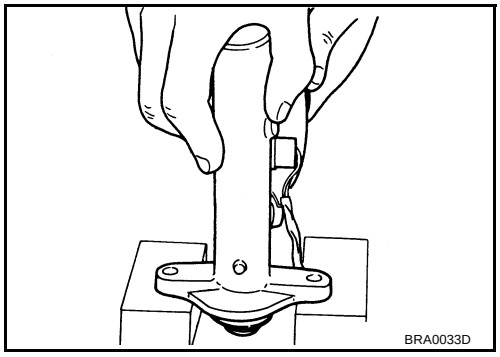


6. Remove the snap ring while pushing the primary piston in to prevent the piston from popping out.
7. Holding the primary piston rod, pull the primary piston assembly, the plate, and the guide straight out.
8. Remove the plate and guide from the primary piston.

CAUTION:
When removing the plate from the primary piston rod, make sure the inside of the plate does not damage the rod.



9. Tap flange using a soft block such as wood, and carefully pull the secondary piston assembly straight out to prevent cylinder inner wall from being damaged.



Inspection after Disassembly

Master cylinder

- Check that there is no damage, friction, rusting, or pinholes on the cylinder inner wall, and replace if there are any non-standard conditions.

Assembly

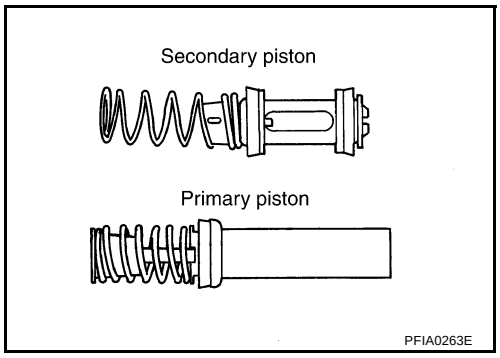
CAUTION:

- **Do not use mineral oils such as kerosene, gasoline during the cleaning and assembly process.**
- **Make sure there is no foreign matter such as dirt or dust attached to the inner cylinder walls, the piston, or the cap seal, and use care to avoid damaging parts with the assembly tools.**
- **Do not drop parts. If a part is dropped, do not use it.**

1. Apply brake fluid to cylinder inner wall body and contact surface of the piston assembly, and apply the silicon grease in the inner kit to the primary piston rod.
2. Insert the secondary piston and primary piston into cylinder body in this order.

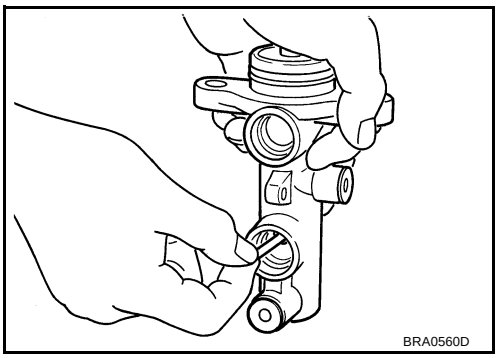
CAUTION:

- **Do not reuse the primary and secondary piston assemblies.**
- **Be sure to replace the assembly without disassembling the new inner kit.**



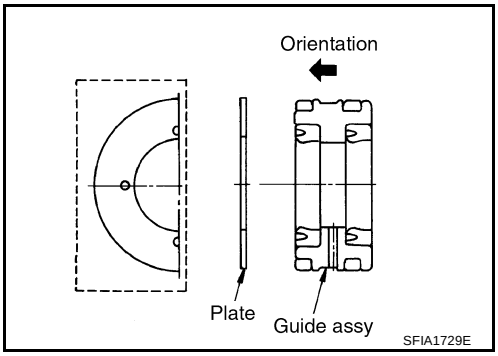
- **Pay attention to the orientation of the piston cup, and insert straight to prevent the cup from being caught by cylinder inner wall.**

3. Perform a visually inspection of the secondary piston slit through the tank boss hole on the secondary-side of the cylinder body, and install the piston stopper.



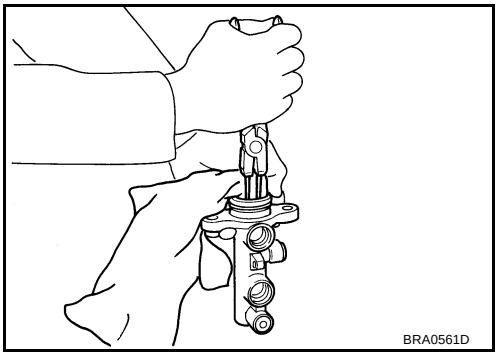
4. Insert the plate and guide into the cylinder body.

CAUTION:
- **Make sure not to damage the primary piston rod.**
- **Pay attention to the direction of the guide.**
- **Do not drop the O-ring.**
- **Make sure the guide and/or plate are not inserted at an angle.**



5. Cover the primary piston rod with cloth to prevent it getting damaged, and attach the snap ring with the primary piston pushed in.

CAUTION:
- **Make sure the area around the snap ring is snug in the cylinder body bore groove.**
- **Do not reuse the snap ring.**

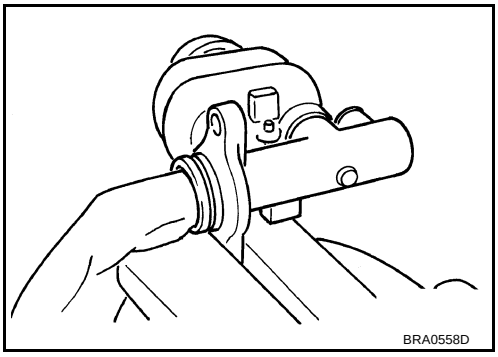


6. Place the side of the cylinder body with chamfering around the pin insertion hole up, and secure the cylinder body flange section with a vise.

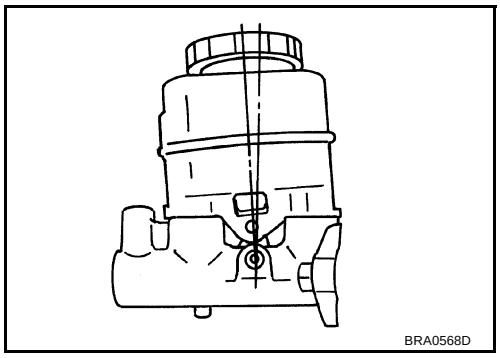
CAUTION:
When securing in a vise, use copper plates or cloth to protect the flange.

7. Apply brake fluid to the grommet and attach the reservoir tank to the master cylinder.

CAUTION:
Do not reuse the grommet.



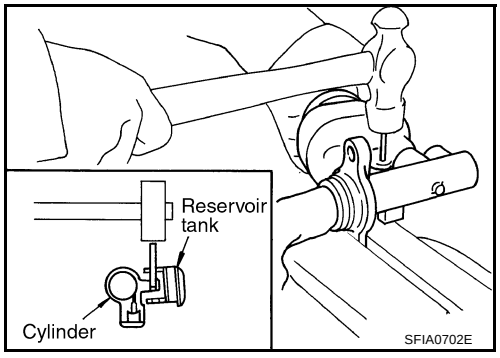
NOTE:
Attach the reservoir tank in the orientation shown in the figure.



8. Tilt the reservoir tank so that the mounting pin can be inserted as shown in the figure, and insert the mounting pin. When the mounting pin has passed the master cylinder pinhole, return the reservoir tank to a level position. Attach the mounting pin to the opposite mounting pin hole of the reservoir tank so that it is the same as the insertion side.

CAUTION:

- **Be sure to insert pin from the chamfered pinhole of cylinder body.**
- **Do not reuse reservoir tank and mounting pin.**



BRAKE BOOSTER

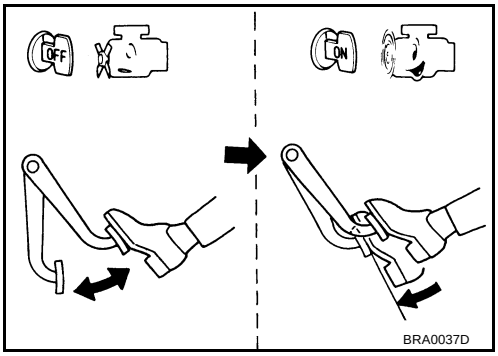
PFP:47200

On-Vehicle Inspection

NFS0000L

OPERATING CHECK

With the engine stopped, change the vacuum to the atmospheric pressure by depressing the brake pedal several times. Then with brake pedal fully depressed, start the engine and when the vacuum pressure reaches the standard, check that the clearance between the brake pedal and floor panel decreases.

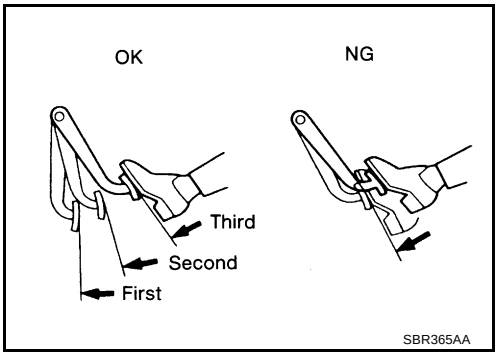


CAUTION:

Depressing pedal interval is approximately 5 seconds.

AIRTIGHT CHECK

- Run the engine at idle for approximately 1 minute, and stop it after applying vacuum to the booster. Depress the brake pedal normally to change the vacuum to the atmospheric pressure. Check that distance between the brake pedal and floor panel gradually increases.
- Depress brake pedal while engine is running, and stop engine with pedal depressed. The pedal stroke should not change after holding pedal down for 30 seconds.



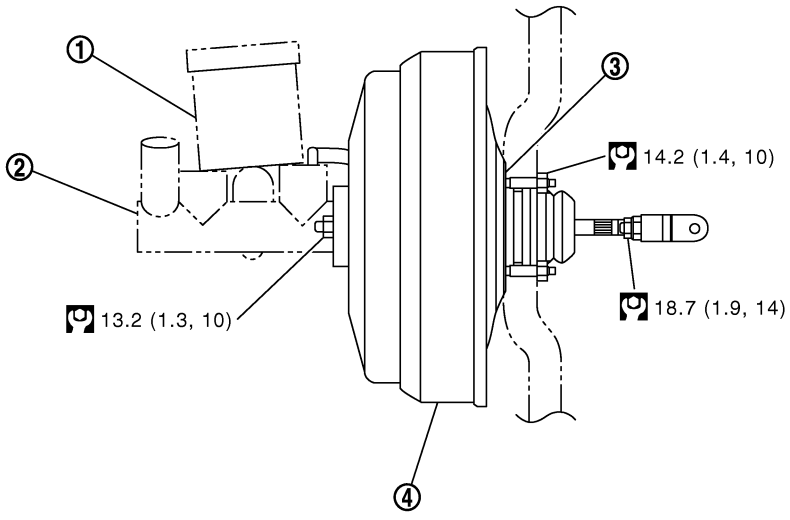
CAUTION:

Depressing pedal interval is approximately 5 seconds.

Components

NFS000IG

SEC. 460•465•470



1. Reservoir tank
2. Master cylinder
3. Gasket
4. Brake booster

Refer to GI-11, "Components" , for the symbols in the figure.

Removal and Installation

NFS0000M

REMOVAL

CAUTION:

- **Be careful not to deform or bend brake piping while removing and installing the brake booster.**
- **Replace clevis pin if it is damaged.**
- **Be careful not to damage brake booster stud bolt threads. If brake booster is tilted or inclined during installation, the dash panel may damage the threads.**
- **Attach the check valve in the correct orientation.**

1. Remove vacuum hose from the brake booster. Refer to BR-25, "VACUUM LINES" .
2. Remove the brake master cylinder. Refer to BR-24, "Removal and Installation" .
3. Remove the brake piping between brake master cylinder and ABS actuator and electric unit (control unit). Refer to BR-12, "Hydraulic Circuit" .

   CAUTION:

   For M/T vehicles with remove the brake piping after removing the clutch reservoir tank bolt.
4. Remove the brake pedal attachment snap pin and clevis pin from inside the vehicle.
5. Remove the nuts on the brake booster and brake pedal assembly.
6. Remove brake booster assembly from the engine compartment side.

INSPECTION AFTER REMOVAL

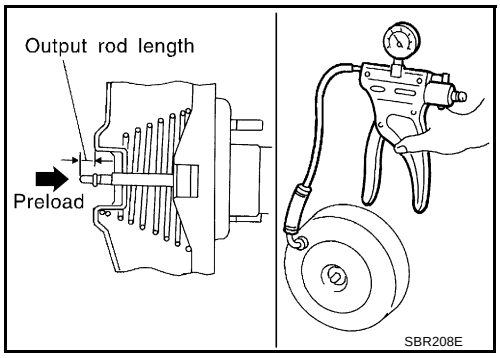
Output Rod Length Inspection

1. Using a handy vacuum pump, apply a vacuum of –66.7 kPa (–500 mmHg,–19.69 inHg) to the brake booster.
2. Check output rod length.

Standard dimension when vacuum –66.7 kPa (–500 mmHg, –19.69 inHg)

With TCS : 10.4 mm (0.409 in)

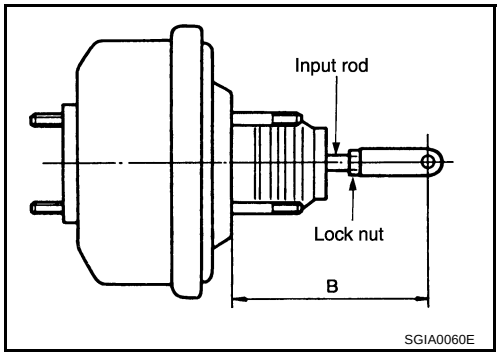
With VDC : –6.2 mm (–0.244 in)



INSTALLATION

1. Loosen the lock nut to adjust the input rod length so that the length “B” (in the figure on the right) satisfies the specified value.

   Length “B” : 125 mm (4.92 in)
2. After adjusting “B”, temporarily tighten the lock nut to install the booster assembly to the vehicle. At this time, make sure to install a gasket between the booster assembly and the vehicle.
3. Connect the brake pedal with the clevis of the input rod.
4. Install the pedal bracket mounting nuts and tighten them to the specified torque.
5. Install the brake piping between brake master cylinder and ABS actuator and electric unit (control unit). Refer to BR-12, "Hydraulic Circuit" .
6. Install the master cylinder to the booster assembly. Refer to BR-24, "Removal and Installation" .
7. Adjust the height and play of the brake pedal. Refer to BR-7, "ADJUSTMENT" .
8. Tighten the lock nut of the input rod to the specified torque. Refer to BR-23, "Components" .
9. Refill new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

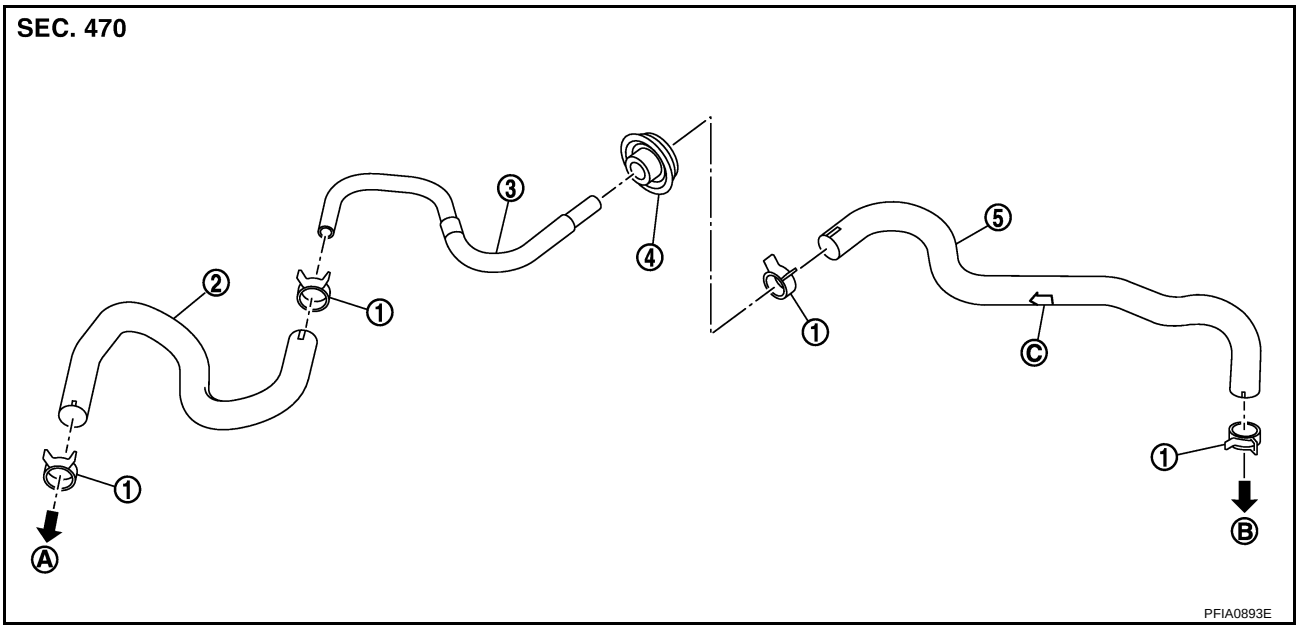


VACUUM LINES

PFP:41920

Components

NFS000IH



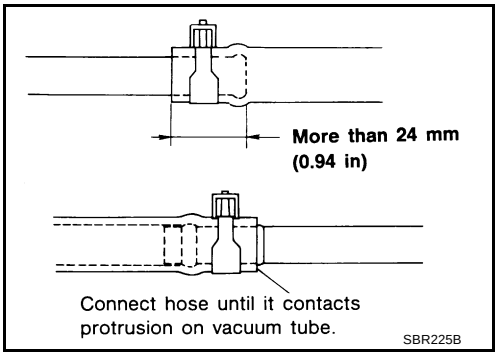
1. Clamp	2. Vacuum hose	3. Vacuum tube
4. Grommet	5. Vacuum hose (built in check valve)	
A. To intake manifold	B. To brake booster	C. Stamp indicating engine direction

Removal and Installation

NFS0000N

CAUTION:

- **Because vacuum hose contains a check valve, it must be installed in the correct orientation. Refer to the stamp or label to confirm correct installation. The brake booster will not operate normally if the hose is installed in the wrong direction.**
- **Insert the vacuum hose for at least 24 mm (0.94 in).**
- **Do not use lubricating oil during assembly.**



Inspection

NFS0000O

VISUAL INSPECTION

Check for improper assembly, damage and deteriorate.

CHECK VALVE INSPECTION

Airtightness Inspection

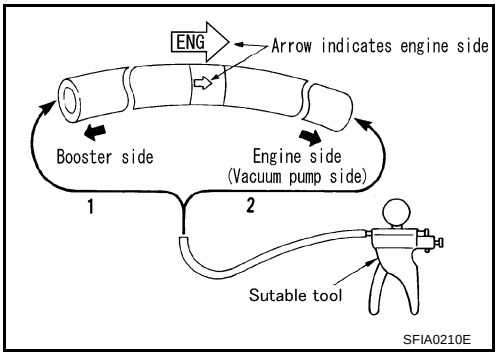
Use a hand-held vacuum pump to check.

When connected to booster side (1):

Vacuum decrease should be within 1.3 kPa (10 mmHg, 0.39 inHg) for 15 seconds under a vacuum of −66.7 kPa (−500 mmHg, −19.69 inHg)

When connected to engine side (2):

No vacuum will be applied



FRONT DISC BRAKE

PFP:41000

On-Vehicle Inspection

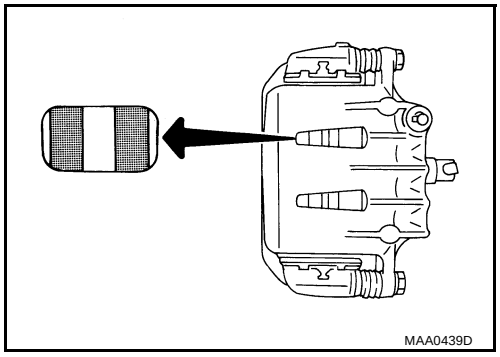
NFS000AS

PAD WEAR INSPECTION

Other than Brembo Calipers

- Check pad thickness from check hole on cylinder body. Use a scale for inspection if necessary.

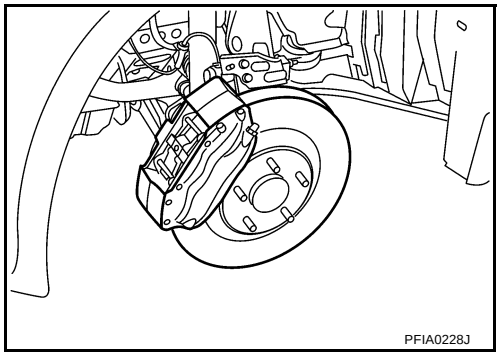
Standard thickness : 11.0 mm (0.433 in)
Repair limit thickness : 2.0 mm (0.079 in)


MAA0439D

With Brembo Calipers

- Inspect the thickness of the pad through the caliper inspection hole. Use a scale for inspection if necessary.

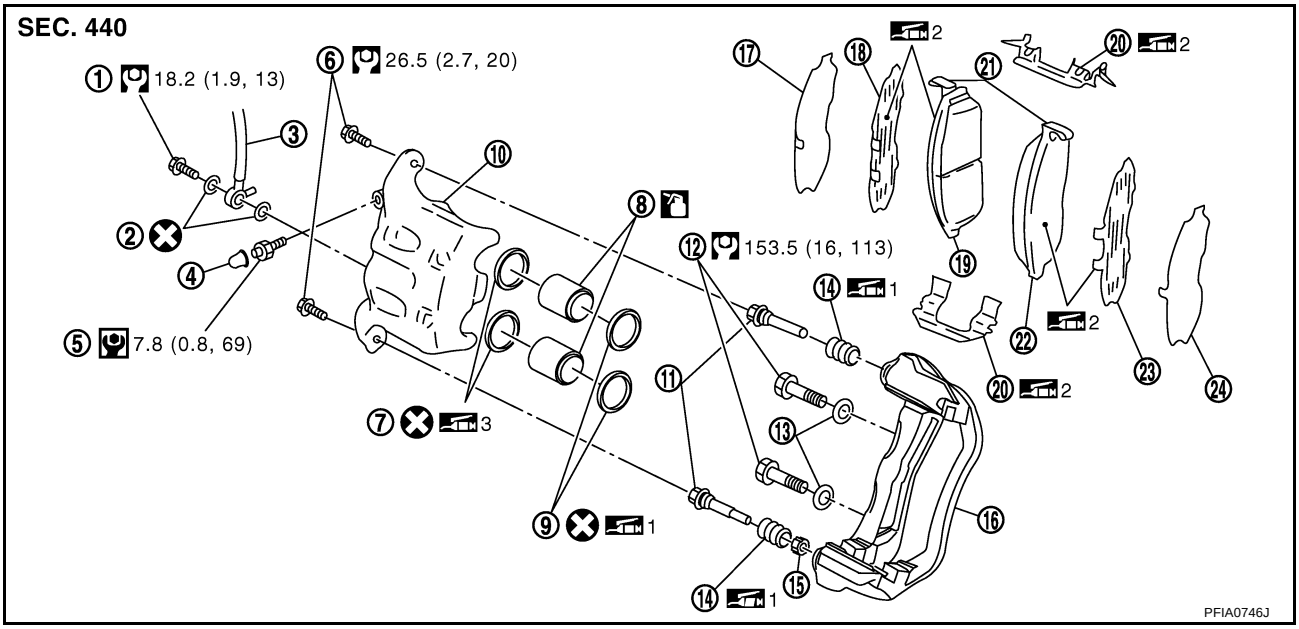
Standard thickness : 9.3 mm (0.366 in)
Repair limit thickness : 2.0 mm (0.079 in)


PFIA0228J

Components

NFS000AT

OTHER THAN BREMBO CALIPERS



1. Union bolt	2. Copper washer	3. Brake hose
4. Cap	5. Bleed valve	6. Sliding pin bolt
7. Piston seal	8. Piston	9. Piston boot
10. Cylinder body	11. Sliding pin	12. Torque member mounting bolt
13. Washer	14. Sliding pin boot	15. Bushing
16. Torque member	17. inner shim cover	18. inner shim
19. Inner pad	20. Pad retainer	21. Pad wear sensor
22. Outer pad	23. Outer shim	24. Outer shim cover

Refer to GI-11, "Components" and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease.

3: Apply polyglycol ether based lubricant.

: Apply brake fluid.

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

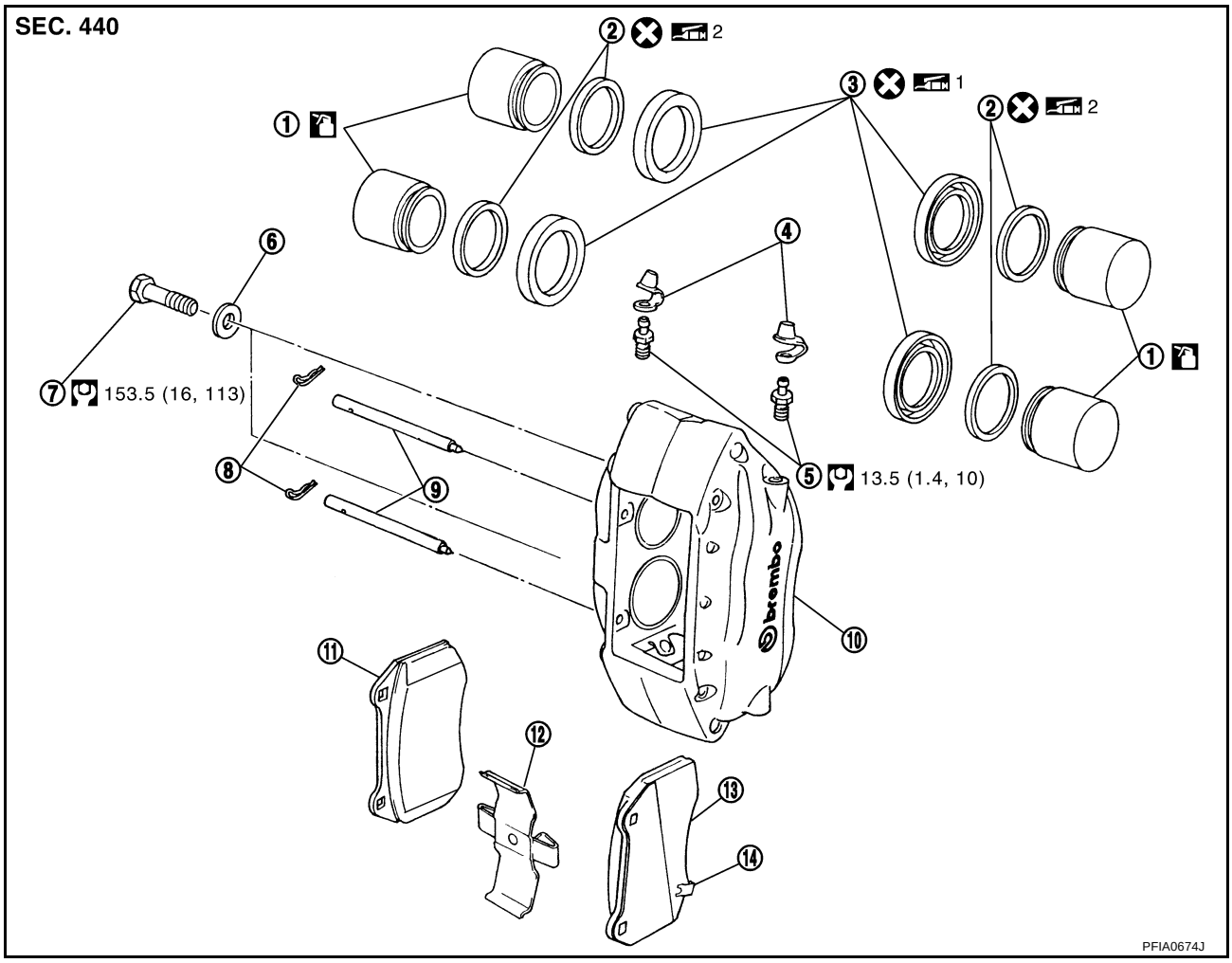
CAUTION:

- **While removing cylinder body, do not depress brake pedal because piston will pop out.**
- **It is not necessary to remove torque member mounting bolts on torque member and brake hose except for disassembly or replacement of caliper assembly. In this case, hang cylinder body with a wire so that brake hose is not under tension.**
- **Do not damage piston boot.**
- **If any shim is subject to serious corrosion, replace it with a new one.**
- **Always replace shim and shim covers as a set when replacing brake pads.**
- **Keep disc rotor clean of brake fluid.**
- **Burnish the brake pads and disc rotor mutually contacting surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to BR-38, "Brake Burnishing Procedure" .**

WITH BREMBO CALIPERS

NOTE:

Refer to BR-30, "HOW TO APPLY GREASE TO THE BRAKE PAD" for how to apply grease to brake pads.



1.	Piston	2.	Piston seal	3.	Piston boot
4.	Cap	5.	Bleed valve	6.	Washer
7.	Bolt	8.	Clips	9.	Pad pins
10.	Caliper	11.	Inner pad	12.	Cross spring
13.	Outer pad	14.	Pad wear sensor		

Refer to GI-11, "Components" and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply polyglycol ether based lubricant.

: Apply brake fluid.

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

- **While the brake pad and cylinder body are separated, the piston may suddenly jump out, so do not depress the brake pedal.**
- **Apart from caliper assembly, disassembly or replacement, there is no need to remove caliper bolts or brake hose or tube.**
- **Do not damage piston boot.**
- **Keep disc rotor clean of brake fluid.**

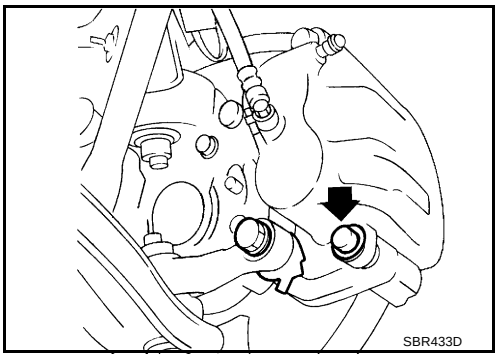
- **Burnish the brake pads and disc rotor mutually contacting surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to BR-38, "Brake Burnishing Procedure" .**

Removal and Installation of Brake Pad (Other than Brembo Calipers)

NFS000AU

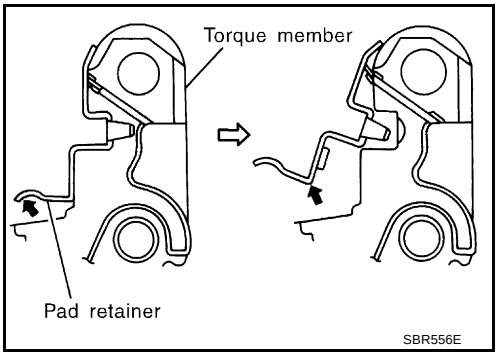
REMOVAL

1. Remove tires from vehicle with a power tool.
2. Remove lower sliding pin bolt.



3. Hang cylinder body with a wire, and remove pads, shims and pad retainers from torque member.

   CAUTION:
   - **When removing pad retainer from torque member, lift pad retainer in the direction shown by arrow (shown in the figure) so as not to deform it.**
   - **Do not damage piston boot.**
   - **Keep disc rotor clean of brake fluid.**

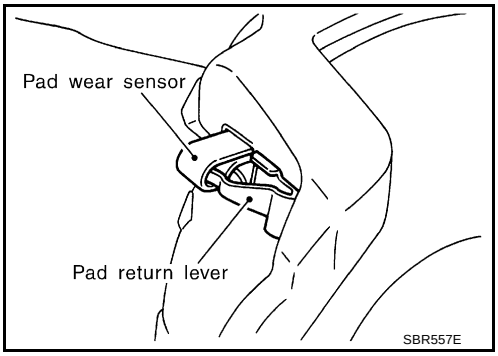


INSTALLATION

1. Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease between pad retainer and pad.
2. Install pad retainers and pad assemblies to torque member.

   CAUTION:
   Inner pad and outer pad have pad-return mechanism on upper side of pad retainer. When installing pad to torque member, be sure to install pad return lever to pad wear sensor securely.
3. Install cylinder body to torque member.

   CAUTION:
   When replacing pads with new ones, press in piston until pads can be installed. In this case, carefully monitor brake fluid level in reservoir tank because brake fluid will return to master cylinder reservoir tank.



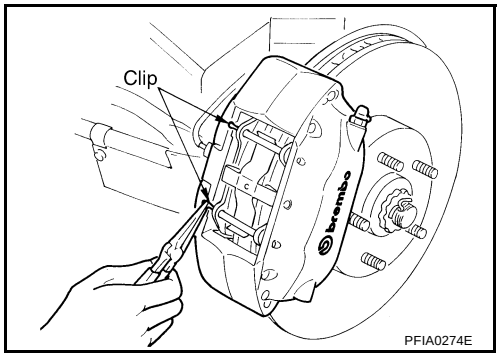
4. Install lower sliding pin bolt, and tighten it to the specified torque. Refer to BR-27, "Components" .
5. Secure disc rotor with wheel nuts. Depress brake pedal a few times until it gets a responsive touch.
6. Check front disc brake for drag.
7. Install tires to vehicle.

Removal and Installation of Brake Pad (With Brembo Calipers)

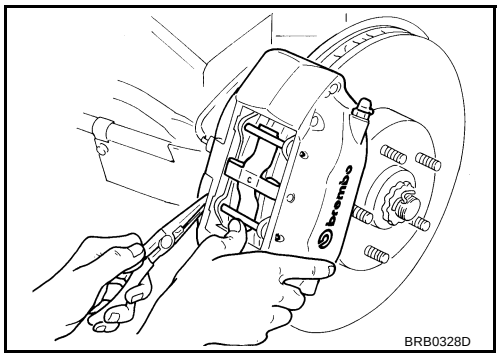
NFS0000W

REMOVAL

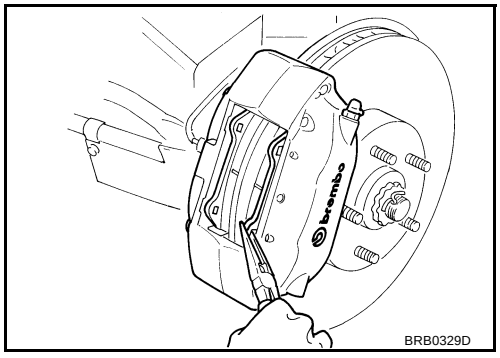
1. Remove tires from vehicle with a power tool.
2. Remove the clip from the pad pin.



3. Remove the pad pin while holding down the cross spring, then remove the cross spring from the caliper.



4. Using pliers, remove the pad from the caliper.



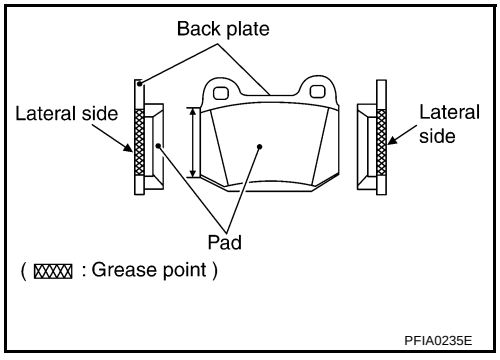
HOW TO APPLY GREASE TO THE BRAKE PAD

Pad Side

Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease about 0.5 g (0.018 oz) per surface equally to back plate side of Inner Pad and Outer Pad. (Refer to the figure.)

CAUTION:

Make sure no foreign matter attaches itself to the grease.



INSTALLATION

1. Insert the piston to the position where the pad is attached.

   NOTE:

   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

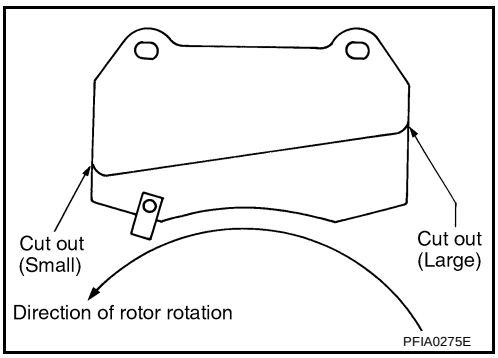
   CAUTION:

   By pushing in the piston, the brake fluid returns to the master cylinder reservoir tank. Watch the level of the surface of the reservoir tank.

2. Attach pad.

CAUTION:

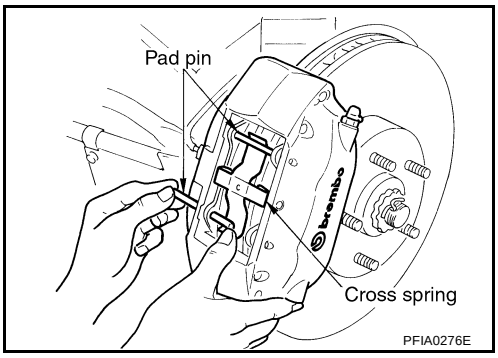
- **Attach the pad with wear sensor to the outer side.**
- **The side of the shim with the larger cutouts should be on the entry side of the disc rotor spin.**



3. Insert the upper pad pin from the inner cylinder side, then insert firmly to the outer cylinder side through the hole in the top of the pad.
4. As shown in the figure, place the top of the cross spring over the top pad pin, press in the cross spring, push the lower pad pin from the inner cylinder side to the outer cylinder side, and secure the cross spring.
5. Insert the clip in the small hole at the end of the pad pin.

CAUTION:

If the clip is not fully attached, the pad pin or the pad could fall out while the vehicle is in motion.



6. Install tires to vehicle.

Removal and Installation of Brake Caliper Assembly (Other than Brembo Calipers)

NFS000AV

REMOVAL

1. Remove tires from vehicle with a power tool.
2. Fasten disc rotor using wheel nut.
3. Drain brake fluid gradually (from bleed valve while depressing brake pedal). Refer to BR-10, "Drain and Refill" .
4. Remove union bolt, and then remove brake hose from caliper assembly.
5. Remove torque member mounting bolts (from torque member), and remove caliper assembly (from vehicle with a power tool).

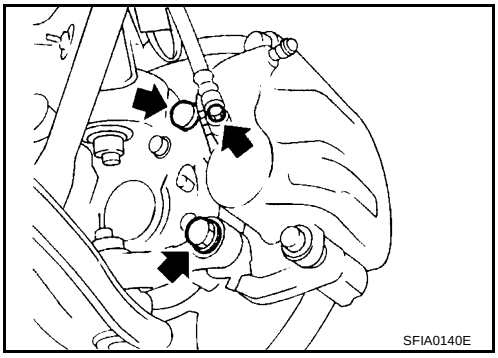
CAUTION:

Do not drop brake pad.

6. Remove disc rotor.

CAUTION:

Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove disc rotor.



INSTALLATION

CAUTION:

- **Refill with new brake fluid “DOT 3”.**
- **Do not reuse drained brake fluid.**

1. Install disc rotor.

CAUTION:

Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.

2. Install caliper assembly to vehicle, and tighten torque member mounting bolts to the specified torque. Refer to BR-27, "Components" .

CAUTION:

Before installing torque member to vehicle, wipe oil and grease on washer seats on steering knuckle and mounting surface of torque member.

3. Install a projection of brake hose metal fitting by aligning with protrusions on cylinder body, and tighten union bolt to the specified torque. Refer to BR-27, "Components" .

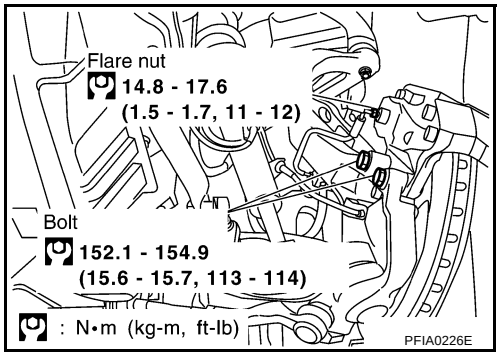
   CAUTION:
   - **Do not reuse copper washers for union bolts.**
   - **Assemble brake hose securely on caliper assembly.**
4. After installing caliper assembly, refill with new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .
5. Install tires to vehicle.

Removal and Installation of Brake Caliper Assembly (With Brembo Calipers)

NFS0000X

REMOVAL

1. Remove tires from vehicle with a power tool.
2. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
3. Remove the brake pad. Refer to BR-30, "Removal and Installation of Brake Pad (With Brembo Calipers)" .
4. Remove the brake tube flare nut using a flare wrench.
5. Remove the brake tube bracket from the knuckle spindle.



6. Remove the caliper bolt and remove the caliper assembly from the vehicle.
7. Remove disc rotor.

   CAUTION:
   Put matching marks of wheel hub assembly and disc rotor, if it is necessary to remove when removing disc rotor.

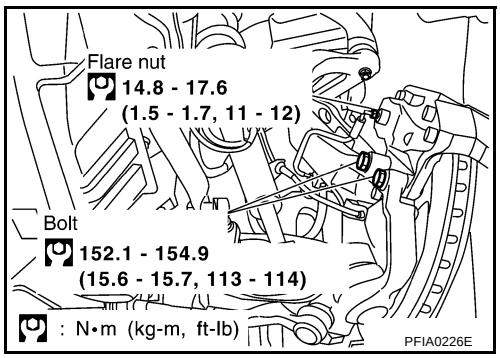
INSTALLATION

CAUTION:
- **Refill with new brake fluid “DOT 3”.**
- **Never reuse drained brake fluid.**

1. Install disc rotor.

   CAUTION:
   Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.
2. Install caliper assembly to the vehicle, and tighten bolts to the specified torque.

   CAUTION:
   When attaching the caliper assembly to the vehicle, wipe any oil off the knuckle spindle washers and caliper assembly attachment surfaces.



3. Attach the brake tube to the caliper assembly and partially tighten the flare nut.

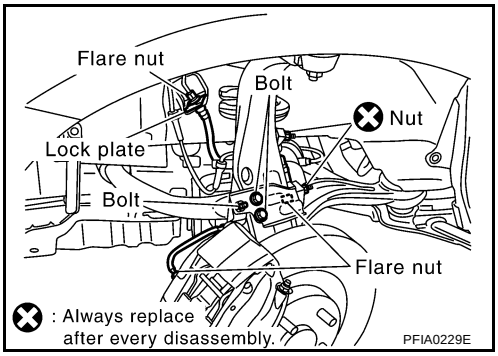
4. Attach the brake tube bracket to the knuckle spindle and tighten to the specified torque.

   : 10.8 – 15.6 N·m (1.1 – 1.5 kg-m, 8 – 11 ft-lb)

5. Using a flare nut crowfoot and torque wrench, tighten the caliper assembly and brake tube connection flare nut to the specified torque.

   : 14.8 – 17.6 N·m (1.5 – 1.7 kg-m, 11 – 12 ft-lb)

6. Attach brake pad. Refer to BR-30, "Removal and Installation of Brake Pad (With Brembo Calipers)" .



7. Refill new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .
8. Install tires to vehicle.

Disassembly and Assembly of Brake Caliper Assembly (Other than Brembo Calipers)

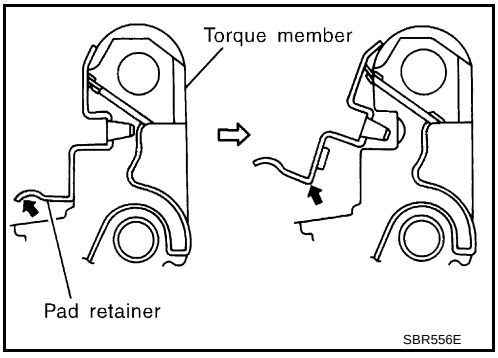
NFS000AW

NOTE:
Do not remove torque member, brake pads, shims, shim covers and pad retainers, when disassembling or assembling cylinder body.

DISASSEMBLY

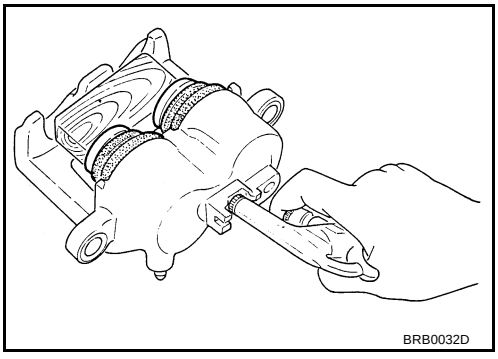
1. Remove caliper assembly from vehicle. Refer to BR-31, "Removal and Installation of Brake Caliper Assembly (Other than Brembo Calipers)" .
2. Remove sliding pin bolts from cylinder body, and remove pads, shims, shim cover and pad retainers from torque member.

   CAUTION:
   When removing pad retainer from torque member, lift the pad retainer in the direction shown by arrow (shown in the figure) so as not to deform it.



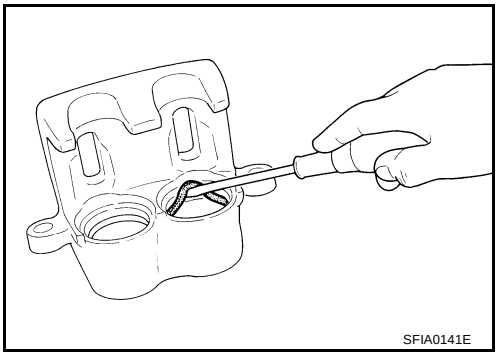
3. Remove sliding pins and sliding pin boots from torque member.
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.

   CAUTION:
   Do not get fingers caught in the pistons.



5. Using a flat-bladed screwdriver, remove piston seals from cylinder body.

   CAUTION:
   Be careful not to damage the inner wall of cylinder.



INSPECTION AFTER DISASSEMBLY

Cylinder Body

CAUTION:

Use new brake fluid to clean. Do not use mineral oils such as gasoline or kerosene.

- Check the inner wall of cylinder for corrosion, wear, and damage. If a malfunction is detected, replace cylinder body.
- Minor flaws caused by corrosion or a foreign material can be removed by polishing a surface of the inner wall with a fine sandpaper. Replace cylinder body, if a malfunction is detected.

Torque Member

Check for wear, cracks, and damage. If a malfunction is detected, replace applicable part.

Piston

CAUTION:

The piston sliding surface is plated. Do not polish with sandpaper.

Check piston surface for corrosion, wear, and damage. If a malfunction is detected, replace applicable part.

Sliding Pin, Sliding Pin Bolt, and Sliding Pin Boot

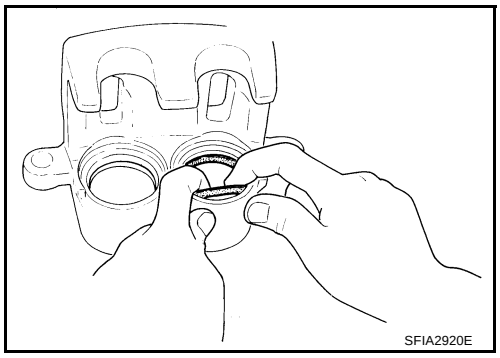
Check sliding pins and sliding pin boots for wear, damage, and cracks. If a malfunction is detected, replace applicable part.

ASSEMBLY

1. Apply polyglycol ether based lubricant to the piston seal, and install them to the cylinder body.

   CAUTION:

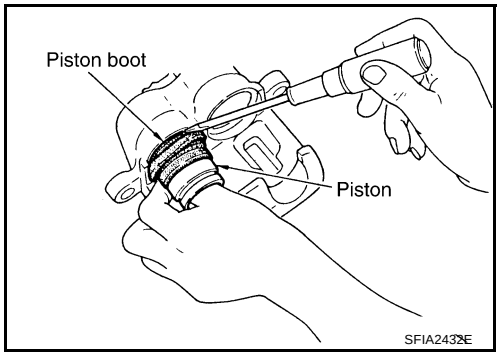
   Do not reuse piston seal.



2. Apply rubber grease to piston boots. Cover the piston end with piston boot, and install cylinder-side lip on piston boot properly into groove on cylinder body.

   CAUTION:

   Do not reuse piston boot.

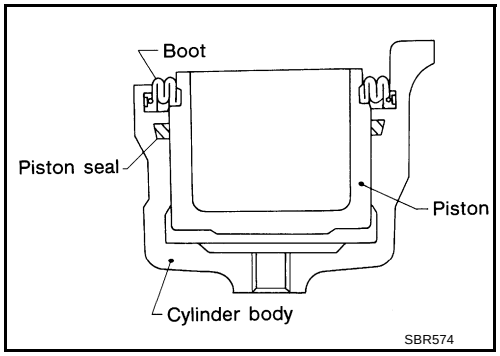


3. Apply brake fluid to piston, and press piston into cylinder body by hand to assemble piston-side lip on piston boot properly into a groove on piston.

   CAUTION:

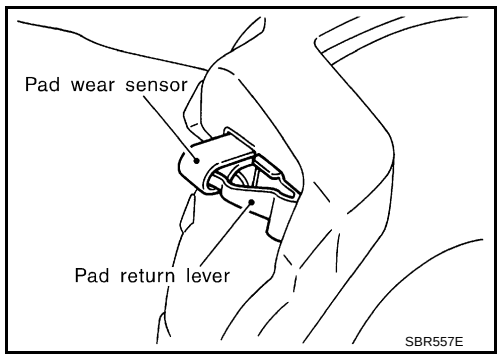
   Press piston evenly and change pressing point to prevent inner wall of cylinder from being rubbed.

4. Install sliding pins and sliding pin boots to the torque member.



5. Install the torque member to the steering knuckle and tighten the mounting bolts to the specified torque. Refer to BR-27, "Components" .

CAUTION:
Before installing torque member to vehicle, wipe off oil and grease on the washer seats on steering knuckle and the mounting surface of the torque member.



6. Install pad retainers to torque member.
7. Press in piston until pads can be installed, and then install cylinder body to torque member.
8. Install cylinder body, and tighten sliding pin bolt to the specified torque. Refer to BR-27, "Components" .
9. Position a projection of brake hose metal fitting by aligning with protrusions on cylinder body and tighten union bolt to specified torque. Refer to BR-12, "Hydraulic Circuit" .

CAUTION:
- **Assemble brake hose securely to cylinder body.**
- **Do not reuse copper washer for union bolts.**

10. After installing caliper assembly, refill with new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .

DISC ROTOR INSPECTION

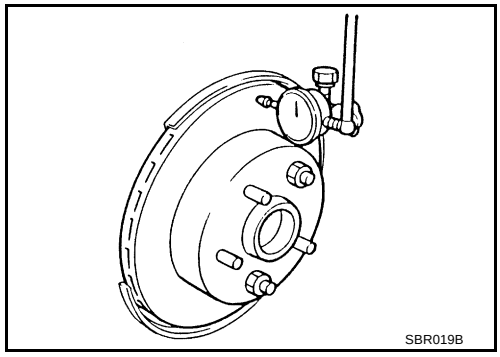
Visual Inspection

Check surfaces of disc rotor for uneven wear, cracks, and serious damage. If a malfunction is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, secure disc rotor to wheels hub. (2 or more positions)
2. Using a dial indicator, check runout.

Measurement point:
At a point 10.0 mm (0.394 in) from outer edge of disc
Runout limit (with it attached to the vehicle):
0.035 mm (0.0014 in) or less



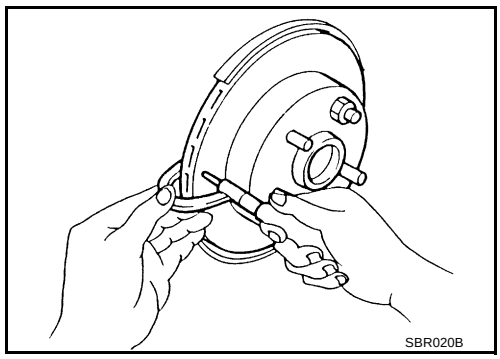
NOTE:
Make sure that wheel bearing axial end play is with in the specification before measuring runout. Refer to FAX-4, "On-Vehicle Inspection" .

3. If runout is outside limit, find the minimum runout point by shifting the mounting positions of disc rotor and wheel hub by one hole.
4. If runout is still outside the limit after performing the above operation, replace or lathe the disc rotor. [When lathing, use the Pro–Cut PFM On–Car Brake Lathe (Tool No. 38–PFM90.5) or equivalent.]

Thickness Inspection

Using a micrometer, check thickness of disc rotor. If thickness is outside standard, replace disc rotor.

Standard thickness : 28.0 mm (1.10 in)
Repair limit thickness : 26.0 mm (1.02 in)
Maximum uneven wear (measured at 8 positions)
: 0.015 mm (0,0006 in) or less



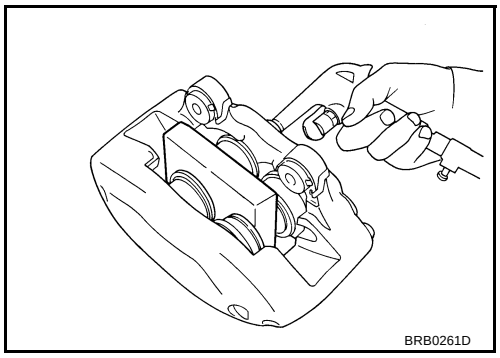
Disassembly and Assembly of Brake Caliper Assembly (With Brembo Calipers)

NFS0000Y

DISASSEMBLY

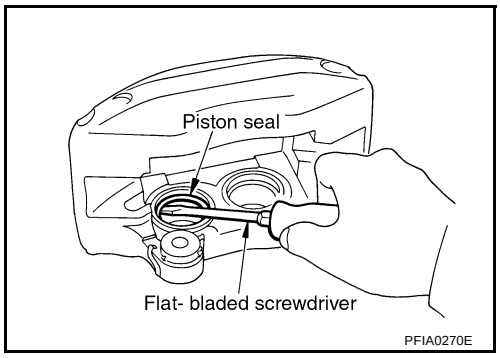
1. Insert a piece of wood as shown in the figure, blow air in through the flare nut mounting hole, and remove the piston and piston boot. If the four pistons do not all come out at the same time, press the piston(s) that have come out a ways into the cylinder body and blow air in again.

   CAUTION:
   Do not get fingers caught in the piston.
2. Remove the piston boot from the piston.



3. Using a flat-bladed screwdriver, remove the piston seal.

   CAUTION:
   - **Be careful not to damage cylinder inner wall.**
   - **Never remove the four bolts from the inner and outer sides of the caliper. Do not tighten them further, either.**



CALIPER INSPECTION

Caliper

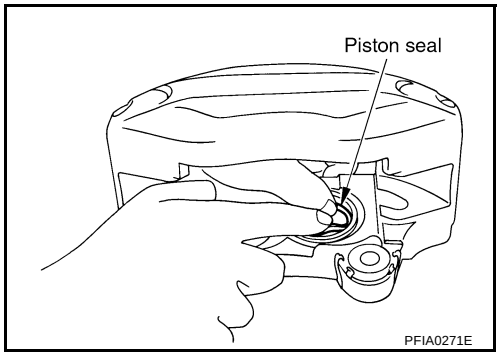
CAUTION:
- **Use new brake fluid to clean. Do not use mineral oils such as gasoline or kerosene.**
- **Check for corrosion, wear, or damage to the cylinder inner wall, and replace the caliper if there are any non-standard conditions.**

Piston

CAUTION:
- **Since the piston surface is plated, do not repair using sandpaper.**
- **Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.**

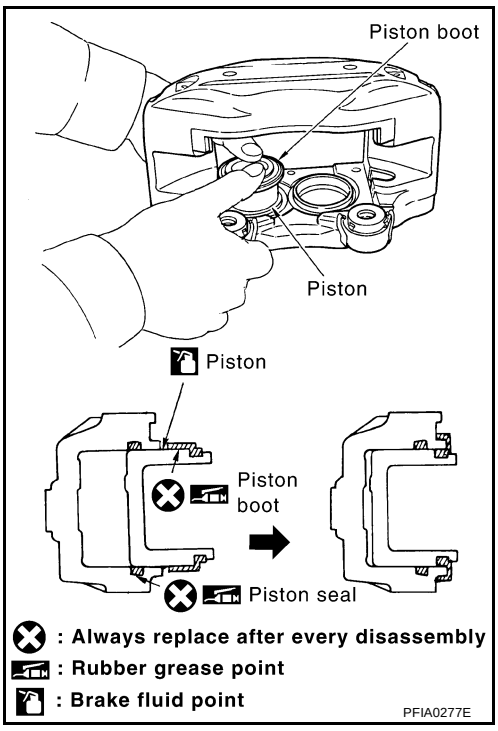
ASSEMBLY

1. Apply polyglycol ether based lubricant to the piston seal, and install them to the cylinder body.



2. Apply rubber grease to the piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.
3. Insert the piston into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

CAUTION:
Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



4. Attach the shim and shim cover to the pad and attach to the caliper.

DISC ROTOR INSPECTION

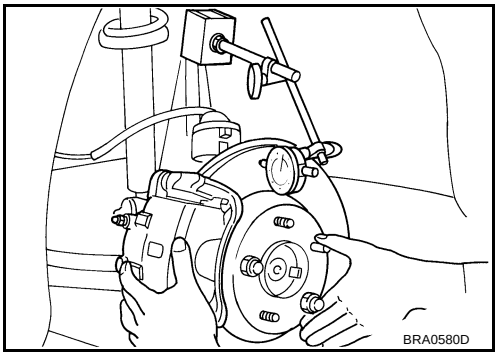
Visual Inspection

Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)
Runout limit (with it attached to the vehicle)
: 0.040 mm (0.0016 in) or less
Runout limit (just the disc rotor)
: 0.040 mm (0.0016 in) or less



NOTE:
Make sure that wheel bearing axial end play is with in the specifications before measuring runout. Refer to FAX-4, "On-Vehicle Inspection" .

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.
4. If runout is still outside the limit after performing the above operation, replace or lathe the disc rotor. [When lathing, use the Pro–Cut PFM On–Car Brake Lathe (Tool No. 38–PFM90.5) or equivalent.]

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.

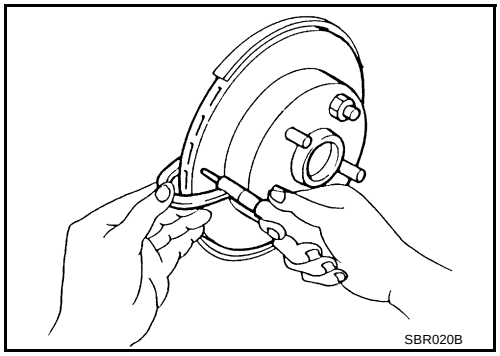
Standard

Standard thickness : 30.0 mm (1.181 in)

Wear limit : 28.4 mm (1.118 in)

Maximum uneven wear (measured at 8 positions)

: 0.015 mm (0.0006 in) or less



Brake Burnishing Procedure

NFS000AX

Burnish the brake pad and disc rotor mutually contacting surfaces of disc rotor according to following procedure after refinishing or replacing disc rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

CAUTION:

- **Be careful of vehicle speed because brake does not operate easily until pad and disc rotor are securely fitted.**
- **Only perform this procedure under safe road and traffic conditions. Use extreme caution.**

1. Drive vehicle on straight, flat road.
2. Depress brake pedal with the power to stop vehicle within 3 to 5 seconds until the vehicle stops.
3. Drive without depressing brake for a few minutes to cool brake.
4. Repeat steps 1 to 3 until pad and disc rotor are securely fitted.

REAR DISC BRAKE

PFP:44000

On-Vehicle Inspection

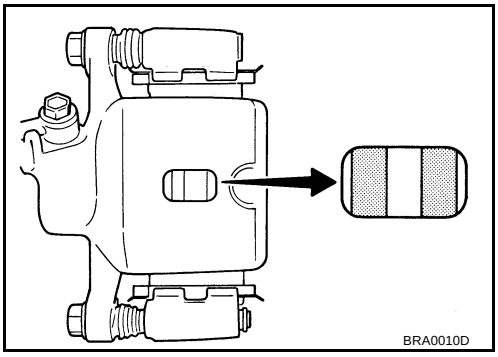
NFS0000Z

PAD WEAR INSPECTION

Other than Brembo Calipers

- Inspect the thickness of the pad through the cylinder body inspection hole. Use a scale for inspection if necessary.

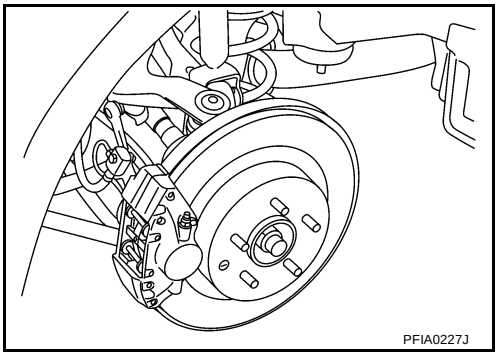
Standard thickness : 8.5 mm (0.335 in)
Repair limit thickness : 2.0 mm (0.079 in)



With Brembo Calipers

- Inspect the thickness of the pad through the caliper inspection hole. Use a scale for inspection if necessary.

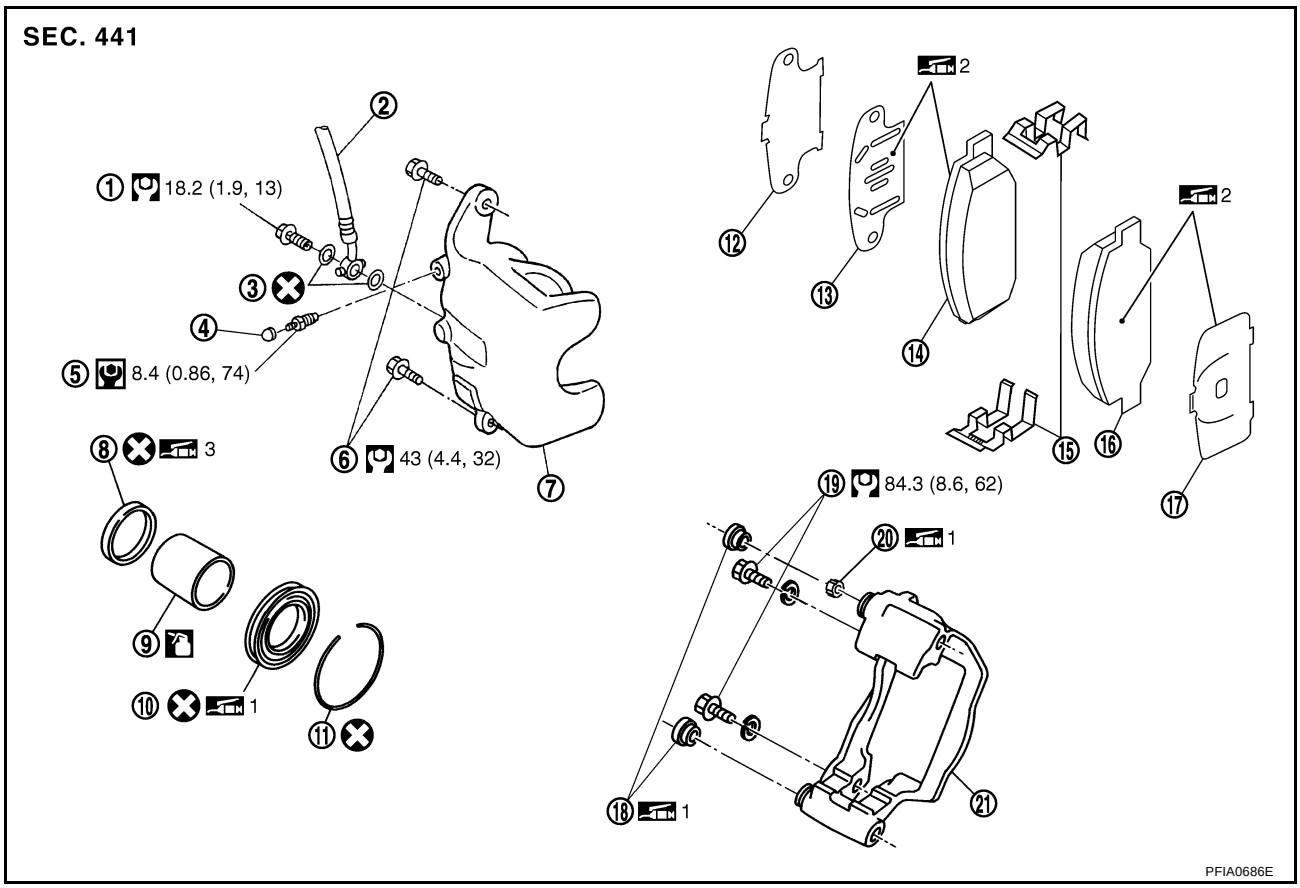
Standard thickness : 9.1 mm (0.358 in)
Repair limit thickness : 2.0 mm (0.079 in)



Components

NFS00010

OTHER THAN BREMBO CALIPERS



1.	Union bolt	2.	Brake hose	3.	Copper washer
4.	Cap	5.	Bleed valve	6.	Sliding pin bolt
7.	Cylinder body	8.	Piston seal	9.	Piston
10.	Piston boot	11.	Retaining ring	12.	Inner shim cover
13.	Inner shim	14.	Inner pad	15.	Pad retainer
16.	Outer pad	17.	Outer shim	18.	Slide pin boot
19.	Torque member bolt	20.	Bushing	21.	Torque member

Refer to GI-11, "Components" and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease.

3: Apply polyglycol ether based lubricant.

: Apply brake fluid.

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

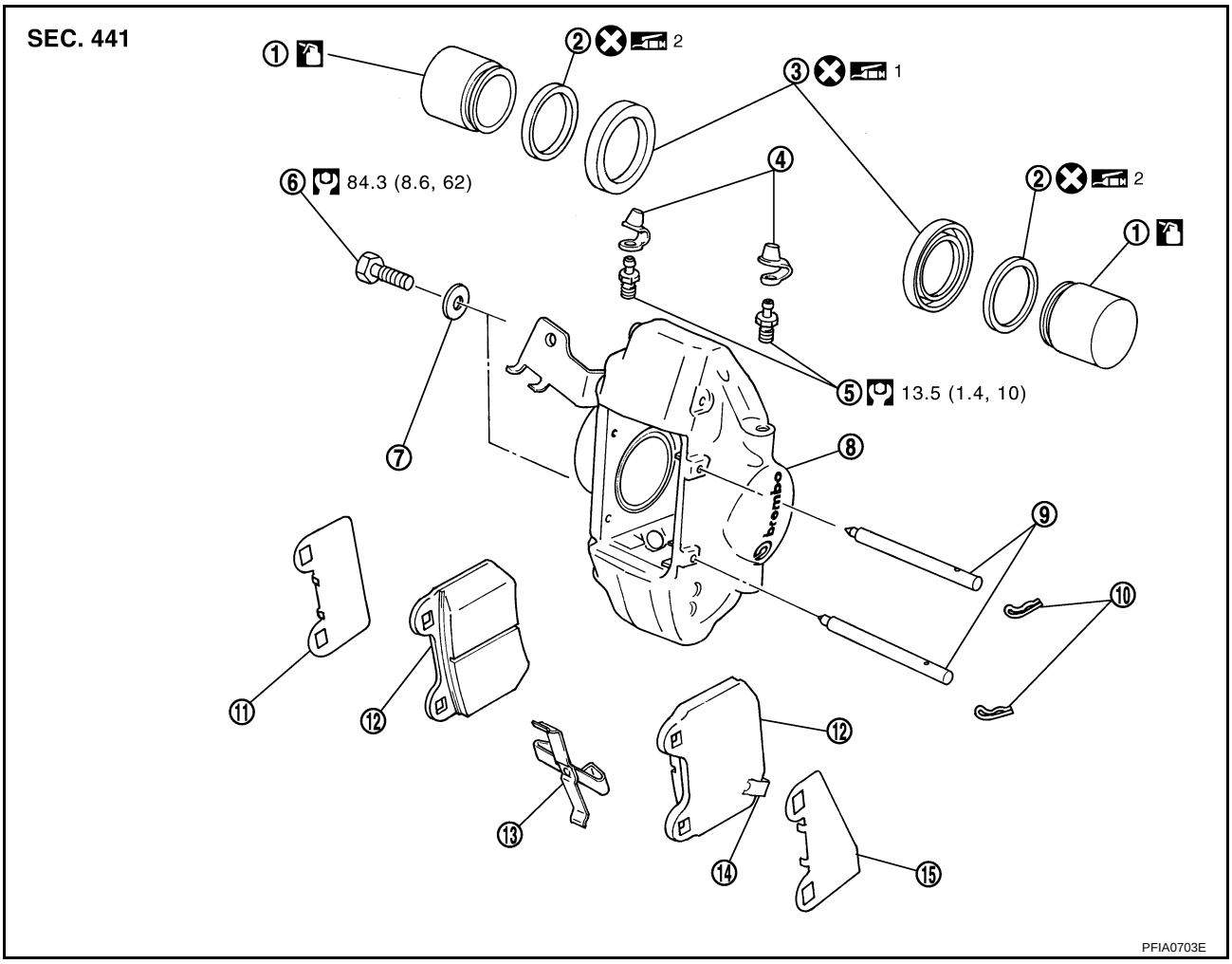
CAUTION:

- **While removing cylinder body, never depress the brake pedal because the piston will pop out.**
- **It is not necessary to remove bolts on torque member and brake hose except for disassembly or replacement of the caliper assembly. In this case, hang cylinder body with a wire so as not to stretch brake hose.**
- **Do not damage piston boot.**
- **If any shim is subject to serious corrosion, replace it with a new one.**
- **Always replace shims and shim covers as a set when replacing brake pads.**
- **Keep disc rotor clean of brake fluid.**

WITH BREMBO CALIPERS

NOTE:

Refer to BR-43, "HOW TO APPLY GREASE TO THE BRAKE PAD" for how to apply grease to brake pads.



1.	Piston	2.	Piston seal	3.	Piston boot
4.	Cap	5.	Bleed valve	6.	Bolt
7.	Washer	8.	Caliper	9.	Pad pins
10.	Clips	11.	Inner shim cover	12.	Brake pad
13.	Cross spring	14.	Pad wear sensor	15.	Outer shim cover

Refer to GI-11, "Components" and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply polyglycol ether based lubricant.

: Apply brake fluid.

WARNING:

Clean dust on caliper and brake pad with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

- **While removing cylinder body, never depress the brake pedal because the piston will pop out.**
- **Apart from caliper assembly, disassembly or replacement, there is no need to remove caliper bolts or brake hose or tube.**
- **Do not damage piston boot.**
- **Always replace shim covers as a set when replacing brake pads.**
- **Keep disc rotor clean of brake fluid.**

Removal and Installation of Brake Pad (Other than Brembo Calipers)

NFS00011

REMOVAL

1. Remove tires from vehicle with a power tool.
2. Remove sliding pin bold (one on top).
3. Hang cylinder body with a wire, and remove pads, pad retainers, shims and shim cover from torque member.

INSTALLATION

1. Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the rear of the pad and to both sides of the shim, and attach the inner shim and shim cover to the inner pad, and the outer shim to the outer pad.
2. Attach the pad retainer and pad to the torque member.
3. Push the piston in so that the pad is firmly attached and attach the cylinder body to the torque member.

   NOTE:
   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

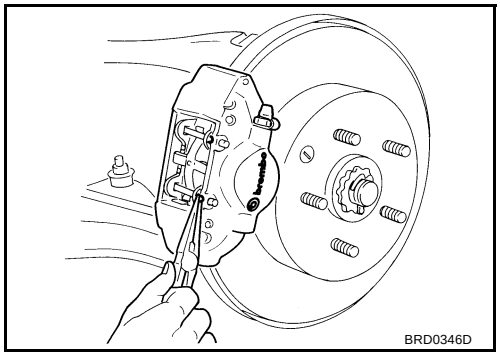
   CAUTION:
   By pushing in the piston, the brake fluid returns to the master cylinder reservoir tank. Watch the level of the surface of the reservoir tank.
4. Attach the sliding pin bolt (one on top) and tighten to the specified torque.
5. Check brake for drag.
6. Install tires to vehicle.

Removal and Installation of Brake Pad (With Brembo Calipers)

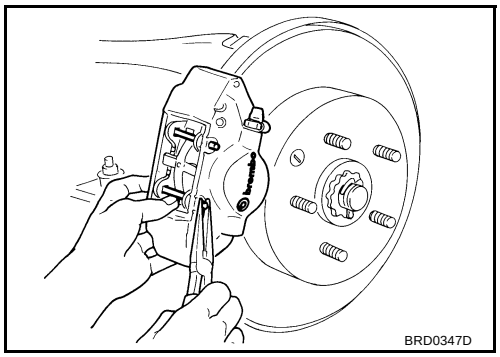
NFS00016

REMOVAL

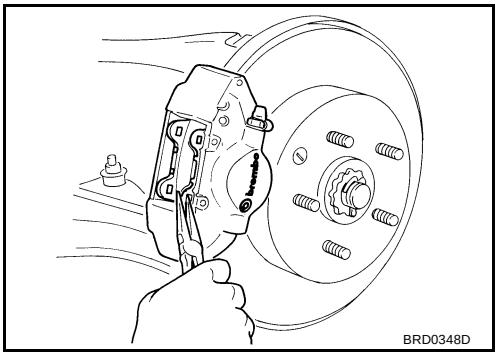
1. Remove tires from vehicle with a power tool.
2. Remove the clip from the pad pin.



3. Remove the pad pin while holding down the cross spring, then remove the cross spring from the caliper.



4. Using pliers, remove the pad from the caliper.



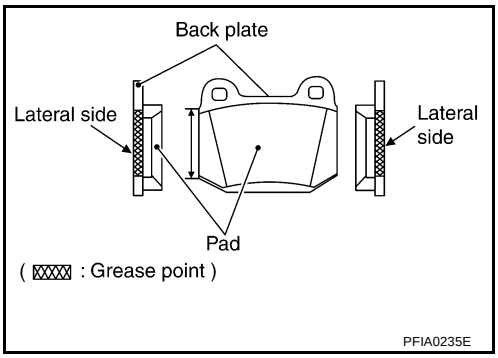
HOW TO APPLY GREASE TO THE BRAKE PAD

Pad Side

Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease about 0.5 g (0.018 oz) per surface equally to back plate side of Inner Pad and Outer Pad. (Refer to the figure)

CAUTION:

Make sure no foreign matter attaches itself to the grease.



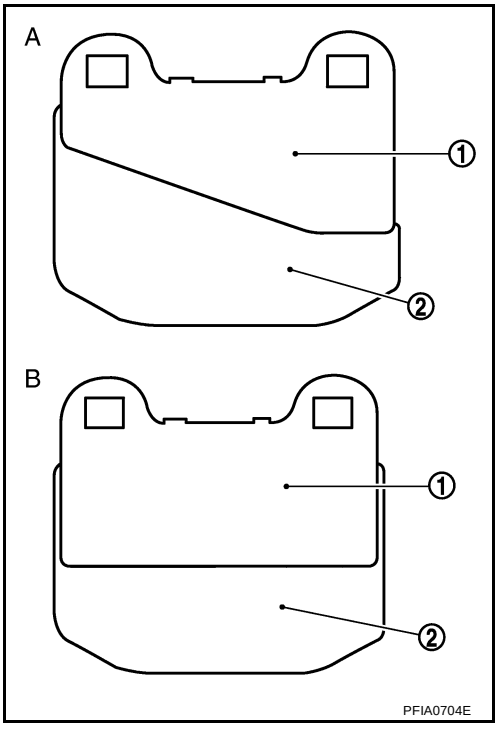
Pad Rear

Apply approximately 1.5 g (0.053 oz) of PBC (Poly Butyl Cuprysil) grease or silicone -based grease between shim cover (1) and pad (2).

- A: Outer side
- B: Inner side

CAUTION:

Make sure no foreign matter attaches itself to the grease.



INSTALLATION

1. Insert the piston to the position where the pad is attached.

   NOTE:

   Using a disc brake piston tool (commercial service tool), etc., makes it easier to push in the piston.

   CAUTION:

   Pushing the piston in will make the brake fluid return to the master cylinder reservoir tank, so watch the level of the surface of the reservoir tank.

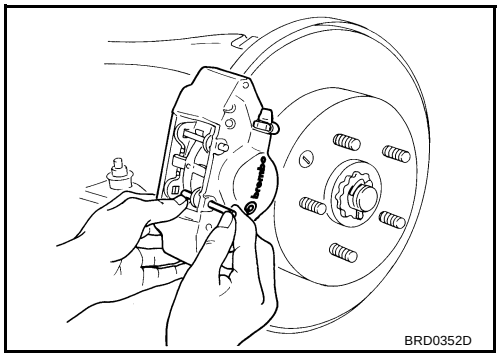
2. Attach pad and shim cover.

CAUTION:
Attach the pad with wear sensor to the outer side.

3. Insert the upper pad pin from the outer cylinder side, then insert firmly to the inner cylinder side through the hole in the top of the pad.
4. As shown in the figure, place the top of the cross spring over the top pad pin, press in the cross spring, push the lower pad pin from the outer cylinder side to the inner cylinder side, and secure the cross spring.
5. Insert the clip in the small hole at the end of the pad pin.

CAUTION:
If the clip is not fully attached, the pad pin or the pad could fall out while the vehicle is in motion.

6. Install tires to vehicle.



Removal and Installation of Brake Caliper Assembly (Other than Brembo Calipers)

NFS00012

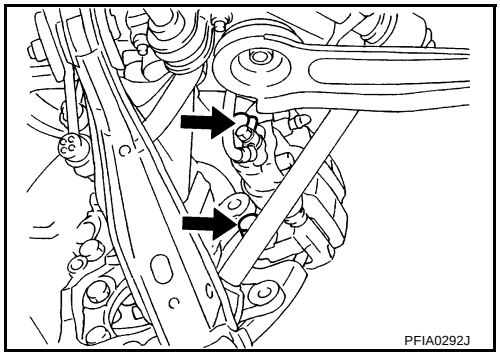
REMOVAL

1. Remove tires from vehicle with a power tool.
2. Fasten disc rotor using wheel nut.
3. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
4. Remove union bolts then disconnect brake hose from caliper assembly and torque member bolts, and remove caliper assembly.

CAUTION:
Do not drop brake pad.

5. Remove disc rotor.

CAUTION:
Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove disc rotor.



INSTALLATION

CAUTION:

- **Refill with new brake fluid “DOT 3”.**
- **Do not reuse drained brake fluid.**

1. Install disc rotor.

CAUTION:
Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.

2. Install caliper assembly to the vehicle, and tighten torque member mounting bolts to the specified torque.

CAUTION:
Before installing caliper assembly to the vehicle, wipe off oil and grease on washer seats on axle assembly and mounting surface of caliper assembly.

3. Install L-shape pin of brake hose to caliper assembly and tighten union bolts to the specified torque.

CAUTION:

- **Do not reuse the copper washer for union bolts.**
- **Securely attach brake hose to protrusion on caliper assembly.**

4. Insert new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .
5. Check rear disc brake for drag.
6. Install tires to vehicle.

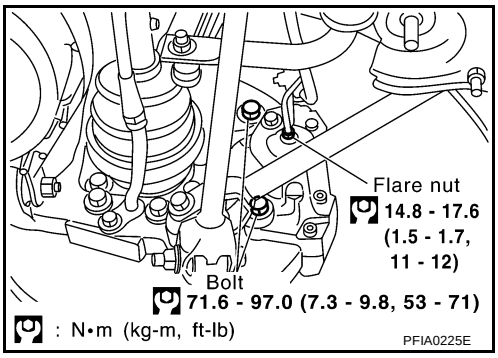
Removal and Installation of Brake Caliper Assembly (With Brembo Calipers)

NFS00017

REMOVAL

1. Remove tires from vehicle with a power tool.
2. Drain brake fluid. Refer to BR-10, "Drain and Refill" .
3. Remove the brake pad. Refer to BR-42, "Removal and Installation of Brake Pad (With Brembo Calipers)" .
4. Remove the brake tube flare nut using a flare wrench.
5. Remove the brake hose bolt, move the brake hose, and remove the caliper assembly from the vehicle.
6. Remove disc rotor.

CAUTION:
Put matching marks on wheel hub assembly and disc rotor, if it is necessary to remove disc rotor.



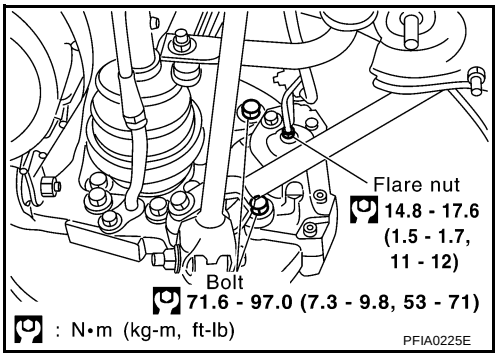
INSTALLATION

CAUTION:
- **Refill with new brake fluid “DOT 3”.**
- **Do not reuse drained brake fluid.**

1. Install disc rotor.

CAUTION:
Put alignment marks on disc rotor and wheel hub at the time of removal when reusing disc rotor.

2. Install the brake tube to the caliper assembly and partially tighten the flare nut.
3. Install the caliper assembly to the vehicle and tighten the bolt to the specified torque.
4. Tighten the flare nut to the specified torque.
5. Install brake pad and shim. Refer to BR-42, "Removal and Installation of Brake Pad (With Brembo Calipers)" .
6. Refill new brake fluid and bleed air. Refer to BR-11, "Bleeding Brake System" .
7. Install tires to vehicle.



Disassembly and Assembly of Brake Caliper Assembly (Other than Brembo Calipers)

NFS00013

NOTE:
Do not remove torque member, pads, shims, shim cover and pad retainers when disassembling and assembling cylinder body assembly.

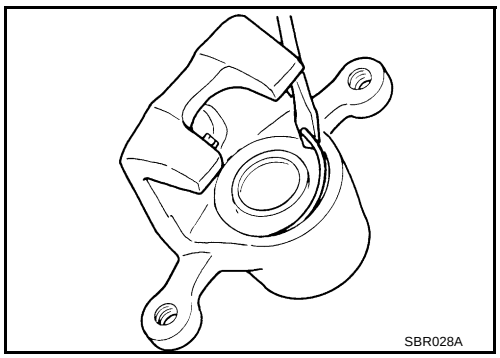
DISASSEMBLY

1. Remove the slide pin bolt, and then remove cylinder body from torque member.

CAUTION:
Do not drop pads, shims, shim covers and pad retainers from torque member.

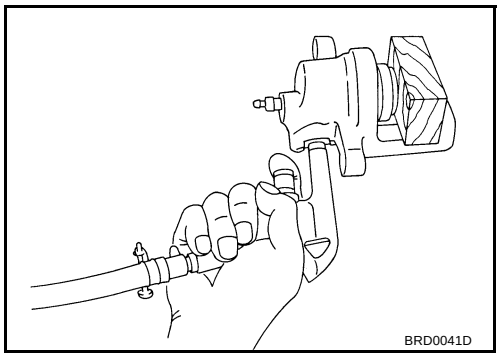
2. Remove sliding pin boot from torque member.

3. As shown in the figure, using a flat-bladed screwdriver, remove the retaining ring from the cylinder body.


SBR028A

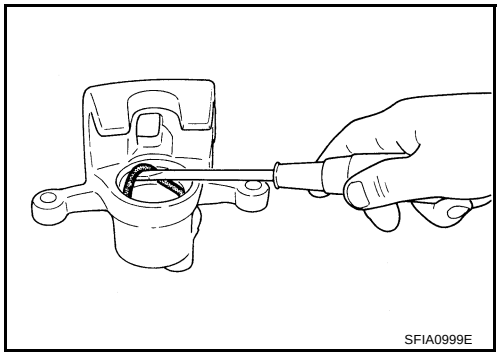
4. Place a wooden block as shown in the figure, and blow air from union bolt mounting hole to remove pistons and piston boots.

CAUTION:
Do not get fingers caught in the piston.


BRD0041D

5. Using a flat-bladed screwdriver, remove piston seals from cylinder body.

CAUTION:
Be careful not to damage cylinder inner wall.


SFIA0999E

CALIPER INSPECTION

Cylinder Body

CAUTION:

- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check inner wall of cylinder for corrosion, wear, and damage. If any non-standard condition is detected, replace cylinder body.**
- **Minor flaws caused by corrosion or a foreign material can be removed by polishing the surface with a fine sandpaper. Replace the cylinder body, if necessary.**

Torque Member

Check for wear, cracks, and damage. If damage or deformation is present, replace the affected part.

Piston

CAUTION:
Since the piston surface is plated, do not repair using sandpaper.
Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.

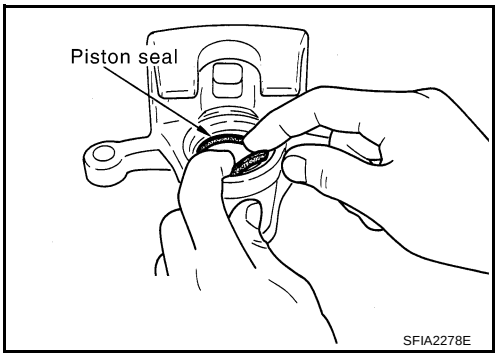
Sliding Pin Bolts and Sliding Pin Boots

Check that there is no wear, damage, or cracks in the sliding pin bolts and sliding pin boots, and if there are, replace them.

ASSEMBLY

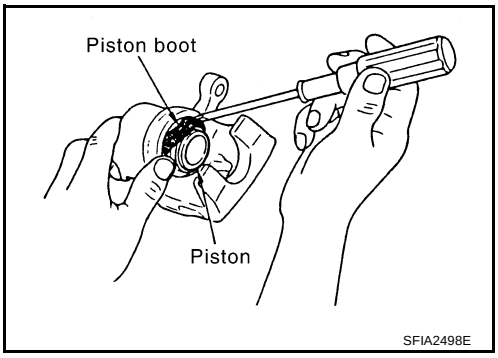
1. Apply polyglycol ether based lubricant to the piston seal, and install them to the cylinder body.

   CAUTION:
   Do not reuse piston seal.



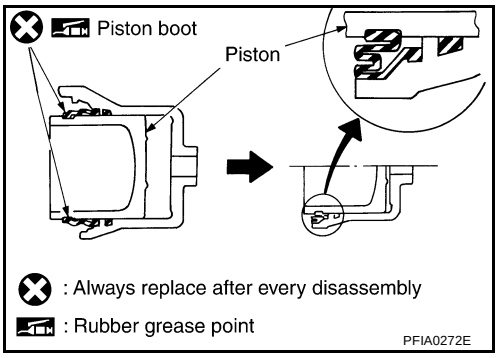
2. Apply rubber grease to piston boot. Cover the piston end with the piston boot, and then install cylinder slide lip on the piston boot securely into the groove on cylinder body.

   CAUTION:
   Do not reuse the piston boot.



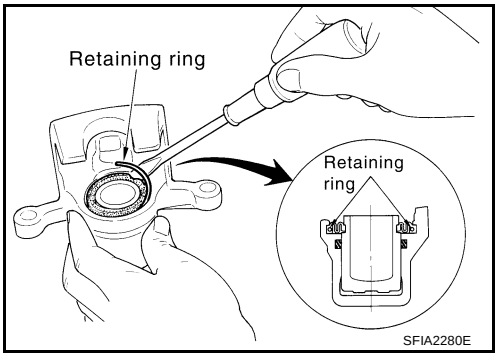
3. Apply a brake fluid to the piston, insert into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

   CAUTION:
   Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



4. Fix piston boot with retaining ring.

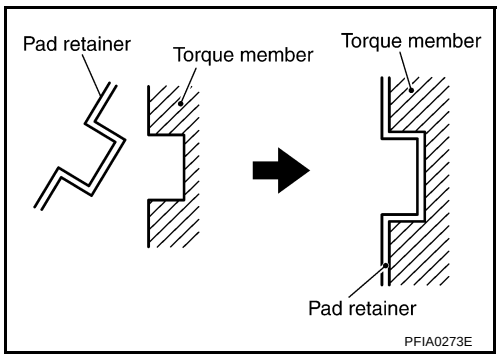
   CAUTION:
   - **Make sure the boot is firmly in the cylinder body groove.**
   - **Do not reuse the retaining ring.**



5. Install the sliding pin bolt and sliding pin boot to the torque member.
6. Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the rear of the pad and to both sides of the shim, and attach the inner shim and shim cover to the inner pad, and the outer shim to the outer pad.

7. Install the pad retainers and pads to the torque member.

CAUTION:
When attaching the pad retainer, attach it firmly so that it does not float up higher than the torque member, as shown in the figure.



8. After assembling shims and shim cover to pad, install it to the torque member.
9. Install cylinder body. Tighten sliding pin bolts to the specified torque. Refer to BR-40, "Components" .

DISC ROTOR INSPECTION

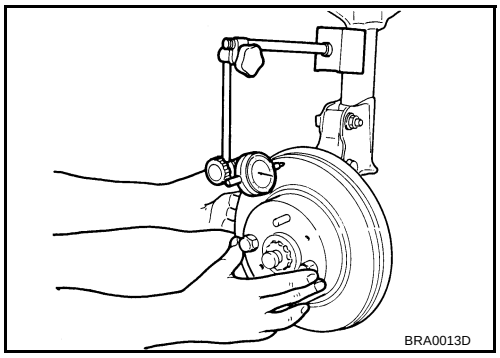
Visual Inspection

Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)
Measurement position:
At a point 10 mm (0.39 in) from outer edge of the disc
Runout limit (with it attached to the vehicle):
0.055 mm (0.0022 in) or less
Runout limit (just the disc rotor):
0.020 mm (0.008 in) or less



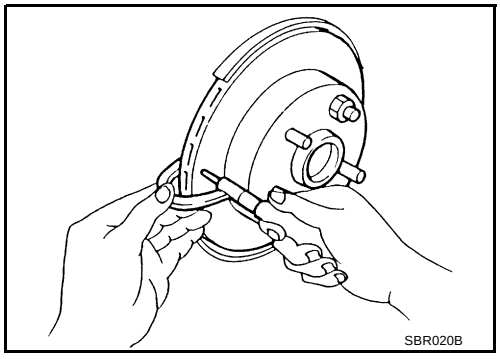
NOTE:
Make sure that wheel bearing axial end play is with in the specification before measuring runout. Refer to RAX-6, "On-Vehicle Inspection" .

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.
4. If runout is still outside the limit after performing the above operation, replace or lathe the disc rotor. [When lathing, use the Pro–Cut PFM On–Car Brake Lathe (Tool No. 38–PFM90.5) or equivalent.]

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.

Standard
Standard thickness : 16.0 mm (0.630 in)
Wear limit : 14.0 mm (0.551 in)
Maximum uneven wear (measured at 8 positions)
: 0.015 mm (0.0006 in) or less



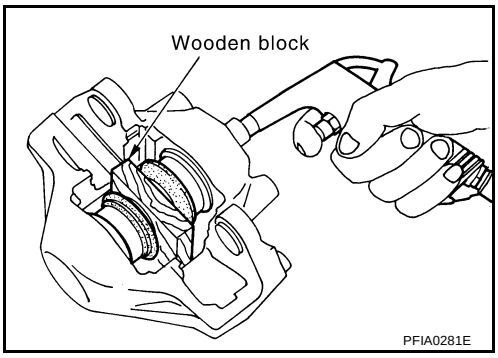
Disassembly and Assembly of Brake Caliper Assembly (With Brembo Calipers)

NFS00018

DISASSEMBLY

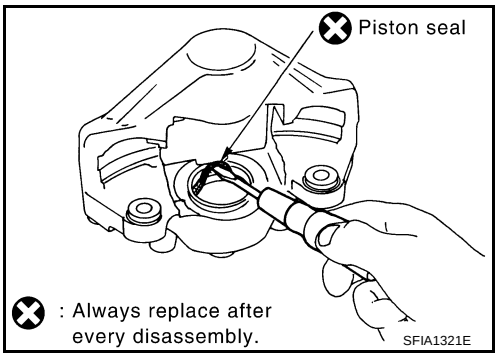
1. Insert a piece of wood as shown in the figure, blow air in through the flare nut mounting hole, and remove the piston and piston boot.

   CAUTION:
   Do not get fingers caught in the piston.
2. Remove the piston boot from the piston.



3. Using a flat-bladed screwdriver, remove the piston seal.

   CAUTION:
   - **Be careful not to damage cylinder inner wall.**
   - **Never remove the four bolts from the inner and outer sides of the caliper. Do not tighten them further, either.**



CALIPER INSPECTION

Caliper

CAUTION:
- **Use new brake fluid to clean. Never use mineral oils such as gasoline or kerosene.**
- **Check for corrosion, wear, or damage to the cylinder inner wall, and replace the caliper if there are any non-standard conditions.**

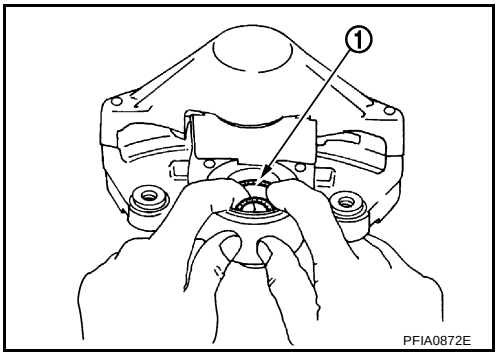
Piston

CAUTION:
- **Since the piston surface is plated, do not repair using sandpaper.**
- **Check piston surface for corrosion, wear, and damage. If any non-standard condition is detected, replace applicable part.**

ASSEMBLY

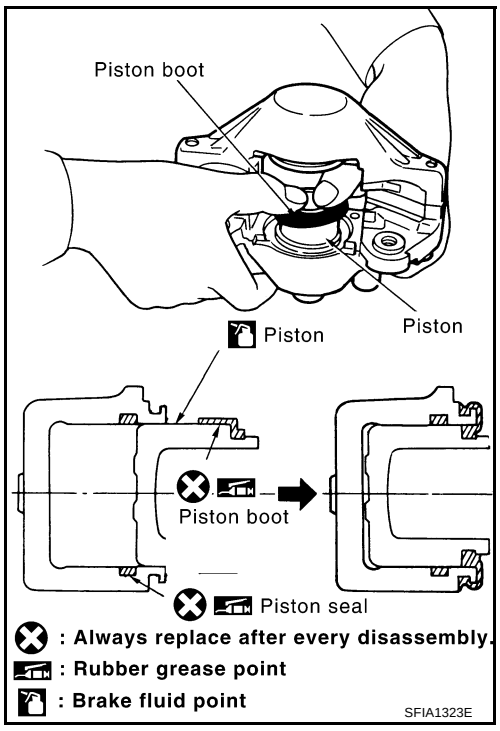
1. Apply polyglycol ether based lubricant to the piston seal (1), and install them to the cylinder body.

   CAUTION:
   Do not reuse piston seal.



2. Apply rubber grease to the piston boot, place it on the piston, and firmly insert the piston boot cylinder-side lip into the cylinder body groove.
3. Insert the piston into the cylinder body by hand and firmly attach the piston boot piston-side lip into the piston groove.

CAUTION:
Press the piston evenly and vary the pressing point to prevent cylinder inner wall from being rubbed.



DISC ROTOR INSPECTION

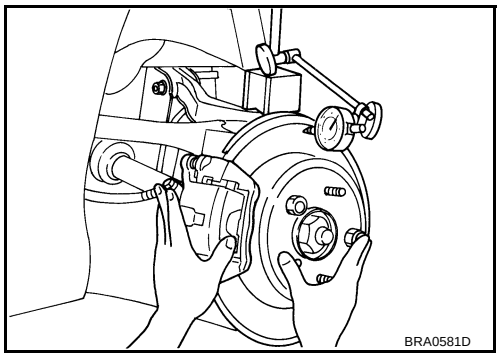
Visual Inspection

Check surface of the disc rotor for uneven wear, cracks, and serious damage. If any non-standard condition is detected, replace applicable part.

Runout Inspection

1. Using wheel nuts, fix disc rotor to the wheel hub. (2 or more positions)
2. Inspect runout using a dial gauge.

Standard value
(measured at 10 mm (0.39 in) inside the disc edge)
Runout limit (with it attached to the vehicle)
: 0.070 mm (0.0028 in) or less
Runout limit (just for disc rotor)
: 0.040 mm (0.0016 in) or less

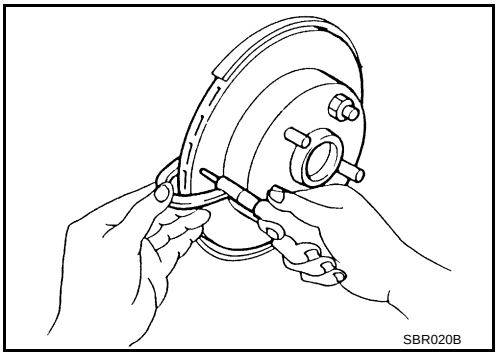


NOTE:
Make sure that wheel bearing axial end play is with in the specification before measuring runout. Refer toRAX-6, "On-Vehicle Inspection" .

3. If runout is outside the limit, find the minimum runout point by shifting mounting positions of the disc rotor and wheel hub by one hole.
4. If runout is still outside the limit after performing the above operation, replace or lathe the disc rotor. [When lathing, use the Pro–Cut PFM On–Car Brake Lathe (Tool No. 38–PFM90.5) or equivalent.]

Thickness Inspection

Using a micrometer, check thickness of the disc rotor. If thickness is outside the standard, replace disc rotor.



Standard

Standard thickness : 22.0 mm (0.866 in)

Wear limit : 20.2 mm (0.795 in)

Maximum uneven wear (measured at 8 positions)

: 0.015 mm (0.0020 in) or less

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NFS00019

Unit: mm (in)

Brake model			Other than brembo	With brembo
Front brake	Rotor outer diameter × thickness		320 × 28.0 (12.60 × 1.102)	324 × 30.0 (12.76 × 1.181)
	Pad length × width × thickness		130.0 × 50.0 × 11.0 (5.12 × 1.97 × 0.43)	117.1 × 53.3 × 9.3 (4.61 × 2.098 × 0.366)
	Cylinder bore diameter		45.0 × 2 (1.772 × 2)	38 (1.50) × 2 + 44 (1.73) × 2
Rear brake	Rotor outer diameter × thickness		308 × 16 (12.13 × 0.63)	322 × 22 (12.68 × 0.87)
	Pad length × width × thickness		83.0 × 31.9 × 8.5 (3.27 × 1.26 × 0.335)	76.6 × 45 × 9.1 (3.016 × 1.77 × 0.358)
	Cylinder bore diameter		42.86 (1.6874)	40.0 × 2 (1.575)
Master cylinder	Cylinder bore diameter		26.99 (1.0626)	
Control valve	Valve type		Electric brake force distribution	
Brake booster	Diaphragm diameter	Coupe	255 (10.04)	Pri: 230 (9.06) Sec: 205 (8.07)
		Roadster	Pri: 230 (9.06) Sec: 205 (8.07)	Pri: 230 (9.06) Sec: 205 (8.07)
Recommended brake fluid			DOT 3	

Brake Pedal

NFS0001A

Brake pedal height (from dash lower panel top surface)	M/T models	153.2 – 163.2 mm (6.03 – 6.43 in)
	A/T models	161.5 – 171.5 mm (6.36 – 6.75 in)
Depressed pedal height [under a force of 490 N (50 kg, 110 lb) with the engine running]	M/T models	More than 90 mm (3.54 in)
	A/T models	More than 95 mm (3.74 in)
Clearance between threaded end of the stop lamp switch/ASCD cancel switch and stopper rubber		0.74 – 1.96 mm (0.0291 – 0.0772 in)
Pedal play		3 – 11 mm (0.12 – 0.43 in)

Brake Booster

NFS0001B

Vacuum leakage [at vacuum of –66.7 kPa (–500 mmHg, –19.69 inHg)]		Within 3.3 kPa (25 mmHg, 0.98 inHg) of vacuum for 15 seconds
Output rod length	With TCS	10.4 mm (0.409 in)
	With VDC	–6.2 mm (–0.244 in)
Input rod length		125 mm (4.92 in)

Check Valve

NFS0001C

Vacuum leakage [at vacuum of –66.7 kPa(–500 mmHg, –19.69 inHg)]	Within 1.3 kPa (10 mmHg, 0.39 inHg) of vacuum for 15 seconds

Front Disc Brake

NFS0001D

Brake model		Other than brembo	With brembo
Brake pad	Standard thickness (new)	11.0 mm (0.433 in)	9.3 mm (0.366 in)
	Repair limit thickness	2.0 mm (0.079 in)	2.0 mm (0.079 in)
Disc rotor	Standard thickness (new)	28.0 mm (1.102 in)	30.0mm (1.181 in)
	Repair limit thickness	26.0 mm (1.024 in)	28.4mm (1.118 in)
	Maximum uneven wear (measured at 8 positions)	0.015mm (0.0006 in) or less	0.015 mm (0.0006 in) or less
	Runout limit (with it attached to the vehicle)	0.035 mm (0.0014 in) or less	0.040 mm (0.0016 in) or less
	Runout limit (just the disc rotor)	0.020 mm (0.0008 in) or less	0.040 mm (0.0016 in) or less

Rear Disc Brake

NFS0001E

Brake model		Other than brembo	With brembo
Brake pad	Standard thickness (new)	8.5 mm (0.335 in)	9.1 mm (0.358 in)
	Repair limit thickness	2.0 mm (0.079 in)	2.0 mm (0.079 in)
Disc rotor	Standard thickness (new)	16.0 mm (0.630 in)	22.0 mm (0.866 in)
	Repair limit thickness	14.0 mm (0.551 in)	20.2 mm (0.795 in)
	Maximum uneven wear (measured at 8 positions)	0.015 mm (0.0006 in) or less	0.015 mm (0.0006 in) or less
	Runout limit (with it attached to the vehicle)	0.055 mm (0.0022 in) or less	0.070 mm (0.0028 in) or less
	Runout limit (just the disc rotor)	0.020 mm (0.008 in) or less	0.040 mm (0.0016 in) or less

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BRAKE CONTROL SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NFS0001M

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

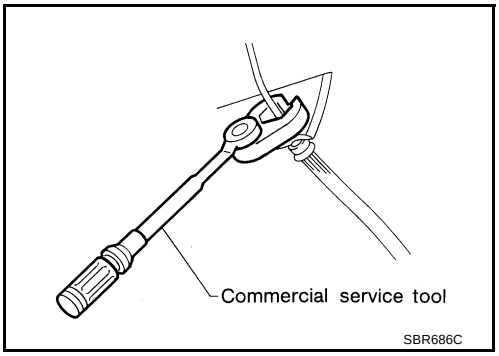
NFS0001N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0001O

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene to clean. They will ruin rubber parts and cause improper operation.
- Use a flare nut wrench when removing flare nuts, and use a flare nut crowfoot and torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of ABS actuator and electric unit (control unit) or the battery negative terminal.



WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precautions for Brake Control

NFS0001P

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

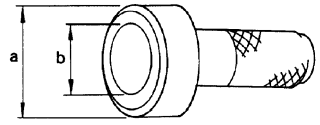
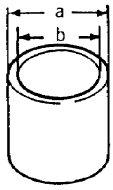
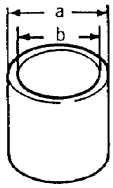
PREPARATION

PFP:00002

Special Service Tools

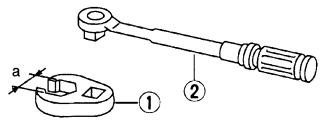
NFS0001Q

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	
KV40104710 (—) Drift a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0001R

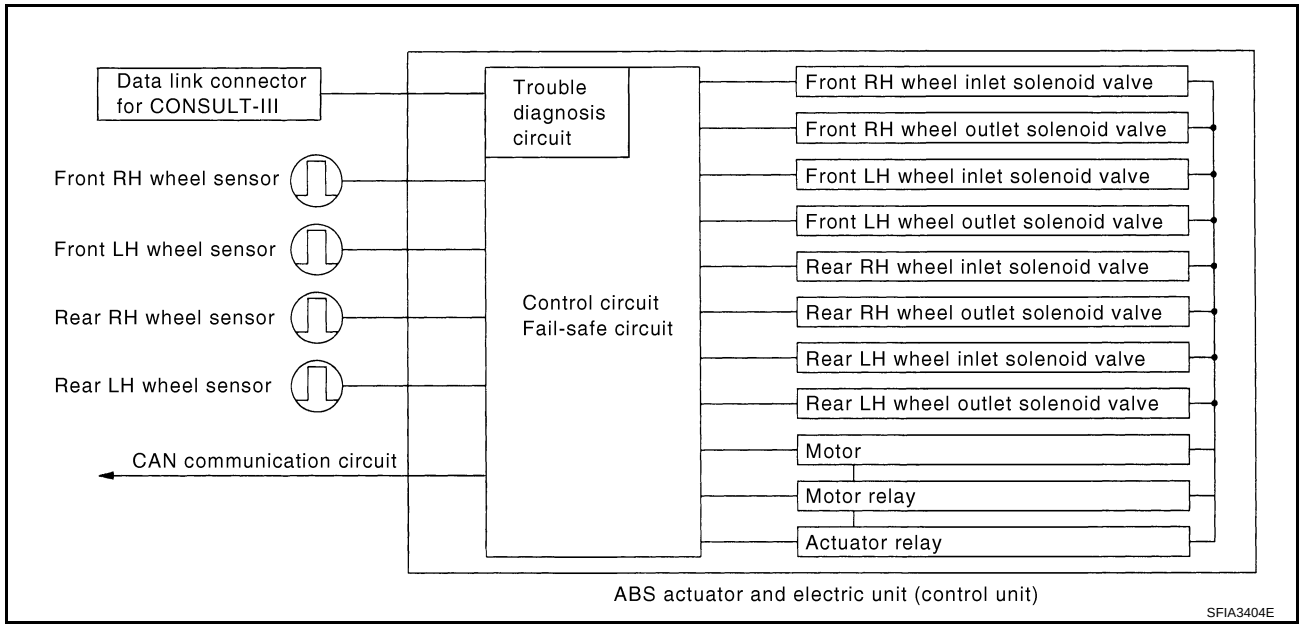
Tool name		Description
1. Flare nut crowfoot a: 10 mm (0.39 in) / 12 mm (0.47 in) 2. Torque wrench	 S-NT360	Installing brake tube

SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0001S



ABS Function

NFS0001T

- The Anti-Lock Braking System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-III is available.

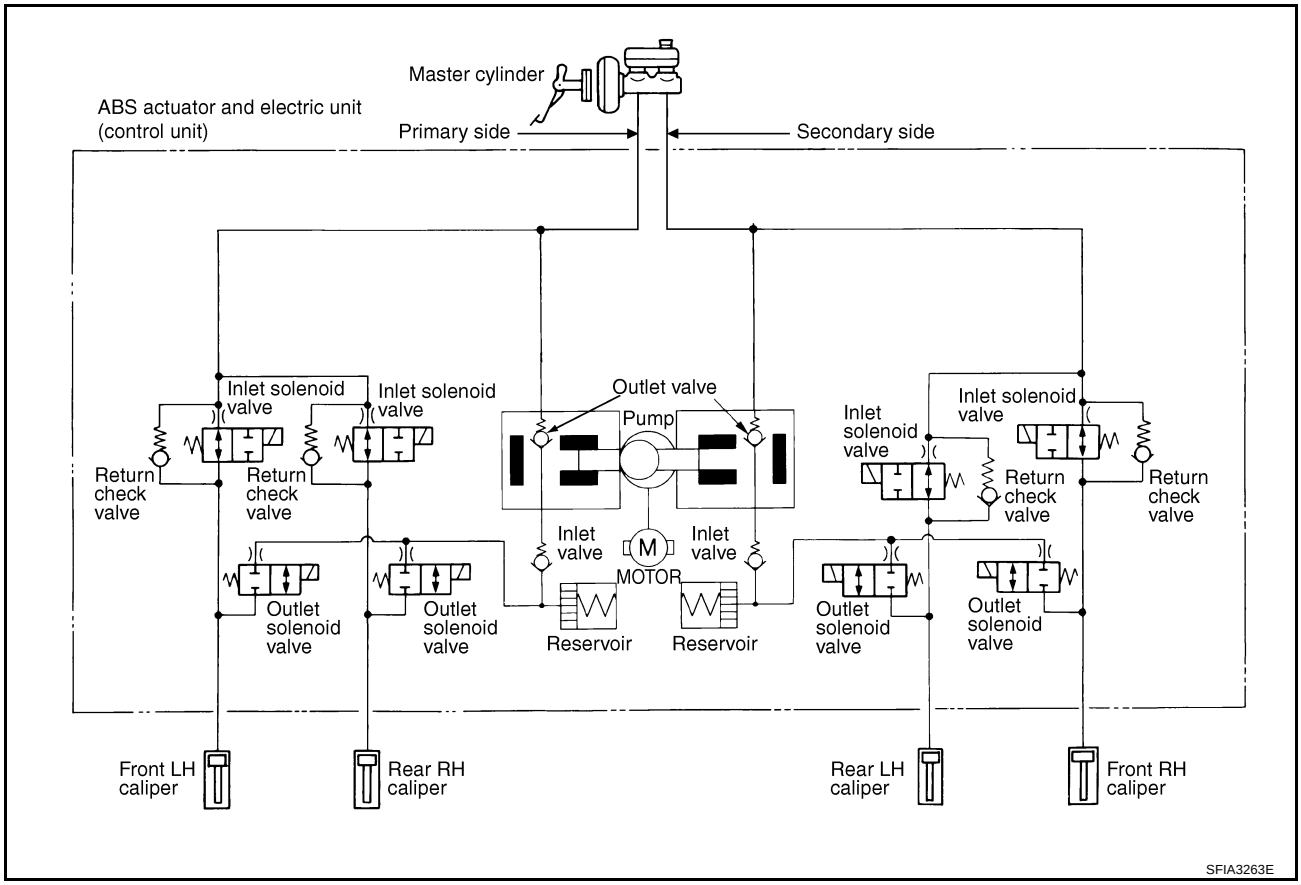
EBD Function

NFS0001U

- Electronic Brake Distribution is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-III is available.

Hydraulic Circuit Diagram

NFS0001W



CAN Communication

NFS0001X

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000II

ABS, EBD SYSTEM

In case of electrical problems with the ABS, the ABS warning lamp will turn on. In case of electrical problems with the EBD, brake warning lamp, ABS warning lamp will turn on. Simultaneously, the ABS become one of the following conditions of the Fail-Safe function.

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicle without ABS equipment.

  NOTE:
  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.
- For EBD trouble, The EBD and ABS become inoperative, are the condition of the vehicle is the same as the condition of vehicles without ABS, EBD equipment.

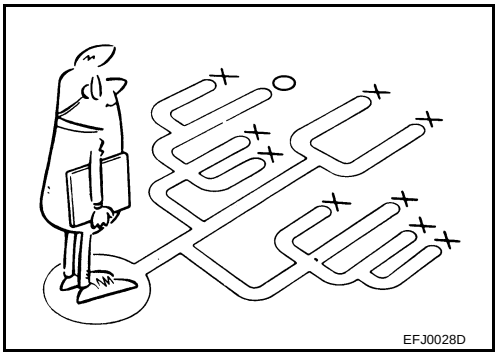
How to Proceed with Diagnosis

NFS0001Y

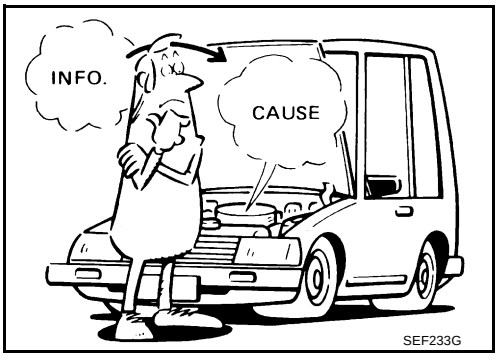
BASIC CONCEPT

- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.
- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


EFJ0028D

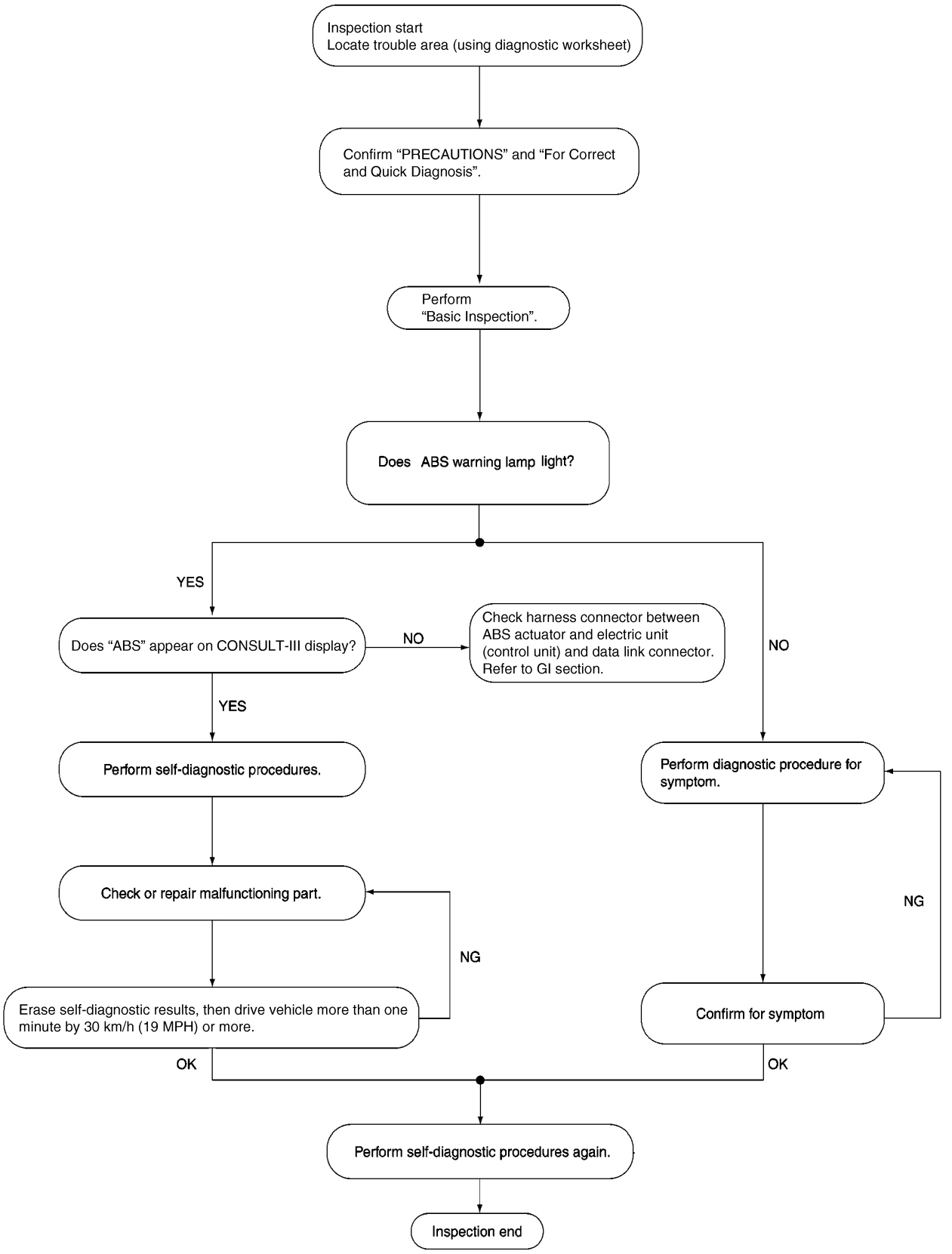
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-19, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-3, "General Precautions" .

DIAGNOSIS FLOWCHART



SFIA3405E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

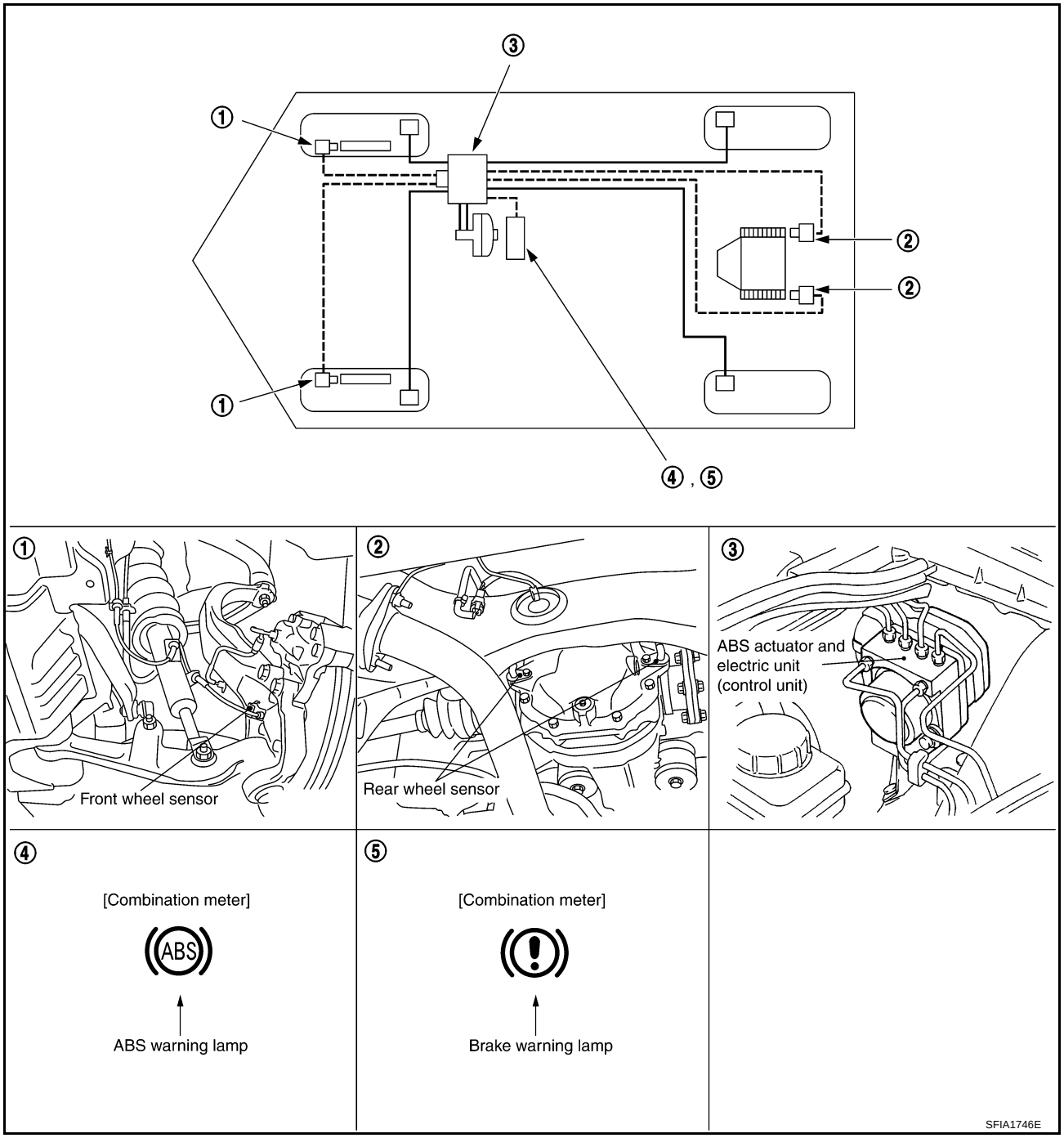
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ ABS does not work (Wheels lock when braking)	☐ Lack of sense of acceleration	
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA3264E

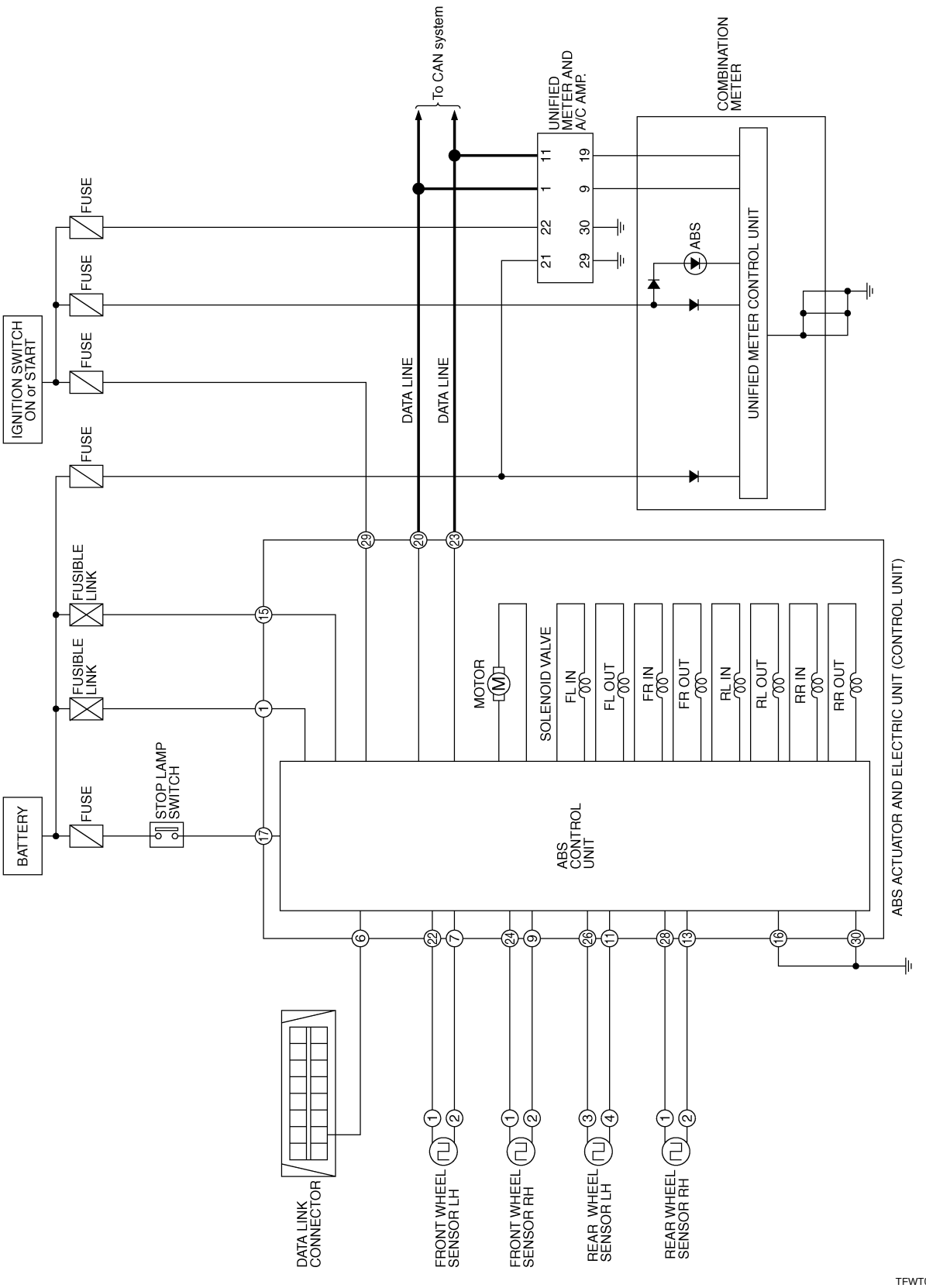
Component Parts Location

NFS0001Z



Schematic

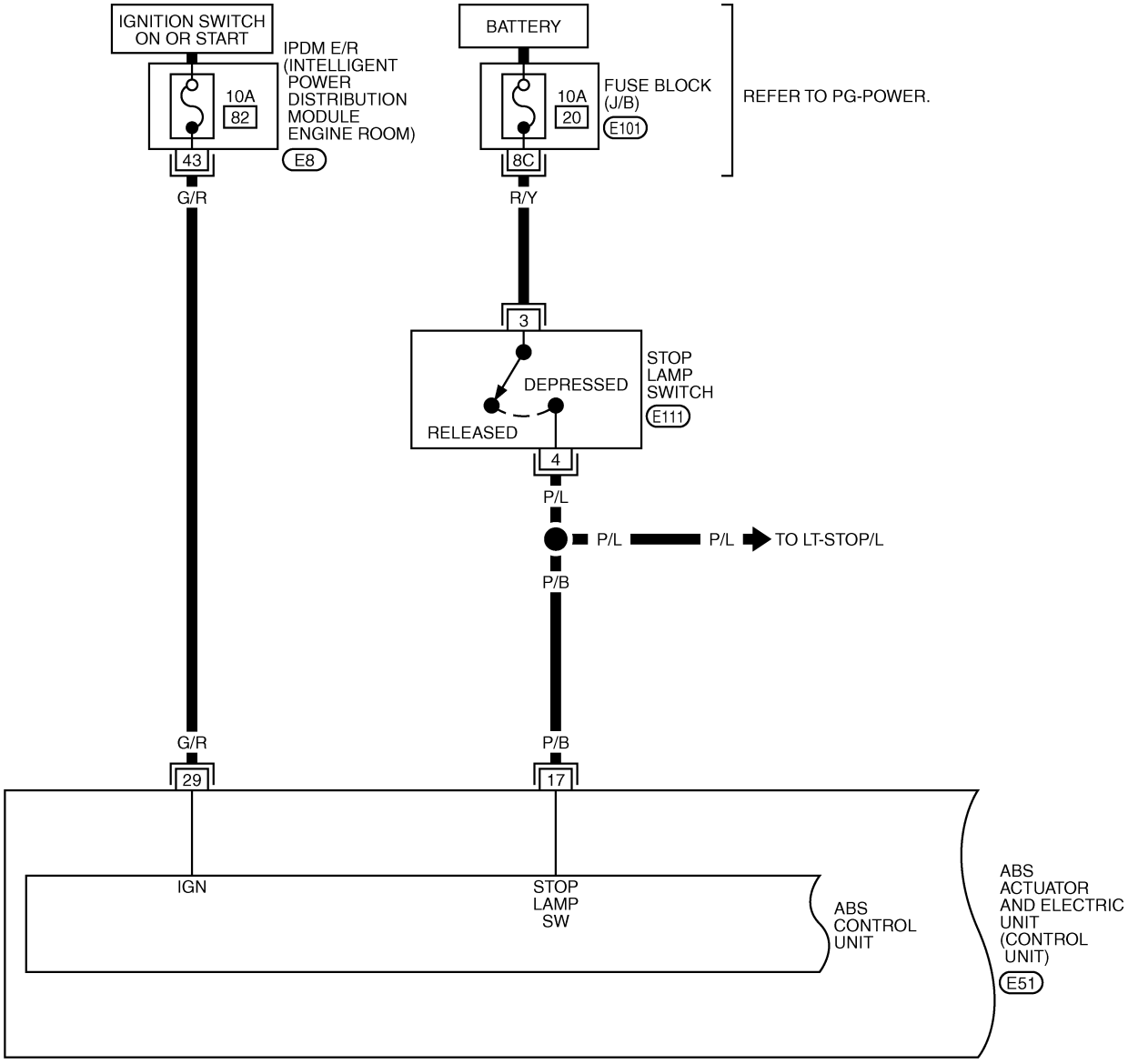
NFS00020

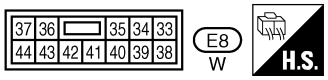


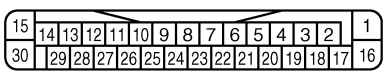
Wiring Diagram — ABS —

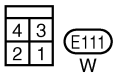
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BRC-ABS-01







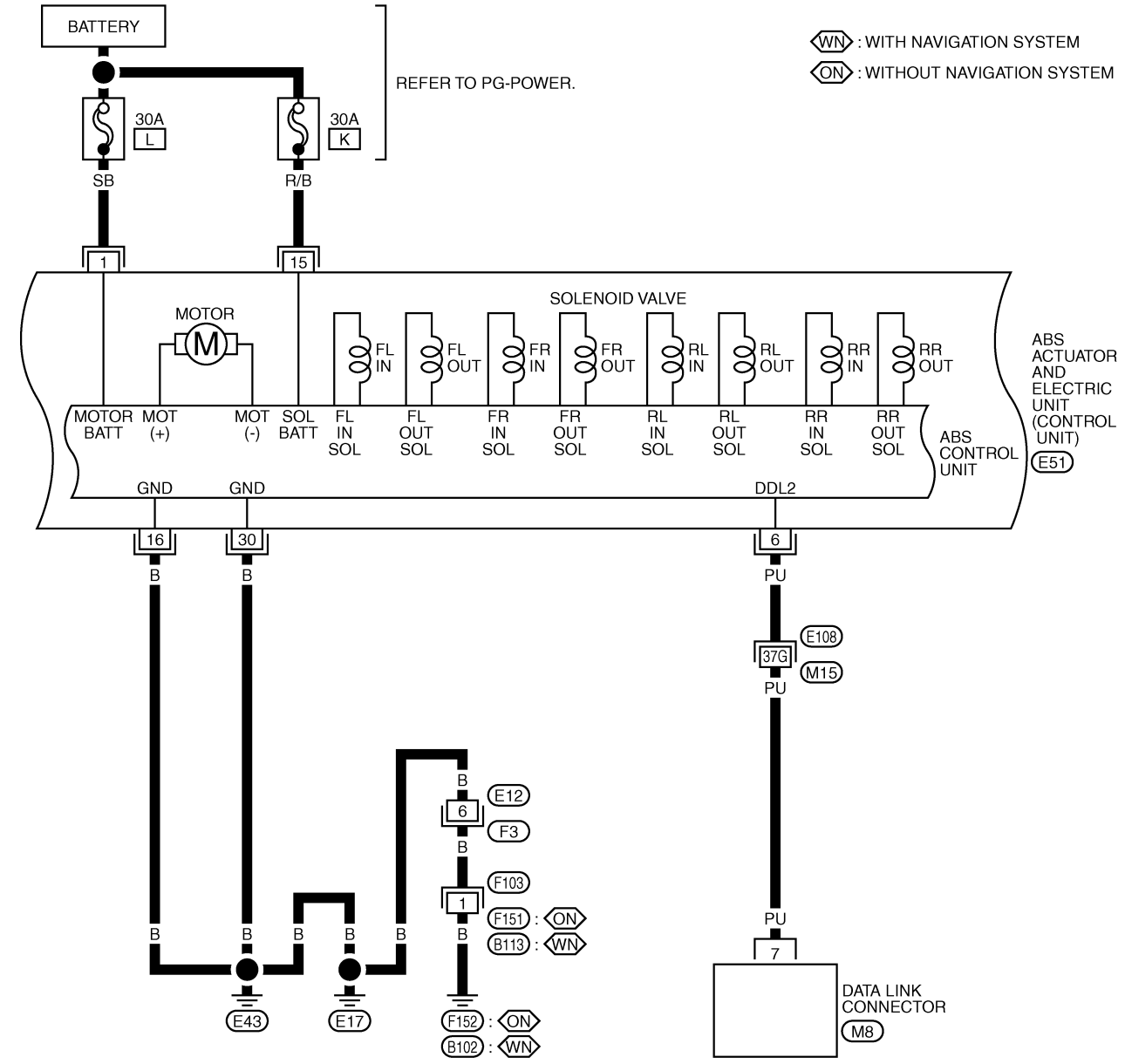


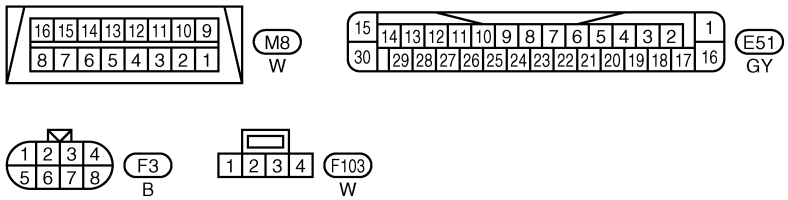
REFER TO THE FOLLOWING.

E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0376E

BRC-ABS-02

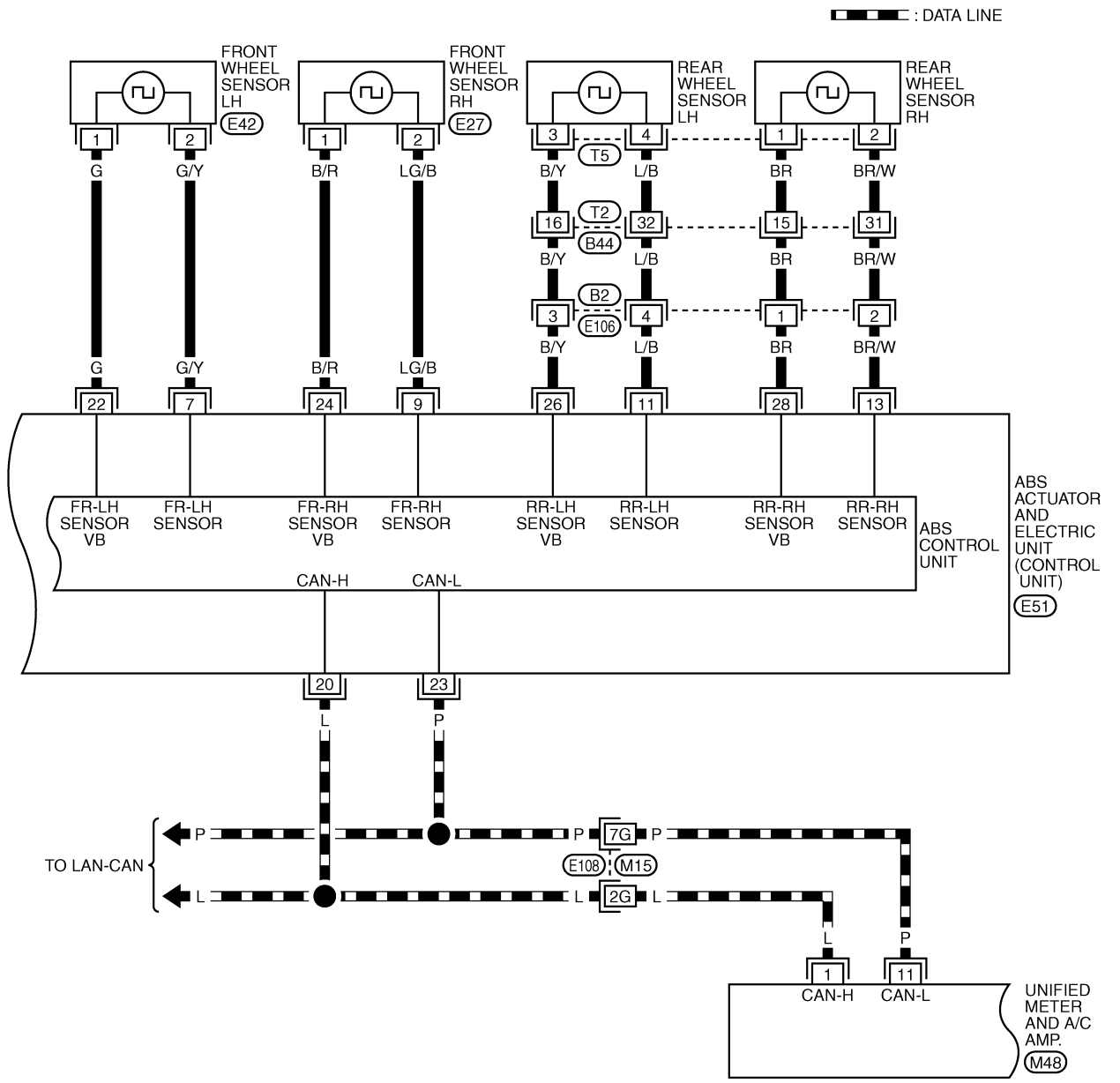


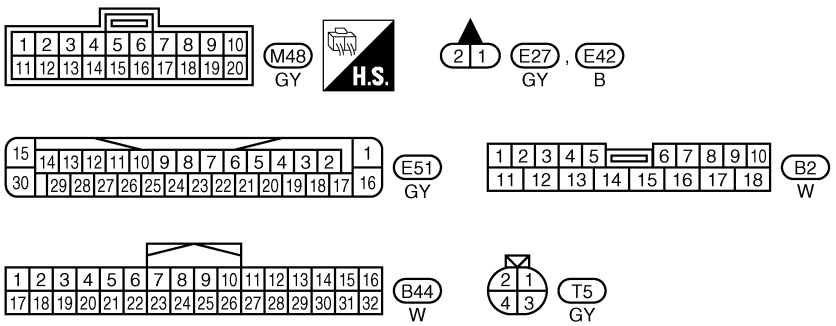


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0365E

BRC-ABS-03

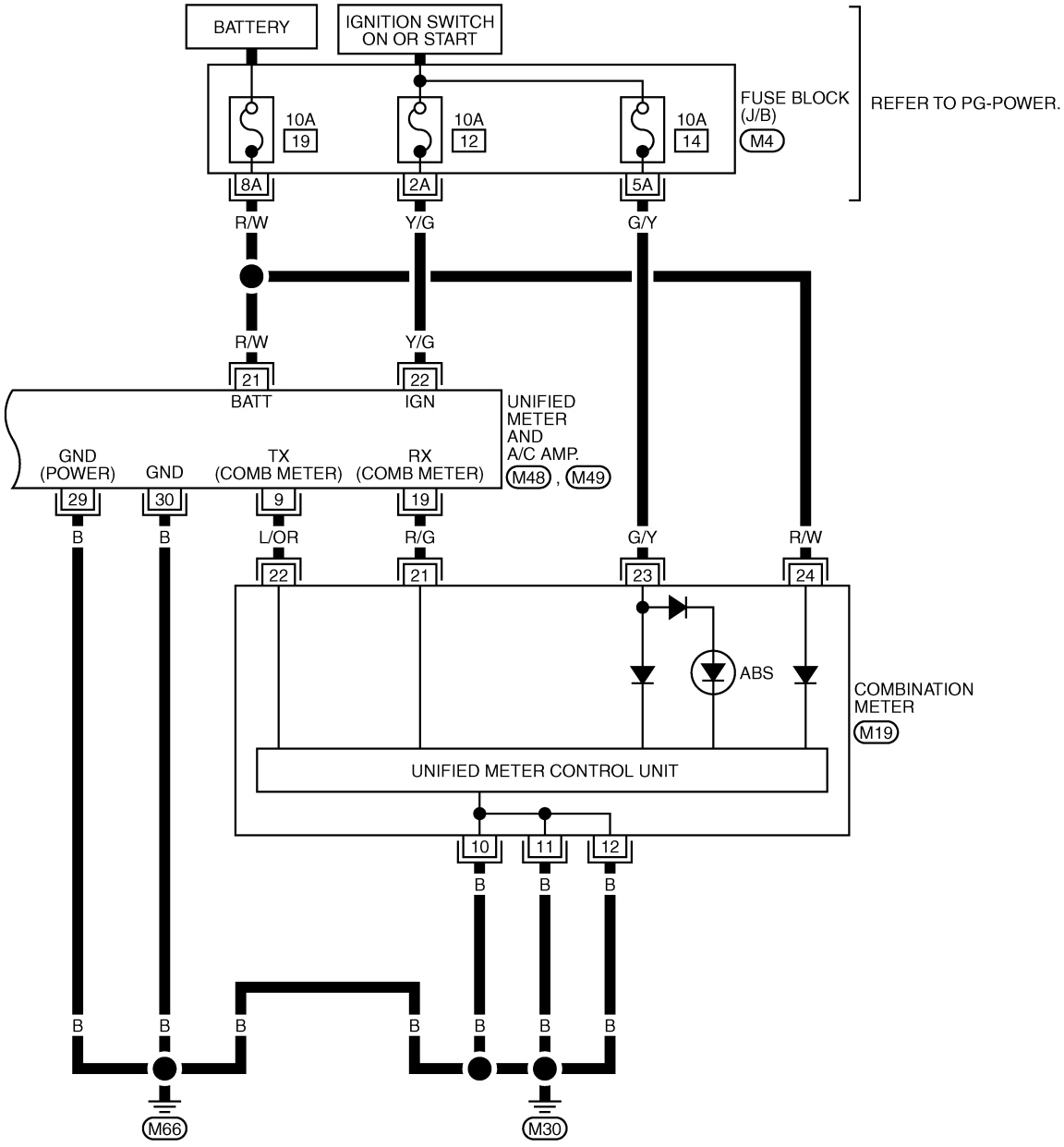


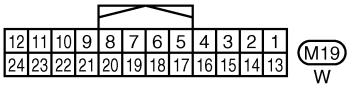


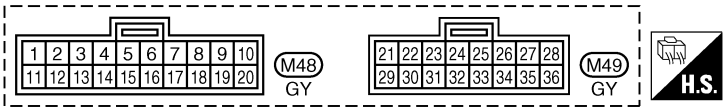
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0366E

BRC-ABS-04







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0046E

Control Unit Input/Output Signal Standard

NFS00022

REFERENCE VALUE FROM CONSULT-III

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
WHEEL SENSOR	Wheel speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)
		While driving (Note 1)	Nearly matches the speedometer display (± 10% or less)
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON
		When the actuator relay operates and the actuator solenoid does not operate	OFF
EBD WARN LAMP	Brake warning lamp on condition (Note 2)	Brake warning lamp ON	ON
		Brake warning lamp OFF	OFF
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON
		Brake pedal not depressed	OFF
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF
		When the actuator relay is not operating	ON
ABS WARN LAMP	ABS warning lamp on condition (Note 3)	ABS warning lamp ON	ON
		ABS warning lamp OFF	OFF
BATTERY VOLT	Battery voltage supplied to ABS control unit	Ignition switch ON	10 - 16V
GEAR	Determined gear shift position from the A/T PNP switch signal	Driving	M/T vehicles are always left in 1.
ENGINE RPM	Engine running	With engine stopped	0 rpm
		With engine running	Almost in accordance with tachometer display
FAIL SIGNAL	Fail signal status	During ABS fail-safe During EBD fail-safe	ON

Note 1: Confirm tire pressure is normal.
Note 2: Serves as EBD warning lamp.
Note 3: ON/OFF timing of ABS warning lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal).

CONSULT- II Functions (ABS)

NFS00023

CONSULT-III MAIN FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	Reference
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-19, "Self-Diagnosis"
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-21, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-44, "CAN Diagnostic Support Monitor"
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-22, "Active Test"
FUNCTION TEST	Conducted by CONSULT-III instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

Self-Diagnosis

NFS000HD

OPERATION PROCEDURE

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

HOW TO ERASE SELF-DIAGNOSIS RESULTS

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp and brake warning lamp turn OFF.

   CAUTION:

   If memory cannot be erased, perform applicably diagnosis.

   - When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
   - Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-1 [C1101]	When the circuit in the rear RH wheel sensor is open.	BRC-25, "Wheel Sensor System" (Note 1)
RR LH SENSOR-1 [C1102]	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR-1 [C1103]	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR-1 [C1104]	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR-2 [C1105]	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR-2 [C1108]	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-27, "ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-27, "ABS Actuator and Electric Unit (Control Unit)"
MAIN RELAY [C1114]	When the control unit detects an error in the actuator relay system.	BRC-29, "ABS Actuator Relay or ABS Motor Relay Power System"
STOP LAMP SW [C1116]	When a stop lamp switch open-circuit is detected.	BRC-30, "Stop Lamp Switch System"
FR LH IN ABS SOL [C1120]	When the control unit detects an error in the front left inlet solenoid system.	BRC-29, "ABS Actuator Relay or ABS Motor Relay Power System"
FR LH OUT ABS SOL [C1121]	When the control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL [C1122]	When the control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL [C1123]	When the control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL [C1124]	When the control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL [C1125]	When the control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL [C1126]	When the control unit detects an error in the rear right inlet solenoid system.	
RR RH OUT ABS SOL [C1127]	When the control unit detects an error in the rear right outlet solenoid system.	

Display item	Malfunction detecting condition	Check item
EMERGENCY BRAKE [C1153]	When the ABS actuator and electric unit (control unit) malfunctions (pressure increase is too much or too little).	BRC-31, "ABS Actuator and Electric Unit (Control Unit) 2"
CAN COMM CIRCUIT [U1000]	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-31, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HE

DISPLAY ITEM LIST

×: Standard –: Not applicable ▼: Option

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECM INPUT SIGNALS	MAIN SIGNALS	SELECTION MENU	
FR LH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by rear LH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by rear RH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	—	×	▼	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	—	×	▼	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	—	×	▼	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	—	×	▼	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	—	×	▼	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	—	×	▼	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	—	×	▼	Rear left wheel inside ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	—	×	▼	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	—	×	▼	Brake warning lamp (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	×	×	▼	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	—	×	▼	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR RLY (ON/OFF)	—	×	▼	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	—	×	▼	ABS warning lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	▼	The voltage supplied to the ABS control unit is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECM INPUT SIGNALS	MAIN SIGNALS	SELECTION MENU	
EBD SIGNAL (ON/OFF)	—	—	▼	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	—	—	▼	ABS operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	—	—	▼	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	—	—	▼	ABS fail-safe signal (ON/OFF) status is displayed.

Active Test

NFS000IN

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.

TEST ITEM

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

For ABS solenoid valve, touch “UP”, “KEEP”, and “DOWN”.Then use screen monitor to check that solenoid valve operates as shown in the table below.

Operation	ABS solenoid valve		
	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF

ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Correct and Quick Diagnosis

NFS00024

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-19, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	This is the sound of the motor operating inside ABS actuator, and there may be some low sounds while the ABS is operating.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal

ABS WARNING LAMP ON/OFF TIMING

×: ON –: OFF

Condition	ABS warning lamp	Remarks
Ignition switch OFF	—	—
For approximately “1” second after ignition switch ON	×	—
After approximately “1” second after ignition switch ON. (When system is normal)	—	Turns off 2 second after engine start
ABS error	×	When there is an ABS actuator and electric unit error (power or ground error)

Basic Inspection

NFS00025

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around ABS actuator for leaks. If there is leaking or oozing fluid, check following items.
   - If ABS actuator connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or ABS actuator screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than ABS actuator connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at ABS actuator, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace ABS actuator body.

     CAUTION:
     ABS actuator and electric unit (control unit) cannot be disassembled.
3. Check brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

ABS WARNING LAMP INSPECTION

1. Make sure ABS warning lamp turned on approximately 1 second when the ignition switch is turned ON. Check CAN communications. Refer to BRC-31, "CAN Communication System" .
2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. Make sure ABS warning lamp turn off 2 seconds after the engine is started. If ABS warning lamp has not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit.
4. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-19, "HOW TO ERASE SELF-DIAGNOSIS RESULTS"

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS00026

After using the CONSULT-III SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR -1, -2
FR LH SENSOR -1, -2
RR RH SENSOR -1, -2
RR LH SENSOR -1, -2

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK TIRE

Check air pressure, wear, and size.

Are the air pressure, wear, and size within the standard values?

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

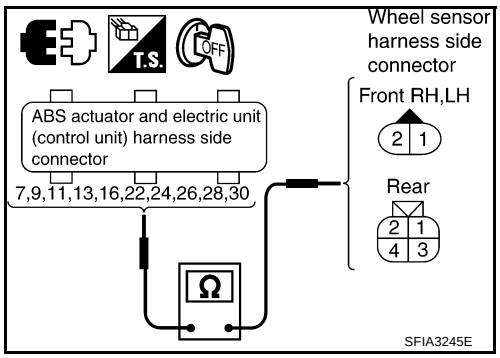
1. Disconnect ABS control unit connector and the malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connector, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect the wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS control unit (control unit) connector E51.
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit) (signal)	ABS actuator and electric unit (control unit) (ground)
Front RH	24	1	9	2	24, 9	16, 30
Front LH	22	1	7	2	22, 7	
Rear RH	28	1	13	2	28, 13	
Rear LH	26	3	11	4	26, 11	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

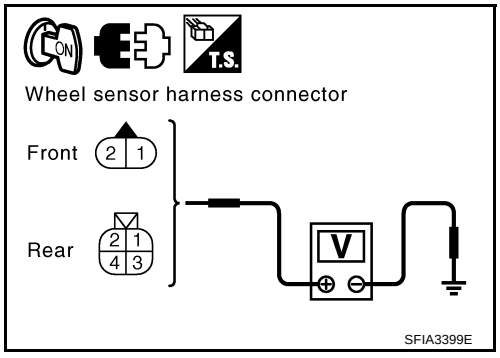
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

6. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Disconnect malfunctioning wheel sensor connector.
2. Turn ignition switch ON and check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH	1	—	8 V or more
Front LH			
Rear RH			
Rear LH	3		



OK or NG

OK >> Replace wheel sensor.
NG >> Replace ABS actuator and electric unit (control unit).

ABS Actuator and Electric Unit (Control Unit)

NFS00028

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit). Re-conduct ABS actuator and electric unit (control unit) self-diagnosis.
NO >> INSPECTION END

ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems

NFS00029

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

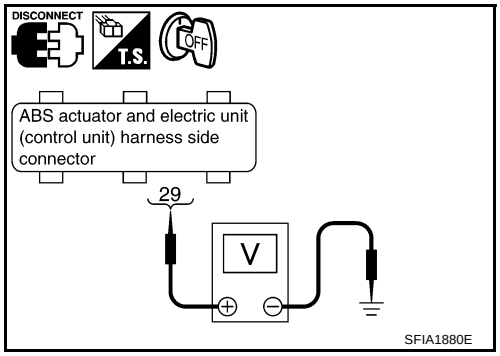
1. Disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, and so on, If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

Is the result of self-diagnosis normal?

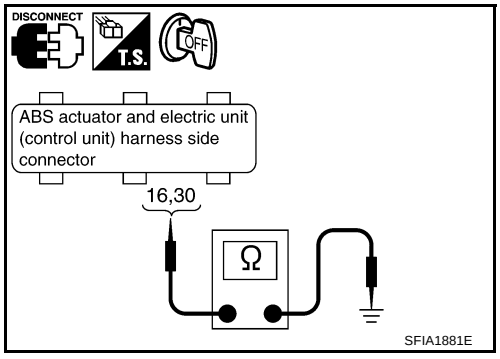
YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER AND GROUND CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check continuity and voltage between connector terminals and ground.



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Voltage
Power supply	29	Ignition switch ON	Battery voltage (Approx. 12 V)
		Ignition switch OFF	Approx. 0 V



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Continuity
Ground	16, 30	Ignition switch OFF	Yes

OK or NG

OK >> Check battery (terminal looseness, power drop, etc.) error. If there is an error, make repairs.
NG >> Corresponding harness circuit error. Repair the circuit.

ABS Actuator Relay or ABS Motor Relay Power System

NFS0002A

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
MAIN RELAY

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector E51, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

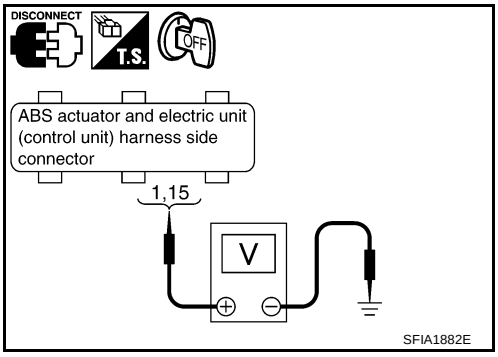
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ABS ACTUATOR RELAY OR ABS MOTOR RELAY POWER CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. For ABS actuator relay, measure the voltage between the connector terminal 1 and ground. For ABS motor relay, measure the voltage between connector terminal 15 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
1, 15	—	Battery voltage (Approx. 12 V)



OK or NG

OK >> GO TO 4
NG >> Error in the circuit between battery and ABS actuator and electric unit (control unit). Repair the circuit.

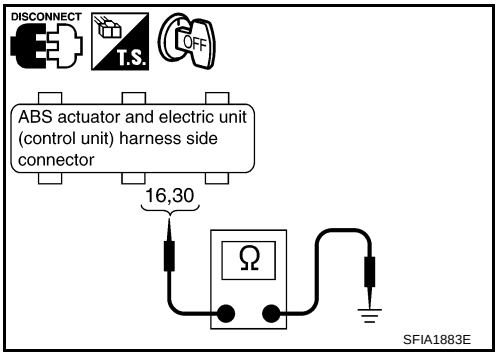
4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
16, 30	—	Yes

OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Open or short in harness. Repair or replace the harness.



Stop Lamp Switch System

NFS0002B

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector E51 and stop lamp switch connector E112, check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.
3. Start engine.
4. Repeat Pumping brake pedal carefully several times, then perform self-diagnosis again.

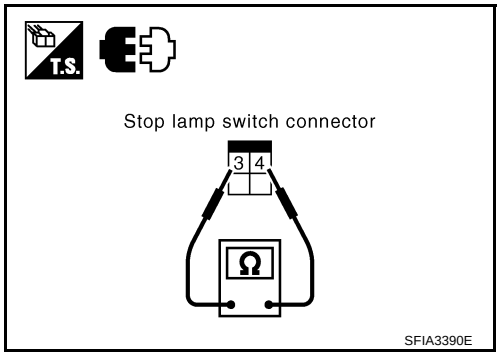
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

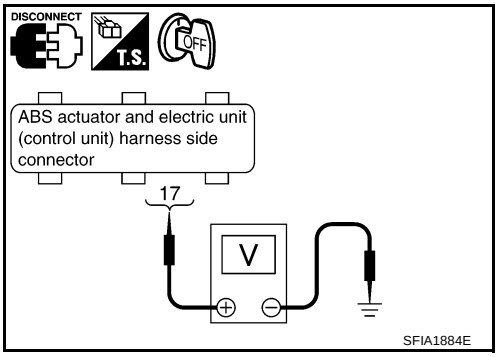


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check voltage between ABS actuator and electric unit (control unit) connector terminal and ground.



ABS actuator and electric unit (control unit)	Ground	Measurement condition	Voltage
17	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> INSPECTION END
NG >> Open or short in harness between ABS actuator and electric unit and stop lamp switch. Repair or replace the harness.

ABS Actuator and Electric Unit (Control Unit) 2

NFS0002C

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit).
NO >> INSPECTION END

CAN Communication System

NFS0002D

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-48, "CAN System Specification Chart" .
NO >> Connector terminal connector is loose, damaged, open, or shorted.

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0002E

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system.

2. CHECK FRONT AND REAR AXLE

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. CHECK WHEEL SENSOR AND SENSOR ROTOR

Wheel Sensor Inspection

- Wheel sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Wheel sensor connector connection inspection
- Wheel sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-19, "OPERATION PROCEDURE" .

Unexpected Pedal Reaction

NFS0002F

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

YES >>
- Bleed air from the brake piping.
- Check brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repairs.

NO >> GO TO 2.

2. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector, and make sure the braking force is sufficient when the ABS is not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-32, "Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

The Braking Distance is Long

NFS0002G

CAUTION:
On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-32, "Excessive ABS Function Operation Frequency" .

NG >>
- Bleed air from the brake piping.
- Check brake system.

The ABS Function Does Not Operate

NFS0002H

CAUTION:
The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-32, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-19, "OPERATION PROCEDURE" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0002I

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

Does the symptom occur?

YES >> GO TO 2.

NO >> Perform self-diagnosis. Refer to BRC-19, "OPERATION PROCEDURE" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.

NO >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-32, "Excessive ABS Function Operation Frequency" .

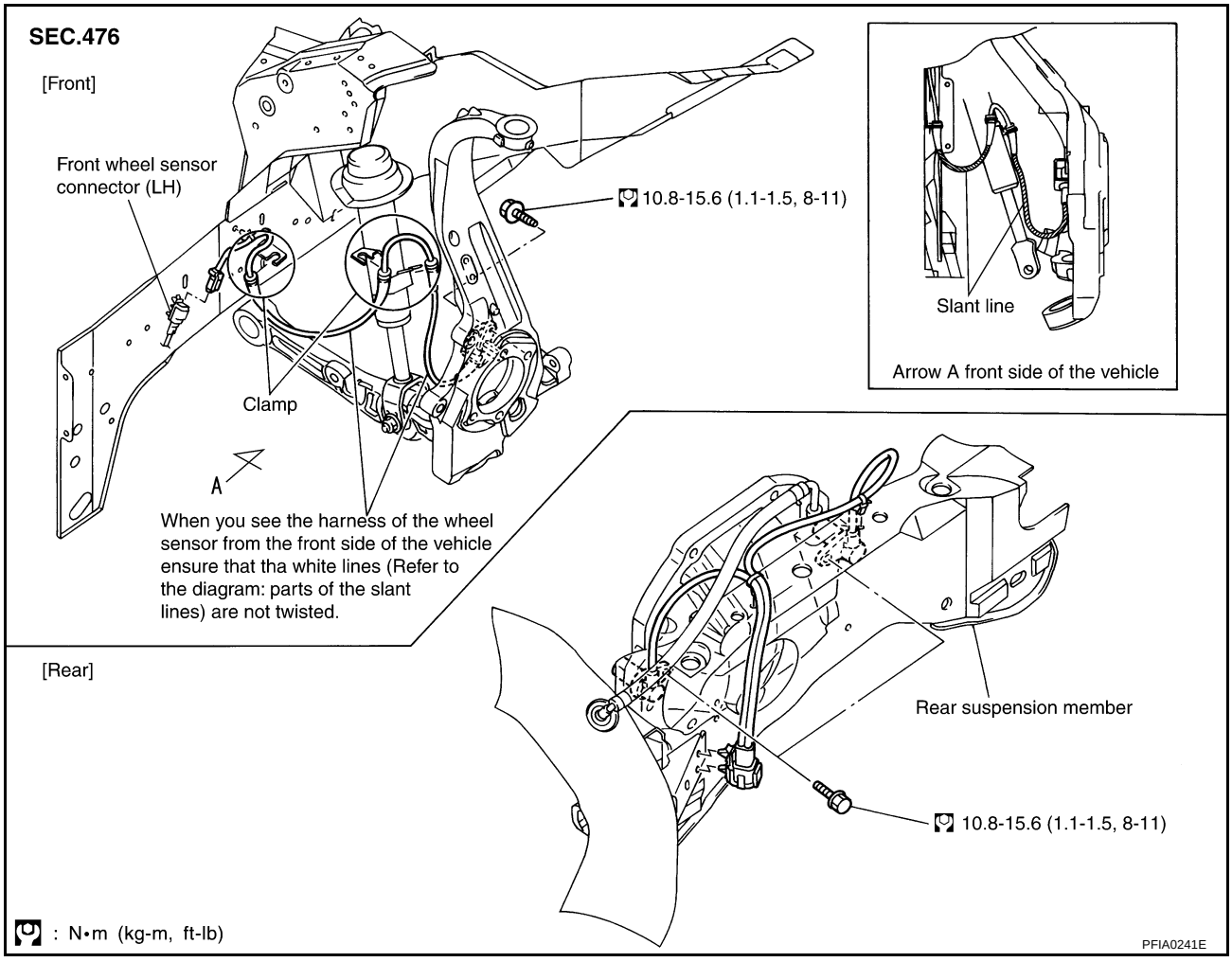
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0002J

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS0002K

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
  - Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
  - Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the companion flange.

INSTALLATION

Front

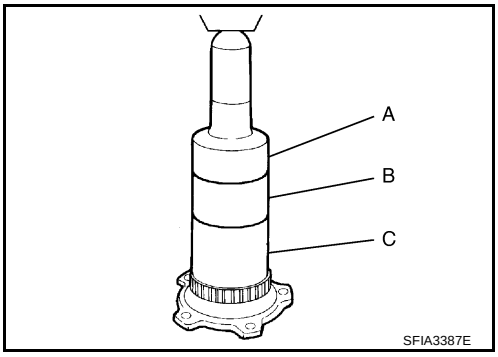
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
  - Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number	A: ST30720000 (J-25405)
	B: ST27863000 (—)
	C: KV40104710 (—)

  - Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.



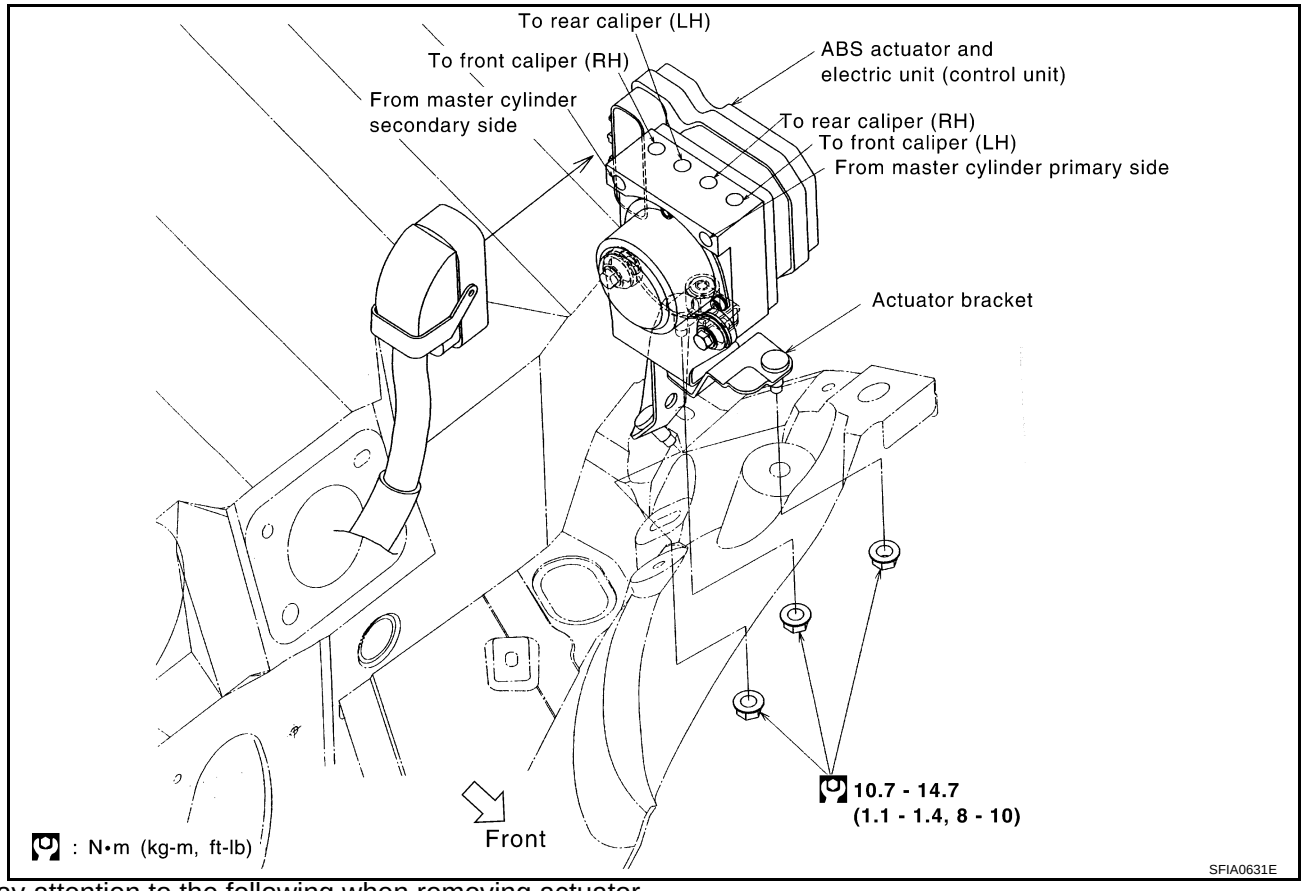
ABS ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

NFS0002L

COMPONENTS



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer to BR-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NFS0002M

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

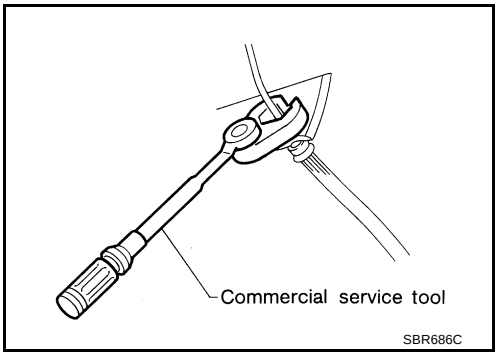
NFS0002N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0002O

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut crowfoot and torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of ABS actuator and electric unit (control unit) or the battery negative terminal.



WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precautions for Brake Control

NFS0002P

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting

diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.

- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

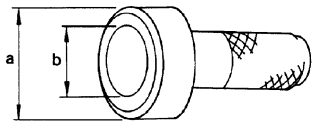
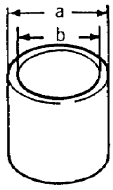
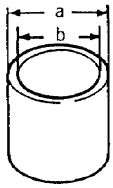
PREPARATION

PFP:00002

Special Service Tools

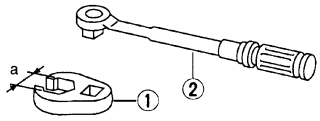
NFS0002Q

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	Installation rear sensor rotor
KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0002R

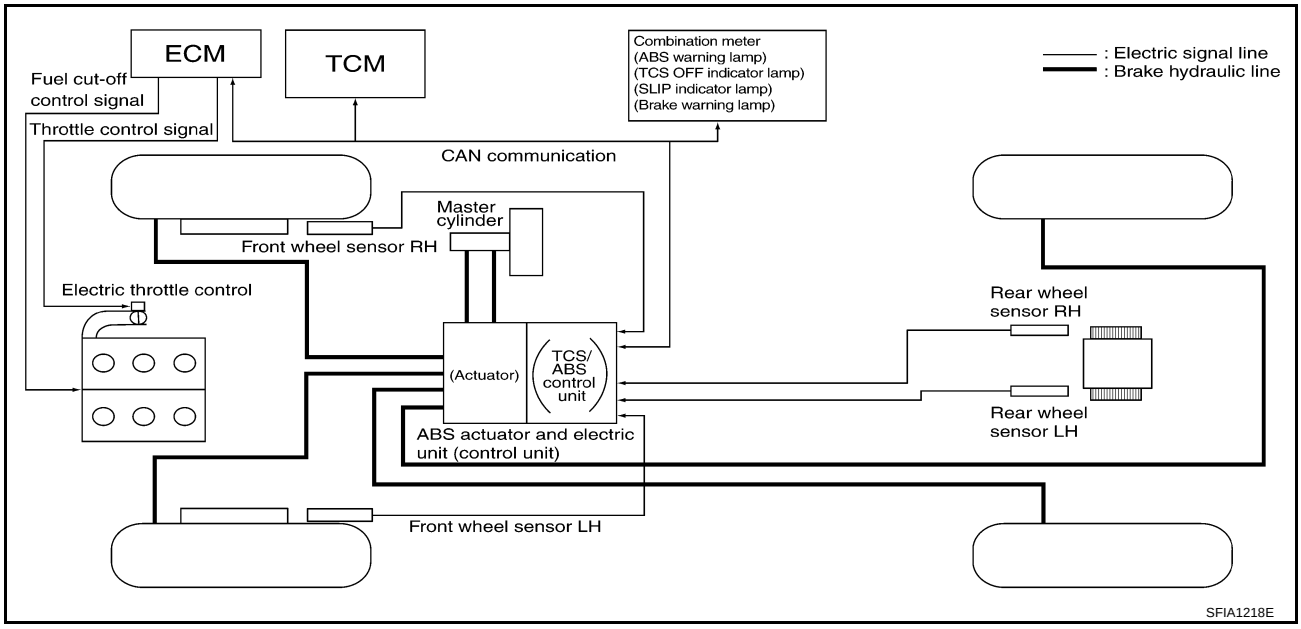
Tool name		Description
1. Flare nut crowfoot a: 10 mm (0.39 in) / 12mm (0.47 in) 2. Torque wrench	 S-NT360	Installing brake tube

SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0002S



TCS Function

NFS0002T

- The wheel spin occurrence of the drive wheels is detected by the ABS actuator and electric unit (control unit) using the wheel speed signals from all four wheels, so when wheel spin occurs, the amount of wheel spin is reduced by cutting the fuel to the engine, and partially closing the throttle valve to reduce the engine torque. The throttle opening is also controlled to obtain the optimum engine torque.
- Depending on road circumstances, the driver may have a sluggish feel. This is normal, because the optimum traction has the highest priority under TCS operation.
- TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.
- During TCS operation, it informs a driver of system operation by flashing SLIP indicator lamp.

ABS Function

NFS0002U

- The Anti-Lock Braking System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical system diagnosis by CONSULT-III is available.

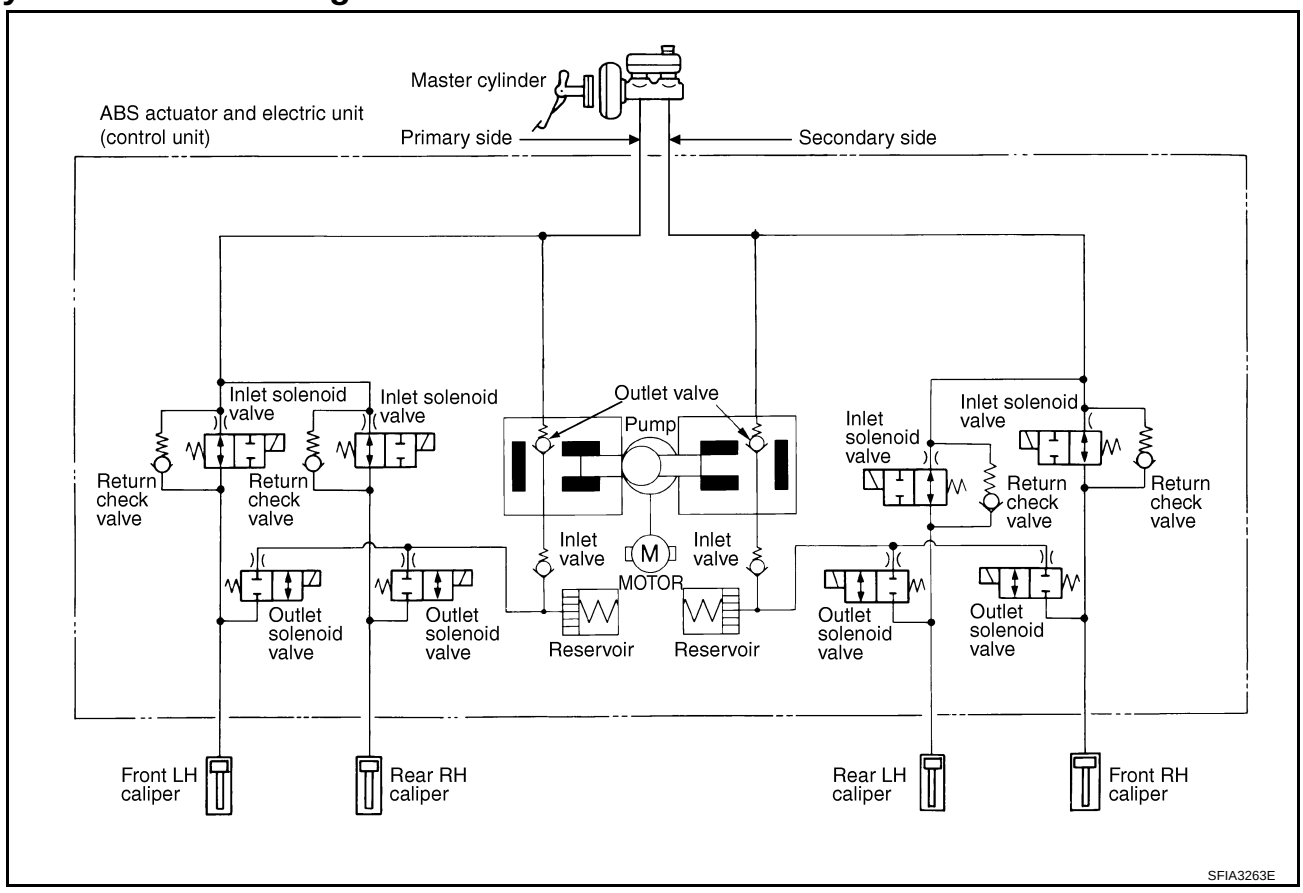
EBD Function

NFS0002V

- The Electronic Brake Distribution is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical system diagnosis by CONSULT-III is available.

Hydraulic Circuit Diagram

NFS0002X



CAN Communication

NFS0002Y

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000IJ

TCS SYSTEM

In case of Throttle Control System trouble, the TCS OFF indicator lamp and SLIP indicator lamp are turned on, and the condition of the vehicle is the same as the condition of vehicles without TCS equipment. In case of trouble to the Throttle Control System, the ABS control continues to operate normally without TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform the self-diagnosis for TCS/ABS control system.

ABS, EBD SYSTEM

In case of electrical problems with the ABS, the ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp will turn on. In case of electrical problem with the EBD, brake warning lamp, ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the TCS/ABS become one of the following conditions of the Fail-Safe function.

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicles without TCS/ABS equipment.

  NOTE:
  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.

How to Proceed with Diagnosis

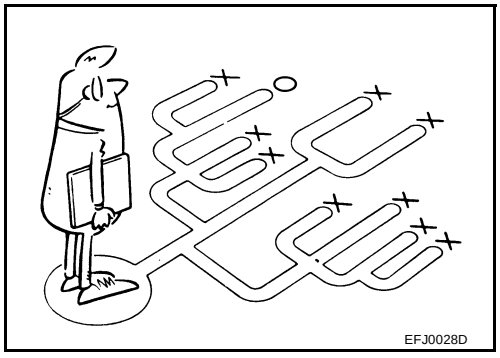
NFS0002Z

BASIC CONCEPT

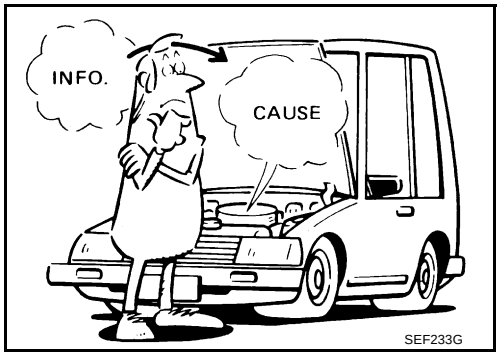
- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


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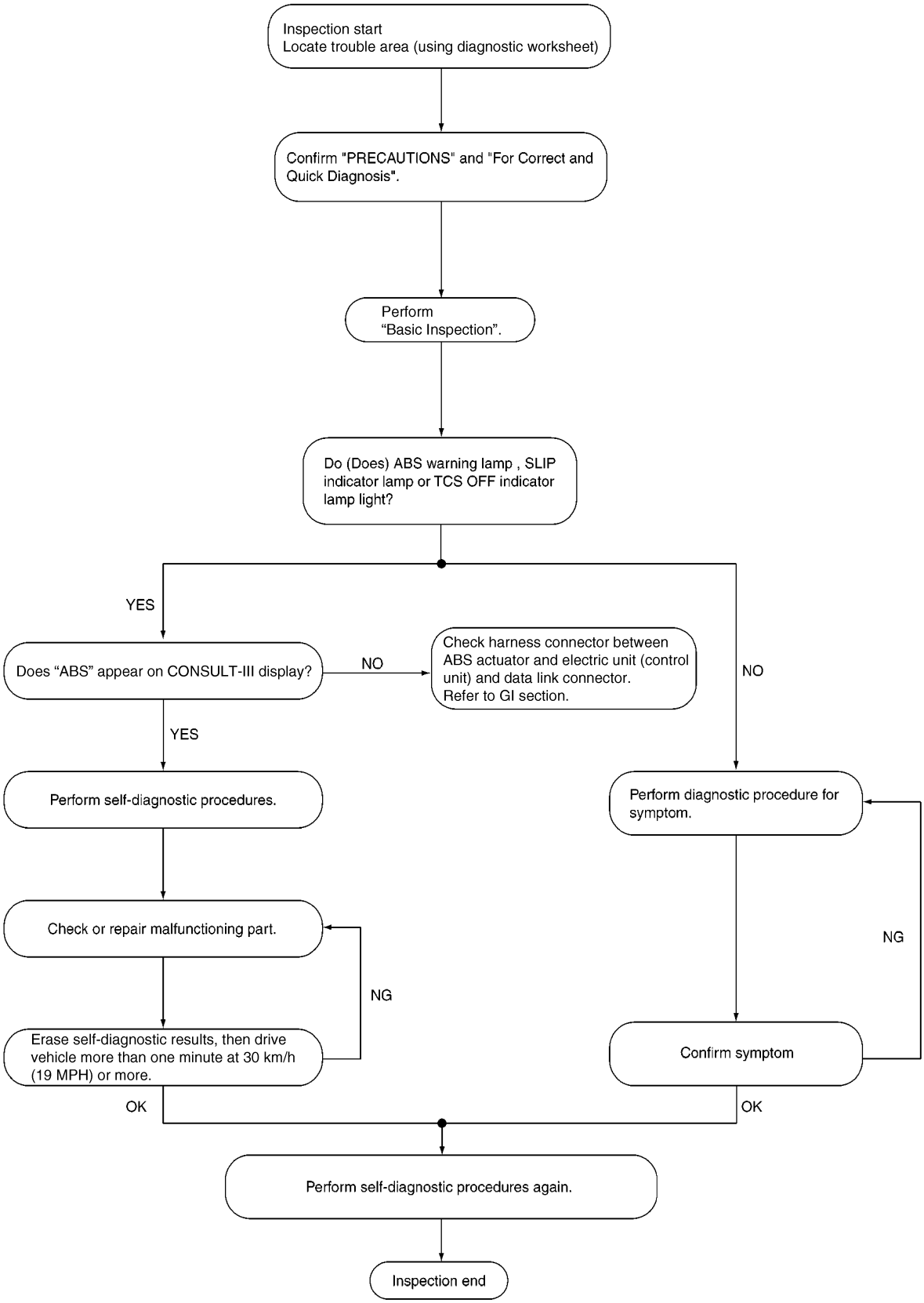
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-53, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-3, "General Precautions"

DIAGNOSIS FLOWCHART



SFIA3406E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

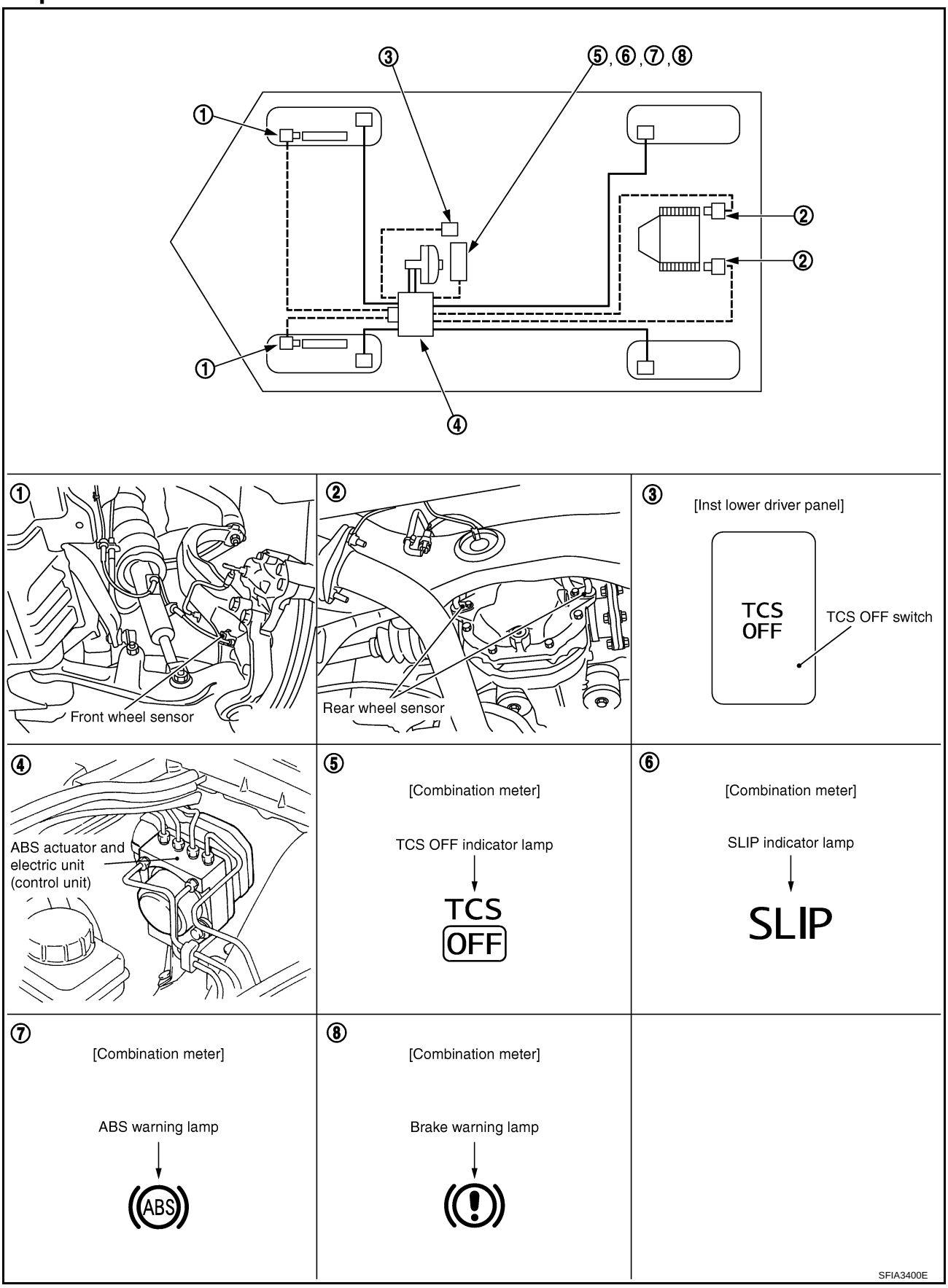
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA3265E

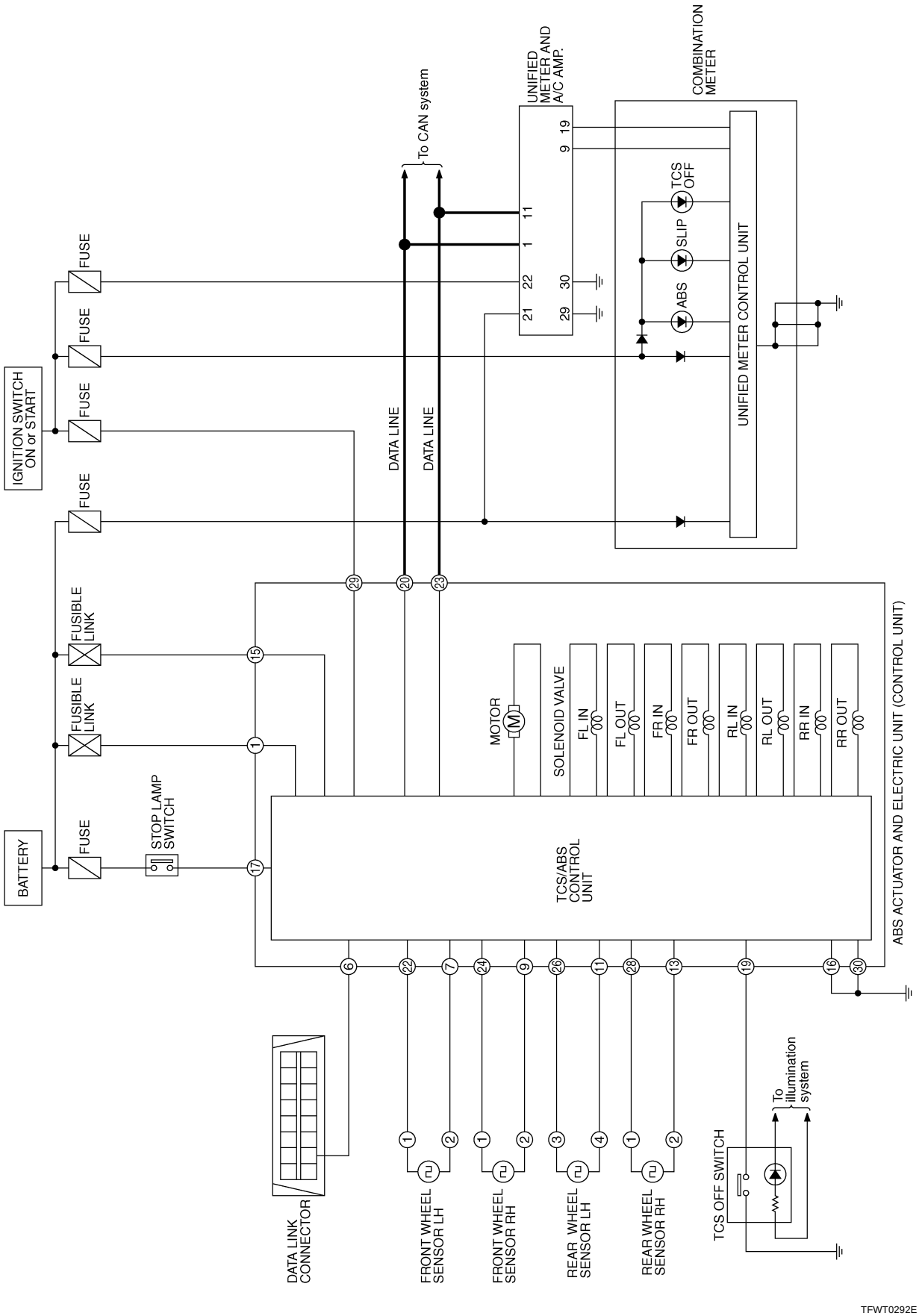
Component Parts Location

NFS00030



Schematic

NFS00031

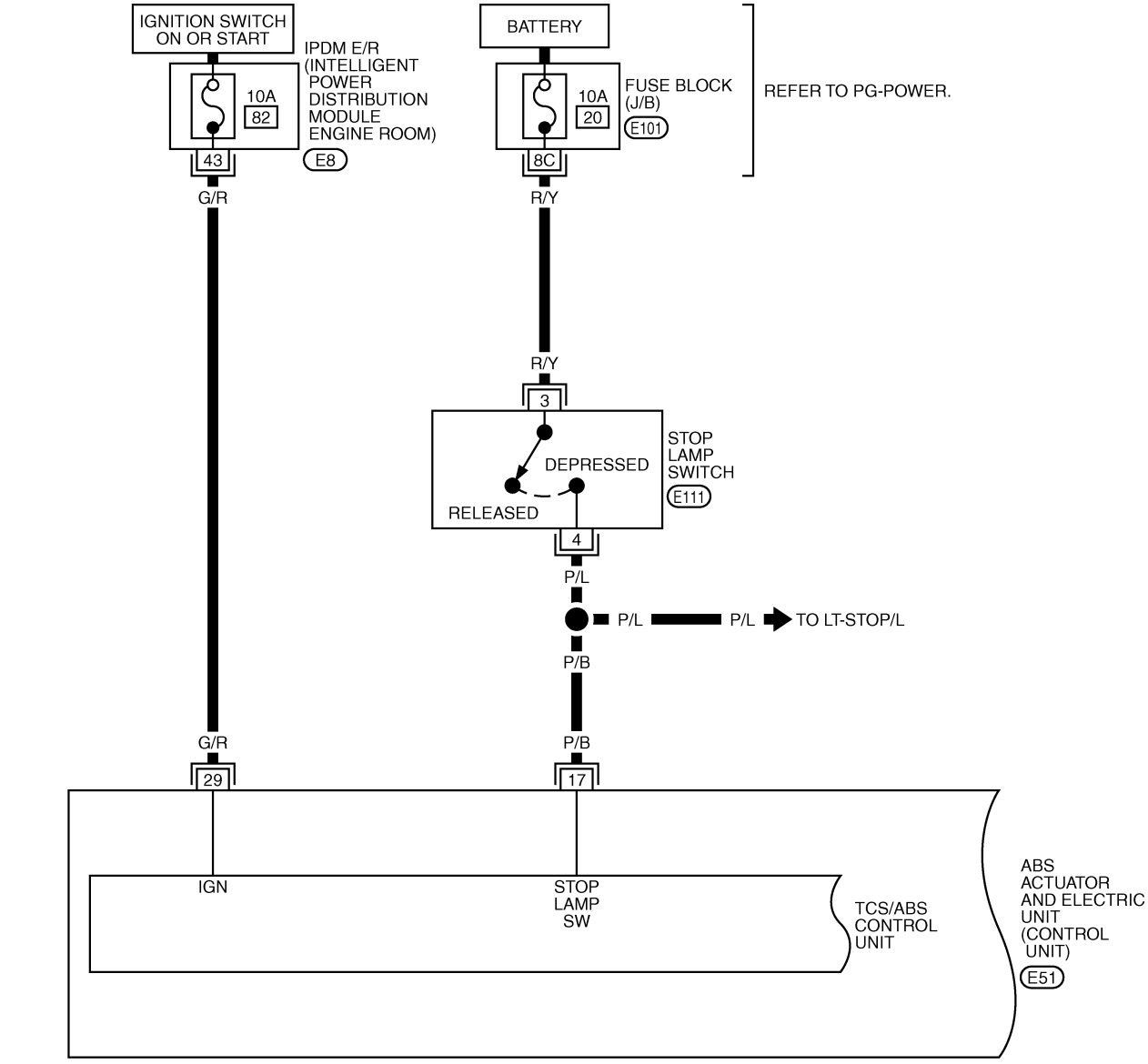


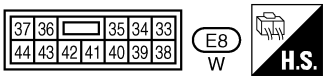
TFWT0292E

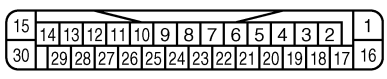
Wiring Diagram — TCS —

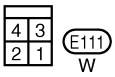
NFS00032

BRC-TCS-01





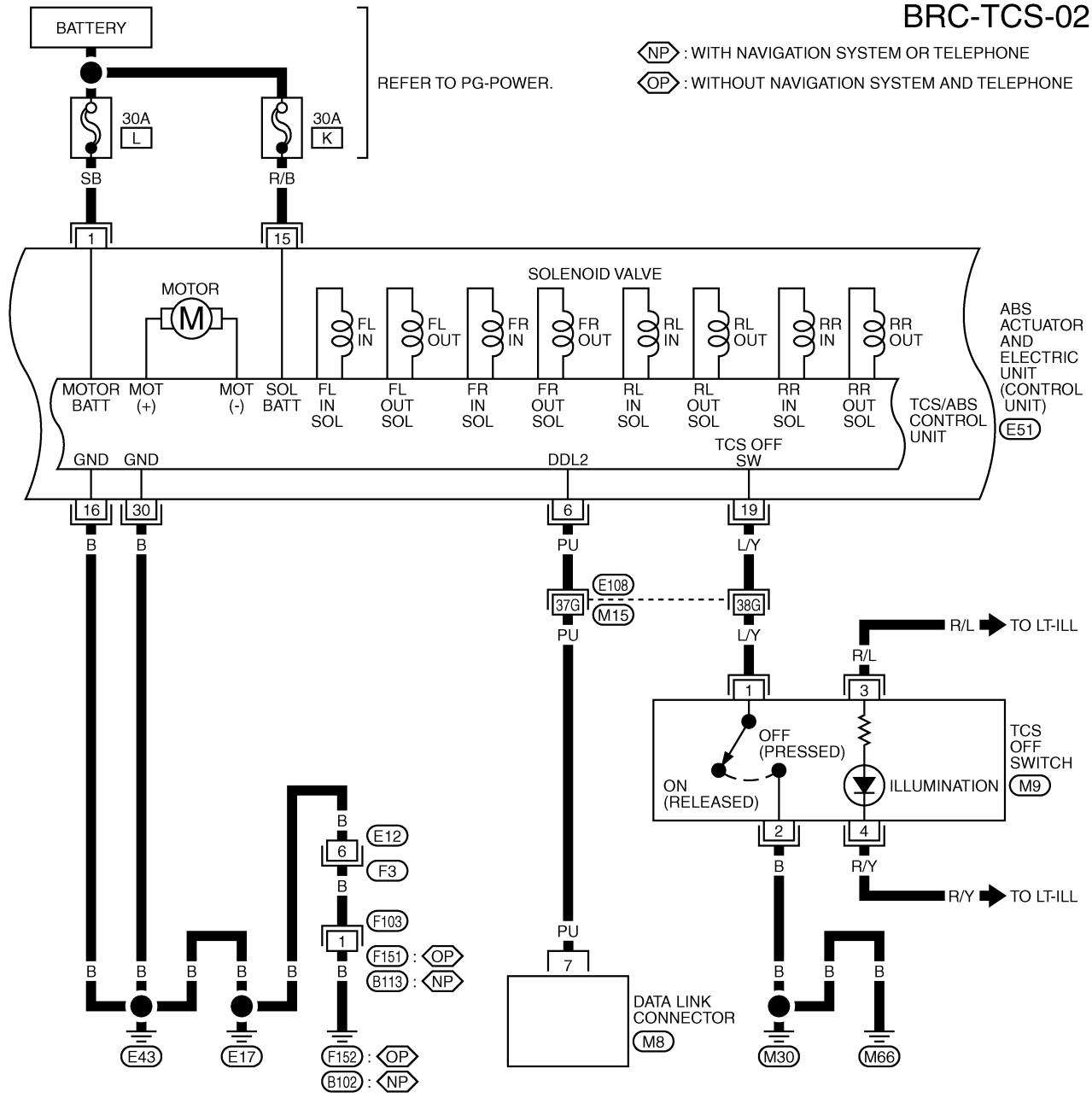


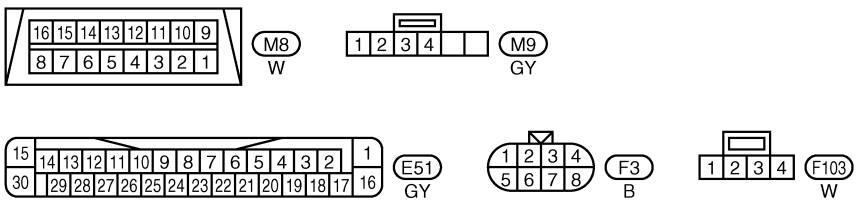


REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0377E

BRC-TCS-02

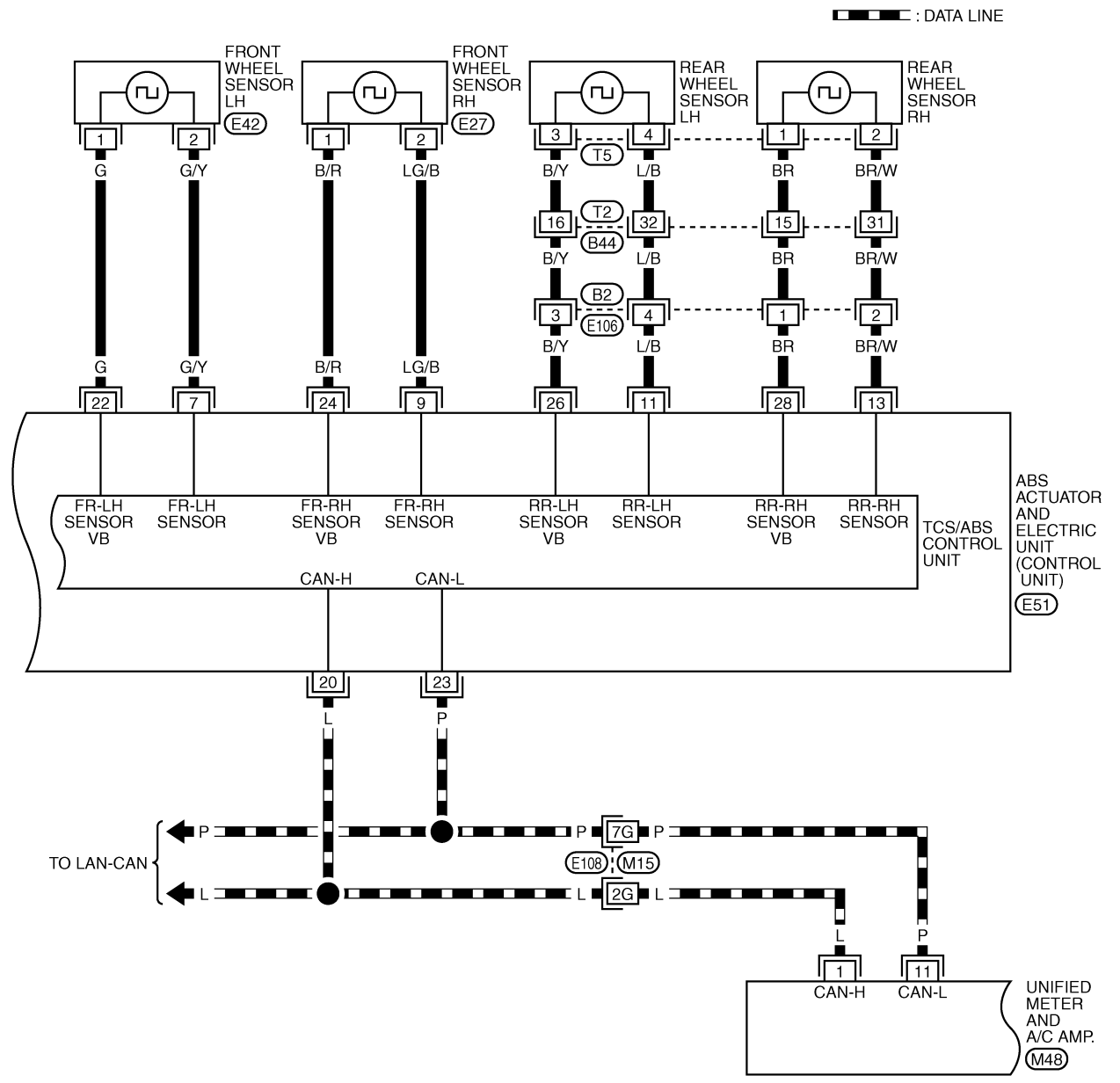


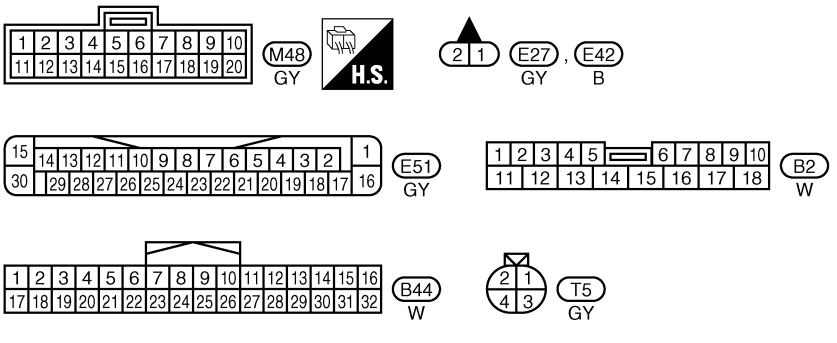


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0378E

BRC-TCS-03

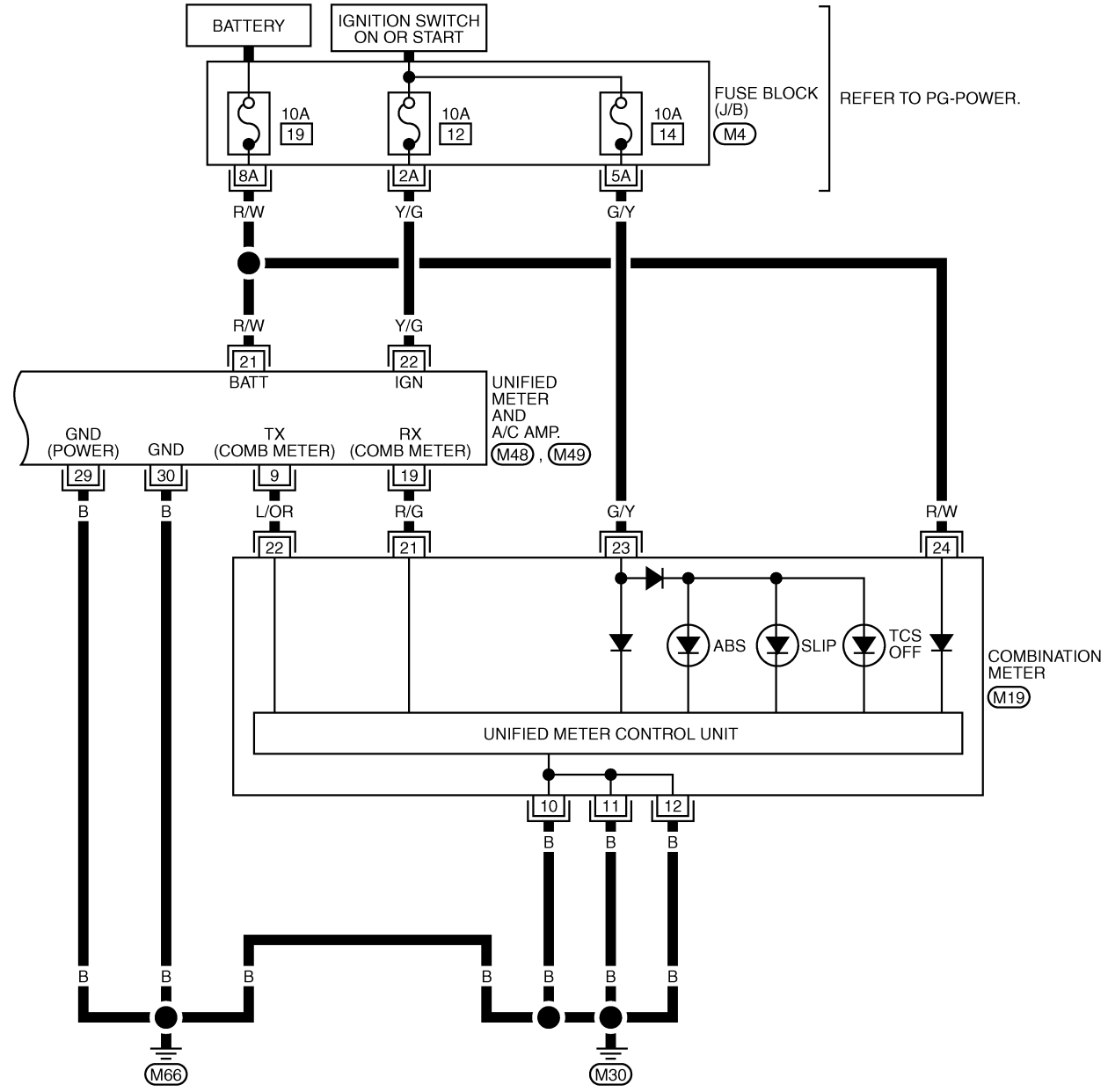


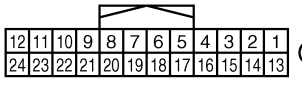


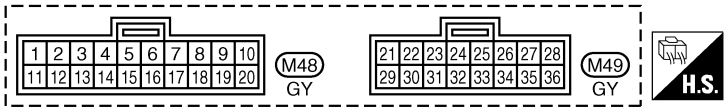
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0295E

BRC-TCS-04







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0041E

Control Unit Input/Output Signal Standard

NFS00034

REFERENCE VALUE FROM CONSULT-III

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
WHEEL SENSOR	Wheel speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)
		While driving (Note 1)	Nearly matches the speedometer display (±10% or less)
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON
		When the actuator relay operates and the actuator solenoid does not operate	OFF
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON
		Brake pedal not depressed	OFF
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF
		When the actuator relay is not operating	ON
EBD WARN LAMP	Brake warning lamp on condition (Note 2)	Brake warning lamp ON	ON
		Brake warning lamp OFF	OFF
ABS WARN LAMP	ABS warning lamp on condition (Note 3)	ABS warning lamp ON	ON
		ABS warning lamp OFF	OFF
OFF LAMP	TCS OFF indicator lamp on condition (Note 4)	TCS OFF indicator lamp ON	ON
		TCS OFF indicator lamp OFF	OFF
SLIP LAMP	SLIP indicator lamp on condition (Note 5)	SLIP indicator lamp ON	ON
		SLIP indicator lamp OFF	OFF
OFF SW	TCS switch ON-OFF status	TCS OFF switch ON (TCS OFF indicator lamp ON)	ON
		TCS OFF switch OFF (TCS OFF indicator lamp OFF)	OFF
BATTERY VOLT	Battery voltage supplied to TCS/ABS control unit	Ignition switch ON	10 - 16 V
GEAR	Determined gear shift position from the A/T PNP switch signal	Driving	1 - 5 ● Differs depending on the transmission status. (M/T vehicles are always left in 1.)
ENGINE RPM	Engine running	With engine stopped	0 rpm
		With engine running	Almost in accordance with tachometer display
N POSITION SIGNAL	Determined gear shift position from the A/T PNP switch signal (Note 5)	N position	ON
		Other than N position	OFF

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
P POSITION SIGNAL	Determined gear shift position from the A/T PNP switch signal (Note 6)	P position	ON
		Other than P position	OFF
FAIL SIGNAL	Fail signal status	During TCS fail-safe During ABS fail-safe During EBD fail-safe	ON
ACCEL POS SIG	Open/close condition of throttle valve (linked with accelerator pedal).	Accelerator pedal not depressed (ignition switch is ON)	0 %
		Depress accelerator pedal (ignition switch is ON)	0 to 100 %

Note 1: Confirm tire pressure is normal.
Note 2: Serves as EBD warning lamp.
Note 3: ON/OFF timing of ABS warning lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal).
Note 4: ON/OFF timing of TCS OFF indicator lamp
ON: For approximately 1 second after the ignition switch is turned on, when an error is detected, or when the TCS OFF switch is on.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal), when TCS OFF switch is off.
Note 5: ON/OFF timing of SLIP indicator lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal), when TCS function is not operating
Flash: When the TCS function is operating during driving.
Note 6: A/T models.

CONSULT- II Functions (ABS)

NFS00035

CONSULT-III MAIN FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	Reference
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-53, "Self-diagnosis"
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-55, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-44, "CAN Diagnostic Support Monitor"
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-57, "Active Test"
FUNCTION TEST	Conducted by CONSULT-III instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

Self-diagnosis

NFS000HG

OPERATION PROCEDURE

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

HOW TO ERASE SELF-DIAGNOSIS RESULTS

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

   CAUTION:
   If memory cannot be erased, perform applicably diagnosis.

   - When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
   - Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-1 [C1101]	When the circuit in the rear RH wheel sensor is open.	BRC-61, "Wheel Sensor System" (Note 1)
RR LH SENSOR-1 [C1102]	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR-1 [C1103]	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR-1 [C1104]	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR-2 [C1105]	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR-2 [C1108]	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-64, "ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
CONTROLLER FAILURE [C1110]	When there is an internal error in the ABS actuator and electric unit (control unit).	BRC-63, "ABS Actuator and Electric Unit (Control Unit)"
PUMP MOTOR [C1111]	When the ABS actuator and electric unit (control unit) detects an error in the motor or motor relay.	BRC-65, "ABS Actuator Relay or ABS Motor Relay Power System"
MAIN RELAY [C1114]	When the control unit detects an error in the actuator relay system	BRC-65, "ABS Actuator Relay or ABS Motor Relay Power System"

Display item	Malfunction detecting condition	Check item
STOP LAMP SW [C1116]	When a stop lamp switch open-circuit is detected.	BRC-66, "Stop Lamp Switch System"
FR LH IN ABS SOL [C1120]	When the control unit detects an error in the front left inlet solenoid system.	BRC-65, "ABS Actuator Relay or ABS Motor Relay Power System"
FR LH OUT ABS SOL [C1121]	When the control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL [C1122]	When the control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL [C1123]	When the control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL [C1124]	When the control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL [C1125]	When the control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL [C1126]	When the control unit detects an error in the rear right inlet solenoid system.	
RR RH OUT ABS SOL [C1127]	When the control unit detects an error in the rear right outlet solenoid system.	
EMERGENCY BRAKE [C1153]	When the ABS actuator and electric unit (control unit) malfunctions (pressure increase is too much or too little).	BRC-67, "ABS Actuator and Electric Unit (Control Unit) 2"
ENGINE SIGNAL 1 [C1130]	Major engine components are malfunctioning.	BRC-63, "Engine System"
ENGINE SIGNAL 2 [C1131]		
ENGINE SIGNAL 3 [C1132]		
ENGINE SIGNAL 4 [C1133]		
ENGINE SIGNAL 5 [C1134]		
ENGINE SIGNAL 6 [C1136]		
CAN COMM CIRCUIT [U1000]	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-67, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.

Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HH

DISPLAY ITEM LIST

×: Standard –: Not applicable ▼: Option

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [(km/h (MPH)]	×	×	▼	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by Rear LH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	▼	Wheel speed calculated by Rear RH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	×	▼	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	×	▼	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	×	▼	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	×	▼	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	×	▼	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	×	▼	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	×	▼	Rear left rear wheel inside ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	×	▼	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	–	×	▼	Brake warning lamp (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	×	×	▼	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	×	▼	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR RLY (ON/OFF)	–	×	▼	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	×	▼	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	×	▼	TCS OFF indicator lamp (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	▼	TCS OFF switch (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	×	▼	SLIP indicator lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	▼	The voltage supplied to the ABS actuator and electric unit (control unit) is displayed.
GEAR (A/T model)	×	×	▼	The gear position determined from the A/T PNP switch signal is displayed.
ENGINE SPEED (rpm)	×	×	▼	Engine speed status determined from the CAN communication signal is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
N POSI SIG (ON/OFF) (A/T model)	–	–	▼	Shift position determined from the A/T PNP switch signal is displayed.
P POSI SIG (ON/OFF) (A/T model)	–	–	▼	Shift position determined from the A/T PNP switch signal is displayed.
ACCEL POS SIG (%)	×	–	▼	Throttle position status determined from the CAN communication signal is displayed.
EBD SIGNAL (ON/OFF)	–	–	▼	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	▼	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	–	–	▼	TCS operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	▼	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	▼	ABS fail-safe signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	–	–	▼	TCS fail-safe signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	–	–	▼	Ignition switch START position signal input status is displayed.
ASCD SIGNAL (ON/OFF)	–	–	▼	ASCD (ON/OFF) status is displayed.

Active Test

NFS000IO

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.

TEST ITEM

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

For ABS solenoid valve, touch “UP”, “KEEP”, and “DOWN”.Then use screen monitor to check that solenoid valve operates as shown in the table below.

Operation	ABS solenoid valve		
	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF

ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Correct and Quick Diagnosis

NFS00036

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-53, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- TCS/ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	This is the sound of the motor operating inside ABS actuator and electric unit (control unit), and there may be some low sounds while TCS or ABS is operating.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	

Symptom	Symptom description	Result
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
TCS operation (SLIP indicator lamp ON)	TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.	Normal When conducting the inspection on a chassis dynamometer, cancel the TCS function.
	When inspecting the speedometer, etc., press TCS OFF switch to turn off TCS function before conducting the work.	
	When accelerator pedal is depressed on a chassis dynamometer (front wheel fixing type), the vehicle speed will not increase. This is normal, because TCS is activated by the stationary front wheels. The warning lamp may also turn on to show “sensor system error” in this case. This is not a malfunction either, because the stationary front wheels are detected. Restart engine, and drive the vehicle at 30 km/h (19 MPH) or more or higher to check that the warning lamp no longer turns on.	
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal
Sluggish feel	Depending on road circumstances, the driver may have a sluggish feel. This is normal, because under TCS operation optimum traction has the highest priority (safety first). Sometimes the driver has a slight sluggish feel in response to substantial accelerator pedal operation.	Normal

ABS WARNING LAMP, TCS OFF INDICATOR LAMP AND SLIP INDICATOR LAMP ON/OFF TIMING

×: ON –: OFF

Condition	ABS warning lamp	TCS OFF indicator lamp	SLIP indicator lamp	Remarks
Ignition switch OFF	—	—		—
For approximately “1” second after ignition switch ON	×	×	×	—
After approximately “1” second after ignition switch ON (When system is normal)	—	—	—	Turns off 2 second after engine start
When the TCS OFF switch is turned on (TCS function off)	—	×	—	—
TCS/ABS error	×	×	×	—
	×	×	—	When there is an ABS actuator and electric unit (control unit) error (power or ground error)
TCS error	—	×	×	—

Basic Inspection

NFS00037

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around ABS actuator and electric unit (control unit) for leaks. If there is leaking or oozing fluid, check the following items.
   - If ABS actuator and electric unit (control unit) connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or ABS actuator and electric unit (control unit) screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than ABS actuator and electric unit (control unit) connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at ABS actuator and electric unit (control unit), if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the ABS actuator and electric unit (control unit) body.

     CAUTION:
     ABS actuator and electric unit (control unit) cannot be disassembled.
3. Check brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION

1. Make sure ABS warning lamp, TCS OFF indicator lamp (when TCS OFF switch is OFF), and SLIP indicator lamp turns ON approximately 1 second when the ignition switch is turned ON. If they do not, check the TCS OFF indicator lamp and then TCS OFF switch. Refer to BRC-68, "TCS OFF SWITCH" . Check CAN communications. Refer to “CAN Communication Inspection”. If there are no errors with TCS OFF switch and CAN communication system, check combination meter. Refer to BRC-67, "CAN Communication System" .
2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. With the engine running, make sure TCS OFF indicator lamp turns on and off when TCS OFF switch is turned on and off. If the indicator lamp status does not correspond to switch operation, check the TCS OFF switch system. Refer to BRC-68, "TCS OFF SWITCH" .
4. Make sure ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp turn off 2 seconds after the engine is started. If ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit (control unit).
5. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-53, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS00038

After using the CONSULT-III SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR -1, -2
FR LH SENSOR -1, -2
RR RH SENSOR -1, -2
RR LH SENSOR -1, -2

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK TIRE

Check air pressure, wear, and size.

Are the air pressure, wear, and size within the standard values?

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

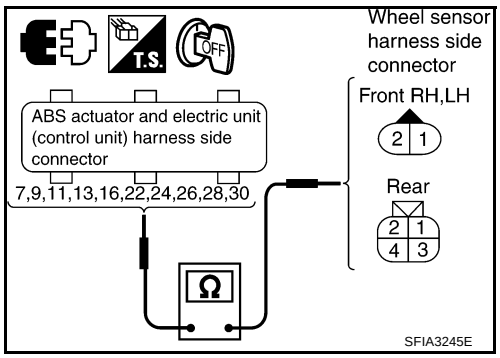
1. Disconnect ABS actuator and electric unit (control unit) connector and malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connector, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS actuator and electric unit (control unit) connector E51.
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit) (signal)	ABS actuator and electric unit (control unit) (ground)
Front RH	24	1	9	2	24, 9	16, 30
Front LH	22	1	7	2	22, 7	
Rear RH	28	1	13	2	28, 13	
Rear LH	26	3	11	4	26, 11	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

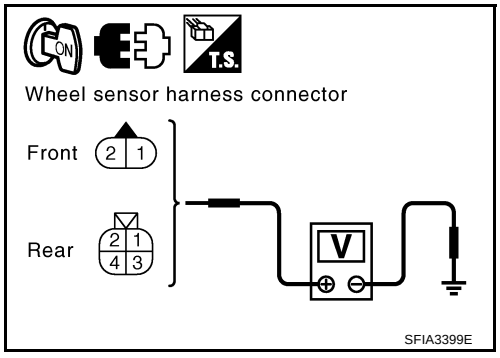
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

6. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Disconnect malfunctioning wheel sensor connector.
2. Turn ignition switch ON and check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH	1	—	8 V or more
Front LH			
Rear RH			
Rear LH	3		



OK or NG

OK >> Replace wheel sensor.
NG >> Replace ABS actuator and electric unit (control unit).

Engine System

NFS00039

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK ENGINE SYSTEM

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct ECM self-diagnosis.
2. Re-conduct ABS actuator and electric unit (control unit) self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

ABS Actuator and Electric Unit (Control Unit)

NFS0003A

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

YES >> Replace ABS actuator and electric unit (control unit). Re-conduct the self-diagnosis.
NO >> INSPECTION END

ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems

NFS0003B

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

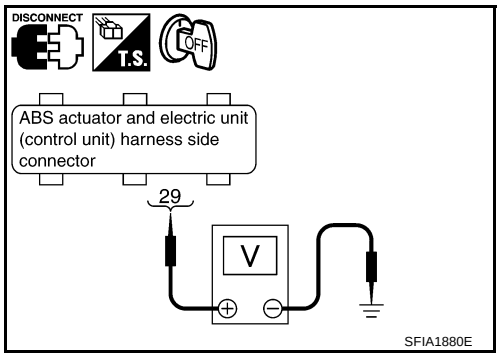
1. Disconnect ABS actuator and electric unit (control unit) connector, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

Is the result of self-diagnosis normal?

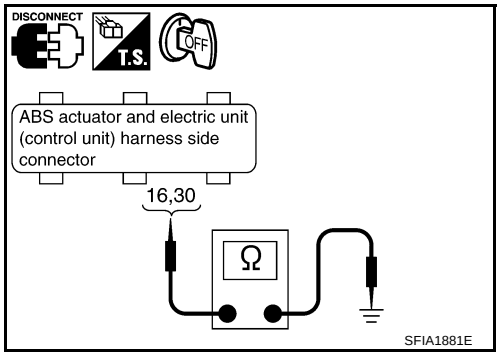
YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER AND GROUND CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check continuity and voltage between ABS actuator and electric unit (control unit) connector and ground.



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Voltage
Power supply	29	Ignition switch ON	Battery voltage (Approx. 12 V)
		Ignition switch OFF	Approx. 0 V



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Continuity
Ground	16, 30	Ignition switch OFF	Yes

OK or NG

OK >> Check battery (terminal looseness, power drop, etc.) Error. If there is an error, make repairs.
NG >> Corresponding harness circuit error. Repair the circuit.

ABS Actuator Relay or ABS Motor Relay Power System

NFS0003C

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
PUMP MOTOR
MAIN RELAY

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

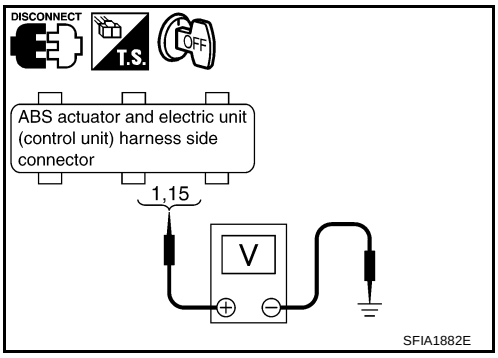
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ABS ACTUATOR RELAY OR ABS MOTOR RELAY POWER CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. For ABS actuator relay, measure the voltage between the connector terminal 1 and ground. For ABS motor relay, measure the voltage between connector terminal 15 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
1, 15	—	Battery voltage (Approx. 12 V)



OK or NG

OK >> GO TO 4
NG >> Error in the circuit between battery and ABS actuator and electric unit (control unit). Repair the circuit.

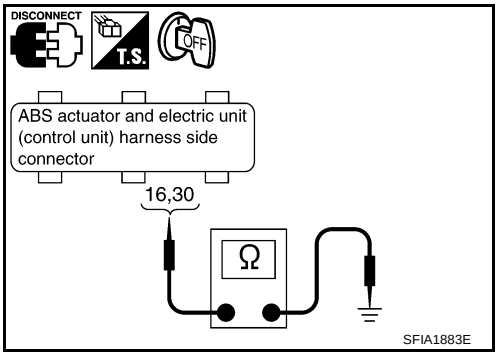
4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
16, 30	—	Yes

OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Open or short in harness. Repair or replace the harness.



Stop Lamp Switch System

NFS0003D

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector and stop lamp switch connector E111, check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.
3. Start engine
4. Repeat pumping brake pedal carefully several time, then perform self-diagnosis again

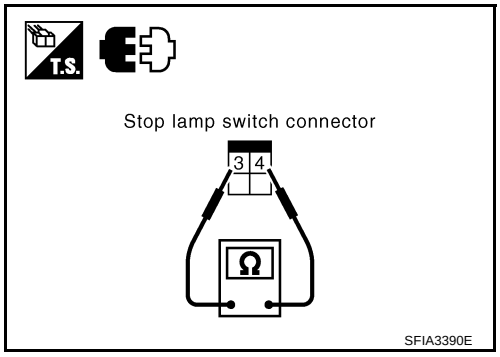
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

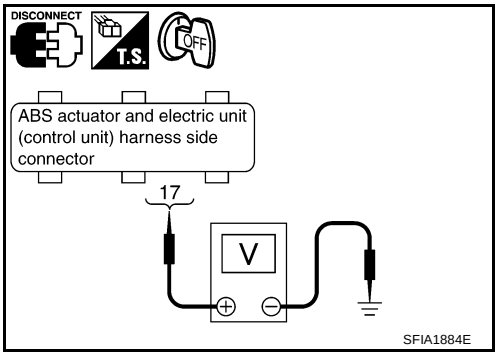


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check voltage between ABS actuator and electric unit (control unit) connector terminal and the ground.



ABS actuator and electric unit (control unit)	Ground	Measurement condition	Voltage
17	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> INSPECTION END
NG >> Open or short in harness between ABS actuator and electric unit (control unit) and stop lamp switch. Repair or replace the harness.

ABS Actuator and Electric Unit (Control Unit) 2

NFS0003E

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit).
NO >> INSPECTION END

CAN Communication System

NFS0003F

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-48, "CAN System Specification Chart" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

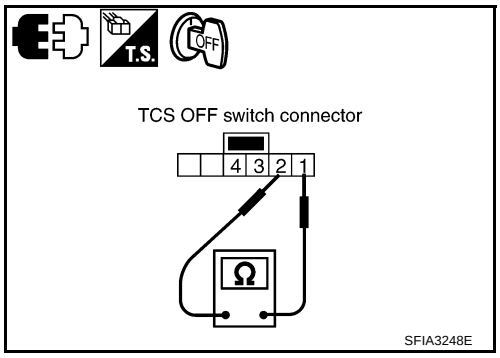
Component Inspection

NFS0003G

TCS OFF SWITCH

- Turn ignition switch OFF, disconnect the TCS OFF switch connector M9, and check continuity between terminals 1 and 2.

1 - 2 : Continuity should exist when pushing the switch.
: Continuity should not exist when releasing the switch.



TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0003H

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system.

2. CHECK FRONT AND REAR AXLE

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. CHECK WHEEL SENSOR AND SENSOR ROTOR

Wheel Sensor Inspection

- Wheel sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Wheel sensor connector connection inspection
- Wheel sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-53, "OPERATION PROCEDURE" .

Unexpected Pedal Reaction

NFS0003I

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

YES >> ● Bleed air from the brake piping.
● Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repairs.

NO >> GO TO 2.

2. CHECK FUNCTION

Disconnect the ABS actuator and electric unit (control unit) connector, and make sure the braking force is sufficient when the ABS is not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-69, "Excessive ABS Function Operation Frequency" .

NG >> Check brake system.

The Braking Distance Is Long

NFS0003J

CAUTION:

On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-69, "Excessive ABS Function Operation Frequency" .

NG >> ● Bleed air from the brake piping.
● Check brake system.

The ABS Function Does Not Operate

NFS0003K

CAUTION:

The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-69, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-53, "OPERATION PROCEDURE" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0003L

CAUTION:

Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

Does the symptom occur?

YES >> GO TO 2.
NO >> Perform self-diagnosis. Refer to BRC-53, "OPERATION PROCEDURE" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.
NO >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-69, "Excessive ABS Function Operation Frequency" .

The Vehicle Jerks Around During TCS/ABS Control

NFS0003M

1. CHECK ENGINE SPEED SIGNAL

Conduct CONSULT-III ABS actuator and electric unit (control unit) “Data Monitor”.

Is the speed during idling 400 rpm or higher?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK ECM SELF-DIAGNOSIS RESULT ITEM

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-81, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 3.

3. SYMPTOM CHECK 1

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK A/T SELF-DIAGNOSIS RESULT ITEM

Perform A/T self-diagnosis.

OK or NG

OK >> GO TO 5.
NG >> Check the corresponding items. Refer toAT-40, "TROUBLE DIAGNOSIS" in “A/T”.

5. SYMPTOM CHECK 2

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK SELF-DIAGNOSIS RESULT ITEM 1

Conduct self-diagnosis of the ABS actuator and electric unit (control unit).

Are self-diagnosis items displayed?

YES >> Check the corresponding items, make repairs, and re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.
NO >> GO TO 7.

7. CHECK CONNECTOR

1. Disconnect the ABS actuator and electric unit (control unit) connector and the ECM connectors, check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the connector.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> If the connector terminal contact is loose, damaged, open or shorted, repair or replace the connector terminal.
NG >> GO TO 8.

8. CHECK SELF-DIAGNOSIS RESULT ITEM 2

Re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any non-standard items.
NO >> GO TO 9.

9. CHECK CIRCUIT BETWEEN ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) AND THE ECM

Check CAN communication system. Refer to BRC-67, "CAN Communication System" .

OK or NG

OK >> INSPECTION END
NG >> Connect the connector and re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.

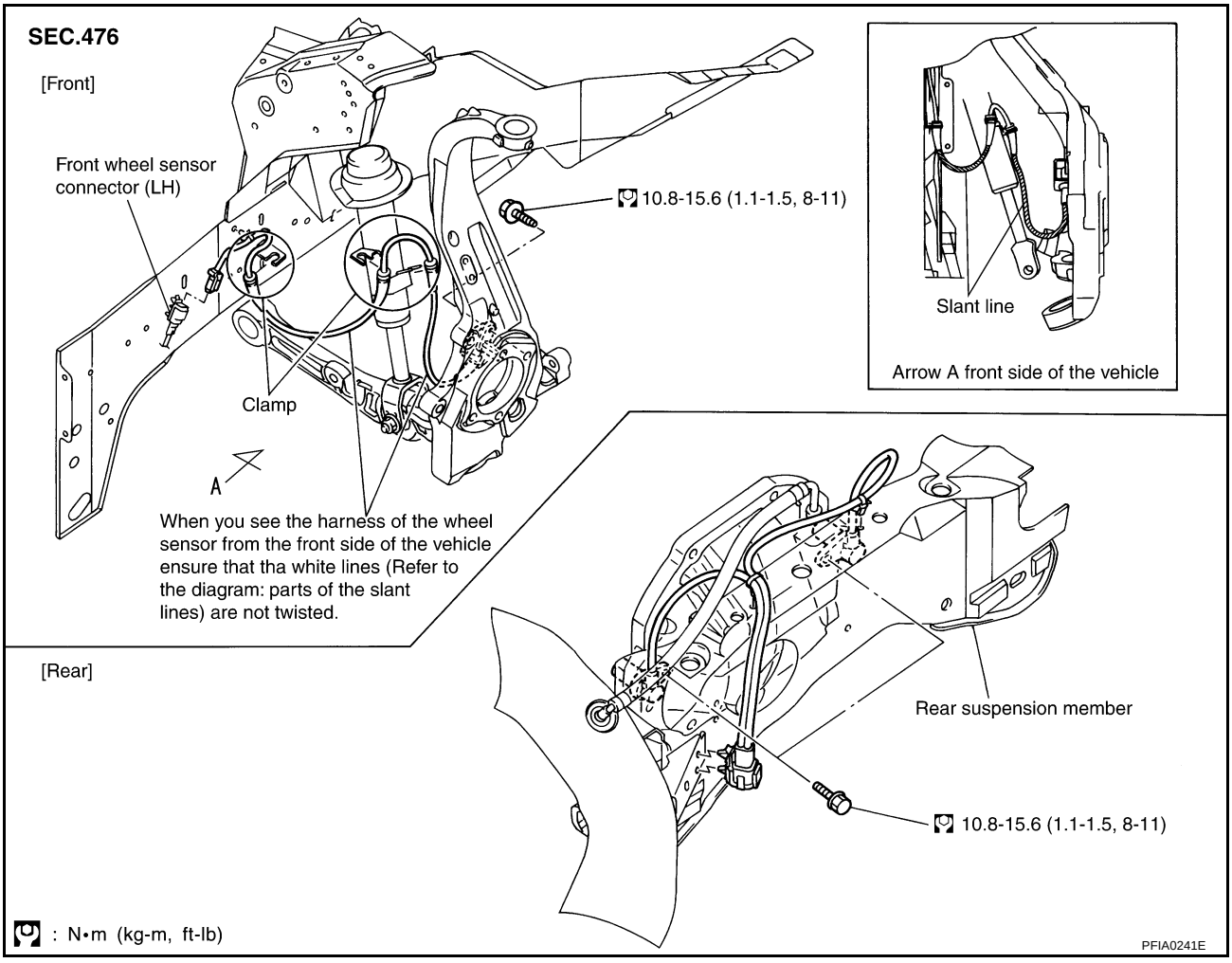
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0003N

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS0003O

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
- Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
- Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the side flange.

INSTALLATION

Front

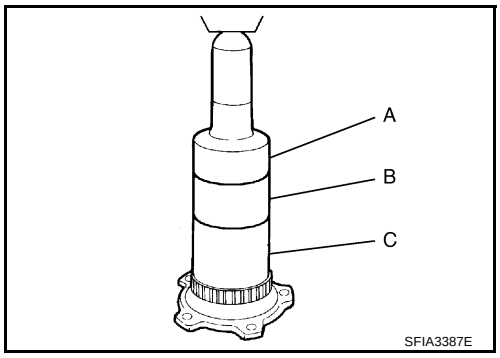
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
- Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number	A: ST30720000 (J-25405)
	B: ST27863000 (—)
	C: KV40104710 (—)

- Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.



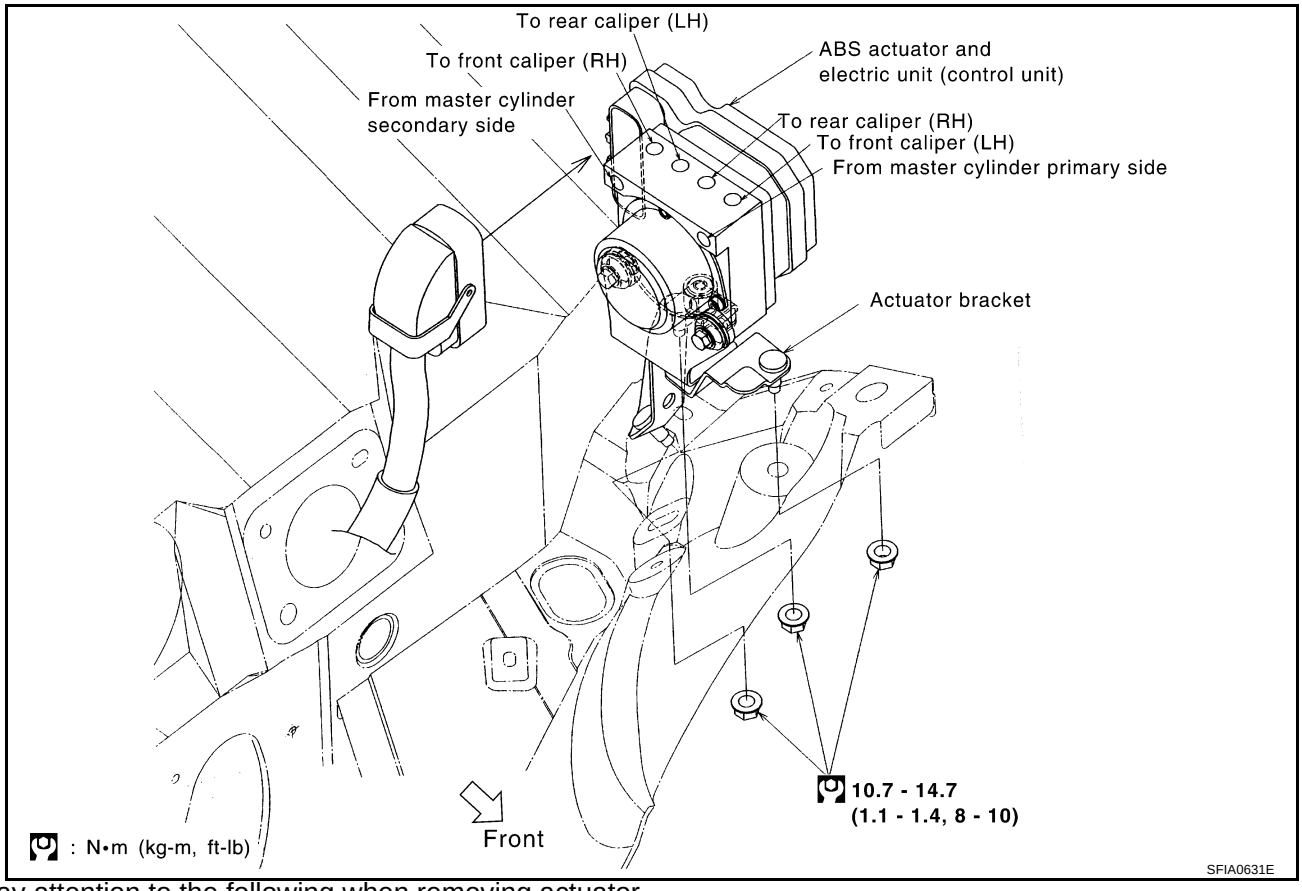
ABS ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

NFS0003P

COMPONENTS



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer toBR-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NFS000TP

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

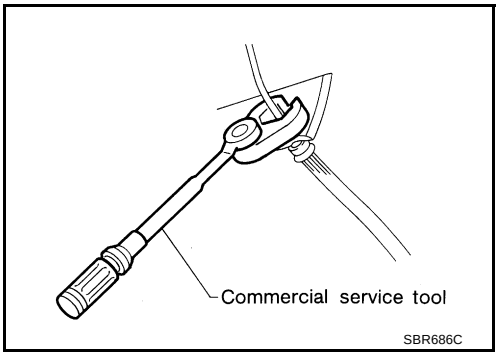
NFS0003R

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0003S

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut crowfoot and torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of VDC/TCS/ABS control unit or the battery negative terminal.



WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precautions for Brake Control

NFS0003T

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) Have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- If the following components are replaced with non-genuine components or converted, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (Shock Absorber, Strut, Spring, Bush, etc.), Tires, wheels (exclude specified size), components related to brake (Pad, Rotor, Caliper, etc.), Components related to engine (Muffler, ECM, etc.), Components related to body reinforcement (Roll bar, Tower bar, etc.).
- Driving in the condition of breakage or excessive wear of the suspension, tires or components related to the brakes may cause the VDC OFF indicator lamp and the SLIP indicator lamp to turn on, and the VDC system may not operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur if the brake pedal is used. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp carves on a freeway), the VDC may not operate normally, or the VDC warning lamp may turn on. However, this is not a problem if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. When VDC function is OFF (VDC SW ON) may cause the yaw rate/side G -sensor system indicate a problem. However this is not a problem if normal operation can be resumed after restarting the engine.

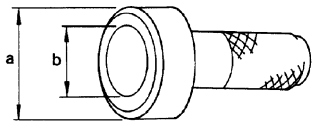
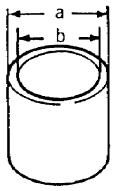
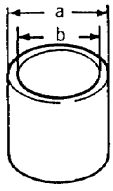
PREPARATION

PFP:00002

Special Service Tools

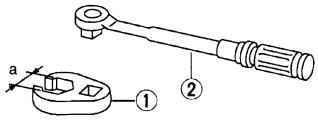
NFS0003U

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	
KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0003V

Tool name		Description
1. Flare nut crowfoot a: 10mm (0.39 in) / 12mm (0.47 in) 2. Torque wrench	 S-NT360	installing brake tube

ON-VEHICLE SERVICE

PFP:00000

Adjustment of Steering Angle Sensor Neutral Position

NFS0003W

In case of doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before running vehicle.

Situation	Adjustment of Steering Angle Sensor Neutral Position
Removing/Installing VDC/TCS/ABS control unit	–
Replacing VDC/TCS/ABS control unit	×
Removing/Installing steering angle sensor	×
Removing/Installing steering components	×
Removing/Installing suspension components	×
Change 4 tires to new ones	–
Tire rotation	–
Adjusting wheel alignment	×

×: Required
–: Not required

1. Stop vehicle with front wheels in straight-ahead position.
2. Turn ignition switch ON and in the following order touch “ABS” “WORK SUPPORT” “ANGLE SENSOR ADJUSTMENT” in CONSULT-III screen.
3. Touch “START”.

   CAUTION:
   Do not touch steering wheel while adjusting steering angle sensor.
4. After approximately 10 seconds, touch “END”. (After approximately 60 seconds, it ends automatically.)
5. Turn ignition switch OFF, then turn it ON again.

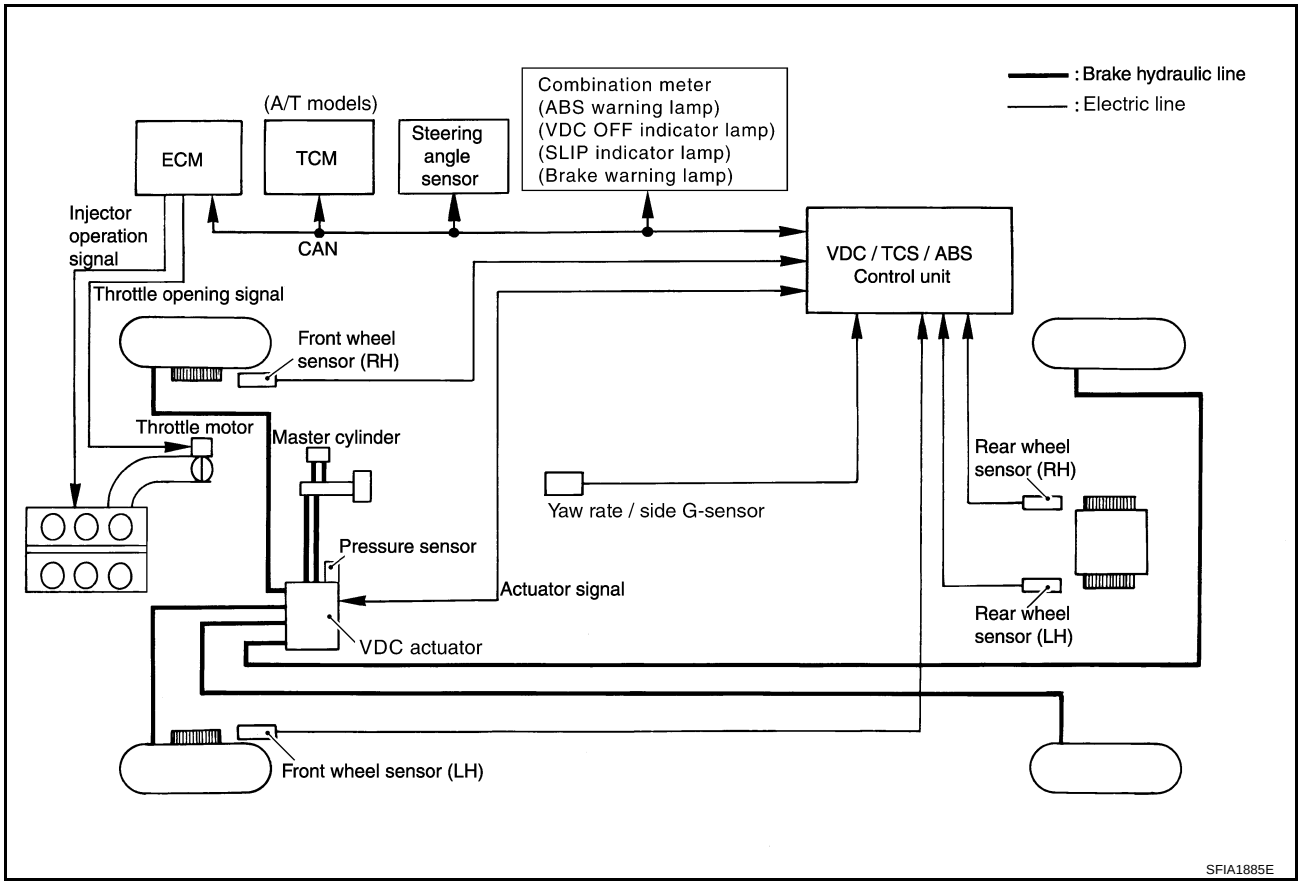
   CAUTION:
   Be sure to carry out above operation.
6. Run vehicle with front wheels in straight-ahead position, then stop.
7. Select “DATA MONITOR”, “ECU INPUT SIGNALS”, and “STEERING ANGLE SIGNAL” on CONSULT-III screen. Then check that “STEERING ANGLE SIGNAL” is within 0±2.5°. If value is more than specification, repeat steps 1 to 7.
8. Erase memory of VDC/TCS/ABS control unit and ECM.
9. Turn ignition switch to OFF.

SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0003X



VDC Function

NFS0003Y

- In addition to the TCS/ABS function, the driver steering amount and brake operation amount are detected from the steering angle sensor and pressure sensor, and the vehicle's driving status (amount of under-steering / over-steering) is determined from information from the yaw rate/side G sensor, wheel sensor, etc., and this information is used to improve vehicle stability by controlling the braking and engine power to all four wheels.
- The SLIP indicator lamp flashes to inform the driver of VDC operation.
- During VDC operation, the body and brake pedal lightly vibrate and mechanical noises may be heard. This is normal.
- The ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp might turn on when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is on a turn table or a ship while the engine is running. In this case, restart the engine on a normal road, and if the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off, there is no problem.

TCS Function

NFS0003Z

- The wheel spin of the drive wheels is detected by the VDC/TCS/ABS control unit from the wheel speed signals from the four wheels, so if wheel spin occurs, the rear wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle value is restricted to reduce the engine torque and decrease the amount of wheel spin. In addition, the degree the throttle is opened is controlled to achieve the optimum engine torque.
- Depending on road circumstances, the driver may have a sluggish feel. This is normal, because the optimum traction has the highest priority under TCS operation.
- TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.
- During TCS operation, it informs a driver of system operation by flashing SLIP indicator lamp.

ABS Function

NFS00040

- The Anti-Lock Braking System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-III is available.

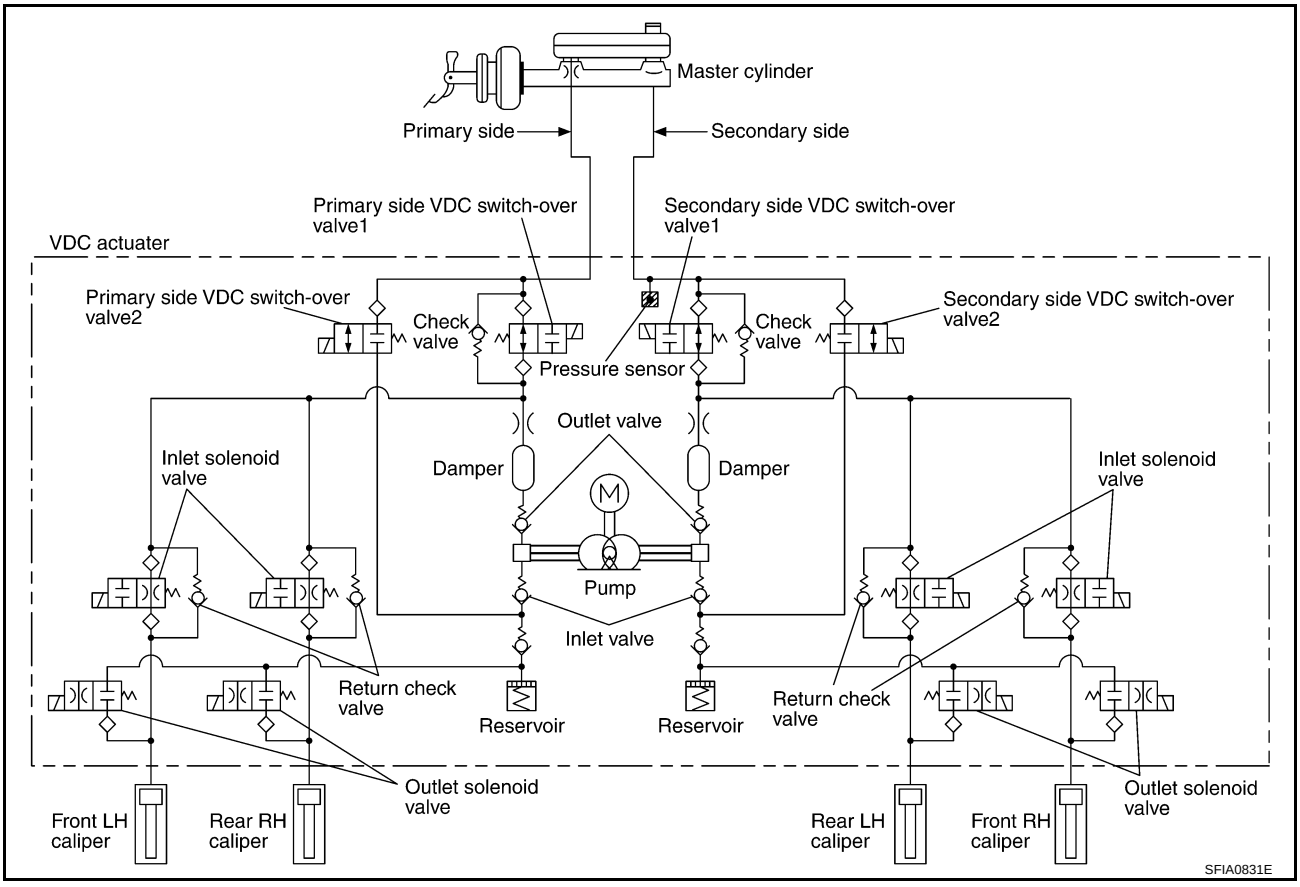
EBD Function

NFS00041

- Electronic Brake Distribution is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-III is available.

Hydraulic Circuit Diagram

NFS00043



CAN Communication

NFS00044

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000IK

VDC/TCS SYSTEM

In case of Throttle Control System trouble, the VDC OFF indicator lamp and SLIP indicator lamp are turned on, and the condition of the vehicle is the same as the condition of vehicles without VDC/TCS equipment. In case of trouble to the Throttle Control System, the ABS control continues to operate normally without VDC/TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform the self diagnosis for VDC/TCS/ABS control system.

ABS, EBD SYSTEM

In case of the electrical problems with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of the electrical problem with the EBD, brake warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the Fail-Safe function.

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicle without VDC/TCS/ABS equipment.

  NOTE:

  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.
- For EBD trouble, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without VDC/TCS/ ABS, EBD equipment.

How to Proceed With Diagnosis

NFS00045

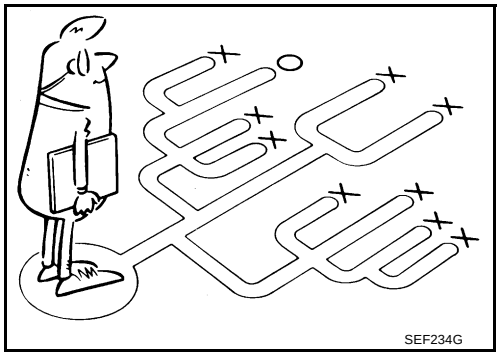
BASIC CONCEPT

- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

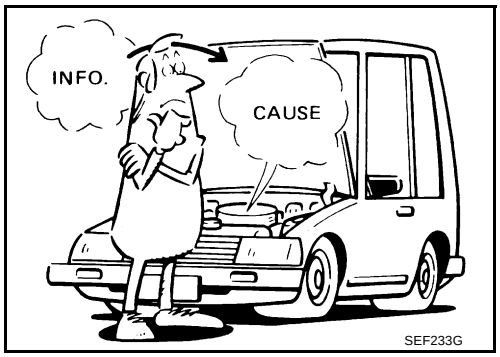
- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:

  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


SEF234G

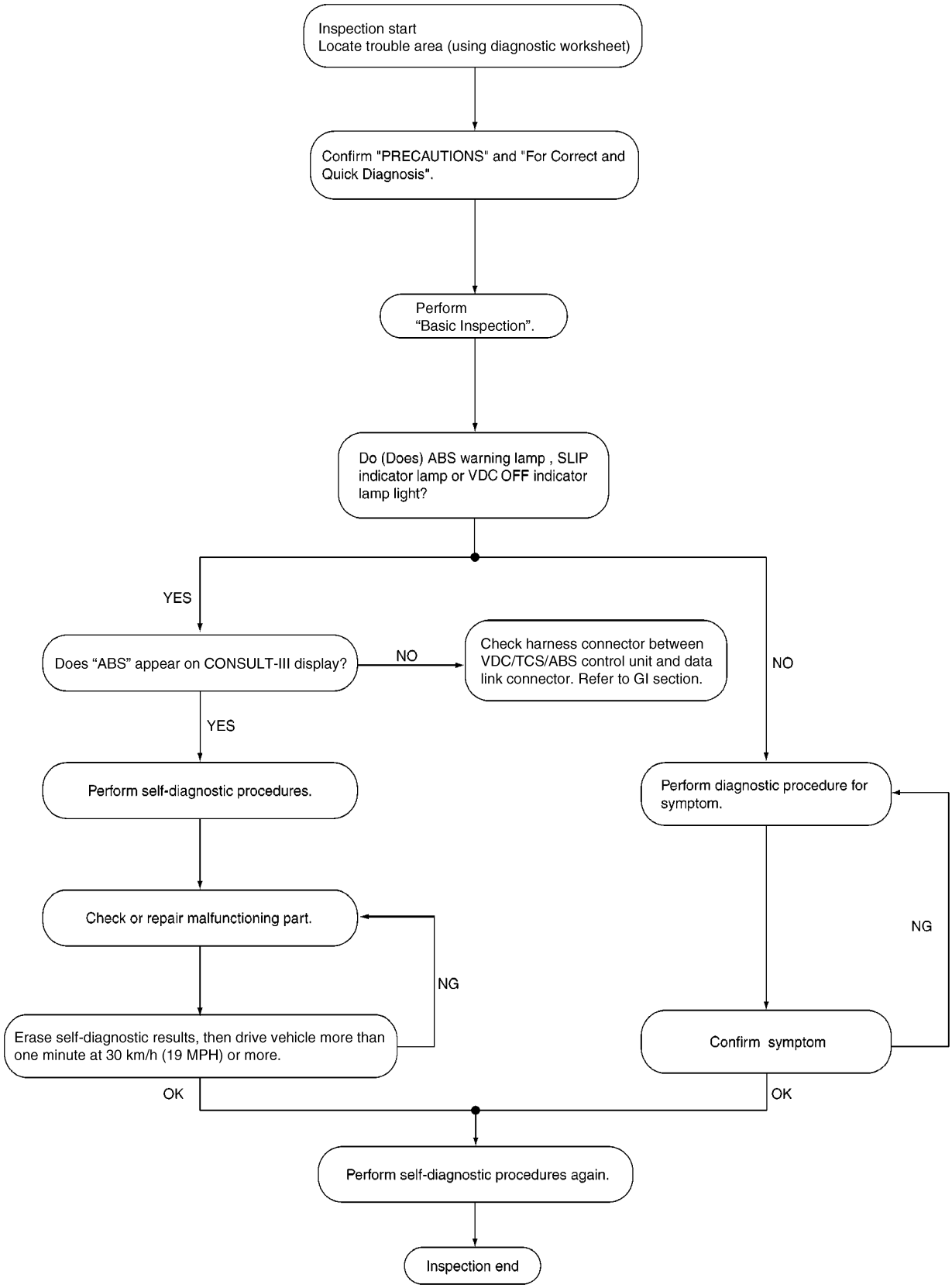
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to carry out “erase memory”. Refer to BRC-96, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-3, "General Precautions"

DIAGNOSIS FLOWCHART



SFIA3407E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

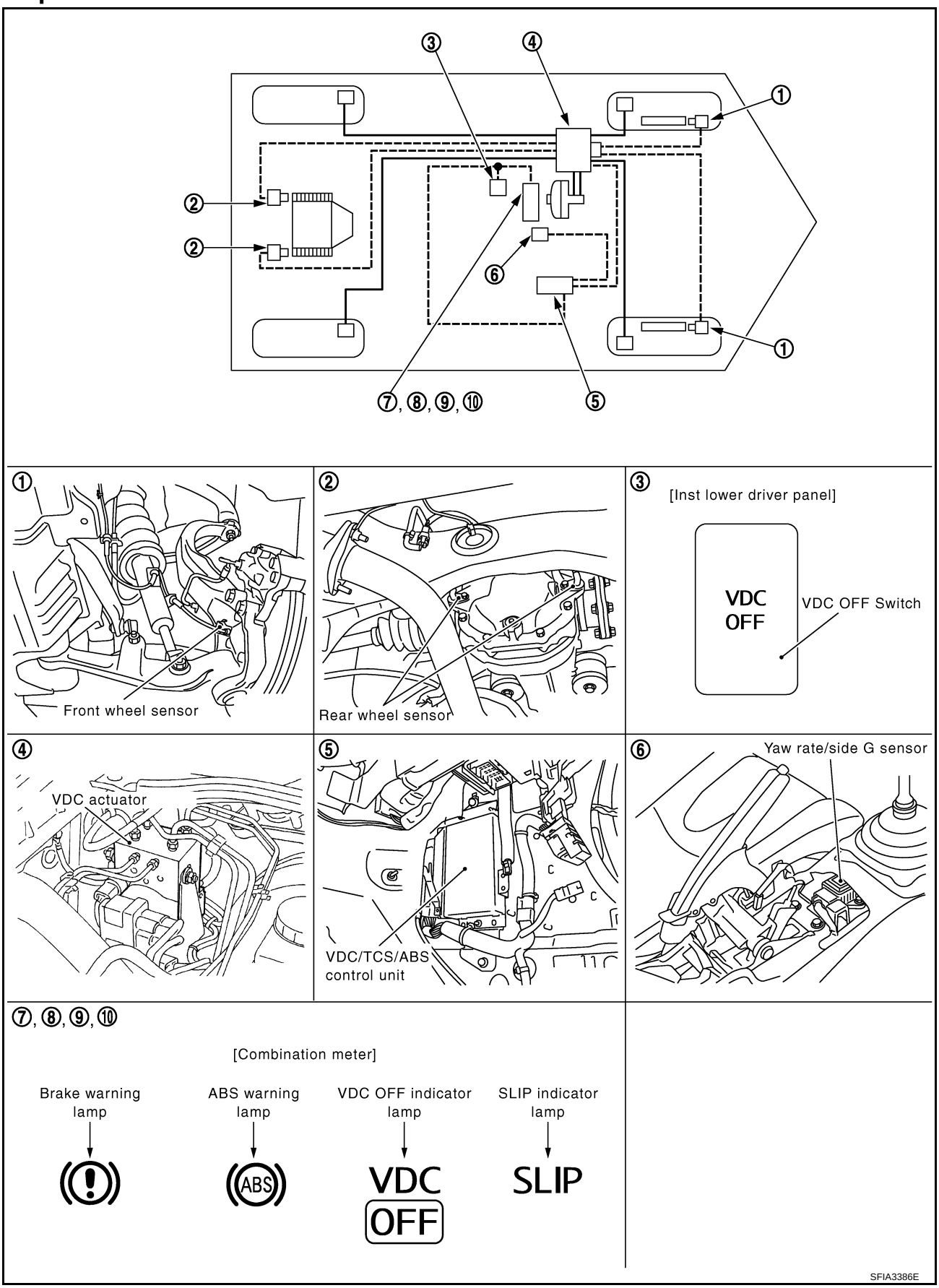
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA3265E

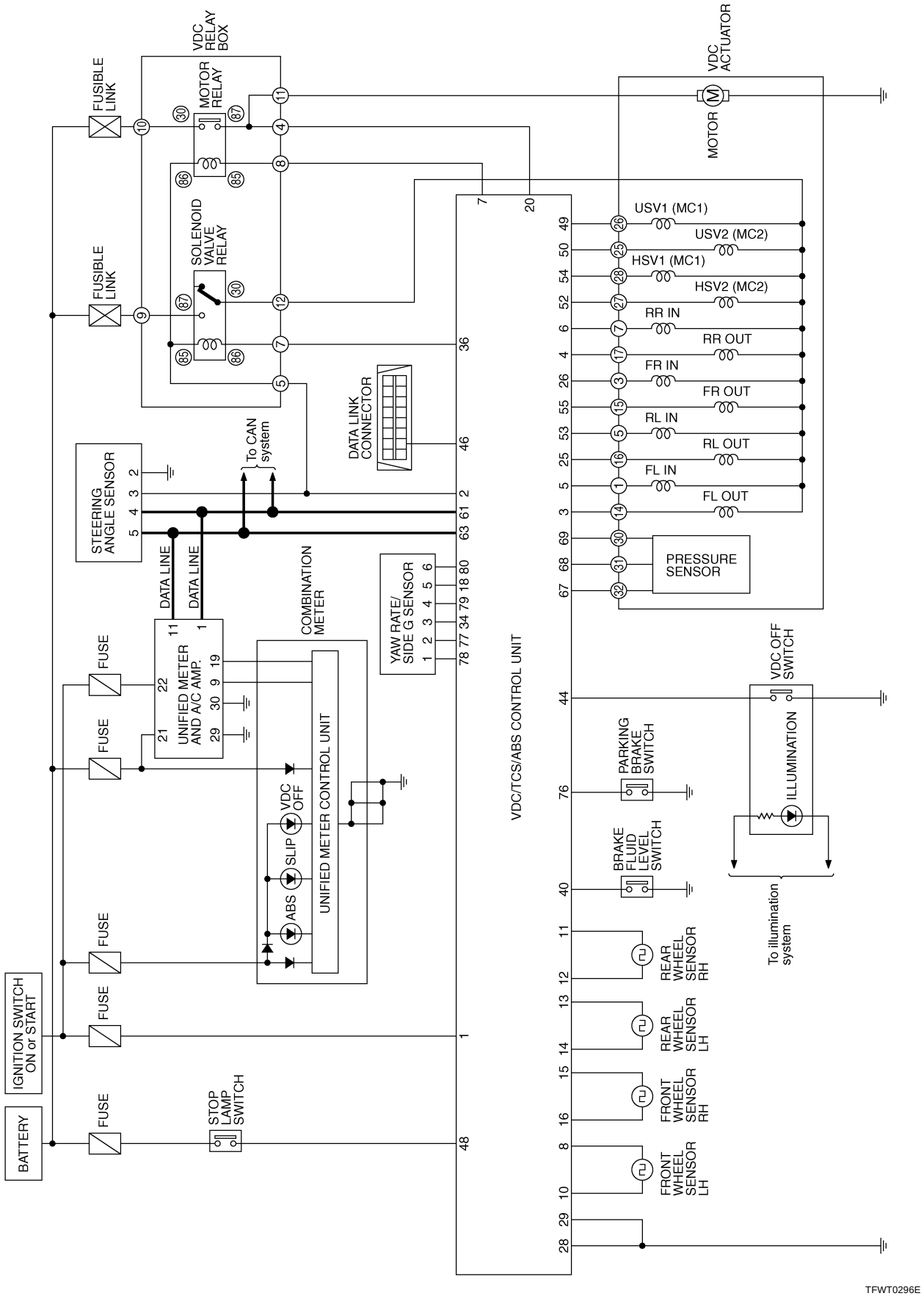
Component Parts Location

NFS000TL



Schematic

NFS00047

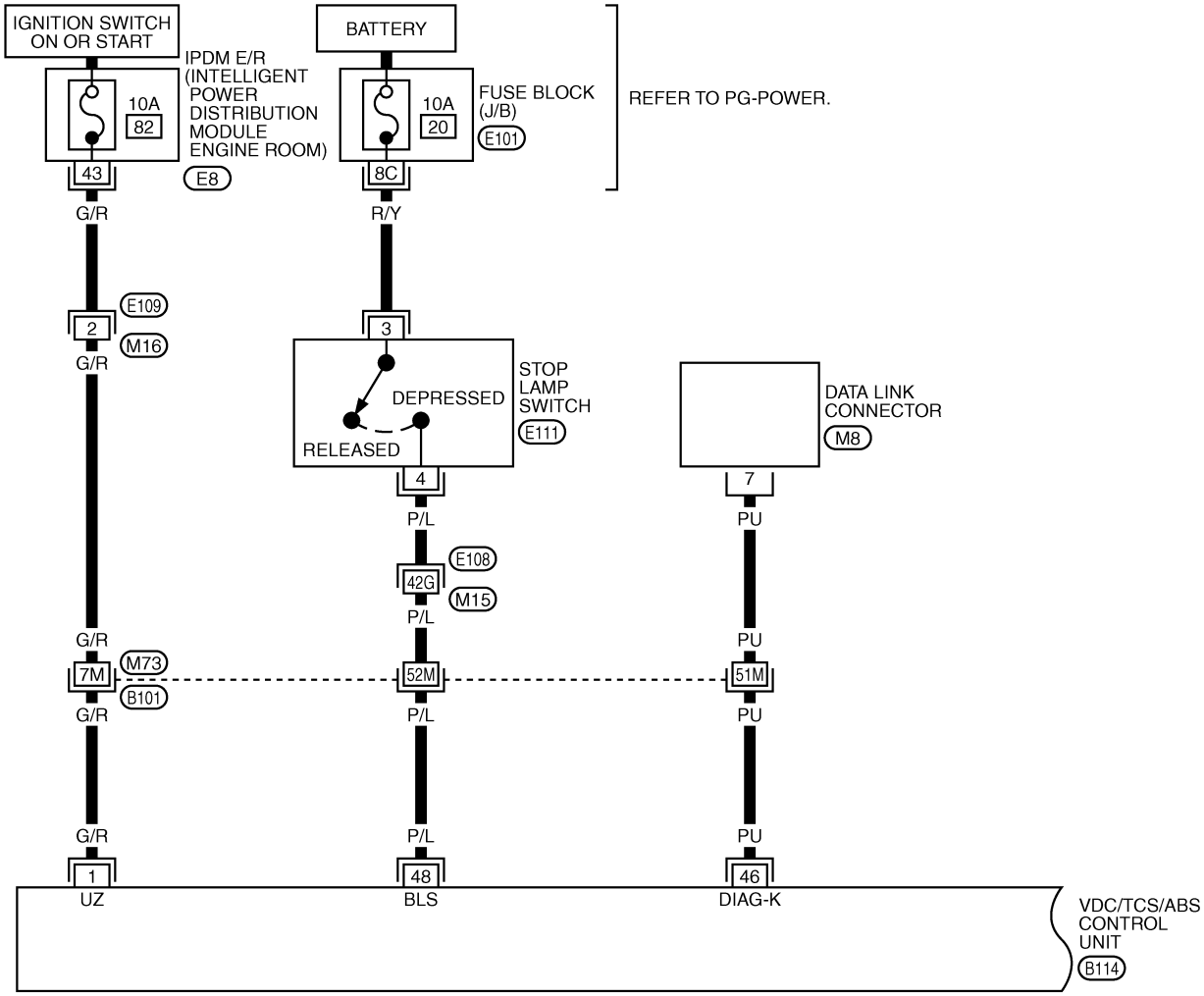


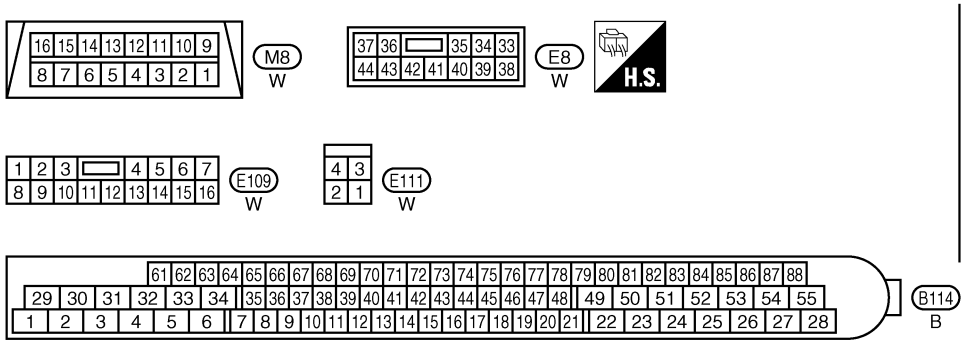
TFWT0296E

Wiring Diagram — VDC —

NFS00048

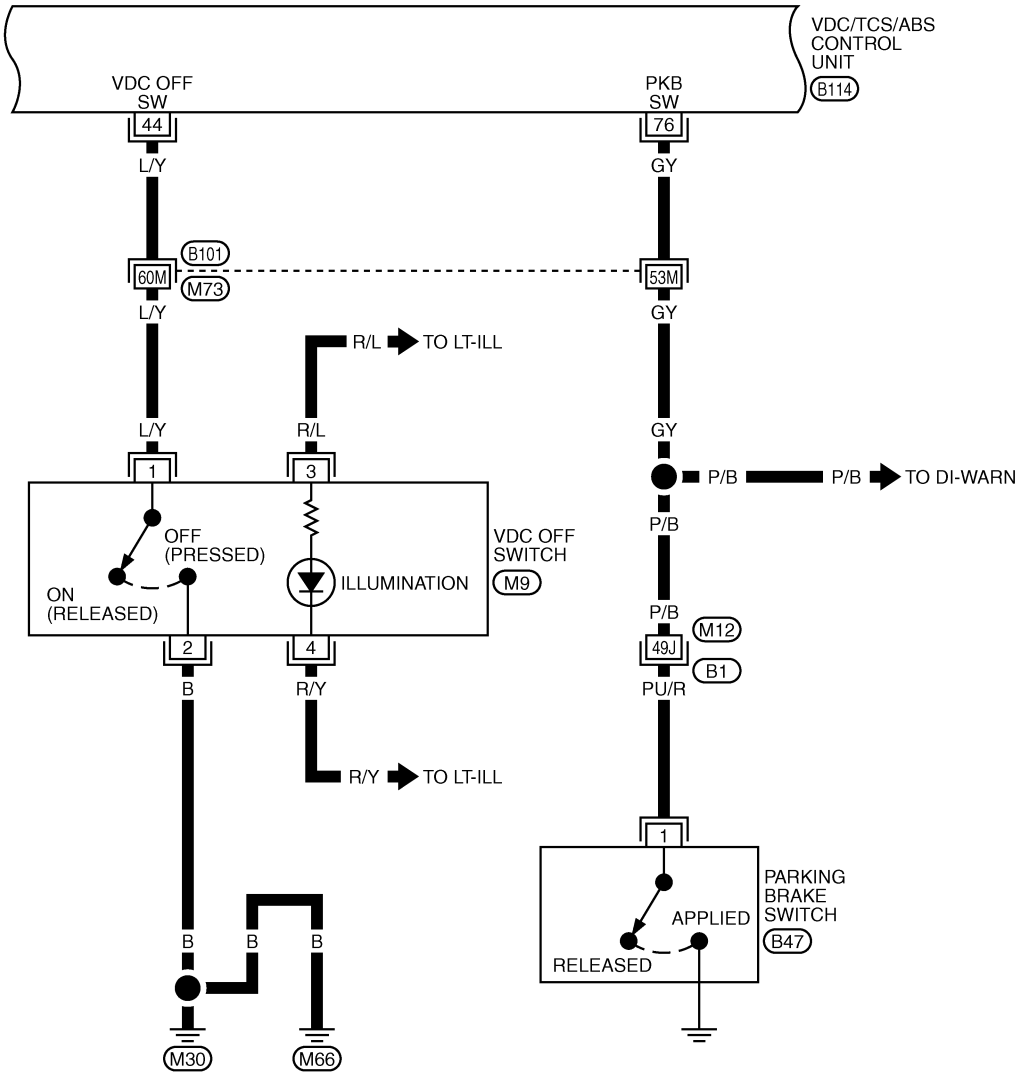
BRC-VDC-01

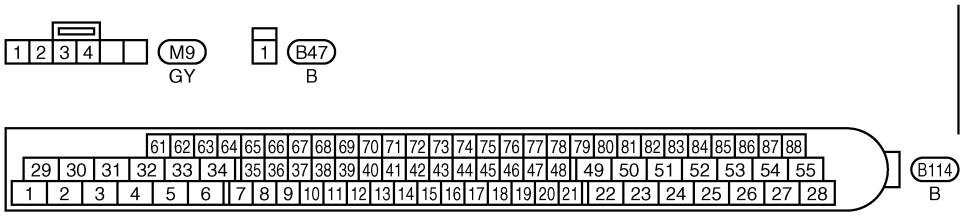




REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

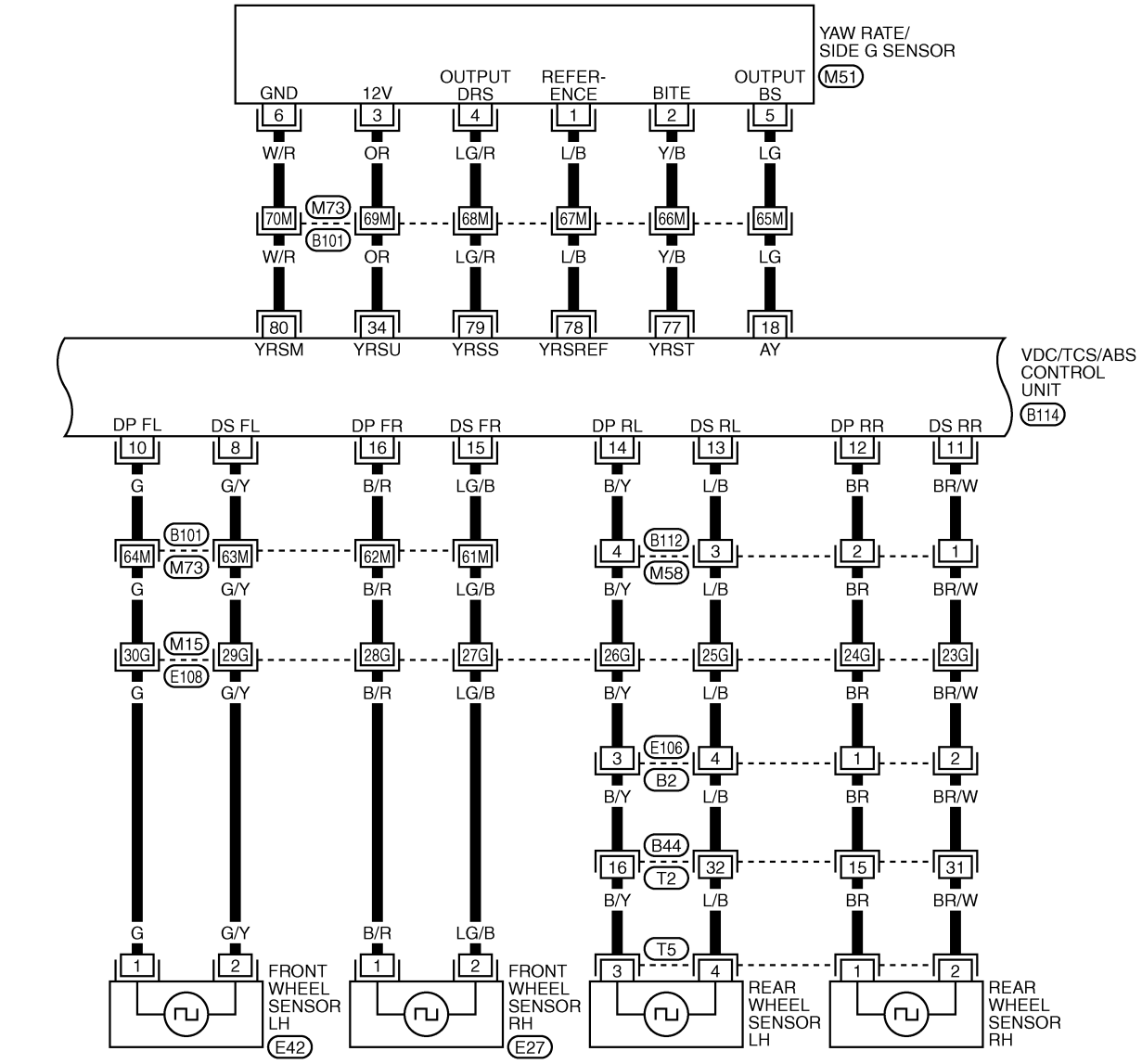
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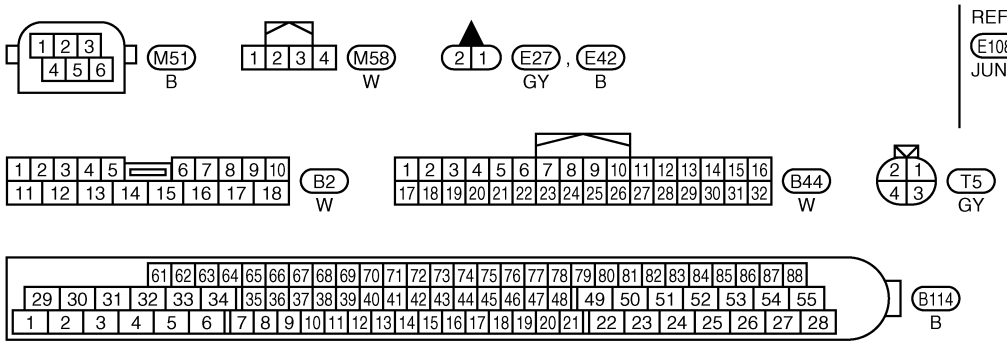

VDC/TCS/ABS CONTROL UNIT
B114
VDC OFF SW
44
L/Y
PKB SW
76
GY
B101
60M
M73
53M
L/Y
GY
R/L
TO LT-ILL
L/Y
R/L
GY
1
3
P/B
P/B
TO DI-WARN
P/B
OFF (PRESSED)
ON (RELEASED)
ILLUMINATION
VDC OFF SWITCH
M9
P/B
M12
49J
B1
2
4
B
R/Y
PU/R
R/Y
TO LT-ILL
1
PARKING BRAKE SWITCH
B47
APPLIED
RELEASED
B
B
B
M30
M66


1 2 3 4
M9
GY
1
B47
B
REFER TO THE FOLLOWING.
B1 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
B114
B

TFWT0379E

BRC-VDC-03

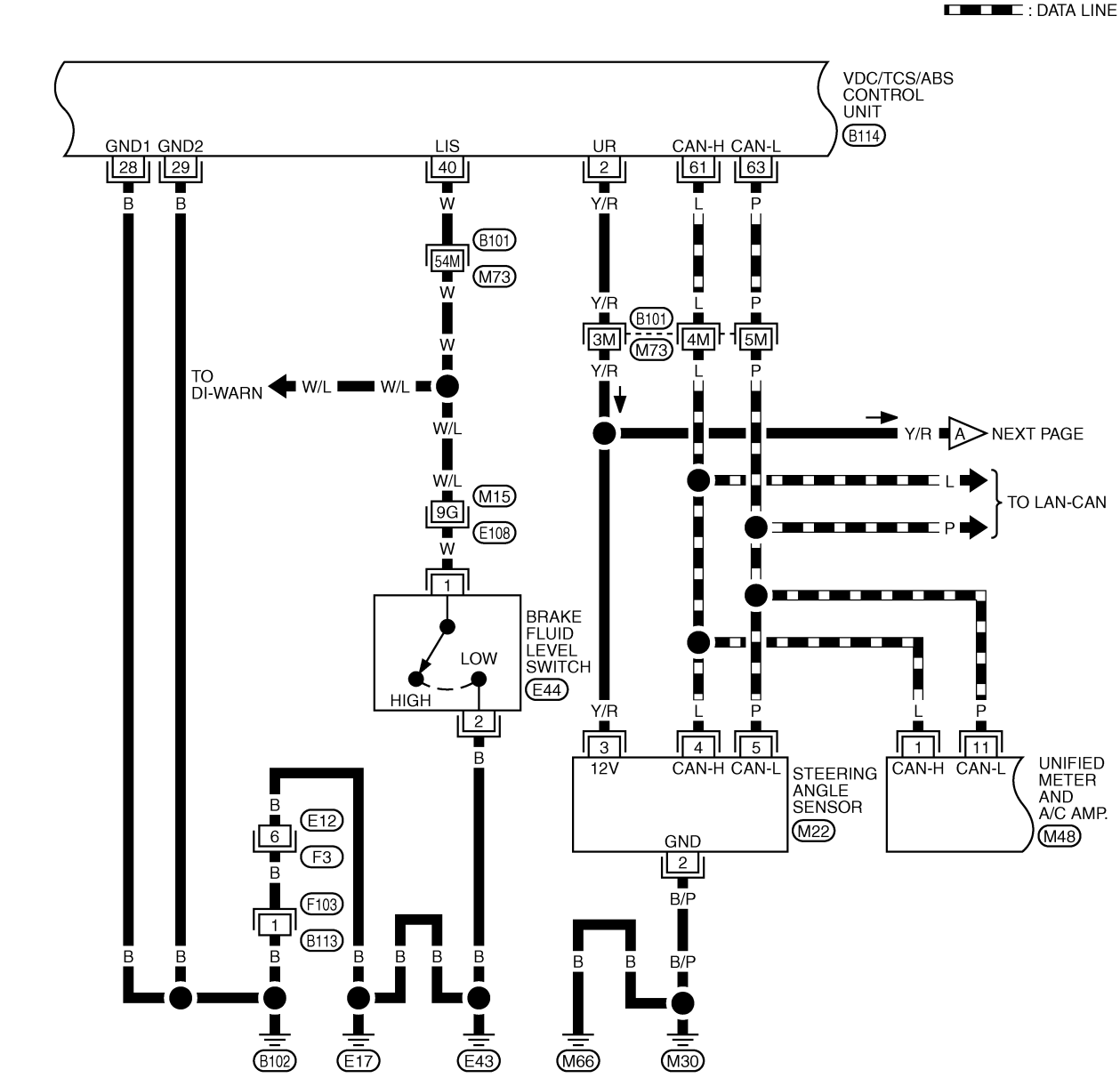


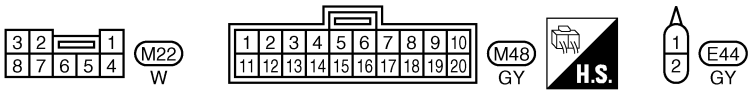


REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

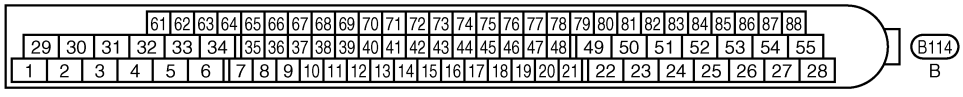
TFWT0370E

BRC-VDC-04



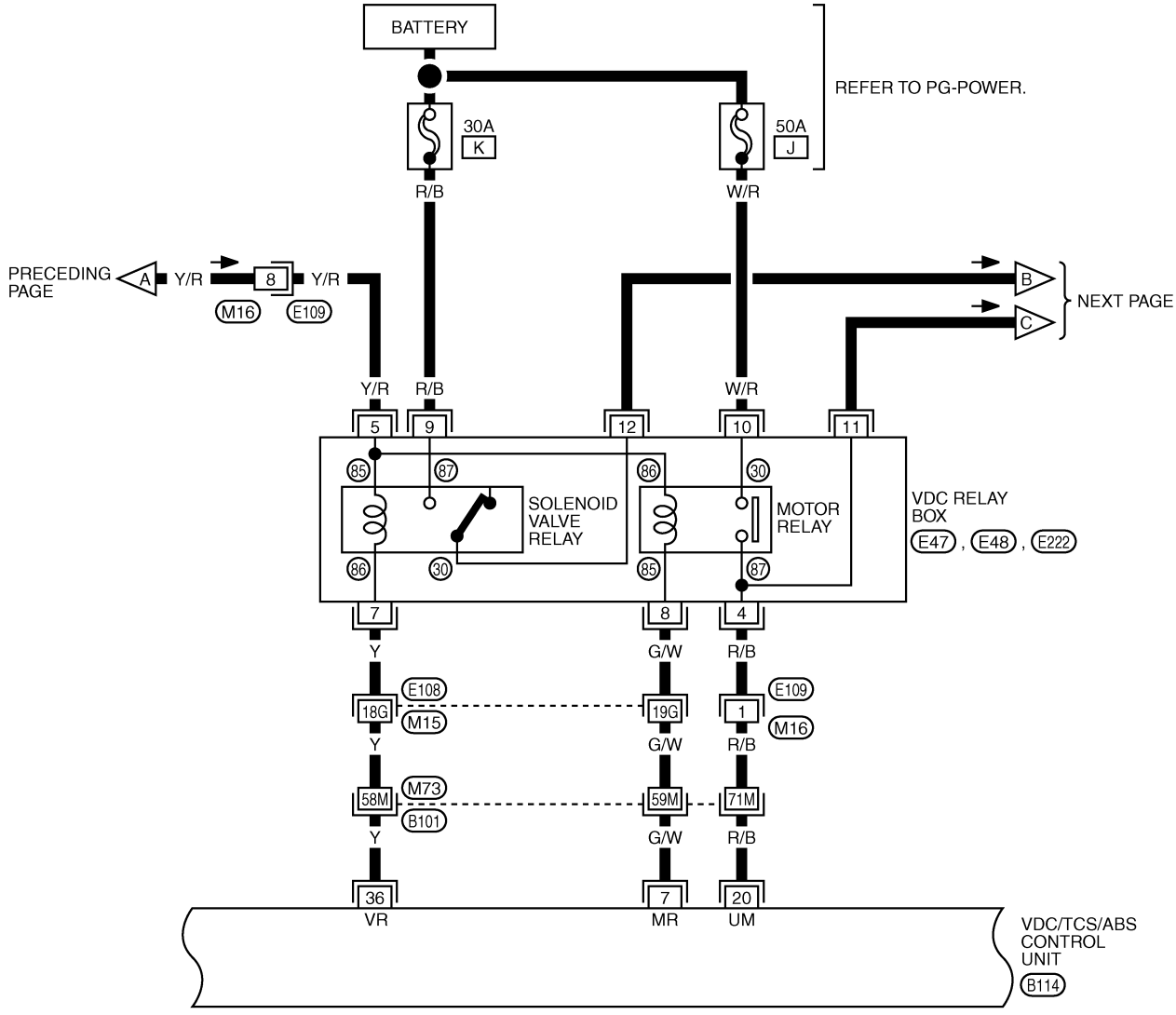


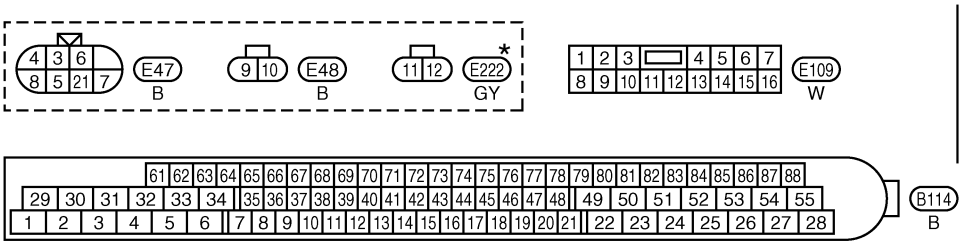
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E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)



TFWT0380E

BRC-VDC-05



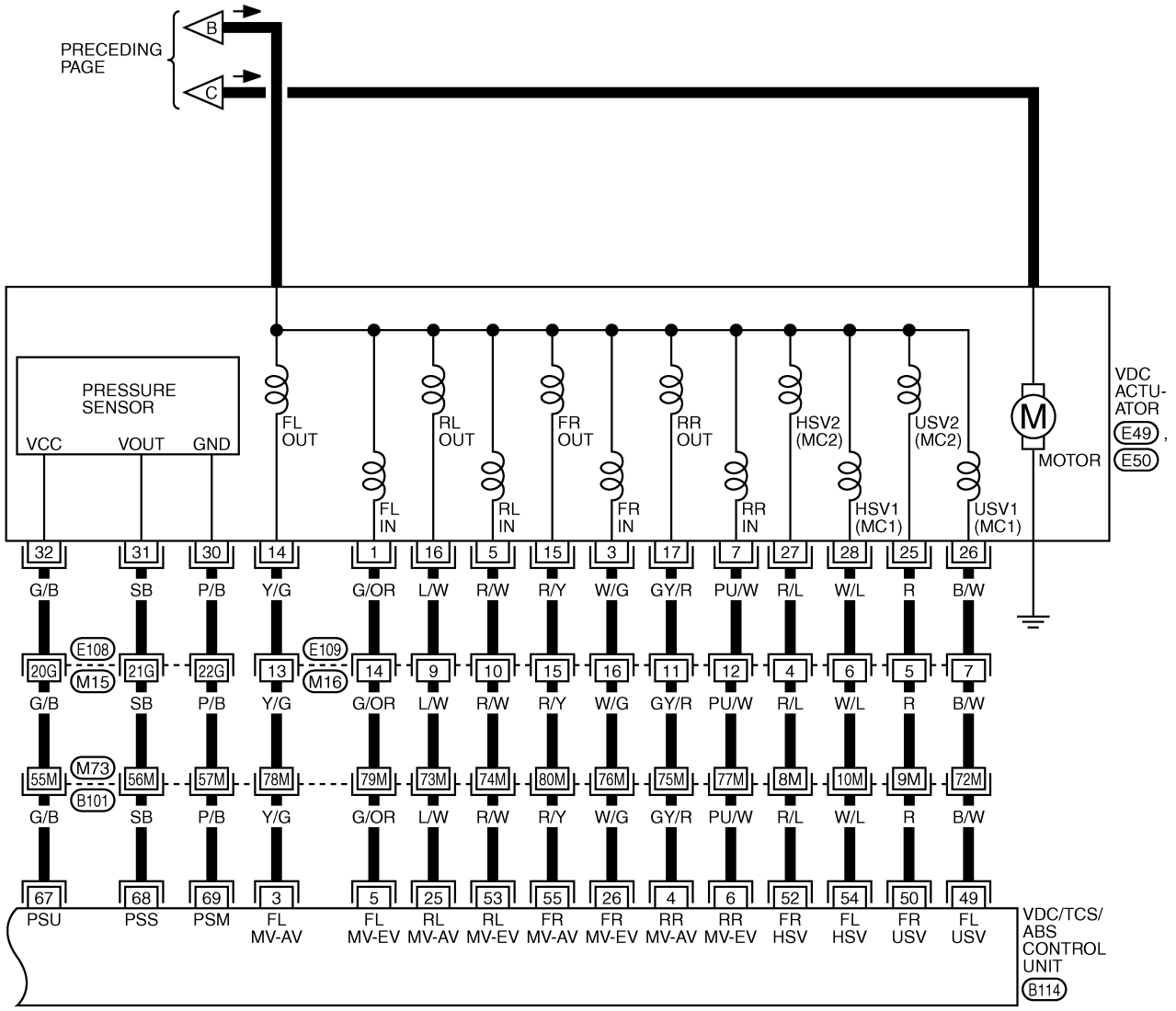


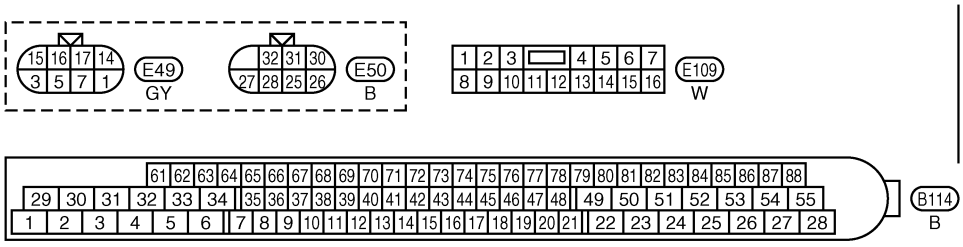
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TFWT0372E

BRC-VDC-06

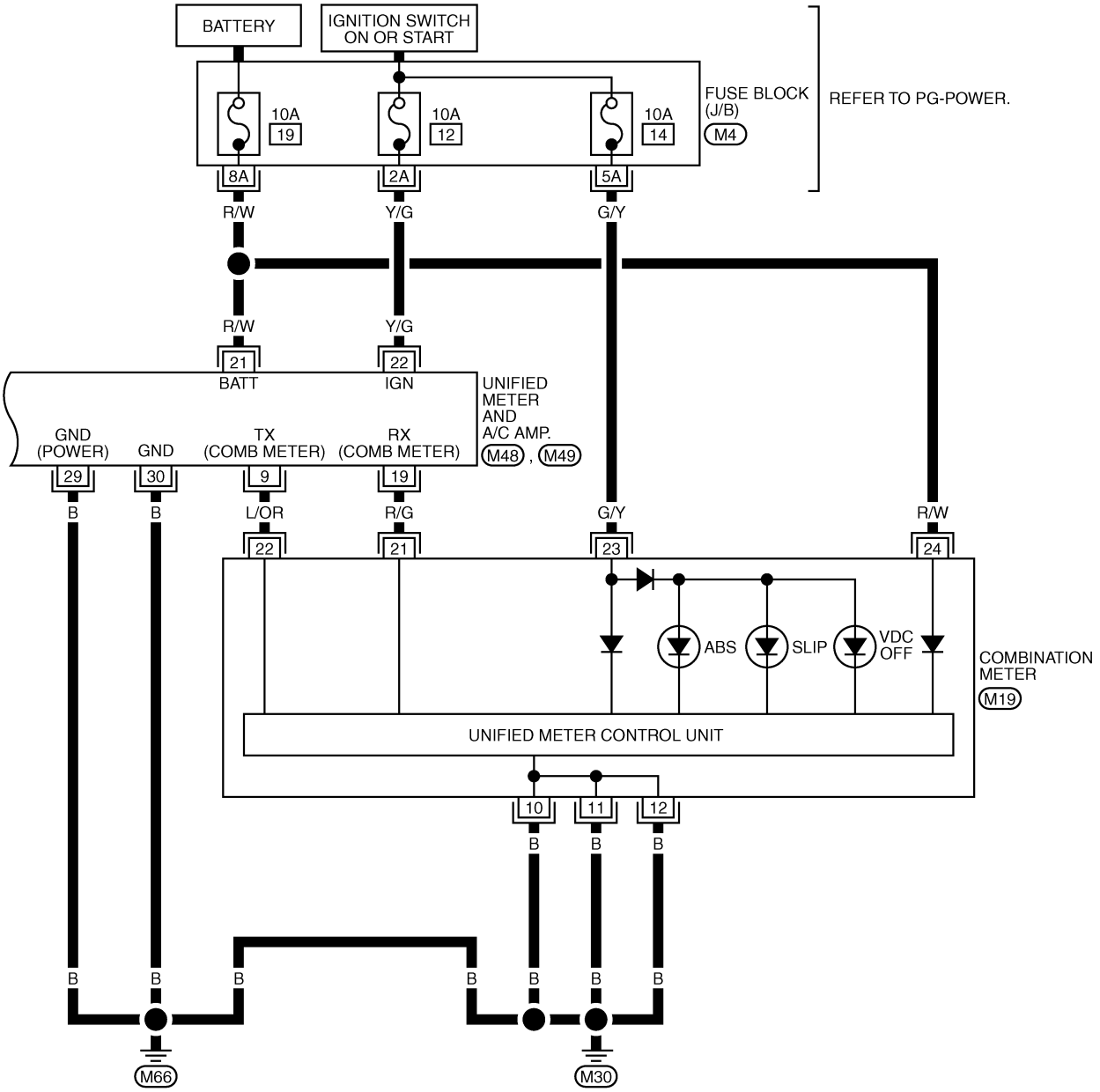


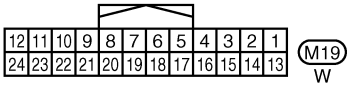


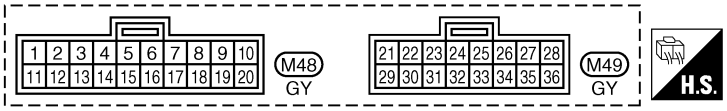
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0373E

BRC-VDC-07







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0303E

Control Unit Input/Output Signal Standard

NFS00049

REFERENCE VALUE FROM CONSULT-III

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
WHEEL SENSOR	Vehicle speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)
		While driving (Note 1)	Nearly matches the speedometer display (±10% or less)
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON
		When the actuator relay operates and the actuator solenoid does not operate	OFF
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON
		Brake pedal not depressed	OFF
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF
		When the actuator relay is not operating	ON
ABS WARN LAMP	ABS warning lamp on condition (Note 2)	ABS warning lamp ON	ON
		ABS warning lamp OFF	OFF
OFF LAMP	VDC OFF indicator lamp on condition (Note 3)	When the VDC OFF indicator lamp on	ON
		When the VDC OFF indicator lamp off	OFF
OFF SW	VDC OFF switch ON-OFF status	VDC OFF switch ON (When the VDC OFF indicator lamp on)	ON
		When VDC OFF switch OFF (When the VDC OFF indicator lamp off)	OFF
SLIP LAMP	SLIP indicator lamp on condition (Note 4)	When SLIP indicator lamp is ON	ON
		When SLIP indicator lamp is OFF	OFF
BATTERY VOLT	Battery voltage supplied to VDC/TCS/ABS control unit	Ignition switch ON	10 - 16V
GEAR	Determined gear shift position from the A/T PNP switch signal	Always	1 (M/T vehicles normally remain at 1)
POSITION	Shift position determined by the A/T PNP switch signal	Always	## (M/T vehicles normally remain at ##)
YAW RATE SEN	Yaw rate detected by yaw rate sensor	Vehicle stopped	Approx. 0 d/s
		While driving	-70 - 70d/s
ACCEL POS SIG	Throttle open/close status (linked to the accelerator pedal)	Do not step on the accelerator pedal (When ignition switch is on)	0%
		Step on the Brake pedal (When ignition switch is on)	0 to 100%
SIDE G-SENSOR	Side G detected by side G sensor	Vehicle stopped	Approx. 0 m/s^2
		While driving	-24.3 - 24.1 m/s^2
ST ANGLE SIG	Steering angle detected by steering angle sensor	Straight-ahead condition	Approx. 0°
		Steering wheel turned	-720 - 720°

Monitor item	Display Content	Data monitor	
		Condition	Reference values for normal operation
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	Do not step on the Brake pedal (When ignition switch is on)	Approx. 0 bar
		Step on the accelerator pedal (When ignition switch is on)	-40 - 300 bar
ENGINE RPM	Engine running	With engine stopped	0rpm
		Engine running	Almost in accordance with tachometer display
SNOW MODE SW	Snow mode switch ON/OFF condition	Snow mode switch ON	ON
		Snow mode switch OFF	OFF
CONTROL BOOSTER	Boost control status	When control booster is operating	ON
		When control booster is not operating	OFF
M MODE	A/T manual mode status	Always	OFF (M/T vehicles normally remain OFF)
OD OFF SW	A/T OD switch status	Always	OFF (M/T vehicles normally remain OFF)
PARK BRAKE SW	Parking brake status	Parking brake depressed	ON
		Parking brake not depressed	OFF
USV HSV	VDC switch-over valve status	During actuator change-over valve operation or during a fail-safe	ON
		When the actuator relay operates and the actuator change-over valve does not operate	OFF
V/R POWER	Actuator relay activated (ON/OFF)	When actuator relay is active (engine is running).	ON
		When actuator relay is not active (before engine starts and in fail-safe mode).	OFF
M/R OUTPUT	Actuator motor and motor relay status (ON/OFF)	When actuator motor and motor relay are active (“ACTIVE TEST” with CONSULT-III).	ON
		When the actuator motor and motor relay are not operating	OFF
FLUID LEV SW	Brake fluid level sensor ON/OFF status	When brake fluid level sensor is on	ON
		When the brake fluid level sensor is off	OFF
FAIL SIGNAL	Fail signal status	During VDC fail-safe During TCS fail-safe During ABS fail-safe During EBD fail-safe	ON

Note 1: Confirm tire pressure is normal.
Note 2: ON/OFF timing of ABS warning lamp
ON: Approximately 1 sec. After turning on the ignition switch or when an error is detected.
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal).
Note 3: ON/OFF timing of VDC OFF indicator lamp
ON: Approximately 1 sec. After the ignition switch is turned on, an error is detected, or the VDC OFF switch is on
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal) and the VDC OFF switch is off
Note 4: ON/OFF timing of SLIP indicator lamp
ON: Approximately 1 sec. After turning on the ignition switch or when an error is detected.
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal) and the VDC/TCS function is not operating
Flashing: VDC/TCS function is active during driving

CONSULT-III Functions (ABS)

NFS0004A

CONSULT-III MAIN FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	Reference
WORK SUPPORT	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.	BRC-79, "Adjustment of Steering Angle Sensor Neutral Position"
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-96, "Self-Diagnosis"
DATA MONITOR	Input/Output data in the VDC/TCS/ABS control unit can be read.	BRC-99, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-44, "CAN Diagnostic Support Monitor"
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the VDC/TCS/ABS control unit and also shifts some parameters in a specified range.	BRC-101, "Active Test"
FUNCTION TEST	Conducted by CONSULT-III instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	VDC/TCS/ABS control unit part number can be read.	—

Self-Diagnosis

NFS000HK

OPERATION PROCEDURE

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

HOW TO ERASE SELF-DIAGNOSIS RESULTS

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

   CAUTION:

   If memory cannot be erased, perform applicably diagnosis.

   - When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
   - Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR -1 [C1101]	When the circuit in the rear RH wheel sensor is open.	BRC-105, "Wheel Sensor System" (Note 1)
RR LH SENSOR - 1 [C1102]	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR - 1 [C1103]	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR - 1 [C1104]	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR -2 [C1105]	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR - 2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR -2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR - 2 [C1108]	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the VDC/TCS/ABS power voltage is lower than normal.	BRC-120, "VDC/TCS/ABS Control Unit Power and Ground Systems"
CONTROLLER FAILURE [C1110]	When there is an internal error in the VDC/TCS/ABS control unit.	BRC-107, "VDC/TCS/ABS Control Unit 1"
PUMP MOTOR [C1111]	When the control unit detects an error in the motor or motor relay.	BRC-116, "ABS Motor and Motor Relay System"
MAIN RELAY [C1114]	When the control unit detects an error in the actuator relay system.	BRC-118, "Actuator Relay System"
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input is malfunction.	BRC-105, "Wheel Sensor System" (Note 1)
STOP LAMP SW [C1116]	When a stop lamp switch open-circuit is detected.	BRC-119, "Stop Lamp Switch System"
FR LH IN ABS SOL [C1120]	When the VDC/TCS/ABS control unit detects an error in the front left inlet solenoid system.	BRC-113, "Solenoid and VDC Change-Over Valve System"
FR LH OUT ABS SOL [C1121]	When the VDC/TCS/ABS control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL [C1122]	When the VDC/TCS/ABS control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL [C1123]	When the VDC/TCS/ABS control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL [C1124]	When the VDC/TCS/ABS control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL [C1125]	When the VDC/TCS/ABS control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL [C1126]	When the VDC/TCS/ABS control unit detects an error in the rear left inlet solenoid system.	
RR RH OUT ABS SOL [C1127]	When the VDC/TCS/ABS control unit detects an error in the rear right outlet solenoid system.	

Display item	Malfunction detecting condition	Check item
USV LINE [FL-RR] [C1147]	When the primary side VDC change-over valve 1 circuit is open or short-circuit.	BRC-113, "Solenoid and VDC Change-Over Valve System"
USV LINE [FR-RL] [C1148]	When the secondary side VDC change-over valve 1 circuit is open or short-circuit.	
HSV LINE [FL-RR] [C1149]	When the primary side VDC change-over valve 2 circuit is open or short-circuit.	
HSV LINE [FR-RL] [C1150]	When the secondary side VDC change-over valve 2 circuit is open or short-circuit.	
PRESS SEN CIRCUIT [C1142]	Pressure sensor open-circuit. When a short-circuit is detected. Or, when a pressure sensor error is detected.	BRC-108, "Pressure Sensor System"
ST ANG SEN CIRCUIT [C1143]	When the steering angle sensor neutral point has deviated. Or, when a steering angle sensor error is detected.	BRC-110, "Steering Angle Sensor System"
ST ANG SEN SIGNAL [C1144]	Neutral position correction of steering angle sensor is not finished.	BRC-79, "Adjustment of Steering Angle Sensor Neutral Position"
YAW RATE SENSOR [C1145]	When a yaw rate sensor error is detected. Or, when the yaw rate sensor circuit is open. When a short-circuit is detected.	BRC-111, "Yaw Rate/Side G Sensor System"
SIDE G - SEN CIRCUIT [C1146]	When there is an error in the side G sensor. Or, when the side G sensor circuit is open or short-circuited.	BRC-111, "Yaw Rate/Side G Sensor System"
ENGINE SIGNAL 1 [C1130]	Major engine components malfunctioning.	BRC-107, "Engine System"
ENGINE SIGNAL 2 [C1131]		
ENGINE SIGNAL 3 [C1132]		
ENGINE SIGNAL 4 [C1133]		
ENGINE SIGNAL 5 [C1134]		
ENGINE SIGNAL 6 [C1135]		
EMERGENCY BRAKE [C1153]	When the VDC/TCS/ABS control unit is malfunctioning (excessive pressure increase or insufficient pressure increase).	BRC-121, "VDC/TCS/ABS Control Unit 2"
BR FLUID LEVEL LOW [C1155]	The brake fluid level has dropped. Or, when there is a short to ground in the circuit between the VDC/TCS/ABS control unit and the fluid level sensor.	BRC-121, "Brake Fluid Level Switch System"
ST ANG SEN COM CIR [C1156]	CAN communication line or steering angle sensor has generated an error.	BRC-122, "CAN Communication System"
CAN COMM CIRCUIT [U1000]	When VDC/TCS/ABS control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-122, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the vehicle at approximately 30 km/h (19 MPH) for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HL

DISPLAY ITEM LIST

×: Standard –: Not applicable ▼: Option

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR [km/h (MPH)]	x	x	▼	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [km/h (MPH)]	x	x	▼	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	x	x	▼	Wheel speed calculated by rear RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	x	x	▼	Wheel speed calculated by rear LH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	x	▼	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	x	▼	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	x	▼	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	x	▼	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	x	▼	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	x	▼	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	x	▼	Rear left inlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	x	▼	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	x	x	▼	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	x	▼	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR REL (ON/OFF)	–	x	▼	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	x	▼	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	x	▼	VDC OFF indicator lamp (ON/OFF) status is displayed.
OFF SW (ON/OFF)	x	x	▼	VDC OFF switch (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	x	▼	SLIP indicator lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	x	x	▼	The voltage supplied to the VDC/TCS/ABS control unit is displayed.
GEAR	x	x	▼	The gear position determined from the A/T PNP switch signal is displayed.
SLCT LVR POSI (For A/T models)	x	x	▼	Shift position determined from the A/T PNP switch signal is displayed.
YAW RATE SEN (d/s)	x	x	▼	Yaw rate detected by the yaw rate sensor is displayed.
ACCEL POS SIG (%)	x	–	▼	Throttle position status determined from the CAN communication signal is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
SIDE G SENSOR (m/s^2)	x	–	▼	Side G detected by the side G sensor is displayed.
STR ANGLE SIG (°)	x	–	▼	Steering angle detected by the steering angle sensor is displayed.
PRESS SENSOR (bar)	x	–	▼	Brake hydraulic pressured detected by the pressure sensor is displayed.
ENGINE RPM (rpm)	x	–	▼	The engine speed status determined from the CAN communication signal is displayed.
SNOW MODE SW (ON/OFF)	–	–	▼	Snow mode switch (ON/OFF) status determined from the CAN communication signal is displayed.
BST OPER SIG (ON/OFF)	–	–	▼	Control booster operation signal (ON/OFF) status determined from the CAN communication signal is displayed.
M - MODE SIG (ON/OFF)	–	–	▼	M mode (ON/OFF) status determined from the CAN communication signal is displayed.
OD OFF SW (ON/OFF)	–	–	▼	OD cancel switch (ON/OFF) status determined from the CAN communication signal is displayed.
EBD SIGNAL (ON/OFF)	–	–	▼	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	▼	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	–	–	▼	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	–	–	▼	VDC operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	▼	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	▼	ABS fail-safe signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	–	–	▼	TCS fail-safe signal (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	–	–	▼	The VDC fail-safe signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	–	–	▼	Ignition switch START position signal input status is displayed.
ASCD SIGNAL (ON/OFF)	–	–	▼	ASCD (ON/OFF) status is displayed.
FLUID LEV (ON/OFF)	x	–	▼	Brake fluid level sensor (ON/OFF) status is displayed.
PARKING BRAKE SW (ON/OFF)	x	–	▼	Parking brake switch (ON/OFF) status is displayed.
USV FL-RR (ON/OFF)	–	–	▼	Primary side USV solenoid valve (ON/OFF) status is displayed.
USV FR-RL (ON/OFF)	–	–	▼	Secondary side USV solenoid valve (ON/OFF) status is displayed.
HSV FL-RR (ON/OFF)	–	–	▼	Primary side HSV solenoid valve (ON/OFF) status is displayed.
HSV FR-RL (ON/OFF)	–	–	▼	Secondary side HSV solenoid valve (ON/OFF) status is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
V/R OUTPUT (ON/OFF)	–	–	▼	Valve relay operation signal (ON/OFF) status is displayed.
M/R OUTPUT (ON/OFF)	–	–	▼	Monitor relay operation signal (ON/OFF) status is displayed.

Active Test

NFS000IP

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.

TEST ITEM

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

- When conducting an active test of the ABS function, select the main item for each test item. In addition, when conducting an active test of the VDC/TCS function, select the item menu for each test item.
- For the ABS solenoid valve, touch “UP”, “KEEP”, “DOWN” on the display screen. For the ABS solenoid valve (ACT), touch “UP”, “ACT UP”, “ACT KEEP” and confirm that the solenoid valves (IN, OUT, USV, HSV) operate as shown in the table below.

Operation	ABS solenoid valve			ABS solenoid valve (ACT)		
	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
USV [FR - RL]	OFF	OFF	OFF	OFF	ON	ON
HSV [FR - RR]	OFF	OFF	OFF	OFF	ON*	OFF

*: ON for 1 to 2 seconds after the touch, and then OFF

ABS Motor

Touch “ON”, “OFF” on the display screen and make sure the ABS motor relay is operating as shown in the table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Correct and Quick Diagnosis

NFS0004B

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- When replacing steering angle sensor, steering system components or suspension system components, and when adjusting the alignment, be sure to adjust the steering angle sensor neutral position before driving. Refer to BRC-79, "Adjustment of Steering Angle Sensor Neutral Position" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-96, "HOW TO ERASE SELF-DIAGNOSIS RESULTS" .

- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- VDC/TCS/ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	The is a motor operation sound inside VDC/TCS/ABS actuator, and sometimes there is a slight sound when VDC, TCS, or ABS operates.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
TCS operation (SLIP indicator lamp ON)	TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.	Normal Cancel the VDC/TCS function for the inspection on a chassis dynamometer.
	When inspecting the speedometer, etc., press VDC OFF switch to turn off TCS function before conducting the work.	
	When accelerator pedal is depressed on a chassis dynamometer (front wheel fixing type), the vehicle speed will not increase. This is normal, because TCS is activated by the stationary front wheels. The warning lamp may also turn on to show “sensor system error” in this case. This is not a malfunction either, because the stationary front wheels are detected. Restart engine, and drive the vehicle at 30 km/h (19 MPH) or higher to check that the warning lamp no longer turns on.	
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal
Sluggish feel	Depending on road circumstances, the driver may have a sluggish feel. This is normal, because under TCS operation optimum traction has the highest priority (safety first). Sometimes the driver has a slight sluggish feel in response to substantial accelerator pedal operation.	Normal

ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP AND BRAKE WARNING LAMP ON/OFF TIMING

×: ON –: OFF

Condition	ABS warning lamp	VDC OFF indicator lamp	SLIP indicator lamp	Brake warning lamp (Note 1)	Remarks
Ignition switch OFF.	—	—	—	—	—
Approx. Within 1 seconds after ignition switch is turned ON.	×	×	×	× (Note 1)	—
Approx. 1 seconds after ignition switch ON.	—	—	—	× (Note 1)	Turns OFF 2 seconds after engine starts.
VDC OFF switch is turned ON. (VDC function is OFF.)	—	×	—	—	—
VDC/TCS/ABS error.	×	×	—	—	There is a malfunction in VDC/TCS/ABS control unit, SLIP indicator lamp turns off (when the power supply or ground circuits return an error).
	×	×	×	—	—
When VDC/TCS is not functioning normally.	—	×	×	—	—
EBD error.	×	×	×	×	—

Note 1:Brake warning lamp will turn on in case of operating parking brake (switch turned on) or of actuating brake fluid level switch (brake fluid is insufficient).

Basic Inspection

NFS0004C

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around VDC actuator for leaks. If there is leaking or oozing fluid, check the following items.
   - If VDC actuator connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or VDC actuator screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than VDC actuator connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at VDC actuator, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the VDC actuator body.

     CAUTION:
     VDC actuator cannot be disassembled.
3. Check the brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION

1. Make sure ABS warning lamp, VDC OFF indicator lamp (when VDC OFF switch is OFF), and SLIP indicator lamp turns ON approximately 1 second when the ignition switch is turned ON. If they do not, check the VDC OFF indicator lamp and then VDC OFF switch. Refer to BRC-122, "VDC OFF SWITCH" . Check CAN communications. Refer to “CAN Communication Inspection”. If there are no errors with VDC OFF switch and CAN communication system, check combination meter. Refer to BRC-122, "CAN Communication System" .

2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. With the engine running, make sure VDC OFF indicator lamp turns on and off when VDC OFF switch is turned on and off. If the indicator lamp status does not correspond to switch operation, check the VDC OFF switch system. Refer to BRC-122, "VDC OFF SWITCH" .
4. Make sure ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off 2 seconds after the engine is started. If ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the VDC/TCS/ABS control unit.
5. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-96, "HOW TO ERASE SELF-DIAGNOSIS RESULTS"

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS0004D

After using the CONSULT-III SELF-DIAG RESULTS to determine the location of the malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

- **Do not measure the resistance value and also voltage between the sensor terminal with tester etc., because the sensor is an active sensor.**
- **Do not expand the terminal of the connector with a/the tester terminal stick, when it does the inspection with the tester.**

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR-1,-2
FR LH SENSOR- 1,-2
RR RH SENSOR-1,-2
RR LH SENSOR-1,- 2
ABS SENSOR [ABNORMAL SIGNAL]

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK TIRE

Check air pressure, wear, and size.

Are air pressure, wear, and size within the standard values?

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

- Check the condition of the sensor mount (for looseness, etc.).
- Check the surface of the front sensor rotor rubber for damage.
- Check the rear sensor rotor for damage.

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

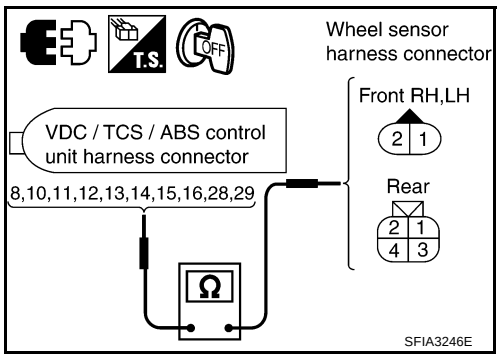
1. Disconnect VDC/TCS/ABS control unit connector and malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connectors, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect wheel sensor connector E42 (FR - LH), E27 (FR - RH), T5 (RR - RH, LH) and VDC/TCS/ABS control unit connector B114.
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	VDC/TCS/ABS control unit	Wheel sensor	VDC/TCS/ABS control unit	Wheel sensor	VDC/TCS/ABS control unit (signal)	VDC/TCS/ABS control unit (ground)
Front RH	16	1	15	2	16, 15	28, 29
Front LH	10	1	8	2	10, 8	
Rear RH	12	1	11	2	12, 11	
Rear LH	14	3	13	4	14, 13	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

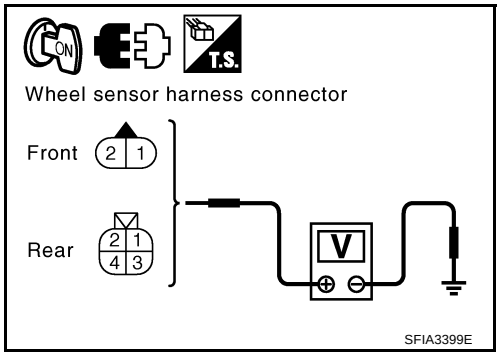
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

6. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Disconnect malfunctioning wheel sensor connector.
2. Turn ignition switch ON and check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH	1	—	8 V or more
Front LH			
Rear RH			
Rear LH	3		



OK or NG

OK >> Replace wheel sensor.
NG >> Replace ABS actuator and electric unit (control unit).

Engine System

NFS0004E

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK ENGINE SYSTEM

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct the ECM self-diagnosis.
2. Re-conduct VDC/TCS/ABS control unit self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

VDC/TCS/ABS Control Unit 1

NFS0004F

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

YES >> Replace VDC/TCS/ABS control unit. Re-conduct the self-diagnosis.
NO >> INSPECTION END

Pressure Sensor System

NFS0004G

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK STOP LAMP SWITCH CONNECTOR

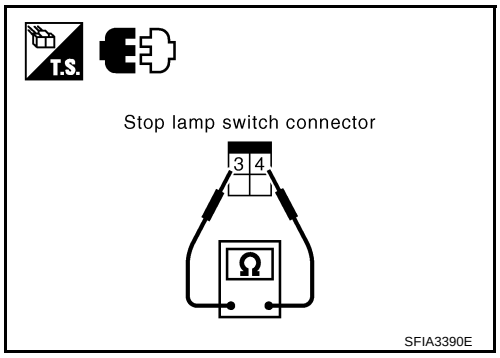
1. Disconnect stop lamp switch connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, then perform self-diagnosis again.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.



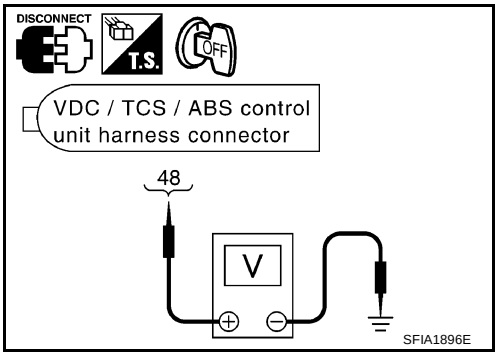
Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector B114.
2. Check voltage between VDC/TCS/ABS control unit connector B114 terminal 48 and ground.



VDC/TCS/ABS control unit	Ground	Measurement condition	Voltage
48	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> GO TO 5.
NG >> Open or short in harness. Repair or replace the harness.

5. CHECK PRESSURE SENSOR CONNECTOR

1. Disconnect VDC actuator connector E50 and VDC/TCS/ABS control unit connector, check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then perform self-diagnosis.

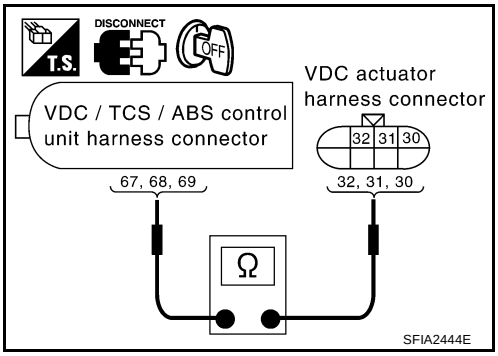
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 6.

6. CHECK PRESSURE SENSOR HARNESS

1. Turn ignition switch OFF and disconnect VDC actuator connector E50 and VDC/TCS/ABS control unit connector B114.
2. Check continuity between VDC/TCS/ABS control unit connector and VDC actuator connector.

VDC/TCS/ABS control unit	VDC actuator	Continuity
69	30	Yes
68	31	
67	32	



OK or NG

OK >> GO TO 7.
NG >> If the open or short in harness, repair or replace the harness.

7. CHECK PRESSURE SENSOR

1. Connect VDC actuator and VDC/TCS/ABS control unit connectors.
2. Conduct “DATA MONITOR” of the “PRESS SENSOR” to check if the status is normal.

Condition	Data monitor display
When brake pedal is depressed.	– 40 – 300 bar
When brake pedal is released.	Approx. 0 bar

OK or NG

OK >> INSPECTION END
NG >> If the pressure sensor is damaged or malfunctioning, replace the VDC actuator (pressure sensor it built in).

Steering Angle Sensor System

NFS0004H

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ST ANG SEN CIRCUIT

Is the above displayed in the self-diagnosis item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect steering angle sensor connector and VDC/TCS/ABS control unit connector and check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then preform self-diagnosis.

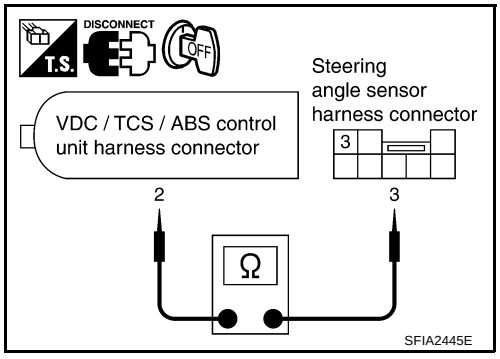
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STEERING ANGLE SENSOR HARNESS

1. Check CAN communication system. Refer to BRC-122, "CAN Communication System" .
2. Turn ignition switch OFF and disconnect steering angle sensor connector M22 and VDC/TCS/ABS control unit connector B114.
3. Check continuity between VDC/TCS/ABS control unit connector terminal 2 and steering angle sensor connector terminal 3.

VDC/TCS/ABS control unit	Steering angle sensor	Continuity
2	3	Yes



OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace the harness.

4. CHECK DATA MONITOR

1. Connect steering angle sensor and VDC/TCS/ABS control unit connectors.
2. Conduct “DATA MONITOR” of the “STR ANGLE SIG” to check if the status is normal.

Steering condition	Data monitor
Straight-ahead	Approx. 0°
Turn wheel to the right by 90 °	Approx. + 90°
Turn wheel to the left by 90 °	Approx. - 90°

OK or NG

OK >> Re-conduct VDC/TCS/ABS control unit self-diagnosis.
NG >> Replace spiral cable (steering angle sensor) and adjust neutral position of steering angle sensor. Refer to BRC-79, "Adjustment of Steering Angle Sensor Neutral Position" .

Yaw Rate/Side G Sensor System

NFS0004I

CAUTION:
Sudden turns (such as spin turns, acceleration turns), drifting, etc. When VDC function is OFF (VDC OFF switch ON) may cause the yaw rate/side G sensor system indicate a problem. However this is not a problem if normal operation can be resumed after restarting the engine.

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
YAW RATE SENSOR
SIDE G-SENSOR

CAUTION:
When on a turntable, such as at a parking structure entrance, or when on a moving object with the engine running, the VDC OFF indicator lamp might turn on and the self-diagnosis using the CONSULT-III the yaw rate sensor system might be displayed, but in this case there is no problem with the yaw rate sensor system. As soon as the vehicle leaves the turntable or moving object, restart the engine to return the system to normal.

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

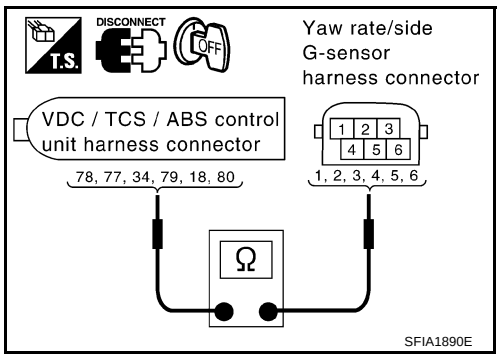
1. Disconnect yaw rate/side G sensor connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK YAW RATE/SIDE G SENSOR HARNESS

1. Turn ignition switch OFF and disconnect yaw rate/side G sensor connector M51 and VDC/TCS/ABS control unit connector B114.
2. Check continuity between VDC/TCS/ABS control unit vehicle side connector and yaw rate/side G sensor vehicle side connector.



VDC/TCS/ABS control unit	Yaw rate/side G sensor	Continuity
18	5	Yes
34	3	
77	2	
78	1	
79	4	
80	6	

OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace the harness.

4. CHECK YAW RATE/SIDE G SENSOR

1. Connect yaw rate/side G sensor and VDC/TCS/ABS control unit connectors.
2. Use “DATA MONITOR” to check if the yaw rate/side G sensor are normal.

Vehicle status	Yaw rate sensor (Data monitor standard)	Side G sensor (Data monitor standard)
When stopped	- 4 to + 4 deg/s	- 1.1 to + 1.1 m/s^2
Right turn	Negative value	Negative value
Left turn	Positive value	Positive value

OK or NG

OK >> INSPECTION END
NG >> Replace the malfunctioning yaw rate/side G sensor, and then re-conduct the VDC/TCS/ABS control unit self-diagnosis.

Solenoid and VDC Change-Over Valve System

NFS0004J

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
USV LINE [FL-RR]
USV LINE [FR-RL]
HSV LINE [FL-RR]
HSV LINE [FR-RL]

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

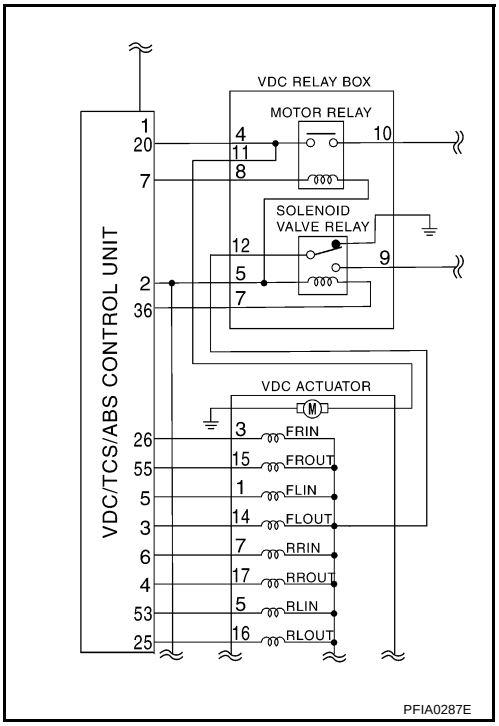
1. Disconnect VDC/TCS/ABS control unit connector and solenoid connector E49, E50 and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK SOLENOID INPUT SIGNAL

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector.
2. Check resistance between VDC/TCS/ABS control unit connector and ground.



VDC/TCS/ABS control unit	Ground	Resistance value
26	—	6.0 – 11 Ω
5		
6		
53		
55		3.0 – 5.0 Ω
3		
4		
25		
49		6.0 – 11 Ω
50		
54		3.0 – 5.0 Ω
52		

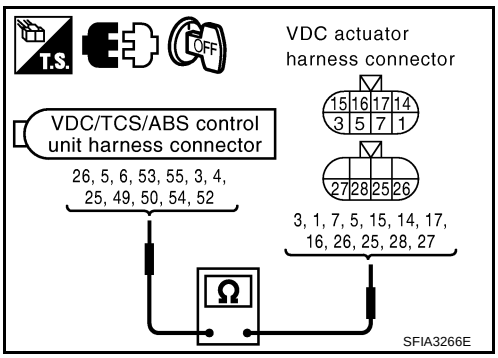
OK or NG

OK >> Check the VDC/TCS/ABS control unit power system. Refer to BRC-120, "VDC/TCS/ABS Control Unit Power and Ground Systems" .

NG >> GO TO 4.

4. CHECK SOLENOID HARNESS

1. Disconnect VDC actuator connector.
2. Check continuity between VDC/TCS/ABS control unit connector B114 and VDC actuator connector E49.



VDC/TCS/ABS control unit	VDC actuator	Continuity
26	3	Yes
5	1	
6	7	
53	5	
55	15	
3	14	
4	17	
25	16	
49	26	
50	25	
54	28	
52	27	

OK or NG

OK >> Replace VDC/TCS/ABS actuator assembly.
NG >> Open or short in harness. Repair or replace the harness.

ABS Motor and Motor Relay System

NFS0004K

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect VDC relay box connector E47, E48, E222 and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

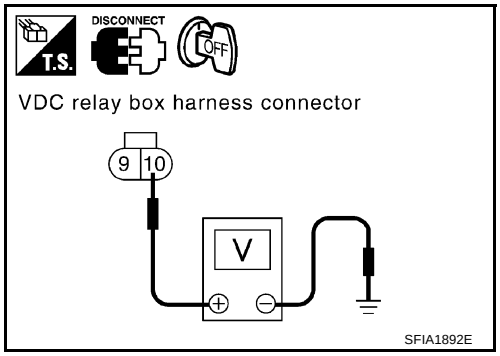
3. CHECK ABS MOTOR AND MOTOR RELAY POWER SYSTEM

1. Disconnect VDC relay box connectors E48.
2. Check voltage between VDC relay box connector and ground.

VDC relay box	Ground	Voltage
10	—	Battery voltage (Approx. 12 V)

OK or NG

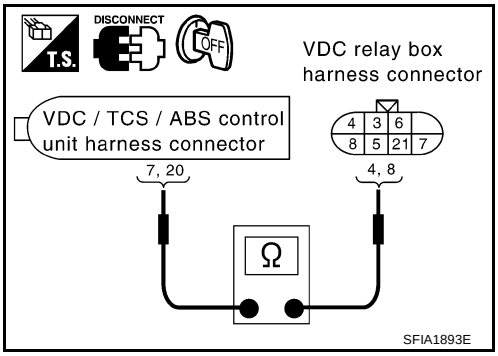
OK >> GO TO 4.
NG >> The circuit between battery and VDC relay box terminal 10 is open or shorted. Repair the circuit.



4. CHECK ABS MOTOR AND MOTOR RELAY HARNESS

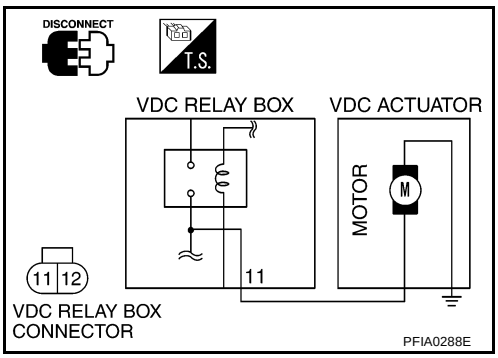
1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector B114 and VDC relay box connector E47.
2. Check continuity between VDC/TCS/ABS control unit connector and VDC relay box vehicle side connector.

VDC/TCS/ABS control unit	VDC relay box	Continuity
20	4	Yes
7	8	



3. Check if the actuator motor operates when a 12 V voltage is applied to the VDC relay box connector E222 terminal 12.

CAUTION:
Operate the actuator motor for 4 seconds or less to prevent heat generation.



OK or NG

OK >> GO TO 5.
NG >> The actuator motor or actuator motor circuit open or short in harness. Repair or replace the actuator motor or actuator motor circuit harness.

5. CHECK ABS MOTOR RELAY

ABS motor relay independent inspection. Refer toBRC-123, "ABS MOTOR RELAY AND ACTUATOR RELAY".

OK or NG

OK >> Replace VDC actuator assembly.
NG >> Replace VDC relay box.

Actuator Relay System

NFS0004L

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
MAIN RELAY

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect VDC relay box connector E47, E48, E222 and VDC/TCS/ABS control unit connector B114 and check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

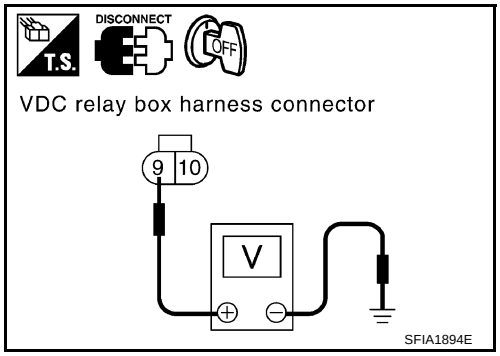
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ACTUATOR RELAY POWER SYSTEM

1. Turn ignition switch OFF and disconnect VDC relay box connector E48.
2. Check voltage between VDC relay box connector and ground.

VDC relay box	Ground	Voltage
9	—	Battery voltage (Approx. 12 V)



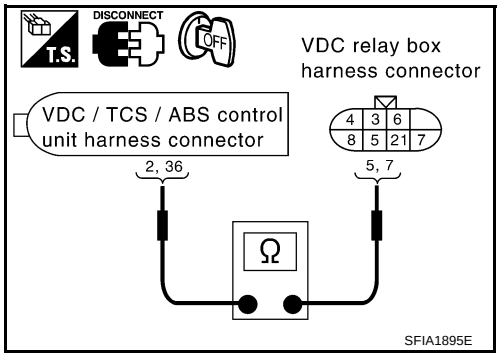
OK or NG

OK >> GO TO 4.
NG >> The circuit between battery and VDC relay box harness connector E48 terminal 9 is open or shorted. Repair the circuit.

4. CHECK ACTUATOR RELAY HARNESS

1. Disconnect VDC/TCS/ABS control unit connector B114.
2. Check continuity between VDC/TCS/ABS control unit connector and VDC relay box connector E47.

VDC/TCS/ABS control unit	VDC relay box	Continuity
2	5	Yes
36	7	



OK or NG

OK >> GO TO 5.
NG >> Open or short in harness. Repair or replace the harness.

5. CHECK ACTUATOR RELAY

Independently check VDC actuator relay. Refer to BRC-123, "ABS MOTOR RELAY AND ACTUATOR RELAY".

OK or NG

OK >> Replace VDC actuator assembly.
NG >> Replace VDC relay box.

Stop Lamp Switch System

NFS0004M

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect stop lamp switch connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, then perform self-diagnosis again.

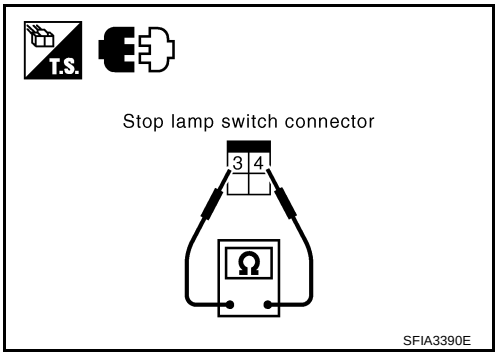
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

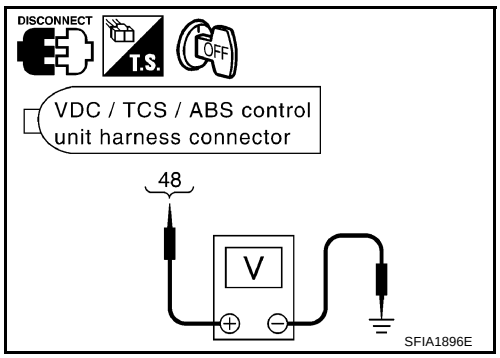


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector B114.
2. Check voltage between VDC/TCS/ABS control unit connector B114 terminal 48 and ground.



VDC/TCS/ABS control unit	Ground	Measurement condition	Voltage
48	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> Connect the connectors and conduct a VDC/TCS/ABS control unit self-diagnosis.
NG >> Open or short in harness. Repair or replace the harness.

VDC/TCS/ABS Control Unit Power and Ground Systems

NFS0004N

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect VDC/TCS/ABS control unit connector and check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

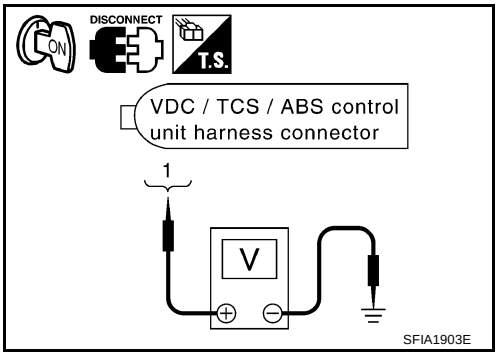
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK VDC/TCS/ABS CONTROL UNIT POWER AND GROUND CIRCUIT

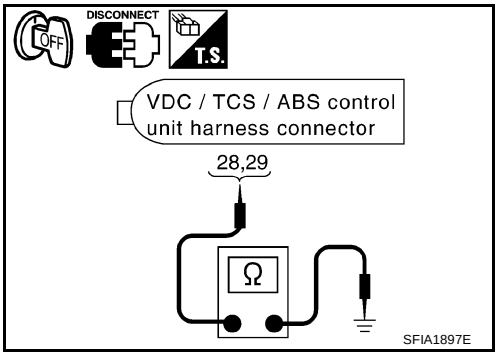
1. Disconnect VDC/TCS/ABS control unit connector B114.
2. With the ignition switch turned on and off, check voltage between VDC/TCS/ABS control unit connector and ground.

Signal name	VDC/TCS/ABS control unit	Ground	Voltage
Power supply	1	—	Battery voltage (Approx. 12 V)



3. Check continuity between VDC/TCS/ABS control unit and ground.

Signal name	VDC/TCS/ABS control unit	Ground	Continuity
Ground	28, 29	—	Yes



OK or NG

OK >> Check battery (terminal looseness, low voltage, etc.) For any non-standard condition. If any non-standard condition exists, recharge or replace battery as necessary.

NG >> The corresponding harness circuit is open or shorted. Repair the circuit.

VDC/TCS/ABS Control Unit 2

NFS0004O

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace VDC/TCS/ABS control unit and re-conduct the self-diagnosis.

NO >> INSPECTION END

Brake Fluid Level Switch System

NFS0004P

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

1. Check brake reservoir tank fluid level. If the level is low, add brake fluid.
2. Erase the self-diagnosis results and check self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is the above displayed in the self-diagnosis display items?

YES >> GO TO 2.

NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect brake fluid level switch connector and VDC/TCS/ABS control unit connector and check terminal for deformation, disconnection, looseness, and so on. If there is any non-standard condition, repair or replace the terminal.
2. Securely reconnect the connectors and then perform self-diagnosis.

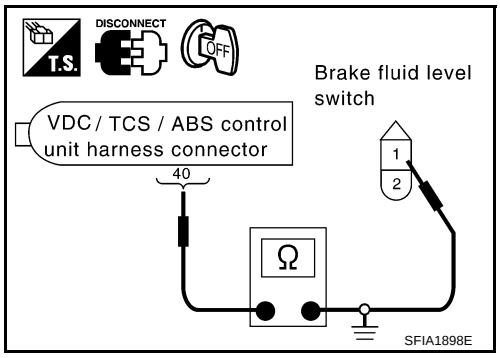
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK HARNESS BETWEEN THE BRAKE FLUID LEVEL SWITCH AND THE VDC/TCS/ABS CONTROL UNIT

1. Turn ignition switch OFF and disconnect brake fluid level switch connector, VDC/TCS/ABS control unit, connectors.
2. Check continuity between brake fluid level switch connector E44 and VDC/TCS/ABS control unit connector B114.

VDC/TCS/ABS control unit	Brake fluid level switch	Continuity
40	1	Yes
	Ground	No
Ground	2	Yes



OK or NG

OK >> Connect connectors and conduct a VDC/TCS/ABS control unit self-diagnosis.
NG >> If the open or short in harness, repair or replace the harness.

CAN Communication System

NFS0004Q

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the VDC/TCS/ABS control unit connector, and check the terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-48, "CAN System Specification Chart" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

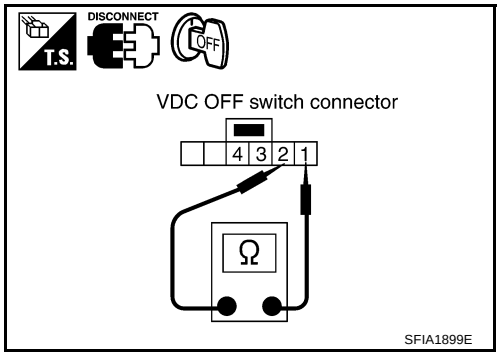
Component Inspection

NFS0004R

VDC OFF SWITCH

- Turn ignition switch OFF, and disconnect the VDC OFF switch connector M9, and check the continuity between terminals 1 and 2.

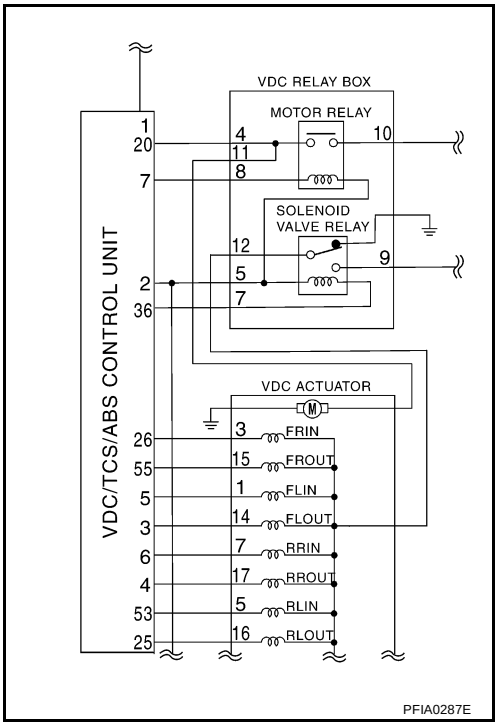
1 - 2 :Continuity should exist when pushing the switch.
continuity should not exist when releasing the switch.



ABS MOTOR RELAY AND ACTUATOR RELAY

- Turn ignition switch OFF and disconnect the VDC relay box connector E47, E48, E222.
- Apply a voltage of 12 V between the ABS motor relay terminal 8 and the actuator relay terminal 7 and then check the continuity between the following terminals.

ABS motor relay	Between terminal 4 to 10	Continuity should exist.
Actuator relay	Between terminal 9 to 12	Continuity should exist.



VDC/TCS/ABS ACTUATOR

Actuator Operation Inspection

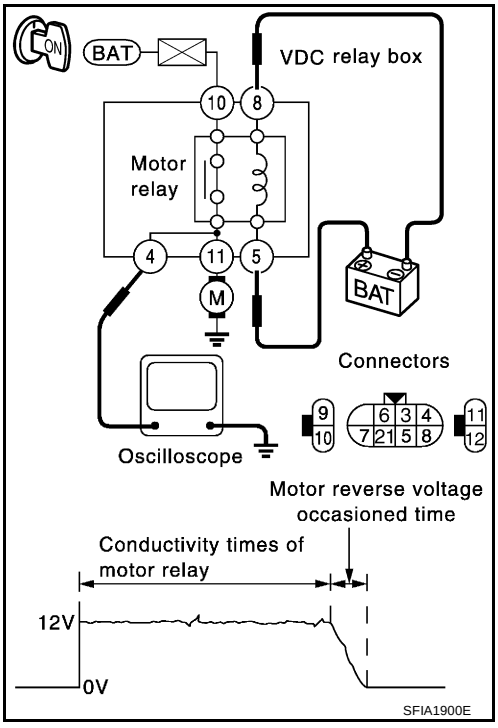
1. Turn ignition switch ON, apply a voltage of 12 V between the relay box terminal 5 and 8, use an oscilloscope to measure the motor voltage at this time (between terminal 11 and the ground), and check the motor reverse voltage occurrence time when operation is stopped.

Motor counter-electromotive force duration:

0.1 second or more

CAUTION:

- **The above check should be performed after motor relay unit inspection to make sure relay operates normally.**
- **To prevent overheating, do not drive actuator motor more than 4 seconds.**
- **The motor reverse voltage occurrence time is standard when the battery voltage is 12 V and the air temperature is 20°C (68°F), and this time is a little shorter when the battery voltage is low or the air temperature is low.**



TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0004S

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system

2. CHECK FRONT AND REAR AXLE

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. CHECK WHEEL SENSOR AND SENSOR ROTOR

Wheel Sensor Inspection

- Wheel sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Wheel sensor connector connection inspection
- Wheel sensor harness inspection

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 sec. After the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-96, "OPERATION PROCEDURE" .

Unexpected Pedal Reaction

NFS0004T

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

YES >>
- Bleed air from the brake piping.
- Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repair.

NO >> GO TO 2.

2. CHECK FUNCTION

Disconnect the VDC/TCS/ABS control unit connector and make sure the braking force is sufficient when the ABS in not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-124, "Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

The Braking Distance Is Long

NFS0004U

CAUTION:
On slippery road surfaces, the stopping distance might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Disconnect VDC/TCS/ABS control unit connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-124, "Excessive ABS Function Operation Frequency" .

NG >>
- Bleed air from the brake piping.
- Check brake system.

The ABS Function Does Not Operate

NFS0004V

CAUTION:
The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-124, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-96, "OPERATION PROCEDURE" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0004W

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine (at approximately 10 km/h (6MPH) or higher)**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

Does the symptom occur?

YES >> GO TO 2.

NO >> Perform self-diagnosis. Refer to BRC-96, "OPERATION PROCEDURE" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.

NO >> GO TO 3. CHECK WHEEL SENSOR AND SENSOR ROTOR in BRC-124, "Excessive ABS Function Operation Frequency" .

Vehicle Jerks During VDC/TCS/ABS Control

NFS0004X

1. CHECK ENGINE SPEED SIGNAL

Conduct CONSULT-III VDC/TCS/ABS control unit “Data Monitor”.

Is engine speed at idle 400 rpm or higher?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK ECM SELF-DIAGNOSIS RESULT ITEM

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-81, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 3.

3. SYMPTOM CHECK 1

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK A/T SELF-DIAGNOSIS RESULTS ITEM

Perform A/T self-diagnosis.

OK or NG

OK >> GO TO 5.
NG >> Check the corresponding items. Refer to AT-40, "TROUBLE DIAGNOSIS" in “A/T”.

5. SYMPTOM CHECK 2

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK SELF-DIAGNOSIS RESULT ITEM 1

Conduct self-diagnosis of the VDC/TCS/ABS control unit.

Are self-diagnosis items displayed?

YES >> Check the corresponding items, make repairs, and re-conduct the VDC/TCS/ABS control unit self-diagnosis.
NO >> GO TO 7.

7. CHECK CONNECTOR

1. Disconnect the VDC/TCS/ABS control unit and the ECM connectors, check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the connector.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> If the connector terminal contact is loose, damaged, open or shorted, repair or replace the connector terminal.
NG >> GO TO 8.

8. CHECK SELF-DIAGNOSIS RESULT ITEM 2

Re-conduct the VDC/TCS/ABS control unit self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any non-standard items.
NO >> GO TO 9.

9. CHECK CIRCUIT BETWEEN VDC/TCS/ABS CONTROL UNIT AND THE ECM

Check CAN communication system. Refer to BRC-122, "CAN Communication System" .

OK or NG

OK >> INSPECTION END
NG >> Connect the connectors, and re-conduct the VDC/TCS/ABS control unit self-diagnosis.

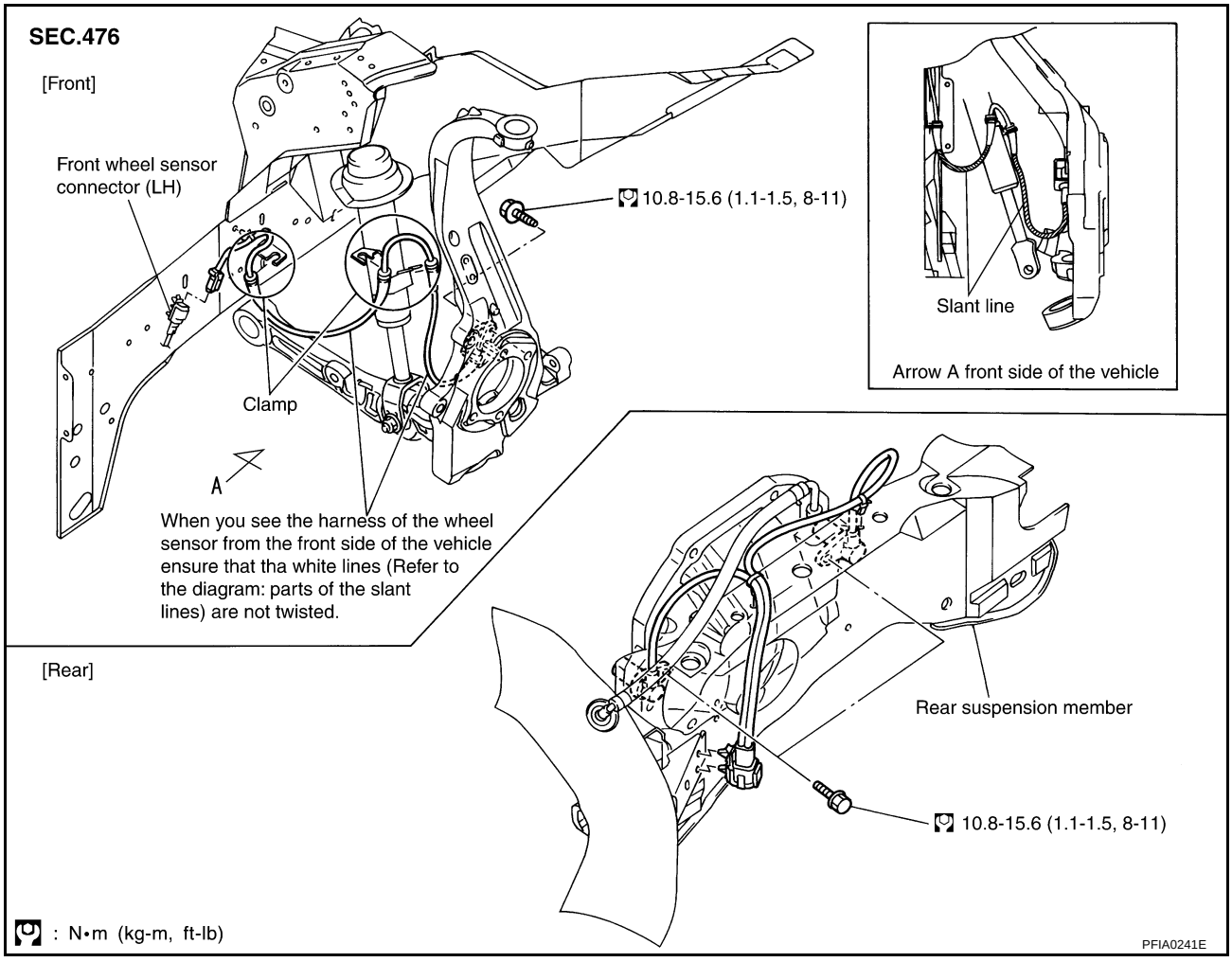
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0004Y

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- **As much as possible, avoid rotating sensor when removing it. Pull sensors out without pulling on sensor harness.**
- **Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing sensor. Tighten installation bolts and nuts to specified torques.

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

VDC/TCS/ABS CONTROL UNIT

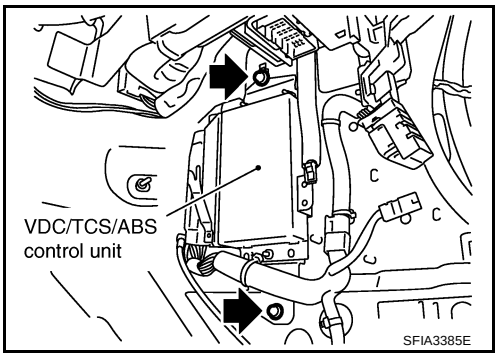
PFP:47660

Removal and Installation

NFS0004Z

REMOVAL

1. Remove dash side finisher (RH). Refer to IP-12, "(C) Dash Side Finisher (RH/LH)" .
2. Remove VDC/TCS/ABS control unit bolts.
3. Remove VDC/TCS/ABS control unit.



INSTALLATION

Installation in the reverse order of removal.

- When installing the VDC/TCS/ABS control unit, tighten bolts to the specified torque.

VDC/TCS/ABS control unit bolts : 8.3 N·m (0.85 kg–m, 73 in–lb)

CAUTION:

When replacing VDC/TCS/ABS control unit, make sure to adjust neutral position of steering angle sensor. Refer to BRC-79, "Adjustment of Steering Angle Sensor Neutral Position" .

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS00050

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
- Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
- Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the companion flange.

INSTALLATION

Front

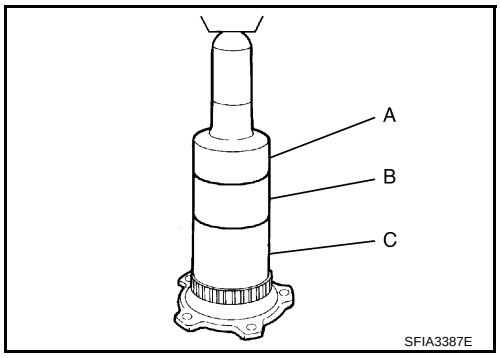
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
- Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number	A: ST30720000 (J-25405)
	B: ST27863000 (—)
	C: KV40104710 (—)

- Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.



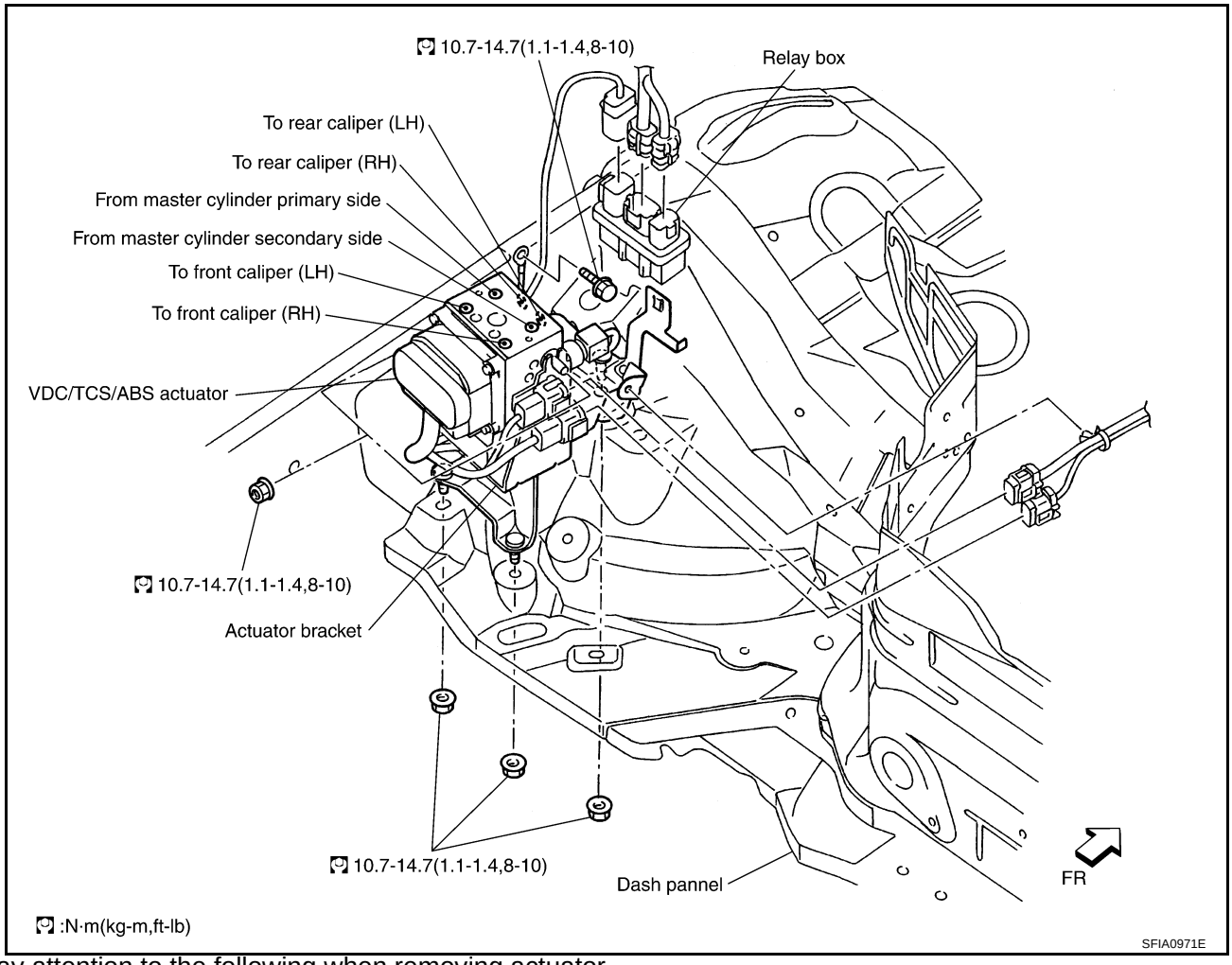
VDC/TCS/ABS ACTUATOR

PFP:47660

Removal and Installation

NFS00051

COMPONENTS



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer to BR-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

G SENSOR

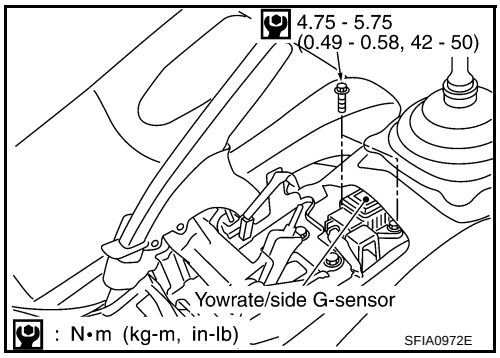
PFP:47930

Removal and Installation

NFS00052

REMOVAL

1. Remove center console. Refer to IP-16, "CENTER CONSOLE" .
2. Remove harness connector.
3. Remove installation bolts. Remove yaw rate/side G sensor.



CAUTION:

- **Do not drop or strike the yaw rate/side G sensor, because it has little endurance to impact.**
- **Do not use power tool etc., because yaw rate/side G sensor is weak for the impact.**

INSTALLATION

To install, follow procedure for removal in reverse order.

CAUTION:

- **Do not drop or strike the yaw rate/side G sensor, because it has little endurance to impact.**

STEERING ANGLE SENSOR

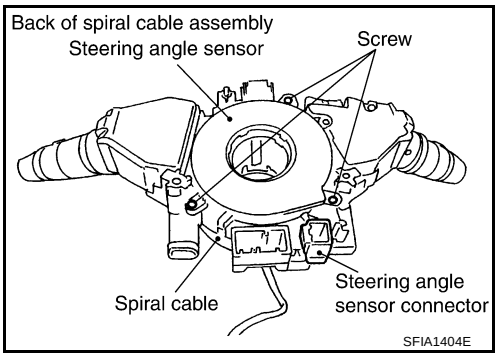
PFP:25554

Removal and Installation

NFS00053

REMOVAL

1. Remove spiral cable assembly. Refer to SRS-42, "SPIRAL CABLE" .
2. Remove steering angle sensor.



INSTALLATION

Install in the reverse order of removal.

NOTE:

After work, make sure to adjust neutral position of steering angle sensor. Refer to BRC-79, "Adjustment of Steering Angle Sensor Neutral Position" .

SECTION CL
CLUTCH

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

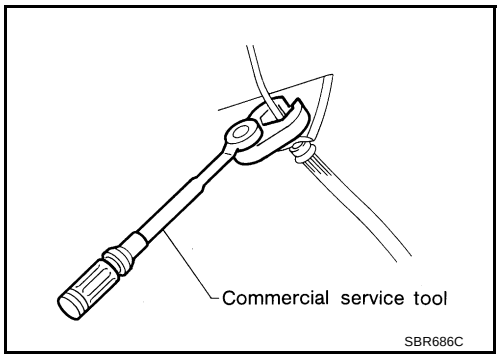
NCS00001

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Service Notice or Precautions

NCS00002

- Recommended clutch fluid is brake fluid “DOT 3”. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained clutch fluid.
- Be careful not to splash clutch fluid on painted areas.
- When removing clutch tube, use a flare nut wrench.
- When installing clutch tube, use a flare nut torque wrench.
- Use new clutch fluid to clean or wash all parts of master cylinder.
- Never use mineral oils such as gasoline or kerosene. It will ruin the rubber parts of the hydraulic system.
- If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.
- Do not disassemble CSC body.



WARNING:

After cleaning clutch disc, wipe it with a dust collector. Do not use compressed air.

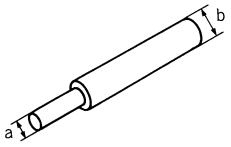
PREPARATION

PFP:00002

Special Service Tools

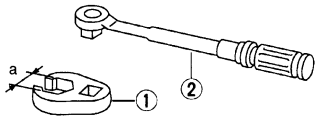
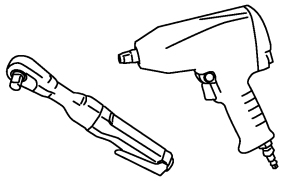
NCS00003

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST20050240 (—) Diaphragm adjusting wrench  ZZA0508D	Adjusting unevenness of diaphragm spring of clutch cover
ST20670000 (—) Clutch aligning bar a: 15 mm (0.59 in) dia. b: 23 mm (0.91 in) dia.  ZZA1178D	Installing clutch disc

Commercial Service Tools

NCS00004

Tool name	Description
Pin punch Tip diameter: 4.5 mm (0.177 in) dia.  ZZA0515D	Removing and installing master cylinder spring pin
1. Flare nut crowfoot a: 10 mm (0.39 in) 2. Torque wrench  S-NT360	Removing and installing clutch piping
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NCS00005

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

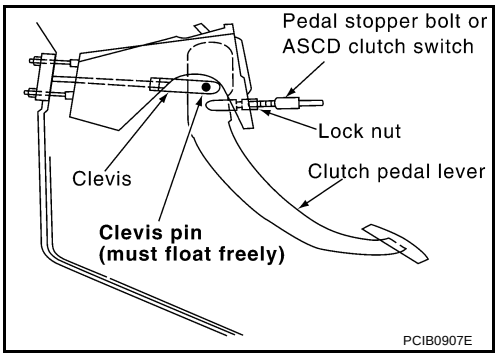
Reference page		CL-5	CL-7	CL-9	CL-11	EM-101	CL-16										EM-134
SUSPECTED PARTS (Possible cause)		CLUTCH PEDAL (Free play out of adjustment)	CLUTCH LINE (Air in line)	MASTER CYLINDER PISTON CUP (Damaged)	CSC (Concentric Slave Cylinder) (Worn, dirty or damaged)	ENGINE MOUNTING (Loose)	CLUTCH DISC (Out of true)	CLUTCH DISC (Runout is excessive)	CLUTCH DISC (Lining broken)	CLUTCH DISC (Dirty or burned)	CLUTCH DISC (Oily)	CLUTCH DISC (Worn out)	CLUTCH DISC (Hardened)	CLUTCH DISC (Lack of spline grease)	DIAPHRAGM SPRING (Damaged)	DIAPHRAGM SPRING (Out of tip alignment)	PRESSURE PLATE (Distortion)	FLYWHEEL (Distortion)
Symptom	Clutch grabs/chatters					1		2			2	2	2			2		
	Clutch pedal spongy		1	2	2													
	Clutch noisy				1													
	Clutch slips	1									2	2			3		4	5
	Clutch does not disengage	1	2	3	4		5	5	5	5	5			5	6	6	7	

CLUTCH PEDAL

PFP:46540

On-Vehicle Inspection and Adjustment

NCS00006



1. Check to see if the clevis pin floats freely in the bore of the clutch pedal. It should not be bound by the clevis or clutch pedal.

a. If the clevis pin is not free, check that the pedal stopper bolt or ASCD clutch switch is not applying pressure to the clutch pedal causing the clevis pin to bind. To adjust, loosen lock nut and turn pedal stopper bolt or ASCD clutch switch.

b. Tighten the lock nut. Refer to CL-6, "Removal and Installation" .

c. Verify that the clevis pin floats in the bore of the clutch pedal. It should not be bound by the clutch pedal.

d. If the clevis pin is still not free, remove the clevis pin and check for deformation or damage. Replace clevis pin if necessary. Leave pin removed for step 2.

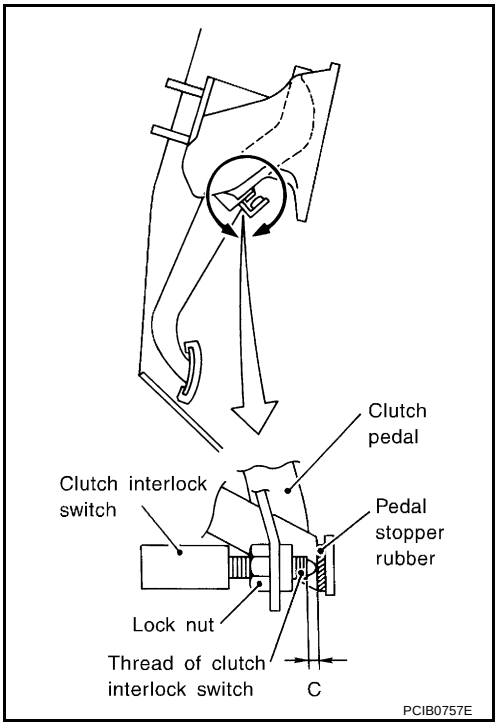
2. Check clutch pedal stroke for free range of movement.

a. With the clevis pin removed, manually move the clutch pedal up and down to determine if it moves freely.

b. If any sticking is noted, replace the related parts (clutch pedal assembly, bushing etc.). Re-assemble the clutch pedal and re-verify that the clevis pin floats freely in the bore of the clutch pedal.

3. Adjust clearance “C” while depressing clutch pedal fully. (With clutch interlock switch)

Clearance C : 0.1 - 1.0 mm (0.004 - 0.039 in)



4. Check clutch hydraulic and system components (clutch master cylinder, CSC, etc.) for sticking or binding.

a. If any sticking or binding noted, repair or replace related parts as necessary.

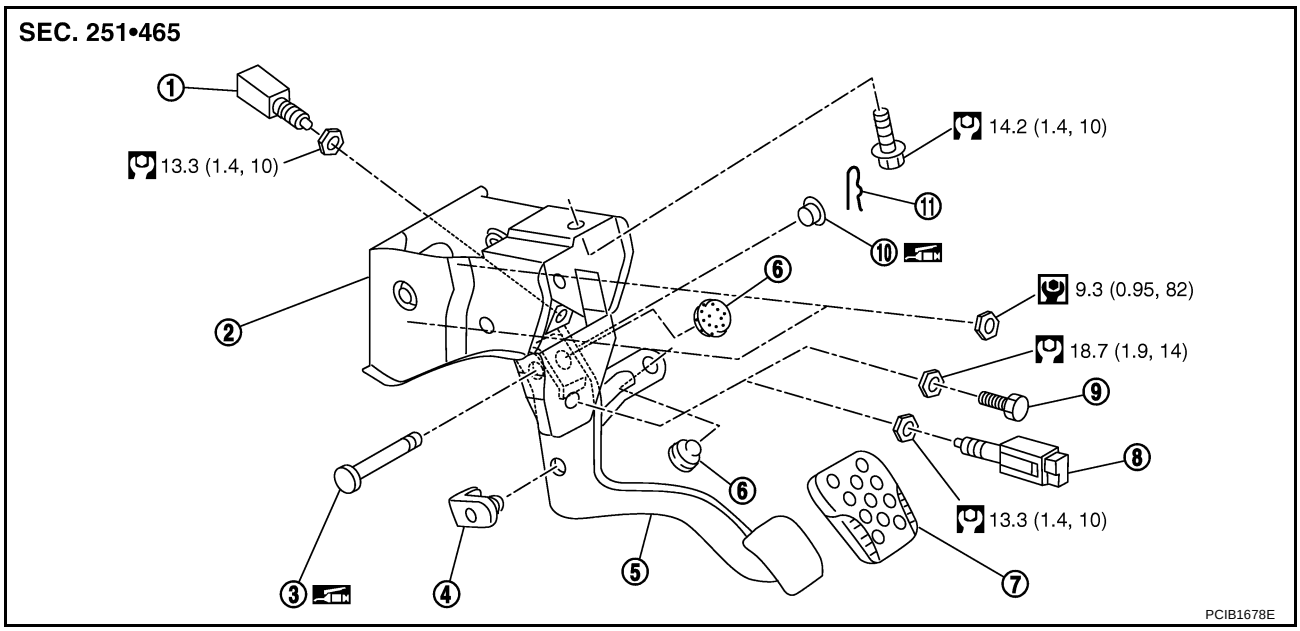
b. If hydraulic system repair was necessary, bleed the clutch hydraulic system. Refer to CL-7, "Bleeding" .

NOTE:
Do not use a vacuum assist or any other type of power bleeder on this system. Use of a vacuum assist or power bleeder will not purge all the air from the system.

Removal and Installation

NCS00007

COMPONENTS



1. Clutch interlock switch
2. Bracket
3. Clevis pin
4. Pedal stopper rubber
5. Clutch pedal
6. Stopper rubber
7. Pedal pad
8. ASCD clutch switch (With ASCD)
9. Pedal stopper bolt (Without ASCD)
10. Bushing
11. Snap pin

Refer to GI-11, "Components" , and the followings for the symbols in the figure.

: Apply lithium-based grease including molybdenum disulphide.

REMOVAL

1. Remove kicking plate. Refer to EI-35, "Removal and Installation (for Coupe Models)" or EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove footrest. Refer to EI-43, "Removal and Installation" .
3. Remove dash side finisher (LH). Refer to IP-11, "Removal and Installation" .
4. Remove instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
5. Remove the clutch interlock switch and ASCD clutch switch (with ASCD) connectors and harness.
6. Remove the snap pin and clevis pin.
7. Remove the pedal bracket mounting bolt and nuts and then remove the clutch pedal assembly.

INSPECTION AFTER REMOVAL

Check clutch pedal for bend, damage, or a cracked weld. If bend, damage, or a cracked weld is found, replace the clutch pedal assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Tighten pedal stopper bolt lock nut or ASCD clutch switch lock nut to the specified torque after installing the clutch pedal assembly in the vehicle and adjusting the pedal free play. Refer to CL-5, "On-Vehicle Inspection and Adjustment" .
- After installing the clutch interlock switch, adjust the switch position. Refer to CL-5, "On-Vehicle Inspection and Adjustment" .

CLUTCH FLUID

PFP:00017

Bleeding

NCS00008

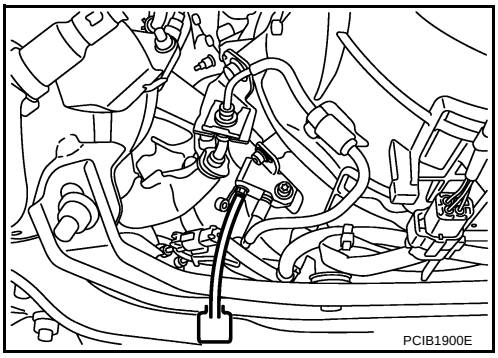
CAUTION:

- **Monitor fluid level in the reservoir tank to make sure it does not empty.**
- **Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.**

NOTE:

Do not use a vacuum assist or any other type of power bleeder on this system. Use of a vacuum assist or power bleeder will not purge all the air from the system.

1. Fill the master cylinder reservoir tank with new clutch fluid.
2. Connect a transparent vinyl hose to the air bleeder valve.
3. Depress clutch pedal slowly and fully several times at an interval of 2 to 3 seconds and hold it.
4. With clutch pedal depressed, open air bleeder valve to release air.
5. Close air bleeder valve.
6. Release clutch pedal and wait for 5 seconds.
7. Repeat steps 3 to 6 until no bubbles can be observed in the clutch fluid.
8. Tighten air bleeder valve to the specified torque. Refer to CL-11, "COMPONENTS" .

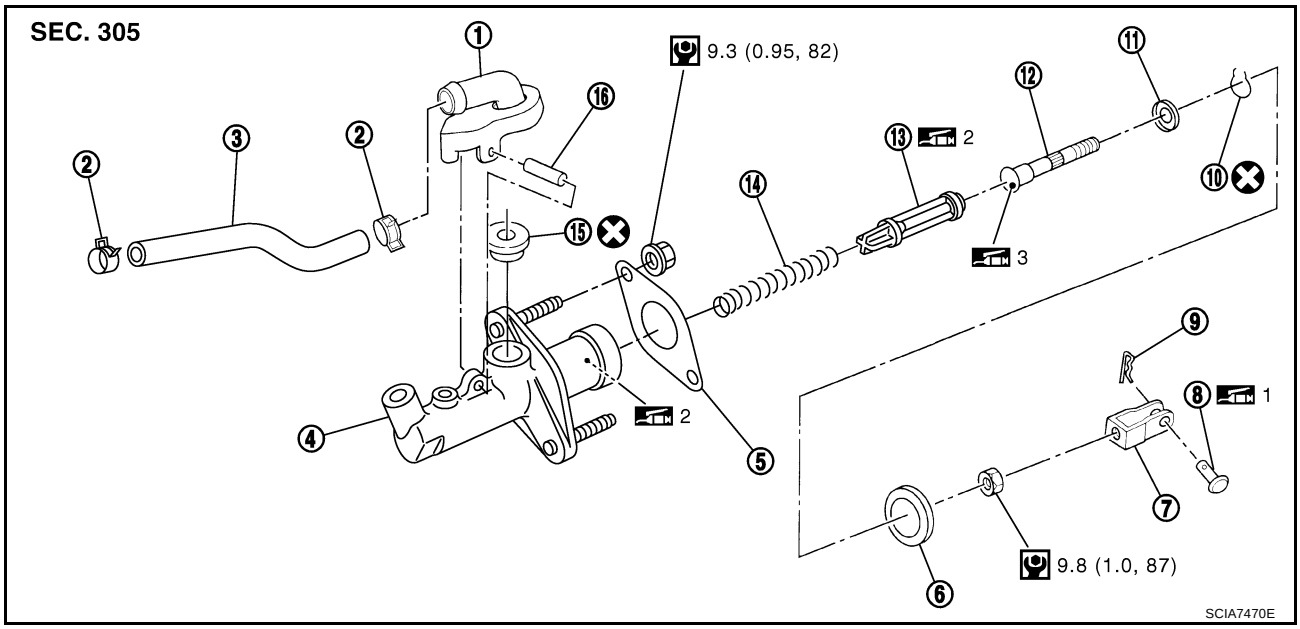

PCIB1900E

CLUTCH MASTER CYLINDER

PFP:30610

Components

NCS001A1



1. Nipple	2. Clamp	3. Reservoir hose
4. Cylinder body	5. Packing	6. Seat
7. Clevis	8. Clevis pin	9. Snap pin
10. Stopper ring	11. Stopper	12. Push rod
13. Piston assembly	14. Return spring	15. Reservoir seal
16. Spring pin		

Refer to GI-11, "Components" , and the followings for the symbols in the figure.

1: Apply lithium-based grease including molybdenum disulphide.

2: Apply rubber lubricant.

3: Apply silicone grease

Removal and Installation

NCS00009

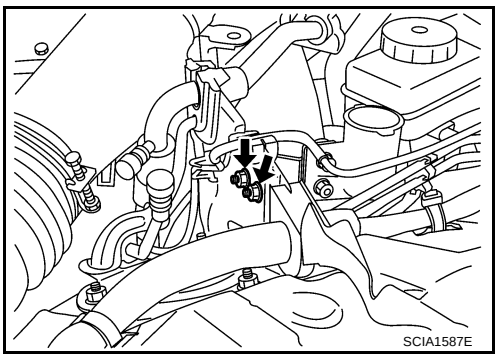
REMOVAL

1. Remove kicking plate. Refer to EI-35, "Removal and Installation (for Coupe Models)" or EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove footrest. Refer to EI-43, "Removal and Installation" .
3. Remove dash side finisher. Refer to IP-11, "Removal and Installation" .
4. Remove instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
5. Remove snap pin and clevis pin from the clevis, and separate it from clutch pedal.
6. Remove hoodledge cover. Refer to EI-20, "Removal and Installation" .
7. Drain clutch fluid in reservoir tank and then remove reservoir hose.

CAUTION:

Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.

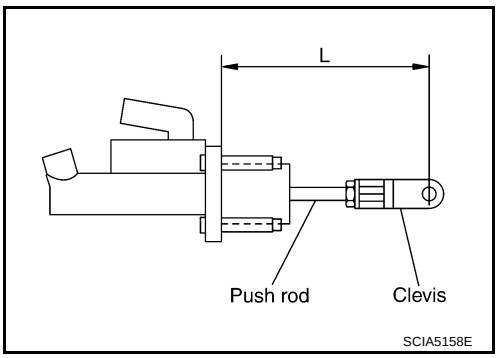
8. Remove reservoir tank mounting nut and then remove reservoir tank.
9. Remove clutch tube using a flare nut wrench.
10. Remove mounting nuts and then remove packing and master cylinder assembly.



INSTALLATION

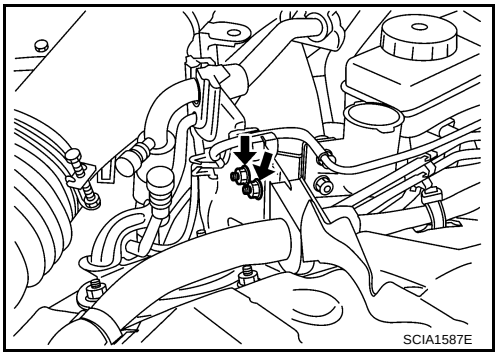
1. Check position of clevis and push rod. If measurement is outside the standard length, adjust position of clevis and push rod.

   Length "L" : 111.0 ± 0.5 mm (4.37 ± 0.02 in)



2. Install packing and master cylinder assembly and tighten mounting nuts to the specified torque. Refer to CL-8, "Components" .
3. Connect clutch tube to master cylinder assembly and temporarily tighten flare nut.
4. Tighten clutch tube flare nut to the specified torque using a flare nut torque wrench. Refer to CL-15, "Removal and Installation" .
5. Install clevis to the clutch pedal, and fix clevis with clevis pin.
6. Install snap pin to the clevis pin.
7. Install reservoir hose to the nipple. Install the reservoir tank to the vehicle, and then tighten mounting nuts to the specified torque.

   : 5.8 N·m (0.59 Kg-m, 51 in-lb)



8. After completing this procedure, inspect and adjust for clutch pedal and then bleed the clutch hydraulic system. Refer to CL-5, "On-Vehicle Inspection and Adjustment" and CL-7, "Bleeding" .
9. Install hoodledge cover.
10. Install instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
11. Install dash side finisher. Refer to IP-11, "Removal and Installation" .
12. Install footrest. Refer to EI-43, "FLOOR TRIM" .
13. Install kicking plate. Refer to EI-35, "Removal and Installation (for Coupe Models)" or EI-37, "Removal and Installation (for Roadster Models)" .

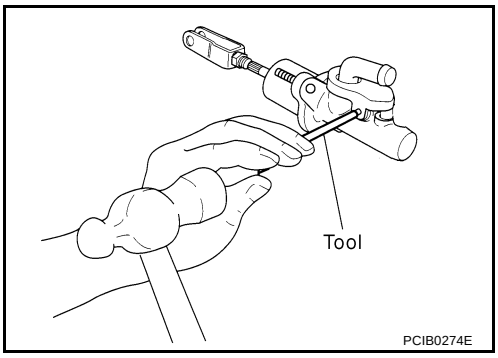
Disassembly and Assembly

NCS0000A

DISASSEMBLY

1. Remove spring pin, nipple and reservoir seal from cylinder body using a pin punch.
2. Loosen push rod lock nut. Remove clevis and lock nut.
3. Remove the seat from the cylinder body.
4. Remove the stopper ring and stopper, and then remove the push rod, piston assembly and return spring from the cylinder body.

   CAUTION:
   Restrain the push rod while doing this because there is a danger the piston assembly will fly out of the cylinder body.



INSPECTION AFTER DISASSEMBLY

Check for any of the conditions shown below. If any malfunction is found, replace the part concerned.

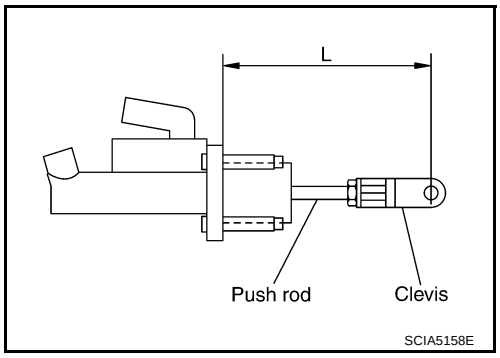
- Damaged cylinder internal wall, foreign matter, wear, corrosion, or pin hole
- Damaged or deformed nipple or reservoir tank
- Settling of the spring
- Cracked and deformed seat

ASSEMBLY

1. Apply rubber lubricant to internal surface of the cylinder body, sliding surface of piston assembly, and the piston cup. Insert return spring and piston assembly to the cylinder body.
2. Apply silicone grease to the push rod and install the stopper before installing the stopper ring.

   CAUTION:
   - **Do not reuse stopper ring.**
   - **Restrain the push rod while doing this because there is a danger the piston assembly will fly out of the master cylinder.**
3. Install seat to the cylinder body.
4. Install clevis to push rod.
5. Check and adjust the position of clevis and push rod. After adjusting “L”, tighten lock nut to the specified torque. Refer to CL-8, "Components" .

   Length “L” : 111.0 ± 0.5 mm (4.37 ± 0.02 in)



6. Install reservoir seal and nipple to cylinder body. Install spring pin using a pin punch.

   CAUTION:
   Do not reuse reservoir seal.

CSC (CONCENTRIC SLAVE CYLINDER)

PFP:30500

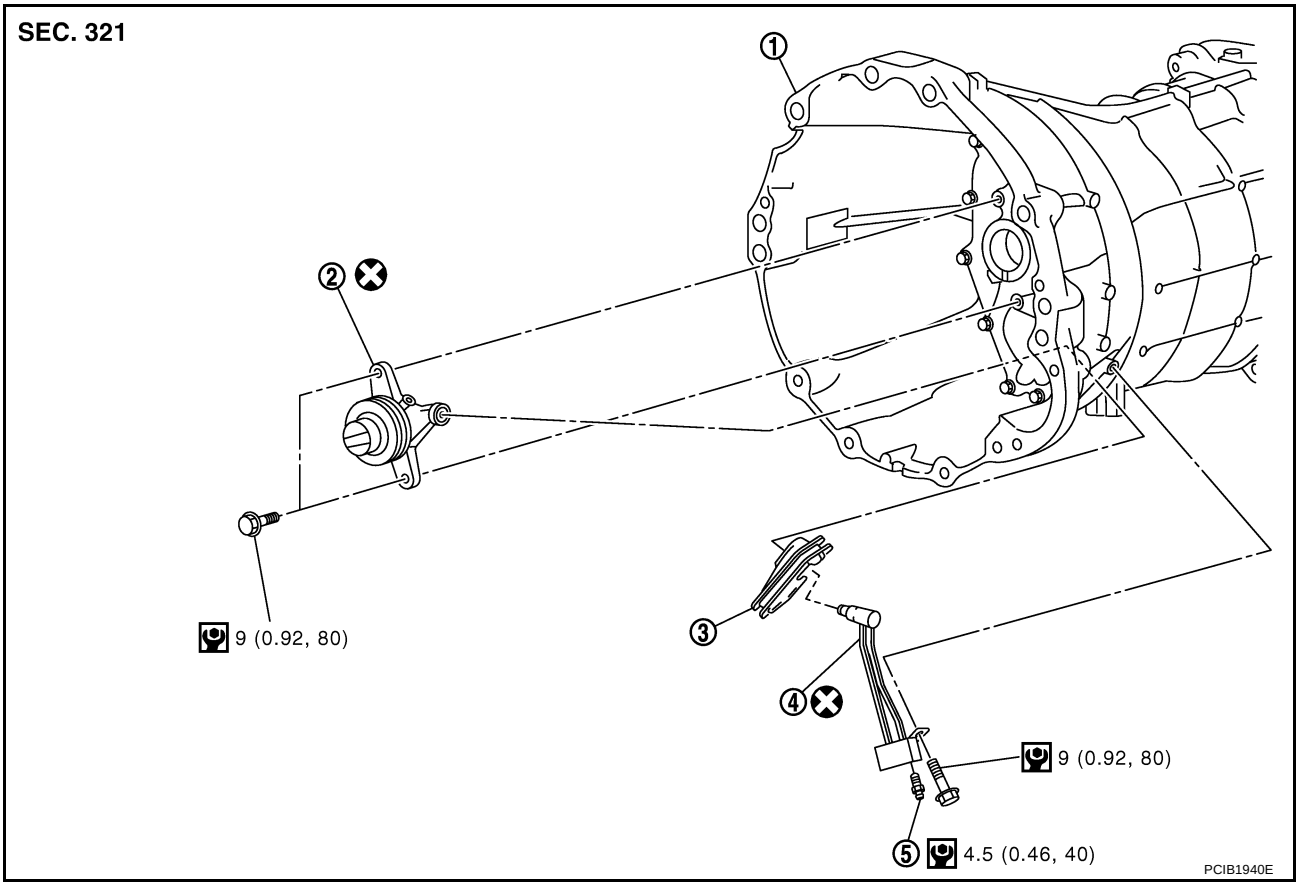
Removal and Installation

NCS0029M

CAUTION:

- **If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.**
- **Do not disassemble CSC body.**
- **Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.**

COMPONENTS



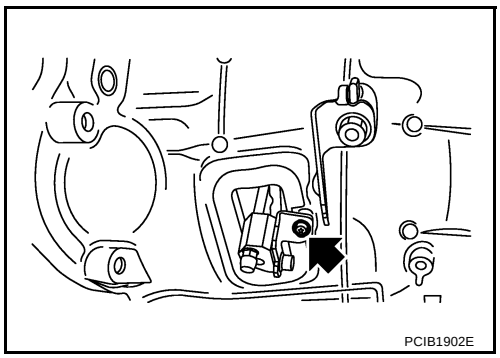
1.	Transmission assembly	2.	CSC (Concentric Slave Cylinder) body	3.	Dust cover
4.	CSC (Concentric Slave Cylinder) tube	5.	Air bleeder valve		

Refer to GI-11, "Components" for the symbols in the figure.

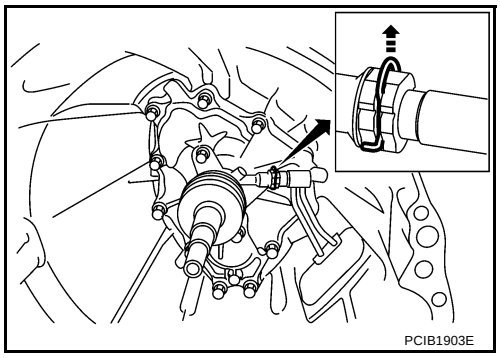
REMOVAL

1. Remove transmission assembly from the vehicle. Refer to MT-18, "Removal and Installation" .

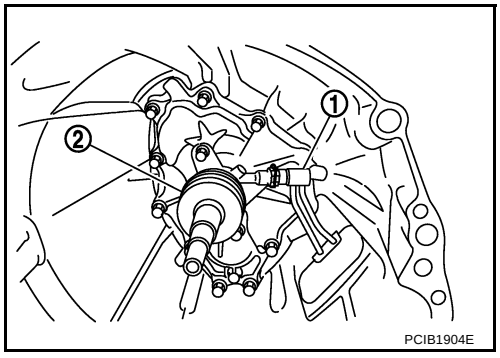
2. Remove CSC tube mounting bolt.


PCIB1902E

3. Pull up the lock pin of CSC body.

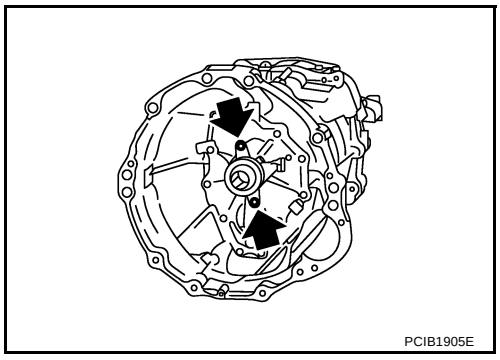

PCIB1903E

4. Pull out the CSC tube (1) from the CSC body (2).
5. Remove CSC tube and dust cover from transmission case.
6. Remove air bleeder valve from CSC tube.



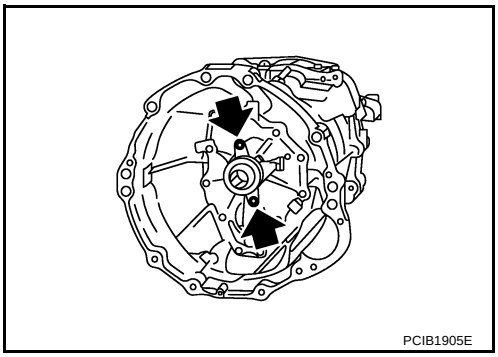
PCIB1904E

7. Remove CSC body from transmission case.


PCIB1905E

INSTALLATION

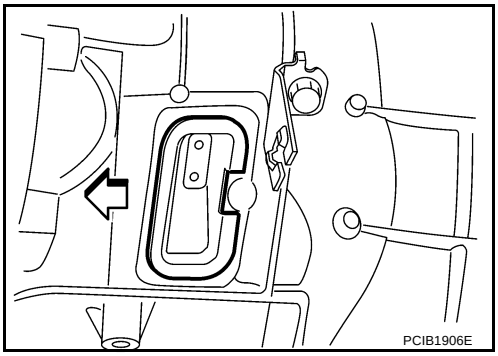
1. Install CSC body to transmission case and then tighten mounting bolts to the specified torque. Refer to CL-11, "COMPONENTS" .



CAUTION:
- **Do not reuse CSC body.**
- **Do not insert and operate CSC body because piston and stopper of CSC body components may fall off.**

2. Install dust cover to transmission case.

⇦ : Vehicle front

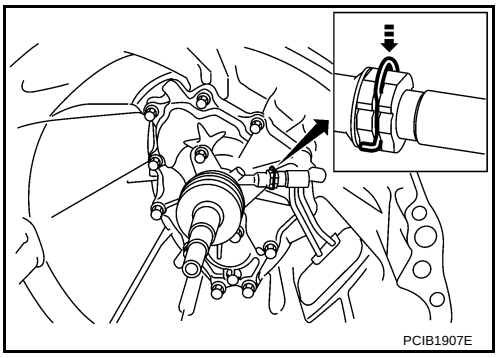


CAUTION:
Be careful with the orientation of dust cover.

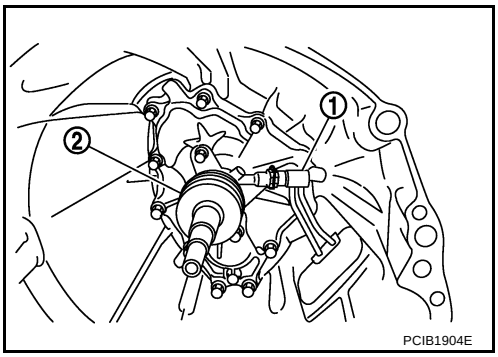
3. Insert CSC tube to dust cover.

CAUTION:
- **Do not reuse CSC tube.**
- **Be sure not to damage O-ring of CSC tube.**

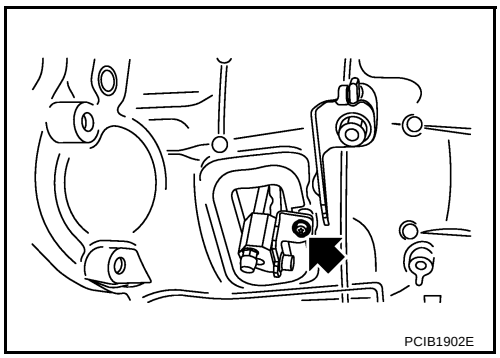
4. Press down the lock pin of the CSC body.



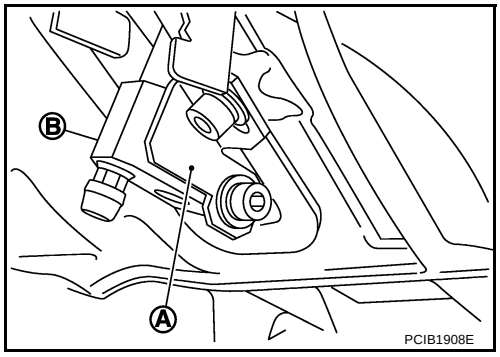
5. Insert the CSC tube (1) into the connector of the CSC body (2) until it clicks.



6. Install CSC tube mounting bolt and then tighten mounting bolt to the specified torque. Refer to CL-11, "COMPONENTS" .


PCIB1902E

CAUTION:
Assemble the components checking that the bracket (A) on the CSC body and the nozzle (B) closely contact each other before tightening the bolt. When assembled correctly, the components should not move beyond the allowable looseness of the connector on the CSC body.



PCIB1908E

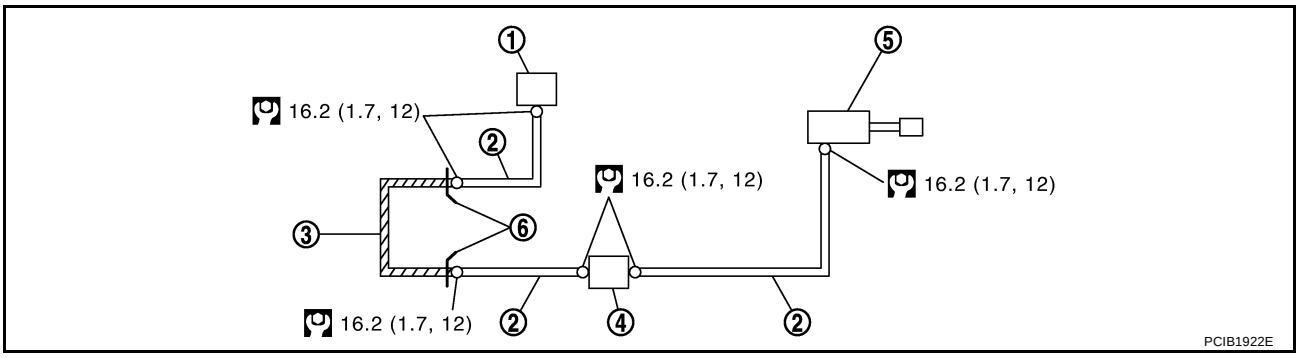
7. Install transmission assembly to the vehicle. Refer to MT-20, "INSTALLATION" .
8. Bleed the air from the clutch hydraulic system, Refer to CL-7, "Bleeding" .

CLUTCH PIPING

PFP:30650

Removal and Installation

NCS0000D



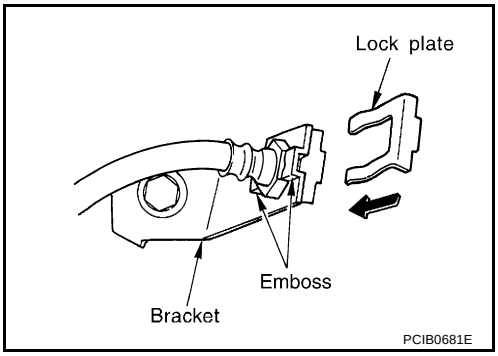
1.	CSC (Concentric Slave Cylinder) assembly	2.	Clutch tube	3.	Clutch hose
4.	Connector	5.	Master cylinder assembly	6.	Lock plate

Refer to GI-11, "Components" , for the symbol in the figure.

Carefully observe the following steps during clutch tube removal and installation.

- Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.
- When fixing clutch hose to bracket, align clutch hose metal fittings with bracket positioning emboss and lock plate to secure. At this time, prevent twisting or damage of clutch hose. In addition, be careful not to damage clutch hose.
- Tighten clutch tube flare nut to the specified torque.

  CAUTION:
  Be careful not to damage flare nut and clutch tube.
- After installation, bleed the clutch hydraulic system. Refer to CL-7, "Bleeding" .



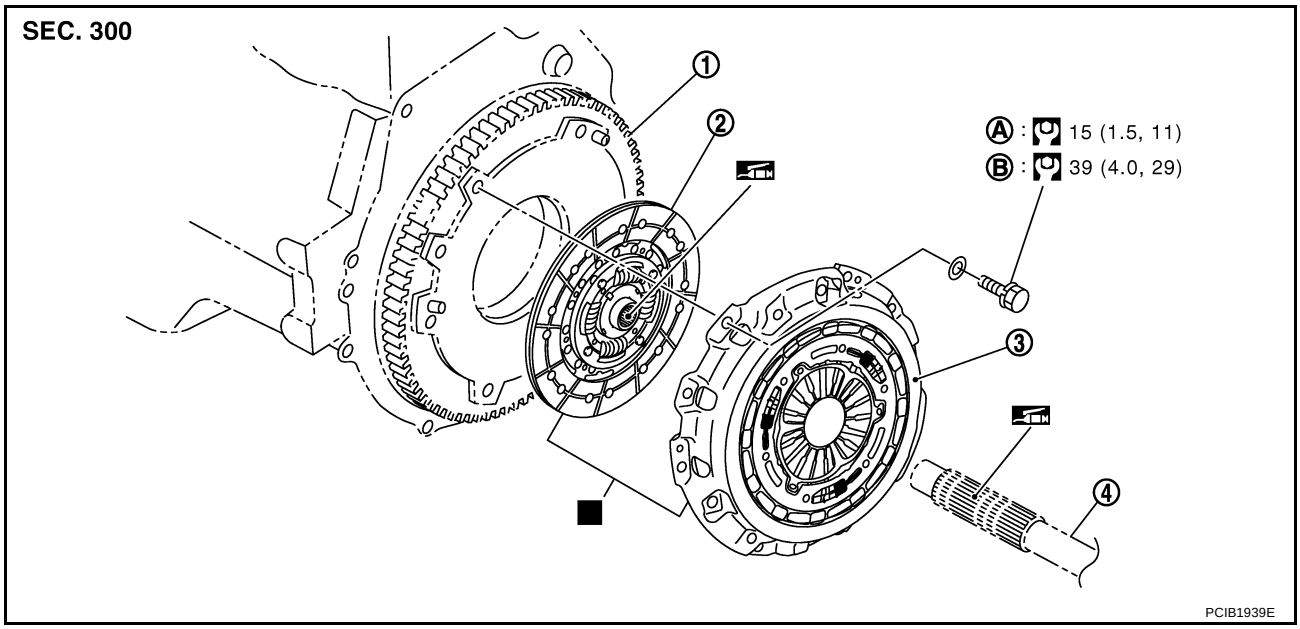
CLUTCH DISC, CLUTCH COVER

PFP:30100

Removal and Installation

NCS0000G

COMPONENTS



1. Flywheel
2. Clutch disc
3. Clutch cover
4. Main drive gear

A. First step

B. Final step

Refer to GI-11, "Components" , and the followings for the symbols in the figure.

■ : Replace the parts as a set.

: Apply lithium-based grease including molybdenum disulphide

CAUTION:

- **If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.**
- **Be careful not to bring any grease into contact with the clutch disc facing, pressure plate surface and flywheel surface.**
- **If flywheel is removed, align dowel pin with the smallest hole of flywheel. Refer to EM-111, "ASSEMBLY" .**
- **When installing, be careful that grease applied to main drive gear does not adhere to clutch disc.**
- **Do not clean in solvent on clutch disk.**

REMOVAL

1. Remove transmission assembly from the vehicle. Refer to MT-18, "Removal and Installation" .
2. Loosen clutch cover mounting bolts with power tool. Remove clutch cover and clutch disc.

   CAUTION:

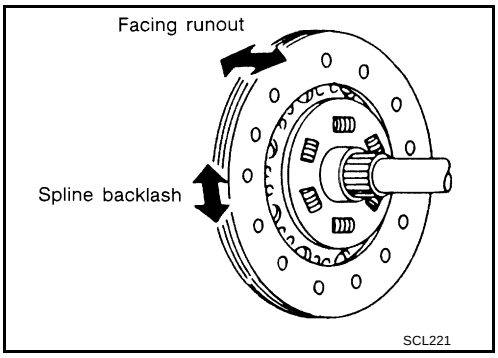
   Do not drop clutch disc.

INSPECTION AND ADJUSTMENT AFTER REMOVAL

Clutch Disc

- Measure circumference runout relative to the clutch disc center spline. If it is outside the specification, replace clutch disc and clutch cover as a set.

  Runout limit/diameter of the area to be measured
  : 1.0 mm (0.039 in)/230 mm (9.06 in) dia.

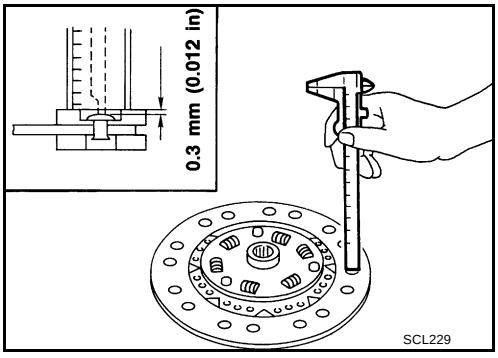


- Measure backlash for clutch disc spline and main drive shaft spline at the circumference of the clutch disc. If it is outside the specified range, replace clutch disc and clutch cover as a set.

  Maximum backlash of spline
  : 1.0 mm (0.039 in)

- Using calipers, measure the depth to the clutch disc facing rivet heads. If it exceeds the allowable wear limit, replace clutch disc and clutch cover as a set.

  Facing wear limit (depth to the rivet head)
  : 0.3 mm (0.012 in)

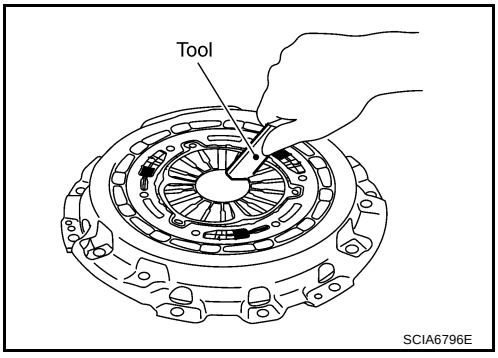


Clutch Cover

Check diaphragm spring lever claws for unevenness with the lever still on the vehicle. If they exceed the tolerance, adjust lever height using the diaphragm adjusting wrench.

Tolerance for diaphragm spring lever unevenness
: 0.8 mm (0.031 in)

Tool number : ST20050240 (—)



- Check clutch cover thrust ring for wear or breakage. If wear or breakage is found, replace clutch disc and clutch cover as a set.

  NOTE:
  - Worn thrust ring will generate a beating noise when tapped at the rivet with a hammer.
  - Broken thrust ring will make a clinking sound when cover is shaken up and down.

- If a trace of burn or discoloration is found on the clutch cover pressure plate to clutch disc contact surface, repair the surface with sandpaper. If surface is damaged or distorted, replace clutch disc and clutch cover as a set.

INSTALLATION

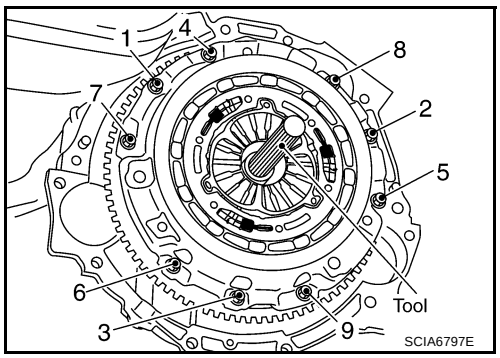
1. Apply recommended grease to clutch disc and main drive gear spline.

   CAUTION:
   Be sure to apply grease to the points specified. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip or judder. And if it adheres to seal of CSC body, it cause clutch fluid leakage. Wipe off excess grease. Wipe off any grease oozing from the parts.

2. Install clutch disc and clutch cover. Pre-tighten mounting bolts and install clutch aligning bar.

   Tool number : ST20670000 (—)

   CAUTION:
   If either clutch disk or clutch cover is needed to be replaced, replace them as a set.
3. Tighten clutch cover mounting bolts evenly in two steps in the order shown in the figure. Refer to CL-16, "Removal and Installation" .
4. Install transmission assembly. Refer to MT-18, "Removal and Installation" .



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Clutch Control System

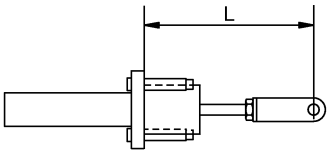
NCS0000H

Type of clutch control	Hydraulic

Clutch Master Cylinder

NCS0000I

Unit: mm (in)

Inner diameter	17.46 (11/16)
Standard length “L” between clevis and push rod  PCIB1944E	111.0 ± 0.5 (4.37 ± 0.02)

Clutch Disc

NCS0000K

Unit: mm (in)

Facing size (Outer dia. × inner dia. × thickness)	240 × 160 × 3.8 (9.45 × 6.30 × 0.150)
Wear limit (depth to the rivet head)	0.3 (0.012)
Runout limit/diameter of the area to be measured	1.0 (0.039)/230 (9.06) dia.
Maximum backlash of spline (at outer edge disc)	1.0 (0.039)

Clutch Cover

NCS0000L

Set-load	10,300 N (1,050.6 kg, 2,315.4 lb)
Diaphragm spring lever height	44.6 - 46.8 mm (1.756 - 1.843 in)
Uneven limit of diaphragm spring toe height	0.8 mm (0.031 in) or less

Clutch Pedal

NCS0000M

Unit: mm (in)

Clearance ″C″ between pedal stopper rubber and clutch interlock switch threaded while clutch pedal is fully depressed.	0.1 - 1.0 (0.004 - 0.039)

SECTION CO
ENGINE COOLING SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NBS0001M

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NBS0001N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Liquid Gasket

NBS0001O

REMOVAL OF LIQUID GASKET SEALING

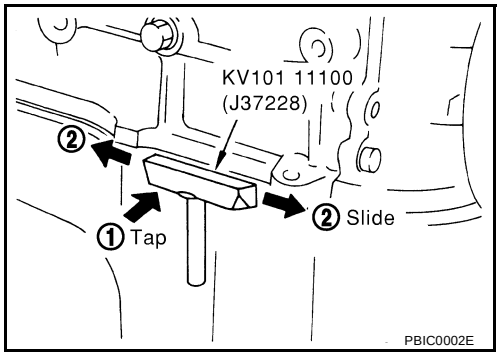
- After removing mounting bolts and nuts, separate the mating surface using seal cutter (SST) and remove old liquid gasket sealing.

  CAUTION:

  Be careful not to damage the mating surfaces.
- Tap seal cutter to insert it, and then slide it by tapping on the side as shown in the figure.
- In areas where seal cutter (SST) is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

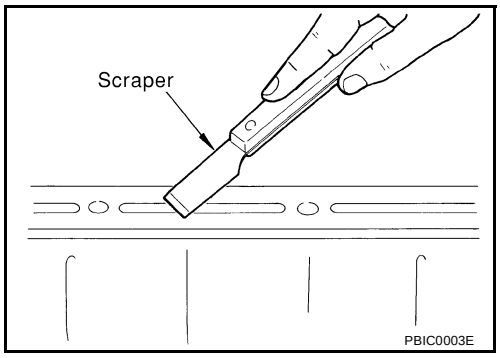
  CAUTION:

  If for some unavoidable reason tool such as screwdriver is used, be careful not to damage the mating surfaces.

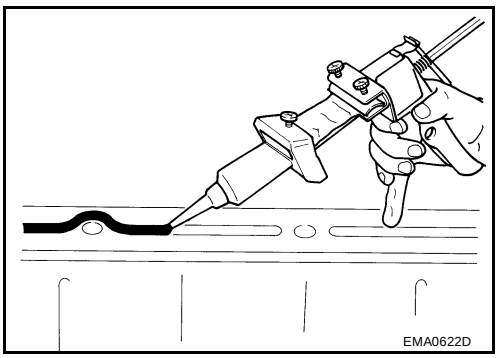


LIQUID GASKET APPLICATION PROCEDURE

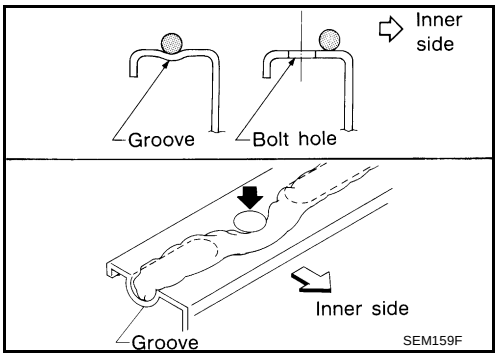
1. Using scraper, remove old liquid gasket adhering to the liquid gasket application surface and the mating surface.
   - Remove liquid gasket completely from the groove of the liquid gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.



3. Attach liquid gasket tube to tube presser [SST: WS39930000 (—)].
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for the liquid gasket application, apply liquid gasket to the groove.



   - As for the bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of service manual.
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten mounting bolts or nuts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



CAUTION:
If there are specific instructions in this manual, observe them.

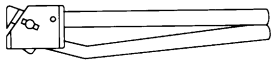
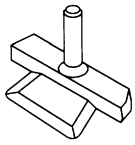
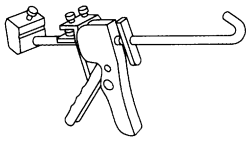
PREPARATION

PFP:00002

Special Service Tools

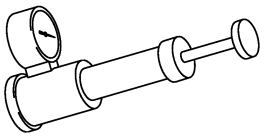
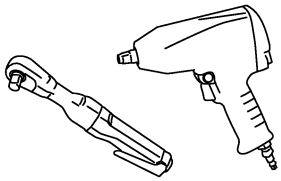
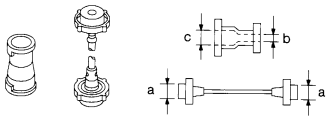
NBS0001P

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV99103510 (—) Radiator plate pliers A  S-NT224	Installing radiator upper and lower tanks
KV99103520 (—) Radiator plate pliers B  S-NT225	Removing radiator upper and lower tanks
KV10111100 (J37228) Seal cutter  NT046	Removing chain tensioner cover and water pump cover
WS39930000 (—) Tube presser  S-NT052	Pressing the tube of liquid gasket

Commercial Service Tools

NBS0001Q

Tool name	Description
Radiator cap tester  PBIC1982E	Checking radiator and radiator cap
Power tool  PBIC0190E	Loosening nuts and bolts
Radiator cap tester adapter  S-NT564	Adapting radiator cap tester to radiator cap and radiator filler neck a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)

OVERHEATING CAUSE ANALYSIS

PFP:00012

Troubleshooting Chart

NBS0001R

	Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	—	
		Damaged fins	Dust contamination or paper clogging	
			Physical damage	
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)	
	Reduced air flow	Cooling fan does not operate	Fan assembly	—
		High resistance to fan rotation		
		Damaged fan blades		
	Damaged radiator shroud	—	—	—
	Improper engine coolant mixture ratio	—	—	—
	Poor engine coolant quality	—	Engine coolant viscosity	—
	Insufficient engine coolant	Engine coolant leaks	Cooling hose	Loose clamp
				Cracked hose
			Water pump	Poor sealing
			Radiator cap	Loose
				Poor sealing
			Radiator	O-ring for damage, deterioration or improper fitting
				Cracked radiator tank
				Cracked radiator core
			Reservoir tank	Cracked reservoir tank
		Overflowing reservoir tank	Exhaust gas leaks into cooling system	Cylinder head deterioration
				Cylinder head gasket deterioration

OVERHEATING CAUSE ANALYSIS

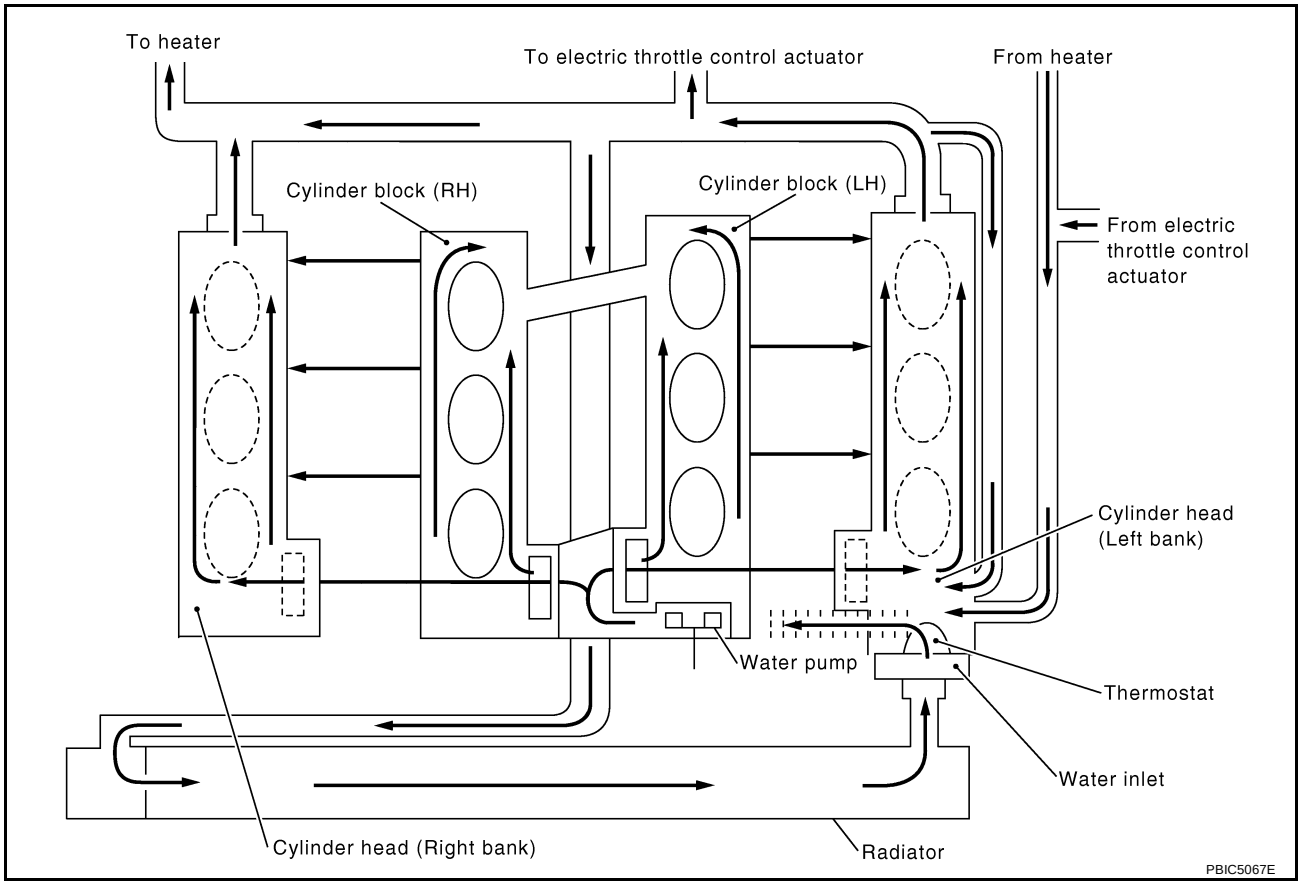
	Symptom		Check items	
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load
				Driving in low gear for extended time
				Driving at extremely high speed
			Powertrain system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes	
			Improper ignition timing	
	Blocked or restricted air flow	Blocked bumper	—	—
		Blocked radiator grille	Installed car brassiere	
			Mud contamination or paper clogging	
		Blocked radiator	—	
		Blocked condenser	Blocked air flow	
		Installed large fog lamp		

COOLING SYSTEM

PFP:21020

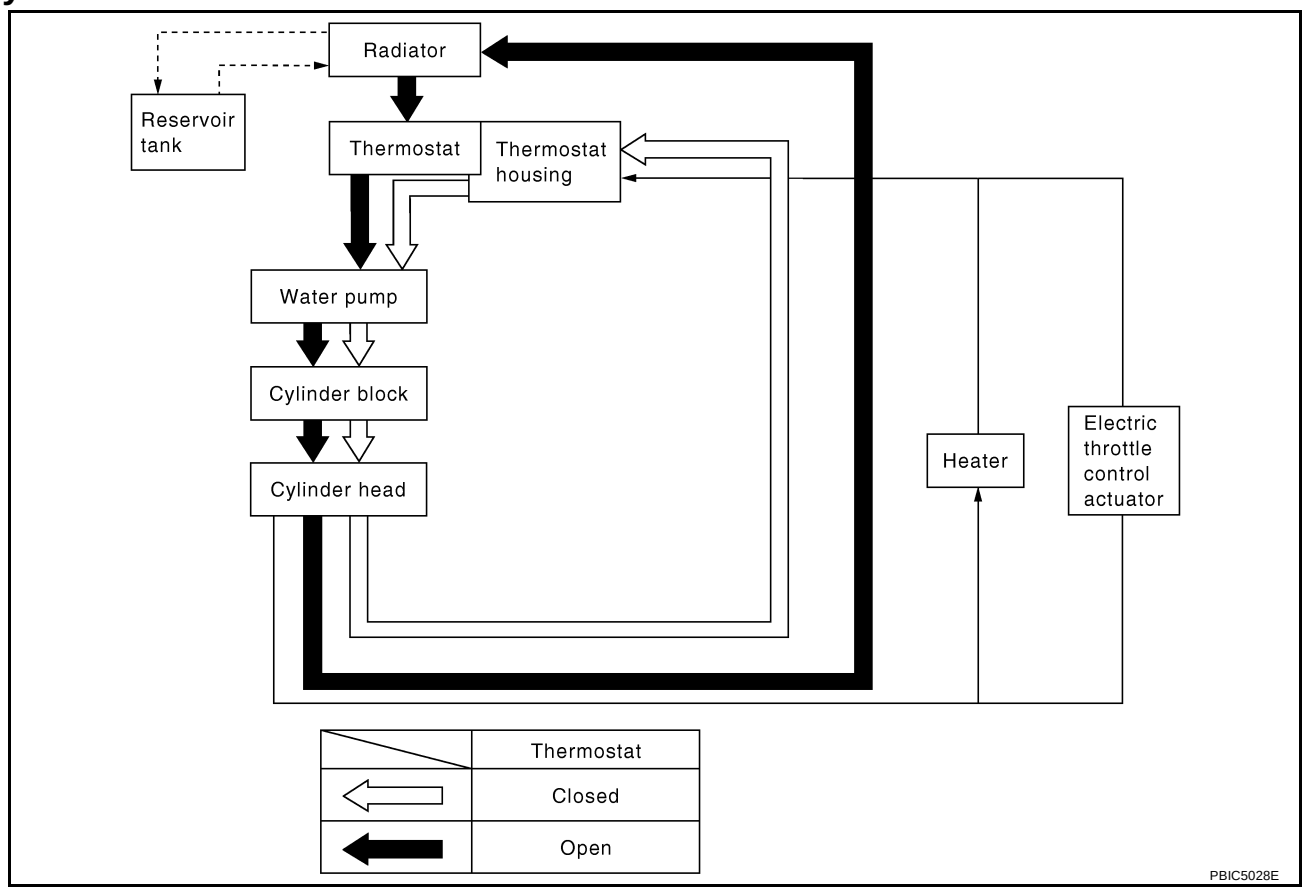
Cooling Circuit

NBS0001S



System Chart

NBS0001T



ENGINE COOLANT

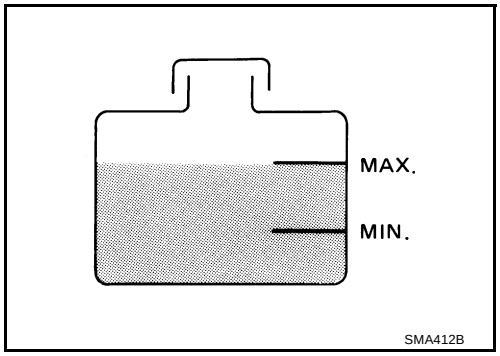
PFP:KQ100

Inspection

NBS0001U

LEVEL CHECK

- Check if the reservoir tank engine coolant level is within the “MIN” to “MAX” range when engine is cool.
- Adjust the engine coolant level as necessary.



LEAK CHECK

- To check for leaks, apply pressure to the cooling system with radiator cap tester (commercial service tool) and radiator cap tester adapter (commercial service tool) (A).

  Testing pressure

  : 157 kPa (1.6 kg/cm^2 , 23 psi)

  WARNING:

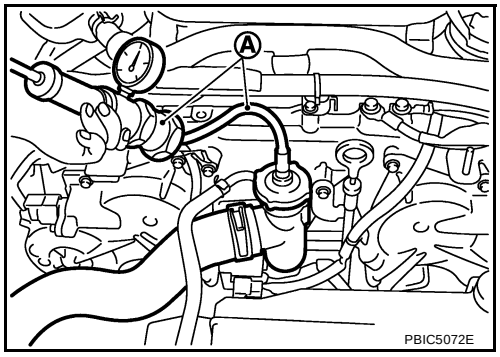
  Do not remove radiator cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator.

  CAUTION:

  Higher test pressure than specified may cause radiator damage.

  NOTE:

  In a case that engine coolant decreases, replenish radiator with engine coolant.



- If anything is found, repair or replace damaged parts.

Changing Engine Coolant

NBS0001V

WARNING:

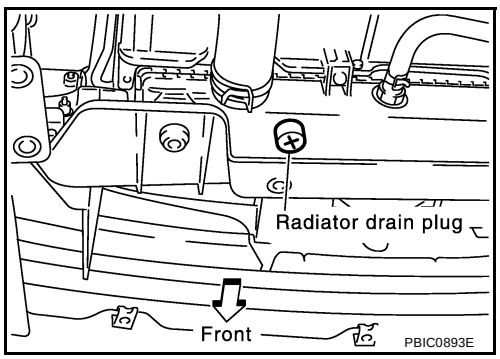
- **To avoid being scalded, do not change engine coolant when engine is hot.**
- **Wrap a thick cloth around cap and carefully remove cap. First, turn cap a quarter of a turn to release built-up pressure. Then turn cap all the way.**

CAUTION:

Be careful not to allow engine coolant to contact drive belts.

DRAINING ENGINE COOLANT

1. Remove undercover with power tool.
2. Open radiator drain plug at the bottom of radiator, and then remove radiator cap.



When drain all of engine coolant in the system, open water drain plugs on engine cylinder block. Refer to EM-108, "DISASSEMBLY" .

3. Remove reservoir tank as necessary, and drain engine coolant and clean reservoir tank before installing.
4. Check drained engine coolant for contaminants such as rust, corrosion or discoloration.
   If contaminated, flush the engine cooling system. Refer to CO-12, "FLUSHING COOLING SYSTEM" .

REFILLING ENGINE COOLANT

1. Install reservoir tank if removed, and radiator drain plug.

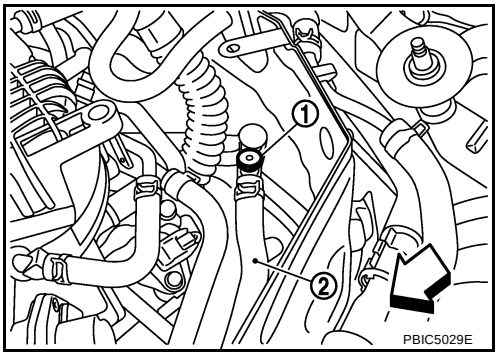
   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

   Radiator drain plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-111, "ASSEMBLY" .
2. Make sure that each hose clamp has been firmly tightened.
3. Remove air relief plug (1) on heater hose.

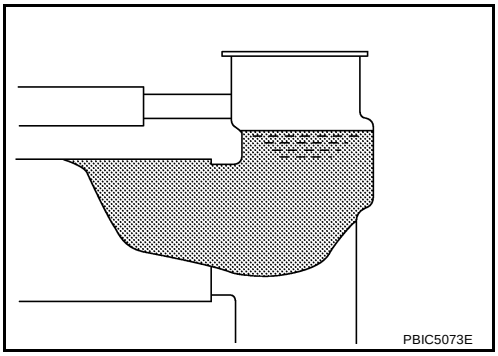
   2 : Heater hose
   ⇦ : Vehicle front



4. Fill radiator and reservoir tank to specified level.
   - **Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (2-1/8 US qt, 1-3/4 lmp qt) a minute to allow air in system to escape.**
   - **Use Genuine NISSAN Long Life Antifreeze/Coolant or equivalent mixed with water (distilled or demineralized). Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS".**

     Engine coolant capacity
     (with reservoir tank at “MAX” level)

     : Approx. 9.0 ℓ (9 - 1/2 US qt, 7- 7/8 lmp qt)



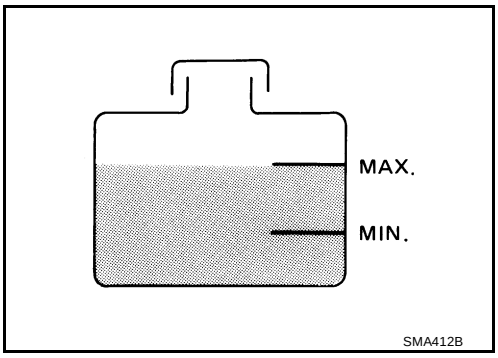
     Reservoir tank capacity (at “MAX” level)

     : 0.8 ℓ (7/8 US qt, 3/4 lmp qt)

   - When engine coolant overflows air relief hole on heater hose, install air relief plug with new O-ring.

     Air relief plug:

     : 1.2 N·m (0.12 kg-m, 11 in-lb)



5. Install radiator cap.
6. Warm up until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
   - Make sure thermostat opening condition by touching radiator hose (lower) to see a flow of warm water.

   CAUTION:
   Watch water temperature gauge so as not to overheat engine.

7. Stop engine and cool down to less than approximately 50°C (122°F).
   - Cool down using fan to reduce the time.
   - If necessary, refill radiator up to filler neck with engine coolant.
8. Refill reservoir tank to “MAX” level line with engine coolant.
9. Repeat steps 4 through 7 two or more times with radiator cap installed until engine coolant level no longer drops.
10. Check cooling system for leaks with engine running.
11. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between “COOL” and “WARM”.
    - Sound may be noticeable at heater unit.
12. Repeat step 11 three times.
13. If sound is heard, bleed air from cooling system by repeating step 4 through 7 until engine coolant level no longer drops.

FLUSHING COOLING SYSTEM

1. Install reservoir tank if removed, and radiator drain plug.

   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

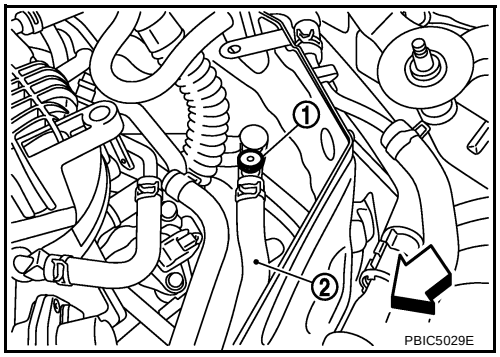
   Radiator drain plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-111, "ASSEMBLY" .

2. Remove air relief plug (1) on heater hose.

   2 : Heater hose
   ⇦ : Vehicle front



3. Fill radiator with water until water spills from the air relief hole, then close air relief plug. Fill radiator and reservoir tank with water and reinstall radiator cap.

   Air relief plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

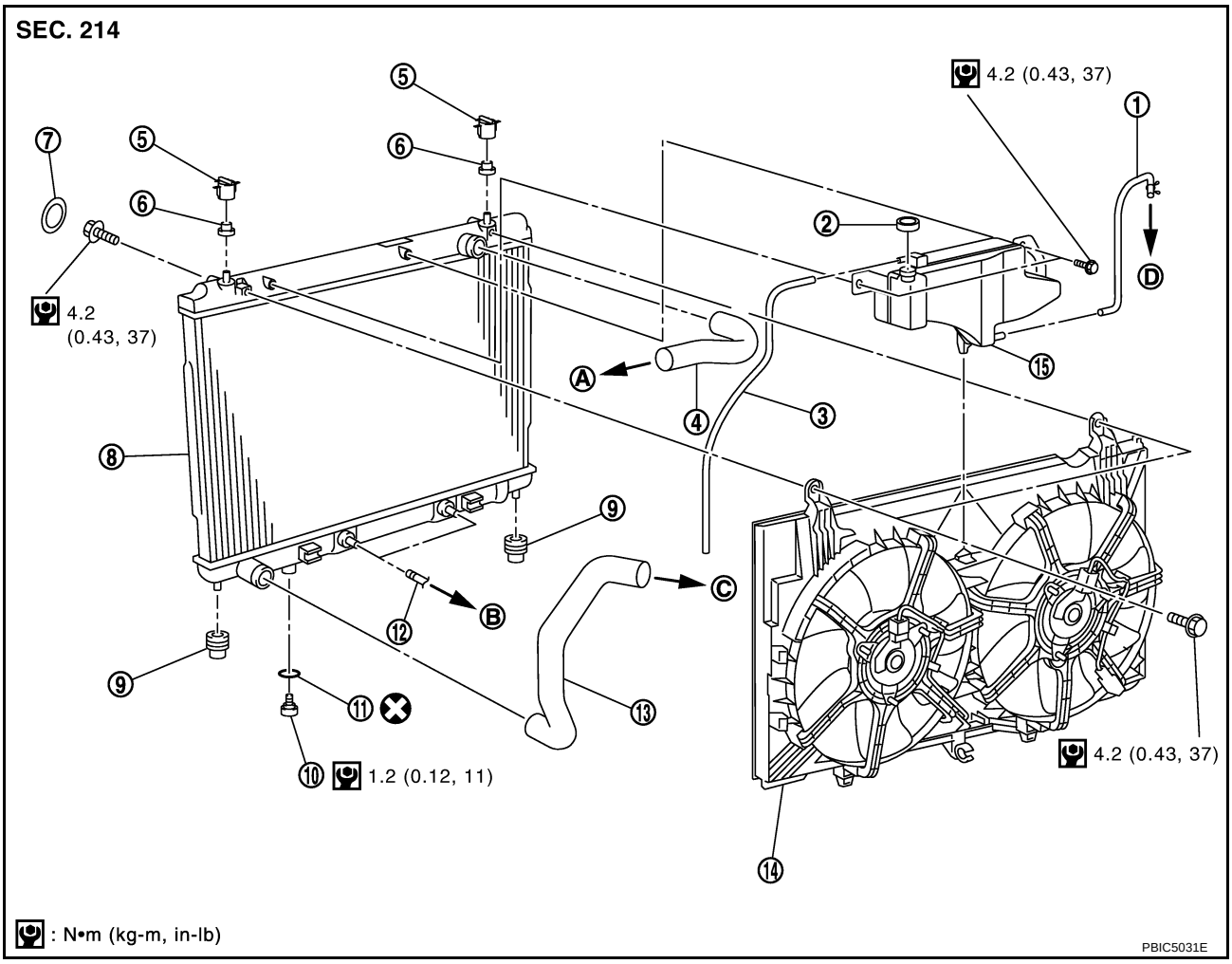
4. Run engine and warm it up to normal operating temperature.
5. Rev engine two or three times under no-load.
6. Stop engine and wait until it cools down.
7. Drain water from the system. Refer to CO-10, "DRAINING ENGINE COOLANT" .
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.

RADIATOR

PFP:21400

Removal and Installation

NBS0001W



1. Reservoir tank hose	2. Reservoir tank cap	3. Reservoir tank hose
4. Radiator hose (upper)	5. Upper mount bracket	6. Mounting rubber (upper)
7. Cover	8. Radiator	9. Mounting rubber (lower)
10. Radiator drain plug	11. O-ring	12. A/T fluid cooler hose (A/T models)
13. Radiator hose (lower)	14. Radiator cooling fan assembly	15. Reservoir tank
A. To water outlet	B. To A/T fluid cooler tube (A/T models)	C. To water inlet
D. To water outlet		

- Refer to GI-11, "Components" for symbol marks in the figure.

WARNING:

Do not remove radiator cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

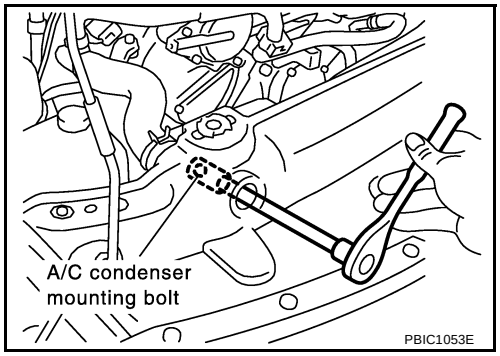
REMOVAL

1. Remove undercover with power tool.
2. Drain engine coolant from radiator. Refer to CO-10, "Changing Engine Coolant" .

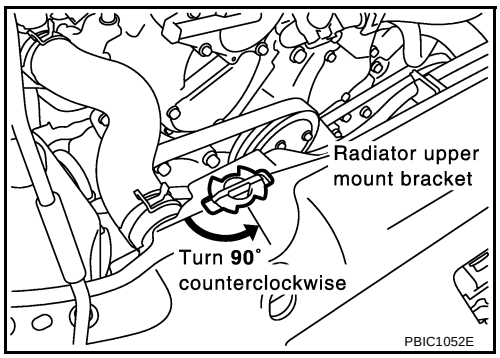
   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove air duct and air cleaner case assembly. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Remove bracket mounting bolt for anchoring A/C piping from vehicle left side, so that A/C piping can be moved.

5. Remove reservoir tank.
6. Removal radiator hoses (upper and lower) and reservoir tank hose.

   CAUTION:
   Be careful not to allow engine coolant to contact drive belts.
7. Remove radiator cooling fan assembly. Refer to CO-21, "COOLING FAN" .
8. Disconnect A/T fluid cooler hoses. (A/T models)
   - Install blind plug to avoid leakage of A/T fluid.
9. Remove cover, and then two A/C condenser mounting bolts located in upper part of radiator.



10. Rotate two radiator upper mount brackets 90 degrees in the direction as shown in the figure, and remove them.

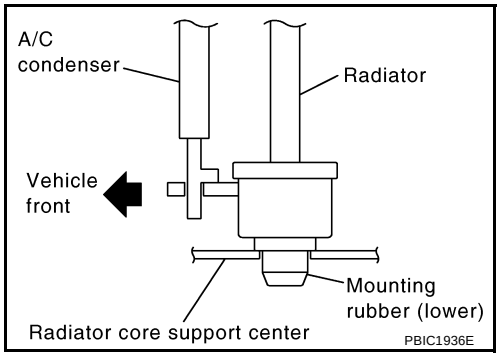


11. Remove radiator as follows:

    CAUTION:
    Do not damage or scratch A/C condenser and radiator core when removing.

a. With lifting and pulling radiator in a rear direction, disassemble lower mount from radiator core support center.

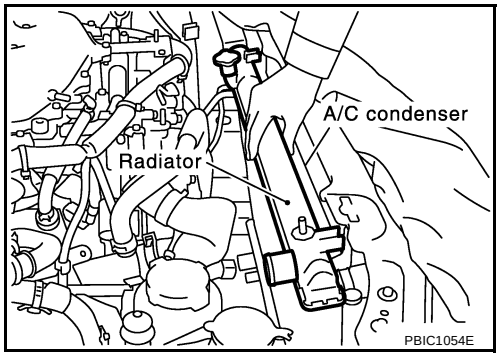
   CAUTION:
   Because A/C condenser is onto the front-lower portion of radiator, moving to rear direction should be at minimum.



b. Lift A/C condenser up and remove radiator after disengaging the fitting as front-bottom surface.

   CAUTION:
   Lifting A/C condenser should be minimum to prevent a load to A/C piping.

c. After removing radiator, put A/C condenser on radiator core support center to prevent a load to A/C piping, and temporarily fix it with rope or similar means.



INSTALLATION

Installation is the reverse order of removal.

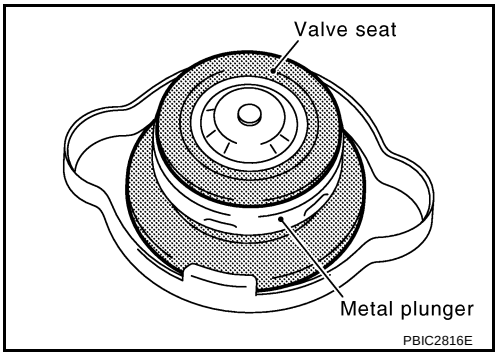
INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant using radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool). Refer to CO-10, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant and A/T fluid.

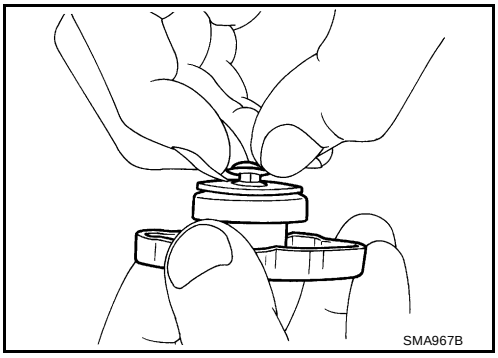
Checking Radiator Cap

NBS0001X

- Check valve seat of radiator cap.
  - Check if valve seat is swollen to the extent that the edge of the plunger cannot be seen when watching it vertically from the top.
  - Check if valve seat has no soil and damage.



- Pull negative-pressure valve to open it, and make sure that it is completely closed when released.
  - Make sure that there is no dirt or damage on the valve seat of radiator cap negative-pressure valve.
  - Make sure that there are no unusualness in the opening and closing conditions of negative-pressure valve.



- Check radiator cap relief pressure.

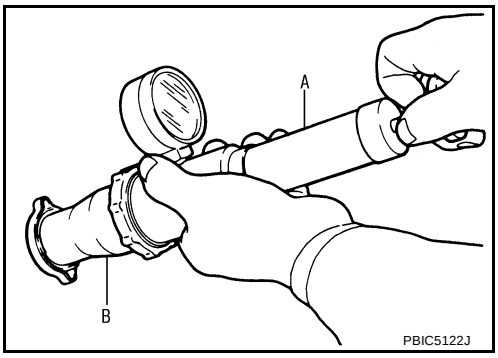
Standard:

108 - 127 kPa (1.1 - 1.3 kg/cm^2 , 16 - 18 psi)

Limit:

88 kPa (0.9 kg/cm^2 , 13 psi)

  - When connecting radiator cap to the radiator cap tester (commercial service tool) (A) and the radiator cap tester adapter (commercial service tool) (B), apply engine coolant to the cap seal surface.



- Replace radiator cap if there is an unusualness related to the above three.

CAUTION:

When installing radiator cap, thoroughly wipe out the filler neck to remove any waxy residue or foreign material.

Checking Radiator

NBS0001Y

Check radiator for mud or clogging. If necessary, clean radiator as follows.

- Be careful not to bend or damage the radiator fins.
- When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape harness and electrical connectors to prevent water from entering.

1. Apply water by hose to the back side of radiator core vertically downward.

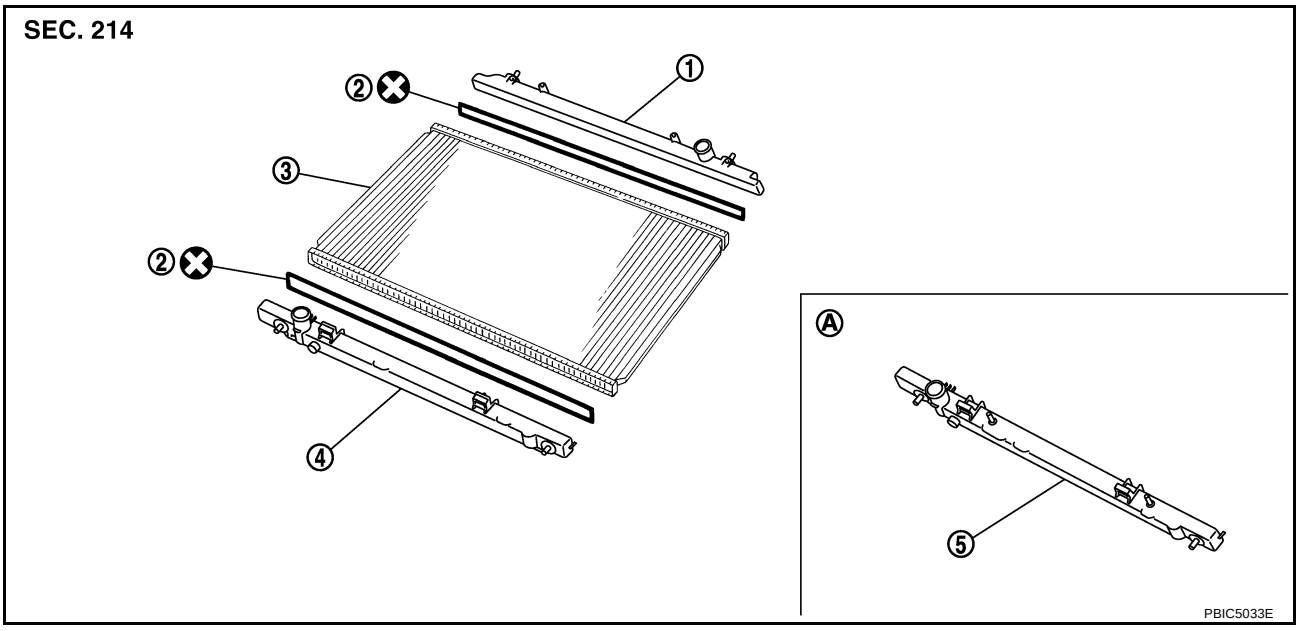
2. Apply water again to all radiator core surface once per minute.
3. Stop washing if any stains no longer flow out from radiator.
4. Blow air into the back side of radiator core vertically downward.
   - Use compressed air lower than 490 kPa (5 kg/cm^2 , 71 psi) and keep distance more than 30 cm (11.8 in).
5. Blow air again into all the radiator core surfaces once per minute until no water sprays out.

RADIATOR (ALUMINUM TYPE)

PFP:21460

Disassembly and Assembly

NBS0001Z



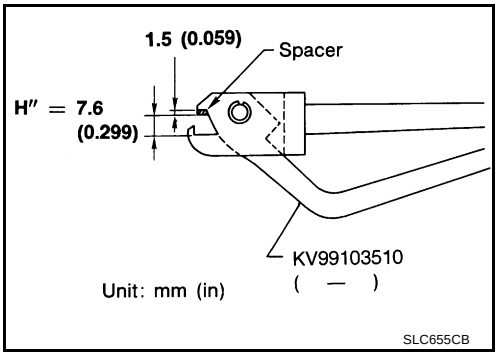
1. Upper tank
2. Sealing rubber
3. Core
4. Lower tank
5. Lower tank (with A/T fluid cooler)

A. A/T models

- Refer to GI-11, "Components" for symbol marks in the figure.

PREPARATION

1. Attach spacer to tip of radiator plate pliers A (SST).
   Spacer specification: 18 mm (0.71 in) wide × 8.5 mm (0.335 in) long × 1.5 mm (0.059 in) thick.



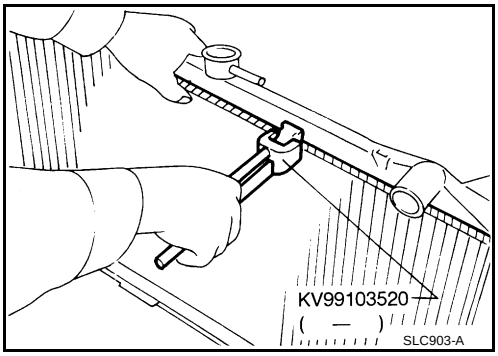
2. Make sure that when radiator plate pliers A [SST: KV99103510 (—)] are closed dimension H″ is approx. 7.6 mm (0.299 in).
3. Adjust dimension H″ with spacer, if necessary.

DISASSEMBLY

1. Remove upper and lower tanks with radiator plate pliers B (SST).

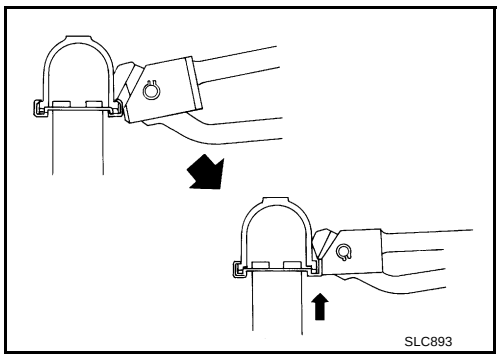
   CAUTION:
   Do not disassemble lower tank and A/T fluid cooler. (A/T models)

   NOTE:
   Regard lower tank and A/T fluid cooler as an assembly. (A/T models)



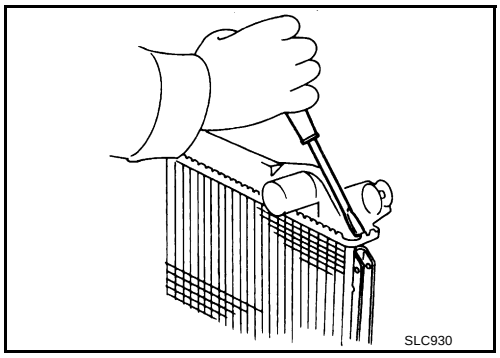
- Grip the crimped edge and bend it upwards so that radiator plate pliers B [SST: KV99103520(—)] slips off.

  CAUTION:
  Do not bend excessively.

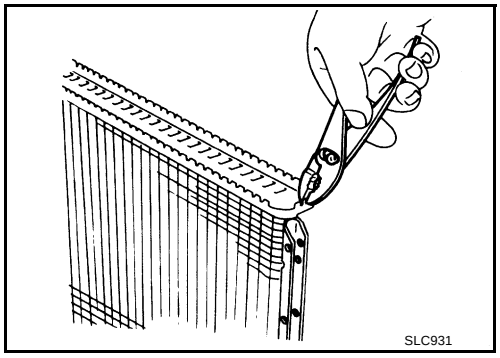


- In areas where radiator plate pliers B [SST: KV99103520(—)] cannot be used, use screwdriver to bend the edge up.

  CAUTION:
  Be careful not to damage tank.

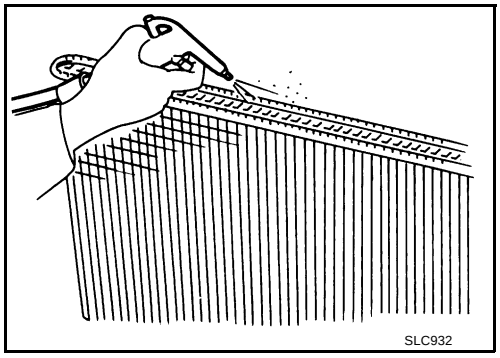


2. Remove sealing rubber.
3. Make sure the edge stands straight up.



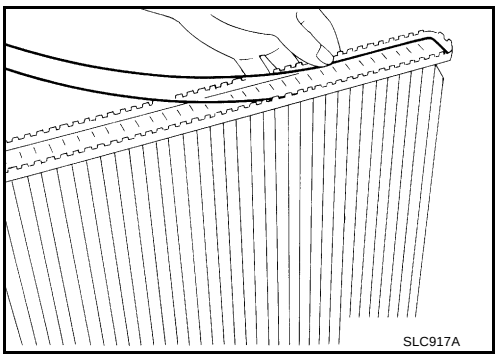
ASSEMBLY

1. Clean contact portion of tank.

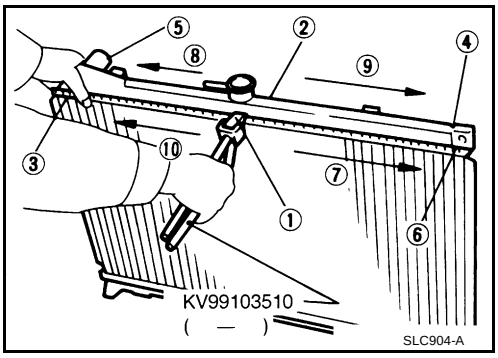


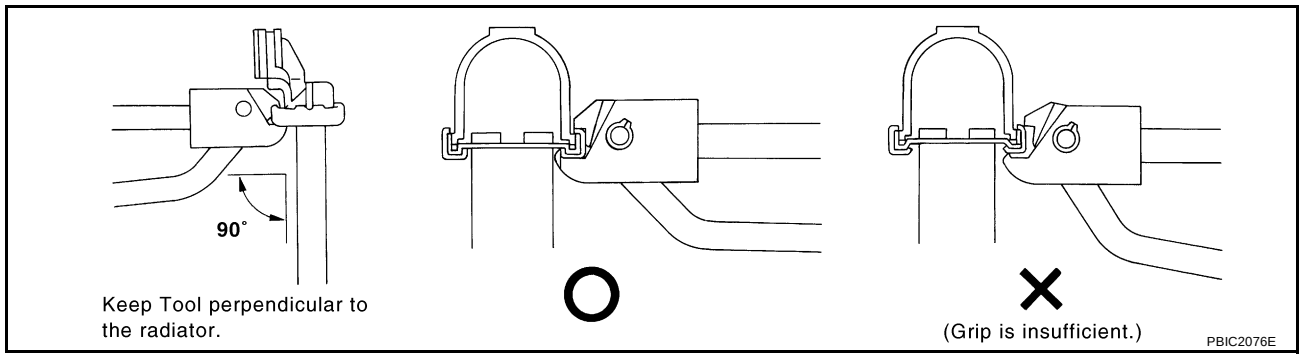
2. Install sealing rubber while pushing it with fingers.

CAUTION:
Be careful not to twist sealing rubber.

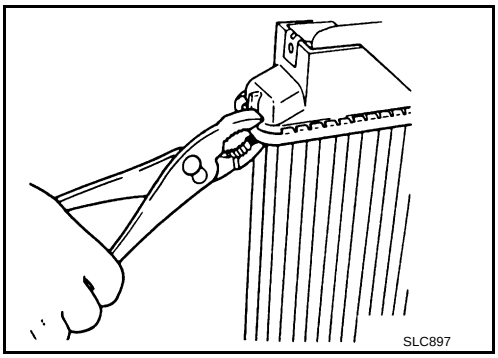


3. Caulk tank in numerical order as shown in the figure with radiator plate pliers A (SST).



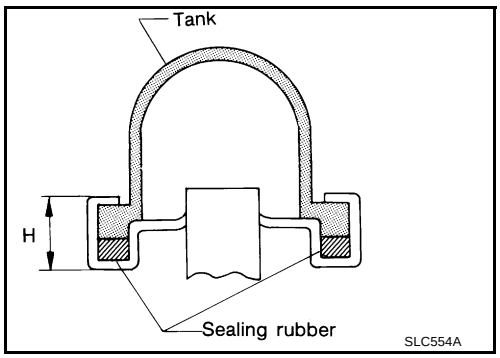


- Use pliers in the locations where radiator plate pliers A [SST: KV99103510 (—)] cannot be used.



4. Make sure that the rim is completely crimped down.

Standard height "H" : 8.0 - 8.4 mm (0.315 - 0.331 in)

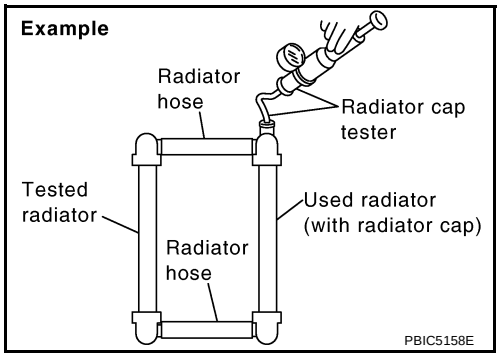


5. Make sure that there is no leakage.
Refer to CO-20, "INSPECTION" .

INSPECTION

1. Apply pressure with radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool).
   - Provide used radiator and connect it to tested radiator using radiator hoses as shown in the figure.

   NOTE:
   The used radiator should be tested beforehand to confirm it has no leakage. If used one is not available, it is possible to use new service part as a radiator testing tool.



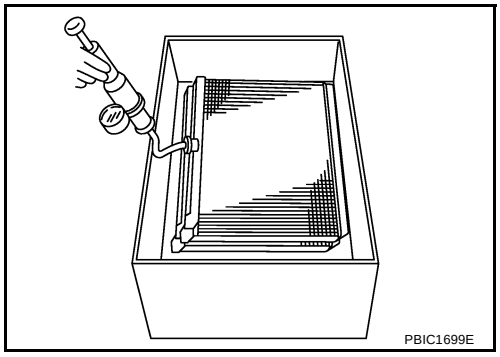
Testing pressure

: 157 kPa (1.6 kg/cm^2 , 23 psi)

WARNING:
To prevent the risk of hose coming undone while under pressure, securely fasten it down with hose clamp.

CAUTION:
Attach hose to A/T fluid cooler to seal its inlet and outlet.
(A/T models)

2. Check for leakage by soaking radiator in water container with the testing pressure applied.

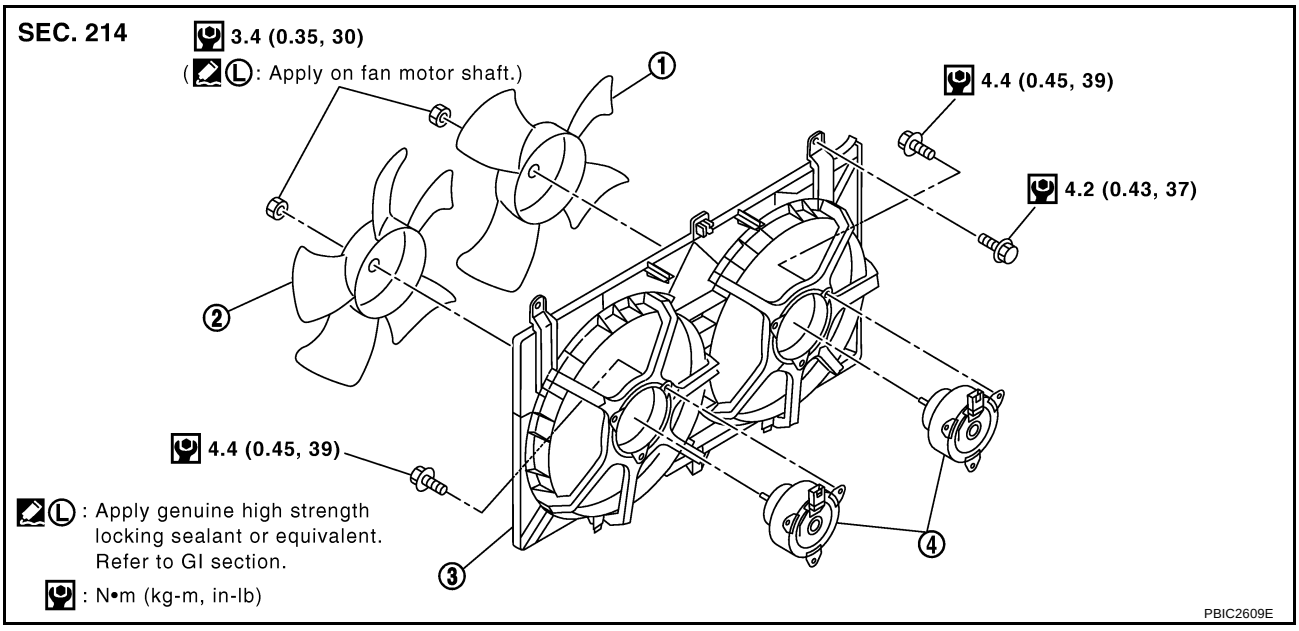


COOLING FAN

PFP:21140

Removal and Installation

NBS00020

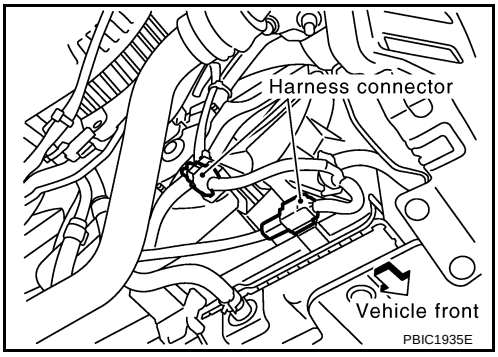


1. Cooling fan (RH)
2. Cooling fan (LH)
3. Fan shroud
4. Fan motor

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Drain engine coolant from radiator. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove air cleaner case assembly (RH, LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Remove reservoir tank. Refer to CO-13, "RADIATOR" .
5. Disconnect radiator hose (upper) at radiator side. Refer to CO-13, "RADIATOR" .
6. Disconnect fan motor harness connectors at the right-lower portion of fan shroud.



7. Remove mounting bolts to lift up and radiator cooling fan assembly.

   CAUTION:
   Be careful not to damage or scratch on radiator core.

INSTALLATION

Installation is the reverse order of removal.

NOTE:
Cooling fans are controlled by ECM. For details, refer to EC-543, "DTC P1217 ENGINE OVER TEMPERATURE" .

Disassembly and Assembly

NBS00021

DISASSEMBLY

1. Remove cooling fans (RH and LH) from fan motors.
2. Remove fan motors from fan shroud.

INSPECTION AFTER DISASSEMBLY

Cooling Fan

Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

ASSEMBLY

Assembly is the reverse order of disassembly.

CAUTION:

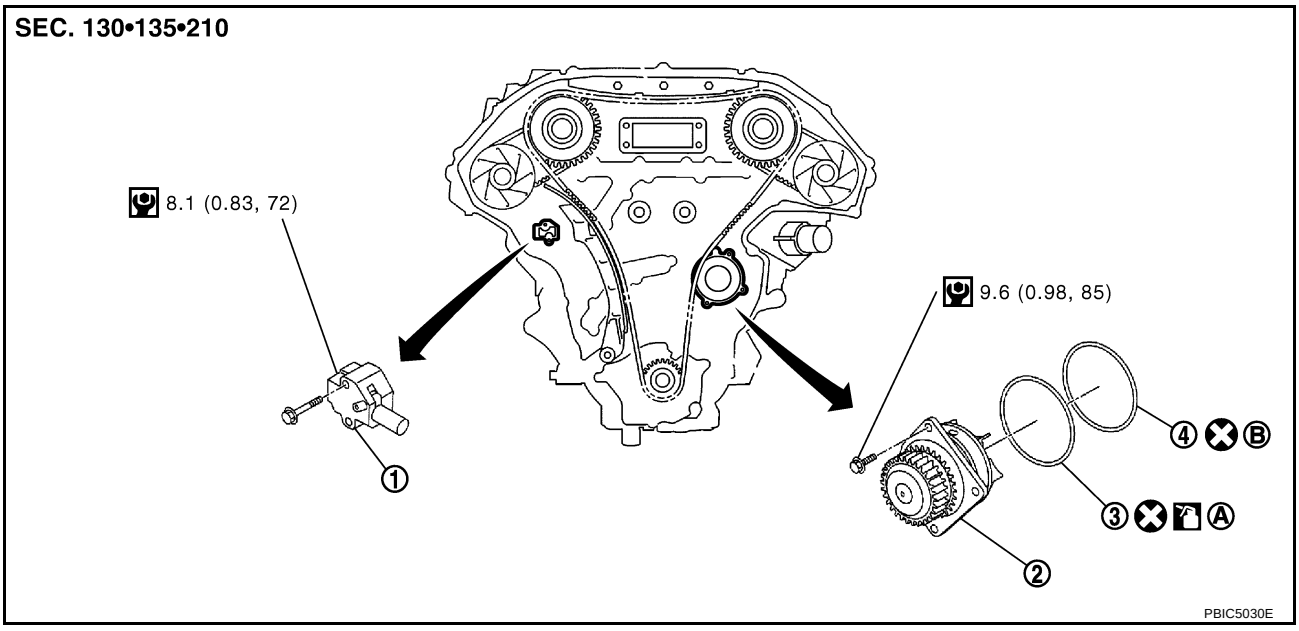
RH and LH cooling fans are different. Be careful not to misassemble them.

WATER PUMP

PFP:21020

Removal and Installation

NBS00022



1. Timing chain tensioner (primary)	2. Water pump	3. O-ring
4. O- ring		
A. Identify with yellow paint mark	B. Identify with light blue paint mark Apply engine coolant	

- Refer to GI-11, "Components" for symbol marks in the figure.

CAUTION:

- **When removing water pump assembly, be careful not to get engine coolant on drive belt.**
- **Water pump cannot be disassembled and should be replaced as a unit.**
- **After installing water pump, connect hose and clamp securely, then check for leaks using radiator cap tester (commercial service tool) and radiator cap tester adapter (commercial service tool).**

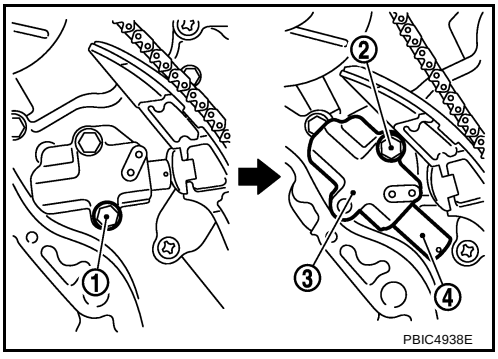
REMOVAL

1. Remove front timing chain case. Refer to EM-44, "FRONT TIMING CHAIN CASE" .
2. Remove timing chain tensioner (primary) as follows:

a. Remove lower mounting bolt (1).

b. Loosen upper mounting bolt (2) slowly, and then turn chain tensioner (primary) (3) on the upper mounting bolt so that plunger (4) is fully expanded.

NOTE:
Even if plunger is fully expanded, it is not dropped from the body of timing chain tensioner (primary).



c. Remove upper mounting bolt, and then remove timing chain tensioner (primary).

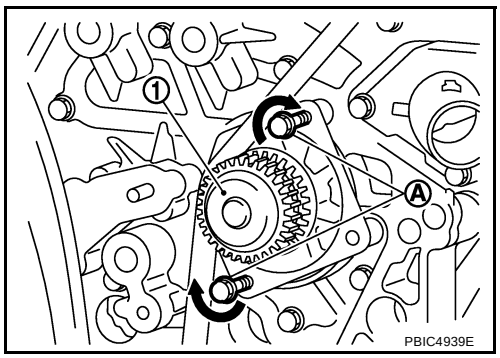
3. Remove water pump as follows:

a. Remove three water pump mounting bolts. Secure a gap between water pump gear and timing chain, by turning crankshaft counterclockwise until timing chain looseness on water pump sprocket becomes maximum.

b. Screw M8 bolts (A) [pitch: 1.25 mm (0.049 in) length: approx. 50 mm (1.97 in)] into water pumps upper and lower mounting bolt holes until they reach timing chain case. Then, alternately tighten each bolt for a half turn, and pull out water pump (1).

CAUTION:

- **Pull straight out while preventing vane from contacting socket in installation area.**
- **Remove water pump without causing sprocket to contact timing chain.**



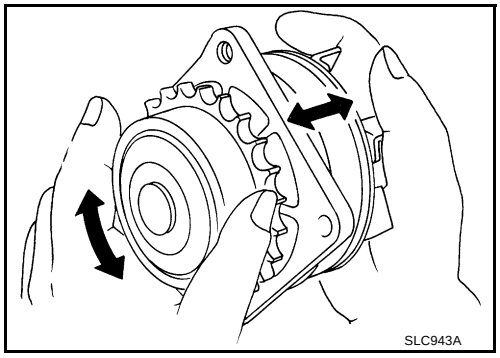
c. Remove M8 bolts and O-rings from water pump (1).

CAUTION:

Do not disassemble water pump.

INSPECTION AFTER REMOVAL

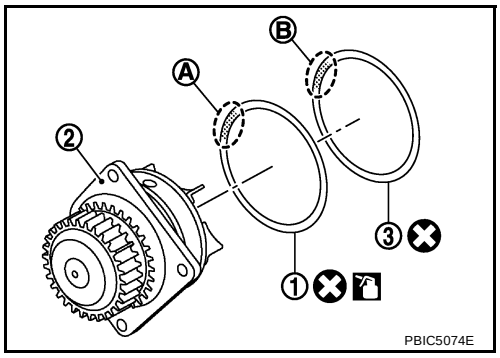
- Check for badly rusted or corroded water pump body assembly.
- Check for rough operation due to excessive end play.
- Replace water pump, if necessary.



INSTALLATION

1. Install new O-rings to water pump.
   - Apply engine oil to O-rings (1) and engine coolant to O-ring (3) as shown in the figure.
   - Locate O-ring (1) with yellow paint mark (A) to engine front side.
   - Locate O-ring (3) with light blue paint mark (B) to rear side.

   2 : Water pump



2. Install water pump.

CAUTION:

Do not allow cylinder block to nip O-rings when installing water pump.

- Make sure that timing chain and water pump sprocket are engaged.
- Insert water pump by tightening mounting bolts alternately and evenly.

3. Install timing chain tensioner (primary) as follows:

a. Turn crankshaft clockwise so that timing chain on the timing chain tensioner (primary) side is loose.

b. Pull plunger stopper tab up (or turn lever downward) so as to remove plunger stopper tab from the ratchet of plunger.

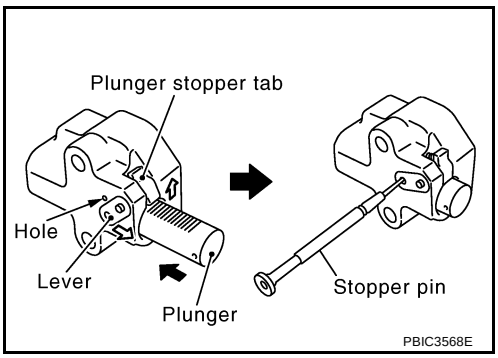
NOTE:
Plunger stopper tab and lever are synchronized.

c. Push plunger into the inside of tensioner body.

d. Hold plunger in the fully compressed position by engaging plunger stopper tab with the tip of ratchet.

e. To secure lever, insert stopper pin through hole of lever into tensioner body hole.

- The lever parts and the tab are synchronized. Therefore, the plunger will be secured under this condition.



NOTE:
Figure shows the example of 1.2 mm (0.047 in) diameter thin screwdriver being used as the stopper pin.

f. Install timing chain tensioner (primary).

- Remove dust and foreign material completely from backside of timing chain tensioner (primary) and from installation area of rear timing chain case.

g. Remove stopper pin.

h. Make sure again that timing chain and water pump sprocket are engaged.

4. Install in the reverse order of removal after this step.

- **After starting engine, let idle for three minutes, then rev engine up to 3,000 rpm under no load to purge air from the high-pressure chamber of chain tensioner. Engine may produce a rattling noise. This indicates that air still remains in the chamber and is not a matter of concern.**

INSPECTION AFTER INSTALLATION

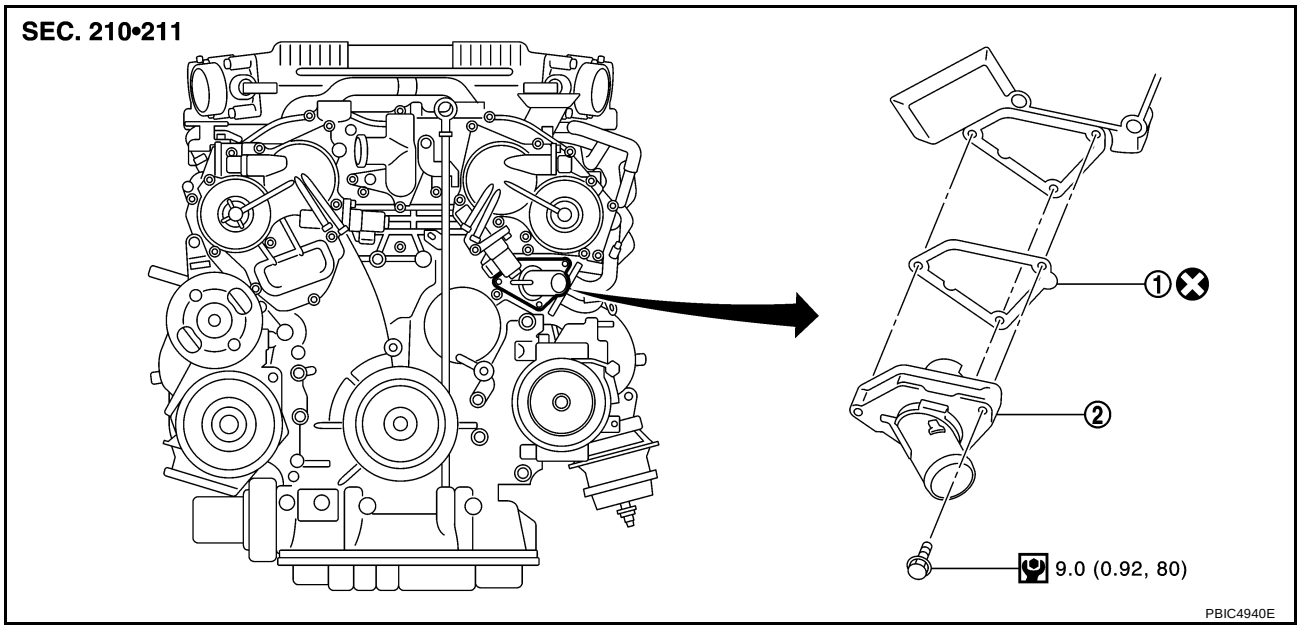
- Check for leaks of engine coolant using radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool). Refer to CO-10, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

WATER INLET AND THERMOSTAT ASSEMBLY

PFP:21200

Removal and Installation

NBS00023



1. Gasket
2. Water inlet and thermostat assembly

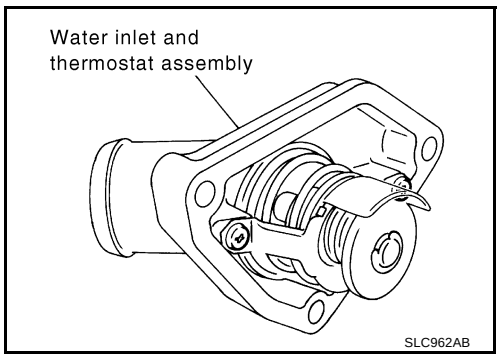
- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove undercover with power tool.
2. Drain engine coolant from radiator drain plug at the bottom of radiator. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove air duct and air cleaner case (LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Disconnect radiator hose (lower) from water inlet and thermostat assembly.
5. Remove intake valve timing control solenoid.
6. Remove water inlet and thermostat assembly.

   CAUTION:
   Do not disassemble water inlet and thermostat assembly. Replace them as a unit, if necessary.

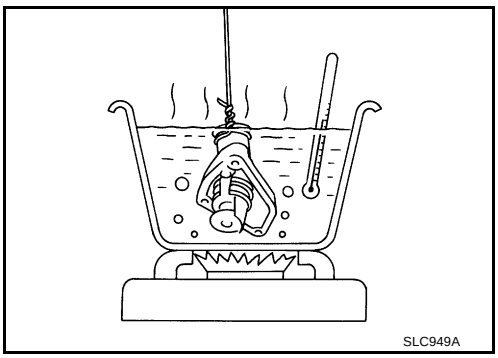


INSPECTION AFTER REMOVAL

1. Check valve seating condition at ordinary room temperatures. It should seat tightly.

2. Check valve operation.

Thermostat	Standard
Valve opening temperature	82°C (180°F)
Maximum valve lift	9.0 mm / 95°C (0.354 in / 203°F)
Valve closing temperature	77°C (171°F)



- If the malfunctioning condition, when valve seating at ordinary room temperature, or measured values are out of the standard, replace water inlet and thermostat assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

- **Be careful not to spill engine coolant over engine room. Use rag to absorb engine coolant.**

INSPECTION AFTER INSTALLATION

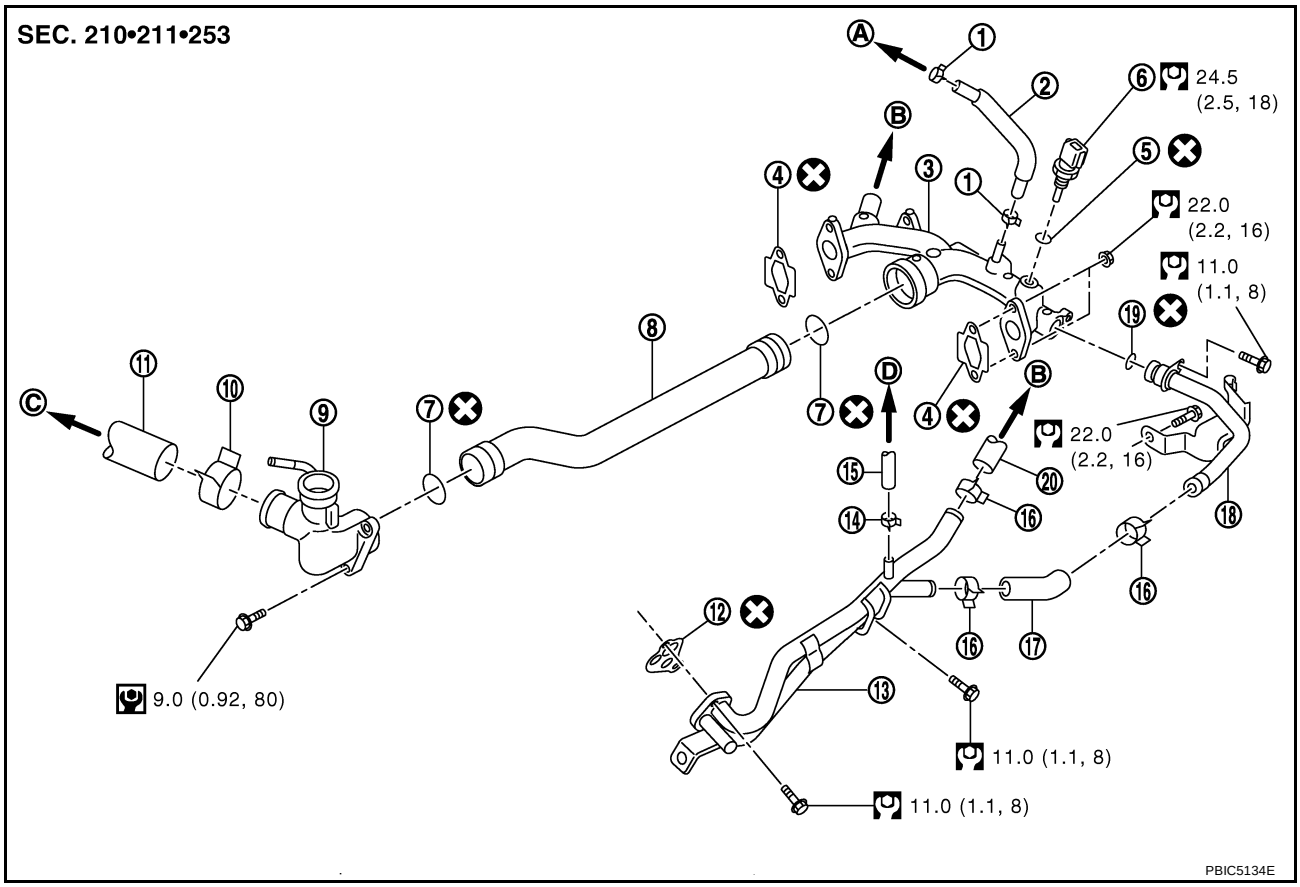
- Check for leaks of engine coolant using radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool). Refer to CO-10, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

WATER OUTLET AND WATER PIPING

PFP:11060

Removal and Installation

NBS00024



1.	Clamp	2.	Water hose	3.	Water outlet (rear)
4.	Gasket	5.	Washer	6.	Engine coolant temperature sensor
7.	O-ring	8.	Water outlet pipe	9.	Water outlet (front)
10.	Clamp	11.	Radiator hose (upper)	12.	Gasket
13.	Heater pipe	14.	Clamp	15.	Water hose
16.	Clamp	17.	Heater hose	18.	Water bypass pipe
19.	O-ring	20.	Heater hose		
A.	To EVAP piping	B.	To heater core	C.	To radiator
D.	To electric throttle control actuator				

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove undercover with power tool.
2. Drain engine coolant from radiator drain plug at the bottom of radiator, and from water drain plug at the front of cylinder block. Refer to CO-10, "Changing Engine Coolant" and CO-23, "WATER PUMP" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
4. Remove air duct and air cleaner case (RH, LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
5. Remove radiator hose (upper), heater hoses and water hoses.
6. Remove the following parts, when remove water outlet.
   - A/T fluid charging pipe (A/T models): Refer to AT-242, "TRANSMISSION ASSEMBLY" .
   - Intake manifold collector: Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
7. Remove engine coolant temperature sensor as necessary.

CAUTION:
Be careful not to damage engine coolant temperature sensor.

8. Remove oil level gauge and guide. Refer to EM-44, "FRONT TIMING CHAIN CASE" .
9. Remove water outlet, heater pipe, water bypass hoses and water pipe.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Securely insert each hose, and install clamp at a position where it does not interfere with the pipe bulge.
- When inserting water pipe into water outlet, apply neutral detergent to O-ring.

INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant using radiator cap tester adapter (commercial service tool) and radiator cap tester (commercial service tool). Refer to CO-10, "LEAK CHECK" .
- Start and warm up engine. Visually make sure that there is no leaks of engine coolant.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00100

Standard and Limit

NBS00025

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at “MAX” level)	9.0 (9-1/2, 7- 7/8)
Reservoir tank engine coolant capacity (At “MAX” level)	0.8 (7/8, 3/4)

RADIATOR

Unit: kPa (kg/cm^2 , psi)

Cap relief pressure	Standard	108 - 127 (1.1 - 1.3, 16 - 18)
	Limit	88 (0.9, 13)
Leakage test pressure		157 (1.6, 23)

THERMOSTAT

Valve opening temperature	82°C (180°F)
Maximum valve lift	9.0 mm / 95°C (0.354 in / 203°F)
Water closing temperature	77°C (171°F)

SECTION DI
DRIVER INFORMATION SYSTEM

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PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS0005P

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS0005Q

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

COMBINATION METERS

PFP:24814

System Description

NKS0005S

UNIFIED METER CONTROL UNIT

- Speedometer, odo/trip meter, tachometer, fuel gauge and water temperature gauge are controlled by the unified meter control unit, which is built into the combination meter. Unified meter control unit receives a signals from unified meter and A/C amp.
- Warning lamp and indicator lamp of combination meter are controlled by signals drawn from the unified meter and A/C amp.
- Odo/trip meter and A/T indicator segments can be checked in self-diagnosis mode.
- Meters/gauges can be checked in self-diagnosis mode.

UNIFIED METER AND A/C AMP.

Refer to DI-44, "COMBINATION METER CONTROL FUNCTION" in “UNIFIED METER AND A/C AMP”.

POWER SUPPLY AND GROUND CIRCUIT

Power is supplied at all times

- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to combination meter terminal 24.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminal 23.

With the ignition switch in the ACC or ON position, power is supplied

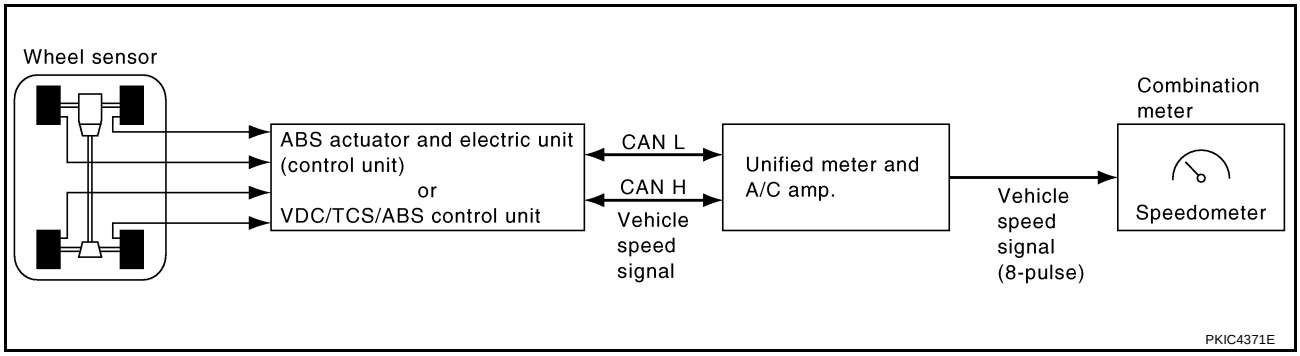
- through 10A fuse [No. 6, located in the fuse block (J/B)]
- to combination meter terminal 14.

Ground is supplied

- to combination meter terminals 10, 11 and 12
- through body grounds M30 and M66.

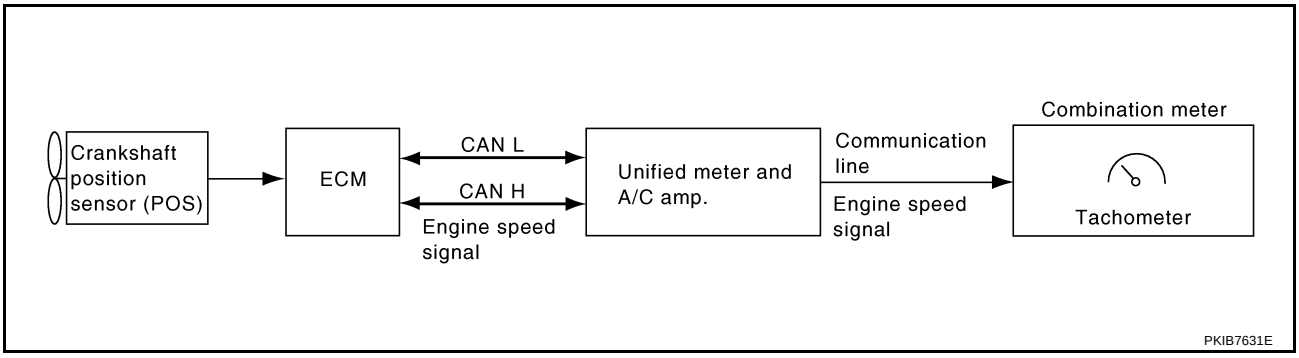
SPEEDOMETER

- VDC/TCS/ABS control unit [with VDC] or ABS actuator and electric unit (control unit) [without VDC] provides a vehicle speed signal to the unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. converts the vehicle speed signal to the 8-pulse signal, and outputs the vehicle speed signal (8-pulse) to combination meter.
- Combination meter indicates the vehicle speed according to vehicle speed signal (8-pulse).



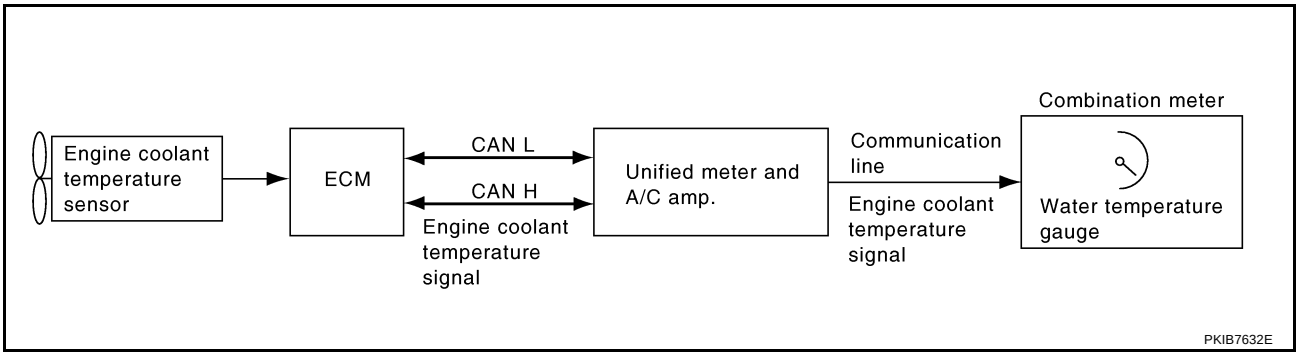
TACHOMETER

- ECM provides engine speed signal to unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. transmits engine speed signal to combination meter with communication line.
- Combination meter indicates the engine speed according to engine speed signal.



WATER TEMPERATURE GAUGE

- ECM provides engine coolant temperature signal to unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. transmits engine coolant temperature signal to combination meter with communication line.
- Combination meter indicates the engine coolant temperature according to engine coolant temperature signal.



FUEL GAUGE

- Unified meter and A/C amp. reads a resistor signal from fuel level sensor.

Signal is supplied

- from unified meter and A/C amp. terminal 36
- through fuel level sensor unit and fuel pump (main) terminals 5 and 2, and
- through fuel level sensor unit (sub) terminals 2 and 1
- to unified meter and A/C amp. terminal 28.

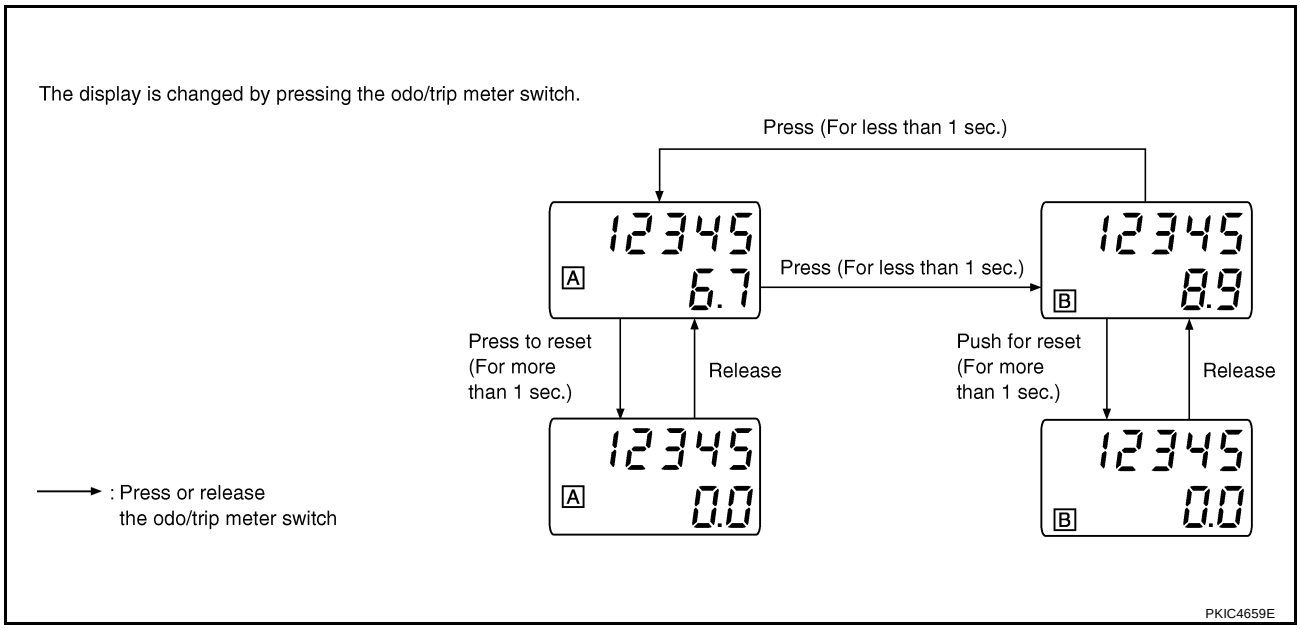
- Unified meter and A/C amp. provides a fuel level signal to combination meter with communication line.
- Combination meter indicates the approximate fuel level according to fuel level signal.

ODO/TRIP METER

- VDC/TCS/ABS control unit [with VDC] or ABS actuator and electric unit (control unit) [without VDC] provides a vehicle speed signal to the unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. converts the vehicle speed signal to the 8-pulse signal, and outputs the vehicle speed signal (8-pulse) to combination meter.
- Combination meter uses the vehicle speed signal (8-pulse) to calculate the mileage, and displays it.

How to Change The Display

Pressing the odo/trip meter switch toggles the display mode in the following order.



- The odo/trip meter display mode toggling and trip display resetting can be identified by the time elapsed from pressing the odo/trip meter switch to releasing it.
- When resetting with “trip A” displayed, only “trip A” is reset. (The “trip B” functions in the same way.)

NOTE:
The record of the odo meter is kept even if the battery cable is disconnected. The record of the trip meter is erased when the battery cable is disconnected.

ILLUMINATION CONTROL

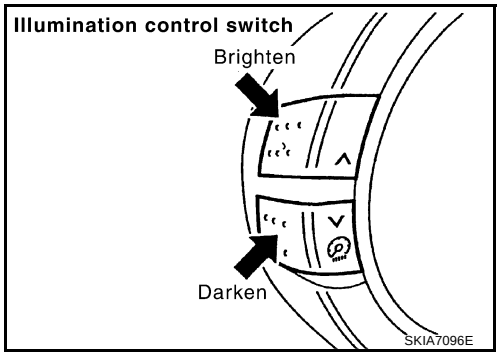
Daytime Mode

When ignition switch is turned ON, combination meter and triple meter illumination is turned ON by unified meter control unit.

Nighttime Mode

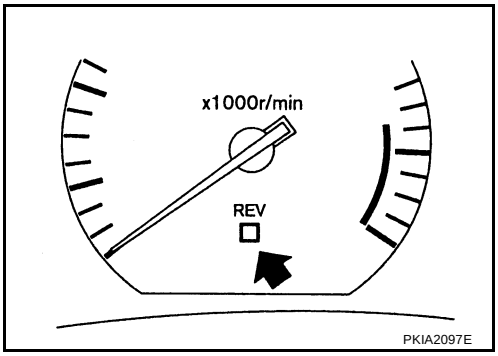
- Unified meter control unit is transferred to nighttime mode, with ignition switch turned ON and position light request signal from BCM with CAN communication.
- When in nighttime mode, trip computer switch, and illumination control switch illumination turns ON by unified meter control unit. Each illumination is controlled by unified meter control unit.
- Each illumination can be adjusted to 16 step by illumination control switch in nighttime mode.

NOTE:
For further details of illumination circuit, refer to LT-156, "ILLUMINATION" .



SHIFT-UP INDICATOR

- Shift-up indicator can be used when shifting up at a constant engine speed from any gear while driving. It becomes a guide for shift-up timing.
- Shift-up indicator flashes approximately 500 rpm before reaching the engine speed set. It illuminates when reaching the engine speed set.



Shift-up engine speed can be set by the shift-up indicator setting mode on trip computer. Refer to DI-29, "Shift-up Indicator Setting Mode" .

NOTE:

- There may be a time lag between the shift-up indicator illumination and the tachometer indication.
- If the battery cable is disconnected, the set engine speed becomes 7,000 rpm.

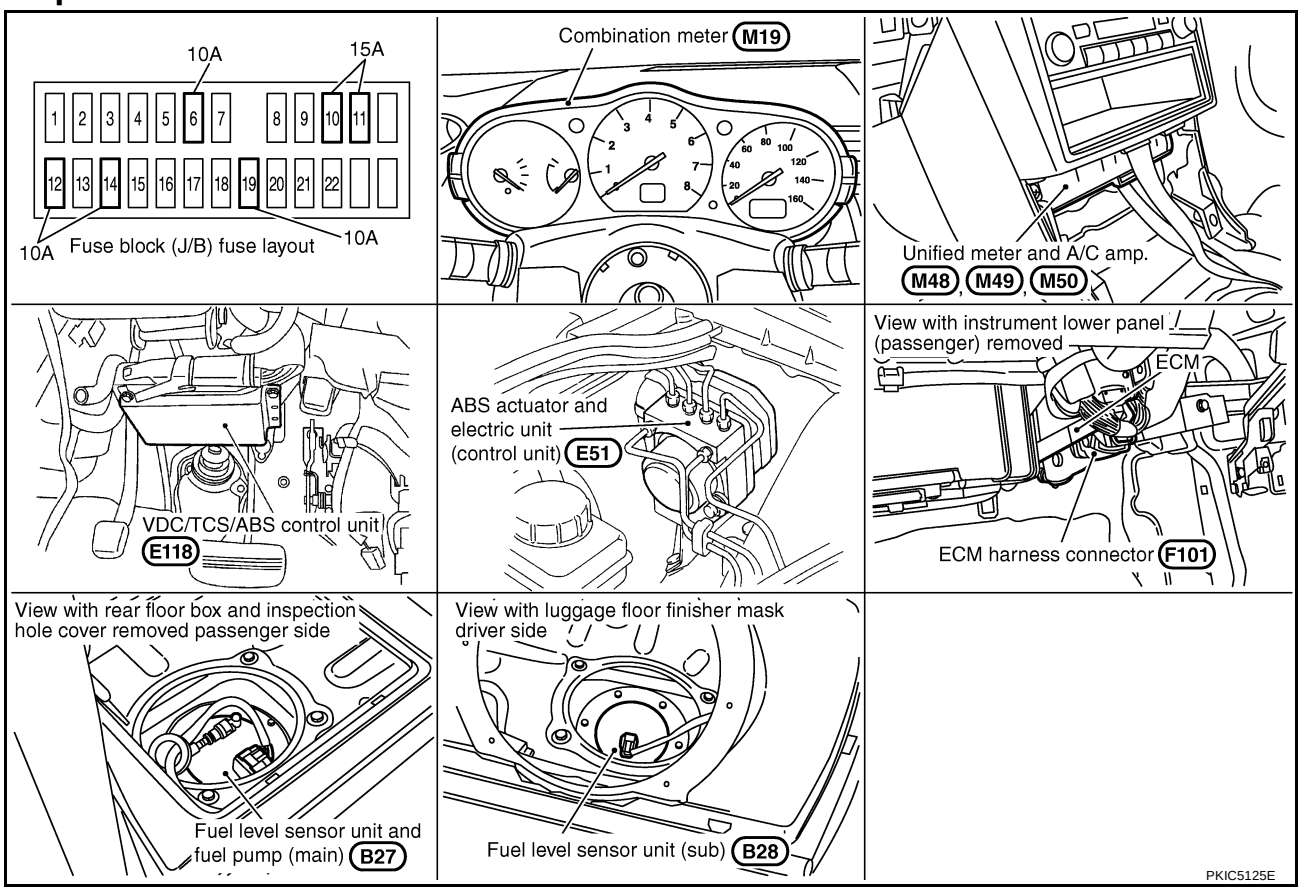
FAIL-SAFE

Combination meter performs fail-safe operation when unified meter and A/C amp. communication is malunction.

Function		Fail-safe operation
Speedometer		Return to zero
Tachometer		Reset to zero
Fuel gauge		
Water temperature gauge		
Illumination control	Combination meter illumination	Change to nighttime mode
Odo/trip meter		Integrate in response to 8-pulse input
A/T indicator		The display turns OFF
Meter buzzer		The meter buzzer turns OFF
Warning lamp/indicator lamp	ABS warning lamp	The lamp turns ON
	VDC OFF indicator lamp	
	TCS OFF indicator lamp	
	SLIP indicator lamp	
	Brake warning lamp	
	Tire pressure warning lamp	
	A/T CHECK lamp	The lamp turns OFF
	Oil pressure warning lamp	
	Door warning lamp	
	High beam indicator lamp	
	Turn signal indicator lamp	
	Malfunction indicator lamp	
	CRUISE indicator lamp	
	SET indicator lamp	

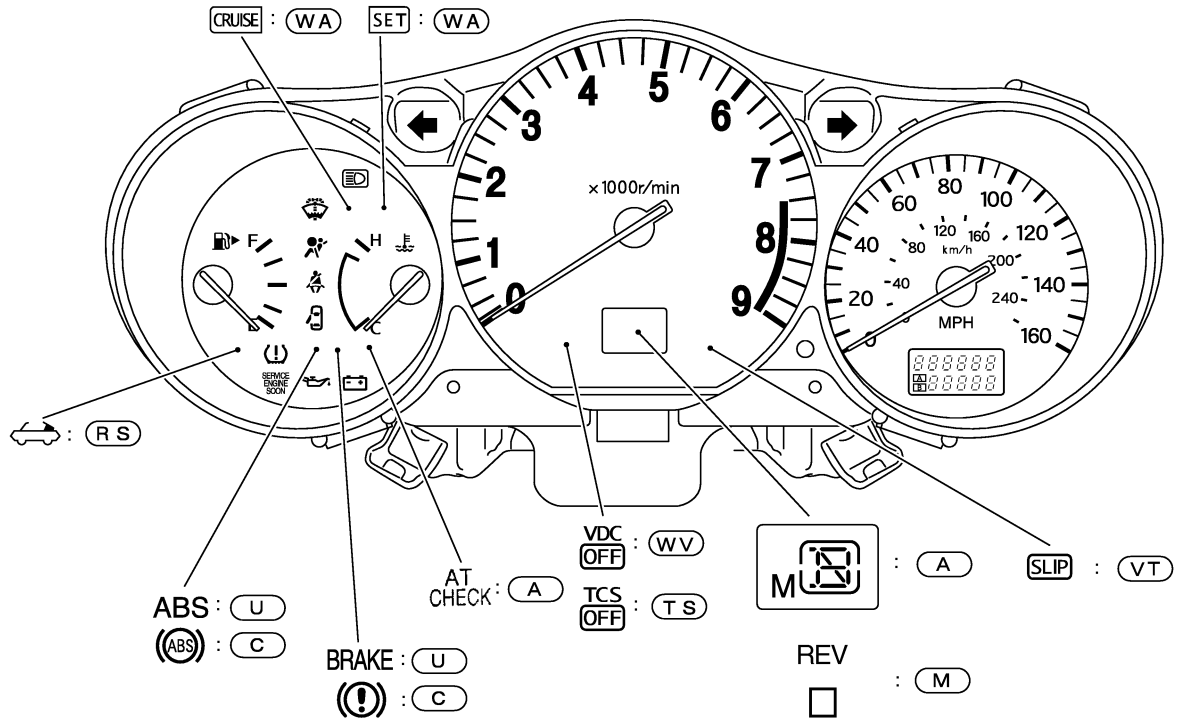
Component Parts and Harness Connector Location

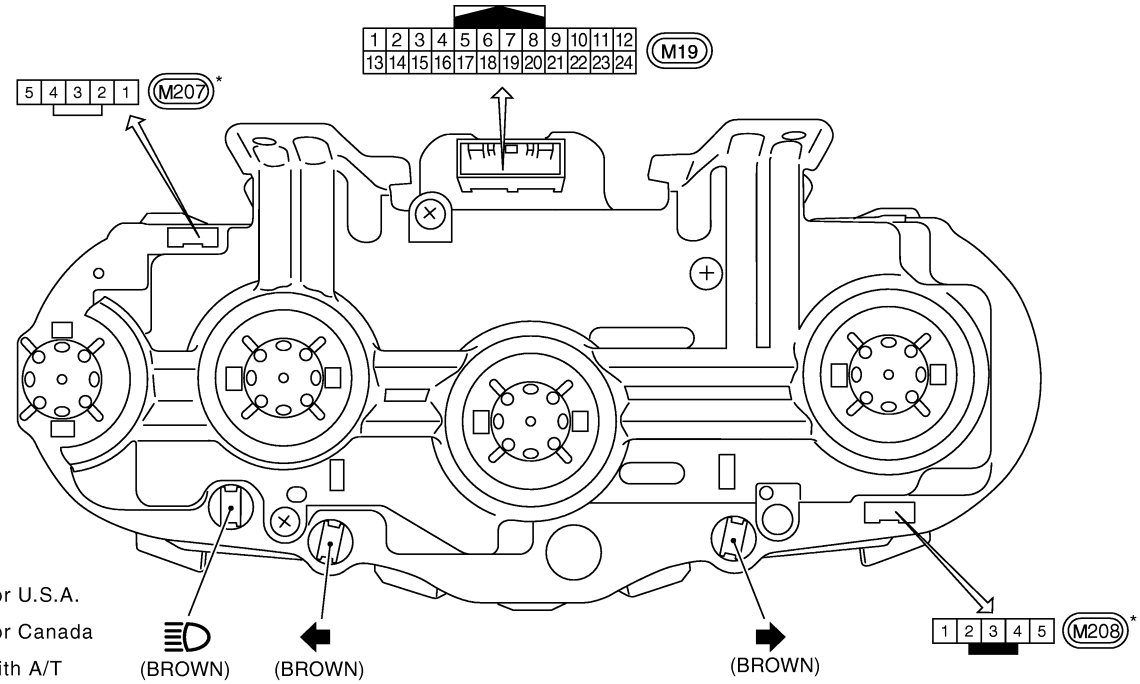
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Arrangement of Combination Meter

NKS0005U





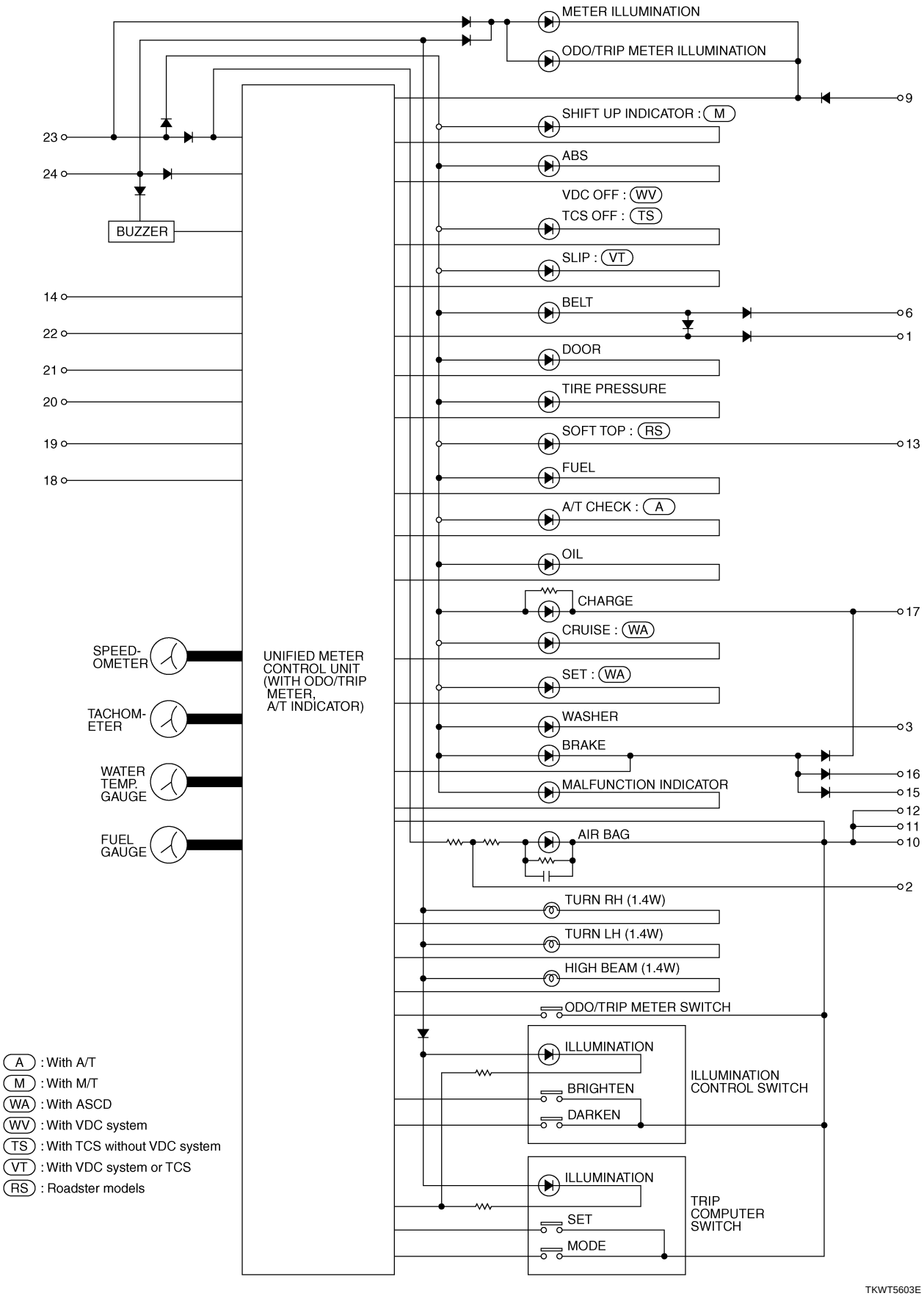
U : For U.S.A.
C : For Canada
A : With A/T
M : With M/T
RS :Roadster models
WA :With ASCD
WV : With VDC system
TS : With TCS without VDC system
VT : With VDC system or TCS
Bulb wattage : 1.4W
( ) : Bulb socket color

* THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

SKIB9134E

Schematic

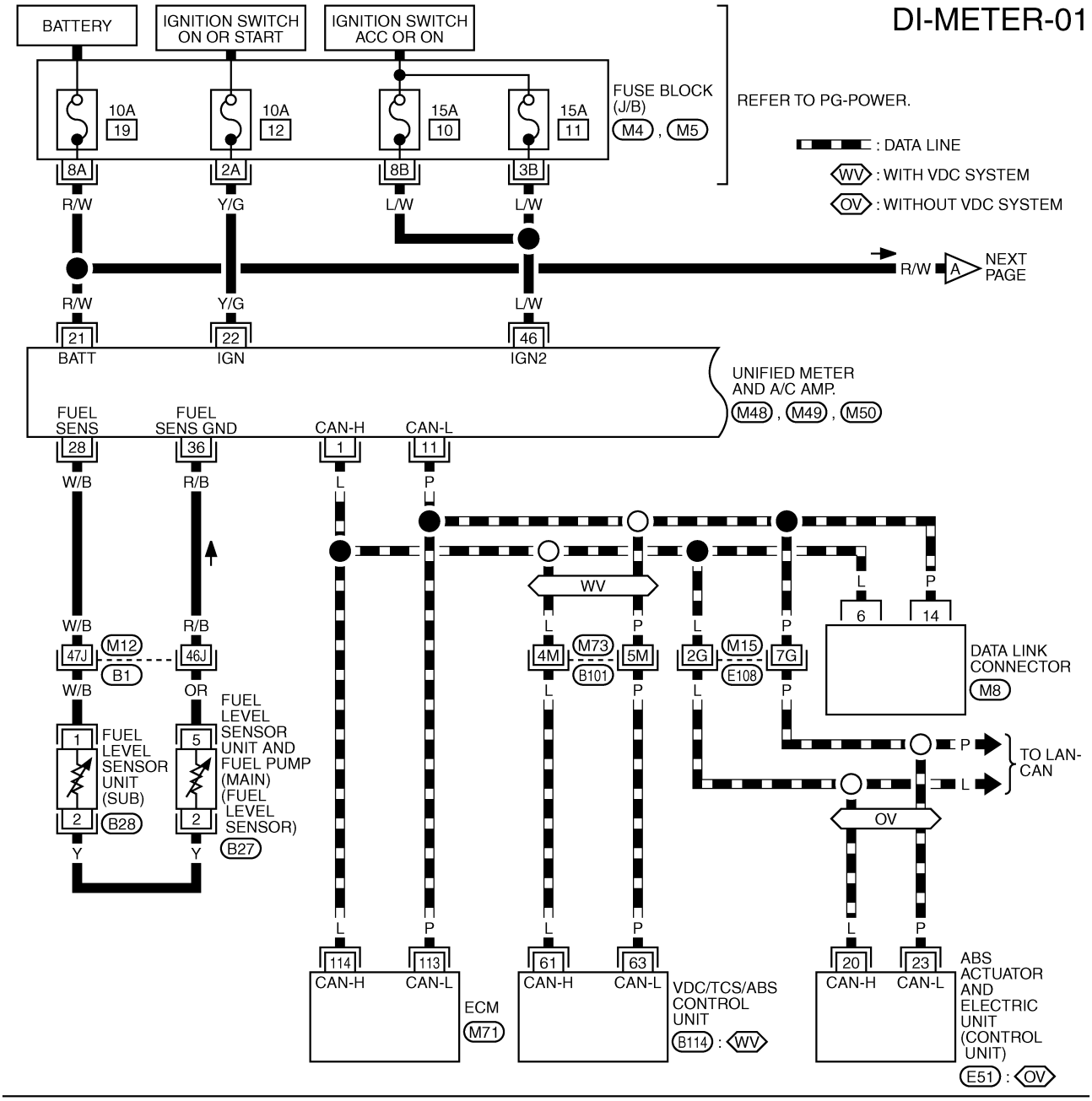
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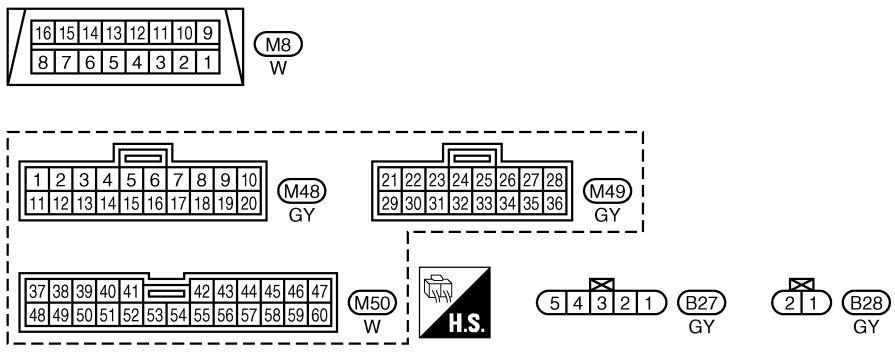


TKWT5603E

Wiring Diagram — METER —

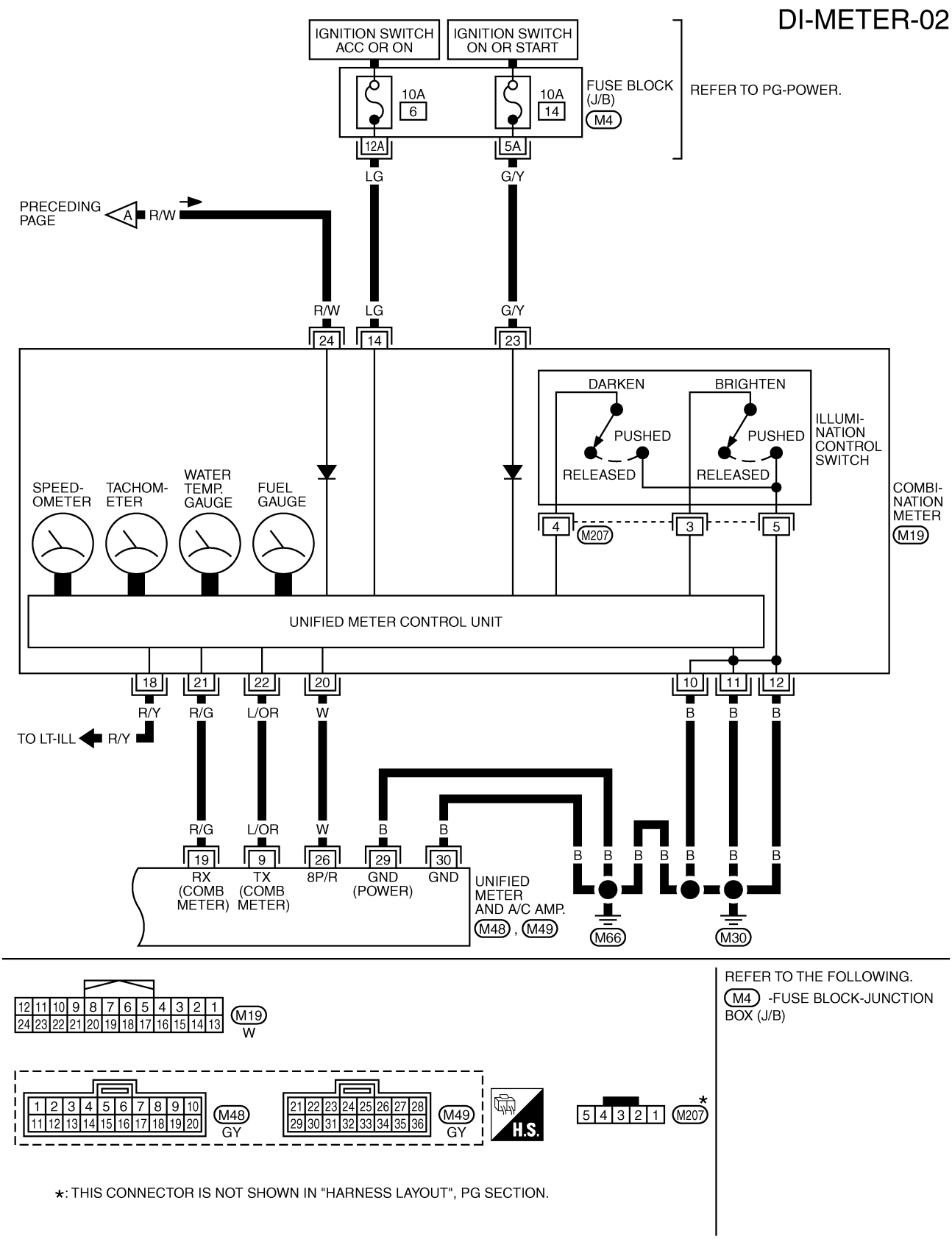
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REFER TO THE FOLLOWING.
E108 , B1 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M71 , E51 , B114 -ELECTRICAL UNITS

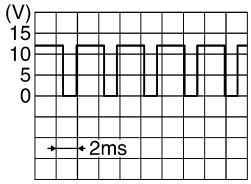
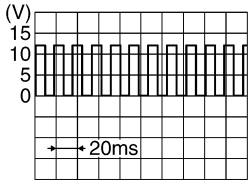
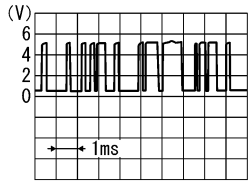
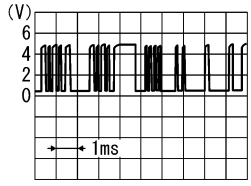
TKWT5721E


DI-METER-02
IGNITION SWITCH ACC OR ON
IGNITION SWITCH ON OR START
10A 6
10A 14
FUSE BLOCK (J/B) M4
REFER TO PG-POWER.
12A
5A
LG
G/Y
PRECEDING PAGE
A
R/W
R/W
LG
G/Y
24
14
23
DARKEN
BRIGHTEN
PUSHED
PUSHED
RELEASED
RELEASED
ILLUMI-NATION CONTROL SWITCH
SPEED-OMETER
TACHOM-ETER
WATER TEMP. GAUGE
FUEL GAUGE
COMBI-NATION METER M19
4
M207
3
5
UNIFIED METER CONTROL UNIT
18
21
22
20
10
11
12
R/Y
R/G
L/OR
W
B
B
B
TO LT-ILL
R/Y
R/G
L/OR
W
B
B
19
9
26
29
30
RX (COMB METER)
TX (COMB METER)
8P/R
GND (POWER)
GND
UNIFIED METER AND A/C AMP.
M48 , M49
M66
M30
M19
W
M48
GY
M49
GY
H.S.
M207
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5605E

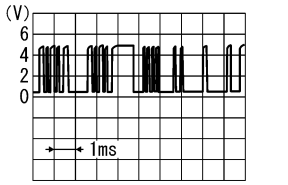
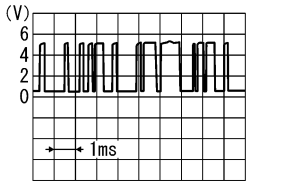
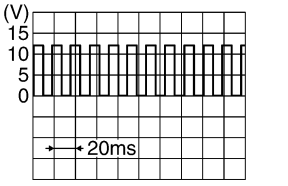
Terminals and Reference Value for Combination Meter

NKS0005X

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
10	B	Ground	ON	—	0 V
11					
12					
14	LG	ACC power supply	ACC	—	Battery voltage
18	R/Y	Illumination signal	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.>When brightness level is midway  PKIA3771E
				Lighting switch OFF	0 V
20	W	Vehicle speed signal input (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 5 V due to specifications (connected units).  PKIA1935E
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition power supply	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Value for Unified Meter and A/C Amp.

NKS0005Y

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	L	CAN-H	—	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
11	P	CAN-L	—	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition power supply	ON	—	Battery voltage
26	W	Vehicle speed signal output (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 5 V due to specifications (connected units).  PKIA1935E
28	W/B	Fuel level sensor signal	—	—	Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .
29	B	Ground (For power)	ON	—	0 V
30	B	Ground	ON	—	0 V
36	R/B	Fuel level sensor ground	ON	—	0 V
46	L/W	ACC power supply	ACC	—	Battery voltage

Self-Diagnosis Mode of Combination Meter

NKS0005Z

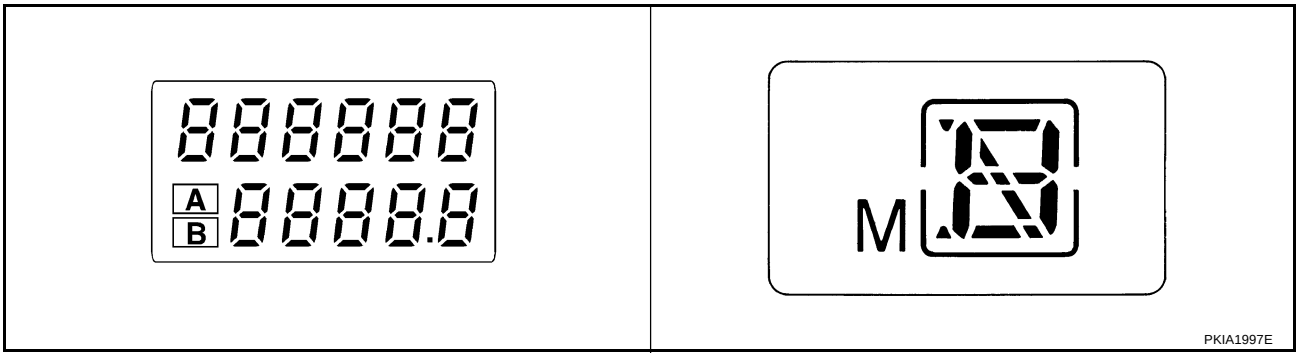
SELF-DIAGNOSIS FUNCTION

- Odo/trip meter segment and A/T indicator segment operation can be checked in self-diagnosis mode.
- Meters/gauges can be checked in self-diagnosis mode.

OPERATION PROCEDURE

1. Turn ignition switch ON, and switch the odo/trip meter to “trip A” or “trip B”.

   NOTE:
   If the diagnosis function is activated with “trip A” displayed, the mileage on “trip A” will indicate “0000.0”, but the actual trip mileage will be retained. (The “trip B” functions in the same way.)
2. Turn ignition switch OFF.
3. While pressing the odo/trip meter switch, turn ignition switch ON again.
4. Make sure that the trip meter displays “0000.0”.
5. Press the odo/trip meter switch at least 3 times (within 7 seconds after the ignition switch is turned ON).
6. All the segments on the odo/trip meter and A/T indicator illuminate, and simultaneously the low-fuel warning lamp indicator illuminates. At this time, the unified meter control unit is turned to diagnosis mode.

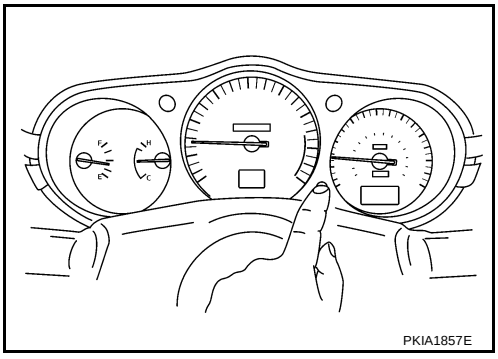


NOTE:

- Check combination meter power supply and ground circuit when self-diagnosis mode of combination meter does not start. Replace combination meter if normal.
- If any of the segments is not displayed, replace combination meter.

7. Press the odo/trip meter switch. Each meter/gauge should indicate as shown in the figure while pressing odo/trip meter switch. (At this time, the low-fuel warning lamp goes off).

   NOTE:
   If any of the meter/gauge is not activated, replace combination meter.



CONSULT-III Function (METER A/C AMP)

NKS00060

Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

Trouble Diagnosis

NKS00061

HOW TO PERFORM TROUBLE DIAGNOSIS

1. Confirm the symptom or customer complaint.
2. Perform preliminary check. Refer to DI-16, "PRELIMINARY CHECK" .
3. According to the symptom chart, make sure of the symptom cause and repair or replace applicable parts.
4. Does the meter operate normally? If so, GO TO 5. If not, GO TO 2.
5. INSPECTION END

PRELIMINARY CHECK

1. CHECK OPERATION OF SELF-DIAGNOSIS MODE (COMBINATION METER)

Perform self-diagnosis mode of combination meter. Refer to DI-15, "SELF-DIAGNOSIS FUNCTION" .

Does self-diagnosis mode operation normally?

YES >> GO TO 2.
NO >> GO TO 3.

2. CHECK UNIFIED METER AND A/C AMP. (CONSULT-III)

Perform self-diagnosis of unified meter and A/C amp. Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" .

Self-diagnostic results

No malfunction detected >> INSPECTION END
Malfunction detected >> Check applicable parts, and repair or replace corresponding parts.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT OF COMBINATION METER

Check power supply and ground circuit of combination meter. Refer to DI-17, "Power Supply and Ground Circuit Inspection" .

OK or NG

OK >> Replace combination meter.
NG >> Repair power supply and ground circuit of combination meter.

Symptom Chart

NKS00062

Symptom	Possible cause
Speedometer and odo/trip meter indication is malfunction.	Refer to DI-18, "Vehicle Speed Signal Inspection" .
Tachometer indication is malfunction.	Refer to DI-19, "Engine Speed Signal Inspection" .
Water temperature gauge indication is malfunction.	Refer to DI-19, "Engine Coolant Temperature Signal Inspection" .
Fuel gauge indication is malfunction.	Refer to DI-19, "Fuel Level Sensor Signal Inspection" .
Low-fuel warning lamp indication is irregular.	
A/T position indicator is malfunction.	Refer to DI-70, "A/T Indicator Is Malfunction" .
Illumination control does not operate.	Refer to DI-21, "Illumination Control Switch Inspection" .

Power Supply and Ground Circuit Inspection

NKS00064

1. CHECK FUSE

Check for blown combination meter fuses.

Power source	Fuse No.
Battery	19
Ignition switch ACC or ON	6
Ignition switch ON or START	14

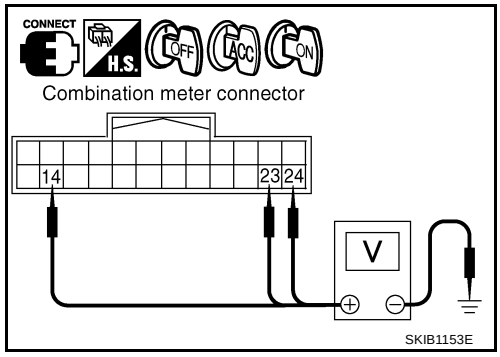
OK or NG

OK >> GO TO 2.
NG >> Be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between combination meter harness connector M19 terminals 24, 23, 14 and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M19	24	Ground	Battery voltage	Battery voltage	Battery voltage
	23		0 V	0 V	Battery voltage
	14		0 V	Battery voltage	Battery voltage



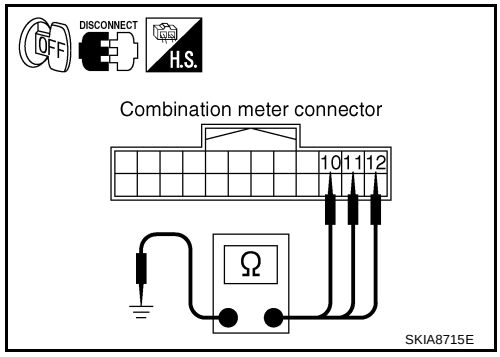
OK or NG

OK >> GO TO 3.
NG >> Repair harness between combination meter and fuse.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector.
3. Check continuity between combination meter harness connector M19 terminals 10, 11, 12 and ground.

10 – Ground
11 – Ground **: Continuity should exist.**
12 – Ground



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Vehicle Speed Signal Inspection

NKS00065

Symptom: Indication is irregular for the Speedometer and odo/trip meter.

1. CHECK VDC/TCS/ABS CONTROL UNIT OR ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform the following units self-diagnosis.

- VDC/TCS/ABS control unit [with VDC]. Refer to BRC-96, "CONSULT-III Functions (ABS)" .
- ABS actuator and electric unit (control unit) [without VDC (with TCS)]. Refer to BRC-52, "CONSULT-III MAIN FUNCTION" .
- ABS actuator and electric unit (control unit) [without VDC (without TCS)]. Refer to BRC-19, "CONSULT-III MAIN FUNCTION" .

Self-diagnostic results

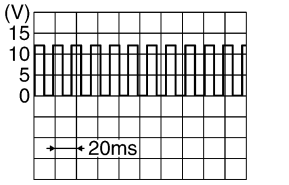
No malfunction detected >> GO TO 2.
Malfunction detected >> Check applicable parts, and repair or replace corresponding parts.

2. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

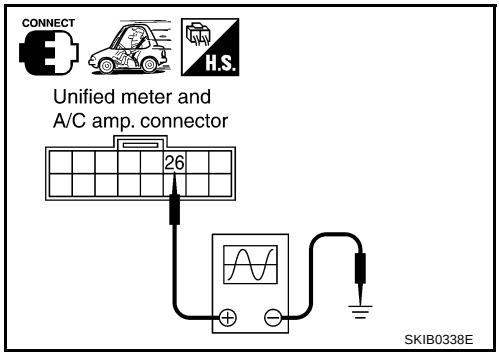
1. Start engine and drive vehicle at approximately 40 km/h (25 MPH).
2. Check voltage signal between unified meter and A/C amp. harness connector M49 terminal 26 and ground.

NOTE:
Maximum voltage may be 5 V due to specifications (connected units).

26 – Ground:



PKIA1935E



SKIB0338E

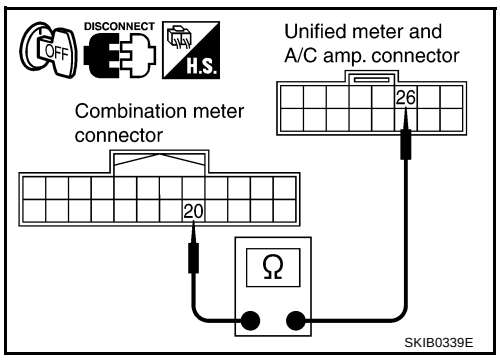
OK or NG

OK >> GO TO 3.
NG >>
- If monitor indicates “0 V” constantly, repair or replace malfunctioning parts after checking each unit inputting vehicle speed signal (8 pulse), harness and connector between each unit and unified meter and A/C amp.
- If monitor indicates “5 V” or “12 V” constantly, replace unified meter and A/C amp.

3. CHECK CONTINUITY BETWEEN COMBINATION METER AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 20 and unified meter and A/C amp. harness connector M49 terminal 26.

20 – 26 : Continuity should exist.



SKIB0339E

OK or NG

OK >> Replace combination meter.
NG >> Repair harness or connector.

Engine Speed Signal Inspection

NKS00066

Symptom: Tachometer indication is malfunction.

1. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-III.
2. Using “TACHO METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” with tachometer pointer of combination meter.

OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “ENGINE” on CONSULT-III.
2. Using “ENG SPEED” on “DATA MONITOR”, check the CONSULT-III screen when the engine is idling.
3. Select “METER A/C AMP” on CONSULT-III.
4. Using “TACHO METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” of the idling speed with that of the “ENG SPEED”.

OK or NG

OK >> Perform ECM self-diagnosis. Refer to EC-116, "CONSULT-III Function (ENGINE)" .
NG >> Replace unified meter and A/C amp.

Engine Coolant Temperature Signal Inspection

NKS00067

Symptom: Water temperature gauge indication is malfunction.

1. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-III.
2. Using “W TEMP METER” on the “DATA MONITOR”, compare the value of “DATA MONITOR” with water temperature gauge pointer of combination meter.

Water temperature gauge pointer	Reference value of data monitor [°C (°F)]
Hot	Approx. 130 (266)
Middle	Approx. 70 - 105 (158 - 221)
Cold	Approx. 50 (122)

OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “ENGINE” on CONSULT-III.
2. Using “COOLAN TEMP/S” on “DATA MONITOR”, check the CONSULT-III screen.
3. Select “METER A/C AMP” on CONSULT-III.
4. Using “W TEMP METER” on, compare the value of “DATA MONITOR” with that of the “COOLAN TEMP/S”.

OK or NG

OK >> Perform ECM self-diagnosis. Refer to EC-116, "CONSULT-III Function (ENGINE)" .
NG >> Replace unified meter and A/C amp.

Fuel Level Sensor Signal Inspection

NKS00068

Symptom:

- Fuel gauge indication is malfunction.
- Low-fuel warning lamp indication is irregular.

NOTE:
The following symptoms are not malfunction.

Fuel level sensor unit

- Depending on vehicle position or driving circumstance, the fuel level in the tank varies, and the pointer may fluctuate.
- If the vehicle is fueled with the ignition switch ON, the pointer will move slowly.

Low-fuel warning lamp

- Depending on vehicle position or driving circumstance, the fuel in the tank flows and the warning lamp ON timing may change.

1. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “METER A/C AMP” on CONSULT-III.
2. Using “FUEL METER” on “DATA MONITOR”, compare the value of “DATA MONITOR” with fuel gauge pointer of combination meter.

Fuel gauge indication	Value on monitor [lit.]
Full	Approx. 74
Three quarters	Approx. 61
Half	Approx. 42
A quarter	Approx. 22
Empty	Approx. 8

OK or NG

OK >> GO TO 2.
NG >> Replace combination meter.

2. CHECK FUEL LEVEL SENSOR

1. Turn ignition switch OFF.
2. Check components. Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .

OK or NG

OK >> GO TO 3.
NG >> Replace fuel level sensor unit.

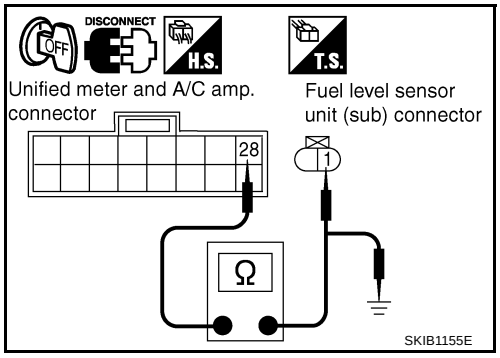
3. CHECK FUEL LEVEL SENSOR (SUB) CIRCUIT

1. Disconnect unified meter and A/C amp. connector and fuel level sensor unit (sub) connector.
2. Check continuity between unified meter and A/C amp. harness connector M49 terminal 28 and fuel level sensor unit (sub) harness connector B28 terminal 1.

28 – 1 : Continuity should exist.

3. Check continuity between unified meter and A/C amp. harness connector M49 terminal 28 and ground.

28 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

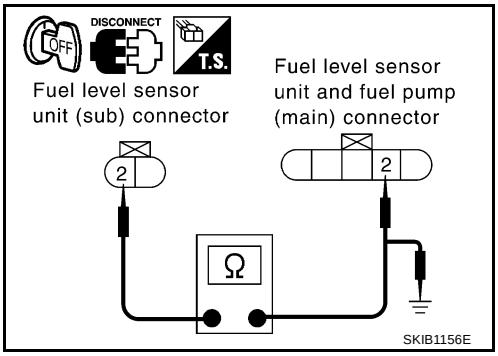
4. CHECK FUEL LEVEL SENSOR (MAIN·SUB) CIRCUIT

1. Disconnect fuel level sensor unit and fuel pump (main) connector.
2. Check continuity between fuel level sensor unit (sub) harness connector B28 terminal 2 and fuel level sensor unit and fuel pump (main) harness connector B27 terminal 2.

2 – 2 : Continuity should exist.

3. Check continuity between fuel level sensor unit (sub) harness connector B28 terminal 2 and ground.

2 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

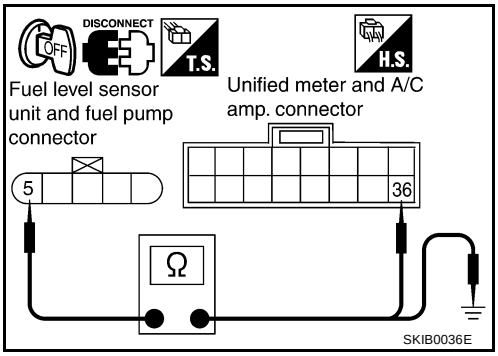
5. CHECK FUEL LEVEL SENSOR (MAIN) CIRCUIT

1. Check continuity between fuel level sensor unit and fuel pump (main) harness connector B27 terminal 5 and unified meter and A/C amp. harness connector M49 terminal 36.

5 – 36 : Continuity should exist.

2. Check continuity between fuel level sensor unit and fuel pump (main) harness connector B27 terminal 5 and ground.

5 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK INSTALLATION CONDITION

Check fuel level sensor unit installation, and check whether the float arm interferes or binds with any of the internal components in the fuel tank.

OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Install the fuel level sensor unit properly.

Illumination Control Switch Inspection

NKS00069

Symptom: Illumination control does not operate.

1. CHECK CONNECTOR

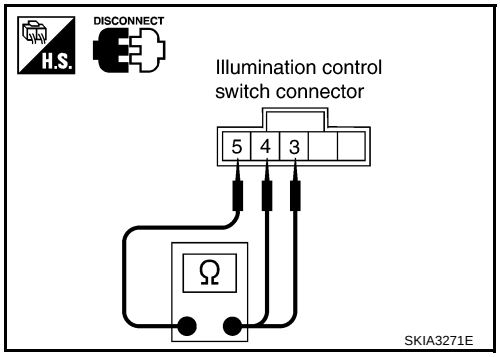
1. Turn ignition switch OFF.
2. Remove combination meter.
3. Remove rear finisher of combination meter.
4. Check illumination control switch connector for looseness.

OK or NG

OK >> GO TO 2.
NG >> Repair illumination control switch connector.

2. CHECK ILLUMINATION CONTROL SWITCH

1. Disconnect illumination control switch connector.
2. Check continuity between illumination control switch harness connector M207 terminals 3 or 4 and 5.



Terminal		Condition	Continuity
3	5	Illumination control switch upper side (BRIGHTEN) is pressed.	Yes
		Illumination control switch upper side (BRIGHTEN) is released.	No
4		Illumination control switch lower side (DARKEN) is pressed.	Yes
		Illumination control switch lower side (DARKEN) is released.	No

OK or NG

OK >> Replace combination meter.
NG >> Replace illumination control switch.

Fuel Gauge Pointer Fluctuates, Indicator Wrong Value or Varies

NKS0006A

1. CHECK FUEL GAUGE FLUCTUATION

Test drive vehicle to see if gauge fluctuates only during driving or at the instant of stopping.

Does the indication value vary only during driving or at the instant of stopping?

YES >> The pointer fluctuation may be caused by fuel level change in the fuel tank. Condition is normal.
NO >> Ask the customer about the situation when the symptom occurs in detail, and perform the trouble diagnosis.

Fuel Gauge Does Not Move to FULL Position

NKS0006B

1. QUESTION 1

Does it take a long time for the pointer to move to FULL position?

YES >> GO TO 2.
NO >> GO TO 3.

2. QUESTION 2

Was the vehicle fueled with the ignition switch ON?

YES >> Be sure to fuel the vehicle with the ignition switch OFF. Otherwise, it will take a long time to move to FULL position because of the characteristic of the fuel gauge.
NO >> GO TO 3.

3. QUESTION 3

Is the vehicle parked on an incline?

YES >> Check the fuel level indication with vehicle on a level surface.
NO >> GO TO 4.

4. QUESTION 4

During driving, does the fuel gauge pointer move gradually toward EMPTY position?

YES >> Check the fuel level sensor unit. Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .
NO >> The float arm may interfere or bind with any of the components in the fuel tank.

Electrical Components Inspection

NKS0006C

FUEL LEVEL SENSOR UNIT

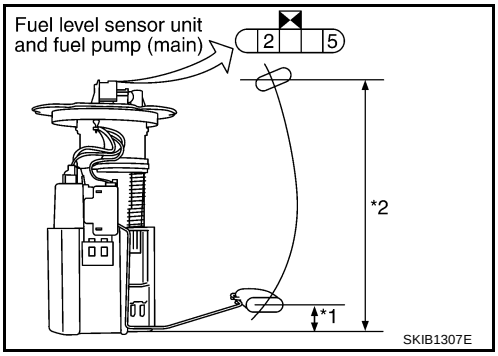
For removal, refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

Fuel Level Sensor Unit and Fuel Pump (Main)

Check the resistance between terminals 2 and 5.

Terminal		Float position [mm (in)]			Resistance value [Ω]
2	5	*1	Empty	30 (1.18)	Approx. 80
		*2	Full	210 (8.27)	Approx. 3

*1 and *2: When float rod is in contact with stopper.

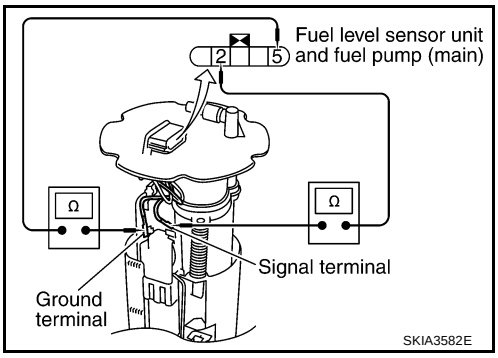


- If the results of check are NG, check the fuel level sensor unit and fuel pump (main) harness. Refer to DI-23, "Fuel Level Sensor Unit and Pump (Main) Harness" .

Fuel Level Sensor Unit and Pump (Main) Harness

Check the continuity between the following terminals.

Terminal	Continuity
2 - Signal terminal	Yes
5 - Ground terminal	



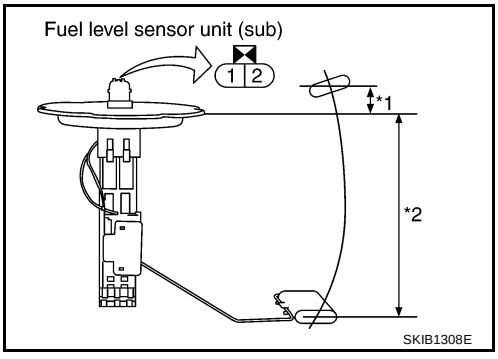
- If the results of check are NG, replace fuel pump assembly. If the results of check are OK, replace fuel level sensor unit.

Fuel Level Sensor Unit (Sub)

Check the resistance between terminals 1 and 2.

Terminal		Float position [mm (in)]			Resistance value [Ω]
1	2	*1	Full	8 (0.31)	Approx. 3
		*2	Empty	175 (6.89)	Approx. 43

*1 and *2: When float rod is in contact with stopper.

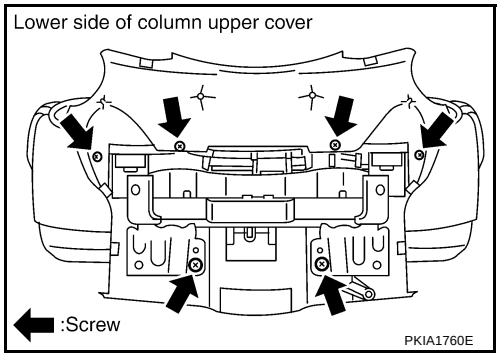


Removal and Installation for Combination Meter

NKS0006D

REMOVAL

1. Remove instrument driver panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY"
3. Remove bolts (4) and remove column upper cover and combination meter assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove screws (6) and remove combination meter.

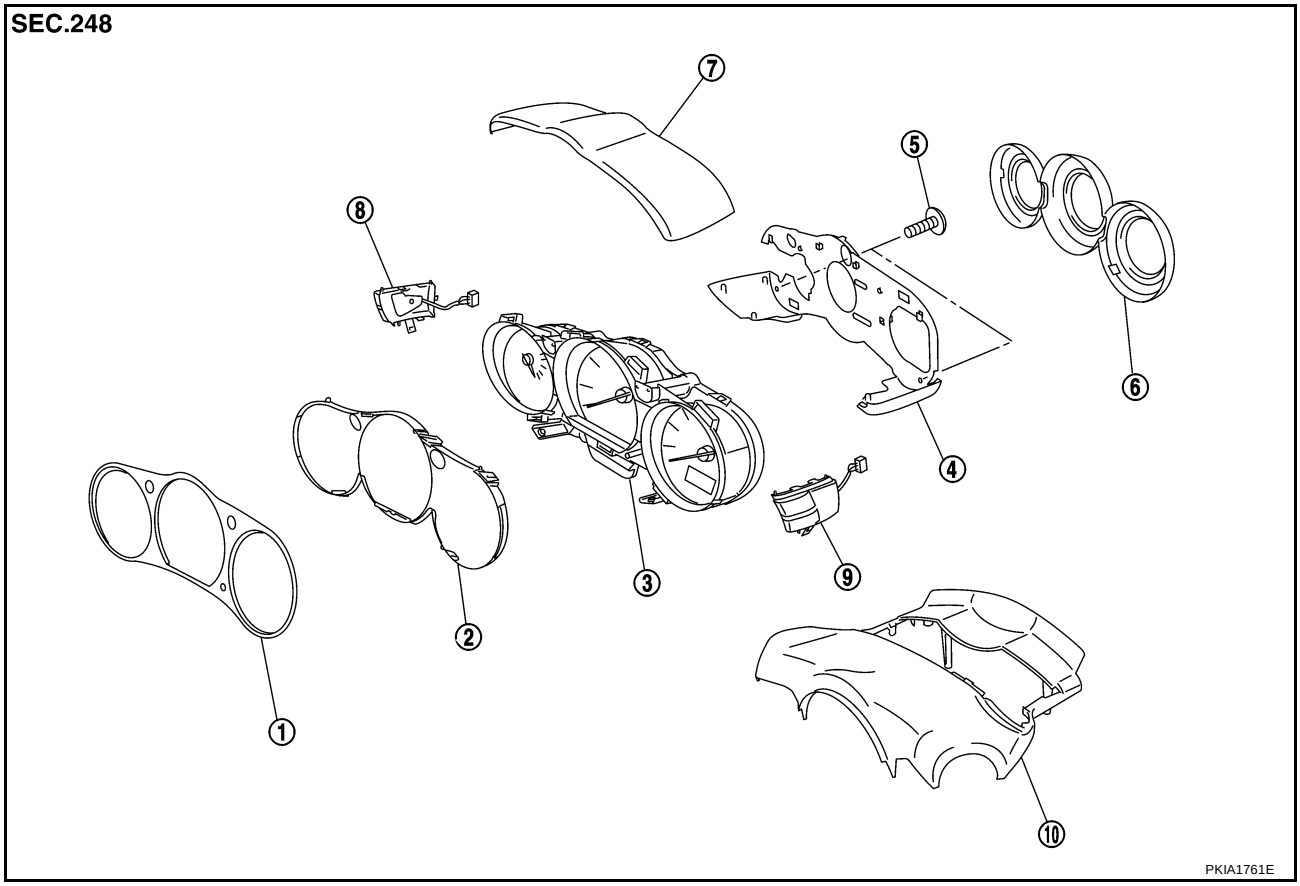


INSTALLATION

Installation is the reverse order of removal.

Disassembly and Assembly for Combination Meter

NKS0006E

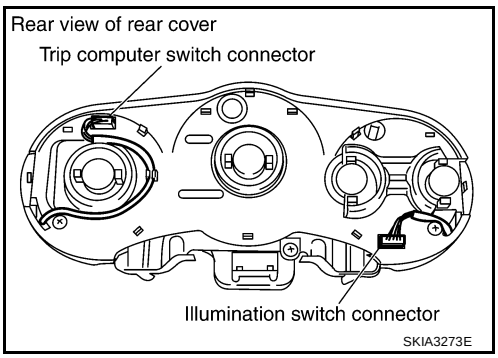


1. Front finisher
2. Front cover
3. Unified meter control unit
4. Rear cover
5. Screws
6. Rear finisher
7. Upper cover
8. Illumination control switch
9. Trip computer switch
10. Steering column upper cover

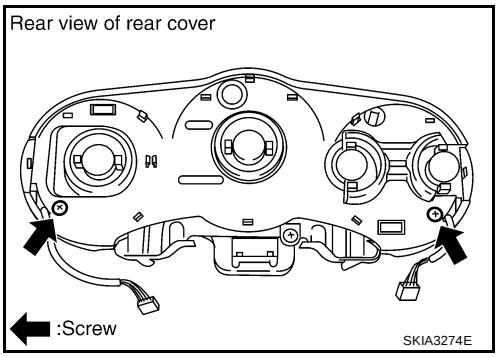
DISASSEMBLY

1. Remove screws (6) to separate steering column upper cover.
2. Disengage tabs (2) to separate front finisher.
3. Disengage tabs (8) to separate rear finisher.

4. Disconnect illumination control switch connector and trip computer switch connector.



5. Remove screws (2) and remove rear cover.



6. Disengage tabs (4) to separate upper cover from rear cover.
7. Remove illumination control switch.
8. Remove trip computer switch.
9. Disengage tabs (7) to separate front cover.

ASSEMBLY

Assembly is the reverse order of disassembly.

TRIPLE METERS

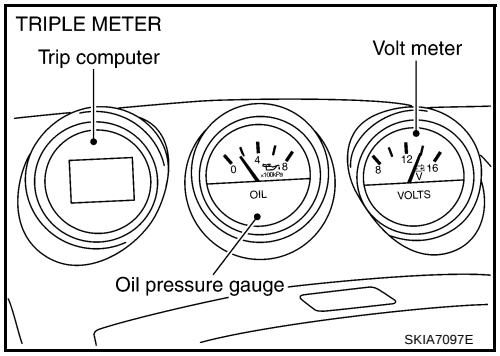
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System Description

NKS0006F

TRIPLE METER

- Oil pressure gauge and voltmeter are controlled by the triple meter.
- Trip computer is controlled by the signals from the unified meter and A/C amp.
- Triple meter operation can be checked with self-diagnosis mode of combination meter.



UNIFIED METER AND A/C AMP.

Refer to DI-45, "TRIPLE METER CONTROL FUNCTION" in “UNIFIED METER AND A/C AMP”.

POWER SUPPLY AND GROUND CIRCUIT

Power is supplied at all times

- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to triple meter terminal 2.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to triple meter terminal 3.

Ground is supplied

- to triple meter terminal 1
- through grounds M30 and M66.

VOLTMETER

When ignition switch is turned to the ON position, the voltmeter indicates the battery voltage.

OIL PRESSURE GAUGE

With the ignition switch in the ON or START position, power is supplied

- through triple meter terminal 9
- to oil pressure sensor terminal 1.

Ground is supplied

- to triple meter terminal 7
- through oil pressure sensor terminal 3.

And triple meter reads oil pressure signal from oil pressure sensor

- from oil pressure sensor terminal 2
- to triple meter terminal 8.

NOTE:

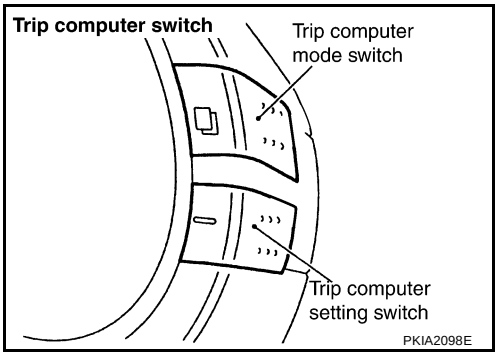
- Triple meter judges an oil pressure condition by oil pressure signal, and transmits oil pressure warning lamp signal to combination meter through unified meter and A/C amp. with communication line.
- Oil pressure gauge is not designed to indicate the low oil level. Use the oil level gauge to check the oil level.

TRIP COMPUTER

Function

When the ignition switch is turned ON, the display scrolls all the modes. And then shows the mode chosen before the ignition switch is turned OFF.

- Trip computer is operated by the trip computer switch.
- Trip computer receives a switch signal from combination meter through the unified meter and A/C amp. with communication line.



The mode of the trip computer is the following.

- Vehicle speed
- Ambient air temperature
- DTE (distance to empty)
- Average fuel consumption
- Average vehicle speed
- Trip time
- Trip distance
- Stopwatch
- Shift-up indicator setting mode

How to Change/ Reset the Displayed Mode

- The displayed mode can be selected in the following order by momentarily pressing the trip computer mode switch.
  - Vehicle speed → Ambient air temperature → DTE → Average fuel consumption and average vehicle speed → Trip time and trip distance → Stopwatch → Shift-up indicator setting
- Holding the trip computer setting switch for more than 1 second resets the displayed mode (Average fuel consumption, average vehicle speed, trip time, trip distance or stopwatch).

NOTE:
When the ambient air temperature warning, the tire pressure warning, and the DTE warning, match warning conditions at the same time, the display automatically displays the ambient air temperature warning.

Vehicle Speed

- Trip computer receives vehicle speed signal from combination meter through the unified meter and A/C amp. with communication line.
- Trip computer displays the vehicle speed according to vehicle speed signal.

Ambient Air Temperature

- Unified meter and A/C amp. reads ambient air temperature signal from ambient air temperature sensor.

Signal is supplied

- from unified meter and A/C amp. terminal 39
- through ambient sensor terminal 1 and 2
- to unified meter and A/C amp. terminal 49.

- Trip computer receives ambient air temperature signal from the unified meter and A/C amp. with communication line.
- Trip computer displays ambient air temperature according to ambient air temperature signal.

NOTE:
- Indication range is between –30 and 55 °C (–22 and 131 °F).
- When ambient air temperature is less than –30 °C (–22 °F) or more than 55 °C (131 °F), the display shows “--”.
- When ambient air temperature is less than 3 °C (37 °F) continuously, the display shows “ICY” as warning. At more than 4 °C (39 °F) the display stops showing “ICY”.

DTE (Distance to Empty)

- Unified meter and A/C amp. uses following signals to calculate the DTE signal.
  - Fuel remaining signal (from the fuel level sensor unit)
  - Fuel consumption signal (from ECM)
  - Vehicle speed signal [from VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit)]
- Trip computer receives DTE signal from the unified meter and A/C amp. with communication line.
- Trip computer displays the DTE according to DTE signal.
- The indication is refreshed every 30 seconds.

NOTE:

- When fuel remaining is less than approx. 10 ℓ (10-5/8 US qt, 8-3/4 Imp qt), the display shows “dte” blink as a warning. And the fuel remaining is less than approx. 8 ℓ (8-1/2 US qt, 7 Imp qt), the display shows “----”.
- When the battery cable is disconnected and reconnected, the display shows “----” for 30 seconds.

Average Fuel Consumption

- Unified meter and A/C amp. uses following signals to calculate the average fuel consumption signal.
  - Fuel consumption signal (from ECM)
  - Vehicle speed signal [from VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit)]
- Trip computer receives the average fuel consumption signal from the unified meter and A/C amp. with communication line.
- Trip computer displays the average fuel consumption according to the average fuel consumption signal.
- The indication is refreshed every 30 seconds.

NOTE:

If the average fuel consumption is reset, the average vehicle speed is reset at the same time. While driving about 1/3 miles (500 m) or for 80 seconds after resetting, the display shows “----”.

Average Vehicle Speed

- Unified meter and A/C amp. uses following signals to calculate the average vehicle speed signal.
  - Trip distance signal
  - Trip time signal
- Trip computer receives the average vehicle speed signal from the unified meter and A/C amp. with communication line.
- Trip computer displays the average vehicle speed according the average vehicle speed signal.
- The indication shows refreshed every 30 seconds.

NOTE:

If the average vehicle speed is reset, the average fuel consumption will be reset at the same time. After resetting, the display will show “----” for 30 seconds.

Trip Time

- Unified meter and A/C amp. calculates the time during ignition switch ON.
- Trip computer receives the trip time signal from the unified meter and A/C amp. with communication line.
- Trip computer displays trip time according to the trip time signal.

NOTE:

If trip time is reset, trip distance is reset at the same time.

Trip Distance

- Unified meter and A/C amp. uses following signals to calculate the average fuel consumption signal.
  - Trip time signal
  - Vehicle speed signal from VDC/TCS/ABS control unit or ABS actuator and electric unit (control unit)
- Trip computer receives the trip distance signal from the unified meter and A/C amp. with communication line.
- Trip computer displays the trip distance according to the trip distance signal.

NOTE:

If trip distance is reset, trip time will be reset at the same time.

Stopwatch

Trip computer displays stopwatch.

NOTE:

- After 100 hours, the time will start from the reset display again.
- Even if the display is switched to the other mode while the time is starting, the stopwatch continues to advance until the time in the stopwatch mode is stopped.
- When the ignition switch is turned OFF, the stopwatch is reset.

Shift-up Indicator Setting Mode

Trip computer setting switch	Press and hold (for more than 1 sec.)	Press (for less than 1 sec.)
Setting engine speed	Increase setting engine speed by 500 rpm.	Increase setting engine speed by 100 rpm.

NOTE:

The range of engine speed is 2,000 - 8,000 rpm (when exceeding 8,000 rpm returns to 2,000 rpm).

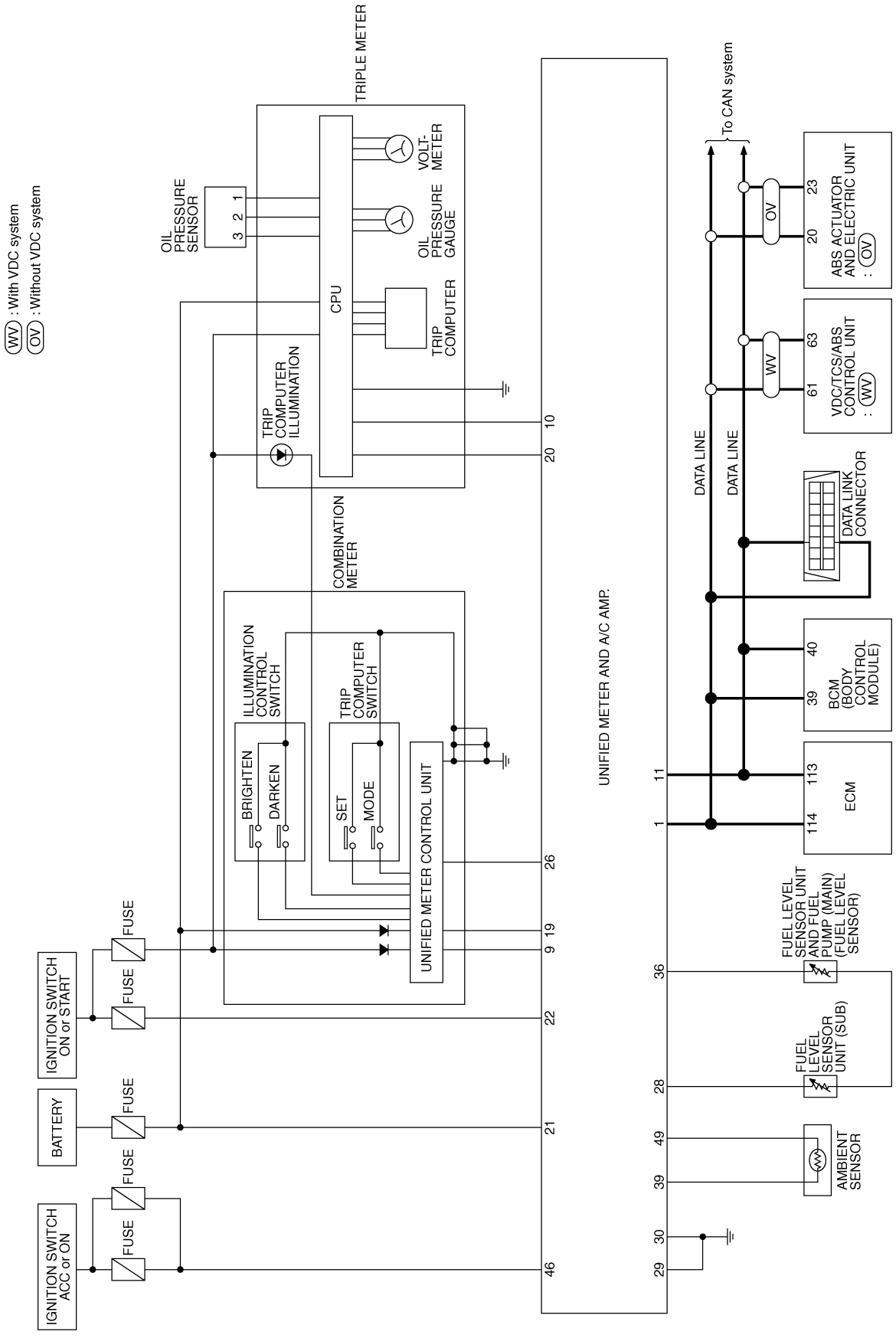
FAIL-SAFE

Triple meter performs fail-safe operation when unified meter and A/C amp. communication is malfunctioning.

Function		Fail-safe operation
Trip computer	Vehicle speed indication	Displays “---”
	Outside air temperature indication	Displays “--”
	DTE (Distance to empty) indication	Displays “----”
	Average fuel consumption indication	
	Average vehicle speed indication	
	Trip distance indication	
	Trip time indication	Displays “--:--”
Illumination control	Triple meter illumination	Change to nighttime mode.

Schematic

NKS0006G

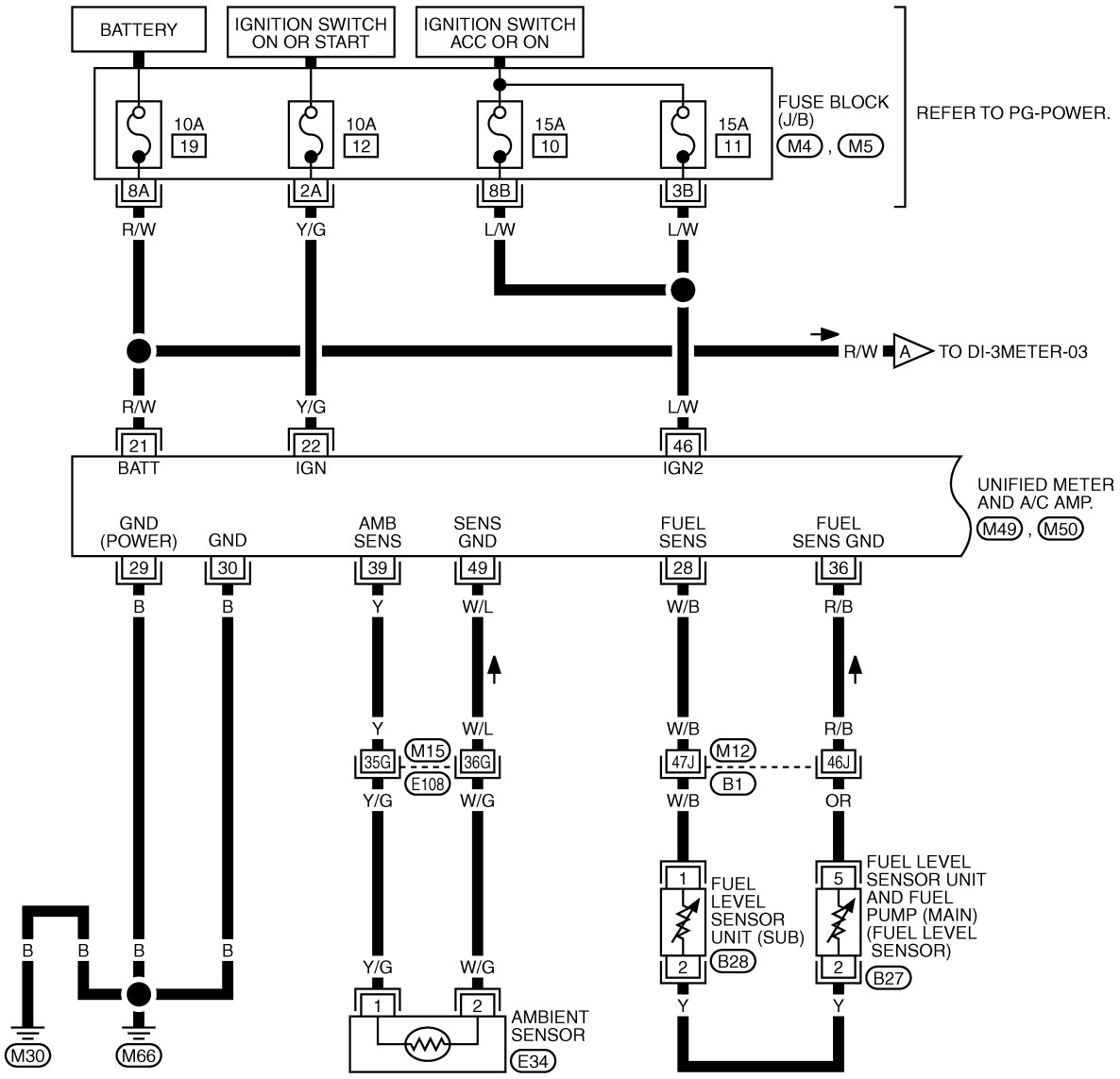


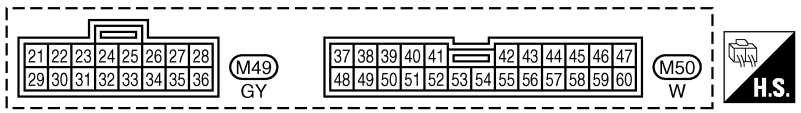
TKWT5722E

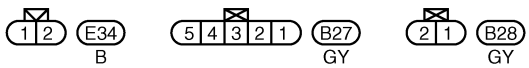
Wiring Diagram — 3METER —

NKS004RC

DI-3METER-01



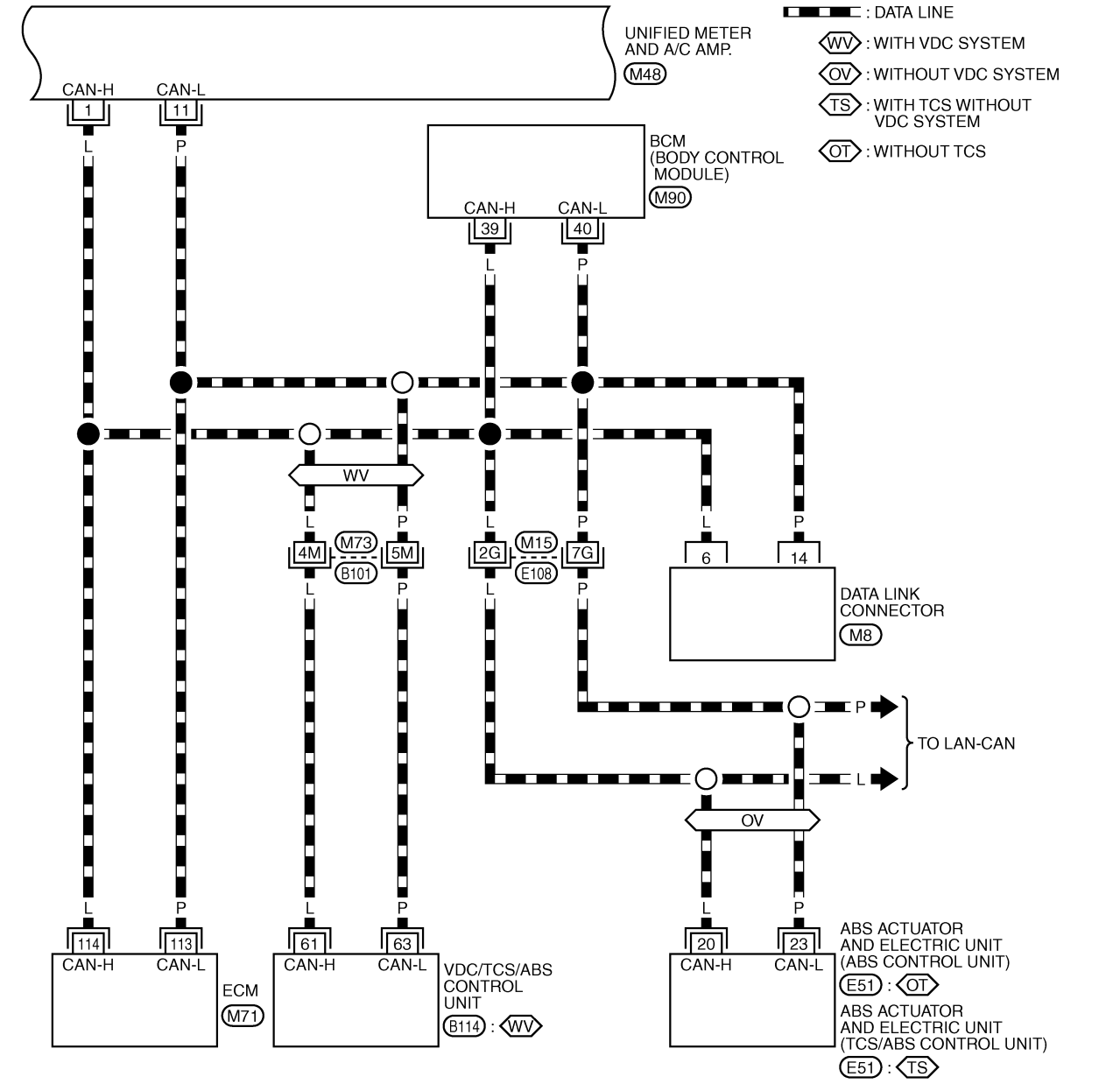


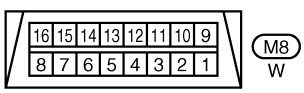


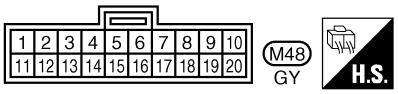
REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT3991E

DI-3METER-02

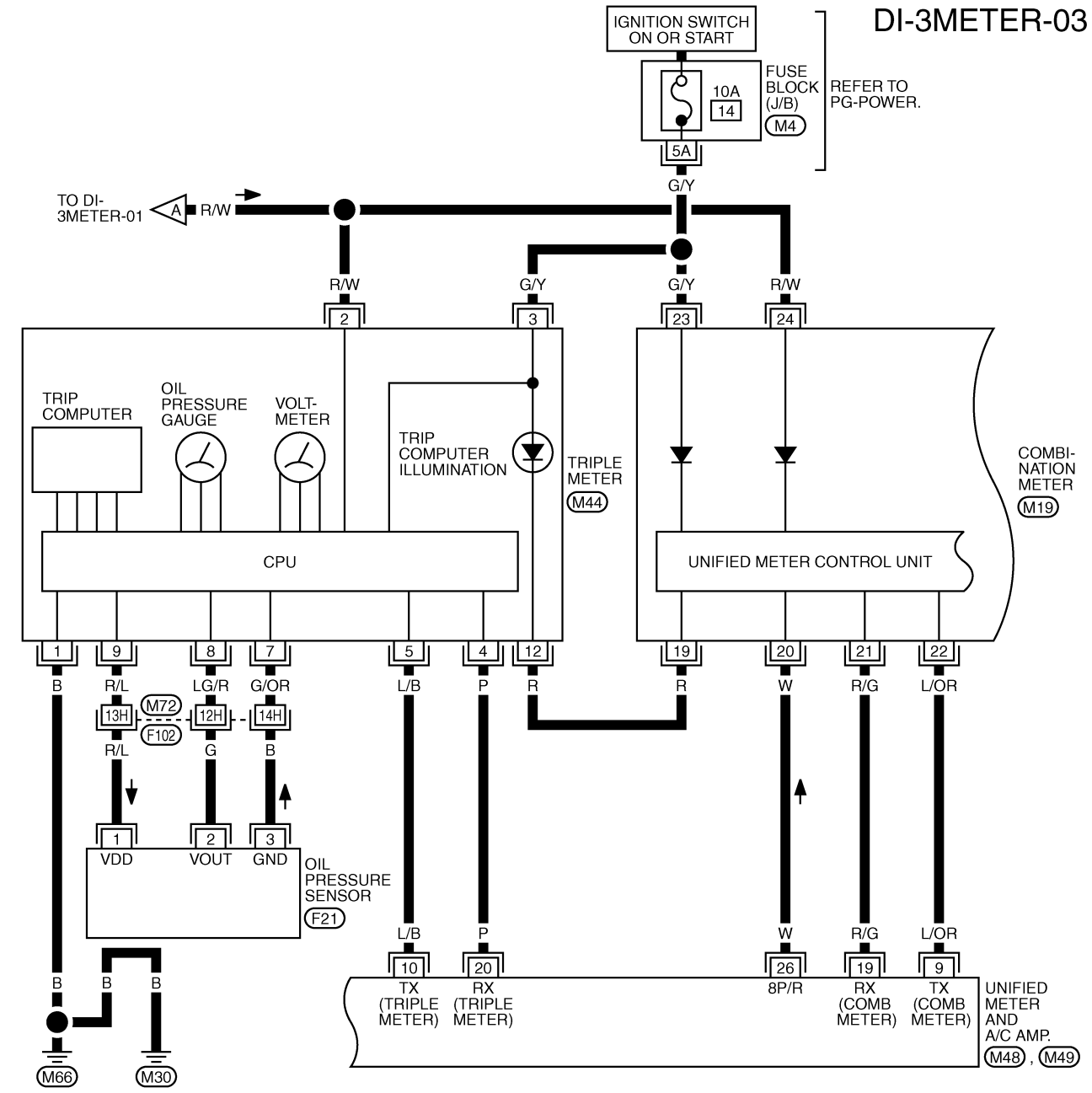






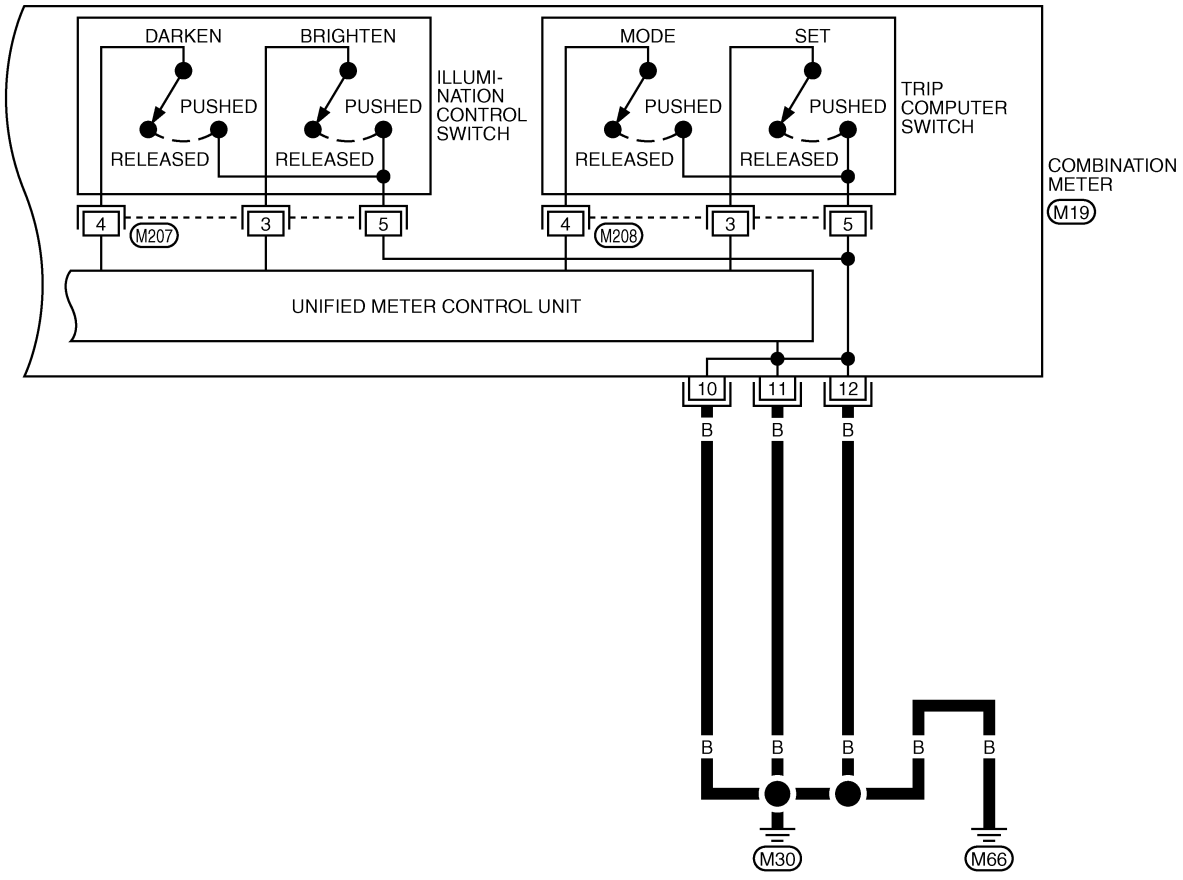
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M71 , M90 , E51 , B114 -ELECTRICAL UNITS

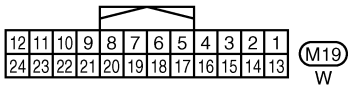
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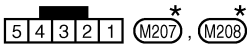

DI-3METER-03
IGNITION SWITCH ON OR START
FUSE BLOCK (J/B) M4
10A 14
5A
REFER TO PG-POWER.
G/Y
TO DI-3METER-01
A
R/W
R/W
G/Y
G/Y
R/W
2
3
23
24
TRIP COMPUTER
OIL PRESSURE GAUGE
VOLT-METER
TRIP COMPUTER ILLUMINATION
TRIPLE METER M44
COMBI-NATION METER M19
CPU
UNIFIED METER CONTROL UNIT
1
9
8
7
5
4
12
19
20
21
22
B
R/L
LG/R
G/OR
L/B
P
R
R
W
R/G
L/OR
13H
M72
F102
12H
14H
R/L
G
B
1
2
3
VDD
VOUT
GND
OIL PRESSURE SENSOR F21
L/B
P
W
R/G
L/OR
10
20
26
19
9
TX (TRIPLE METER)
RX (TRIPLE METER)
8P/R
RX (COMB METER)
TX (COMB METER)
UNIFIED METER AND A/C AMP. M48, M49
B
B
B
M66
M30
M19 W
M44 W
M48 GY
M49 GY
H.S.
F21 B
REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5724E

DI-3METER-04





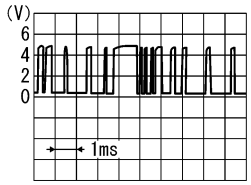
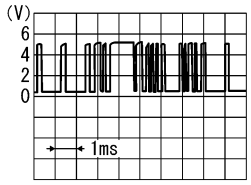
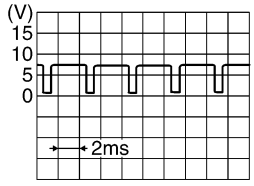


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWB1893E

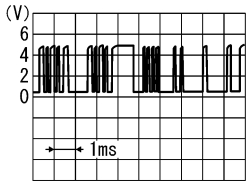
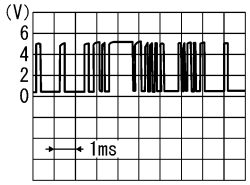
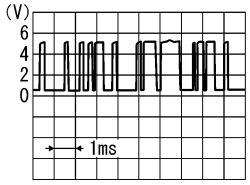
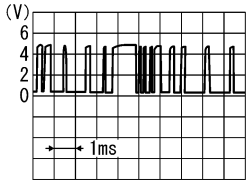
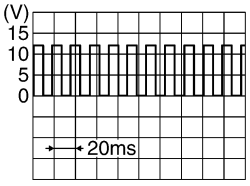
Terminals and Reference Value for Triple Meter

NKS0006I

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	B	Ground	ON	—	0 V
2	R/W	Battery power supply	OFF	—	Battery voltage
3	G/Y	Ignition power supply	ON	—	Battery voltage
4	P	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3364E
5	L/B	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3363E
7	G/OR	Oil pressure sensor ground	ON	—	0 V
8	LG/R	Oil pressure sensor signal	ON	When ignition switch is in ON position (Engine stopped.)	1 V
				Engine running [When the oil pressure is 80 psi (500 kPa)]	3 V
9	R/L	Oil pressure sensor power supply	ON	—	5 V
12	R	Illumination signal input	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.> When brightness level is midway  SKIA7256E
				Lighting switch OFF	0 V

Terminals and Reference Value for Unified Meter and A/C Amp.

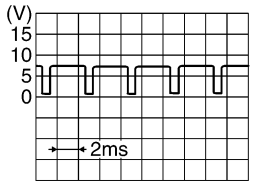
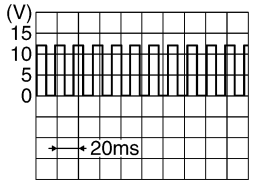
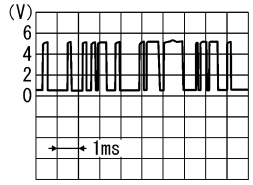
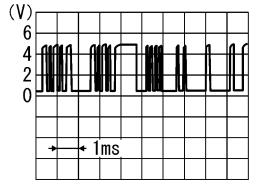
NKS0006K

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	L	CAN-H	—	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
10	L/B	TX communication line (To triple meter)	ON	—	 SKIA3363E
11	P	CAN-L	—	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
20	P	RX communication line (From triple meter)	ON	—	 SKIA3364E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition power supply	ON	—	Battery voltage
26	W	Vehicle speed signal output (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 5 V due to specifications (connected units).  PKIA1935E
28	W/B	Fuel level sensor signal	—	—	Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .
29	B	Ground (For power)	ON	—	0 V
30	B	Ground	ON	—	0 V
36	R/B	Fuel level sensor ground	ON	—	0 V
39	Y	Ambient sensor signal	—	—	Refer to ATC-92, "Ambient Sensor Circuit" .

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
46	L/W	ACC power supply	ACC	—	Battery voltage
49	W/L	Ambient sensor ground	ON	—	Approx. 0 V

Terminals and Reference Value for Combination Meter

NKS0006J

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
10 11 12	B	Ground	ON	—	0 V
19	R	Illumination signal output	ON	Lighting switch ON, then operate the illumination control switch.	<e.g.> When brightness level is midway  SKIA7256E
				Lighting switch OFF	0 V
20	W	Vehicle speed signal input (8-pulse)	ON	Speedometer operated. [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 5 V due to specifications (connected units).  PKIA1935E
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition power supply	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

Self-Diagnosis Mode of Triple Meter

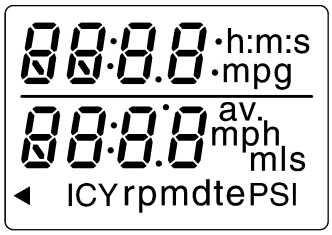
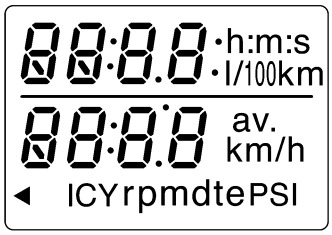
NKS0006L

SELF-DIAGNOSIS FUNCTION

Triple meter operation can be checked with self-diagnosis mode of combination meter.

OPERATION PROCEDURE

1. While pressing the odo/trip meter switch, turn ignition switch ON.
2. Make sure that the trip meter displays “0000.0”.
3. Press the odo/trip meter switch at least 3 times (within 7 seconds after the ignition switch is turned ON).
4. All the segments on the trip computer illuminate. At this time, the triple meter is turned to self-diagnosis mode.

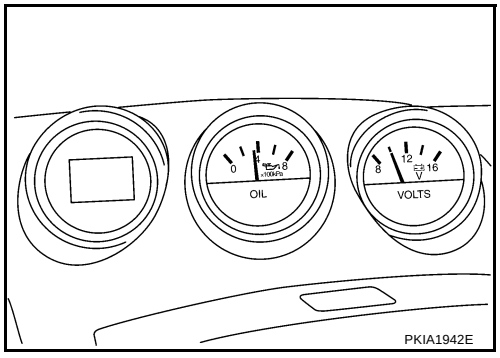
For USA	For Canada
	

SKIA8981E

NOTE:
If any of the segments is not displayed, replace triple meter.

5. Press the odo/trip meter switch. voltmeter and oil pressure gauge should indicate as shown in the figure while pressing odo/trip meter switch.

   NOTE:
   If voltmeter or oil pressure gauge is not activated, replace triple meter.



PKIA1942E

CONSULT-III Function (METER A/C AMP)

NKS0006M

Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

Trouble Diagnosis

NKS0006N

HOW TO PERFORM TROUBLE DIAGNOSIS

1. Confirm the symptom or customer complaint.
2. Perform diagnosis according to diagnosis flow. Refer to DI-39, "PRELIMINARY CHECK" .
3. According to the symptom chart, repair or replace the cause of the symptom.
4. Does the meter operate normally? If so, GO TO 5. If not, GO TO 2.
5. INSPECTION END

PRELIMINARY CHECK

1. CHECK COMMUNICATION LINE

Perform self-diagnosis of unified meter and A/C amp.

Self-diagnostic results content

No malfunction detected>>GO TO 2.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

2. CHECK OPERATION OF SELF-DIAGNOSIS MODE (COMBINATION METER)

Activate self-diagnosis mode of combination meter. Refer to DI-15, "Self-Diagnosis Mode of Combination Meter" .

Does self-diagnosis mode operate?

YES >> GO TO 3.
NO >> Check combination meter power supply and ground circuit. If normal, replace combination meter.

3. CHECK OPERATION OF SELF-DIAGNOSIS MODE (TRIPLE METER)

Check operation of triple meter in self-diagnosis mode. Refer to DI-38, "Self-Diagnosis Mode of Triple Meter" .

Does self-diagnosis mode operation namely?

YES >> INSPECTION END
NO >> GO TO 4.

4. CHECK POWER SUPPLY AND GROUND CIRCUIT OF TRIPLE METER

Check power supply and ground circuit of triple meter.

OK or NG

OK >> Replace triple meter.
NG >> Repair power supply and ground circuit of triple meter.

Symptom Chart

NKS0006O

Trouble phenomenon	Possible cause
Speed indication is not displayed properly.	Refer to DI-40, "Vehicle Speed Signal Inspection" .
Ambient air temperature indication is not displayed properly. (It may take a short time to steady the indication after ignition switch is turned ON.) **NOTE:** If the meter is powered up with the ambient sensor disconnected, ambient air temperature display will show “---” even if the sensor is reconnected. In this case, with the sensor connected, disconnect and reconnect the battery, then the correct temperature will be displayed.	Refer to ATC-92, "AMBIENT TEMPERATURE INPUT PROCESS" in “ATC”.
DTE (distance to empty) indication is not displayed properly.	Refer to DI-40, "Fuel Consumption Monitor Signal Inspection" .
Average fuel consumption indication is not displayed properly.	
Shift-up indicator setting indication is not displayed properly or shift-up indicator does not operate properly.	Refer to DI-42, "Trip Computer Switch Inspection" .

Trouble phenomenon	Possible cause
Average vehicle speed indication is not indicated properly.	Replace triple meter.
Trip distance indication is not indicated properly.	
Trip time indication is not indicated properly.	
Stopwatch indication is not displayed properly.	
Indication is malfunction of voltmeter.	
Indication is malfunction of oil pressure gauge.	Refer to DI-40, "Oil Pressure Sensor Signal Inspection" .
Trip computer switch is not operate.	Refer to DI-42, "Trip Computer Switch Inspection" .

Vehicle Speed Signal Inspection

NKS0006R

Symptom: Speed indication is not displayed properly.

1. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Start engine and select “METER A/C AMP” on CONSULT-III.
2. Using “SPEED METER” on the “DATA MONITOR”, compare the value of data monitor with speed indication of trip computer.

OK or NG

OK >> Refer to DI-18, "Vehicle Speed Signal Inspection" of “COMBINATION METERS”.
NG >> Replace triple meter.

Fuel Consumption Monitor Signal Inspection

NKS0006S

Symptom:

- DTE (distance to empty) indication is not displayed properly.
- Average fuel consumption indication is not displayed properly.

1. CHECK ECM (CONSULT-III)

Perform self-diagnosis of ECM. Refer to EC-116, "CONSULT-III Function (ENGINE)" .

Self-diagnostic results

No malfunction detected>>Replace unified meter and A/C amp.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

Oil Pressure Sensor Signal Inspection

NKS0006T

Symptom: Indication is malfunction of oil pressure gauge.

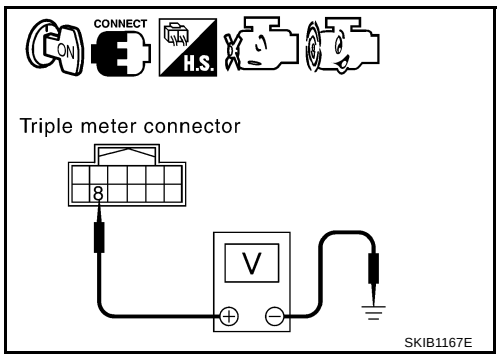
1. CHECK OIL PRESSURE SENSOR SIGNAL INPUT

1. Turn ignition switch ON.
2. Check voltage between triple meter harness connector M44 terminal 8 and ground.

8 – Ground

When ignition switch is in ON position (Engine stopped.) : Approx. 1 V

Engine running [When the oil pressure is 80 psi (500 kPa)] : Approx. 3 V



OK or NG

OK >> Replace triple meter.
NG >> GO TO 2.

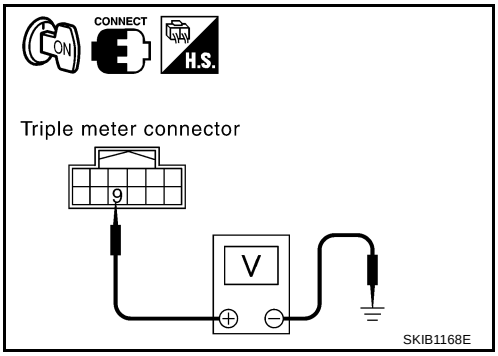
2. CHECK OIL PRESSURE SENSOR POWER SUPPLY

Check voltage between triple meter harness connector M44 terminal 9 and ground.

9 – Ground : Approx. 5 V

OK or NG

OK >> GO TO 3.
NG >> Replace triple meter.



3. CHECK OIL PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect triple meter and oil pressure switch connector.
3. Check continuity between triple meter harness connector M44 terminal 9 and oil pressure sensor harness connector F21 terminal 1.

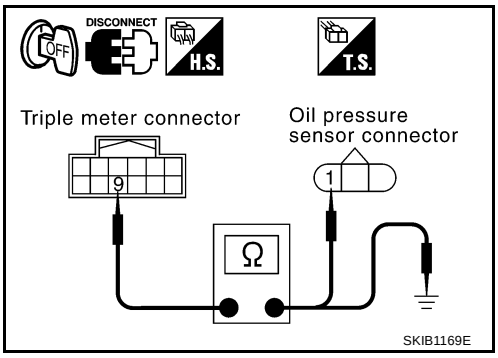
9 – 1 : Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 9 and ground.

9 – Ground : Continuity should not exist.

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.



4. CHECK OIL PRESSURE SENSOR SIGNAL CIRCUIT

1. Check continuity between triple meter harness connector M44 terminal 8 and oil pressure sensor harness connector F21 terminal 2.

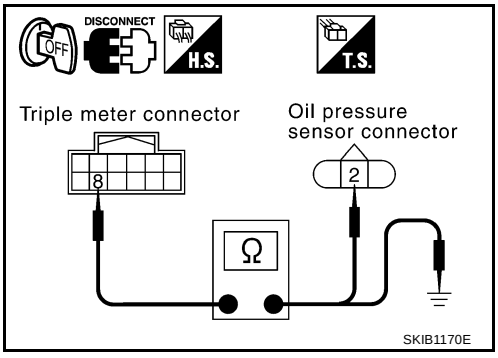
8 – 2 : Continuity should exist.

2. Check continuity between triple meter harness connector M44 terminal 8 and ground.

8 – Ground :Continuity should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.



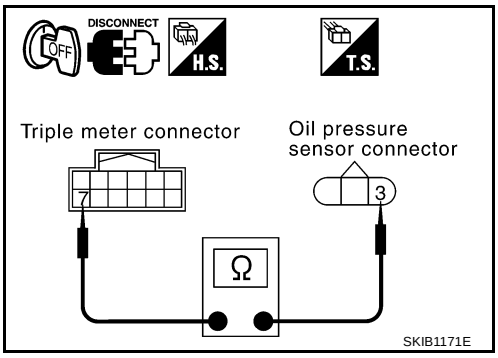
5. CHECK OIL PRESSURE SENSOR GROUND CIRCUIT

Check continuity between triple meter harness connector M44 terminal 7 and oil pressure sensor harness connector F21 terminal 3.

7 – 3 : Continuity should exist.

OK or NG

OK >> Replace oil pressure sensor.
NG >> Repair harness or connector.



Trip Computer Switch Inspection

NKS0006U

Symptom:

- Shift-up indicator setting indication is not displayed properly or shift-up indicator does not operate properly.
- Trip computer switch does not operate.

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Remove combination meter. Refer to DI-24, "Removal and Installation for Combination Meter" .
3. Remove rear finisher to combination meter. Refer to DI-24, "Disassembly and Assembly for Combination Meter" .
4. Check trip computer switch connector for looseness.

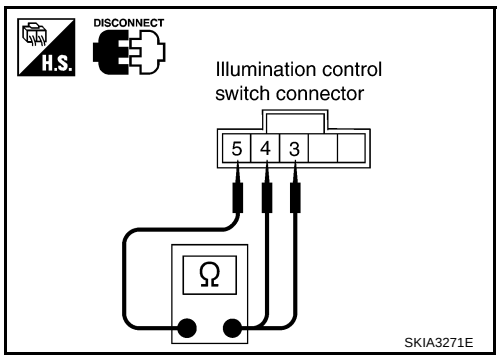
OK or NG

OK >> GO TO 2.
NG >> Repair trip computer switch connector.

2. CHECK CIRCUIT

1. Disconnect trip computer switch connector.
2. Check continuity between trip computer switch harness connector M208 terminals 3, 4 and 5.

Terminal		Condition	Continuity
3	5	Setting switch is pressed.	Yes
		Setting switch is released.	No
4		Mode switch is pressed.	Yes
		Mode switch is released.	No



OK or NG

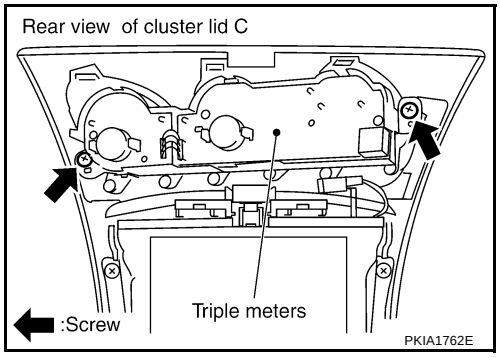
OK >> Replace combination meter.
NG >> Replace trip computer switch.

Removal and Installation of Triple Meters

NKS0006V

REMOVAL

1. Remove cluster lid C. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove screws (2), and remove triple meters.



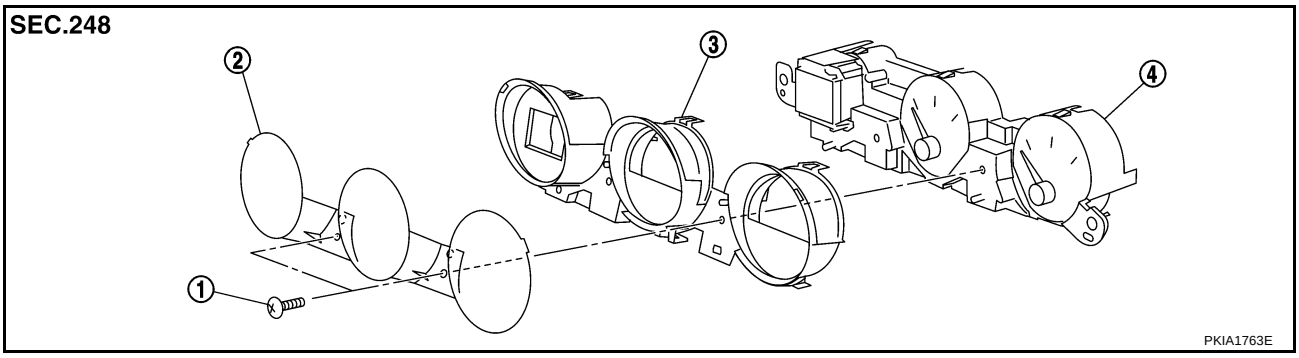
INSTALLATION

Installation is the reverse order of removal.

Disassembly and Assembly for Triple Meters

NKS0006W

SEC.248



1. Screw
2. Front cover
3. Upper housing
4. Triple meter

DISASSEMBLY

1. Remove screws (2), and remove front cover.
2. Disengage tabs (6) to separate upper housing.

ASSEMBLY

Assembly is the reverse order of disassembly.

UNIFIED METER AND A/C AMP

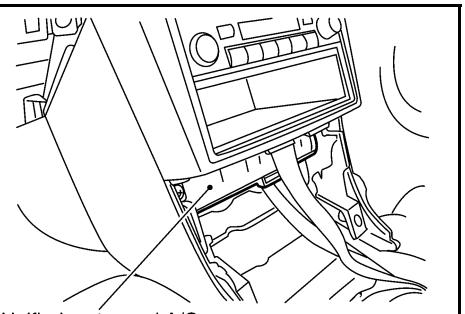
PFP:27760

System Description

NKS0006X

DESCRIPTION

- For the unified meter and A/C amp., the signal required for controlling the combination meter and triple meter are integrated in the A/C auto amp.
- Unified meter and A/C amp. corresponds a CONSULT-III function (self-diagnosis results, CAN diagnosis support monitor and data monitor).


Unified meter and A/C amp.
SKIB0018E

COMBINATION METER CONTROL FUNCTION

- Unified meter and A/C amp. receives necessary information for combination meter from each unit.
- Unified meter and A/C amp. converses with the combination meter transmits a signal through with communication line (TX, RX) between unified meter and A/C amp. and combination meter.

Input/output signals between unified meter and A/C amp. and combination meter.

Unit	Input	Output
Unified meter and A/C amp.	● Seat belt buckle switch signal (Driver's side) ● Trip computer mode switch signal ● Trip computer setting switch signal ● Illumination control nighttime required signal ● Refuel status signal ● Vehicle speed signal ● Low-fuel warning lamp condition signal ● Self-diagnosis condition signal ● Odo/trip switch signal ● Delivery destination data signal ● Combination meter receive error signal ● Combination meter specifications signal ● Triple meter specifications signal	● Engine speed signal ● Engine coolant temperature signal ● Fuel level sensor signal (resistance value) ● Malfunction indicator lamp signal ● ABS warning lamp signal ● Tire pressure warning lamp signal ● Brake warning lamp signal ● Oil pressure warning lamp signal ● Turn indicator signal ● High beam request signal ● VDC OFF indicator lamp signal ● TCS OFF indicator lamp signal ● SLIP indicator lamp signal ● CRUISE indicator lamp signal ● SET indicator lamp signal ● A/T CHECK indicator lamp signal ● A/T position indicator signal ● Manual mode indicator signal ● Manual mode gear position signal ● Shift-up indicator setting signal ● CAN communication condition signal of A/T ● Door switch signal ● Position lights request signal ● Buzzer output signal

NOTE:
Combination meter performs fail-safe operation when unified meter and A/C amp. communication is malfunctioning. Refer to DI-7, "FAIL-SAFE" .

TRIPLE METER CONTROL FUNCTION

- Unified meter and A/C amp. receives necessary information for triple meter from each unit.
- Unified meter and A/C amp. calculates necessary information for trip computer.
- Unified meter and A/C amp. converses with the combination meter transmits a signal with through communication line (TX, RX) between unified meter and A/C amp. and triple meter.

Input/output signals between unified meter and A/C amp. and triple meter

Unit	Input	Output
Unified meter and A/C amp.	● LCD indication condition signal ● Shift-up indicator setting signal ● Oil pressure warning lamp signal ● Triple meter receive error signal	● Ambient air temperature signal ● Ambient air temperature warning signal ● Trip distance signal ● Trip time signal ● Average vehicle speed signal ● Average fuel consumption signal ● Vehicle speed signal ● DTE (Distance to empty) signal ● DTE (Distance to empty) warning signal ● Tire pressure warning signal ● Trip computer mode switch signal ● Trip computer setting switch signal ● Self-diagnosis condition signal ● Odo/trip switch signal ● Triple meter specifications signal

NOTE:
Triple meter performs fail-safe operation when unified meter and A/C amp. communication is malfunctioning. Refer to DI-29, "FAIL-SAFE" .

A/C AUTO AMP. FUNCTION

Unified meter and A/C amp. controls each operation for A/C auto amp. Regarding A/C control, refer to ATC-24, "AIR CONDITIONER CONTROL" in ATC section.

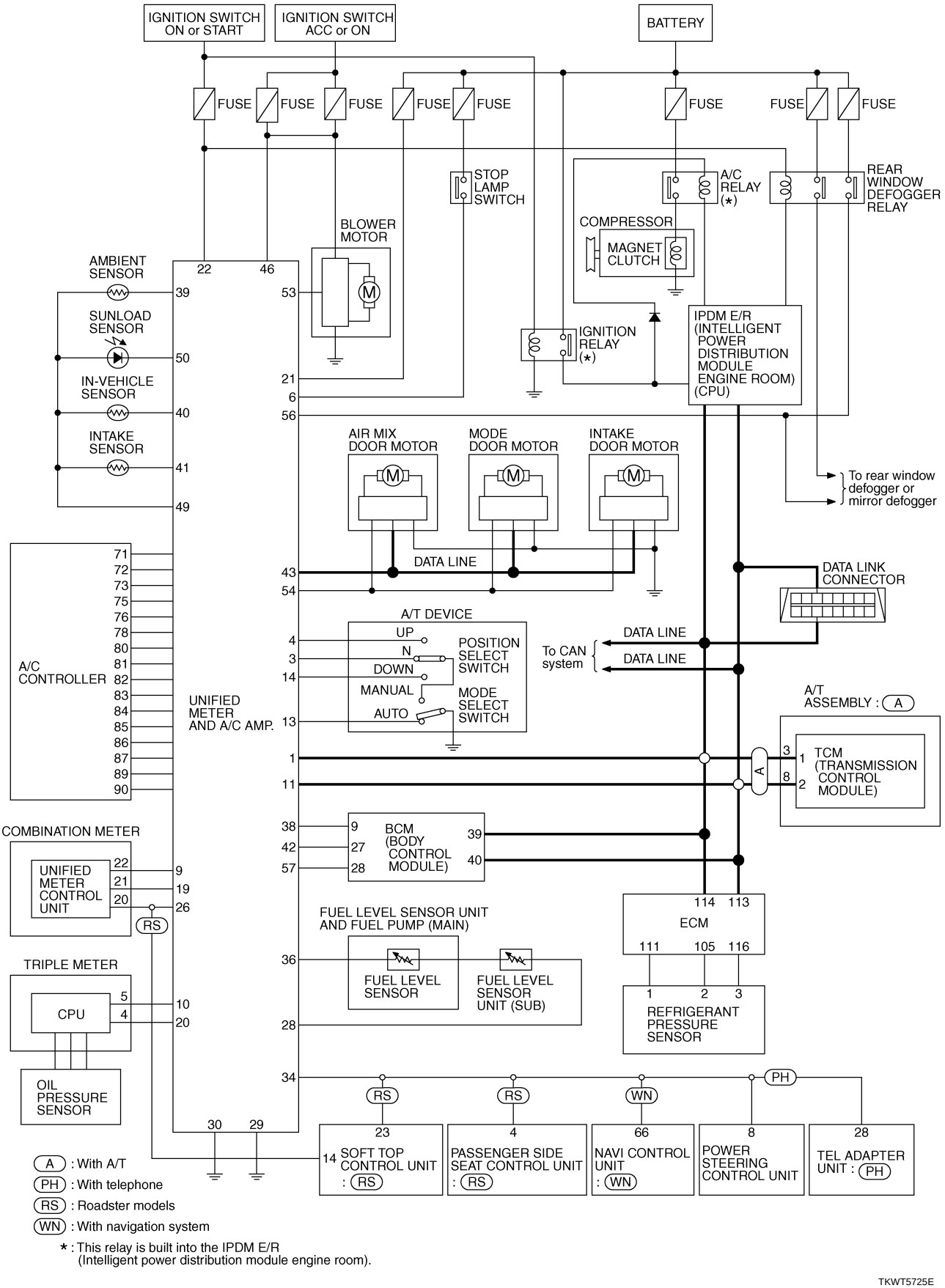
OTHER FUNCTIONS

Signal Buffer Function

Unified meter and A/C amp. transmits each signal to other units with CAN communication.

Schematic

NKS004RD



TKWT5725E

CONSULT-III Function (METER A/C AMP)

NKS00071

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

System	Diagnosis mode	Description
METER A/C AMP	SELF-DIAG RESULTS	Unified meter and A/C amp. check the conditions and displays memorized erro.
	DATA MONOTOR	Displays unified meter and A/C amp. input data in real time.

SELF-DIAGNOSTIC RESULTS

Display Item List

Display item [Code]	Malfunction is detected when...	Reference page
CAN COMM CIRC [U1000]	When unifield meter and A/C amp. is not transmitting or receiving CAN communication signal for 2 seconds or less.	DI-50
T/METER COMM CIRC [B2201]	Malfunction is detected in communication of between triple meter and unified meter and A/C amp.	DI-50
METER COMM CIRC [B2202]	Malfunction is detected in communication of between combination meter and unified meter and A/C amp.	DI-52
VEHICLE SPEED CIRC [B2205]	When an erroneous signal is input. **CAUTION:** **Even when there is no malfunction on speed signal system, malfunction may be misinterpreted when battery has low voltage (when maintaining 7 - 8 V for about 2 seconds).**	DI-55

NOTE:
"TIME" means the following.

- 0: Means detected malfunction at present.
- 1-63: Means detected malfunction in past. (Displays number of ignition switch OFF → ON after detecting malfunction. "Self-diagnosis result" is erased when exceeding "63".)

DATA MONITOR

Display Item List

Monitor item [Unit]	MAIN SIGNALS	SELECTION FROM MENU	Contents
SPEED METER [km/h] or [mph]	X	X	This is the angle correction value after the speed signal from the VDC/TCS/ABS control unit [with VDC system] or ABS actuator and electric unit (control unit) [without VDC system] is converted into the vehicle speed.
SPEED OUTPUT [km/h] or [mph]	X	X	This is the angle correction value before the speed signal from the VDC/TCS/ABS control unit [with VDC system] or ABS actuator and electric unit (control unit) [without VDC system] is converted into the vehicle speed.
TACHO METER [rpm]	X	X	This is the converted value for the engine speed signal from the ECM.
W TEMP METER [°C] or [°F]	X	X	This is the converted value for the engine coolant temperature signal from the ECM.
FUEL METER [lit.]	X	X	This is the processed value for the signal (resistance value) from the fuel gauge.
DISTANCE [km] or [mile]	X	X	This is the calculated value for the speed signal from the VDC/TCS/ABS control unit [with VDC system] or ABS actuator and electric unit (control unit) [without VDC system] and the signal (resistance signal) from the fuel gauge.
FUEL W/L [ON/OFF]	X	X	Indicates [ON/OFF] condition of low-fuel warning lamp.
MIL [ON/OFF]		X	Indicates [ON/OFF] condition of malfunction indicator lamp.

Monitor item [Unit]		MAIN SIGNALS	SELECTION FROM MENU	Contents
AIR PRES W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of low tire pressure warning lamp.
SEAT BELT W/L*1	[ON/OFF]		X	Indicates [ON/OFF] condition of seat belt warning lamp.
BUZZER	[ON/OFF]	X	X	Indicates [ON/OFF] condition of buzzer.
DOOR W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of door warning lamp.
HI-BEAM IND	[ON/OFF]		X	Indicates [ON/OFF] condition of high beam indicator.
TURN IND	[ON/OFF]		X	Indicates [ON/OFF] condition of turn indicator.
OIL W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of oil pressure warning lamp.
VDC/TCS IND	[ON/OFF]		X	Indicates [ON/OFF] condition of VDC/TCS OFF indicator lamp.
ABS W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of ABS warning lamp.
SLIP IND	[ON/OFF]		X	Indicates [ON/OFF] condition of SLIP indicator lamp.
BRAKE W/L*2	[ON/OFF]		X	Indicates [ON/OFF] condition of brake warning lamp.
M RANGE SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of manual mode range switch.
NM RANGE SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of except for manual mode range switch.
AT SFT UP SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift up switch.
AT SFT DWN SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift down switch.
AT P MODE SW	[ON/OFF]		X	Indicates [ON/OFF] condition of A/T power mode switch.
AT S MODE SW	[ON/OFF]		X	Indicates [ON/OFF] condition of A/T snow mode switch.
BRAKE SW	[ON/OFF]		X	Indicates [ON/OFF] condition of brake switch (stop lamp switch).
AT-M IND	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T manual mode indicator.
AT-M GEAR	[5/4/3/2/1]	X	X	Indicates [5/4/3/2/1] condition of A/T manual mode gear position.
P RANGE IND	ON/OFF	X	X	Indicates [ON/OFF] condition of A/T shift P range indicator.
R RANGE IND	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift R range indicator.
N RANGE IND	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift N range indicator.
D RANGE IND	[ON/OFF]	X	X	Indicates [ON/OFF] condition of A/T shift D range indicator.
AT CHECK W/L	[ON/OFF]		X	Indicates [ON/OFF] condition of A/T CHECK warning lamp.
CRUISE IND	[ON/OFF]		X	Indicates [ON/OFF] condition of CRUISE indicator.
SET IND	[ON/OFF]		X	Indicates [ON/OFF] condition of SET indicator.

NOTE:

Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

*1: It dose not change when fastening or unfastening the passenger seat belt.

*2: Monitor keeps indicating “OFF” when brake warning lamp is on by the parking brake operation or low brake fluid level.

Power Supply and Ground Circuit Inspection

NKS001M5

1. CHECK FUSE

Check for blown fuses.

Power source	Fuse No.
Battery	19
Ignition switch ACC or ON	10,11
Ignition switch ON or START	12

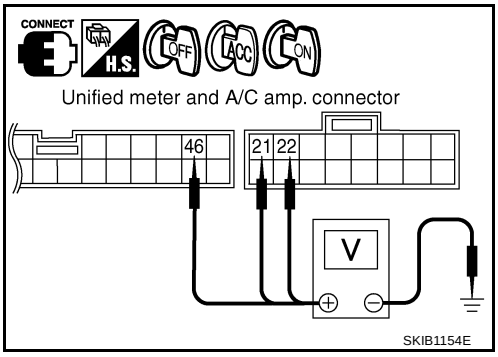
OK or NG

OK >> GO TO 2.
NG >> Be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between unified meter and A/C amp. harness connector terminals and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal				
M49	21	Ground	Battery voltage	Battery voltage	Battery voltage
M50	46		0 V	Battery voltage	Battery voltage
M49	22		0 V	0 V	Battery voltage



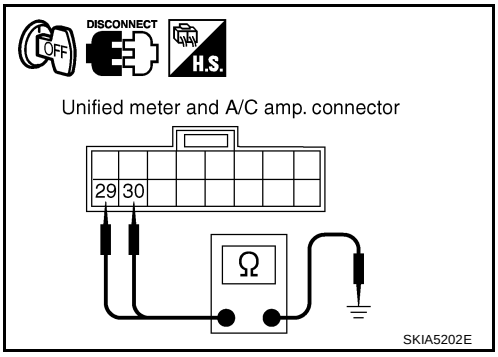
OK or NG

OK >> GO TO 3.
NG >> Check harness between unified meter and A/C amp. and fuse.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between unified meter and A/C amp. harness connector and ground.

Connector	Terminal		Continuity
M49	29	Ground	Yes
	30		



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

DTC [U1000] CAN Communication Circuit

NKS00072

Symptom: Display CAN COMM CIRC [U1000] at the result of self-diagnosis for unified meter and A/C amp.

1. CHECK CAN COMMUNICATION

1. Select “SELF-DIAG RESULTS” mode for “METER A/C AMP” with CONSULT-III.

>> Go to “LAN system”. Refer to LAN-48, "CAN System Specification Chart" .

DTC [B2201] Triple Meter Communication Circuit

NKS00073

Symptom: Display T/METER COMM CIRC [B2201] at the result of self-diagnosis for unified meter and A/C amp.

NOTE:
For the wiring diagram, refer to DI-31, "Wiring Diagram — 3METER —" .

1. CHECK CONNECTOR

Check triple meter, unified meter and A/C amp. and terminals (triple meter side, unified meter and A/C amp. side, and harness side) for looseness or bent terminals.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK METER/GAUGES VISUALLY

Does the pointer on the meter/gauges fluctuate at the engine start?

Is the fluctuation acceptable?

YES >> GO TO 3.
NO >> GO TO 6.

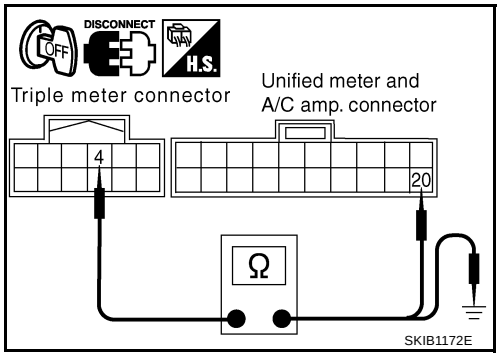
3. CHECK CONTINUITY COMMUNICATION CIRCUIT (TX: TRIPLE METER)

1. Turn ignition switch OFF.
2. Disconnect triple meter connector and unified meter and A/C amp. connector.
3. Check continuity between triple meter harness connector M44 terminal 4 and unified meter and A/C amp. harness connector M48 terminal 20.

4 – 20 : Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 4 (P) and ground.

4 – Ground : Continuity should not exist.



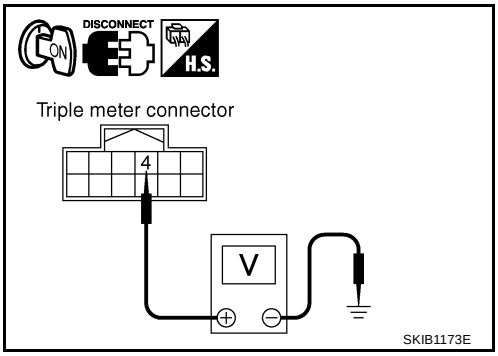
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK VOLTAGE OF UNIFIED METER AND A/C AMP.

1. Connect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between triple meter harness connector M44 terminal 4 and ground.

4 – Ground : Approx. 5 V



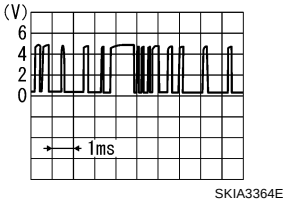
OK or NG

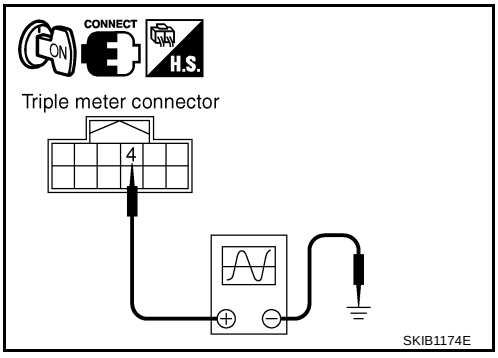
OK >> GO TO 5.
NG >> Replace unified meter and A/C amp.

5. CHECK VOLTAGE SIGNAL OF COMBINATION METER

1. Turn ignition switch OFF.
2. Connect triple meter connector.
3. Turn ignition switch ON.
4. Check voltage signal between triple meter harness connector M44 terminal 4 and ground.

4 – Ground:





OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Replace triple meter.

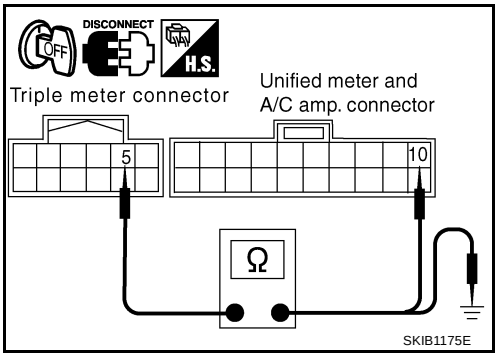
6. CHECK CONTINUITY COMMUNICATION CIRCUIT (RX: TRIPLE METER)

1. Turn ignition switch OFF.
2. Disconnect triple meter connector and unified meter and A/C amp. connector.
3. Check continuity between triple meter harness connector M44 terminal 5 and unified meter and A/C amp. harness connector M48 terminal 10.

5 – 10 : Continuity should exist.

4. Check continuity between triple meter harness connector M44 terminal 5 and ground.

5 – Ground : Continuity should not exist.



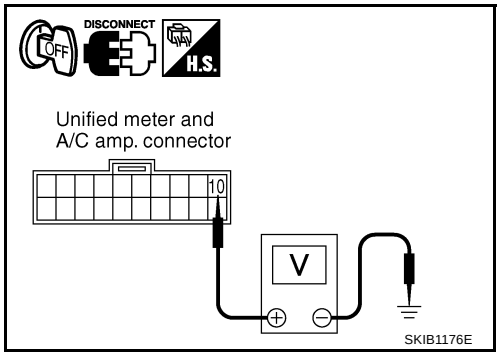
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK VOLTAGE OF COMBINATION METER

1. Connect triple meter connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M48 terminal 10 and ground.

10 – Ground : Approx. 5 V



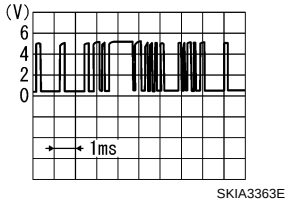
OK or NG

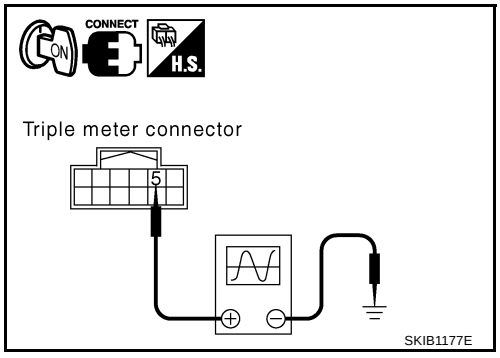
OK >> GO TO 8.
NG >> Replace triple meter.

8. CHECK VOLTAGE SIGNAL OF UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Connect triple meter connector and unified meter and A/C amp. connector.
3. Turn ignition switch ON.
4. Check voltage signal between triple meter harness connector M44 terminal 5 and ground.

5 – Ground :





OK or NG

OK >> Replace triple meter.
NG >> Replace unified meter and A/C amp.

DTC [B2202] Meter Communication Circuit

NKS00074

Symptom: Display METER COMM CIRC [B2202] at the result of self-diagnosis for unified meter and A/C amp.

NOTE:
For the wiring diagram, refer to DI-11, "Wiring Diagram — METER —" .

1. CHECK CONNECTOR

Check combination meter, unified meter and A/C amp. and terminals (combination meter side, unified meter and A/C amp. side, and harness side) for looseness or bent terminals.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK METER/GAUGES VISUALLY

Does the pointer on the meter/gauges fluctuate at the engine start?

Is the fluctuation acceptable?

YES >> GO TO 3.
NO >> GO TO 6.

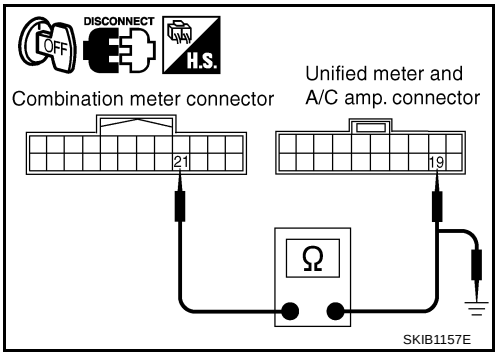
3. CHECK CONTINUITY COMMUNICATION CIRCUIT (TX: COMBINATION METER)

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 21 and unified meter and A/C amp. harness connector M48 terminal 19.

21 – 19 : Continuity should exist.

4. Check continuity between combination meter harness connector M19 terminal 21 and ground.

21 – Ground : Continuity should not exist.



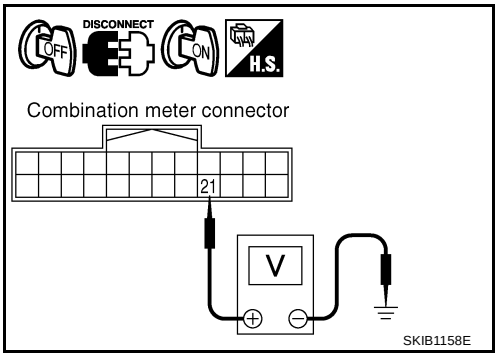
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK VOLTAGE OF UNIFIED METER AND A/C AMP.

1. Connect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between combination meter harness connector M19 terminal 21 and ground.

21 – Ground : Approx. 5 V



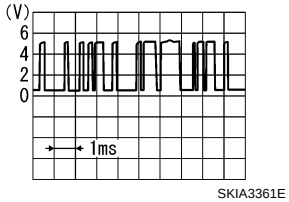
OK or NG

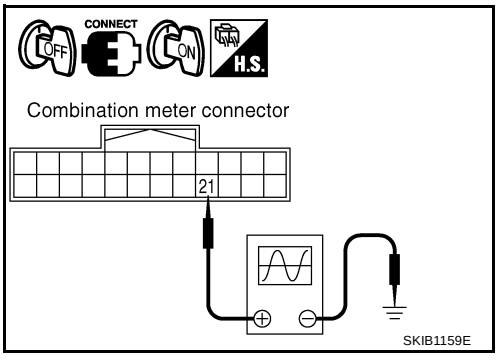
OK >> GO TO 5.
NG >> Replace unified meter and A/C amp.

5. CHECK VOLTAGE SIGNAL OF COMBINATION METER

1. Turn ignition switch OFF.
2. Connect combination meter connector.
3. Turn ignition switch ON.
4. Check voltage signal between combination meter harness connector M19 terminal 21 and ground.

21 – Ground:





OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Replace combination meter.

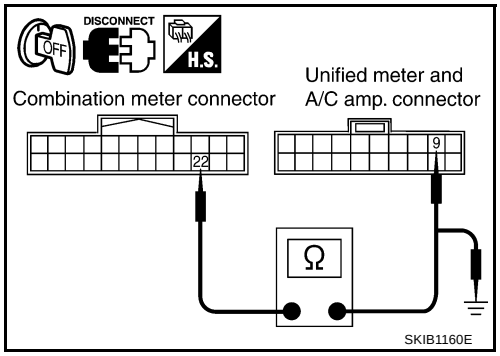
6. CHECK CONTINUITY COMMUNICATION CIRCUIT (RX: COMBINATION METER)

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and unified meter and A/C amp. connector.
3. Check continuity between combination meter harness connector M19 terminal 22 and unified meter and A/C amp. harness connector M48 terminal 9.

22 – 9 : Continuity should exist.

4. Check continuity between combination meter harness connector M19 terminal 22 (L/OR) and ground.

22 – Ground : Continuity should not exist.



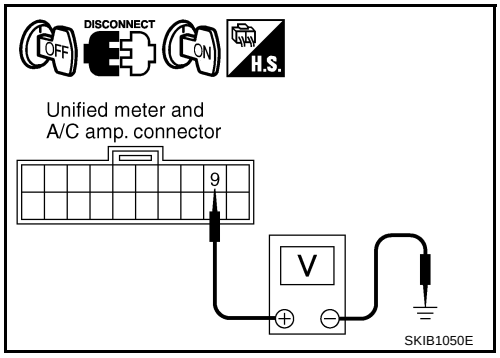
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK VOLTAGE OF COMBINATION METER

1. Connect combination meter connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M48 terminal 9 and ground.

9 – Ground : Approx. 5 V



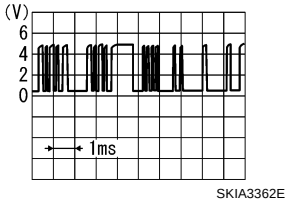
OK or NG

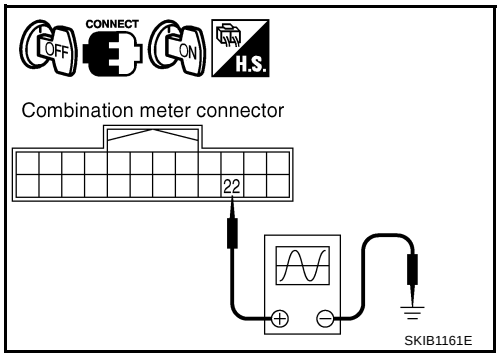
OK >> GO TO 8.
NG >> Replace combination meter.

8. CHECK VOLTAGE SIGNAL OF UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Connect unified meter and A/C amp. connector.
3. Turn ignition switch ON.
4. Check voltage signal between combination meter harness connector M19 terminal 22 and ground.

22 – Ground:





OK or NG

OK >> Replace combination meter.
NG >> Replace unified meter and A/C amp.

DTC [B2205] Vehicle Speed Circuit

NKS00075

Symptom: Display VEHICLE SPEED CIRC [B2205] at the result of self-diagnosis for unified meter and A/C amp.

1. CHECK VDC/TCS/ABS CONTROL UNIT OR ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform the following unit self-diagnosis.

- VDC/TCS/ABS control unit [with VDC]. Refer to BRC-96, "CONSULT-III Functions (ABS)" .
- ABS actuator and electric unit (control unit) [without VDC]. Refer to BRC-52, "CONSULT-III MAIN FUNCTION" (with TCS) or BRC-19, "CONSULT-III MAIN FUNCTION" (without TCS).

Self-diagnostic results content

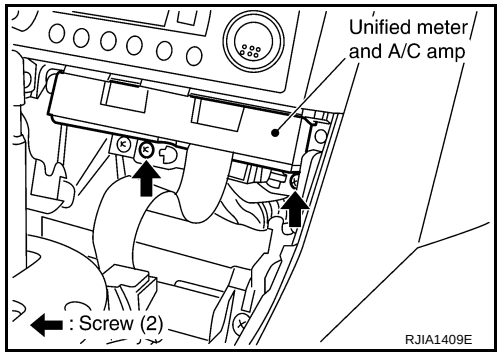
No malfunction detected>>Replace unified meter and A/C amp.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

Removal and Installation of Unified Meter and A/C Amp.

NKS00076

REMOVAL

1. Remove the console finisher (A/T) or console boot (M/T). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove the fixing screws, then remove the unified meter and A/C amp.



INSTALLATION

Installation is the reverse order of removal.

WARNING LAMPS

PFP:24814

System Description

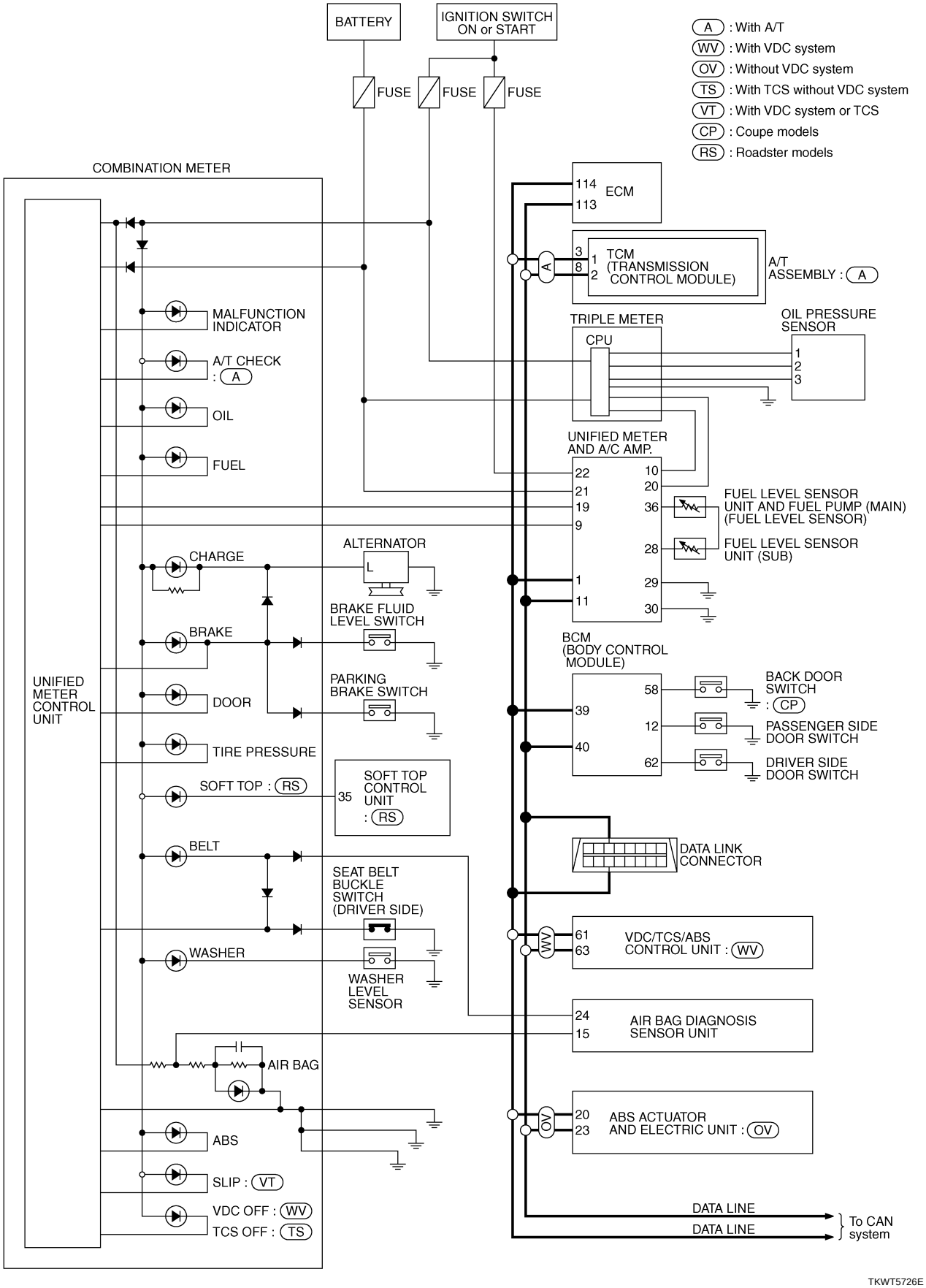
NKS00264

OIL PRESSURE WARNING LAMP

- Triple meter reads oil pressure signal from oil pressure sensor.
- Triple meter judges an oil pressure condition by oil pressure signal, and transmits oil pressure warning lamp signal to unified meter and A/C amp. with communication line.
- Unified meter and A/C amp. transmits oil pressure switch signal to combination meter with communication line.
- Combination meter turns oil pressure warning lamp according to oil pressure switch signal.

Schematic

NKS004RE



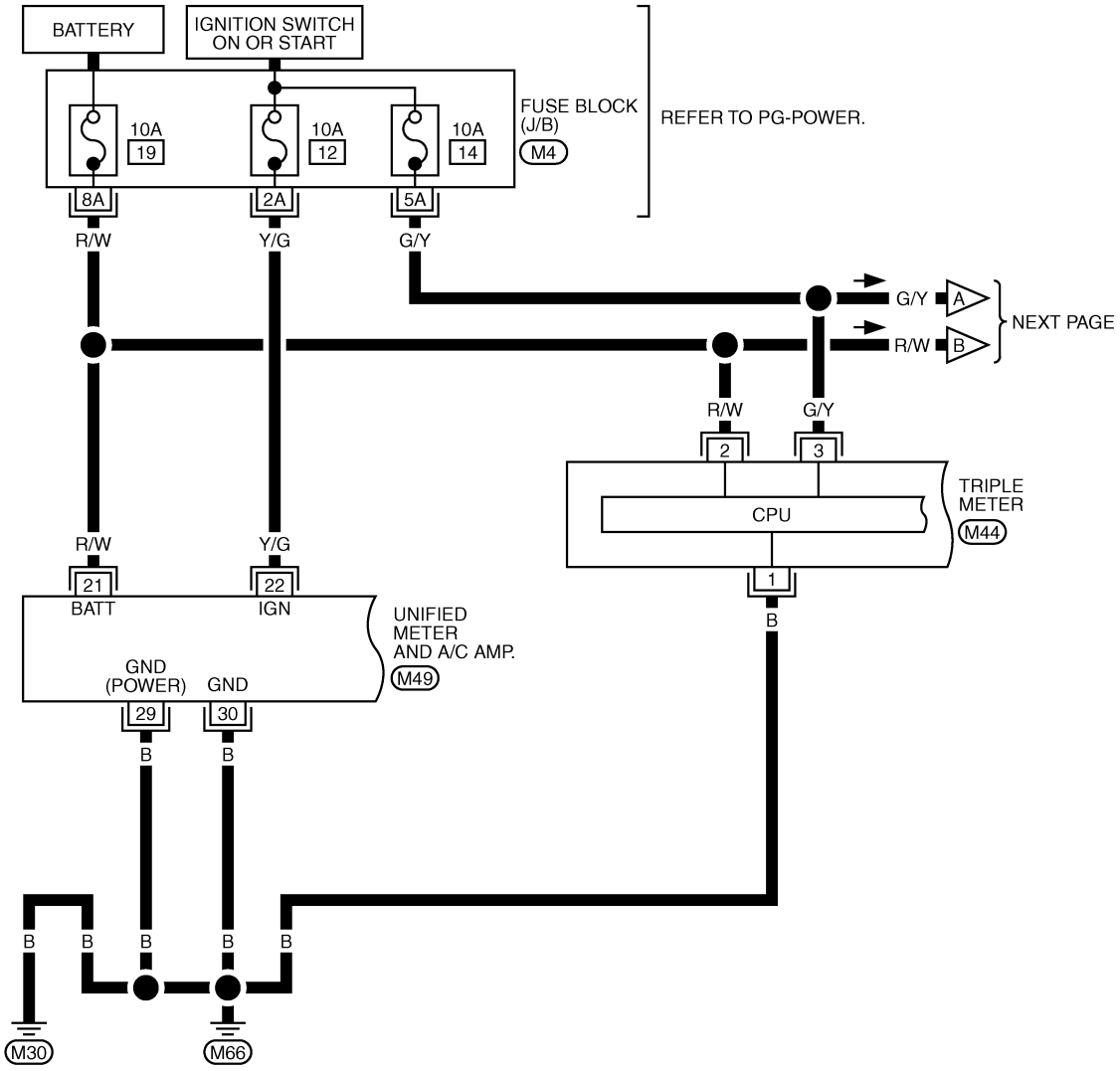
TKWT5726E

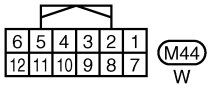
NOTE:
For the further details, refer to descriptions on each system.

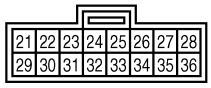
Wiring Diagram — WARN —

NKS004RF

DI-WARN-01



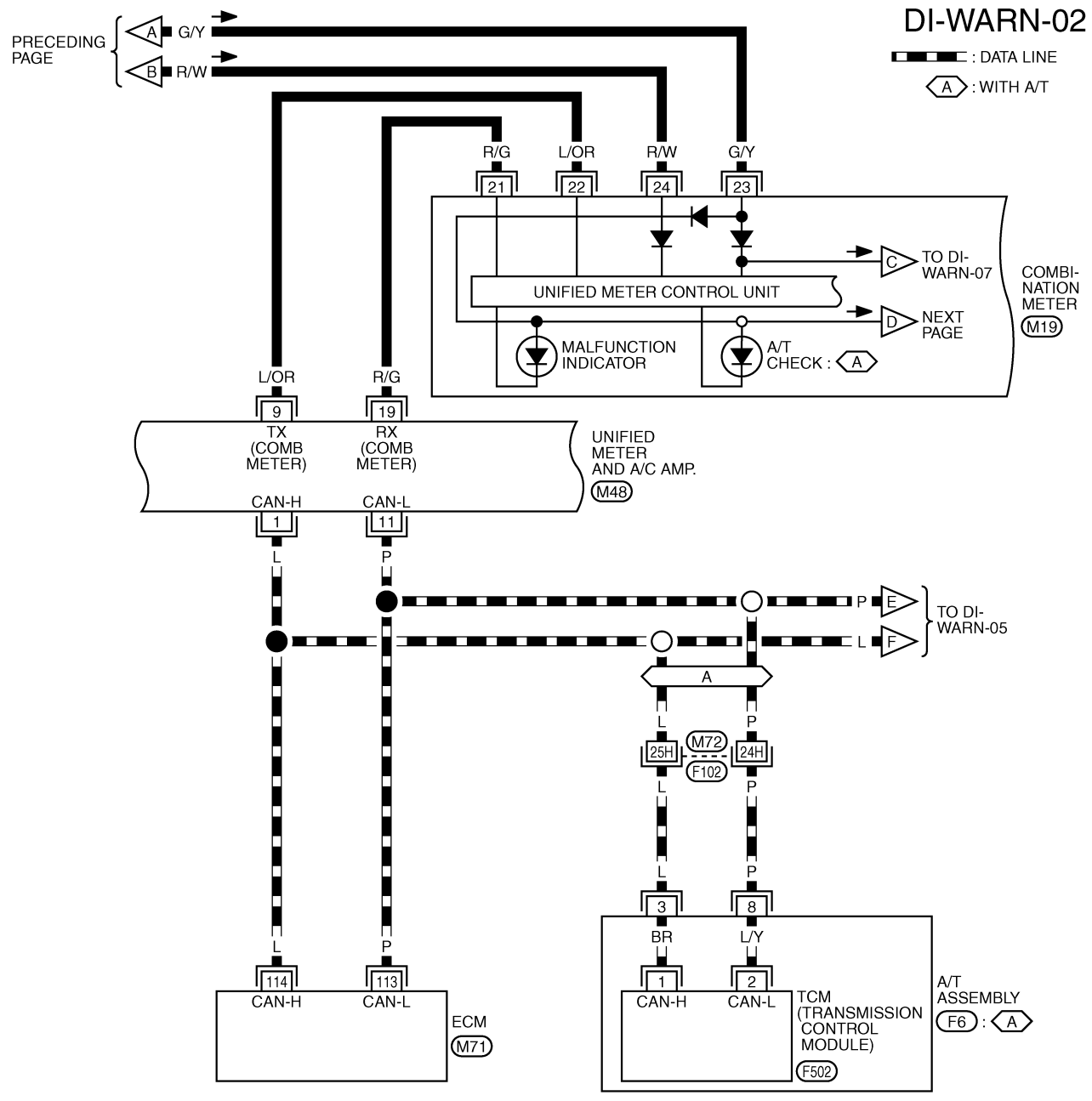


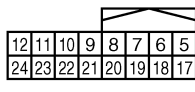


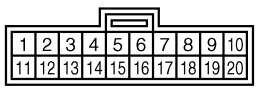


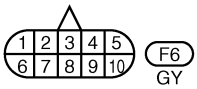
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

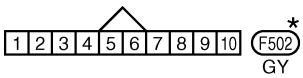
TKWT0485E









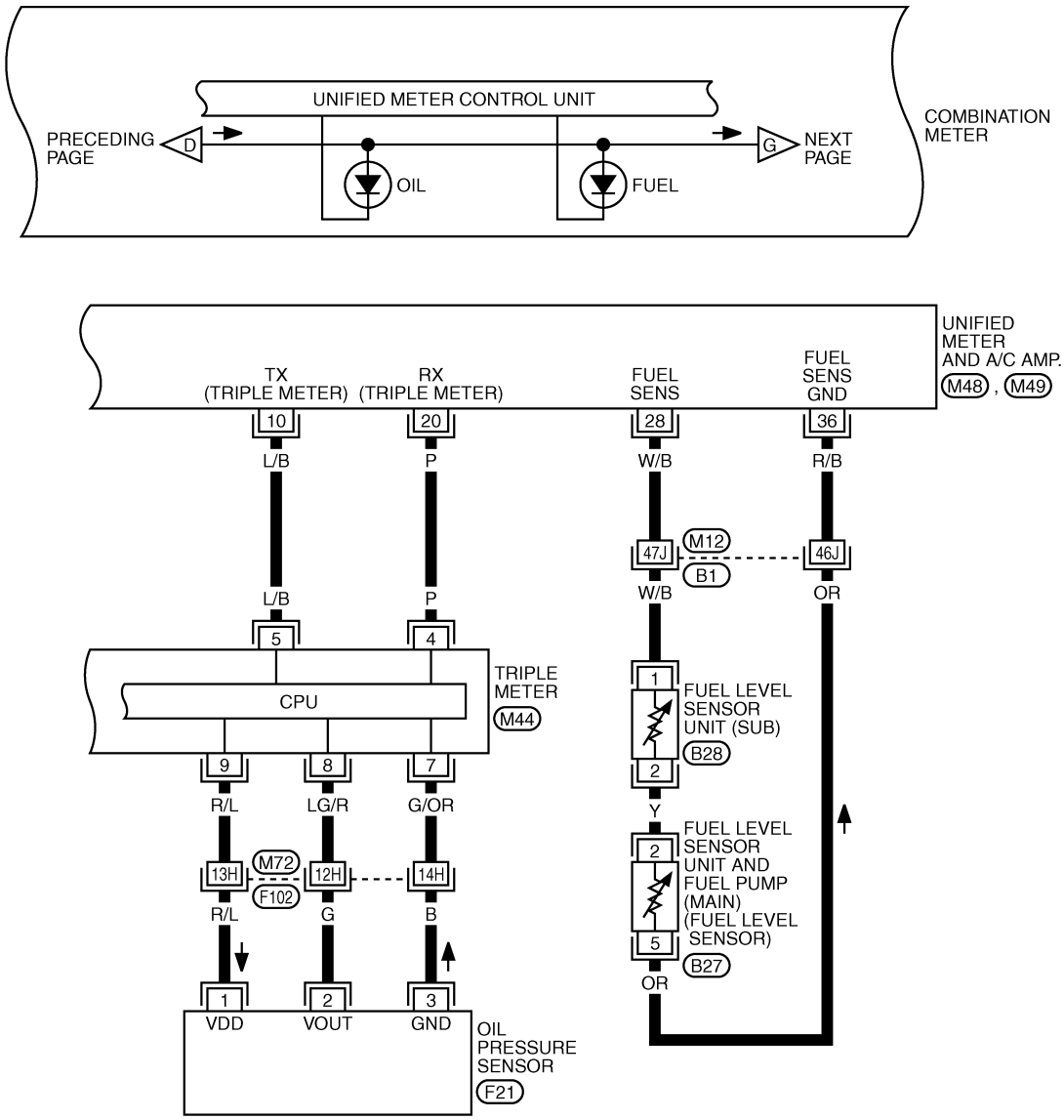


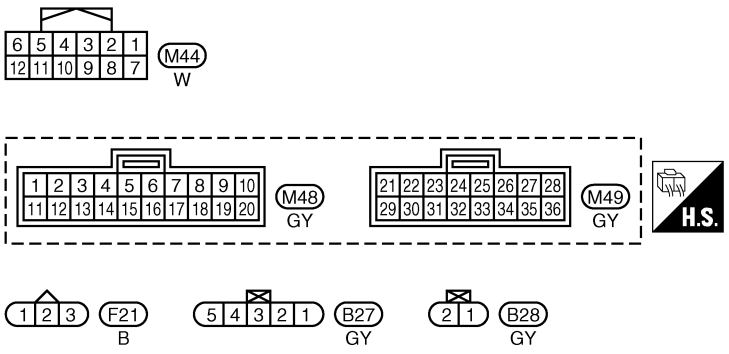
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M71 -ELECTRICAL UNITS

TKWT5727E

DI-WARN-03

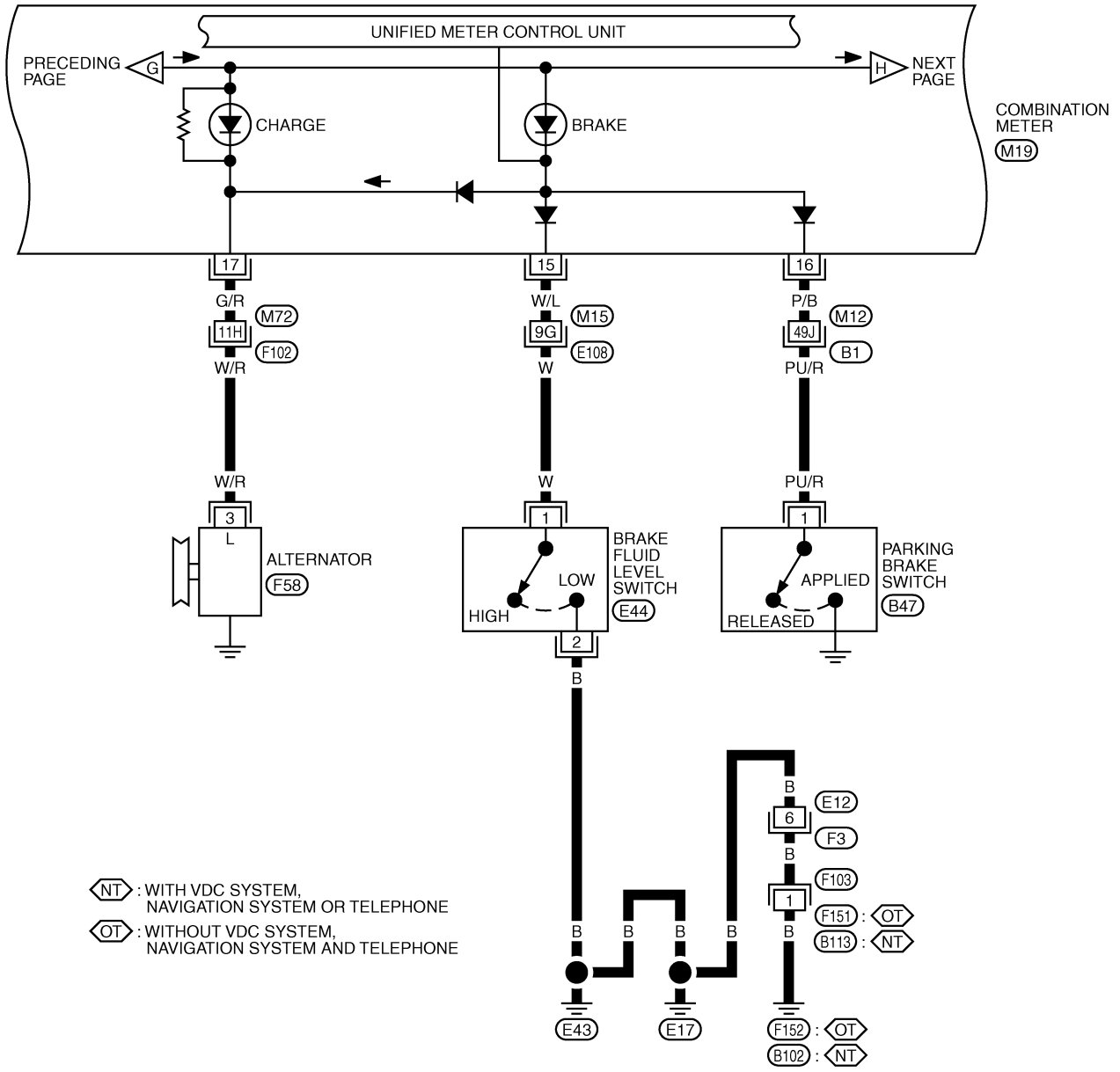


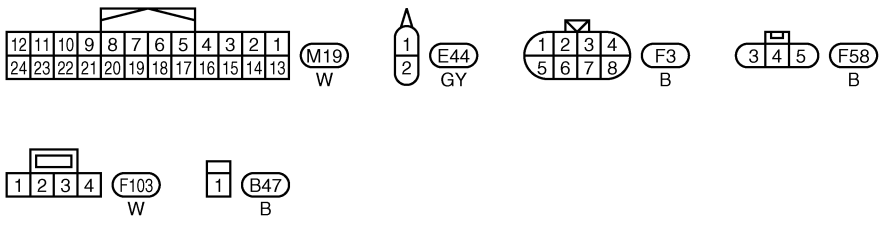


REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5728E

DI-WARN-04



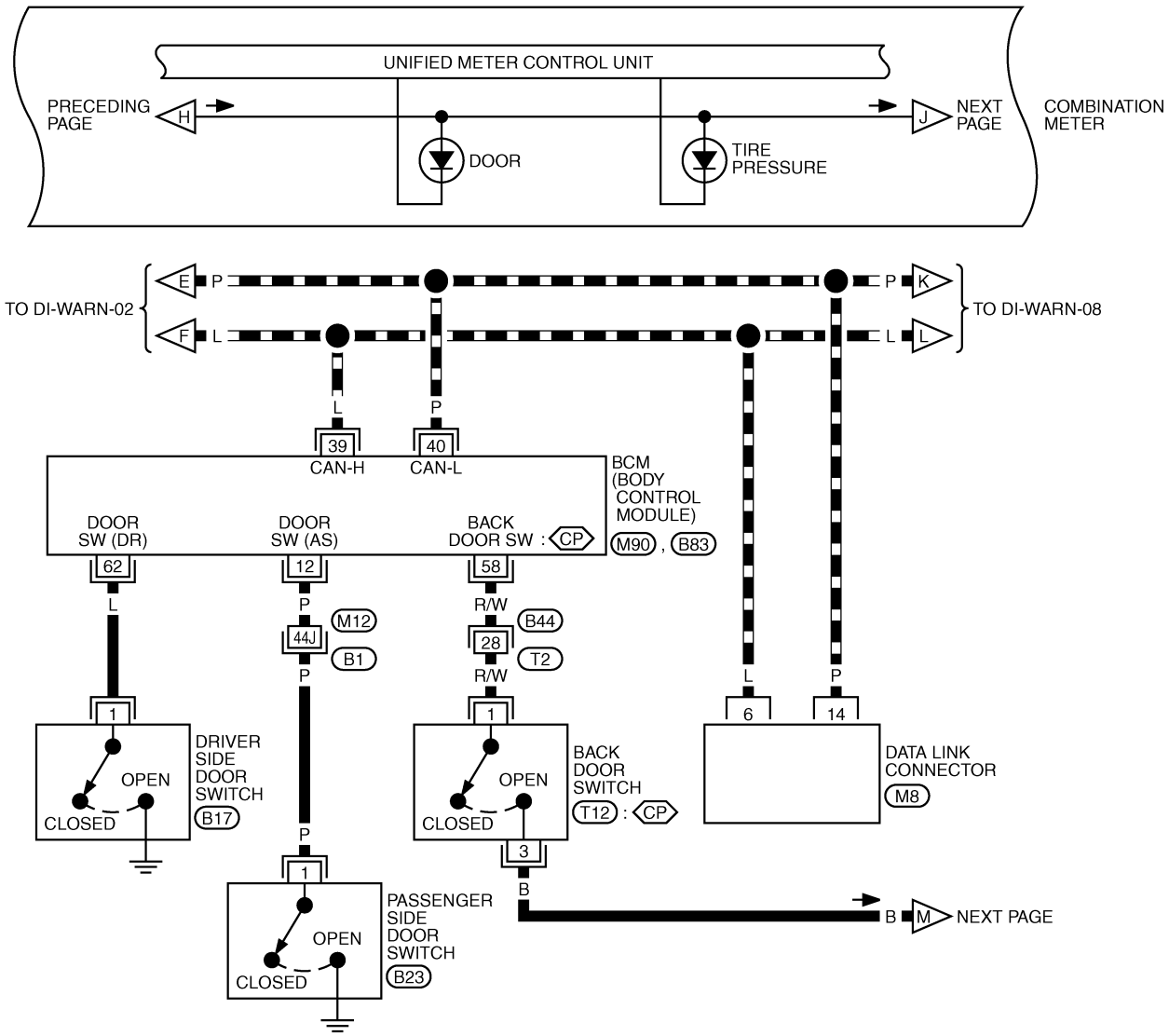


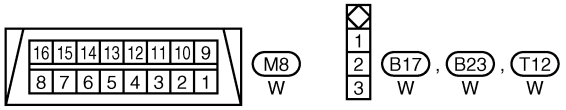
REFER TO THE FOLLOWING.
E108 , F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

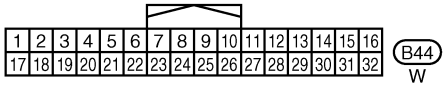
TKWT5729E

DI-WARN-05

: DATA LINE
CP : COUPE MODELS



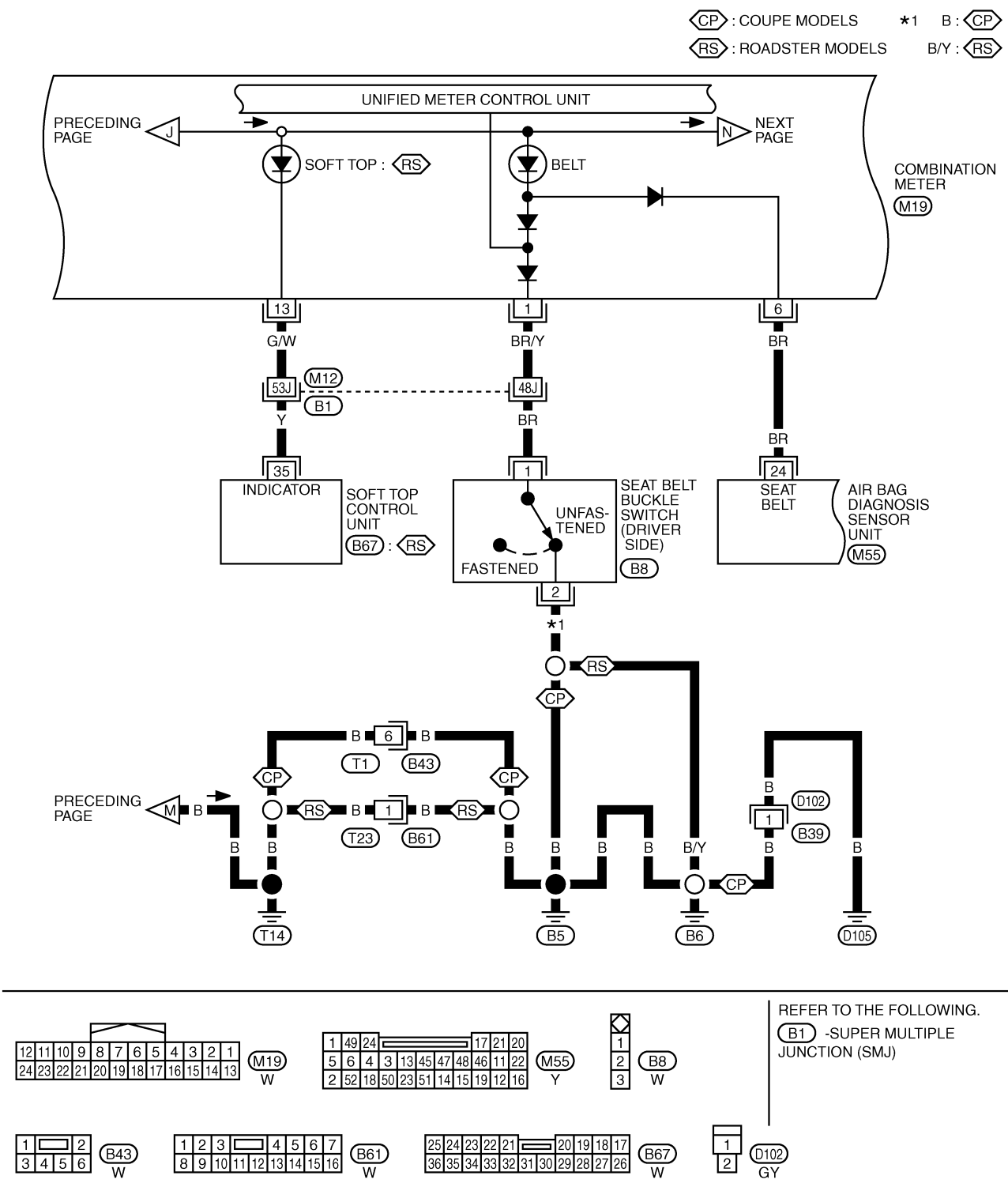




REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

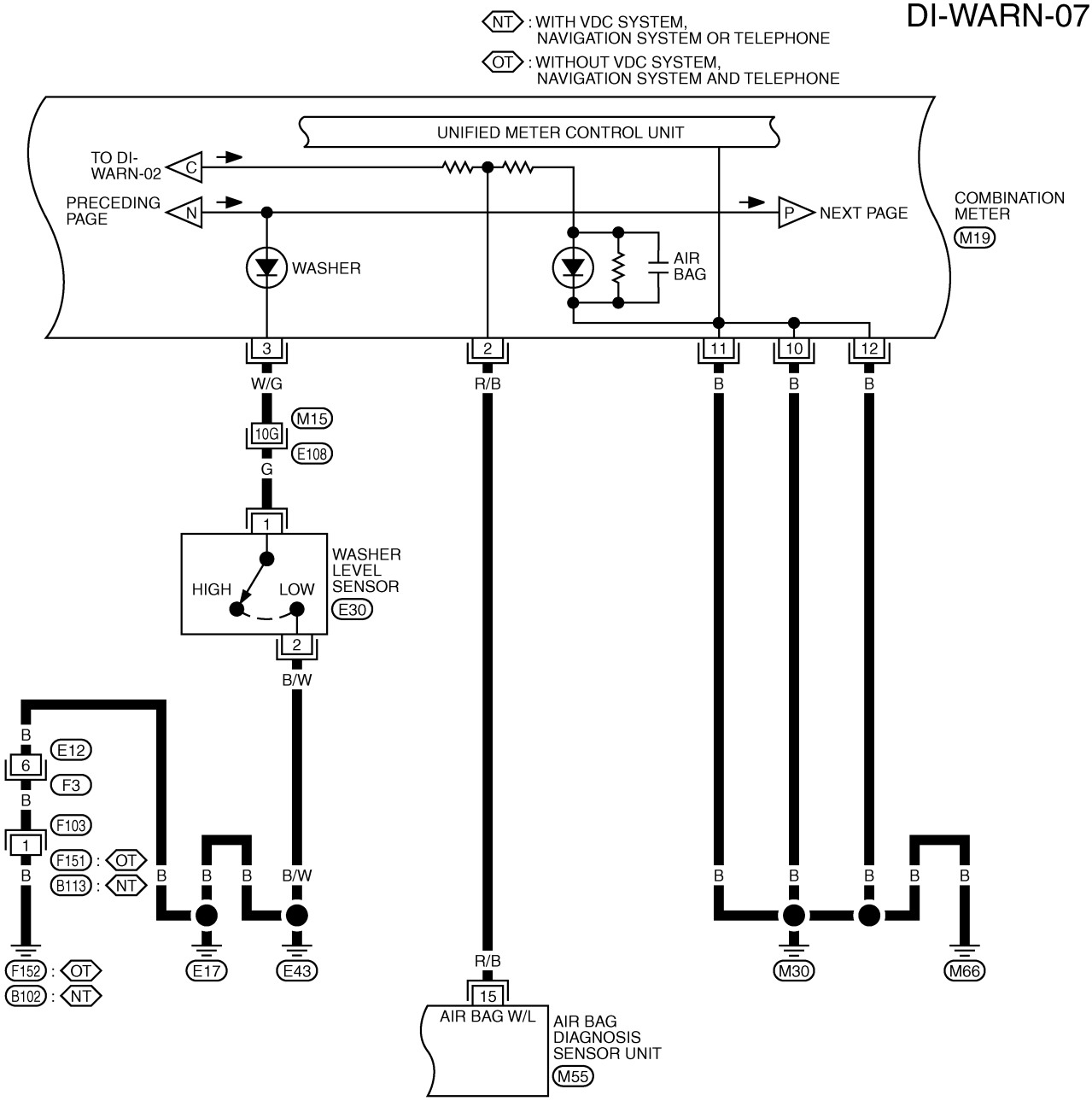
TKWT3995E

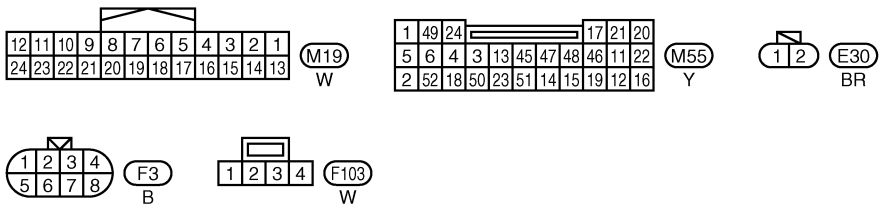
DI-WARN-06



TKWT5730E

DI-WARN-07



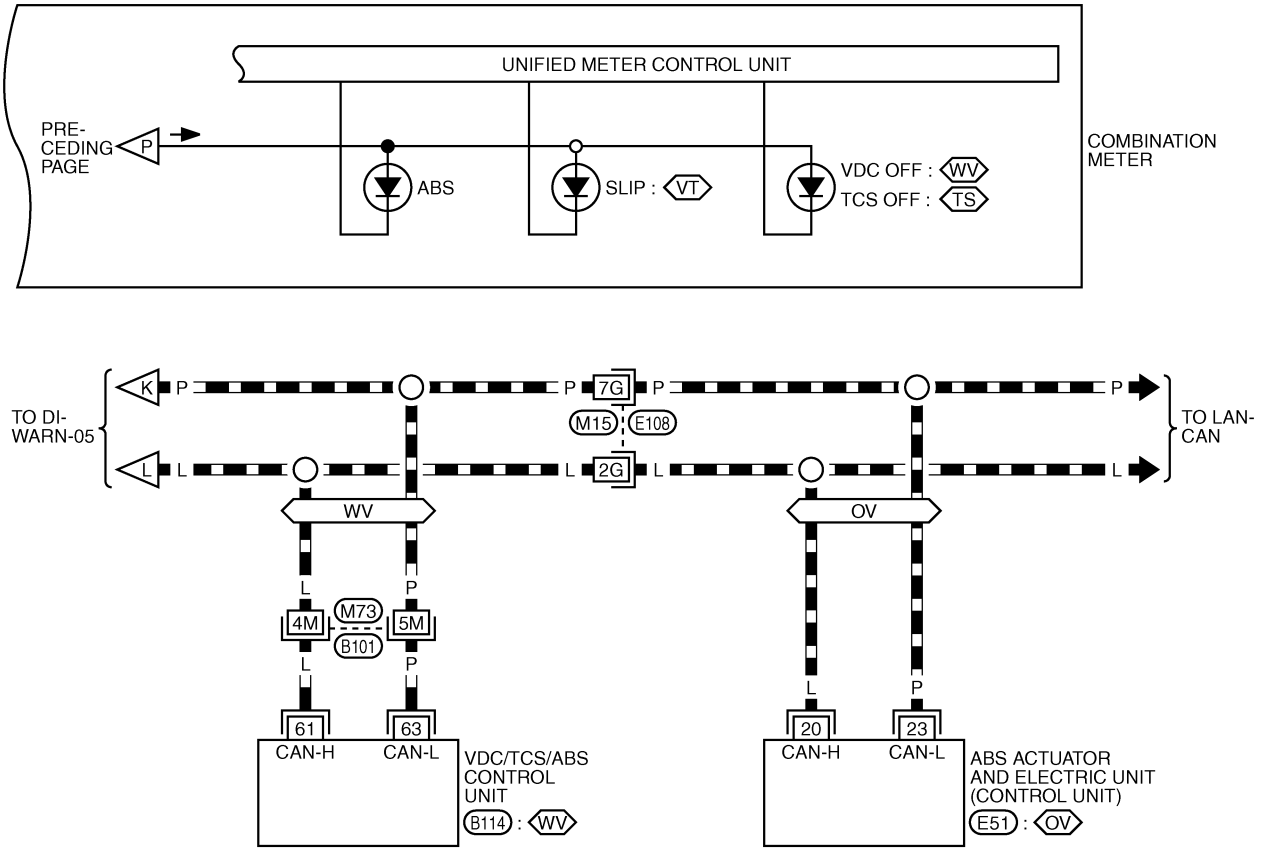


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5731E

DI-WARN-08

: DATA LINE
WV : WITH VDC SYSTEM
OV : WITHOUT VDC SYSTEM
TS : WITH TCS WITHOUT VDC SYSTEM
VT : WITH VDC SYSTEM OR TCS



REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E51 , B114 -ELECTRICAL UNITS

TKWT5612E

CONSULT-III Function (METER A/C AMP)

NKS00079

Refer to DI-15, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

Oil Pressure Warning Lamp Stays Off (Ignition Switch ON) or Stays On (Oil Pressure Is Normal)

NKS0007A

NOTE:
For oil pressure inspection, refer to LU-7, "OIL PRESSURE CHECK" .

1. CHECK OIL PRESSURE GAUGE

Start the engine.

Does oil pressure gauge operate?

YES >> GO TO 2.
NO >> Check oil pressure sensor signal.

2. CHECK COMMUNICATION LINE

Perform self-diagnosis of unified meter and A/C amp. Refer to DI-15, "CONSULT-III Function (METER A/C AMP)" .

Self-diagnostic results

No malfunction detected>>GO TO 3.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

3. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

Select “METER A/C AMP” on CONSULT-III. Operate ignition switch with “OIL W/L” of “DATA MONITOR” and check operation status.

“OIL W/L”	
When ignition switch is in ON position (Engine stopped.)	: ON
When engine running	: OFF

OK or NG

OK >> Replace combination meter.
NG >> Replace triple meter.

A/T INDICATOR

PFP:24814

System Description

NKS00265

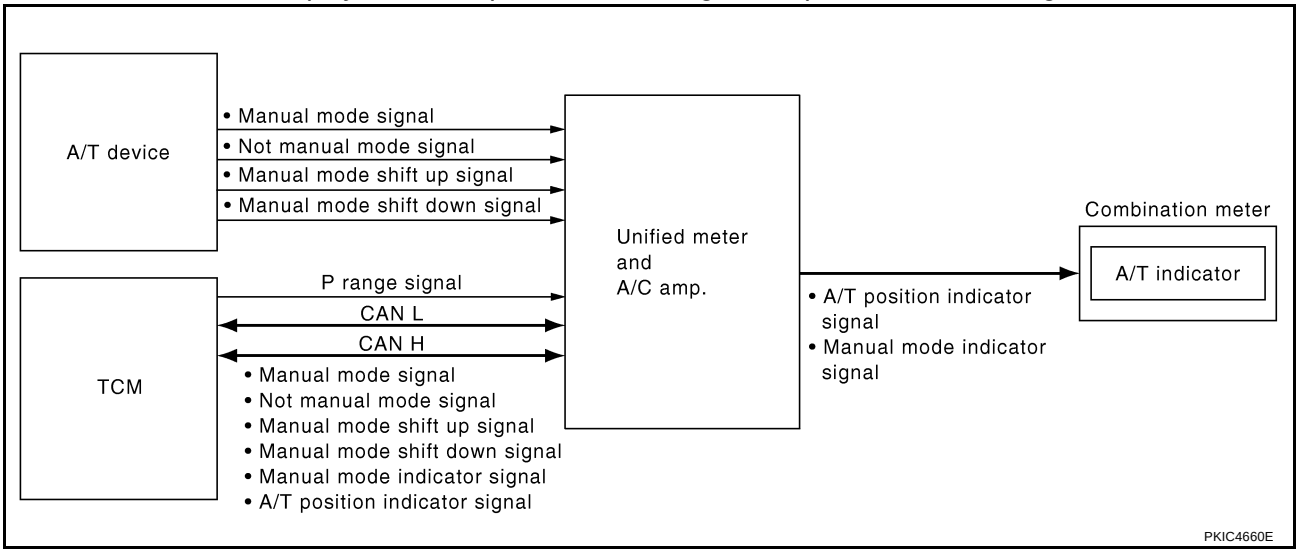
A/T position is displayed in the A/T indicator in the combination meter.

MANUAL MODE

- Unified meter and A/C amp. reads manual mode signal and shift-up/down signal from A/T device, and transmits the signals to TCM with CAN communication.
- TCM processes manual mode signal and shift-up/down signal, and transmits manual mode indicator signal and A/T position indicator signal to unified meter and A/C amp. with CAN communication.
- Unified meter and A/C amp. transmits manual mode indicator signal and A/T position indicator signal to combination meter with the communication line.
- Combination meter displays A/T gear position and manual mode indicator according to A/T position indicator signal and manual mode indication signal.

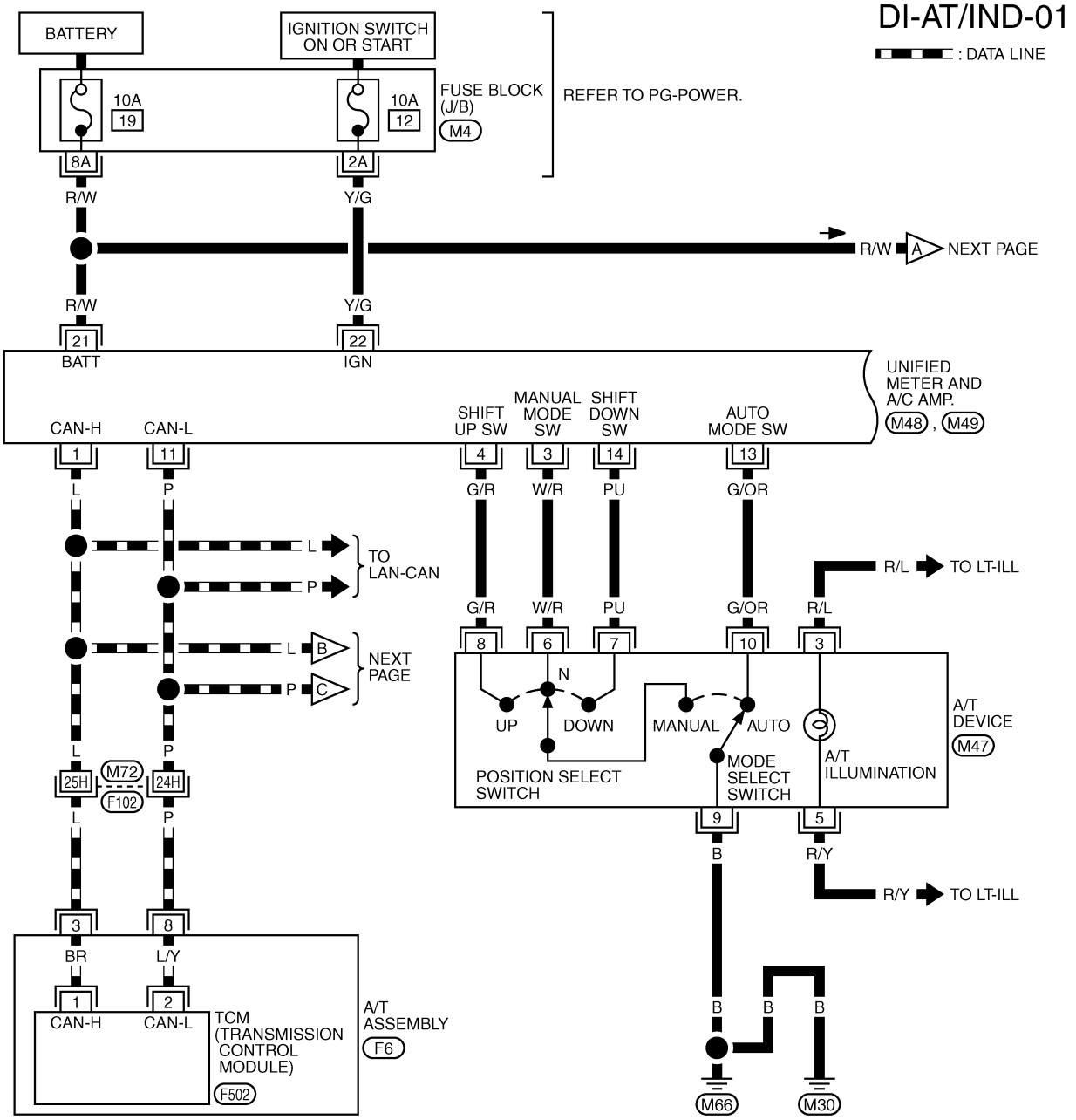
NOT MANUAL MODE

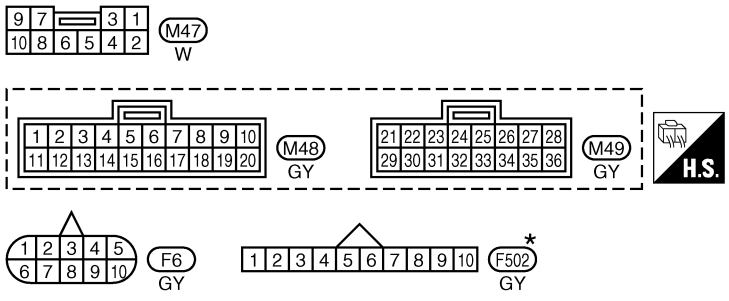
- Unified meter and A/C amp. reads not manual mode signal from A/T device, and transmits the signals to TCM with CAN communication.
- TCM transmits A/T position indicator signal to unified meter and A/C amp. with CAN communication.
- Unified meter and A/C amp. transmits A/T position indicator signal to combination meter with the communication line.
- Combination meter displays A/T shift position according to A/T position indicator signal.



Wiring Diagram — AT/IND —

NKS0007B





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

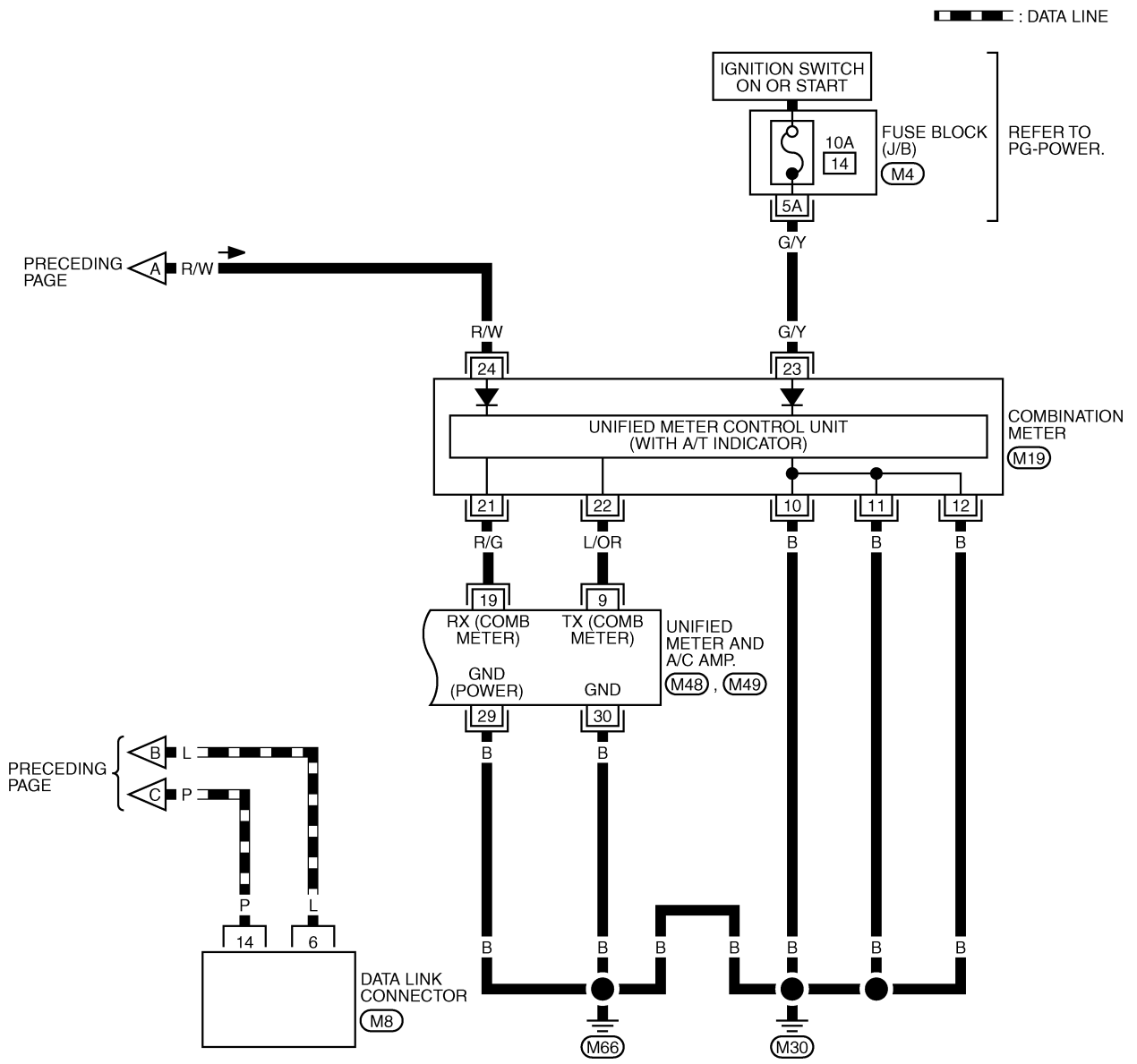
REFER TO THE FOLLOWING.

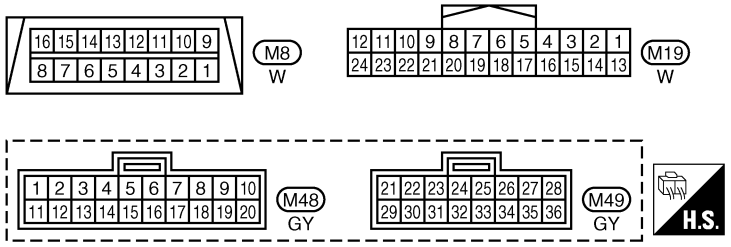
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5732E

DI-AT/IND-02





REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT2309E

CONSULT-III Function (METER A/C AMP)

NKS0007C

Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

A/T Indicator Is Malfunction

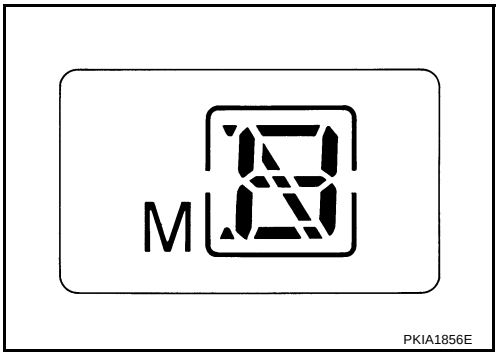
NKS0007D

1. CHECK A/T INDICATOR SEGMENTS

Perform self-diagnosis mode of combination meter. Refer to DI-15, "OPERATION PROCEDURE" .

Are all segments displayed?

YES >> GO TO 2.
NO >> Replace combination meter.



2. CHECK UNIFIED METER AND A/C AMP. (CONSULT-III)

Perform self-diagnosis of unified meter and A/C amp. Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" .

Self-diagnostic results

No malfunction detected>>GO TO 3.
Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

3. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Use “DATA MONITOR” of “METER A/C AMP” on CONSULT-III. Confirm each indication on the monitor when shifting the selector lever.

CONSULT-II display	Selector lever position	Status
AT-M IND	Manual mode range	ON
	Except for manual mode range	OFF
AT-M GEAR	Manual mode range (shift up or down)	5–1
	Except for manual mode range	1
P RANGE IND	P range	ON
	Except for P range	OFF
R RANGE IND	R range	ON
	Except for R range	OFF
N RANGE IND	N range position	ON
	Except for N range	OFF
D RANGE IND	D range position	ON
	Except for D range	OFF

OK or NG

OK >> Replace combination meter.
NG >> GO TO 4.

4. CHECK TCM (CONSULT-III)

Perform TCM self-diagnosis. Refer to AT-84, "CONSULT-III Function (TRANSMISSION)" .

Self-diagnostic results

No malfunction detected>>Replace unified meter and A/C amp.
Malfunction detected>>Check applicable parts, and repair or replace corresponding parts.

WARNING CHIME

PFP:24814

System Description

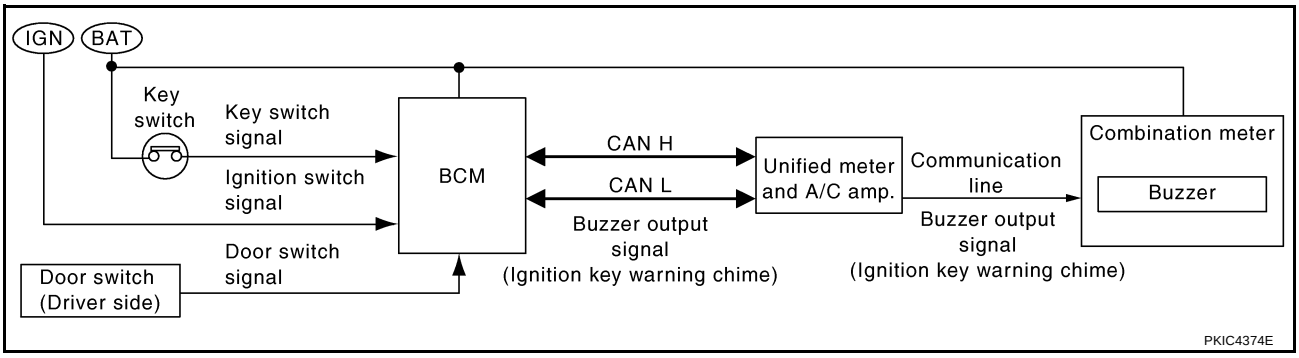
NKS00266

- The buzzer for warning chime system is installed in the combination meter.
- The buzzer sounds when the combination meter receives buzzer output signal from each unit through unified meter and A/C amp.

IGNITION KEY WARNING CHIME

With the key inserted into the key switch, and the ignition switch in OFF or ACC position, when driver's door is open, the ignition key warning chime sounds.

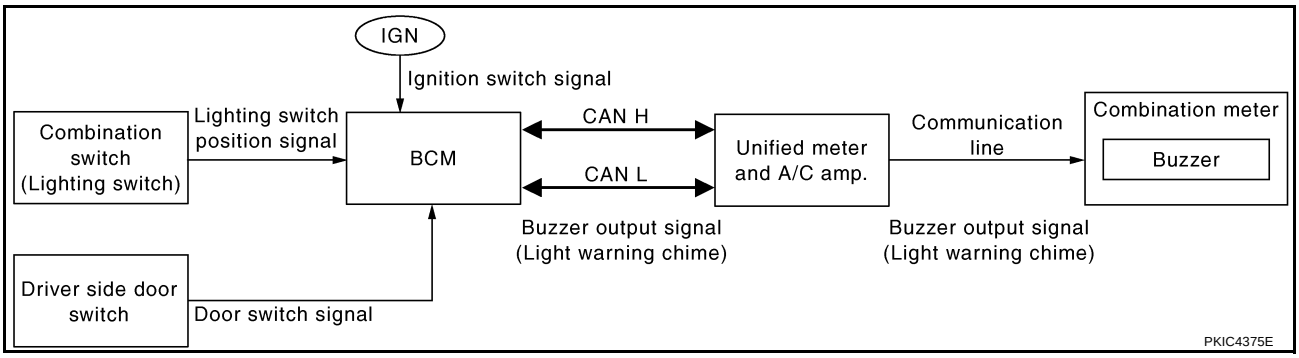
- BCM detects key inserted into the key switch, ignition switch in OFF or ACC position, and driver side door switch ON. And then, BCM transmits buzzer output signal (ignition key warning chime) to unified meter and A/C amp. with CAN communication.
- Unified meter and A/C amp. transmits buzzer output signal (ignition key warning chime) to combination meter with communication line.
- When combination meter receives buzzer output signal (ignition key warning chime), it sounds the buzzer.



LIGHT WARNING CHIME

With ignition switch in OFF or ACC position, drivers door open, and lighting switch in 1ST or 2ND position, the light warning chime will sounds.

- BCM detects ignition switch in OFF or ACC position, driver side door switch ON, and lighting switch in 1ST or 2ND position. And then, BCM transmits buzzer output signal (light warning chime) to unified meter and A/C amp. with CAN communication line.
- Unified meter and A/C amp. transmits buzzer output signal (light warning chime) to combination meter with communication line.
- When combination meter receives buzzer output signal (light warning chime), it sounds the buzzer.



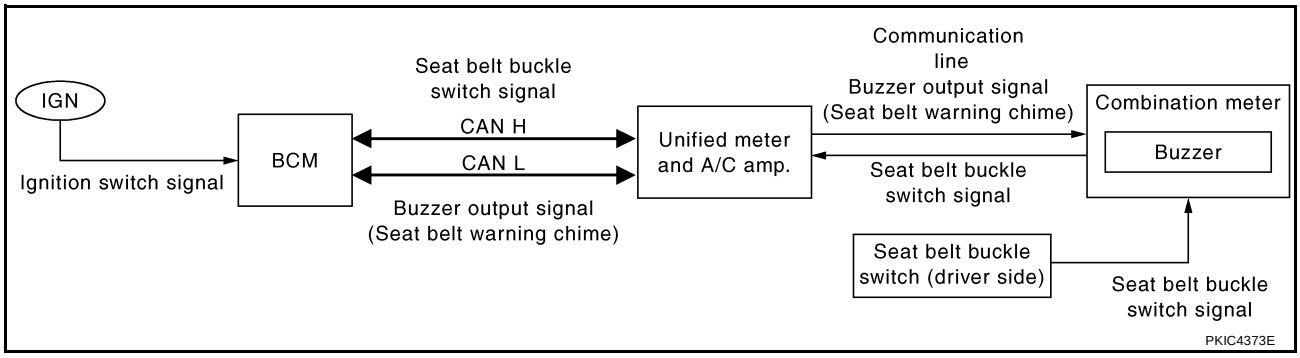
NOTE:

For further details of combination switch, refer to LT-87, "Combination Switch Reading Function" .

SEAT BELT WARNING CHIME

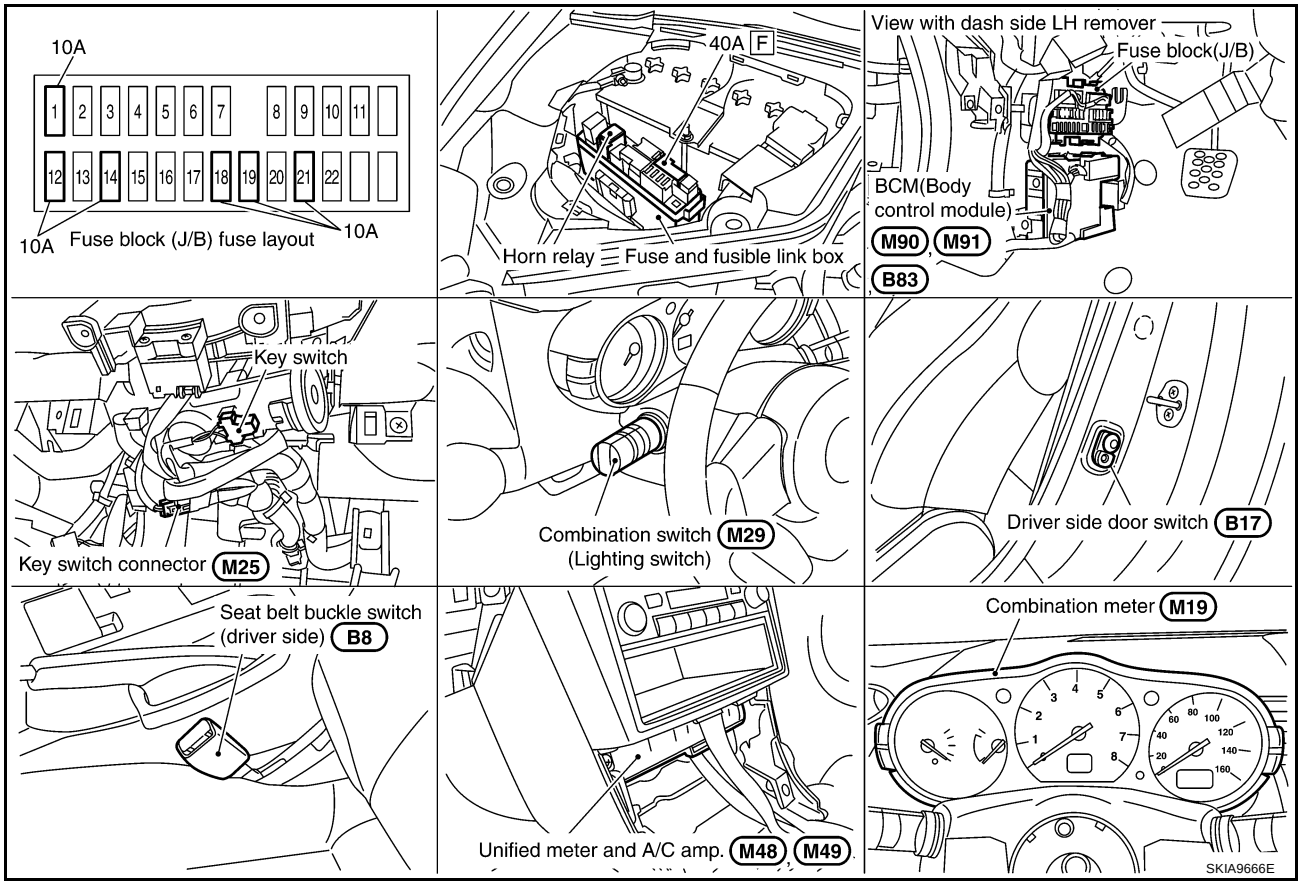
With ignition switch turned ON and driver seat belt unfastened, seat belt warning chime sounds for approximately 6 seconds.

- Combination meter reads a ON/OFF signal from seat belt buckle switch, and transmits seat belt buckle switch signal to unified meter and A/C amp. with communication line.
- BCM receives seat belt buckle switch signal (driver side) from unified meter and A/C amp. with CAN communication line.
- BCM detects ignition switch turned ON and seat belt buckle switch (driver side) ON. And then, BCM transmits buzzer output signal (seat belt warning chime) to unified meter and A/C amp. with CAN communication.
- Unified meter and A/C amp. transmits buzzer output signal (seat belt warning chime) to combination meter with communication line.
- When combination meter receives buzzer output signal (seat belt warning chime), it sounds the buzzer.



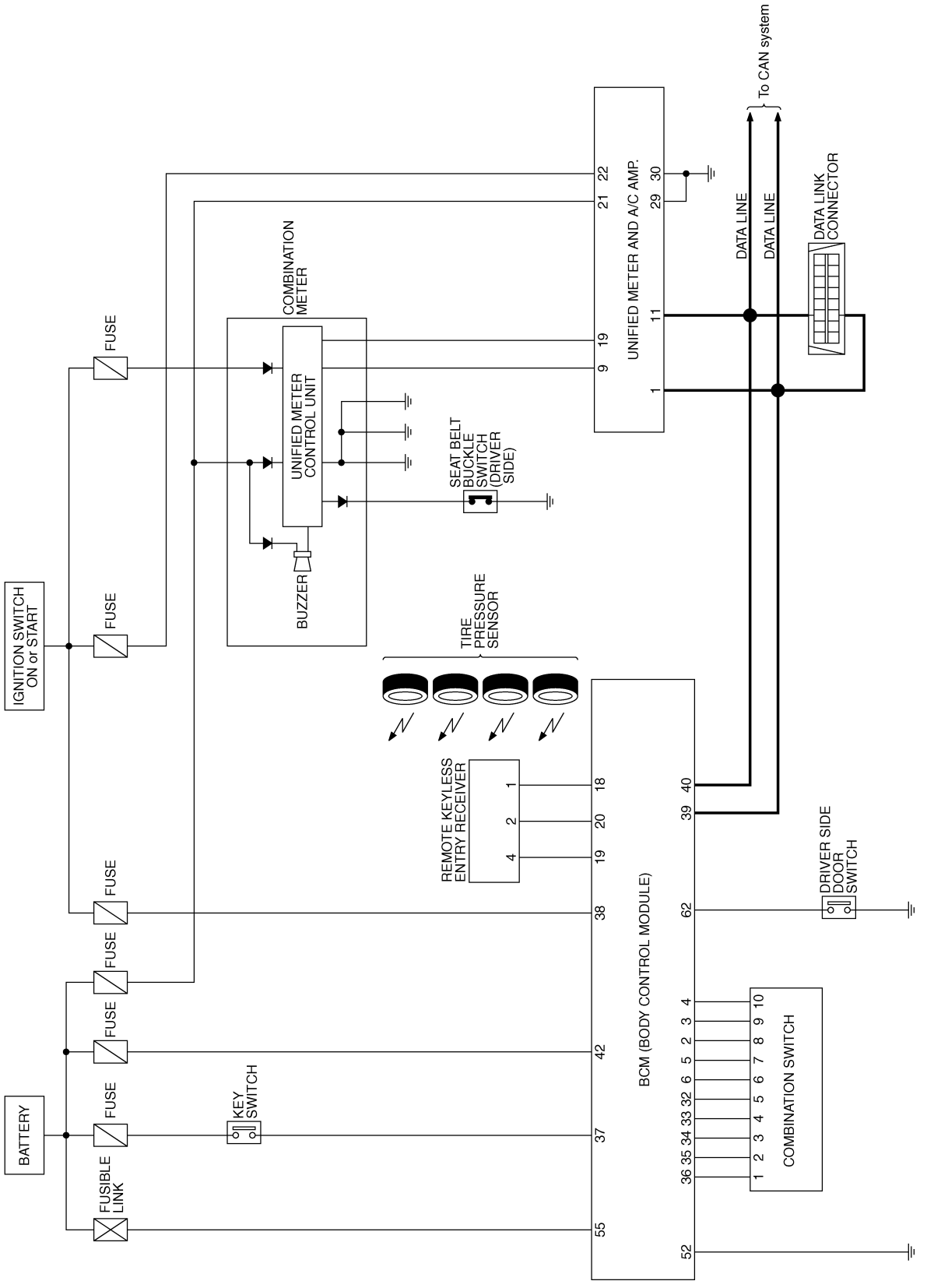
Component Parts and Harness Connector Location

NKS0007F



Schematic

NKS0007I

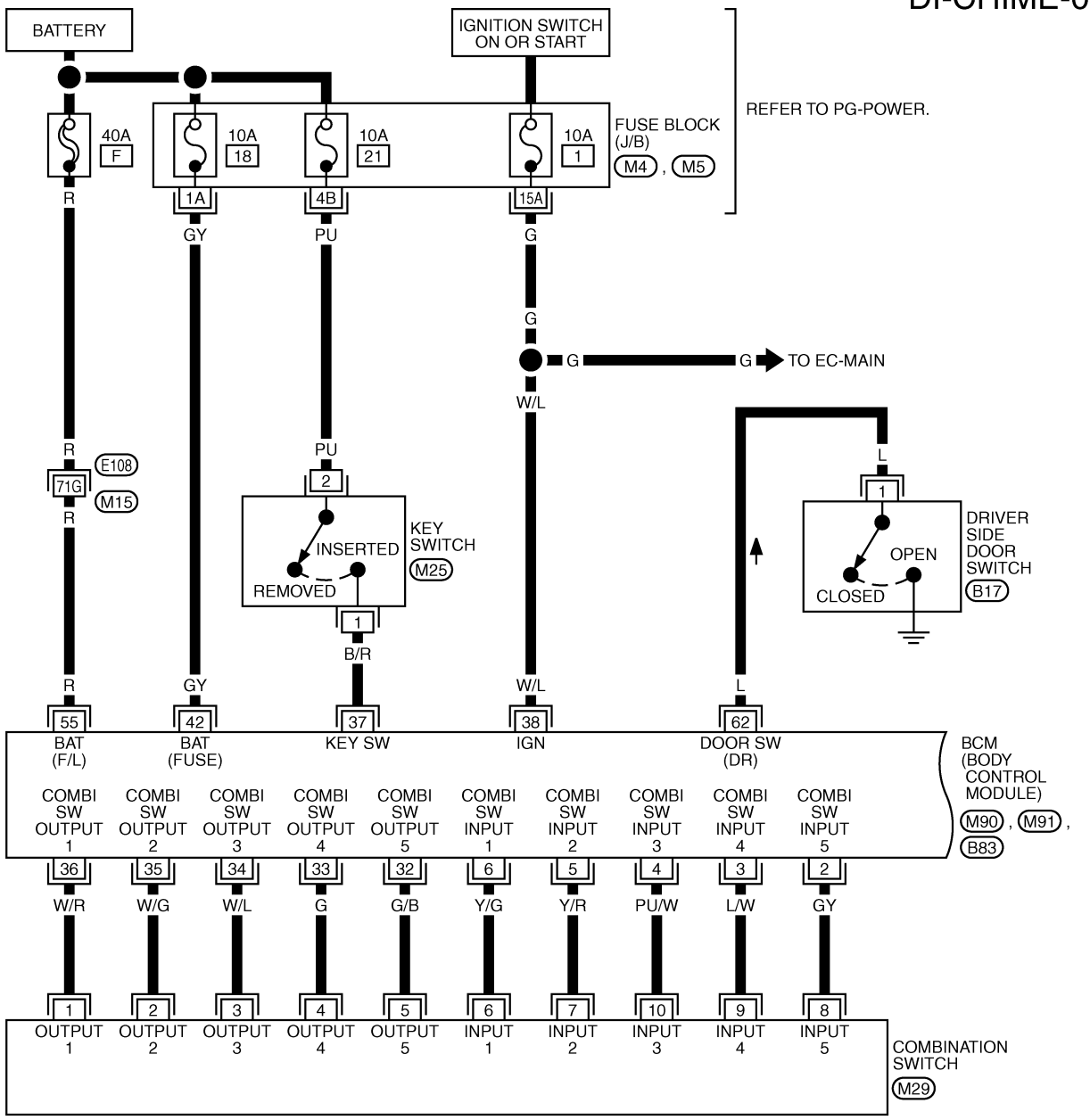


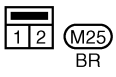
TKWT2310E

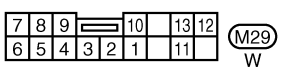
Wiring Diagram — CHIME —

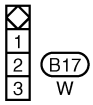
NKS004RG

DI-CHIME-01









REFER TO THE FOLLOWING.

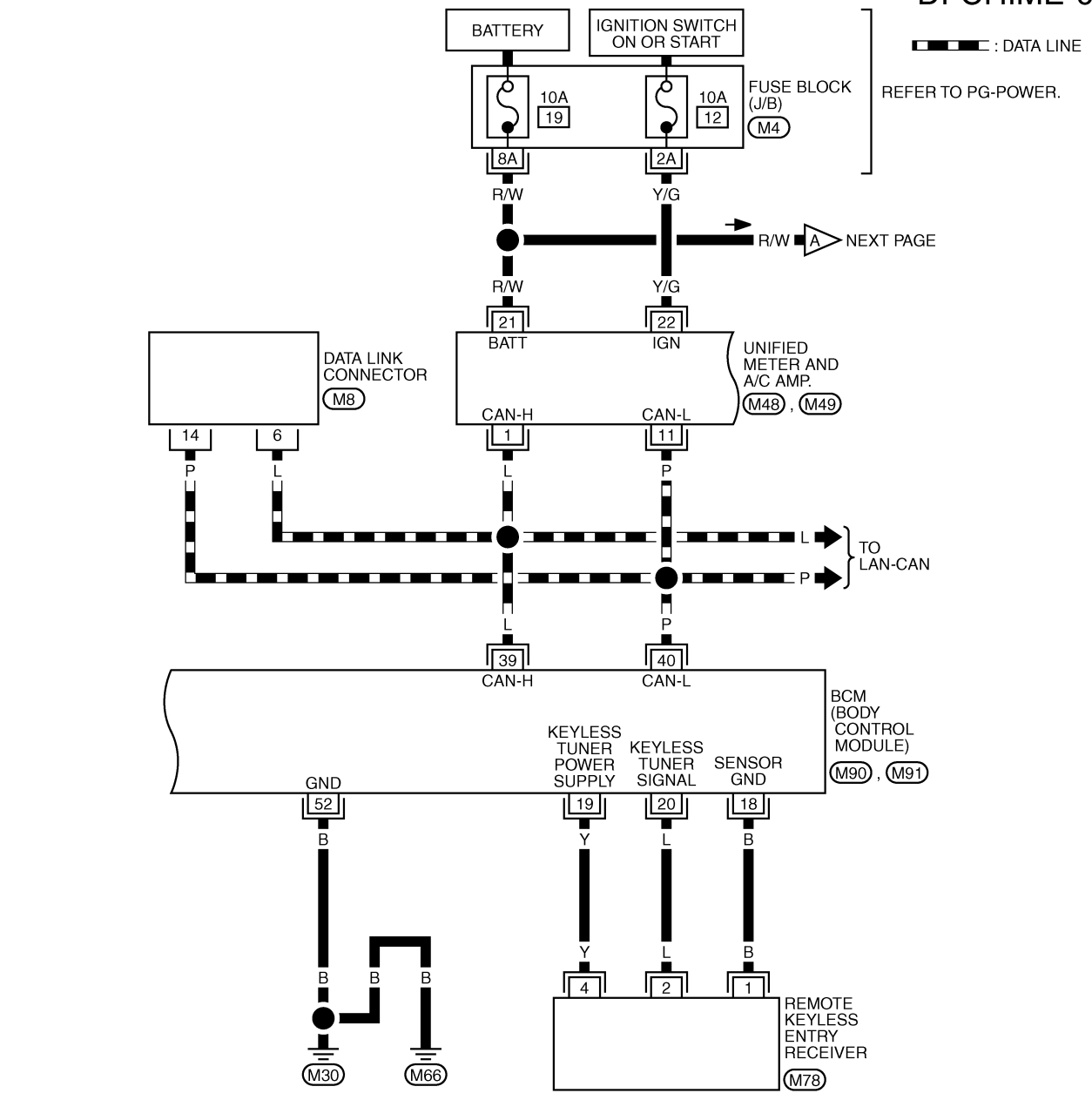
E108 -SUPER MULTIPLE JUNCTION (SMJ)

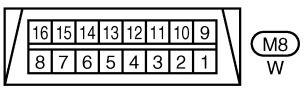
M4, M5 -FUSE BLOCK-JUNCTION BOX (J/B)

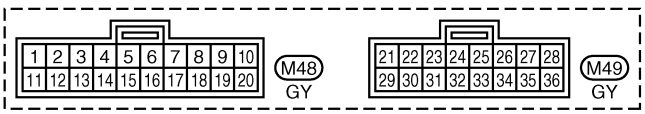
M90, M91, B83 -ELECTRICAL UNITS

TKWT5733E

DI-CHIME-02



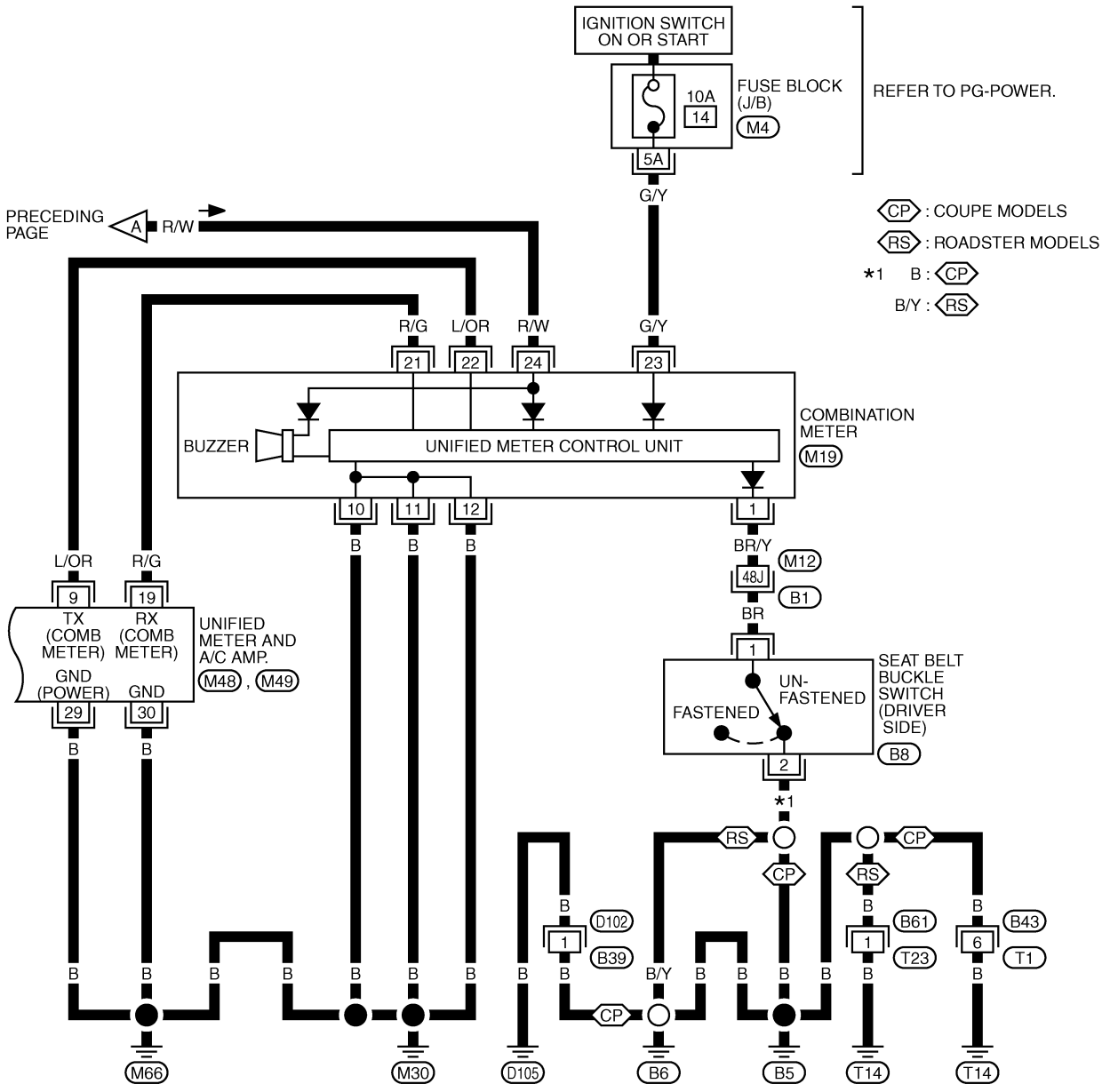


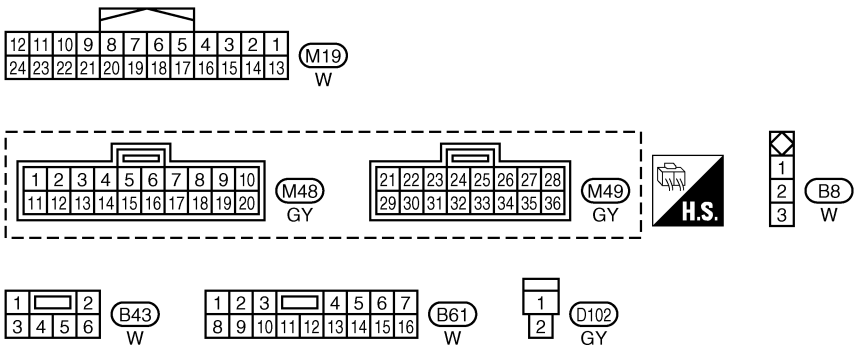


REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91 -ELECTRICAL UNITS

TKWT2312E

DI-CHIME-03





REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

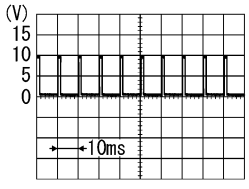
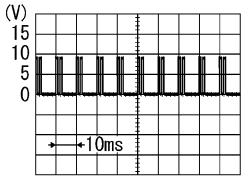
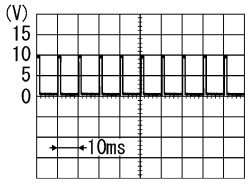
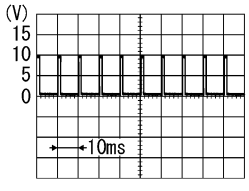
TKWT5734E

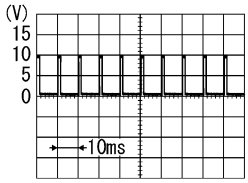
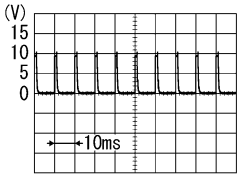
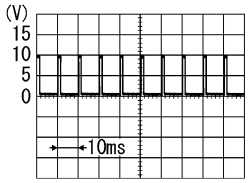
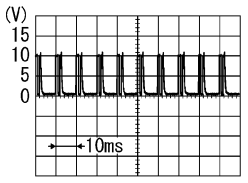
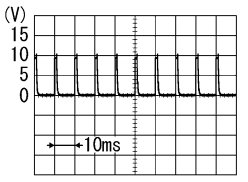
Terminals and Reference Value for BCM

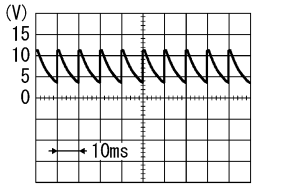
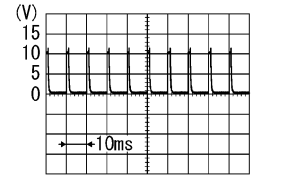
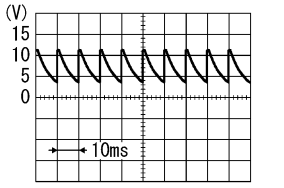
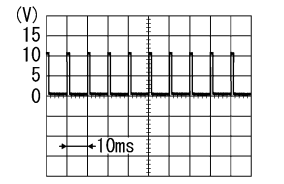
NKS0007K

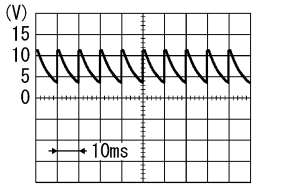
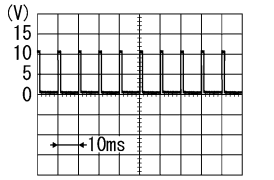
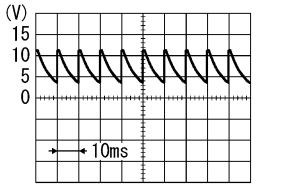
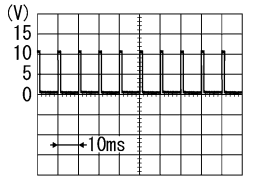
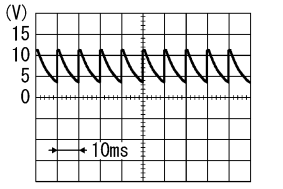
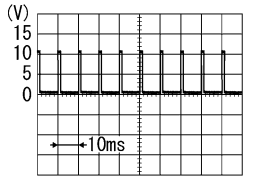
CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value (Approx.)
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch) ● Turn signal switch to right	 PKIB4959J 1.0 V
					Lighting switch 2ND	 PKIB4953J 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch) ● Turn signal switch to left	 PKIB4959J 1.0 V
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	0 V
					Any of the conditions below ● Front wiper switch MIST ● Front wiper switch INT ● Front wiper switch LO	 PKIB4959J 1.0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value (Approx.)
			Ignition switch	Operation or condition		
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	0 V
					Any of the conditions below ● Front washer switch ● Rear washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4959J 1.0 V
					Rear wiper switch ON (Wiper intermittent dial position 4)	 PKIB4955J 0.8 v
6	Y/G	Combination switch input 1	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	0 V
					Any of the conditions below ● Front wiper switch HI ● Rear wiper switch INT ● Wiper intermittent dial position 3	 PKIB4959J 1.0 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2	 PKIB4952J 1.7 V
					Any of the conditions below ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4955J 0.8 V

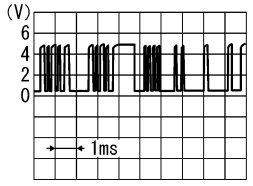
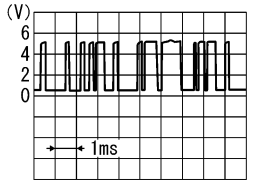
Terminal No.	Wire color	Signal name	Measuring condition			Reference value (Approx.)
			Ignition switch	Operation or condition		
18	B	Remote keyless entry receiver (Ground)	—	—		Refer to WT-20, "Control Unit Input/Output Signal Standard" .
19	Y	Remote keyless entry receiver (Power supply)				
20	L	Remote keyless entry receiver (Signal)				
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4956J 1.0 V
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J 7.2 V
					Any of the conditions below ● Lighting switch 1ST (The same result with lighting switch 2ND) ● Rear wiper switch INT ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4958J 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value (Approx.)
			Ignition switch	Operation or condition		
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch) ● Rear washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 3	 PKIB4958J 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch) ● Front wiper switch INT ● Front wiper switch HI	 PKIB4958J 1.2 V
36	W/R	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J 7.2 V
					Any of the conditions below ● Turn signal switch to right ● Turn signal switch to left ● Front wiper switch MIST ● Front wiper switch LO ● Front washer switch	 PKIB4958J 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
37	B/R	Key switch signal	OFF	Key is removed.	0 V
				Key is inserted.	12 V
38	W/L	Ignition power supply	ON	—	Battery voltage
39	L	CAN-H	—	—	—
40	P	CAN-L	—	—	—
42	GY	Battery power supply (FUSE)	OFF	—	Battery voltage
52	B	Ground	ON	—	0 V
55	R	Battery power supply (F/L)	OFF	—	Battery voltage
62	L	Driver side door switch signal	OFF	Door switch is released. (Door switch ON)	0 V
				Door switch is pressed. (Door switch OFF)	5 V

Terminals and Reference Value for Unified Meter and A/C Amp.

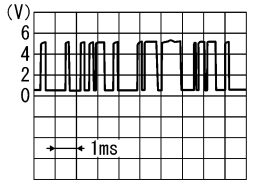
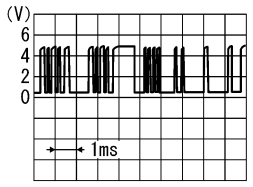
NKS0007L

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	L	CAN-H	OFF	—	—
9	L/OR	TX communication line (To combination meter)	ON	—	 SKIA3362E
11	P	CAN-L	OFF	—	—
19	R/G	RX communication line (From combination meter)	ON	—	 SKIA3361E
21	R/W	Battery power supply	OFF	—	Battery voltage
22	Y/G	Ignition power supply	ON	—	Battery voltage
29	B	Ground (POWER)	ON	—	0 V
30	B	Ground	ON	—	0 V

Terminals and Reference Value for Combination Meter

NKS0007M

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
1	BR/Y	Seat belt buckle switch (Driver side)	ON	Seat belt is unfastened.	0 V
				Seat belt is fastened.	5 V

Terminal No.	Wire color	Item	Measuring condition		Reference value (Approx.)
			Ignition switch	Operation or condition	
10	B	Ground	ON	—	0 V
11					
12					
21	R/G	TX communication line (To unified meter and A/C amp.)	ON	—	 SKIA3361E
22	L/OR	RX communication line (From unified meter and A/C amp.)	ON	—	 SKIA3362E
23	G/Y	Ignition power supply	ON	—	Battery voltage
24	R/W	Battery power supply	OFF	—	Battery voltage

CONSULT-III Function (METER A/C AMP)

NKS0007O

Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" in “UNIFIED METER AND A/C AMP”.

CONSULT-III Function (BCM)

NKS0007P

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

DIAGNOSTIC ITEMS DESCRIPTION

System	Test item	Diagnosis mode	Description
BCM	BCM	SELF-DIAG RESULT	BCM performs self-diagnosis of CAN communication.
	BUZZER	DATA MONITOR	The input data to the BCM control unit is displayed in real time.
		ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

DATA MONITOR

Display Item List

Monitor item [Unit]		ALL SIGNALS	SELECTION FROM MENU	Contents
IGN ON SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of ignition switch.
KEY ON SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of key switch.
DOOR SW-DR	[ON/OFF]	X	X	Indicates [ON/OFF] condition of driver side door switch.
LIGHT SW 1ST	[ON/OFF]	X	X	Indicates [ON/OFF] condition of lighting switch.
BUCKLE SW	[ON/OFF]	X	X	Indicates [ON/OFF] condition of seat belt switch.

ACTIVE TEST

Display Item List

Test item	Malfunction is detected when…
LIGHT WARN ALM	This test is able to check light warning chime operation.
IGN KEY WARN ALM	This test is able to check ignition key warning chime operation.
SEAT BELT WARN ALM	This test is able to check seat belt warning chime operation.

SELF-DIAGNOSTIC RESULTS

Display Item List

Display item [Code]	Malfunction is detected when…
CAN communication [U1000]	Malfunction is detected in CAN communication.

NOTE:
If “CAN communication [U1000]” is indicated, after printing the monitor item, go to “CAN system”. Refer to LAN-48, "CAN System Specification Chart" .

Trouble Diagnosis

NKS00267

HOW TO PERFORM TROUBLE DIAGNOSIS

1. Confirm the symptom and customer complaint.
2. Understand the outline of system. Refer to DI-71, "System Description" .
3. Perform the preliminary inspection. Refer to DI-84, "PRELIMINARY INSPECTION" .
4. Referring to trouble diagnosis chart, make sure the cause of the malfunction and repair or replace applicable parts. Refer to DI-84, "Symptom Chart" .
5. Does warning chime system operate normally? If yes, GO TO 6. If no, GO TO 4.
6. INSPECTION END

PRELIMINARY INSPECTION

1. CHECK BCM (CONSULT-III)

Perform self-diagnosis of BCM. Refer to BCS-15, "CONSULT-III Function (BCM)" .

Self-diagnostic results

No malfunction detected>> GO TO 2.
Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

2. CHECK UNIFIED METER AND A/C AMP. (CONSULT-III)

Perform self-diagnosis of unified meter and A/C amp. Refer to DI-47, "CONSULT-III Function (METER A/C AMP)" .

Self-diagnostic results

No malfunction detected>> INSPECTION END
Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

Symptom Chart

NKS00268

Symptom	Diagnoses/Service procedure
All warning chimes do not activate.	Perform the following inspections. 1. DI-84, "Power Supply and Ground Circuit Inspection". 2. DI-85, "Meter Buzzer Circuit Inspection". Replace BCM, found normal function in the above inspections.
Ignition key warning chime does not activate.	Perform the following inspections. 1. DI-87, "Key Switch Signal Inspection". 2. DI-86, "Driver Side Door Switch Signal Inspection". Replace BCM, found normal function in the above inspection.
Light warning chime does not activate.	Perform the following inspections. 1. DI-88, "Lighting Switch Signal Inspection". 2. DI-86, "Driver Side Door Switch Signal Inspection". Replace BCM, found normal function in the above inspection.
Seat belt warning chime does not activate.	Perform DI-88, "Seat Belt Buckle Switch (Driver Side) Signal Inspection" . Replace BCM, found normal function in the above inspection.

Power Supply and Ground Circuit Inspection

NKS00269

1. CHECK FUSE AND FUSIBLE LINK

Check for blown BCM fuse and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START	1

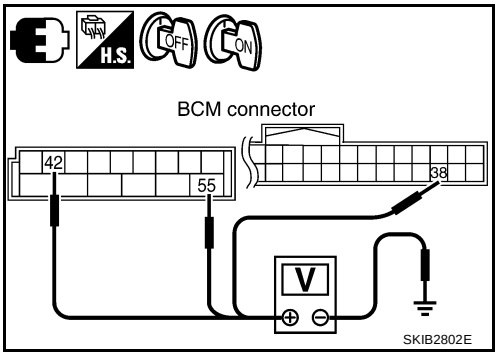
OK or NG

OK >> GO TO 2.
NG >> Be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position	
(+)		(–)	OFF	ON
Connector	Terminal (Wire color)			
M91	42	Ground	Battery voltage	Battery voltage
	55			
M90	38		0 V	Battery voltage



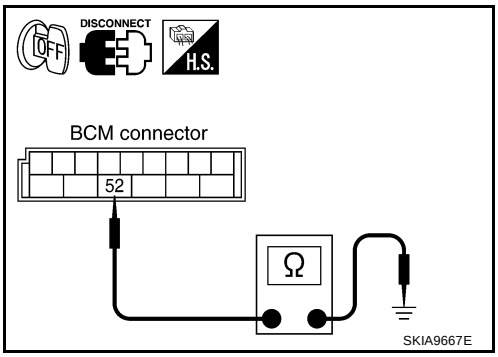
OK or NG

OK >> GO TO 3.
NG >> Repair harness between BCM and fuse.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM harness connector M91 terminal 52 and ground.

52 – Ground : Continuity should exist.



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Meter Buzzer Circuit Inspection

NKS0026F

1. CHECK OPERATION OF METER BUZZER

1. Select “BUZZER” of “BCM” on CONSULT-III.
2. Perform “LIGHT WARN ALM”, “IGN KEY WARN ALM” or “SEAT BELT WARN ALM” of “ACTIVE TEST”.

Does meter buzzer beep?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK UNIFIED METER AND A/C AMP. INPUT SIGNAL

1. Select “METER A/C AMP” on CONSULT-III.
2. With “DATA MONITOR”, confirm “BUZZER” under the condition of buzzer input. (Seat belt warning chime, turn signal lamp operate, etc.)

“BUZZER”
Under the condition of buzzer input : ON
Except above : OFF

OK or NG

OK >> Replace combination meter.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

3. CHECK BATTERY POWER SUPPLY OF COMBINATION METER

Check battery power supply of combination meter. Refer to DI-17, "Power Supply and Ground Circuit Inspection" in combination meter.

OK or NG

OK >> GO TO 4.
NG >> Repair battery power supply circuit of combination meter.

4. CHECK BATTERY POWER SUPPLY OF UNIFIED METER AND A/C AMP.

Check battery power supply of unified meter and A/C amp. Refer to DI-49, "Power Supply and Ground Circuit Inspection" in unified meter and A/C amp.

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair battery power supply circuit of unified meter and A/C amp.

Driver Side Door Switch Signal Inspection

NKS0026A

1. CHECK BCM INPUT SIGNAL

With CONSULT-III

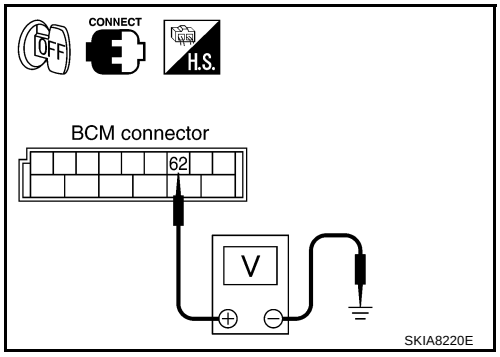
1. Select “BCM”.
2. With “DATA MONITOR” of “BUZZER”, confirm “DOOR SW-DR” when the driver side door is operated.

“DOOR SW-DR”
When driver side door is opened : ON
When driver side door is closed : OFF

Without CONSULT-III

Check voltage between BCM harness connector B83 terminal 62 and ground.

62 – Ground
When driver side door is opened : Approx. 0 V
When driver side door is closed : Approx. 5 V



OK or NG

OK >> INSPECTION END
NG >> GO TO 2.

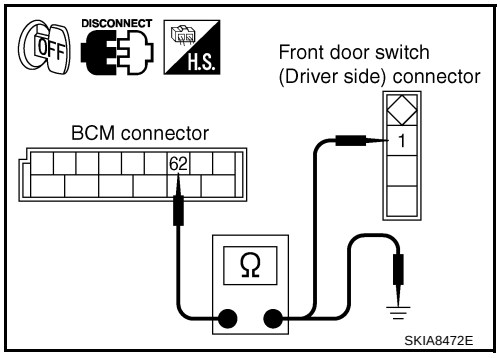
2. CHECK DRIVER SIDE DOOR SWITCH CIRCUIT

1. Disconnect BCM connector and driver side door switch connector.
2. Check continuity between BCM harness connector B83 terminal 62 and driver side door switch harness connector B17 terminal 1.

62 – 1 : Continuity should exist.

3. Check continuity between BCM harness connector B4 terminal 62 (W) and ground.

62 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK DRIVER SIDE DOOR SWITCH

Check driver side door switch. Refer to DI-90, "DRIVER SIDE DOOR SWITCH" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace driver side door switch.

Key Switch Signal Inspection

NKS0026B

1. CHECK FUSE

Check if the key switch 10A fuse [No. 21, located in the fuse block (J/B)] is blown.

OK or NG

OK >> GO TO 2.
NG >> Be sure to repair the cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK BCM INPUT SIGNAL

With CONSULT-III

1. Select “BCM”.
2. With “DATA MONITOR” of “BUZZER”, confirm “KEY ON SW” when the key switch is operated.

“KEY ON SW”

When key is inserted to ignition key cylinder : ON

When key is removed from ignition key cylinder : OFF

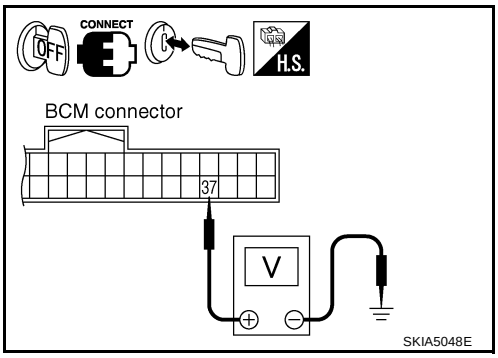
Without CONSULT-III

Check voltage between BCM harness connector M90 terminal 37 and ground.

37 – Ground

When key is inserted to ignition key cylinder : Approx. 12 V

When key is removed from ignition key cylinder : Approx. 0 V



OK or NG

OK >> INSPECTION END
NG >> GO TO 3.

3. CHECK KEY SWITCH

Check continuity between key switch. Refer to DI-90, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace key switch.

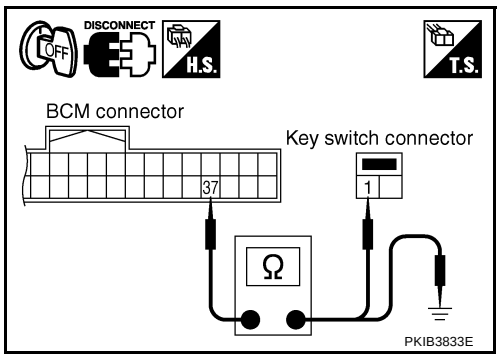
4. CHECK KEY SWITCH CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector M90 terminal 37 and key switch harness connector M25 terminal 1.

37 – 1 : Continuity should exist.

3. Check continuity between BCM harness connector M90 terminal 37 and ground.

37 – Ground : Continuity should not exist.



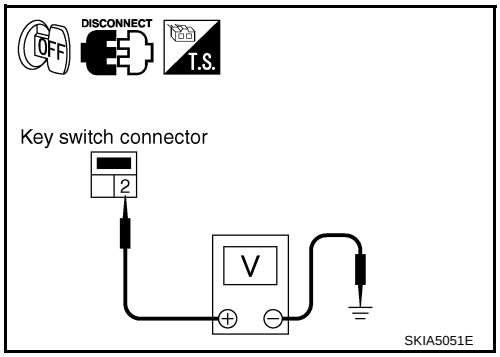
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK KEY SWITCH POWER SUPPLY CIRCUIT

Check voltage between key switch harness connector M25 terminal 2 and ground.

2 – Ground : Battery voltage



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check continuity between key switch and fuse.

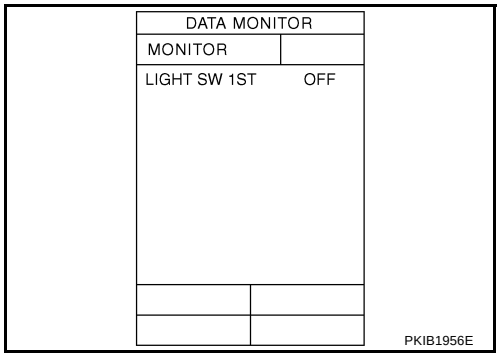
Lighting Switch Signal Inspection

NKS0026C

1. CHECK BCM INPUT SIGNAL

1. Select “BCM” on CONSULT-III.
2. With “DATA MONITOR” of “BUZZER”, confirm “LIGHT SW 1ST” when the lighting switch is operated.

“LIGHT SW 1ST”
Lighting switch (1st position) : ON
Lighting switch (OFF) : OFF



OK or NG

OK >> INSPECTION END
NG >> Check lighting switch. Refer to LT-92, "Combination Switch Inspection" .

Seat Belt Buckle Switch (Driver Side) Signal Inspection

NKS0026D

1. CHECK SEAT BELT BUCKLE SWITCH (DRIVER SIDE) SIGNAL INPUT (BCM)

1. Select “BCM” on CONSULT-III.
2. With “DATA MONITOR” of “BUZZER”, confirm “BUCKLE SW” when the seat belt buckle switch (driver side) is operated.

“BUCKLE SW”
When seat belt is fastened : OFF
When seat belt is unfastened : ON

OK or NG

OK >> INSPECTION END
NG >> GO TO 2.

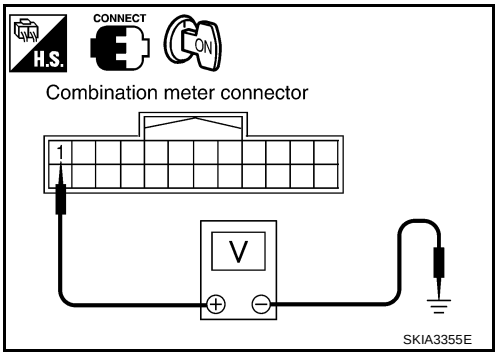
2. CHECK SEAT BELT BUCKLE SWITCH (DRIVER SIDE) SIGNAL INPUT (COMBINATION METER)

1. Turn ignition switch ON.
2. Check voltage between combination meter harness connector M19 terminal 1 and ground.

1 – Ground

When seat belt is fastened : Approx. 12 V

When seat belt is unfastened : Approx. 0 V



OK or NG

OK >> Replace combination meter.
NG >> GO TO 3.

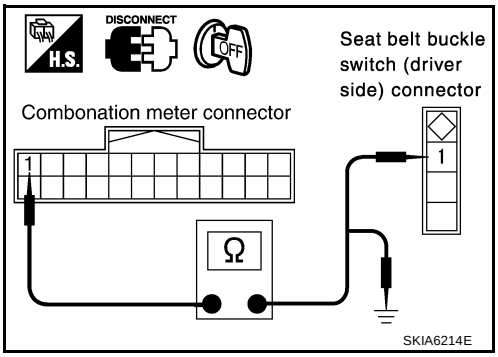
3. CHECK SEAT BELT BUCKLE SWITCH (DRIVER SIDE) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and seat belt buckle switch (driver side) connector.
3. Check continuity between combination meter harness connector M19 terminal 1 and seat belt buckle switch (driver side) harness connector B8 terminal 1.

1 – 1 : Continuity should exist.

4. Check continuity between combination meter harness connector M19 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK SEAT BELT BUCKLE SWITCH (DRIVER SIDE)

Check seat belt buckle switch (driver side). Refer to DI-90, "SEAT BELT BUCKLE SWITCH (DRIVER SIDE)" .

OK or NG

OK >> Check seat belt buckle switch (driver side) ground circuit.
NG >> Replace seat belt buckle switch (driver side).

Component Inspection

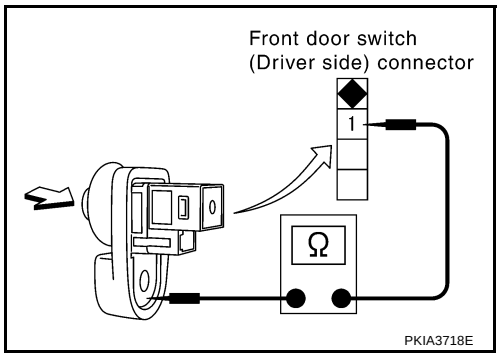
NKS0026E

DRIVER SIDE DOOR SWITCH

Check continuity between terminal 1 and door switch case ground.

1 – Door switch case ground

When driver side door switch is released	**: Continuity should exist.**
When driver side door switch is pressed	**: Continuity should not exist.**

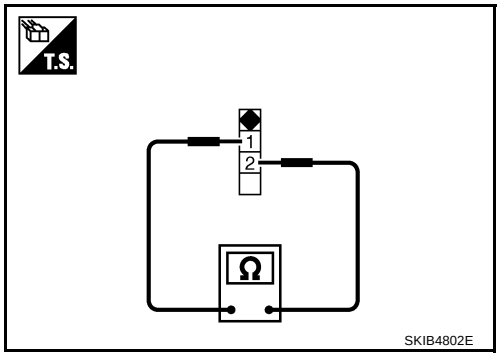


SEAT BELT BUCKLE SWITCH (DRIVER SIDE)

Check continuity between terminals 1 and 2.

1 – 2

When seat belt (driver side) is fastened	**: Continuity should not exist.**
When seat belt (driver side) is unfastened	**: Continuity should exist.**

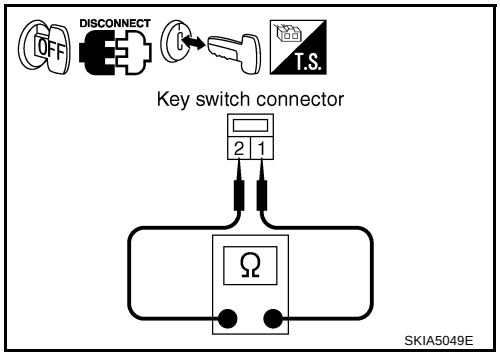


KEY SWITCH

Check continuity between key switch terminals 1 and 2.

1 – 2

When key is inserted to ignition key cylinder	**: Continuity should exist.**
When key is removed from ignition key cylinder	**: Continuity should not exist.**



CAN COMMUNICATION

PFP:23710

System Description

NKS001M6

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

NKS001M7

Refer to LAN-48, "CAN System Specification Chart" in “LAN SYSTEM”.

SECTION EC
ENGINE CONTROL SYSTEM

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NBS00027

NOTE:

- **If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC U1010 is displayed with other DTC, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

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P0850	0850	P-N POS SW/CIRCUIT	EC-520
P1078	1078	EXH TIM SEN/CIR-B1	EC-528
P1084	1084	EXH TIM SEN/CIR-B2	EC-528

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DTC*1		Items (CONSULT-III screen terms)	Reference page
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P1168	1168	CLOSED LOOP-B2	EC-540
P1211	1211	TCS C/U FUNCTN	EC-541
P1212	1212	TCS/CIRC	EC-542
P1217	1217	ENG OVER TEMP	EC-543
P1225	1225	CTP LEARNING-B1	EC-557
P1226	1226	CTP LEARNING-B1	EC-559
P1233	1233	ETC FUNCTION/CIRC-B2	EC-561
P1234	1234	CTP LEARNING-B2	EC-557
P1235	1235	CTP LEARNING-B2	EC-559
P1236	1236	ETC MOT-B2	EC-571
P1238	1238	ETC ACTR-B2	EC-580
P1239	1239	TP SENSOR-B2	EC-582
P1290	1290	ETC MOT PWR-B2	EC-592
P1421	1421	COLD START CONTROL	EC-600
P1564	1564	ASCD SW	EC-602
P1572	1572	ASCD BRAKE SW	EC-610
P1574	1574	ASCD VHL SPD SEN	EC-625
P1610 - P1615	1610 - 1615	NATS MALFUNCTION	EC-46
P1715	1715	IN PULY SPEED	EC-627
P1730	1730	A/T INTERLOCK	AT-141
P1752	1752	I/C SOLENOID/CIRC	AT-145
P1757	1757	FR/B SOLENOID/CIRC	AT-147
P1762	1762	D/C SOLENOID/CIRC	AT-149
P1767	1767	HLR/C SOL/CIRC	AT-151
P1772	1772	LC/B SOLENOID/CIRC	AT-153
P1774	1774	LC/B SOLENOID FNCT	AT-155
P1805	1805	BRAKE SW/CIRCUIT	EC-628
P2100	2100	ETC MOT PWR-B1	EC-592
P2101	2101	ETC FUNCTION/CIRC-B1	EC-561
P2103	2103	ETC MOT PWR	EC-592
P2118	2118	ETC MOT-B1	EC-571
P2119	2119	ETC ACTR-B1	EC-580
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P2123	2123	APP SEN 1/CIRC	EC-633
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P2138	2138	APP SENSOR	EC-650

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P2A03	2A03	A/F SENSOR1 (B2)	EC-659

*1: 1st trip DTC No. is the same as DTC No.
*2: This number is prescribed by SAE J2012.
*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.
*4: The troubleshooting for this DTC needs CONSULT-III.

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NOTE:

- **If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC U1010 is displayed with other DTC, first perform the diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

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A/F SEN1 HTR (B2)	P0052	0052	EC-165
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A/F SENSOR1 (B1)	P0131	0131	EC-257
A/F SENSOR1 (B1)	P0132	0132	EC-266
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A/T 3RD GR FNCTN	P0733	0733	AT-119
A/T 4TH GR FNCTN	P0734	0734	AT-121
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APP SEN 1/CIRC	P2123	2123	EC-633
APP SEN 2/CIRC	P2127	2127	EC-641
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Items (CONSULT-III screen terms)	DTC*1		Reference page
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CTP LEARNING-B1	P1226	1226	EC-559
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ETC FUNCTION/CIRC-B2	P1233	1233	EC-561
ETC MOT PWR	P2103	2103	EC-592
ETC MOT PWR-B1	P2100	2100	EC-592
ETC MOT PWR-B2	P1290	1290	EC-592
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FUEL LEVL SEN/CIRC	P0463	0463	EC-494
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MAF SEN/CIRCUIT-B2	P010B	010B	EC-197
MAF SEN/CIRCUIT-B2	P010C	010C	EC-208
MAF SEN/CIRCUIT-B2	P010D	010D	EC-208
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NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	**P0000**	**0000**	**—**
P-N POS SW/CIRCUIT	P0850	0850	EC-520
PNP SW/CIRC	P0705	0705	AT-102
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PURG VOLUME CONT/V	P0444	0444	EC-431
PURG VOLUME CONT/V	P0445	0445	EC-431
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TCC SOLENOID/CIRC	P0740	0740	AT-125
TCM	P0700	0700	AT-101
TCS C/U FUNCTN	P1211	1211	EC-541
TCS/CIRC	P1212	1212	EC-542
THERMSTAT FNCTN	P0128	0128	EC-246
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TP SEN 1/CIRC-B1	P0223	0223	EC-361
TP SEN 1/CIRC-B2	P2132	2132	EC-361
TP SEN 1/CIRC-B2	P2133	2133	EC-361
TP SEN 2/CIRC-B1	P0122	0122	EC-229
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TP SEN 2/CIRC-B2	P0227	0227	EC-229
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*1: 1st trip DTC No. is the same as DTC No.

*2: This number is prescribed by SAE J2012.
*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.
*4: The troubleshooting for this DTC needs CONSULT-III.

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NBS00029

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

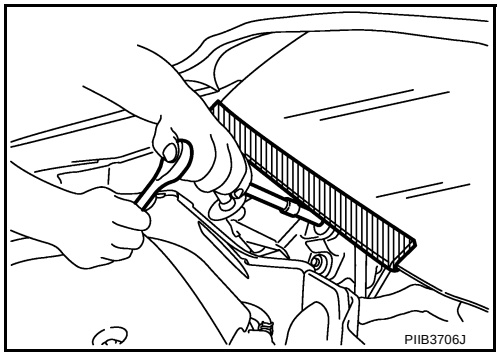
NBS0002A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NBS006TI

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



On Board Diagnostic (OBD) System of Engine and A/T

NBS0002B

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

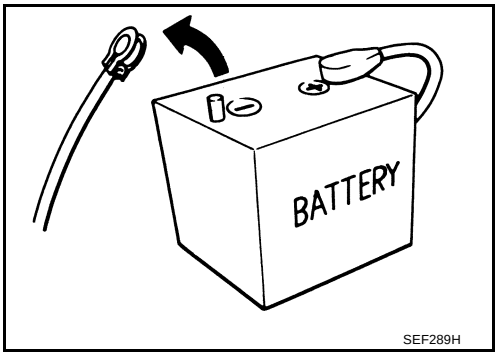
- **Be sure to turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to PG-76, "HARNESS CONNECTOR" .**
- **Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to light up due to the short circuit.**

- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to the malfunction of the EVAP system or fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.**

Precaution

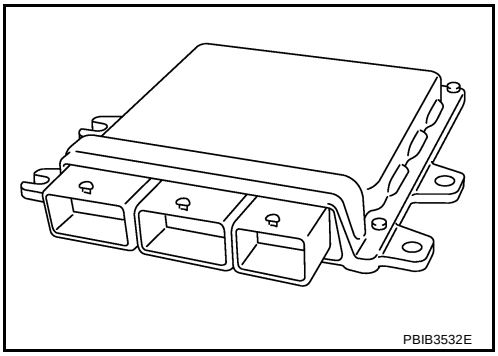
NBS0002C

- **Always use a 12 volt battery as power source.**
- **Do not attempt to disconnect battery cables while engine is running.**
- **Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect battery ground cable. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned OFF.**
- **Before removing parts, turn ignition switch OFF and then disconnect battery ground cable.**



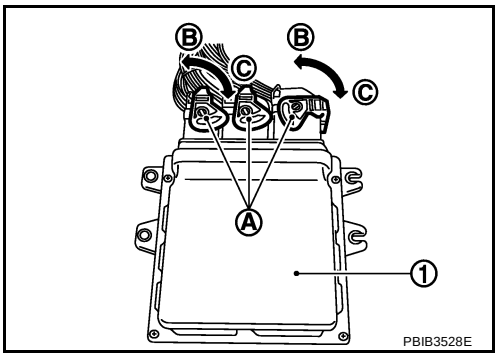
SEF289H

- **Do not disassemble ECM.**
- **If a battery cable is disconnected, the memory will return to the ECM value.**
  The ECM will now start to self-control at its initial value. Engine operation can vary slightly when the terminal is disconnected. However, this is not an indication of a malfunction. Do not replace parts because of a slight variation.
- **If the battery is disconnected, the following emission related diagnostic information will be lost within 24 hours.**
  - **Diagnostic trouble codes**
  - **1st trip diagnostic trouble codes**
  - **Freeze frame data**
  - **1st freeze frame data**
  - **System readiness test (SRT) codes**
  - **Test values**


PBIB3532E

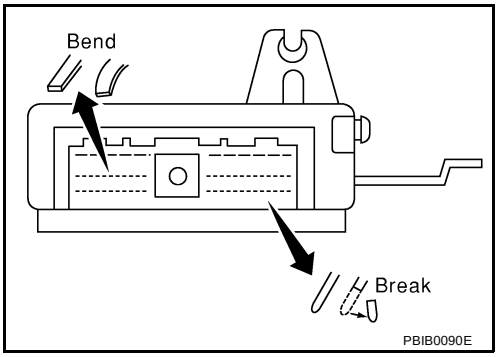
- **When connecting ECM harness connector (A), fasten (B) it securely with a lever as far as it will go as shown in the figure.**

  1 : ECM
  C : Loosen



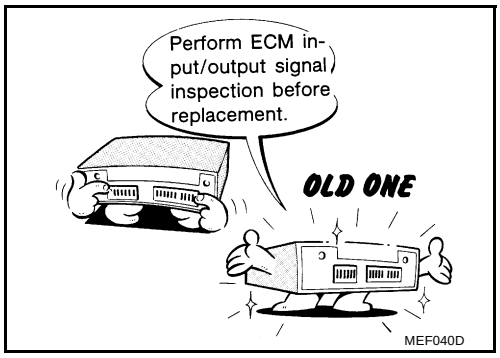
PBIB3528E

- **When connecting or disconnecting pin connectors into or from ECM, take care not to damage pin terminals (bend or break).**
  Make sure that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.
- **Securely connect ECM harness connectors.**
  A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to ICs.

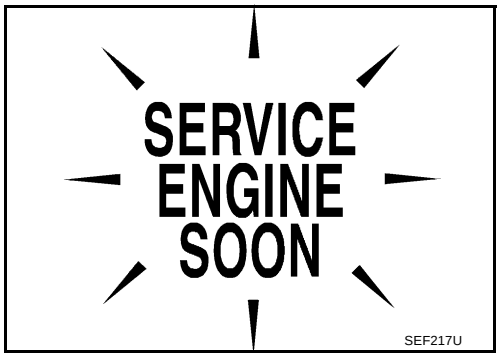


PBIB0090E

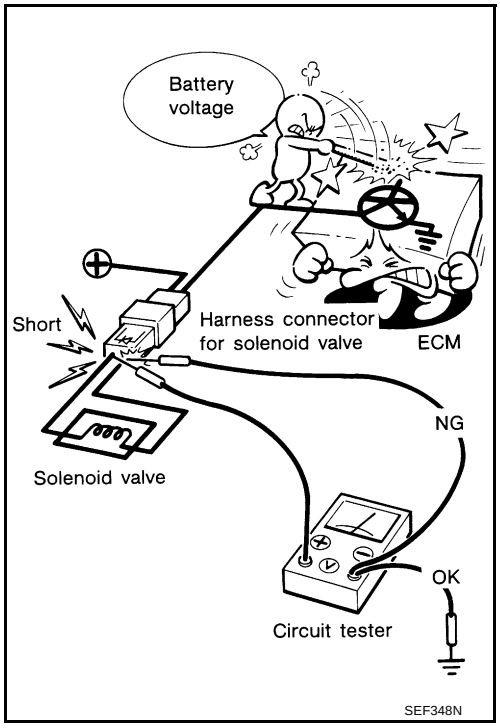
- Keep engine control system harness at least 10 cm (4 in) away from adjacent harness, to prevent engine control system malfunctions due to receiving external noise, degraded operation of ICs, etc.
- Keep engine control system parts and harness dry.
- Before replacing ECM, perform ECM Terminals and Reference Value inspection and make sure ECM functions properly. Refer to EC-103, "ECM Terminals and Reference Value".
- Handle mass air flow sensor carefully to avoid damage.
- Do not clean mass air flow sensor with any type of detergent.
- Do not disassemble electric throttle control actuator.
- Even a slight leak in the air intake system can cause serious incidents.
- Do not shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).



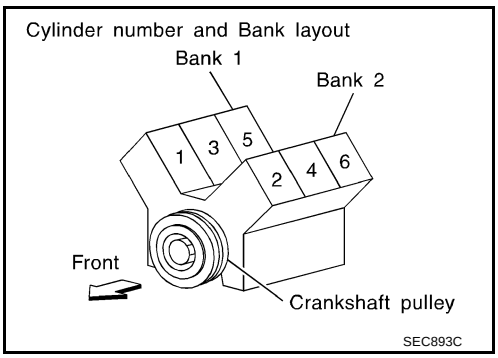
- After performing each TROUBLE DIAGNOSIS, perform DTC Confirmation Procedure or Overall Function Check.
  The DTC should not be displayed in the DTC Confirmation Procedure if the repair is completed. The Overall Function Check should be a good result if the repair is completed.



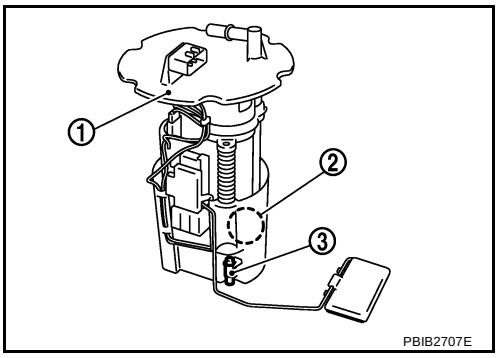
- When measuring ECM signals with a circuit tester, never allow the two tester probes to contact.
  Accidental contact of probes will cause a short circuit and damage the ECM power transistor.
- Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.



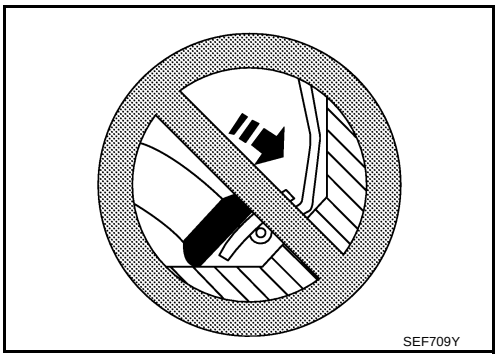
- **B1 indicates the bank 1, B2 indicates the bank 2 as shown in the figure.**



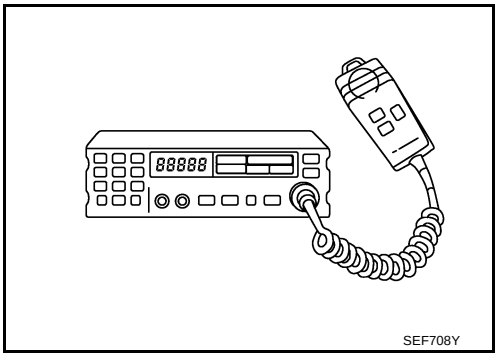
- **Do not operate fuel pump when there is no fuel in lines.**
  - 1 : Fuel level sensor unit and fuel pump
  - 2 : Fuel pressure regulator
  - 3 : Fuel tank temperature sensor
- **Tighten fuel hose clamps to the specified torque.**



- **Do not depress accelerator pedal when starting.**
- **Immediately after starting, do not rev up engine unnecessarily.**
- **Do not rev up engine just prior to shutdown.**



- **When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.**
  - **Keep the antenna as far as possible from the electronic control units.**
  - **Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls. Do not let them run parallel for a long distance.**
  - **Adjust the antenna and feeder line so that the standing-wave radio can be kept smaller.**
  - **Be sure to ground the radio to vehicle body.**



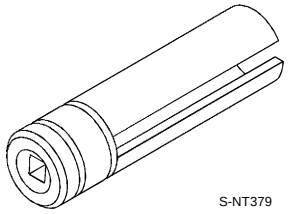
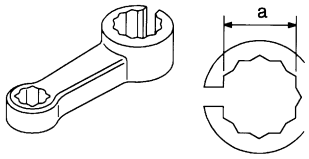
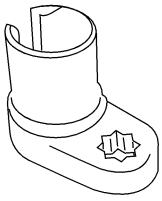
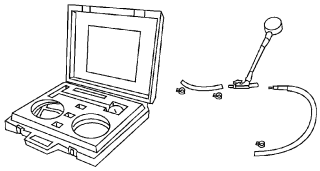
PREPARATION

PFP:00002

Special Service Tools

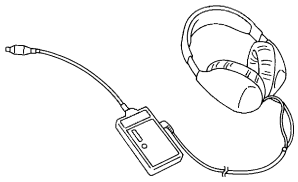
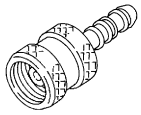
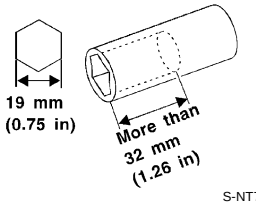
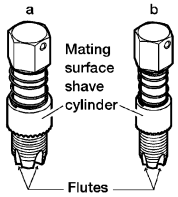
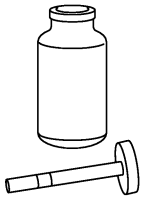
NBS0002E

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
KV10117100 (J-36471-A) Heated oxygen sensor wrench	 S-NT379	Loosening or tightening heated oxygen sensor with 22 mm (0.87 in) hexagon nut
KV10114400 (J-38365) Heated oxygen sensor wrench	 S-NT636	Loosening or tightening heated oxygen sensor **a: 22 mm (0.87 in)**
(J-44626) Air fuel ratio (A/F) sensor wrench	 LEM054	Loosening or tightening air fuel ratio (A/F) sensor 1
(J-44321) Fuel pressure gauge kit	 LEC642	Checking fuel pressure

Commercial Service Tools

NBS0002F

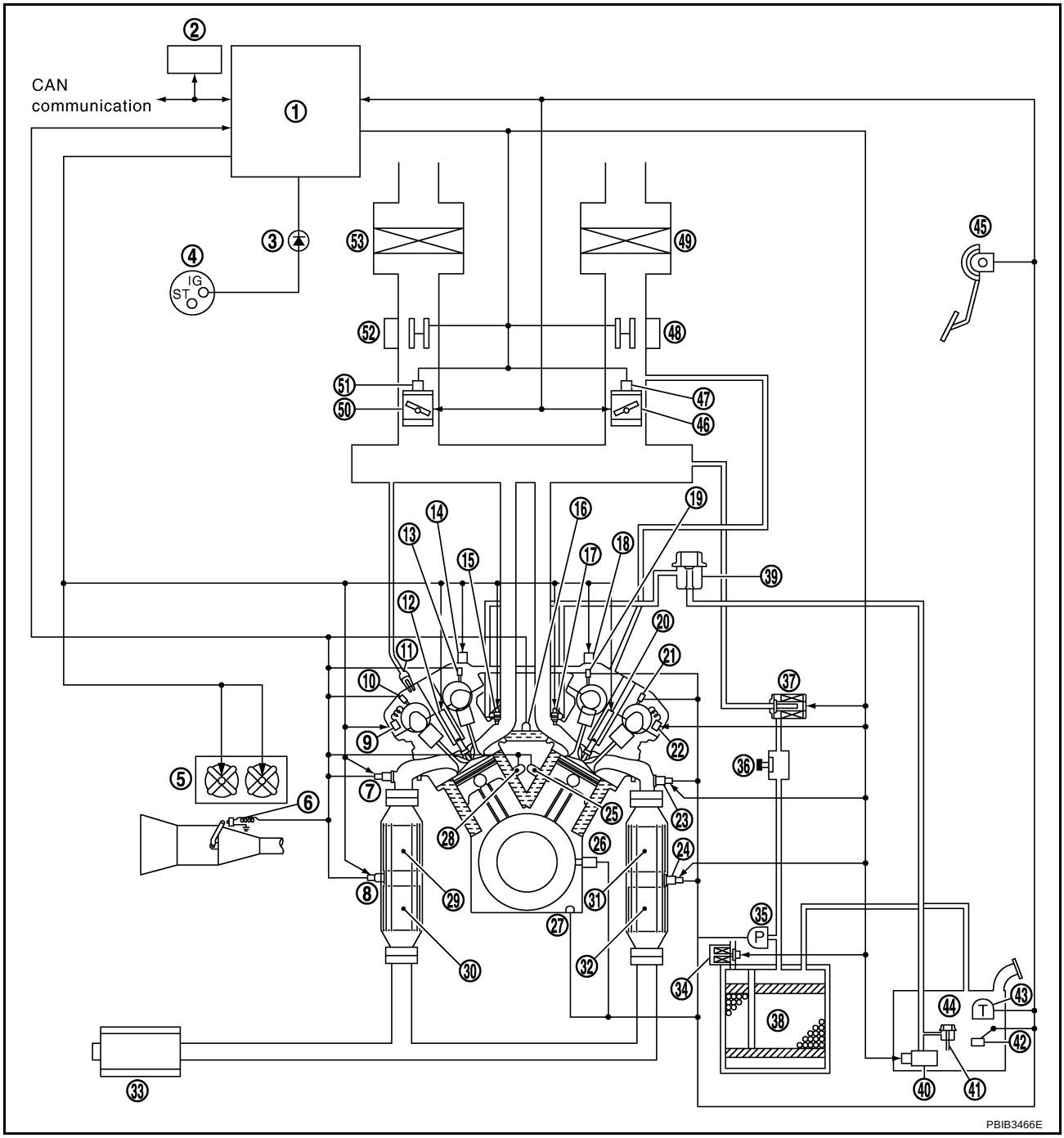
Tool name (Kent-Moore No.)		Description
Leak detector i.e.: (J-41416)	 S-NT703	Locating the EVAP leak
EVAP service port adapter i.e.: (J-41413-OBD)	 S-NT704	Applying positive pressure through EVAP service port
Fuel filler cap adapter i.e.: (MLR-8382)	 S-NT815	Checking fuel tank vacuum relief valve opening pressure
Socket wrench	 S-NT705	Removing and installing engine coolant temperature sensor
Oxygen sensor thread cleaner i.e.: (J-43897-18) (J-43897-12)	 AEM488	Reconditioning the exhaust system threads before installing a new oxygen sensor. Use with anti-seize lubricant shown below. **a: 18 mm diameter with pitch 1.5 mm for Zirconia Oxygen Sensor** **b: 12 mm diameter with pitch 1.25 mm for Titania Oxygen Sensor**
Anti-seize lubricant i.e.: (Permatex™ 133AR or equivalent meeting MIL specification MIL-A-907)	 S-NT779	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads.

ENGINE CONTROL SYSTEM

PFP:23710

System Diagram

NBS0002H



1.	ECM	2.	Data link connector	3.	MIL
4.	Ignition switch	5.	Cooling fan	6.	PNP switch
7.	A/F sensor 1	8.	Heated oxygen sensor 2	9.	Exhaust valve timing control magnet retarder
10.	Exhaust valve timing control position sensor	11.	PCV valve	12.	Spark plug
13.	Camshaft position sensor (PHASE)	14.	Intake valve timing control solenoid valve	15.	Fuel injector
16.	Engine coolant temperature sensor	17.	Fuel injector	18.	Intake valve timing control solenoid valve
19.	Camshaft position sensor (PHASE)	20.	Spark plug	21.	Exhaust valve timing control position sensor

22.	Exhaust valve timing control magnet retarder	23.	A/F sensor 1	24.	Heated oxygen sensor 2
25.	Knock sensor	26.	Crankshaft position sensor (POS)	27.	Engine oil temperature sensor
28.	Knock sensor	29.	Three way catalyst 1	30.	Three way catalyst 2
31.	Three way catalyst 1	32.	Three way catalyst 2	33.	Muffler
34.	EVAP canister vent control valve	35.	EVAP control system pressure sensor	36.	EVAP service port
37.	EVAP canister purge volume control solenoid valve	38.	EVAP canister	39.	Fuel camper
40.	Fuel pump	41.	Fuel pressure regulator	42.	Fuel level sensor
43.	Fuel tank temperature sensor	44.	Fuel tank	45.	Accelerator pedal position sensor
46.	Electric throttle control actuator	47.	Throttle position sensor	48.	Mass air flow sensor (with intake air temperature sensor)
49.	Air cleaner	50.	Electric throttle control actuator	51.	Throttle position sensor
52.	Mass air flow sensor (with intake air temperature sensor)	53.	Air cleaner		

Multiport Fuel Injection (MFI) System

NBS0002I

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed*3 Piston position	Fuel injection & mixture ratio control	Fuel injector
Camshaft position sensor (PHASE)			
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Park/neutral position (PNP) switch	Gear position		
Knock sensor	Engine knocking condition		
Battery	Battery voltage*3		
Power steering pressure sensor	Power steering operation		
Heated oxygen sensor 2*1	Density of oxygen in exhaust gas		
Air conditioner switch	Air conditioner operation*2		
Wheel sensor	Vehicle speed*2		

*1: This sensor is not used to control the engine system under normal conditions.
*2: This signal is sent to the ECM through CAN communication line.
*3: ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

The amount of fuel injected from the fuel injector is determined by the ECM. The ECM controls the length of time the valve remains open (injection pulse duration). The amount of fuel injected is a program value in the ECM memory. The program value is preset by engine operating conditions. These conditions are determined by input signals (for engine speed and intake air) from both the crankshaft position sensor and the mass air flow sensor.

VARIOUS FUEL INJECTION INCREASE/DECREASE COMPENSATION

In addition, the amount of fuel injected is compensated to improve engine performance under various operating conditions as listed below.

<Fuel increase>

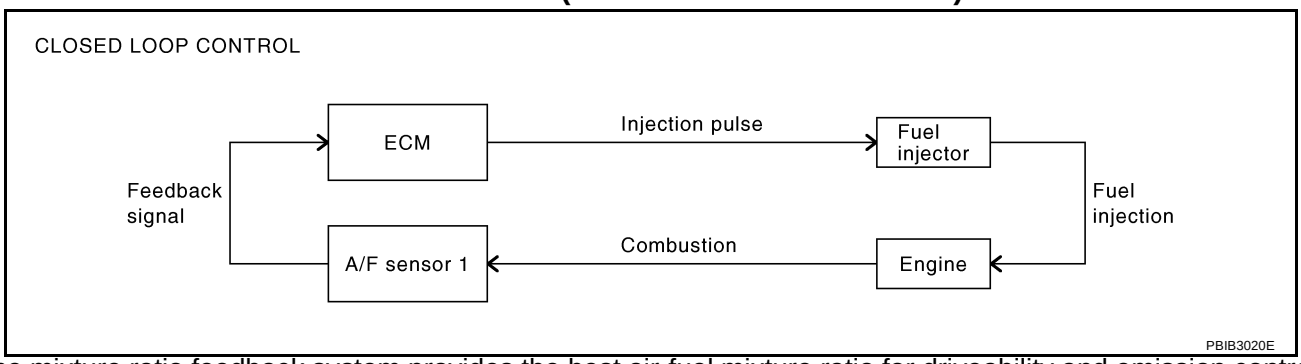
- During warm-up
- When starting the engine
- During acceleration
- Hot-engine operation

- When selector lever is changed from N to D (A/T models)
- High-load, high-speed operation

<Fuel decrease>

- During deceleration
- During high engine speed operation

MIXTURE RATIO FEEDBACK CONTROL (CLOSED LOOP CONTROL)



The mixture ratio feedback system provides the best air-fuel mixture ratio for driveability and emission control. The three way catalyst 1 can then better reduce CO, HC and NOx emissions. This system uses air fuel ratio (A/F) sensor 1 in the exhaust manifold to monitor whether the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about air fuel ratio (A/F) sensor 1, refer to EC-257, "DTC P0131, P0151 A/F SENSOR 1" . This maintains the mixture ratio within the range of stoichiometric (ideal air-fuel mixture).
This stage is referred to as the closed loop control condition.
Heated oxygen sensor 2 is located downstream of the three way catalyst 1. Even if the switching characteristics of air fuel ratio (A/F) sensor 1 shift, the air-fuel ratio is controlled to stoichiometric by the signal from heated oxygen sensor 2.

Open Loop Control

The open loop system condition refers to when the ECM detects any of the following conditions. Feedback control stops in order to maintain stabilized fuel combustion.

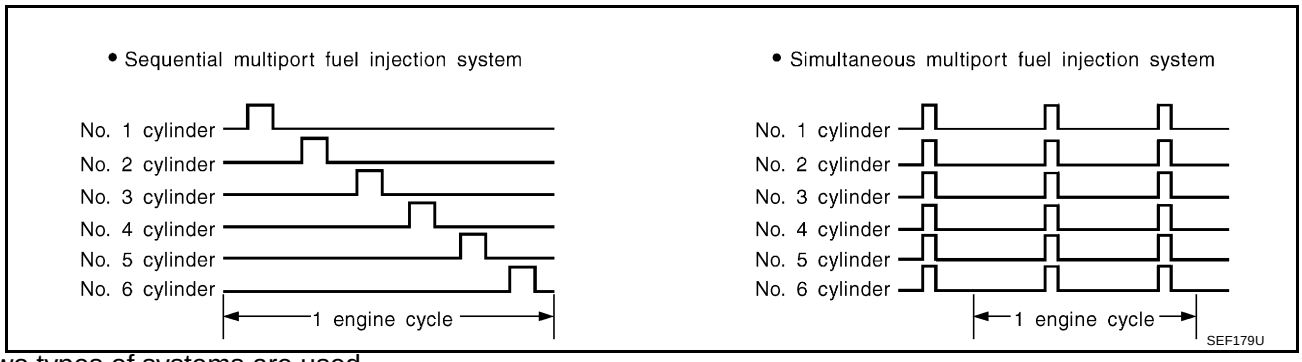
- Deceleration and acceleration
- High-load, high-speed operation
- Malfunction of air fuel ratio (A/F) sensor 1 or its circuit
- Insufficient activation of air fuel ratio (A/F) sensor 1 at low engine coolant temperature
- High engine coolant temperature
- During warm-up
- After shifting from N to D (A/T models)
- When starting the engine

MIXTURE RATIO SELF-LEARNING CONTROL

The mixture ratio feedback control system monitors the mixture ratio signal transmitted from air fuel ratio (A/F) sensor 1. This feedback signal is then sent to the ECM. The ECM controls the basic mixture ratio as close to the theoretical mixture ratio as possible. However, the basic mixture ratio is not necessarily controlled as originally designed. Both manufacturing differences (i.e., mass air flow sensor hot wire) and characteristic changes during operation (i.e., fuel injector clogging) directly affect mixture ratio.
Accordingly, the difference between the basic and theoretical mixture ratios is monitored in this system. This is then computed in terms of “injection pulse duration” to automatically compensate for the difference between the two ratios.
“Fuel trim” refers to the feedback compensation value compared against the basic injection duration. Fuel trim includes short term fuel trim and long term fuel trim.
“Short term fuel trim” is the short-term fuel compensation used to maintain the mixture ratio at its theoretical value. The signal from air fuel ratio (A/F) sensor 1 indicates whether the mixture ratio is RICH or LEAN compared to the theoretical value. The signal then triggers a reduction in fuel volume if the mixture ratio is rich, and an increase in fuel volume if it is lean.

"Long term fuel trim" is overall fuel compensation carried out long-term to compensate for continual deviation of the short term fuel trim from the central value. Such deviation will occur due to individual engine differences, wear over time and changes in the usage environment.

FUEL INJECTION TIMING



Two types of systems are used.

Sequential Multiport Fuel Injection System

Fuel is injected into each cylinder during each engine cycle according to the firing order. This system is used when the engine is running.

Simultaneous Multiport Fuel Injection System

Fuel is injected simultaneously into all six cylinders twice each engine cycle. In other words, pulse signals of the same width are simultaneously transmitted from the ECM.
The six fuel injectors will then receive the signals two times for each engine cycle.
This system is used when the engine is being started and/or if the fail-safe system (CPU) is operating.

FUEL SHUT-OFF

Fuel to each cylinder is cut off during deceleration, operation of the engine at excessively high speeds or operation of the vehicle at excessively high speeds.

Electronic Ignition (EI) System

NBS0002J

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed*2 Piston position	Ignition timing control	Power transistor
Camshaft position sensor (PHASE)			
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Knock sensor	Engine knocking		
Park/neutral position (PNP) switch	Gear position		
Battery	Battery voltage*2		
Wheel sensor	Vehicle speed*1		

*1: This signal is sent to the ECM through CAN communication line.
*2: ECM determines the start signal status by the signals of engine speed and battery voltage.

SYSTEM DESCRIPTION

Firing order: 1-2-3-4-5-6
The ignition timing is controlled by the ECM to maintain the best air-fuel ratio for every running condition of the engine. The ignition timing data is stored in the ECM.
The ECM receives information such as the injection pulse width and camshaft position sensor (PHASE) signal. Computing this information, ignition signals are transmitted to the power transistor.
During the following conditions, the ignition timing is revised by the ECM according to the other data stored in the ECM.

- At starting

- During warm-up
- At idle
- At low battery voltage
- During acceleration

The knock sensor retard system is designed only for emergencies. The basic ignition timing is programmed within the anti-knocking zone, if recommended fuel is used under dry conditions. The retard system does not operate under normal driving conditions. If engine knocking occurs, the knock sensor monitors the condition. The signal is transmitted to the ECM. The ECM retards the ignition timing to eliminate the knocking condition.

Fuel Cut Control (at No Load and High Engine Speed)

NBS0002K

INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Park/neutral position (PNP) switch	Neutral position	Fuel cut control	Fuel injector
Accelerator pedal position sensor	Accelerator pedal position		
Engine coolant temperature sensor	Engine coolant temperature		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed		
Wheel sensor	Vehicle speed*		

*: This signal is sent to the ECM through CAN communication line.

SYSTEM DESCRIPTION

If the engine speed is above 1,800 rpm under no load (for example, the shift position is neutral and engine speed is over 1,800 rpm) fuel will be cut off after some time. The exact time when the fuel is cut off varies based on engine speed.
Fuel cut will be operated until the engine speed reaches 1,500 rpm, then fuel cut will be cancelled.

NOTE:
This function is different from deceleration control listed under EC-25, "Multiport Fuel Injection (MFI) System" .

AIR CONDITIONING CUT CONTROL

PFP:23710

Input/Output Signal Chart

NBS0002L

Sensor	Input Signal to ECM	ECM function	Actuator
Air conditioner switch	Air conditioner ON signal*1	Air conditioner cut control	Air conditioner relay
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*2		
Engine coolant temperature sensor	Engine coolant temperature		
Refrigerant pressure sensor	Refrigerant pressure		
Power steering pressure sensor	Power steering operation		
Wheel sensor	Vehicle speed*1		
Battery	Battery voltage*2		

*1: This signal is sent to the ECM through CAN communication line.
*2: ECM determines the start signal status by the signal of engine speed and battery voltage.

SYSTEM DESCRIPTION

This system improves engine operation when the air conditioner is used.
Under the following conditions, the air conditioner is turned OFF.

- When the accelerator pedal is fully depressed.
- When cranking the engine.
- At high engine speeds.
- When the engine coolant temperature becomes excessively high.
- When operating power steering during low engine speed or low vehicle speed.
- When engine speed is excessively low.
- When refrigerant pressure is excessively low or high.

System Description

NBS006TJ

This system improves engine operation when the air conditioner is used.
Under the following conditions, the air conditioner is turned off.

- When the accelerator pedal is fully depressed.
- When cranking the engine.
- At high engine speeds.
- When the engine coolant temperature becomes excessively high.
- When operating power steering during low engine speed or low vehicle speed.
- When engine speed is excessively low.
- When refrigerant pressure is excessively low or high.

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

PFP:18930

System Description

NBS0002M

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
ASCD brake switch	Brake pedal operation	ASCD vehicle speed control	Electric throttle control actuator
Stop lamp switch	Brake pedal operation		
ASCD clutch switch (M/T models)	Clutch pedal operation		
ASCD steering switch	ASCD steering switch operation		
Park/neutral position (PNP) switch	Gear position		
Wheel sensor.	Vehicle speed*		
TCM (A/T models)	Powertrain revolution*		

*: This signal is sent to the ECM through CAN communication line.

BASIC ASCD SYSTEM

Refer to Owner's Manual for ASCD operating instructions.
Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal. Driver can set vehicle speed in advance between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH).
ECM controls throttle angle of electric throttle control actuator to regulate engine speed.
Operation status of ASCD is indicated by CRUISE indicator and SET indicator in combination meter. If any malfunction occurs in ASCD system, it automatically deactivates control.

NOTE:
Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws.

SET OPERATION

Press MAIN switch. (The CRUISE indicator in combination meter illuminates.)
When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press SET/COAST switch. (Then SET indicator in combination meter illuminates.)

ACCELERATE OPERATION

If the RESUME/ACCELERATE switch is pressed during cruise control driving, increase the vehicle speed until the switch is released or vehicle speed reaches maximum speed controlled by the system.
And then ASCD will keep the new set speed.

CANCEL OPERATION

When any of following conditions exist, cruise operation will be canceled.

- CANCEL switch is pressed
- More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared)
- Brake pedal is depressed
- Clutch pedal is depressed or gear position is changed to the neutral position (M/T models)
- Selector lever is changed to N, P, R position (A/T models)
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
- VDC/TCS system is operated

When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking indicator lamp.

- Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE lamp may blink slowly.
  When the engine coolant temperature decreases to the normal operating temperature, CRUISE lamp will stop blinking and the cruise operation will be able to work by pressing SET/COAST switch or RESUME/ACCELERATE switch.
- Malfunction for some self-diagnoses regarding ASCD control: SET lamp will blink quickly.

If MAIN switch is turned to OFF during ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

COAST OPERATION

When the SET/COAST switch is pressed during cruise control driving, decrease vehicle set speed until the switch is released. And then ASCD will keep the new set speed.

RESUME OPERATION

When the RESUME/ACCELERATE switch is pressed after cancel operation other than pressing MAIN switch is performed, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- Brake pedal is released
- Clutch pedal is released (M/T models)
- A/T selector lever is in other than P and N positions (A/T models)
- Vehicle speed is greater than 40 km/h (25 MPH) and less than 144 km/h (89 MPH)

Component Description

NBS0002N

ASCD STEERING SWITCH

Refer to EC-602

ASCD BRAKE SWITCH

Refer to EC-610 and EC-671 .

ASCD CLUTCH SWITCH

Refer to EC-610 and EC-671 .

STOP LAMP SWITCH

Refer to EC-610 , EC-628 and EC-671 .

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EC-561 , EC-571 , EC-580 and EC-592 .

ASCD INDICATOR

Refer to EC-681 .

CAN COMMUNICATION

PFP:23710

System Description

NBS0002O

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
Refer to LAN-48, "CAN System Specification Chart" , about CAN communication for detail.

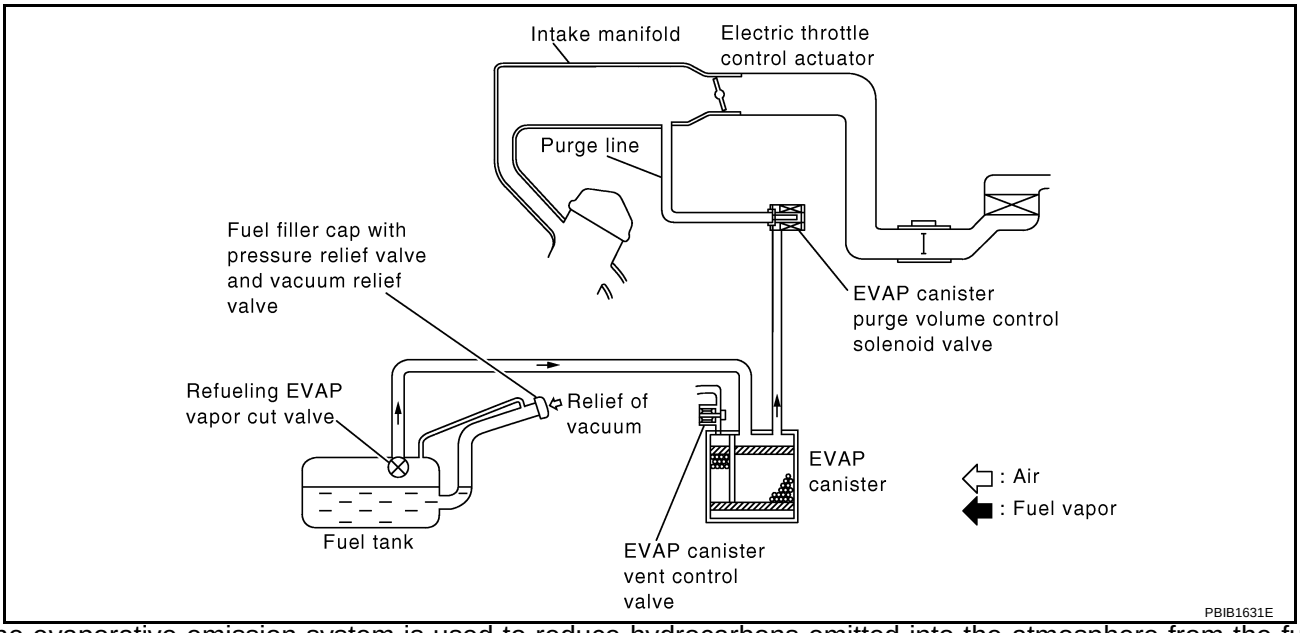
EVAPORATIVE EMISSION SYSTEM

PFP:14950

Description

NBS0002P

SYSTEM DESCRIPTION



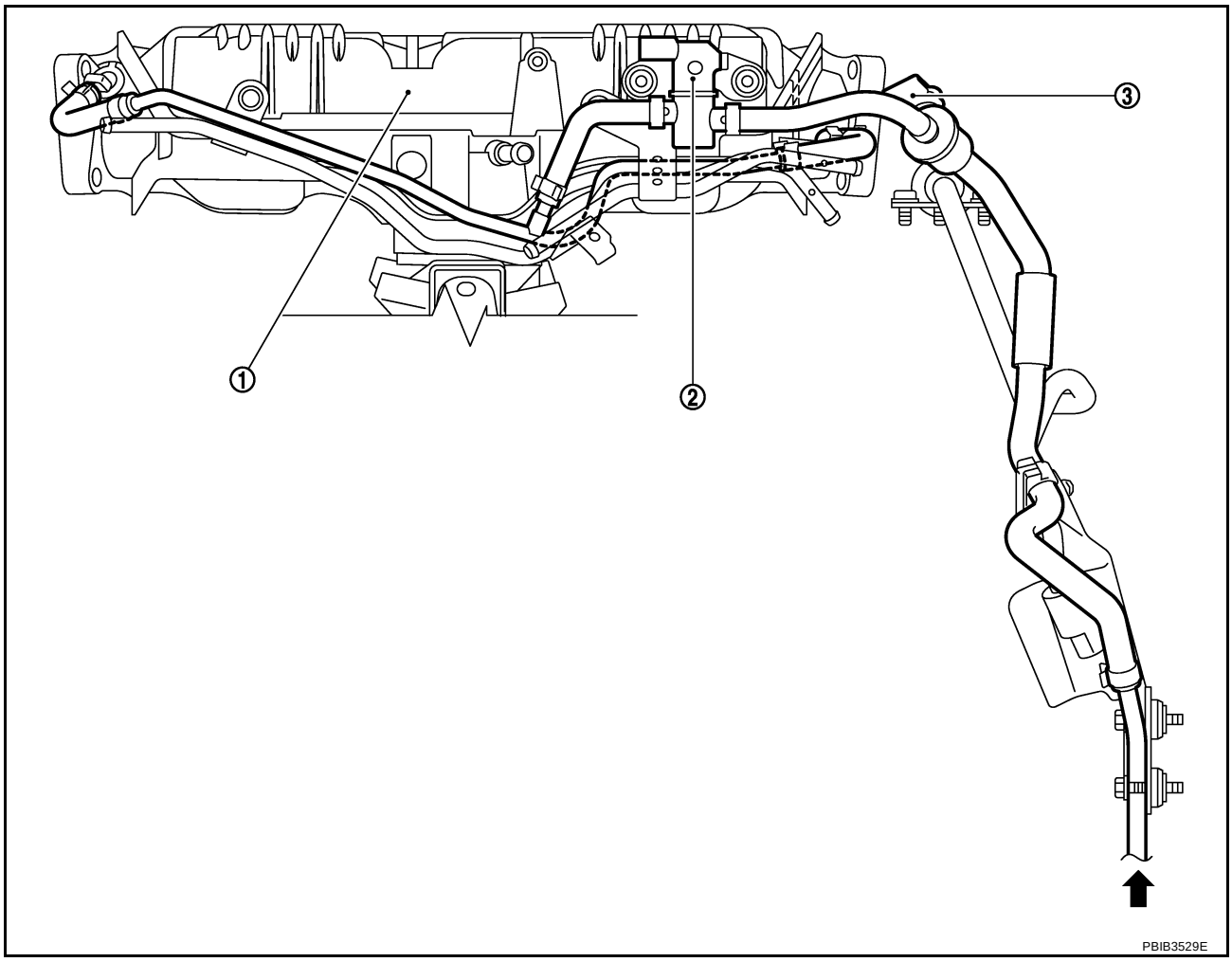
The evaporative emission system is used to reduce hydrocarbons emitted into the atmosphere from the fuel system. This reduction of hydrocarbons is accomplished by activated charcoals in the EVAP canister.

The fuel vapor in the sealed fuel tank is led into the EVAP canister which contains activated carbon and the vapor is stored there when the engine is not operating or when refueling to the fuel tank.

The vapor in the EVAP canister is purged by the air through the purge line to the intake manifold when the engine is operating. EVAP canister purge volume control solenoid valve is controlled by ECM. When the engine operates, the flow rate of vapor controlled by EVAP canister purge volume control solenoid valve is proportionally regulated as the air flow increases.

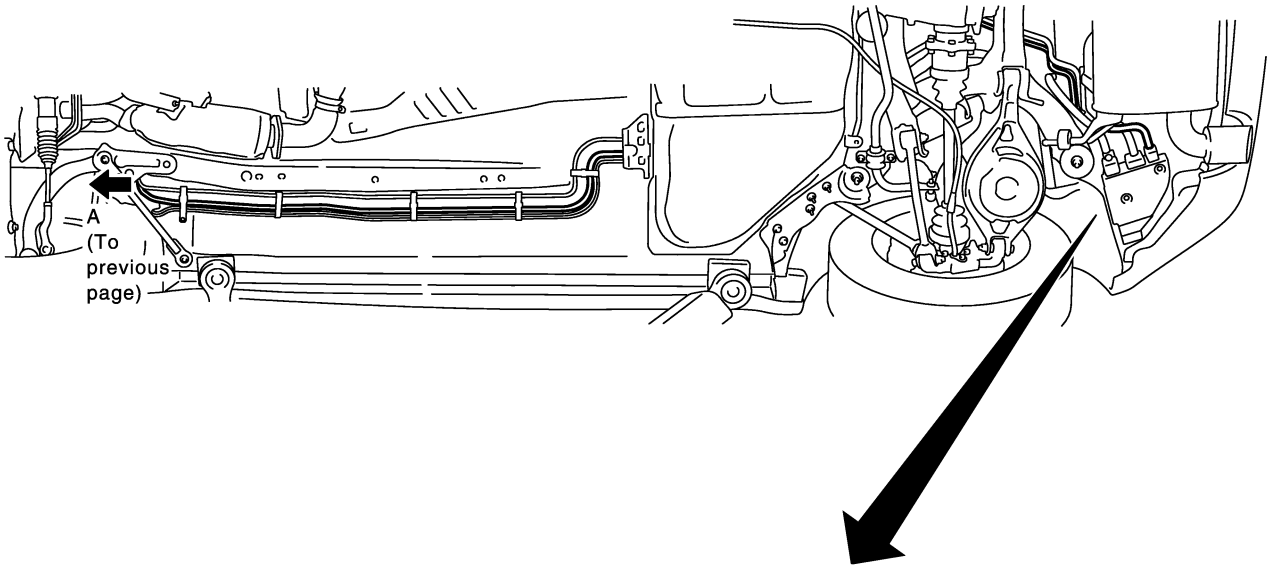
EVAP canister purge volume control solenoid valve also shuts off the vapor purge line during decelerating and idling.

EVAPORATIVE EMISSION LINE DRAWING

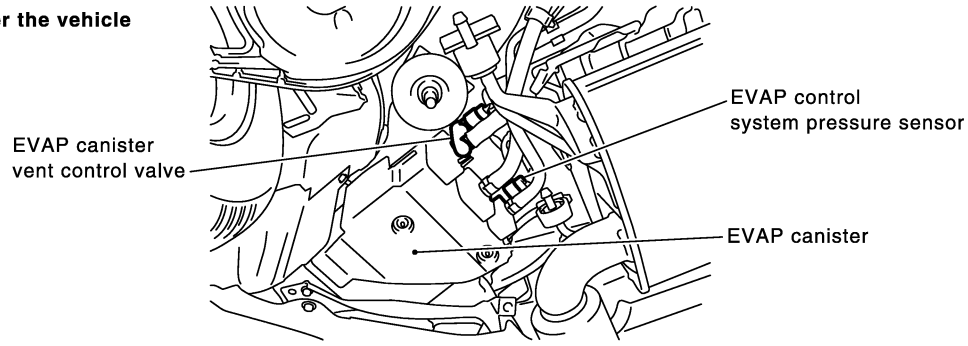


1. Intake manifold collector
2. EVAP canister purge volume control solenoid valve
3. EVAP service port

⬅: From next page



View from under the vehicle



PBIB1066E

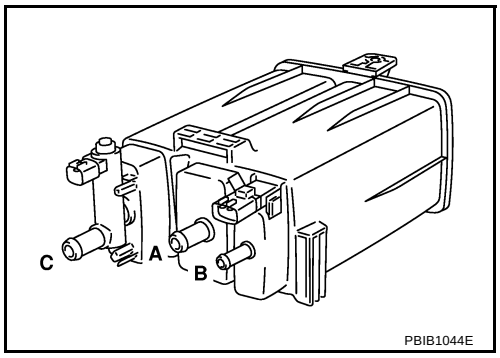
Component Inspection

NBS0002Q

EVAP CANISTER

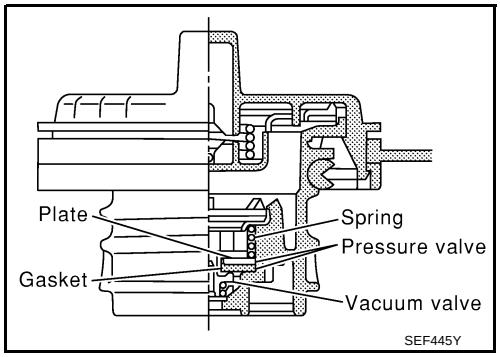
Check EVAP canister as follows:

1. Block port **B** .
2. Blow air into port **A** and check that it flows freely out of port **C** .
3. Release blocked port **B** .
4. Apply vacuum pressure to port **B** and check that vacuum pressure exists at the ports **A** and **C** .
5. Block port **A** and **B** .
6. Apply pressure to port **C** and check that there is no leakage.



FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)

1. Wipe clean valve housing.

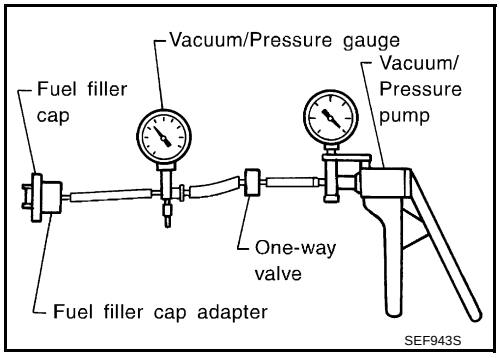


2. Check valve opening pressure and vacuum.

Pressure: **15.3 - 20.0 kPa (0.156 - 0.204 kg/cm^2 , 2.22 - 2.90 psi)**

Vacuum: **–6.0 to –3.3 kPa (–0.061 to –0.034 kg/cm^2 , –0.87 to –0.48 psi)**

3. If out of specification, replace fuel filler cap as an assembly.



CAUTION:

Use only a genuine fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436 .

FUEL TANK TEMPERATURE SENSOR

Refer to EC-347 .

EVAP CANISTER VENT CONTROL VALVE

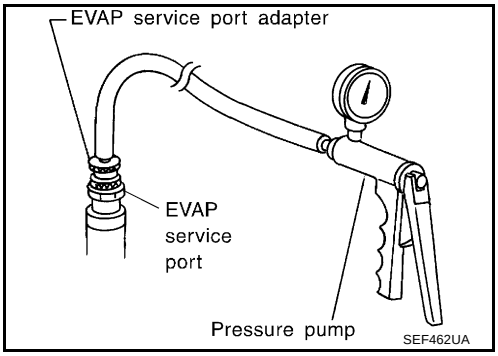
Refer to EC-442 .

EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455 .

EVAP SERVICE PORT

Positive pressure is delivered to the EVAP system through the EVAP service port. If fuel vapor leakage in the EVAP system occurs, use a leak detector to locate the leak.

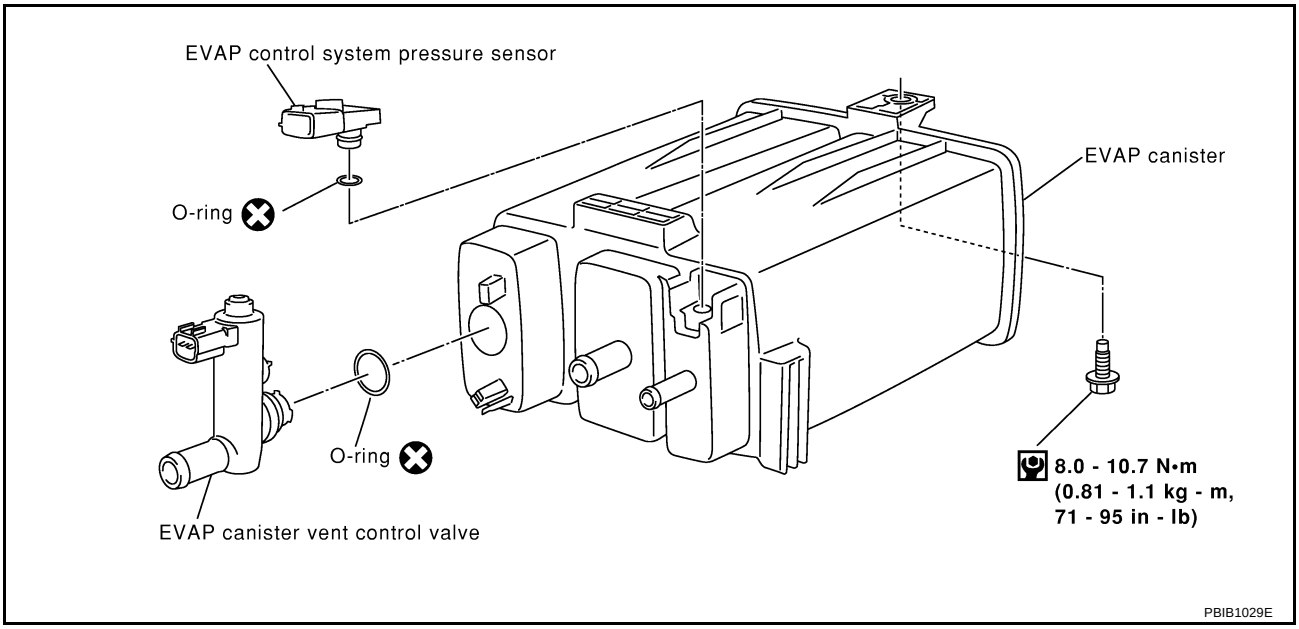


Removal and Installation

NBS0002R

EVAP CANISTER

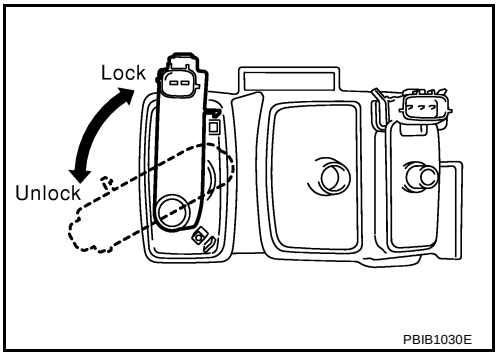
Tighten EVAP canister as shown in the figure.



EVAP CANISTER VENT CONTROL VALVE

1. Turn EVAP canister vent control valve counterclockwise.
2. Remove the EVAP canister vent control valve.

Always replace O-ring with a new one.



How to Detect Fuel Vapor Leakage

NBS0002S

CAUTION:

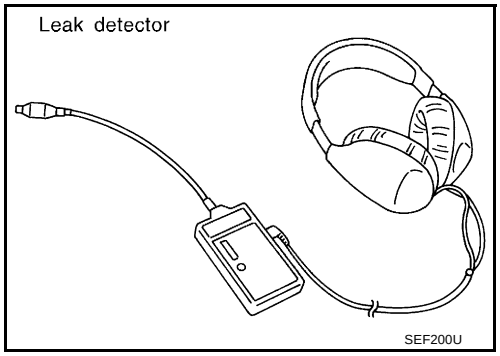
- **Never use compressed air or a high pressure pump.**
- **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in EVAP system.**

NOTE:

- Do not start engine.
- Improper installation of EVAP service port adapter to the EVAP service port may cause a leak.

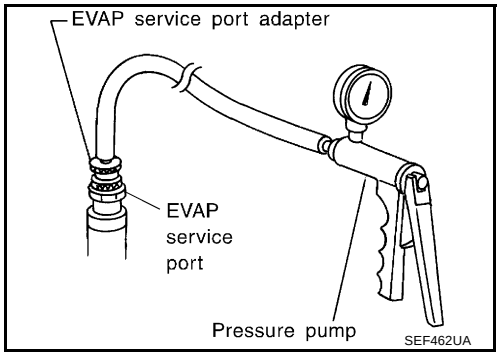
WITH CONSULT-III

1. Attach the EVAP service port adapter securely to the EVAP service port.
2. Also attach the pressure pump and hose to the EVAP service port adapter.
3. Turn ignition switch ON.
4. Select the “EVAP SYSTEM CLOSE” of “WORK SUPPORT MODE” with CONSULT-III.
5. Touch “START”. A bar graph (Pressure indicating display) will appear on the screen.
6. Apply positive pressure to the EVAP system until the pressure indicator reaches the middle of the bar graph.
7. Remove EVAP service port adapter and hose with pressure pump.
8. Locate the leak using a leak detector. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

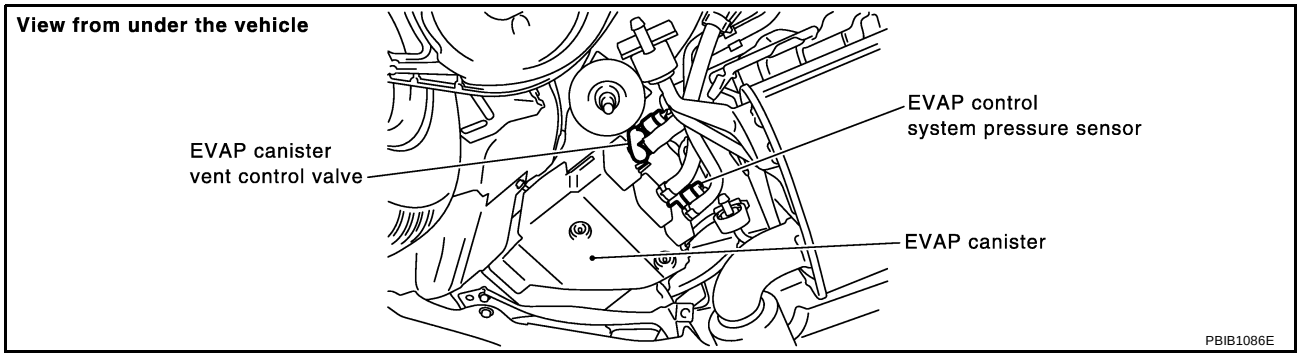


WITHOUT CONSULT-III

1. Attach the EVAP service port adapter securely to the EVAP service port.
2. Also attach the pressure pump with pressure gauge to the EVAP service port adapter.



3. Apply battery voltage between the terminals of EVAP canister vent control valve to make a closed EVAP system.



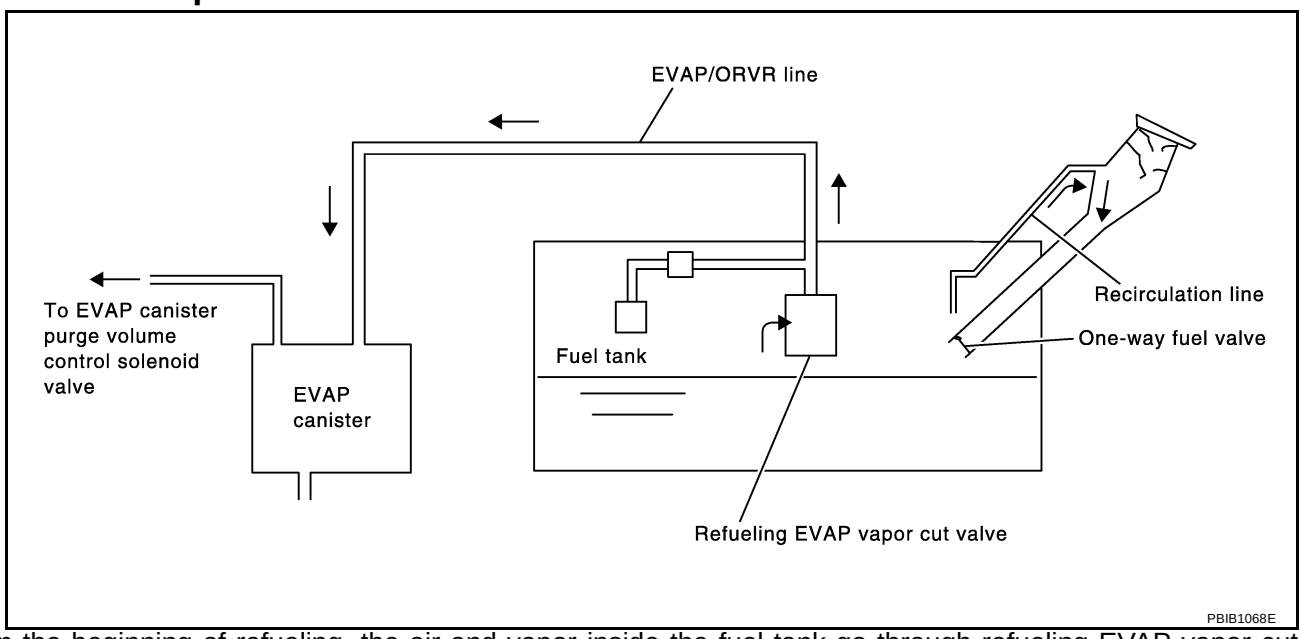
4. To locate the leak, deliver positive pressure to the EVAP system until pressure gauge points reach 1.38 to 2.76 kPa (0.014 to 0.028 kg/cm^2 , 0.2 to 0.4 psi).
5. Remove EVAP service port adapter and hose with pressure pump.
6. Locate the leak using a leak detector. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

PFP:00032

System Description

NBS0002T



From the beginning of refueling, the air and vapor inside the fuel tank go through refueling EVAP vapor cut valve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the EVAP canister and the air is released to the atmosphere.

When the refueling has reached the full level of the fuel tank, the refueling EVAP vapor cut valve is closed and refueling is stopped because of auto shut-off. The vapor which was absorbed by the EVAP canister is purged during driving.

WARNING:

When conducting inspections below, be sure to observe the following:

- **Put a “CAUTION: FLAMMABLE” sign in workshop.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.**
- **Be sure to furnish the workshop with a CO_2 fire extinguisher.**

CAUTION:

- **Before removing fuel line parts, carry out the following procedures:**
  - **Put drained fuel in an explosion-proof container and put lid on securely.**
  - **Release fuel pressure from fuel line. Refer to EC-79, "FUEL PRESSURE RELEASE" .**
  - **Disconnect battery ground cable.**
- **Always replace O-ring when the fuel gauge retainer is removed.**
- **Do not kink or twist hose and tube when they are installed.**
- **Do not tighten hose and clamps excessively to avoid damaging hoses.**
- **After installation, run engine and check for fuel leaks at connection.**
- **Do not attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically. Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.**

Diagnostic Procedure

NBS0002U

SYMPTOM: FUEL ODOR FROM EVAP CANISTER IS STRONG.

1. CHECK EVAP CANISTER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
   The weight should be less than 2.2 kg (4.9 lb).

OK or NG

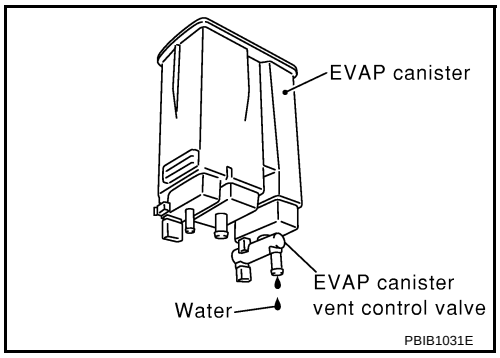
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK IF EVAP CANISTER SATURATED WITH WATER

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3.
No >> GO TO 5.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

5. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "Component Inspection" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

SYMPTOM: CANNOT REFUEL/FUEL ODOR FROM THE FUEL FILLER OPENING IS STRONG WHILE REFUELING.

1. CHECK EVAP CANISTER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Weigh the EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
   The weight should be less than 2.2 kg (4.9 lb).

OK or NG

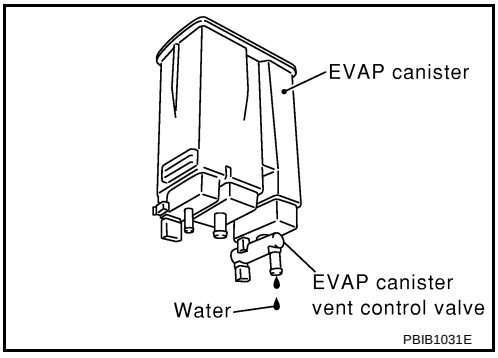
OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK IF EVAP CANISTER SATURATED WITH WATER

Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 3.
No >> GO TO 5.



3. REPLACE EVAP CANISTER

Replace EVAP canister with a new one.

>> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the EVAP hose between EVAP canister and vehicle frame for clogging or poor connection.

>> Repair or replace EVAP hose.

5. CHECK VENT HOSES AND VENT TUBES

Check hoses and tubes between EVAP canister and refueling EVAP vapor cut valve for clogging, kink, looseness and improper connection.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace hoses and tubes.

6. CHECK FILLER NECK TUBE

Check recirculation line for clogging, dents and cracks.

OK or NG

OK >> GO TO 7.
NG >> Replace filler neck tube.

7. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

8. CHECK FUEL FILLER TUBE

Check filler neck tube and hose connected to the fuel tank for clogging, dents and cracks.

OK or NG

OK >> GO TO 9.
NG >> Replace fuel filler tube.

9. CHECK ONE-WAY FUEL VALVE-I

Check one-way valve for clogging.

OK or NG

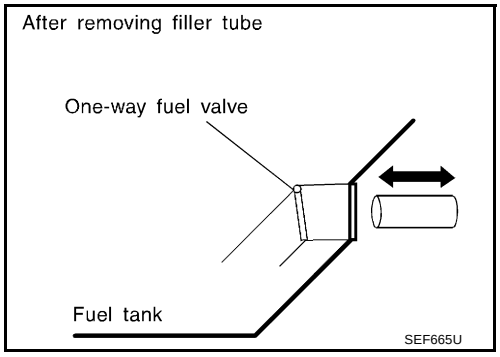
OK >> GO TO 10.
NG >> Repair or replace one-way fuel valve with fuel tank.

10. CHECK ONE-WAY FUEL VALVE-II

1. Make sure that fuel is drained from the tank.
2. Remove fuel filler tube and hose.
3. Check one-way fuel valve for operation as follows.
   When a stick is inserted, the valve should open, when removing stick it should close.
   Do not drop any material into the tank.

OK or NG

OK >> **INSPECTION END**
NG >> Replace fuel filler tube or replace one-way fuel valve with fuel tank.



Component Inspection

NBS0002V

REFUELING EVAP VAPOR CUT VALVE

With CONSULT-III

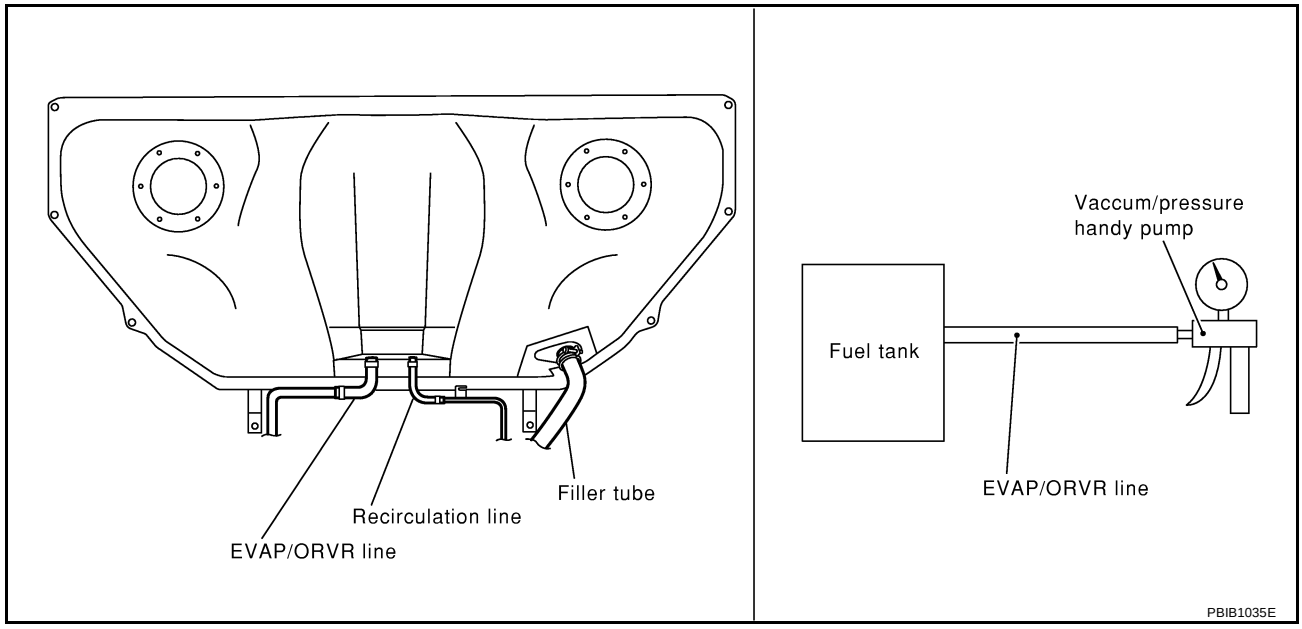
1. Remove fuel tank. Refer to FL-10, "FUEL TANK" .
2. Drain fuel from the tank as follows:

a. Remove fuel feed hose located on the fuel gauge retainer.
b. Connect a spare fuel hose, one side to fuel gauge retainer where the hose was removed and the other side to a fuel container.
c. Drain fuel using “FUEL PUMP RELAY” in “ACTIVE TEST” mode with CONSULT-III.

3. Check refueling EVAP vapor cut valve for being stuck to close as follows.
   Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
4. Check refueling EVAP vapor cut valve for being stuck to open as follows.

a. Connect vacuum pump to hose end.
b. Remove fuel gauge retainer with fuel gauge unit.
   Always replace O-ring with new one.
c. Put fuel tank upside down.

d. Apply vacuum pressure to hose end [–13.3 kPa (–100 mmHg, –3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



Without CONSULT-III

1. Remove fuel tank. Refer to FL-10, "FUEL TANK" .
2. Drain fuel from the tank as follows:

a. Remove fuel gauge retainer.

b. Drain fuel from the tank using a handy pump into a fuel container.

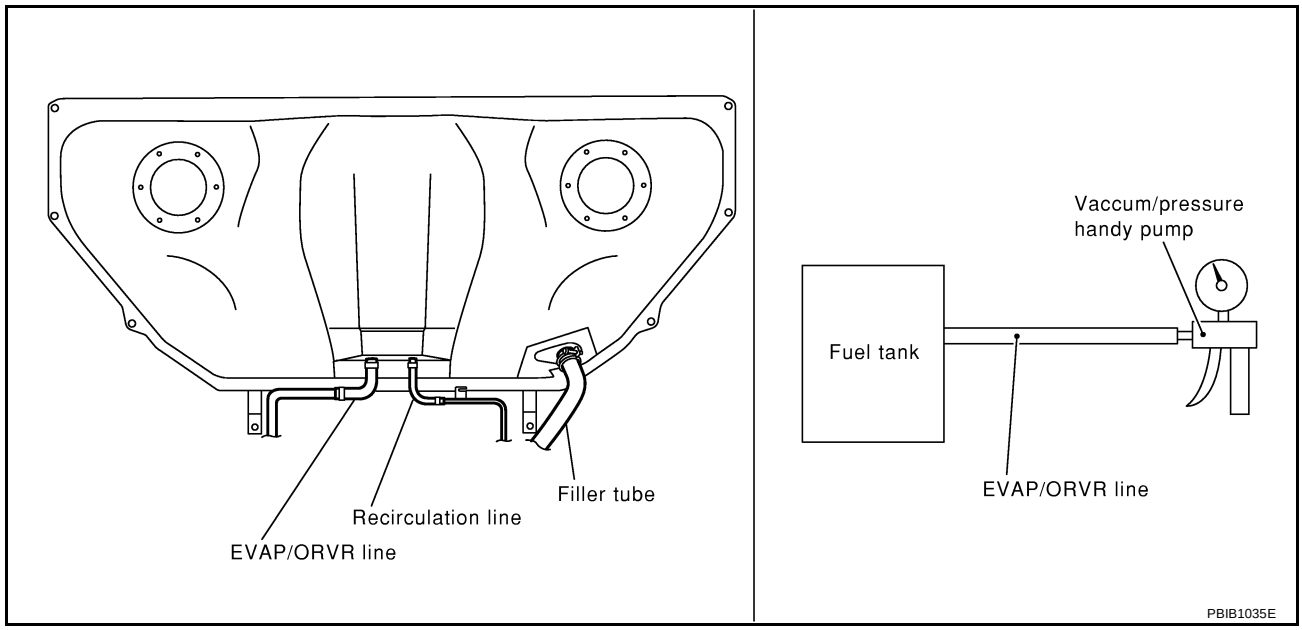
3. Check refueling EVAP vapor cut valve for being stuck to close as follows.
   Blow air into the refueling EVAP vapor cut valve (from the end of EVAP/ORVR line hose), and check that the air flows freely into the tank.
4. Check refueling EVAP vapor cut valve for being stuck to open as follows.

a. Connect vacuum pump to hose end.

b. Remove fuel gauge retainer with fuel gauge unit.
   Always replace O-ring with new one.

c. Put fuel tank upside down.

d. Apply vacuum pressure to hose end [–13.3 kPa (–100 mmHg, –3.94 inHg)] with fuel gauge retainer remaining open and check that the pressure is applicable.



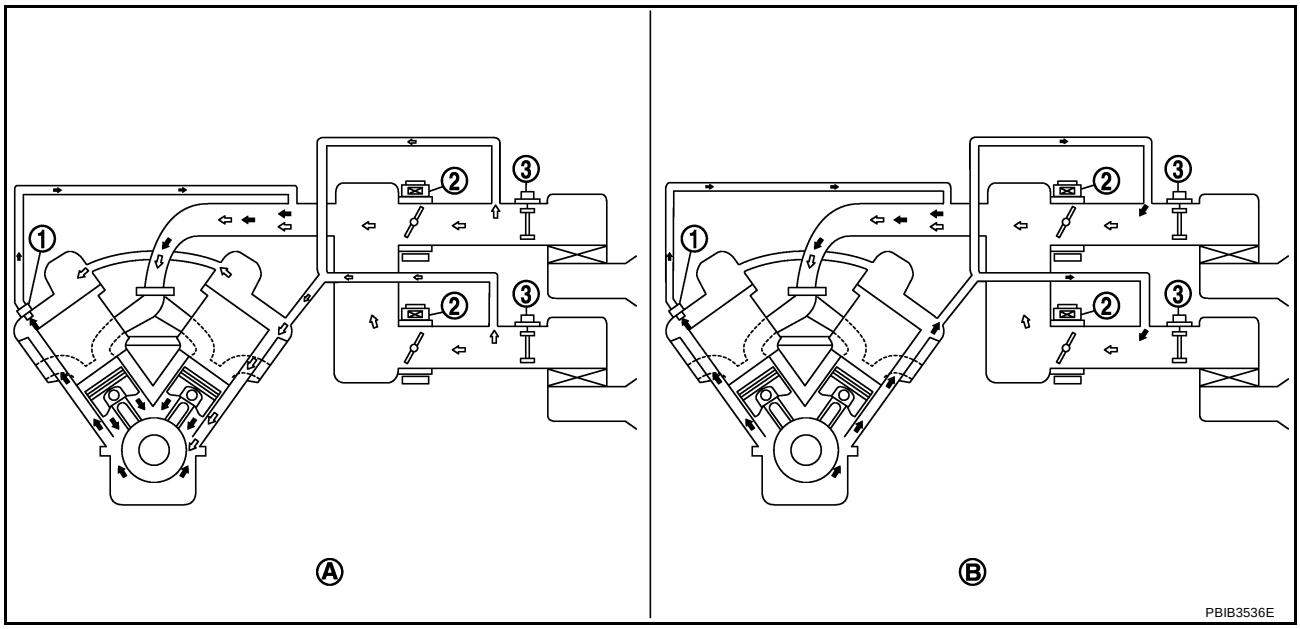
POSITIVE CRANKCASE VENTILATION

PFP:11810

Description

NBS0002W

SYSTEM DESCRIPTION



1. PCV valve
2. Electric throttle control actuator
3. Mass air flow sensor

A. Normal condition
B. Hi-load condition

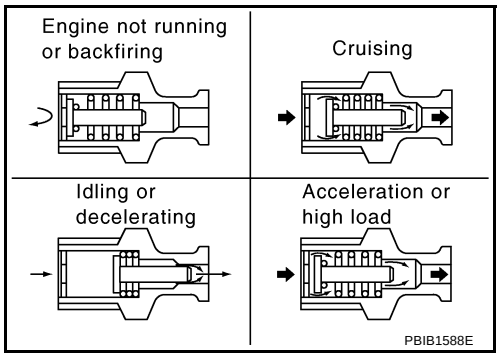
⇦: Fresh air

⬅: Blow-by air

This system returns blow-by gas to the intake manifold.

The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold. During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve. Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air. The ventilating air is then drawn from the air inlet tubes into the crankcase. In this process the air passes through the hose connecting air inlet tubes to rocker cover. Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve. The flow goes through the hose connection in the reverse direction.

On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.

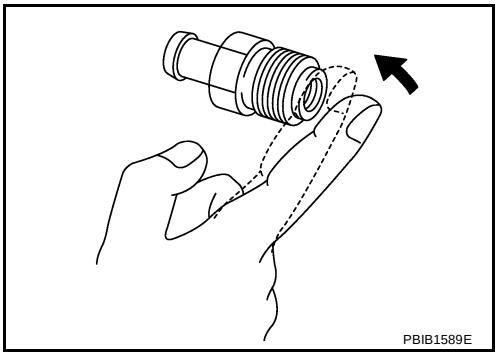


Component Inspection

NBS0002X

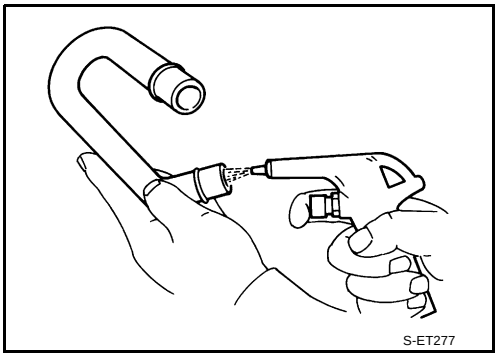
PCV (POSITIVE CRANKCASE VENTILATION) VALVE

With engine running at idle, remove PCV valve from rocker cover. A properly working valve makes a hissing noise as air passes through it. A strong vacuum should be felt immediately when a finger is placed over valve inlet.



PCV VALVE VENTILATION HOSE

1. Check hoses and hose connections for leaks.
2. Disconnect all hoses and clean with compressed air. If any hose cannot be freed of obstructions, replace.



NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)

PFP:25386

Description

NBS0002Y

- **If the security indicator lights up with the ignition switch in the ON position or “NATS MALFUNCTION” is displayed on “SELF-DIAG RESULTS” screen, perform self-diagnostic results mode with CONSULT-III using NATS program card. Refer to BL-150, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)" .**
- **Confirm no self-diagnostic results of NVIS (NATS) is displayed before touching “ERASE” in “SELF-DIAG RESULTS” mode with CONSULT-III.**
- **When replacing ECM, initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs must be carried out with CONSULT-III using NATS program card.**
  Therefore, be sure to receive all keys from vehicle owner. Regarding the procedures of NVIS (NATS) initialization and all NVIS (NATS) ignition key ID registration, refer to CONSULT-III Operation Manual, IVIS/NVIS.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

NBS0002Z

The ECM has an on board diagnostic system, which detects malfunctions related to engine sensors or actuators. The ECM also records various emission-related diagnostic information including:

Emission-related diagnostic information	Diagnostic service
Diagnostic Trouble Code (DTC)	Service $03 of SAE J1979
Freeze Frame data	Service $02 of SAE J1979
System Readiness Test (SRT) code	Service $01 of SAE J1979
1st Trip Diagnostic Trouble Code (1st Trip DTC)	Service $07 of SAE J1979
1st Trip Freeze Frame data	
Test values and Test limits	Service $06 of SAE J1979
Calibration ID	Service $09 of SAE J1979

The above information can be checked using procedures listed in the table below.

×: Applicable —: Not applicable

	DTC	1st trip DTC	Freeze Frame data	1st trip Freeze Frame data	SRT status	SRT code	Test value
CONSULT-III	×	×	×	×	×	×	—
GST	×	×	×	—	×	×	×
ECM	×	×*	—	—	×	—	—

*: When DTC and 1st trip DTC simultaneously appear on the display, they cannot be clearly distinguished from each other.

The malfunction indicator lamp (MIL) on the instrument panel lights up when the same malfunction is detected in two consecutive trips (Two trip detection logic), or when the ECM enters fail-safe mode.
(Refer to EC-89, "Fail-safe Chart" .)

Two Trip Detection Logic

NBS00030

When a malfunction is detected for the 1st time, 1st trip DTC and 1st trip Freeze Frame data are stored in the ECM memory. The MIL will not light up at this stage. <1st trip>
If the same malfunction is detected again during the next drive, the DTC and Freeze Frame data are stored in the ECM memory, and the MIL lights up. The MIL lights up at the same time when the DTC is stored. <2nd trip> The “trip” in the “Two Trip Detection Logic” means a driving mode in which self-diagnosis is performed during vehicle operation. Specific on board diagnostic items will cause the ECM to light up or blink the MIL, and store DTC and Freeze Frame data, even in the 1st trip, as shown below.

×: Applicable —: Not applicable

Items	MIL				DTC		1st trip DTC	
	1st trip		2nd trip		1st trip displaying	2nd trip displaying	1st trip displaying	2nd trip displaying
	Blinking	Lighting up	Blinking	Lighting up				
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0306 is being detected	×	—	—	—	—	—	×	—
Misfire (Possible three way catalyst damage) — DTC: P0300 - P0306 is being detected	—	—	×	—	—	×	—	—
One trip detection diagnoses (Refer to EC-48, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS" .)	—	×	—	—	×	—	—	—
Except above	—	—	—	×	—	×	×	—

When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.

Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

Emission-related Diagnostic Information

NBS00031

EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS

×: Applicable —: Not applicable

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
CAN COMM CIRCUIT	U1000	1000*5	—	—	1	×	EC-151
CAN COMM CIRCUIT	U1001	1001*5	—	—	2	—	EC-151
CONTROL UNIT(CAN)	U1010	1010	—	—	1 (A/T) 2 (M/T)	× (A/T) — (M/T)	EC-154
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	**P0000**	**0000**	—	—	—	**Flashing*7**	EC-63
INT/V TIM CONT-B1	P0011	0011	—	—	2	×	EC-156
EXH/V TIM CONT-B1	P0014	0014	—	—	2	×	EC-160
INT/V TIM CONT-B2	P0021	0021	—	—	2	×	EC-156
EXH/V TIM CONT-B2	P0024	0024	—	—	2	×	EC-160
A/F SEN1 HTR (B1)	P0031	0031	—	×	2	×	EC-165
A/F SEN1 HTR (B1)	P0032	0032	—	×	2	×	EC-165
HO2S2 HTR (B1)	P0037	0037	—	×	2	×	EC-173
HO2S2 HTR (B1)	P0038	0038	—	×	2	×	EC-173
A/F SEN1 HTR (B2)	P0051	0051	—	×	2	×	EC-165
A/F SEN1 HTR (B2)	P0052	0052	—	×	2	×	EC-165
HO2S2 HTR (B2)	P0057	0057	—	×	2	×	EC-173
HO2S2 HTR (B2)	P0058	0058	—	×	2	×	EC-173
INT/V TIM V/CIR-B1	P0075	0075	—	—	2	×	EC-183
EX V/T MGT/RTDR-B1	P0078	0078	—	—	2	×	EC-190
INT/V TIM V/CIR-B2	P0081	0081	—	—	2	×	EC-183
EX V/T MGT/RTDR-B2	P0084	0084	—	—	2	×	EC-190
MAF SEN/CIRCUIT-B1	P0101	0101	—	—	2	×	EC-197
MAF SEN/CIRCUIT-B1	P0102	0102	—	—	1	×	EC-208
MAF SEN/CIRCUIT-B1	P0103	0103	—	—	1	×	EC-208
MAF SEN/CIRCUIT-B2	P010B	010B	—	—	2	×	EC-197
MAF SEN/CIRCUIT-B2	P010C	010C	—	—	1	×	EC-208
MAF SEN/CIRCUIT-B2	P010D	010D	—	—	1	×	EC-208
IAT SEN/CIRCUIT-B1	P0112	0112	—	—	2	×	EC-218
IAT SEN/CIRCUIT-B1	P0113	0113	—	—	2	×	EC-218
ECT SEN/CIRC	P0117	0117	—	—	1	×	EC-223
ECT SEN/CIRC	P0118	0118	—	—	1	×	EC-223
TP SEN 2/CIRC-B1	P0122	0122	—	—	1	×	EC-229
TP SEN 2/CIRC-B1	P0123	0123	—	—	1	×	EC-229

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
ECT SENSOR	P0125	0125	—	—	2	×	EC-239
IAT SENSOR-B1	P0127	0127	—	—	2	×	EC-243
THERMSTAT FNCTN	P0128	0128	—	—	2	×	EC-246
A/F SENSOR1 (B1)	P0130	0130	—	×	2	×	EC-248
A/F SENSOR1 (B1)	P0131	0131	—	×	2	×	EC-257
A/F SENSOR1 (B1)	P0132	0132	—	×	2	×	EC-266
A/F SENSOR1 (B1)	P0133	0133	×	×	2	×	EC-275
HO2S2 (B1)	P0137	0137	×	×	2	×	EC-287
HO2S2 (B1)	P0138	0138	×	×	2	×	EC-298
HO2S2 (B1)	P0139	0139	×	×	2	×	EC-313
A/F SENSOR1 (B2)	P0150	0150	—	×	2	×	EC-248
A/F SENSOR1 (B2)	P0151	0151	—	×	2	×	EC-257
A/F SENSOR1 (B2)	P0152	0152	—	×	2	×	EC-266
A/F SENSOR1 (B2)	P0153	0153	×	×	2	×	EC-275
HO2S2 (B2)	P0157	0157	×	×	2	×	EC-287
HO2S2 (B2)	P0158	0158	×	×	2	×	EC-298
HO2S2 (B2)	P0159	0159	×	×	2	×	EC-313
FUEL SYS-LEAN-B1	P0171	0171	—	—	2	×	EC-324
FUEL SYS-RICH-B1	P0172	0172	—	—	2	×	EC-334
FUEL SYS-LEAN-B2	P0174	0174	—	—	2	×	EC-324
FUEL SYS-RICH-B2	P0175	0175	—	—	2	×	EC-334
FTT SENSOR	P0181	0181	—	—	2	×	EC-344
FTT SEN/CIRCUIT	P0182	0182	—	—	2	×	EC-348
FTT SEN/CIRCUIT	P0183	0183	—	—	2	×	EC-348
EOT SENSOR	P0196	0196	—	—	2	×	EC-352
EOT SEN/CIRCUIT	P0197	0197	—	—	2	×	EC-239
EOT SEN/CIRCUIT	P0198	0198	—	—	2	×	EC-239
TP SEN 1/CIRC-B1	P0222	0222	—	—	1	×	EC-361
TP SEN 1/CIRC-B1	P0223	0223	—	—	1	×	EC-361
TP SEN 2/CIRC-B2	P0227	0227	—	—	1	×	EC-229
TP SEN 2/CIRC-B2	P0228	0228	—	—	1	×	EC-229
MULTI CYL MISFIRE	P0300	0300	—	—	2	×	EC-371
CYL 1 MISFIRE	P0301	0301	—	—	2	×	EC-371
CYL 2 MISFIRE	P0302	0302	—	—	2	×	EC-371
CYL 3 MISFIRE	P0303	0303	—	—	2	×	EC-371
CYL 4 MISFIRE	P0304	0304	—	—	2	×	EC-371
CYL 5 MISFIRE	P0305	0305	—	—	2	×	EC-371
CYL 6 MISFIRE	P0306	0306	—	—	2	×	EC-371
KNOCK SEN/CIRC-B1	P0327	0327	—	—	2	—	EC-379
KNOCK SEN/CIRC-B1	P0328	0328	—	—	2	—	EC-379
KNOCK SEN/CIRC-B2	P0332	0332	—	—	2	—	EC-379
KNOCK SEN/CIRC-B2	P0333	0333	—	—	2	—	EC-379

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
CKP SEN/CIRCUIT	P0335	0335	—	—	2	×	EC-386
CMP SEN/CIRC-B1	P0340	0340	—	—	2	×	EC-394
CMP SEN/CIRC-B2	P0345	0345	—	—	2	×	EC-394
TW CATALYST SYS-B1	P0420	0420	×	×	2	×	EC-406
TW CATALYST SYS-B2	P0430	0430	×	×	2	×	EC-406
EVAP PURG FLOW/MON	P0441	0441	×	×	2	×	EC-411
EVAP SMALL LEAK	P0442	0442	×	×	2	×	EC-416
PURG VOLUME CONT/V	P0443	0443	—	—	2	×	EC-423
PURG VOLUME CONT/V	P0444	0444	—	—	2	×	EC-431
PURG VOLUME CONT/V	P0445	0445	—	—	2	×	EC-431
VENT CONTROL VALVE	P0447	0447	—	—	2	×	EC-437
VENT CONTROL VALVE	P0448	0448	—	—	2	×	EC-444
EVAP SYS PRES SEN	P0451	0451	—	—	2	×	EC-450
EVAP SYS PRES SEN	P0452	0452	—	—	2	×	EC-456
EVAP SYS PRES SEN	P0453	0453	—	—	2	×	EC-465
EVAP GROSS LEAK	P0455	0455	—	—	2	×	EC-475
EVAP VERY SML LEAK	P0456	0456	×*4	×	2	×	EC-482
FUEL LEV SEN SLOSH	P0460	0460	—	—	2	×	EC-490
FUEL LEVEL SENSOR	P0461	0461	—	—	2	×	EC-492
FUEL LEVL SEN/CIRC	P0462	0462	—	—	2	×	EC-494
FUEL LEVL SEN/CIRC	P0463	0463	—	—	2	×	EC-494
VEH SPEED SEN/CIRC*6	P0500	0500	—	—	2	×	EC-496
ISC SYSTEM	P0506	0506	—	—	2	×	EC-498
ISC SYSTEM	P0507	0507	—	—	2	×	EC-500
PW ST P SEN/CIRC	P0550	0550	—	—	2	—	EC-502
ECM BACK UP/CIRCUIT	P0603	0603	—	—	2	×	EC-508
ECM	P0605	0605	—	—	1 or 2	× or —	EC-512
SENSOR POWER/CIRC	P0643	0643	—	—	1	×	EC-514
TCM	P0700	0700	—	—	1	×	AT-101
PNP SW/CIRC	P0705	0705	—	—	2	×	AT-102
ATF TEMP SEN/CIRC	P0710	0710	—	—	2	×	AT-134
TURBINE SENSOR	P0717	0717	—	—	2	×	AT-113
VEH SPD SEN/CIR AT*6	P0720	0720	—	—	2	×	AT-108
A/T 1ST GR FNCTN	P0731	0731	—	—	2	×	AT-115
A/T 2ND GR FNCTN	P0732	0732	—	—	2	×	AT-117
A/T 3RD GR FNCTN	P0733	0733	—	—	2	×	AT-119
A/T 4TH GR FNCTN	P0734	0734	—	—	2	×	AT-121
A/T 5TH GR FNCTN	P0735	0735	—	—	2	×	AT-123
TCC SOLENOID/CIRC	P0740	0740	—	—	2	×	AT-125
A/T TCC S/V FNCTN	P0744	0744	—	—	2	×	AT-127
L/PRESS SOL/CIRC	P0745	0745	—	—	2	×	AT-129
P-N POS SW/CIRCUIT	P0850	0850	—	—	2	×	EC-520

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
EXH TIM SEN/CIR-B1	P1078	1078	—	—	2	×	EC-528
EXH TIM SEN/CIR-B2	P1084	1084	—	—	2	×	EC-528
CLOSED LOOP-B1	P1148	1148	—	—	1	×	EC-540
CLOSED LOOP-B2	P1168	1168	—	—	1	×	EC-540
TCS C/U FUNCTN	P1211	1211	—	—	2	—	EC-541
TCS/CIRC	P1212	1212	—	—	2	—	EC-542
ENG OVER TEMP	P1217	1217	—	—	1	×	EC-543
CTP LEARNING-B1	P1225	1225	—	—	2	—	EC-557
CTP LEARNING-B1	P1226	1226	—	—	2	—	EC-559
ETC FUNCTION/CIRC-B2	P1233	1233	—	—	1	×	EC-561
CTP LEARNING-B2	P1234	1234	—	—	2	—	EC-557
CTP LEARNING-B2	P1235	1235	—	—	2	—	EC-559
ETC MOT-B2	P1236	1236	—	—	1	×	EC-571
ETC ACTR-B2	P1238	1238	—	—	1	×	EC-580
TP SENSOR-B2	P1239	1239	—	—	1	×	EC-582
ETC MOT PWR-B2	P1290	1290	—	—	1	×	EC-592
COLD START CONTROL	P1421	1421	—	—	2	×	EC-600
ASCD SW	P1564	1564	—	—	1	—	EC-602
ASCD BRAKE SW	P1572	1572	—	—	1	—	EC-610
ASCD VHL SPD SEN	P1574	1574	—	—	1	—	EC-625
NATS MALFUNCTION	P1610 - P1615	1610 - 1615	—	—	2	—	EC-46
IN PULY SPEED	P1715	1715	—	—	2	—	EC-627
A/T INTERLOCK	P1730	1730	—	—	1	×	AT-141
I/C SOLENOID/CIRC	P1752	1752	—	—	1	×	AT-145
FR/B SOLENOID/CIRC	P1757	1757	—	—	1	×	AT-147
D/C SOLENOID/CIRC	P1762	1762	—	—	1	×	AT-149
HLR/C SOL/CIRC	P1767	1767	—	—	1	×	AT-151
LC/B SOLENOID/CIRC	P1772	1772	—	—	1	×	AT-153
LC/B SOLENOID FNCT	P1774	1774	—	—	1	×	AT-155
BRAKE SW/CIRCUIT	P1805	1805	—	—	2	—	EC-628
ETC MOT PWR-B1	P2100	2100	—	—	1	×	EC-592
ETC FUNCTION/CIRC-B1	P2101	2101	—	—	1	×	EC-561
ETC MOT PWR	P2103	2103	—	—	1	×	EC-592
ETC MOT-B1	P2118	2118	—	—	1	×	EC-571
ETC ACTR-B1	P2119	2119	—	—	1	×	EC-580
APP SEN 1/CIRC	P2122	2122	—	—	1	×	EC-633
APP SEN 1/CIRC	P2123	2123	—	—	1	×	EC-633
APP SEN 2/CIRC	P2127	2127	—	—	1	×	EC-641
APP SEN 2/CIRC	P2128	2128	—	—	1	×	EC-641
TP SENSOR2/CIRC-B2	P2132	2132	—	—	1	×	EC-361
TP SENSOR2/CIRC-B2	P2133	2133	—	—	1	×	EC-361
TP SENSOR-B1	P2135	2135	—	—	1	×	EC-582

Items (CONSULT-III screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-III GST*2	ECM*3					
APP SENSOR	P2138	2138	—	—	1	×	EC-650
A/F SENSOR1 (B1)	P2A00	2A00	—	×	2	×	EC-659
A/F SENSOR1 (B2)	P2A03	2A03	—	×	2	×	EC-659

*1: 1st trip DTC No. is the same as DTC No.
*2: This number is prescribed by SAE J2012.
*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.
*4: SRT code will not be set if the self-diagnostic result is NG.
*5: The troubleshooting for this DTC needs CONSULT-III.
*6: When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.
*7: When the ECM is in the mode of displaying SRT status, MIL may flash. For the details, refer to EC-56, "How to Display SRT Status" .

DTC AND 1ST TRIP DTC

The 1st trip DTC (whose number is the same as the DTC number) is displayed for the latest self-diagnostic results obtained. If the ECM memory was cleared previously, and the 1st trip DTC did not reoccur, the 1st trip DTC will not be displayed.
If a malfunction is detected during the 1st trip, the 1st trip DTC is stored in the ECM memory. The MIL will not light up (two trip detection logic). If the same malfunction is not detected in the 2nd trip (meeting the required driving pattern), the 1st trip DTC is cleared from the ECM memory. If the same malfunction is detected in the 2nd trip, both the 1st trip DTC and DTC are stored in the ECM memory and the MIL lights up. In other words, the DTC is stored in the ECM memory and the MIL lights up when the same malfunction occurs in two consecutive trips. If a 1st trip DTC is stored and a non-diagnostic operation is performed between the 1st and 2nd trips, only the 1st trip DTC will continue to be stored. For malfunctions that blink or light up the MIL during the 1st trip, the DTC and 1st trip DTC are stored in the ECM memory.
Procedures for clearing the DTC and the 1st trip DTC from the ECM memory are described in EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
For malfunctions in which 1st trip DTCs are displayed, refer to EC-48, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS" . These items are required by legal regulations to continuously monitor the system/component. In addition, the items monitored non-continuously are also displayed on CONSULT-III.
1st trip DTC is specified in Service $07 of SAE J1979. 1st trip DTC detection occurs without lighting up the MIL and therefore does not warn the driver of a malfunction. However, 1st trip DTC detection will not prevent the vehicle from being tested, for example during Inspection/Maintenance (I/M) tests.
When a 1st trip DTC is detected, check, print out or write down and erase (1st trip) DTC and Freeze Frame data as specified in Work Flow procedure Step 2, refer to EC-82, "WORK FLOW" . Then perform DTC Confirmation Procedure or Overall Function Check to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair.

How to Read DTC and 1st Trip DTC

DTC and 1st trip DTC can be read by the following methods.

With CONSULT-III

With GST

CONSULT-III or GST (Generic Scan Tool) Examples: P0340, P0850, P1148, etc.
These DTCs are prescribed by SAE J2012.
(CONSULT-III also displays the malfunctioning component or system.)

No Tools

The number of blinks of the MIL in the Diagnostic Test Mode II (Self-Diagnostic Results) indicates the DTC. Example: 0340, 0850, 1148, etc.
These DTCs are controlled by NISSAN.

- **1st trip DTC No. is the same as DTC No.**
- **Output of a DTC indicates a malfunction. However, GST or the Diagnostic Test Mode II do not indicate whether the malfunction is still occurring or has occurred in the past and has returned to normal. CONSULT-III can identify malfunction status as shown below. Therefore, using CONSULT-III (if available) is recommended.**

A sample of CONSULT-III display for DTC and 1st trip DTC is shown below. DTC or 1st trip DTC of a malfunction is displayed in “SELF-DIAGNOSTIC RESULTS” mode of CONSULT-III. Time data indicates how many times the vehicle was driven after the last detection of a DTC.

If the DTC is being detected currently, the time data will be [0].
If a 1st trip DTC is stored in the ECM, the time data will be [1t].

FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA

The ECM records the driving conditions such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed, vehicle speed, absolute throttle position, base fuel schedule and intake air temperature at the moment a malfunction is detected.
Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data. The data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST. For details, see EC-119, "Freeze Frame Data and 1st Trip Freeze Frame Data" .
Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175
2		Except the above items (Includes A/T related items)
3	1st trip freeze frame data	

For example, the EGR malfunction (Priority: 2) was detected and the freeze frame data was stored in the 2nd trip. After that when the misfire (Priority: 1) is detected in another trip, the freeze frame data will be updated from the EGR malfunction to the misfire. The 1st trip freeze frame data is updated each time a different malfunction is detected. There is no priority for 1st trip freeze frame data. However, once freeze frame data is stored in the ECM memory, 1st trip freeze data is no longer stored (because only one freeze frame data or 1st trip freeze frame data can be stored in the ECM). If freeze frame data is stored in the ECM memory and freeze frame data with the same priority occurs later, the first (original) freeze frame data remains unchanged in the ECM memory.
Both 1st trip freeze frame data and freeze frame data (along with the DTCs) are cleared when the ECM memory is erased. Procedures for clearing the ECM memory are described in EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

SYSTEM READINESS TEST (SRT) CODE

System Readiness Test (SRT) code is specified in Service $01 of SAE J1979.
As part of an enhanced emissions test for Inspection & Maintenance (I/M), certain states require the status of SRT be used to indicate whether the ECM has completed self-diagnosis of major emission systems and components. Completion must be verified in order for the emissions inspection to proceed.
If a vehicle is rejected for a State emissions inspection due to one or more SRT items indicating “INCMP”, use the information in this Service Manual to set the SRT to “CMPLT”.
In most cases the ECM will automatically complete its self-diagnosis cycle during normal usage, and the SRT status will indicate “CMPLT” for each application system. Once set as “CMPLT”, the SRT status remains “CMPLT” until the self-diagnosis memory is erased.
Occasionally, certain portions of the self-diagnostic test may not be completed as a result of the customer's normal driving pattern; the SRT will indicate “INCMP” for these items.

NOTE:
The SRT will also indicate “INCMP” if the self-diagnosis memory is erased for any reason or if the ECM memory power supply is interrupted for several hours.
If, during the state emissions inspection, the SRT indicates “CMPLT” for all test items, the inspector will continue with the emissions test. However, if the SRT indicates “INCMP” for one or more of the SRT items the vehicle is returned to the customer untested.

NOTE:
If MIL is ON during the state emissions inspection, the vehicle is also returned to the customer untested even though the SRT indicates “CMPLT” for all test items. Therefore, it is important to check SRT (“CMPLT”) and DTC (No DTCs) before the inspection.

SRT Item

The table below shows required self-diagnostic items to set the SRT to “CMPLT”.

SRT item (CONSULT-III indication)	Performance Priority*	Required self-diagnostic items to set the SRT to "CMPLT"	Corresponding DTC No.
CATALYST	2	Three way catalyst function	P0420, P0430
EVAP SYSTEM	1	EVAP control system	P0442
	2	EVAP control system	P0456
	2	EVAP control system purge flow monitoring	P0441
HO2S	2	Air fuel ratio (A/F) sensor 1	P0133, P0153
		Heated oxygen sensor 2	P0139, P0159
		Heated oxygen sensor 2	P0137, P0157
		Heated oxygen sensor 2	P0138, P0158

*: If completion of several SRTs is required, perform driving patterns (DTC confirmation procedure), one by one based on the priority for models with CONSULT-III.

SRT Set Timing

SRT is set as "CMPLT" after self-diagnosis has been performed one or more times. Completion of SRT is done regardless of whether the result is OK or NG. The set timing is different between OK and NG results and is shown in the table below.

Self-diagnosis result		Example				
		Diagnosis	Ignition cycle ← ON →	OFF	← ON →	OFF ← ON →	OFF ← ON →
All OK	Case 1	P0400	OK (1)	— (1)	OK (2)	— (2)
		P0402	OK (1)	— (1)	— (1)	OK (2)
		P1402	OK (1)	OK (2)	— (2)	— (2)
		SRT of EGR	"CMPLT"	"CMPLT"	"CMPLT"	"CMPLT"
	Case 2	P0400	OK (1)	— (1)	— (1)	— (1)
		P0402	— (0)	— (0)	OK (1)	— (1)
		P1402	OK (1)	OK (2)	— (2)	— (2)
		SRT of EGR	"INCMP"	"INCMP"	"CMPLT"	"CMPLT"
NG exists	Case 3	P0400	OK	OK	—	—
		P0402	—	—	—	—
		P1402	NG	—	NG	NG (Consecutive NG)
		(1st trip) DTC	1st trip DTC	—	1st trip DTC	DTC (= MIL "ON")
		SRT of EGR	"INCMP"	"INCMP"	"INCMP"	"CMPLT"

OK: Self-diagnosis is carried out and the result is OK.
NG: Self-diagnosis is carried out and the result is NG.
—: Self-diagnosis is not carried out.

When all SRT related self-diagnoses showed OK results in a single cycle (Ignition OFF-ON-OFF), the SRT will indicate "CMPLT". → Case 1 above
When all SRT related self-diagnoses showed OK results through several different cycles, the SRT will indicate "CMPLT" at the time the respective self-diagnoses have at least one OK result. → Case 2 above
If one or more SRT related self-diagnoses showed NG results in 2 consecutive cycles, the SRT will also indicate "CMPLT". → Case 3 above
The table above shows that the minimum number of cycles for setting SRT as "INCMP" is one (1) for each self-diagnosis (Case 1 & 2) or two (2) for one of self-diagnoses (Case 3). However, in preparation for the state emissions inspection, it is unnecessary for each self-diagnosis to be executed twice (Case 3) for the following reasons:

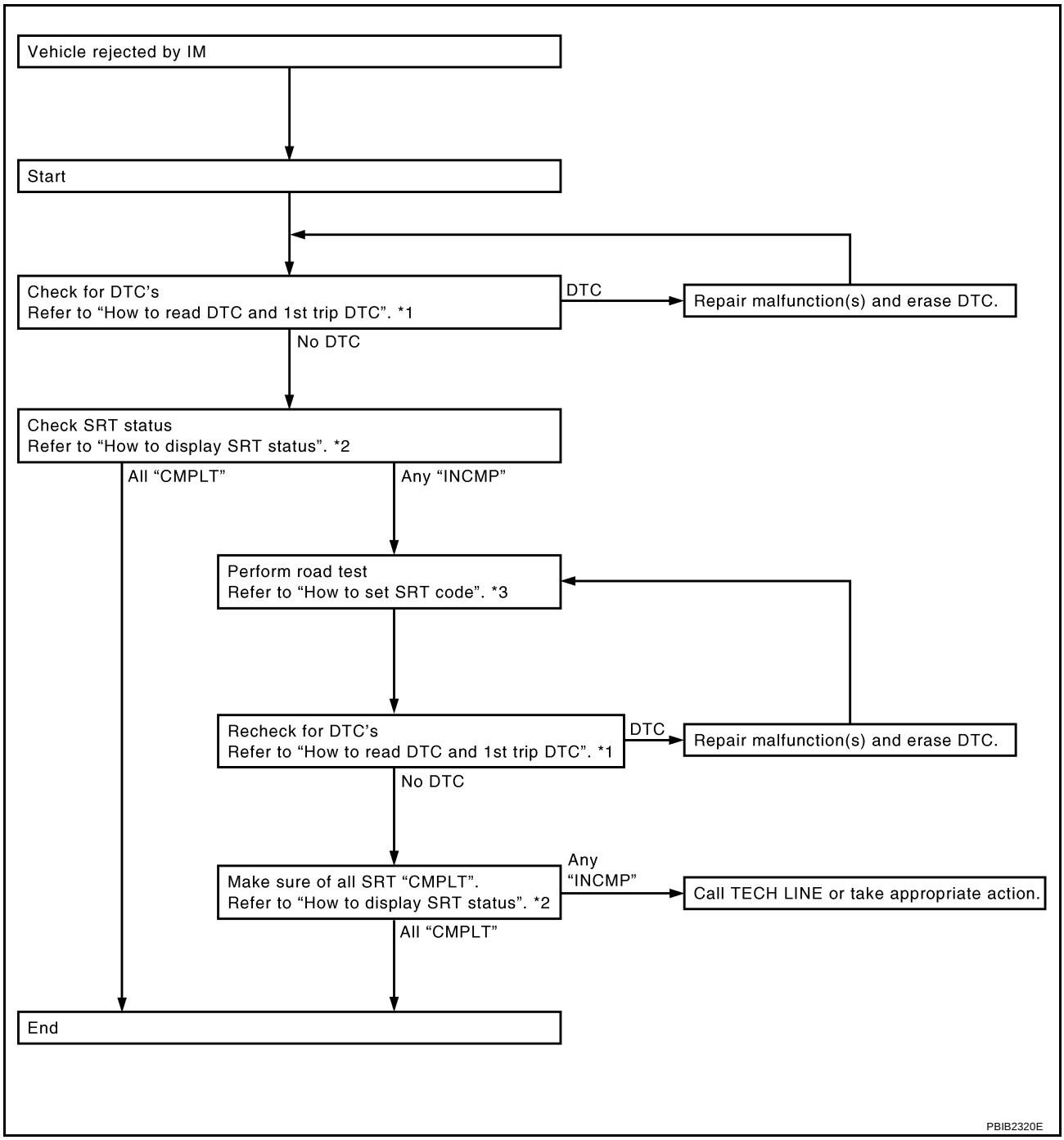
- The SRT will indicate "CMPLT" at the time the respective self-diagnoses have one (1) OK result.
- The emissions inspection requires "CMPLT" of the SRT only with OK self-diagnosis results.

- When, during SRT driving pattern, 1st trip DTC (NG) is detected prior to “CMPLT” of SRT, the self-diagnosis memory must be erased from ECM after repair.
- If the 1st trip DTC is erased, all the SRT will indicate “INCMP”.

NOTE:
SRT can be set as “CMPLT” together with the DTC(s). Therefore, DTC check must always be carried out prior to the state emission inspection even though the SRT indicates “CMPLT”.

SRT Service Procedure

If a vehicle has failed the state emissions inspection due to one or more SRT items indicating “INCMP”, review the flowchart diagnostic sequence on the next page.



*1 EC-52 *2 EC-56 *3 EC-57

How to Display SRT Status

WITH CONSULT-III

Selecting “SRT STATUS” in “DTC & SRT CONFIRMATION” mode with CONSULT-III.
For items whose SRT codes are set, a “CMPLT” is displayed on the CONSULT-III screen; for items whose SRT codes are not set, “INCMP” is displayed.
A sample of CONSULT-III display for SRT code is shown in the figure.
“INCMP” means the self-diagnosis is incomplete and SRT is not set. “CMPLT” means the self-diagnosis is complete and SRT is set.

NOTE:

Though displayed on the CONSULT-III screen, “HO2S HTR” is not SRT item.

WITH GST

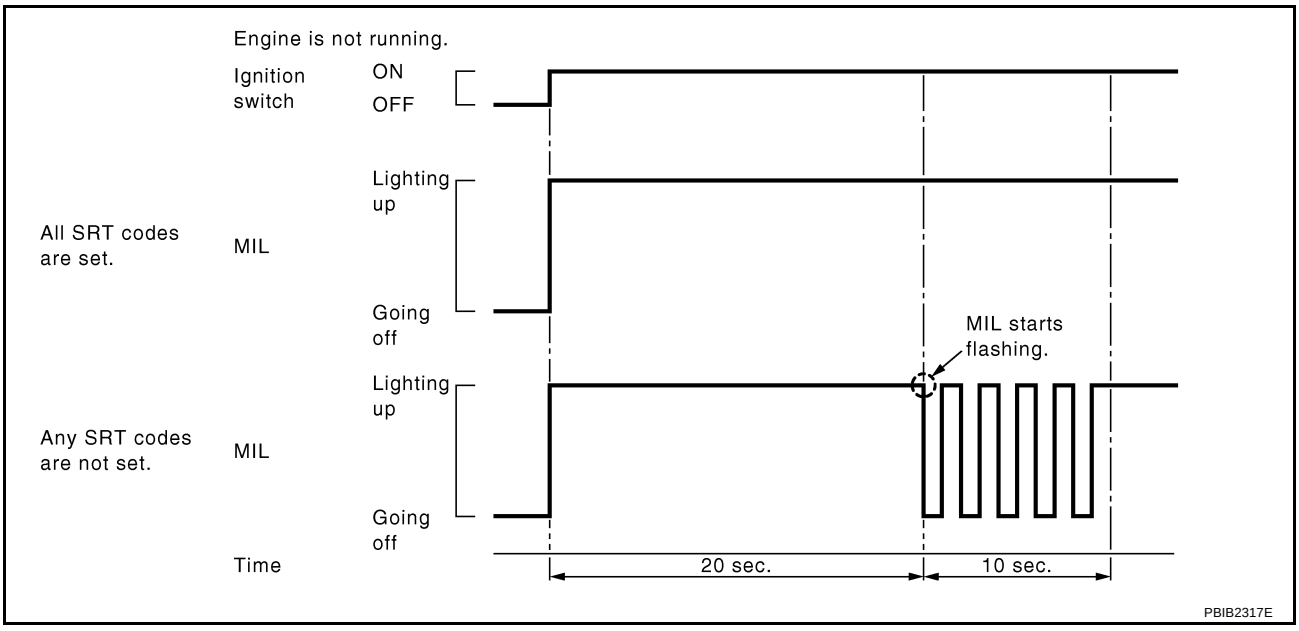
Selecting Service $01 with GST (Generic Scan Tool)

NO TOOLS

A SRT code itself can not be displayed while only SRT status can be.

1. Turn ignition switch ON and wait 20 seconds.
2. SRT status is indicated as shown below.

- When all SRT codes are set, MIL lights up continuously.
- When any SRT codes are not set, MIL will flash periodically for 10 seconds.



How to Set SRT Code

To set all SRT codes, self-diagnosis for the items indicated above must be performed one or more times. Each diagnosis may require a long period of actual driving under various conditions.

WITH CONSULT-III

Perform corresponding DTC Confirmation Procedure one by one based on Performance Priority in the table on EC-53, "SRT Item" .

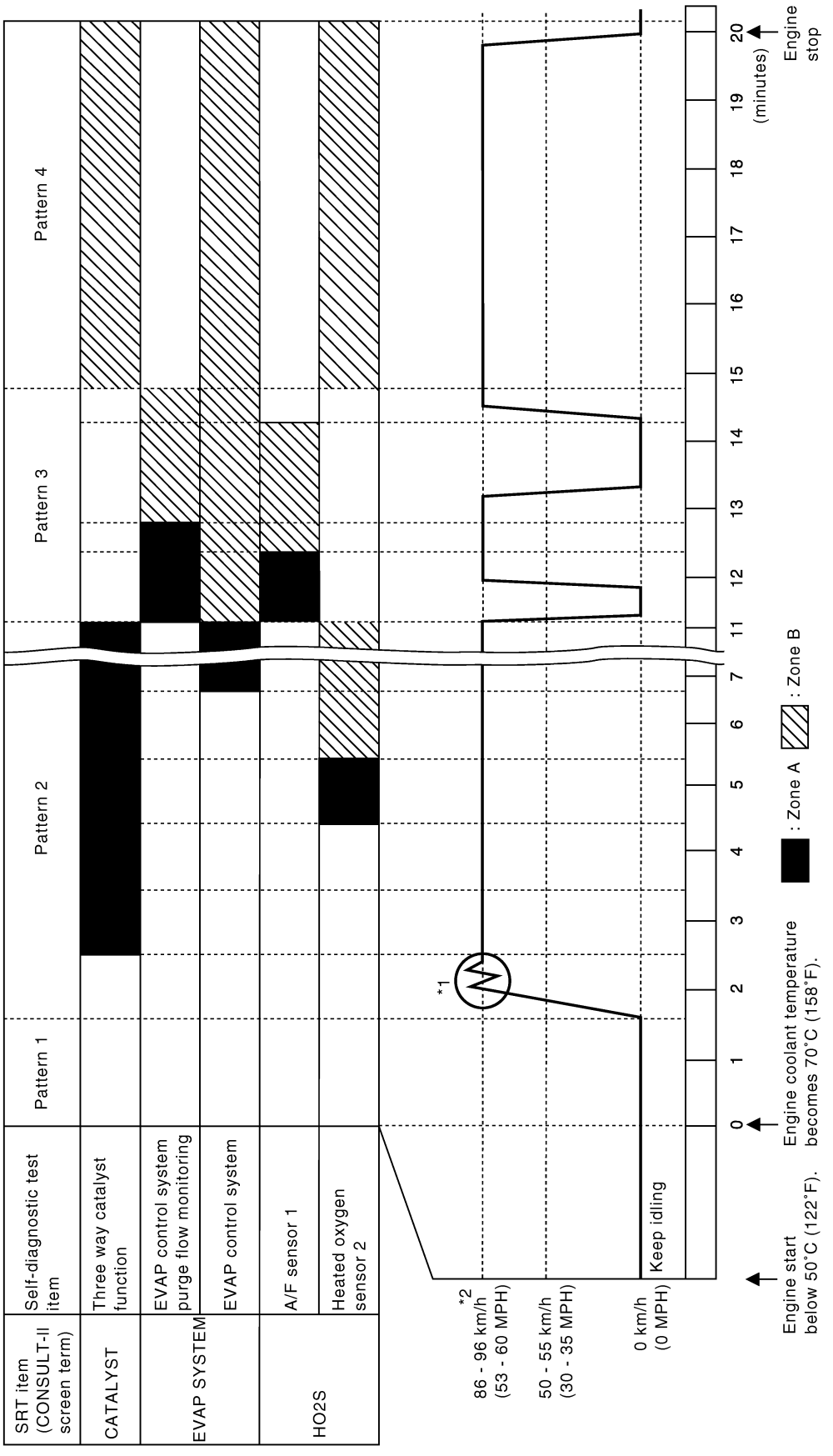
WITHOUT CONSULT-III

The most efficient driving pattern in which SRT codes can be properly set is explained on the next page. The driving pattern should be performed one or more times to set all SRT codes.

Driving Pattern

Note: Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws.
Refer to next page for more information and explanation of chart.

Driving pattern



PBIB2906E

- The time required for each diagnosis varies with road surface conditions, weather, altitude, individual driving habits, etc.
  Zone A refers to the range where the time, required for the diagnosis under normal conditions*, is the shortest.
  Zone B refers to the range where the diagnosis can still be performed if the diagnosis is not completed within zone A.

*: Normal conditions refer to the following:

- Sea level
- Flat road
- Ambient air temperature: 20 - 30°C (68 - 86°F)
- Diagnosis is performed as quickly as possible under normal conditions.
  Under different conditions [For example: ambient air temperature other than 20 - 30°C (68 - 86°F)], diagnosis may also be performed.

Pattern 1:

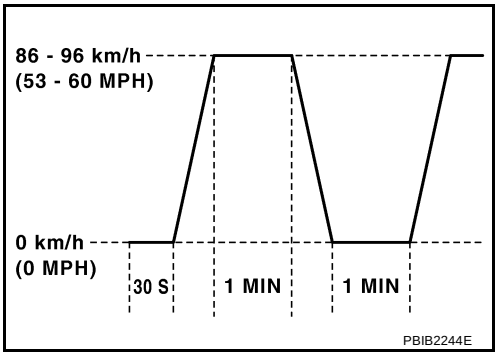
- **The engine is started at the engine coolant temperature of −10 to 35°C (14 to 95°F) (where the voltage between the ECM terminal 71 and ground is 3.0 - 4.3V).**
- **The engine must be operated at idle speed until the engine coolant temperature is greater than 70°C (158°F) (where the voltage between the ECM terminal 71 and ground is lower than 1.4V).**
- **The engine is started at the fuel tank temperature of warmer than 0°C (32°F) (where the voltage between the ECM terminal 106 and ground is less than 4.1V).**

Pattern 2:

- When steady-state driving is performed again even after it is interrupted, each diagnosis can be conducted. In this case, the time required for diagnosis may be extended.

Pattern 3:

- Operate vehicle following the driving pattern shown in the figure.
- Release the accelerator pedal during decelerating vehicle speed from 90 km/h (56 MPH) to 0 km/h (0 MPH).



Pattern 4:

- The accelerator pedal must be held very steady during steady-state driving.
- If the accelerator pedal is moved, the test must be conducted all over again.

*1: Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH), then release the accelerator pedal and keep it released for more than 10 seconds. Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH) again.
*2: Checking the vehicle speed with GST is advised.

Suggested Transmission Gear Position for A/T Models

Set the selector lever in the D position.

Suggested Upshift Speeds for M/T Models

Shown below are suggested vehicle speeds for shifting into a higher gear. These suggestions relate to fuel economy and vehicle performance. Actual upshift speeds will vary according to road conditions, the weather and individual driving habits.

	For normal acceleration in low altitude areas [less than 1,219 m (4,000 ft)]:		For quick acceleration in low altitude areas and high altitude areas [over 1,219 m (4,000 ft)]:
Gear change	ACCEL shift point km/h (MPH)	CRUISE shift point km/h (MPH)	km/h (MPH)
1st to 2nd	21 (13)	13 (8)	24 (15)
2nd to 3rd	37 (23)	26 (16)	40 (25)
3rd to 4th	48 (30)	40 (25)	64 (40)
4th to 5th	60 (37)	45 (28)	72 (45)
6th	68 (42)	53 (33)	80 (50)

Suggested Maximum Speed in Each Gear

Downshift to a lower gear if the engine is not running smoothly, or if you need to accelerate.
Do not exceed the maximum suggested speed (shown below) in any gear. For level road driving, use the highest gear suggested for that speed. Always observe posted speed limits and drive according to the road conditions to ensure sage operation. Do not over-rev the engine when shifting to a lower gear as it may cause engine damage or loss of vehicle control.

Gear	km/h (MPH)
1st	65 (40)
2nd	106 (66)
3rd	152 (95)
4th	—
5th	—
6th	—

TEST VALUE AND TEST LIMIT (GST ONLY — NOT APPLICABLE TO CONSULT-III)

The following is the information specified in Service $06 of SAE J1979.
The test value is a parameter used to determine whether a system/circuit diagnostic test is OK or NG while being monitored by the ECM during self-diagnosis. The test limit is a reference value which is specified as the maximum or minimum value and is compared with the test value being monitored.
These data (test value and test limit) are specified by Test ID (TID) and Component ID (CID) and can be displayed on the GST screen.

Item	Self-diagnostic test item	DTC	Test value (GST display)		Test limit	Conversion
			TID	CID		
CATALYST	Three way catalyst function (Bank 1)	P0420	01H	01H	Max.	1/128
		P0420	02H	81H	Min.	1
	Three way catalyst function (Bank 2)	P0430	03H	02H	Max.	1/128
		P0430	04H	82H	Min.	1
EVAP SYSTEM	EVAP control system (Small leak)	P0442	05H	03H	Max.	1/128 mm^2
	EVAP control system purge flow monitoring	P0441	06H	83H	Min.	20 mV
	EVAP control system (Very small leak)	P0456	07H	03H	Max.	1/128 mm^2

Item	Self-diagnostic test item	DTC	Test value (GST display)		Test limit	Conversion
			TID	CID		
HO2S	Air fuel ratio (A/F) sensor 1 (Bank 1)	P0131	41H	8EH	Min.	5mV
		P0132	42H	0EH	Max.	5mV
		P2A00	43H	0EH	Max.	0.002
		P2A00	44H	8EH	Min.	0.002
		P0133	45H	8EH	Min.	0.004
		P0130	46H	0EH	Max.	5mV
		P0130	47H	8EH	Min.	5mV
		P0133	48H	8EH	Min.	0.004
	Air fuel ratio (A/F) sensor 1 (Bank 2)	P0151	4CH	8FH	Min.	5mV
		P0152	4DH	0FH	Max	5mV
		P2A03	4EH	0FH	Max.	0.002
		P2A03	4FH	8FH	Min.	0.002
		P0153	50H	8FH	Min.	0.004
		P0150	51H	0FH	Max.	5mV
		P0150	52H	8FH	Min.	5mV
		P0153	53H	8FH	Min.	0.004
	Heated oxygen sensor 2 (Bank 1)	P0138	1CH	06H	Max.	10mV
		P0139	19H	86H	Min.	10mV/500 ms
		P0137	1AH	86H	Min.	10 mV
		P0138	1BH	06H	Max.	10 mV
	Heated oxygen sensor 2 (Bank 2)	P0158	24H	07H	Max	10mV
		P0159	21H	87H	Min.	10 mV/500 ms
		P0157	22H	87H	Min.	10 mV
		P0158	23H	07H	Max.	10 mV
HO2S HTR	Air fuel ratio (A/F) sensor 1 heater (Bank 1)	P0032	57H	10H	Max.	5 mV
		P0031	58H	90H	Max.	5 mV
	Air fuel ratio (A/F) sensor 1 heater (Bank 2)	P0052	59H	11H	Max.	5 mV
		P0051	5AH	91H	Max.	5 mV
	Heated oxygen sensor 2 heater (Bank 1)	P0038	2DH	0AH	Max.	20 mV
		P0037	2EH	8AH	Min.	20 mV
	Heated oxygen sensor 2 heater (Bank 2)	P0058	2FH	0BH	Max.	20 mV
		P0057	30H	8BH	Min.	20 mV

HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION

How to Erase DTC

WITH CONSULT-III

The emission related diagnostic information in the ECM can be erased by selecting “ERASE” in the “SELF-DIAG RESULTS” mode with CONSULT-III.

If DTCs are displayed for both ECM and TCM (Transmission control module), they need to be erased individually from the ECM and TCM (Transmission control module).

NOTE:

If the DTC is not for A/T related items (see EC-8, "INDEX FOR DTC"), skip steps 2 through 4.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Turn CONSULT-III ON and touch “A/T”.
3. Touch “SELF-DIAG RESULTS”.

4. Touch “ERASE”. [The DTC in the TCM (Transmission control module) will be erased.] Then touch “BACK” twice.
5. Touch “ENGINE”.
6. Touch “SELF-DIAG RESULTS”.
7. Touch “ERASE”. (The DTC in the ECM will be erased.)

WITH GST

The emission related diagnostic information in the ECM can be erased by selecting Service $04 with GST.

NOTE:
If the DTC is not for A/T related items (see EC-8, "INDEX FOR DTC"), skip step 2.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-38, "HOW TO ERASE DTC (WITH GST)" . (The DTC in the TCM will be erased.)
3. Select Service $04 with GST (Generic Scan Tool).

NO TOOLS

NOTE:
If the DTC is not for A/T related items (see EC-8, "INDEX FOR DTC"), skip step 2.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-38, "HOW TO ERASE DTC (NO TOOLS)" . (The DTC in the TCM will be erased.)
3. Change the diagnostic test mode from Mode II to Mode I by depressing the accelerator pedal. Refer to EC-63, "HOW TO SWITCH DIAGNOSTIC TEST MODE" .

- **If the battery is disconnected, the emission-related diagnostic information will be lost within 24 hours.**
- **The following data are cleared when the ECM memory is erased.**
  - Diagnostic trouble codes
  - 1st trip diagnostic trouble codes
  - Freeze frame data
  - 1st trip freeze frame data
  - System readiness test (SRT) codes
  - Test values

Actual work procedures are explained using a DTC as an example. Be careful so that not only the DTC, but all of the data listed above, are cleared from the ECM memory during work procedures.

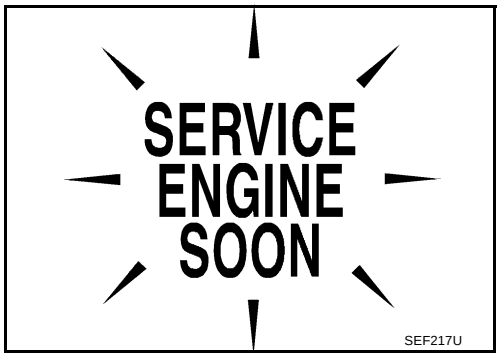
Malfunction Indicator Lamp (MIL)

NBS00032

DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check. If the MIL does not light up, refer to DI-56, "WARNING LAMPS" , or see EC-716, "MIL AND DATA LINK CONNECTOR" .
2. When the engine is started, the MIL should go off. If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



ON BOARD DIAGNOSTIC SYSTEM FUNCTION

The on board diagnostic system has the following three functions.

Diagnostic Test Mode	KEY and ENG. Status	Function	Explanation of Function
Mode I	Ignition switch in ON position  Engine stopped 	BULB CHECK	This function checks the MIL bulb for damage (blown, open circuit, etc.). If the MIL does not come on, check MIL circuit.
	Engine running 	MALFUNCTION WARNING	This is a usual driving condition. When a malfunction is detected twice in two consecutive driving cycles (two trip detection logic), the MIL will light up to inform the driver that a malfunction has been detected. The following malfunctions will light up or blink the MIL in the 1st trip. ● Misfire (Possible three way catalyst damage) ● One trip detection diagnoses
Mode II	Ignition switch in ON position  Engine stopped 	SELF-DIAGNOSTIC RESULTS	This function allows DTCs and 1st trip DTCs to be read.

When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.
Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

MIL Flashing Without DTC

When any SRT codes are not set, MIL may flash without DTC. For the details, refer to EC-56, "How to Display SRT Status" .

HOW TO SWITCH DIAGNOSTIC TEST MODE

NOTE:

- **It is better to count the time accurately with a clock.**
- **It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.**
- **Always ECM returns to Diagnostic Test Mode I after ignition switch is turned OFF.**

How to Set Diagnostic Test Mode II (Self-diagnostic Results)

1. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
2. Repeat the following procedure quickly 5 times within 5 seconds.

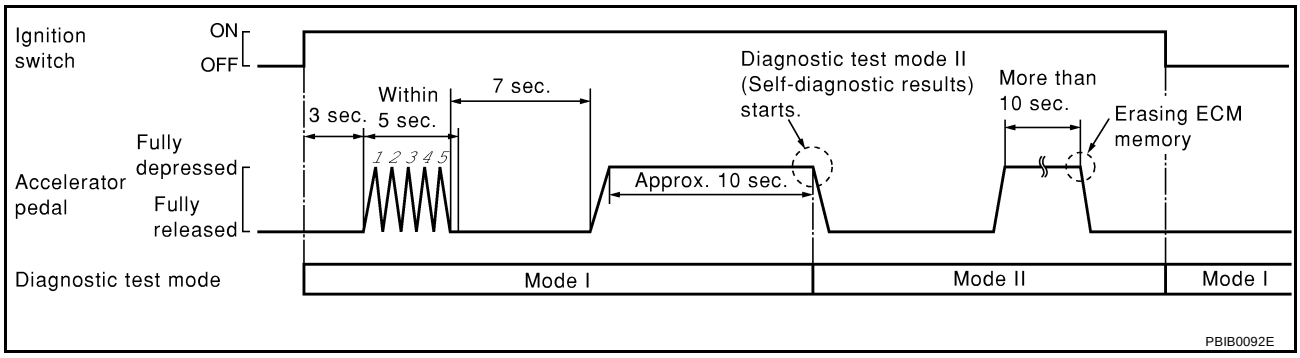
a. Fully depress the accelerator pedal.
b. Fully release the accelerator pedal.

3. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 10 seconds until the MIL starts blinking.

NOTE:
Do not release the accelerator pedal for 10 seconds if MIL may start blinking on the halfway of this 10 seconds. This blinking is displaying SRT status and is continued for another 10 seconds. For the details, refer to EC-56, "How to Display SRT Status" .

4. Fully release the accelerator pedal.
   ECM has entered to Diagnostic Test Mode II (Self-diagnostic results).

NOTE:
Wait until the same DTC (or 1st trip DTC) appears to confirm all DTCs certainly.



How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

1. Set ECM in Diagnostic Test Mode II (Self-diagnostic results).
   Refer to EC-63, "How to Set Diagnostic Test Mode II (Self-diagnostic Results)" .
2. Fully depress the accelerator pedal and keep it for more than 10 seconds.
   The emission-related diagnostic information has been erased from the backup memory in the ECM.
3. Fully release the accelerator pedal, and confirm the DTC 0000 is displayed.

DIAGNOSTIC TEST MODE I — BULB CHECK

In this mode, the MIL on the instrument panel should stay ON. If it remains OFF, check the bulb.
Refer to DI-56, "WARNING LAMPS" or see EC-716, "MIL AND DATA LINK CONNECTOR" .

DIAGNOSTIC TEST MODE I — MALFUNCTION WARNING

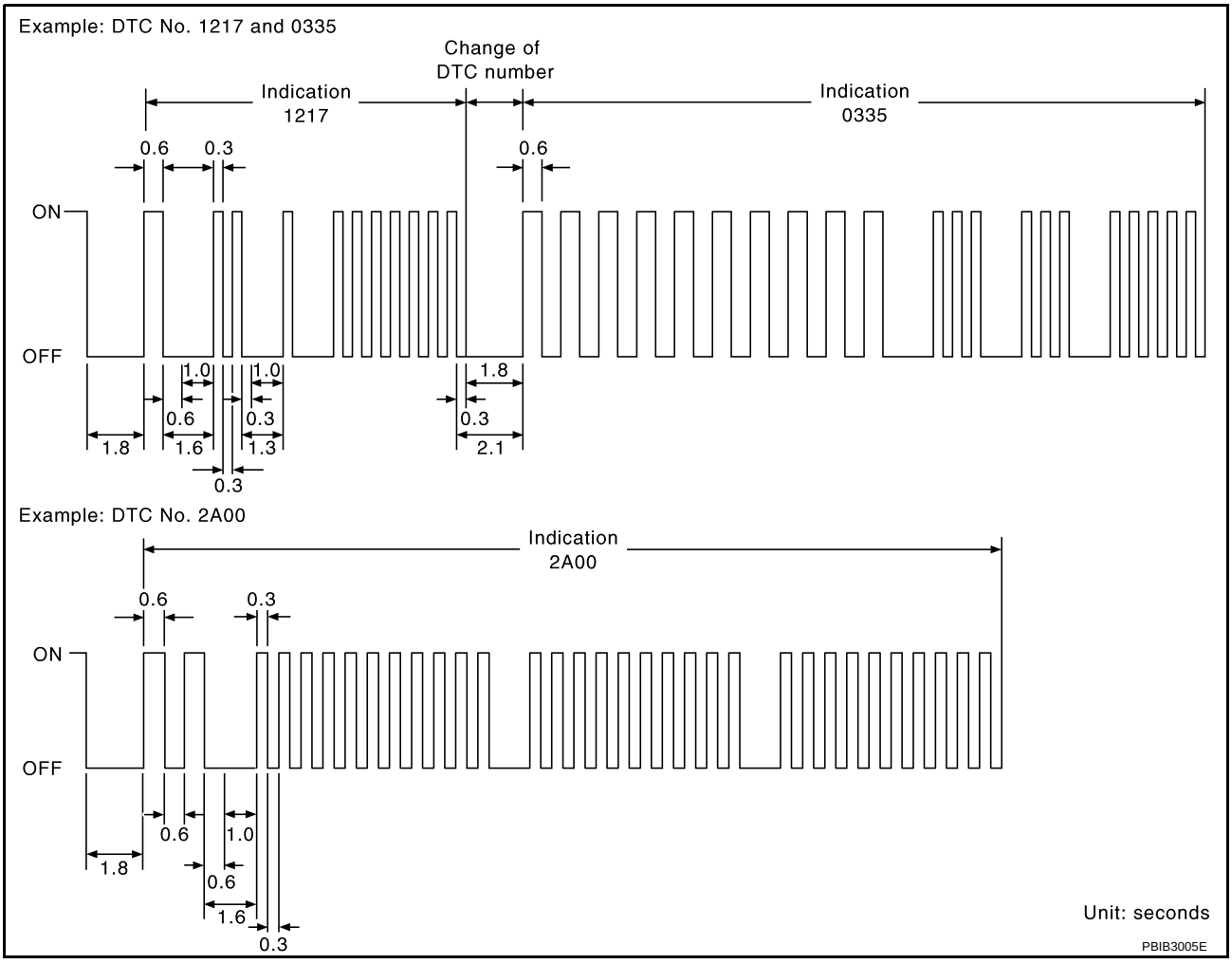
MIL	Condition
ON	When the malfunction is detected.
OFF	No malfunction.

These DTC numbers are clarified in Diagnostic Test Mode II (SELF-DIAGNOSTIC RESULTS)

DIAGNOSTIC TEST MODE II — SELF-DIAGNOSTIC RESULTS

In this mode, the DTC and 1st trip DTC are indicated by the number of blinks of the MIL as shown below. The DTC and 1st trip DTC are displayed at the same time. If the MIL does not illuminate in diagnostic test mode I (Malfunction warning), all displayed items are 1st trip DTCs. If only one code is displayed when the MIL illuminates in diagnostic test mode II (SELF-DIAGNOSTIC RESULTS), it is a DTC; if two or more codes are displayed, they may be either DTCs or 1st trip DTCs. DTC No. is same as that of 1st trip DTC. These uniden-

tified codes can be identified by using the CONSULT-III or GST. A DTC will be used as an example for how to read a code.



A particular trouble code can be identified by the number of four-digit numeral flashes as follows. The length of time the 1,000th-digit numeral flashes on and off is 1.2 seconds consisting of an ON (0.6-second) - OFF (0.6-second) cycle. The 100th-digit numeral and lower digit numerals consist of a 0.3-second ON and 0.3-second OFF cycle. A change from one digit numeral to another occurs at an interval of 1.0-second OFF. In other words, the later numeral appears on the display 1.3 seconds after the former numeral has disappeared.

Number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Flashes	10	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16

A change from one trouble code to another occurs at an interval of 1.8-second OFF.
In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. (See EC-8, "INDEX FOR DTC")

How to Erase Diagnostic Test Mode II (Self-diagnostic Results)

The DTC can be erased from the back up memory in the ECM by depressing accelerator pedal.
Refer to EC-64, "How to Erase Diagnostic Test Mode II (Self-diagnostic Results)" .

- **If the battery is disconnected, the DTC will be lost from the backup memory within 24 hours.**
- **Be careful not to erase the stored memory before starting trouble diagnoses.**

OBD System Operation Chart

NBS00033

RELATIONSHIP BETWEEN MIL, 1ST TRIP DTC, DTC, AND DETECTABLE ITEMS

- When a malfunction is detected for the 1st time, the 1st trip DTC and the 1st trip freeze frame data are stored in the ECM memory.

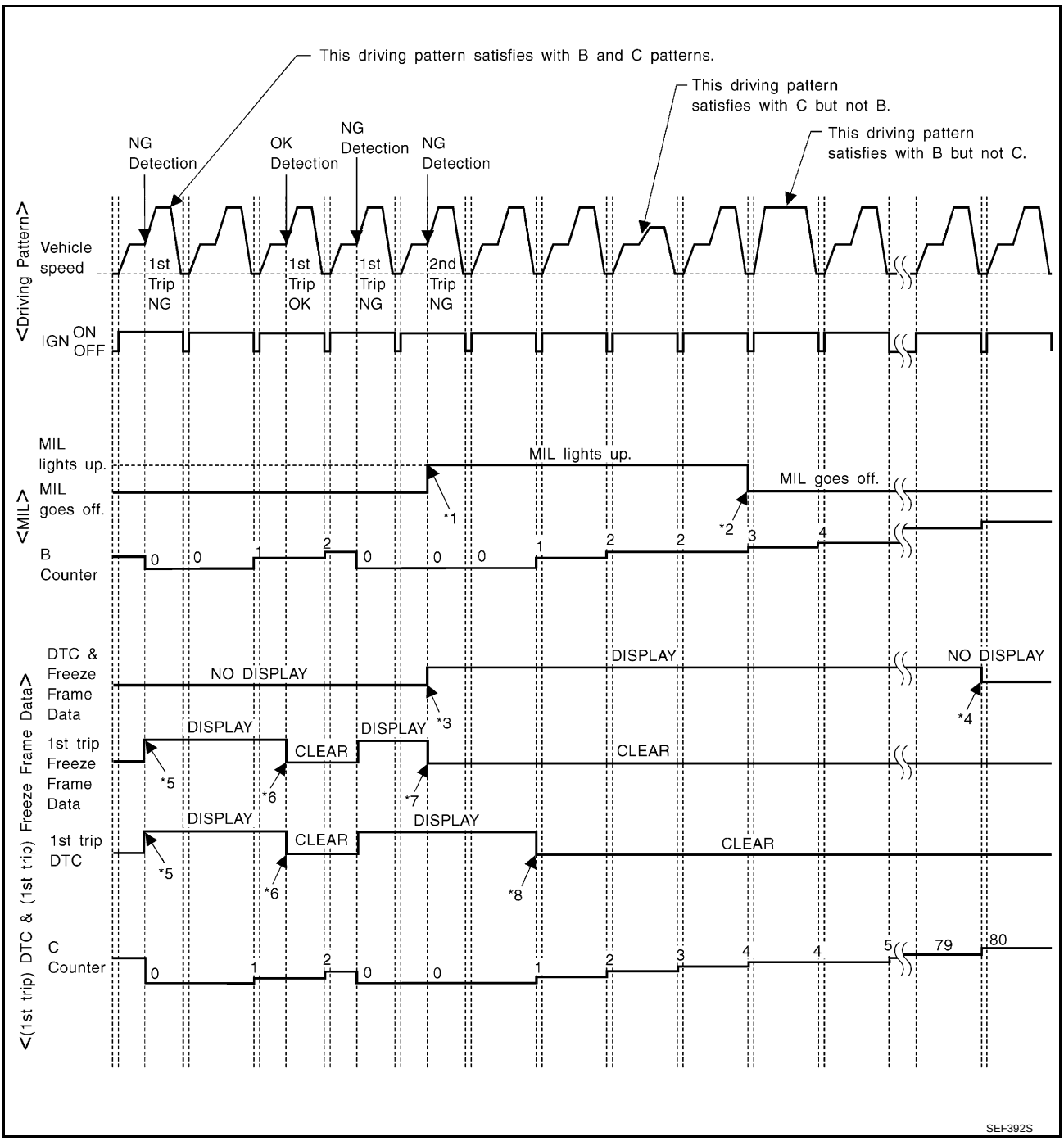
- When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data are stored in the ECM memory, and the MIL will come on. For details, refer to EC-47, "Two Trip Detection Logic" .
- The MIL will go off after the vehicle is driven 3 times (driving pattern B) with no malfunction. The drive is counted only when the recorded driving pattern is met (as stored in the ECM). If another malfunction occurs while counting, the counter will reset.
- The DTC and the freeze frame data will be stored until the vehicle is driven 40 times (driving pattern A) without the same malfunction recurring (except for Misfire and Fuel Injection System). For Misfire and Fuel Injection System, the DTC and freeze frame data will be stored until the vehicle is driven 80 times (driving pattern C) without the same malfunction recurring. The “TIME” in “SELF-DIAGNOSTIC RESULTS” mode of CONSULT-III will count the number of times the vehicle is driven.
- The 1st trip DTC is not displayed when the self-diagnosis results in OK for the 2nd trip.

SUMMARY CHART

Items	Fuel Injection System	Misfire	Other
MIL (goes off)	3 (pattern B)	3 (pattern B)	3 (pattern B)
DTC, Freeze Frame Data (no display)	80 (pattern C)	80 (pattern C)	40 (pattern A)
1st Trip DTC (clear)	1 (pattern C), *1	1 (pattern C), *1	1 (pattern B)
1st Trip Freeze Frame Data (clear)	*1, *2	*1, *2	1 (pattern B)

For details about patterns B and C under “Fuel Injection System” and “Misfire”, see EC-68 .
For details about patterns A and B under “Other”, see EC-70 .
*1: Clear timing is at the moment OK is detected.
*2: Clear timing is when the same malfunction is detected in the 2nd trip.

RELATIONSHIP BETWEEN MIL, DTC, 1ST TRIP DTC AND DRIVING PATTERNS FOR “MISFIRE ” <EXHAUST QUALITY DETERIORATION>, “FUEL INJECTION SYSTEM”



*1: When the same malfunction is detected in two consecutive trips, MIL will light up.

*2: MIL will go off after vehicle is driven 3 times (pattern B) without any malfunctions.

*3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

*4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 80 times (pattern C) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)

*5: When a malfunction is detected for the 1st time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.

*6: The 1st trip DTC and the 1st trip freeze frame data will be cleared at the moment OK is detected.

*7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

*8: 1st trip DTC will be cleared when vehicle is driven once (pattern C) without the same malfunction after DTC is stored in ECM.

EXPLANATION FOR DRIVING PATTERNS FOR “MISFIRE <EXHAUST QUALITY DETERIORATION>”, “FUEL INJECTION SYSTEM”

<Driving Pattern B>

Driving pattern B means the vehicle operation as follows:
All components and systems should be monitored at least once by the OBD system.

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunction.
- The MIL will go off when the B counter reaches 3. (*2 in OBD SYSTEM OPERATION CHART)

<Driving Pattern C>

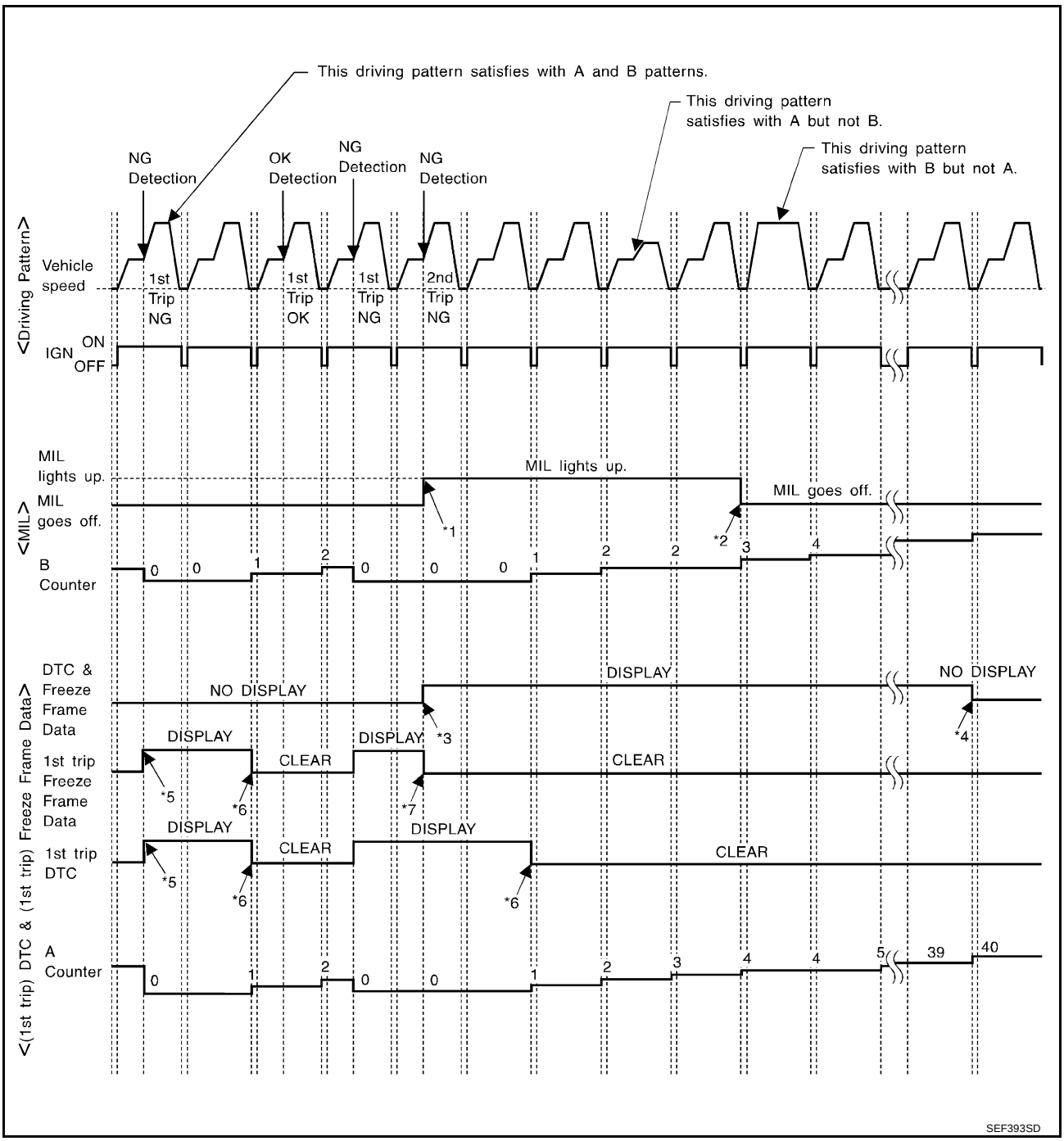
Driving pattern C means the vehicle operation as follows:
The following conditions should be satisfied at the same time:
Engine speed: (Engine speed in the freeze frame data) ±375 rpm
Calculated load value: (Calculated load value in the freeze frame data) x (1±0.1) [%]
Engine coolant temperature (T) condition:

- When the freeze frame data shows lower than 70°C (158°F), T should be lower than 70°C (158°F).
- When the freeze frame data shows higher than or equal to 70°C (158°F), T should be higher than or equal to 70°C (158°F).

Example:
If the stored freeze frame data is as follows:
Engine speed: 850 rpm, Calculated load value: 30%, Engine coolant temperature: 80°C (176°F)
To be satisfied with driving pattern C, the vehicle should run under the following conditions:
Engine speed: 475 - 1,225 rpm, Calculated load value: 27 - 33%, Engine coolant temperature: more than 70°C (158°F)

- The C counter will be cleared when the malfunction is detected regardless of vehicle conditions above.
- The C counter will be counted up when vehicle conditions above is satisfied without the same malfunction.
- The DTC will not be displayed after C counter reaches 80.(*2 in OBD SYSTEM OPERATION CHART)
- The 1st trip DTC will be cleared when C counter is counted once without the same malfunction after DTC is stored in ECM.

RELATIONSHIP BETWEEN MIL, DTC, 1ST TRIP DTC AND DRIVING PATTERNS EXCEPT FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"



*1: When the same malfunction is detected in two consecutive trips, MIL will light up.

*2: MIL will go off after vehicle is driven 3 times (pattern B) without any malfunctions.

*3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

*4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 40 times (pattern A) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)

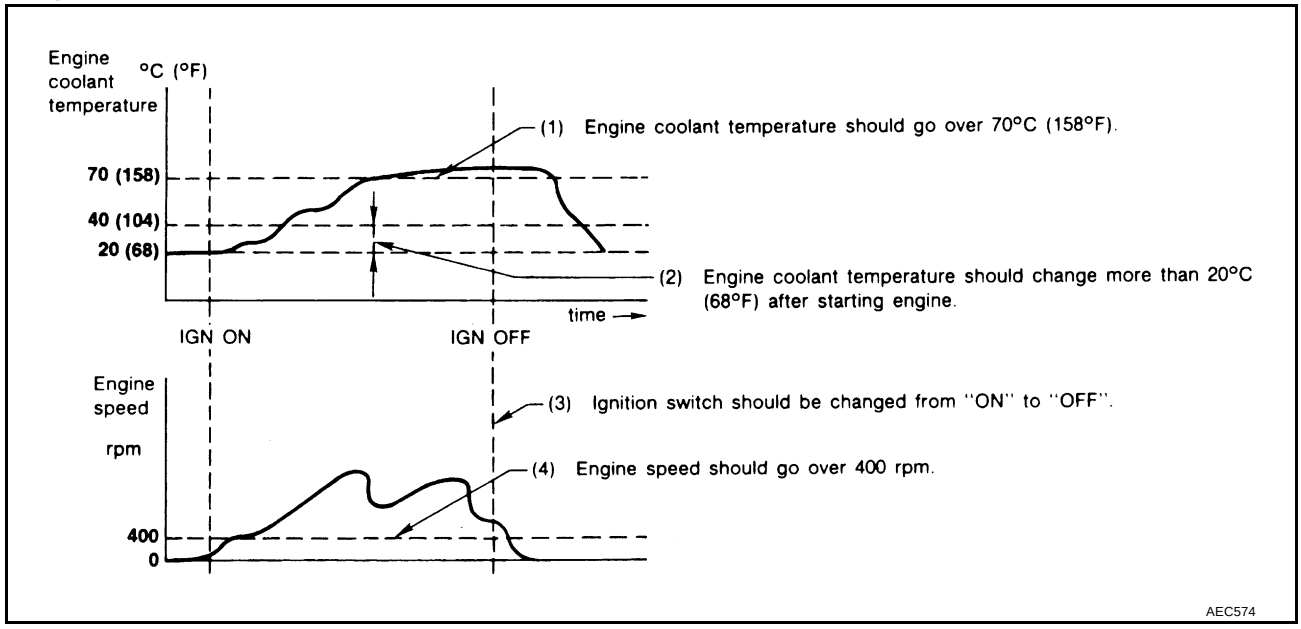
*5: When a malfunction is detected for the 1st time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.

*6: 1st trip DTC will be cleared after vehicle is driven once (pattern B) without the same malfunction.

*7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

EXPLANATION FOR DRIVING PATTERNS EXCEPT FOR "MISFIRE <EXHAUST QUALITY DETERIORATION>", "FUEL INJECTION SYSTEM"

<Driving Pattern A>



- The A counter will be cleared when the malfunction is detected regardless of (1) - (4).
- The A counter will be counted up when (1) - (4) are satisfied without the same malfunction.
- The DTC will not be displayed after the A counter reaches 40.(*2 in OBD SYSTEM OPERATION CHART)

<Driving Pattern B>

Driving pattern B means the vehicle operation as follows:
All components and systems should be monitored at least once by the OBD system.

- The B counter will be cleared when the malfunction is detected once regardless of the driving pattern.
- The B counter will be counted up when driving pattern B is satisfied without any malfunctions.
- The MIL will go off when the B counter reaches 3 (*2 in OBD SYSTEM OPERATION CHART).

BASIC SERVICE PROCEDURE

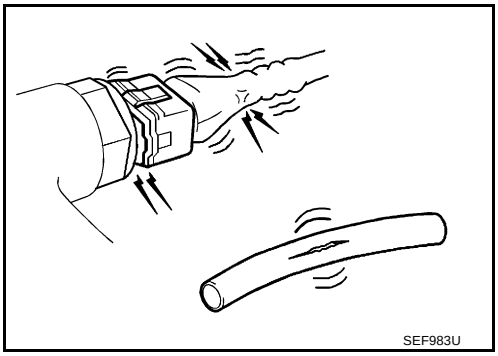
PFP:00018

Basic Inspection

NBS00034

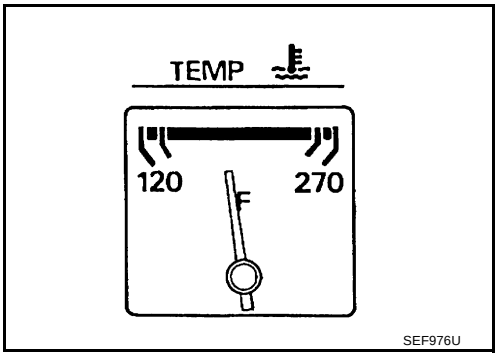
1. INSPECTION START

1. Check service records for any recent repairs that may indicate a related malfunction, or a current need for scheduled maintenance.
2. Open engine hood and check the following:
- Harness connectors for improper connections
- Wiring harness for improper connections, pinches and cut
- Vacuum hoses for splits, kinks and improper connections
- Hoses and ducts for leaks
- Air cleaner clogging
- Gasket


SEF983U

3. Confirm that electrical or mechanical loads are not applied.
- Headlamp switch is OFF.
- Air conditioner switch is OFF.
- Rear window defogger switch is OFF.
- Steering wheel is in the straight-ahead position, etc.

4. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge.
Ensure engine stays below 1,000 rpm.

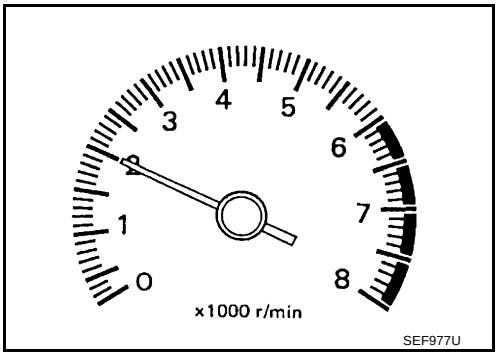


SEF976U

5. Run engine at about 2,000 rpm for about 2 minutes under no-load.
6. Make sure that no DTC is displayed with CONSULT-III or GST.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.



SEF977U

2. REPAIR OR REPLACE

Repair or replace components as necessary according to corresponding Diagnostic Procedure.

>> GO TO 3.

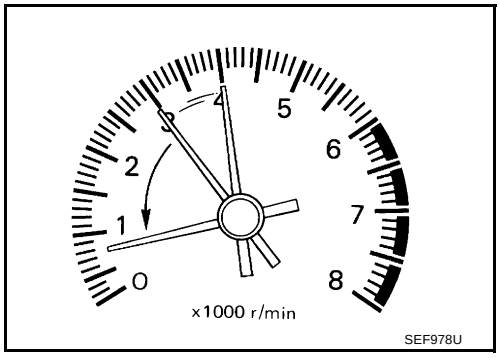
3. CHECK TARGET IDLE SPEED

With CONSULT-III

1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
3. Read idle speed in “DATA MONITOR” mode with CONSULT-III. Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm (in Neutral position)



Without CONSULT-III

1. Run engine at about 2,000 rpm for about 2 minutes under no-load.
2. Rev engine (2,000 to 3,000 rpm) two or three times under no-load, then run engine at idle speed for about 1 minute.
3. Check idle speed. Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm (in Neutral position)

OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .

>> GO TO 5.

5. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-77, "Throttle Valve Closed Position Learning" .

>> GO TO 6.

6. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-77, "Idle Air Volume Learning" .

Is Idle Air Volume Learning carried out successfully?

Yes or No

Yes >> GO TO 7.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

7. CHECK TARGET IDLE SPEED AGAIN

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Read idle speed in “DATA MONITOR” mode with CONSULT-III.
   Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm (in Neutral position)

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed. Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)

M/T: 650 ± 50 rpm (in Neutral position)

OK or NG

OK >> GO TO 10.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit.
  Refer to EC-394, "DTC P0340, P0345 CMP SENSOR (PHASE)" .
- Check crankshaft position sensor (POS) and circuit.
  Refer to EC-386, "DTC P0335 CKP SENSOR (POS)" .

OK or NG

OK >> GO TO 9.
NG >> 1. Repair or replace.
2. GO TO 4.

9. CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-150, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)" .

>> GO TO 4.

10. CHECK IGNITION TIMING

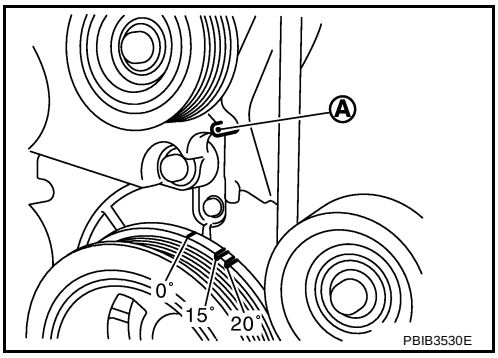
1. Run engine at idle.
2. Check ignition timing with a timing light.

   A : Timing indicator

   Refer to EC-76, "IGNITION TIMING" .

A/T: 15 ± 5° BTDC (in P or N position)

M/T: 15 ± 5° BTDC (in Neutral position)



OK or NG

OK >> GO TO 19.
NG >> GO TO 11.

11. PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .

>> GO TO 12.

12. PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform EC-77, "Throttle Valve Closed Position Learning" .

>> GO TO 13.

13. PERFORM IDLE AIR VOLUME LEARNING

Refer to EC-77, "Idle Air Volume Learning" .
Is Idle Air Volume Learning carried out successfully?

Yes or No

Yes >> GO TO 14.
No >> 1. Follow the instruction of Idle Air Volume Learning.
2. GO TO 4.

14. CHECK TARGET IDLE SPEED AGAIN

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Read idle speed in “DATA MONITOR” mode with CONSULT-III.
Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm (in Neutral position)

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed. Refer to EC-76, "IDLE SPEED" .

A/T: 650 ± 50 rpm (in P or N position)
M/T: 650 ± 50 rpm (in Neutral position)

OK or NG

OK >> GO TO 15.
NG >> GO TO 17.

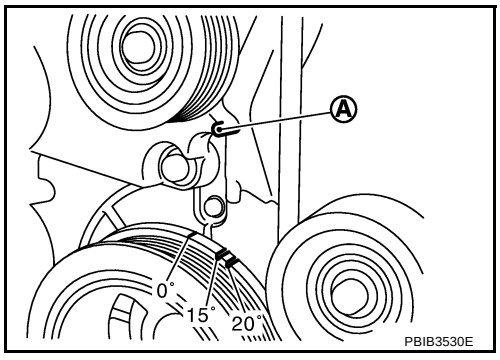
15. CHECK IGNITION TIMING AGAIN

1. Run engine at idle.
2. Check ignition timing with a timing light.

A : Timing indicator

Refer to EC-76, "IGNITION TIMING" .

A/T: 15 ± 5° BTDC (in P or N position)
M/T: 15 ± 5° BTDC (in Neutral position)



OK or NG

OK >> GO TO 19.
NG >> GO TO 16.

16. CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to EM-53, "TIMING CHAIN" .

OK or NG

OK >> GO TO 17.
NG >> 1. Repair the timing chain installation.
2. GO TO 4.

17. DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit.
  Refer to EC-394, "DTC P0340, P0345 CMP SENSOR (PHASE)" .
- Check crankshaft position sensor (POS) and circuit.
  Refer to EC-386, "DTC P0335 CKP SENSOR (POS)" .

OK or NG

OK >> GO TO 18.
NG >> 1. Repair or replace.
2. GO TO 4.

18. CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-150, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)" .

>> GO TO 4.

19. INSPECTION END

Did you replace the ECM, referring this Basic Inspection procedure?

Yes or No

Yes >> 1. Perform EC-76, "VIN Registration"
2. Perform EC-76, "Exhaust Valve Timing Control Learning" .
3. **INSPECTION END**

No >> **INSPECTION END**

Idle Speed and Ignition Timing Check

NBS00035

IDLE SPEED

With CONSULT-III

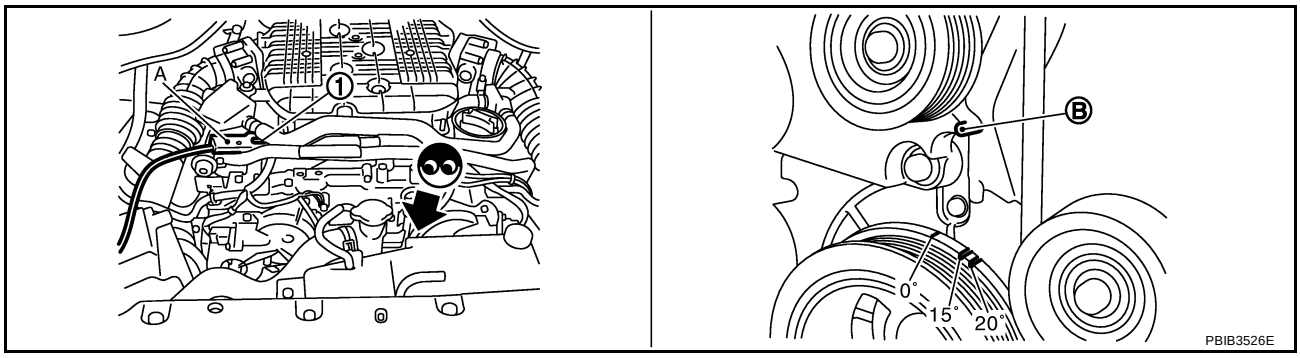
Check idle speed in “DATA MONITOR” mode with CONSULT-III.

With GST

Check idle speed in Service $01 with GST.

IGNITION TIMING

1. Attach timing light to loop wire as shown.



1. Loop wire
A. Timing light
B. Timing indicator

2. Check ignition timing.

Procedure After Replacing ECM

NBS006SZ

When replacing ECM, the following procedure must be performed.

1. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-152, "ECM Re-communicating Function" .
2. Perform EC-76, "VIN Registration" .
3. Perform EC-76, "Exhaust Valve Timing Control Learning" .
4. Perform EC-77, "Accelerator Pedal Released Position Learning" .
5. Perform EC-77, "Throttle Valve Closed Position Learning" .
6. Perform EC-77, "Idle Air Volume Learning" .

VIN Registration

NBS00037

DESCRIPTION

VIN Registration is an operation to registering VIN in ECM. It must be performed each time ECM is replaced.

NOTE:

Accurate VIN which is registered in ECM may be required for Inspection & Maintenance (I/M).

OPERATION PROCEDURE

With CONSULT-III

1. Check the VIN of the vehicle and note it. Refer to GI-46, "IDENTIFICATION INFORMATION" .
2. Turn ignition switch ON and engine stopped.
3. Select “VIN REGISTRATION” in “WORK SUPPORT” mode.
4. Follow the instruction of CONSULT-III display.

Exhaust Valve Timing Control Learning

NBS00038

DESCRIPTION

Exhaust Valve Timing Control Learning is an operation to learn the characteristic of exhaust valve timing control magnet retarder by comparing the target angle of exhaust camshaft with the actual retarded angle of exhaust camshaft. It must be performed each time exhaust valve timing control magnet retarder is disconnected or replaced, or ECM is replaced.

OPERATION PROCEDURE

With CONSULT-III

1. Start engine and warm it up to normal operation temperature.
2. Set shift lever in neutral position and confirm that following electrical or mechanical loads are not applied.
   - Headlamp switch is OFF
   - Air conditioner switch is OFF
   - Rear defogger switch is OFF
   - Steering wheel is in the straight-ahead position, etc
3. Keep the engine speed between 1,800 and 2,000 rpm.
4. Select “EXH V/T CONTROL LEARN” in “WORK SUPPORT” mode with CONSULT-III.
5. Touch “START” and wait 20 seconds.
6. Make sure that “CMPLT” is displayed on CONSULT-III screen.

Learning completed : CMPLT
Learning not yet : YET

Without CONSULT-III

1. Start engine and warm it up to normal operation temperature.
2. Set shift lever in neutral position and confirm that following electrical or mechanical loads are not applied.
   - Headlamp switch is OFF
   - Air conditioner switch is OFF
   - Rear defogger switch is OFF
   - Steering wheel is in the straight-ahead position, etc
3. Keep the engine speed between 1,800 and 2,000 rpm at 20 seconds.

Accelerator Pedal Released Position Learning

NBS00039

DESCRIPTION

Accelerator Pedal Released Position Learning is an operation to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. It must be performed each time harness connector of accelerator pedal position sensor or ECM is disconnected.

OPERATION PROCEDURE

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON and wait at least 2 seconds.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON and wait at least 2 seconds.
5. Turn ignition switch OFF and wait at least 10 seconds.

Throttle Valve Closed Position Learning

NBS0003A

DESCRIPTION

Throttle Valve Closed Position Learning is an operation to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time harness connector of electric throttle control actuator or ECM is disconnected.

OPERATION PROCEDURE

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.
   Make sure that throttle valve moves during above 10 seconds by confirming the operating sound.

Idle Air Volume Learning

NBS0003B

DESCRIPTION

Idle Air Volume Learning is an operation to learn the idle air volume that keeps each engine within the specific range. It must be performed under any of the following conditions:

- Each time electric throttle control actuator or ECM is replaced.

- Idle speed or ignition timing is out of specification.

PREPARATION

Before performing Idle Air Volume Learning, make sure that all of the following conditions are satisfied. Learning will be cancelled if any of the following conditions are missed for even a moment.

- Battery voltage: More than 12.9V (At idle)
- Engine coolant temperature: 70 - 100°C (158 - 212°F)
- Park/neutral position (PNP) switch: ON
- Electric load switch: OFF
  (Air conditioner, headlamp, rear window defogger)
  On vehicles equipped with daytime light systems, if the parking brake is applied before the engine is started, the headlamp will not be illuminated.
- Steering wheel: Neutral (Straight-ahead position)
- Vehicle speed: Stopped
- Transmission: Warmed-up

– For A/T models with CONSULT-III

• Drive vehicle until “ATF TEMP SE 1” in “DATA MONITOR” mode of “A/T” system indicates less than 0.9V.

– For A/T models without CONSULT-III and M/T models

• Drive vehicle for 10 minutes.

OPERATION PROCEDURE

With CONSULT-III

1. Perform EC-77, "Accelerator Pedal Released Position Learning" .
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Start engine and warm it up to normal operating temperature.
4. Check that all items listed under the topic PREPARATION (previously mentioned) are in good order.
5. Select “IDLE AIR VOL LEARN” in “WORK SUPPORT” mode.
6. Touch “START” and wait 20 seconds.
7. Make sure that “CMPLT” is displayed on CONSULT-III screen. If “CMPLT” is not displayed, Idle Air Volume Learning will not be carried out successfully. In this case, find the cause of the incident by referring to the DIAGNOSIS PROCEDURE below.
8. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in Neutral position)
Ignition timing	A/T: 15 ± 5° BTDC (in P or N position) M/T: 15 ± 5° BTDC (in Neutral position)

Without CONSULT-III

NOTE:

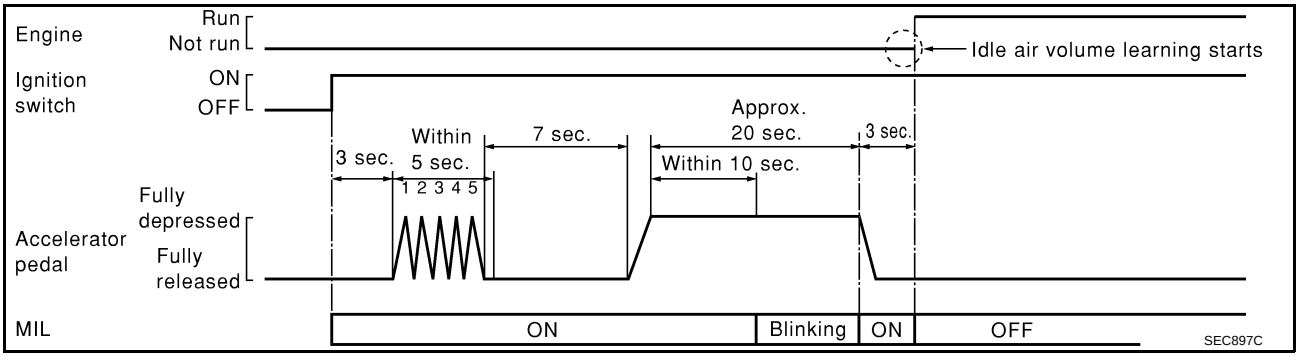
- **It is better to count the time accurately with a clock.**
- **It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.**

1. Perform EC-77, "Accelerator Pedal Released Position Learning" .
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Start engine and warm it up to normal operating temperature.
4. Check that all items listed under the topic PREPARATION (previously mentioned) are in good order.
5. Turn ignition switch OFF and wait at least 10 seconds.
6. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
7. Repeat the following procedure quickly five times within 5 seconds.

a. Fully depress the accelerator pedal.

b. Fully release the accelerator pedal.

8. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 20 seconds until the MIL stops blinking and turned ON.
9. Fully release the accelerator pedal within 3 seconds after the MIL turned ON.
10. Start engine and let it idle.
11. Wait 20 seconds.



12. Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications.

ITEM	SPECIFICATION
Idle speed	A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in Neutral position)
Ignition timing	A/T: 15 ± 5° BTDC (in P or N position) M/T: 15 ± 5° BTDC (in Neutral position)

13. If idle speed and ignition timing are not within the specification, Idle Air Volume Learning will not be carried out successfully. In this case, find the cause of the incident by referring to the DIAGNOSTIC PROCEDURE below.

DIAGNOSTIC PROCEDURE

If Idle Air Volume Learning cannot be performed successfully, proceed as follows:

1. **Check that throttle valve is fully closed.**
2. **Check PCV valve operation.**
3. **Check that downstream of throttle valve is free from air leakage.**
4. **When the above three items check out OK, engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident.**
   It is useful to perform EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .
5. **If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform Idle Air Volume Learning all over again:**
   - **Engine stalls.**
   - **Erroneous idle.**

Fuel Pressure Check

NBS0003C

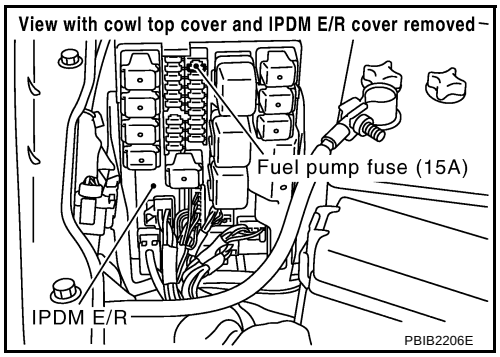
FUEL PRESSURE RELEASE

With CONSULT-III

1. Turn ignition switch ON.
2. Perform “FUEL PRESSURE RELEASE” in “WORK SUPPORT” mode with CONSULT-III.
3. Start engine.
4. After engine stalls, crank it two or three times to release all fuel pressure.
5. Turn ignition switch OFF.

Without CONSULT-III

1. Remove fuel pump fuse (1) located in IPDM E/R (2).
2. Start engine.
3. After engine stalls, crank it two or three times to release all fuel pressure.
4. Turn ignition switch OFF.
5. Reinstall fuel pump fuse after servicing fuel system.



FUEL PRESSURE CHECK

CAUTION:

Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger.

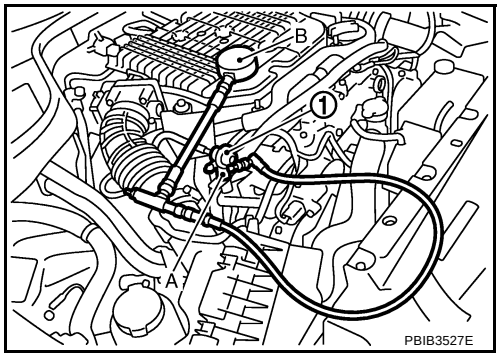
NOTE:

Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel pressure cannot be completely released because Z33 models do not have fuel return system.
Use Fuel Pressure Gauge Kit (J-44321) to check fuel pressure.

1. Release fuel pressure to zero. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Install the inline fuel quick disconnected fitting (A) between fuel damper (1) and fuel injector tube.
3. Connect the fuel pressure gauge (quick connector adapter hose) (B) to the inline fuel quick disconnected fitting.
4. Turn ignition switch ON and check for fuel leakage.
5. Start engine and check for fuel leakage.
6. Read the indication of fuel pressure gauge.

At idling: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

7. If result is unsatisfactory, go to next step.
8. Check fuel hoses and fuel tubes for clogging.
   If OK, replace “fuel filter and fuel pump assembly”.
   If NG, repair or replace.



TROUBLE DIAGNOSIS

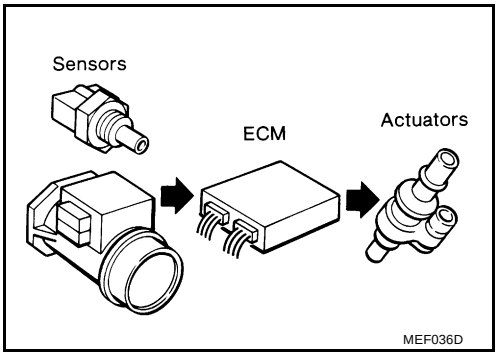
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Trouble Diagnosis Introduction

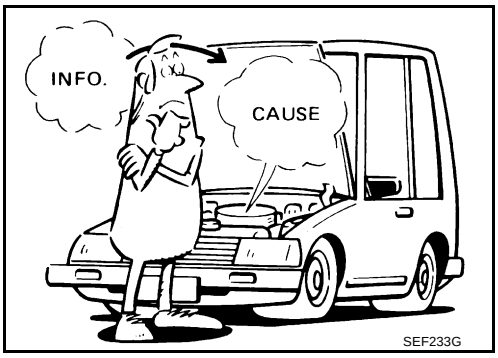
NBS0003D

INTRODUCTION

The engine has an ECM to control major systems such as fuel control, ignition control, idle air control system, etc. The ECM accepts input signals from sensors and instantly drives actuators. It is essential that both input and output signals are proper and stable. At the same time, it is important that there are no malfunctions such as vacuum leaks, fouled spark plugs, or other malfunctions with the engine.



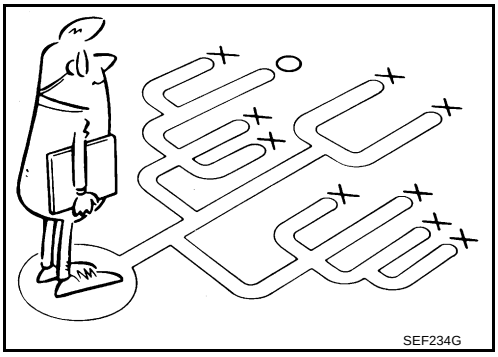
It is much more difficult to diagnose an incident that occurs intermittently rather than continuously. Most intermittent incidents are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.



A visual check only may not find the cause of the incidents. A road test with CONSULT-III (or GST) or a circuit tester connected should be performed. Follow the WORK FLOW on EC-82 .

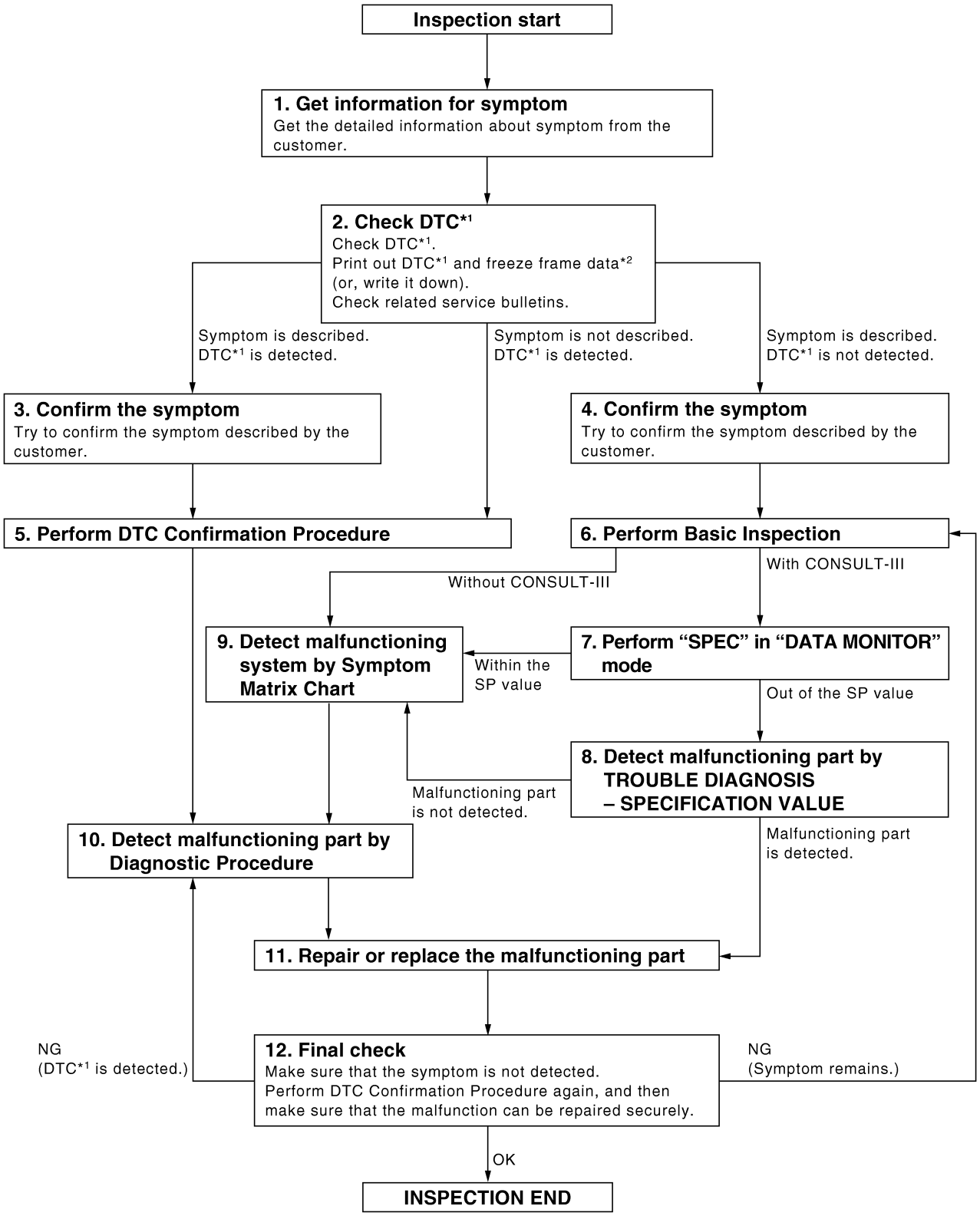
Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such incidents, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A DIAGNOSTIC WORKSHEET like the example on EC-86 should be used.

Start your diagnosis by looking for conventional malfunctions first. This will help troubleshoot driveability malfunctions on an electronically controlled engine vehicle.



WORK FLOW

Overall Sequence



*1: Include 1st trip DTC.
*2: Include 1st trip freeze frame data.

PBIB3456E

Detailed Flow

1. GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the EC-85, "DIAGNOSTIC WORKSHEET" .

>> GO TO 2.

2. CHECK DTC*1

1. Check DTC*1 .
2. Perform the following procedure if DTC*1 is displayed.

- Record DTC*1 and freeze frame data*2 . (Print them out with CONSULT-III or GST.)
- Erase DTC*1 . (Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .)
- Study the relationship between the cause detected by DTC*1 and the symptom described by the customer. (Symptom Matrix Chart is useful. Refer to EC-90, "Symptom Matrix Chart" .)

3. Check related service bulletins for information.

Is any symptom described and any DTC detected?

Symptom is described, DTC*1 is displayed>>GO TO 3.
Symptom is described, DTC*1 is not displayed>>GO TO 4.
Symptom is not described, DTC*1 is displayed>>GO TO 5.

3. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer (except MIL ON).
DIAGNOSIS WORK SHEET is useful to verify the incident.
Connect CONSULT-III to the vehicle and check diagnosis results.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
DIAGNOSIS WORK SHEET is useful to verify the incident.
Connect CONSULT-III to the vehicle and check diagnosis results.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5. PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC Confirmation Procedure for the displayed DTC*1 , and then make sure that DTC*1 is detected again.

If two or more DTCs*1 are detected, refer to EC-87, "DTC Inspection Priority Chart" and determine trouble diagnosis order.

NOTE:

- Freeze frame data*2 is useful if the DTC*1 is not detected.
- Perform Overall Function Check if DTC Confirmation Procedure is not included on Service Manual. This simplified check procedure is an effective alternative though DTC*1 cannot be detected during this check. If the result of Overall Function Check is NG, it is the same as the detection of DTC*1 by DTC Confirmation Procedure.

Is DTC*1 detected?

Yes >> GO TO 10.
No >> Check according to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

6. PERFORM BASIC INSPECTION

Perform EC-71, "Basic Inspection" .

With CONSULT-III>>GO TO 7.
Without CONSULT-III>>GO TO 9.

7. PERFORM SPEC IN DATA MONITOR MODE

With CONSULT-III
Make sure that “MAS A/F SE-B1”, “MAS A/F SE-B2”, “B/FUEL SCHDL”, and “A/F ALPHA-B1”, “A/F ALPHA-B2” are within the SP value using CONSULT-III “SPEC” in "DATA MONITOR" mode.
Refer to EC-133, "Diagnostic Procedure" .

Are they within the SP value?

Yes >> GO TO 9.
No >> GO TO 8.

8. DETECT MALFUNCTIONING PART BY TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Detect malfunctioning part according to EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .

Is malfunctioning part detected?

Yes >> GO TO 11.
No >> GO TO 9.

9. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM MATRIX CHART

Detect malfunctioning system according to EC-90, "Symptom Matrix Chart" based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

>> GO TO 10.

10. DETECT MALFUNCTIONING PART BY DIAGNOSTIC PROCEDURE

Inspect according to Diagnostic Procedure of the system.

NOTE:
The Diagnostic Procedure in EC section described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnostic Procedure. For details, refer to Circuit Inspection in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" .

Is malfunctioning part detected?

Yes >> GO TO 11.
No >> Monitor input data from related sensors or check voltage of related ECM terminals using CONSULT-III. Refer to EC-127, "CONSULT-III Reference Value in Data Monitor" , EC-103, "ECM Terminals and Reference Value" .

11. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnostic Procedure again after repair and replacement.
3. Check DTC. If DTC is displayed, erase it, refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 12.

12. FINAL CHECK

When DTC was detected in step 2, perform DTC Confirmation Procedure or Overall Function Check again, and then make sure that the malfunction have been repaired securely.
When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and make sure that the symptom is not detected.

OK or NG

NG (DTC*1 is detected)>>GO TO 10.
NG (Symptom remains)>>GO TO 6.
OK >> 1. Before returning the vehicle to the customer, make sure to erase unnecessary DTC*1 in ECM and TCM (Transmission Control Module). (Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" and AT-38, "HOW TO ERASE DTC" .)
2. If the completion of SRT is needed, drive vehicle under the specific driving pattern. Refer to EC-58, "Driving Pattern" .
3. **INSPECTION END**

*1: Include 1st trip DTC.
*2: Include 1st trip freeze frame data.

DIAGNOSTIC WORKSHEET

Description

There are many operating conditions that lead to the malfunction of engine components. A good grasp of such conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a incident. It is important to fully understand the symptoms or conditions for a customer complaint.
Utilize a diagnostic worksheet like the one on the next page in order to organize all the information for troubleshooting.
Some conditions may cause the MIL to come on steady or blink and DTC to be detected. Examples:

- Vehicle ran out of fuel, which caused the engine to misfire.
- Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

KEY POINTS

WHAT ..... Vehicle & engine model
WHEN ..... Date, Frequencies
WHERE..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SEF907L

Worksheet Sample

Customer name MR/MS		Model & Year	VIN
Engine #		Trans.	Mileage
Incident Date		Manuf. Date	In Service Date
Fuel and fuel filler cap		☐ Vehicle ran out of fuel causing misfire ☐ Fuel filler cap was left off or incorrectly screwed on.	
Symptoms	☐ Startability	☐ Impossible to start ☐ No combustion ☐ Partial combustion ☐ Partial combustion affected by throttle position ☐ Partial combustion NOT affected by throttle position ☐ Possible but hard to start ☐ Others [ ]	
	☐ Idling	☐ No fast idle ☐ Unstable ☐ High idle ☐ Low idle ☐ Others [ ]	
	☐ Driveability	☐ Stumble ☐ Surge ☐ Knock ☐ Lack of power ☐ Intake backfire ☐ Exhaust backfire ☐ Others [ ]	
	☐ Engine stall	☐ At the time of start ☐ While idling ☐ While accelerating ☐ While decelerating ☐ Just after stopping ☐ While loading	
Incident occurrence		☐ Just after delivery ☐ Recently ☐ In the morning ☐ At night ☐ In the daytime	
Frequency		☐ All the time ☐ Under certain conditions ☐ Sometimes	
Weather conditions		☐ Not affected	
	Weather	☐ Fine ☐ Raining ☐ Snowing ☐ Others [ ]	
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold ☐ Humid °F	
Engine conditions		☐ Cold ☐ During warm-up ☐ After warm-up Engine speed 0 2,000 4,000 6,000 8,000 rpm	
Road conditions		☐ In town ☐ In suburbs ☐ Highway ☐ Off road (up/down)	
Driving conditions		☐ Not affected ☐ At starting ☐ While idling ☐ At racing ☐ While accelerating ☐ While cruising ☐ While decelerating ☐ While turning (RH/LH) Vehicle speed 0 10 20 30 40 50 60 MPH	
Malfunction indicator lamp		☐ Turned on ☐ Not turned on	

MTBL0017

DTC Inspection Priority Chart

NBS0003E

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:

- **If DTC U1000 or U1001 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC U1010 is displayed with other DTC, first perform the diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION".**

Priority	Detected items (DTC)
1	● U1000 U1001 CAN communication line ● U1010 CAN communication ● P0101 P0102 P0103 P010B P010C P010D Mass air flow sensor ● P0112 P0113 P0127 Intake air temperature sensor ● P0117 P0118 P0125 Engine coolant temperature sensor ● P0122 P0123 P0222 P0223 P0227 P0228 P1225 P1226 P1234 P1235 P1239 P2132 P2133 P2135 Throttle position sensor ● P0128 Thermostat function ● P0181 P0182 P0183 Fuel tank temperature sensor ● P0196 P0197 P0198 Engine oil temperature sensor ● P0327 P0328 P0332 P0333 Knock sensor ● P0335 Crankshaft position sensor (POS) ● P0340 P0345 Camshaft position sensor (PHASE) ● P0460 P0461 P0462 P0463 Fuel level sensor ● P0500 Vehicle speed sensor ● P0605 ECM ● P0643 Sensor power supply ● P0700 TCM ● P0705 P0850 Park/neutral position (PNP) switch ● P1610 - P1615 NATS ● P2122 P2123 P2127 P2128 P2138 Accelerator pedal position sensor

Priority	Detected items (DTC)
2	● P0031 P0032 P0051 P0052 Air fuel ratio (A/F) sensor 1 heater ● P0037 P0038 P0057 P0058 Heated oxygen sensor 2 heater ● P0075 P0081 Intake valve timing control solenoid valve ● P0078 P0084 Exhaust valve timing control magnet retarder* ● P0130 P0131 P0132 P0133 P0150 P0151 P0152 P0153 P2A00 P2A03 Air fuel ratio (A/F) sensor 1 ● P0137 P0138 P0139 P0158 P0159 Heated oxygen sensor 2 ● P0441 EVAP control system purge flow monitoring ● P0443 P0444 P0445 EVAP canister purge volume control solenoid valve ● P0447 P0448 EVAP canister vent control valve ● P0451 P0452 P0453 EVAP control system pressure sensor ● P0550 Power steering pressure sensor ● P0603 ECM power supply ● P0710 P0717 P0720 P0731 P0732 P0733 P0734 P0735 P0740 P0744 P0745 P1730 P1752 P1757 P1762 P1767 P1772 P1774 A/T related sensors, solenoid valves and switches ● P1078 P1084 Exhaust valve timing control position sensor ● P1217 Engine over temperature (OVERHEAT) ● P1233 P2101 Electric throttle control function ● P1236 P2118 Throttle control motor ● P1290 P2103 P2103 Throttle control motor relay ● P1805 Brake switch
3	● P0011 P0021 Intake valve timing control ● P0014 P0024 Exhaust valve timing control* ● P0171 P0172 P0174 P0175 Fuel injection system function ● P0300 - P0306 Misfire ● P0420 P0430 Three way catalyst function ● P0442 EVAP control system (SMALL LEAK) ● P0455 EVAP control system (GROSS LEAK) ● P0456 EVAP control system (VERY SMALL LEAK) ● P0506 P0507 Idle speed control system ● P1148 P1168 Closed loop control ● P1211 TCS control unit ● P1212 TCS communication line ● P1238 P2119 Electric throttle control actuator ● P1421 Cold start control ● P1564 ASCD steering switch ● P1572 ASCD brake switch ● P1574 ASCD vehicle speed sensor ● P1715 Turbine revolution sensor

Fail-safe Chart

NBS0003F

When the DTC listed below is detected, the ECM enters fail-safe mode and the MIL lights up.

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0102 P0103 P010C P010D	Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.
P0117 P0118	Engine coolant temperature sensor circuit	Engine coolant temperature will be determined by ECM based on the time after turning ignition switch ON or START. CONSULT-III displays the engine coolant temperature decided by ECM.
		Condition: Just as ignition switch is turned ON or START — Engine coolant temperature decided (CONSULT-III display): 40°C (104°F)
		Condition: More than approx. 4 minutes after ignition ON or START — Engine coolant temperature decided (CONSULT-III display): 80°C (176°F)
		Condition: Except as shown above — Engine coolant temperature decided (CONSULT-III display): 40 - 80°C (104 - 176°F) (Depends on the time)
		When the fail-safe system for engine coolant temperature sensor is activated, the cooling fan operates while engine is running.
P0122 P0123 P0222 P0223 P0227 P0228 P1239 P2132 P2133 P2135	Throttle position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.
P0643	Sensor power supply	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1233 P2101	Electric throttle control function	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1236 P2118	Throttle control motor	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1238 P2119	Electric throttle control actuator	(When electric throttle control actuator does not function properly due to the return spring malfunction:) ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.
		(When throttle valve opening angle in fail-safe mode is not in specified range:) ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.
		(When ECM detects the throttle valve is stuck open:) While the vehicle is driving, it slows down gradually by fuel cut. After the vehicle stops, the engine stalls. The engine can restart in N or P (A/T), Neutral (M/T) position, and engine speed will not exceed 1,000 rpm or more.
P1290 P2100 P2103	Throttle control motor relay	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

- When there is an open circuit on MIL circuit, the ECM cannot warn the driver by lighting up MIL when there is malfunction on engine control system.
  Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
  The fail-safe function also operates when above diagnoses except MIL circuit are detected and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

Symptom Matrix Chart

NBS0003G

SYSTEM — BASIC ENGINE CONTROL SYSTEM

		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Fuel	Fuel pump circuit	1	1	2	3	2		2	2			3		2	EC-691
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-80
	Fuel injector circuit	1	1	2	3	2		2	2			2			EC-686
	Evaporative emission system	3	3	4	4	4	4	4	4	4		4			EC-33
Air	Positive crankcase ventilation system	3	3	4	4	4	4	4	4	4		4	1		EC-44
	Incorrect idle speed adjustment						1	1	1	1		1			EC-71
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	EC-561, EC-580
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			EC-71
	Ignition circuit	1	1	2	2	2		2	2			2			EC-698
Power supply and ground circuit		2	2	3	3	3		3	3		2	3			EC-142

	SYMPTOM													Reference page
	HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Mass air flow sensor circuit	1			2										EC-197, EC-208
Engine coolant temperature sensor circuit						3			3					EC-223, EC-239
Air fuel ratio (A/F) sensor 1 circuit		1	2	3	2		2	2			2			EC-165, EC-248 , EC-257 , EC-266 , EC-275 , EC-659
Throttle position sensor circuit						2			2					EC-229, EC-361 , EC-557 , EC-559 , EC-582
Accelerator pedal position sensor circuit			3	2	1									EC-514, EC-633 , EC-641 , EC-650
Knock sensor circuit			2								3			EC-379
Crankshaft position sensor (POS) circuit	2	2												EC-386
Camshaft position sensor (PHASE) circuit	3	2												EC-394
Vehicle speed signal circuit		2	3		3						3			EC-496
Power steering pressure sensor circuit		2					3	3						EC-502
ECM	2	2	3	3	3	3	3	3	3	3	3			EC-508, EC-512
Intake valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-183
Exhaust valve timing control magnet retarder circuit		3	2		1	3	2	2	3		3			EC-160
Park/neutral position (PNP) switch circuit			3		3		3	3			3			EC-520
Refrigerant pressure sensor circuit		2				3			3		4			EC-710
Electrical load signal circuit							3							EC-684
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	ATC-33
VDC/TCS/ABS control unit ABS actuator and electric unit (control unit)			4											BRC-82, BRC-42

1 - 6: The numbers refer to the order of inspection.

(continued on next page)

SYSTEM — ENGINE MECHANICAL & OTHER

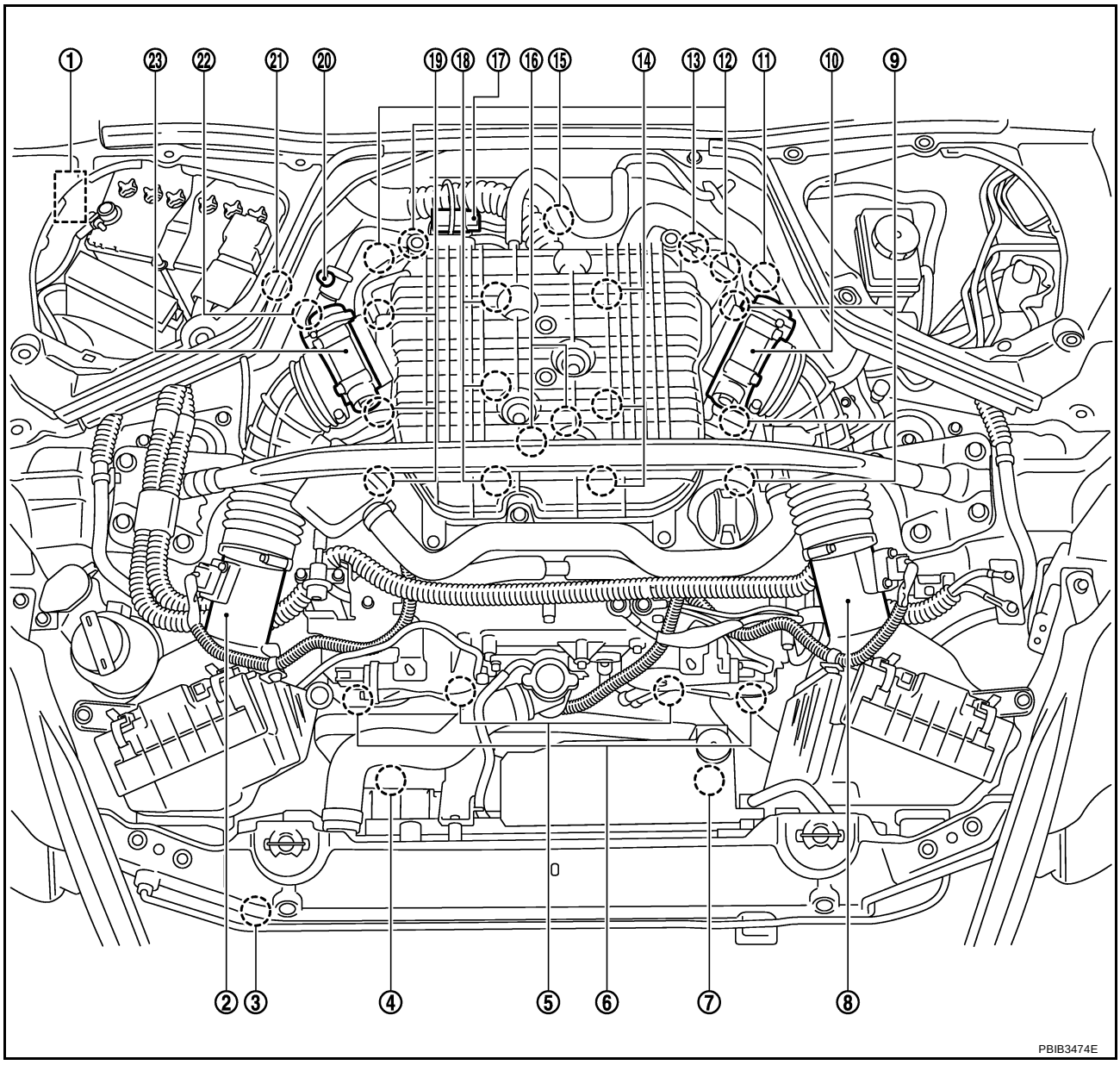
		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Fuel	Fuel tank	5	5												FL-10
	Fuel piping			5	5	5		5	5			5			EM-34
	Vapor lock														—
	Valve deposit	5		5	5	5		5	5			5			—
	Poor fuel (Heavy weight gasoline, Low octane)														—
Air	Air duct	5	5	5	5	5	5	5	5	5		5			EM-15
	Air cleaner														EM-15
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)														EM-15
	Electric throttle control actuator														EM-17
	Air leakage from intake manifold/ Collector/Gasket														EM-17, EM-20
Cranking	Battery	1	1	1		1		1	1			1		1	SC-4
	Generator circuit														SC-20
	Starter circuit	3													SC-8
	Signal plate	6													EM-107
	Park/neutral position (PNP) switch	4													MT-11 or AT-102
Engine	Cylinder head	5	5	5	5	5		5	5			5			EM-89
	Cylinder head gasket										4		3		
	Cylinder block	6	6	6	6	6		6	6			6	4		EM-107
	Piston														
	Piston ring														
	Connecting rod														
	Bearing														
	Crankshaft														

		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Valve mechanism	Timing chain	5	5	5	5	5		5	5			5			EM-53
	Camshaft														EM-72
	Intake valve timing control														EM-53
	Exhaust valve timing control														EM-53
	Intake valve												3		EM-89
	Exhaust valve														
Exhaust	Exhaust manifold/Tube/Muffler/Gasket	5	5	5	5	5		5	5			5			EM-22, EX-3
	Three way catalyst														
Lubrication	Oil pan/Oil strainer/Oil pump/Oil filter/Oil gallery	5	5	5	5	5		5	5			5			EM-26, LU-10 , LU-9
	Oil level (Low)/Filthy oil														LU-6
Cooling	Radiator/Hose/Radiator filler cap	5	5	5	5	5		5	5		4	5			CO-13, CO-17
	Thermostat									5					CO-26
	Water pump														CO-23
	Water gallery														CO-28
	Cooling fan									5					CO-21
	Coolant level (Low)/Contaminated coolant														CO-10
NVIS (NISSAN Vehicle Immobilizer System — NATS)		1	1												EC-46 or BL-150

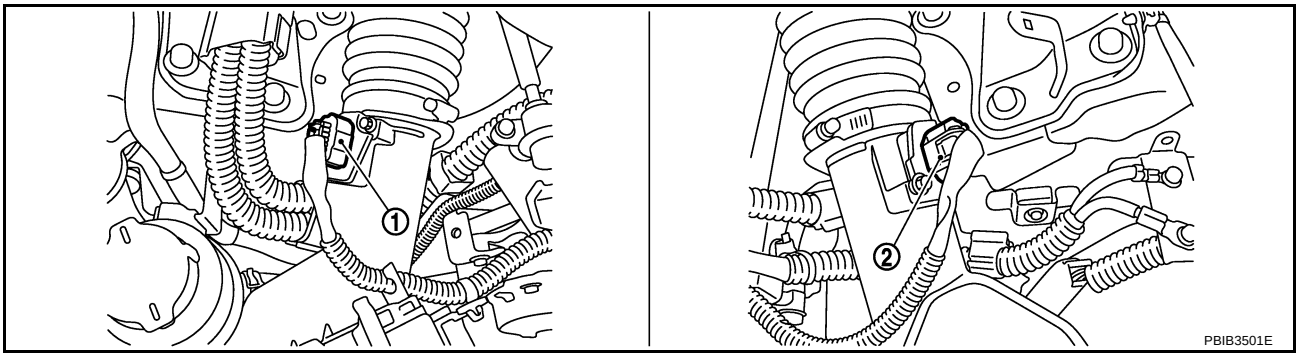
1 - 6: The numbers refer to the order of inspection.

Engine Control Component Parts Location

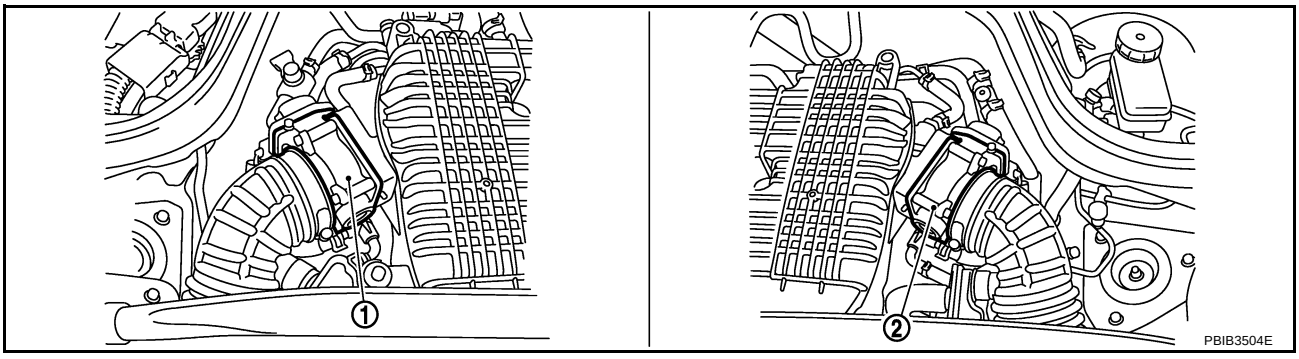
NBS0003I



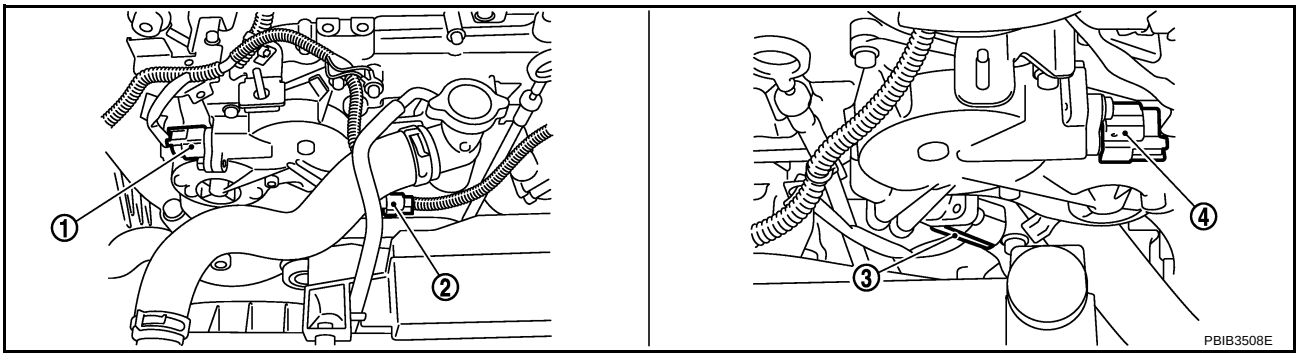
1. IPDM E/R
2. Mass air flow sensor (with intake air temperature sensor) (bank 1)
3. Refrigerant pressure sensor
4. Cooling fan motor-2
5. Intake valve timing control solenoid valve
6. Exhaust valve timing control magnet retarder
7. Cooling fan motor-1
8. Mass air flow sensor (with intake air temperature sensor) (bank 2)
9. Ignition coil (with power transistor) and spark plug (bank 2)
10. Electric throttle control actuator (bank 2)
11. A/F sensor 1 (bank 2)
12. Exhaust valve timing control position sensor
13. Camshaft position sensor (PHASE)
14. Fuel injector (bank 2)
15. Engine coolant temperature sensor
16. Knock sensor
17. EVAP canister purge volume control solenoid valve
18. Fuel injector (bank 1)
19. Ignition coil (with power transistor) and spark plug (bank 1)
20. EVAP service port
21. A/F sensor 1 (bank 1)
22. Crankshaft position sensor (POS)
23. Electric throttle control actuator (bank 1)



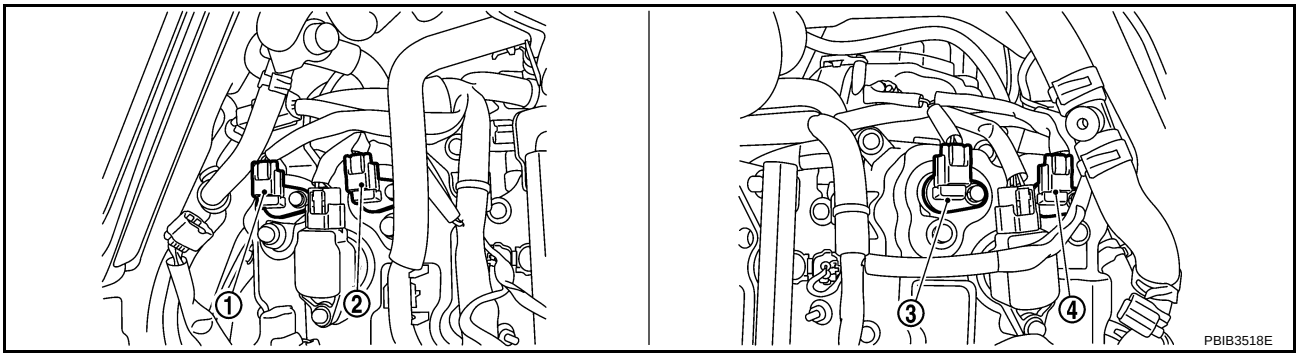
1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)



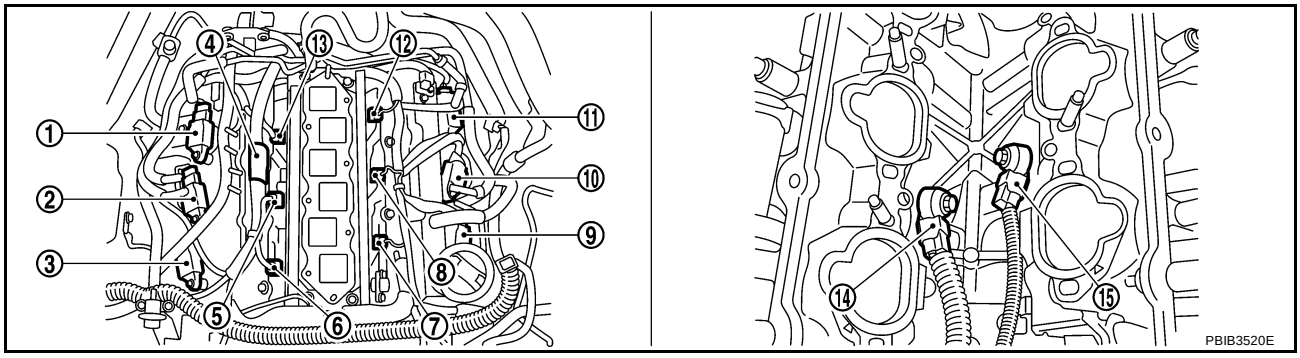
1. Electric throttle control actuator (bank 1)
2. Electric throttle control actuator (bank 2)



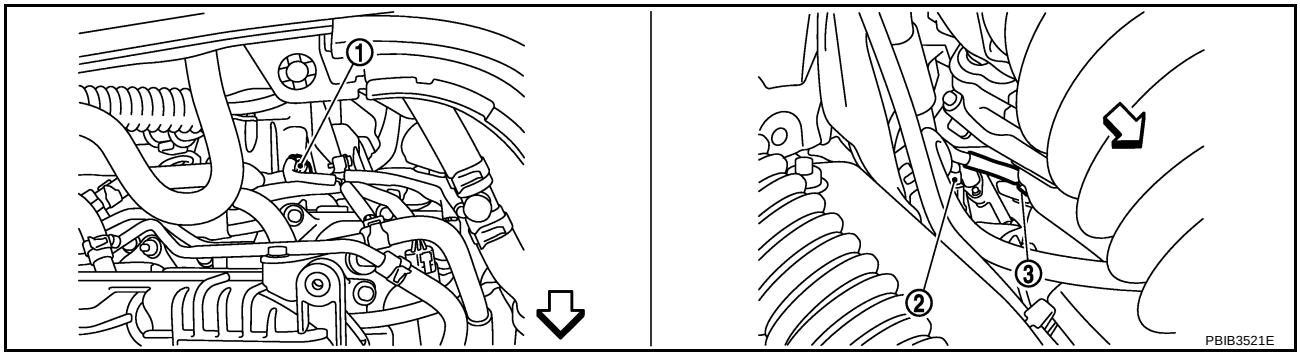
1. Exhaust valve timing control magnet retarder (bank 1) harness connector
2. Intake valve timing control solenoid valve (bank 1) harness connector
3. Intake valve timing control solenoid valve (bank 2) harness connector
4. Exhaust valve timing control magnet retarder (bank 2) harness connector



1. Exhaust valve timing control position sensor (bank 1)
2. Camshaft position sensor (PHASE) (bank 1)
3. Camshaft position sensor (PHASE) (bank 2)
4. Exhaust valve timing control position sensor (bank 2)

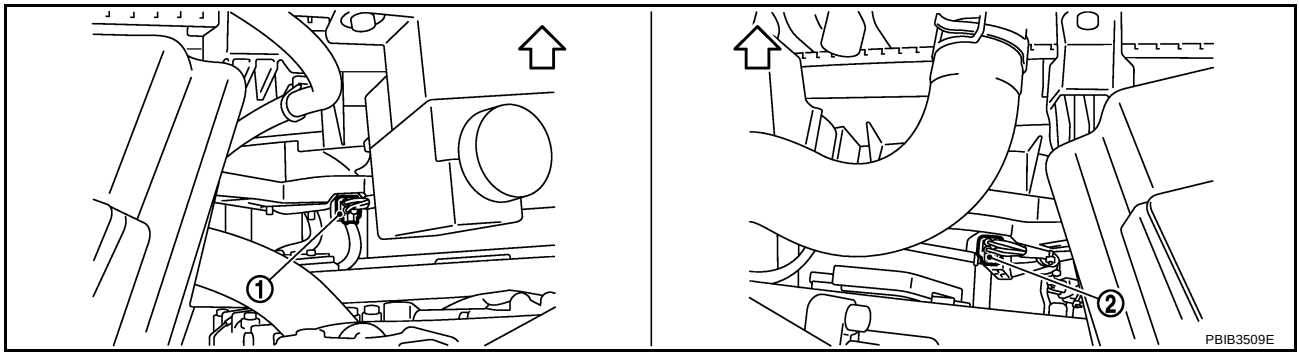


1. Ignition coil No.5 (with power transistor)
2. Ignition coil No.3 (with power transistor)
3. Ignition coil No.1 (with power transistor)
4. Condenser
5. Fuel injector No.3
6. Fuel injector No.1
7. Fuel injector No.2
8. Fuel injector No.4
9. Ignition coil No.2 (with power transistor)
10. Ignition coil No.4 (with power transistor)
11. ignition coil No.6 (with power transistor)
12. Fuel injector No.6
13. Fuel injector No.5
14. Knock sensor (bank 1)
15. Knock sensor (bank 2)



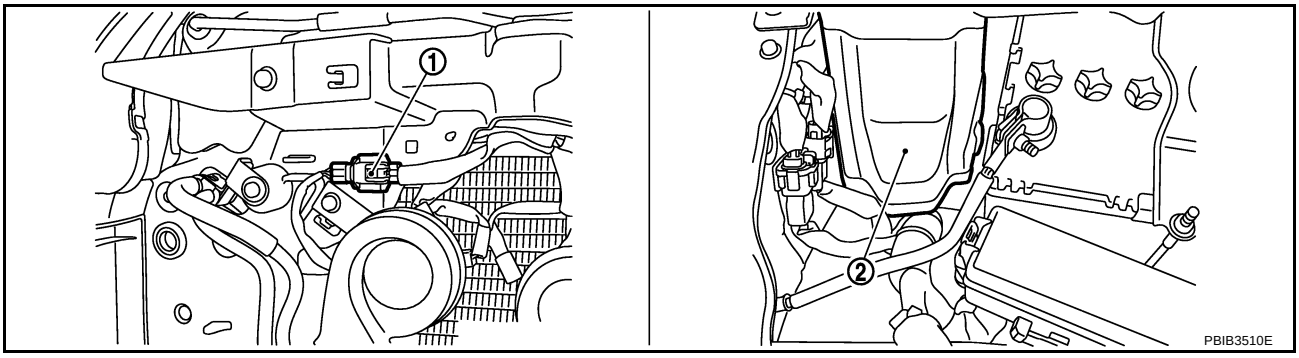
1. Engine coolant temperature sensor
2. A/F sensor 1 (bank 1)
3. Crankshaft position sensor

⇦: Vehicle front

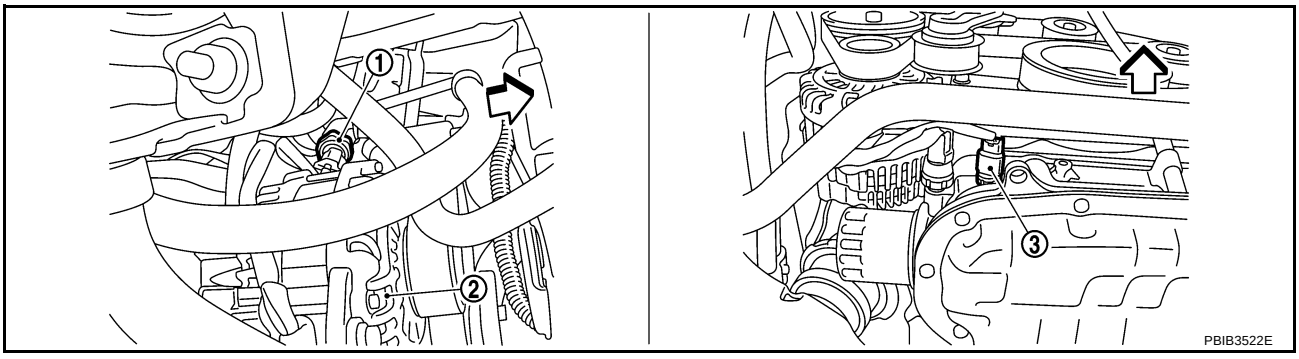


1. Cooling fan motor-1
2. Cooling fan motor-2

⇦: Vehicle front

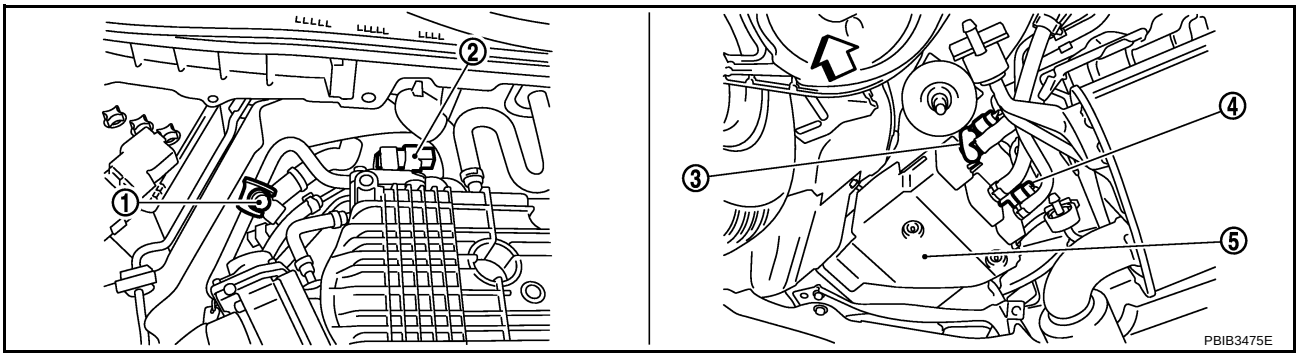


1. Refrigerant pressure sensor harness connector
2. IPDM E/R



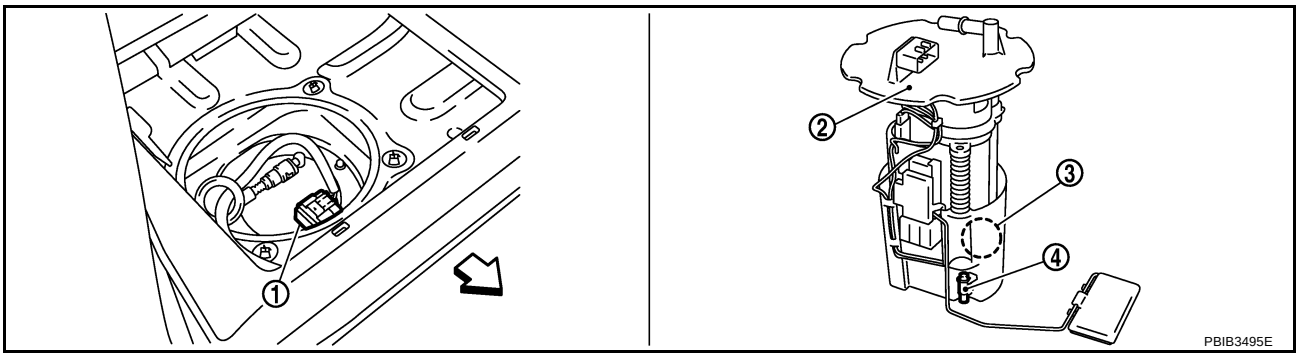
1. Power steering pressure sensor
2. Alternator
3. Engine oil temperature sensor

⇦: Vehicle front



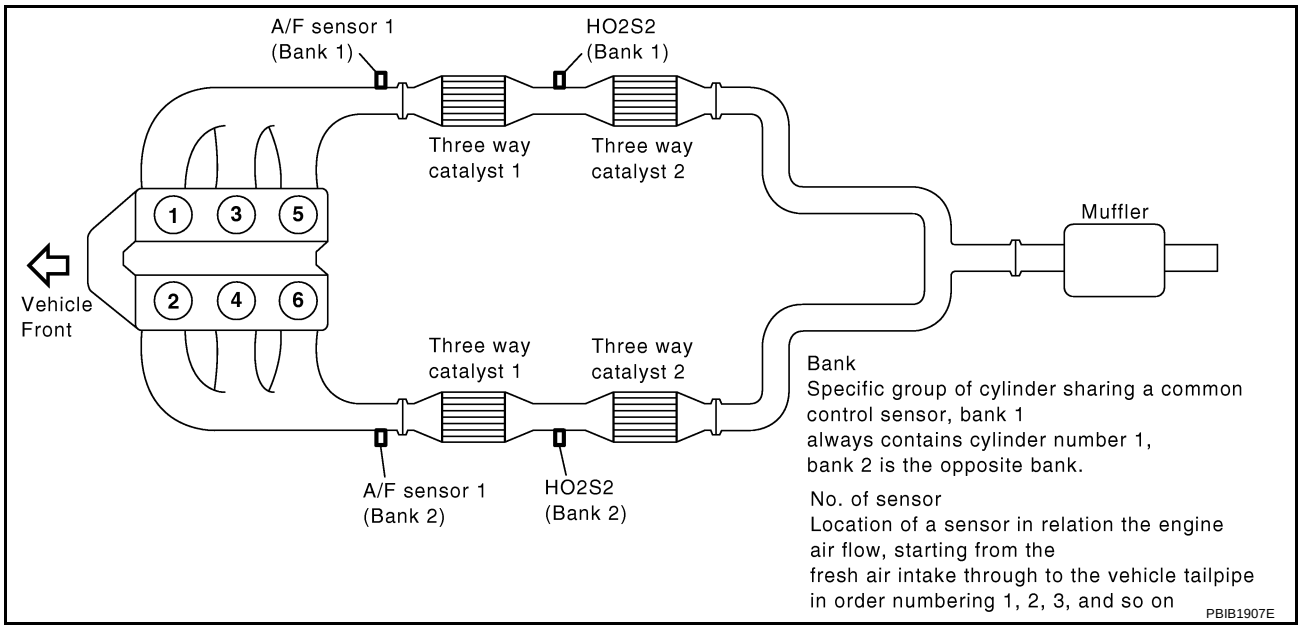
1. EVAP service port
2. EVAP canister purge volume control solenoid valve
3. EVAP canister vent control valve
4. EVAP control system pressure sensor
5. EVAP canister

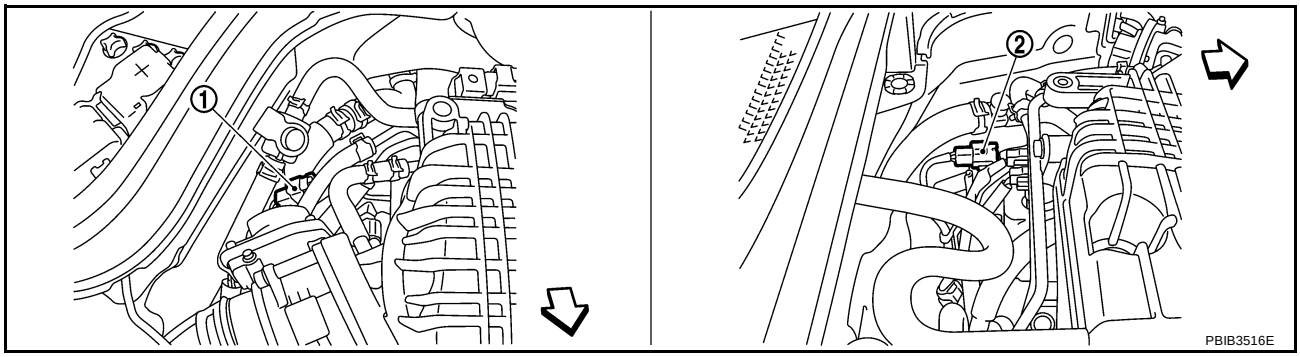
⇦: Vehicle front



1. Fuel level sensor unit and fuel pump harness connector
2. Fuel level sensor unit and fuel pump
3. Fuel pressure regurator
4. Fuel tank temperature sensor

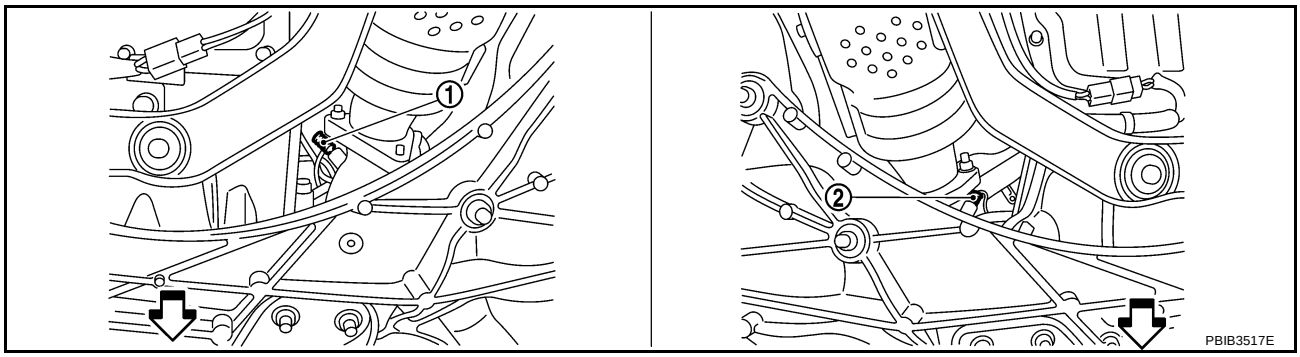
⇦: Vehicle front





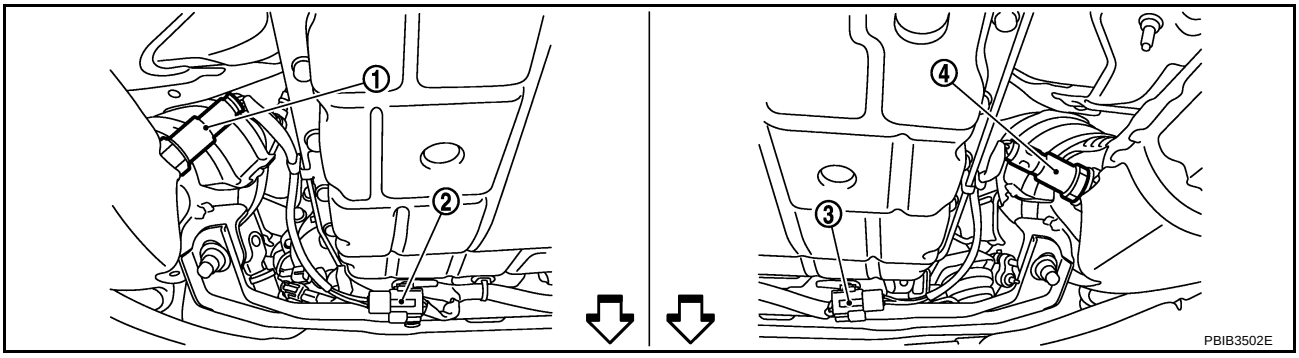
1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front



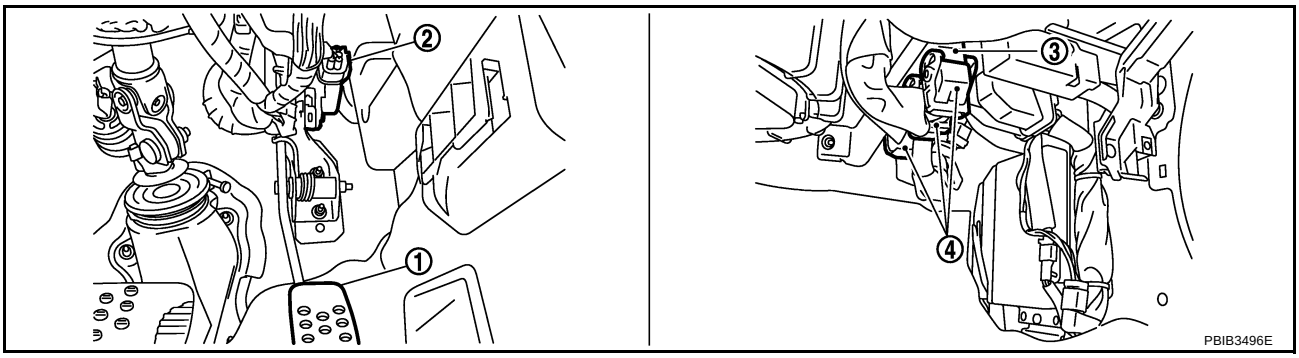
1. A/F sensor 1 (bank 1)
2. A/F sensor 1 (bank 2)

⇦: Vehicle front

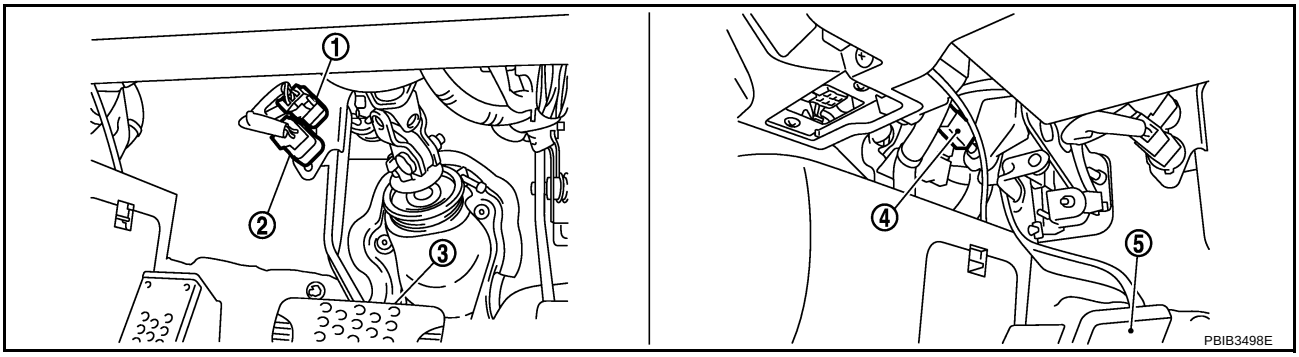


1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

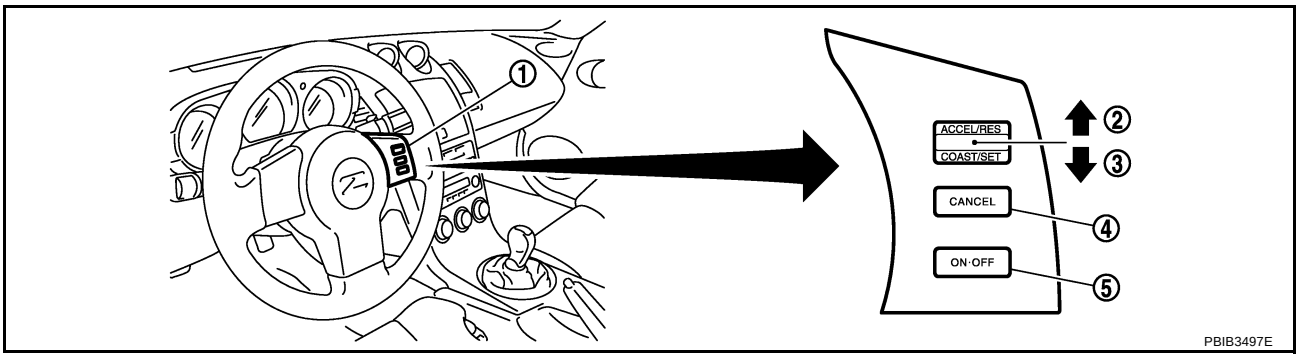
⇦: Vehicle front



1. Accelerator pedal
2. Accelerator pedal position sensor
3. ECM
4. ECM harness connector



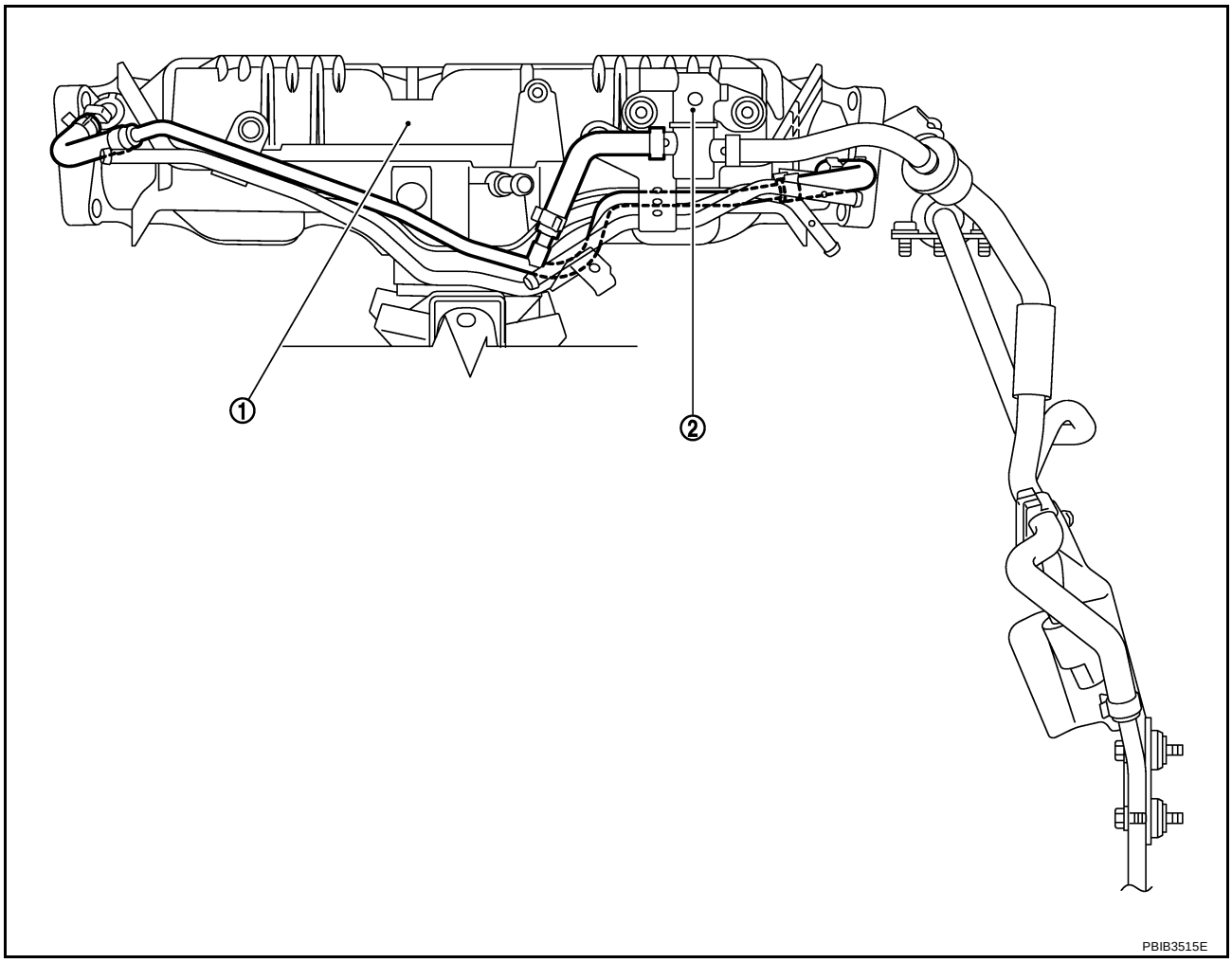
1. Stop lamp switch
2. ASCD brake switch
3. Brake pedal
4. ASCD clutch switch
5. Clutch pedal



1. ASCD steering switch
2. RESUME/ACCELERATE switch
3. SET/COAST switch
4. CANCEL switch
5. MAIN switch

Vacuum Hose Drawing

NBS0003J

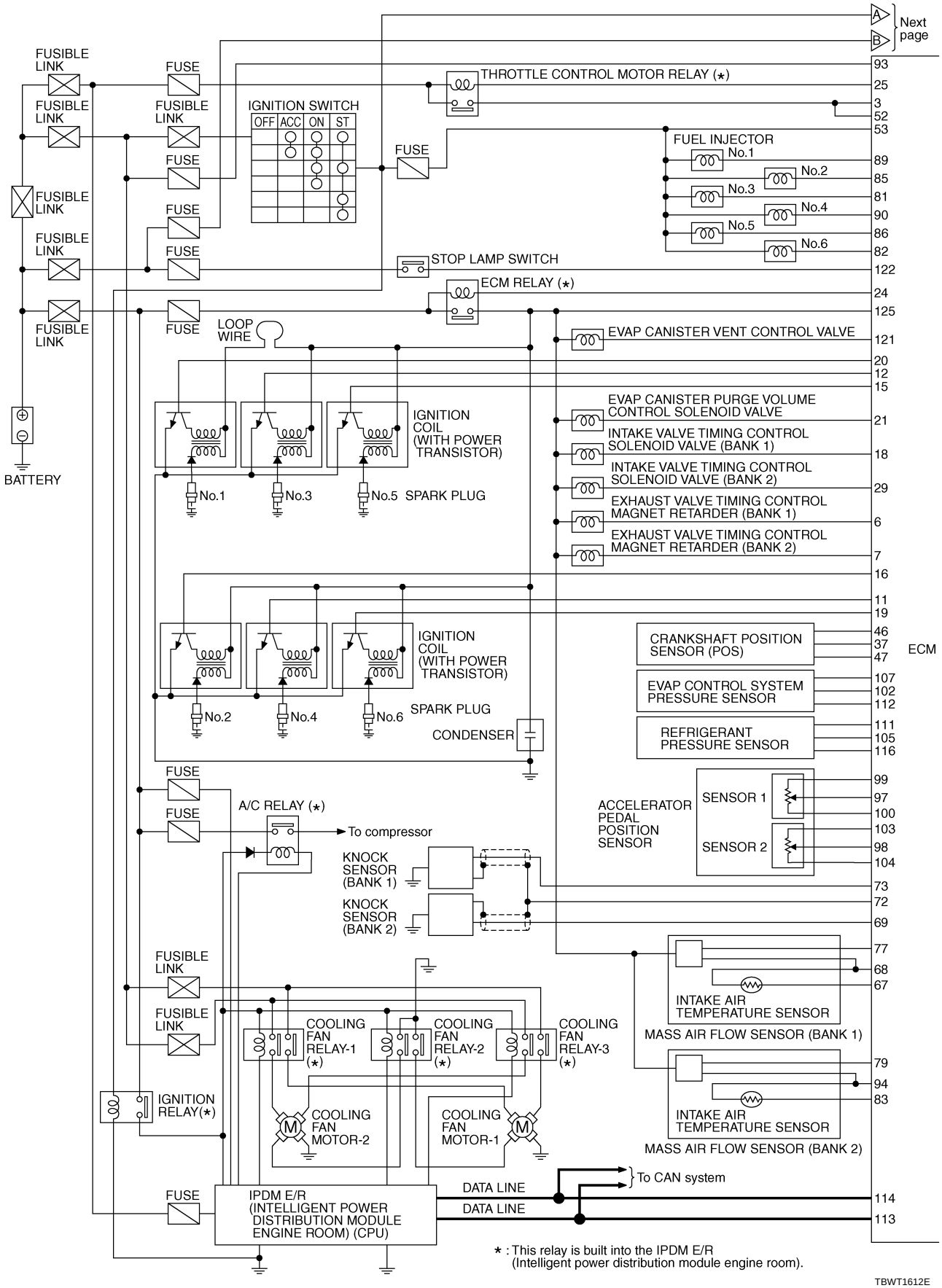


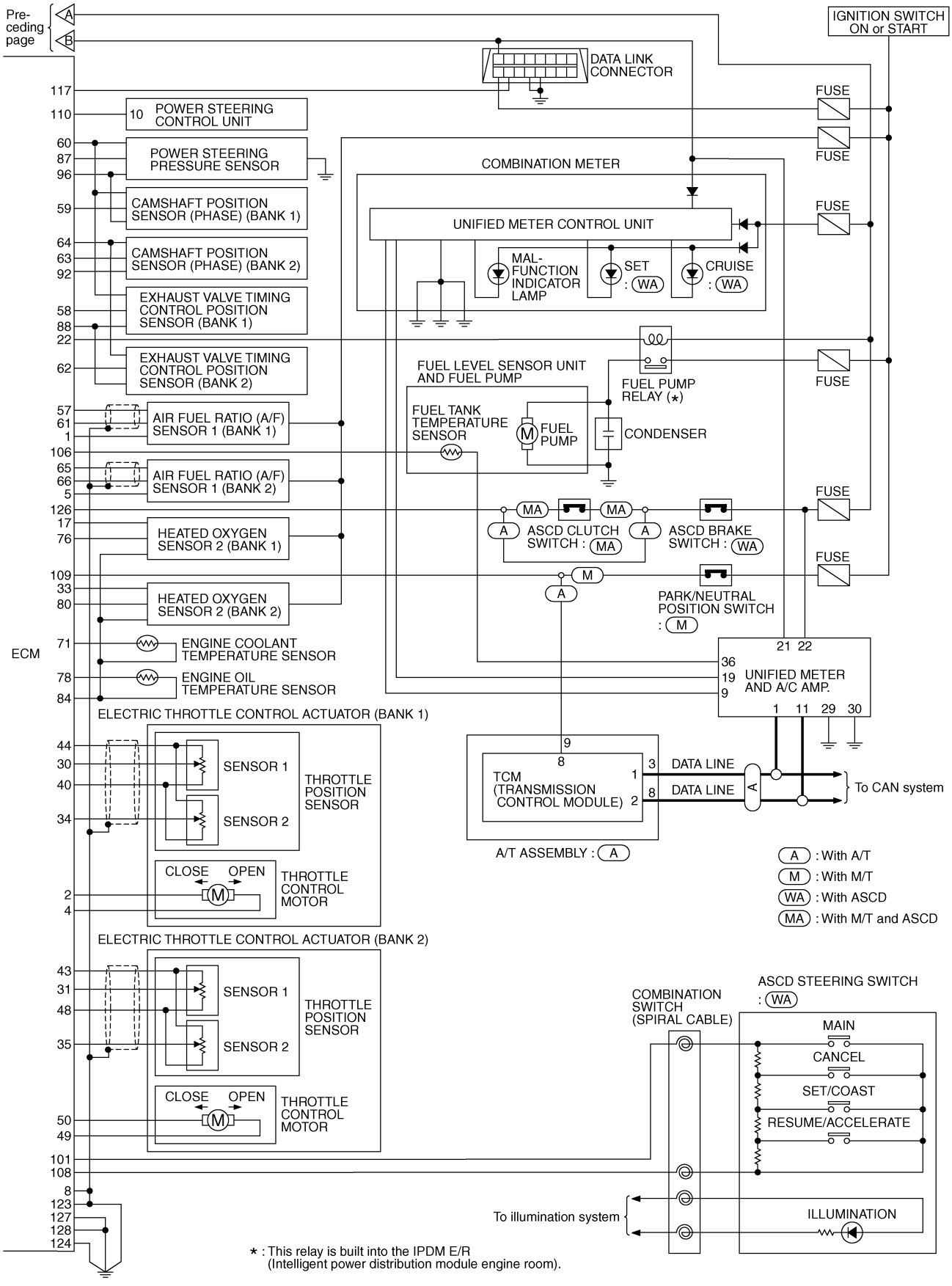
1. Intake manifold collector
2. EVAP canister purge volume control solenoid valve

Refer to EC-24, "System Diagram" for Vacuum Control System.

Circuit Diagram

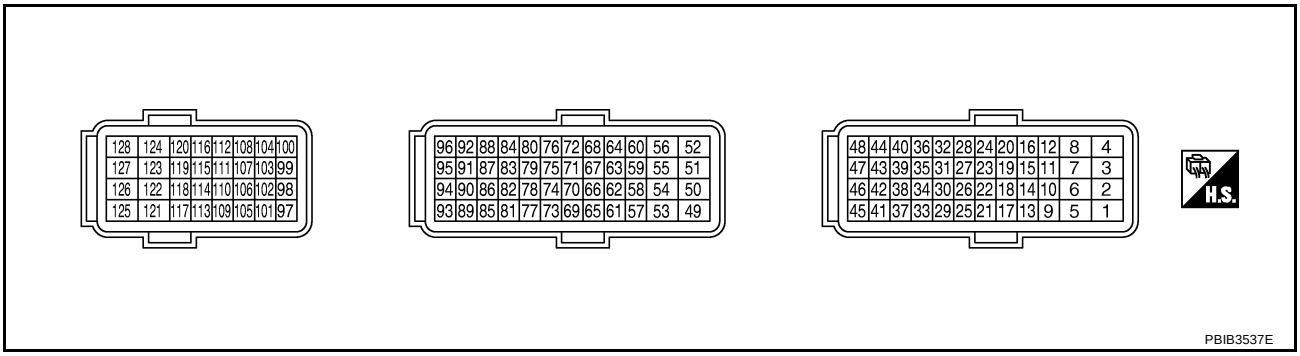
NBS0003K




Pre-ceding page
A
B
IGNITION SWITCH ON or START
DATA LINK CONNECTOR
FUSE
117
110
10 POWER STEERING CONTROL UNIT
60
87
96
POWER STEERING PRESSURE SENSOR
COMBINATION METER
59
CAMSHAFT POSITION SENSOR (PHASE) (BANK 1)
UNIFIED METER CONTROL UNIT
64
63
92
CAMSHAFT POSITION SENSOR (PHASE) (BANK 2)
MAL-FUNCTION INDICATOR LAMP
SET : WA
CRUISE : WA
58
88
22
EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 1)
62
EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 2)
FUEL LEVEL SENSOR UNIT AND FUEL PUMP
FUEL PUMP RELAY (*)
57
61
1
AIR FUEL RATIO (A/F) SENSOR 1 (BANK 1)
FUEL TANK TEMPERATURE SENSOR
FUEL PUMP
CONDENSER
106
65
66
5
AIR FUEL RATIO (A/F) SENSOR 1 (BANK 2)
126
17
76
HEATED OXYGEN SENSOR 2 (BANK 1)
MA
A
ASCD CLUTCH SWITCH : MA
ASCD BRAKE SWITCH : WA
109
33
80
HEATED OXYGEN SENSOR 2 (BANK 2)
M
PARK/NEUTRAL POSITION SWITCH : M
ECM
71
ENGINE COOLANT TEMPERATURE SENSOR
78
ENGINE OIL TEMPERATURE SENSOR
84
21 22
36
19
9
UNIFIED METER AND A/C AMP.
1 11 29 30
ELECTRIC THROTTLE CONTROL ACTUATOR (BANK 1)
44
30
40
34
SENSOR 1
SENSOR 2
THROTTLE POSITION SENSOR
CLOSE OPEN
THROTTLE CONTROL MOTOR
2
4
9
8
TCM (TRANSMISSION CONTROL MODULE)
3
1
8
2
DATA LINE
DATA LINE
To CAN system
A/T ASSEMBLY : A
A : With A/T
M : With M/T
WA : With ASCD
MA : With M/T and ASCD
ELECTRIC THROTTLE CONTROL ACTUATOR (BANK 2)
43
31
48
35
SENSOR 1
SENSOR 2
THROTTLE POSITION SENSOR
CLOSE OPEN
THROTTLE CONTROL MOTOR
50
49
COMBINATION SWITCH (SPIRAL CABLE)
ASCD STEERING SWITCH : WA
MAIN
CANCEL
SET/COAST
RESUME/ACCELERATE
101
108
8
123
127
128
124
To illumination system
ILLUMINATION
* : This relay is built into the IPDM E/R
(Intelligent power distribution module engine room).
TBWT1613E

ECM Harness Connector Terminal Layout

NBS0003L



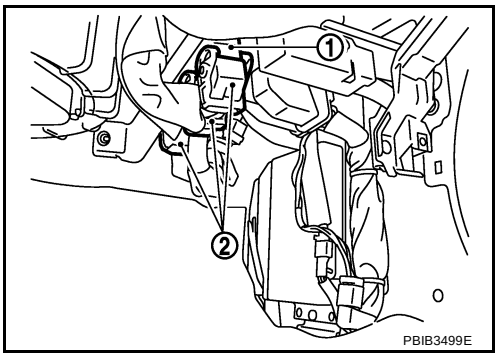
ECM Terminals and Reference Value

NBS0003M

PREPARATION

ECM (1) is located behind the passenger side instrument lower panel. For this inspection, remove passenger side instrument lower panel.

2 : ECM harness connector

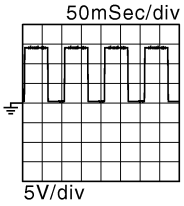


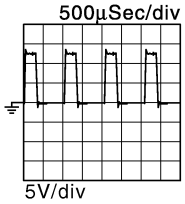
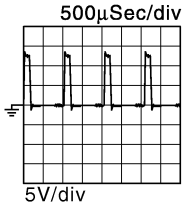
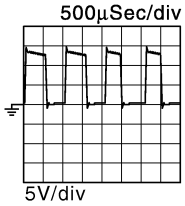
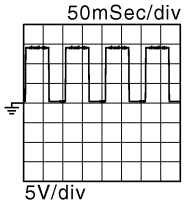
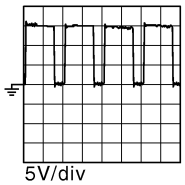
ECM INSPECTION TABLE

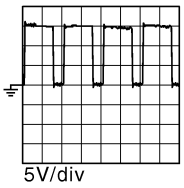
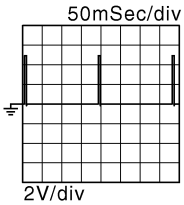
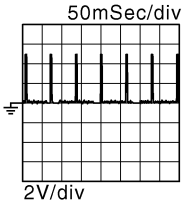
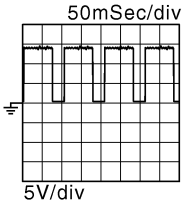
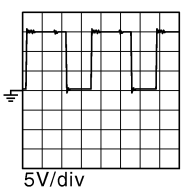
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

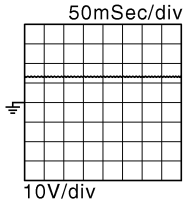
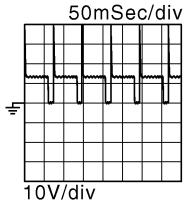
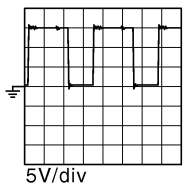
CAUTION:

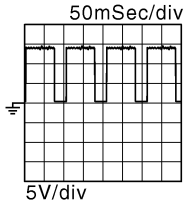
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECMs transistor. Use a ground other than ECM terminals, such as the ground.

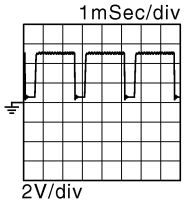
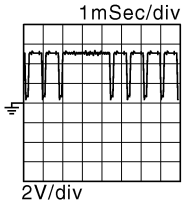
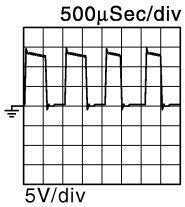
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E

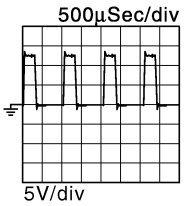
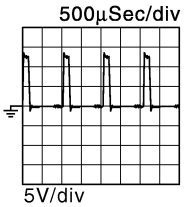
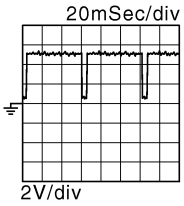
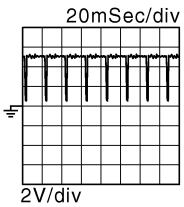
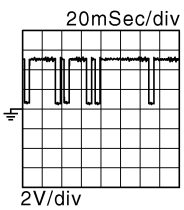
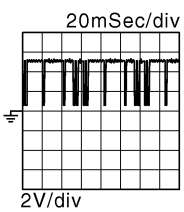
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	G	Throttle control motor (Open) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★  PBIB3538E
6	L/OR	Exhaust valve timing control magnet retarder (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Around 2,500 rpm while the engine speed is rising	7 - 12V★  PBIB3542E

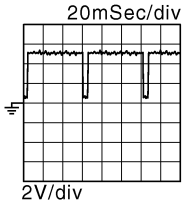
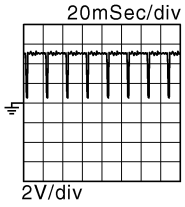
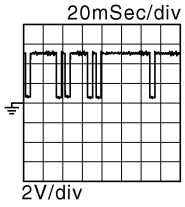
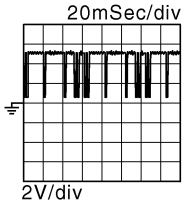
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
7	Y/R	Exhaust valve timing control magnet retarder (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Around 2,500 rpm while the engine speed is rising	7 - 12V★  5V/div PBIB3542E
8	B/P	ECM ground	**[Engine is running]** ● Idle speed	Body ground
11 12 15 16 19 20	GY LG/R PU G/B L/R Y/B	Ignition signal No. 4 Ignition signal No. 3 Ignition signal No. 5 Ignition signal No. 2 Ignition signal No. 6 Ignition signal No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  50mSec/div 2V/div PBIB3543E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	0.1 - 0.4V★  50mSec/div 2V/div PBIB3544E
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  50mSec/div 5V/div PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
18	W/G	Intake valve timing control solenoid valve (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	7 - 12V★  5V/div PBIB3546E

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
21	GY/R	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed ● Accelerator pedal: Not depressed even slightly, after engine starting.	BATTERY VOLTAGE (11 - 14V)★  PBIB3547E
			[Engine is running] ● Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14V)★  PBIB3548E
22	L/W	Fuel pump relay	**[Ignition switch: ON]** ● For 1 second after turning ignition switch ON **[Engine is running]**	0 - 1.5V
			[Ignition switch: ON] ● More than 1 second after turning ignition switch ON.	BATTERY VOLTAGE (11 - 14V)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
29	G/W	Intake valve timing control solenoid valve (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	7 - 12V★  PBIB3546E

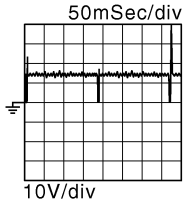
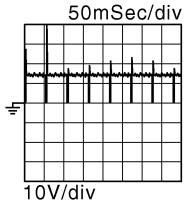
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
30	Y	Throttle position sensor 1 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
31	L/G	Throttle position sensor 1 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
34	L	Throttle position sensor 2 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
35	L/Y	Throttle position sensor 2 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
37	LG/B	Crankshaft position sensor (POS)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3549E
			[Engine is running] ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3550E
40	R	Sensor ground [Throttle position sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
47	Y/G	Sensor ground [Crankshaft position sensor (POS)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
48	W/L	Sensor ground [Throttle position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
49	L/B	Throttle control motor (Close) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E

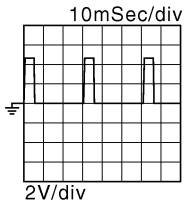
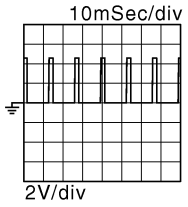
TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
50	PU/W	Throttle control motor (Open) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
53	P/L	Ignition switch	**[Ignition switch: OFF]**	0V
			[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
58	Y/G	Exhaust valve timing control position sensor (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3551E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3552E
59	BR/Y	Camshaft position sensor (PHASE) (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	3.0 - 5.0V★  PBIB3553E
			[Engine is running] ● Engine speed: 2,000 rpm	3.0 - 5.0V★  PBIB3554E

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
62	B/Y	Exhaust valve timing control position sensor (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3551E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3552E
63	SB	Camshaft position sensor (PHASE) (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	3.0 - 5.0V★  PBIB3553E
			[Engine is running] ● Engine speed: 2,000 rpm	1.0 - 4.0V★  PBIB3554E
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
67	W/L	Intake air temperature sensor (bank 1)	**[Engine is running]**	0 - 4.8V Output voltage varies with intake air temperature.

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
68	B	Sensor ground [Mass air flow sensor (bank1), Intake air temperature sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
69	W	Knock sensor (bank 2)	**[Engine is running]** ● Idle speed	2.5V*
71	Y/B	Engine coolant temperature sensor	**[Engine is running]**	0 - 4.8V Output voltage varies with engine coolant temperature.
72	—	Sensor ground [Knock sensor (bank 1), Knock sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
73	W	Knock sensor (bank 1)	**[Engine is running]** ● Idle speed	2.5V*
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
77	L/W	Mass air flow sensor (bank1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
78	G/W	Engine oil temperature sensor	**[Engine is running]**	0 - 4.8V Output voltage varies with engine oil temperature.
79	GY/R	Mass air flow sensor (bank2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
81 82 85 86 89 90	R/B L/R BR W/B G/Y Y/R	Fuel injector No. 3 Fuel injector No. 6 Fuel injector No. 2 Fuel injector No. 5 Fuel injector No. 1 Fuel injector No. 4	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★ 
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★ 
83	G	Intake air temperature sensor (bank 2)	**[Engine is running]**	0 - 4.8V Output voltage varies with intake air temperature.
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
87	Y	Power steering pressure sensor	**[Engine is running]** ● Steering wheel: Being turned	0.5 - 4.5V
			[Engine is running] ● Steering wheel: Not being turned	0.4 - 0.8V
88	LG/B	Sensor ground [Exhaust valve timing control position sensor (bank 1), Exhaust valve timing control position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
92	B/P	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
93	P	Power supply for ECM (Back-up)	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
94	L/Y	Sensor ground [Mass air flow sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
96	P/L	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Power steering pressure sensor]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	1.95 - 2.40V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	2.0 - 2.5V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
101	G/Y	ASCD steering switch	**[Ignition switch: ON]** ● ASCD steering switch: OFF	4V
			[Ignition switch: ON] ● MAIN switch: Pressed	0V
			[Ignition switch: ON] ● CANCEL switch: Pressed	1V
			[Ignition switch: ON] ● RESUME/ACCELERATE switch: Pressed	3V
			[Ignition switch: ON] ● SET/COAST switch: Pressed	2V
102	LG	EVAP control system pressure sensor	**[Ignition switch: ON]**	1.8 - 4.8V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
105	L	Refrigerant pressure sensor	**[Engine is running]** ● **Warm-up condition** ● Both A/C switch and blower switch: ON (Compressor operates.)	1.0 - 4.0V
106	W	Fuel tank temperature sensor	**[Engine is running]**	0 - 4.8V Output voltage varies with fuel tank temperature.
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
108	B/Y	Sensor ground (ASCD steering switch)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
109	BR	PNP switch	**[Ignition switch: ON]** ● Shift lever: P or N (A/T), Neutral (M/T) position	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON] ● Shift lever: Except above position	0V

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
110	Y	Engine speed output signal	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle	1V★  PBIB3557E
			[Engine is running] ● Engine speed: 2,000 rpm	1V★  PBIB3558E
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V
112	PU	Sensor ground (EVAP control system pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
113	P	CAN communication line	—	—
114	L	CAN communication line	—	—
116	W	Sensor ground (Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
117	PU	Data link connector	**[Ignition switch: ON]** ● GST: Disconnected	5V - Battery voltage (11 - 14V)
121	LG	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
123 124	B/W B/R	ECM ground	**[Engine is running]** ● Idle speed	Body ground
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal: Slightly depressed (A/T) ● Brake pedal and/or clutch pedal: Slightly depressed (M/T)	0V
			[Ignition switch: ON] ● Brake pedal: Fully released (A/T) ● Brake pedal and clutch pedal: Fully released (M/T)	BATTERY VOLTAGE (11 - 14V)
127 128	B B	ECM ground	**[Engine is running]** ● Idle speed	Body ground

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

*: This may vary depending on internal resistance of the tester.

CONSULT-III Function (ENGINE)

NBS0003N

FUNCTION

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT-III unit.
Self-diagnostic results	Self-diagnostic results such as 1st trip DTC, DTCs and 1st trip freeze frame data or freeze frame data can be read and erased quickly.*
Data monitor	Input/Output data in the ECM can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.
Active test	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ECMs and also shifts some parameters in a specified range.
Function test	This mode is used to inform customers when their vehicle condition requires periodic maintenance.
DTC & SRT confirmation	The status of system monitoring tests and the self-diagnosis status/result can be confirmed.
ECU Identification	ECM part number can be read.

*: The following emission-related diagnostic information is cleared when the ECM memory is erased.

- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values

ENGINE CONTROL COMPONENT PARTS/CONTROL SYSTEMS APPLICATION

		Item	DIAGNOSTIC TEST MODE						
			WORK SUPPORT	SELF-DIAGNOSTIC RESULTS		DATA MONITOR	ACTIVE TEST	DTC & SRT CONFIRMATION	
				DTC*1	FREEZE FRAME DATA*2			SRT STATUS	DTC WORK SUPPORT
ENGINE CONTROL COMPONENT PARTS	INPUT	Crankshaft position sensor (POS)		×	×	×			
		Camshaft position sensor (PHASE)		×	×	×			
		Mass air flow sensor		×		×			
		Engine coolant temperature sensor		×	×	×	×		
		Engine oil temperature sensor				×			
		Air Fuel ratio (A/F) sensor 1		×		×		×	×
		Heated oxygen sensor 2		×		×		×	×
		Vehicle speed sensor		×	×	×			
		Accelerator pedal position sensor		×		×			
		Throttle position sensor		×	×	×			
		Fuel tank temperature sensor		×		×	×		
		EVAP control system pressure sensor		×		×			
		Intake air temperature sensor		×	×	×			
		Knock sensor		×					
		Refrigerant pressure sensor				×			
		Closed throttle position switch (accelerator pedal position sensor signal)				×			
		Air conditioner switch				×			
		Park/neutral position (PNP) switch		×		×			
		Stop lamp switch		×		×			
		Power steering pressure sensor		×		×			
		Battery voltage				×			
		Load signal				×			
		Exhaust valve timing control position sensor		×		×			
		Fuel level sensor		×		×			
		ASCD steering switch		×		×			
		ASCD brake switch		×		×			
		ASCD clutch switch		×		×			

Item			DIAGNOSTIC TEST MODE						
			WORK SUPPORT	SELF-DIAGNOSTIC RESULTS		DATA MONITOR	ACTIVE TEST	DTC & SRT CONFIRMATION	
				DTC*1	FREEZE FRAME DATA*2			SRT STATUS	DTC WORK SUPPORT
ENGINE CONTROL COMPONENT PARTS	OUTPUT	Fuel injector				×	×		
		Power transistor (Ignition timing)				×	×		
		Throttle control motor relay		×		×			
		Throttle control motor		×					
		EVAP canister purge volume control solenoid valve		×		×	×		×
		Air conditioner relay				×			
		Fuel pump relay	×			×	×		
		Cooling fan relay		×		×	×		
		Air fuel ratio (A/F) sensor 1 heater		×		×		×*3	
		Heated oxygen sensor 2 heater		×		×		×*3	
		EVAP canister vent control valve	×	×		×	×		
		Intake valve timing control solenoid valve		×		×	×		
		Exhaust valve timing control magnet retarder	×	×		×	×		
		Calculated load value			×	×			

X: Applicable

*1: This item includes 1st trip DTCs.

*2: This mode includes 1st trip freeze frame data or freeze frame data. The items appear on CONSULT-III screen in freeze frame data mode only if a 1st trip DTC or DTC is detected. For details, refer to EC-119, "Freeze Frame Data and 1st Trip Freeze Frame Data" .

*3: Always “CMPLT” is displayed.

INSPECTION PROCEDURE

Refer to GI-36, "CONSULT-III/GST CHECKING SYSTEM" .

WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE
FUEL PRESSURE RELEASE	● FUEL PUMP WILL STOP BY TOUCHING START DURING IDLING. CRANK A FEW TIMES AFTER ENGINE STALLS.	When releasing fuel pressure from fuel line
IDLE AIR VOL LEARN	● THE IDLE AIR VOLUME THAT KEEPS THE ENGINE WITHIN THE SPECIFIED RANGE IS MEMORIZED IN ECM.	When learning the idle air volume
SELF-LEARNING CONT	● THE COEFFICIENT OF SELF-LEARNING CONTROL MIXTURE RATIO RETURNS TO THE ORIGINAL COEFFICIENT.	When clearing the coefficient of self-learning control value

WORK ITEM	CONDITION	USAGE
EVAP SYSTEM CLOSE	CLOSE THE EVAP CANISTER VENT CONTROL VALVE IN ORDER TO MAKE EVAP SYSTEM CLOSE UNDER THE FOLLOWING CONDITIONS. ● IGN SW ON ● ENGINE NOT RUNNING ● AMBIENT TEMPERATURE IS ABOVE 0°C (32°F). ● NO VACUUM AND NO HIGH PRESSURE IN EVAP SYSTEM ● FUEL TANK TEMP. IS MORE THAN 0°C (32°F). ● WITHIN 10 MINUTES AFTER STARTING EVAP SYSTEM CLOSE ● WHEN TRYING TO EXECUTE EVAP SYSTEM CLOSE UNDER THE CONDITION EXCEPT ABOVE, CONSULT-III WILL DISCONTINUE IT AND DISPLAY APPROPRIATE INSTRUCTION. **NOTE:** **WHEN STARTING ENGINE, CONSULT-III MAY DISPLAY "BATTERY VOLTAGE IS LOW. CHARGE BATTERY", EVEN IN USING CHARGED BATTERY.**	When detecting EVAP vapor leak point of EVAP system
VIN REGISTRATION	● IN THIS MODE, VIN IS REGISTERED IN ECM.	When registering VIN in ECM
EXH V/T CONTROL LEARN	● IN THIS MODE, OPERATION TO LEARN EXHAUST VALVE TIMING CONTROL MAGNET RETARDER CHARACTERISTIC.	When learning the exhaust valve timing control
TARGET IDLE RPM ADJ*	● IDLE CONDITION	When setting target idle speed
TARGET IGN TIM ADJ*	● IDLE CONDITION	When adjusting target ignition timing

*: This function is not necessary in the usual service procedure.

SELF-DIAG RESULTS MODE

Self Diagnostic Item

Regarding items of DTC and 1st trip DTC, refer to EC-48, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS" .)

Freeze Frame Data and 1st Trip Freeze Frame Data

Freeze frame data item*	Description
DIAG TROUBLE CODE [PXXXX]	● The engine control component part/control system has a trouble code, it is displayed as PXXXX. (Refer to EC-8, "INDEX FOR DTC" .)
FUEL SYS-B1	● "Fuel injection system status" at the moment a malfunction is detected is displayed.
FUEL SYS-B2	● One mode in the following is displayed. Mode2: Open loop due to detected system malfunction Mode3: Open loop due to driving conditions (power enrichment, deceleration enleanment) Mode4: Closed loop - using oxygen sensor(s) as feedback for fuel control Mode5: Open loop - has not yet satisfied condition to go to closed loop
CAL/LD VALUE [%]	● The calculated load value at the moment a malfunction is detected is displayed.
COOLANT TEMP [°C] or [°F]	● The engine coolant temperature at the moment a malfunction is detected is displayed.
L-FUEL TRM-B1 [%]	● "Long-term fuel trim" at the moment a malfunction is detected is displayed.
L-FUEL TRM-B2 [%]	● The long-term fuel trim indicates much more gradual feedback compensation to the base fuel schedule than short-term fuel trim.
S-FUEL TRM-B1 [%]	● "Short-term fuel trim" at the moment a malfunction is detected is displayed.
S-FUEL TRM-B2 [%]	● The short-term fuel trim indicates dynamic or instantaneous feedback compensation to the base fuel schedule.

Freeze frame data item*	Description
ENGINE SPEED [rpm]	● The engine speed at the moment a malfunction is detected is displayed.
VEHICL SPEED [km/h] or [mph]	● The vehicle speed at the moment a malfunction is detected is displayed.
ABSOL TH-P/S [%]	● The throttle valve operating angle at the moment a malfunction is detected is displayed.
B/FUEL SCHDL [msec]	● The base fuel schedule at the moment a malfunction is detected is displayed.
INT/A TEMP SE [°C] or [°F]	● The intake air temperature at the moment a malfunction is detected is displayed.

*: This item is the same as that of 1st trip freeze frame data.

DATA MONITOR MODE

Monitored Item

×: Applicable

Monitored item [Unit]	Description	Remarks
ENG SPEED [rpm]	● Indicates the engine speed computed from the signals of the crankshaft position sensor (POS) and camshaft position sensor (PHASE).	● Accuracy becomes poor if engine speed drops below the idle rpm. ● If the signal is interrupted while the engine is running, an abnormal value may be indicated.
MAS A/F SE-B1 [V]	● The signal voltage of the mass air flow sensor is displayed.	● When the engine is stopped, a certain value is indicated. ● When engine is running specification range is indicated in “SPEC”.
MAS A/F SE-B2 [V]		
B/FUEL SCHDL [msec]	● “Base fuel schedule” indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	● When engine is running specification range is indicated in “SPEC”.
A/F ALPHA-B1 [%]	● The mean value of the air-fuel ratio feedback correction factor per cycle is indicated.	● When the engine is stopped, a certain value is indicated. ● This data also includes the data for the air-fuel ratio learning control. ● When engine is running specification range is indicated in “SPEC”.
A/F ALPHA-B2 [%]		
COOLAN TEMP/S [°C] or [°F]	● The engine coolant temperature (determined by the signal voltage of the engine coolant temperature sensor) is displayed.	● When the engine coolant temperature sensor is open or short-circuited, ECM enters fail-safe mode. The engine coolant temperature determined by the ECM is displayed.
A/F SEN1 (B1) [V]	● The A/F signal computed from the input signal of the A/F sensor 1 is displayed.	
A/F SEN1 (B2) [V]		
HO2S2 (B1) [V]	● The signal voltage of the heated oxygen sensor 2 is displayed.	
HO2S2 (B2) [V]		
HO2S2 MNTR(B1) [RICH/LEAN]	● Display of heated oxygen sensor 2 signal: RICH: Means the amount of oxygen after three way catalyst is relatively small. LEAN: Means the amount of oxygen after three way catalyst is relatively large.	● When the engine is stopped, a certain value is indicated.
HO2S2 MNTR(B2) [RICH/LEAN]		
VHCL SPEED SE [km/h] or [mph]	● The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
BATTERY VOLT [V]	● The power supply voltage of ECM is displayed.	
ACCEL SEN 1 [V]	● The accelerator pedal position sensor signal voltage is displayed.	● ACCEL SEN 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
ACCEL SEN 2 [V]		

Monitored item [Unit]	Description	Remarks
TP SEN 1-B1 [V]	● The throttle position sensor signal voltage is displayed.	● THRTL SEN 2-B1 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
TP SEN 2-B1 [V]		
FUEL T/TMP SE [°C] or [°F]	● The fuel temperature (determined by the signal voltage of the fuel tank temperature sensor) is displayed.	
INT/A TEMP SE [°C] or [°F]	● The intake air temperature (determined by the signal voltage of the intake air temperature sensor) is indicated.	
EVAP SYS PRES [V]	● The signal voltage of EVAP control system pressure sensor is displayed.	
FUEL LEVEL SE [V]	● The signal voltage of the fuel level sensor is displayed.	
START SIGNAL [ON/OFF]	● Indicates start signal status [ON/OFF] computed by the ECM according to the signals of engine speed and battery voltage.	● After starting the engine, [OFF] is displayed regardless of the starter signal.
CLSD THL POS [ON/OFF]	● Indicates idle position [ON/OFF] computed by ECM according to the accelerator pedal position sensor signal.	
AIR COND SIG [ON/OFF]	● Indicates [ON/OFF] condition of the air conditioner switch as determined by the air conditioner signal.	
P/N POSI SW [ON/OFF]	● Indicates [ON/OFF] condition from the park/neutral position (PNP) switch signal.	
PW/ST SIGNAL [ON/OFF]	● [ON/OFF] condition of the power steering system (determined by the signal voltage of the power steering pressure sensor) is indicated.	
LOAD SIGNAL [ON/OFF]	● Indicates [ON/OFF] condition from the electrical load signal. ON: Rear window defogger switch is ON and/or lighting switch is in 2nd position. OFF: Both rear window defogger switch and lighting switch are OFF.	
IGNITION SW [ON/OFF]	● Indicates [ON/OFF] condition from ignition switch signal.	
HEATER FAN SW [ON/OFF]	● Indicates [ON/OFF] condition from the heater fan switch signal.	
BRAKE SW [ON/OFF]	● Indicates [ON/OFF] condition from the stop lamp switch signal.	
INJ PULSE-B1 [msec]	● Indicates the actual fuel injection pulse width compensated by ECM according to the input signals.	● When the engine is stopped, a certain computed value is indicated.
INJ PULSE-B2 [msec]		
IGN TIMING [BTDC]	● Indicates the ignition timing computed by ECM according to the input signals.	● When the engine is stopped, a certain value is indicated.
CAL/LD VALUE [%]	● “Calculated load value” indicates the value of the current air flow divided by peak air flow.	
MASS AIRFLOW [g·m/s]	● Indicates the mass air flow computed by ECM according to the signal voltage of the mass air flow sensor.	
PURG VOL C/V [%]	● Indicates the EVAP canister purge volume control solenoid valve control value computed by the ECM according to the input signals. ● The opening becomes larger as the value increases.	
INT/V TIM(B1) [°CA]	● Indicates [°CA] of intake camshaft advanced angle.	
INT/V TIM(B2) [°CA]		
EXH/V TIM B1 [°CA]	● Indicates [°CA] of exhaust camshaft retarded angle.	
EXH/V TIM B2 [°CA]		

Monitored item [Unit]	Description	Remarks
INT/V SOL(B1) [%]	● The control value of the intake valve timing control solenoid valve (determined by ECM according to the input signals) is indicated. ● The advance angle becomes larger as the value increases.	
INT/V SOL(B2) [%]		
EX VTC DTY B1 [%]	● The control value of the exhaust valve timing control magnet retarder (determined by ECM according to the input signals) is indicated. ● The retard angle becomes larger as the value increases.	
EX VTC DTY B2 [%]		
TP SEN 1-B2 [V]	● The throttle position sensor signal voltage is displayed.	● THRTL SEN 2-B2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
TP SEN 2-B2 [V]		
AIR COND RLY [ON/OFF]	● The air conditioner relay control condition (determined by ECM according to the input signals) is indicated.	
FUEL PUMP RLY [ON/OFF]	● Indicates the fuel pump relay control condition determined by ECM according to the input signals.	
VENT CONT/V [ON/OFF]	● The control condition of the EVAP canister vent control valve (determined by ECM according to the input signals) is indicated. ON: Closed OFF: Open	
THRTL RELAY [ON/OFF]	● Indicates the throttle control motor relay control condition determined by the ECM according to the input signals.	
COOLING FAN [HI/LOW/OFF]	● The control condition of the cooling fan (determined by ECM according to the input signals) is indicated. HI: High speed operation LOW: Low speed operation OFF: Stop	
HO2S2 HTR (B1) [ON/OFF]	● Indicates [ON/OFF] condition of heated oxygen sensor 2 heater determined by ECM according to the input signals.	
HO2S2 HTR (B2) [ON/OFF]		
I/P PULLY SPD [rpm]	● Indicates the engine speed computed from the turbine revolution sensor signal.	
VEHICLE SPEED [km/h] or [mph]	● Indicates the vehicle speed computed from the revolution sensor signal.	
IDL A/V LEARN [YET/CMPLT]	● Display the condition of Idle Air Volume Learning YET: Idle Air Volume Learning has not been performed yet. CMPLT: Idle Air Volume Learning has already been performed successfully.	
TRVL AFTER MIL [km] or [mile]	● Distance traveled while MIL is activated.	
ENG OIL TEMP [°C] or [°F]	● The engine oil temperature (determined by the signal voltage of the engine oil temperature sensor) is displayed.	
A/F S1 HTR(B1) [%]	● Indicates A/F sensor 1 heater control value computed by ECM according to the input signals. ● The current flow to the heater becomes larger as the value increases.	
A/F S1 HTR(B2) [%]		
AC PRESS SEN [V]	● The signal voltage from the refrigerant pressure sensor is displayed.	

Monitored item [Unit]	Description	Remarks
VHCL SPEED SE [km/h] or [mph]	● The vehicle speed computed from the vehicle speed signal sent from TCM is displayed.	
SET VHCL SPD [km/h] or [mph]	● The preset vehicle speed is displayed.	
MAIN SW [ON/OFF]	● Indicates [ON/OFF] condition from MAIN switch signal.	
CANCEL SW [ON/OFF]	● Indicates [ON/OFF] condition from CANCEL switch signal.	
RESUME/ACC SW [ON/OFF]	● Indicates [ON/OFF] condition from RESUME/ACCELERATE switch signal.	
SET SW [ON/OFF]	● Indicates [ON/OFF] condition from SET/COAST switch signal.	
BRAKE SW1 [ON/OFF]	● Indicates [ON/OFF] condition from ASCD brake switch signal and ASCD clutch switch signal (M/T)	
BRAKE SW2 [ON/OFF]	● Indicates [ON/OFF] condition of stop lamp switch signal.	
VHCL SPD CUT [NON/CUT]	● Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low compared with the ASCD set speed, and ASCD operation is cut off.	
LO SPEED CUT [NON/CUT]	● Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low, and ASCD operation is cut off.	
AT OD MONITOR [ON/OFF]	● Indicates [ON/OFF] condition of A/T O/D according to the input signal from the TCM.	● For M/T models always “OFF” is displayed.
AT OD CANCEL [ON/OFF]	● Indicates [ON/OFF] condition of A/T O/D cancel request signal.	● For M/T models always “OFF” is displayed.
CRUISE LAMP [ON/OFF]	● Indicates [ON/OFF] condition of CRUISE lamp determined by the ECM according to the input signals.	
SET LAMP [ON/OFF]	● Indicates [ON/OFF] condition of SET lamp determined by the ECM according to the input signals.	
EXH V/T LEARN [YET/CMPLT]	● Display the condition of Exhaust Valve Timing Control Learning YET: Exhaust Valve Timing Control Learning has not been performed yet. CMPLT: Exhaust Valve Timing Control Learning has already been performed successfully.	
A/F ADJ-B1	● Indicates the correction of factor stored in ECM. The factor is calculated from the difference between the target air-fuel ratio stored in ECM and the air-fuel ratio calculated from A/F sensor 1 signal.	
A/F ADJ-B2		
Voltage [V]	● Voltage, frequency, duty cycle or pulse width measured by the probe.	● Only “#” is displayed if item is unable to be measured. ● Figures with “#”s are temporary ones. They are the same figures as an actual piece of data which was just previously measured.
Frequency [msec], [Hz] or [%]		
DUTY-HI		
DUTY-LOW		
PLS WIDTH-HI		
PLS WIDTH-LOW		

NOTE:
Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

ACTIVE TEST MODE

Test Item

TEST ITEM	CONDITION	JUDGEMENT	CHECK ITEM (REMEDY)
FUEL INJECTION	● Engine: Return to the original trouble condition ● Change the amount of fuel injection using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Fuel injector ● Air fuel ratio (A/F) sensor 1
IGNITION TIMING	● Engine: Return to the original trouble condition ● Timing light: Set ● Retard the ignition timing using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Perform Idle Air Volume Learning.
POWER BALANCE	● Engine: After warming up, idle the engine. ● A/C switch OFF ● Shift lever: P or N (A/T), Neutral (M/T) ● Cut off each fuel injector signal one at a time using CONSULT-III.	Engine runs rough or dies.	● Harness and connectors ● Compression ● Fuel injector ● Power transistor ● Spark plug ● Ignition coil
COOLING FAN*	● Ignition switch: ON ● Turn the cooling fan “HI”, “LOW” and “OFF” using CONSULT-III.	Cooling fan moves and stops.	● Harness and connectors ● Cooling fan motor ● IPDM E/R
ENG COOLANT TEMP	● Engine: Return to the original trouble condition ● Change the engine coolant temperature using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Engine coolant temperature sensor ● Fuel injector
FUEL PUMP RELAY	● Ignition switch: ON (Engine stopped) ● Turn the fuel pump relay “ON” and “OFF” using CONSULT-III and listen to operating sound.	Fuel pump relay makes the operating sound.	● Harness and connectors ● Fuel pump relay
PURG VOL CONT/V	● Engine: After warming up, run engine at 1,500 rpm. ● Change the EVAP canister purge volume control solenoid valve opening percent using CONSULT-III.	Engine speed changes according to the opening percent.	● Harness and connectors ● Solenoid valve
FUEL/T TEMP SEN	● Change the fuel tank temperature using CONSULT-III.		
VENT CONTROL/V	● Ignition switch: ON (Engine stopped) ● Turn solenoid valve “ON” and “OFF” with the CONSULT-III and listen to operating sound.	Solenoid valve makes an operating sound.	● Harness and connectors ● Solenoid valve
INT V/T ASSIGN ANGLE	● Engine: Return to the original trouble condition ● Change intake valve timing using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Intake valve timing control solenoid valve
EXH V/T ASSIGN ANGLE	● Engine: Return to the original trouble condition ● Change exhaust valve timing using CONSULT-III.	If trouble symptom disappears, see CHECK ITEM.	● Harness and connectors ● Exhaust valve timing control magnet retarder

*: Leaving cooling fan “OFF” with CONSULT-III while engine is running may cause the engine to overheat.

DTC & SRT CONFIRMATION MODE

SRT STATUS Mode

For details, refer to EC-53, "SYSTEM READINESS TEST (SRT) CODE" .

SRT WORK SUPPORT Mode

This mode enables a technician to drive a vehicle to set the SRT while monitoring the SRT status.

DTC WORK SUPPORT Mode

Test mode	Test item	Corresponding DTC No.	Reference page
EVAPORATIVE SYSTEM	PURG FLOW P0441	P0441	EC-411
	EVP SML LEAK P0442/P1442*	P0442	EC-416
	EVP V/S LEAK P0456/P1456*	P0456	EC-482
	PURG VOL CN/V P1444	P0443	EC-423
A/F SEN1	A/F SEN1 (B1) P1276	P0130	EC-248
	A/F SEN1 (B1) P1278/P1279	P0133	EC-275
	A/F SEN1 (B2) P1286	P0150	EC-248
	A/F SEN1 (B2) P1288/P1289	P0153	EC-275
HO2S2	HO2S2 (B1) P0139	P0139	EC-313
	HO2S2 (B1) P1146	P0138	EC-298
	HO2S2 (B1) P1147	P0137	EC-287
	HO2S2 (B2) P0159	P0159	EC-313
	HO2S2 (B2) P1166	P0158	EC-298
	HO2S2 (B2) P1167	P0157	EC-287

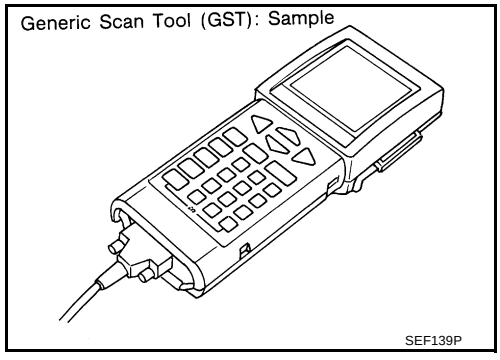
*: DTC P1442 and P1456 does not apply to Z33 models but appears in DTC WORK SUPPORT Mode screens.

Generic Scan Tool (GST) Function

NBS0003O

DESCRIPTION

Generic Scan Tool (OBDII scan tool) complying with SAE J1978 has 8 different functions explained below.
ISO9141 is used as the protocol.
The name GST or Generic Scan Tool is used in this service manual.



FUNCTION

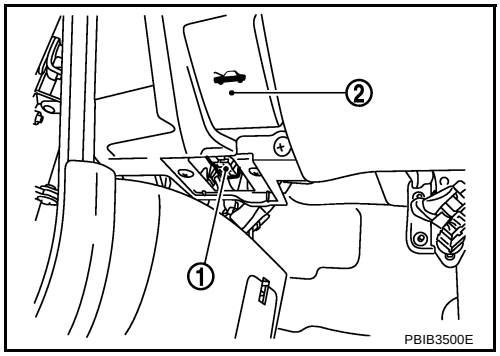
Diagnostic test mode		Function
Service $01	READINESS TESTS	This diagnostic service gains access to current emission-related data values, including analog inputs and outputs, digital inputs and outputs, and system status information.
Service $02	(FREEZE DATA)	This diagnostic service gains access to emission-related data value which were stored by ECM during the freeze frame. For details, refer to EC-53, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA" .
Service $03	DTCs	This diagnostic service gains access to emission-related power train trouble codes which were stored by ECM.

Diagnostic test mode		Function
Service $04	CLEAR DIAG INFO	This diagnostic service can clear all emission-related diagnostic information. This includes: ● Clear number of diagnostic trouble codes (Service $01) ● Clear diagnostic trouble codes (Service $03) ● Clear trouble code for freeze frame data (Service $01) ● Clear freeze frame data (Service $02) ● Reset status of system monitoring test (Service $01) ● Clear on board monitoring test results (Service $06 and $07)
Service $06	(ON BOARD TESTS)	This diagnostic service accesses the results of on board diagnostic monitoring tests of specific components/systems that are not continuously monitored.
Service $07	(ON BOARD TESTS)	This diagnostic service enables the off board test drive to obtain test results for emission-related powertrain components/systems that are continuously monitored during normal driving conditions.
Service $08	—	This diagnostic service can close EVAP system in ignition switch ON position (Engine stopped). When this diagnostic service is performed, EVAP canister vent control valve can be closed. In the following conditions, this mode cannot function. ● Low ambient temperature ● Low battery voltage ● Engine running ● Ignition switch OFF ● Low fuel temperature ● Too much pressure is applied to EVAP system
Service $09	(CALIBRATION ID)	This diagnostic service enables the off-board test device to request specific vehicle information such as Vehicle Identification Number (VIN) and Calibration IDs.

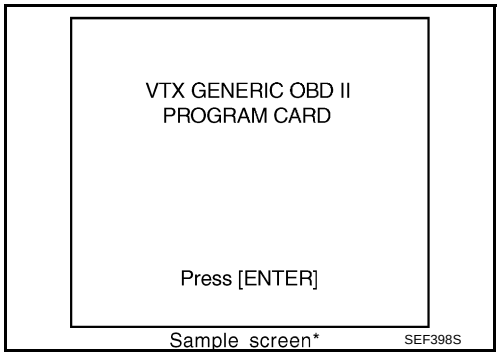
INSPECTION PROCEDURE

1. Turn ignition switch OFF.
2. Connect GST to data link connector (1), which is located under LH dash panel near the hood opener handle.

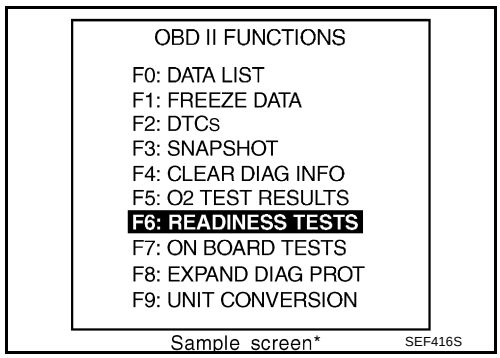
   2 : Hood opener handle



3. Turn ignition switch ON.
4. Enter the program according to instruction on the screen or in the operation manual.
   (*: Regarding GST screens in this section, sample screens are shown.)



5. Perform each diagnostic mode according to each service procedure.
For further information, see the GST Operation Manual of the tool maker.



CONSULT-III Reference Value in Data Monitor

NBS0003P

Remarks:
- Specification data are reference values.
- Specification data are output/input values which are detected or supplied by the ECM at the connector.
  * Specification data may not be directly related to their components signals/values/operations.
  i.e. Adjust ignition timing with a timing light before monitoring IGN TIMING, because the monitor may show the specification data in spite of the ignition timing not being adjusted to the specification data. This IGN TIMING monitors the data calculated by the ECM according to the signals input from the camshaft position sensor and other ignition timing related sensors.

MONITOR ITEM	CONDITION		SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-III value with the tachometer indication.		Almost the same speed as the tachometer indication
MAS A/F SE-B1	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
MAS A/F SE-B2	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
B/FUEL SCHDL	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
A/F ALPHA-B1 A/F ALPHA-B2	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
COOLAN TEMP/S	● Engine: After warming up		More than 70°C (158°F)
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V
HO2S2 (B1) HO2S2 (B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		LEAN ←→ RICH
VHCL SPEED SE	● Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Almost the same speed as the speedometer indication
BATTERY VOLT	● Ignition switch: ON (Engine stopped)		11 - 14V
ACCEL SEN 1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN 2*1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
TP SEN 1-B1 TP SEN 2-B1*1	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T) or 1st (M/T) position	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V
FUEL T/TMP SE	● Ignition switch: ON		Indicates fuel tank temperature
INT/A TEMP SE	● Ignition switch: ON		Indicates intake air temperature

MONITOR ITEM	CONDITION		SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON		Approx. 1.8 - 4.8V
FUEL LEVEL SE	● Ignition switch: ON		Depending on fuel level of fuel tank
START SIGNAL	● Ignition switch: ON → START → ON		OFF → ON → OFF
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF
AIR COND SIG	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
P/N POSI SW	● Ignition switch: ON	Shift lever: P or N (A/T), Neutral (M/T) position	ON
		Shift lever: Except above position	OFF
PW/ST SIGNAL	● Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
		Steering wheel: Being turned	ON
LOAD SIGNAL	● Ignition switch: ON	Rear window defogger switch: ON and/or lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	● Ignition switch: ON → OFF → ON		ON → OFF → ON
HEATER FAN SW	● Engine: After warming up, idle the engine	Heater fan switch: ON	ON
		Heater fan switch: OFF	OFF
BRAKE SW	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
INJ PULSE-B1 INJ PULSE-B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
IGN TIMING	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	6° - 16° BTDC
		2,000 rpm	25° - 45° BTDC
CAL/LD VALUE	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s
PURG VOL C/V	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle (Accelerator pedal is not depressed even slightly, after engine starting)	0%
		2,000 rpm	—

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V TIM(B1) INT/V TIM(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		2,000 rpm	Approx. 0° - 30°CA
EXH/V TIM B1 EXH/V TIM B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°CA
INT/V SOL(B1) INT/V SOL(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		2,000 rpm	Approx. 0% - 50%
EX VTC DTY B1 EX VTC DTY B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%
TP SEN 1-B2 TP SEN 2-B2*1	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T) or 1st (M/T) position	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V
AIR COND RLY	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates)	ON
FUEL PUMP RLY	● For 1 second after turning ignition switch ON ● Engine running or cranking		ON
	● Except above conditions		OFF
VENT CONT/V	● Ignition switch: ON		OFF
THRTL RELAY	● Ignition switch: ON		ON
COOLING FAN	● Engine: After warming up, idle the engine ● Air conditioner switch: OFF	Engine coolant temperature is 97°C (206°F) or less	OFF
		Engine coolant temperature is between 98°C (208°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	HI
HO2S2 HTR (B1) HO2S2 HTR (B2)	● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		ON
	● Engine speed: Above 3,600 rpm		OFF
I/P PULLY SPD	● Vehicle speed: More than 20 km/h (12 MPH)		Almost the same speed as the tachometer indication
VEHICLE SPEED	● Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Almost the same speed as the speedometer indication

MONITOR ITEM	CONDITION		SPECIFICATION
IDL A/V LEARN	● Engine: Running	Idle air volume learning has not been performed yet.	YET
		Idle air volume learning has already been performed successfully.	CMPLT
ENG OIL TEMP	● Engine: After warming up		More than 70°C (158°F)
TRVL AFTER MIL	● Ignition switch: ON	Vehicle has traveled after MIL has turned ON.	0 - 65,535 km (0 - 40,723 mile)
A/F S1 HTR(B1) A/F S1 HTR(B2)	● Engine: After warming up, idle the engine (More than 140 seconds after starting engine)		4 - 100%
AC PRESS SEN	● Engine: Idle ● Both A/C switch and blower switch are ON. (Compressor operates.)		1.0 - 4.0V
VHCL SPEED SE	● Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Almost the same speed as the speedometer indication
SET VHCL SPD	● Engine: Running	ASCD: Operating	The preset vehicle speed is displayed.
MAIN SW	● Ignition switch: ON	MAIN switch: Pressed	ON
		MAIN switch: Released	OFF
CANCEL SW	● Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	● Ignition switch: ON	RESUME/ACCELERATE switch: Pressed	ON
		RESUME/ACCELERATE switch: Released	OFF
SET SW	● Ignition switch: ON	SET/COAST switch: Pressed	ON
		SET/COAST switch: Released	OFF
BRAKE SW1 (ASCD brake switch)	● Ignition switch: ON	● Brake pedal: Fully released (A/T) ● Brake pedal and clutch pedal: Fully released (M/T)	ON
		● Brake pedal: Slightly depressed (A/T) ● Brake pedal and/or clutch pedal: Slightly depressed (M/T)	OFF
BRAKE SW2 (Stop lamp switch)	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
VHCL SPD CUT	● Ignition switch: ON		NON
LO SPEED CUT	● Ignition switch: ON		NON
AT OD MONITOR	● Ignition switch: ON		OFF
AT OD CANSEL	● Ignition switch: ON		OFF
CRUISE LAMP	● Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● MAIN switch: ON ● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89MPH)	ASCD: Operating	ON
		ASCD: Not operating	OFF
EXH V/T LEARN	● Engine: Running	Exhaust Valve Timing Control Learning has not been performed yet.	YET
		Exhaust Valve Timing Control Learning has not been performed yet.	CMPLT
A/F ADJ B1	● Engine: Running		–0.330 - 0.330
A/F ADJ B2	● Engine: Running		–0.330 - 0.330

*1: Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

PFP:00031

Description

NBS0003R

The specification (SP) value indicates the tolerance of the value that is displayed in “SPEC” in “DATA MONITOR” mode of CONSULT-III during normal operation of the Engine Control System. When the value in “SPEC” in “DATA MONITOR” mode is within the SP value, the Engine Control System is confirmed OK. When the value in “SPEC” in “DATA MONITOR” mode is NOT within the SP value, the Engine Control System may have one or more malfunctions.
The SP value is used to detect malfunctions that may affect the Engine Control System, but will not light the MIL.
The SP value will be displayed for the following three items:

- B/FUEL SCHDL (The fuel injection pulse width programmed into ECM prior to any learned on board correction)
- A/F ALPHA-B1/B2 (The mean value of air-fuel ratio feedback correction factor per cycle)
- MAS A/F SE-B1/B2 (The signal voltage of the mass air flow sensor)

Testing Condition

NBS0003S

- Vehicle driven distance: More than 5,000 km (3,107 miles)
- Barometric pressure: 98.3 - 104.3 kPa (1.003 - 1.064 kg/cm^2 , 14.25 - 15.12 psi)
- Atmospheric temperature: 20 - 30°C (68 - 86°F)
- Engine coolant temperature: 75 - 95°C (167 - 203°F)
- Transmission: Warmed-up
  - For A/T models: After the engine is warmed up to normal operating temperature, drive vehicle until “ATF TEMP 1” (A/T fluid temperature sensor signal) indicates more than 60°C (140°F).
  - For M/T models: After the engine is warmed up to normal operating temperature, drive vehicle for 5 minutes.
- Electrical load: Not applied
  - Rear window defogger switch, air conditioner switch, lighting switch are OFF. Steering wheel is straight ahead.
- Engine speed: Idle

Inspection Procedure

NBS0003T

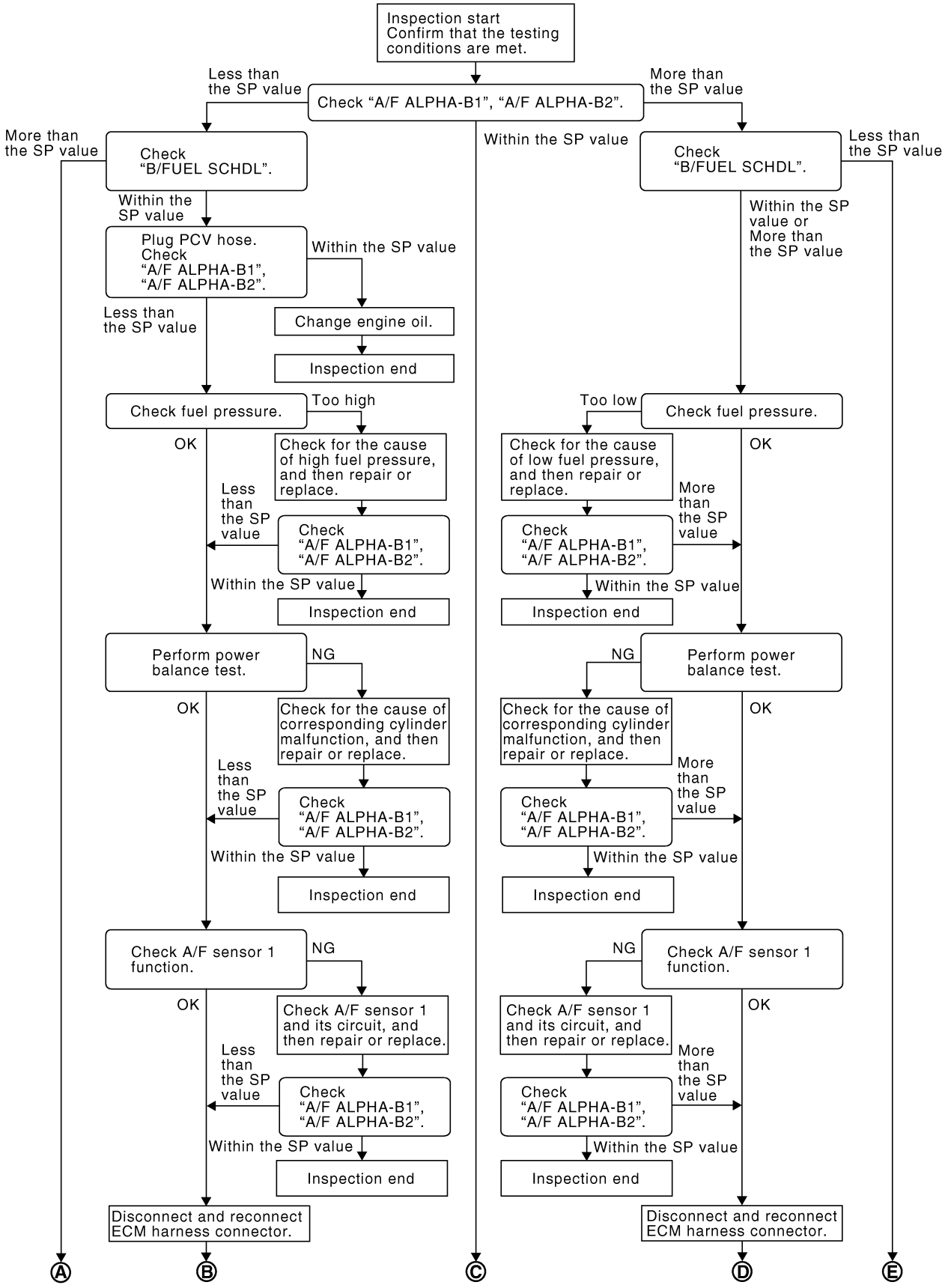
NOTE:
Perform “SPEC” in “DATA MONITOR” mode in maximum scale display.

1. Perform EC-71, "Basic Inspection" .
2. Confirm that the testing conditions indicated above are met.
3. Select “B/FUEL SCHDL”, “A/F ALPHA-B1”, “A/F ALPHA-B2”, “MAS A/F SE-B1” and “MAS A/F SE-B2” in “SPEC” of ”DATA MONITOR” mode with CONSULT-III.
4. Make sure that monitor items are within the SP value.
5. If NG, go to EC-133, "Diagnostic Procedure" .

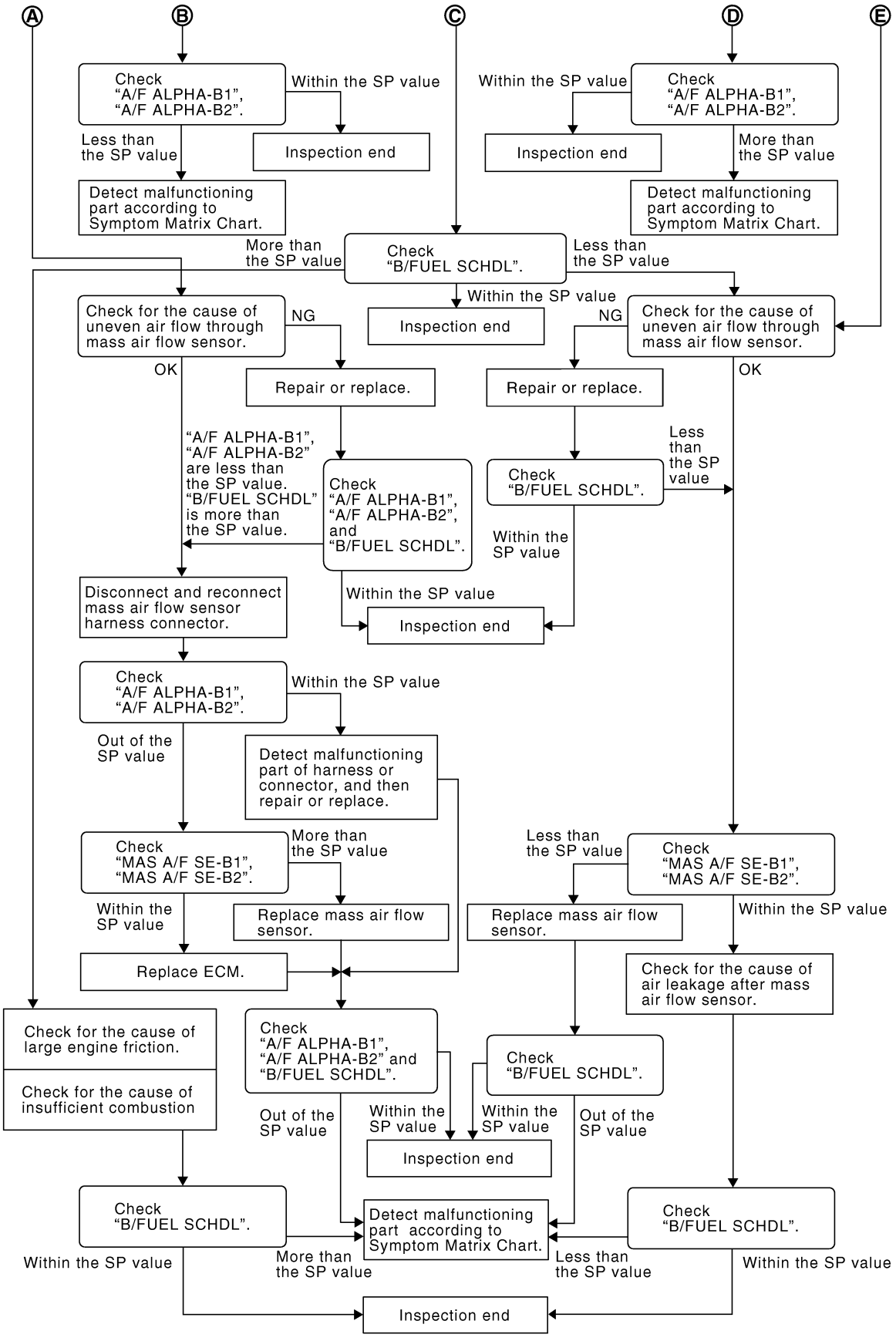
Diagnostic Procedure

NBS0003U

OVERALL SEQUENCE



PBIB2268E


Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Check "A/F ALPHA-B1", "A/F ALPHA-B2".
Within the SP value
Inspection end
Less than the SP value
Detect malfunctioning part according to Symptom Matrix Chart.
Within the SP value
Check "A/F ALPHA-B1", "A/F ALPHA-B2".
Inspection end
More than the SP value
Detect malfunctioning part according to Symptom Matrix Chart.
More than the SP value
Check "B/FUEL SCHDL".
Less than the SP value
Within the SP value
Inspection end
Check for the cause of uneven air flow through mass air flow sensor.
NG
OK
Repair or replace.
NG
Check for the cause of uneven air flow through mass air flow sensor.
OK
Repair or replace.
"A/F ALPHA-B1", "A/F ALPHA-B2" are less than the SP value. "B/FUEL SCHDL" is more than the SP value.
Check "A/F ALPHA-B1", "A/F ALPHA-B2", and "B/FUEL SCHDL".
Check "B/FUEL SCHDL".
Less than the SP value
Within the SP value
Within the SP value
Inspection end
Disconnect and reconnect mass air flow sensor harness connector.
Check "A/F ALPHA-B1", "A/F ALPHA-B2".
Within the SP value
Out of the SP value
Detect malfunctioning part of harness or connector, and then repair or replace.
Check "MAS A/F SE-B1", "MAS A/F SE-B2".
More than the SP value
Within the SP value
Replace mass air flow sensor.
Replace ECM.
Less than the SP value
Check "MAS A/F SE-B1", "MAS A/F SE-B2".
Within the SP value
Replace mass air flow sensor.
Check for the cause of air leakage after mass air flow sensor.
Check for the cause of large engine friction.
Check for the cause of insufficient combustion
Check "A/F ALPHA-B1", "A/F ALPHA-B2" and "B/FUEL SCHDL".
Check "B/FUEL SCHDL".
Out of the SP value
Within the SP value
Within the SP value
Out of the SP value
Inspection end
Check "B/FUEL SCHDL".
Within the SP value
More than the SP value
Detect malfunctioning part according to Symptom Matrix Chart.
Less than the SP value
Check "B/FUEL SCHDL".
Within the SP value
Inspection end
PBIB3531E

DETAILED PROCEDURE

1. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Confirm that the testing conditions are met. Refer to EC-132, "Testing Condition" .
3. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” in mode, and make sure that the each indication is within the SP value.

   NOTE:
   Check “A/F ALPHA-B1”, “A/F ALPHA-B2” for approximately 1 minute because they may fluctuate. It is NG if the indication is out of the SP value even a little.

OK or NG

OK >> GO TO 17.
NG (Less than the SP value)>>GO TO 2.
NG (More than the SP value)>>GO TO 3.

2. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> GO TO 4.
NG (More than the SP value)>>GO TO 19.

3. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> GO TO 6.
NG (More than the SP value)>>GO TO 6.
NG (Less than the SP value)>>GO TO 25.

4. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Stop the engine.
2. Disconnect PCV hose, and then plug it.
3. Start engine.
4. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> GO TO 5.
NG >> GO TO 6.

5. CHANGE ENGINE OIL

1. Stop the engine.
2. Change engine oil.

   NOTE:
   This symptom may occur when a large amount of gasoline is mixed with engine oil because of driving conditions (such as when engine oil temperature does not rise enough since a journey distance is too short during winter). The symptom will not be detected after changing engine oil or changing driving condition.

>> **INSPECTION END**

6. CHECK FUEL PRESSURE

Check fuel pressure. (Refer to EC-79, "Fuel Pressure Check" .)

OK or NG

OK >> GO TO 9.
NG (Fuel pressure is too high)>>Replace fuel pressure regulator, refer to EC-79, "Fuel Pressure Check" . GO TO 8.
NG (Fuel pressure is too low)>>GO TO 7.

7. DETECT MALFUNCTIONING PART

1. Check the following.
- Clogged and bent fuel hose and fuel tube
- Clogged fuel filter
- Fuel pump and its circuit (Refer to EC-691, "FUEL PUMP" .)
2. If NG, repair or replace the malfunctioning part. (Refer to EC-79, "Fuel Pressure Check" .)
If OK, replace fuel pressure regulator.

>> GO TO 8.

8. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. PERFORM POWER BALANCE TEST

1. Perform “POWER BALANCE” in “ACTIVE TEST” mode.
2. Make sure that the each cylinder produces a momentary engine speed drop.

OK or NG

OK >> GO TO 12.
NG >> GO TO 10.

10. DETECT MALFUNCTIONING PART

1. Check the following.
- Ignition coil and its circuit (Refer to EC-698, "IGNITION SIGNAL" .)
- Fuel injector and its circuit (Refer to EC-686, "FUEL INJECTOR" .)
- Intake air leakage
- Low compression pressure (Refer to EM-89, "CHECKING COMPRESSION PRESSURE" .)
2. If NG, repair or replace the malfunctioning part.
If OK, replace fuel injector. (It may be caused by leakage from fuel injector or clogging.)

>> GO TO 11.

11. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 12.

12. CHECK A/F SENSOR 1 FUNCTION

Perform all DTC Confirmation Procedure related with A/F sensor 1.

- For DTC P0130, P0150, refer to EC-248, "DTC Confirmation Procedure" .
- For DTC P0131, P0151, refer to EC-267, "DTC Confirmation Procedure" .
- For DTC P0132, P0152, refer to EC-660, "DTC Confirmation Procedure" .
- For DTC P0133, P0153, refer to EC-276, "DTC Confirmation Procedure" .
- For DTC P2A00, P2A03, refer to EC-660, "DTC Confirmation Procedure" .

OK or NG

OK >> GO TO 15.
NG >> GO TO 13.

13. CHECK A/F SENSOR 1 CIRCUIT

Perform Diagnostic Procedure according to corresponding DTC.

>> GO TO 14.

14. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 15.

15. DISCONNECT AND RECONNECT ECM HARNESS CONNECTOR

1. Stop the engine.
2. Disconnect ECM harness connector. Check pin terminal and connector for damage, and then reconnect it.

>> GO TO 16.

16. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> Detect malfunctioning part according to EC-90, "Symptom Matrix Chart" .

17. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG (More than the SP value)>>GO TO 18.
NG (Less than the SP value)>>GO TO 25.

18. DETECT MALFUNCTIONING PART

1. Check for the cause of large engine friction. Refer to the following.
- Engine oil level is too high
- Engine oil viscosity
- Belt tension of power steering, alternator, A/C compressor, etc. is excessive
- Noise from engine
- Noise from transmission, etc.
2. Check for the cause of insufficient combustion. Refer to the following.
- Valve clearance malfunction
- Intake valve timing control function malfunction
- Camshaft sprocket installation malfunction, etc.

>> Repair or replace malfunctioning part, and then GO TO 30.

19. CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system

OK or NG

OK >> GO TO 21.
NG >> Repair or replace malfunctioning part, and then GO TO 20.

20. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”, AND “B/FUEL SCHDL”

Select “A/F ALPHA-B1”, “A/F ALPHA-B2”, and “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG (“B/FUEL SCHDL” is more, “A/F ALPHA-B1”, “A/F ALPHA-B2” are less than the SP value)>>GO TO 21.

21. DISCONNECT AND RECONNECT MASS AIR FLOW SENSOR HARNESS CONNECTOR

1. Stop the engine.
2. Disconnect mass air flow sensor harness connector. Check pin terminal and connector for damage and then reconnect it again.

>> GO TO 22.

22. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”

1. Start engine.
2. Select “A/F ALPHA-B1”, “A/F ALPHA-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> 1. Detect malfunctioning part of mass air flow sensor circuit and repair it.
Refer to EC-197, "DTC P0101, P010B MAF SENSOR" .
2. GO TO 29.

NG >> GO TO 23.

23. CHECK “MAS A/F SE-B1”, “MAS A/F SE-B2”

Select “MAS A/F SE-B1”, “MAS A/F SE-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> GO TO 24.
NG (More than the SP value)>>Replace mass air flow sensor, and then GO TO 29.

24. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS(NATS) system and registration of all NVIS(NATS) ignition key IDs.
Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> GO TO 29.

25. CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system

OK or NG

OK >> GO TO 27.
NG >> Repair or replace malfunctioning part, and then GO TO 26.

26. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG (Less than the SP value)>>GO TO 27.

27. CHECK “MAS A/F SE-B1”, “MAS A/F SE-B2”

Select “MAS A/F SE-B1”, “MAS A/F SE-B2” in “SPEC” of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

OK or NG

OK >> GO TO 28.
NG (Less than the SP value)>>Replace mass air flow sensor, and then GO TO 30.

28. CHECK INTAKE SYSTEM

Check for the cause of air leak after the mass air flow sensor. Refer to the following.

- Disconnection, looseness, and cracks in air duct
- Looseness of oil filler cap
- Disconnection of oil level gauge
- Open stuck, breakage, hose disconnection, or cracks of PCV valve
- Disconnection or cracks of EVAP purge hose, open stuck of EVAP canister purge volume control solenoid valve
- Malfunctioning seal of rocker cover gasket
- Disconnection, looseness, or cracks of hoses, such as vacuum hose, connecting to intake air system parts
- Malfunctioning seal of intake air system, etc.

>> GO TO 30.

29. CHECK “A/F ALPHA-B1”, “A/F ALPHA-B2”, AND “B/FUEL SCHDL”

Select “A/F ALPHA-B1”, “A/F ALPHA-B2”, and “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> Detect malfunctioning part according to EC-90, "Symptom Matrix Chart" .

30. CHECK “B/FUEL SCHDL”

Select “B/FUEL SCHDL” in “SPEC” of "DATA MONITOR" mode, and then make sure that the indication is within the SP value.

OK or NG

OK >> **INSPECTION END**
NG >> Detect malfunctioning part according to EC-90, "Symptom Matrix Chart" .

TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

PFP:00006

Description

NBS0003V

Intermittent incidents may occur. In many cases, the malfunction resolves itself (the part or circuit function returns to normal without intervention). It is important to realize that the symptoms described in the customer's complaint often do not recur on (1st trip) DTC visits. Realize also that the most frequent cause of intermittent incidents occurrences is poor electrical connections. Because of this, the conditions under which the incident occurred may not be clear. Therefore, circuit checks made as part of the standard diagnostic procedure may not indicate the specific malfunctioning area.

Common intermittent incidents Report Situations

STEP in Work Flow	Situation
2	The CONSULT-III is used. The SELF-DIAG RESULTS screen shows time data other than [0] or [1t].
3 or 4	The symptom described by the customer does not recur.
5	(1st trip) DTC does not appear during the DTC Confirmation Procedure.
10	The Diagnostic Procedure for PXXXX does not indicate the malfunctioning area.

Diagnostic Procedure

NBS0003W

1. INSPECTION START

Erase (1st trip) DTCs.
Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 2.

2. CHECK GROUND TERMINALS

Check ground terminals for corroding or loose connection.
Refer to EC-150, "Ground Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. SEARCH FOR ELECTRICAL INCIDENT

Perform GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" , “INCIDENT SIMULATION TESTS”.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK CONNECTOR TERMINALS

Refer to GI-24, "How to Check Terminal" , “HOW TO PROBE CONNECTORS”, “How to Check Enlarged Contact Spring of Terminal”.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace connector.

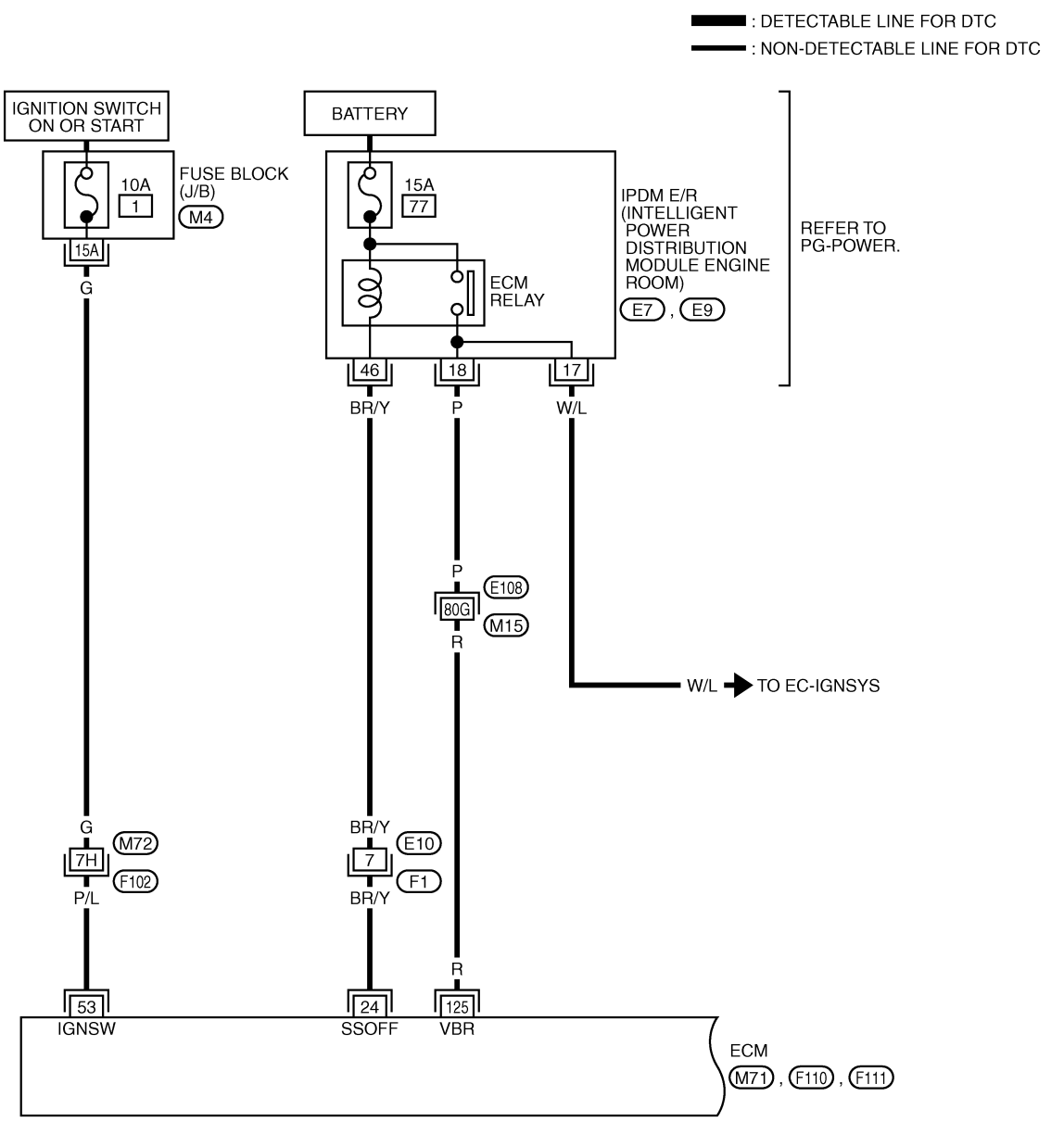
POWER SUPPLY AND GROUND CIRCUIT

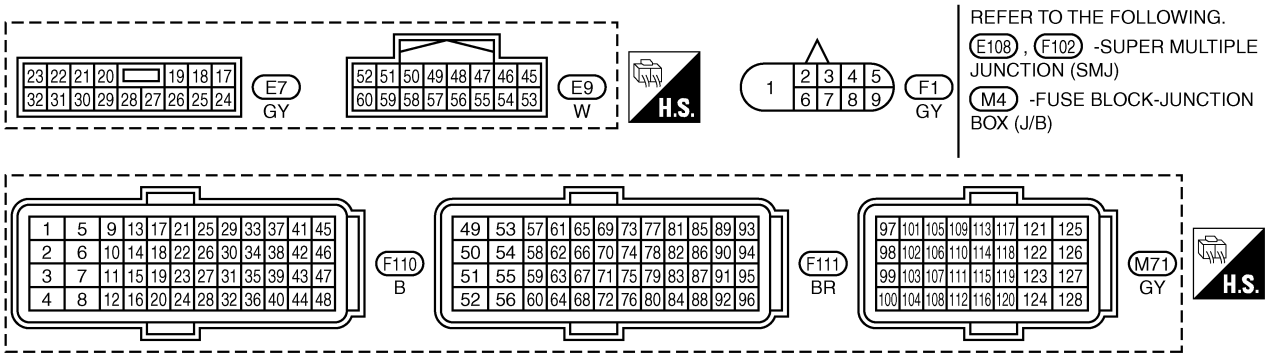
PFP:24110

Wiring Diagram

NBS0003X

EC-MAIN-01





TBWT1614E

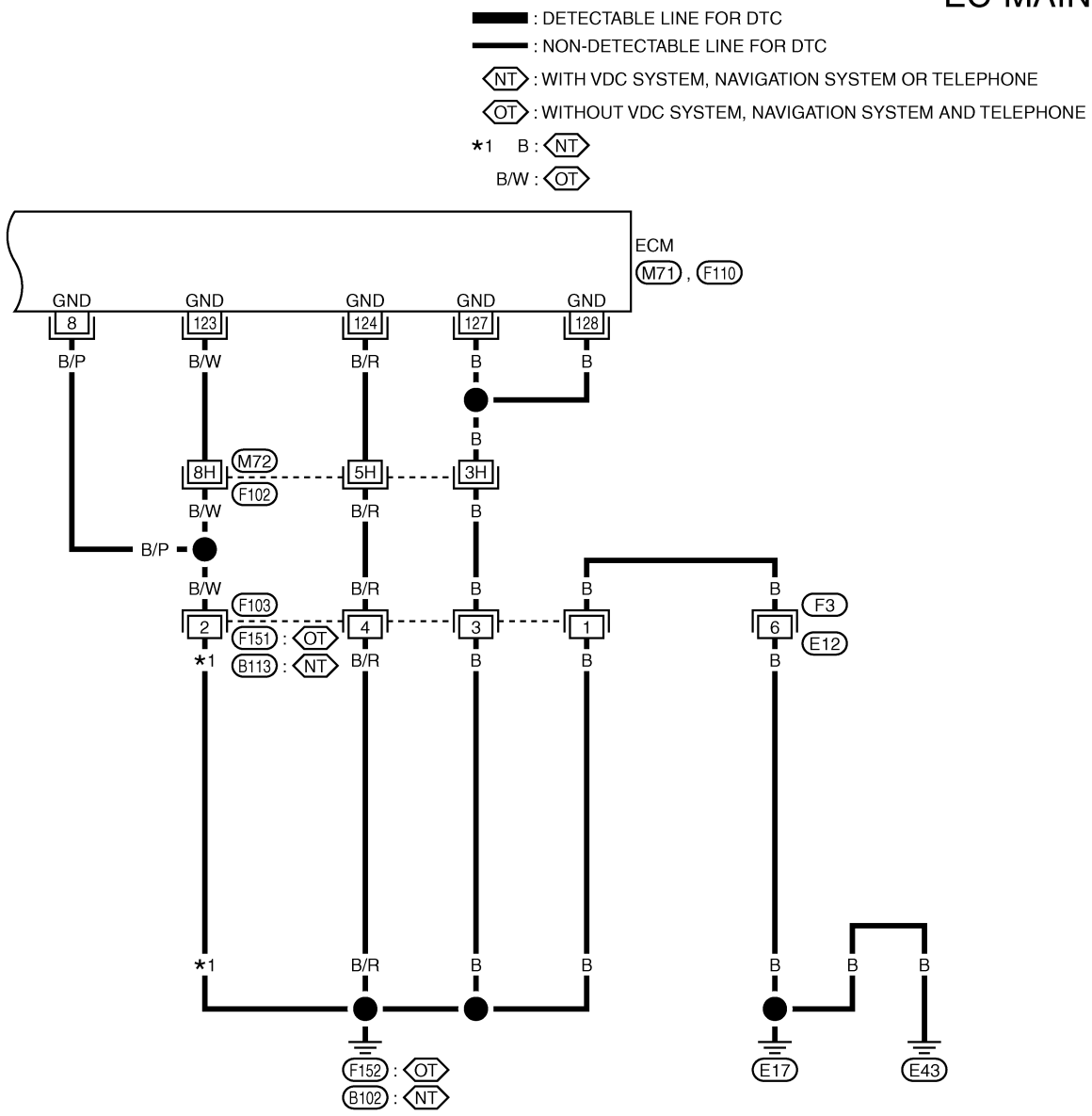
Specification data are reference values and are measured between each terminal and ground.

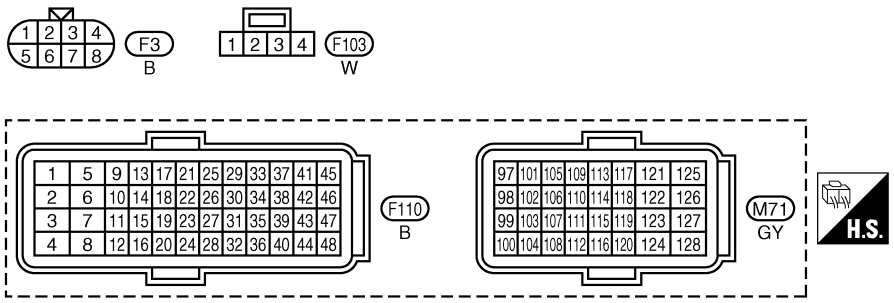
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
53	P/L	Ignition switch	**[Ignition switch: OFF]**	0V
			[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

EC-MAIN-02





REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1615E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
8	B/P	ECM ground	**[Engine is running]** ● Idle speed	Body ground
123 124	B/W B/R	ECM ground	**[Engine is running]** ● Idle speed	Body ground
127 128	B B	ECM ground	**[Engine is running]** ● Idle speed	Body ground

Diagnostic Procedure

NBS0003Y

1. INSPECTION START

Start engine.

Is engine running?

Yes or No

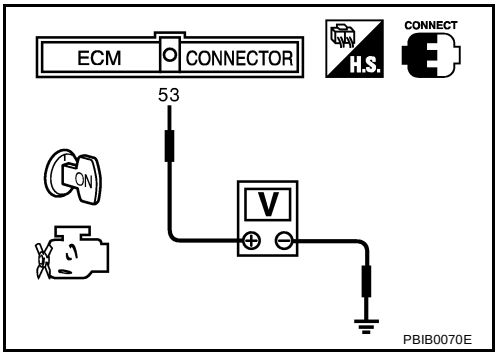
Yes >> GO TO 8.

No >> GO TO 2.

2. CHECK ECM POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF and then ON.
2. Check voltage between ECM terminal 53 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

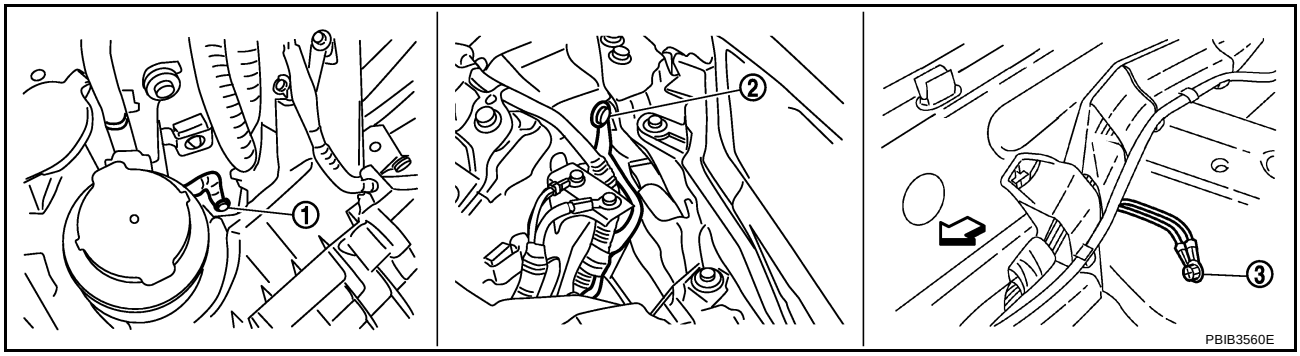
- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between ECM and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

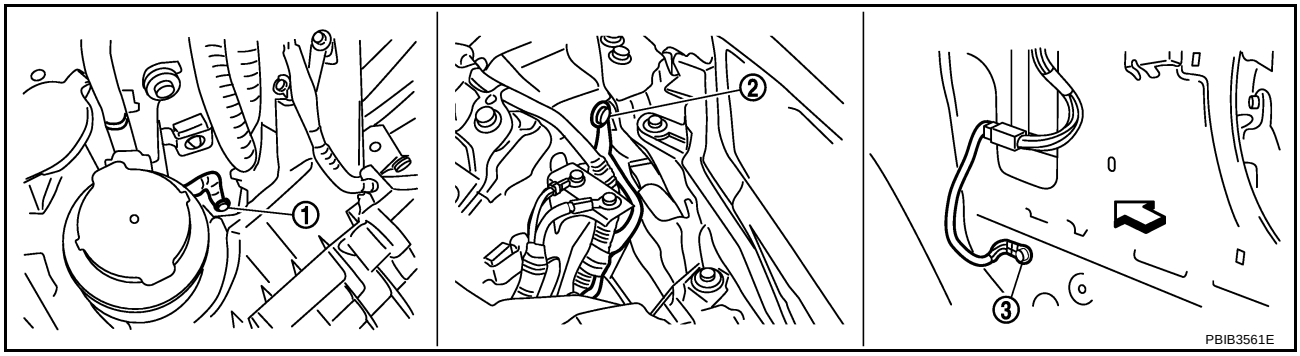


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 5.
NG >> Repair or replace ground connections.

5. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-I

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 8, 123, 124, 127, 128 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

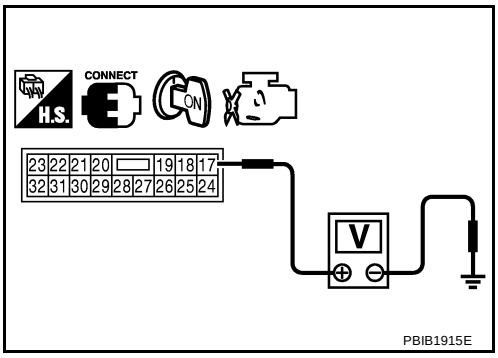
- Harness connectors M72, F102
- Harness connectors F103, B113 (Models with VDC system, navigation system or telephone) or F151 (Models without VDC system, navigation system and telephone)
- Harness connectors F3, E12
- Harness for open or short between ECM and ground

>> Repair open circuit or short to power in harness or connectors.

7. CHECK ECM POWER SUPPLY CIRCUIT-II

1. Reconnect ECM harness connector disconnected.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R terminal 17 and ground with CONSULT-III or tester.

Voltage: Battery voltage



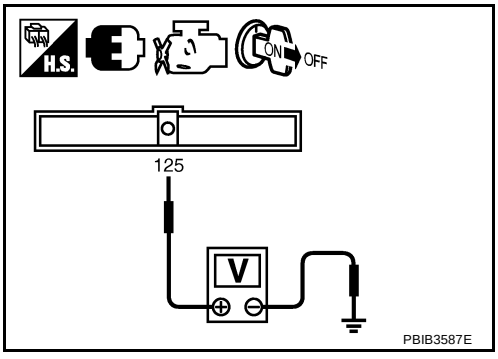
OK or NG

OK >> Go to EC-698, "IGNITION SIGNAL" .
NG >> GO TO 8.

8. CHECK ECM POWER SUPPLY CIRCUIT-III

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON and then OFF.
3. Check voltage between ECM terminals 125 and ground with CONSULT-III or tester.

Voltage: After turning ignition switch OFF, battery voltage will exist for a few seconds, then drop approximately 0V.



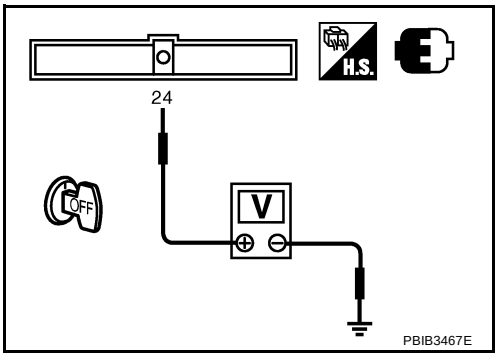
OK or NG

OK >> GO TO 15.
NG (Battery voltage does not exist.)>>GO TO 9.
NG (Battery voltage exists for more than a few seconds.)>>GO TO 12.

9. CHECK ECM POWER SUPPLY CIRCUIT-IV

Check voltage between ECM terminal 24 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 10.
NG >> GO TO 12.

10. CHECK ECM POWER SUPPLY CIRCUIT-V

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E7.
3. Check harness continuity between ECM terminals 125 and IPDM E/R terminal 18.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 18.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E108, M15
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK ECM POWER SUPPLY CIRCUIT-VI

1. Disconnect IPDM E/R harness connector E9.
2. Check harness continuity between ECM terminal 24 and IPDM E/R terminal 46.
   Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness or connectors E10, F1
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK 15A FUSE

1. Disconnect 15A fuse from IPDM E/R.
2. Check 15A fuse.

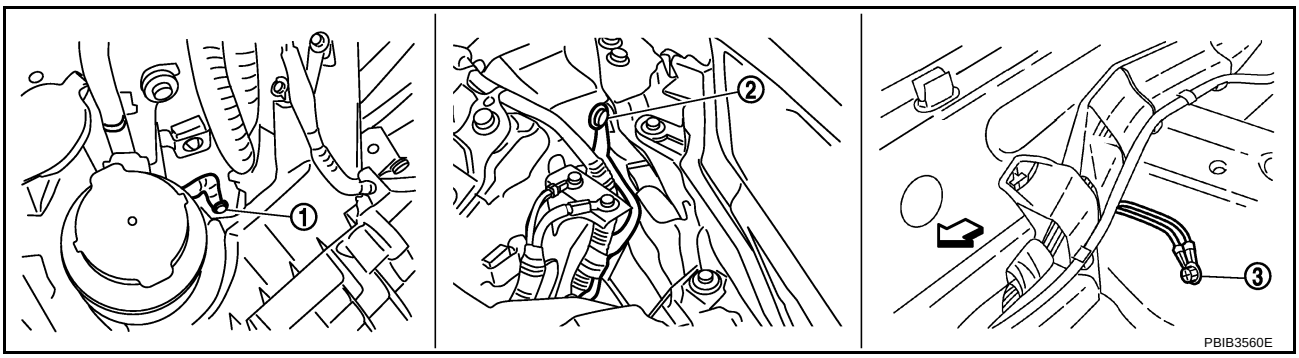
OK or NG

OK >> GO TO 18.
NG >> Replace 15A fuse.

15. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

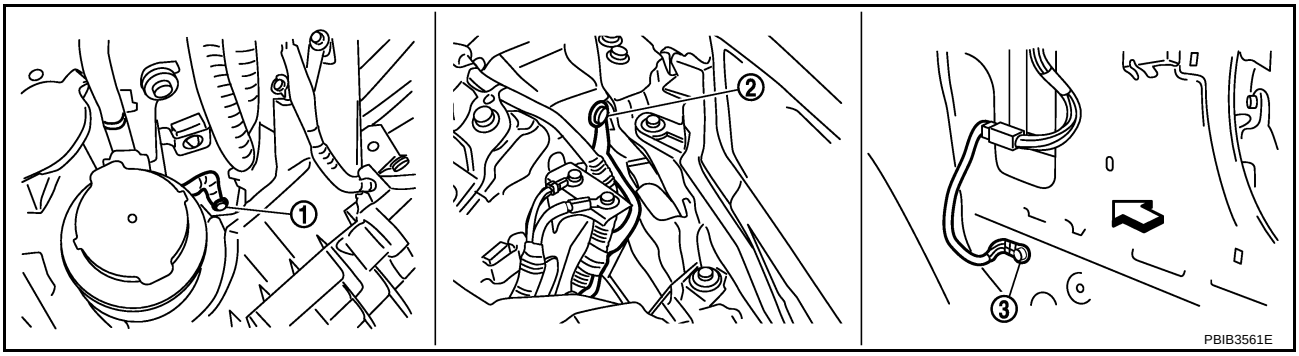


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 16.
NG >> Repair or replace ground connections.

16. CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT-II

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 8, 123, 124, 127, 128 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 18.
NG >> GO TO 17.

17. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F103, B113 (Models with VDC system, navigation system or telephone) or F151 (Models without VDC system, navigation system and telephone)
- Harness or connectors F3, E12
- Harness or connectors M72, F102
- Harness for open or short between ECM and ground.

>> Repair open circuit or short to power in harness or connectors.

18. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

Ground Inspection

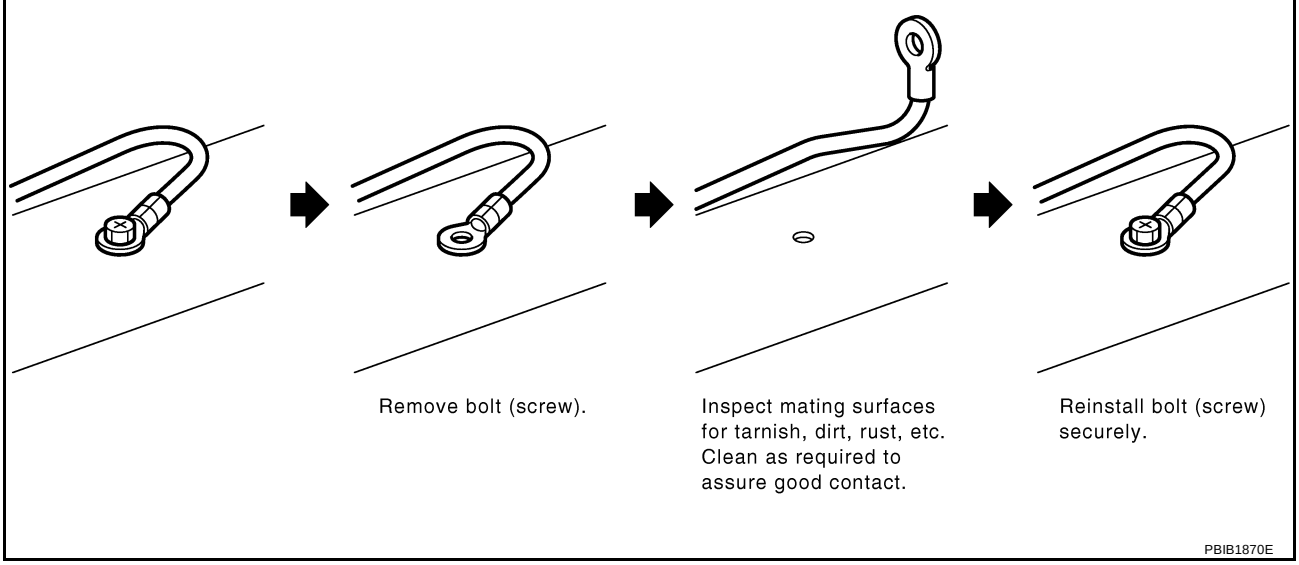
NBS0003Z

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This unwanted resistance can change the way a circuit works.
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically affect an electronically controlled circuit. A poor or corroded ground can easily affect the circuit. Even when the ground connection looks clean, there can be a thin film of rust on the surface.
When inspecting a ground connection follow these rules:

- Remove the ground bolt or screw.
- Inspect all mating surfaces for tarnish, dirt, rust, etc.
- Clean as required to assure good contact.
- Reinstall bolt or screw securely.
- Inspect for “add-on” accessories which may be interfering with the ground circuit.
- If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure no ground wires have excess wire insulation.

For detailed ground distribution information, refer to PG-27, "Ground Distribution" .

Ground Inspection



DTC U1000, U1001 CAN COMMUNICATION LINE

PFP:23710

Description

NBS00040

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

NBS006T0

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1000*1 1000*1	CAN communication line	● When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.	● Harness or connectors (CAN communication line is open or shorted)
U1001*2 1001*2		● When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	

*1: **This self-diagnosis has the one trip detection logic.**
*2: **The MIL will not light up for this self-diagnosis.**

DTC Confirmation Procedure

NBS006T1

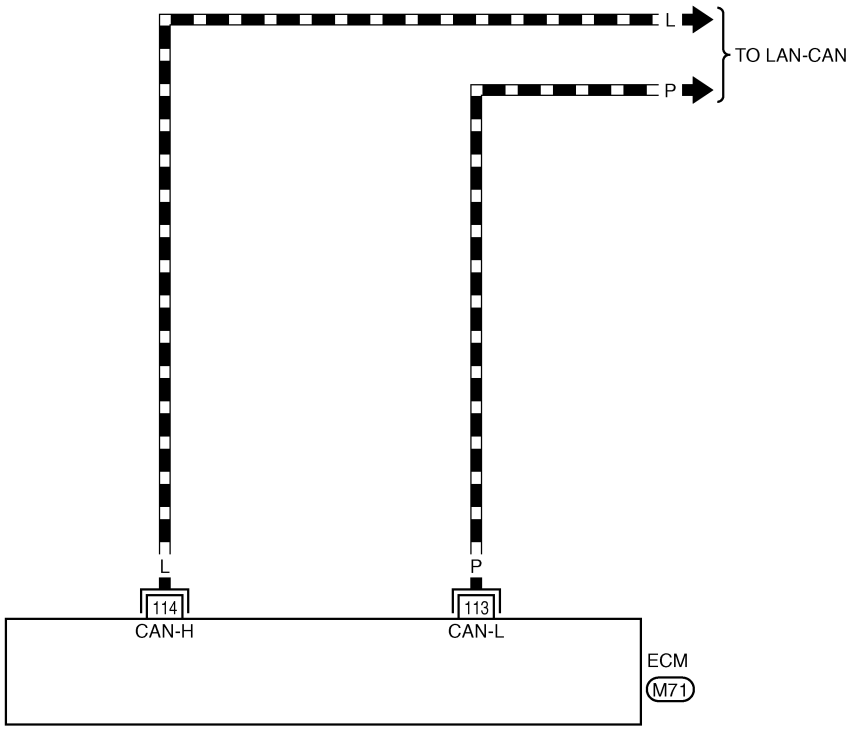
1. Turn ignition switch ON and wait at least 3 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-153, "Diagnostic Procedure" .

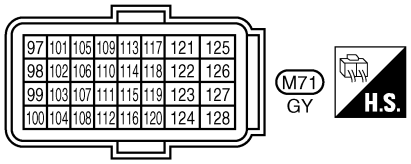
Wiring Diagram

NBS006T2

EC-CAN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
: DATA LINE





TBWT1616E

Diagnostic Procedure

NBS006T3

Go to LAN-48, "CAN System Specification Chart" .

DTC U1010 CAN COMMUNICATION

PFP:23710

Description

NBS002VL

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

NBS006T4

- **This self-diagnosis has one trip detection logic (A/T models).**
- **The MIL will not light up for this self-diagnosis (M/T models).**

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
U1010 1010	CAN communication bus	When detecting error during the initial diagnosis of CAN controller of ECM.	● ECM

DTC Confirmation Procedure

NBS002VN

WITH CONSULT-III

1. Turn ignition switch ON.
2. Check DTC.
3. If DTC is detected, go to EC-155, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS002VO

1. INSPECTION START

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” mode with CONSULT-III.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-154, "DTC Confirmation Procedure" .
5. Is the DTC U1010 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform DTC Confirmation Procedure.**
   See EC-154, "DTC Confirmation Procedure" .
4. Is the DTC U1010 displayed again?

Yes or No

Yes >> GO TO 2.
No >> **INSPECTION END**

2. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning"
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0011, P0021 IVT CONTROL

PFP:23796

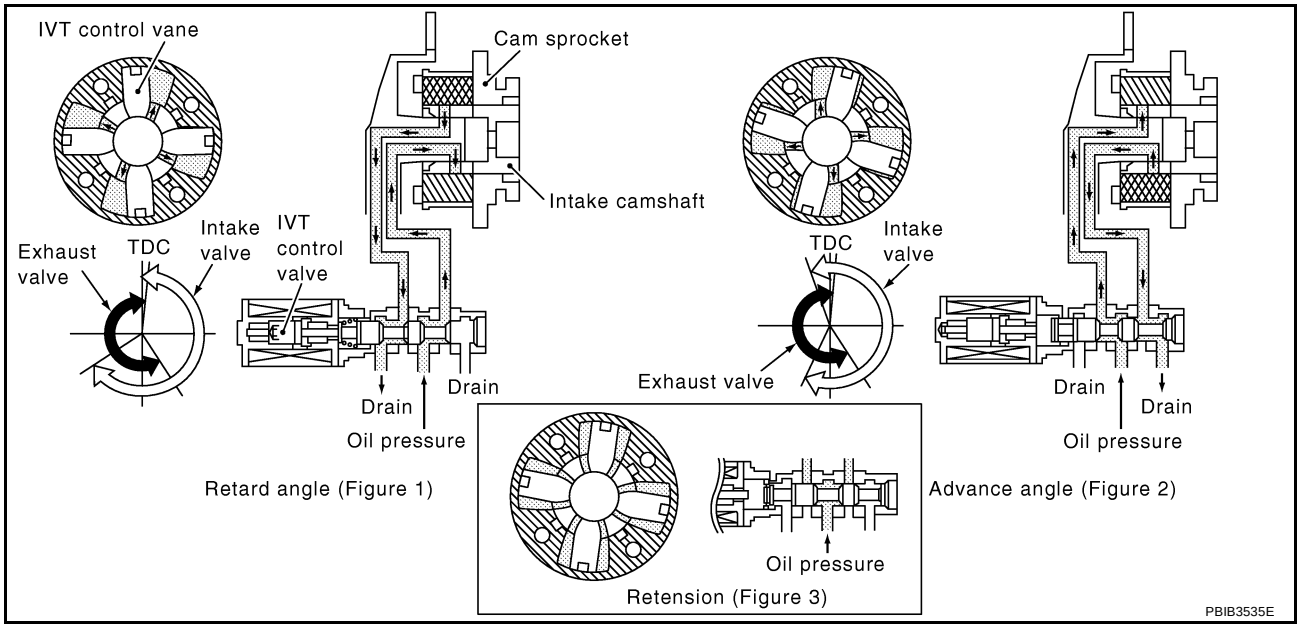
Description

NBS00045

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed and piston position	Intake valve timing control	Intake valve timing control solenoid valve
Camshaft position sensor (PHASE)			
Engine coolant temperature sensor	Engine coolant temperature		
Wheel sensor	Vehicle speed*		

*: This signal is sent to the ECM through CAN Communication line



This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the intake valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the intake valve timing control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the intake valve to increase engine torque in low/mid speed range and output in high-speed range.

CONSULT-III Reference Value in Data Monitor Mode

NBS00046

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V TIM(B1) INT/V TIM(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		2,000 rpm	Approx. 0° - 30°CA
INT/V SOL(B1) INT/V SOL(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		2,000 rpm	Approx. 0% - 50%

On Board Diagnosis Logic

NBS00047

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0011 0011 (Bank 1)	Intake valve timing control performance	There is a gap between angle of target and phase-control angle degree.	● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) ● Intake valve timing control solenoid valve ● Accumulation of debris to the signal pick-up portion of the camshaft ● Timing chain installation ● Foreign matter caught in the oil groove for intake valve timing control
P0021 0021 (Bank 2)			

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Intake valve timing control	The signal is not energized to the solenoid valve and the valve control does not function.

DTC Confirmation Procedure

NBS00048

CAUTION:

Always drive at a safe speed.

NOTE:

- **If DTC P0011 or P0021 is displayed with DTC P0075 or P0081, first perform trouble diagnosis for DTC P0075 or P0081. Refer to EC-183, "DTC P0075, P0081 IVT CONTROL SOLENOID VALVE" .**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10V and 16V at idle.

WITH CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Maintain the following conditions for at least 6 consecutive seconds.
   Hold the accelerator pedal as steady as possible.

ENG SPEED	500 - 2,000 rpm (A constant rotation is maintained.)
COOLANT TEMP/S	More than 60°C (140°F)
B/FUEL SCHDL	More than 3.5 msec
Shift lever	P or N (A/T), neutral (M/T) position

4. Let engine idle for 10 seconds.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-158, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to next step.
7. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,700 - 3,175 rpm (A constant rotation is maintained.)
COOLANT TEMP/S	More than 70°C (158°F)
Shift lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

8. Check 1st trip DTC.
9. If 1st trip DTC is detected, go to EC-158, "Diagnostic Procedure" .

WITH GST

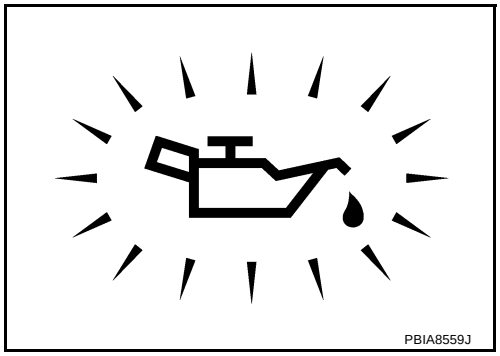
Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS00049

1. CHECK OIL PRESSURE WARNING LAMP

1. Start engine.
2. Check oil pressure warning lamp and confirm it is not illuminated.



OK or NG

OK >> GO TO 2.
NG >> Go to LU-7, "OIL PRESSURE CHECK" .

2. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-159, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace malfunctioning intake valve timing control solenoid valve.

3. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-393, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace crankshaft position sensor (POS).

4. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-405, "Component Inspection" .

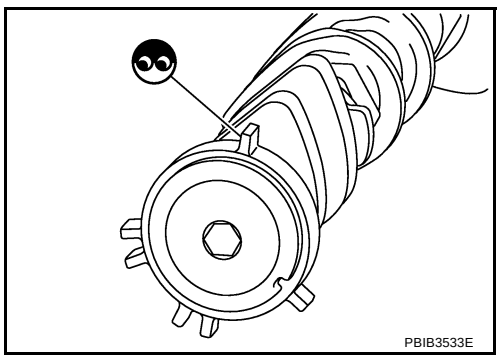
OK or NG

OK >> GO TO 5.
NG >> Replace malfunctioning camshaft position sensor (PHASE).

5. CHECK CAMSHAFT (INT)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end



OK or NG

OK >> GO TO 6.
NG >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.

6. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misaligned.
Are there any service records that may cause timing chain misaligned?

Yes or No

Yes >> Check timing chain installation. Refer to EM-53, "TIMING CHAIN" .
No >> GO TO 7.

7. CHECK LUBRICATION CIRCUIT

Refer to EM-74, "INSPECTION AFTER REMOVAL" .

OK or NG

OK >> GO TO 8.
NG >> Clean lubrication line.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
For Wiring Diagram, refer to EC-388 for crankshaft position sensor (POS) and EC-397 for camshaft position sensor (PHASE).

>> **INSPECTION END**

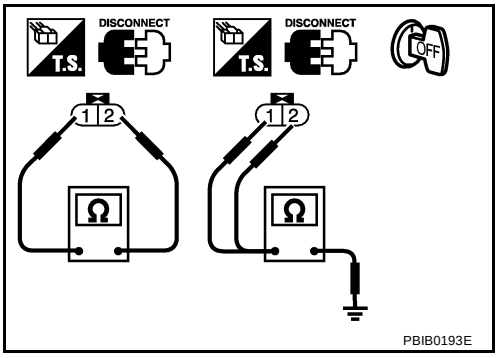
Component Inspection

NBS0004A

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

1. Disconnect intake valve timing control solenoid valve harness connector.
2. Check resistance between intake valve timing control solenoid valve as follows.

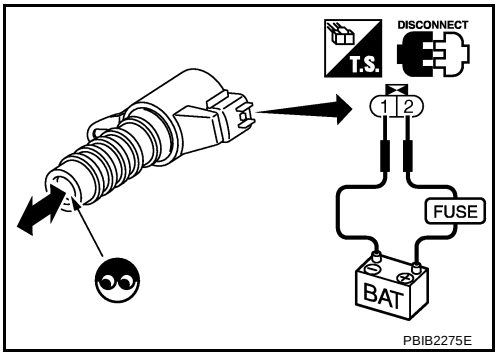
Terminal	Resistance
1 and 2	7.0 - 7.5Ω [at 20°C (68°F)]
1 or 2 and ground	∞ Ω (Continuity should not exist.)



PBIB0193E

If NG, replace intake valve timing control solenoid valve.
If OK, go to next step.

3. Remove intake valve timing control solenoid valve.
4. Provide 12V DC between intake valve timing control solenoid valve terminals and then interrupt it. Make sure that the plunger moves as shown in the figure.



PBIB2275E

CAUTION:
Do not apply 12V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.
If NG, replace intake valve timing control solenoid valve.

NOTE:
Always replace O-ring when intake valve timing control solenoid valve is removed.

Removal and Installation

NBS0004B

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EM-53, "TIMING CHAIN" .

DTC P0014 P0024 EVT CONTROL

PFP:23795

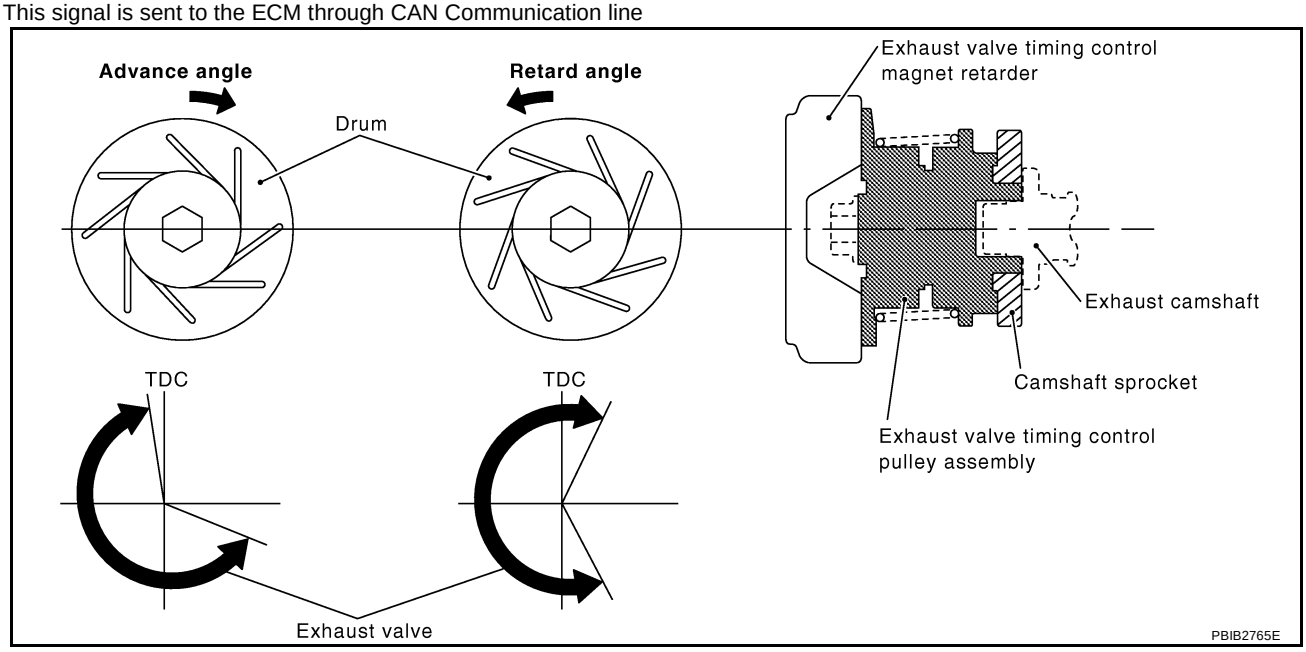
Description

NBS0004C

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed and piston position	Exhaust valve timing control	Exhaust valve timing control magnet retarder
Camshaft position sensor (PHASE)			
Engine coolant temperature sensor	Engine coolant temperature		
Exhaust valve timing control position sensor	Exhaust valve timing signal		
Wheel sensor	Vehicle speed*		

*: This signal is sent to the ECM through CAN Communication line



This mechanism magnetically controls cam phases continuously with the fixed operating angle of the exhaust valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the exhaust valve timing control magnet retarder depending on driving status. This makes it possible to control the shut/open timing of the exhaust valve to increase engine torque and output in a range of high engine speed.

CONSULT-III Reference Value in Data Monitor Mode

NBS0004D

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
EXH/V TIM B1 EXH/V TIM B2	● Engine: After warming up ● Shift lever: Neutral ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°CA
EX VTC DTY B1 EX VTC DTY B2	● Engine: After warming up ● Shift lever: Neutral ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%

On Board Diagnosis Logic

NBS0004E

DTC No.	Trouble diagnosis name	Detecting condition	Possible cause
P0014 0014 (Bank 1)	Exhaust valve timing control performance	There is a gap between angle of target and phase-control angle degree.	● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) ● Exhaust valve timing control position sensor ● Exhaust valve timing control magnet retarder ● Accumulation of debris to the signal pick-up portion of the camshaft ● Timing chain installation ● Exhaust valve timing control pulley assembly
P0024 0024 (Bank 2)			

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Exhaust valve timing control	The signal is not energized to the Exhaust valve timing control magnet retarder and the magnet retarder control does not function.

DTC Confirmation Procedure

NBS0004F

CAUTION:

Always drive at a safe speed.

NOTE:

- **If DTC P0014 or P0024 is displayed with DTC P0078, P0084, P1078 or P1084, first perform trouble diagnosis for DTC P0078, P0084 or P1078, P1084. Refer to EC-190, "DTC P0078 P0084 EVT CONTROL MAGNET RETARDER" or EC-528, "DTC P1078 P1084 EVT CONTROL POSITION SENSOR" .**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10V and 16V at idle.

WITH CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Maintain the following conditions for at least 6 consecutive seconds.
   Hold the accelerator pedal as steady as possible.

ENG SPEED	500 - 2,000 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 60°C (140°F)
B/FUEL SCHDL	More than 3.5 msec
Shift lever	P or N (A/T), neutral (M/T) position

4. Let engine idle for 10 seconds.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-162, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to next step.
7. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,700 - 2,950 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 70°C (158°F)
Shift lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

8. Check 1st trip DTC.
9. If 1st trip DTC is detected, go to EC-162, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS0004G

1. INSPECTION START

Do you have CONSULT-III?

Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. CHECK FUNCTION OF EXHAUST VALVE TIMING CONTROL-I

With CONSULT-III

1. Turn ignition switch ON.
2. Select “EXH V/T ANGLE” in “ACTIVE TEST” mode with CONSULT-III.
3. Start engine and keep the engine speed at 2,500 rpm, then touch “START”.
4. Make sure that the values of “EXH/V TIM B1” and “EXH/V TIM B2” change when touching “UP” or “DOWN”.

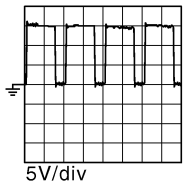
OK or NG

OK >> GO TO 12.
NG >> GO TO 4.

3. CHECK FUNCTION OF EXHAUST VALVE TIMING CONTROL-II

Without CONSULT-III

1. Start engine and keep the engine speed at 2,500 rpm, then touch “START”.
2. Read the voltage signal between ECM terminal 6 (bank 1), 7 (bank 2) and ground with oscilloscope.
3. Verify that the oscilloscope screen shows the signal wave as shown below.



PBIB3542E

OK or NG

OK >> GO TO 12.
NG >> GO TO 4.

4. CHECK EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

Refer to EC-164, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. REPLACE EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Replace exhaust valve timing control magnet retarder.
2. Perform EC-76, "Exhaust Valve Timing Control Learning" .

>> **INSPECTION END**

6. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Refer to EC-539, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace malfunctioning exhaust valve timing control position sensor.

7. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-393, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace crankshaft position sensor (POS).

8. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-405, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace malfunctioning camshaft position sensor (PHASE).

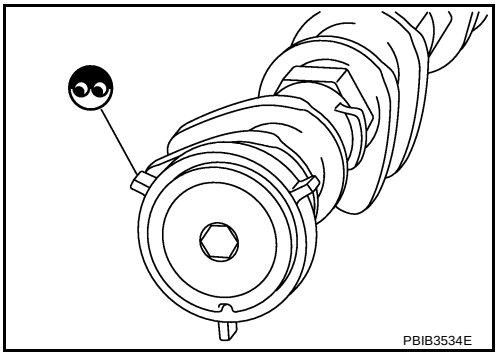
9. CHECK CAMSHAFT (EXH)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 10.
NG >> Remove debris and clean the signal plate of camshaft rear end or malfunctioning replace camshaft.



10. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misaligned.
Are there any service records that may cause timing chain misaligned?

Yes or No

Yes >> Check timing chain installation. Refer to EM-53, "TIMING CHAIN" .
No >> GO TO 11.

11. REPLACE EXHAUST VALVE TIMING CONTROL PULLEY ASSEMBLY

1. Replace exhaust valve timing control pulley assembly and exhaust valve timing control magnet retarder. Refer to EM-72, "CAMSHAFT" and EM-44, "FRONT TIMING CHAIN CASE" .
2. Perform EC-76, "Exhaust Valve Timing Control Learning" .

>> **INSPECTION END**

12. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
For Wiring Diagram, refer to EC-388 for crankshaft position sensor (POS) and EC-397 for camshaft position sensor (PHASE).

>> **INSPECTION END**

Component Inspection

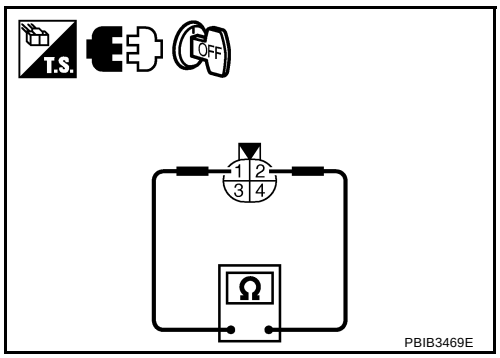
NBS0004H

EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Disconnect exhaust valve timing control magnet retarder harness connector.
2. Check resistance between exhaust valve timing control magnet retarder terminals 1 and 2.

   Resistance: 9.0 - 11.0Ω [at 20°C (68°F)]

3. If NG, replace exhaust valve timing control magnet retarder and go to the next step.
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .



Removal and Installation

NBS0004I

EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

Refer to EM-44, "FRONT TIMING CHAIN CASE" .

DTC P0031, P0032, P0051, P0052 A/F SENSOR 1 HEATER

PFP:22693

Description

NBS000B6

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE) Crankshaft position sensor (POS)	Engine speed	Air fuel ratio (A/F) sensor 1 heater control	Air fuel ratio (A/F) sensor 1 heater
Mass air flow sensor	Amount of intake air		

The ECM performs ON/OFF duty control of the A/F sensor 1 heater corresponding to the engine operating condition to keep the temperature of A/F sensor 1 element at the specified range.

CONSULT-III Reference Value in Data Monitor Mode

NBS000B7

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
A/F S1 HTR(B1) A/F S1 HTR(B2)	● Engine: After warming up, idle the engine (More than 140 seconds after starting engine)	4 - 100%

On Board Diagnosis Logic

NBS000B8

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0031 0031 (Bank 1) P0051 0051 (Bank 2)	Air fuel ratio (A/F) sensor 1 heater control circuit low input	The current amperage in the air fuel ratio (A/F) sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)	● Harness or connectors (The A/F sensor 1 heater circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1 heater
P0032 0032 (Bank 1) P0052 0052 (Bank 2)	Air fuel ratio (A/F) sensor 1 heater control circuit high input	The current amperage in the air fuel ratio (A/F) sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)	● Harness or connectors (The A/F sensor 1 heater circuit is shorted.) ● Air fuel ratio (A/F) sensor 1 heater

DTC Confirmation Procedure

NBS000B9

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is between 10.5V and 16V at idle.

WITH CONSULT-III

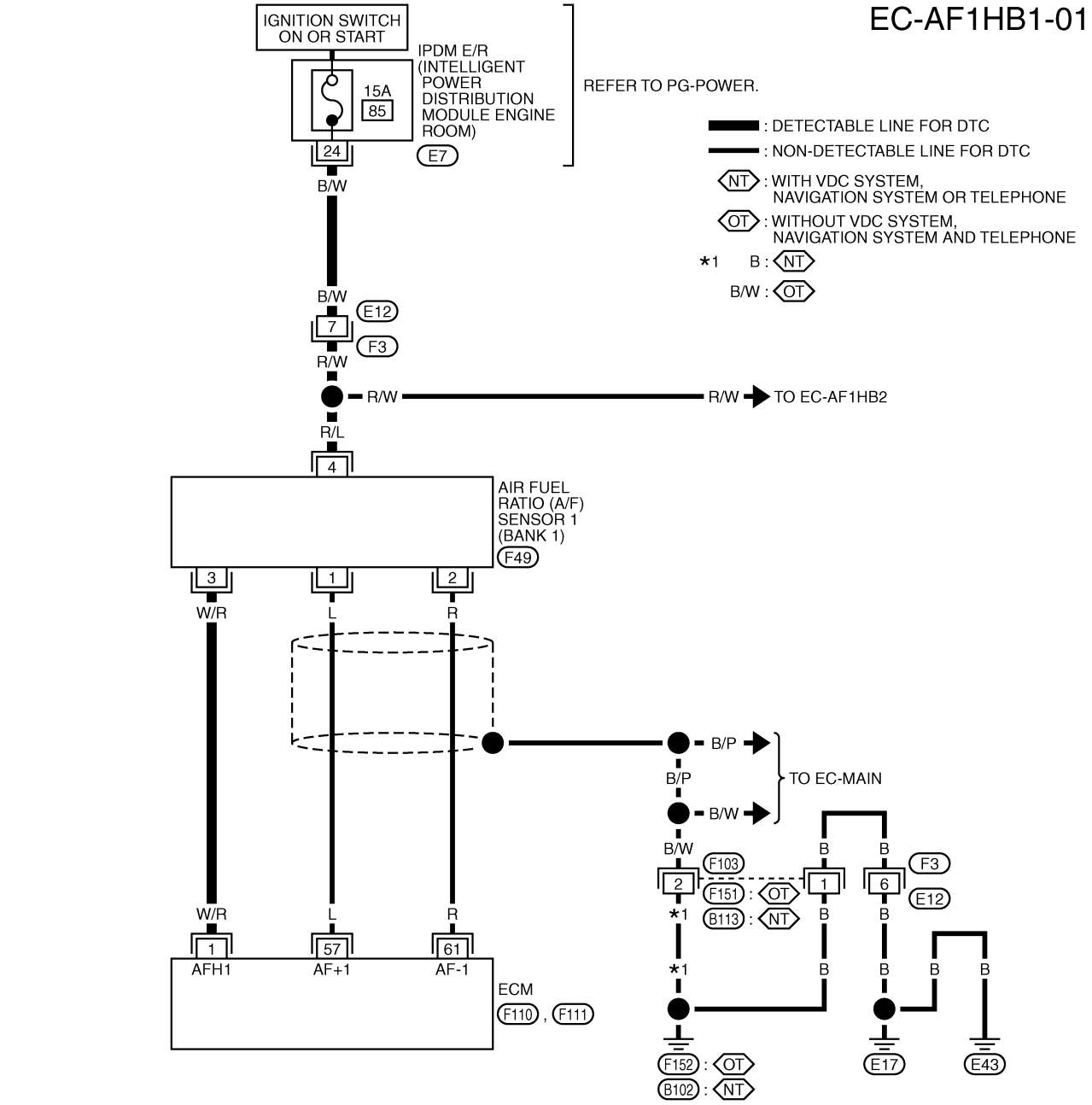
1. Start engine and let it idle for at least 10 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-170, "Diagnostic Procedure" .

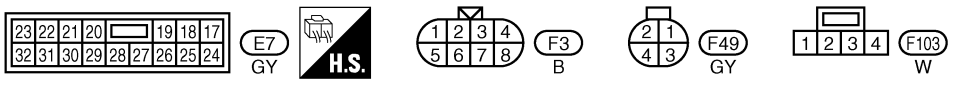
WITH GST

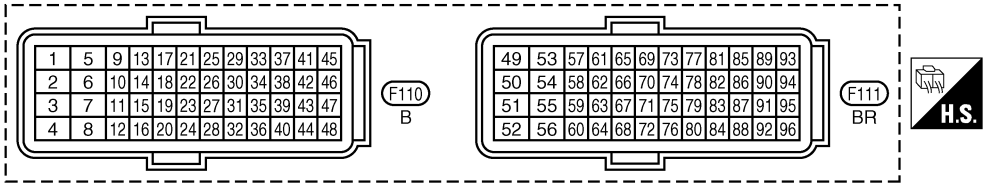
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS000BA





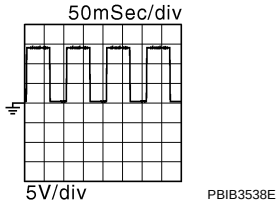


TBWT1617E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

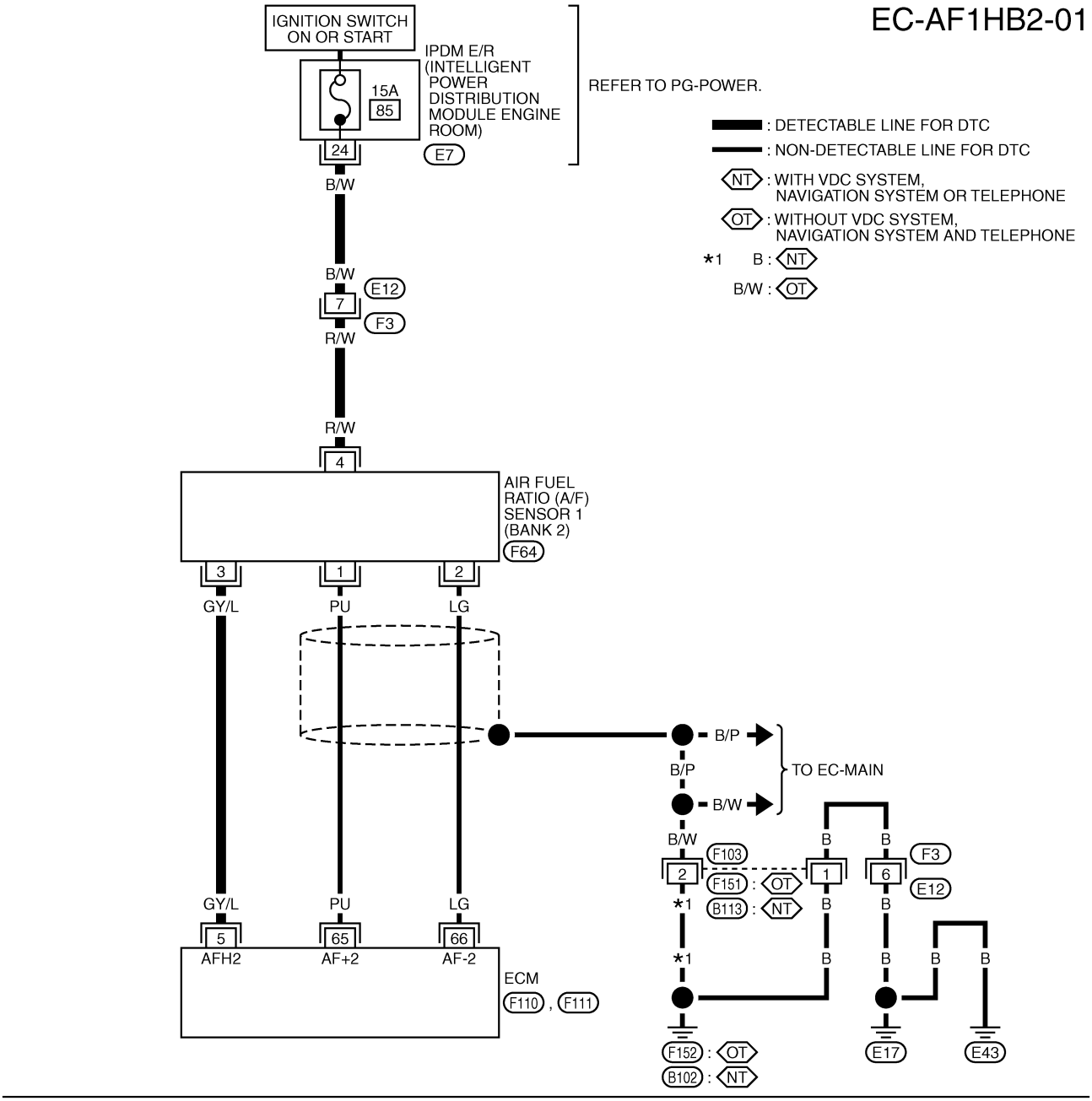
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★ 
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

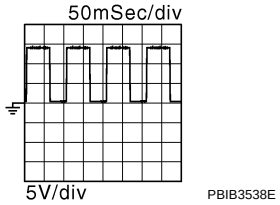


TBWT1618E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

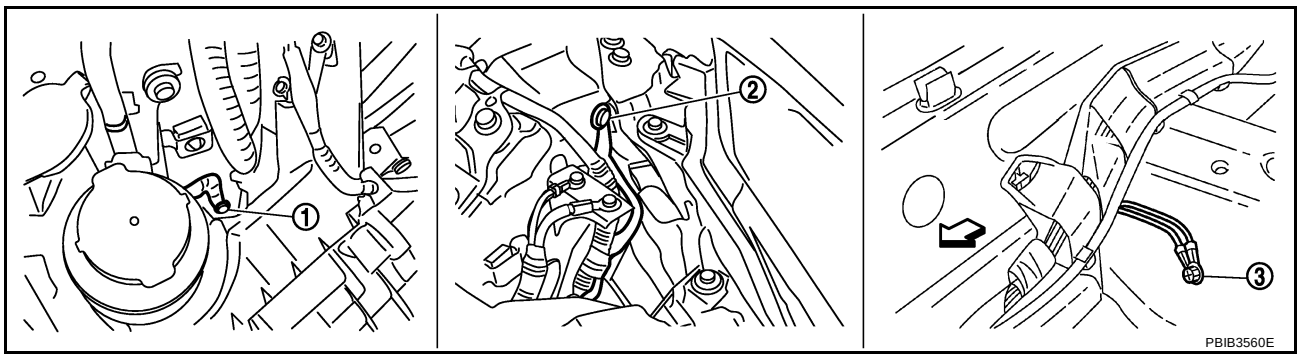
Diagnostic Procedure

NBS000BB

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

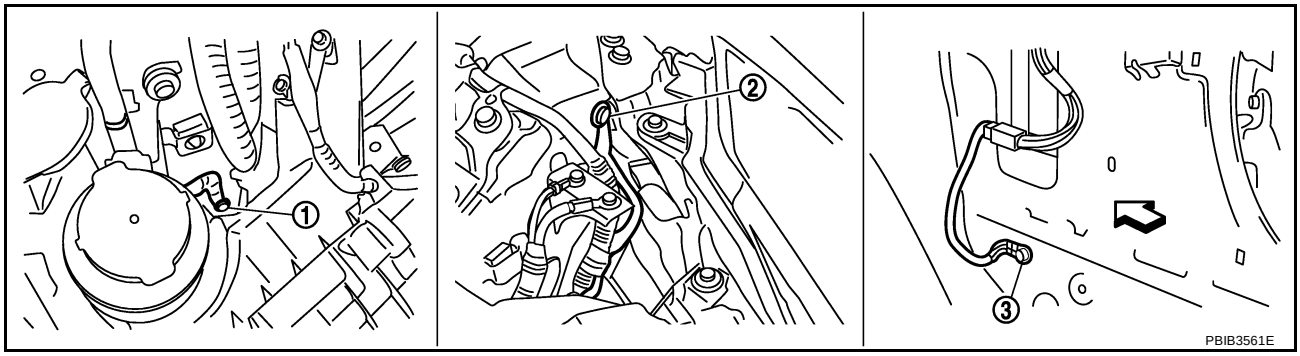


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

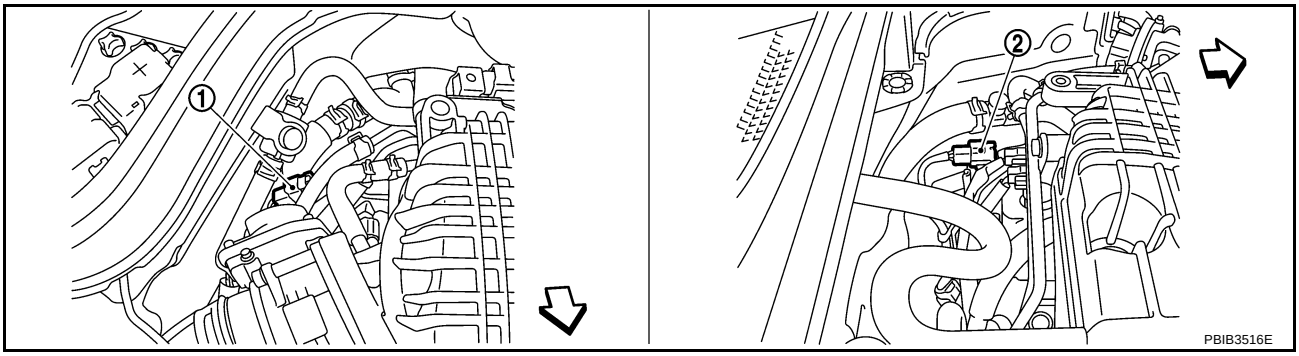
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

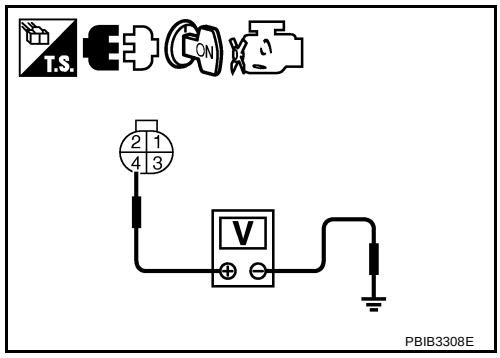


1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle fornt

2. Turn ignition switch ON.
3. Check voltage between air fuel ratio sensor (A/F) sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between air fuel ratio (A/F) sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 1 (bank 1) or 5 (bank 2) and air fuel ratio (A/F) sensor 1 terminal 3.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground or short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to EC-172, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning air fuel ratio (A/F) sensor 1.

6. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

NBS000BC

AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Check resistance between terminals 3 and 4.

Resistance: 1.8 - 2.44Ω [at 25°C (77°F)]

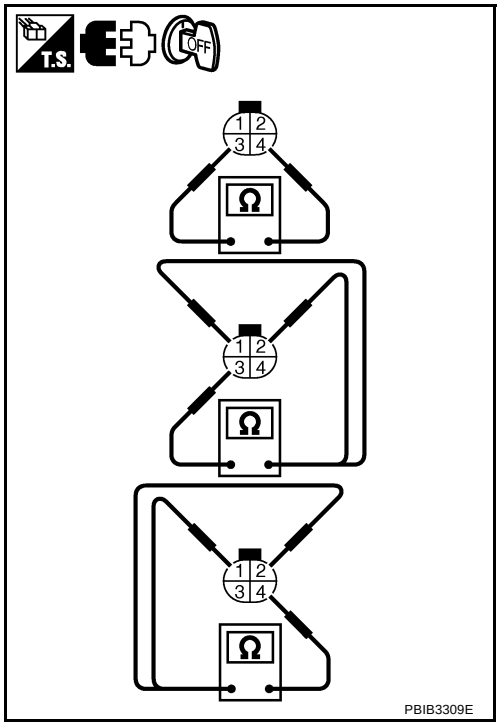
Check continuity between terminals 3 and 1, 2, terminals 4 and 1, 2.

Continuity should not exist.

If NG, replace the air fuel ratio (A/F) sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**



Removal and Installation

NBS000BD

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0037, P0038, P0057, P0058 HO2S2 HEATER

PFP:226A0

Description

NBS0004J

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Camshaft position sensor (PHASE)	Engine speed	Heated oxygen sensor 2 (HO2S2) heater control	Heated oxygen sensor 2 (HO2S2) heater
Crankshaft position sensor (POS)			
Engine coolant temperature sensor	Engine coolant temperature		
Mass air flow sensor	Amount of intake air		

The ECM performs ON/OFF control of the heated oxygen sensor 2 (HO2S2) heater corresponding to the engine speed, amount of intake air and engine coolant temperature.

OPERATION

Engine speed rpm	Heated oxygen sensor 2 heater
Above 3,600	OFF
Below 3,600 rpm after the following conditions are met. ● Engine: After warming up ● Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON

CONSULT-III Reference Value in Data Monitor Mode

NBS0004K

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 HTR (B1) HO2S2 HTR (B2)	● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON
	● Engine speed: Above 3,600 rpm	OFF

On Board Diagnosis Logic

NBS0004L

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0037 0037 (Bank 1) P0057 0057 (Bank 2)	HO2S2 heater control circuit low	The current amperage in the HO2S2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the HO2S2 heater.)	● Harness or connectors (The HO2S2 heater circuit is open or shorted.) ● HO2S2 heater
P0038 0038 (Bank 1) P0058 0058 (Bank 2)	HO2S2 heater control circuit high	The current amperage in the HO2S2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the HO2S2 heater.)	● Harness or connectors (The HO2S2 heater circuit is shorted.) ● HO2S2 heater

DTC Confirmation Procedure

NBS0004M

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is between 11V and 16V at idle.

WITH CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start the engine and keep the engine speed between 3,500 rpm and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-179, "Diagnostic Procedure" .

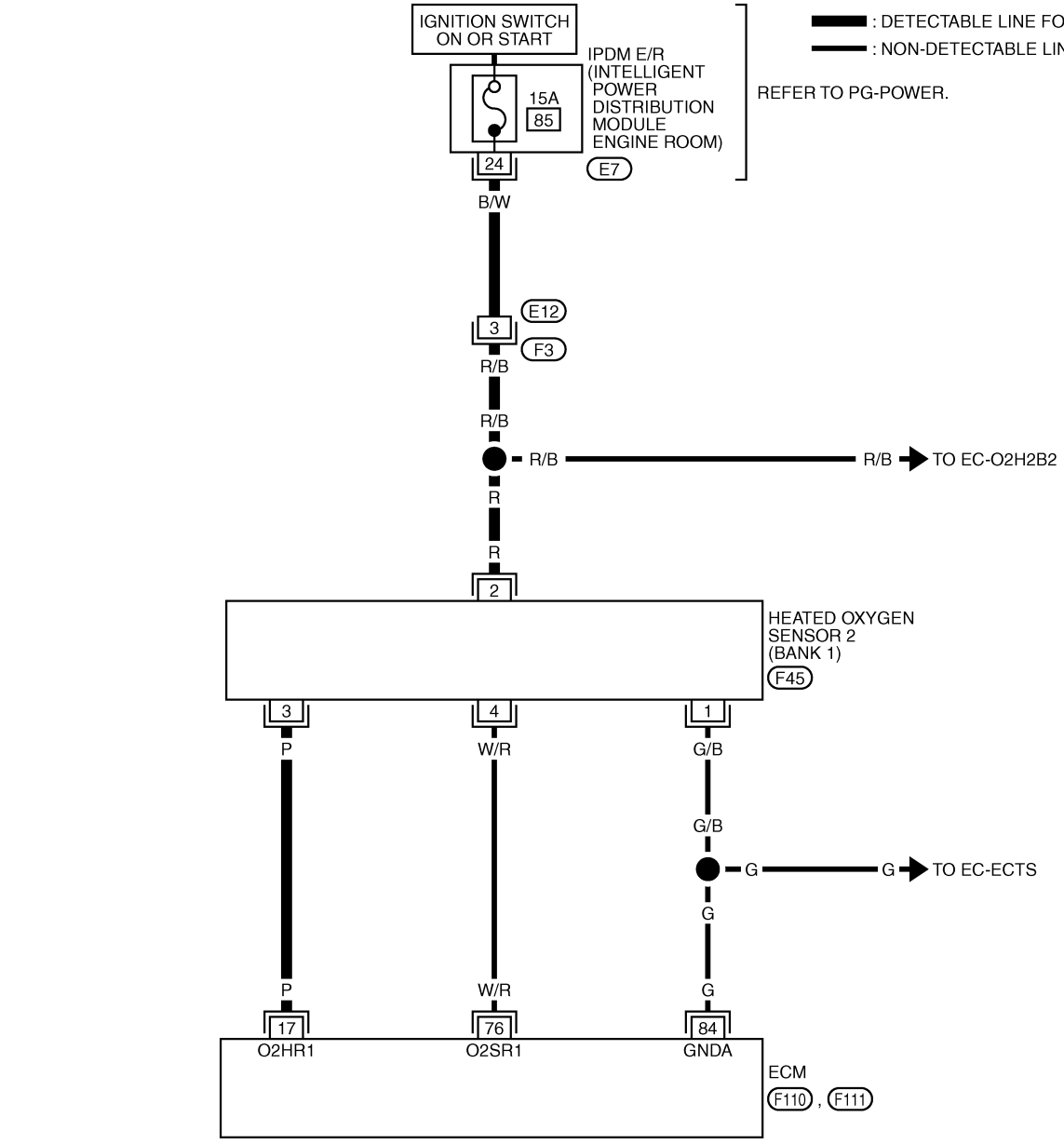
WITH GST

Follow the procedure “WITH CONSUT-III” above.

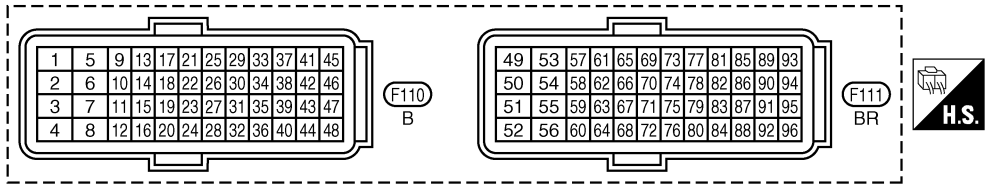
Wiring Diagram
BANK 1

NBS0004N

EC-O2H2B1-01





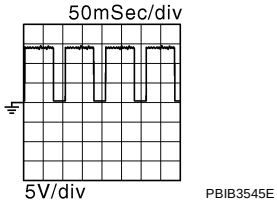


TBWT1619E

Specification data are reference values and are measured between each terminal and ground.

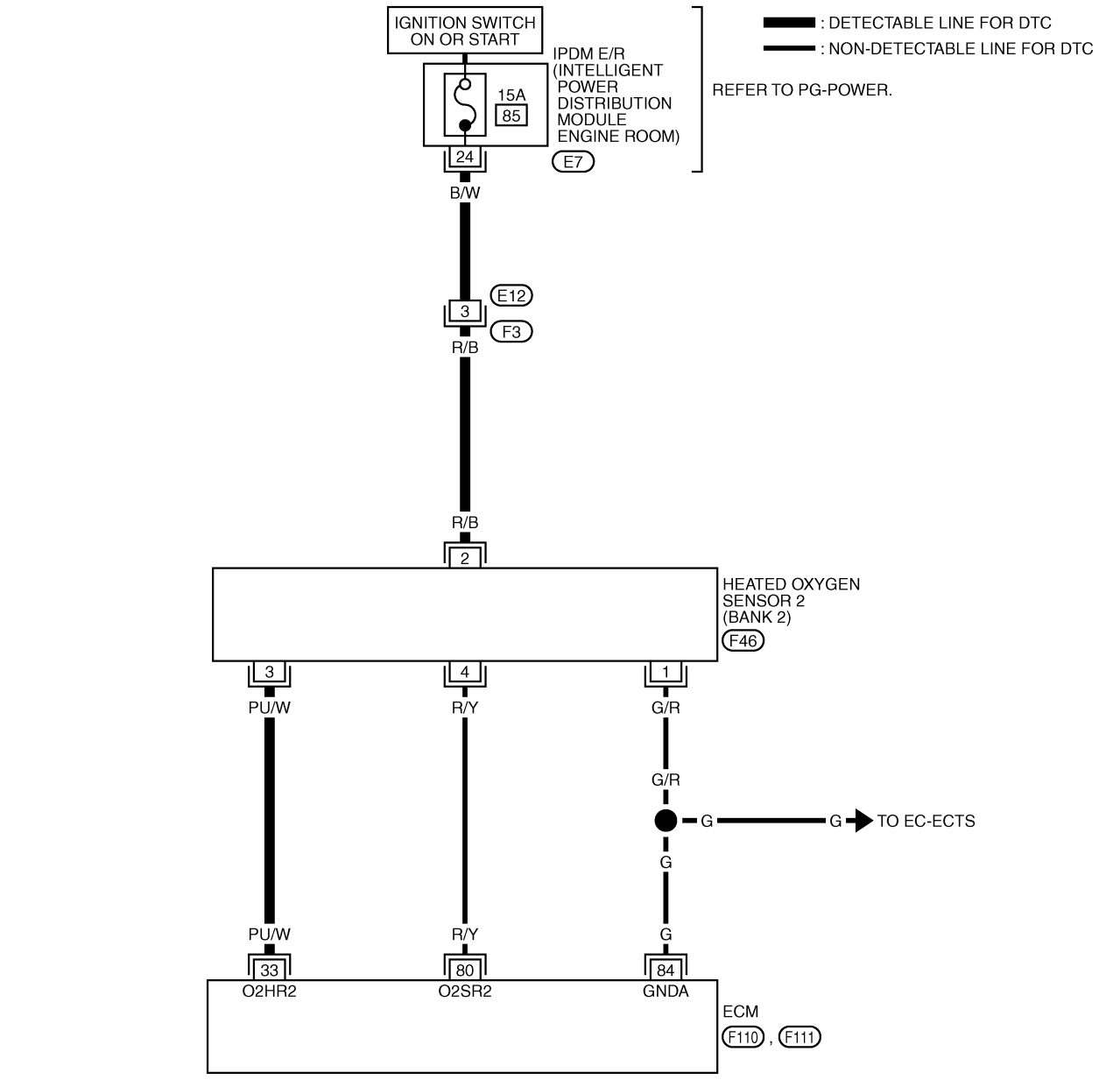
CAUTION:

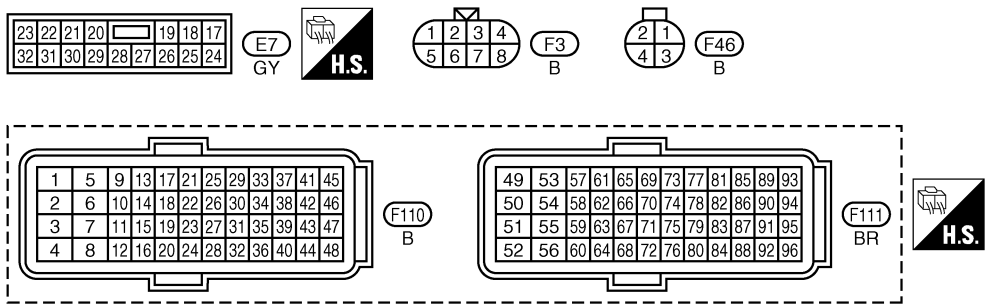
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★ 
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

BANK 2

EC-O2H2B2-01



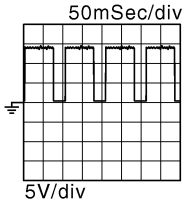


TBWT1620E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

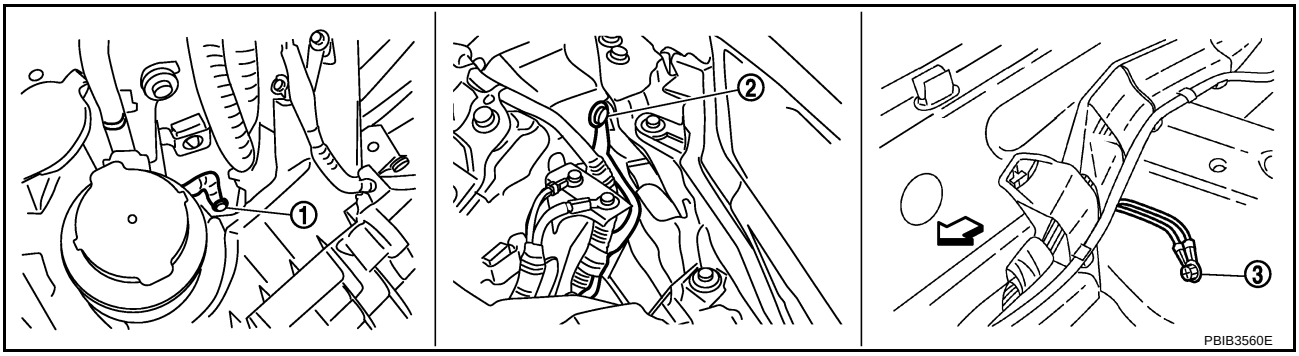
Diagnostic Procedure

NBS0004O

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

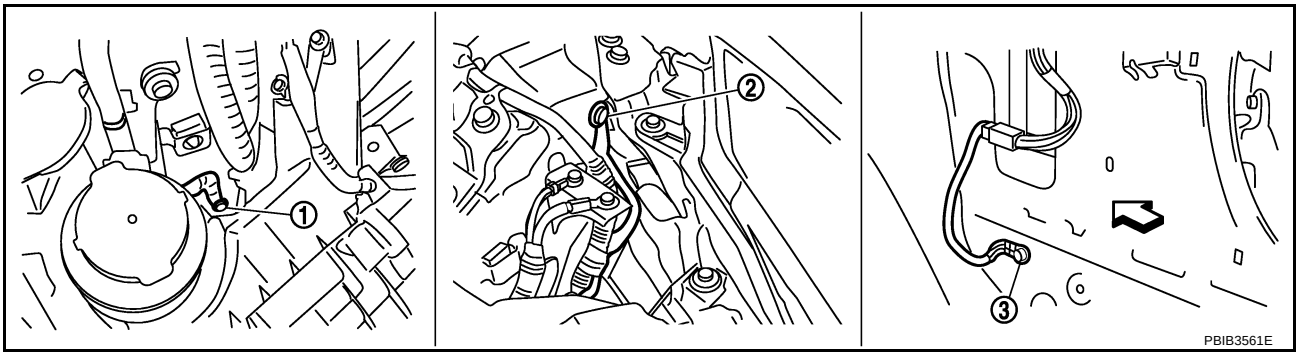


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

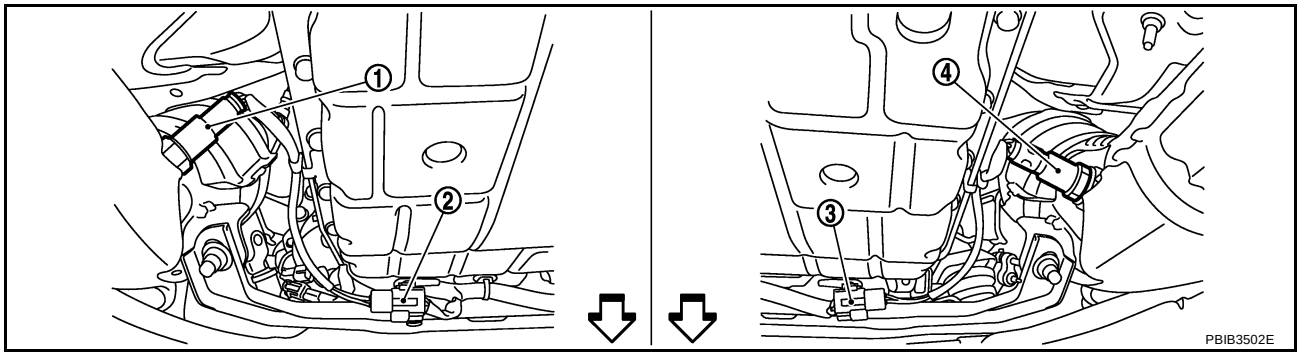
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK HO2S2 POWER SUPPLY CIRCUIT

1. Disconnect heated oxygen sensor 2 harness connector.

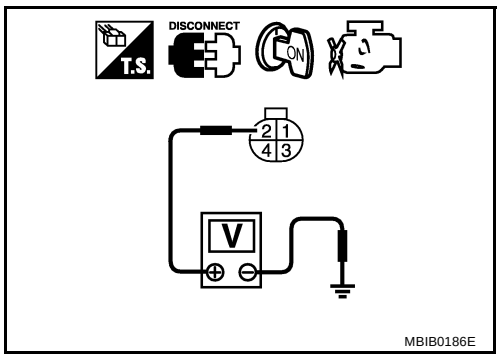


1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

2. Turn ignition switch ON.
3. Check voltage between HO2S2 terminal 2 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between heated oxygen sensor 2 and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 HEATER OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0037, P0038	17	3	1
P0057, P0058	33	3	2

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2 HEATER

Refer to EC-181, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

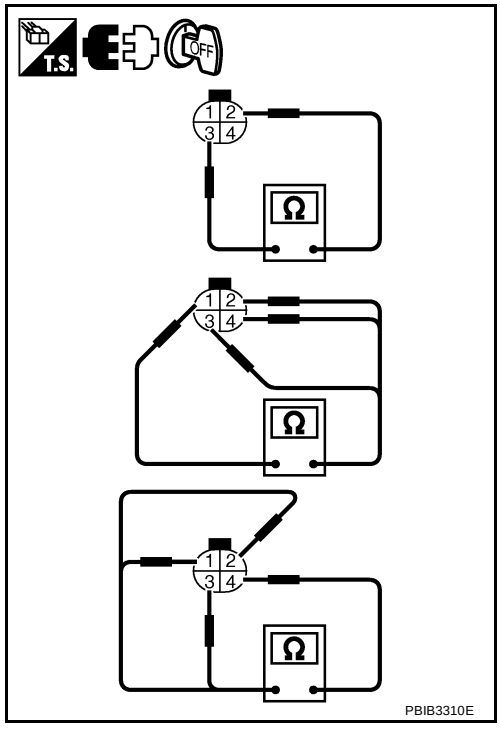
Component Inspection

NBS0004P

HEATED OXYGEN SENSOR 2 HEATER

1. Check resistance between HO2S2 terminals as follows.

Terminal No.	Resistance
2 and 3	3.4 - 4.4 Ω [at 25°C (77°F)]
1 and 2, 3, 4	∞ Ω (Continuity should not exist)
4 and 1, 2, 3	



2. If NG, replace heated oxygen sensor 2.

CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

NBS0004Q

HEATED OXYGEN SENSOR 2

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

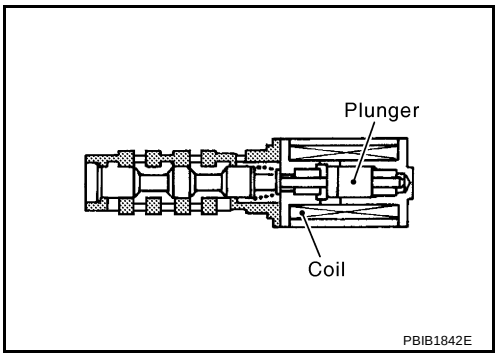
DTC P0075, P0081 IVT CONTROL SOLENOID VALVE

PFP:23796

Component Description

NBS000BR

Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.
The intake valve timing control solenoid valve changes the oil amount and direction of flow through intake valve timing control unit or stops oil flow.
The longer pulse width advances valve angle.
The shorter pulse width retards valve angle.
When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the intake valve angle at the control position.



CONSULT-III Reference Value in Data Monitor Mode

NBS000BS

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V SOL(B1) INT/V SOL(B2)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		2,000 rpm	Approx. 0% - 50%

On Board Diagnosis Logic

NBS000BT

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0075 0075 (Bank 1)	Intake valve timing control solenoid valve circuit	An improper voltage is sent to the ECM through intake valve timing control solenoid valve.	● Harness or connectors (The intake valve timing control solenoid valve circuit is open or shorted.) ● Intake valve timing control solenoid valve
P0081 0081 (Bank 2)			

DTC Confirmation Procedure

NBS000BU

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-188, "Diagnostic Procedure" .

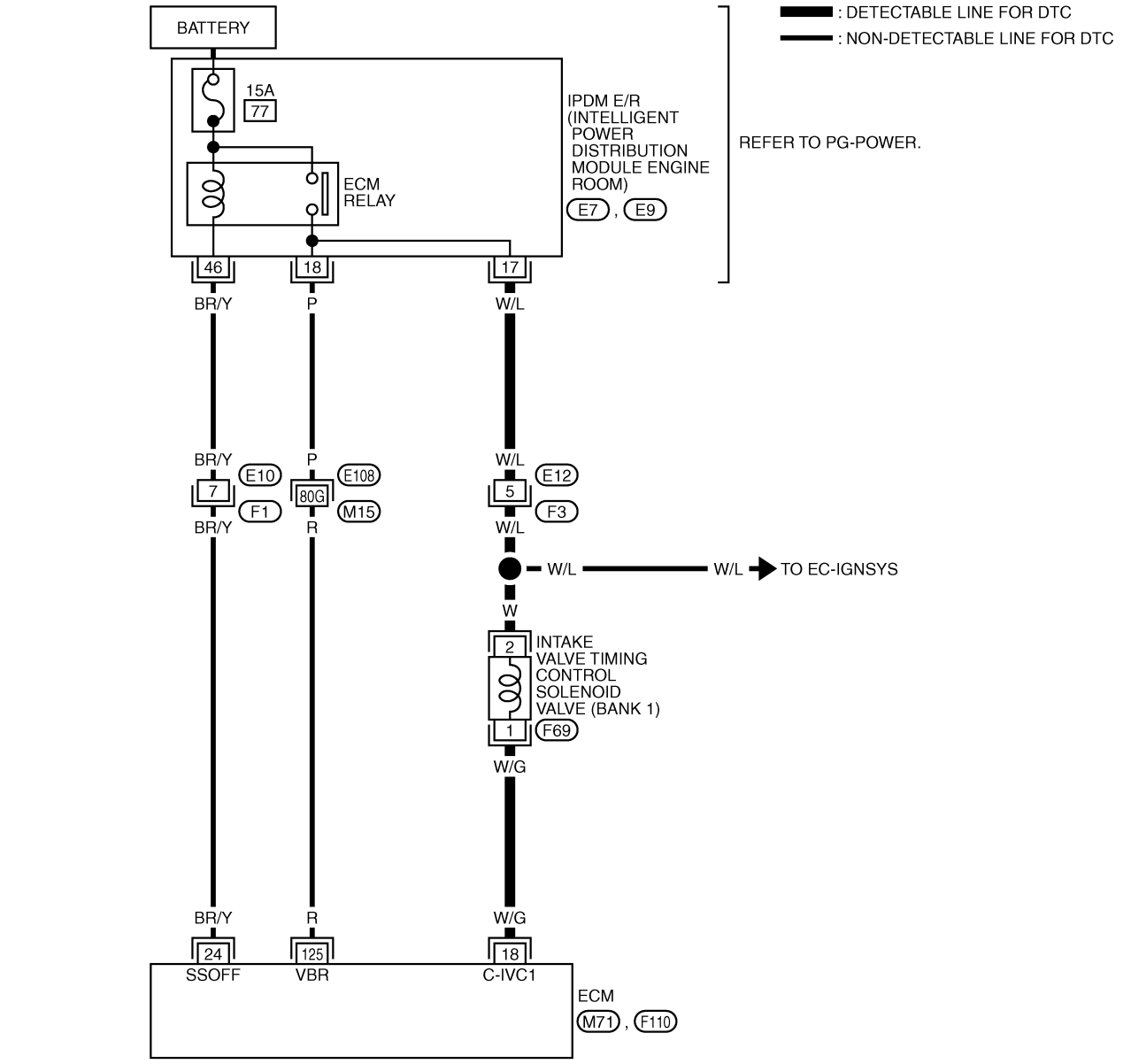
WITH GST

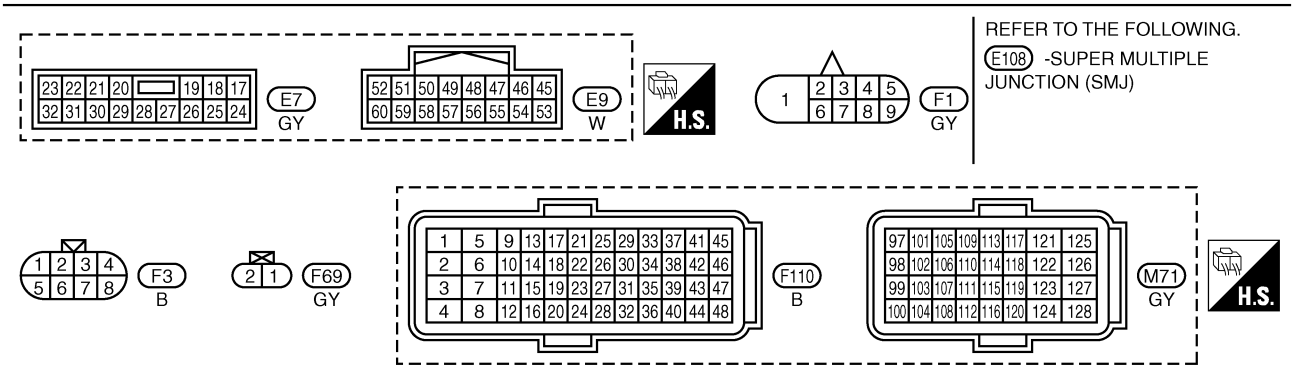
Following the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS000BV

EC-IVCB1-01

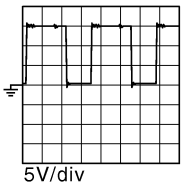




TBWT1621E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

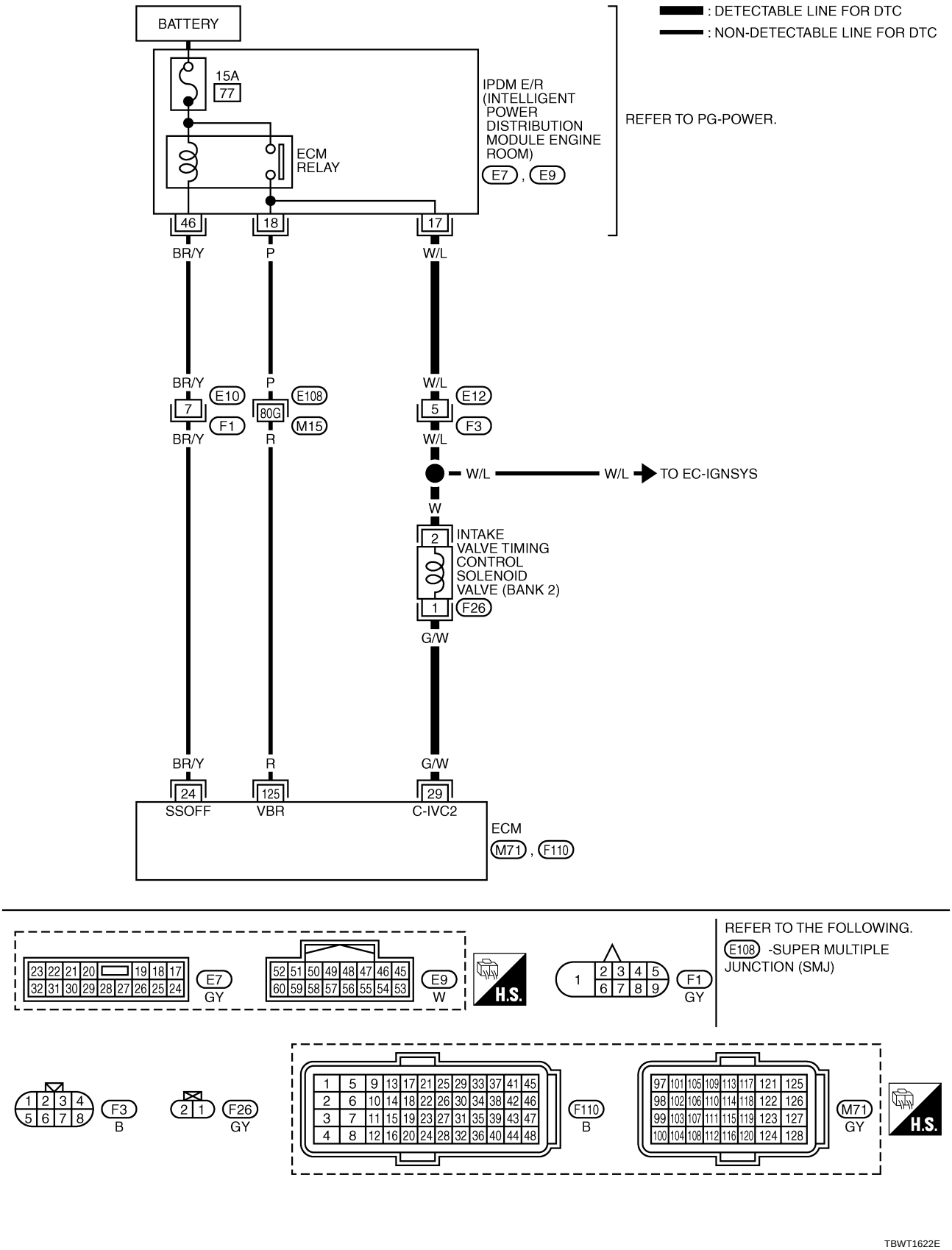
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
18	W/G	Intake valve timing control solenoid valve (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	7 - 12V★  PBIB3546E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

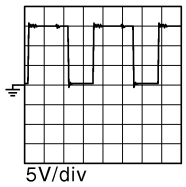
EC-IVCB2-01



TBWT1622E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
29	G/W	Intake valve timing control solenoid valve (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	7 - 12V★  5V/div PBIB3546E
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

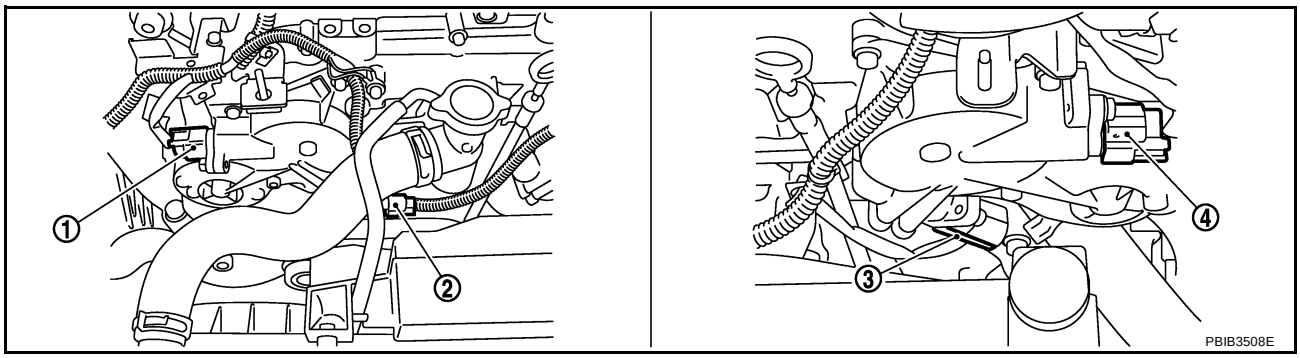
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS000BW

1. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

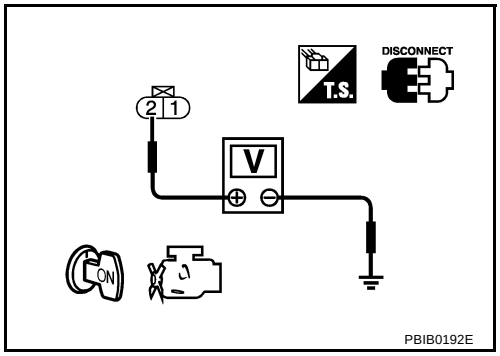
1. Turn ignition switch OFF.
2. Disconnect intake valve timing control solenoid valve harness connector.



1. Exhaust valve timing control magnet retarder (bank 1) harness connector
2. Intake valve timing control solenoid valve (bank 1) harness connector
3. Intake valve timing control solenoid valve (bank 2) harness connector
4. Exhaust valve timing control magnet retarder (bank 2) harness connector

3. Turn ignition switch ON.
4. Check voltage between intake valve timing control solenoid valve terminal 2 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between intake valve timing control solenoid valve and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 18 (bank 1) or 29 (bank 2) and intake valve timing control solenoid valve terminal 1. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EC-189, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace malfunctioning intake valve timing control solenoid valve.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

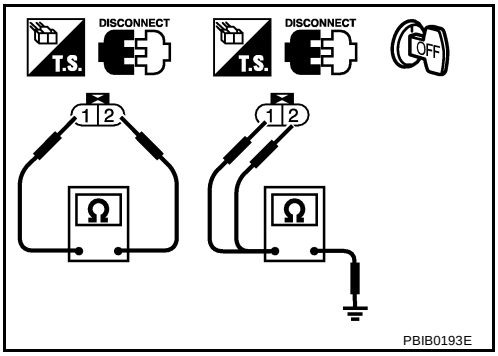
NBS000BX

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

1. Disconnect intake valve timing control solenoid valve harness connector.
2. Check resistance between intake valve timing control solenoid valve as follows.

Terminal	Resistance
1 and 2	7.0 - 7.5Ω [at 20°C (68°F)]
1 or 2 and ground	∞ Ω (Continuity should not exist.)

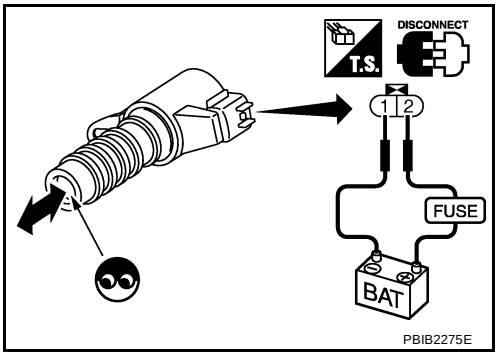
If NG, replace intake valve timing control solenoid valve.
If OK, go to next step.



3. Remove intake valve timing control solenoid valve.
4. Provide 12V DC between intake valve timing control solenoid valve terminals and then interrupt it. Make sure that the plunger moves as shown in the figure.

CAUTION:
Do not apply 12V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.
If NG, replace intake valve timing control solenoid valve.

NOTE:
Always replace O-ring when intake valve timing control solenoid valve is removed.



Removal and Installation

NBS000BY

INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Refer to EM-53, "TIMING CHAIN" .

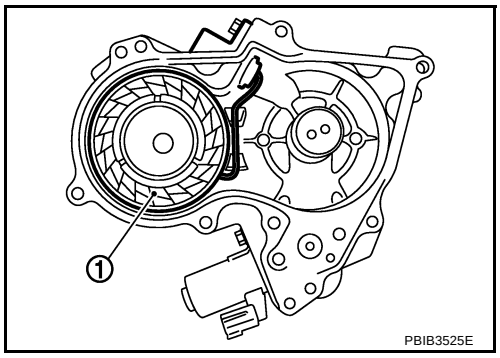
DTC P0078 P0084 EVT CONTROL MAGNET RETARDER

PFP:23795

Component Description

NBS0004R

Exhaust valve timing control magnet retarder (1) controls the shut/open timing of the exhaust valve by ON/OFF pulse duty signals sent from the ECM.
The longer pulse width retards valve angle.
The shorter pulse width advances valve angle.



CONSULT-III Reference Value in Data Monitor Mode

NBS0004S

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
EX VTC DTY B1 EX VTC DTY B2	● Engine: After warming up ● Shift lever: Neutral ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%

On Board Diagnosis Logic

NBS0004T

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0078 0078 (Bank 1)	Exhaust valve timing control magnet retarder circuit	An improper voltage is sent to the ECM through exhaust valve timing control magnet retarder.	● Harness or connectors (Exhaust valve timing control magnet retarder circuit is open or shorted.) ● Exhaust valve timing control magnet retarder
P0084 0084 (Bank 2)			

DTC Confirmation Procedure

NBS0004U

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-195, "Diagnostic Procedure" .

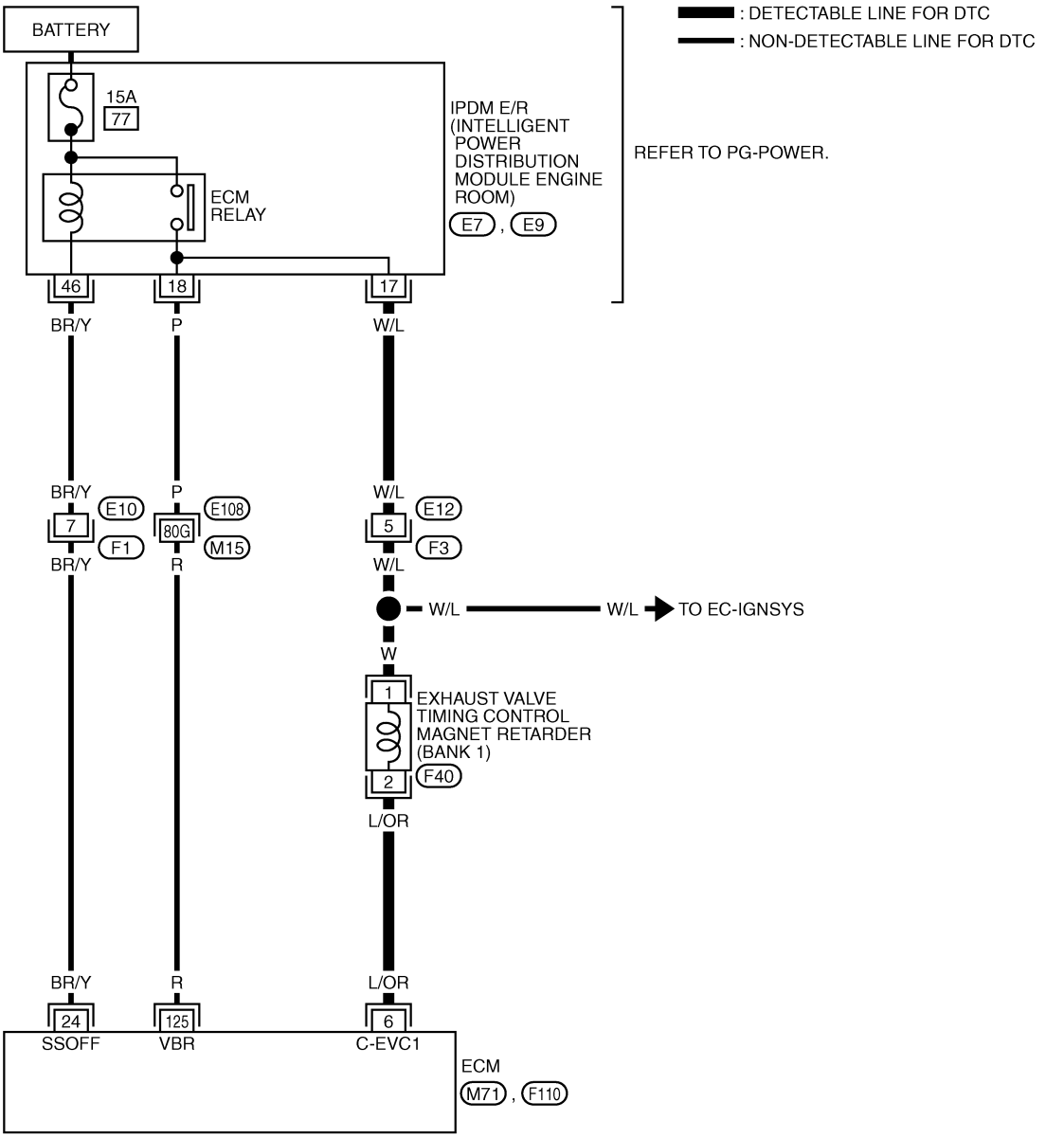
WITH GST

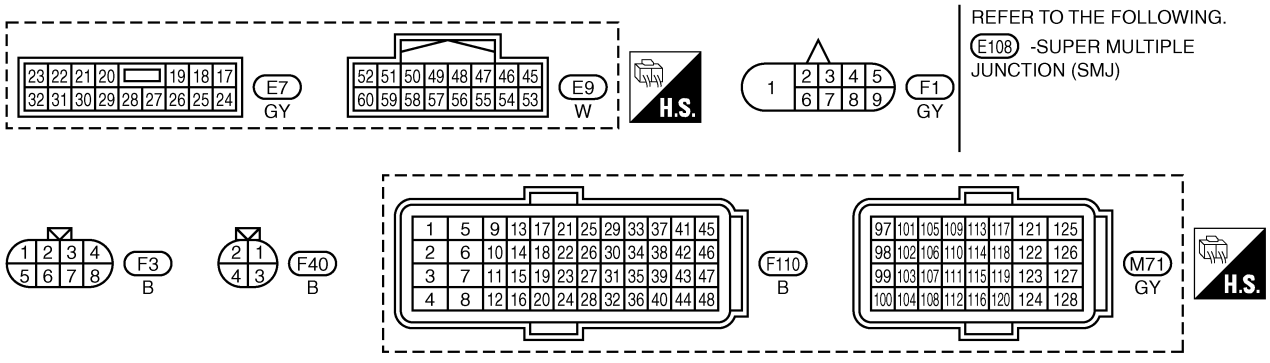
Following the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS0004V

EC-EVCB1-01



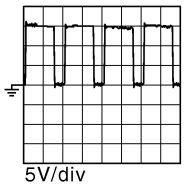


TBWT1623E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

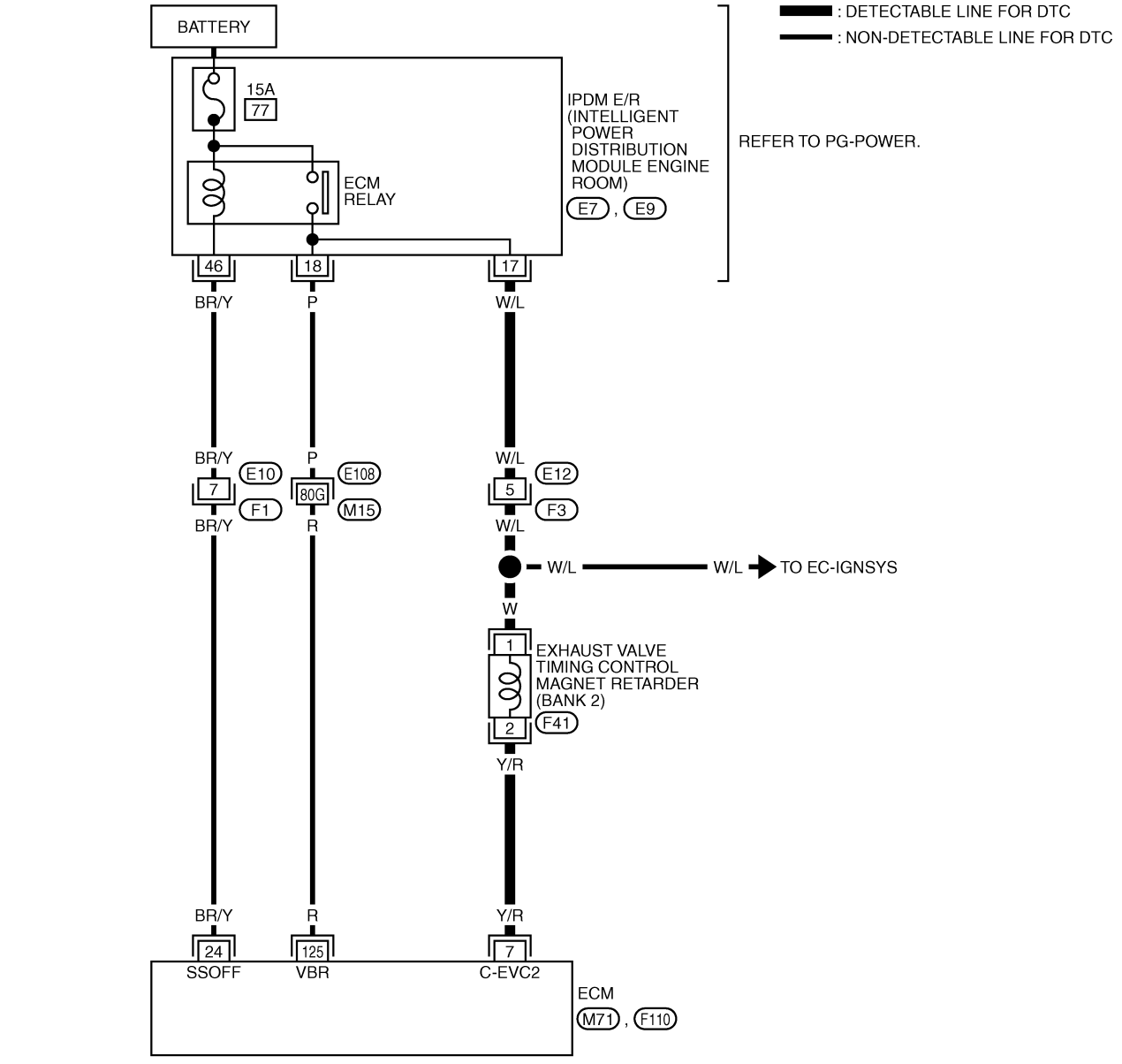
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

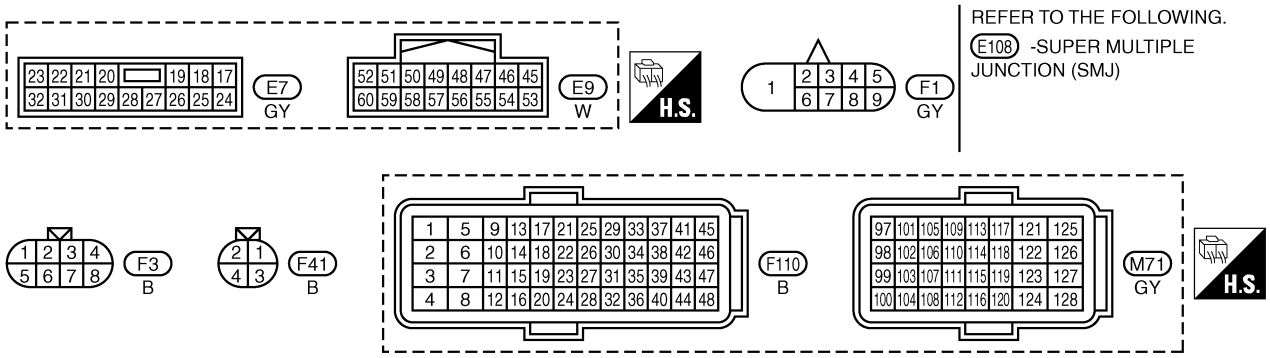
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
6	L/OR	Exhaust valve timing control magnet retarder (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Around 2,500 rpm while the engine speed is rising	7 - 12V★  PBIB3542E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

EC-EVCB2-01



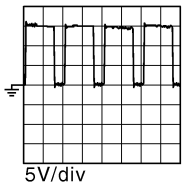


TBWT1624E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
7	Y/R	Exhaust valve timing control magnet retarder (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	BATTERY VOLTAGE (11 - 14V)
			[Engine is running] ● **Warm-up condition** ● Around 2,500 rpm while the engine speed is rising	7 - 12V★  PBIB3542E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

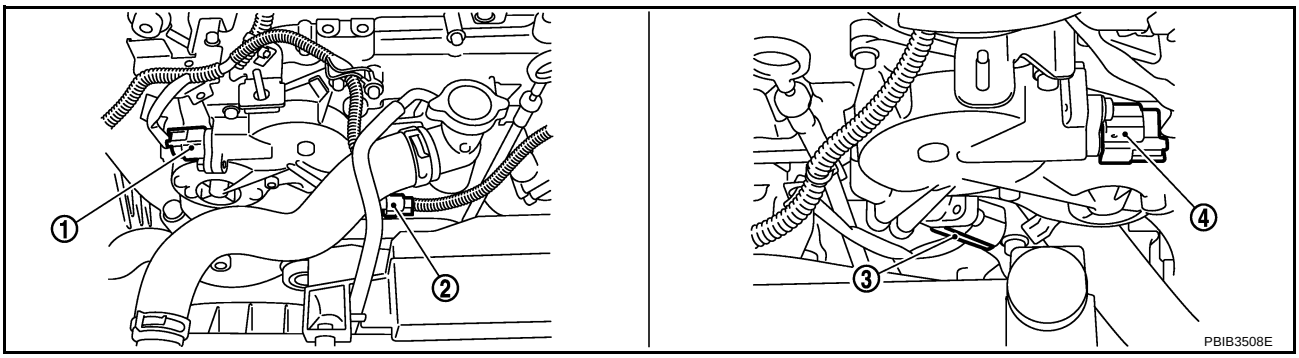
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS0004W

1. CHECK EXHAUST VALVE TIMING CONTROL MAGNET RETARDER POWER SUPPLY CIRCUIT

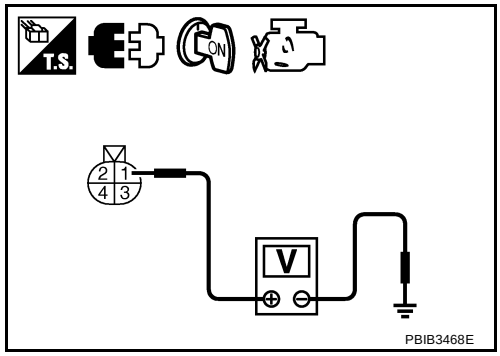
1. Turn ignition switch OFF.
2. Disconnect exhaust valve timing control magnet retarder harness connector.



1. Exhaust valve timing control magnet retarder (bank 1) harness connector
2. Intake valve timing control solenoid valve (bank 1) harness connector
3. Intake valve timing control solenoid valve (bank 2) harness connector
4. Exhaust valve timing control magnet retarder (bank 2) harness connector

3. Turn ignition switch ON.
4. Check voltage between exhaust valve timing control magnet retarder terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between exhaust valve timing control magnet retarder and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EXHAUST VALVE TIMING CONTROLMAGNET RETARDER OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Checking harness continuity between exhaust valve timing control magnet retarder terminal 2 and ECM terminal 6 (bank 1), 7 (bank 2).
   Refer to Wiring Diagram

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

Refer to EC-196, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. REPLACE EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Replace malfunctioning exhaust valve timing control magnet retarder.
2. Perform EC-76, "Exhaust Valve Timing Control Learning" .

>> **INSPECTION END**

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

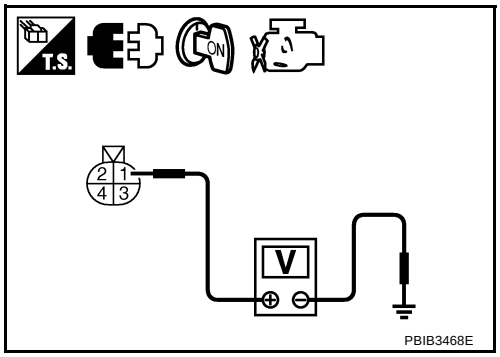
NBS0004X

EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

1. Disconnect exhaust valve timing control magnet retarder harness connector.
2. Check resistance between exhaust valve timing control magnet retarder terminals 1and 2.

Resistance: 9.0 - 11.0Ω [at 20°C (68°F)]

3. If NG, replace exhaust valve timing control magnet retarder and go to the next step.
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .



Removal and Installation

NBS0004Y

EXHAUST VALVE TIMING CONTROL MAGNET RETARDER

Refer to EM-44, "FRONT TIMING CHAIN CASE" .

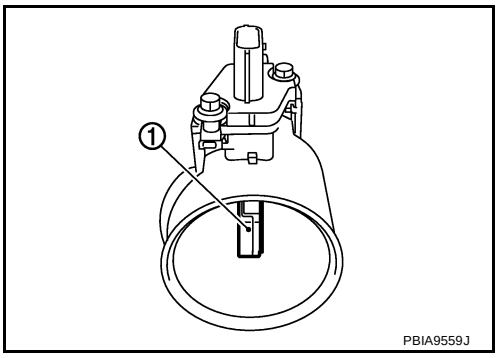
DTC P0101, P010B MAF SENSOR

PFP:22680

Component Description

NBS0004Z

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire is to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The more air, the greater the heat loss.
Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-III Reference Value in Data Monitor Mode

NBS00050

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAS A/F SE-B1	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
MAS A/F SE-B2			
CAL/LD VALUE	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s

On Board Diagnosis Logic

NBS00051

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0101 0101 (Bank 1)	Mass air flow sensor circuit range/performance problem	A)	A high voltage from the sensor is sent to ECM under light load driving condition.	● Harness or connectors (The sensor circuit is open or shorted.) ● Mass air flow sensor ● EVAP control system pressure sensor ● Intake air temperature sensor
P010B 010B (Bank 2)		B)	A low voltage from the sensor is sent to ECM under heavy load driving condition.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air leaks ● Mass air flow sensor ● EVAP control system pressure sensor ● Intake air temperature sensor

DTC Confirmation Procedure

NBS00052

Perform PROCEDURE FOR MALFUNCTION A first.
If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

NOTE:
If engine will not start or stops soon, wait at least 10 seconds with engine stopped (Ignition switch ON) instead of running engine at idle speed.

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Run engine for at least 10 seconds at idle speed.
3. Check 1st trip DTC.
4. If 1st trip DTC is detected, go to EC-203, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION B

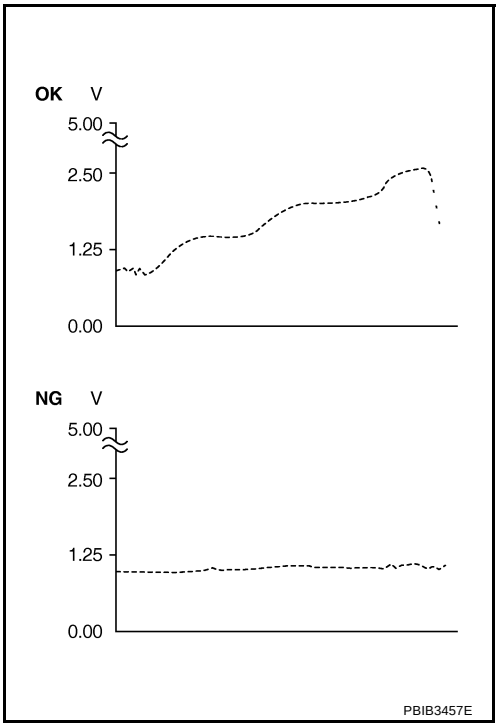
CAUTION:
Always drive vehicle at a safe speed.

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
   If engine cannot be started, go to EC-203, "Diagnostic Procedure" .
2. Select “DATA MONITOR” mode with CONSULT-III.
3. Check the voltage of “MAS A/F SE-B1” and “MAS A/F SE-B2” with “DATA MONITOR”.
4. Increases engine speed to about 4,000 rpm.
5. Monitor the linear voltage rise in response to engine speed increases.
   If NG, go to EC-203, "Diagnostic Procedure" .
   If OK, go to following step.
6. Maintain the following conditions for at least 10 consecutive seconds.

ENG SPEED	More than 2,000 rpm
THRTL SEN 1	More than 3V
THRTL SEN 2	More than 3V
Shift lever	Suitable position
Driving location	Driving vehicle uphill (Increased engine load) will help maintain the driving conditions required for this test.

7. Check 1st trip DTC.
8. If 1st trip DTC is detected, go to EC-203, "Diagnostic Procedure" .



Overall Function Check

NBS00053

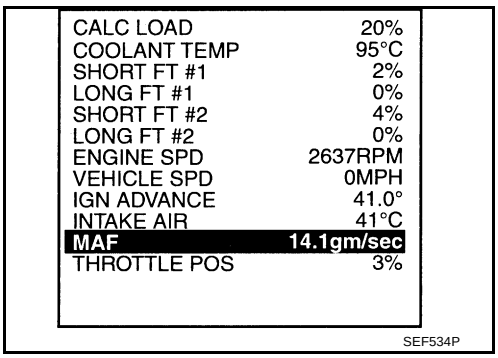
PROCEDURE FOR MALFUNCTION B

Use this procedure to check the overall function of the mass air flow sensor circuit. During this check, a 1st trip DTC might not be confirmed.

With GST

1. Start engine and warm it up to normal operating temperature.
2. Select Service $01 with GST.

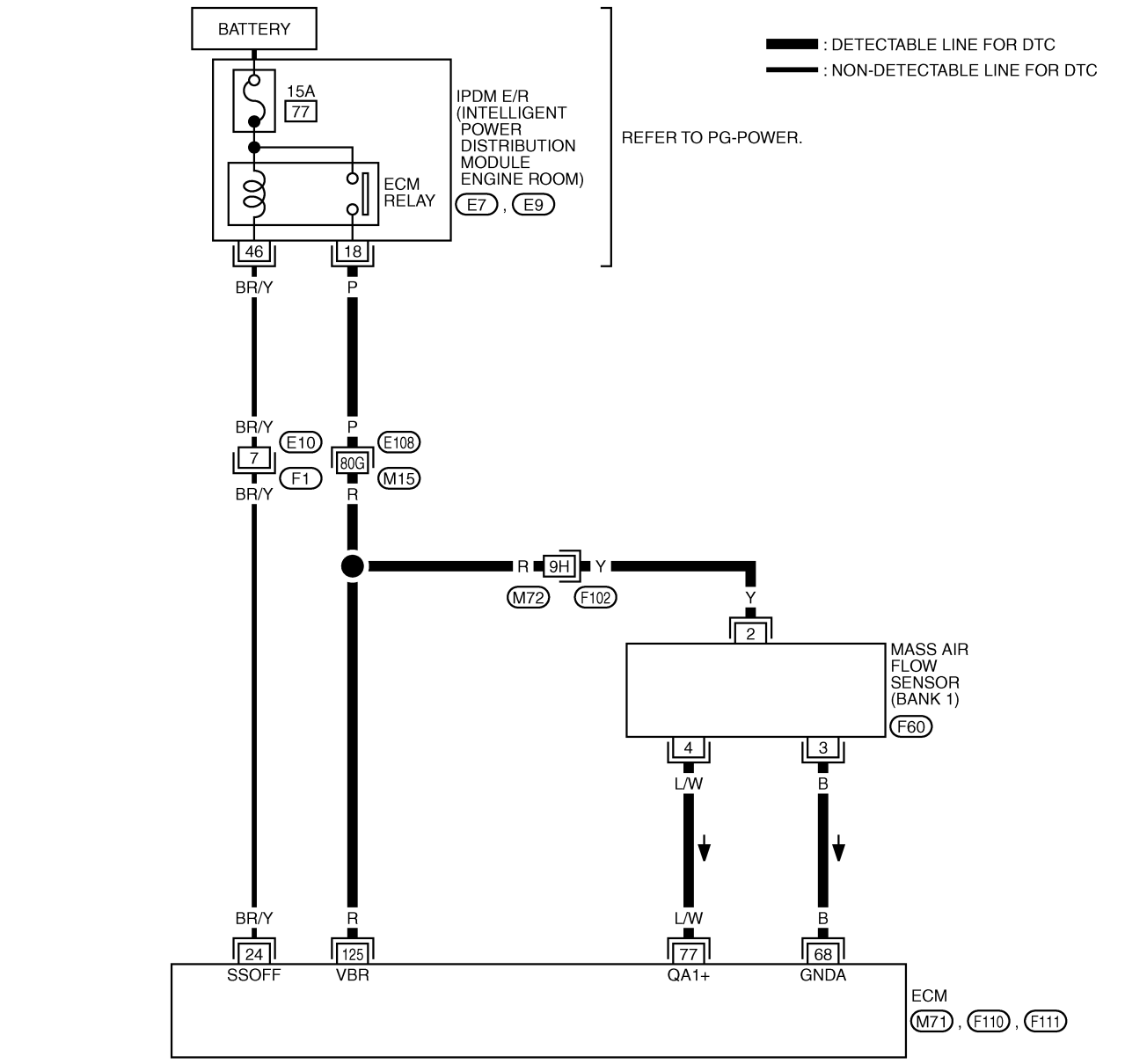
3. Check the mass air flow sensor signal with Service $01.
4. Check for linear mass air flow sensor signal value rise in response to increases to about 4,000 rpm in engine speed.
5. If NG, go to EC-203, "Diagnostic Procedure" .



Wiring Diagram
BANK 1

NBS00054

EC-MAFSB1-01



TBWT1625E

Specification data are reference values and are measured between each terminal and ground.

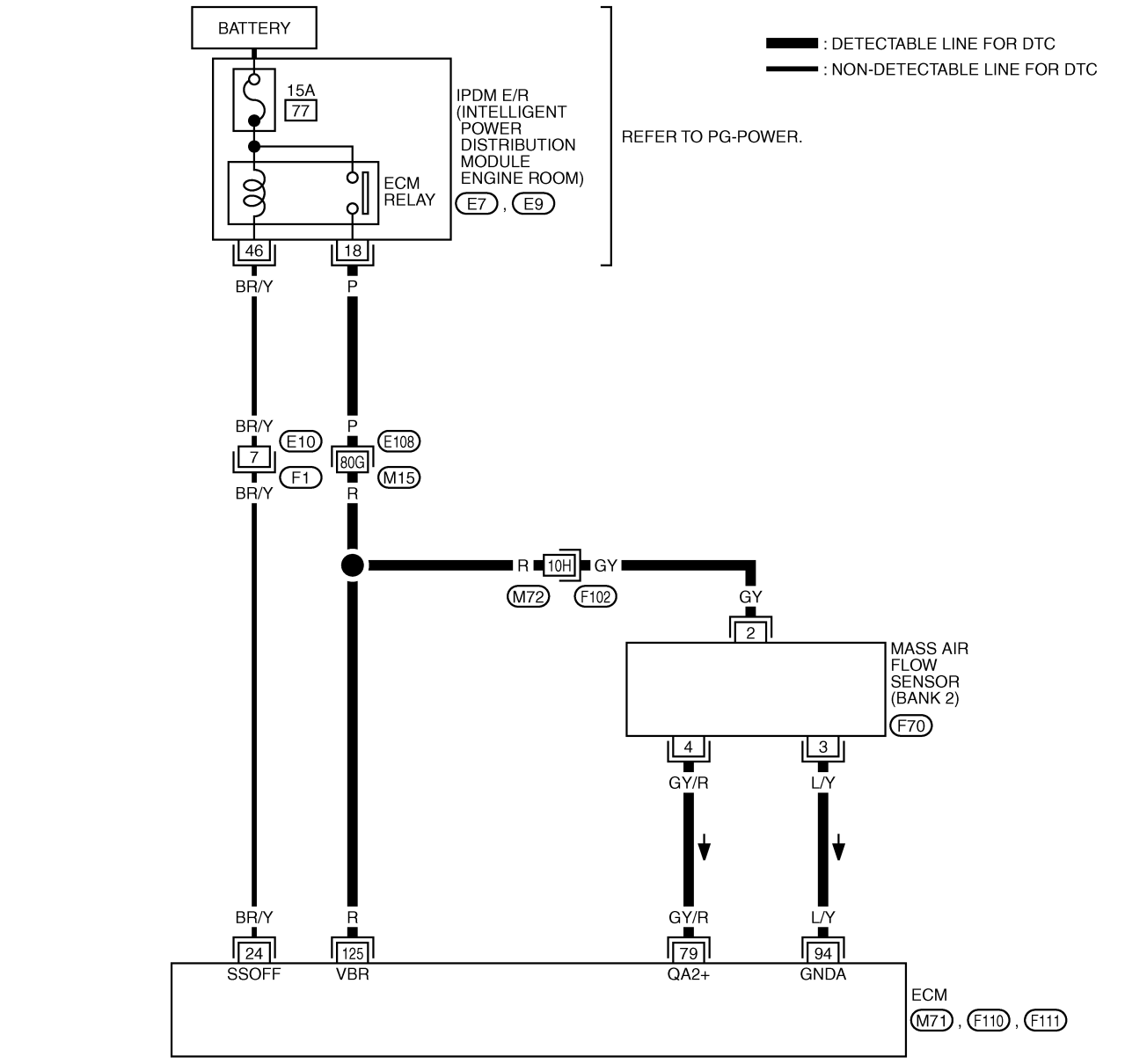
CAUTION:

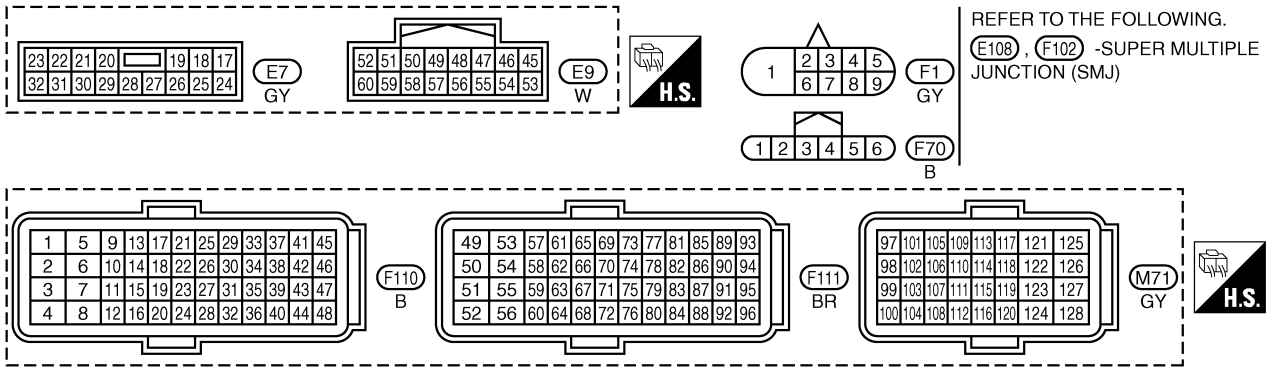
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
68	B	Sensor ground [Mass air flow sensor (bank1), Intake air temperature sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
77	L/W	Mass air flow sensor (bank1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

BANK 2

EC-MAFSB2-01





TBWT1626E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
79	GY/R	Mass air flow sensor (bank2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
94	L/Y	Sensor ground [Mass air flow sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS00055

1. INSPECTION START

Which malfunction (A or B) is duplicated?

A or B

A >> GO TO 3.
B >> GO TO 2.

2. CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct and intake manifold

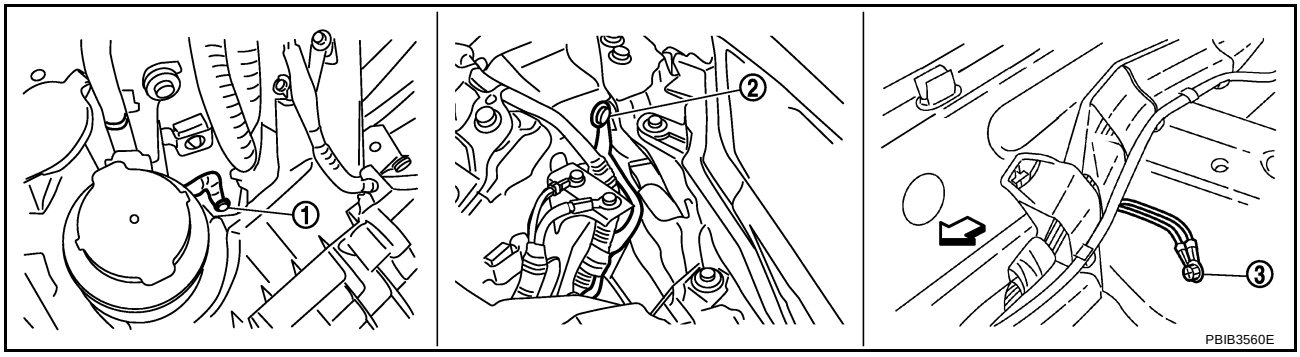
OK or NG

OK >> GO TO 3.
NG >> Reconnect the parts.

3. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

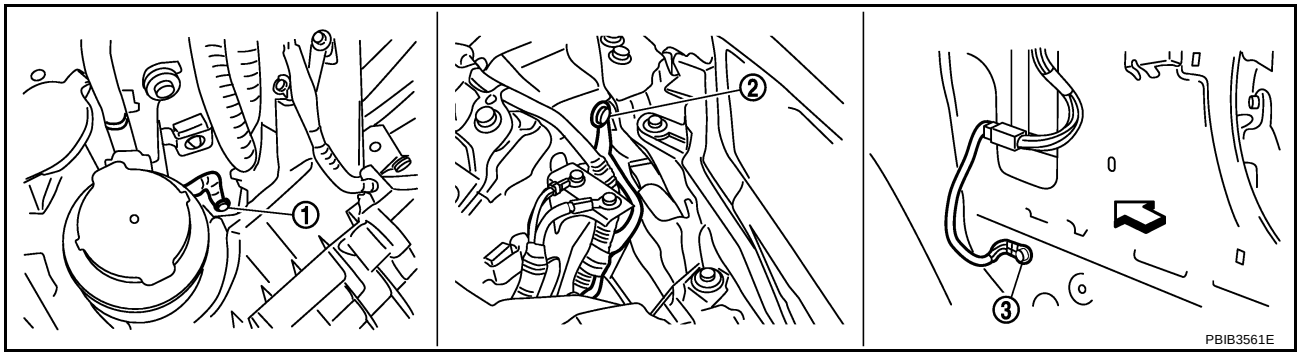


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

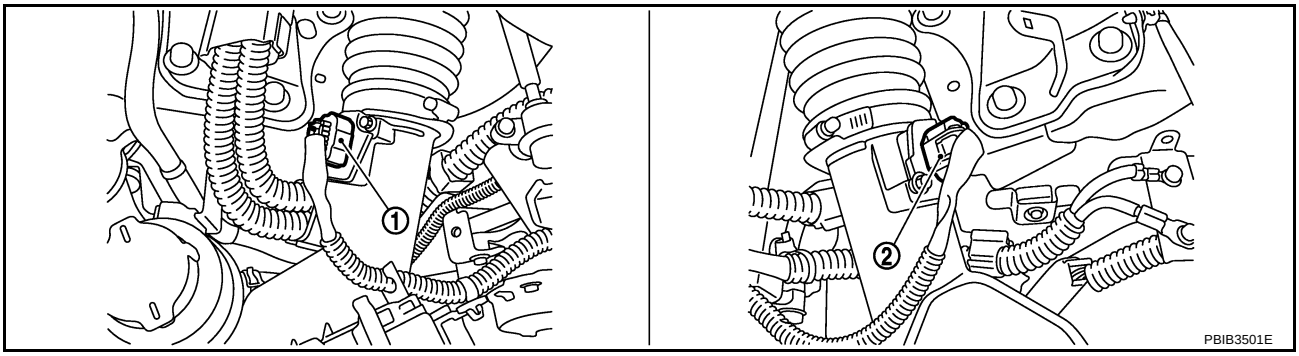
⇦: Vehicle front

OK or NG

OK >> GO TO 4.
NG >> Repair or replace ground connections.

4. CHECK MASS AIR FLOW SENSOR POWER SUPPLY CIRCUIT

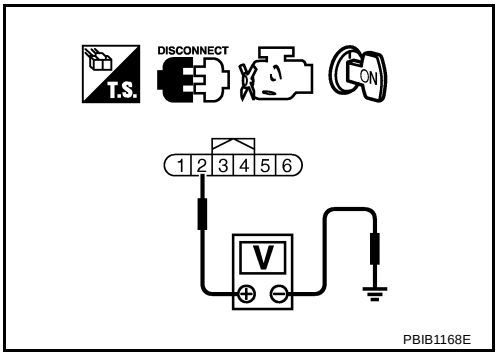
1. Disconnect mass air flow sensor harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

2. Turn ignition switch ON.
3. Check voltage between mass air flow sensor terminal 2 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK MASS AIR FLOW SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between mass air flow sensor terminal 3 and ECM terminal 68 (bank 1), 94 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK MASS AIR FLOW SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between mass air flow sensor terminal 4 and ECM terminal 77 (bank 1), 79 (bank 2).
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTAKE AIR TEMPERATURE SENSOR

Check mass air flow sensor (with intake air temperature sensor) (bank 1).
Refer to EC-245, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace mass air flow sensor (with intake air temperature sensor) (bank 1).

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP control system pressure sensor.

10. CHECK MASS AIR FLOW SENSOR

Refer to EC-206, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace malfunctioning mass air flow sensor.

11. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

NBS006UZ

MASS AIR FLOW SENSOR

With CONSULT-III

1. Reconnect all harness connectors disconnected.
2. Start engine and warm it up to normal operating temperature.
3. Connect CONSULT-III and select “DATA MONITOR” mode.
4. Select “MAS A/F SE-B1” and “MAS A/F SE-B2”, and check indication under the following conditions.

Monitor item	Condition	Indication
MAS A/F SE-B1 MAS A/F SE-B2	Ignition switch ON (Engine stopped.)	Approx. 0.4V
	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1V
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7V
	Idle to about 4,000 rpm	0.8 - 1.1V to Approx. 2.4V*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

5. If the voltage is out of specification, proceed the following.

a. Check for the cause of uneven air flow through mass air flow sensor. Refer to following.

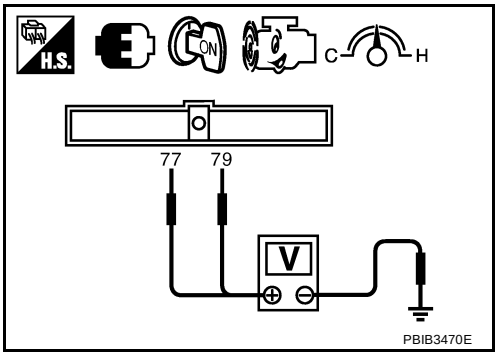
- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

b. If NG, repair or replace malfunctioning part and perform step 2 to 4 again.
If OK, go to next step.

6. Turn ignition switch OFF.
7. Disconnect mass air flow sensor harness connector and reconnect it again.
8. Perform step 2 to 4 again.
9. If NG, clean or replace mass air flow sensor.

Without CONSULT-III

1. Reconnect all harness connectors disconnected.
2. Start engine and warm it up to normal operating temperature.
3. Check voltage between ECM terminal 77 [Mass air flow sensor (bank 1) signal], 79 [Mass air flow sensor (bank 2) signal] and ground.



Condition	Voltage V
Ignition switch ON (Engine stopped.)	Approx. 0.4
Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
Idle to about 4,000 rpm	0.8 - 1.1 to Approx. 2.4*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

4. If the voltage is out of specification, proceed the following.

a. Check for the cause of uneven air flow through mass air flow sensor. Refer to following.

- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system parts

b. If NG, repair or replace malfunctioning part and perform step 2 and 3 again.
If OK, go to next step.

5. Turn ignition switch OFF.
6. Disconnect mass air flow sensor harness connector and reconnect it again.
7. Perform step 2 and 3 again.
8. If NG, clean or replace mass air flow sensor.

Removal and Installation

NBS006V0

MASS AIR FLOW SENSOR

Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

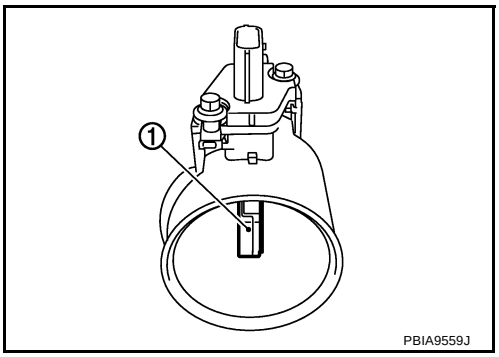
DTC P0102, P0103, P010C, P010D MAF SENSOR

PFP:22680

Component Description

NBS00058

The mass air flow sensor (1) is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire is to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The more air, the greater the heat loss.
Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



CONSULT-III Reference Value in Data Monitor Mode

NBS00059

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAS A/F SE-B1	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
MAS A/F SE-B2			
CAL/LD VALUE	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	5% - 35%
		2,500 rpm	5% - 35%
MASS AIRFLOW	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	2.0 - 6.0 g·m/s
		2,500 rpm	7.0 - 20.0 g·m/s

On Board Diagnosis Logic

NBS0005A

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0102 0102 (Bank 1) P010C 010C (Bank 2)	Mass air flow sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air leaks ● Mass air flow sensor
P0103 0103 (Bank 1) P010D 010D (Bank 2)	Mass air flow sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Mass air flow sensor

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Mass air flow sensor circuit	Engine speed will not rise more than 2,400 rpm due to the fuel cut.

DTC Confirmation Procedure

NBS0005B

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P0102, P010C

With CONSULT-III

1. Start engine and wait at least 5 seconds.
2. Check DTC.
3. If DTC is detected, go to EC-213, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR DTC P0103, P010D

With CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.
3. If DTC is detected, go to EC-213, "Diagnostic Procedure" .
   If DTC is not detected, go to next step.
4. Start engine and wait at least 5 seconds.
5. Check DTC.
6. If DTC is detected, go to EC-213, "Diagnostic Procedure" .

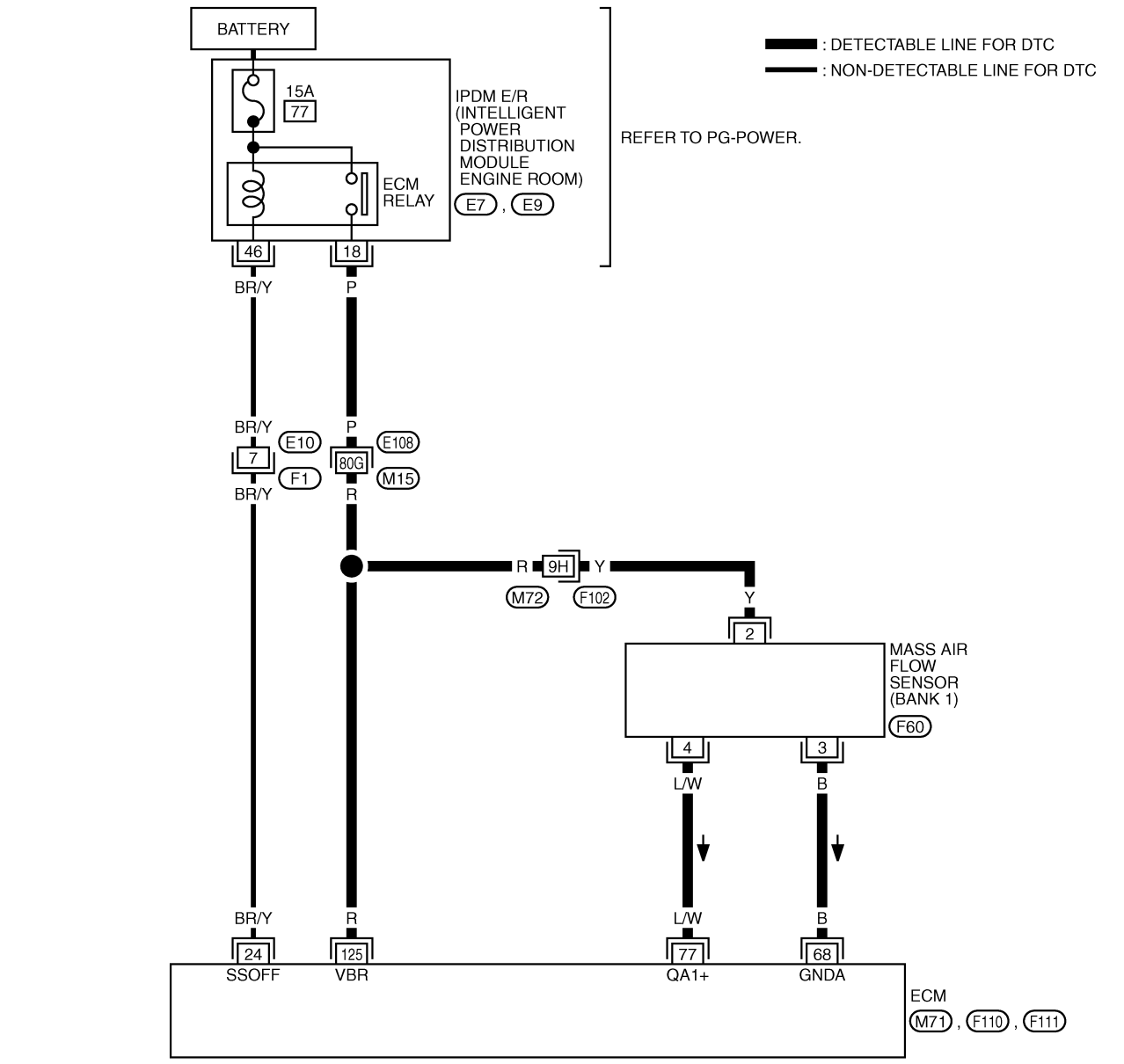
With GST

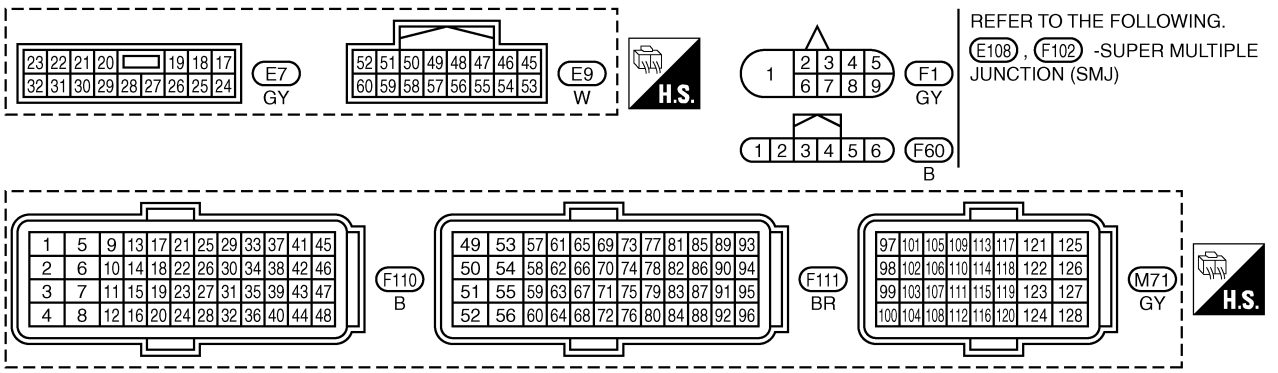
Follow the procedure “With CONSULT-III” above.

Wiring Diagram
BANK 1

NBS006U1

EC-MAFSB1-01





TBWT1625E

Specification data are reference values and are measured between each terminal and ground.

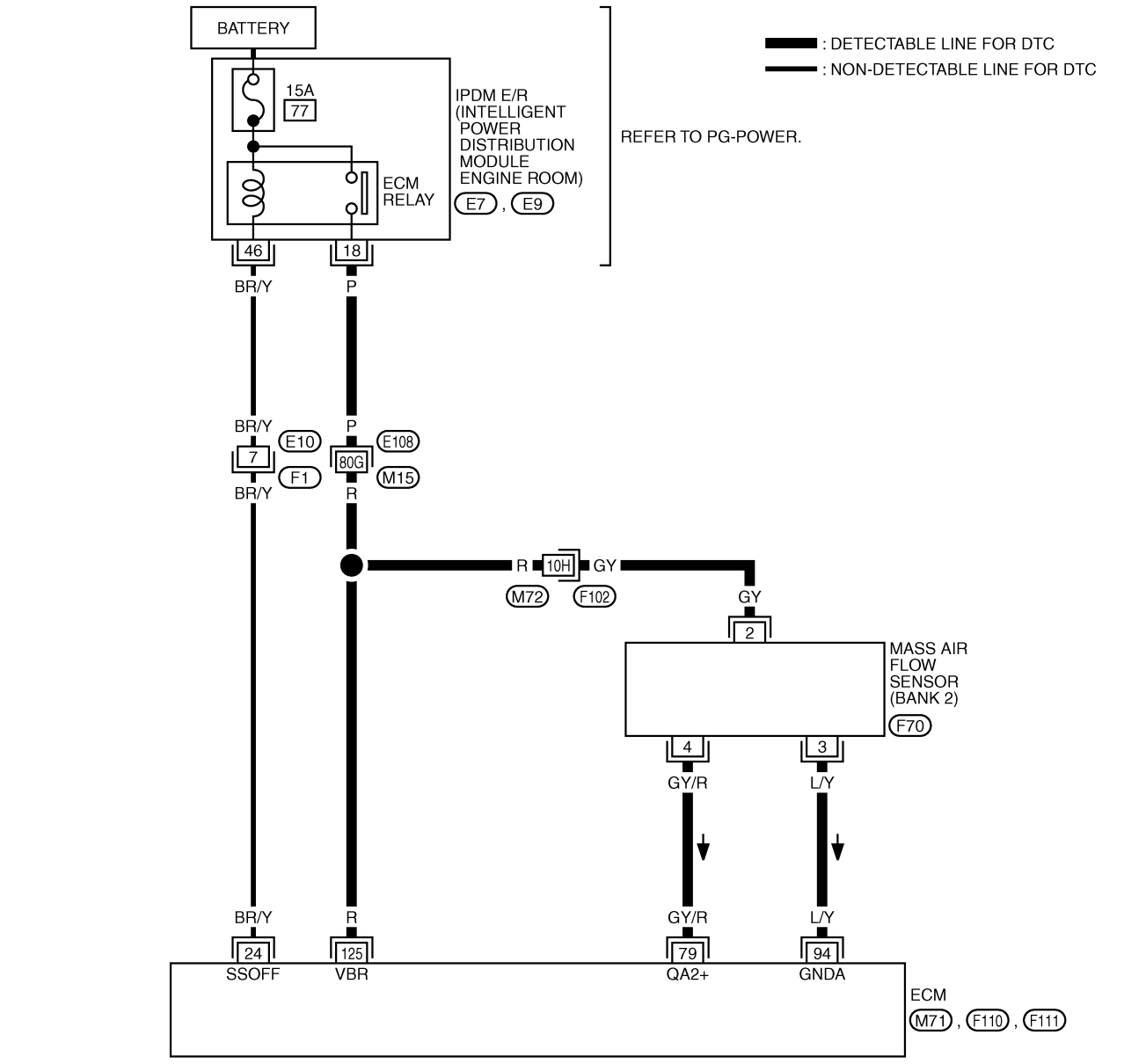
CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
68	B	Sensor ground [Mass air flow sensor (bank1), Intake air temperature sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
77	L/W	Mass air flow sensor (bank1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

BANK 2

EC-MAFSB2-01



TBWT1626E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
79	GY/R	Mass air flow sensor (bank2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0.8 - 1.1V
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,500 rpm	1.4 - 1.7V
94	L/Y	Sensor ground [Mass air flow sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS006U2

1. INSPECTION START

Confirm the detected DTC.

Which DTC is detected?

P0102, P010C>>GO TO 2.
P0103, P010D>>GO TO 3.

2. CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct and intake manifold

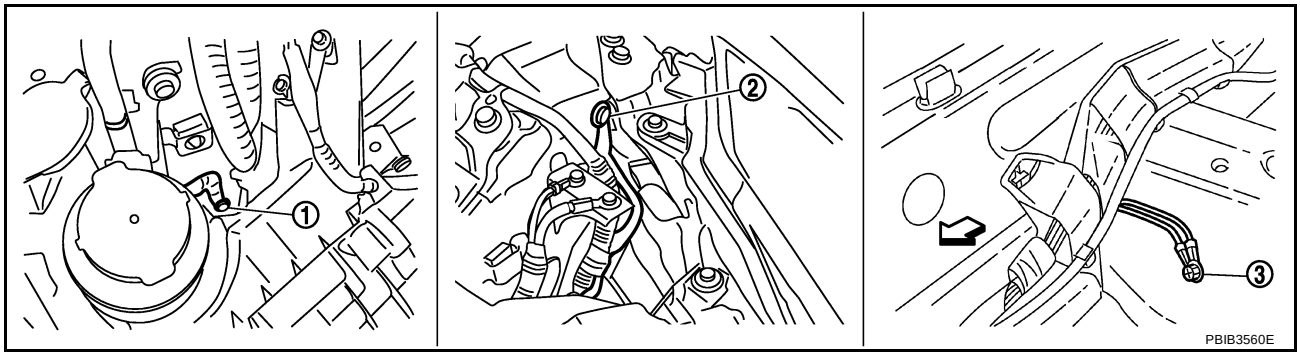
OK or NG

OK >> GO TO 3.
NG >> Reconnect the parts.

3. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

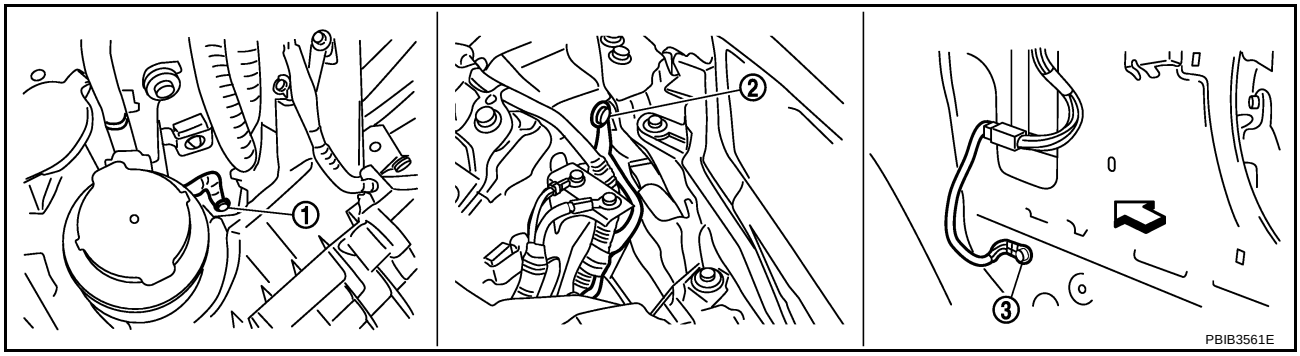


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

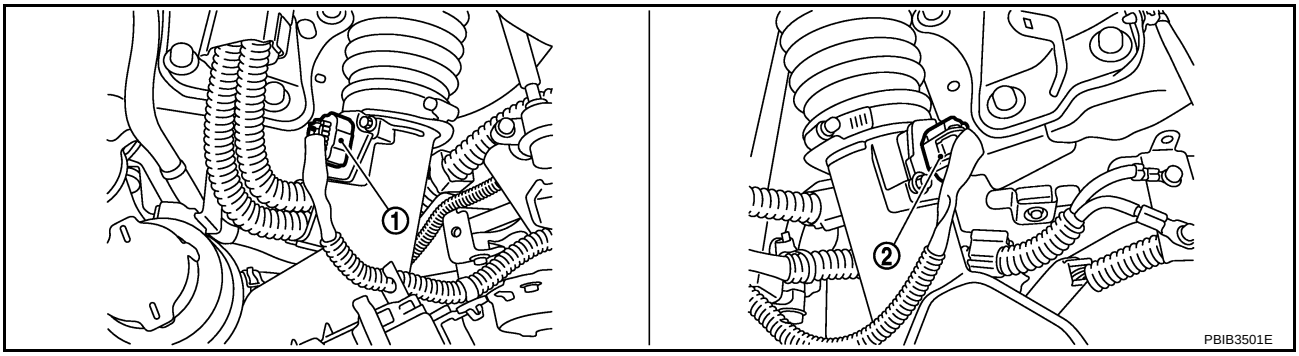
⇦: Vehicle front

OK or NG

OK >> GO TO 4.
NG >> Repair or replace ground connections.

4. CHECK MASS AIR FLOW SENSOR POWER SUPPLY CIRCUIT

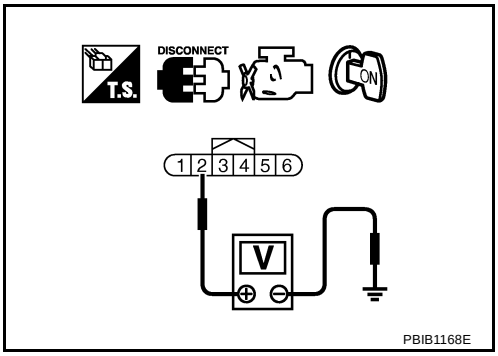
1. Disconnect mass air flow sensor harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

2. Turn ignition switch ON.
3. Check voltage between mass air flow sensor terminal 2 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between IPDM E/R and mass air flow sensor
- Harness for open or short between mass air flow sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK MASS AIR FLOW SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between mass air flow sensor terminal 3 and ECM terminal 68 (bank 1), 94 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK MASS AIR FLOW SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between mass air flow sensor terminal 4 and ECM terminal 77 (bank 1), 79 (bank 2).
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK MASS AIR FLOW SENSOR

Refer to EC-216, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace malfunctioning mass air flow sensor.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

NBS006V1

MASS AIR FLOW SENSOR

With CONSULT-III

1. Reconnect all harness connectors disconnected.
2. Start engine and warm it up to normal operating temperature.
3. Connect CONSULT-III and select “DATA MONITOR” mode.
4. Select “MAS A/F SE-B1” and “MAS A/F SE-B2”, and check indication under the following conditions.

Monitor item	Condition	Indication
MAS A/F SE-B1 MAS A/F SE-B2	Ignition switch ON (Engine stopped.)	Approx. 0.4V
	Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1V
	2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7V
	Idle to about 4,000 rpm	0.8 - 1.1V to Approx. 2.4V*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

5. If the voltage is out of specification, proceed the following.

a. Check for the cause of uneven air flow through mass air flow sensor. Refer to following.
   - Crushed air ducts
   - Malfunctioning seal of air cleaner element
   - Uneven dirt of air cleaner element
   - Improper specification of intake air system parts

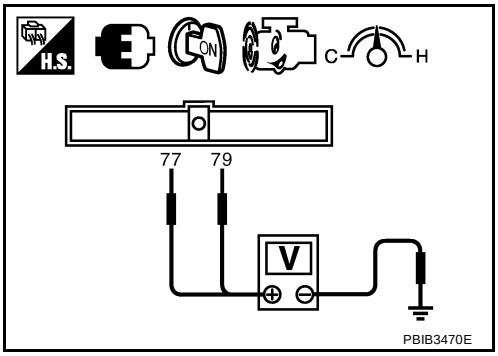
b. If NG, repair or replace malfunctioning part and perform step 2 to 4 again.
   If OK, go to next step.

6. Turn ignition switch OFF.
7. Disconnect mass air flow sensor harness connector and reconnect it again.
8. Perform step 2 to 4 again.
9. If NG, clean or replace mass air flow sensor.

Without CONSULT-III

1. Reconnect all harness connectors disconnected.

2. Start engine and warm it up to normal operating temperature.
3. Check voltage between ECM terminal 77 [Mass air flow sensor (bank 1) signal], 79 [Mass air flow sensor (bank 2) signal] and ground.



Condition	Voltage V
Ignition switch ON (Engine stopped.)	Approx. 0.4
Idle (Engine is warmed-up to normal operating temperature.)	0.8 - 1.1
2,500 rpm (Engine is warmed-up to normal operating temperature.)	1.4 - 1.7
Idle to about 4,000 rpm	0.8 - 1.1 to Approx. 2.4*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

4. If the voltage is out of specification, proceed the following.

a. Check for the cause of uneven air flow through mass air flow sensor. Refer to following.
   - Crushed air ducts
   - Malfunctioning seal of air cleaner element
   - Uneven dirt of air cleaner element
   - Improper specification of intake air system parts

b. If NG, repair or replace malfunctioning part and perform step 2 and 3 again.
   If OK, go to next step.

5. Turn ignition switch OFF.
6. Disconnect mass air flow sensor harness connector and reconnect it again.
7. Perform step 2 and 3 again.
8. If NG, clean or replace mass air flow sensor.

Removal and Installation

NBS006V2

MASS AIR FLOW SENSOR

Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

DTC P0112, P0113 IAT SENSOR

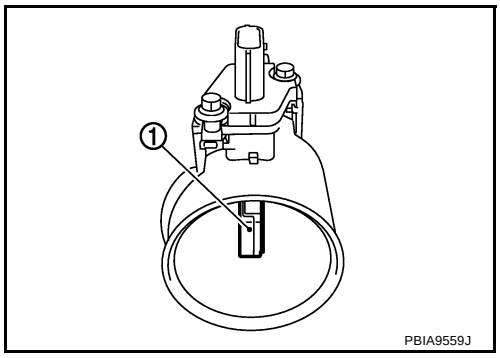
PFP:22630

Component Description

NBS0005G

The intake air temperature sensor is built-into mass air flow sensor (1). The sensor detects intake air temperature and transmits a signal to the ECM.
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.

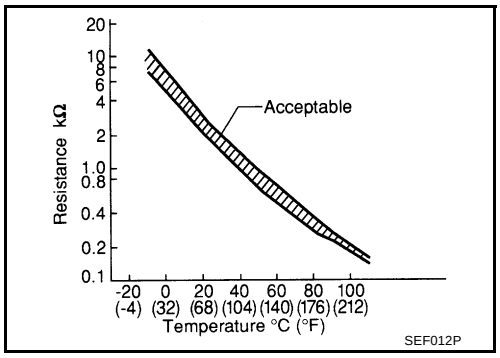
NOTE:
ECM uses only the intake air temperature sensor (bank 1) for engine control and self-diagnosis.
It does not use the intake air temperature sensor (bank 2)



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

*: This data is reference values and is measured between ECM terminal 67 (Intake air temperature sensor) (bank 1) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS0005H

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0112 0112 (Bank 1)	Intake air temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Intake air temperature sensor
P0113 0113 (Bank 1)	Intake air temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC Confirmation Procedure

NBS0005I

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-220, "Diagnostic Procedure" .

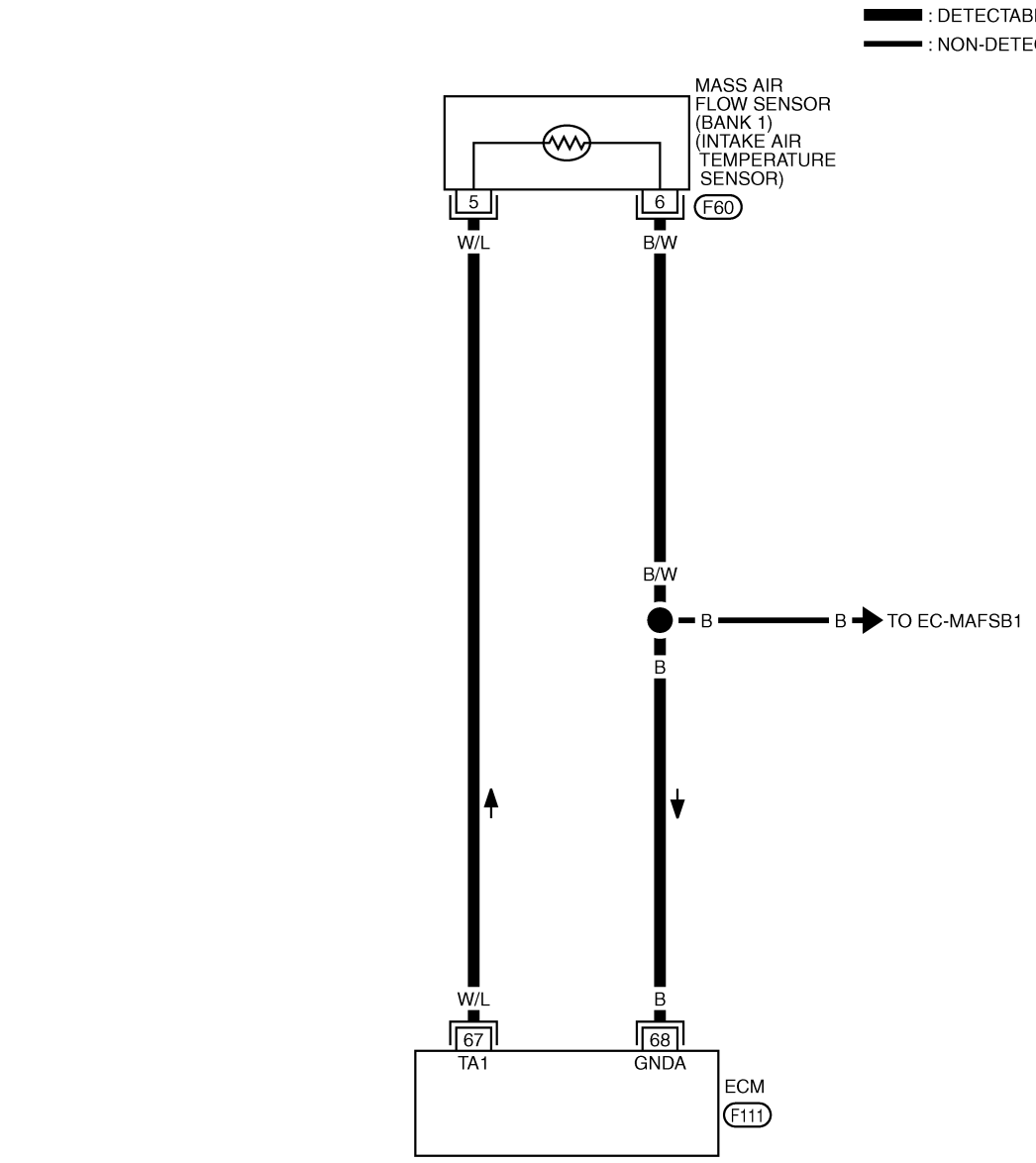
WITH GST

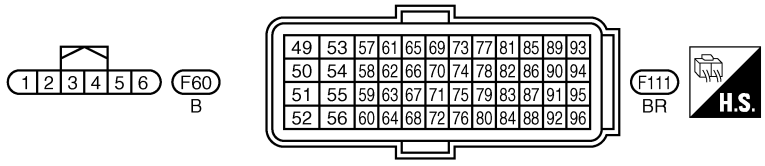
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS0005J

EC-IATSB1-01





TBWT1627E

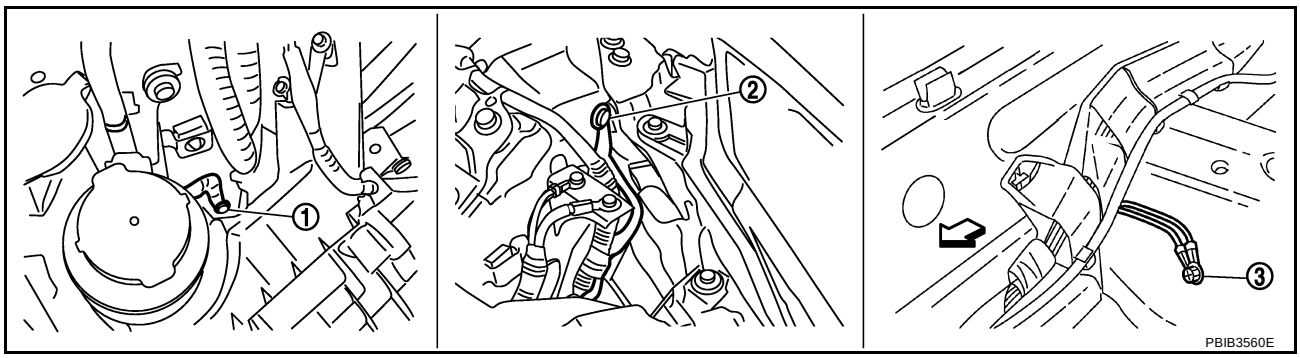
Diagnostic Procedure

NBS0005K

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

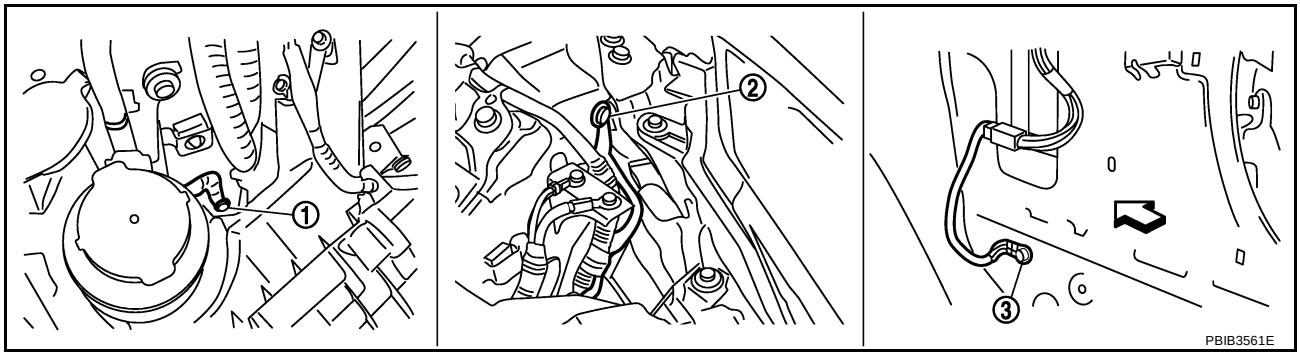


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

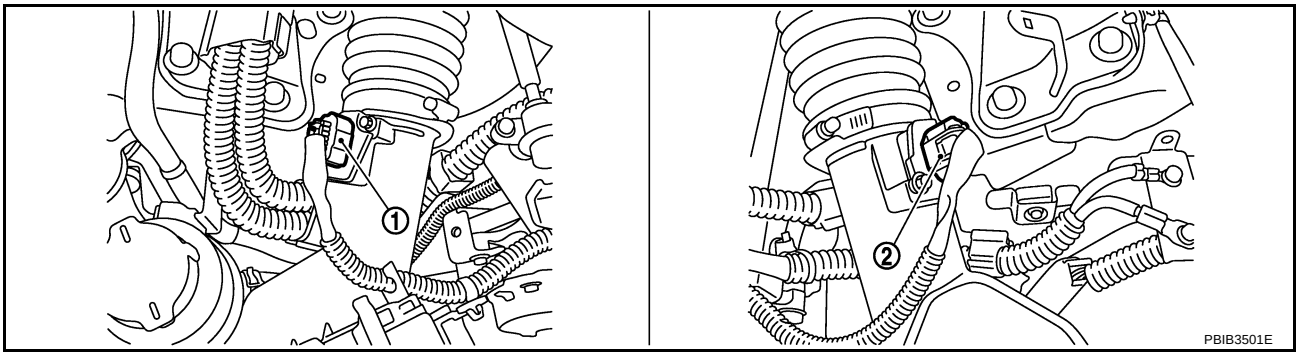
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

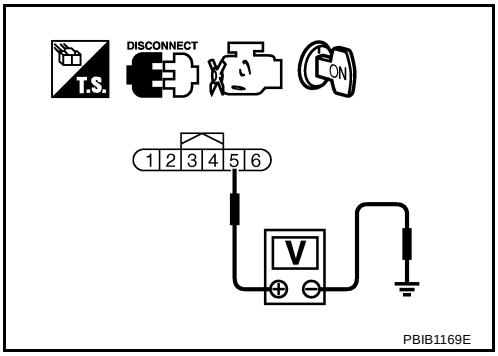
1. Disconnect mass air flow sensor (with intake air temperature sensor) (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

2. Turn ignition switch ON.
3. Check voltage between mass air flow sensor (with intake air temperature sensor) (bank 1) terminal 5 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK INTAKE AIR TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between mass air flow sensor (with intake air temperature sensor) (bank 1) terminal 6 and ECM terminal 68.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-222, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace mass air flow sensor (with intake air temperature sensor) (bank 1).

5. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

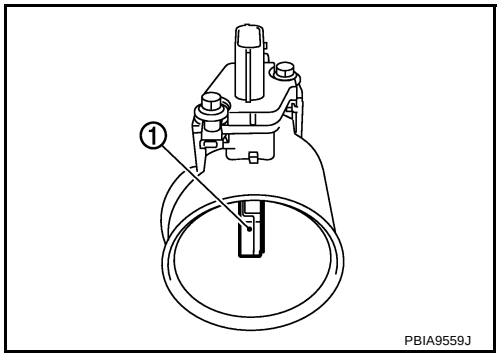
NBS0005L

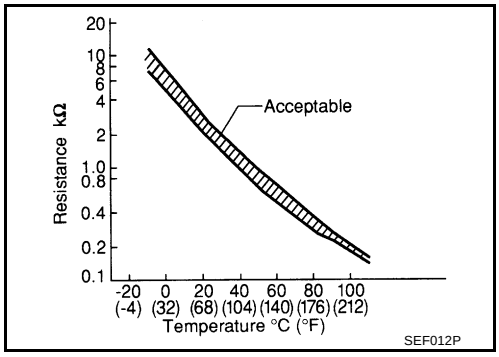
INTAKE AIR TEMPERATURE SENSOR

1. Check resistance between mass air flow sensor (with intake air temperature sensor) (bank 1) (1) terminals 5 and 6 under the following conditions.

Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.800 - 2.200

2. If NG, replace mass air flow sensor (with intake air temperature sensor) (bank 1).





Removal and Installation

NBS0005M

MASS AIR FLOW SENSOR

Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

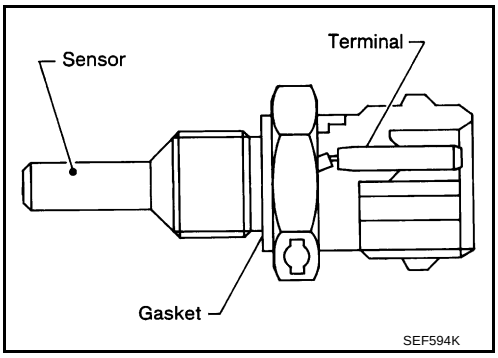
DTC P0117, P0118 ECT SENSOR

PFP:22630

Component Description

NBS0005N

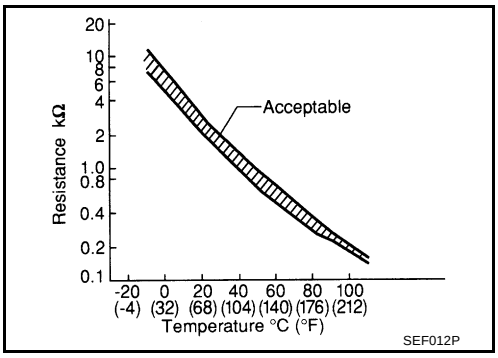
The engine coolant temperature (ECT) sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 71 (Engine coolant temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS0005O

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P0117 0117	Engine coolant temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Engine coolant temperature sensor
P0118 0118	Engine coolant temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode	
Engine coolant temperature sensor circuit	Engine coolant temperature will be determined by ECM based on the time after turning ignition switch ON or START. CONSULT-III displays the engine coolant temperature decided by ECM.	
	Condition	Engine coolant temperature decided (CONSULT-III display)
	Just as ignition switch is turned ON or START	40°C (104°F)
	More than approx. 4 minutes after ignition ON or START	80°C (176°F)
	Except as shown above	40 - 80°C (104 - 176°F) (Depends on the time)
	When the fail-safe system for engine coolant temperature sensor is activated, the cooling fan operates while engine is running.	

DTC Confirmation Procedure

NBS0005P

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.
3. If DTC is detected, go to EC-226, "Diagnostic Procedure" .

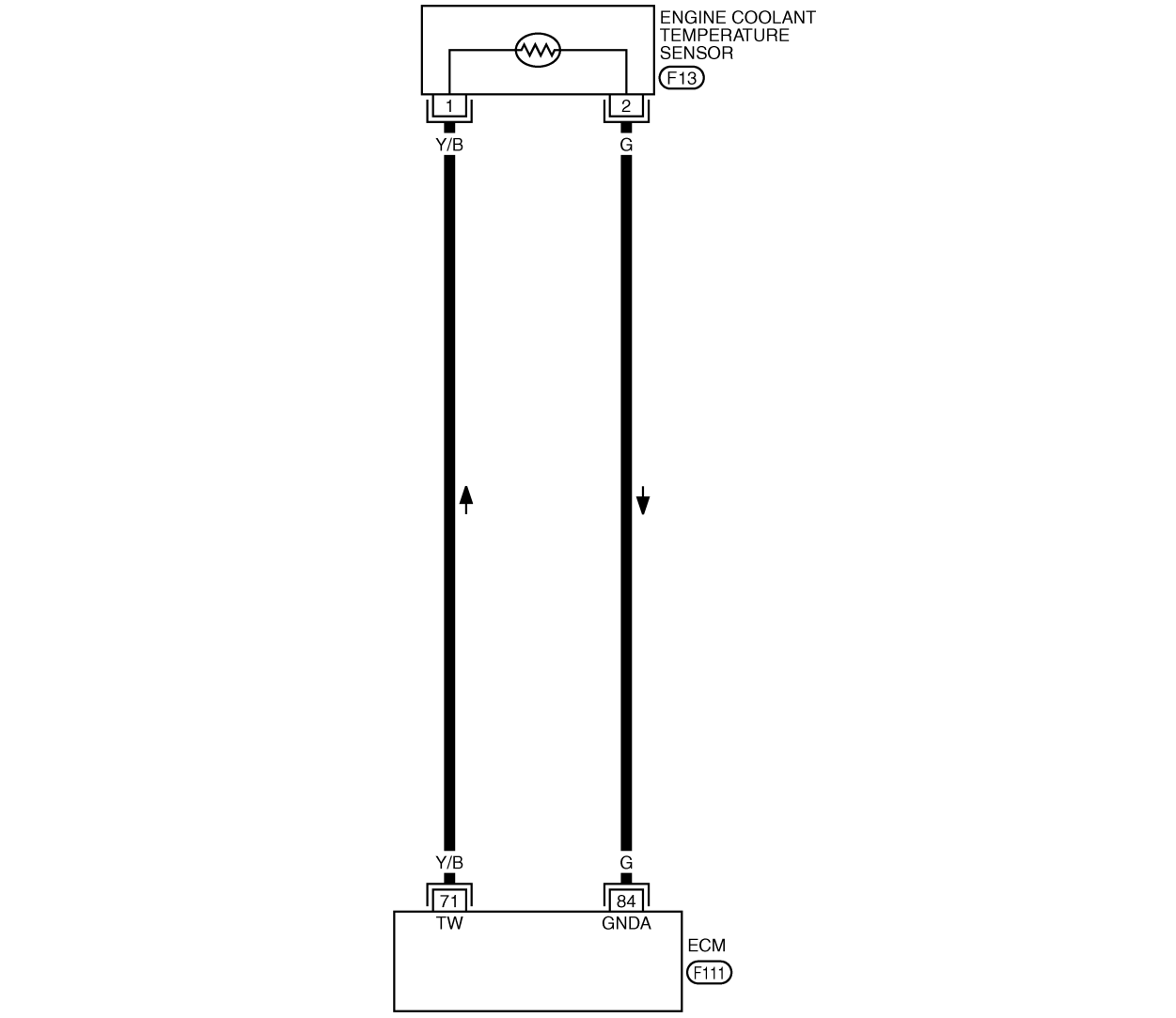
WITH GST

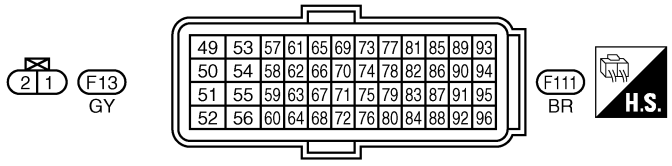
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS0005Q

EC-ECTS-01





TBWT1629E

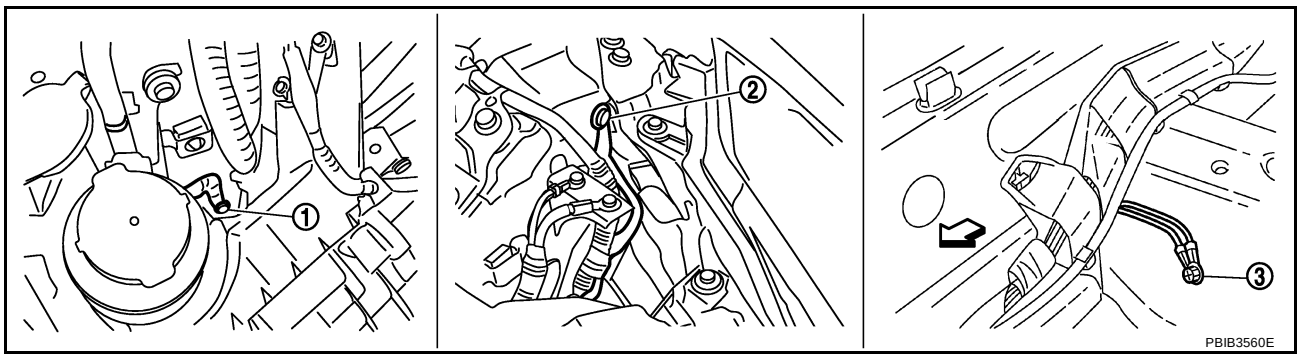
Diagnostic Procedure

NBS0005R

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

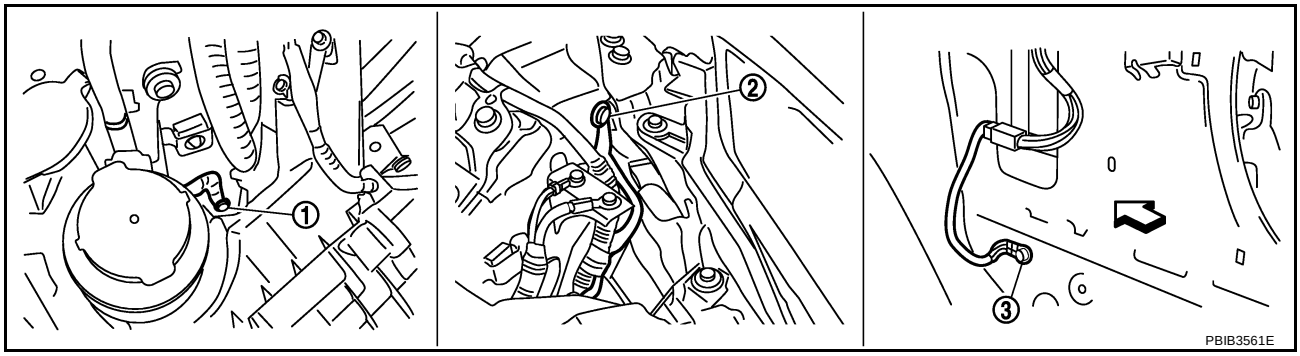


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

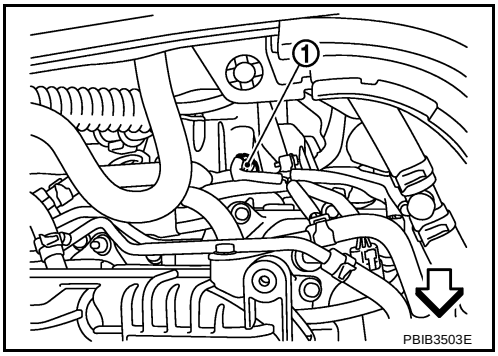
OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect engine coolant temperature sensor harness connector (1).

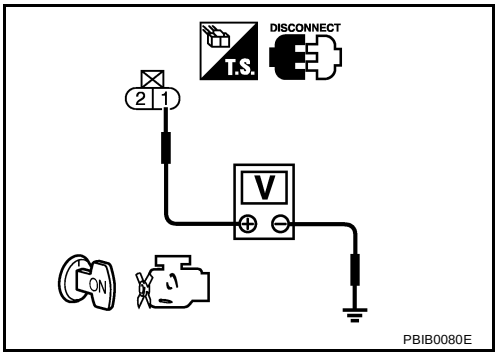
   ⇦ : Vehicle front

2. Turn ignition switch ON.



3. Check voltage between engine coolant temperature sensor terminal 1 and ground with CONSULT-III or tester.

   Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK ENGINE COOLANT TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ENGINE COOLANT TEMPERATURE sensor terminal 2 and ECM terminal 84.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-228, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace engine coolant temperature sensor.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

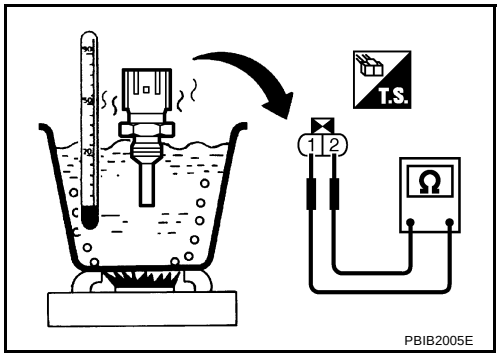
>> **INSPECTION END**

Component Inspection

NBS0005S

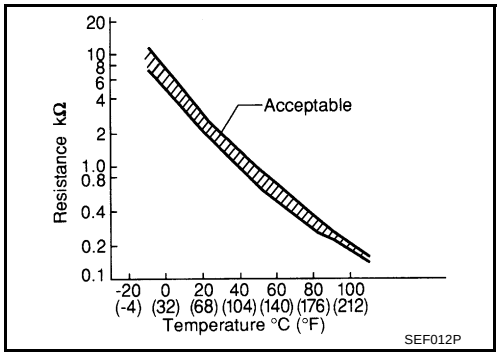
ENGINE COOLANT TEMPERATURE SENSOR

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.37 - 2.63
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

NBS0005T

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-28, "WATER OUTLET AND WATER PIPING" .

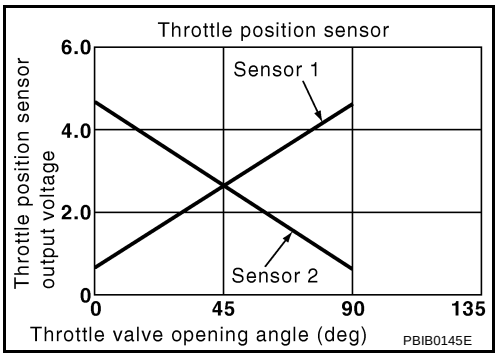
DTC P0122, P0123, P0227, P0228 TP SENSOR

PFP:16119

Component Description

NBS0005U

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-III Reference Value in Data Monitor Mode

NBS0005V

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
TP SEN 1-B1 TP SEN 1-B2 TP SEN 2-B1* TP SEN 2-B2*	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

NBS0005W

These self-diagnoses have the one trip detection logic.

NOTE:
If DTC P0122, P0123, P0227 or P0228 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0122 0122 (Bank 1) P0227 0227 (Bank 2)	Throttle position sensor 2 circuit low input	An excessively low voltage from the TP sensor 2 is sent to ECM.	● Harness or connectors (TP sensor 2 circuit is open or shorted.) ● Electric throttle control actuator (TP sensor 2)
P0123 0123 (Bank 1) P0228 0228 (Bank 2)	Throttle position sensor 2 circuit high input	An excessively high voltage from the TP sensor 2 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS0005X

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-235, "Diagnostic Procedure" .

WITH GST

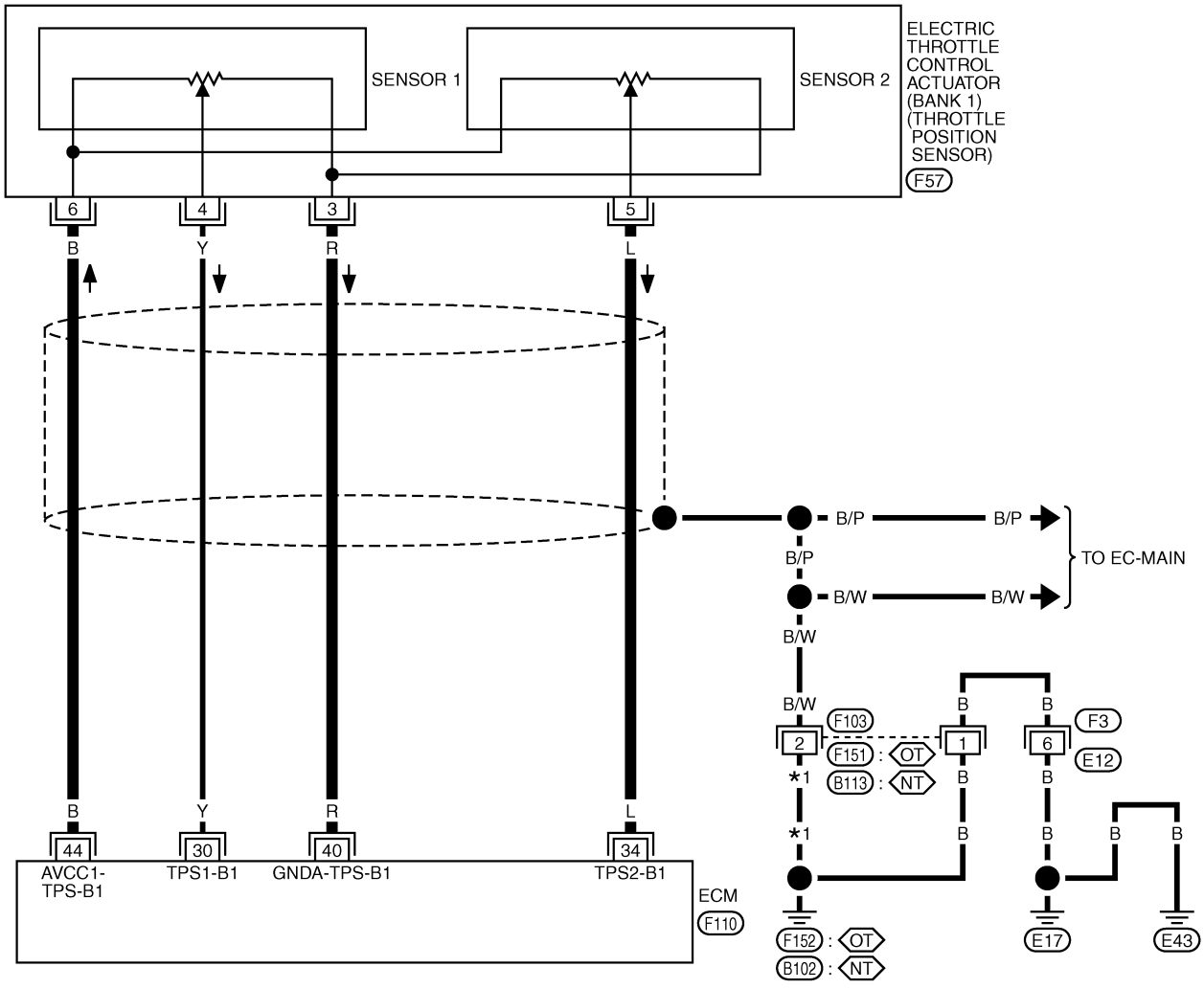
Follow the procedure “WITH CONSULT-III” above.

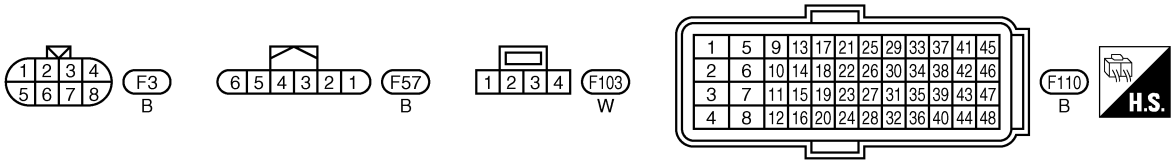
Wiring Diagram
BANK 1

NBS0005Y

EC-TPS2B1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
*1 B : NT
B/W : OT





TBWT1630E

Specification data are reference values and are measured between each terminal and ground.

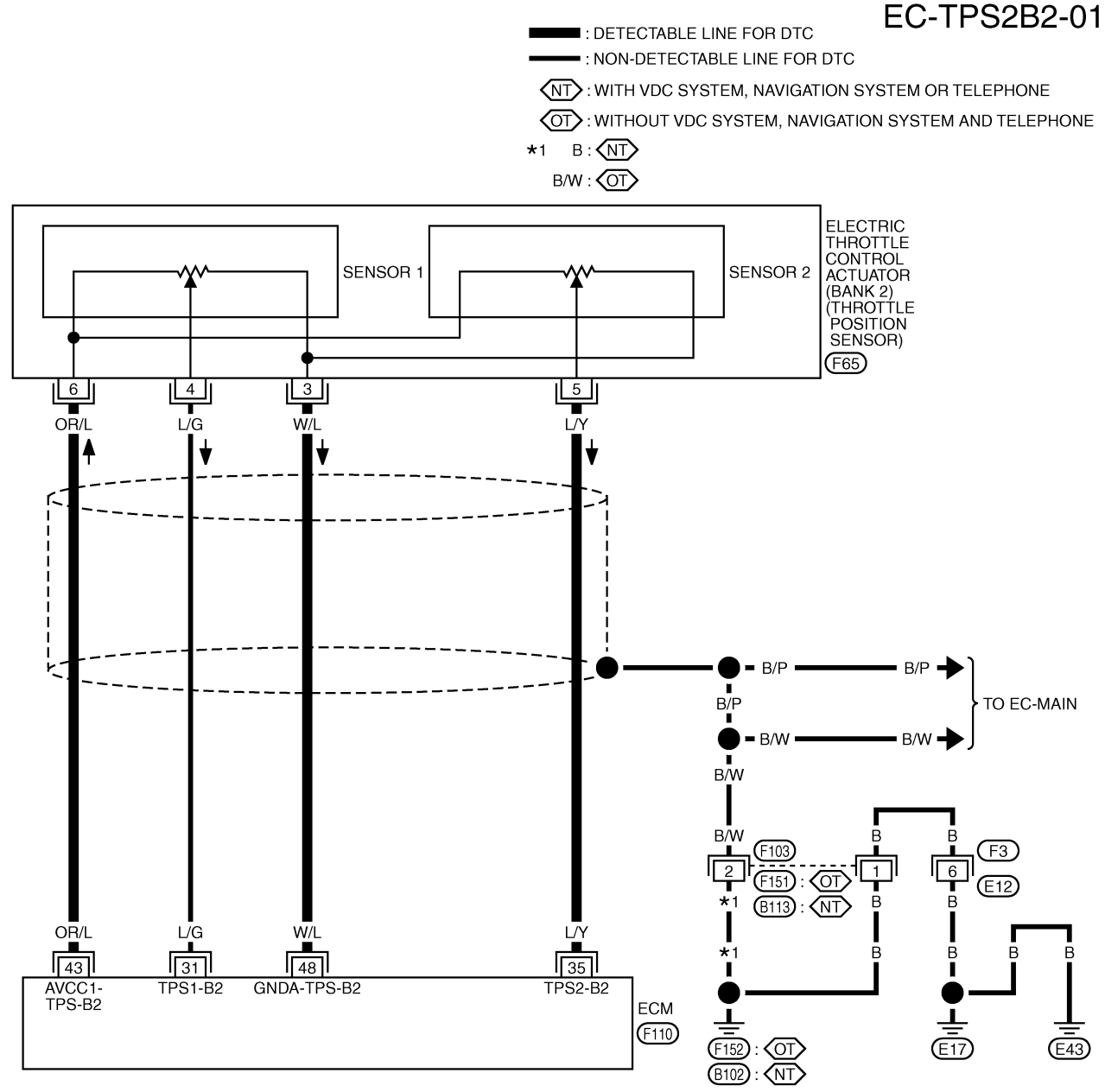
CAUTION:

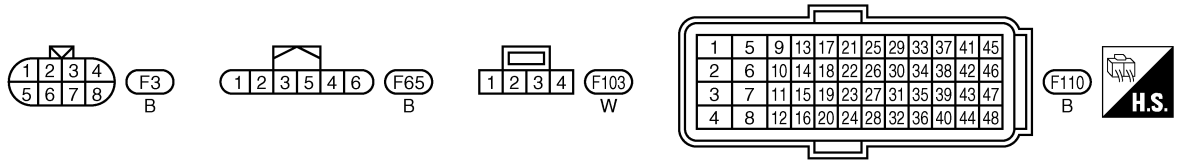
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
30	Y	Throttle position sensor 1 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
34	L	Throttle position sensor 2 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
40	R	Sensor ground [Throttle position sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V

BANK 2

EC-TPS2B2-01





TBWT1631E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
31	L/G	Throttle position sensor 1 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
35	L/Y	Throttle position sensor 2 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
48	W/L	Sensor ground [Throttle position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

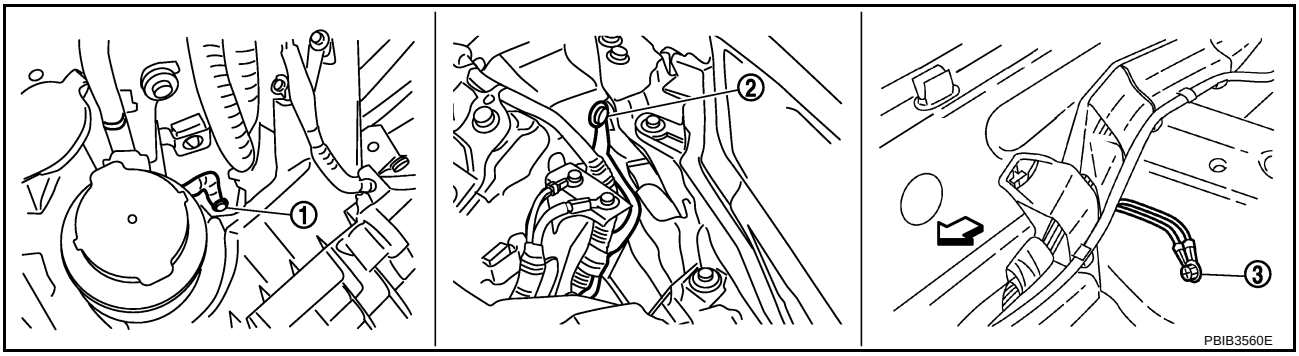
Diagnostic Procedure

NBS0005Z

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

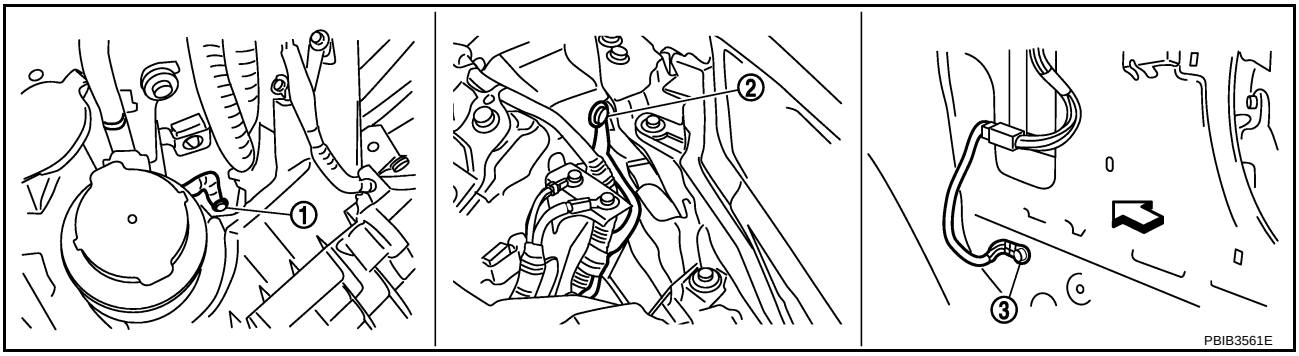


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

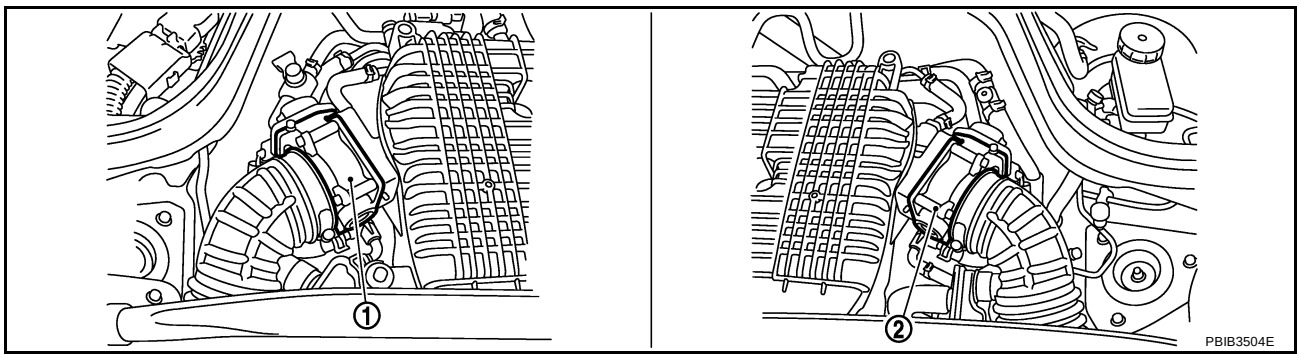
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

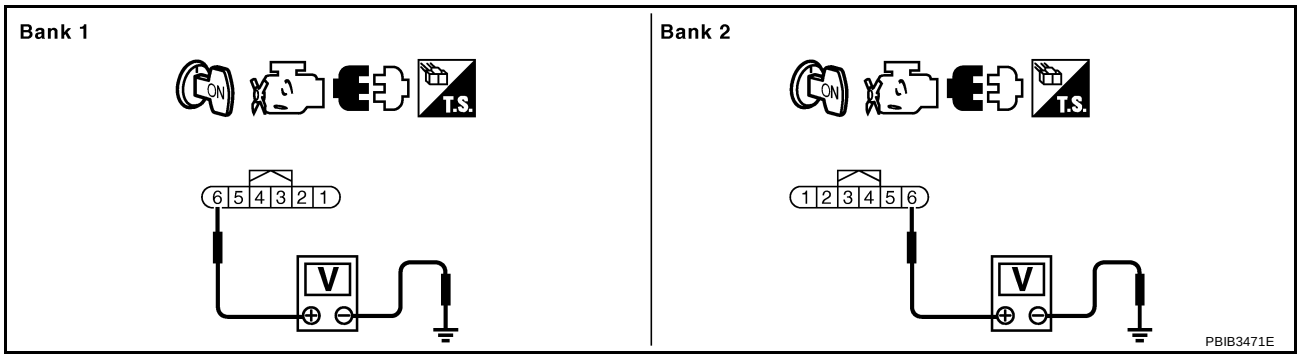
2. CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control actuator (bank 1)
2. Electric throttle control actuator (bank 2)

2. Turn ignition switch ON.
3. Check voltage between electric throttle control actuator terminal 6 and ground with CONSULT-III or tester.



Voltage: Approximately 5V

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

3. CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 3 and ECM terminal 40 (bank 1) or 48 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 34 (bank 1) or 35 (bank 2) and electric throttle control actuator terminal 5.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK THROTTLE POSITION SENSOR

Refer to EC-237, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace malfunctioning electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

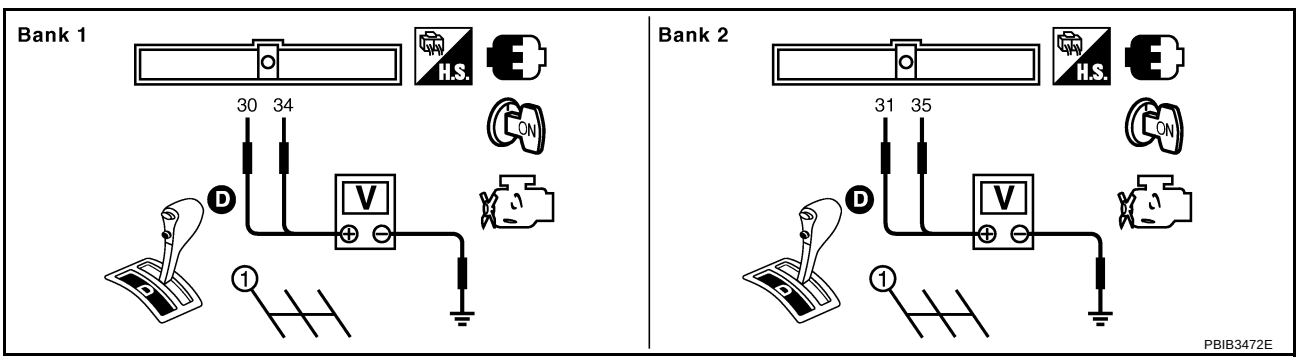
>> **INSPECTION END**

Component Inspection

NBS00060

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.
5. Check voltage between ECM terminals 30 [TP sensor 1 (bank 1) signal], 31 [TP sensor 1 (bank 2) signal], 34 [TP sensor 2 (bank 1) signal], 35 [TP sensor 2 (bank 2) signal] and ground under the following conditions.



Terminal	Accelerator pedal	Voltage
30 [TP sensor 1 (bank 1)] 31 [TP sensor 1 (bank 2)]	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
34 [TP sensor 2 (bank 1)] 35 [TP sensor 2 (bank 2)]	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V

6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS00061

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

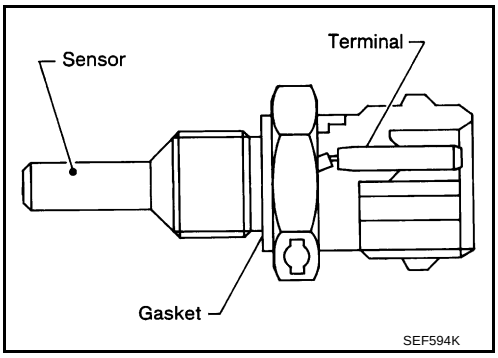
DTC P0125 ECT SENSOR

PFP:22630

Component Description

NBS00062

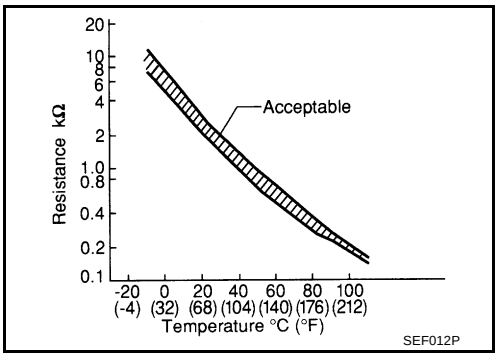
The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260

*: This data is reference values and is measured between ECM terminal 71 (Engine coolant temperature sensor) and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS00063

NOTE:
If DTC P0125 is displayed with P0117 or P0118, first perform the trouble diagnosis for DTC P0117 or P0118.
Refer to EC-223, "DTC P0117, P0118 ECT SENSOR" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0125 0125	Insufficient engine coolant temperature for closed loop fuel control	● Voltage sent to ECM from the sensor is not practical, even when some time has passed after starting the engine. ● Engine coolant temperature is insufficient for closed loop fuel control.	● Harness or connectors (High resistance in the circuit) ● Engine coolant temperature sensor ● Thermostat

DTC Confirmation Procedure

NBS00064

CAUTION:

Be careful not to overheat engine.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-III.
3. Check that “COOLAN TEMP/S” is above 10°C (50°F).
   If it is above 10°C (50°F), the test result will be OK.
   If it is below 10°C (50°F), go to following step.
4. Start engine and run it for 65 minutes at idle speed.
   If “COOLAN TEMP/S” increases to more than 10°C (50°F) within 65 minutes, stop engine because the test result will be OK.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-241, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

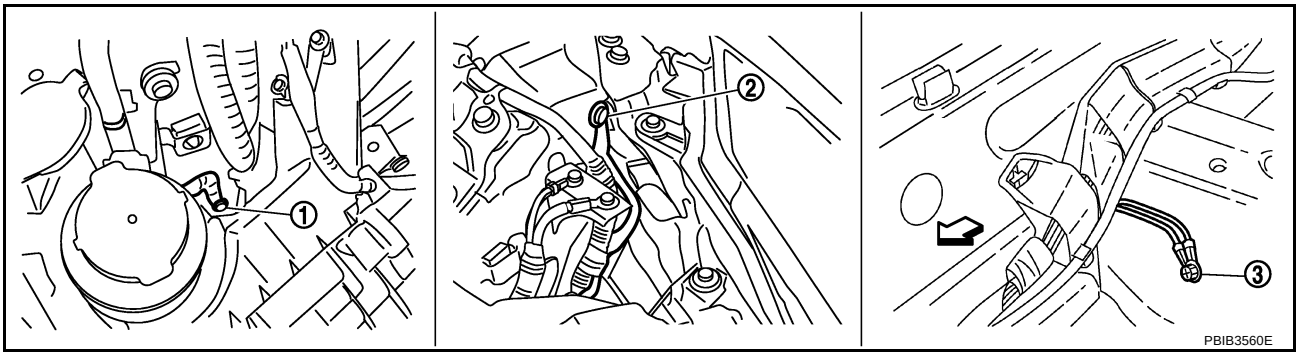
Diagnostic Procedure

NBS00065

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

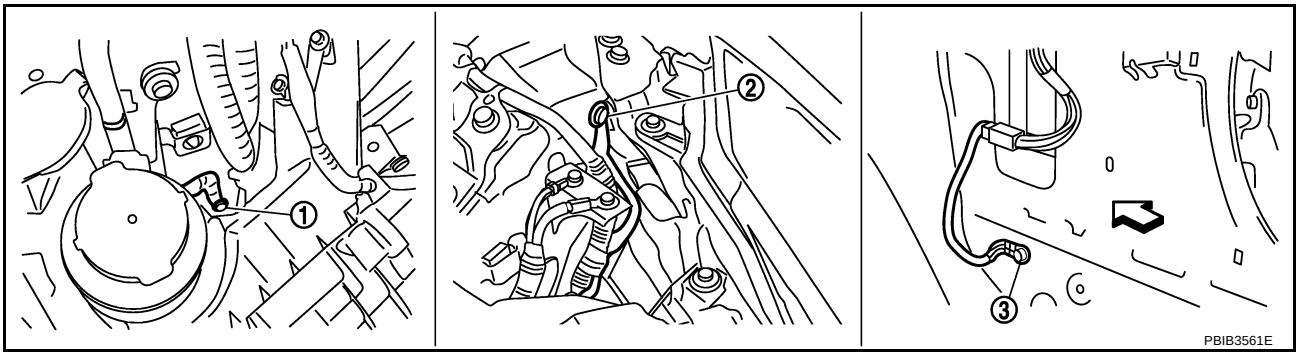


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-242, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace engine coolant temperature sensor.

3. CHECK THERMOSTAT OPERATION

When the engine is cold [lower than 70°C (158°F)] condition, grasp lower radiator hose and confirm the engine coolant does not flow.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace thermostat. Refer to CO-26, "WATER INLET AND THERMOSTAT ASSEMBLY" .

4. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-225, "Wiring Diagram" .

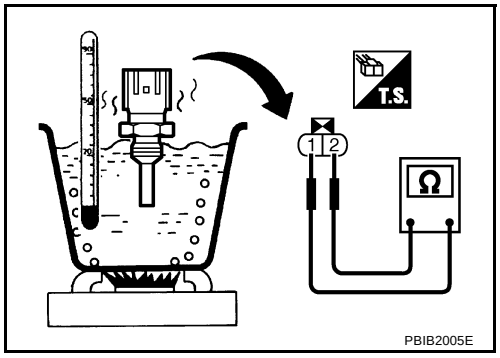
>> **INSPECTION END**

Component Inspection

NBS00066

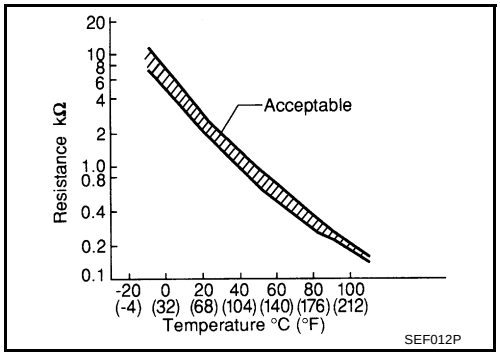
ENGINE COOLANT TEMPERATURE SENSOR

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.37 - 2.63
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

NBS00067

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-28, "WATER OUTLET AND WATER PIPING" .

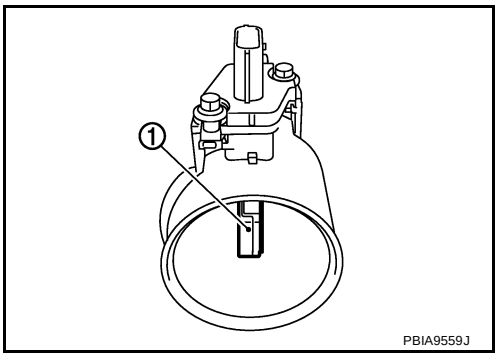
DTC P0127 IAT SENSOR

PFP:22630

Component Description

NBS00068

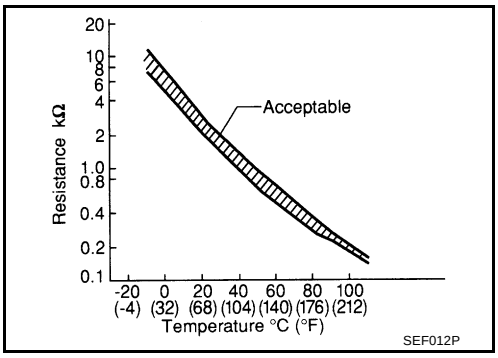
The intake air temperature sensor (1) is built into mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.
The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.



<Reference data>

Intake air temperature °C (°F)	Voltage* V	Resistance kΩ
25 (77)	3.3	1.800 - 2.200
80 (176)	1.2	0.283 - 0.359

*: This data is reference values and is measured between ECM terminal 67 [Intake air temperature sensor (bank 1)] and ground.



CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS00069

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0127 0127	Intake air temperature too high	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signal from engine coolant temperature sensor.	● Harness or connectors (The sensor circuit is open or shorted) ● Intake air temperature sensor

DTC Confirmation Procedure

NBS0006A

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:
This test may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-III

1. Wait until engine coolant temperature is less than 90°C (194°F)
a. Turn ignition switch ON.
b. Select “DATA MONITOR” mode with CONSULT-III.
c. Check the engine coolant temperature.
d. If the engine coolant temperature is not less than 90°C (194°F), turn ignition switch OFF and cool down engine.

   NOTE:
   Perform the following steps before engine coolant temperature is above 90°C (194°F).
2. Turn ignition switch ON.
3. Select “DATA MONITOR” mode with CONSULT-III.

4. Start engine.
5. Hold vehicle speed at more than 70 km/h (43 MPH) for 100 consecutive seconds.
6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-244, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

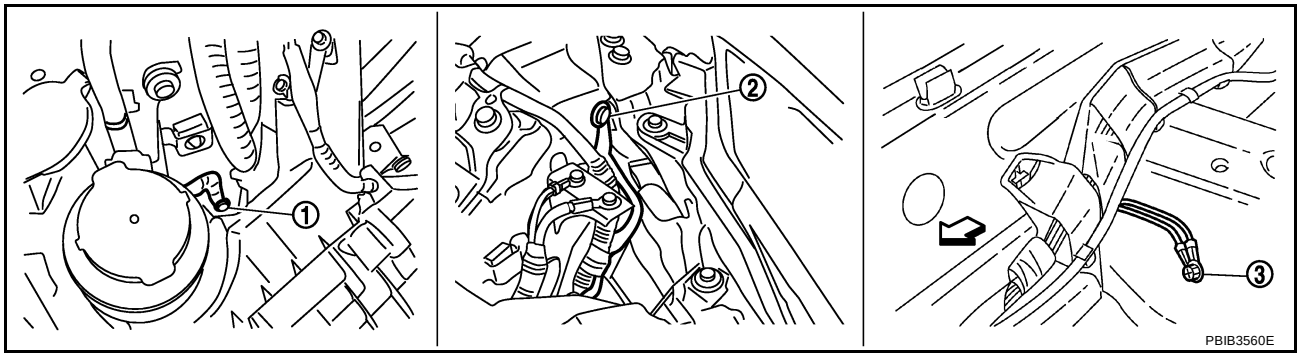
Diagnostic Procedure

NBS0006B

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

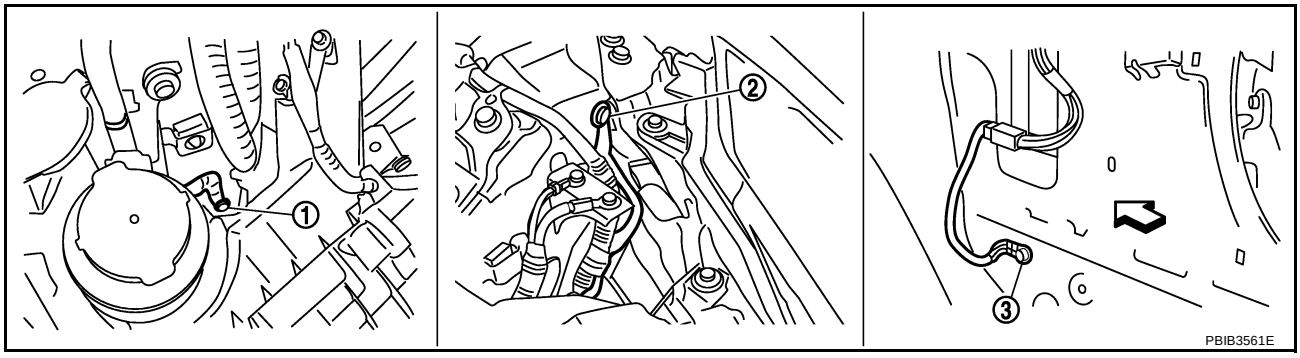


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-222, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace mass air flow sensor (with intake air temperature sensor) (bank 1).

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-219, "Wiring Diagram" .

>> **INSPECTION END**

Component Inspection

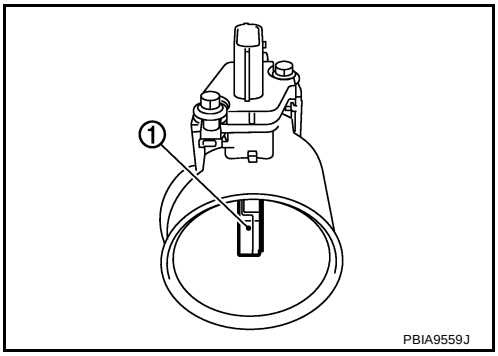
NBS0006C

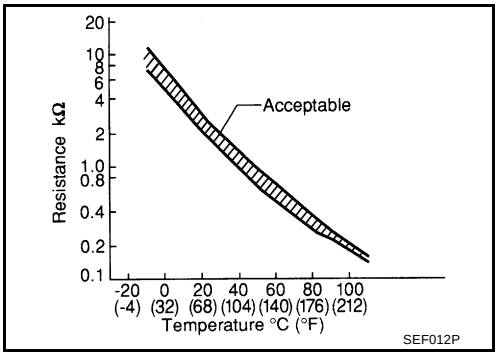
INTAKE AIR TEMPERATURE SENSOR

1. Check resistance between mass air flow sensor (with intake air temperature sensor) (bank 1) (1) terminals 5 and 6 under the following conditions.

Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.800 - 2.200

2. If NG, replace mass air flow sensor (with intake air temperature sensor) (bank 1).





Removal and Installation

NBS0006D

MASS AIR FLOW SENSOR

Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

DTC P0128 THERMOSTAT FUNCTION

PFP:21200

On Board Diagnosis Logic

NBS0006E

Engine coolant temperature has not risen enough to open the thermostat even though the engine has run long enough.
This is due to a leak in the seal or the thermostat stuck open.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0128 0128	Thermostat function	The engine coolant temperature does not reach to specified temperature even though the engine has run long enough.	● Thermostat ● Leakage from sealing portion of thermostat ● Engine coolant temperature sensor

DTC Confirmation Procedure

NBS0006F

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:

- **For best results, perform at ambient temperature of –10°C (14°F) or higher.**
- **For best results, perform at engine coolant temperature of –10°C (14°F) to 68°C (154°F).**

WITH CONSULT-III

1. Replace thermostat with new one. Refer to CO-26, "WATER INLET AND THERMOSTAT ASSEMBLY" . Use only a genuine NISSAN thermostat as a replacement. If an incorrect thermostat is used, the MIL may come on.
2. Turn ignition switch ON.
3. Select “COOLAN TEMP/S” in “DATA MONITOR” mode with CONSULT-III.
4. Check the indication of “COOLAN TEMP/S”.
   If it is below 68°C (154°F), go to following step.
   If it is above 68°C (154°F), cool down the engine to less than 60°C (140°F), then go to next step.
5. Drive vehicle for 10 consecutive minutes under the following conditions.

VHCL SPEED SE	80 - 120 km/h (50 - 75 MPH)

6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-246, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS0006G

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-247, "Component Inspection" .

OK or NG

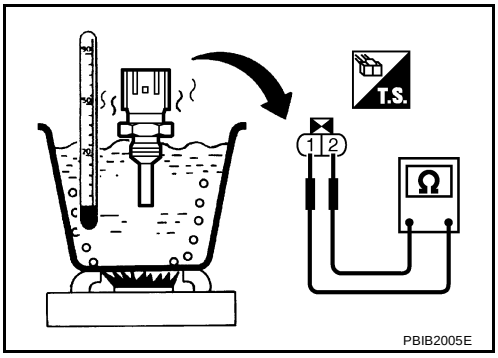
OK >> **INSPECTION END**
NG >> Replace engine coolant temperature sensor.

Component Inspection

NBS0006H

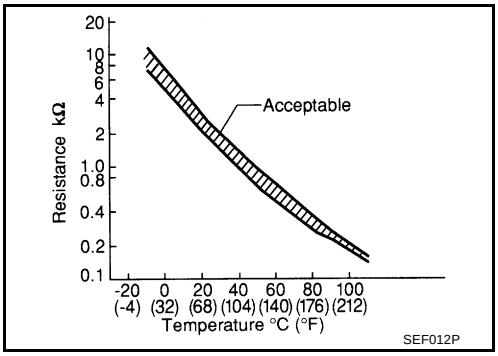
ENGINE COOLANT TEMPERATURE SENSOR

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.37 - 2.63
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

NBS0006I

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-28, "WATER OUTLET AND WATER PIPING" .

DTC P0130, P0150 A/F SENSOR 1

PFP:22693

Component Description

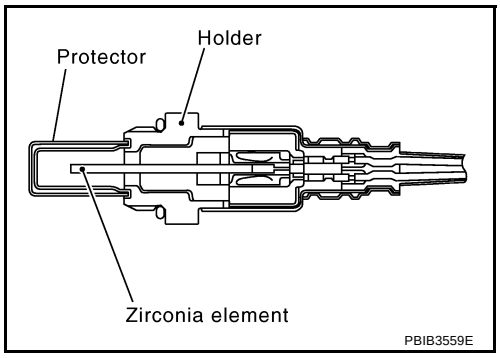
NBS006U5

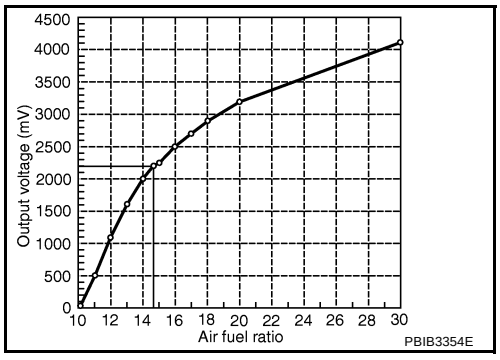
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS000ET

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS000EU

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0130 0130 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly in the range other than approx. 2.2V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P0150 0150 (Bank 2)		● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2V.	

DTC Confirmation Procedure

NBS006U6

Perform PROCEDURE FOR MALFUNCTION A first.
If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

PROCEDURE FOR MALFUNCTION A

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Let engine idle for 2 minutes.

3. Check 1st trip DTC.
4. If 1st trip DTC is detected, go to EC-254, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION B

CAUTION:
Always drive vehicle at a safe speed.

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-III.
3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.
   If the indication is constantly approx. 1.5V and does not fluctuates, go to EC-254, "Diagnostic Procedure" .
   If the indication fluctuates around 1.5V, go to next step.
4. Select “A/F SEN1 (B1) P1276” (for DTC P0130) or “A/F SEN1 (B2) P1286” (for DTC P0150) of “A/F SEN1” in “DTC WORK SUPPORT” mode with CONSULT-III.
5. Touch “START”.
6. When the following conditions are met, “TESTING” will be displayed on the CONSULT-III screen.

ENG SPEED	1,100 - 3,200 rpm
VHCL SPEED SE	More than 64 km/h (40 MPH)
B/FUEL SCHDL	1.0 - 8.0 msec
Shift lever	D position (A/T) 5th position (M/T)

   If “TESTING” is not displayed after 20 seconds, retry from step 2.
7. Release accelerator pedal fully.
   NOTE:
   Never apply brake during releasing the accelerator pedal.
8. Make sure that “TESTING” changes to “COMPLETED”.
   If “TESTING” changed to “OUT OF CONDITION”, retry from step 6.
9. Make sure that “OK” is displayed after touching “SELF-DIAG RESULT”.
   If “NG” is displayed, go to EC-254, "Diagnostic Procedure" .

Overall Function Check

NBS006U7

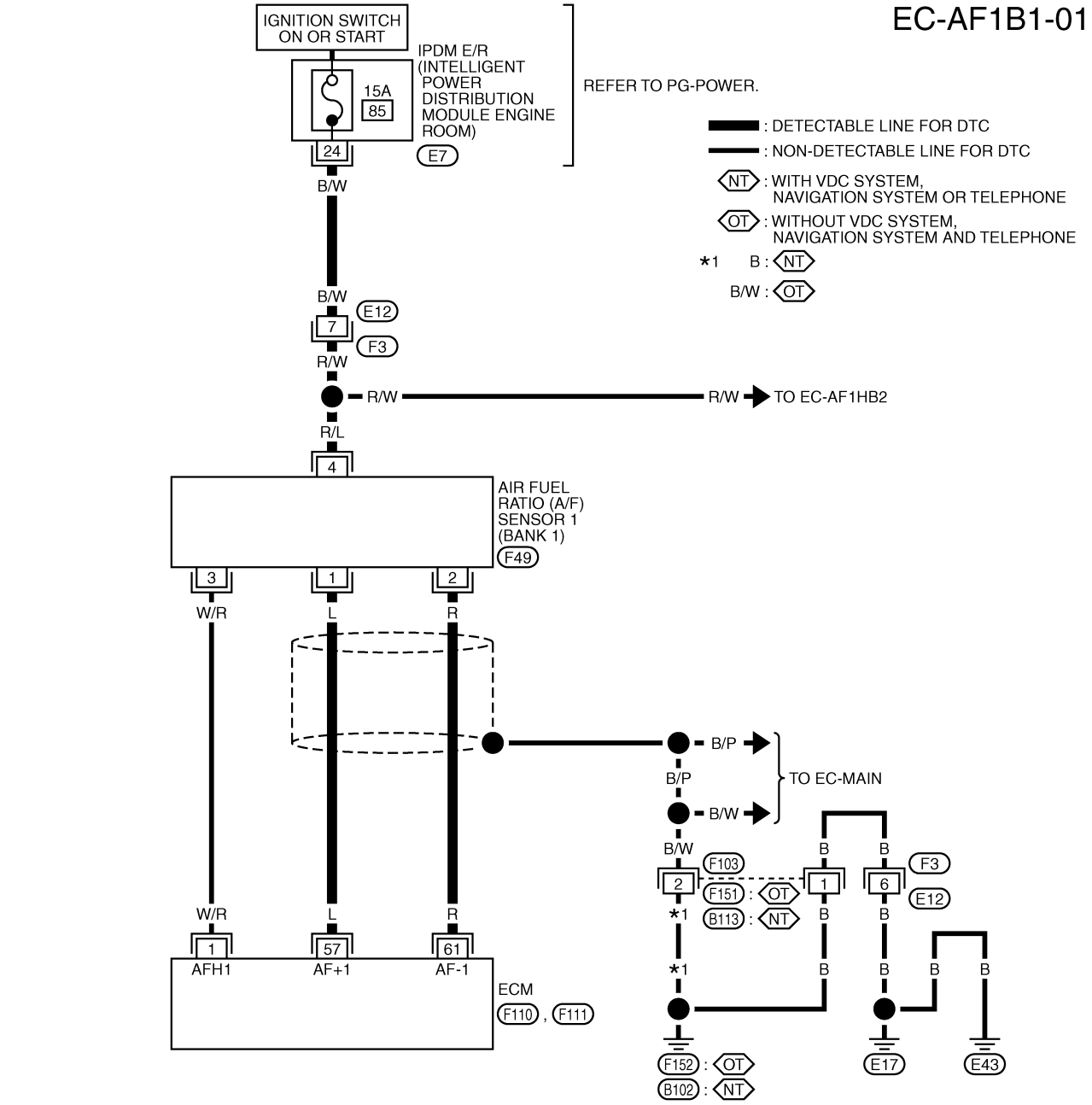
Use this procedure to check the overall function of the A/F sensor 1 circuit. During this check, a 1st trip DTC might not be confirmed.

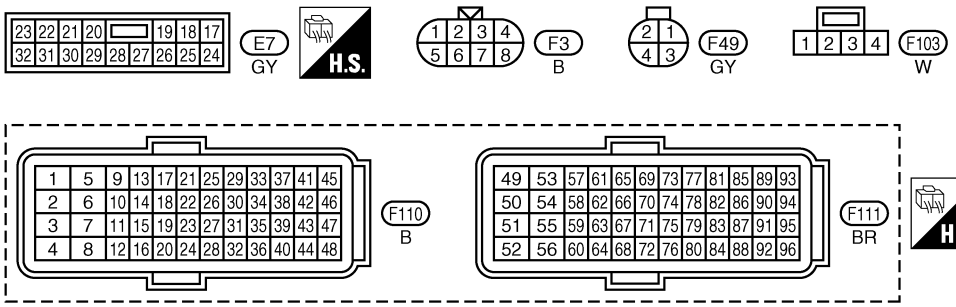
WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in the suitable gear position.
3. Set shift lever to D position (A/T) or 5th position (M/T), then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (30 MPH).
   NOTE:
   Never apply brake during releasing the accelerator pedal.
4. Repeat steps 2 and 3 for five times.
5. Stop the vehicle and turn ignition switch OFF.
6. Wait at least 10 seconds and restart engine.
7. Repeat steps 2 and 3 for five times.
8. Stop the vehicle and connect GST to the vehicle.
9. Make sure that no 1st trip DTC is displayed.
   If the 1st trip DTC is displayed, go to EC-254, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS006U8

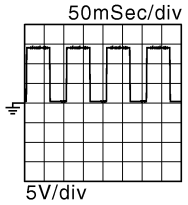




TBWT1632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

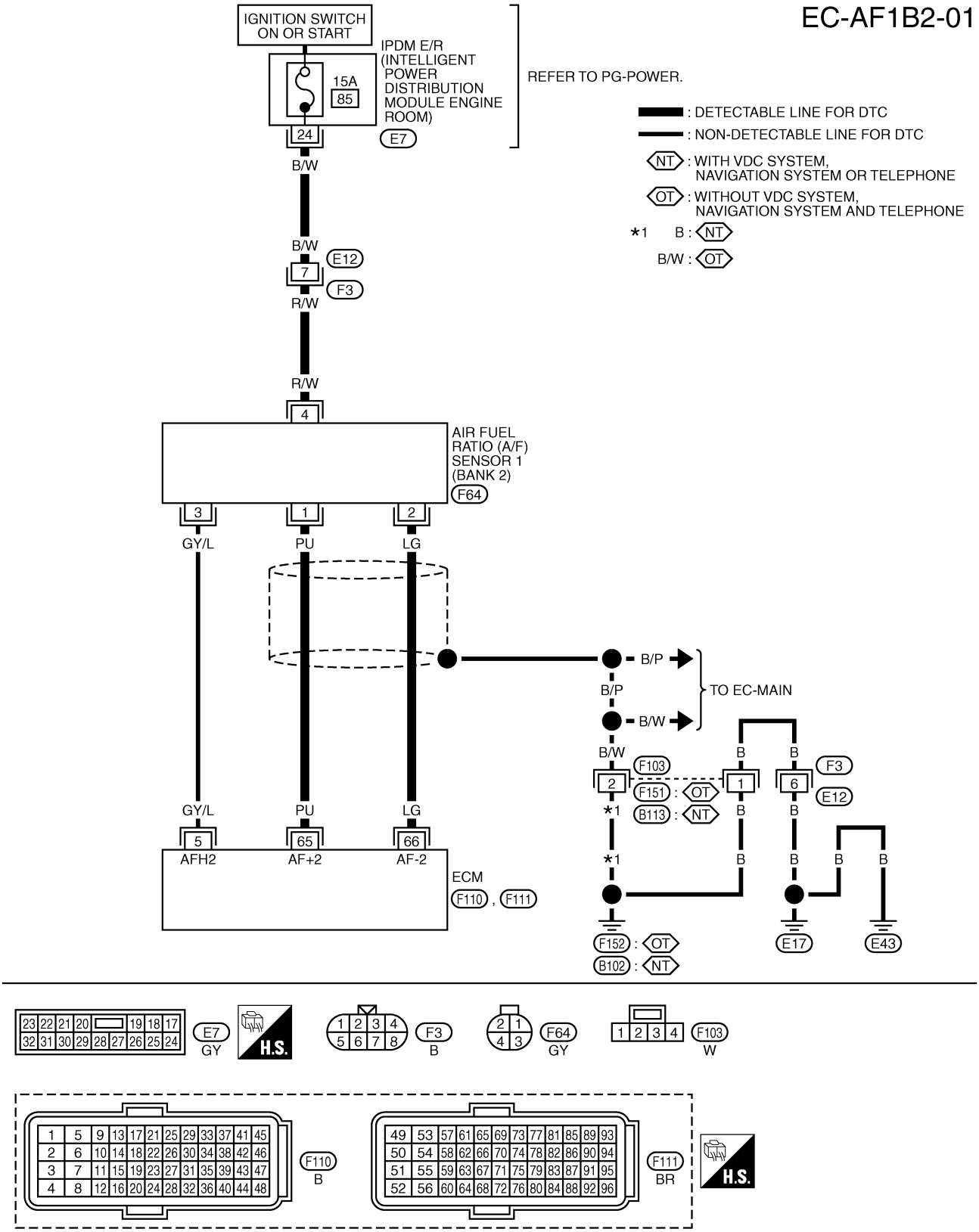
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

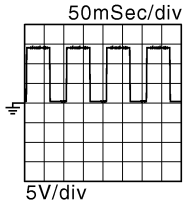
EC-AF1B2-01



TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★  PBIB3538E
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

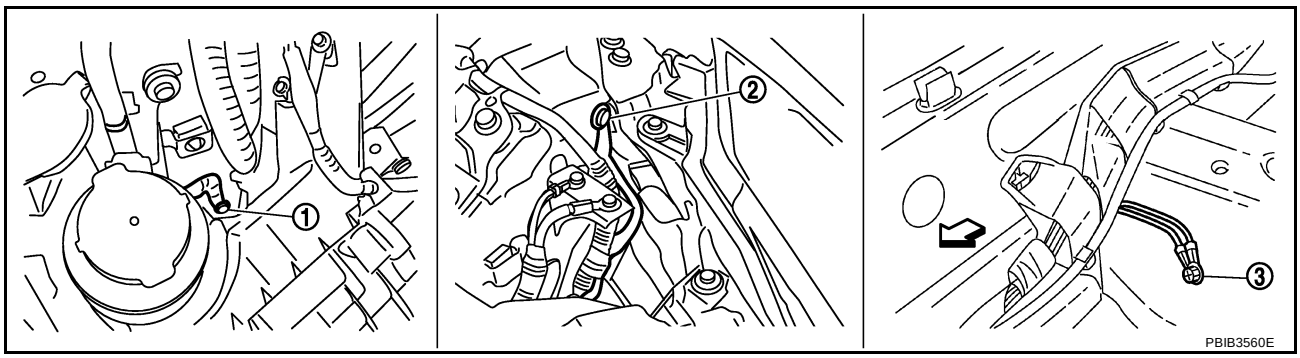
Diagnostic Procedure

NBS006U9

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

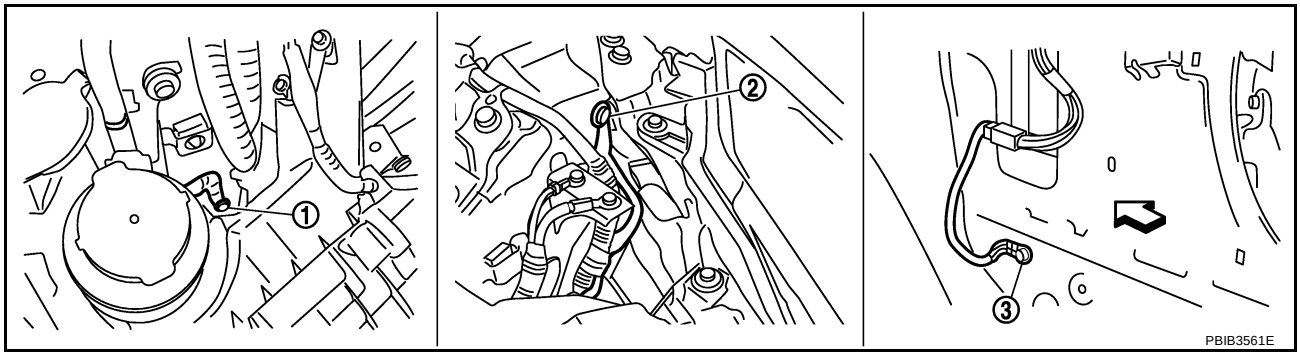


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

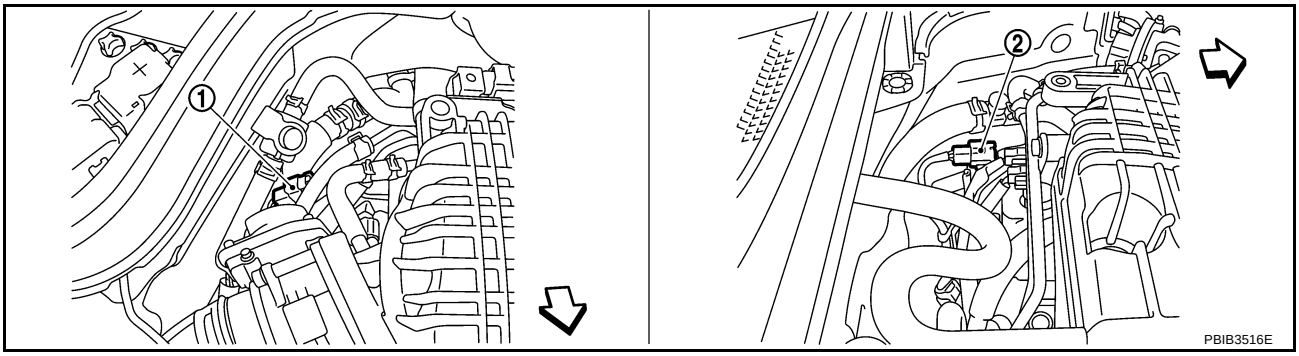
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

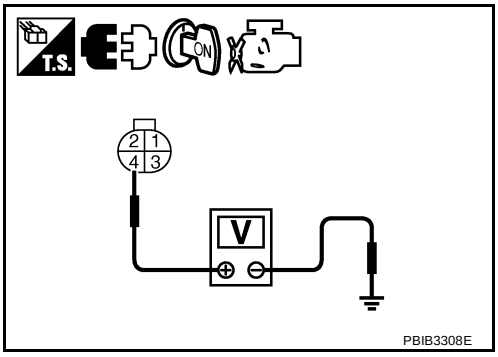


1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace.

6. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads (using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12) and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

NBS006UA

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0131, P0151 A/F SENSOR 1

PFP:22693

Component Description

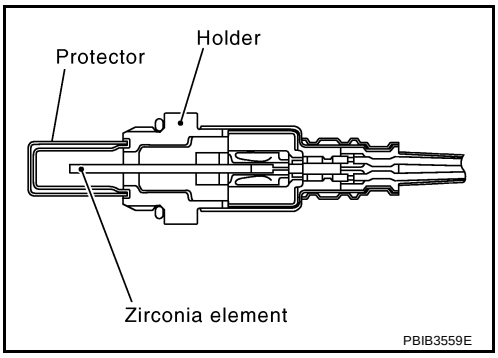
NBS006UB

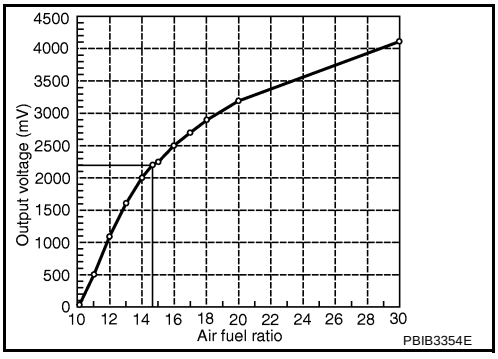
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS006UC

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS006UD

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0131 0131 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit low voltage	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 0V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P0151 0151 (Bank 2)			

DTC Confirmation Procedure

NBS006UE

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-III.
3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.
   If the indication is constantly approx. 0V, go to EC-263, "Diagnostic Procedure" .
   If the indication is not constantly approx. 0V, go to next step.
4. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
5. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.
6. Maintain the following conditions for about 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 MPH)
B/FUEL SCHDL	1.5 - 9.0 msec
Shift lever	Suitable position

NOTE:
- **Keep the accelerator pedal as steady as possible during the cruising.**
- **If this procedure is not completed within 1 minute after restarting engine at step 4, return to step 4.**

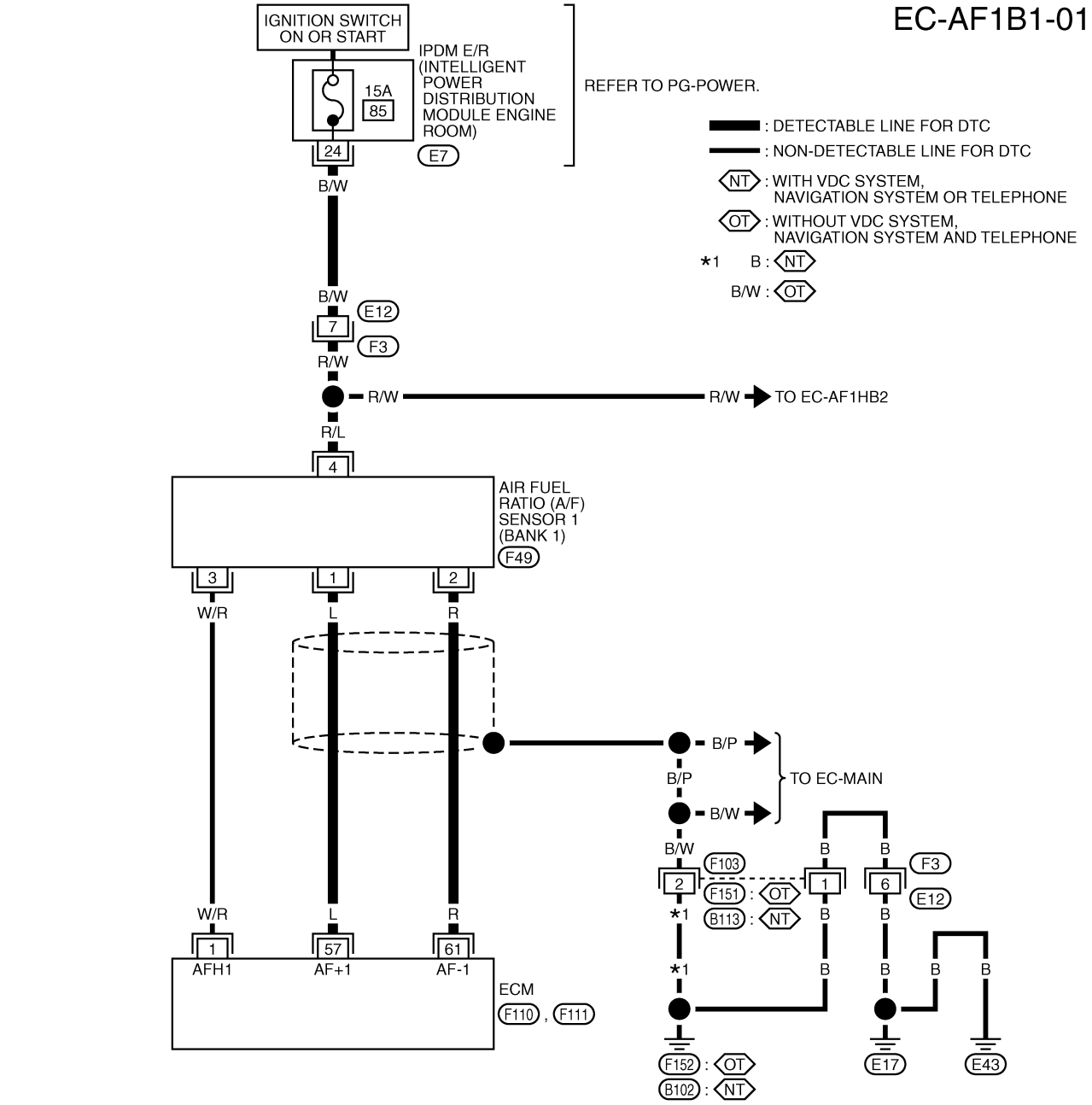
7. Check 1st trip DTC.
8. If 1st trip DTC is displayed, go to EC-263, "Diagnostic Procedure" .

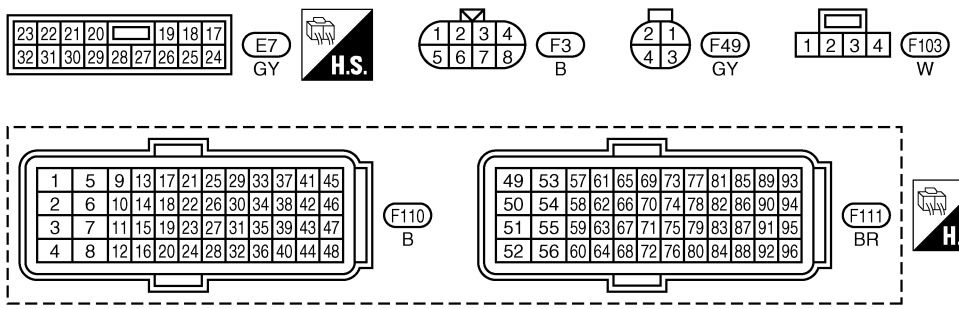
WITH GST

Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS006UF



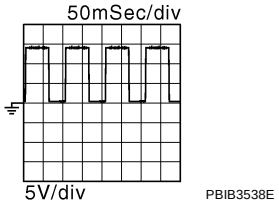


TBWT1632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

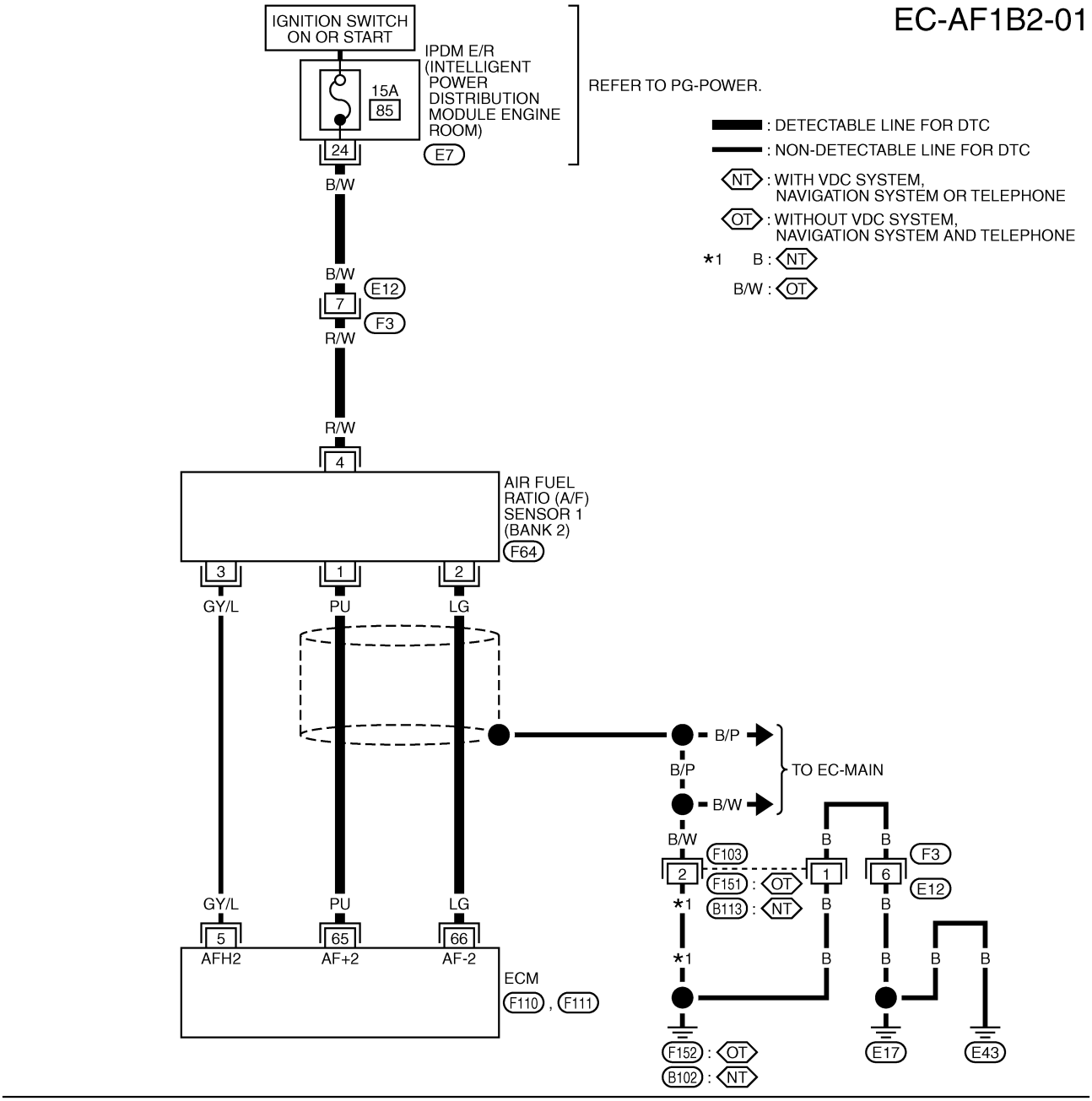
CAUTION:

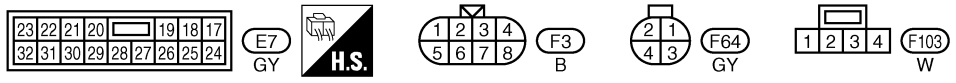
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

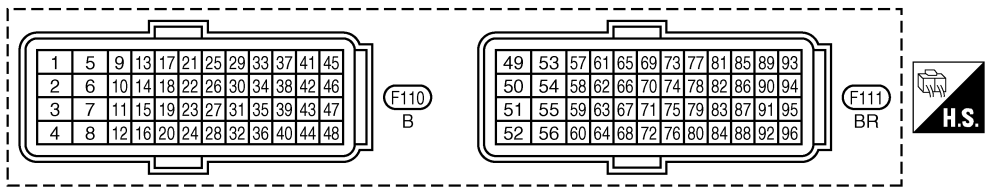
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★ 
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2





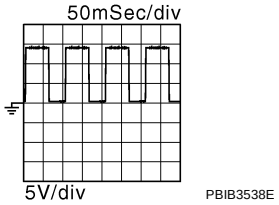


TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

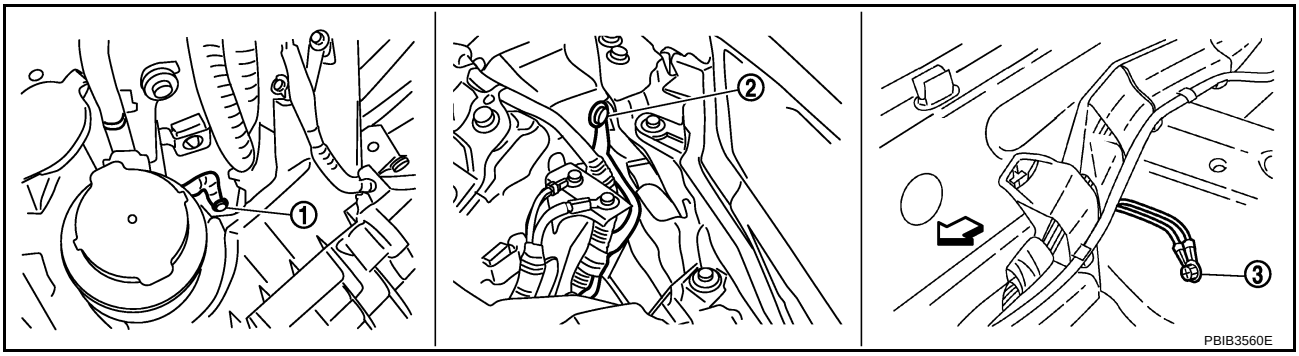
Diagnostic Procedure

NBS006UG

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

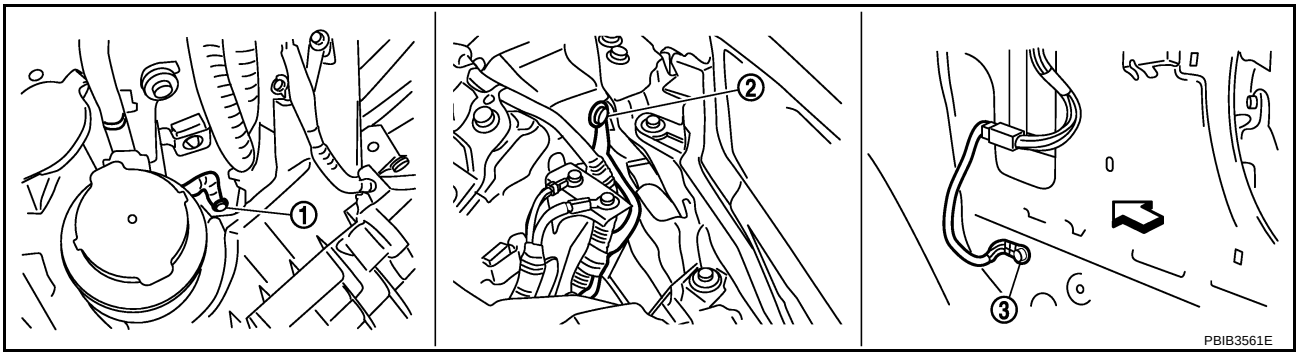


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

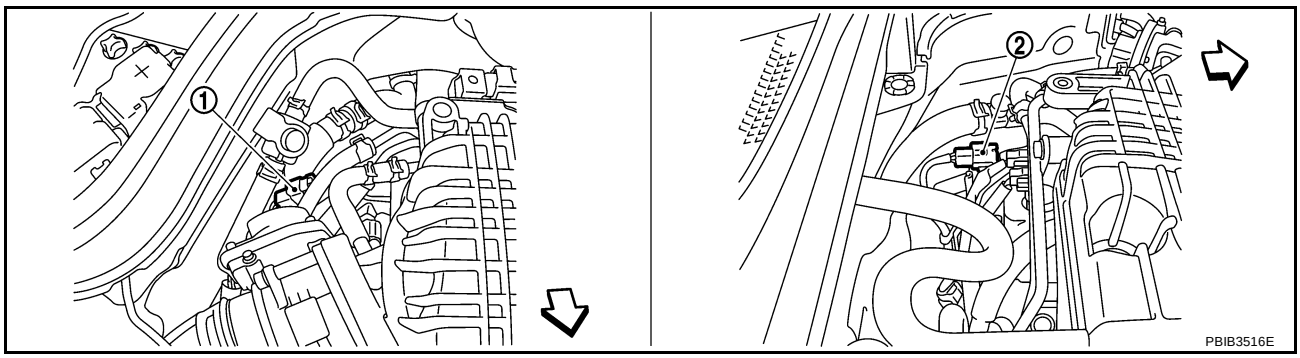
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

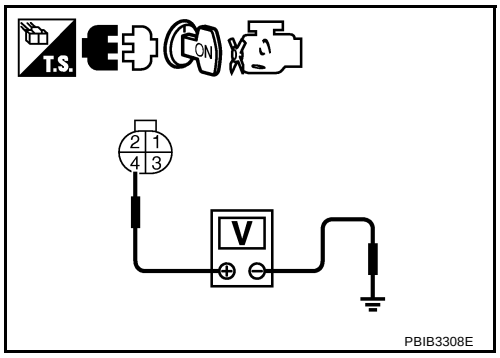


1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace.

6. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads (using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12) and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

NBS006UH

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0132, P0152 A/F SENSOR 1

PFP:22693

Component Description

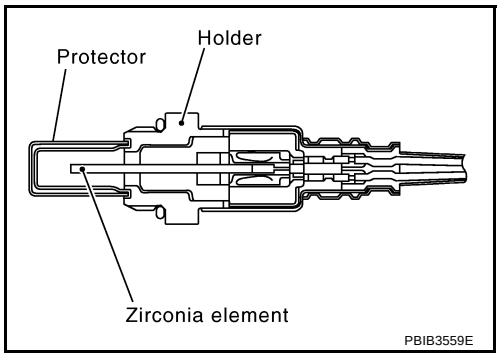
NBS006UI

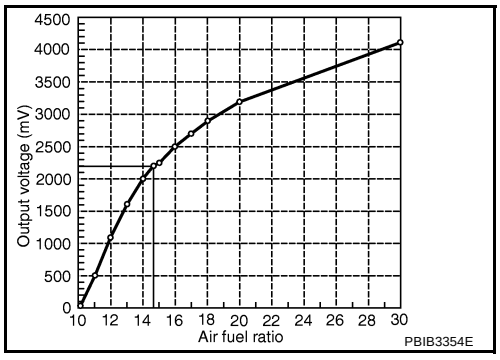
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS006UJ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS006UK

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0132 0132 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit high voltage	● The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 5V.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1
P0152 0152 (Bank 2)			

DTC Confirmation Procedure

NBS000EA

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

CAUTION:
Always drive vehicle at a safe speed.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “A/F SEN1 (B1)” or “A/F SEN1 (B2)” in “DATA MONITOR” mode with CONSULT-III.
3. Check “A/F SEN1 (B1)” or “A/F SEN1 (B2)” indication.
   If the indication is constantly approx. 5V, go to EC-272, "Diagnostic Procedure" .
   If the indication is not constantly approx. 5V, go to next step.
4. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
5. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.
6. Maintain the following conditions for about 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 MPH)
B/FUEL SCHDL	1.5 - 9.0 msec
Shift lever	Suitable position

NOTE:
- **Keep the accelerator pedal as steady as possible during the cruising.**
- **If this procedure is not completed within 1 minute after restarting engine at step 4, return to step 4.**

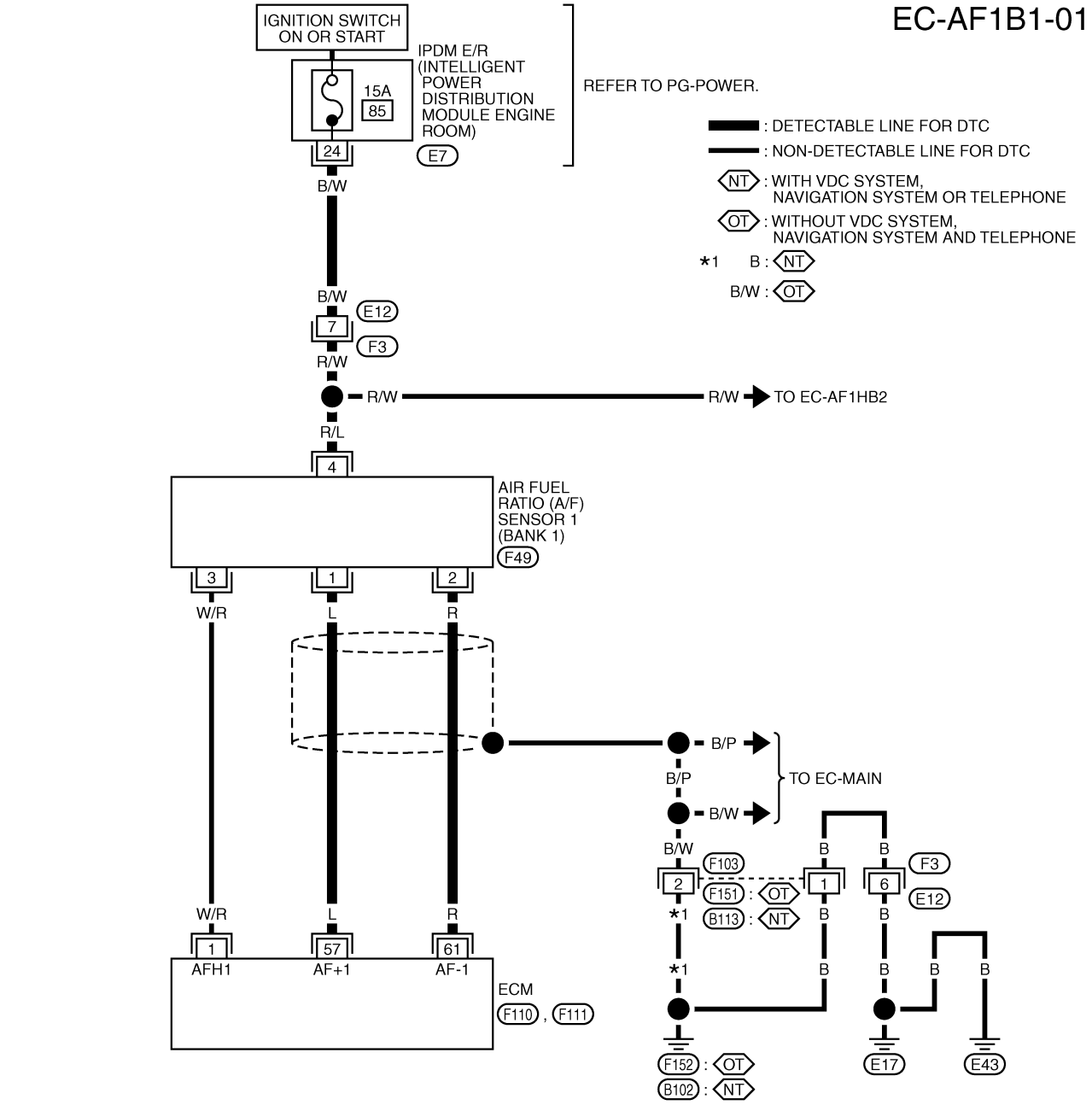
7. Check 1st trip DTC.
8. If 1st trip DTC is displayed, go to EC-272, "Diagnostic Procedure" .

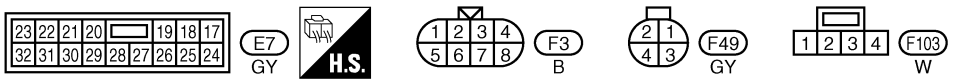
WITH GST

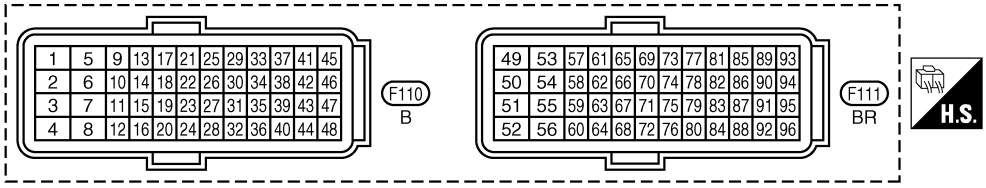
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS006UL



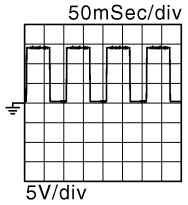




TBWT1632E

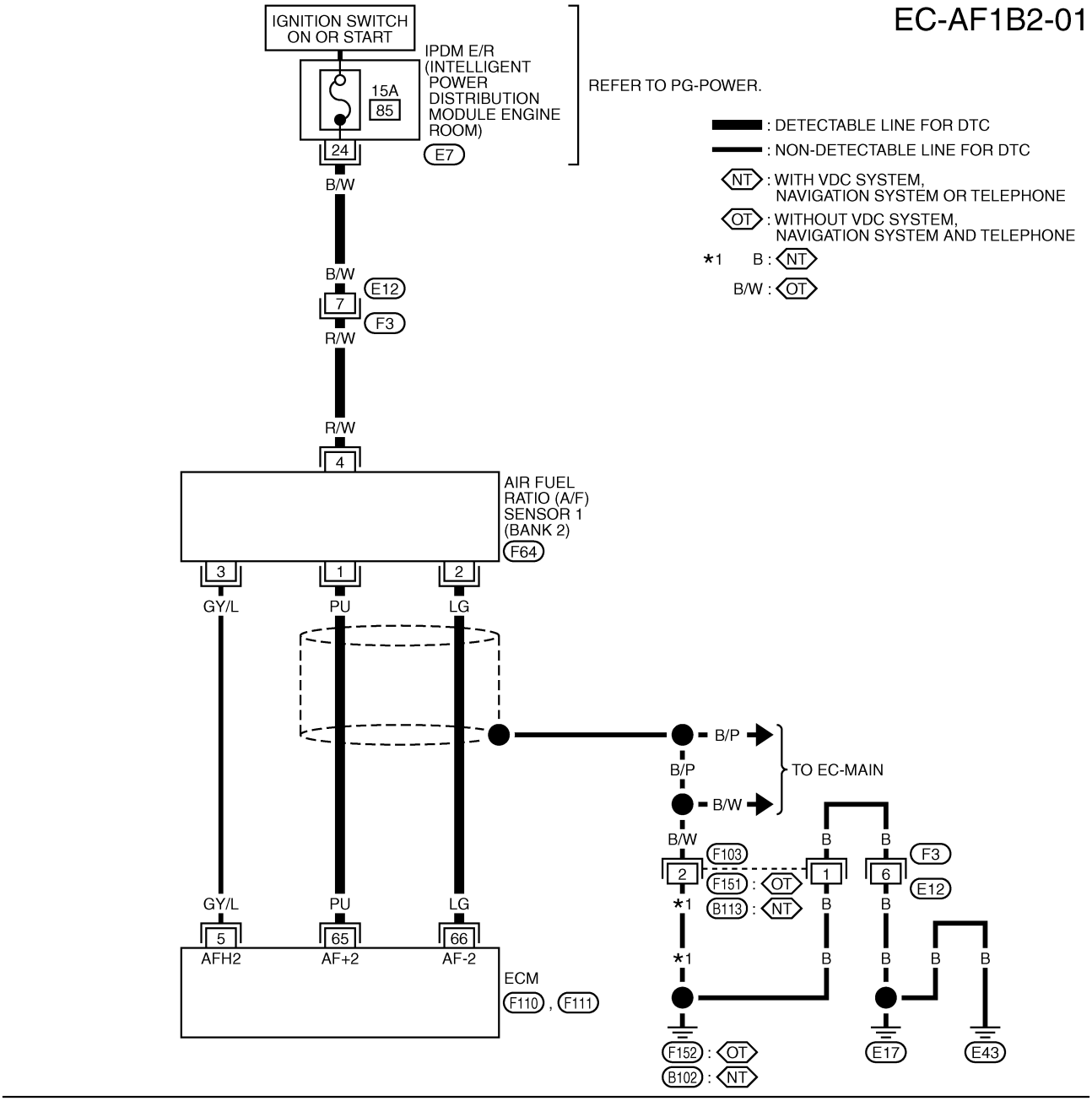
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

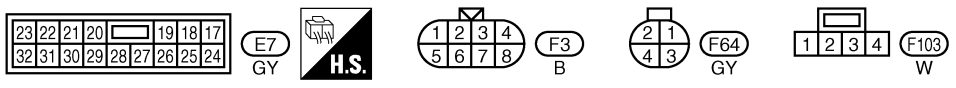
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

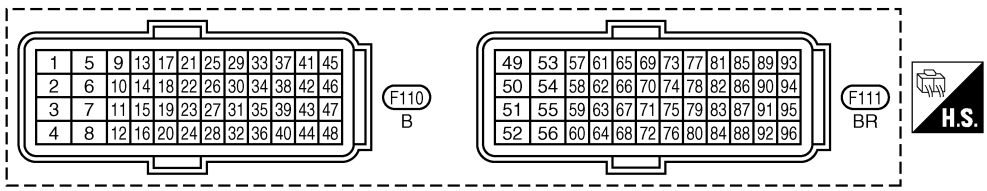
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2



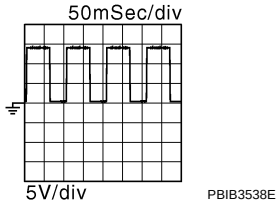




TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

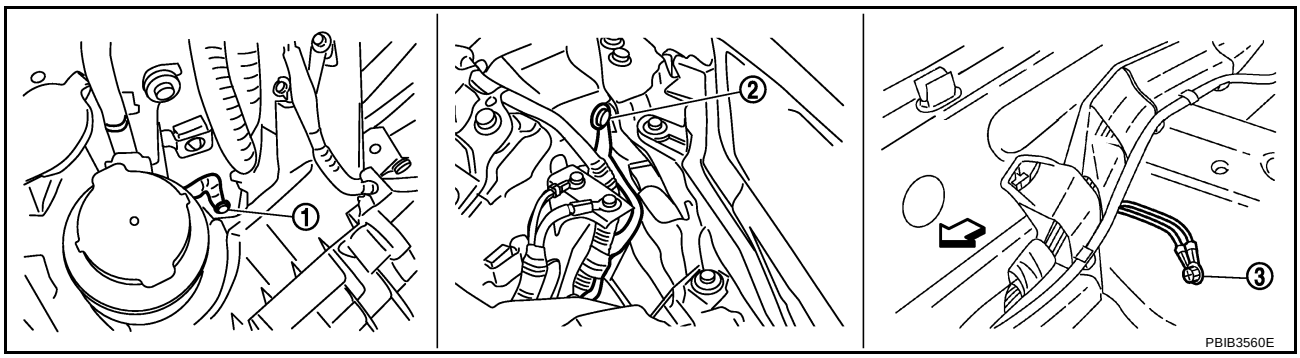
Diagnostic Procedure

NBS006UM

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

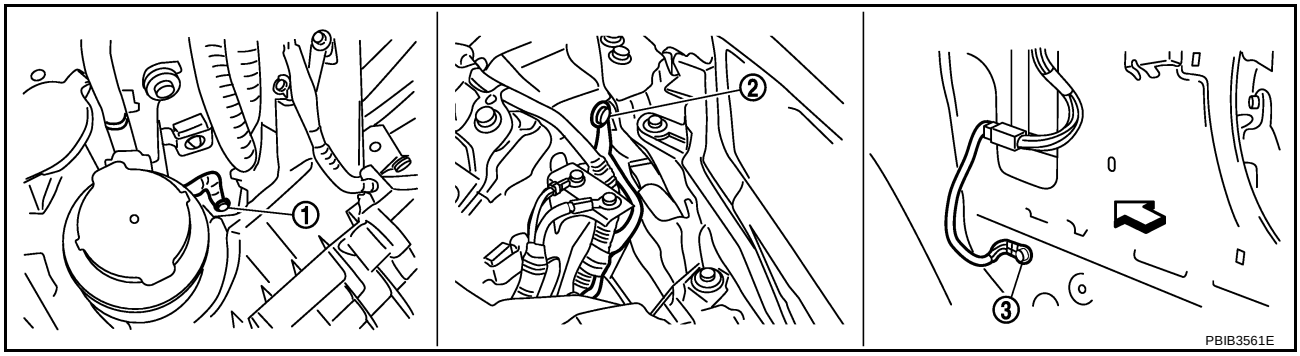


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

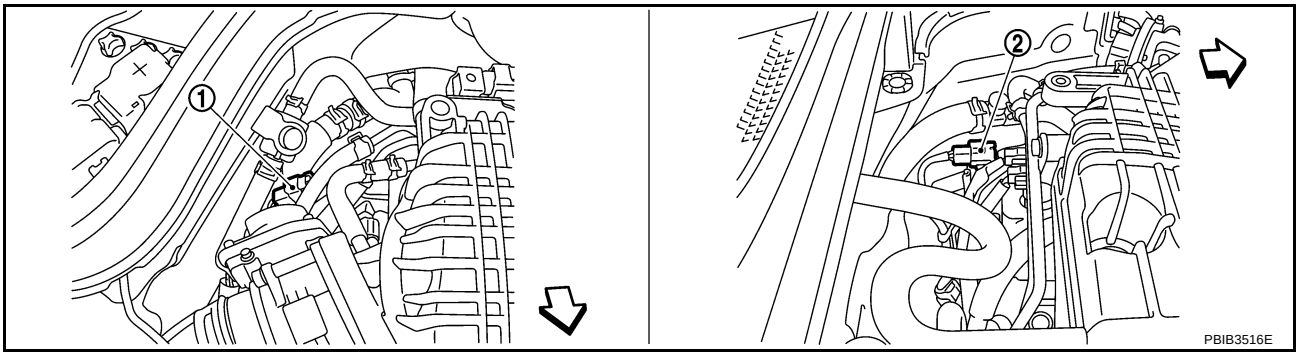
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.

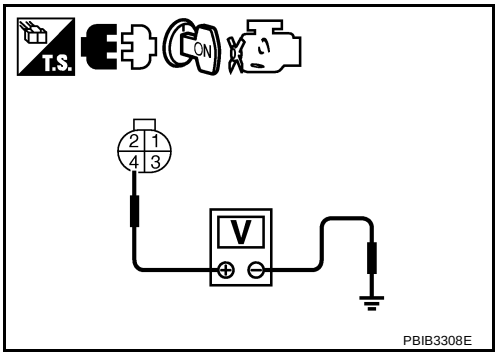


1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

2. Turn ignition switch ON.
3. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace.

6. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads (using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12) and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

NBS006UN

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0133, P0153 A/F SENSOR 1

PFP:22693

Component Description

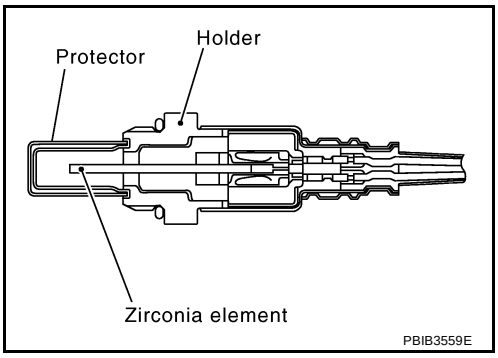
NBS006UO

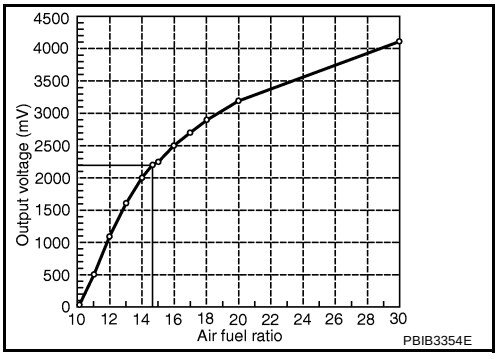
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS006UP

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS000F2

To judge the malfunction of A/F sensor 1, this diagnosis measures response time of the A/F signal computed by ECM from the A/F sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and the A/F sensor 1 temperature index. Judgment is based on whether the compensated time (the A/F signal cycling time index) is inordinately long or not.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P0133 0133 (Bank 1)	Air fuel ratio (A/F) sensor 1 circuit slow response	● The response of the A/F signal computed by ECM from A/F sensor 1 signal takes more than the specified time.	● Harness or connectors (The A/F sensor 1 circuit is open or shorted.) ● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater ● Fuel pressure ● Fuel injector ● Intake air leaks ● Exhaust gas leaks ● PCV valve ● Mass air flow sensor
P0153 0153 (Bank 2)			

DTC Confirmation Procedure

NBS000F3

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1minute under no load.
4. Let engine idle for 1 minute.
5. Select “A/F SEN1(B1) P1278/P1279” (for DTC P0133) or “A/F SEN1(B2) P1288/P1289” (for DTC P0153) of “A/F SEN1” in “DTC WORK SUPPORT” mode with CONSULT-III.
6. Touch “START”.
   If “COMPLETED” appears on CONSULT-III screen, go to step 10.
   If “COMPLETED” does not appear on CONSULT-III screen, go to the following step.
7. After perform the following procedure, “TESTING” will be displayed on the CONSULT-III screen.

a. Increase the engine speed up to 4,000 to 5,000 rpm and keep it for 10 seconds.
b. Fully release accelerator pedal and then let engine idle for about 10 seconds.
   If “TESTING” is not displayed after 10 seconds, refer to EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .

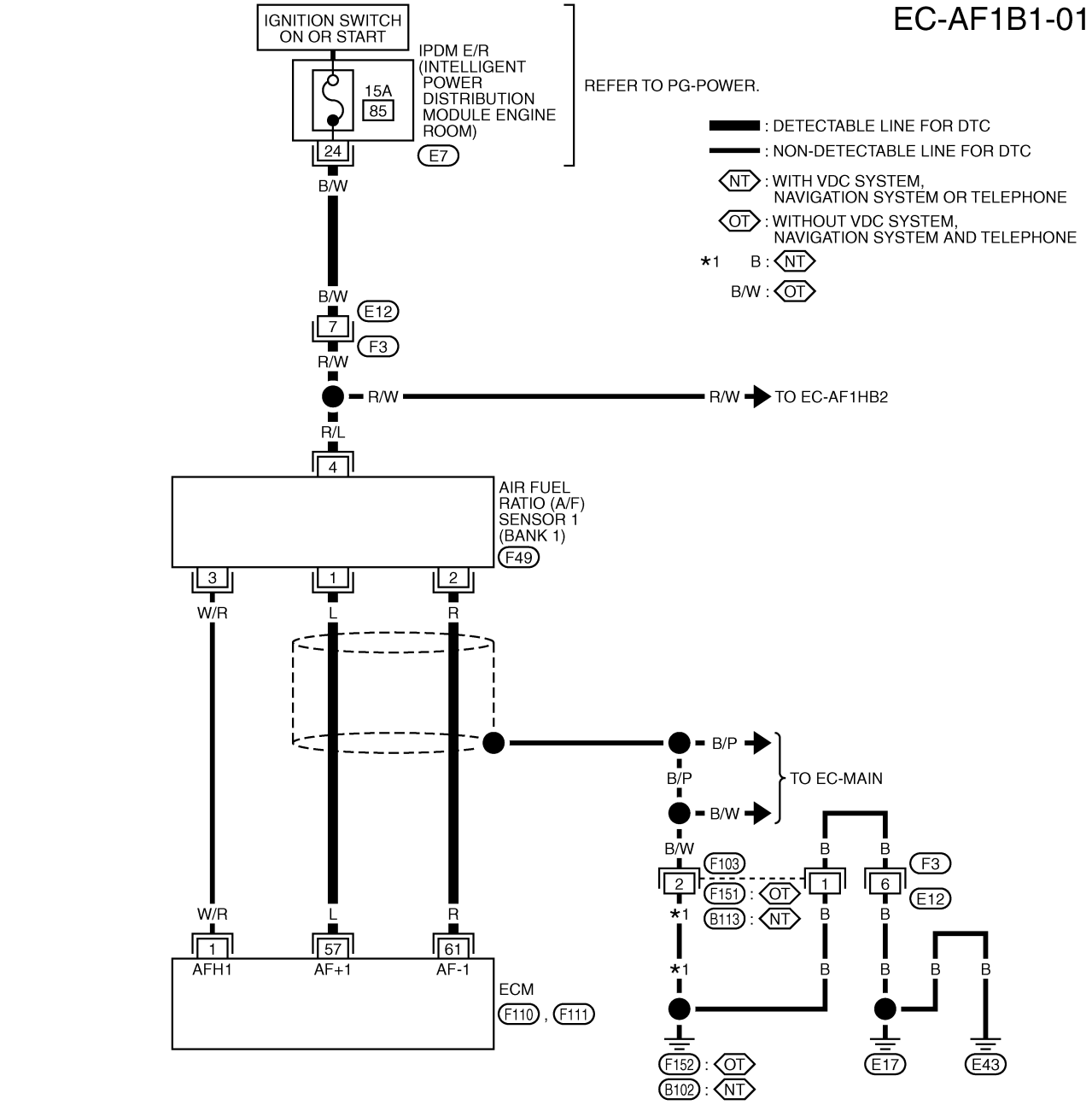
8. Wait for about 20 seconds at idle at under the condition that “TESTING” is displayed on the CONSULT-III screen.
9. Make sure that “TESTING” changes to “COMPLETED”.
   If “TESTING” changed to “OUT OF CONDITION”, refer to EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .
10. Make sure that “OK” is displayed after touching “SELF-DIAG RESULT”.
    If “NG” is displayed, go to EC-281, "Diagnostic Procedure" .

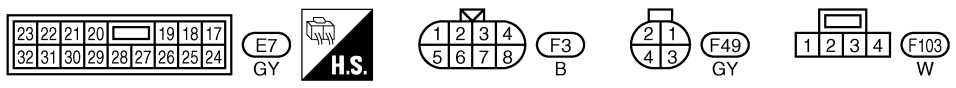
WITH GST

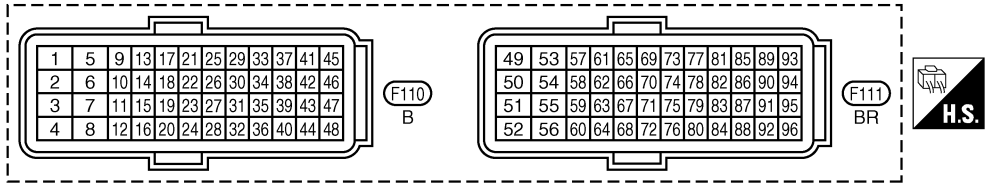
1. Start engine and warm it up to normal operating temperature.
2. Select Service $01 with GST.
3. Calculate the total value of “Short term fuel trim” and “Long term fuel trim” indications.
   Make sure that the total percentage should be within ±15%.
   If OK, go to the following step.
   If NG, check the following.
   - Intake air leaks
   - Exhaust gas leaks
   - Incorrect fuel pressure
   - Lack of fuel
   - Fuel injector
   - Incorrect PCV hose connection
   - PCV valve
   - Mass air flow sensor
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1minute under no load.
6. Let engine idle for 1 minute.
7. Increase the engine speed up to 4,000 to 5,000 rpm and keep it for 10 seconds.
8. Fully release accelerator pedal and then let engine idle for about 1 minute.
9. Select Service $07 with GST.
   If 1st trip DTC is detected, go to EC-281, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS006UQ





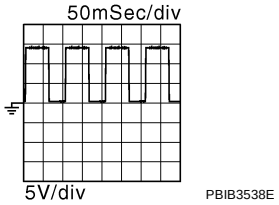


TBWT1632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

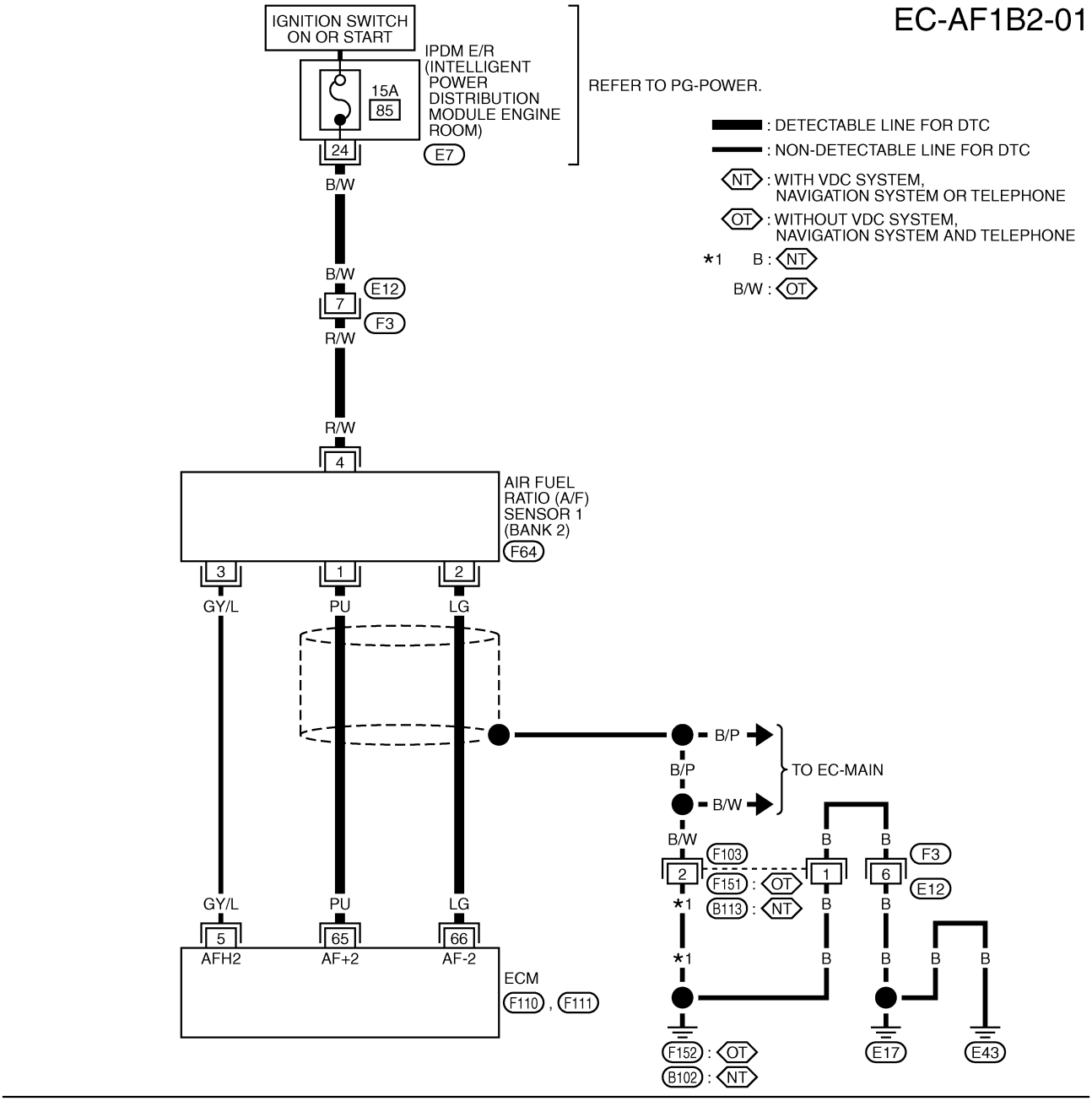
CAUTION:

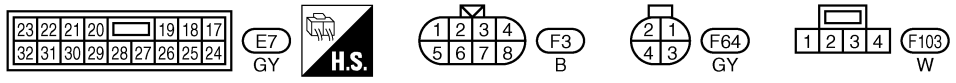
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

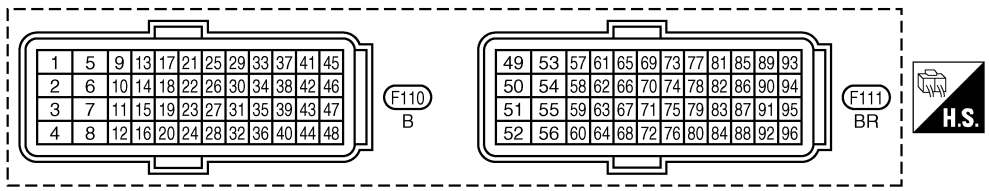
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★ 
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2





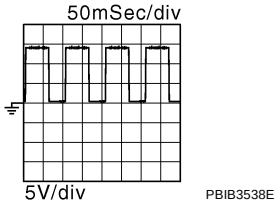


TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

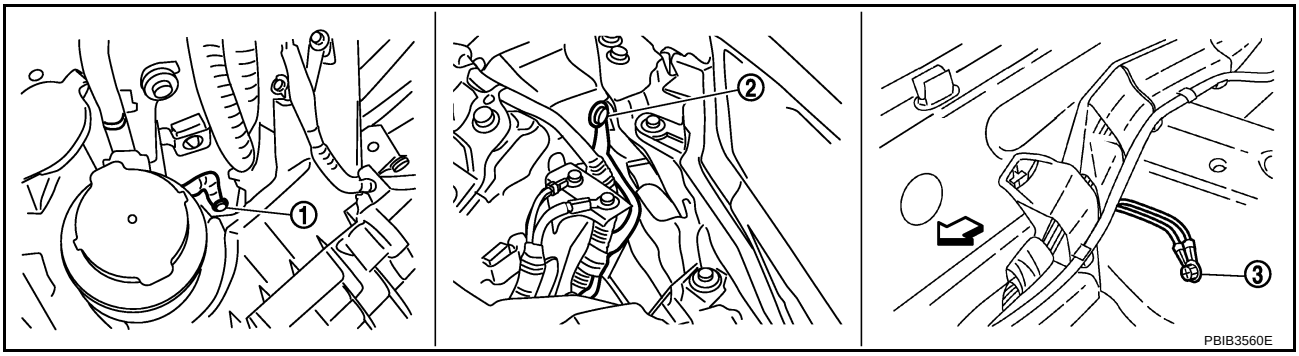
Diagnostic Procedure

NBS006UR

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

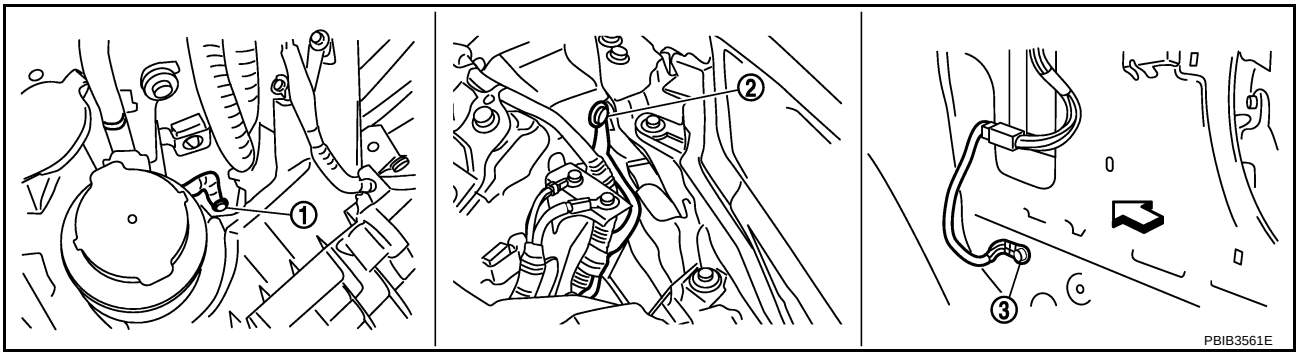


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

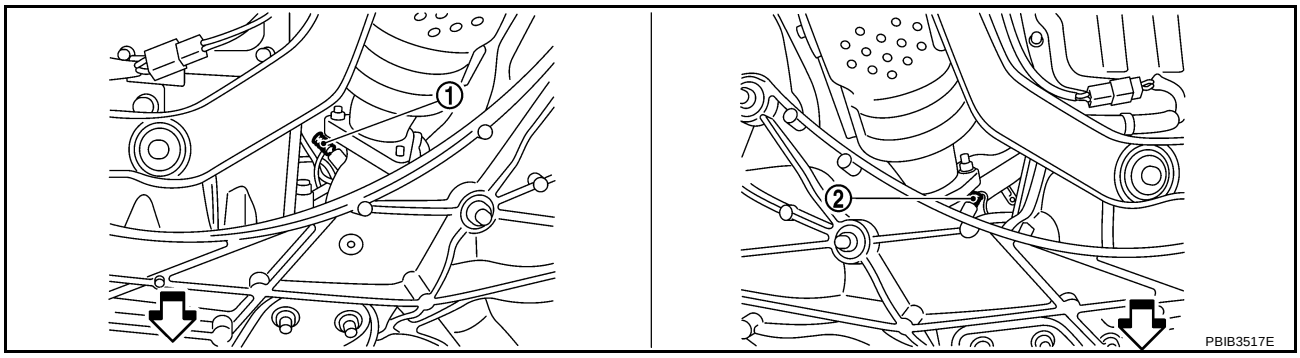
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. RETIGHTEN AIR FUEL RATIO (A/F) SENSOR 1

Loosen and retighten the air fuel ratio (A/F) sensor 1.



1. A/F sensor 1 (bank 1)
2. A/F sensor 1 (bank 2)

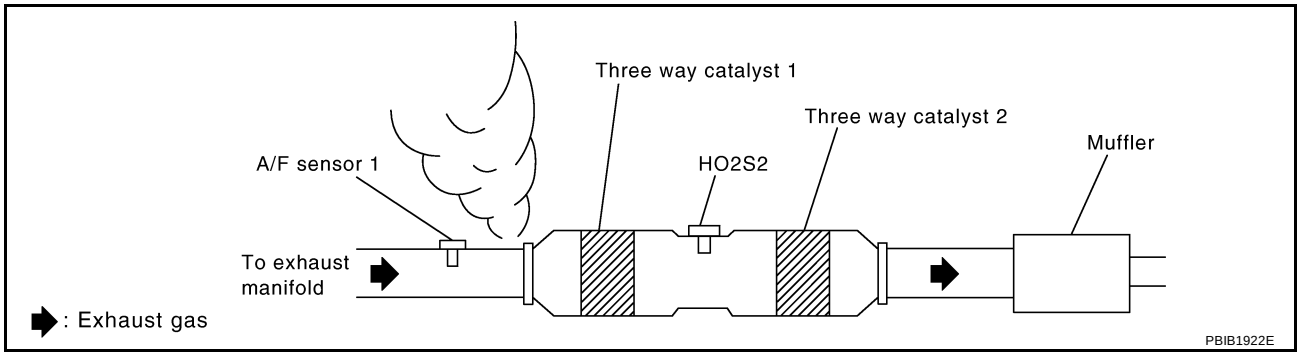
⇦: Vehicle front

Tightening torque: 50 N-m (5.1 kg-m, 37 ft-lb)

>> GO TO 3.

3. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace.

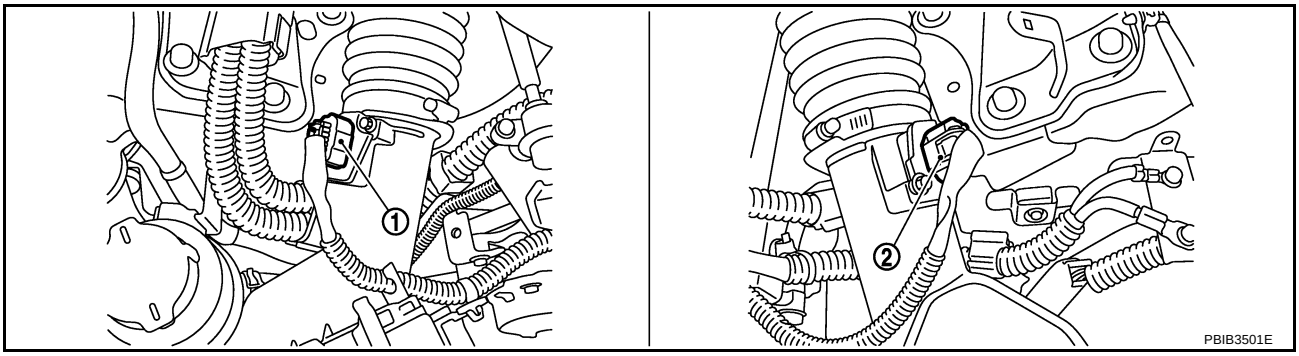
5. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR” or “START”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0174 or P0172 or P0175 detected? Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.
9. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0174 or P0172 or P0175 detected? Is it difficult to start engine?

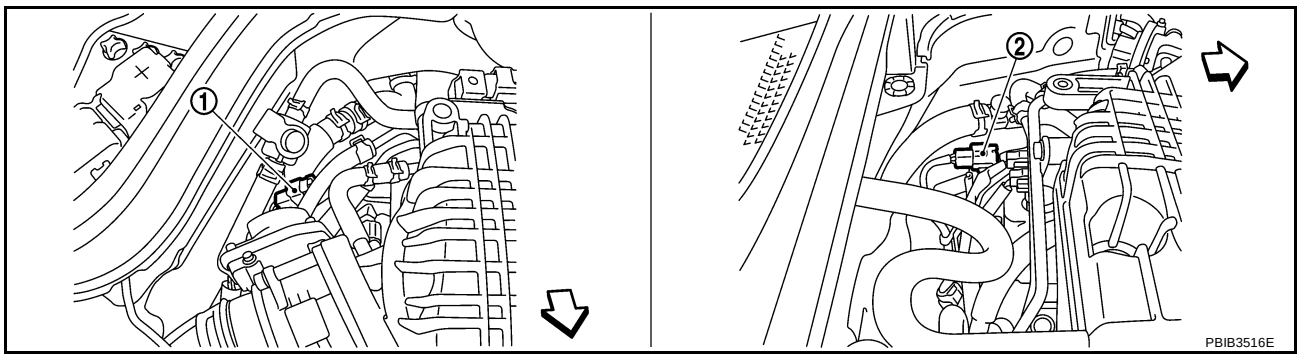
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-324, "DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION" or EC-334, "DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 6.

6. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.

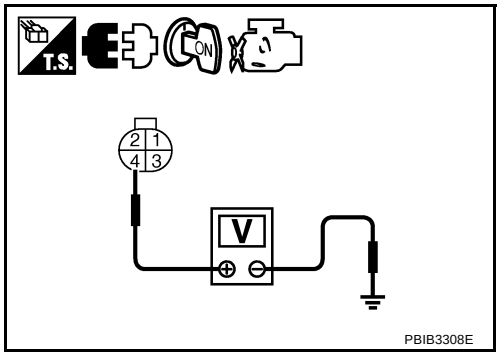


1. A/F sensor 1 harness connector (bank 1)
2. A/F sensor 1 harness connector (bank 2)

⇦: Vehicle front

3. Turn ignition switch ON.
4. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

8. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to EC-172, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace malfunctioning A/F sensor 1.

10. CHECK MASS AIR FLOW SENSOR

Refer to EC-206, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace malfunctioning mass air flow sensor.

11. CHECK PCV VALVE

Refer to EC-44, "POSITIVE CRANKCASE VENTILATION" .

OK or NG

OK >> GO TO 12.
NG >> Repair or replace PCV valve.

12. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 13.
NG >> Repair or replace.

13. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads (using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12) and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

NBS006US

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

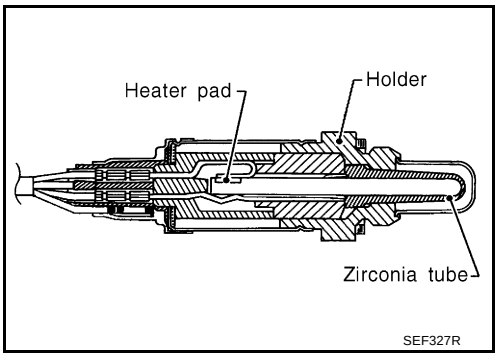
DTC P0137, P0157 HO2S2

PFP:226A0

Component Description

NBS000CW

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-III Reference Value in Data Monitor Mode

NBS000CX

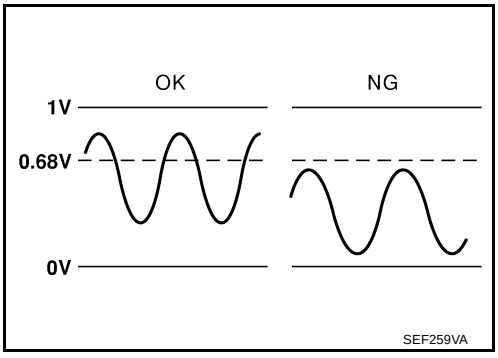
Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	LEAN ←→ RICH

On Board Diagnosis Logic

NBS000CY

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity before the three way catalyst 1 causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the maximum voltage of the sensor is sufficiently high during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0137 0137 (Bank 1) P0157 0157 (Bank 2)	Heated oxygen sensor 2 circuit low voltage	The maximum voltage from the sensor is not reached to the specified voltage.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector ● Intake air leaks

DTC Confirmation Procedure

NBS000CZ

NOTE:
If DTC confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

TESTING CONDITION:
For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30 °C (32 to 86 °F).

1. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that "COOLAN TEMP/S" indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).
7. Open engine hood.
8. Select "HO2S2 (B1) P1147" (for DTC P0137) or "HO2S2 (B2) P1167" (for DTC P0157) of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT-III.
9. Start engine and following the instruction of CONSULT-III.

   NOTE:
   It will take at most 10 minutes until "COMPLETED" is displayed.
10. Make sure that "OK" is displayed after touching "SELF-DIAG RESULTS".
    If "NG" is displayed, refer to EC-293, "Diagnostic Procedure" .
    If "CAN NOT BE DIAGNOSED" is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).

b. Return to step 1.

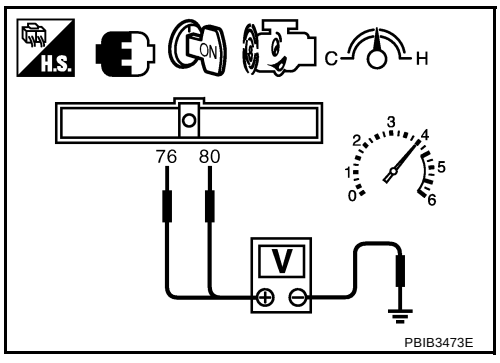
Overall Function Check

NBS000D0

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.68V at least once during this procedure.
   If the voltage can be confirmed in step 6, step 7 is not necessary.

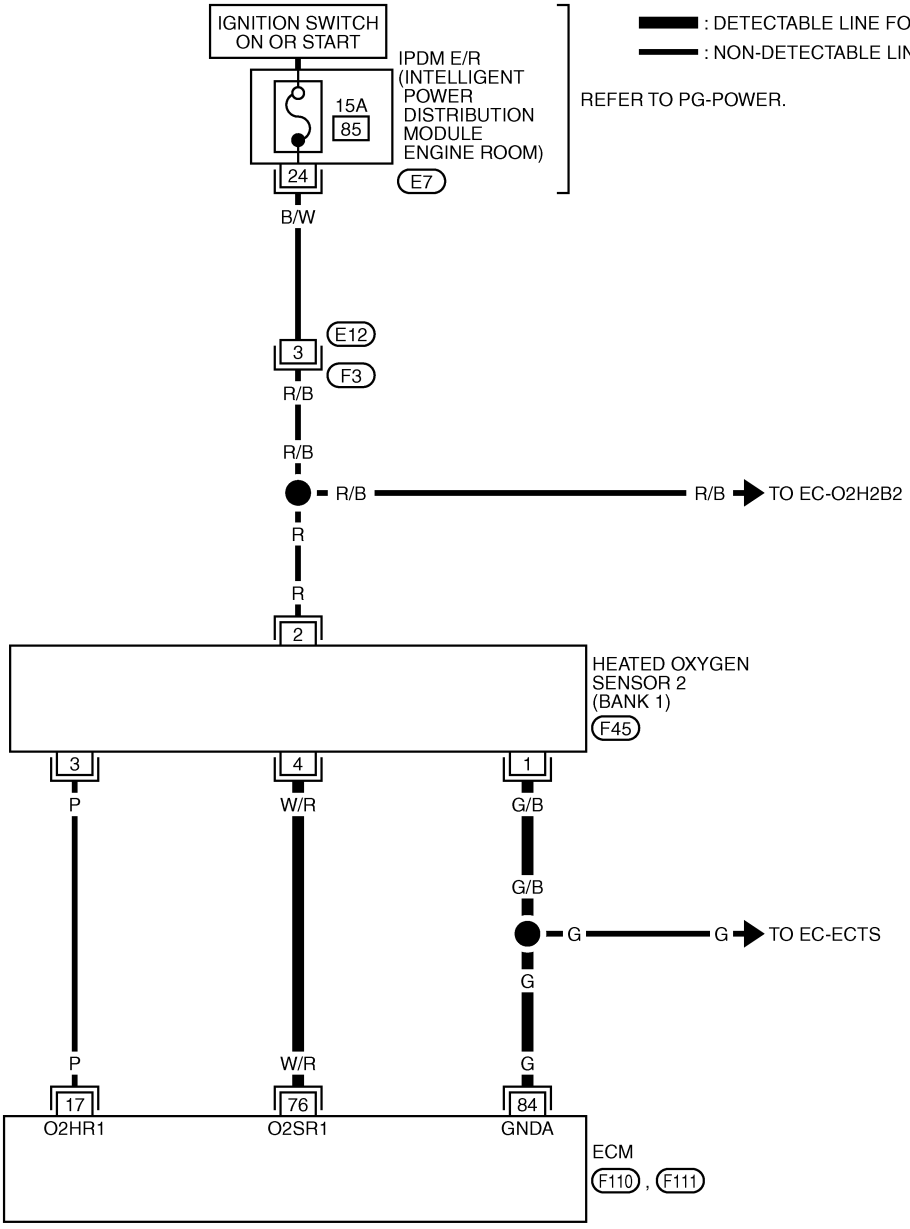


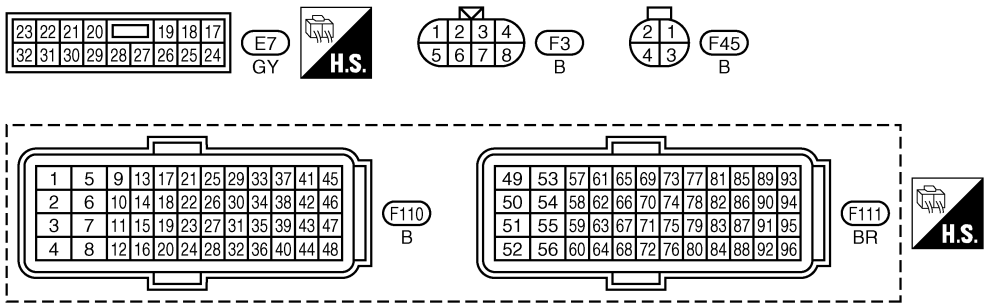
7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be above 0.68V at least once during this procedure.
8. If NG, go to EC-293, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS000D1

EC-O2S2B1-01



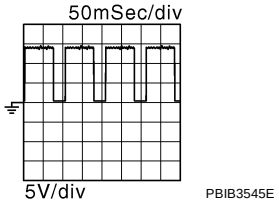


TBWT1634E

Specification data are reference values and are measured between each terminal and ground.

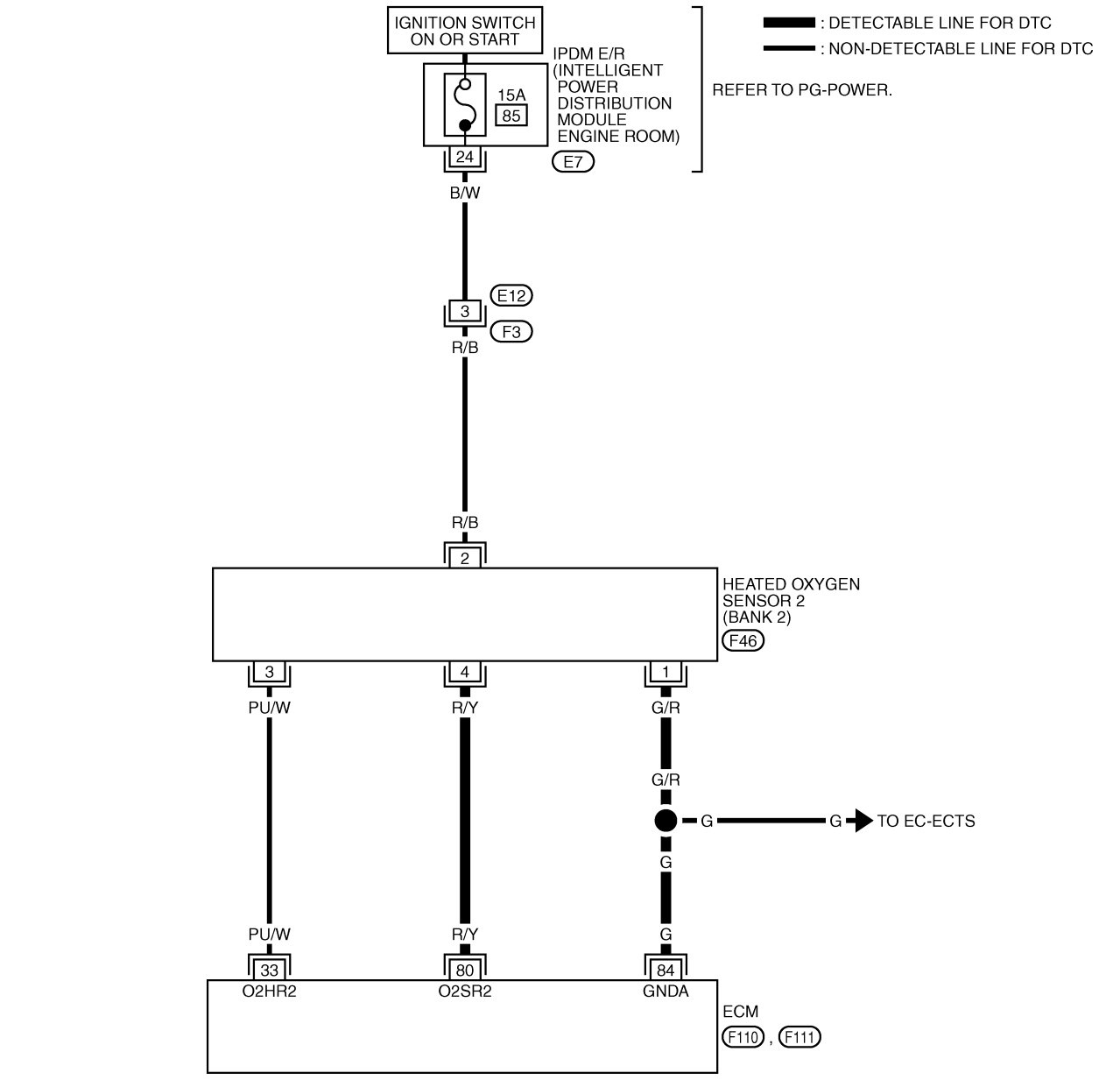
CAUTION:

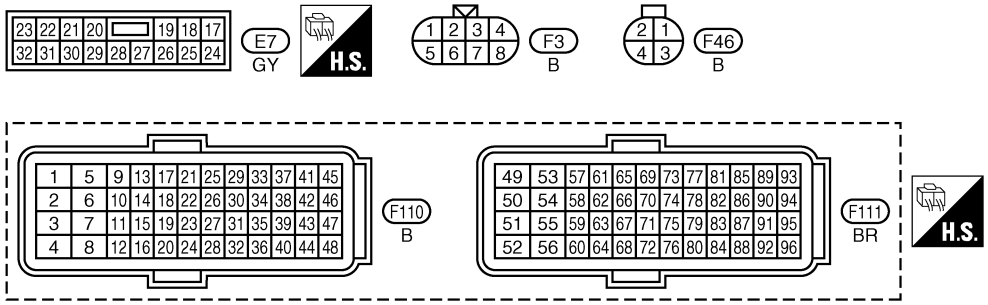
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

BANK 2

EC-O2S2B2-01



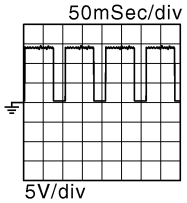


TBWT1635E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

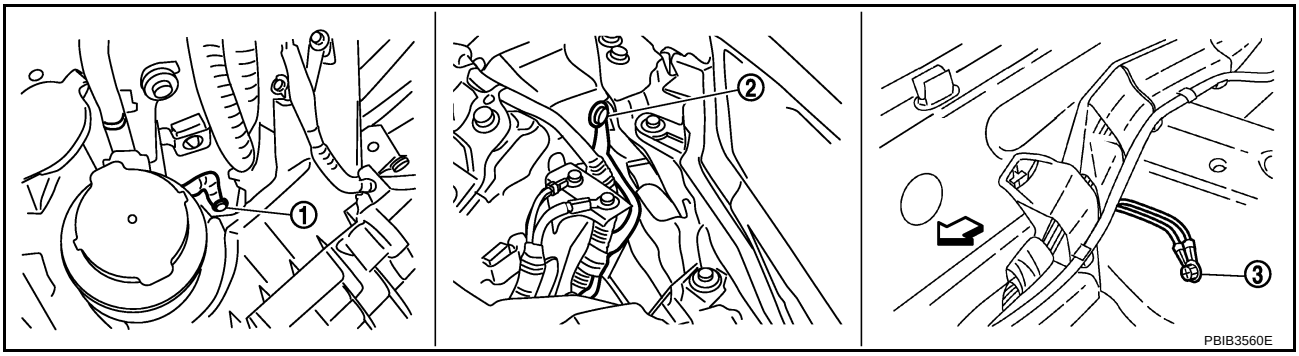
Diagnostic Procedure

NBS000D2

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

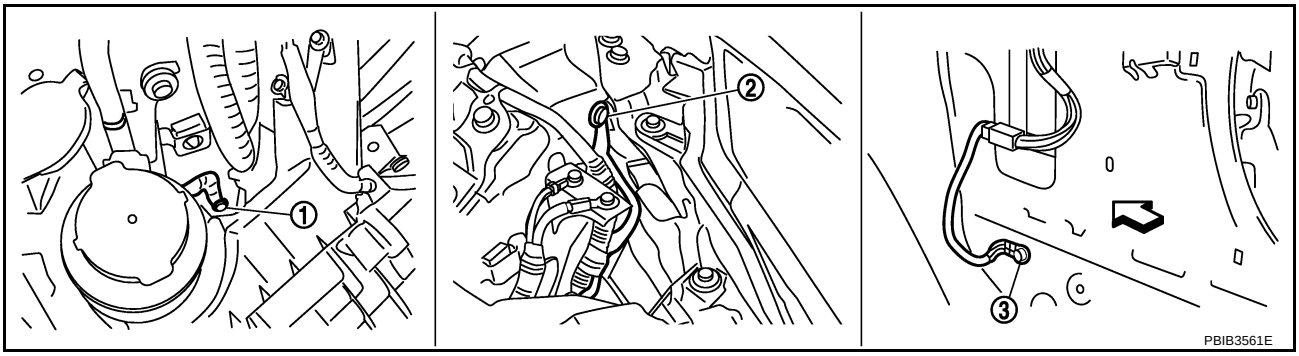


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

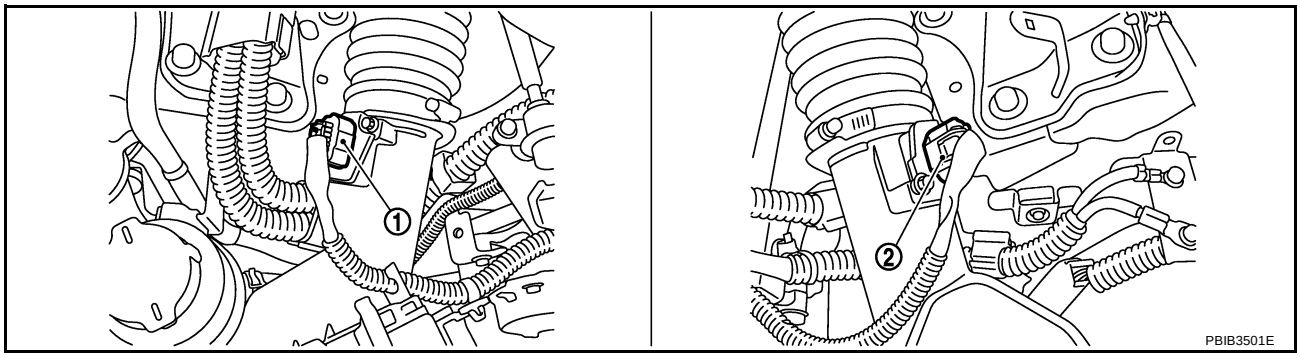
2. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171 or P0174 detected?
   Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector, and restart and run engine for at least 5 seconds at idle speed.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171 or P0174 detected?
   Is it difficult to start engine?

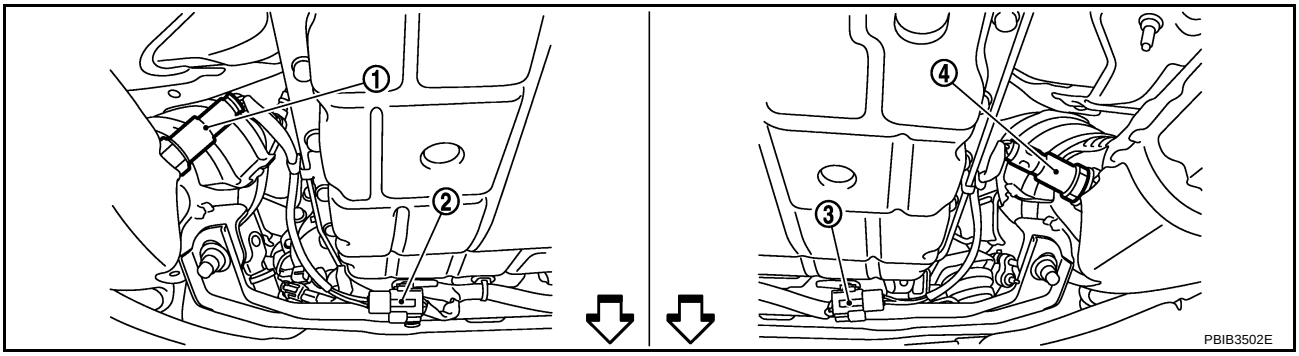
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171or P0174. Refer to EC-324, "DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect heated oxygen sensor 2 harness connector.



1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

4. Check harness continuity between HO2S2 terminal 1 and ECM terminal 84. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0137	76	4	1
P0157	80	4	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0137	76	4	1
P0157	80	4	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-296, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

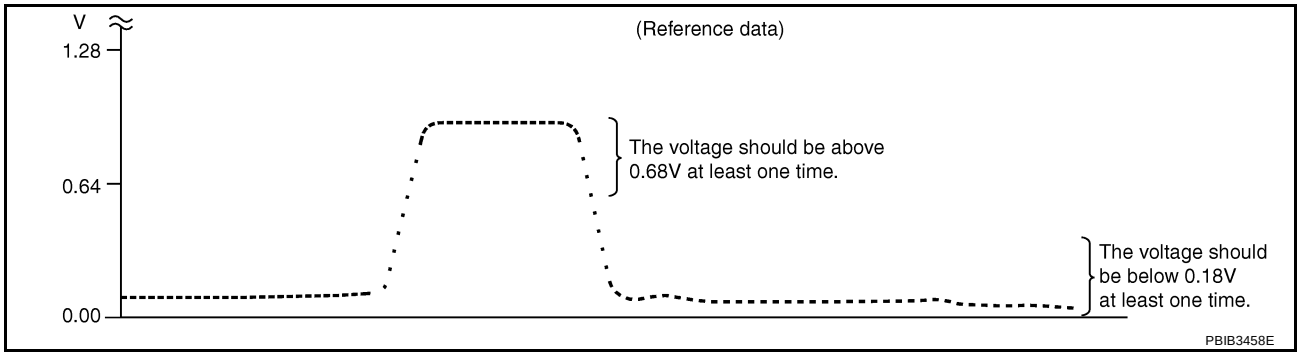
Component Inspection

NBS000D3

HEATED OXYGEN SENSOR 2

With CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-III.
7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.68V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is −25%.

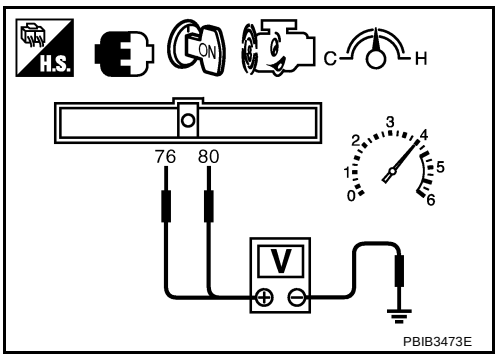
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
(Depress and release accelerator pedal as soon as possible.)
The voltage should be above 0.68V at least once during this procedure.
If the voltage is above 0.68V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

NBS000D4

HEATED OXYGEN SENSOR 2

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

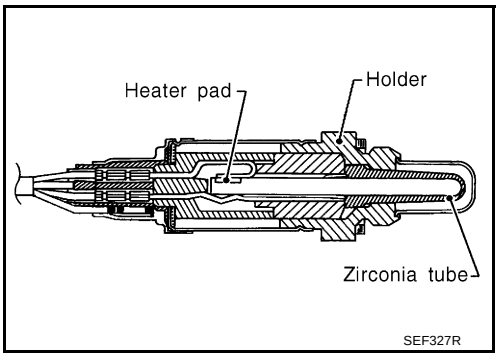
DTC P0138, P0158 HO2S2

PFP:226A0

Component Description

NBS001NK

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-III Reference Value in Data Monitor Mode

NBS001NL

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	LEAN ←→ RICH

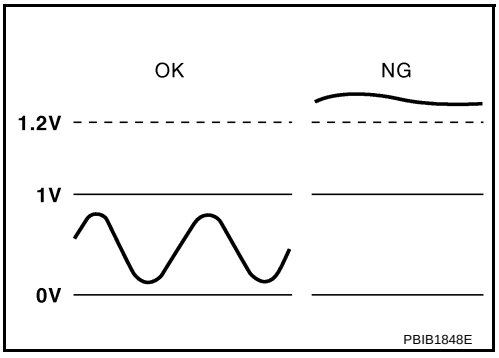
On Board Diagnosis Logic

NBS001NM

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst 1 causes the longer switching time.

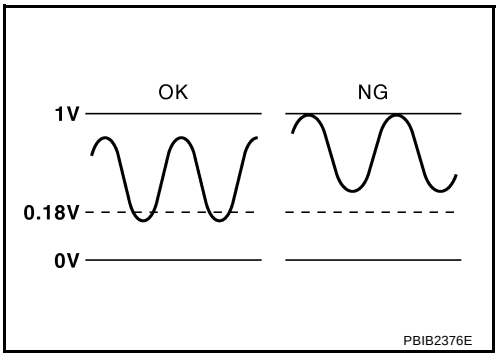
MALFUNCTION A

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during the various driving condition such as fuel-cut.



MALFUNCTION B

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0138 0138 (Bank 1)	Heated oxygen sensor 2 circuit high voltage	A)	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2
P0158 0158 (Bank 2)		B)	The minimum voltage from the sensor is not reached to the specified voltage.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector

DTC Confirmation Procedure

NBS001NN

Perform PROCEDURE FOR MALFUNCTION A first.
If DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

With CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 2 minutes.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-305, "PROCEDURE FOR MALFUNCTION A" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION B

With CONSULT-III

TESTING CONDITION:
For better results, perform “DTC WORK SUPPORT” at a temperature of 0 to 30 °C (32 to 86 °F).

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Make sure that “COOLAN TEMP/S” indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when “COOLAN TEMP/S” indication reaches to 70°C (158°F).
6. Open engine hood.
7. Select “HO2S2 (B1) P1146” (for DTC P0138) or “HO2S2 (B2) P1166” (for DTC P0158) of “HO2S2” in “DTC WORK SUPPORT” mode with CONSULT-III.
8. Start engine and following the instruction of CONSULT-III.
   NOTE:
   It will take at most 10 minutes until “COMPLETED” is displayed.
9. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”.
   If “NG” is displayed, refer to EC-308, "PROCEDURE FOR MALFUNCTION B" .
   If “CAN NOT BE DIAGNOSED” is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
b. Return to step 1.

Overall Function Check

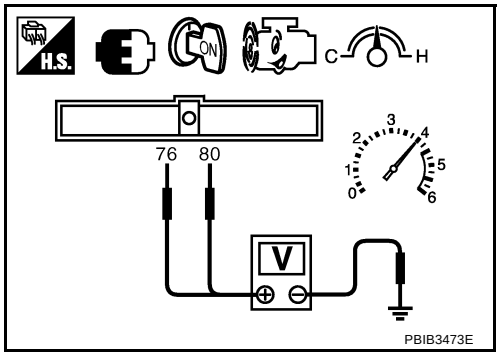
NBS001NW

PROCEDURE FOR MALFUNCTION B

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

With GST

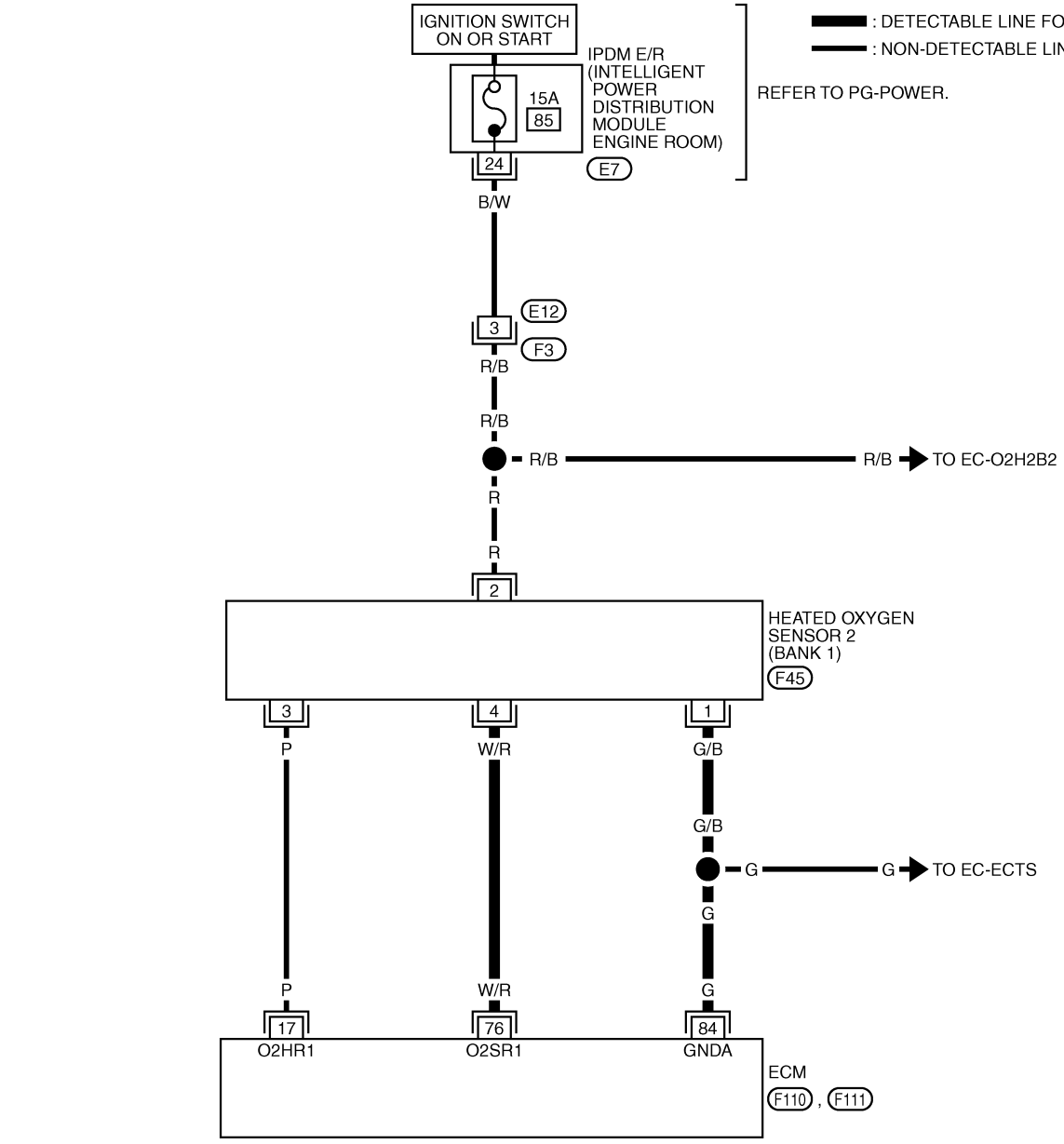
1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B2) signal] or 80 [HO2S2 (B1) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be below 0.18V at least once during this procedure.
   If the voltage can be confirmed in step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position.
   The voltage should be below 0.18V at least once during this procedure.
8. If NG, go to EC-308, "PROCEDURE FOR MALFUNCTION B" .



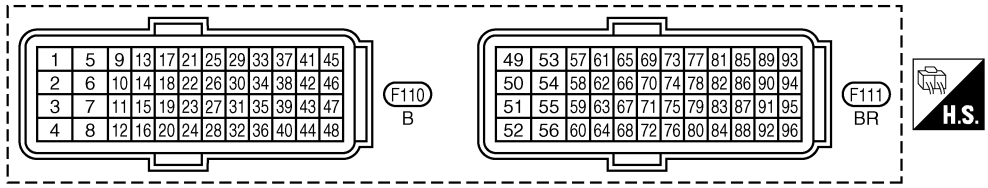
Wiring Diagram
BANK 1

NBS006UT

EC-O2S2B1-01





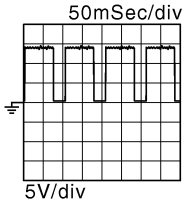


TBWT1634E

Specification data are reference values and are measured between each terminal and ground.

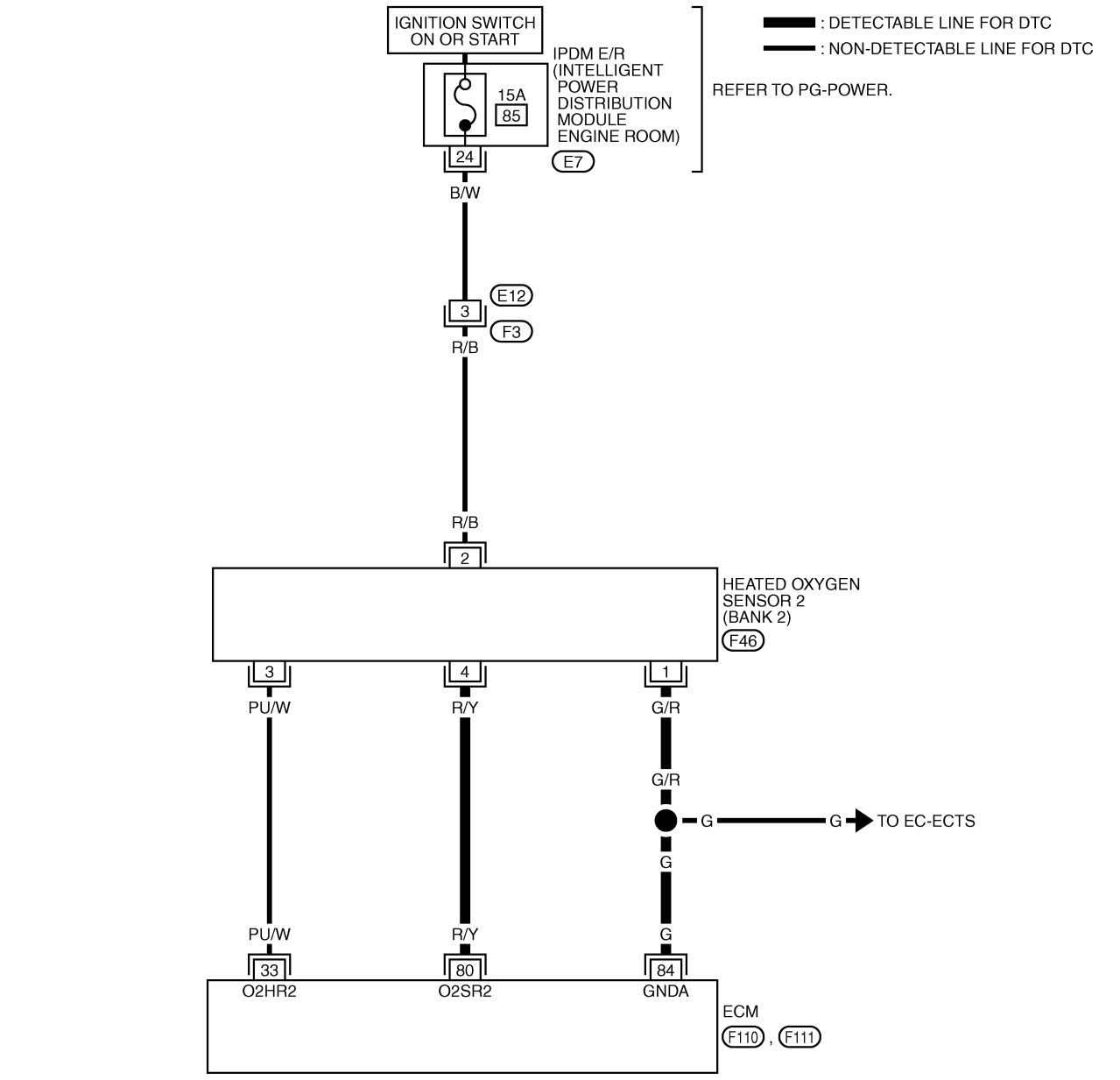
CAUTION:

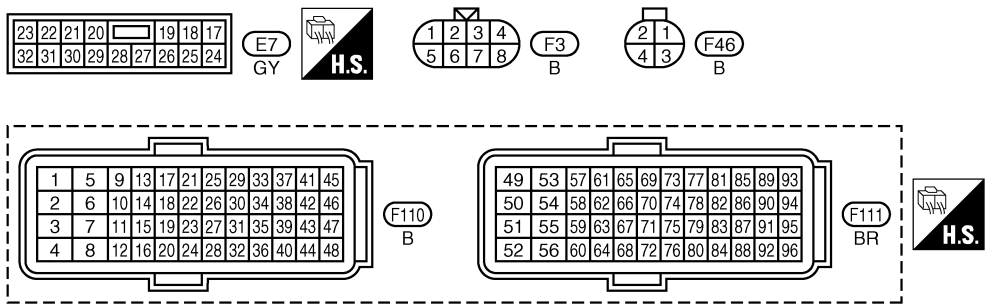
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

BANK 2

EC-O2S2B2-01



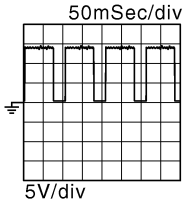


TBWT1635E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

Diagnostic Procedure

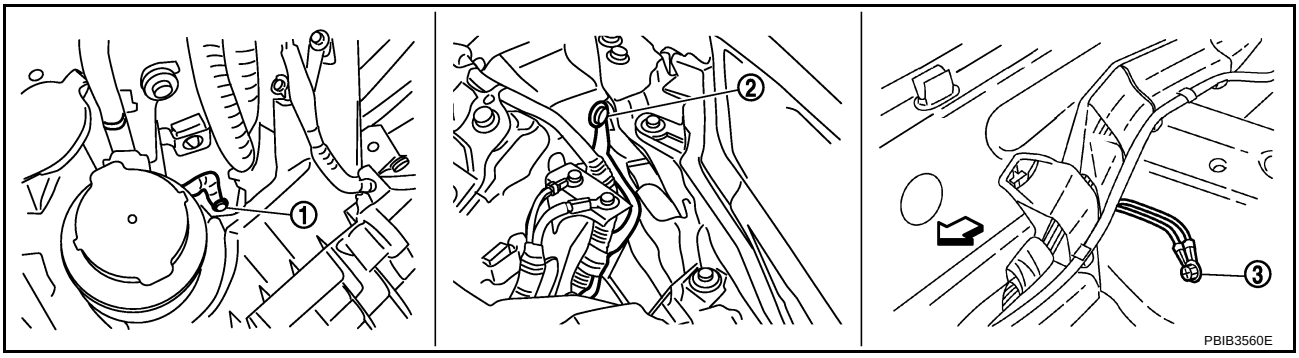
NBS001NO

PROCEDURE FOR MALFUNCTION A

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

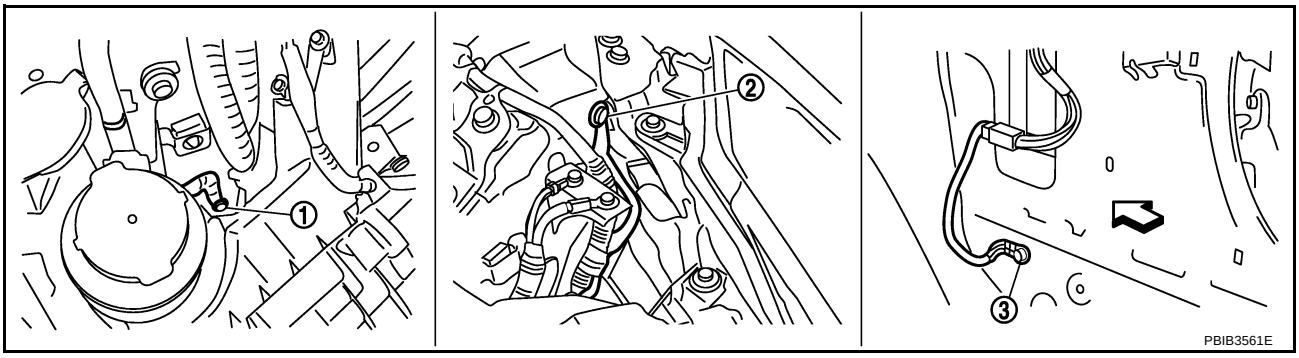


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

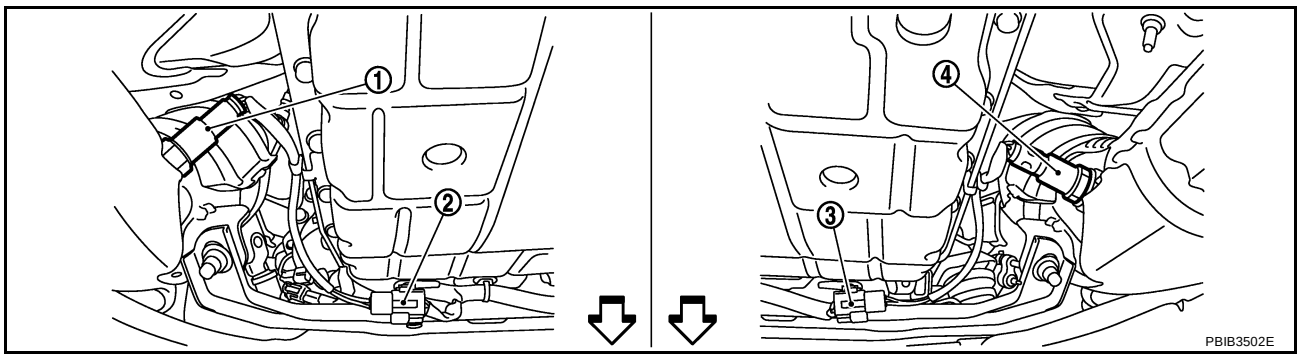
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Disconnect heated oxygen sensor 2 harness connector.



1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

2. Disconnect ECM harness connector.
3. Check harness continuity between HO2S2 terminal 1 and ECM terminal 84. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	76	4	1
P0158	80	4	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	76	4	1
P0158	80	4	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 CONNECTOR FOR WATER

Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-296, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

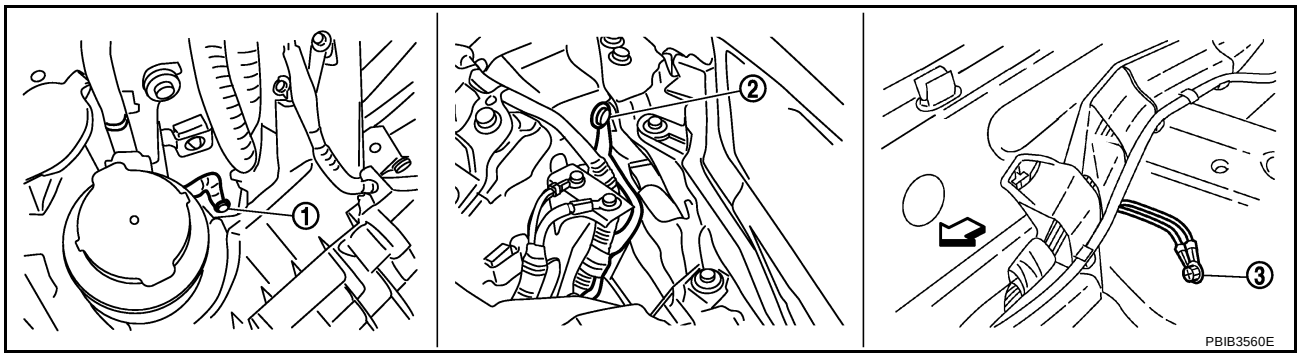
>> **INSPECTION END**

PROCEDURE FOR MALFUNCTION B

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

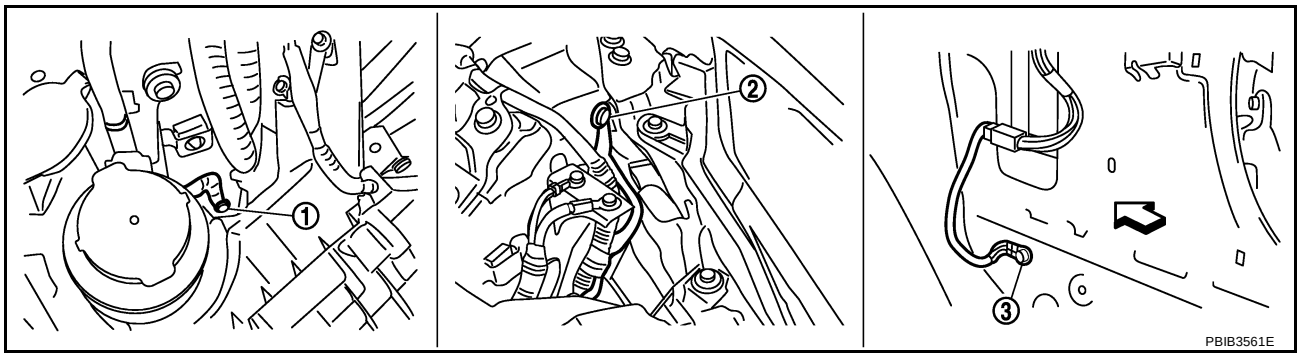


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

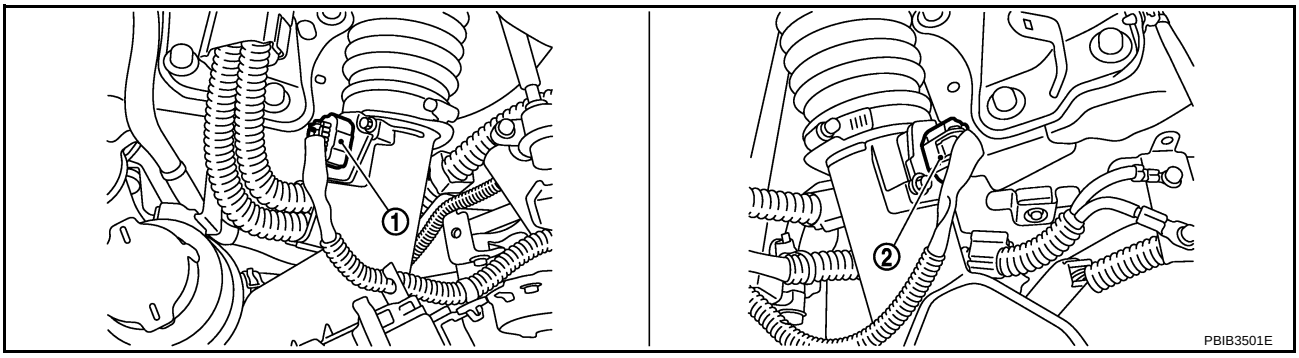
2. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0172 or P0175 detected?
   Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector, and restart and run engine for at least 5 seconds at idle speed.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0172 or P0175 detected?
   Is it difficult to start engine?

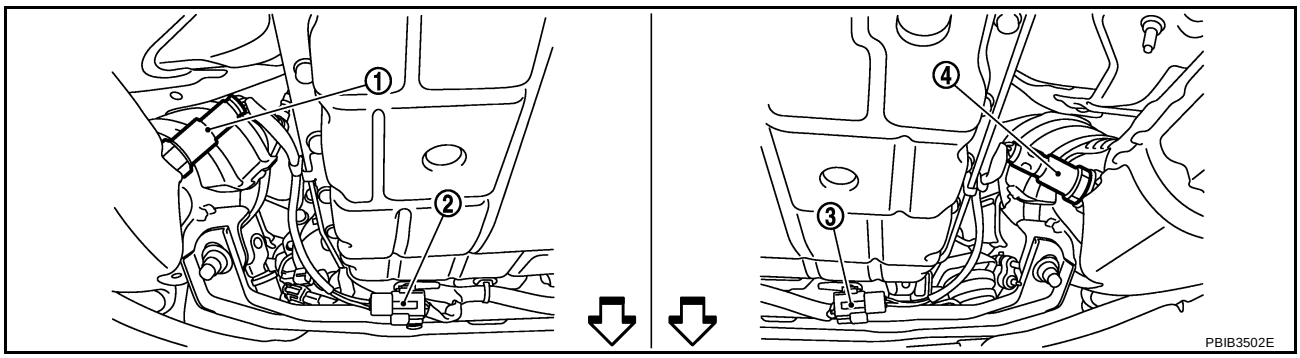
Yes or No

Yes >> Perform trouble diagnosis for DTC P0172, P0175. Refer to EC-334, "DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 harness connector.



1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between HO2S2 terminal 1 and ECM terminal 84. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	76	4	1
P0158	80	4	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0138	76	4	1
P0158	80	4	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-296, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

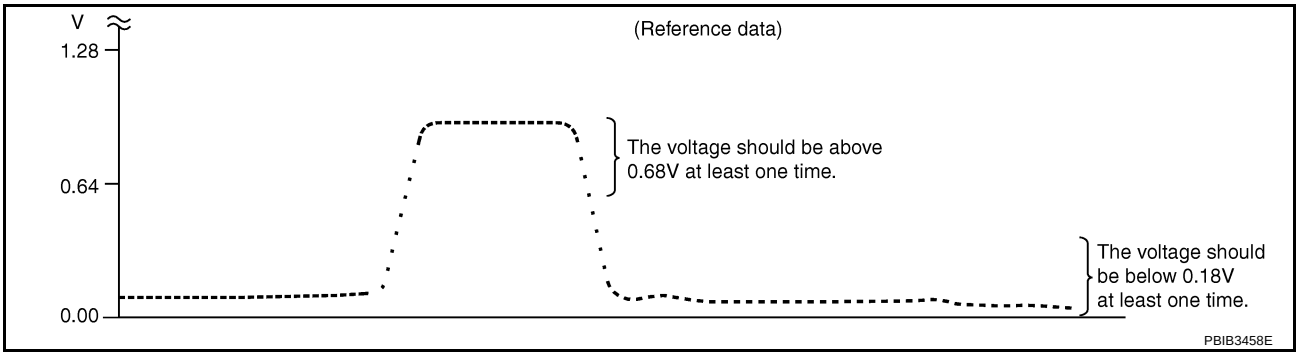
Component Inspection

NBS0006P

HEATED OXYGEN SENSOR 2

With CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-III.
7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.68V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is −25%.

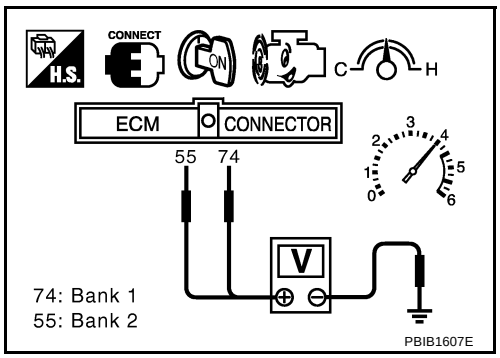
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   The voltage should be above 0.68V at least once during this procedure.
   If the voltage is above 0.68V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

NBS0006Q

HEATED OXYGEN SENSOR 2

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

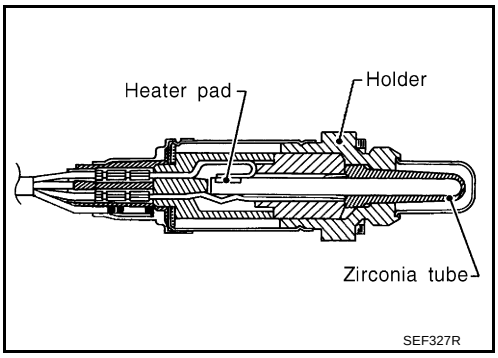
DTC P0139, P0159 HO2S2

PFP:226A0

Component Description

NBS0006R

The heated oxygen sensor 2, after three way catalyst 1, monitors the oxygen level in the exhaust gas on each bank.
Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air-fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.
This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1V in richer conditions to 0V in leaner conditions.
Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



CONSULT-III Reference Value in Data Monitor Mode

NBS0006S

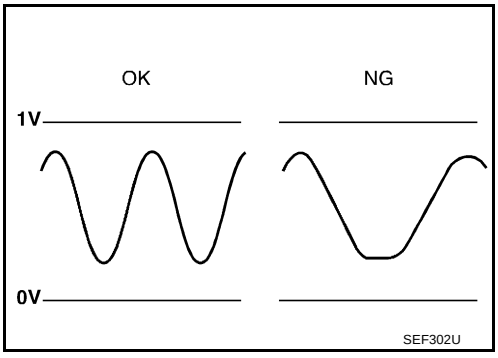
Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
HO2S2 (B1) HO2S2 (B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	0 - 0.3V ←→ Approx. 0.6 - 1.0V
HO2S2 MNTR(B1) HO2S2 MNTR(B2)	● Revving engine from idle to 3,000 rpm quickly after the following conditions are met – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	LEAN ←→ RICH

On Board Diagnosis Logic

NBS0006T

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity before the three way catalyst 1 causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the switching response of the sensor's voltage is faster than specified during the various driving condition such as fuel-cut.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0139 0139 (Bank 1) P0159 0159 (Bank 2)	Heated oxygen sensor 2 circuit slow response	It takes more time for the sensor to respond between rich and lean than the specified time.	● Harness or connectors (The sensor circuit is open or shorted) ● Heated oxygen sensor 2 ● Fuel pressure ● Fuel injector ● Intake air leaks

DTC Confirmation Procedure

NBS0006U

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

TESTING CONDITION:
For better results, perform “DTC WORK SUPPORT” at a temperature of 0 to 30 °C (32 to 86 °F).

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Make sure that “COOLAN TEMP/S” indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when “COOLAN TEMP/S” indication reaches to 70°C (158°F).
6. Select “HO2S2 (B1) P0139” or “HO2S2 (B2) P0159” of “HO2S2” in “DTC WORK SUPPORT” mode with CONSULT-III.
7. Start engine and following the instruction of CONSULT-III.
   NOTE:
   It will take at most 10 minutes until “COMPLETED” is displayed.
8. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”.
   If “NG” is displayed, refer to EC-319, "Diagnostic Procedure" .
   If “CAN NOT BE DIAGNOSED” is displayed, perform the following.

a. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
b. Return to step 1.

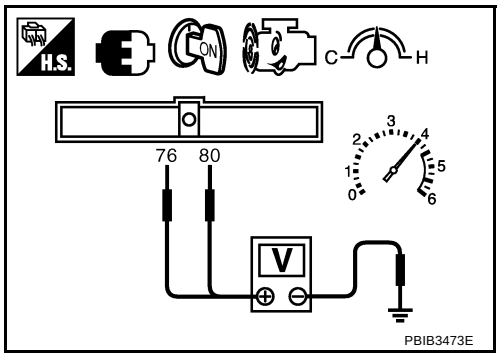
Overall Function Check

NBS0006V

Use this procedure to check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

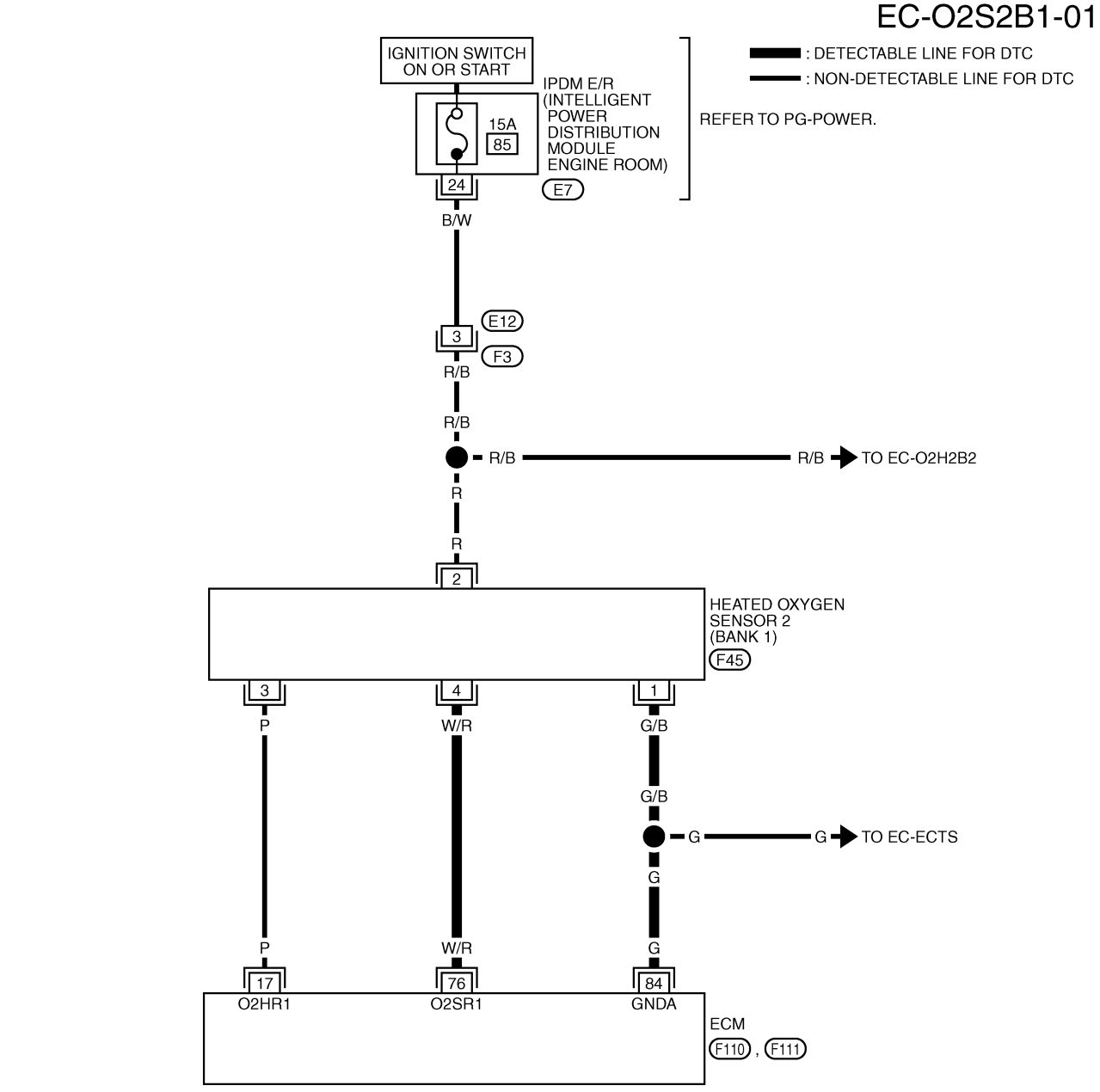
1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.
6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
   (Depress and release accelerator pedal as soon as possible.)
   A change of voltage should be more than 0.24V for 1 second during this procedure.
   If the voltage can be confirmed in step 6, step 7 is not necessary.

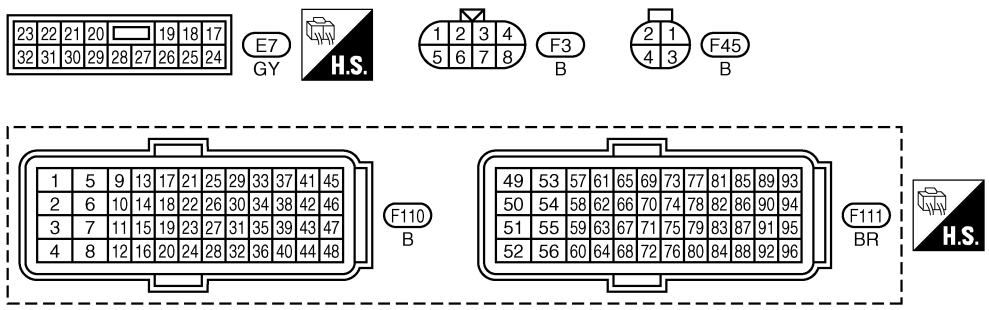


7. Keep vehicle at idling for 10 minutes, then check the voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
   A change of voltage should be more than 0.24V for 1 second during this procedure.
8. If NG, go to EC-319, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS006UU



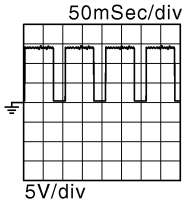


TBWT1634E

Specification data are reference values and are measured between each terminal and ground.

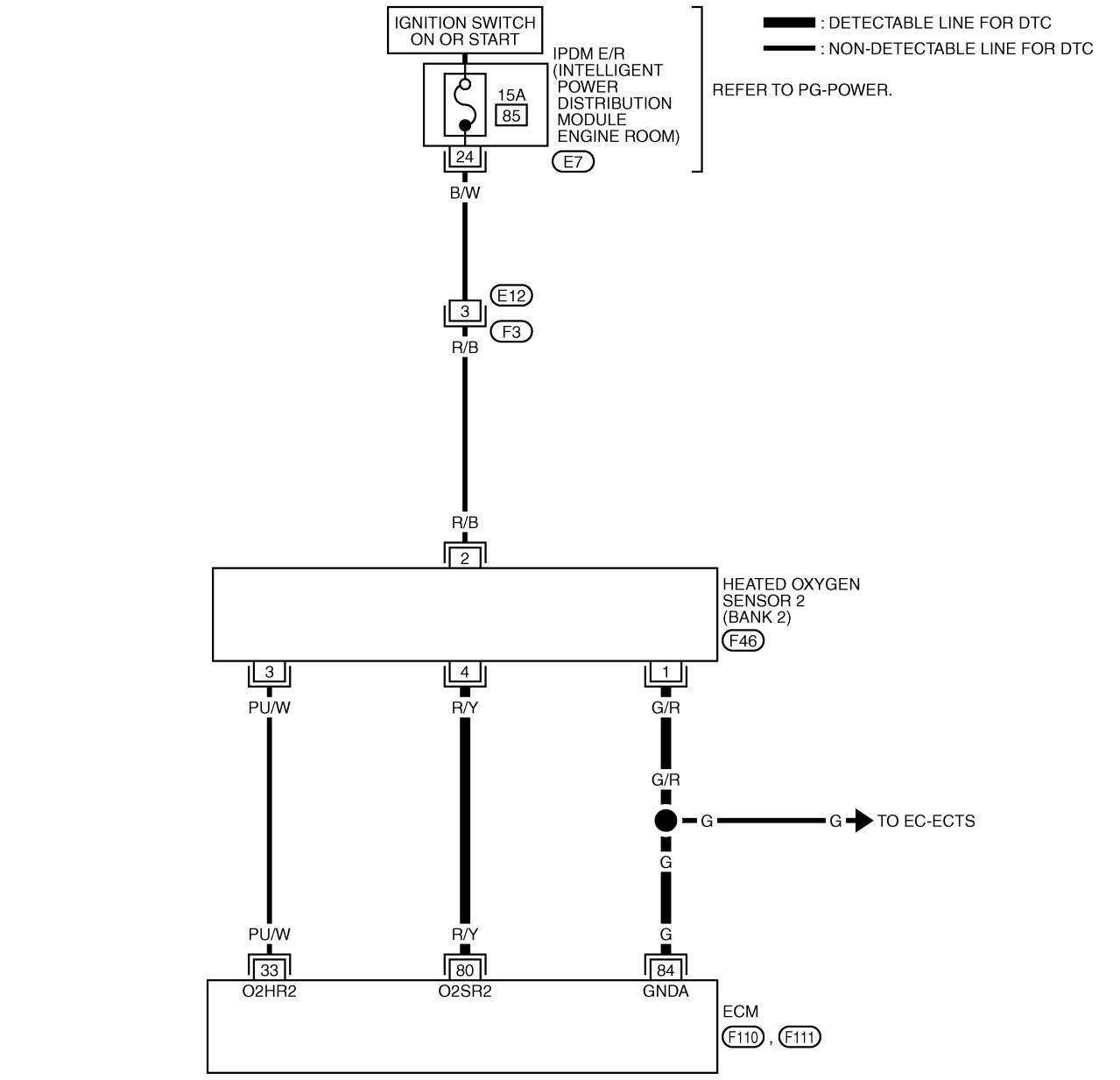
CAUTION:

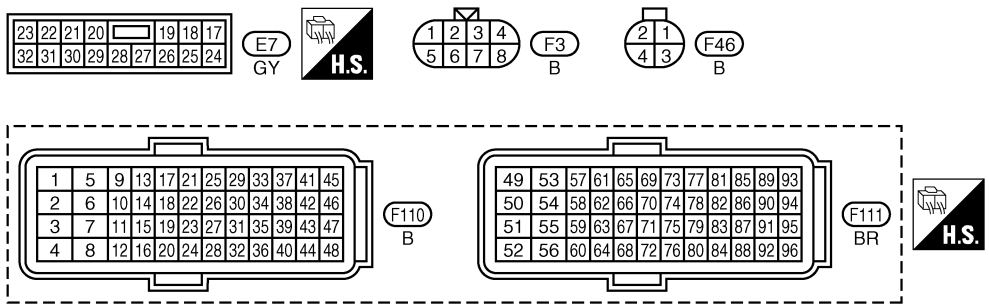
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
17	P	Heated oxygen sensor 2 heater (bank 1)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
76	W/R	Heated oxygen sensor 2 (bank 1)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

BANK 2

EC-O2S2B2-01



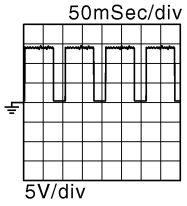


TBWT1635E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
33	PU/W	Heated oxygen sensor 2 heater (bank 2)	**[Engine is running]** ● Engine speed: Below 3,600 rpm after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 14V★  PBIB3545E
			[Ignition switch: ON] ● Engine stopped **[Engine is running]** ● Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14V)
80	R/Y	Heated oxygen sensor 2 (bank 2)	**[Engine is running]** ● Revving engine from idle to 3,000 rpm quickly after the following conditions are met. – Engine: After warming up – Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load.	0 - 1.0V
84	G	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

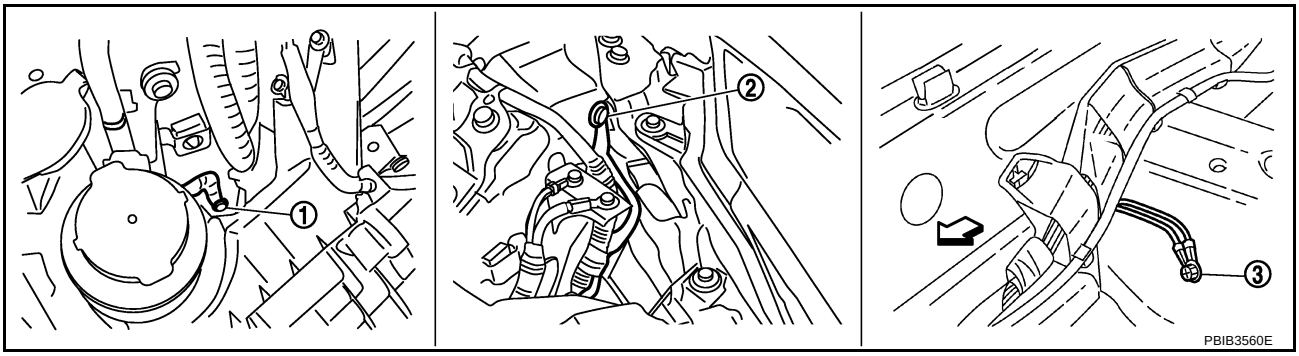
Diagnostic Procedure

NBS006UV

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

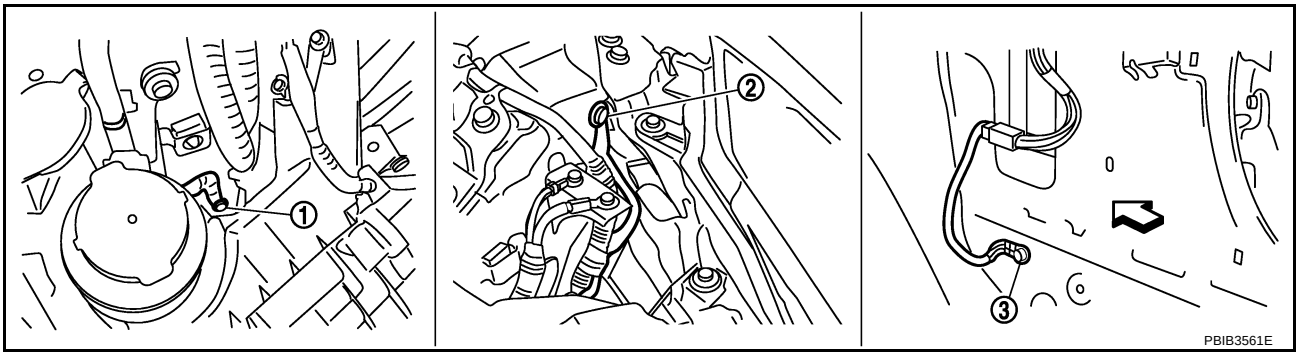


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

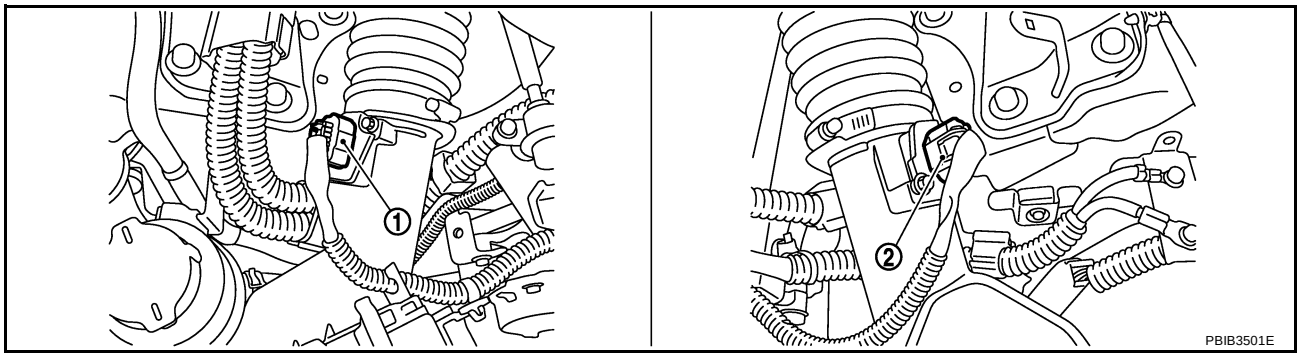
2. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector, and restart and run engine for at least 5 seconds at idle speed.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
5. Make sure DTC P0102 is displayed.
6. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
7. Make sure DTC P0000 is displayed.
8. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

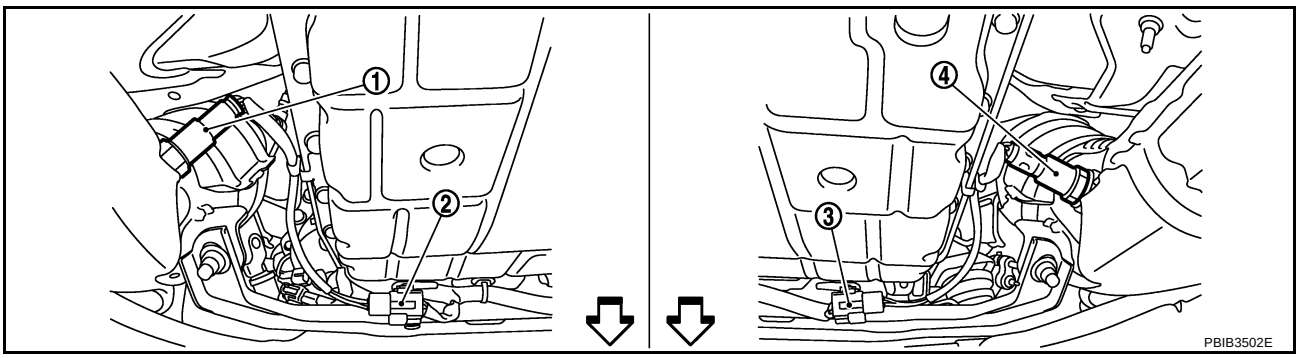
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-324, "DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION" or EC-334, "DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 3.

3. CHECK HO2S2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 harness connector.



1. Heated oxygen sensor 2 (bank 2)
2. Heated oxygen sensor 2 (bank 2) harness connector
3. Heated oxygen sensor 2 (bank 1)
4. Heated oxygen sensor 2 (bank 1) harness connector

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between HO2S2 terminal 1 and ECM terminal 84. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK HO2S2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal and HO2S2 terminal as follows. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0139	76	4	1
P0159	80	4	2

Continuity should exist.

2. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

DTC	Terminals		Bank
	ECM	Sensor	
P0139	76	4	1
P0159	80	4	2

Continuity should not exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK HEATED OXYGEN SENSOR 2

Refer to EC-322, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning heated oxygen sensor 2.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

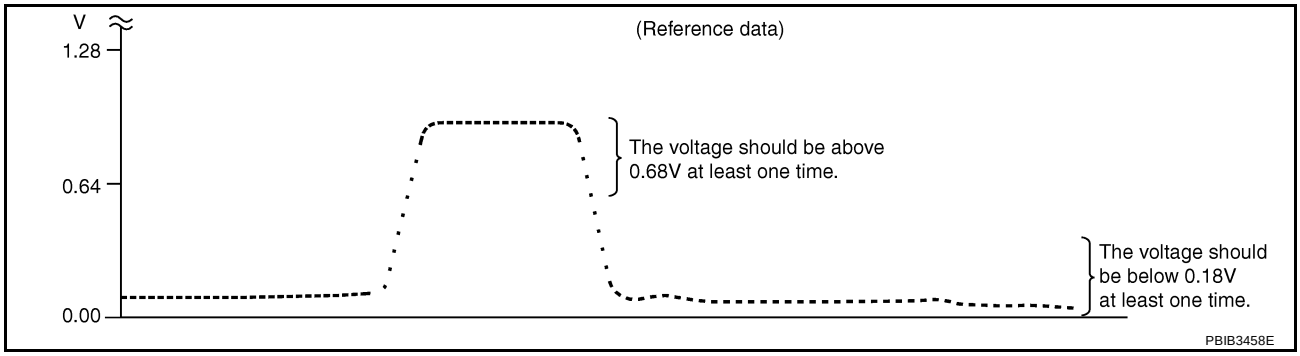
Component Inspection

NBS006UW

HEATED OXYGEN SENSOR 2

With CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select “FUEL INJECTION” in “ACTIVE TEST” mode, and select “HO2S2 (B1)/(B2)” as the monitor item with CONSULT-III.
7. Check “HO2S2 (B1)/(B2)” at idle speed when adjusting “FUEL INJECTION” to ±25%.



“HO2S2 (B1)/(B2)” should be above 0.68V at least once when the “FUEL INJECTION” is +25%.
“HO2S2 (B1)/(B2)” should be below 0.18V at least once when the “FUEL INJECTION” is −25%.

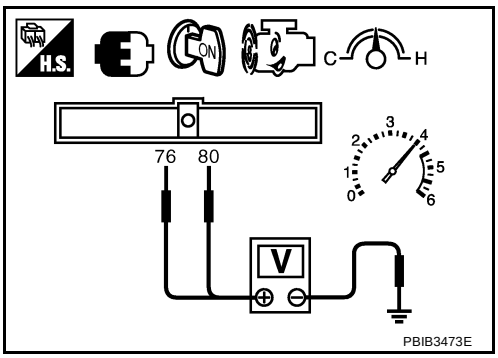
CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Without CONSULT-III

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Set voltmeter probes between ECM terminal 76 [HO2S2 (B1) signal] or 80 [HO2S2 (B2) signal] and ground.

6. Check the voltage when revving up to 4,000 rpm under no load at least 10 times.
(Depress and release accelerator pedal as soon as possible.)
The voltage should be above 0.68V at least once during this procedure.
If the voltage is above 0.68V at step 6, step 7 is not necessary.
7. Keep vehicle at idling for 10 minutes, then check voltage. Or check the voltage when coasting from 80 km/h (50 MPH) in D position (A/T), 4th gear position (M/T).
The voltage should be below 0.18V at least once during this procedure.
8. If NG, replace heated oxygen sensor 2.



CAUTION:

- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

NBS006UX

HEATED OXYGEN SENSOR 2

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

NBS00070

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from the air fuel ratio (A/F) sensors 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.
In case the amount of the compensation value is extremely large (The actual mixture ratio is too lean.), the ECM judges the condition as the fuel injection system malfunction and lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0171 0171 (Bank 1)	Fuel injection system too lean	● Fuel injection system does not operate properly. ● The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)	● Intake air leaks ● Air fuel ratio (A/F) sensor 1 ● Fuel injector ● Exhaust gas leaks ● Incorrect fuel pressure ● Lack of fuel ● Mass air flow sensor ● Incorrect PCV hose connection
P0174 0174 (Bank 2)			

DTC Confirmation Procedure

NBS00071

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
4. Clear the self-learning control coefficient by touching “CLEAR”.
5. Start engine again and le it idle for at least 10 minutes.
6. Check 1st trip DTC.
   The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to EC-330, "Diagnostic Procedure" .

   NOTE:
   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

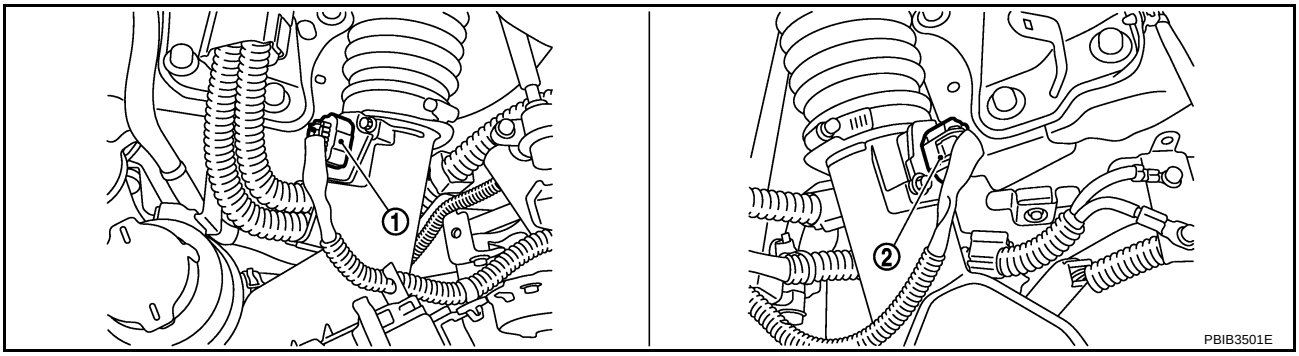
a. Turn ignition switch OFF and wait at least 10 seconds.
b. Start engine and select “DATA MONITOR” mode with CONSULT-III.
c. Drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for 10 minutes.
   Refer to the table below.
   Hold the accelerator pedal as steady as possible.
   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
8. Crank engine while depressing accelerator pedal. If engine starts, go to EC-330, "Diagnostic Procedure" . If engine does not start, check exhaust and intake air leak visually.

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
6. Select Service $03 with GST. Make sure DTC P0102 is detected.
7. Select Service $04 with GST and erase the DTC P0102.
8. Start engine again and let it idle for at least 10 minutes.
9. Select Service $07 with GST. The 1st trip DTC P0171 or P0174 should be detected at this stage, if a malfunction exists. If so, go to EC-330, "Diagnostic Procedure" .

   NOTE:
   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

a. Turn ignition switch OFF and wait at least 10 seconds.
b. Start engine and drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for 10 minutes. Refer to the table below.
   Hold the accelerator pedal as steady as possible.
   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

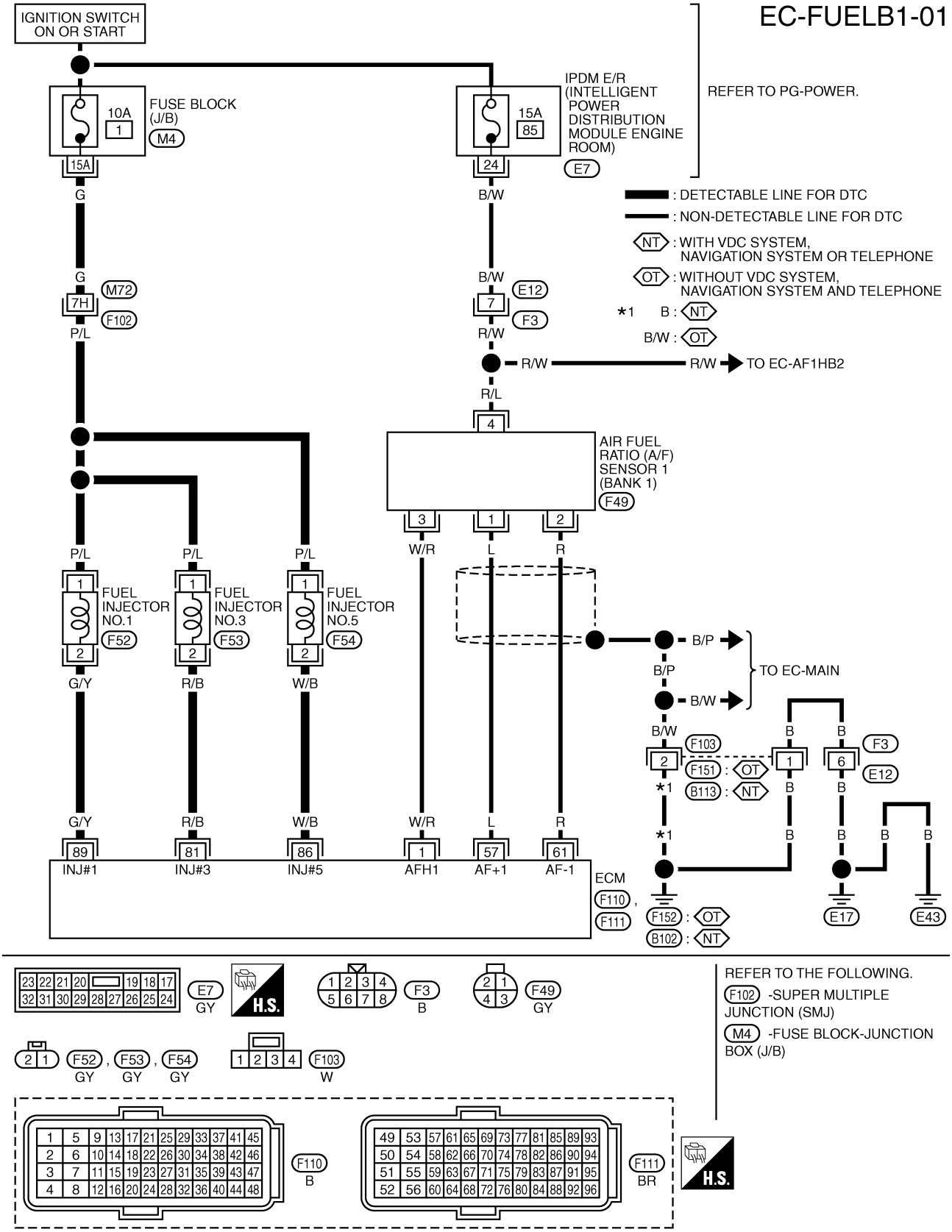
Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

10. If it is difficult to start engine at step 8, the fuel injection system has a malfunction.
11. Crank engine while depressing accelerator pedal. If engine starts, go to EC-330, "Diagnostic Procedure" . If engine does not start, check exhaust and intake air leak visually.

Wiring Diagram

NBS00072

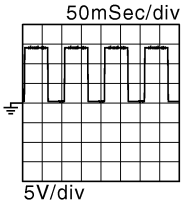
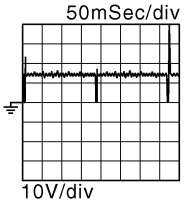
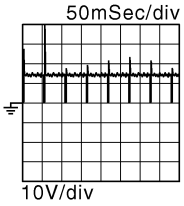
BANK 1



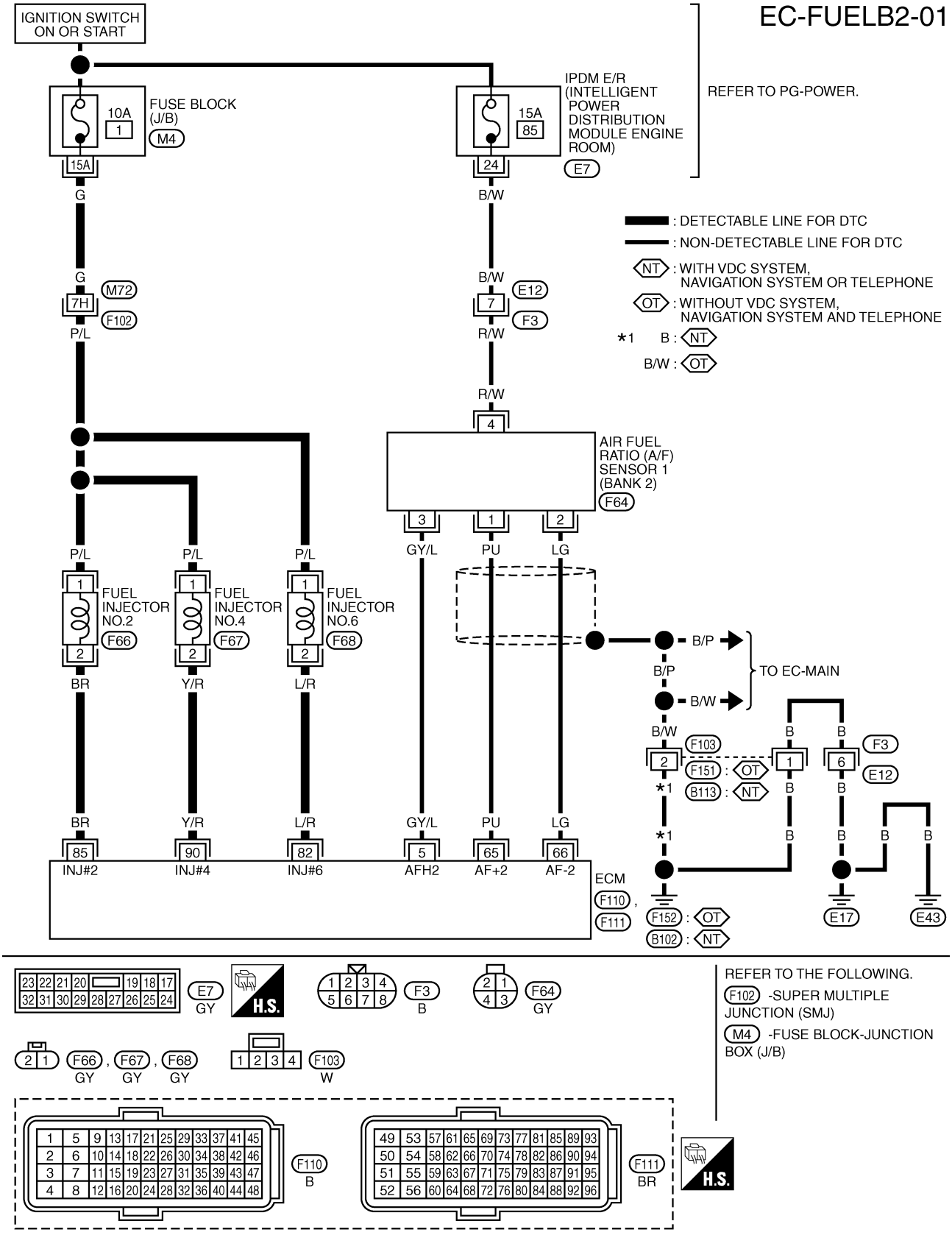
TBWT1636E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
81 86 89	R/B W/B G/Y	Fuel injector No. 3 Fuel injector No. 5 Fuel injector No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

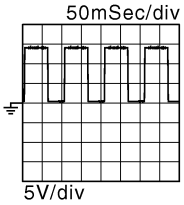
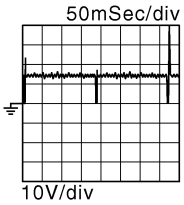
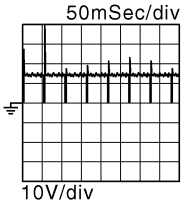
BANK 2



TBWT1638E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

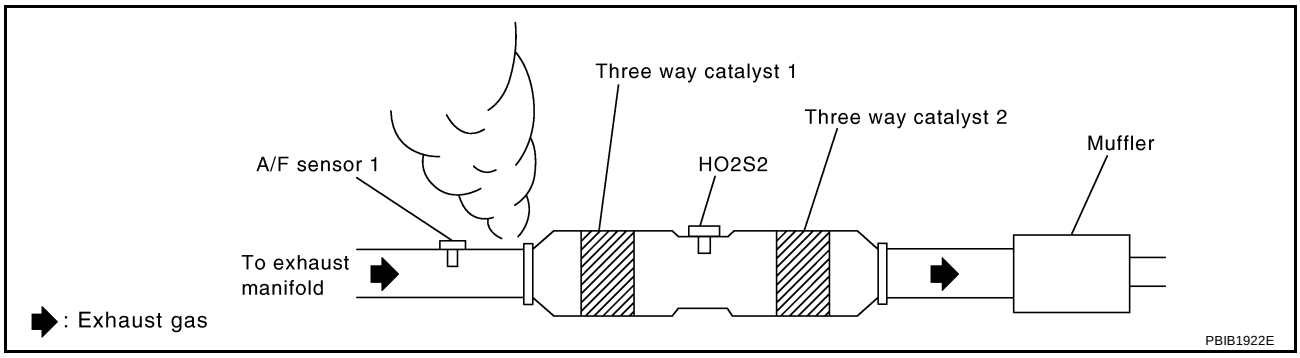
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★  PBIB3538E
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
82 85 90	L/R BR Y/R	Fuel injector No. 6 Fuel injector No. 2 Fuel injector No. 4	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

Diagnostic Procedure

NBS00073

1. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

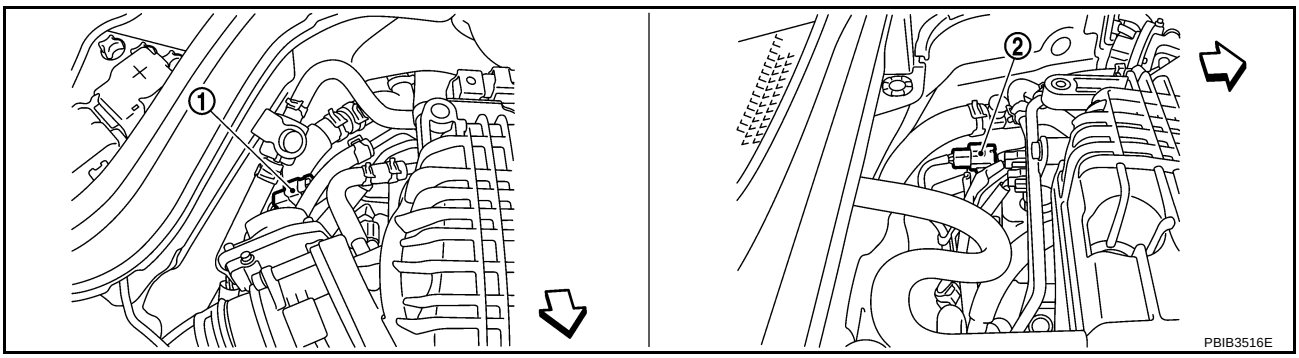
1. Listen for an intake air leak after the mass air flow sensor.
2. Check PCV hose connection.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.



1. A/F sensor 1 harness connector (bank 1)
2. A/Fsensor 1 harness connector (bank 2)

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank 1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

5. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

6. Also check harness for short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

1. Release fuel pressure to zero. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Install fuel pressure gauge and check fuel pressure. Refer to EC-80, "FUEL PRESSURE CHECK" .

At idling: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-691, "FUEL PUMP" .)
- Fuel pressure regulator (Refer to EC-80, "FUEL PRESSURE CHECK")
- Fuel lines (Refer to FL-3, "Checking Fuel Lines" .)
- Fuel filter for clogging

>> Repair or replace.

6. CHECK MASS AIR FLOW SENSOR

With CONSULT-III

1. Install all removed parts.
2. Start engine and warm it up normal temperature.
3. Check “MASS AIR FLOW” in “DATA MONITOR” mode with CONSULT-III.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

1. Install all removed parts.
2. Start engine and warm it up normal temperature.
3. Check mass air flow sensor signal in Service $01 with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 7.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to EC-197, "DTC P0101, P010B MAF SENSOR" .

7. CHECK FUNCTION OF FUEL INJECTOR

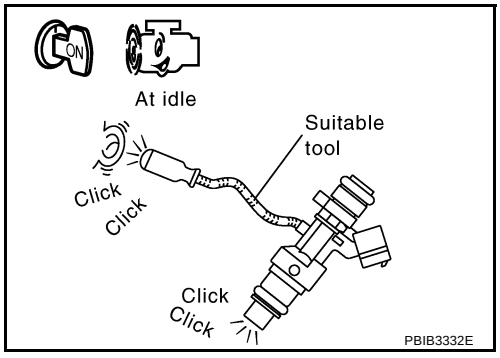
With CONSULT-III

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
3. Make sure that each circuit produces a momentary engine speed drop.

Without CONSULT-III

1. Start engine and let it idle.
2. Listen to each fuel injector operating sound.

Clickng sound should be heard.



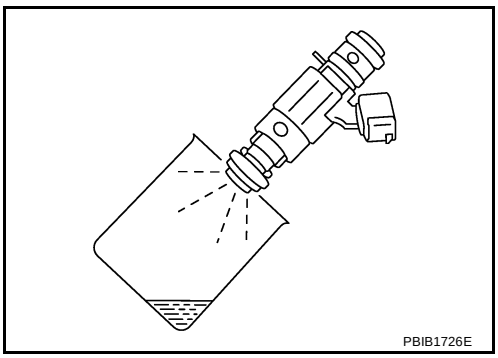
OK or NG

OK >> GO TO 8.
NG >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-686, "FUEL INJECTOR" .

8. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
3. Disconnect all fuel injector harness connectors.
4. Remove fuel injector gallery assembly. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all fuel injectors connected to fuel injector gallery.
5. For DTC P0171, reconnect fuel injector harness connectors on bank 1.
   For DTC P0174, reconnect fuel injector harness connectors on bank 2.
6. Disconnect all ignition coil harness connectors.
7. Prepare pans or saucers under each fuel injector.
8. Crank engine for about 3 seconds.
   For DTC P0171, make sure that fuel sprays out from fuel injectors on bank 1.
   For DTC P0174, make sure that fuel sprays out from fuel injectors on bank 2.

Fuel should be sprayed evenly for each fuel injector.



OK or NG

OK >> GO TO 9.
NG >> Replace fuel injectors from which fuel does not spray out. Always replace O-ring with new ones.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION

PFP:16600

On Board Diagnosis Logic

NBS00074

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from the air fuel ratio (A/F) sensors 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.
In case the amount of the compensation value is extremely large (The actual mixture ratio is too rich.), the ECM judges the condition as the fuel injection system malfunction and lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0172 0172 (Bank 1) P0175 0175 (Bank 2)	Fuel injection system too rich	● Fuel injection system does not operate properly. ● The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)	● Air fuel ratio (A/F) sensor 1 ● Fuel injector ● Exhaust gas leaks ● Incorrect fuel pressure ● Mass air flow sensor

DTC Confirmation Procedure

NBS00075

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
4. Clear the self-learning control coefficient by touching “CLEAR”.
5. Start engine again and let it idle for at least 10 minutes.
6. Check 1st trip DTC.
   The 1st trip DTC P0172, P0175 should be detected at this stage, if a malfunction exists.
   If so, go to EC-340, "Diagnostic Procedure" .
   NOTE:
   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

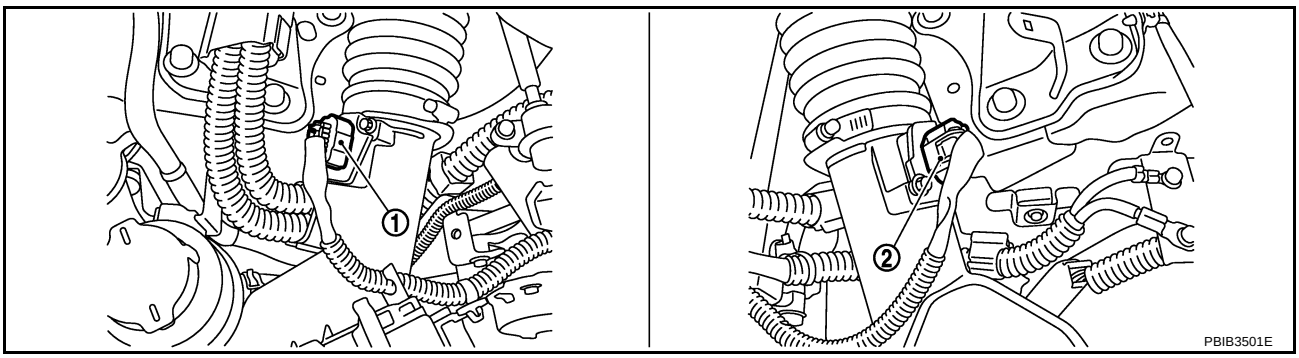
a. Turn ignition switch OFF and wait at least 10 seconds.
b. Start engine and select “DATA MONITOR” mode with CONSULT-III.
c. Drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for a certain time.
   Refer to the table below.
   Hold the accelerator pedal as steady as possible.
   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

7. If it is difficult to start engine at step 6, the fuel injection system has a malfunction, too.
8. Crank engine while depressing accelerator pedal.
   If engine starts, go to EC-340, "Diagnostic Procedure" . If engine does not start, remove ignition plugs and check for fouling, etc.

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor (bank 1) harness connector. Then restart and run engine for at least 5 seconds at idle speed.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
5. Select Service $03 with GST. Make sure DTC P0102 is detected.
6. Select Service $04 with GST and erase the DTC P0102.
7. Start engine again and let it idle for at least 10 minutes.
8. Select Service $07 with GST. The 1st trip DTC P0172 or P0175 should be detected at this stage, if a malfunction exists. If so, go to EC-340, "Diagnostic Procedure" .

   NOTE:
   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

a. Turn ignition switch OFF and wait at least 10 seconds.

b. Start engine and drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.
   Hold the accelerator pedal as steady as possible.
   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

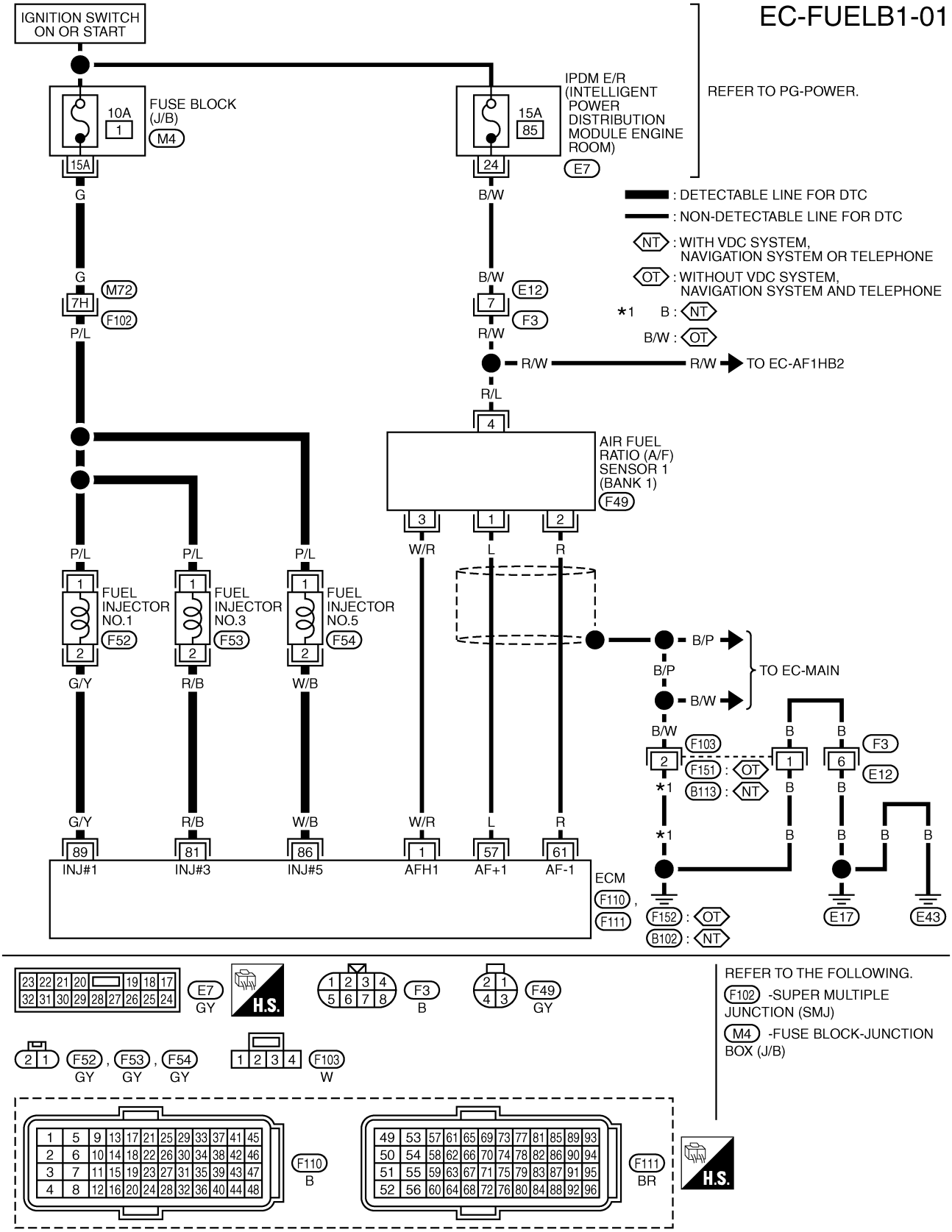
Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

9. If it is difficult to start engine at step 7, the fuel injection system has a malfunction.
10. Crank engine while depressing accelerator pedal.
    If engine starts, go to EC-340, "Diagnostic Procedure" . If engine does not start, remove ignition plugs and check for fouling, etc.

Wiring Diagram

NBS006UY

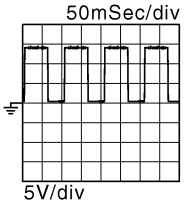
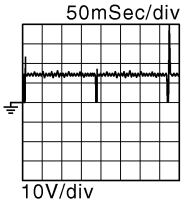
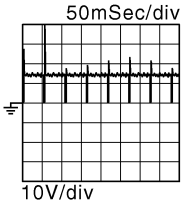
BANK 1



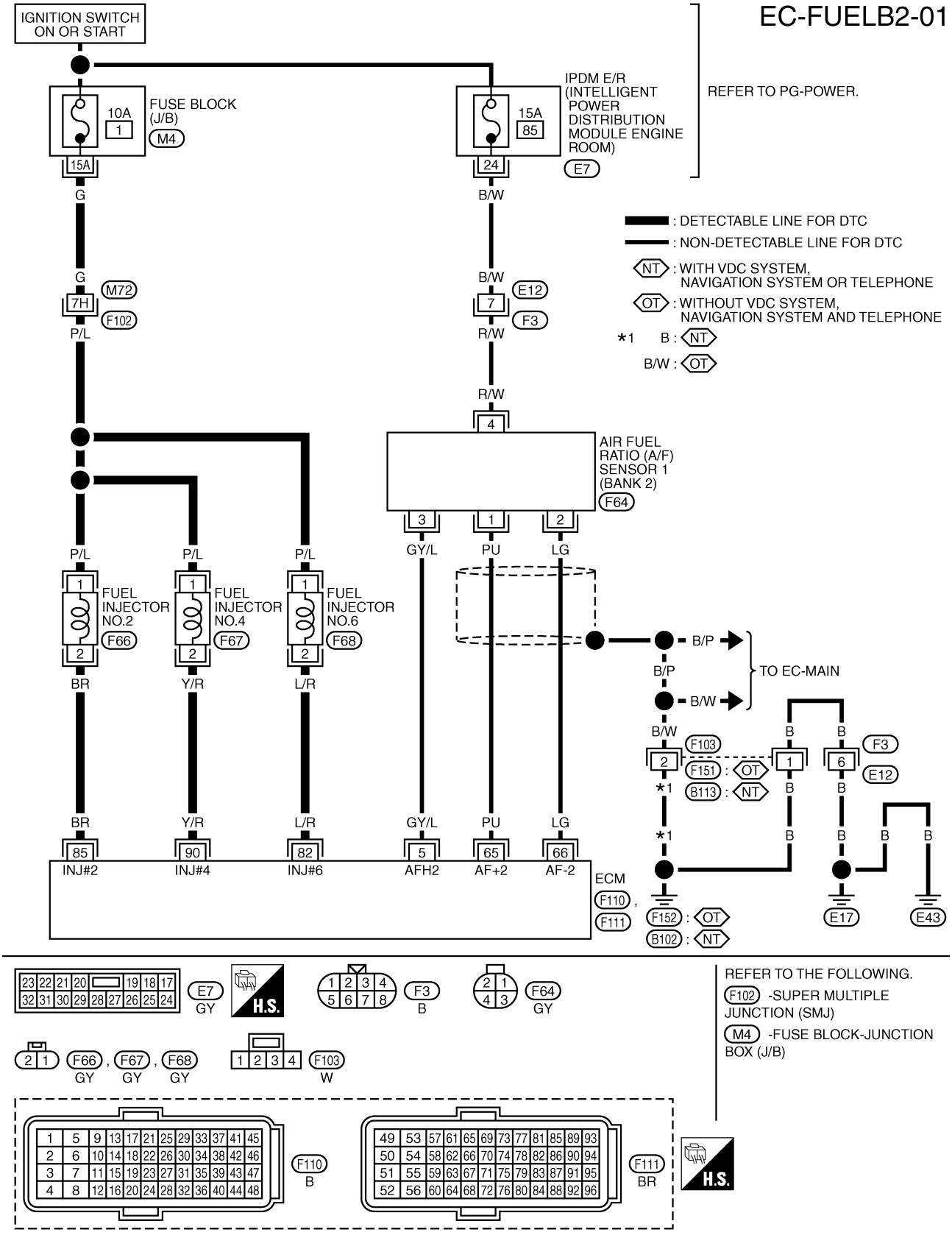
TBWT1636E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★  PBIB3538E
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
81 86 89	R/B W/B G/Y	Fuel injector No. 3 Fuel injector No. 5 Fuel injector No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

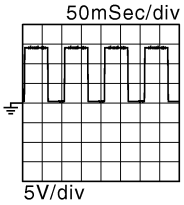
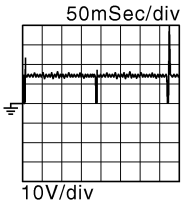
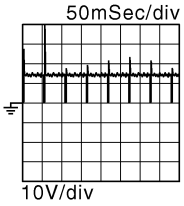
BANK 2



TBWT1638E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

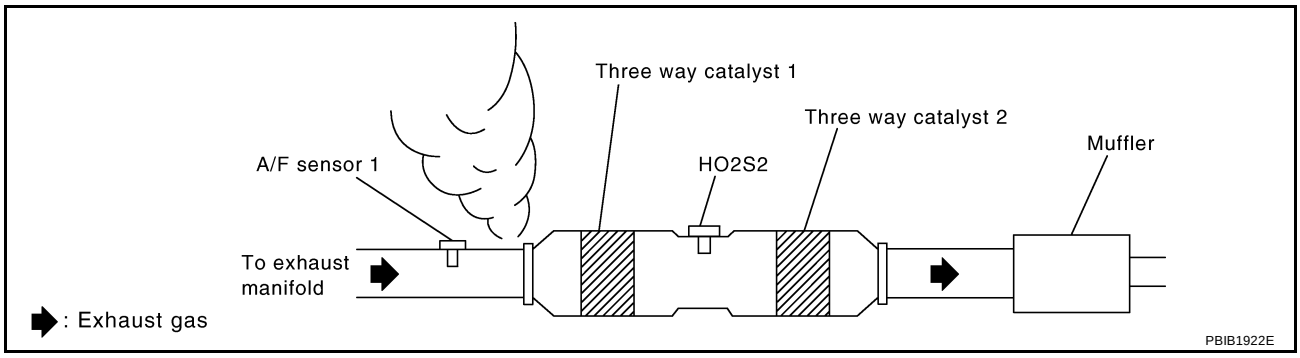
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★  PBIB3538E
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.
82 85 90	L/R BR Y/R	Fuel injector No. 6 Fuel injector No. 2 Fuel injector No. 4	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

Diagnostic Procedure

NBS00077

1. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst 1.



OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK FOR INTAKE AIR LEAK

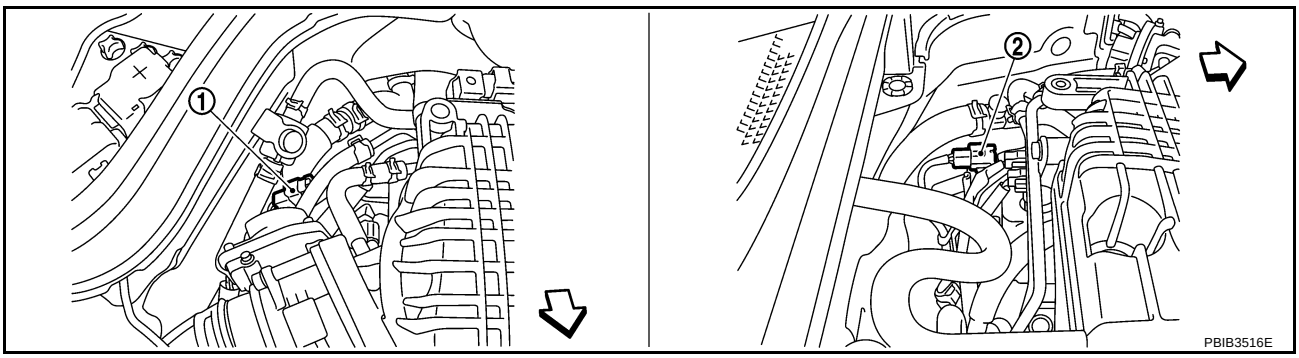
Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.



1. A/F sensor 1 harness connector (bank 1)
2. A/F sensor 1 harness connector (bank 2)

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank 1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

5. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

6. Also check harness for short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUEL PRESSURE

1. Release fuel pressure to zero. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Install fuel pressure gauge and check fuel pressure. Refer to EC-80, "FUEL PRESSURE CHECK" .

At idling: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-691, "FUEL PUMP" .)
- Fuel pressure regulator (Refer to EC-80, "FUEL PRESSURE CHECK" .)

>> Repair or replace.

6. CHECK MASS AIR FLOW SENSOR

With CONSULT-III

1. Install all removed parts.
2. Start engine and warm it up to normal temperature.
3. Check “MASS AIR FLOW” in “DATA MONITOR” mode with CONSULT-III.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

1. Install all removed parts.
2. Start engine and warm it up to normal temperature.
3. Check mass air flow sensor signal in Service $01 with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 7.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to EC-197, "DTC P0101, P010B MAF SENSOR" .

7. CHECK FUNCTION OF FUEL INJECTOR

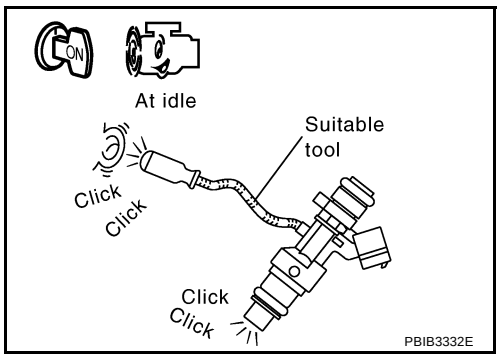
With CONSULT-III

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
3. Make sure that each circuit produces a momentary engine speed drop.

Without CONSULT-III

1. Start engine and let it idle.
2. Listen to each fuel injector operating sound.

Clickng sound should be heard.



OK or NG

OK >> GO TO 8.
NG >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-686, "FUEL INJECTOR" .

8. CHECK FUEL INJECTOR

1. Remove fuel injector assembly. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all fuel injectors connected to fuel injector gallery.
2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
3. Disconnect all fuel injector harness connectors.
4. Disconnect all ignition coil harness connectors.
5. Prepare pans or saucers under each fuel injectors.
6. Crank engine for about 3 seconds.
   Make sure fuel does not drip from fuel injector.

OK or NG

OK (Does not drip.)>>GO TO 9.
NG (Drips.)>>Replace the fuel injectors from which fuel is dripping. Always replace O-ring with new one.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

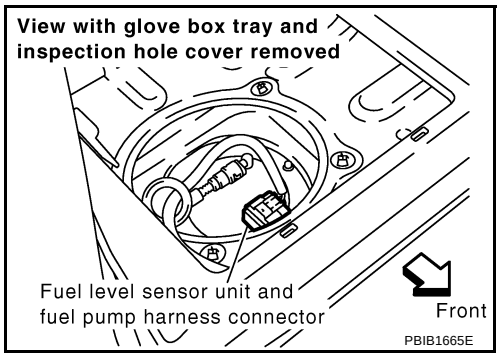
DTC P0181 FTT SENSOR

PFP:22630

Component Description

NBS00078

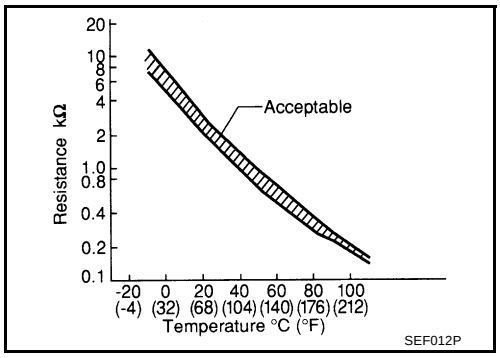
The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Fluid temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90

*: This data is reference values and is measured between ECM terminal 106 (Fuel tank temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS00079

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0181 0181	Fuel tank temperature sensor circuit range/ performance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	● Harness or connectors (The sensor circuit is open or shorted) ● Fuel tank temperature sensor

DTC Confirmation Procedure

NBS0007A

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 10 seconds.
2. Check 1st trip DTC.
   If 1st trip DTC is detected, go to EC-346, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to following step.
3. Select “DATA MONITOR” mode with CONSULT-III.
4. Check “COOLAN TEMP/S” value.
   If “COOLAN TEMP/S” is less than 60°C (140°F), the result will be OK.
   If “COOLAN TEMP/S” is above 60°C (140°F), go to the following step.
5. Cool engine down until “COOLAN TEMP/S” is less than 60°C (140°F).
6. Wait at least 10 seconds.
7. Check 1st trip DTC.
8. If 1st trip DTC is detected, go to EC-346, "Diagnostic Procedure" .

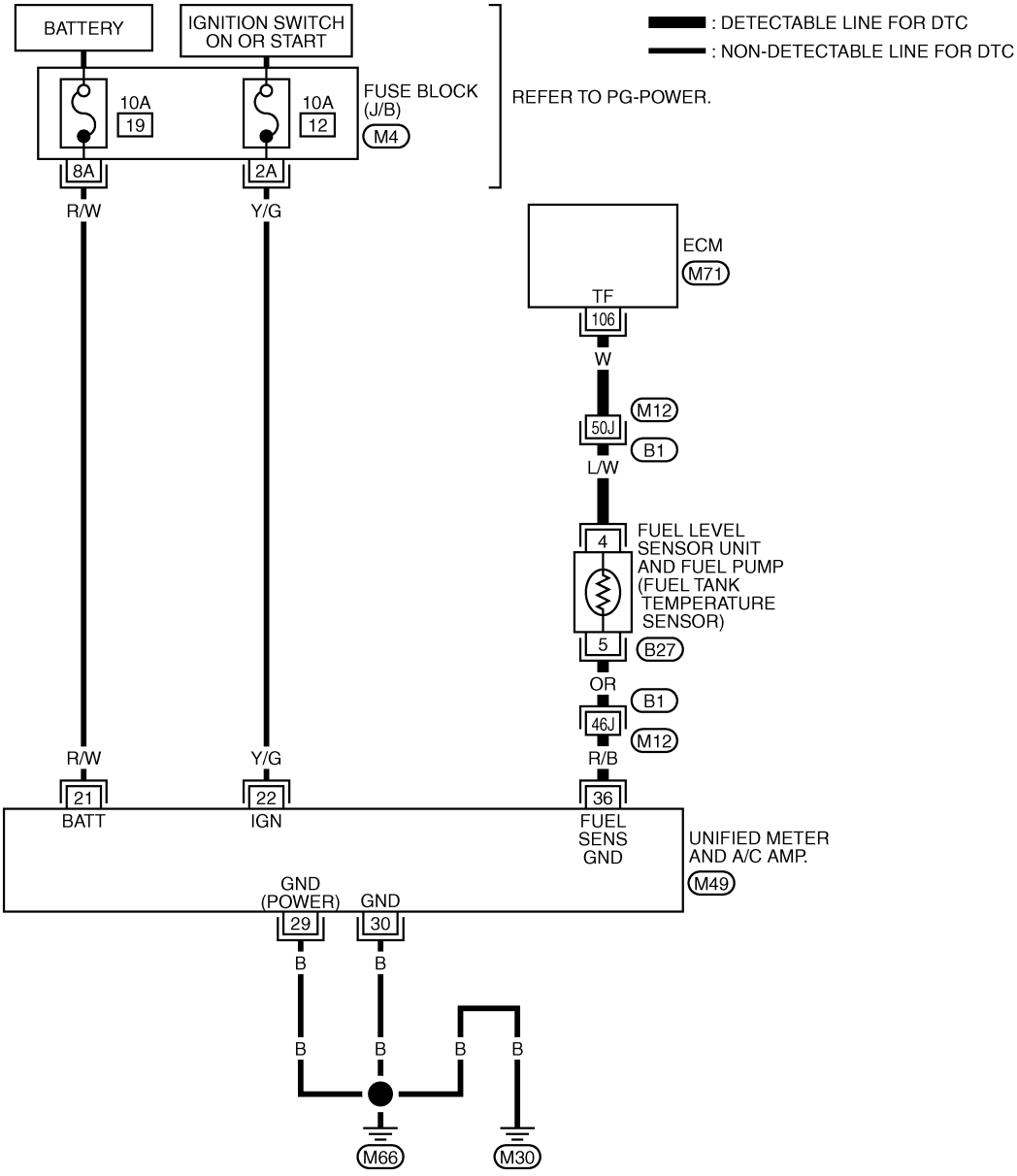
WITH GST

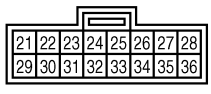
Follow the procedure “WITH CONSULT-III” above.

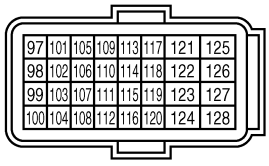
Wiring Diagram

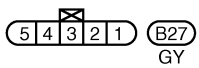
NBS0007B

EC-FTTS-01









REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1640E

Diagnostic Procedure

NBS0007C

1. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

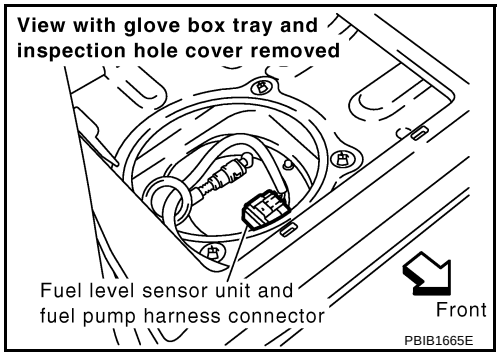
Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

OK or NG

OK >> GO TO 2.
NG >> Go to DI-19, "Fuel Level Sensor Signal Inspection" .

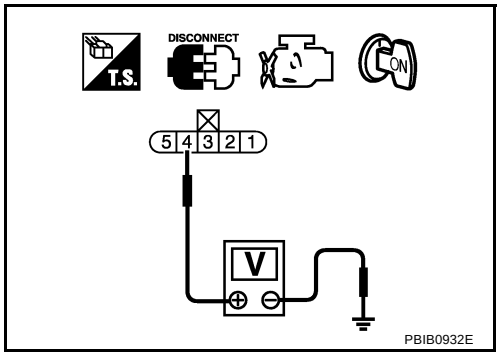
2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Turn ignition switch ON.



3. Check voltage between “fuel level sensor unit and fuel pump” terminal 4 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between ECM and “fuel level sensor unit and fuel pump”

>> Repair open circuit or short to ground or short to power in harness or connector.

4. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect “unified meter and A/C amp.” harness connector M49.
3. Check harness continuity between “fuel level sensor unit and fuel pump” terminal 5 and “unified meter and A/C amp.” terminal 36. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between “fuel level sensor unit and fuel pump” and “unified meter and A/C amp.”

>> Repair open circuit or short to ground or short to power in harness or connector.

6. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace fuel level sensor unit.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

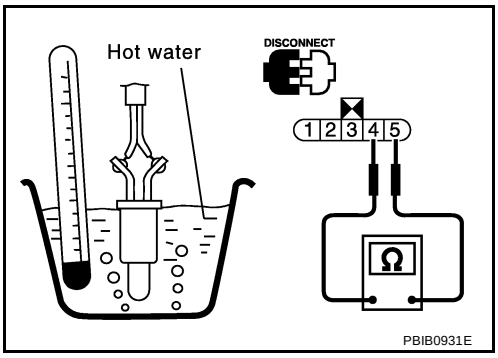
NBS0007D

FUEL TANK TEMPERATURE SENSOR

1. Remove fuel level sensor unit.
2. Check resistance between “fuel level sensor unit and fuel pump” terminals 4 and 5 by heating with hot water as shown in the figure.

Temperature °C (°F)	Resistance kΩ
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90

3. If NG, replace fuel level sensor unit.



Removal and Installation

NBS0007E

FUEL TANK TEMPERATURE SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

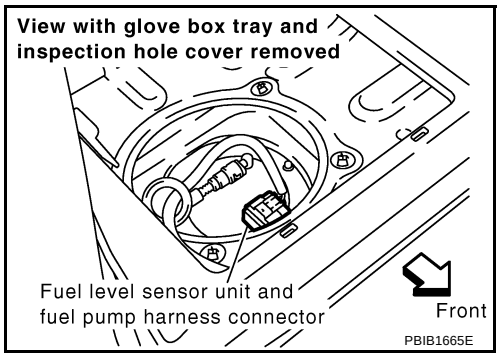
DTC P0182, P0183 FTT SENSOR

PFP:22630

Component Description

NBS0007F

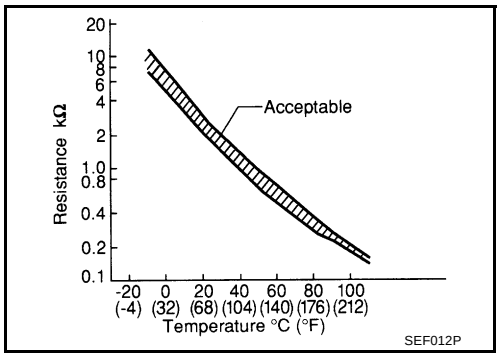
The fuel tank temperature sensor is used to detect the fuel temperature inside the fuel tank. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the fuel temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Fluid temperature °C (°F)	Voltage* V	Resistance kΩ
20 (68)	3.5	2.3 - 2.7
50 (122)	2.2	0.79 - 0.90

*: This data is reference values and is measured between ECM terminal 106 (Fuel tank temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS0007G

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0182 0182	Fuel tank temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Fuel tank temperature sensor
P0183 0183	Fuel tank temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

DTC Confirmation Procedure

NBS0007H

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-350, "Diagnostic Procedure" .

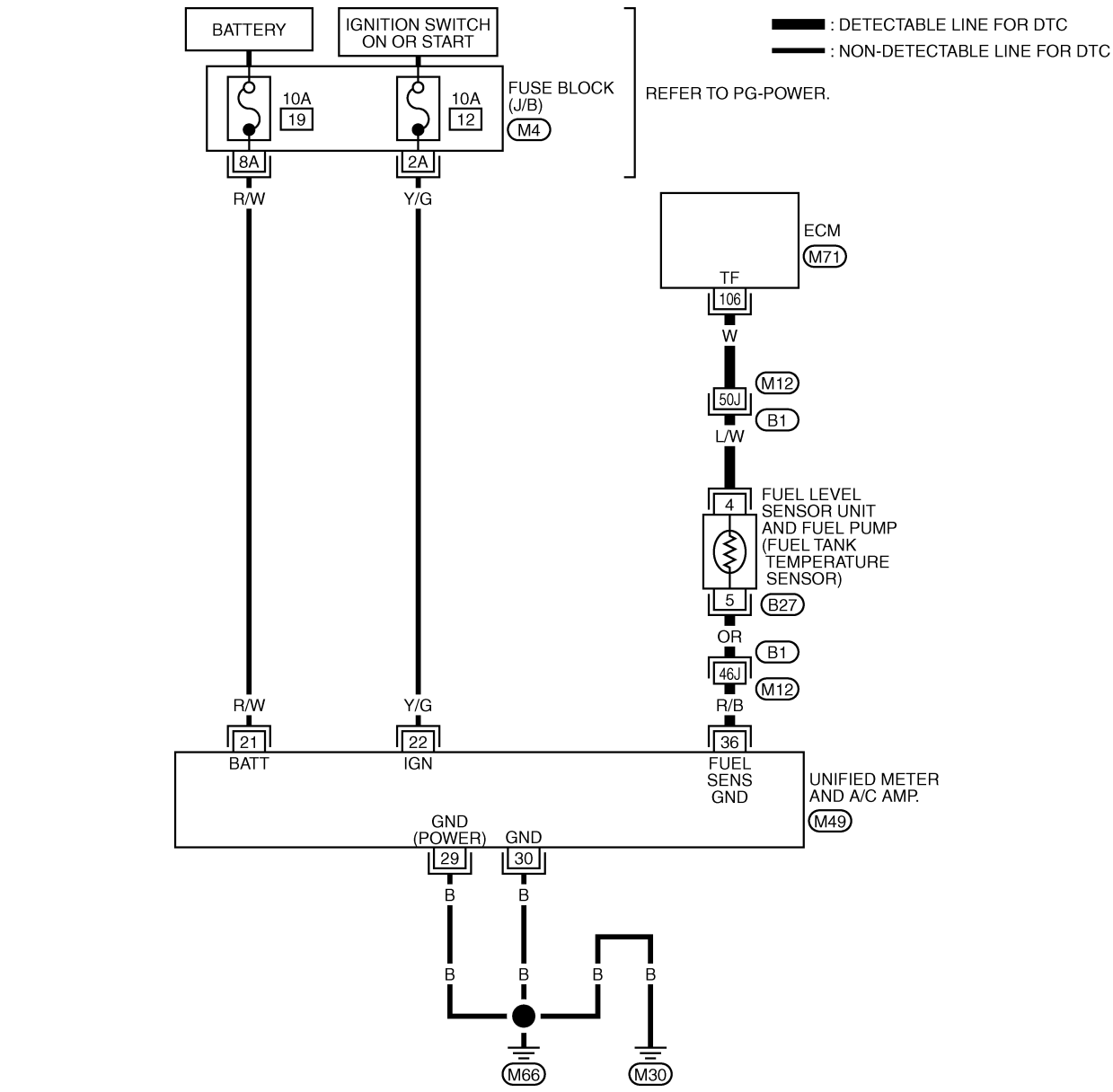
WITH GST

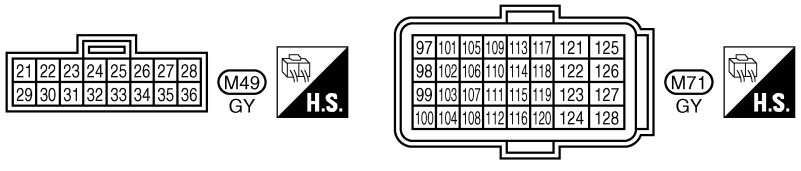
Follow the procedure “WITH CONSULT-III” above.

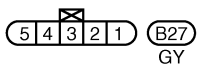
Wiring Diagram

NBS0007I

EC-FTTS-01







REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1640E

Diagnostic Procedure

NBS0007J

1. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

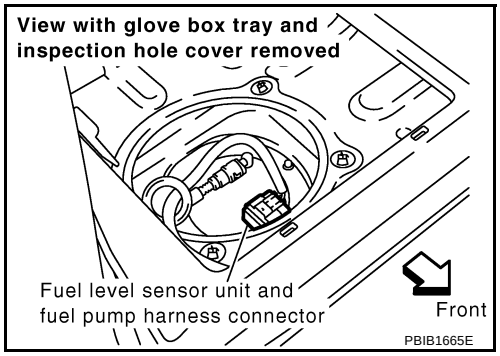
Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

OK or NG

OK >> GO TO 2.
NG >> Go to DI-19, "Fuel Level Sensor Signal Inspection" .

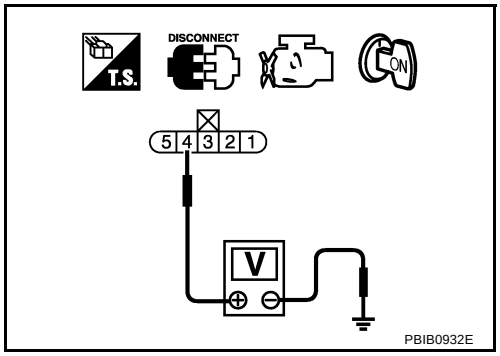
2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Turn ignition switch ON.



3. Check voltage between “fuel level sensor unit and fuel pump” terminal 4 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between ECM and “fuel level sensor unit and fuel pump”

>> Repair open circuit or short to ground or short to power in harness or connector.

4. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect “unified meter and A/C amp.” harness connector M49.
3. Check harness continuity between “fuel level sensor unit and fuel pump” terminal 5 and “unified meter and A/C amp.” terminal 36. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B1, M12
- Harness for open or short between “fuel level sensor unit and fuel pump” and “unified meter and A/C amp.”

>> Repair open circuit short to ground or short to power in harness or connector.

6. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace fuel level sensor unit.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

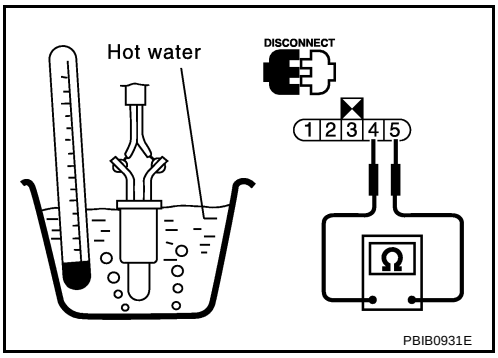
NBS0007K

FUEL TANK TEMPERATURE SENSOR

1. Remove fuel level sensor unit.
2. Check resistance between “fuel level sensor unit and fuel pump” terminals 4 and 5 by heating with hot water as shown in the figure.

Temperature °C (°F)	Resistance kΩ
20 (68)	2.3 - 2.7
50 (122)	0.79 - 0.90

3. If NG, replace fuel level sensor unit.



Removal and Installation

NBS0007L

FUEL TANK TEMPERATURE SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

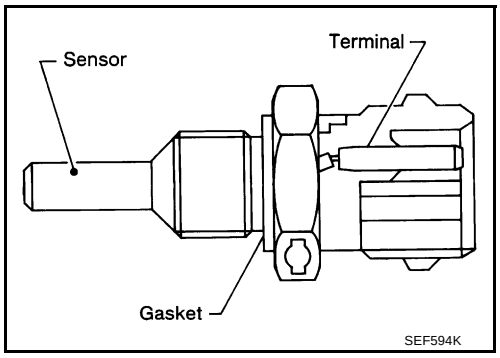
DTC P0196 EOT SENSOR

PFP:22630

Component Description

NBS006TK

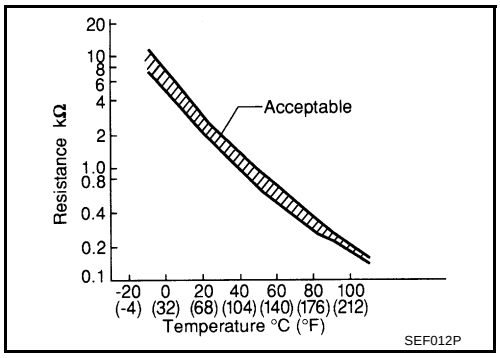
The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



< Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153

*: This data is reference values and is measured between ECM terminal 78 (Engine oil temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS006TL

NOTE:

If DTC P0196 is displayed with P0197 or P0198, first perform the trouble diagnosis for DTC P0197 or P0198. Refer to EC-356, "DTC P0197, P0198 EOT SENSOR" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0196 0196	Engine oil temperature sensor range/performance	Rationally incorrect voltage from the sensor is sent to ECM, compared with the voltage signals from engine coolant temperature sensor and intake air temperature sensor.	● Harness or connectors (The sensor circuit is open or shorted) ● Engine oil temperature sensor

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Engine oil temperature sensor	Exhaust valve timing control does not function.

DTC Confirmation Procedure

NBS006TM

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and let it idle for 5 minutes and 10 seconds.
4. Check 1st trip DTC.
   If 1st trip DTC is detected, go to EC-354, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to following steps.
5. Select “DATA MONITOR” mode with CONSULT-III.
6. Check that “COOLAN TEMP/S” indicates above 80°C (176°F).
   If it is above 80°C (176°F), go to the following steps.
   If it is below 80°C (176°F), warm engine up until “COOLAN TEMP/S” indicates more than 80°C (176°F). Then go to the following steps.
7. Turn ignition switch OFF and soak the vehicle at cool place.
8. Turn ignition switch ON.
   NOTE:
   Do not turn ignition switch OFF until step 12
9. Select “DATA MONITOR” mode with CONSULT-III.
10. Check the following.

COOLAN TEMP/S	Below 40°C (104°F)
INT/A TEMP SE	Below 40°C (104°F)
Difference between “COOLAN TEMP/S” and “INT/A TEMP SE”	Within 6°C (11°F)

   If they are within the specified range, go to following steps.
   If they are out of the specified range, soak the vehicle to met the above conditions. Then go to following steps.
   NOTE:
   - **Do not turn ignition switch OFF.**
   - **If it is supposed to need a long period of time, do not deplete the battery.**
11. Start engine and let it idle for 5 minutes.
12. Check 1st trip DTC.
13. If 1st trip DTC is detected, go to EC-354, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

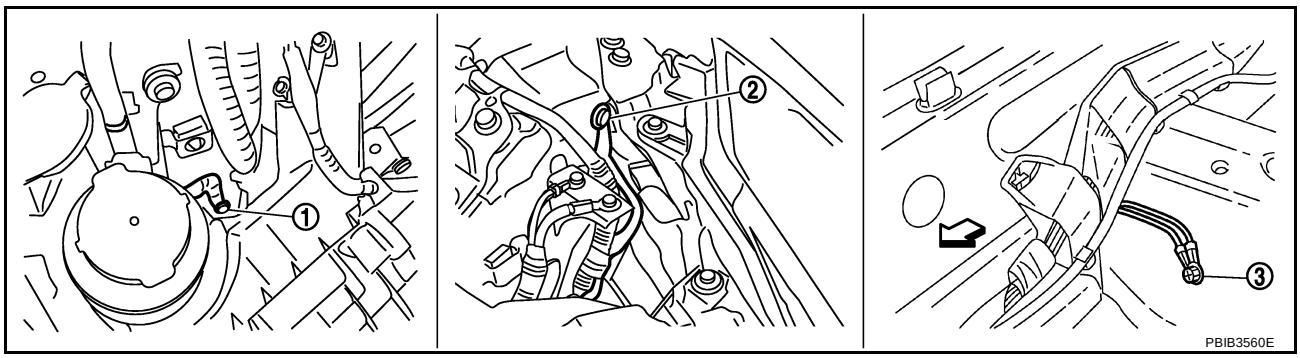
Diagnostic Procedure

NBS006TN

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

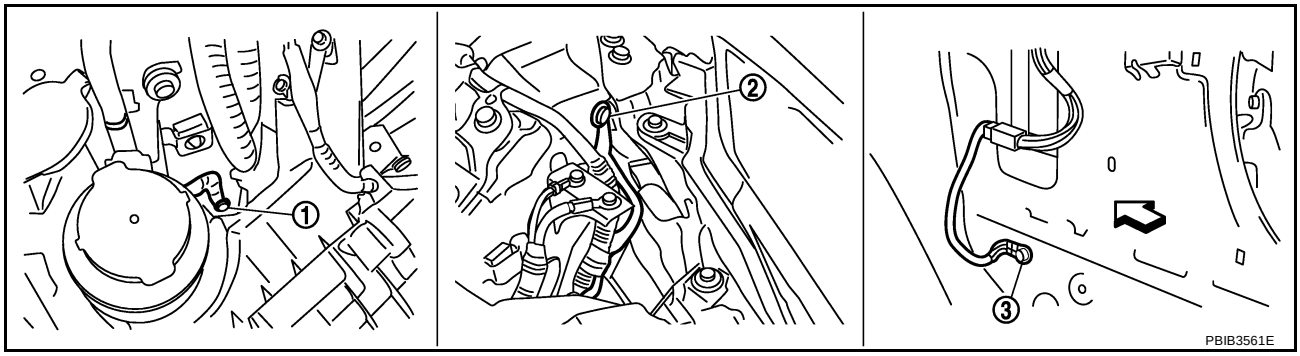


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ENGINE OIL TEMPERATURE SENSOR

Refer to EC-355, "Component Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Replace engine oil temperature sensor.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-357, "Wiring Diagram" .

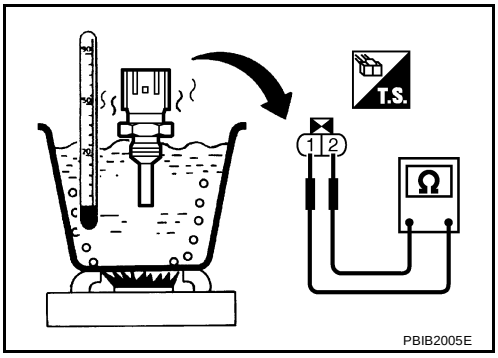
>> **INSPECTION END**

Component Inspection

NBS006TO

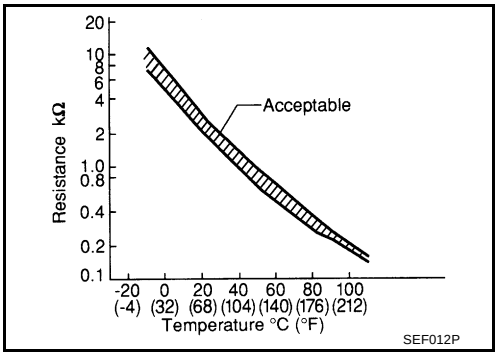
ENGINE OIL TEMPERATURE SENSOR

1. Check resistance between engine oil temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine oil temperature sensor.

Removal and Installation

NBS006TP

ENGINE OIL TEMPERATURE SENSOR

Refer to EM-26, "OIL PAN AND OIL STRAINER" .

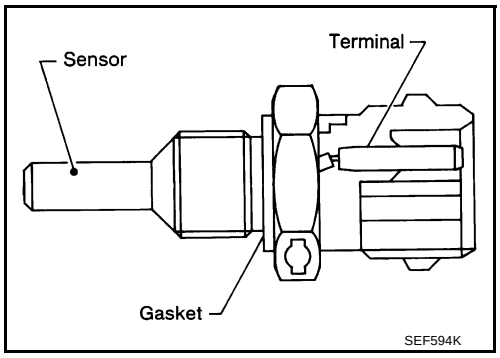
DTC P0197, P0198 EOT SENSOR

PFP:22630

Component Description

NBS006TQ

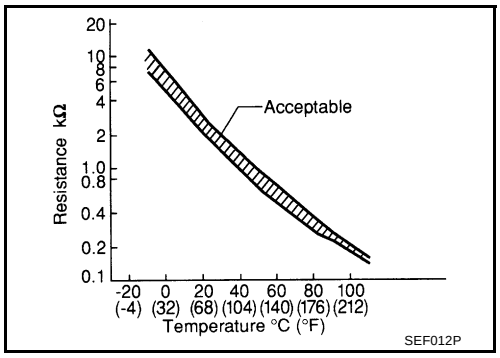
The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine coolant temperature °C (°F)	Voltage* V	Resistance kΩ
–10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.1 - 2.9
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153

*: This data is reference value and is measured between ECM terminal 78 (Engine oil temperature sensor) and ground.



CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

On Board Diagnosis Logic

NBS006TR

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P0197 0197	Engine oil temperature sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (Engine coolant temperature sensor circuit is open or shorted.) ● Engine oil temperature sensor
P0198 0198	Engine oil temperature sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Engine oil temperature sensor	Exhaust valve timing control does not function.

DTC Confirmation Procedure

NBS006TS

NOTE:

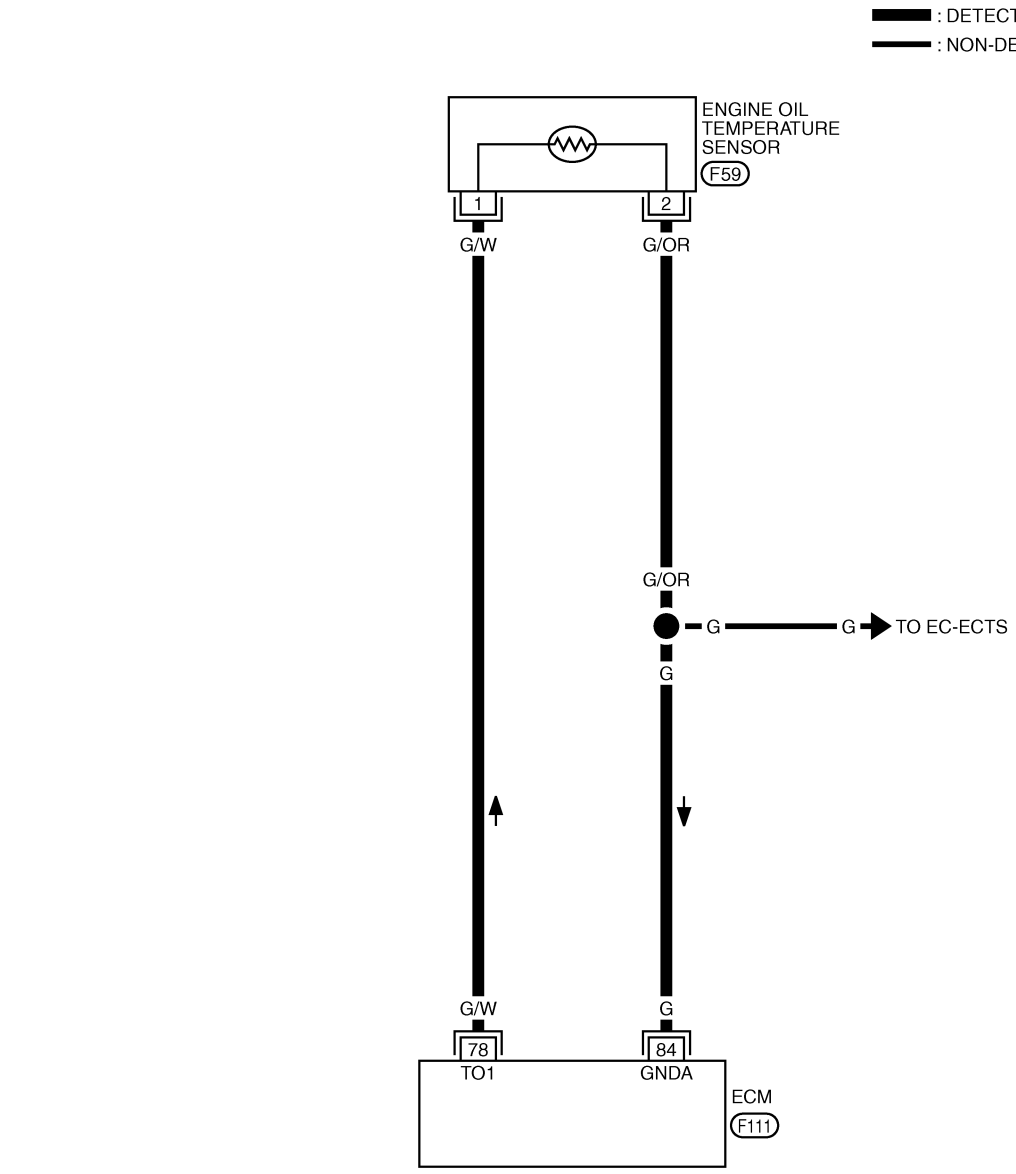
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

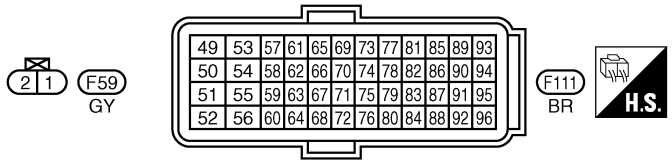
1. Start engine and wait at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-358, "Diagnostic Procedure" .

Wiring Diagram

NBS006TT

EC-EOTS-01





TBWT1684E

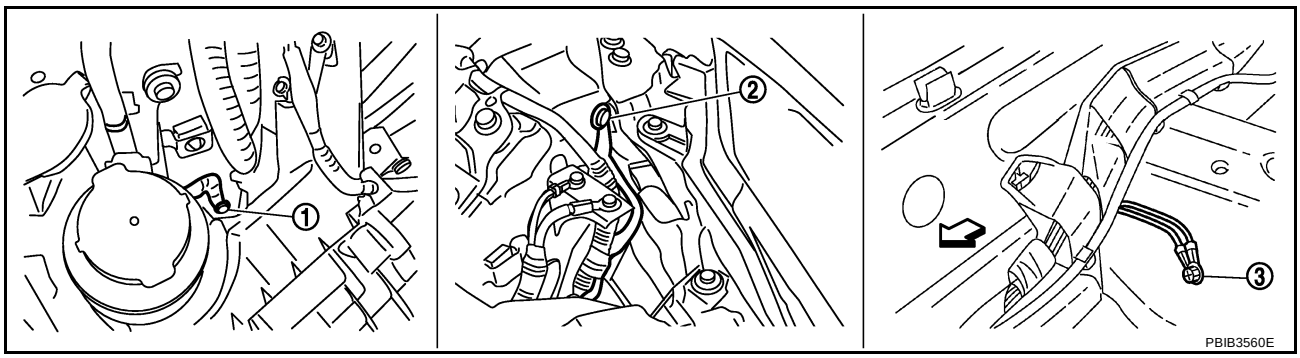
Diagnostic Procedure

NBS006TU

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

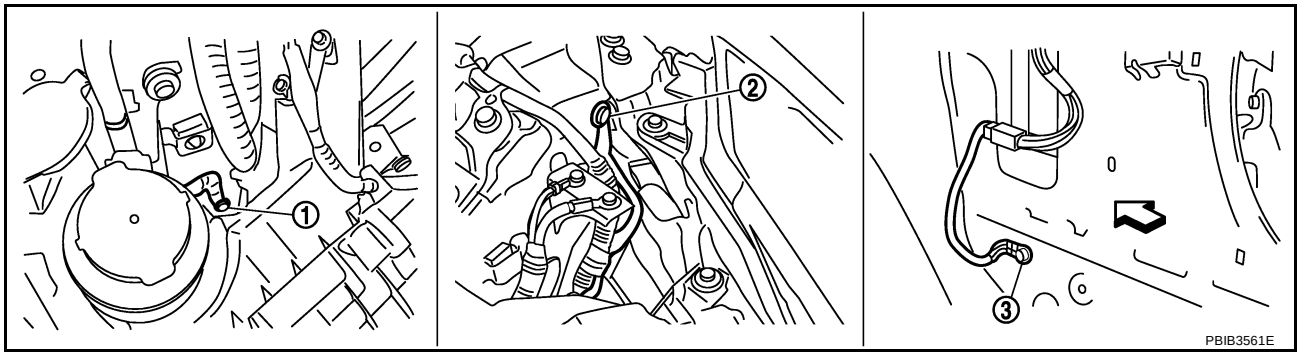


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

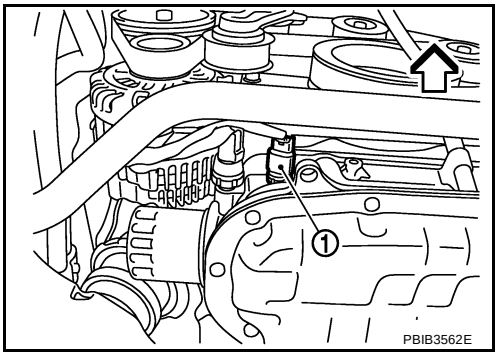
OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK EOT SENSOR POWER SUPPLY CIRCUIT

1. Disconnect engine oil temperature (EOT) sensor (1) harness connector.

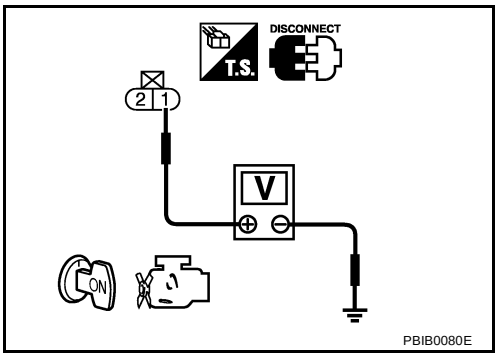
   ⇦ : Vehicle front

2. Turn ignition switch ON.



3. Check voltage between EOT sensor terminal 1 and ground with CONSULT-III or tester.

   Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EOT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 84 and ECT sensor terminal 2. Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ENGINE OIL TEMPERATURE SENSOR

Refer to EC-360, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace engine oil temperature sensor.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

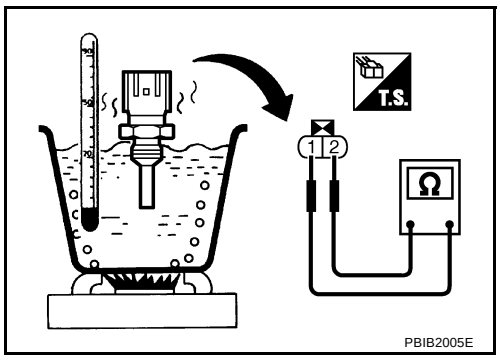
>> **INSPECTION END**

Component Inspection

NBS006TV

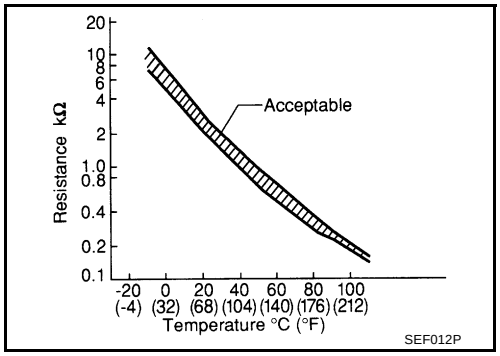
ENGINE OIL TEMPERATURE SENSOR

1. Check resistance between engine oil temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Temperature °C (°F)	Resistance kΩ
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine oil temperature sensor.

Removal and Installation

NBS006TW

ENGINE OIL TEMPERATURE SENSOR

Refer to EM-26, "OIL PAN AND OIL STRAINER" .

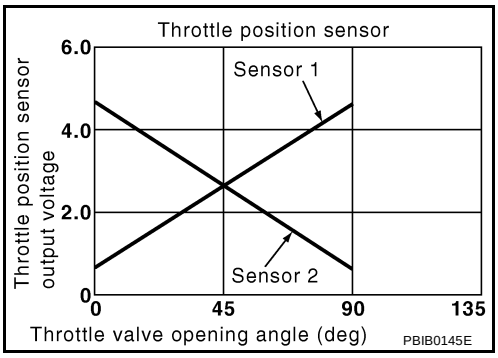
DTC P0222, P0223, P2132, P2133 TP SENSOR

PFP:16119

Component Description

NBS0007M

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-III Reference Value in Data Monitor Mode

NBS0007N

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
TP SEN 1-B1 TP SEN 1-B2 TP SEN 2-B1* TP SEN 2-B2*	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T), 1st (M/T)	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

NBS0007O

These self-diagnoses have the one trip detection logic.

NOTE:
If DTC P0222, P0223, P2132 or P2133 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0222 0222 (Bank 1) P2132 2133 (Bank 2)	Throttle position sensor 1 circuit low input	An excessively low voltage from the TP sensor 1 is sent to ECM.	● Harness or connectors (TP sensor 1 circuit is open or shorted.) ● Electric throttle control actuator (TP sensor 1)
P0223 0223 (Bank 1) P2133 2133 (Bank 2)	Throttle position sensor 1 circuit high input	An excessively high voltage from the TP sensor 1 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode an the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS0007P

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-367, "Diagnostic Procedure" .

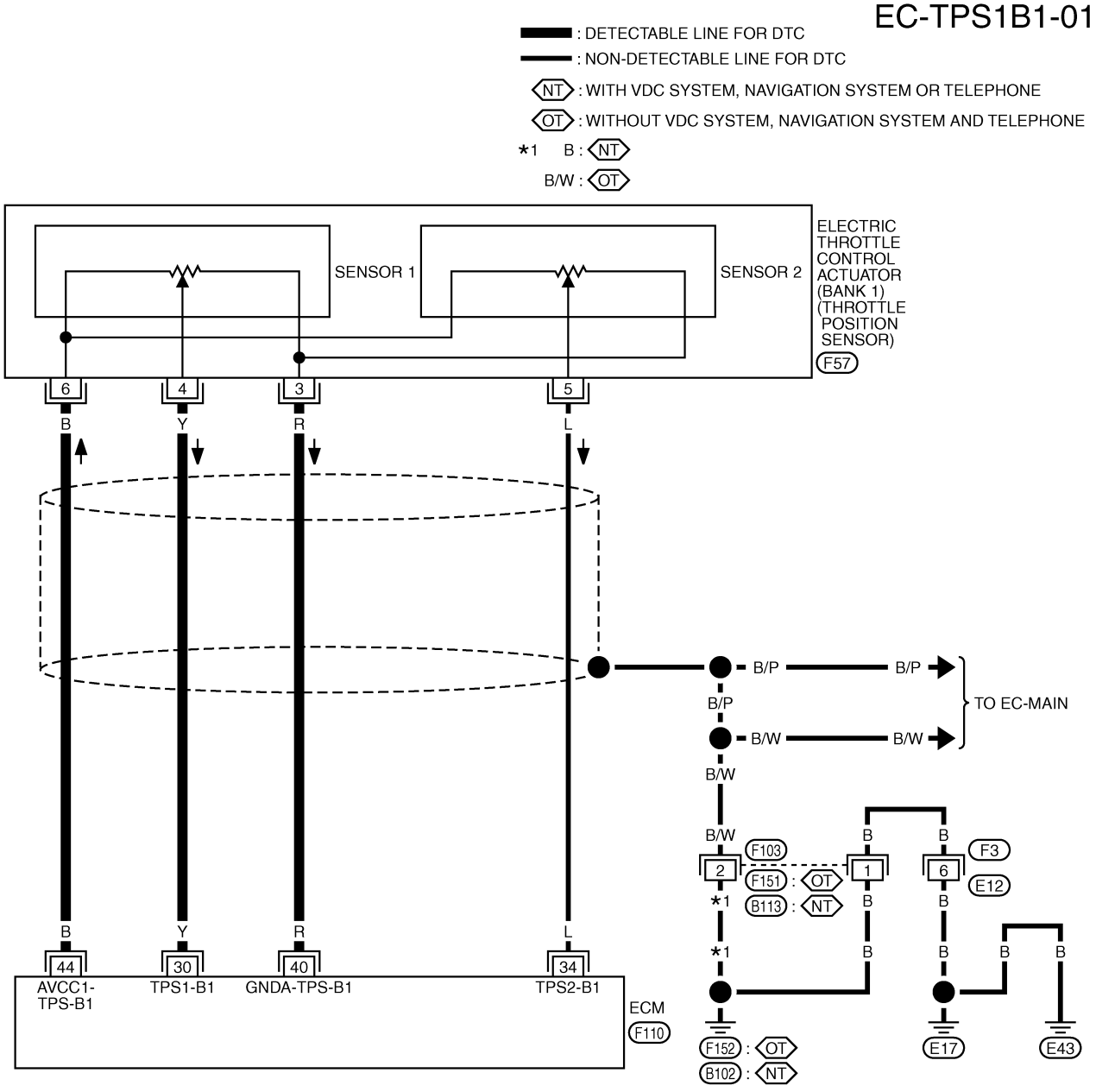
WITH GST

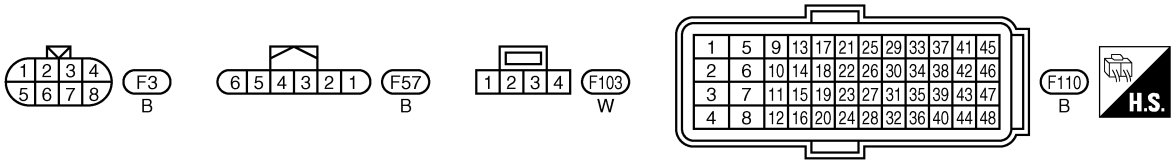
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS006V3

EC-TPS1B1-01





TBWT1641E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

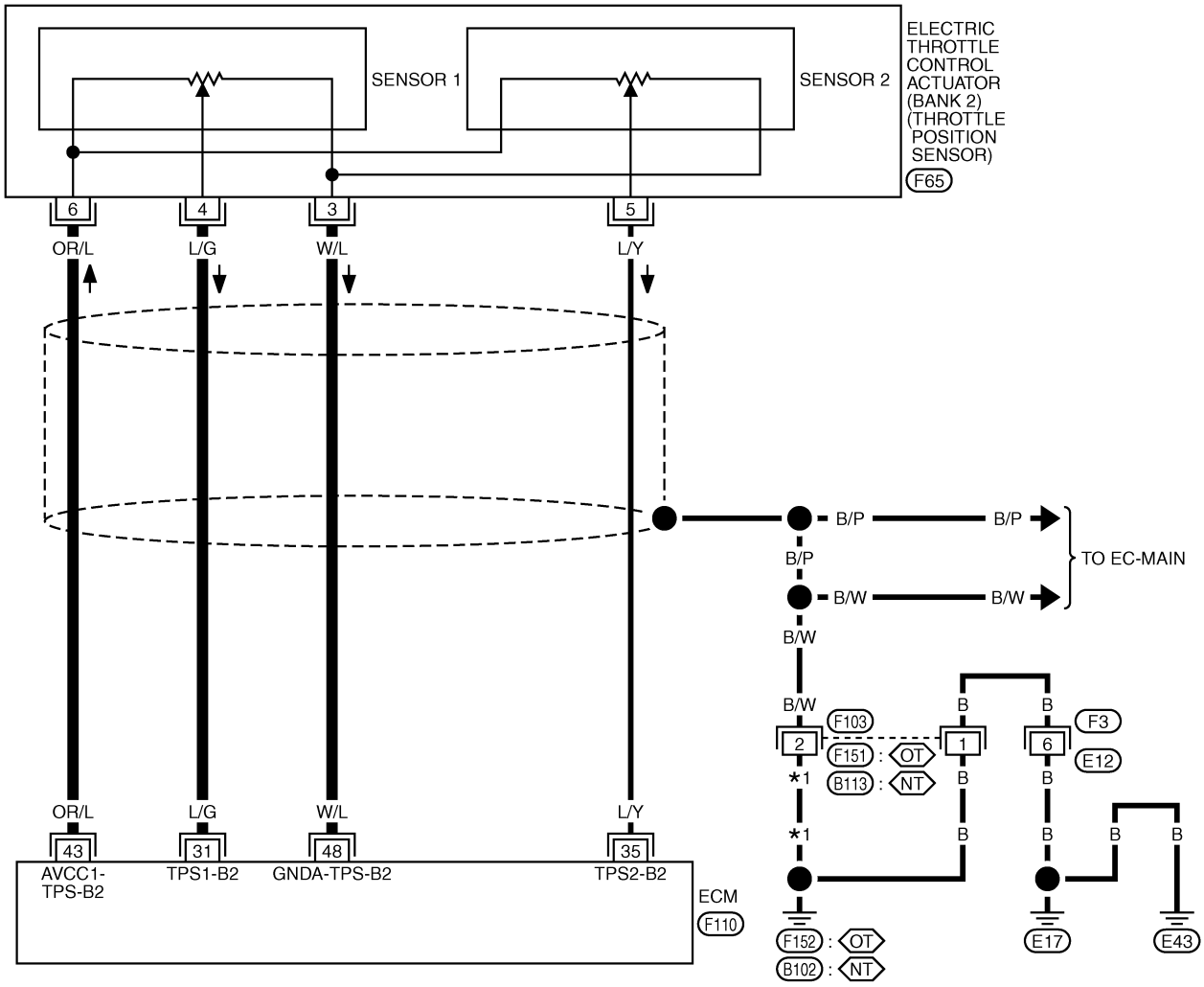
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

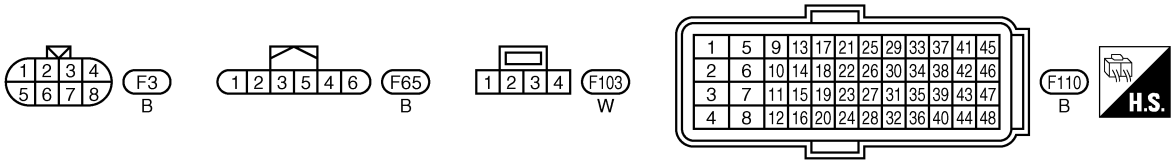
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
30	Y	Throttle position sensor 1 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
34	L	Throttle position sensor 2 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
40	R	Sensor ground [Throttle position sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V

BANK 2

EC-TPS1B2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
*1 B : NT
B/W : OT





TBWT1642E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
31	L/G	Throttle position sensor 1 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
35	L/Y	Throttle position sensor 2 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
48	W/L	Sensor ground [Throttle position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

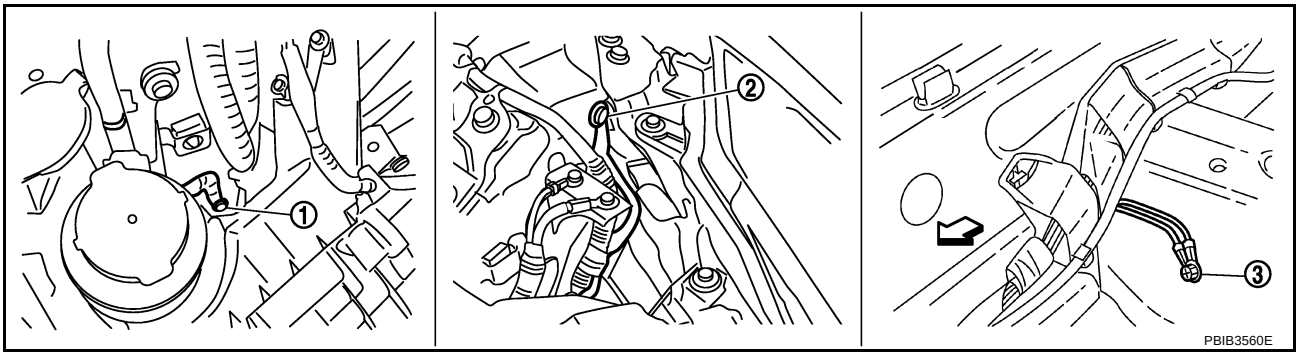
Diagnostic Procedure

NBS0007R

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

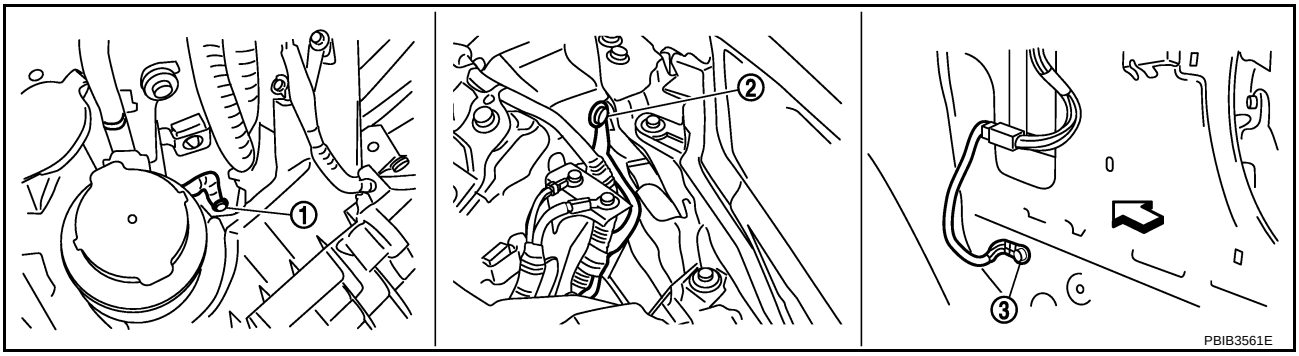


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

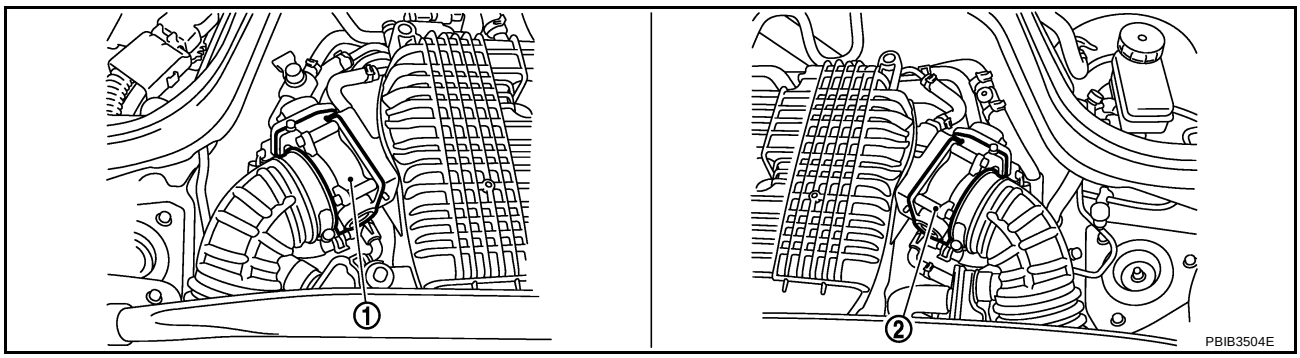
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

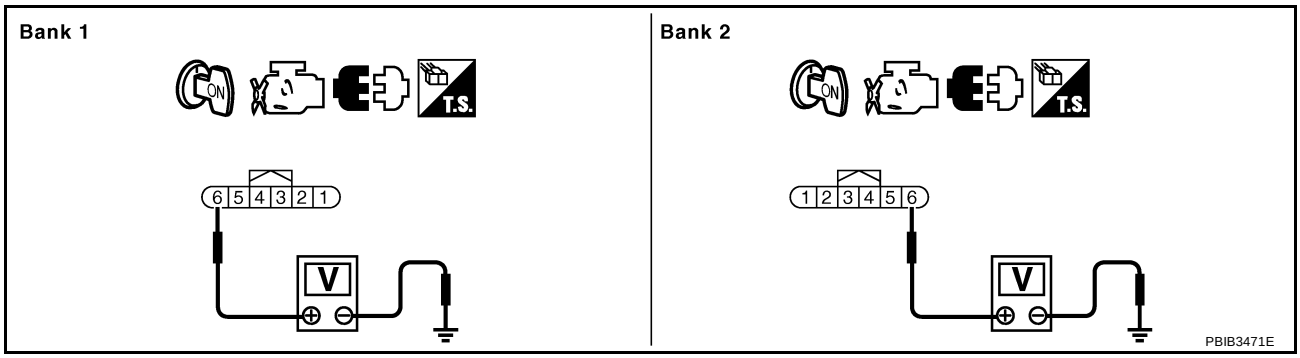
2. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control actuator (bank 1)
2. Electric throttle control actuator (bank 2)

2. Turn ignition switch ON.
3. Check voltage between electric throttle control actuator terminal 6 and ground with CONSULT-III or tester.



Voltage: Approximately 5V

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness.

3. CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 6 and ECM terminal 44 (bank 1) or 43 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit.

4. CHECK THROTTLE POSITION SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 3 and ECM terminal 40 (bank 1) or 48 (bank 2). Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 30 (bank 1) or 31 (bank 2) and electric throttle control actuator terminal 4. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK THROTTLE POSITION SENSOR

Refer to EC-369, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

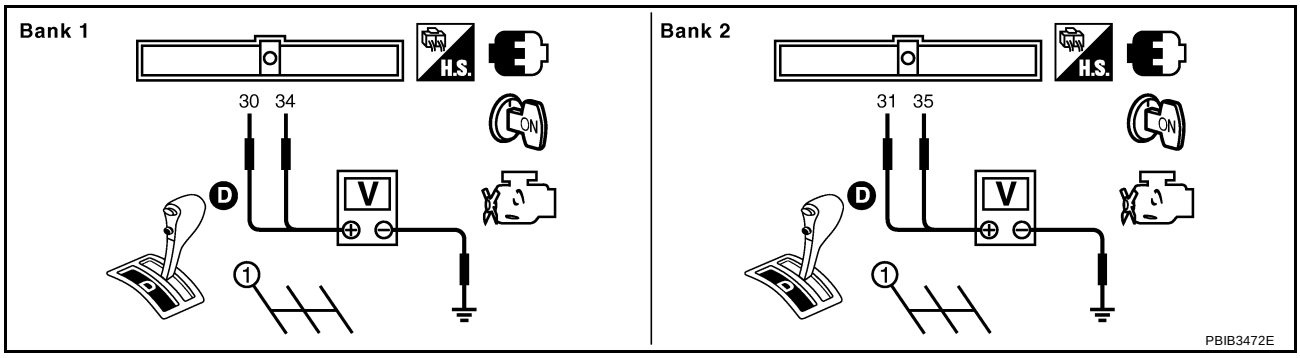
Component Inspection

NBS006V4

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.

5. Check voltage between ECM terminals 30 [TP sensor 1 (bank 1) signal], 31 [TP sensor 1 (bank 2) signal], 34 [TP sensor 2 (bank 1) signal], 35 [TP sensor 2 (bank 2) signal] and ground under the following conditions.



Terminal	Accelerator pedal	Voltage
30 [TP sensor 1 (bank 1)] 31 [TP sensor 1 (bank 2)]	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
34 [TP sensor 2 (bank 1)] 35 [TP sensor 2 (bank 2)]	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V

6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS006V5

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P0300 - P0306 MULTIPLE CYLINDER MISFIRE, NO. 1 - 6 CYLINDER MISFIRE

PFP:00000

On Board Diagnosis Logic

NBS0007U

When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crankshaft position (CKP) sensor (POS) signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input Signal to ECM	ECM function
Crankshaft position sensor (POS)	Engine speed	On board diagnosis of misfire

The misfire detection logic consists of the following two conditions.

1. One Trip Detection Logic (Three Way Catalyst Damage)
   On the 1st trip that a misfire condition occurs that can damage the three way catalyst (TWC) due to overheating, the MIL will blink.
   When a misfire condition occurs, the ECM monitors the CKP sensor signal every 200 engine revolutions for a change.
   When the misfire condition decreases to a level that will not damage the TWC, the MIL will turn off.
   If another misfire condition occurs that can damage the TWC on a 2nd trip, the MIL will blink.
   When the misfire condition decreases to a level that will not damage the TWC, the MIL will remain on.
   If another misfire condition occurs that can damage the TWC, the MIL will begin to blink again.
2. Two Trip Detection Logic (Exhaust quality deterioration)
   For misfire conditions that will not damage the TWC (but will affect vehicle emissions), the MIL will only light when the misfire is detected on a 2nd trip. During this condition, the ECM monitors the CKP sensor signal every 1,000 engine revolutions.
   A misfire malfunction can be detected on any one cylinder or on multiple cylinders.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0300 0300	Multiple cylinder misfire detected	Multiple cylinder misfire.	● Improper spark plug ● Insufficient compression ● Incorrect fuel pressure ● The fuel injector circuit is open or shorted ● Fuel injector ● Intake air leak ● The ignition signal circuit is open or shorted ● Lack of fuel ● Signal plate ● Air fuel ratio (A/F) sensor 1 ● Incorrect PCV hose connection
P0301 0301	No.1 cylinder misfire detected	No. 1 cylinder misfires.	
P0302 0302	No. 2 cylinder misfire detected	No. 2 cylinder misfires.	
P0303 0303	No. 3 cylinder misfire detected	No. 3 cylinder misfires.	
P0304 0304	No. 4 cylinder misfire detected	No. 4 cylinder misfires.	
P0305 0305	No. 5 cylinder misfire detected	No. 5 cylinder misfires.	
P0306 0306	No. 6 cylinder misfire detected	No. 6 cylinder misfires.	

DTC Confirmation Procedure

NBS0007V

CAUTION:

Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws when driving.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Restart engine and let it idle for about 15 minutes.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-372, "Diagnostic Procedure" .

   NOTE:

   If 1st trip DTC is not detected during above procedure, performing the following procedure is advised.

a. Turn ignition switch OFF and wait at least 10 seconds.

b. Start engine and drive the vehicle under the similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.

   Hold the accelerator pedal as steady as possible.

   The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

Engine speed	Engine speed in the freeze frame data ± 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data ± 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70 °C (158 °F), T should be lower than 70 °C (158 °F).
	When the freeze frame data shows higher than or equal to 70 °C (158 °F), T should be higher than or equal to 70 °C (158 °F).

The time to driving varies according to the engine speed in the freeze frame data.

Engine speed	Time
Around 1,000 rpm	Approximately 10 minutes
Around 2,000 rpm	Approximately 5 minutes
More than 3,000 rpm	Approximately 3.5 minutes

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS0007W

1. CHECK FOR INTAKE AIR LEAK AND PCV HOSE

1. Start engine and run it at idle speed.
2. Listen for the sound of the intake air leak.
3. Check PCV hose connection.

OK or NG

OK >> GO TO 2.
NG >> Discover air leak location and repair.

2. CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

OK or NG

OK (With CONSULT-III)>>GO TO 3.
OK (Without CONSULT-III)>>GO TO 4.
NG >> Repair or replace it.

3. PERFORM POWER BALANCE TEST

With CONSULT-III

1. Perform “POWER BALANCE” in “ACTIVE TEST” mode.
2. Is there any cylinder which does not produce a momentary engine speed drop?

Yes or No

Yes >> GO TO 4.
No >> GO TO 9.

4. CHECK FUNCTION OF FUEL INJECTOR

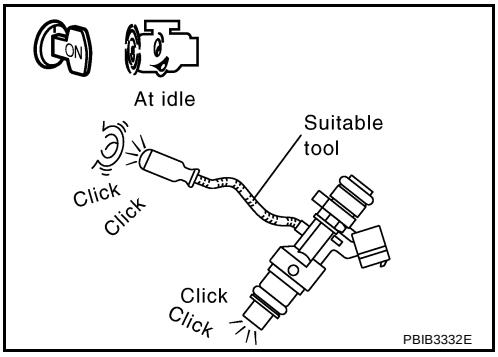
With CONSULT-III

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
3. Make sure that each circuit produces a momentary engine speed drop.

Without CONSULT-III

1. Start engine and let it idle.
2. Listen to each fuel injector operating sound.

Clickng sound should be heard.



OK or NG

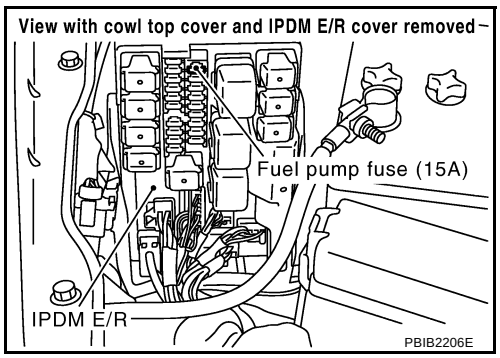
OK >> GO TO 5.
NG >> Perform trouble diagnosis for FUEL INJECTOR, refer to EC-686, "FUEL INJECTOR" .

5. CHECK FUNCTION OF IGNITION COIL-I

CAUTION:
Do the following procedure in the place where ventilation is good without the combustible.

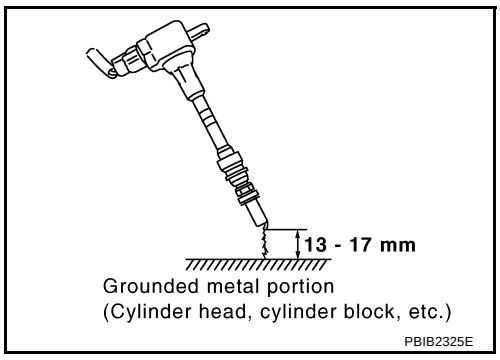
1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

   NOTE:
   Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.
4. Start engine.
5. After engine stalls, crank it two or three times to release all fuel pressure.
6. Turn ignition switch OFF.
7. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
8. Remove ignition coil and spark plug of the cylinder to be checked.



9. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
10. Connect spark plug and harness connector to ignition coil.
11. Fix ignition coil using a rope etc. with gap of 13 - 17 mm between the edge of the spark plug and grounded metal portion as shown in the figure.
12. Crank engine for about 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

    Spark should be generated.



CAUTION:

- **Do not approach to the spark plug and the ignition coil within 50cm. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20kV or more.**
- **It might cause to damage the ignition coil if the gap of more than 17 mm is taken.**

NOTE:
When the gap is less than 13 mm, the spark might be generated even if the coil is malfunctioning.

OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. CHECK FUNCTION OF IGNITION COIL-II

1. Turn ignition switch OFF.
2. Disconnect spark plug and connect a known-good spark plug.
3. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

   Spark should be generated.

OK or NG

OK >> GO TO 7.
NG >> Check ignition coil, power transistor and their circuits. Refer to EC-698, "IGNITION SIGNAL" .

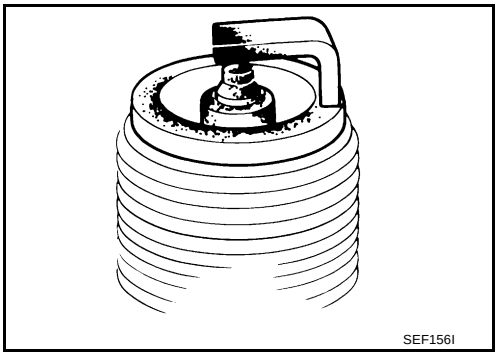
7. CHECK SPARK PLUG

Check the initial spark plug for fouling, etc.

OK or NG

OK >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to MA-18, "Changing Spark Plugs (Iridium-Tipped Type)" .

NG >> 1. Repair or clean spark plug.
2. GO TO 8.



8. CHECK FUNCTION OF IGNITION COIL-III

1. Reconnect the initial spark plugs.
2. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

OK or NG

OK >> **INSPECTION END**

NG >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to MA-18, "Changing Spark Plugs (Iridium-Tipped Type)" .

9. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to EM-89, "CHECKING COMPRESSION PRESSURE" .

OK or NG

OK >> GO TO 10.

NG >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

10. CHECK FUEL PRESSURE

1. Install all removed parts.
2. Release fuel pressure to zero. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Install fuel pressure gauge and check fuel pressure. Refer to EC-80, "FUEL PRESSURE CHECK" .

At idle: Approximately 350 kPa (3.57 kg/cm^2 , 51 psi)

OK or NG

OK >> GO TO 12.

NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Fuel pump and circuit (Refer to EC-691, "FUEL PUMP" .)
- Fuel pressure regulator (Refer to EC-80, "FUEL PRESSURE CHECK" .)
- Fuel lines (Refer tor FL-3, "Checking Fuel Lines" .)
- Fuel filter for clogging

>> Repair or replace.

12. CHECK IGNITION TIMING

Check the following items. Refer to EC-71, "Basic Inspection" .

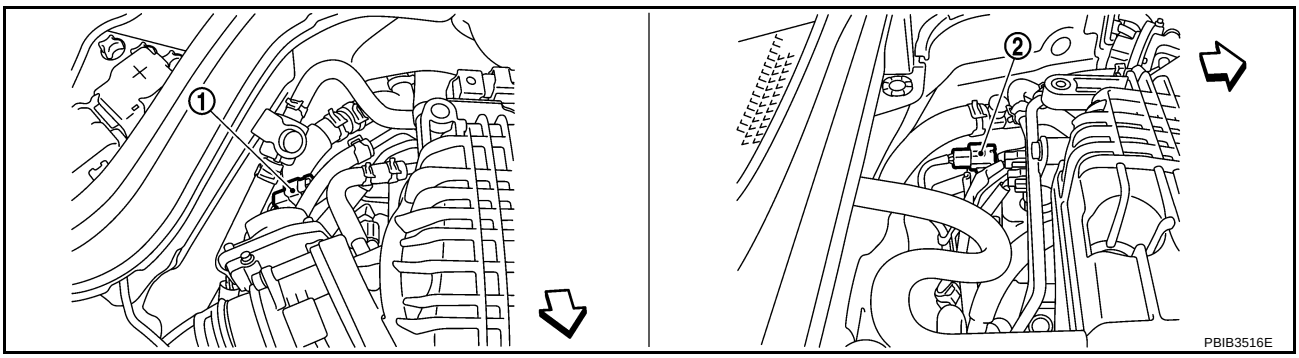
Items	Specifications
Target idle speed	A/T: 650 ± 50 rpm (in P or N position) M/T: 650 ± 50 rpm (in neutral position)
Ignition timing	A/T: 15 ± 5° BTDC (in P or N position) M/T: 15 ± 5° BTDC (in neutral position)

OK or NG

OK >> GO TO 13.
NG >> Follow the EC-71, "Basic Inspection" .

13. CHECK A/F SENSOR 1 INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.



1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank 1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

5. Check harness continuity between the following terminals and ground. Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

6. Also check harness for short to power.

OK or NG

OK >> GO TO 14.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK A/F SENSOR 1 HEATER

Refer to EC-172, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> Replace malfunctioning A/F sensor 1.

15. CHECK MASS AIR FLOW SENSOR

With CONSULT-III

1. Start engine and warm it up to normal temperature.
2. Check mass air flow sensor signal in “DATA MONITOR” mode with CONSULT-III.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

With GST

1. Start engine and warm it up to normal temperature.
2. Check mass air flow sensor signal in Service $01 with GST.

2.0 - 6.0 g·m/sec: at idling
7.0 - 20.0 g·m/sec: at 2,500 rpm

OK or NG

OK >> GO TO 16.
NG >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to EC-197, "DTC P0101, P010B MAF SENSOR" .

16. CHECK SYMPTOM MATRIX CHART

Check items on the rough idle symptom in EC-90, "Symptom Matrix Chart" .

OK or NG

OK >> GO TO 17.
NG >> Repair or replace.

17. ERASE THE 1ST TRIP DTC

Some tests may cause a 1st trip DTC to be set.
Erase the 1st trip DTC from the ECM memory after performing the tests.
Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .

>> GO TO 18.

18. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0327, P0328, P0332, P0333 KS

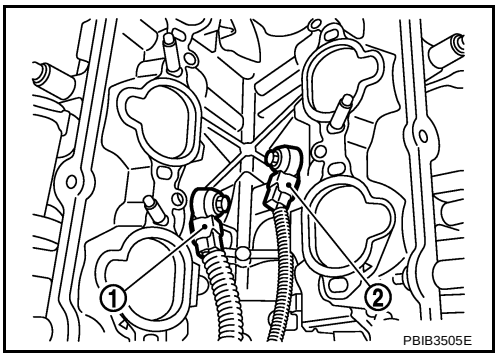
PFP:22060

Component Description

NBS0007X

The knock sensor is attached to the cylinder block. It senses engine knocking using a piezoelectric element. A knocking vibration from the cylinder block is sensed as vibrational pressure. This pressure is converted into a voltage signal and sent to the ECM.

1 : Knock sensor (bank 1)
2 : Knock sensor (bank 2)



On Board Diagnosis Logic

NBS0007Y

The MIL will not light up for these self-diagnoses.

DTC No.	Trouble diagnosis name	DTC detected condition	Possible cause
P0327 0327 (Bank 1)	Knock sensor circuit low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Knock sensor
P0332 0332 (Bank 2)			
P0328 0328 (Bank 1)	Knock sensor circuit high input	An excessively high voltage from the sensor is sent to ECM.	
P0333 0333 (Bank 2)			

DTC Confirmation Procedure

NBS0007Z

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-III

1. Start engine and run it for at least 5 seconds at idle speed.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-383, "Diagnostic Procedure" .

WITH GST

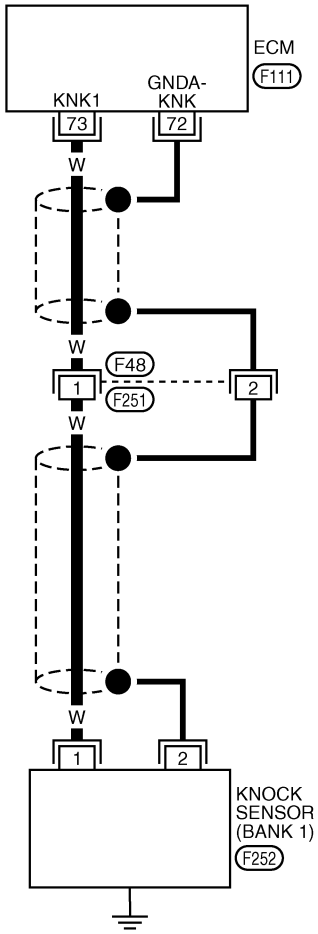
Follow the procedure “WITH CONSULT-III” above.

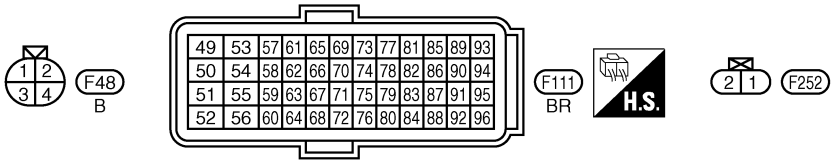
Wiring Diagram
BANK 1

NBS00080

EC-KSB1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1643E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

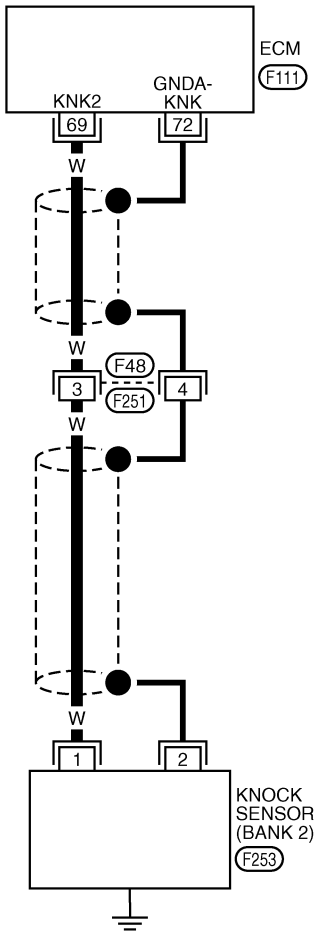
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

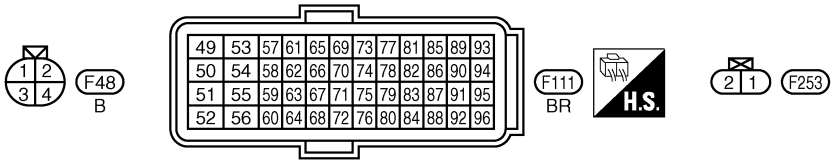
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
72	—	Sensor ground [Knock sensor (bank 1), Knock sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
73	W	Knock sensor (bank 1)	**[Engine is running]** ● Idle speed	Approximately 2.5V

BANK 2

EC-KSB2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1644E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
69	W	Knock sensor (bank 2)	**[Engine is running]** ● Idle speed	Approximately 2.5V
72	—	Sensor ground [Knock sensor (bank 1), Knock sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V

Diagnostic Procedure

NBS00081

1. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check resistance between ECM terminal 73 (bank 1), 69 (bank 2) and ground. Refer to Wiring Diagram.

   NOTE:
   It is necessary to use an ohmmeter which can measure more than 10 MΩ.

   Resistance: Approximately 532 - 588 kΩ [at 20°C (68°F)]

4. Also check harness for short to ground and short to power.

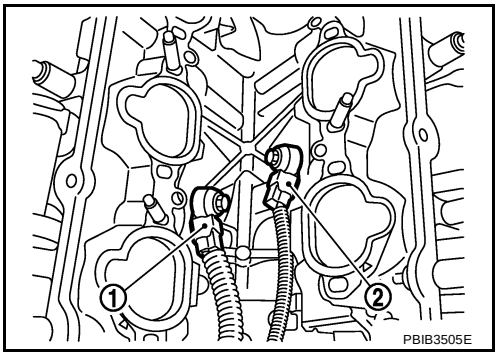
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

1. Disconnect knock sensor harness connector.

   1 : Knock sensor (bank 1)
   2 : Knock sensor (bank 2)



2. Check harness continuity between ECM terminal 73 (bank 1), 69 (bank 2) and knock sensor terminal 1. Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F48, F251
- Harness for open or short between ECM and knock sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK KNOCK SENSOR

Refer to EC-385, "Component Inspection" .

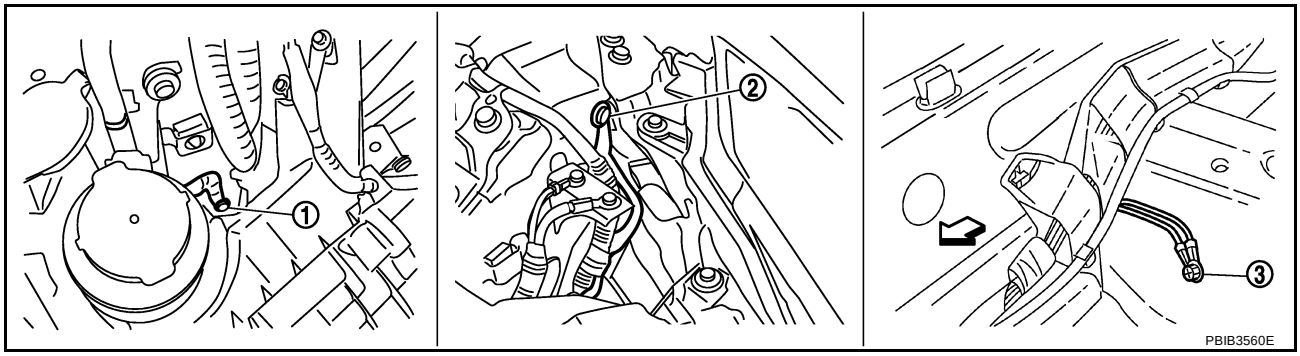
OK or NG

OK >> GO TO 5.
NG >> Replace knock sensor.

5. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

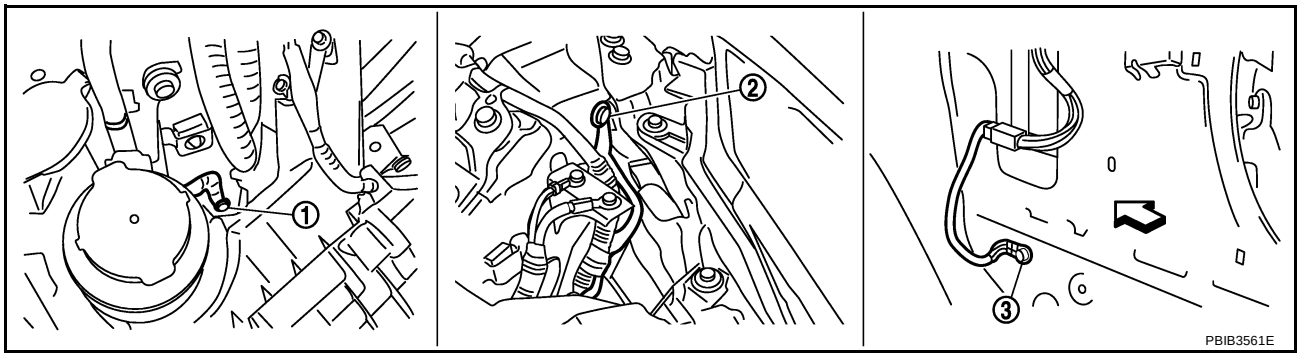


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 6.
NG >> Repair or replace ground connections.

6. CHECK KNOCK SENSOR SHIELD CIRCUIT FOR OPEN AND SHORT

1. Disconnect knock sensor harness connector.
2. Check harness continuity between ECM terminal 72 and knock sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F48, F251
- Harness for open or short between ECM and knock sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

NBS00082

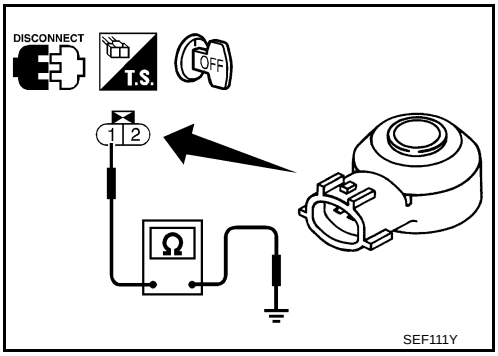
KNOCK SENSOR

Check resistance between knock sensor terminal 1 and ground.

NOTE:
It is necessary to use an ohmmeter which can measure more than 10 MΩ.

Resistance: Approximately 532 - 588 kΩ [at 20°C (68°F)]

CAUTION:
Do not use any knock sensors that have been dropped or physically damaged. Use only new ones.



Removal and Installation

NBS00083

KNOCK SENSOR

Refer to EM-107, "CYLINDER BLOCK" .

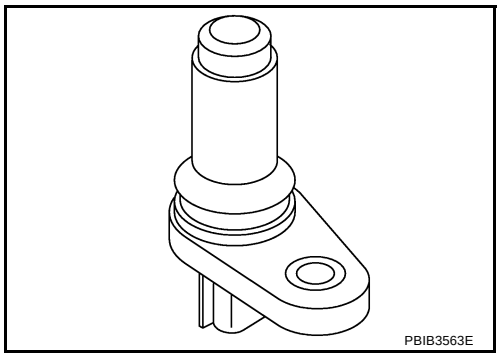
DTC P0335 CKP SENSOR (POS)

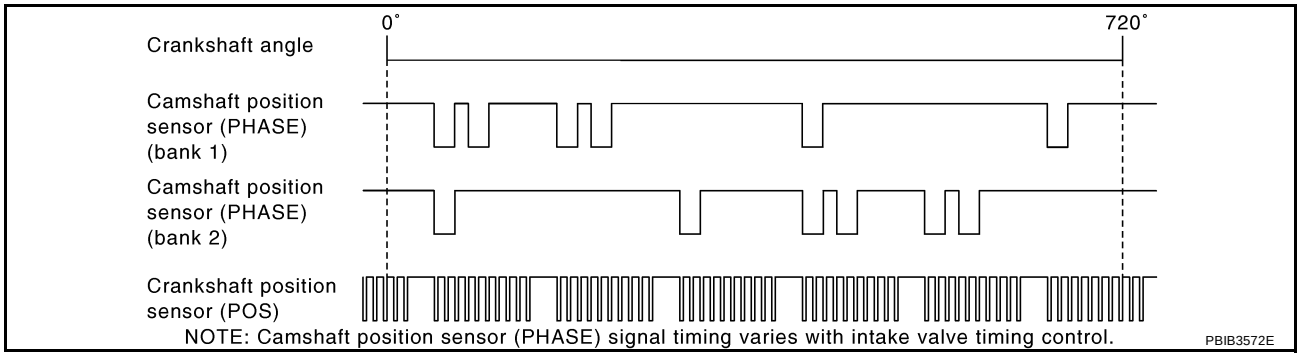
PFP:23731

Component Description

NBS00084

The crankshaft position sensor (POS) is located on the oil pan facing the gear teeth (cogs) of the signal plate. It detects the fluctuation of the engine revolution.
The sensor consists of a permanent magnet and Hall IC.
When the engine is running, the high and low parts of the teeth cause the gap with the sensor to change.
The changing gap causes the magnetic field near the sensor to change.
Due to the changing magnetic field, the voltage from the sensor changes.
The ECM receives the voltage signal and detects the fluctuation of the engine revolution.
ECM receives the signals as shown in the figure.


PBIB3563E



CONSULT-III Reference Value in Data Monitor Mode

NBS00085

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-III value with the tachometer indication.	Almost the same speed as the tachometer indication.

On Board Diagnosis Logic

NBS00086

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0335 0335	Crankshaft position sensor (POS) circuit	● The crankshaft position sensor (POS) signal is not detected by the ECM during the first few seconds of engine cranking. ● The proper pulse signal from the crankshaft position sensor (POS) is not sent to ECM while the engine is running. ● The crankshaft position sensor (POS) signal is not in the normal pattern during engine running.	● Harness or connectors [CKP sensor (POS) circuit is open or shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● EVAP control system pressure sensor ● Refrigerant pressure sensor ● Signal plate

DTC Confirmation Procedure

NBS00087

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch ON.

WITH CONSULT-III

1. Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-390, "Diagnostic Procedure" .

WITH GST

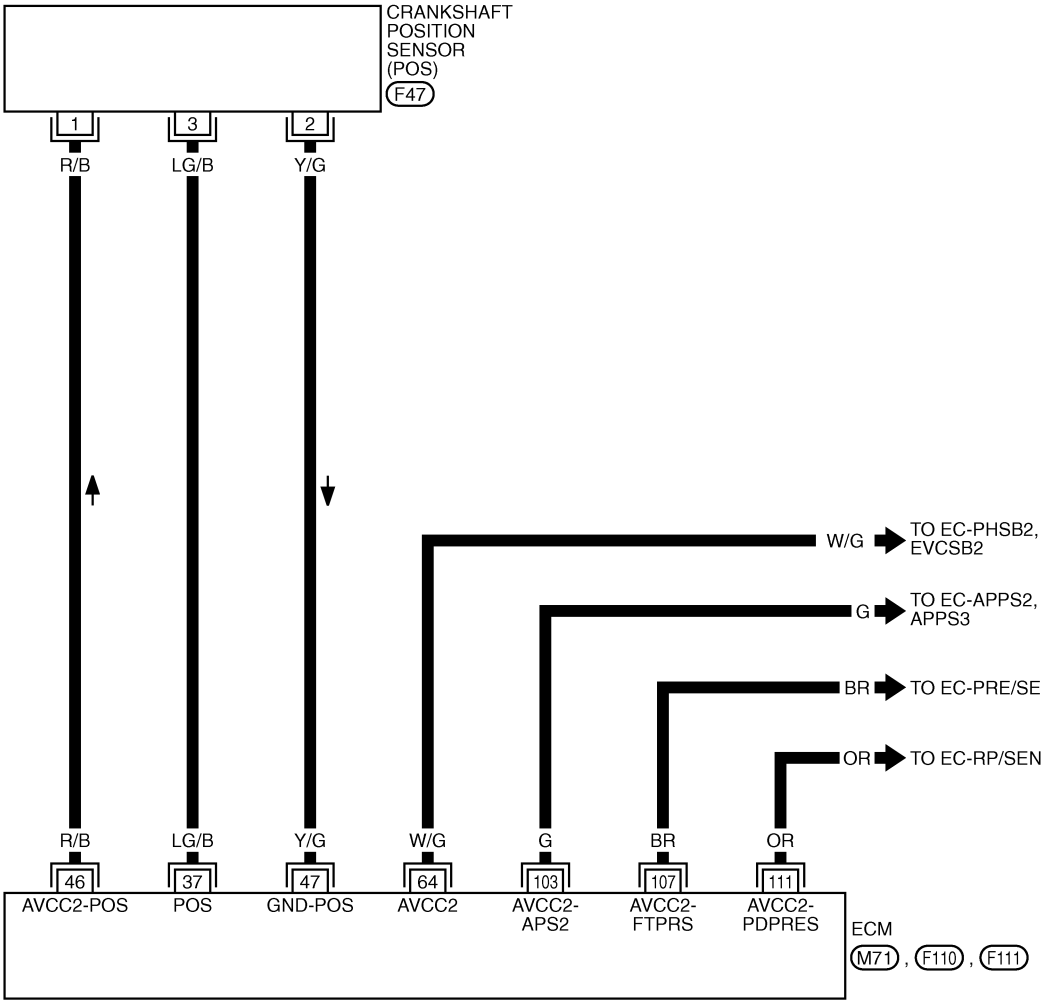
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

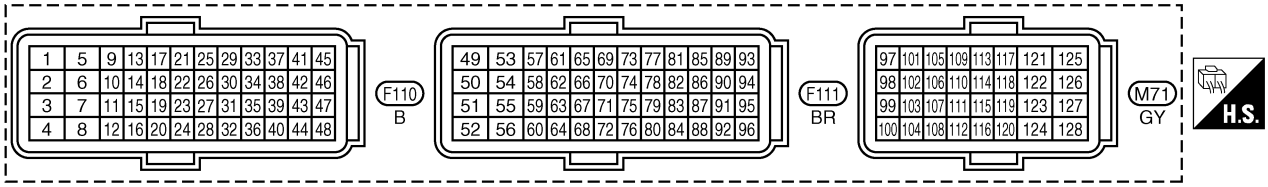
NBS00088

EC-POS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



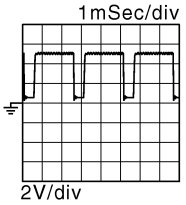
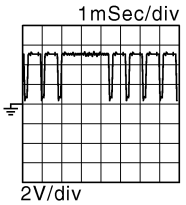




TBWT1645E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
37	LG/B	Crankshaft position sensor (POS)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3549E
			[Engine is running] ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3550E
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
47	Y/G	Sensor ground [Crankshaft position sensor (POS)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

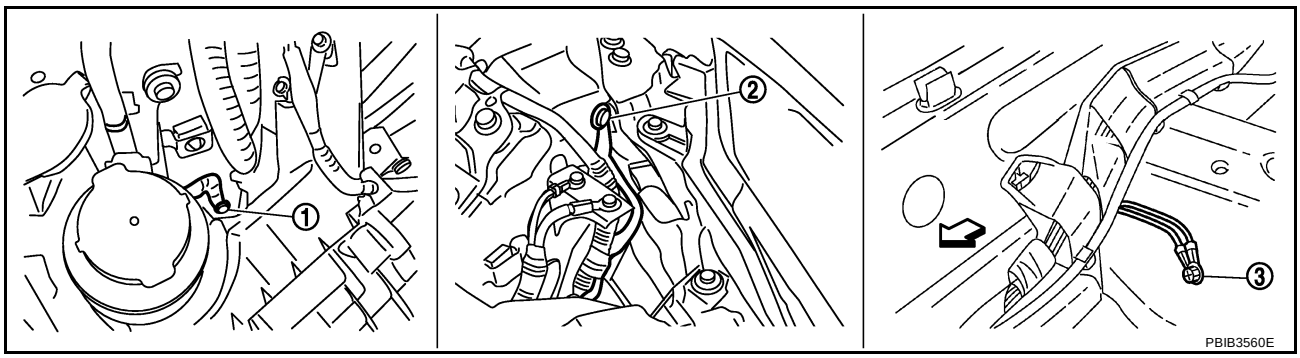
Diagnostic Procedure

NBS00089

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

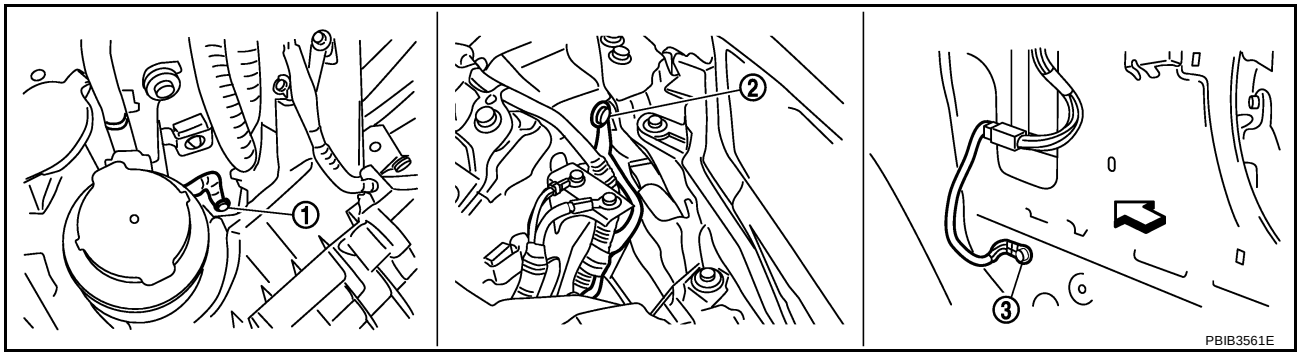


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

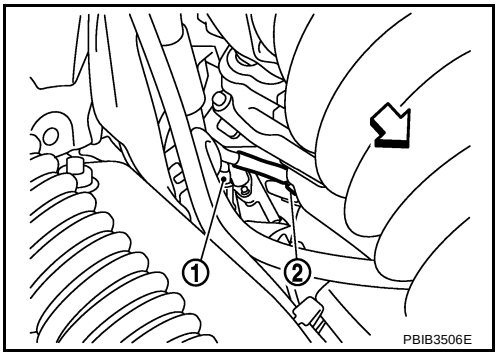
2. CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY CIRCUIT-I

1. Disconnect crankshaft position (CKP) sensor (POS) (2) harness connector.

   1 : A/F sensor 1 (bank 1)

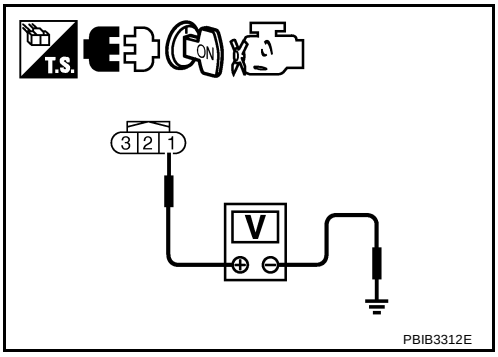
   ⇦ : Vehicle front

2. Turn ignition switch ON.



3. Check voltage between CKP sensor (POS) terminal 1 and ground with CONSULT-III or tester.

   Voltage: Approximately 5V



OK or NG

OK >> GO TO 8.
NG >> GO TO 3.

3. CHECK CKP SENSOR (POS) POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between CKP sensor (POS) terminal 1 and ECM terminal 46. Refer to Wiring Diagram.

   Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit.

4. CHECK CKP SENSOR (POS) POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor terminal 1	EC-711

OK or NG

OK >> GO TO 5.
NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK COMPONENTS

Check the following.

- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning component.

6. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> GO TO 7.

7. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

8. CHECK CKP SENSOR (POS) GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between CKP sensor (POS) terminal 2 and ECM terminal 47.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

9. CHECK CKP SENSOR (POS) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between CKP sensor (POS) terminal 3 and ECM terminal 37.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-393, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace CKP sensor (POS).

11. CHECK GEAR TOOTH

Visually check for chipping signal plate gear tooth.

OK or NG

OK >> GO TO 12.
NG >> Replace the signal plate.

12. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

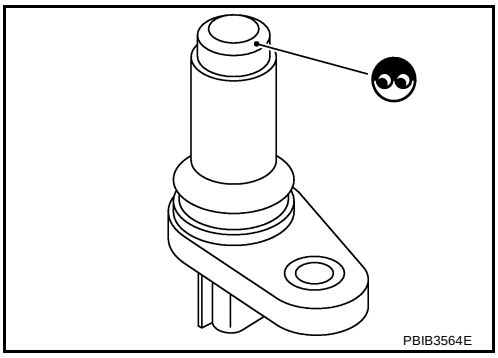
>> **INSPECTION END**

Component Inspection

NBS0008A

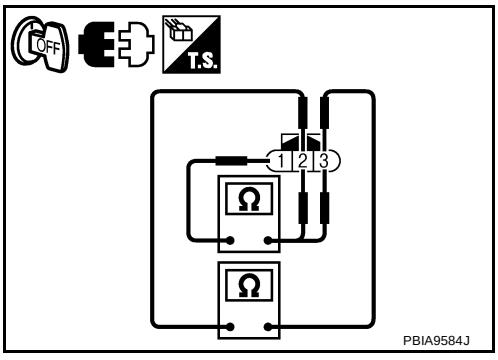
CRANKSHAFT POSITION SENSOR (POS)

1. Loosen the fixing bolt of the sensor.
2. Disconnect CKP sensor (POS) harness connector.
3. Remove the sensor.
4. Visually check the sensor for chipping.



5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	Except 0 or ∞
1 (+) - 3 (-)	
2 (+) - 3 (-)	



Removal and Installation

NBS0008B

CRANKSHAFT POSITION SENSOR (POS)

Refer to EM-26, "OIL PAN AND OIL STRAINER" .

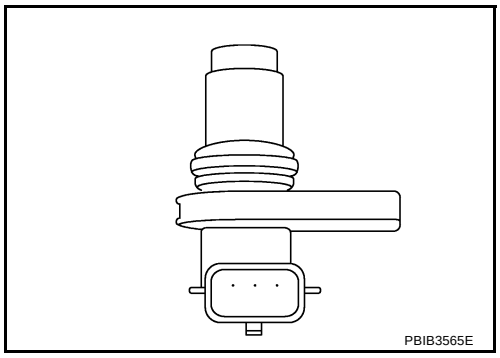
DTC P0340, P0345 CMP SENSOR (PHASE)

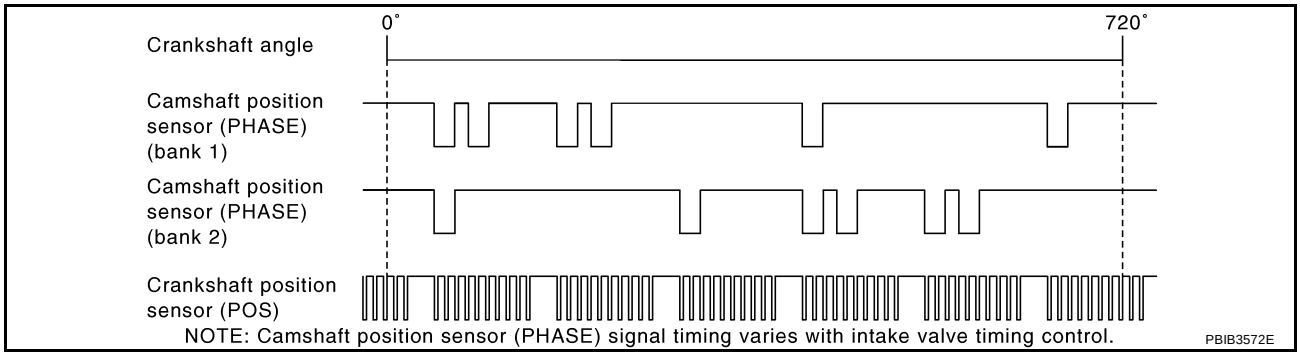
PFP:23731

Component Description

NBS0008C

The camshaft position sensor (PHASE) senses the retraction of camshaft (INT) to identify a particular cylinder. The camshaft position sensor (PHASE) senses the piston position.
When the crankshaft position sensor (POS) system becomes inoperative, the camshaft position sensor (PHASE) provides various controls of engine parts instead, utilizing timing of cylinder identification signals.
The sensor consists of a permanent magnet and Hall IC.
When engine is running, the high and low parts of the teeth cause the gap with the sensor to change.
The changing gap causes the magnetic field near the sensor to change.
Due to the changing magnetic field, the voltage from the sensor changes.
ECM receives the signals as shown in the figure.


PBIB3565E



CONSULT-III Reference Value in Data Monitor Mode

NBS0008D

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
ENG SPEED	● Run engine and compare CONSULT-III value with the tachometer indication.	Almost the same speed as the tachometer indication.

On Board Diagnosis Logic

NBS0008E

NOTE:
If DTC P0340 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0340 0340 (Bank 1)	Camshaft position sensor (PHASE) circuit	● The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking. ● The cylinder No. signal is not sent to ECM during engine running. ● The cylinder No. signal is not in the normal pattern during engine running.	● Harness or connectors [CMP sensor (PHASE) (bank 1) circuit is open or shorted.] ● Camshaft position sensor (PHASE) (bank 1) ● Camshaft (INT) ● Starter motor (Refer to SC-8, "STARTING SYSTEM" .) ● Starting system circuit (Refer to SC-8, "STARTING SYSTEM" .) ● Dead (Weak) battery
P0345 0345 (Bank 2)			● Harness or connectors [CMP sensor (PHASE) (bank 2) circuit is open or shorted.] [CKP sensor (POS) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Camshaft position sensor (PHASE) (bank 2) ● Crankshaft position sensor (POS) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● EVAP control system pressure sensor ● Refrigerant pressure sensor ● Camshaft (INT) ● Starter motor (Refer to SC-8, "STARTING SYSTEM" .) ● Starting system circuit (Refer to SC-8, "STARTING SYSTEM" .) ● Dead (Weak) battery

DTC Confirmation Procedure

NBS0008F

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10.5V with ignition switch ON.

WITH CONSULT-III

1. Crank engine for at least 2 seconds and run it for at least 5 seconds at idle speed.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-400, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to next step.
4. Maintaining engine speed at more than 800 rpm for at least 5 seconds.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-400, "Diagnostic Procedure" .

WITH GST

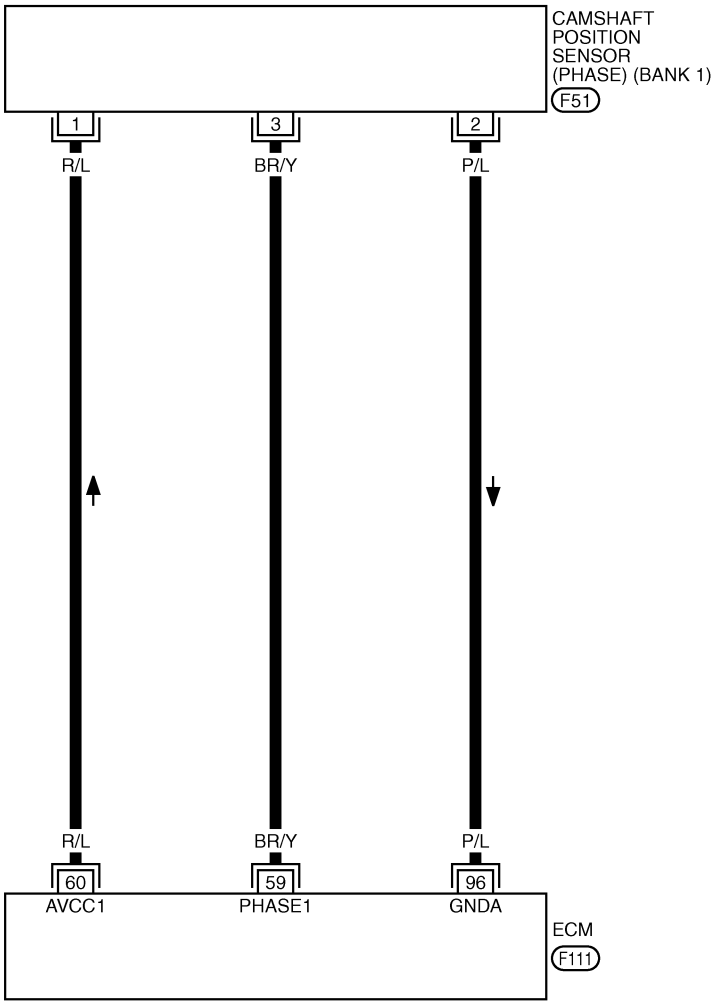
Follow the procedure “WITH CONSULT-III” above.

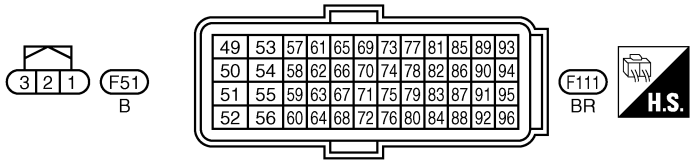
Wiring Diagram
BANK 1

NBS0008G

EC-PHSB1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



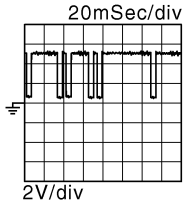
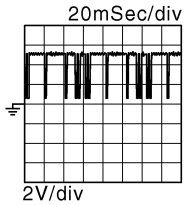


TBWT1646E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

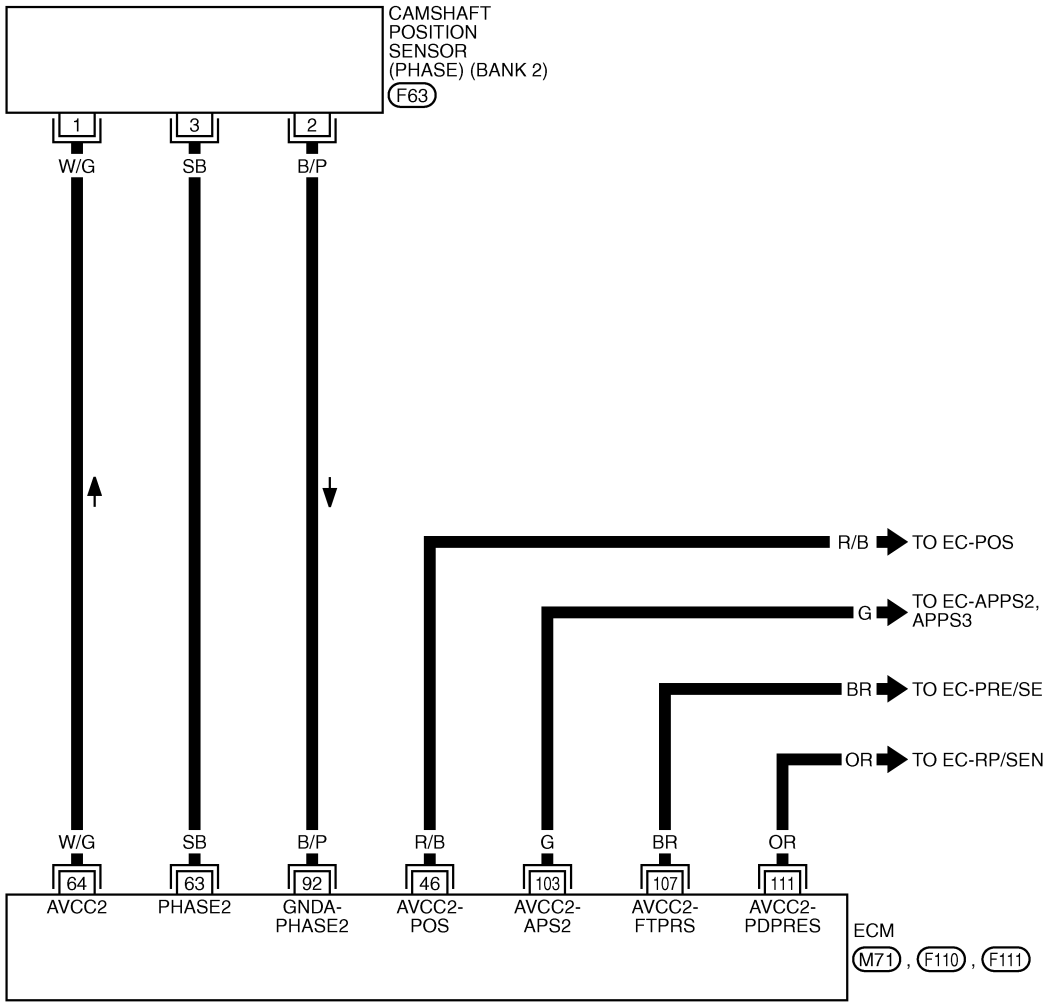
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
59	BR/Y	Camshaft position sensor (PHASE) (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	3.0 - 5.0V★  PBIB3553E
			[Engine is running] ● Engine speed: 2,000 rpm	3.0 - 5.0V★  PBIB3554E
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
96	P/L	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Power steering pressure sensor]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

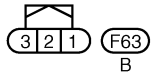
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

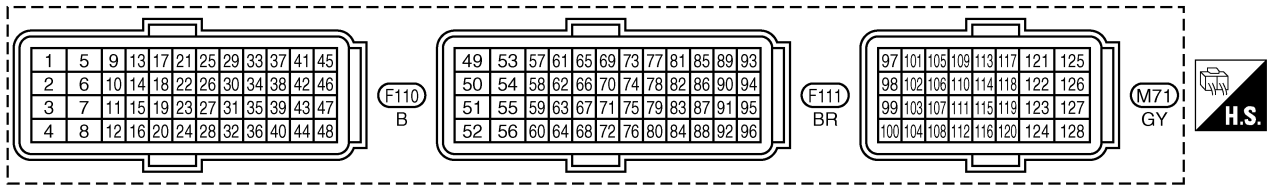
BANK 2

EC-PHSB2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





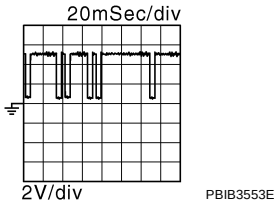
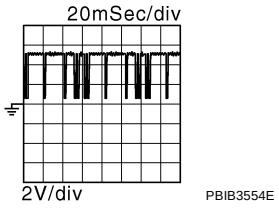


TBWT1647E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
63	SB	Camshaft position sensor (PHASE) (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	3.0 - 5.0V★  PBIB3553E
			[Engine is running] ● Engine speed: 2,000 rpm	1.0 - 4.0V★  PBIB3554E
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
92	B/P	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS0008H

1. CHECK STARTING SYSTEM

Turn ignition switch to START position.

Does the engine turn over?

Does the starter motor operate?

Yes or No

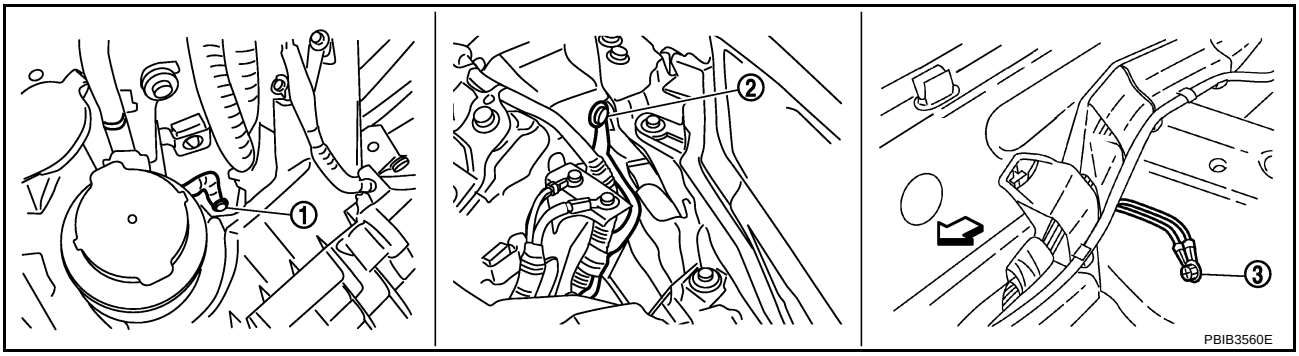
Yes >> GO TO 2.

No >> Check starting system. (Refer to SC-8, "STARTING SYSTEM" .)

2. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

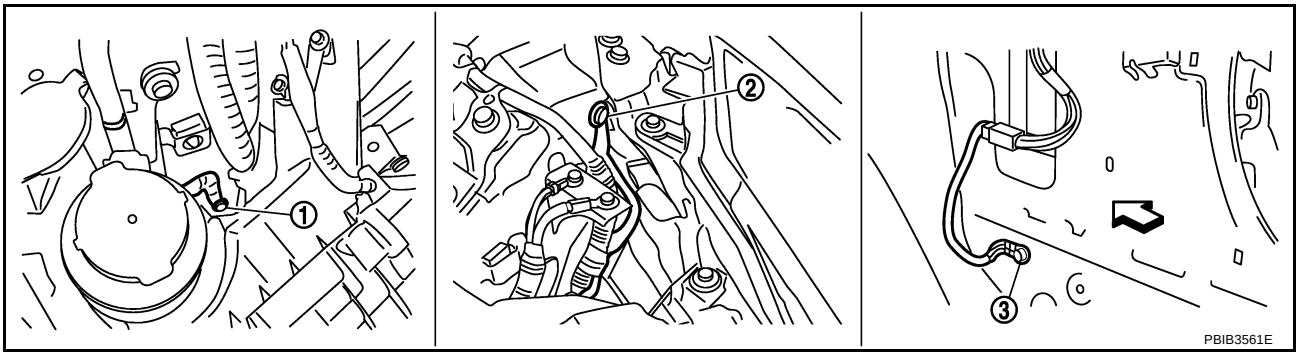


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 3.
NG >> Repair or replace ground connections.

3. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY CIRCUIT-I

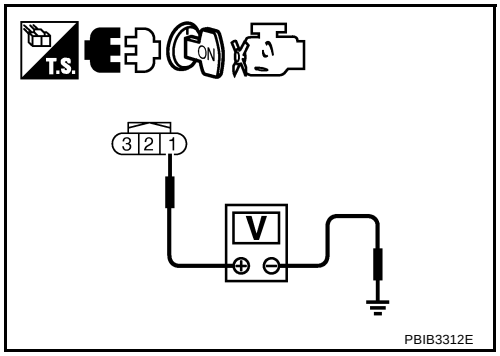
1. Disconnect camshaft position (CMP) sensor (PHASE) harness connector.



1. Exhaust valve timing control position sensor (bank 1)
2. Camshaft position sensor (PHASE) (bank 1)
3. Camshaft position sensor (PHASE) (bank 2)
4. Exhaust valve timing control position sensor (bank 2)

2. Turn ignition switch ON.
3. Check voltage between CMP sensor (PHASE) terminal 1 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 9.
NG-1 >> P0340: Repair open circuit or short to ground or short to power in harness or connectors.
NG-2 >> P0345: GO TO 4.

4. CHECK CMP SENSOR (PHASE) POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between CMP sensor (PHASE) terminal 1 and ECM terminal 64. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit.

5. CHECK CMP SENSOR (PHASE) POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor 1	EC-711

OK or NG

OK >> GO TO 6.
NG >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 7.
NG >> Replace malfunctioning component.

7. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> GO TO 8.

8. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

9. CHECK CMP SENSOR (PHASE) GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ECM terminal 92 (bank 2) or 96 (bank 1) and CMP sensor (PHASE) terminal 2.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground short to power.

OK or NG

OK >> GO TO 10.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK CMP SENSOR (PHASE) INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 59 (bank 1) or 63 (bank 2) and CMP sensor (PHASE) terminal 2.
   Refer to Wiring Diagram.

   Continuity should exist.
3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 11.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

11. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-405, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> Replace malfunctioning CMP sensor (PHASE).

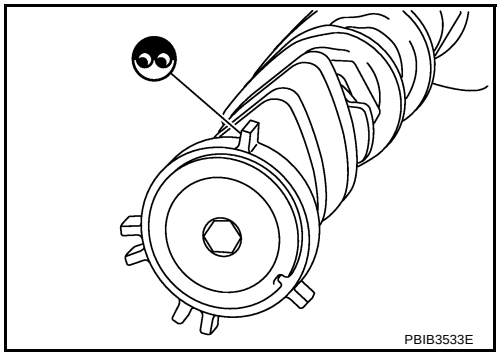
12. CHECK CAMSHAFT (INT)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 13.
NG >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft.



13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

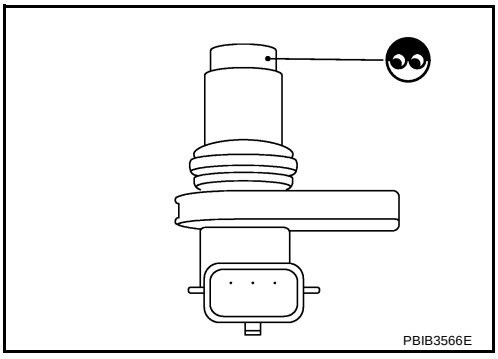
>> **INSPECTION END**

Component Inspection

NBS0008I

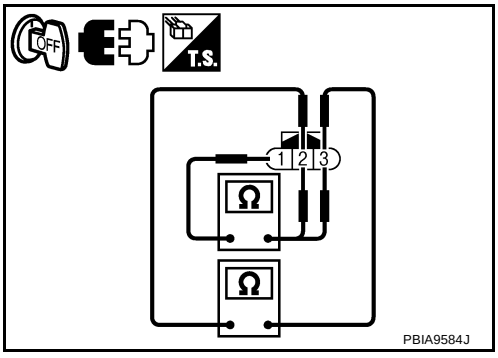
CAMSHAFT POSITION SENSOR (PHASE)

1. Loosen the fixing bolt of the sensor.
2. Disconnect CMP sensor (PHASE) harness connector.
3. Remove the sensor.
4. Visually check the sensor for chipping.



5. Check resistance as shown in the figure.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	Except 0 or ∞
1 (+) - 3 (-)	
2 (+) - 3 (-)	



Removal and Installation

NBS0008J

CAMSHAFT POSITION SENSOR (PHASE)

Refer to EM-72, "CAMSHAFT" .

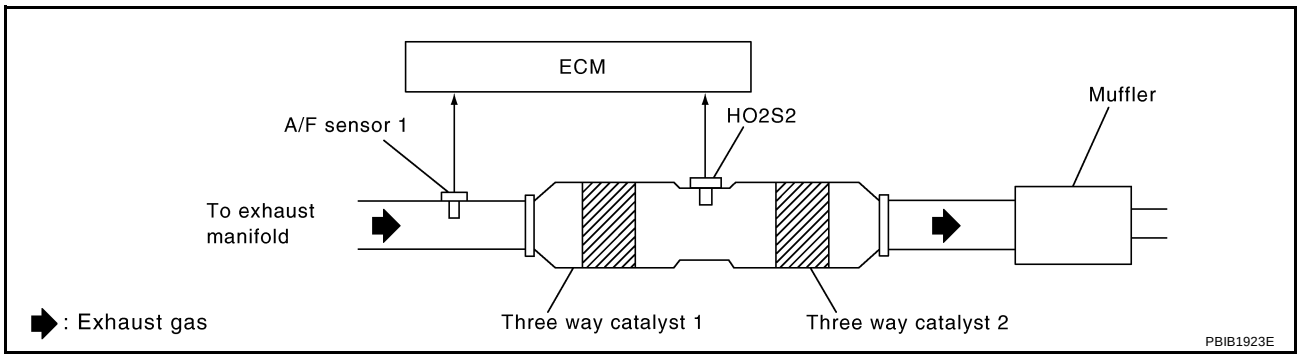
DTC P0420, P0430 THREE WAY CATALYST FUNCTION

PFP:20905

On Board Diagnosis Logic

NBS0008K

The ECM monitors the switching frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2. A three way catalyst 1 with high oxygen storage capacity will indicate a low switching frequency of heated oxygen sensor 2. As oxygen storage capacity decreases, the heated oxygen sensor 2 switching frequency will increase.
When the frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2 approaches a specified limit value, the three way catalyst 1 malfunction is diagnosed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0420 0420 (Bank 1)	Catalyst system efficiency below threshold	● Three way catalyst 1 does not operate properly. ● Three way catalyst 1 does not have enough oxygen storage capacity.	● Three way catalyst 1 ● Exhaust tube ● Intake air leaks ● Fuel injector ● Fuel injector leaks ● Spark plug ● Improper ignition timing
P0430 0430 (Bank 2)			

DTC Confirmation Procedure

NBS0008L

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

TESTING CONDITION:
Do not hold engine speed for more than the specified minutes below.

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Start engine and warm it up to the normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that “COOLAN TEMP/S” indicates more than 70°C (158°F).
   If not, warm up engine and go to next step when “COOLAN TEMP/S” indication reaches to 70°C (158°F).
7. Open engine hood.
8. Select “DTC & SRT CONFIRMATION” then “SRT WORK SUPPORT” mode with CONSULT-III.
9. Rev engine up to 2,000 to 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely.
   If “INCMP” of “CATALYST” changed to “CMPLT”, go to step 12.
10. Wait 5 seconds at idle.
11. Rev engine up to 2,000 to 3,000 rpm and maintain it until “INCMP” of “CATALYST” changes to “CMPLT” (It will take approximately 5 minutes).
    If not “CMPLT”, stop engine and cool it down to less than 70°C (158°F) and then retest from step 1.
12. Select “SELF-DIAG RESULTS” mode with CONSULT-III.

13. Confirm that the 1st trip DTC is not detected.
If the 1st trip DTC is detected, go to EC-407, "Diagnostic Procedure" .

Overall Function Check

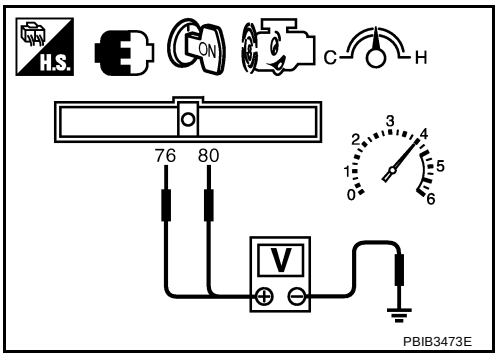
NBS0008M

Use this procedure to check the overall function of the three way catalyst 1. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1minute.
5. Open engine hood.
6. Set voltmeters probes between ECM terminal 76 [HO2S2 (bank 1) signal], 80 [HO2S2 (bank 2) signal] and ground.
7. Keep engine speed at 2,500 rpm constant under no load.
8. Make sure that the voltage does not vary for more than 5 seconds. It the voltage fluctuation cycle take less than 5 seconds. Go to EC-407, "Diagnostic Procedure" .

- 1cycle: 0.6 - 1.0 → 0 - 0.3 → 0.6 - 1.0



Diagnostic Procedure

NBS0008N

1. CHECK EXHAUST SYSTEM

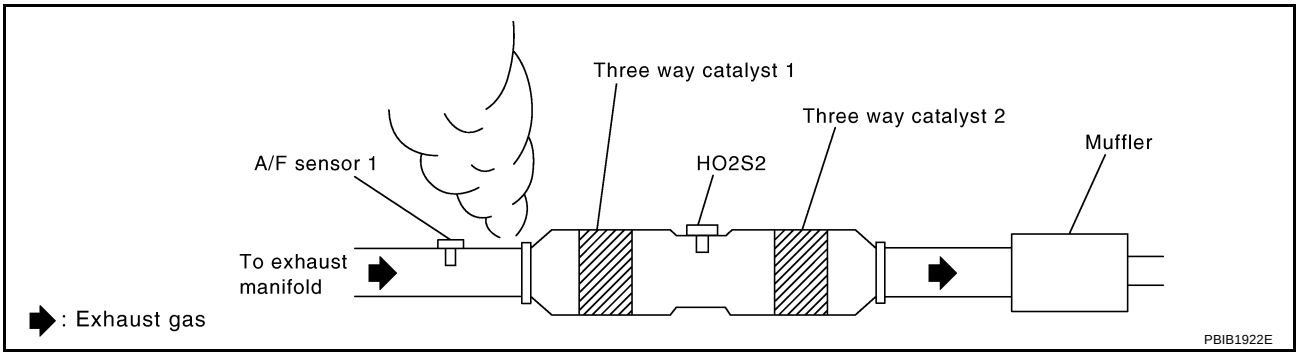
Visually check exhaust tubes and muffler for dent.

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before the three way catalyst 1.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

4. CHECK IGNITION TIMING

Check the following items. Refer to EC-71, "Basic Inspection" .

Items	Specifications	
Target idle speed	A/T	650 ± 50 rpm (in P or N position)
	M/T	650 ± 50 rpm (in Neutral position)
Ignition timing	A/T	15 ± 5° BTDC (in P or N position)
	M/T	15 ± 5° BTDC (in Neutral position)

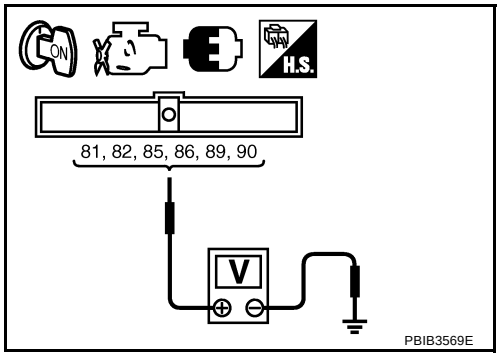
OK or NG

OK >> GO TO 5.
NG >> Follow the EC-71, "Basic Inspection" .

5. CHECK FUEL INJECTOR

1. Stop engine and turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Turn ignition switch ON.
4. Check voltage between ECM terminals 81, 82, 85, 86, 89, 90 and ground with CONSULT-III or tester.
   Refer to Wiring Diagram for fuel injectors, EC-687, "Wiring Diagram" .

   Voltage: Battery voltage



OK or NG

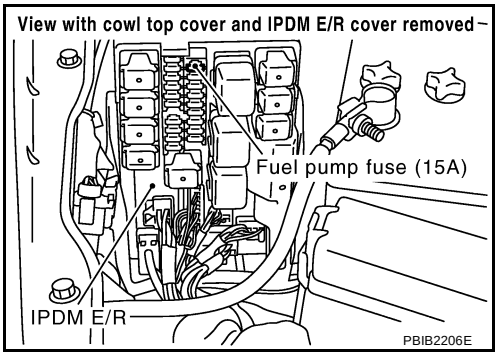
OK >> GO TO 6.
NG >> Perform EC-688, "Diagnostic Procedure" .

6. CHECK FUNCTION OF IGNITION COIL-I

CAUTION:
Do the following procedure in the place where ventilation is good without the combustible.

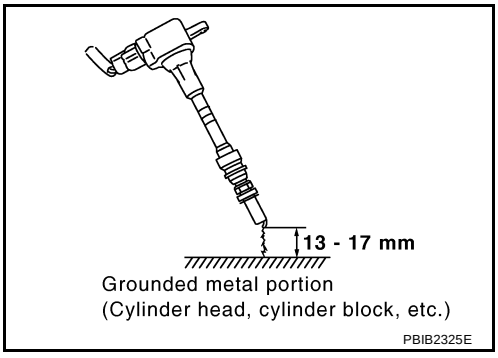
1. Turn ignition switch OFF.
2. Reconnect ECM harness connector disconnected.
3. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

   NOTE:
   Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.
4. Start engine.
5. After engine stalls, crank it two or three times to release all fuel pressure.
6. Turn ignition switch OFF.
7. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
8. Remove ignition coil and spark plug of the cylinder to be checked.



9. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
10. Connect spark plug and harness connector to ignition coil.
11. Fix ignition coil using a rope etc. with gap of 13 - 17 mm between the edge of the spark plug and grounded metal portion as shown in the figure.
12. Crank engine for about 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

    Spark should be generated.



CAUTION:

- **Do not approach to the spark plug and the ignition coil within 50cm. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20kV or more.**
- **It might cause to damage the ignition coil if the gap of more than 17 mm is taken.**

NOTE:
When the gap is less than 13 mm, the spark might be generated even if the coil is malfunctioning.

OK or NG

OK >> GO TO 10.
NG >> GO TO 7.

7. CHECK FUNCTION OF IGNITION COIL-II

1. Turn ignition switch OFF.
2. Disconnect spark plug and connect a known-good spark plug.
3. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

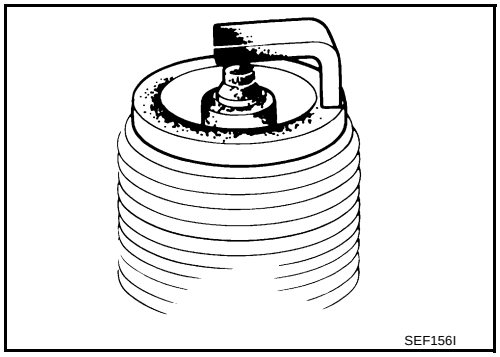
   Spark should be generated.

OK or NG

OK >> GO TO 8.
NG >> Check ignition coil, power transistor and their circuits. Refer to EC-698, "IGNITION SIGNAL" .

8. CHECK SPARK PLUG

1. Turn ignition switch OFF.
2. Check the spark plugs and check for fouling, etc.



OK or NG

OK >> GO TO 9.
NG >> Repair or replace spark plug (s) with standard type one (s). For spark plug type ignition coil. Refer to MA-18, "Changing Spark Plugs (Iridium-Tipped Type)" .

9. CHECK FUNCTION OF IGNITION COIL-III

1. Reconnect the initial spark plugs.
2. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

OK or NG

OK >> **INSPECTION END**
NG >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to MA-18, "Changing Spark Plugs (Iridium-Tipped Type)" .

10. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Remove fuel injector assembly.
   Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
   Keep fuel hose and all fuel injectors connected to fuel injector gallery.
3. Disconnect all ignition coil harness connectors.
4. Reconnect all fuel injector harness connectors disconnected.
5. Turn ignition switch ON.
   Make sure fuel does not drip from fuel injector.

OK or NG

OK (Does not drip.)>>GO TO 11.
NG (Drips.)>>Replace the fuel injector(s) from which fuel is dripping.

11. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

Trouble is fixed.>>**INSPECTION END**
Trouble is not fixed.>>Replace three way catalyst assembly.

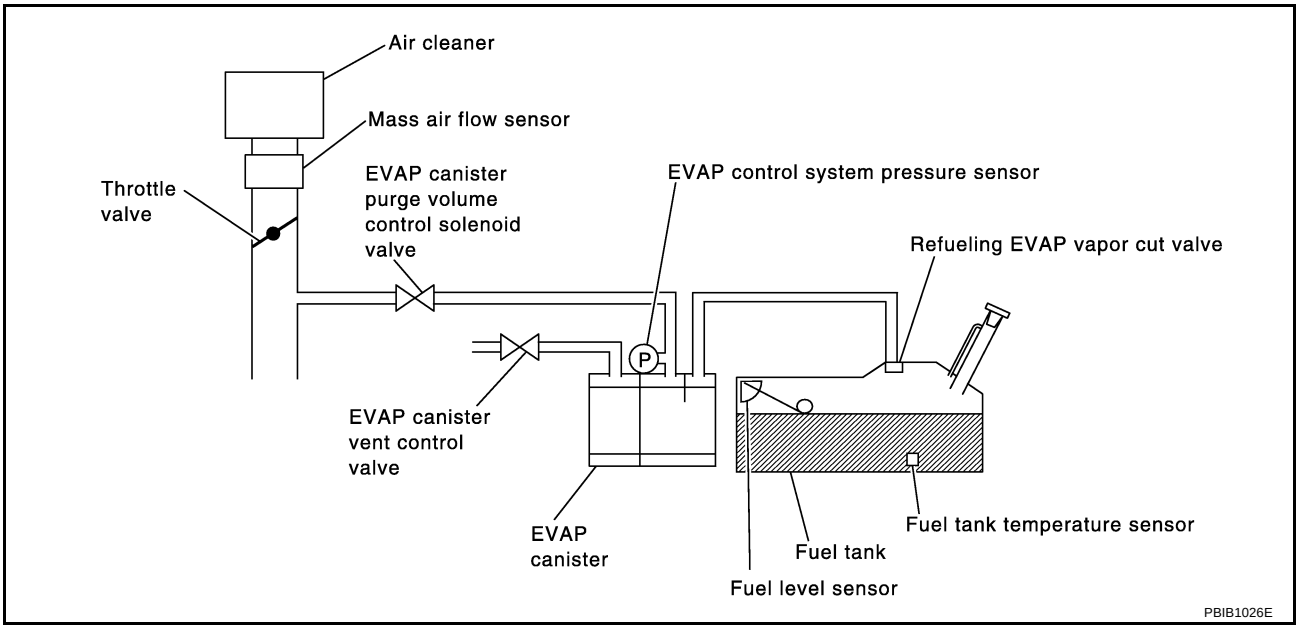
DTC P0441 EVAP CONTROL SYSTEM

PFP:14950

System Description

NBS0008O

NOTE:
If DTC P0441 is displayed with other DTC such as P2122, P2123, P2127, P2128 or P2138, first perform trouble diagnosis for other DTC.



In this evaporative emission (EVAP) control system, purge flow occurs during non-closed throttle conditions. Purge volume is related to air intake volume. Under normal purge conditions (non-closed throttle), the EVAP canister purge volume control solenoid valve is open to admit purge flow. Purge flow exposes the EVAP control system pressure sensor to intake manifold vacuum.

On Board Diagnosis Logic

NBS0008P

Under normal conditions (non-closed throttle), sensor output voltage indicates if pressure drop and purge flow are adequate. If not, a malfunction is determined.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0441 0441	EVAP control system incorrect purge flow	EVAP control system does not operate properly, EVAP control system has a leak between intake manifold and EVAP control system pressure sensor.	● EVAP canister purge volume control solenoid valve stuck closed ● EVAP control system pressure sensor and the circuit ● Loose, disconnected or improper connection of rubber tube ● Blocked rubber tube ● Cracked EVAP canister ● EVAP canister purge volume control solenoid valve circuit ● Accelerator pedal position sensor ● Blocked purge port ● EVAP canister vent control valve

DTC Confirmation Procedure

NBS0008Q

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and let it idle for at least 70 seconds.
4. Select “PURG FLOW P0441” of “EVAPORATIVE SYSTEM” in “DTC & SRT CONFIRMATION” mode with CONSULT-III.
5. Touch “START”.
   If “COMPLETED” is displayed, go to step 7.
6. When the following conditions are met, “TESTING” will be displayed on the CONSULT-III screen. Maintain the conditions continuously until “TESTING” changes to “COMPLETED”. (It will take at least 35 seconds.)

Shift lever	Suitable position
VHCL SPEED SE	32 - 120 km/h (20 - 75 MPH)
ENG SPEED	500 - 3,000 rpm
B/FUEL SCHDL	1.3 - 9.0 msec
COOLAN TEMP/S	70 - 100°C (158 - 212°F)

If “TESTING” is not changed for a long time, retry from step 2.

7. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”. If “NG” is displayed, refer to EC-413, "Diagnostic Procedure" .

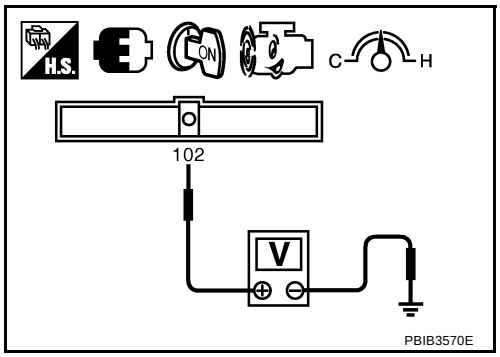
Overall Function Check

NBS0008R

Use this procedure to check the overall monitoring function of the EVAP control system purge flow monitoring. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Lift up drive wheels.
2. Start engine (VDC switch or TCS switch OFF) and warm it up to normal operating temperature.
3. Turn ignition switch OFF, wait at least 10 seconds.
4. Start engine and wait at least 70 seconds.
5. Set voltmeter probes to ECM terminals 102 (EVAP control system pressure sensor signal) and ground.
6. Check EVAP control system pressure sensor value at idle speed and note it.
7. Establish and maintain the following conditions for at least 1 minute.



Air conditioner switch	ON
Headlamp switch	ON
Rear window defogger switch	ON
Engine speed	Approx. 3,000 rpm
Shift lever	Any position other than P, N or R

8. Verify that EVAP control system pressure sensor value stays 0.1V less than the value at idle speed (measured at step 6) for at least 1 second.
9. If NG, go to EC-413, "Diagnostic Procedure" .

Diagnostic Procedure

NBS0008S

1. CHECK EVAP CANISTER

1. Turn ignition switch OFF.
2. Check EVAP canister for cracks.

OK or NG

OK (With CONSULT-III)>>GO TO 2.
OK (Without CONSULT-III)>>GO TO 3.
NG >> Replace EVAP canister.

2. CHECK PURGE FLOW

With CONSULT-III

1. Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .
2. Start engine and let it idle.
3. Select “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III.
4. Rev engine up to 2,000 rpm.
5. Touch “Qd” and “Qu” on CONSULT-III screen to adjust “PURG VOL CONT/V” opening and check vacuum existence.

PURG VOL CONT/V	Vacuum
100%	Should exist.
0%	Should not exist.

OK or NG

OK >> GO TO 7.
NG >> GO TO 4.

3. CHECK PURGE FLOW

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose connected to EVAP canister purge volume control solenoid valve at EVAP service port and install vacuum gauge. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .
4. Start engine and let it idle.

   Do not depress accelerator pedal even slightly

5. Check vacuum gauge indication before 60 seconds passed after starting engine.

   Vacuum should not exist.

6. Revving engine up to 2,000 rpm after 100 seconds passed after starting engine.

   Vacuum should exist.

OK or NG

OK >> GO TO 7.
NG >> GO TO 4.

4. CHECK EVAP PURGE LINE

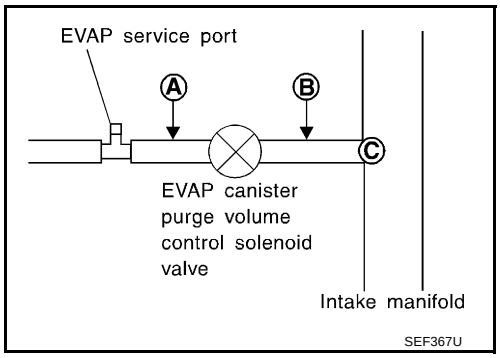
1. Turn ignition switch OFF.
2. Check EVAP purge line for improper connection or disconnection. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 5.
NG >> Repair it.

5. CHECK EVAP PURGE HOSE AND PURGE PORT

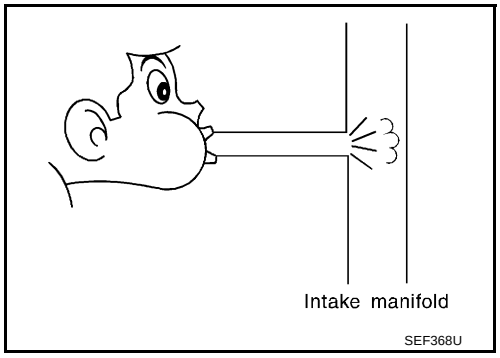
1. Disconnect purge hoses connected to EVAP service port **A** and EVAP canister purge volume control solenoid valve **B** .
2. Blow air into each hose and EVAP purge port **C** .



3. Check that air flows freely.

OK or NG

OK (With CONSULT-III)>>GO TO 6.
OK (Without CONSULT-III)>>GO TO 7.
NG >> Repair or clean hoses and/or purge port.



6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

1. Start engine.
2. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP canister purge volume control solenoid valve.

8. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 9.
NG >> Replace EVAP control system pressure sensor.

9. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR FUNCTION

Refer to EC-457, "DTC Confirmation Procedure" for DTC P0452 and EC-466, "DTC Confirmation Procedure" for P0453.

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP control system pressure sensor.

10. CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 11.
NG >> Clean the rubber tube using an air blower.

11. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> Replace EVAP canister vent control valve.

12. CHECK EVAP PURGE LINE

Inspect EVAP purge line (pipe and rubber tube). Check for evidence of leaks.
Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 13.
NG >> Replace it.

13. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 14.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

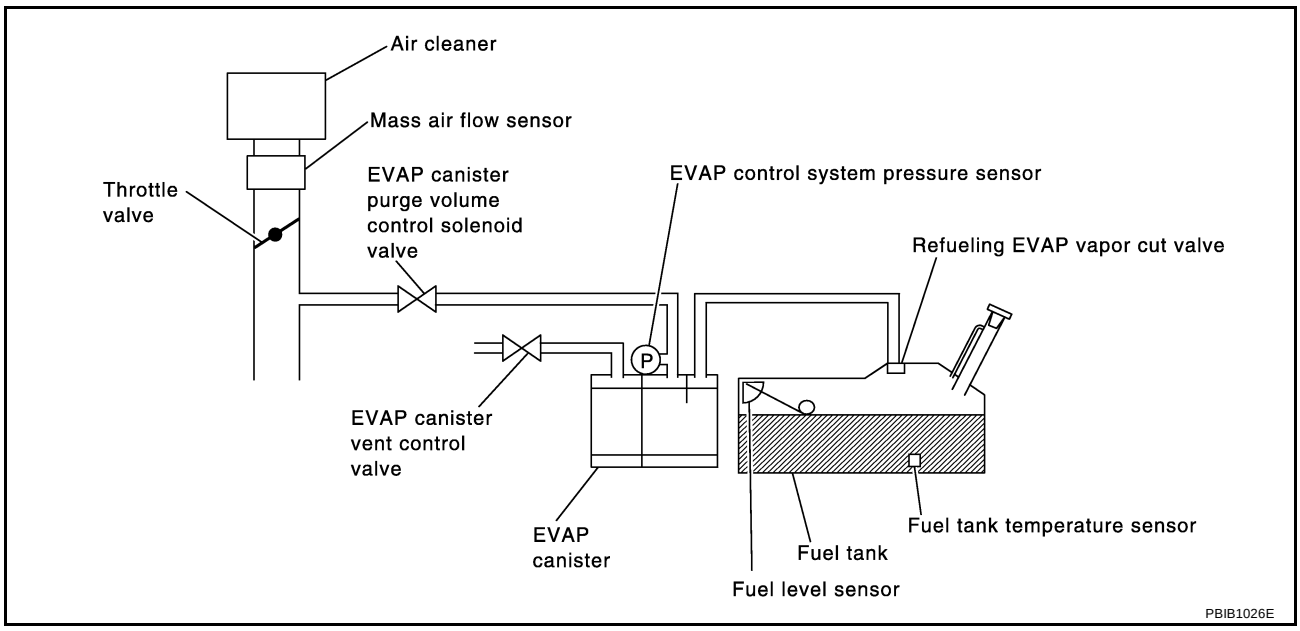
DTC P0442 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

NBS0008T

This diagnosis detects leaks in the EVAP purge line using engine intake manifold vacuum.
If pressure does not increase, the ECM will check for leaks in the line between the fuel tank and EVAP canister purge volume control solenoid valve, under the following Vacuum test conditions.
The EVAP canister vent control valve is closed to shut the EVAP purge line off. The EVAP canister purge volume control solenoid valve will then be opened to depressurize the EVAP purge line using intake manifold vacuum. After this occurs, the EVAP canister purge volume control solenoid valve will be closed.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0442 0442	EVAP control system small leak detected (negative pressure)	EVAP control system has a leak, EVAP control system does not operate properly.	● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Fuel filler cap remains open or fails to close. ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged ● EVAP canister is saturated with water ● EVAP control system pressure sensor ● Fuel level sensor and the circuit ● Refueling EVAP vapor cut valve ● ORVR system leaks

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**
- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

NBS0008U

NOTE:

- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- **Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.**
- **Always perform test at a temperature of 0 to 30°C (32 to 86°F).**

WITH CONSULT-III

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
4. Make sure that the following conditions are met.
   COOLAN TEMP/S: 0 - 70°C (32 - 158°F)
   INT/A TEMP SE: 0 - 30°C (32 - 86°F)
5. Select "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.
   Follow the instruction displayed.

   NOTE:
   If the engine speed cannot be maintained within the range displayed on the CONSULT-III screen, go to EC-71, "Basic Inspection" .
6. Make sure that "OK" is displayed.
   If "NG" is displayed, refer to EC-418, "Diagnostic Procedure" .

   NOTE:
   Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.

WITH GST

NOTE:
Be sure to read the explanation of EC-58, "Driving Pattern" before driving vehicle.

1. Start engine.
2. Drive vehicle according to EC-58, "Driving Pattern" .
3. Stop vehicle.
4. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
5. Select Service $07 with GST.

- If P0442 is displayed on the screen, go to EC-418, "Diagnostic Procedure" .
- If P0441 is displayed on the screen, go to EC-413, "Diagnostic Procedure" .

Diagnostic Procedure

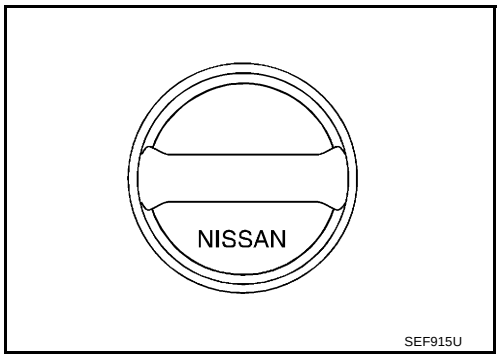
NBS0008V

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-36, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)" .

OK or NG

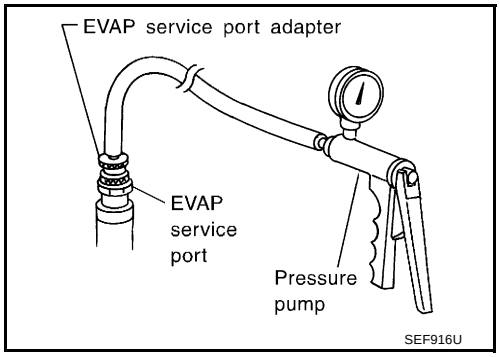
OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

With CONSULT-III>>GO TO 6.
Without CONSULT-III>>GO TO 7.

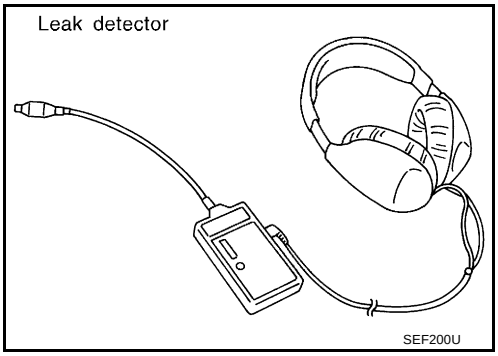


6. CHECK FOR EVAP LEAK

With CONSULT-III

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-III.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

   CAUTION:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



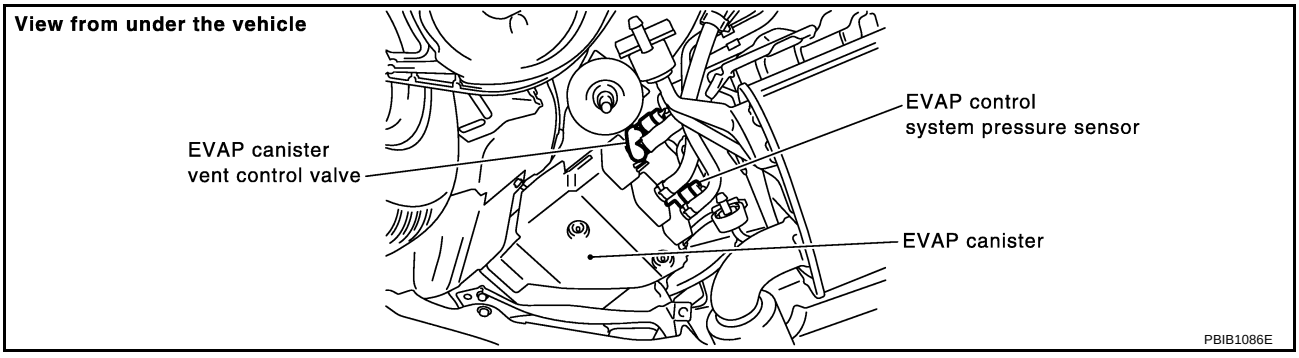
OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

7. CHECK FOR EVAP LEAK

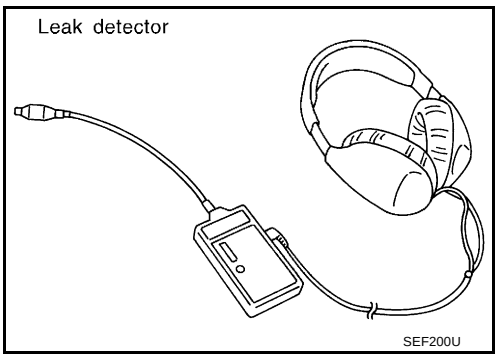
Without CONSULT-III

1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)



3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

   CAUTION:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
  Refer to EC-37, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-442, "Component Inspection" .

OK or NG

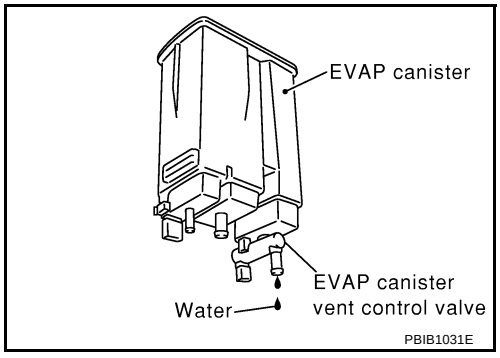
OK >> GO TO 9.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

9. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 10.
No (With CONSULT-III)>>GO TO 12.
No (Without CONSULT-III)>>GO TO 13.



10. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.
The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK (With CONSULT-III)>>GO TO 12.
OK (Without CONSULT-III)>>GO TO 13.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-III

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-III screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 16.
NG >> GO TO 14.

14. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-100, "Vacuum Hose Drawing" .

OK or NG

OK >> GO TO 15.
NG >> Repair or reconnect the hose.

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-464, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 19.
NG >> Repair or reconnect the hose.

19. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 20.

20. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-39, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 21.
NG >> Repair or replace hoses and tubes.

21. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 22.
NG >> Repair or replace hose, tube or filler neck tube.

22. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "REFUELING EVAP VAPOR CUT VALVE" .

OK or NG

OK >> GO TO 23.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

23. CHECK FUEL LEVEL SENSOR

Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .

OK or NG

OK >> GO TO 24.
NG >> Replace fuel level sensor unit.

24. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0443 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

PFP:14920

Description

NBS000FE

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	EVAP canister purge flow control	EVAP canister purge volume control solenoid valve
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Fuel tank temperature sensor	Fuel temperature in fuel tank		
Wheel sensor	Vehicle speed*2		

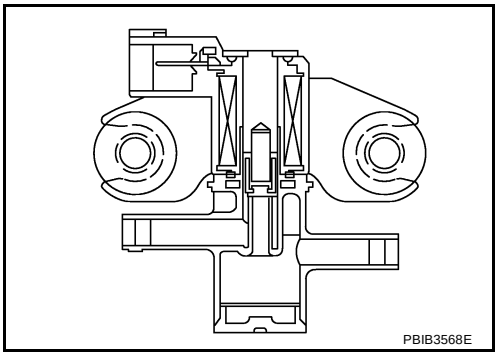
*1: ECM determines the start signal status by the signals of engine speed and battery voltage.

*2: This signal is sent to the ECM through CAN communication line.

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/OFF duty to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



CONSULT-III Reference Value in Data Monitor Mode

NBS000FF

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PURG VOL C/V	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle (Accelerator pedal is not depressed even slightly, after engine starting)	0%
		2,000 rpm	—

On Board Diagnosis Logic

NBS000FG

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0443 0443	EVAP canister purge volume control solenoid valve	The canister purge flow is detected during the specified driving conditions, even when EVAP canister purge volume control solenoid valve is completely closed.	● EVAP control system pressure sensor ● EVAP canister purge volume control solenoid valve (The valve is stuck open.) ● EVAP canister vent control valve ● EVAP canister ● Hoses (Hoses are connected incorrectly or clogged.)

DTC Confirmation Procedure

NBS000FH

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “PURG VOL CN/V P1444” of “EVAPORATIVE SYSTEM” in “DTC WORK SUPPORT” mode with CONSULT-III.
5. Touch “START”.
6. Start engine and let it idle until “TESTING” on CONSULT-III changes to “COMPLETED”. (It will take approximately 10 seconds.)
   If “TESTING” is not displayed after 5 minutes, retry from step 2.
7. Make sure that “OK” is displayed after touching “SELF-DIAG RESULTS”. If “NG” is displayed, refer to EC-427, "Diagnostic Procedure" .

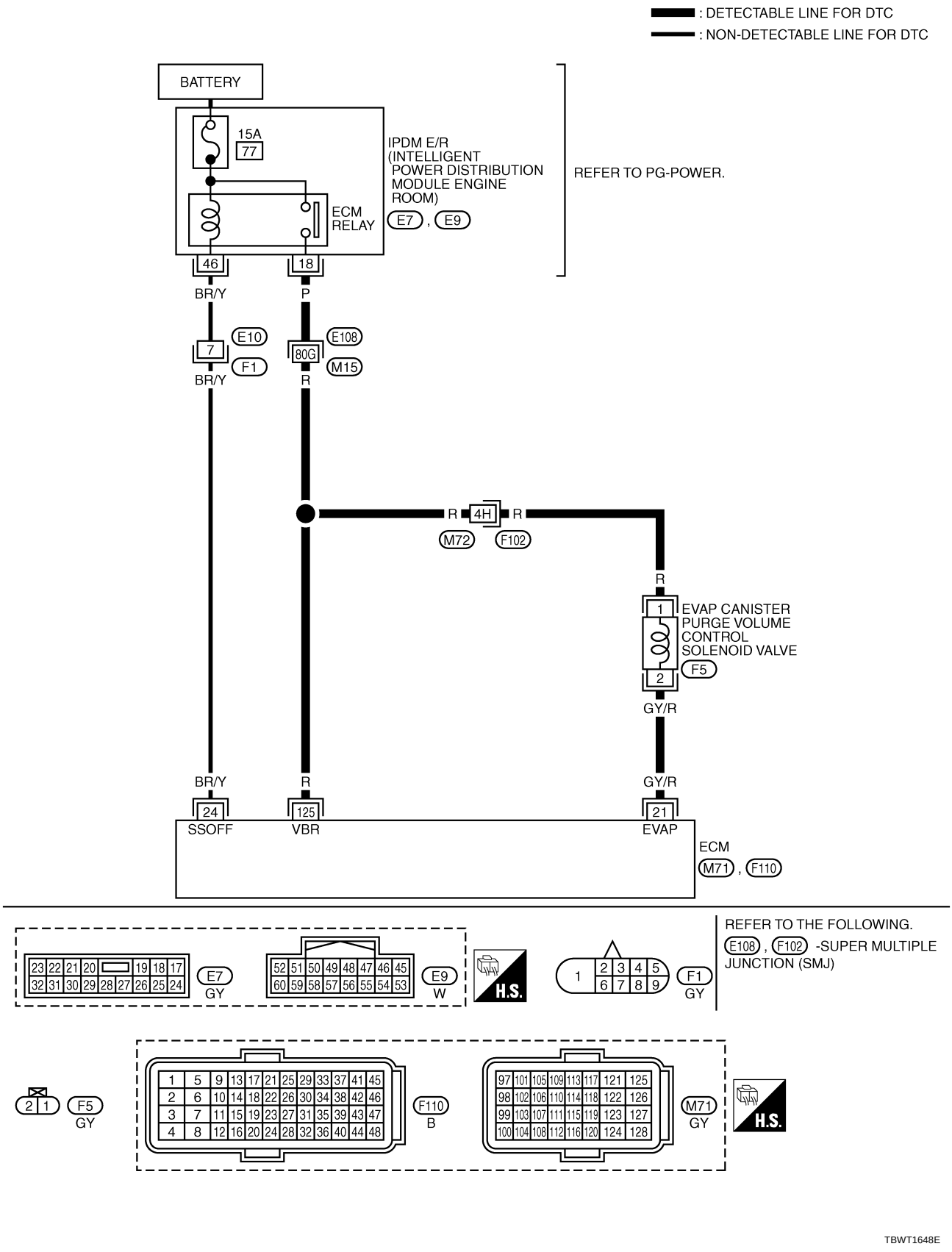
WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and let it idle for at least 20 seconds.
4. Select Service $07 with GST.
5. If 1st trip DTC is detected, go to EC-427, "Diagnostic Procedure" .

Wiring Diagram

NBS000FI

EC-PGC/V-01

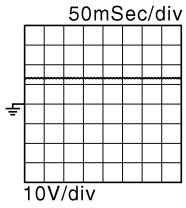
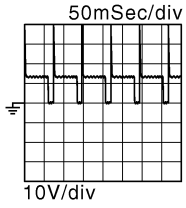


TBWT1648E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
21	GY/R	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed ● Accelerator pedal: Not depressed even slightly, after engine starting.	BATTERY VOLTAGE (11 - 14V)★  PBIB3547E
			[Engine is running] ● Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14V)★  PBIB3548E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

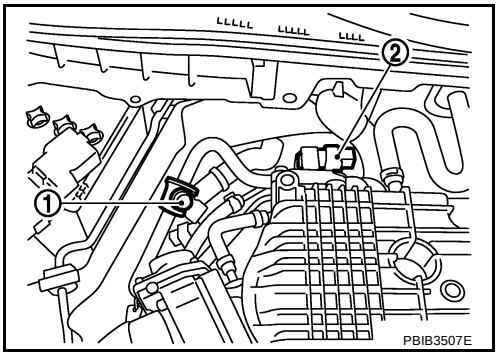
NBS000FJ

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister purge volume control solenoid valve (2) harness connector.

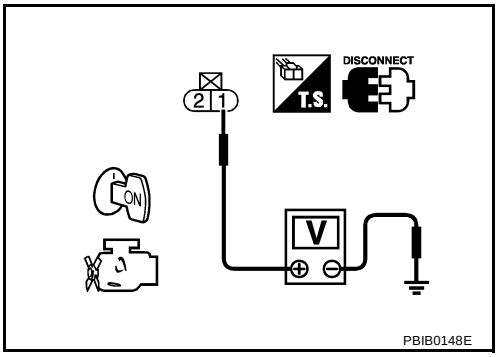
   1 : EVAP service port

3. Turn ignition switch ON.



4. Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-III or tester.

   Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 21 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 5.
NG >> Replace EVAP control system pressure sensor.

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455, "Component Inspection" .

OK or NG

OK (With CONSULT-III)>>GO TO 6.
OK (Without CONSULT-III)>>GO TO 7.
NG >> Replace EVAP control system pressure sensor.

6. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Start engine.
4. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-430, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP canister purge volume control solenoid valve.

8. CHECK RUBBER TUBE FOR CLOGGING

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 9.
NG >> Clean the rubber tube using an air blower.

9. CHECK EVAP CANISTER VENT CONTROL VALVE

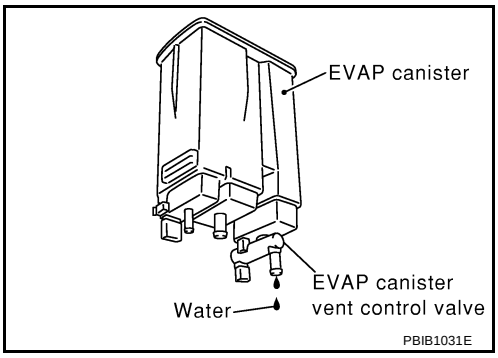
Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace EVAP canister vent control valve.

10. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?



OK or NG

OK >> GO TO 11.
NG >> GO TO 13.

11. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

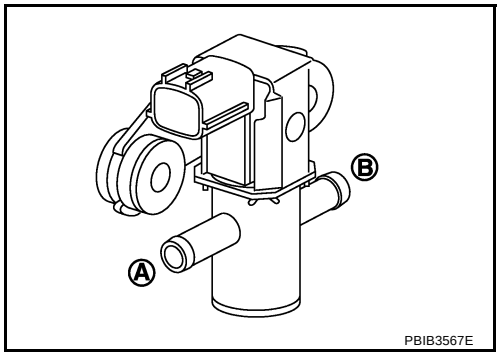
NBS000FK

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

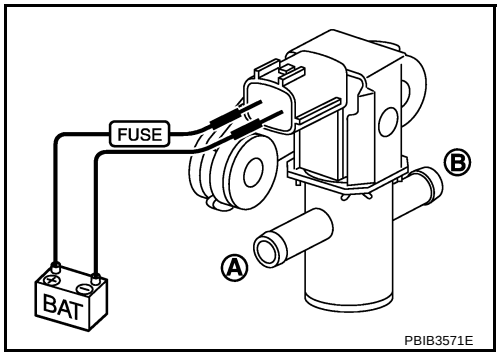
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



Without CONSULT-III

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



Removal and Installation

NBS000FL

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P0444, P0445 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

PFP:14920

Description

NBS0008W

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	EVAP canister purge flow control	EVAP canister purge volume control solenoid valve
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Fuel tank temperature sensor	Fuel temperature in fuel tank		
Wheel sensor	Vehicle speed*2		

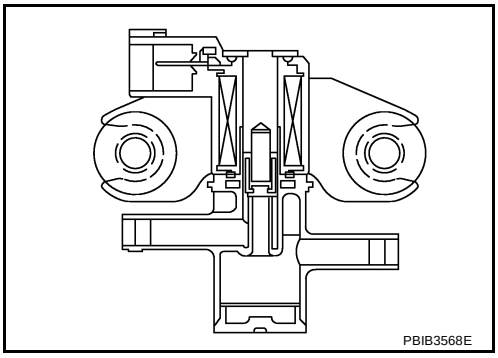
*1: ECM determines the start signal status by the signals of engine speed and battery voltage.

*2: This signal is sent to the ECM through CAN communication line.

This system controls flow rate of fuel vapor from the EVAP canister. The opening of the vapor by-pass passage in the EVAP canister purge volume control solenoid valve changes to control the flow rate. The EVAP canister purge volume control solenoid valve repeats ON/OFF operation according to the signal sent from the ECM. The opening of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions. When the engine is operating, the flow rate of fuel vapor from the EVAP canister is regulated as the air flow changes.

COMPONENT DESCRIPTION

The EVAP canister purge volume control solenoid valve uses a ON/OFF duty to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.


PBIB3568E

CONSULT-III Reference Value in Data Monitor Mode

NBS0008X

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PURG VOL C/V	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle (Accelerator pedal is not depressed even slightly, after engine starting)	0%
		2,000 rpm	—

On Board Diagnosis Logic

NBS0008Y

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0444 0444	EVAP canister purge volume control solenoid valve circuit open	An excessively low voltage signal is sent to ECM through the valve	● Harness or connectors (The solenoid valve circuit is open or shorted.) ● EVAP canister purge volume control solenoid valve
P0445 0445	EVAP canister purge volume control solenoid valve circuit shorted	An excessively high voltage signal is sent to ECM through the valve	● Harness or connectors (The solenoid valve circuit is shorted.) ● EVAP canister purge volume control solenoid valve

DTC Confirmation Procedure

NBS0008Z

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and let it idle for at least 13 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-435, "Diagnostic Procedure" .

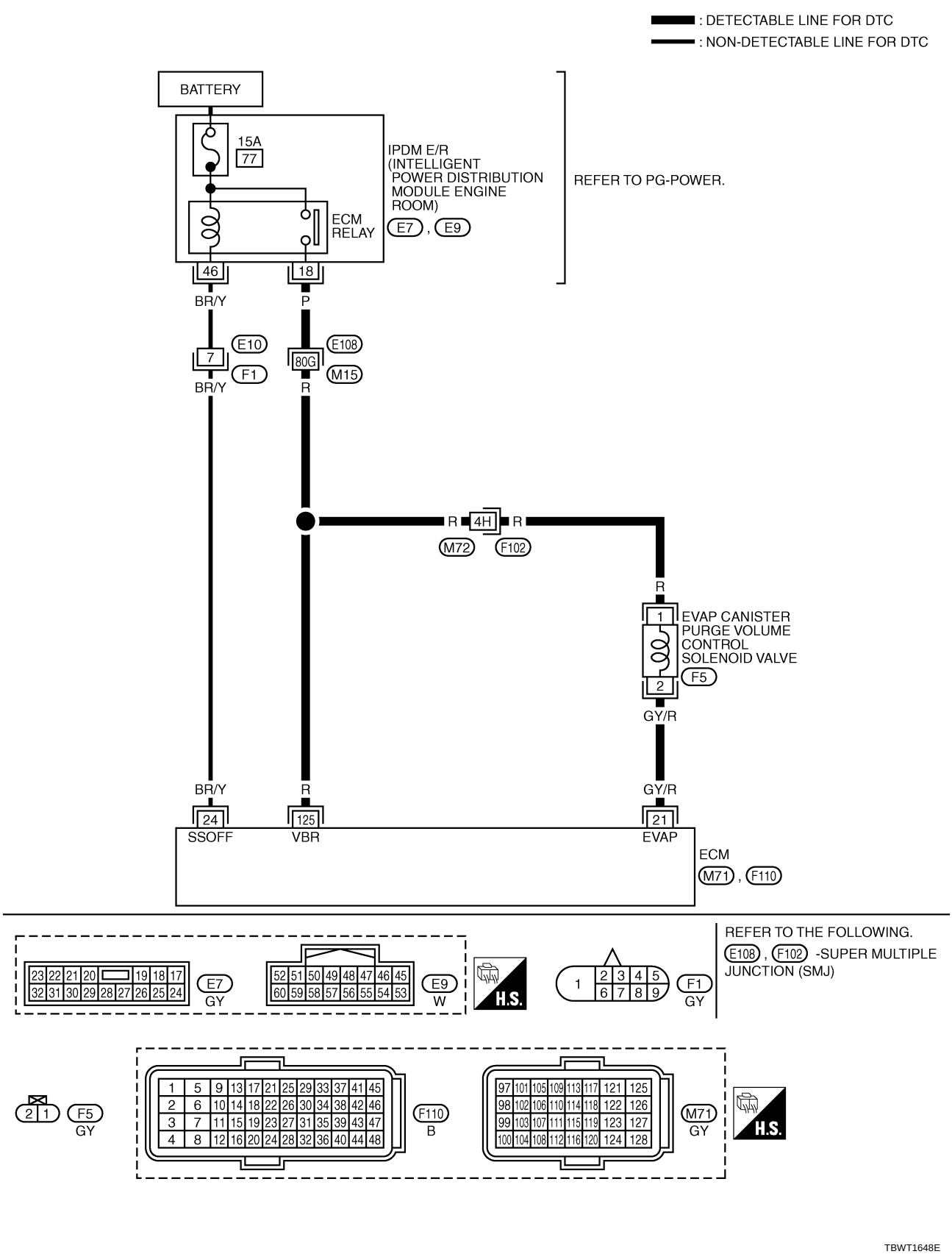
WITH GST

Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS00090

EC-PGC/V-01

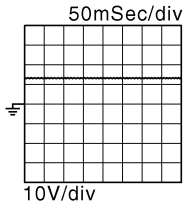
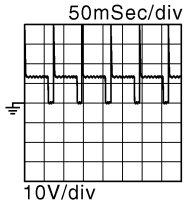


TBWT1648E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
21	GY/R	EVAP canister purge volume control solenoid valve	**[Engine is running]** ● Idle speed ● Accelerator pedal: Not depressed even slightly, after engine starting.	BATTERY VOLTAGE (11 - 14V)★  PBIB3547E
			[Engine is running] ● Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14V)★  PBIB3548E
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

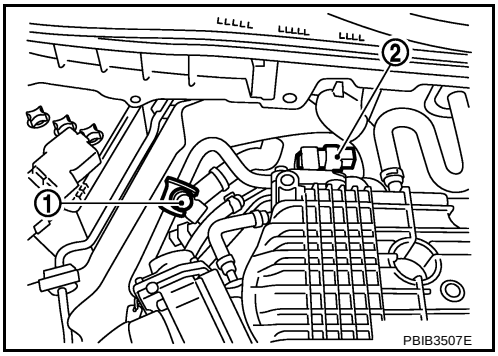
NBS00091

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister purge volume control solenoid valve (2) harness connector.

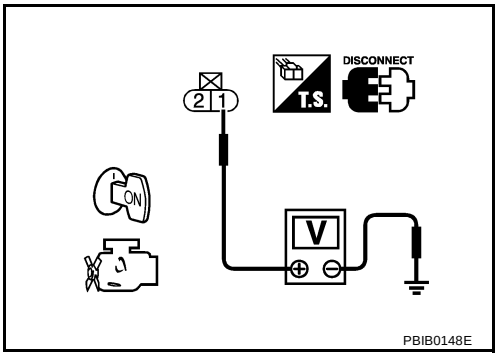
   1 : EVAP service port

3. Turn ignition switch ON.



4. Check voltage between EVAP canister purge volume control solenoid valve terminal 1 and ground with CONSULT-III or tester.

   Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness connectors M72, F102
- Harness for open or short between EVAP canister purge volume control solenoid valve and IPDM E/R
- Harness for open or short between EVAP canister purge volume control solenoid valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 21 and EVAP canister purge volume control solenoid valve terminal 2. Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK (With CONSULT-III)>>GO TO 4.
OK (Without CONSULT-III)>>GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-III

1. Reconnect all harness connectors disconnected.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace EVAP canister purge volume control solenoid valve.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

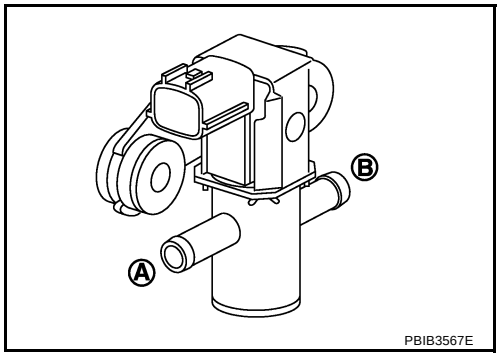
NBS00092

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

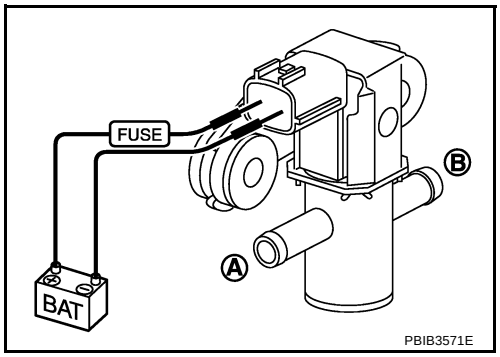
Condition (PURG VOL CONT/V value)	Air passage continuity between A and B
100%	Yes
0%	No



Without CONSULT-III

Check air passage continuity of EVAP canister purge volume control solenoid valve under the following conditions.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	Yes
No supply	No



Removal and Installation

NBS00093

EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

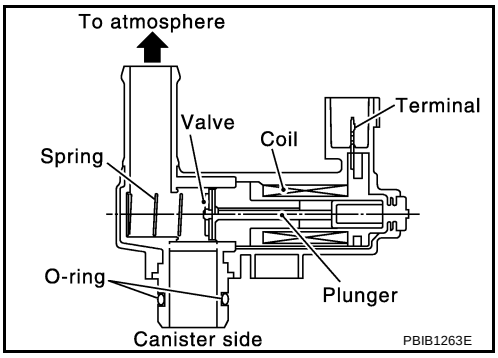
DTC P0447 EVAP CANISTER VENT CONTROL VALVE

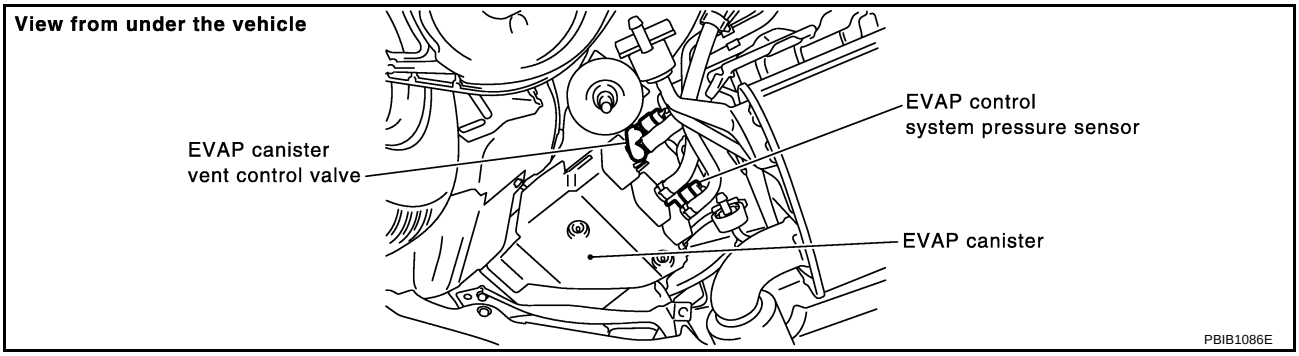
PFP:14935

Component Description

NBS00094

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.
This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.
This solenoid valve is used only for diagnosis, and usually remains opened.
When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows “EVAP Control System” diagnosis.





CONSULT-III Reference Value in Data Monitor Mode

NBS00095

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	● Ignition switch: ON	OFF

On Board Diagnosis Logic

NBS00096

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0447 0447	EVAP canister vent control valve circuit open	An improper voltage signal is sent to ECM through EVAP canister vent control valve.	● Harness or connectors (The valve circuit is open or shorted.) ● EVAP canister vent control valve

DTC Confirmation Procedure

NBS00097

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and wait at least 8 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-440, "Diagnostic Procedure" .

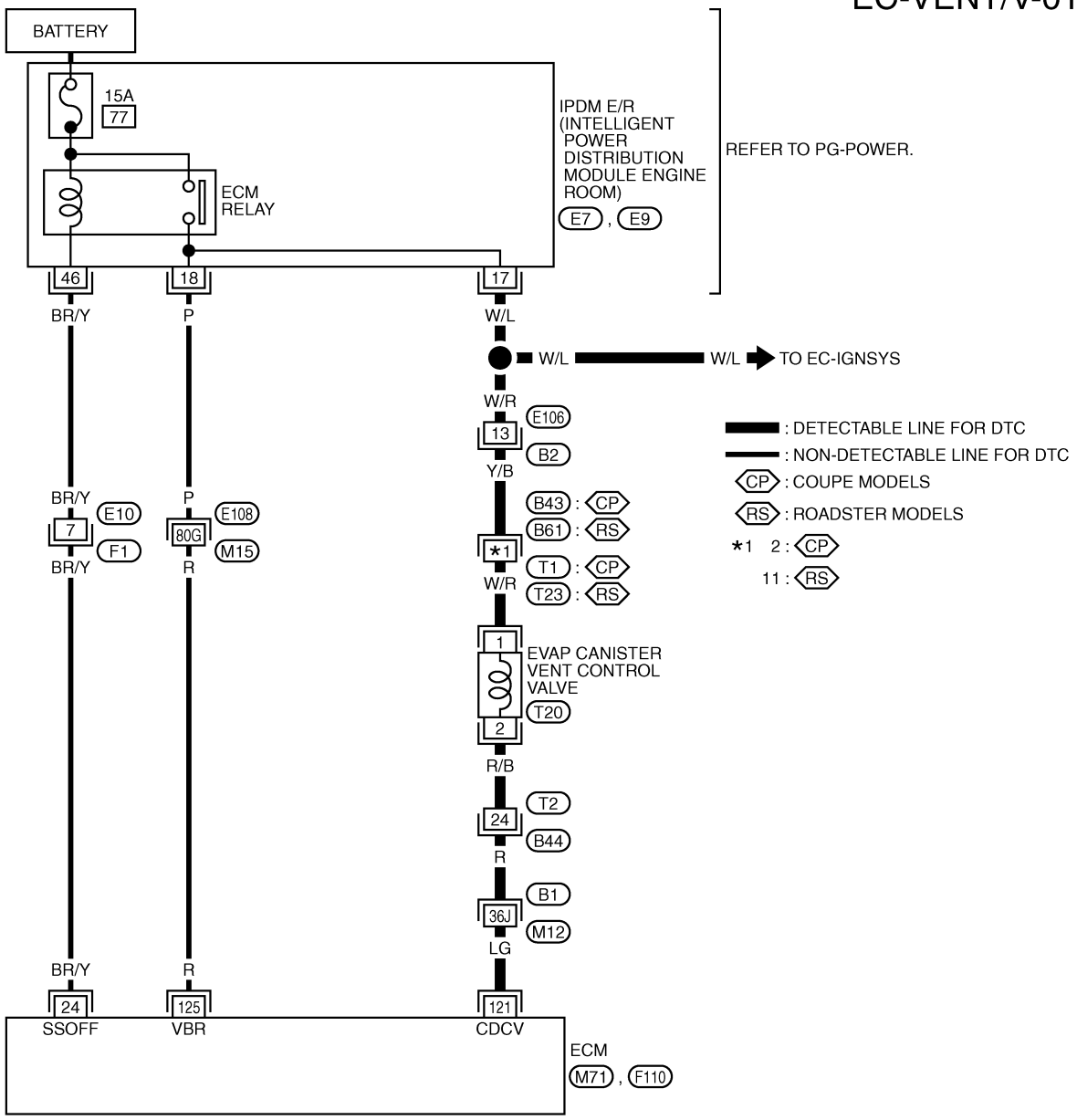
WITH GST

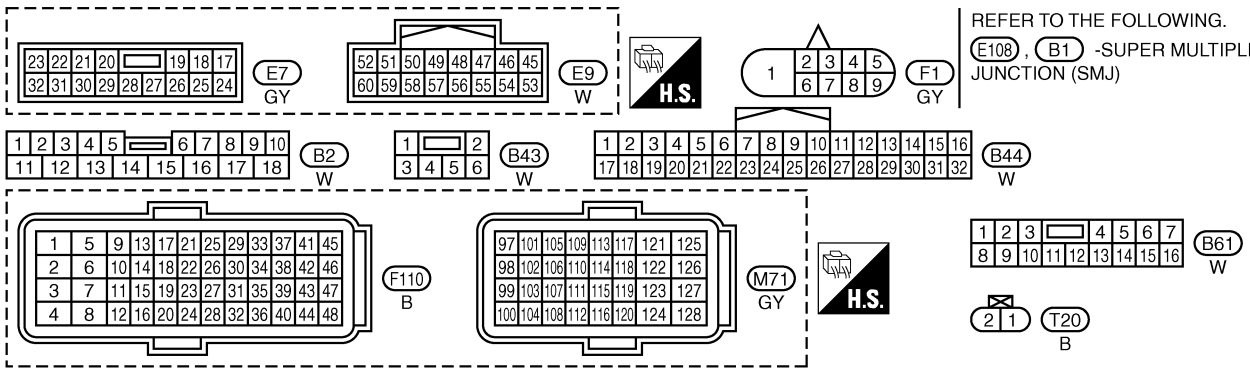
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS00098

EC-VENT/V-01





TBWT1649E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
121	LG	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS00099

1. INSPECTION START

Do you have CONSULT-III?

Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. CHECK EVAP CANISTER VENT CONTROL VALVE CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “VENT CONTROL/V” in “ACTIVE TEST” mode with CONSULT-III.
3. Touch “ON/OFF” on CONSULT-III screen.
4. Check for operating sound of the valve.

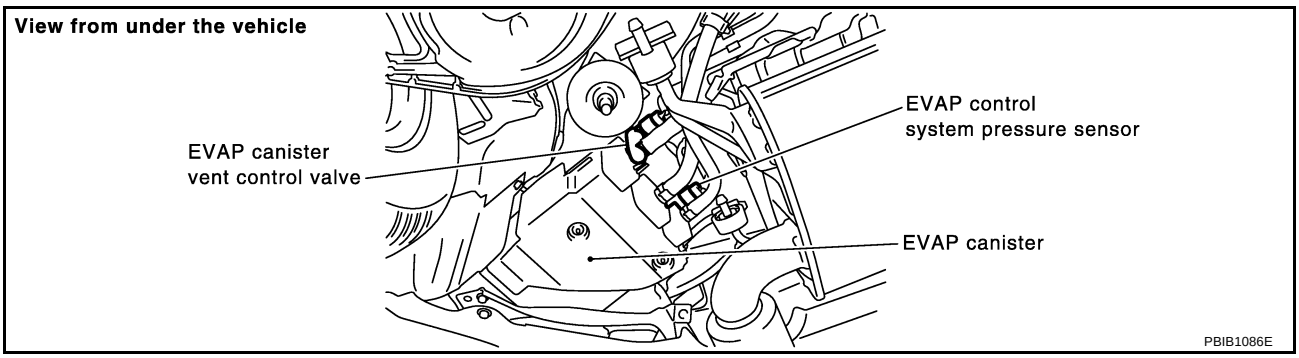
Clicking noise should be heard.

OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

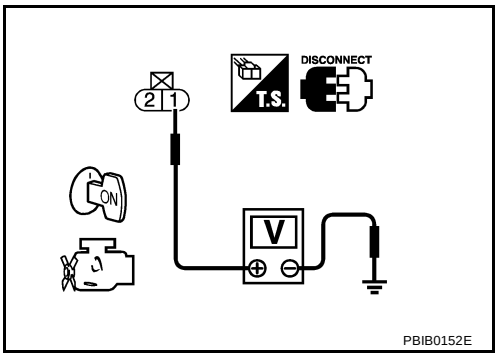
3. CHECK EVAP CANISTER VENT CONTROL VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EVAP canister vent control valve harness connector.



3. Turn ignition switch ON.
4. Check voltage between EVAP canister vent control valve terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E106, B2
- Harness connectors B43, T1 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- IPDM E/R harness connector E7
- Harness for open or short between EVAP canister vent control valve and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK EVAP CANISTER VENT CONTROL VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 121 and EVAP canister vent control valve terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP canister vent control valve and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK RUBBER TUBE FOR CLOGGING

1. Turn ignition switch OFF.
2. Disconnect rubber tube connected to EVAP canister vent control valve.
3. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 8.
NG >> Clean the rubber tube using an air blower.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> Replace EVAP canister vent control valve.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

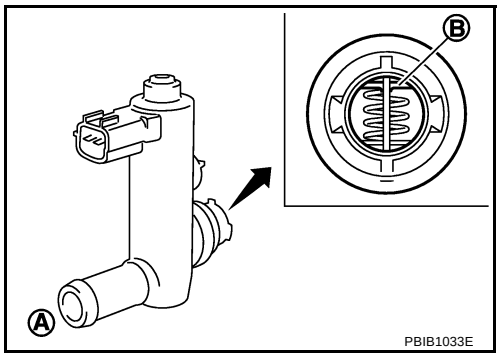
Component Inspection

NBS0009A

EVAP CANISTER VENT CONTROL VALVE

With CONSULT-III

1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.
   If NG, replace EVAP canister vent control valve.
   If OK, go to next step.
3. Reconnect harness connectors disconnected.
4. Turn ignition switch ON.
5. Perform “VENT CONTROL/V” in “ACTIVE TEST” mode.
6. Check air passage continuity and operation delay time.
   Make sure new O-ring is installed properly.



Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

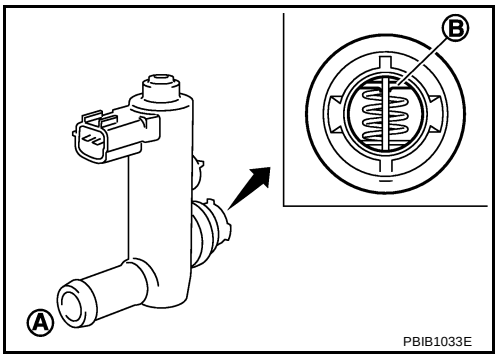
Operation takes less than 1 second.

If NG, replace EVAP canister vent control valve.
If OK, go to next step.

7. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
8. Perform step 6 again.

Without CONSULT-III

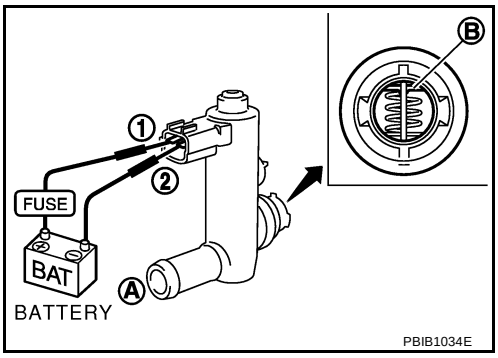
1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.



3. Check air passage continuity and operation delay time under the following conditions.
   Make sure new O-ring is installed properly.

Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes

Operation takes less than 1 second.



If NG, replace EVAP canister vent control valve.
If OK, go to next step.

4. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
5. Perform step 3 again.

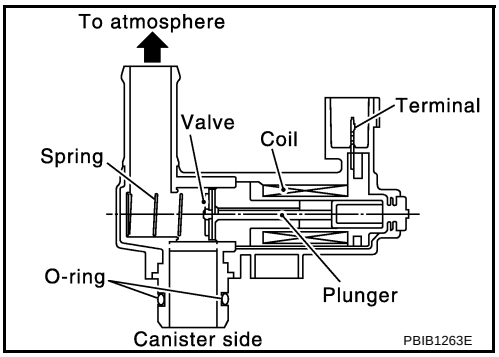
DTC P0448 EVAP CANISTER VENT CONTROL VALVE

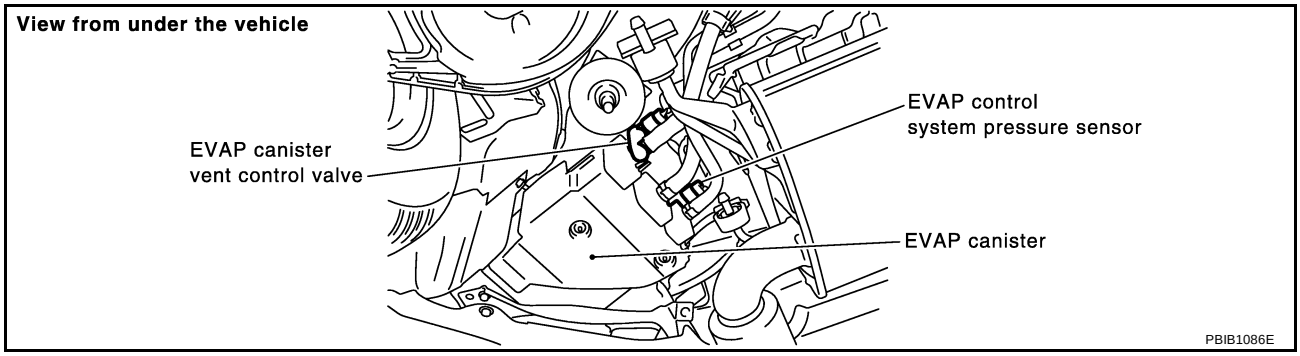
PFP:16935

Component Description

NBS000FM

The EVAP canister vent control valve is located on the EVAP canister and is used to seal the canister vent.
This solenoid valve responds to signals from the ECM. When the ECM sends an ON signal, the coil in the solenoid valve is energized. A plunger will then move to seal the canister vent. The ability to seal the vent is necessary for the on board diagnosis of other evaporative emission control system components.
This solenoid valve is used only for diagnosis, and usually remains opened.
When the vent is closed, under normal purge conditions, the evaporative emission control system is depressurized and allows “EVAP Control System” diagnosis.





CONSULT-III Reference Value in Data Monitor Mode

NBS000FN

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
VENT CONT/V	● Ignition switch: ON	OFF

On Board Diagnosis Logic

NBS000FO

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0448 0448	EVAP canister vent control valve close	EVAP canister vent control valve remains closed under specified driving conditions.	● EVAP canister vent control valve ● EVAP control system pressure sensor and the circuit ● Blocked rubber tube to EVAP canister vent control valve ● EVAP canister is saturated with water

DTC Confirmation Procedure

NBS000FP

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
4. Start engine and let it idle for at least 1 minute.
5. Repeat next procedures for three times.

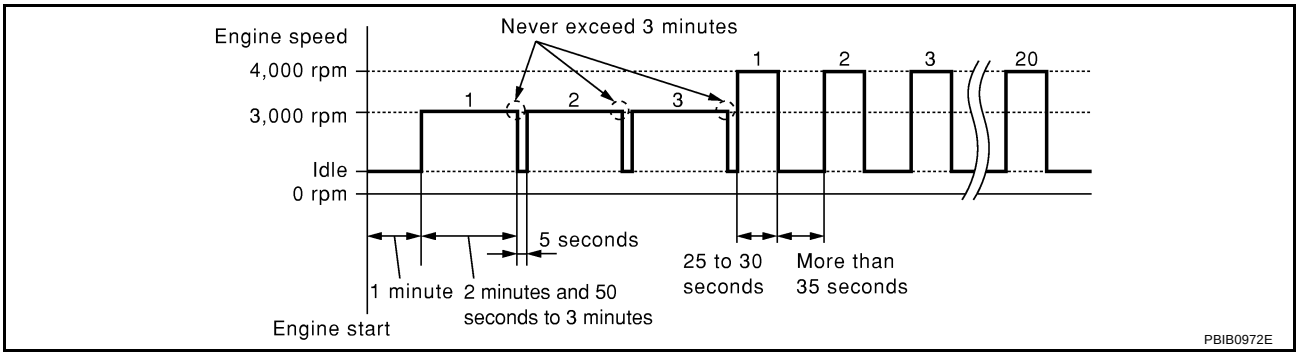
a. Increase the engine speed up to 3,000 to 3,500 rpm and keep it for 2 minutes and 50 seconds to 3 minutes.
Never exceed 3 minutes.

b. Fully released accelerator pedal and keep engine idle for about 5 seconds.

6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-447, "Diagnostic Procedure" .
If 1st trip DTC is not detected, go to the next step.
8. Repeat next procedure for 20 times.

a. Quickly increase the engine speed up to 4,000 to 4,500 rpm or more and keep it for 25 to 30 seconds.

b. Fully released accelerator pedal and keep engine idle for at least 35 seconds.



9. Check 1st trip DTC.
10. If 1st trip DTC is detected, go to EC-447, "Diagnostic Procedure" .

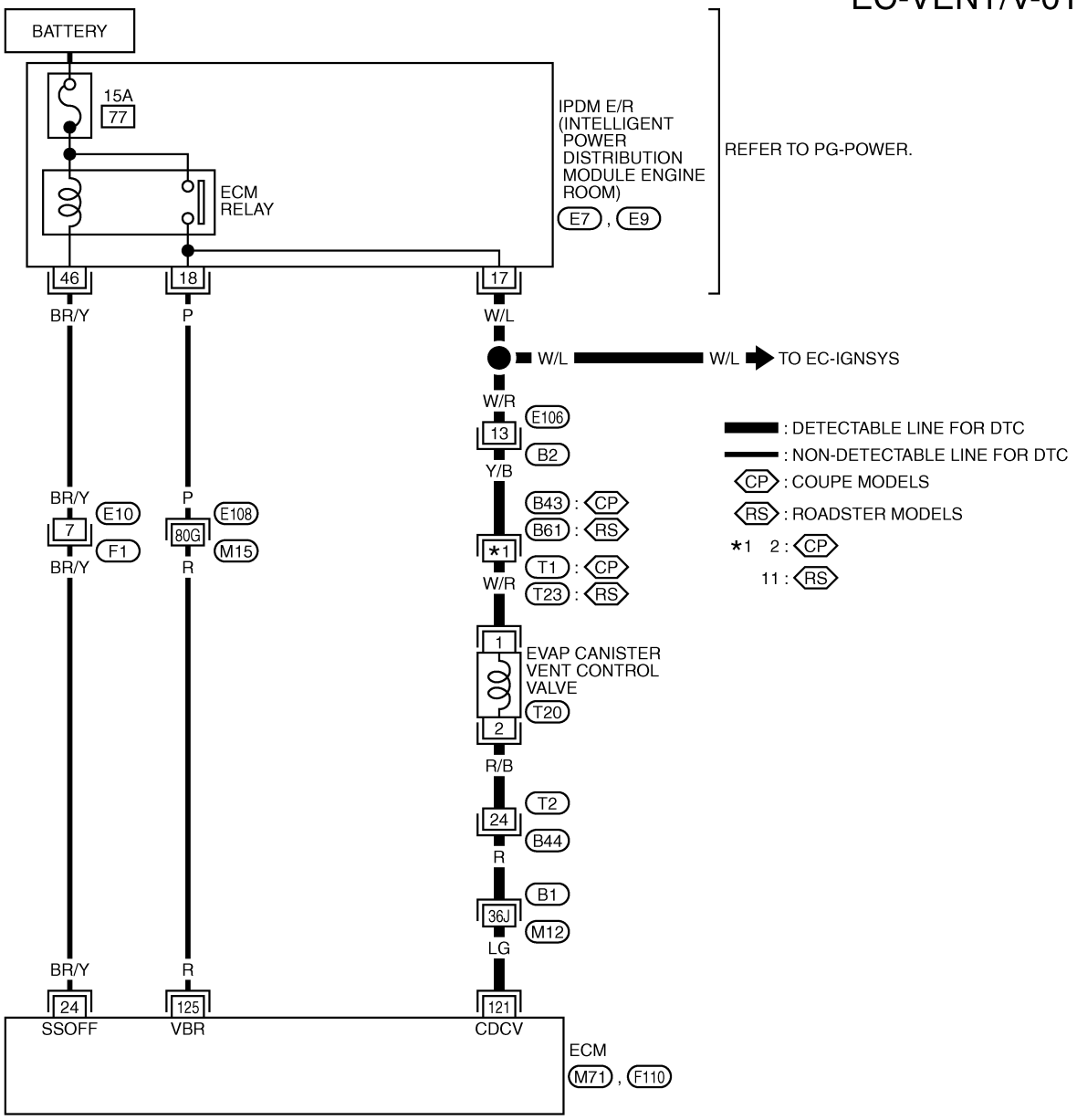
WITH GST

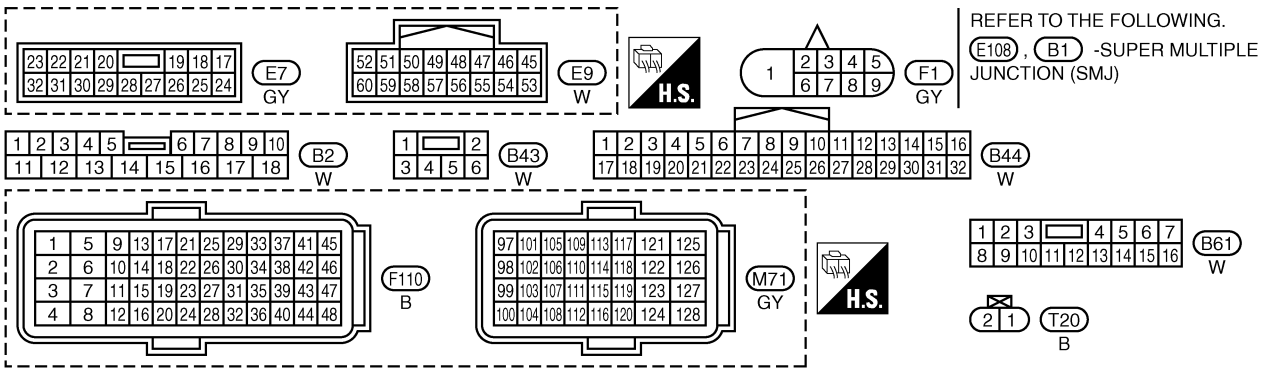
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000FQ

EC-VENT/V-01





TBWT1649E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

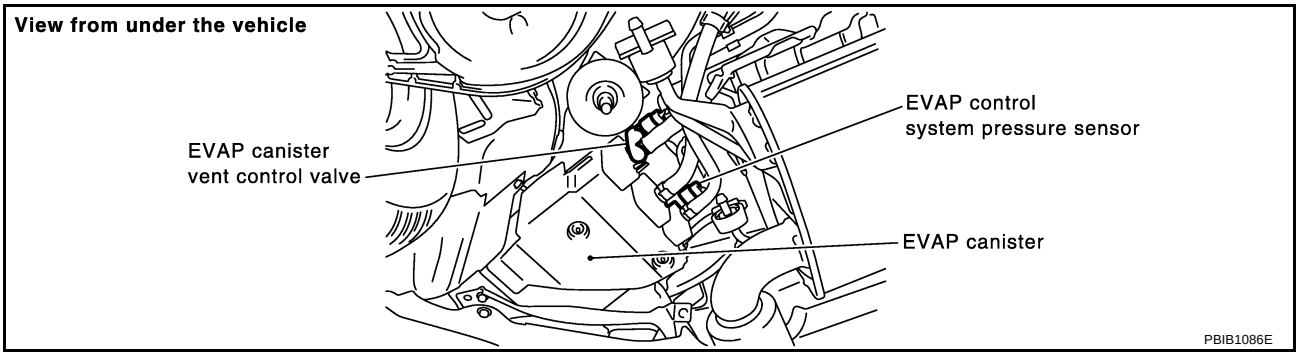
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
121	LG	EVAP canister vent control valve	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS000FR

1. CHECK RUBBER TUBE

1. Turn ignition switch OFF.
2. Disconnect rubber tube connected to EVAP canister vent control valve.



3. Check the rubber tube for clogging.

OK or NG

OK >> GO TO 2.
NG >> Clean rubber tube using an air blower.

2. CHECK EVAP CANISTER VENT CONTROL VALVE

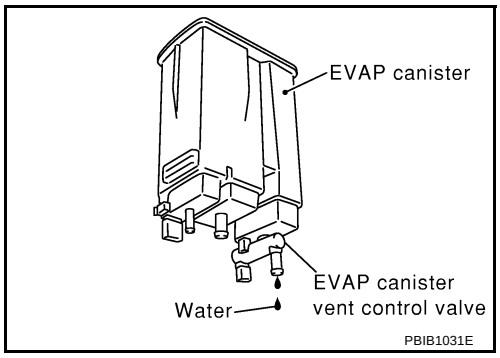
Refer to EC-449, "EVAP CANISTER VENT CONTROL VALVE" .

OK or NG

OK >> GO TO 3.
NG >> Replace EVAP canister vent control valve.

3. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?



OK or NG

OK >> GO TO 4.
NG >> GO TO 6.

4. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.
The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.
2. Check connectors for water.

Water should not exist.

OK or NG

OK >> GO TO 7.
NG >> Replace EVAP control system pressure sensor.

7. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace EVAP control system pressure sensor.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

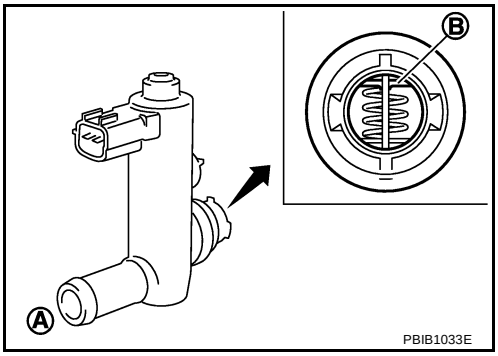
Component Inspection

NBS000FS

EVAP CANISTER VENT CONTROL VALVE

With CONSULT-III

1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.
   If NG, replace EVAP canister vent control valve.
   If OK, go to next step.
3. Reconnect harness connectors disconnected.
4. Turn ignition switch ON.
5. Perform “VENT CONTROL/V” in “ACTIVE TEST” mode.
6. Check air passage continuity and operation delay time.
   Make sure new O-ring is installed properly.



Condition VENT CONTROL/V	Air passage continuity between A and B
ON	No
OFF	Yes

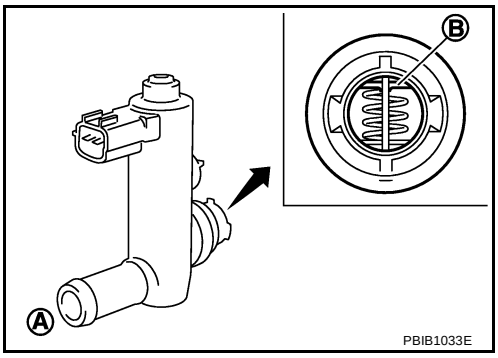
Operation takes less than 1 second.

If NG, replace EVAP canister vent control valve.
If OK, go to next step.

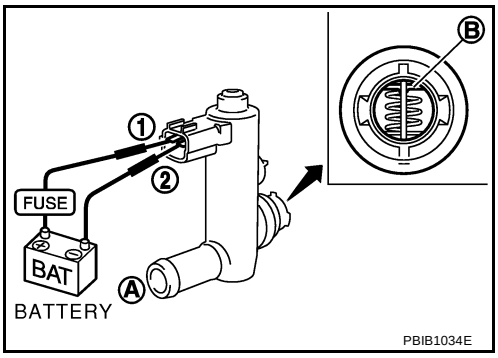
7. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
8. Perform step 6 again.

Without CONSULT-III

1. Remove EVAP canister vent control valve from EVAP canister.
2. Check portion **B** of EVAP canister vent control valve for being rusted.



3. Check air passage continuity and operation delay time under the following conditions.
   Make sure new O-ring is installed properly.



Condition	Air passage continuity between A and B
12V direct current supply between terminals 1 and 2	No
OFF	Yes

Operation takes less than 1 second.

If NG, replace EVAP canister vent control valve.
If OK, go to next step.

4. Clean the air passage (Portion **A** to **B**) of EVAP canister vent control valve using an air blower.
5. Perform step 3 again.

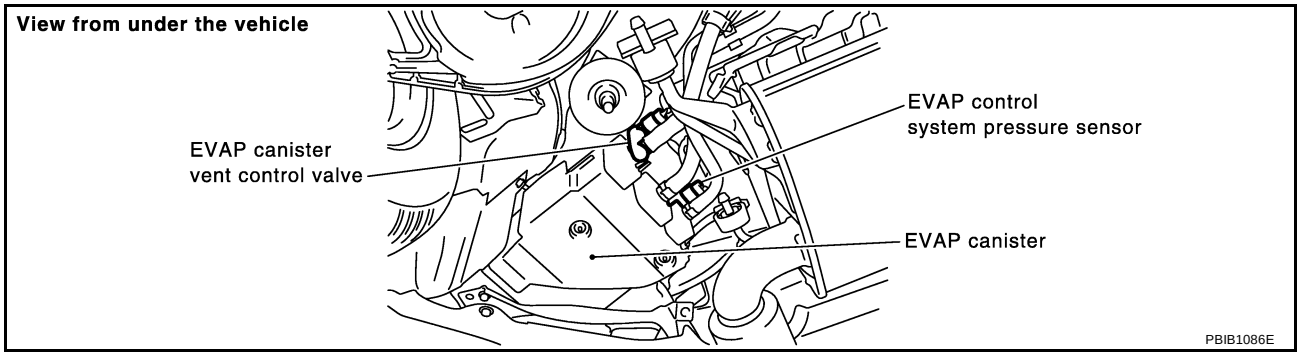
DTC P0451 EVAP CONTROL SYSTEM PRESSURE SENSOR

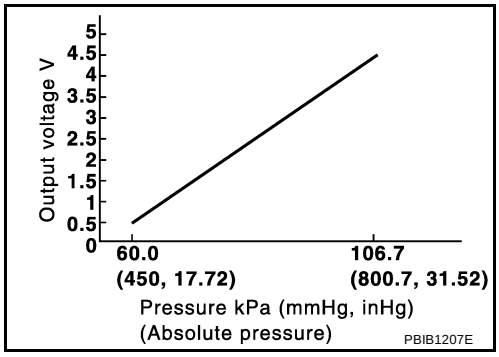
PFP:22365

Component Description

NBS0009B

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-III Reference Value in Data Monitor Mode

NBS0009C

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

NBS0009D

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0451 0451	EVAP control system pressure sensor performance	ECM detects a sloshing signal from the EVAP control system pressure sensor	● Harness or connectors (EVAP control system pressure sensor circuit is shorted.) [CKP sensor (POS) circuit is shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● EVAP control system pressure sensor ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● Refrigerant pressure sensor

DTC Confirmation Procedure

NBS0009E

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start engine and wait at least 40 seconds.
   NOTE:
   Do not depress accelerator pedal even slightly.
3. Check 1st trip DTC.
4. If 1st trip DTC is detected, go to EC-452, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

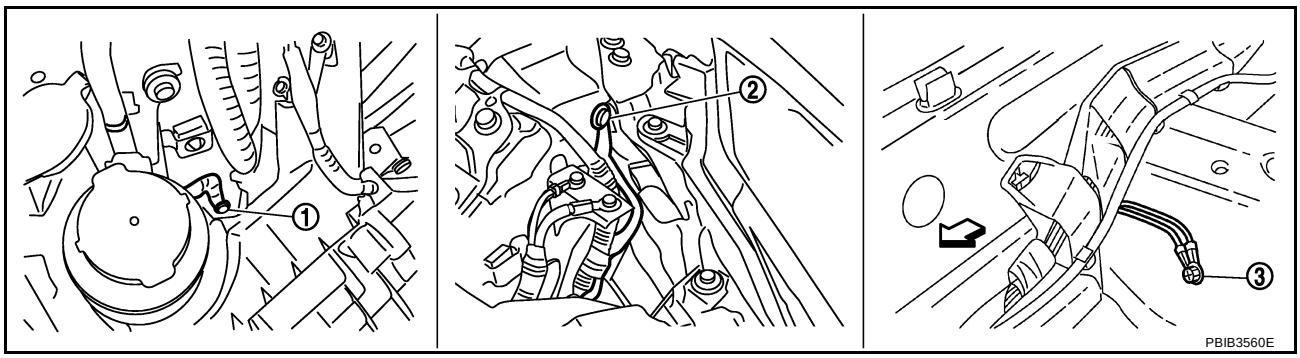
Diagnostic Procedure

NBS0009F

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

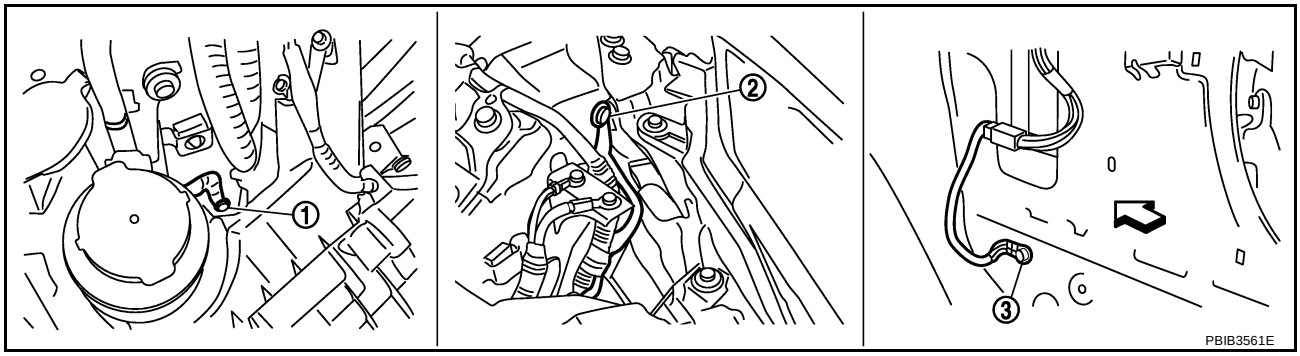


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

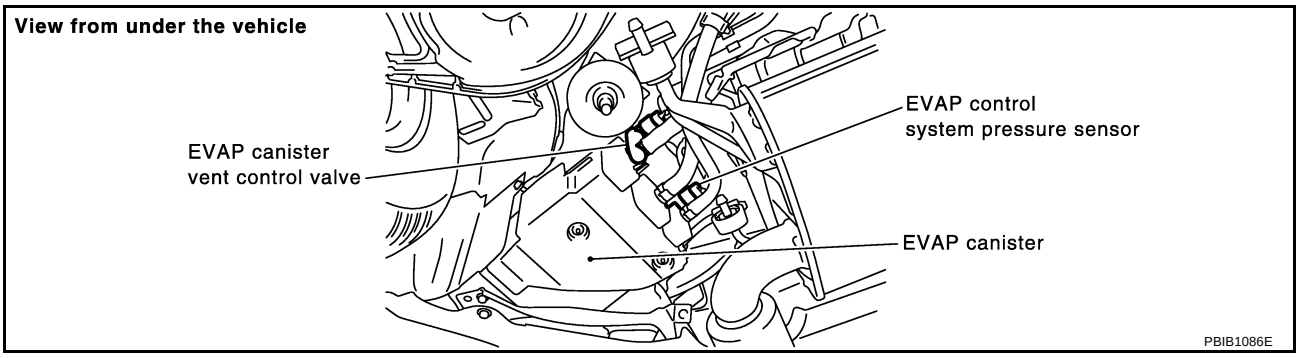
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR CONNECTOR FOR WATER

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

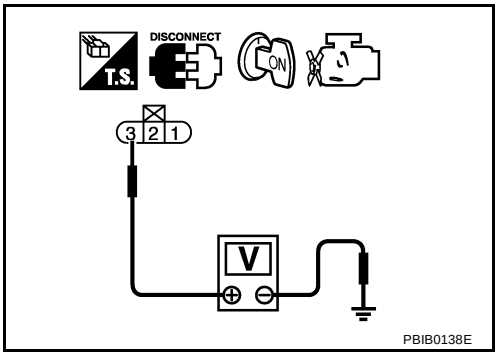
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 3 and ECM terminal 107. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

1. Harness connectors T2, B44
2. Harness connectors B1, M12
3. Harness for open between ECM and EVAP control system pressure sensor.

>> Repair open circuit.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor 1	EC-711

OK or NG

OK >> GO TO 7.
NG >> Repair short to ground or short to power in harness or connectors.

7. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 8.
NG >> Replace malfunctioning component.

8. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-455, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace EVAP control system pressure sensor.

11. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .
Refer to EC-458, "Wiring Diagram" .

>> **INSPECTION END**

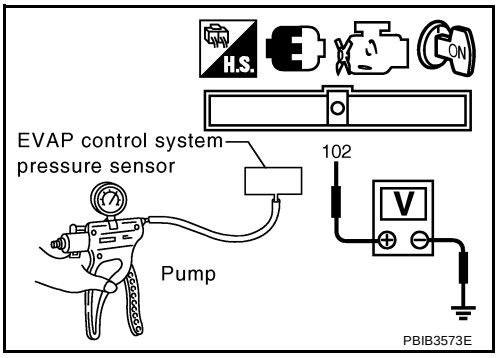
Component Inspection

NBS0009G

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Always replace O-ring with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 102 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

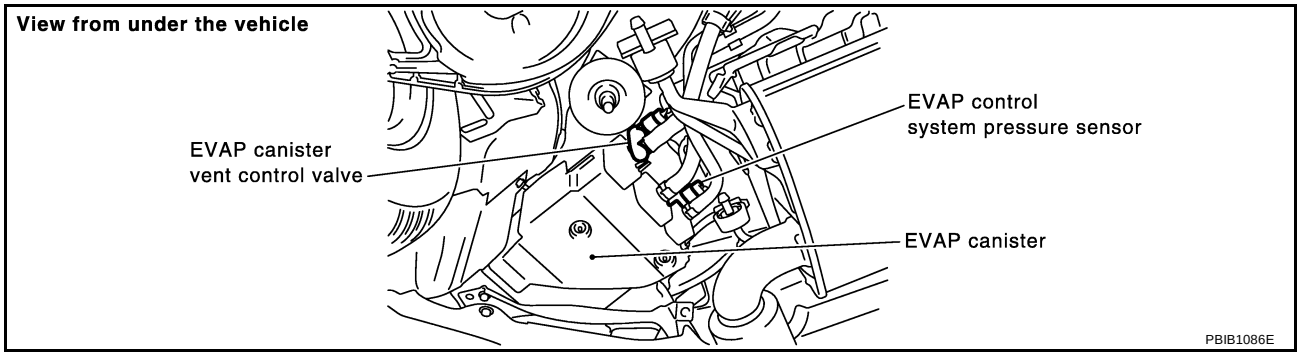
DTC P0452 EVAP CONTROL SYSTEM PRESSURE SENSOR

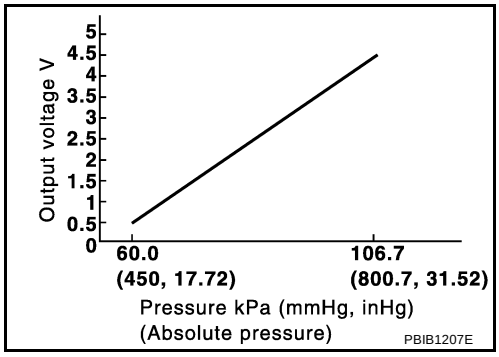
PFP:25085

Component Description

NBS0009H

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-III Reference Value in Data Monitor Mode

NBS0009I

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

NBS0009J

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0452 0452	EVAP control system pressure sensor low input	An excessively low voltage from the sensor is sent to ECM.	● Harness or connectors (EVAP control system pressure sensor circuit is shorted.) [CKP sensor (POS) circuit is shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● EVAP control system pressure sensor ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● Refrigerant pressure sensor

DTC Confirmation Procedure

NBS0009K

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

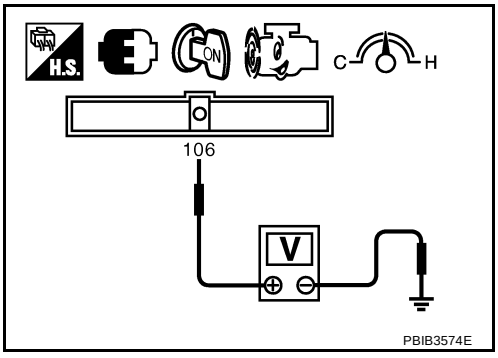
TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “DATA MONITOR” mode with CONSULT-III.
5. Make sure that “FUEL T/TEMP SE” is more than 0°C (32°F).
6. Start engine and wait at least 20 seconds.
7. Check 1st trip DTC.
8. If 1st trip DTC is detected, go to EC-460, "Diagnostic Procedure" .

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Check that voltage between ECM terminal 106 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and wait at least 20 seconds.
5. Select Service $07 with GST.
   If 1st trip DTC is detected, go to EC-460, "Diagnostic Procedure"
   .

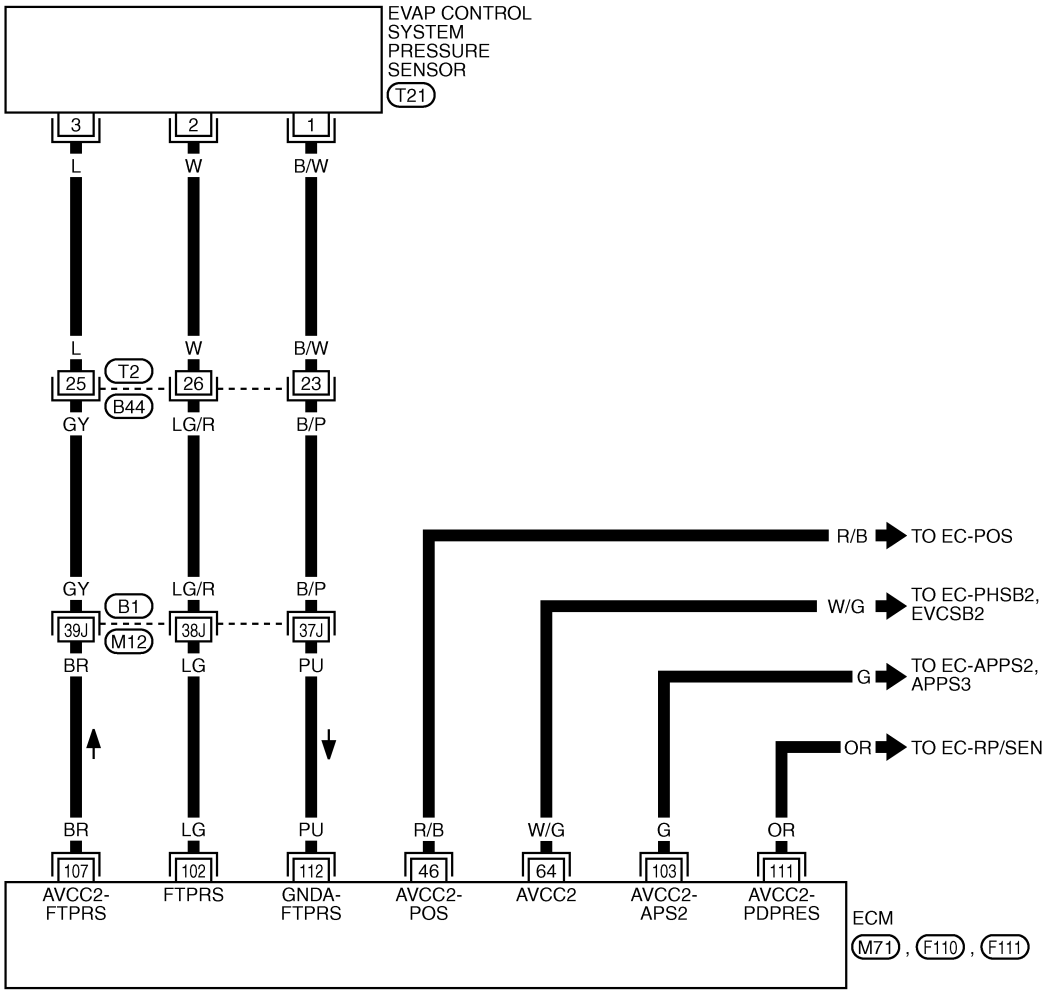


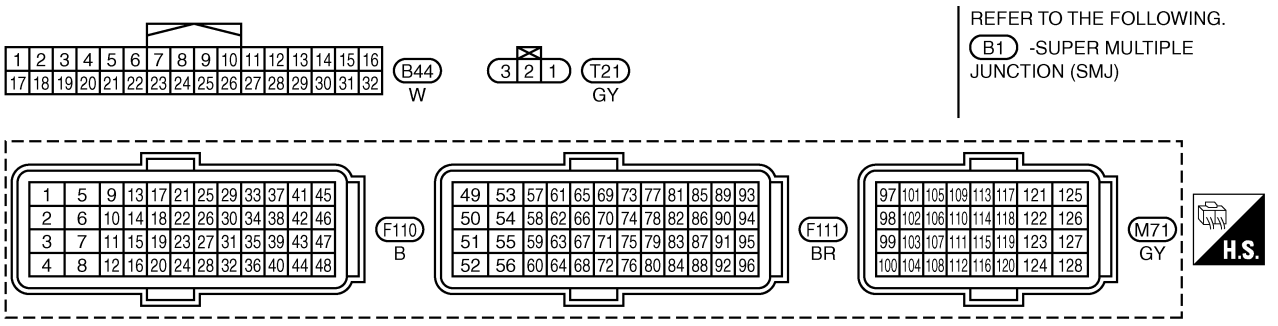
Wiring Diagram

NBS0009L

EC-PRE/SE-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1650E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
102	LG	EVAP control system pressure sensor	**[Ignition switch: ON]**	1.8 - 4.8V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V
112	PU	Sensor ground (EVAP control system pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

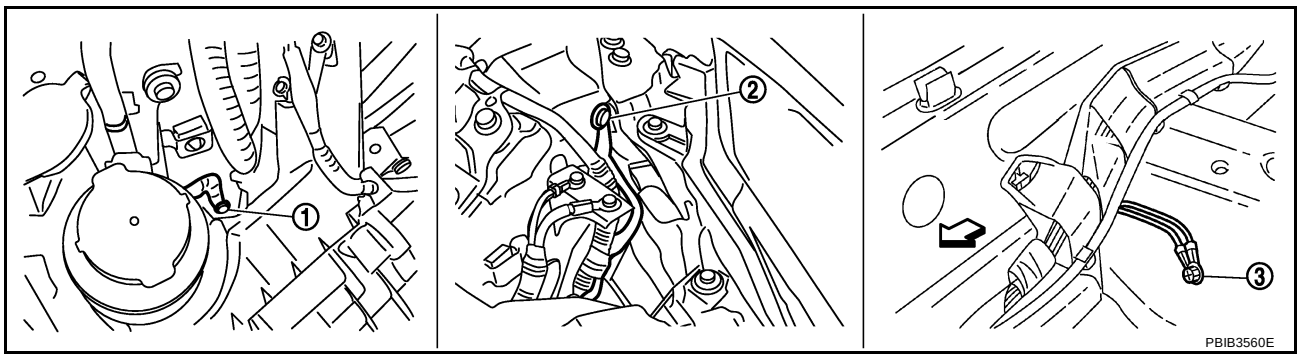
Diagnostic Procedure

NBS0009M

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

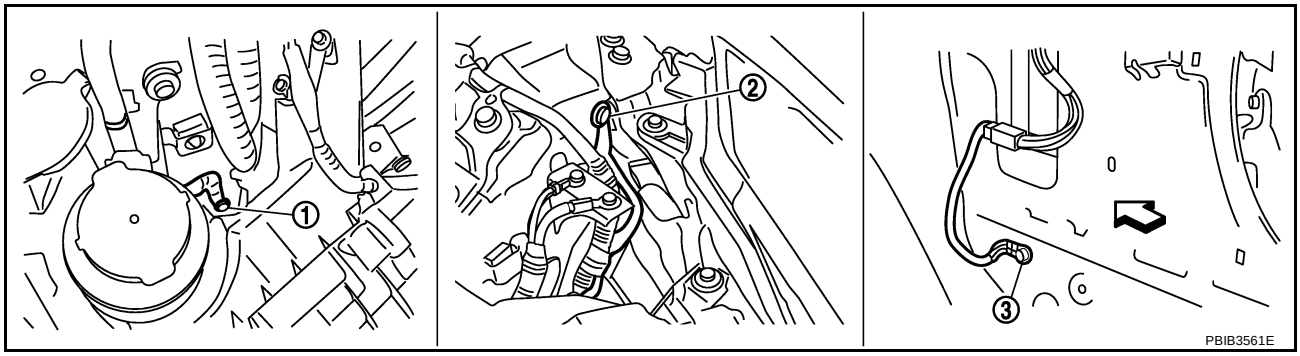


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

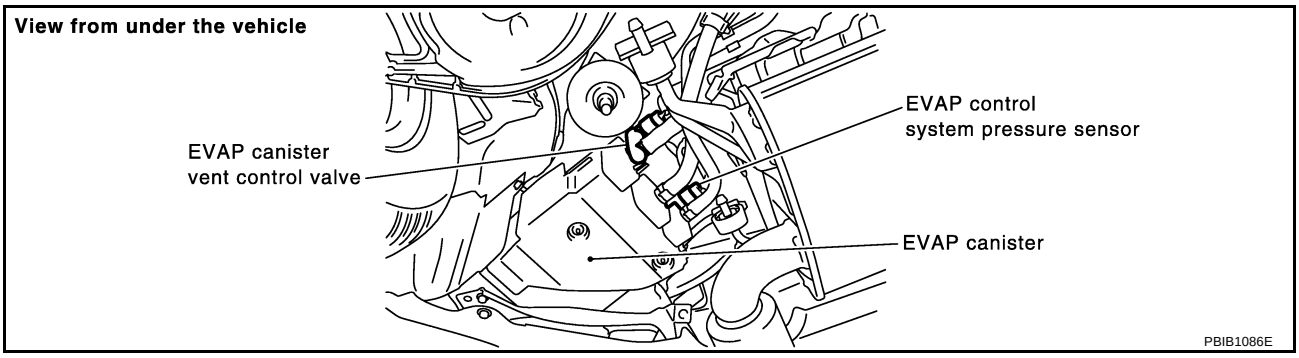
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

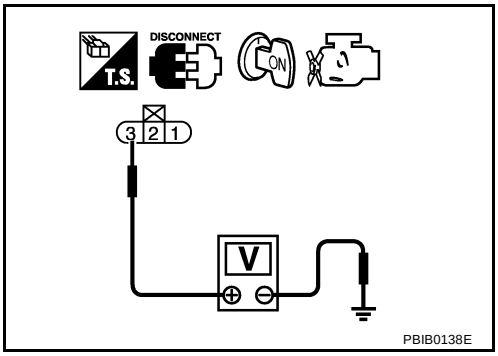
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 3 and ECM terminal 107. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

1. Harness connectors T2, B44
2. Harness connectors B1, M12
3. Harness for open between ECM and EVAP control system pressure sensor.

>> Repair open circuit.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor 1	EC-711

OK or NG

OK >> GO TO 7.
NG >> Repair short to ground or short to power in harness or connectors.

7. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 8.
NG >> Replace malfunctioning component.

8. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 112. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 102 and EVAP control system pressure sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-464, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> Replace EVAP control system pressure sensor.

15. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

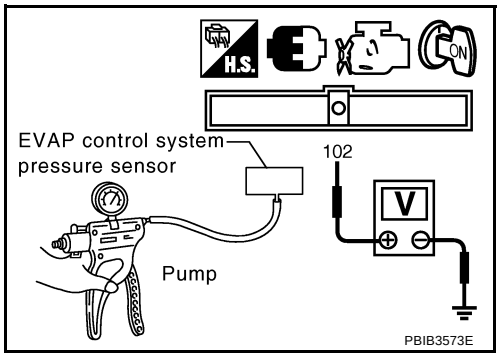
Component Inspection

NBS0009N

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Always replace O-ring with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 102 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

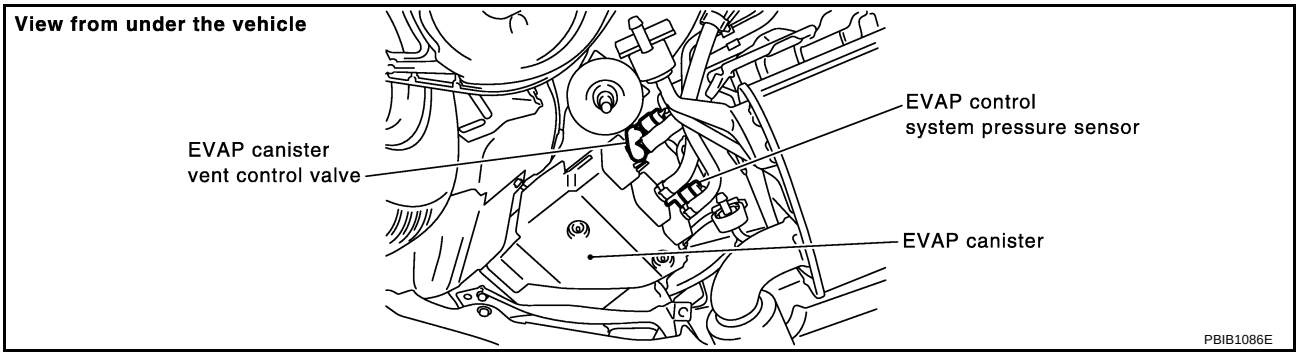
DTC P0453 EVAP CONTROL SYSTEM PRESSURE SENSOR

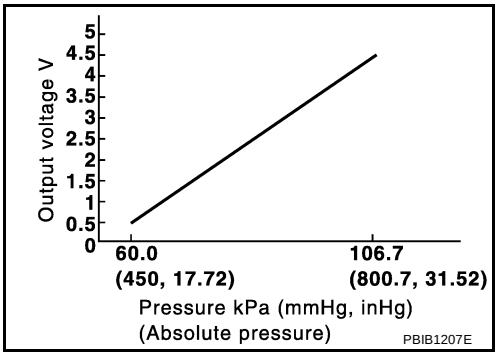
PFP:25085

Component Description

NBS0009O

The EVAP control system pressure sensor detects pressure in the purge line. The sensor output voltage to the ECM increases as pressure increases.





CONSULT-III Reference Value in Data Monitor Mode

NBS0009P

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
EVAP SYS PRES	● Ignition switch: ON	Approx. 1.8 - 4.8V

On Board Diagnosis Logic

NBS0009Q

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0453 0453	EVAP control system pressure sensor high input	An excessively high voltage from the sensor is sent to ECM.	● Harness or connectors (EVAP control system pressure sensor circuit is shorted.) [CKP sensor (POS) circuit is shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (APP sensor 2 circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● EVAP control system pressure sensor ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● Accelerator pedal position sensor ● Refrigerant pressure sensor ● EVAP canister vent control valve ● EVAP canister ● Rubber hose from EVAP canister vent control valve to vehicle frame

DTC Confirmation Procedure

NBS0009R

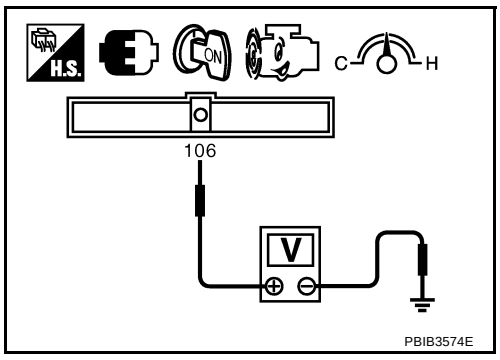
NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Always perform test at a temperature of 5°C (41°F) or more.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Select “DATA MONITOR” mode with CONSULT-III.
5. Make sure that “FUEL T/TEMP SE” is more than 0°C (32°F).
6. Start engine and wait at least 20 seconds.
7. Check 1st trip DTC.
8. If 1st trip DTC is detected, go to EC-469, "Diagnostic Procedure" .

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Check that voltage between ECM terminal 106 (Fuel tank temperature sensor signal) and ground is less than 4.2V.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and wait at least 20 seconds.
5. Select Service $07 with GST.
   If 1st trip DTC is detected, go to EC-469, "Diagnostic Procedure"
   .

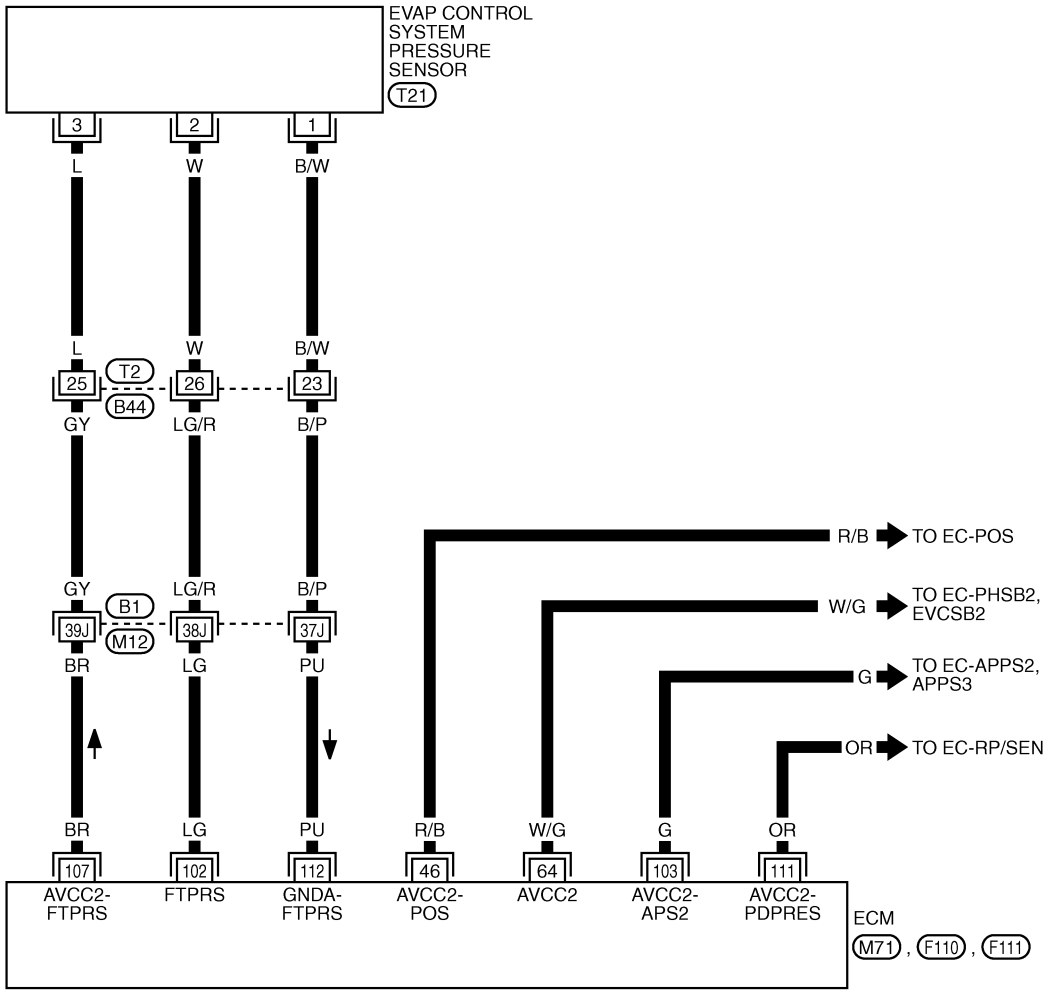


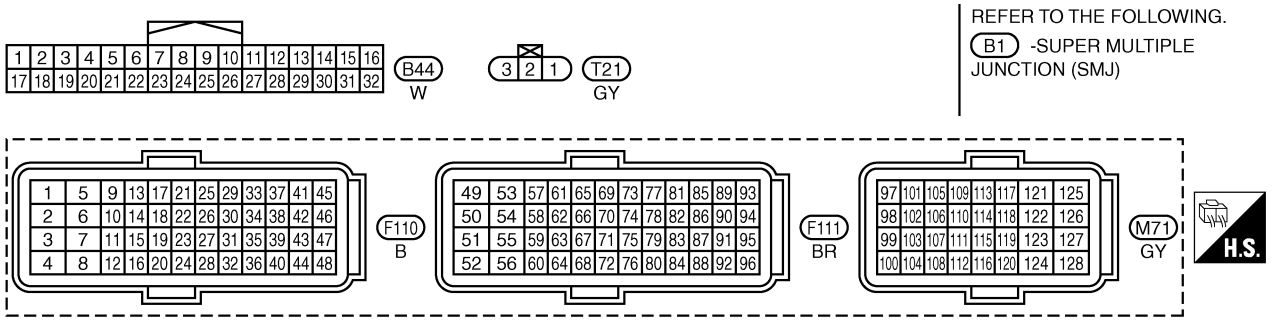
Wiring Diagram

NBS0009S

EC-PRE/SE-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1650E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
102	LG	EVAP control system pressure sensor	**[Ignition switch: ON]**	1.8 - 4.8V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V
112	PU	Sensor ground (EVAP control system pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

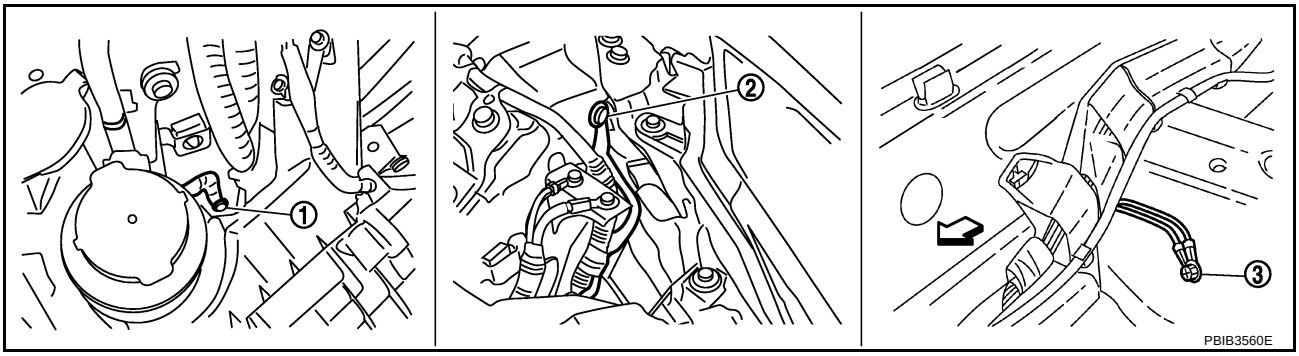
Diagnostic Procedure

NBS0009T

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

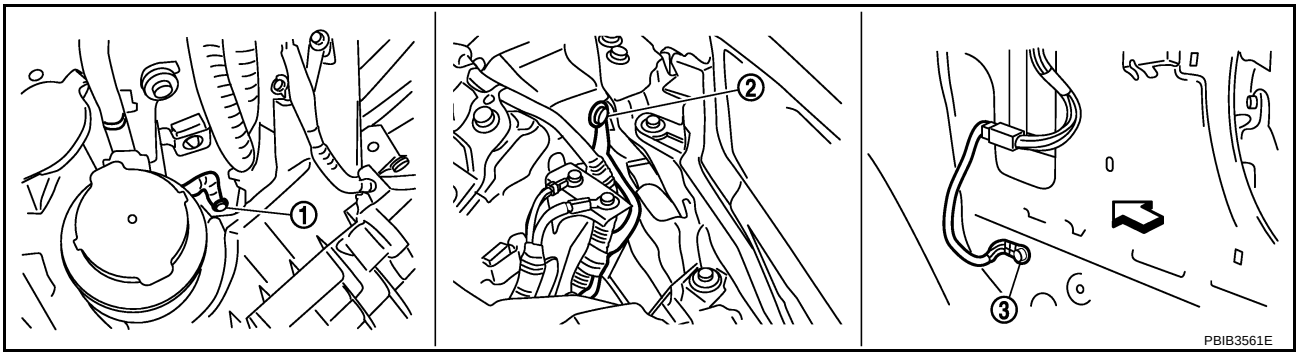


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

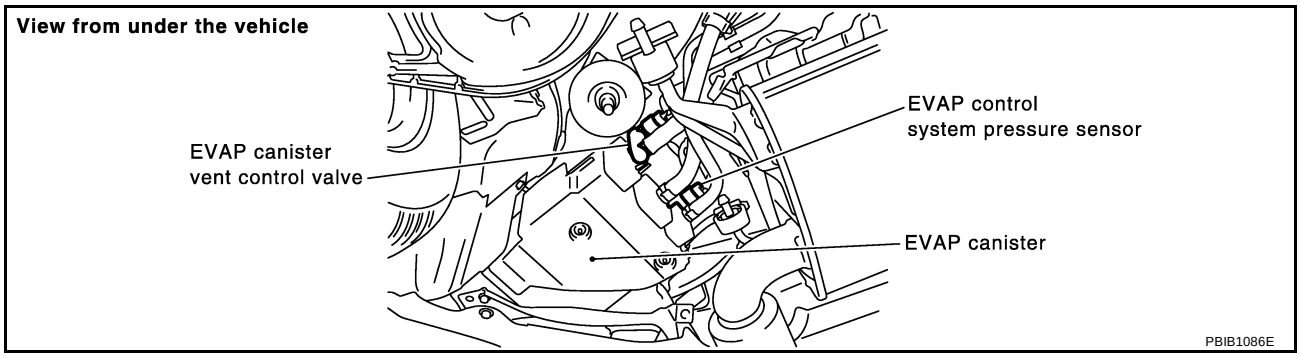
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK CONNECTOR

1. Disconnect EVAP control system pressure sensor harness connector.



2. Check sensor harness connector for water.

Water should not exist.

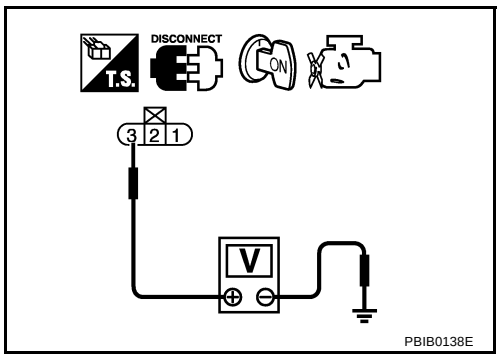
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness connector.

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-I

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 10.
NG >> GO TO 4.

4. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 3 and ECM terminal 107. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

1. Harness connectors T2, B44
2. Harness connectors B1, M12
3. Harness for open between ECM and EVAP control system pressure sensor.

>> Repair open circuit.

6. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor 1	EC-711

OK or NG

OK >> GO TO 7.
NG >> Repair short to ground or short to power in harness or connectors.

7. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .

OK or NG

OK >> GO TO 8.
NG >> Replace malfunctioning component.

8. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 20.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 112. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 102 and EVAP control system pressure sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors T2, B44
- Harness connectors B1, M12
- Harness for open or short between EVAP control system pressure sensor and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK RUBBER TUBE

1. Disconnect rubber tube connected to EVAP canister vent control valve.
2. Check the rubber tube for clogging, vent and kinked.

OK or NG

OK >> GO TO 15.
NG >> Clean the rubber tube using an air blower.

15. CHECK EVAP CANISTER VENT CONTROL VALVE

Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister vent control valve.

16. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-474, "Component Inspection" .

OK or NG

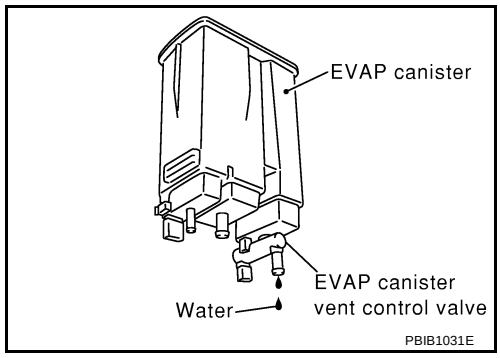
OK >> GO TO 17.
NG >> Replace EVAP control system pressure sensor.

17. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 18.
No >> GO TO 20.



18. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.
The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK >> GO TO 20.
NG >> GO TO 19.

19. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

20. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

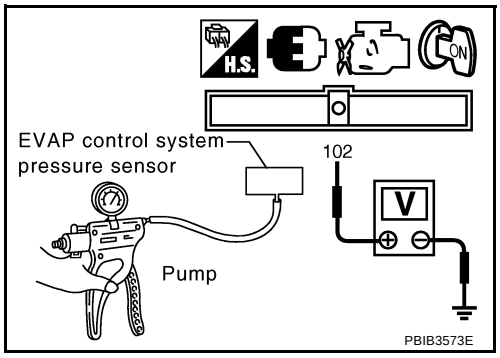
Component Inspection

NBS0009U

EVAP CONTROL SYSTEM PRESSURE SENSOR

1. Remove EVAP control system pressure sensor with its harness connector connected from EVAP canister. **Always replace O-ring with a new one.**
2. Install a vacuum pump to EVAP control system pressure sensor.
3. Turn ignition switch ON and check output voltage between ECM terminal 102 and ground under the following conditions.

Applied vacuum kPa (mmHg, inHg)	Voltage V
Not applied	1.8 - 4.8
-26.7 (-200, -7.87)	2.1 to 2.5V lower than above value



CAUTION:

- **Always calibrate the vacuum pump gauge when using it.**
- **Do not apply below -93.3 kPa (-700 mmHg, -27.56 inHg) or pressure over 101.3 kPa (760 mmHg, 29.92 inHg).**

4. If NG, replace EVAP control system pressure sensor.

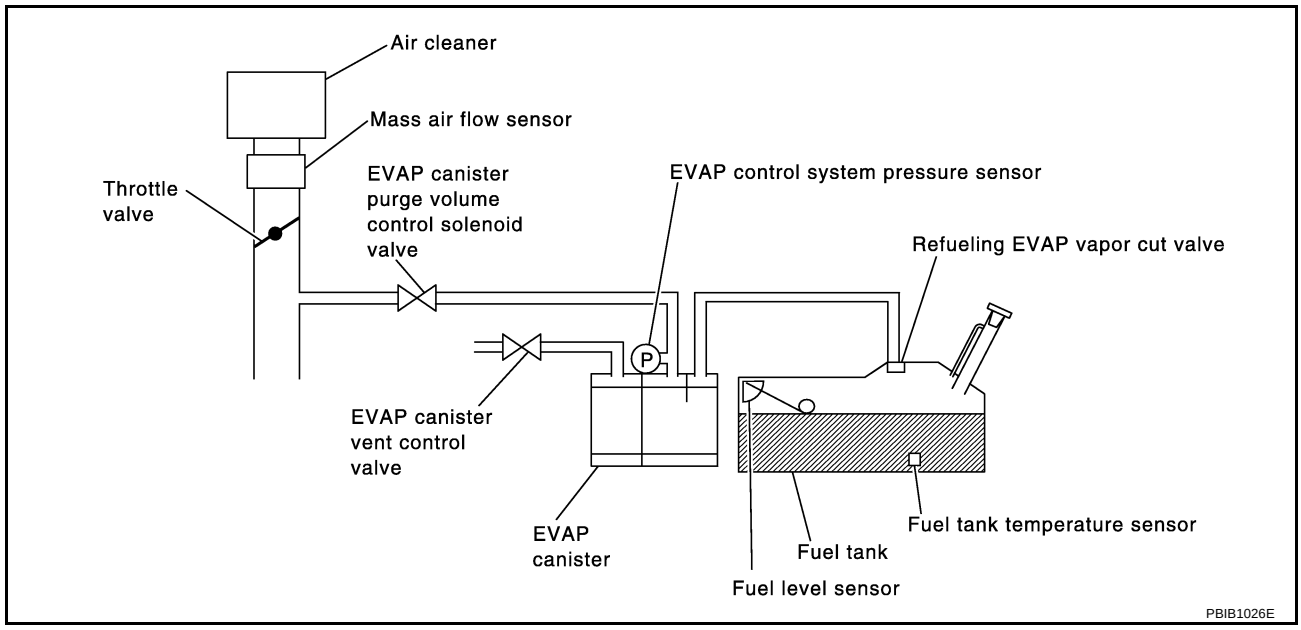
DTC P0455 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

NBS0009V

This diagnosis detects a very large leak (fuel filler cap fell off etc.) in EVAP system between the fuel tank and EVAP canister purge volume control solenoid valve.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0455 0455	EVAP control system gross leak detected	EVAP control system has a very large leak such as fuel filler cap fell off, EVAP control system does not operate properly.	● Fuel filler cap remains open or fails to close. ● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent. ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged. ● EVAP control system pressure sensor ● Refueling EVAP vapor cut valve ● ORVR system leaks

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**

- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

NBS0009W

CAUTION:

Never remove fuel filler cap during the DTC Confirmation Procedure.

NOTE:

- **Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- **Perform "DTC WORK SUPPORT" when the fuel level is between 1/4 and 3/4 full, and vehicle is placed on flat level surface.**
- **Open engine hood before conducting the following procedures.**

WITH CONSULT-III

1. Tighten fuel filler cap securely until ratcheting sound is heard.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON and select "DATA MONITOR" mode with CONSULT-III.
5. Make sure that the following conditions are met.
   COOLAN TEMP/S: 0 - 70°C (32 - 158°F)
   INT/A TEMP SE: 0 - 60°C (32 - 140°F)
6. Select "EVAP SML LEAK P0442/P1442" of "EVAPORATIVE SYSTEM" in "DTC WORK SUPPORT" mode with CONSULT-III.
   Follow the instruction displayed.

   NOTE:
   If the engine speed cannot be maintained within the range displayed on the CONSULT-III screen, go to EC-71, "Basic Inspection" .
7. Make sure that "OK" is displayed.
   If "NG" is displayed, select "SELF-DIAG RESULTS" mode and make sure that "EVAP GROSS LEAK [P0455]" is displayed. If it is displayed, refer to EC-477, "Diagnostic Procedure" .
   If P0442 is displayed, perform EC-418, "Diagnostic Procedure" for DTC P0442.

WITH GST

NOTE:

Be sure to read the explanation of EC-58, "Driving Pattern" before driving vehicle.

1. Start engine.
2. Drive vehicle according to EC-58, "Driving Pattern" .
3. Stop vehicle.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Select Service $07 with GST.
   - If P0441 is displayed on the screen, go to EC-413, "Diagnostic Procedure" , for DTC P0441.
   - If P0442 is displayed on the screen, go to EC-418, "Diagnostic Procedure" , for DTC P0442.
   - If P0455 is displayed on the screen, go to EC-477, "Diagnostic Procedure" .

Diagnostic Procedure

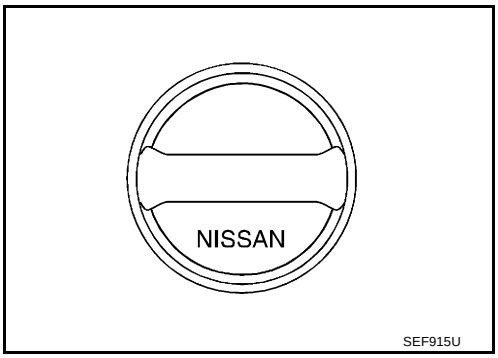
NBS0009X

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-36, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)" .

OK or NG

OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks, improper connection or disconnection.
Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 6.
NG >> Repair or reconnect the hose.

6. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 7.

7. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

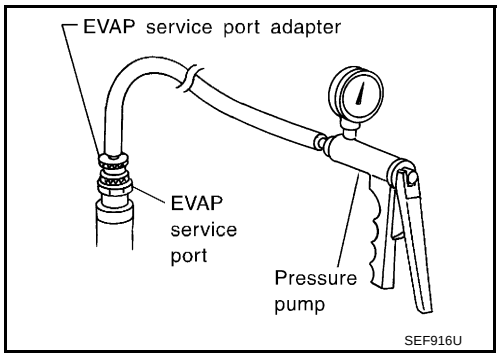
- EVAP canister vent control valve is installed properly.
  Refer to EC-37, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-442, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

8. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

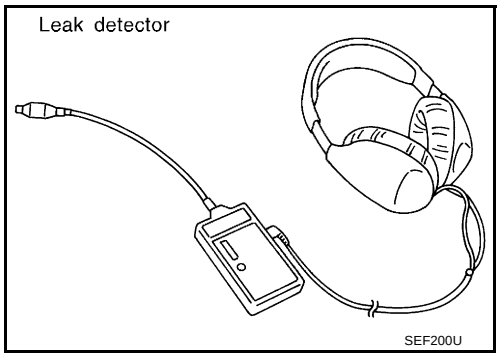
With CONSULT-III>>GO TO 9.
Without CONSULT-III>>GO TO 10.

9. CHECK FOR EVAP LEAK

With CONSULT-III

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-III.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.

   CAUTION:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.
   Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



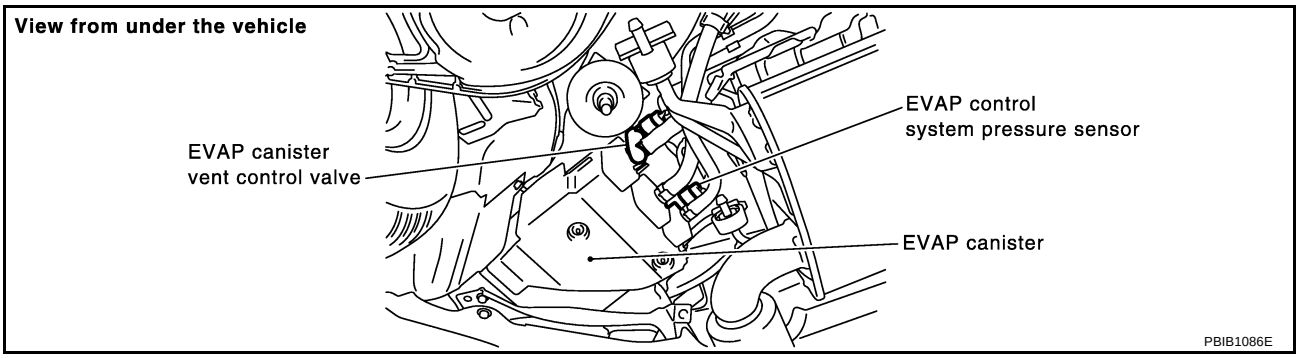
OK or NG

OK >> GO TO 11.
NG >> Repair or replace.

10. CHECK FOR EVAP LEAK

Without CONSULT-III

1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)

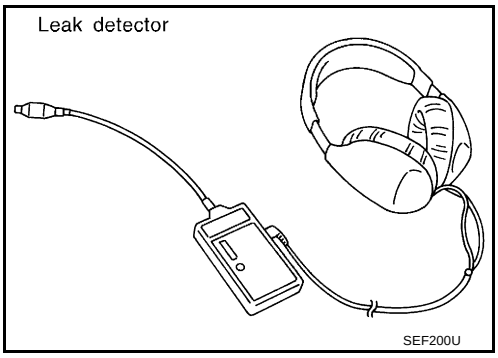


3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

CAUTION:

- **Never use compressed air or a high pressure pump.**
- **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**

4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



OK or NG

OK >> GO TO 12.
NG >> Repair or replace.

11. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-III

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-III screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15.
NG >> GO TO 13.

13. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-100, "Vacuum Hose Drawing" .

OK or NG

OK (With CONSULT-III)>>GO TO 14.
OK (Without CONSULT-III)>>GO TO 15.
NG >> Repair or reconnect the hose.

14. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

With CONSULT-III

1. Start engine.
2. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode with CONSULT-III. Check that engine speed varies according to the valve opening.

OK or NG

OK >> GO TO 16.
NG >> GO TO 15.

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-464, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-39, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 19.
NG >> Repair or replace hoses and tubes.

19. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 20.
NG >> Repair or replace hose, tube or filler neck tube.

20. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "REFUELING EVAP VAPOR CUT VALVE" .

OK or NG

OK >> GO TO 21.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

21. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

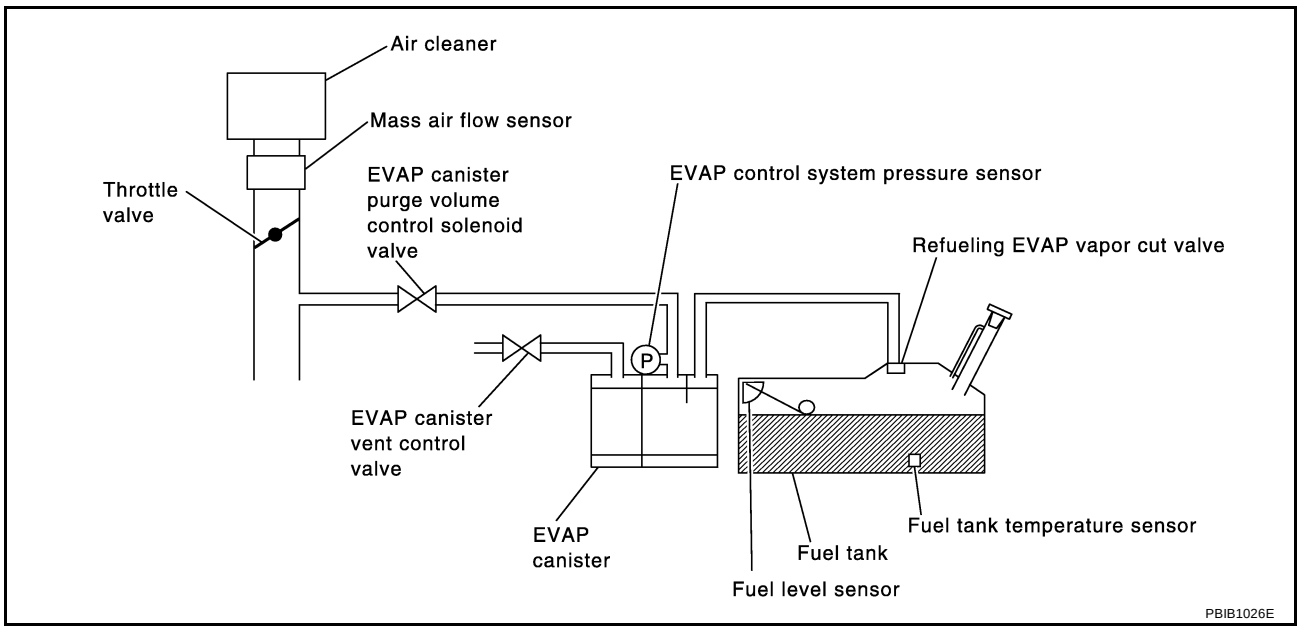
DTC P0456 EVAP CONTROL SYSTEM

PFP:14950

On Board Diagnosis Logic

NBS0009Y

This diagnosis detects very small leaks in the EVAP line between fuel tank and EVAP canister purge volume control solenoid valve, using the intake manifold vacuum in the same way as conventional EVAP small leak diagnosis.
If ECM judges a leak which corresponds to a very small leak, the very small leak P0456 will be detected.
If ECM judges a leak equivalent to a small leak, EVAP small leak P0442 will be detected.
If ECM judges there are no leaks, the diagnosis will be OK.



DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0456 0456	Evaporative emission control system very small leak (negative pressure check)	● EVAP system has a very small leak. ● EVAP system does not operate properly.	● Incorrect fuel tank vacuum relief valve ● Incorrect fuel filler cap used ● Fuel filler cap remains open or fails to close. ● Foreign matter caught in fuel filler cap. ● Leak is in line between intake manifold and EVAP canister purge volume control solenoid valve. ● Foreign matter caught in EVAP canister vent control valve. ● EVAP canister or fuel tank leaks ● EVAP purge line (pipe and rubber tube) leaks ● EVAP purge line rubber tube bent ● Loose or disconnected rubber tube ● EVAP canister vent control valve and the circuit ● EVAP canister purge volume control solenoid valve and the circuit ● Fuel tank temperature sensor ● O-ring of EVAP canister vent control valve is missing or damaged ● EVAP canister is saturated with water ● EVAP control system pressure sensor ● Refueling EVAP vapor cut valve ● ORVR system leaks ● Fuel level sensor and the circuit ● Foreign matter caught in EVAP canister purge volume control solenoid valve

CAUTION:

- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the MIL may come on.**
- **If the fuel filler cap is not tightened properly, the MIL may come on.**
- **Use only a genuine NISSAN rubber tube as a replacement.**

DTC Confirmation Procedure

NBS0009Z

NOTE:

- **If DTC P0456 is displayed with P0442, first perform trouble diagnosis for DTC P0456.**
- **After repair, make sure that the hoses and clips are installed properly.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

- **Open engine hood before conducting following procedure.**
- **If any of following conditions are met just before the DTC confirmation procedure, leave the vehicle for more than 1 hour.**
  - **Fuel filler cap is removed.**
  - **Refilled or drained the fuel.**
  - **EVAP component parts is/are removed.**
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**

WITH CONSULT-III

1. Turn ignition switch ON and select “DATA MONITOR” mode with CONSULT-III.
2. Make sure the following conditions are met.
   FUEL LEVEL SE: 0.25 - 1.4V
   COOLAN TEMP/S: 0 - 32°C (32 - 90°F)
   FUEL T/TMP SE: 0 - 35°C (32 - 95°F)
   INT/A TEMP SE: More than 0°C (32°F)
   If NG, turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle) or refilling/draining fuel until the output voltage condition of the “FUEL LEVEL SE” meets within the range above and leave the vehicle for more than 1 hour. Then start from step 1).
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON.
5. Select “EVAP V/S LEAK P0456/P1456” of “EVAPORATIVE SYSTEM” in “DTC WORK SUPPORT” mode with CONSULT-III.
   Follow the instruction displayed.
6. Make sure that “OK” is displayed.
   If “NG” is displayed, refer to EC-484, "Diagnostic Procedure" .

   NOTE:
   - **If the engine speed cannot be maintained within the range displayed on CONSULT-III screen, go to EC-71, "Basic Inspection" .**
   - **Make sure that EVAP hoses are connected to EVAP canister purge volume control solenoid valve properly.**

Overall Function Check

NBS000A0

WITH GST

Use this procedure to check the overall function of the EVAP very small leak function. During this check, a 1st trip DTC might not be confirmed.

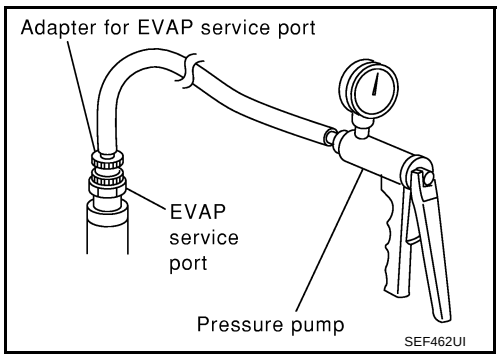
CAUTION:

- **Never use compressed air, doing so may damage the EVAP system.**
- **Do not start engine.**
- **Do not exceeded 4.12 kPa (0.042 kg/cm^2 , 0.6 psi).**

1. Attach the EVAP service port adapter securely to the EVAP service port. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

2. Set the pressure pump and a hose.
3. Also set a vacuum gauge via 3-way connector and a hose.
4. Turn ignition switch ON.
5. Connect GST and select Service $08.
6. Using Service $08 control the EVAP canister vent control valve (close).
7. Apply pressure and make sure the following conditions are satisfied.
   Pressure to be applied: 2.7 kPa (20 mmHg, 0.79 inHg)
   Time to be waited after the pressure drawn in to the EVAP system and the pressure to be dropped: 60 seconds and the pressure should not be dropped more than 0.4 kPa (3 mmHg, 0.12 inHg).
   If NG, go to EC-484, "Diagnostic Procedure" .
   If OK, go to next step.
8. Disconnect GST.
9. Start engine and warm it up to normal operating temperature.
10. Turn ignition switch OFF and wait at least 10 seconds.
11. Restart engine and let it idle for 90 seconds.
12. Keep engine speed at 2,000 rpm for 30 seconds.
13. Turn ignition switch OFF.

    NOTE:
    For more information, refer to GST Instruction Manual.



Diagnostic Procedure

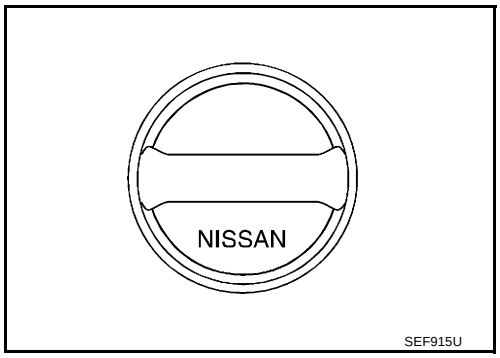
NBS000A1

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-36, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)" .

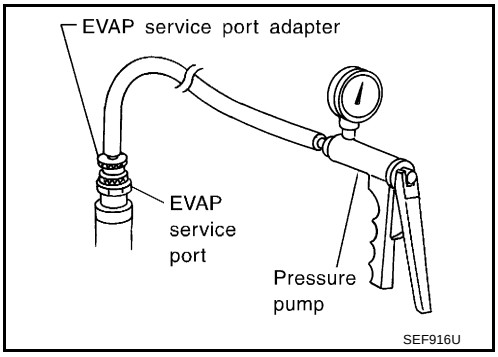
OK or NG

OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. INSTALL THE PRESSURE PUMP

To locate the EVAP leak, install EVAP service port adapter and pressure pump to EVAP service port securely. For the location of EVAP service port, refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

NOTE:
Improper installation of the EVAP service port adapter to the EVAP service port may cause leaking.

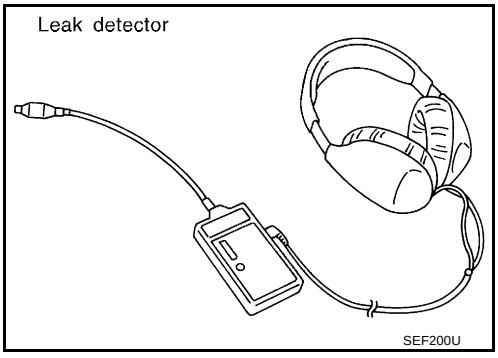


With CONSULT-III>>GO TO 6.
Without CONSULT-III>>GO TO 7.

6. CHECK FOR EVAP LEAK

With CONSULT-III

1. Turn ignition switch ON.
2. Select “EVAP SYSTEM CLOSE” of “WORK SUPPORT” mode with CONSULT-III.
3. Touch “START” and apply pressure into the EVAP line until the pressure indicator reaches the middle of the bar graph.
   CAUTION:
   - **Never use compressed air or a high pressure pump.**
   - **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**
4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details.
   Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



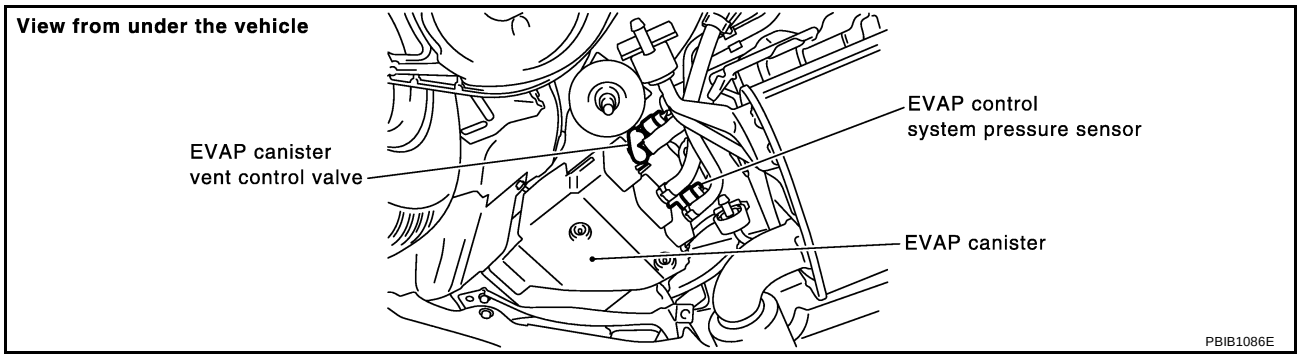
OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

7. CHECK FOR EVAP LEAK

Without CONSULT-III

1. Turn ignition switch OFF.
2. Apply 12 volts DC to EVAP canister vent control valve. The valve will close. (Continue to apply 12 volts until the end of test.)

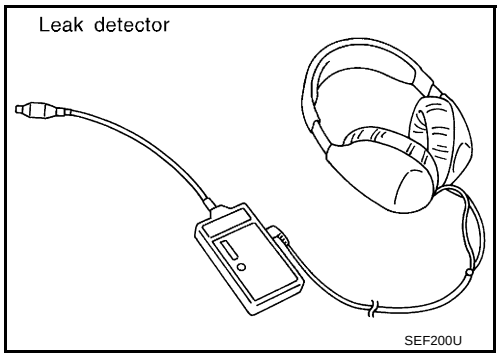


3. Pressurize the EVAP line using pressure pump with 1.3 to 2.7 kPa (10 to 20 mmHg, 0.39 to 0.79 inHg), then remove pump and EVAP service port adapter.

CAUTION:

- **Never use compressed air or a high pressure pump.**
- **Do not exceed 4.12 kPa (0.042 kg/cm^2 , 0.6 psi) of pressure in the system.**

4. Using EVAP leak detector, locate the EVAP leak. For the leak detector, refer to the instruction manual for more details. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .



OK or NG

OK >> GO TO 8.
NG >> Repair or replace.

8. CHECK EVAP CANISTER VENT CONTROL VALVE

Check the following.

- EVAP canister vent control valve is installed properly.
  Refer to EC-37, "Removal and Installation" .
- EVAP canister vent control valve.
  Refer to EC-442, "Component Inspection" .

OK or NG

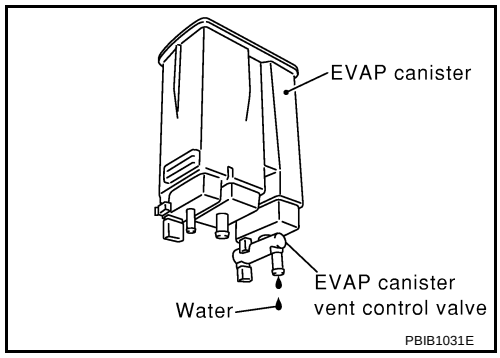
OK >> GO TO 9.
NG >> Repair or replace EVAP canister vent control valve and O-ring.

9. CHECK IF EVAP CANISTER SATURATED WITH WATER

1. Remove EVAP canister with EVAP canister vent control valve and EVAP control system pressure sensor attached.
2. Does water drain from the EVAP canister?

Yes or No

Yes >> GO TO 10.
No (With CONSULT-III)>>GO TO 12.
No (Without CONSULT-III)>>GO TO 13.



10. CHECK EVAP CANISTER

Weigh the EVAP canister with the EVAP canister vent control valve and EVAP control system pressure sensor attached.

The weight should be less than 2.2 kg (4.9 lb).

OK or NG

OK (With CONSULT-III)>>GO TO 12.
OK (Without CONSULT-III)>>GO TO 13.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- EVAP canister for damage
- EVAP hose between EVAP canister and vehicle frame for clogging or poor connection

>> Repair hose or replace EVAP canister.

12. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

With CONSULT-III

1. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
2. Start engine.
3. Perform “PURG VOL CONT/V” in “ACTIVE TEST” mode.
4. Touch “Qu” on CONSULT-III screen to increase “PURG VOL CONT/V” opening to 100%.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

13. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Stop engine.
3. Disconnect vacuum hose to EVAP canister purge volume control solenoid valve at EVAP service port.
4. Start engine and let it idle for at least 80 seconds.
5. Check vacuum hose for vacuum when revving engine up to 2,000 rpm.

Vacuum should exist.

OK or NG

OK >> GO TO 16.
NG >> GO TO 14.

14. CHECK VACUUM HOSE

Check vacuum hoses for clogging or disconnection. Refer to EC-100, "Vacuum Hose Drawing" .

OK or NG

OK >> GO TO 15.
NG >> Repair or reconnect the hose.

15. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Refer to EC-436, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace EVAP canister purge volume control solenoid valve.

16. CHECK FUEL TANK TEMPERATURE SENSOR

Refer to EC-347, "Component Inspection" .

OK or NG

OK >> GO TO 17.
NG >> Replace fuel level sensor unit.

17. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR

Refer to EC-464, "Component Inspection" .

OK or NG

OK >> GO TO 18.
NG >> Replace EVAP control system pressure sensor.

18. CHECK EVAP PURGE LINE

Check EVAP purge line (pipe, rubber tube, fuel tank and EVAP canister) for cracks or improper connection. Refer to EC-34, "EVAPORATIVE EMISSION LINE DRAWING" .

OK or NG

OK >> GO TO 19.
NG >> Repair or reconnect the hose.

19. CLEAN EVAP PURGE LINE

Clean EVAP purge line (pipe and rubber tube) using air blower.

>> GO TO 20.

20. CHECK EVAP/ORVR LINE

Check EVAP/ORVR line between EVAP canister and fuel tank for clogging, kink, looseness and improper connection. For location, refer to EC-39, "ON BOARD REFUELING VAPOR RECOVERY (ORVR)" .

OK or NG

OK >> GO TO 21.
NG >> Repair or replace hoses and tubes.

21. CHECK RECIRCULATION LINE

Check recirculation line between filler neck tube and fuel tank for clogging, kink, cracks, looseness and improper connection.

OK or NG

OK >> GO TO 22.
NG >> Repair or replace hose, tube or filler neck tube.

22. CHECK REFUELING EVAP VAPOR CUT VALVE

Refer to EC-42, "Component Inspection" .

OK or NG

OK >> GO TO 23.
NG >> Replace refueling EVAP vapor cut valve with fuel tank.

23. CHECK FUEL LEVEL SENSOR

Refer to DI-23, "FUEL LEVEL SENSOR UNIT" .

OK or NG

OK >> GO TO 24.
NG >> Replace fuel level sensor unit.

24. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0460 FUEL LEVEL SENSOR

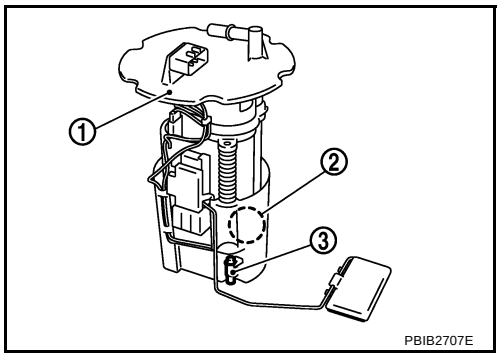
PFP:25060

Component Description

NBS000A2

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the “unified meter and A/C amp.”. The “unified meter and A/C amp.” sends the fuel level sensor signal to the ECM through CAN communication line.

1 : Fuel level sensor unit and fuel pump
2 : Fuel pressure regulator
3 : Fuel tank temperature sensor



It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

On Board Diagnosis Logic

NBS000A3

NOTE:

- **If DTC P0460 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P0460 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

When the vehicle is parked, naturally the fuel level in the fuel tank is stable. It means that output signal of the fuel level sensor does not change. If ECM senses sloshing signal from the sensor, fuel level sensor malfunction is detected.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0460 0460	Fuel level sensor circuit noise	Even though the vehicle is parked, a signal being varied is sent from the fuel level sensor to ECM.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor

DTC Confirmation Procedure

NBS000A4

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and wait maximum of 2 consecutive minutes.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-490, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000A5

1. CHECK FUEL GAUGE OPERATION

Refer to DI-15, "Self-Diagnosis Mode of Combination Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-15, "Self-Diagnosis Mode of Combination Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-19, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

NBS000A6

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

DTC P0461 FUEL LEVEL SENSOR

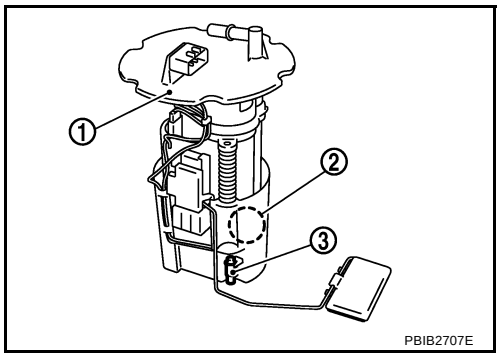
PFP:25060

Component Description

NBS006VA

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the “unified meter and A/C amp.”. The “unified meter and A/C amp.” sends the fuel level sensor signal to the ECM through CAN communication line.

1 : Fuel level sensor unit and fuel pump
2 : Fuel pressure regulator
3 : Fuel tank temperature sensor



It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

On Board Diagnosis Logic

NBS000A8

NOTE:

- **If DTC P0461 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE".**
- **If DTC P0461 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

Driving long distances naturally affect fuel gauge level.
This diagnosis detects the fuel gauge malfunction of the gauge not moving even after a long distance has been driven.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0461 0461	Fuel level sensor circuit range/performance	The output signal of the fuel level sensor does not change within the specified range even though the vehicle has been driven a long distance.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor

Overall Function Check

NBS000A9

Use this procedure to check the overall function of the fuel level sensor function. During this check, a 1st trip DTC might not be confirmed.

WARNING:
When performing following procedure, be sure to observe the handling of the fuel. Refer to FL-10, "FUEL TANK" .
TESTING CONDITION:
Before starting overall function check, preparation of draining fuel and refilling fuel is required.

WITH CONSULT-III

NOTE:
Start from step 10, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

1. Prepare a fuel container and a spare hose.
2. Release fuel pressure from fuel line, refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Remove the fuel feed hose on the fuel level sensor unit.
4. Connect a spare fuel hose where the fuel feed hose was removed.
5. Turn ignition switch OFF and wait at least 10 seconds then turn ON.
6. Select “FUEL LEVEL SE” in “DATA MONITOR” mode with CONSULT-III.
7. Check “FUEL LEVEL SE” output voltage and note it.
8. Select “FUEL PUMP” in “ACTIVE TEST” mode with CONSULT-III.

9. Touch “ON” and drain fuel approximately 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) and stop it.
10. Check “FUEL LEVEL SE” output voltage and note it.
11. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
12. Check “FUEL LEVEL SE” output voltage and note it.
13. Confirm whether the voltage changes more than 0.03V during step 7 to 10 and 10 to 12.
    If NG, go to EC-493, "Diagnostic Procedure" .

WITH GST

NOTE:
Start from step 8, if it is possible to confirm that the fuel cannot be drained by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) in advance.

1. Prepare a fuel container and a spare hose.
2. Release fuel pressure from fuel line. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Remove the fuel feed hose on the fuel level sensor unit.
4. Connect a spare fuel hose where the fuel feed hose was removed.
5. Turn ignition switch ON.
6. Drain fuel by 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal) from the fuel tank using proper equipment.
7. Confirm that the fuel gauge indication varies.
8. Fill fuel into the fuel tank for 30 ℓ (7-7/8 US gal, 6-5/8 Imp gal).
9. Confirm that the fuel gauge indication varies.
10. If NG, go to EC-493, "Diagnostic Procedure" .

Diagnostic Procedure

NBS000AA

1. CHECK FUEL GAUGE OPERATION

Refer to DI-15, "Self-Diagnosis Mode of Combination Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-15, "Self-Diagnosis Mode of Combination Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-19, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

NBS000AB

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY"

DTC P0462, P0463 FUEL LEVEL SENSOR

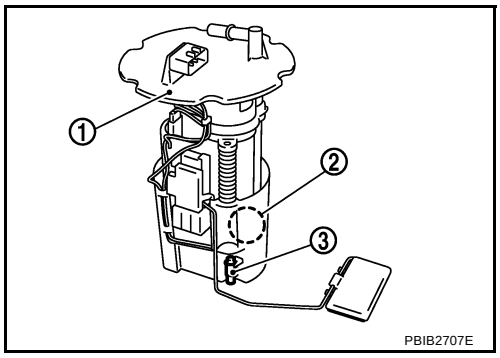
PFP:25060

Component Description

NBS006VB

The fuel level sensor is mounted in the fuel level sensor unit. The sensor detects a fuel level in the fuel tank and transmits a signal to the “unified meter and A/C amp.”. The “unified meter and A/C amp.” sends the fuel level sensor signal to the ECM through CAN communication line.

1 : Fuel level sensor unit and fuel pump
2 : Fuel pressure regulator
3 : Fuel tank temperature sensor



It consists of two parts, one is mechanical float and the other is variable resistor. Fuel level sensor output voltage changes depending on the movement of the fuel mechanical float.

On Board Diagnosis Logic

NBS000AD

NOTE:

- **If DTC P0462 or P0463 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE".**
- **If DTC P0462 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

This diagnosis indicates the former, to detect open or short circuit malfunction.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0462 0462	Fuel level sensor circuit low input	An excessively low voltage is sent from the sensor is sent to ECM.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The sensor circuit is open or shorted) ● Unified meter and A/C amp. ● Fuel level sensor
P0463 0463	Fuel level sensor circuit high input	An excessively high voltage is sent from the sensor is sent to ECM.	

DTC Confirmation Procedure

NBS000AE

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at ignition switch ON.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-494, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000AF

1. CHECK FUEL GAUGE OPERATION

Refer to DI-15, "Self-Diagnosis Mode of Combination Meter" .

OK or NG

OK >> GO TO 2.
NG >> Follow the instruction of DI-15, "Self-Diagnosis Mode of Combination Meter" .

2. CHECK FUEL LEVEL SENSOR AND CIRCUIT

Refer to DI-19, "Fuel Level Sensor Signal Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning parts.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Removal and Installation

NBS000AG

FUEL LEVEL SENSOR

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

DTC P0500 VSS

PFP:32702

Description

NBS000AH

NOTE:

- **If DTC P0500 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P0500 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

The vehicle speed signal is sent to the “unified meter and A/C amp”. from the VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) by CAN communication line. The unified meter and A/C amp. then sends the signal to the ECM by CAN communication line.

On Board Diagnosis Logic

NBS000AI

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0500 0500	Vehicle speed sensor	The almost 0 km/h (0 MPH) signal from vehicle speed sensor is sent to ECM even when vehicle is being driven.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (The vehicle speed signal circuit is open or shorted) ● Wheel sensor ● Unified meter and A/C amp. ● VDC/TCS/ABS control unit (with VDC models) ● ABS actuator and electric unit (control unit) (without VDC models)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Detected items	Engine operating condition in fail-safe mode
Vehicle speed sensor	When the fail-safe system for vehicle speed sensor is activated, the cooling fan operates (High) while engine is running.

DTC Confirmation Procedure

NBS000AJ

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Steps 1 and 2 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-III

1. Start engine (VDC switch or TCS switch OFF).
2. Read “VHCL SPEED SE” in “DATA MONITOR” mode with CONSULT-III. The vehicle speed on CONSULT-III should exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.
   If NG, go to EC-497, "Diagnostic Procedure" .
   If OK, go to following step.
3. Select “DATA MONITOR” mode with CONSULT-III.
4. Warm engine up to normal operating temperature.
5. Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,800 - 6,000 rpm (A/T) 1,800 - 6,000 rpm (M/T)
COOLAN TEMP/S	More than 70°C (158°F)

B/FUEL SCHDL	5.0 - 31.8 msec (A/T) 5.0 - 31.8 msec (M/T)
Shift lever	Except P or N position (A/T) Neutral position (M/T)
PW/ST SIGNAL	OFF

6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-497, "Diagnostic Procedure" .

Overall Function Check

NBS000AK

Use this procedure to check the overall function of the vehicle speed sensor circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Lift up drive wheels.
2. Start engine.
3. Read vehicle speed sensor signal in Service $01 with GST.
   The vehicle speed sensor on GST should be able to exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.
4. If NG, go to EC-497, "Diagnostic Procedure" .

Diagnostic Procedure

NBS000AL

1. CHECK DTC WITH “VDC/TCS/ABS CONTROL UNIT (WITH VDC MODELS)” OR “ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITHOUT VDC MODELS)”

Refer to BRC-82, "TROUBLE DIAGNOSIS" (with VDC models) or refer to BRC-42, "TROUBLE DIAGNOSIS" (without VDC models).

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK DTC WITH UNIFIED METER AND A/C AMP.

Refer to DI-4, "COMBINATION METERS" .

>> **INSPECTION END**

DTC P0506 ISC SYSTEM

PFP:23781

Description

NBS000AM

NOTE:
If DTC P0506 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.
The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor (POS) detects the actual engine speed and sends a signal to the ECM.
The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration, and engine load (air conditioner, power steering and cooling fan operation, etc.).

On Board Diagnosis Logic

NBS000AN

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0506 0506	Idle speed control system RPM lower than expected	The idle speed is less than the target idle speed by 100 rpm or more.	● Electric throttle control actuator ● Intake air leak

DTC Confirmation Procedure

NBS000AO

NOTE:
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- **If the target idle speed is out of the specified value, perform EC-77, "Idle Air Volume Learning" , before conducting DTC Confirmation Procedure. For the target idle speed, refer to EC-718, "SERVICE DATA AND SPECIFICATIONS (SDS)" .**

TESTING CONDITION:
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**
- **Always perform the test at a temperature above −10°C (14°F).**

WITH CONSULT-III

1. Open engine hood.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Restart engine and run it for at least 1 minute at idle speed.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-498, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000AP

1. CHECK INTAKE AIR LEAK

1. Start engine and let it idle.
2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 2.
NG >> Discover air leak location and repair.

2. REPLACE ECM

1. Stop engine.
2. Replace ECM.
3. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-152, "ECM Re-communicating Function" .
4. Perform EC-76, "VIN Registration" .
5. Perform EC-76, "Exhaust Valve Timing Control Learning" .
6. Perform EC-77, "Accelerator Pedal Released Position Learning" .
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0507 ISC SYSTEM

PFP:23781

Description

NBS000AQ

NOTE:
If DTC P0507 is displayed with other DTC, first perform the trouble diagnosis for the other DTC.
The ECM controls the engine idle speed to a specified level through the fine adjustment of the air, which is let into the intake manifold, by operating the electric throttle control actuator. The operating of the throttle valve is varied to allow for optimum control of the engine idling speed. The crankshaft position sensor (POS) detects the actual engine speed and sends a signal to the ECM.
The ECM controls the electric throttle control actuator so that the engine speed coincides with the target value memorized in the ECM. The target engine speed is the lowest speed at which the engine can operate steadily. The optimum value stored in the ECM is determined by taking into consideration various engine conditions, such as during warming up, deceleration, and engine load (air conditioner, power steering and cooling fan operation, etc.).

On Board Diagnosis Logic

NBS000AR

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0507 0507	Idle speed control system RPM higher than expected	The idle speed is more than the target idle speed by 200 rpm or more.	● Electric throttle control actuator ● Intake air leak ● PCV system

DTC Confirmation Procedure

NBS000AS

NOTE:
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- **If the target idle speed is out of the specified value, perform EC-77, "Idle Air Volume Learning" , before conducting DTC Confirmation Procedure. For the target idle speed, refer to EC-718, "SERVICE DATA AND SPECIFICATIONS (SDS)" .**

TESTING CONDITION:
- **Before performing the following procedure, confirm that battery voltage is more than 11V at idle.**
- **Always perform the test at a temperature above −10°C (14°F).**

WITH CONSULT-III

1. Open engine hood.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Restart engine and run it for at least 1 minute at idle speed.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-500, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000AT

1. CHECK PCV HOSE CONNECTION

Confirm that PCV hose is connected correctly.

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK INTAKE AIR LEAK

1. Start engine and let it idle.
2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 3.
NG >> Discover air leak location and repair.

3. REPLACE ECM

1. Stop engine.
2. Replace ECM.
3. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-152, "ECM Re-communicating Function" .
4. Perform EC-76, "VIN Registration" .
5. Perform EC-76, "Exhaust Valve Timing Control Learning" .
6. Perform EC-77, "Accelerator Pedal Released Position Learning" .
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0550 PSP SENSOR

PFP:49763

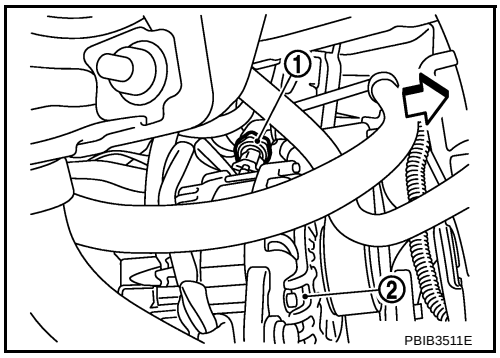
Component Description

NBS000AU

Power steering pressure (PSP) sensor (1) is installed to the power steering high-pressure tube and detects a power steering load. This sensor is a potentiometer which transforms the power steering load into output voltage, and emits the voltage signal to the ECM. The ECM controls the electric throttle control actuator and adjusts the throttle valve opening angle to increase the engine speed and adjusts the idle speed for the increased load.

2 : Alternator

⇦ : Vehicle front



CONSULT-III Reference Value in Data Monitor Mode

NBS000AV

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
PW/ST SIGNAL	● Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
		Steering wheel: Being turned	ON

On Board Diagnosis Logic

NBS000AW

The MIL will not light up for this self-diagnosis.

NOTE:
If DTC P0550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0550 0550	Power steering pressure sensor circuit	An excessively low or high voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted) ● Power steering pressure sensor

DTC Confirmation Procedure

NBS000AX

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for at least 5 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-505, "Diagnostic Procedure" .

WITH GST

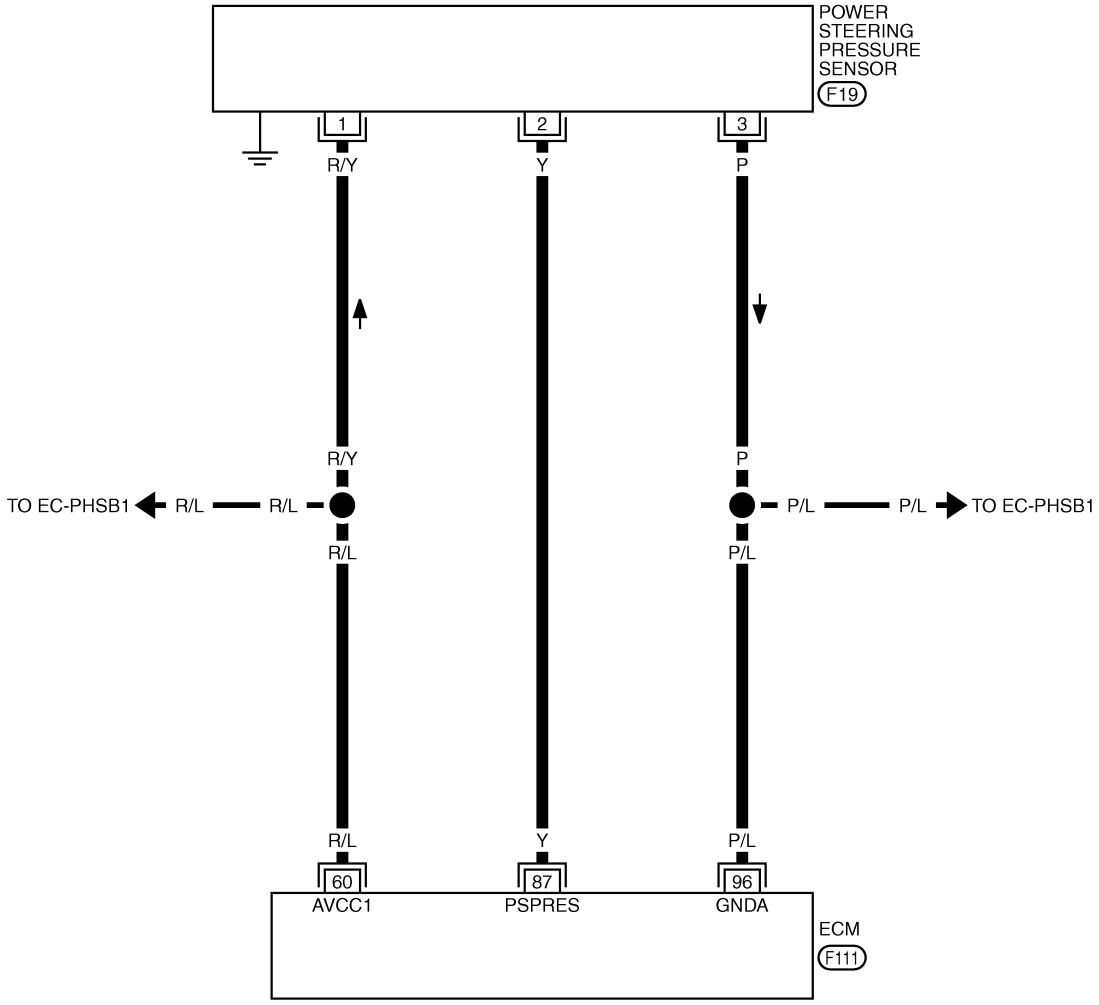
Follow the procedure “WITH CONSULT-III” above.

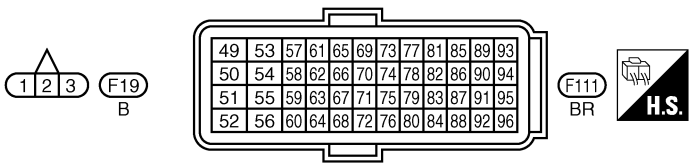
Wiring Diagram

NBS000AY

EC-PS/SEN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





TBWT1651E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
87	Y	Power steering pressure sensor	**[Engine is running]** ● Steering wheel: Being turned	0.5 - 4.5V
			[Engine is running] ● Steering wheel: Not being turned	0.4 - 0.8V
96	P/L	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Power steering pressure sensor]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

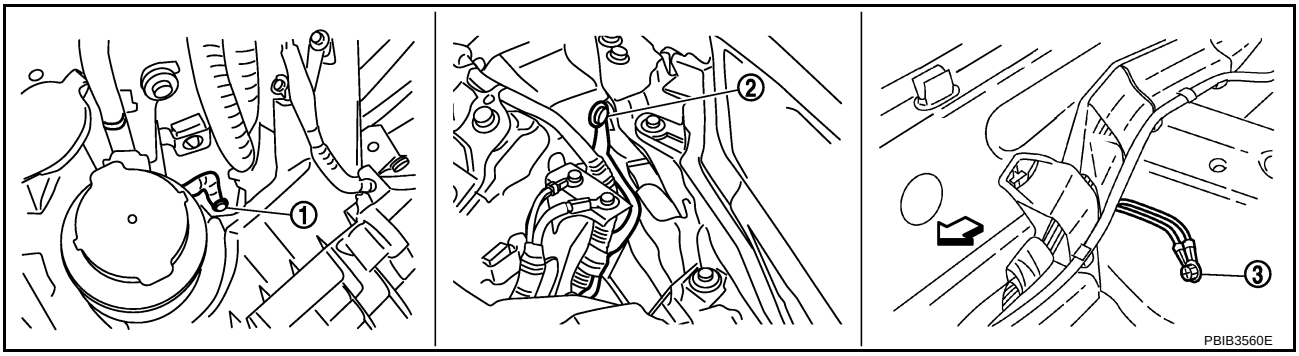
Diagnostic Procedure

NBS000AZ

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

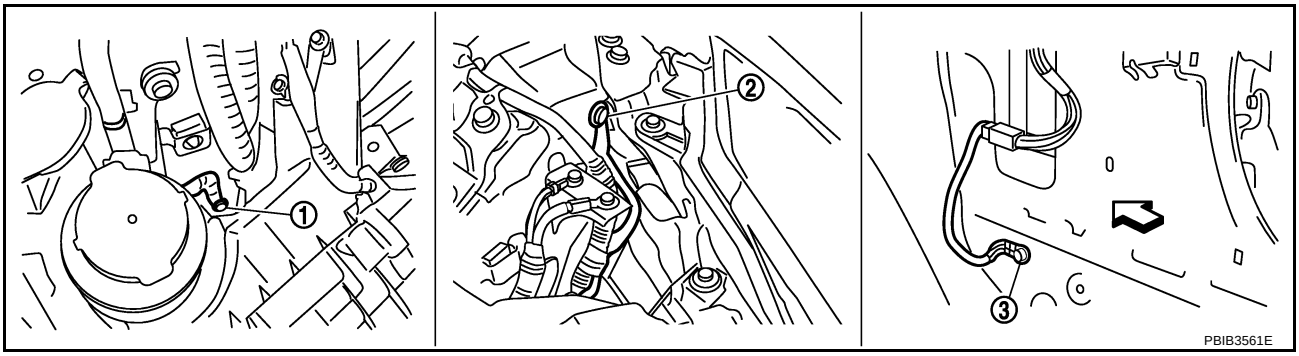


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

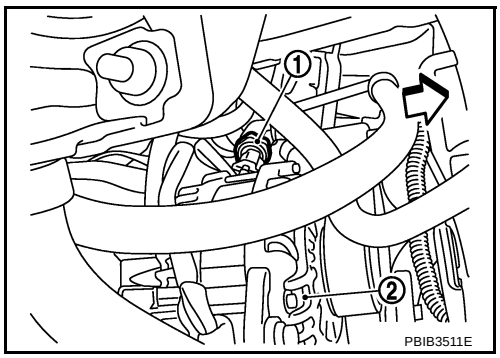
2. CHECK PSP SENSOR POWER SUPPLY CIRCUIT

1. Disconnect power steering pressure (PNP) sensor (1) harness connector.

   1 : Alternator

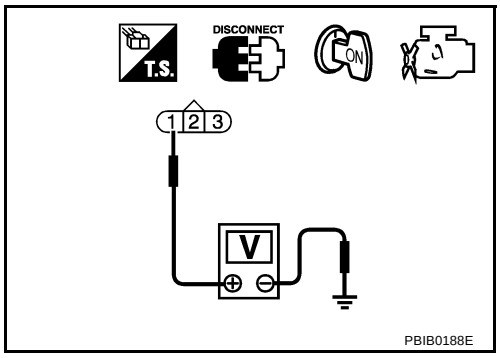
   ⇦ : Vehicle front

2. Turn ignition switch ON.



3. Check voltage between PSP sensor terminal 1 and ground with CONSULT-III or tester.

   Voltage: Approximately 5V



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK PSP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between PSP sensor terminal 3 and ECM terminal 96. Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK PSP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 87 and PSP sensor terminal 2. Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PSP SENSOR

Refer to EC-507, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace PNP sensor.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

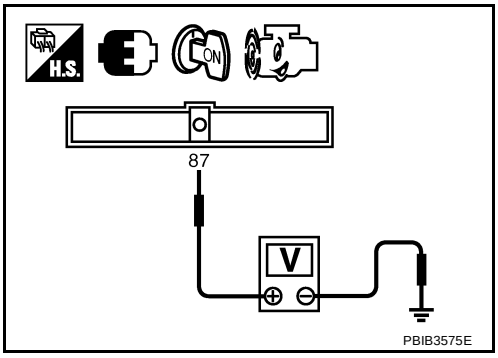
Component Inspection

NBS000B0

POWER STEERING PRESSURE SENSOR

1. Reconnect all harness connectors disconnected.
2. Start engine and let it idle.
3. Check voltage between ECM terminal 87 and ground under the following conditions.

Condition	Voltage
Steering wheel: Being turned	0.5 - 4.5V
Steering wheel: Not being turned	0.4 - 0.8V



Removal and Installation

NBS000B1

POWER STEERING PRESSURE SENSOR

Refer to PS-33, "HYDRAULIC LINE" .

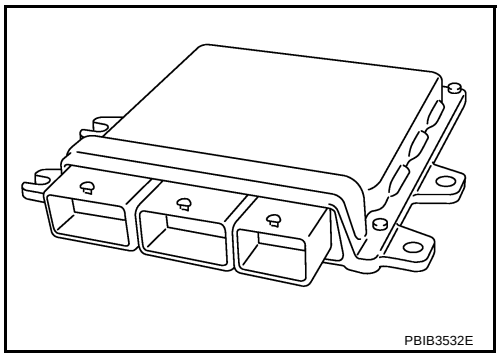
DTC P0603 ECM POWER SUPPLY

PFP:23710

Component Description

NBS000BE

Battery voltage is supplied to the ECM even when the ignition switch is turned OFF for the ECM memory function of the DTC memory, the air-fuel ratio feedback compensation value memory, the Idle Air Volume Learning value memory, etc.


PBIB3532E

On Board Diagnosis Logic

NBS000BF

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0603 0603	ECM power supply circuit	ECM back-up RAM system does not function properly.	● Harness or connectors [The ECM power supply (back-up) circuit is open or shorted.] ● ECM

DTC Confirmation Procedure

NBS000BG

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
3. Repeat steps 3 and 4 for four times.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-510, "Diagnostic Procedure" .

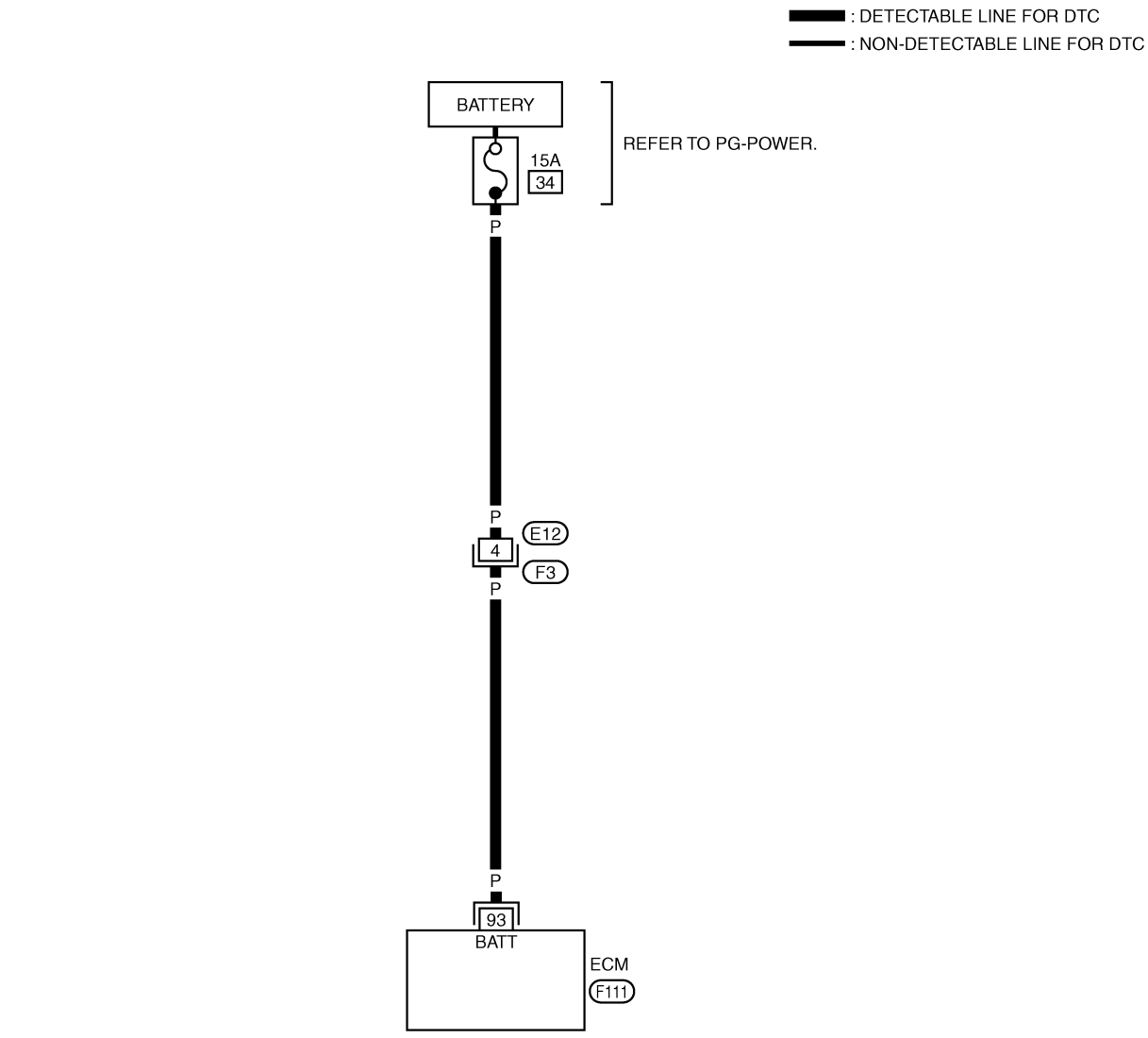
WITH GST

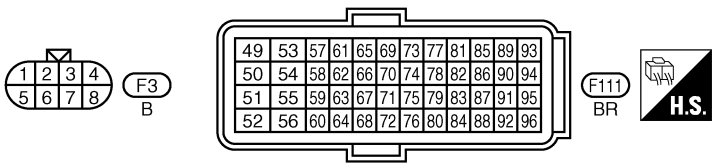
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000BH

EC-ECM/PW-01





TBWT1652E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
93	P	Power supply for ECM (Back-up)	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)

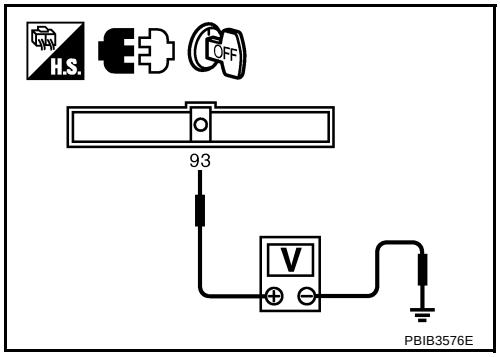
Diagnostic Procedure

NBS000BI

1. CHECK ECM POWER SUPPLY

1. Turn ignition switch OFF.
2. Check voltage between ECM terminal 93 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- 15A fuse
- Harness for open or short between ECM and battery

>> Repair or replace harness or connectors.

3. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness or connectors.

4. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-III.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-508, "DTC Confirmation Procedure" .
5. Is the 1st trip DTC P0603 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform DTC Confirmation Procedure.**
   See EC-508, "DTC Confirmation Procedure" .
4. Is the 1st trip DTC P0603 displayed again?

Yes or No

Yes >> GO TO 5.
No >> **INSPECTION END**

5. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

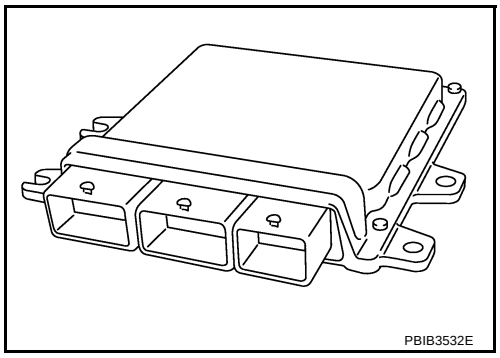
DTC P0605 ECM

PFP:23710

Component Description

NBS000B2

The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.



On Board Diagnosis Logic

NBS000B3

This self-diagnosis has one or two trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P0605 0605	Engine control module	A)	ECM calculation function is malfunctioning.	● ECM
		B)	ECM EEP-ROM system is malfunctioning.	
		C)	ECM self shut-off function is malfunctioning.	

FAIL-SAFE MODE

ECM enters fail-safe mode when the malfunction A is detected.

Detected items	Engine operation condition in fail-safe mode
Malfunction A	● ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring. ● ECM deactivates ASCD operation.

DTC Confirmation Procedure

NBS000B4

Perform PROCEDURE FOR MALFUNCTION A first. If the 1st trip DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION B. If there is no malfunction on PROCEDURE FOR MALFUNCTION B, perform PROCEDURE FOR MALFUNCTION C.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A

With CONSULT-III

1. Turn ignition switch ON.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-513, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION B

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
3. Check 1st trip DTC.
4. If 1st trip DTC is detected, go to EC-513, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION C

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
3. Repeat step 3 for 32 times.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-513, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

Diagnostic Procedure

NBS000B5

1. INSPECTION START

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-III.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-512, "DTC Confirmation Procedure" .
5. Is the 1st trip DTC P0605 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform DTC Confirmation Procedure.**
   See EC-512, "DTC Confirmation Procedure" .
4. Is the 1st trip DTC P0605 displayed again?

Yes or No

Yes >> GO TO 2.
No >> **INSPECTION END**

2. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

DTC P0643 SENSOR POWER SUPPLY

PFP:18919

On Board Diagnosis Logic

NBS000DW

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0643 0643	Sensor power supply circuit short	ECM detects a voltage of power source for sensor is excessively low or high.	● Harness or connectors (APP sensor 1 circuit is shorted.) (TP sensor circuit is shorted.) [CMP sensor (PHASE) (bank 1) circuit is shorted.] [EVT control position sensor (bank 1) circuit is shorted.] (PSP sensor circuit is shorted.) ● Accelerator pedal position sensor ● Throttle position sensor ● Camshaft position sensor (PHASE) (bank 1) ● Exhaust valve timing control position sensor (bank 1) ● Power steering pressure sensor

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

NBS000DX

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-517, "Diagnostic Procedure" .

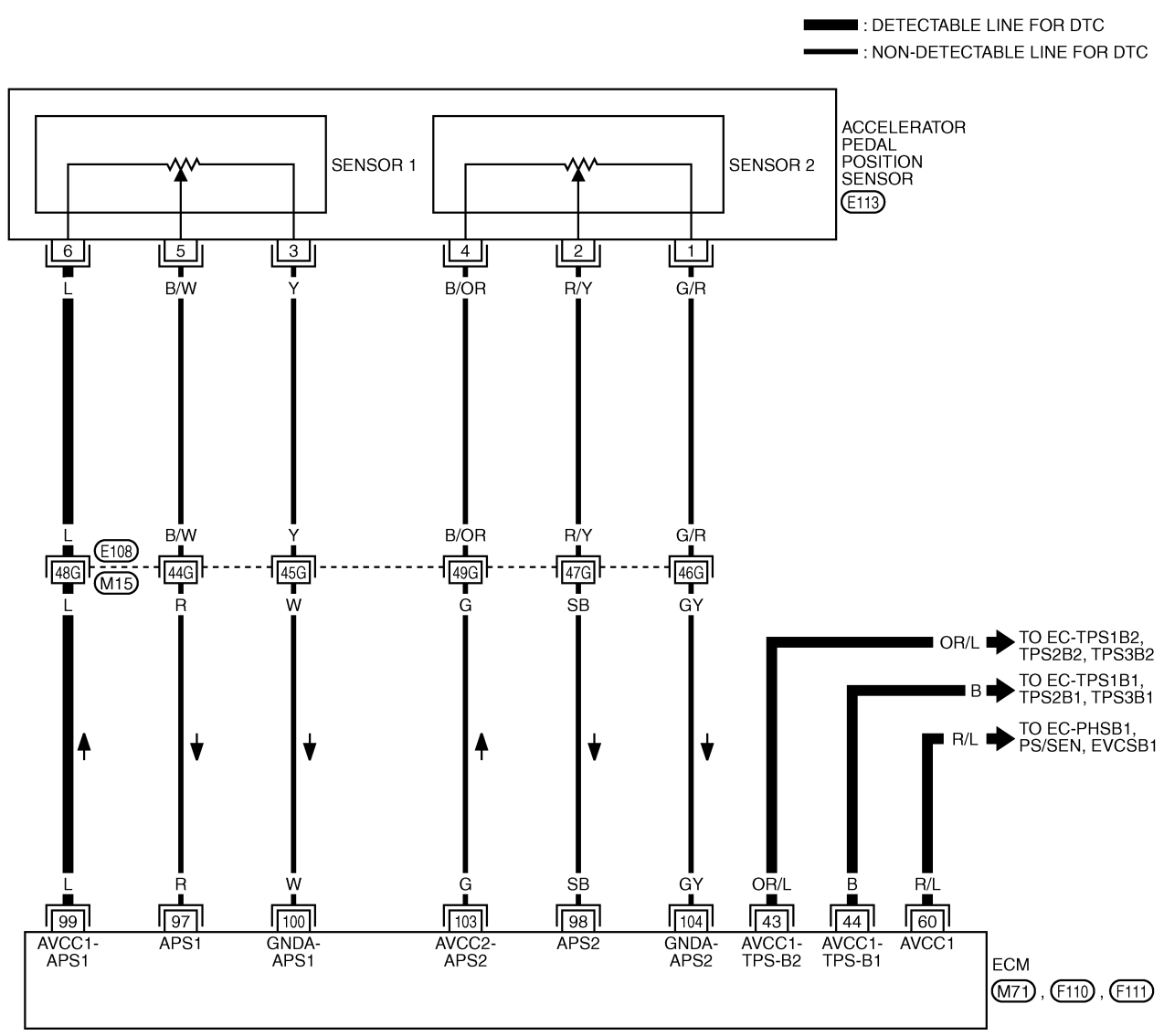
WITH GST

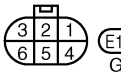
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

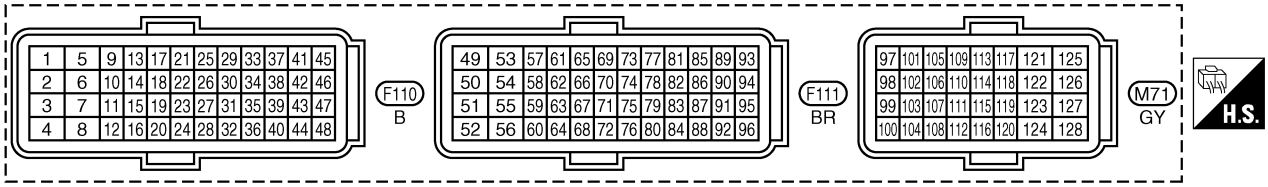
NBS000DY

EC-SEN/PW-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT1653E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	1.95 - 2.40V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

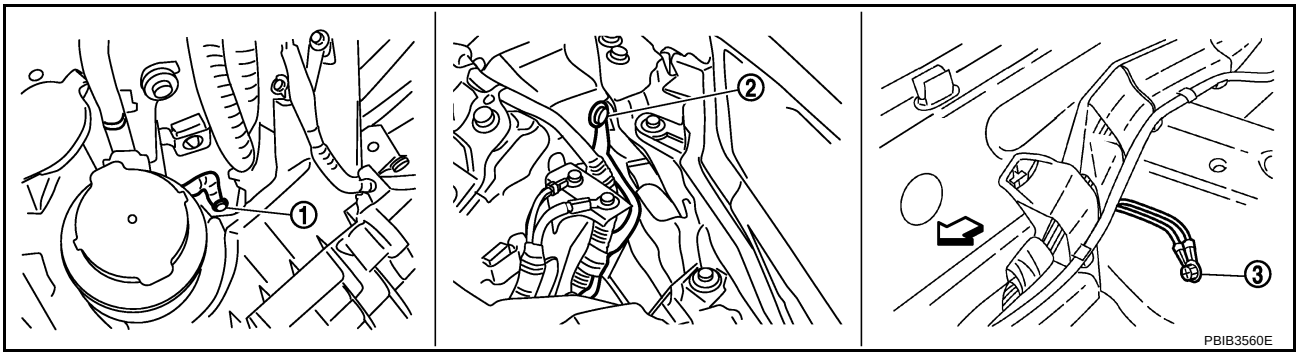
Diagnostic Procedure

NBS000DZ

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

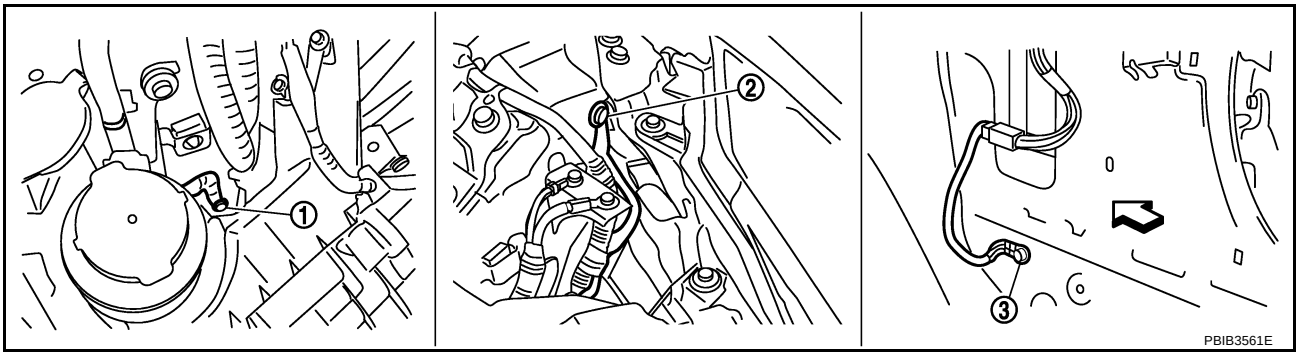


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

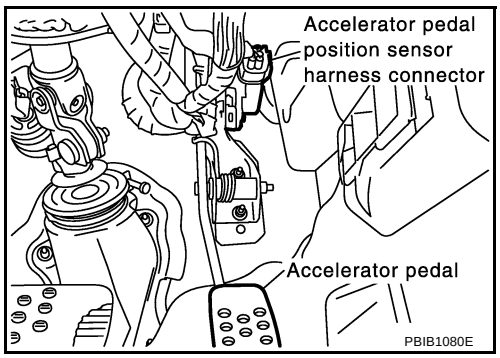
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

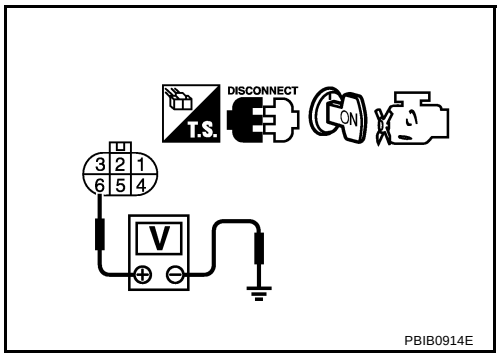
2. CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT-I

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 6 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

3. CHECK SENSOR POWER SUPPLY CIRCUITS

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
43	Electric throttle control actuator (bank 2) terminal 6	EC-365
44	Electric throttle control actuator (bank 1) terminal 6	EC-363
60	CMP sensor (PHASE) (bank 1) terminal 1	EC-397
	EVT control position sensor (bank 1) terminal 1	EC-530
	PSP sensor terminal 1	EC-503
99	APP sensor terminal 6	EC-515

OK or NG

OK >> GO TO 4.
NG >> Repair short to ground or short to power in harness or connectors.

4. CHECK COMPONENTS

Check the following.

- Camshaft position senosr (PHASE) (bank 1) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 1) (Refer to EC-539, "Component Inspection" .)
- Power steering pressure sensor (Refer to EC-507, "Component Inspection" .)

OK or NG

OK >> GO TO 5.
NG >> Replace malfunctioning component.

5. CHECK TP SENSOR

Refer to EC-369, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace malfunctioning electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK APP SENSOR

Refer to EC-640, "Component Inspection" .

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

DTC P0850 PNP SWITCH

PFP:23006

Component Description

NBS000GB

When the shift position is P or N (A/T), Neutral (M/T), park/neutral position (PNP) switch is ON.
ECM detects the position because the continuity of the line (the ON signal) exists.

CONSULT-III Reference Value in Data Monitor Mode

NBS000GC

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
P/N POSI SW	● Ignition switch: ON	Shift lever: P or N (A/T), Neutral (M/T) position	ON
		Shift lever: Except above position	OFF

On Board Diagnosis Logic

NBS000GD

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0850 0850	Park/neutral position switch	The signal of the park/neutral position (PNP) switch is not changed in the process of engine starting and driving.	● Harness or connectors [The park/neutral position (PNP) switch circuit is open or shorted.] ● Park/neutral position (PNP) switch ● TCM (A/T models)

DTC Confirmation Procedure

NBS000GE

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “P/N POSI SW” in “DATA MONITOR” mode with CONSULT-III. Then check the “P/N POSI SW” signal under the following conditions.

Position (Shift lever)	Known-good signal
N or P position (A/T) Neutral position (M/T)	ON
Except above position	OFF

If NG, go to EC-525, "Diagnostic Procedure" .
If OK, go to following steps.

3. Select “DATA MONITOR” mode with CONSULT-III.
4. Start engine and warm it up to normal operating temperature.
5. Maintain the following conditions for at least 60 consecutive seconds.

ENG SPEED	1,400 - 6375 rpm
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	2.0 - 31.8 msec
VHCL SPEED SE	More than 64 km/h (40 MPH)
Shift lever	Suitable position

6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-525, "Diagnostic Procedure" .

Overall Function Check

NBS000GF

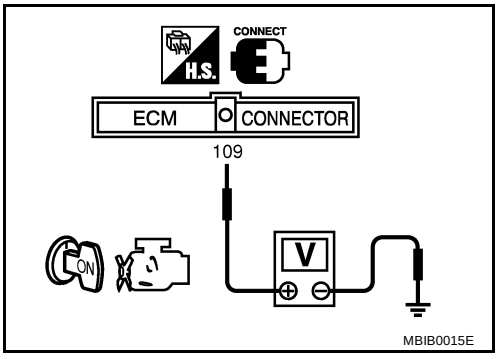
Use this procedure to check the overall function of the park/neutral position (PNP) switch circuit. During this check, a 1st trip DTC might not be confirmed.

WITH GST

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 109 (PNP switch signal) and ground under the following conditions.

Condition (Shift lever)	Voltage V (Known-good data)
P or N position (A/T) Neutral position (M/T)	Approx. 0
Except above position	BATTERY VOLTAGE (11 - 14V)

3. If NG, go to EC-525, "Diagnostic Procedure" .

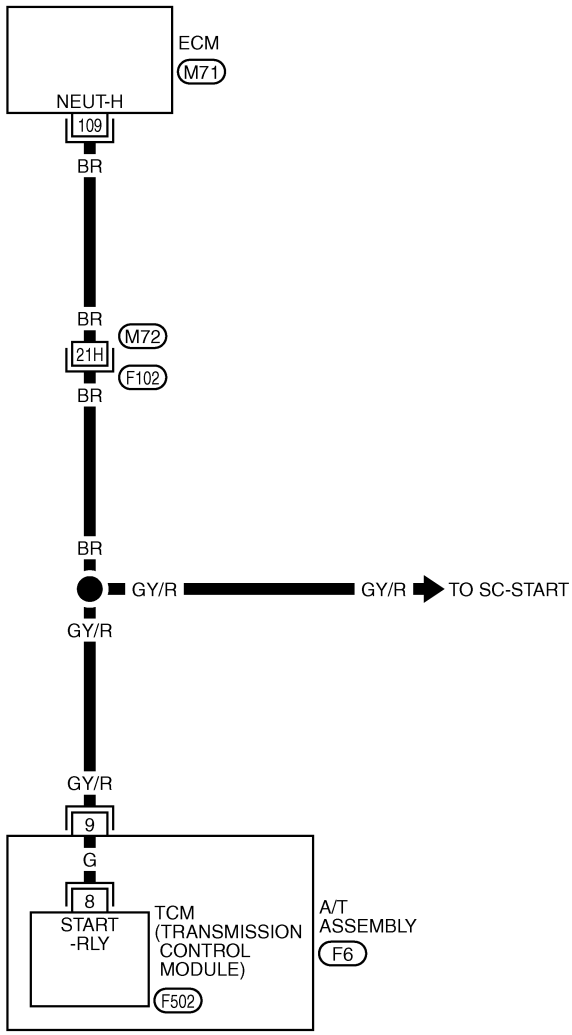


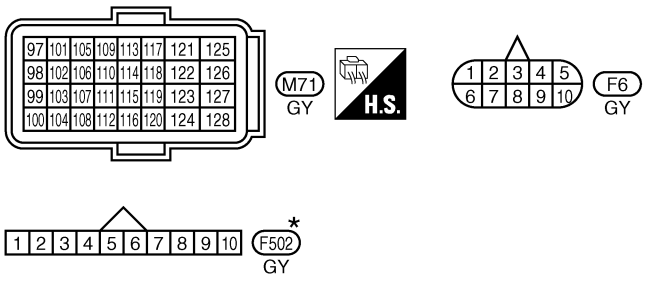
Wiring Diagram
A/T MODELS

NBS000GG

EC-PNP/SW-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1654E

Specification data are reference values and are measured between each terminal and ground.

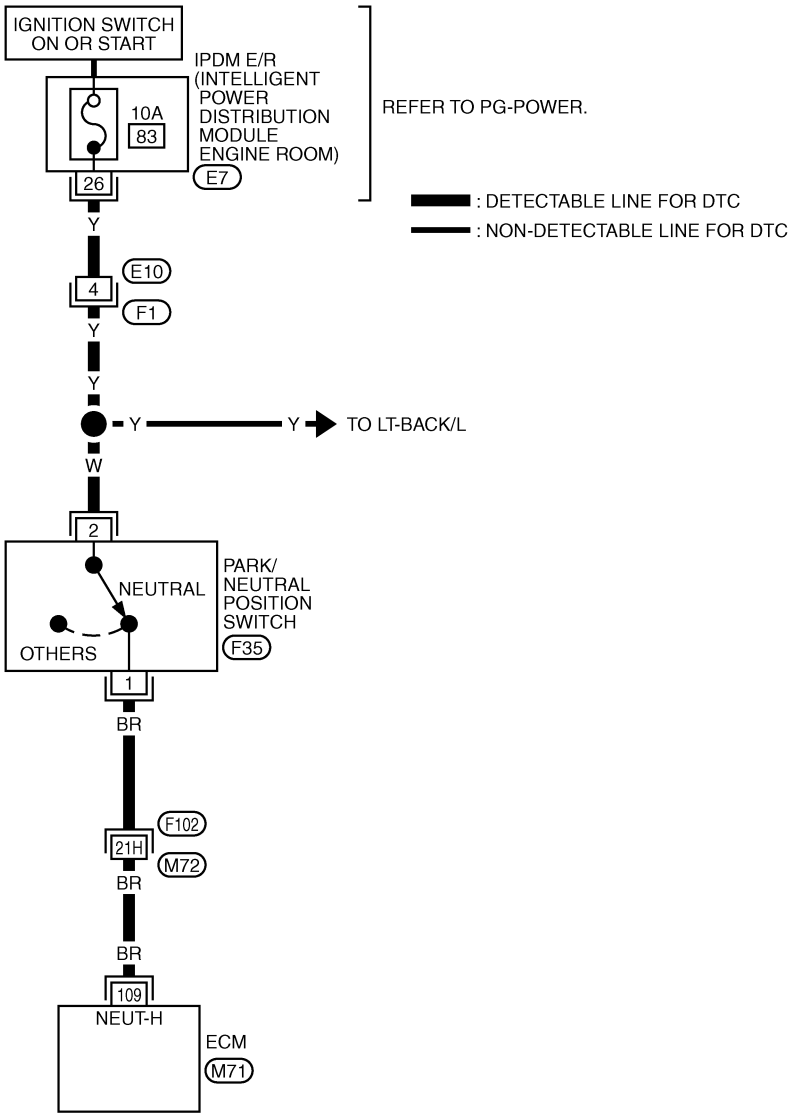
CAUTION:

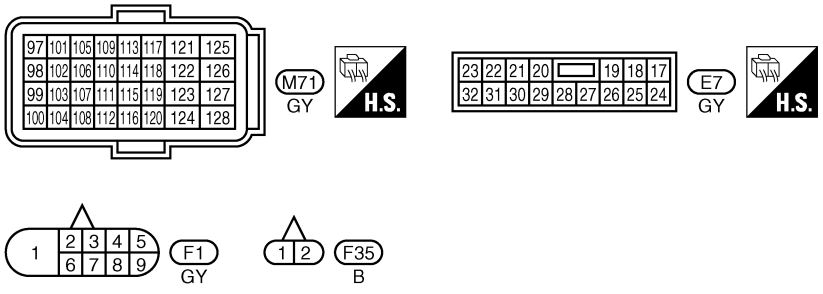
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
109	BR	PNP switch	**[Ignition switch: ON]** ● Shift lever: P or N position	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON] ● Shift lever: Except above position	0V

M/T MODELS

EC-PNP/SW-02





REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1655E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
109	BR	PNP switch	**[Ignition switch: ON]** ● Shift lever: Neutral position	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON] ● Shift lever: Except above position	0V

Diagnostic Procedure

NBS000GH

A/T MODELS

1. CHECK DTC WITH TCM

Refer to AT-37, "OBD-II Diagnostic Trouble Code (DTC)" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace.

2. CHECK STARTING SYSTEM

Turn ignition switch OFF, then turn it to START.

Does starter motor operate?

Yes or No

Yes >> GO TO 3.
No >> Refer to SC-8, "STARTING SYSTEM" .

3. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Disconnect ECM harness connector.
4. Check harness continuity between A/T assembly terminal 9 and ECM terminal 109. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors F102, M72
- Harness for open or short between A/T assembly and ECM.

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

1. Check harness continuity between A/T assembly terminal 9 and TCM terminal 8.
   Refer to AT-97, "DTC P0615 START SIGNAL CIRCUIT" .

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

M/T MODELS

1. CHECK PNP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect park/neutral position (PNP) switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between PNP switch terminal 2 and ground with CONSULT-III or tester.

   Voltage: Battery voltage

OK or NG

OK >> GO TO 3
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector E10, F1
- 10A fuse
- IPDM harness connector E7
- Harness for open or short between ECM and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 109 and PNP switch terminal 1.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector F102, M72
- Harness for open or short between PNP switch and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK PNP SWITCH

Refer to MT-11, "PARK/NEUTRAL POSITION SWITCH" .

OK or NG

OK >> GO TO 6.
NG >> Replace PNP switch.

6. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair open dircuit or short to ground or short to power in harness or connectors.

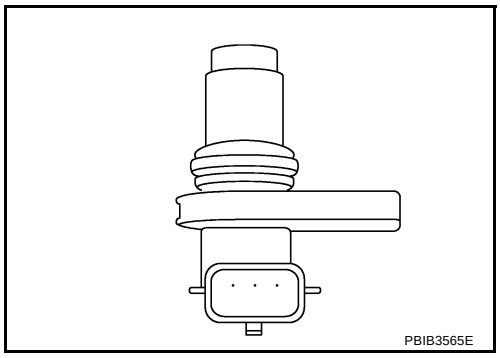
DTC P1078 P1084 EVT CONTROL POSITION SENSOR

PFP:23731

Component Description

NBS000BJ

Exhaust valve timing control position sensor detects the concave groove of the exhaust camshaft rear end.
This sensor signal is used for sensing a position of the exhaust camshaft.
This sensor uses a Hall IC.
Based on the position of the exhaust camshaft, ECM controls exhaust valve timing control magnet retarder to optimize the shut/open timing of exhaust valve for the driving condition.



CONSULT-III Reference Value in Data Monitor Mode

NBS000BK

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
EXH/V TIM B1 EXH/V TIM B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°CA

On Board Diagnosis Logic

NBS000BL

NOTE:
If DTC P1078 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1078 1078 (Bank 1)	Exhaust valve timing control position sensor circuit	An excessively high or low voltage from the sensor is sent to ECM.	● Harness or connectors [Exhaust valve timing control position sensor (bank 1) circuit is open or shorted) ● Exhaust valve timing control position sensor (bank 1) ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 1) ● Accumulation of debris to the signal pick-up portion of the camshaft
P1084 1084 (Bank 2)			● Harness or connectors [EVT control position sensor (bank 2) circuit is shorted.] [CKP sensor (POS) circuit is shorted.] [CMP sensor (PHASE) (bank 2) circuit is open or shorted.] (APP sensor 2 circuit is shorted.) (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Exhaust valve timing control position sensor (bank 2) ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Accelerator pedal position sensor ● EVAP control system pressure sensor ● Refrigerant pressure sensor ● Accumulation of debris to the signal pick-up portion of the camshaft

DTC Confirmation Procedure

NBS000BM

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Start engine and let it idle for 10 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-534, "Diagnostic Procedure" .

WITH GST

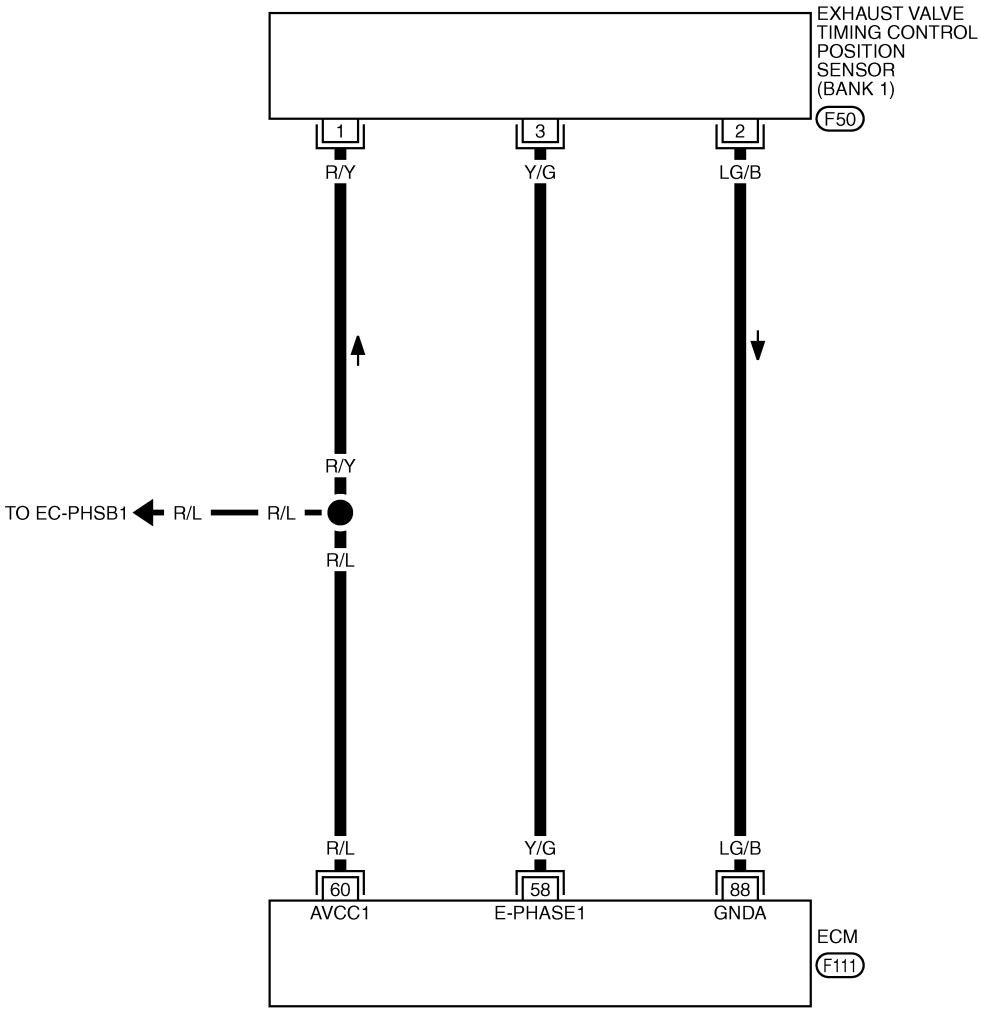
Follow the procedure WITH CONSULT-III above.

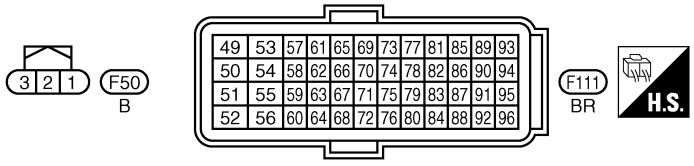
Wiring Diagram
BANK 1

NBS000BN

EC-EVCSB1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC

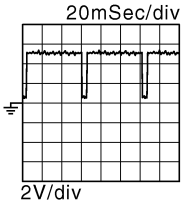
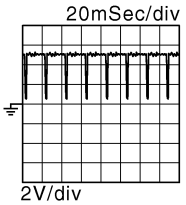




TBWT1656E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

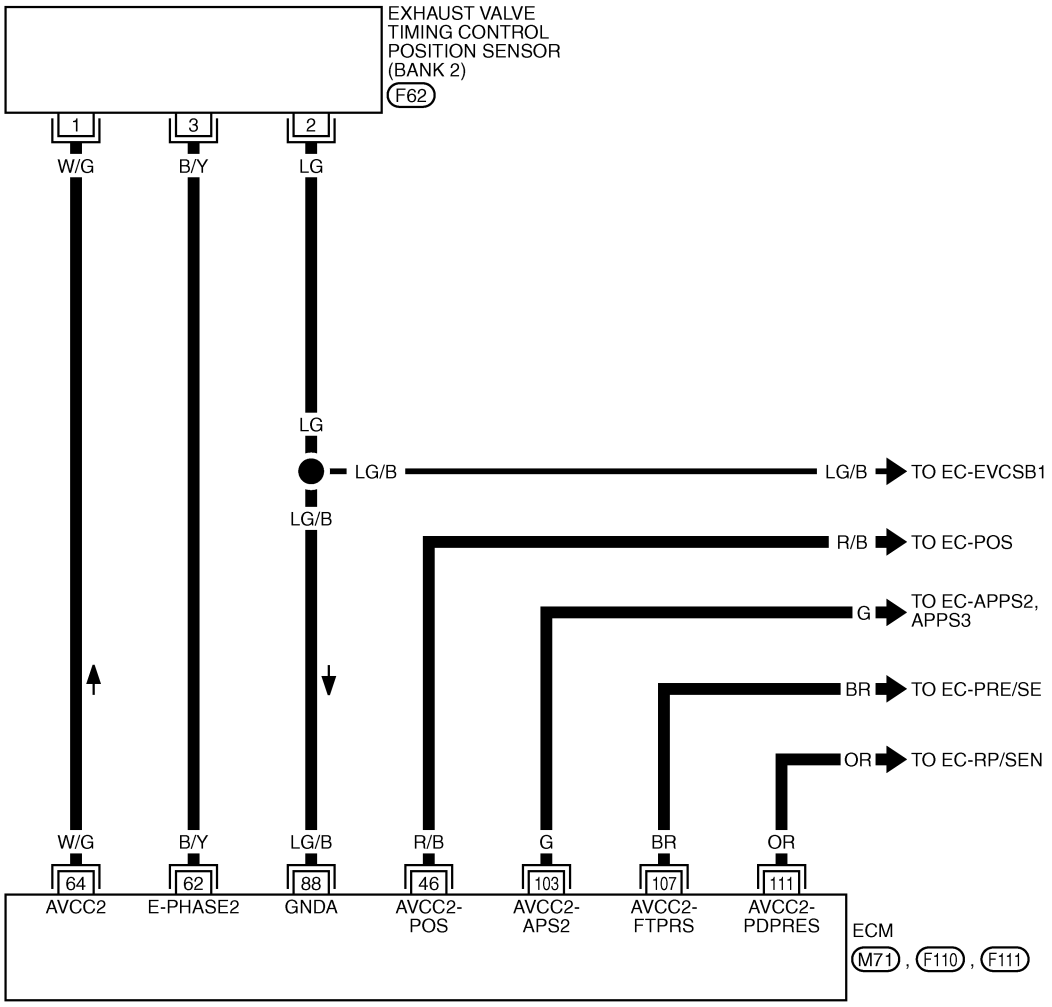
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
58	Y/G	Exhaust valve timing control position sensor (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3551E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3552E
60	R/L	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	**[Ignition switch: ON]**	5V
88	LG/B	Sensor ground [Exhaust valve timing control position sensor (bank 1), Exhaust valve timing control position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

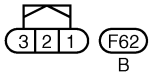
★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

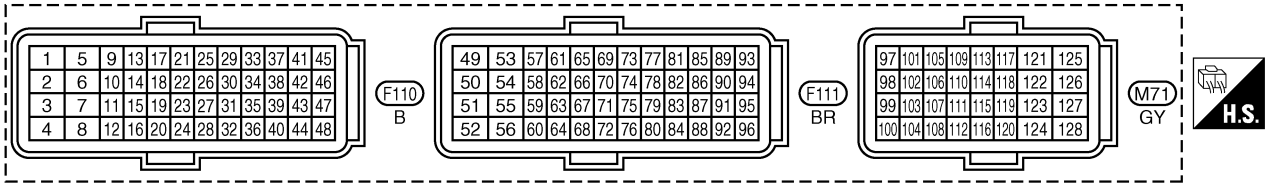
BANK 2

EC-EVCSB2-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC



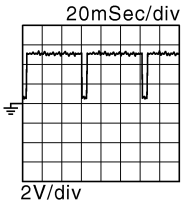
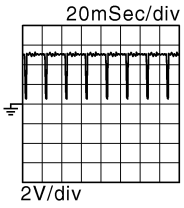




TBWT1657E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
62	B/Y	Exhaust valve timing control position sensor (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	4.0 - 5.0V★  PBIB3551E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	4.0 - 5.0V★  PBIB3552E
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
88	LG/B	Sensor ground [Exhaust valve timing control position sensor (bank 1), Exhaust valve timing control position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

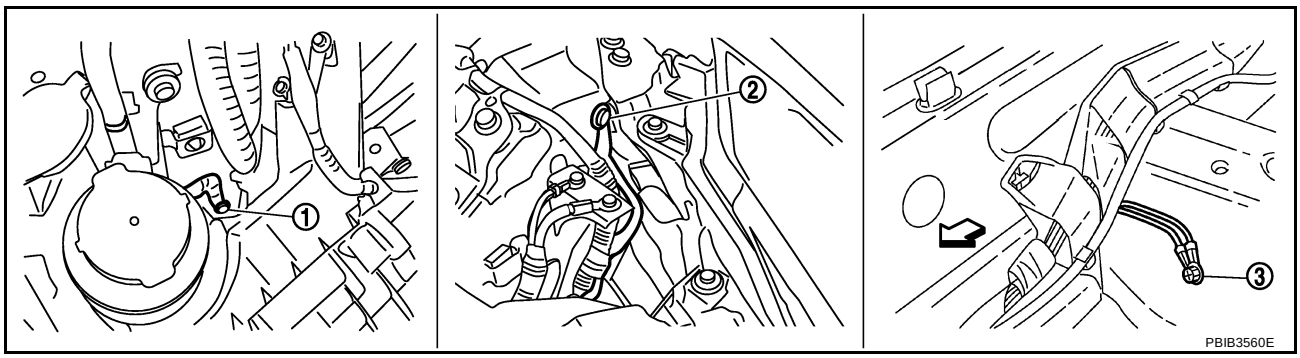
Diagnostic Procedure

NBS000BO

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

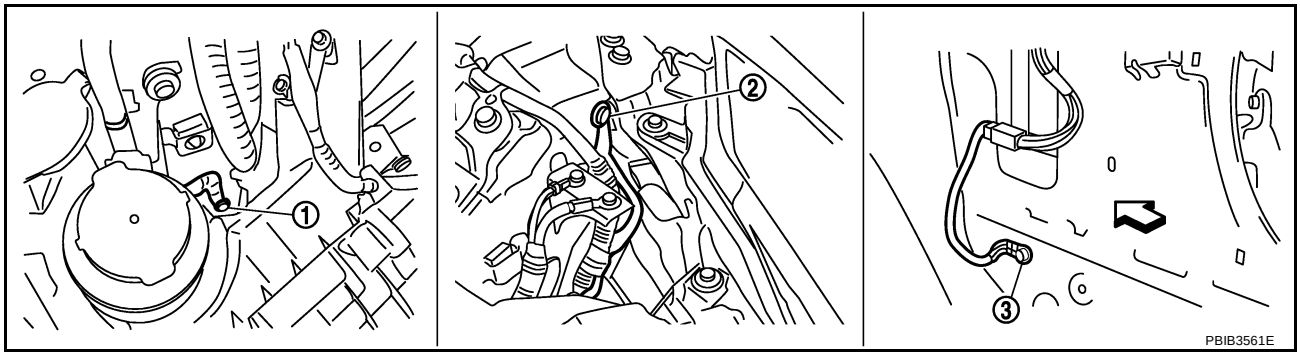


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-I

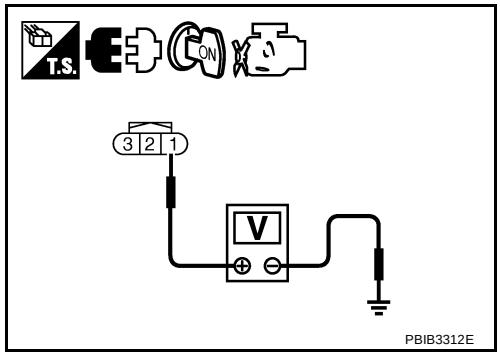
1. Disconnect exhaust valve timing control position sensor harness connector.



1. Exhaust valve timing control position sensor (bank 1)
2. Camshaft position sensor (PHASE) (bank 1)
3. Camshaft position sensor (PHASE) (bank 2)
4. Exhaust valve timing control position sensor (bank 2)

2. Turn ignition switch ON.
3. Check voltage between exhaust valve timing control position sensor terminal 1 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 8.
NG-1 >> P1078: Repair open circuit or short to ground or short to power in harness connector.
NG-2 >> P1084: GO TO 3.

3. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between exhaust valve timing control position sensor terminal 1 and ECM terminal 64.
   Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit.

4. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor terminal 1	EC-711

OK or NG

OK >> GO TO 5.
NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning component.

6. CHECK APP SENSOR

Refer to EC-648, "Component Inspection" .

OK or NG

OK >> GO TO 14.
NG >> GO TO 7.

7. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

8. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between exhaust valve timing control position sensor terminal 2 and ECM terminal 88. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors..

9. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 58 (bank 1) or 62 (bank 2) and exhaust valve timing control position sensor terminal 3.
Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Refer to EC-539, "Component Inspection" .

OK or NG

OK >> GO TO 11.
NG >> Replace exhaust valve timing control position sensor.

11. CHECK CRANKSHAFT POSITION SENSOR (POS)

Refer to EC-393, "Component Inspection" .

OK or NG

OK >> GO TO 12.
NG >> Replace crankshaft position sensor (POS).

12. CHECK CAMSHAFT POSITION SENSOR (PHASE)

Refer to EC-405, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> Replace malfunctioning camshaft position sensor (PHASE).

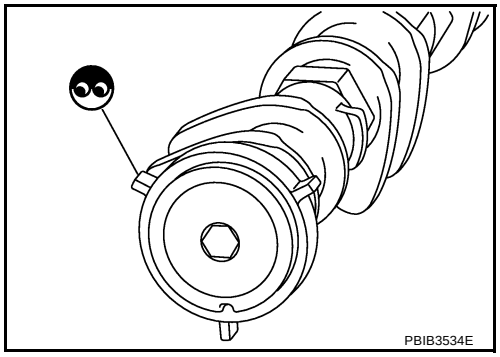
13. CHECK CAMSHAFT (EXH)

Check the following;

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

OK or NG

OK >> GO TO 14.
NG >> Remove debris and clean the signal plate of camshaft rear end or replace malfunctioning camshaft.



14. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

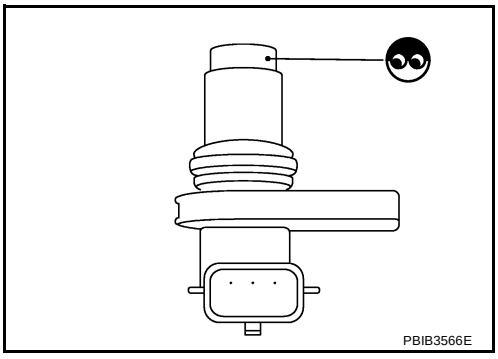
>> **INSPECTION END**

Component Inspection

NBS000BP

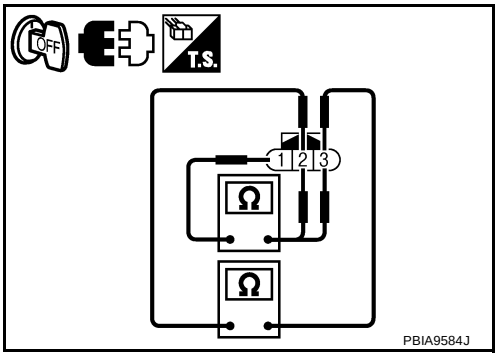
EXHAUST VALVE TIMING CONTROL POSITION SENSOR

1. Disconnect exhaust valve timing control position sensor harness connector.
2. Loosen the fixing bolt of the sensor.
3. Remove the sensor.
4. Visually check the sensor for chipping.



5. Check resistance as shown below.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) - 2 (-)	Except 0 or ∞
1 (+) - 3 (-)	
2 (+) - 3 (-)	



6. If NG, replace exhaust valve timing control position sensor.

Removal and Installation

NBS000BQ

EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Refer to EM-72, "CAMSHAFT" .

DTC P1148, P1168 CLOSED LOOP CONTROL

PFP:22690

On Board Diagnosis Logic

NBS000D5

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1148 1148 (Bank 1)	Closed loop control function	The closed loop control function for bank 1 does not operate even when vehicle is driving in the specified condition.	● Harness or connectors [The air fuel ratio (A/F) sensor 1 circuit is open or shorted.] ● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater
P1168 1168 (Bank 2)		The closed loop control function for bank 2 does not operate even when vehicle is driving in the specified condition.	

NOTE:
DTC P1148 or P1168 is displayed with another DTC for air fuel ratio (A/F) sensor 1.
Perform the trouble diagnosis for the corresponding DTC.

DTC P1211 TCS CONTROL UNIT

PFP:47850

Description

NBS000D6

The malfunction information related to TCS is transferred through the CAN communication line from VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) to ECM.

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) but also for ECM after TCS related repair.

On Board Diagnosis Logic

NBS000D7

- **Freeze frame data is not stored in the ECM for this self-diagnosis.**
- **The MIL will not light up for this self-diagnosis.**

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1211 1211	TCS control unit	ECM receives a malfunction information from VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models).	● VDC/TCS/ABS control unit (with VDC models) ● ABS actuator and electric unit (control unit) (without VDC models) ● TCS related parts

DTC Confirmation Procedure

NBS000D8

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

WITH CONSULT-III

1. Start engine and let it idle for at least 60 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-541, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000D9

Go to BRC-82, "TROUBLE DIAGNOSIS" (With VDC models) or BRC-42, "TROUBLE DIAGNOSIS" (Without VDC models).

DTC P1212 TCS COMMUNICATION LINE

PFP:47850

Description

NBS000DA

NOTE:

- **If DTC P1212 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1212 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

This CAN communication line is used to control the smooth engine operation during the TCS operation. Pulse signals are exchanged between ECM and VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models).

Be sure to erase the malfunction information such as DTC not only for VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) but also for ECM after TCS related repair.

On Board Diagnosis Logic

NBS000DB

- **Freeze frame data is not stored in the ECM for this self-diagnosis.**
- **The MIL will not light up for this self-diagnosis.**

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1212 1212	TCS communication line	ECM can not receive the information from VDC/TCS/ABS control unit (with VDC models) or “ABS actuator and electric unit (control unit)” (without VDC models) continuously.	● Harness or connectors (The CAN communication line is open or shorted.) ● VDC/TCS/ABS control unit (with VDC models) ● ABS actuator and electric unit (control unit) (without VDC models) ● Dead (Weak) battery

DTC Confirmation Procedure

NBS000DC

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5V at idle.

WITH CONSULT-III

1. Start engine and let it idle for at least 10 seconds.
2. Check 1st trip DTC.
3. If 1st trip DTC is detected, go to EC-542, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000DD

Go to BRC-82, "TROUBLE DIAGNOSIS" (With VDC models) or BRC-42, "TROUBLE DIAGNOSIS" (Without VDC models).

DTC P1217 ENGINE OVER TEMPERATURE

PFP:00000

Description

NBS000DE

SYSTEM DESCRIPTION

NOTE:

- **If DTC P1217 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1217 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**

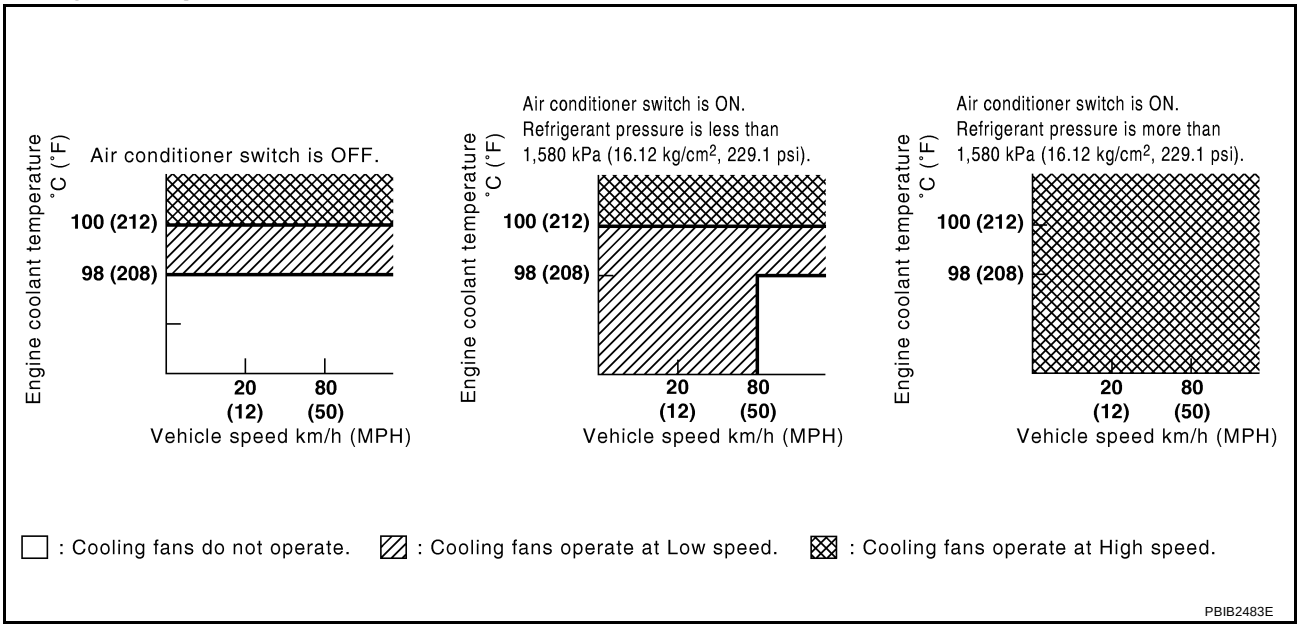
Cooling Fan Control

Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	Cooling fan control	IPDM E/R (Cooling fan relays)
Battery	Battery voltage*1		
Wheel sensor	Vehicle speed*2		
Engine coolant temperature sensor	Engine coolant temperature		
Air conditioner switch	Air conditioner ON signal*2		
Refrigerant pressure sensor	Refrigerant pressure		

*1: The ECM determines the start signal status by the signals of engine speed and battery voltage.
*2: This signal is sent to ECM through CAN communication line.

The ECM controls the cooling fan corresponding to the vehicle speed, engine coolant temperature, refrigerant pressure, and air conditioner ON signal. The control system has 3-step control [HIGH/LOW/OFF].

Cooling Fan Operation



Cooling Fan Relay Operation

The ECM controls cooling fan relays in the IPDM E/R through CAN communication line.

Cooling fan speed	Cooling fan relay		
	1	2	3
Stop	OFF	OFF	OFF
Low	ON	OFF	OFF
High	ON	ON	ON

COMPONENT DESCRIPTION

Cooling Fan Motor

The cooling fan operates at each speed when the current flows in the cooling fan motor as follows.

Cooling fan speed	Cooling fan motor terminals	
	(+)	(–)
Low	1	4
	2	3
High	1 and 2	3 and 4

CONSULT-III Reference Value in Data Monitor Mode

NBS000DF

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
AIR COND SIG	● Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
COOLING FAN	● Engine: After warming up, idle the engine ● Air conditioner switch: OFF	Engine coolant temperature is 97°C (206°F) or less	OFF
		Engine coolant temperature is between 98°C (208°F) and 99°C (210°F)	LOW
		Engine coolant temperature is 100°C (212°F) or more	HI

On Board Diagnosis Logic

NBS000DG

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.
When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.
This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1217 1217	Engine over temperature (Overheat)	● Cooling fan does not operate properly (Overheat). ● Cooling fan system does not operate properly (Overheat). ● Engine coolant was not added to the system using the proper filling method. ● Engine coolant is not within the specified range.	● Harness or connectors (The cooling fan circuit is open or shorted.) ● Cooling fan ● IPDM E/R (Cooling fan relays) ● Radiator hose ● Radiator ● Radiator cap ● Water pump ● Thermostat For more information, refer to EC-555, "Main 12 Causes of Overheating" .

CAUTION:
When a malfunction is indicated, be sure to replace the coolant. Refer to CO-10, "Changing Engine Coolant" . Also, replace the engine oil. Refer to LU-7, "Changing Engine Oil" .

1. **Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to MA-12, "ANTI-FREEZE COOLANT MIXTURE RATIO" .**
2. **After refilling coolant, run engine to ensure that no water-flow noise is emitted.**

Overall Function Check

NBS000DH

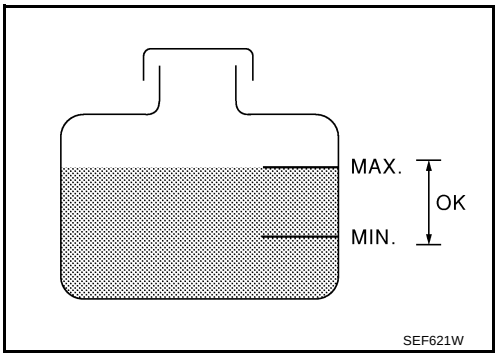
Use this procedure to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

WARNING:
Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.
Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

WITH CONSULT-III

1. Check the coolant level in the reservoir tank and radiator.

   NOTE:
   Allow engine to cool before checking coolant level.
   If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-549, "Diagnostic Procedure" .
2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-549, "Diagnostic Procedure" .
3. Turn ignition switch ON.
4. Perform “COOLING FAN” in “ACTIVE TEST” mode with CONSULT-III.
5. If the results are NG, go to EC-549, "Diagnostic Procedure" .

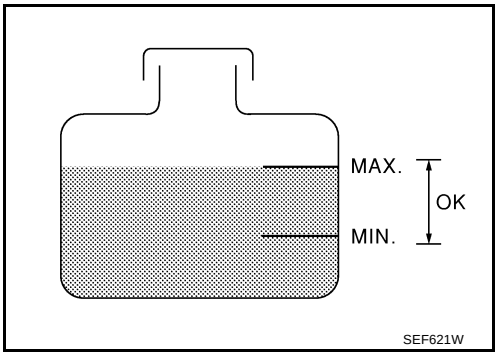


WITH GST

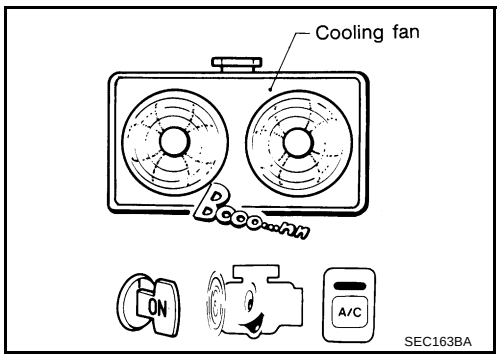
1. Check the coolant level in the reservoir tank and radiator.

   NOTE:
   Allow engine to cool before checking coolant level.
   If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to EC-549, "Diagnostic Procedure" .
2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to EC-549, "Diagnostic Procedure" .
3. Start engine.

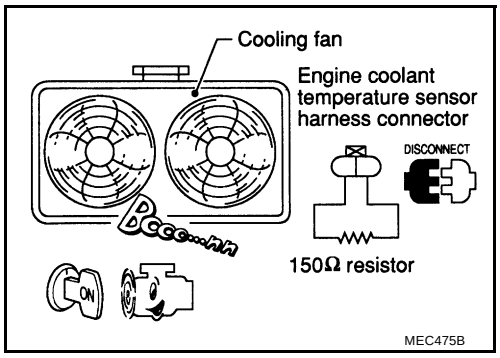
   CAUTION:
   Be careful not to overheat engine.
4. Turn air conditioner switch ON.
5. Turn blower fan switch ON.



6. Make sure that cooling fans operates at low speed.
   If NG, go to EC-549, "Diagnostic Procedure" .
   If OK, go to the following steps.
7. Turn ignition switch OFF.
8. Turn air conditioner switch and blower fan switch OFF.
9. Disconnect engine coolant temperature sensor harness connector.
10. Connect 150Ω resistor to engine coolant temperature sensor harness connector.

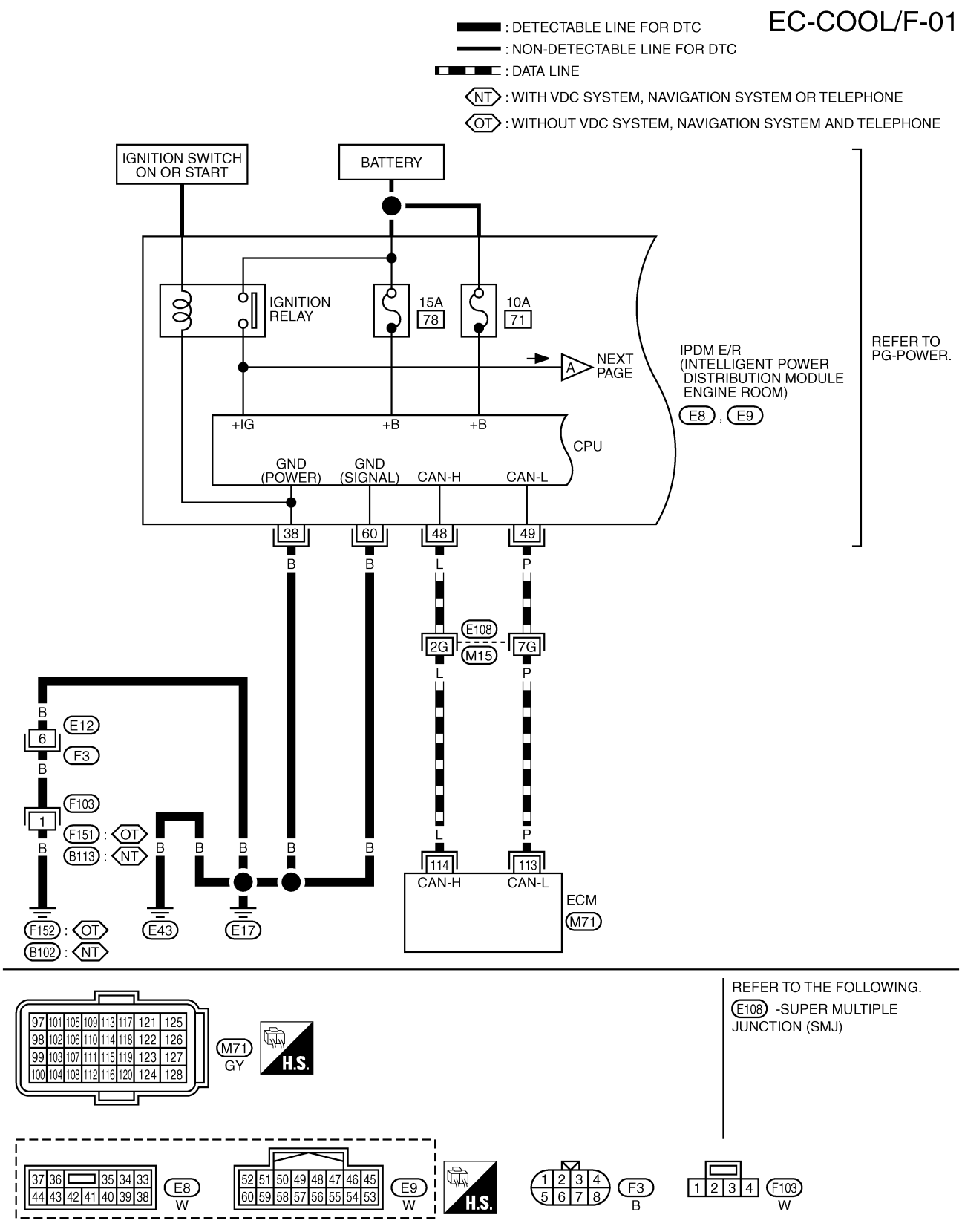


11. Restart engine and make sure that cooling fans operates at higher speed than low speed.
    CAUTION:
    Be careful not to overheat engine.
12. If NG, go to EC-549, "Diagnostic Procedure" .



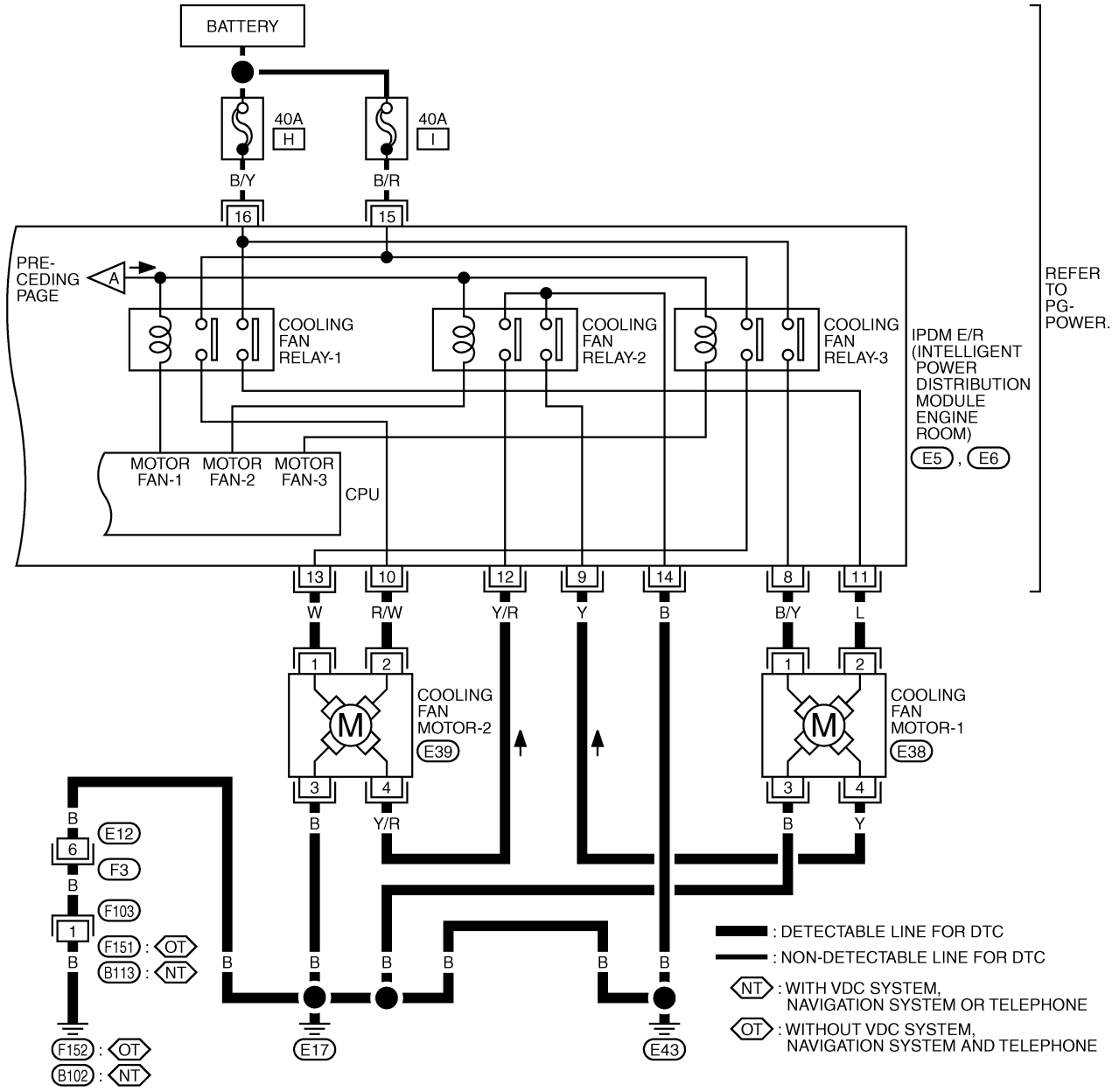
Wiring Diagram

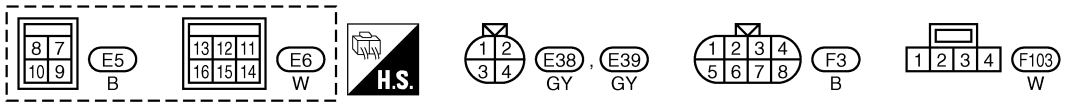
NBS000DI



TBWT1658E

EC-COOL/F-02





TBWT1659E

Diagnostic Procedure

NBS000DJ

1. INSPECTION START

Do you have CONSULT-III?

Yes or No

Yes >> GO TO 2.
No >> GO TO 4.

2. CHECK COOLING FAN LOW SPEED OPERATION

With CONSULT-III

1. Start engine and let it idle.
2. Select “COOLING FAN” in “ACTIVE TEST” mode with CONSULT-III and touch “LOW” on the CONSULT-III screen.
3. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

OK >> GO TO 3.
NG >> Check cooling fan low speed control circuit. (Go to EC-551, "PROCEDURE A" .)

3. CHECK COOLING FAN HIGH SPEED OPERATION

With CONSULT-III

1. Touch “HIGH” on the CONSULT-III screen.
2. Make sure that cooling fans-1 and -2 operate at higher speed than low speed.

OK or NG

OK >> GO TO 6.
NG >> Check cooling fan high speed control circuit. (Go to EC-554, "PROCEDURE B" .)

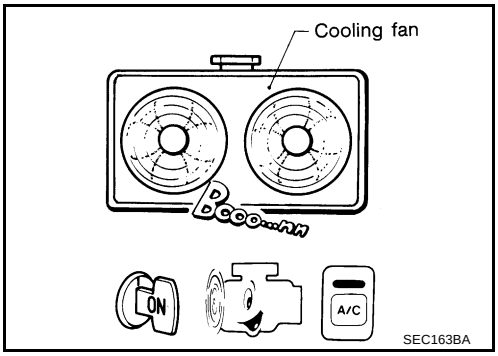
4. CHECK COOLING FAN LOW SPEED OPERATION

Without CONSULT-III

1. Start engine and let it idle.
2. Turn air conditioner switch ON.
3. Turn blower fan switch ON.
4. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

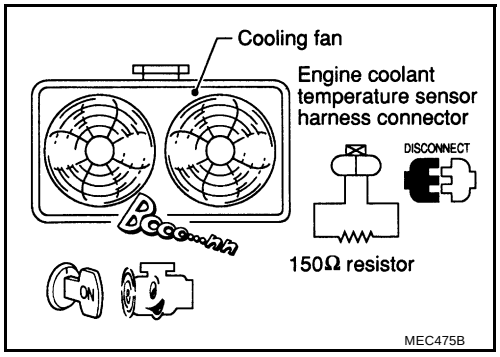
OK >> GO TO 5.
NG >> Check cooling fan low speed control circuit. (Go to EC-551, "PROCEDURE A" .)



5. CHECK COOLING FAN HIGH SPEED OPERATION

Without CONSULT-III

1. Turn ignition switch OFF.
2. Turn air conditioner switch and blower fan switch OFF.
3. Disconnect engine coolant temperature sensor harness connector.
4. Connect 150Ω resistor to engine coolant temperature sensor harness connector.
5. Restart engine and make sure that cooling fans-1 and -2 operate at higher speed than low speed.



OK or NG

OK >> GO TO 6.
NG >> Check cooling fan high speed control circuit. (Go to EC-554, "PROCEDURE B" .)

6. CHECK COOLING SYSTEM FOR LEAK

Refer to CO-10, "LEAK CHECK" .

OK or NG

OK >> GO TO 7.
NG >> Check the following for leak.

- Hose
- Radiator
- Water pump

7. CHECK RADIATOR CAP

Refer to CO-15, "Checking Radiator Cap" .

OK or NG

OK >> GO TO 8.
NG >> Replace radiator cap.

8. CHECK THERMOSTAT

Refer to CO-26, "WATER INLET AND THERMOSTAT ASSEMBLY" .

OK or NG

OK >> GO TO 9.
NG >> Replace thermostat

9. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-228, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace engine coolant temperature sensor.

10. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, go to EC-555, "Main 12 Causes of Overheating" .

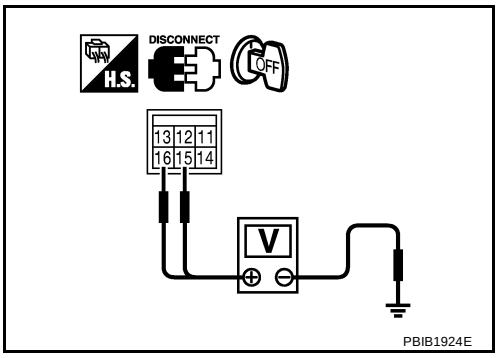
>> **INSPECTION END**

PROCEDURE A

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector E6.
3. Check voltage between IPDM E/R terminals 15, 16 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

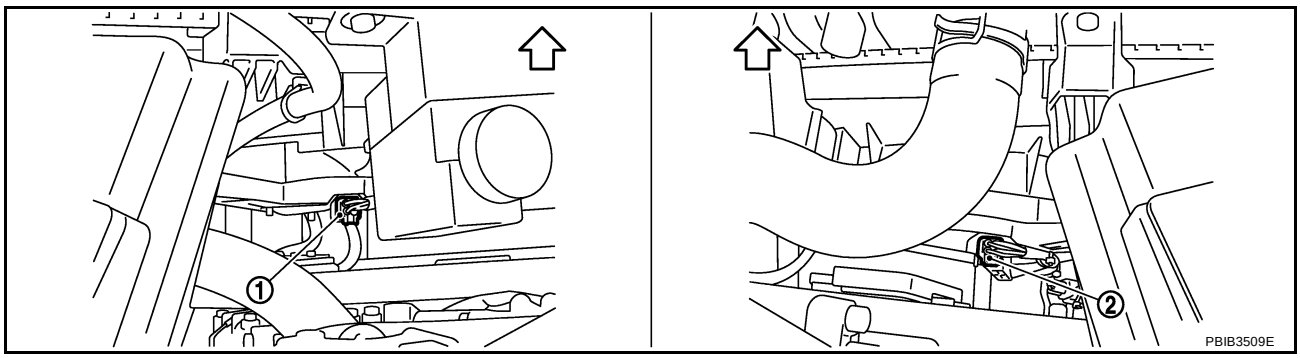
Check the following.

- 40A fusible links
- Harness for open or short between IPDM E/R and battery

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COOLING FAN MOTORS CIRCUIT

1. Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.



1. Cooling fan motor-1
2. Cooling fan motor-2

⇦: Vehicle front

2. Disconnect all IPDM E/R harness connectors.
3. Check harness continuity between the following;
   cooling fan motor-1 terminal 2 and IPDM E/R terminal 11,
   cooling fan motor-1 terminal 3 and ground,
   IPDM E/R terminal 38, 60 and ground,
   Refer to wiring diagram.

   Continuity should exist.

4. Check harness continuity between the following;
   cooling fan motor-2 terminal 2 and IPDM E/R terminal 10,
   cooling fan motor-2 terminal 3 and ground.
   Refer to wiring diagram.

   Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector E12, F3
- Harness connectors F103, B113 (Models with VDC system, navigation system or telephone) or F151 (Models wiithout VDC system, navigation system and telephone)
- Harness for open or short between cooling fan motors-1, 2 and IPDM E/R
- Harness for open or short between cooling fan motors-1, 2 and ground
- Harness for open or short between IPDM E/R and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK COOLING FAN MOTORS

Refer to EC-556, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Replace malfunctioning cooling fan motors.

6. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

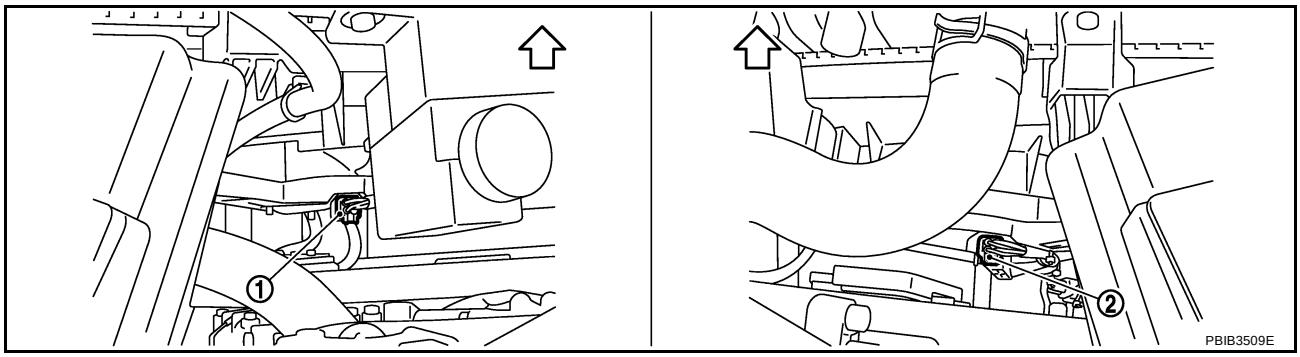
OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair or replace harness or connector.

PROCEDURE B

1. CHECK COOLING FAN MOTORS CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.



1. Cooling fan motor-1
2. Cooling fan motor-2

⇦: Vehicle front

3. Disconnect all IPDM E/R harness connectors.
4. Check harness continuity between the following;
   cooling fan motor-1 terminal 1 and IPDM E/R terminal 8,
   cooling fan motor-1 terminal 4 and IPDM E/R terminal 9,
   IPDM E/R terminal 14 and ground,
   Refer to wiring diagram.

   Continuity should exist.

5. Also check harness connector for short to ground or short to power.
6. Check harness continuity between the following;
   cooling fan motor-2 terminal 1 and IPDM E/R terminal 13,
   cooling fan motor-2 terminal 4 and IPDM E/R terminal 12,
   Refer to wiring diagram.

   Continuity should exist.

7. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING PART

Check the following.

- Harness for open or short between cooling fan motors-1, 2 and IPDM E/R
- Harness for open or short between IPDM E/R and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COOLING FAN MOTORS

Refer to EC-556, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace malfunctioning cooling fan motors.

4. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair or replace harness or connectors.

Main 12 Causes of Overheating

NBS000DK

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	● Blocked radiator ● Blocked condenser ● Blocked radiator grille ● Blocked bumper	● Visual	No blocking	—
	2	● Coolant mixture	● Coolant tester	50 - 50% coolant mixture	MA-12
	3	● Coolant level	● Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	CO-10
	4	● Radiator cap	● Pressure tester	88 - 127 kPa (0.90 - 1.30 kg/cm^2 , 12.8 - 18.4 psi) (Limit)	CO-15
ON*2	5	● Coolant leaks	● Visual	No leaks	CO-10
ON*2	6	● Thermostat	● Touch the upper and lower radiator hoses	Both hoses should be hot	CO-26
ON*1	7	● Cooling fan	● CONSULT-III	Operating	See trouble diagnosis for DTC P1217 (EC-543).
OFF	8	● Combustion gas leak	● Color checker chemical tester 4 Gas analyzer	Negative	—
ON*3	9	● Coolant temperature gauge	● Visual	Gauge less than 3/4 when driving	—
		● Coolant overflow to reservoir tank	● Visual	No overflow during driving and idling	CO-10
OFF*4	10	● Coolant return from reservoir tank to radiator	● Visual	Should be initial level in reservoir tank	CO-10
OFF	11	● Cylinder head	● Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	EM-89
	12	● Cylinder block and pistons	● Visual	No scuffing on cylinder walls or piston	EM-107

*1: Turn the ignition switch ON.
*2: Engine running at 3,000 rpm for 10 minutes.
*3: Drive at 90 km/h (55 MPH) for 30 minutes and then let idle for 10 minutes.
*4: After 60 minutes of cool down time.
For more information, refer to CO-6, "OVERHEATING CAUSE ANALYSIS" .

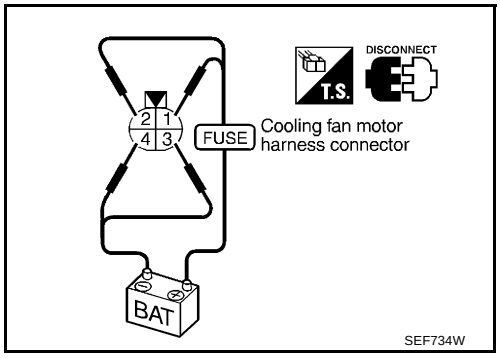
Component Inspection

NBS000DL

COOLING FAN MOTORS-1 AND -2

1. Disconnect cooling fan motor harness connectors.
2. Supply cooling fan motor terminals with battery voltage and check operation.

	Speed	terminals	
		(+)	(–)
Cooling fan motor	Low	1	4
		2	3
	High	1 and 2	3 and 4



Cooling fan motor should operate.

If NG, replace cooling fan motors.

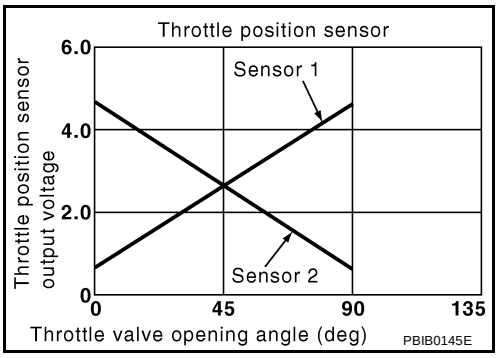
DTC P1225, P1234 TP SENSOR

PFP:16119

Component Description

NBS000DM

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



On Board Diagnosis Logic

NBS000DN

The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1225 1225	Closed throttle position learning performance	Closed throttle position learning value is excessively low.	● Electric throttle control actuator (TP sensor 1 and 2)

DTC Confirmation Procedure

NBS000DO

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-558, "Diagnostic Procedure" .

WITH GST

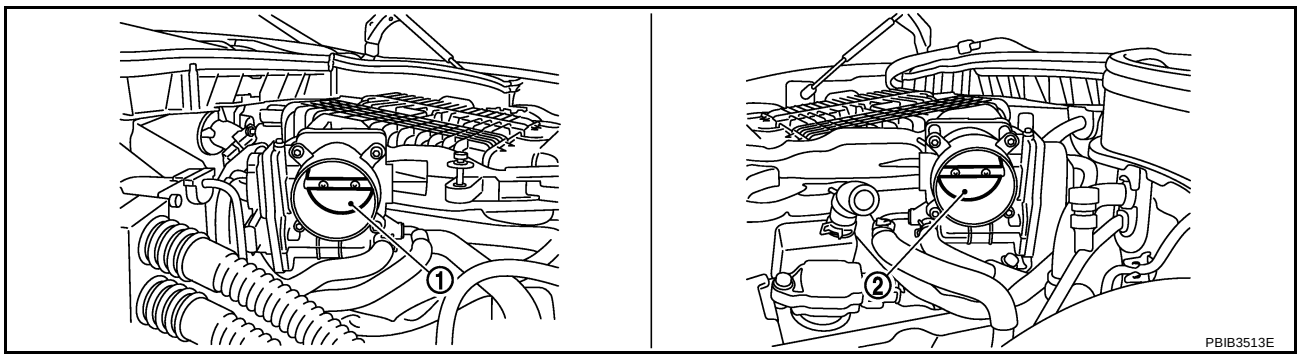
Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000DP

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.
2. Remove the intake air duct.
3. Check if foreign matter is caught between the throttle valve and the housing.



1. Throttle valve (bank 1)
2. Throttle valve (bank 2)

OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

Removal and Installation

NBS000DQ

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

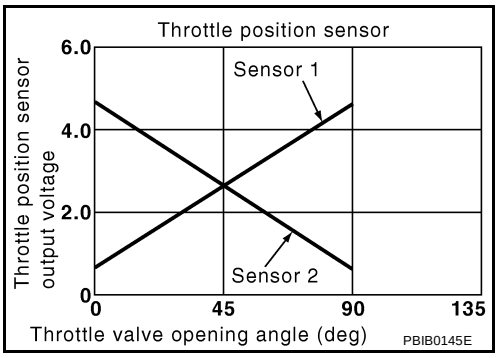
DTC P1226, P1235 TP SENSOR

PFP:16119

Component Description

NBS000DR

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



On Board Diagnosis Logic

NBS000DS

The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1226 1226	Closed throttle position learning performance	Closed throttle position learning is not performed successfully, repeatedly.	● Electric throttle control actuator (TP sensor 1 and 2)

DTC Confirmation Procedure

NBS000DT

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

WITH CONSULT-III

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Repeat steps 3 and 4 for 32 times.
5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-560, "Diagnostic Procedure" .

WITH GST

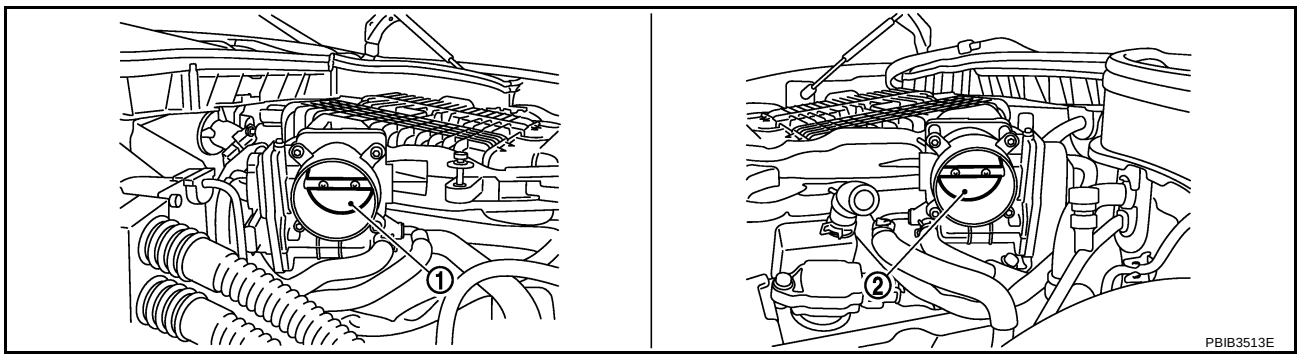
Follow the procedure “With CONSULT-III” above.

Diagnostic Procedure

NBS000DU

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.
2. Remove the intake air duct.
3. Check if foreign matter is caught between the throttle valve and the housing.



1. Throttle valve (bank 1)
2. Throttle valve (bank 2)

OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

Removal and Installation

NBS000DV

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P1233, P2101 ELECTRIC THROTTLE CONTROL FUNCTION

PFP:16119

Description

NBS000C3

NOTE:
If DTC P1233 or P2101 is displayed with DTC P1238, P1290, P2100, P2119 first perform the trouble diagnosis for DTC P1238, P2119 or P1290, P2100. Refer to EC-580, "DTC P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR" or EC-592, "DTC P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY" .

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.
The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The current opening angle of the throttle valve is detected by the throttle position sensor and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

NBS000C4

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1233 1233 (Bank 2) P2101 2101 (Bank 1)	Electric throttle control performance	Electric throttle control function does not operate properly.	● Harness or connectors (The throttle control motor circuit is open or shorted) ● Electric throttle control actuator

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

NBS000C5

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V when engine is running.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.
4. If DTC is detected, go to EC-566, "Diagnostic Procedure" .

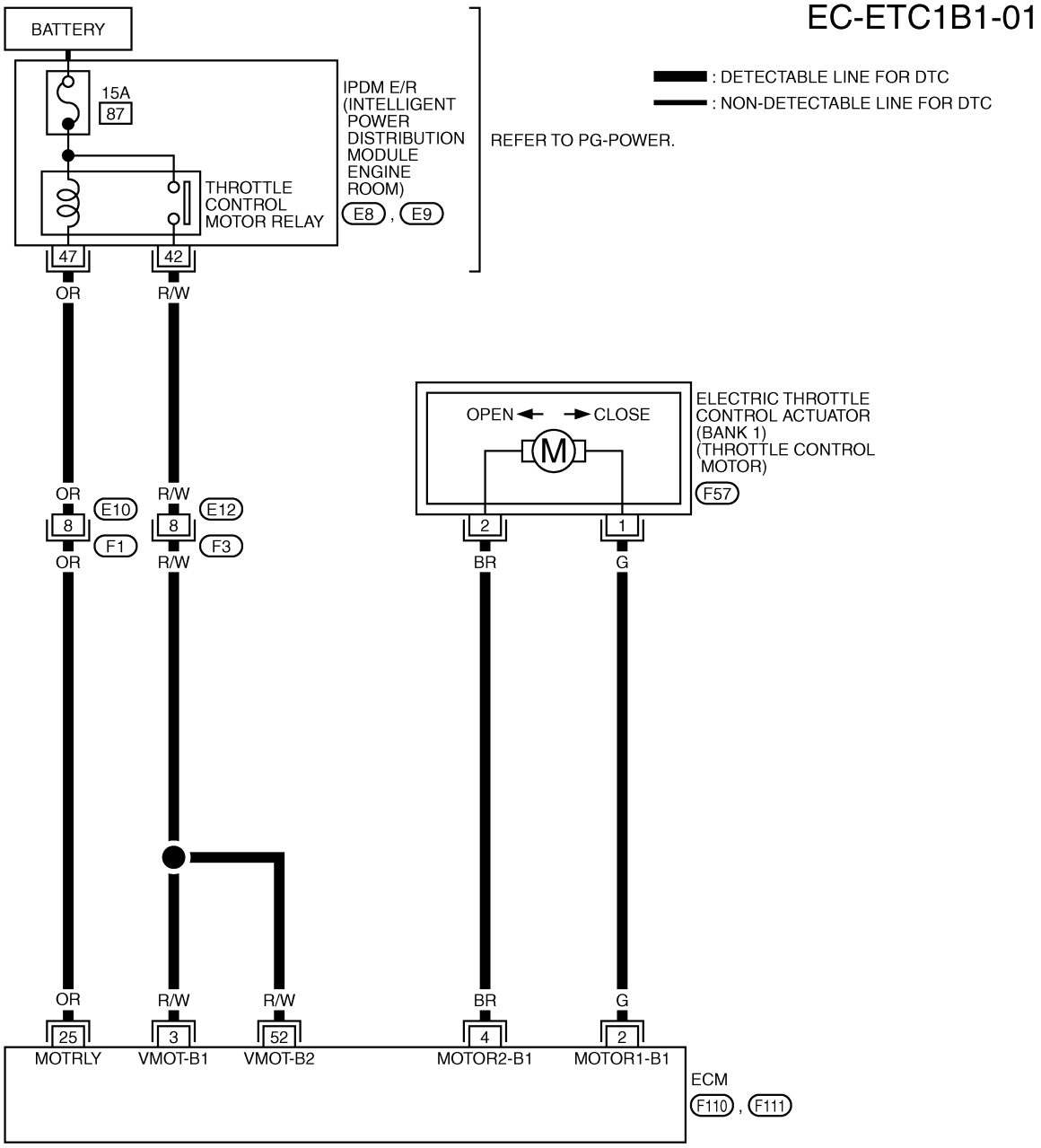
WITH GST

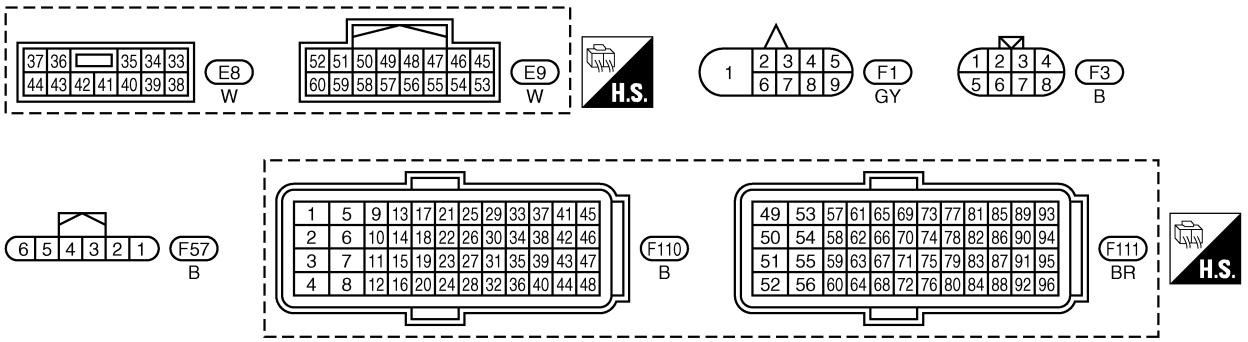
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000C6

BANK 1

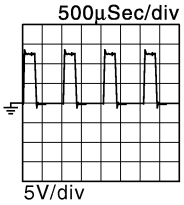
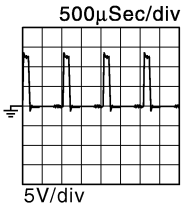
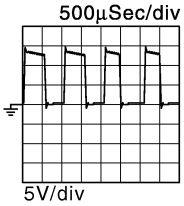




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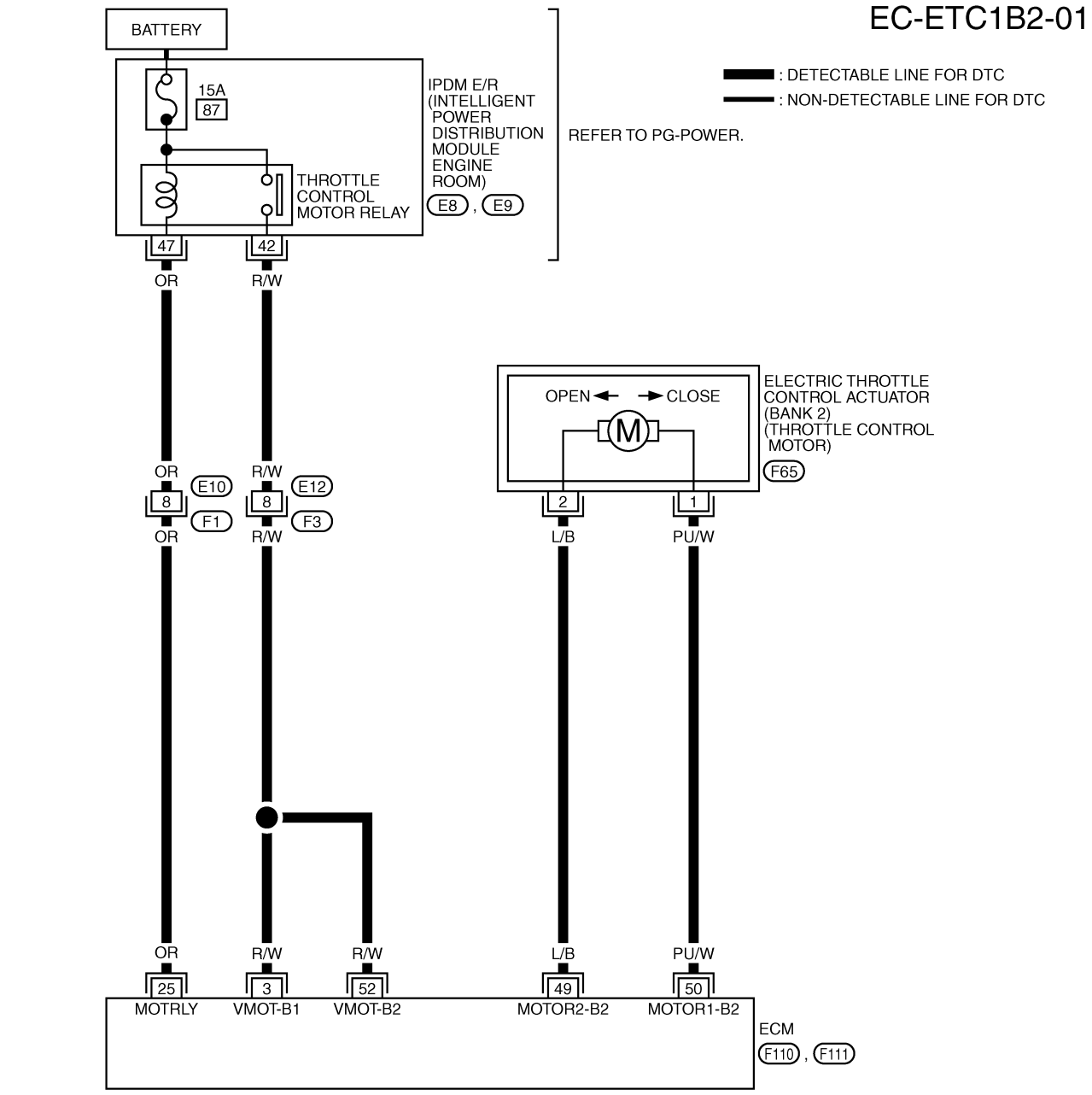
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

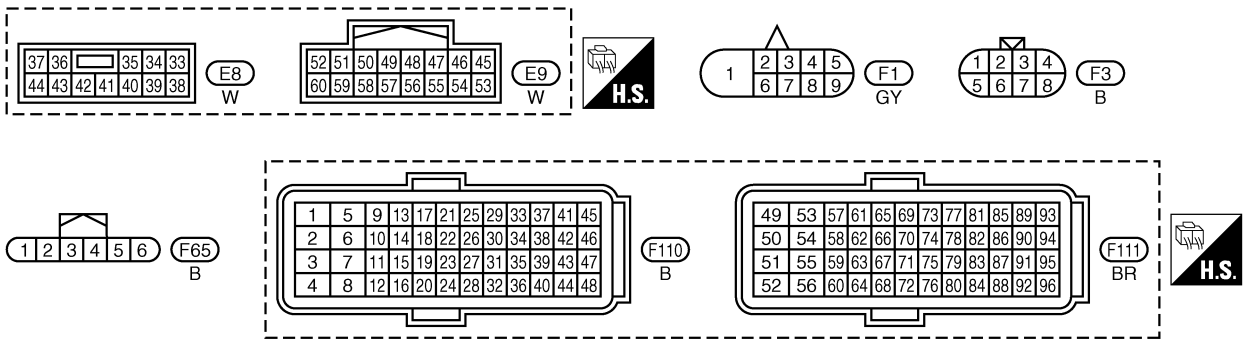
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	G	Throttle control motor (Open) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

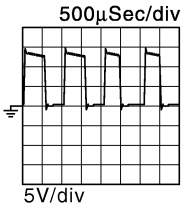
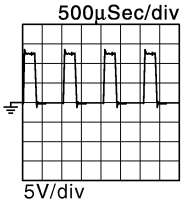
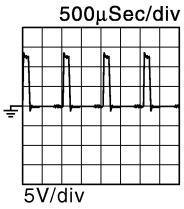




TBWT1667E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
49	L/B	Throttle control motor (Close) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
50	PU/W	Throttle control motor (Open) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

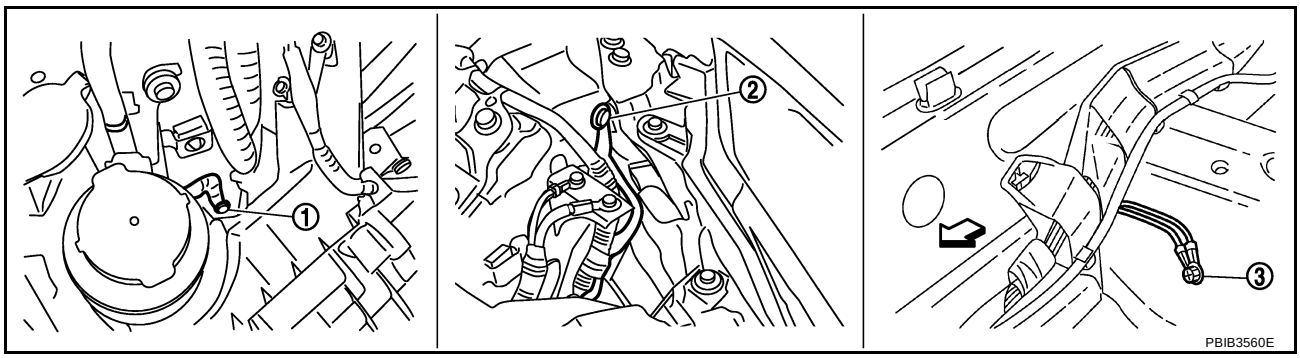
Diagnostic Procedure

NBS000C7

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

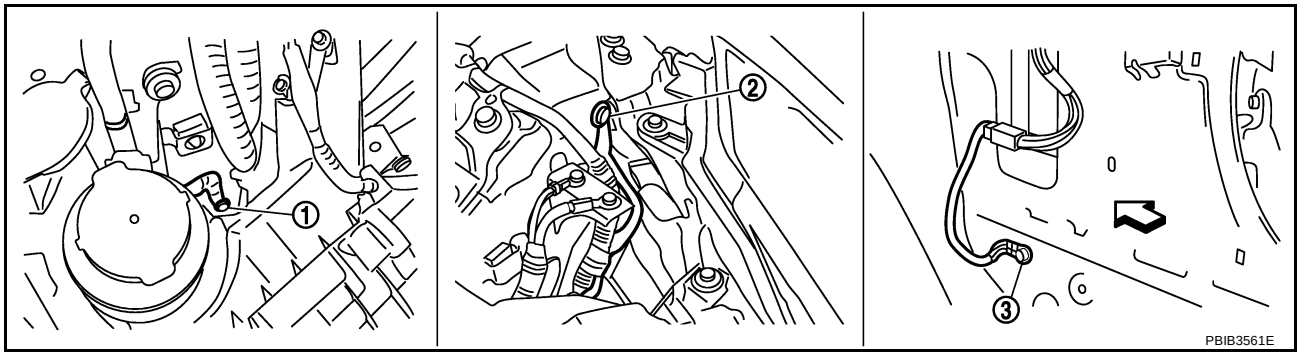


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

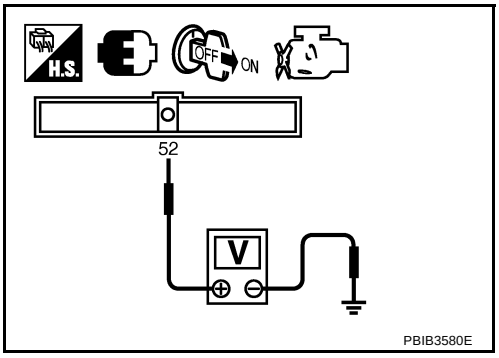
OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

Check voltage between ECM terminal 3 (bank 1), 52 (bank 2) and ground under the following conditions with CONSULT-III or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



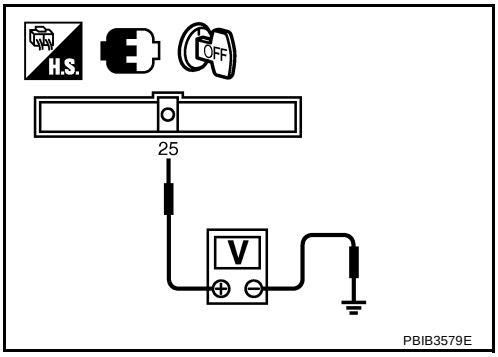
OK or NG

OK >> GO TO 12.
NG >> GO TO 3.

3. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Check voltage between ECM terminal 25 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 7.
NG >> GO TO 4.

4. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E9.
3. Check continuity between ECM terminal 25 and IPDM E/R terminal 47. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK FUSE

1. Disconnect 15A fuse.
2. Check 15A fuse for blown.

OK or NG

OK >> GO TO 9.
NG >> Replace 15A fuse.

7. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E8.
3. Check continuity between ECM terminal 3 (bank 1), 52 (bank 2) and IPDM E/R terminal 42. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

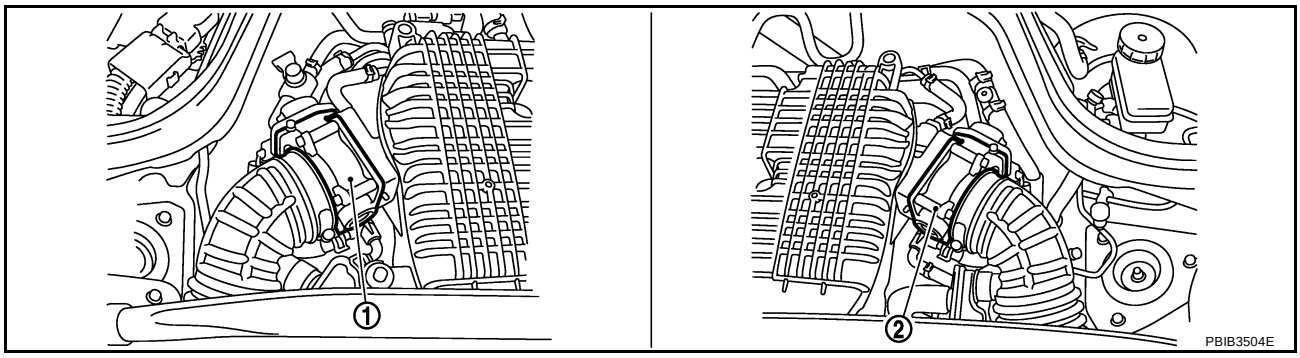
OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair or replace harness or connectors.

10. CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control acutator (bank 1)
2. Electric throttle control acutator (bank 2)

3. Disconnect ECM harness connector.
4. Check harness continuity between the following terminals. Refer to Wiring Diagram.

Bank	Electric throttle control actuator terminal	ECM terminal	Continuity
1	1	2	Should exist
		4	Should not exist
	2	2	Should not exist
		4	Should exist
2	1	49	Should not exist
		50	Should exist
	2	49	Should exist
		50	Should not exist

5. Also check harness for short to ground and short to power.

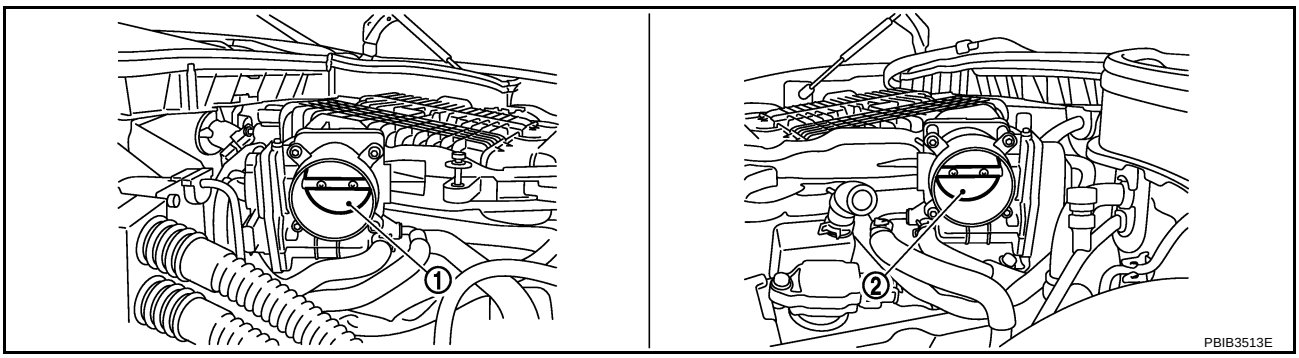
OK or NG

OK >> GO TO 11.

NG >> Repair or replace.

11. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct.
2. Check if foreign matter is caught between the throttle valve and the housing.



1. Throttle valve (bank 1)
2. Throttle valve (bank 2)

OK or NG

OK >> GO TO 12.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

12. CHECK THROTTLE CONTROL MOTOR

Refer to EC-570, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> GO TO 14.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 14.
NG >> Repair or replace harness or connectors.

14. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

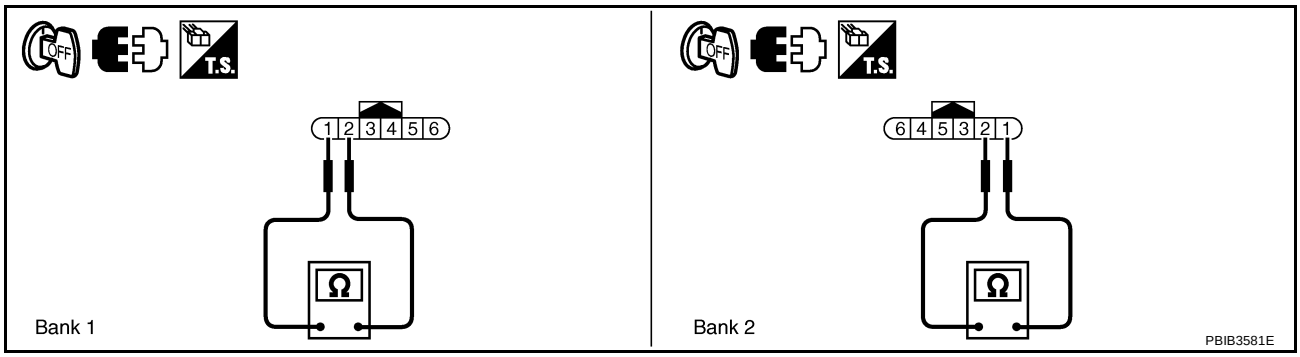
>> **INSPECTION END**

Component Inspection

NBS000C8

THROTTLE CONTROL MOTOR

1. Disconnect electric throttle control actuator harness connector.
2. Check resistance between terminals 1 and 2.



Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

3. If NG, replace electric throttle control actuator and go to next step.
4. Perform EC-77, "Throttle Valve Closed Position Learning" .
5. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000C9

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P1236, P2118 THROTTLE CONTROL MOTOR

PFP:16119

Component Description

NBS000CG

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The current opening angle of the throttle valve is detected by the throttle position sensor and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

NBS000CH

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1236 1236 (Bank 2) P2118 2118 (Bank 1)	Throttle control motor circuit short	ECM detects short in both circuits between ECM and throttle control motor.	● Harness or connectors (The throttle control motor circuit is shorted.) ● Electric throttle control actuator (Throttle control motor)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

NBS000CI

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.
4. If DTC is detected, go to EC-576, "Diagnostic Procedure" .

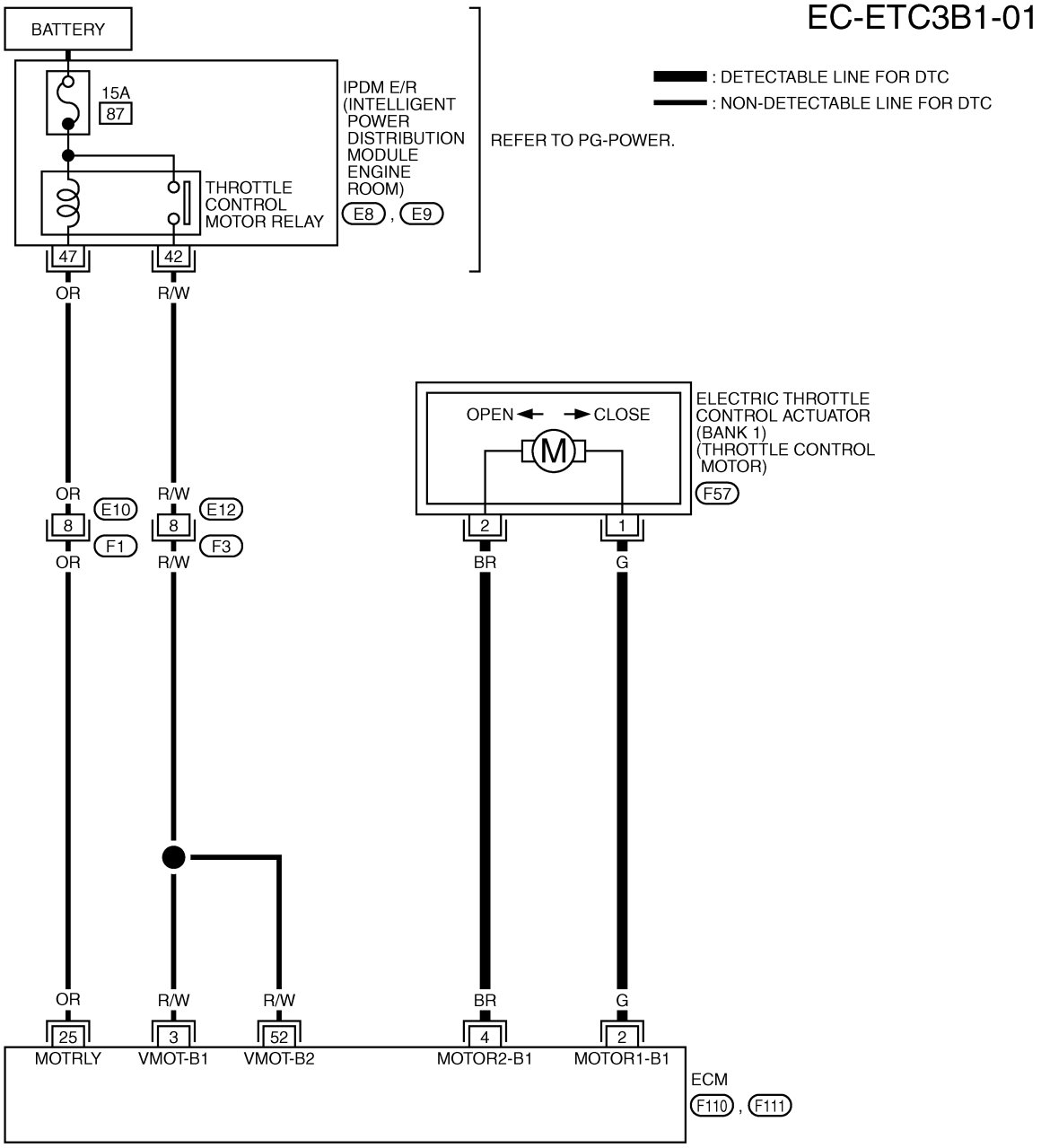
WITH GST

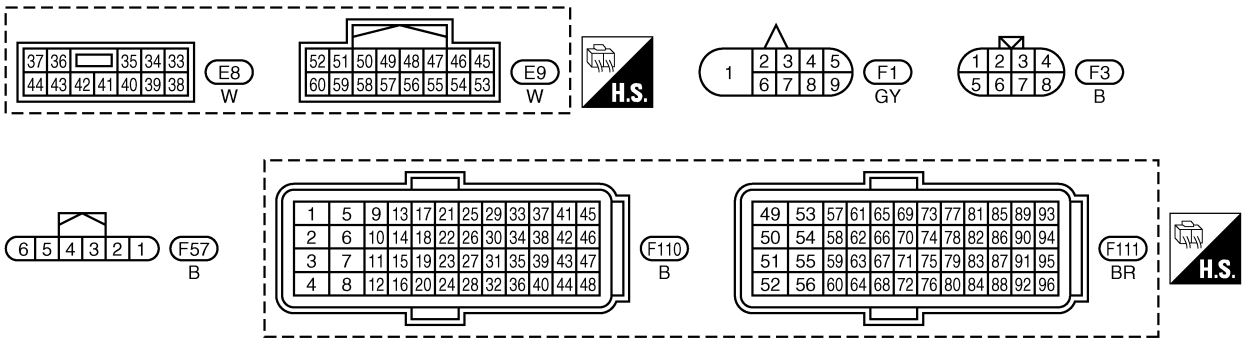
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000CJ

BANK 1

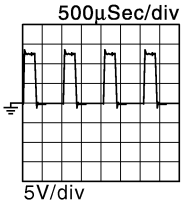
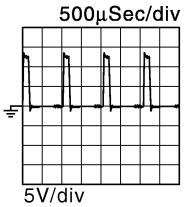
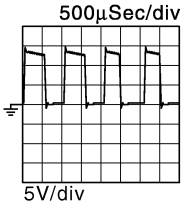




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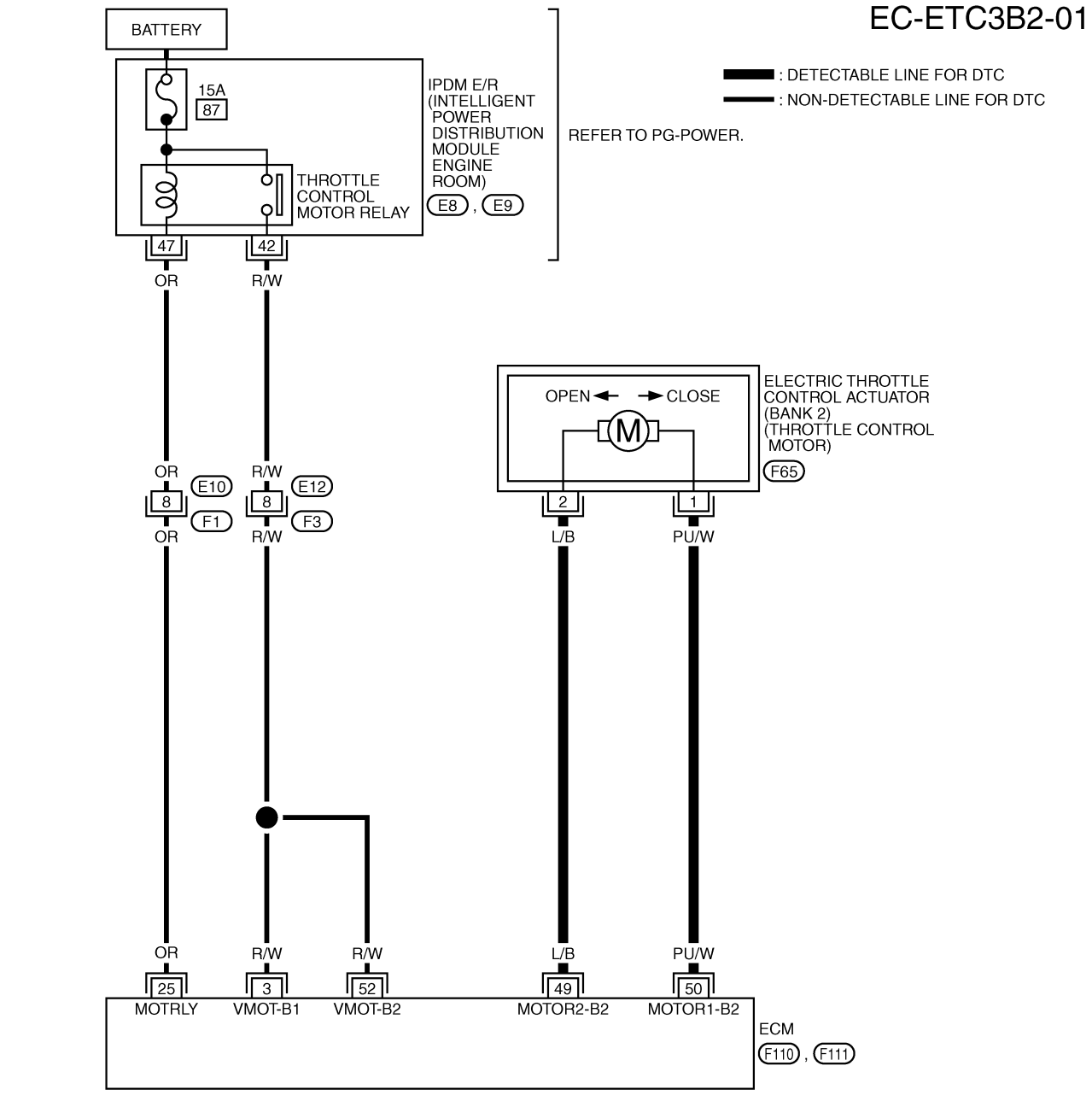
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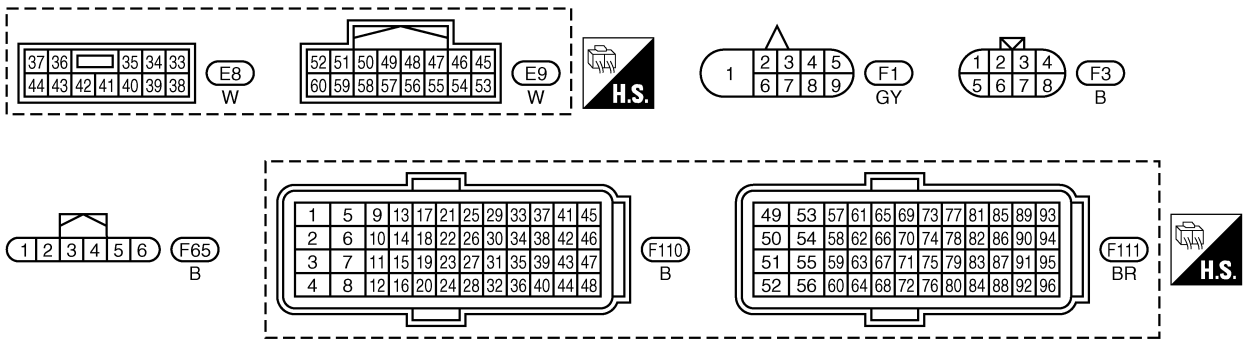
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	G	Throttle control motor (Open) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

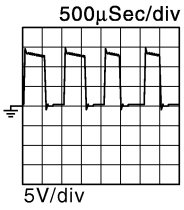
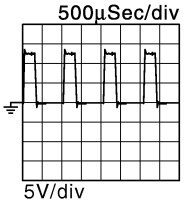
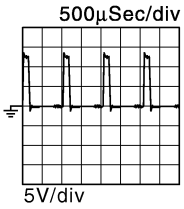




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Specification data are reference values and are measured between each terminal and ground.
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CAUTION:
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TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
49	L/B	Throttle control motor (Close) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
50	PU/W	Throttle control motor (Open) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

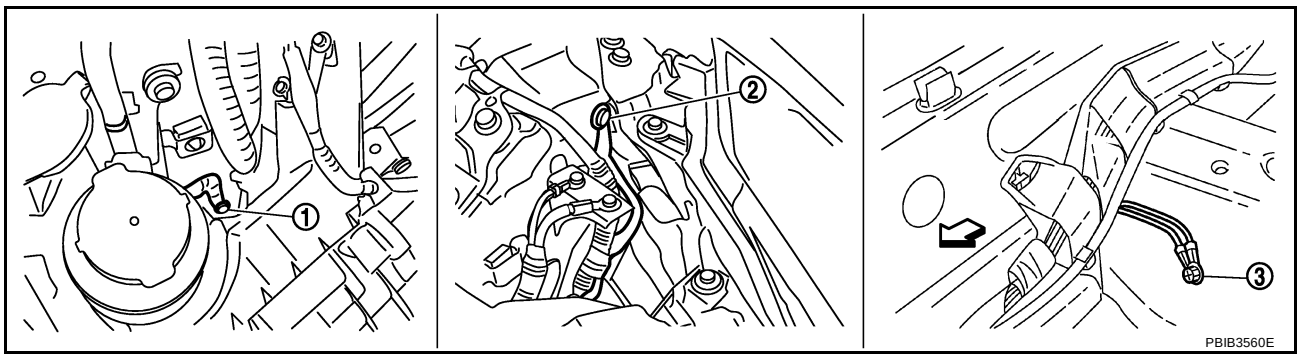
Diagnostic Procedure

NBS000CK

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

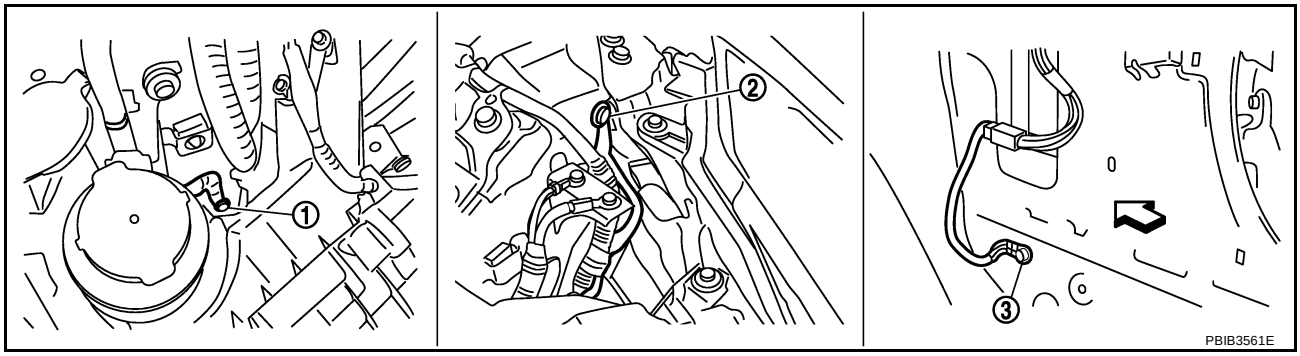


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

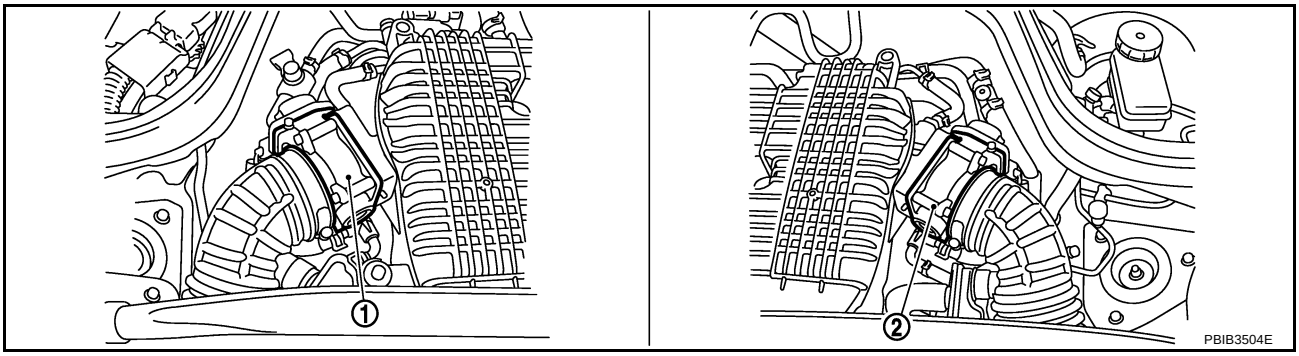
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT FOR OPEN OR SHORT

1. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control acutator (bank 1)
2. Electric throttle control acutator (bank 2)

2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals. Refer to Wiring Diagram.

Bank	Electric throttle control actuator terminal	ECM terminal	Continuity
1	1	2	Should exist
		4	Should not exist
	2	2	Should not exist
		4	Should exist
2	1	49	Should not exist
		50	Should exist
	2	49	Should exist
		50	Should not exist

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK THROTTLE CONTROL MOTOR

Refer to EC-579, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 5.

4. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness or connectors.

5. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

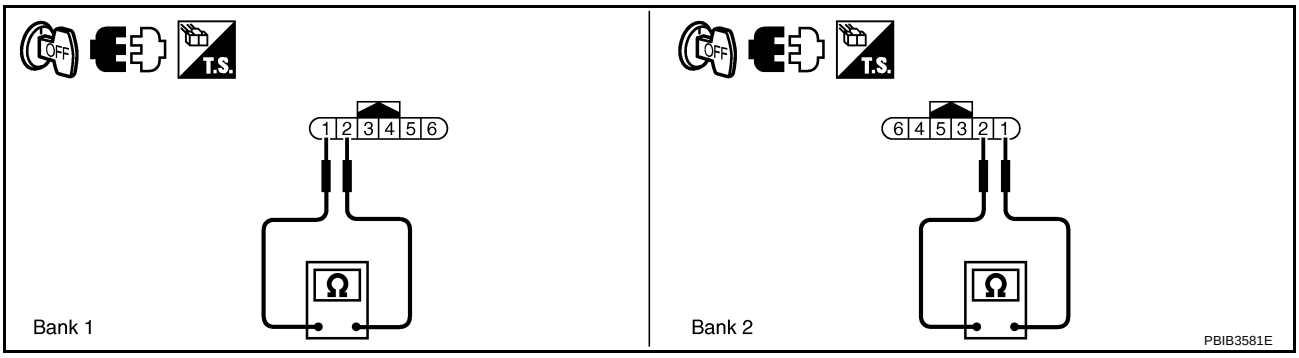
>> **INSPECTION END**

Component Inspection

NBS006V8

THROTTLE CONTROL MOTOR

1. Disconnect electric throttle control actuator harness connector.
2. Check resistance between terminals 1 and 2.



Resistance: Approximately 1 - 15 Ω [at 25 °C (77°F)]

3. If NG, replace electric throttle control actuator and go to next step.
4. Perform EC-77, "Throttle Valve Closed Position Learning" .
5. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS006V9

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P1238, P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

PFP:16119

Component Description

NBS000BZ

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc.
The throttle control motor is operated by the ECM and it opens and closes the throttle valve.
The throttle position sensor detects the throttle valve position, and the opening and closing speed of the throttle valve and feeds the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

On Board Diagnosis Logic

NBS000C0

This self-diagnosis has the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition		Possible cause
P1238 1238 (Bank 2)	Electric throttle control actuator	A)	Electric throttle control actuator does not function properly due to the return spring malfunction.	● Electric throttle control actuator
P2119 2119 (Bank 1)		B)	Throttle valve opening angle in fail-safe mode is not in specified range.	
		C)	ECM detects the throttle valve is stuck open.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Detected items	Engine operating condition in fail-safe mode
Malfunction A	ECM controls the electric throttle actuator by regulating the throttle opening around the idle position. The engine speed will not rise more than 2,000 rpm.
Malfunction B	ECM controls the electric throttle control actuator by regulating the throttle opening to 20 degrees or less.
Malfunction C	While the vehicle is driving, it slows down gradually by fuel cut. After the vehicle stops, the engine stalls. The engine can restart in N or P (A/T), Neutral (M/T) position, and engine speed will not exceed 1,000 rpm or more.

DTC Confirmation Procedure

NBS000C1

NOTE:

- **Perform PROCEDURE FOR MALFUNCTION A AND B first. If the DTC cannot be confirmed, perform PROCEDURE FOR MALFUNCTION C.**
- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR MALFUNCTION A AND B

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Set shift lever to D position (A/T) or 1st position (M/T), and wait at least 3 seconds.
3. Set shift lever to P position (A/T) or Neutral position (M/T).
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Turn ignition switch ON and wait at least 1 second.
6. Set shift lever to D position (A/T) or 1st position (M/T), and wait at least 3 seconds.
7. Set shift lever to P position (A/T) or Neutral position (M/T).
8. Turn ignition switch OFF, wait at least 10 seconds, and then turn ON.
9. Check DTC.
10. If DTC is detected, go to EC-581, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR MALFUNCTION C

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Set shift lever to D position (A/T) or 1st position (M/T) and wait at least 3 seconds.
3. Set shift lever to N, P position (A/T) or Neutral (M/T) position.
4. Start engine and let it idle for 3 seconds.
5. Check DTC.
6. If DTC is detected, go to EC-581, "Diagnostic Procedure" .

With GST

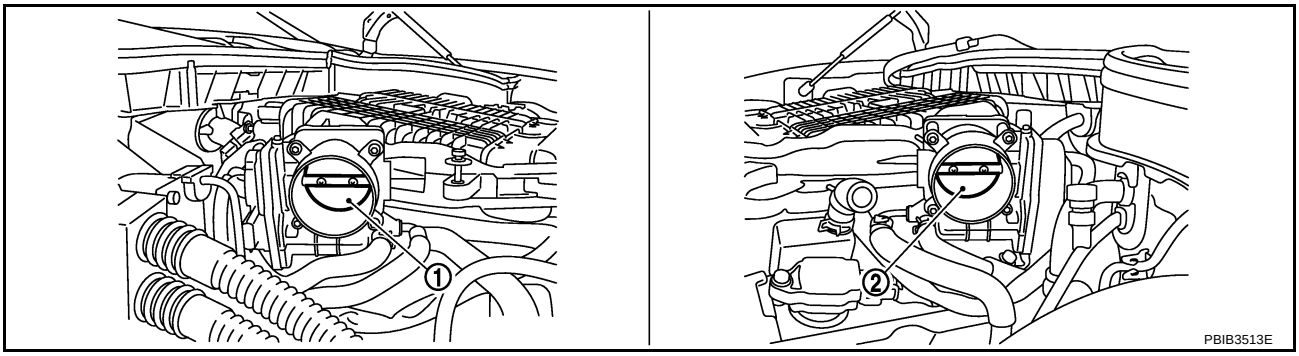
Follow the procedure “With CONSULT-III” above.

Diagnostic Procedure

NBS000C2

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct.
2. Check if foreign matter is caught between the throttle valve and the housing.



1. Throttle valve (bank 1)
2. Throttle valve (bank 2)

OK or NG

OK >> GO TO 2.
NG >> Remove the foreign matter and clean the electric throttle control actuator inside.

2. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

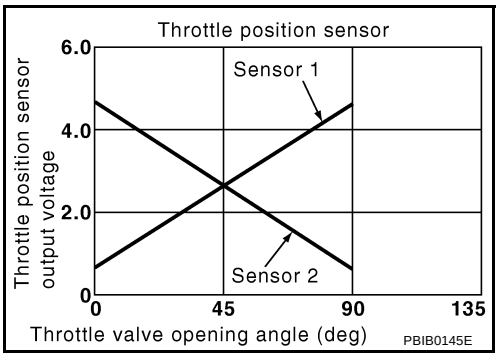
DTC P1239, P2135 TP SENSOR

PFP:16119

Component Description

NBS000H5

Electric throttle control actuator consists of throttle control motor, throttle position sensor, etc. The throttle position sensor responds to the throttle valve movement.
The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



CONSULT-III Reference Value in Data Monitor Mode

NBS000H6

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
TP SEN 1-B1 TP SEN 2-B1*1 TP SEN 1-B2 TP SEN 2-B2*1	● Ignition switch: ON (Engine stopped) ● Shift lever: D (A/T) or 1st (M/T) position	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V

*: Throttle position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

NBS000H7

This self-diagnosis has the one trip detection logic.

NOTE:
If DTC P1239 or P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2135 2135	Throttle position sensor circuit range/perfor-mance	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1 and TP sensor 2.	● Harness or connector (TP sensor 1 and 2 circuit is open or shorted.) ● Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MIL lights up.

Engine operation condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS000H8

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

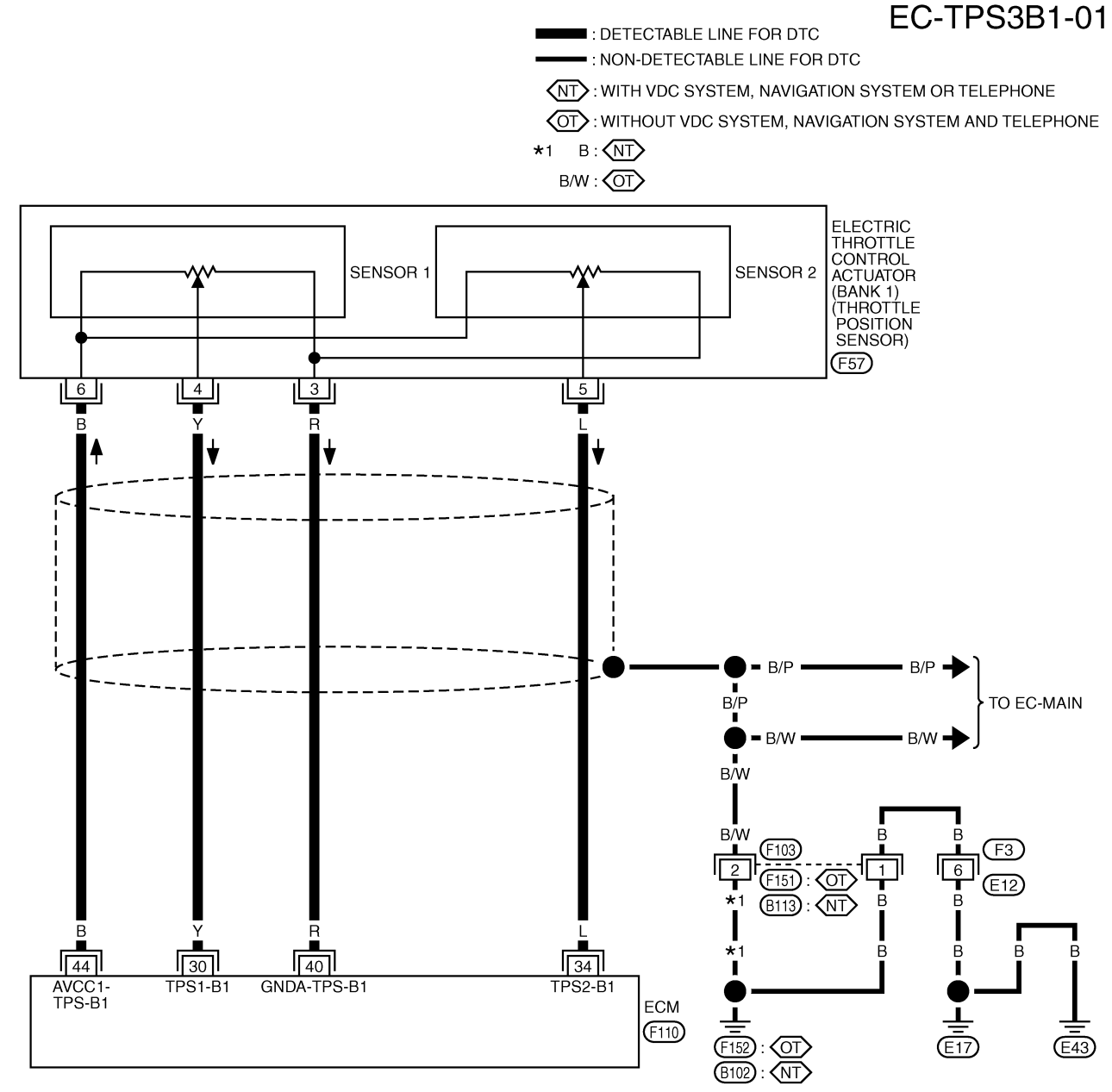
1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-588, "Diagnostic Procedure" .

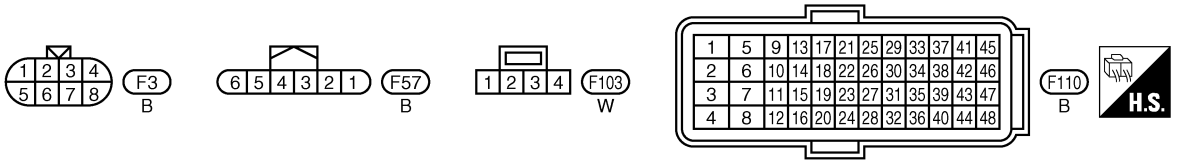
WITH GST

Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
BANK 1

NBS000H9





TBWT1672E

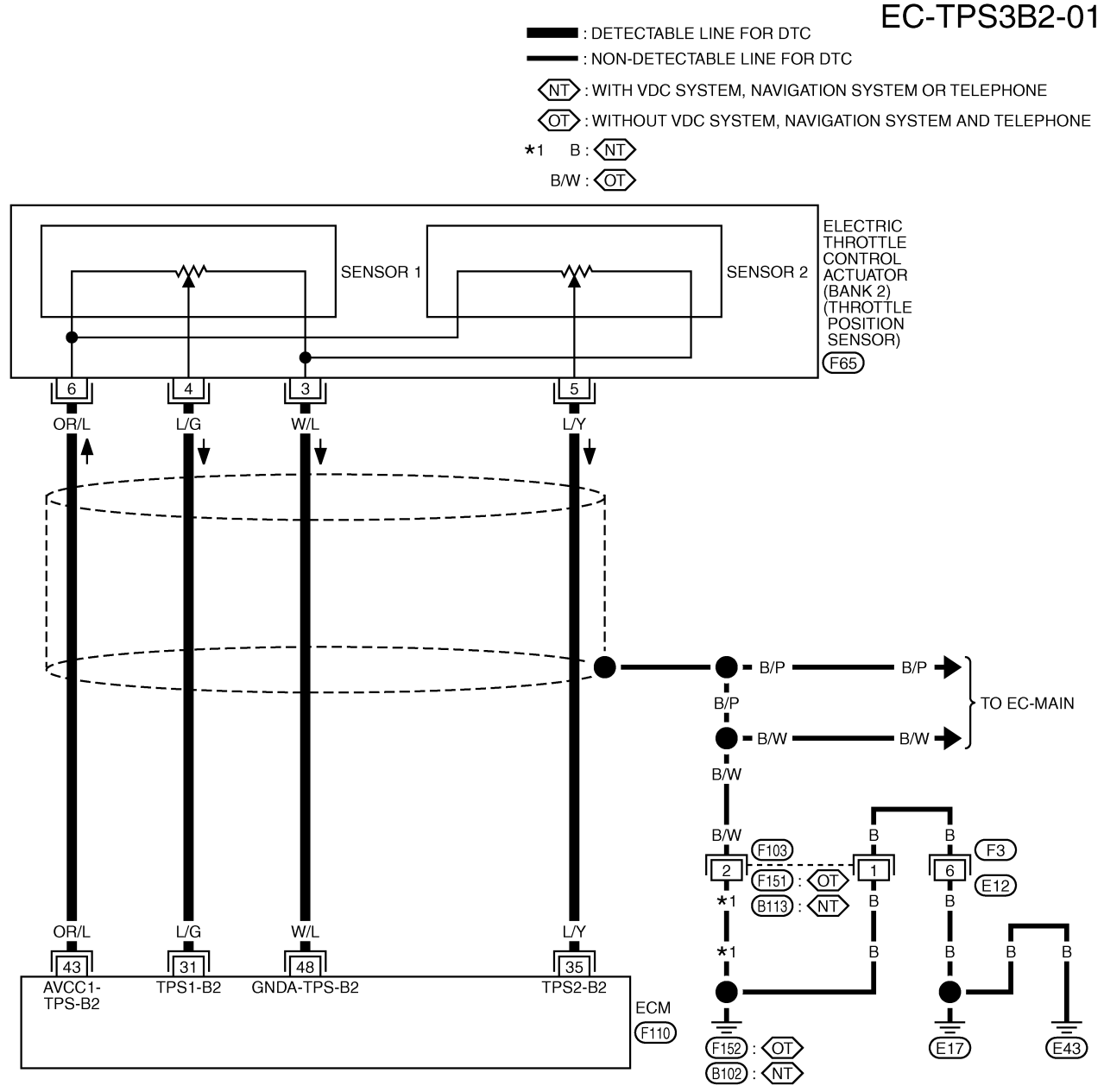
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

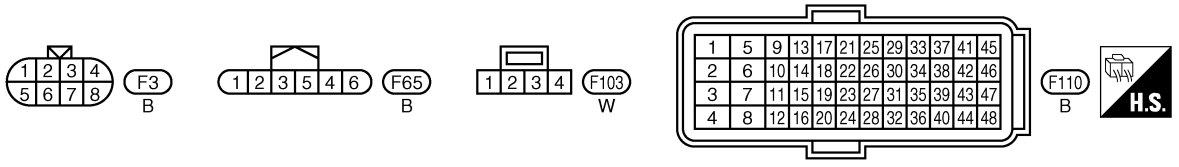
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
30	Y	Throttle position sensor 1 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
34	L	Throttle position sensor 2 (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
40	R	Sensor ground [Throttle position sensor (bank 1)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
44	B	Sensor power supply [Throttle position sensor (bank 1)]	**[Ignition switch: ON]**	5V

BANK 2

EC-TPS3B2-01





TBWT1673E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
31	L/G	Throttle position sensor 1 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	More than 0.36V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	Less than 4.75V
35	L/Y	Throttle position sensor 2 (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	Less than 4.75V
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	More than 0.36V
43	OR/L	Sensor power supply [Throttle position sensor (bank 2)]	**[Ignition switch: ON]**	5V
48	W/L	Sensor ground [Throttle position sensor (bank 2)]	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

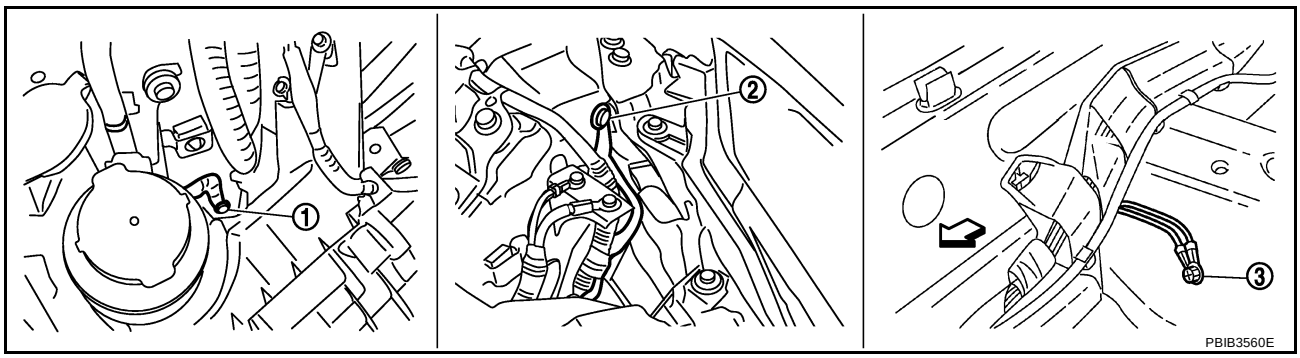
Diagnostic Procedure

NBS000HA

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

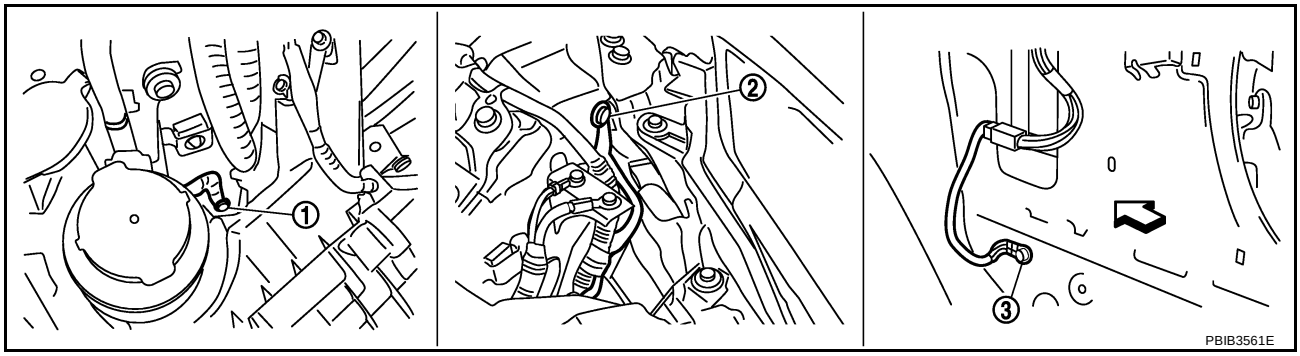


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

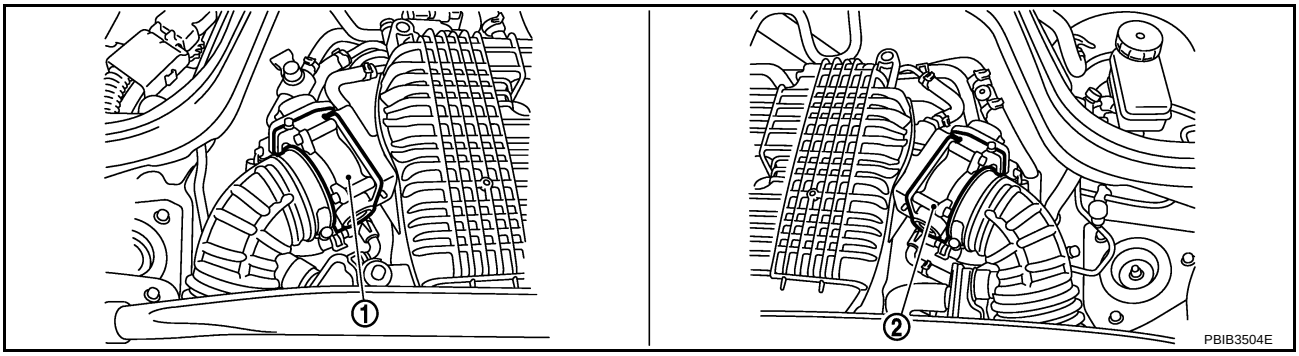
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

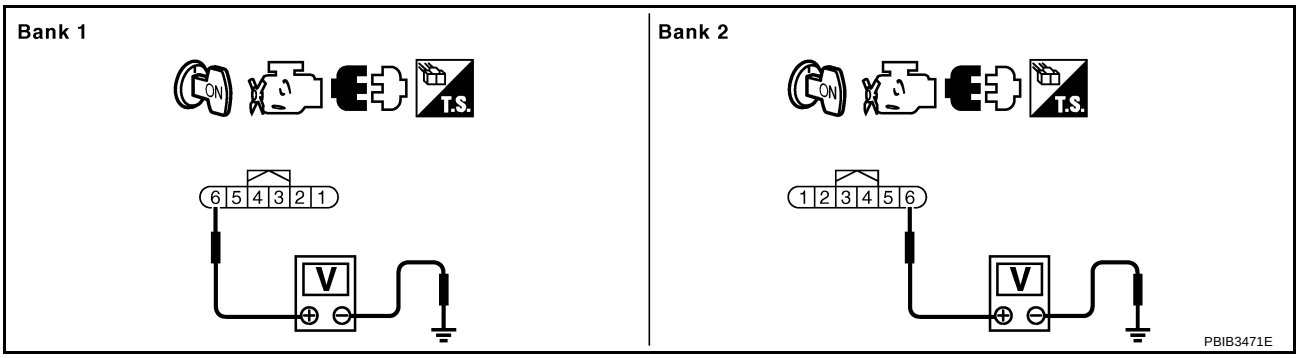
2. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.



1. Electric throttle control actuator (bank 1)
2. Electric throttle control actuator (bank 2)

2. Turn ignition switch ON.
3. Check voltage between electric throttle control actuator terminal 6 and ground with CONSULT-III or tester.



Voltage: Approximately 5V

OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to ground or short to power in harness or connectors.

3. CHECK THROTTLE POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 3 and ECM terminal 40 (bank 1) or 48 (bank 2).
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between the following;
   ECM terminal 30 (bank 1) or 31 (bank 2) and electric throttle control actuator terminal 4,
   ECM terminal 34 (bank 1) or 35 (bank 2) and electric throttle control actuator terminal 5.
   Refer to Wiring Diagram.

   Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK THROTTLE POSITION SENSOR

Refer to EC-590, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace the electric throttle control actuator.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

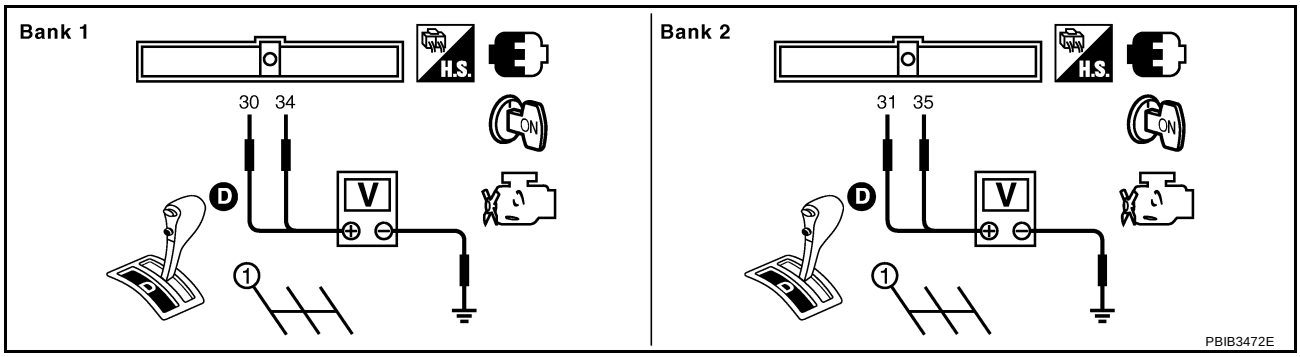
>> **INSPECTION END**

Component Inspection

NBS000HB

THROTTLE POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Perform EC-77, "Throttle Valve Closed Position Learning" .
3. Turn ignition switch ON.
4. Set shift lever to D (A/T) or 1st (M/T) position.
5. Check voltage between ECM terminals 30 [TP sensor 1 (bank 1) signal], 31 [TP sensor 1 (bank 2) signal], 34 [TP sensor 2 (bank 1) signal]. 35 [TP sensor 2 (bank 2) signal] and ground under the following conditions.



Terminal	Accelerator pedal	Voltage
30 [TP sensor 1 (bank 1)] 31 [TP sensor 1 (bank 2)]	Fully released	More than 0.36V
	Fully depressed	Less than 4.75V
34 [TP sensor 2 (bank 1)] 35 [TP sensor 2 (bank 2)]	Fully released	Less than 4.75V
	Fully depressed	More than 0.36V

6. If NG, replace electric throttle control actuator and go to the next step.
7. Perform EC-77, "Throttle Valve Closed Position Learning" .
8. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000HC

ELECTRIC THROTTLE CONTROL ACTUATOR

Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .

DTC P1290, P2100, P2103 THROTTLE CONTROL MOTOR RELAY

PFP:16119

Component Description

NBS000CA

Power supply for the throttle control motor is provided to the ECM via throttle control motor relay. The throttle control motor relay is ON/OFF controlled by the ECM. When the ignition switch is turned ON, the ECM sends an ON signal to throttle control motor relay and battery voltage is provided to the ECM. When the ignition switch is turned OFF, the ECM sends an OFF signal to throttle control motor relay and battery voltage is not provided to the ECM.

CONSULT-III Reference Value in Data Monitor Mode

NBS000CB

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
THRTL RELAY	● Ignition switch: ON	ON

On Board Diagnosis Logic

NBS000CC

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1290 1290 (Bank 2) P2100 2100 (Bank 1)	Throttle control motor relay circuit open	ECM detects a voltage of power source for throttle control motor is excessively low.	● Harness or connectors (The throttle control motor relay circuit is open) ● Throttle control motor relay
P2103 2103	Throttle control motor relay circuit short	ECM detect the throttle control motor relay is stuck ON.	● Harness or connectors (The throttle control motor relay circuit is shorted) ● Throttle control motor relay

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC Confirmation Procedure

NBS000CD

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

PROCEDURE FOR DTC P1290, P2100

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V.

With CONSULT-III

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.
4. If DTC is detected, go to EC-597, "Diagnostic Procedure" .

With GST

Follow the procedure “With CONSULT-III” above.

PROCEDURE FOR DTC P2103

With CONSULT-III

1. Turn ignition switch ON and wait at least 1 second.
2. Start engine and let it idle for 5 seconds.

3. Check DTC.
4. If DTC is detected, go to EC-597, "Diagnostic Procedure" .

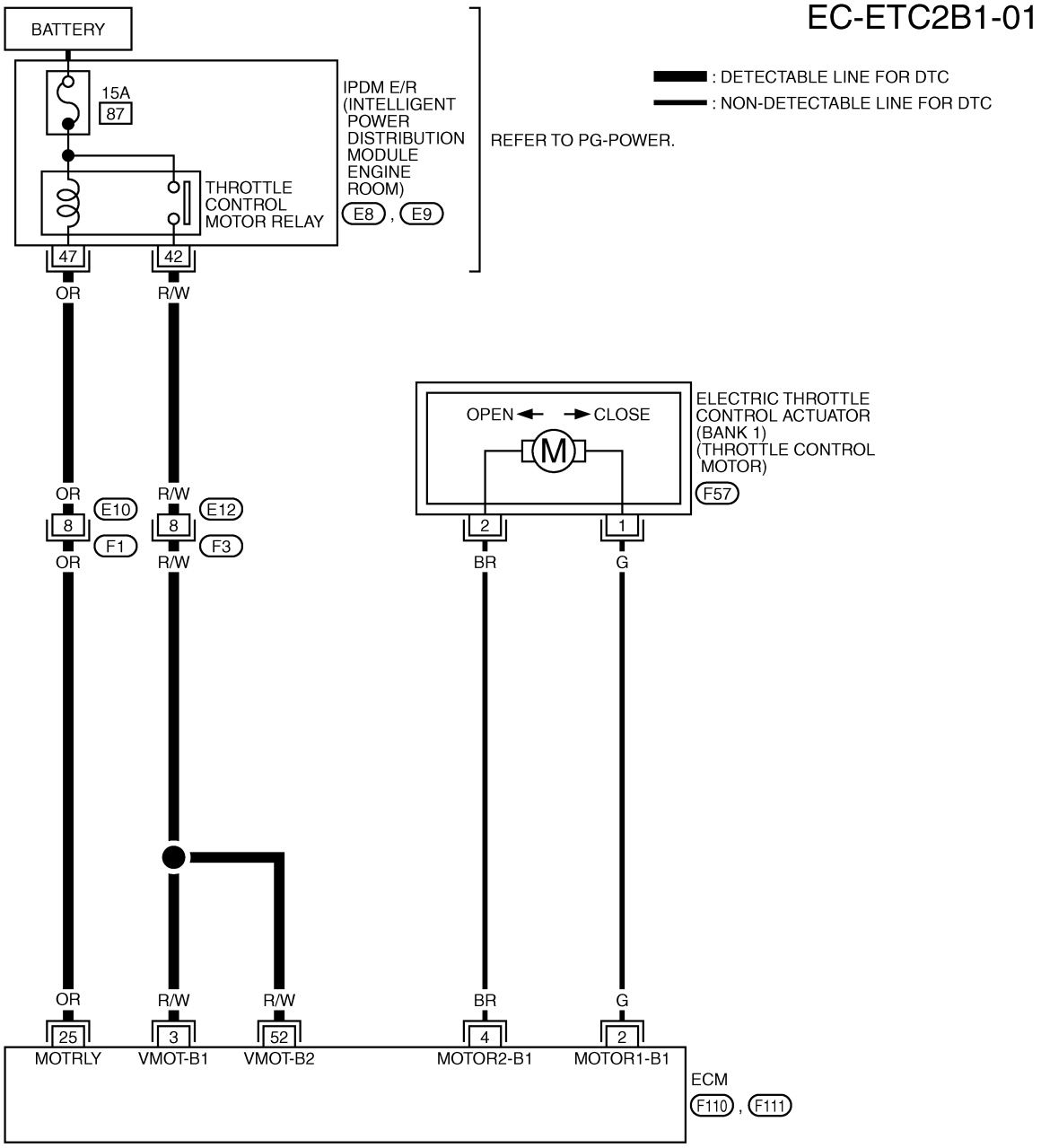
With GST

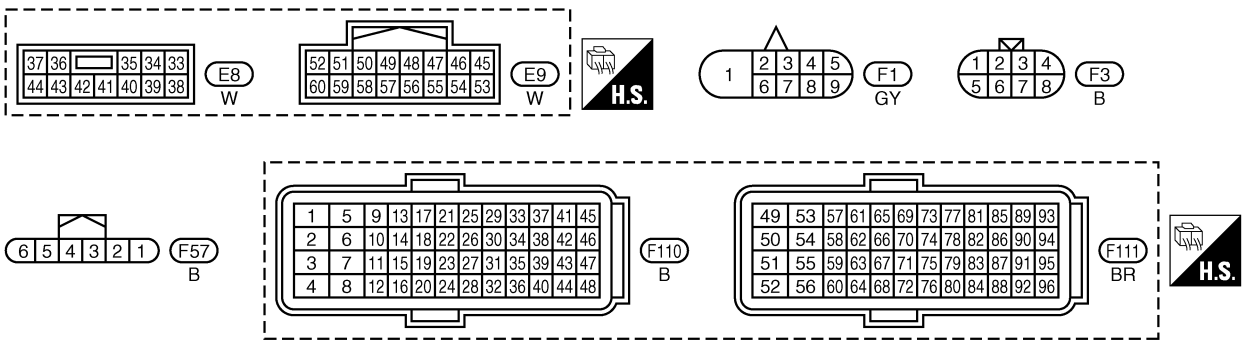
Follow the procedure “With CONSULT-III” above.

Wiring Diagram

NBS000CE

BANK 1

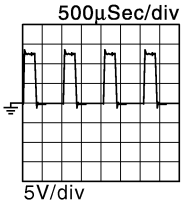
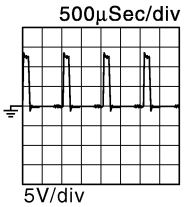
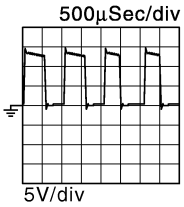




TBWT1664E

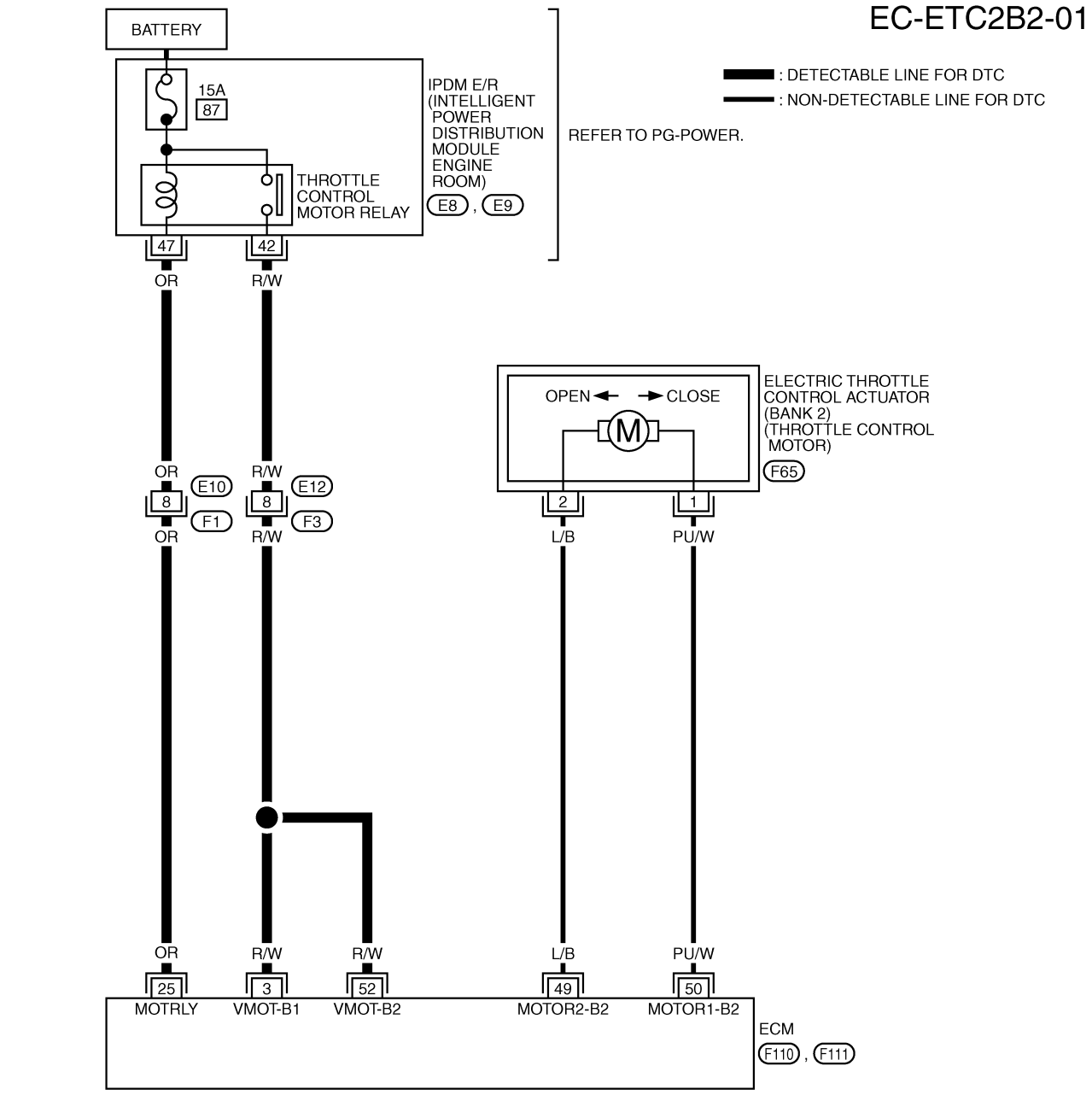
Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

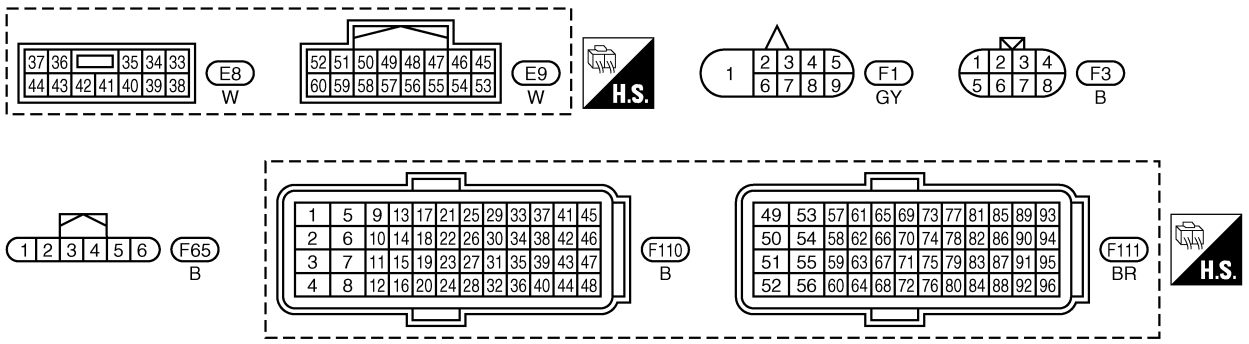
CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
2	G	Throttle control motor (Open) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
4	BR	Throttle control motor (Close) (bank 1)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

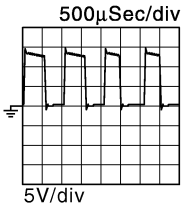
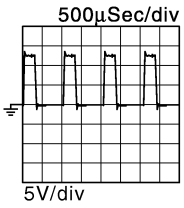
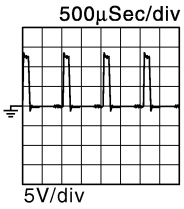




TBWT1665E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
3	R/W	Throttle control motor relay power supply (bank 1)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)
25	OR	Throttle control motor relay	**[Ignition switch: OFF]**	BATTERY VOLTAGE (11 - 14V)
			[Ignition switch: ON]	0 - 1.0V
49	L/B	Throttle control motor (Close) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: In the middle of releasing operation	0 - 14V★  PBIB3541E
50	PU/W	Throttle control motor (Open) (bank 2)	**[Ignition switch: ON]** ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully depressed	0 - 14V★  PBIB3539E
			[Ignition switch: ON] ● Engine stopped ● Shift lever: D (A/T) or 1st (M/T) ● Accelerator pedal: Fully released	0 - 14V★  PBIB3540E
52	R/W	Throttle control motor relay power supply (bank 2)	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

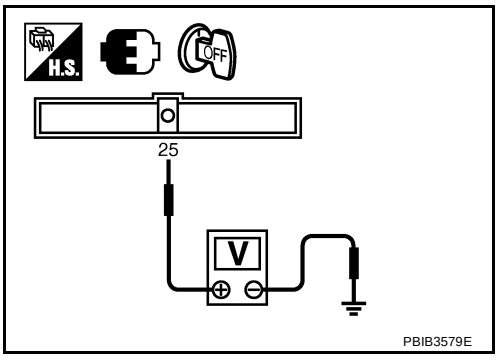
Diagnostic Procedure

NBS000CF

1. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Check voltage between ECM terminal 25 and ground with CONSULT-III or tester.

Voltage: Battery voltage



PBIB3579E

OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E9.
3. Check continuity between ECM terminal 25 and IPDM E/R terminal 47.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E10, F1
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK FUSE

1. Disconnect 15A fuse.
2. Check 15A fuse for blown.

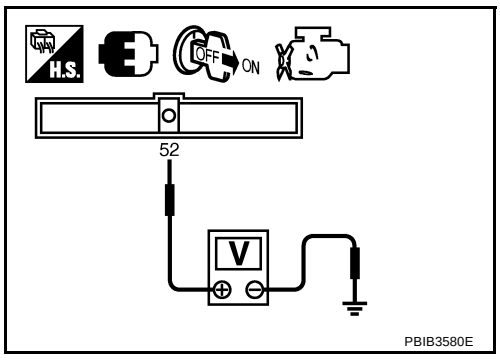
OK or NG

OK >> GO TO 8.
NG >> Replace 15A fuse.

5. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-I

Check voltage between ECM terminal 3 (bank 1), 52 (bank 2) and ground under the following conditions with CONSULT-III or tester.

Ignition switch	Voltage
OFF	Approximately 0V
ON	Battery voltage (11 - 14V)



OK or NG

OK >> GO TO 8.
NG >> GO TO 6.

6. CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT-II

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector E8.
3. Check continuity between ECM terminal 3 (bank 1), 52 (bank 2) and IPDM E/R terminal 42.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between ECM and IPDM E/R

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-16, "IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)" .

NG >> Repair or replace harness or connectors.

DTC P1421 COLD START CONTROL

PFP:23710

Description

NBS006TX

ECM controls ignition timing and engine idle speed when engine is started with prewarming up condition. This control promotes the activation of three way catalyst by heating the catalyst and reduces emissions.

On Board Diagnosis Logic

NBS006TY

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1421 1421	Cold start emission reduction strategy monitoring	ECM does not control ignition timing and engine idle speed properly when engine is started with prewarming up condition.	● Lack of intake air volume ● Fuel injection system ● ECM

DTC Confirmation Procedure

NBS006TZ

NOTE:

- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- **If DTC P1421 is displayed with other DTC, first perform the trouble diagnosis for other DTC.**

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Select “DATA MONITOR” mode with CONSULT-III.
4. Check that the “COOLAN TEMP/S” indication is between 4°C (39°F) and 36°C (97°F).
   If “COOLAN TEMP/S” indication is within the specified value, go to the following step.
   If “COOLANT TEMP/S” indication is out of the specified value, cool engine down or warm engine up and go to step 1.
5. Start engine and let it idle for 5 minutes.
6. Check 1st trip DTC.
7. If 1st trip DTC is detected, go to EC-600, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS006U0

1. PERFORM IDLE AIR VOLUME LEARNING

Perform EC-77, "Idle Air Volume Learning" .
Is Idle Air Volume Learning carried out successfully?

Yes or No

Yes >> GO TO 2.
No >> Follow the instruction of Idle Air Volume Learning.

2. CHECK INTAKE SYSTEM

Check for the cause of intake air volume lacking. Refer to the following.

- Crushed intake air passage
- Intake air passage clogging

OK or NG

OK >> GO TO 3.
NG >> Repair or replace malfunctioning part

3. CHECK FUEL INJECTION SYSTEM FUNCTION

Perform EC-324, "DTC Confirmation Procedure" for DTC P0171.

OK or NG

OK >> GO TO 4.
NG >> Go to EC-330, "Diagnostic Procedure" for DTC P0171.

4. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-III.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-600, "DTC Confirmation Procedure" .
5. Is the 1st trip DTC P1421 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform DTC Confirmation Procedure.**
   See EC-600, "DTC Confirmation Procedure" .
4. Is the 1st trip DTC P1421 displayed again?

Yes or No

Yes >> GO TO 5.
No >> **INSPECTION END**

5. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs.
   Refer to BL-152, "ECM Re-communicating Function" .
3. Perform EC-76, "VIN Registration" .
4. Perform EC-76, "Exhaust Valve Timing Control Learning" .
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

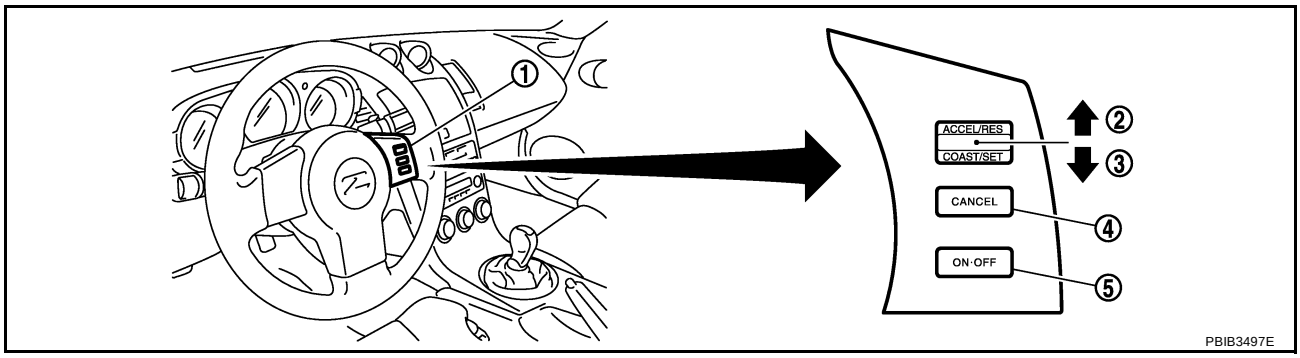
DTC P1564 ASCD STEERING SWITCH

PFP:25551

Component Description

NBS000FT

ASCD steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.



1. ASCD steering switch
2. RESUME/ACCELERATE switch
3. SET/COAST switch
4. CANCEL switch
5. MAIN switch

Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.

CONSULT-III Reference Value in Data Monitor Mode

NBS000FU

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAIN SW	● Ignition switch: ON	MAIN switch: Pressed	ON
		MAIN switch: Released	OFF
CANCEL SW	● Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	● Ignition switch: ON	RESUME/ACCELERATE switch: Pressed	ON
		RESUME/ACCELERATE switch: Released	OFF
SET SW	● Ignition switch: ON	SET/COAST switch: Pressed	ON
		SET/COAST switch: Released	OFF

On Board Diagnosis Logic

NBS000FV

- **This self-diagnosis has the one trip detection logic.**
- **The MIL will not light up for this self-diagnosis.**

NOTE:
If DTC P1564 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605.
Refer to EC-512, "DTC P0605 ECM".

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1564 1564	ASCD steering switch	● An excessively high voltage signal from the ASCD steering switch is sent to ECM. ● ECM detects that input signal from the ASCD steering switch is out of the specified range. ● ECM detects that the ASCD steering switch is stuck ON.	● Harness or connectors (The switch circuit is open or shorted.) ● ASCD steering switch ● ECM

DTC Confirmation Procedure

NBS000FW

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-III

1. Turn ignition switch ON and wait at least 10 seconds.
2. Press MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
3. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
4. Press RESUME/ACCELERATE switch for at least 10 seconds, then release it and wait at least 10 seconds.
5. Press SET/COAST switch for at least 10 seconds, then release it and wait at least 10 seconds.
6. Check DTC.
7. If DTC is detected, go to EC-606, "Diagnostic Procedure" .

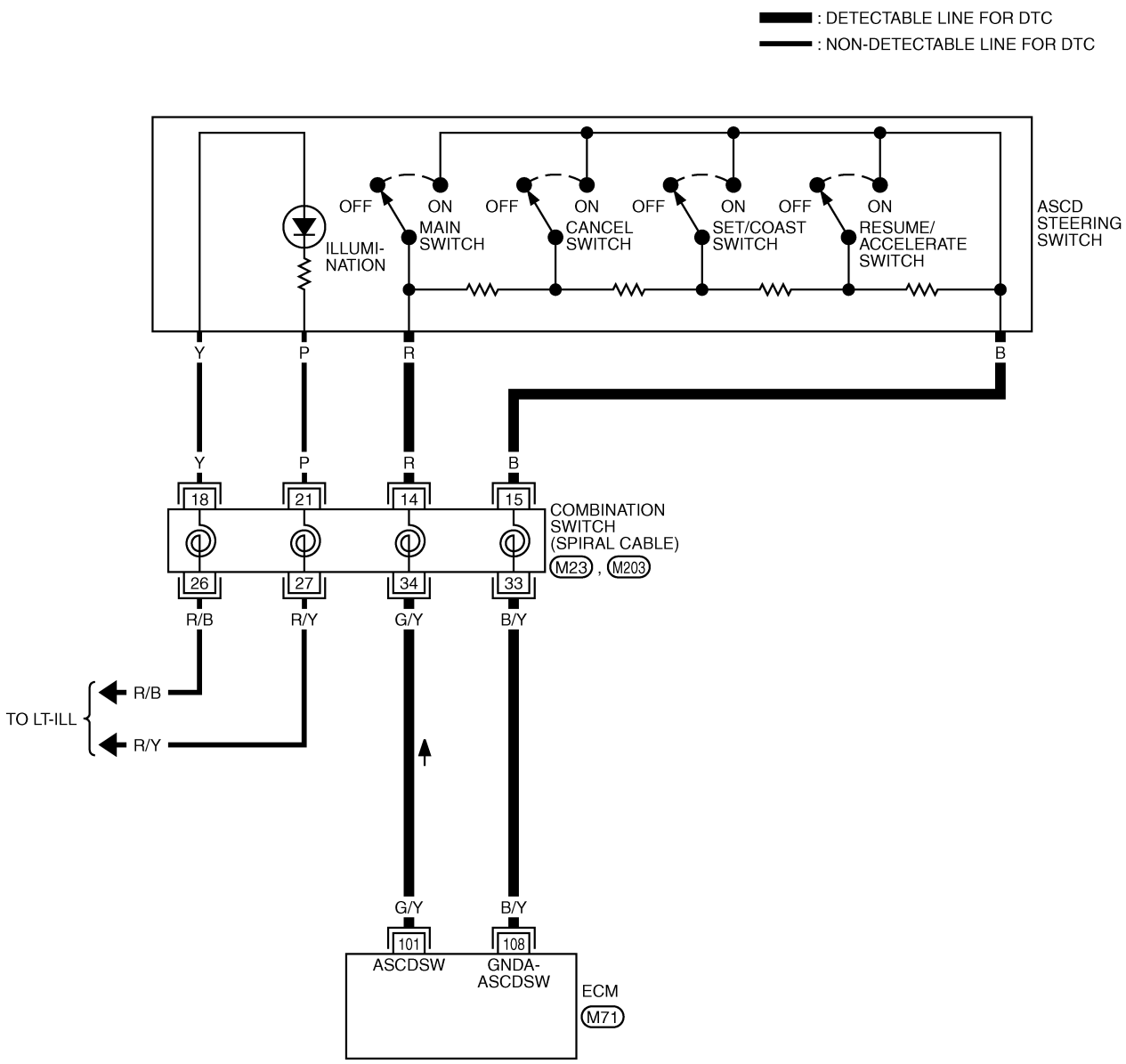
WITH GST

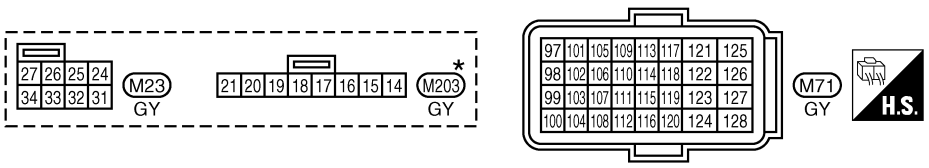
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000FX

EC-ASC/SW-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TBWT1660E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
101	G/Y	ASCD steering switch	**[Ignition switch: ON]** ● ASCD steering switch: OFF	4V
			[Ignition switch: ON] ● MAIN switch: Pressed	0V
			[Ignition switch: ON] ● CANCEL switch: Pressed	1V
			[Ignition switch: ON] ● RESUME/ACCELERATE switch: Pressed	3V
			[Ignition switch: ON] ● SET/COAST switch: Pressed	2V
108	B/Y	Sensor ground (ASCD steering switch)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

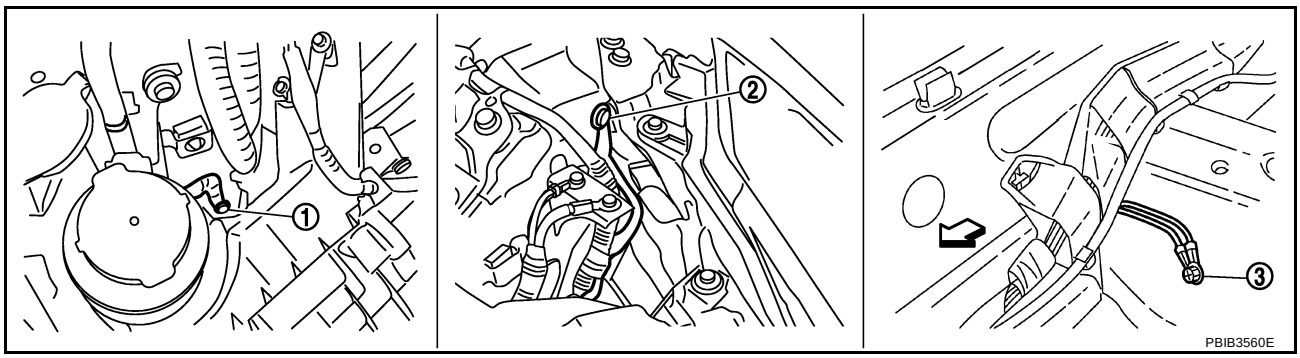
Diagnostic Procedure

NBS000FY

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

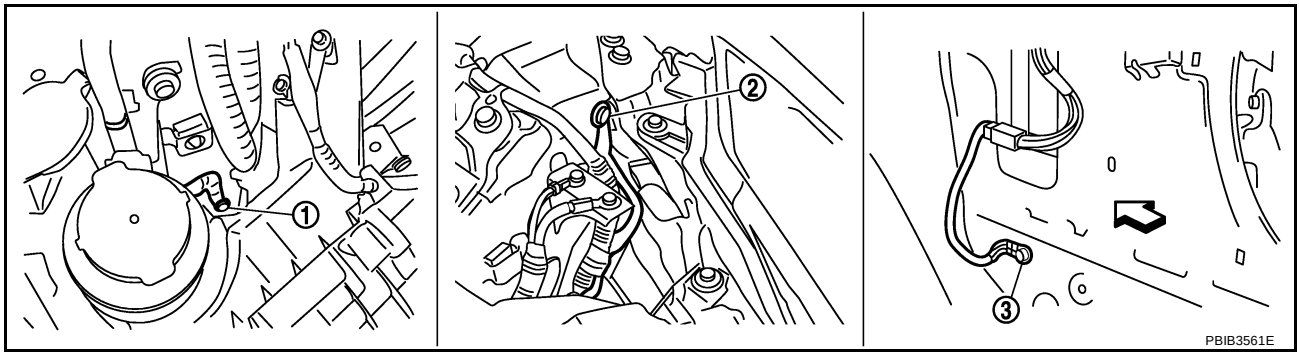


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK ASCD STEERING SWITCH CIRCUIT

With CONSULT-III

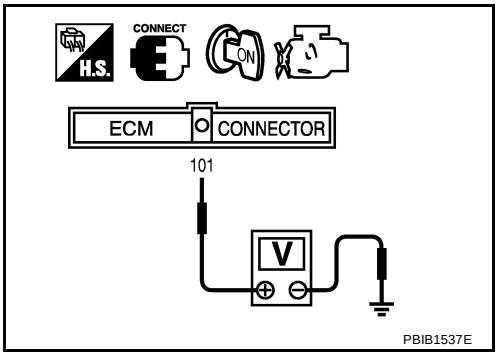
1. Turn ignition switch ON.
2. Select “MAIN SW”, “RESUME/ACC SW”, “SET SW” and “CANCEL SW” in “DATA MONITOR” mode with CONSULT-III.
3. Check each item indication under the following conditions.

Switch	Monitor item	Condition	Indication
MAIN switch	MAIN SW	Pressed	ON
		Released	OFF
CANCEL switch	CANCEL SW	Pressed	ON
		Released	OFF
RESUME/ACCELERATE switch	RESUME/ACC SW	Pressed	ON
		Released	OFF
SET/COAST switch	SET SW	Pressed	ON
		Released	OFF

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 101 and ground with pressing each button.

Switch	Condition	Voltage [V]
MAIN switch	Pressed	Approx. 0
	Released	Approx. 4
CANCEL switch	Pressed	Approx. 1
	Released	Approx. 4
RESUME/ACCELERATE switch	Pressed	Approx. 3
	Released	Approx. 4
SET/COAST switch	Pressed	Approx. 2
	Released	Approx. 4



OK or NG

OK >> GO TO 8.
NG >> GO TO 3.

3. CHECK ASCD STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect combination switch harness connector M203.
4. Check harness continuity between combination switch terminal 15 and ECM terminal 108. Refer to Wiring Diagram.

Continuity should exist.

5. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 101 and combination switch terminal 14. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Combination switch (spiral cable)
- Harness for open and short between ECM and combination switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD STEERING SWITCH

Refer to EC-609, "Component Inspection" .

OK or NG

OK >> GO TO 8.
NG >> Replace steering wheel.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

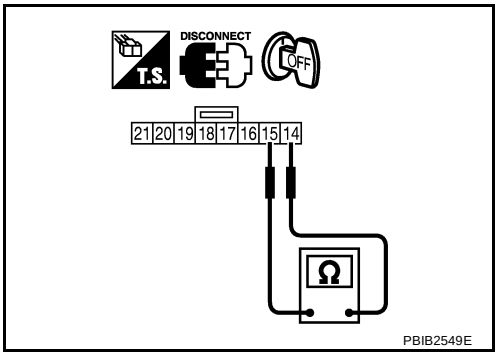
>> **INSPECTION END**

Component Inspection

NBS000FZ

ASCD STEERING SWITCH

1. Disconnect combination switch (spiral cable) harness connector M203.
2. Check continuity between combination switch harness connector terminals 14 and 15 with pushing each switch.



Switch	Condition	Resistance [Ω]
MAIN switch	Pressed	Approx. 0
	Released	Approx. 4,000
CANCEL switch	Pressed	Approx. 250
	Released	Approx. 4,000
RESUME/ACCELERATE switch	Pressed	Approx. 1,480
	Released	Approx. 4,000
SET/COAST switch	Pressed	Approx. 660
	Released	Approx. 4,000

3. If NG, replace ASCD steering switch.

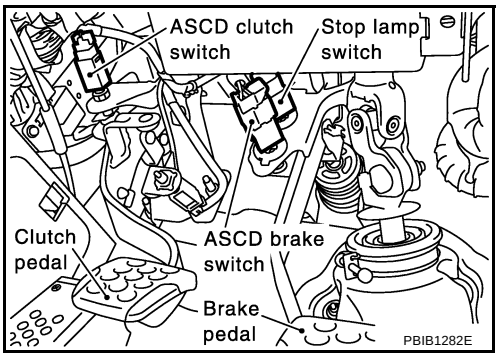
DTC P1572 ASCD BRAKE SWITCH

PFP:25320

Component Description

NBS000G0

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by this input of two kinds (ON/OFF signal).
Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-III Reference Value in Data Monitor Mode

NBS000G1

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW1 (ASCD brake switch)	● Ignition switch: ON	● Brake pedal: Fully released (A/T) ● Brake pedal and clutch pedal: Fully released (M/T)	ON
		● Brake pedal: Slightly depressed (A/T) ● Brake pedal and/or clutch pedal: Slightly depressed (M/T)	OFF
BRAKE SW2 (Stop lamp switch)	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

NBS000G2

- **This self-diagnosis has the one trip detection logic.**
- **The MIL will not light up for this self-diagnosis.**

NOTE:

- **If DTC P1572 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-512, "DTC P0605 ECM".**
- **This self-diagnosis has the one trip detection logic. When malfunction A is detected, DTC is not stored in ECM memory. And in that case, 1st trip DTC and 1st trip freeze frame data are displayed. 1st trip DTC is erased when ignition switch OFF. And even when malfunction A is detected in two consecutive trips, DTC is not stored in ECM memory.**

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition		Possible Cause
P1572 1572	ASCD brake switch	A)	When the vehicle speed is above 30km/h (19 MPH), ON signals from the stop lamp switch and the ASCD brake switch are sent to ECM at the same time.	● Harness or connectors (The stop lamp switch circuit is shorted.) ● Harness or connectors (The ASCD brake switch circuit is shorted.) ● Harness or connectors (The ASCD clutch switch circuit is shorted.) (M/T models) ● Stop lamp switch ● ASCD brake switch ● ASCD clutch switch (M/T models) ● Incorrect stop lamp switch installation ● Incorrect ASCD brake switch installation ● Incorrect ASCD clutch switch installation (M/T models) ● ECM
		B)	ASCD brake switch signal is not sent to ECM for extremely long time while the vehicle is driving	

DTC Confirmation Procedure

NBS000G3

CAUTION:
Always drive vehicle at a safe speed.

NOTE:

- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
- Procedure for malfunction B is not described here. It takes extremely long time to complete procedure for malfunction B. By performing procedure for malfunction A, the incident that causes malfunction B can be detected.

TESTING CONDITION:
Steps 4 and 5 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-III

1. Start engine (VDC switch or TCS switch OFF).
2. Select “DATA MONITOR” mode with CONSULT-III.
3. Press MAIN switch and make sure that CRUISE indicator lights up.
4. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Shift lever	Suitable position

5. Check 1st trip DTC.
6. If 1st trip DTC is detected, go to EC-615, "Diagnostic Procedure" .
   If 1st trip DTC is not detected, go to the following step.
7. Drive the vehicle for at least 5 consecutive seconds under the following condition.

VHCL SPEED SE	More than 30 km/h (19 MPH)
Shift lever	Suitable position
Driving location	Depress the brake pedal for more than five seconds so as not to come off from the above-mentioned vehicle speed.

8. Check 1st trip DTC.
9. If 1st trip DTC is detected, go to EC-615, "Diagnostic Procedure" .

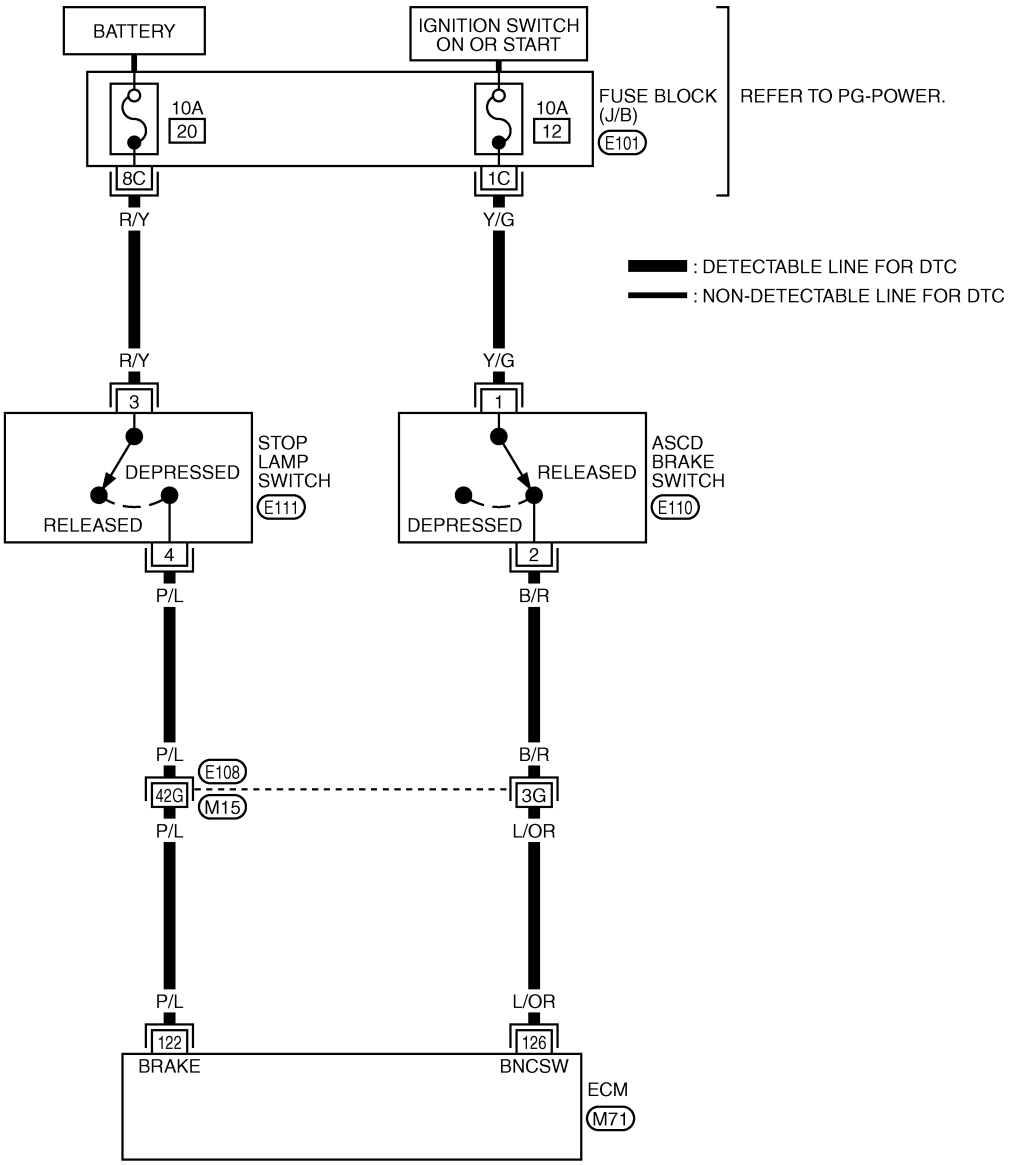
WITH GST

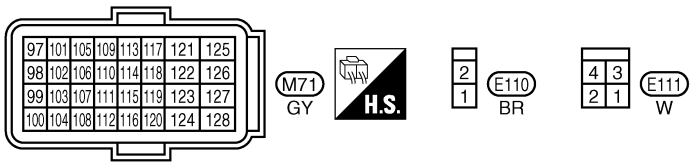
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram
A/T MODELS

NBS000G4

EC-ASC/BS-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1661E

Specification data are reference values and are measured between each terminal and ground.

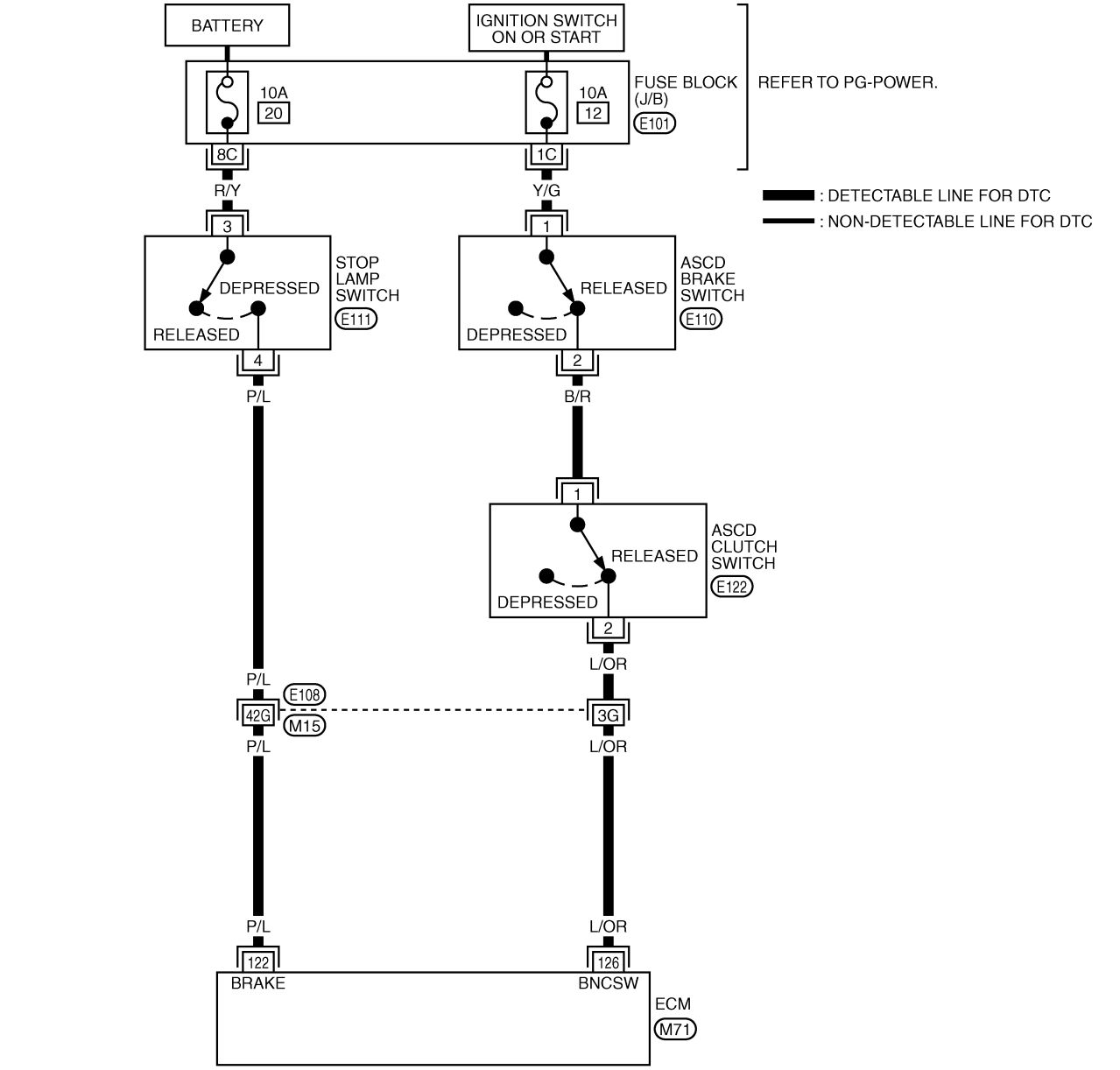
CAUTION:

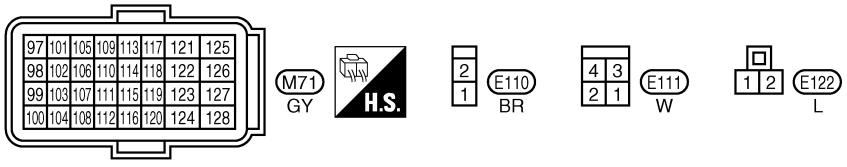
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal: Slightly depressed	0V
			[Ignition switch: ON] ● Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14V)

M/T MODELS

EC-ASC/BS-02





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1662E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal and/or clutch pedal: Slightly depressed	0V
			[Ignition switch: ON] ● Brake pedal and clutch pedal: Fully released	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS000G5

A/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-III

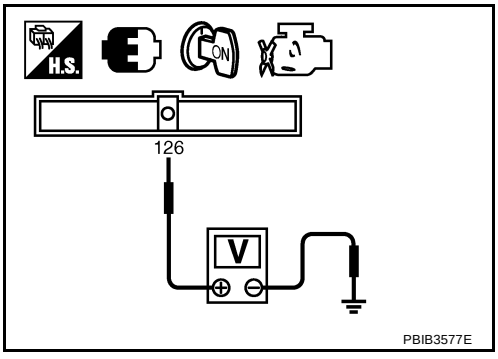
1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-III.
3. Check “BRAKE SW1” indication under the following conditions.

CONDITION	INDICATION
Brake pedal: Slightly depressed	OFF
Brake pedal: Fully released	ON

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 126 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal: Slightly depressed	Approximately 0V
Brake pedal: Fully released	Battery voltage



OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT-III

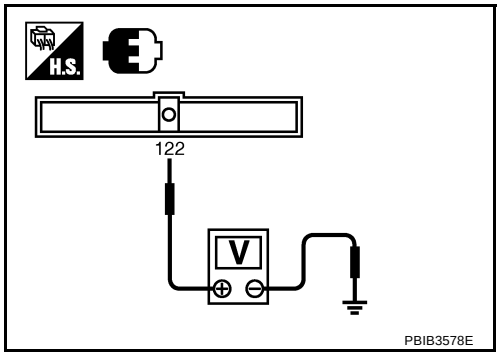
1. Select “BRAKE SW2” in “DATA MONITOR” mode with CONSULT-III.
2. Check “BRAKE SW2” indication under the following conditions.

CONDITION	INDICATION
Brake pedal: Fully released	OFF
Brake pedal: Slightly depressed	ON

Without CONSULT-III

Check voltage between ECM terminal 122 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal: Fully released	Approximately 0V
Brake pedal: Slightly depressed	Battery voltage

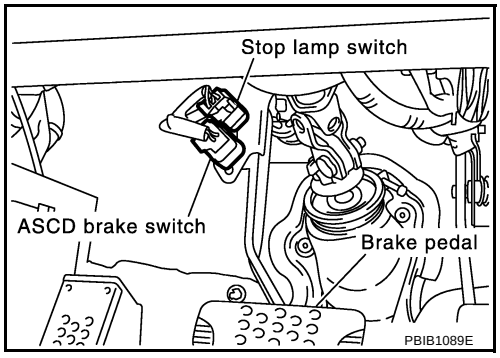


OK or NG

OK >> GO TO 13.
NG >> GO TO 8.

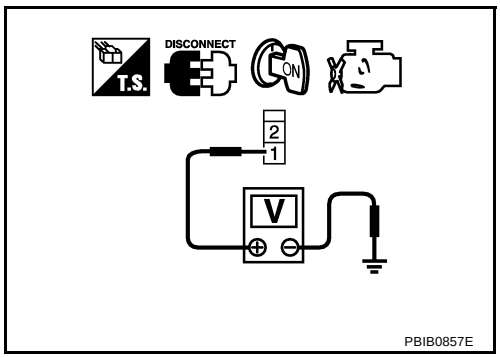
3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 126 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

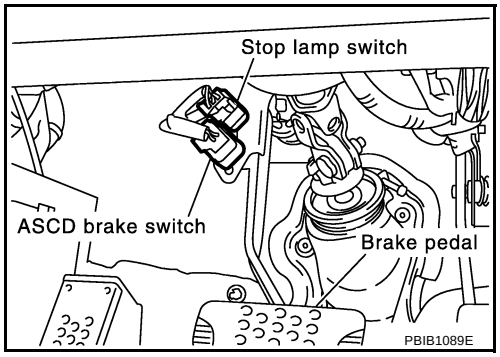
Refer to EC-624, "Component Inspection"

OK or NG

OK >> GO TO 13.
NG >> Replace ASCD brake switch.

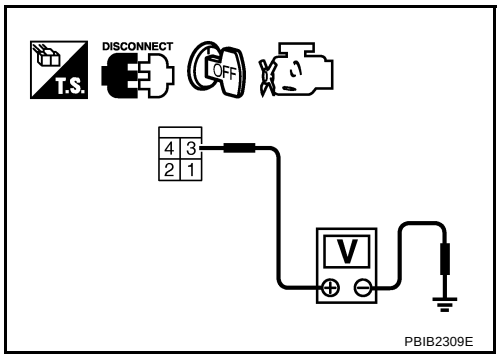
8. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.



3. Check voltage between stop lamp switch terminal 3 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and battery

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 122 and stop lamp switch terminal 4. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 12.
NG >> GO TO 11.

11. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

12. CHECK STOP LAMP SWITCH

Refer to EC-624, "Component Inspection"

OK or NG

OK >> GO TO 13.
NG >> Replace stop lamp switch.

13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

M/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-III

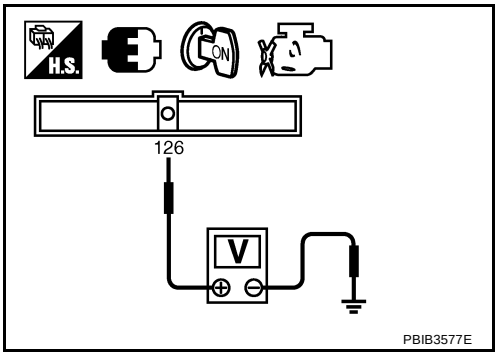
1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-III.
3. Check “BRAKE SW1” indication under the following conditions.

CONDITION	INDICATION
Brake pedal and/or clutch pedal: Slightly depressed	OFF
Brake pedal and clutch pedal: Fully released	ON

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 126 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal and/or clutch pedal: Slightly depressed	Approximately 0V
Brake pedal and clutch pedal: Fully released	Battery voltage



OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK OVERALL FUNCTION-II

With CONSULT-III

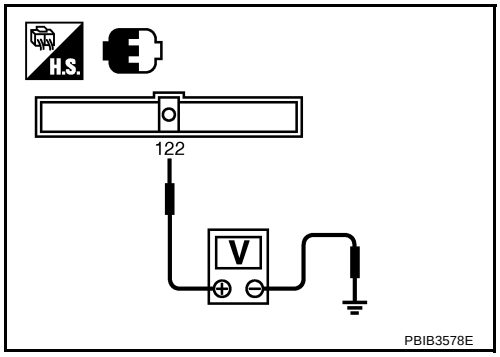
1. Select “BRAKE SW2” in “DATA MONITOR” mode with CONSULT-III.
2. Check “BRAKE SW2” indication under the following conditions.

CONDITION	INDICATION
Brake pedal: Fully released	OFF
Brake pedal: Slightly depressed	ON

Without CONSULT-III

Check voltage between ECM terminal 122 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal: Fully released	Approximately 0V
Brake pedal: Slightly depressed	Battery voltage

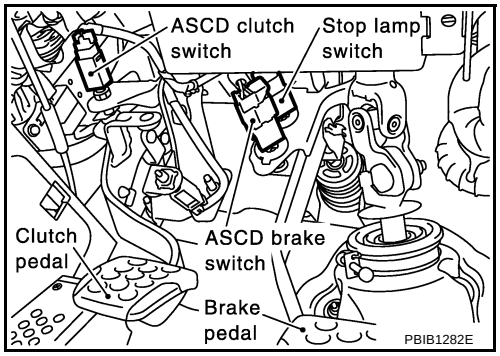


OK or NG

OK >> GO TO 16.
NG >> GO TO 11.

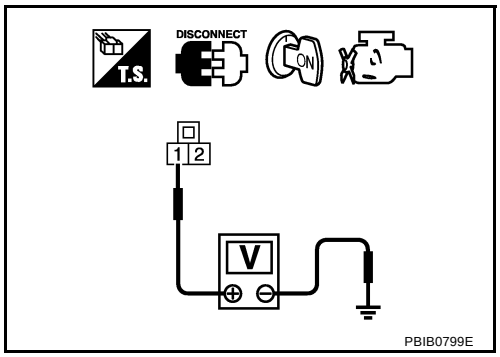
3. CHECK ASCD BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD clutch switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage

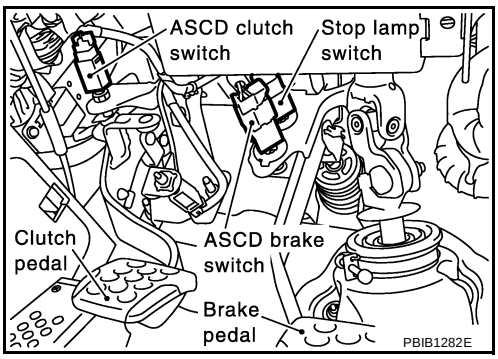


OK or NG

OK >> GO TO 8.
NG >> GO TO 4.

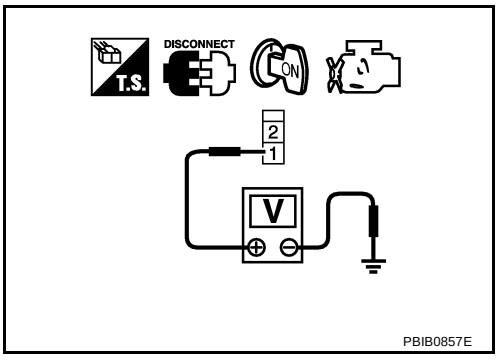
4. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ASCD brake switch terminal 2 and ASCD clutch switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK ASCD BRAKE SWITCH

Refer to EC-624, "Component Inspection"

OK or NG

OK >> GO TO 16.
NG >> Replace ASCD brake switch.

8. CHECK ASCD CLUTCH SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ASCD clutch switch terminal 2 and ECM terminal 126. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and ASCD clutch switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK ASCD CLUTCH SWITCH

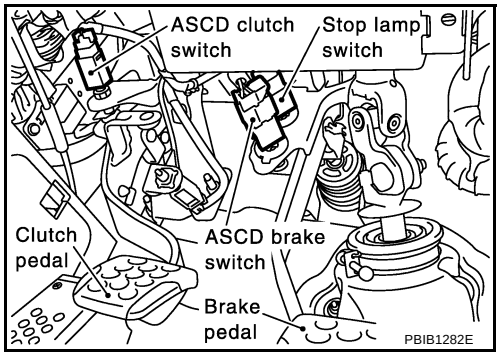
Refer to EC-624, "Component Inspection" .

OK or NG

OK >> GO TO 16.
NG >> Replace ASCD clutch switch.

11. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.

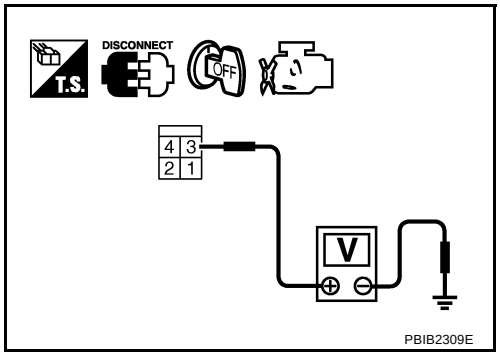


3. Check voltage between stop lamp switch terminal 3 and ground with CONSULT-III or tester.

Voltage: Battery voltage

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.



12. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between stop lamp switch and battery

>> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 122 and stop lamp switch terminal 4. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

14. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

15. CHECK STOP LAMP SWITCH

Refer to EC-624, "Component Inspection"

OK or NG

OK >> GO TO 16.
NG >> Replace stop lamp switch.

16. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

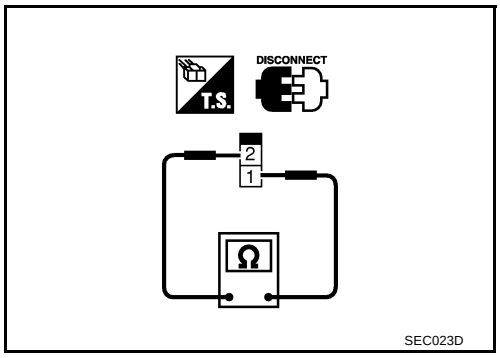
NBS000G6

ASCD BRAKE SWITCH

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Check continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
Brake pedal: Fully released	Should exist
Brake pedal: Slightly depressed	Should not exist

If NG, adjust ASCD brake switch installation, refer to BR-7, "BRAKE PEDAL" , and perform step 3 again.

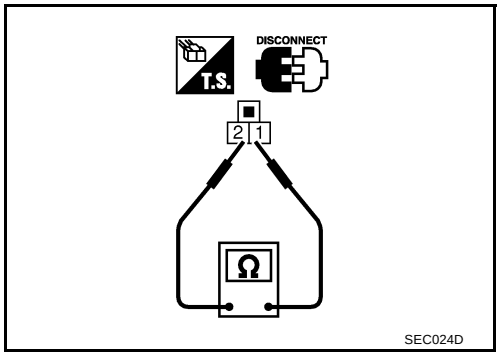


ASCD CLUTCH SWITCH (M/T MODELS)

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Check continuity between ASCD clutch switch terminals 1 and 2 under the following conditions.

Condition	Continuity
Clutch pedal: Fully released	Should exist
Clutch pedal: Slightly depressed	Should not exist

If NG, adjust ASCD clutch switch installation, refer to CL-5, "CLUTCH PEDAL" , and perform step 3 again.

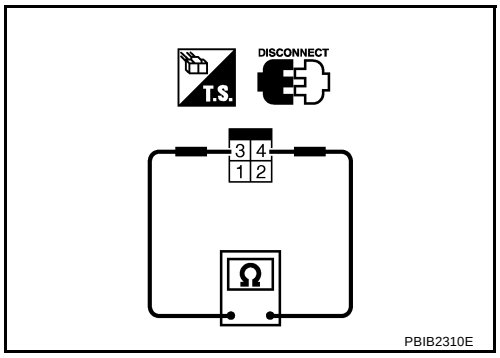


STOP LAMP SWITCH

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check continuity between stop lamp switch terminals 3 and 4 under the following conditions.

Condition	Continuity
Brake pedal: Fully released	Should not exist
Brake pedal: Slightly depressed	Should exist

If NG, adjust stop lamp switch installation, refer to BR-7, "BRAKE PEDAL" , and perform step 3 again.



DTC P1574 ASCD VEHICLE SPEED SENSOR

PFP:31036

Component Description

NBS000G7

The ECM receives two vehicle speed sensor signals via CAN communication line. One is sent from “unified meter and A/C amp.”, and the other is from TCM (Transmission control module). The ECM uses these signals for ASCD control. Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for ASCD functions.

On Board Diagnosis Logic

NBS000G8

- **This self-diagnosis has the one trip detection logic.**
- **The MIL will not light up for this self-diagnosis.**

NOTE:

- **If DTC P1574 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1574 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**
- **If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500. Refer to EC-496, "DTC P0500 VSS"**
- **If DTC P1574 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-512, "DTC P0605 ECM"**

DTC No.	Trouble Diagnosis Name	DTC Detecting Condition	Possible Cause
P1574 1574	ASCD vehicle speed sensor	ECM detects a difference between two vehicle speed signals is out of the specified range.	● Harness or connectors (The CAN communication line is open or shorted.) ● Unified meter and A/C amp. ● VDC/TCS/ABS control unit (with VDC models) ● ABS actuator and electric unit (control unit) (without VDC models) ● Wheel sensor ● TCM(A/T models) ● ECM

DTC Confirmation Procedure

NBS000G9

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Step 3 may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

WITH CONSULT-III

1. Start engine (VDC switch or TCS switch OFF).
2. Select “DATA MONITOR” mode with CONSULT-III.
3. Drive the vehicle at more than 40 km/h (25 MPH).
4. Check DTC.
5. If DTC is detected, go to EC-626, "Diagnostic Procedure" .

WITH GST

Follow the procedure “WITH CONSULT-III” above.

Diagnostic Procedure

NBS000GA

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to AT-37 .

OK or NG

OK >> GO TO 2.
NG >> Perform trouble shooting relevant to DTC indicated.

2. CHECK DTC WITH “VDC/TSC/ABS CONTROL UNIT (WITH VDC MODELS)” OR “ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITHOUT VDC MODELS)”

Refer to BRC-82, "TROUBLE DIAGNOSIS" or refer to BRC-42, "TROUBLE DIAGNOSIS" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace.

3. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

Refer to DI-4, "COMBINATION METERS" .

>> **INSPECTION END**

DTC P1715 INPUT SPEED SENSOR (TURBINE REVOLUTION SENSOR)

PFP:31935

Description

NBS002VP

ECM receives turbine revolution sensor signal from TCM through CAN communication line. ECM uses this signal for engine control.

CONSULT-III Reference Value in Data Monitor Mode

NBS002VQ

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
I/P PULLY SPD	● Vehicle speed: More than 20 km/h (12 MPH)	Almost the same speed as the tachometer indication

On Board Diagnosis Logic

NBS002VR

NOTE:

- **If DTC P1715 is displayed with DTC U1000, U1001 first perform the trouble diagnosis for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .**
- **If DTC P1715 is displayed with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to EC-154, "DTC U1010 CAN COMMUNICATION" .**
- **If DTC P1715 is displayed with DTC P0605, first perform the trouble diagnosis for DTC P0605. Refer to EC-512, "DTC P0605 ECM" .**
- **If DTC P1715 is displayed with DTC P0335, first perform the trouble diagnosis for DTC P0335. Refer to EC-386, "DTC P0335 CKP SENSOR (POS)" .**
- **If DTC P1715 is displayed with DTC P0340 or P0345 first perform the trouble diagnosis for DTC P0340 or P0345. Refer to EC-394, "DTC P0340, P0345 CMP SENSOR (PHASE)" .**

The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1715 1715	Input speed sensor (Turbine revolution sensor) (TCM output)	Turbine revolution sensor signal is different from the theoretical value calculated by ECM from revolution sensor signal and engine rpm signal.	● Harness or connectors (The CAN communication line is open or shorted) ● Harness or connectors (Turbine revolution sensor circuit is open or shorted) ● TCM

Diagnostic Procedure

NBS002VS

1. CHECK DTC WITH TCM

Check DTC with TCM. Refer to AT-37, "ON BOARD DIAGNOSTIC (OBD) SYSTEM" .

OK or NG

OK >> GO TO 2.
NG >> Perform trouble shooting relevant to DTC indicated.

2. REPLACE TCM

Replace TCM. Refer to AT-40, "TROUBLE DIAGNOSIS" .

>> **INSPECTION END**

DTC P1805 BRAKE SWITCH

PFP:25320

Description

NBS000GI

Brake switch signal is applied to the ECM through the stop lamp switch when the brake pedal is depressed. This signal is used mainly to decrease the engine speed when the vehicle is driving.

CONSULT-III Reference Value in Data Monitor Mode

NBS000GJ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

NBS000GK

The MIL will not light up for this self-diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1805 1805	Brake switch	A brake switch signal is not sent to ECM for extremely long time while the vehicle is driving.	● Harness or connectors (The stop lamp switch circuit is open or shorted.) ● Stop lamp switch

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Engine operating condition in fail-safe mode	
ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.	
Vehicle condition	Driving condition
When engine is idling	Normal
When accelerating	Poor acceleration

DTC Confirmation Procedure

NBS000GL

WITH CONSULT-III

1. Turn ignition switch ON.
2. Fully depress the brake pedal for at least 5 seconds.
3. Erase the DTC with CONSULT-III.
4. Check 1st trip DTC.
5. If 1st trip DTC is detected, go to EC-630, "Diagnostic Procedure" .

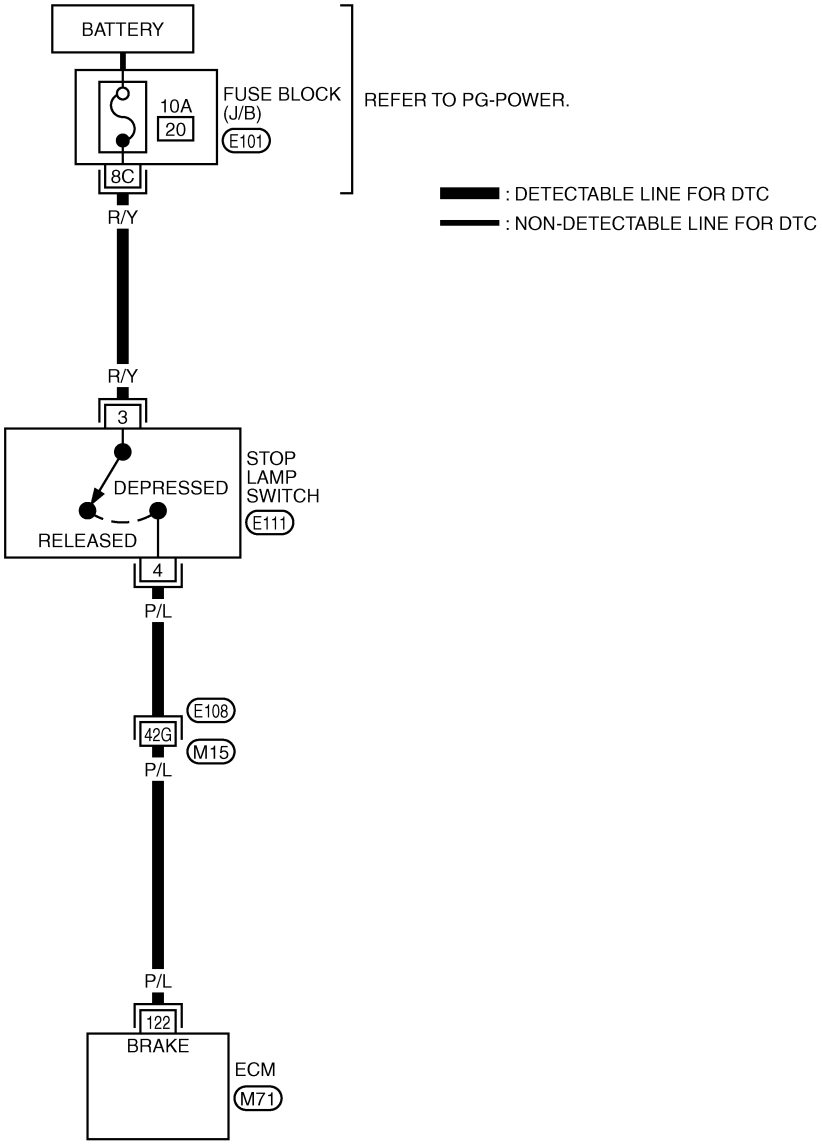
WITH GST

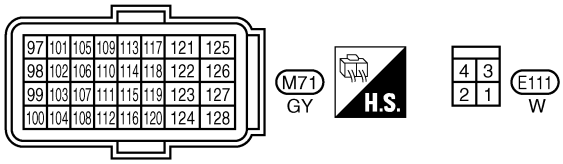
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

NBS000GM

EC-BRK/SW-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1663E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS000GN

1. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Check the stop lamp when depressing and releasing the brake pedal.

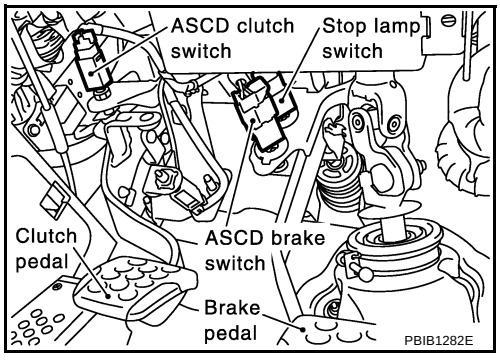
Brake pedal	Stop lamp
Fully released	Not illuminated
Slightly depressed	Illuminated

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

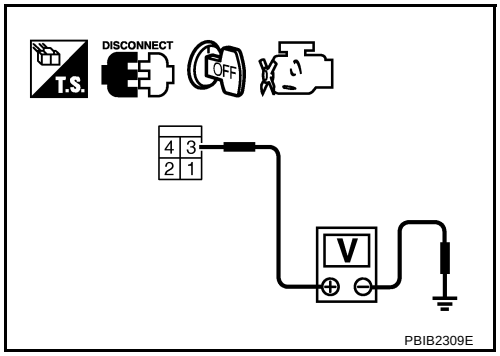
2. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.



2. Check voltage between stop lamp switch terminal 3 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- 10A fuse
- Fuse block (J/B) connector E101
- Harness for open and short between stop lamp switch and fuse

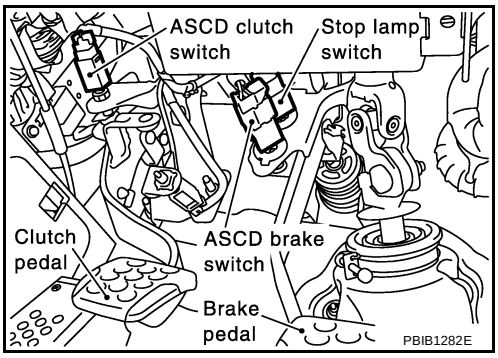
>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Disconnect stop lamp switch harness connector.
3. Check harness continuity between ECM terminal 122 and stop lamp switch terminal 4.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and stop lamp switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK STOP LAMP SWITCH

Refer to EC-632, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace stop lamp switch.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

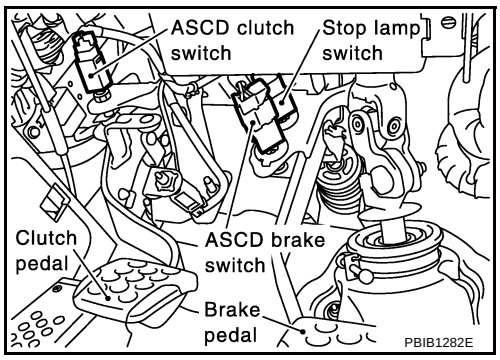
>> **INSPECTION END**

Component Inspection

NBS000GO

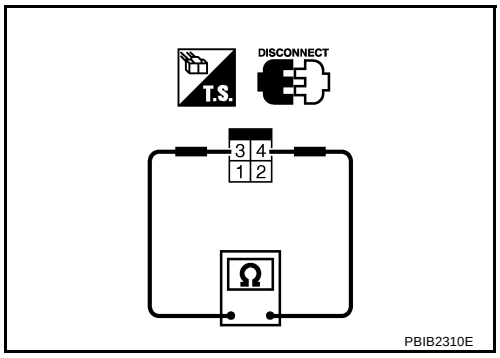
STOP LAMP SWITCH

1. Disconnect stop lamp switch harness connector.



2. Check continuity between stop lamp switch terminals 3 and 4 under the following conditions.

Conditions	Continuity
Brake pedal: Fully released	Should not exist
Brake pedal: Slightly depressed	Should exist



3. If NG, adjust stop lamp switch installation, refer to BR-7, "BRAKE PEDAL" , and perform step 2 again.

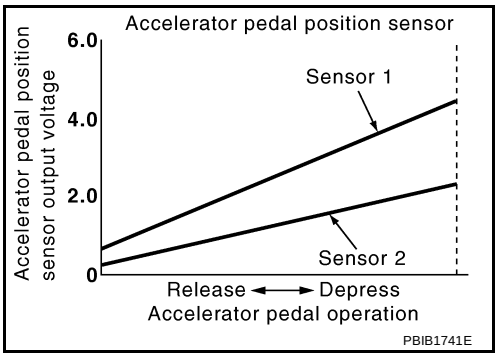
DTC P2122, P2123 APP SENSOR

PFP:18002

Component Description

NBS000GP

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



CONSULT-III Reference Value in Data Monitor Mode

NBS000GQ

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN 1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN 2*1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage.

On Board Diagnosis Logic

NBS000GR

These self-diagnoses have the one trip detection logic.

NOTE:
If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2122 2122	Accelerator pedal position sensor 1 circuit low input	An excessively low voltage from the APP sensor 1 is sent to ECM.	● Harness or connectors (The APP sensor 1 circuit is open or shorted.) ● Accelerator pedal position sensor (APP sensor 1)
P2123 2123	Accelerator pedal position sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS000GS

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-637, "Diagnostic Procedure" .

WITH GST

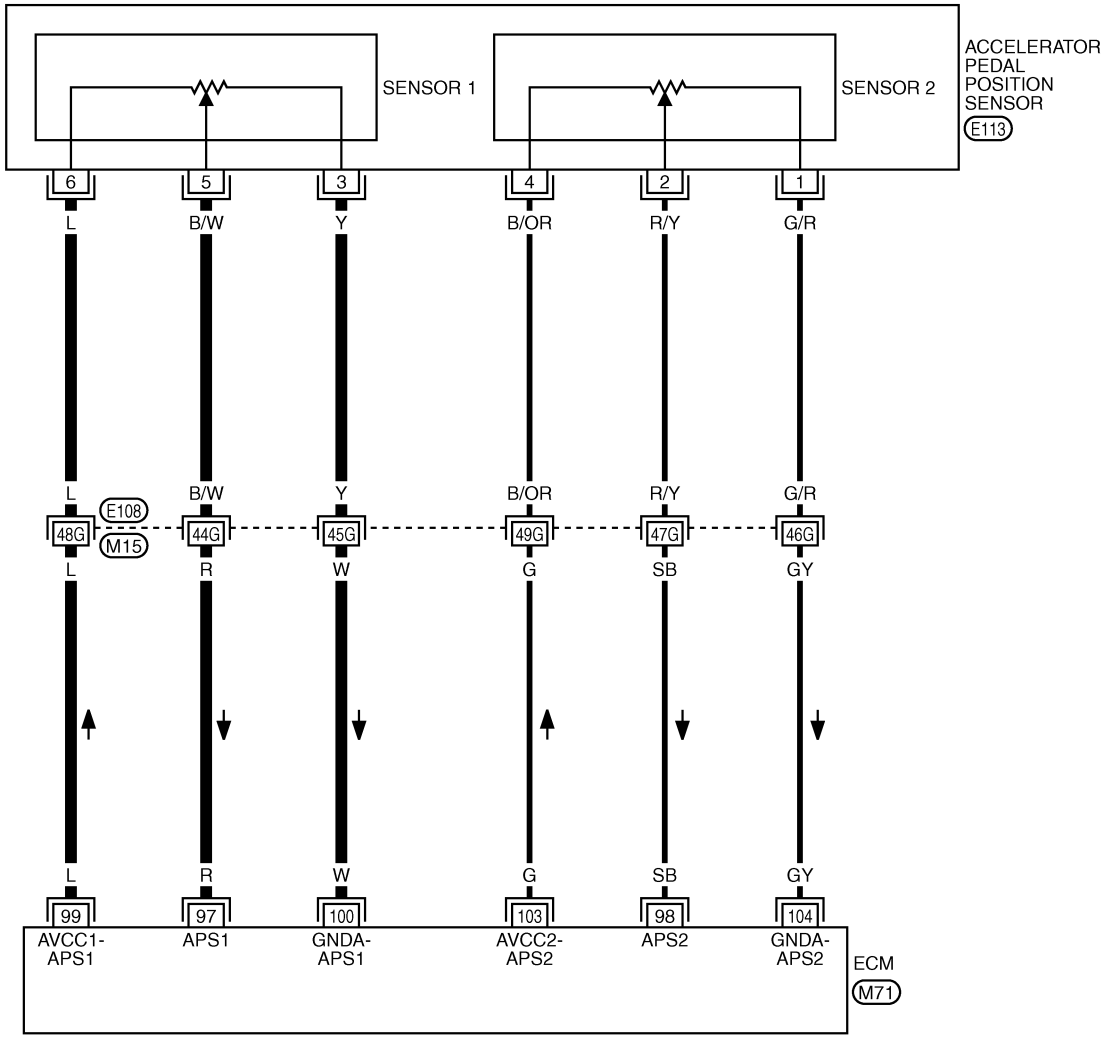
Follow the procedure “WITH CONSULT-III” above.

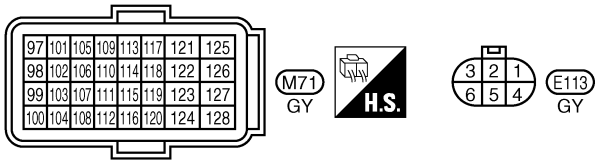
Wiring Diagram

NBS000GT

EC-APPS1-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1670E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	1.95 - 2.40V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

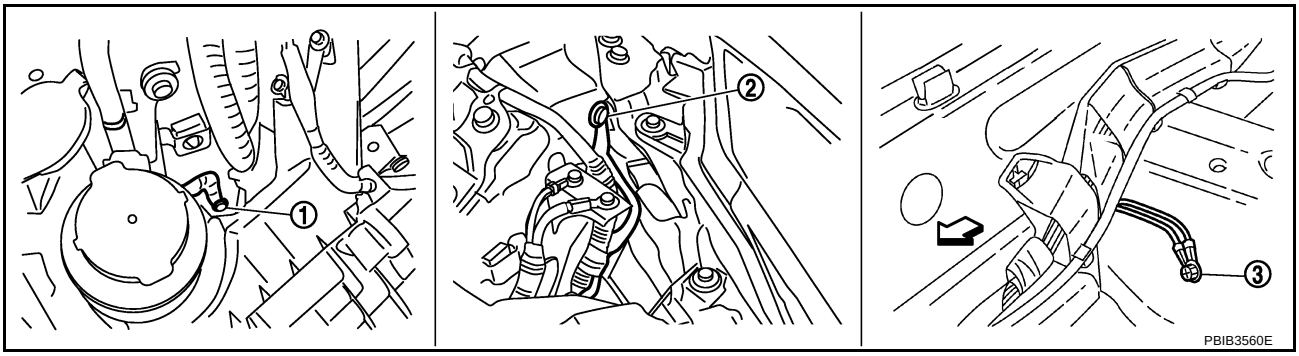
Diagnostic Procedure

NBS000GU

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

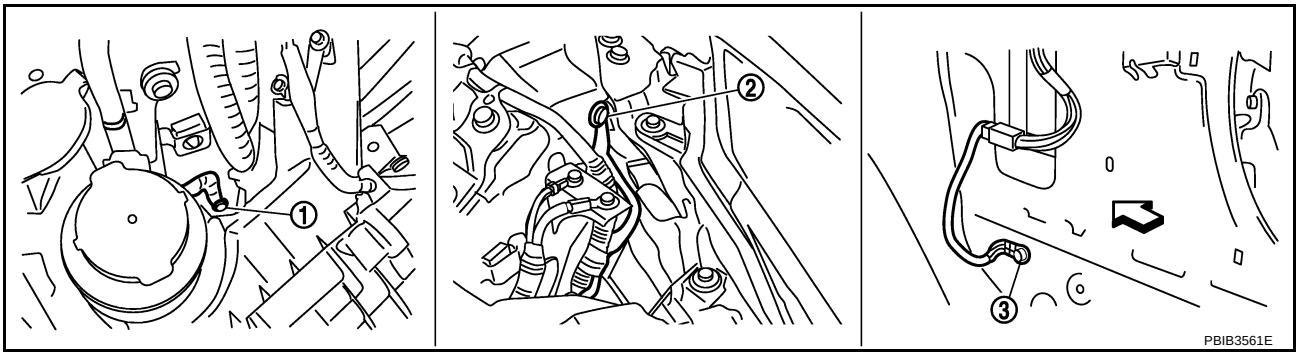


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

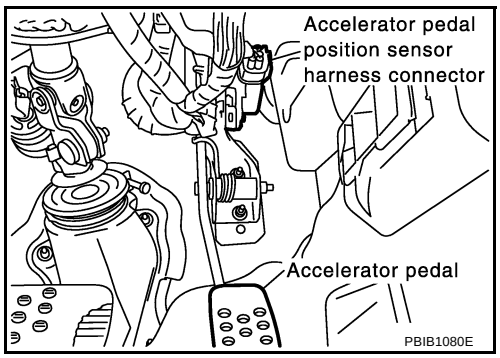
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

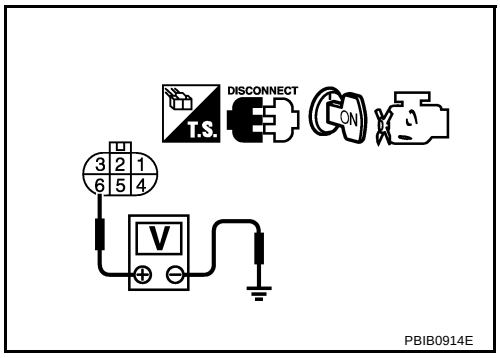
2. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 6 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 3 and ECM terminal 100. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 97 and APP sensor terminal 5. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK APP SENSOR

Refer to EC-658, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

10. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

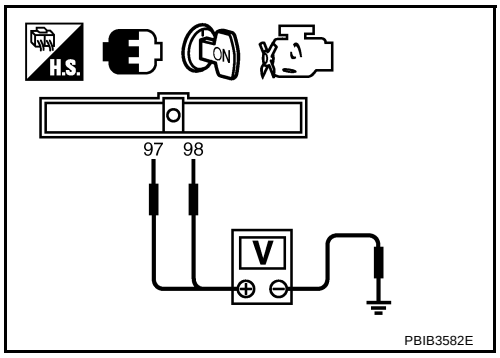
>> **INSPECTION END**

Component Inspection

NBS000GV

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 97 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.



Terminal	Accelerator pedal	Voltage
97 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V

4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000GW

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

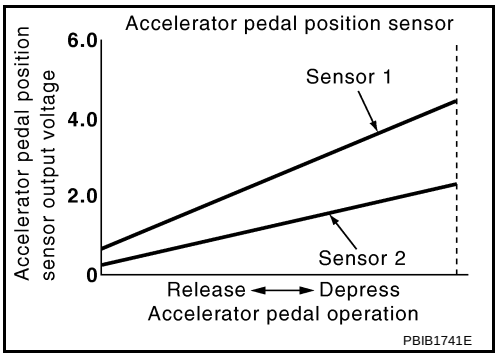
DTC P2127, P2128 APP SENSOR

PFP:18002

Component Description

NBS000GX

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



CONSULT-III Reference Value in Data Monitor Mode

NBS000GY

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN 1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN 2*1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage.

On Board Diagnosis Logic

NBS000GZ

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2127 2127	Accelerator pedal position sensor 2 circuit low input	An excessively low voltage from the APP sensor 2 is sent to ECM.	● Harness or connectors (APP sensor 2 dircuit is open or shorted.) [CKP sensor (POS) circuit is open or shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Accelerator pedal position sensor ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● EVAP control system pressure sensor ● Refrigerant pressure sensor
P2128 2128	Accelerator pedal position sensor 2 circuit high input	An excessively high voltage from the APP sensor 2 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS000H0

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-645, "Diagnostic Procedure" .

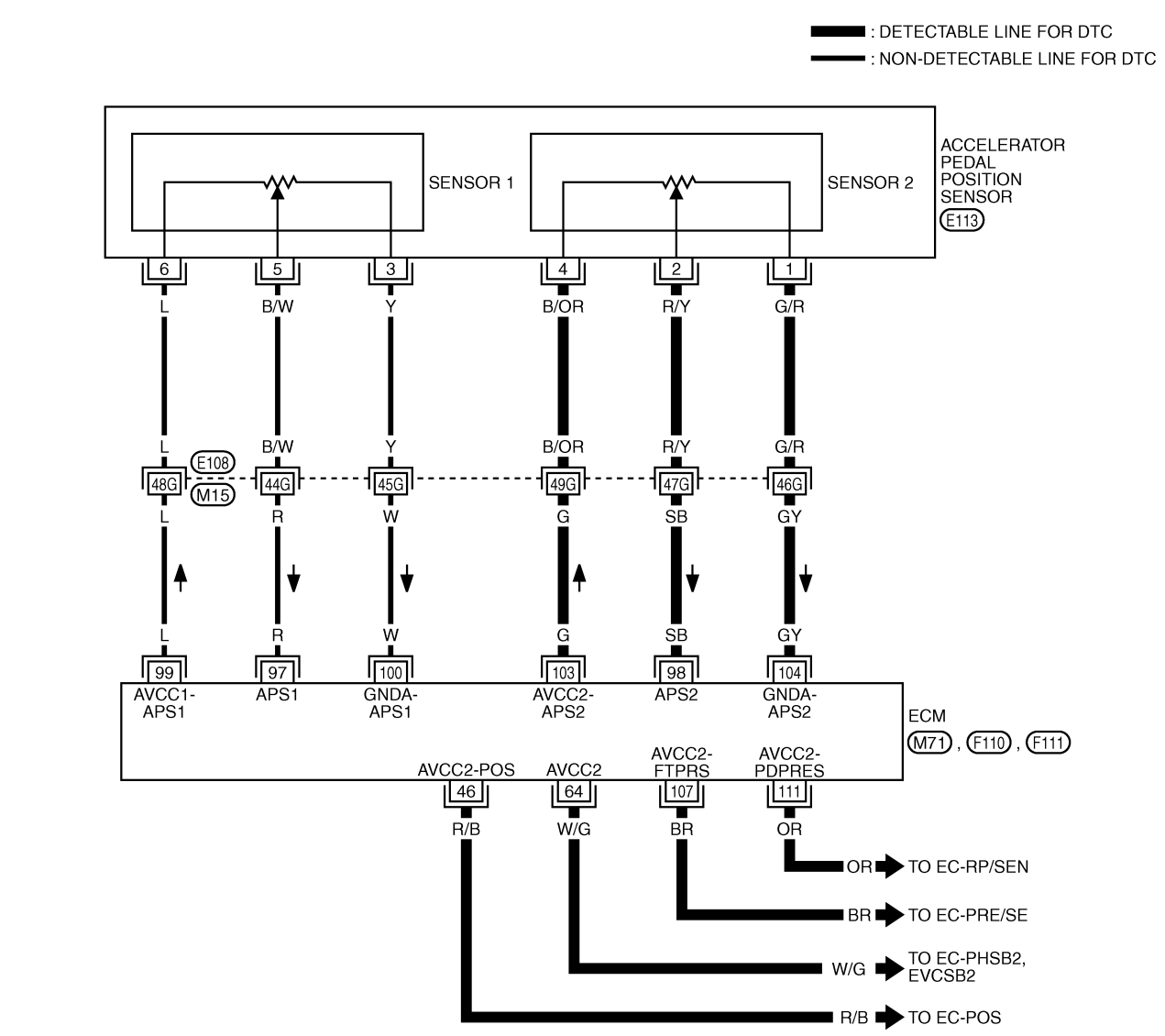
WITH GST

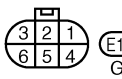
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

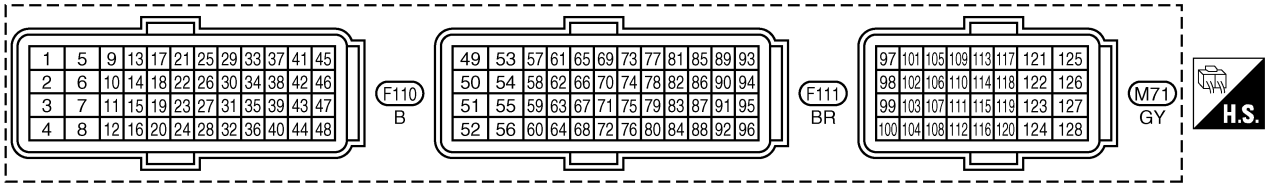
NBS000H1

EC-APPS2-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT1671E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	1.95 - 2.40V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

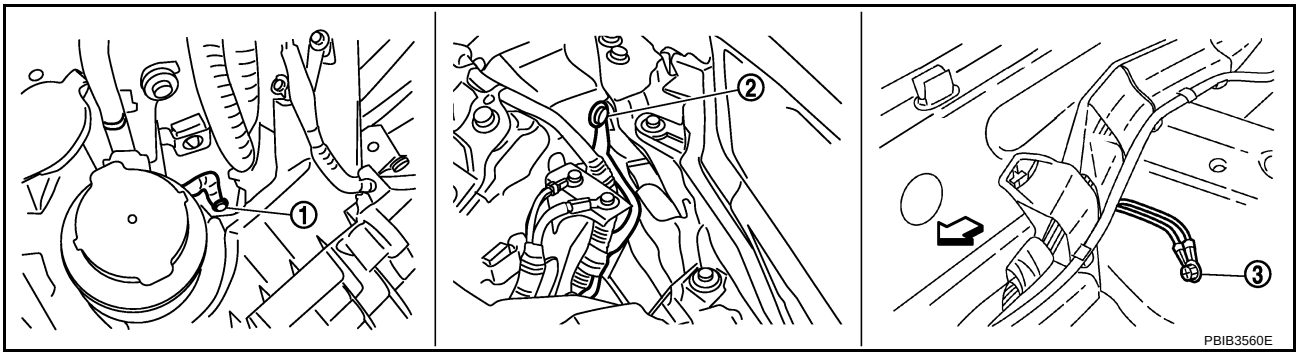
Diagnostic Procedure

NBS000H2

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

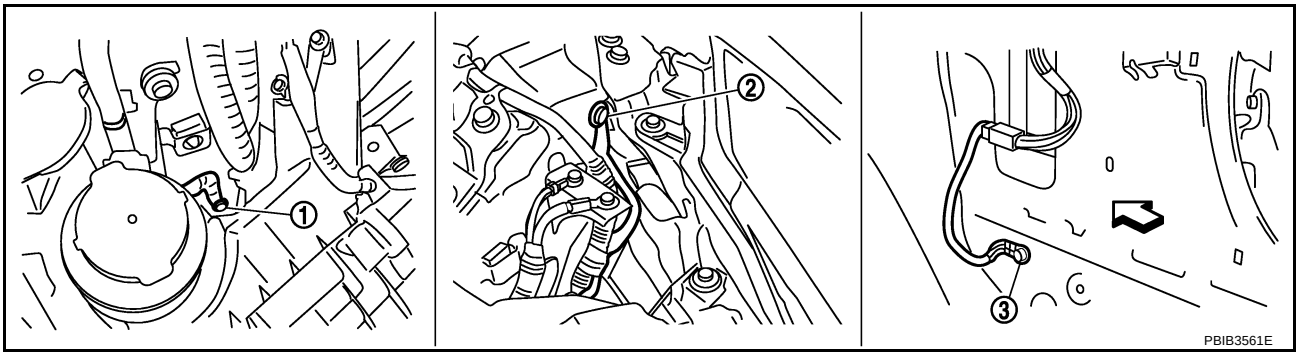


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

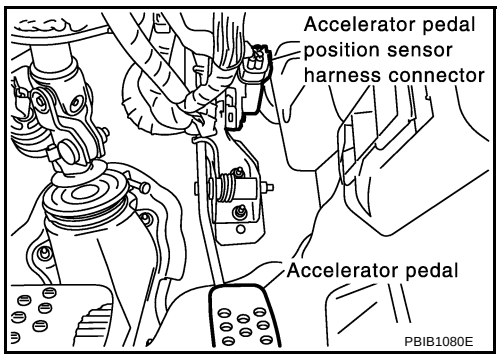
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

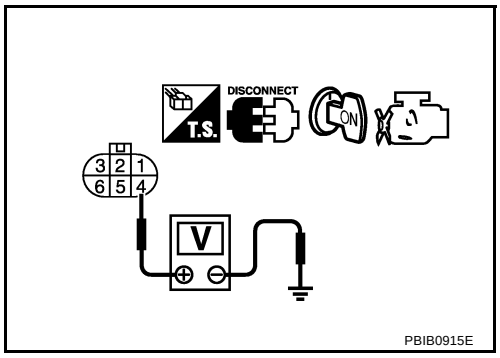
2. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT- I

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between APP sensor terminal 4 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

3. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 4 and ECM terminal 103. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open between ECM and APP sensor

>> Repair open circuit.

5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor terminal 1	EC-711

OK or NG

OK >> GO TO 6.
NG >> Repair short to ground or short to power in harness or connectors.

6. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 13.
NG >> Replace malfunctioning component.

7. CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 1 and ECM terminal 104.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 98 and APP sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 11.
NG >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

11. CHECK APP SENSOR

Refer to EC-658, "Component Inspection" .

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.

12. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

13. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

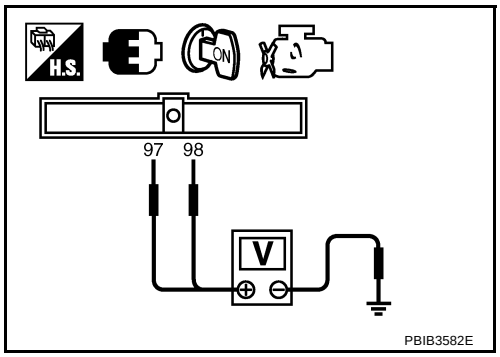
Component Inspection

NBS000H3

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 97 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
97 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V



4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000H4

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

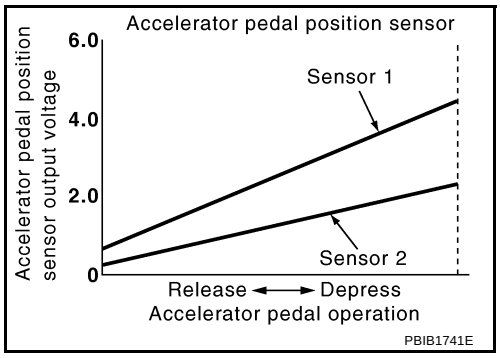
DTC P2138 APP SENSOR

PFP:18002

Component Description

NBS000HD

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.
Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



CONSULT-III Reference Value in Data Monitor Mode

NBS000HE

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN 1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.0 - 4.8V
ACCEL SEN 2*1	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.3 - 1.2V
		Accelerator pedal: Fully depressed	3.9 - 4.8V
CLSD THL POS	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage.

On Board Diagnosis Logic

NBS000HF

This self-diagnosis has the one trip detection logic.

NOTE:
If DTC P2138 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.
Refer to EC-514, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P2138 2138	Accelerator pedal position sensor circuit range/performance	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.	● Harness or connector (The APP sensor 1 and 2 circuit is open or shorted.) Harness or connectors (APP sensor 2 dircuit is open or shorted.) [CKP sensor (POS) circuit is open or shorted.] [CMP sensor (PHASE) (bank 2) circuit is shorted.] [EVT control position sensor (bank 2) circuit is shorted.] (EVAP control system pressure sensor circuit is shorted.) (Refrigerant pressure sensor circuit is shorted.) ● Accelerator pedal position sensor (APP sensor 1 and 2) ● Crankshaft position sensor (POS) ● Camshaft position sensor (PHASE) (bank 2) ● Exhaust valve timing control position sensor (bank 2) ● EVAP control system pressure sensor ● Refrigerant pressure sensor

FAIL-SAFE MODE

When the malfunction is detected, ECM enters fail-safe mode and the MIL lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

NBS000HG

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 8V at idle.

WITH CONSULT-III

1. Start engine and let it idle for 1 second.
2. Check DTC.
3. If DTC is detected, go to EC-654, "Diagnostic Procedure" .

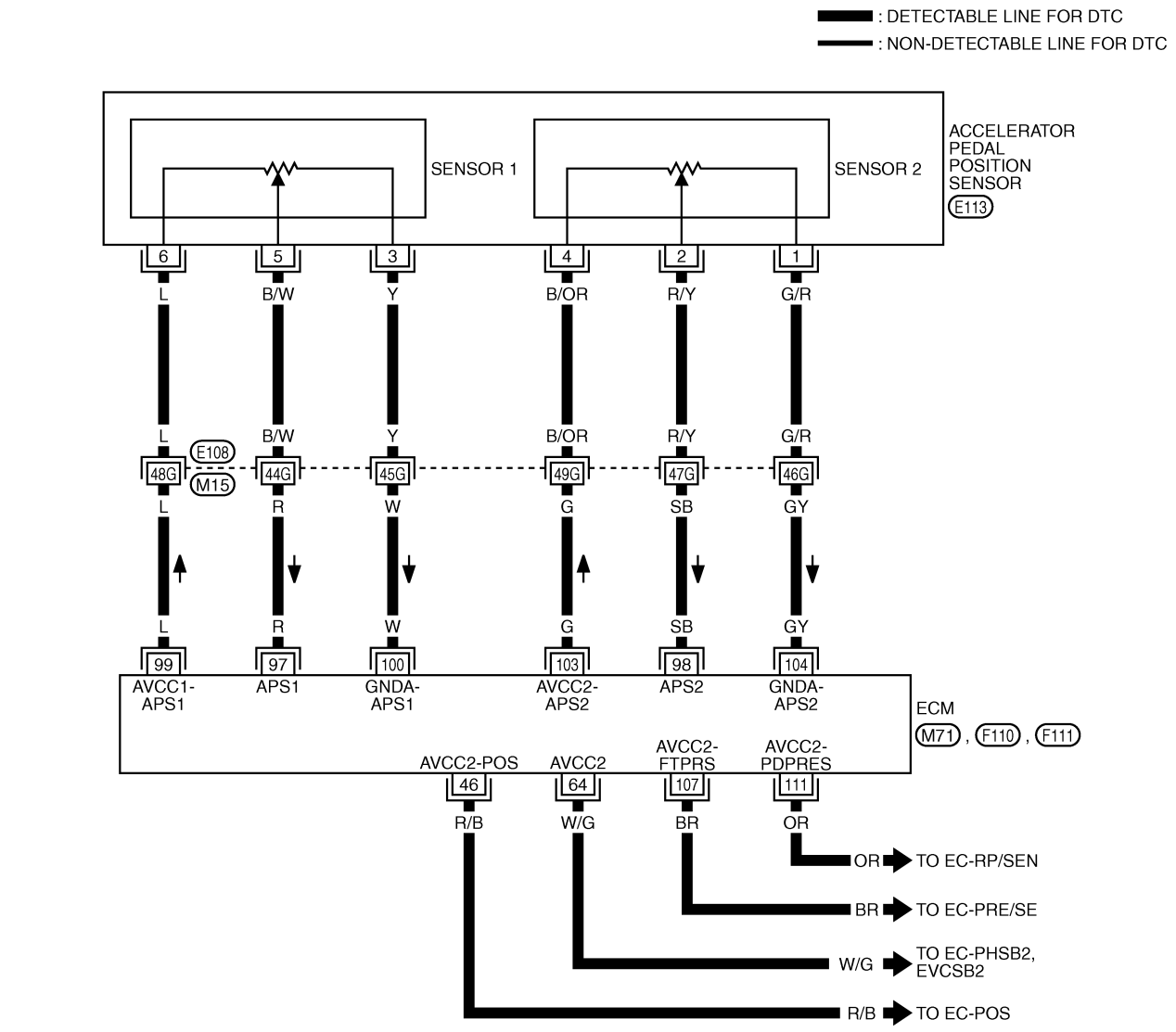
WITH GST

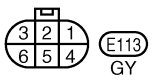
Follow the procedure “WITH CONSULT-III” above.

Wiring Diagram

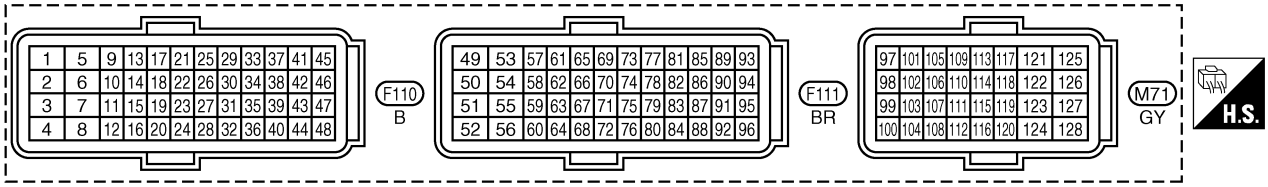
NBS000HH

EC-APPS3-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)



TBWT1674E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
46	R/B	Sensor power supply [Crankshaft position sensor (POS)]	**[Ignition switch: ON]**	5V
64	W/G	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control position sensor (bank 2)]	**[Ignition switch: ON]**	5V
97	R	Accelerator pedal position sensor 1	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	3.9 - 4.7V
98	SB	Accelerator pedal position sensor 2	**[Ignition switch: ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.15 - 0.60V
			[Ignition switch: ON] ● Engine stopped ● Accelerator pedal: Fully depressed	1.95 - 2.40V
99	L	Sensor power supply (Accelerator pedal position sensor 1)	**[Ignition switch: ON]**	5V
100	W	Sensor ground (Accelerator pedal position sensor 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
103	G	Sensor power supply (Accelerator pedal position sensor 2)	**[Ignition switch: ON]**	5V
104	GY	Sensor ground (Accelerator pedal position sensor 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V
107	BR	Sensor power supply (EVAP control system pressure sensor)	**[Ignition switch: ON]**	5V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V

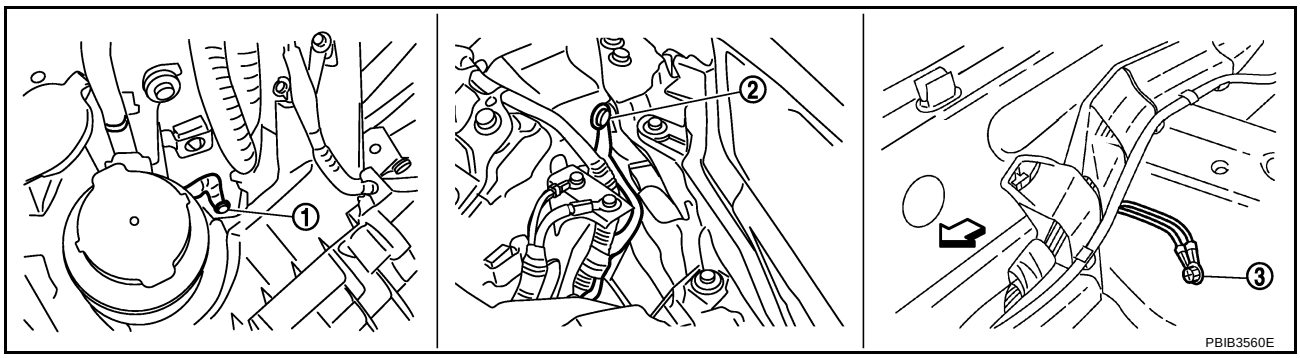
Diagnostic Procedure

NBS000HI

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

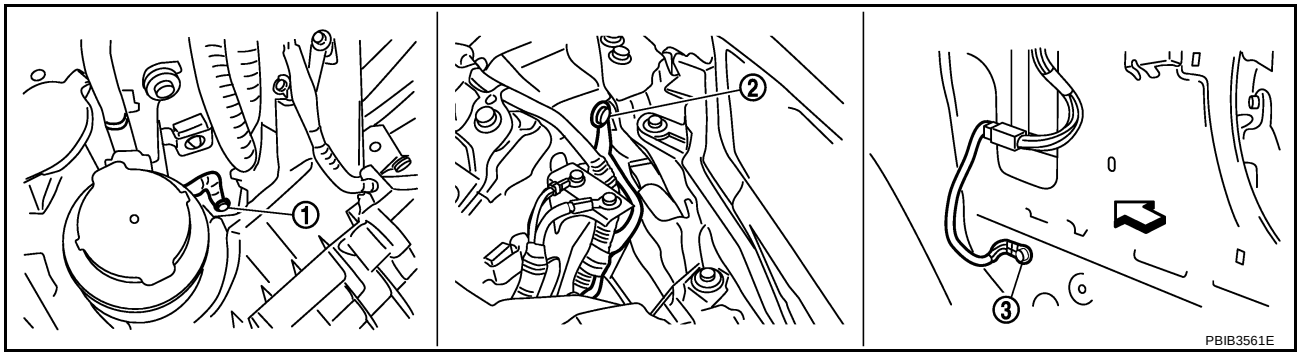


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

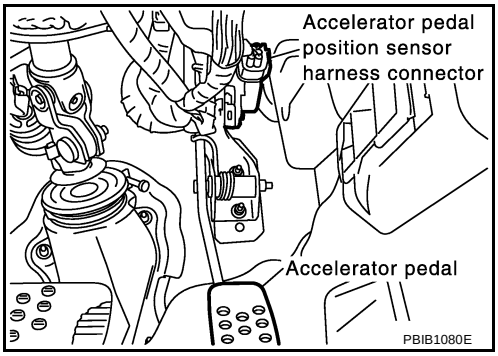
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.

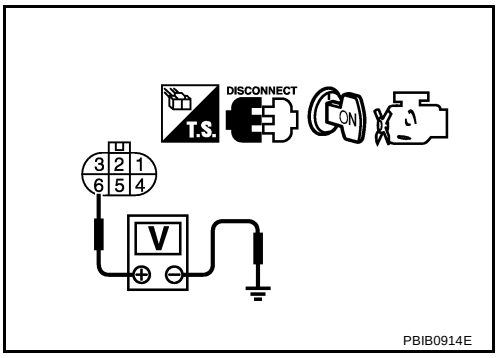


3. Check voltage between APP sensor terminal 6 and ground with CONSULT-III or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.



3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

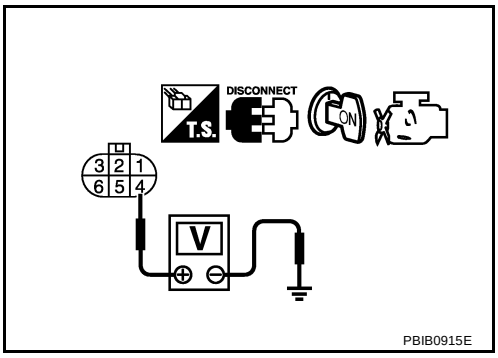
4. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-I

Check voltage between APP sensor terminal 4 and ground with CONSULT-III or tester.

Voltage: Approximately 5V

OK or NG

OK >> GO TO 9.
NG >> GO TO 5.



5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between APP sensor terminal 4 and ECM terminal 103.
   Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open between ECM and APP sensor

>> Repair open circuit.

7. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
46	CKP sensor (POS) terminal 1	EC-388
64	CMP sensor (PHASE) (bank 2) terminal 1	EC-399
	EVT control position sensor (bank 2) terminal 1	EC-532
103	APP sensor terminal 4	EC-643
107	EVAP control system pressure sensor terminal 3	EC-458
111	Refrigerant pressure sensor terminal 1	EC-711

OK or NG

OK >> GO TO 8.
NG >> Repair short to ground or short to power in harness or connectors.

8. CHECK COMPONENTS

Check the following.

- Crankshaft position sensor (POS) (Refer to EC-393, "Component Inspection" .)
- Camshaft position sensor (PHASE) (bank 2) (Refer to EC-405, "Component Inspection" .)
- Exhaust valve timing control position sensor (bank 2) (Refer to EC-539, "Component Inspection" .)
- EVAP control system pressure sensor (Refer to EC-464, "Component Inspection" .)
- Refrigerant pressure sensor (Refer to ATC-80, "COMPONENT INSPECTION" .)

OK or NG

OK >> GO TO 15.
NG >> Replace malfunctioning component.

9. CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following;
   APP sensor terminal 3 and ECM terminal 100.
   APP sensor terminal 1 and ECM terminal 104,
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 11.
NG >> GO TO 10.

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

11. CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between the following;
   ECM terminal 97 and APP sensor terminal 5,
   ECM terminal 98 and APP sensor terminal 2.
   Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 13.
NG >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and APP sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK APP SENSOR

Refer to EC-658, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> GO TO 14.

14. REPLACE ACCELERATOR PEDAL ASSEMBLY

1. Replace accelerator pedal assembly.
2. Perform EC-77, "Accelerator Pedal Released Position Learning" .
3. Perform EC-77, "Throttle Valve Closed Position Learning" .
4. Perform EC-77, "Idle Air Volume Learning" .

>> **INSPECTION END**

15. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

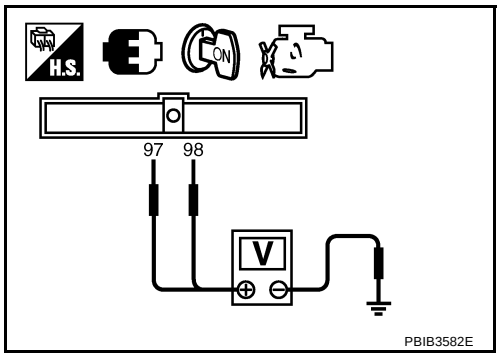
Component Inspection

NBS000HJ

ACCELERATOR PEDAL POSITION SENSOR

1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. Check voltage between ECM terminals 97 (APP sensor 1 signal), 98 (APP sensor 2 signal) and ground under the following conditions.

Terminal	Accelerator pedal	Voltage
97 (Accelerator pedal position sensor 1)	Fully released	0.5 - 1.0V
	Fully depressed	3.9 - 4.7V
98 (Accelerator pedal position sensor 2)	Fully released	0.15 - 0.60V
	Fully depressed	1.95 - 2.40V



4. If NG, replace accelerator pedal assembly and go to next step.
5. Perform EC-77, "Accelerator Pedal Released Position Learning" .
6. Perform EC-77, "Throttle Valve Closed Position Learning" .
7. Perform EC-77, "Idle Air Volume Learning" .

Removal and Installation

NBS000HK

ACCELERATOR PEDAL

Refer to ACC-3, "ACCELERATOR CONTROL SYSTEM" .

DTC P2A00, P2A03 A/F SENSOR 1

PFP:22693

Component Description

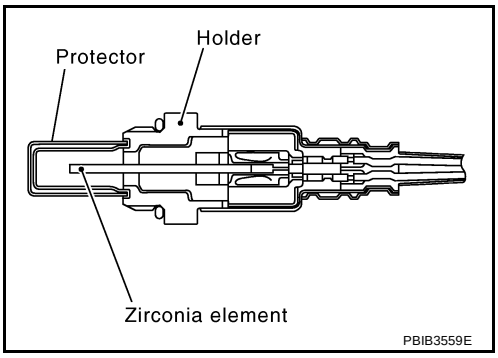
NBS006V7

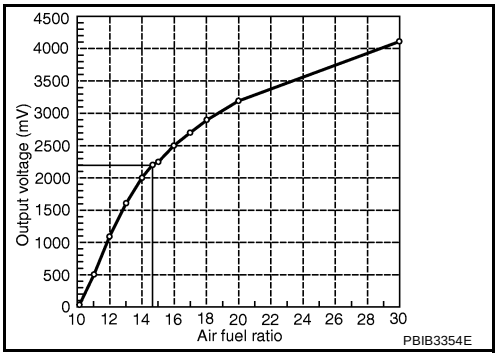
The air fuel ratio (A/F) sensor 1 is a planar one-cell limit current sensor. The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.

The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of about 800°C (1,472°F).





CONSULT-III Reference Value in Data Monitor Mode

NBS000EF

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
A/F SEN1 (B1) A/F SEN1 (B2)	● Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2V

On Board Diagnosis Logic

NBS000EG

To judge the malfunction, the A/F signal computed by ECM from the A/F sensor 1 signal is monitored not to be shifted to LEAN side or RICH side.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible Cause
P2A00 2A00 (Bank 1) P2A03 2A03 (Bank 2)	Air fuel ratio (A/F) sensor 1 circuit range/performance	● The output voltage computed by ECM from the A/F sensor 1 signal is shifted to the lean side for a specified period. ● The output voltage computed by ECM from the A/F sensor 1 signal is shifted to the rich side for a specified period.	● Air fuel ratio (A/F) sensor 1 ● Air fuel ratio (A/F) sensor 1 heater ● Fuel pressure ● Fuel injector ● Intake air leaks

DTC Confirmation Procedure

NBS000EH

NOTE:
If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

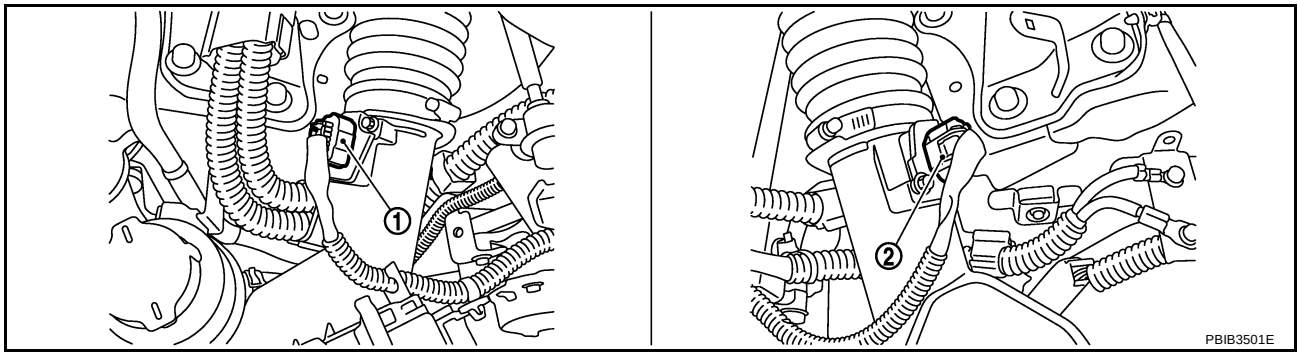
TESTING CONDITION:
Before performing the following procedure, confirm that battery voltage is more than 11V at idle.

WITH CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON and select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
4. Clear the self-learning coefficient by touching “CLEAR”.
5. Turn ignition switch OFF and wait at least 10 seconds.
6. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
7. Let engine idle for 1 minute.
8. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
9. Check 1st trip DTC.
10. If 1st trip DTC is detected, go to EC-665, "Diagnostic Procedure" .

WITH GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Disconnect mass air flow sensor (bank 1) harness connector.

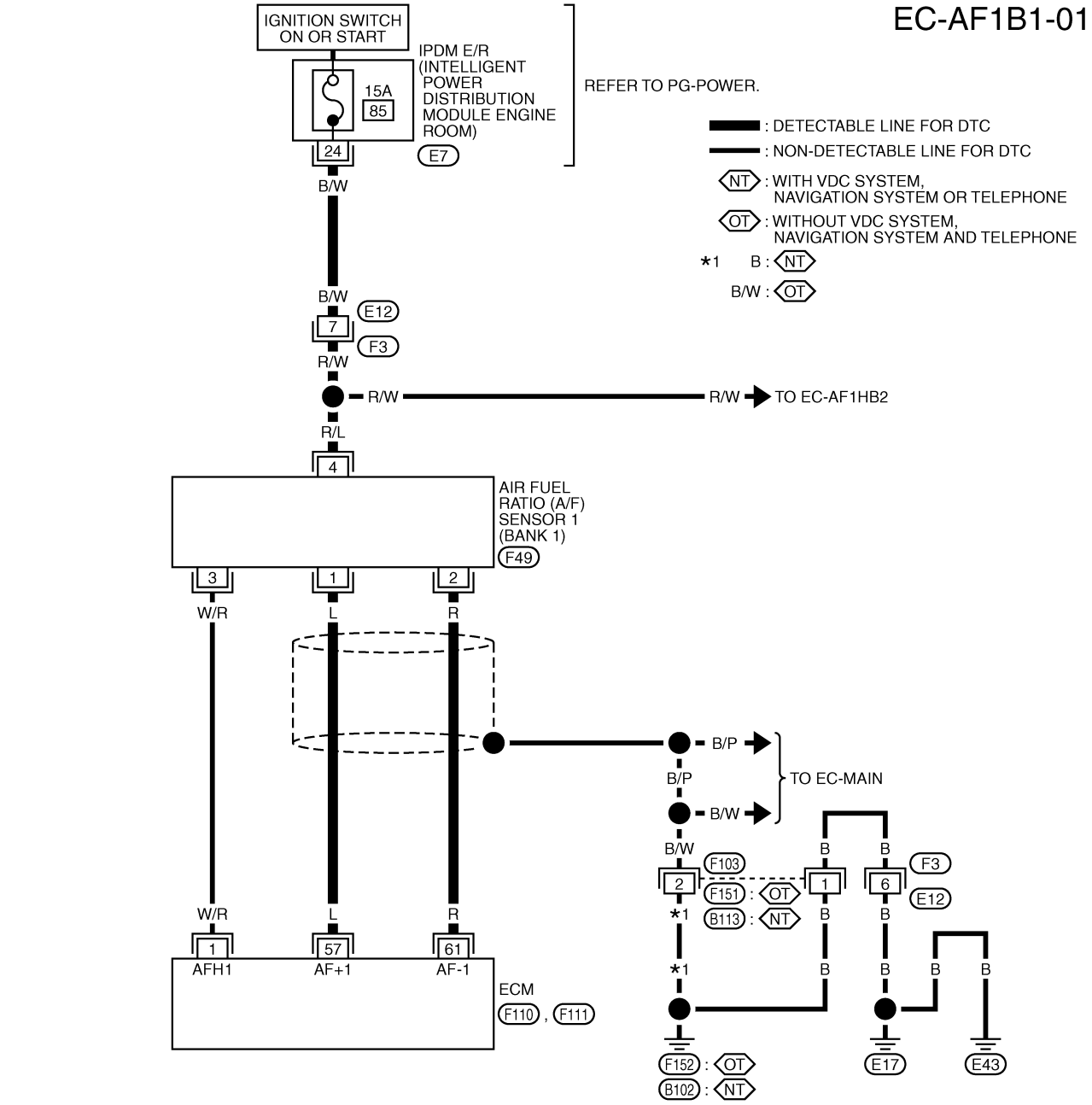


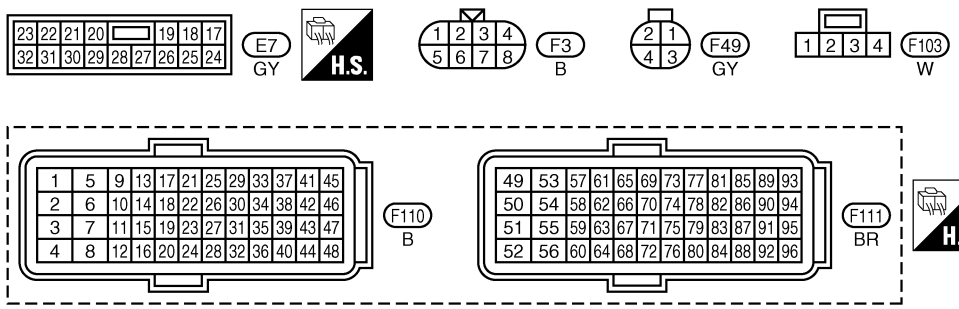
1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Start engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
6. Select Service $03 with GST and make sure that DTC P0102 is detected.
7. Select Service $04 with GST and erase the DTC P0102.
8. Start engine and keep the engine speed between 3,500 and 4,000 rpm for 1 minute under no load.
9. Let engine idle for 1 minute.
10. Keep engine speed between 2,500 and 3,000 rpm for 20 minutes.
11. Select Service $07 with GST.
    If 1st trip DTC is detected, go to EC-665, "Diagnostic Procedure" .

Wiring Diagram
BANK 1

NBS000EI



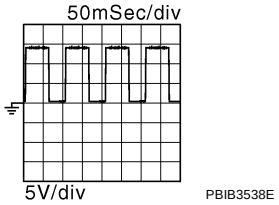


TBWT1632E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

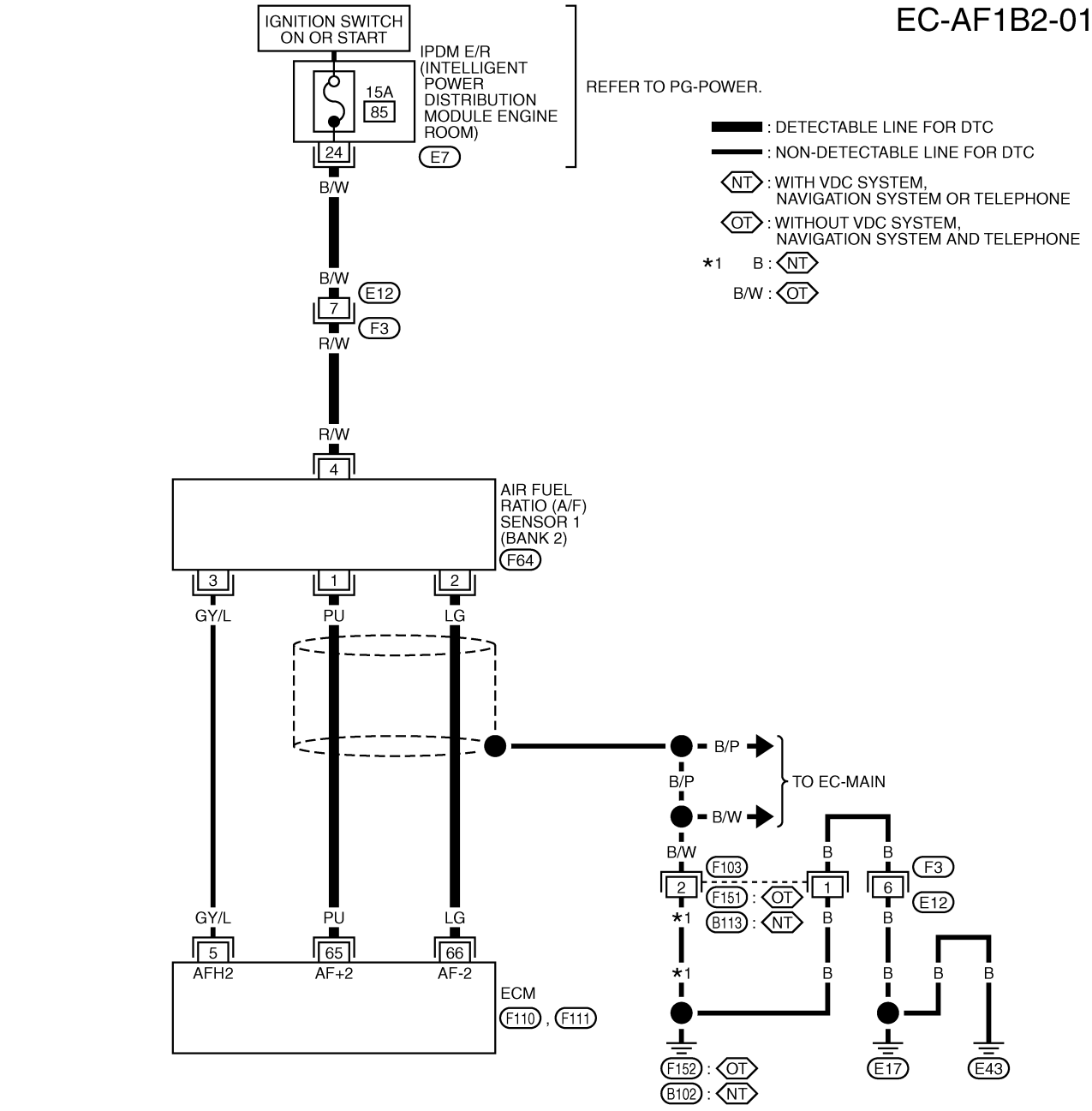
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

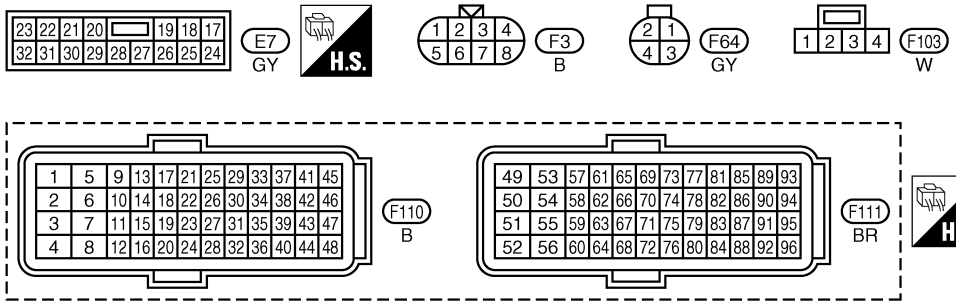
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
1	W/R	A/F sensor 1 heater (bank 1)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8V★ 
57	L	A/F sensor 1 (bank 1)	**[Ignition switch: ON]**	2.2V
61	R	A/F sensor 1 (bank 1)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

BANK 2

EC-AF1B2-01



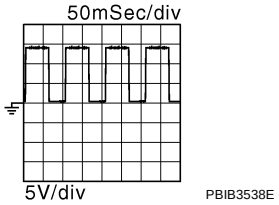


TBWT1633E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
5	GY/L	A/F sensor 1 heater (bank 2)	**[Engine is running]** ● **Warm-up condition** ● Idle speed (More than 140 seconds after starting engine)	2.9 - 8.8★ 
65	PU	A/F sensor 1 (bank 2)	**[Ignition switch: ON]**	2.2V
66	LG	A/F sensor 1 (bank 2)	**[Ignition switch: ON]** ● **Warm-up condition** ● Engine speed: 2,000 rpm	1.8V Output voltage varies with air fuel ratio.

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

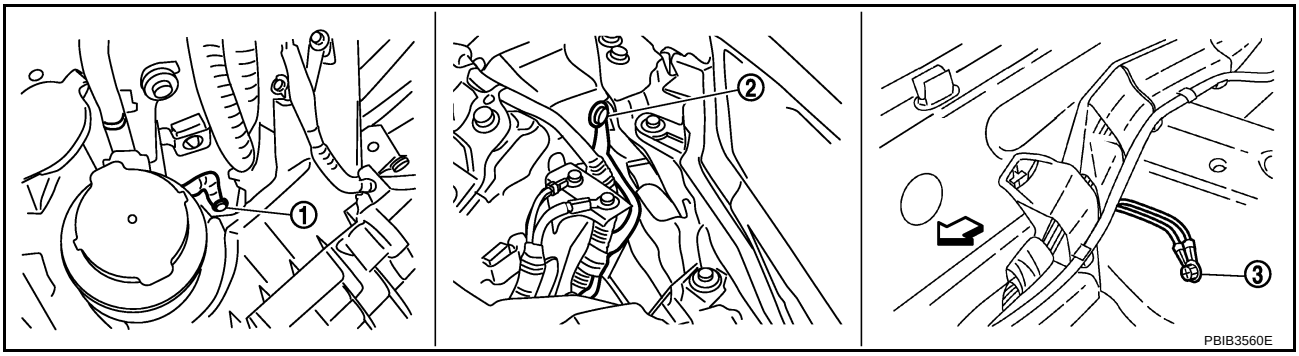
Diagnostic Procedure

NBS001NX

1. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

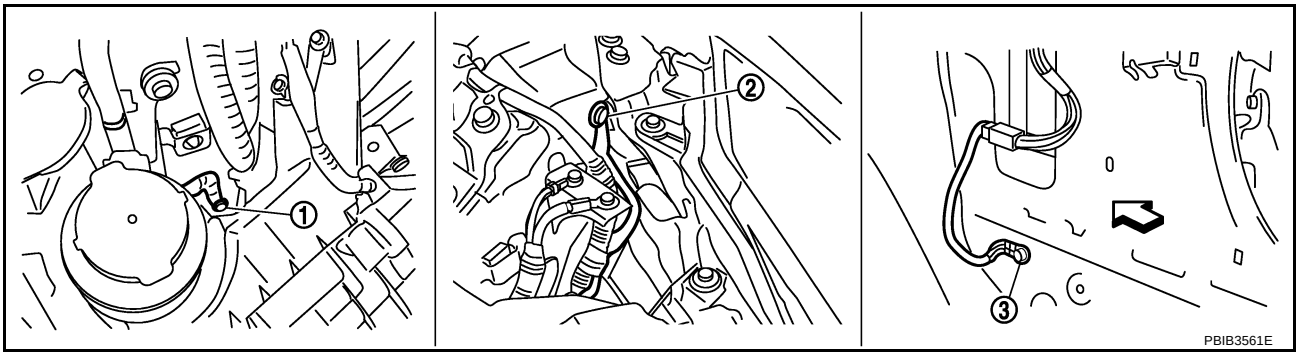


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn ignition switch OFF.
2. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

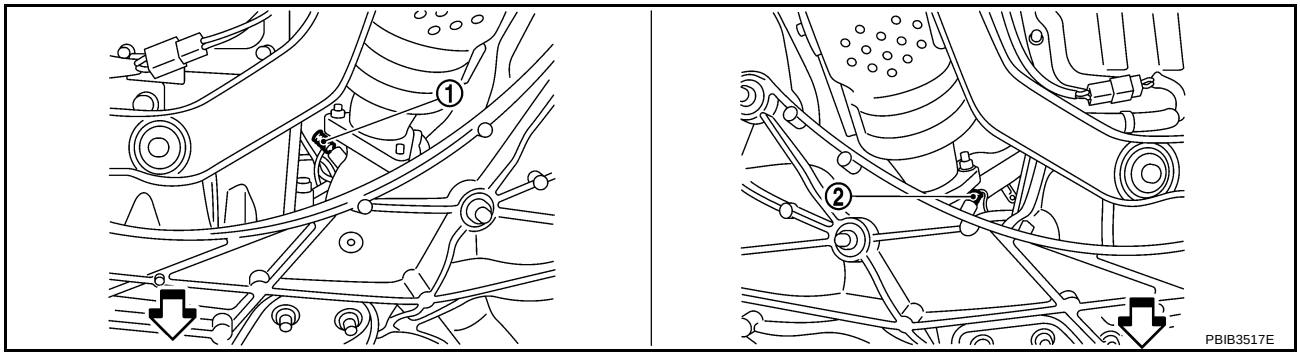
⇦: Vehicle front

OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

2. RETIGHTEN AIR FUEL RATIO SENSOR 1

1. Loosen and retighten the air fuel ratio (A/F) sensor 1.



1. A/F sensor 1 (bank1)
2. A/F sensor 1 (bank 2)

⇦: Vehicle front

Tightening torque: 50 N-m (5.1 kg-m, 37 ft-lb)

>> GO TO 3.

3. CHECK FOR INTAKE AIR LEAK

1. Start engine and run it at idle.
2. Listen for an intake air leak after the mass air flow sensor.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace.

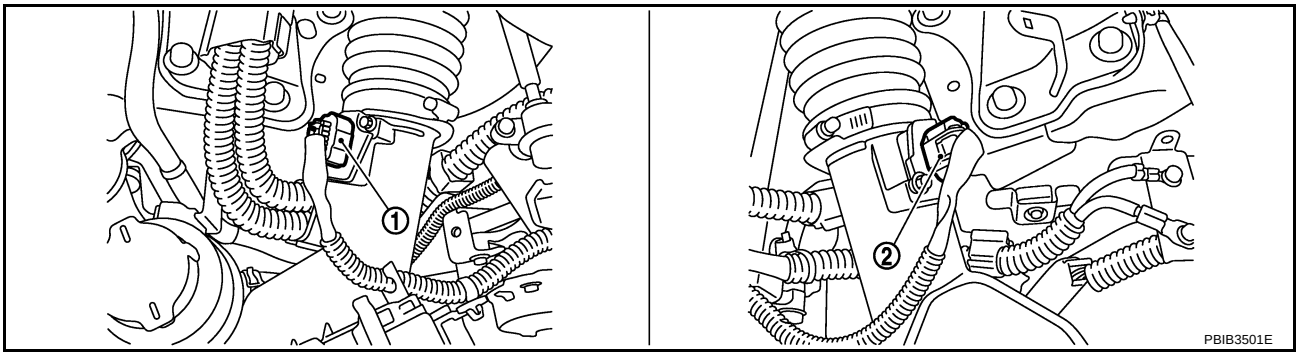
4. CLEAR THE SELF-LEARNING DATA

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.
4. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.
9. Run engine for at least 10 minutes at idle speed.
   Is the 1st trip DTC P0171, P0172, P0174 or P0175 detected?
   Is it difficult to start engine?

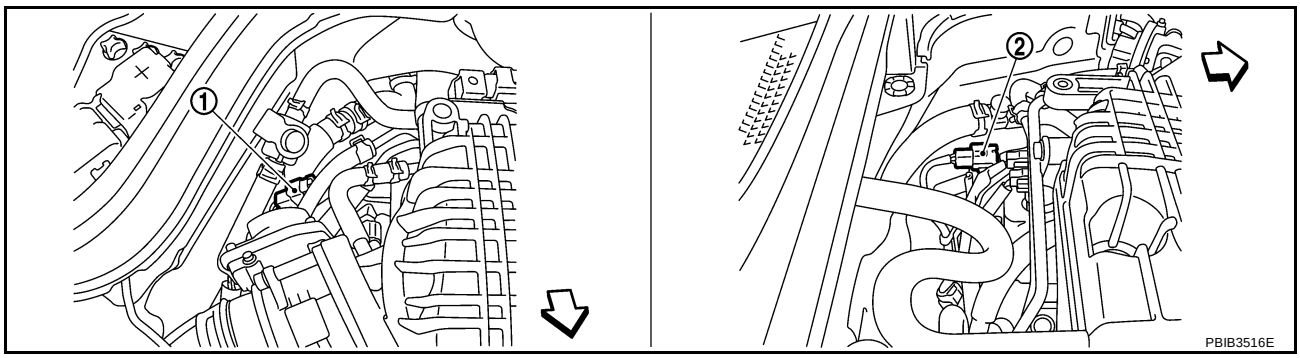
Yes or No

Yes >> Perform trouble diagnosis for DTC P0171, P0174 or P0172, P0175. Refer to EC-324, "DTC P0171, P0174 FUEL INJECTION SYSTEM FUNCTION" or EC-334, "DTC P0172, P0175 FUEL INJECTION SYSTEM FUNCTION" .

No >> GO TO 5.

5. CHECK HARNESS CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.



1. A/F sensor 1 (bank 1) harness connector
2. A/F sensor 1 (bank 2) harness connector

⇦: Vehicle front

3. Check harness connector for water.

Water should not exit.

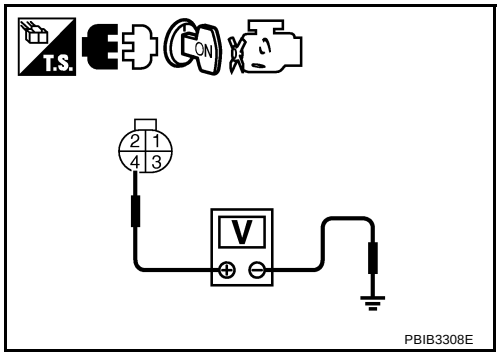
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness connector.

6. CHECK A/F SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between A/F sensor 1 terminal 4 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- IPDM E/R harness connector E7
- 15A fuse
- Harness for open or short between A/F sensor 1 and fuse

>> Repair or replace harness or connectors.

8. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals.
   Refer to Wiring Diagram.

	A/F sensor 1 terminal	ECM terminal
Bank1	1	57
	2	61
Bank 2	1	65
	2	66

Continuity should exist.

4. Check harness continuity between the following terminals and ground.
   Refer to Wiring Diagram.

Bank 1		Bank 2	
A/F sensor 1 terminal	ECM terminal	A/F sensor 1 terminal	ECM terminal
1	57	1	65
2	61	2	66

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to EC-172, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> GO TO 11.

10. CHECK INTERMITTENT INCIDENT

Perform EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 11.
NG >> Repair or replace.

11. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning A/F sensor 1.

CAUTION:

- **Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

>> GO TO 12.

12. CONFIRM A/F ADJUSTMENT DATA

1. Turn ignition switch ON.
2. Select “A/F ADJ-B1” and “A/F ADJ-B2” in “DATA MONITOR” mode with CONSULT-III.
3. Make sure that “0.000” is displayed on CONSULT-III screen.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 13.

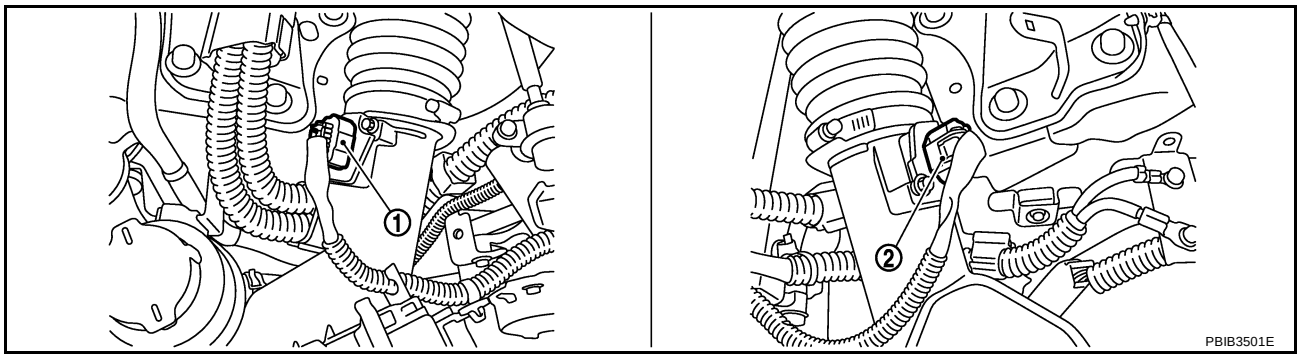
13. CLEAR THE SELF-LEARNING DATA.

With CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Select “SELF-LEARNING CONT” in “WORK SUPPORT” mode with CONSULT-III.
3. Clear the self-learning control coefficient by touching “CLEAR”.

Without CONSULT-III

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor (bank 1) harness connector.



1. Mass air flow sensor (with intake air temperature sensor) (bank 1)
2. Mass air flow sensor (with intake air temperature sensor) (bank 2)

4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor (bank 1) harness connector.
6. Make sure DTC P0102 is displayed.
7. Erase the DTC memory. Refer to EC-61, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" .
8. Make sure DTC P0000 is displayed.

>> GO TO 14.

14. CONFIRM A/F ADJUSTMENT DATA

1. Turn ignition switch OFF and then ON.
2. Select “A/F ADJ-B1” and “A/F ADJ-B2” in “DATA MONITOR” mode with CONSULT-III.
3. Make sure that “0.000” is displayed on CONSULT-III screen.

>> **INSPECTION END**

Removal and Installation

NBS000EK

AIR FUEL RATIO (A/F) SENSOR 1

Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

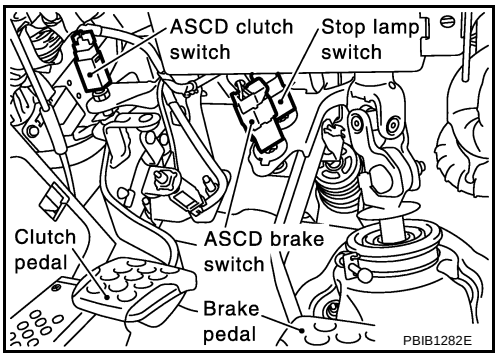
ASCD BRAKE SWITCH

PFP:25320

Component Description

NBS000I9

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON. ECM detects the state of the brake pedal by this input of two kinds (ON/OFF signal).
Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.



CONSULT-III Reference Value in Data Monitor Mode

NBS000IA

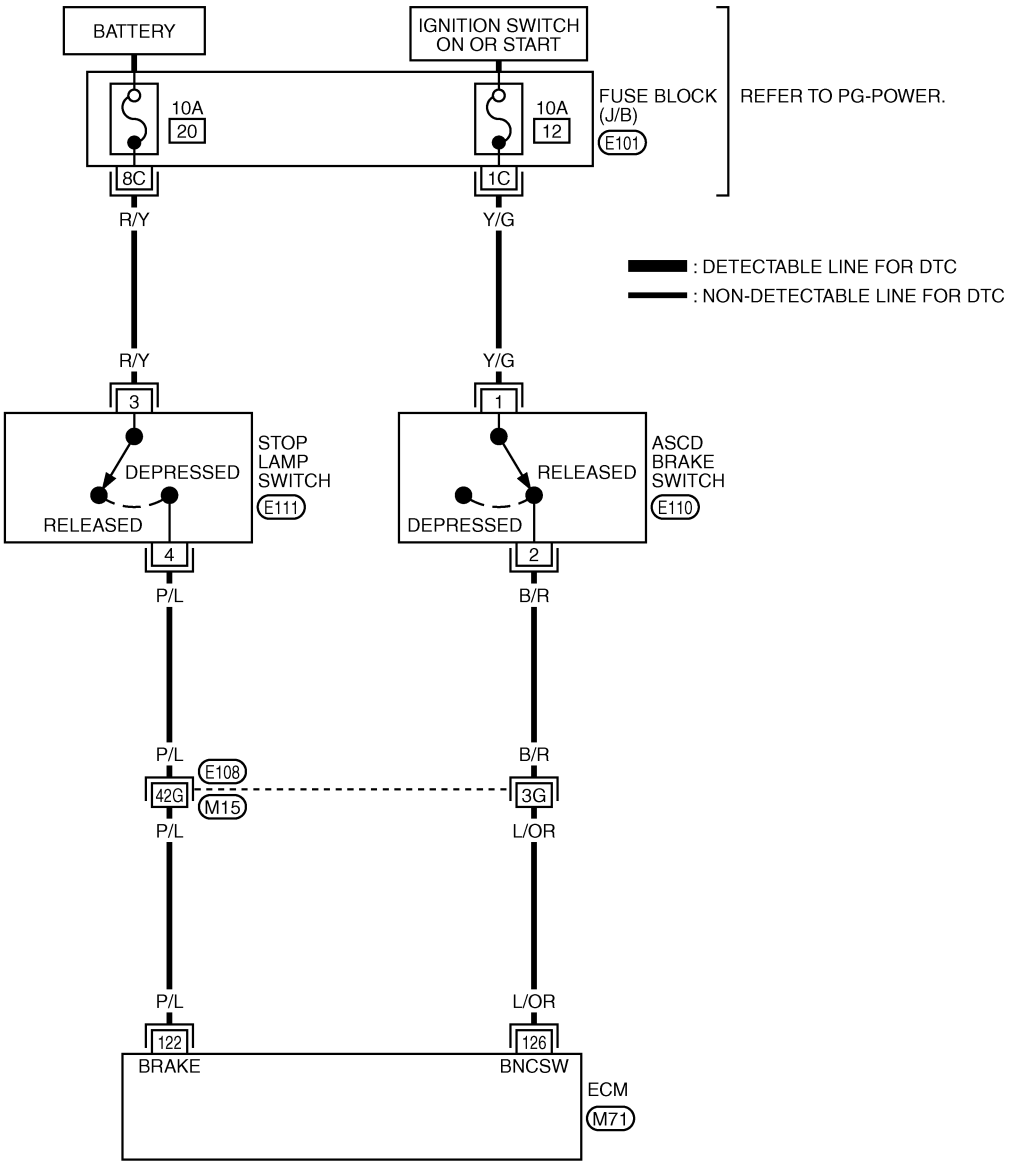
Specification data are reference values.

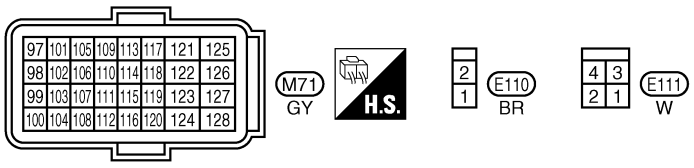
MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW1 (ASCD brake switch)	● Ignition switch: ON	● Brake pedal: Fully released (A/T) ● Brake pedal and clutch pedal: Fully released (M/T)	ON
		● Brake pedal: Slightly depressed (A/T) ● Brake pedal and/or clutch pedal: Slightly depressed (M/T)	OFF
BRAKE SW2 (Stop lamp switch)	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON

Wiring Diagram
A/T MODELS

NBS000IB

EC-ASCBOF-01





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1675E

Specification data are reference values and are measured between each terminal and ground.

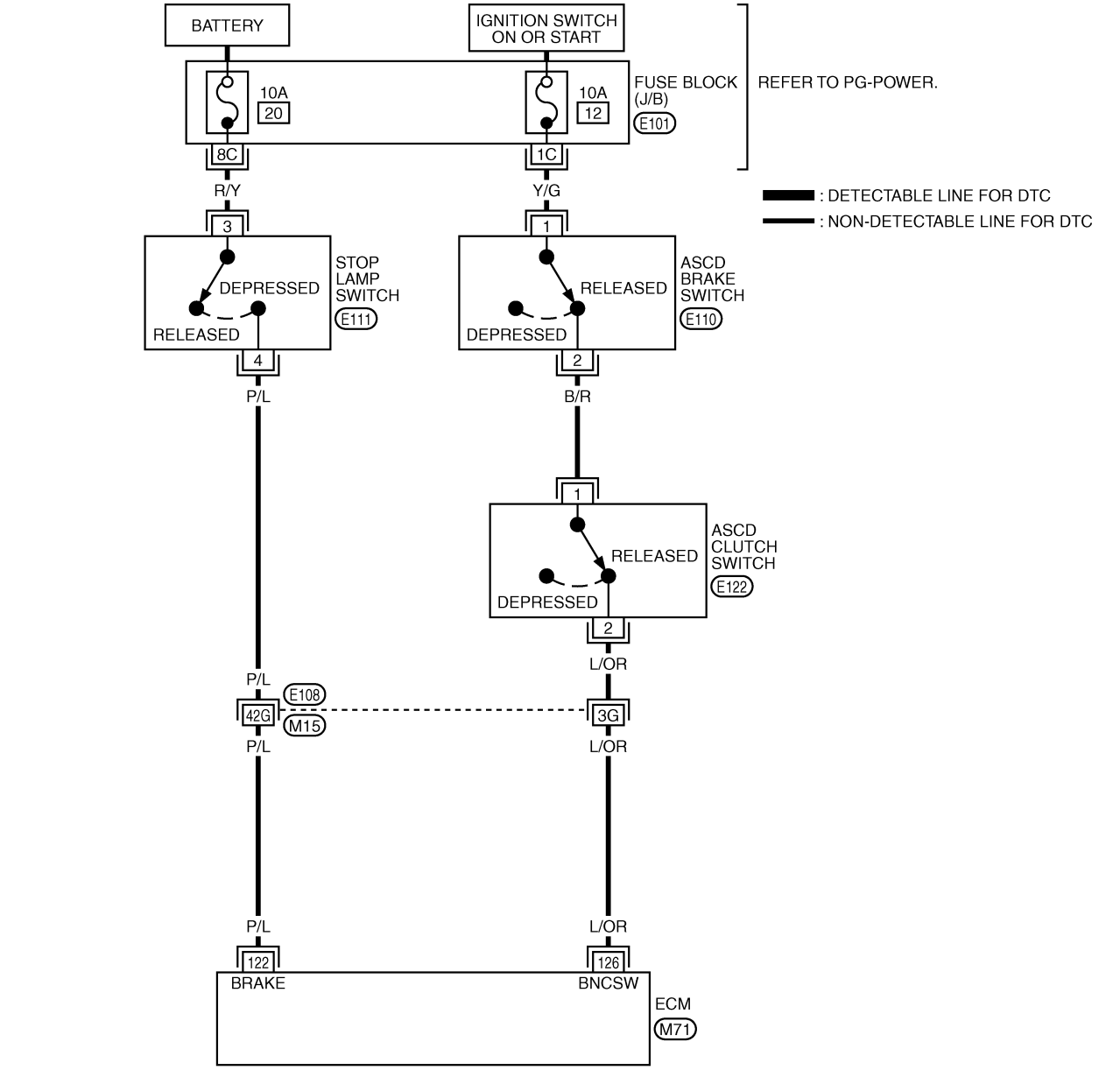
CAUTION:

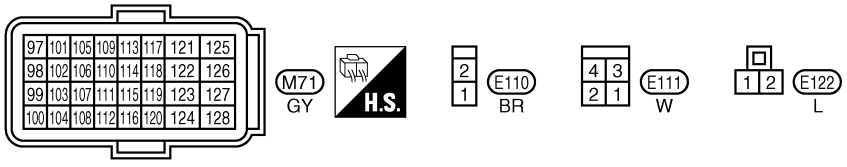
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal: Slightly depressed	0V
			[Ignition switch: ON] ● Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14V)

M/T MODELS

EC-ASCBOF-02





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1676E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
122	P/L	Stop lamp switch	**[Ignition switch: OFF]** ● Brake pedal: Fully released	0V
			[Ignition switch: OFF] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)
126	L/OR	ASCD brake switch	**[Ignition switch: ON]** ● Brake pedal and/or clutch pedal: Slightly depressed	0V
			[Ignition switch: ON] ● Brake pedal and clutch pedal: Fully released	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

NBS000IC

A/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-III

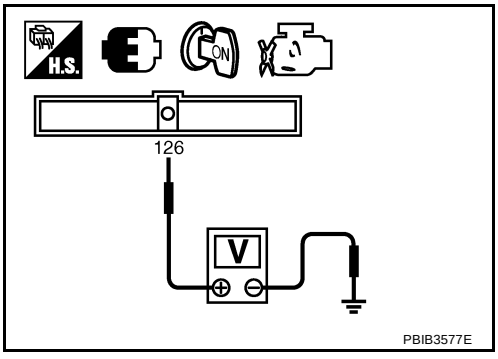
1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-III.
3. Check “BRAKE SW1” indication under the following conditions.

CONDITION	INDICATION
Brake pedal: Slightly depressed	OFF
Brake pedal: Fully released	ON

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 126 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal: Slightly depressed	Approximately 0V
Brake pedal: Fully released	Battery voltage



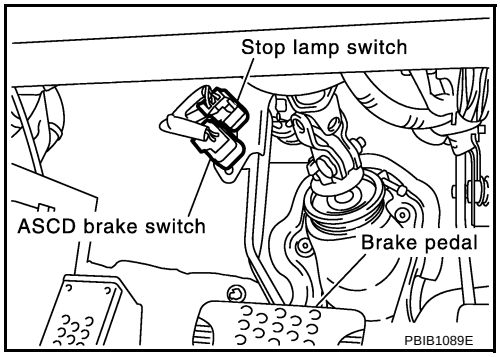
OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

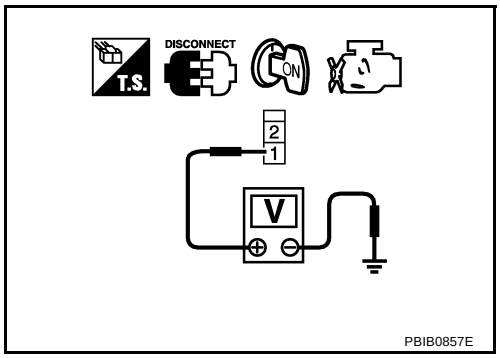
2. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminal 126 and ASCD brake switch terminal 2. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and ASCD brake switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH

Refer to EC-680, "Component Inspection"

OK or NG

OK >> GO TO 7.
NG >> Replace ASCD brake switch.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

M/T MODELS

1. CHECK OVERALL FUNCTION-I

With CONSULT-III

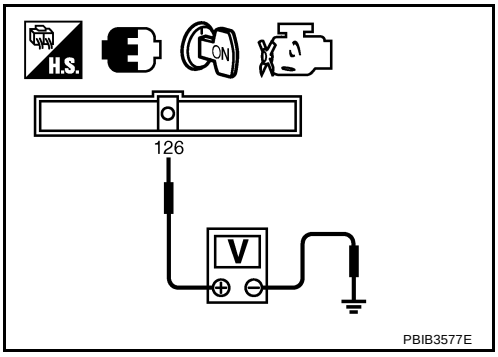
1. Turn ignition switch ON.
2. Select “BRAKE SW1” in “DATA MONITOR” mode with CONSULT-III.
3. Check “BRAKE SW1” indication under the following conditions.

CONDITION	INDICATION
Brake pedal and/or clutch pedal: Slightly depressed	OFF
Brake pedal and clutch pedal: Fully released	ON

Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between ECM terminal 126 and ground under the following conditions.

CONDITION	VOLTAGE
Brake pedal and/or clutch pedal: Slightly depressed	Approximately 0V
Brake pedal and clutch pedal: Fully released	Battery voltage

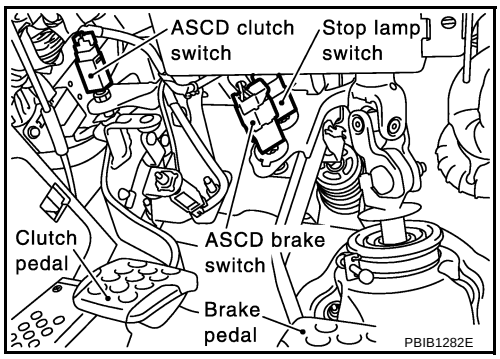


OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

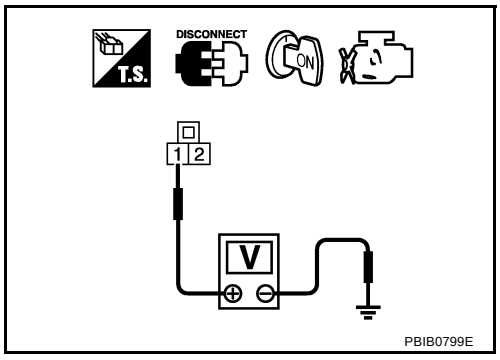
2. CHECK ASCD BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD clutch switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage

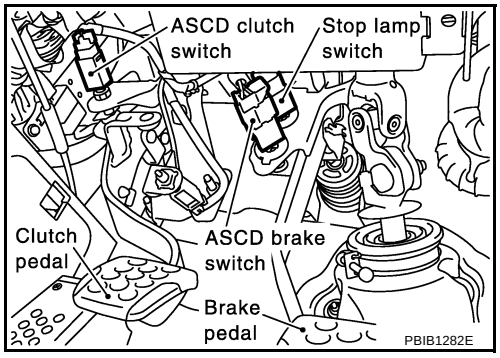


OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

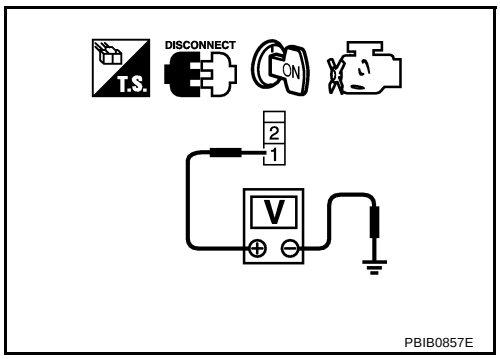
3. CHECK ASCD BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Turn ignition switch ON.



4. Check voltage between ASCD brake switch terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Fuse block (J/B) connector E101
- 10A fuse
- Harness for open or short between ASCD brake switch and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ASCD brake switch terminal 2 and ASCD clutch switch terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK ASCD BRAKE SWITCH

Refer to EC-680, "Component Inspection"

OK or NG

OK >> GO TO 10.
NG >> Replace ASCD brake switch.

7. CHECK ASCD CLUTCH SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ASCD clutch switch terminal 2 and ECM terminal 126. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E108, M15
- Harness for open or short between ECM and ASCD clutch switch

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK ASCD CLUTCH SWITCH

Refer to EC-680, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace ASCD clutch switch.

10. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

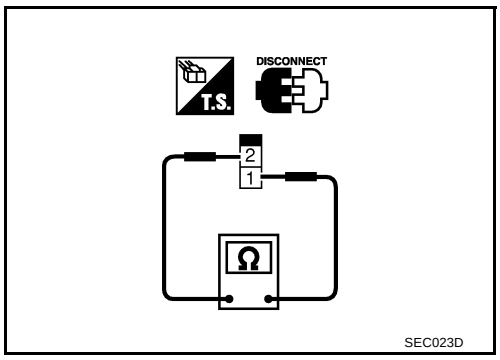
NBS000ID

ASCD BRAKE SWITCH

1. Turn ignition switch OFF.
2. Disconnect ASCD brake switch harness connector.
3. Check continuity between ASCD brake switch terminals 1 and 2 under the following conditions.

Condition	Continuity
Brake pedal: Fully released	Should exist
Brake pedal: Slightly depressed	Should not exist

If NG, adjust ASCD brake switch installation, refer to BR-7, "BRAKE PEDAL" , and perform step 3 again.

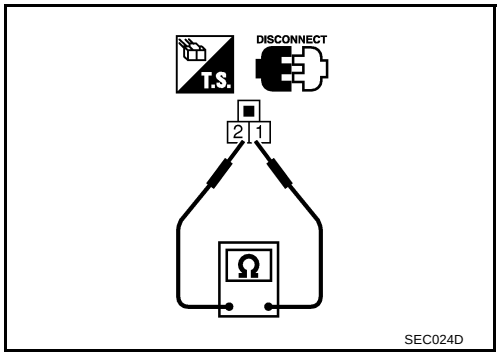


ASCD CLUTCH SWITCH (M/T MODELS)

1. Turn ignition switch OFF.
2. Disconnect ASCD clutch switch harness connector.
3. Check continuity between ASCD clutch switch terminals 1 and 2 under the following conditions.

Condition	Continuity
Clutch pedal: Fully released	Should exist
Clutch pedal: Slightly depressed	Should not exist

If NG, adjust ASCD clutch switch installation, refer to CL-5, "CLUTCH PEDAL" , and perform step 3 again.



ASCD INDICATOR

PFP:24814

Component Description

NBS000IE

ASCD indicator lamp illuminates to indicate ASCD operation status. Lamp has two indicators, CRUISE, SET, and is integrated in combination meter.
CRUISE indicator illuminates when MAIN switch on ASCD steering switch is turned ON to indicated that ASCD system is ready for operation.
SET indicator illuminates when following conditions are met.

- CRUISE indicator is illuminated.
- SET/COAST switch on ASCD steering switch is turned ON while vehicle speed is within the range of ASCD setting.

SET indicator remains lit during ASCD control.
Refer to EC-30, "AUTOMATIC SPEED CONTROL DEVICE (ASCD)" for the ASCD function.

CONSULT-III Reference Value in Data Monitor Mode

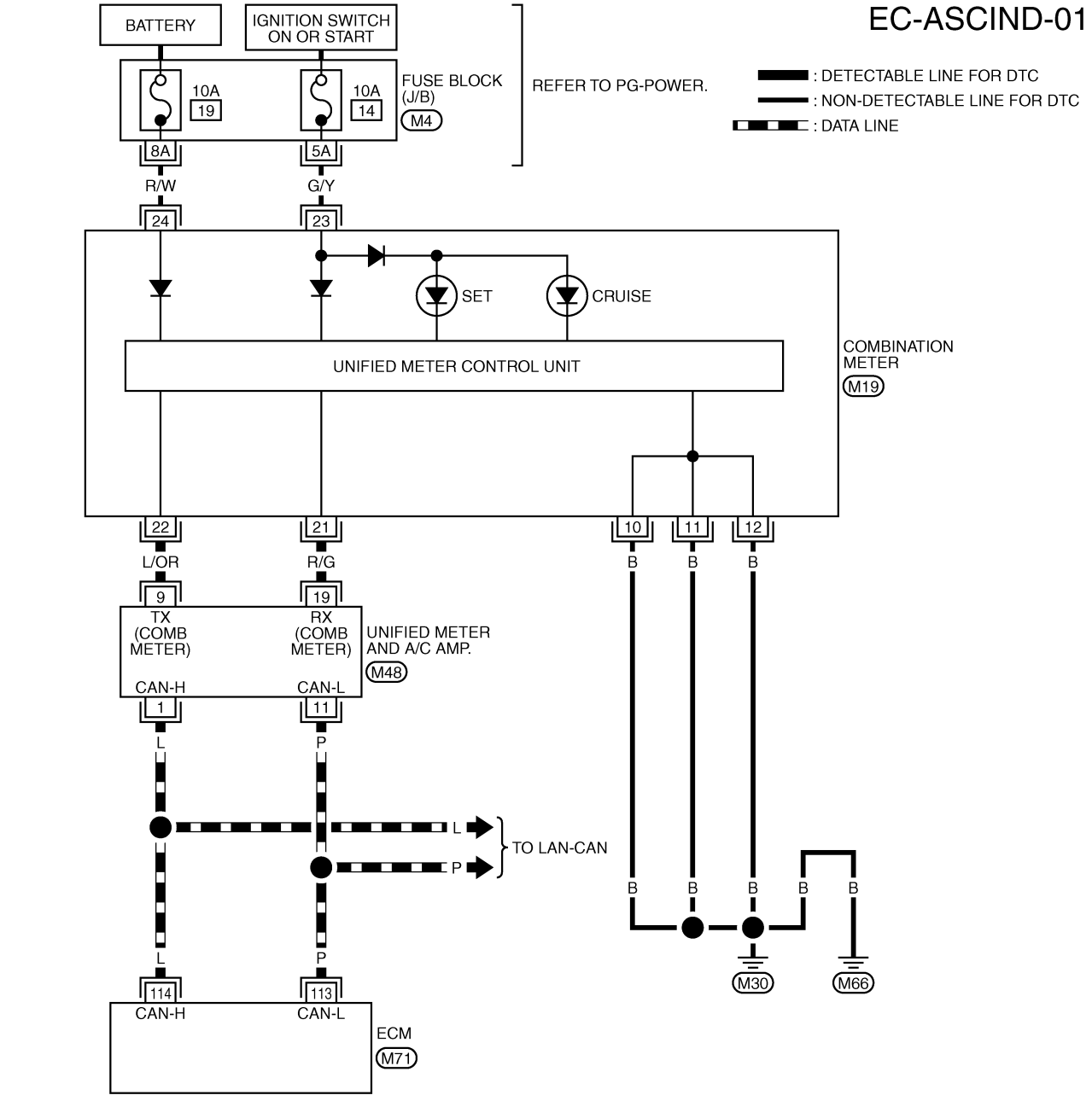
NBS000IF

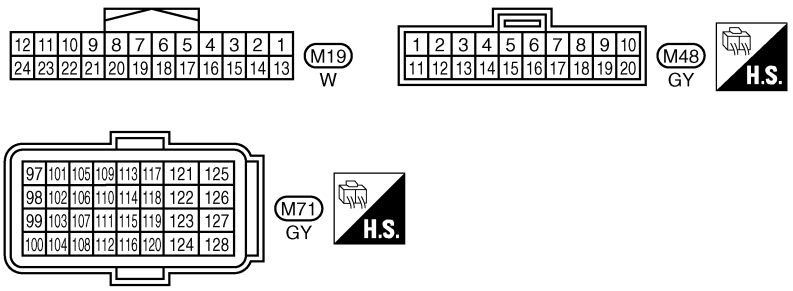
Specification data are reference value.

MONITOR ITEM	CONDITION		SPECIFICATION
CRUISE LAMP	● Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● MAIN switch: ON	ASCD: Operating	ON
	● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89MPH)	ASCD: Not operating	OFF

Wiring Diagram

NBS000IG





REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1677E

Diagnostic Procedure

NBS000IH

1. CHECK OVERALL FUNCTION

Check ASCD indicator under the following conditions.

ASCD INDICATOR	CONDITION		SPECIFICATION
CRUISE LAMP	● Ignition switch: ON	● MAIN switch: Pressed at the 1st time → at the 2nd time	ON → OFF
SET LAMP	● MAIN switch: ON ● When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)	ASCD: Operating	ON
		ASCD: Not operating	OFF

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

2. CHECK DTC

Check that DTC U1000 or U1001 is not displayed.

OK or NG

OK >> GO TO 3.
NG >> Perform trouble diagnoses for DTC U1000, U1001. Refer to EC-151, "DTC U1000, U1001 CAN COMMUNICATION LINE" .

3. CHECK DTC WITH “UNIFIED METER AND A/C AMP.”

Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

OK or NG

OK >> GO TO 4.
NG >> Go to DI-52, "DTC [B2202] Meter Communication Circuit" .

4. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

ELECTRICAL LOAD SIGNAL

PFP:25350

Description

NBS000I6

The electrical load signal (Headlamp switch signal, rear window defogger switch signal, etc.) is transferred through the CAN communication line from BCM to ECM via IPDM E/R.

CONSULT-III Reference Value in Data Monitor Mode

NBS000I7

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
LOAD SIGNAL	● Ignition switch: ON	Rear window defogger switch: ON and/or lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
HEATER FAN SW	● Engine: After warming up, idle the engine	Heater fan switch: ON	ON
		Heater fan switch: OFF	OFF

Diagnostic Procedure

NBS000I8

1. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-I

1. Turn ignition switch ON.
2. Connect CONSULT-III and select “DATA MONITOR” mode.
3. Select “LOAD SIGNAL” and check indication under the following conditions.

Condition	Indication
Rear window defogger switch: ON	ON
Rear window defogger switch: OFF	OFF

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK LOAD SIGNAL CIRCUIT OVERALL FUNCTION-II

Check “LOAD SIGNAL” indication under the following conditions.

Condition	Indication
Lighting switch: ON at 2nd position	ON
Lighting switch: OFF	OFF

OK or NG

OK >> GO TO 3.
NG >> GO TO 5.

3. CHECK HEATER FAN SIGNAL CIRCUIT OVERALL FUNCTION

With CONSULT-III

Check “HEATER FAN SW” in “DATA MONITOR” mode with CONSULT-III under the following conditions.

Condition	Indication
Heater fan: Operating	ON
Heater fan: Not operating	OFF

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 6.

4. CHECK REAR WINDOW DEFOGGER SYSTEM

Refer to GW-56, "REAR WINDOW DEFOGGER" .

>> **INSPECTION END**

5. CHECK HEADLAMP SYSTEM

Refer to LT-5, "HEADLAMP (FOR USA)" or LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -" .

>> **INSPECTION END**

6. CHECK HEATER FAN CONTROL SYSTEM

Refer to ATC-33, "TROUBLE DIAGNOSIS" .

>> **INSPECTION END**

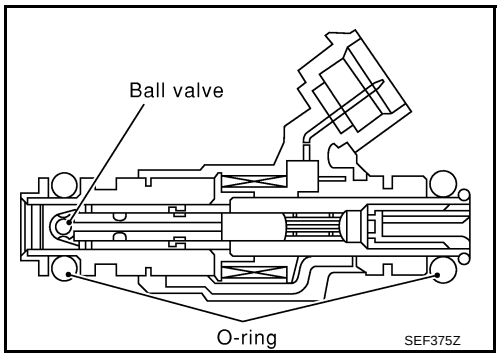
FUEL INJECTOR

PFP:16600

Component Description

NBS000HQ

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the fuel injector circuit, the coil in the fuel injector is energized. The energized coil pulls the ball valve back and allows fuel to flow through the fuel injector into the intake manifold. The amount of fuel injected depends upon the fuel injection pulse duration. Pulse duration is the length of time the fuel injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.



CONSULT-III Reference Value in Data Monitor Mode

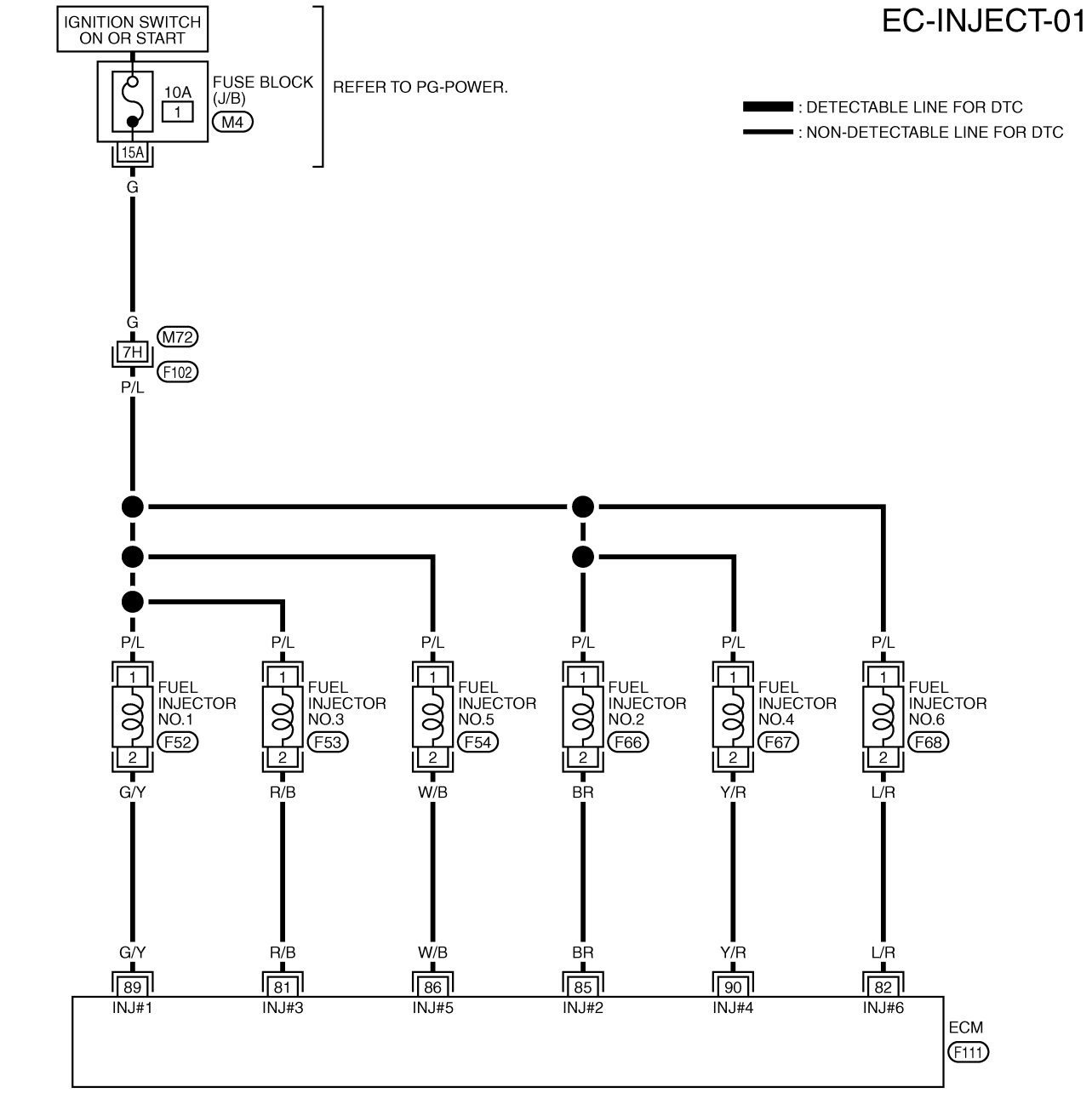
NBS000HR

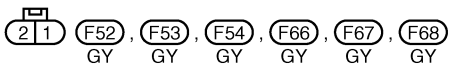
Specification data are reference values.

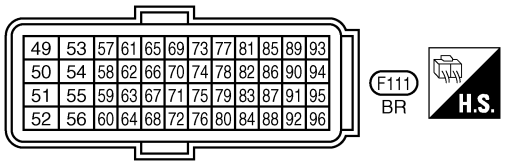
MONITOR ITEM	CONDITION		SPECIFICATION
B/FUEL SCHDL	See EC-132, "TROUBLE DIAGNOSIS - SPECIFICATION VALUE" .		
INJ PULSE-B1 INJ PULSE-B2	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) position ● Air conditioner switch: OFF ● No load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec

Wiring Diagram

NBS000HS







REFER TO THE FOLLOWING.

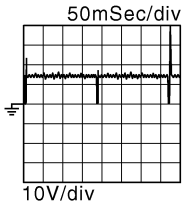
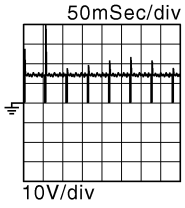
F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1678E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
81 82 85 86 89 90	R/B L/R BR W/B G/Y Y/R	Fuel injector No. 3 Fuel injector No. 6 Fuel injector No. 2 Fuel injector No. 5 Fuel injector No. 1 Fuel injector No. 4	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	BATTERY VOLTAGE (11 - 14V)★  PBIB3555E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14V)★  PBIB3556E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS000HT

1. INSPECTION START

Turn ignition switch to START.
Is any cylinder ignited?

Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. CHECK OVERALL FUNCTION

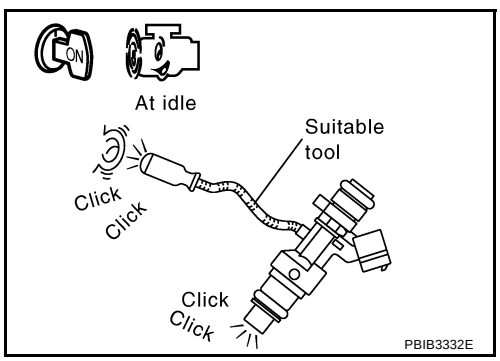
With CONSULT-III

1. Start engine.
2. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
3. Make sure that each circuit produces a momentary engine speed drop.

Without CONSULT-III

1. Start engine and let it idle.
2. Listen to each fuel injector operating sound.

Clickng sound should be heard.



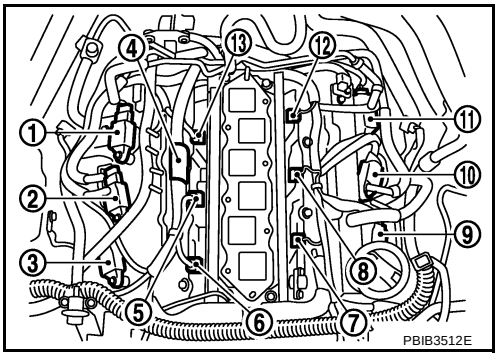
PBIB3332E

OK or NG

OK >> INSPECTION END.
NG >> GO TO 3.

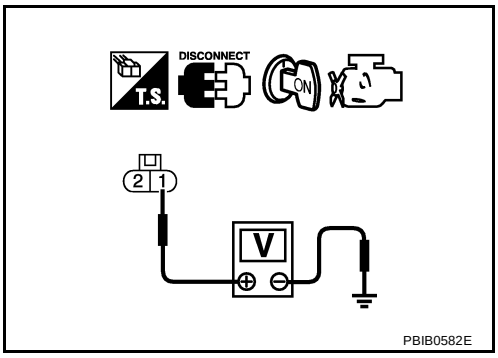
3. CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.



1 : Ignition coil No.5 (with power transistor)
2 : Ignition col No.3 (with power transistor)
3 : Ignition coil No.1 (with power transistor)
4 : Condenser
5 : Fuel injector No.3
6 : Fuel injector No.1
7 : Fuel injector No.2
8 : Fuel injector No.4
9 : Ignition coil No.2 (with power transistor)
10 : Ignition coil No.4 (with power transistor)
11 : Ignition coil No.6 (with power transistor)
12 : Fuel injector No.6
13 : Fuel injector No.5

3. Turn ignition switch ON.
4. Check voltage between fuel injector terminal 1 and ground with CONSULT-III or tester.



Voltage: Battery voltage

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors M72, F102
- Fuse block (J/B) connector M4
- 10A fuse
- Harness for open or short between fuel injector and fuse

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK FUEL INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between fuel injector terminal 2 and ECM terminals 81, 82, 85, 86, 89, 90. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK FUEL INJECTOR

Refer to EC-690, "Component Inspection" .

OK or NG

OK >> GO TO 7.
NG >> Replace malfunctioning fuel injector.

7. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

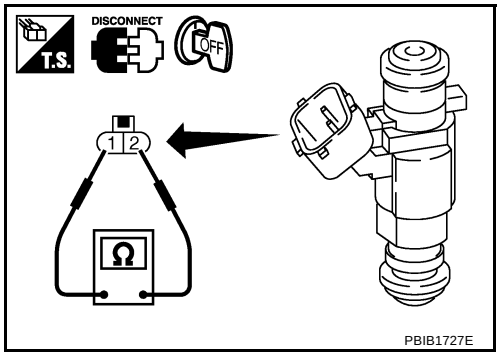
Component Inspection

NBS000HU

FUEL INJECTOR

1. Disconnect fuel injector harness connector.
2. Check resistance between terminals as shown in the figure.

Resistance: 11.1 - 14.3Ω [at 10 - 60°C (50 - 140°F)]



Removal and Installation

NBS000HV

FUEL INJECTOR

Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .

FUEL PUMP

PFP:17042

Description

NBS000HW

SYSTEM DESCRIPTION

Sensor	Input Signal to ECM	ECM Function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*	Fuel pump control	Fuel pump relay
Battery	Battery voltage*		

*: ECM determines the start signal status by the signals of engine speed and battery voltage.

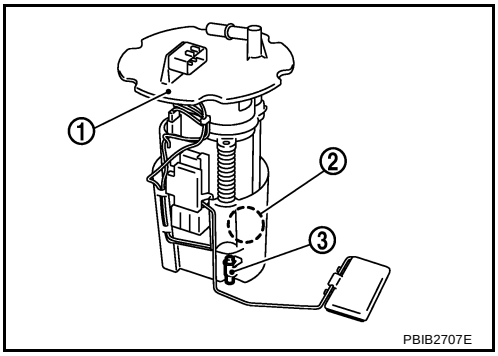
The ECM activates the fuel pump for several seconds after the ignition switch is turned ON to improve engine startability. If the ECM receives a engine speed signal from the camshaft position sensor (PHASE), it knows that the engine is rotating, and causes the pump to operate. If the engine speed signal is not received when the ignition switch is ON, the engine stalls. The ECM stops pump operation and prevents battery discharging, thereby improving safety. The ECM does not directly drive the fuel pump. It controls the ON/OFF fuel pump relay, which in turn controls the fuel pump.

Condition	Fuel pump operation
Ignition switch: ON	Operates for 1 second.
Engine running or cranking	Operates.
Engine: Stopped	Stops in 1.5 seconds.
Except as shown above	Stops.

COMPONENT DESCRIPTION

A turbine type design fuel pump is used in the fuel tank.

1 : Fuel level sensor unit and fuel pump
2 : Fuel pressure regulator
3 : Fuel tank temperature sensor



PBIB2707E

CONSULT-III Reference Value in Data Monitor Mode

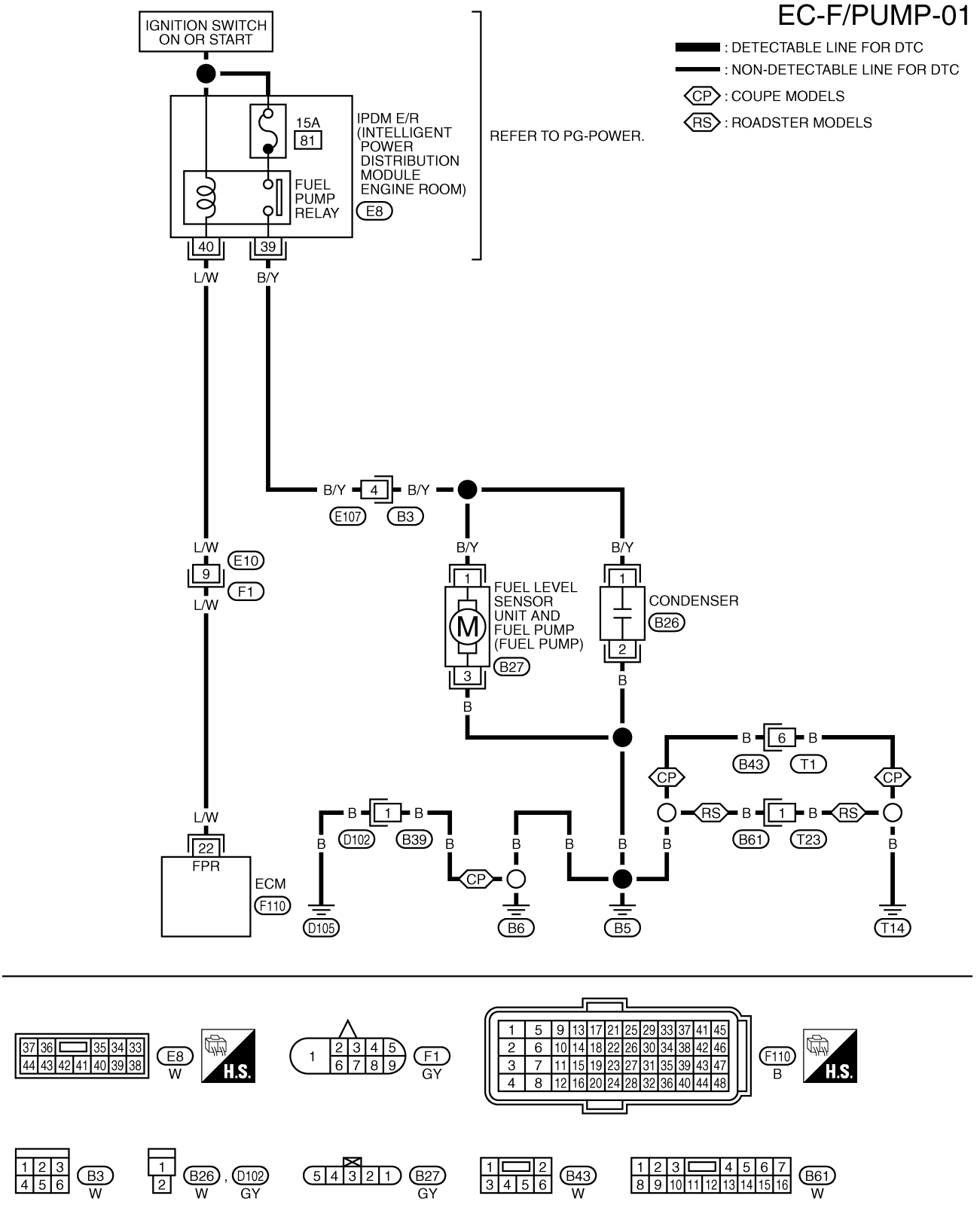
NBS000HX

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
FUEL PUMP RLY	● For 1 second after turning ignition switch ON ● Engine running or cranking	ON
	● Except above conditions	OFF

Wiring Diagram

NBS000HY



TBWT1679E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
22	L/W	Fuel pump relay	**[Ignition switch: ON]** ● For 1 second after turning ignition switch ON **[Engine is running]**	0 - 1.5V
			[Ignition switch: ON] ● More than 1 second after turning ignition switch ON.	BATTERY VOLTAGE (11 - 14V)

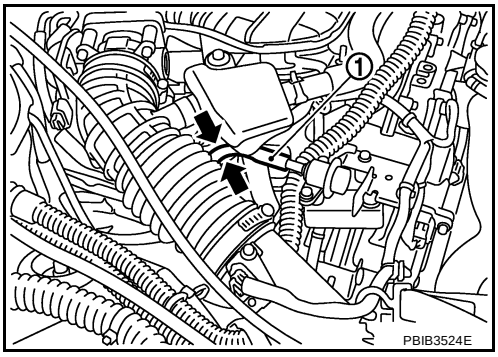
Diagnostic Procedure

NBS000HZ

1. CHECK OVERALL FUNCTION

1. Turn ignition switch ON.
2. Pinch fuel feed hose (1) with two fingers.

Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned ON.



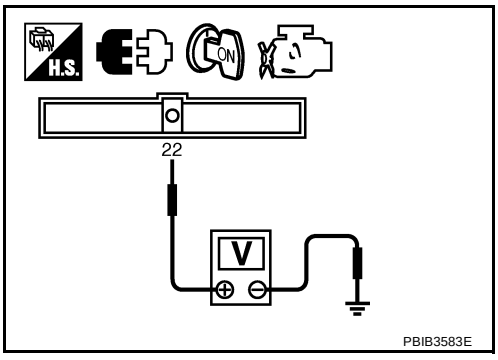
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 2.

2. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Turn ignition switch ON.
4. Check voltage between ECM terminal 22 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK FUEL PUMP POWER SUPPLY CIRCUIT-I

1. Disconnect IPDM E/R harness connector E8.
2. Check harness continuity between IPDM E/R terminal 40 and ECM terminal 22. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> GO TO 15.

4. DETECT MALFUNCTIONING PART

Check the following.

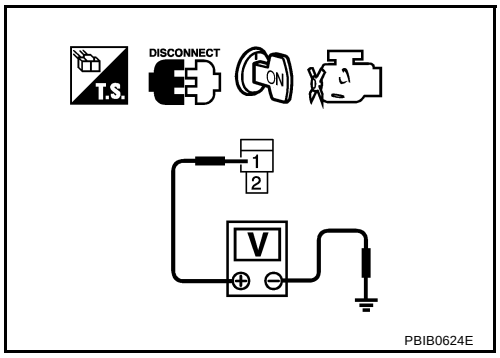
- Harness connectors E10, F1
- Harness for open or short between IPDM E/R and ECM

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK CONDENSER POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Disconnect condenser harness connector.
4. Turn ignition switch ON.
5. Check voltage between condenser terminal 1 and ground with CONSULT-III or tester.

Voltage: Battery voltage should exist for 1 second after ignition switch is turned ON.



OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. CHECK 15A FUSE

1. Turn ignition switch OFF.
2. Disconnect 15A fuse.
3. Check 15A fuse.

OK or NG

OK >> GO TO 7.
NG >> Replace fuse.

7. CHECK CONDENSER POWER SUPPLY CIRCUIT-II

1. Disconnect IPDM E/R harness connector E8.
2. Check harness continuity between IPDM E/R terminal 39 and condenser terminal 1. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 15.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E107, B3
- Harness for open or short between IPDM E/R and condenser

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK CONDENSER GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check harness continuity between condenser terminal 2 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 11.
NG >> GO TO 10

10. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors B43, T1 (Coupe models)
- Harness connectors B39, D102 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- Harness for open or short between condenser and ground

>> Repair open circuit or short to power in harness or connectors.

11. CHECK CONDENSER

Refer to EC-697, "Component Inspection" .

OK or NG

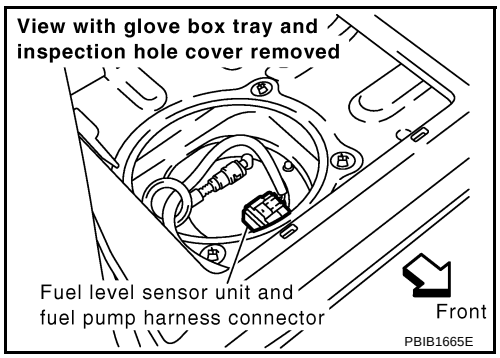
OK >> GO TO 12.
NG >> Replace condenser.

12. CHECK FUEL PUMP POWER SUPPLY AND GROUND CIRCUIT FOR OPEN AND SHORT

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Disconnect harness connectors E107, B3.
3. Check harness continuity between the following;
   “fuel level sensor unit and fuel pump” terminal 1 and harness connector B3 terminal 4,
   “fuel level sensor unit and fuel pump” terminal 3 and ground.
   Refer to Wiring Diagram.

   Continuity should exist.

4. Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 14.
NG >> GO TO 13.

13. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector B3
- Harness connectors B43, T1 (Coupe models)
- Harness connectors B39, D102 (Coupe models)
- Harness connectors B61, T23 (Roadster models)
- Harness for open or short between “fuel level sensor unit and fuel pump” and harness connector B3
- Harness for open or short between “fuel level sensor unit and fuel pump” and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

14. CHECK FUEL PUMP

Refer to EC-697, "Component Inspection" .

OK or NG

OK >> GO TO 15.
NG >> Replace “fuel level sensor unit and fuel pump”.

15. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair or replace harness or connectors.

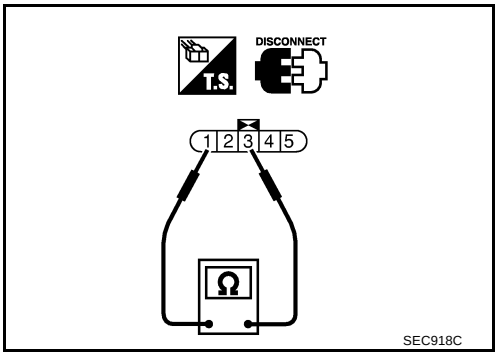
Component Inspection

NBS000I0

FUEL PUMP

1. Disconnect “fuel level sensor unit and fuel pump” harness connector.
2. Check resistance between “fuel level sensor unit and fuel pump” terminals 1 and 3.

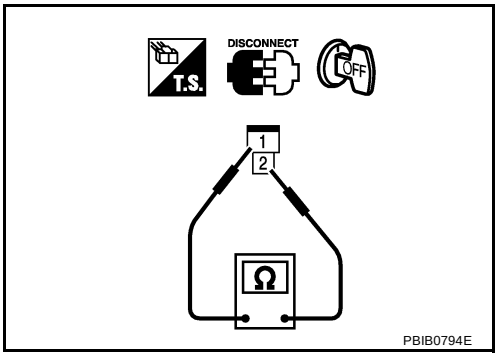
Resistance: 0.2 - 5.0Ω [at 25°C (77°F)]



CONDENSER

1. Disconnect condenser harness connector.
2. Check resistance between condenser terminals 1 and 2.

Resistance: Above 1 MΩ [at 25°C (77°F)]



Removal and Installation

NBS000I1

FUEL PUMP

Refer to FL-4, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" .

IGNITION SIGNAL

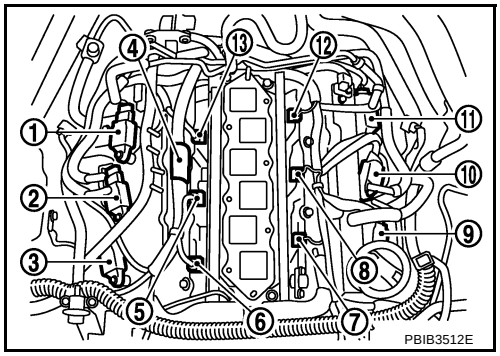
PFP:22448

Component Description

NBS000HL

IGNITION COIL & POWER TRANSISTOR

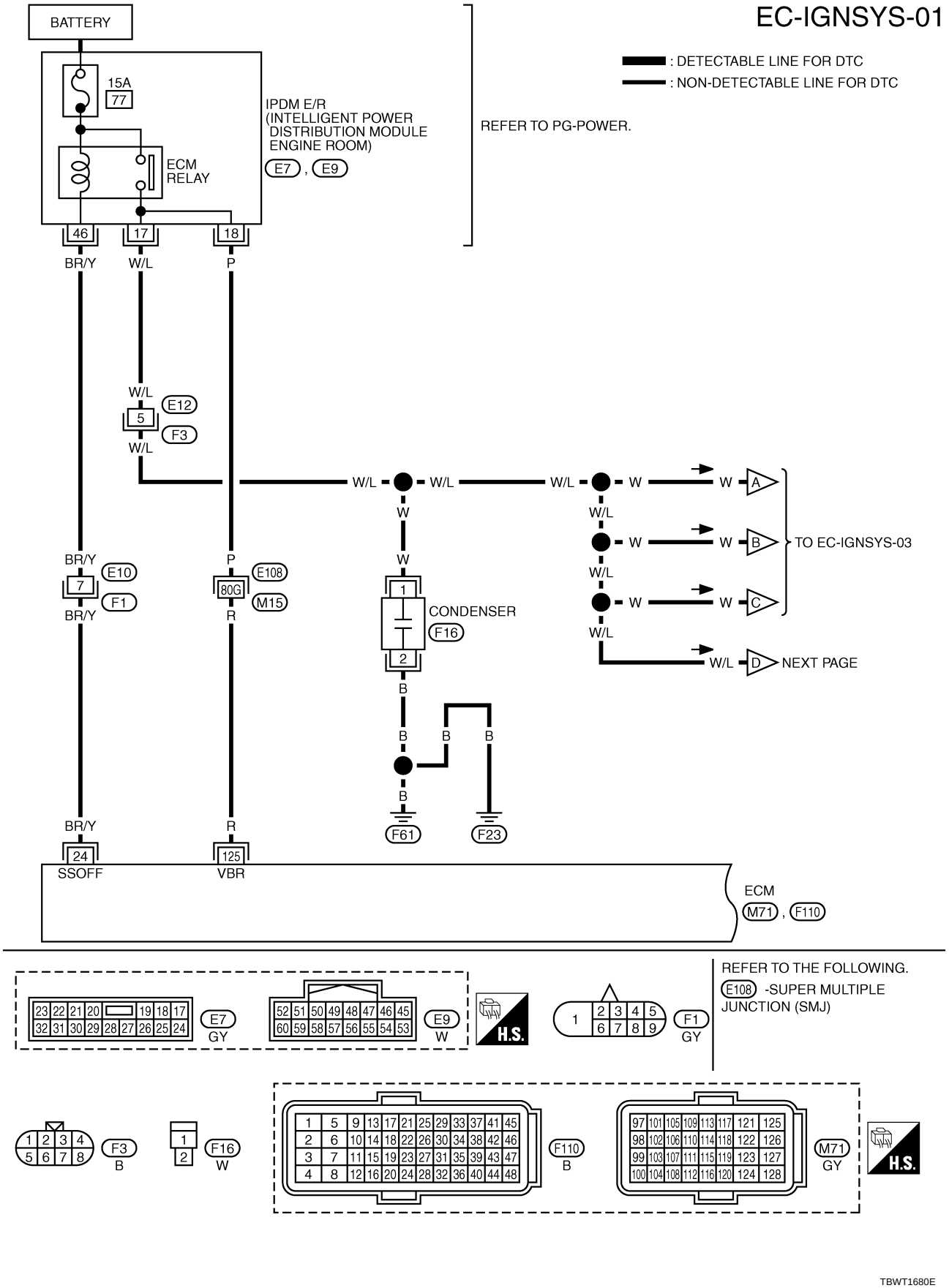
The ignition signal from the ECM is sent to and amplified by the power transistor. The power transistor turns ON and OFF the ignition coil primary circuit. This ON/OFF operation induces the proper high voltage in the coil secondary circuit.



1 : Ignition coil No.5 (with power transistor)
2 : Ignition col No.3 (with power transistor)
3 : Ignition coil No.1 (with power transistor)
4 : Condenser
5 : Fuel injector No.3
6 : Fuel injector No.1
7 : Fuel injector No.2
8 : Fuel injector No.4
9 : Ignition coil No.2 (with power transistor)
10 : Ignition coil No.4 (with power transistor)
11 : Ignition coil No.6 (with power transistor)
12 : Fuel injector No.6
13 : Fuel injector No.5

Wiring Diagram

NBS000HM



TBWT1680E

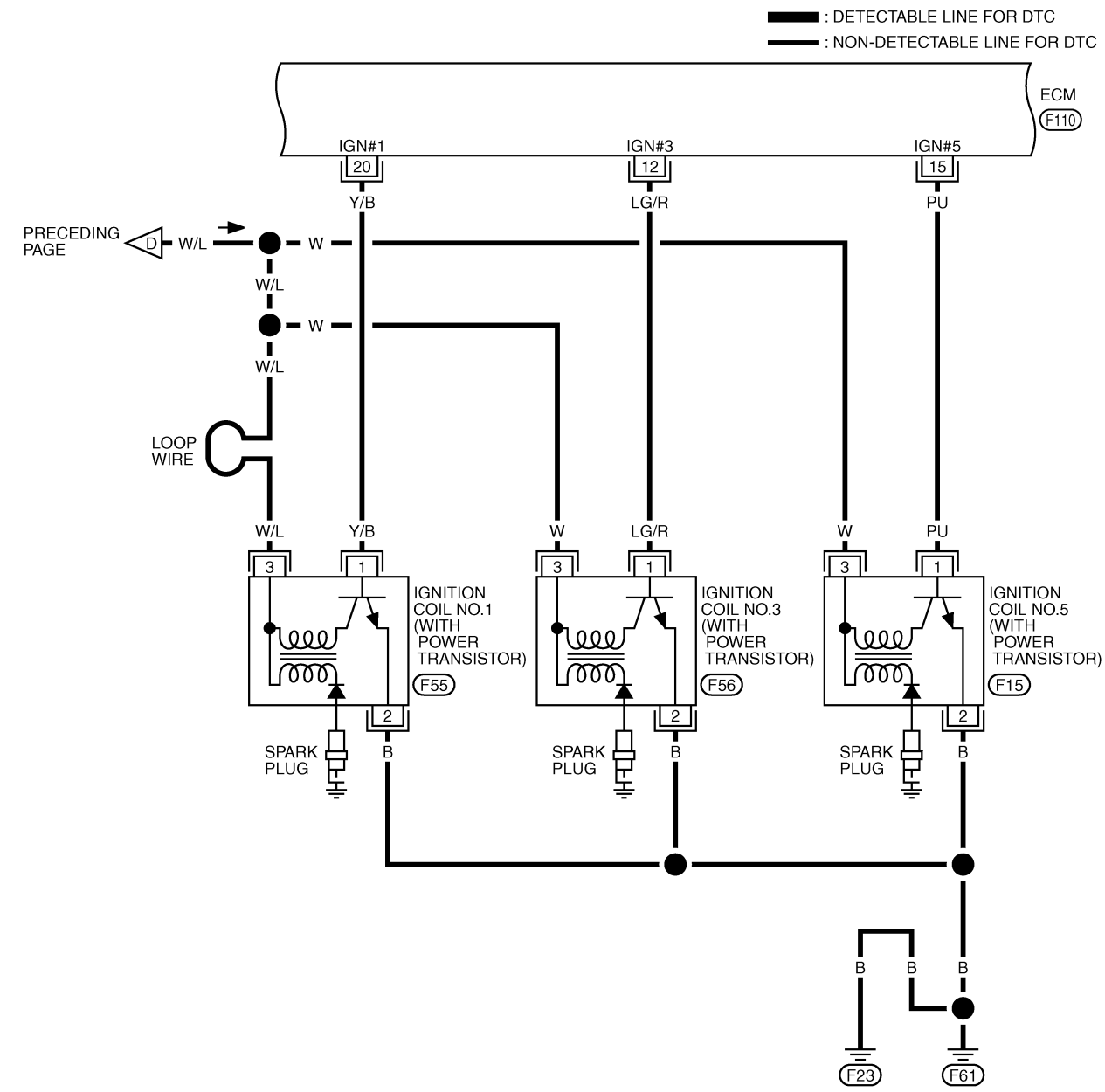
Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
24	BR/Y	ECM relay (Self shut-off)	**[Engine is running]** **[Ignition switch: OFF]** ● For a few seconds after turning ignition switch OFF	0 - 1.5V
			[Ignition switch: OFF] ● More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14V)
125	R	Power supply for ECM	**[Ignition switch: ON]**	BATTERY VOLTAGE (11 - 14V)

EC-IGNSYS-02





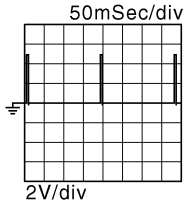
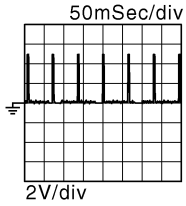
TBWT1681E

IGNITION SIGNAL

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

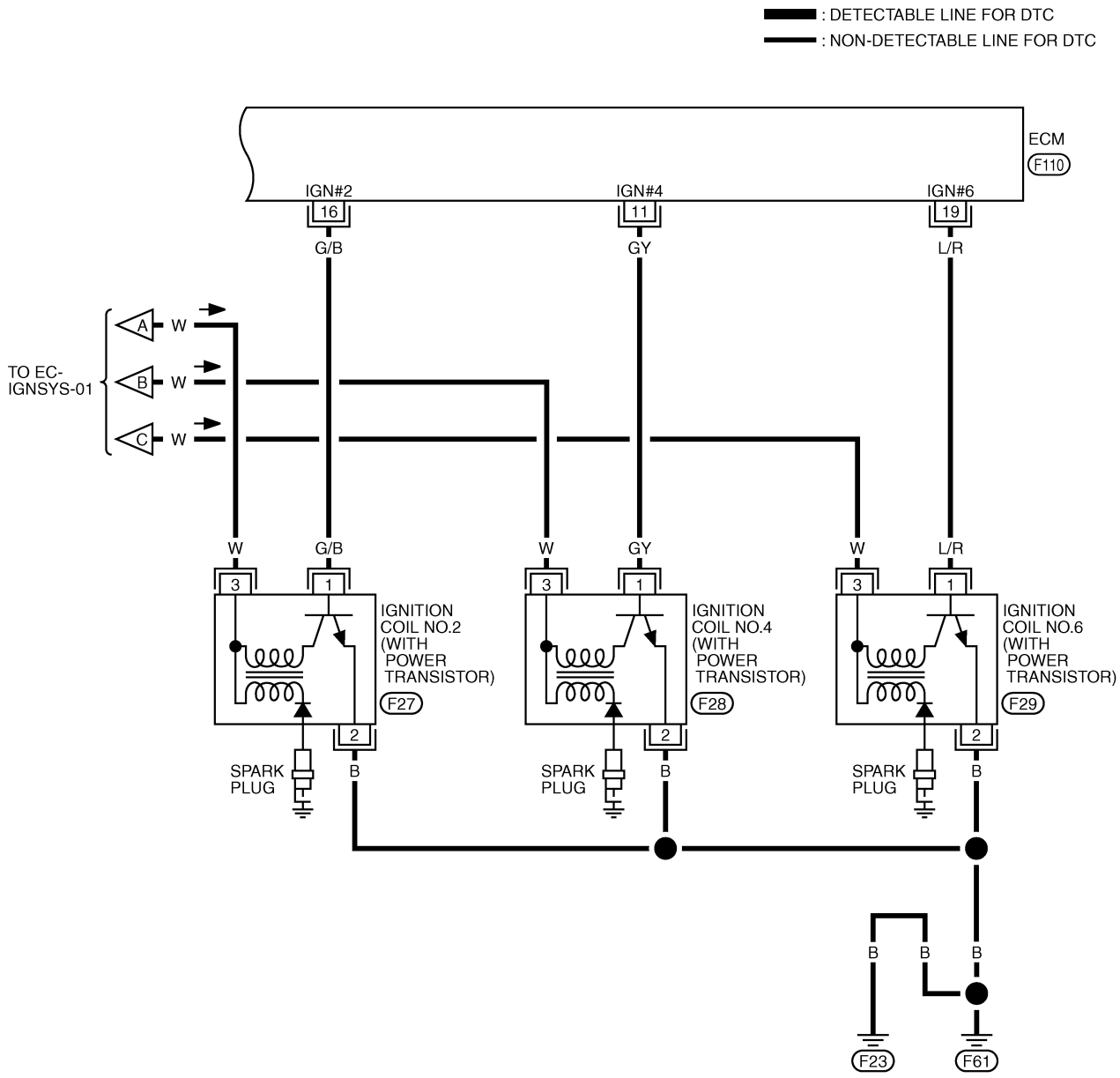
CAUTION:

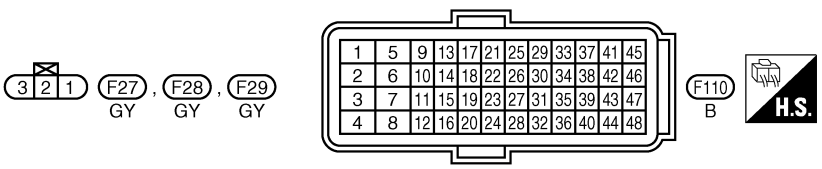
Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
12 15 20	LG/R PU Y/B	Ignition signal No. 3 Ignition signal No. 5 Ignition signal No. 1	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  PBIB3543E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	0.1 - 0.4V★  PBIB3544E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

EC-IGNSYS-03



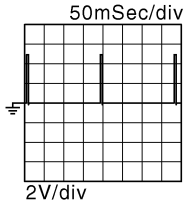
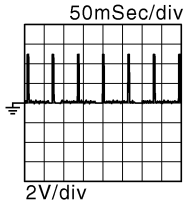


TBWT1682E

Specification data are reference values and are measured between each terminal and ground.
Pulse signal is measured by CONSULT-III.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
11 16 19	GY G/B L/R	Ignition signal No. 4 Ignition signal No. 2 Ignition signal No. 6	**[Engine is running]** ● **Warm-up condition** ● Idle speed **NOTE:** The pulse cycle changes depending on rpm at idle.	0 - 0.2V★  PBIB3543E
			[Engine is running] ● **Warm-up condition** ● Engine speed: 2,000 rpm	0.1 - 0.4V★  PBIB3544E

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

Diagnostic Procedure

NBS000HN

1. CHECK ENGINE START

Turn ignition switch OFF and restart engine.
Is engine running?

Yes or No

Yes (With CONSULT-III)>>GO TO 2.
Yes (Without CONSULT-III)>>GO TO 3.
No >> GO TO 4.

2. CHECK OVERALL FUNCTION

With CONSULT-III

1. Perform “POWER BALANCE” in “ACTIVE TEST” mode with CONSULT-III.
2. Make sure that each circuit produces a momentary engine speed drop.

OK or NG

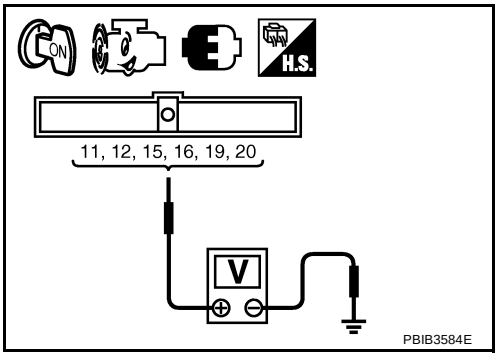
OK >> **INSPECTION END**
NG >> GO TO 10.

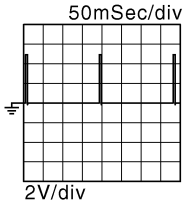
3. CHECK OVERALL FUNCTION

Without CONSULT-III

1. Let engine idle.
2. Read the voltage signal between ECM terminals 11, 12, 15, 16, 19, 20 and ground with an oscilloscope.
3. Verify that the oscilloscope screen shows the signal wave as shown below.

   NOTE:
   The pulse cycle changes depending on rpm at idle.





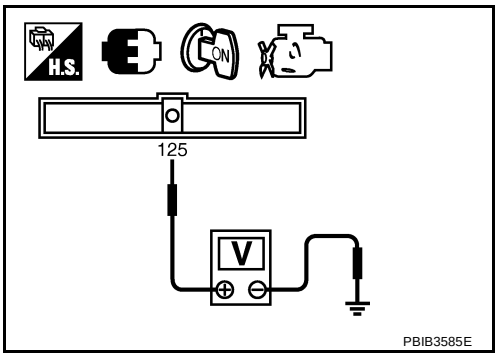
OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

4. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-I

1. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
2. Check voltage between ECM terminals 125 and ground with CONSULT-III or tester.

   Voltage: Battery voltage

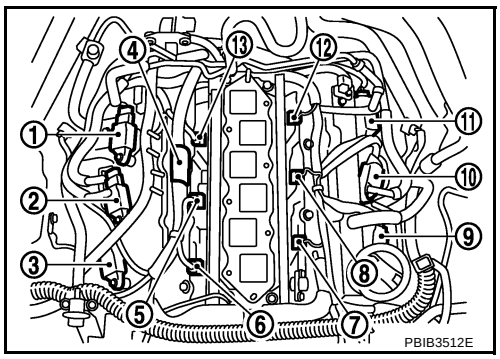


OK or NG

OK >> GO TO 5.
NG >> Go to EC-142, "POWER SUPPLY AND GROUND CIRCUIT" .

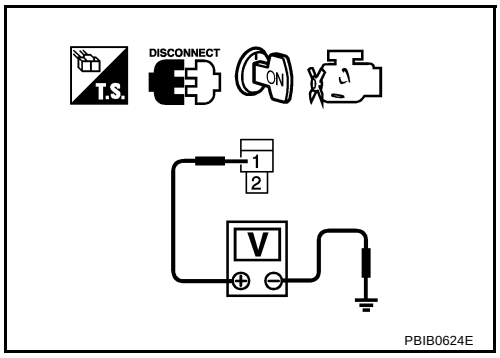
5. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.



1 : Ignition coil No.5 (with power transistor)
2 : Ignition col No.3 (with power transistor)
3 : Ignition coil No.1 (with power transistor)
4 : Condenser
5 : Fuel injector No.3
6 : Fuel injector No.1
7 : Fuel injector No.2
8 : Fuel injector No.4
9 : Ignition coil No.2 (with power transistor)
10 : Ignition coil No.4 (with power transistor)
11 : Ignition coil No.6 (with power transistor)
12 : Fuel injector No.6
13 : Fuel injector No.5

3. Turn ignition switch ON.
4. Check voltage between condenser terminal 1 and ground with CONSULT-III or tester.



Voltage: Battery voltage

OK or NG

OK >> GO TO 8.
NG >> GO TO 6.

6. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-III

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector E7.
3. Check harness continuity between IPDM E/R terminal 17 and condenser terminal 1. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 14.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E12, F3
- Harness for open or short between IPDM E/R and condenser

>> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK CONDENSER GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between condenser terminal 2 and ground. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 9.
NG >> Repair open circuit or short to power in harness or connectors.

9. CHECK CONDENSER

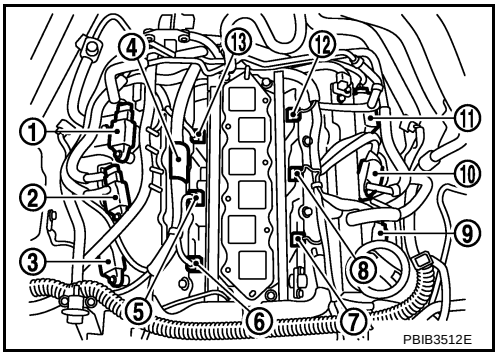
Refer to EC-708, "Component Inspection" .

OK or NG

OK >> GO TO 10.
NG >> Replace condenser.

10. CHECK IGNITION COIL POWER SUPPLY CIRCUIT-IV

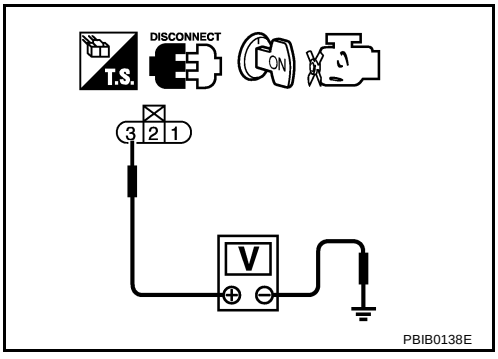
1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Disconnect ignition coil harness connector.



1 : Ignition coil No.5 (with power transistor)
2 : Ignition col No.3 (with power transistor)
3 : Ignition coil No.1 (with power transistor)
4 : Condenser
5 : Fuel injector No.3
6 : Fuel injector No.1
7 : Fuel injector No.2
8 : Fuel injector No.4
9 : Ignition coil No.2 (with power transistor)
10 : Ignition coil No.4 (with power transistor)
11 : Ignition coil No.6 (with power transistor)
12 : Fuel injector No.6
13 : Fuel injector No.5

4. Turn ignition switch ON.
5. Check voltage between ignition coil terminal 3 and ground with CONSULT-III or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 11.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

11. CHECK IGNITION COIL GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Check harness continuity between ignition coil terminal 2 and ground.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to power.

OK or NG

OK >> GO TO 12.
NG >> Repair open circuit or short to power in harness or connectors.

12. CHECK IGNITION COIL OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminals 11, 12, 15, 16, 19, 20 and ignition coil terminal 1.
   Refer to Wiring Diagram.

   Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 13.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

13. CHECK IGNITION COIL WITH POWER TRANSISTOR

Refer to EC-708, "Component Inspection" .

OK or NG

OK >> GO TO 14.
NG >> Replace malfunctioning ignition coil with power transistor.

14. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair open circuit or short to ground or short to power in harness connectors.

Component Inspection

NBS000HO

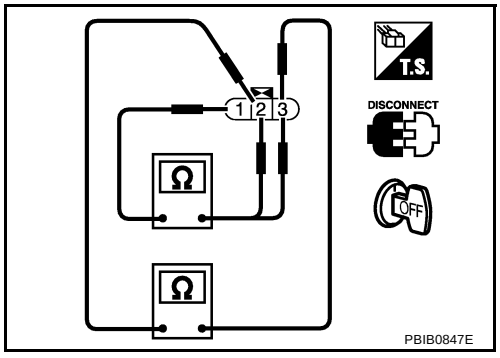
IGNITION COIL WITH POWER TRANSISTOR

CAUTION:

Do the following procedure in the place where ventilation is good without the combustible.

1. Turn ignition switch OFF.
2. Disconnect ignition coil harness connector.
3. Check resistance between ignition coil terminals as follows.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 and 2	Except 0 or ∞
1 and 3	Except 0
2 and 3	

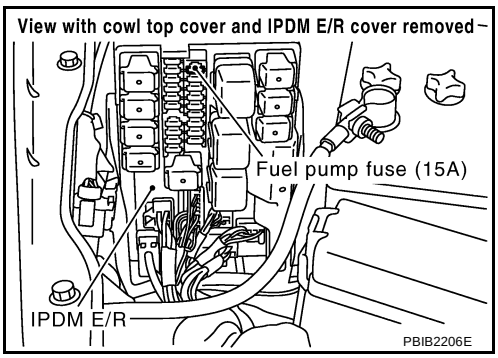


4. If NG, Replace ignition coil with power transistor.
   If OK, go to next step.
5. Turn ignition switch OFF.
6. Reconnect all harness connectors disconnected.

7. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

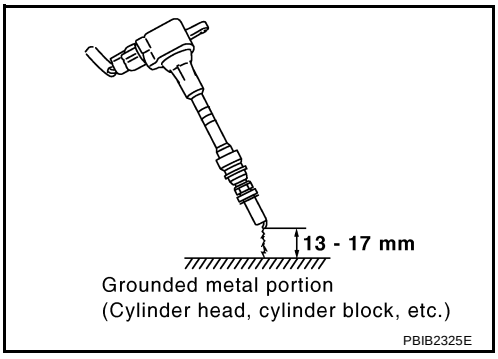
NOTE:
Do not use CONSULT-III to release fuel pressure, or fuel pressure applies again during the following procedure.

8. Start engine.
9. After engine stalls, crank it two or three times to release all fuel pressure.
10. Turn ignition switch OFF.
11. Remove ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
12. Remove ignition coil and spark plug of the cylinder to be checked.



13. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
14. Connect spark plug and harness connector to ignition coil.
15. Fix ignition coil using a rope etc. with gap of 13 - 17 mm between the edge of the spark plug and grounded metal portion as shown in the figure.
16. Crank engine for about 3 seconds, and check whether spark is generated between the spark plug and the grounded part.

Spark should be generated.



CAUTION:

- **Do not approach to the spark plug and the ignition coil within 50cm. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20kV or more.**
- **It might cause to damage the ignition coil if the gap of 17 mm or more is taken.**

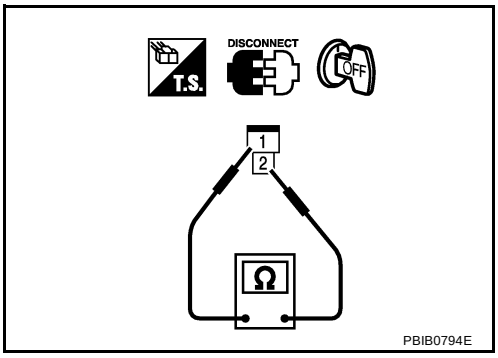
NOTE:
When the gap is less than 13 mm, the spark might be generated even if the coil is malfunctioning.

17. If NG, Replace ignition coil with power transistor.

CONDENSER

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.
3. Check resistance between condenser terminals 1 and 2.

Resistance: Above 1 MΩ [at 25°C (77°F)]



Removal and Installation

NBS000HP

IGNITION COIL WITH POWER TRANSISTOR

Refer to EM-31, "IGNITION COIL" .

REFRIGERANT PRESSURE SENSOR

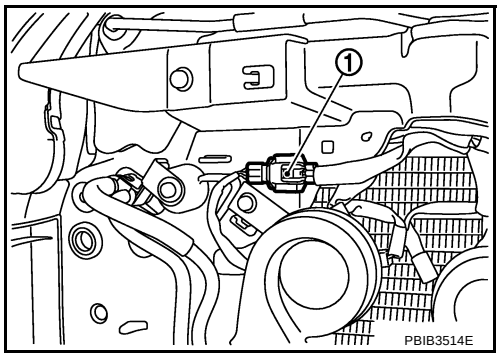
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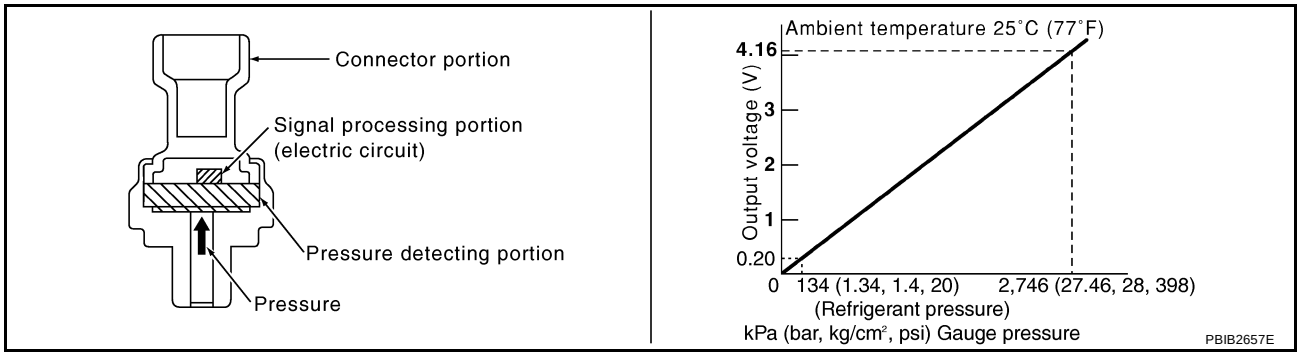
Component Description

NBS000I2

The refrigerant pressure sensor is installed at the condenser of the air conditioner system. The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. The voltage signal is sent to ECM, and ECM controls cooling fan system.

1 : Refrigerant pressure sensor harness connector



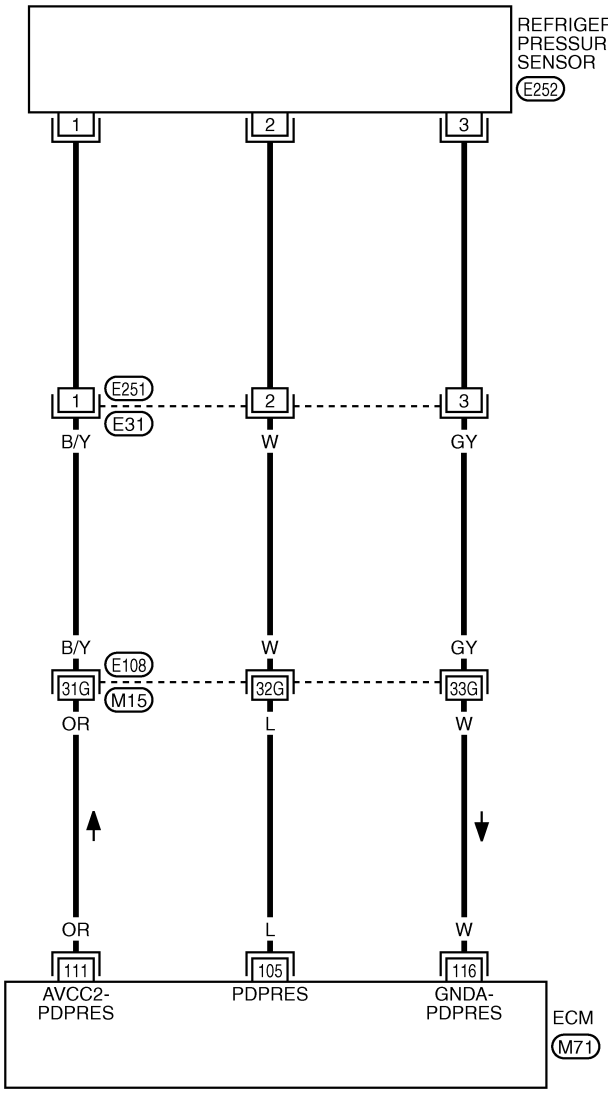


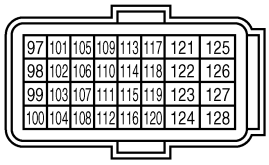
Wiring Diagram

NBS000I3

EC-RP/SEN-01

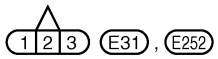
: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





M71
GY

H.S.



E31 , E252
B B

REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TBWT1683E

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
105	L	Refrigerant pressure sensor	**[Engine is running]** ● **Warm-up condition** ● Both A/C switch and blower switch: ON (Compressor operates.)	1.0 - 4.0V
111	OR	Sensor power supply (Refrigerant pressure sensor)	**[Ignition switch: ON]**	5V
116	W	Sensor ground (Refrigerant pressure sensor)	**[Engine is running]** ● **Warm-up condition** ● Idle speed	0V

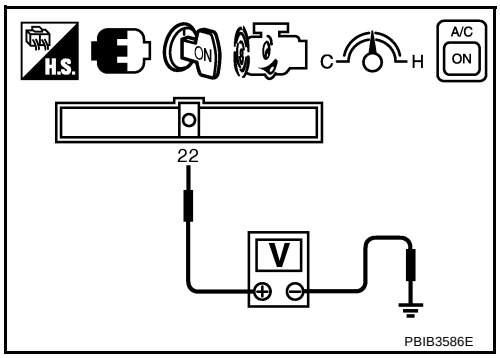
Diagnostic Procedure

NBS000I4

1. CHECK REFRIGERANT PRESSURE SENSOR OVERALL FUNCTION

1. Start engine and warm it up to normal operating temperature.
2. Turn A/C switch and blower fan switch ON.
3. Check voltage between ECM terminal 105 and ground with CONSULT-III or tester.

Voltage: 1.0 - 4.0V



OK or NG

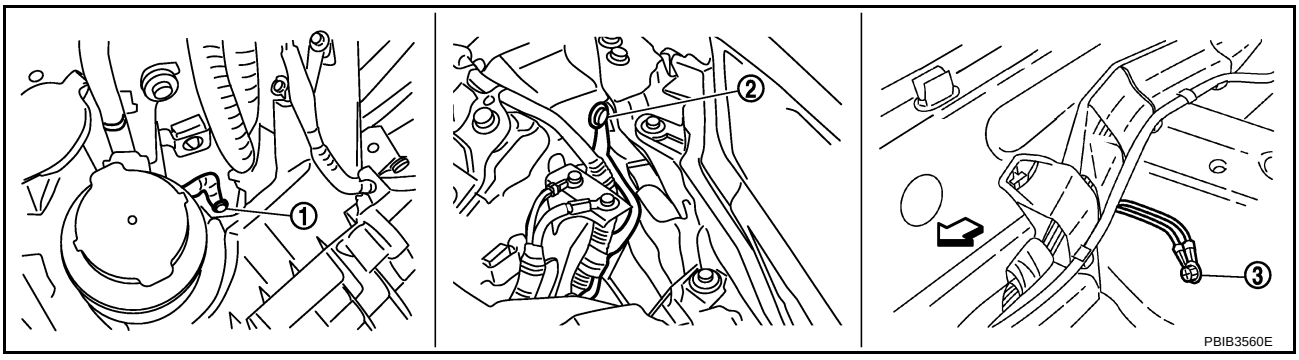
OK >> **INSPECTION END**

NG >> GO TO 2.

2. CHECK GROUND CONNECTIONS

Models with VDC system, navigation system or telephone

1. Turn A/C switch and blower fan switch OFF.
2. Stop engine.
3. Turn ignition switch OFF.
4. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .

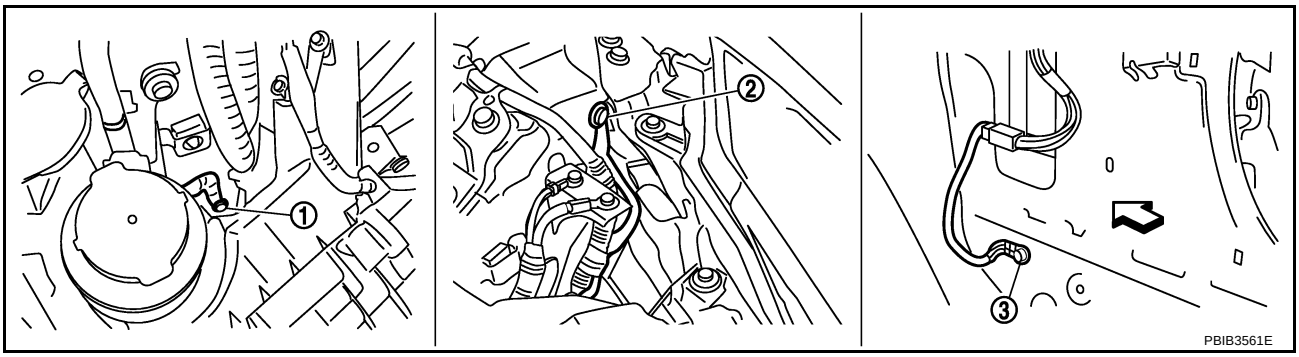


1. Body ground E17
2. Body ground E43
3. Body ground B102

⇦: Vehicle front

Models without VDC system, navigation system and telephone

1. Turn A/C switch and blower fan switch OFF.
2. Stop engine.
3. Turn ignition switch OFF.
4. Loosen and retighten ground screws on the body. Refer to EC-150, "Ground Inspection" .



1. Body ground E17
2. Body ground E43
3. Body ground F152 (Passenger side view with dash side finisher removed)

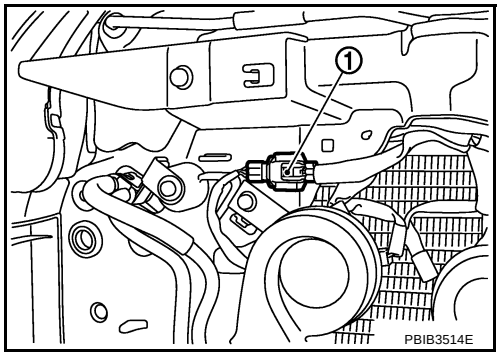
⇦: Vehicle front

OK or NG

OK >> GO TO 3.
NG >> Repair or replace ground connections.

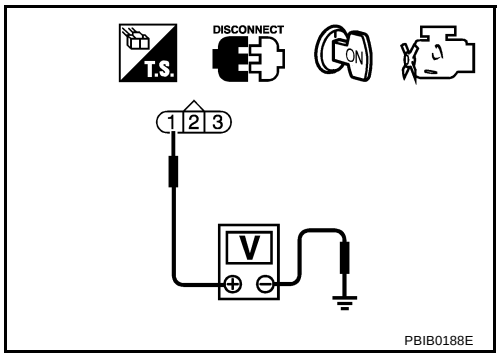
3. CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect refrigerant pressure sensor harness connector (1).
2. Turn ignition switch ON.



3. Check voltage between refrigerant pressure sensor terminal 1 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between refrigerant pressure sensor terminal 3 and ECM terminal 116. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

7. CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM terminal 105 and refrigerant pressure sensor terminal 2. Refer to Wiring Diagram.

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

8. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E251, E31
- Harness for open or short between ECM and refrigerant pressure sensor

>> Repair open circuit or short to ground or short to power in harness or connectors.

9. CHECK INTERMITTENT INCIDENT

Refer to EC-141, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> Replace refrigerant pressure sensor.
NG >> Repair or replace.

Removal and Installation

NBS000I5

REFRIGERANT PRESSURE SENSOR

Refer to ATC-135, "Removal and Installation of Refrigerant Pressure Sensor" .

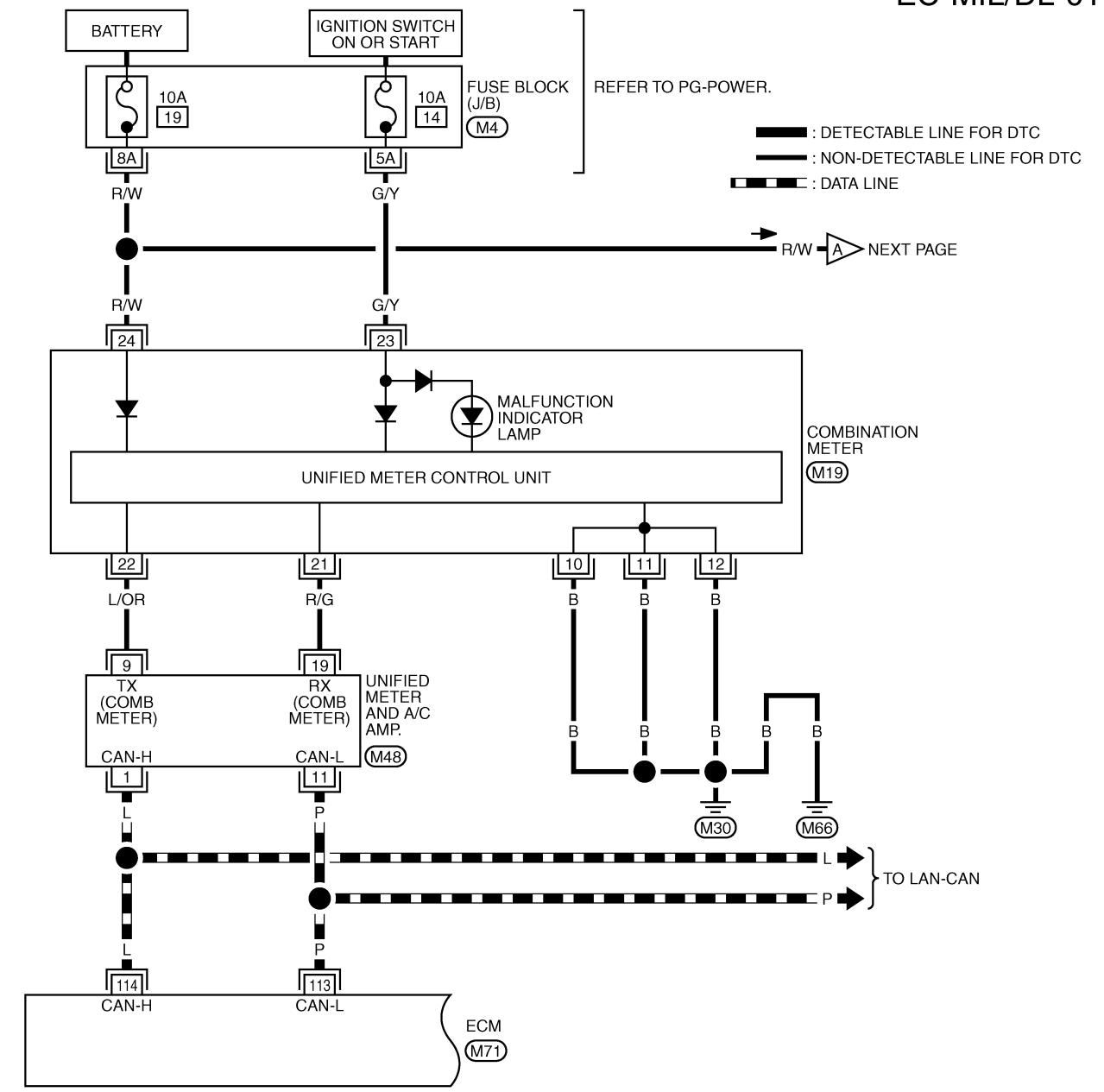
MIL AND DATA LINK CONNECTOR

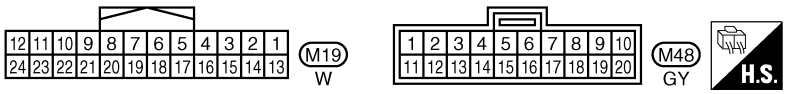
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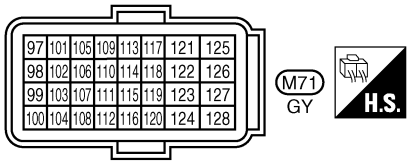
Wiring Diagram

NBS000II

EC-MIL/DL-01



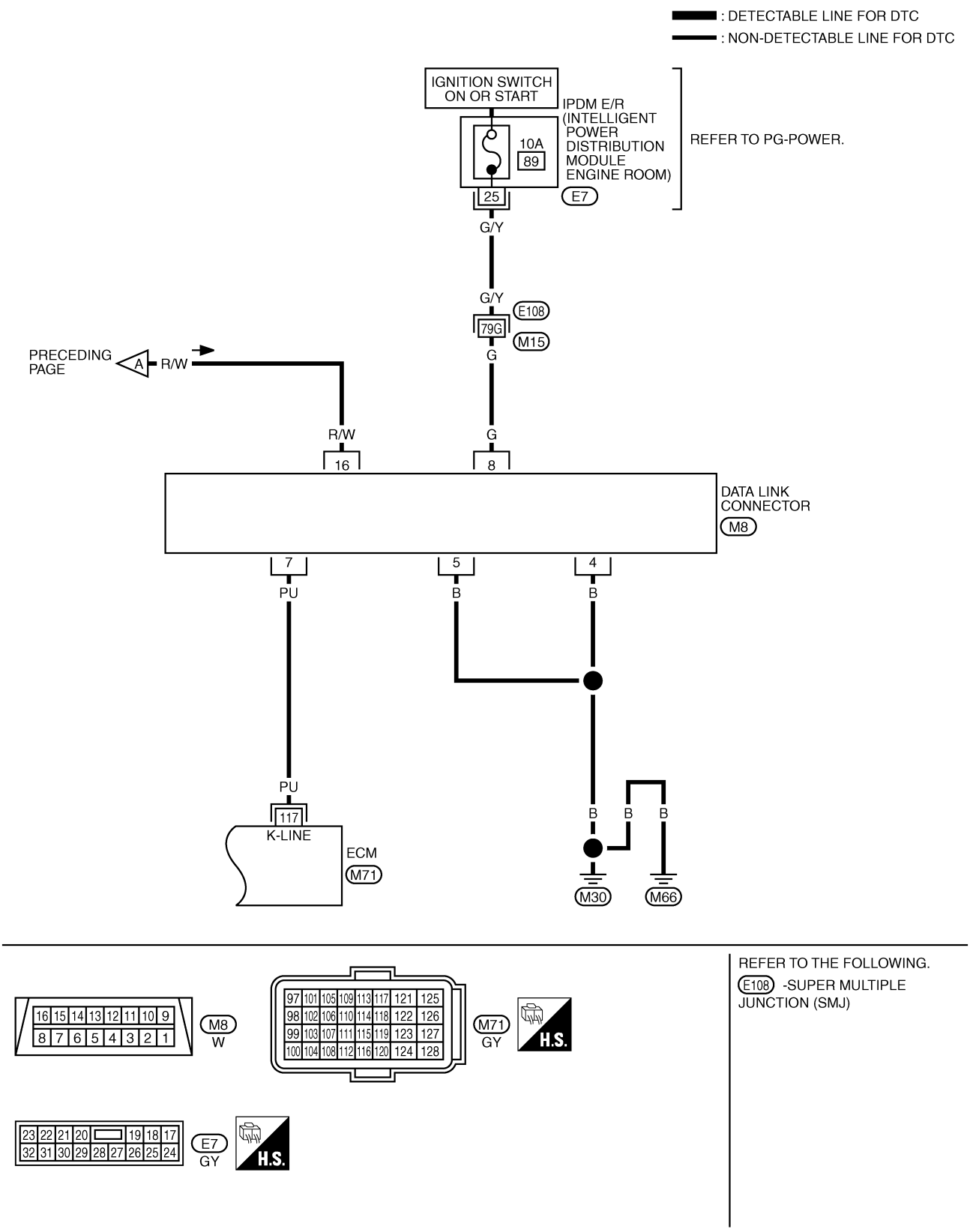




REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TBWT1685E

EC-MIL/DL-02



TBWT1686E

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Fuel Pressure

NBS000IJ

Fuel pressure at idling kPa (kg/cm^2 , psi)	Approximately 350 (3.57, 51)

Idle Speed and Ignition Timing

NBS000IK

Target idle speed	A/T	No load* (in P or N position)	650 ± 50 rpm
	M/T	No load* (in Neutral position)	
Air conditioner: ON	A/T	In P or N position	650 rpm or more
	M/T	In Neutral position	800 rpm or more
Ignition timing	A/T	In P or N position	15° ± 5° BTDC
	M/T	In Neutral position	

*: Under the following conditions:

- Air conditioner switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Calculated Load Value

NBS000IL

Conditions	Calculated load value % (Using CONSULT-III or GST)
At idle	5 - 35
At 2,500 rpm	5 - 35

Mass Air Flow Sensor

NBS000IM

Supply voltage	Battery voltage (11 - 14V)
Output voltage at idle	0.8 - 1.1V*
Mass air flow (Using CONSULT-III or GST)	2.0 - 6.0 g·m/sec at idle* 7.0 - 20.0 g·m/sec at 2,500 rpm*

*: Engine is warmed up to normal operating temperature and running under no load.

Intake Air Temperature Sensor

NBS000IN

Temperature °C (°F)	Resistance kΩ
25 (77)	1.800 - 2.200

Engine Coolant Temperature Sensor

NBS000IO

Temperature °C (°F)	Resistance kΩ
20 (68)	2.37 - 2.63
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260

Air Fuel Ratio (A/F) Sensor 1 Heater

NBS000IP

Resistance [at 25°C (77°F)]	1.8 - 2.44Ω

Heated Oxygen sensor 2 Heater

NBS000IQ

Resistance [at 25°C (77°F)]	3.4 - 4.4Ω

Crankshaft Position Sensor (POS)

NBS000IR

Refer to EC-393, "Component Inspection" .

Camshaft Position Sensor (PHASE)

NBS000IS

Refer to EC-405, "Component Inspection" .

Throttle Control Motor

NBS000IT

Resistance [at 25°C (77°F)]	Approximately 1 - 15Ω

Fuel Injector

NBS000IU

Resistance [at 10 - 60°C (50 - 140°F)]	11.1 - 14.3Ω

Fuel Pump

NBS000IV

Resistance [at 25°C (77°F)]	0.2 - 5.0Ω

SECTION EI
EXTERIOR & INTERIOR

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00086

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

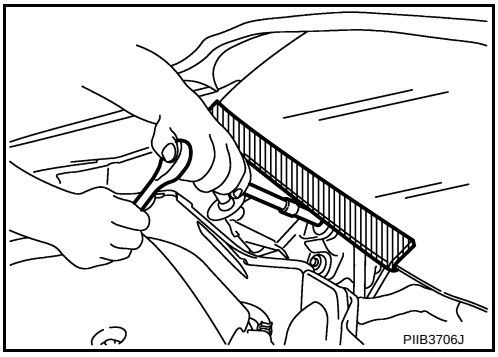
NIS001H4

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NIS001H5

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Work

NIS00088

- After removing and installing the opening/closing parts, be sure to carry out fitting adjustments to check their operation.
- Check the lubrication level, damage, and wear of each part. If necessary, grease or replace it.

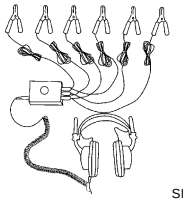
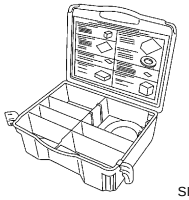
PREPARATION

PFP:00002

Special Service Tools

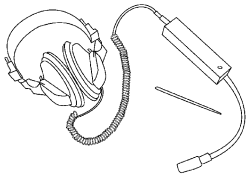
NIS00089

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J-39570) Chassis ear  SIIA0993E	Locationg the noise
(J-43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS0008A

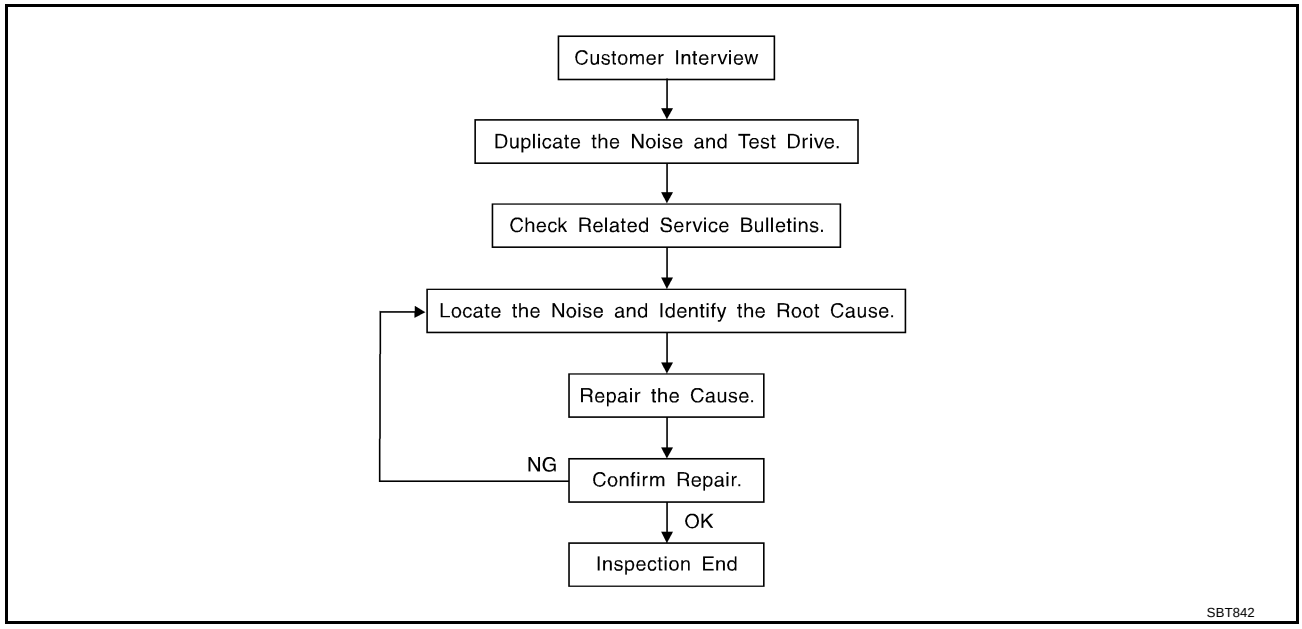
Tool name	Description
Engine ear  SIIA0995E	Locationg the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS0008B



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to EI-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to EI-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS0008C

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sun-visor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted under-hood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

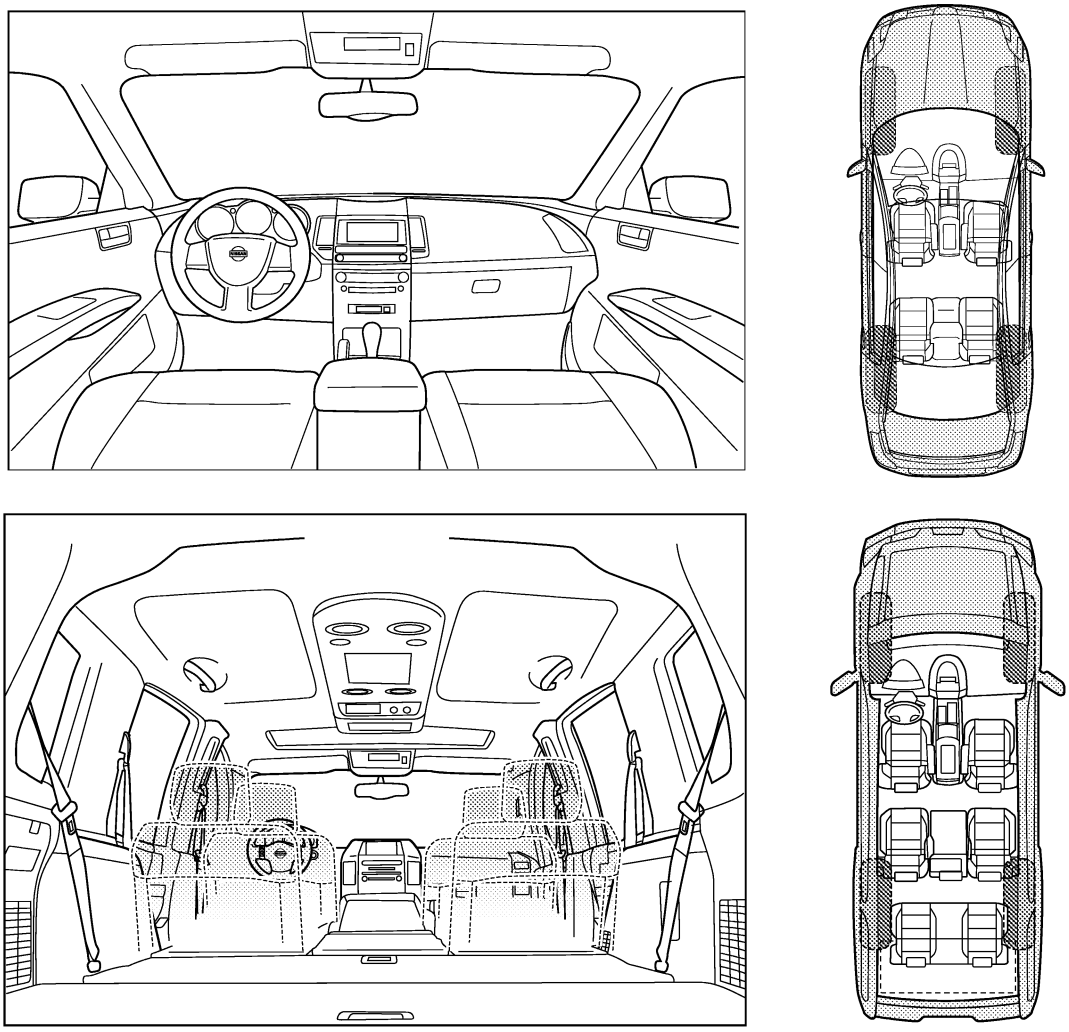
Diagnostic Worksheet

NIS0008D

SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

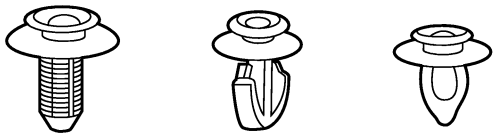
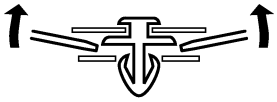
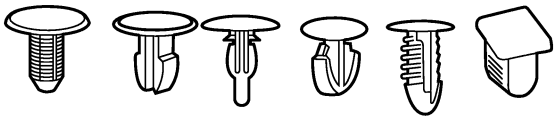
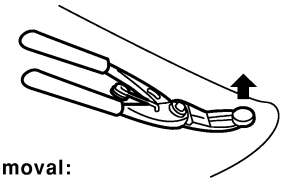
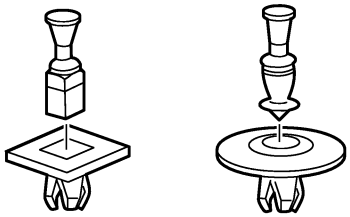
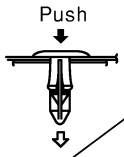
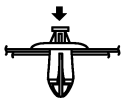
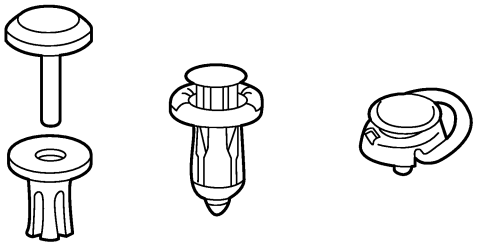
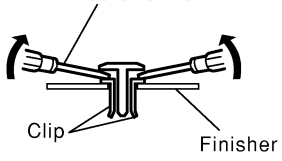
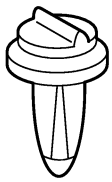
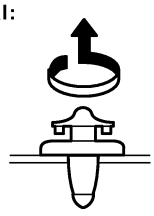
PIIB8742E

CLIP AND FASTENER

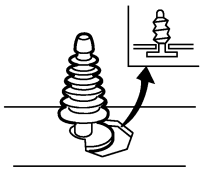
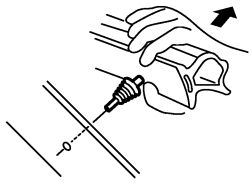
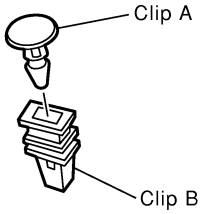
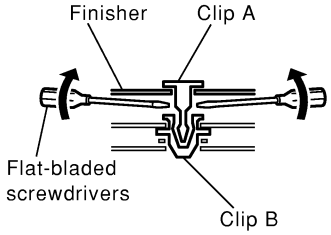
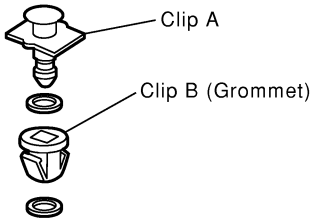
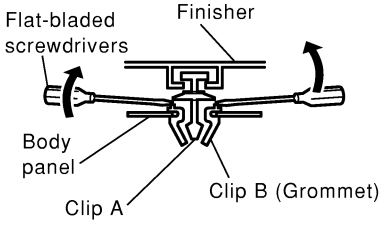
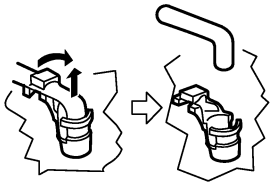
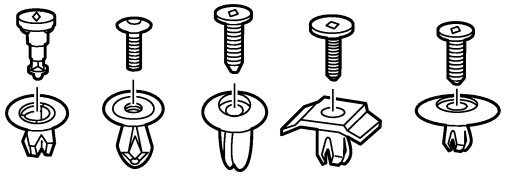
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Clip and Fastener

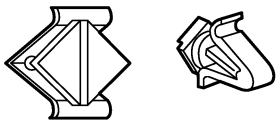
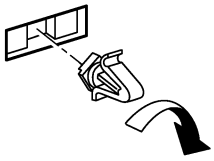
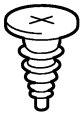
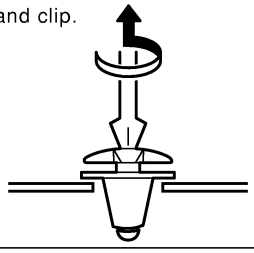
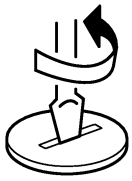
NIS0008E

Symbol No.	Shapes	Removal & Installation
C101		**Removal:** Remove by bending up with flat-bladed screwdrivers or clip remover. 
C103		 **Removal:** Remove with a clip remover.
C203		**Removal:** Push center pin to catching position. (Do not remove center pin by hitting it.) Push  Push  **Installation:**
C205		**Removal:** Flat-bladed screwdriver  Clip Finisher
C206		**Removal:** 

SIIA0315E

Symbol No.	Shapes	Removal & Installation
CE103 		**Removal:** 
CF110 		**Removal:** 
CF118 		**Removal:** 
CR103		**Removal:** Holder portion of clip must be spread out to remove rod. 
CS101 		**Removal:** 1. Screw out with a Phillips screwdriver. 2. Remove female portion with flat-bladed screwdriver. 

SIIA0316E

Symbol No.	Shapes	Removal & Installation
CG101 		**Removal:**  Rotate 45° to remove  **Removal:** **Installation:** 
CS102 		
CS113 		**Removal:** Disconnect upper connection of clip with a flat-bladed screwdriver, then remove clip while inserting a flat-bladed screwdriver between body panel and clip. 
C111 		

SIIA0317E

FRONT BUMPER

PFP:F2022

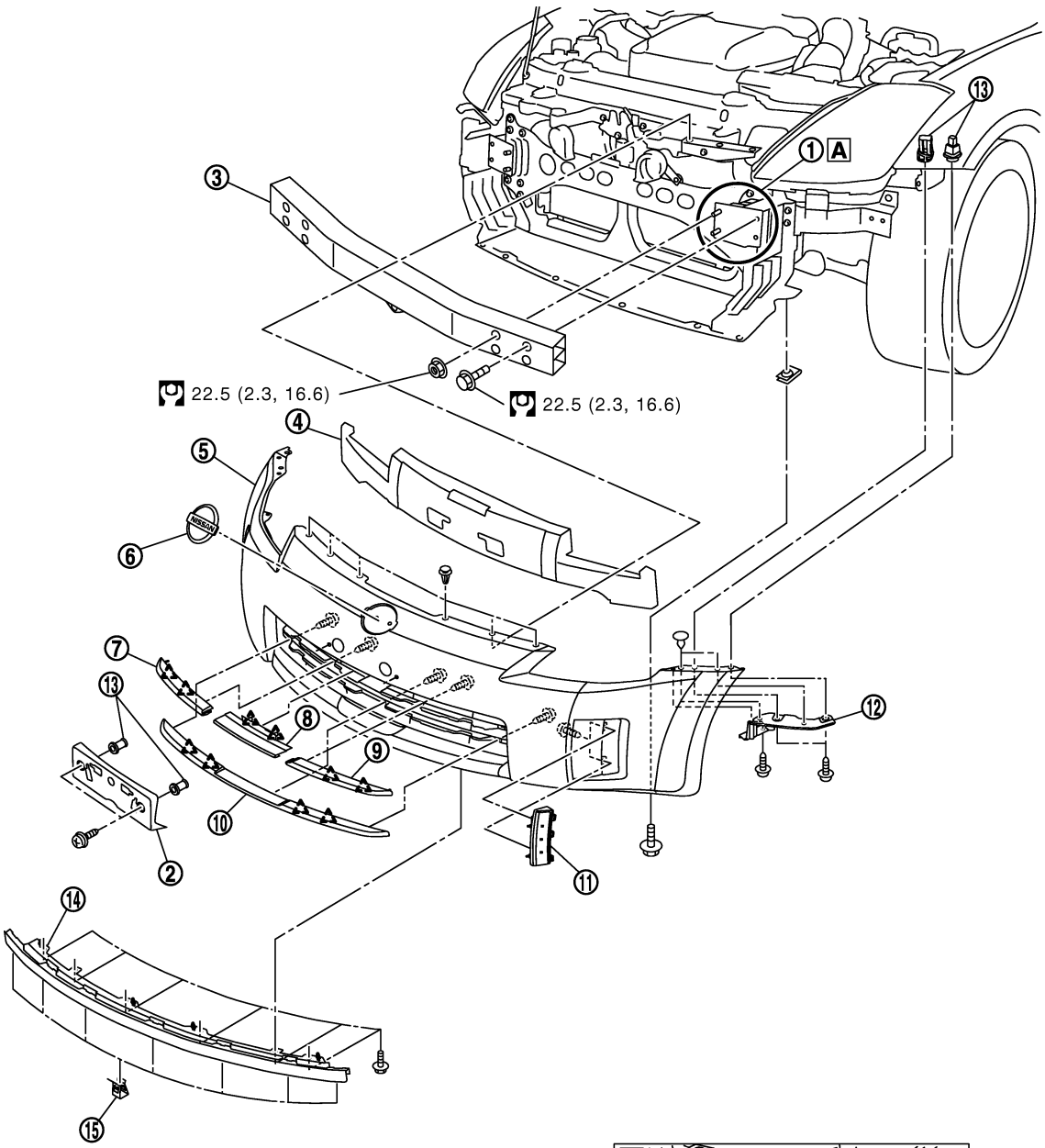
Removal and Installation

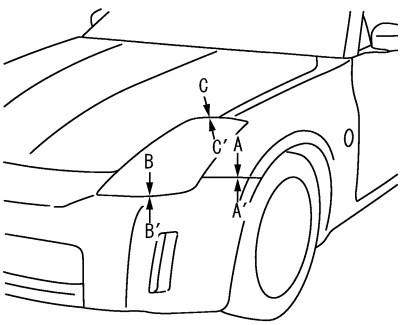
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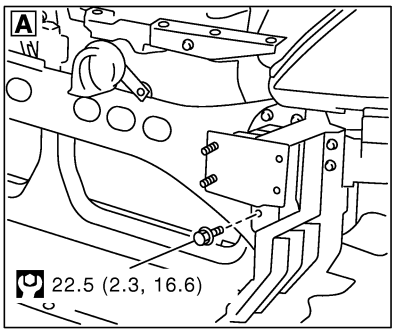
CAUTION:

Bumper fascia is made of resin. Do not apply strong force to it, and be careful to prevent contact with oil.

SEC. 620







: N•m (kg-m, ft-lb)

PIIB7143J

1. Bumper stay
2. License plate bracket
3. Bumper reinforcement
4. Energy absorber
5. Bumper fascia assembly
6. Front emblem
7. Bumper upper side molding (RH)
8. Front bumper center
9. Bumper upper side molding (LH)
10. Bumper lower molding
11. Bumper side reflector
12. Bumper side bracket
13. Grommet
14. Air spoiler
15. Retainer

Pawl

REMOVAL

1. Remove clips of bumper fascia upper portion.
2. Remove screw of bumper fascia lower portion.
3. Remove screws of bumper fascia both side.
4. Remove screws and bolts of both right/left fender protectors on front side. Refer to EI-21, "FENDER PROTECTOR" .
5. Pull out both right/left sides of bumper fascia and remove bumper fascia assembly.

   CAUTION:
   When removing bumper fascia, 2 workers are required so as to prevent it from dropping.
6. Remove energy absorber.
7. Remove bolts and nuts of bumper reinforcement and remove bumper fascia.
8. Remove clips of bumper shield-sight and remove bumper shield-sight.
9. Remove bolts of bumper stay and remove bumper stay.

INSTALLATION

Install in the reverse order of removal.

NOTE:
After installing, perform fitting adjustment.

	Portion	Clearance
Front bumper - Front fender	A - A	0 - 0.5 mm (0 - 0.020 in)
Front bumper - Head lamp	B - B	5.9 - 8.9 mm (0.232 - 0.350 in)
Hood - Head lamp	C - C	1.7 - 5.3 mm (0.067 - 0.209 in)

Removal and Installation of Bumper Side Reflector (Left Side)

NIS001H6

REMOVAL

1. Remove the front part of fender protector by removing screws and clips.
2. Remove screw of bumper side reflector (left side).

INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Bumper Side Reflector (Right Side)

NIS001H7

REMOVAL

1. Remove bumper assembly.
2. Remove screw of bumper side reflector (right side).

INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Bumper Molding (Upper side, Lower)

NIS001H8

REMOVAL

1. Remove front bumper fascia. Refer to EI-14, "Removal and Installation" .
2. Remove screw of bumper molding (upper side, lower).
3. Disengage the plastic pawls to remove the bumper molding (upper side, lower).

INSTALLATION

Install in the reverse order of removal.

REAR BUMPER

PFP:H5022

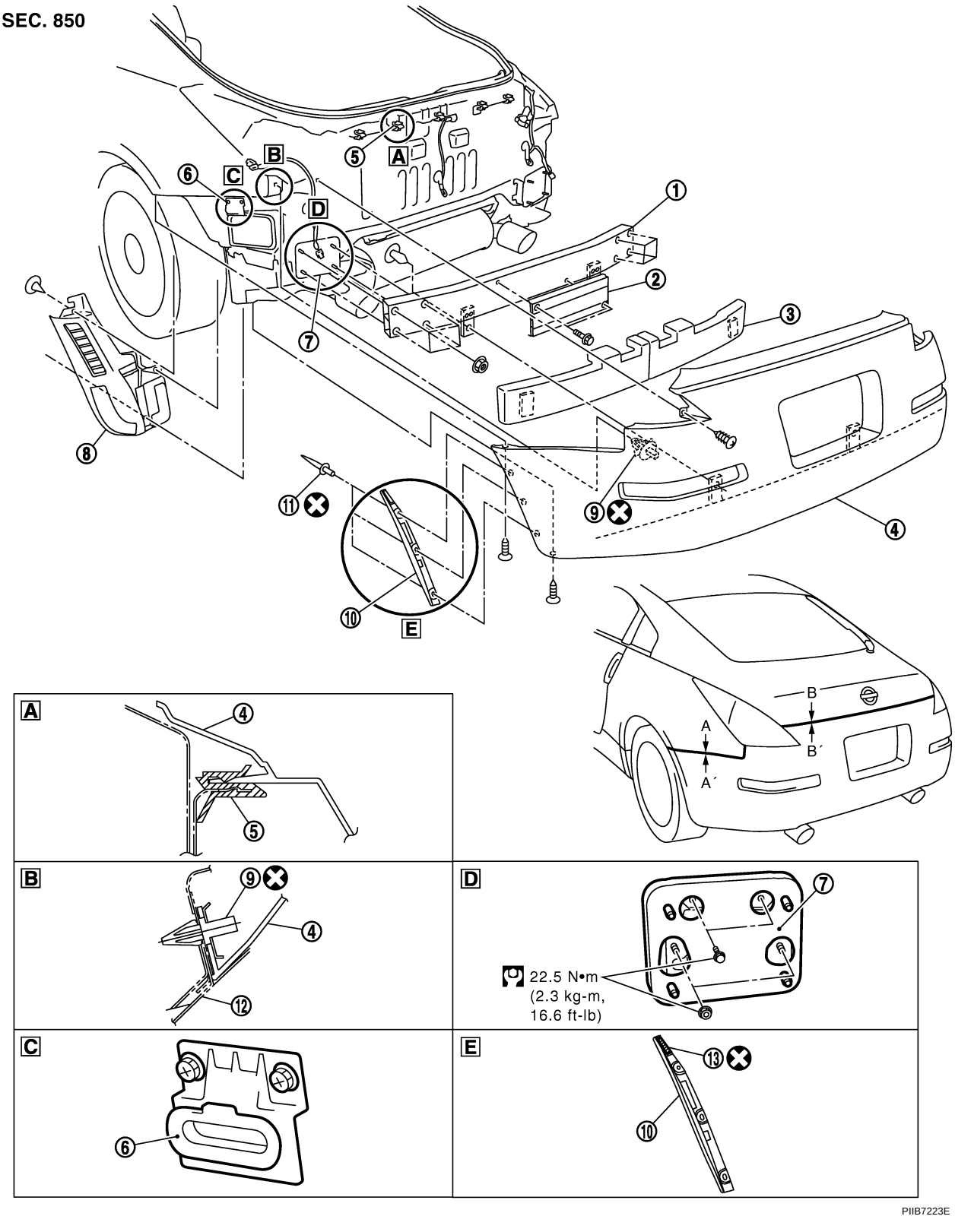
Removal and Installation

NIS0008G

CAUTION:

Bumper fascia is made of resin. Do not apply strong force to it, and be careful to prevent contact with oil.

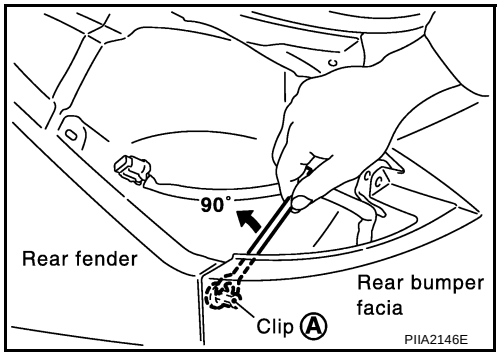
SEC. 850



1. Bumper reinforcement
2. Bumper over rider
3. Energy absorber
4. Bumper fascia assembly
5. Bumper clip
6. Bumper retainer
7. Bumper stay
8. Closing rear bumper
9. Clip (A)
10. Fillet molding (only 19in models)
11. Rivet
12. Rear fender panel
13. Double-faced adhesive tape

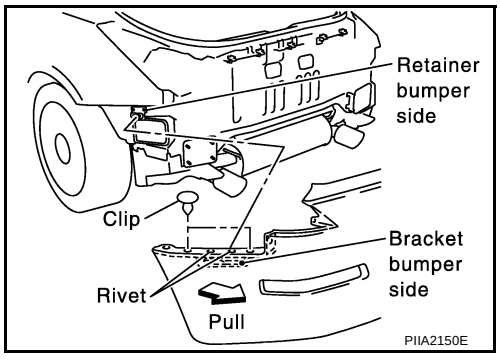
REMOVAL

1. Remove rear combination lamp assembly. Refer to LT-127, "Removal and Installation" .
2. Remove screw rear combination portion.
3. Remove clips of closing rear bumper.
4. Remove bolt and screw of both edges bumper fascia.
5. Rotate clip (A) in corner of bumper fascia 90 degrees and remove from bracket.
6. Remove clips from lower portion bumper fascia.
7. Pull out upper portion bumper fascia toward rear and disengage from clip.



8. Pull out both edges bumper fascia toward rear and disengage retainer from braked.
9. Disconnect license lamp and turn signal lamp harness connector and remove bumper fascia assembly.

   CAUTION:
   When removing bumper fascia, 2 workers are required so as to prevent it from dropping.
10. Remove bumper energy absorber.
11. Remove screws of bumper over rider.
12. Remove nuts and bolts of bumper reinforcement.
13. Remove bumper stay bolts.



INSTALLATION

Install in the reverse order of removal.

NOTE:
After installing, perform fitting adjustment.

	Portion	Clearance
Rear bumper - Rear fender	A - A	0 - 0.5 mm (0 - 0.020 in)
Rear bumper - Back door	B - B	3.9 - 7.1 mm (0.154 - 0.280 in)

REMOVAL AND INSTALLATION OF BUMPER SIDE BRACKETS AND FILLET MOLDING

REMOVAL

Shave head of rivet with drill [4.0 to 4.5 mm (0.157 to 0.177 in) dia.]

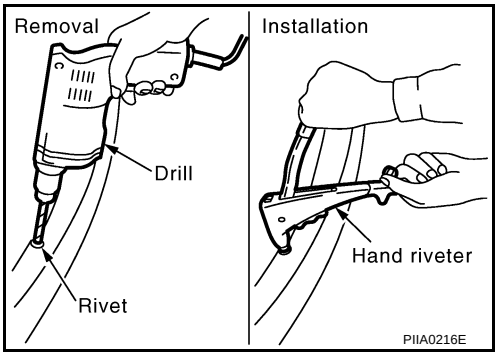
INSTALLATION

Install parts to fascia firmly with hand riveter.

NOTE:

Use the following rivet, when installing of parts.

Rivet thickness	**: 1.2 – 6.4 mm (0.047 – 0.252 in)**
Under hole diameter	**: 4.1 – 4.4 mm (0.161 – 0.173 in) dia.**

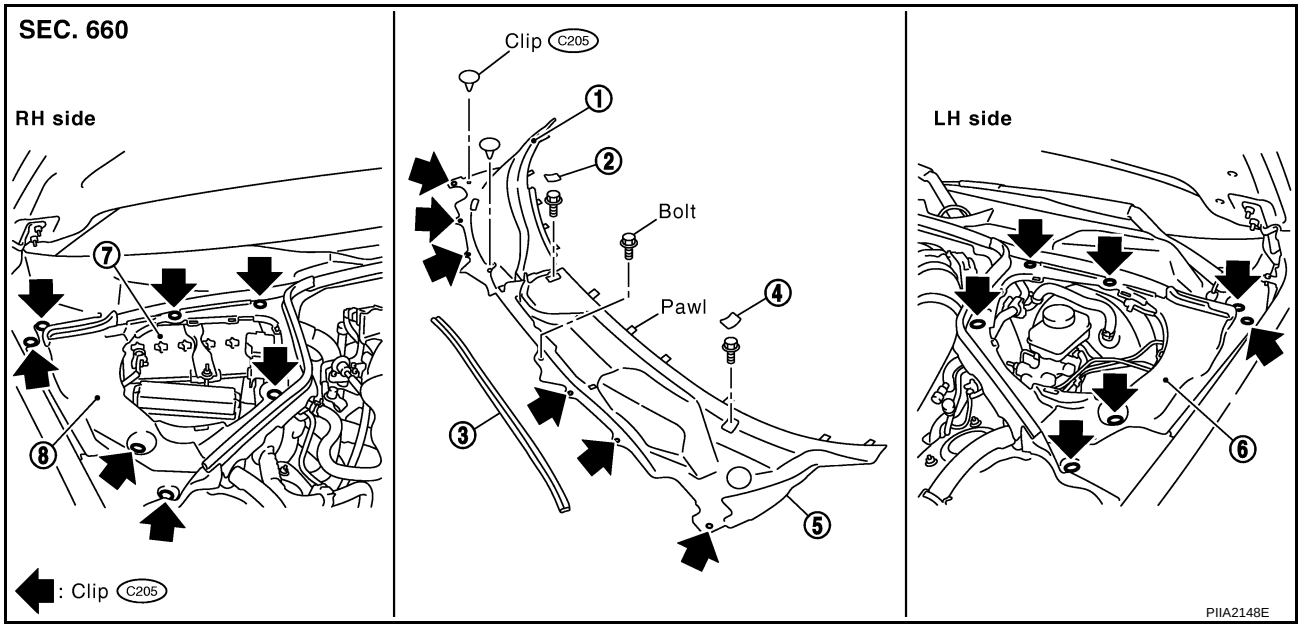


COWL TOP

PFP:66100

Removal and Installation

NIS0008H



1. Cowl top cover (RH)
2. Cap
3. Cowl top seal rubber
4. Cap
5. Cowl top cover (LH)
6. Hoodledge cover (LH)
7. Battery
8. Hoodledge cover (RH)

REMOVAL

1. Remove clips of hoodledge cover (LH/RH).
2. Remove both wiper arms (LH/RH). Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .
3. Remove cowl top seal rubber.
4. Remove clips of cowl top cover (RH) and remove cowl top cover (RH).
5. Remove clips, cap, screws and remove cowl top cover (LH).
6. Remove washer hose from cowl top cover.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

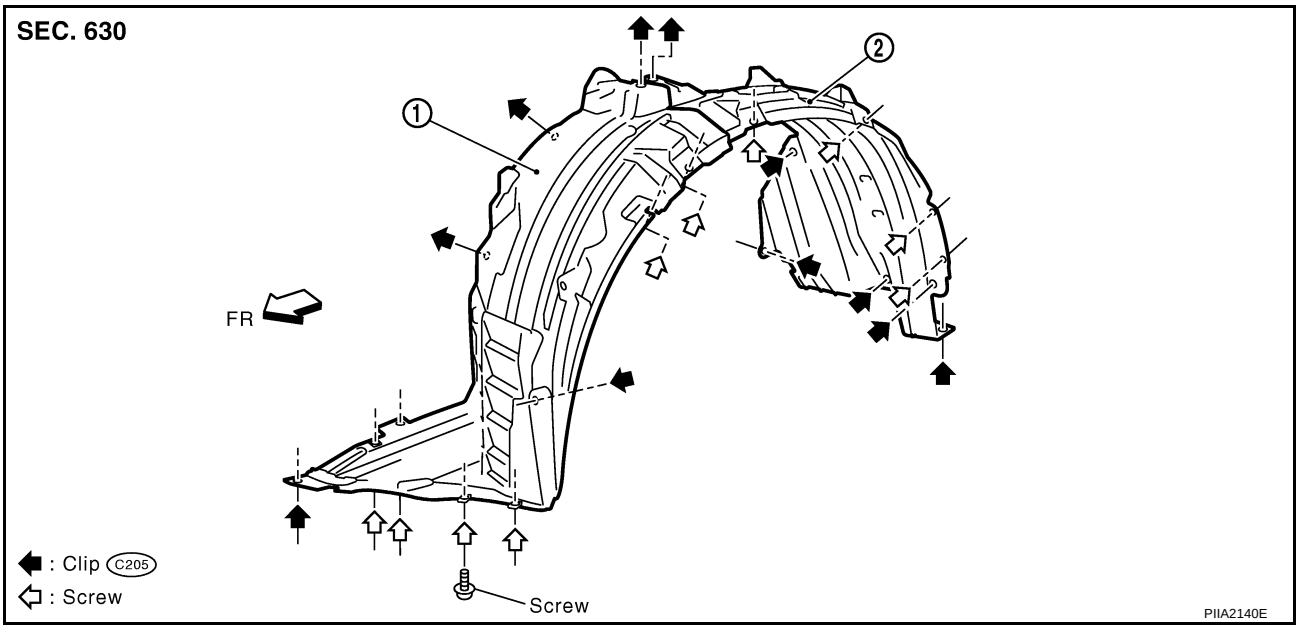
After installing, perform adjustment of wiper arm. Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .

FENDER PROTECTOR

PFP:63840

Removal and Installation

NIS0008I



1. Fender protector (front)
2. Fender protector (rear)

REMOVAL

1. Remove screws and clips of fender protector.
2. Remove fender protector front and remove fender protector rear.

INSTALLATION

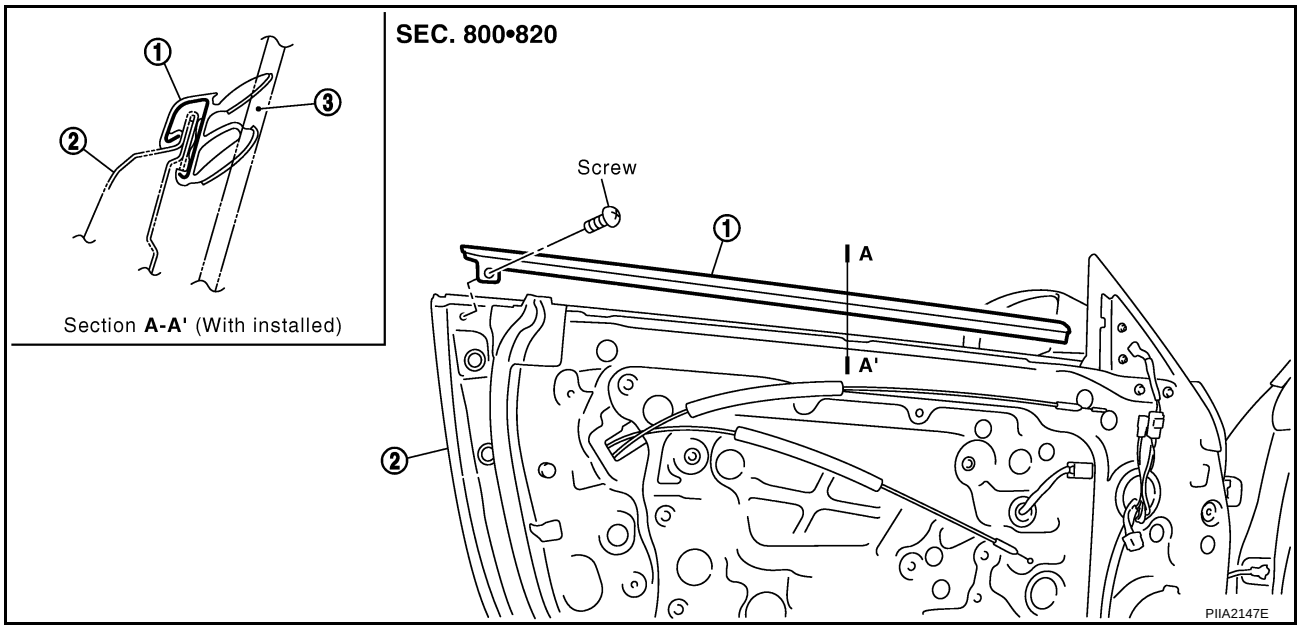
Install in the reverse order of removal.

DOOR OUTSIDE MOLDING

PFP:82820

Removal and Installation

NIS0008J



1. Door outside molding
2. Front door panel
3. Glass

REMOVAL

1. Open windows fully.
2. Remove door finisher. Refer to EI-33, "Removal and Installation" .
3. Remove rear end of door outside molding screw.
4. Disconnect pawls on front edge of molding.
5. Disconnect pawls in the order from front side of door panel portion, with clip clamp remover.
6. Remove slide molding rearward side, after disconnecting all pawls.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

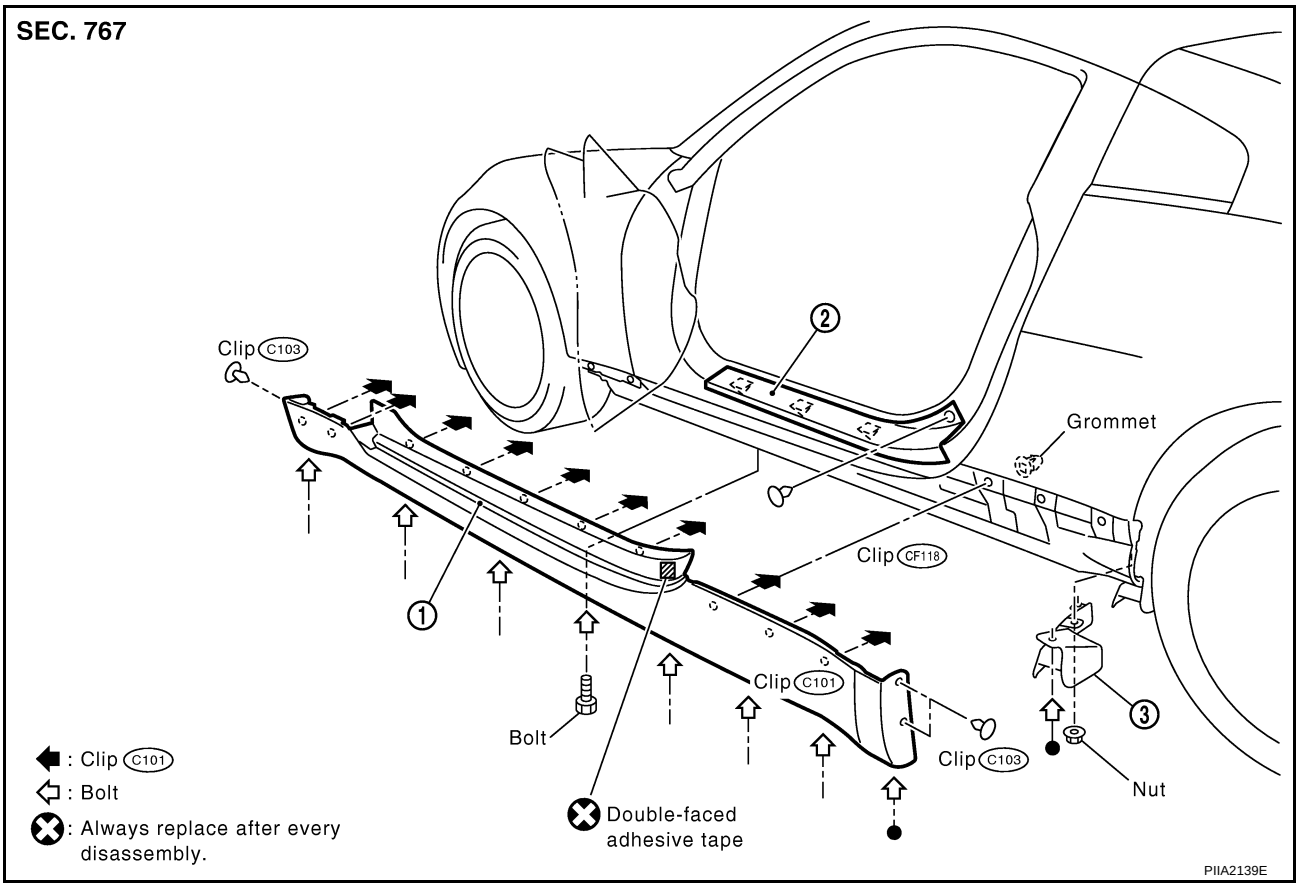
- **Be careful not to apply excessive force when removing because it is easy to deform parts.**
- **After removal, visually inspect molding, and if it is deformed, replace it with new molding.**

SIDE SILL FINISHER

PFP:76852

Removal and Installation

NIS0008K



1. Side sill finisher
2. Kicking plate outer
3. Reflector mudguard rear

REMOVAL

1. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove kicking plate outer. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove bolts of side sill finisher lower portion.
4. Remove clips of side sill finisher front and rear portion.
5. Remove bolt and nut of reflector mudguard rear.
6. Insert clip clamp remover between panel and side sill finisher, and pull up side sill finisher.

INSTALLATION

Install in the reverse order of removal.

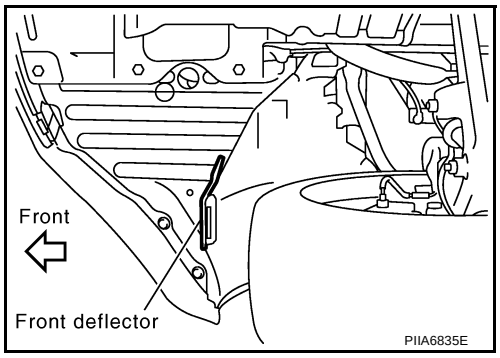
CAUTION:

When installing side sill finisher, check that clips are securely fitted in panel holes on body, and then press them in.

FRONT DEFLECTOR

Removal

Remove screws and clips of front deflector and remove front deflector.



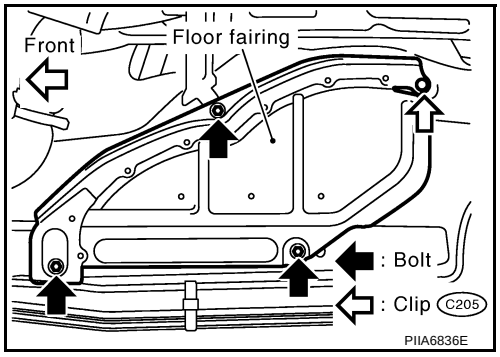
Installation

Install in the reverse order of removal.

FLOOR FAIRING

Removal

Remove bolts and clip of floor fairing and remove floor fairing.



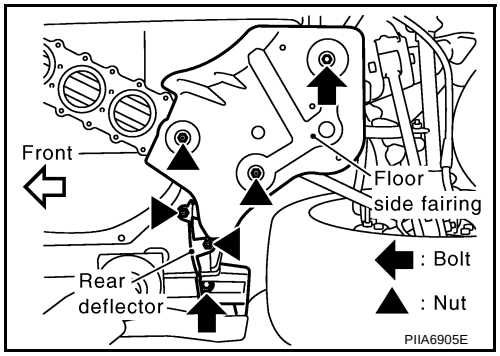
Installation

Install in the reverse order of removal.

FLOOR SIDE FAIRING

Removal

Remove nuts and bolt of floor side fairing and remove floor side fairing.



Installation

Install in the reverse order of removal.

REAR DEFLECTOR

Removal

Remove nuts and bolt of rear deflector and remove rear deflector.

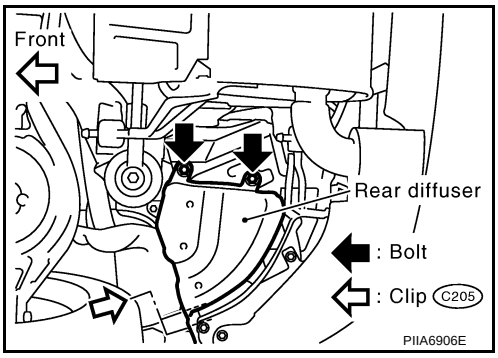
Installation

Install in the reverse order of removal.

REAR DIFFUSER

Removal

Remove bolts and clips of rear diffuser and remove rear diffuser.



Installation

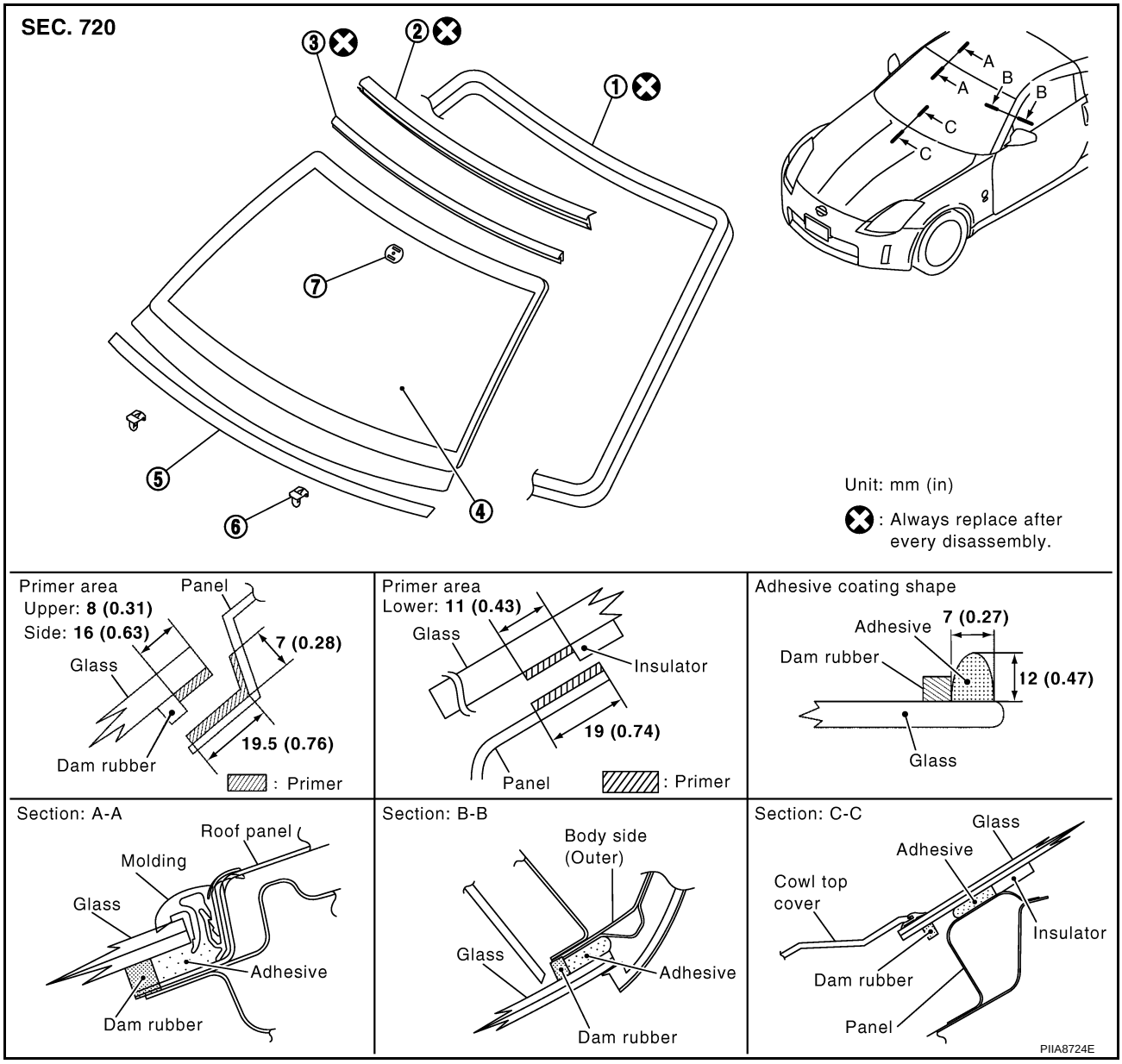
Install in the revers order of removal.

WINDSHIELD MOLDING

PFP:72700

Removal and Installation

NIS0008L



1. Dam rubber
2. Fastener
3. Molding (upper)
4. Windshield glass
5. Insulator
6. Spacer
7. Mirror base

REMOVAL

Remove windshield molding. Refer to GW-11, "WINDSHIELD GLASS" .

NOTE:

- Apply protective tape around circumference of windshield.
- Guiding a cutter knife along glass, cut surface of molding.
- Using pliers, draw out all remaining molding left in flanged area of body, and remove it completely from adhering surface on glass.

INSTALLATION

Install windshield molding. Refer to GW-11, "WINDSHIELD GLASS" .

NOTE:

- Align matching marks on body and glass. Install glass to body.

- Press entire surface of glass lightly to fit it completely.

Using a spatula, repair any adhesive overflow or shortage to make surface smooth. Position windshield moldings and allow their adhesion.

CAUTION:

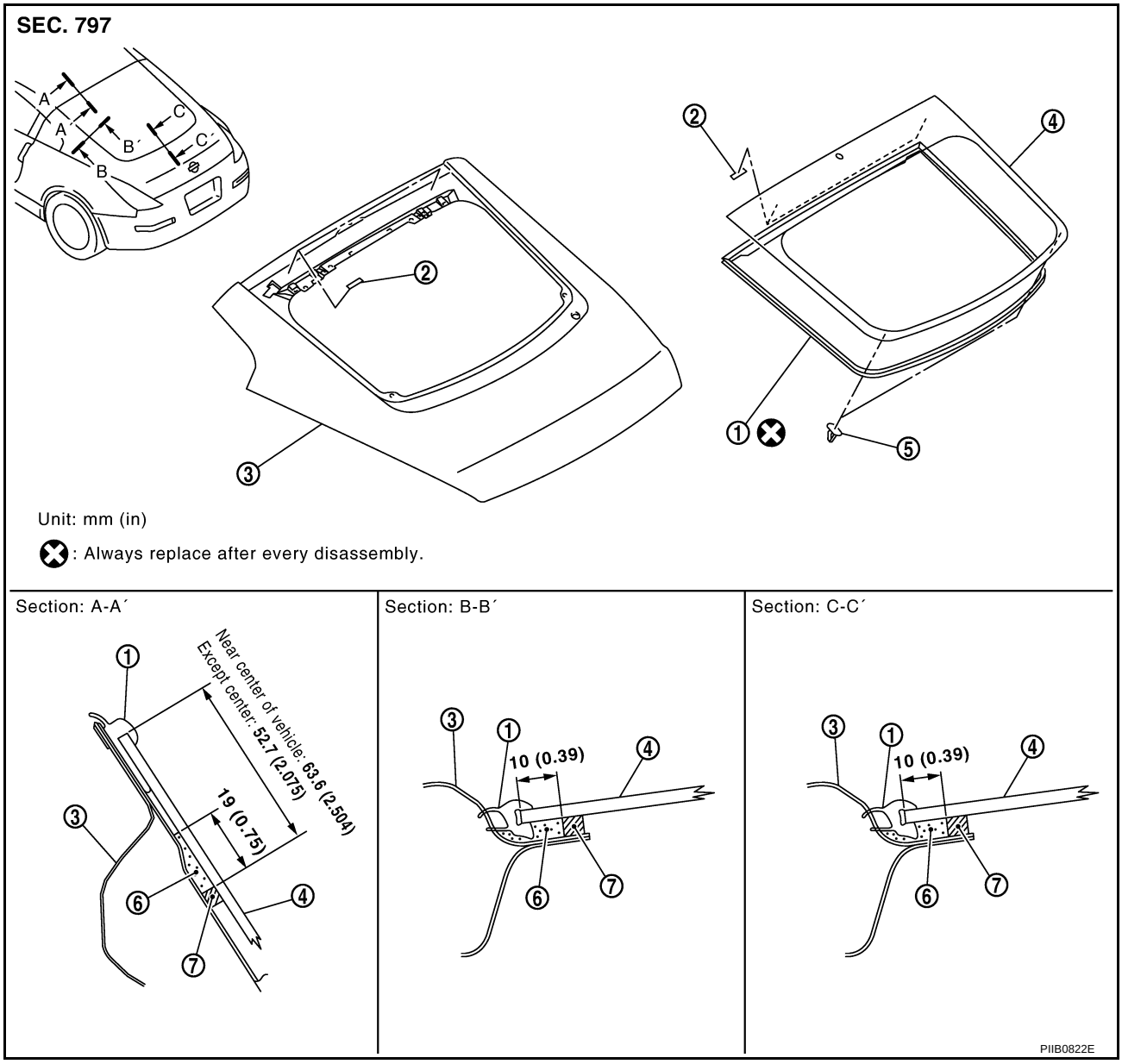
- **Be sure to install windshield molding before adhesive hardens.**
- **After installing glass, keep door windows open and avoid driving vehicle until adhesive has completely cured.**

REAR WINDOW MOLDING

PFP:79762

Removal and Installation

NIS0008M



1. Back door window molding
2. Dual lock fastener
3. Back door
4. Back door window glass
5. Holder
6. Adhesive
7. Dam rubber

REMOVAL OF BACK DOOR WINDOW MOLDING

Remove back door window molding. Refer to GW-14, "BACK DOOR WINDOW GLASS" .

NOTE:

Apply a strip of protective tape along the contour of back door window glass (molding) to prevent paint surface from being damaged.

INSTALLATION OF BACK DOOR WINDOW MOLDING

Install back door window molding. Refer to GW-14, "BACK DOOR WINDOW GLASS" .

NOTE:

- Clean adhesive portion of back door window glass and around circumference with white gasoline.
- Apply dam rubber to all surfaces of glass.
- Attach back door window molding to side face of glass.

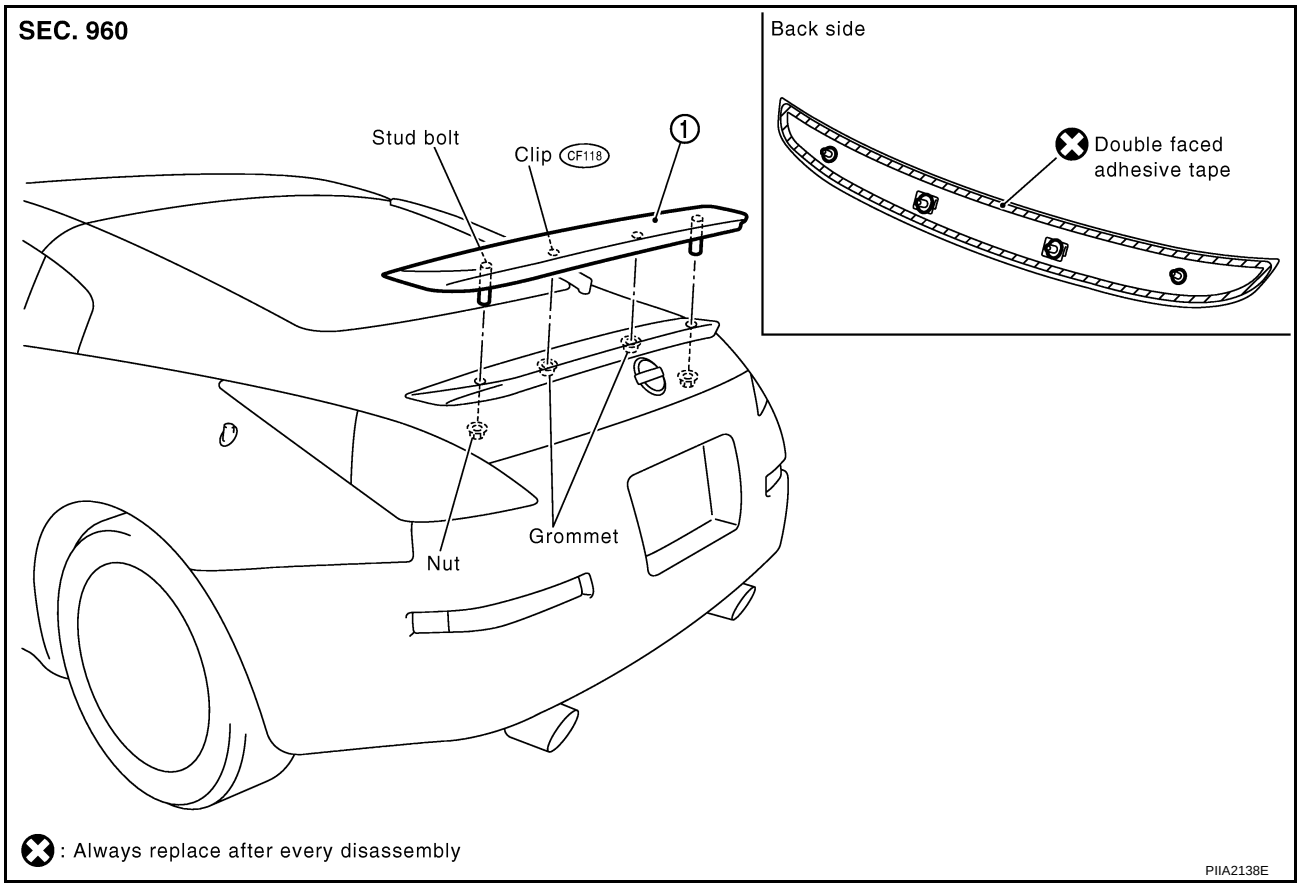
- Back door window molding should not overlap on the surface of back door window glass.

REAR SPOILER

PFP:96030

Removal and Installation

NIS0008N



1. Rear spoiler

REMOVAL

1. Remove back door finisher lower. Refer to EI-47, "Removal and Installation (for Coupe Models)" .
2. Remove nuts of rear spoiler.
3. Remove clip of rear spoiler.
4. Remove double-faced adhesive tapes with wide plastic spatula between back door and rear spoiler.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

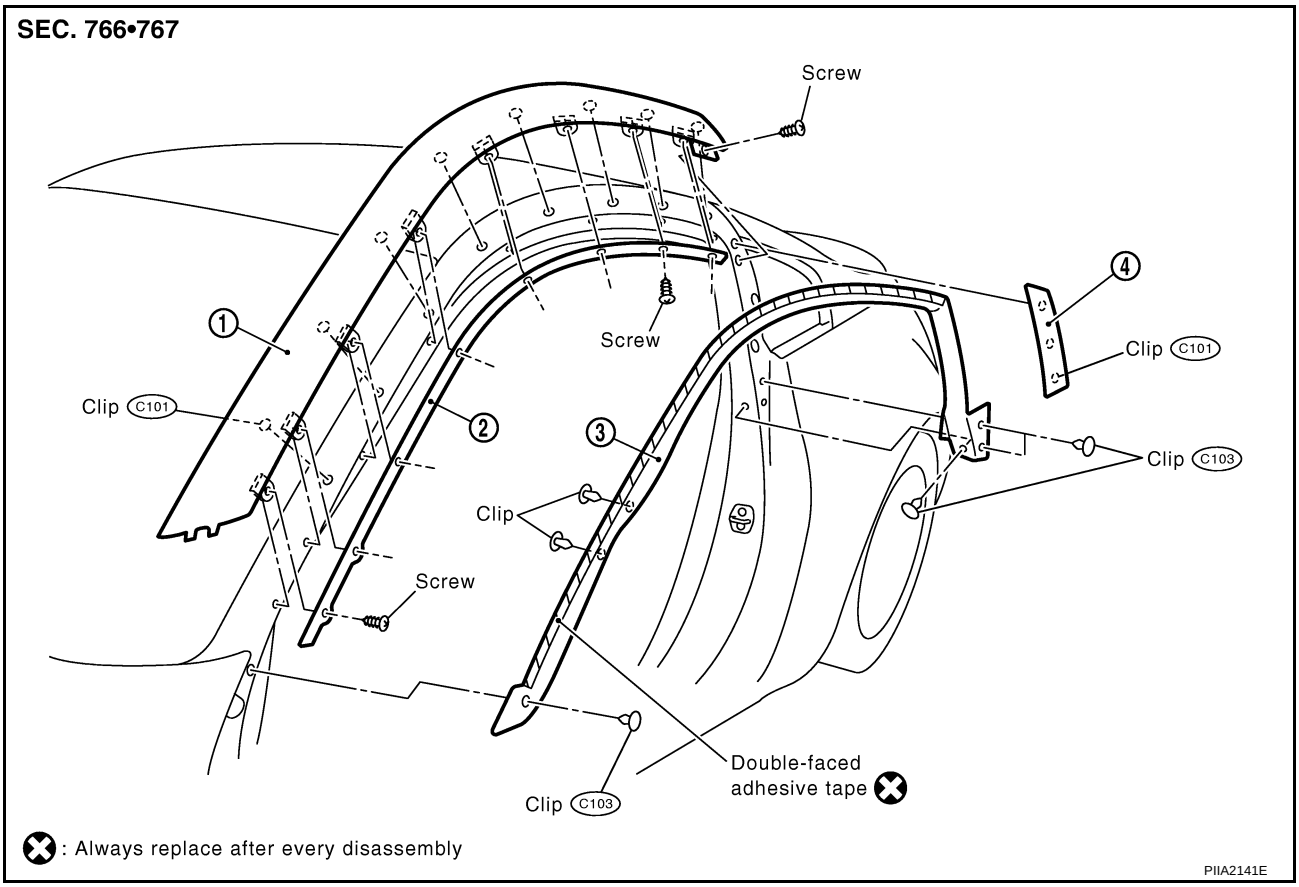
- **Do not let air between contact surfaces when installing.**
- **To secure contact, do not wash vehicle within 24 hours after installation.**

ROOF SIDE MOLDING

PFP:73854

Removal and Installation (for Coupe Models)

NIS0008O



1. Front pillar finisher
2. Retainer body side weatherstrip
3. Body side weatherstrip
4. Lock pillar finisher

FRONT PILLAR FINISHER

Removal

1. Remove lock pillar finisher.
2. Remove clip and double-faced adhesive tapes of body side weatherstrip.
3. Remove body side weatherstrip.
4. Remove screw of retainer body side weatherstrip.
5. Remove screw and clip of front pillar finisher.
6. Remove front pillar finisher.

Installation

Install in the reverse order of removal.

LOCK PILLER FINISHER

Removal

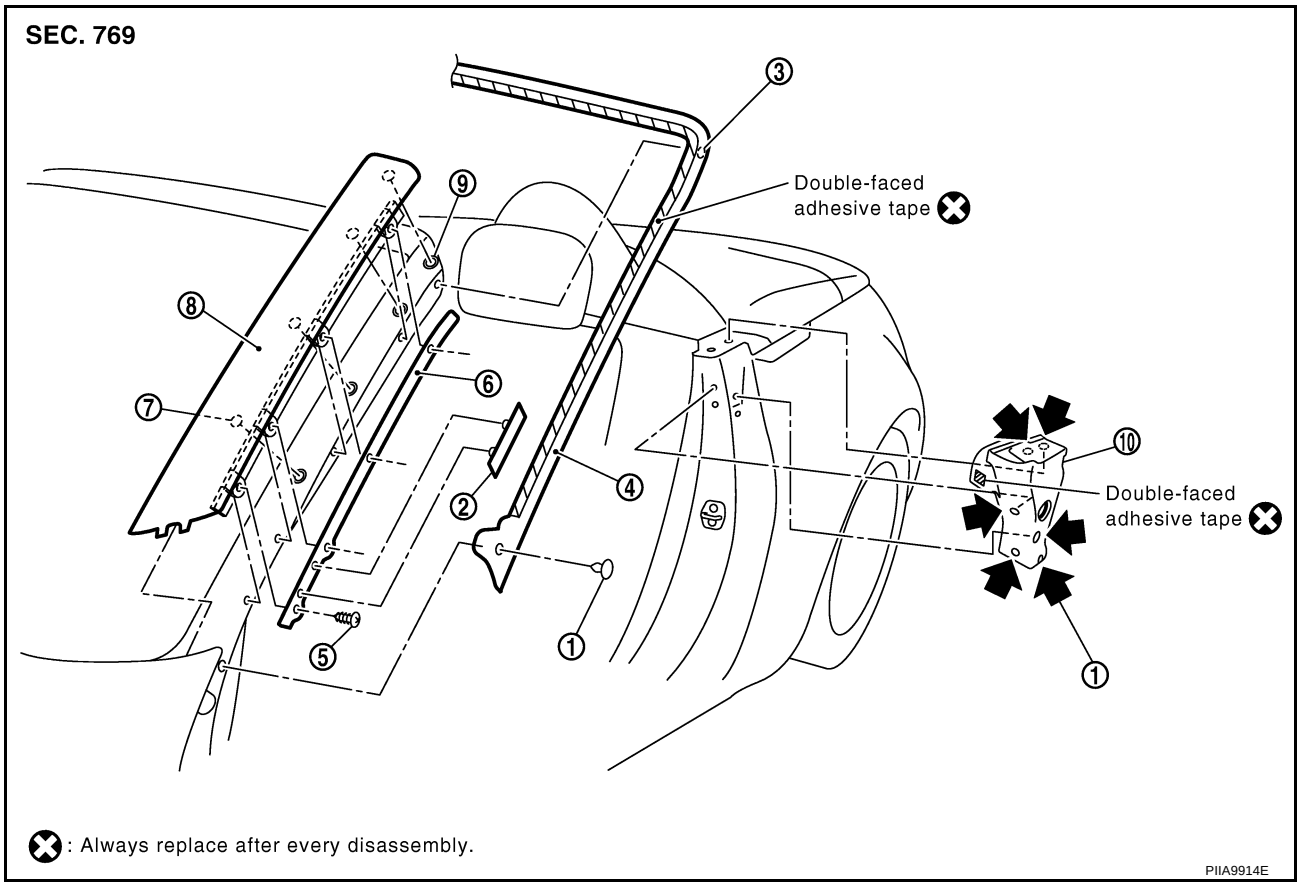
Lift and twist lock pillar finisher up from lock pillar disconnect clips.

Installation

Install in the reverse order of removal.

Removal and Installation (for Roadster Models)

NIS0008P



1. Clip (C103)
2. Clip
3. Clip (CE103)
4. Body side glass-run rubber
5. Screw
6. Retainer
7. Clip (C101)
8. Front pillar finisher
9. Grommet
10. Body side weatherstrip

FRONT PILLAR FINISHER

Removal

1. Open soft top.
2. Remove clip and double-faced adhesive tapes of body side glass-run rubber.
   NOTE:
   Slide body side glass run slightly upward to remove clip on middle portion of glass run rubber side from retainer.
3. Remove body side glass-run rubber.
4. Remove screw of retainer.
5. Remove screw and clips of front pillar finisher.
6. Remove front pillar finisher.

Installation

Install in the reverse order of removal.

BODY SIDE WEATHERSTRIP

Removal

1. Open soft top.
2. Disconnect clips and remove body side weatherstrip.

Installation

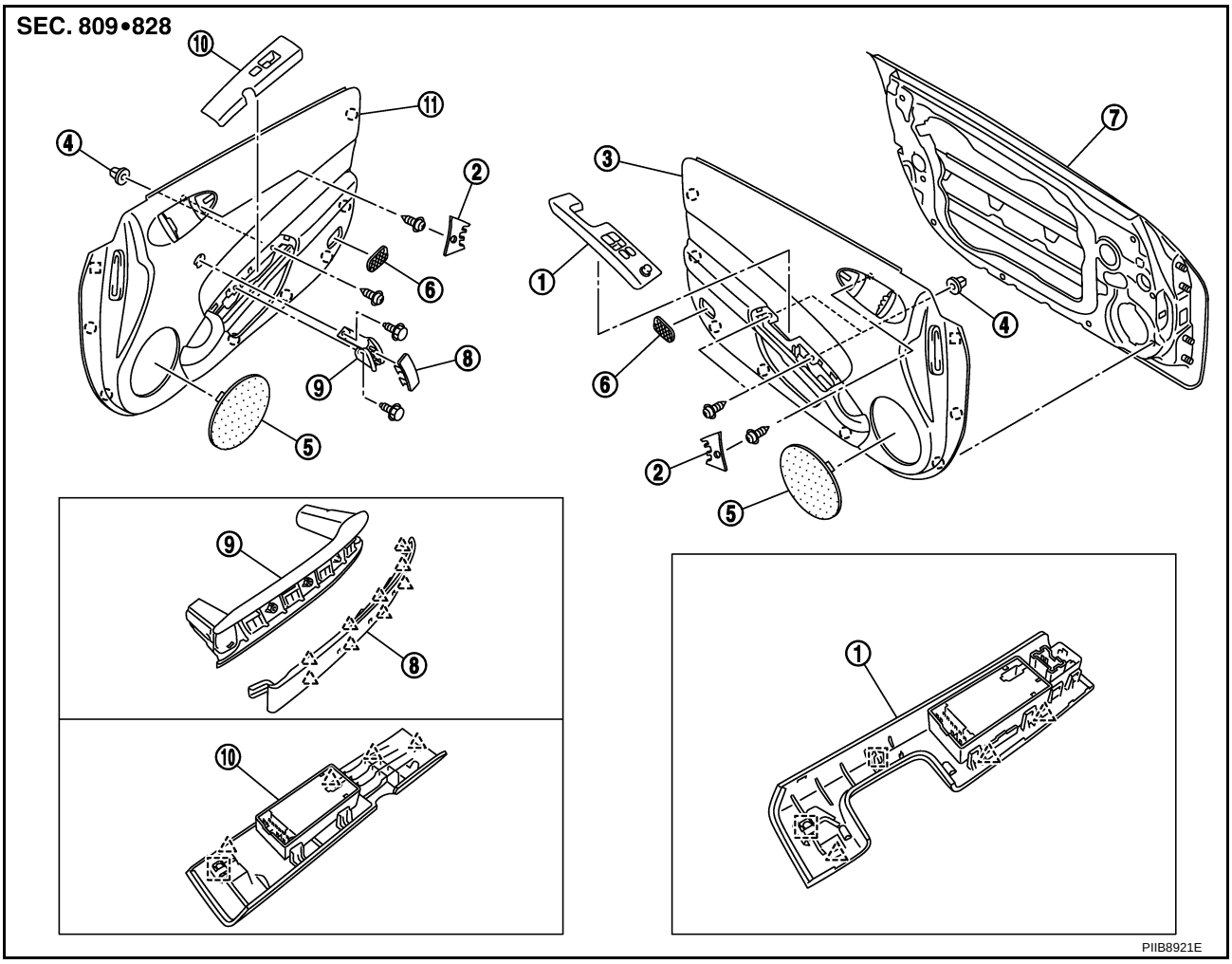
Install in the reverse order of removal.

DOOR FINISHER

PFP:80900

Removal and Installation

NIS0008Q



1. Power window main switch finisher	2. Inside handle escutcheon	3. Driver door finisher assembly
4. Grommet	5. Speaker grille	6. Step lamp lens
7. Door panel assembly (LH)	8. Door grip finisher	9. Door grip
10. Power window sub switch finisher	11. Passenger door finisher assembly	
Clip	Pawl	Metal clip

DRIVER DOOR FINISHER

Removal

1. Remove cap inside handle portion and remove screw.
2. Remove power window main switch finisher.
3. Disconnect harness connector power window main switch.
4. Remove screw of power window main switch portion.
5. Disengage both of the door main harness clip on the rear surface of the door finisher.
6. Disengage part of the bottle holder's illumination harness connector.
7. Pull up door finisher and remove connector inside handle cable and lock knob cable.

Installation

Install in the reverse order of removal.

CAUTION:

To install finisher, check if all clips are matched over holes of panel on vehicle, then push it.

PASSENGER DOOR FINISHER

Removal

1. Remove cap inside handle portion and remove screw.
2. Insert taping flat-bladed screwdriver into edge portion, disconnect pawls, and remove door grip finisher.
3. Remove screw of door grip portion.
4. Remove power window sub switch finisher.
5. Disconnect harness connector power window sub switch.
6. Disengage both of the door main harness clip on the rear surface of the door finisher.
7. Disengage part of the bottle holder's illumination harness connector.
8. Remove screw of power window sub switch portion.
9. Pull up door finisher and remove connector inside handle cable and lock knob cable.

Installation

Install in the reverse order of removal.

CAUTION:

To install finisher, check if all clips are matched over holes of panel on vehicle, then push it.

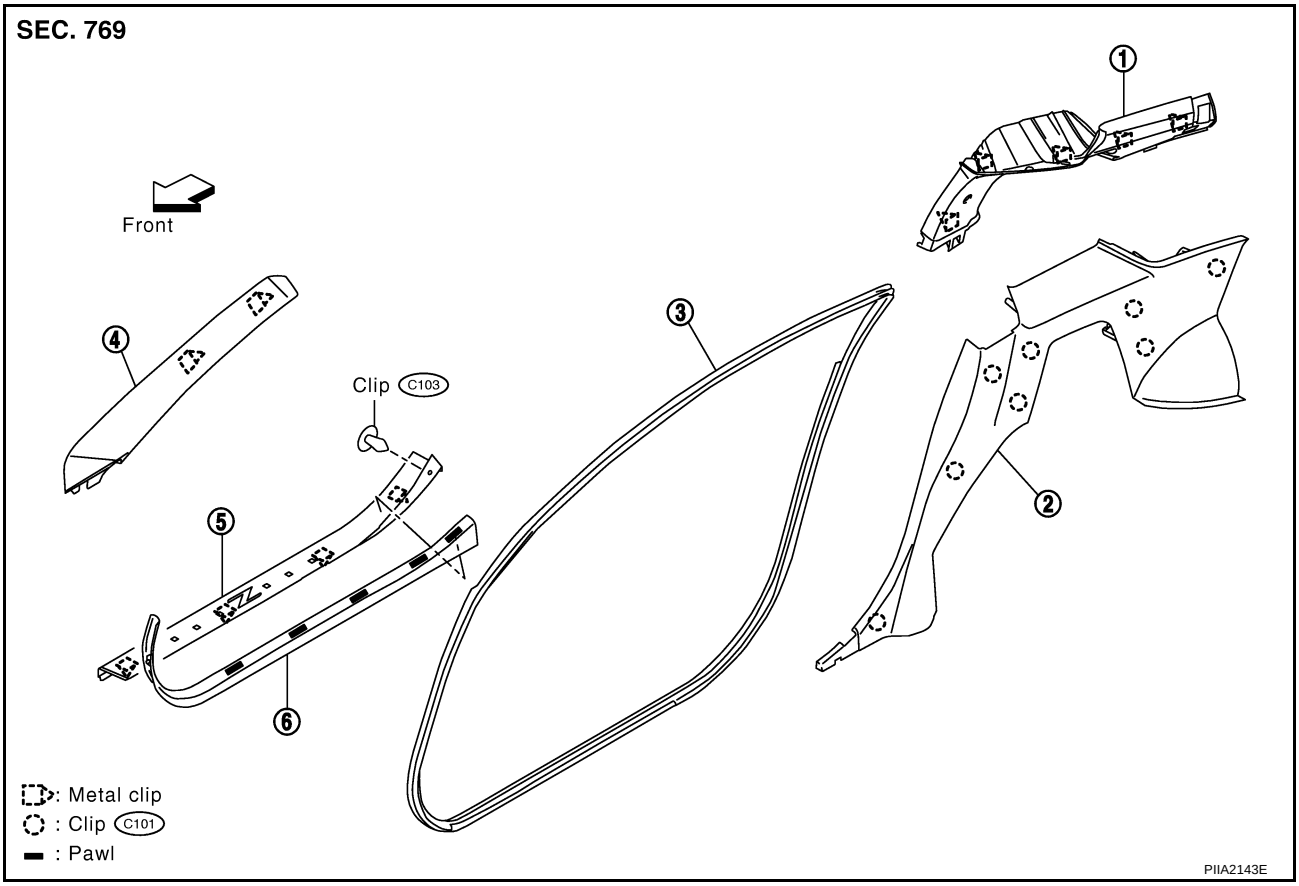
BODY SIDE TRIM

PFP:76913

Removal and Installation (for Coupe Models)

NIS0008R

CAUTION:
Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.



1. Rear pillar finisher
2. Rear side finisher
3. Body side welt
4. Front pillar garnish
5. Kicking plate outer
6. Kicking plate inner

REAR SIDE FINISHER

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove rear side finisher.

Installation

Install in the reverse order of removal.

REAR PILLAR FINISHER

Removal

1. Remove back door weatherstrip. Refer to BL-103, "Removal and Installation of Back Door Weatherstrip" .
2. Remove luggage finisher lower center. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Disconnect harness connector at luggage room lamp.
4. Remove luggage side finisher upper. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
5. Remove seat belt shoulder anchor. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" .
6. Remove kicking plate inner.
7. Remove body side welt.
8. Remove rear side finisher.
9. Remove rear pillar finisher.

Installation

Install in the reverse order of removal.

FRONT PILLAR GARNISH

Removal

1. Remove body side welt.
2. Remove front pillar garnish.

Installation

Install in the reverse order of removal.

KICKING PLATE

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove clip of kicking plate outer.
4. Remove kicking plate outer.

Installation

Install in the reverse order of removal.

BODY SIDE WELT

Removal

1. Remove kicking plate inner.
2. Remove body side welt.

Installation

Install in the reverse order of removal.

CAUTION:

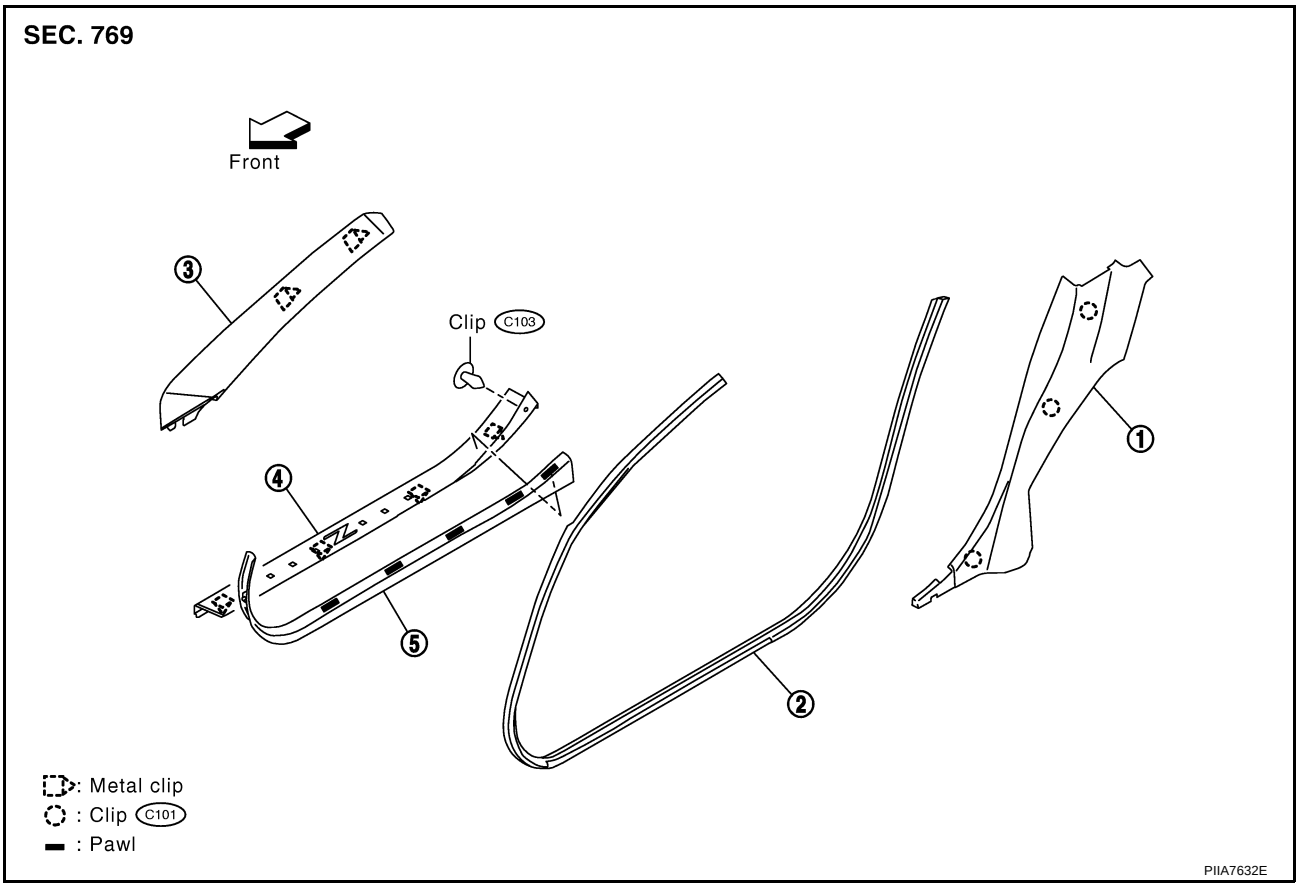
To install, check if all clips are matched over holes of panel on vehicle, then push on.

Removal and Installation (for Roadster Models)

NIS0008S

CAUTION:

Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.



1. Rear side finisher
2. Body side welt
3. Front pillar garnish
4. Kicking plate outer
5. Kicking plate inner

REAR SIDE FINISHER

Removal

1. Remove kicking plate inner.
2. Remove body side weatherstrip. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
3. Remove body side welt.
4. Remove rear side finisher.

Installation

Install in the reverse order of removal.

FRONT PILLAR GARNISH

Removal

1. Partially remove body side welt.
2. Remove front pillar garnish.

Installation

Install in the reverse order of removal.

KICKING PLATE

Removal

1. Remove kicking plate inner.
2. Remove body side welt.
3. Remove clip of kicking plate outer and remove kicking plate outer.

Installation

Install in the reverse order of removal.

BODY SIDE WELT

Removal

1. Remove kicking plate inner.
2. Remove body side welt.

Installation

Install in the reverse order of removal.

CAUTION:

To install, check if all clips are matched over holes of panel on vehicle, then push on.

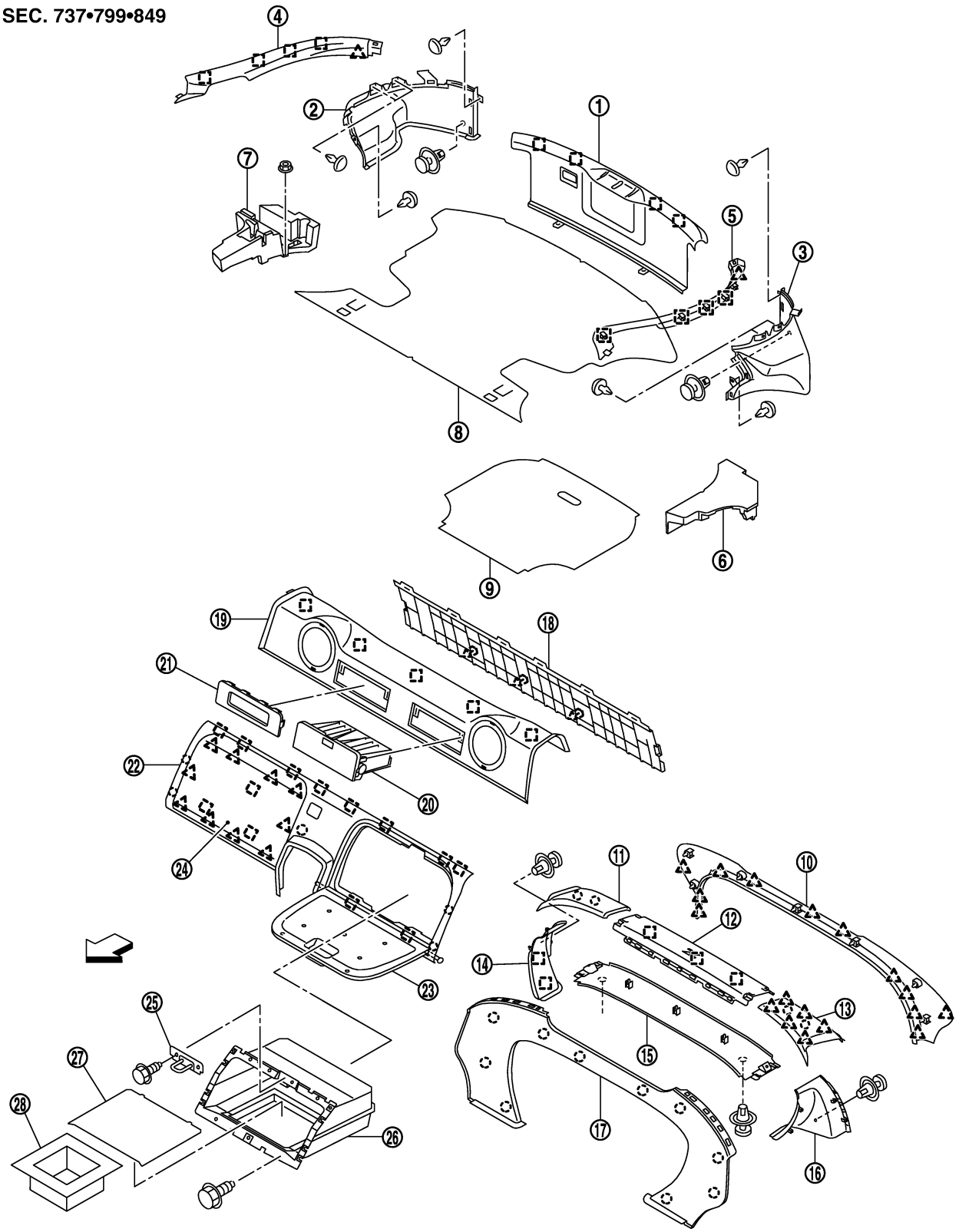
LUGGAGE FLOOR TRIM

PFP:84999

Removal and Installation (for Coupe Models)

NIS0008T

SEC. 737•799•849



PIIB7155J

1. Luggage finisher lower (center)
2. Luggage side finisher lower (RH)
3. Luggage side finisher lower (LH)
4. Luggage side finisher upper (RH)
5. Luggage side finisher upper (LH)
6. Trunk side box
7. Tool box
8. Luggage floor carpet
9. Spare tire cover
10. Strut cover rear
11. Strut cover upper (RH)
12. Strut cover upper (center)
13. Strut cover upper (LH)
14. Strut cover lower (RH)
15. Strut cover lower (center)
16. Strut cover lower (LH)
17. Strut cover front
18. Luggage floor finisher upper (rear)
19. Luggage floor finisher upper (front)
20. Rear parcel box
21. Rear parcel escutcheon
22. Luggage floor finisher lower
23. Rear floor box lid
24. Luggage floor finisher mask
25. Rear floor box striker
26. Rear floor box
27. Rear floor box mat
28. Tray

Clip

Pawl

Metal clip

LUGGAGE FLOOR TRIM

Removal

1. Remove back door welt. Refer to EI-47, "BACK DOOR" .
2. Remove luggage floor carpet.
3. Remove spare tire cover.
4. Remove luggage finisher lower (center).
5. Remove luggage side finisher upper (RH/LH).
6. Remove strut cover upper (RH/LH).
7. Remove strut cover rear.
8. Remove clip of luggage side finisher lower and remove luggage side finisher lower.
9. Remove strut cover front.
10. Remove strut cover upper (center).
11. Remove clip of strut cover lower (RH/LH) and remove strut cover lower.
12. Remove strut cover lower (center).

Installation

Install in the reverse order of removal.

REAR FLOOR BOX

Removal

1. Remove kicking plate inner. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove rear side finisher. Refer to EI-35, "BODY SIDE TRIM" .
4. Remove console box. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Remove screw of rear floor box and remove rear floor box.
6. Remove pins of rear floor box lid and remove rear floor box lid.
7. Remove luggage floor finisher mask.
8. Remove screws of rear floor box lock and remove rear floor box lock.
9. Remove tray.

Installation

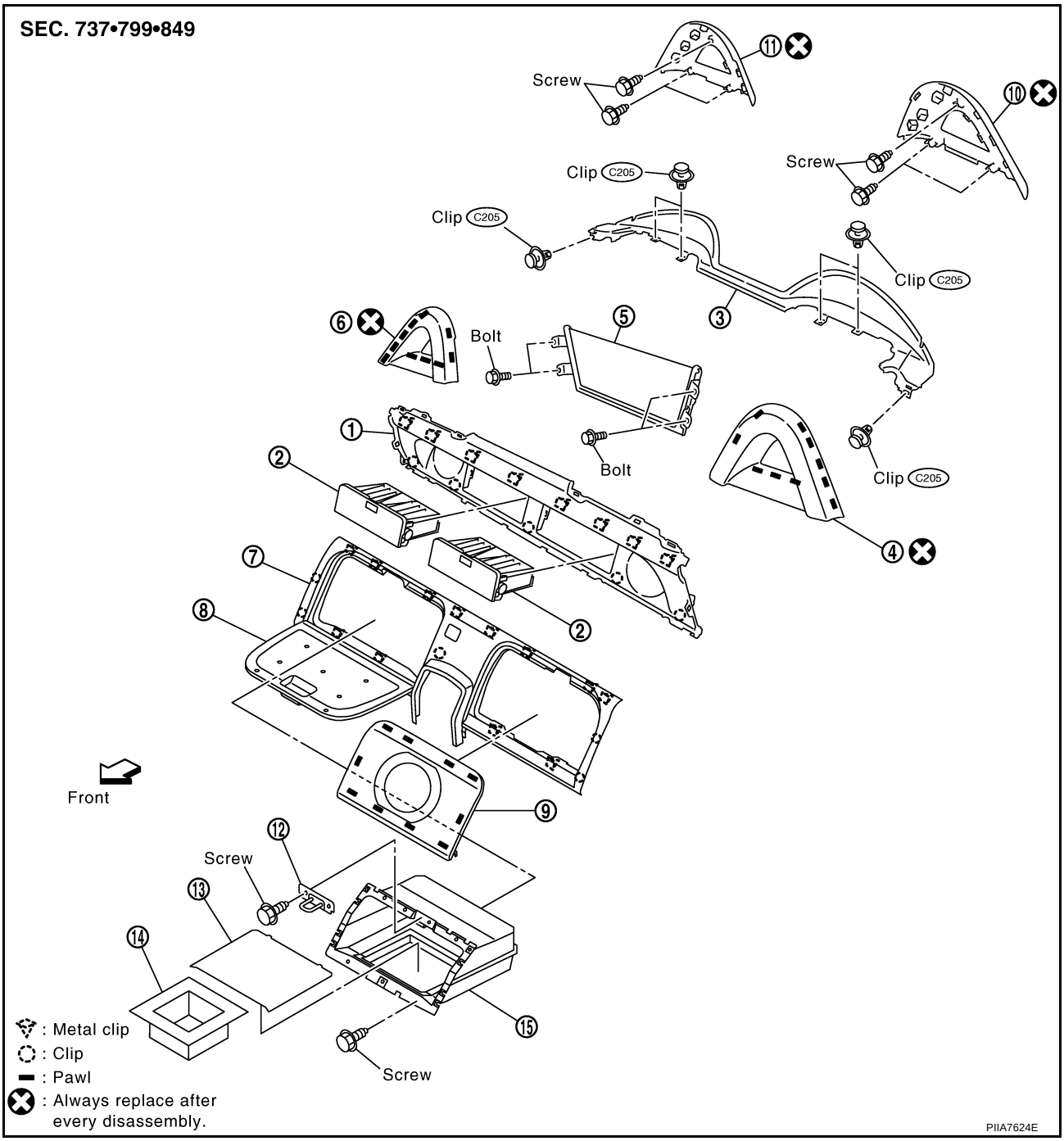
Install in the reverse order of removal.

CAUTION:

To install, check if all clips are matched over holes panel on vehicle, then push on.

Removal and Installation (for Roadster Models)

NIS0008U



1. Luggage floor finisher upper	2. Rear parcel box	3. Back panel finisher assembly
4. Guard frame protector front (LH)	5. Storage lid deflector	6. Guard frame protector front (RH)
7. Luggage floor finisher lower	8. Real floor box lid	9. Luggage floor finisher mask
10. Guard frame protector rear (LH)	11. Guard frame protector rear (RH)	12. Rear floor box striker
13. Rear floor box mat	14. Tray	15. Rear floor box

REAR FLOOR BOX

Removal

1. Remove center console finisher. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Remove luggage floor finisher lower.

5. Remove rear floor box lid and luggage floor finisher mask from luggage floor finisher lower.
6. Remove rear floor box mat and tray.
7. Remove screws, and remove rear floor box striker.
8. Loosen mounting screws and remove rear floor box.

Installation

Install in the reverse order of removal.

LUGGAGE FLOOR FINISHER UPPER

Removal

1. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove luggage floor finisher lower.
4. Remove rear parcel box (RH/LH).
5. Remove luggage floor finisher upper.

Installation

Install in the reverse order of removal.

BACK PANEL FINISHER

Removal

1. Remove kicking plate inner and partially remove rear of body side welt (RH/LH). Refer to EI-37, "Removal and Installation (for Roadster Models)" .
2. Remove rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
3. Remove cover and shoulder anchor bolt of seat belt (RH/LH). Refer to SB-6, "Removal and Installation of Seat Belt (Roadster)" .
4. Remove front guard frame protector (RH/LH).
5. Loosen mounting bolts and remove storage lid deflector.
6. Loosen screws and remove rear guard frame protector (RH/LH).
7. Remove clips, remove back panel finisher assembly.

Installation

Install in the reverse order of removal.

CAUTION:

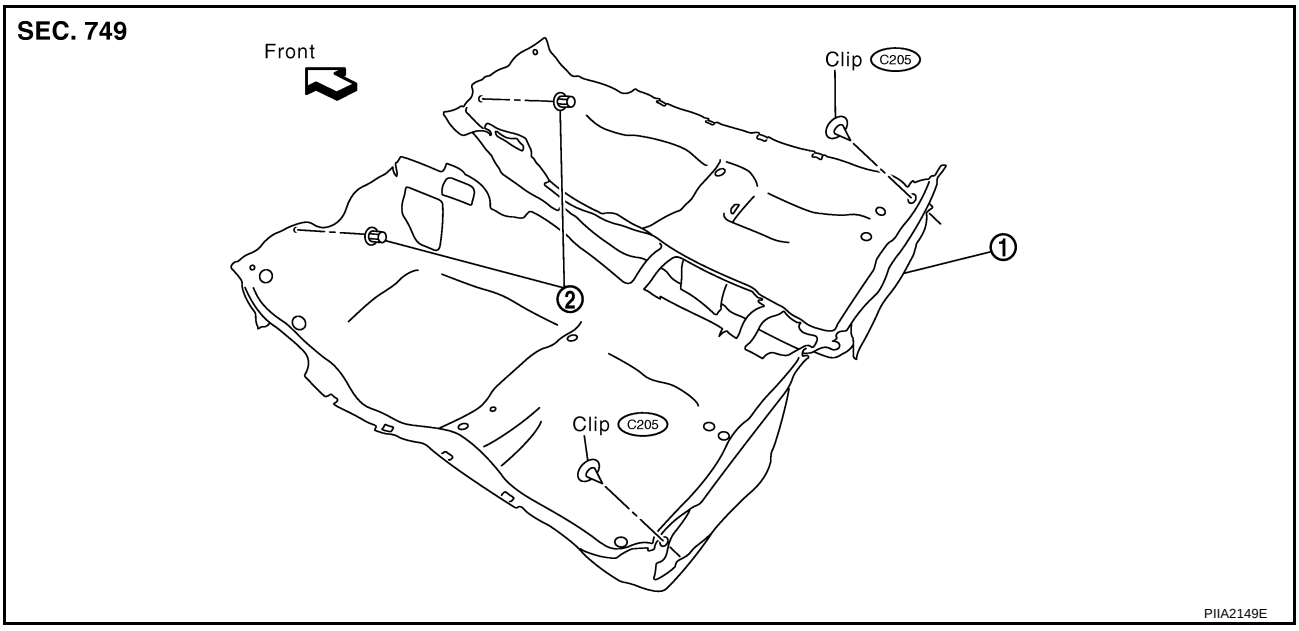
To install, check if all clips are matched over holes panel on vehicle, then push on.

FLOOR TRIM

PFP:74902

Removal and Installation

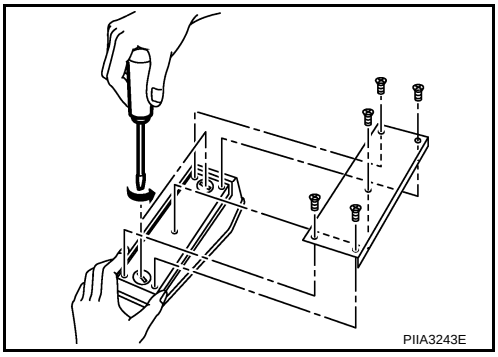
NIS0008V



1. Floor carpet assembly
2. Nut

REMOVAL

1. Remove driver seat and passenger seat. Refer to SE-67, "SEAT" .
2. Remove center console. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. Remove instrument side panel (left and right). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove body side welt. Refer to EI-35, "BODY SIDE TRIM" .
5. Remove kicking plate inner. Refer to EI-35, "BODY SIDE TRIM" .
6. Remove screw of footrest and remove plate.
7. Remove clips of footrest and remove footrest.
8. Remove dash side finisher. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
9. Remove nut and clips of floor carpet.
10. Remove floor carpet assembly.



INSTALLATION

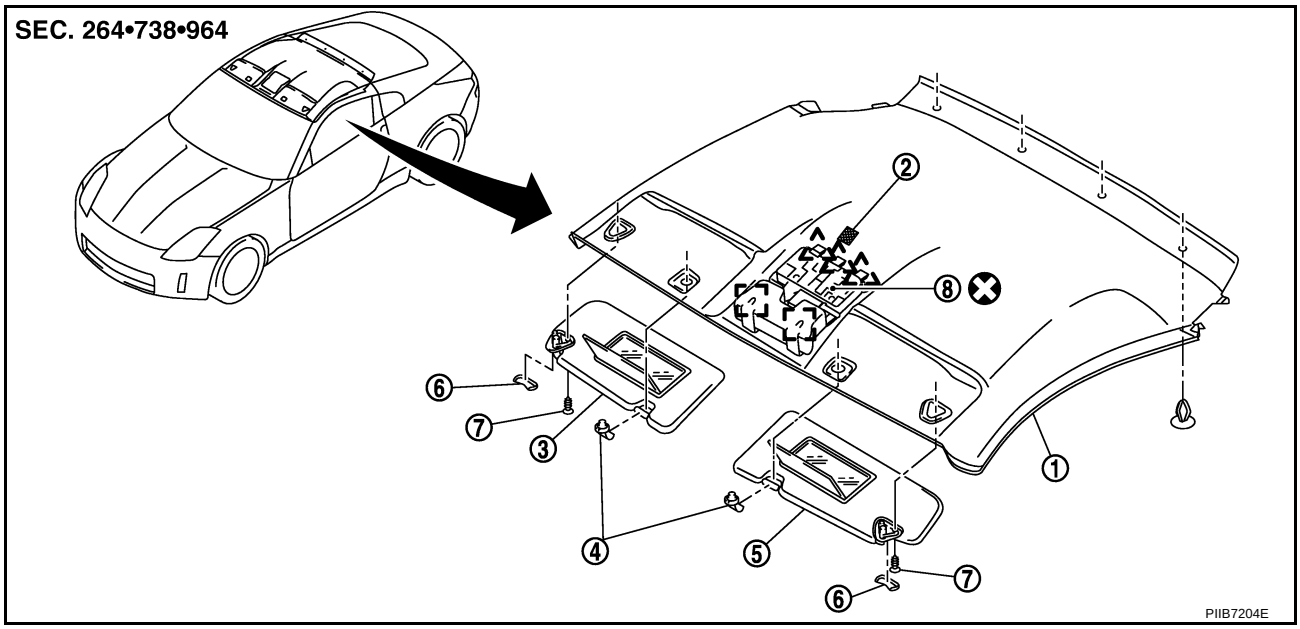
Install in the reverse order of removal.

HEADLINING

PFP:73910

Removal and Installation (for Coupe Models)

NIS0008W

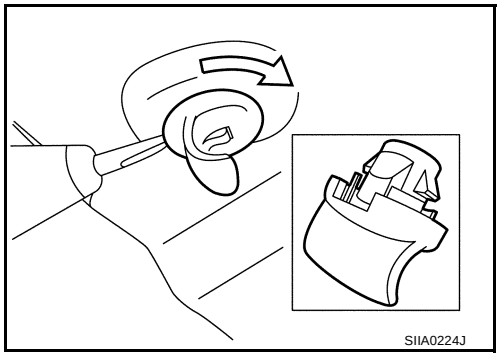


1. Headlining	2. Dual lock fastener	3. Sun-visor (RH)
4. Sun-visor holder	5. Sun-visor (LH)	6. cap
7. Screw	8. Map lamp assembly	
Pawl	Metal clip	

REMOVAL

1. Remove back door welt. Refer to EI-47, "BACK DOOR" .
2. Remove luggage floor carpet. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
3. Remove luggage finisher lower center. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
4. Disconnect harness connector at luggage room lamp.
5. Remove luggage side finisher upper. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
6. Remove kicking plate inner. Refer to EI-36, "KICKING PLATE" .
7. Remove body side welt. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
8. Remove rear side finisher. Refer to EI-35, "REAR SIDE FINISHER" .
9. Remove seat belt anchor. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" .
10. Remove rear pillar finisher. Refer to EI-35, "REAR PILLAR FINISHER" .
11. Remove front pillar garnish. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
12. Disconnect harness connector at map lamp.
13. Remove sun-visor (RH/LH).
14. Remove sun-visors holder (RH/LH).

    NOTE:
    Insert flat-bladed screw driver to edge, and turn it 90 degrees and remove sun-visor holder.



15. Remove dual lock fastener.
16. Remove clips of headlining rear potion.

17. Remove headlining, turn to 90 degrees and take out from back door.

CAUTION:

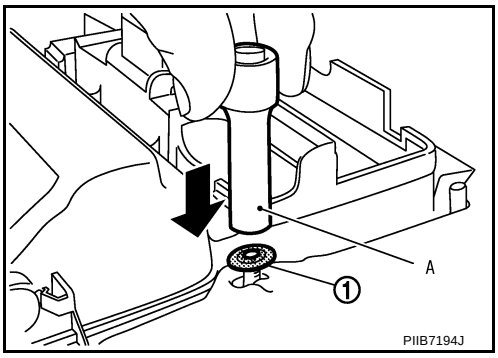
- **Always remove or install in a pair.**
- **Cover surroundings with waste to avoid scratches or damages.**
- **Do not bend headlining too hard.**

INSTALLATION

Install in the reverse order of removal.

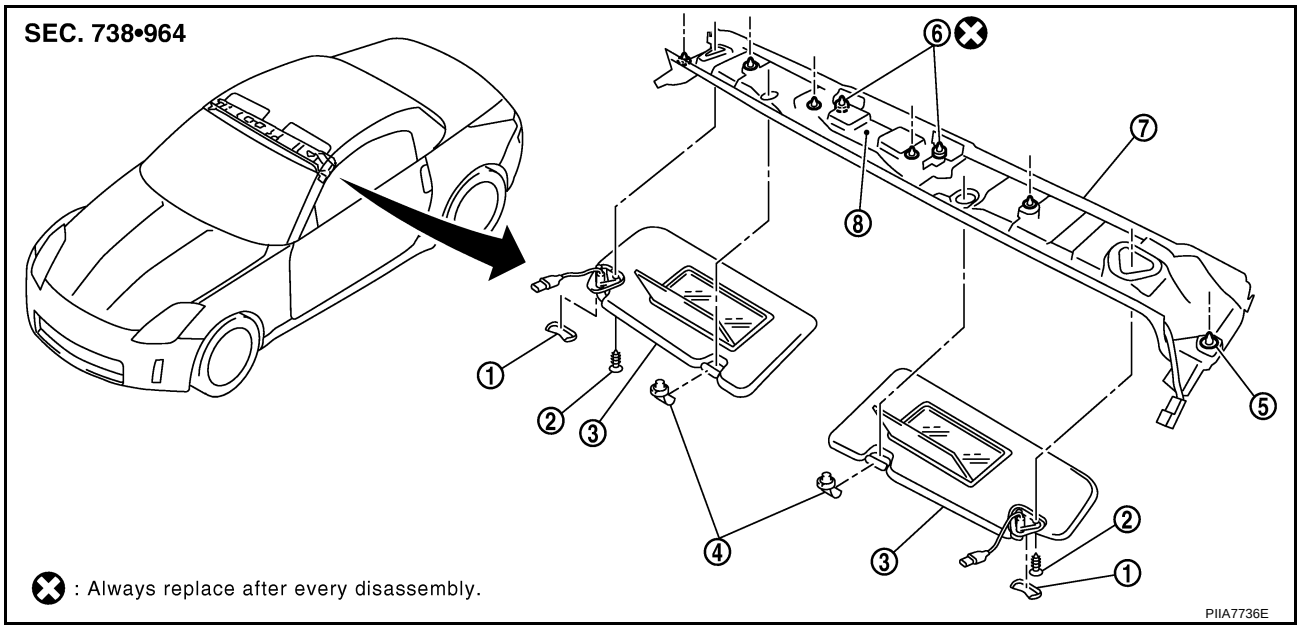
CAUTION:

- **Do not bend headlining when installing.**
- **When installing the map lamp assembly (new unit) or assist grip assembly (new unit), use tools like drafter or deep socket A to eliminate the gap between the headlining and the above new units while the push on nuts (1).**



Removal and Installation (for Roadster Models)

NIS0008X



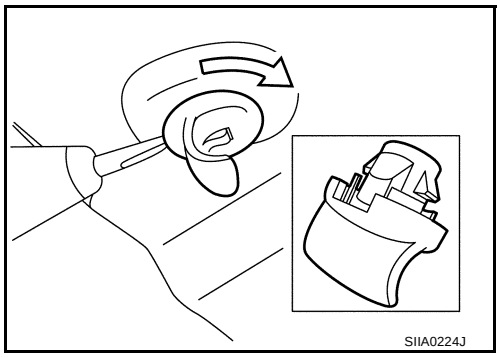
1. Cap	2. Screw	3. Sun-visor
4. Sun-visor holder	5. Clip (C101)	6. Clip (C101)
7. Roof front finisher	8. Map lamp	

ROOF FRONT FINISHER

Removal

1. Remove cap and screws and disconnect harness connector, then remove sun-visor.
2. Remove sun-visors holder (RH/LH).

   NOTE:
   Insert flat-bladed screw driver to edge, and turn it 90 degrees and remove sun-visor holder.



3. Remove body side welt and front pillar garnish. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
4. Disconnect harness connector and remove roof front finisher.

Installation

Install in the reverse order of removal.

CAUTION:

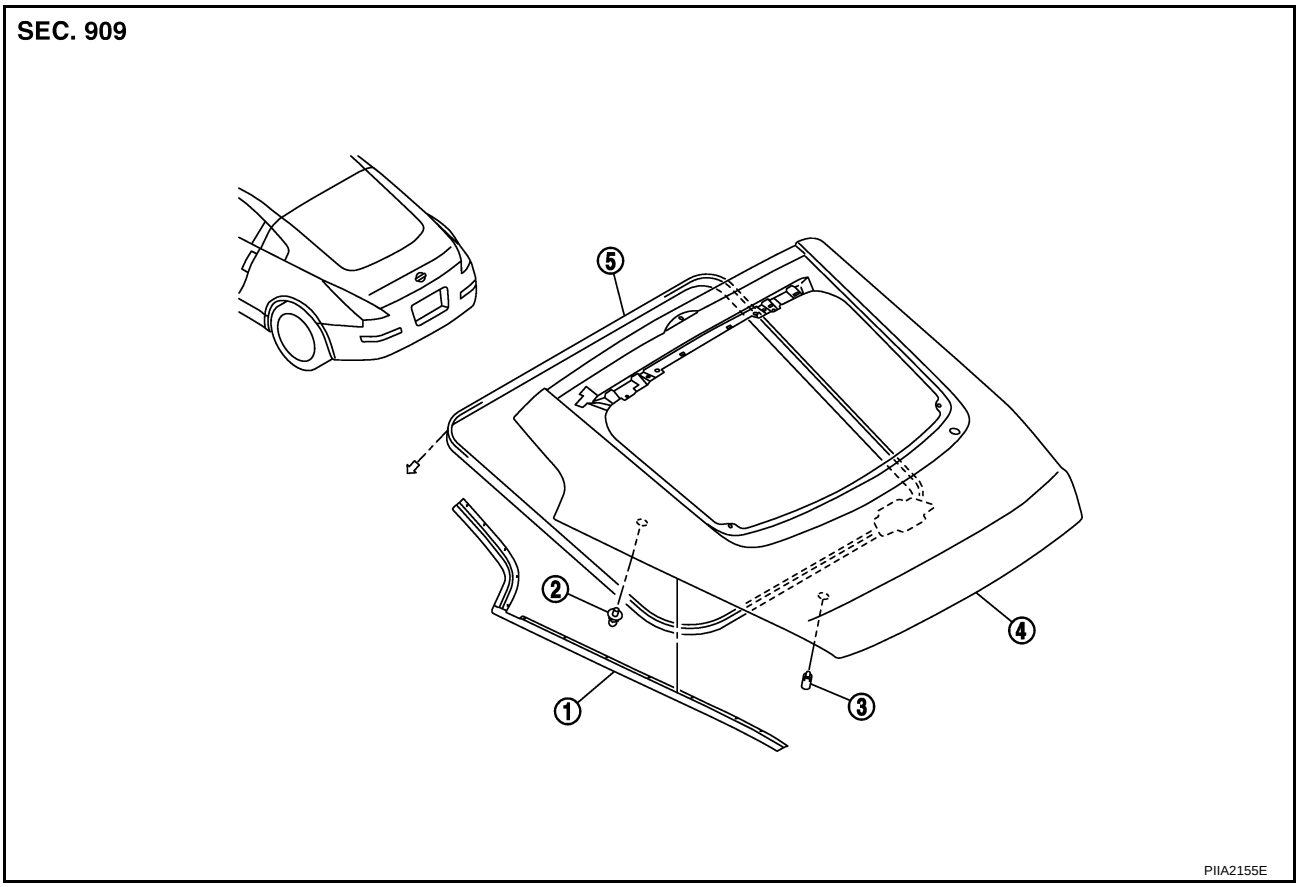
To install, check if all clips are matched over holes panel on vehicle, then push on.

BACK DOOR

PFP:90100

Removal and Installation (for Coupe Models)

NIS0008Y



1. Back door molding
2. Bumper rubber
3. Bumper rubber
4. Back door panel
5. Back door welt

BACK DOOR MOLDING

Removal

Remove clips of back door molding and remove back door molding.

Installation

Install in the reverse order of removal.

BACK DOOR WELT

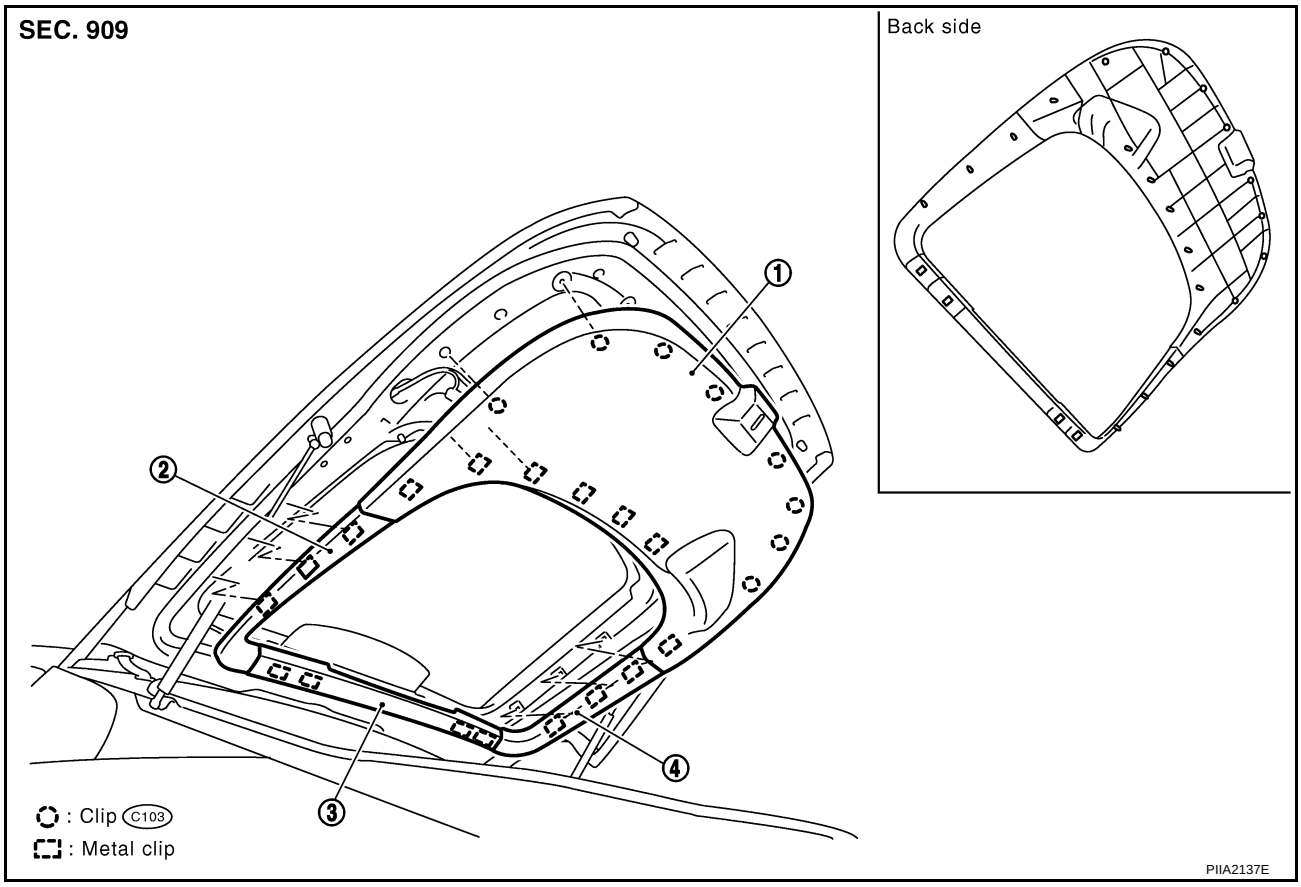
Removal

Remove back door welt.

Installation

Install in the reverse order of removal.

BACK DOOR FINISHER



1. Back door finisher lower
2. Back door finisher side (LH)
3. Back door finisher side (RH)
4. Back door finisher upper

Removal

1. Remove back door finisher lower.
2. Remove back door finisher upper.
3. Remove back door finisher side (RH/LH).

Installation

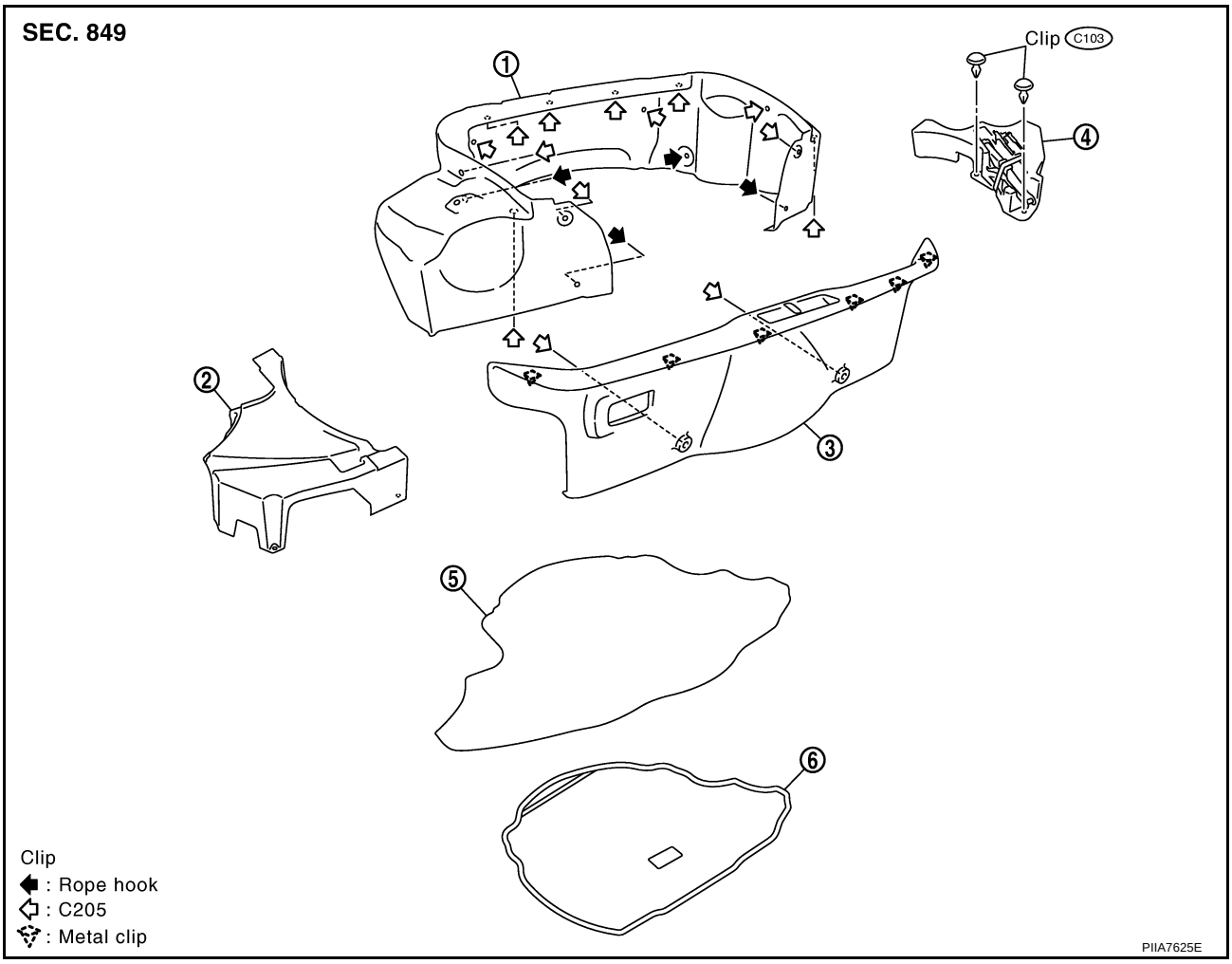
Install in the reverse order of removal.

TRUNK ROOM TRIM & TRUNK LID FINISHER

PFP:84920

Removal and Installation (for Roadstar Models)

NIS0008Z



1. Trunk front finisher
2. Trunk side box
3. Trunk rear finisher
4. Tool box
5. Trunk floor carpet
6. Spare tire cover

TRUNK ROOM TRIM

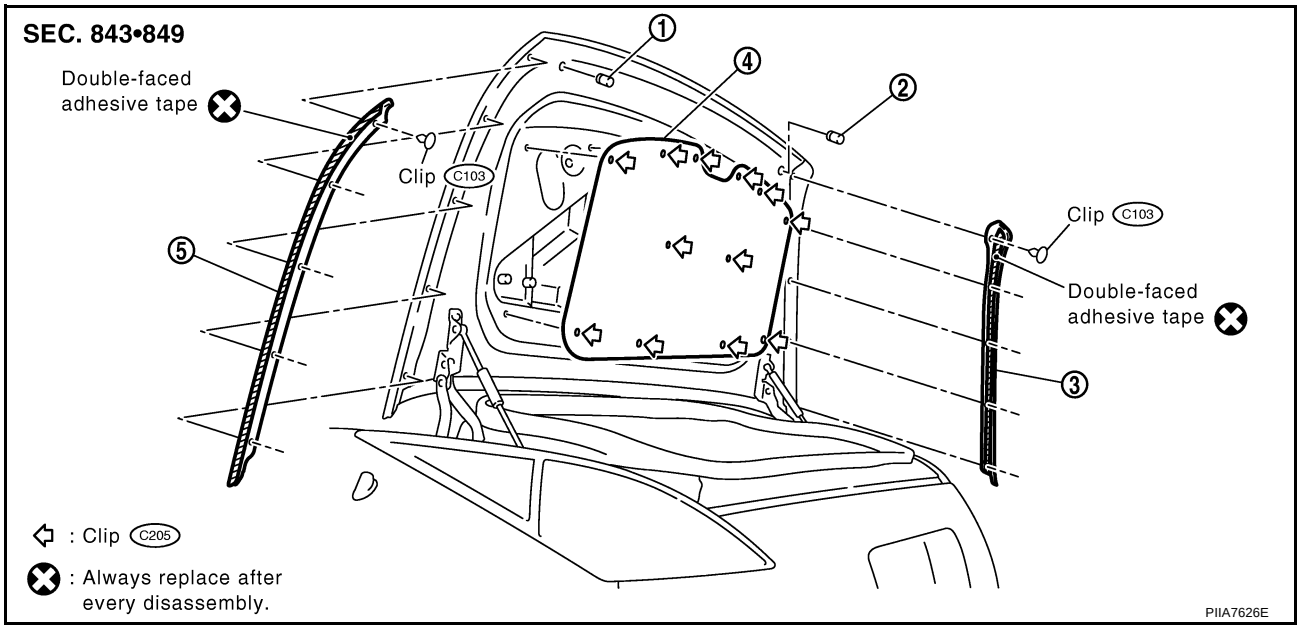
Removal

1. Remove trunk lid weatherstrip. Refer to BL-113, "Removal and Installation of Trunk Lid Weatherstrip" .
2. Remove trunk floor carpet.
3. Remove spare tire cover.
4. Remove trunk lid release lever from trunk rear finisher.
5. Remove clips and remove trunk rear finisher.
6. Remove clips of trunk front finisher and remove trunk front finisher.
7. Remove trunk side box.
8. Remove clips and remove tool box.

Installation

Install in the reverse order of removal.

TRUNK LID FINISHER



1. Bumper rubber
2. Bumper rubber
3. Trunk lid molding (RH)
4. Trunk lid finisher
5. Trunk lid molding (LH)

Removal

Remove clips of trunk lid finisher and remove trunk lid finisher.

Installation

Install in the reverse order of removal.

TRUNK LID MOLDING

Removal

1. Remove clips and double-faced adhesive tape of trunk lid molding.
2. Remove trunk lid molding (LH/RH).

Installation

Install in the reverse order of removal.

SECTION EM
ENGINE MECHANICAL

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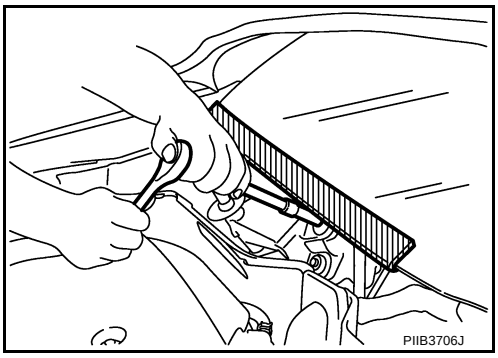
PRECAUTIONS

PFP:00001

Precautions for Procedures without Cowl Top Cover

NBS003FC

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Battery Service

NBS003FD

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Drain Engine Coolant and Engine Oil

NBS00002

Drain engine coolant and engine oil when engine is cooled.

Precautions for Disconnecting Fuel Piping

NBS00003

- Before starting work, make sure no fire or spark producing items are in the work area.
- Release fuel pressure before disconnecting and disassembly.
- After disconnecting pipes, plug openings to stop fuel leakage.

Precautions for Removal and Disassembly

NBS00004

- When instructed to use special service tools, use specified tools. Always be careful to work safely, avoid forceful or uninstructed operations.
- Exercise maximum care to avoid damage to mating or sliding surfaces.
- Cover openings of engine system with tape or equivalent, if necessary, to seal out foreign materials.
- Mark and arrange disassembly parts in an organized way for easy troubleshooting and re-assembly.
- When loosening bolts and nuts, as a basic rule, start with the one furthest outside, then the one diagonally opposite, and so on. If the order of loosening is specified, do exactly as specified. Power tools may be used in the step.

Precautions for Inspection, Repair and Replacement

NBS00005

Before repairing or replacing, thoroughly inspect parts. Inspect new replacement parts in the same way, and replace if necessary.

Precautions for Assembly and Installation

NBS00006

- Use torque wrench to tighten bolts or nuts to specification.
- When tightening bolts and nuts, as a basic rule, equally tighten in several different steps starting with the ones in center, then ones on inside and outside diagonally in this order. If the order of tightening is specified, do exactly as specified.
- Replace with new gasket, packing, oil seal or O-ring.
- Dowel pins are used for several parts alignment. When replacing and reassembling with dowel pins, make sure that dowel pins are installed in the original portion.
- Thoroughly wash, clean, and air-blow each part. Carefully check engine oil or engine coolant passages for any restriction and blockage.
- Avoid damaging sliding or mating surfaces. Completely remove foreign materials such as cloth lint or dust. Before assembly, oil sliding surfaces well.
- Release air within route when refilling after draining engine coolant.

- After repairing, start engine and increase engine speed to check engine coolant, fuel, engine oil, and exhaust gases for leakage.

Parts Requiring Angle Tightening

NBS00007

- Use angle wrench [SST: KV10112100 (BT8653-A)] for the final tightening of the following engine parts:
  - Cylinder head bolts
  - Lower cylinder block bolts
  - Connecting rod cap bolts
- Do not use a torque value for final tightening.
- The torque value for these parts are for a preliminary step.
- Ensure thread and seat surfaces are clean and coated with engine oil.

Precautions for Liquid Gasket

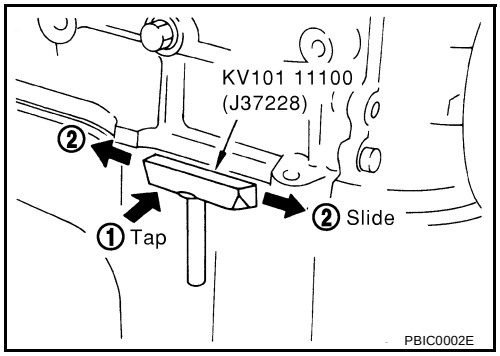
NBS00008

REMOVAL OF LIQUID GASKET SEALING

- After removing mounting bolts and nuts, separate the mating surface using seal cutter (SST) and remove old liquid gasket sealing.

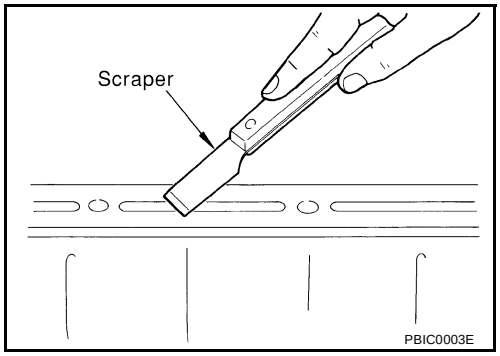
  CAUTION:
  Be careful not to damage the mating surfaces.
- Tap seal cutter to insert it, and then slide it by tapping on the side as shown in the figure.
- In areas where seal cutter (SST) is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

  CAUTION:
  If for some unavoidable reason tool such as screwdriver is used, be careful not to damage the mating surfaces.

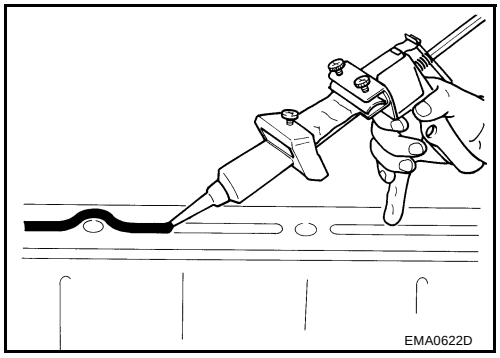


LIQUID GASKET APPLICATION PROCEDURE

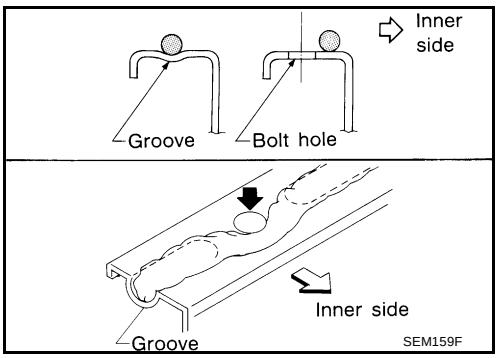
1. Using scraper, remove old liquid gasket adhering to the gasket application surface and the mating surface.
   - Remove liquid gasket completely from the groove of the gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.



3. Attach liquid gasket tube to tube presser [SST: WS39930000 (—)].
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for liquid gasket application, apply liquid gasket to the groove.



- As for bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of this manual.
- Within five minutes of liquid gasket application, install the mating component.
- If liquid gasket protrudes, wipe it off immediately.
- Do not retighten mounting bolts or nuts after the installation.
- After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



CAUTION:

If there are specific instructions in this manual, observe them.

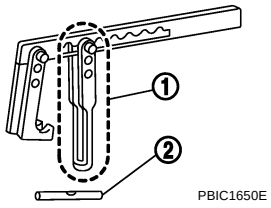
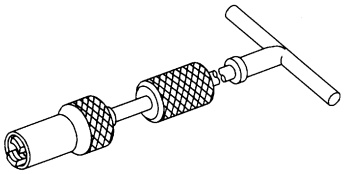
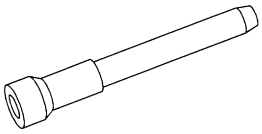
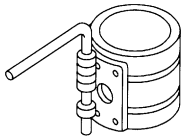
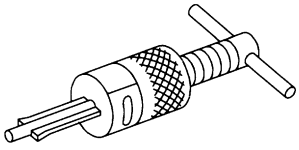
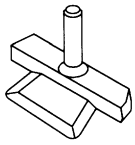
PREPARATION

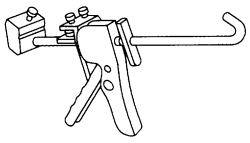
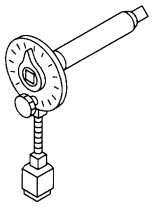
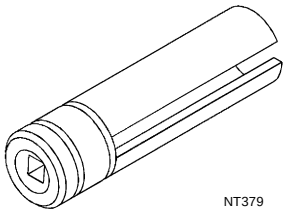
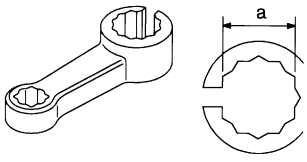
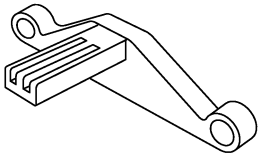
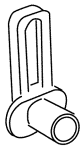
PFP:00002

Special Service Tools

NBS00009

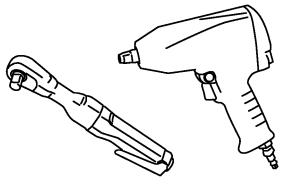
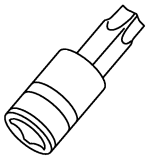
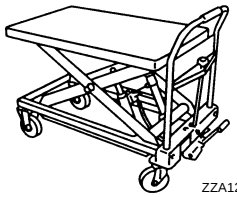
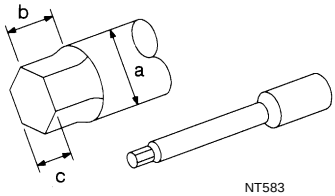
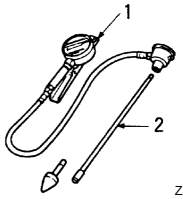
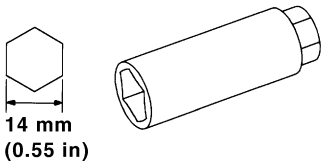
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

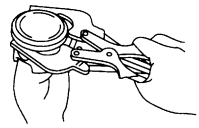
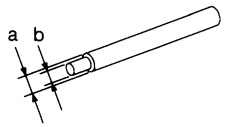
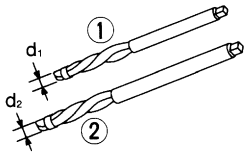
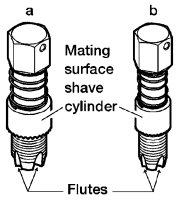
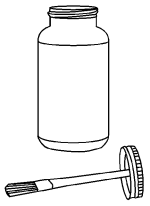
Tool number (Kent-Moore No.) Tool name		Description
KV10116200 (J26336-A) Valve spring compressor 1. KV10115900 (J26336-20) Attachment 2. KV10109220 (—) Adapter	 PBIC1650E	Disassembling valve mechanism Part (1) is a component of KV10116200 (J26336-A), but Part (2) is not so.
KV10107902 (J38959) Valve oil seal puller	 NT011	Replacing valve oil seal
— (J39386) Valve oil seal drift	 NT024	Installing valve oil seal
EM03470000 (J8037) Piston ring compressor	 NT044	Installing piston assembly into cylinder bore
ST16610001 (J23907) Pilot bushing puller	 NT045	Removing pilot bushing (M/T models) or pilot converter (A/T models)
KV10111100 (J37228) Seal cutter	 NT046	Removing oil pan (lower and upper), front and rear timing chain case, etc.

Tool number (Kent-Moore No.) Tool name		Description
WS39930000 (—) Tube presser	 NT052	Pressing the tube of liquid gasket
KV10112100 (BT8653-A) Angle wrench	 NT014	Tightening bolts for bearing cap, cylinder head, etc. in angle
KV10117100 (J3647-A) Heated oxygen sensor wrench	 NT379	Loosening or tightening heated oxygen sensor 2 **For 22 mm (0.87 in) width hexagon nut**
KV10114400 (J38365) Heated oxygen sensor wrench	 NT636	Loosening or tightening air fuel ratio sensor 1 **a: 22 mm (0.87 in)**
KV10118600 (J-48641) Ring gear stopper	 PBIC5052E	Removing and installing crankshaft pulley
— (J-45488) Quick connector release	 PBIC0198E	Removing fuel tube quick connectors in engine room

Commercial Service Tools

NBS0000A

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
TORX socket  PBIC1113E	Removing and installing flywheel **Size: T55**
(—) Manual lift table caddy  ZZA1210D	Removing and installing engine
(J24239-01) Cylinder head bolt wrench  NT583	Loosening and tightening cylinder head bolt, and used with angle wrench [SST: KV10112100 (BT8653-A)] **a: 13 (0.51) dia.** **b: 12 (0.47)** **c: 10 (0.39)** Unit: mm (in)
(—) 1. Compression gauge 2. Adapter  ZZA0008D	Checking compression pressure
(—) Spark plug wrench  **14 mm** **(0.55 in)** PBIC3874E	Removing and installing spark plug
(—) Valve seat cutter set  NT048	Finishing valve seat dimensions

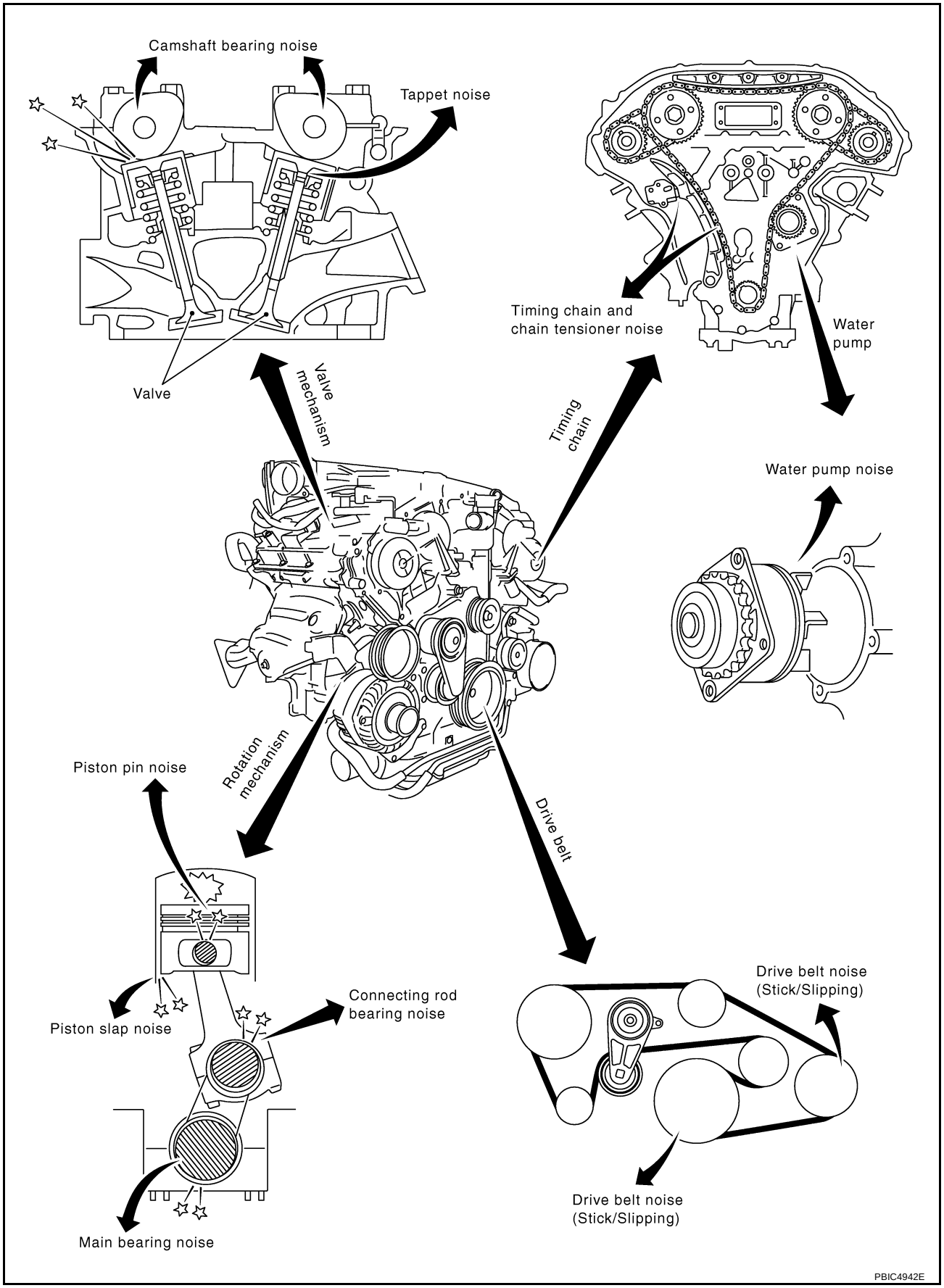
(Kent-Moore No.) Tool name	Description
(—) Piston ring expander  NT030	Removing and installing piston ring
(—) Valve guide drift  NT015	Removing and installing valve guide **Intake and Exhaust:** **a: 9.5 mm (0.374 in) dia.** **b: 5.5 mm (0.217 in) dia.**
(—) Valve guide reamer  NT016	(1): Reaming valve guide inner hole (2): Reaming hole for oversize valve guide **Intake and Exhaust:** **d_1 : 6.0 mm (0.236 in) dia.** **d_2 : 10.2 mm (0.402 in) dia.**
(J-43897-18) (J-43897-12) Oxygen sensor thread cleaner  AEM488	Reconditioning the exhaust system threads before installing a new air fuel ratio sensor and heated oxygen sensor (Use with anti-seize lubricant shown below.) **a: J-43897-18 [18 mm (0.71 in) dia.] for zirconia heated oxygen sensor and air fuel ratio sensor** **b: J-43897-12 [12 mm (0.47 in) dia.] for titania heated oxygen sensor**
(—) Anti-seize lubricant (Permatex 133AR or equivalent meeting MIL specification MIL-A-907)  AEM489	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting — Engine Noise

NBS0000B



Use the Chart Below to Help You Find the Cause of the Symptom.

NBS0000C

1. Locate the area where noise occurs.
2. Confirm the type of noise.
3. Specify the operating condition of engine.
4. Check specified noise source.

If necessary, repair or replace these parts.

Location of noise	Type of noise	Operating condition of engine						Source of noise	Check item	Reference page
		Before warm-up	After warm-up	When starting	When idling	When racing	While driving			
Top of engine Rocker cover Cylinder head	Ticking or clicking	C	A	—	A	B	—	Tappet noise	Valve clearance	EM-80
	Rattle	C	A	—	A	B	C	Camshaft bearing noise	Camshaft runout Camshaft journal oil clearance	EM-74 EM-74
Crankshaft pulley Cylinder block (Side of engine) Oil pan	Slap or knock	—	A	—	B	B	—	Piston pin noise	Piston to piston pin oil clearance Connecting rod bushing oil clearance	EM-125 EM-127
	Slap or rap	A	—	—	B	B	A	Piston slap noise	Piston to cylinder bore clearance Piston ring side clearance Piston ring end gap Connecting rod bend and torsion	EM-129 EM-126 EM-126 EM-127
	Knock	A	B	C	B	B	B	Connecting rod bearing noise	Connecting rod bushing oil clearance Connecting rod bearing oil clearance	EM-127 EM-131
	Knock	A	B	—	A	B	C	Main bearing noise	Main bearing oil clearance Crankshaft runout	EM-132 EM-131
Front of engine Timing chain case	Tapping or ticking	A	A	—	B	B	B	Timing chain and chain tensioner noise	Timing chain cracks and wear Timing chain tensioner operation	EM-60 EM-53
Front of engine	Squeaking or fizzing	A	B	—	B	—	C	Drive belts (Sticking or slipping)	Drive belts deflection	EM-12
	Creaking	A	B	A	B	A	B	Drive belts (Slipping)	Idler pulley bearing operation	
	Squall Creak	A	B	—	B	A	B	Water pump noise	Water pump operation	CO-23, "WATER PUMP"

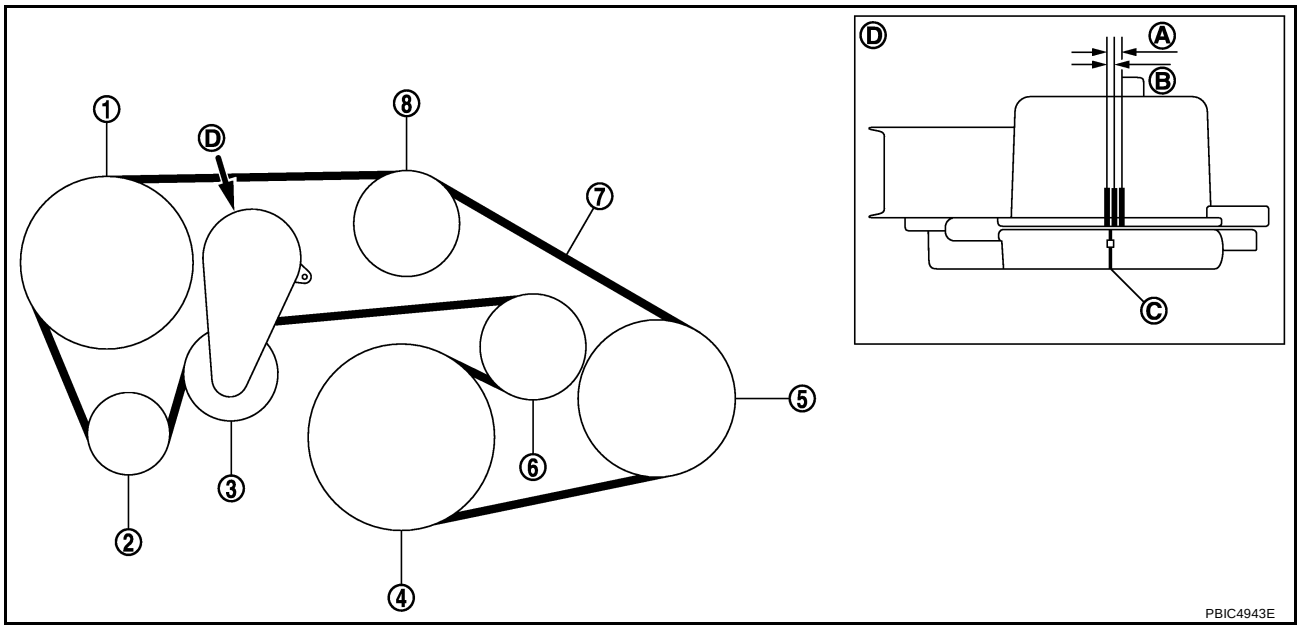
A: Closely related B: Related C: Sometimes related —: Not related

DRIVE BELTS

PFP:02117

Checking Drive Belts

NBS0000D



1.	Power steering oil pump	2.	Alternator	3.	Drive belt auto-tensioner
4.	Crankshaft pulley	5.	A/C compressor	6.	Idler pulley
7.	Drive belt	8.	Idler pulley		
A.	Possible use range	B.	Range when new drive belt is installed	C.	Indicator
D.	View D				

WARNING:

Be sure to perform this step when engine is stopped.

- Make sure that the indicator (C) (notch on fixed side) of drive belt auto-tensioner is within the possible use range (A).

  NOTE:

  Check the drive belt auto-tensioner indication when the engine is cold.
- When new drive belt is installed, the indicator (C) (notch on fixed side) should be within the range (B) in the figure.
- Visually check entire drive belt for wear, damage or cracks.
- If the indicator (C) (notch on fixed side) is out of the possible use range or belts is damaged, replace drive belt.

Tension Adjustment

NBS0000E

Belt tension is not necessary, as it is automatically adjusted by drive belt auto-tensioner.

Removal and Installation

NBS0000F

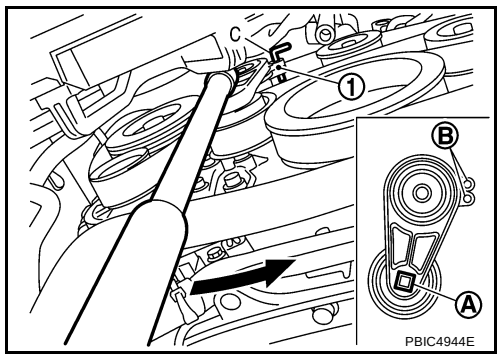
REMOVAL

1. Remove undercover with power tool.
2. Remove reservoir tank. Refer to CO-13, "RADIATOR" .

3. While securely holding the square hole (A) in pulley center of auto tensioner (1) with a spinner handle, move spinner handle in the direction of arrow (loosening direction of drive belt).

CAUTION:
Avoid placing hand in a location where pinching may occur if the holding tool accidentally comes off.

⬅ : Loosing direction of drive belt



4. Under the above condition, insert a metallic bar of approximately 6 mm (0.24 in) diameter [hexagonal wrench (C) shown as example in the figure] through the holding boss (B) to lock auto-tensioner pulley arm.
5. Remove drive belt.

INSTALLATION

Note the following, and install in the reverse order of removal.

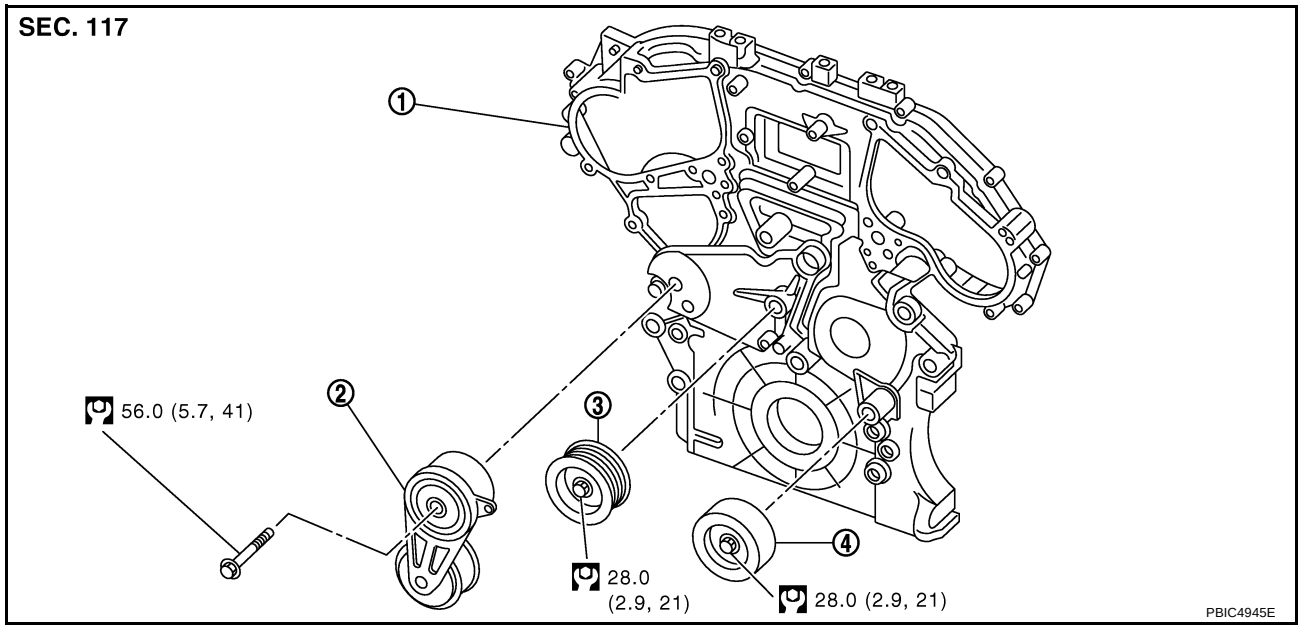
CAUTION:
- **Make sure drive belt is securely installed around all pulleys.**
- **Make sure drive belt is correctly engaged with the pulley groove.**
- **Check for engine oil and engine coolant are not adhered drive belt and pulley groove.**

INSPECTION AFTER INSTALLATION

Turn crankshaft pulley clockwise several times to equalize tension between each pulley, and then confirm tension of drive belt at indicator (notch on fixed side) is within the possible use range. Refer to EM-12, "Checking Drive Belts" .

Components

NBS006TG



1. Front timing chain case
2. Drive belt auto-tensioner
3. Idler pulley
4. Idler pulley

- Refer to GI-11, "Components" for symbol marks in the figure.

Removal and Installation of Drive Belt Auto-Tensioner

NBS006TH

REMOVAL

1. Remove drive belt. Refer to EM-12, "Removal and Installation" .
   - Keep auto-tensioner pulley arm locked after drive belt is removed.
2. Remove auto-tensioner and idler pulley.
   - Keep auto-tensioner pulley arm locked to install or remove auto-tensioner.

INSTALLATION

Installation is the reverse order of removal.

CAUTION:

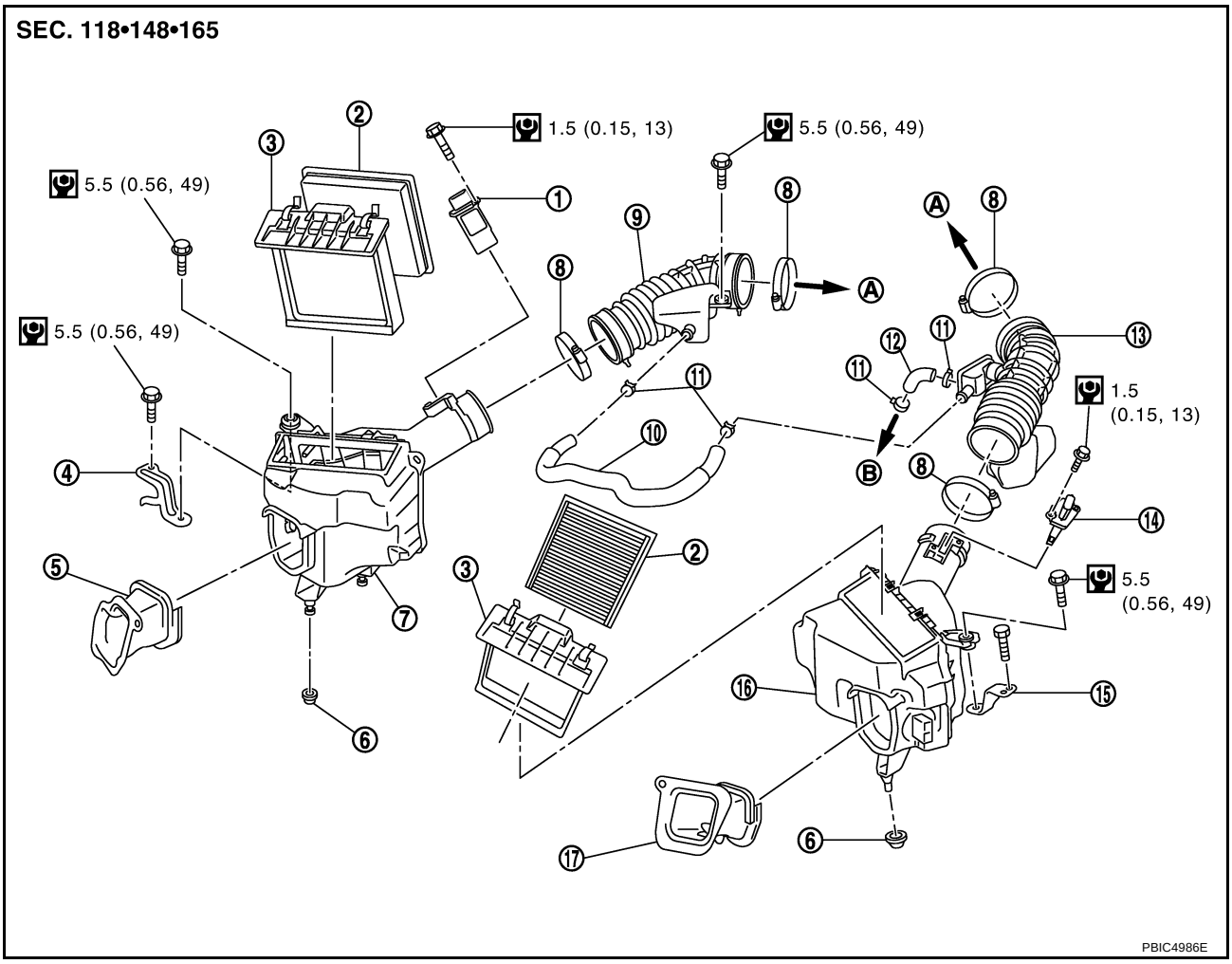
If there is damage greater than peeled paint, replace drive belt auto-tensioner.

AIR CLEANER AND AIR DUCT

PFP:16500

Removal and Installation

NBS0000G



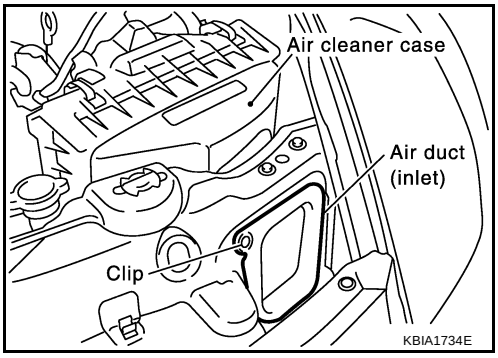
1. Mass air flow sensor (RH)	2. Air cleaner filter	3. Holder
4. Bracket	5. Air duct (inlet)	6. Grommet
7. Air cleaner case (RH)	8. Clamp	9. Air duct (RH)
10. Air hose	11. Clamp	12. PCV hose
13. Air duct (LH)	14. Mass air flow sensor (LH)	15. Bracket
16. Air cleaner case (LH)	17. Air duct (inlet)	
A. To electric throttle control actuator	B. To rocker cover (left bank)	

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove clips, and slide air duct (inlet) frontward, disengage clips and air cleaner case.

   NOTE:
   When removing air duct (inlet), remove front bumper and bumper fascia stay radiator core support center. Refer to EI-14, "FRONT BUMPER" and BL-19, "RADIATOR CORE SUPPORT".



2. Disconnect harness connector from mass air flow sensor.

3. Disconnect PCV hose.
4. Remove air cleaner case/mass air flow sensor assembly and air duct assembly disconnecting their joints.
   - Add marks as necessary for easier installation.
5. Remove mass air flow sensor from air cleaner case.

CAUTION:
Handle mass air flow sensor with care.
- **Do not shock it.**
- **Do not disassemble it.**
- **Do not touch its sensor.**

INSPECTION AFTER REMOVAL

Inspect air duct for crack or tear.

- If anything found, replace air duct.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Align marks. Attach each joint. Screw clamps firmly.

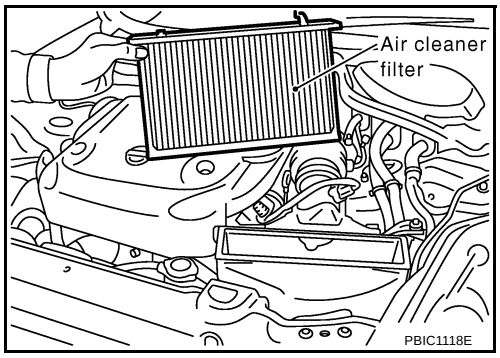
CAUTION:
Keep the clearance more than 5 mm between tower bar and air duct.

Changing Air Cleaner Filter

NBS0000H

REMOVAL

1. Unhook clips, and lift holder.
2. Remove air cleaner filter.



INSTALLATION

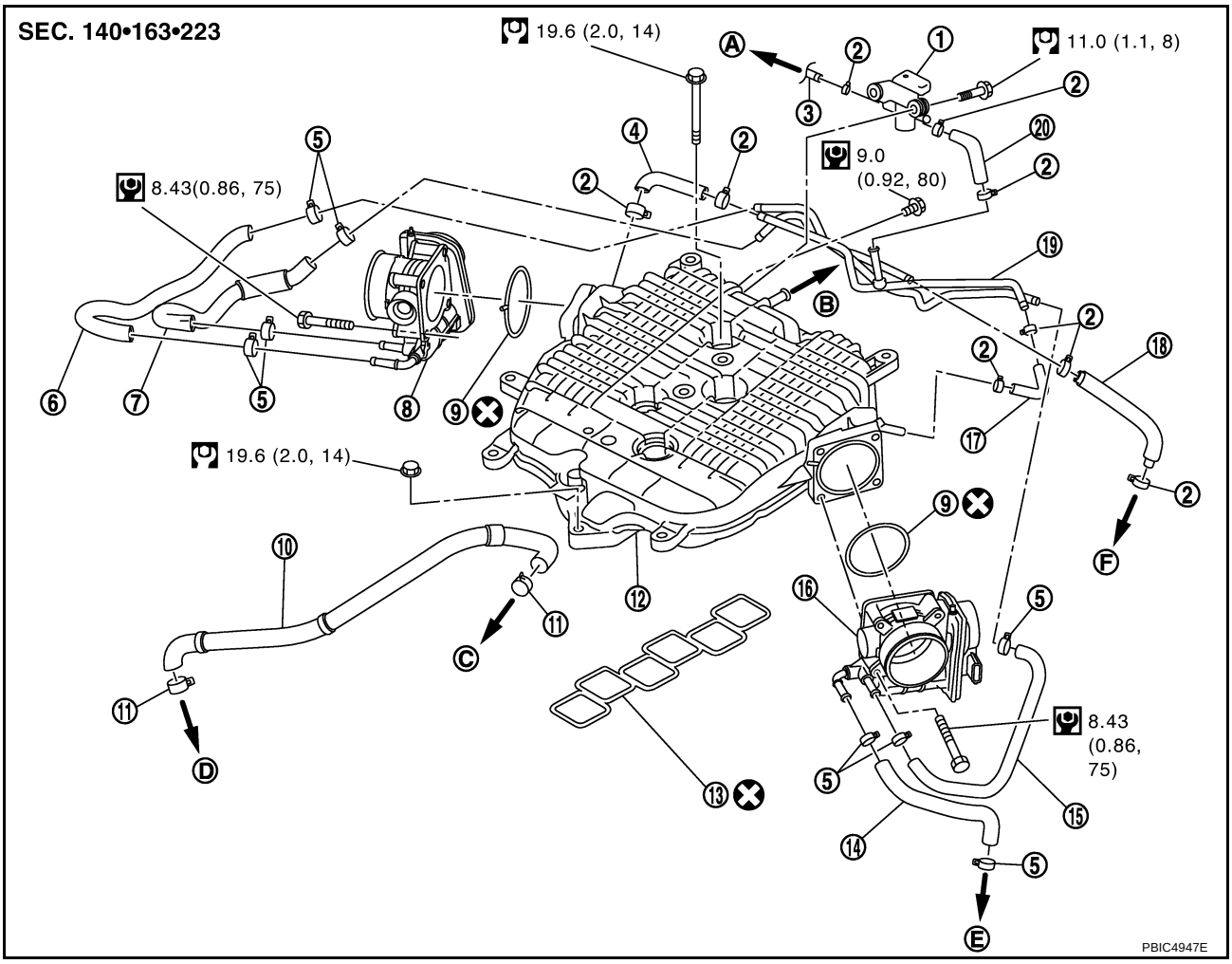
Installation is the reverse order of removal.

INTAKE MANIFOLD COLLECTOR

PFP:14003

Removal and Installation

NBS006VD



1.	EVAP canister purge control solenoid valve	2.	Clamp	3.	EVAP hose
4.	EVAP hose	5.	Clamp	6.	Water hose
7.	Water hose	8.	Electric throttle control actuator (bank1)	9.	Gasket
10.	PCV hose	11.	Clamp	12.	Intake manifold collector
13.	Gasket	14.	Water hose	15.	Water hose
16.	Electric throttle control actuator (bank2)	17.	EVAP hose	18.	Water hose
19.	EVAP tube assembly	20.	EVAP hose		
A.	To vacuum pipe	B.	To brake booster	C.	To intake manifold collector
D.	To PCV valve	E.	To heater pipe	F.	To water outlet (rear)

- Refer to GI-11, "Components" for symbol marks in the figure.

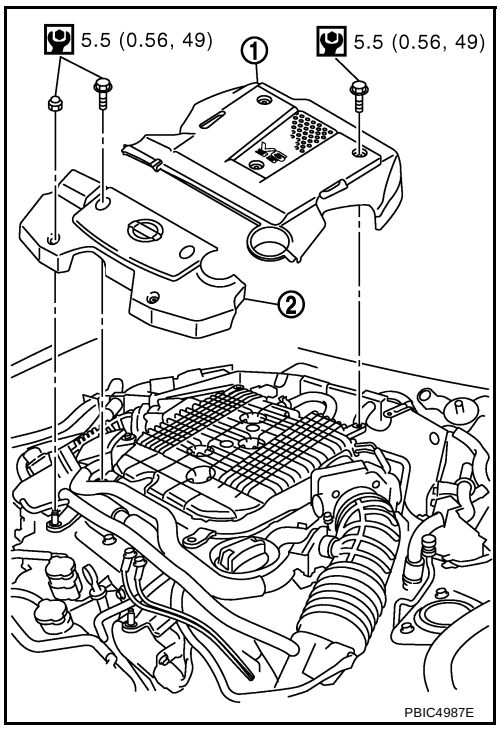
REMOVAL

WARNING:

To avoid the danger of being scalded, do not drain the engine coolant when the engine is hot.

1. Remove tower bar. Refer to FSU-20, "TOWER BAR" .

2. Remove engine cover (1) (2) with power tool.



3. Remove air cleaner case and air duct (RH, LH). Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Remove electric throttle control actuator (bank1, bank2) as follows:

NOTE:
When removing only intake manifold collector, move electric throttle control actuator without disconnecting water hose.

a. Drain engine coolant.

CAUTION:
Perform this step when engine is cold.

b. Disconnect water hoses from electric throttle control actuator. When engine coolant is not drained from radiator, attach plug to water hoses to prevent engine coolant leakage.

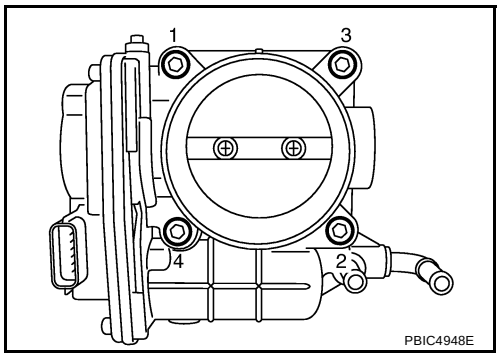
CAUTION:
Do not spill engine coolant on drive belt.

c. Disconnect harness connector.

d. Loosen mounting bolts in reverse order as shown in the figure.

CAUTION:
- **Handle carefully to avoid any shock to electric throttle control actuator.**
- **Do not disassemble.**

NOTE:
- Figure shows electric throttle control actuator (bank1) viewed from the air duct side.
- Viewed from the air duct side, order of loosening mounting bolts of electric throttle control actuator (bank2) is the same as that of the electric throttle control actuator (bank1).

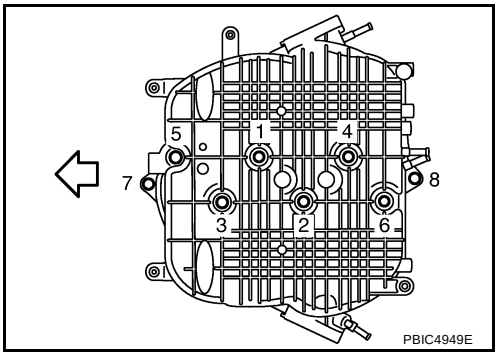


5. Disconnect vacuum hose, PCV hose and EVAP hose from intake manifold collector.
6. Remove EVAP canister purge volume control solenoid valve and EVAP tube assembly from intake manifold collector.

7. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove intake manifold collector.

⇦ : Engine front

CAUTION:
Cover engine openings to avoid entry of foreign materials.



8. Remove PCV hose [between intake manifold collector and rocker cover (right bank)].

INSTALLATION

Note the following, and install in the reverse order of removal.

Intake Manifold Collector

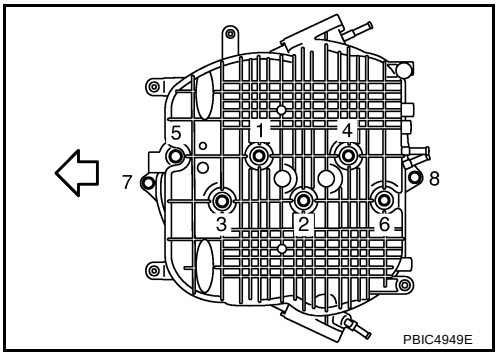
If stud bolts were removed, install them and tighten to the specified torque below.

: 10.8 N·m (1.1 kg-m, 8 ft-lb)

- Tighten mounting bolts in numerical order as shown in the figure.

⇦ : Engine front

NOTE:
Tighten mounting bolts to secure gasket and intake manifold collector.



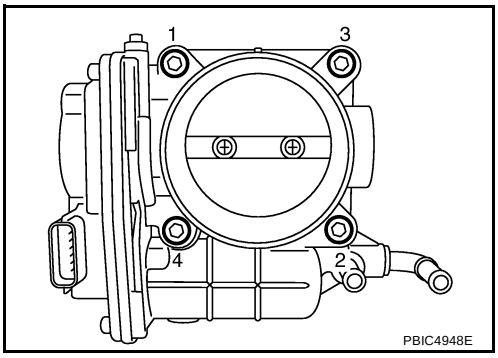
Water Hose

- Insert hose by 27 to 32 mm (1.06 to 1.26 in) from connector end.
- Clamp hose at location of 3 to 7 mm (0.12 to 0.28 in) from hose end.

Electric Throttle Control Actuator

- Install in the reverse order of removal.
- Tighten mounting bolts in numerical order as shown in the figure.

CAUTION:
- **Handle carefully to avoid any shock to electric throttle control actuator.**
- **Do not disassemble.**
- **The figure shows the electric throttle control actuator (bank1) viewed from the air duct side.**
- **Viewed from the air duct side, order of tightening mounting bolts of electric throttle control actuator (bank2) is the same as that of the electric throttle control actuator (bank1).**



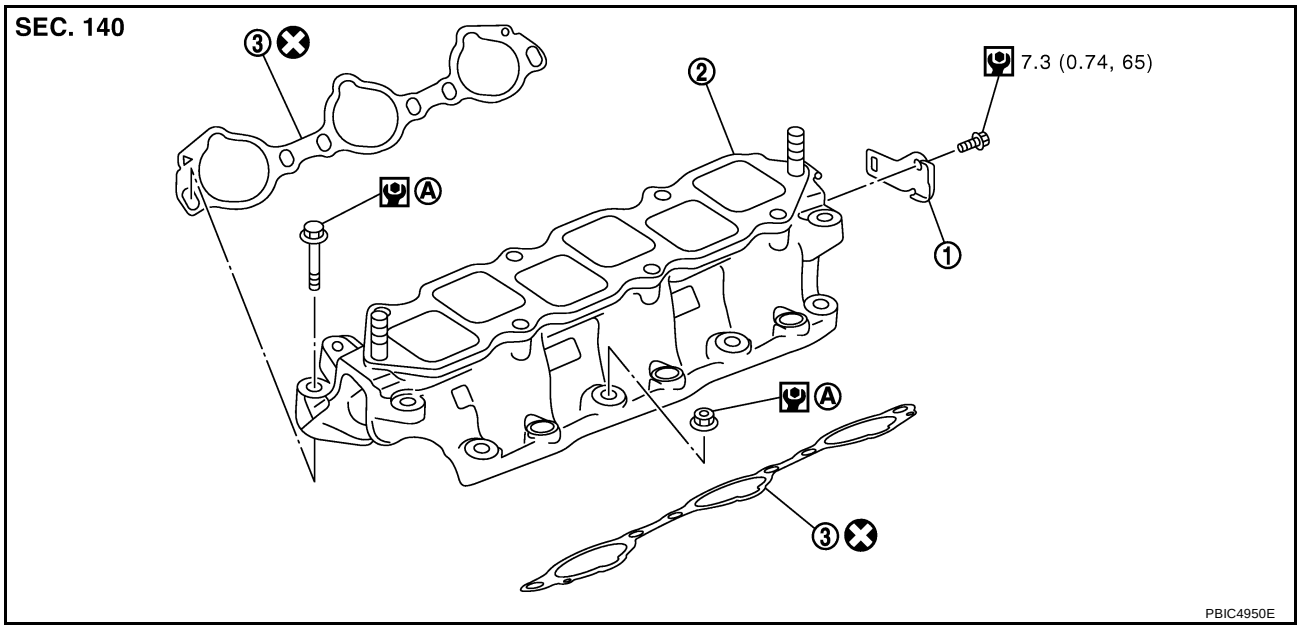
- Perform the “Throttle Valve Closed Position Learning” when harness connector of electric throttle control actuator is disconnected. Refer to EC-77, "Throttle Valve Closed Position Learning" .
- Perform the “Idle Air Volume Learning” and “Throttle Valve Closed Position Learning” when electric throttle control actuator is replaced. Refer to EC-77, "Idle Air Volume Learning" .

INTAKE MANIFOLD

PFP:14003

Removal and Installation

NBS0000J



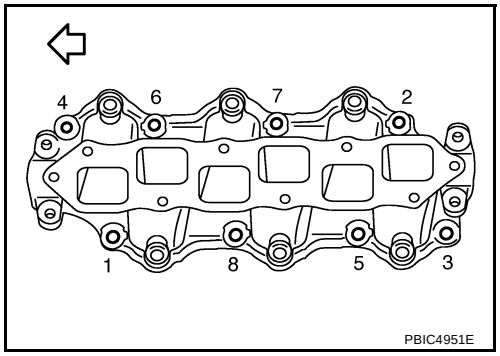
1. Harness bracket
2. Intake manifold
3. Gasket

A. Refer to EM-21

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
3. Remove fuel tube and fuel injector assembly. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
4. Remove harness bracket.
5. Loosen mounting nuts and bolts with power tool in reverse order as shown in the figure to remove intake manifold.



⇦ : Engine front

CAUTION:

- **Cover engine openings to avoid entry of foreign materials.**
- **Put a mark on the intake manifold and the cylinder head with paint before removal because they need installed in the specified direction.**
- **Loosen mounting bolts and nuts from the inside of manifold to the outside.**

6. Remove gaskets.

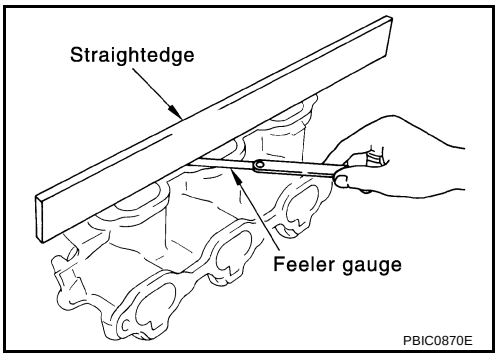
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of the intake manifold mating surface with straightedge and feeler gauge.

  Limit : 0.1 mm (0.004 in)

- If it exceeds the limit, replace intake manifold.



INSTALLATION

Note the following, and install in the reverse order of removal.

Intake Manifold

- If stud bolts were removed, install them and tighten to the specified torque below.

  : 9.8 N·m (1.0 kg-m, 7 ft-lb)

- Tighten all mounting nuts and bolts to the specified torque in two or more steps in numerical order shown in the figure.

  ⇦ : Engine front

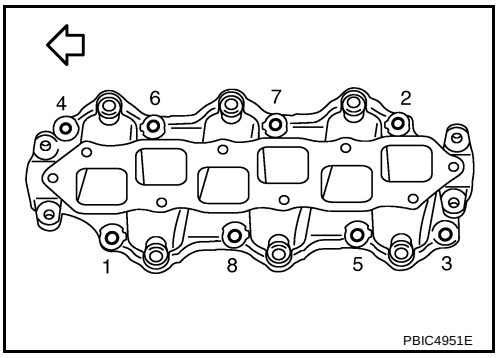
  CAUTION:
  - **Install intake manifold with the marks (put on the intake manifold and the cylinder head before removal) aligned.**
  - **Tighten mounting bolts and nuts from the outside of manifold to the inside.**

  1st step

  : 7.4 N·m (0.75 kg-m, 5 ft-lb)

  2nd step and after

  : 29.0 N·m (3.0 kg-m, 21 ft-lb)

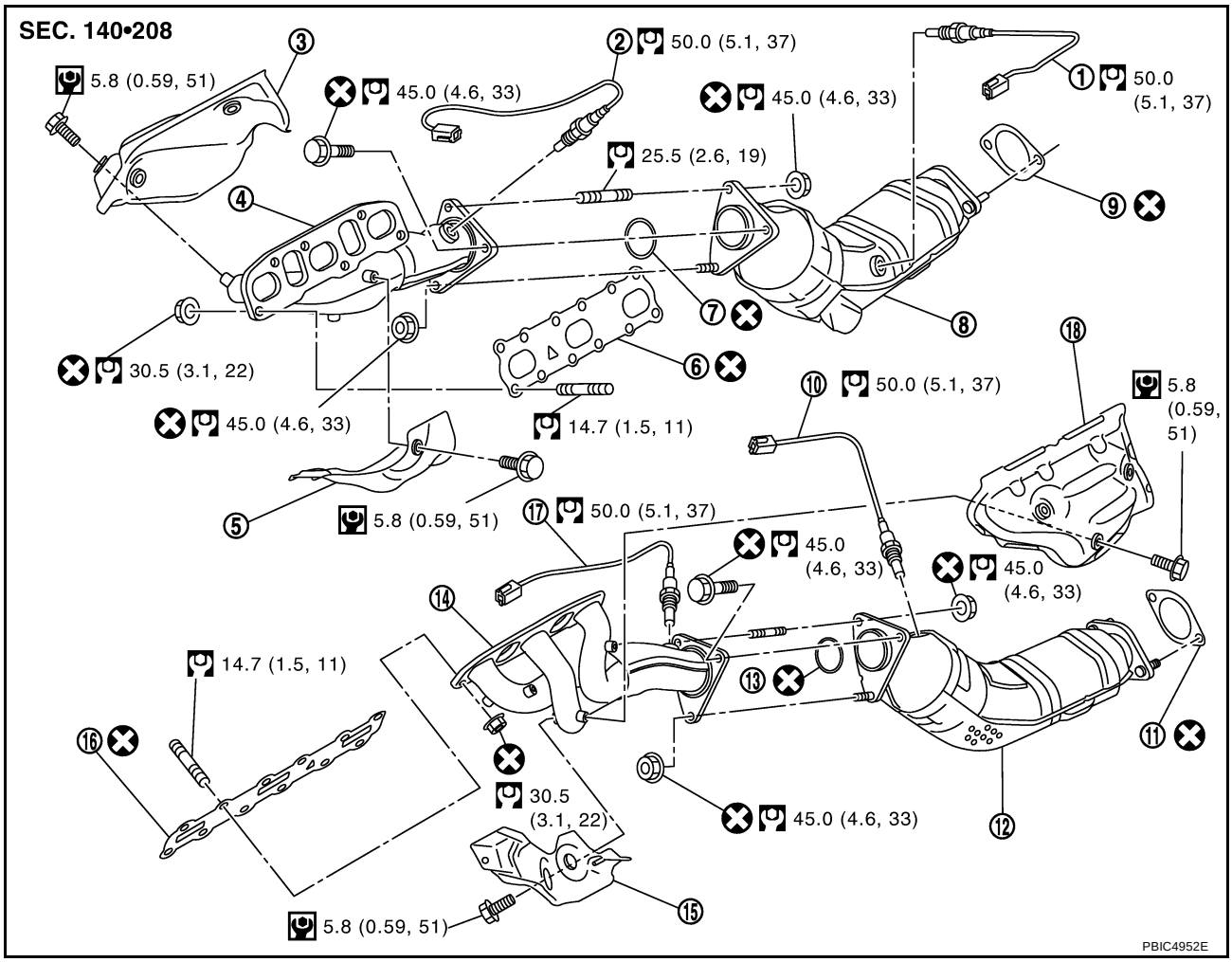


EXHAUST MANIFOLD AND THREE WAY CATALYST

PFP:14004

Removal and Installation

NBS0000K



1.	Heated oxygen sensor (bank 1)	2.	Air fuel ratio sensor (bank 1)	3.	Exhaust manifold cover (upper)
4.	Exhaust manifold (right bank)	5.	Exhaust manifold cover (lower)	6.	Gasket
7.	Ring gasket	8.	Three way catalyst (right bank)	9.	Gasket
10.	Heated oxygen sensor (bank 2)	11.	Gasket	12.	Three way catalyst (left bank)
13.	Ring gasket	14.	Exhaust manifold (left bank)	15.	Exhaust manifold cover (lower)
16.	Gasket	17.	Air fuel ratio sensor (bank 2)	18.	Exhaust manifold cover (upper)

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

WARNING:

Perform the work when the exhaust and cooling system have completely cooled down.

NOTE:

When removing right bank side parts only, step 3, 10 and 11 are unnecessary.

1. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
2. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
3. Drain engine coolant. Refer to CO-10, "Changing Engine Coolant" .

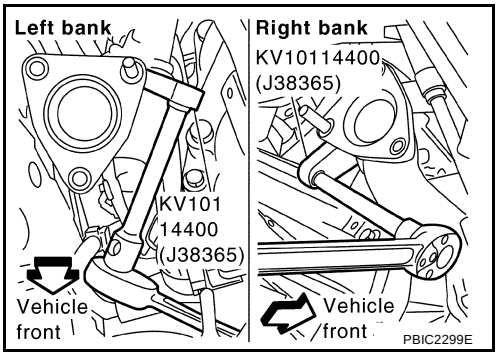
   CAUTION:

   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
4. Remove air cleaner case and air duct. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .

5. Remove undercover with power tool.
6. Disconnect heated oxygen sensor harness connectors.

   CAUTION:
   - **Be careful not to damage heated oxygen sensor 2.**
   - **Discard any heated oxygen sensor 2 which has been dropped onto a hard surface such as a concrete floor. Replace with a new sensor.**
7. Remove exhaust mounting bracket between three way catalysts (right and left bank) and transmission. Refer to EX-3, "EXHAUST SYSTEM" .
8. Remove exhaust front tube and three way catalysts (right and left bank).
9. Disconnect harness connector and remove air fuel ratio sensor 1 on both banks using heated oxygen sensor wrench (SST).
   - Put marks to identify installation positions of each air fuel ratio sensor 1.

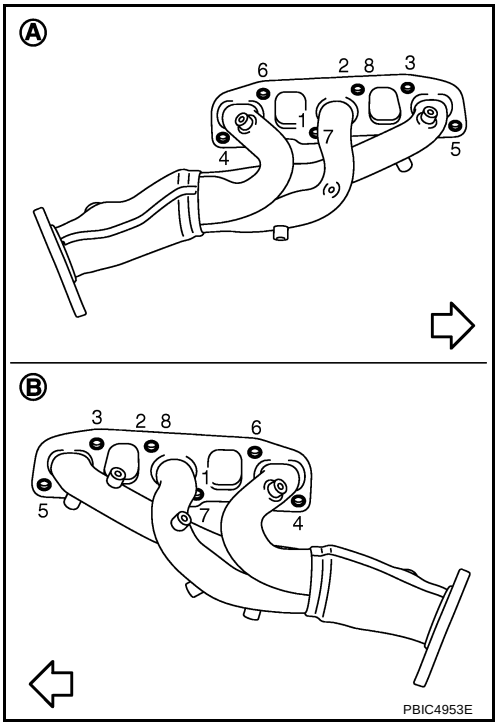
   CAUTION:
   - **Be careful not to damage air fuel ratio sensor 1.**
   - **Discard any air fuel ratio sensor 1 which has been dropped onto a hard surface such as a concrete floor. Replace with a new sensor.**



10. Disconnect steering lower joint at power steering gear assembly side, and release steering lower shaft. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE"
11. Remove water bypass pipe and heater pipe. Refer to CO-28, "WATER OUTLET AND WATER PIPING" .
12. Remove exhaust manifold cover.
13. Loosen mounting nuts in reverse order as shown in the figure to remove exhaust manifold.

    NOTE:
    Disregard the numerical order No. 7 and 8 in removal.

    A : Right bank
    B : Left bank
    ⇦ : Engine front



14. Remove gaskets.

    CAUTION:
    Cover engine openings to avoid entry of foreign materials.

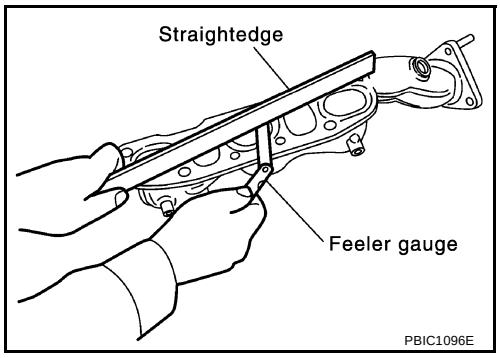
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of the exhaust manifold mating surface with straightedge and feeler gauge.

  Limit : 0.7 mm (0.028 in)

- If it exceeds the limit, replace exhaust manifold.



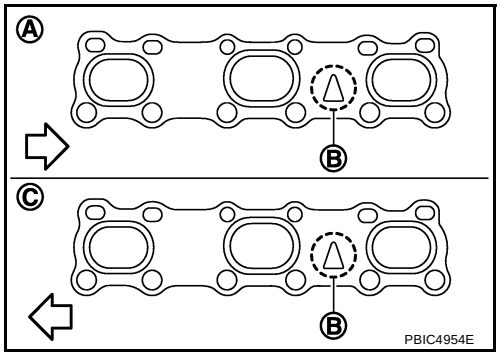
INSTALLATION

Note the following, and install in the reverse order of removal.

Exhaust Manifold Gasket

- Install exhaust manifold gasket in direction shown in the figure.

  A : Right bank
  B : Triangle press
  C : Left bank
  ⇦ : Engine front



Exhaust Manifold

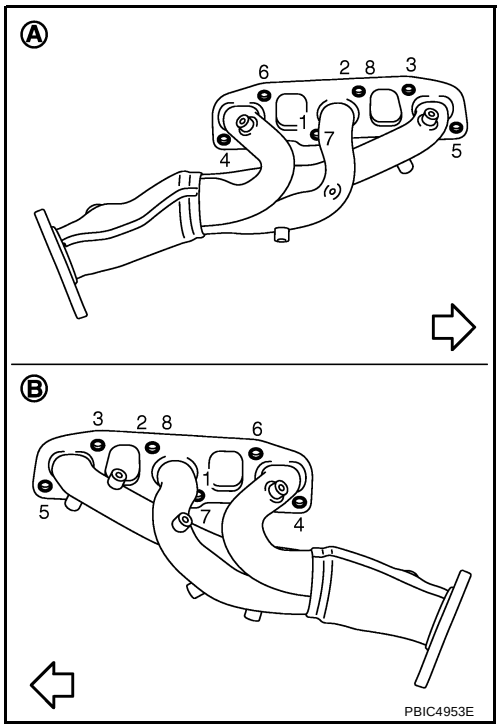
- If stud bolts were removed, install them and tighten to the specified torque below.

  : 14.7 N·m (1.5 kg-m, 11 ft-lb)

- Install mounting exhaust manifold in numerical order as shown in the figure.

  NOTE:
  Tighten nuts No. 1 and 2 in two steps. The numerical order No. 7 and 8 shown second step.

  A : Right bank
  B : Left bank
  ⇦ : Engine front



Air Fuel Ratio Sensor 1 and Heated Oxygen Sensor 2

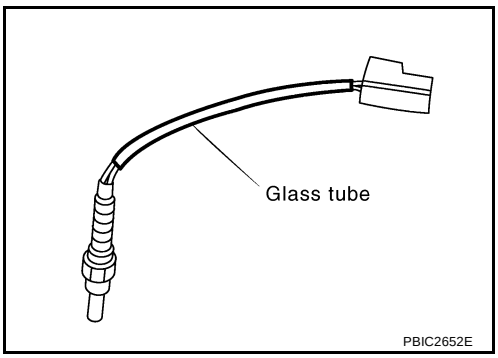
- Install air fuel ratio sensor 1 and heated oxygen sensor 2 in the original position.

- Install referring to the following if the installation positions cannot be identified.

Glass tube color

Air fuel ratio sensor 1*	**: Black**
Heated oxygen sensor 2 (bank 1)	**: White**
Heated oxygen sensor 2 (bank 2)	**: White**

***: Air fuel ratio sensor 1 is the same for both bank 1 and bank 2.**



CAUTION:

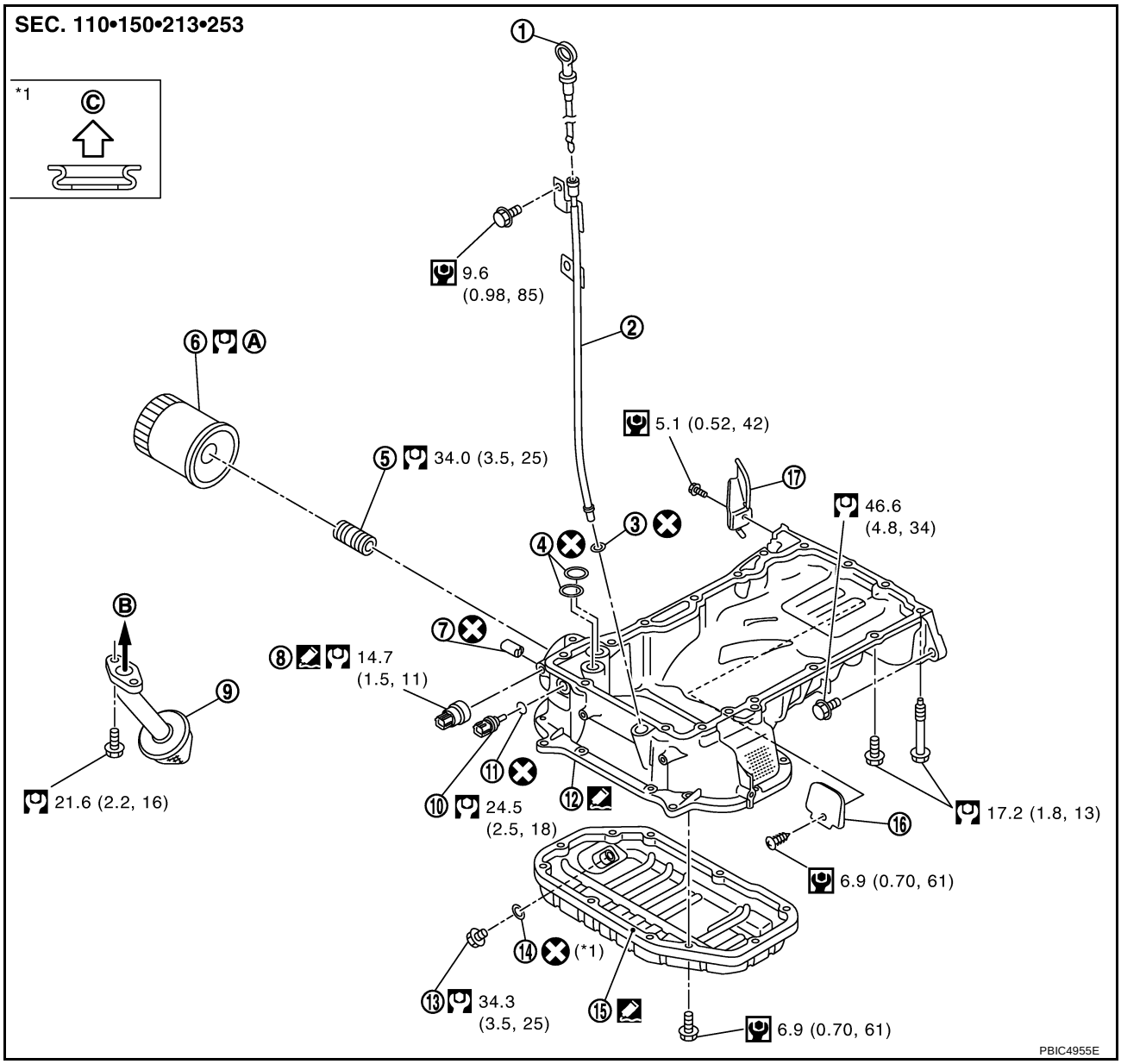
- **Before installing a new air fuel ratio sensor 1 and heated oxygen sensor 2, clean exhaust system threads using oxygen sensor thread cleaner (commercial service tool: J-43897-18 or J43897-12) and apply anti-seize lubricant (commercial service tool).**
- **Do not over torque air fuel ratio sensor 1 and heated oxygen sensor 2. Doing so may cause damage to air fuel ratio sensor 1 and heated oxygen sensor 2, resulting in the "MIL" coming on.**

OIL PAN AND OIL STRAINER

PFP:11110

Removal and Installation

NBS0000L



1.	Oil level gauge	2.	Oil level gauge guide	3.	O-ring
4.	O-ring	5.	Connector bolt	6.	Oil filter
7.	Plug	8.	Oil pressure switch	9.	Oil strainer
10.	Oil temperature sensor	11.	Washer	12.	Oil pan (upper)
13.	Drain plug	14.	Drain plug washer	15.	Oil pan (lower)
16.	Rear cover plate	17.	Rear plate cover		
A.	Refer to LU-9	B.	To oil pump	C.	Oil pan side

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

WARNING:

To avoid the danger of being scalded, do not drain engine oil when engine is hot.

CAUTION:

To remove oil pan (upper), remove engine assembly first.

NOTE:

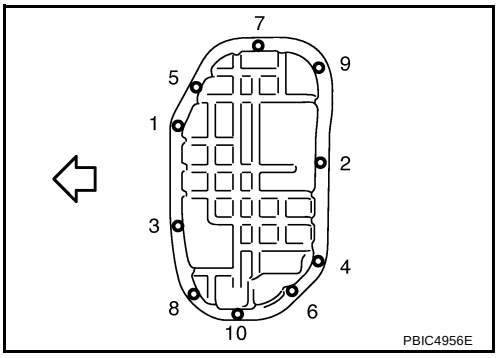
When removing oil pan (lower) only, remove engine assembly is not necessary. Perform step 1, 2 and 10.

1. Drain engine oil. Refer to LU-7, "Changing Engine Oil" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine oil on drive belts.**
2. Remove undercover with power tool.
3. Remove engine assembly from the vehicle, and separate front suspension member and transmission from engine. Refer to EM-101, "ENGINE ASSEMBLY" .
4. Lift the engine with hoist, and mount it onto widely use engine stand. Refer to EM-108, "DISASSEMBLY" .
5. Remove alternator. Refer to SC-20, "CHARGING SYSTEM" .
6. Remove starter motor. Refer to SC-8, "STARTING SYSTEM" .
7. Remove idler pulley and bracket assembly. Refer to EM-53, "TIMING CHAIN" .
8. Remove oil filter, as necessary. Refer to LU-9, "OIL FILTER" .
9. Remove oil temperature sensor, as necessary.
10. Remove oil pan (lower) as follows:

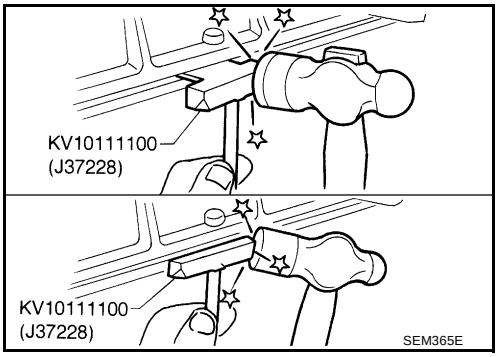
a. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove.

⇦ : Engine front



b. Insert seal cutter (SST) between oil pan (upper) and oil pan (lower).

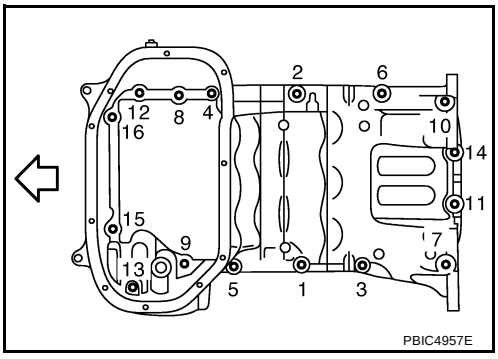
   CAUTION:
   - **Be careful not to damage the mating surfaces.**
   - **Do not insert screwdriver, this will damage the mating surface.**



11. Remove oil strainer.
12. Remove rear cover plate.
13. Loosen mounting bolts with power tool in reverse order as shown in the figure to remove oil pan (upper).
    - Insert seal cutter [SST: KV10111100 (J37228)] between oil pan (upper) and cylinder block. Slide seal cutter by tapping on the side of tool with hammer. Remove oil pan (upper).

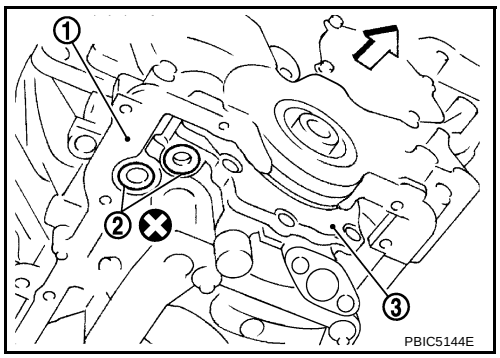
    CAUTION:
    - **Be careful not to damage mating surfaces.**
    - **Do not insert screwdriver, this will damage the mating surface.**

⇦ : Engine front



14. Remove O-rings (2) from bottom of lower cylinder block (1) and oil pump (3).

⇦ : Engine front



INSPECTION AFTER REMOVAL

Clean oil strainer if any object attached.

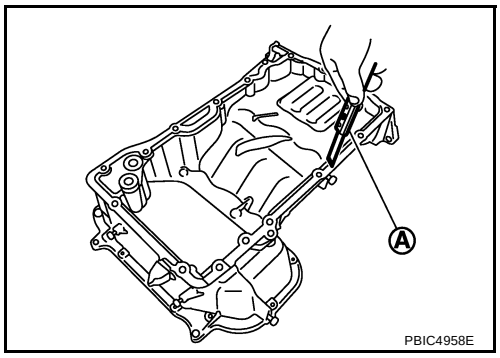
INSTALLATION

1. Install oil pan (upper) as follows:

a. Use scraper to remove old liquid gasket from mating surfaces.

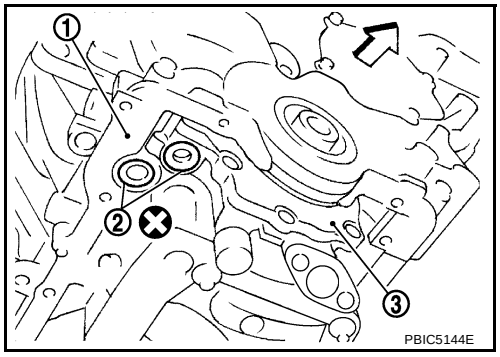
- Also remove the old liquid gasket from mating surface of lower cylinder block.
- Remove old liquid gasket from the bolt holes and threads.

CAUTION:
Do not scratch or damage the mating surfaces when cleaning off old liquid gasket.



b. Install new O-rings (2) on the bottom of lower cylinder block (1) and oil pump (3).

⇦ : Engine front

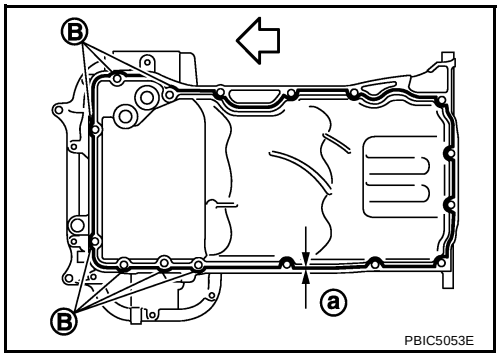


c. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to the lower cylinder block mating surface of oil pan (upper) to a limited portion as shown in the figure. **Use Genuine RTV Silicone Sealant or equivalent. Refer to** **GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"** **.**

a : 4.0 - 5.0 mm (0.157 - 0.197 in)

⇦ : Engine front

CAUTION:
- **For bolt holes (B) (7 locations), apply liquid gasket outside the holes.**
- **Attaching should be done within 5 minutes after coating.**



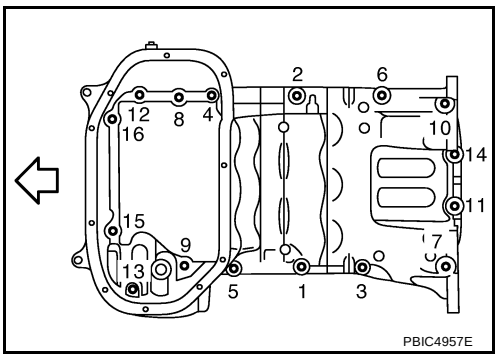
d. Install oil pan (upper).

CAUTION:
Install avoiding misalignment of both oil pan gasket and O-rings.

- Tighten mounting bolts in numerical order as shown in the figure.
- There are two types of mounting bolts. Refer to the following for locating bolts.

⇦ : Engine front

M8 × 92 mm (3.62 in) : 7, 10, 13
M8 × 25 mm (0.98 in) : Except the above



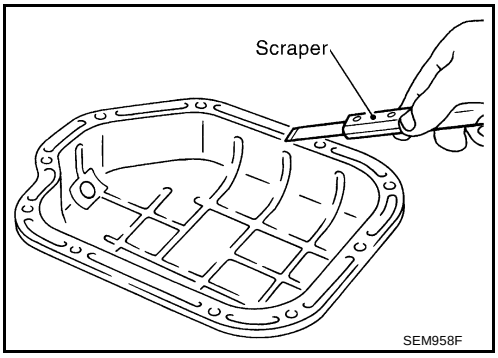
e. Tighten transmission joint bolts. Refer to MT-18, "TRANSMISSION ASSEMBLY" (M/T models) or AT-242, "TRANSMISSION ASSEMBLY" (A/T models).

2. Install oil strainer to oil pump.
- Apply locking sealant to the thread of mounting bolts.
Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

3. Install oil pan (lower) as follows:

a. Use scraper to remove old liquid gasket from mating surfaces.
- Also remove old liquid gasket from mating surface of oil pan (upper).
- Remove old liquid gasket from the bolt holes and thread.

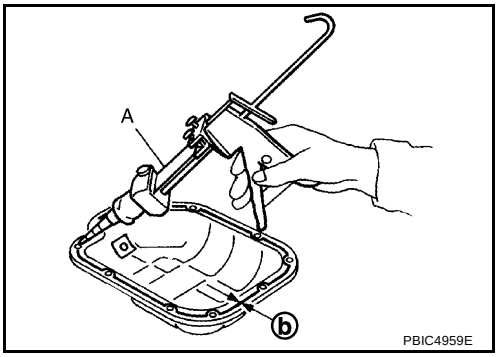
CAUTION:
Do not scratch or damage the mating surfaces when cleaning off old liquid gasket.



b. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] (A) to the oil pan (lower) as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

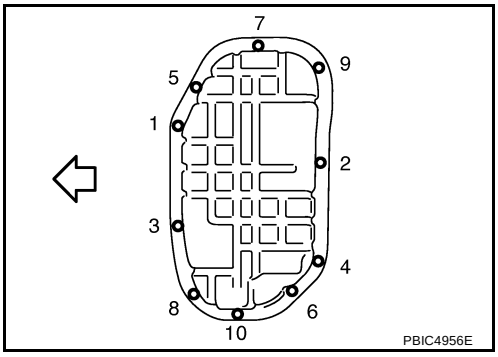
CAUTION:
Attaching should be done within 5 minutes after coating.

b : 4.0 – 5.0 mm (0.157 – 0.197 in)



c. Install oil pan (lower).
- Tighten mounting bolts in numerical order as shown in the figure.

⇦ : Engine front



4. Install oil pan drain plug.
- Refer to the figure of components of former page for installation direction of drain plug washer. Refer to EM-26, "Removal and Installation" .

5. Install in the reverse order of removal after this step.

NOTE:
At least 30 minutes after oil pan is installed, pour engine oil.

INSPECTION AFTER INSTALLATION

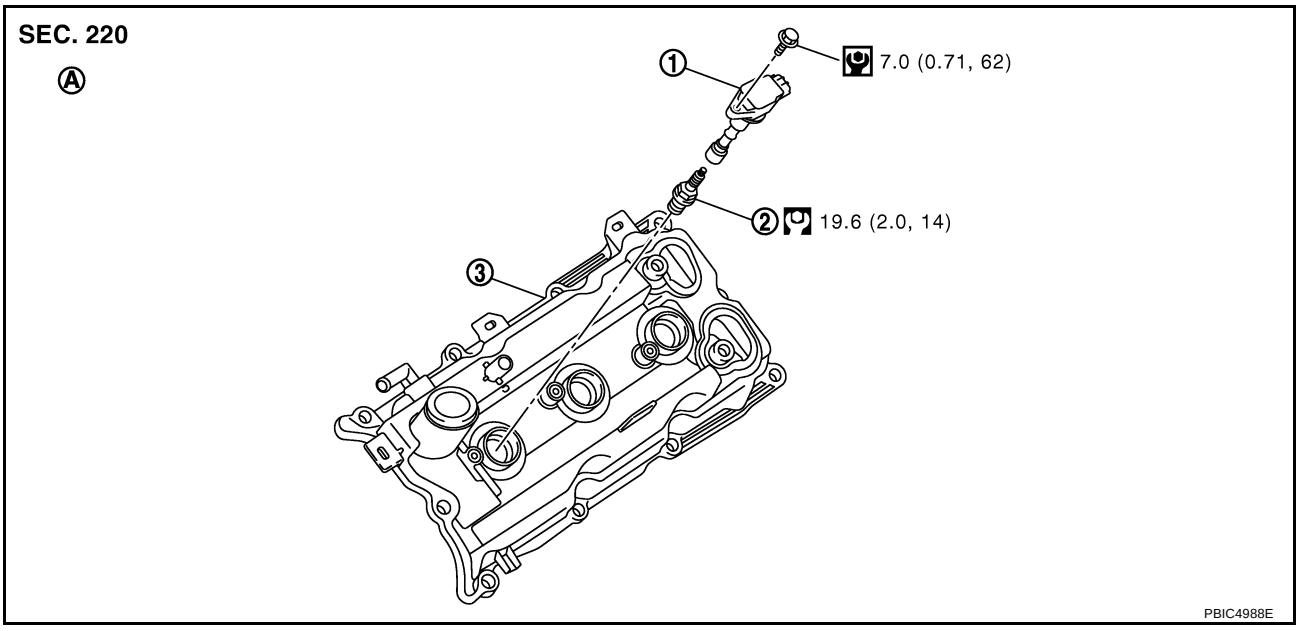
1. Check engine oil level and adjust engine oil. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leak of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check engine oil level again. Refer to LU-6, "ENGINE OIL" .

IGNITION COIL

PFP:22448

Removal and Installation

NBS0000M



1. Ignition coil
2. Spark plug
3. Rocker cover

A. Left bank

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove air cleaner case and air duct. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
3. Move aside harness, harness bracket, and hoses located above ignition coil.
4. Remove electric throttle control actuator. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
5. Disconnect harness connector from ignition coil.
6. Remove ignition coil.

CAUTION:
Do not shock it.

INSTALLATION

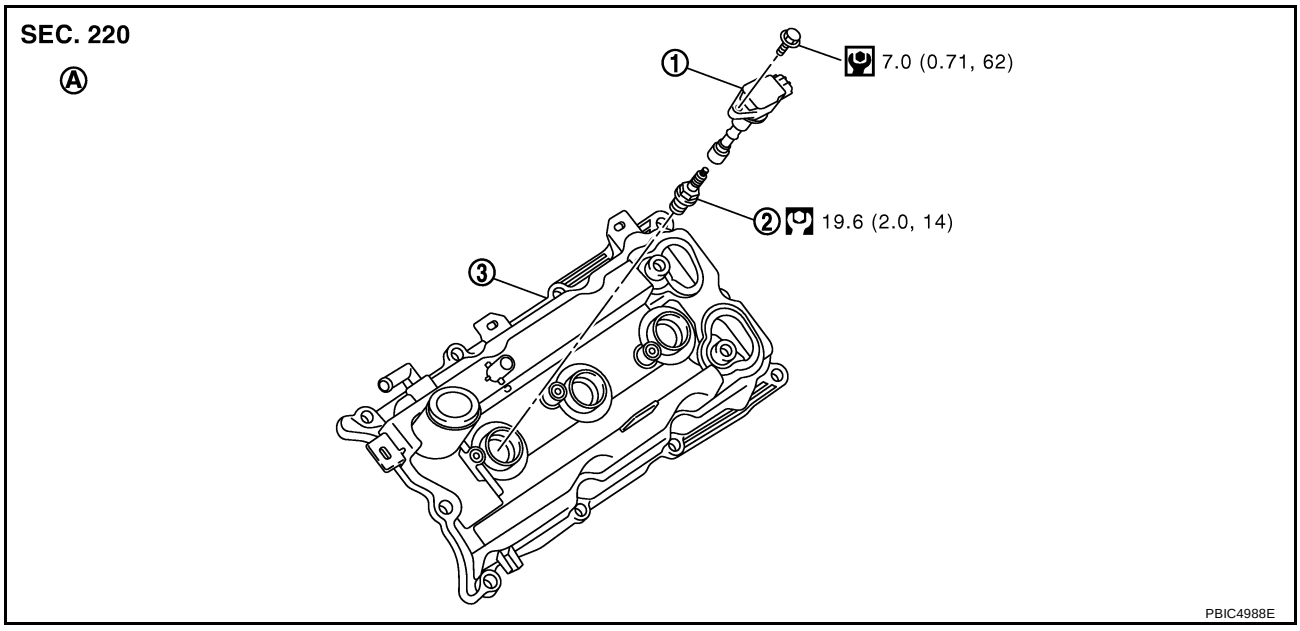
Installation is the reverse order of removal.

SPARK PLUG (IRIDIUM-TIPPED TYPE)

PFP:21478

Removal and Installation

NBS0000N



1. Ignition coil
2. Spark plug
3. Rocker cover

A. Left bank

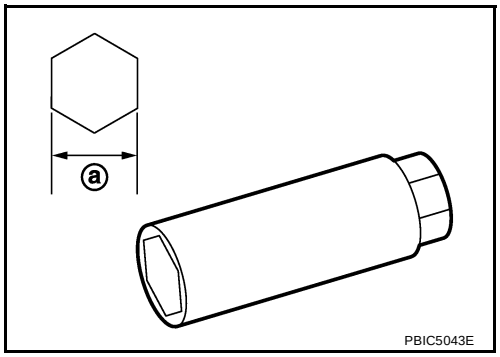
- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove ignition coil. Refer to EM-31, "IGNITION COIL" .
3. Remove spark plug using spark plug wrench (commercial service tool).

   CAUTION:
   Do not drop or shock it.

   a : 14 mm (0.55 in)



INSPECTION AFTER REMOVAL

Make	DENSO
Standard type	FXE22HR-11

Gap (Nominal) : 1.1 mm (0.043 in)

CAUTION:

- **Do not drop or shock spark plug.**

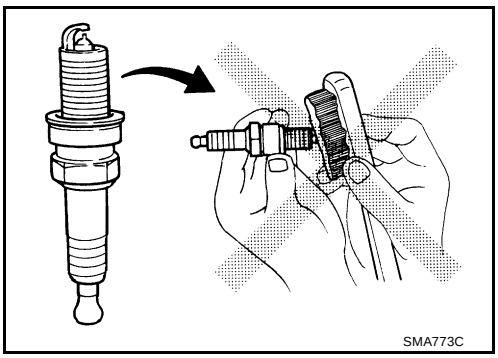
- **Do not use wire brush for cleaning.**
- **If plug tip is covered with carbon, spark plug cleaner may be used.**

  Cleaner air pressure:

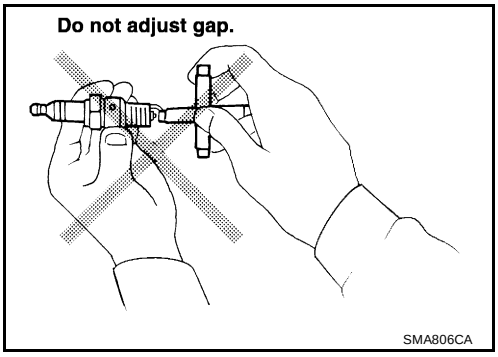
  Less than 588 kPa (6 kg/cm^2 , 85 psi)

  Cleaning time:

  Less than 20 seconds



- **Checking and adjusting plug gap is not required between change intervals.**



INSTALLATION

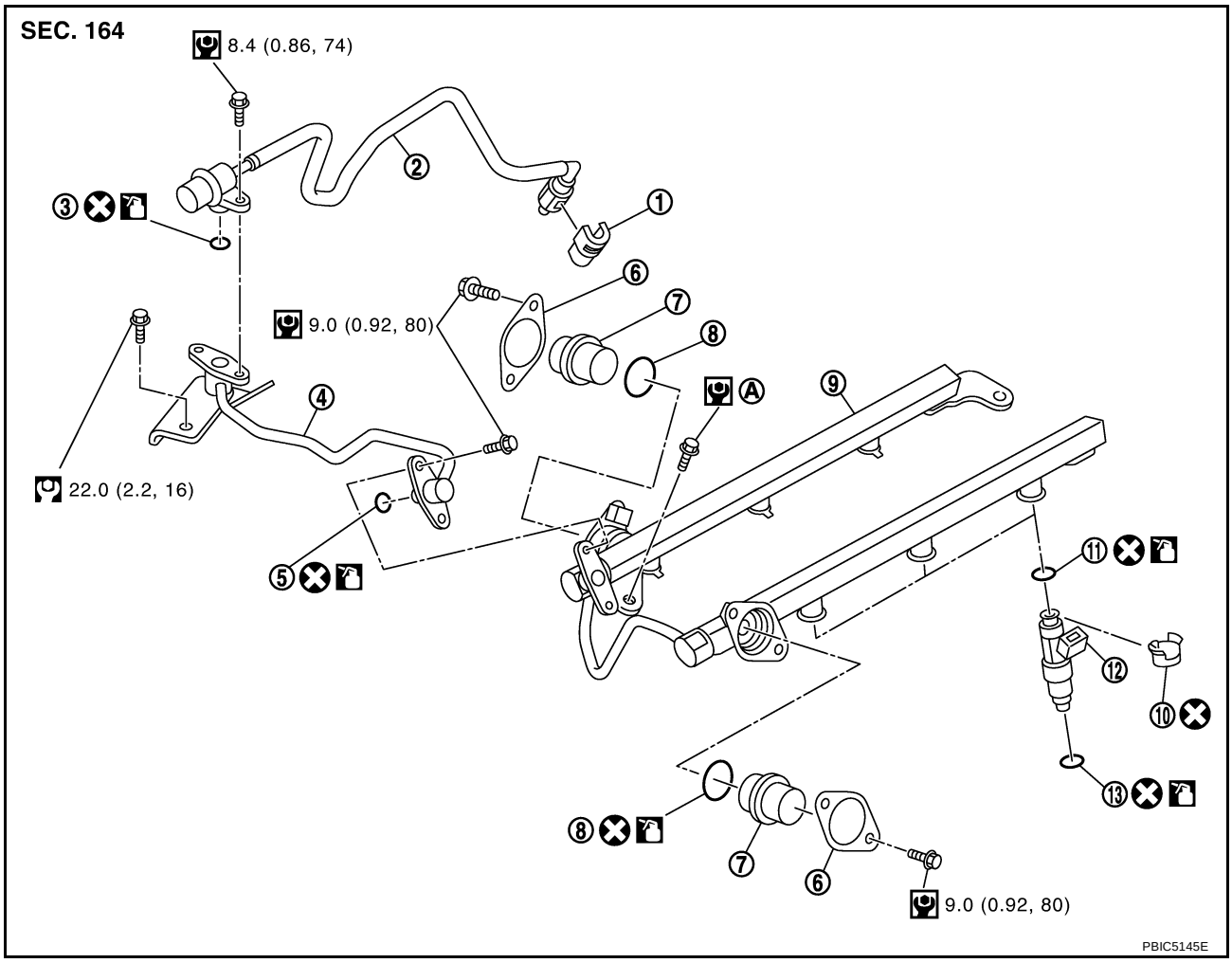
Installation is the reverse order of removal.

FUEL INJECTOR AND FUEL TUBE

PFP:16600

Removal and Installation

NBS0000O



1. Quick connector cap	2. Fuel feed hose (with damper)	3. O-ring
4. Fuel sub tube	5. O-ring	6. Fuel damper cap
7. Fuel damper	8. O-ring	9. Fuel tube
10. Clip	11. O-ring (black)	12. Fuel injector
13. O-ring (green)		
A. Refer to EM-37		

- Refer to GI-11, "Components" for symbol marks in the figure.

CAUTION:
Do not remove or disassemble parts unless instructed as shown in the figure.

REMOVAL

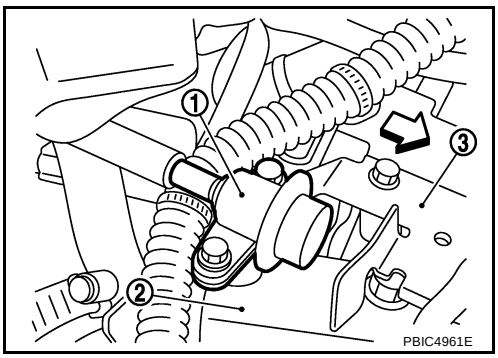
WARNING:

- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from the work area.**
- **To avoid the danger of being scalded, do not drain engine coolant when engine is hot.**

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Drain engine coolant, or when water hoses are disconnected, attach plug to prevent engine coolant leakage. Refer to CO-10, "Changing Engine Coolant" and EM-17, "INTAKE MANIFOLD COLLECTOR" .

CAUTION:
Perform this step when engine is cold.

4. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
5. Remove fuel feed hose (with damper) (1) from fuel sub-tube (2) and harness bracket (3).



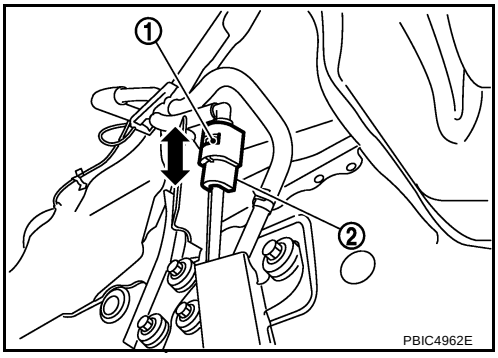
⇦ : Engine front

NOTE:
There is no fuel return route.

CAUTION:
- **While hoses are disconnected, plug them to prevent fuel from draining.**
- **Do not separate fuel damper and fuel feed hose.**

6. When separating fuel feed hose (with damper) and centralized under-floor piping connection, disconnect quick connector as follows:

a. Remove quick connector cap (2) from quick connector connection on right member side.
b. Disconnect fuel feed hose (with damper) (1) from bracket hose clamp.



c. Disconnect quick connector from centralized under-floor piping as follows:

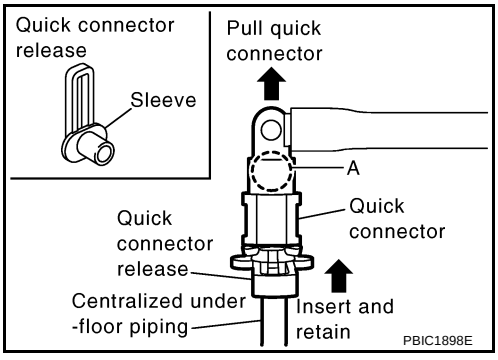
CAUTION:
Disconnect quick connector by using quick connector release [SST: — (J-45488)], not by picking out retainer tabs.

i. With the sleeve side of quick connector release facing quick connector, install quick connector release onto centralized under-floor piping.

ii. Insert quick connector release into quick connector until sleeve contacts and goes no further. Hold quick connector release on that position.

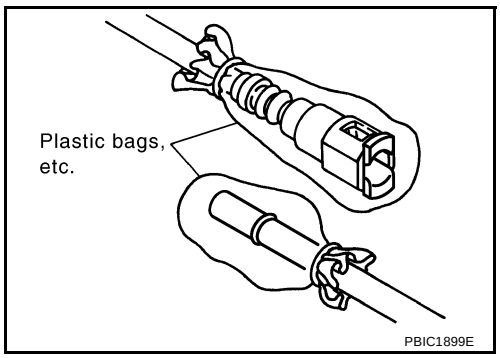
CAUTION:
Inserting quick connector release hard will not disconnect quick connector. Hold quick connector release where it contacts and goes no further.

iii. Draw and pull out quick connector straight from centralized under-floor piping.



CAUTION:
- **Pull quick connector holding “A” position as shown in the figure.**
- **Do not pull with lateral force applied. O-ring inside quick connector may be damaged.**
- **Prepare container and cloth beforehand as fuel will leak out.**
- **Avoid fire and sparks.**
- **Keep parts away from heat source. Especially, be careful when welding is performed around them.**
- **Do not expose parts to battery electrolyte or other acids.**
- **Do not bend or twist connection between quick connector and fuel feed hose (with damper) during installation/removal.**

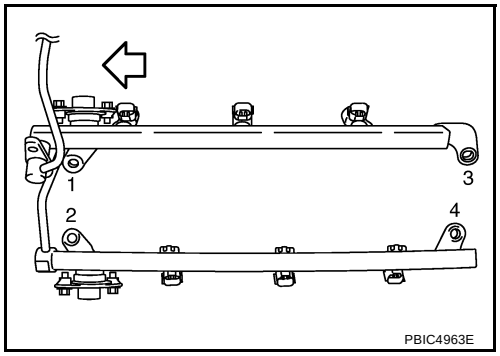
- **To keep clean the connecting portion and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



7. Disconnect harness connector from fuel injector.
8. Loosen mounting bolts in reverse order as shown in the figure, and remove fuel tube and fuel injector assembly.

CAUTION:
Do not tilt it, or remaining fuel in pipes may flow out from pipes.

⇦ : Engine front

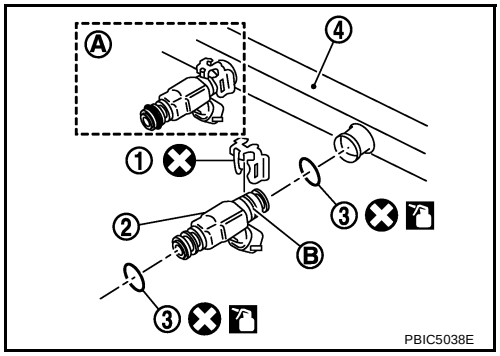


9. Remove fuel injector (2) from fuel tube (4) as follows:

3 : O-ring
A : Installed condition
B : Clip mounting groove

a. Open and remove clip (1).
b. Remove fuel injector (2) from fuel tube (4) by pulling straight.

CAUTION:
- **Be careful with remaining fuel that may go out from fuel tube.**
- **Be careful not to damage injector nozzles during removal.**
- **Do not bump or drop fuel injector.**
- **Do not disassemble fuel injector.**



10. Remove fuel sub-tube and fuel damper, if necessary.

INSTALLATION

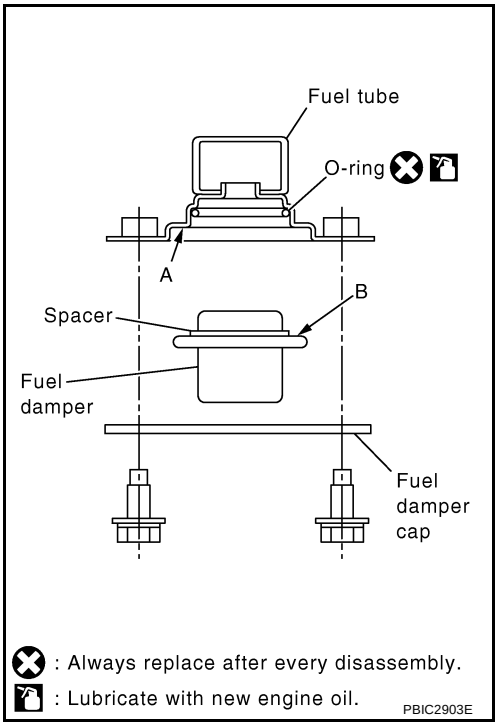
1. Install fuel damper as follows:

a. Install new O-ring to fuel tube as shown.

- When handling new O-ring, be careful of the following caution:

CAUTION:

- **Handle O-ring with bare hands. Do not wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Do not clean O-ring with solvent.**
- **Make sure that O-ring and its mating part are free of foreign material.**
- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, do not insert it quickly into fuel tube.**
- **Insert new O-ring straight into fuel tube. Do not twist it.**



b. Install spacer to fuel damper.

c. Insert fuel damper straight into fuel tube.

CAUTION:

- **Insert straight, making sure that the axis is lined up.**
- **Do not pressure-fit with excessive force.**

Reference value : 130 N (13.3 kg, 29.2 lb)

- Insert fuel damper unit “B” is touching “A” of fuel tube.

d. Tighten bolts evenly in turn.

- After tightening bolts, make sure that there is no gap between fuel damper cap and fuel tube.

2. Install fuel sub-tube.

- When handling new O-ring, be careful of the following caution:

CAUTION:

- **Handle O-ring with bare hands. Do not wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Do not clean O-ring with solvent.**
- **Make sure that O-ring and its mating part are free of foreign material.**
- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, do not insert it quickly into fuel tube.**
- **Insert O-ring straight into fuel tube. Do not decenter or twist it.**

- Insert fuel sub-tube straight into fuel tube.
- Tighten mounting bolts evenly in turn.
- After tightening mounting bolts, make sure that there is no gap between flange and fuel sub-tube.

3. Install O-rings to fuel injector, paying attention to the following.

CAUTION:

- **Upper and lower O-ring are different. Be careful not to confuse them.**

Fuel tube side : Black
Nozzle side : Green

- **Handle O-ring with bare hands. Do not wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Do not clean O-ring with solvent.**
- **Make sure that O-ring and its mating part are free of foreign material.**

- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, do not insert it quickly into fuel tube.**
- **Insert O-ring straight into fuel injector. Do not decenter or twist it.**

4. Install fuel injector to fuel tube as follows:

   2 : O-ring (Black)

   4 : O-ring (Green)

a. Insert clip (3) into clip mounting groove (D) on fuel injector (5).

CAUTION:

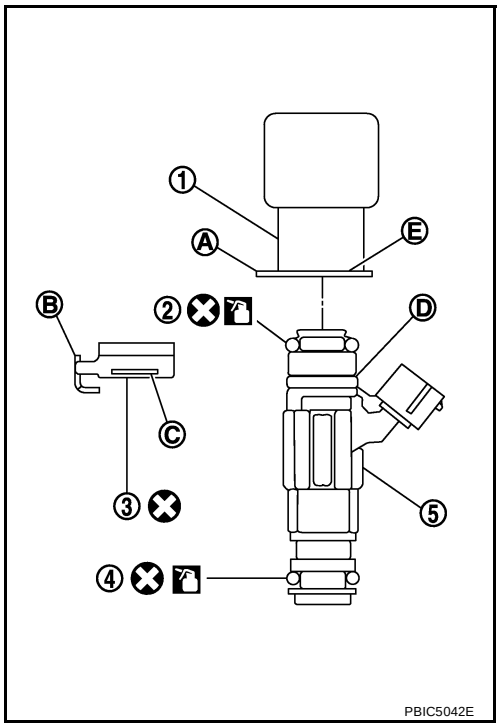
- **Do not reuse clip. Replace it with a new one.**
- **Be careful to keep clip from interfering with O-ring. If interference occurs, replace O-ring.**

b. Insert fuel injector (5) into fuel tube (1) with clip attached.

- Insert it while matching it to the axial center.
- Insert fuel injector (5) so that protrusion (A) of fuel tube matches cutout (B) of clip (3).
- Make sure that fuel tube flange (E) is securely fixed in flange fixing groove (C) on clip (3).

c. Make sure that installation is complete by checking that fuel injector does not rotate or come off.

- Make sure that protrusions of fuel injectors are aligned with cutouts of clips after installation.



5. Install fuel tube and fuel injector assembly to intake manifold.

CAUTION:

Be careful not to let tip of injector nozzle come in contact with other parts.

- Tighten mounting bolts in two steps in numerical order as shown in the figure.

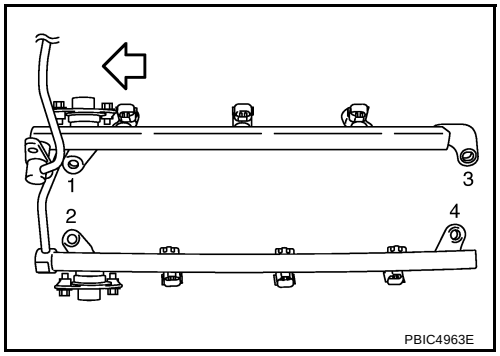
  ⇦ : Engine front

  1st step

  : 10.1 N·m (1.0 kg-m, 7 ft-lb)

  2nd step

  : 23.6 N·m (2.4 kg-m, 17 ft-lb)



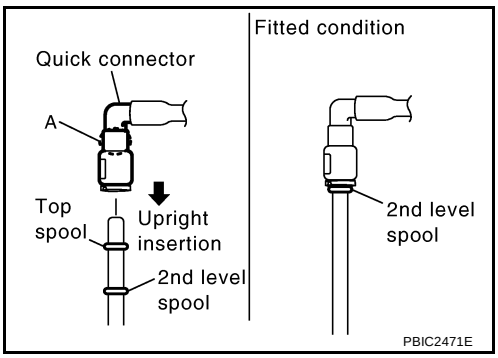
6. Connect fuel injector harness connector.
7. Connect fuel feed hose (with damper).
   - Handling procedure of O-ring is the same as that of fuel damper and fuel sub-tube.
   - Insert fuel damper straight into fuel sub-tube.
   - Tighten mounting bolts evenly in turn.
   - After tightening mounting bolts, make sure that there is no gap between flange and fuel sub-tube.
8. Connect quick connector between fuel feed hose (with damper) and centralized under-floor piping connection as follows:

a. Make sure no foreign substances are deposited in and around centralized under-floor piping and quick connector, and no damage on them.

b. Thinly apply new engine oil around centralized under-floor piping from tip end to spool end.

c. Align center to insert quick connector straightly into centralized under-floor piping.

- Insert quick connector to centralized under-floor piping until top spool is completely inside quick connector, and 2nd level spool exposes right below quick connector.



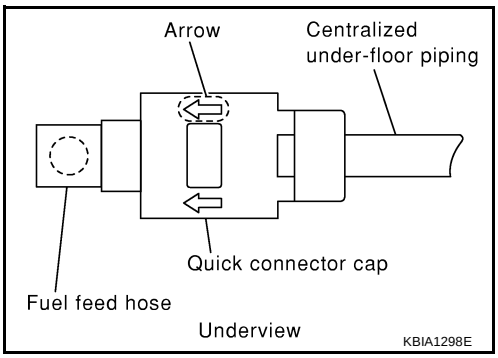
CAUTION:

- **Hold “A” position as shown in the figure when inserting centralized under-floor piping into quick connector.**
- **Carefully align center to avoid inclined insertion to prevent damage to O-ring inside quick connector.**
- **Insert until you hear a “click” sound and actually feel the engagement.**
- **To avoid misidentification of engagement with a similar sound, be sure to perform the next step.**

d. Pull quick connector by hand holding “A” position. Make sure it is completely engaged (connected) so that it does not come out from centralized under-floor piping.

e. Install quick connector cap to quick connector connection.

- Install quick connector cap with arrow on surface facing in direction of quick connector (fuel feed hose side).



CAUTION:

If cap cannot be installed smoothly, quick connector may have not been installed correctly. Check connection again.

9. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Check on Fuel Leakage

1. Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.

   NOTE:
   Use mirrors for checking at points out of clear sight.

2. Start engine. With engine speed increased, check again for fuel leakage at connection points.

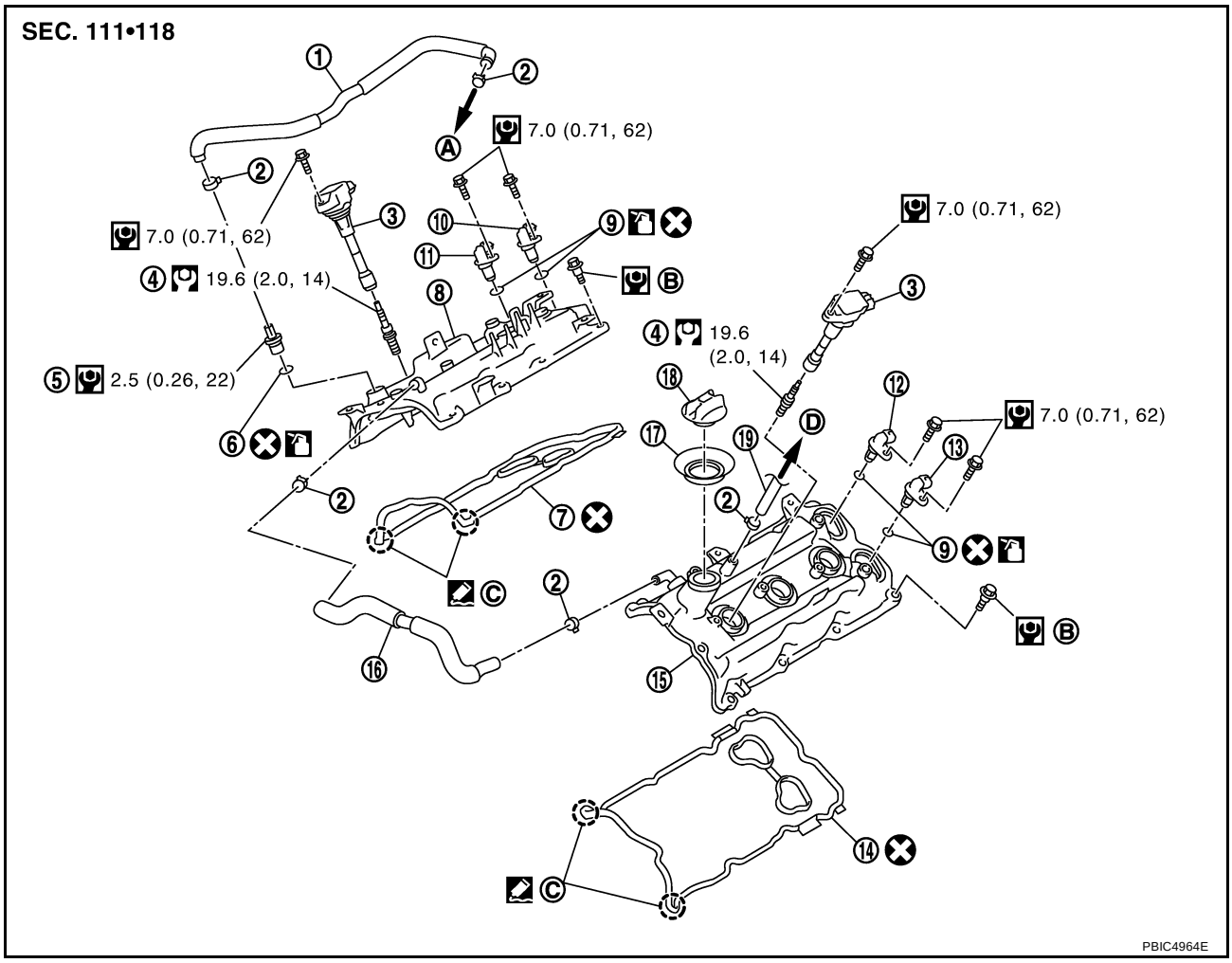
   CAUTION:
   Do not touch engine immediately after stopped, as engine becomes extremely hot.

ROCKER COVER

PFP:13264

Removal and Installation

NBS0000P



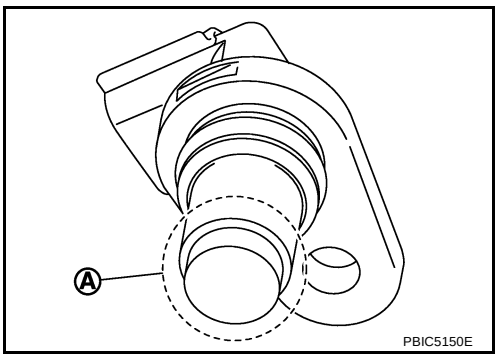
1.	PCV hose	2.	Clamp	3.	Ignition coil
4.	Spark plug	5.	PCV valve	6.	O-ring
7.	Rocker cover gasket (right bank)	8.	Rocker cover (right bank)	9.	O-ring
10.	Camshaft position sensor (bank 1)	11.	Exhaust valve timing control position sensor (bank 1)	12.	Camshaft position sensor (bank 2)
13.	Exhaust valve timing control position sensor (bank 2)	14.	Rocker cover gasket (left bank)	15.	Rocker cover (left bank)
16.	PCV hose	17.	Oil catcher	18.	Oil filler cap
19.	PCV hose				
A.	To intake manifold collector	B.	Refer to EM-40	C.	Camshaft bracket side
D.	To air duct				

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove engine cover. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
3. Separate engine harness removing their brackets from rocker covers.
4. Remove ignition coil. Refer to EM-31, "IGNITION COIL" .

5. Remove camshaft position sensor and exhaust valve timing control position sensor.

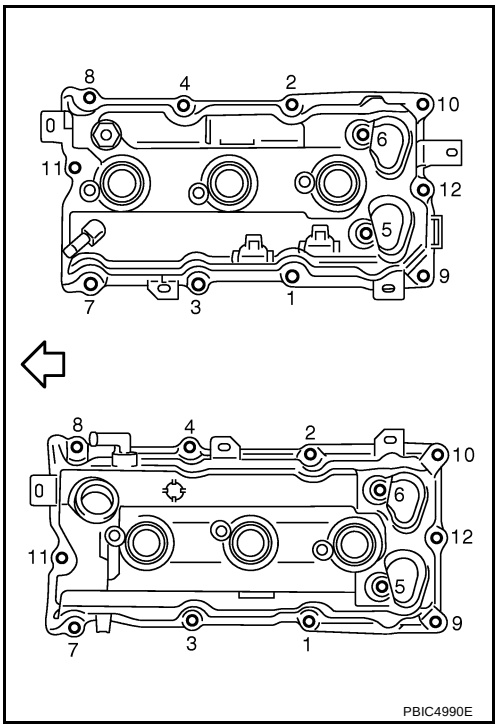


A : Keep off any magnetic materials

CAUTION:

- **Handle carefully to avoid dropping and shocks.**
- **Do not disassemble.**
- **Do not allow metal powder to adhere to magnetic part at sensor tip.**
- **Do not place sensors in a location where they are exceed to magnetism.**

6. Remove PCV hoses from rocker covers.
7. Remove PCV valve and O-ring from rocker cover, if necessary.
8. Remove oil filler cap from rocker cover, if necessary.
9. Loosen mounting bolts with power tool in reverse order as shown in the figure.



⇦ : Engine front

10. Remove rocker cover gaskets from rocker covers.
11. Use scraper to remove all trances of liquid gasket from cylinder head and camshaft bracket (No. 1).

CAUTION:

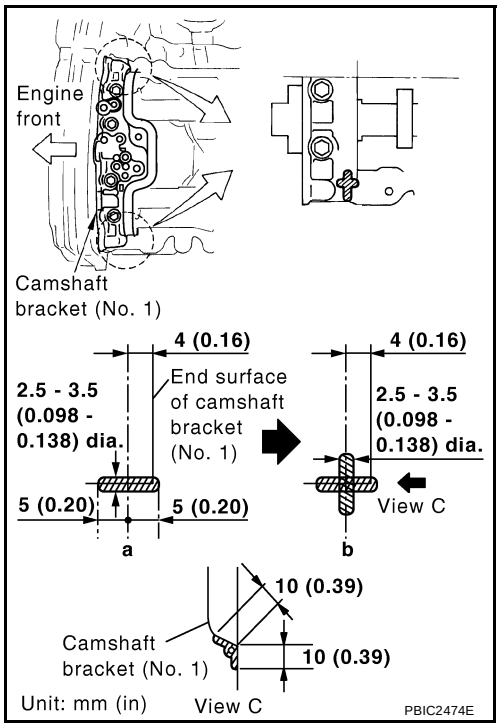
Do not scratch or damage the mating surface when cleaning off old liquid gasket.

INSTALLATION

1. Apply liquid gasket with tube presser [SST: WS39930000 (—)] to joint part among rocker cover, cylinder head and camshaft bracket (No. 1) as follows:
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   NOTE:
   The figure shows an example of left bank side [zoomed in shows camshaft bracket (No. 1)].

a. Refer to the figure “a” to apply liquid gasket to joint part of camshaft bracket (No. 1) and cylinder head.

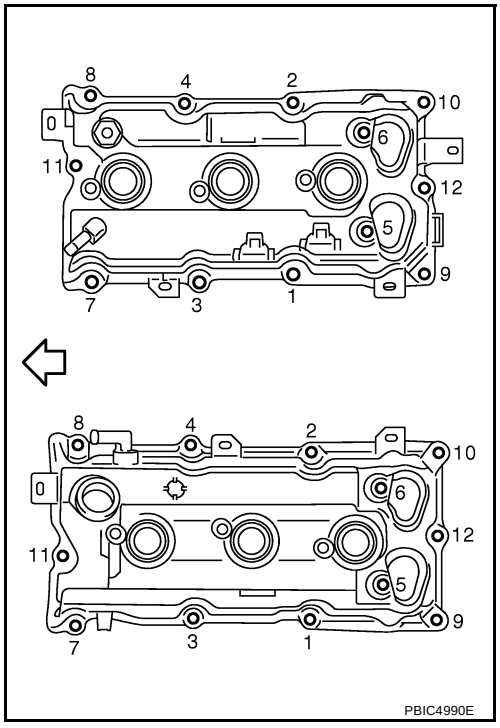
b. Refer to the figure “b” to apply liquid gasket to the figure “a” squarely.



2. Install new rocker cover gasket to rocker cover.
3. Install rocker cover.
   - Check if rocker cover gasket is not dropped from installation groove of rocker cover.
4. Tighten bolts in two steps separately in numerical order as shown in the figure.

   ⇦ : Engine front

   1st step
   : 2.0 N·m (0.2 kg-m, 18 in-lb)
   2nd step
   : 8.3 N·m (0.85 kg-m, 73 in-lb)



5. Install oil filler cap to rocker cover (left bank), if removed.
6. Install new O-ring and PCV valve to rocker cover (right bank), if removed.
7. Install PCV hose.
   - Insert PCV hose by 25 to 30 mm (0.98 to 1.18 in) from connector end.
   - When installing, be careful not to twist or come in contact with other parts.

- Install PCV hose between right and left rocker covers with its identification paint facing upward (right rocker cover side). Refer to component figure in EM-40, "Removal and Installation" .

8. Install in the reverse order of removal after this step.

FRONT TIMING CHAIN CASE

PFP:13599

Removal and Installation

NBS0000Q

NOTE:

- This section describes removal/installation procedure of front timing chain case and timing chain related parts without removing oil pan (upper) on vehicle.
- When oil pan (upper) needs to be removed or installed, or when rear timing chain case is removed or installed, remove oil pans (upper and lower) first. Then remove front timing chain case, timing chain related parts, and rear timing chain case in this order, and install in the reverse order of removal. Refer to EM-53, "TIMING CHAIN" .
- Refer to EM-53, "TIMING CHAIN" for component parts location.

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove undercover with power tool.
3. Release the fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
4. Disconnect the battery cable from the negative terminal.
5. Drain engine oil. Refer to LU-7, "Changing Engine Oil" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine oil on drive belts.**
6. Drain engine coolant from radiator. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
7. Remove radiator cooling fan assembly. Refer to CO-21, "COOLING FAN" .
8. Separate engine harnesses removing their brackets from front timing chain case.
9. Remove drive belts. Refer to EM-12, "DRIVE BELTS" .
10. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
11. Remove harness bracket and fuel sub tube mounting bolt on front timing chain case.
12. Remove oil level gauge and guide.
13. Remove power steering oil pump from bracket with piping connected, and temporarily secure it to aside. Refer to PS-28, "POWER STEERING OIL PUMP" .
14. Remove power steering oil pump bracket. Refer to PS-28, "POWER STEERING OIL PUMP" .
15. Remove alternator. Refer to SC-20, "CHARGING SYSTEM" .
16. Remove water outlet and water piping. Refer to CO-28, "WATER OUTLET AND WATER PIPING" .
17. Remove left and right valve timing control covers with the following procedure.

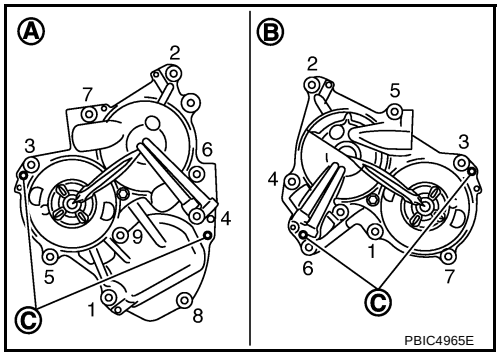
a. Disconnect valve timing control harness connector.

b. Loosen mounting bolts in reverse order as shown in the figure.

   A : Right bank

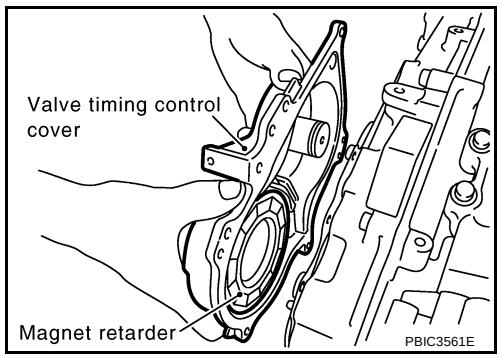
   B : Left bank

   C : Dowel pin hole



c. Shaft is engaged with intake side camshaft sprocket center hole on inside. Pull straight out so as not to tilt until the joint is disengaged.

- The mating surface of magnet retarder may be fitted with the exhaust side camshaft sprocket via the engine oil. Open valve timing control cover carefully.
- If the mating surface of magnet retarder is fitted with the camshaft sprocket, open the cover within the range that the load is not applied to the harness. And then, remove it so as to prevent magnet retarder from dropping.



CAUTION:

- **Be careful not to damage magnet retarder.**
- **When carrying valve timing control cover, face the magnet retarder side up to prevent the cover from falling from magnet retarder.**
- **Do not remove magnet retarder from valve timing control cover. (Disassembly prohibited parts)**

18. Remove rocker covers (right and left banks). Refer to EM-40, "ROCKER COVER" .

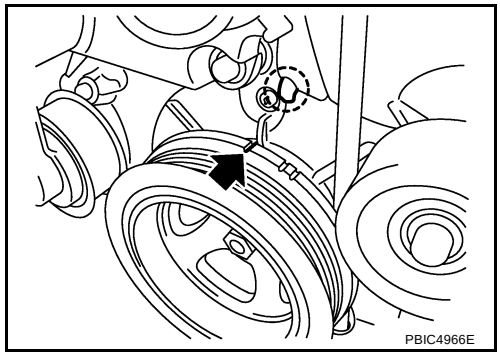
NOTE:
When only timing chain (primary) is removed, rocker cover does not need to be removed.

19. Obtain No. 1 cylinder at TDC of its compression stroke as follows:

NOTE:
When timing chain is not removed/installed, this step is not required.

a. Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.

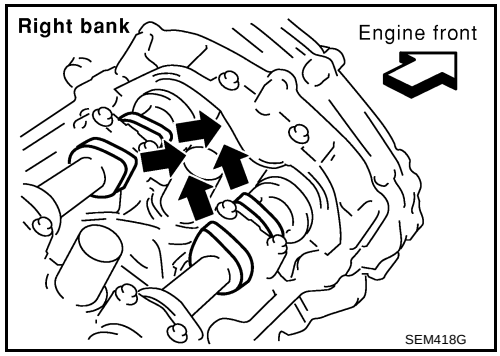
⬅ : Timing mark (grooved without color)



b. Make sure that intake and exhaust cam noses on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.

- If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.

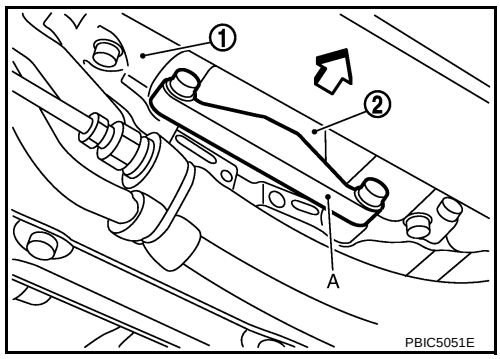
NOTE:
When only timing chain (primary) is removed, rocker cover does not need to be removed. To make sure that No. 1 cylinder is at its compression TDC, remove front timing chain case first. Then check mating marks on camshaft sprockets. Refer to EM-60, "INSTALLATION" .



20. Remove crankshaft pulley as follows:

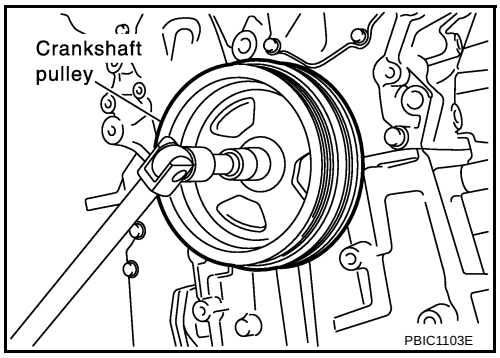
a. Remove rear cover plate and set ring gear stopper [SST: KV10118600 (J-48641)] (A) as shown in the figure.

1 : Oil pan
2 : Fly wheel (M/T models) or drive plate (A/T models)
⇦ : Vehicle front



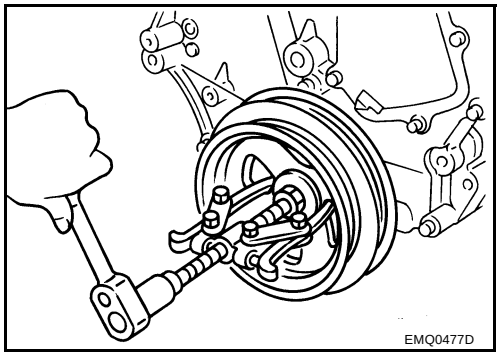
b. Loosen crankshaft pulley bolt and locate bolt seating surface as 10 mm (0.39 in) from its original position.

CAUTION:
Do not remove crankshaft pulley bolt as it will be used as a supporting point for suitable puller.



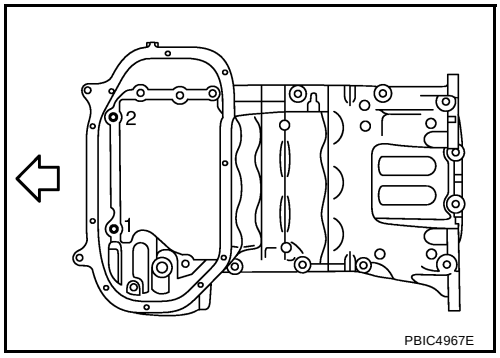
c. Place suitable puller tab on holes of crankshaft pulley, and pull crankshaft pulley through.

CAUTION:
Do not put suitable puller tab on crankshaft pulley periphery, as this will damage internal damper.



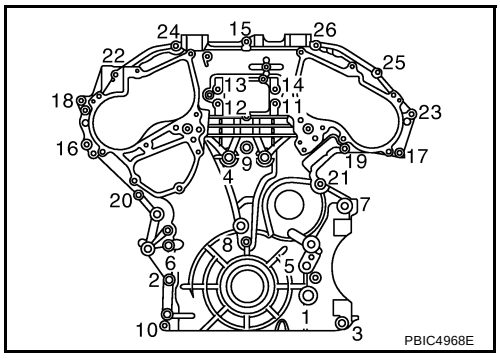
21. Remove oil pan (lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
22. Loosen two mounting bolts in front of oil pan (upper) in reverse order as shown in the figure.

⇦ : Engine front



23. Remove front timing chain case as follows:

a. Loosen mounting bolts in reverse order as shown in the figure.



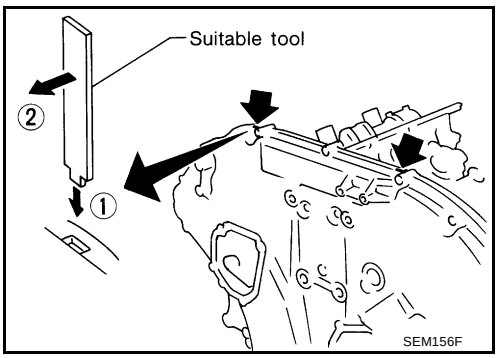
b. Insert suitable tool into the notch at the top of the front timing chain case as shown (1).

c. Pry off case by moving tool as shown (2).

- Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

CAUTION:

- **Do not use screwdriver or something similar.**
- **After removal, handle front timing chain case carefully so it does not tilt, cant, or warp under a load.**

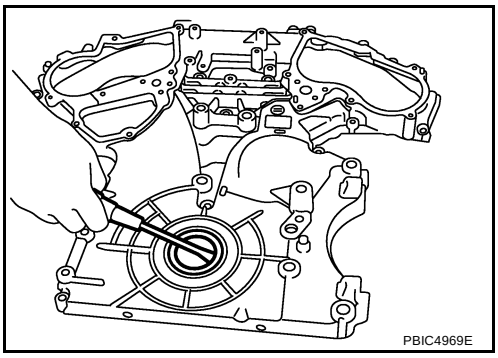


24. Remove front oil seal from front timing chain case using suitable tool.

- Use screwdriver for removal.

CAUTION:

Be careful not to damage front timing chain case.

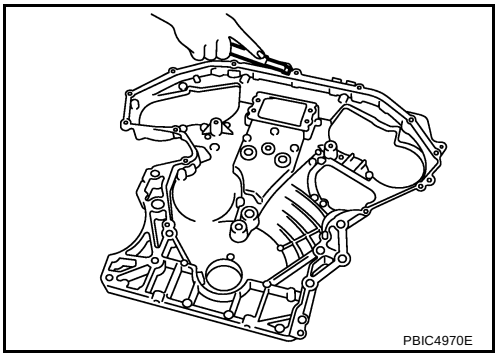


25. Remove timing chain and related parts. Refer to EM-53, "TIMING CHAIN" .

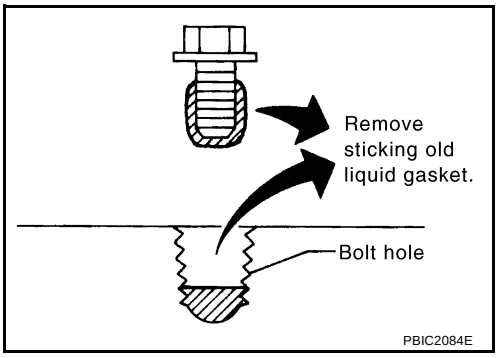
26. Use scraper to remove all traces of old liquid gasket from front and rear timing chain cases and oil pan (upper), and liquid gasket mating surfaces.

CAUTION:

Be careful not to allow gasket fragments to enter oil pan.



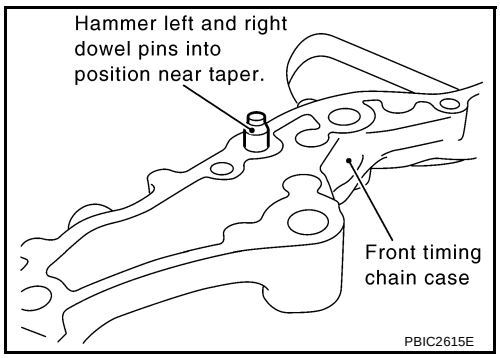
- Remove old liquid gasket from bolt hole and thread.



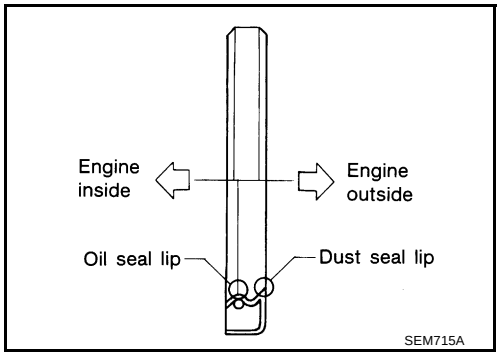
INSTALLATION

1. Install timing chain and related parts. Refer to EM-53, "TIMING CHAIN" .

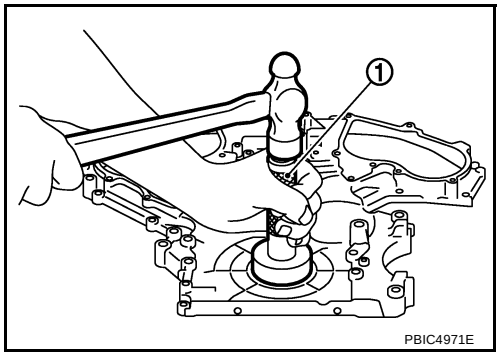
2. Hammer dowel pins (right and left) into front timing chain case up to a point close to taper in order to shorten protrusion length.



3. Install new front oil seal on the front timing chain case.
   - Apply new engine oil to both oil seal lip and dust seal lip.
   - Install it so that each seal lip is oriented as shown in the figure.



   - Using suitable drift [outer diameter: 60 mm (2.36 in)] (A), press-fit oil seal until it becomes flush with front timing chain case end face.
   - Make sure the garter spring is in position and seal lip is not inverted.

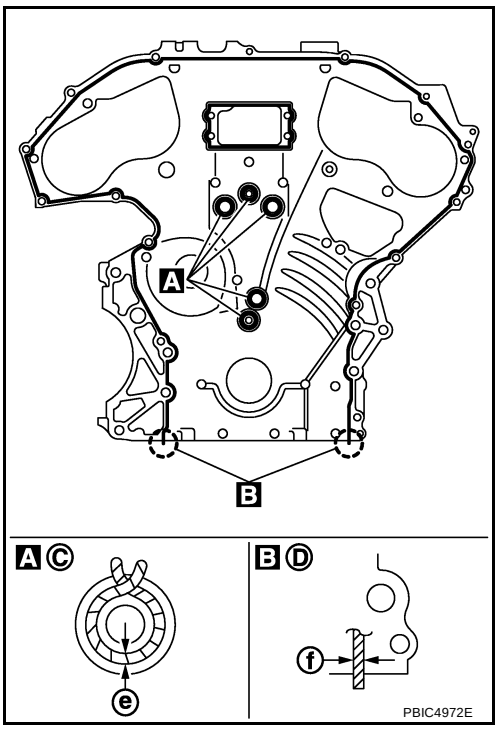


4. Install front timing chain case as follows:

a. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to front timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

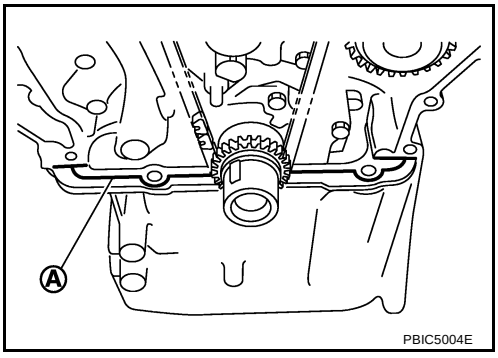
C : Bolt hole
D : Protrusion
e : 2.6 - 3.6 mm (0.102 - 0.142 in)
f : 3.4 - 4.4 mm (0.134 - 0.173 in)

NOTE:
Apply liquid gasket, start and end up application at the portions (A) shown in the figure.



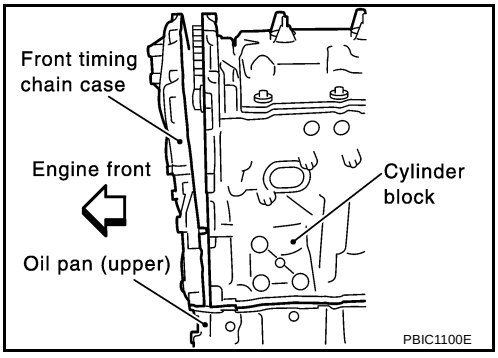
- Apply liquid gasket with tube presser [SST: WS39930000 (—)] to top surface of oil pan (upper) as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

A : 4.0 - 5.0 mm (0.157 - 0.197 in)



b. Assemble front timing chain case as follows:
Fit lower end of front timing chain case tightly onto top face of oil pan (upper). From the fitting point, make entire front timing chain case contact rear timing chain case completely.

CAUTION:
- **Be careful not to damage front oil seal by interference with front end of crankshaft.**
- **Attaching should be done within 5 minutes after liquid gasket application.**



c. Install front timing chain case as to fit its dowel pin hole together dowel pin on rear timing chain case.

d. Tighten mounting bolts to the specified torque in numerical order as shown in the figure.

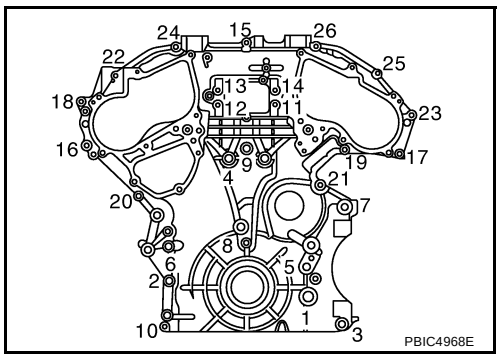
- There are two types of mounting bolts. Refer to the following for locating bolts.

M10 bolts : 1, 2, 3, 4, 5, 6, 7

: 55.0 N·m (5.6 kg-m, 41 ft-lb)

M6 bolts : Except the above

: 12.7 N·m (1.3 kg-m, 9 ft-lb)

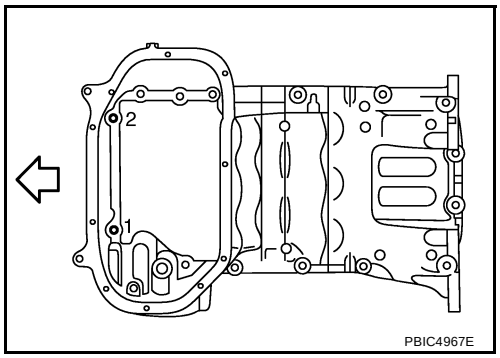


e. After all bolts tightened, retighten them to the specified torque in numerical order as shown in the figure.

5. Install two mounting bolts in front of oil pan (upper) in numerical order as shown in the figure.

: 17.2 N·m (1.8 kg-m, 13 ft-lb)

⇦ : Engine front



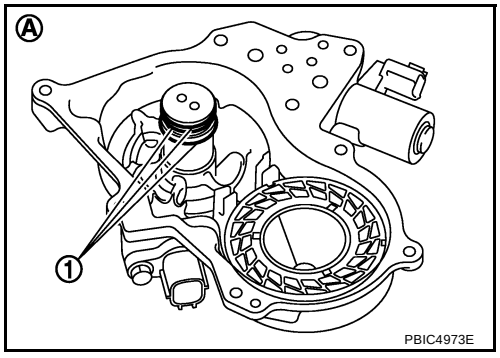
6. Install oil pan (lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
7. Install right and left valve timing control covers as follows.

a. Install new seal rings (1) in shaft grooves.

CAUTION:

When replacing seal ring, replace all rings with new one.

A : Left bank



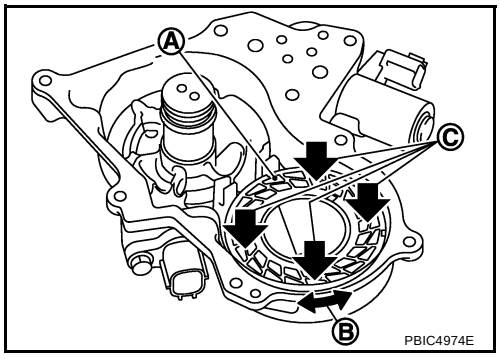
b. To check the joint between dowel pins and dowel pin holes, check the looseness in the axle direction by pushing the mating surface of magnet retarder (A) at several places and the circumferential looseness (between dowel pins and dowel pin holes) by twisting in the circumferential direction.

CAUTION:

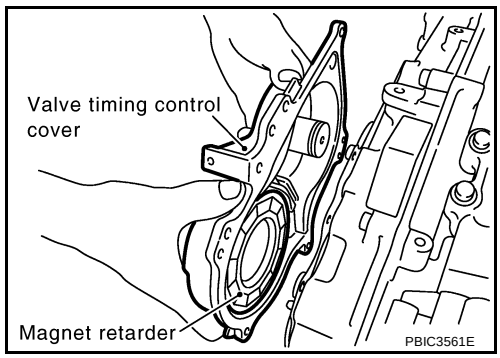
Always perform this procedure when removing because the gap between dowel pins and dowel pin holes may not be caused on purpose.

B : Moves slightly

C : Not shaken



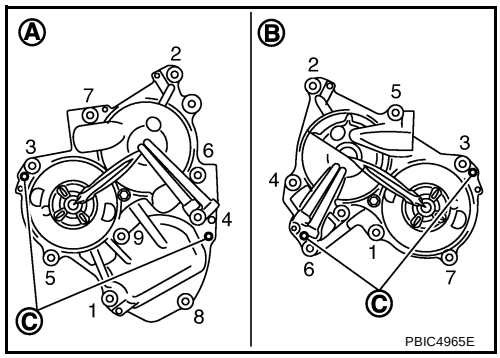
c. Install valve timing control cover with new gasket to front timing chain case.



CAUTION:

- **Do not face the magnet retarder side down to prevent magnet retarder from dropping.**
- **Check the mating surface of magnet retarder and the drum of exhaust side camshaft sprocket for foreign materials.**
- **Align the center of both shaft holes of the shaft and the intake side camshaft sprocket, and then insert them.**
- **Be careful not to drop the seal ring from the shaft groove.**
- **When setting the valve timing control cover in position by hand, if valve timing control cover is not contacting with the front timing chain case, the dowel pin of magnet retarder may not be aligned with the dowel pin holes of cover. In this case, return to step "b".**

d. Tighten mounting bolts in numerical order as shown in the figure.



CAUTION:

Completely tighten the mounting bolts with the seat surface of valve timing control cover contacting with front timing chain case.

: 11.3 N·m (1.2 kg-m, 8 ft-lb)

A : Right bank
B : Left bank
C : Dowel pin hole

- After all bolt are tightened, tighten No.1 bolt to the specified torque again.

8. Install crankshaft pulley as follows:

a. Fix crankshaft using ring gear stopper [SST: KV10118600 (J-48641)].

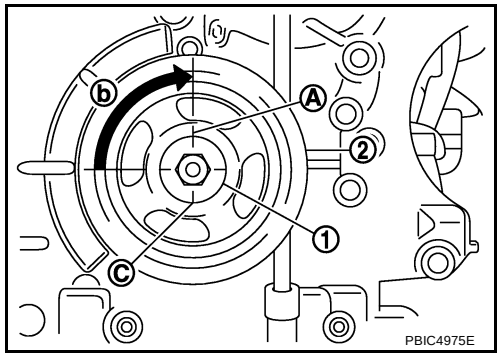
b. Install crankshaft pulley, taking care not to damage front oil seal.

- When press-fitting crankshaft pulley with plastic hammer, tap on its center portion (not circumference).

c. Tighten crankshaft pulley bolt.

: 44.1 N·m (4.5 kg-m, 33 ft-lb)

d. Place a paint mark (A) on crankshaft pulley (2) aligning with the angle mark (C) on crankshaft pulley bolt (1). Tighten the bolt 90 degrees (one marks) (b).



9. Rotate crankshaft pulley in normal direction (clockwise when viewed from front) to confirm it turns smoothly.

10. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluid leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .

- Run engine to check for unusual noise and vibration.

  NOTE:
  If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.
- Warm up engine thoroughly to make sure there is no leakage of exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level

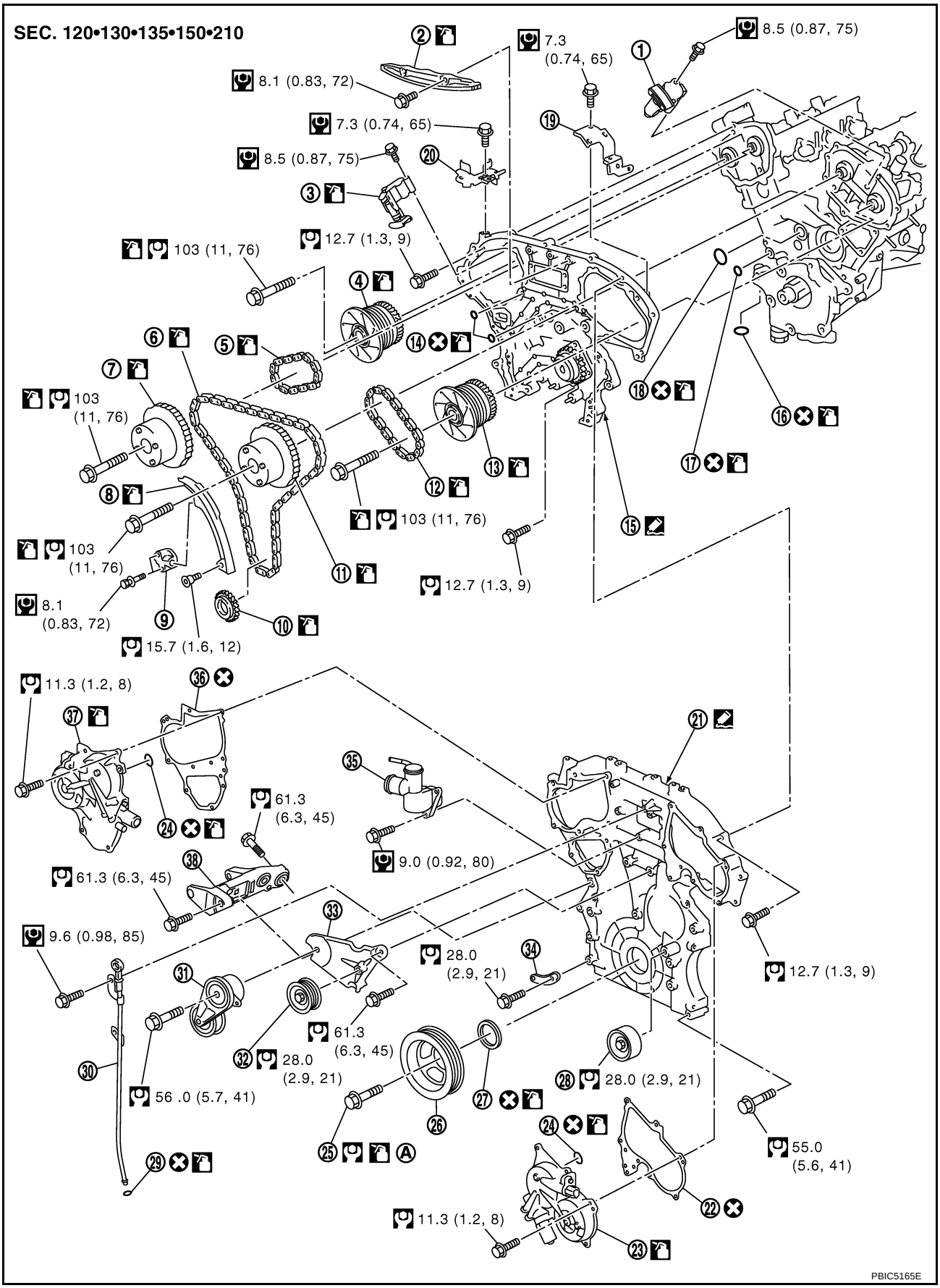
* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

TIMING CHAIN

PFP:13028

Removal and Installation

NBS0000S



1.	Timing chain tensioner (secondary) (left bank)	2.	Internal chain guide	3.	Timing chain tensioner (secondary) (right bank)
4.	Camshaft sprocket (EXH)	5.	Timing chain (secondary)	6.	Timing chain (primary)
7.	Camshaft sprocket (INT)	8.	Slack guide	9.	Timing chain tensioner (primary)
10.	Crankshaft sprocket	11.	Camshaft sprocket (INT)	12.	Timing chain (secondary)
13.	Camshaft sprocket (EXH)	14.	O-ring	15.	Rear timing chain case
16.	O-ring	17.	O-ring	18.	O-ring
19.	Bracket	20.	Bracket	21.	Front timing chain case
22.	Valve timing control cover gasket (LH)	23.	Valve timing control cover (LH)	24.	O-ring
25.	Crankshaft pulley bolt	26.	Crankshaft pulley	27.	Front oil seal
28.	Idler pulley	29.	O-ring	30.	Oil level gauge guide
31.	Drive belt auto-tensioner	32.	Idler pulley	33.	Idler pulley bracket
34.	Alternator bracket	35.	Water outlet (front)	36.	Valve timing control cover gasket (RH)
37.	Valve timing control cover (RH)	38.	Power steering oil pump bracket		
A.	Refer to EM-60				

- Refer to GI-11, "Components" for symbol marks in the figure.

NOTE:

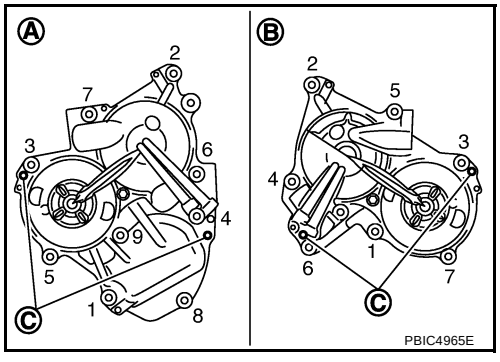
- This section describes procedures for removing/installing front timing chain case and timing chain related parts, and rear timing chain case, when oil pan (upper) needs to be removed/installed for engine overhaul, etc.
- To remove/install front timing chain case, timing chain, and its related parts without removing oil pan (upper), refer to EM-44, "FRONT TIMING CHAIN CASE" .

REMOVAL

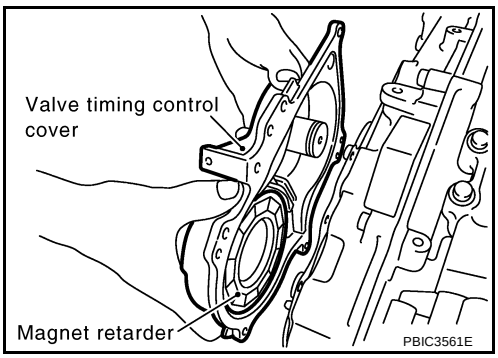
1. Remove engine assembly from the vehicle, and separate front suspension member and transmission from engine. Refer to EM-101, "ENGINE ASSEMBLY" .
2. Lift the engine with hoist and mount it onto widely use engine stand. Refer to EM-108, "DISASSEMBLY" .
3. Remove intake manifold collector. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
4. Remove power steering oil pump bracket. Refer to PS-28, "POWER STEERING OIL PUMP" .
5. Remove alternator. Refer to SC-20, "CHARGING SYSTEM" .
6. Remove water bypass hose, water hose clamp and idler pulley bracket from front timing chain case.
7. Remove left and right valve timing control covers (including magnet retarder and cover) with the following procedure.

a. Loosen mounting bolts in reverse order as shown in the figure.

A : Right bank
B : Left bank
C : Dowel pin hole



b. Shaft is engaged with intake side camshaft sprocket center hole on inside. Pull straight out so as not to tilt until the joint is disengaged.
   - The mating surface of magnet retarder may be fitted with the exhaust side camshaft sprocket via the engine oil. Open valve timing control cover carefully.
   - If the mating surface of magnet retarder is fitted with the camshaft sprocket, open the cover within the range that the load is not applied to the harness. And then, remove it so as to prevent magnet retarder from dropping.

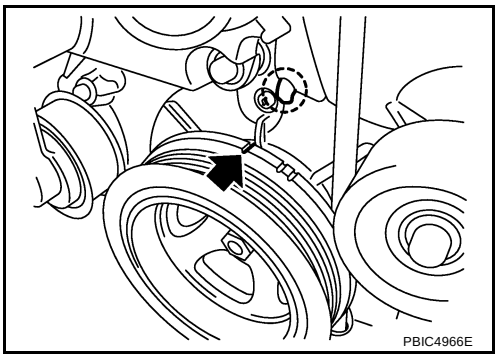


CAUTION:
- **Be careful not to damage magnet retarder.**
- **When carrying valve timing control cover, face the magnet retarder side up to prevent the cover from falling from magnet retarder.**
- **Do not remove magnet retarder from valve timing control cover. (Disassembly prohibited parts)**

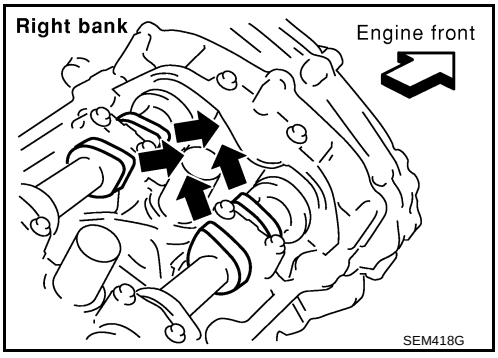
8. Remove rocker covers (right and left banks). Refer to EM-40, "ROCKER COVER" .
9. Obtain No. 1 cylinder at TDC of its compression stroke as follows:

a. Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.

   ⬅ : Timing mark (grooved line without color)



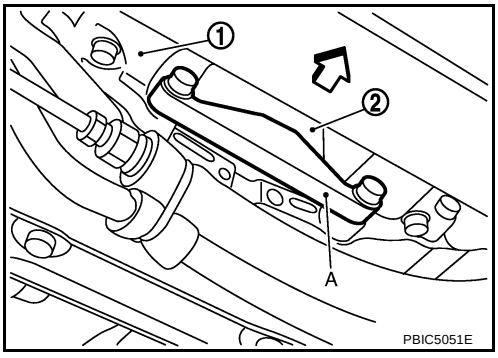
b. Make sure that intake and exhaust cam noses on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.
   - If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.



10. Remove crankshaft pulley as follows:

a. Remove rear cover plate and set ring gear stopper [SST: KV10118600 (J-48641)] (A) as shown in the figure.

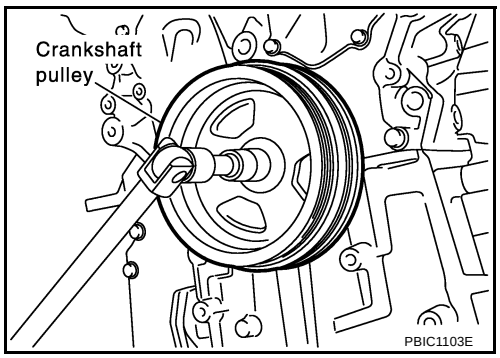
   1 : Oil pan
   2 : Fly wheel (M/T models) or drive plate (A/T models)
   ⇦ : Vehicle front



b. Loosen crankshaft pulley bolt and rotate bolt seating surface at 10 mm (0.39 in) from its original position.

CAUTION:

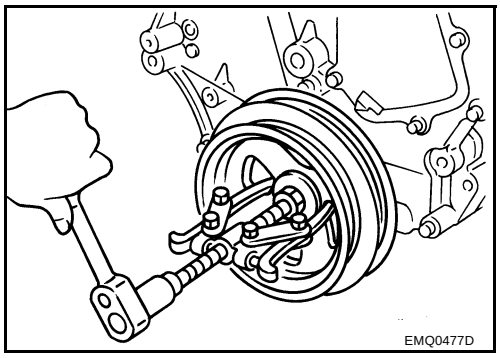
Do not remove crankshaft pulley bolt as it will be used as a supporting point for suitable puller.



c. Place suitable puller tab on holes of crankshaft pulley, and pull crankshaft pulley through.

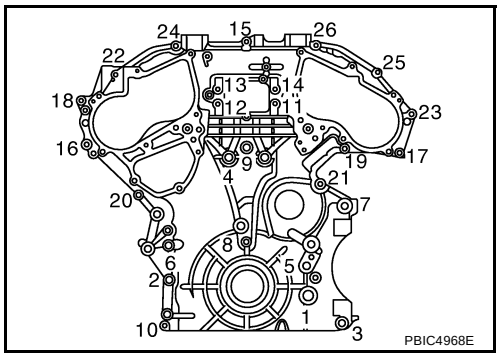
CAUTION:

Do not put suitable puller tab on crankshaft pulley periphery, as this will damage internal damper.



11. Remove oil pans (upper and lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
12. Remove front timing chain case as follows:

a. Loosen mounting bolts in reverse order as shown in the figure.



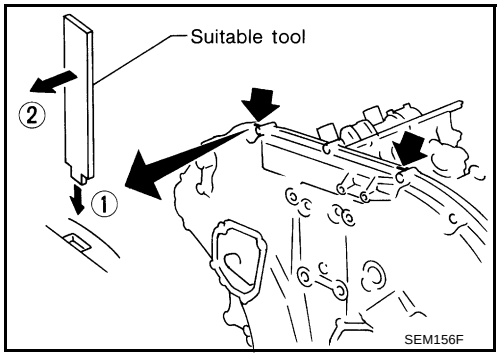
b. Insert suitable tool into the notch at the top of the front timing chain case as shown (1).

c. Pry off case by moving the tool as shown (2).

- Use seal cutter [SST: KV10111100 (J37228)] to cut liquid gasket for removal.

CAUTION:

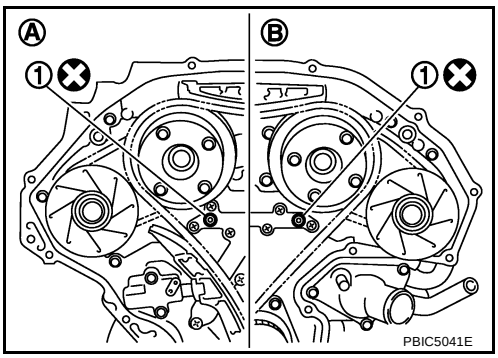
- **Do not use screwdriver or something similar.**
- **After removal, handle front timing chain case carefully so it does not tilt, cant, or warp under a load.**



13. Remove O-ring (1) from rear timing chain case.

A : Right bank

B : Left bank

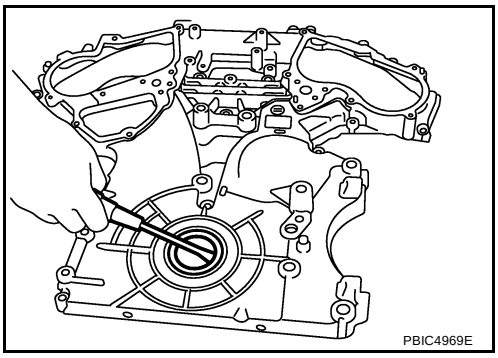


14. Remove front oil seal from front timing chain case using suitable tool.

- Use screwdriver for removal.

CAUTION:

Be careful not to damage front timing chain case.



15. Remove timing chain tensioner (primary) as follows:

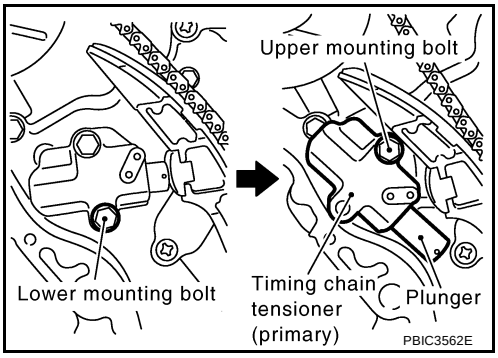
a. Remove lower mounting bolt.

b. Loosen upper mounting bolt slowly, and then turn timing chain tensioner (primary) on the mounting bolt so that plunger is fully expanded.

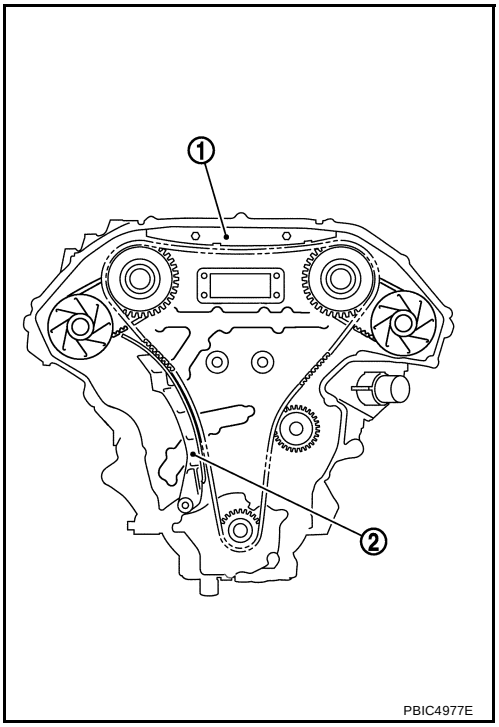
NOTE:

Even if plunger is fully expanded, it is not dropped from the body of timing chain tensioner (primary).

c. Remove upper mounting bolt, and then remove timing chain tensioner (primary).



16. Remove internal chain guide (1) and slack guide (2).



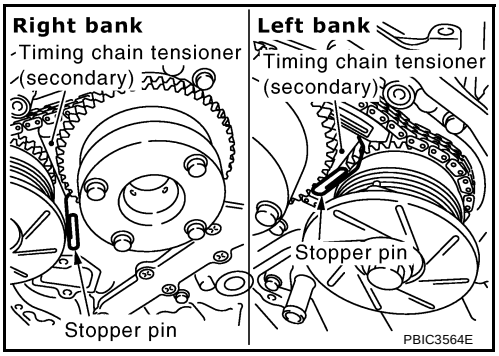
17. Remove timing chain (primary) and crankshaft sprocket.

CAUTION:
After removing timing chain (primary), do not turn crankshaft and camshaft separately, or valves will strike the piston heads.

18. Remove timing chain (secondary) and camshaft sprockets as follows:

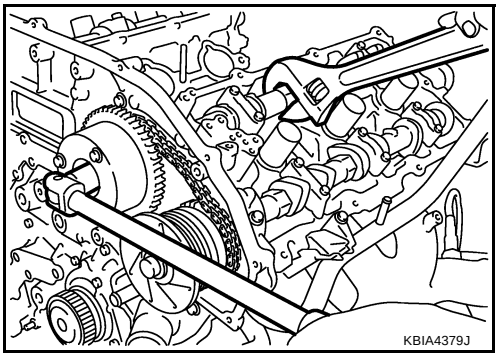
a. Attach suitable stopper pin to the right and left timing chain tensioners (secondary).

NOTE:
- Use approximately 0.5 mm (0.02 in) dia. hard metal pin as a stopper pin.
- For removal of timing chain tensioner (secondary), refer to EM-72, "CAMSHAFT" . [Removing camshaft bracket (No. 1) is required.]



b. Remove intake and exhaust camshaft sprocket bolts.
- Secure the hexagonal portion of camshaft using wrench to loosen mounting bolts.

CAUTION:
Do not loosen mounting bolts with securing anything other than the camshaft hexagonal portion or with tensioning the timing chain.

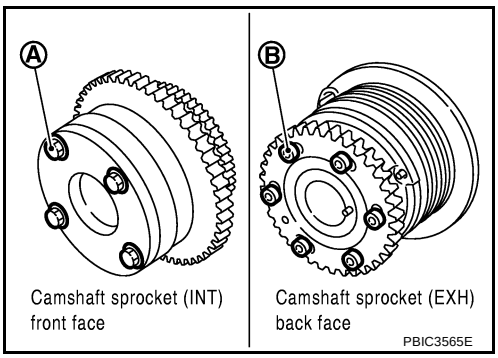


c. Remove timing chain (secondary) together with camshaft sprockets.

CAUTION:
- **Handle carefully to avoid any shock to camshaft sprocket.**

- **Do not disassemble. (Do not loosen bolts “A” and “B” as shown in the figure.)**

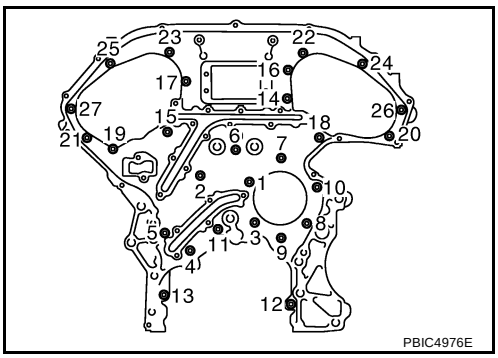
NOTE:
Camshaft sprocket (INT) is two-for-one structure of primary and secondary sprockets.



19. Remove water pump. Refer to CO-23, "WATER PUMP" .
20. Remove rear timing chain case as follows:

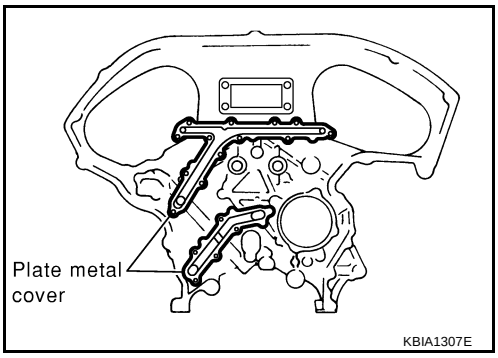
a. Loosen and remove mounting bolts in reverse order as shown in the figure.

b. Cut liquid gasket using seal cutter [SST: KV10111100 (J37228)] and remove rear timing chain case.

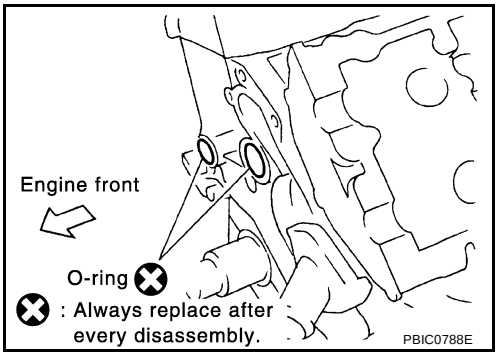


CAUTION:

- **Do not remove plate metal cover of oil passage.**
- **After removal, handle rear timing chain case carefully so it does not tilt, cant, or warp under a load.**



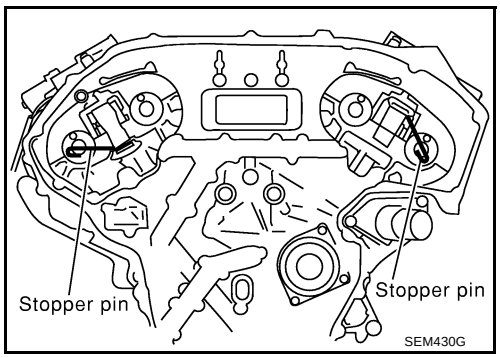
21. Remove O-rings from cylinder block.



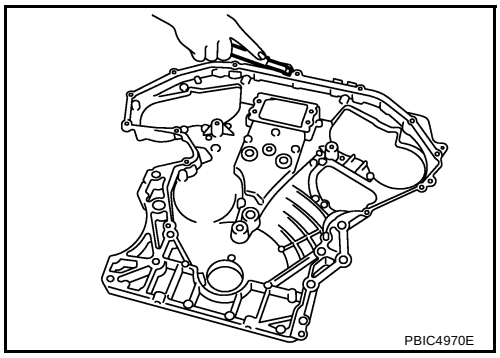
22. Remove timing chain tensioners (secondary) from cylinder head as follows, if necessary.

a. Remove camshaft brackets (No. 1). Refer to EM-72, "REMOVAL" .

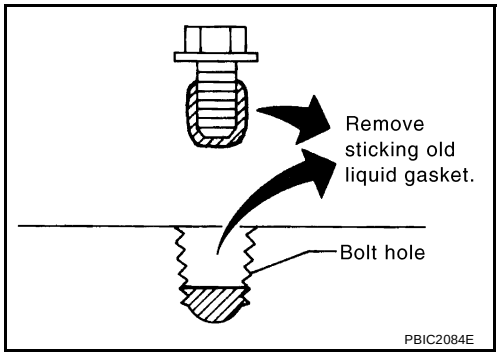
b. Remove timing chain tensioners (secondary) with stopper pin attached.



23. Use scraper to remove all traces of old liquid gasket from front and rear timing chain cases, and opposite mating surfaces.



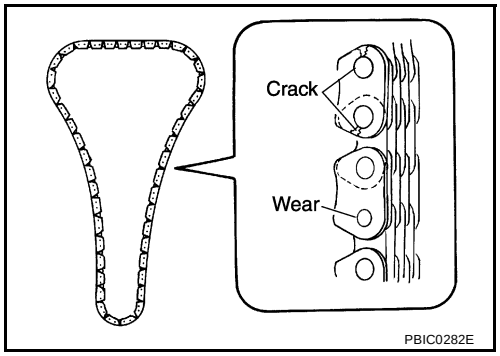
- Remove old liquid gasket from bolt hole and thread.



INSPECTION AFTER REMOVAL

Timing Chain

Check for cracks and any excessive wear at link plates and roller links of timing chain. Replace timing chain as necessary.

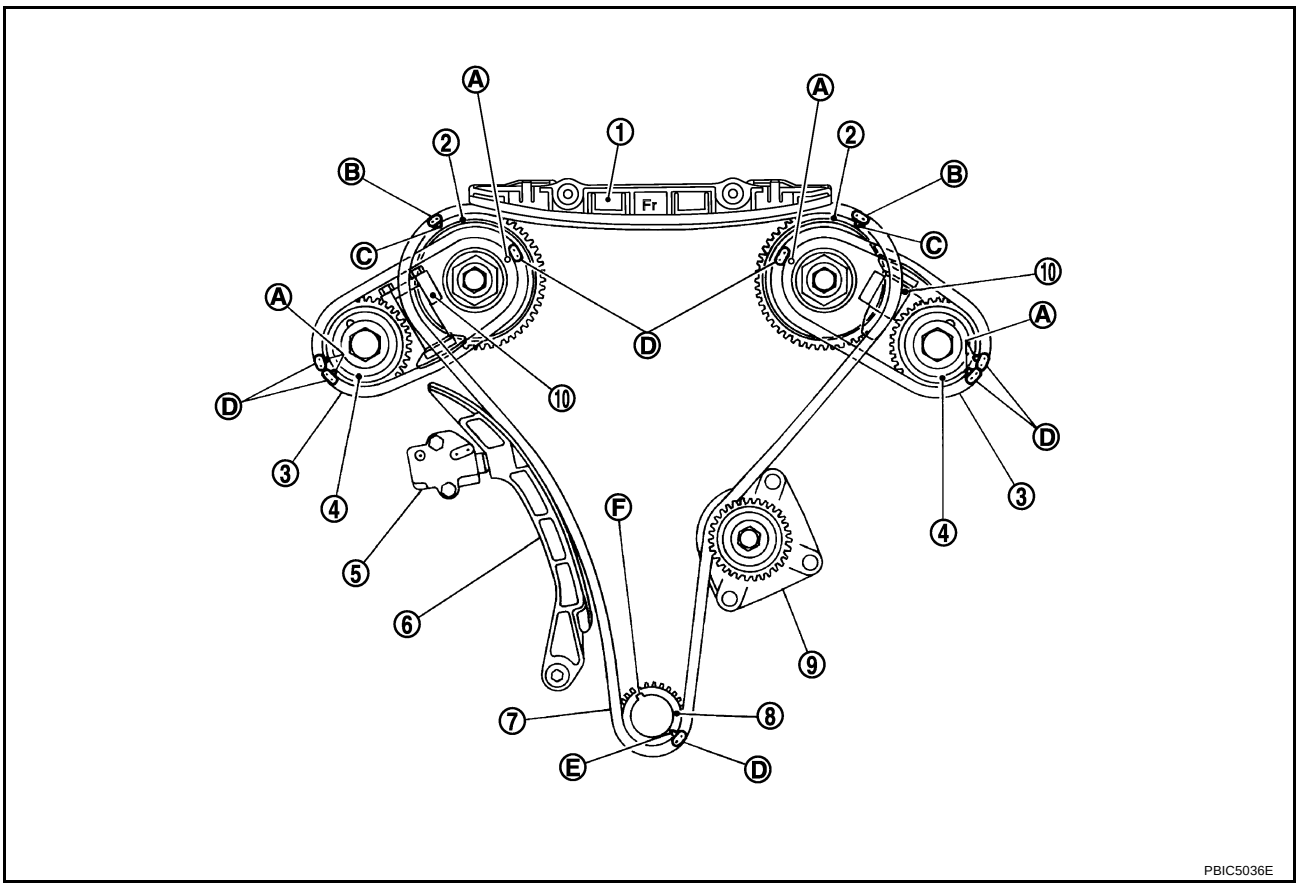


INSTALLATION

NOTE:

- The below figure shows the relationship between the mating mark on each timing chain and that on the corresponding sprocket, with the components installed.

- In this figure, the drum of exhaust side camshaft sprocket has been omitted.



1.	Internal chain guide	2.	Camshaft sprocket (INT)	3.	Timing chain (secondary)
4.	Camshaft sprocket (EXH)	5.	Timing chain tensioner (primary)	6.	Slack guide
7.	Timing chain (primary)	8.	Crankshaft sprocket	9.	Water pump
10.	Timing chain tensioner (secondary)				
A.	Mating mark [punched (back side)]	B.	Mating mark (yellow link)	C.	Mating mark (punched)
D.	Mating mark (orange link)	E.	Mating mark (notched)	F.	Crankshaft key

1. Install timing chain tensioners (secondary) to cylinder head as follows if removed. Refer to EM-77, "INSTALLATION" .

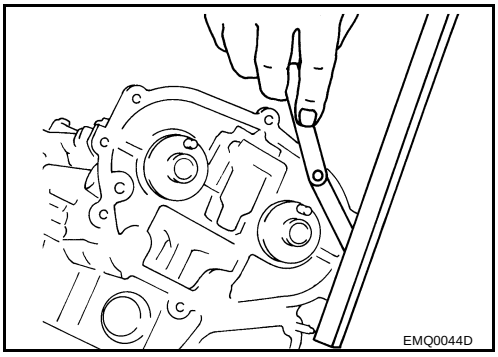
a. Install timing chain tensioners (secondary) with stopper pin attached and new O-ring.

b. Install camshaft brackets (No. 1). Refer to EM-77, "INSTALLATION" .

2. Measure difference in levels between front end faces of camshaft bracket (No.1) and cylinder head.

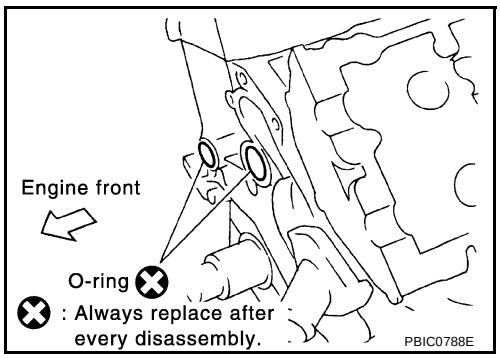
Standard : –0.14 to 0.14 mm (–0.0055 to 0.0055 in)

- Measure two positions (Both intake and exhaust side) for a single bank.
- If the measured value is out of the standard, re-install camshaft bracket (No.1).



3. Install rear timing chain case as follows:

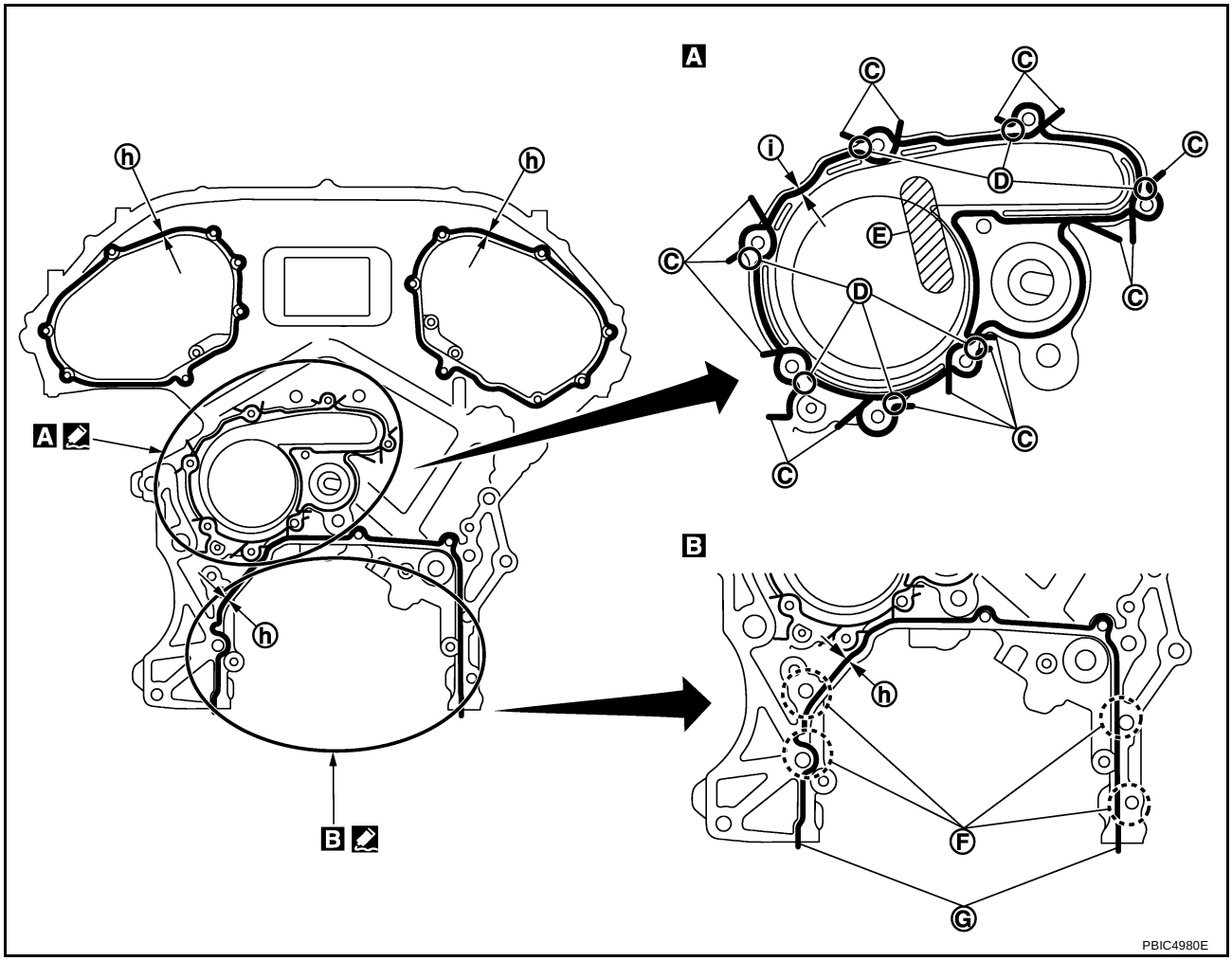
a. Install new O-rings onto cylinder block.



b. Apply liquid gasket with tube presser [SST: WS39930000 (—)] to rear timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

CAUTION:

- **For “A” in the figure, completely wipe out liquid gasket extended on a portion touching at engine coolant.**
- **Apply liquid gasket on installation position of water pump and cylinder head very completely.**

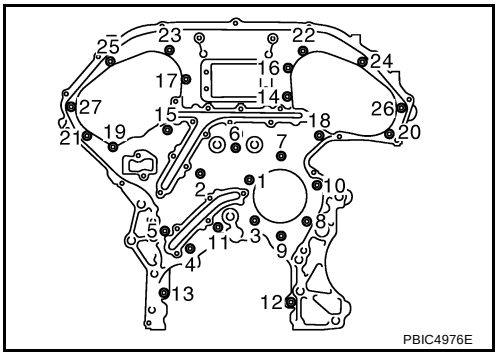


C.	Protrusion	D.	Clearance 1 mm (0.04 in)	E.	Do not protrude in this area
F.	Run along bolt hole inner side	G.	Protrusions at beginning and end of gasket		
h.	3.9 mm (0.154 in)	i	2.7 mm (0.106 in)		

- Refer to GI-11, "Components" for symbol marks in the figure.

c. Align rear timing chain case and water pump assembly with dowel pins (right and left) on cylinder block and install rear timing chain case.
   - Make sure O-rings stay in place during installation to cylinder block.

d. Tighten mounting bolts in numerical order as shown in the figure.
   - There are two types of mounting bolts. Refer to the following for locating bolts.



Bolt length: Bolt position

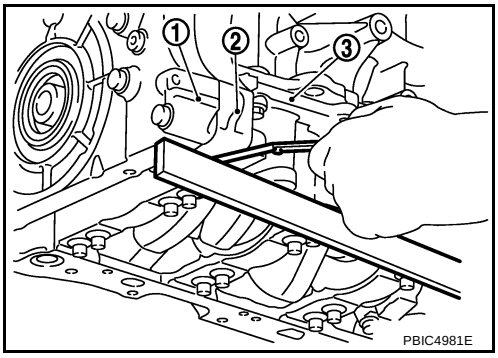
20 mm (0.79 in) : 1, 2, 3, 6, 7, 8, 9, 10

16 mm (0.63 in) : Except the above

: 12.7 N·m (1.3 kg-m, 9 ft-lb)

e. After all bolts are tightened, retighten them to the specified in numerical order shown in the figure.
   - If liquid gasket protrudes, wipe it off immediately.

f. After installing rear timing chain case, check the surface height difference between following parts on oil pan (upper) mounting surface.



1 : Front timing chain case
2 : Rear timing chain case
3 : Lower cylinder block

Standard

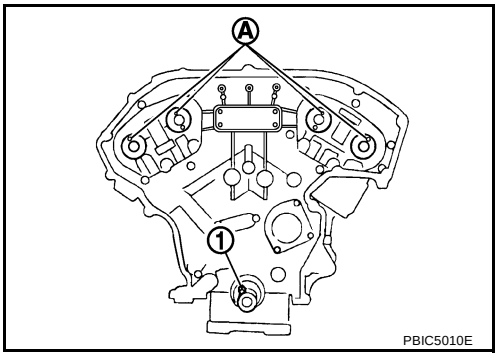
Rear timing chain case to cylinder block:

–0.24 to 0.14 mm (–0.0094 to 0.0055 in)

   - If not within standard, repeat the installation procedure.

4. Install water pump with new O-rings. Refer to CO-23, "WATER PUMP" .

5. Make sure that dowel pin (A) and crankshaft key (1) are located as shown in the figure. (No. 1 cylinder at compression TDC)



NOTE:
Though camshaft does not stop at the position as shown in the figure, for the placement of cam nose, it is generally accepted camshaft is placed for the same direction of the figure.

Camshaft dowel pin

: At cylinder head upper face side in each bank.

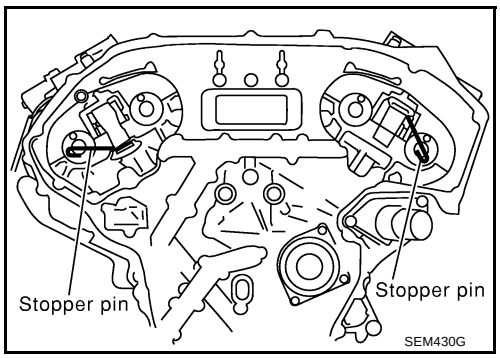
Crankshaft key

: At cylinder head side of right bank.

6. Install timing chains (secondary) and camshaft sprockets as follows:

CAUTION:
- **When replacing camshaft sprocket (EXH), replace valve timing control cover (including magnet retarder and cover).**
- **Mating marks between timing chain and sprockets slip easily. Confirm all mating mark positions repeatedly during the installation process.**

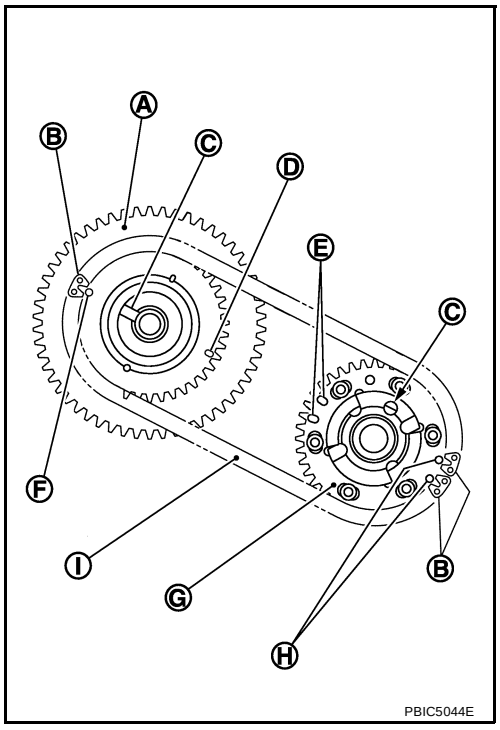
a. Push plunger of timing chain tensioner (secondary) and keep it pressed in with stopper pin.



b. Install timing chains (secondary) and camshaft sprockets.

NOTE:
Figure shows right bank (rear view).

A : Camshaft sprocket (INT) back face
B : Orange link
C : Dowel groove or hole
D : Mating mark (oval)
E : Mating mark (2 oval)
F : Mating mark (circle)
G : Camshaft sprocket (EXH) back face
H : Mating mark (2 circle)
I : Timing chain (secondary)



- Align the mating marks on timing chain (secondary) (orange link) with the ones on intake and exhaust camshaft sprockets (punched), and install them.

NOTE:
- Mating marks for intake camshaft sprocket are on the back side of camshaft sprocket (secondary).
- There are two types of mating marks, circle and oval types. They should be used for the right and left banks, respectively.

Right bank : Use circle type (F, H)
Left bank : Use oval type (D, E)

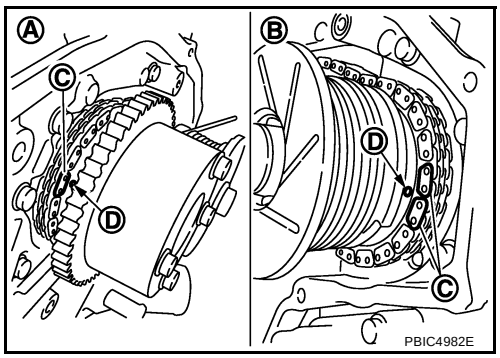
- Align dowel pin hole on the small diameter side of the camshaft front end with dowel pin on the back side of camshaft sprockets, and install them.
- In case that positions of each mating mark and each dowel pin are not fit on mating parts, make fine adjustment to the position holding the hexagonal portion on camshaft with wrench or equivalent.
- Mounting bolts for camshaft sprockets must be tightened in the step “d”. Tightening them by hand is enough to prevent the dislocation of dowel pins.

c. Make sure that timing chain (secondary) is not loose from each camshaft sprocket.

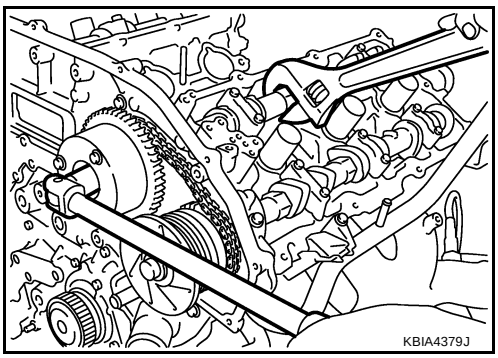
- Make sure the mating marks (punched) (D) on each camshaft sprocket are positioned on the mating marks (orange link) (C) on timing chain (secondary).

A : Intake side
B : Exhaust side

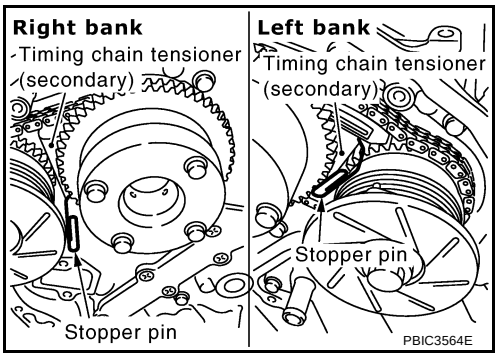
NOTE:
Mating mark (punched) in the figure is for checking loose at this step.



d. Tighten camshaft sprocket mounting bolts.
   - Secure camshaft using wrench at the hexagonal portion to tighten mounting bolts.

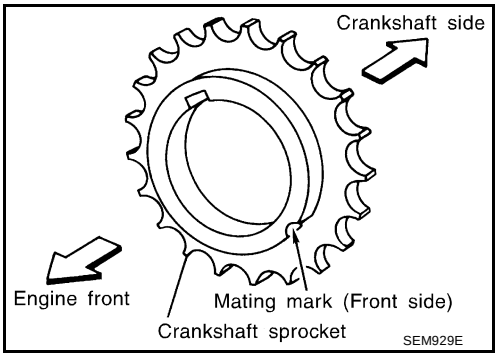


e. Pull stopper pins out from timing chain tensioners (secondary).



7. Install timing chain (primary) as follows:

a. Install crankshaft sprocket.
   - Make sure the mating marks on crankshaft sprocket face the front of engine.

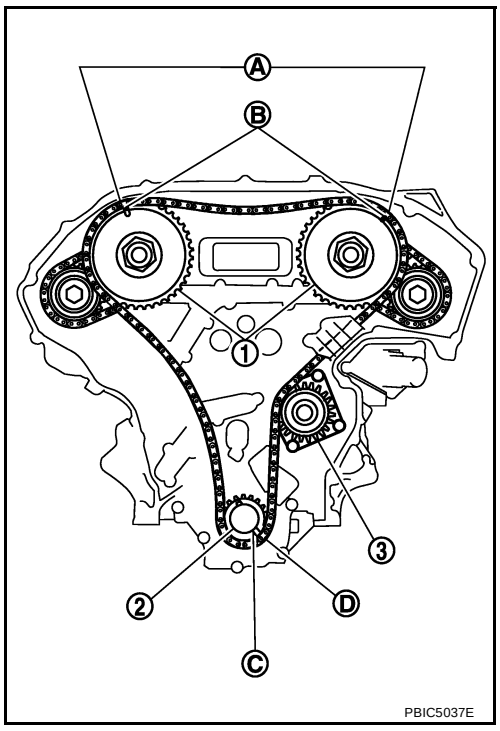


b. Install timing chain (primary).

- Install timing chain (primary) so the mating mark (punched) (B) on camshaft sprocket (INT) (1) is aligned with the yellow link (A) on timing chain, while the mating mark (notched) (C) on crankshaft sprocket (2) is aligned with the orange link (D) on timing chain, as shown in the figure.

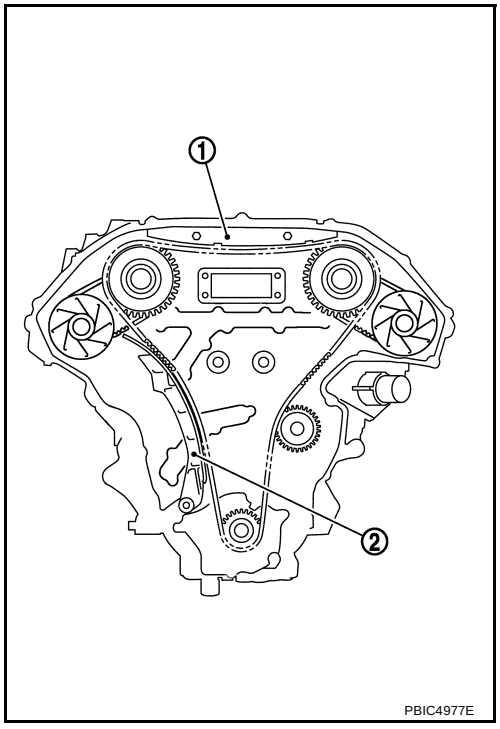
  3 : Water pump

- When it is difficult to align mating marks of timing chain (primary) with each sprocket, gradually turn camshaft using wrench on the hexagonal portion to align it with the mating marks.
- During alignment, be careful to prevent dislocation of mating mark alignments of timing chains (secondary).



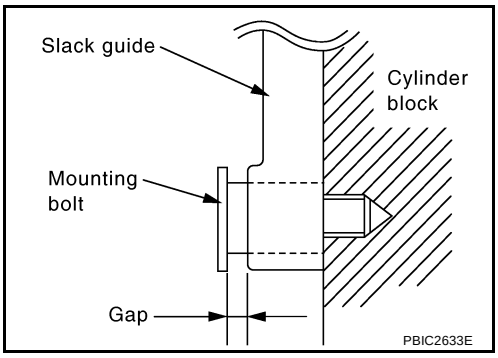
PBIC5037E

8. Install internal chain guide (1), slack guide (2) and timing chain tensioner (primary).



PBIC4977E

CAUTION:
Do not overtighten slack guide mounting bolts. It is normal for a gap to exist under the bolt seats when mounting bolts are tightened to specification.



9. Install the timing chain tensioner (primary) with the following procedure:

a. Pull plunger stopper tab up (or turn lever downward) so as to remove plunger stopper tab from the ratchet of plunger.

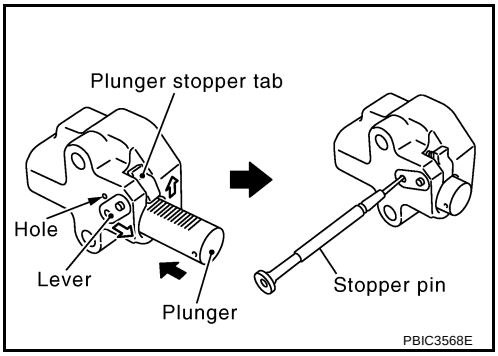
NOTE:
Plunger stopper tab and lever are synchronized.

b. Push plunger into the inside of tensioner body.

c. Hold plunger in the fully compressed position by engaging plunger stopper tab with the tip of ratchet.

d. To secure lever, insert stopper pin through hole of lever into tensioner body hole.

- The lever parts and the tab are synchronized. Therefore, the plunger will be secured under this condition.

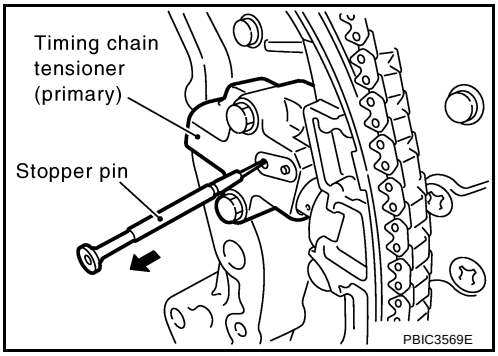


NOTE:
Figure shows the example of 1.2 mm (0.047 in) diameter thin screwdriver being used as the stopper pin.

e. Install timing chain tensioner (primary).

- Remove any dirt and foreign materials completely from the back and the mounting surfaces of timing chain tensioner (primary).

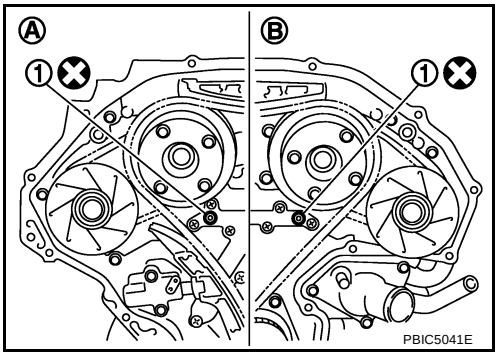
f. Pull out stopper pin after installing, and then release plunger.



10. Make sure again that the mating marks on sprockets and timing chain have not slipped out of alignment.

11. Install new O-ring (1) on rear timing chain case.

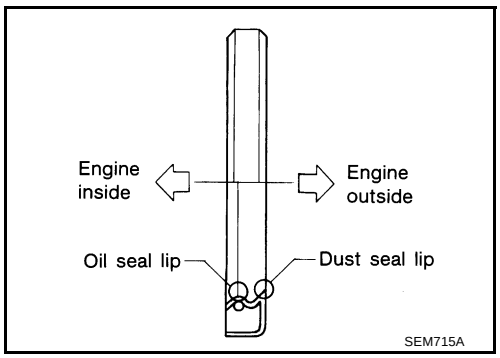
A : Right bank
B : Left bank



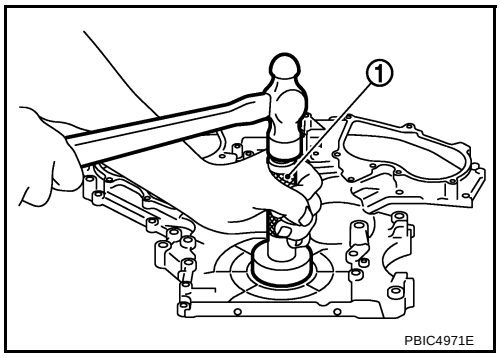
12. Install new front oil seal on front timing chain case.

- Apply new engine oil to both oil seal lip and dust seal lip.

- Install it so that each seal lip is oriented as shown in the figure.



- Using suitable drift (1), press-fit oil seal until it becomes flush with front timing chain case end face.
- Make sure the garter spring is in position and seal lip is not inverted.

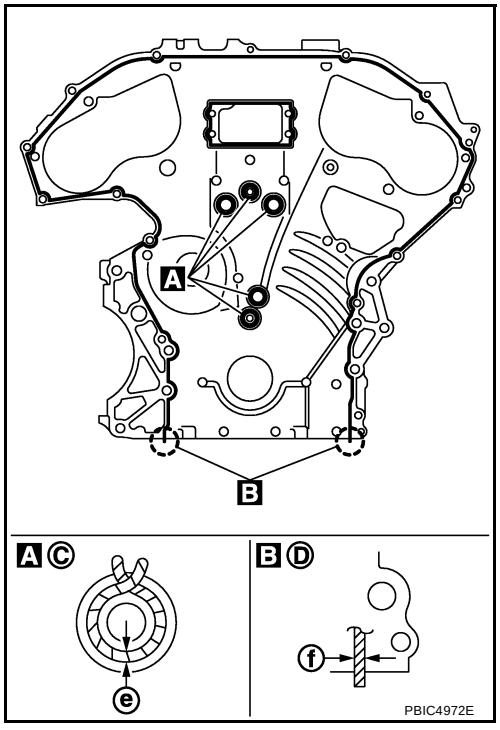


13. Install front timing chain case as follows:

a. Apply a continuous bead of liquid gasket with tube presser [SST: WS39930000 (—)] to front timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

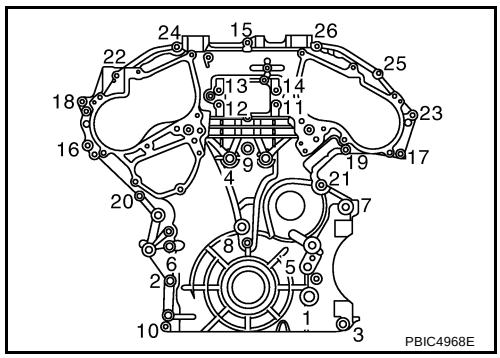
C : Bolt hole
D : Protrusion
e : 2.6 - 3.6 mm (0.102 - 0.142 in)
f : 3.4 - 4.4 mm (0.134 - 0.173 in)

NOTE:
Apply liquid gasket, start and end up application at the portions (a) shown in the figure.



b. Install front timing chain case as to fit its dowel pin hole together dowel pin on rear timing chain case.

c. Tighten mounting bolts to the specified torque in numerical order as shown in the figure.



- There are two types of mounting bolts. Refer to the following for locating bolts.

M8 bolts : 1, 2, 3, 4, 5, 6, 7

: 55.0 N·m (5.6 kg-m, 41 ft-lb)

M6 bolts : Except the above

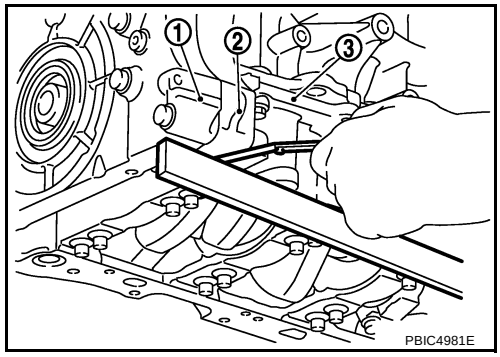
: 12.7 N·m (1.3 kg-m, 9 ft-lb)

d. After all bolts are tightened, retighten them to the specified torque in numerical order shown in the figure.

CAUTION:

Be sure to wipe off any excessive liquid gasket leaking on surface mating with oil pan (upper).

e. After installing front timing chain case, check the surface height difference between the following parts on the oil pan (upper) mounting surface.



1 : Front timing chain case
2 : Rear timing chain case
3 : Lower cylinder block

Standard

Front timing chain case to rear timing chain case:

–0.14 to 0.14 mm (–0.005 to 0.0055 in)

- If not within standard, repeat the installation procedure.

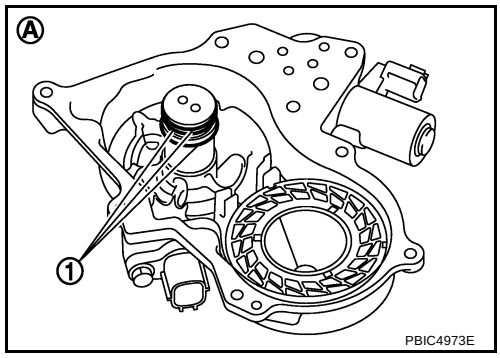
14. Install right and left valve timing control covers as follows:

a. Install new seal rings (1) in shaft grooves.

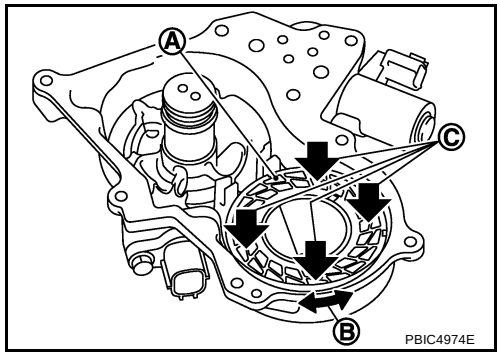
CAUTION:

When replacing seal rings, replace all rings with new one.

A : Left bank



b. To check the joint between dowel pins and dowel pin holes, check the looseness in the axle direction by pushing the mating surface of magnet retarder (A) at several places and the circumferential looseness (between dowel pins and dowel pin holes) by twisting in the circumferential direction.

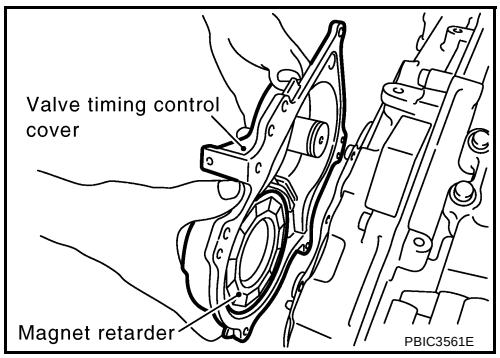


CAUTION:

Always perform this procedure when removing because the gap between dowel pins and dowel pin holes may not be caused on purpose.

B : Moves slightly
C : Not shaken

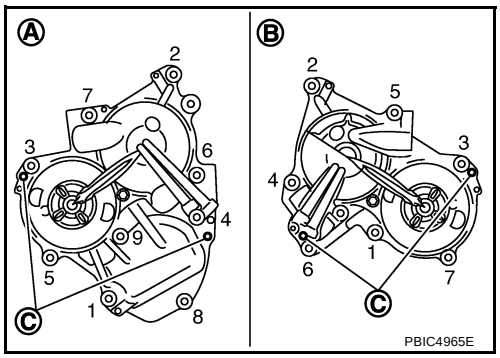
c. Install valve timing control cover to front timing chain case.



CAUTION:

- **Do not face the magnet retarder side down to prevent magnet retarder from dropping.**
- **Check the mating surface of magnet retarder and the drum of exhaust side camshaft sprocket for foreign materials.**
- **Align the center of both shaft holes of the shaft and the intake side camshaft sprocket, and then insert them.**
- **Be careful not to drop the seal ring from the shaft groove.**
- **When setting the valve timing control cover in position by hand, if valve timing control cover is not contacting with the front timing chain case, the dowel pin of magnet retarder may not be aligned with the dowel pin holes of cover. In this case, return to step "b".**

d. Tighten mounting bolts in numerical order as shown in the figure.



CAUTION:

Completely tighten the mounting bolts with the seat surface of valve timing control cover contacting with front timing chain case.

: 11.3 N·m (1.2 kg-m, 8 ft-lb)

A : Right bank
B : Left bank
C : Dowel pin hole

- After all bolts are tightened, tighten No.1 bolt to the specified torque again.

15. Install oil pans (upper and lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
16. Install rocker covers (right and left banks). Refer to EM-40, "ROCKER COVER" .
17. Install crankshaft pulley as follows:

a. Fix crankshaft using ring gear stopper [SST: KV10118600 (J-48641)].

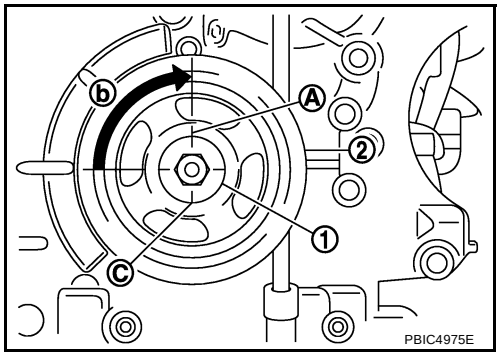
b. Install crankshaft pulley, taking care not to damage front oil seal.

- When press-fitting crankshaft pulley with plastic hammer, tap on its center portion (not circumference).

c. Tighten crankshaft pulley bolt.

: 44.1 N·m (4.5 kg-m, 33 ft-lb)

d. Place a paint mark (A) on crankshaft pulley (2) aligning with the angle mark (C) on crankshaft pulley bolt (1). Tighten the bolt 90 degrees (one marks) (b).



18. Rotate crankshaft pulley in normal direction (clockwise when viewed from engine front) to confirm it turns smoothly.
19. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

  NOTE:
  If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.
- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level
Fuel	Leakage	Leakage	Leakage
Exhaust gases	—	Leakage	—

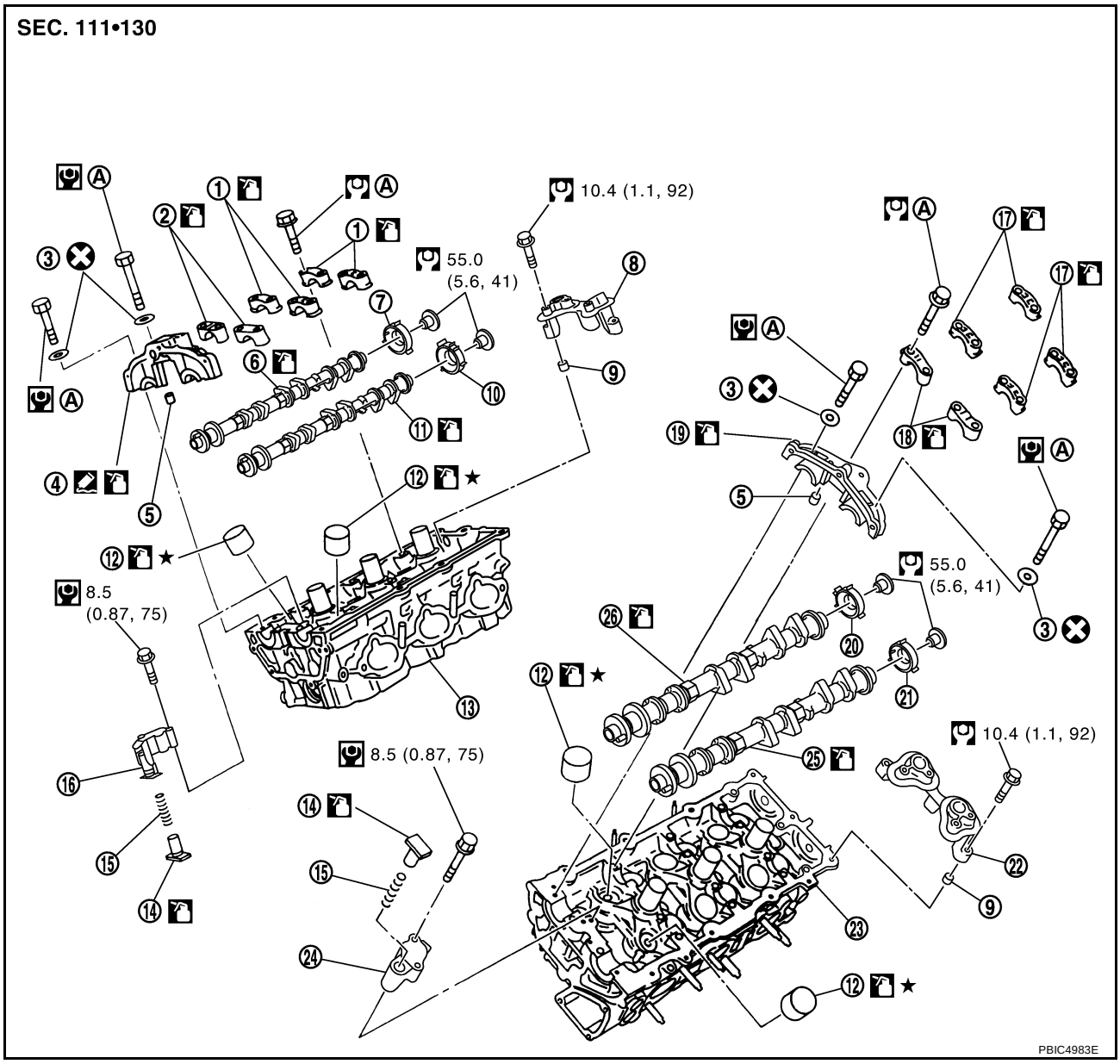
* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

CAMSHAFT

PFP:13001

Removal and Installation

NBS0000T



1. Camshaft bracket (No. 3, 4)	2. Camshaft bracket (No. 2)	3. Seal washer
4. Camshaft bracket (No. 1)	5. Dowel pin	6. Camshaft (EXH) (right bank)
7. Camshaft signal plate (EXH)	8. Camshaft sensor bracket	9. Dowel pin
10. Camshaft signal plate (INT)	11. Camshaft (INT) (right bank)	12. Valve lifter
13. Cylinder head (right bank)	14. Plunger	15. Spring
16. Timing chain tensioner (secondary) (right bank)	17. Camshaft bracket (No. 3, 4)	18. Camshaft bracket (No. 2)
19. Camshaft bracket (No. 1)	20. Camshaft signal plate (INT)	21. Camshaft signal plate (EXH)
22. Camshaft sensor bracket	23. Cylinder head (left bank)	24. Timing chain tensioner (secondary) (left bank)
25. Camshaft (EXH) (left bank)	26. Camshaft (INT) (left bank)	

A. Refer to EM-77

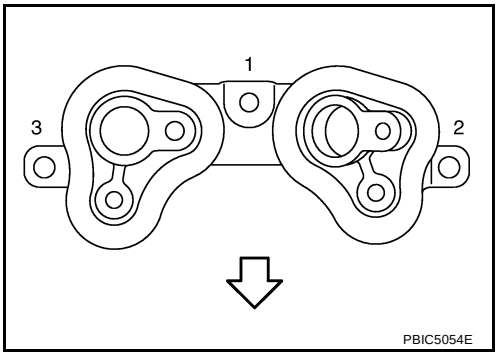
- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

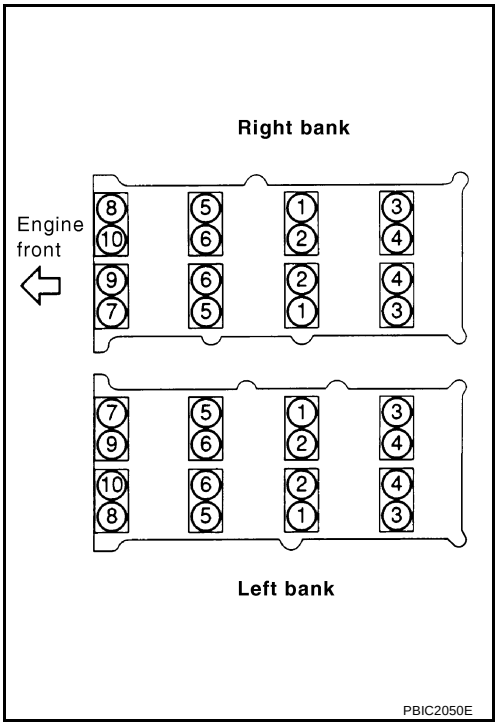
1. Remove front timing chain case, camshaft sprocket, and timing chain. Refer to EM-53, "TIMING CHAIN" .

2. Remove fuel sub tube. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
3. Remove camshaft sensor bracket bolts in reverse order as shown in the figure.

   ⇦ : Engine front



4. Remove intake and exhaust camshaft brackets.
   - Mark camshafts, camshaft brackets and bolts so they are placed in the same position and direction for installation.
   - Equally loosen camshaft bracket bolts in several steps in reverse order as shown in the figure.



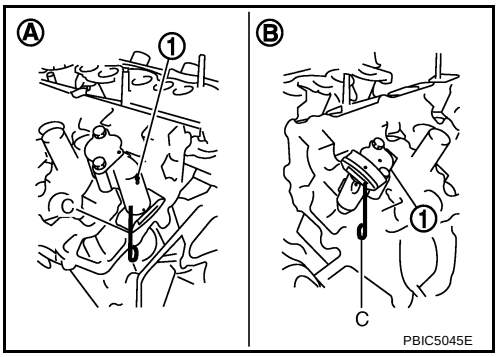
5. Remove camshaft.
6. Remove valve lifter.
   - Identify installation positions, and store them without mixing them up.
7. Remove timing chain tensioner (secondary) (1) from cylinder head.

   A : Right bank

   B : Left bank

   - Remove timing chain tensioner (secondary) (1) with its stopper pin (C) attached.

   NOTE:
   Stopper pin (C) was attached when timing chain (secondary) was removed.



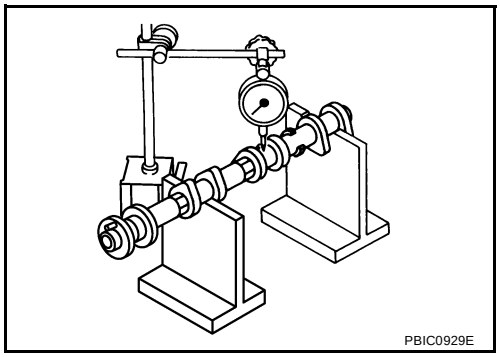
INSPECTION AFTER REMOVAL

Camshaft Runout

1. Put V-block on precise flat table, and support No. 2 and 4 journals of camshaft.

   CAUTION:
   Do not support journal No. 1 (on the side of camshaft sprocket) because it has a different diameter from the other three locations.
2. Set dial indicator vertically to No. 3 journal.
3. Turn camshaft to one direction with hands, and measure the camshaft runout on a dial indicator. (Total indicator reading)

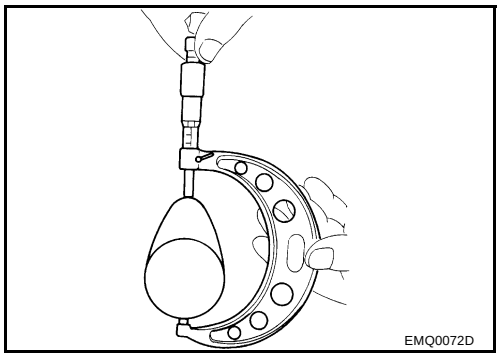
   Standard : Less than 0.02 mm (0.0008 in)
   Limit : 0.05 mm (0.0020 in)
4. If it exceeds the limit, replace camshaft.


PBIC0929E

Camshaft Cam Height

1. Measure the camshaft cam height with a micrometer.

   Standard cam height:
   Intake : 45.865 – 46.055 mm (1.8057 – 1.8132 in)
   Exhaust : 45.875 – 46.065 mm (1.8061 – 1.8136 in)
   Cam wear limit
   : 0.2 mm (0.008 in)
2. If wear is beyond the limit, replace camshaft.

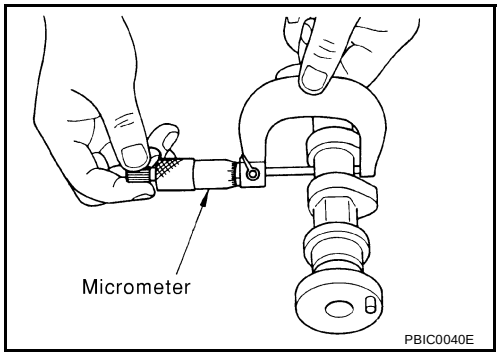

EMQ0072D

Camshaft Journal Oil Clearance

CAMSHAFT JOURNAL DIAMETER

- Measure the outer diameter of camshaft journal with a micrometer.

  Standard:
  No. 1 : 25.935 - 25.955 mm (1.0211 - 1.0218 in)
  No. 2, 3, 4 : 23.445 - 23.465 mm (0.9230 - 0.9238 in)

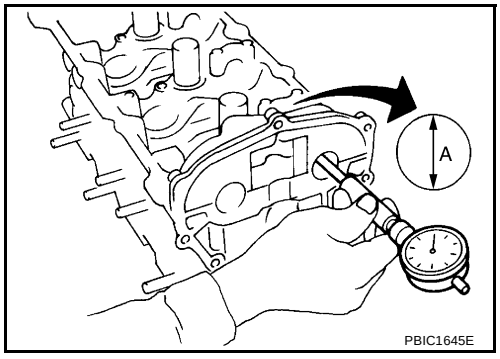


PBIC0040E

CAMSHAFT BRACKET INNER DIAMETER

- Tighten camshaft bracket bolt with the specified torque. Refer to EM-77, "INSTALLATION" for the tightening procedure.
- Measure the inner diameter “A” of camshaft bracket with a bore gauge.

  Standard:
  No. 1 : 26.000 - 26.021 mm (1.0236 - 1.0244 in)
  No. 2, 3, 4 : 23.500 - 23.521 mm (0.9252 - 0.9260 in)



PBIC1645E

CAMSHAFT JOURNAL OIL CLEARANCE

- (Oil clearance) = (Camshaft bracket inner diameter) – (Camshaft journal diameter)

Standard:

No. 1 : 0.045 - 0.086 mm (0.0018 - 0.0034 in)

No. 2, 3, 4 : 0.035 - 0.076 mm (0.0014 - 0.0030 in)

Limit : 0.15 mm (0.0059 in)

- If it exceeds the limit, replace either or both camshaft and cylinder head.

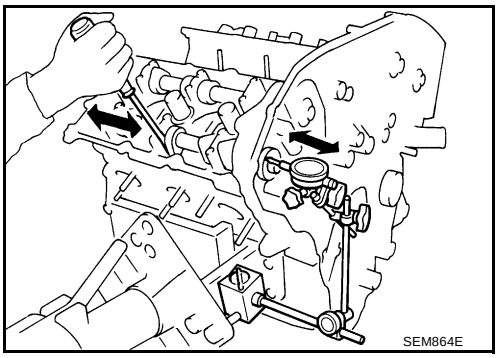
NOTE:
Camshaft brackets cannot be replaced as single parts, because there are machined together with cylinder head. Replace whole cylinder head assembly.

Camshaft End Play

- Install a dial indicator in thrust direction on front end of camshaft. Measure the end play of a dial indicator when camshaft is moved forward/backward (in direction to axis).

Standard : 0.115 - 0.188 mm (0.0045 - 0.0074 in)

Limit : 0.24 mm (0.0094 in)



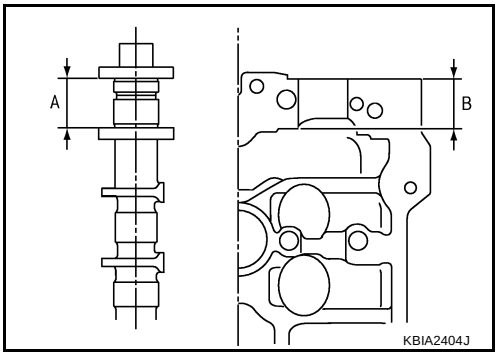
- Measure the following parts if out of the limit.
  - Dimension “A” for camshaft No. 1 journal

Standard : 27.500 - 27.548 mm (1.0827 - 1.0846 in)

  - Dimension “B” for cylinder head No. 1 journal bearing

Standard : 27.360 - 27.385 mm (1.0772 - 1.0781 in)

- Refer to the standards above, and then replace camshaft and/or cylinder head.



Camshaft Sprocket Runout

1. Put V-block on precise flat table, and support No. 2 and 4 journal of camshaft.

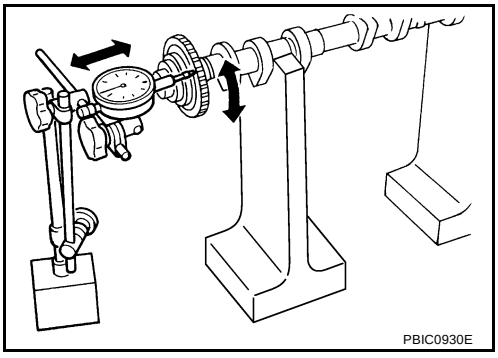
CAUTION:
Do not support journal No. 1 (on the side of camshaft sprocket) because it has a different diameter from the other three locations.

2. Measure the camshaft sprocket runout with a dial indicator. (Total indicator reading)

Limit : 0.15 mm (0.0059 in)

- If it exceeds the limit, replace camshaft sprocket.

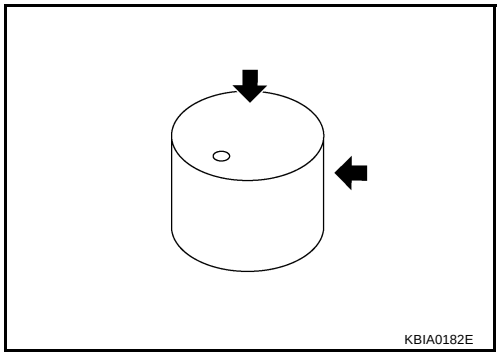
CAUTION:
When replacing camshaft sprocket (EXH), replace valve timing control cover (including magnet retarder and cover).



Valve Lifter

Check if surface of valve lifter has any wear or cracks.

- If anything above is found, replace valve lifter. Refer to EM-138, "Available Valve Lifter" .



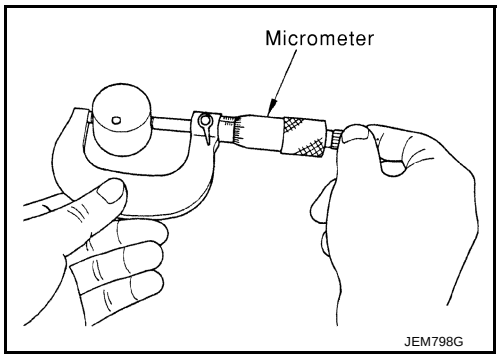
Valve Lifter Clearance

VALVE LIFTER OUTER DIAMETER

- Measure the outer diameter at 1/2 height of valve lifter with a micrometer since valve lifter is in barrel shape.

Standard (Intake and exhaust)

: 33.980 – 33.990 mm (1.3378 – 1.3382 in)

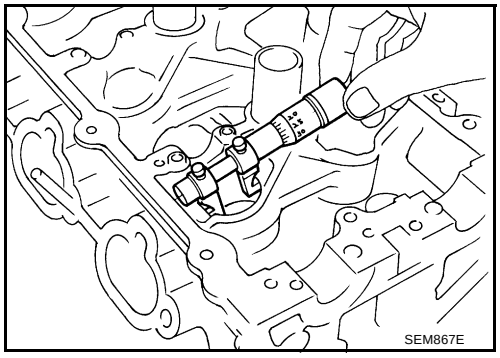


VALVE LIFTER HOLE DIAMETER

- Measure the inner diameter of valve lifter hole of cylinder head with an inside micrometer.

Standard (Intake and exhaust)

: 34.000 - 34.016 mm (1.3386 - 1.3392 in)



VALVE LIFTER CLEARANCE

- (Valve lifter clearance) = (Valve lifter hole diameter) – (Valve lifter outer diameter)

Standard (Intake and exhaust)

: 0.010 – 0.036 mm (0.0004 – 0.0014 in)

- If the calculated value is out of the standard, referring to each standard of valve lifter outer diameter and valve lifter hole diameter, replace either or both valve lifter and cylinder head.

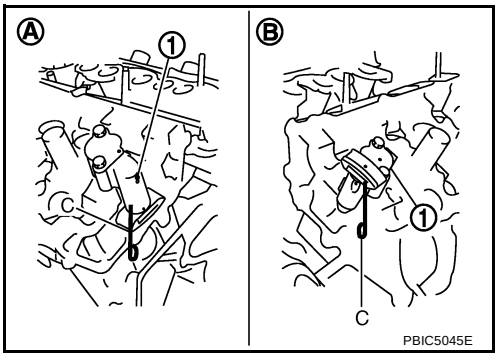
INSTALLATION

1. Install timing chain tensioners (secondary) (1) on both sides of cylinder head.

   A : Right bank

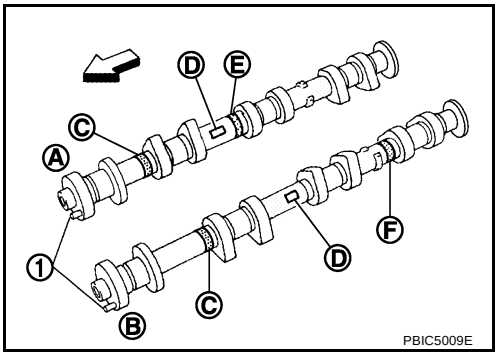
   B : Left bank

   - Install timing chain tensioner with its stopper pin (C) attached.
   - Install timing chain tensioner with sliding part facing downward on right-side cylinder head, and with sliding part facing upward on left-side cylinder head.



2. Install valve lifter.
   - Install it in the original position.
3. Install camshafts.
   - Follow your identification marks made during removal, or follow the identification marks that are present on new camshafts for proper placement and direction.

     ⇦ : Engine front

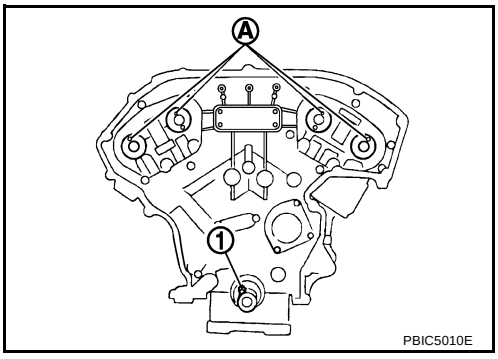


Bank	INT/EXH	Dowel pin (1)	Paint marks			Identification mark (D)
			M1 (E)	M2 (F)	M3 (C)	
RH	INT (A)	Yes	Green	No	Light blue	1E
	EXH (B)	Yes	No	Green	Light blue	1F
LH	INT (A)	Yes	Green	No	Light blue	1G
	EXH (B)	Yes	No	Green	Light blue	1H

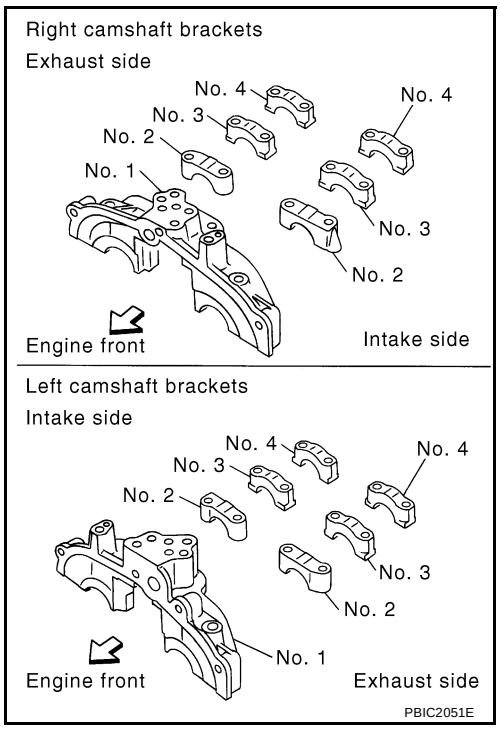
   - Install camshaft so that and dowel pin (A) on front end face are positioned as shown in the figure. (No. 1 cylinder TDC on its compression stroke)

     1 : Crankshaft key

     NOTE:
     Though camshaft does not stop at the portion as shown in the figure, for the placement of cam nose, it is generally accepted camshaft is placed for the same direction of the figure.

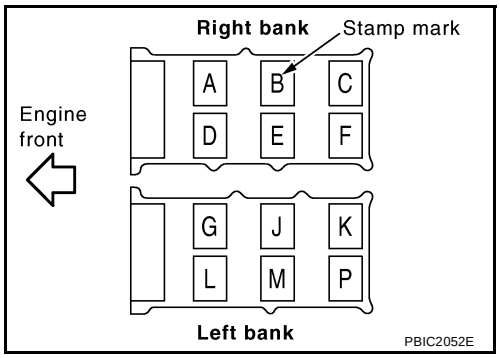


4. Install camshaft brackets.
   - Remove foreign material completely from camshaft bracket backside and from cylinder head installation face.
   - Install camshaft bracket in original position and direction as shown in the figure.



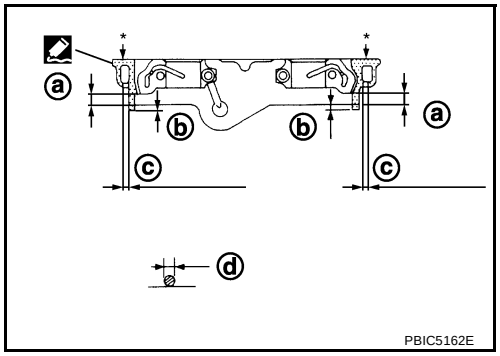
   - Install camshaft brackets (No. 2 to 4) aligning the stamp marks as shown in the figure.

     NOTE:
     There are no identification marks indicating left and right for camshaft bracket (No. 1).



   - Apply liquid gasket to mating surface of camshaft bracket (No. 1) as shown on right and left banks.
     Use Genuine RTV Silicone Sealant or equivalent. Refer to **GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"** **.**

     a : 8.5 mm (0.335 in)
     b : 2 mm
     c : Clearance 5 mm (0.20 in)
     d : ϕ 2.5 mm (0.098 in)



5. Tighten camshaft bracket bolts in the following steps, in numerical order as shown in the figure.

a. Tighten No. 7 to 10 in numerical order as shown.

: **1.96 N·m (0.2 kg-m, 17 in-lb)**

b. Tighten No. 1 to 6 in numerical order as shown.

: **1.96 N·m (0.2 kg-m, 17 in-lb)**

c. Tighten No. 1 to 10 in numerical order as shown.

: **5.88 N·m (0.6 kg-m, 52 in-lb)**

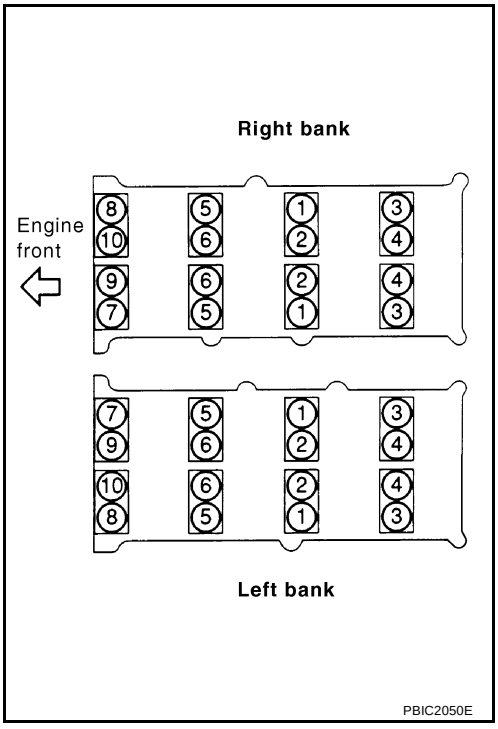
d. Tighten No. 1 to 10 in numerical order as shown.

: **10.4 N·m (1.1 kg-m, 92 in-lb)**

CAUTION:

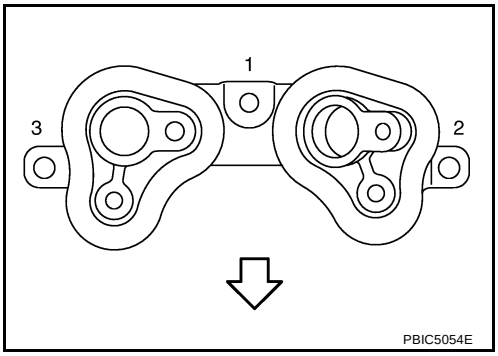
After tightening mounting bolts of camshaft brackets (No. 1), be sure to wipe off excessive liquid gasket from the parts list below.

- **Mating surface of rocker cover**
- **Mating surface of rear timing chain case**



6. Inspect and adjust the valve clearance. Refer to EM-80, "Valve Clearance" .
7. Install camshaft sensor bracket.
   - Tighten camshaft sensor bracket bolts in numerical order as shown in the figure.

   : Engine front



8. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Inspection of Camshaft Sprocket (INT) Oil Groove

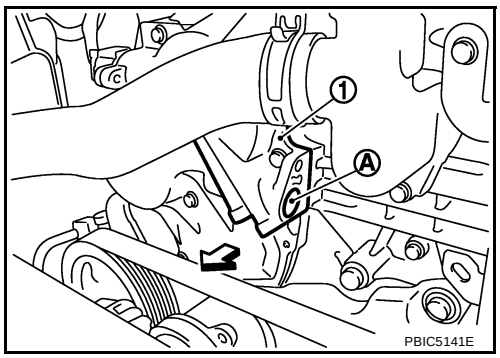
CAUTION:

- **Perform this inspection only when DTC P0011 or P0021 are detected in self-diagnostic results of CONSULT-III and it is directed according to inspection procedure of EC section. Refer to EC-81, "TROUBLE DIAGNOSIS" .**
- **Check when engine is cold so as to prevent burns from any splashing engine oil.**

1. Check the engine oil level. Refer to LU-6, "ENGINE OIL" .
2. Perform the following procedure so as to prevent the engine from being unintentionally started while checking.

a. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
b. Disconnect ignition coil and injector harness connectors.
3. Remove intake valve timing control solenoid valve. Refer to EM-72, "CAMSHAFT" .

4. Crank the engine, and then make sure that engine oil comes out from valve timing control solenoid valve hole. End crank after checking.



1 : Valve timing control solenoid valve

⇦ : Engine front

WARNING:

Be careful not to touch rotating parts (drive belts, idler pulley, and crankshaft pulley, etc.).

CAUTION:

Engine oil may squirt from intake valve timing control solenoid valve installation hole during cranking. Use a shop cloth to prevent the engine components and the vehicle. Do not allow engine oil to get on rubber components such as drive belt or engine mount insulators. Immediately wipe off any splashed engine oil.

- Clean oil groove between oil strainer and intake valve timing control solenoid valve if engine oil does not come out from valve timing control solenoid valve hole. Refer to LU-4, "LUBRICATION SYSTEM" .

5. Remove components between intake valve timing control solenoid valve and camshaft sprocket (INT), and then check each oil groove for clogging.
   - Clean oil groove if necessary. Refer to LU-4, "LUBRICATION SYSTEM" .
6. After inspection, install removed parts.

Inspection for Leaks

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

NOTE:

If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.

- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level
Fuel	Leakage	Leakage	Leakage
Exhaust gases	—	Leakage	—

* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

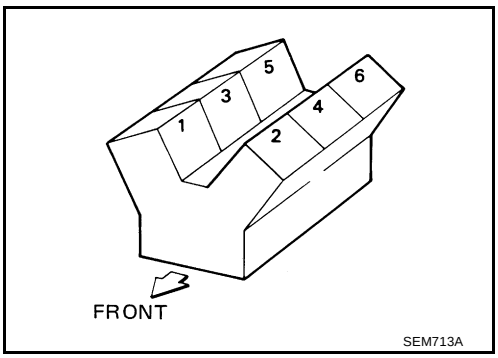
Valve Clearance

NBS0000U

INSPECTION

Perform inspection as follows after removal, installation or replacement of camshaft or valve-related parts, or if there is unusual engine conditions regarding valve clearance.

In cases of removing/installing or replacing camshaft and valve-related parts, or of unusual engine conditions due to changes in valve clearance (found malfunctions during stating, idling or causing noise), perform inspection as follows:

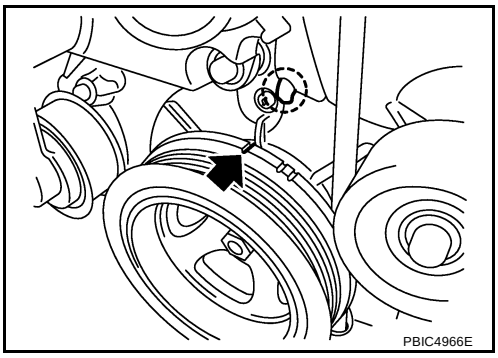


1. Remove rocker covers (right and left bank). Refer to EM-40, "ROCKER COVER" .
2. Measure the valve clearance as follows:

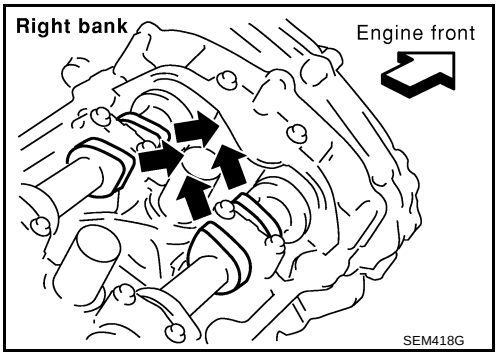
a. Set No. 1 cylinder at TDC of its compression stroke.

- Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator.

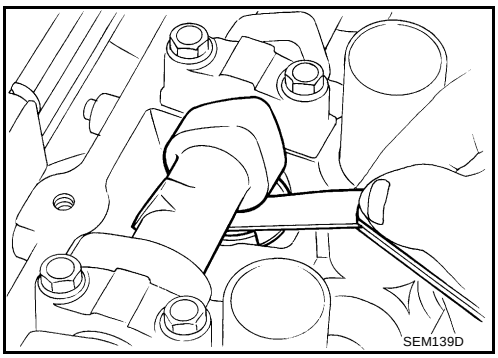
  ⬅ : Timing mark (grooved line without color)



- Make sure that intake and exhaust cam nose on No. 1 cylinder (engine front side of right bank) are located as shown in the figure.
- If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.



b. Use a feeler gauge, measure the clearance between valve lifter and camshaft.



Valve clearance:

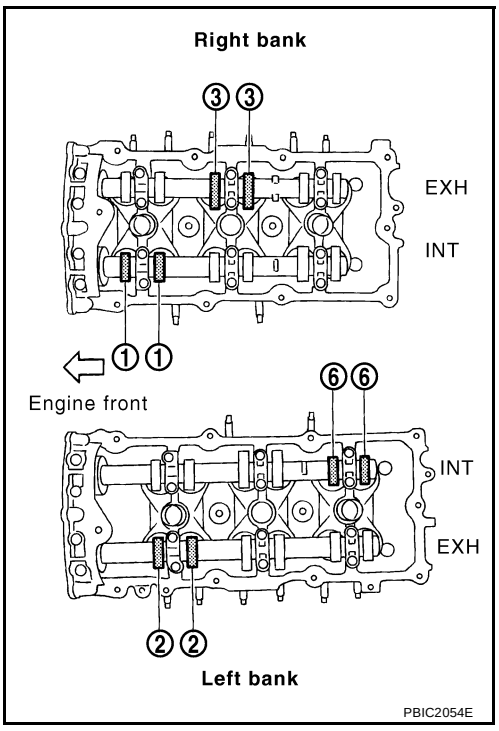
Unit: mm (in)

Items	Cold	Hot * (reference data)
Intake	0.26 - 0.34 (0.010 - 0.013)	0.304 - 0.416 (0.012 - 0.016)
Exhaust	0.29 - 0.37 (0.011 - 0.015)	0.308 - 0.432 (0.012 - 0.017)

*: Approximately 80°C (176°F)

- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).
- No. 1 cylinder at compression TDC

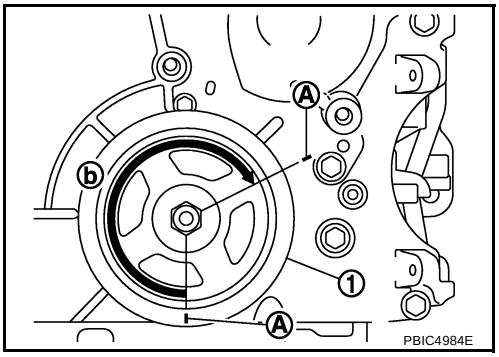
Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 1 cylinder at compression TDC	EXH		×	
	INT	×		
Measuring position (left bank)		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 1 cylinder at compression TDC	INT			×
	EXH	×		



c. Rotate crankshaft by 240 degrees clockwise (when viewed from engine front) to align No. 3 cylinder at TDC of its compression stroke.

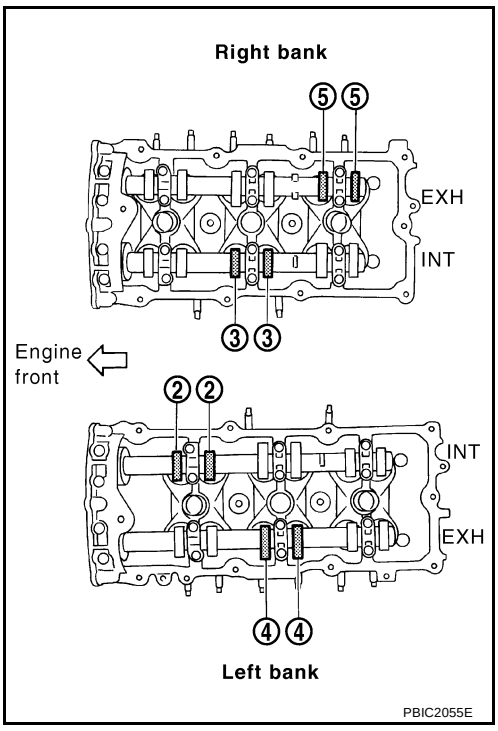
NOTE:

- To align cylinder No. 3 with the compression top dead center, place matching marks (A) on the crankshaft pulley (1) side and on the cylinder block side at a point 240° (b) counter-clockwise from the compression top dead center using the hex head of the crankshaft pulley bolt as a guide.



- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).
- No. 3 cylinder at compression TDC

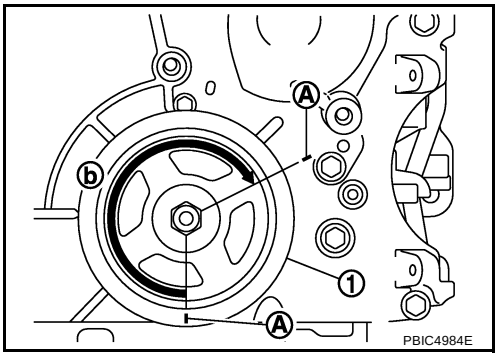
Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 3 cylinder at compression TDC	EXH			×
	INT		×	
Measuring position (left bank)		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 3 cylinder at compression TDC	INT	×		
	EXH		×	



d. Rotate crankshaft by 240 degrees clockwise (when viewed from engine front) to align No. 5 cylinder at TDC of its compression stroke.

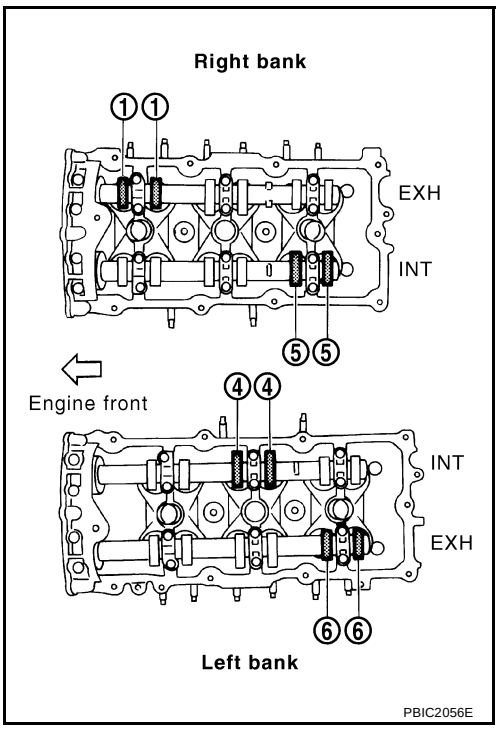
NOTE:

- To align cylinder No. 5 with the compression top dead center, place matching marks (A) on the crankshaft pulley (1) side and on the cylinder block side at a point 240° (b) counter-clockwise from the compression top dead center using the hex head of the crankshaft pulley bolt as a guide.



- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).
- No. 5 cylinder at compression TDC

Measuring position (right bank)		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 5 cylinder at compression TDC	EXH	×		
	INT			×
Measuring position (left bank)		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 5 cylinder at compression TDC	INT		×	
	EXH			×

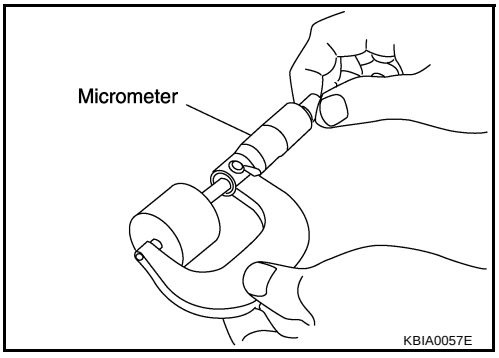


3. If the measured values are out of the standard, perform adjustment. Refer to EM-84, "ADJUSTMENT" .

ADJUSTMENT

- Perform adjustment depending on selected head thickness of valve lifter.

1. Measure the valve clearance. Refer to EM-80, "INSPECTION" .
2. Remove camshaft. Refer to EM-72, "REMOVAL" .
3. Remove valve lifters at the locations that are out of the standard.
4. Measure the center thickness of removed valve lifters with a micrometer.



5. Use the equation below to calculate valve lifter thickness for replacement.

Valve lifter thickness calculation: $t = t_1 + (C_1 - C_2)$

t = Valve lifter thickness to be replaced

t_1 = Removed valve lifter thickness

C_1 = Measured valve clearance

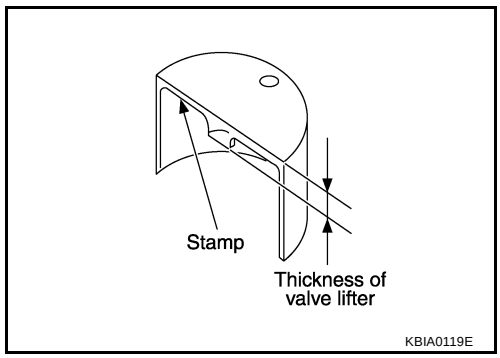
C_2 = Standard valve clearance:

Intake : 0.30 mm (0.012 in)*

Exhaust : 0.33 mm (0.013 in)*

***: Approximately 20°C (68°F)**

- Thickness of new valve lifter can be identified by stamp marks on the reverse side (inside the cylinder).
  Stamp mark 788T indicates 7.88 mm (0.3102 in) in thickness.



Available thickness of valve lifter: 27 sizes with range 7.88 to 8.40 mm (0.3102 to 0.3307 in) in steps of 0.02 mm (0.0008 in) (when manufactured at factory). Refer to EM-138, "Available Valve Lifter" .

6. Install selected valve lifter.
7. Install camshaft. Refer to EM-77, "INSTALLATION" .
8. Manually turn crankshaft pulley a few turns.
9. Make sure that the valve clearances for cold engine are within the specifications by referring to the specified values. Refer to EM-80, "INSPECTION" .
10. Install all removal parts in the reverse order of removal. Refer to EM-77, "INSTALLATION" .
11. Warm up the engine, and check for unusual noise and vibration.

OIL SEAL

PFP:00100

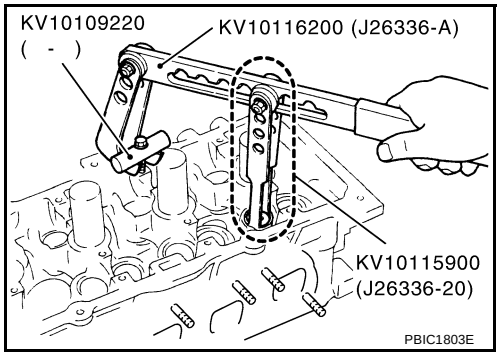
Removal and Installation of Valve Oil Seal

NBS0000V

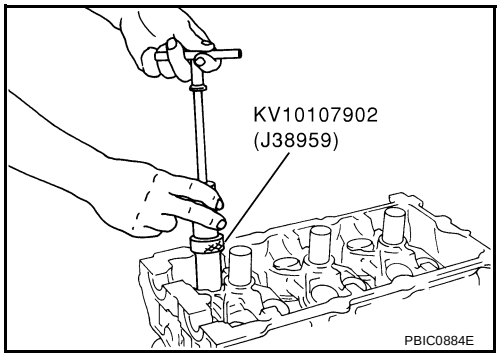
REMOVAL

1. Remove camshaft relating to valve oil seal to be removed. Refer to EM-72, "CAMSHAFT" .
2. Remove valve lifters. Refer to EM-72, "CAMSHAFT" .
3. Turn crankshaft until the cylinder requiring new oil seals is at TDC. This will prevent valve from dropping into cylinder.
4. Remove valve collet.
   - Compress valve spring with valve spring compressor, attachment, adapter (SST). Remove valve collet with magnet hand.

     CAUTION:
     When working, take care not to damage valve lifter holes.



5. Remove valve spring retainer, valve spring and valve spring seat.
6. Remove valve oil seal using valve oil seal puller (SST).

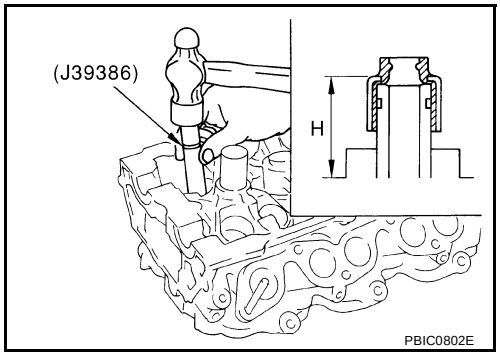


INSTALLATION

1. Apply engine oil on new valve oil seal joint and seal lip.
2. Using valve oil seal drift (SST), press fit valve oil seal to height “H” shown in the figure.

   NOTE:
   Dimension “H”: Height measured before valve spring seat installation

   Intake and exhaust : 14.3 - 14.9 mm (0.563 - 0.587 in)



3. Install in the reverse order of removal after this step.

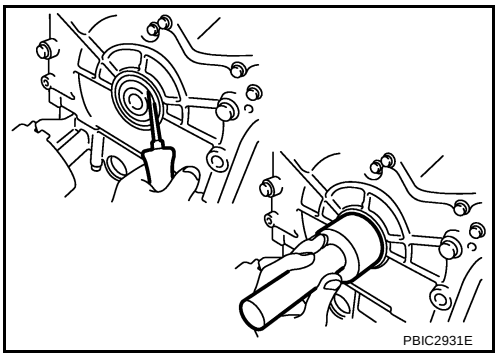
Removal and Installation of Front Oil Seal

NBS0000W

REMOVAL

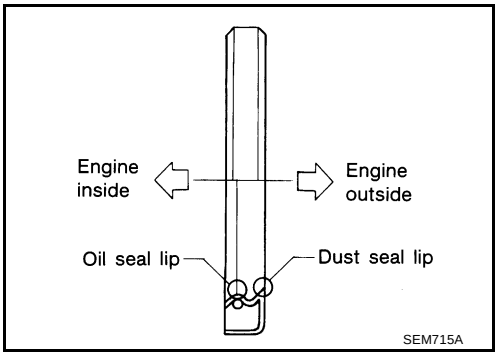
1. Remove the following parts:
   - Undercover
   - Drive belts: Refer to EM-12, "DRIVE BELTS" .
   - Radiator cooling fan assembly: Refer to CO-21, "COOLING FAN" .
   - Crankshaft pulley: Refer to EM-53, "TIMING CHAIN" .
2. Remove front oil seal using suitable tool.

CAUTION:
Be careful not to damage front timing chain case and crankshaft.



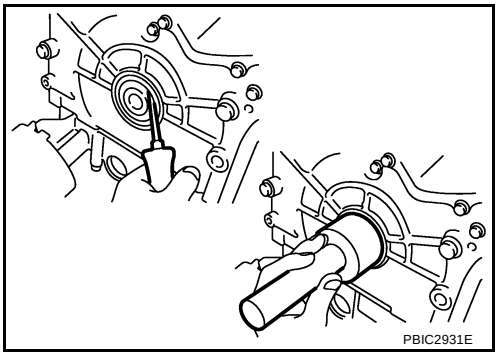
INSTALLATION

1. Apply engine oil to both oil seal lip and dust seal lip of new front oil seal.
2. Install front oil seal.
   - Install front oil seal so that each seal lip is oriented as shown in the figure.



   - Using suitable drift, press-fit until the height of front oil seal is level with the mounting surface.
     - Suitable drift: outer diameter 60 mm (2.36 in), inner diameter 50 mm (1.97 in).

CAUTION:
- **Be careful not to damage front timing chain case and crankshaft.**
- **Press-fit straight and avoid causing burrs or tilting oil seal.**



3. Install in the reverse order of removal after this step.

Removal and Installation of Rear Oil Seal

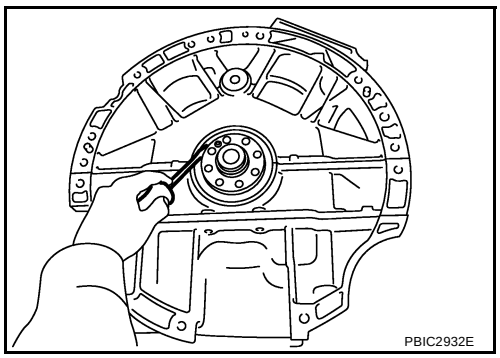
NBS0000X

REMOVAL

1. Remove transmission assembly. Refer to MT-18, "TRANSMISSION ASSEMBLY" (M/T models) or AT-242, "TRANSMISSION ASSEMBLY" (A/T models).
2. Remove clutch cover and clutch disk (M/T models). Refer to CL-16, "CLUTCH DISC, CLUTCH COVER" .
3. Remove flywheel (M/T models) or drive plate (A/T models). Refer to EM-107, "CYLINDER BLOCK" .

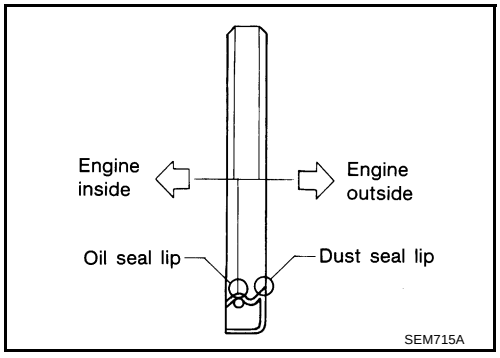
4. Remove rear oil seal with a suitable tool.

CAUTION:
Be careful not to damage crankshaft and cylinder block.

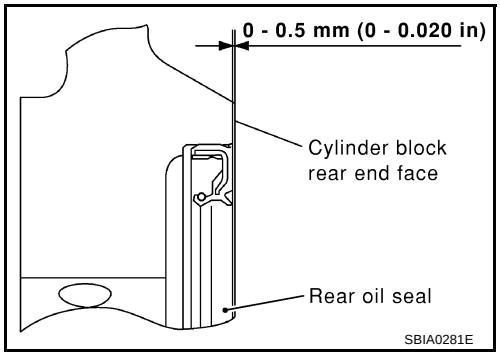


INSTALLATION

1. Apply new engine oil to new rear oil seal joint surface and seal lip.
2. Install rear oil seal so that each seal lip is oriented as shown.

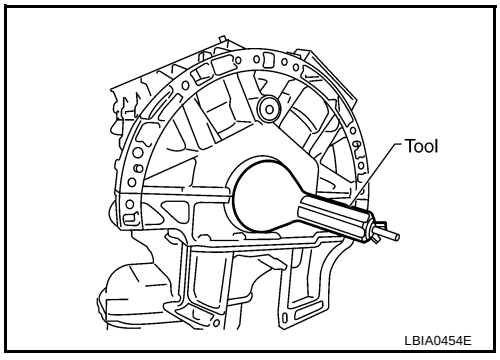


- Press in rear oil seal to the position as shown.



- Using suitable drift, press-fit until the height of front oil seal is level with the mounting surface.
  - Suitable drift: outer diameter 100 mm (3.94 in), inner diameter 85 mm (3.35 in).

CAUTION:
- **Be careful not to damage crankshaft and cylinder block.**
- **Press-fit oil seal straight to avoid causing burrs or tilting.**



3. Install in the reverse order of removal after this step.

CYLINDER HEAD

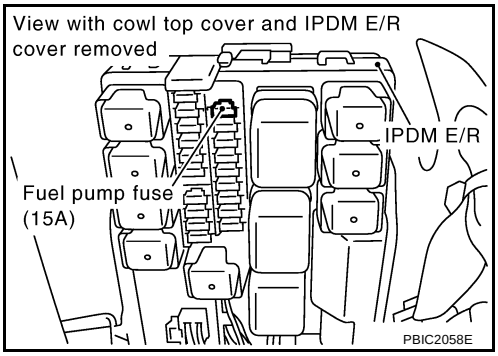
PFP:11041

On-Vehicle Service

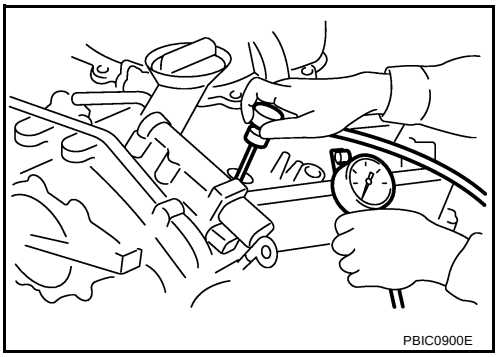
NBS0000Y

CHECKING COMPRESSION PRESSURE

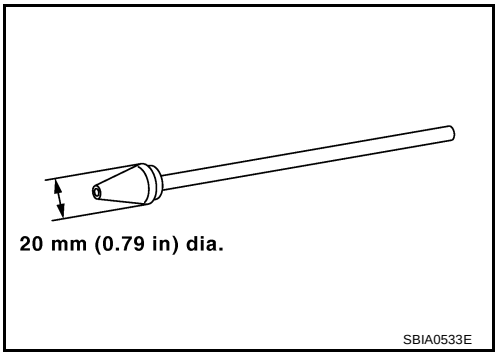
1. Warm up engine thoroughly. Then, stop it.
2. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Disconnect fuel pump fuse to avoid fuel injection during measurement.



4. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
5. Remove ignition coil and spark plug from each cylinder. Refer to EM-31, "IGNITION COIL" and EM-32, "SPARK PLUG (IRIDIUM-TIPPED TYPE)" .
6. Connect engine tachometer (not required in use of CONSULT-III).
7. Install compression tester (Commercial service tool) with adapter onto spark plug hole.



- Use the adapter whose picking up end inserted to spark plug hole is smaller than 20 mm (0.79 in) in diameter. Otherwise, it may be caught by cylinder head during removal.



8. With accelerator pedal fully depressed, turn ignition switch to “START” for cranking. When the gauge pointer stabilizes, read the compression pressure and engine rpm. Perform these steps to check each cylinder.

Compression pressure:

Unit: kPa (kg/cm^2 , psi) /rpm

Standard	Minimum	Differential limit between cylinders
1,275 (13.0, 185)/300	981 (10.0, 142)/300	98 (1.0, 14)/300

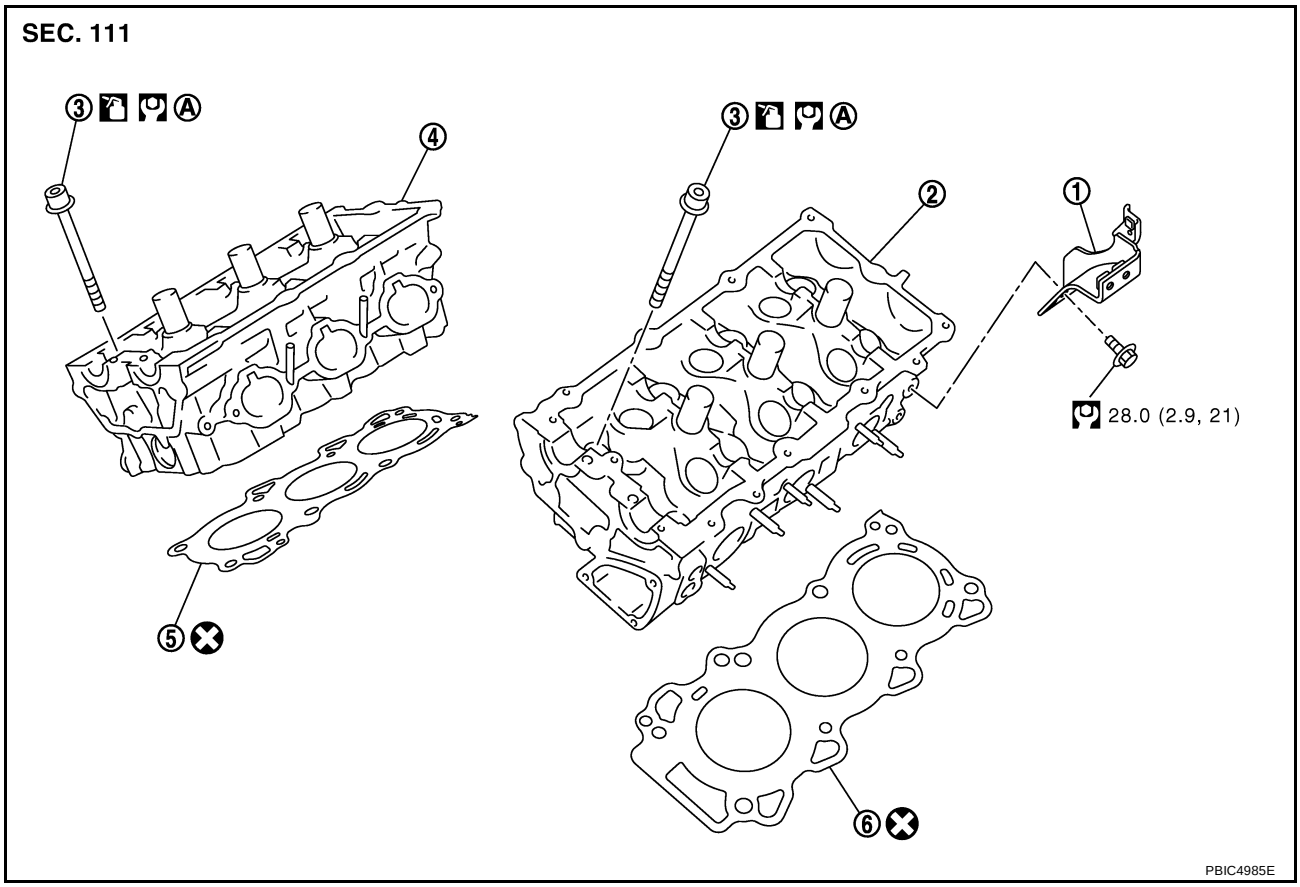
CAUTION:
Always use a fully changed battery to obtain specified engine speed.

- If the engine speed is out of specified range, check battery liquid for proper gravity. Check engine speed again with normal battery gravity.
- If compression pressure is below minimum value, check valve clearances and parts associated with combustion chamber (valve, valve seat, piston, piston ring, cylinder bore, cylinder head, cylinder head gasket). After the checking, measure compression pressure again.
- If some cylinders have low compression pressure, pour small amount of engine oil into the spark plug hole of the cylinder to re-check it for compression.
  - If the added engine oil improves the compression, piston rings may be worn out or damaged. Check the piston rings and replace if necessary.
  - If the compression pressure remains at low level despite the addition of engine oil, valves may be malfunctioning. Check valves for damage. Replace valve or valve seat accordingly.
- If two adjacent cylinders have respectively low compression pressure and their compression remains low even after the addition of engine oil, cylinder head gaskets are leaking. In such a case, replace cylinder head gaskets.

9. After inspection is completed, install removed parts.
10. Start engine, and make sure that engine runs smoothly.
11. Perform trouble diagnosis. If DTC appears, erase it. Refer to EC-81, "TROUBLE DIAGNOSIS" .

Removal and Installation

NBS0000Z



1. Engine rear lower slinger
2. Cylinder head (left bank)
3. Cylinder head bolt
4. Cylinder head (right bank)
5. Cylinder head gasket (right bank)
6. Cylinder head gasket (left bank)
7. Oil level gauge guide

A. Refer to EM-92

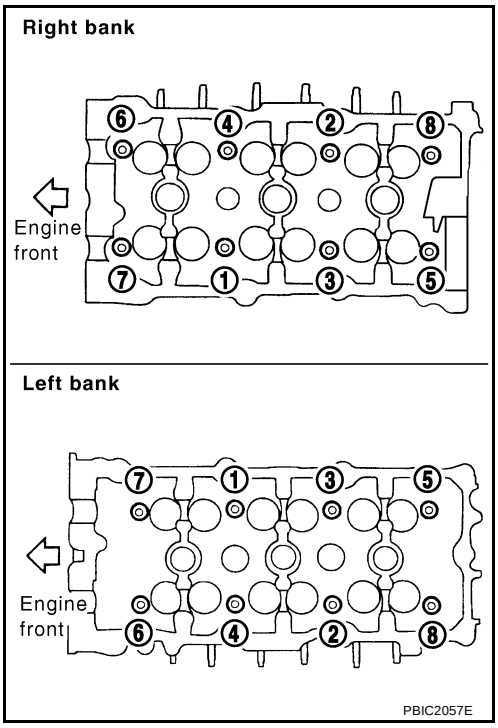
- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove engine assembly from vehicle, and separate front suspension member and transmission from engine. Refer to EM-101, "ENGINE ASSEMBLY" .
2. Remove the following parts:

- Fuel tube and fuel injector assembly: Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .
- Intake manifold: Refer to EM-20, "INTAKE MANIFOLD" .
- Exhaust manifold: Refer to EM-22, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .
- Water inlet and thermostat assembly: Refer to CO-26, "WATER INLET AND THERMOSTAT ASSEMBLY" .
- Water outlet and water pipe: Refer to CO-28, "WATER OUTLET AND WATER PIPING" .
- Front and rear timing chain case: Refer to EM-53, "TIMING CHAIN" .

3. Remove camshaft (INT, EXH). Refer to EM-72, "CAMSHAFT" .
4. Remove cylinder head bolts in reverse order as shown in the figure with cylinder head bolt wrench (commercial service tool).



5. Remove cylinder head gaskets.

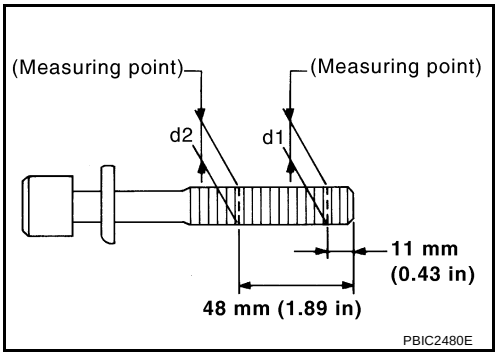
INSPECTION AFTER REMOVAL

Cylinder Head Bolts Outer Diameter

- Cylinder head bolts are tightened by plastic zone tightening method. Whenever the size difference between “d1” and “d2” exceeds the limit, replace them with new one.

  Limit (“d1” – “d2”) : 0.18 mm (0.0071 in)

- If reduction of outer diameter appears in a position other than “d2”, use it as “d2” point.



Cylinder Head Distortion

NOTE:
When performing this inspection, cylinder block distortion should be also checked. Refer to EM-128, "CYLINDER BLOCK DISTORTION" .

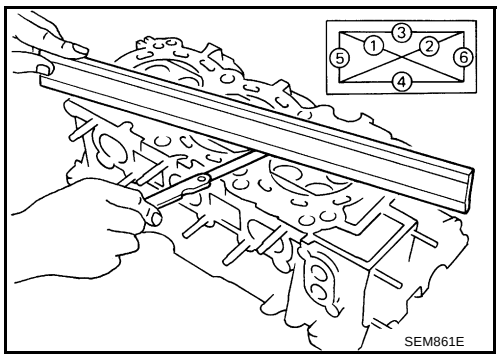
1. Using scraper, wipe off oil, scale, gasket, sealant and carbon deposits from surface of cylinder head.

   CAUTION:
   Do not allow gasket fragments to enter engine oil or engine coolant passages.

2. At each of several locations on bottom surface of cylinder head, measure the distortion in six directions.

   Limit : 0.1 mm (0.004 in)

   - If it exceeds the limit, replace cylinder head.

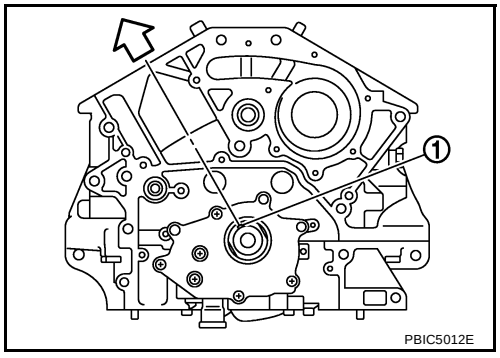


INSTALLATION

1. Install new cylinder head gaskets.
2. Turn crankshaft until No. 1 piston is set at TDC.
   - Crankshaft key should line up with the right bank cylinder center line as shown in the figure.

   1 : Crankshaft key

   ⇦ : Right bank side



3. Install cylinder head follow the steps below to tighten cylinder head bolts in numerical order as shown in the figure.

   CAUTION:
   If cylinder head bolts re-used, check their outer diameters before installation. Refer to EM-91, "Cylinder Head Bolts Outer Diameter" .

a. Apply new engine oil to threads and seat surfaces of cylinder head bolts.

b. Tighten all cylinder head bolts.

   : 105 N·m (11 kg-m, 77 ft-lb)

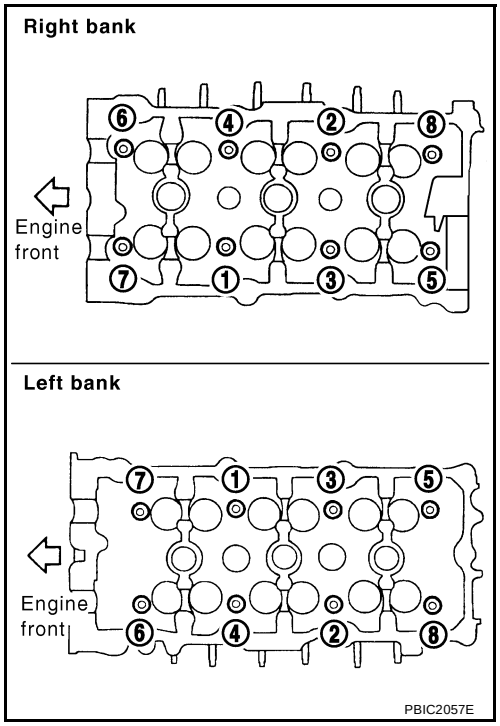
c. Completely loosen all cylinder head bolts.

   : 0 N·m (0 kg-m, 0 ft-lb)

   CAUTION:
   In step “c”, loosen bolts in reverse order of that indicated in the figure.

d. Tighten all cylinder head bolts.

   : 39.2 N·m (4.0 kg-m, 29 ft-lb)

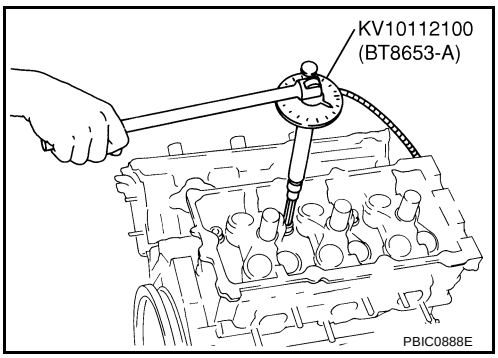


e. Turn all bolts 95 degrees clockwise (angle tightening).

CAUTION:
Check the tightening angle by using angle wrench (SST). Avoid judgment by visual inspection without tool.

- Check tightening angle indicated on angle wrench (SST) indicator plate.

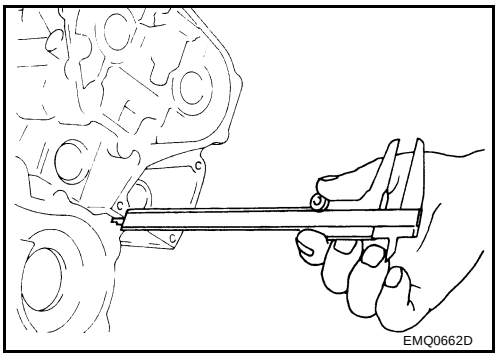
f. Turn all bolts 95 degrees clockwise again (angle tightening).



4. After installing cylinder head, measure distance between front end faces of cylinder block and cylinder head (left and right banks).

Standard : 14.1 - 14.9 mm (0.555 - 0.587 in)

- If the measured value is out of the standard, re-install cylinder head.



5. Install in the reverse order of removal after this step.

INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

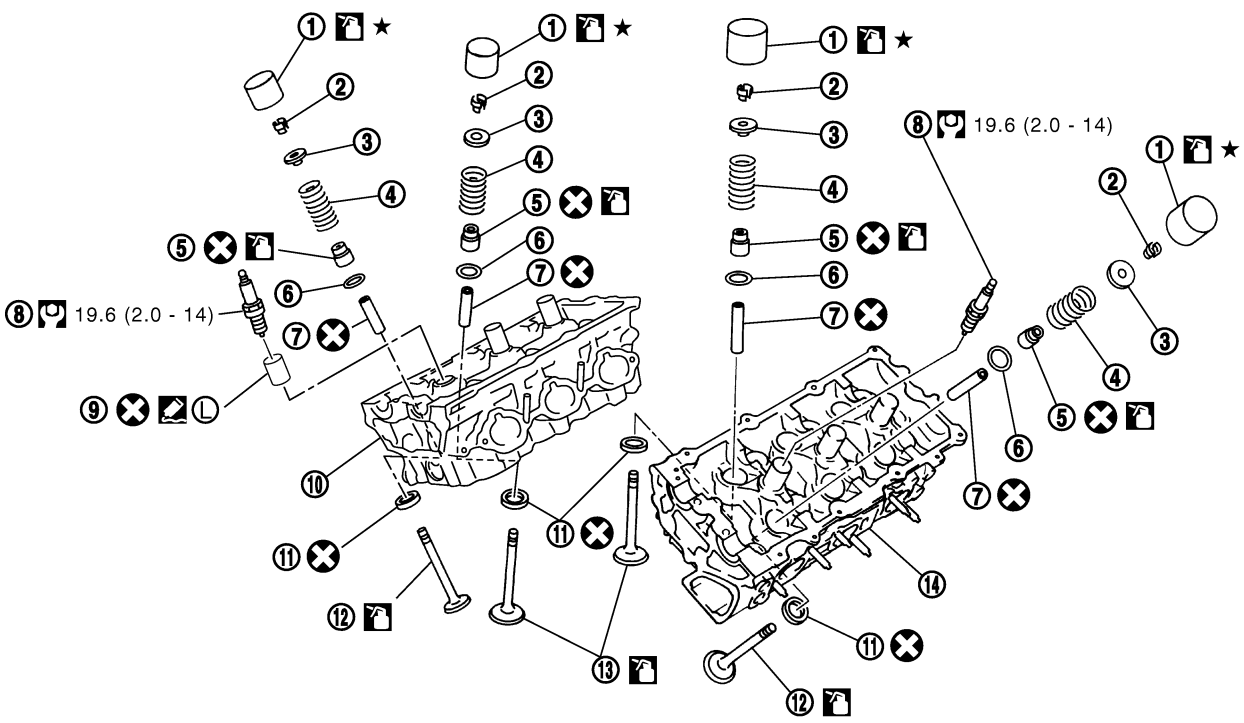
Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level
Fuel	Leakage	Leakage	Leakage
Exhaust gases	—	Leakage	—

* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

Disassembly and Assembly

NBS00010

SEC. 111•130•220



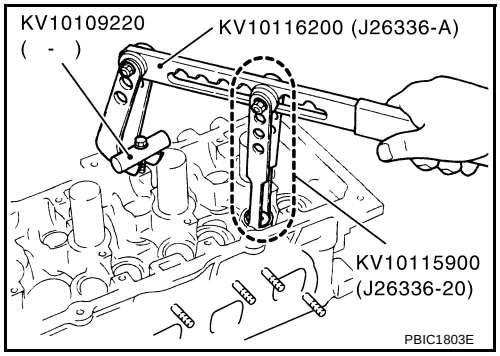
1. Valve lifter	2. Valve collet	3. Valve spring retainer
4. Valve spring	5. Valve oil seal	6. Valve spring seat
7. Valve guide	8. Spark plug	9. Spark plug tube
10. Cylinder head (right bank)	11. Valve seat	12. Valve (EXH)
13. Valve (INT)	14. Cylinder head (left bank)	

- Refer to GI-11, "Components" for symbol marks in the figure.

DISASSEMBLY

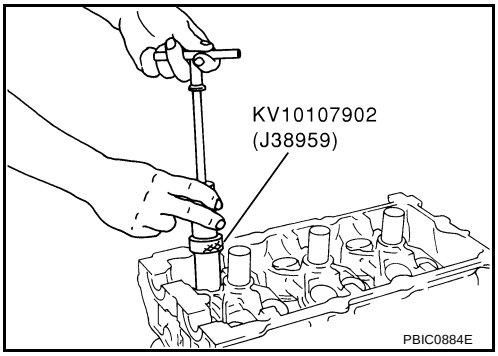
1. Remove spark plug with spark plug wrench (commercial service tool).
2. Remove valve lifter.
   - Identify installation positions, and store them without mixing them up.
3. Remove valve collet.
   - Compress valve spring with valve spring compressor, attachment and adapter (SST). Remove valve collet with magnet hand.

   CAUTION:
   When working, take care not to damage valve lifter holes.



4. Remove valve spring retainer, valve spring and valve spring seat.
5. Push valve stem to combustion chamber side, and remove valve.
   - Identify installation positions, and store them without mixing them up.

6. Remove valve oil seals using valve oil seal puller (SST).



7. If valve seat must be replaced, refer to EM-99, "VALVE SEAT REPLACEMENT" .
8. If valve guide must be replaced, refer to EM-97, "VALVE GUIDE REPLACEMENT" .
9. Remove spark plug tube, as necessary.
   - Using pair of pliers, pull spark plug tube out of cylinder head.

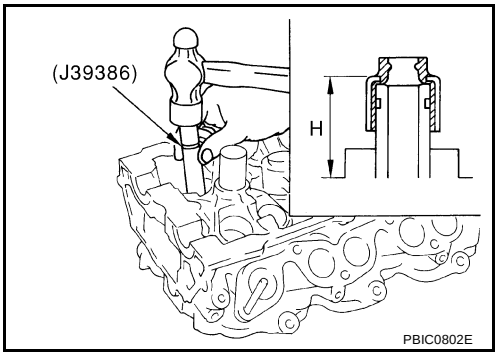
   CAUTION:
   - **Take care not to damage cylinder head.**
   - **Once removed, spark plug tube will be deformed and cannot be reused. Do not remove it unless absolutely necessary.**

ASSEMBLY

1. When valve guide is removed, install it. Refer to EM-97, "VALVE GUIDE REPLACEMENT" .
2. When valve seat is removed, install it. Refer to EM-99, "VALVE SEAT REPLACEMENT" .
3. Install valve oil seals.
   - Install with valve oil seal drift (SST) to match dimension in the figure.

   Height “H” (Without valve spring seat installed)

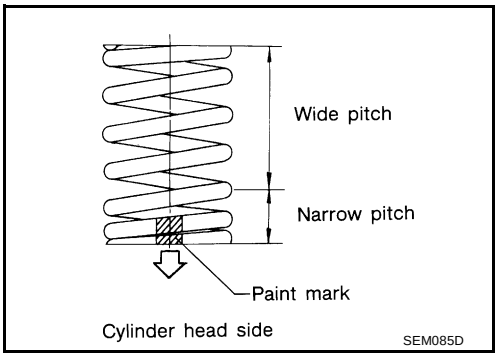
   Intake and exhaust : 14.3 - 14.9 mm (0.563 - 0.587 in)



4. Install valve spring seat.
5. Install valves.

   NOTE:
   Larger diameter valves are for intake side.
6. Install valve spring (uneven pitch type).
   - Install narrow pitch end (paint mark) to cylinder head side (valve spring seat side).

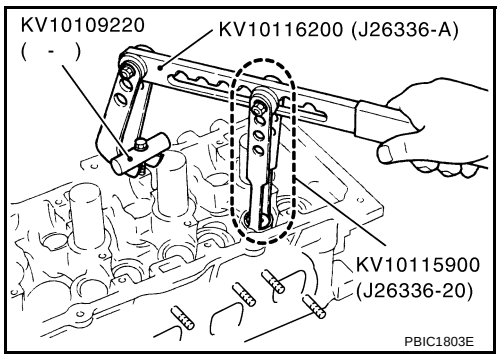
   Paint mark color : Yellowish green



7. Install valve spring retainer.

8. Install valve collet.
   - Compress valve spring with valve spring compressor, attachment and adapter (SST). Install valve collet with magnet hand.

     CAUTION:
     When working, take care not to damage valve lifter holes.
   - Tap valve stem edge lightly with plastic hammer after installation to check its installed condition.



9. Install valve lifter.
   - Install it in the original position.
10. Install spark plug tube.
   - Press-fit spark plug tube as follows:

a. Remove old liquid gasket adhering to cylinder head mounting hole.

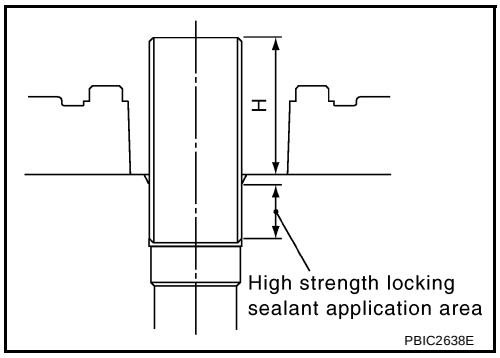
b. Apply liquid gasket to area within approximately 12 mm (0.47 in) from edge of spark plug tube press-fit side.
   Use Genuine High Strength Locking Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

c. Using drift, press-fit spark plug tube so that its height “H” is as specified in the figure.

   Standard press-fit height “H”:

   : 37.7 - 38.7 mm (1.484 - 1.524 in)

   CAUTION:
   - **When press-fitting, take care not to deform spark plug tube.**
   - **After press-fitting, wipe off liquid gasket protruding onto cylinder-head upper face.**



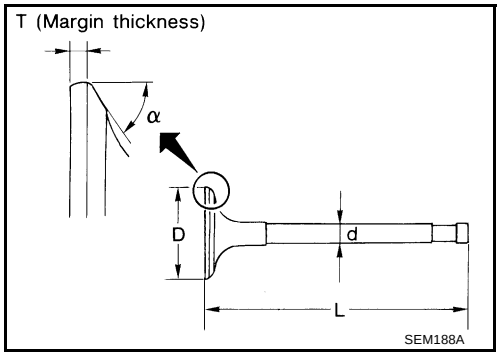
11. Install spark plug with spark plug wrench (commercial service tool).

Inspection After Disassembly

NBS00011

VALVE DIMENSIONS

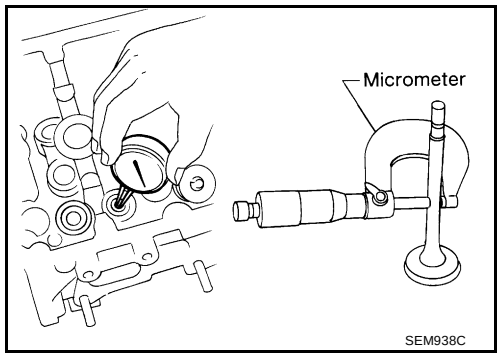
- Check dimensions of each valve. For dimensions, refer to EM-139, "Valve Dimensions" .
- If dimensions are out of the standard, replace valve and check valve seat contact. Refer to EM-99, "VALVE SEAT CONTACT" .



VALVE GUIDE CLEARANCE

Valve Stem Diameter

Measure diameter of valve stem with micrometer.



Standard

Intake : 5.965 - 5.980 mm (0.2348 - 0.2354 in)

Exhaust : 5.962 - 5.970 mm (0.2347 - 0.2350 in)

Valve Guide Inner Diameter

Measure inner diameter of valve guide with inside micrometer.

Standard

Intake and Exhaust : 6.000 - 6.018 mm (0.2362 - 0.2369 in)

Valve Guide Clearance

(Valve guide clearance) = (Valve guide inner diameter) – (Valve stem diameter)

Valve guide clearance:

Standard

Intake : 0.020 - 0.053 mm (0.0008 - 0.0021 in)

Exhaust : 0.030 - 0.056 mm (0.0012 - 0.0022 in)

Limit

Intake : 0.08 mm (0.0031 in)

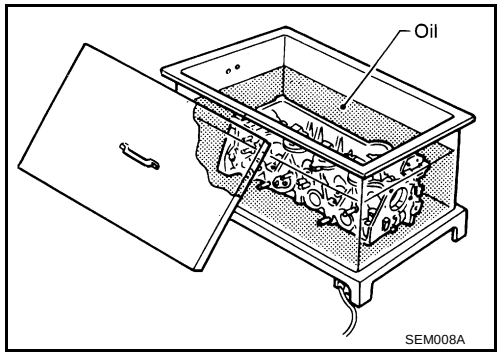
Exhaust : 0.09 mm (0.0035 in)

- If it exceeds the limit, replace valve and/or valve guide. When valve guide must be replaced, refer to EM-97, "VALVE GUIDE REPLACEMENT" .

VALVE GUIDE REPLACEMENT

When valve guide is removed, replace with Oversize (Service) [0.2 mm (0.008 in)] valve guide.

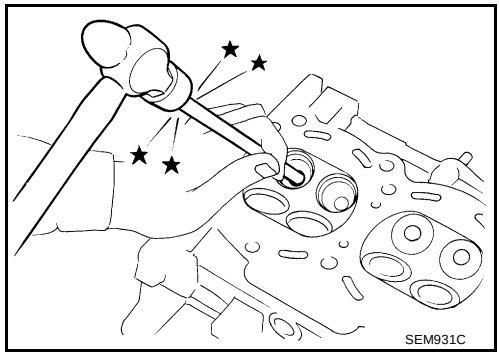
1. To remove valve guide, heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



2. Drive out valve guide with a press [under a 20 kN (2 ton, 2.2 US ton, 2.0 lmp ton) pressure] or hammer and suitable tool.

WARNING:

Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.

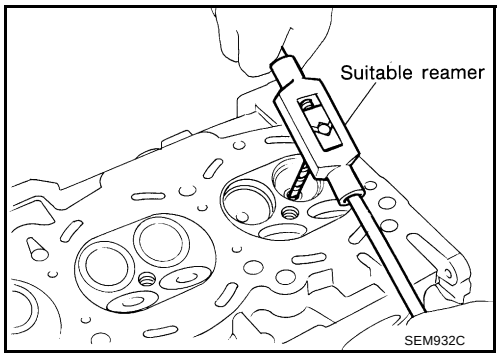


3. Using valve guide reamer (commercial service tool), ream cylinder head valve guide hole.

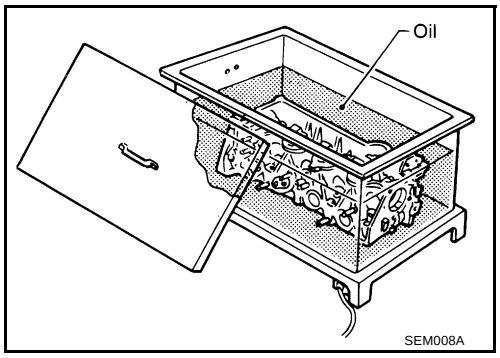
Valve guide hole diameter (for service parts):

Intake and exhaust

: 10.175 - 10.196 mm (0.4006 - 0.4014 in)



4. Heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



5. Using valve guide drift (commercial service tool), press valve guide from camshaft side to the dimensions as in the figure.

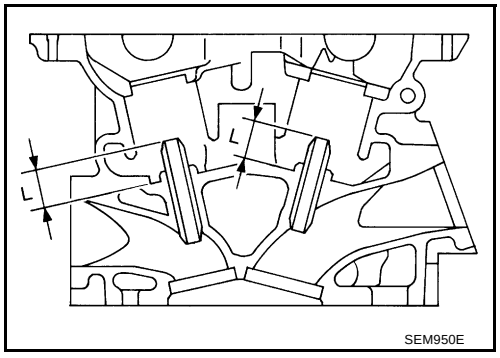
Projection "L"

Intake and exhaust

: 12.6 - 12.8 mm (0.496 - 0.504 in)

WARNING:

Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.

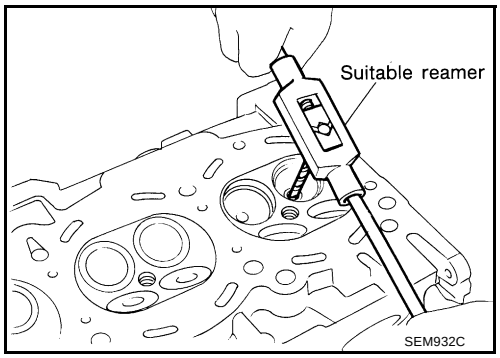


6. Using valve guide reamer (commercial service tool), apply reamer finish to valve guide.

Standard:

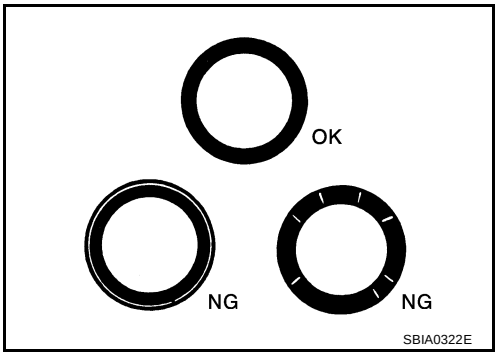
Intake and exhaust

: 6.000 - 6.018 mm (0.2362 - 0.2369 in)



VALVE SEAT CONTACT

- After confirming that the dimensions of valve guides and valves are within the specifications, perform this procedure.
- Apply prussian blue (or white lead) onto contacting surface of valve seat to check the condition of the valve contact on the surface.
- Check if the contact area band is continuous all around the circumference.
- If not, grind to adjust valve fitting and check again. If the contacting surface still has “NG” conditions even after the re-check, replace valve seat. Refer to EM-99, "VALVE SEAT REPLACEMENT" .



VALVE SEAT REPLACEMENT

When valve seat is removed, replace with Oversize (Service) [0.5 mm (0.020 in)] valve seat.

1. Bore out old seat until it collapses. Boring should not continue beyond the bottom face of the seat recess in cylinder head. Set the machine depth stop to ensure this. Refer to EM-141, "Valve Seat" .

   CAUTION:

   Prevent to scratch cylinder head by excessive boring.

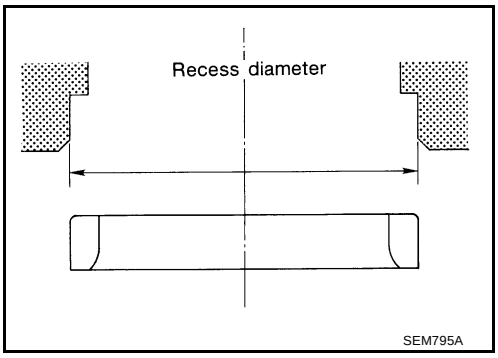
2. Ream cylinder head recess diameter for service valve seat.

   Oversize (Service) [0.5 mm (0.020 in)]

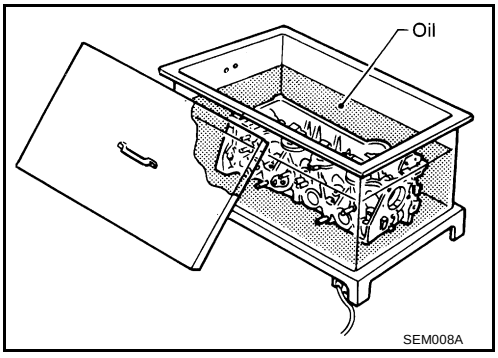
   Intake : 38.500 - 38.516 mm (1.5157 - 1.5164 in)

   Exhaust : 32.100 - 32.116 mm (1.2638 - 1.2644 in)

   - Be sure to ream in circles concentric to valve guide center. This will enable valve to fit correctly.



3. Heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil.



4. Provide valve seats cooled well with dry ice. Force fit valve seat into cylinder head.

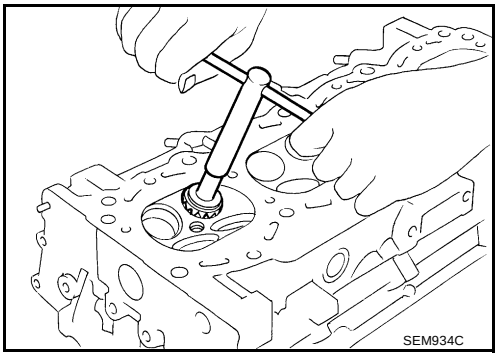
   WARNING:

   - **Avoid directly touching cold valve seats.**
   - **Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.**

5. Using valve seat cutter set (commercial service tool) or valve seat grinder, finish seat to the specified dimensions. Refer to EM-141, "Valve Seat" .

   CAUTION:

   When using valve seat cutter, firmly grip cutter handle with both hands. Then, press on the contacting surface all around the circumference to cut in a single drive. Improper pressure on with cutter or cutting many different times may result in stage valve seat.



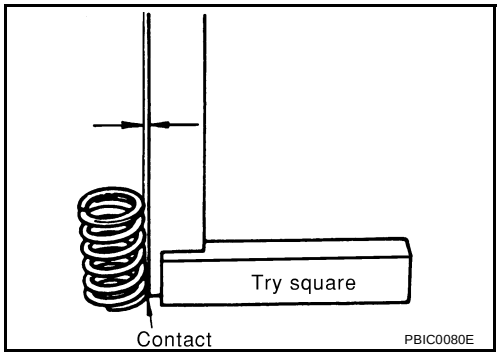
6. Using compound, grind to adjust valve fitting.
7. Check again for normal contact. Refer to EM-99, "VALVE SEAT CONTACT" .

VALVE SPRING SQUARENESS

- Set try square along the side of valve spring and rotate spring. Measure the maximum clearance between the top face of spring and try square.

  Limit: : 1.9 mm (0.075 in)

- If it exceeds the limit, replace valve spring.



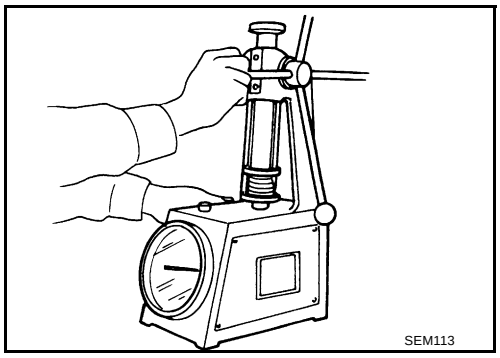
VALVE SPRING DIMENSIONS AND VALVE SPRING PRESSURE LOAD

- Check valve spring pressure at specified spring height.

Standard:

Intake and exhaust

Free height	**: 43.85 mm (1.7264 in)**
Installation height	**: 37.0 mm (1.457 in)**
Installation load	**: 166 – 188 N (16.9 – 19.2 kg, 37 – 42 lb)**
Height during valve open	**: 26.8 mm (1.055 in)**
Load with valve open	**: 502 – 566 N (51.2 – 57.7 kg, 113 – 127 lb)**



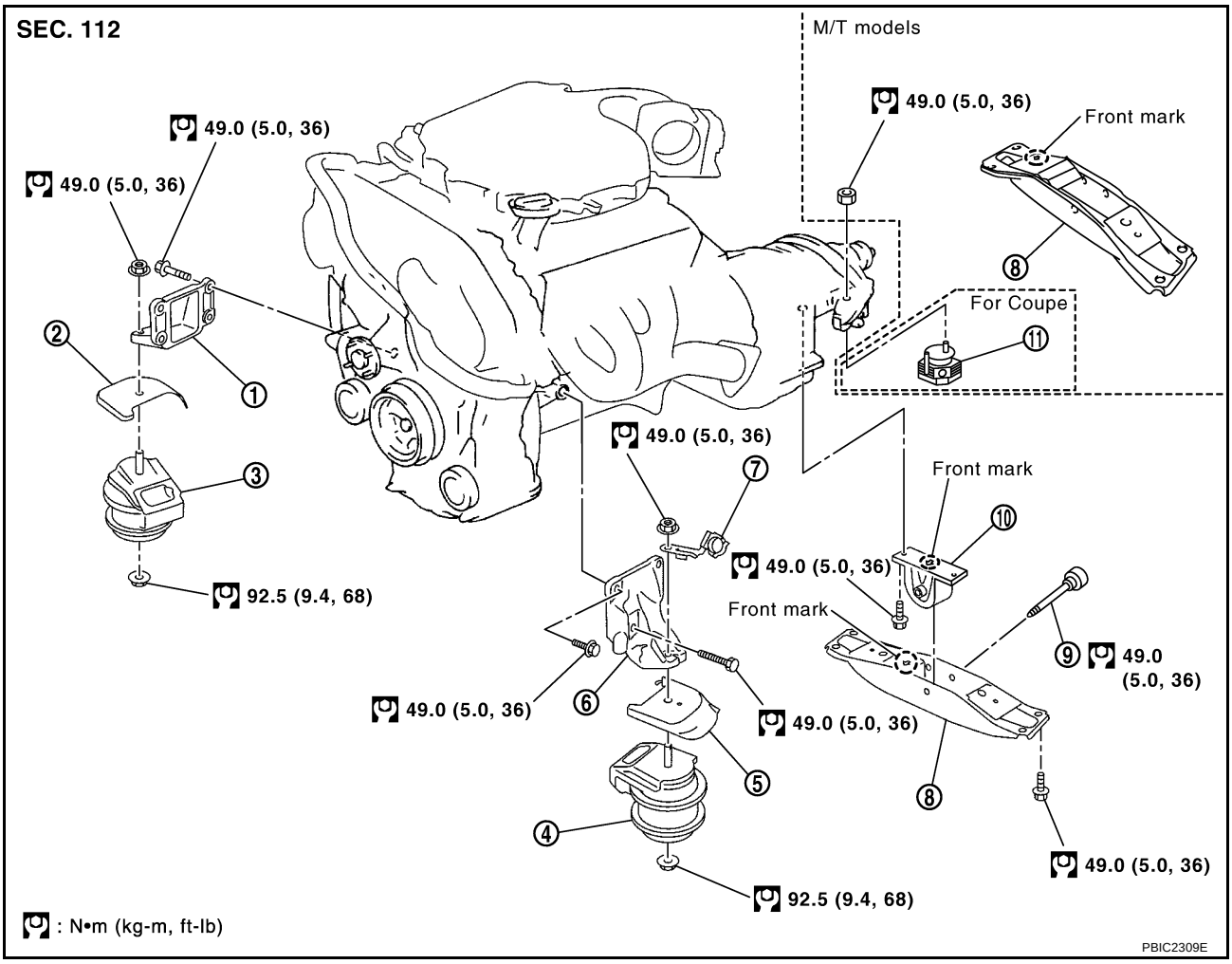
- If the installation load or load with valve open is out of the standard, replace valve spring.

ENGINE ASSEMBLY

PFP:10001

Removal and Installation

NBS00012



1. Engine mounting bracket (RH)
2. Heat insulator (RH)
3. Engine mounting Insulator (RH)
4. Engine mounting insulator (LH)
5. Heat insulator (LH)
6. Engine mounting bracket (LH)
7. Harness bracket
8. Rear engine mounting member
9. Mass damper
10. Engine mounting insulator (rear)
11. Dynamic damper

WARNING:

- **Situate vehicle on a flat and solid surface.**
- **Place chocks at front and back of rear wheels.**
- **For engines not equipped with engine slingers, attach proper slingers and bolts described in PARTS CATALOG.**

CAUTION:

- **Always be careful to work safely, avoid forceful or uninstructed operations.**
- **Do not start working until exhaust system and engine coolant are cool enough.**
- **If items or work required are not covered by the engine section, refer to the applicable sections.**
- **Always use the support point specified for lifting.**
- **Use either 2-pole lift type or separate type lift as best you can. If board-on type is used for unavoidable reasons, support at the rear axle jacking point with transmission jack or similar tool before starting work, in preparation for the backward shift of center of gravity.**
- **For supporting points for lifting and jacking point at rear axle, refer to GI-39, "Garage Jack and Safety Stand" .**

REMOVAL

Outline

At first, remove engine and transmission assembly with front suspension member from vehicle downward. Then separate engine from transmission.

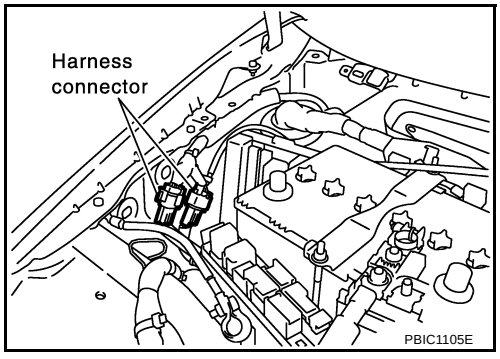
Preparation

1. Release fuel pressure. Refer to EC-79, "FUEL PRESSURE RELEASE" .
2. Drain engine coolant from radiator. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:
   - **Perform this step when engine is cold.**
   - **Do not spill engine coolant on drive belts.**
3. Disconnect both battery cables. Refer to SC-4, "BATTERY" .
4. Remove the following parts:
   - Tower bar: Refer to FSU-20, "TOWER BAR" .
   - Engine cover: Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
   - Cowl top cover (RH): Refer to EI-20, "COWL TOP" .
   - Undercover
   - Drive belts: Refer to EM-12, "DRIVE BELTS" .
   - Front road wheels and tires
5. Remove air cleaner case and air duct. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
6. Discharge refrigerant from A/C circuit. Refer to ATC-123, "REFRIGERANT LINES" .
7. Remove radiator cooling fan assembly, reservoir tank and hoses. Refer to CO-21, "COOLING FAN" and CO-13, "RADIATOR" .

Engine Room

1. Disconnect heater hose at engine-side, and fit a plug onto hose end to prevent engine coolant leak.
2. Disconnect ground cable (between vehicle to left cylinder head).
3. Disconnect battery positive cable harness at vehicle side and temporarily fasten it on engine.
4. Disconnect A/C piping from A/C compressor, and temporarily fasten it on vehicle with a rope.
5. Remove engine room harness connectors as shown in the figure.



6. Disconnect two body ground cables.
7. Disconnect brake booster vacuum hose.
8. Disconnect fuel feed hose (with damper) and EVAP hose. Refer to EM-34, "FUEL INJECTOR AND FUEL TUBE" .

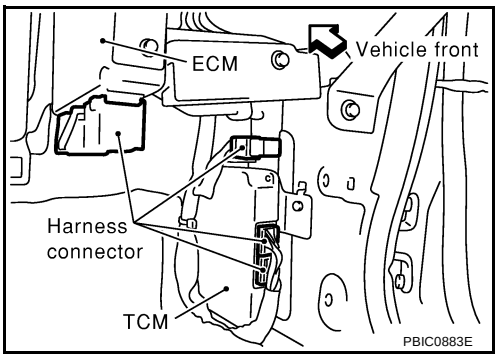
   CAUTION:
   Fit plugs onto disconnected hoses to prevent fuel leak.
9. Remove reservoir tank of power steering oil pump, and piping from vehicle, and temporarily secure them on engine.

   CAUTION:
   When temporarily securing, keep the reservoir tank upright to avoid a fluid leak.

Passenger Room Side

Follow procedure below to disconnect engine room harness connectors at passenger room side, and temporarily secure them on engine.

1. Remove passenger-side kicking plate inner, dash side finisher, and instrument passenger panel lower. Refer to EI-35, "BODY SIDE TRIM" and IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect engine room harness connectors at unit sides TCM (A/T models), ECM and other.



3. Disengage intermediate fixing point. Pull out engine room harnesses to engine room side, and temporarily secure them on engine.

CAUTION:

- **When pulling out harnesses, take care not to damage harnesses and connectors.**
- **After temporarily securing, cover connectors with vinyl or similar material to protect against foreign material adhesion.**

Vehicle Underbody

1. Remove exhaust front tube. Refer to EX-3, "EXHAUST SYSTEM" .
2. Disconnect steering lower joint at power steering gear assembly side, and release steering lower shaft. Refer to PS-10, "STEERING COLUMN" .
3. Remove propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

CAUTION:

Do not impact or damage propeller shaft tube.

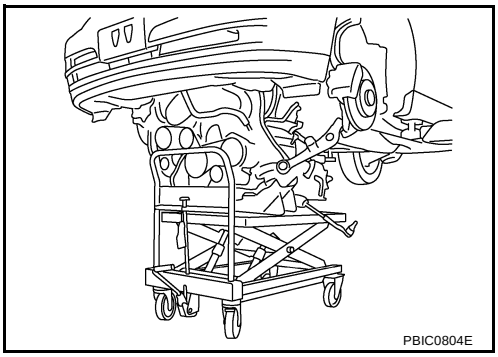
4. Disengage shift lever and remove clutch tube (M/T models). Refer to MT-18, "TRANSMISSION ASSEMBLY" and CL-15, "CLUTCH PIPING" .
5. Disengage A/T control rod at control device assembly side. Then, temporarily secure it on transmission, so that it does not sag (A/T models). Refer to AT-204, "SHIFT CONTROL SYSTEM" .
6. Remove rear plate cover from oil pan (upper). Then remove bolts fixing drive plate to torque converter (A/T models). Refer to EM-26, "OIL PAN AND OIL STRAINER" and AT-242, "TRANSMISSION ASSEMBLY" .
7. Remove bolts fixing transmission to lower rear side of oil pan (upper). Refer to MT-18, "TRANSMISSION ASSEMBLY" (M/T models) or AT-242, "TRANSMISSION ASSEMBLY" (A/T models).
8. Remove front stabilizer. Refer to FSU-18, "STABILIZER BAR" .
9. Separate steering outer sockets from steering knuckle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
10. Separate transverse links from suspension member and vehicle body. Refer to FSU-13, "TRANSVERSE LINK" .

Removal Work

1. Use a manual lift table caddy (commercial service tool) or equivalently rigid tool such as transmission jack. Securely support bottom of suspension member and transmission.

CAUTION:

Put a piece of wood or something similar as the supporting surface, secure a completely stable condition.



2. Remove front cross bar. Refer to FSU-5, "FRONT SUSPENSION ASSEMBLY" .

3. Remove rear engine mounting member bolts.
4. Remove front suspension member mounting nuts. Refer to FSU-5, "FRONT SUSPENSION ASSEMBLY" .
5. Carefully lower jack, or raise lift to remove the engine, transmission and front suspension member assembly. When performing work, observe the following caution:

CAUTION:

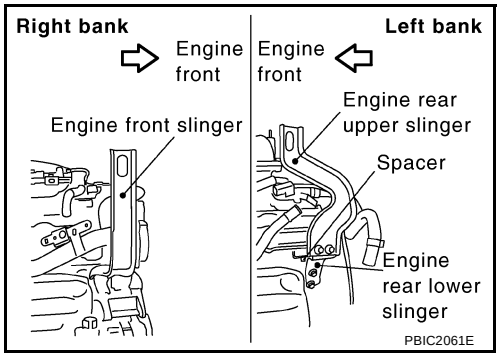
- **Confirm there is no interference with the vehicle.**
- **Make sure that all connection points have been disconnected.**
- **Keep in mind the center of the vehicle gravity changes. If necessary, use jack(s) to support the vehicle at rear jacking point(s) to prevent it from falling it off the lift.**

Separation Work

1. Install engine slingers into front of cylinder head (right bank) and rear of cylinder head (left bank).

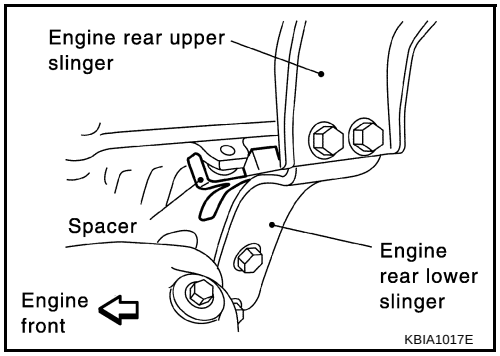
Slinger bolts:

: 28.0 N·m (2.9 kg-m, 21 ft-lb)



- To protect rocker cover against damage caused by tilting of engine slinger, insert spacer between cylinder head and engine rear lower slinger, in direction shown in the figure.

NOTE:
Spacer is a component part of engine rear upper slinger assembly.



2. Remove power steering oil pump from engine side. Refer to PS-28, "POWER STEERING OIL PUMP" .
3. Remove engine mounting insulators (RH and LH) under side nut.
4. Lift with hoist and separate engine and transmission assembly from front suspension member.

CAUTION:

- **Before and during this lifting, always make sure that any harnesses are left connected.**
- **Avoid damage to and oil/grease smearing or spills onto engine mounting insulator.**

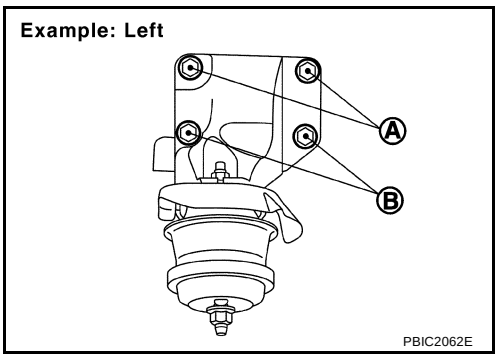
5. Remove alternator. Refer to SC-20, "CHARGING SYSTEM" .
6. Remove A/C compressor. Refer to ATC-125, "Removal and Installation of Compressor" .
7. Remove starter motor. Refer to SC-8, "STARTING SYSTEM" .
8. Separate engine from transmission. Refer to MT-18, "TRANSMISSION ASSEMBLY" (M/T models) or AT-242, "TRANSMISSION ASSEMBLY" (A/T models).
9. Remove engine mounting insulators (RH and LH) and brackets (RH and LH) from engine.
10. Remove rear engine mounting member and engine mounting insulator (rear) from transmission.

INSTALLATION

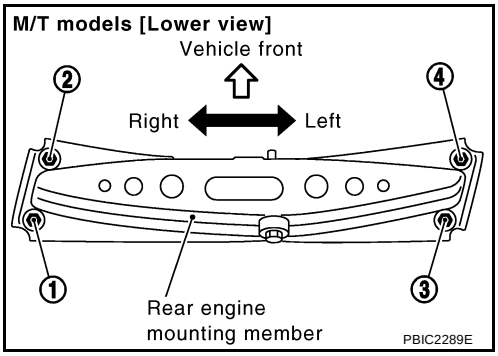
Note the following, and install in the reverse order of removal.

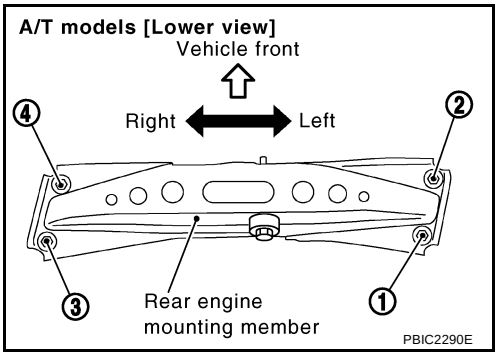
- Do not allow engine mounting insulator to be damage and careful no engine oil gets on it.
- For a location with a positioning pin, insert it securely into hole of mating part.
- For a part with a specified installation orientation, refer to component figure in EM-101, "Removal and Installation" .

- When installing engine mounting brackets (RH and LH) on cylinder block, tighten two upper bolts (shown as “A” in the figure) first. Then tighten two lower bolts (shown as “B” in the figure).



- Make sure all engine mounting insulators are seated properly, then tighten mounting nuts.
- Tighten rear engine mounting member bolts in numerical order as shown in the figure.





INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Use procedure below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items	Before starting engine	Engine running	After engine stopped
Engine coolant	Level	Leakage	Level
Engine oil	Level	Leakage	Level
Other oils and fluid*	Level	Leakage	Level
Fuel	Leakage	Leakage	Leakage
Exhaust gases	—	Leakage	—

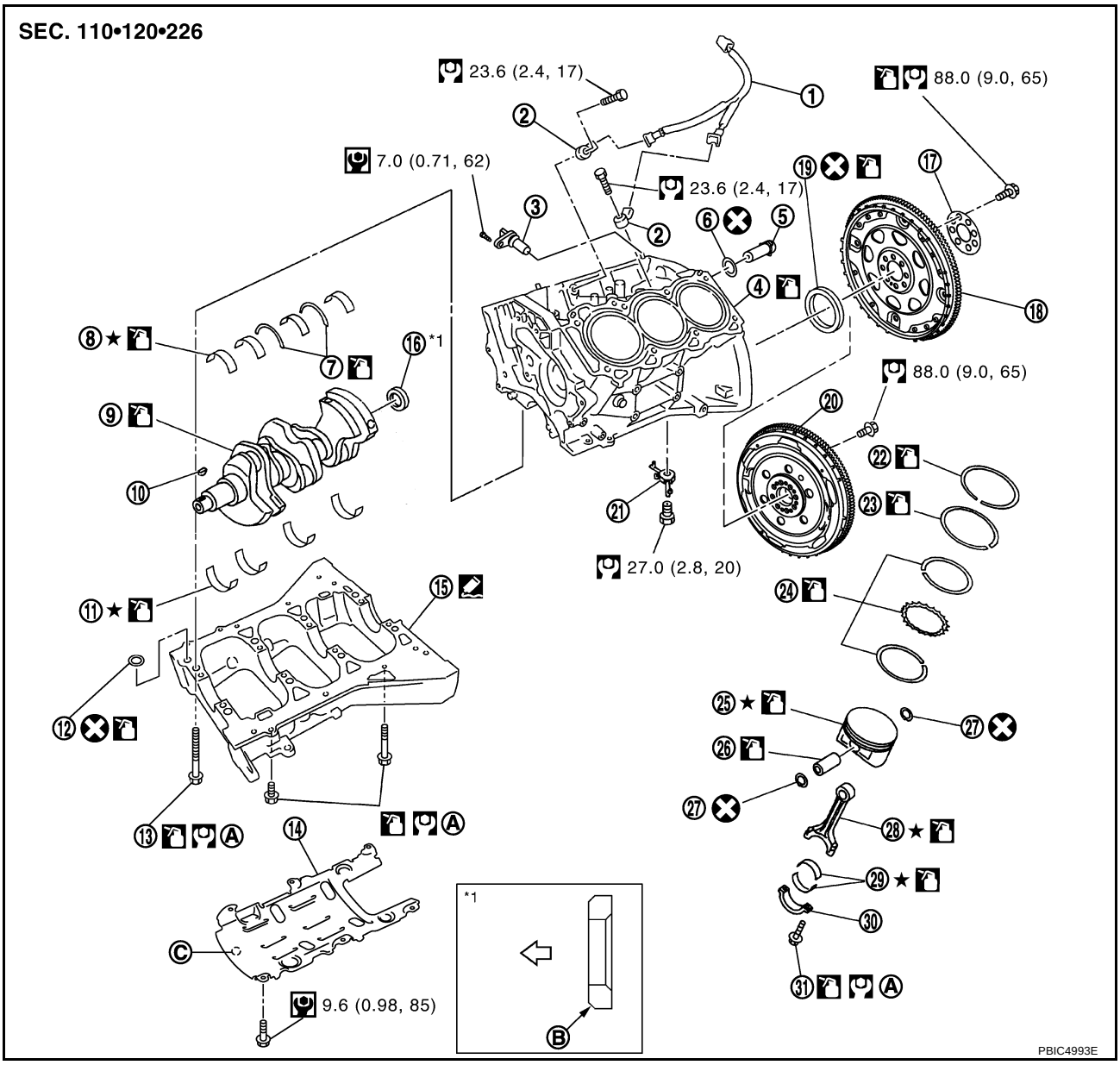
* Transmission/transaxle/CVT fluid, power steering fluid, brake fluid, etc.

CYLINDER BLOCK

PFP:11010

Disassembly and Assembly

NBS00013



1. Sub harness	2. Knock sensor	3. Crankshaft position sensor
4. Cylinder block	5. Cylinder block heater (for Canada)	6. O-ring
7. Thrust bearing	8. Main bearing (upper)	9. Crankshaft
10. Crankshaft key	11. Main bearing (lower)	12. O-ring
13. Lower cylinder block bolt	14. Baffle plate	15. Lower cylinder block
16. Pilot converter	17. Reinforcement plate	18. Drive plate (A/T models)
19. Rear oil seal	20. Fly wheel (M/T models)	21. Oil jet
22. Top ring	23. Second ring	24. Oil ring
25. Piston	26. Piston pin	27. Snap ring
28. Connecting rod	29. Connecting rod bearing	30. Connecting rod bearing cap
31. Connecting rod bolt		
A. Refer to EM-111	B. Chamfered	C. Front mark
⇦ Crankshaft side		

- Refer toGI-11, "Components" for symbol marks in the figure.

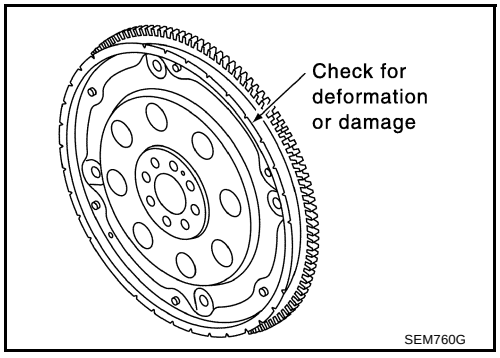
DISASSEMBLY

1. Remove engine assembly from vehicle, and separate front suspension member and transmission from engine. Refer to EM-101, "ENGINE ASSEMBLY" .
2. Remove engine mounting brackets (RH and LH). Refer to EM-101, "ENGINE ASSEMBLY" .
3. Remove the parts that may restrict installation of engine to widely use engine stand.

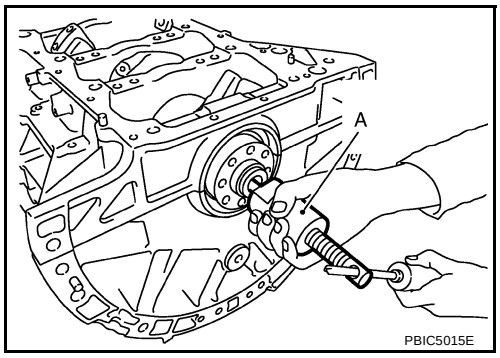
   NOTE:
   The procedure is described assuming that you use a widely use engine stand holding the surface, to which transmission is installed.

   - Remove clutch cover and clutch disk (M/T models). Refer to CL-16, "CLUTCH DISC, CLUTCH COVER" .
   - Remove flywheel (M/T models) or drive plate (A/T models). Fix crankshaft with a ring gear stopper [SST: KV10118600 (J-48641)], and remove mounting bolts.
   - Loosen mounting bolts in diagonal order.
   - Check for deformation or damage (A).

   CAUTION:
   - **Do not disassemble drive plate.**
   - **Never place drive plate with signal plate facing down.**
   - **When handling signal plate, take care not to damage or scratch it.**
   - **Handle signal plate in a manner that prevents it from becoming magnetized.**



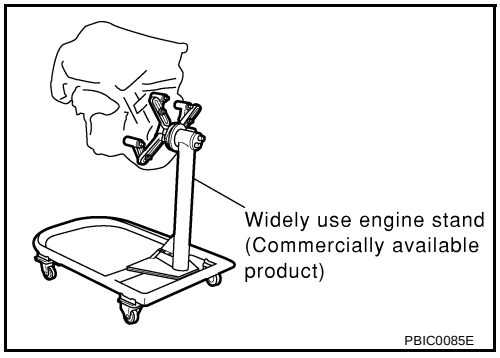
4. Remove pilot bushing (M/T models) or pilot converter (A/T models) using pilot bushing puller [SST: ST16610001 (J-23907)] (A) or suitable tool as necessary.



5. Lift the engine with hoist to install it onto the widely use engine stand.
   - A widely use engine stand can be used.

   CAUTION:
   Use engine stand that has a load capacity [approximately 220 kg (485 lb) or more] large enough for supporting the engine weight.

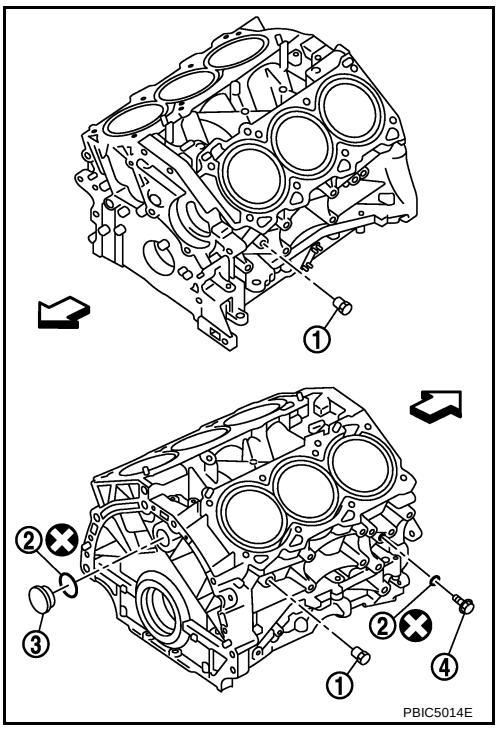
   NOTE:
   This example is engine stand for holding at transmission mounting side with flywheel (M/T models) or drive plate (A/T models) removed.



6. Drain engine oil. Refer to LU-7, "Changing Engine Oil" .

7. Drain engine coolant by removing water drain plugs (1, 4) from cylinder block both sides as shown in the figure.

   2 : Washer
   3 : Plug
   ⇦ : Engine front

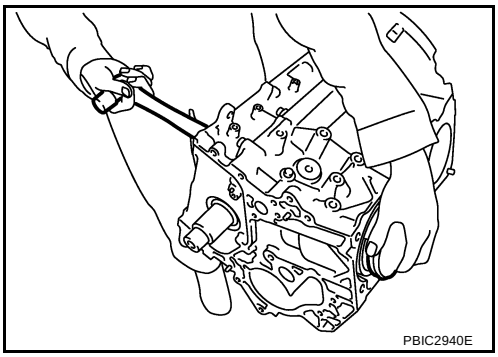


8. Remove oil pan (upper, lower). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
9. Remove front timing chain case, timing chain and rear timing chain case. Refer to EM-53, "TIMING CHAIN" .
10. Remove cylinder head. Refer to EM-89, "CYLINDER HEAD" .
11. Remove knock sensor.

    CAUTION:
    Carefully handle sensor avoiding shocks.
12. Remove rear oil seal.
13. Remove baffle plate from lower cylinder block.
14. Remove piston and connecting rod assembly as follows:
    - Before removing piston and connecting rod assembly, check the connecting rod side clearance. Refer to EM-125, "CONNECTING ROD SIDE CLEARANCE" .

a. Position crankshaft pin corresponding to connecting rod to be removed onto the bottom dead center.
b. Remove connecting rod bearing cap.
c. Using hammer handle or similar tool, push piston and connecting rod assembly out to the cylinder head side.

   CAUTION:
   Be careful not to damage the cylinder wall and crankshaft pin, resulting from an interference of the connecting rod big end.



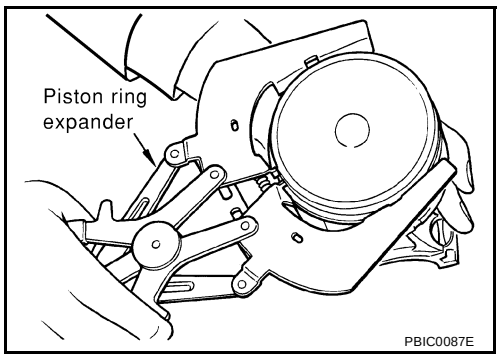
15. Remove connecting rod bearings from connecting rod and connecting rod bearing cap.

    CAUTION:
    Identify installation position, and store them without mixing them up.
16. Remove piston rings form piston.
    - Before removing piston rings, check the piston ring side clearance. Refer to EM-126, "PISTON RING SIDE CLEARANCE" .

- Use piston ring expander (commercial service tool).

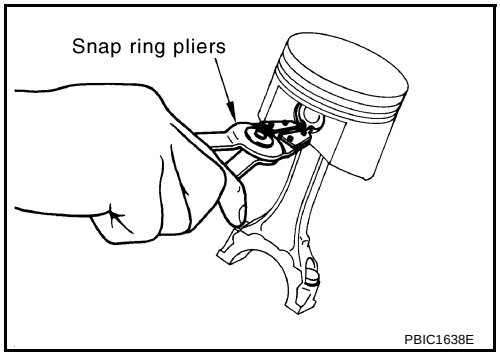
CAUTION:

- **When removing piston rings, be careful not to damage piston.**
- **Be careful not to damage piston rings by expanding them excessively.**

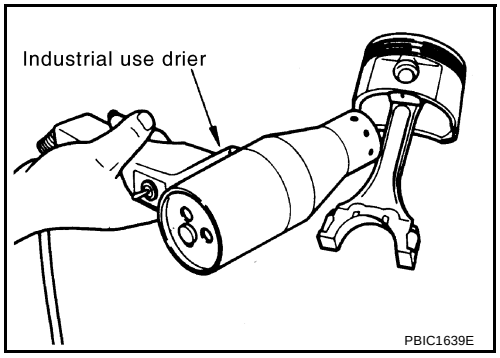


17. Remove piston from connecting rod as follows:

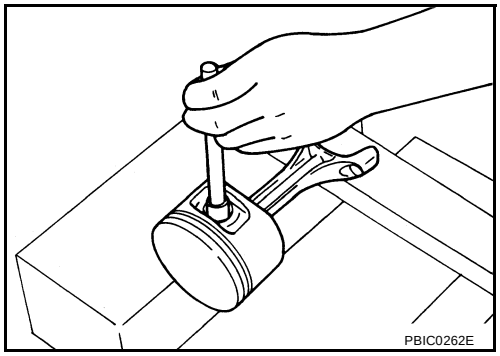
a. Using snap ring pliers, remove snap ring.



b. Heat piston to 60 to 70°C (140 to 158°F) with industrial use drier or equivalent.



c. Push out piston pin with stick of outer diameter approximately 20 mm (0.79 in).

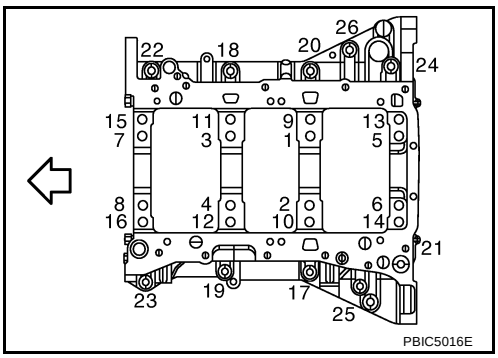


18. Remove lower cylinder block bolts.

NOTE:
Use TORX socket (size E14).

- Before loosening lower cylinder block bolts, measure the crankshaft end play. Refer to EM-125, "CRANKSHAFT END PLAY" .
- Loosen lower cylinder block bolts in reverse order shown in the figure in several different steps.

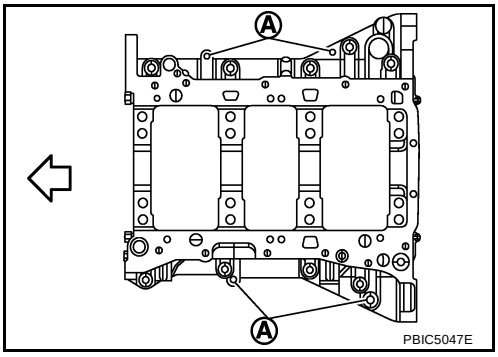
⇦ : Engine front



19. Remove lower cylinder block as follows:
Screw M8 bolt [Pitch: 1.25 mm (0.049 in), Length: approx. 50 mm (1.97 in)] into bolt holes (A) shown in the figure. Then equally tighten each bolt, and remove lower cylinder block.

⇦ : Engine front

CAUTION:
- **Be careful not to damage the mating surface.**
- **Do not tighten bolts too much.**
- **Do not insert screw driver, this will damage the mating surface.**



20. Remove crankshaft.
21. Pull rear oil seal out from rear end of crankshaft.
22. Remove main bearings and thrust bearings from cylinder block and lower cylinder block.

CAUTION:
- **Identify installation positions, and store them without mixing them up.**
- **Be careful not to drop main bearing, and to scratch the surface.**

23. Remove oil jet.

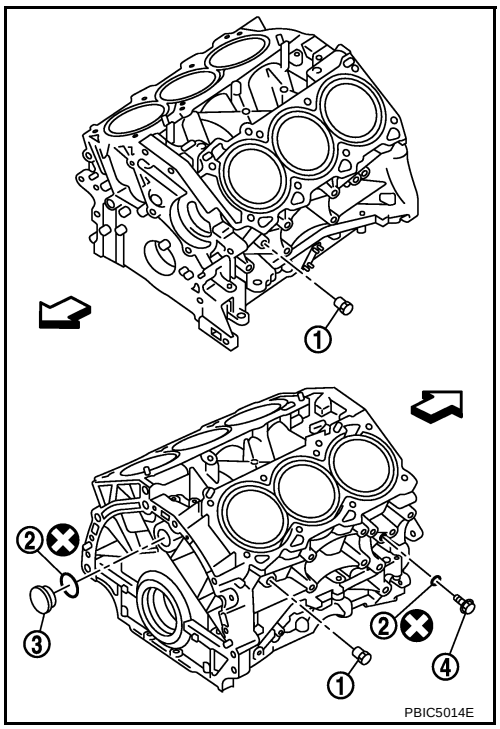
ASSEMBLY

1. Fully air-blow engine coolant and engine oil passages in cylinder block, cylinder bore and crankcase to remove any foreign material.

CAUTION:
Use a goggles to protect your eye.

2. Install each plug to cylinder block as shown in the figure.
   - Apply sealant to the thread of water drain plug (1).
     Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Apply sealant to the thread of plugs (3) and (4).
     Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Replace washers (2) with new one.

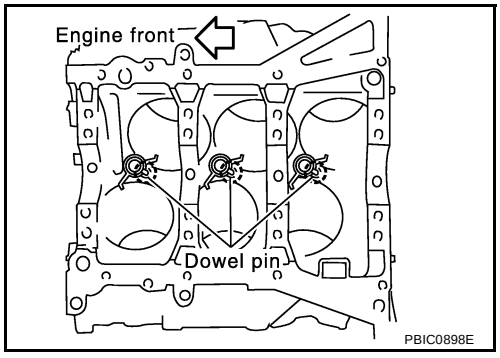
   ⇦ : Engine front



   - Tighten each plug as specified below.

Part	Washer	Tightening torque
1	No	19.6 N·m (2.0 kg-m, 14 in-lb)
3	Yes	78.0 N·m (8.0 kg-m, 58 ft-lb)
4	Yes	12.3 N·m (1.3 kg-m, 9 ft-lb)

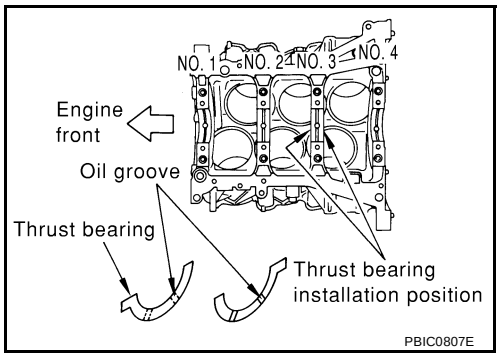
3. Install oil jet.
   - Insert oil jet dowel pin into cylinder block dowel pin hole, and tighten mounting bolts.



4. Install main bearings and thrust bearings as follows:

a. Remove dust, dirt, and engine oil on bearing mating surfaces of cylinder block and lower cylinder block.

b. Install thrust bearings to the both sides of the No. 3 journal housing on cylinder block.
   - Install thrust bearings with the oil groove facing crankshaft arm (outside).
   - Install thrust bearing with a protrusion on one end on cylinder block. Align each protrusion with mating notch.

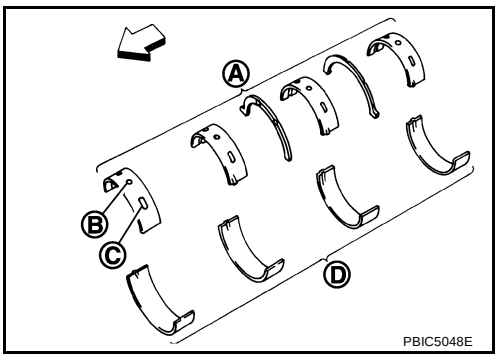


c. Install main bearings paying attention to the direction.

A : Cylinder block side

D : Lower cylinder block side

⇦ : Engine front



- Main bearing with oil hole (B) and groove (C) goes on cylinder block. The one without them goes on lower cylinder block.
- Before installing main bearings, apply engine oil to the bearing surface (inside). Do not apply engine oil to the back surface, but thoroughly clean it.
- When installing, align main bearing stopper protrusion to cut-out of cylinder block and lower cylinder block.
- Ensure the oil holes on cylinder block and those on the corresponding bearing are aligned.

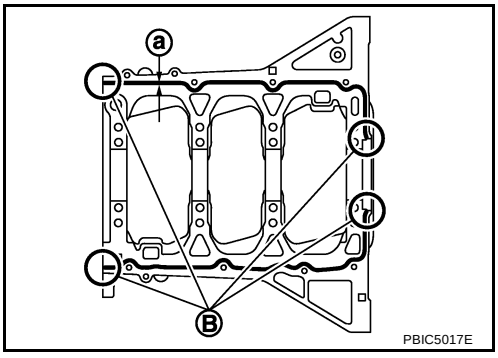
5. Install crankshaft to cylinder block.
   - While turning crankshaft by hand, check that it turns smoothly.
6. Install lower cylinder block.

NOTE:
Lower cylinder block cannot be replaced as a single part, because it is machined together with cylinder block.

- Apply a continuous bead of liquid gasket with the tube presser [SST: WS39930000(—)] to lower cylinder block as shown in the figure.

a : 3.5 – 4.5 mm (0.138 – 0.177 in) dia

b : Apply to end



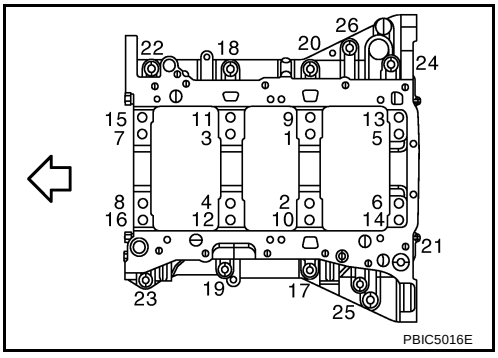
7. Inspect the outer diameter of lower cylinder block bolt. Refer to EM-133, "LOWER CYLINDER BLOCK BOLT OUTER DIAMETER" .
8. Install lower cylinder block bolts in numerical order as shown in the figure as follows:

a. Apply new engine oil to threads and seat surfaces of lower cylinder block bolts.

b. Tighten lower cylinder block bolt (No.17 to 26) in numerical order as shown in the figure.

: 25.0 N·m (2.6 kg-m, 18 ft-lb)

⇦ : Engine front



c. Repeat step b.

d. Tighten lower cylinder block bolts (No.1 to 16) in numerical order as shown in the figure.

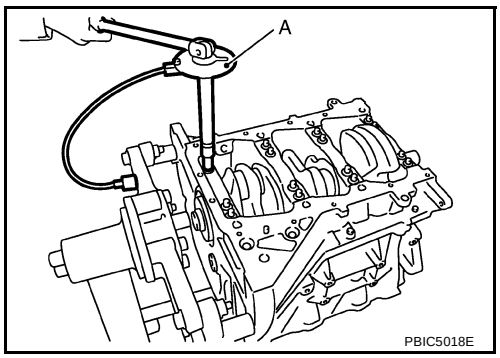
NOTE:
Use TORX socket (size E14) for bolts No.1 to 16.

: 35.3 N·m (3.6 kg-m, 26 ft-lb)

e. Turn lower cylinder block bolts (No.1 to 16) 90 degrees clockwise (angle tightening).

CAUTION:

Use the angle wrench [SST: KV10112100 (BT8653-A)] (A) to check tightening angle. Do not make judgment by visual inspection.

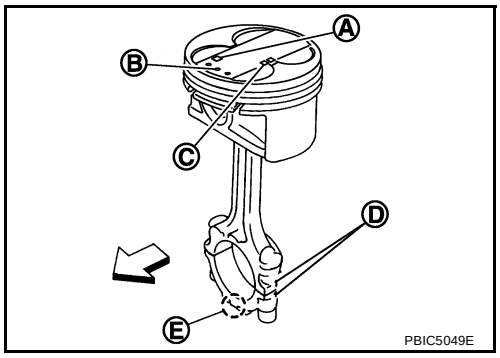


- After installing lower cylinder block bolts, make sure that crankshaft can be rotated smoothly by hand.
- Check the crankshaft end play. Refer to EM-125, "CRANKSHAFT END PLAY" .

9. Install piston to connecting rod as follows:

a. Using snap ring pliers, install new snap ring to the groove of piston rear side.
   - Insert it fully into groove to install.

b. Install piston to connecting rod.
   - Using industrial use drier or similar tool, heat piston until piston pin can be pushed in by hand without excess force [approx. 60 to 70°C (140 to 158°F)]. From the front to the rear, insert piston pin into piston and connecting rod.
   - Assemble so that the front mark on the piston head and the cylinder number on connecting rod are positioned as shown in the figure.



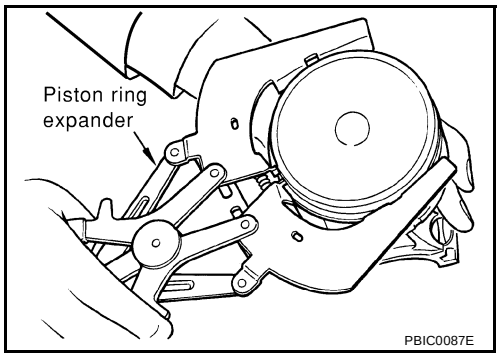
A	: Piston grade number
B	: Front mark
C	: Pin grade number
D	: Cylinder number
E	: Front mark
⇦	: Engine front

c. Install new snap ring to the groove of the piston front side.
   - Insert it fully into groove to install.
   - After installing, make sure that connecting rod moves smoothly.

10. Using piston ring expander (commercial service tool), install piston rings.

CAUTION:

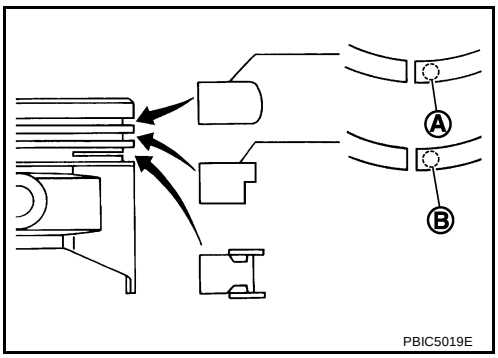
- **When installing piston rings, be careful not to damage piston.**
- **Be careful not to damage piston rings by expending them excessively.**



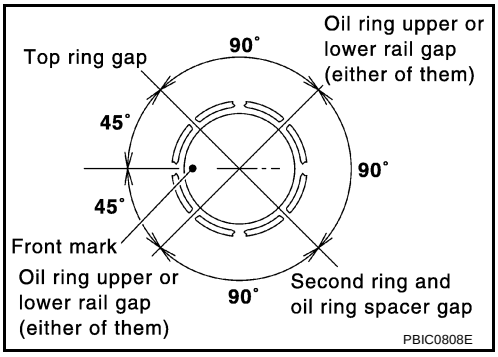
- If there is stamped mark on ring, mount it with marked side up.

Stamped mark:

Top ring (A)	**: 1N**
Second ring (B)	**: 2N**

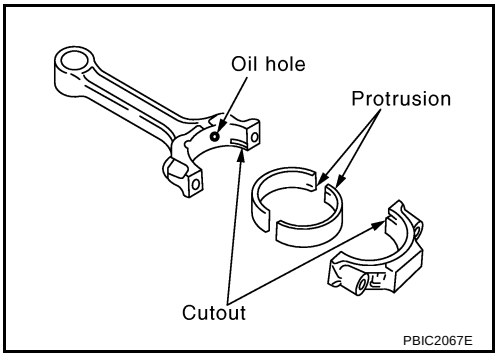


- Mount second ring with cut out side down.
- Position each ring with the gap as shown in the figure referring to the piston front mark.



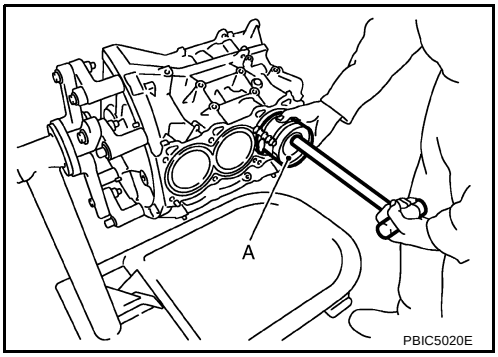
- Check the piston ring side clearance. Refer to EM-126, "PISTON RING SIDE CLEARANCE" .

11. Install connecting rod bearings to connecting rod and connecting rod bearing cap.
    - Before installing connecting rod bearings, apply engine oil to the bearing surface (inside). Do not apply engine oil to the back surface, but thoroughly clean it.
    - When installing, align connecting rod bearing stopper protrusion with cutout of connecting rods and connecting rod bearing caps to install.
    - Ensure the oil hole on connecting rod and that on the corresponding bearing are aligned.

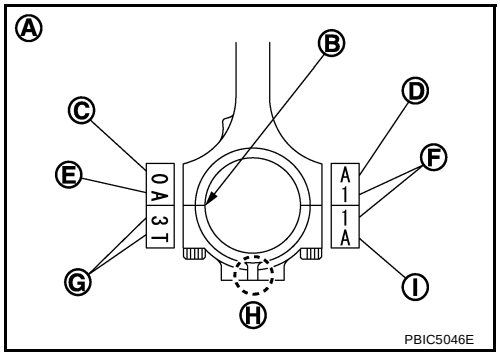


12. Install piston and connecting rod assembly to crankshaft.
    - Position crankshaft pin corresponding to connecting rod to be installed onto the bottom dead center.
    - Apply engine oil sufficiently to the cylinder bore, piston and crankshaft pin journal.
    - Match the cylinder position with the cylinder number on connecting rod to install.
    - Be sure that front mark on piston head is facing front of engine.
    - Using piston ring compressor [SST: EM03470000 (J8037)] (A) or suitable tool, install piston with the front mark on the piston head facing the front of engine.

CAUTION:
Be careful not to damage the cylinder wall and crankshaft pin, resulting from an interference of the connecting rod big end.



13. Install connecting rod bearing cap.
    - Match the stamped cylinder number marks on connecting rod with those on connecting rod bearing cap to install.
    - Be sure that front mark (H) on connecting rod bearing cap is facing front of engine.



A : Sample code
B : Bearing stopper groove
C : Small-end diameter grade
D : Big end diameter grade
E : Weight grade
F : Cylinder No.
G : Management code
I : Management code

14. Inspect the outer diameter of connecting rod bolt. Refer to EM-133, "LOWER CYLINDER BLOCK BOLT OUTER DIAMETER" .
15. Tighten connecting rod bolts as follows:

a. Apply engine oil to the threads and seats of connecting rod bolts.

b. Tighten connecting rod bolts.

: 28.4 N·m (2.9 kg-m, 21 ft-lb)

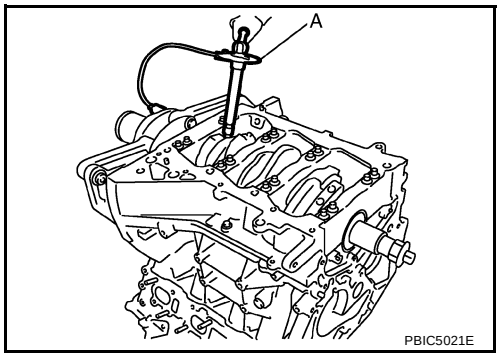
c. Completely loosen connecting rod bolts.

: 0 N·m (0 kg-m, 0 ft-lb)

d. Tighten connecting rod bolts.

: 24.5 N·m (2.5 kg-m, 18 ft-lb)

e. Then turn connecting rod bolts 90 degrees clockwise (angle tightening).



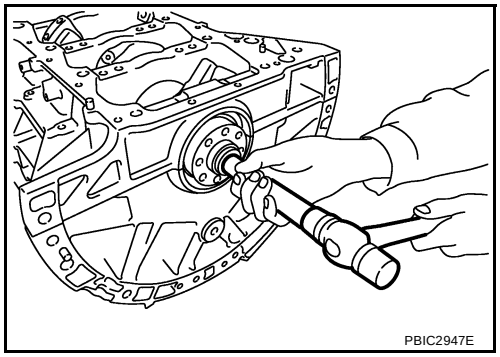
CAUTION:

Use angle wrench [SST: KV10112100 (BT8653-A)] (A) to check tightening angle. Do not make judgment by visual inspection.

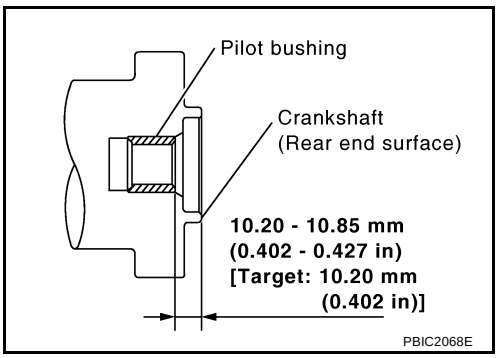
- After tightening connecting rod bolts, make sure that crankshaft rotates smoothly.
- Check the connecting rod side clearance. Refer to EM-125, "CONNECTING ROD SIDE CLEARANCE" .

16. Install baffle plate.
17. Install new rear oil seal. Refer to EM-86, "OIL SEAL" .
18. Install pilot bushing (M/T models) or pilot converter (A/T models).
    - With drift of the following outer diameter, press-fit as far as it will go.

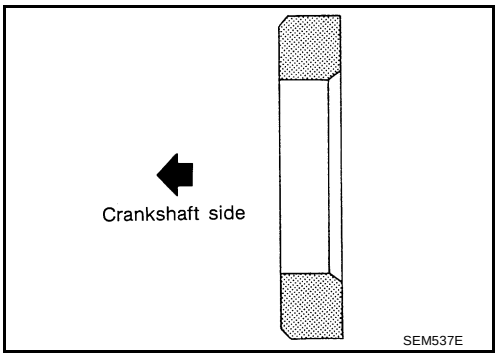
Pilot bushing : Approx. 17 mm (0.67 in)
Pilot converter : Approx. 33 mm (1.30 in)



- Press-fit pilot bushing as the dimension in the figure. (M/T models)



- Press-fit pilot converter with its chamfer facing crankshaft as shown in the figure. (A/T models)



19. Install cylinder head. Refer to EM-89, "CYLINDER HEAD" .
20. Install rear timing chain case. Refer to EM-53, "TIMING CHAIN" .
21. Install oil pan (upper). Refer to EM-26, "OIL PAN AND OIL STRAINER" .
22. Install knock sensors.

A : Right bank
B : Left bank
⇦ : Engine front

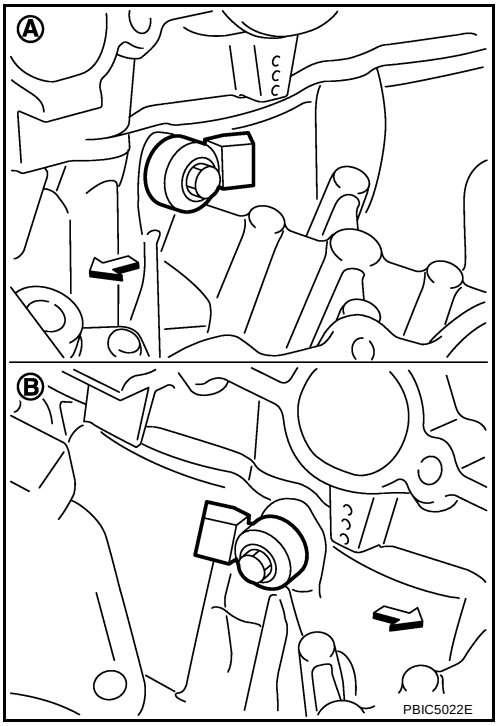
- Install knock sensor so that connector faces rear of engine.
- After installing knock sensor, connect harness connector, and lay it out to rear of engine.

CAUTION:

- **Do not tighten mounting bolts while holding connector.**
- **If any impact by dropping is applied to knock sensor, replace it with new one.**

NOTE:

- Make sure that there is no foreign material on the cylinder block mating surface and the back surface of knock sensor.
- Make sure that knock sensor does not interfere with other parts.

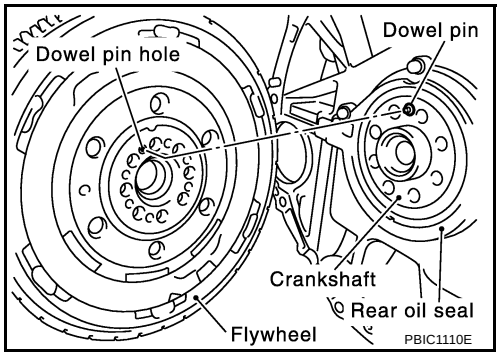


23. Note the following, assemble in the reverse order of disassembly after this step.

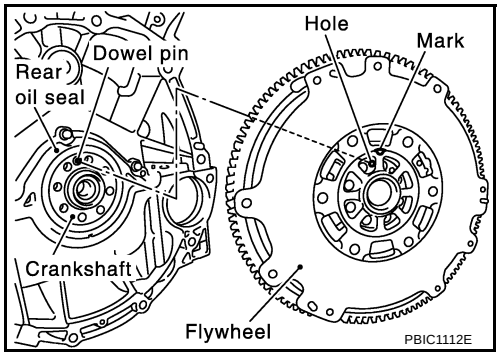
Flywheel (M/T models)

- When installing flywheel to crankshaft, be sure to correctly align crankshaft side dowel pin and flywheel side dowel pin hole.

  CAUTION:
  If these are not aligned correctly, engine runs roughly and "MIL" turns on.



- There is a mating mark on the clutch cover side of flywheel. Refer it during installation.



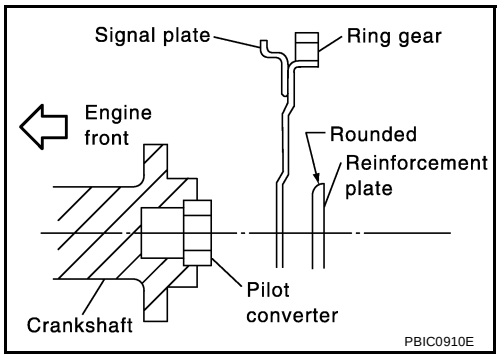
- Holding ring gear with ring gear stopper [SST: KV11018600 (J-48641)], tighten securing bolts with TORX socket (size: T55, commercial service tool).
- Tighten the mounting bolts crosswise over several times.

Drive plate (A/T models)

- When installing drive plate to crankshaft, be sure to correctly align crankshaft side dowel pin and drive plate side dowel pin hole.

  CAUTION:
  If these are not aligned correctly, engine runs roughly and "MIL" turns on.

- Install drive plate and reinforcement plate as shown in the figure.
- Holding ring gear with ring gear stopper [SST: KV10118600 (J-48641)].
- Tighten the mounting bolts crosswise over several times.



How to Select Piston and Bearing

NBS00014

DESCRIPTION

Selection points	Selection parts	Selection items	Selection methods
Between cylinder block to crankshaft	Main bearing	Main bearing grade (bearing thickness)	Determined by match of cylinder block bearing housing grade (inner diameter of housing) and crankshaft journal grade (outer diameter of journal)
Between crankshaft to connecting rod	Connecting rod bearing	Connecting rod bearing grade (bearing thickness)	Combining service grades for connecting rod big end diameter and crankshaft pin outer diameter determine connecting rod bearing selection.
Between cylinder block to piston	Piston and piston pin assembly (Piston is available together with piston pin as assembly.)	Piston grade (piston skirt diameter)	Piston grade = cylinder bore grade (inner diameter of bore)
Between piston to connecting rod*	—	—	—

*: For the service parts, the grade for fitting cannot be selected between piston pin and connecting rod. (Only “0” grade is available.) The information at the shipment from the plant is described as a reference.

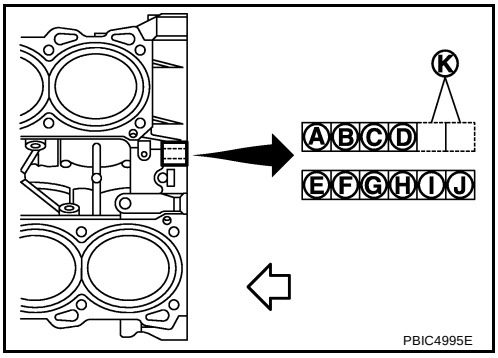
- The identification grade stamped on each part is the grade for the dimension measured in new condition. This grade cannot apply to reused parts.
- For reused or repaired parts, measure the dimension accurately. Determine the grade by comparing the measurement with the values of each selection table.
- For details of the measurement method of each part, the reuse standards and the selection method of the selective fitting parts, refer to the text.

HOW TO SELECT PISTON

When New Cylinder Block is Used

Check the cylinder bore grade (“1”, “2” or “3”) on rear side of cylinder block, and select piston of the same grade.

NOTE:
Piston is available with piston pin as a set for the service part. (Only “0” grade piston pin is available.)

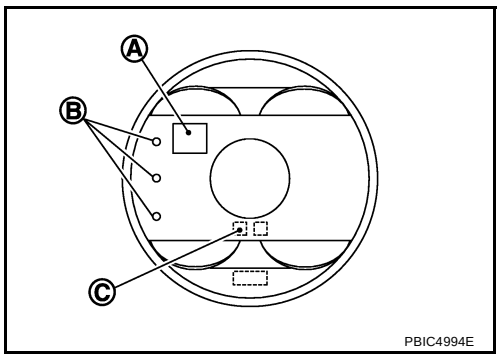


A : Bearing housing grade No. 1
B : Bearing housing grade No. 2
C : Bearing housing grade No. 3
D : Bearing housing grade No. 4
E : Cylinder bore grade No. 1
F : Cylinder bore grade No. 2
G : Cylinder bore grade No. 3
H : Cylinder bore grade No. 4
I : Cylinder bore grade No. 5
J : Cylinder bore grade No. 6
K : Identification code
⇦ : Engine front

When Cylinder Block is Reused

1. Measure the cylinder bore inner diameter. Refer to EM-129, "Cylinder Bore Inner Diameter" .

2. Determine the bore grade by comparing the measurement with the values under the cylinder bore inner diameter of the “Piston Selection Table”.



A : Piston grade number
B : Front mark
C : Piston pin grade number

3. Select piston of the same grade.

Piston Selection Table

Unit: mm (in)

Grade	1	2	3
Cylinder bore inner diameter	95.500 - 95.510 (3.7598 - 3.7602)	95.510 - 95.520 (3.7602 - 3.7606)	95.520 - 95.530 (3.7606 - 3.7610)
Piston skirt diameter	95.480 - 95.490 (3.7590 - 3.7594)	95.490 - 95.500 (3.7594 - 3.7598)	95.500 - 95.510 (3.7598 - 3.7602)

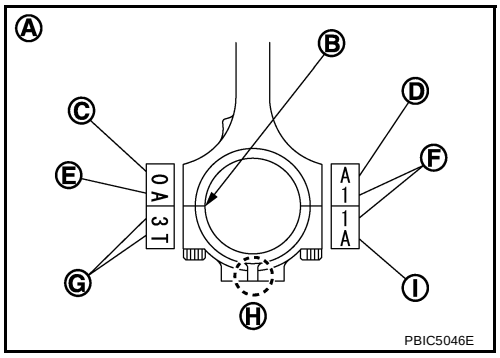
NOTE:

- Piston is available together with piston pin as assembly.
- Piston pin (piston pin hole) grade is provided only for the parts installed at the plant. For service parts, no piston pin grades can be selected. (Only “0” grade is available.)
- No second grade mark is available on piston.

HOW TO SELECT CONNECTING ROD BEARING

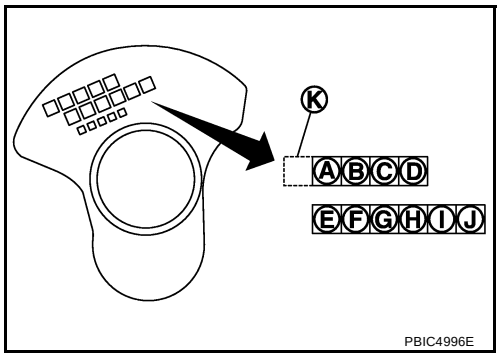
When New Connecting Rod and Crankshaft are Used

1. “Connecting Rod Bearing Selection Table” rows correspond to connecting rod big end diameter grade (D) stamped on side face of connecting rod.



A : Sample code
B : Bearing stopper groove
C : Small end diameter grade
D : Big end diameter grade
E : Weight grade
F : Cylinder No.
G : Management code
H : Front mark
I : Management code

2. “Connecting Rod Bearing Selection Table” columns correspond to pin journal diameter grade (E - J) on front side of crankshafts.



A : Main journal diameter grade No. 1
B : Main journal diameter grade No. 2
C : Main journal diameter grade No. 3
D : Main journal diameter grade No. 4
E : Pin diameter grade No. 1
F : Pin diameter grade No. 2
G : Pin diameter grade No. 3
H : Pin diameter grade No. 4
I : Pin diameter grade No. 5
J : Pin diameter grade No. 6
K : Identification code

3. Select connecting rod bearing grade at the point where selected row and column meet in “Connecting Rod Bearing Selection Table”.

When Crankshaft and Connecting Rod are Reused

1. Measure the connecting rod big end diameter and crankshaft pin journal diameter. Refer to EM-127, "CONNECTING ROD BIG END DIAMETER" . and EM-131, "CRANKSHAFT PIN JOURNAL DIAMETER" .
2. Correspond the measured dimension in “Connecting rod big end diameter” row of “Connecting Rod Bearing Selection Table”.
3. Correspond the measured dimension in “Crankshaft pin journal diameter” column of “Connecting Rod Bearing Selection Table”.
4. Select connecting rod bearing grade at the point where selected row and column meet in following selection table.

Connecting Rod Bearing Selection Table

Crankshaft pin journal diameter Unit: mm (in) / Connecting rod big end diameter Unit: mm (in)		Mark	0	1	2	3	4	5	6	7	8	9	W	X	Y
		Hole diameter	57.000 - 57.001 (2.2441 - 2.2441)	57.001 - 57.002 (2.2441 - 2.2442)	57.002 - 57.003 (2.2442 - 2.2442)	57.003 - 57.004 (2.2442 - 2.2442)	57.004 - 57.005 (2.2442 - 2.2443)	57.005 - 57.006 (2.2443 - 2.2443)	57.006 - 57.007 (2.2443 - 2.2444)	57.007 - 57.008 (2.2444 - 2.2444)	57.008 - 57.009 (2.2444 - 2.2444)	57.009 - 57.010 (2.2444 - 2.2445)	57.010 - 57.011 (2.2445 - 2.2445)	57.011 - 57.012 (2.2445 - 2.2446)	57.012 - 57.013 (2.2446 - 2.2446)
Mark	Axle diameter														
A	53.974 - 53.973 (2.1250 - 2.1249)		0	0	0	0	0	0	1	1	1	1	1	1	2
B	53.973 - 53.972 (2.1249 - 2.1249)		0	0	0	0	0	1	1	1	1	1	1	2	2
C	53.972 - 53.971 (2.1249 - 2.1248)		0	0	0	0	1	1	1	1	1	1	2	2	2
D	53.971 - 53.970 (2.1248 - 2.1248)		0	0	0	1	1	1	1	1	1	2	2	2	2
E	53.970 - 53.969 (2.1248 - 2.1248)		0	0	1	1	1	1	1	1	2	2	2	2	2
F	53.969 - 53.968 (2.1248 - 2.1247)		0	1	1	1	1	1	1	2	2	2	2	2	2
G	53.968 - 53.967 (2.1247 - 2.1247)		1	1	1	1	1	1	2	2	2	2	2	2	3
H	53.967 - 53.966 (2.1247 - 2.1246)		1	1	1	1	1	2	2	2	2	2	2	3	3
J	53.966 - 53.965 (2.1246 - 2.1246)		1	1	1	1	2	2	2	2	2	2	3	3	3
K	53.965 - 53.964 (2.1246 - 2.1246)		1	1	1	2	2	2	2	2	2	3	3	3	3
L	53.964 - 53.963 (2.1246 - 2.1245)		1	1	2	2	2	2	2	2	3	3	3	3	3
M	53.963 - 53.962 (2.1245 - 2.1245)		1	2	2	2	2	2	2	3	3	3	3	3	3
N	53.962 - 53.961 (2.1245 - 2.1244)		2	2	2	2	2	2	3	3	3	3	3	3	4
P	53.961 - 53.960 (2.1244 - 2.1244)		2	2	2	2	2	3	3	3	3	3	3	4	4
R	53.960 - 53.959 (2.1244 - 2.1244)		2	2	2	2	3	3	3	3	3	3	4	4	4
S	53.959 - 53.958 (2.1244 - 2.1243)		2	2	2	3	3	3	3	3	3	4	4	4	4
T	53.958 - 53.957 (2.1243 - 2.1243)		2	2	3	3	3	3	3	3	4	4	4	4	4
U	53.957 - 53.956 (2.1243 - 2.1242)		2	3	3	3	3	3	3	4	4	4	4	4	4

PBIC5023E

Connecting Rod Bearing Grade Table

Grade number	Thickness mm (in)	Identification color (mark)
0	1.497 – 1.500 (0.0589 – 0.0591)	Black
1	1.500 – 1.503 (0.0591 – 0.0592)	Brown

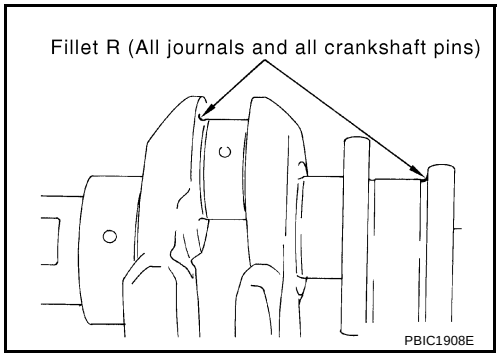
Grade number	Thickness mm (in)	Identification color (mark)
2	1.503 – 1.506 (0.0592 – 0.0593)	Green
3	1.506 – 1.509 (0.0593 – 0.0594)	Yellow
4	1.509 – 1.512 (0.0594 – 0.0595)	Blue

Undersize Bearings Usage Guide

- When the specified connecting rod bearing oil clearance is not obtained with standard size connecting rod bearings, use undersize (US) bearings.
- When using undersize (US) bearing, measure the connecting rod bearing inner diameter with bearing installed, and grind crankshaft pin so that the connecting rod bearing oil clearance satisfies the standard.

CAUTION:

In grinding crankshaft pin to use undersize bearings, keep the fillet R [1.5 – 1.7 mm (0.059 – 0.067 in)].



Bearing undersize table

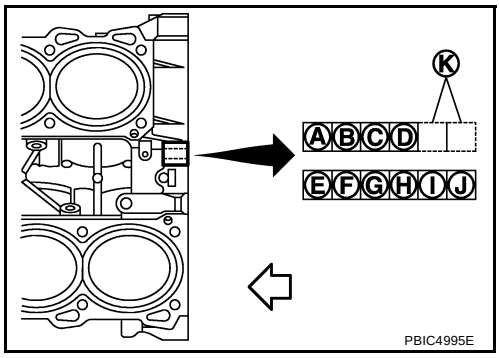
Unit: mm (in)

Size	Thickness
US 0.25 (0.0098)	1.626 - 1.634 (0.0640 - 0.0643)

HOW TO SELECT MAIN BEARING

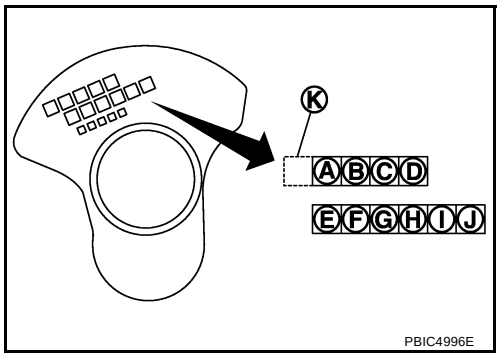
When New Cylinder Block and Crankshaft are Used

1. “Main Bearing Selection Table” rows correspond to bearing housing grade on rear left side of cylinder block.



A : Bearing housing grade No. 1
B : Bearing housing grade No. 2
C : Bearing housing grade No. 3
D : Bearing housing grade No. 4
E : Cylinder bore grade No. 1
F : Cylinder bore grade No. 2
G : Cylinder bore grade No. 3
H : Cylinder bore grade No. 4
I : Cylinder bore grade No. 5
J : Cylinder bore grade No. 6
K : Identification code
⇦ : Engine front

2. “Main Bearing Selection Table” columns correspond to journal diameter grade on front side of crankshaft.



A : Main journal diameter grade No. 1
B : Main journal diameter grade No. 2
C : Main journal diameter grade No. 3
D : Main journal diameter grade No. 4
E : Pin diameter grade No. 1
F : Pin diameter grade No. 2
G : Pin diameter grade No. 3
H : Pin diameter grade No. 4

I : Pin diameter grade No. 5

J : Pin diameter grade No. 6

K : Identification code

3. Select main bearing grade at the point where selected row and column meet in “Main Bearing Selection Table”.

When Cylinder Block and Crankshaft are Reused

1. Measure cylinder block main bearing housing inner diameter and crankshaft main journal diameter. Refer to EM-129, "MAIN BEARING HOUSING INNER DIAMETER" and EM-130, "CRANKSHAFT MAIN JOURNAL DIAMETER" .
2. Correspond the measured dimension in “Cylinder block main bearing housing inner diameter” row of “Main Bearing Selection Table”.
3. Correspond the measured dimension in “Crankshaft main journal diameter” column of “Main Bearing Selection Table”.
4. Select main bearing grade at the point where selected row and column meet in following selection table.

Main Bearing Selection Table

Cylinder block main bearing housing inner diameter Unit: mm (in) / Crankshaft main journal diameter Unit: mm (in)		Mark	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	4	7
		Hole diameter	69.993 - 69.994 (2.7556 - 2.7557)	69.994 - 69.995 (2.7557 - 2.7557)	69.995 - 69.996 (2.7557 - 2.7557)	69.996 - 69.997 (2.7557 - 2.7558)	69.997 - 69.998 (2.7558 - 2.7558)	69.998 - 69.999 (2.7558 - 2.7559)	69.999 - 70.000 (2.7559 - 2.7559)	70.000 - 70.001 (2.7559 - 2.7559)	70.001 - 70.002 (2.7559 - 2.7560)	70.002 - 70.003 (2.7560 - 2.7560)	70.003 - 70.004 (2.7560 - 2.7561)	70.004 - 70.005 (2.7561 - 2.7561)	70.005 - 70.006 (2.7561 - 2.7561)	70.006 - 70.007 (2.7561 - 2.7562)	70.007 - 70.008 (2.7562 - 2.7562)	70.008 - 70.009 (2.7562 - 2.7563)	70.009 - 70.010 (2.7563 - 2.7563)	70.010 - 70.011 (2.7563 - 2.7563)	70.011 - 70.012 (2.7563 - 2.7564)	70.012 - 70.013 (2.7564 - 2.7564)	70.013 - 70.014 (2.7564 - 2.7565)	70.014 - 70.015 (2.7565 - 2.7565)	70.015 - 70.016 (2.7565 - 2.7565)	70.016 - 70.017 (2.7565 - 2.7566)
Mark	Axle diameter																									
A	64.975 - 64.974 (2.5581 - 2.5580)		0	0	0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34
B	64.974 - 64.973 (2.5580 - 2.5580)		0	0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4
C	64.973 - 64.972 (2.5580 - 2.5579)		0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4
D	64.972 - 64.971 (2.5579 - 2.5579)		01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4
E	64.971 - 64.970 (2.5579 - 2.5579)		01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45
F	64.970 - 64.969 (2.5579 - 2.5578)		01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45
G	64.969 - 64.968 (2.5578 - 2.5578)		1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45
H	64.968 - 64.967 (2.5578 - 2.5578)		1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5
J	64.967 - 64.966 (2.5578 - 2.5577)		1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5
K	64.966 - 64.965 (2.5577 - 2.5577)		12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5
L	64.965 - 64.964 (2.5577 - 2.5576)		12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56
M	64.964 - 64.963 (2.5576 - 2.5576)		12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56
N	64.963 - 64.962 (2.5576 - 2.5576)		2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56
P	64.962 - 64.961 (2.5576 - 2.5575)		2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6
R	64.961 - 64.960 (2.5575 - 2.5575)		2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6
S	64.960 - 64.959 (2.5575 - 2.5574)		23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6
T	64.959 - 64.958 (2.5574 - 2.5574)		23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67
U	64.958 - 64.957 (2.5574 - 2.5574)		23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67
V	64.957 - 64.956 (2.5574 - 2.5573)		3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67
W	64.956 - 64.955 (2.5573 - 2.5573)		3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7
X	64.955 - 64.954 (2.5573 - 2.5572)		3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7
Y	64.954 - 64.953 (2.5572 - 2.5572)		34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7
4	64.953 - 64.952 (2.5572 - 2.5572)		34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7	X
7	64.952 - 64.951 (2.5572 - 2.5571)		34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7	X	X

PBIC5024E

Main Bearing Grade Table (All Journals)

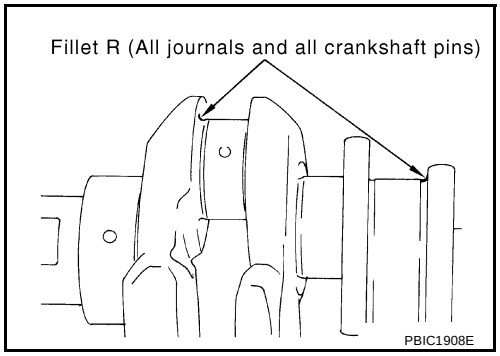
Grade number		Thickness Unit: mm (in)	Width Unit: mm (in)	Identification color	Remarks
0		2.500 - 2.503 (0.0984 - 0.0985)	19.9 - 20.1 (0.783 - 0.791)	Black	Grade and color are the same for upper and lower bearings.
1		2.503 - 2.506 (0.0985 - 0.0987)		Brown	
2		2.506 - 2.509 (0.0987 - 0.0988)		Green	
3		2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
4		2.512 - 2.515 (0.0989 - 0.0990)		Blue	
5		2.515 - 2.518 (0.0990 - 0.0991)		Pink	
6		2.518 - 2.521 (0.0991 - 0.0993)		Purple	
7		2.521 - 2.524 (0.0993 - 0.0994)		White	
01	UPR	2.503 - 2.506 (0.0985 - 0.0987)		Brown	Grade and color are different for upper and lower bearings.
	LWR	2.500 - 2.503 (0.0984 - 0.0985)		Black	
12	UPR	2.506 - 2.509 (0.0987 - 0.0988)		Green	
	LWR	2.503 - 2.506 (0.0985 - 0.0987)		Brown	
23	UPR	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
	LWR	2.506 - 2.509 (0.0987 - 0.0988)		Green	
34	UPR	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
	LWR	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
45	UPR	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
	LWR	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
56	UPR	2.518 - 2.521 (0.0991 - 0.0993)		Purple	
	LWR	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
67	UPR	2.521 - 2.524 (0.0993 - 0.0994)		White	
	LWR	2.518 - 2.521 (0.0991 - 0.0993)		Purple	

Undersize Bearing Usage Guide

- When the specified main bearing oil clearance is not obtained with standard size main bearings, use underside (US) bearing.
- When using undersize (US) bearing, measure the main bearing inner diameter with bearing installed, and grind main journal so that the main bearing oil clearance satisfies the standard.

CAUTION:

In grinding crankshaft main journal to use undersize bearings, keep the fillet R [1.5 – 1.7 mm (0.059 – 0.067 in)].



Bearing undersize table

Unit: mm (in)

Size	Thickness
US 0.25 (0.0098)	2.633 - 2.641 (0.1037 - 0.1040)

Inspection After Disassembly

NBS00015

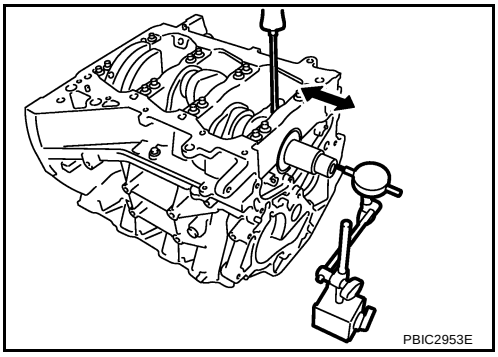
CRANKSHAFT END PLAY

- Measure the clearance between thrust bearings and crankshaft arm when crankshaft is moved fully forward or backward with dial indicator.

Standard : 0.10 - 0.25 mm (0.0040 - 0.0098 in)

Limit : 0.30 mm (0.0120 in)

- If the measured value exceeds the limit, replace thrust bearings, and measure again. If it still exceeds the limit, replace crankshaft also.


PBIC2953E

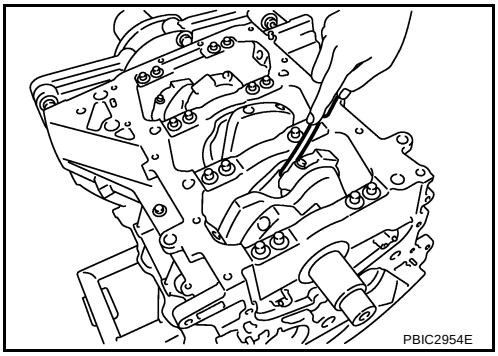
CONNECTING ROD SIDE CLEARANCE

- Measure the side clearance between connecting rod and crankshaft arm with feeler gauge.

Standard : 0.20 - 0.35 mm (0.0080 - 0.0138 in)

Limit : 0.40 mm (0.0160 in)

- If the measured value exceeds the limit, replace connecting rod, and measure again. If it still exceeds the limit, replace crankshaft also.

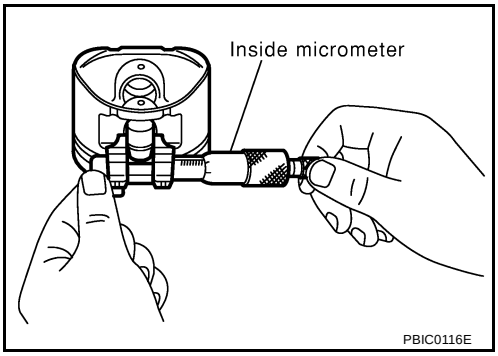

PBIC2954E

PISTON TO PISTON PIN OIL CLEARANCE

Piston Pin Hole Diameter

Measure the inner diameter of piston pin hole with inside micrometer.

Standard : 21.993 - 22.005 mm (0.8659 - 0.8663 in)

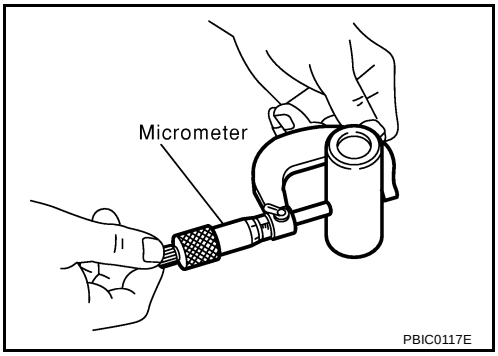


PBIC0116E

Piston Pin Outer Diameter

Measure the outer diameter of piston pin with micrometer.

Standard : 21.989 - 22.001 mm (0.8657 - 0.8662 in)



PBIC0117E

Piston to Piston Pin Oil Clearance

(Piston to piston pin oil clearance) = (Piston pin hole diameter) – (Piston pin outer diameter)

Standard : 0.002 - 0.006 mm (0.0001 - 0.0002 in)

- If the calculated value is out of the standard, replace piston and piston pin assembly.

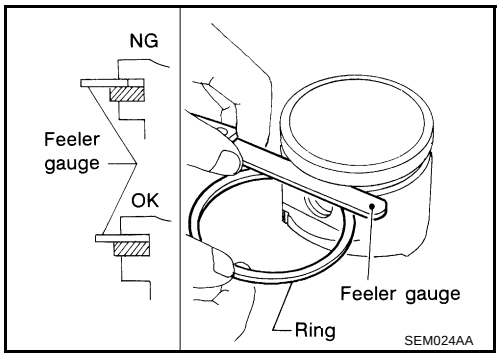
- When replacing piston and piston pin assembly, refer to EM-119, "HOW TO SELECT PISTON" .

NOTE:

- Piston is available together with piston pin as assembly.
- Piston pin (piston pin hole) grade is provided only for the parts installed at the plant. For service parts, no piston pin grades can be selected. (Only “0” grade is available.)

PISTON RING SIDE CLEARANCE

- Measure the side clearance of piston ring and piston ring groove with feeler gauge.



Standard:

Top ring	**: 0.040 - 0.080 mm (0.0016 - 0.0031 in)**
2nd ring	**: 0.030 - 0.070 mm (0.0012 - 0.0028 in)**
Oil ring	**: 0.055 - 0.155 mm (0.0022 - 0.0061 in)**

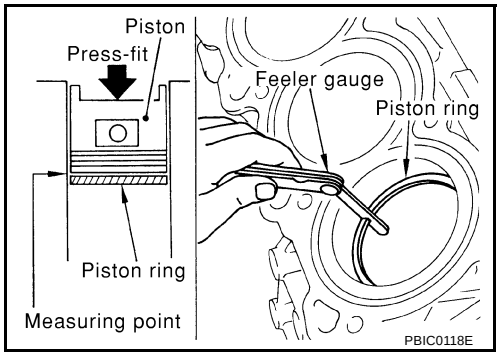
Limit

Top ring	**: 0.11 mm (0.0043 in)**
2nd ring	**: 0.10 mm (0.0040 in)**
Oil ring	**: 0.19 mm (0.0075 in)**

- If the measured value exceeds the limit replace piston ring, and measure again. If it still exceeds the limit replace piston also.

PISTON RING END GAP

- Make sure that cylinder bore inner diameter is within the specification. Refer to EM-129, "Cylinder Bore Inner Diameter" .
- Lubricate with new engine oil to piston and piston ring, and then insert piston ring until middle of cylinder with piston, and measure the piston ring end gap with feeler gauge.



Standard:

Top ring	**: 0.23 - 0.33 mm (0.0091 - 0.0130 in)**
2nd ring	**: 0.33 - 0.48 mm (0.0130 - 0.0189 in)**
Oil ring	**: 0.17 - 0.47 mm (0.0067 - 0.0185 in)**

Limit:

Top ring	**: 0.42 mm (0.0165 in)**
2nd ring	**: 0.57 mm (0.0224 in)**
Oil ring	**: 0.63 mm (0.0248 in)**

- If the measured value exceeds the limit, replace piston ring, and measure again. If it still exceeds the limit, re-bore cylinder and use oversize piston and piston rings.

CONNECTING ROD BEND AND TORSION

- Check with connecting rod aligner.

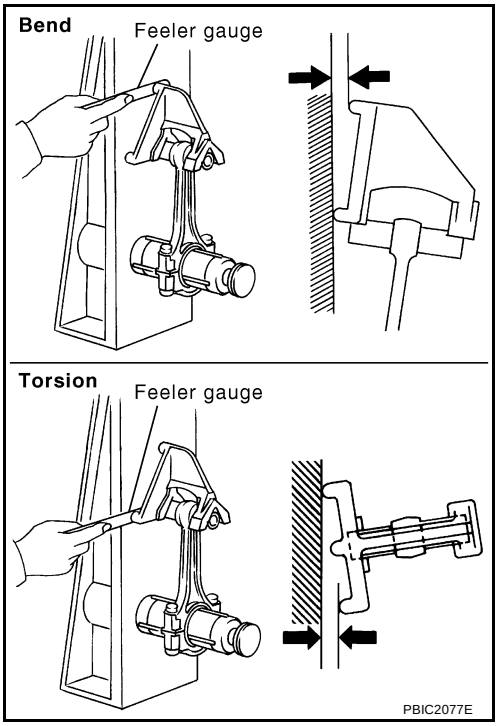
Bend:

Limit: 0.15 mm (0.0059 in) per 100 mm (3.94 in) length

Torsion:

Limit: 0.30 mm (0.0120 in) per 100 mm (3.94 in) length

- If it exceeds the limit, replace connecting rod assembly.

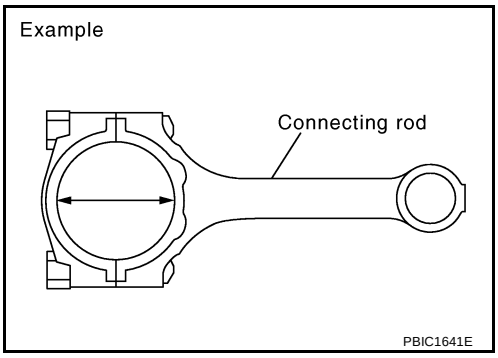


CONNECTING ROD BIG END DIAMETER

- Install connecting rod bearing cap without installing connecting rod bearing, and tightening connecting rod bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of connecting rod big end with inside micrometer.

Standard : 57.000 - 57.013 mm (2.2441 - 2.2446 in)

- If out of the standard, replace connecting rod assembly.

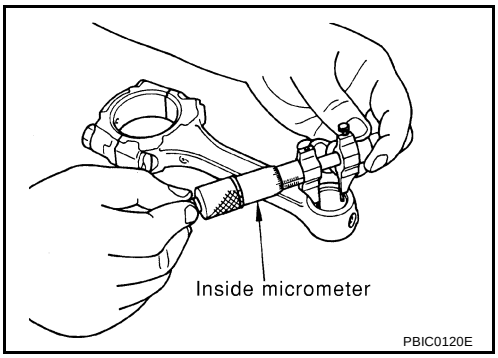


CONNECTING ROD BUSHING OIL CLEARANCE

Connecting Rod Bushing Inner Diameter

Measure the inner diameter of connecting rod bushing with inside micrometer.

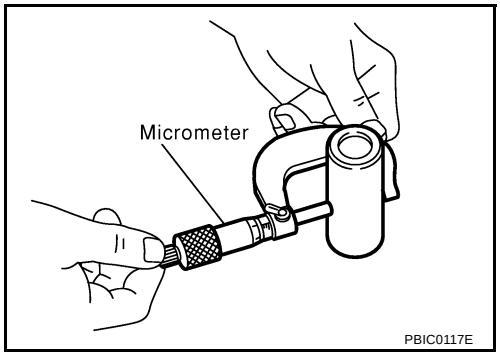
Standard : 22.000 - 22.012 mm (0.8661 - 0.8666 in)



Piston Pin Outer Diameter

Measure the outer diameter of piston pin with micrometer.

Standard : 21.989 - 22.001 mm (0.8657 - 0.8662 in)



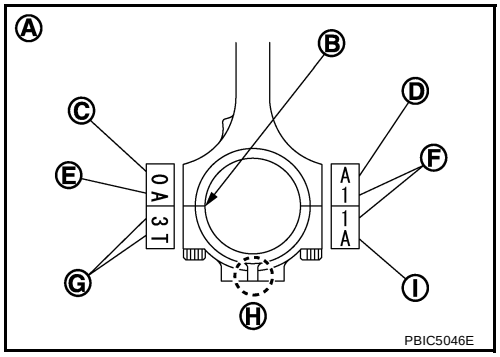
Connecting Rod Bushing Oil Clearance

(Connecting rod bushing oil clearance) = (Connecting rod bushing inner diameter) – (Piston pin outer diameter)

Standard : 0.005 - 0.017 mm (0.0002 - 0.0007 in)

Limit : 0.030 mm (0.0012 in)

- If the measured value exceeds the limit, replace connecting rod assembly and/or piston and piston pin assembly.
- If replacing piston and piston pin assembly, refer to EM-119, "HOW TO SELECT PISTON" .
- If replacing connecting rod assembly, refer to EM-131, "CONNECTING ROD BEARING OIL CLEARANCE" to select the connecting rod bearing.

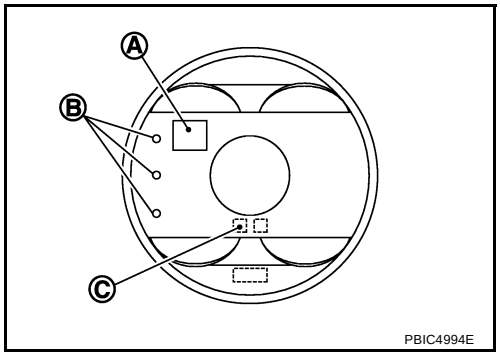


A : Sample code
B : Bearing stopper groove
C : Small end diameter grade
D : Big end diameter grade
E : Weight grade
F : Cylinder No.
G : Management code
H : Front mark
I : Management code

Factory installed parts grading:

- Service parts apply only to grade “0”.

A : Piston grade number
B : Front mark
C : Piston pin grade number



Unit: mm (in)

Grade	0	1
Connecting rod bushing inner diameter *	22.000 - 22.006 (0.8661 - 0.8664)	22.006 - 22.012 (0.8664 - 0.8666)
Piston pin hole diameter	21.993 - 21.999 (0.8659 - 0.8661)	21.999 - 22. 005 (0.8661 - 0.8663)
Piston pin outer diameter	21.989 - 21.995 (0.8657- 0.8659)	21.995 - 22.001 (0.8659 - 0.8662)

*: After installing in connecting rod

CYLINDER BLOCK DISTORTION

- Using scraper, remove gasket on the cylinder block surface, and also remove engine oil, scale, carbon, or other contamination.

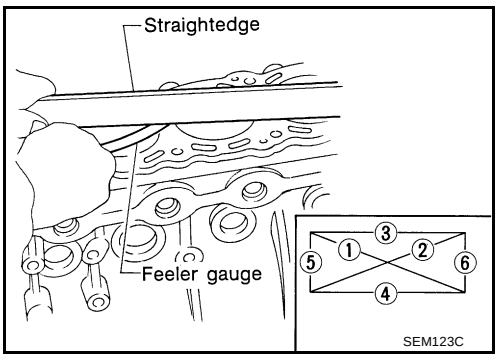
CAUTION:

Be careful not to allow gasket flakes to enter engine oil or engine coolant passages.

- Measure the distortion on the cylinder block upper face at some different points in six directions with straightedge and feeler gauge.

  Limit : 0.1 mm (0.004 in)

- If it exceeds the limit, replace cylinder block.



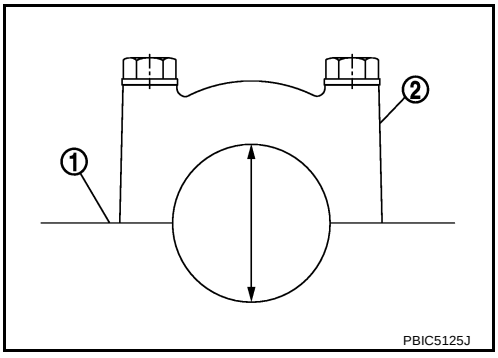
MAIN BEARING HOUSING INNER DIAMETER

- Install lower cylinder block (2) without installing main bearings, and tighten lower cylinder block bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of main bearing housing with bore gauge.

  Standard : 69.993 - 70.017 mm (2.7556 - 2.7566 in)

- If out of the standard, replace cylinder block (1) and lower cylinder block (2) as assembly.

  NOTE:
  Cylinder block cannot be replaced as a single part, because it is machined together with lower cylinder block.

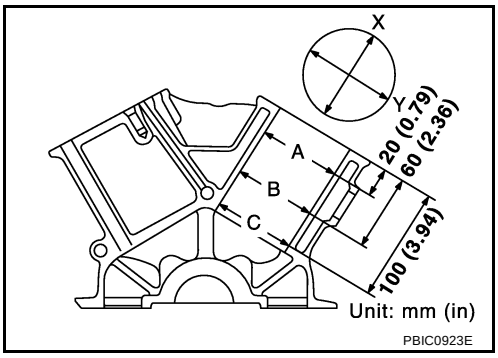


PISTON TO CYLINDER BORE CLEARANCE

Cylinder Bore Inner Diameter

- Using bore gauge, measure cylinder bore for wear, out-of-round and taper at six different points on each cylinder. (“X” and “Y” directions at “A”, “B” and “C”) (“X” is in longitudinal direction of engine)

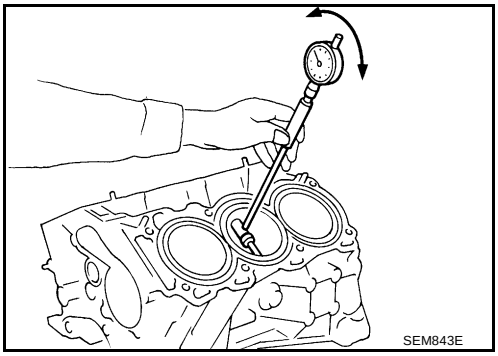
  Standard inner diameter:
  95.500 - 95.530 mm (3.7598 - 3.7610 in)
  Wear limit:
  0.2 mm (0.008 in)
  Out-of-round (Difference between “X” and “Y”):
  0.015 mm (0.0006 in)
  Taper limit (Difference between “A” and “C”):
  0.01 mm (0.0004 in)



- If the measured value exceeds the limit, or if there are scratches and/or seizure on the cylinder inner wall, hone or re-bore the inner wall.
- Oversize piston is provided. When using oversize piston, re-bore cylinder so that the clearance of the piston-to-cylinder bore satisfies the standard.

  CAUTION:
  When using oversize piston, use over size pistons for all cylinders with oversize piston rings.

  Oversize (OS) : 0.2 mm (0.008 in)



Piston Skirt Diameter

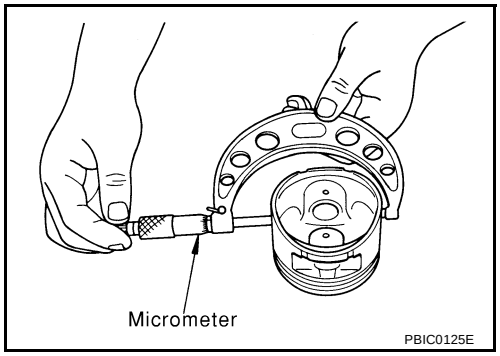
Measure the outer diameter of piston skirt with micrometer.

Measure point

: Distance from the top 38.8 mm (1.528 in)

Standard

: 95.480 - 95.510 mm (3.7590 - 3.7602 in)



Piston to Cylinder Bore Clearance

Calculate by piston skirt diameter and cylinder bore inner diameter (direction “Y”, position “B”).
(Clearance) = (Cylinder bore inner diameter) – (Piston skirt diameter).

Standard : 0.010 - 0.030 mm (0.0004 - 0.0012 in)

Limit : 0.08 mm (0.0031 in)

- If calculated value exceeds the limit, replace piston and piston pin assembly. Refer to EM-119, "HOW TO SELECT PISTON" .

Re-boring Cylinder Bore

1. Cylinder bore size is determined by adding piston to cylinder bore clearance to piston skirt diameter.

   Re-bored size calculation: D = A + B – C

   where,

   D: Bored diameter

   A: Piston skirt diameter as measured

   B: Piston to cylinder bore clearance (standard value)

   C: Honing allowance 0.02 mm (0.0008 in)

2. Install lower cylinder block, and tighten to the specified torque. Otherwise, cylinder bores may be distorted in final assembly.
3. Cut cylinder bores.

   NOTE:
   - When any cylinder needs boring, all other cylinders must also be bored.
   - Do not cut too much out of cylinder bore at a time. Cut only 0.05 mm (0.0020 in) or so in diameter at a time.
4. Hone cylinders to obtain the specified piston to cylinder bore clearance.
5. Measure finished cylinder bore for the out-of-round and taper.

   NOTE:
   Measurement should be done after cylinder bore cools down.

CRANKSHAFT MAIN JOURNAL DIAMETER

- Measure the outer diameter of crankshaft main journals with micrometer.

  Standard : 64.951 - 64.975 mm (2.5571 - 2.5581 in) dia.

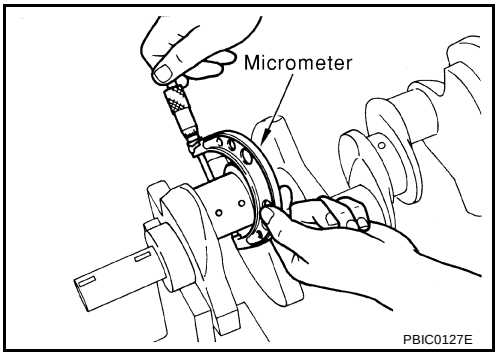
- If out of the standard, measure the main bearing oil clearance. Then use undersize bearing. Refer to EM-132, "MAIN BEARING OIL CLEARANCE" .

CRANKSHAFT PIN JOURNAL DIAMETER

- Measure the outer diameter of crankshaft pin journal with micrometer.

Standard : 53.956 - 53.974 mm (2.1242 - 2.1250 in) dia.

- If out of the standard, measure the connecting rod bearing oil clearance. Then use undersize bearing. Refer to EM-131, "CONNECTING ROD BEARING OIL CLEARANCE" .



CRANKSHAFT OUT-OF-ROUND AND TAPER

- Measure the dimensions at four different points as shown in the figure on each main journal and pin journal with micrometer.
- Out-of-round is indicated by the difference in the dimensions between “X” and “Y” at “A” and “B”.
- Taper is indicated by the difference in the dimensions between “A” and “B” at “X” and “Y”.

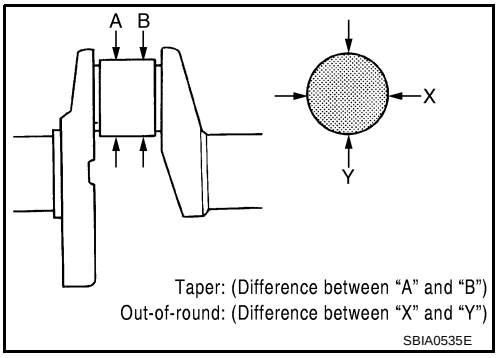
Limit:

Out-of-round (Difference between “X” and “Y”)

: 0.0025 mm (0.0001 in)

Taper (Difference between “A” and “B”)

: 0.0025 mm (0.0001 in)



- If the measured value exceeds the limit, correct or replace crankshaft.
- If corrected, measure the bearing oil clearance of the corrected main journal and/or pin journal. Then select the main bearing and/or connecting rod bearing. Refer to EM-132, "MAIN BEARING OIL CLEARANCE" and/or EM-131, "CONNECTING ROD BEARING OIL CLEARANCE" .

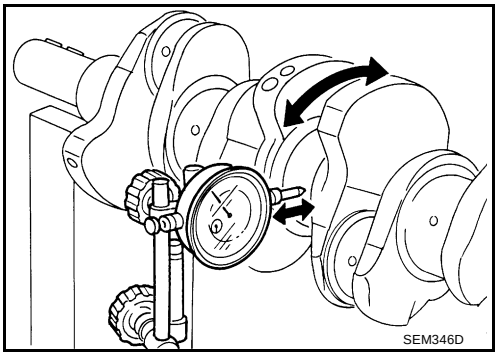
CRANKSHAFT RUNOUT

- Place V-block on precise flat table, and support the journals on the both end of crankshaft.
- Place dial indicator straight up on the No. 3 journal.
- While rotating crankshaft, read the movement of the pointer on dial indicator. (Total indicator reading)

Standard : Less than 0.05 mm (0.0020 in)

Limit : 0.10 mm (0.004 in)

- If it exceeds the limit, replace crankshaft.



CONNECTING ROD BEARING OIL CLEARANCE

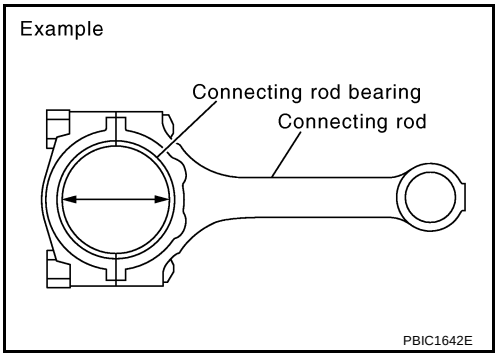
Method by Calculation

- Install connecting rod bearings to connecting rod and cap, and tighten connecting rod bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of connecting rod bearing with inside micrometer.

(Bearing oil clearance) = (Connecting rod bearing inner diameter) – (Crankshaft pin journal diameter)

Standard : 0.040 - 0.053 mm (0.0016 - 0.0021 in) (actual clearance)

Limit : 0.070 mm (0.0028 in)



- If the calculated value exceeds the limit, select proper connecting rod bearing according to connecting rod big end diameter and crankshaft pin journal diameter to obtain the specified bearing oil clearance. Refer to EM-120, "HOW TO SELECT CONNECTING ROD BEARING" .

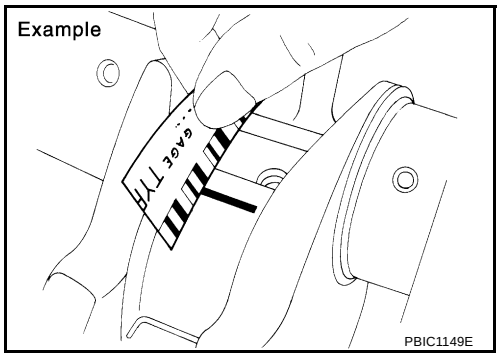
Method of Using Plastigage

- Remove oil and dust on crankshaft pin journal and the surfaces of each bearing completely.
- Cut plastigage slightly shorter than the bearing width, and place it in crankshaft axial direction, avoiding oil holes.
- Install connecting rod bearings to connecting rod and cap, and tighten connecting rod bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.

  CAUTION:
  Do not rotate crankshaft.

- Remove connecting rod bearing cap and bearing, and using scale on plastigage bag, measure the plastigage width.

  NOTE:
  The procedure when the measured value exceeds the limit is same as that described in the “Method by Calculation”.



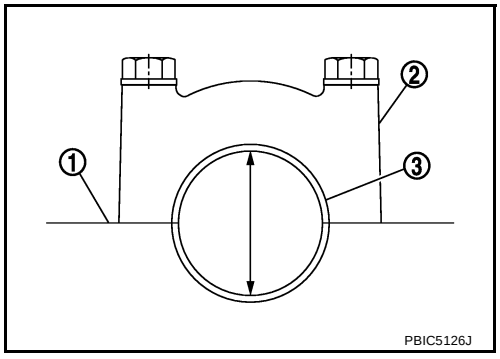
MAIN BEARING OIL CLEARANCE

Method by Calculation

- Install main bearings (3) to cylinder block (1) and lower cylinder block (2), and tighten lower cylinder block bolts to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.
- Measure the inner diameter of main bearing with bore gauge.

(Bearing clearance) = (Main bearing inner diameter) – (Crankshaft main journal diameter)

Standard	**:**	**0.035 - 0.045 mm (0.0014 - 0.0018 in) (actual clearance)**
Limit	**:**	**0.065 mm (0.0026 in)**



- If the clearance exceeds the limit, select proper main bearing according to main bearing inner diameter and crankshaft main journal diameter to obtain the specified bearing oil clearance. Refer to EM-122, "HOW TO SELECT MAIN BEARING" .

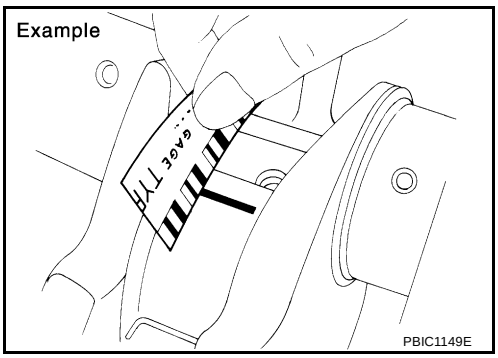
Method of Using Plastigage

- Remove oil and dust on crankshaft main journal and the surfaces of each bearing completely.
- Cut plastigage slightly shorter than the bearing width, and place it in crankshaft axial direction, avoiding oil holes.
- Install main bearings to cylinder block and lower cylinder block, and tighten lower cylinder block bolts with lower cylinder block to the specified torque. Refer to EM-111, "ASSEMBLY" for the tightening procedure.

  CAUTION:
  Do not rotate crankshaft.

- Remove lower cylinder block and bearings, and using scale on plastigage bag, measure the plastigage width.

  NOTE:
  The procedure when the measured value exceeds the limit is same as that described in the “Method by Calculation”.

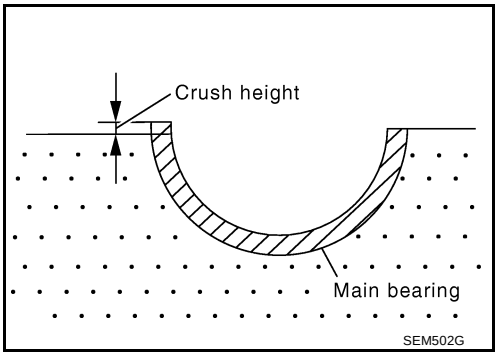


CRUSH HEIGHT OF MAIN BEARING

- When lower cylinder block is removed after being tightened to the specified torque with main bearings installed, the tip end of bearing must protrude. Refer to EM-111, "ASSEMBLY" for the tightening procedure.

  Standard : There must be crush height.

- If the standard is not met, replace main bearings.

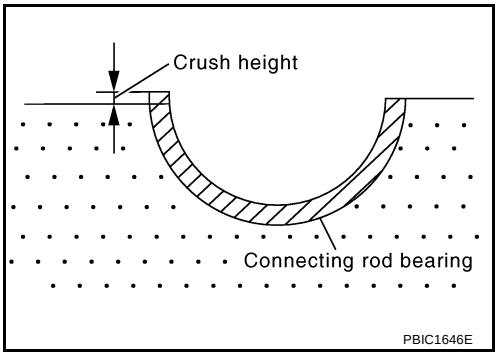


CRUSH HEIGHT OF CONNECTING ROD BEARING

- When connecting rod bearing cap is removed after being tightened to the specified torque with connecting rod bearings installed, the tip end of bearing must protrude. Refer to EM-111, "ASSEMBLY" for the tightening procedure.

  Standard : There must be crush height.

- If the standard is not met, replace connecting rod bearings.

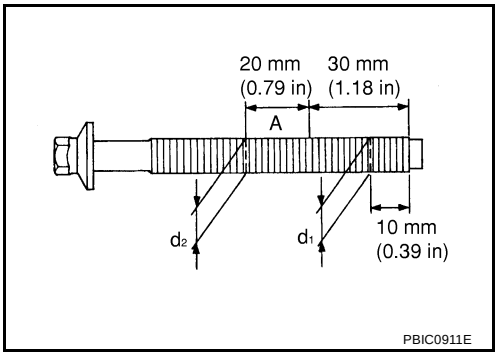


LOWER CYLINDER BLOCK BOLT OUTER DIAMETER

- Measure the outer diameters (“d_1 ”, “d_2 ”) at two positions as shown in the figure.
- If reduction appears in “A” range, regard it as “d_2 ”.

  Limit (“d_1 ” – “d_2 ”) : 0.11 mm (0.0043 in)

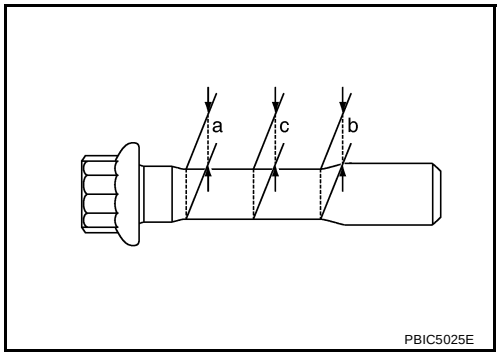
- If it exceeds the limit (large difference in dimensions), replace lower cylinder block bolt with new one.



CONNECTING ROD BOLT OUTER DIAMETER

- Measure the outer diameter (“a”, “b” and “c”) at the position shown in the figure.

  a : Value at the end of the smaller diameter of the bolt
  b : Value at the end of the smaller diameter of the bolt (opposite side “a”)
  c : Value of the smallest diameter of the smaller of the bolt



- Obtain a mean value (d) of (a) and (b).
- Subtract (c) from (d).

Limit (“d” – “c”) : 0.09 mm (0.0035 in)

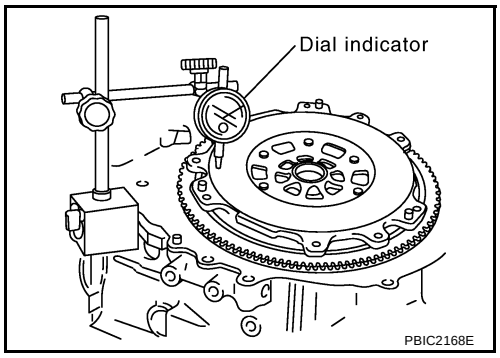
- If it exceeds the limit (large difference in dimensions), replace the bolt with new one.

FLYWHEEL DEFLECTION (M/T MODELS)

- Measure the deflection of flywheel contact surface to clutch with dial indicator.
- Measure the deflection at 210 mm (8.27 in) dia.

Standard : 0.45 mm (0.0177 in) or less

- If the measured value is out of the standard, replace flywheel.



MOVEMENT AMOUNT OF FLYWHEEL (M/T MODELS)

CAUTION:
Do not disassemble double mass flywheel.

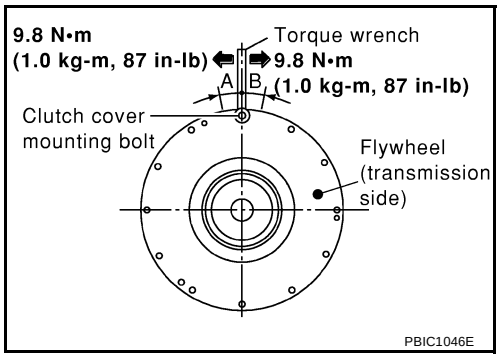
Movement Amount of Radial (Rotation) Direction

Check the movement amount of radial (rotation) direction as follows:

1. Install bolt to clutch cover mounting hole, and place a torque wrench on the extended line of the flywheel center line.
   - Tighten bolt at a force of 9.8 N·m (1.0 kg-m, 87 in-lb) to keep it from loosening.
2. Put a mating mark on circumferences of the two flywheel masses without applying any load (Measurement standard points).
3. Apply a force of 9.8 N·m (1.0 kg-m, 87 in-lb) in each direction, and mark the movement amount on the mass on the transmission side.
4. Measure dimensions of movement amounts “A” and “B” on circumference of flywheel on the transmission side.

Standard : 24 mm (0.94 in) or less

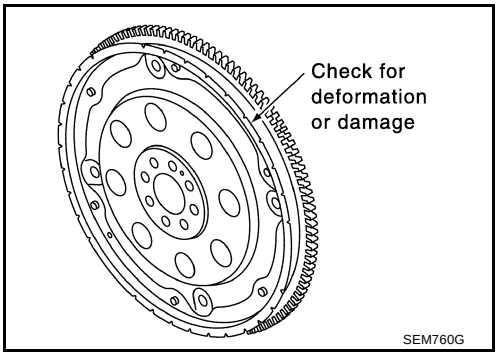
- If the measured value is out of the standard, replace flywheel.



DRIVE PLATE (A/T MODELS)

- Check drive plate and signal plate for deformation or cracks.

  CAUTION:
  - **Do not disassemble drive plate.**
  - **Do not place drive plate with signal plate facing down.**
  - **When handling signal plate, take care not to damage or scratch it.**
  - **Handle signal plate in a manner that prevents it from becoming magnetized.**
- If anything is found, replace drive plate.

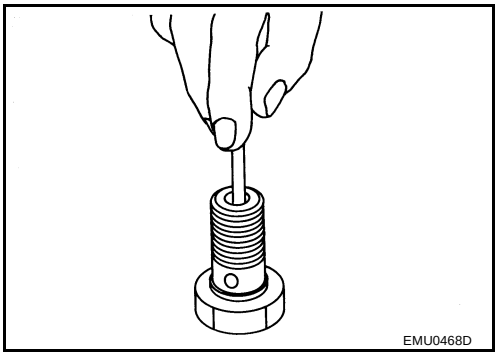


OIL JET

- Check nozzle for deformation and damage.
- Blow compressed air from nozzle, and check for clogs.
- If it is not satisfied, clean or replace oil jet.

OIL JET RELIEF VALVE

- Using clean plastic stick, press check valve in oil jet relief valve. Make sure that valve moves smoothly with proper reaction force.
- If it is not satisfied, replace oil jet relief valve.



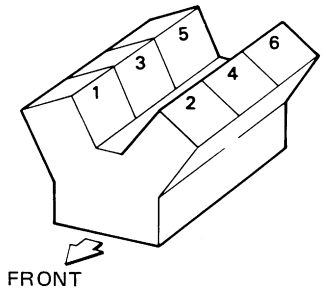
SERVICE DATA AND SPECIFICATIONS (SDS)

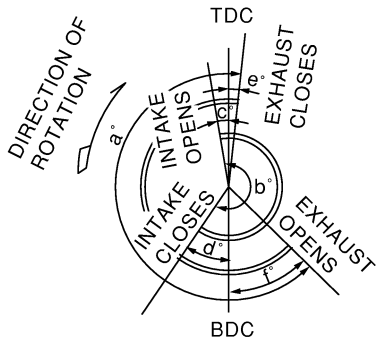
PFP:00100

Standard and Limit

NBS00016

GENERAL SPECIFICATIONS

Cylinder arrangement		V-6
Displacement cm^3 (cu in)		3,498 (213.45)
Bore and stroke mm (in)		95.5 x 81.4 (3.76 x 3.205)
Valve arrangement		DOHC
Firing order		1-2-3-4-5-6
Number of piston rings	Compression	2
	Oil	1
Number of main bearings		4
Compression ratio		10.6
Compression pressure kPa (kg/cm^2 , psi)/300 rpm	Standard	1,275 (13.0, 185)
	Minimum	981 (10.0, 142)
	Differential limit between cylinders	98 (1.0, 14)
Cylinder number	 SEM713A	

Valve timing (Intake valve timing control - “OFF”)	 PBIC0187E

Unit: degree

a	b	c	d	e	f
248	248	2	66	0	68

INTAKE MANIFOLD COLLECTOR, INTAKE MANIFOLD AND EXHAUST MANIFOLD

Unit: mm (in)

Items		Limit
Surface distortion	Intake manifold collector	0.1 (0.004)
	Intake manifold	0.1 (0.004)
	Exhaust manifold	0.3 (0.012)

SPARK PLUG

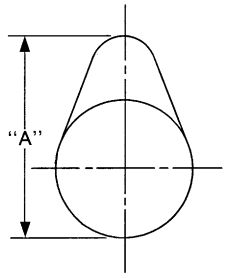
Unit: mm (in)

Make	DENSO
Standard type	FXE22HR11
Gap (Nominal)	1.1 (0.043)

CAMSHAFT AND CAMSHAFT BEARING

Unit: mm (in)

Items		Standard	Limit
Camshaft journal oil clearance	No. 1	0.045 - 0.086 (0.0018 - 0.0034)	0.15 (0.0059)
	No. 2, 3, 4	0.035 - 0.076 (0.0014 - 0.0030)	
Camshaft bracket inner diameter	No. 1	26.000 - 26.021 (1.0236 - 1.0244)	—
	No. 2, 3, 4	23.500 - 23.521 (0.9252 - 0.9260)	—
Camshaft journal diameter	No. 1	25.935 - 25.955 (1.0211 - 1.0218)	—
	No. 2, 3, 4	23.445 - 23.465 (0.9230 - 0.9238)	—
Camshaft end play		0.115 - 0.188 (0.0045 - 0.0074)	0.24 (0.0094)
Camshaft cam height “A”	Intake	45.865 - 46.055 (1.8057 - 1.8132)	0.2 (0.008)*1
	Exhaust	45.875 - 46.065 (1.8061 - 1.8136)	
Camshaft runout (TIR*2)		Less than 0.02 (0.0008)	0.05 (0.0020)
Camshaft sprocket runout (TIR*2)		—	0.15 (0.0059)



SEM671

*1 : Cam wear limit

*2 : Total indicator reading

Valve Lifter

Unit: mm (in)

Items	Standard
Valve lifter outer diameter	33.980 - 33.990 (1.3378 - 1.3382)
Valve lifter hole diameter	34.000 - 34.016 (1.3386 - 1.3392)
Valve lifter clearance	0.010 - 0.036 (0.0004 - 0.0014)

Valve Clearance

Unit: mm (in)

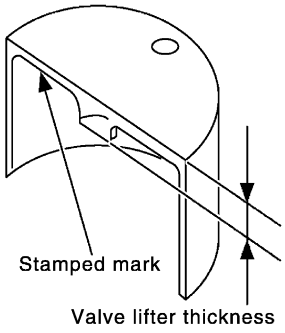
Items	Cold	Hot* (reference data)
Intake	0.26 - 0.34 (0.010 - 0.013)	0.304 - 0.416 (0.012 - 0.016)
Exhaust	0.29 - 0.37 (0.011 - 0.015)	0.308 - 0.432 (0.012 - 0.017)

*: Approximately 80°C (176°F)

Available Valve Lifter

Unit: mm (in)

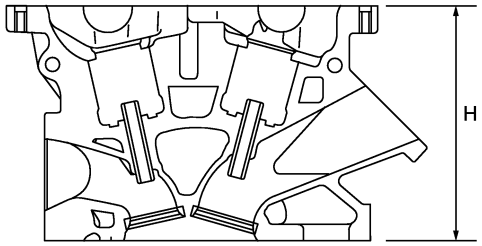
Identification (stamped) mark	Thickness
788T	7.88 (0.3102)
790T	7.90 (0.3110)
792T	7.92 (0.3118)
794T	7.94 (0.3126)
796T	7.96 (0.3134)
798T	7.98 (0.3142)
800T	8.00 (0.3150)
802T	8.02 (0.3157)
804T	8.04 (0.3165)
806T	8.06 (0.3173)
808T	8.08 (0.3181)
810T	8.10 (0.3189)
812T	8.12 (0.3197)
814T	8.14 (0.3205)
816T	8.16 (0.3213)
818T	8.18 (0.3220)
820T	8.20 (0.3228)
822T	8.22 (0.3236)
824T	8.24 (0.3244)
826T	8.26 (0.3252)
828T	8.28 (0.3260)
830T	8.30 (0.3268)
832T	8.32 (0.3276)
834T	8.34 (0.3283)
836T	8.36 (0.3291)
838T	8.38 (0.3299)
840T	8.40 (0.3307)



CYLINDER HEAD

Unit: mm (in)

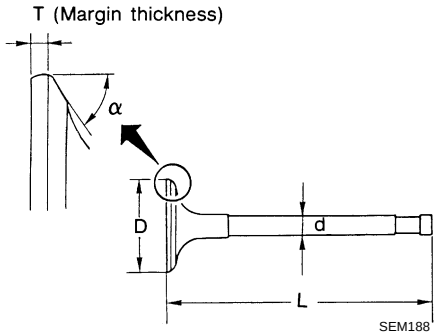
Items	Standard	Limit
Head surface distortion	Less than 0.03 (0.0012)	0.1 (0.004)
Normal cylinder head height “H”	126.3 - 126.5 (4.972 - 4.980)	—



PBIC0924E

Valve Dimensions

Unit: mm (in)

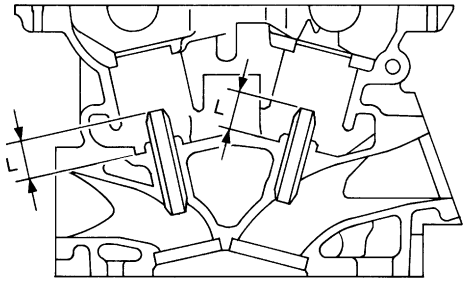


SEM188

Valve head diameter “D”	Intake	36.6 - 36.9 (1.441 - 1.453)
	Exhaust	30.2 - 30.5 (1.189 - 1.201)
Valve length “L”	Intake	97.13 (3.8240)
	Exhaust	94.67 (3.7272)
Valve stem diameter “d”	Intake	5.965 - 5.980 (0.2348 - 0.2354)
	Exhaust	5.962 - 5.970 (0.2347 - 0.2350)
Valve seat angle “α”	Intake	45°15′ - 45°45′
	Exhaust	
Valve margin “T”	Intake	1.1 (0.043)
	Exhaust	1.3 (0.051)
Valve margin “T” limit		0.5 (0.020)
Valve stem end surface grinding limit		0.2 (0.008)

Valve Guide

Unit: mm (in)

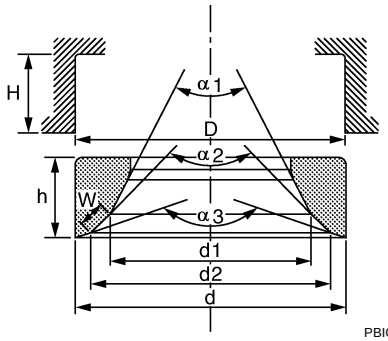


SEM950E

Items		Standard	Oversize (Service) [0.2 (0.008)]
Valve guide	Outer diameter	10.023 - 10.034 (0.3946 - 0.3950)	10.223 - 10.234 (0.4025 - 0.4029)
	Inner diameter (Finished size)	6.000 - 6.018 (0.2362 - 0.2369)	
Cylinder head valve guide hole diameter		9.975 - 9.996 (0.3927 - 0.3935)	10.175 - 10.196 (0.4006 - 0.4014)
Interference fit of valve guide		0.027 - 0.059 (0.0011 - 0.0023)	
Items		Standard	Limit
Valve guide clearance	Intake	0.020 - 0.053 (0.0008 - 0.0021)	0.08 (0.0031)
	Exhaust	0.030 - 0.056 (0.0012 - 0.0022)	0.09 (0.0035)
Projection length “L”		12.6 - 12.8 (0.496 - 0.504)	

Valve Seat

Unit: mm (in)



PBIC2745E

Items		Standard	Oversize (Service) [0.5 (0.02)]
Cylinder head seat recess diameter “D”	Intake	38.000 - 38.016 (1.4961 - 1.4967)	38.500 - 38.516 (1.5157 - 1.5164)
	Exhaust	31.600 - 31.616 (1.2441 - 1.2447)	32.100 - 32.116 (1.2638 - 1.2644)
Valve seat outer diameter “d”	Intake	38.097 - 38.113 (1.4999 - 1.5005)	38.597 - 38.613 (1.5196 - 1.5202)
	Exhaust	31.680 - 31.696 (1.2472 - 1.2479)	32.180 - 32.196 (1.2669 - 1.2676)
Valve seat interference fit	Intake	0.081 - 0.113 (0.0032 - 0.0044)	
	Exhaust	0.064 - 0.096 (0.0025 - 0.0038)	
Diameter “d1”*1	Intake	34.6 (1.36)	
	Exhaust	27.7 (1.091)	
Diameter “d2”*2	Intake	35.9 - 36.4 (1.413 - 1.433)	
	Exhaust	29.3 - 29.8 (1.154 - 1.173)	
Angle “α1”	Intake	60°	
	Exhaust	60°	
Angle “α2”	Intake	88°45′ - 90°15′	
	Exhaust	88°45′ - 90°15′	
Angle “α3”	Intake	120°	
	Exhaust	120°	
Contacting width “W”*3	Intake	1.0 - 1.4 (0.039 - 0.055)	
	Exhaust	1.2 - 1.6 (0.047 - 0.063)	
Height “h”	Intake	5.9 - 6.0 (0.232 - 0.236)	5.05 - 5.15 (0.1988 - 0.2028)
	Exhaust	5.9 - 6.0 (0.232 - 0.236)	4.95 - 5.05 (0.1949 - 0.1988)
Depth “H”		6.0 (0.236)	

*1 : Diameter made by intersection point of conic angles “α1” and “α2”

*2 : Diameter made by intersection point of conic angles “α2” and “α3”

*3 : Machining data

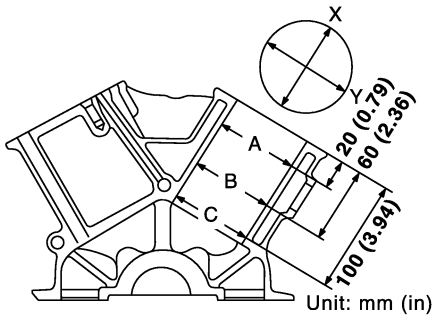
Valve Spring

Unit: mm (in)

Items	
Free height	43.85 (1.7264)
Installation height	37.00 (1.4567)
Installation load	166 - 188 N (16.9 - 19.2 kg, 37 - 42 lb)
Height during valve open	26.8 (1.0551)
Load with valve open	502 - 566 N (51.2 - 57.7 kg, 113 - 127 lb)
squareness	1.9 (0.075)

CYLINDER BLOCK

Unit: mm (in)



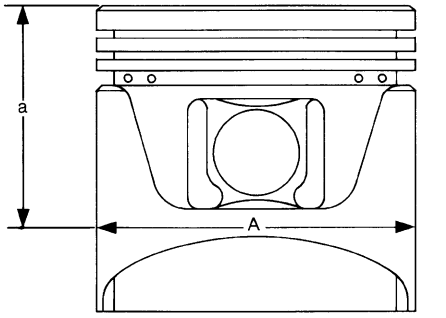
PBIC0923E

Surface distortion		Standard		Less than 0.03 (0.0012)
		Limit		0.1 (0.004)
Main bearing housing inner diameter		Standard		69.993 - 70.017 (2.7556 - 2.7566)
Cylinder bore	Inner diameter	Standard	Grade No. 1	95.500 - 95.510 (3.7598 - 3.7602)
			Grade No. 2	95.510 - 95.520 (3.7602 - 3.7606)
			Grade No. 3	95.520 - 95.530 (3.7606 - 3.7610)
		Wear limit		0.2 (0.008)
Out-of-round (Difference between “X” and “Y”)		Limit		0.015 (0.0006)
Taper (Difference between “A” and “C”)				0.01 (0.0004)
Main bearing housing inner diameter (Without bearing)			Grade No. A	69.993 - 69.994 (2.7556 - 2.7557)
			Grade No. B	69.994 - 69.995 (2.7557 - 2.7557)
			Grade No. C	69.995 - 69.996 (2.7557 - 2.7557)
			Grade No. D	69.996 - 69.997 (2.7557 - 2.7558)
			Grade No. E	69.997 - 69.998 (2.7558 - 2.7558)
			Grade No. F	69.998 - 69.999 (2.7558 - 2.7559)
			Grade No. G	69.999 - 70.000 (2.7559 - 2.7559)
			Grade No. H	70.000 - 70.001 (2.7559 - 2.7559)
			Grade No. J	70.001 - 70.002 (2.7559 - 2.7560)
			Grade No. K	70.002 - 70.003 (2.7560 - 2.7560)
			Grade No. L	70.003 - 70.004 (2.7560 - 2.7561)
			Grade No. M	70.004 - 70.005 (2.7561 - 2.7561)
			Grade No. N	70.005 - 70.006 (2.7561 - 2.7561)
			Grade No. P	70.006 - 70.007 (2.7561 - 2.7562)
			Grade No. R	70.007 - 70.008 (2.7562 - 2.7562)
			Grade No. S	70.008 - 70.009 (2.7562 - 2.7563)
			Grade No. T	70.009 - 70.010 (2.7563 - 2.7563)
			Grade No. U	70.010 - 70.011 (2.7563 - 2.7563)
			Grade No. V	70.011 - 70.012 (2.7563 - 2.7564)
			Grade No. W	70.012 - 70.013 (2.7564 - 2.7564)
			Grade No. X	70.013 - 70.014 (2.7564 - 2.7565)
			Grade No. Y	70.014 - 70.015 (2.7565 - 2.7565)
			Grade No. 4	70.015 - 70.016 (2.7565 - 2.7565)
			Grade No. 7	70.016 - 70.017 (2.7565 - 2.7566)
Difference in inner diameter between cylinders		Standard		Less than 0.03 (0.0012)

PISTON, PISTON RING AND PISTON PIN

Available Piston

Unit: mm (in)



SEM882E

Items		Standard	Oversize (Service) [0.20 (0.008)]
"a" dimension		38.8 (1.528)	
Piston skirt diameter "A"	Grade No. 1	95.480 - 95.490 (3.7590 - 3.7594)	—
	Grade No. 2	95.490 - 95.500 (3.7594 - 3.7598)	—
	Grade No. 3	95.500 - 95.510 (3.7598 - 3.7602)	—
	Service	—	95.680 - 95.710 (3.7669 - 3.7681)
Items		Standard	Limit
Piston pin hole diameter	Grade No. 0	21.993 - 21.999 (0.8659 - 0.8661)	—
	Grade No. 1	21.999 - 22.005 (0.8661 - 0.8663)	—
Piston to cylinder bore clearance		0.010 - 0.030 (0.0004 - 0.0012)	0.08 (0.0031)

Piston Ring

Unit: mm (in)

Items		Standard	Limit
Side clearance	Top	0.040 - 0.080 (0.0016 - 0.0031)	0.11 (0.0043)
	2nd	0.030 - 0.070 (0.0012 - 0.0028)	0.10 (0.004)
	Oil ring	0.055 - 0.155 (0.0022 - 0.0061)	—
End gap	Top	0.23 - 0.33 (0.0091 - 0.0130)	0.42 (0.0165)
	2nd	0.33 - 0.48 (0.0130 - 0.0189)	0.57 (0.0224)
	Oil (rail ring)	0.17 - 0.47 (0.0067 - 0.0185)	0.63 (0.0248)

Piston Pin

Unit: mm (in)

Items		Standard	Limit
Piston pin outer diameter	Grade No. 0	21.989 - 21.995 (0.8657 - 0.8659)	—
	Grade No. 1	21.995 - 22.001 (0.8659 - 0.8662)	—
Piston to piston pin oil clearance		0.002 - 0.006 (0.0001 - 0.0002)	—
Connecting rod bushing oil clearance		0.005 - 0.017 (0.0002 - 0.0007)	0.030 (0.0012)

CONNECTING ROD

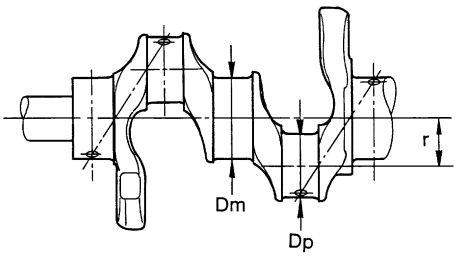
Unit: mm (in)

Items		Standard	Limit
Center distance		144.15 - 144.25 (5.6752 - 5.6791)	—
Bend [per 100 (3.94)]		—	0.15 (0.0059)
Torsion [per 100 (3.94)]		—	0.30 (0.0120)
Connecting rod bushing inner diameter*	Grade No. 0	22.000 - 22.006 (0.8661 - 0.8664)	—
	Grade No. 1	22.006 - 22.012 (0.8664 - 0.8666)	—
Connecting rod big end diameter (Without bearing)		57.000 - 57.013 (2.2441 - 2.2446)	—
Side clearance		0.20 - 0.35 (0.0080 - 0.0138)	0.40 (0.0160)

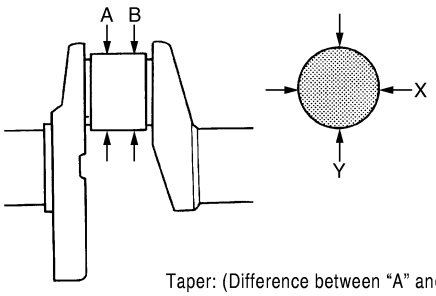
*: After installing in connecting rod

CRANKSHAFT

Unit: mm (in)



SEM645



Taper: (Difference between “A” and “B”)
Out-of-round: (Difference between “X” and “Y”)

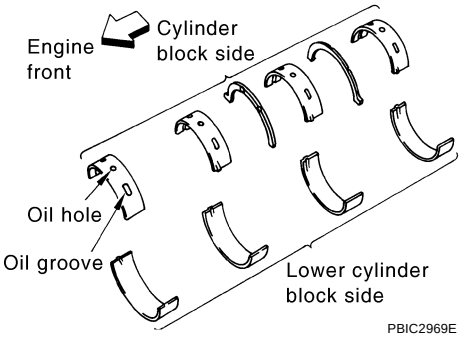
SBIA0535E

Main journal diameter. “Dm” grade	Standard	Grade No. A	64.975 - 64.974 (2.5581 - 2.5580)
		Grade No. B	64.974 - 64.973 (2.5580 - 2.5580)
		Grade No. C	64.973 - 64.972 (2.5580 - 2.5579)
		Grade No. D	64.972 - 64.971 (2.5579 - 2.5579)
		Grade No. E	64.971 - 64.970 (2.5579 - 2.5579)
		Grade No. F	64.970 - 64.969 (2.5579 - 2.5578)
		Grade No. G	64.969 - 64.968 (2.5578 - 2.5578)
		Grade No. H	64.968 - 64.967 (2.5578 - 2.5578)
		Grade No. J	64.967 - 64.966 (2.5578 - 2.5577)
		Grade No. K	64.966 - 64.965 (2.5577 - 2.5577)
		Grade No. L	64.965 - 64.964 (2.5577 - 2.5576)
		Grade No. M	64.964 - 64.963 (2.5576 - 2.5576)
		Grade No. N	64.963 - 64.962 (2.5576 - 2.5576)
		Grade No. P	64.962 - 64.961 (2.5576 - 2.5575)
		Grade No. R	64.961 - 64.960 (2.5575 - 2.5575)
		Grade No. S	64.960 - 64.959 (2.5575 - 2.5574)
		Grade No. T	64.959 - 64.958 (2.5574 - 2.5574)
		Grade No. U	64.958 - 64.957 (2.5574 - 2.5574)
		Grade No. V	64.957 - 64.956 (2.5574 - 2.5573)
		Grade No. W	64.956 - 64.955 (2.5573 - 2.5573)
		Grade No. X	64.955 - 64.954 (2.5573 - 2.5572)
		Grade No. Y	64.954 - 64.953 (2.5572 - 2.5572)
		Grade No. 4	64.953 - 64.952 (2.5572 - 2.5572)
		Grade No. 7	64.952 - 64.951 (2.5572 - 2.5571)
Pin journal diameter. “Dp”	Standard	Grade No. A	53.974 - 53.973 (2.1250 - 2.1249)
		Grade No. B	53.973 - 53.972 (2.1249 - 2.1249)
		Grade No. C	53.972 - 53.971 (2.1249 - 2.1248)
		Grade No. D	53.971 - 53.970 (2.1248 - 2.1248)
		Grade No. E	53.970 - 53.969 (2.1248 - 2.1248)
		Grade No. F	53.969 - 53.968 (2.1248 - 2.1247)
		Grade No. G	53.968 - 53.967 (2.1247 - 2.1247)
		Grade No. H	53.967 - 53.966 (2.1247 - 2.1246)
		Grade No. J	53.966 - 53.965 (2.1246 - 2.1246)
		Grade No. K	53.965 - 53.964 (2.1246 - 2.1246)
		Grade No. L	53.964 - 53.963 (2.1246 - 2.1245)
		Grade No. M	53.963 - 53.962 (2.1245 - 2.1245)
		Grade No. N	53.962 - 53.961 (2.1245 - 2.1244)
		Grade No. P	53.961 - 53.960 (2.1244 - 2.1244)
		Grade No. R	53.960 - 53.959 (2.1244 - 2.1244)
		Grade No. S	53.959 - 53.958 (2.1244 - 2.1243)
		Grade No. T	53.958 - 53.957 (2.1243 - 2.1243)
		Grade No. U	53.957 - 53.956 (2.1243 - 2.1242)

Center distance “r”		40.66 - 40.74 (1.6008 - 1.6039)
Out-of-round (Difference between “X” and “Y”)	Limit	0.0025 (0.0001)
Taper (Difference between “A” and “B”)		0.0025 (0.0001)
Crankshaft runout (TIR*)	Standard	Less than 0.05 (0.0020)
	Limit	0.10 (0.004)
Crankshaft end play	Standard	0.10 - 0.25 (0.0040 - 0.0098)
	Limit	0.30 (0.0120)

*: Total indicator reading

MAIN BEARING



Grade number	UPR/LWR	Thickness mm (in)	Width mm (in)	Identification color	Remarks
0	—	2.500 - 2.503 (0.0984 - 0.0985)	19.9 - 20.1 (0.783 - 0.791)	Black	Grade is the same for upper and lower bearings.
1	—	2.503 - 2.506 (0.0985 - 0.0987)		Brown	
2	—	2.506 - 2.509 (0.0987 - 0.0988)		Green	
3	—	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
4	—	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
5	—	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
6	—	2.518 - 2.521 (0.0991 - 0.0993)		Purple	
7	—	2.521 - 2.524 (0.0993 - 0.0994)		White	
01	UPR	2.503 - 2.506 (0.0985 - 0.0987)		Brown	Grade is different for upper and lower bearings.
	LWR	2.500 - 2.503 (0.0984 - 0.0985)		Black	
12	UPR	2.506 - 2.509 (0.0987 - 0.0988)		Green	
	LWR	2.503 - 2.506 (0.0985 - 0.0987)		Brown	
23	UPR	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
	LWR	2.506 - 2.509 (0.0987 - 0.0988)		Green	
34	UPR	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
	LWR	2.509 - 2.512 (0.0988 - 0.0989)		Yellow	
45	UPR	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
	LWR	2.512 - 2.515 (0.0989 - 0.0990)		Blue	
56	UPR	2.518 - 2.521 (0.0991 - 0.0993)		Purple	
	LWR	2.515 - 2.518 (0.0990 - 0.0991)		Pink	
67	UPR	2.521 - 2.524 (0.0993 - 0.0994)		White	
	LWR	2.518 - 2.521 (0.0991 - 0.0993)		Purple	

Undersize

Unit: mm (in)

Items	Thickness	Main journal diameter
0.25 (0.0098)	2.132 - 2.140 (0.0839 - 0.0843)	Grind so that bearing clearance is the specified value.

Main Bearing Oil Clearance

Unit: mm (in)

Items	Standard	Limit
Main bearing oil clearance	0.035 - 0.045 (0.0014 - 0.0018)*	0.065 (0.0026)

*: Actual clearance

CONNECTING ROD BEARING

Grade number	Thickness mm (in)	Identification color (mark)
0	1.497 - 1.500 (0.0589 - 0.0591)	Black
1	1.500 - 1.503 (0.0591 - 0.0592)	Brown
2	1.503 - 1.506 (0.0592 - 0.0593)	Green
3	1.506 - 1.509 (0.0593 - 0.0594)	Yellow
4	1.509 - 1.512 (0.0594 - 0.0595)	Blue

Undersize

Unit: mm (in)

Items	Thickness	Crank pin journal diameter
0.25 (0.0098)	1.626 - 1.634 (0.0640 - 0.0643)	Grind so that bearing clearance is the specified value.

Connecting Rod Bearing Oil Clearance

Unit: mm (in)

Items	Standard	Limit
Connecting rod bearing oil clearance	0.040 - 0.053 (0.0016 - 0.0021)*	0.070 (0.0028)

*: Actual clearance

SECTION EX
EXHAUST SYSTEM

CONTENTS

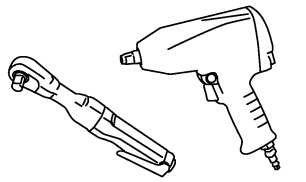
PREPARATION 2
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EXHAUST SYSTEM 3
Checking Exhaust System 3
Removal and Installation 3
REMOVAL 4
INSTALLATION 4
INSPECTION AFTER INSTALLATION 5

PREPARATION

PFP:00002

Commercial Service Tools

NBS000J4

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening nuts and bolts

EXHAUST SYSTEM

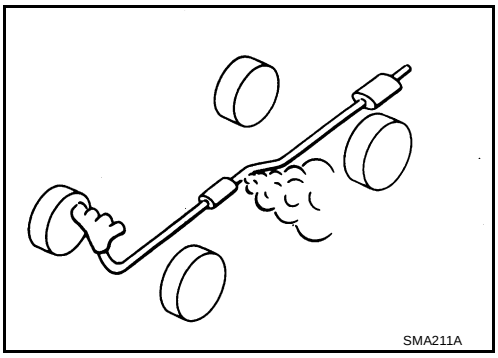
PFP:20100

Checking Exhaust System

NBS000J5

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage or deterioration.

- If anything is found, repair or replace damaged parts.

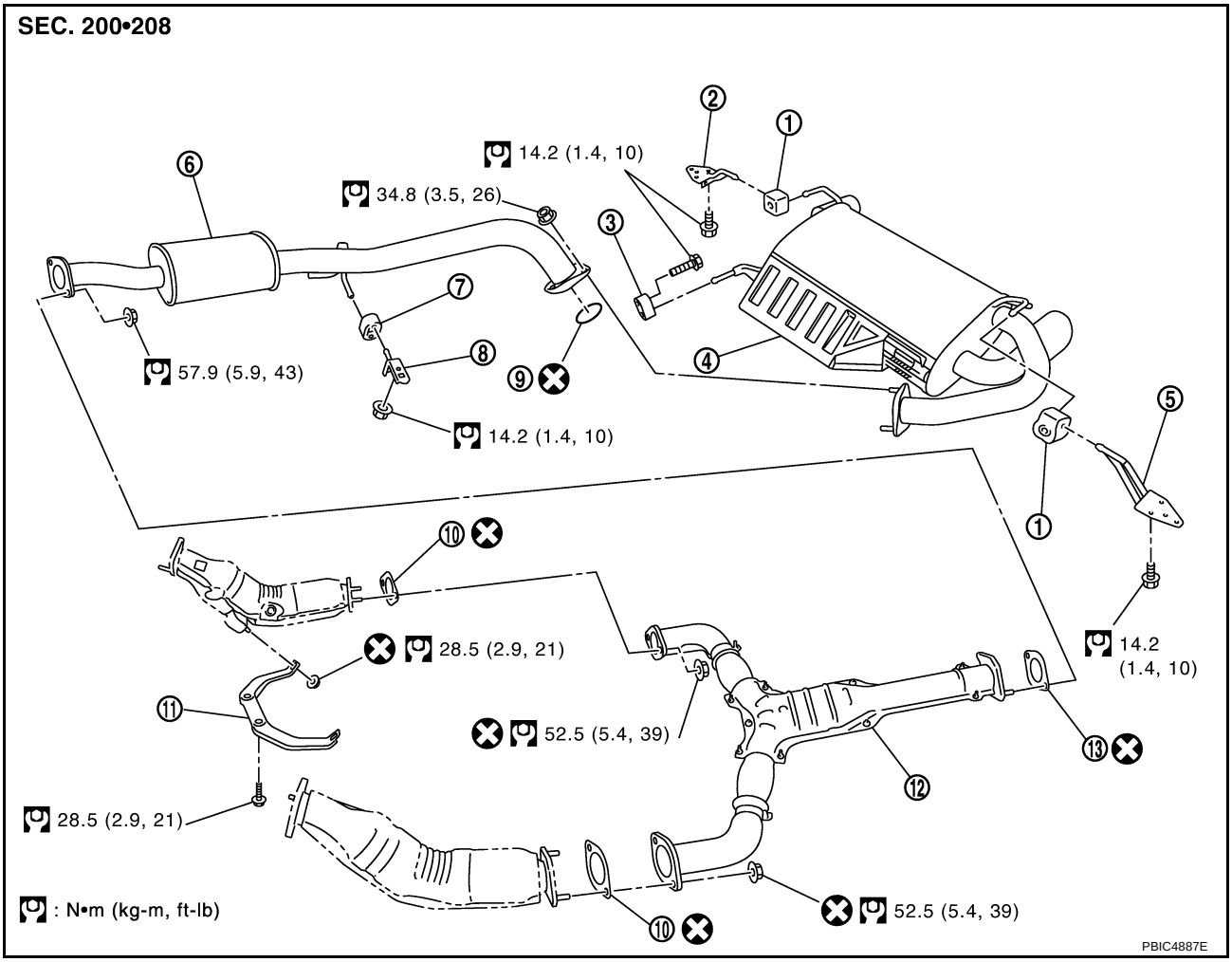


Removal and Installation

NBS000J6

CAUTION:

- **Be sure to use genuine exhaust system parts or equivalents which are specially designed for heat resistance, corrosion resistance, and shape.**
- **Perform the operation with the exhaust system fully cooled down because the system will be hot just after engine stops.**
- **Be careful not to cut your hand on the insulator edge.**



1. Mounting rubber
2. Main muffler mounting bracket
3. Mounting rubber
4. Main muffler
5. Main muffler mounting bracket
6. Center muffler
7. Mounting rubber
8. Mounting bracket
9. Ring gasket

10. Gasket
11. Exhaust mounting bracket
12. Exhaust front tube
13. Gasket

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

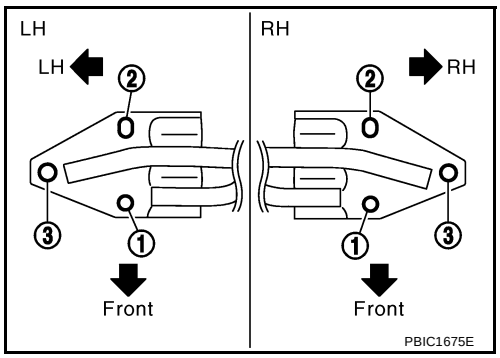
- Disconnect each joint and mounting with power tool.
- When removing main muffler, remove main muffler mounting bracket bolts.
- For removing and installing parts around propeller shaft, be careful of the following caution.

CAUTION:
Be sure to prevent propeller shaft from interfering parts and tools. If necessary, install protector to propeller shaft to prevent damage.
For propeller shaft protector, refer to PR-5, "REAR PROPELLER SHAFT" .

INSTALLATION

Note the following, and install in the reverse order of removal.

- Tighten main muffler mounting bracket bolts in numerical order as shown in the figure.

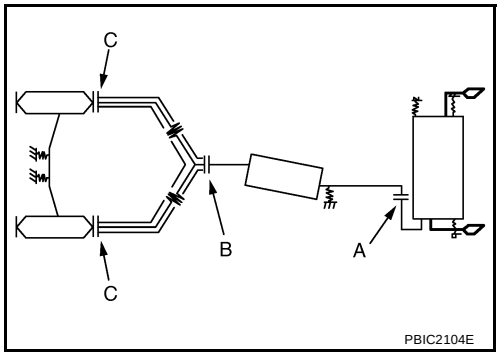


When reassembling main muffler only.

1. Temporarily tighten connecting flange (A).
2. Move main muffler front/rear/left/right so that clearance between tail tube and bumper is even.
3. Tighten connecting flange (A) to the specified torque.

When reassembling center muffler.

1. Temporarily tighten connecting flanges in order of (A) and (B).
2. Move main muffler front/rear/left/right so that clearance between tail tube and bumper is even.
3. Tighten connecting flanges in order of (A) and (B) to the specified torque.



When reassembling exhaust front tube.

1. Temporarily tighten connecting flanges of center muffler in order of (B) and (C).
2. Move main muffler front/rear/left/right so that clearance between tail tube and bumper is even.
3. Tighten connecting flanges in order of (B) and (C) to the specified torque.

CAUTION:

- **Always replace exhaust tube gaskets with new ones when reassembling.**
- **If heat insulator is badly deformed, repair or replace it. If deposits such as mud pile up on heat insulator, remove them.**
- **When installing heat insulator avoid large gaps or interference between heat insulator and each exhaust pipe.**
- **Remove deposits from the sealing surface of each connection. Connect them securely to avoid gas leakage.**
- **Temporarily tighten mounting nuts on the exhaust manifold side and mounting bolts on the vehicle side. Check each part for unusual interference, and then tighten them to the specified torque.**
- **When installing each mounting rubber, avoid twisting or unusual extension in up/down and right/left directions.**

INSPECTION AFTER INSTALLATION

- Make sure that clearance between tail tube and bumper is even.
- With engine running, check exhaust tube joints for gas leakage and unusual noises.
- Make sure that mounting brackets and mounting rubbers are installed properly and free from undue stress. Improper installation could result in excessive noise and vibration.

SECTION FAX
FRONT AXLE

CONTENTS

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Commercial Service Tools 2
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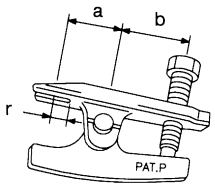
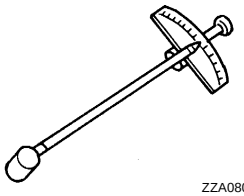
PREPARATION

PFP:00002

Special Service Tools

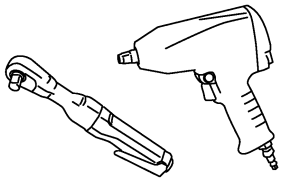
NDS0000N

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
HT72520000 (J-25730-A) Ball joint remover a: 33 mm (1.30 in) b: 50 mm (1.97 in) r: 11.5 mm (0.453 in)  NT546	Removing steering outer socket
ST3127S000 (J-25765-A) Preload gauge  ZZA0806D	Measuring rotating torque of ball joint

Commercial Service Tools

NDS0000O

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NDS0000P

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			FAX-4	—	FAX-4	NVH in WT section.	NVH in WT section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Parts interference	Wheel bearing damage	TIRES	ROAD WHEEL	STEERING
Symptom	FRONT AXLE	Noise	×	×		×	×	×
		Shake	×	×		×	×	×
		Vibration	×	×		×		×
		Shimmy	×	×		×	×	×
		Judder	×			×	×	×
		Poor quality ride or handling	×	×	×	×	×	

×: Applicable

FRONT WHEEL HUB AND KNUCKLE

PFP:40202

On-Vehicle Inspection

NDS0000Q

Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

WHEEL BEARING INSPECTION

- Move wheel hub in the axial direction by hand. Make sure there is no looseness of wheel bearing.

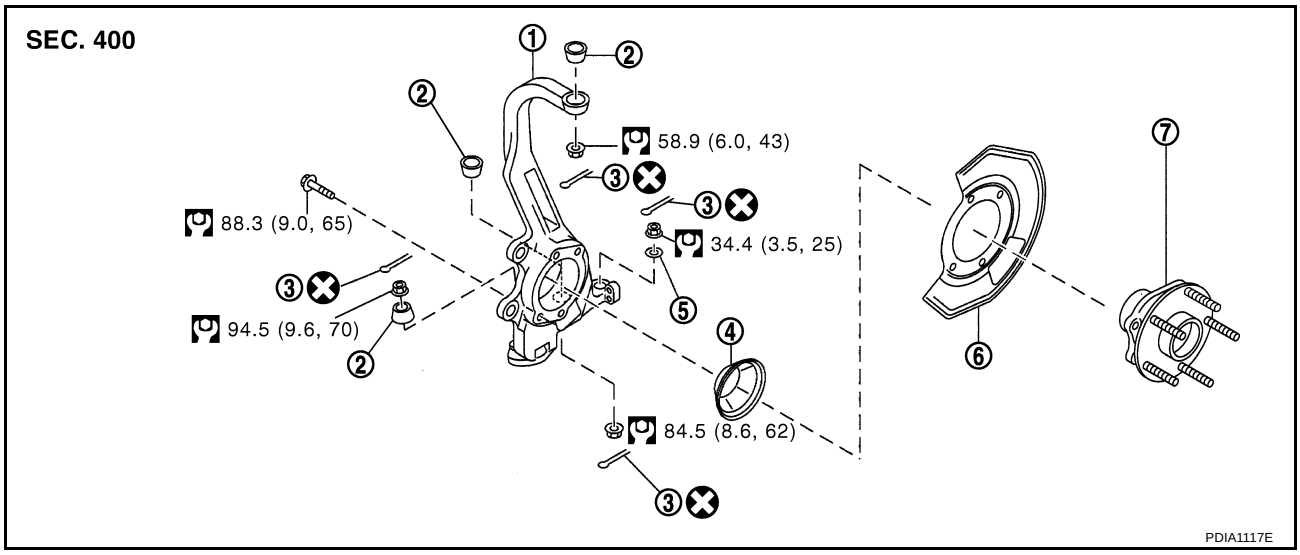
  Axial end play : 0.05 mm (0.002 in) or less

- Rotate wheel hub and make sure there is no unusual noise or other irregular conditions. If there are any irregular conditions, replace wheel hub and bearing assembly.

Removal and Installation

NDS0000R

COMPONENTS



1. Steering knuckle
2. Ball seat
3. Cotter pin
4. Hub cap
5. Washer
6. Splash guard
7. Wheel hub and bearing assembly

Refer to GI-11, "Components" , for the symbols in figure

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-26, "FRONT DISC BRAKE" .

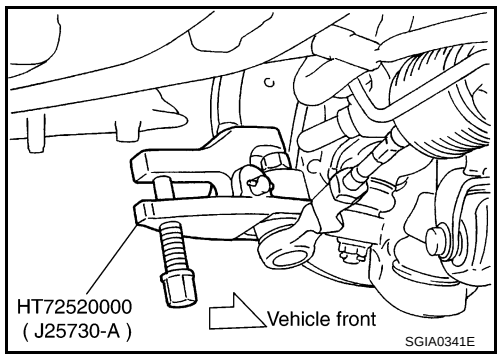
   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
4. Remove disc rotor.
5. Remove wheel sensor from steering knuckle. Refer to BRC-73, "WHEEL SENSORS" (with TCS), BRC-128, "WHEEL SENSORS" (with VDC).

   CAUTION:
   Do not pull on wheel sensor harness.
6. Remove brake hose bracket from steering knuckle. Refer to BR-12, "BRAKE TUBE AND HOSE" .
7. Remove cotter pin at steering outer socket, then loosen mounting nut.

8. Use a ball joint remover to remove steering outer socket from steering knuckle. Be careful not to damage ball joint boot.

CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (SST) from coming off.

9. After removing upper link, transverse link, compression rod and cotter pin at steering knuckle, loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove upper link, transverse link and compression rod from steering knuckle. Be careful not to damage ball joint boot.



CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.

11. Remove steering knuckle and wheel hub and bearing assembly fixing bolt.
12. Remove wheel hub and bearing assembly from steering knuckle.

INSPECTION AFTER REMOVAL

- About the inspection for upper link, compression rod, steering outer socket, refer to FSU-14, "UPPER LINK" , FSU-16, "COMPRESSION ROD" , PS-17, "POWER STEERING GEAR AND LINKAGE" .

Visual Inspection

- Check steering knuckle and ball seat for deformation, cracks, and other damage. Replace steering knuckle and ball seat if cracks, deformation or other damage is found.
- Check ball joint boot for deformation, damage, and also for grease leakage. Replace steering knuckle assembly if cracks, deformation or also for grease leakage is found.

Steering Knuckle Ball Joint Inspection

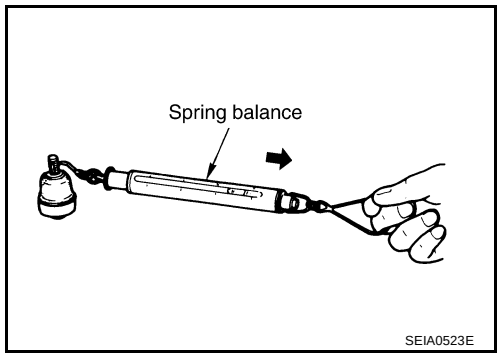
- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

CAUTION:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

- Hook spring balance at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.

Swing force:
0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)
Spring balance measurement
2.23 - 21.2 N (0.22 - 2.16 kg, 0.50 - 4.77 lb)

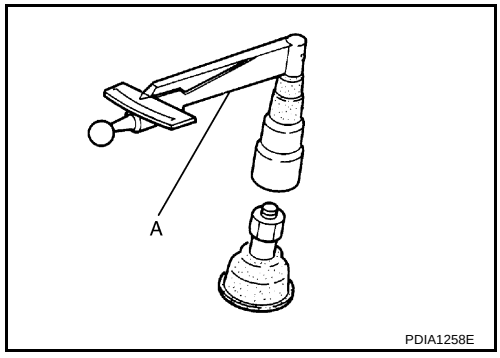


- If it is outside the standard, replace steering knuckle.

Rotating Torque Inspection

- Attach mounting nut to ball stud. Check that rotating torque is within specifications with a preload gauge.

Tool number A: ST3127S000 (J–25765–A)
Rotating torque:
0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)



- If it is outside the standard, replace steering knuckle.

Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

Axial end play : 0 mm (0 in)

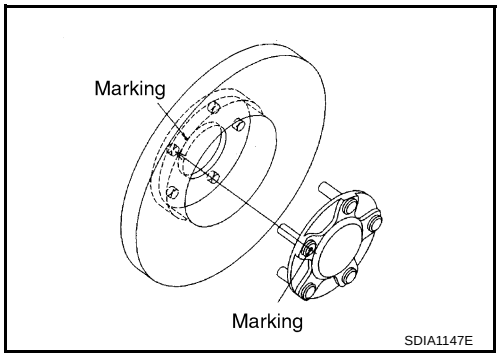
- If it is outside the standard, replace steering knuckle.

INSTALLATION

- Refer to FAX-4, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

- Wheel hub and bearing assembly and disc must be installed to fit the marked position each other.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Bearing

NDS0000S

Axial end play	0.05 mm (0.002 in) or less

BALL JOINT

Swing force	0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)
Measurement on spring balance (Spring balance hooking position: cotter pin mounting hole)	2.23 - 21.2 N (0.22 - 2.16 kg, 0.50 - 4.77 lb)
Rotating torque	0.147 - 1.4 N·m (0.02 - 0.14 kg-m, 2 - 12 in-lb)
Axial end play	0 mm (0 in)

SECTION FL
FUEL SYSTEM

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Standard and Limit 12
Tightening Torque 12

PRECAUTIONS

PFP:00001

Precautions for Battery Service

NBS000IW

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

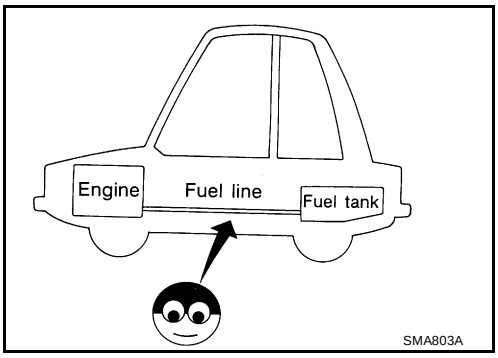
FUEL SYSTEM

PFP:17503

Checking Fuel Lines

NBS000IX

Inspect fuel lines, fuel filler cap and fuel tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.



General Precautions

NBS000IY

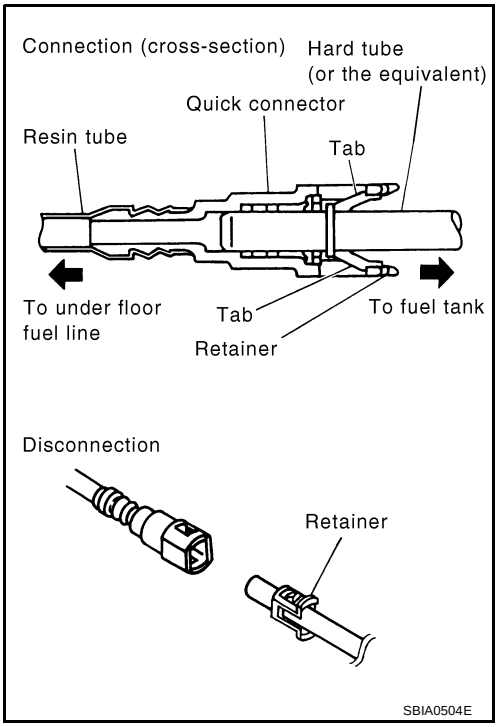
WARNING:

When replacing fuel line parts, be sure to observe the following.

- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from the work area.**
- **Put drained fuel in an explosion-proof container and put the lid on securely. Keep the container in safe area.**

CAUTION:

- **Use gasoline required by the regulations for octane number. Refer to GI-5, "Precautions for Fuel (Unleaded Premium Gasoline Required)" .**
- **Before removing fuel line parts, perform the following procedures:**
  - **Release fuel pressure from the fuel lines. Refer to EC-79, "FUEL PRESSURE RELEASE" .**
  - **Disconnect negative battery terminal.**
- **Always replace O-rings and clamps with new ones.**
- **Do not kink or twist tubes when they are being installed.**
- **Do not tighten hose clamps excessively to avoid damaging hoses.**
- **After connecting fuel tube quick connectors, make sure quick connectors are secure.**
  Ensure that connector and resin tube do not contact any adjacent parts.
- **After installing tubes, make sure there is no fuel leakage at connections in the following steps.**
  - **Apply fuel pressure to fuel lines with turning ignition switch “ON” (with engine stopped). Then check for fuel leaks at connections.**
  - **Start engine and rev it up and check for fuel leaks at connections.**
- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the “MIL” may come on.**
- **For servicing “Evaporative Emission System” parts, refer to EC-33, "EVAPORATIVE EMISSION SYSTEM" .**

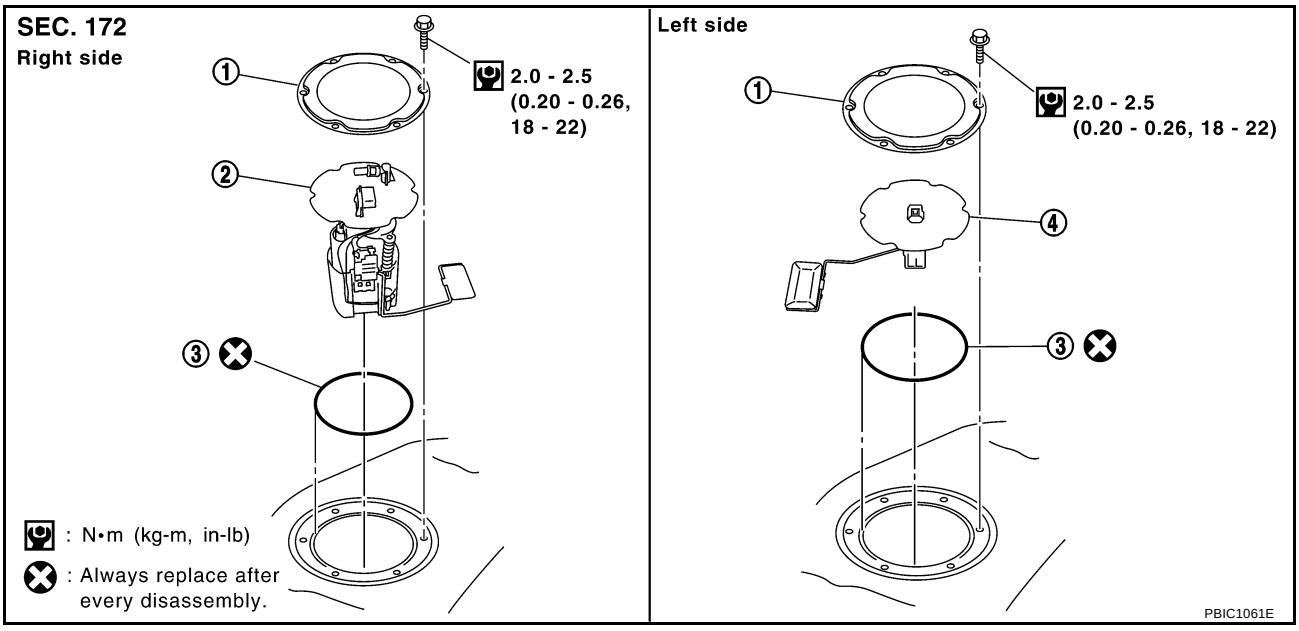


FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY

PFP:17042

Removal and Installation

NBS000IZ



1. Retainer
2. Main fuel level sensor unit, fuel filter and fuel pump assembly
3. O-ring
4. Sub fuel level sensor unit

REMOVAL

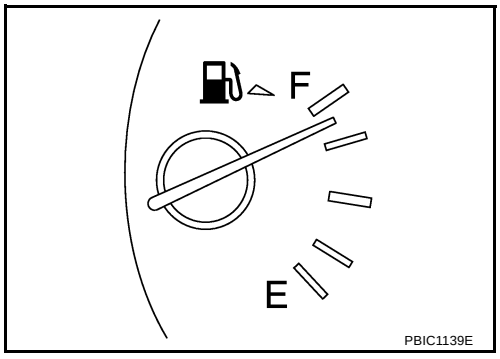
WARNING:

Be sure to read “General Precautions” when working on the fuel system. Refer to FL-3, "General Precautions" .

1. Check fuel level on fuel gauge. If fuel gauge indicates more than the level as shown in the figure (full or almost full), drain fuel from fuel tank until gauge indicates level as shown in the figure or below.

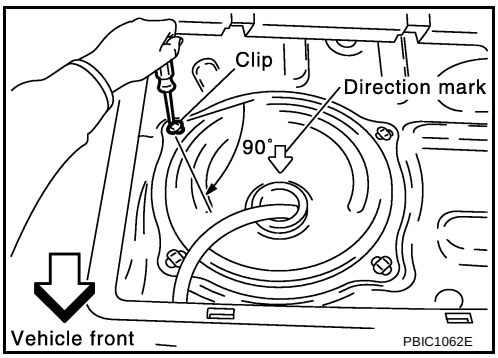
   NOTE:
   Because fuel will be spilled when removing main and sub fuel level sensor units for the top of the fuel is above the main and sub fuel level sensor units installation surface.

   - As a guide, fuel level becomes the position as shown in the figure or below when approximately 20 ℓ (5-1/4 US gal, 4-3/8 Imp gal) of fuel are drained from fuel tank.
   - In a case that fuel pump does not operate, perform the following procedure.

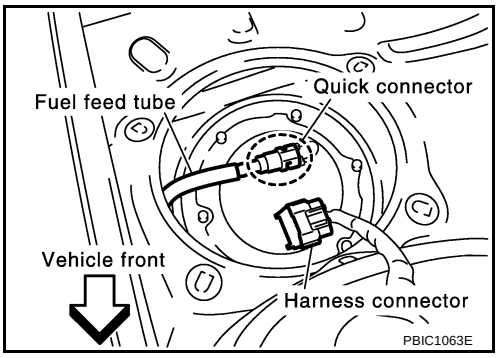


a. Insert hose of less than 25 mm (0.98 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from fuel filler tube.
b. Disconnect fuel filler hose from fuel filler tube. Refer to FL-10, "FUEL TANK" .
c. Insert hose into fuel tank through fuel filler hose to draw fuel from fuel tank.
2. Release the fuel pressure from the fuel lines. Refer to EC-79, "FUEL PRESSURE RELEASE" .
3. Open fuel filler lid.
4. Open filler cap and release the pressure inside fuel tank.
5. Remove woofer or rear floor box mat and rear floor box. Refer to AV-49, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" or EI-39, "LUGGAGE FLOOR TRIM" .

6. Remove inspection hole cover for main and sub fuel level sensor units by turning clips clockwise by 90 degrees.

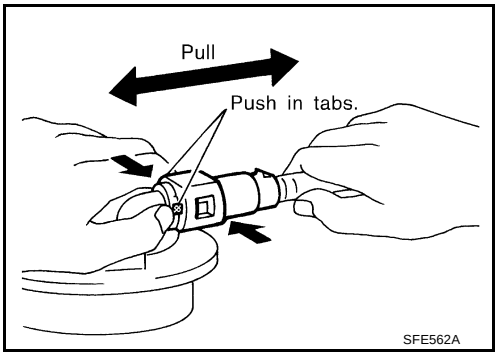


7. Disconnect harness connector and quick connector.



Disconnect quick connector as follows:

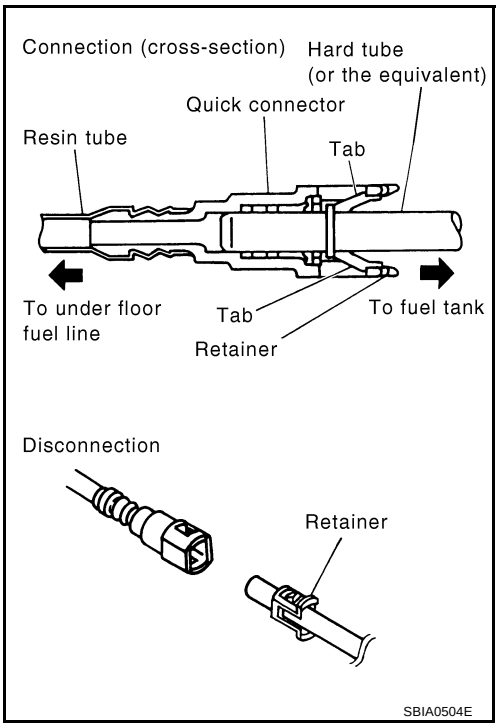
- Hold the sides of connector, push in tabs and pull out fuel feed tube.
- If quick connector sticks to tube of fuel level sensor unit, push and pull quick connector several times until it start to move. Then disconnect quick connector by pulling.



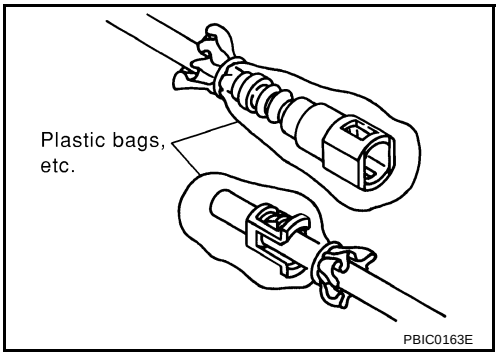
CAUTION:

- **Quick connector can be disconnected when the tabs are completely depressed. Do not twist it more than necessary.**
- **Do not use any tools to disconnect quick connector.**
- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Do not bend or twist resin tube during installation and disconnection.**
- **Do not remove the remaining retainer on hard tube (or equivalent) except when resin tube or retainer is replaced.**
- **When resin tube or hard tube (or equivalent) is replaced, also replace retainer with new one.**
- **Replace same color retainer as before replacing.**

Retainer color: White



- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



8. Remove main fuel level sensor unit, fuel filter and fuel pump assembly, and sub fuel level sensor unit as follows.

CAUTION:

- **Do not bend float arm during removal.**
- **Avoid polluting the inside by residue fuel. Draw out with avoiding inclination by supporting with a cloth.**
- **Avoid impacts such as falling when handling components.**

a. Removal of main fuel level sensor unit, fuel filter and fuel pump assembly:

i. Remove retainer.

ii. Raise main fuel level sensor unit, fuel filter and fuel pump assembly, and using snap ring pliers, remove fuel hose connector.

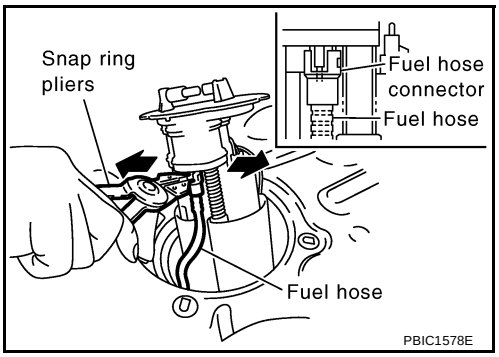
CAUTION:

Be careful not to damage fuel hose connector by expanding them excessively.

b. Removal of sub fuel level sensor unit:

i. Remove retainer.

ii. Raise and release sub fuel level sensor unit to remove.

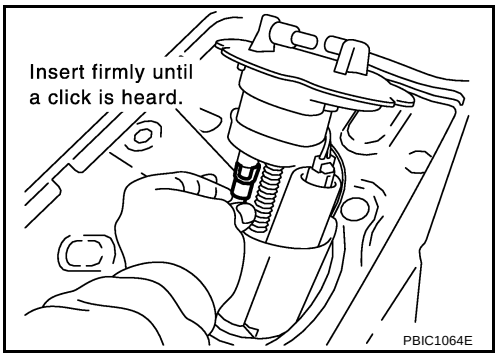


INSTALLATION

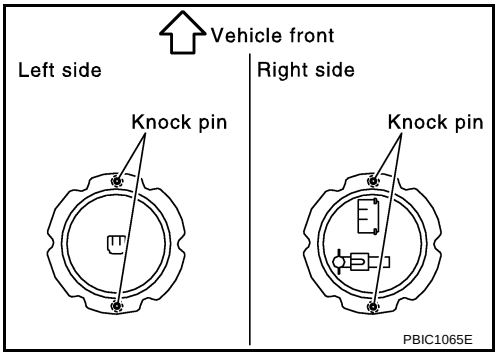
Note the following, and install in the reverse order of removal.

Main and Sub Fuel Level Sensor Unit

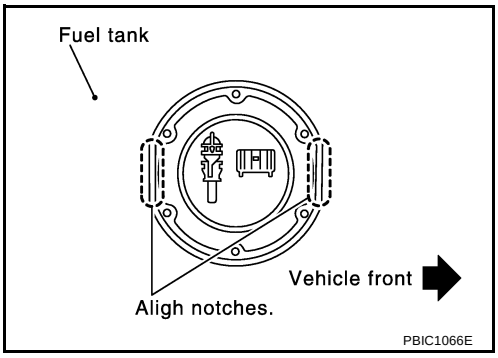
- When installing fuel hose connector insert them fully until a click sound of full stopper engagement is heard.



- Face main and sub fuel level sensor units as shown in the figure, and install them with the knock pin on back aligned with pin hole on fuel tank.



- Install retainer so that its notch becomes parallel with the notch on fuel tank.



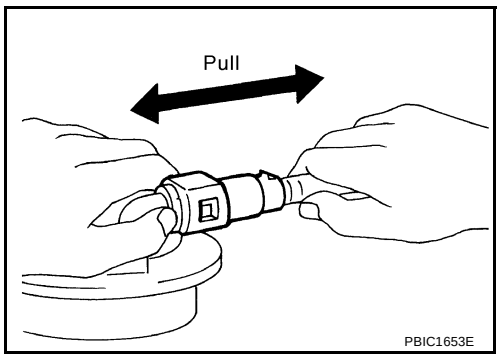
- Tighten retainer mounting bolts evenly.

Quick Connector

Connect quick connector of fuel feed hose as follows:

1. Check the connection for damage or any foreign materials.
2. Align the connector with the tube, then insert the connector straight into the tube until a click sound is heard.
3. After connecting, make sure that the connection is secure by following method.
   - Visually confirm that the two tabs are connected to the connector.

- Pull the tube and the connector to make sure they are securely connected.



Inspection Hole Cover

1. Install inspection hole cover with direction mark (arrow) facing front of vehicle.
2. Lock clips by turning counter-clockwise.

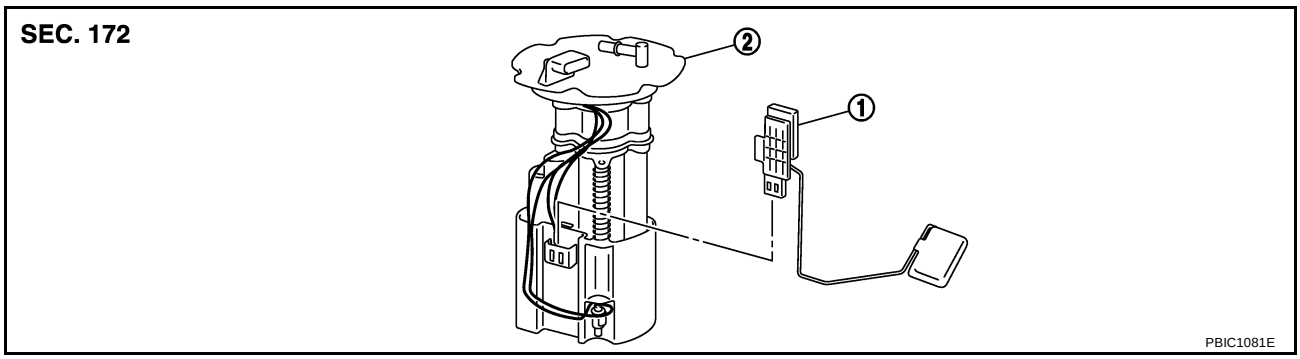
INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), then check connections for leaks by applying fuel pressure to fuel piping.
2. Start engine and rev it up and make sure there are no fuel leaks at the fuel system connections.

Disassembly and Assembly

NBS000J0



1. Fuel level sensor unit
2. Fuel filter and fuel pump assembly

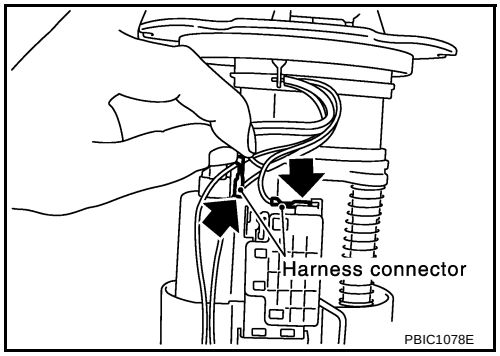
CAUTION:

Sub fuel level sensor unit cannot be disassembled and should be replaced as a unit.

DISASSEMBLY

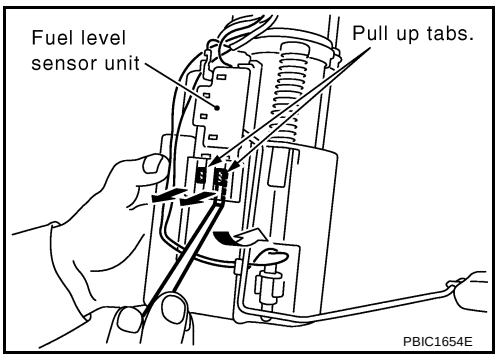
Remove fuel level sensor unit as follows.

1. Disconnect harness connector.
   - Hold connector by fingers and pull it out, because there is no stopper release tab.



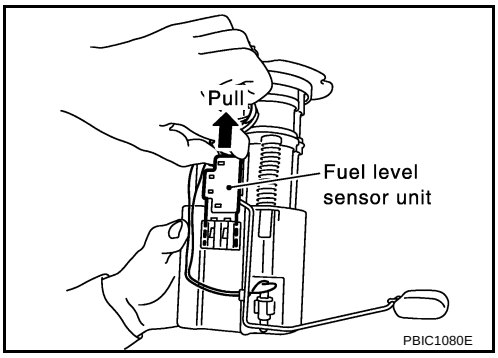
2. Using suitable tool, pull up tabs points as shown in the figure (two points) to release the lock.

CAUTION:
Be careful not to damage it.



3. After fixing tabs are disengaged, slide fuel level sensor unit out in direction shown by the arrow.

CAUTION:
Do not disassemble fuel filter and fuel pump assembly.



ASSEMBLY

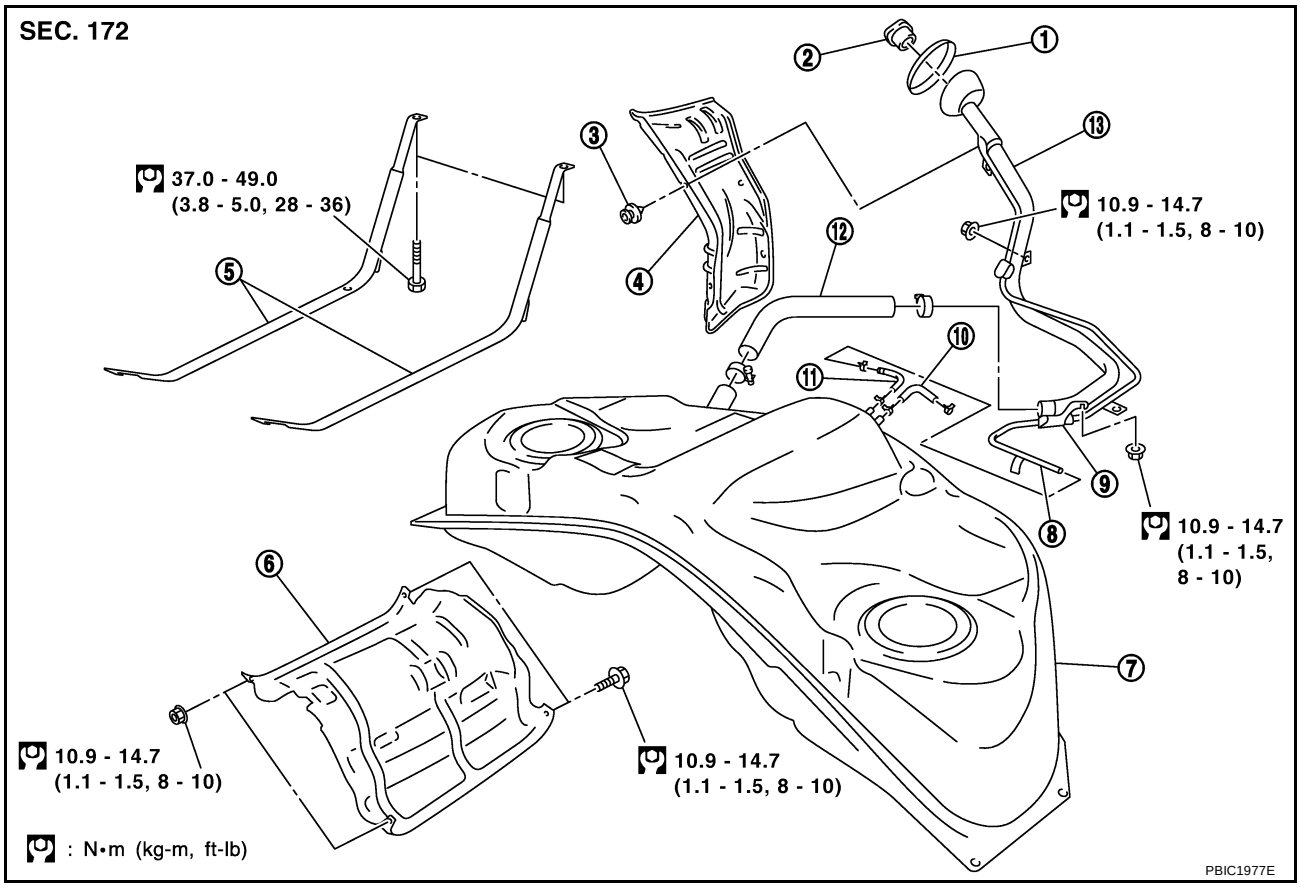
1. Check for damage of fuel level sensor unit installation position on the side of fuel filter and fuel pump assembly.
2. Slide fuel level sensor unit until it aligns to installation groove, then insert it until it stops.
   - Insert until you hear a “click” sound and actually feel the engagement.
   - After inserting, apply force in reverse direction (removal direction) to ensure it cannot be pulled out.
3. Connect harness connector.
   - Securely insert harness connector until it stops.

FUEL TANK

PFP:17202

Removal and Installation

NBS000J1



1. Grommet
2. Fuel filler cap
3. Clip
4. Fuel filler tube protector
5. Fuel tank mounting band
6. Fuel tank protector
7. Fuel tank
8. Vent tube
9. Vent hose
10. EVAP hose
11. Vent hose
12. Fuel filler hose
13. Fuel filler tube

REMOVAL

WARNING:

Be sure to read “General Precautions” before working on the fuel system. Refer to FL-3, "General Precautions" .

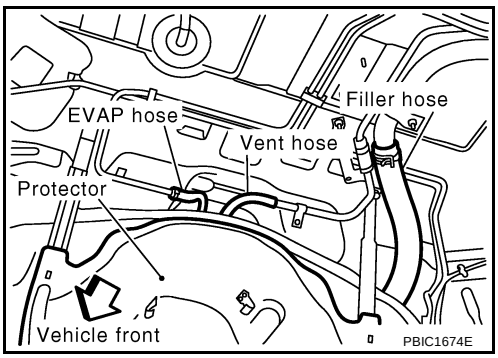
- Drain fuel from fuel tank if necessary. Refer to FL-4, "REMOVAL" .
- Perform work on level place.

1. Perform steps 2 to 7 of “REMOVAL” in “ FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY” on main and sub fuel level sensor units. Refer to FL-4, "REMOVAL" .
2. Remove tunnel stay. Refer to RSU-5, "REAR SUSPENSION ASSEMBLY" .
3. Remove exhaust front tube, center muffler and main muffler. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

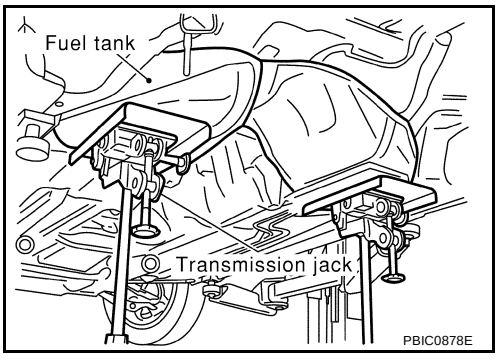
   CAUTION:

   Do not impact or damage propeller shaft tube.
5. Remove parking rear brake cables. Refer to PB-4, "PARKING BRAKE CONTROL" .
6. Remove rear suspension assembly. Refer to RSU-5, "REAR SUSPENSION ASSEMBLY" .
7. Remove fuel tank protector.

8. Disconnect fuel filler hose, vent hose and EVAP hoses at fuel tank side.



9. Remove fuel tank mounting band bolts while supporting fuel tank.



10. Supporting with hands, descend transmission jack carefully, and remove fuel tank.

CAUTION:

- **Make sure that all connection points have been disconnected.**
- **Confirm there is no interference with vehicle.**

11. Remove fuel filler tube, if necessary.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Surely clamp fuel hoses and insert hose to the length below.

Fuel filler hose	**: 35 mm (1.38 in)**
The other hoses	**: 25 mm (0.98 in)**

- Be sure hose clamp is not placed on swelled area of fuel tube.
- Tighten fuel hose clamp so that the distance between its lugs becomes to the following.

Fuel tank side	**: 8 - 12 mm (0.31 - 0.47 in)**
Fuel filler tube side	**: 5.7 - 9.7 mm (0.224 - 0.382 in)**

- To connect quick connector, refer to FL-7, "Quick Connector" .

INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), and check connections for leakage by applying fuel pressure to fuel piping.
2. Start engine and rev it up and make sure there are no fuel leaks at the fuel system connections.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

NBS000J2

Fuel tank capacity	Approx. 76 ℓ (20 US gal, 16-3/4 Imp gal)
Fuel recommendation	Refer to GI-5

Tightening Torque

NBS000J3

Unit : N·m (kg-m, ft-lb)
N·m (kg-m, in-lb)*

Main fuel level sensor unit, fuel filter and fuel pump assembly	2.0 - 2.5 (0.20 - 0.26, 18 - 22)*
Sub fuel level sensor unit	2.0 - 2.5 (0.20 - 0.26, 18 - 22)*
Fuel tank mounting band	37.0 - 49.0 (3.8 - 5.0, 28 - 36)
Fuel filler tube	10.9 - 14.7 (1.1 - 1.5, 8 - 10)
Fuel tank protector	10.9 - 14.7 (1.1 - 1.5, 8 - 10)

SECTION FSU
FRONT SUSPENSION

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PRECAUTIONS

PFP:00001

Caution

NES00001

- When installing rubber bushings, final tightening must be carried out under unladen conditions with tires on ground. Oil will shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Caulking nuts are not reusable. Always use new ones when installing. Since new caulking nuts are pre-oiled, tighten as they are.
- Avoid burden to front cross bar.

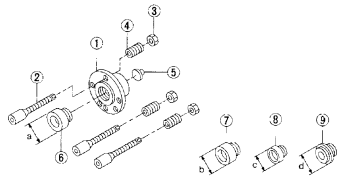
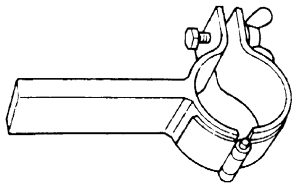
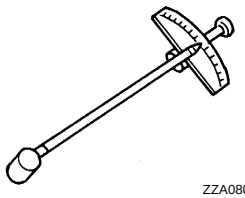
PREPARATION

PFP:00002

Special Service Tools

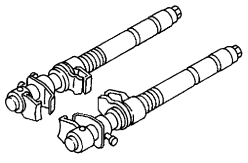
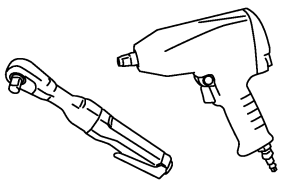
NES00002

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV991040S0 (—) CCK gauge attachment 1. Plate 2. Guide bolts 3. Nuts 4. Springs 5. Center plate 6. KV99104020 Adapter A a: 72 mm (2.83 in) dia. 7. KV99104030 Adapter B b: 65 mm (2.56 in) dia. 8. KV99104040 Adapter C c: 57 mm (2.24 in) dia. 9. KV99104050 Adapter D d: 53.4 mm (2.102 in) dia.  S-NT498	Measuring wheel alignment
ST35652000 (—) Strut attachment  ZZA0807D	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A)  ZZA0806D	Measuring rotating torque of ball joint

Commercial Service Tools

NES00003

Tool name	Description
Spring compressor  S-NT717	Removing coil spring
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NES00004

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			FSU-8	FSU-11	—	—	—	FSU-8	FSU-6	FSU-18	NVH in PR section	NVH in RFD section.	NVH in FAX and FSU section.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	FRONT SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×	×	×	×
		Shake	×	×	×	×		×			×		×	×	×	×	×	×
		Vibration	×	×	×	×	×				×		×	×		×		×
		Shimmy	×	×	×	×			×				×	×	×		×	×
		Judder	×	×	×								×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×			

×: Applicable

FRONT SUSPENSION ASSEMBLY

PFP:54010

On-Vehicle Inspection

NES00005

Make sure the mounting conditions (looseness, back lash) of each component and component statues (wear, damage) are normal.

INSPECTION OF BALL JOINT END PLAY OF EACH LINK

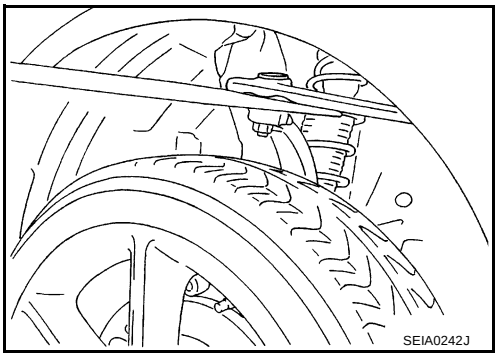
1. Set front wheels in a straight-ahead position. Do not depress brake pedal.
2. Check ball joint axial end play of each link.

CAUTION:
Be careful not to damage ball joint boot.

Upper Link Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between upper link and steering knuckle.

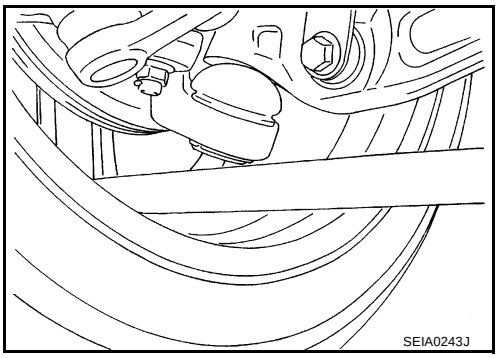
Axial end play : 0 mm (0 in)


SEIA0242J

Steering Knuckle Lower Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between steering knuckle and wheel.

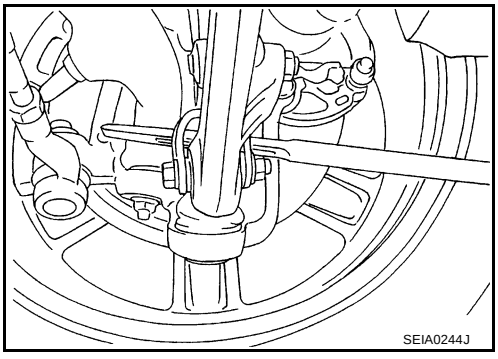
Axial end play : 0 mm (0 in)


SEIA0243J

Compression Rod Ball Joint

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between compression rod and transverse link.

Axial end play : 0 mm (0 in)


SEIA0244J

SHOCK ABSORBER INSPECTION

Check shock absorber for oil leakage, damage and replace if necessary. Refer to FSU-10, "COIL SPRING AND SHOCK ABSORBER" .

Wheel Alignment Inspection

NES00006

DESCRIPTION

- Measure wheel alignment under unladen conditions.

  NOTE:
  Unladen conditions mean that fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats are designated positions.

PRELIMINARY CHECK

- Check tires for improper air pressure and wear.
- Check road wheels for runout.
- Check wheel bearing axial end play.
- Check ball joint axial end play of compression rod, upper link, and steering knuckle
- Check shock absorber operation.
- Check each mounting part of axle and suspension for looseness and deformation.
- Check each link, rod and member for cracks, deformation and other damage.
- Check vehicle posture.

GENERAL INFORMATION AND RECOMMENDATIONS

- A four-wheel thrust alignment should be performed.
  - This type of alignment is recommended for any NISSAN/INFINITI vehicle.
  - The four-wheel “thrust” process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
  - The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
  - The rack should be checked to ensure that it is level.
- Make sure the machine is properly calibrated.
  - Your alignment equipment should be regularly calibrated in order to give correct information.
  - Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

THE ALIGNMENT PROCESS

IMPORTANT:

Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Do not use these indicators.**
  - The alignment specifications programmed into your machine that operate these indicators may not be correct.
  - This may result in an ERROR.
- Some newer alignment machines are equipped with an optional “Rolling Compensation” method to “compensate” the sensors (alignment targets or head units). **Do not use this “Rolling Compensation” method.**
  - Use the “Jacking Compensation Method”. After installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.
  - See Instructions in the alignment machine you're using for more information on this.

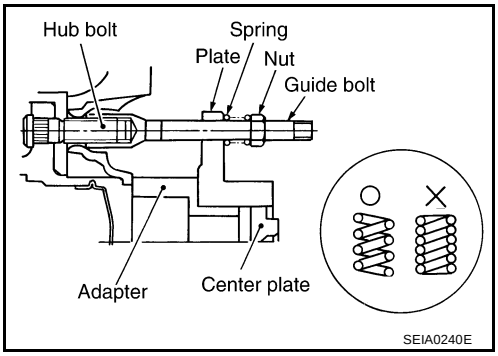
INSPECTION OF CAMBER, CASTER AND KINGPIN INCLINATION ANGLES

- Camber, caster, kingpin inclination angles cannot be adjusted.
- Before inspection, mount front wheels onto turning radius gauge. Mount rear wheels onto a stand that has same height so vehicle will remain horizontal.

Using a CCK Gauge

Install the CCK gauge attachment [SST: KV991040S0 (–)] with the following procedure on wheel, then measure wheel alignment.

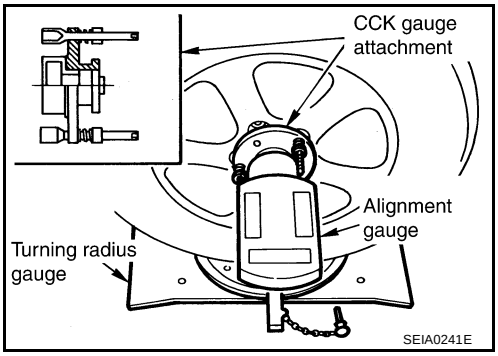
1. Remove there wheel nuts, and install a guide bolt to hub bolt.
2. Screw adapter into plate body until it contacts body tightly.
3. Screw center plate into plate.
4. Insert plate on guide bolt. Put spring in, and then evenly screw both guide bolt nut. When fastening guide bolt nut, do not completely compress spring.



5. Place the dent of alignment gauge onto the projection of center plate and tightly contact them to measure.

Camber, caster, kingpin inclination angles:

Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .



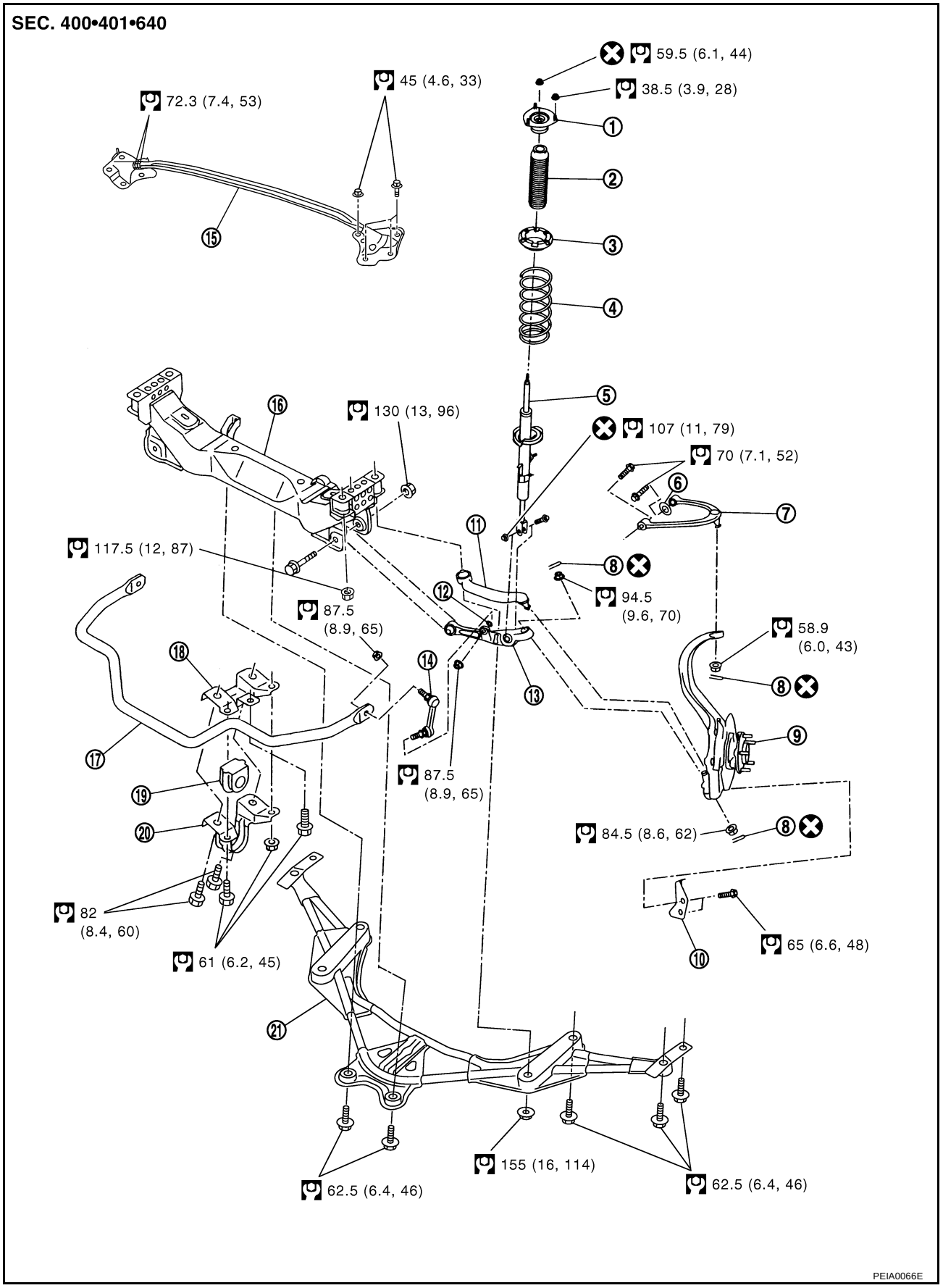
CAUTION:

- **If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage, and replace suspect parts if necessary.**
- **King pin inclination angle is reference value, no inspection is required. (Due to the type of suspension, the kingpin inclination angle cannot be measured correctly using a normal alignment tester.)**

Components

NES00007

SEC. 400•401•640



1. Mounting insulator	2. Bound bumper	3. Spring upper seat
4. Coil spring	5. Shock absorber	6. Stopper rubber
7. Upper link	8. Cotter pin	9. Front axle
10. Steering stopper bracket	11. Compression rod	12. Washer
13. Transverse link	14. Stabilizer connecting rod	15. Tower bar
16. Front suspension member	17. Stabilizer bar	18. Stabilizer clamp bracket
19. Stabilizer bushing	20. Stabilizer clamp	21. Front cross bar

Refer to GI-11, "Components" ,for the symbols in the figure.

Removal and Installation

NES00008

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-26, "FRONT DISC BRAKE" .
3. Remove undercover with power tool.
4. Remove fixing bolts and nuts, then remove front cross bar from vehicle with power tool.
5. Remove steering hydraulic piping bracket from front suspension member. Refer to PS-33, "HYDRAULIC LINE" .
6. Remove steering gear and front suspension member attachment bolts and hang steering gear on vehicle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
7. Set jack under engine.

   CAUTION:
   When setting jack to engine, use a wooden block or an equivalent for the setting.
8. Remove fixing bolt and nut between shock absorber and transverse link with power tool.
9. Remove cotter pin of upper link ball joint, then loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove upper link from steering knuckle. Be careful not to damage ball joint boot.

    CAUTION:
    Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
11. Remove fixing nut and washer located at the bottom of stabilizer connecting rod, and then remove stabilizer connecting rod from transverse link with power tool.
12. Remove fixing nuts between engine mounting insulator and front suspension member. Refer to EM-101, "ENGINE ASSEMBLY" .
13. Remove fixing nuts between front suspension member and body with power tool.
14. Remove front suspension assembly form vehicle.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

COIL SPRING AND SHOCK ABSORBER

PFP:54302

Removal and Installation

NES00009

REMOVAL

1. Remove tire with power tool.
2. Remove undercover with power tool.
3. Remove harness of wheel sensor from shock absorber. Refer to BRC-73, "WHEEL SENSORS" (With TCS), BRC-128, "WHEEL SENSORS" (With VDC).

   CAUTION:
   Do not pull on wheel sensor harness.
4. Remove mounting nuts of brake hose from shock absorber.
5. Remove mounting bolt and nut between shock absorber and transverse link with power tool.
6. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
7. Remove mounting nuts on mounting insulator with power tool, then remove shock absorber from vehicle.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

Disassembly and Assembly

NES0000A

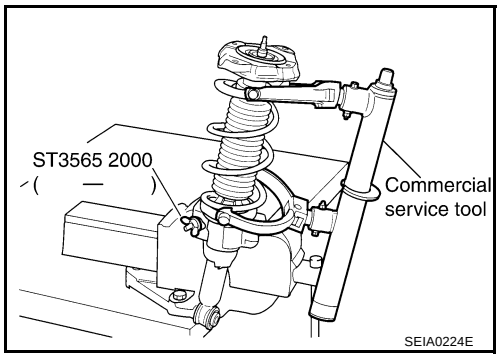
DISASSEMBLY

NOTE:
Make sure piston rod on shock absorber is not damaged when removing components from shock absorber.

1. Install strut attachment (SST) to shock absorber and fix it in a vise.

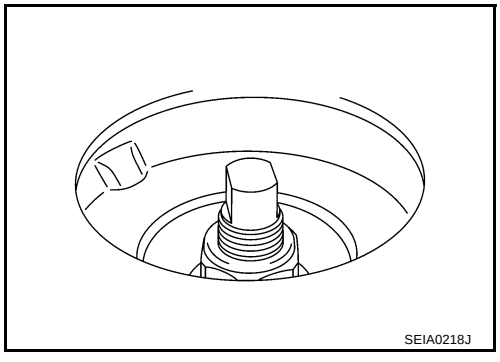
   CAUTION:
   When installing strut attachment (SST) to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.
2. Using a spring compressor (commercial service tool), compress coil spring between spring upper seat and spring lower seat (on shock absorber) until coil spring is free.

   CAUTION:
   Be sure spring compressor (commercial service tool) is securely attached to coil spring. Compress coil spring.



3. Check that coil spring between spring upper seat and spring lower seat is free and then secure piston rod tip so that piston rod does not turn, and remove piston rod lock nut.
4. Remove mounting insulator, bound bumper, spring upper seat. Then remove coil spring from shock absorber.
5. Gradually release spring compressor (commercial service tool), and remove coil spring.

   CAUTION:
   Loosen while making sure coil spring attachment position does not move.
6. Remove strut attachment (SST) from shock absorber.



INSPECTION AFTER DISASSEMBLY

Shock Absorber Inspection

- Check shock absorber for deformation, cracks, damage, and replace if necessary.
- Check piston rod for damage, uneven wear, distortion, and replace if necessary.
- Check welded and sealed areas for oil leakage, and replace if necessary.

Mounting Insulator and Rubber Parts Inspection

Check mounting insulator for cracks and rubber parts for wear. Replace them if necessary.

Coil Spring Inspection

Check coil spring for cracks, wear or damage, and replace if necessary.

ASSEMBLY

NOTE:

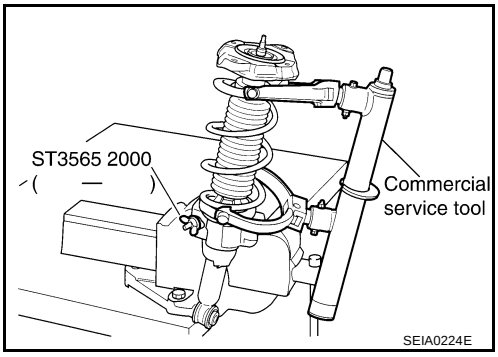
Make sure piston rod on shock absorber is not damaged when attaching components to shock absorber.

1. Install strut attachment (SST) to shock absorber and fix it in a vise.

   CAUTION:

   When installing strut attachment (SST) to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.

2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber.



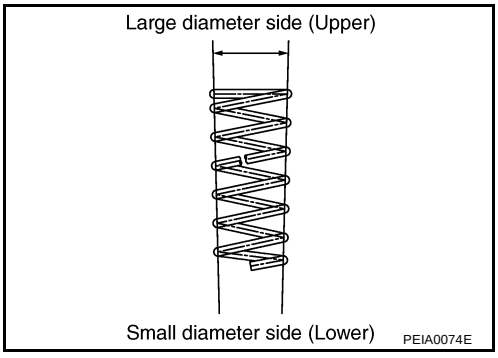
CAUTION:

- **Install coil spring as shown in the figure.**
- **Be sure spring compressor (commercial service tool) is securely attached to coil spring. Compress coil spring.**

3. Apply soapy water to bound bumper and insert into mounting insulator.

   CAUTION:

   Do not use machine oil.

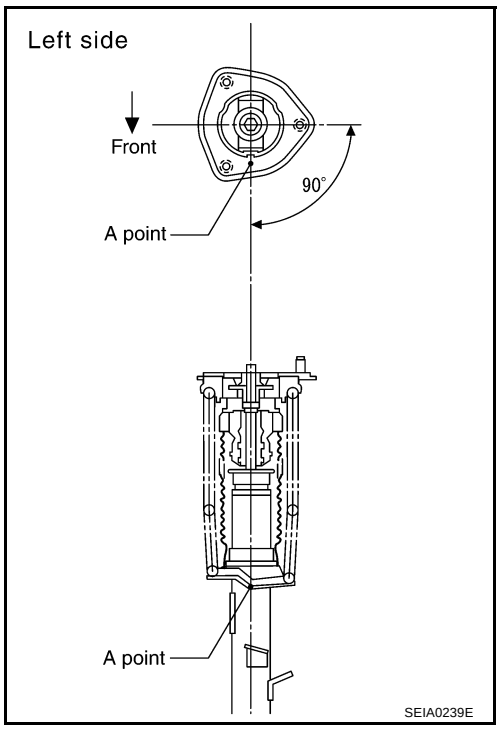


4. Attach spring upper seat and mounting insulator as shown in the figure.

   CAUTION:
   - **Make sure coil spring is securely seated in spring mounting groove of spring upper seat.**
   - **The bottom part of spring should be at the position of A point of spring seat.**

5. Secure piston rod tip so that piston rod does not turn, and tighten the specified torque on piston rod lock nut.
6. Gradually release spring compressor (commercial service tool), and remove coil spring.

   CAUTION:
   Loosen spring compressor (commercial service tool) while making sure coil spring attachment position does not move.
7. Remove strut attachment (SST) from shock absorber.



TRANSVERSE LINK

PFP:54500

Removal and Installation

NES0000B

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove mounting nut and washer on lower portion of stabilizer connecting rod with power tool.
4. Remove mounting nut between transverse link and shock absorber on lower position.
5. Remove mounting nut between transverse link and front suspension member with power tool.
6. Remove transverse link from steering knuckle. Refer to FAX-4, "FRONT WHEEL HUB AND KNUCKLE" .
7. Remove transverse link from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

Check transverse link and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of front suspension member installation position and shock absorber lower side (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

UPPER LINK

PFP:54524

Removal and Installation

NES0000C

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove shock absorber. Refer to FSU-10, "COIL SPRING AND SHOCK ABSORBER" .
4. Remove cotter pin of upper link ball joint, then loosen mounting nut.
5. Use a ball joint remover (suitable tool) to remove upper link from steering knuckle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove bolts holding upper link to body with power tool.
7. Remove upper link from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check upper link and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks, or other damage, and also for grease leakage. If any non-standard condition is found, replace it.

Ball Joint Inspection

- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

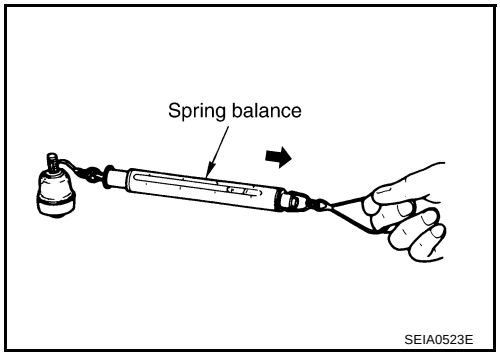
- Hook spring balance at ball stud. Confirm spring balance measurement value is within the specifications when ball stud begins moving.

  Swing torque:

  Less than 2.0 N·m (0.20 kg-m, 18 in-lb)

  Measured value of spring balance:

  Less than 34.8 N (3.5 kg, 7.8 lb)
- If it is outside the specified range, replace upper link assembly.



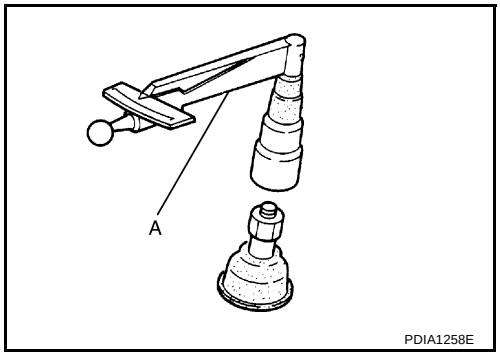
Rotating Torque Inspection

- Attach mounting nut to ball stud. Check that rotating torque is within specifications with a preload gauge.

  Tool number A: ST3127S000 (J–25765–A)

  Rotating torque:

  Less than 2.0 N·m (0.20 kg-m, 18 in-lb)
- If it is outside the specified range, replace upper link assembly.



Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

Axial end play : 0 mm (0 in)

- If it is outside the specified range, replace upper link assembly.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

- Perform final tightening of front suspension member installation position (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

COMPRESSION ROD

PFP:54468

Removal and Installation

NES0000D

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove front cross bar from vehicle with power tool.
4. Remove cotter pin of compression rod ball joint, and loosen nut.
5. Use a ball joint remover (suitable tool) to remove compression rod from steering knuckle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove compression rod from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check compression rod and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks, or other damage, and also for grease leakage. If any non-standard condition is found, replace it.

Ball Joint Inspection

- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measurement, move ball joint at least ten times by hand to check for smooth movement.

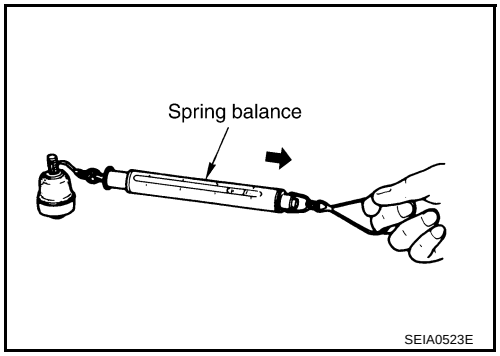
- Hook spring balance at ball stud. Confirm spring balance measurement value is within the specifications when ball stud begins moving.

  Swing torque:

  0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb)

  Measured value of spring balance:

  2.37 - 39.5 N (0.24 - 4.03 kg, 0.53 - 8.88 lb)



- If it is outside the specified range, replace compression rod assembly.

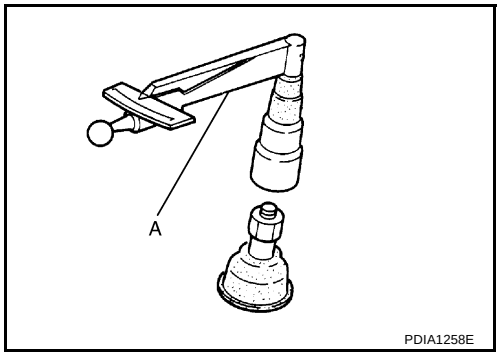
Rotating Torque Inspection

- Attach mounting nut to ball stud. Check that rotating torque is within the specifications with a preload gauge.

  Tool number A: ST3127S000 (J–25765–A)

  Rotating torque:

  0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb)



- If it is outside the specified range, replace compression rod assembly.

AXIAL END PLAY INSPECTION

- Move tip of ball joint in axial direction to check for looseness.

Axial end play : 0 mm (0 in)

- If it is outside the specified range, replace compression rod assembly.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

- Perform final tightening of installation position between front suspension member and front cross bar (rubber bushing) under unladen condition with tires on ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

STABILIZER BAR

PFP:54611

Removal and Installation

NES0000E

REMOVAL

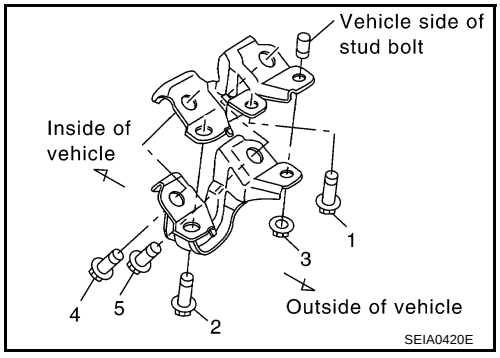
1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove mounting nut on upper portion of stabilizer connecting rod with power tool.
4. Remove fixing bolts and nuts, then remove stabilizer clamp, stabilizer bushing, and stabilizer clamp bracket.
5. Remove stabilizer bar from vehicle.

INSPECTION AFTER REMOVAL

Check stabilizer bar, stabilizer connecting rod, stabilizer bushing, stabilizer clamp and stabilizer clamp bracket for deformation, cracks and damage, and replace if necessary.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.
- Tighten each bolt and nut as shown in the figure for tightening stabilizer bracket and stabilizer clamp. Tightening order is as follows. 1 (fully tighten) → 2 (temporarily tighten) → 3 (temporarily tighten) → 2 (fully tighten) → 3 (fully tighten) → 4, 5 (temporarily tighten) → 4, 5 (fully tighten).



FRONT SUSPENSION MEMBER

PFP:54401

Removal and Installation

NES0000F

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove undercover with power tool.
3. Remove fixing bolts and nuts, then remove front cross bar from vehicle with power tool.
4. Remove steering hydraulic piping bracket from front suspension member. Refer to PS-33, "HYDRAULIC LINE" .
5. Remove steering gear and front suspension member attachment bolts and hang steering gear on vehicle. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .
6. Remove transverse link from front suspension member with power tool. Refer to FSU-13, "TRANSVERSE LINK" .
7. Set jack under engine.

   CAUTION:
   When setting jack to engine, use a wooden block or an equivalent for the setting.
8. Remove fixing nuts between engine mounting insulator and front suspension member. Refer to EM-101, "ENGINE ASSEMBLY" .
9. Remove fixing nuts between front suspension member and body with power tool.
10. Remove front suspension member from vehicle.

INSPECTION AFTER REMOVAL

Check front suspension member for deformation, cracks, or any other damage. Replace if necessary.

INSTALLATION

- Refer to FSU-8, "Components" for tightening torque. Install in the reverse order of removal.
- Perform final tightening of installation position between front suspension member and transverse link (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to FSU-21, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

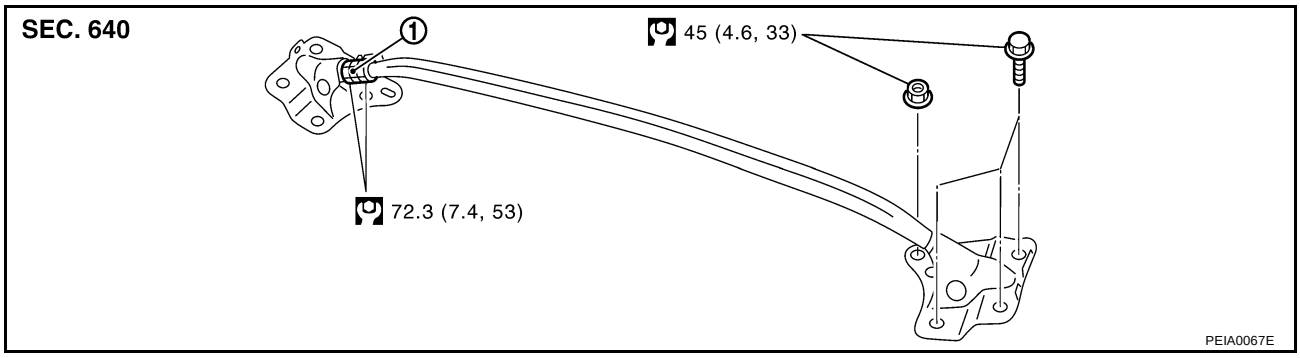
TOWER BAR

PFP:544A2

Removal and Installation

NES0000G

COMPONENTS

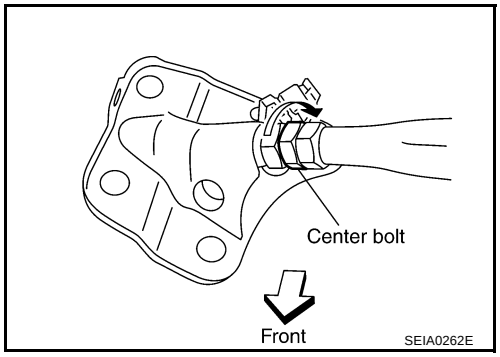


1. Center bolt

Refer to GI-11, "Components" ,for the symbols in the figure

REMOVAL

1. Fix center bolt, and then loosen nut in the right and left side.
2. Loosen center bolt to the direction in the figure on 660° (Or turn bolt 1.7 times) to place the black mark of center bolt above.
3. Remove tower bar fixing bolts and nuts, and remove tower bar from vehicle with power tool.

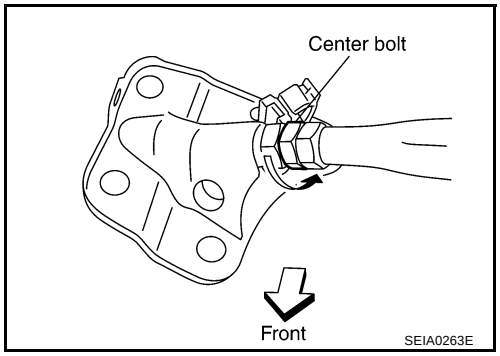


INSTALLATION

1. Install tower bar and tighten at the specified torque.

   NOTE:
   If it is hard to install tower bar, install it turning center bolt.
2. Tighten center bolt to the direction in the figure on 660° (Or turn bolt 1.7 times) to place the black mark of center bolt above.

   NOTE:
   The space between tower bar and engine collector should be between 10.0 mm (0.394 in) and 17.0 mm (0.669 in).
3. Tighten both nut of the right and left side of center bolt.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Alignment (Unladen*)

NES0000H

Camber Degree minute (Decimal degree)		Minimum	–1° 20′ (–1.33°)
		Nominal	–0° 35′ (–0.58°)
		Maximum	0° 10′ (0.17°)
		Left and right difference	45′ (0.75°)
Caster Degree minute (Decimal degree)		Minimum	7° 25′ (7.42°)
		Nominal	8° 10′ (8.17°)
		Maximum	8° 55′ (8.92°)
		Left and right difference	45′ (0.75°)
Kingpin inclination Degree minute (Decimal degree)		Minimum	4° 20′ (4.33°)
		Nominal	5° 05′ (5.08°)
		Maximum	5° 50′ (5.83°)
Total toe-in	Distance	Minimum	0 mm (0 in)
		Nominal	1 mm (0.04 in)
		Maximum	2 mm (0.08 in)
	Angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0° 00′ (0.00°)
		Nominal	0° 02′ 30″ (0.04°)
		Maximum	0° 05′ (0.08°)

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

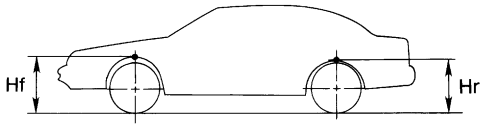
Ball Joint

NES0000I

Swing torque	Less than 2.0 N·m (0.20 kg-m, 18 in-lb) (Upper link) 0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb) (Compression rod)
Measurement on spring balance (cotter pinhole position)	Less than 34.8 N (3.5 kg, 7.8 lb) (Upper link) 2.37 - 39.5 N (0.24 - 4.03 kg, 0.53 - 8.88 lb) (Compression rod)
Rotating torque	Less than 2.0 N·m (0.20 kg-m, 18 in-lb) (Upper link) 0.147 - 2.45 N·m (0.02 - 0.24 kg-m, 2 - 21 in-lb) (Compression rod)
Axial end play	0 mm (0 in)

Wheelarch Height (Unladen*)

NES0000J



SFA818A

Applied model	225/45R18 (Front) 245/45R18 (Rear)		245/40R18 (Front) 265/35R19 (Rear)
	Coupe	Roadster	Coupe
Front (Hf)	683 mm (26.89 in)		683 mm (26.89 in)
Rear (Hr)	706 mm (27.80 in)	705 mm (27.76 in)	703 mm (27.68 in)

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

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NISSAN
350Z
MODEL Z33 SERIES

QUICK REFERENCE INDEX

A GENERAL INFORMATION	GI	General Information
B ENGINE	EM	Engine Mechanical
	LU	Engine Lubrication System
	CO	Engine Cooling System
	EC	Engine Control System
	FL	Fuel System
	EX	Exhaust System
	ACC	Accelerator Control System
C TRANSMISSION/ TRANSAXLE	CL	Clutch
	MT	Manual Transmission
	AT	Automatic Transmission
D DRIVELINE/AXLE	PR	Propeller Shaft
	RFD	Rear Final Drive
	FAX	Front Axle
	RAX	Rear Axle
E SUSPENSION	FSU	Front Suspension
	RSU	Rear Suspension
	WT	Road Wheels & Tires
F BRAKES	BR	Brake System
	PB	Parking Brake System
	BRC	Brake Control System
G STEERING	PS	Power Steering System
	STC	Steering Control System
H RESTRAINTS	SB	Seat Belts
	SRS	Supplemental Restraint System (SRS)
I BODY	BL	Body, Lock & Security System
	GW	Glasses, Window System & Mirrors
	RF	Roof
	EI	Exterior & Interior
	IP	Instrument Panel
	SE	Seat
J AIR CONDITIONER	ATC	Automatic Air Conditioner
K ELECTRICAL	SC	Starting & Charging System
	LT	Lighting System
	DI	Driver Information System
	WW	Wiper, Washer & Horn
	BCS	Body Control System
	LAN	LAN System
	AV	Audio Visual, Navigation & Telephone System
	ACS	Auto Cruise Control System
	PG	Power Supply, Ground & Circuit Elements
L MAINTENANCE	MA	Maintenance
M INDEX	IDX	Alphabetical Index

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FOREWORD

This manual contains maintenance and repair procedure for the 2007 NISSAN 350Z.

In order to assure your safety and the efficient functioning of the vehicle, this manual should be read thoroughly. It is especially important that the PRECAUTIONS in the GI section be completely understood before starting any repair task.

All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

IMPORTANT SAFETY NOTICE

The proper performance of service is essential for both the safety of the technician and the efficient functioning of the vehicle.
The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately.
Service varies with the procedures used, the skills of the technician and the tools and parts available. Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by NISSAN must first be completely satisfied that neither personal safety nor the vehicle's safety will be jeopardized by the service method selected.

NISSAN MOTOR CO., LTD.

QUICK REFERENCE CHART 350Z

PFP:00000

ENGINE TUNE-UP DATA (VQ35HR)

ELS0003W

Engine model		VQ35HR
Firing order		1-2-3-4-5-6
Idle speed rpm A/T (In “P” or “N” position) M/T (In “Neutral” position)		650 ± 50
Ignition timing (BTDC at idle speed) A/T (In “P” or “N” position) M/T (In “Neutral” position)		15° ± 5°
CO% at idle		0.7 - 9.9 % and engine runs smoothly
Tension of drive belts		Auto adjustment by auto tensioner
Radiator cap relief pressure kPa (kg/cm^2 , psi)	Standard	108 - 127 (1.1 - 1.3, 16 - 18)
	Limit	88 (0.9, 13)
Cooling system leakage testing pressure kPa (kg/cm^2 , psi)		157 (1.6, 23)
Compression pressure kPa (kg/cm^2 , psi)/rpm		
	Standard	1,275 (13.0, 185)/300
	Minimum	981 (10.0, 142)/300
	Differential limit between cylinders	98 (1.0, 14)/300
Spark plug	Standard type	FXE22HR11
	Gap (Nominal) mm (in)	1.1 (0.043)

FRONT WHEEL ALIGNMENT (Unladen*)

ELS0003X

Camber Degree minute (Decimal degree)		Minimum	–1°20′ (–1.33°)
		Nominal	–0°35′ (–0.58°)
		Maximum	0°10′ (0.17°)
		Left and right difference	45′ (0.75°)
Caster Degree minute (Decimal degree)		Minimum	7°25′ (7.42°)
		Nominal	8°10′ (8.17°)
		Maximum	8°55′ (8.92°)
		Left and right difference	45′ (0.75°)
Kingpin inclination Degree minute (Decimal degree)		Minimum	4°20′ (4.33°)
		Nominal	5°05′ (5.08°)
		Maximum	5°50′ (5.83°)
Total toe-in	Distance	Minimum	0 mm (0 in)
		Nominal	1 mm (0.04 in)
		Maximum	2 mm (0.08 in)
	Angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0°00′ (0.00°)
		Nominal	0°02′30″ (0.04°)
		Maximum	0°05′ (0.08°)

Wheel turning angle (Full turn)	Inside Degree minute (Decimal degree)	Minimum	35°55′ (35.9°)
		Nominal	38°55′ (38.9°)
		Maximum	39°55′ (39.9°)
	Outside Degree minute (Decimal degree)	Nominal	30°40′ (30.7°)

* : Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

REAR WHEEL ALIGNMENT (Unladen*)

ELS0003Y

Camber Degree minute (Decimal degree)		Minimum	–2°05′ (–2.08°)
		Nominal	–1°35′ (–1.58°)
		Maximum	–1°05′ (–1.08°)
Total toe-in	Distance	Minimum	1.1 mm (0.043 in)
		Nominal	1.9 mm (0.075 in)
		Maximum	2.7 mm (0.106 in)
	Angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0°02′54″ (0.05°)
		Nominal	0°04′54″ (0.08°)
		Maximum	0°06′54″ (0.12°)

* : Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

BRAKE

ELS0003Z

Unit : mm (in)

Front brake	Pad repair limit thickness	2.0 (0.079)
	Rotor repair limit thickness	Other than brembo : 26.0 (1.024) With brembo : 28.4 (1.118)
Rear brake	Pad repair limit thickness	2.0 (0.079)
	Rotor repair limit thickness	Other than brembo : 14.0 (0.551) With brembo : 20.2 (0.795)
Brake pedal height (from dash lower panel top surface)		M/T : 153.2 - 163.2 (6.03 - 6.43) A/T : 161.5 - 171.5 (6.36 - 6.75)
Depressed pedal height*		M/T : More than 90 (3.54) A/T : More than 95 (3.74)

* : Under a force of 490 N(50 kg, 110 lb) with the engine running.

REFILL CAPACITIES

ELS00040

UNIT		Liter	US measure
Fuel tank		76	20 gal
Engine coolant (With reservoir tank)		9.0	9-1/2 qt
Engine	Drain and refill		
	With oil filter change	4.7	5 qt
	Without oil filter change	4.4	4-5/8 qt
	Dry engine (Overhaul)	5.4	5-3/4 qt
Transmission	A/T	10.3	10-7/8 qt
	M/T	2.9	3-1/8 qt
Differential carrier		1.4	3 pt
Power steering system		1.0	1 1/8 qt
Air conditioning system	Compressor oil	0.15	5.3 fl oz
	Refrigerant	0.55 kg	1.21 lb

SECTION GI
GENERAL INFORMATION

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PRECAUTIONS

PFP:00001

Description

NAS00001

Observe the following precautions to ensure safe and proper servicing. These precautions are not described in each individual section.

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NAS00002

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

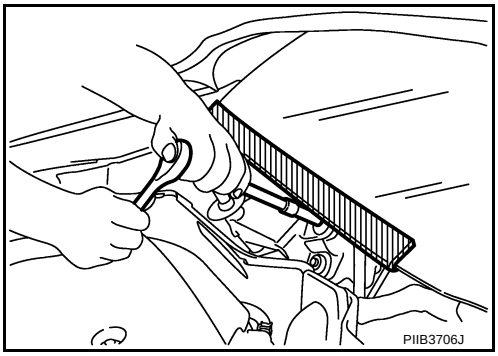
NAS00004

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NAS0005O

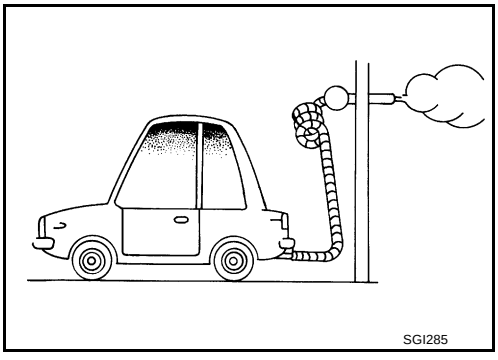
When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.


PIIB3706J

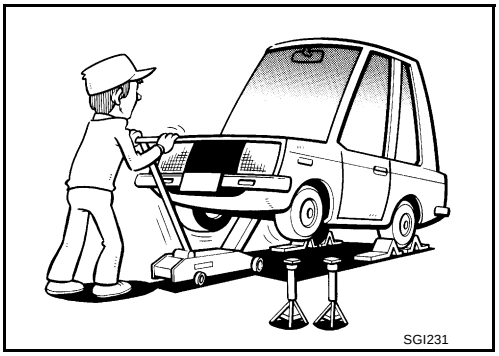
General Precautions

NAS00005

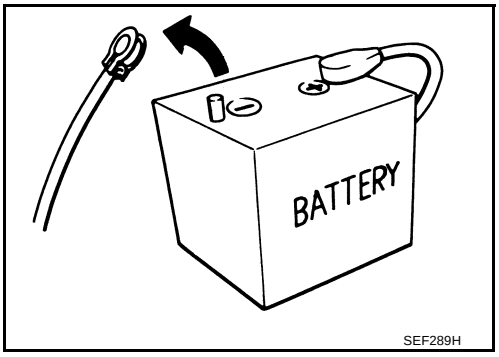
- Do not operate the engine for an extended period of time without proper exhaust ventilation.
  Keep the work area well ventilated and free of any flammable materials. Special care should be taken when handling any flammable or poisonous materials, such as gasoline, refrigerant gas, etc. When working in a pit or other enclosed area, be sure to properly ventilate the area before working with hazardous materials.
  Do not smoke while working on the vehicle.


SGI285

- Before jacking up the vehicle, apply wheel chocks or other tire blocks to the wheels to prevent the vehicle from moving. After jacking up the vehicle, support the vehicle weight with safety stands at the points designated for proper lifting before working on the vehicle.
  These operations should be done on a level surface.
- When removing a heavy component such as the engine or transaxle/transmission, be careful not to lose your balance and drop them. Also, do not allow them to strike adjacent parts, especially the brake tubes and master cylinder.

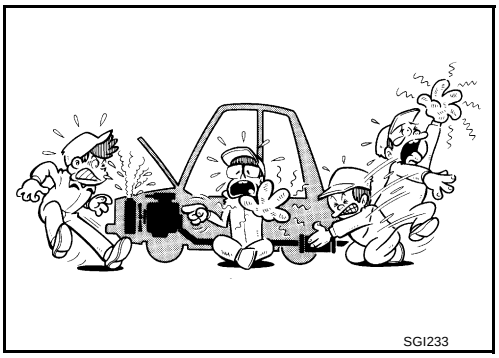

SGI231

- Before starting repairs which do not require battery power:
  Turn off ignition switch.
  Disconnect the negative battery terminal.
- If the battery terminals are disconnected, recorded memory of radio and each control unit is erased.
- Battery posts, terminals and related accessories contain lead and lead compounds. Wash hands after handling.

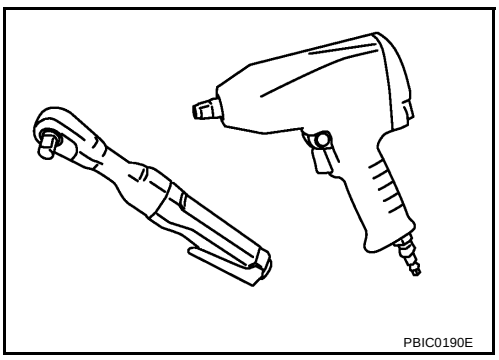


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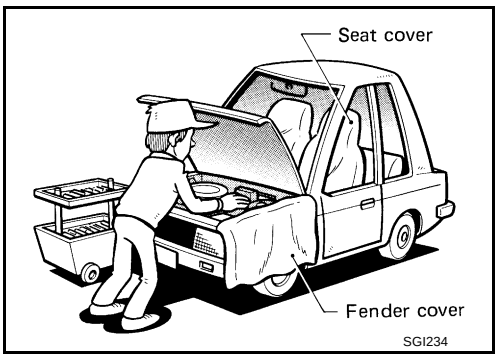
- To prevent serious burns:
  Avoid contact with hot metal parts.
  Do not remove the radiator cap when the engine is hot.
- Dispose of or recycle drained oil or the solvent used for cleaning parts in an appropriate manner.
- Do not attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically.
  Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.
- Clean all disassembled parts in the designated liquid or solvent prior to inspection or assembly.


SGI233

- Replace oil seals, gaskets, packings, O-rings, locking washers, cotter pins, self-locking nuts, etc. with new ones.
- Replace inner and outer races of tapered roller bearings and needle bearings as a set.
- Arrange the disassembled parts in accordance with their assembled locations and sequence.
- Do not touch the terminals of electrical components which use microcomputers (such as ECM).
  Static electricity may damage internal electronic components.
- After disconnecting vacuum or air hoses, attach a tag to indicate the proper connection.
- Use only the fluids and lubricants specified in this manual.
- Use approved bonding agent, sealants or their equivalents when required.
- Use hand tools, power tools (disassembly only) and recommended special tools where specified for safe and efficient service repairs.
- When repairing the fuel, oil, water, vacuum or exhaust systems, check all affected lines for leaks.


PBIC0190E

- Before servicing the vehicle:
  Protect fenders, upholstery and carpeting with appropriate covers.
  Take caution that keys, buckles or buttons do not scratch paint.



WARNING:
To prevent ECM from storing the diagnostic trouble codes, do not carelessly disconnect the harness connectors which are related to the engine control system and TCM (transmission control module) system. The connectors should be disconnected only when working according to the WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.

Precautions for Three Way Catalyst

NAS00006

If a large amount of unburned fuel flows into the catalyst, the catalyst temperature will be excessively high. To prevent this, follow the instructions.

- Use unleaded gasoline only. Leaded gasoline will seriously damage the three way catalyst.
- When checking for ignition spark or measuring engine compression, make tests quickly and only when necessary.
- Do not run engine when the fuel tank level is low, otherwise the engine may misfire, causing damage to the catalyst.

Do not place the vehicle on flammable material. Keep flammable material off the exhaust pipe and the three way catalyst.

Precautions for Fuel (Unleaded Premium Gasoline Required)

NAS0005P

Use unleaded premium gasoline with an octane rating of at least 91 AKI (Anti-Knock Index) number (Research octane number 96).

If unleaded premium gasoline is not available, unleaded regular gasoline with an octane rating of at least 87 AKI number (Research octane number 91) can be used, but only under the following precautions:

- have the fuel tank filled only partially with unleaded regular gasoline, and fill up with unleaded premium gasoline as soon as possible.
- avoid full throttle driving and abrupt acceleration.

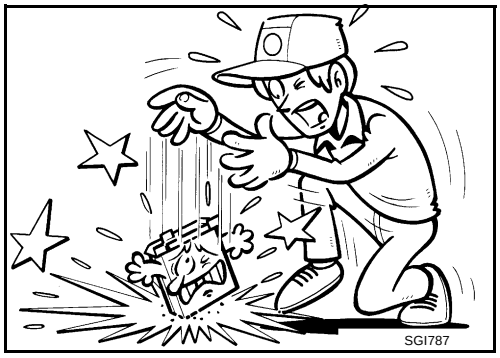
However, for maximum vehicle performance, the use of unleaded premium gasoline is recommended.

CAUTION:
Do not use leaded gasoline. Using leaded gasoline will damage the three way catalyst. Do not use E-85 fuel (85% fuel ethanol, 15% unleaded gasoline) unless the vehicle is specifically designed for E-85 fuel (i.e. Flexible Fuel Vehicle - FFV models). Using a fuel other than that specified could adversely affect the emission control devices and systems, and could also affect the warranty coverage validity.

Precautions for Multiport Fuel Injection System or Engine Control System

NAS00008

- Before connecting or disconnecting any harness connector for the multiport fuel injection system or ECM:
  Turn ignition switch to “OFF” position.
  Disconnect negative battery terminal.
  Otherwise, there may be damage to ECM.
- Before disconnecting pressurized fuel line from fuel pump to injectors, be sure to release fuel pressure.
- Be careful not to jar components such as ECM and mass air flow sensor.

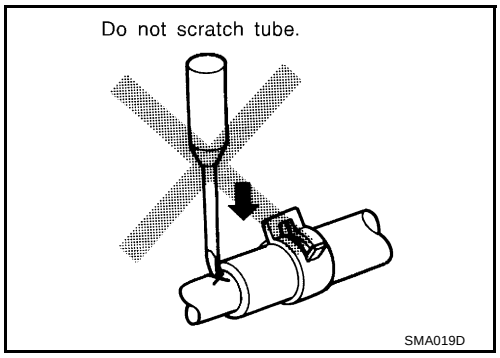


Precautions for Hoses

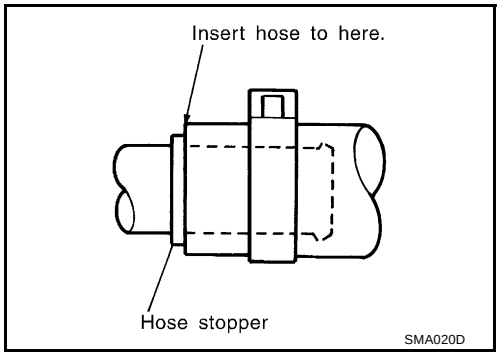
NAS00009

HOSE REMOVAL AND INSTALLATION

- To prevent damage to rubber hose, do not pry off rubber hose with tapered tool or screwdriver.

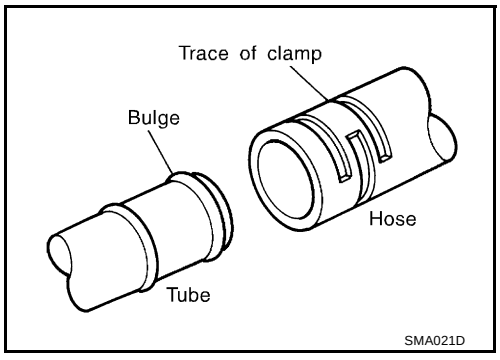


- To reinstall the rubber hose securely, make sure that hose insertion length and orientation is correct. (If tube is equipped with hose stopper, insert rubber hose into tube until it butts up against hose stopper.)

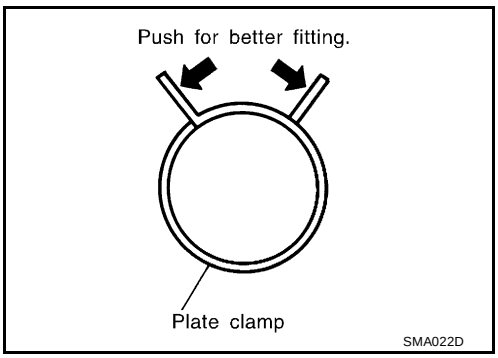


HOSE CLAMPING

- If old rubber hose is re-used, install hose clamp in its original position (at the indentation where the old clamp was). If there is a trace of tube bulging left on the old rubber hose, align rubber hose at that position.
- Discard old clamps; replace with new ones.



- After installing plate clamps, apply force to them in the direction of the arrow, tightening rubber hose equally all around.



Precautions for Engine Oils

NAS0000A

Prolonged and repeated contact with used engine oil may cause skin cancer. Try to avoid direct skin contact with used oil.
If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

HEALTH PROTECTION PRECAUTIONS

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Do not put oily rags in pockets.
- Avoid contaminating clothes, particularly underpants, with oil.
- Heavily soiled clothing and oil-impregnated footwear should not be worn. Overalls must be cleaned regularly.
- First aid treatment should be obtained immediately for open cuts and wounds.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin.
- Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
- Do not use gasoline, kerosene, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- If skin disorders develop, obtain medical advice without delay.
- Where practical, degrease components prior to handling.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.

ENVIRONMENTAL PROTECTION PRECAUTIONS

Dispose of used oil and used oil filters through authorized waste disposal contractors to licensed waste disposal sites, or to the waste oil reclamation trade. if in doubt, contact the local authority for advice on disposal facilities.
It is illegal to pour used oil on to the ground, down sewers or drains, or into water sources.
The regulations concerning pollution vary between regions.

Precautions for Air Conditioning

NAS0000B

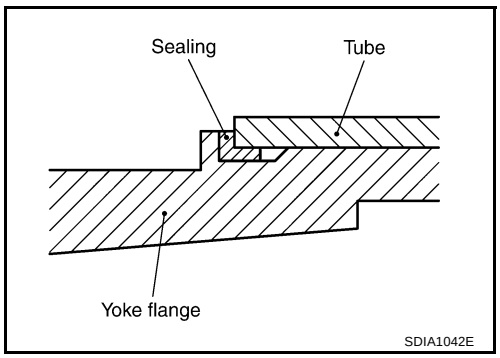
Use an approved refrigerant recovery unit any time the air conditioning system must be discharged. Refer to ATC/MTC section “HFC-134a (R-134a) Service Procedure”, “REFRIGERANT LINES” for specific instructions.

Precautions for Propeller Shaft

NAS0000C

- If propeller shaft is dropped, replace propeller shaft with new one.
- Do not hit, impact, or damage tube.

- If damage such as cracks or peeling off in sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- If there is chipping or looseness in tube, replace propeller shaft with new one.
- Protect propeller shaft with protector (special service tool) during work.



HOW TO USE THIS MANUAL

PFP:00008

Description

NAS0000D

This volume explains “Removal, Disassembly, Installation, Inspection and Adjustment” and “Trouble Diagnoses”.

Terms

NAS0000E

- The captions **WARNING** and **CAUTION** warn you of steps that must be followed to prevent personal injury and/or damage to some part of the vehicle.
  WARNING indicates the possibility of personal injury if instructions are not followed.
  CAUTION indicates the possibility of component damage if instructions are not followed.
  BOLD TYPED STATEMENTS except **WARNING** and **CAUTION** give you helpful information.
  Standard value:Tolerance at inspection and adjustment.
  Limit value:The maximum or minimum limit value that should not be exceeded at inspection and adjustment.

Units

NAS0000F

- The **UNITS** given in this manual are primarily expressed as the SI UNIT (International System of Unit), and alternatively expressed in the metric system and in the yard/pound system.
  Also with regard to tightening torque of bolts and nuts, there are descriptions both about range and about the standard tightening torque.

  “Example”
  Range

  Outer Socket Lock Nut : 59 - 78 N·m (6.0 - 8.0 kg-m, 43 - 58 ft-lb)

  Standard

  Drive Shaft Installation Bolt : 44.3 N·m (4.5 kg-m, 33 ft-lb)

Contents

NAS0000G

- **ALPHABETICAL INDEX** is provided at the end of this manual so that you can rapidly find the item and page you are searching for.
- **A QUICK REFERENCE INDEX**, a black tab (e.g. BR) is provided on the first page. You can quickly find the first page of each section by matching it to the section's black tab.
- **THE CONTENTS** are listed on the first page of each section.
- **THE TITLE** is indicated on the upper portion of each page and shows the part or system.
- **THE PAGE NUMBER** of each section consists of two or three letters which designate the particular section and a number (e.g. “BR-5”).
- **THE SMALL ILLUSTRATIONS** show the important steps such as inspection, use of special tools, knacks of work and hidden or tricky steps which are not shown in the previous large illustrations.
  Assembly, inspection and adjustment procedures for the complicated units such as the automatic transaxle or transmission, etc. are presented in a step-by-step format where necessary.

Relation between Illustrations and Descriptions

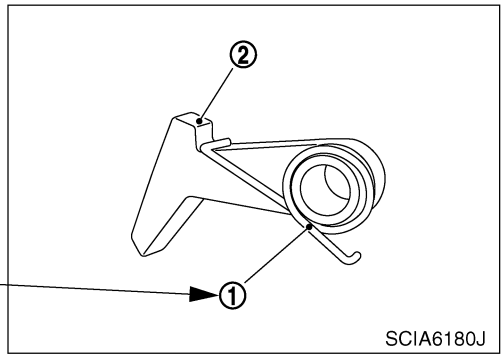
NAS000A2

The following sample explains the relationship between the part description in an illustration, the part name in the text and the service procedures.

< Example 1 >

1. Remove return spring (1) from parking pawl (2).

The identifier number of the part name in the text is consistent with the identifier part number in the illustration.

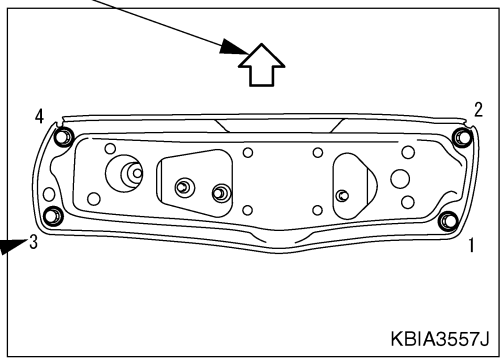


Direction mark

< Example 2 >

- ⇨ : Vehicle front
- Tighten rear member mounting bolts following the numerical order shown in the illustration.
- Note : View upward

The numbers in the illustration are consistent with the service operation instructions.

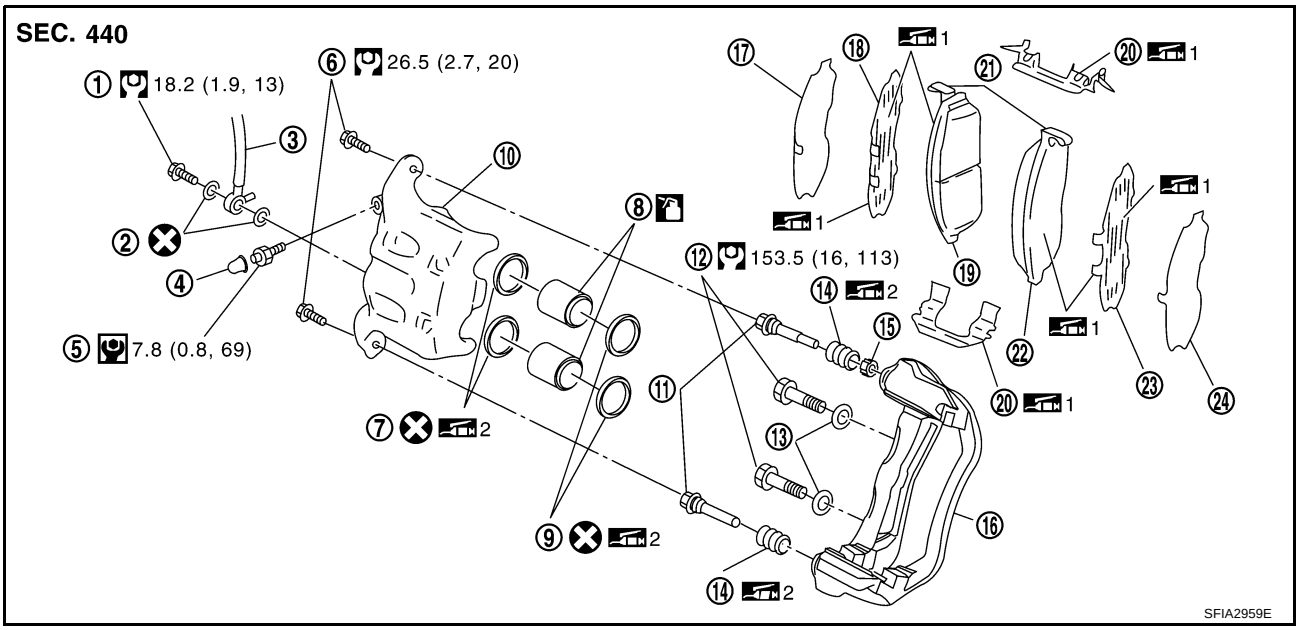


SAIA0519E

Components

NAS0000H

- **THE LARGE ILLUSTRATIONS** are exploded views (see the following) and contain tightening torques, lubrication points, section number of the **PARTS CATALOG** (e.g. SEC. 440) and other information necessary to perform repairs.
  The illustrations should be used in reference to service matters only. When ordering parts, refer to the appropriate **PARTS CATALOG** .
  Components shown in an illustration may be identified by a circled number. When this style of illustration is used, the text description of the components will follow the illustration.



1. Union bolt	2. Copper washer	3. Brake hose
4. Cap	5. Bleed valve	6. Sliding pin bolt
7. Piston seal	8. Piston	9. Piston boot
10. Cylinder body	11. Sliding pin	12. Torque member mounting bolt
13. Washer	14. Sliding pin boot	15. Bushing
16. Torque member	17. Inner shim cover	18. Inner shim
19. Inner pad	20. Pad retainer	21. Pad wear sensor
22. Outer pad	23. Outer shim	24. Outer shim cover
1: PBC (Poly Butyl Cuprysil) grease or silicone-based grease	2: Rubber grease	: Brake fluid

Refer to GI section for additional symbol definitions.

SYMBOLS

SYMBOL	DESCRIPTION		SYMBOL	DESCRIPTION
	Tightening torque The tightening torque specifications of bolts and nuts may be presented as either a range or a standard tightening torque.	: N•m (kg-m, ft-lb)		Always replace after every disassembly.
		: N•m (kg-m, in-lb)	Ⓟ	Apply petroleum jelly.
	Should be lubricated with grease. Unless otherwise indicated, use recommended multi-purpose grease.		Ⓜ	Apply molybdenum added petroleum jelly.
	Should be lubricated with oil.		ATF	Apply ATF.
	Sealing point		★	Select with proper thickness.
Ⓛ	Sealing point with locking sealant.		☆	Adjustment is required.
	Checking point			

SAIA0749E

How to Follow Trouble Diagnoses

NAS0000I

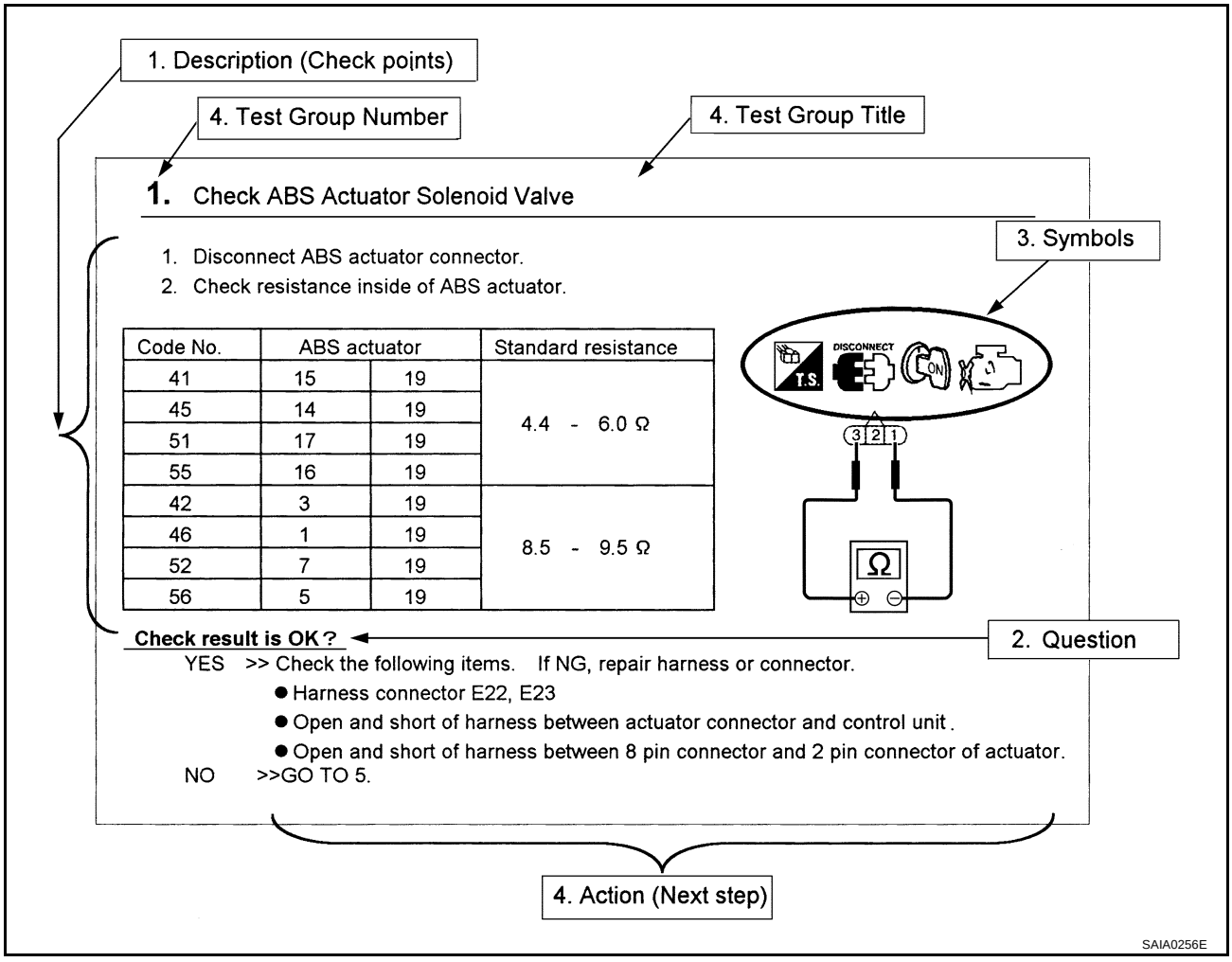
DESCRIPTION

NOTICE:

Trouble diagnoses indicate work procedures required to diagnose problems effectively. Observe the following instructions before diagnosing.

1. **Before performing trouble diagnoses, read the "Preliminary Check", the "Symptom Chart" or the "Work Flow".**
2. **After repairs, re-check that the problem has been completely eliminated.**
3. **Refer to Component Parts and Harness Connector Location for the Systems described in each section for identification/location of components and harness connectors.**
4. **Refer to the Circuit Diagram for quick pinpoint check.**
   If you need to check circuit continuity between harness connectors in more detail, such as when a sub-harness is used, refer to Wiring Diagram in each individual section and Harness Layout in PG section for identification of harness connectors.
5. **When checking circuit continuity, ignition switch should be OFF.**
6. **Before checking voltage at connectors, check battery voltage.**
7. **After accomplishing the Diagnostic Procedures and Electrical Components Inspection, make sure that all harness connectors are reconnected as they were.**

HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES



1. **Work and diagnostic procedure**
   Start to diagnose a problem using procedures indicated in enclosed test groups.
2. **Questions and required results**
   Questions and required results are indicated in bold type in test group.
   The meaning of are as follows:

a. Battery voltage → 11 - 14V or approximately 12V

b. Voltage : Approximately 0V → Less than 1V

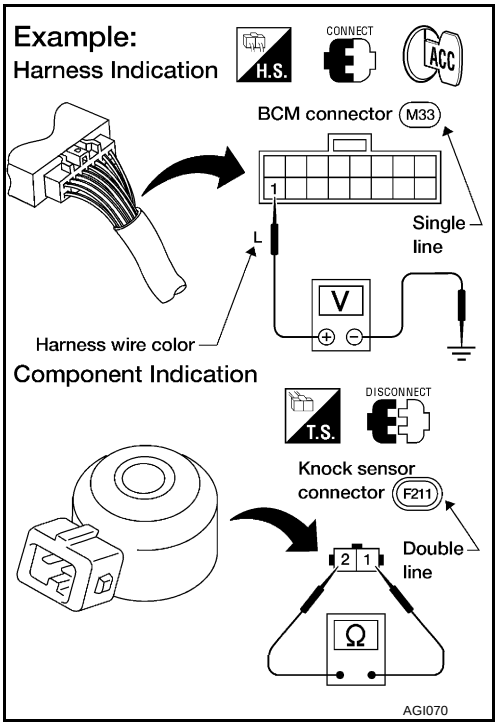
3. **Symbol used in illustration**
   Symbols included in illustrations refer to measurements or procedures. Before diagnosing a problem, familiarize yourself with each symbol. Refer to "Connector Symbols" in GI Section and "KEY TO SYMBOLS SIGNIFYING MEASUREMENTS OR PROCEDURES" below.
4. **Action items**
   Next action for each test group is indicated based on result of each question. Test group number is shown in the left upper portion of each test group.

HARNESS WIRE COLOR AND CONNECTOR NUMBER INDICATION

There are two types of harness wire color and connector number indication.

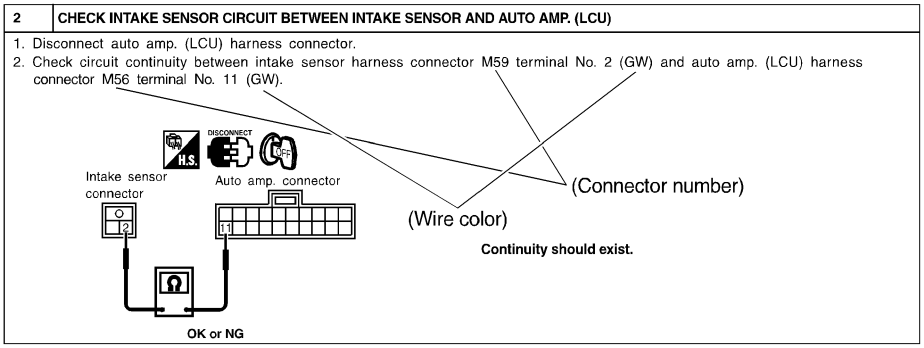
TYPE 1: Harness Wire Color and Connector Number are Shown in Illustration

- Letter designations next to test meter probe indicate harness wire color.
- Connector numbers in a single circle (e.g. M33) indicate harness connectors.
- Connector numbers in a double circle (e.g. F211) indicate component connectors.

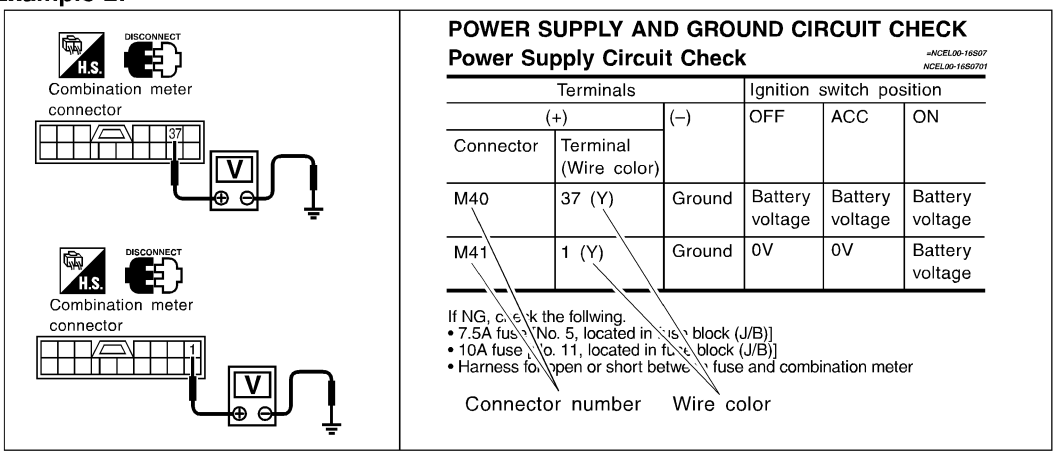


TYPE 2: Harness Wire Color and Connector Number are Shown in Text

Example 1:



Example 2:

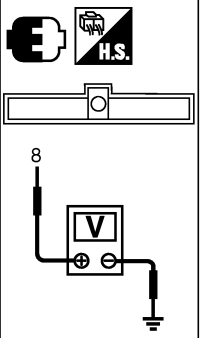


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KEY TO SYMBOLS SIGNIFYING MEASUREMENTS OR PROCEDURES

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Check after disconnecting the connector to be measured.	GST	Procedure with Generic Scan Tool. (GST, OBD-II scan tool)
	Check after connecting the connector to be measured.	NO TOOLS	Procedure without CONSULT-II, CONSULT-III or GST
	Insert key into ignition switch.	A/C OFF	A/C switch is “OFF”.
	Remove key from ignition switch.	A/C ON	A/C switch is “ON”.
	Insert and remove key repeatedly.		REC switch is “ON”.
OFF	Turn ignition switch to “OFF” position.		REC switch is “OFF”.
ACC	Turn ignition switch to “ACC” position.		Fan switch is “ON”. (At any position except for “OFF” position)
ON	Turn ignition switch to “ON” position.		Fan switch is “OFF”.
ST	Turn ignition switch to “START” position.	FUSE	Apply fuse.
OFF ACC	Turn ignition switch from “OFF” to “ACC” position.	FUSE BAT	Apply positive voltage from battery with fuse directly to components.
ACC ON	Turn ignition switch from “ACC” to “ON” position.		
ACC OFF	Turn ignition switch from “ACC” to “OFF” position.		

SAIA1539E

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Turn ignition switch from "OFF" to "ON" position.		Drive vehicle.
	Turn ignition switch from "ON" to "OFF" position.		
	Do not start engine, or check with engine stopped.		Disconnect battery negative cable.
	Start engine, or check with engine running.		Depress brake pedal.
	Apply parking brake.		Release brake pedal.
	Release parking brake.		Depress accelerator pedal.
	Check after engine is warmed up sufficiently.		Release accelerator pedal.
	Votage should be measured with a voltmeter.		Pin terminal check for SMJ type ECM or TCM connectors. **For details regarding the terminal arrangement, refer to the "ELECTRICAL UNITS" electrical reference page at the end of the manual.**
	Circuit resistance should be measured with an ohmmeter.		
	Current should be measured with an ammeter.		
	Pulse signal should be checked with an oscilloscope.		
	Procedure with CONSULT-III		
	Procedure without CONSULT-III		
	Place selector lever in "P" position.		
	Place selector lever in "N" position.		
	Jack up front portion.		
	Jack up rear portion.		
	Inspect under engine room.		
	Inspect under floor.		
	Inspect rear under floor.		

SAIA1540E

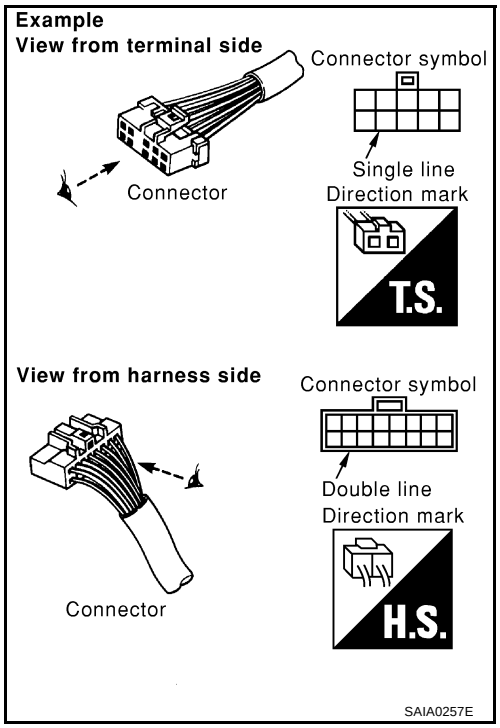
How to Read Wiring Diagrams

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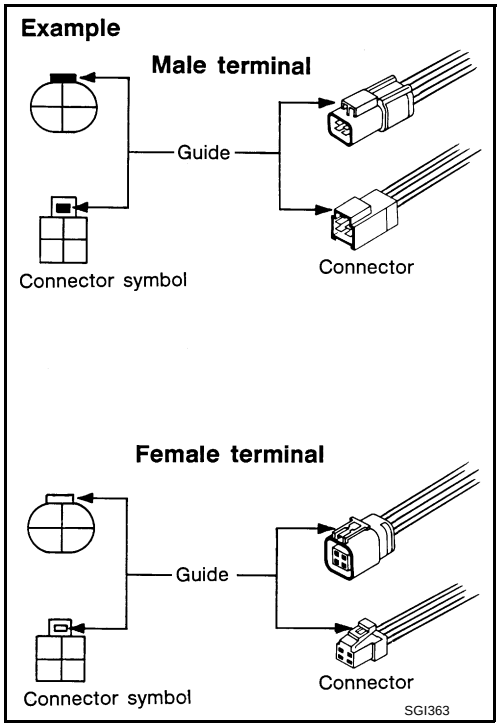
CONNECTOR SYMBOLS

Most of connector symbols in wiring diagrams are shown from the terminal side.

- Connector symbols shown from the terminal side are enclosed by a single line and followed by the direction mark.
- Connector symbols shown from the harness side are enclosed by a double line and followed by the direction mark.
- Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to PG section, “Description”, “HARNESS CONNECTOR”.

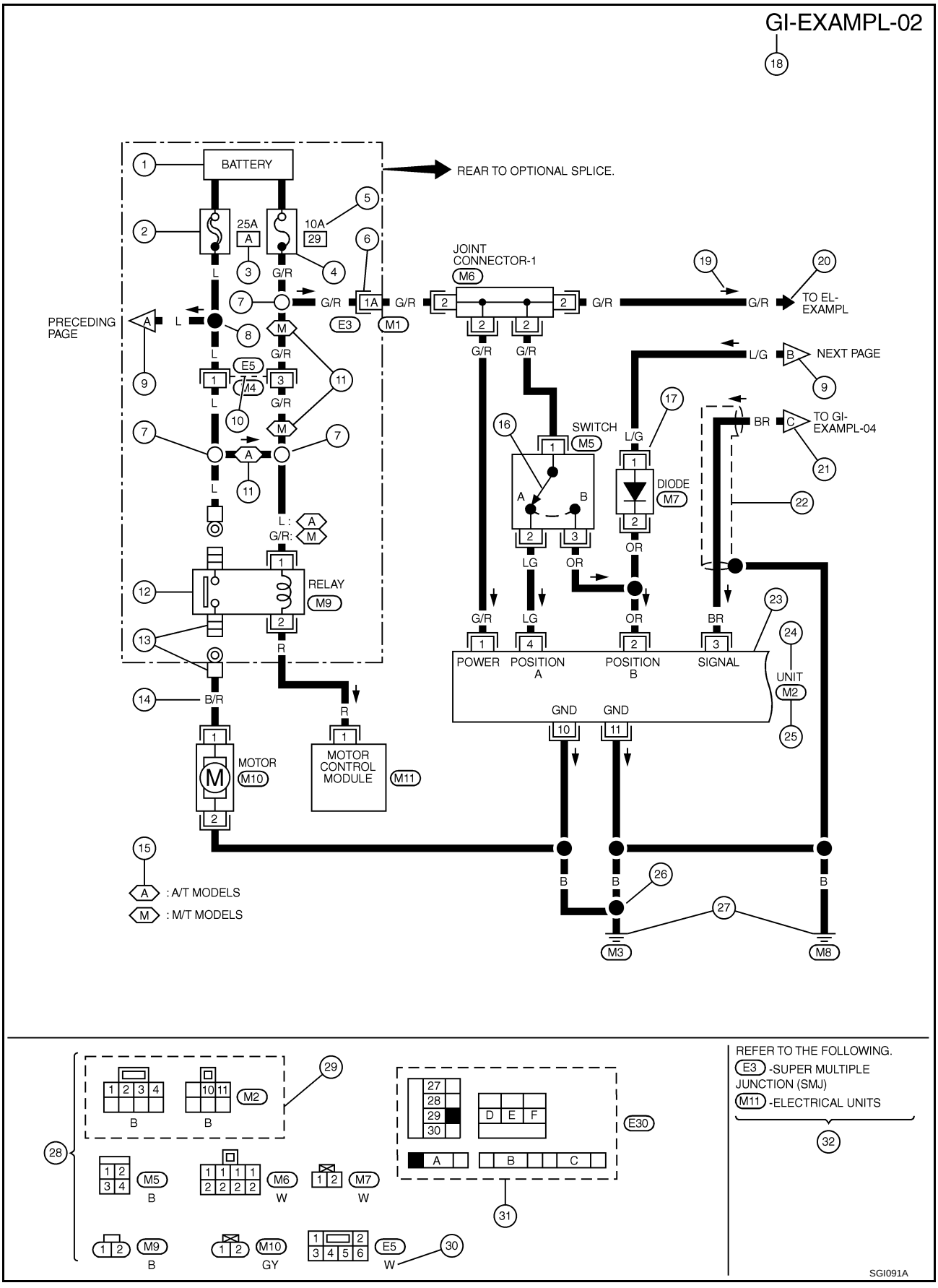


- Male and female terminals
  Connector guides for male terminals are shown in black and female terminals in white in wiring diagrams.

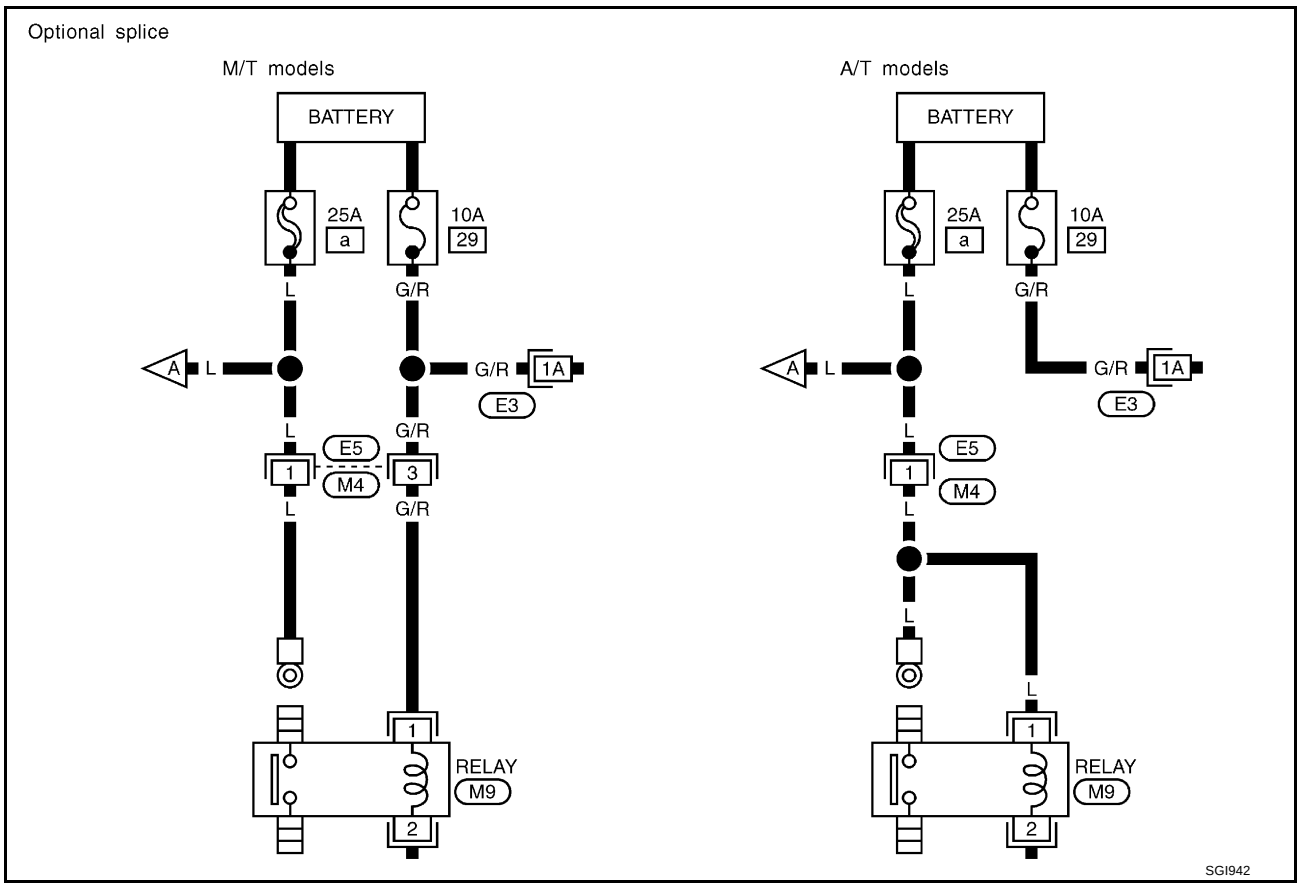


SAMPLE/WIRING DIAGRAM - EXAMPL -

- For detail, refer to following “DESCRIPTION”.



Optional Splice



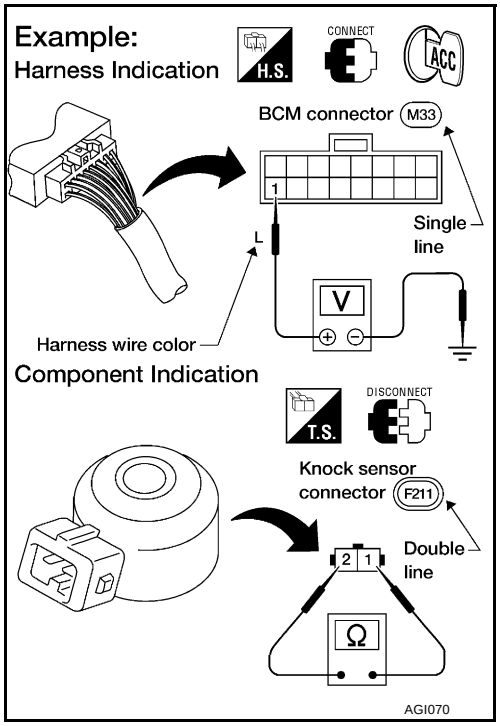
DESCRIPTION

Number	Item	Description
1	Power condition	● This shows the condition when the system receives battery positive voltage (can be operated).
2	Fusible link	● The double line shows that this is a fusible link. ● The open circle shows current flow in, and the shaded circle shows current flow out.
3	Fusible link/fuse location	● This shows the location of the fusible link or fuse in the fusible link or fuse box. For arrangement, refer to PG section, POWER SUPPLY ROUTING.
4	Fuse	● The single line shows that this is a fuse. ● The open circle shows current flow in, and the shaded circle shows current flow out.
5	Current rating	● This shows the current rating of the fusible link or fuse.
6	Connectors	● This shows that connector E3 is female and connector M1 is male. ● The G/R wire is located in the 1A terminal of both connectors. ● Terminal number with an alphabet (1A, 5B, etc.) indicates that the connector is SMJ connector. Refer to PG section, SMJ (SUPER MULTIPLE JUNCTION).
7	Optional splice	● The open circle shows that the splice is optional depending on vehicle application.
8	Splice	● The shaded circle shows that the splice is always on the vehicle.
9	Page crossing	● This arrow shows that the circuit continues to an adjacent page. ● The A will match with the A on the preceding or next page.
10	Common connector	● The dotted lines between terminals show that these terminals are part of the same connector.
11	Option abbreviation	● This shows that the circuit is optional depending on vehicle application.
12	Relay	● This shows an internal representation of the relay. For details, refer to PG section, STANDARDIZED RELAY.
13	Connectors	● This shows that the connector is connected to the body or a terminal with bolt or nut.

Number	Item	Description
14	Wire color	● This shows a code for the color of the wire.
		B = Black W = White R = Red G = Green L = Blue Y = Yellow LG = Light Green BR = Brown OR or O = Orange P = Pink PU or V (Violet) = Purple GY or GR = Gray SB = Sky Blue CH = Dark Brown DG = Dark Green
		When the wire color is striped, the base color is given first, followed by the stripe color as shown below: Example: L/W = Blue with White Stripe
15	Option description	● This shows a description of the option abbreviation used on the page.
16	Switch	● This shows that continuity exists between terminals 1 and 2 when the switch is in the A position. Continuity exists between terminals 1 and 3 when the switch is in the B position.
17	Assembly parts	● Connector terminal in component shows that it is a harness incorporated assembly.
18	Cell code	● This identifies each page of the wiring diagram by section, system and wiring diagram page number.
19	Current flow arrow	● Arrow indicates electric current flow, especially where the direction of standard flow (vertically downward or horizontally from left to right) is difficult to follow. ● A double arrow “ ⟷ ” shows that current can flow in either direction depending on circuit operation.
20	System branch	● This shows that the system branches to another system identified by cell code (section and system).
21	Page crossing	● This arrow shows that the circuit continues to another page identified by cell code. ● The C will match with the C on another page within the system other than the next or preceding pages.
22	Shielded line	● The line enclosed by broken line circle shows shield wire.
23	Component box in wave line	● This shows that another part of the component is also shown on another page (indicated by wave line) within the system.
24	Component name	● This shows the name of a component.
25	Connector number	● This shows the connector number. ● The letter shows which harness the connector is located in. ● Example: **M** : main harness. For detail and to locate the connector, refer to PG section "Main Harness", “Harness Layout”. A coordinate grid is included for complex harnesses to aid in locating connectors.
26	Ground (GND)	● The line spliced and grounded under wire color shows that ground line is spliced at the grounded connector.
27	Ground (GND)	● This shows the ground connection. For detailed ground distribution information, refer to "Ground Distribution" in PG section.
28	Connector views	● This area shows the connector faces of the components in the wiring diagram on the page.
29	Common component	● Connectors enclosed in broken line show that these connectors belong to the same component.
30	Connector color	● This shows a code for the color of the connector. For code meaning, refer to wire color codes, Number 14 of this chart.
31	Fusible link and fuse box	● This shows the arrangement of fusible link(s) and fuse(s), used for connector views of "POWER SUPPLY ROUTING" in PG section. The open square shows current flow in, and the shaded square shows current flow out.
32	Reference area	● This shows that more information on the Super Multiple Junction (SMJ) and Joint Connectors (J/C) exists on the PG section. Refer to "Reference Area" for details.

Harness Indication

- Letter designations next to test meter probe indicate harness (connector) wire color.
- Connector numbers in a single circle M33 indicate harness connectors.



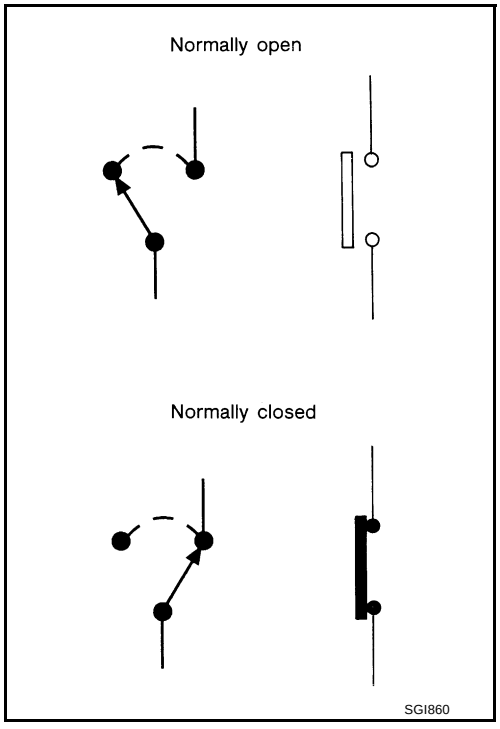
Component Indication

Connector numbers in a double circle F211 indicate component connectors.

Switch Positions

Switches are shown in wiring diagrams as if the vehicle is in the “normal” condition.
A vehicle is in the “normal” condition when:

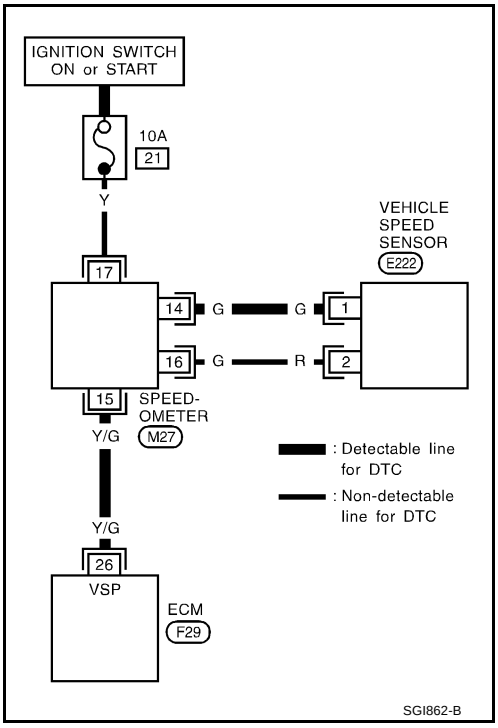
- ignition switch is “OFF”,
- doors, hood and trunk lid/back door are closed,
- pedals are not depressed, and
- parking brake is released.



Detectable Lines and Non-Detectable Lines

In some wiring diagrams, two kinds of lines, representing wires, with different weight are used.

- A line with regular weight (wider line) represents a “detectable line for DTC (Diagnostic Trouble Code)”. A “detectable line for DTC” is a circuit in which ECM can detect its malfunctions with the on board diagnostic system.
- A line with less weight (thinner line) represents a “non-detectable line for DTC”. A “non-detectable line for DTC” is a circuit in which ECM cannot detect its malfunctions with the on board diagnostic system.



Multiple Switch

The continuity of multiple switch is described in two ways as shown below.

- The switch chart is used in schematic diagrams.
- The switch diagram is used in wiring diagrams.

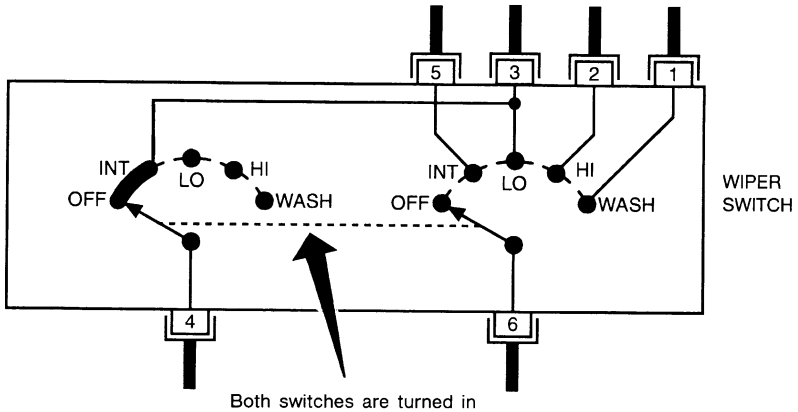
Example

(SWITCH CHART)

WIPER SWITCH

	OFF	INT	LO	HI	WASH
1					○
2				○	
3	○	○	○		
4	○	○			
5		○			
6		○	○	○	○

(SWITCH DIAGRAM)



Continuity circuit of wiper switch

SWITCH POSITION	CONTINUITY CIRCUIT
OFF	3 - 4
INT	3 - 4, 5 - 6
LO	3 - 6
HI	2 - 6
WASH	1 - 6

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Abbreviations

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The following **ABBREVIATIONS** are used:

ABBREVIATION	DESCRIPTION
A/C	Air Conditioner
A/T	Automatic Transaxle/Transmission
ATF	Automatic Transmission Fluid
D_1	Drive range 1st gear
D_2	Drive range 2nd gear
D_3	Drive range 3rd gear
D_4	Drive range 4th gear
FR, RR	Front, Rear
LH, RH	Left-Hand, Right-Hand
M/T	Manual Transaxle/Transmission
OD	Overdrive
P/S	Power Steering
SAE	Society of Automotive Engineers, Inc.
SDS	Service Data and Specifications
SST	Special Service Tools
2WD	2-Wheel Drive
2_2	2nd range 2nd gear
2_1	2nd range 1st gear
1_2	1st range 2nd gear
1_1	1st range 1st gear

SERVICE INFORMATION FOR ELECTRICAL INCIDENT

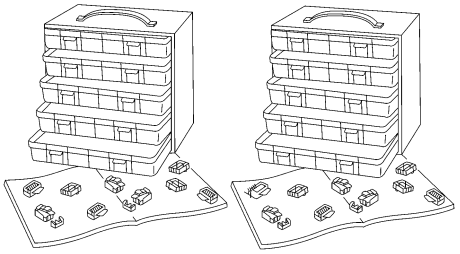
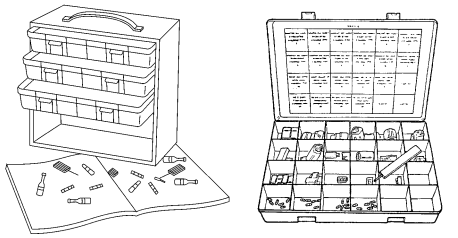
PFP:00000

How to Check Terminal

NAS0000L

CONNECTOR AND TERMINAL PIN KIT

Use the connector and terminal pin kits listed below when replacing connectors or terminals.
The connector and terminal pin kits contain some of the most commonly used NISSAN/INFINITI connectors and terminals. For detailed connector and terminal pin replacement procedures, refer to the latest NISSAN/INFINITI CONNECTOR AND TERMINAL PIN SERVICE MANUAL.

Tool number (Kent-Moore No.) Tool name	Description
- (J38751-95NI) Connector and terminal pin kit (NISSAN) - (J38751-95INF) Connector and terminal pin kit (INFINITI) - (J42992-98KIT) OBD and terminal repair kit - (J42992-2000UPD) OBD-II Connector Kit Update	J38751-95NI, J38751-95INF  WAIA0004E J42992-98KIT, J42992-2000UPD  WAIA0005E

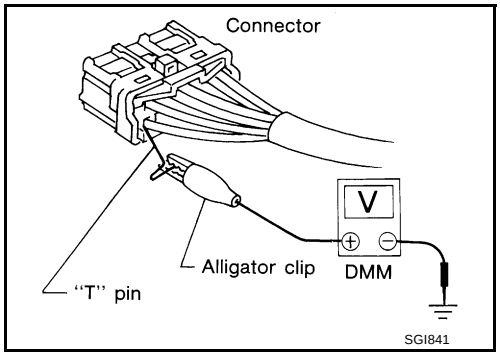
HOW TO PROBE CONNECTORS

Connector damage and an intermittent connection can result from improperly probing of the connector during circuit checks.
The probe of a digital multimeter (DMM) may not correctly fit the connector cavity. To correctly probe the connector, follow the procedures below using a “T” pin. For the best contact grasp the “T” pin using an alligator clip.

Probing from Harness Side

Standard type (not waterproof type) connector should be probed from harness side with “T” pin.

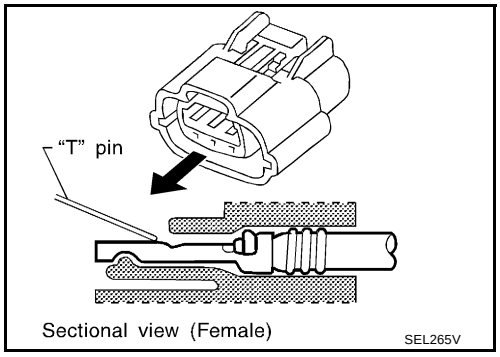
- If the connector has a rear cover such as a ECM connector, remove the rear cover before probing the terminal.
- Do not probe waterproof connector from harness side. Damage to the seal between wire and connector may result.



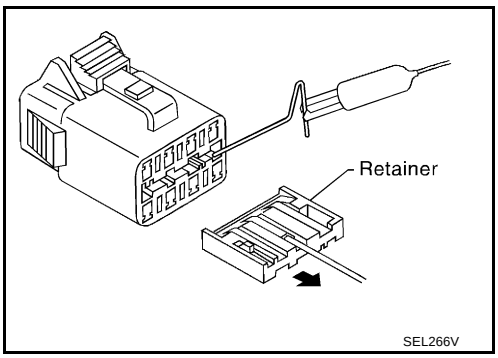
Probing from Terminal Side

FEMALE TERMINAL

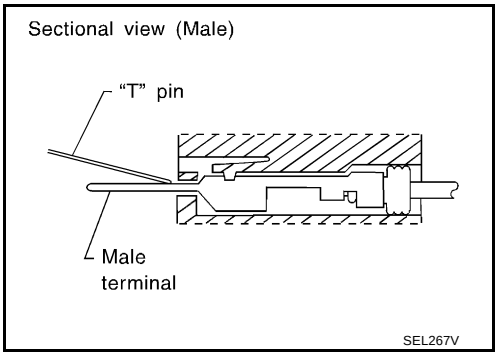
- There is a small notch above each female terminal. Probe each terminal with the “T” pin through the notch.
  Do not insert any object other than the same type male terminal into female terminal.



- Some connectors do not have a notch above each terminal. To probe each terminal, remove the connector retainer to make contact space for probing.



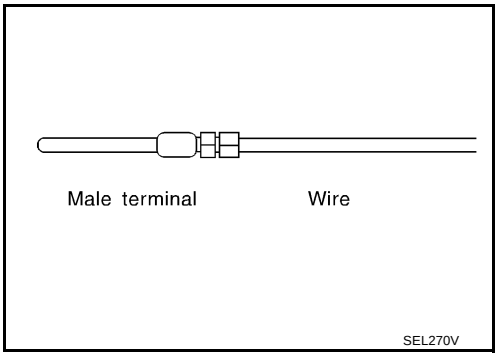
MALE TERMINAL
Carefully probe the contact surface of each terminal using a “T” pin.
Do not bend terminal.



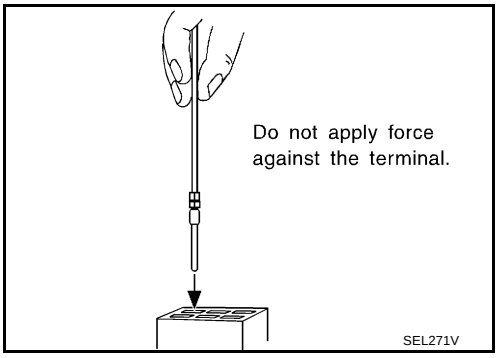
How to Check Enlarged Contact Spring of Terminal

An enlarged contact spring of a terminal may create intermittent signals in the circuit.
If the intermittent open circuit occurs, follow the procedure below to inspect for open wires and enlarged contact spring of female terminal.

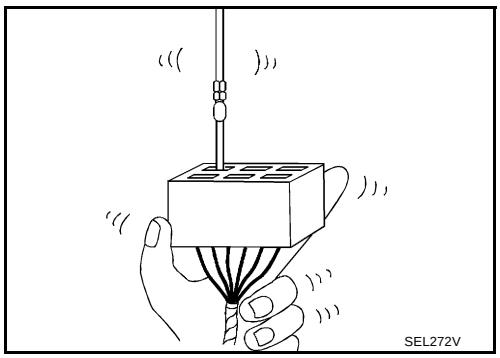
1. Assemble a male terminal and approx. 10 cm (3.9 in) of wire.
   Use a male terminal which matches the female terminal.
2. Disconnect the suspected faulty connector and hold it terminal side up.



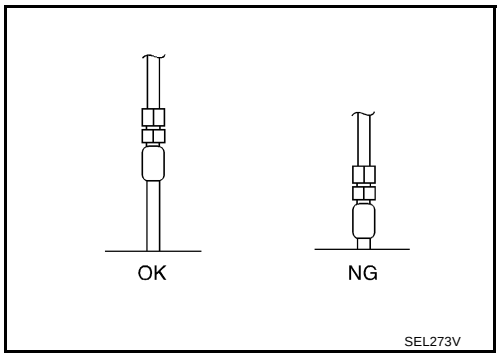
3. While holding the wire of the male terminal, try to insert the male terminal into the female terminal.
   Do not force the male terminal into the female terminal with your hands.



4. While moving the connector, check whether the male terminal can be easily inserted or not.



- If the male terminal can be easily inserted into the female terminal, replace the female terminal.

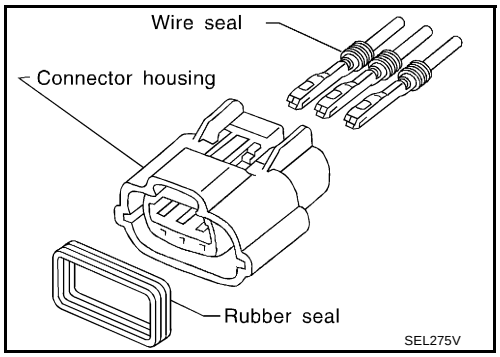


Waterproof Connector Inspection

If water enters the connector, it can short interior circuits. This may lead to intermittent problems. Check the following items to maintain the original waterproof characteristics.

RUBBER SEAL INSPECTION

- Most waterproof connectors are provided with a rubber seal between the male and female connectors. If the seal is missing, the waterproof performance may not meet specifications.
- The rubber seal may come off when connectors are disconnected. Whenever connectors are reconnected, make sure the rubber seal is properly installed on either side of male or female connector.

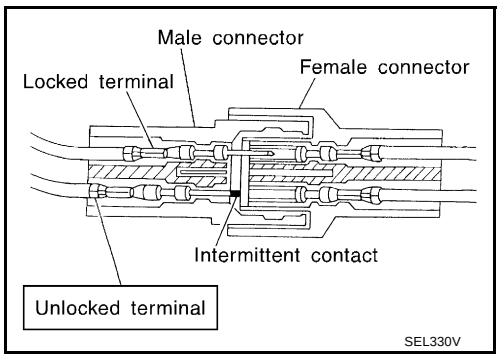


WIRE SEAL INSPECTION

The wire seal must be installed on the wire insertion area of a waterproof connector. Be sure that the seal is installed properly.

Terminal Lock Inspection

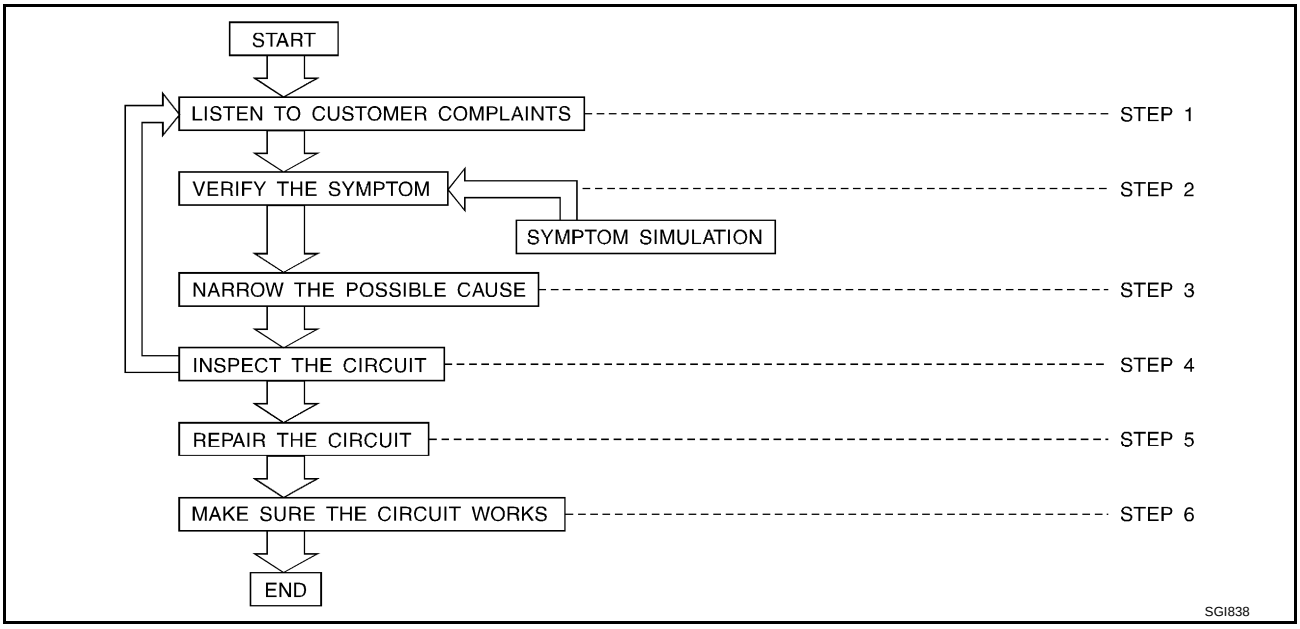
Check for unlocked terminals by pulling wire at the end of connector. An unlocked terminal may create intermittent signals in the circuit.



How to Perform Efficient Diagnosis for an Electrical Incident

NAS0000M

WORK FLOW



STEP	DESCRIPTION	
STEP 1	Get detailed information about the conditions and the environment when the incident occurred. The following are key pieces of information required to make a good analysis:	
	WHAT	Vehicle Model, Engine, Transmission/Transaxle and the System (i.e. Radio).
	WHEN	Date, Time of Day, Weather Conditions, Frequency.
	WHERE	Road Conditions, Altitude and Traffic Situation.
	HOW	System Symptoms, Operating Conditions (Other Components Interaction). Service History and if any After Market Accessories have been installed.
STEP 2	Operate the system, road test if necessary. Verify the parameter of the incident. If the problem cannot be duplicated, refer to “Incident Simulation Tests”.	
STEP 3	Get the proper diagnosis materials together including: ● Power Supply Routing ● System Operation Descriptions ● Applicable Service Manual Sections ● Check for any Service Bulletins Identify where to begin diagnosis based upon your knowledge of the system operation and the customer comments.	
STEP 4	Inspect the system for mechanical binding, loose connectors or wiring damage. Determine which circuits and components are involved and diagnose using the Power Supply Routing and Harness Layouts.	
STEP 5	Repair or replace the incident circuit or component.	
STEP 6	Operate the system in all modes. Verify the system works properly under all conditions. Make sure you have not inadvertently created a new incident during your diagnosis or repair steps.	

INCIDENT SIMULATION TESTS

Introduction

Sometimes the symptom is not present when the vehicle is brought in for service. If possible, re-create the conditions present at the time of the incident. Doing so may help avoid a No Trouble Found Diagnosis. The following section illustrates ways to simulate the conditions/environment under which the owner experiences an electrical incident.

The section is broken into the six following topics:

- Vehicle vibration
- Heat sensitive

- Freezing
- Water intrusion
- Electrical load
- Cold or hot start up

Get a thorough description of the incident from the customer. It is important for simulating the conditions of the problem.

Vehicle Vibration

The problem may occur or become worse while driving on a rough road or when engine is vibrating (idle with A/C on). In such a case, you will want to check for a vibration related condition. Refer to the following illustration.

CONNECTORS & HARNESS

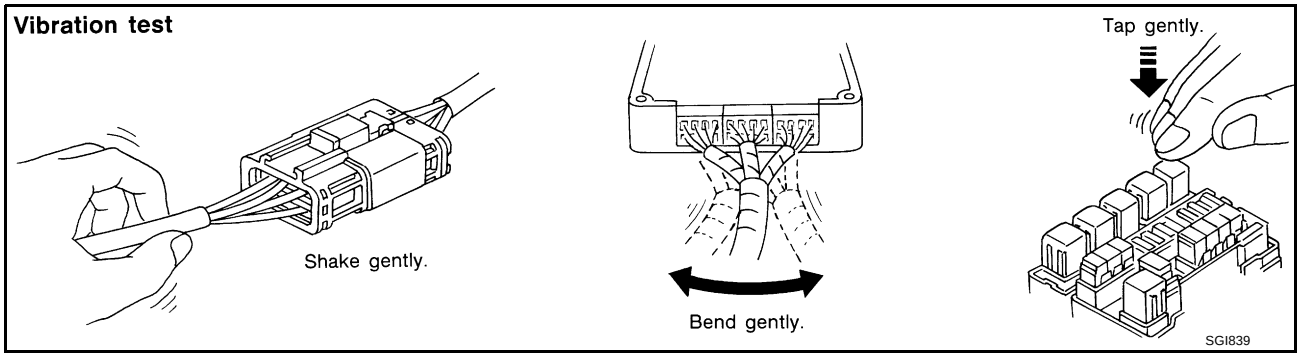
Determine which connectors and wiring harness would affect the electrical system you are inspecting. Gently shake each connector and harness while monitoring the system for the incident you are trying to duplicate. This test may indicate a loose or poor electrical connection.

HINT

Connectors can be exposed to moisture. It is possible to get a thin film of corrosion on the connector terminals. A visual inspection may not reveal this without disconnecting the connector. If the problem occurs intermittently, perhaps the problem is caused by corrosion. It is a good idea to disconnect, inspect and clean the terminals on related connectors in the system.

SENSORS & RELAYS

Gently apply a slight vibration to sensors and relays in the system you are inspecting.
This test may indicate a loose or poorly mounted sensor or relay.



ENGINE COMPARTMENT

There are several reasons a vehicle or engine vibration could cause an electrical complaint. Some of the things to check for are:

- Connectors not fully seated.
- Wiring harness not long enough and is being stressed due to engine vibrations or rocking.
- Wires laying across brackets or moving components.
- Loose, dirty or corroded ground wires.
- Wires routed too close to hot components.

To inspect components under the hood, start by verifying the integrity of ground connections. (Refer to Ground Inspection described later.) First check that the system is properly grounded. Then check for loose connection by gently shaking the wiring or components as previously explained. Using the wiring diagrams inspect the wiring for continuity.

BEHIND THE INSTRUMENT PANEL

An improperly routed or improperly clamped harness can become pinched during accessory installation. Vehicle vibration can aggravate a harness which is routed along a bracket or near a screw.

UNDER SEATING AREAS

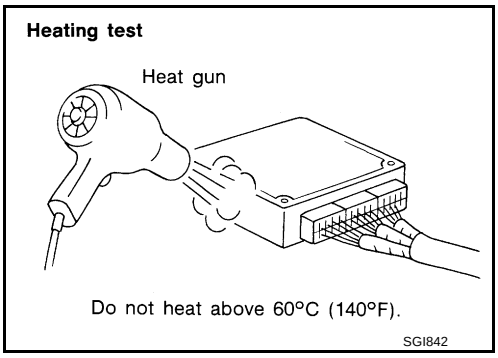
An unclamped or loose harness can cause wiring to be pinched by seat components (such as slide guides) during vehicle vibration. If the wiring runs under seating areas, inspect wire routing for possible damage or pinching.

Heat Sensitive

The customer's concern may occur during hot weather or after car has sat for a short time. In such cases you will want to check for a heat sensitive condition.

To determine if an electrical component is heat sensitive, heat the component with a heat gun or equivalent.

Do not heat components above 60°C (140°F). If incident occurs while heating the unit, either replace or properly insulate the component.

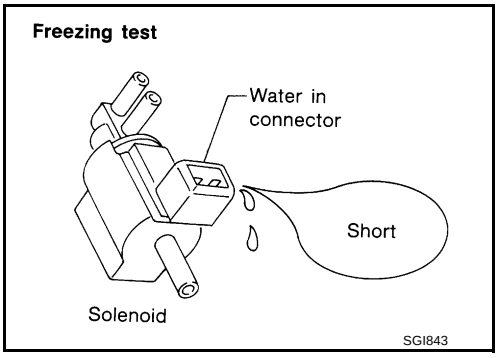


Freezing

The customer may indicate the incident goes away after the car warms up (winter time). The cause could be related to water freezing somewhere in the wiring/electrical system.

There are two methods to check for this. The first is to arrange for the owner to leave his car overnight. Make sure it will get cold enough to demonstrate his complaint. Leave the car parked outside overnight. In the morning, do a quick and thorough diagnosis of those electrical components which could be affected.

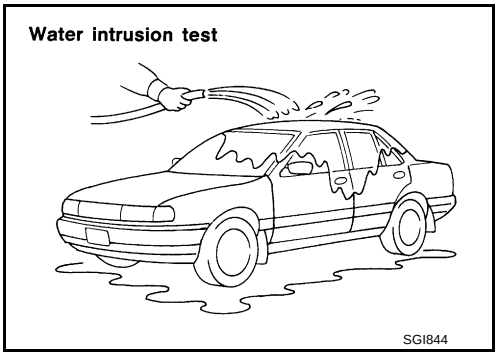
The second method is to put the suspect component into a freezer long enough for any water to freeze. Reinstall the part into the car and check for the reoccurrence of the incident. If it occurs, repair or replace the component.



Water Intrusion

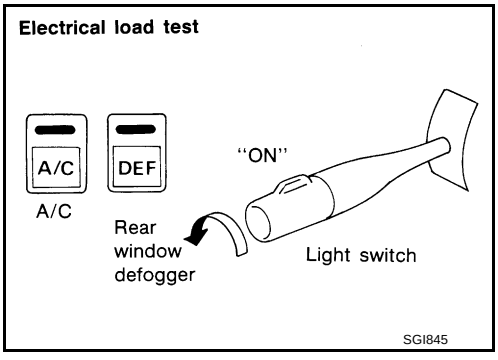
The incident may occur only during high humidity or in rainy/snowy weather. In such cases the incident could be caused by water intrusion on an electrical part. This can be simulated by soaking the car or running it through a car wash.

Do not spray water directly on any electrical components.



Electrical Load

The incident may be electrical load sensitive. Perform diagnosis with all accessories (including A/C, rear window defogger, radio, fog lamps) turned on.



Cold or Hot Start Up

On some occasions an electrical incident may occur only when the car is started cold, or it may occur when the car is restarted hot shortly after being turned off. In these cases you may have to keep the car overnight to make a proper diagnosis.

CIRCUIT INSPECTION

Introduction

In general, testing electrical circuits is an easy task if it is approached in a logical and organized method. Before beginning it is important to have all available information on the system to be tested. Also, get a thorough understanding of system operation. Then you will be able to use the appropriate equipment and follow the correct test procedure.
You may have to simulate vehicle vibrations while testing electrical components. Gently shake the wiring harness or electrical component to do this.

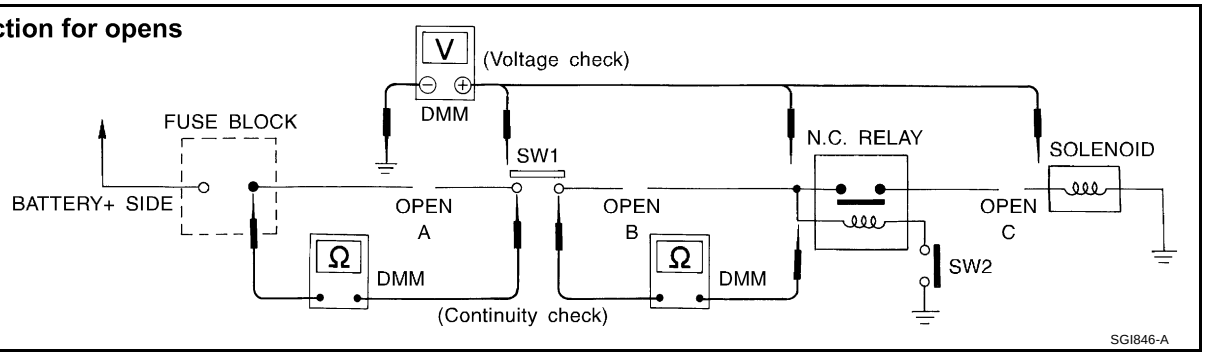
OPEN	A circuit is open when there is no continuity through a section of the circuit.	
SHORT	There are two types of shorts.	
	● SHORT CIRCUIT	When a circuit contacts another circuit and causes the normal resistance to change.
	● SHORT TO GROUND	When a circuit contacts a ground source and grounds the circuit.

NOTE:
Refer to “How to Check Terminal” to probe or check terminal.

Testing for “Opens” in the Circuit

Before you begin to diagnose and test the system, you should rough sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system.

Inspection for opens



CONTINUITY CHECK METHOD
The continuity check is used to find an open in the circuit. The digital multimeter (DMM) set on the resistance function will indicate an open circuit as over limit (no beep tone or no ohms symbol). Make sure to always start with the DMM at the highest resistance level.
To help in understanding the diagnosis of open circuits, please refer to the previous schematic.

- Disconnect the battery negative cable.
- Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
- Connect one probe of the DMM to the fuse block terminal on the load side.
- Connect the other probe to the fuse block (power) side of SW1. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
- Connect the probes between SW1 and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
- Connect the probes between the relay and the solenoid. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

Any circuit can be diagnosed using the approach in the previous example.

VOLTAGE CHECK METHOD

To help in understanding the diagnosis of open circuits please refer to the previous schematic.
In any powered circuit, an open can be found by methodically checking the system for the presence of voltage. This is done by switching the DMM to the voltage function.

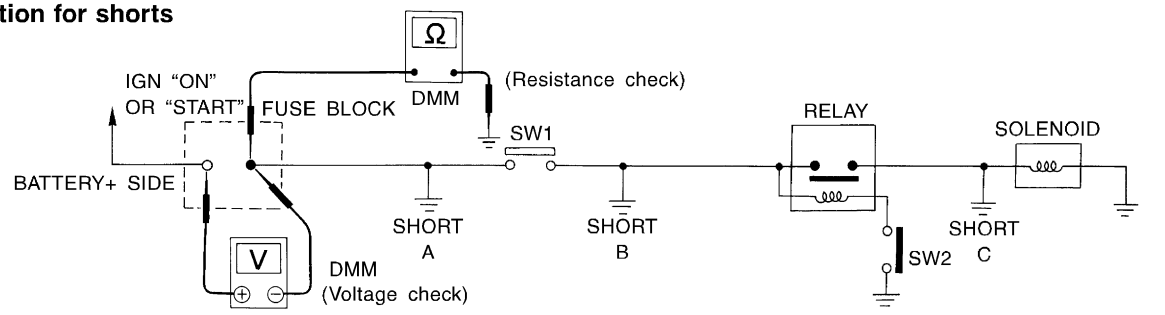
- Connect one probe of the DMM to a known good ground.
- Begin probing at one end of the circuit and work your way to the other end.
- With SW1 open, probe at SW1 to check for voltage.
  voltage; open is further down the circuit than SW1.
  no voltage; open is between fuse block and SW1 (point A).
- Close SW1 and probe at relay.
  voltage; open is further down the circuit than the relay.
  no voltage; open is between SW1 and relay (point B).
- Close the relay and probe at the solenoid.
  voltage; open is further down the circuit than the solenoid.
  no voltage; open is between relay and solenoid (point C).

Any powered circuit can be diagnosed using the approach in the previous example.

Testing for “Shorts” in the Circuit

To simplify the discussion of shorts in the system, please refer to the following schematic.

Inspection for shorts



RESISTANCE CHECK METHOD

- Disconnect the battery negative cable and remove the blown fuse.
- Disconnect all loads (SW1 open, relay disconnected and solenoid disconnected) powered through the fuse.
- Connect one probe of the DMM to the load side of the fuse terminal. Connect the other probe to a known good ground.
- With SW1 open, check for continuity.
  continuity; short is between fuse terminal and SW1 (point A).
  no continuity; short is further down the circuit than SW1.
- Close SW1 and disconnect the relay. Put probes at the load side of fuse terminal and a known good ground. Then, check for continuity.
  continuity; short is between SW1 and the relay (point B).
  no continuity; short is further down the circuit than the relay.
- Close SW1 and jump the relay contacts with jumper wire. Put probes at the load side of fuse terminal and a known good ground. Then, check for continuity.
  continuity; short is between relay and solenoid (point C).
  no continuity; check solenoid, retrace steps.

VOLTAGE CHECK METHOD

- Remove the blown fuse and disconnect all loads (i.e. SW1 open, relay disconnected and solenoid disconnected) powered through the fuse.
- Turn the ignition key to the ON or START position. Verify battery voltage at the battery + side of the fuse terminal (one lead on the battery + terminal side of the fuse block and one lead on a known good ground).
- With SW1 open and the DMM leads across both fuse terminals, check for voltage.
  voltage; short is between fuse block and SW1 (point A).

no voltage; short is further down the circuit than SW1.

- With SW1 closed, relay and solenoid disconnected and the DMM leads across both fuse terminals, check for voltage.
  voltage; short is between SW1 and the relay (point B).
  no voltage; short is further down the circuit than the relay.
- With SW1 closed, relay contacts jumped with fused jumper wire check for voltage.
  voltage; short is down the circuit of the relay or between the relay and the disconnected solenoid (point C).
  no voltage; retrace steps and check power to fuse block.

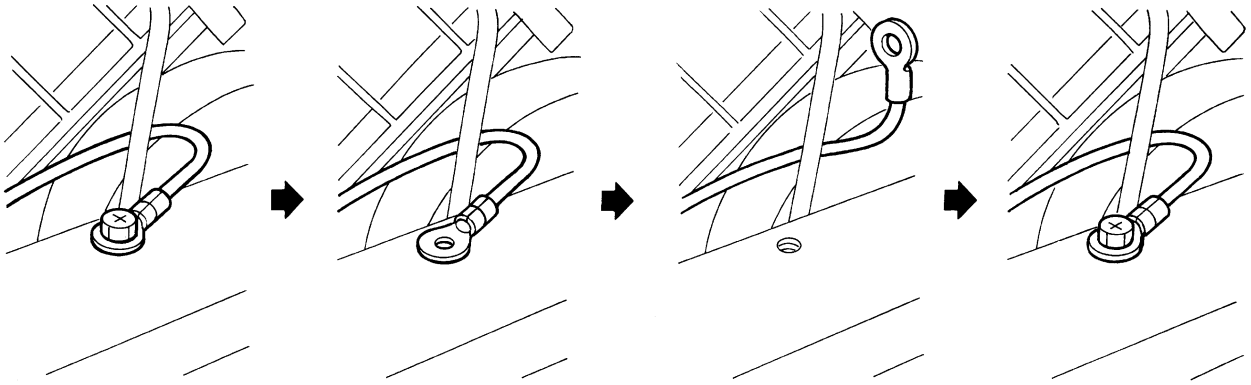
Ground Inspection

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This unwanted resistance can change the way a circuit works.
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically affect an electronically controlled circuit. A poor or corroded ground can easily affect the circuit. Even when the ground connection looks clean, there can be a thin film of rust on the surface.
When inspecting a ground connection follow these rules:

- Remove the ground bolt or screw.
- Inspect all mating surfaces for tarnish, dirt, rust, etc.
- Clean as required to assure good contact.
- Reinstall bolt or screw securely.
- Inspect for “add-on” accessories which may be interfering with the ground circuit.
- If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure no ground wires have excess wire insulation.

For detailed ground distribution information, refer to “Ground Distribution” in PG section.

Ground Inspection



Voltage Drop Tests

Voltage drop tests are often used to find components or circuits which have excessive resistance. A voltage drop in a circuit is caused by a resistance when the circuit is in operation.
Check the wire in the illustration. When measuring resistance with DMM, contact by a single strand of wire will give reading of 0 ohms. This would indicate a good circuit. When the circuit operates, this single strand of wire is not able to carry the current. The single strand will have a high resistance to the current. This will be picked up as a slight voltage drop.
Unwanted resistance can be caused by many situations as follows:

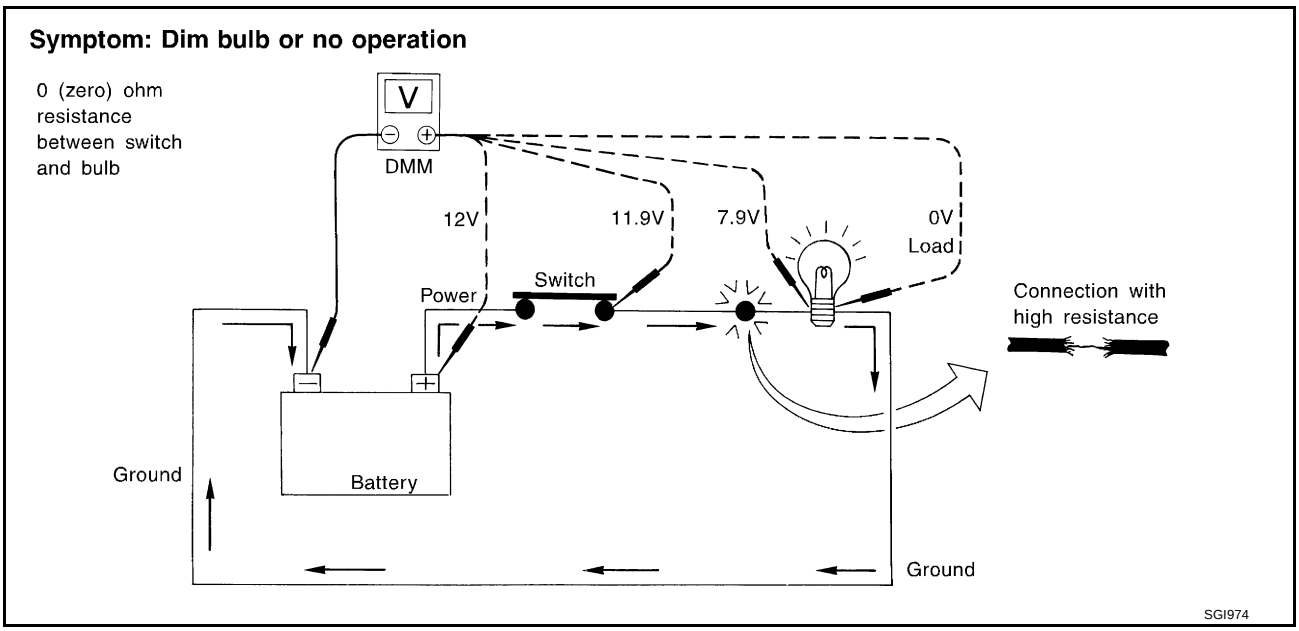
- Undersized wiring (single strand example)
- Corrosion on switch contacts
- Loose wire connections or splices.

If repairs are needed always use wire that is of the same or larger gauge.

MEASURING VOLTAGE DROP — ACCUMULATED METHOD

- Connect the DMM across the connector or part of the circuit you want to check. The positive lead of the DMM should be closer to power and the negative lead closer to ground.
- Operate the circuit.
- The DMM will indicate how many volts are being used to “push” current through that part of the circuit.

Note in the illustration that there is an excessive 4.1 volt drop between the battery and the bulb.



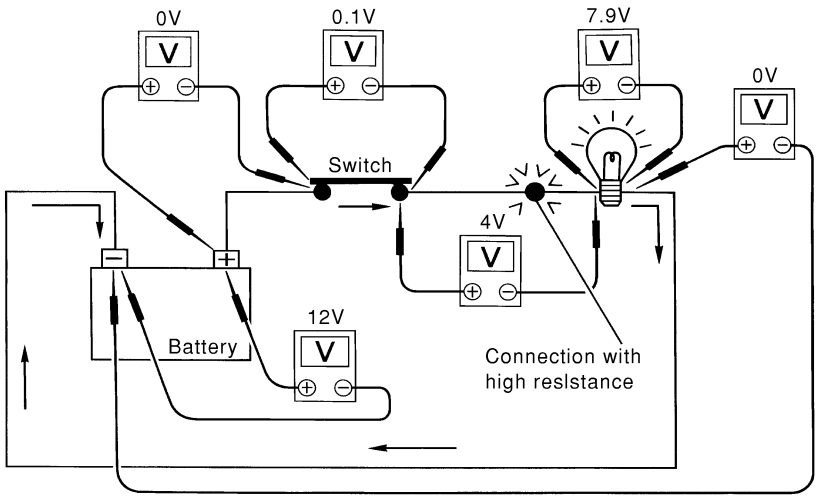
MEASURING VOLTAGE DROP — STEP-BY-STEP

The step-by-step method is most useful for isolating excessive drops in low voltage systems (such as those in “Computer Controlled Systems”).

Circuits in the “Computer Controlled System” operate on very low amperage.

The (Computer Controlled) system operations can be adversely affected by any variation in resistance in the system. Such resistance variation may be caused by poor connection, improper installation, improper wire gauge or corrosion.

The step by step voltage drop test can identify a component or wire with too much resistance.



1. Connect the DMM as shown, starting at the battery and working your way around the circuit.
2. An unusually large voltage drop will indicate a component or wire that needs to be repaired, As you can see the illustration above, the poor connection causes a 4 volt drop.

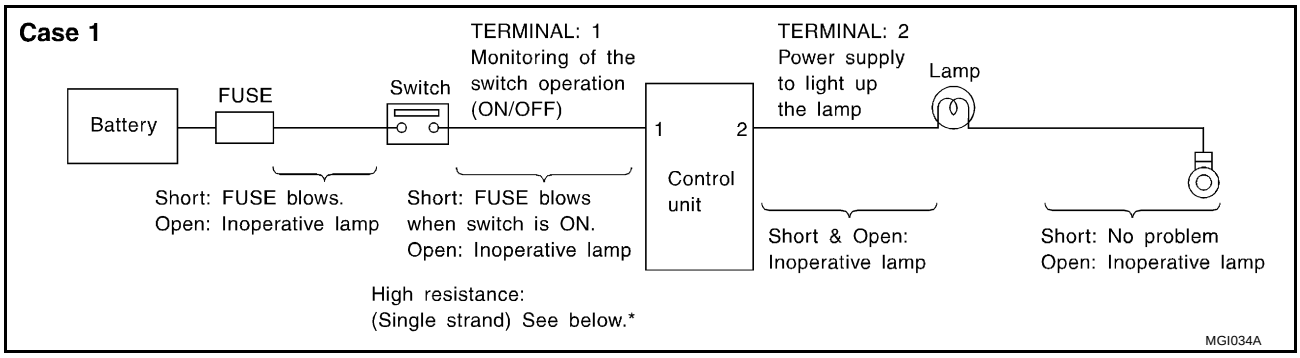
The chart that follows illustrates some maximum allowable voltage drops. These values are given as a guideline, the exact value for each component may vary.

COMPONENT	VOLTAGE DROP
Wire	negligible < .001 volts
Ground Connections	Approx. 0.1 volts
Switch Contacts	Approx. 0.3 volts

SAIA0258E

Control Unit Circuit Test

System Description:When the switch is ON, the control unit lights up the lamp.

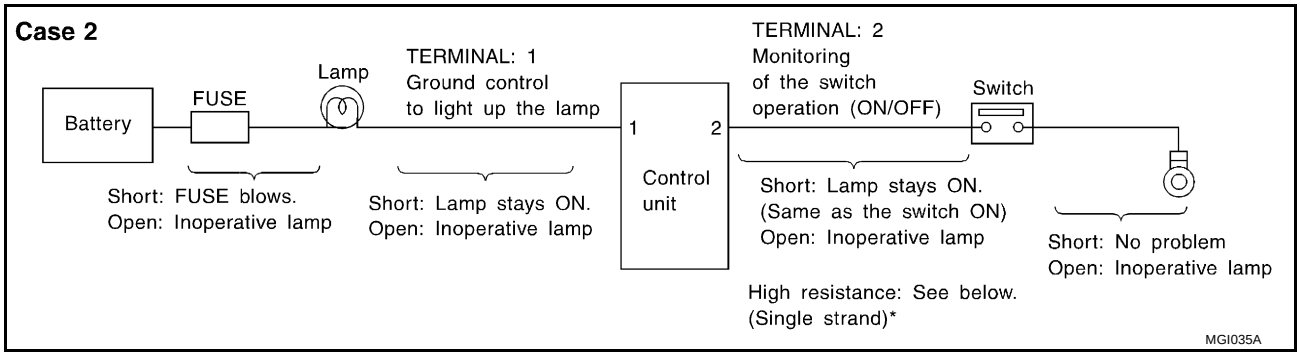


INPUT-OUTPUT VOLTAGE CHART

Pin No.	Item	Condition	Voltage value [V]	In case of high resistance such as single strand [V] *
1	Switch	Switch ON	Battery voltage	Lower than battery voltage Approx. 8 (Example)
		Switch OFF	Approx. 0	Approx. 0
2	Lamp	Switch ON	Battery voltage	Approx. 0 (Inoperative lamp)
		Switch OFF	Approx. 0	Approx. 0

The voltage value is based on the body ground.

*:If high resistance exists in the switch side circuit (caused by a single strand), terminal 1 does not detect battery voltage. Control unit does not detect the switch is ON even if the switch does not turn ON. Therefore, the control unit does not supply power to light up the lamp.



INPUT-OUTPUT VOLTAGE CHART

Pin No.	Item	Condition	Voltage value [V]	In case of high resistance such as single strand [V] *
1	Lamp	Switch ON	Approx. 0	Battery voltage (Inoperative lamp)
		Switch OFF	Battery voltage	Battery voltage
2	Switch	Switch ON	Approx. 0	Higher than 0 Approx. 4 (Example)
		Switch OFF	Approx. 5	Approx. 5

The voltage value is based on the body ground.

*:If high resistance exists in the switch side circuit (caused by a single strand), terminal 2 does not detect approx. 0V. Control unit does not detect the switch is ON even if the switch does not turn ON. Therefore, the control unit does not control ground to light up the lamp.

Control Units and Electrical Parts

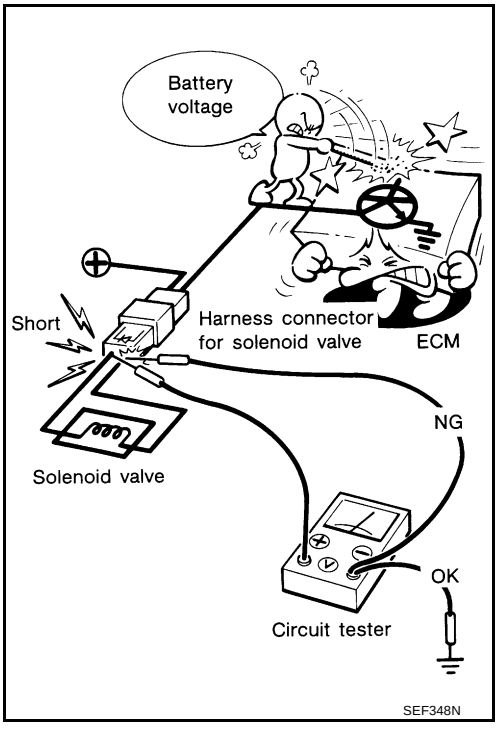
NAS0009Q

PRECAUTIONS

- Never reverse polarity of battery terminals.
- Install only parts specified for a vehicle.
- Before replacing the control unit, check the input and output and functions of the component parts.
- Do not apply excessive force when disconnecting a connector.
- Do not apply excessive shock to the control unit by dropping or hitting it.
- Be careful to prevent condensation in the control unit due to rapid temperature changes and do not let water or rain get on it. If water is found in the control unit, dry it fully and then install it in the vehicle.
- Be careful not to let oil to get on the control unit connector.
- Avoid cleaning the control unit with volatile oil.
- Do not disassemble the control unit, and do not remove the upper and lower covers.



- When using a DMM, be careful not to let test probes get close to each other to prevent the power transistor in the control unit from damaging battery voltage because of short circuiting.
- When checking input and output signals of the control unit, use the specified check adapter.



CONSULT-III/GST CHECKING SYSTEM

PFP:00000

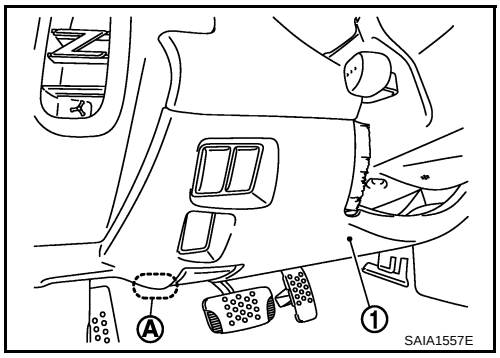
Description

NAS000A4

- When CONSULT-III/GST is connected with a data link connector (A) equipped on the vehicle side, it will communicate with the control unit equipped in the vehicle and then enable various kinds of diagnostic tests.

1 : Instrument driver lower panel

- Refer to CONSULT-III operation manual for more information.



Function and System Application

NAS0000P

Diagnostic test mode	Function	ENGINE	A/T	ABS (Including TCS)	ABS (Including VDC)	AIR BAG	BCM	METER A/C AMP	NATS(NVIS) *	AIR PRESSURE MONITOR	IPDM E/R
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-II.	x	-	-	x	-	x	-	-	x	-
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	x	x	x	x	x	x	x	x	x	x
Trouble diagnostic record	Current self-diagnostic results and all trouble diagnostic records previously stored can be read.	-	-	-	-	x	-	-	-	-	-
Data monitor	Input/Output data in the ECU can be read.	x	x	x	x	-	x	x	-	x	x
CAN diagnosis support monitor	The condition of CAN communication line can be read.	x	x	x	x	-	x	x	-	-	x
Active test	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ECUs and also shifts some parameters in a specified range.	x	-	x	x	-	x	-	-	-	x
DTC & SRT confirmation	The results of SRT (System Readiness Test) and the self-diagnosis status/result can be confirmed.	x	-	-	-	-	-	-	-	-	-
DTC work support	This mode enables a technician to monitor the status/results of self-diagnosis performed by the ECU.	-	x	-	-	-	-	-	-	-	-
ECU (ECM/TCM) part number	ECU (ECM/TCM) part number can be read.	x	x	x	x	-	-	-	-	x	-
ECU discriminated No.	Classification number of a replacement ECU can be read to prevent an incorrect ECU from being installed.	-	-	-	-	x	-	-	-	-	-
Function test	This mode can show results of self-diagnosis of ECU with either ‘OK’ or ‘NG’. For engines, more practical tests regarding sensors/switches and/or actuators are available.	x	x	x	x	x	-	-	-	-	-
Control unit initialization	All registered ignition key IDs in NATS components can be initialized and new IDs can be registered.	-	-	-	-	-	-	-	x	-	-

x: Applicable

*: Nissan Anti-Theft System (Nissan Vehicle Immobilizer System)

CONSULT-III Data Link Connector (DLC) Circuit

NAS000A5

INSPECTION PROCEDURE

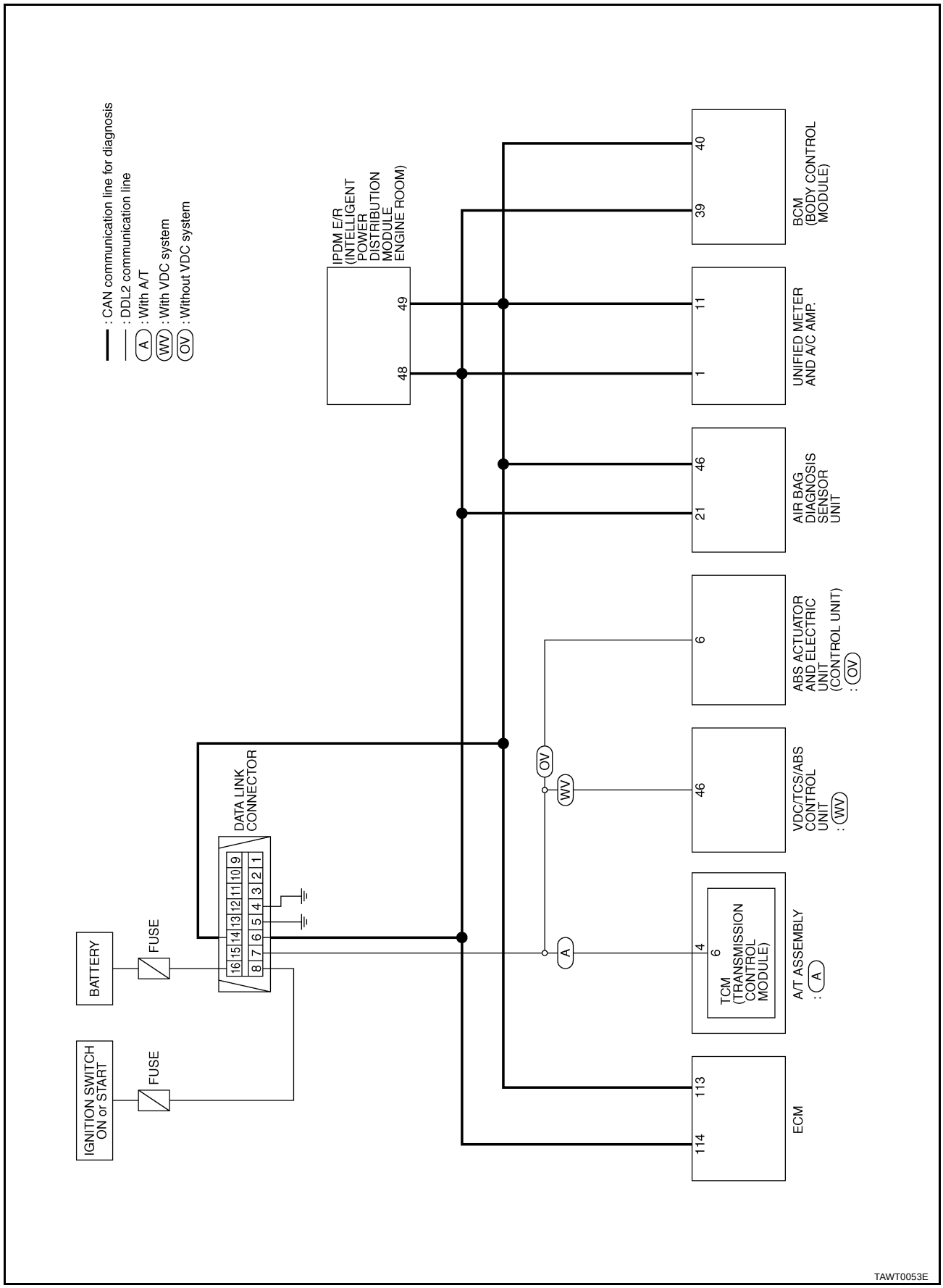
If the CONSULT-III cannot diagnose the system properly, check the following items.

Symptom	Check item
CONSULT-III cannot access any system.	● CONSULT-III DLC power supply circuit (Terminal 8) and ground circuit (Terminal 4)
CONSULT-III cannot access individual system. (Other systems can be accessed.)	● Power supply and ground circuit for the control unit of the system (For detailed circuit, refer to wiring diagram for each system.) ● Open or short circuit between the system and CONSULT-III DLC (For detailed circuit, refer to wiring diagram for each system.) ● Open or short circuit CAN communication line. Refer to LAN-16, "Trouble Diagnosis Flow Chart" .

NOTE:

The DDL1 and DDL2 circuits from DLC pins 12, 13, 14 and 15 may be connected to more than one system. A short in a DDL circuit connected to a control unit in one system may affect CONSULT-III access to other systems.

CIRCUIT DIAGRAM

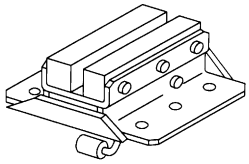
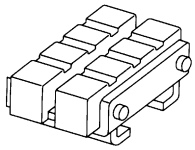


LIFTING POINT

PFP:00000

Commercial Service Tools

NAS0000U

Tool name	Description
Board on attachment	 S-NT001
Safety stand attachment	 S-NT002

CAUTION:

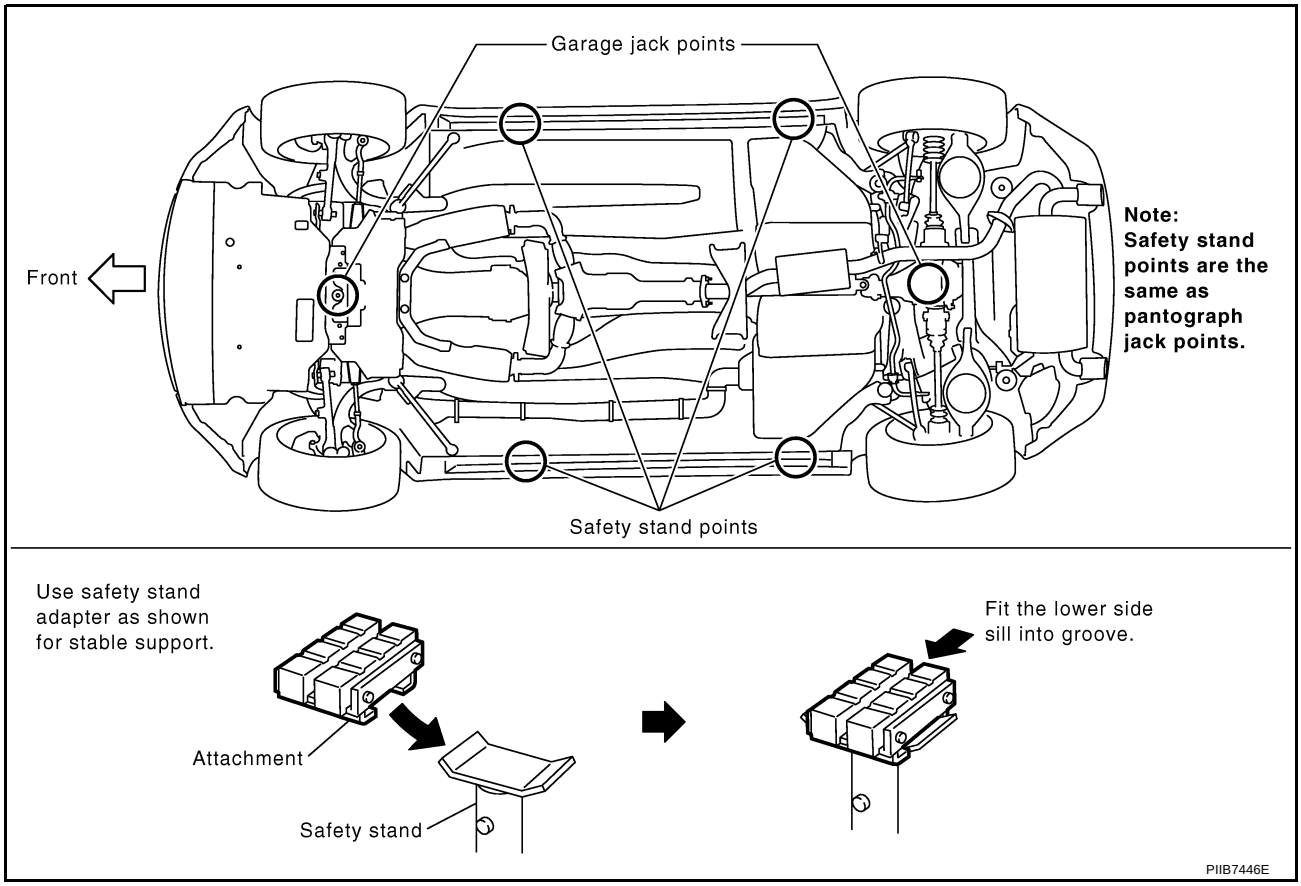
- **Every time the vehicle is lifted up, maintain the complete vehicle curb condition.**
- **Since the vehicle's center of gravity changes when removing main parts on the front side (engine, transmission, suspension etc.), support a jack up point on the rear side garage jack with a mission jack or equivalent.**
- **Since the vehicle's center of gravity changes when removing main parts on the rear side (rear axle, suspension, etc.), support a jack up point on the front side garage jack with a mission jack or equivalent.**
- **Be careful not to smash or do not do anything that would affect piping parts.**

Garage Jack and Safety Stand

NAS0000V

WARNING:

- **Park the vehicle on a level surface when using the jack. Make sure to avoid damaging pipes, tubes, etc. under the vehicle.**
- **Never get under the vehicle while it is supported only by the jack. Always use safety stands when you have to get under the vehicle.**
- **Place wheel chocks at both front and back of the wheels on the ground.**



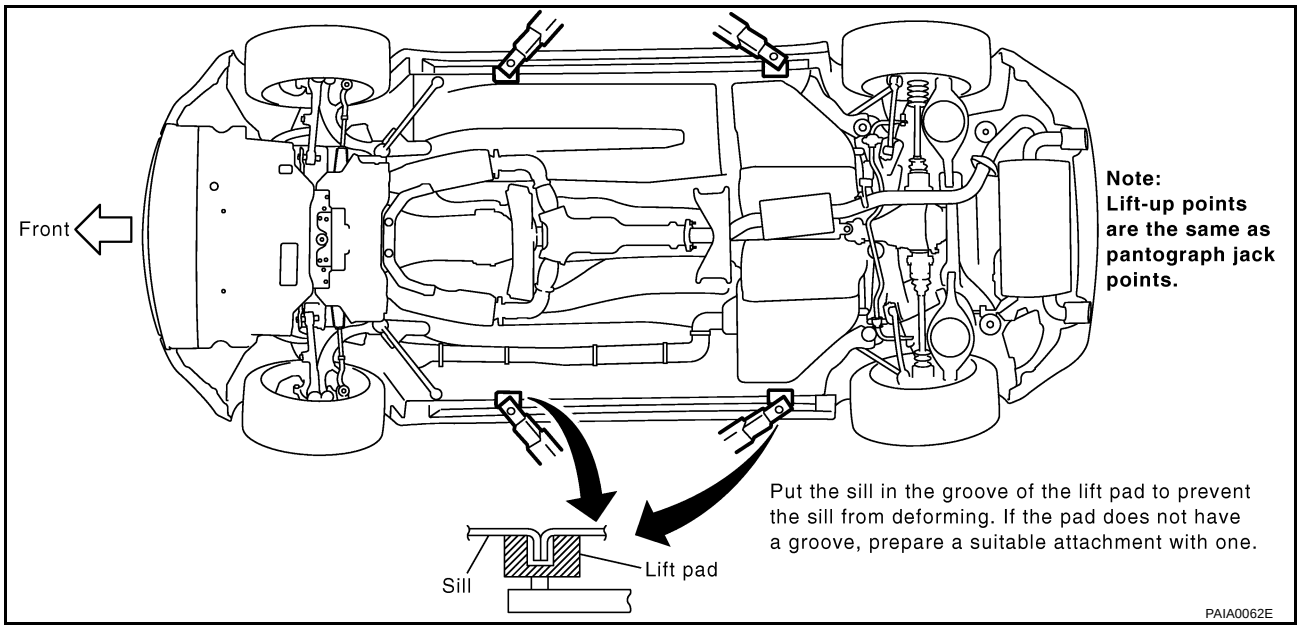
2-Pole Lift

NAS0000W

WARNING:

When lifting the vehicle, open the lift arms as wide as possible and ensure that the front and rear of the vehicle are well balanced.

When setting the lift arm, do not allow the arm to contact the brake tubes, brake cable, fuel lines and sill spoiler.



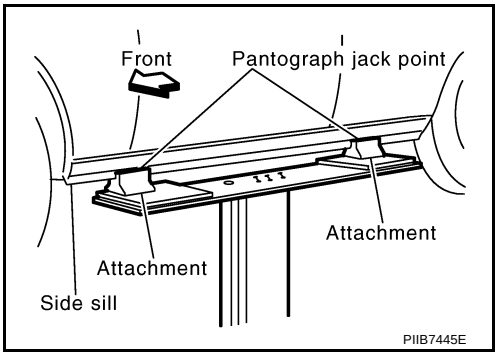
Board-on Lift

NAS0000X

CAUTION:

Make sure vehicle is empty when lifting.

- **The board-on lift attachment set at front end of vehicle should be set on the front of the sill under the front door opening.**
- **Position attachments at front and rear ends of board-on lift.**



TOW TRUCK TOWING

PFP:00000

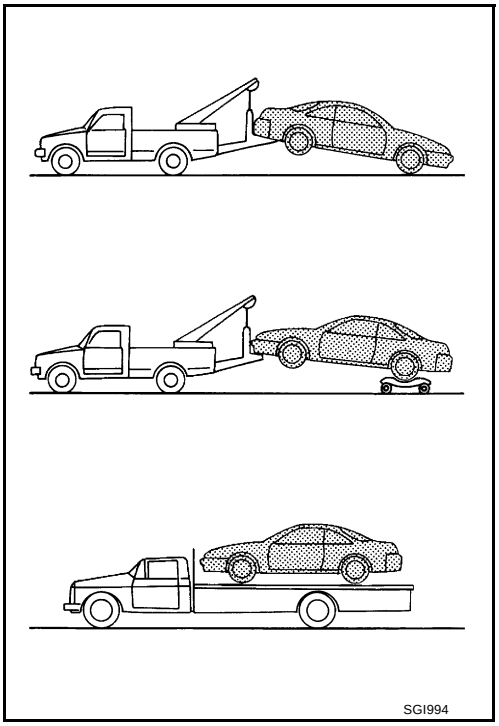
Tow Truck Towing

NAS0000Y

CAUTION:

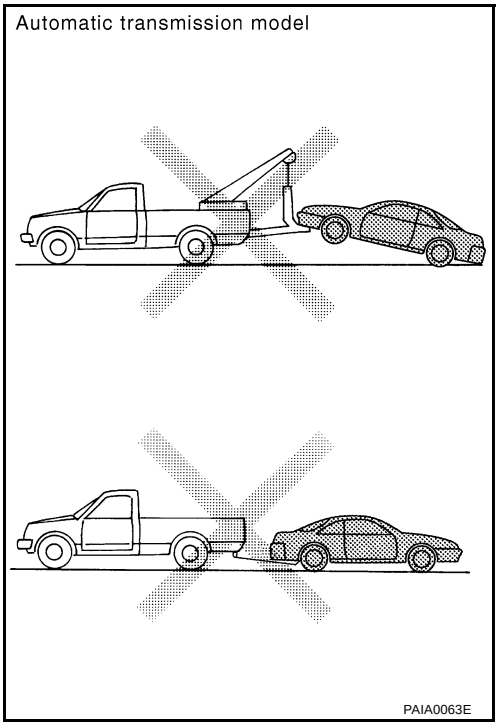
- **All applicable state or Provincial (in Canada) laws and local laws regarding the towing operation must be obeyed.**
- **It is necessary to use proper towing equipment to avoid possible damage to the vehicle during towing operation. Towing is in accordance with Towing Procedure Manual at dealer.**
- **Always attach safety chains before towing.**
- **When towing, make sure that the transmission, steering system and power train are in good order. If any unit is damaged, dollies must be used.**

NISSAN recommends that the vehicle be towed with the driving (rear) wheels off the ground as illustrated.


SGI994

CAUTION:

- **Never tow an automatic transmission model with the rear wheels or four wheels on the ground (forward or backward). This may cause serious and expensive damage to the transmission.**
- **When towing with the front wheels on the ground (if you do not use towing dollies), turn the ignition key to the OFF position, and secure the steering wheel in the straight-ahead position with a rope or similar device. Never place the ignition key in the LOCK position. This will result in damage to the steering lock mechanism.**
- **When towing a manual transmission model with the rear wheels on the ground (if you do not use towing dollies), release the parking brake and move the shift lever to the N (Neutral) position.**



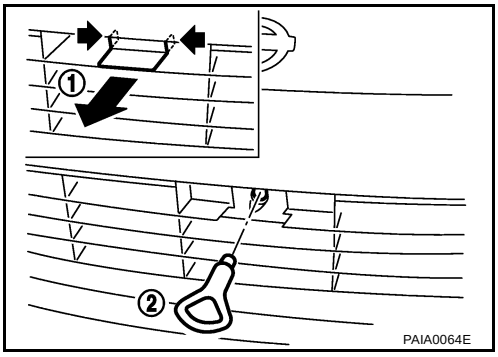
PAIA0063E

Vehicle Recovery (Freeing a Stuck Vehicle)

NAS0000Z

FRONT

After removing the front licence plate (if so equipped),
1 Remove the recovery hook cover from the bumper.
2 Securely install the recovery hook stored with jacking tools.
Make sure that the hook is properly secured in the stored place after use.



WARNING:

- **Stand clear of a stuck vehicle.**
- **Do not spin your tires at high speed. This could cause them to explode and result in serious injury. Parts of your vehicle could also overheat and be damaged.**

CAUTION:

- **Tow chains or cables must be attached only to the vehicle recovery hooks or main structural members of the vehicle. Otherwise, the vehicle body will be damaged.**
- **Do not use the vehicle tie downs to free a vehicle stuck in sand, snow, mud, etc. Never tow a vehicle using the vehicle tie downs or recovery hooks.**
- **Always pull the cable straight out from the front of the vehicle. Never pull on the vehicle at an angle.**
- **Pulling devices should be routed so they do not touch any part of the suspension, steering, brake or cooling systems.**
- **Pull devices such as ropes or canvas straps are not recommended for use in vehicle towing or recovery.**

If your vehicle is stuck in sand, snow, mad, etc., use the following procedure:

1. Turn off the Vehicle Dynamic Control System (if so equipped).
2. Make sure the area in front and behind the vehicle is clear of obstructions.
3. Turn the steering wheel right and left to clear an area around front tires.
4. Slowly rock the vehicle forward and backward.
   - Shift back and forth between R (reverse) and D (drive) (automatic transmission models) or 1st (low) and R (reverse) (manual transmission models).
   - Apply the accelerator as little as possible to maintain the rocking motion.
   - Release the accelerator pedal before shifting between R and D (automatic transmission models) or 1st and R (manual transmission models).
   - Do not spin the tires above 35 MPH (55 km/h).
5. If the vehicle cannot be freed after a few tires, contact a professional towing service to remove the vehicle.

REAR

- Towing hook is not available.

TIGHTENING TORQUE OF STANDARD BOLTS

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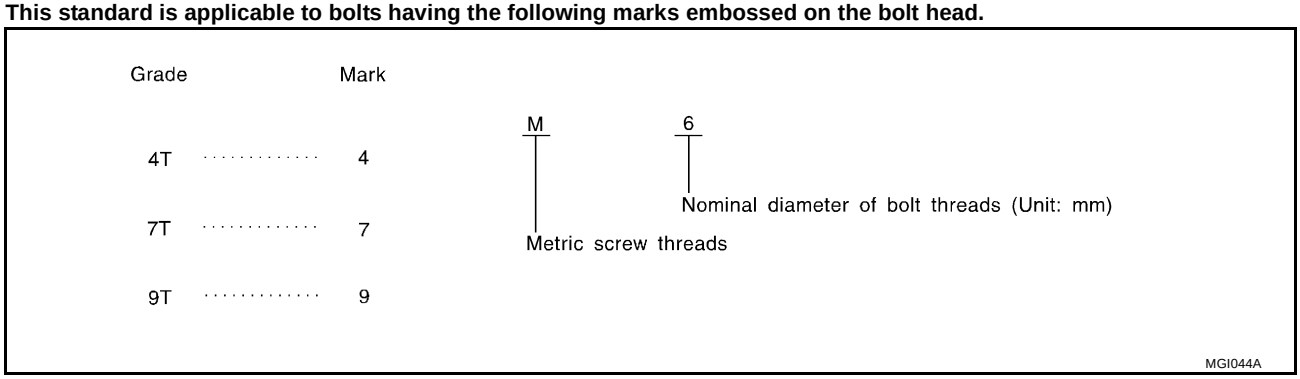
Tightening Torque Table

NAS00010

Grade	Bolt size	Bolt diameter * mm	Pitch mm	Tightening torque (Without lubricant)							
				Hexagon head bolt				Hexagon flange bolt			
				N·m	kg-m	ft-lb	in-lb	N·m	kg-m	ft-lb	in-lb
4T	M6	6.0	1.0	5.5	0.56	4	49	7	0.71	5	62
	M8	8.0	1.25	13.5	1.4	10	—	17	1.7	13	—
			1.0	13.5	1.4	10	—	17	1.7	13	—
	M10	10.0	1.5	28	2.9	21	—	35	3.6	26	—
			1.25	28	2.9	21	—	35	3.6	26	—
	M12	12.0	1.75	45	4.6	33	—	55	5.6	41	—
			1.25	45	4.6	33	—	65	6.6	48	—
	M14	14.0	1.5	80	8.2	59	—	100	10	74	—
7T	M6	6.0	1.0	9	0.92	7	80	11	1.1	8	97
	M8	8.0	1.25	22	2.2	16	—	28	2.9	21	—
			1.0	22	2.2	16	—	28	2.9	21	—
	M10	10.0	1.5	45	4.6	33	—	55	5.6	41	—
			1.25	45	4.6	33	—	55	5.6	41	—
	M12	12.0	1.75	80	8.2	59	—	100	10	74	—
			1.25	80	8.2	59	—	100	10	74	—
	M14	14.0	1.5	130	13	96	—	170	17	125	—
9T	M6	6.0	1.0	11	1.1	8	—	13.5	1.4	10	—
	M8	8.0	1.25	28	2.9	21	—	35	3.6	26	—
			1.0	28	2.9	21	—	35	3.6	26	—
	M10	10.0	1.5	55	5.6	41	—	80	8.2	59	—
			1.25	55	5.6	41	—	80	8.2	59	—
	M12	12.0	1.75	100	10	74	—	130	13	96	—
			1.25	100	10	74	—	130	13	96	—
	M14	14.0	1.5	170	17	125	—	210	21	155	—

*: Nominal diameter

1. **Special parts are excluded.**
2. **This standard is applicable to bolts having the following marks embossed on the bolt head.**



RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS

PFP:00000

Recommended Chemical Products and Sealants

NAS00011

Refer to the following chart for help in selecting the appropriate chemical product or sealant.

	Product Description	Purpose	Nissan North America Part No. (USA)	Nissan Canada Part No. (Canada)	Aftermarket Cross-reference Part Nos.
1	Rear View Mirror Adhesive	Used to permanently remount rear view mirrors to windows.	999MP-AM000P	99998-50505	Permatex 81844
2	Anaerobic Liquid Gasket	For metal-to-metal flange sealing. Can fill a 0.38 mm (0.015 inch) gap and provide instant sealing for most powertrain applications.	999MP-AM001P	99998-50503	Permatex 51813 and 51817
3	High Performance Thread Sealant	Provides instant sealing on any threaded straight or parallel threaded fitting. (Thread sealant only, no locking ability.) ● Do not use on plastic.	999MP-AM002P	999MP-AM002P	Permatex 56521
4	Silicone RTV	Gasket Maker	999MP-AM003P (Ultra Grey)	99998-50506 (Ultra Grey)	Permatex Ultra Grey 82194; Three Bond 1207,1215, 1216, 1217F, 1217G and 1217H Nissan RTV Part No. 999MP-A7007
		Gasket Maker for Maxima/ Quest 5-speed automatic transmission (RE5F22A)	–	–	Three Bond 1281B or exact equivalent in its quality
5	High Temperature, High Strength Thread Locking Sealant (Red)	Threadlocker	999MP-AM004P	999MP-AM004P	Permatex 27200; Three Bond 1360, 1360N, 1305 N&P, 1307N, 1335, 1335B, 1363B, 1377C, 1386B, D&E and 1388 Loctite 648
6	Medium Strength Thread Locking Sealant (Blue)	Threadlocker (service tool removable)	999MP-AM005P	999MP-AM005P	Permatex 24200, 24206, 24240, 24283 and 09178; Three Bond 1322, 1322N, 1324 D&N, 1333D, 1361C, 1364D, 1370C and 1374

IDENTIFICATION INFORMATION

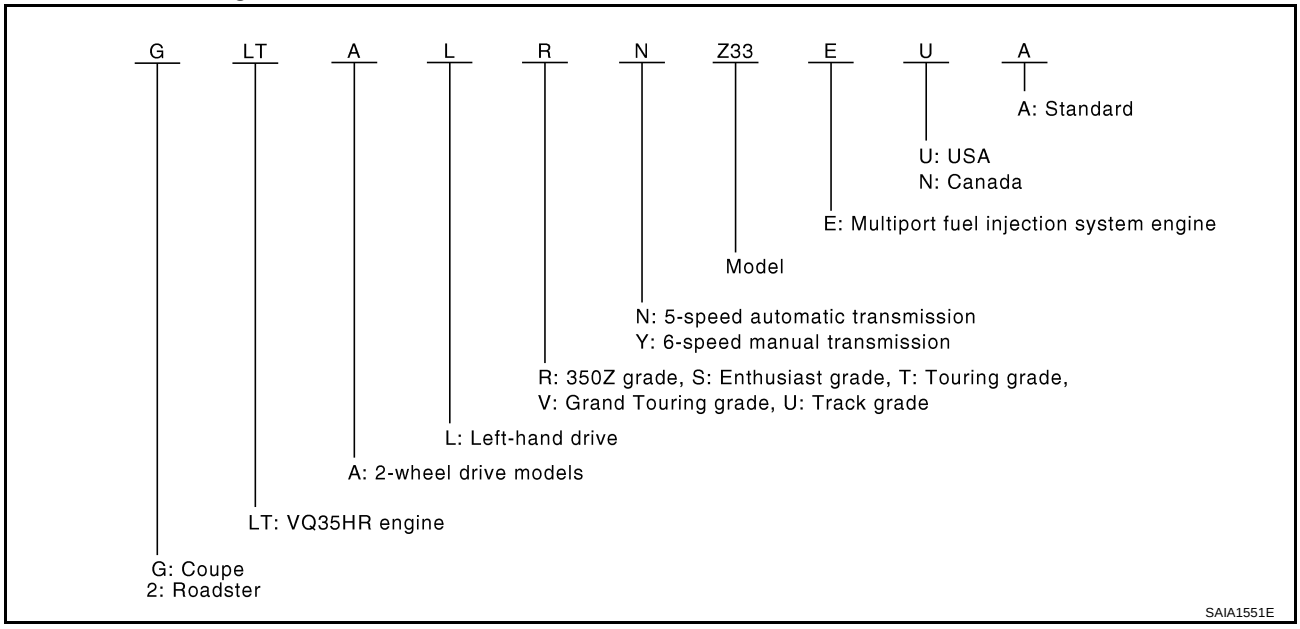
PFP:00010

Model Variation

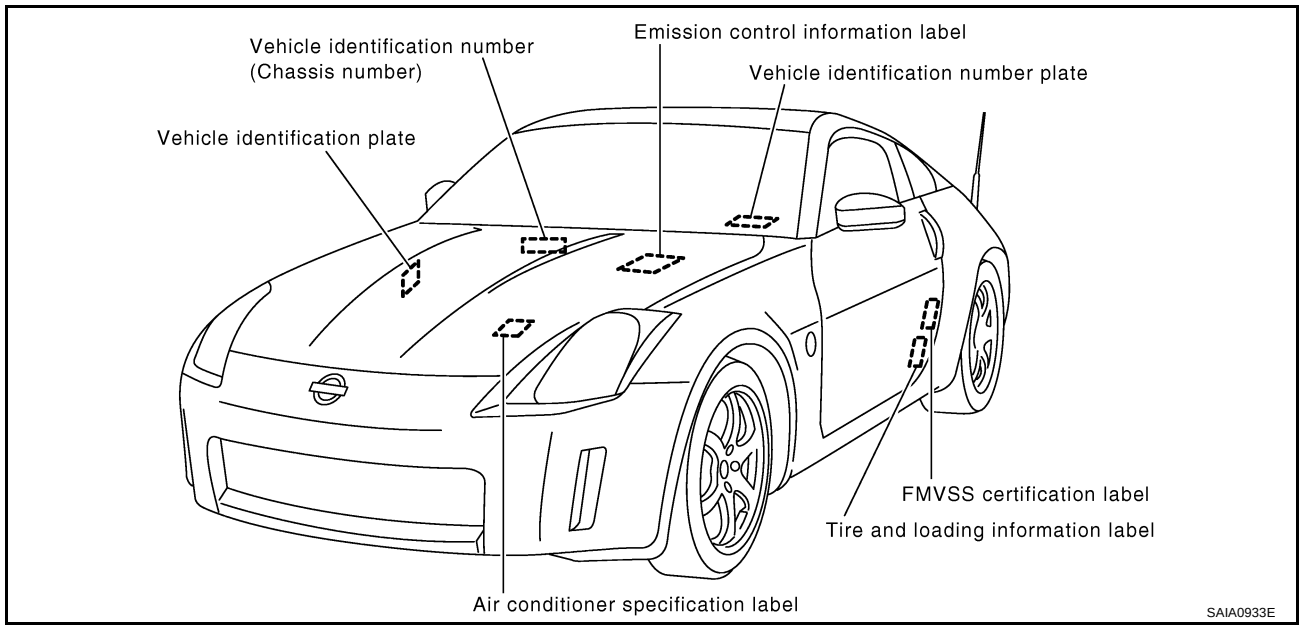
NAS00012

Body	Engine	Transmission	Destination	
			USA	Canada
Coupe	VQ35HR	RE5R05A (5A/T)	GLTALSN-EUA	GLTALTN-ENA
			GLTALTN-EUA	GLTALVN-ENA
			GLTALVN-EUA	—
		FS6R31A (6M/T)	GLTALRY-EUA	GLTALTY-ENA
			GLTALSY-EUA	GLTALVY-ENA
			GLTALTY-EUA	—
			GLTALUY-EUA	—
			GLTALVY-EUA	—
Roadster		RE5R05A (5A/T)	2LTALSN-EUA	2LTALTN-ENA
			2LTALTN-EUA	2LTALVN-ENA
			2LTALVN-EUA	—
		FS6R31A (6M/T)	2LTALSY-EUA	2LTALTY-ENA
			2LTALTY-EUA	2LTALVY-ENA
			2LTALVY-EUA	—

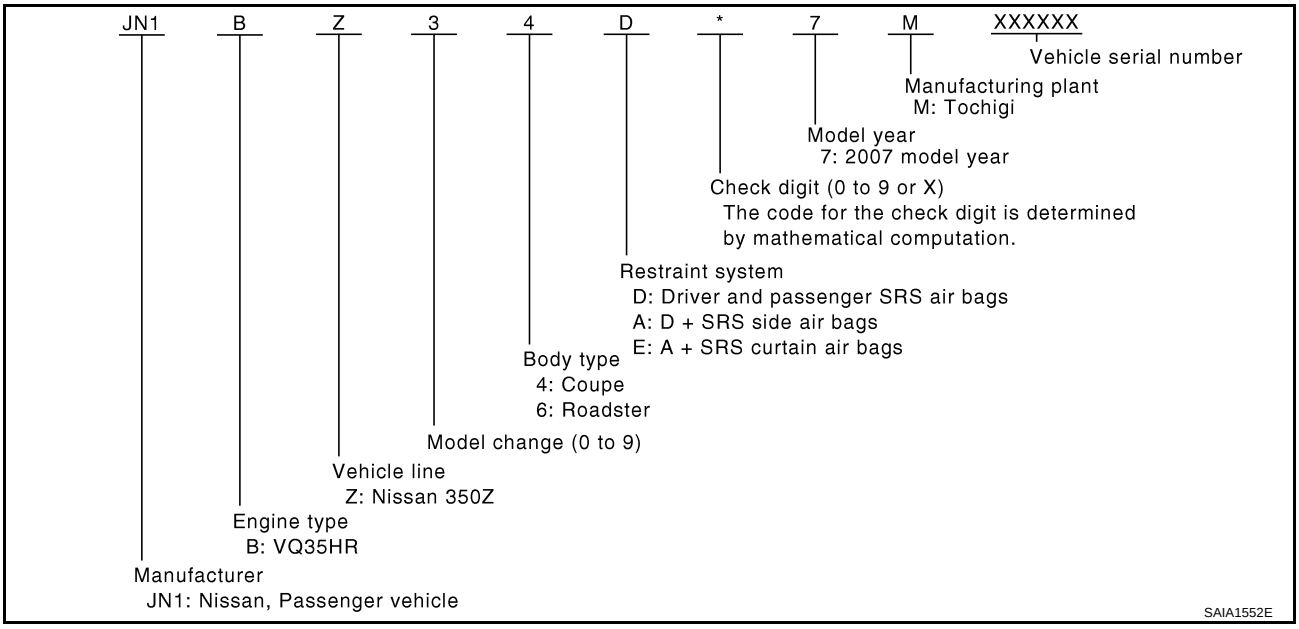
Prefix and suffix designations:



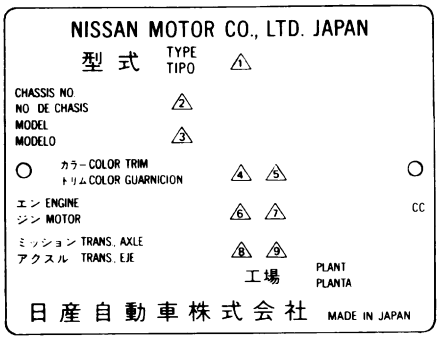
IDENTIFICATION NUMBER



Vehicle Identification Number Arrangement



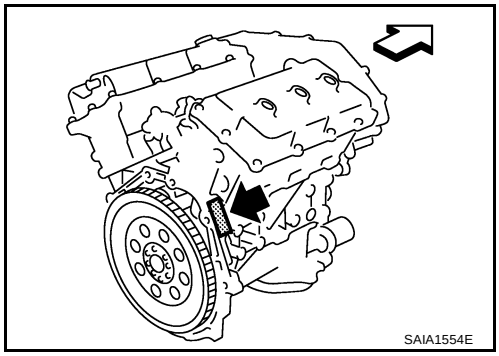
IDENTIFICATION PLATE



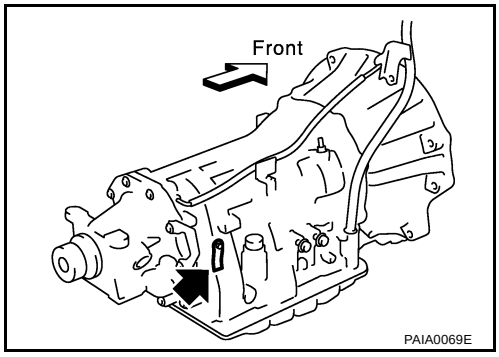
1 Type
2 Vehicle identification number (Chassis number)
3 Model
4 Body color code
5 Trim color code
6 Engine model
7 Engine displacement
8 Transmission model
9 Axle model

SGI315

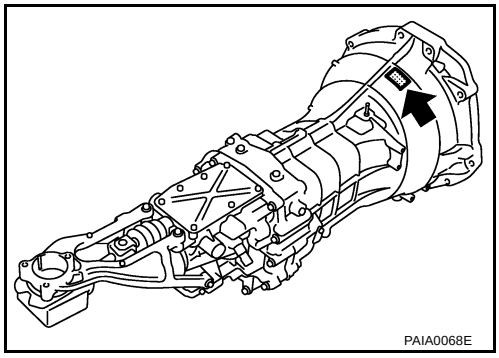
ENGINE SERIAL NUMBER



AUTOMATIC TRANSMISSION NUMBER



MANUAL TRANSMISSION NUMBER



Dimensions

NAS00013

Unit: mm (in)

Model	Coupe	Roadster
Overall length	4,314 (169.8)	4,314 (169.8)
Overall width	1,815 (71.5)	1,815 (71.5)
Overall height	1,323 (52.1)	1,333 (52.5)
Front tread	1,536 (60.5)	1,536 (60.5)
Rear tread	1,540 (60.6)*1, 1,546 (60.9)*2	1,540 (60.6)
Wheelbase	2,650 (104.3)	2,650 (104.3)

*1: For model with 245/45R18 tires
*2: For model with 265/35R19 tires

Wheels & Tires

NAS00014

	Type		Size	Offset mm (in)
Road wheel	Aluminum	Front	18 x 8JJ	30 (1.18)
			18 x 9 JJ	
		Rear	18 x 8-1/2JJ	33 (1.30)
			19 x 10JJ	30 (1.18)
	Spare		17 x 4T	30 (1.18)
Tire	Conventional	Front	225/45R18 91W 245/40R18 93W*	
		Rear	245/45R18 96W 265/35R19 94W*	
	Spare		T145/80D17 107M	

TERMINOLOGY

PFP:00011

SAE J1930 Terminology List

NAS00017

All emission related terms used in this publication in accordance with SAE J1930 are listed. Accordingly, new terms, new acronyms/abbreviations and old terms are listed in the following chart.

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Air cleaner	ACL	Air cleaner
Barometric pressure	BARO	***
Barometric pressure sensor-BCDD	BAROS-BCDD	BCDD
Camshaft position	CMP	***
Camshaft position sensor	CMPS	Crank angle sensor
Canister	***	Canister
Carburetor	CARB	Carburetor
Charge air cooler	CAC	Intercooler
Closed loop	CL	Closed loop
Closed throttle position switch	CTP switch	Idle switch
Clutch pedal position switch	CPP switch	Clutch switch
Continuous fuel injection system	CFI system	***
Continuous trap oxidizer system	CTOX system	***
Crankshaft position	CKP	***
Crankshaft position sensor	CKPS	***
Data link connector	DLC	***
Data link connector for CONSULT-II	DLC for CONSULT-II	Diagnostic connector for CONSULT-II
Diagnostic test mode	DTM	Diagnostic mode
Diagnostic test mode selector	DTM selector	Diagnostic mode selector
Diagnostic test mode I	DTM I	Mode I
Diagnostic test mode II	DTM II	Mode II
Diagnostic trouble code	DTC	Malfunction code
Direct fuel injection system	DFI system	***
Distributor ignition system	DI system	Ignition timing control
Early fuel evaporation-mixture heater	EFE-mixture heater	Mixture heater
Early fuel evaporation system	EFE system	Mixture heater control
Electrically erasable programmable read only memory	EEPROM	***
Electronic ignition system	EI system	Ignition timing control
Engine control	EC	***
Engine control module	ECM	ECCS control unit
Engine coolant temperature	ECT	Engine temperature
Engine coolant temperature sensor	ECTS	Engine temperature sensor
Engine modification	EM	***
Engine speed	RPM	Engine speed
Erasable programmable read only memory	EPROM	***
Evaporative emission canister	EVAP canister	Canister
Evaporative emission system	EVAP system	Canister control solenoid valve
Exhaust gas recirculation valve	EGR valve	EGR valve

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Exhaust gas recirculation control-BPT valve	EGRC-BPT valve	BPT valve
Exhaust gas recirculation control-solenoid valve	EGRC-solenoid valve	EGR control solenoid valve
Exhaust gas recirculation temperature sensor	EGRT sensor	Exhaust gas temperature sensor
EGR temperature sensor		
Flash electrically erasable programmable read only memory	FEEPROM	***
Flash erasable programmable read only memory	FEPROM	***
Flexible fuel sensor	FFS	***
Flexible fuel system	FF system	***
Fuel pressure regulator	***	Pressure regulator
Fuel pressure regulator control solenoid valve	***	PRVR control solenoid valve
Fuel trim	FT	***
Heated Oxygen sensor	HO2S	Exhaust gas sensor
Idle air control system	IAC system	Idle speed control
Idle air control valve-air regulator	IACV-air regulator	Air regulator
Idle air control valve-auxiliary air control valve	IACV-AAC valve	Auxiliary air control (AAC) valve
Idle air control valve-FICD solenoid valve	IACV-FICD solenoid valve	FICD solenoid valve
Idle air control valve-idle up control solenoid valve	IACV-idle up control solenoid valve	Idle up control solenoid valve
Idle speed control-FI pot	ISC-FI pot	FI pot
Idle speed control system	ISC system	***
Ignition control	IC	***
Ignition control module	ICM	***
Indirect fuel injection system	IFI system	***
Intake air	IA	Air
Intake air temperature sensor	IAT sensor	Air temperature sensor
Knock	***	Detonation
Knock sensor	KS	Detonation sensor
Malfunction indicator lamp	MIL	Check engine light
Manifold absolute pressure	MAP	***
Manifold absolute pressure sensor	MAPS	***
Manifold differential pressure	MDP	***
Manifold differential pressure sensor	MDPS	***
Manifold surface temperature	MST	***
Manifold surface temperature sensor	MSTS	***
Manifold vacuum zone	MVZ	***
Manifold vacuum zone sensor	MVZS	***
Mass air flow sensor	MAFS	Air flow meter
Mixture control solenoid valve	MC solenoid valve	Air-fuel ratio control solenoid valve
Multiport fuel injection System	MFI system	Fuel injection control

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Nonvolatile random access memory	NVRAM	***
On board diagnostic system	OBD system	Self-diagnosis
Open loop	OL	Open loop
Oxidation catalyst	OC	Catalyst
Oxidation catalytic converter system	OC system	***
Oxygen sensor	O2S	Exhaust gas sensor
Park position switch	***	Park switch
Park/neutral position switch	PNP switch	Park/neutral switch Inhibitor switch Neutral position switch
Periodic trap oxidizer system	PTOX system	***
Positive crankcase ventilation	PCV	Positive crankcase ventilation
Positive crankcase ventilation valve	PCV valve	PCV valve
Powertrain control module	PCM	***
Programmable read only memory	PROM	***
Pulsed secondary air injection control solenoid valve	PAIRC solenoid valve	AIV control solenoid valve
Pulsed secondary air injection system	PAIR system	Air induction valve (AIV) control
Pulsed secondary air injection valve	PAIR valve	Air induction valve
Random access memory	RAM	***
Read only memory	ROM	***
Scan tool	ST	***
Secondary air injection pump	AIR pump	***
Secondary air injection system	AIR system	***
Sequential multiport fuel injection system	SFI system	Sequential fuel injection
Service reminder indicator	SRI	***
Simultaneous multiport fuel injection system	***	Simultaneous fuel injection
Smoke puff limiter system	SPL system	***
Supercharger	SC	***
Supercharger bypass	SCB	***
System readiness test	SRT	***
Thermal vacuum valve	TVV	Thermal vacuum valve
Three way catalyst	TWC	Catalyst
Three way catalytic converter system	TWC system	***
Three way + oxidation catalyst	TWC + OC	Catalyst
Three way + oxidation catalytic converter system	TWC + OC system	***
Throttle body	TB	Throttle chamber SPI body
Throttle body fuel injection system	TBI system	Fuel injection control
Throttle position	TP	Throttle position
Throttle position sensor	TPS	Throttle sensor
Throttle position switch	TP switch	Throttle switch
Torque converter clutch solenoid valve	TCC solenoid valve	Lock-up cancel solenoid Lock-up solenoid

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Transmission control module	TCM	A/T control unit
Turbocharger	TC	Turbocharger
Vehicle speed sensor	VSS	Vehicle speed sensor
Volume air flow sensor	VAFS	Air flow meter
Warm up oxidation catalyst	WU-OC	Catalyst
Warm up oxidation catalytic converter system	WU-OC system	***
Warm up three way catalyst	WU-TWC	Catalyst
Warm up three way catalytic converter system	WU-TWC system	***
Wide open throttle position switch	WOTP switch	Full switch

***: Not applicable

SECTION GW

GLASSES, WINDOW SYSTEM & MIRRORS

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00049

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

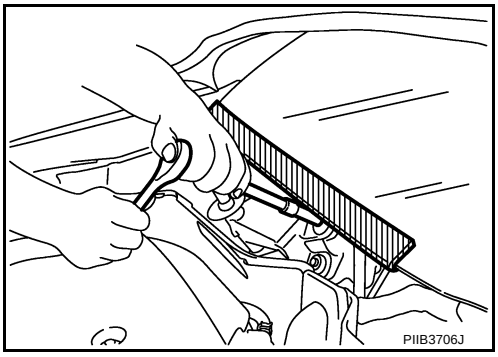
NIS0004A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NIS001L6

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Handling for Adhesive and Primer

NIS0004B

- Do not use an adhesive which is past its usable date. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.
- Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.
- Open the seal of the primer and adhesive just before application. Discard the remainder.
- Before application, be sure to shake the primer container to stir the contents. If any floating material is found, do not use it.
- If any primer or adhesive contacts the skin, wipe it off with gasoline or equivalent and wash the skin with soap.
- When using primer and adhesive, always observe the precautions in the instruction manual.

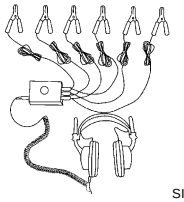
PREPARATION

PFP:00002

Special Service Tools

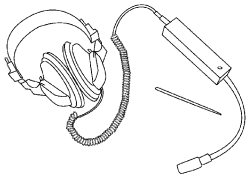
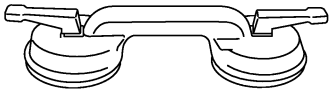
NIS0004D

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS0004E

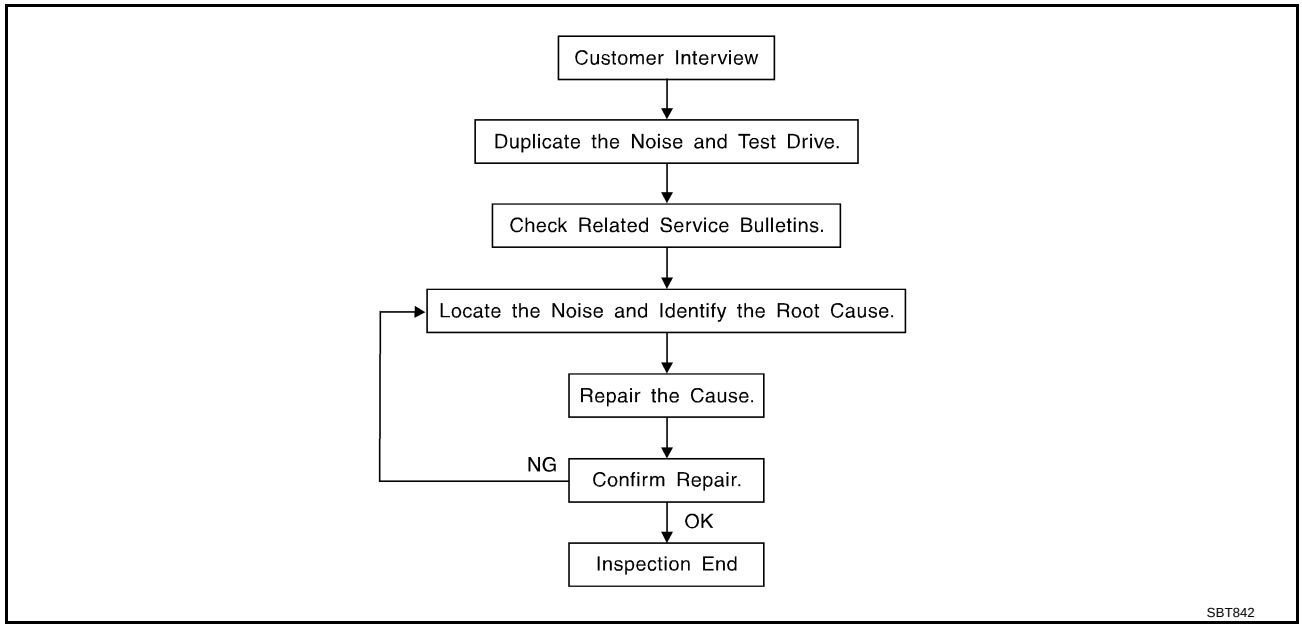
Tool name	Description
Engine ear  SIIA0995E	Locating the noise
Suction lifter  PIIB1805J	Remove the windshield, back door window glass

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS0004F



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to GW-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to GW-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS0004G

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

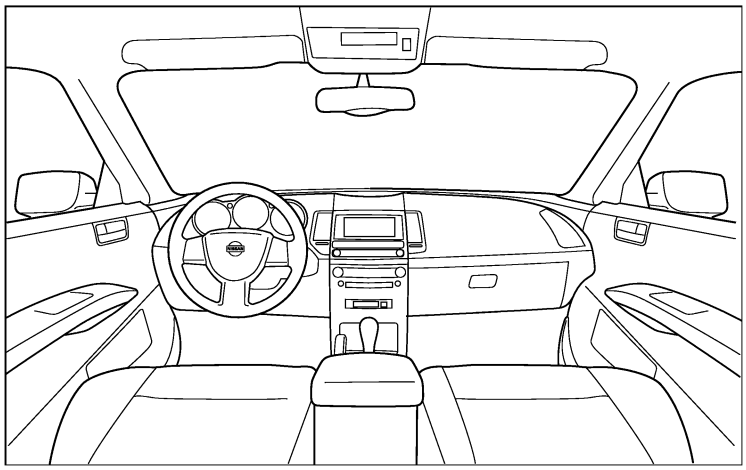
Diagnostic Worksheet

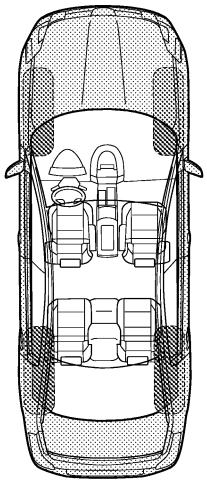
NIS0004H

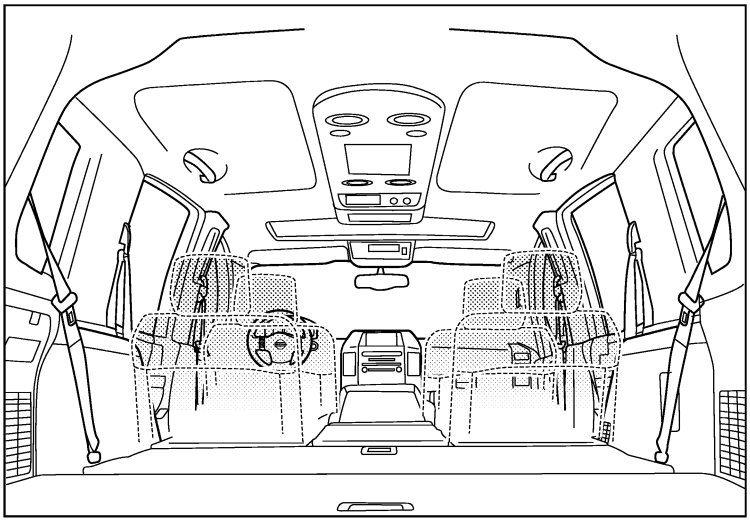
SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

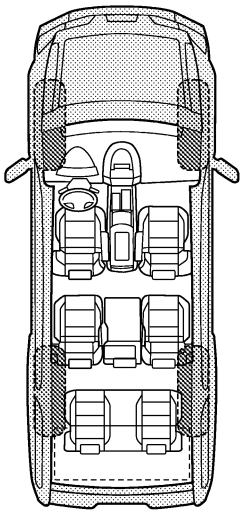
Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.









Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

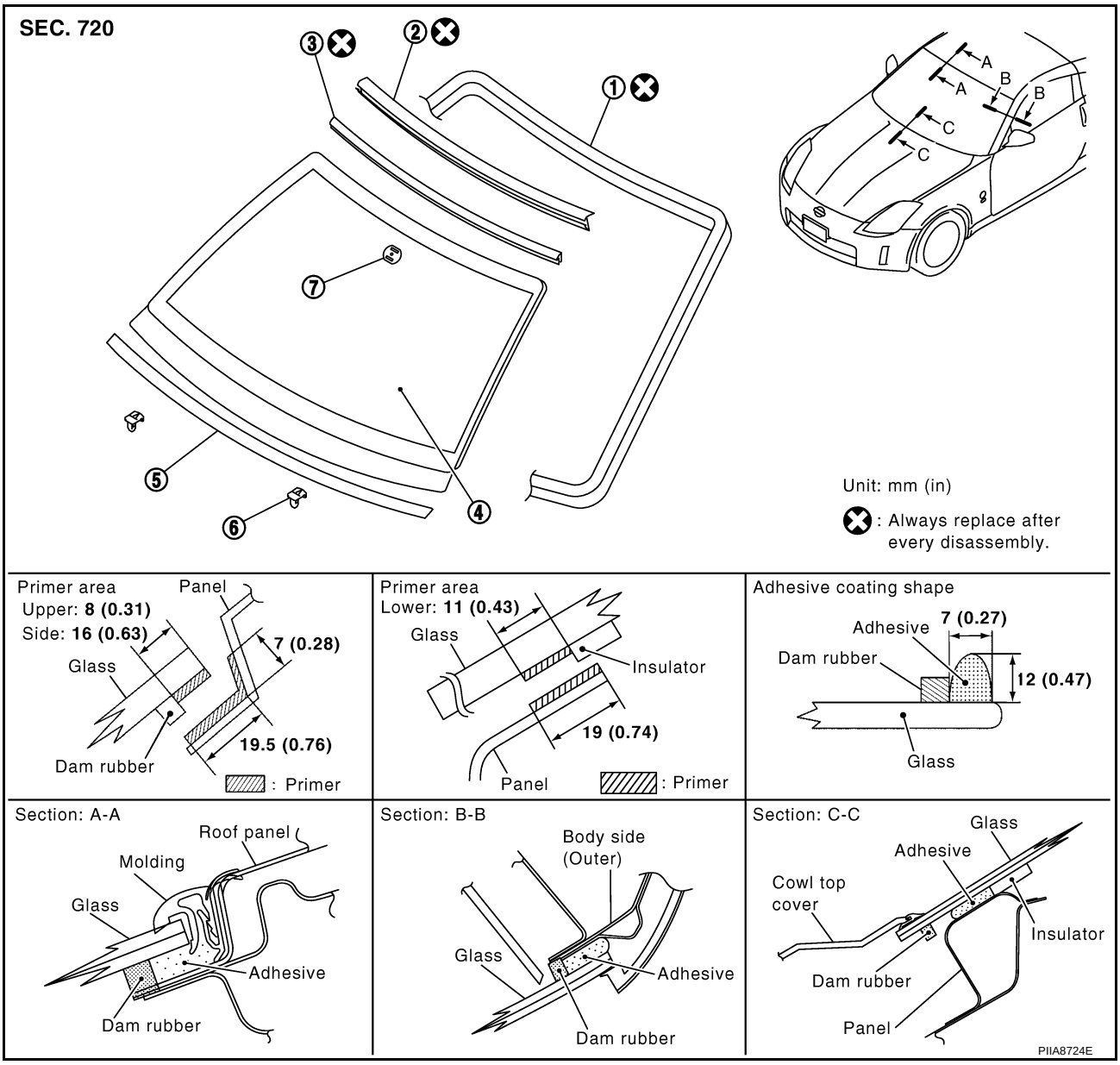
PIIB8742E

WINDSHIELD GLASS

PFP:72712

Removal and Installation

NIS0004I



1. Dam rubber
2. Fastener
3. Molding (upper)
4. Windshield glass
5. Insulator
6. Spacer
7. Mirror base

REMOVAL (COUPE)

1. Remove the front pillar finisher. Refer to EI-31, "Removal and Installation (for Coupe Models)" .
2. Partially remove the headlining (front edge). Refer to EI-44, "Removal and Installation (for Coupe Models)" .
3. Remove the front pillar garnish. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
4. Remove the front wiper arms. Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .
5. Remove the cowl top cover. Refer to EI-20, "COWL TOP" .
6. Apply a protective tape around the windshield glass to protect the painted surface from damage.

NOTE:

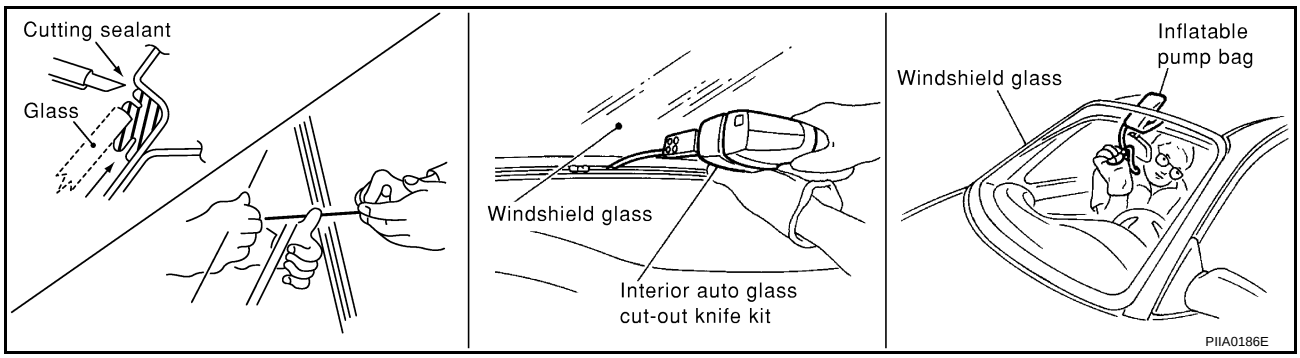
- After removing moldings, remove glass using piano wire or power cutting tool and an inflatable pump bag.
- If a windshield glass is to be reused, mark the body and the glass with mating marks.

WARNING:
When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:
- **When a windshield glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**

7. Remove the windshield glass, using suction lifter.

NOTE:
Do not set or stand the glass on its edge. Small chips may develop into cracks.



REMOVAL (ROADSTER)

1. Open the soft top.
2. Remove the front pillar finisher. Refer to EI-32, "Removal and Installation (for Roadster Models)" .
3. Remove the roof front finisher. Refer to EI-46, "Removal and Installation (for Roadster Models)" .
4. Remove the front pillar garnish. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
5. Remove the front wiper arms. Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .
6. Remove the cowl top cover. Refer to EI-20, "COWL TOP" .
7. Apply a protective tape around the windshield glass to protect the painted surface from damage.

NOTE:
- After removing moldings, remove glass using piano wire or power cutting tool and an inflatable pump bag.
- If a windshield glass is to be reused, mark the body and the glass with mating marks.

WARNING:
When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:
- **When a windshield glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**

8. Remove the windshield glass, using suction lifter.

NOTE:
Do not set or stand the glass on its edge. Small chips may develop into cracks.

INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit (if available) or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- The molding must be installed securely so that it is in position and leaves no gap.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:
- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**

- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the windshield in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

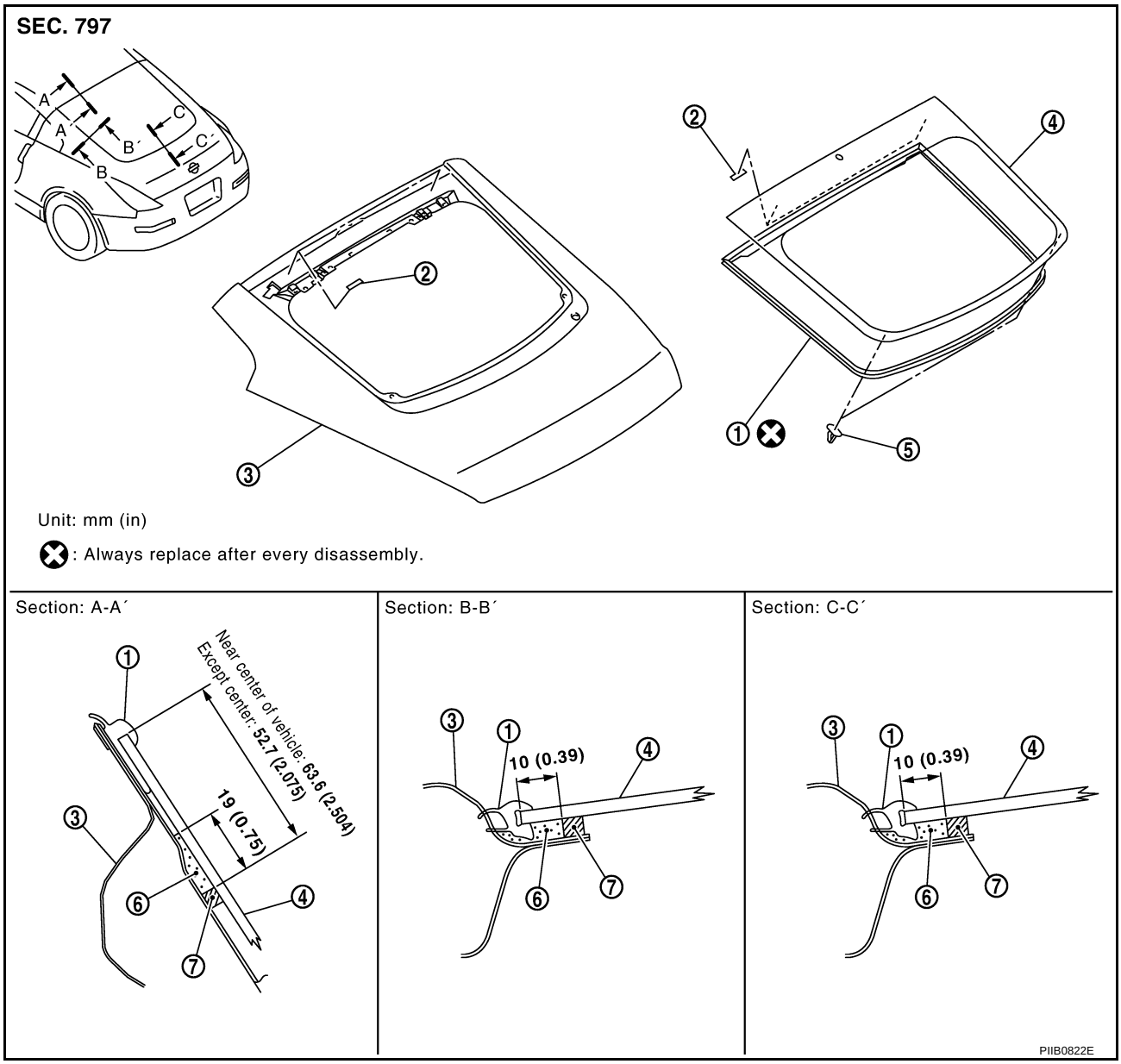
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the windshield area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

BACK DOOR WINDOW GLASS

PFP:90300

Removal and Installation

NIS0004J



1. Back door window molding
2. Dual lock fastener
3. Back door
4. Back door window glass
5. Holder
6. Adhesive
7. Dam rubber

REMOVAL

1. Remove back door finisher. Refer to EI-48, "BACK DOOR FINISHER" .
2. Remove rear wiper arm. Refer to WW-46, "Removal and Installation of Rear Wiper Arm, Adjustment of Wiper Arms Stop Location" .
3. Remove connectors and grounds for rear window defogger.
4. Apply a protective tape around the back door window glass to protect the painted surface from damage. remove glass using piano wire or power cutting tool and an inflatable pump bag.

NOTE:

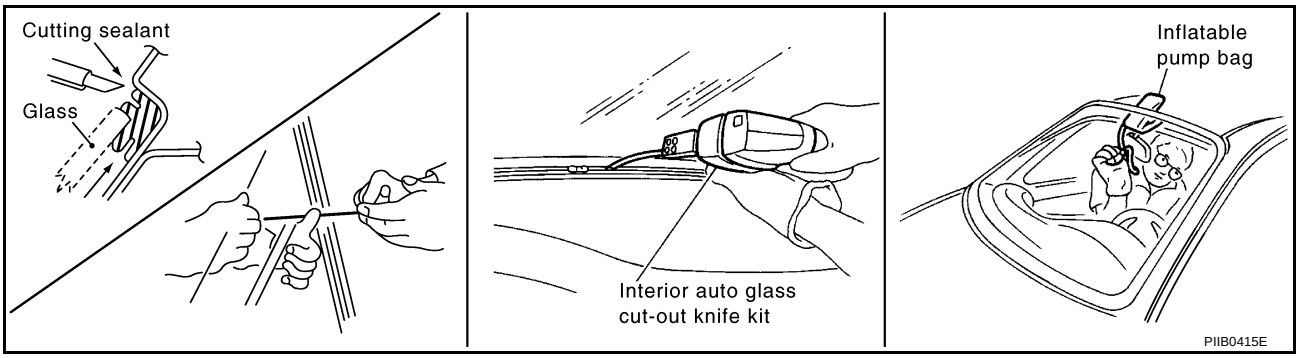
If a back door window glass is to be reused, mark the body and the glass with mating marks.

WARNING:

When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:

- **When a back door window glass is to be reused, do not use a cutting knife or power cutting tool.**
- **Be careful not to scratch the glass when removing.**
- **Do not set or stand the glass on its edge. Small chips may develop into cracks.**



5. Remove the back door window glass, using suction lifter.

INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit (if available) or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:

- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**
- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the back door window in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

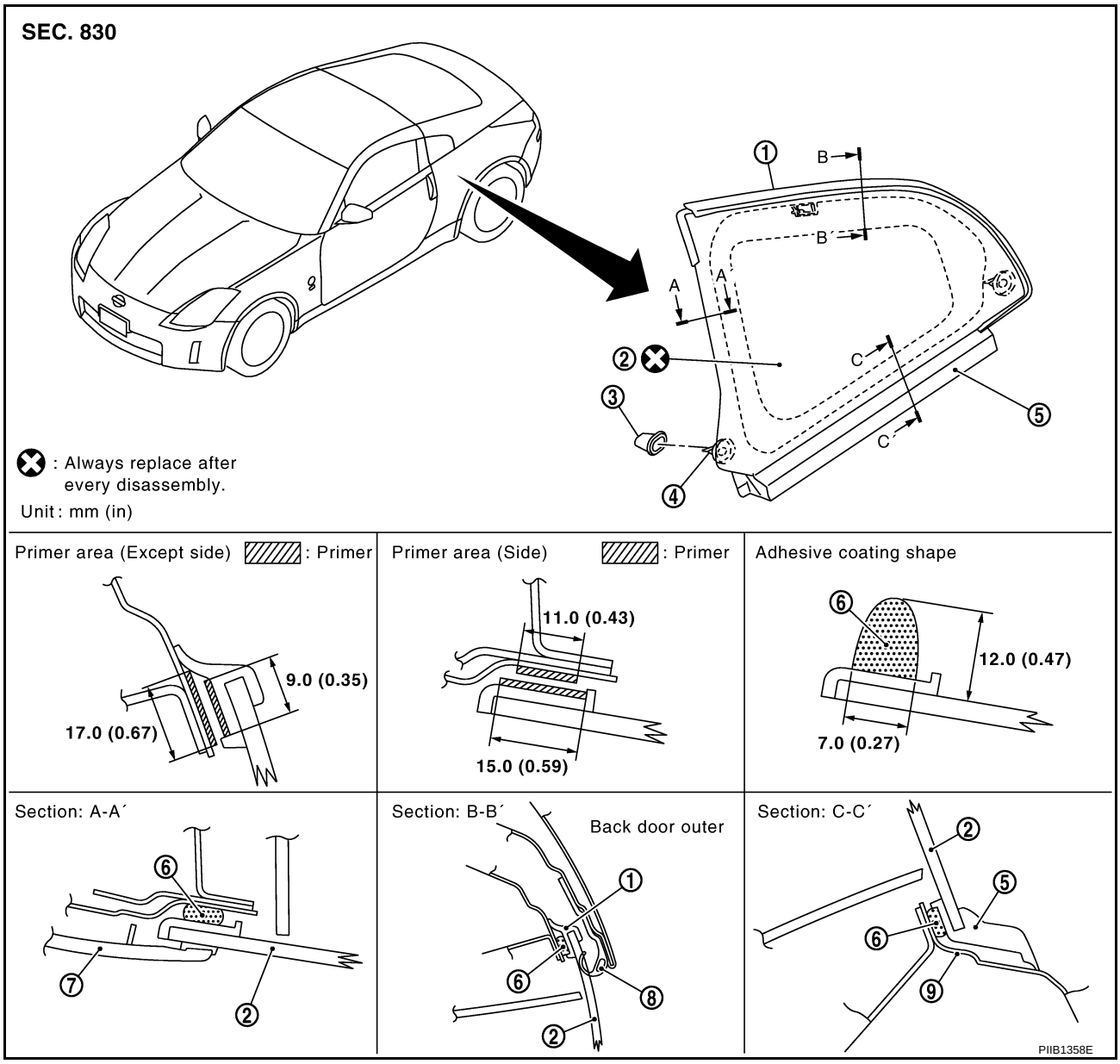
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the back door window area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

SIDE WINDOW GLASS

PFP:83300

Removal and Installation

NIS0004K



1. Side window glass molding (upper)
2. Side window glass
3. Grommet
4. Clip
5. Side window glass molding (lower)
6. Adhesive
7. Lock pillar finisher
8. Back door molding
9. Rear fender

REMOVAL

1. Remove rear side finisher. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove rear pillar finisher. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove headlining. Refer to EI-44, "HEADLINING" .
4. Remove lock pillar finisher. Refer to EI-31, "ROOF SIDE MOLDING" .

NOTE:
If a side window glass is to be reused, mark the body and the glass with mating marks.

WARNING:
When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:
- **Be careful not to scratch the glass when removing.**

- **Do not set or stand the glass on its edge. Small chips may develop into cracks.**

INSTALLATION

- Use a genuine Nissan Urethane Adhesive Kit (if available) or equivalent and follow the instructions furnished with it.
- While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.
- The molding must be installed securely so that it is in position and leaves no gap.
- Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.

WARNING:

- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**
- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the side window in case of an accident.**

CAUTION:

- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidity. The curing time will increase under lower temperature and lower humidity.**

Repairing Water Leaks

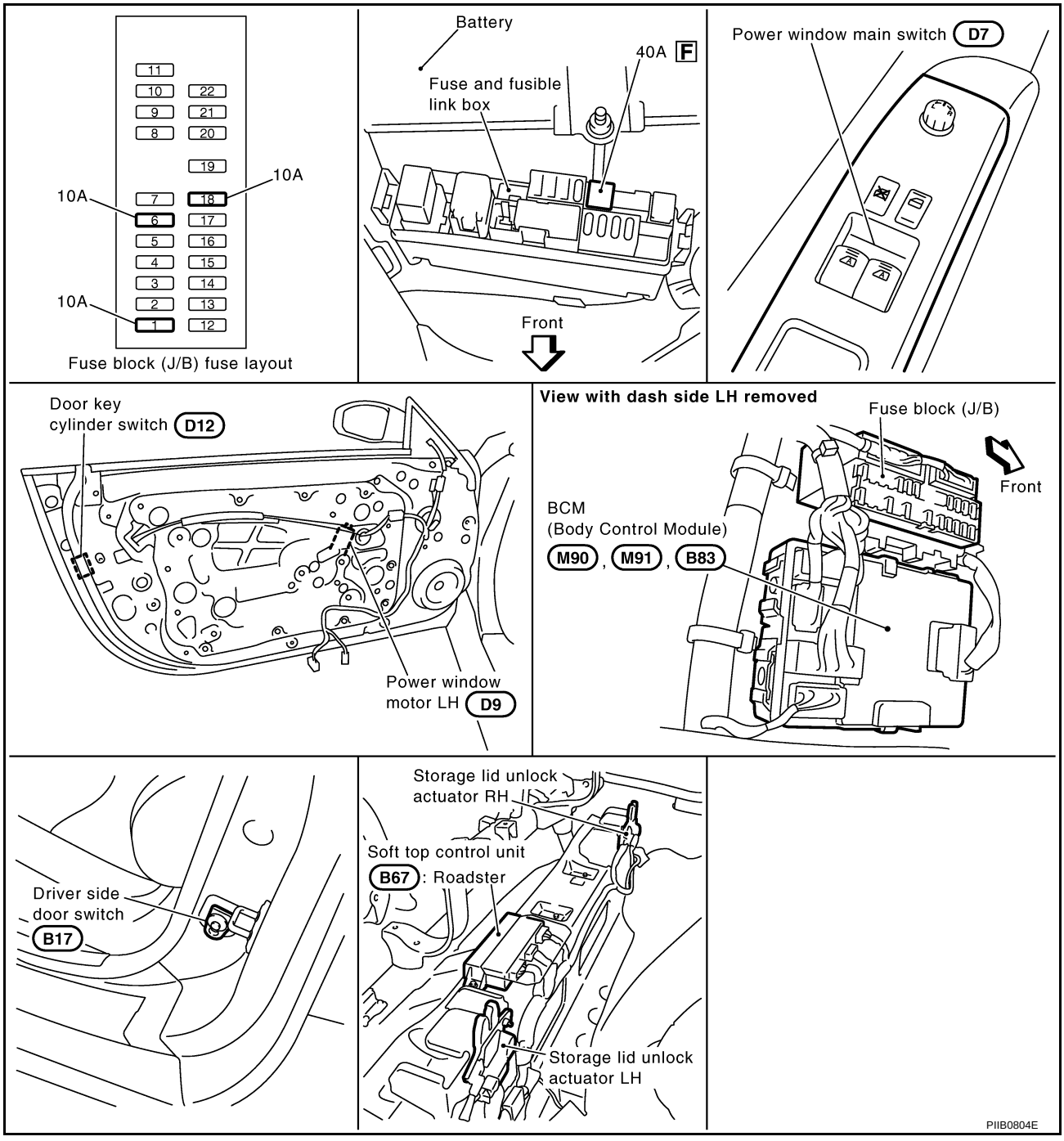
Leaks can be repaired without removing and reinstalling glass.
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the side window area while pushing glass outward.
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

POWER WINDOW SYSTEM

PFP:25401

Component Parts and Harness Connector Location

NIS0004L



System Description

NIS0004M

Power is supplied at all times

- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55.
- through 10A fuse [No. 18, located in the fuse block (J/B)]
- to BCM terminal 42.
- through BCM terminal 54
- to power window main switch terminal 1.
- to power window sub-switch terminal 10.

With ignition switch in ON or START position, power is supplied

- through 10A fuse [No.1, located in the fuse block (J/B)]
- to BCM terminal 38.
- through BCM terminal 53
- to power window main switch terminal 10.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66.
- to power window main switch terminal 15
- through grounds M30 and M66.
- to power window sub-switch terminal 11
- through grounds M30 and M66.

MANUAL OPERATION

Driver Side Door

WINDOW UP

When the driver side window switch in the power window main switch is pressed in the up position,
Power is supplied

- through power window main switch terminal 8
- to driver side power window motor terminal 2.

Ground is supplied

- through driver side power window motor terminal 1
- to power window main switch terminal 11.

Then, the motor raises the window until the switch is released.

WINDOW DOWN

When the driver side window switch in the power window main switch is pressed in the down position,
Power is supplied

- through power window main switch terminal 11
- to driver side power window motor terminal 1.

Ground is supplied

- through side power window motor terminal 2.
- to power window main switch terminal 8

Then, the motor lowers the window until the switch is released.

Passenger Side Door

POWER WINDOW SUB-SWITCH OPERATION

WINDOW UP

When the power window sub-switch is pressed in the up position,
Power is supplied

- through power window sub-switch terminal 8
- to passenger side power window motor terminal 2.

Ground is supplied

- through passenger side power window motor terminal 1.

- to power window sub-switch terminal 9

Then, the motor raises the window until the switch is released.

WINDOW DOWN

When the power window sub-switch is pressed in the down position,
Power is supplied

- through power window sub-switch terminal 9
- to passenger side power window motor terminal 1.

Ground is supplied

- through passenger side power window motor terminal 2.
- to power window sub-switch terminal 8

Then, the motor lowers the window until the switch is released.

POWER WINDOW MAIN SWITCH OPERATION

Signal is sent

- though power window main switch terminal 12.
- to power window sub-switch terminal 16

The operation of passenger side power window with power window main switch is as same as the operation with power window sub-switch.

POWER WINDOW SERIAL LINK

Power window main switch, power window sub-switch and BCM transmit and receive the signal by power window serial link.
The under mentioned signal is transmitted from BCM to power window main switch.

- Driver side door switch signal
- Keyless power window down signal

The under mentioned signal is transmitted from BCM to power window sub-switch.

- Passenger side door switch signal
- Keyless power window down signal

The under mentioned signal is transmitted from power window main switch to power window sub-switch.

- Passenger side door window operation signal
- Power window control by key cylinder switch signal
- Retained power operation signal
- Power window lock signal

AUTO OPERATION

The power window AUTO feature enables the driver to open or close the window without holding the window switch in the down or up position.

POWER WINDOW LOCK

The power window lock is designed to lock operation of passenger side door window.
When the lock position, power window lock signal is sent by using power window serial link from power window main switch to power window sub-switch.
When power window sub-switch is receiving the lock signal, prohibits the operation of passenger side power window by power window sub-switch.

RETAINED POWER OPERATION

When the ignition switch is turned to the OFF position from ON or START position.
Power is supplied for 45 seconds

- through BCM terminal 53.
- to power window main switch terminal 10

When power and ground are supplied, the BCM continues to be energized, and the power window can be operated.
The retained power operation is canceled when the driver side door or the passenger side door is opened.
RAP signal period can be changed by CONSULT-III. Refer to GW-29, "CONSULT-III Function (BCM)" .

ANTI-PINCH SYSTEM

Power window main switch and power window sub-switch monitors the power window motor operation and the power window position (full closed or other) for driver side and passenger side power window by the signals from encoder and limit switch in power window motor (driver side and passenger side).
When power window main switch detects interruption during the following close operation,

- automatic close operation when ignition switch is in the “ON” position
- automatic close operation during retained power operation
- manual close operation during retained power operation

Power window main switch or power window sub-switch controls each power window motor for open and the power window will be lowered about 150 mm (5.91 in).

POWER WINDOW CONTROL BY THE KEY CYLINDER SWITCH

When ignition key switch is OFF, power window can be opened or closed by turning the door key cylinder UNLOCK / LOCK position more then 1.5 second over condition.

- Power window can be opened as the door key cylinder is kept fully turning to the UNLOCK position.
- Power window can be closed as the door key cylinder is kept fully turning to the LOCK position.

The power window operation by the key cylinder switch stops when the following operations are performed.

- While performing open / close the window with power window main switch.
- When the ignition switch is turned ON while the power window control operation by the key cylinder switch.

AUTOMATIC WINDOW ADJUSTING FUNCTION

When the driver's / passenger's door(s) is opened, the window of the opened door is lowered approx. 10 mm (0.39in).
When the door is closed, the window is raised to fully-closed positions.
Automatic window adjusting function system (opening operation) does not operate when the following.

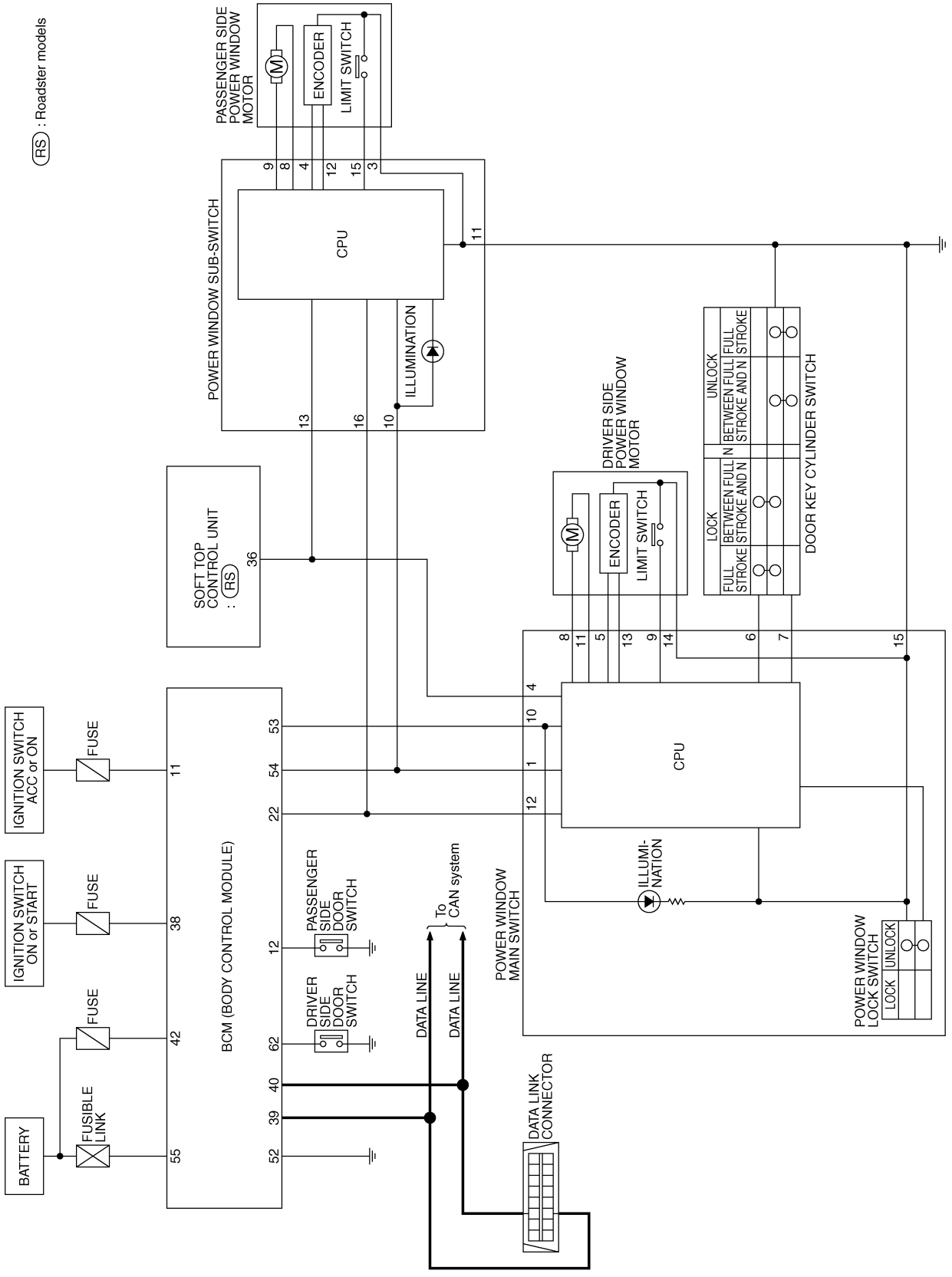
- The window is 10 mm (0.39 in) or more open from fully-closed positions.

Automatic window adjusting function system (closing operation) does not operate when the following.

- The automatic window adjusting function system (opening operation) operation.
- The keyless power window operation.
- The power window control by the key cylinder switch operation.

Schematic

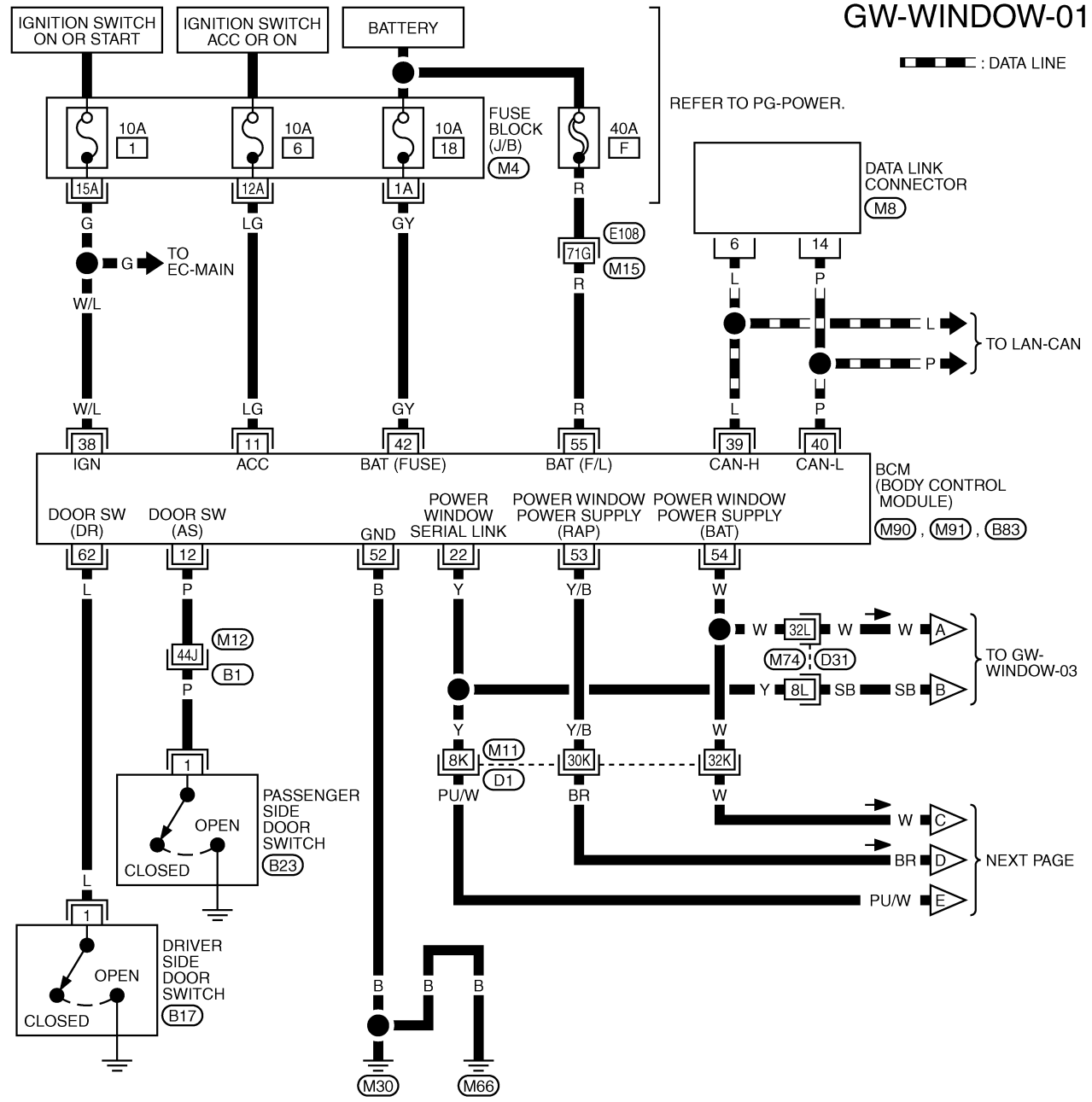
NIS0004N

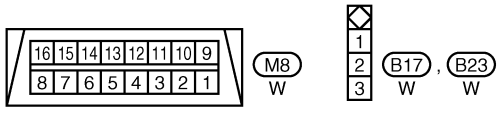


TIWT0969E

Wiring Diagram — WINDOW —

NIS0004O

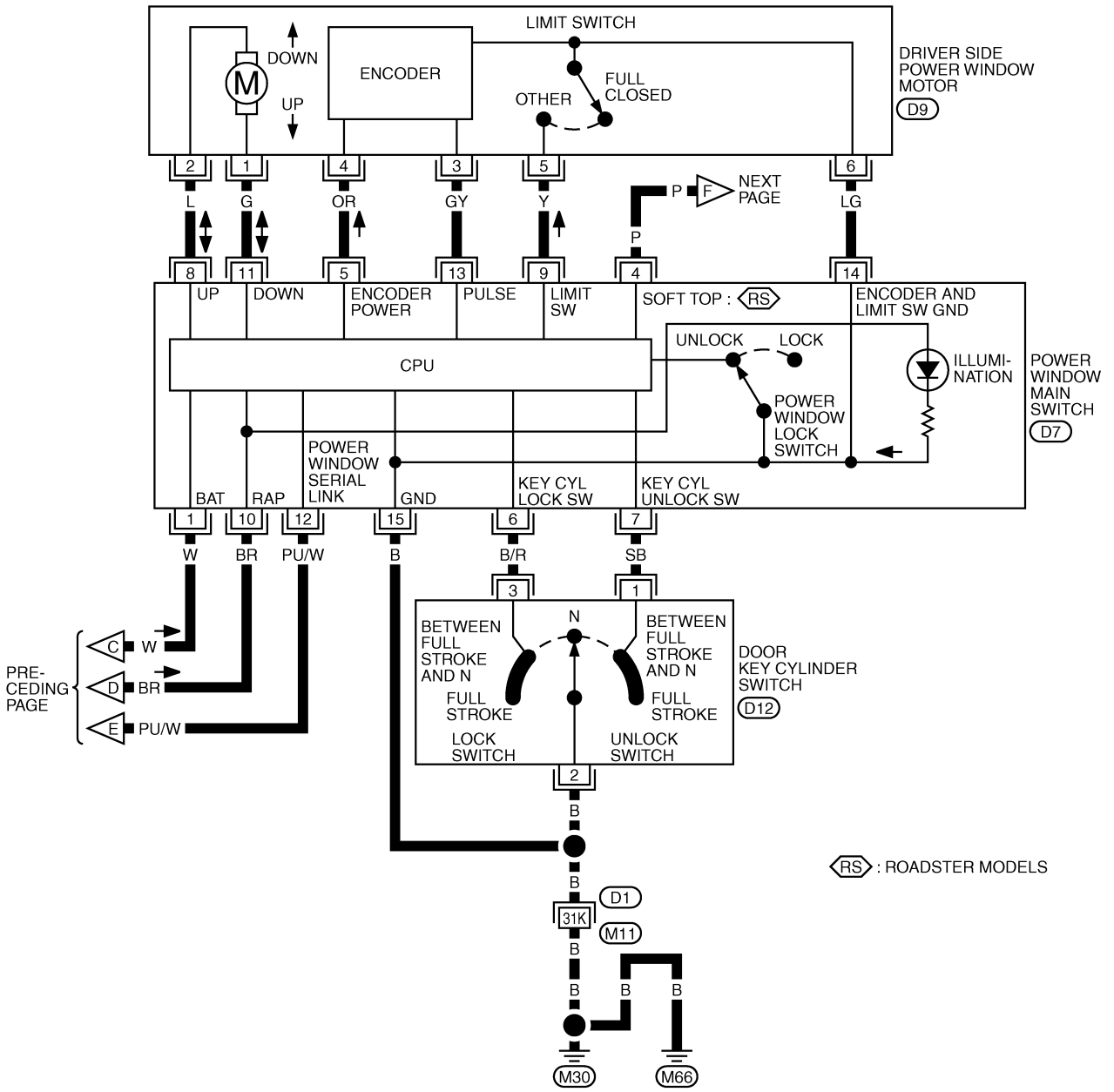




REFER TO THE FOLLOWING.
E108, B1, D1, D31
-SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91, B83
-ELECTRICAL UNITS

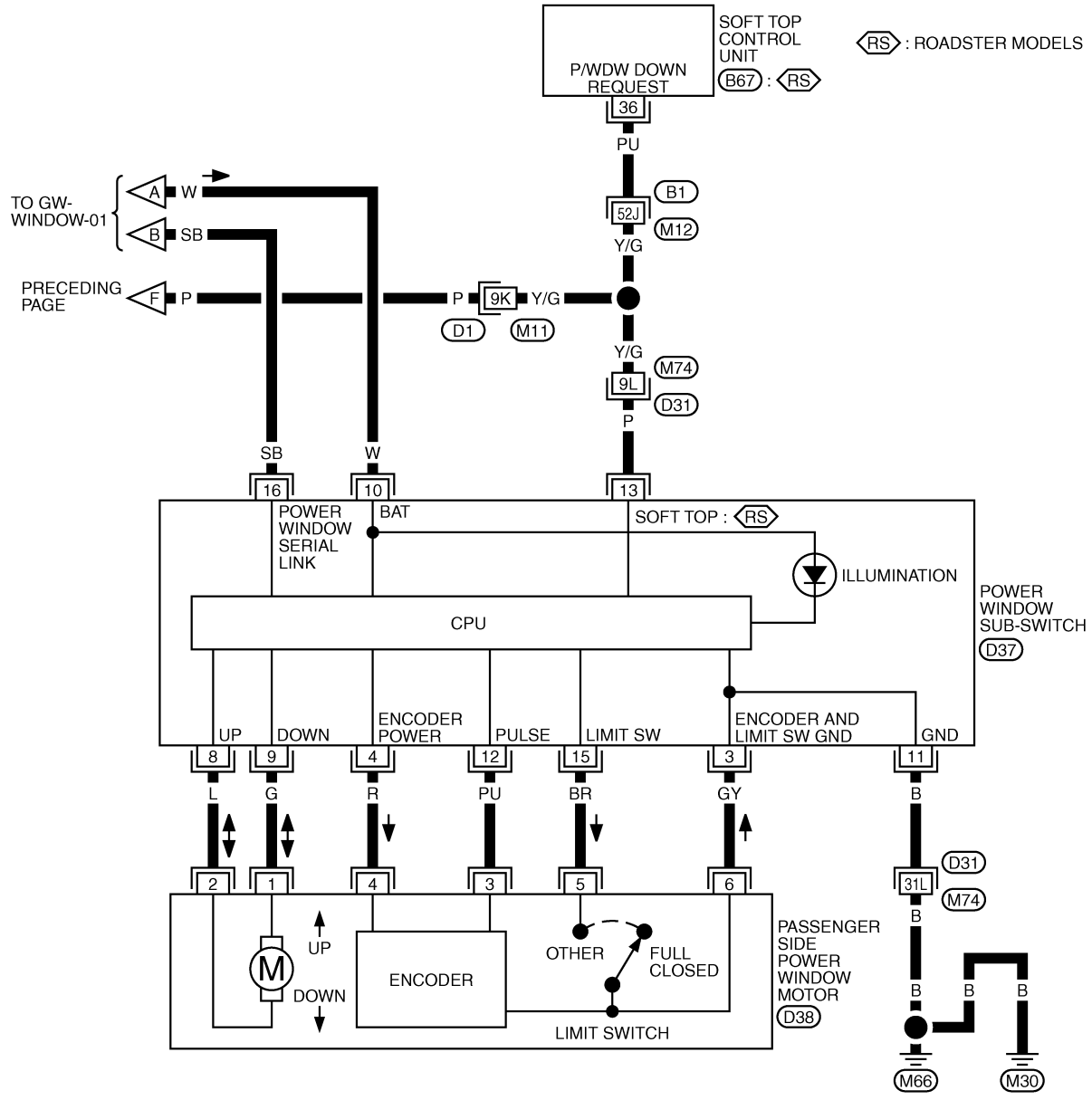
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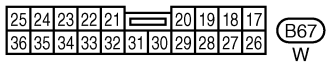
GW-WINDOW-02

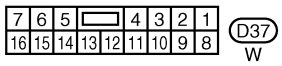


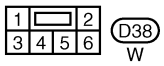
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GW-WINDOW-03







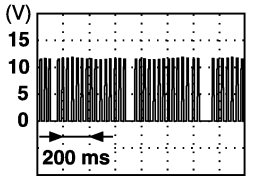


REFER TO THE FOLLOWING.
B1 , D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT1594E

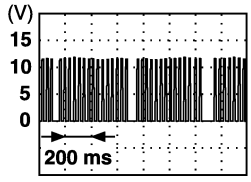
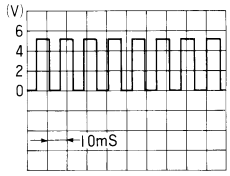
Terminal and Reference Value for BCM

NIS0004P

Terminal	Wire color	Item	Signal input/output	Condition	Voltage (V) (Approx.)
11	LG	Ignition switch ACC power supply (ACC or ON)	Input	Ignition switch (ACC or ON position)	Battery voltage
12	P	Passenger side door switch	Input	ON (open)	0
				OFF (closed)	Battery voltage
22	Y	Power window serial link	Input/Output	—	 PIIA2344J
38	W/L	Ignition switch ON power supply (ON or START)	Input	Ignition switch (ON or START position)	Battery voltage
39	L	CAN-H	Input/Output	—	—
40	P	CAN-L	Input/Output	—	—
42	GY	Power source (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0
53	Y/B	Rap signal	Output	IGN SW ON	Battery voltage
				Within 45 second after ignition switch is turned to OFF	Battery voltage
				When driver side or passenger side door is open in power window timer operates	0
54	W	Power window switch power supply	Output	—	Battery voltage
55	R	Power source (Fusible link)	Input	—	Battery voltage
62	L	Driver side door switch	Input	ON (open)	0
				OFF (closed)	Battery voltage

Terminal and Reference Value for Power Window Main Switch

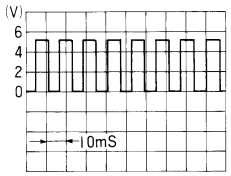
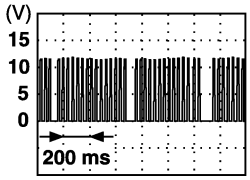
NIS0004Q

Terminal	Wire Color	Item	Signal input/output	Condition	Voltage (V) (Approx.)
1	W	BAT power supply	Input	—	Battery voltage
4*	P	Power window down request signal	Input	When soft top open/close function starts and window down function is operating.	0
				Other than above	5
5	OR	Encoder power supply	Input	—	10
6	B/R	Key cylinder lock switch	Output	Key position (Neutral → Locked)	5 → 0
7	SB	Key cylinder unlock switch	Output	Key position (Neutral → Unlocked)	5 → 0
8	L	Driver side power window motor UP signal	Output	When power window motor UP operation.	Battery voltage
9	Y	Limit switch signal	Input	Driver side door window is between fully-open and just before fully-closed position (ON).	0
				Driver side door window is between just before fully-closed position and fully-closed position (OFF).	5
10	BR	Rap signal	Output	IGN SW ON	Battery voltage
				Within 45 second after ignition switch is turned to OFF	Battery voltage
				When driver side or passenger side door is open in power window timer is operates	0
11	G	Driver side power window motor DOWN signal	Output	When power window motor DOWN operation.	Battery voltage
12	PU/W	Power window serial link	Input/Output	—	 PIIA2344J
13	GY	Encoder pulse signal	Input/Output	When power window motor operates.	 OCC3383D
14	LG	Limit switch and encoder ground	—	—	0
15	B	Ground	—	—	0

*: For Roadster

Terminal and Reference Value for Power Window Sub-Switch

NIS0004R

Terminal	Wire Color	Item	Signal input/output	Condition	Voltage (V) (Approx)
3	GY	Limit switch and encoder ground	—	—	0
4	R	Encoder power supply	Input	—	10
8	L	Passenger side power window motor UP signal	Output	When power window motor UP operation.	Battery voltage
9	G	Passenger side power window motor DOWN signal	Output	When power window motor DOWN operation.	Battery voltage
10	W	BAT power supply	Input	—	Battery voltage
11	B	Ground	—	—	0
12	PU	Encoder pulse signal	Input/Output	When power window motor operates.	 OCC3383D
13*	P	Power window down request signal	Input	When soft top open/close function starts and window down function is operating.	0
				Except the above	5
15	BR	Limit switch signal	Input	Passenger side door window is between fully-open and just before fully-closed position (ON).	0
				Passenger side door window is between just before fully-closed position and fully-closed position (OFF).	5
16	SB	Power window serial link	Input/Output	—	 PIIA2344J

*: For Roadster

CONSULT-III Function (BCM)

NIS0004S

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnostic test item	Check item diagnostic test mode	Content
RETAINED PWR	Work support	Changes setting of each function.
	Data monitor	Displays the input data of BCM in real time.
	Active test	Gives a drive signal to a load to check the operation.

WORK SUPPORT

Work item	Description
RETAINED PWR	Rap signal's power supply period can be changed by mode setting. Selects rap signal's power supply period between three steps ● MODE 1 (45 sec.) / MODE 2 (OFF) / MODE 3 (2 min.).

DATE MONITOR

Monitor item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
DOOR SW–DR	Indicates [ON/OFF] condition of driver side door switch.
DOOR SW–AS	Indicates [ON/OFF] condition of passenger side door switch.

ACTIVE TEST

Test item	Description
RETAINED PWR	This test is able to supply RAP signal (power) from BCM (body control module) to power window system and power sunroof system (if equipped). Those systems can be operated when turning on "RETAINED PWR" on CONSULT-III screen even if the ignition switch is turned OFF. **NOTE:** During this test, CONSULT-III can be operated with ignition switch in "OFF" position. "RETAINED PWR" should be turned "ON" or "OFF" on CONSULT-III screen when ignition switch is ON. Then turn ignition switch OFF to check retained power operation. CONSULT-III might be stuck if "RETAINED PWR" is turned to "ON" or "OFF" on CONSULT-III screen when ignition switch is OFF position.

Work Flow

NIS0004T

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to GW-19, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to GW-30, "Trouble Diagnoses Symptom Chart" .
4. Does power window system operate normally? If Yes, GO TO 5, If No, GO TO 3.
5. INSPECTION END

Trouble Diagnoses Symptom Chart

NIS0004U

- Make sure that other systems using the signal of the following check systems operate normally.

Symptom	Diagnoses / service procedure	Reference page
None of the power windows can be operated using any switch.	1. Check BCM power supply and ground circuit	GW-32
	2. Check power window main switch power supply and ground circuit	GW-46
	3. Check power window serial link	GW-44
	4. Replace BCM.	BCS-17
Driver side power window cannot be operated	1.Check driver side power window motor circuit	GW-33
	2. Replace the power window main switch.	GW-46
Passenger side power window cannot be operated.	1. Check power window sub-switch power supply and ground circuit	GW-47
	2. Check power window serial link	GW-44
	3. Check passenger side power window motor circuit	GW-33
	4. Replace BCM.	BCS-17
Anti-pinch system does not operate normally (driver side).	1. Door window sliding part malfunction ● A foreign material adheres to window glass or grass run rubber. ● Glass run rubber wear or deformation. ● Sash is tilted too much, or not enough.	—
	2. Limit switch adjusting	GW-52
	3. Check limit switch circuit (driver side)	GW-34
	4. Check encoder circuit (driver side)	GW-37
Anti-pinch system does not operate normally (passenger side).	1. Door window sliding part malfunction ● A foreign material adheres to window glass or grass run rubber. ● Glass run rubber wear or deformation. ● Sash is tilted too much, or not enough.	—
	2. Limit switch adjusting	GW-52
	3. Check limit switch circuit (passenger side)	GW-36
	4. Check encoder circuit (passenger side)	GW-39
Power window retained power operation does not operate properly.	1. Check the retained power operation mode setting.	GW-29
	2. Check door switch	GW-42
	3. Replace BCM.	BCS-17

Symptom	Diagnoses / service procedure	Reference page
Automatic window adjusting function does not operate.	1. Check door switch	GW-42
	2. Limit switch adjusting	GW-52
	3. Check limit switch circuit (driver side)	GW-34
	4. Check limit switch circuit (passenger side)	GW-36
	5. Check power window serial link	GW-44
	6. Replace BCM.	BCS-17
Does not operate by the key cylinder switch.	1. Check door key cylinder switch	GW-48
	2. Replace the power window main switch.	EI-33
Power window lock switch does not function.	1. Check power window serial link	GW-44
	2. Replace the power window main switch.	EI-33
Auto operation does not operate but manual operate normally (driver side)	1. Check encoder circuit (driver side)	GW-37
	2. Replace power window main switch	EI-33
Auto operation does not operate but manual operate normally (passenger side)	1. Check encoder circuit (passenger side)	GW-39
	2. Replace power window sub-switch	EI-33

Check BCM Power Supply and Ground Circuit

NIS0004V

1. CHECK FUSE

- Check 10A fuse [No.1, located in fuse block (J/B)]
- Check 10A fuse [No.18, located in fuse block (J/B)]
- Check 40A fusible link (letter **F** , located in the fuse and fusible link box).

NOTE:
Refer to GW-18, "Component Parts and Harness Connector Location" .

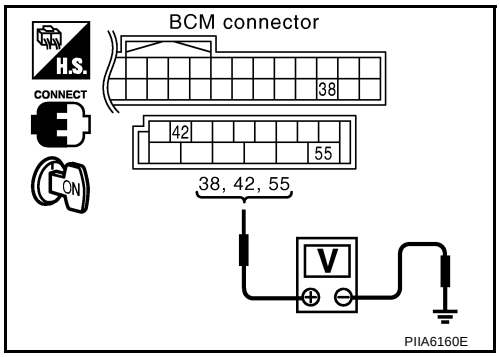
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between BCM connector M90, M91 terminal 38, 42, 55 and ground.

38 (W/L) – Ground : Battery voltage
42 (GY) – Ground : Battery voltage
55 (R) – Ground : Battery voltage



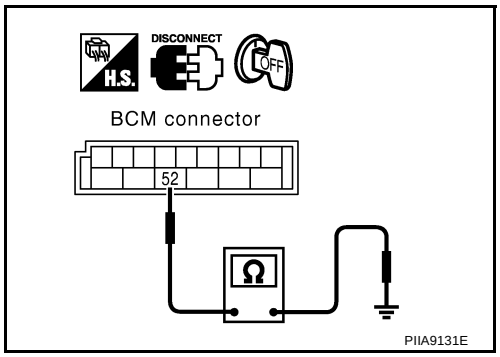
OK or NG

OK >> GO TO 3.
NG >> Check BCM power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM connector M91 terminal 52 and ground.

52 (B) – Ground :Continuity should exist.



OK or NG

OK >> Power supply and ground circuit are OK.
NG >> Check BCM ground circuit for open or short.

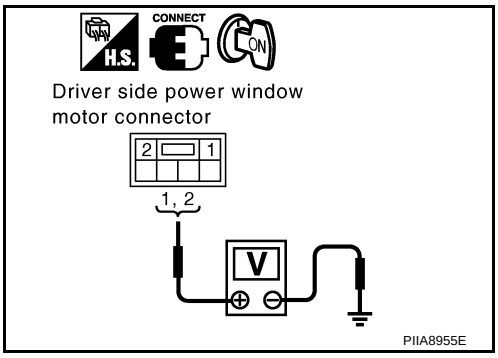
Check Drive Side Power Window Motor Circuit

NIS0004W

1. CHECK POWER WINDOW MAIN SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Power window main switch operate, check voltage between driver side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition of power window main switch	Voltage (V) (Approx.)
	(+)	(-)		
D9	1 (G)	Ground	UP	0
			DOWN	Battery voltage
	2 (L)		UP	Battery voltage
			DOWN	0



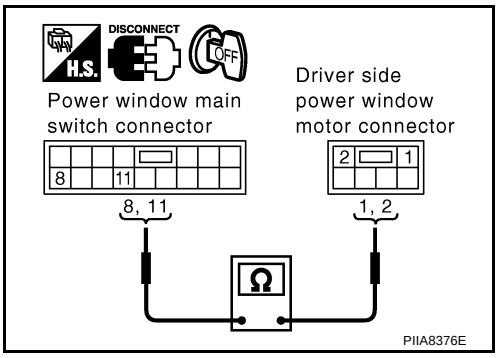
OK or NG

OK >> Replace driver side power window motor.
NG >> GO TO 2.

2. CHECK POWER WINDOW MAIN SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminals 8, 11 and driver side power window motor connector D9 terminals 1, 2.

8 (L) – 2 (L) : Continuity should exist.
11 (G) – 1 (G) : Continuity should exist.



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Repair or replace harness.

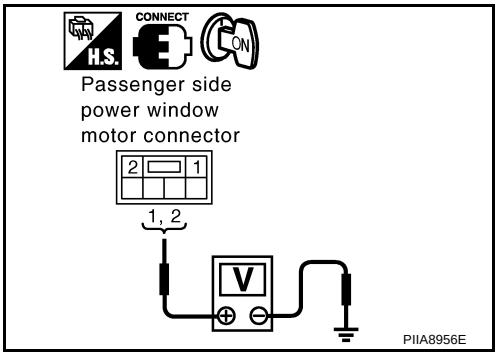
Check Passenger Side Power Window Motor Circuit

NIS0004X

1. CHECK POWER WINDOW SUB-SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Power window sub-switch operate, check voltage between passenger side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition of power window sub-switch	Voltage (V) (Approx.)
	(+)	(-)		
D38	1 (G)	Ground	UP	0
			DOWN	Battery voltage
	2 (L)		UP	Battery voltage
			DOWN	0



OK or NG

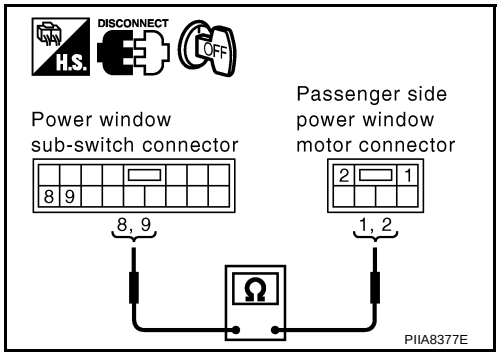
OK >> Replace passenger side power window motor.
NG >> GO TO 2.

2. CHECK PASSENGER SIDE POWER WINDOW MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminals 8, 9 and passenger side power window motor connector D38 terminals 1, 2.

9 (G) – 1 (G) : Continuity should exist.

8 (L) – 2 (L) : Continuity should exist.



OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.

NG >> Repair or replace harness.

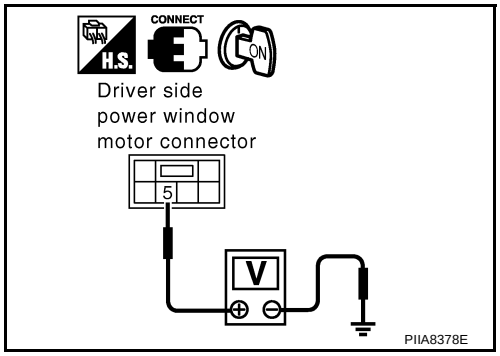
Check Limit Switch Circuit (Driver Side)

NIS0004Y

1. CHECK DRIVER DOOR LIMIT SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check voltage between driver side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
D9	5 (Y)	Ground	Driver side door window is between fully-open and just before fully-closed position (ON)	0
			Driver side door window is between just before fully-closed position and fully-closed position (OFF)	5



OK or NG

OK >> Limit switch circuit is OK.

NG >> GO TO 2.

2. CHECK LIMIT SWITCH GROUND CIRCUIT

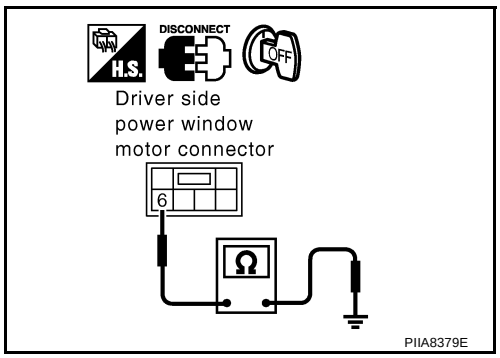
1. Turn ignition switch OFF.
2. Disconnect driver side power window motor connector.
3. Check continuity between driver side power window motor connector D9 terminal 6 and ground.

6 (LG) – Ground : Continuity should exist.

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.



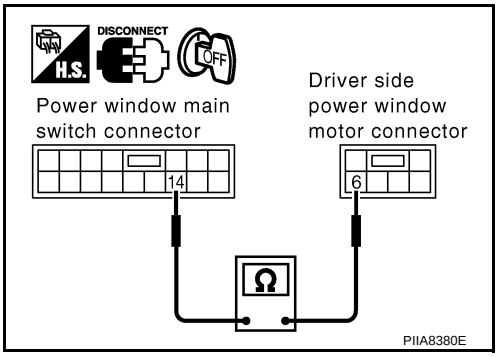
3. CHECK HARNESS CONTINUITY

1. Disconnect power window main switch connector.
2. Check continuity between power window main switch connector D7 terminal 14 and driver side power window motor connector D9 terminal 6.

14 (LG) – 6 (LG) : Continuity should exist.

OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.



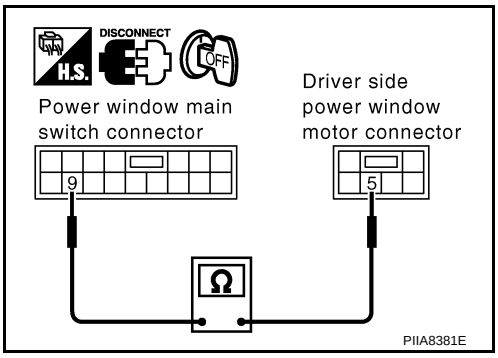
4. CHECK HARNESS CONTINUITY

1. Disconnect power window main switch connector.
2. Check continuity between power window main switch connector D7 terminal 9 and driver side power window motor connector D9 terminal 5.

9 (Y) – 5 (Y) : Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.



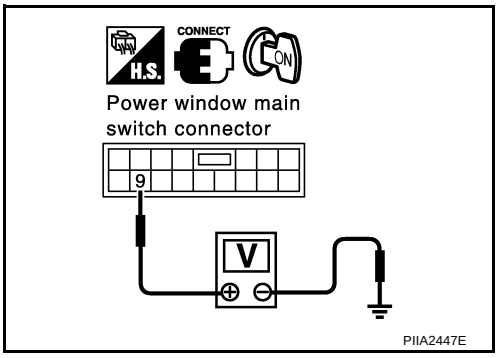
5. CHECK POWER WINDOW MAIN SWITCH OUTPUT SIGNAL

1. Connect power window main switch connector.
2. Turn ignition switch ON.
3. Check voltage between power window main switch connector D7 terminal 9 and ground.

9 (Y) – Ground : Approx. 5V

OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace power window main switch.



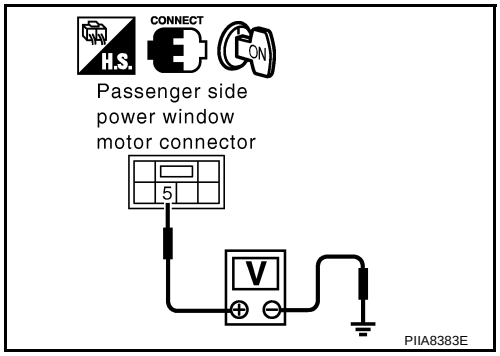
Check Limit Switch Circuit (Passenger Side)

NIS0004Z

1. CHECK POWER WINDOW LIMIT SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check voltage between passenger side power window motor connector and ground.

Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
D38	5 (BR)	Ground	Passenger side door window is between fully-open and just before fully-closed position (ON)	0
			Passenger side door window is between just before fully-closed position and fully-closed position (OFF)	5



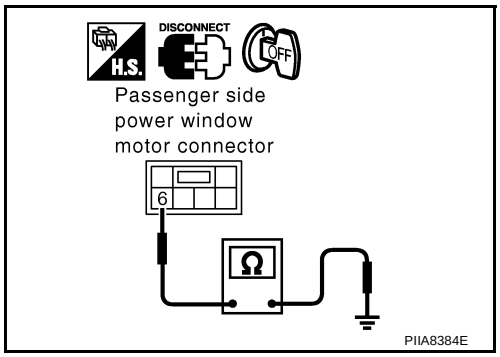
OK or NG

OK >> Limit switch circuit is OK.
NG >> GO TO 2.

2. CHECK LIMIT SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect passenger side power window motor connector.
3. Check continuity between passenger side power window motor connector D38 terminal 6 and ground.

6 (GY) – Ground : Continuity should exist.



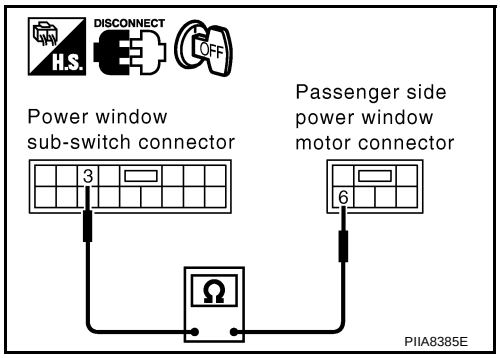
OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK HARNESS CONTINUITY

1. Disconnect power window sub-switch connector.
2. Check continuity between power window sub-switch connector D37 terminal 3 and passenger side power window motor connector D38 terminal 6.

3 (GY) – 6 (GY) : Continuity should exist.



OK or NG

OK >> Replace power window sub-switch.
NG >> Repair or replace harness.

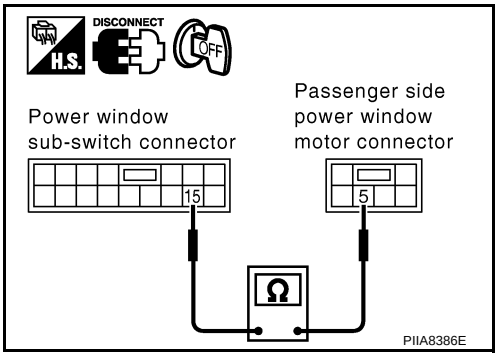
4. CHECK HARNESS CONTINUITY

1. Disconnect power window sub-switch connector.
2. Check continuity between power window sub-switch connector D37 terminal 15 and passenger side power window motor connector D38 terminal 5.

15 (BR) – 5 (BR) : Continuity should exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.



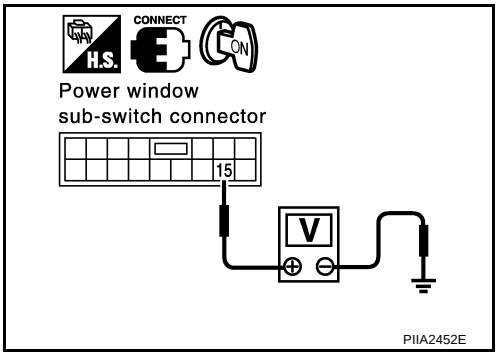
5. CHECK POWER WINDOW SUB-SWITCH OUTPUT SIGNAL

1. Connect power window sub-switch connector.
2. Turn ignition switch ON.
3. Check voltage between power window sub-switch connector D37 terminal 15 and ground.

15 (BR) – Ground : Approx. 5V

OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace power window sub-switch.



Check Encoder Circuit (Driver Side)

NIS00050

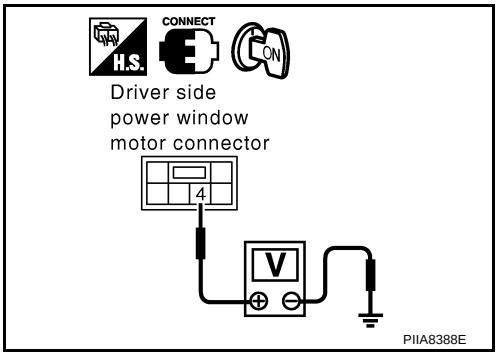
1. CHECK DRIVER SIDE POWER WINDOW MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between driver side power window motor connector D9 terminal 4 and ground.

4 (OR) – Ground : Approx. 10V

OK or NG

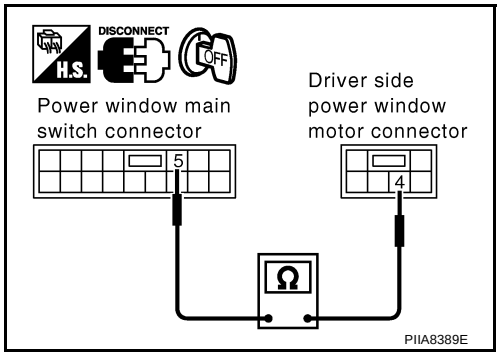
OK >> GO TO 3.
NG >> GO TO 2.



2. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminal 5 and driver side power window motor connector D9 terminal 4.

5 (OR) – 4 (OR) : Continuity should exist.



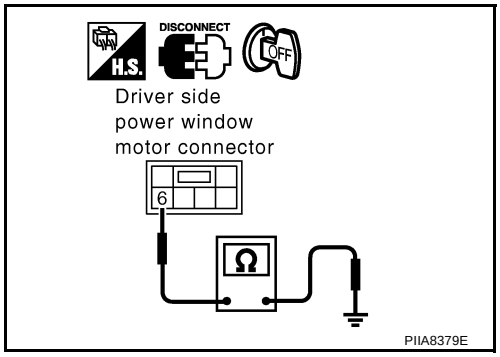
OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.

3. CHECK ENCODER GROUND

1. Turn ignition switch OFF.
2. Disconnect driver side power window motor connector.
3. Check continuity between driver side power window motor connector D9 terminal 6 and ground.

6 (LG) – Ground : Continuity should exist.



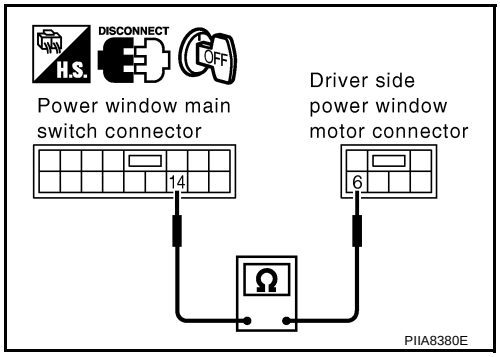
OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK ENCODER GROUND CIRCUIT

1. Disconnect power window main switch connector.
2. Check continuity between power window main switch connector D7 terminal 14 and driver side power window motor connector D9 terminal 6.

14 (LG) – 6 (LG) : Continuity should exist.

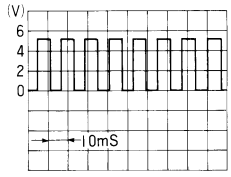


OK or NG

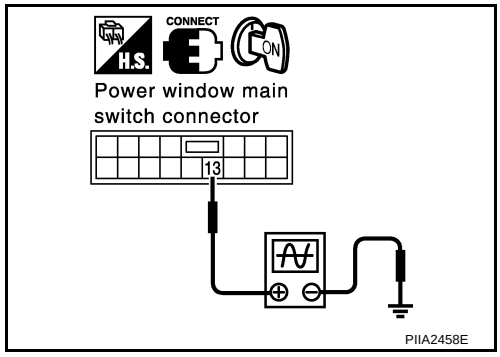
OK >> Replace power window main switch.
NG >> Repair or replace harness.

5. CHECK ENCODER SIGNAL

1. Connect driver side power window motor connector.
2. Turn ignition switch ON.
3. Check signal between power window main switch connector and ground with oscilloscope.

Connector	Terminals (Wire color)		Condition	Signal (Reference valve)
	(+)	(-)		
D7	13 (GY)	Ground	DOWN	

OCC3383D



PIIA2458E

OK or NG

OK >> Replace power window main switch.
NG >> GO TO 6.

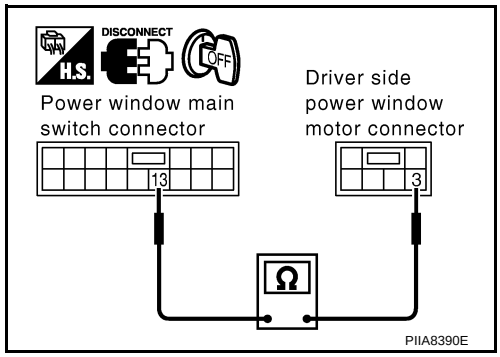
6. CHECK ENCODER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch and driver side power window motor connector.
3. Check continuity between power window main switch connector D7 terminal 13 and driver side power window motor connector D9 terminal 3.

13 (GY) – 3 (GY) : Continuity should exist.

OK or NG

OK >> Replace driver side power window motor.
NG >> Repair or replace harness.



PIIA8390E

Check Encoder Circuit (Passenger Side)

NIS00051

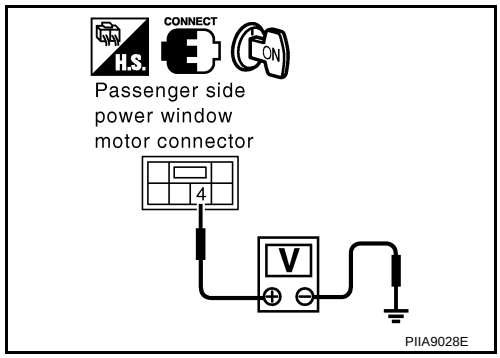
1. CHECK PASSENGER SIDE POWER WINDOW MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between passenger side power window motor connector D38 terminal 4 and ground.

4 (R) – Ground : Approx. 10V

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

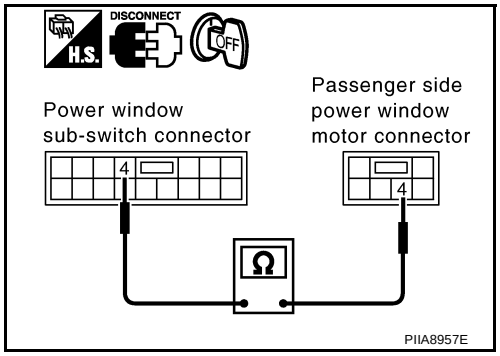


PIIA9028E

2. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminal 4 and passenger side power window motor connector D38 terminal 4.

4 (R) – 4 (R) : Continuity should exist.



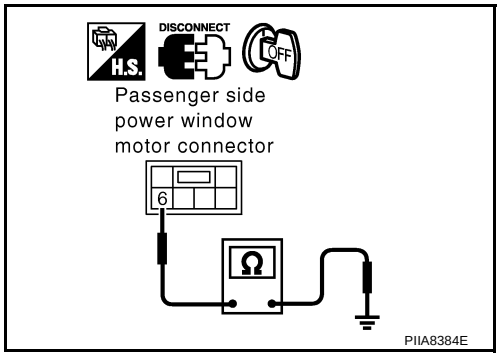
OK or NG

OK >> Replace power window sub-switch.
NG >> Repair or replace harness.

3. CHECK ENCODER GROUND

1. Turn ignition switch OFF.
2. Disconnect passenger side power window motor connector.
3. Check continuity between passenger side power window motor connector D38 terminal 6 and ground.

6 (GY) – Ground : Continuity should exist.



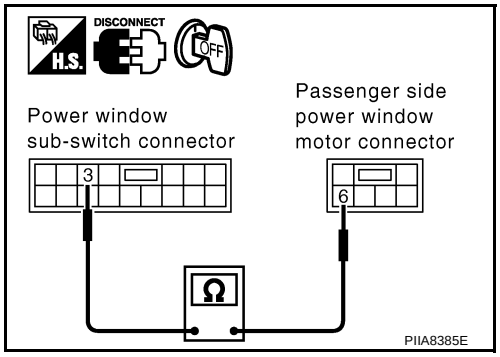
OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK ENCODER GROUND CIRCUIT

1. Disconnect power window sub-switch connector.
2. Check continuity between power window sub-switch connector D37 terminal 3 and passenger side power window motor connector D38 terminal 6.

3 (GY) – 6 (GY) : Continuity should exist.

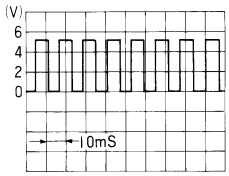


OK or NG

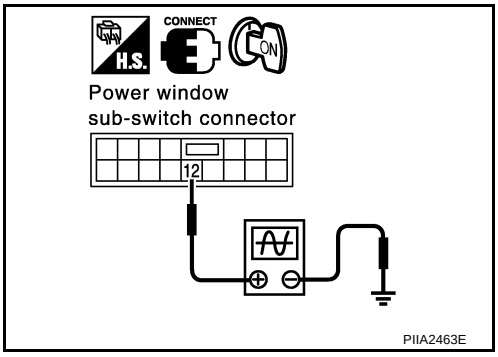
OK >> Replace power window sub switch.
NG >> Repair or replace harness.

5. CHECK ENCODER SIGNAL

1. Connect passenger side power window motor connector.
2. Turn ignition ON.
3. Check signal between power window sub-switch connector and ground with oscilloscope.

Connector	Terminals (Wire color)		Condition	Signal (Reference valve)
	(+)	(-)		
D37	12 (PU)	Ground	DOWN	

OCC3383D



PIIA2463E

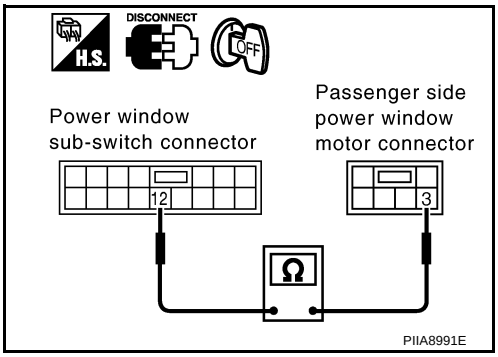
OK or NG

OK >> Replace power window sub-switch.
NG >> GO TO 6.

6. CHECK ENCODER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch and passenger side power window motor connector.
3. Check continuity between power window sub-switch connector D37 terminal 12 and passenger side power window motor connector D38 terminal 3.

12 (PU) – 3 (PU) : Continuity should exist.



PIIA8991E

OK or NG

OK >> Replace passenger side power window motor.
NG >> Repair or replace harness.

Check Door Switch

NIS00052

1. CHECK DOOR SWITCH INPUT SIGNAL

With CONSULT-III

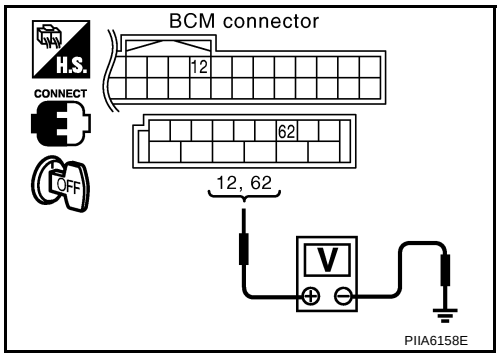
Check door switches (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Without CONSULT-III

1. Turn ignition switch OFF.
2. Check voltage between BCM connector and ground.

Item	Connector	Terminals (Wire color)		Condition	Voltage (V) (Approx.)
		(+)	(–)		
Passenger side door switch	M90	12 (P)	Ground	OPEN	0
				CLOSE	Battery voltage
Driver side door switch	B83	62 (L)		OPEN	0
				CLOSE	Battery voltage



OK or NG

OK >> Door switch is OK.
NG >> GO TO 2.

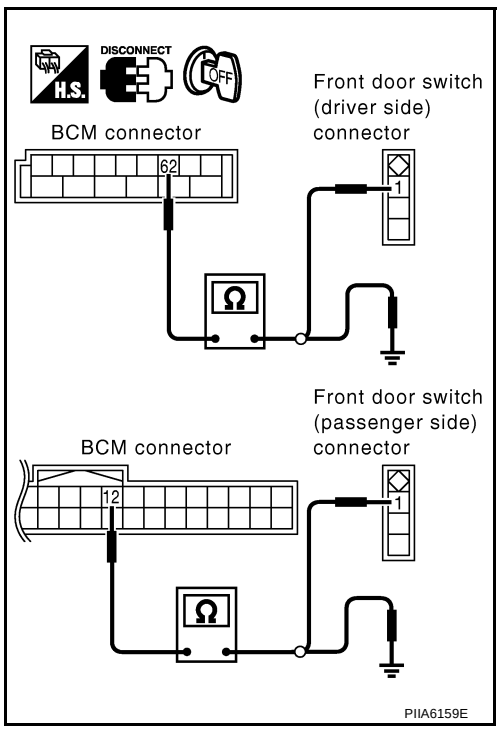
2. CHECK DOOR SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door switch and BCM connector.
3. Check continuity between BCM connector M90, B83 terminals 12, 62 and door switch connector B17, B23 terminals 1.

12 (P) – 1 (P) : Continuity should exist.
62 (L) – 1 (L) : Continuity should exist.

4. Check continuity between BCM connector M90, B83 terminals 12, 62 and ground.

12 (P) – Ground : Continuity should not exist.
62 (L) – Ground : Continuity should not exist.



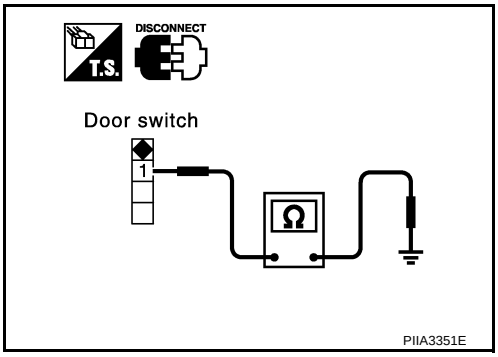
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK DOOR SWITCH

Check continuity between door switch (driver side) or (passenger side) and ground part of door switch.

Terminal		Condition of door switch	Continuity
1	Ground part of door switch	Pushed	No
		Released	Yes



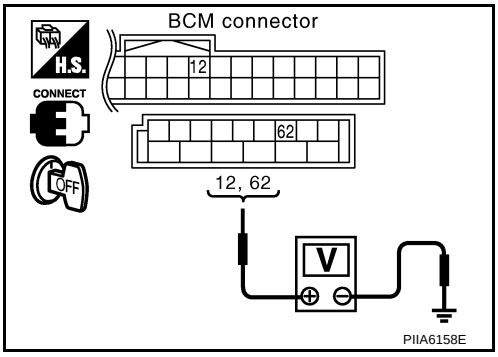
OK or NG

OK >> GO TO 4.
NG >> Replace malfunction door switch.

4. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Check voltage between BCM connector M90, B83 terminals 12, 62 and ground.

12 (P) – Ground : Battery voltage
62 (L) – Ground : Battery voltage



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Replace BCM.

Check Power Window Serial Link

NIS00053

1. CHECK POWER WINDOW SWITCH OUTPUT SIGNAL

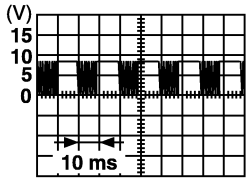
With CONSULT-III

Check door lock and unlock switch (“LOCK SW DR/AS”, “UNLK SW DR/AS”) in DATA MONITOR mode with CONSULT-III. Refer to BL-35, "DATA MONITOR" .

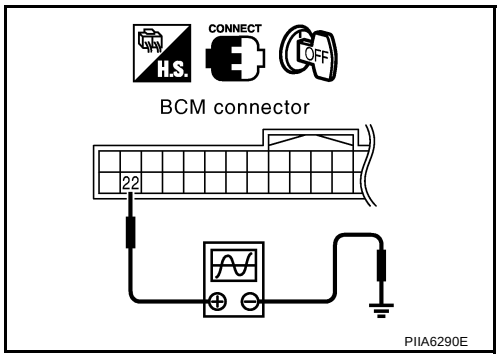
Monitor item	Condition
CDL LOCK SW	LOCK: ON
	UNLOCK: OFF
CDL UNLOCK SW	LOCK: OFF
	UNLOCK: ON

Without CONSULT-III

1. Remove key from ignition switch, and the door of driver side and passenger side is closed.
2. Check signal between BCM connector and ground with oscilloscope when door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.
3. Make sure signals which are shown in the figure below can be detected during 10 second just after door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.

Connector	Terminals (Wire color)		Signal (Reference valve)
	(+)	(–)	
M90	22 (Y)	Ground	

PIIA1297E



PIIA6290E

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK BCM OUTPUT SIGNAL

Check power window serial link (“POWER WINDOW DOWN”) in “ACTIVE TEST” mode with CONSULT-III. Refer to BL-74, "Active Test" .
When “ACTIVE TEST” is perform, is the window of driver side and passenger side lowered?

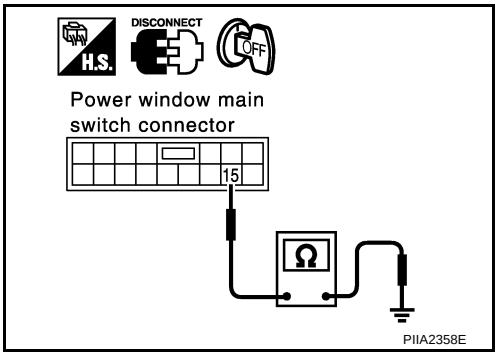
OK or NG

OK >> Further inspection is necessary. Refer to symptom chart.
NG >> Replace BCM.

3. CHECK POWER WINDOW SWITCH GROUND

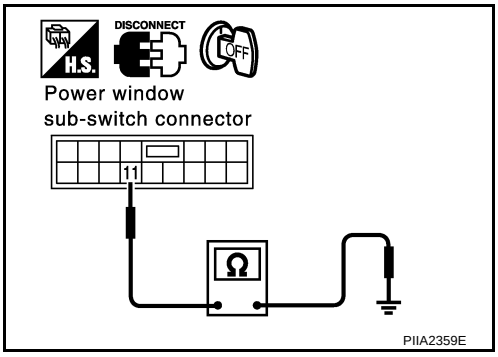
1. Turn ignition switch OFF.
2. Disconnect power window main switch and power window sub-switch connector.
3. Check continuity between power window main switch connector D7 terminals 15 and ground.

15 (B) – Ground : Continuity should exist.



4. Check continuity between power window sub-switch connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



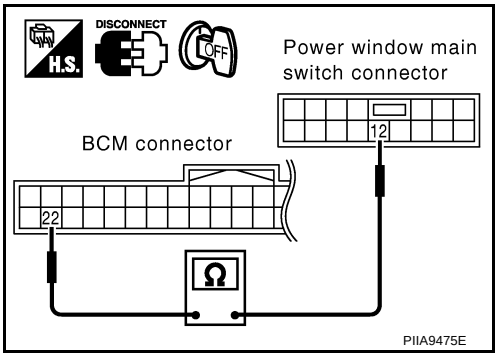
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK POWER WINDOW SERIAL LINK CIRCUIT

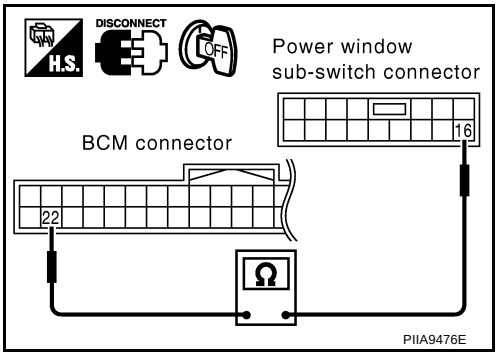
1. Disconnect BCM connector.
2. Check continuity between BCM connector M90 terminal 22 and power window main switch connector D7 terminal 12.

22 (Y) – 12 (PU/W) : Continuity should exist.



3. Check continuity between BCM connector M90 terminal 22 and power window sub-switch connector D37 terminal 16.

22 (Y) – 16 (SB) : Continuity should exist.



OK or NG

OK >> Replace power window main switch.
NG >> Repair or replace harness.

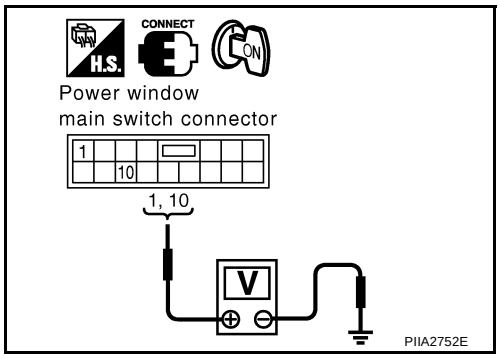
Check Power Window Main Switch Power Supply and Ground Circuit

NIS00054

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between power window main switch connector D7 terminals 1, 10 and ground.

1 (W) – Ground : Battery voltage
10 (BR) – Ground : Battery voltage



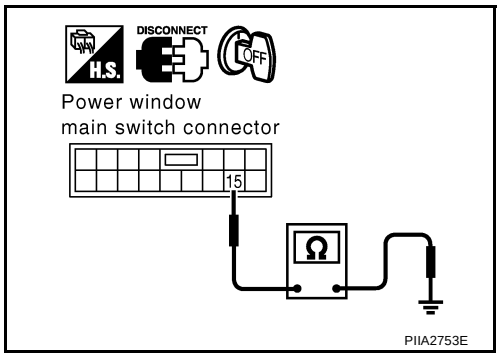
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch connector.
3. Check continuity between power window main switch connector D7 terminal 15 and ground.

15 (B) – Ground : Continuity should exist.



OK or NG

OK >> Power window main switch power supply and ground circuits are OK.
NG >> Repair or replace harness.

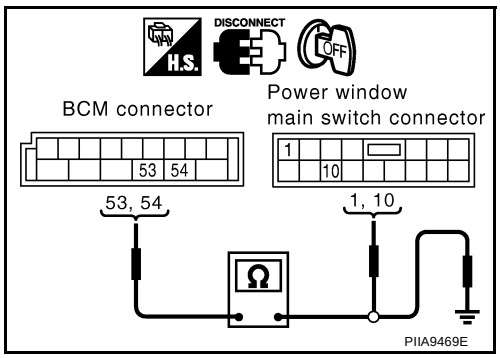
3. CHECK POWER WINDOW MAIN SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and power window main switch connector.
3. Check continuity between BCM connector M91 terminals 53, 54 and power window main switch connector D7 terminal 1, 10.

53 (Y/B) – 10 (BR) : Continuity should exist.
54 (W) – 1 (W) : Continuity should exist.

4. Check continuity between BCM connector M91 terminals 53, 54 and ground.

53 (Y/B) – Ground : Continuity should not exist.
54 (W) – Ground : Continuity should not exist.



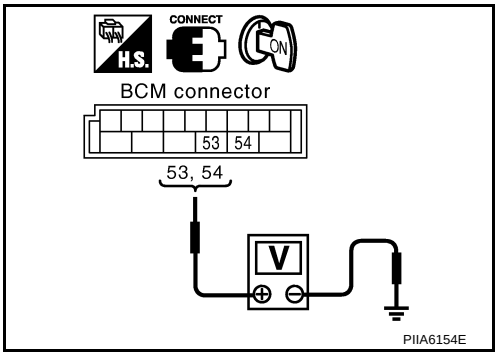
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM connector M91 terminals 53, 54 and ground.

53 (Y/B) – Ground : Battery voltage
54 (W) – Ground : Battery voltage



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace BCM.

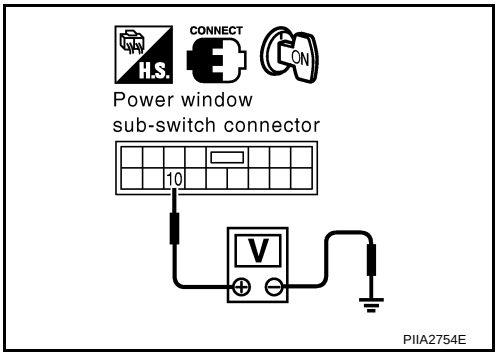
Check Power Window Sub-switch Power Supply and Ground

NIS00055

1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between power window sub-switch connector D37 terminal 10 and ground.

10 (W) – Ground : Battery voltage



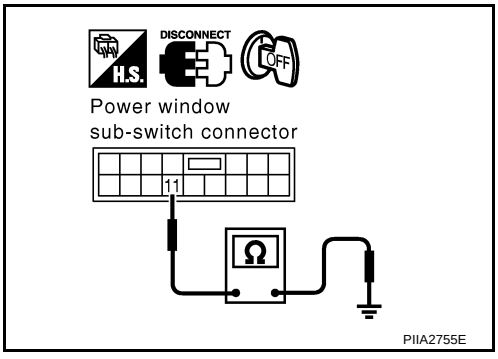
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window sub-switch connector.
3. Check continuity between power window sub-switch connector D37 terminal 11 and ground.

11 (B) – Ground : Continuity should exist.



OK or NG

OK >> Power window sub-switch power supply and ground circuit are OK.
NG >> Repair or replace harness.

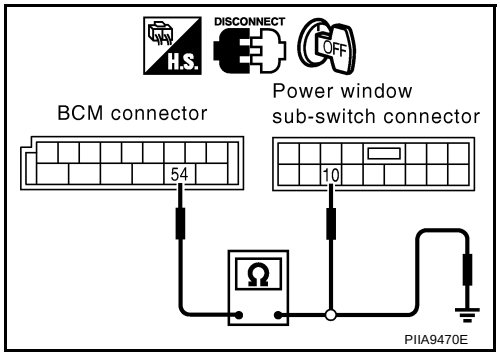
3. CHECK POWER WINDOW SUB-SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and power window sub-switch connector.
3. Check continuity between BCM connector M91 terminal 54 and power window sub-switch connector D37 terminal 10.

54 (W) – 10 (W) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) – Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness.

Check Door Key Cylinder Switch

NIS00056

1. CHECK DOOR KEY CYLINDER SWITCH INPUT SIGNAL

With CONSULT-III

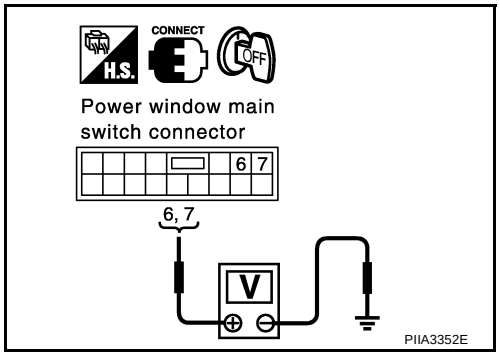
Check door key cylinder switch (“KEY CYL LK-SW”, “KEY CYL UN-SW”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition
KEY CYL LK- SW	Lock: ON
	Neutral/Unlock: OFF
KEY CYL UN- SW	Unlock: ON
	Neutral/Lock: OFF

Without CONSULT-III

1. Turn ignition switch OFF.
2. Check voltage between power window main switch connector and ground.

Connector	Terminals (Wire color)		Key position	Voltage (V) (Approx.)
	(+)	(–)		
D7	6 (B/R)	Ground	Neutral/Unlock	5
			Lock	0
	7 (SB)		Neutral/Lock	5
			Unlock	0



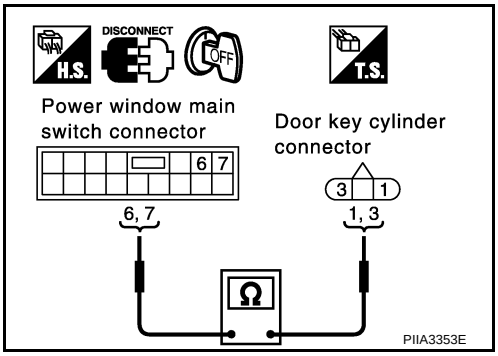
OK or NG

OK >> Door key cylinder switch is OK.
NG >> GO TO 2.

2. CHECK DOOR KEY CYLINDER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power window main switch and door key cylinder switch connector.
3. Check continuity between power window main switch connector D7 terminal 6, 7 and door key cylinder switch connector D12 terminals 1, 3.

6 (B/R) – 3 (B/R) : Continuity should exist.
7 (SB) – 1 (SB) : Continuity should exist.



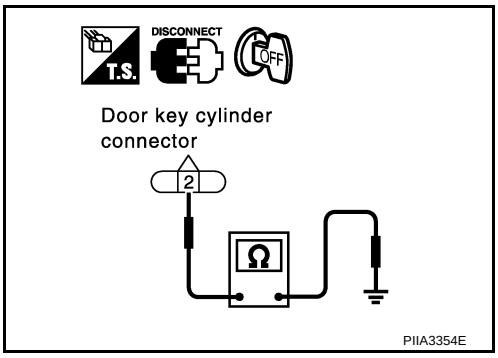
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK DOOR KEY CYLINDER SWITCH GROUND

Check continuity between door key cylinder switch connector D12 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



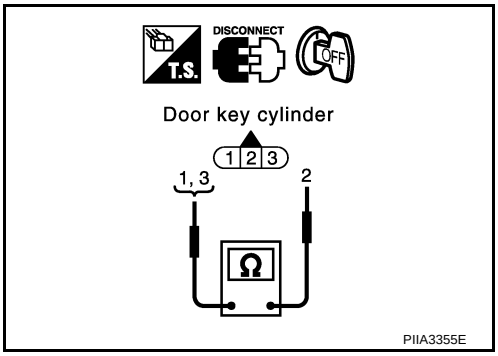
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK DOOR KEY CYLINDER SWITCH

Check continuity between door key cylinder switch connector D12 terminals 1, 3 and 2.

Connector	Terminal		Key position	Continuity
D12	1	2	Neutral/Lock	No
			Unlock	Yes
	3		Neutral/Unlock	No
			Lock	Yes



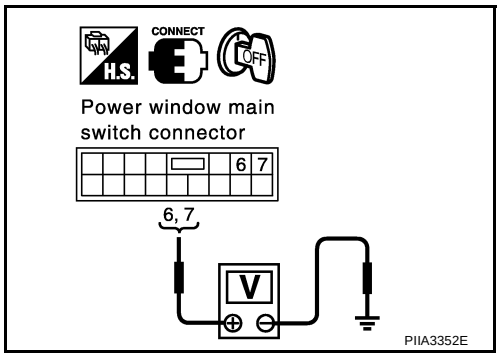
OK or NG

OK >> GO TO 5.
NG >> Replace door key cylinder switch.

5. CHECK POWER WINDOW MAIN SWITCH OUTPUT SIGNAL

1. Connect power window main switch connector.
2. Check voltage between power window main switch connector D7 terminals 6, 7 and ground.

6 (B/R) – Ground : Battery voltage
7 (SB) – Ground : Battery voltage



OK or NG

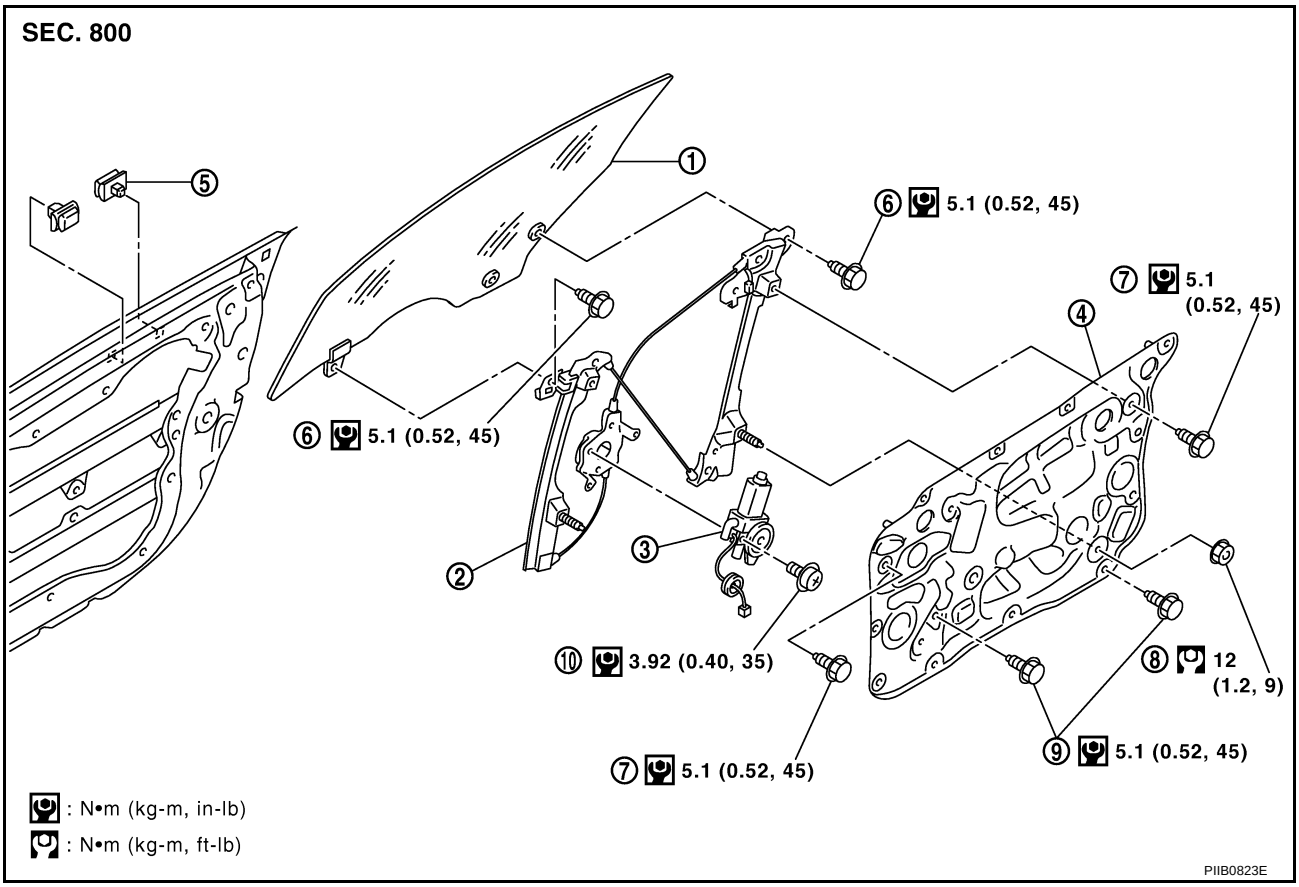
OK >> Check the condition of the harness and the connector.
NG >> Replace power window main switch.

FRONT DOOR GLASS AND REGULATOR

PFP:80300

Removal and Installation

NIS00057

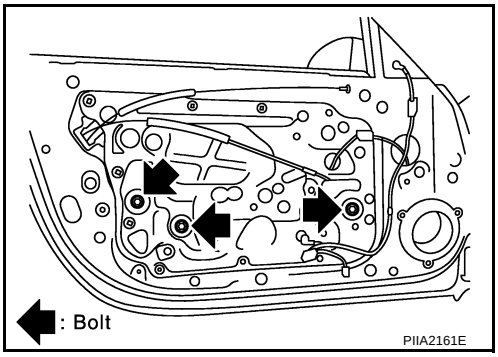


1. Door glass	2. Regulator assembly	3. Power window motor
4. Module assembly	5. Glass stabilizer	6. Glass mounting bolt
7. Regulator mounting bolt	8. Regulator mounting nut	9. Module mounting bolt
10. Power window motor mounting bolt		

DOOR GLASS

Removal

1. Remove front door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Operate power window main switch to raise/lower door window until glass mounting bolts can be seen.
3. Remove the glass mounting bolts.



4. While holding door window, raise it at rear end to pull the glass out of sash toward outside of door.

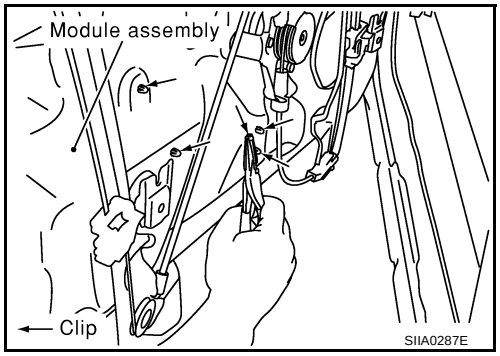
Installation

Install in the reverse order of removal.

REGULATOR ASSEMBLY

Removal

1. Remove front door finisher. Refer to GW-51, "DOOR GLASS" .
2. Remove mounting bolts, and remove module assembly.
3. Disconnect harness connector for the module assembly, and unclip the harness from the back.



Installation

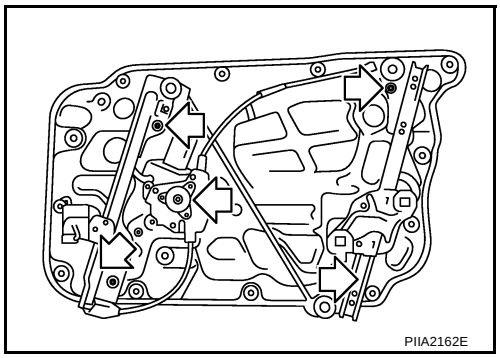
Install in the reverse order of removal.

Inspection after Removal

Check regulator assembly for the following items. If a malfunction is detected, replace or grease it.

- Wire wear
- Regulator deformation
- Grease condition for each sliding part

The arrows in the figure show the application points of body grease.



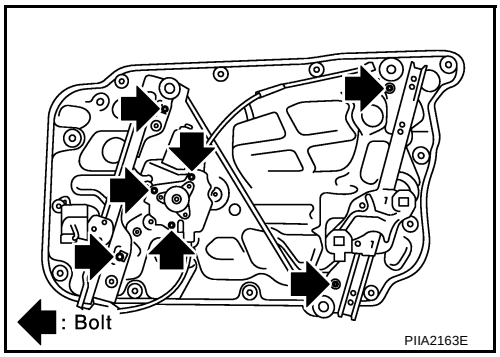
Disassembly and Assembly

NIS00058

REGULATOR ASSEMBLY

Disassembly

Remove power window motor and guide rail from module assembly.



Assembly

Assemble in the reverse order of removal.

Inspection after Installation

NIS00059

SETTING OF LIMIT SWITCH

If any of the following work has been done, set the limit switch (integrated in the motor).

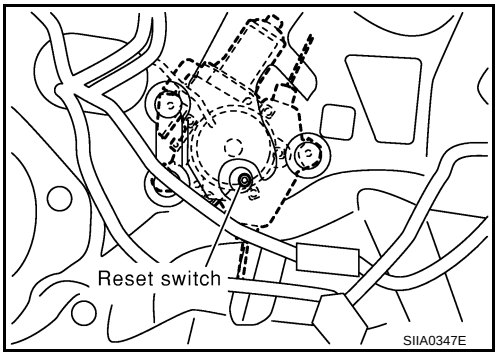
- Removal and installation of regulator.
- Removal and installation of motor from regulator.
- Operate the regulators as a unit.
- Removal and installation of the glass.

Resetting

After installing each component to the vehicle, follow the steps below.

1. With the door open, lift up and hold the power window switch until the door glass is fully closed.
2. Get inside the vehicle and close the door.

   NOTE:
   You need to close the door so the door switch is fully depressed.
3. Press and hold the reset switch. While holding the reset switch, press down and hold the power window switch until the door glass is fully opened.
4. Relese the reset switch.Then, lift up and hold the power window switch until the door glass is fully closed.
5. Open the door to release the door switch. The door glass should partially move down.



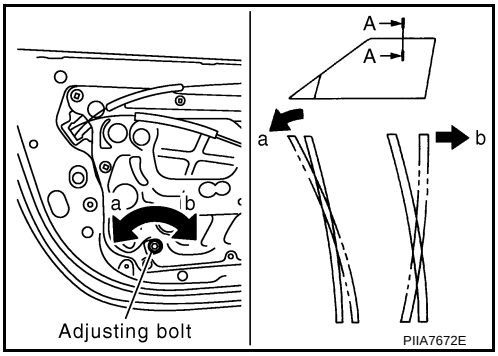
CAUTION:

- **Do not use the window auto function.**
- **Do not release the switch before the window is fully stopped.**

FITTING INSPECTION

- Check that glass is securely fit into glass run groove.
- Lower glass slightly [approx. 10 to 20 mm (0.39 to 0.79 in)] and check the distance between the edge of glass and the body side welt. If the distance is not constant, adjust the glass position by loosening and tightening following bolts.
  - Regulator mounting bolt and nut
  - Glass and guide rail mounting bolt
- Raise the glass fully and adjust the glass top end and body side welt fitting with the adjusting bolt at the lower of the regulator rear rail.

  NOTE:
  - Turn the adjusting bolt clockwise to move the door glass upper end outward.
  - Turn the adjusting bolt counterclockwise to move the door glass upper end inward.
  - If water leaks, repair the fitting (Roadster only). Refer to RF-116, "Repairing Method for Water Leakage Around Doors" .



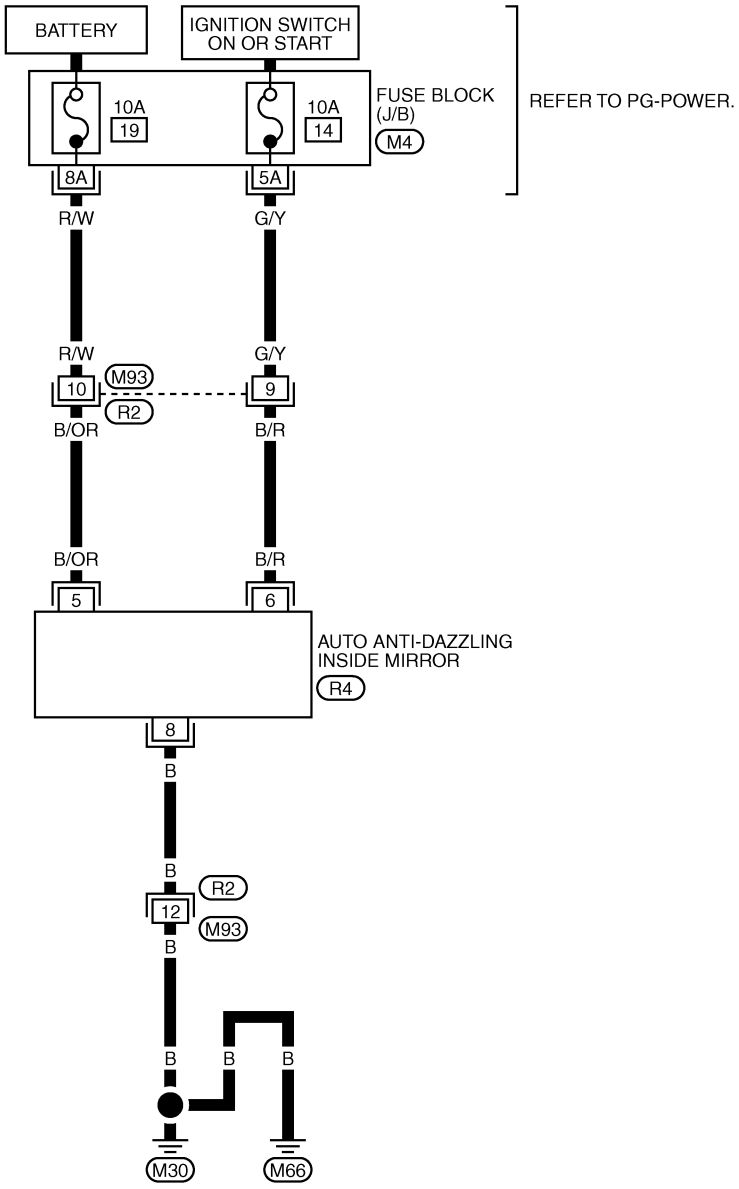
INSIDE MIRROR

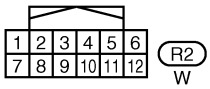
PFP:96321

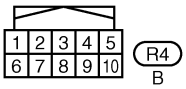
Wiring Diagram –I/MIRR–

NIS0005A

GW-I/MIRR-01





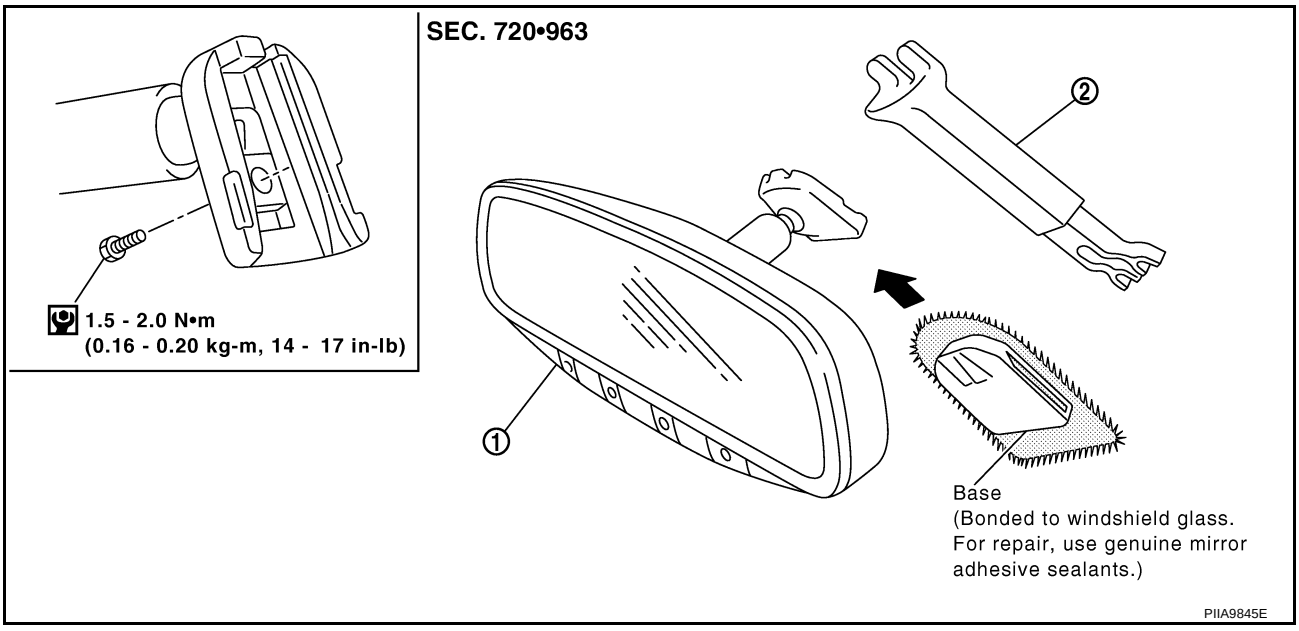


REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT2276E

Removal and Installation

NIS0005B



1. Inside mirror
2. Inside mirror finisher

REMOVAL

1. Remove inside mirror finisher.
2. Remove screw of the mirror base.
3. Slide the mirror base upward to remove.
4. Disconnect the connector.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

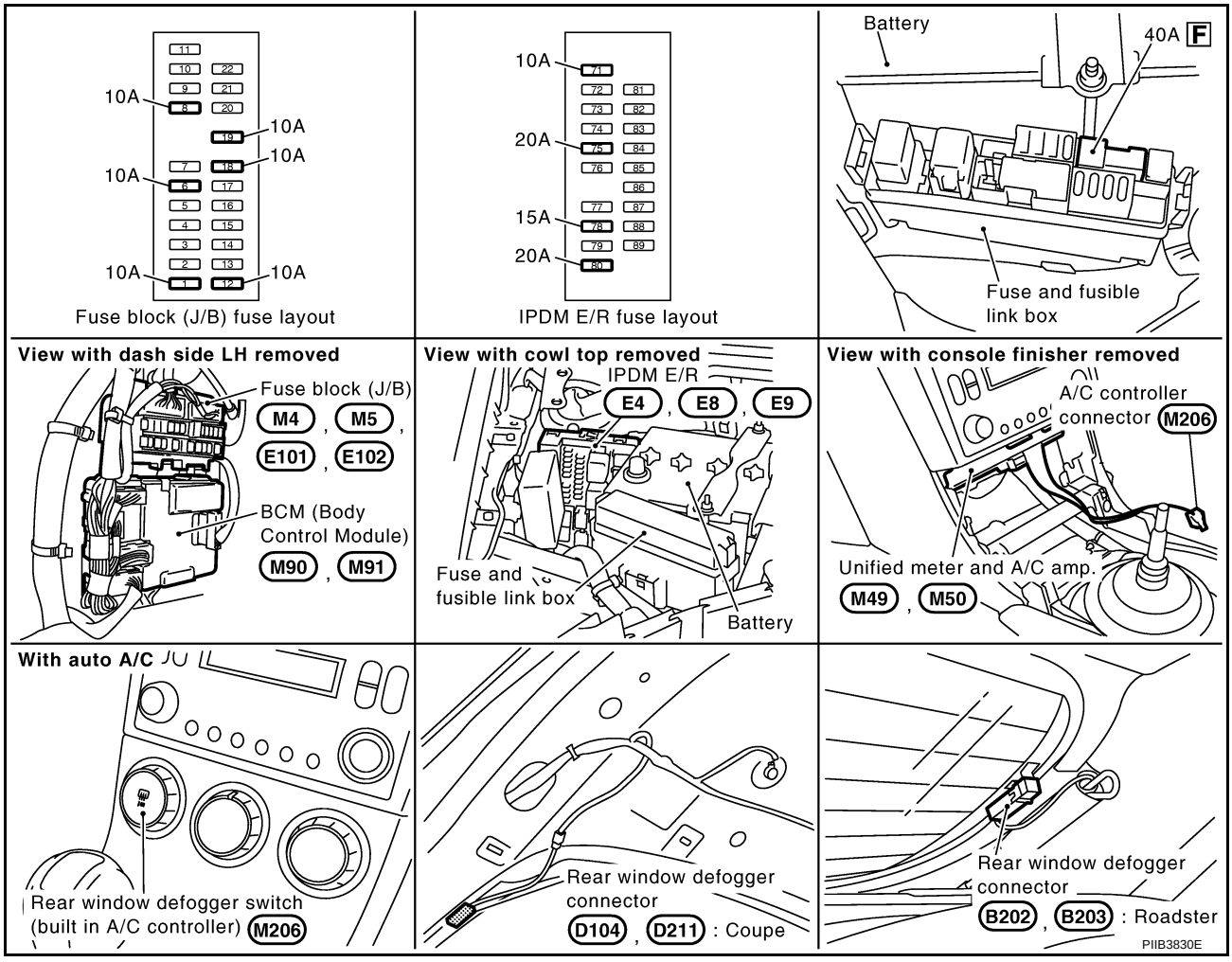
Apply Genuine Mirror Adhesive or equivalent to bonding surface of mounting bracket. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

REAR WINDOW DEFOGGER

PFP:25350

Component Parts and Harness Connector Location

NIS0005C



System Description

NIS0005D

The rear window defogger system is controlled by BCM (Body Control Module) and IPDM E/R (Intelligent Power Distribution Module Engine Room). The rear window defogger operates only for approximately 15 minutes.

Power is supplied at all times

- through 20A fuse [No. 75 and 80, located in the IPDM E/R]
- to rear window defogger relay terminal 3 and 6.
- through 40A fusible link (letter **F** , located in the fuse and fusible link box)
- to BCM terminal 55.
- through 10A fuse [No. 18, located in the fuse block (J/B)]
- to BCM terminal 42.
- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 21.

With the ignition switch turned to ON or START position, power is supplied

- through 10A fuse [No. 1, located in the fuse block (J/B)]
- to BCM terminal 38.
- through 10A fuse [No. 12, located in the fuse block (J/B)]
- to unified meter and A/C amp. terminal 22 and rear window defogger relay terminal 1
- and then through unified meter and A/C amp.
- to A/C controller (rear window defogger switch) terminal 72 and 84.

Ground is supplied

- to BCM terminal 52
- through body grounds M30, and M66.
- to unified meter and A/C amp. terminal 29 and 30
- through body grounds M30 and M66.
- to internal CPU of IPDM E/R terminal 38 and 60
- through body grounds E17, E43, B102 (with VDC system or navigation system) and F152 (without VDC system and navigation system).

When A/C controller (rear window defogger switch) is turned ON,
Rear window defogger switch signals are transmitted,

- through A/C controller terminal 87
- to unified meter and A/C amp.

Then ground is supplied

- to BCM terminal 9
- through unified meter and A/C amp. terminal 38
- through unified meter and A/C amp. terminal 30
- through body grounds M30 and M66.

Then BCM recognizes that rear window defogger switch is turned ON.
Then it sends rear window defogger switch signals to IPDM E/R via DATA LINE (CAN H, CAN L).
When IPDM E/R receives rear window defogger switch signals,
Ground is supplied

- to rear window defogger relay terminal 2
- through IPDM E/R terminal 52
- through internal CPU of IPDM E/R
- through IPDM E/R terminal 60
- through body grounds E17, E43, B102 (with VDC system or navigation system), F152 (without VDC system and navigation system), and then rear window defogger relay is energized.

When rear window defogger relay is turned ON,
Signals are transmitted

- to rear window defogger terminal 1
- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 5. (For Roadster)

Rear window defogger terminal 2 is grounded through body ground D212. (For Coupe)
Rear window defogger terminal 2 is grounded through body ground B5, B6 and T14. (For Roadster)
With power and ground supplied, rear window defogger filaments heat and defog the rear window.
When rear window defogger relay is turned ON,
Power is supplied

- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 7 (For Roadster)
- through fuse block (J/B) terminal 2C
- through 10A fuse [No. 8, located in the fuse block (J/B)]
- through fuse block (J/B) terminal 5B
- to door mirror defogger (Driver side and passenger side) terminal 2.

Door mirror defogger (Driver side and passenger side) terminal 1 is grounded through body grounds M30 and M66.
With power and ground supplied, door mirror defogger filaments heat and defog the mirror.
When rear window defogger relay is turned ON,
Power is supplied

- through rear window defogger relay terminals 5 and 7 (For Coupe)
- through rear window defogger relay terminal 5. (For Roadster)
- to unified meter and A/C amp. terminal 56

Then ground is supplied

- to A/C controller terminal 78
- through unified meter and A/C amp.
- through unified meter and A/C amp. terminal 29 and 30
- through body grounds M30 and M66.

This energizes rear window defogger indicator.

CAN Communication System Description

NIS0005E

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

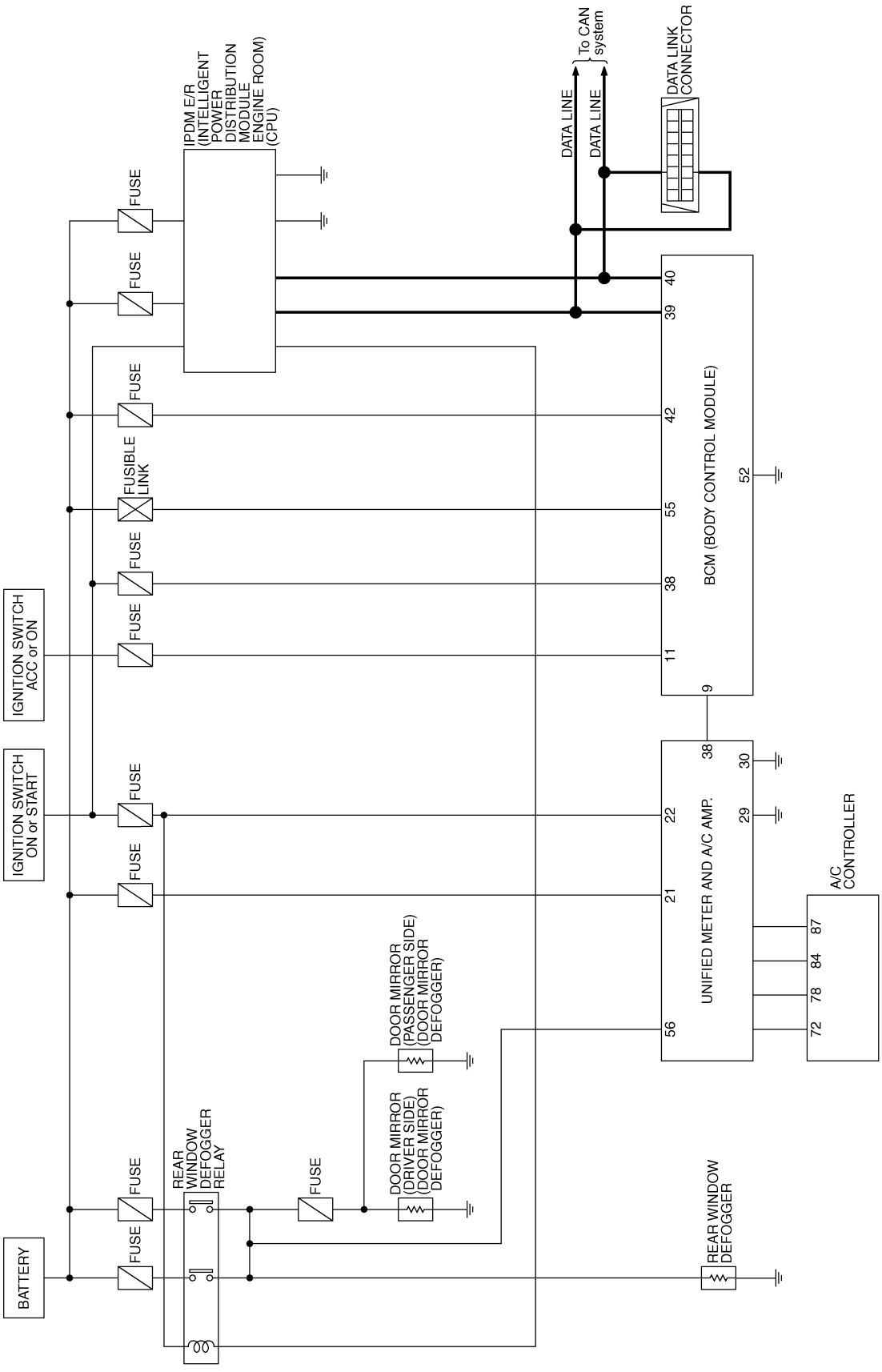
CAN Communication Unit

NIS0005F

Refer to LAN-48, "CAN System Specification Chart" .

Schematic– DEF – / For Coupe

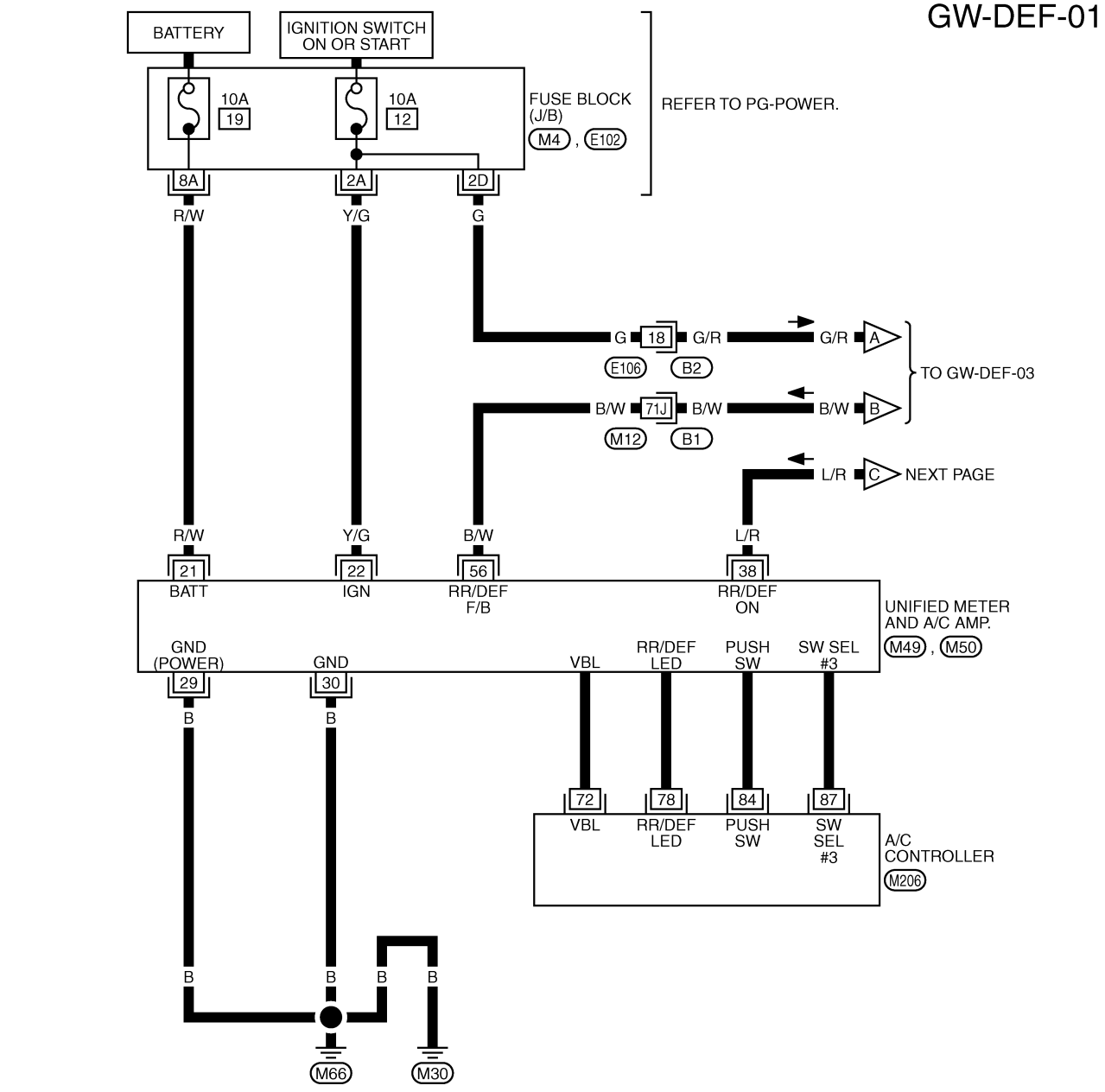
NIS0005G

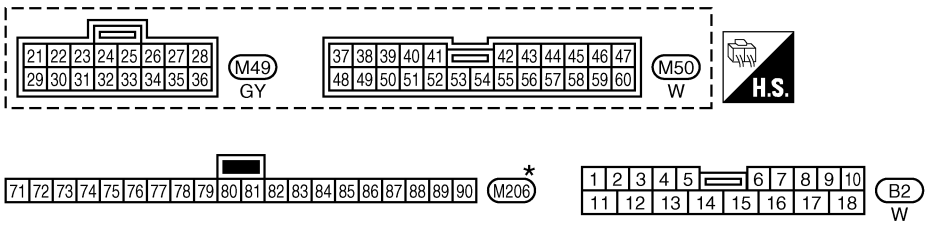


TIWT0972E

Wiring Diagram –DEF– / For Coupe

NIS0005H



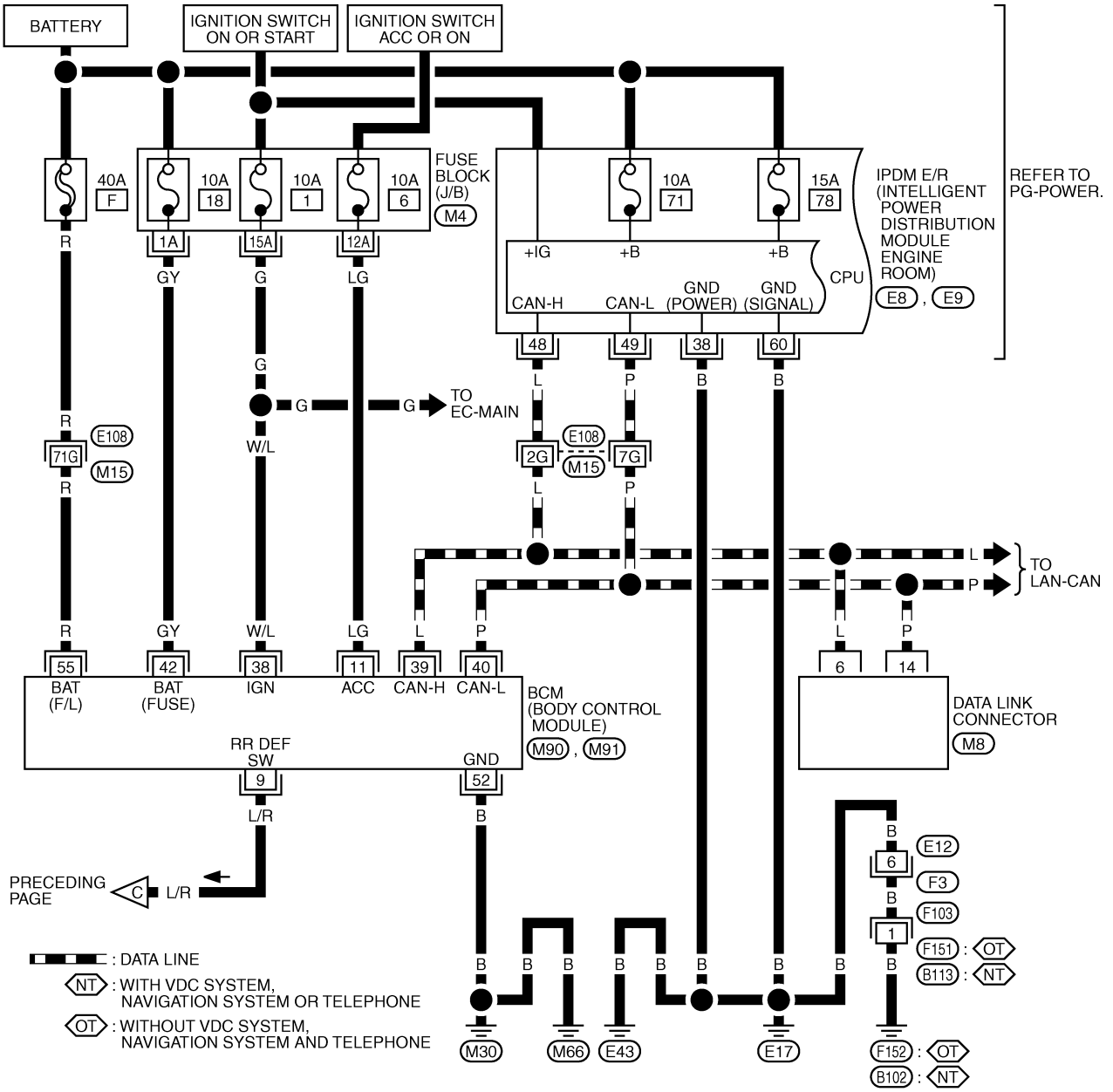


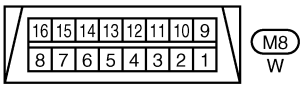
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

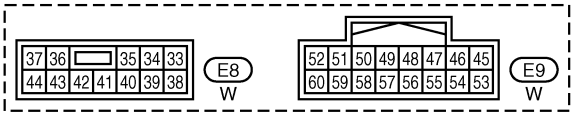
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

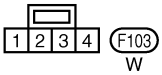
TIWT1595E

GW-DEF-02



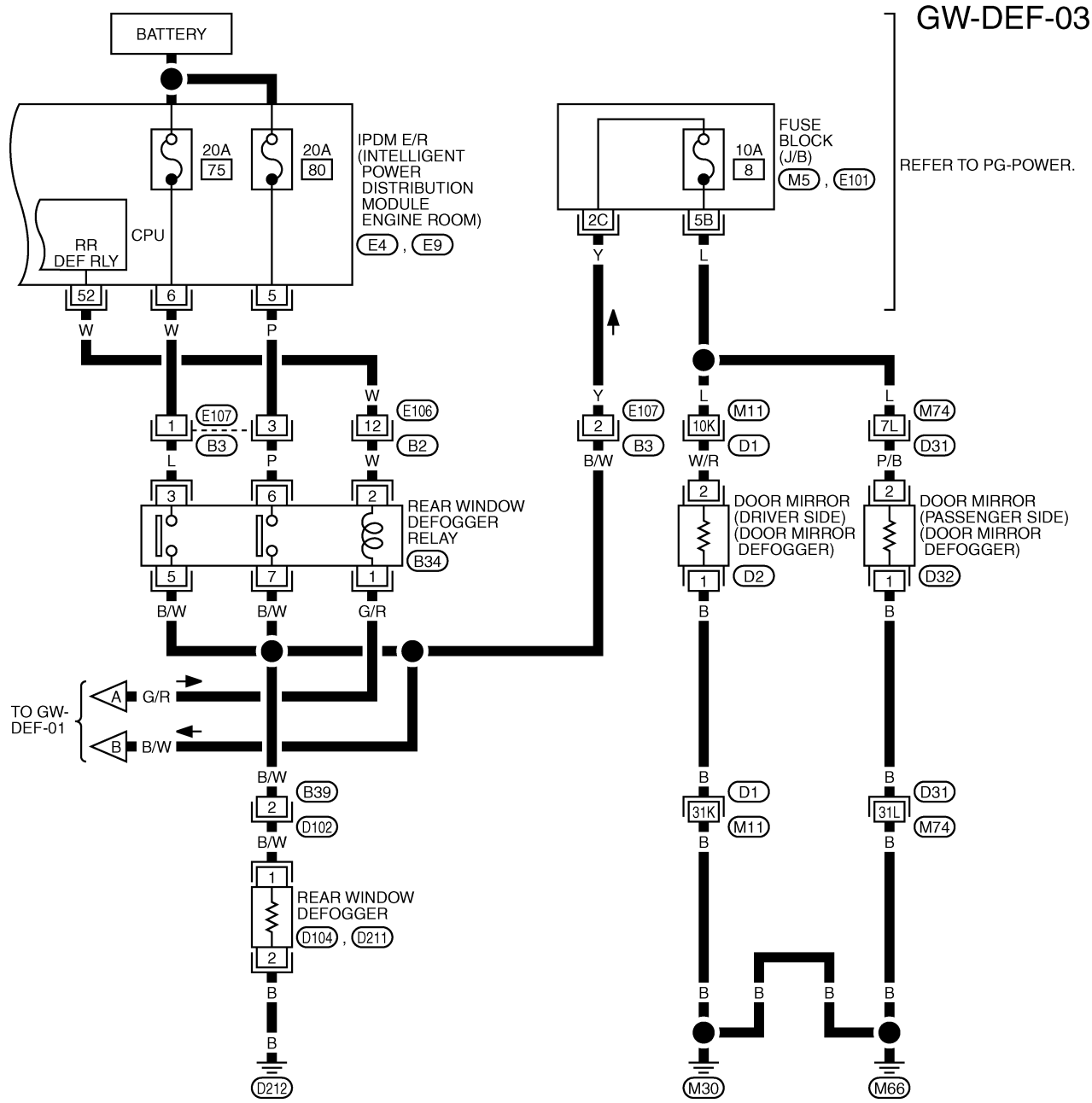






REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M90, M91 -ELECTRICAL UNITS

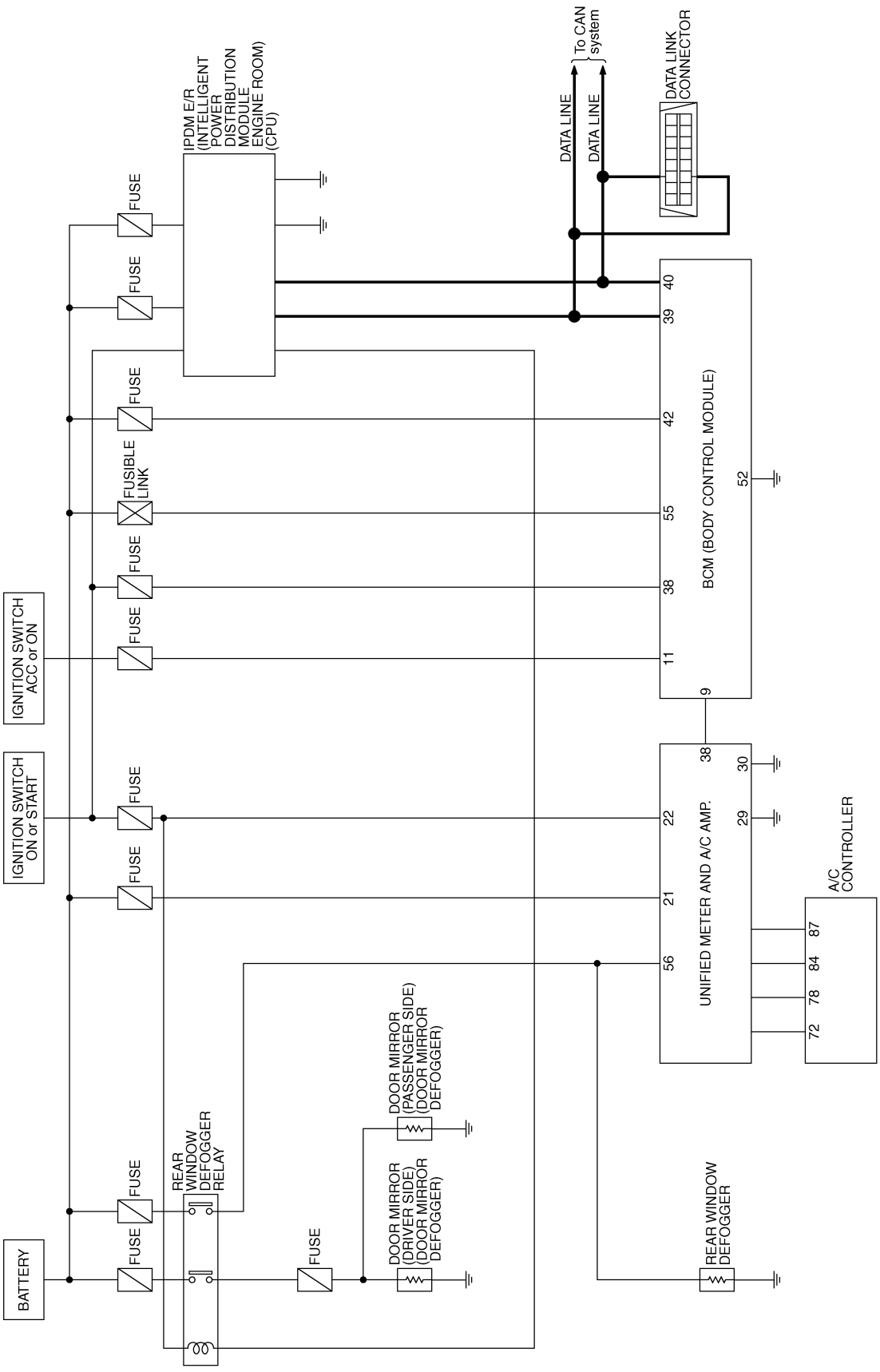
TIWT2277E


GW-DEF-03
BATTERY
20A 75
20A 80
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E4 , E9
RR DEF RLY
CPU
52
6
5
W
W
P
FUSE BLOCK (J/B)
M5 , E101
10A 8
2C
5B
Y
L
REFER TO PG-POWER.
E107
B3
E106
B2
M11
D1
M74
D31
REAR WINDOW DEFOGGER RELAY
B34
DOOR MIRROR (DRIVER SIDE) (DOOR MIRROR DEFOGGER)
D2
DOOR MIRROR (PASSENGER SIDE) (DOOR MIRROR DEFOGGER)
D32
B/W
G/R
W/R
P/B
B
TO GW-DEF-01
A G/R
B B/W
B39
D102
31K
31L
REAR WINDOW DEFOGGER
D104 , D211
D212
M30
M66
H.S.
E4
E9
B2
B3
B34
D2 , D32
D102
D104
D211
REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M5 , E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT1597E

Schematic – DEF – / For Roadster

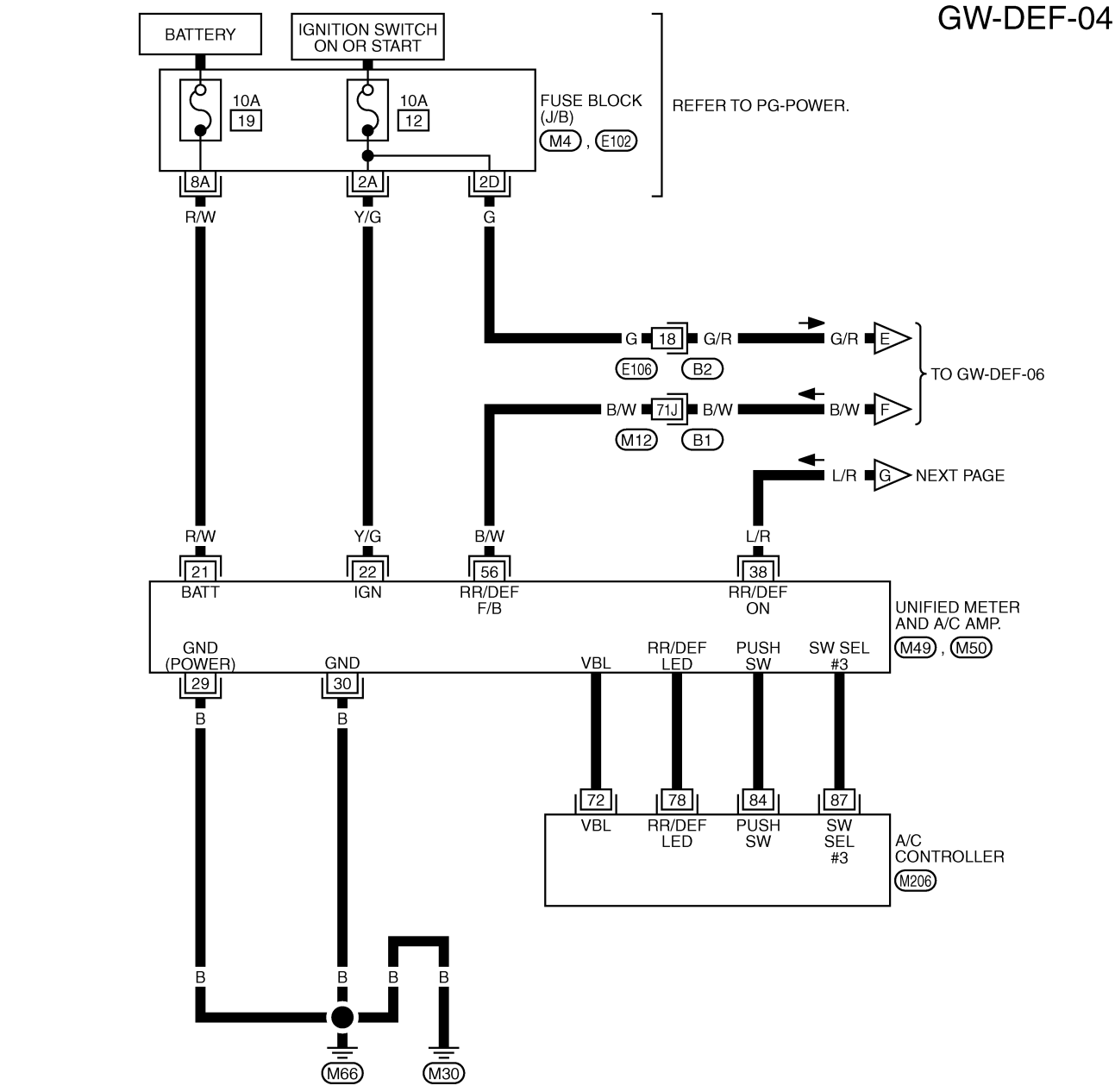
NIS0005I

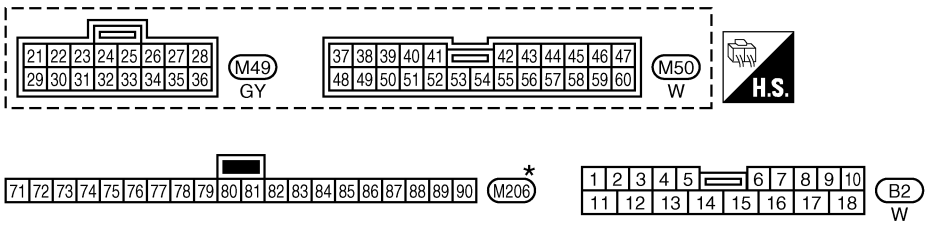


TIWT0975E

Wiring Diagram –DEF– / For Roadster

NIS0005J



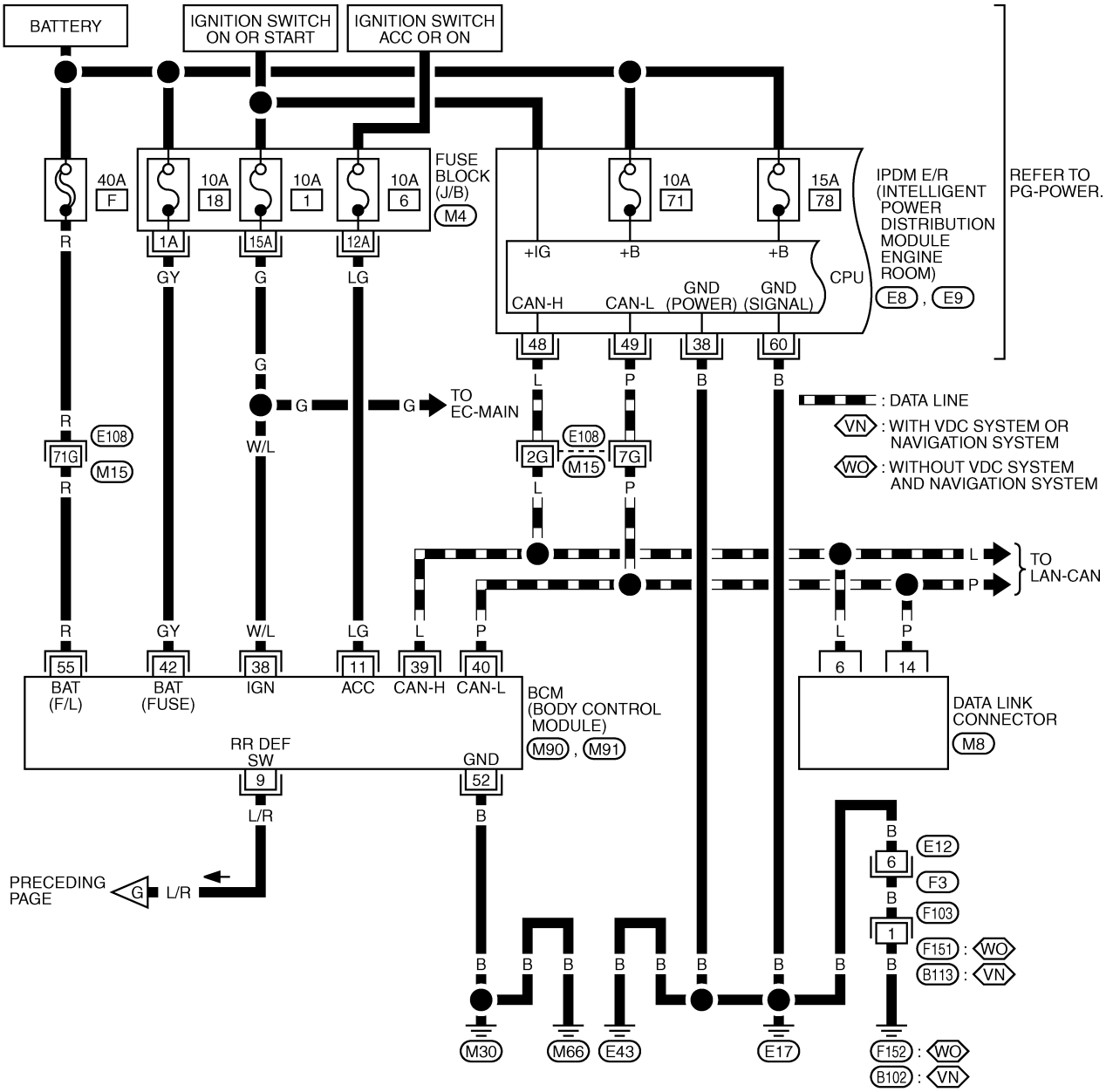


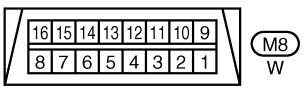
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

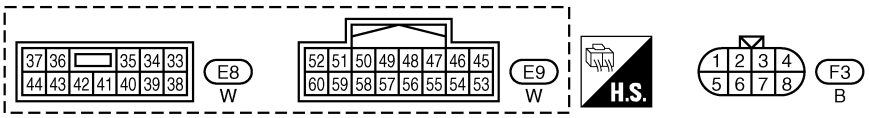
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

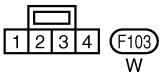
TIWT1598E

GW-DEF-05









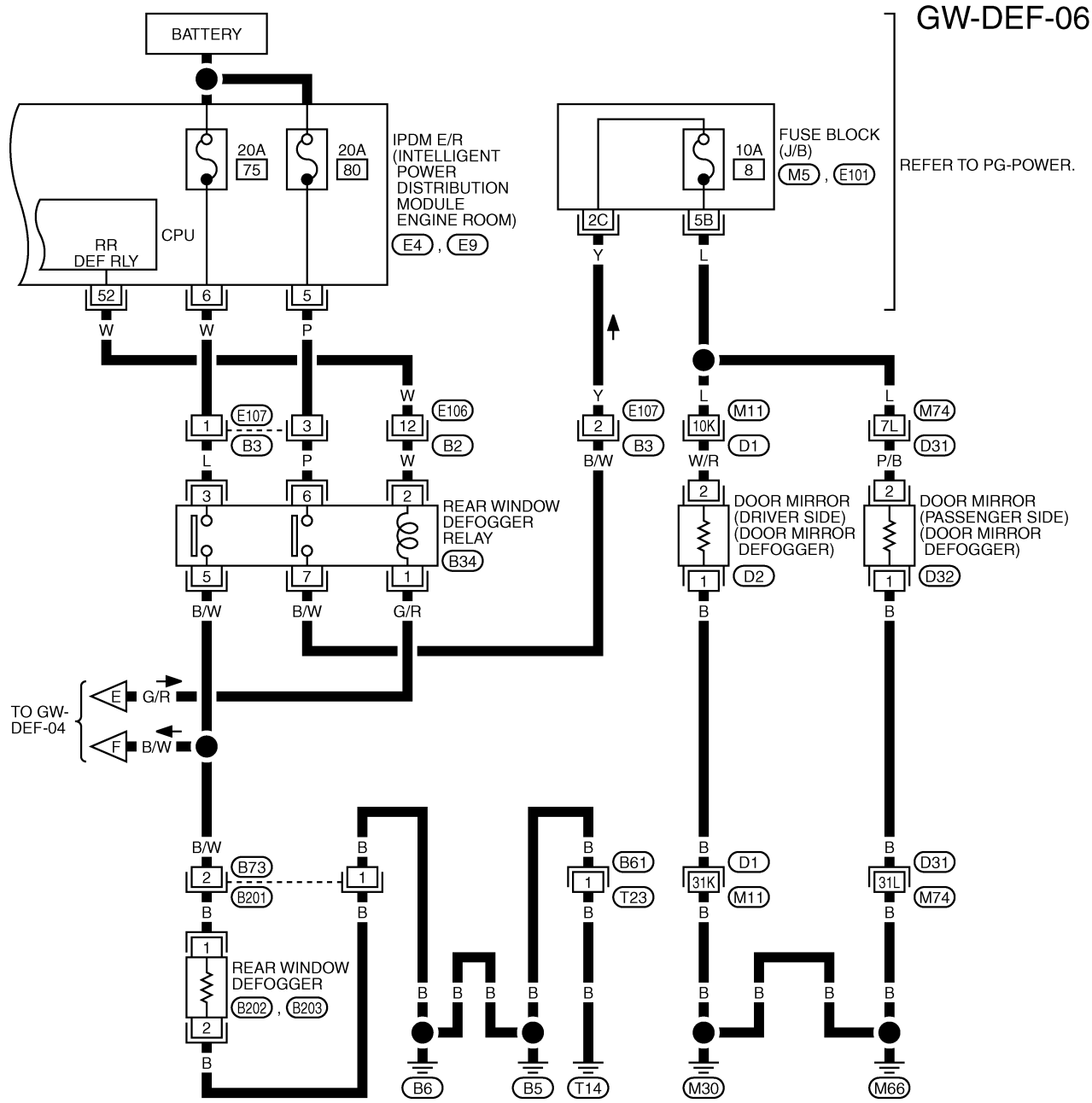
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TIWT2278E


GW-DEF-06
BATTERY
20A 75
20A 80
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E4 , E9
CPU
RR DEF RLY
52
6
5
W
W
P
10A 8
FUSE BLOCK (J/B)
M5 , E101
REFER TO PG-POWER.
2C
5B
Y
L
E107
B3
E106
B2
M11
D1
M74
D31
REAR WINDOW DEFOGGER RELAY
B34
DOOR MIRROR (DRIVER SIDE) (DOOR MIRROR DEFOGGER)
D2
DOOR MIRROR (PASSENGER SIDE) (DOOR MIRROR DEFOGGER)
D32
B/W
B/W
G/R
W/R
P/B
B
TO GW-DEF-04
E G/R
F B/W
B73
B201
B61
T23
D1
M11
D31
M74
REAR WINDOW DEFOGGER
B202 , B203
B6
B5
T14
M30
M66
E4
W
E9
W
H.S.
B2
W
B3
W
B34
BR
B61
W
B201
B
B202
B
B203
B
D2 , D32
W W
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.
REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M5 , E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT1600E

Terminal and Reference Value for BCM

NIS0005K

Terminal	Wire Color	Item	Signal input/output	Condition		Voltage (V) (Approx.)
9	L/R	Rear window defogger switch signal	Output	Rear window defogger switch	: Pressed	0
					: OFF	5
11	LG	Ignition switch ACC power supply (ACC or ON)	Input	Ignition switch (ACC or ON position)		Battery voltage
38	W/L	Ignition switch ON power supply (ON or START)	Input	Ignition switch (ON or START position)		Battery voltage
39	L	CAN-H	Input/Output	—		—
40	P	CAN-L	Input/Output	—		—
42	GY	Power source (Fuse)	Input	—		Battery voltage
52	B	Ground	—	—		0
55	R	Power source (Fusible link)	Input	—		Battery voltage

Terminal and Reference Value for IPDM E/R.

NIS0005L

Terminal	Wire Color	Item	Signal input/output	Condition		Voltage (V) (Approx.)
5	P	Battery power supply	Output	—		Battery voltage
6	W	Battery power supply	Output	—		Battery voltage
38	B	Ground (Power)	—	—		0
48	L	CAN-H	Input/Output	—		—
49	P	CAN-L	Input/Output	—		—
52	W	Rear window defogger relay control signal	Input	Rear window defogger switch	: ON	0
					: OFF	Battery voltage
60	B	Ground (Signal)	—	—		0

Terminal and Reference Value for Unified Meter and A/C Amp.

NIS0005M

Terminal	Wire Color	Item	Signal input/output	Condition		Voltage (V) (Approx.)
21	R/W	Power source (Fuse)	Input	—		Battery voltage
22	Y/G	Ignition switch ON power supply (ON or START)	Input	Ignition switch (ON or START position)		Battery voltage
29	B	Ground (Power)	—	—		0
30	B	Ground	—	—		0
38	L/R	Rear window defogger switch signal	Input	Rear window defogger switch.	: Pressed	0
					: OFF	5
56	B/W	Rear window defogger ON signal	Input	Rear window defogger switch	: ON	Battery voltage
					: OFF	0
72	—	Indicator power supply	Input	Ignition switch (ON or START position)		5
78	—	Rear window defogger indicator signal	Input	Rear window defogger switch	: ON	0
					: OFF	5

Ter-minal	Wire Color	Item	Signal input/out-put	Condition		Voltage (V) (Approx.)
84	—	A/C control push switch power supply	Input	Ignition switch (ON or START position)		5
87	—	Rear window defogger switch ON signal	Input	Rear window defogger switch	: ON	0
					: OFF	5

CONSULT-III Function (BCM)

NIS0005N

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnostic test item	Check item diagnostic test mode	Content
REAR DEFOGGER	Data monitor	Displays the input data of BCM in real time.
	Active test	Gives a drive signal to a load to check the operation.

DATA MONITOR

Display Item List

Monitor item “Operation”		Content
REAR DEF SW	“ON/OFF”	Displays “Press (ON)/others (OFF)” status determined with the rear window defogger switch.
IGN ON SW	“ON/OFF”	Displays “IGN (ON)/OFF” status determined with the ignition switch signal.

ACTIVE TEST

Display Item List

Test item	Content
REAR DEFOGGER	Gives a drive signal to the rear window defogger to activate it.

CONSULT-III Function (IPDM E/R)

NIS0005O

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

IPDM E/R diagnostic test item	Check item diagnostic test mode	Content
REAR DEFOGGER	Data monitor	Displays the input data of BCM in real time.
	Active test	Gives a drive signal to a load to check the operation.

DATA MONITOR

Monitored Item	Description
RR DEF REQ	Indicates [ON/OFF] condition of rear window defogger function by IPDM E/R.

ACTIVE TEST

Test Item	Description
REAR DEFOGGER	This test is able to check rear window defogger operation. Rear window defogger operates when “ON” on CONSULT-III screen is touched.

Work Flow

NIS0005P

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to GW-56, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to GW-69, "Trouble Diagnoses Symptom Chart" .
4. Does rear window defogger operate normally? YES: GO TO 5, NO: GO TO 4.
5. INSPECTION END

Trouble Diagnoses Symptom Chart

NIS0005Q

Make sure that other systems using the signal of the following systems operate normally.

Symptom	Diagnoses / service procedure	Refer to page
Rear window defogger does not operate.	1. CAN communication inspection using CONSLUT-III (self-diagnosis)	BCS-16
	2. Check IPDM E/R operation	GW-70
	3. Check rear window defogger switch circuit	GW-70
	4. Check rear window defogger power supply circuit	GW-71
	5. Replace IPDM E/R.	PG-26
Rear window defogger does not response but door mirror defoggers operate.	1. Check rear window defogger circuit	GW-73*1 GW-74*2
	2. Check filament	GW-78
Both of door mirror defoggers do not response but rear window defogger operates.	Check door mirror defogger power supply circuit	GW-75
Driver side door mirror defogger does not operate.	Check driver side door mirror defogger circuit	GW-76
Passenger side door mirror defogger does not operate.	Check passenger side door mirror defogger circuit	GW-76

*1 : For Coupe

*2 : For Roadster

Check IPDM E/R Operation

NIS0005R

1. CHECK IPDM E/R OPERATION

With CONSULT-III

Check IPDM E/R “REAR DEFOGGER” in “ACTIVE TEST” mode with CONSULT-III.
Refer to GW-68, "ACTIVE TEST" .

When “ACTIVE TEST” is performed, does rear defogger switch indicator illuminate?

YES or NO

YES >> GO TO diagnosis/service procedure 3 in “Trouble Diagnosis Symptom Chart”. Refer to GW-69 .
NO >> GO TO diagnosis/service procedure 4 in “Trouble Diagnosis Symptom Chart”. Refer to GW-69 .

Check Rear Window Defogger Switch Circuit

NIS0005S

1. CHECK REAR WINDOW DEFOGGER SWITCH OPERATION

With CONSULT-III

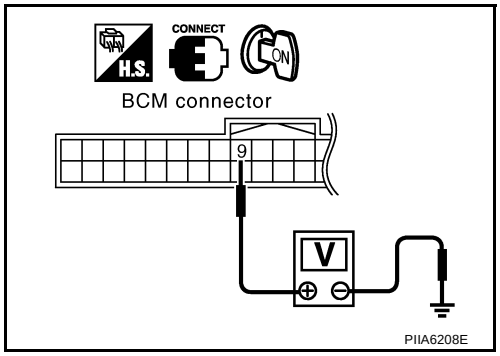
Check (“REAR DEF SW” and “IGN ON SW”) in DATA MONITOR mode with CONSULT-III. Refer to GW-68, "DATA MONITOR" .

When rear defogger switch is turned to ON
REAR DEF SW :ON
When ignition switch is turned to ON
IGN ON SW :ON

With out CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between BCM connector ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(–)			
M90	9 (L/R)	Ground	Rear window defogger switch	: ON	0
				: OFF	5



OK or NG

OK >> Rear window defogger switch check is OK.
NG >> GO TO 2.

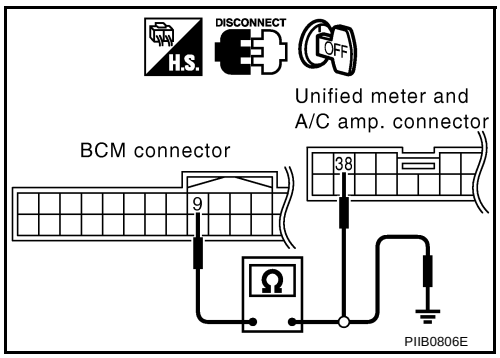
2. REAR WINDOW DEFOGGER SWITCH SIGNAL CIRCUIT HARNESS CONTINUITY INSPECTION

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp.connector.
3. Check continuity between BCM connector M90 terminal 9 and unified meter and A/C amp. connector M50 terminal 38.

9 (L/R) – 38 (L/R) : Continuity should exist

4. Check continuity between BCM harness connector M90 terminal 9 and ground

9 (L/R) – Ground : Continuity should not exist



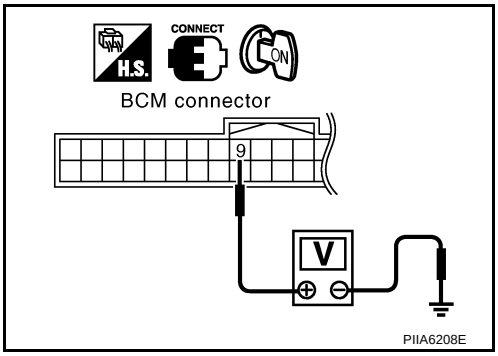
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM connector M90 terminal 9 and ground.

9 (L/R) – Ground :Approx. 5V



OK or NG

OK >> Replace unified meter and A/C amp.
NG >> Replace BCM.

Check Rear Window Defogger Power Supply Circuit

NIS0005T

1. CHECK FUSE

Check 10A fuse [No. 12, located in fuse block (J/B)].

NOTE:
Refer to GW-56, "Component Parts and Harness Connector Location" .

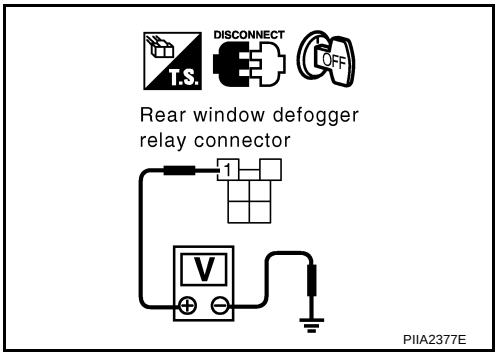
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse, refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. REAR WINDOW DEFOGGER RELAY POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Remove rear window defogger relay.
3. Check voltage between rear window defogger relay connector B34 terminal 1 and ground.

1 (G/R) – Ground : Battery voltage



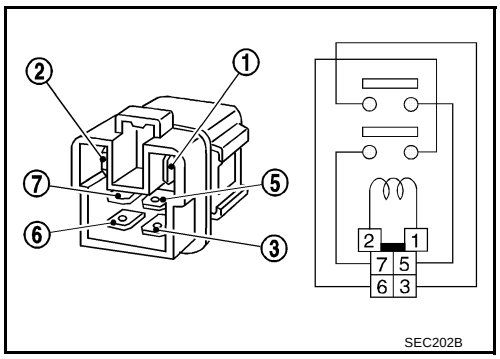
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. REAR WINDOW DEFOGGER RELAY INSPECTION

1. Remove rear window defogger relay.
2. Check continuity between rear window defogger relay terminals 3 and 5, 6 and 7.

Terminal		Condition	Continuity
3	5	12V direct current supply between terminals 1 and 2	Yes
		No current supply	No
6	7	12V direct current supply between terminals 1 and 2	Yes
		No current supply	No



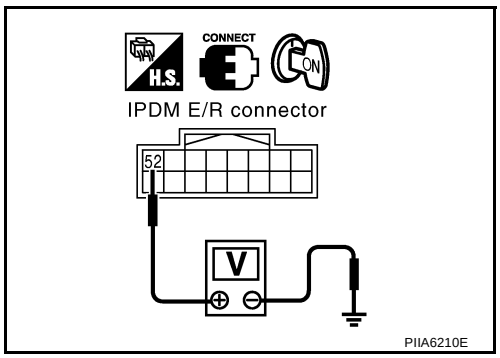
OK or NG

OK >> GO TO 4.
NG >> Replace rear window defogger relay.

4. REAR WINDOW DEFOGGER RELAY GROUND CIRCUIT INSPECTION

1. Installation rear window defogger relay.
2. Turn ignition switch ON.
3. Turn rear window defogger switch OFF.
4. Check voltage between IPDM E/R connector E9 terminal 52 and ground.

52 (B) – Ground : Battery voltage



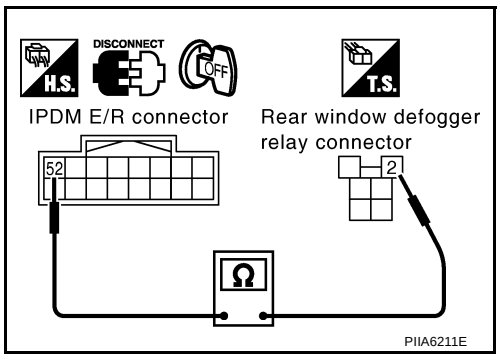
OK or NG

OK >> Rear window defogger power supply circuit is OK.
NG >> GO TO 5.

5. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and rear window defogger relay.
3. Check continuity between IPDM E/R connector E9 terminal 52 and rear window defogger relay connector B34 terminal 2.

52 (W) - 2 (W) :Continuity should exist.



OK or NG

OK >> Check the condition of harness and the connector.
NG >> Repair or replace harness.

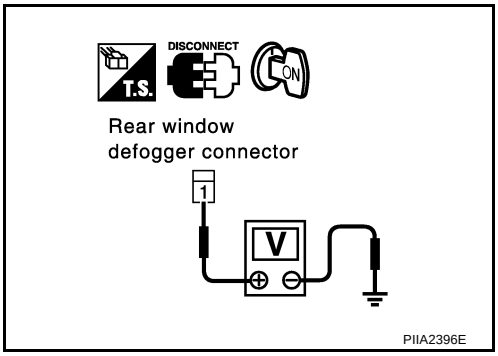
Check Rear Window Defogger Circuit / For Coupe

NIS0005U

1. REAR WINDOW DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Turn ignition switch ON.
4. Check voltage between rear window defogger connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D104	1 (B/W)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0



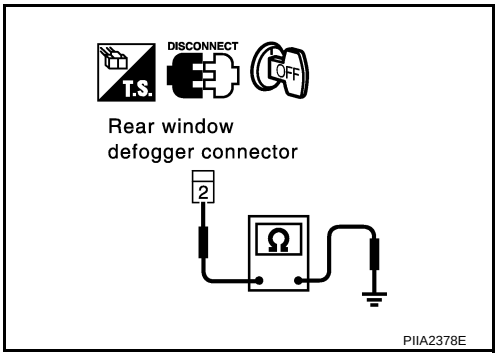
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. REAR WINDOW DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Check continuity between rear window defogger connector D211 terminal 2 and ground.

2 (B) – Ground : Continuity should exist



OK or NG

OK >> Rear window defogger circuit is OK.
NG >> Repair or replace harness.

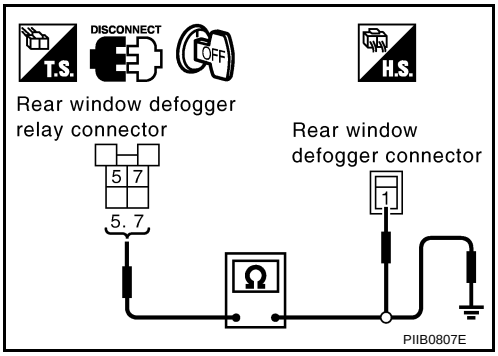
3. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect rear window defogger relay connector.
3. Check continuity between rear window defogger relay connector B34 terminal 5, 7 and rear window defogger connector D104 terminal 1.

5 (B/W) – 1 (B/W) : Continuity should exist.
7 (B/W) – 1 (B/W) : Continuity should exist.

4. Check continuity between rear window defogger relay connector B34 terminal 5, 7 and ground.

5 (B/W) – Ground : Continuity should not exist.
7 (B/W) – Ground : Continuity should not exist.



OK or NG

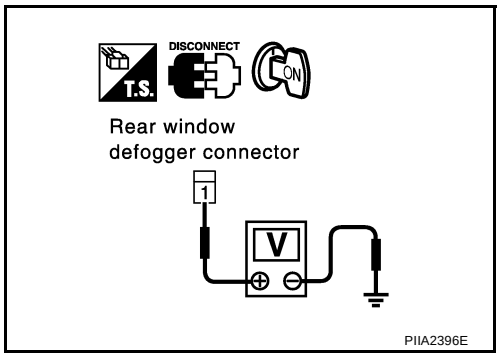
OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness.

Check Rear Window Defogger Circuit / For Roadster

NIS0005V

1. REAR WINDOW DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Turn ignition switch ON.
4. Check voltage between rear window defogger connector and ground.



Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
B202	1 (B)	Ground	Rear window defogger relay	: ON	Battery voltage
				: OFF	0

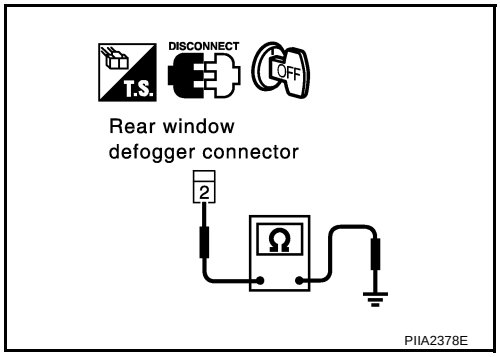
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. REAR WINDOW DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Check continuity between rear window defogger connector D203 terminal 2 and ground.

2(B) – Ground : Continuity should exist



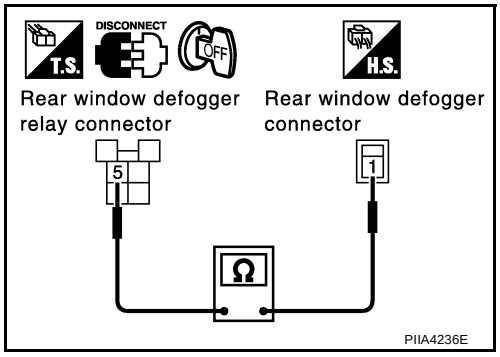
OK or NG

OK >> Rear window defogger circuit is OK.
NG >> Repair or replace harness.

3. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect rear window defogger relay connector.
3. Check continuity between rear window defogger relay connector B34 terminal 5 and rear window defogger connector B202 terminal 1.

5 (B/W) – 1 (B) : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness.

Check Door Mirror Defogger Power Supply Circuit

NIS0005W

1. CHECK FUSE

- Check 10A fuse [No. 8, located in fuse block (J/B)].

NOTE:
Refer to GW-56, "Component Parts and Harness Connector Location" .

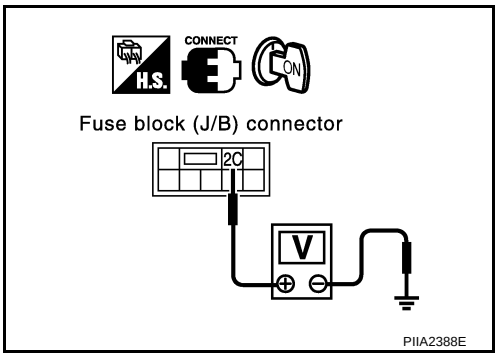
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse, refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION 1

1. Turn ignition switch ON.
2. Rear window defogger switch operate, check voltage between fuse block (J/B) connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
E101	2C (Y)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0



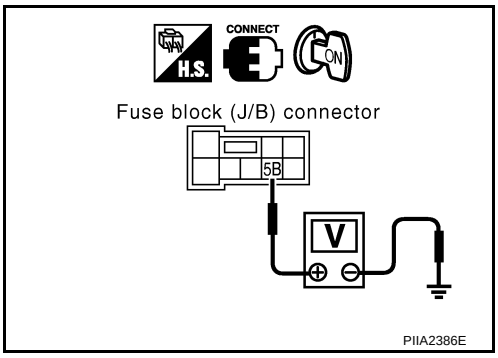
OK or NG

OK >> GO TO 3.
NG >> Repair or replace between harness.

3. DOOR MIRROR DEFOGGER POWER SUPPLY INSPECTION 2

Rear window defogger switch operate, check voltage between Fuse block (J/B) connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
M5	5B (L)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0



OK or NG

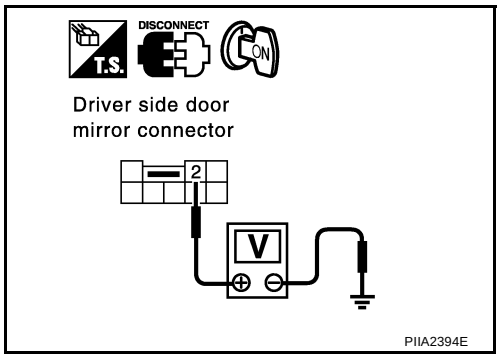
OK >> Repair or replace harness.
NG >> Replace fuse block (J/B).

Check Driver Side Door Mirror Defogger Circuit

NIS0005X

1. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch OFF.
2. Disconnect driver side door mirror defogger connector.
3. Turn ignition switch ON.
4. Rear window defogger switch operate, check voltage between driver side door mirror defogger connector and ground.



Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D2	2 (W/R)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0

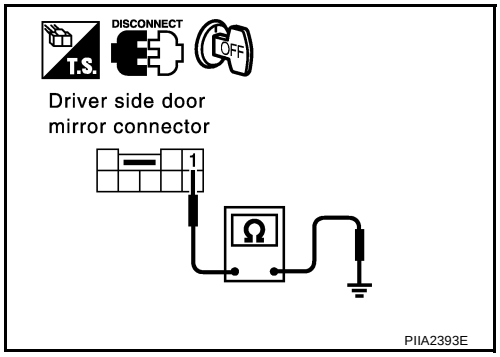
OK or NG

OK >> GO TO 2.
NG >> Repair or replace harness.

2. DOOR MIRROR DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Check continuity between driver side door mirror defogger connector D2 terminal 1 (B) and ground.

1 (B) – Ground : Continuity should exist.



OK or NG

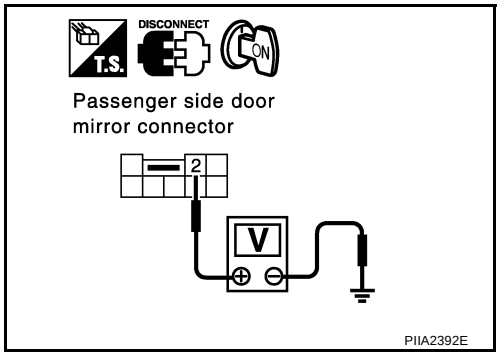
OK >> Check door mirror defogger firmament continuity.
NG >> Repair or replace harness.

Check Passenger Side Door Mirror Defogger Circuit

NIS0005Y

1. DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT INSPECTION

1. Turn ignition switch ON.
2. Disconnect passenger side door mirror defogger connector.
3. Rear window defogger switch operate, check voltage between passenger side door mirror defogger connector and ground.



Connector	Terminal (Wire color)		Condition		Voltage [V] (Approx.)
	(+)	(–)			
D32	2 (P/B)	Ground	Rear window defogger switch	: ON	Battery voltage
				: OFF	0

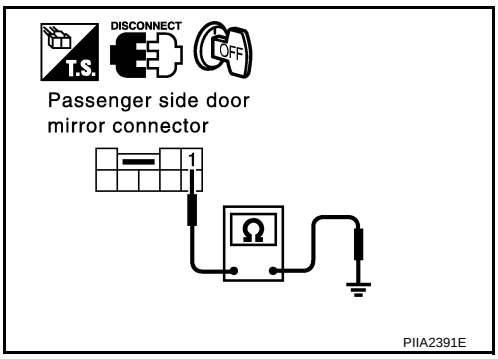
OK or NG

OK >> GO TO 2.
NG >> Repair or replace harness.

2. DOOR MIRROR DEFOGGER GROUND HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Check continuity between passenger side door mirror defogger connector D32 terminal 1 and ground.

1 (B) – Ground : Continuity should exist.



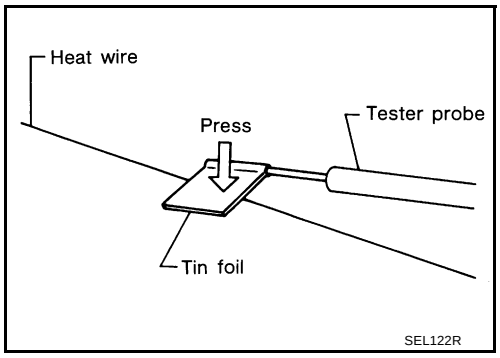
OK or NG

OK >> Check door mirror defogger firmament continuity.
NG >> Repair or replace harness.

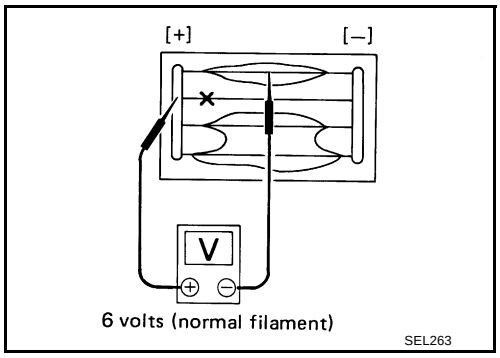
Check Filament

NIS0005Z

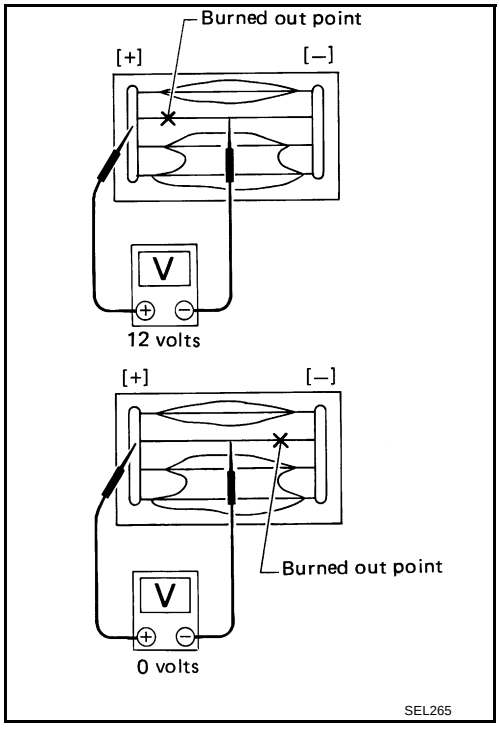
1. When measuring voltage, wrap tin foil around the top of the negative probe. Then press the foil against the wire with your finger.



2. Attach probe circuit tester (in Volt range) to middle portion of each filament.



3. If a filament is burned out, circuit tester registers 0 or battery voltage.
4. To locate burned out point, move probe to left and right along filament. Test needle will swing abruptly when probe passes the point.



Filament Repair

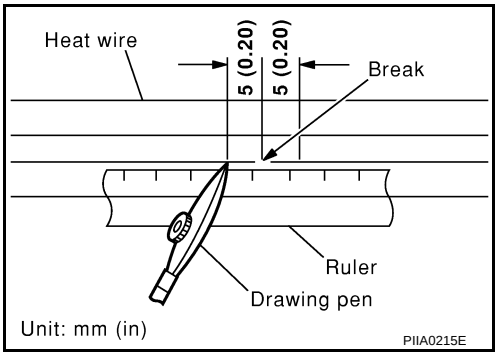
NIS00060

REPAIR EQUIPMENT

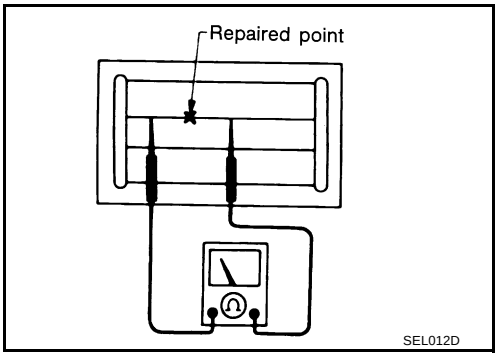
- Conductive silver composition (Dupont No. 4817 or equivalent)
- Ruler 30 cm (11.8 in) long
- Drawing pen
- Heat gun
- Alcohol
- Cloth

REPAIRING PROCEDURE

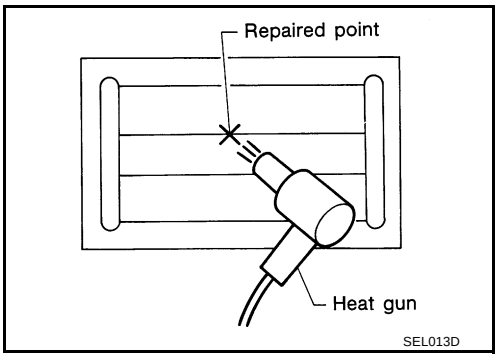
1. Wipe broken heat wire and its surrounding area clean with a cloth dampened in alcohol.
2. Apply a small amount of conductive silver composition to tip of drawing pen.
   Shake silver composition container before use.
3. Place ruler on glass along broken line. Deposit conductive silver composition on break with drawing pen. Slightly overlap existing heat wire on both sides [preferably 5 mm (0.20 in)] of the break.



4. After repair has been completed, check repaired wire for continuity. This check should be performed 10 minutes after silver composition is deposited.
   Do not touch repaired area while test is being performed.



5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet.
   If a heat gun is not available, let the repaired area dry for 24 hours.

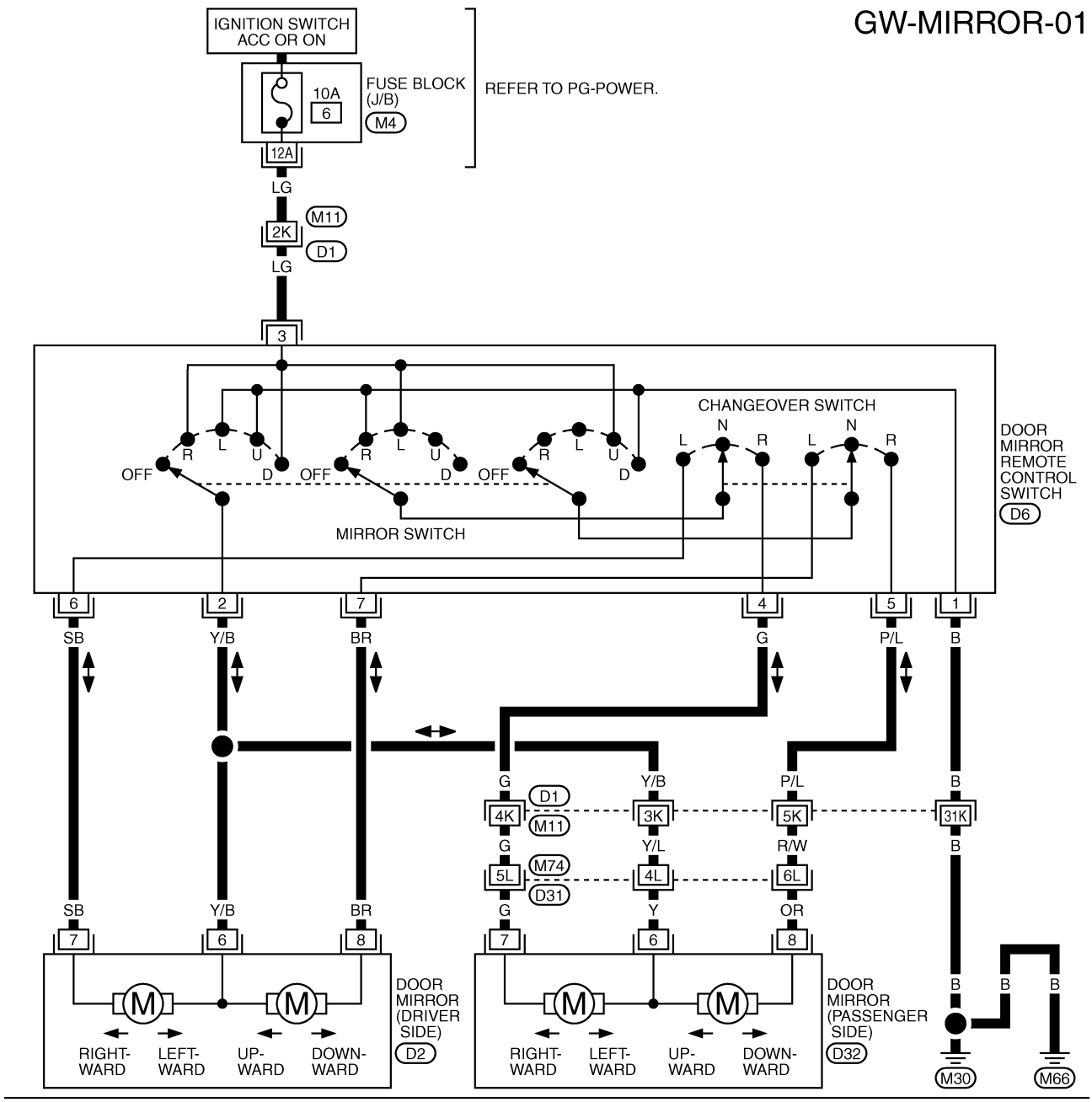


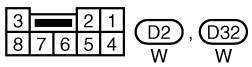
DOOR MIRROR

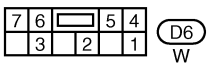
PFP:96301

Wring Diagram –MIRROR–

NIS00061







REFER TO THE FOLLOWING.

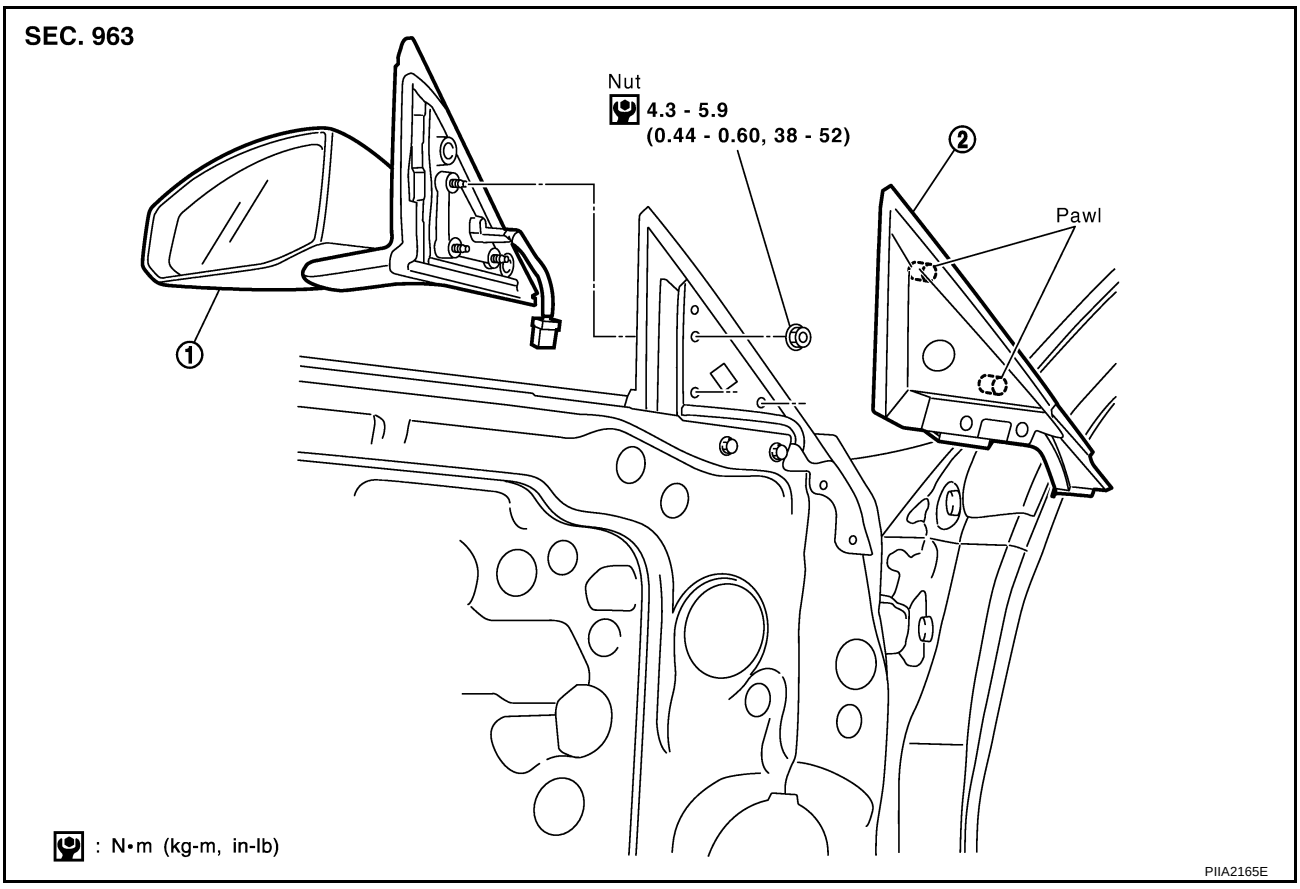
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT1601E

Removal and Installation

NIS00062



1. Door mirror assembly
2. Corner cover inner

REMOVAL

1. Remove door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Remove corner cover inner.
3. Disconnect door mirror harness connector.
4. Remove door mirror mounting nuts, and remove door mirror assembly.

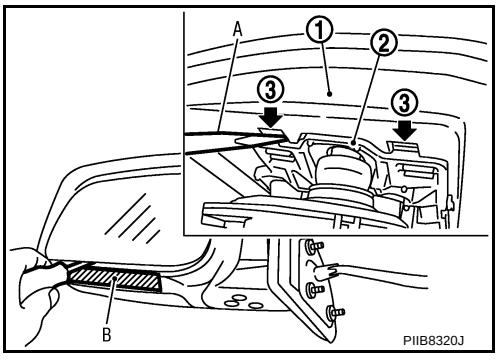
INSTALLATION

Install in the reverse order of removal.

DISASSEMBLY

1. Place the mirror body with mirror glass facing upward.
2. Put a strip of protective tape B on mirror body.
3. As shown in the figure, insert a small slotted screwdriver A into the recess between mirror base (mirror holder) (1) and mirror holder bracket (2) and push up two pawls (3) to remove mirror holder lower half side.

   NOTE:
   When pushing up pawls do not attempt to use one recess only, be sure to push up with both recesses.
   Insert screwdriver into recesses, and push up while rotating (twist) to make work easier.



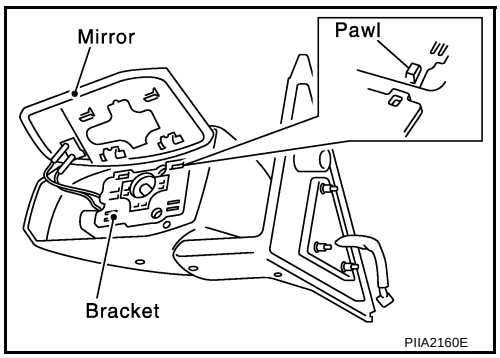
4. Remove two terminals of mirror heater attachment.
5. Lightly lift up lower side of mirror surface from mirror surface, and detach pawls of upper side as if pulling it out. Remove mirror surface from mirror body.

NOTE:
Be certain not to allow grease on sealing agent in center of mirror body assembly (actuator) or back side of mirror surface (mirror holder).

ASSEMBLY

1. Place mirror holder bracket and mirror body assembly (actuator) in a horizontal position.
2. Connect terminals of heater installed mirror.
3. Fit the upper pawls on the mirror face onto the mirror holder bracket first, then press the lower side of mirror face until a click sound is heard to engage the lower pawls.

NOTE:
After installation, visually check that lower pawls are securely engaged from the bottom of mirror face.



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ALPHABETICAL INDEX

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SECTION IP
INSTRUMENT PANEL

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00090

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NIS00091

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions

NIS00092

- Disconnect both battery cables in advance.
- Disconnect air bag system line in advance.
- Never tamper with or force air bag lid open, as this may adversely affect air bag performance.
- Be careful not to scratch pad and other parts.
- When removing or disassembling any part, be careful not to damage or deform it. Protect parts, which may get in the way with cloth.
- When removing parts with a screwdriver or other tool, protect parts by wrapping them with vinyl or tape.
- Keep removed parts protected with cloth.
- If a clip is deformed or damaged, replace it.
- If an unreusable part is removed, replace it with a new one.
- Tighten bolts and nuts firmly to the specified torque.
- After re-assembly has been completed, make sure each part functions correctly.
- Remove stains in the following way.

Water-soluble stains:
Dip a soft cloth in warm water, and then squeeze it tightly. After wiping the stain, wipe with a soft dry cloth.
Oil stain:
Dissolve a synthetic detergent in warm water (density of 2 to 3% or less), dip the cloth, then clean off the stain with the cloth. Next, dip the cloth in fresh water and squeeze it tightly. Then clean off the detergent completely. Then wipe the area with a soft dry cloth.

- Do not use any organic solvent, such as thinner or benzine.

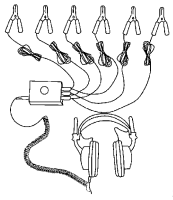
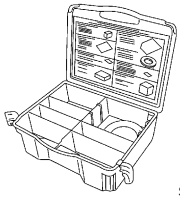
PREPARATION

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Special Service Tools

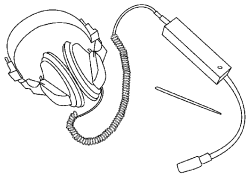
NIS00093

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS00094

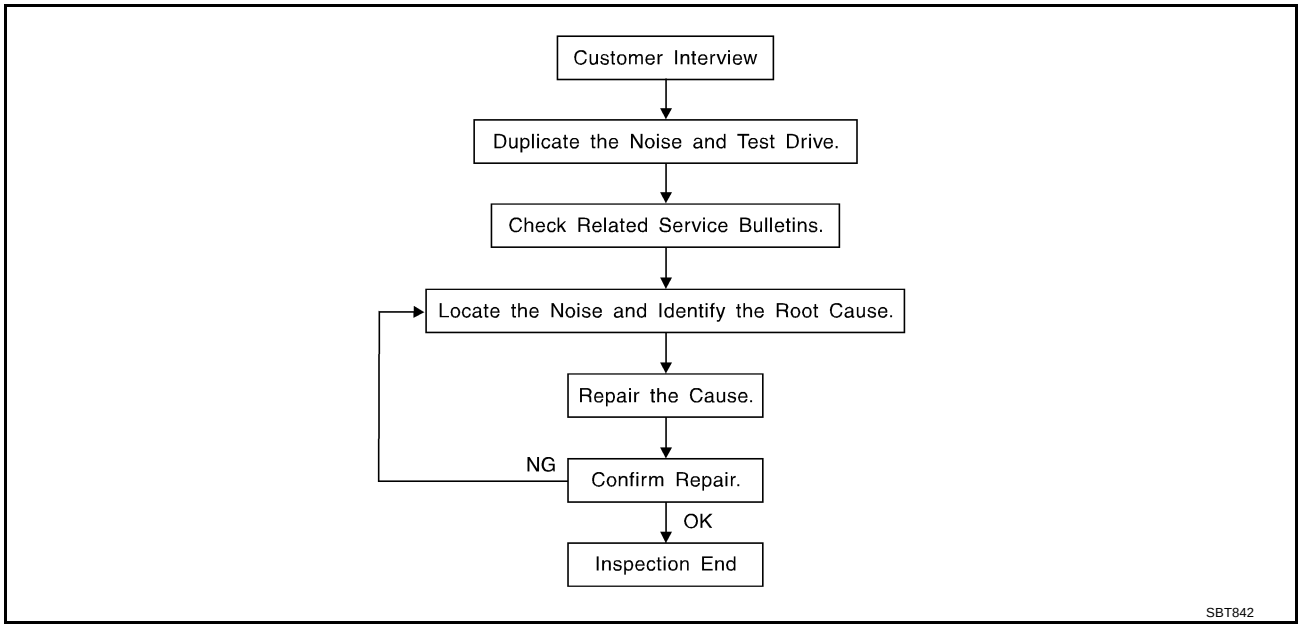
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS00095



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to IP-8, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to IP-6, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS00096

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint

These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

CAUTION:
Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

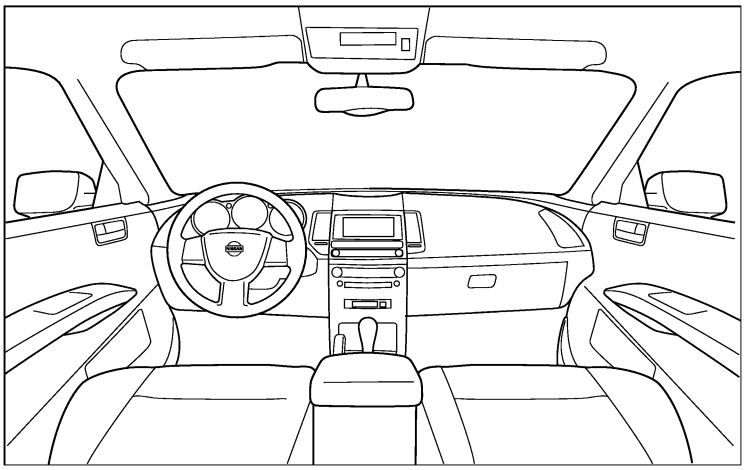
Diagnostic Worksheet

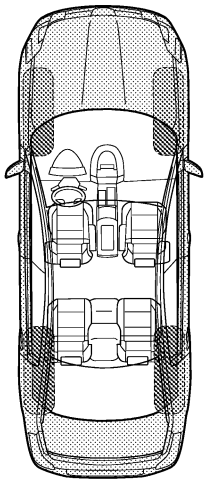
NIS00097

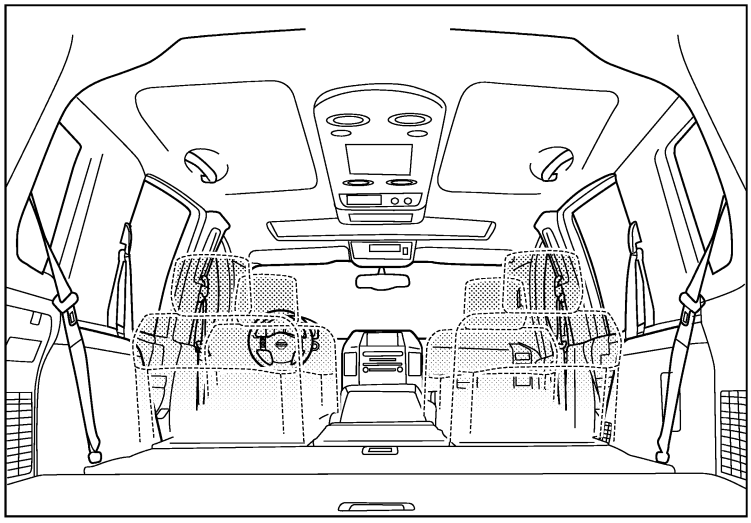
SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

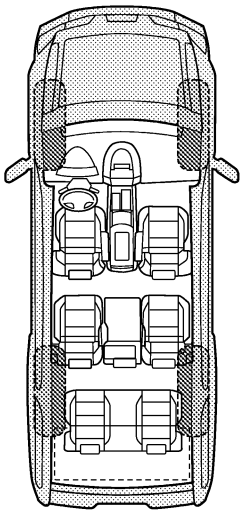
Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.









Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

PIIB8742E

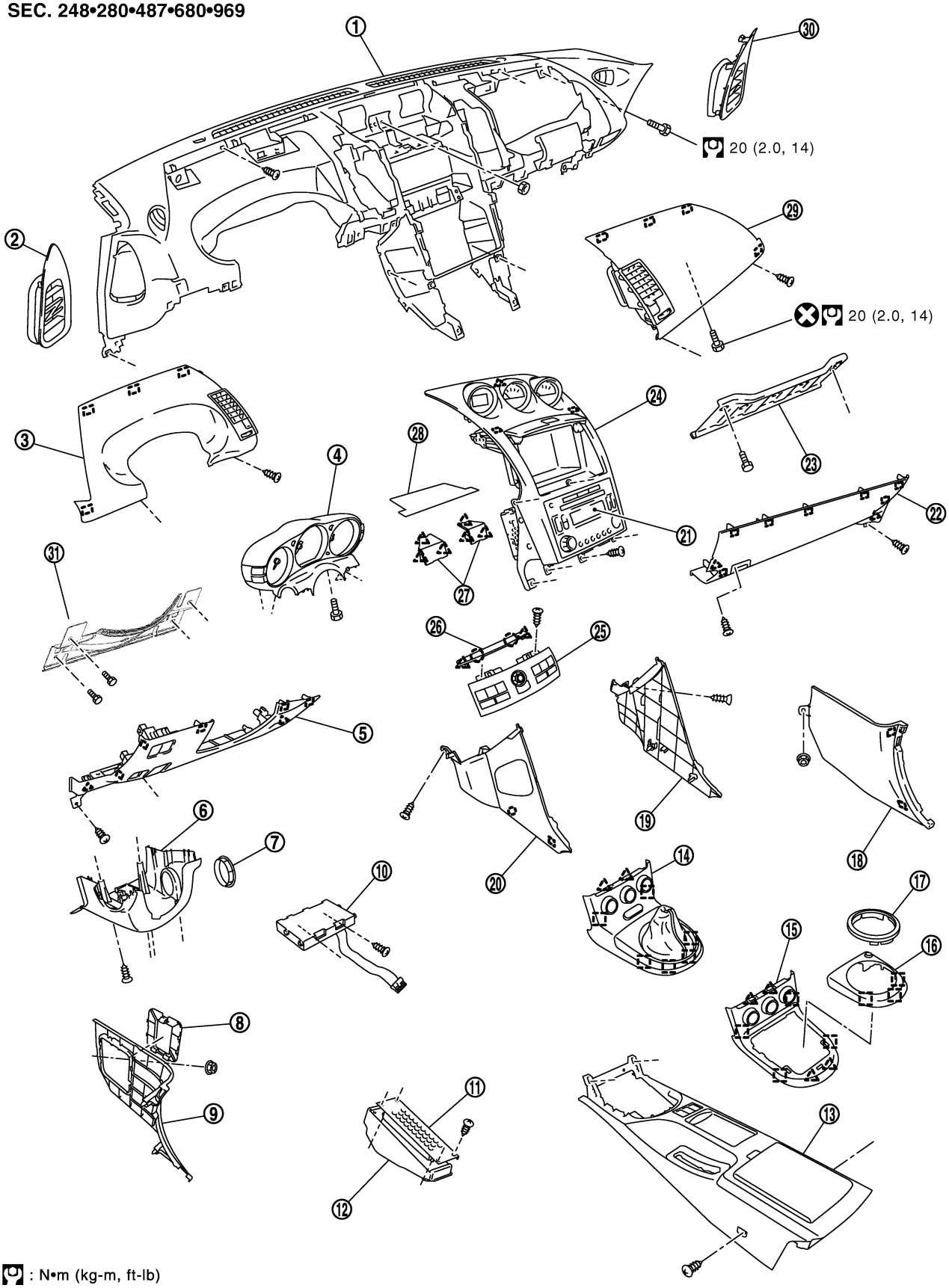
INSTRUMENT PANEL ASSEMBLY

PFP:68200

Component Parts Drawing

NIS00098

SEC. 248•280•487•680•969



: N•m (kg-m, ft-lb)

PIIB9056E

1. Instrument panel
2. Instrument side finisher (LH)
3. Instrument driver panel upper
4. Combination meter
5. Instrument driver panel lower
6. Steering column cover
7. Steering lock escutcheon
8. Fuse cover
9. Dash side finisher (LH)
10. Unified meter and A/C amp.
11. Foot rest plate
12. Foot rest
13. Center console
14. Console boot (M/T)
15. Cluster lid C lower
16. Console finisher (A/T)
17. Console finisher (A/T ring)
18. Dash side finisher (RH)
19. Instrument side panel (RH)
20. Instrument side panel (LH)
21. Audio unit
22. Instrument passenger panel lower
23. Knee protector (RH)
24. Cluster lid C
25. NAVI switch
26. Instrument center panel
27. Instrument finisher (LH/RH)
28. Pocket mat
29. Instrument passenger panel upper
30. Instrument side finisher (RH)
31. Knee protector (LH)

Pawl Clip Metal clip

Removal and Installation

NIS00099

WORK STEP

When removing instrument panel, combination meter, audio and console assembly, take steps in the order shown by the numbers below.

CAUTION:

- **Disconnect both battery cables in advance.**
- **Disconnect air bag system line in advance.**
- **Never tamper with or force air bag lid open, as this may adversely affect air bag performance.**
- **Be careful not to scratch pad and other parts.**

Parts		Reference page	Instrument panel	Combination meter	Audio	Center console
(A)	Kicking plate (RH / LH)	EI-35	[1]	[1]		
(B)	Foot rest	EI-43	[2]	[2]		
(C)	Dash side finisher (RH / LH)	EI-35	[3]	[3]		
(D)	Instrument driver panel lower	IP-12	[4]	[4]		
(E)	Steering column lower cover	IP-12	[5]	[5]		
(F)	Combination meter	IP-12	[6]	[6]		
(G)	Spiral cable	SRS-42	[7]			
(H)	Console finisher (A/T Models)	IP-13	[8]		[1]	[1]
(I)	Cluster lid C lower (A/T Models)	IP-13	[8]		[1]	[1]
(J)	Console boot (M/T Models)	IP-13	[8]		[1]	[1]
(K)	Center console *1	IP-13	[10]			[2]
(L)	Instrument passenger panel lower	IP-13	[11]			
(M)	Instrument side panel (RH / LH)	IP-13	[12]			
(N)	Unified meter and A/C amp.	IP-13	[13]		[2]	
(O)	Instrument center panel (with NAVI models)	IP-14	[14]		[3]	
(P)	NAVI switch (with NAVI models)	IP-14	[15]		[4]	
(Q)	Cluster lid C*2	IP-14	[16]		[5]	
(R)	Display unit (with NAVI models)	IP-14	[17]			
(S)	Front pillar garnish (RH / LH)	EI-36	[18]			
(T)	Instrument driver panel upper	IP-14	[19]			
(U)	Instrument passenger panel upper	IP-14	[20]			
(V)	Instrument side finisher (RH)	IP-14	[21]			
(V)	Instrument panel	IP-15	[22]			

[ ]:number indicates step in removal procedures.

NOTE:

*1: Console rear pocket and coin holder bracket assembly. Refer to IP-16, "CENTER CONSOLE" .

*2: Audio, Instrument upper box, and triple meter assembly. Refer to IP-17, "CLUSTER LID C" .

REMOVAL

(A) Kicking Plate (RH/LH)

Remove kicking plate (RH/LH). Refer to EI-35, "BODY SIDE TRIM" .

(B) Foot Rest

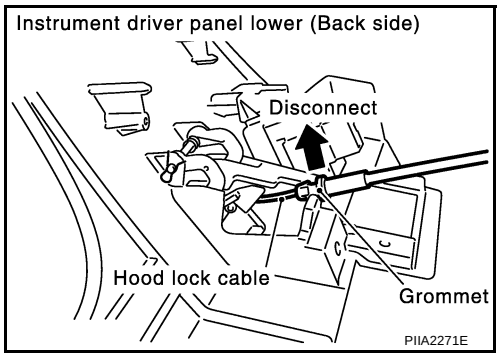
Remove foot rest. Refer to EI-43, "FLOOR TRIM" .

(C) Dash Side Finisher (RH/LH)

1. Remove plastics nut.
2. Remove dash side finisher (RH/LH).

(D) Instrument Driver Panel Lower

1. Remove screws.
2. Remove data link connector.
3. Pull to disengage metal clip by removing panel in horizontal direction.
4. Disconnect in-vehicle sensor and each electrical parts.
5. Remove the grommet, and remove hood lock cable.

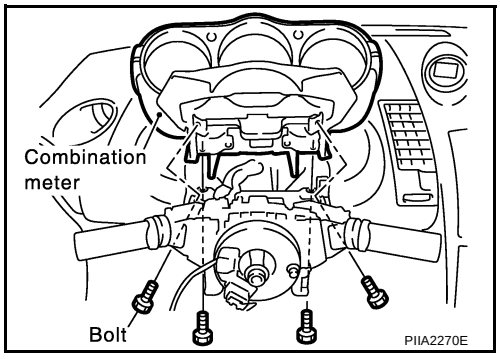


(E) Steering Column Lower Cover

1. Remove screws.
2. Disengage the tab, remove only lower side. (Upper side is integrated in combination meter.)

(F) Combination Meter

After removing bolts, remove harness connector.



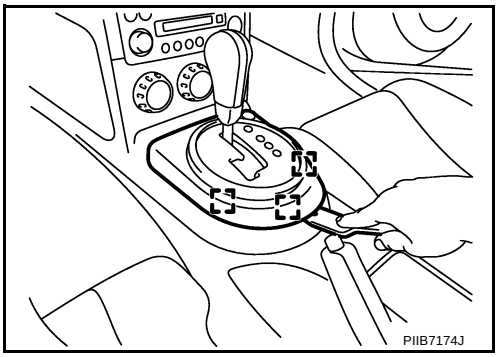
(G) Spiral cable

Remove bolts and remove spiral cable. Refer to SRS-42, "SPIRAL CABLE" .

(H) Console Finisher (A/T Models)

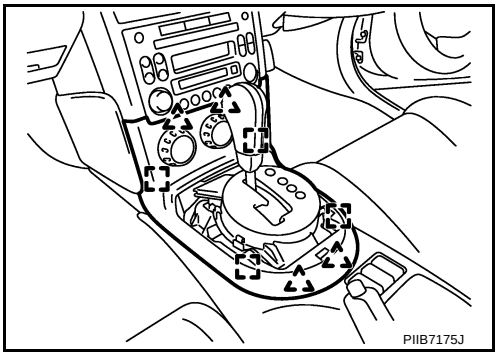
1. Insert a thin flat-bladed screwdriver wrapped with tape from behind console finisher, and remove metal clip on back. Then pull up and back to disengage from front metal clip.
2. Disconnect harness connector, and remove console finisher.

NOTE:
A/C controller is assembled in the console finisher. Therefore, when installing and removing be careful not to use excessive force, etc.



(I) Cluster lid C lower (A/T Models)

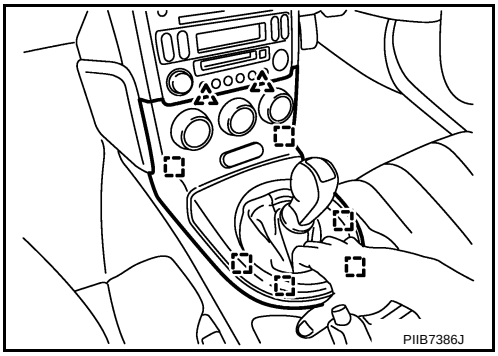
1. Disconnect harness connector.
2. Remove metal clips and pawls, and remove cluster lid C lower.



(J) Console Boot (M/T Models)

1. Remove metal clip.
2. Remove shift knob. Refer to MT-12, "Removal and Installation" .
3. Disconnect harness connector, and remove console boot.

NOTE:
A/C controller is assembled in the console boot. Therefore, when installing and removing be careful not to use excessive force, etc.



(K) Center Console

1. Remove coin holder and ashtray.
2. Remove screws.
3. Remove console sub-harness.
4. After removing, disassemble each parts. Refer to IP-16, "CENTER CONSOLE" .

NOTE:
When removing console, be careful not to pull the harness.

(L) Instrument Passenger Panel Lower

1. Remove screws and bolt.
2. Pull panel horizontally toward you and disengage from metal clip.

(M) Instrument Side Panel (RH/LH)

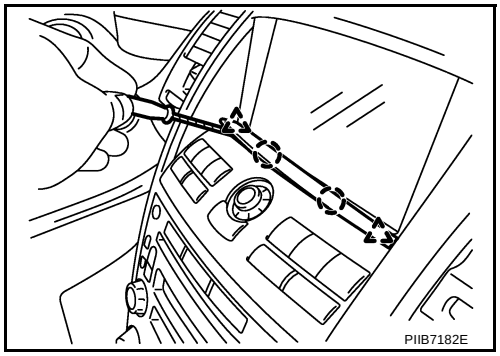
1. Remove screws.
2. Pull to the side, disconnect metal clips, and remove instrument side panel.

(N) Unified Meter And A/C Amp.

Remove screws, and disconnect harness connector, and remove unified meter and A/C amp. Refer to ATC-103, "AUTO AMP" .

(O) Instrument Center Panel

Insert a screwdriver wrapped with tape into the gap and then remove instrument center panel.

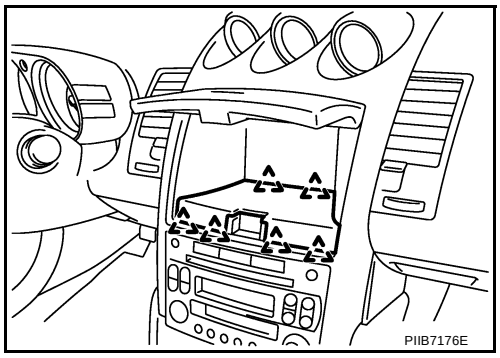


(P) NAVI Switch (With NAVI Models)

Remove NAVI switch. Refer to AV-99, "Removal and Installation of NAVI Switch" .

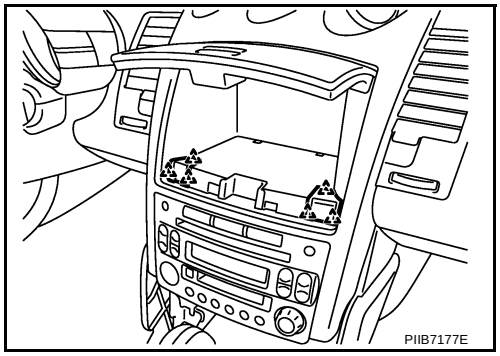
(Q) Cluster Lid C

1. Lift upward while disengaging the pawls, and pull backward to remove the pocket mat. (Without NAVI)



2. Pull backward to remove the instrument finisher (left/right). (Without NAVI)
3. Disengage the metal clip with the upper center pawls.
4. Remove the harness connector of the triple meter and audio unit by pulling backward, and then remove cluster lid C.

   CAUTION:
   Unit is heavy, so be careful not to pinch your fingers when working.
5. After remove cluster lid C and then remove triple meter, instrument upper box and audio unit. Refer to IP-17, "CLUSTER LID C" .



(R) Display Unit (With NAVI Models)

Remove display unit. Refer to AV-99, "Removal and Installation of Display Unit" .

(S) Front Pillar Garnish

Pull to inside of vehicle, disconnect metal clips and remove front pillar garnish. Refer to EI-35, "BODY SIDE TRIM" .

(T) Instrument Driver Panel Upper

1. Remove screws.
2. Disconnect metal clips, then remove instrument driver panel upper.

(U) Instrument Passenger Panel Upper

1. Remove screws.
2. Disconnect metal clips, then remove instrument passenger panel upper.

(V) Instrument Side Finisher (RH)

Using a screwdriver wrapped with tape, pry up and remove instrument side finisher.
Disconnect from metal clip and pull toward you.

(W) Instrument Panel

Remove bolts, nut and screws, and remove instrument panel from passenger door opening portion.

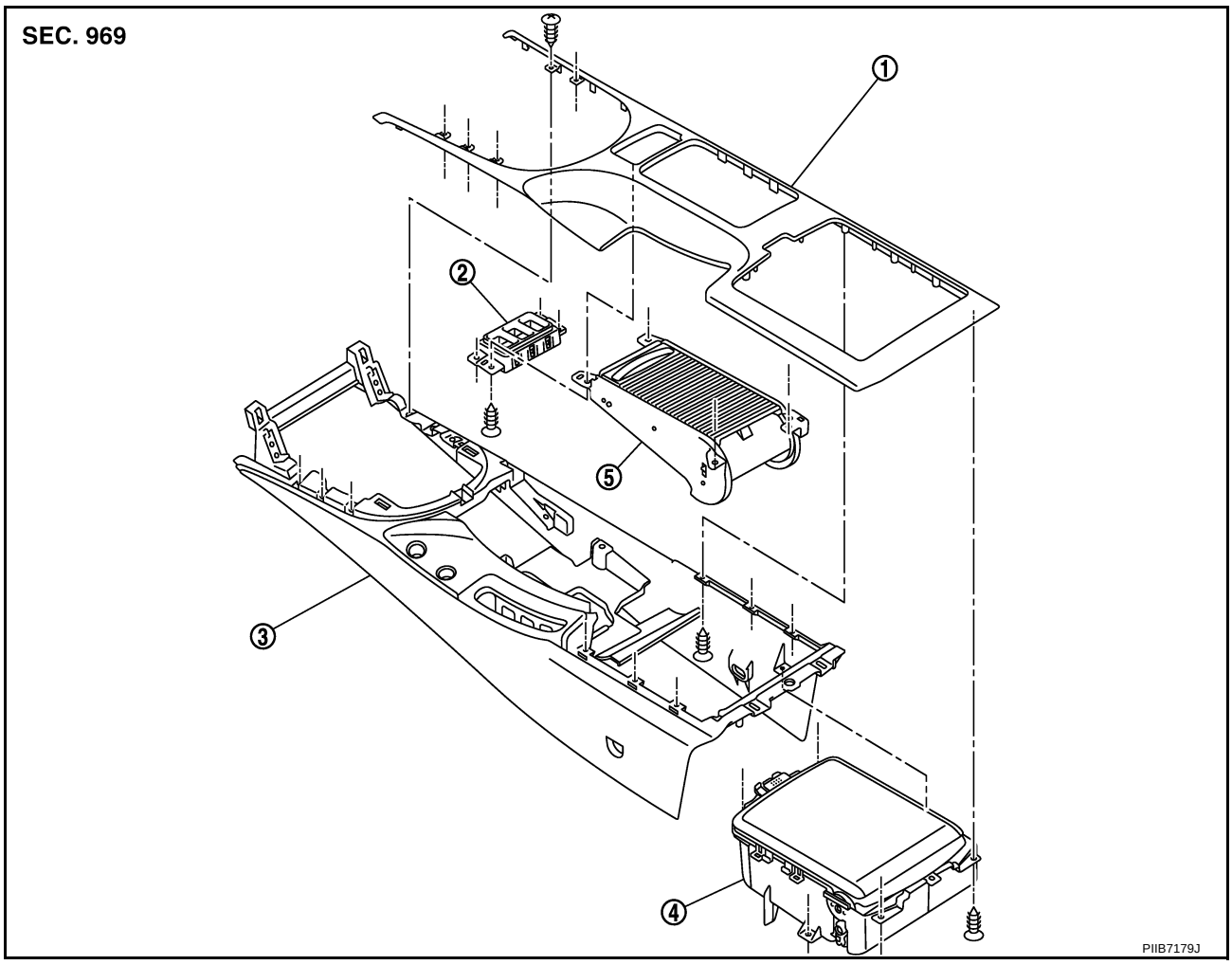
INSTALLATION

To install, reverse the removal procedure sequence.
Assemble the following three parts carefully.

Disassembly and Assembly

NIS0009A

CENTER CONSOLE



1. Console body upper
2. Switch bracket
3. Console body lower
4. Console rear pocket
5. Cup holder

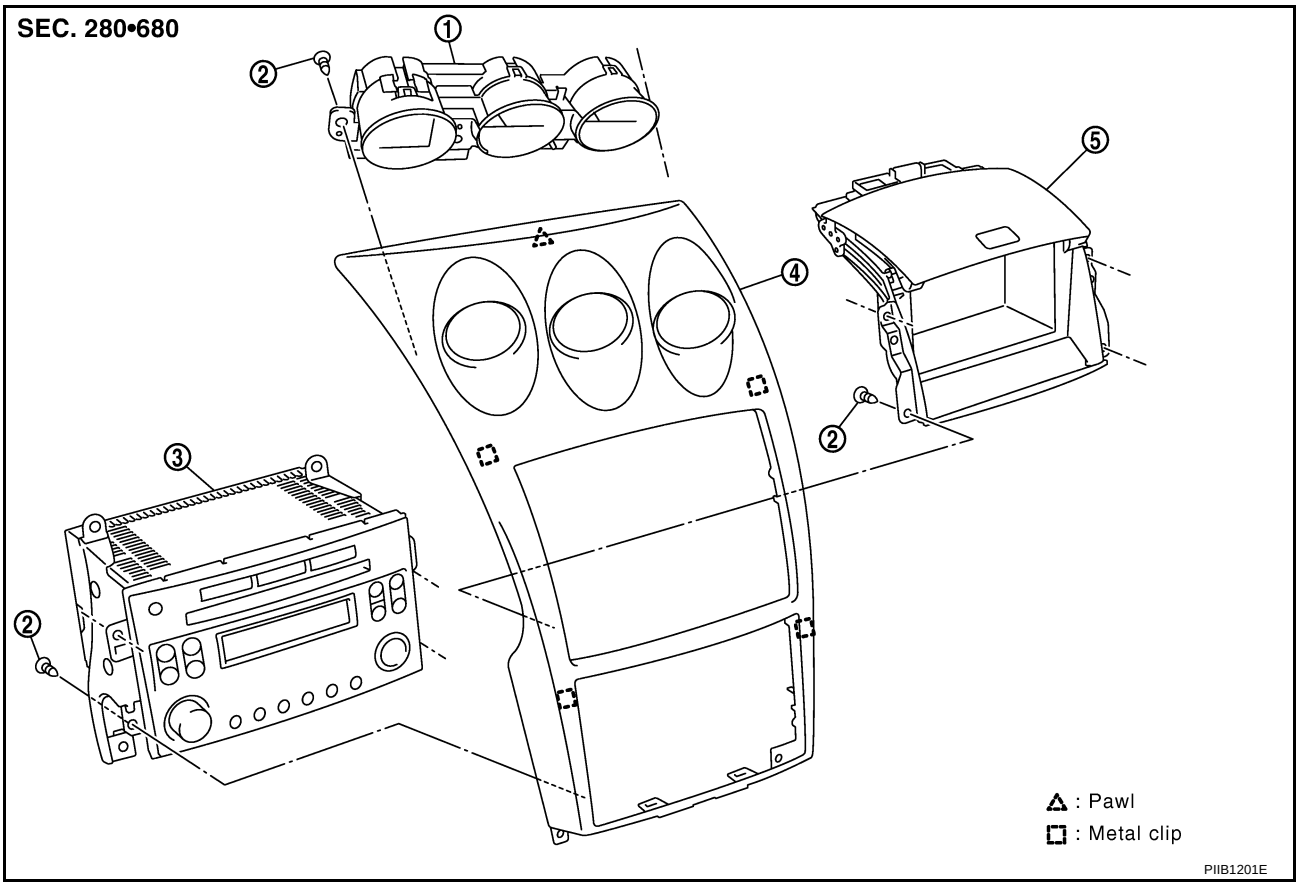
Disassembly

1. Remove screws, remove console body upper.
2. Remove screws, and then remove console rear pocket from console body lower.
3. Remove screws, and then remove switch bracket from console body upper.
4. Remove screws, and then remove cup holder from console body upper.

Assembly

Assemble in the reverse order of disassembly.

CLUSTER LID C



1. Triple meter
2. Screw
3. Audio
4. Cluster lid C
5. Instrument upper box

Disassembly

1. Remove screws, and then triple meter.
2. Remove screws, and then instrument upper box. (Without NAVI models)
3. Remove screws, and then audio unit. Refer to AV-46, "Removal and Installation of Audio Unit (Base system)" ,AV-46, "Locking CD Auto Changer Mechanism (Audio unit of BOSE system)" and AV-47, "Removal and Installation of Audio Unit (BOSE system)" .

Assembly

Assemble in the reverse order of disassembly.

SECTION LAN

LAN SYSTEM

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CAN Communication Circuit 74

PRECAUTIONS

PFP:00001

Precautions for Trouble Diagnosis

NKS004PA

CAUTION:

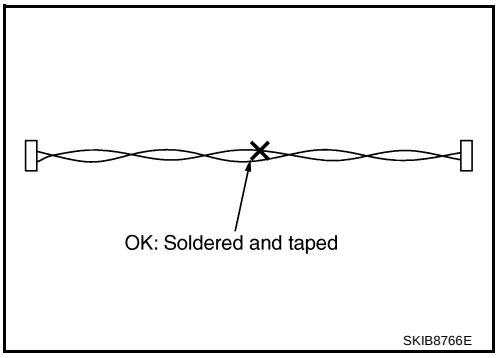
- **Never apply 7.0 V or more to the measurement terminal.**
- **Use a tester with open terminal voltage of 7.0 V or less.**
- **Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.**

Precautions for Harness Repair

NKS004PB

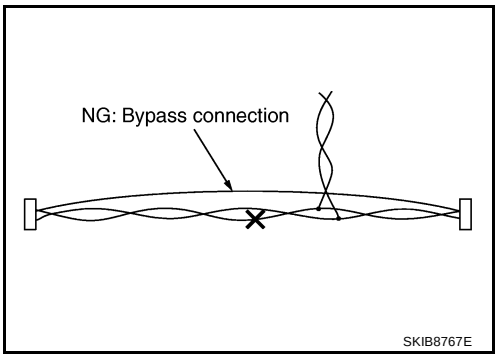
- Solder the repaired area and wrap tape around the soldered area.

  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.

  NOTE:
  Bypass connection may cause CAN communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



- Replace the applicable harness as an assembly if error is detected on the shield lines of CAN communication line.

SYSTEM DESCRIPTION

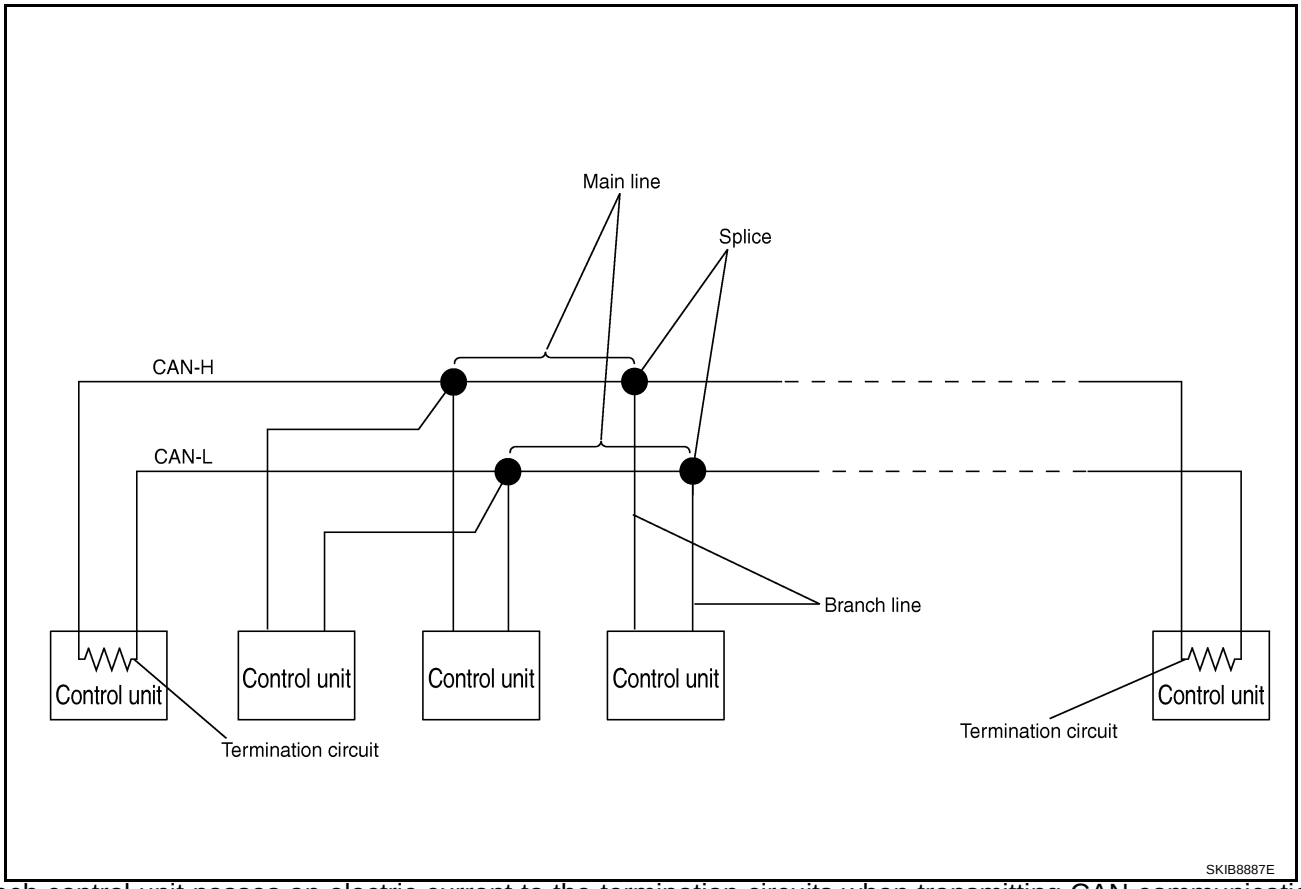
PFP:00000

CAN Communication System

NKS004PC

- CAN communication is a multiplex communication system. This enables the system to transmit and receive large quantities of data at high speed by connecting control units with two communication lines (CAN-H and CAN-L).
- Control units on the CAN network transmit signals using the CAN communication control circuit. They receive only necessary signals from other control units to operate various functions.
- CAN communication lines adopt twisted-pair line style (two lines twisted) for noise immunity.

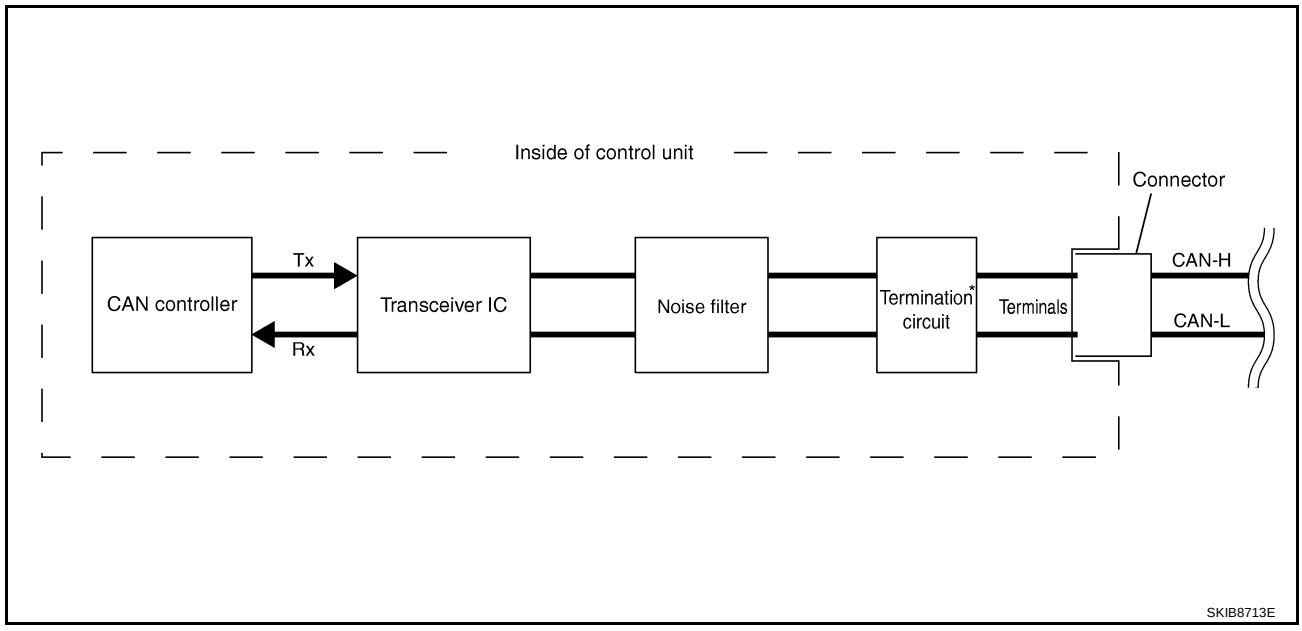
SYSTEM DIAGRAM



Each control unit passes an electric current to the termination circuits when transmitting CAN communication signal. The termination circuits produce an electrical potential difference between CAN-H and CAN-L. CAN communication system transmits and receives CAN communication signals by the potential difference.

Component	Description
Main line	CAN communication line between splices
Branch line	CAN communication line between splice and a control unit
Splice	A point connecting a branch line with a main line
Termination circuit	Refer to LAN-5, "CAN COMMUNICATION CONTROL CIRCUIT" .

CAN COMMUNICATION CONTROL CIRCUIT



Component	System description
CAN controller	It controls CAN communication signal transmission and reception, error detection, etc.
Transceiver IC	It converts digital signal into CAN communication signal, and CAN communication signal into digital signal.
Noise filter	It eliminates noise of CAN communication signal.
Termination circuit* (Resistance of approx. 120 Ω)	It produces potential difference.

*: These are the only control units wired with both ends of CAN communication system.

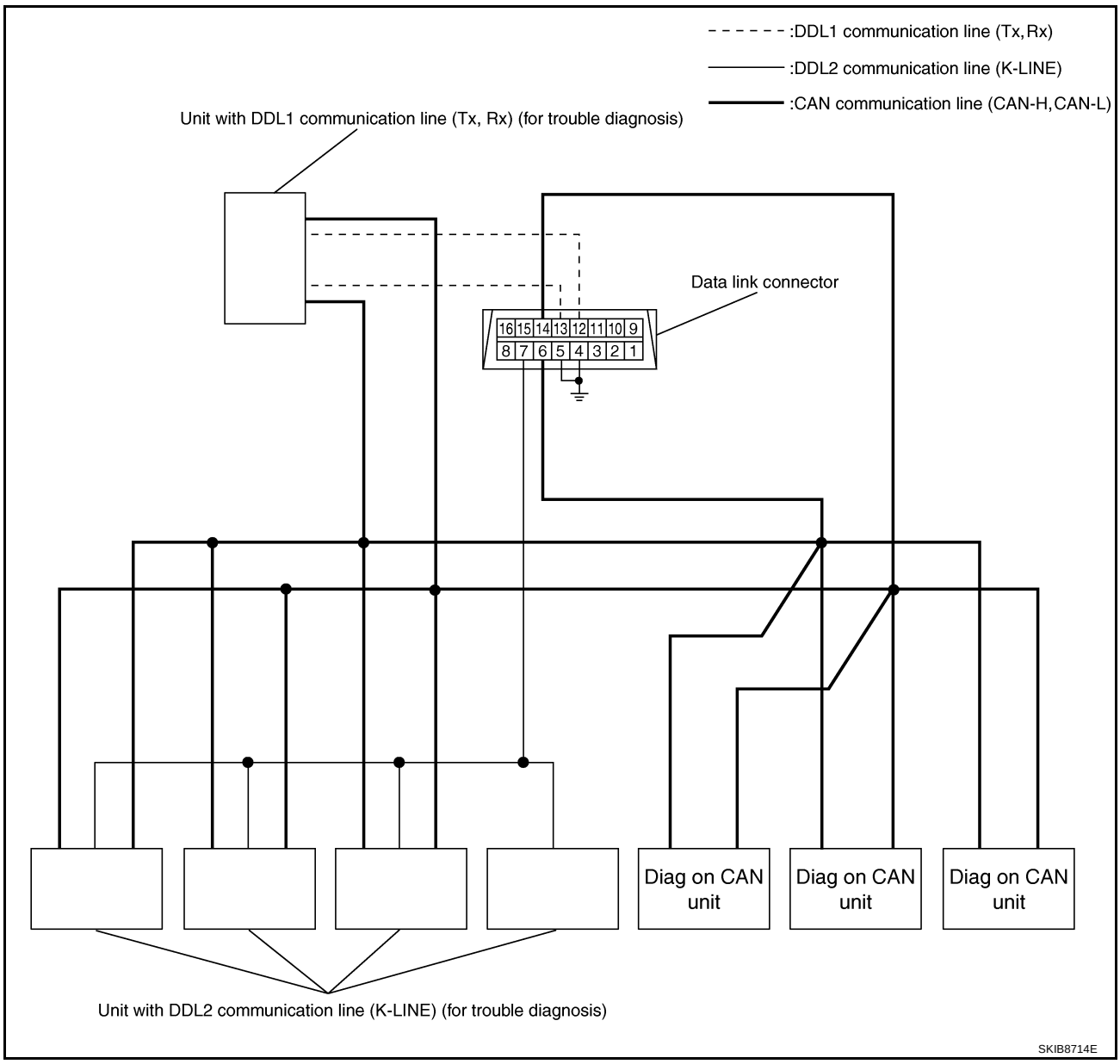
Diag on CAN

NKS004PD

DESCRIPTION

"Diag on CAN" is a diagnosis using CAN communication instead of previous DDL1 and DDL2 communication line, between control unit and diagnosis unit.

SYSTEM DIAGRAM



Name	Harness	Description
DDL1	Tx Rx	It is used for trouble diagnosis. (CAN-H and CAN-L are used for controlling)
DDL2	K-LINE	It is used for trouble diagnosis. (CAN-H and CAN-L are used for controlling)
Diag on CAN	CAN-H CAN-L	It is used for trouble diagnosis and control.

TROUBLE DIAGNOSIS

PFP:00004

Condition of Error Detection

NKS004PE

"U1000" or "U1001" is indicated on SELF-DIAG RESULTS on CONSULT-III if CAN communication signal is not transmitted or received between units for 2 seconds or more.

CAN COMMUNICATION SYSTEM ERROR

- CAN communication line open (CAN-H, CAN-L, or both)
- CAN communication line short (ground, between CAN communication lines, other harnesses)
- Error of CAN communication control circuit of the unit connected to CAN communication line

WHEN INDICATED "U1000" OR "U1001" IS INDICATED EVEN THOUGH CAN COMMUNICATION SYSTEM IS NORMAL

- Removal/installation of parts: Error may be detected when removing and installing CAN communication unit and related parts while turning the ignition switch ON. (A DTC except for CAN communication may be detected.)
- Fuse blown out (removed): CAN communication of the unit may cease.
- Voltage drop: Error may be detected if voltage drops due to discharged battery when turning the ignition switch ON (Depending on the control unit which carries out CAN communication).
- Error may be detected if the power supply circuit of the control unit, which carries out CAN communication, malfunctions (Depending on the control unit which carries out CAN communication).
- Error may be detected if reprogramming is not completed normally.

NOTE:
CAN communication system is normal if "U1000" or "U1001" is indicated on SELF-DIAG RESULTS of CONSULT-III under the above conditions. Erase the memory of the self-diagnosis of each unit.

Symptom When Error Occurs in CAN Communication System

NKS004PF

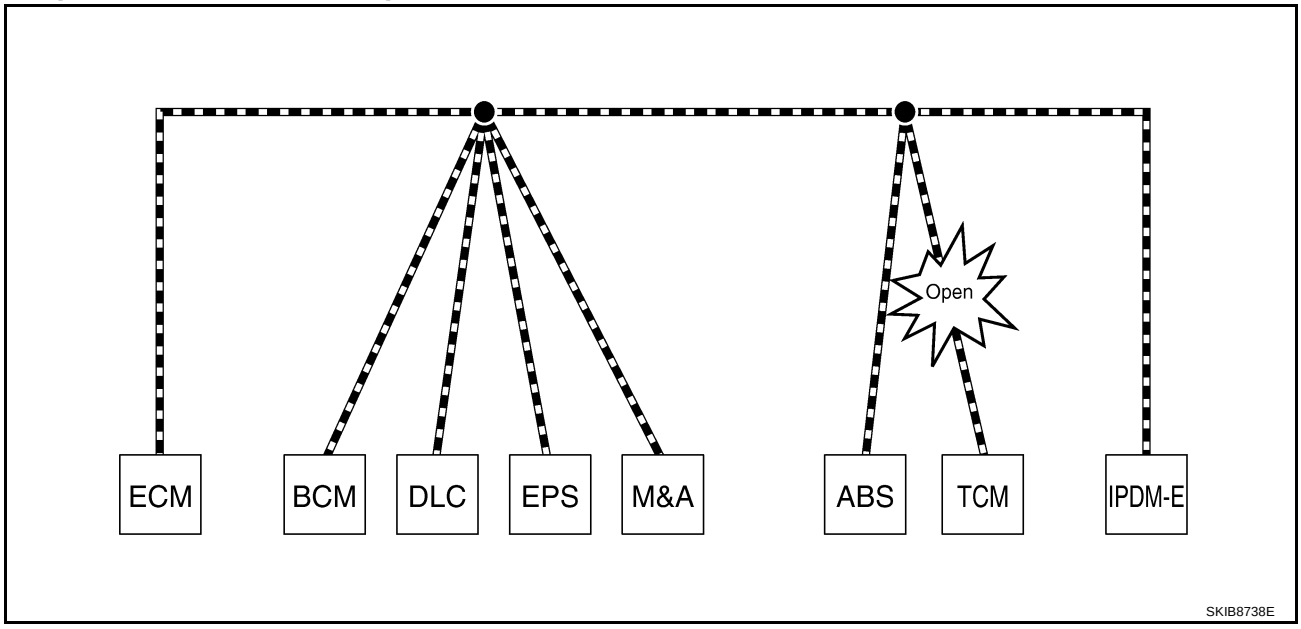
In CAN communication system, multiple units mutually transmit and receive signals. Each unit cannot transmit and receive signals if any error occurs on CAN communication line. Under this condition, multiple control units related to the root cause malfunction or go into fail-safe mode.

ERROR EXAMPLE

NOTE:

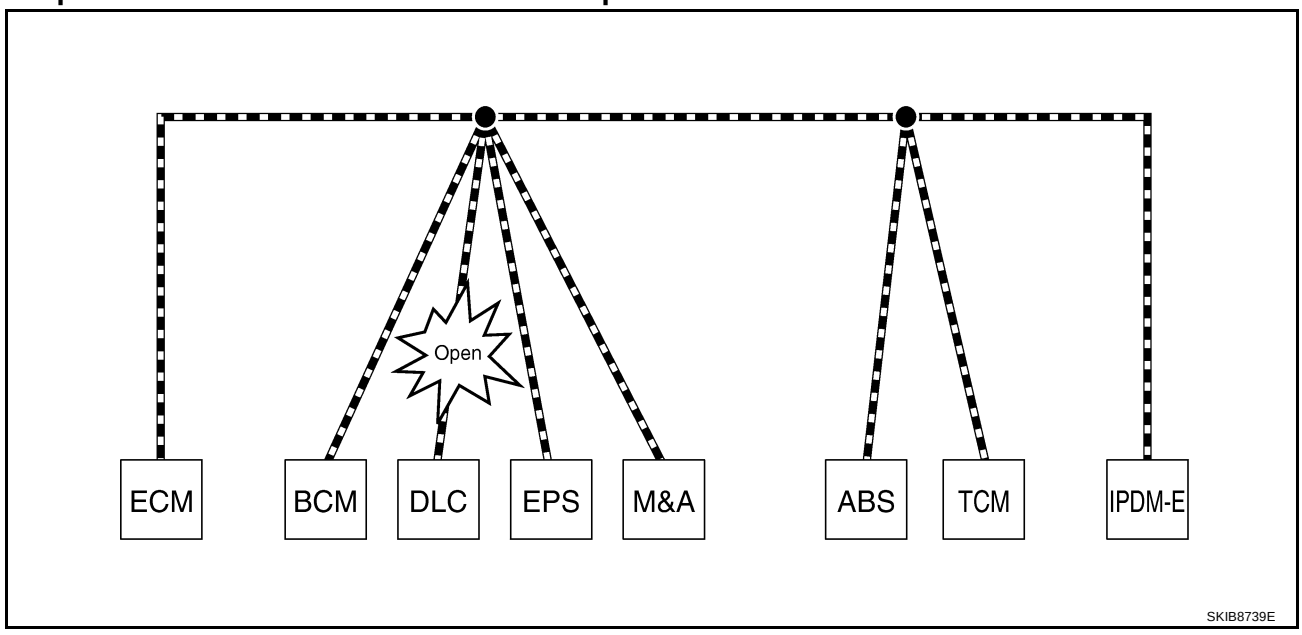
- Each vehicle differs in symptom of each unit under fail-safe mode and CAN communication line wiring.
- Refer to LAN-41, "Abbreviation List" for the unit abbreviation.

Example: TCM branch line open circuit



Unit name	Symptom
ECM	Engine torque limiting is affected, and shift harshness increases.
BCM	Reverse warning chime does not sound.
EPS control unit	Normal operation.
Combination meter	● Shift position indicator and OD OFF indicator turn OFF. ● Warning lamps turn ON.
ABS actuator and electric unit (control unit)	Normal operation.
TCM	No impact on operation.
IPDM E/R	Normal operation.

Example: Data link connector branch line open circuit



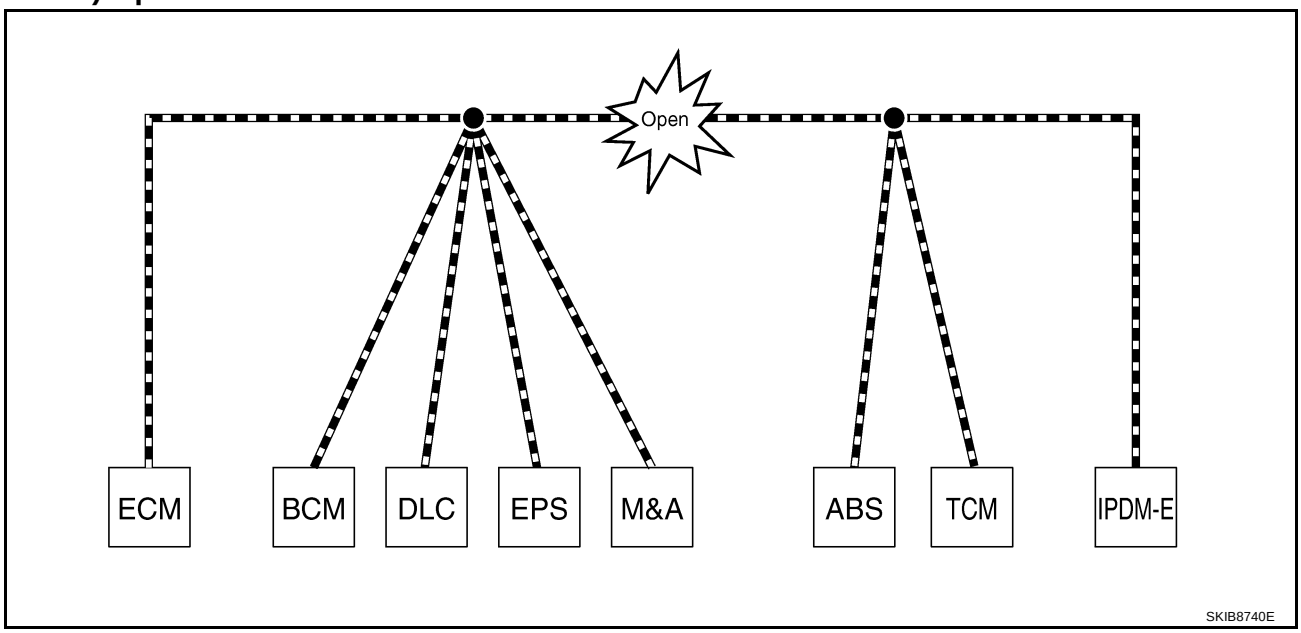
Unit name	Symptom
ECM	Normal operation.
BCM	
EPS control unit	
Combination meter	
ABS actuator and electric unit (control unit)	
TCM	
IPDM E/R	

NOTE:

- When data link connector branch line is open, transmission and reception of CAN communication signals is not affected. Therefore, no symptoms occur. However, be sure to repair malfunctioning circuit.
- When data link connector branch line is open, “ECU list” displayed on the CONSULT-III “CAN DIAG SUPPORT MNTR” may be the same as when the CAN communication line has short-circuit. However, symptoms differ depending on the case. See below chart for the differences.

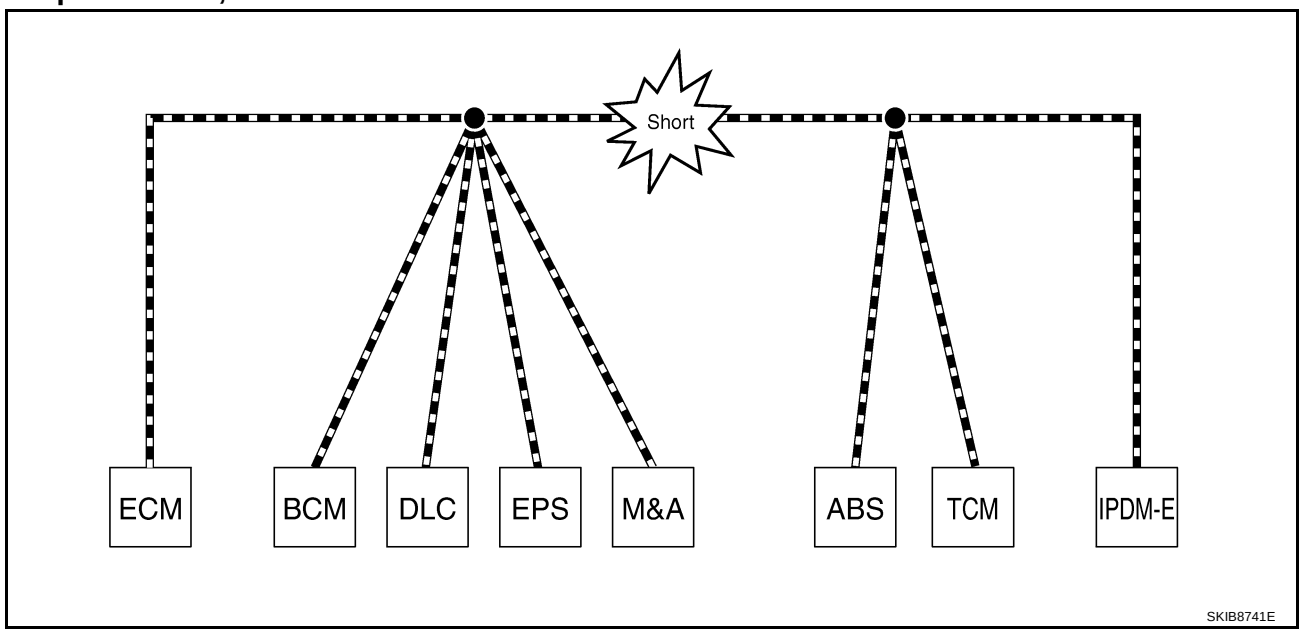
	“ECU list” on the “CAN DIAG SUPPORT MNTR” (CONSULT-III)	Difference of symptom
Data link connector branch line open circuit	All Diag on CAN units are not indicated.	Normal operation.
CAN-H, CAN-L harness short-circuit		Most the units which are connected to the CAN communication system enter fail-safe mode or are deactivated.

Example: Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Open Circuit



Unit name	Symptom
ECM	Engine torque limiting is affected, and shift harshness increases.
BCM	● Reverse warning chime does not sound. ● The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position.
EPS control unit	The steering effort increases.
Combination meter	● The shift position indicator and OD OFF indicator turn OFF. ● The speedometer is inoperative. ● The odo/trip meter stops.
ABS actuator and electric unit (control unit)	Normal operation.
TCM	No impact on operation.
IPDM E/R	When the ignition switch is ON, ● The headlamps (Lo) turn ON. ● The cooling fan continues to rotate.

Example: CAN-H, CAN-L Harness Short Circuit



Unit name	Symptom
ECM	● Engine torque limiting is affected, and shift harshness increases. ● Engine speed drops.
BCM	● Reverse warning chime does not sound. ● The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position. ● The room lamp does not turn ON. ● The engine does not start (if an error or malfunction occurs while turning the ignition switch is OFF.) ● The steering lock does not release (if an error or malfunction occurs while turning the ignition switch is OFF.)
EPS control unit	The steering effort increases.
Combination meter	● The tachometer and the speedometer do not move. ● Warning lamps turn ON. ● Indicator lamps do not turn ON.
ABS actuator and electric unit (control unit)	Normal operation.
TCM	No impact on operation.
IPDM E/R	When the ignition switch is ON, ● The headlamps (Lo) turn ON. ● The cooling fan continues to rotate.

Self-Diagnosis

NKS004PG

DTC	Self-diagnosis item (CONSULT-III indication)	DTC detection condition	Inspection/Action
U1000	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.	Refer to LAN-15, "TROUBLE DIAGNOSES WORK FLOW" .
		When a control unit (except for ECM) is not transmitting or receiving CAN communication signal for 2 seconds or more.	
U1001	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	
U1002	SYSTEM COMM	When a control unit is not transmitting or receiving CAN communication signal for 2 seconds or less.	Start the inspection. Refer to the applicable section of the indicated control unit.
U1010	CONTROL UNIT [CAN]	When an error is detected during the initial diagnosis for CAN controller of each control unit.	Replace the control unit indicating “U1010”.

CAN Diagnostic Support Monitor

NKS004PH

CONSULT-III and CAN diagnostic support monitor (on-board diagnosis function) are used for detecting root cause.

MONITOR ITEM (CONSULT-III)

Example: CAN DIAG SUPPORT MNTR indication

Without PAST

ECM		
	PRSNT	PAST
INITIAL DIAG	OK	
TRANSMIT DIAG	OK	
TCM	OK	
VDC/TCS/ABS	UNKWN	
METER/M&A	OK	
ICC	UNKWN	
BCM/SEC	OK	
IPDM E/R	OK	

With PAST

ECM		
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	-	-
METER/M&A	OK	OK
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	OK	OK
EPS	-	-
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	OK	OK

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Without PAST

Item	PRSNT	Description
Initial diagnosis	OK	Normal at present
	NG	Control unit error (Except for some control units)
Transmission diagnosis	OK	Normal at present
	UNKWN	Unable to transmit signals for 2 seconds or more.
		Diagnosis not performed
Control unit name (Reception diagnosis)	OK	Normal at present
	UNKWN	Unable to receive signals for 2 seconds or more.
		Diagnosis not performed
		No control unit for receiving signals. (No applicable optional parts)

With PAST

Item	PRSNT	PAST	Description
Transmission diagnosis	OK	OK	Normal at present and in the past
		1 – 39	Normal at present, but unable to transmit signals for 2 seconds or more in the past. (The number indicates the number of ignition switch cycles from OFF to ON.)
	UNKWN	0	Unable to transmit signals for 2 seconds or more at present.
Control unit name (Reception diagnosis)	OK	OK	Normal at present and in the past
		1 – 39	Normal at present, but unable to receive signals for 2 seconds or more in the past. (The number indicates the number of ignition switch cycles from OFF to ON.)
	UNKWN	0	Unable to receive signals for 2 seconds or more at present
	–	–	Diagnosis not performed.
			No control unit for receiving signals. (No applicable optional parts)

MONITOR ITEM (ON-BOARD DIAGNOSIS)

NOTE:
For some models, CAN communication diagnosis result is received from the vehicle monitor. (CONSULT-III is not available.)

Example: Vehicle Display

Item	Result indicated	Error counter	Description
CAN_COMM (Initial diagnosis)	OK	0	Normal at present
	NG	1 – 50	Control unit error (The number indicates how many times diagnosis has been run.)
CAN_CIRC_1 (Transmission diagnosis)	OK	0	Normal at present
	UNKWN	1 – 50	Unable to transmit for 2 seconds or more at present. (The number indicates how many times diagnosis has been run.)
CAN_CIRC_2 – 9 (Reception diagnosis of each unit)	OK	0	Normal at present
	UNKWN	1 – 50	Unable to transmit for 2 seconds or more at present. (The number indicates how many times diagnosis has been run.)
			Diagnosis not performed.
			No control unit for receiving signals. (No applicable optional parts)

TROUBLE DIAGNOSES WORK FLOW

PFP:00004

Information Needed for Trouble Diagnosis

NKS004PI

CAN communication system performs trouble diagnosis with the following tools.

Tool	Usage
Interview sheet	For filling in vehicle information and interview with customer.
Data sheet	For copying on-board diagnosis data.
Diagnosis sheet	For detecting the root cause. (Diagnosis sheet includes system diagram for every CAN system type)
ECU list (On the “CAN DIAG SUPPORT MNTR”)	For checking the condition of control units and the status of CAN communication.
SELF-DIAG RESULTS (CONSULT-III)	
CAN DIAG SUPPORT MNTR (CONSULT-III)	
CAN communication signal chart	For converting information received from a customer into CAN communication signal transmission and reception. This information can be used to judge whether a circuit between control units is normal or abnormal.
Abbreviation list	For checking abbreviations in CAN communication signal chart and diagnosis sheet.

How to Use CAN Communication Signal Chart

NKS004PJ

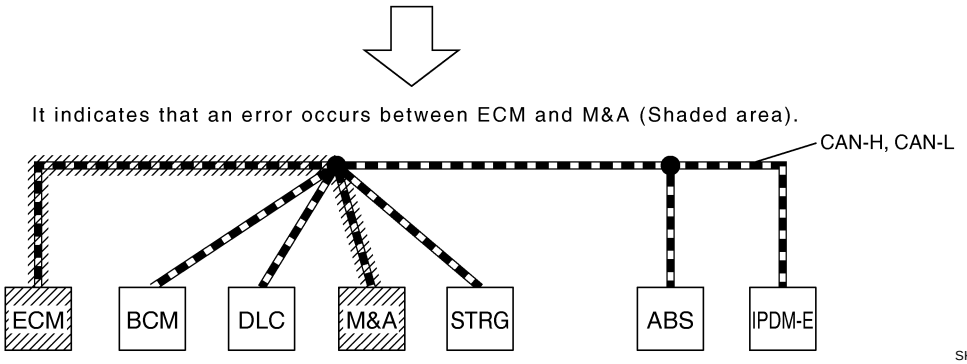
The CAN communication signal chart lists the signals needed for trouble diagnosis. It is useful for detecting the root cause by finding a signal related to the symptom, and by checking transmission and reception unit.

Example: Tachometer does not move even though the engine rotates.

T: Transmit R: Receive

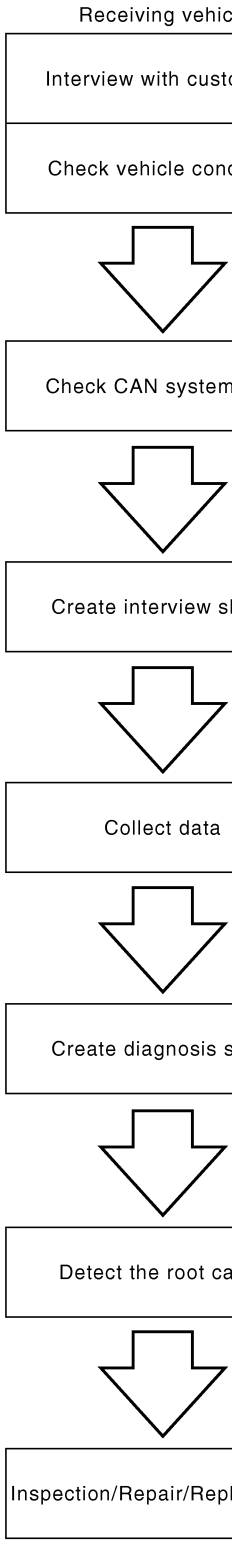
Signal name/Connecting unit	ECM	BCM	M&A	STRG	ABS	IPDM-E
A/C compressor feedback signal	T		R			
A/C compressor request signal	T					R
Accelerator pedal position signal	T				R	
Cooling fan motor operation signal	T					R
Engine coolant temperature signal	T		R			
Engine speed signal	T		R		R	
Fuel consumption monitor signal	T		R			
Malfunction indicator lamp signal	T		R			
A/C switch signal	R	T				
Ignition switch signal		T				R
Sleep/wake up signal		T	R			R

No communication between ECM and M&A.



Trouble Diagnosis Flow Chart

NKS004PK



- Interview with customer. (Since when? In which condition? What symptoms? etc.)
- Check whether or not “U1000” or “U1001” is indicated on self-diagnosis results.
- Check whether or not it is reproduced error.
- Check CAN system type with CAN system type specification chart.
- Fill in interviewed items from customer on the interview sheet.
- Print out or save CONSULT-III data (SELF-DIAG RESULTS and CAN DIAG SUPPORT MNTR).
- Check the diagnosis result of CAN communication with on-board diagnosis function, and copy the item on on-board diagnosis copy sheet.
- Print out applicable CAN system type diagnosis sheet.
- Make sure that all ECUs are received, referring to “ECU list” on the CAN DIAG SUPPORT MNTR.
- Detect the root cause with diagnosis sheet.
- Inspect the root cause and repair or replace the applicable parts.

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Trouble Diagnosis Procedure

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INTERVIEW WITH CUSTOMER

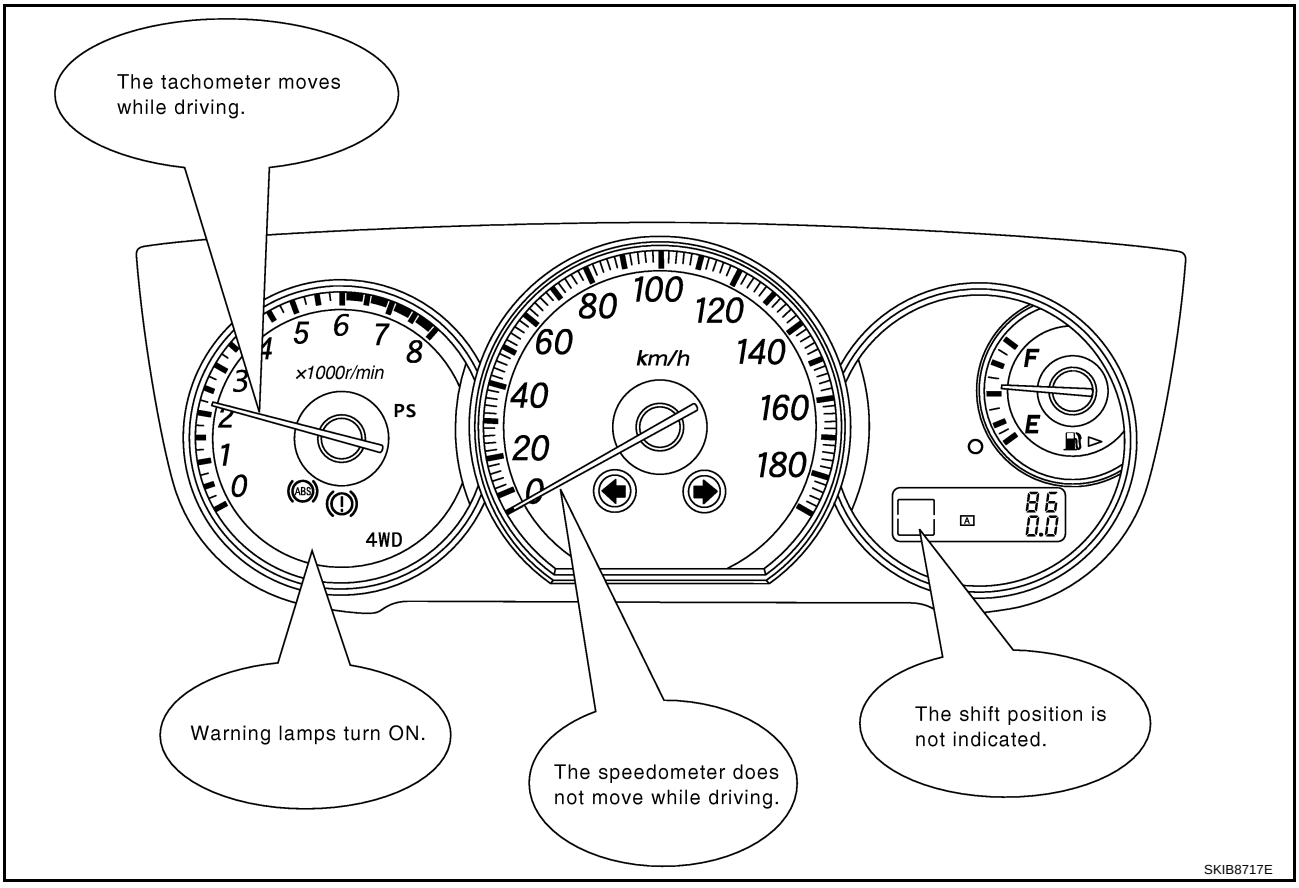
Interview with the customer is important to detect the root cause of CAN communication system errors and to understand vehicle condition and symptoms for proper trouble diagnosis.

Points in interview

- What: Parts name, system name
- When: Date, Frequency
- Where: Road condition, Place
- In what condition: Driving condition/environment
- Result: Symptom

NOTE:

- Check normal units as well as error symptoms.
  - Example: Circuit between ECM and the combination meter is judged normal if the customer indicates tachometer functions normally.
- When a CAN communication system error is present, multiple control units may malfunction or go into fail-safe mode.
- Indication of the combination meter is important to detect the root cause because it is the most obvious from the customer, and it performs CAN communication with many units.



INSPECTION OF VEHICLE CONDITION

- Check whether or not “U1000” or “U1001” is indicated on “SELF-DIAG RESULTS” by CONSULT-III.

  NOTE:
  Root cause cannot be detected using the procedure in this section if “U1000” or “U1001” is not indicated.
- Check whether the symptom is reproduced or not.

  NOTE:
  - Never turn the ignition switch OFF or disconnect the battery cable while the reproducing the error. The error may temporarily correct itself, making it difficult to determine the root cause.
  - The procedures for present errors differ from the procedures for past errors. Refer to LAN-25, "DETECT THE ROOT CAUSE" .

CHECK OF CAN SYSTEM TYPE (HOW TO USE CAN SYSTEM TYPE SPECIFICATION CHART)

Determine CAN system type based on vehicle equipment. Then choose the correct diagnosis sheet.

NOTE:

There are two styles for CAN system type specification charts. Depending on the number of available system types, either style A or style B may be used.

CAN System Type Specification Chart (Style A)

NOTE:

CAN system type is easily checked with the vehicle equipment identification information shown in the chart.

Example:

Vehicle is equipped as follows: Wagon, AWD, VQ35DE, CVT, VDC, and Intelligent Key system. (oval shows an example of CAN system type.)

CAN System Specification Chart

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

Body type	Wagon					
Axle	2WD				AWD	
Engine	QR25DE		VQ35DE			
Transmission	A/T		CVT			
Brake control	ABS				VDC	
Intelligent Key system		×		×		×
CAN system type	1	2	3	4	5	6
Diagnosis sheet	(XX-XX)	(XX-XX)	(XX-XX)	(XX-XX)	(XX-XX)	(XX-XX)
CAN communication signal chart	XX-XX. "TYPE 1/TYPE 2"		XX-XX. "TYPE 3/TYPE 4"		XX-XX. "TYPE 5/TYPE 6"	

Check the vehicle equipment with the vehicle identification number plate.

Check the vehicle equipment.

The number indicates the CAN system type of the vehicle.

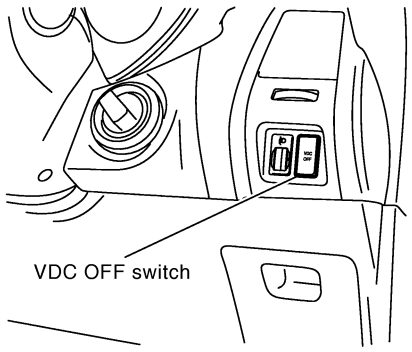
×: Applicable

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

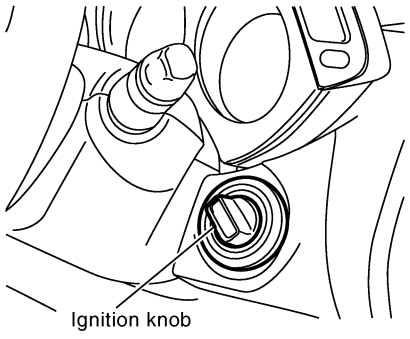
NOTE:

Check CAN system type from the vehicle shape and equipment.

With VDC



With Intelligent Key system



In the above example,

- Checking VDC OFF switch leads to judge whether or not VDC is equipped.
- Checking the ignition knob leads to judge whether or not Intelligent Key system is equipped.

For the above case, CAN system type is "6".

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CAN System Type Specification Chart (Style B)

NOTE:
CAN system type is easily checked with the vehicle equipment identification information shown in the chart.

Example:
Vehicle is equipped as follows: Sedan, 2WD, MR20DE, CVT, ABS, Active AFS, Intelligent Key system, Navigation system and Automatic drive positioner. (⬭ shows an example of CAN system type.)

CAN System Specification Chart

Refer to the specification as shown in the chart.

Body type	Sedan		
Axle	2WD		AWD
Engine	HR15DE	MR20DE	HR15DE
Transmission	A/T	CVT	A/T
Brake control	ABS		
Specification chart	XX.XX "SPECIFICATION CHART A"	YY.YY "SPECIFICATION CHART B"	XX.XX "SPECIFICATION CHART C"

Check the vehicle equipment with the vehicle identification number plate.
Check the vehicle equipment.
Select the applicable vehicle equipment. Refer to the specification chart.

×: Applicable

SPECIFICATION CHART B

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

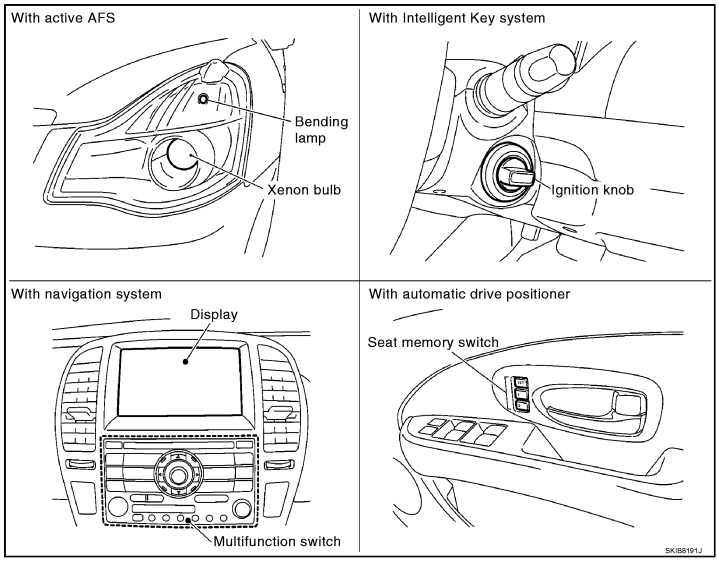
Body type	Sedan											
Axle	2WD											
Engine	MR20DE											
Transmission	CVT											
Brake control	ABS											
Active AFS		×			×	×			×	×		×
Intelligent Key system			×		×		×	×	×	×	×	×
Navigation system				×		×	×		×		×	×
Automatic drive positioner								×		×	×	×
CAN system type	9	10	11	12	13	14	15	16	17	18	19	20
Diagnosis sheet	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX
CAN communication signal chart	XX.XX "TYPE 9/TYPE 10/TYPE 11/TYPE 12/TYPE 13/TYPE 14/TYPE 15/TYPE 16/TYPE 17/TYPE 18/TYPE 19/TYPE 20"											

Check the vehicle equipment.
The number indicates the CAN system type of the vehicle.

×: Applicable

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

NOTE:
Check CAN system type from the vehicle shape and equipment.



In the above example,
- Checking Xenon bulb and bending lamp lead to judge whether or not Active AFS is equipped.
- Checking the ignition knob leads to judge whether or not Intelligent Key system is equipped.
- Checking display and multifunction switch lead to judge whether or not Navigation system is equipped.
- Checking seat memory switch leads to judge whether or not Automatic drive positioner is equipped.

For the above case, CAN system type is "20".

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CREATE INTERVIEW SHEET

Fill out the symptom described by the customer, vehicle condition, and CAN system type on the interview sheet.

Interview Sheet (Example)

CAN Communication System Diagnosis Interview Sheet

Date received: 3, Feb. 2005

Type: DBA-KG11

VIN No.: KG11-005040

Model: BDRARGZ397EDA-E-J-

First registration: 10, Jan. 2005

Mileage: 621

CAN system type: Type 19

Symptom (Results from interview with customer)

- Headlamps suddenly turn ON while driving the vehicle.
- The engine does not restart after stopping the vehicle and turning the ignition switch OFF.
- The cooling fan continues rotating while turning the ignition switch ON.

Condition at inspection

Error Symptom: (Present) / Past

The engine does not start.
While turning the ignition switch ON,
- The headlamps (Lo) turn ON, and the cooling fan continues rotating.
- The interior lamp does not turn ON.

On CONSULT-III screen,
- IPDM E/R is not indicated on SELECT SYSTEM.
- ENGINE: U1001
- BCM, ADAPTIVE LIGHT: U1000

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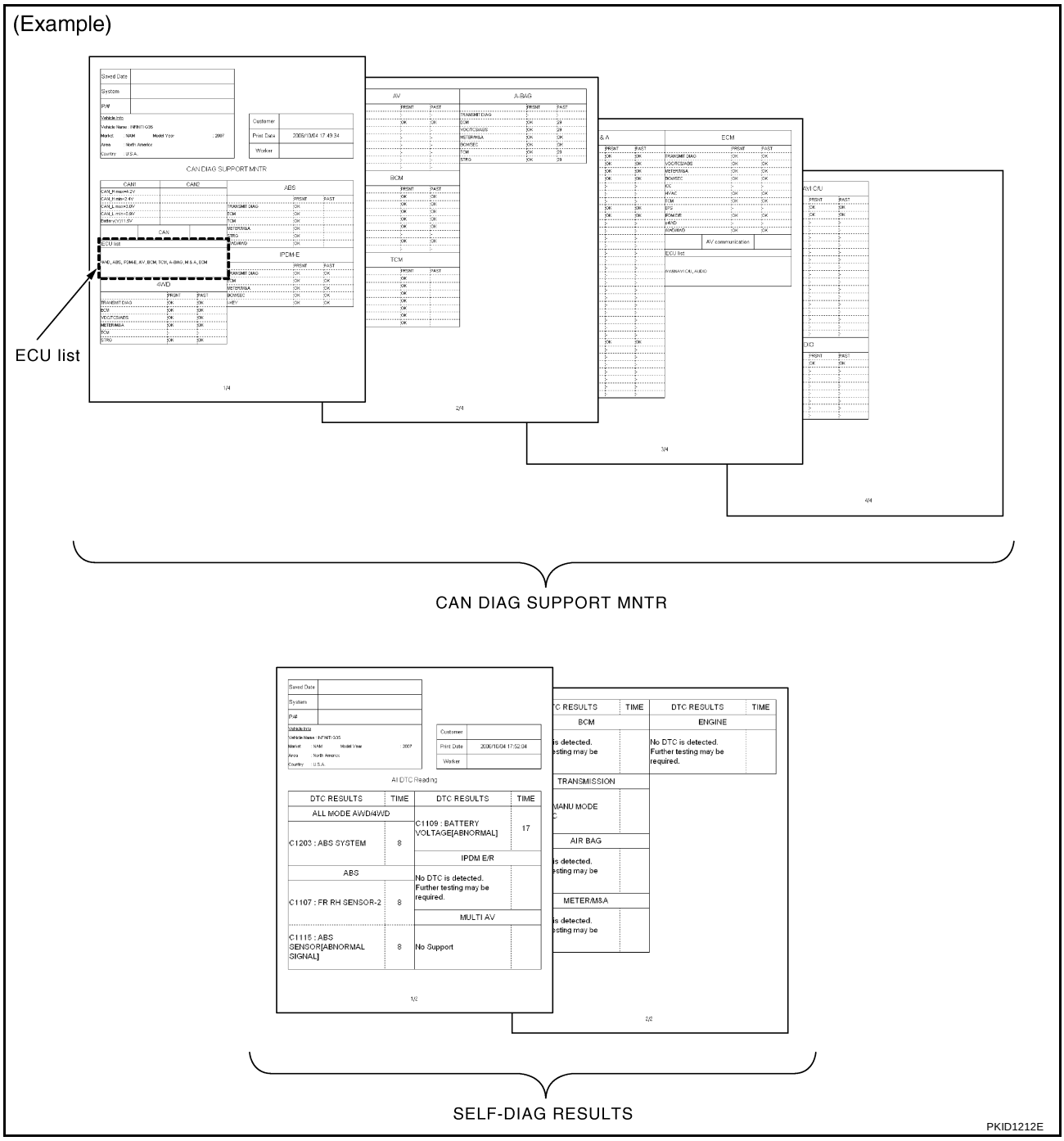
COLLECT DATA

Collect CONSULT-III Data

Print out or save the following CONSULT-III data.

- SELF-DIAG RESULTS
- CAN DIAG SUPPORT MNTR (“ECU list” included)

NOTE:
Some items may not be needed depending on CAN system type of vehicle.



Create On-board Diagnosis Copy Sheet

Display the trouble diagnosis result of CAN communication with the on-board diagnosis function on the vehicle monitor, etc. Copy them on the on-board diagnosis copy sheet.

NOTE:
For some models, CAN communication diagnosis result is received from the vehicle monitor. (CONSULT-III is not available.)

Example: Copy the diagnosis result of CAN communication from the vehicle monitor.

Vehicle monitor indication

CAN DIAG SUPPORT MONITOR

Delete

CAN_COMM	OK	0
CAN_CIRC_1	OK	0
CAN_CIRC_2	UNKWN	12
CAN_CIRC_3	UNKWN	12
CAN_CIRC_4	UNKWN	0
CAN_CIRC_5	OK	0
CAN_CIRC_6	UNKWN	0
CAN_CIRC_7	OK	0
CAN_CIRC_8	UNKWN	0
CAN_CIRC_9	UNKWN	50

Copy

Vehicle monitor (Display control unit) CAN DIAG SUPPORT MONITOR copy sheet

Indication item (Diagnosis item)	Vehicle monitor		Indication item (Diagnosis item)	Vehicle monitor	
	Result indicated	Error counter		Result indicated	Error counter
CAN_COMM (Initial diagnosis)	**OK**	**0**	CAN_CIRC_5 (Receive diagnosis of Unified meter and A/C amp.)	**OK**	**0**
CAN_CIRC_1 (Transmit diagnosis)	**OK**	**0**	CAN_CIRC_6	Not available	
CAN_CIRC_2 (Receive diagnosis of BCM)	**UNKWN**	**12**	CAN_CIRC_7 (Receive diagnosis of IPDM E/R)	**OK**	**0**
CAN_CIRC_3 (Receive diagnosis of ECM)	**UNKWN**	**12**	CAN_CIRC_8	Not available	
CAN_CIRC_4	Not available		CAN_CIRC_9	Not available	

Result indicated: Fill in the indication (OK, NG or UNKWN).
Error counter: Fill in the indicated number.

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CREATE DIAGNOSIS SHEET

NOTE:
Be sure to use the diagnosis sheet for the correct CAN system type.

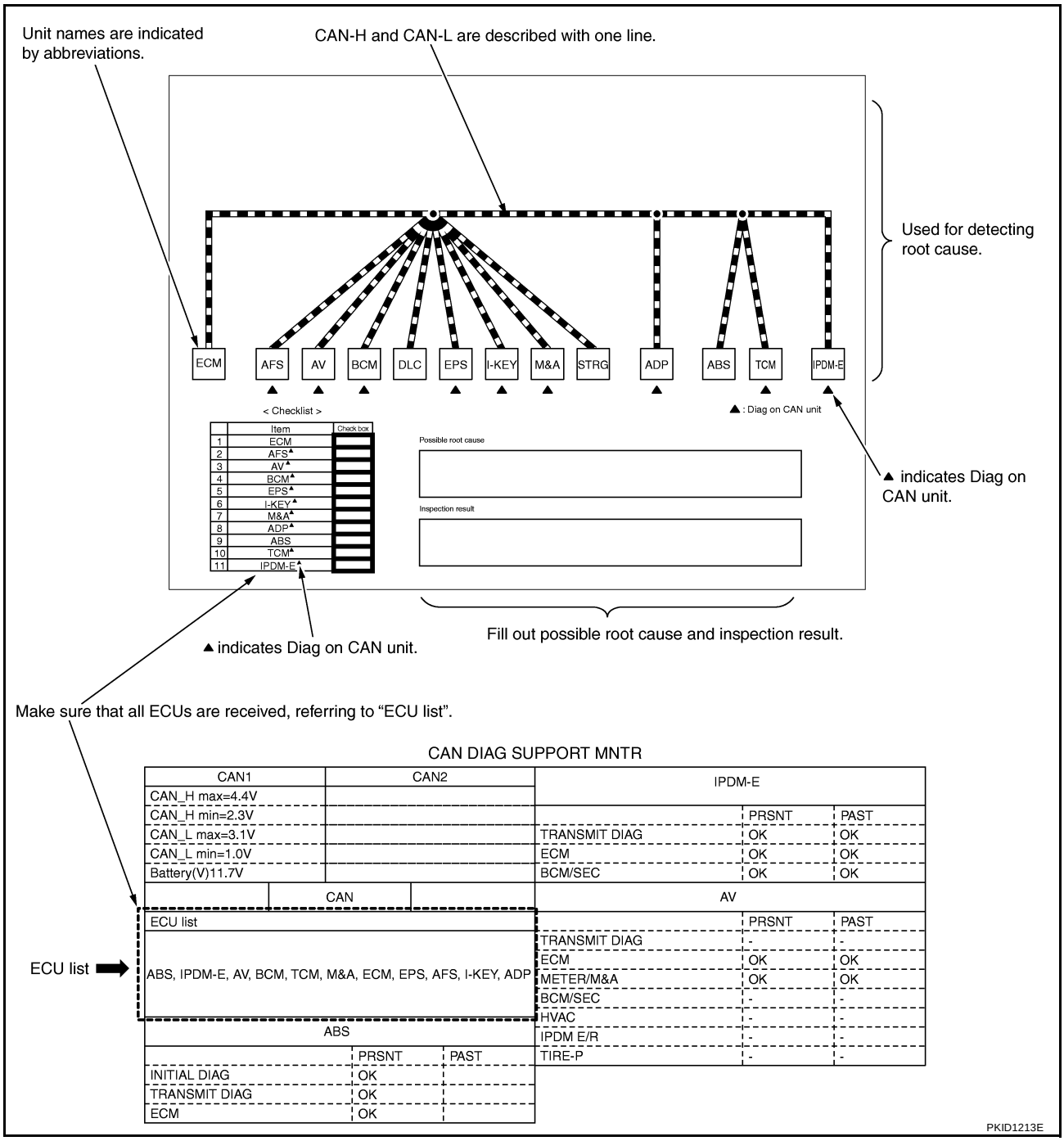
Print Diagnosis Sheet

Print the diagnosis sheet for the applicable CAN system type.

Check Collected Data

Make sure that all ECUs are received, referring to “ECU list”.

- For abbreviations, refer to LAN-41, "Abbreviation List" .



DETECT THE ROOT CAUSE

Identify the root cause using the created diagnosis sheet.

Identifying the root cause

- Draw a line on the diagnosis sheet to indicate the possible cause. Narrow the search.

  NOTE:
  - Color-code when drawing lines.
  - Do not draw a line onto a existing line.
- Drawing a line is not necessary if the circuit is shorted. Refer to LAN-32, "Present Error — Short Circuit —" , LAN-39, "Past Error — Short Circuit —" .

Refer to the following for details of the trouble diagnosis procedure.

- LAN-26, "Present Error — Open Circuit —"
- LAN-32, "Present Error — Short Circuit —"
- LAN-33, "Past Error — Open Circuit —"
- LAN-39, "Past Error — Short Circuit —"

NOTE:
When the root cause appears to be a branch line or short circuit, be sure to check the control unit as well as the communication line.

Present Error — Open Circuit —

Identify the error circuit using information from the “CAN DIAG SUPPORT MNTR” (“ECU list” included).

1. ECU list: Check the items indicated in “ECU list”. Draw a line on the diagnosis sheet to indicate the error circuit.

   NOTE:
   CAN communication line has no error if units other than Diag on CAN units are indicated. An error may be on the power supply of the control unit, DDL1 line or DDL2 line.

a. “TCM” which is Diag on CAN unit, is not indicated on “ECU list”. This indicates that DLC is not receiving a signal from TCM. Draw a line to indicate an error between DLC and TCM (line 1-a in the figure).

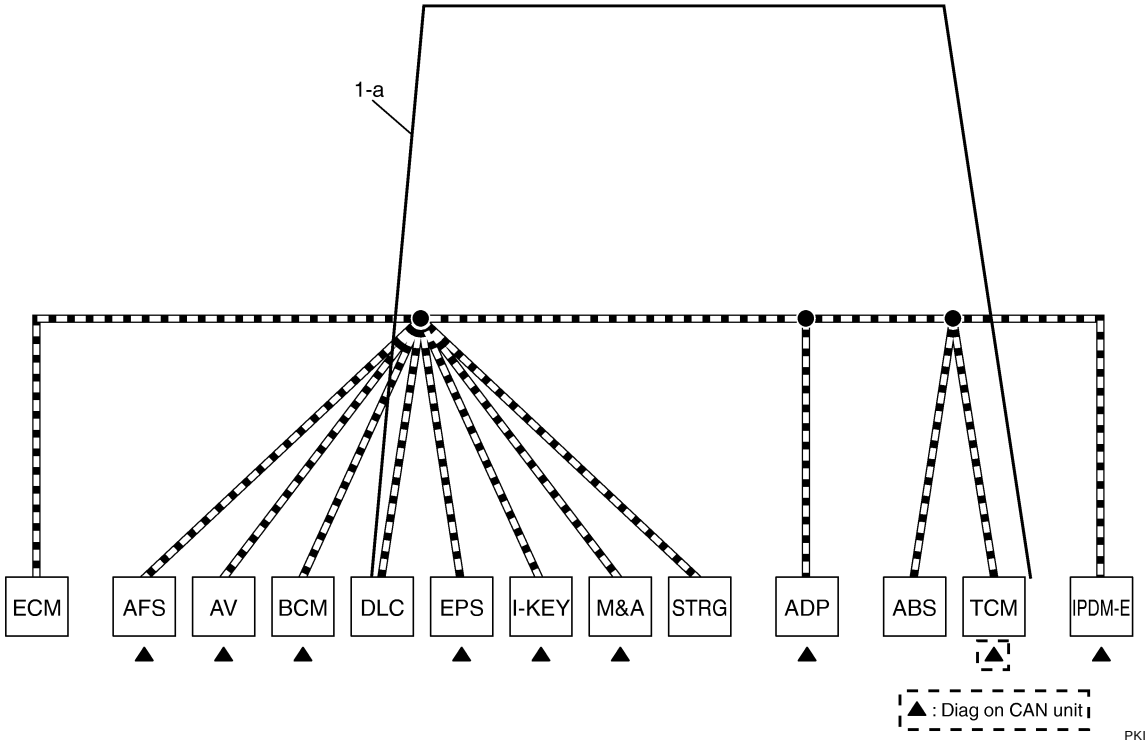
   NOTE:
   - Diag on CAN units are not indicated on the “ECU list” when the CAN line between Diag on CAN unit and the data link connector is open.
   - For a description of Diag on CAN, refer to LAN-6, "Diag on CAN" .

(Example)

CAN DIAG SUPPORT MNTR

CAN1	CAN2	IPDM-E		
CAN_H max=4.3V				
CAN_H min=1.0V			PRSNT	PAST
CAN_L max=3.1V		TRANSMIT DIAG	OK	OK
CAN_L min=0.6V		ECM	OK	OK
Battery(V)11.7V		BCM/SEC	OK	OK

CAN	AV		
ECU list		PRSNT	PAST
	TRANSMIT DIAG	-	-
ABS, IPDM-E, AV, BCM, M&A, ECM, EPS, AFS, I-KEY, ADP	ECM	OK	OK
	METER/M&A	OK	OK
	BCM/SEC	-	-
	HVAC	-	-
	[illegible]	-	



2. CAN DIAG SUPPORT MNTR: Check each item on “CAN DIAG SUPPORT MNTR”. Draw a line on the diagnosis sheet to indicate the error circuit.

a. Reception item of “ECM”: On “TCM”, “UNKWN” is indicated. This means ECM cannot receive the signal from TCM. Draw a line to indicate an error between ECM and TCM (line 2-a in the figure).

NOTE:
If “UNKWN” is indicated on “TRANSMIT DIAG”, then the control unit cannot transmit CAN communication signal to each unit. Draw a line between the control unit and the splice.

b. Reception item of “AFS”: On “TCM”, “UNKWN” is indicated. This means AFS cannot receive the signal from TCM. Draw a line to indicate an error between AFS and TCM (line 2-b in the figure).

c. Reception item of “AV”: “UNKWN” is not indicated. This indicates normal communication between AV and its receiving units. Do not draw any line.

(Example)

ECM

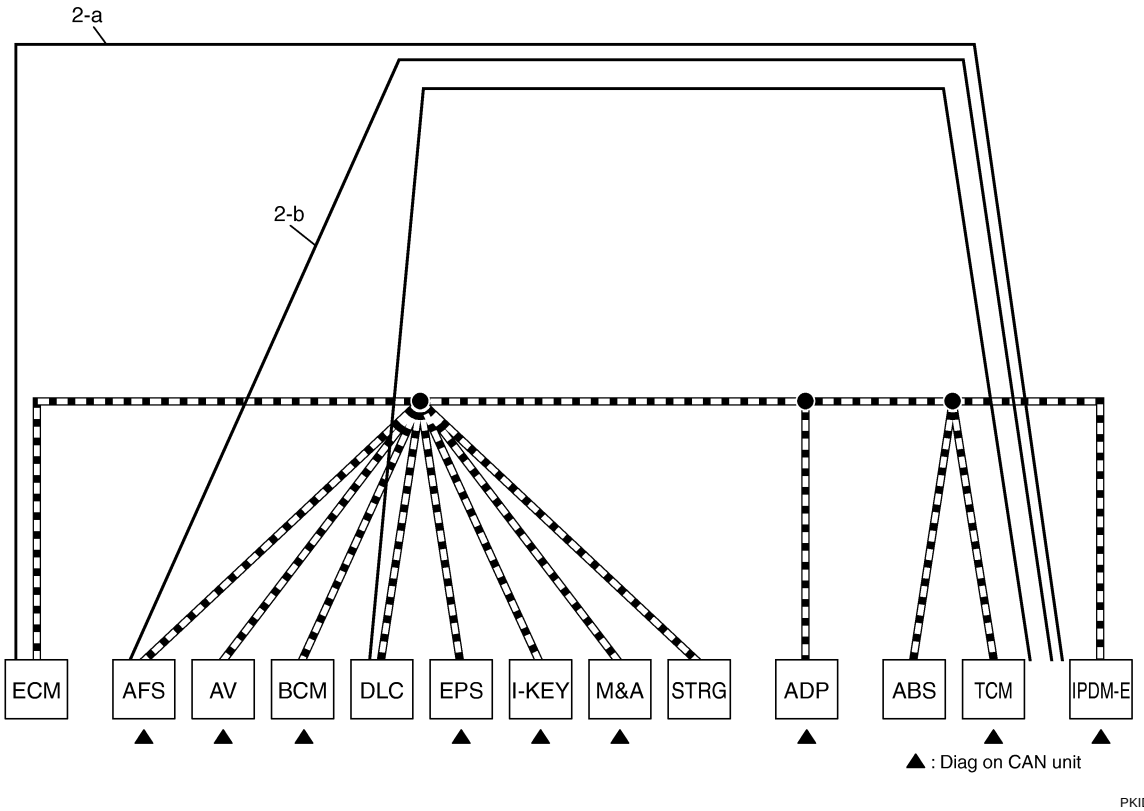
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	OK	OK
METER/M&A	-	-
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	UNKWN	0
EPS	OK	OK
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	-	-

AFS

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	OK
METER/M&A	OK	OK
TCM	UNKWN	0
STRG	OK	OK
EPS	-	-
IPDM E/R	OK	OK

AV

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	OK
METER/M&A	OK	OK
BCM/SEC	-	-
HVAC	-	-
IPDM E/R	-	-
TIRE-P	-	-



d. Reception item of “BCM”: On “TCM”, “UNKWN” is indicated. This means BCM cannot receive the signal from TCM. Draw a line to indicate an error between BCM and TCM (line 2-d in the figure).

e. Reception item of “EPS” and “I-KEY”: “UNKWN” is not indicated. This indicates normal communication between EPS and I-KEY and their receiving units. Do not draw any line.

NOTE:
On CAN DIAG SUPPORT MNTR (without PAST), “UNKWN” is indicated even though the item is not used in the trouble diagnosis. For the details of each item on CAN diagnostic support monitor, refer to LAN-44, "CAN Diagnostic Support Monitor" .

(Example)

BCM

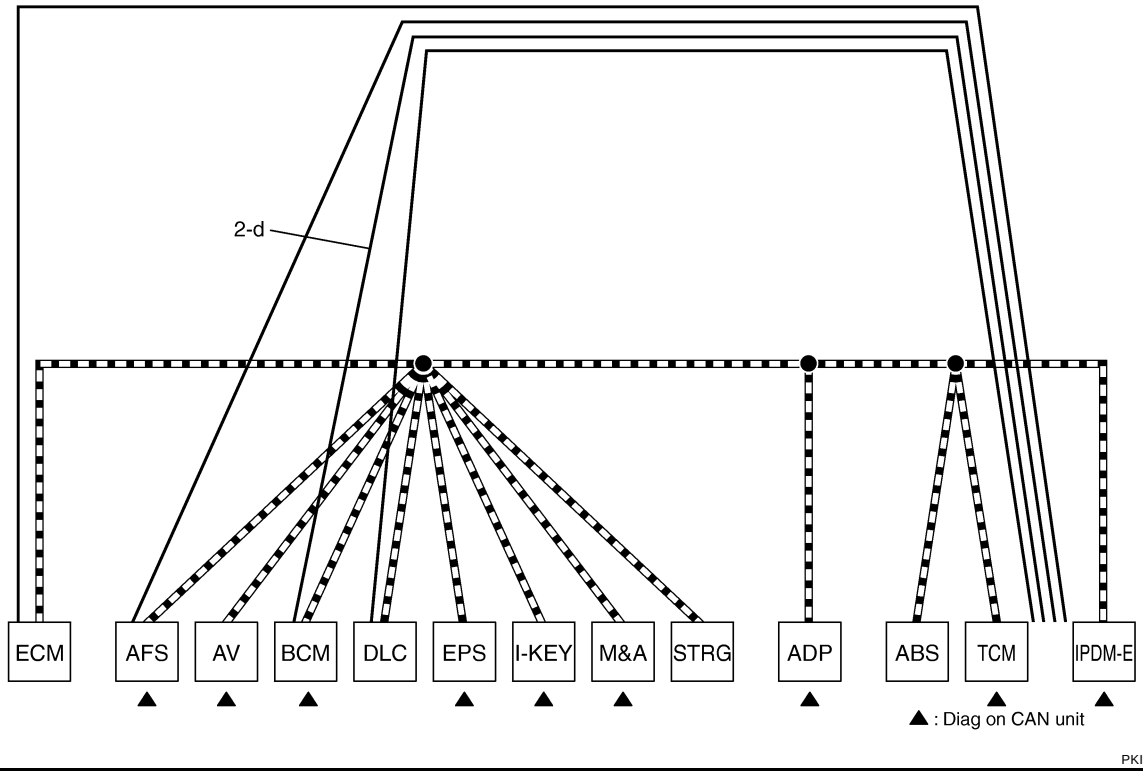
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
METER/M&A	OK	OK
TCM	UNKWN	0
MULTI AV	-	-
IPDM E/R	OK	OK
I-KEY	OK	OK

EPS

	PRSNT	PAST
TRANSMIT DIAG	OK	
ECM	OK	
VDC/TCS/ABS	OK	
METER/M&A	OK	

I-KEY

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
METER/M&A	OK	OK
BCM/SEC	OK	OK



f. Reception item of “M&A”: On “TCM”, “UNKWN” is indicated. This means M&A cannot receive the signal from TCM. Draw a line to indicate an error between M&A and TCM (line 2-f in the figure).

g. Reception item of “ADP”: On “TCM”, “UNKWN” is indicated. This means ADP cannot receive the signal from TCM. Draw a line to indicate an error between ADP and TCM (line 2-g in the figure).

h. Reception item of “ABS”: “UNKWN” is not indicated. This indicates normal communication between ABS and its receiving units. Do not draw any line.

(Example)

M&A

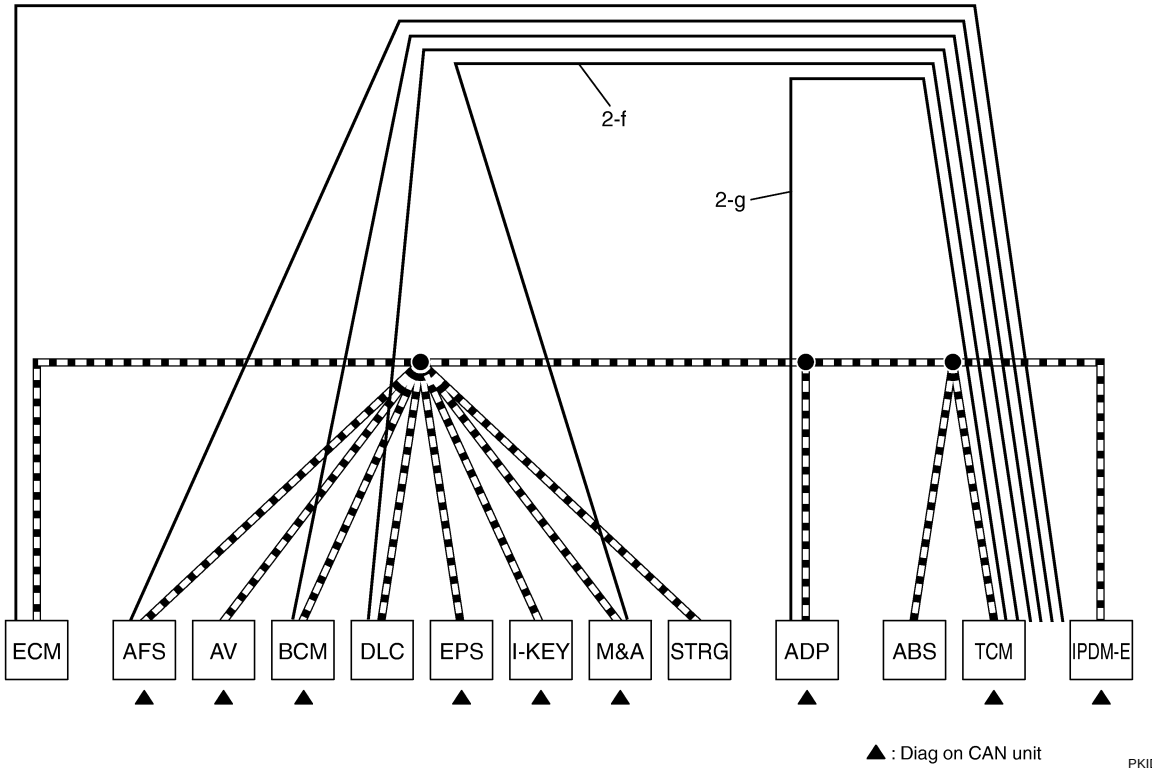
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
TCM	UNKWN	0
BCM/SEC	OK	OK
VDC/TCS/ABS	OK	OK
IPDM E/R	-	-
DISPLAY	-	-
I-KEY	OK	OK
EPS	OK	OK
AWD/4WD	-	-
e4WD	-	-
ICC	-	-
LANE KEEP	-	-
TIRE-P	-	-

ADP

	PRSNT	PAST
TRANSMIT DIAG	-	-
METER/M&A	OK	OK
BCM/SEC	OK	OK
TCM	UNKWN	0

ABS

	PRSNT	PAST
INITIAL DIAG	OK	
TRANSMIT DIAG	OK	
ECM	OK	



i. Reception item of “IPDM-E”: “UNKWN” is not indicated. This indicates normal communication between IPDM-E and its receiving units. Do not draw any line.

3. Based on information received from “CAN DIAG SUPPORT MNTR”, place a check mark on the known good CAN communication line between ECM and IPDM-E.

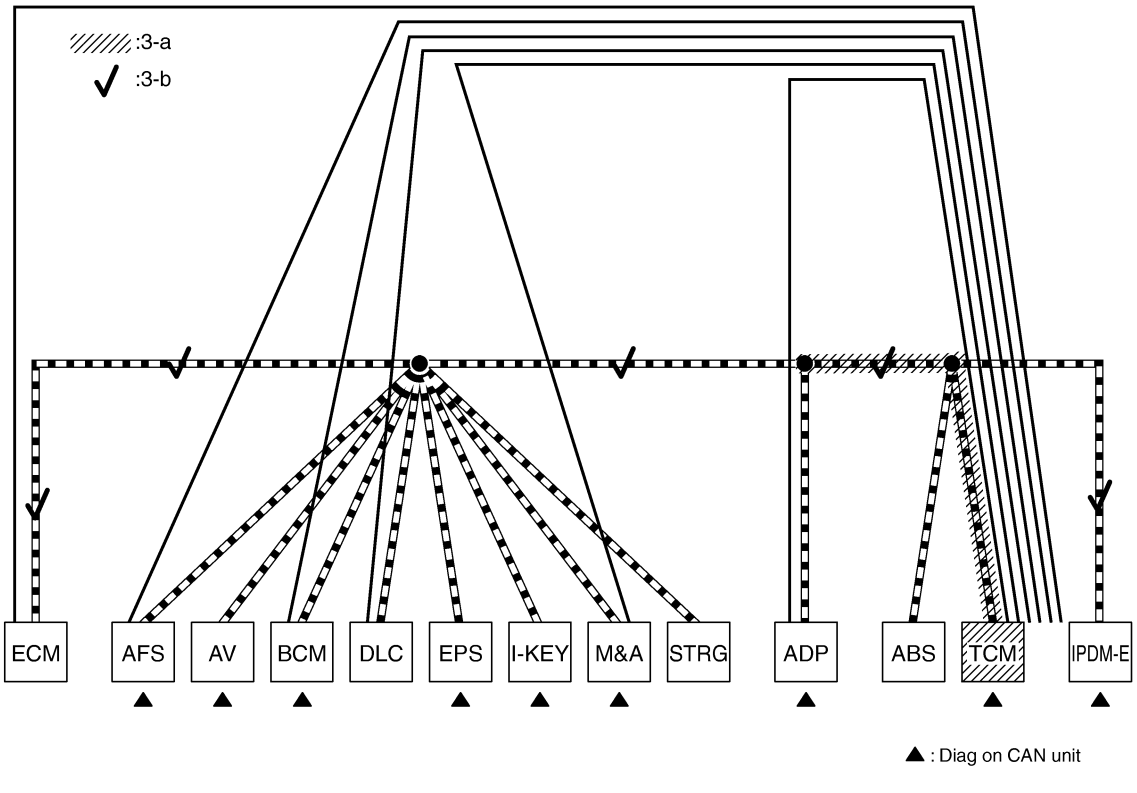
a. Through the previous procedure, the circuit between ADP splice and TCM has the most amount of lines (shade 3-a in the figure).

b. Place a check mark on the known good lines to establish the error circuit.
Reception item of “IPDM-E”: On “ECM”, “OK” is indicated. IPDM-E communicates normally with ECM. Put a check mark on the normal circuit between ECM and IPDM-E (check mark 3-b in the figure).

(Example)

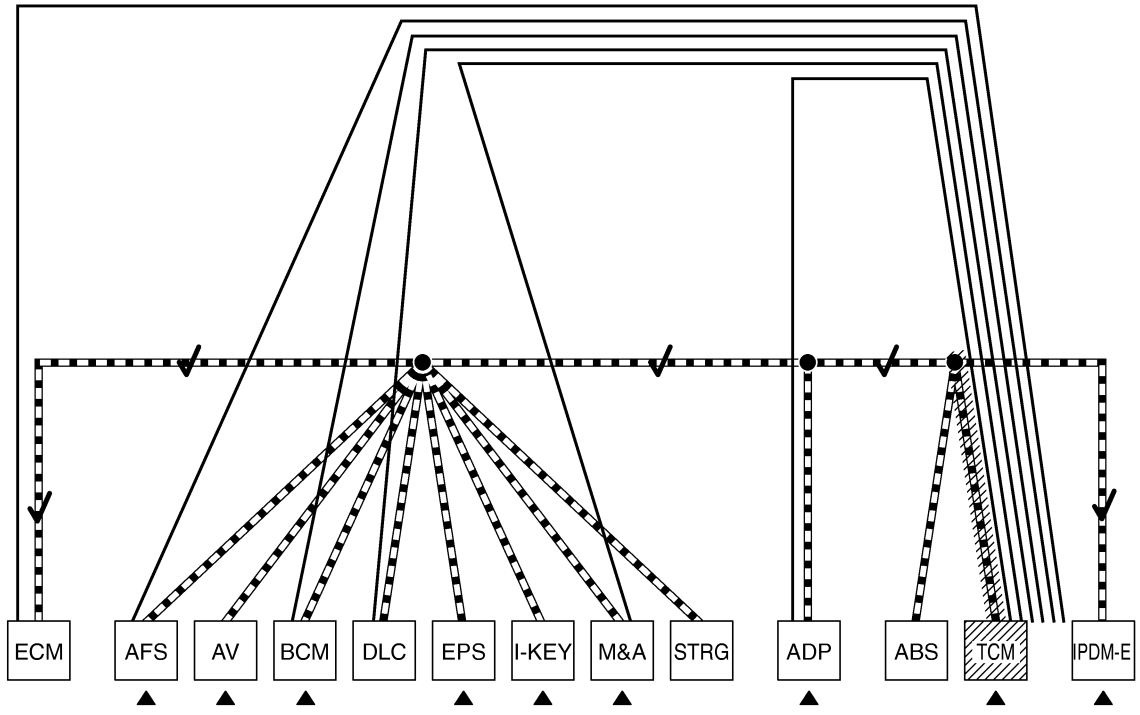
IPDM-E

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
BCM/SEC	OK	OK



4. Through the above procedure, the error is detected in the TCM branch line (shaded in the figure).
   NOTE:
   For abbreviations, refer to LAN-41, "Abbreviation List" .
5. Perform the inspection for the detected error circuit. For the inspection procedure, refer to LAN-65, "Malfunction Area Chart" .

(Example)



< Checklist >

	Item	Check box
1	ECM	✓
2	AFS▲	✓
3	AV▲	✓
4	BCM▲	✓
5	EPS▲	✓
6	I-KEY▲	✓
7	M&A▲	✓
8	ADP▲	✓
9	ABS	✓
10	TCM▲	N-IDC
11	IPDM-E▲	✓

Possible root cause

· Error between TCM and splice.
· Error in TCM.

Inspection result

PKID1219E

Present Error — Short Circuit —

When the symptoms listed below exist, a short circuit of the CAN communication line is a possible cause.

Received data

Item (CONSULT-III)	Indication
ECU list (on the CAN DIAG SUPPORT MNTR)	All Diag on CAN units are not indicated.
CAN DIAG SUPPORT MNTR	“UNKWN” is indicated under “TRANSMIT DIAG” and most reception items.

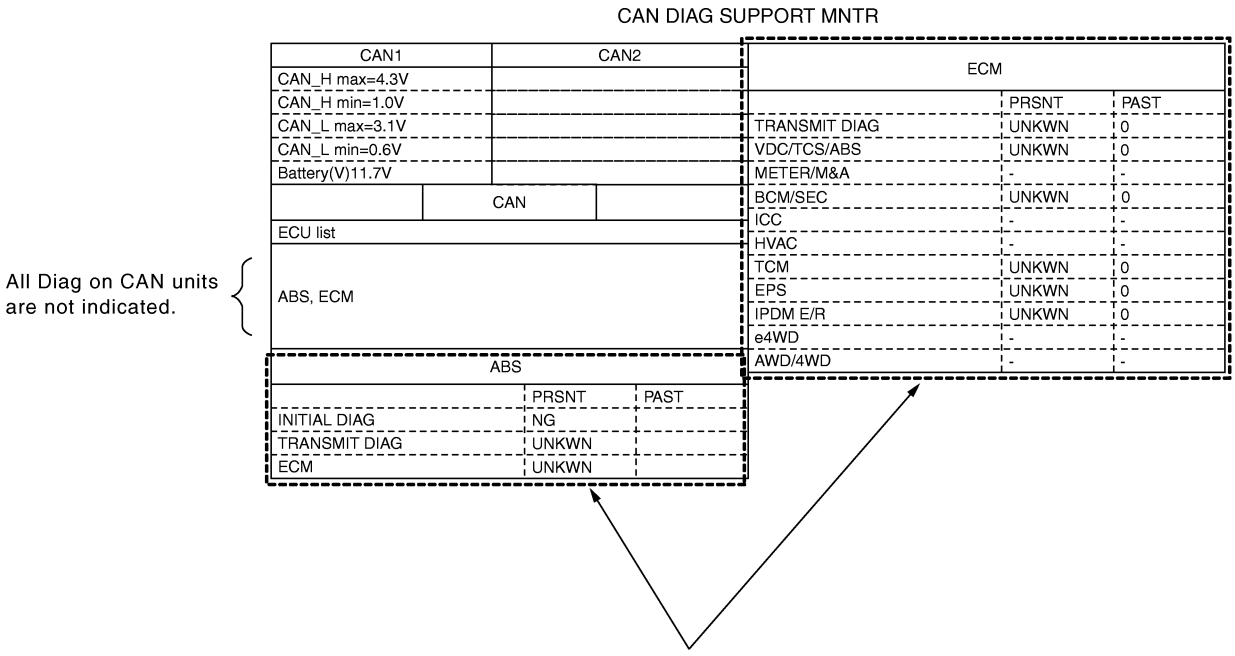
Error symptom

- Most the units connected to the CAN communication system go into fail-safe mode or are deactivated.

Inspection procedure

- Refer to LAN-65, "Malfunction Area Chart" .

(Example)



Past Error — Open Circuit —

Review CAN communication signal chart based on information received from the interview with the customer and on past error information from SELF-DIAG RESULTS and CAN DIAG SUPPORT MNTR.

1. SELF-DIAG RESULTS: Inspect the control units indicating “U1000” or “U1001” on SELF-DIAG RESULTS.

ALL DTC READING

DTC RESULTS	TIME	DTC RESULTS	TIME
ABS		BCM	
U1000 : CAN COMM CIRCUIT	3	No DTC is detected. Further testing may be required.	
IPDM E/R		TRANSMISSION	
No DTC is detected. Further testing may be required.		U1000 : CAN COMM CIRCUIT	3
MULTI AV		METER	
No DTC is detected. Further testing may be required.		U1000 : CAN COMM CIRCUIT	3

DTC RESULTS	TIME	DTC RESULTS	TIME
EPS		AUTO DRIVE POS.	
U1000 : CAN COMM CIRCUIT	PAST	No DTC is detected. Further testing may be required.	
ENGINE			
U1001 : CAN COMM CIRCUIT	1t		
ADAPTIVE LIGHT			
No DTC is detected. Further testing may be required.			
INTELLIGENT KEY			
No DTC is detected. Further testing may be required.			

PKID1221E

2. CAN DIAG SUPPORT MNTR (with PAST): Check the CAN DIAG SUPPORT MNTR (with PAST) of units indicating “U1000” or “U1001” on SELF-DIAG RESULTS. Draw a line on the diagnosis sheet to indicate the possible error circuit.

NOTE:
For the details of each indication on CAN DIAG SUPPORT MNTR, refer to LAN-44, "CAN Diagnostic Support Monitor" .

a. Reception item of “ECM”: “VDC/TCS/ABS”, “3” is indicated in the “PAST”. This means ECM could not receive the signal from ABS in the past. Draw a line between ECM and ABS (line 2-a in the figure).

b. Reception item of “M&A”: “VDC/TCS/ABS”, “3” is indicated in the “PAST”. This means M&A could not receive the signal from ABS in the past. Draw a line between M&A and ABS (line 2-b in the figure).

c. Reception item of “TCM”: “VDC/TCS/ABS”, “3” is indicated in the “PAST”. This means TCM could not receive the signal from ABS in the past. Draw a line between TCM and ABS (line 2-c in the figure).

(Example)

ECM

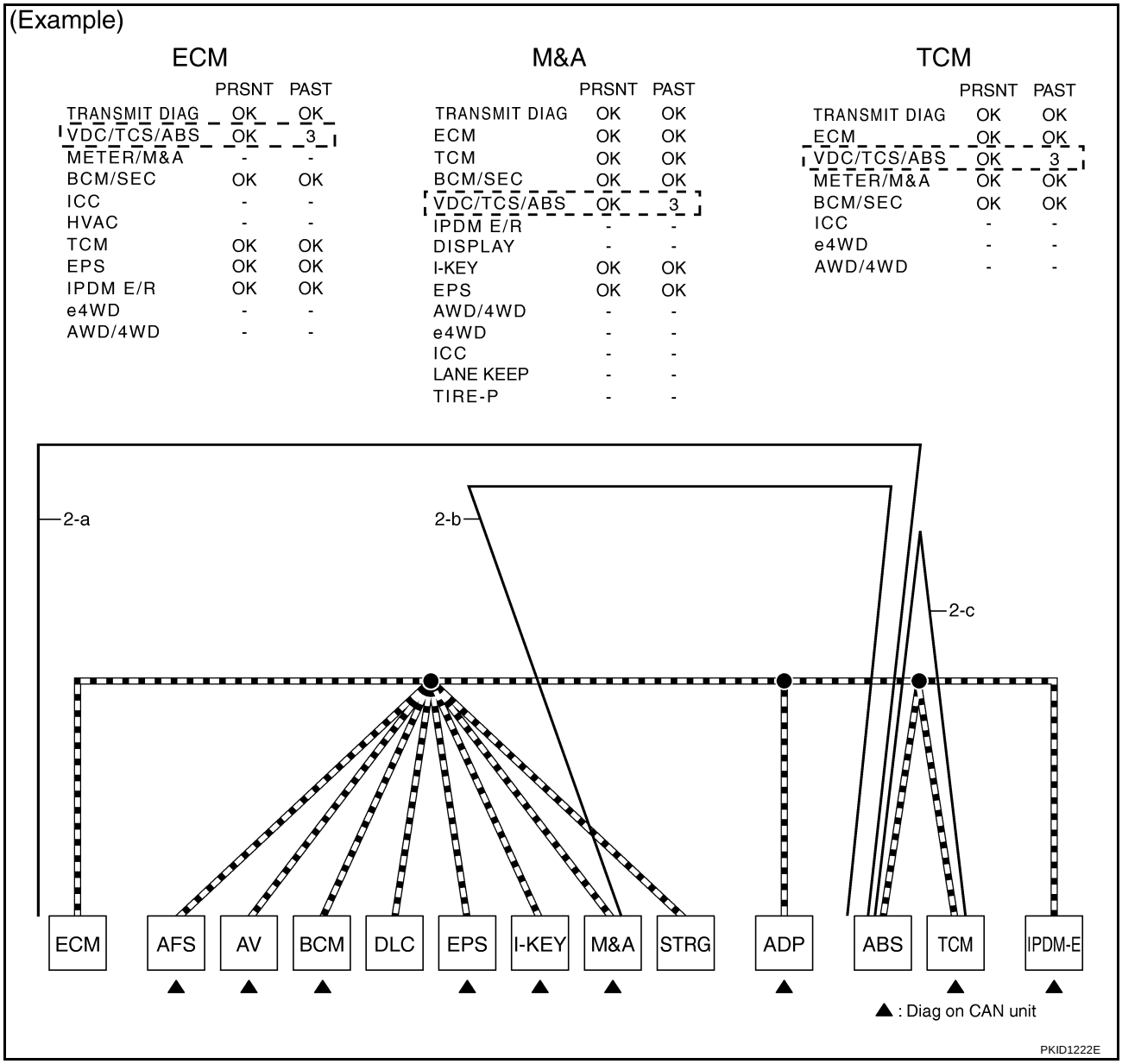
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	OK	3
METER/M&A	-	-
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	OK	OK
EPS	OK	OK
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	-	-

M&A

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
TCM	OK	OK
BCM/SEC	OK	OK
VDC/TCS/ABS	OK	3
IPDM E/R	-	-
DISPLAY	-	-
I-KEY	OK	OK
EPS	OK	OK
AWD/4WD	-	-
e4WD	-	-
ICC	-	-
LANE KEEP	-	-
TIRE-P	-	-

TCM

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
VDC/TCS/ABS	OK	3
METER/M&A	OK	OK
BCM/SEC	OK	OK
ICC	-	-
e4WD	-	-
AWD/4WD	-	-



3. CAN DIAG SUPPORT MNTR (without PAST): Check the CAN DIAG SUPPORT MNTR (without PAST) of units indicating “U1000” or “U1001” on SELF-DIAG RESULTS. Draw a line on the diagnosis sheet to indicate the possible error circuit.

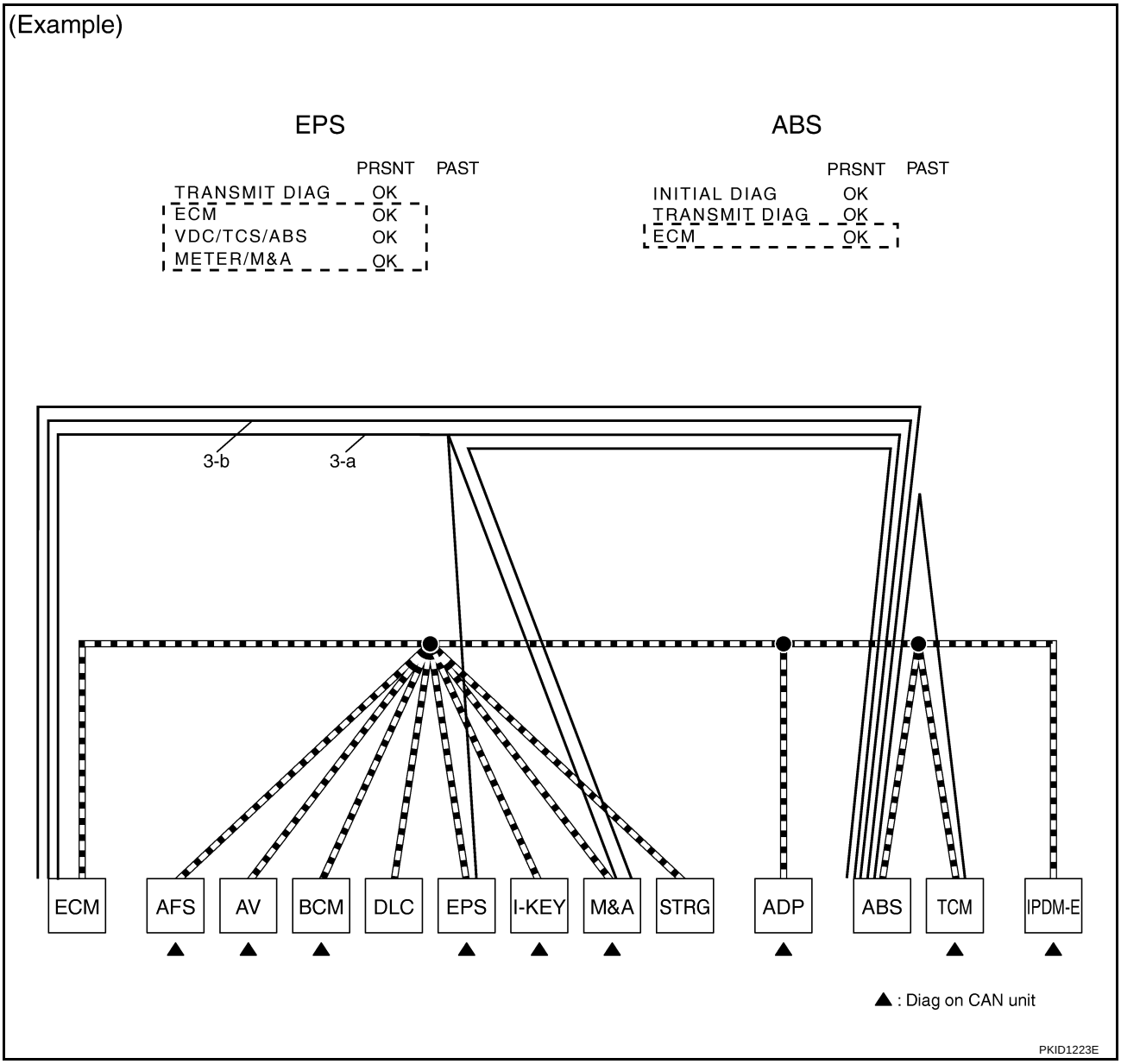
NOTE:

- While an error occurred in the past according to SELF-DIAG RESULTS, it is unclear which signal is not received. Assume that errors were detected from all reception items.
- Draw a single line among the unit and all reception items. (Work flow differs from CAN DIAG SUPPORT MNTR (with PAST).)

a. Reception item of “EPS”: Assume that the unit could not receive the signals from ECM, ABS, and M&A. Draw a line among EPS, ECM, ABS, and M&A (line 3-a in the figure).

b. Reception item of “ABS”: Assume that the unit could not receive the signal from ECM. Draw a line between ABS and ECM (line 3-b in the figure).

(Example)



4. Search for the possible cause using CAN communication signal chart using information from the interview with the customer.

NOTE:
For the details of CAN communication signal, refer to LAN-49, "CAN Communication Signal Chart" .

a. ABS warning lamp turned ON and speedometer did not move: This means that “ABS warning lamp signal” and “Vehicle speed signal” could not communicate between M&A and ABS (4-a in the figure).

b. The tachometer moved normally: This means that “Engine speed signal” could communicate normally between ECM and M&A (4-b in the figure).

(Example)

First registration: 28, Jan. 2005

CAN system type: Type 20

Symptom (Results from interview with customer)

While driving,
- ABS warning lamp turned ON.
- Speedometer did not move.
- Tachometer moved normally.

CAN Communication Signal Chart

T: Transmit R: Receive

Signal name/Connecting unit	ECM	AFS*1	AV*2	BCM	EPS	I-KEY*3	M&A	STRG*1	ADP*4	ABS	TCM	IPDM-E
A/C compressor request signal	T											R
Accelerator pedal position signal	T										R	
Closed throttle position signal	T										R	
Cooling fan speed request signal	T											R
Engine and CVT integrated control signal	T										R	
	R										T	
Engine coolant temperature signal	T						R				R	
4-b Engine speed signal	T						R				R	
Engine status signal	T		R		R							
Fuel consumption monitor signal	T		R				R					
MI signal	T						R					
Wide open throttle position signal	T										R	
ABS warning lamp signal							R			T		
Brake warning lamp signal							R			T		
4-a Steering angle sensor signal		R						T				
Vehicle speed signal	R				R		R			T	R	
		R		R	R	R	T		R			
Input shaft revolution signal	R										T	
Output shaft revolution signal	R										T	
Shift position indicator signal	R	R	R	R*5			R		R*6		T	
Second position indicator signal							R				T	
Front wiper stop position signal				R								T
High beam status signal	R	R										T
Low beam status signal	R	R										T

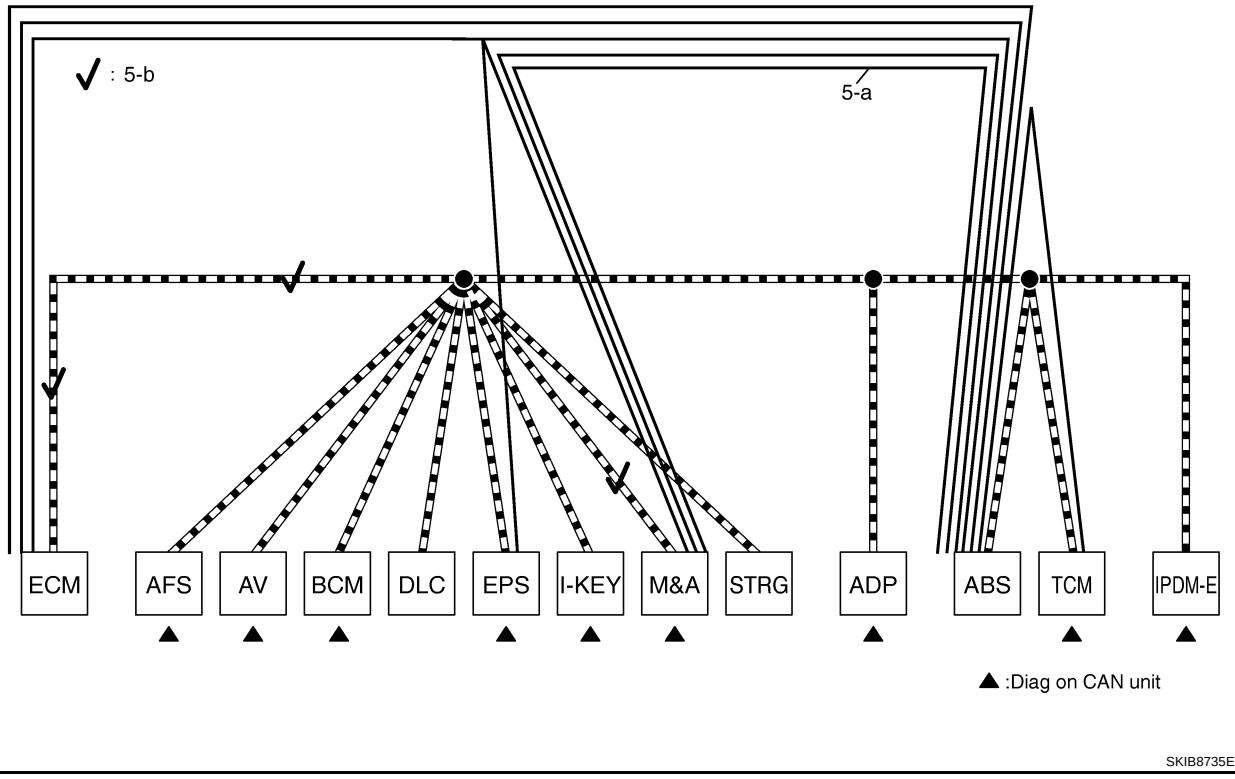
SKIB8895E

5. Fill out the diagnosis sheet based on information from step 4.

a. The ABS warning lamp turned ON and speedometer did not move: Assume that a possible cause is no communication between M&A and ABS. Draw a line between M&A and ABS. (Line 5-a in the figure).

b. The tachometer moved normally: Put check marks between ECM and M&A. The circuit between ECM and M&A is functioning properly (check marks 5-b in the figure).

(Example)

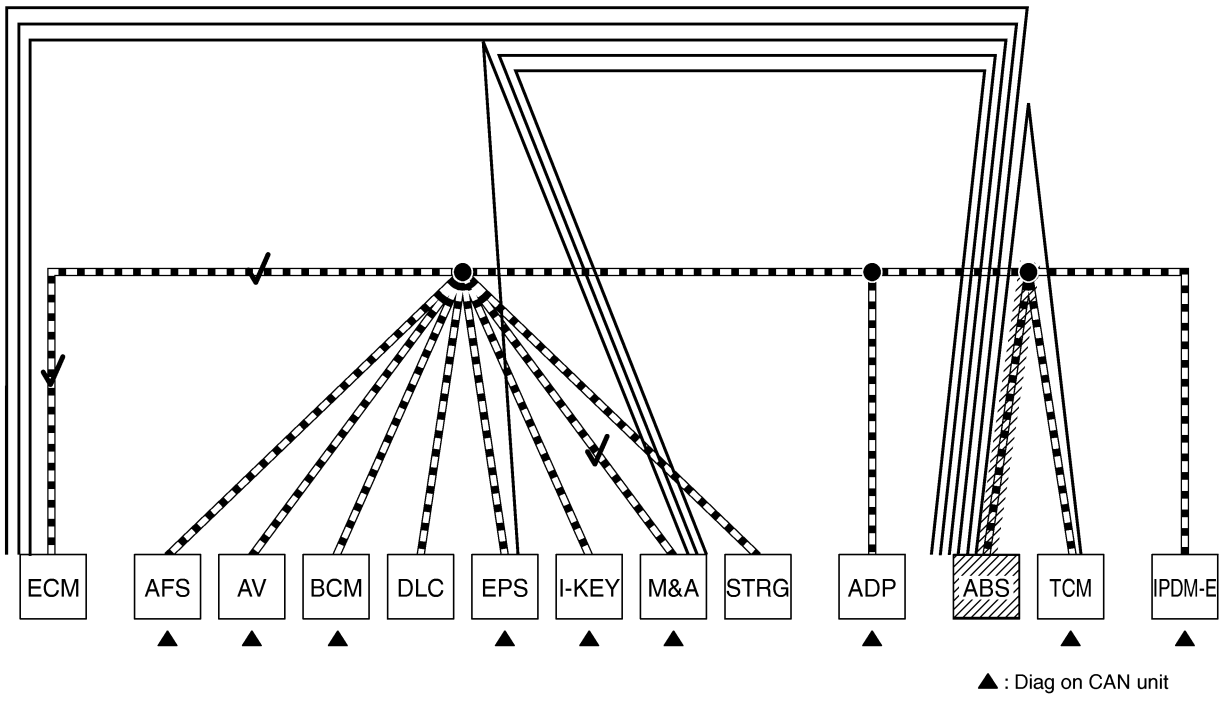


6. The circuit which has the most amount of lines are the possible cause. Error is detected from ABS actuator and electric unit (control unit) branch line (shaded in the figure).

   NOTE:
   For abbreviations, refer to LAN-41, "Abbreviation List" .

7. Perform the inspection procedure for the possible cause. Refer to LAN-65, "Malfunction Area Chart" .

(Example)



< Checklist >

	Item	Check box
1	ECM	✓
2	AFS▲	✓
3	AV▲	✓
4	BCM▲	✓
5	EPS▲	✓
6	I-KEY▲	✓
7	M&A▲	✓
8	ADP▲	✓
9	ABS	✓
10	TCM▲	✓
11	IPDM-E▲	✓

Possible root cause

- Error between ABS actuator and electric unit (control unit) and splice.
- Error in ABS actuator and electric unit (control unit).

Inspection result

PKID1224E

Past Error — Short Circuit —

When the symptoms listed below exist, a short circuit of the CAN communication line is a possible cause.

Item (CONSULT-III)	Indication	Inspection procedure
SELF-DIAG RESULTS	“U1000” and “U1001” is indicated in the past for most units.	Refer to LAN-65, "Malfunction Area Chart" .
CAN DIAG SUPPORT MNTR	Only on CAN DIAG SUPPORT MNTR (with PAST), “1 - 39” is indicated on “PAST” of “TRANSMIT DIAG” and the reception item.	

(Example)

DTC RESULTS	TIME
ENGINE	
U1000 : CAN COMM CIRCUIT	1t
U1001 : CAN COMM CIRCUIT	1t

DTC RESULTS	TIME
ADAPTIVE LIGHT	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
MULTI AV	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
BCM	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
EPS	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
INTELLIGENT KEY	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
METER	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
AUTO DRIVE POS.	
U1000 : CAN COMM CIRCUIT	PAST

“U1000” and “U1001” is indicated in the past for most units.

ECM

	PRSNT	PAST
TRANSMIT DIAG	OK	5
VDC/TCS/ABS	OK	5
METER/M&A	-	-
BCM/SEC	OK	5
ICC	-	-
HVAC	-	-
TCM	OK	5
EPS	OK	5
IPDM E/R	OK	5
e4WD	-	-
AWD/4WD	-	-

AFS

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	5
METER/M&A	OK	5
TCM	OK	5
STRG	OK	5
EPS	-	-
IPDM E/R	OK	5

AV

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	5
METER/M&A	OK	5
BCM/SEC	-	-
HVAC	-	-
IPDM E/R	-	-
TIRE-P	-	-

BCM

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
METER/M&A	OK	5
TCM	OK	5
MULTI AV	-	-
IPDM E/R	OK	5
I-KEY	OK	5

Only on CAN DIAG SUPPORT MNTR (with PAST), “1-39” is indicated on “PAST” of “TRANSMIT DIAG ” and the reception item.

EPS

	PRSNT	PAST
TRANSMIT DIAG	OK	
ECM	OK	
VDC/TCS/ABS	OK	
METER/M&A		

I-KEY

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
METER/M&A	OK	5
	OK	5

M&A

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
TCM	OK	5
BCM/SEC	OK	5
VDC/TCS/ABS	OK	5
IPDM E/R	-	-
	-	-
	OK	5
		5

ADP

	PRSNT	PAST
TRANSMIT DIAG	-	-
METER/M&A	OK	5
BCM/SEC	OK	5
TCM	OK	5

PKID1225E

INDEX FOR DTC

PFP:00004

DTC No. Index

NKS004PM

DTC	Self-diagnosis item (CONSULT-III indication)	DTC detection condition	Inspection
U1000	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.	Refer to LAN-41, "HOW TO USE THIS SECTION" .
		When a control unit (except for ECM) is not transmitting or receiving CAN communication signal for 2 seconds or more.	
U1001	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	
U1002	SYSTEM COMM	When a control unit is not transmitting or receiving CAN communication signal for 2 seconds or less.	Start the inspection. Refer to the applicable section of the indicated control unit.
U1010	CONTROL UNIT [CAN]	When an error is detected during the initial diagnosis for CAN controller of each control unit.	Replace the control unit indicating “U1010”.

HOW TO USE THIS SECTION

PFP:00008

Caution

NKS004PN

- This section describes information peculiar to a vehicle, sheets for trouble diagnosis, and inspection procedures.
- For trouble diagnosis procedure, refer to LAN-17, "Trouble Diagnosis Procedure" .

Abbreviation List

NKS004PO

Abbreviations in CAN communication signal chart, and the diagnosis sheet are as per the following list.

Abbreviation	Unit name	SELECT SYSTEM (CONSULT-III)	CAN DIAG SUPPORT MNTR (CONSULT-III)
A-BAG	Air bag diagnosis sensor unit	AIR BAG	—
ABS	ABS actuator and electric unit (control unit)	ABS	VDC/TCS/ABS
	VDC/TCS/ABS control unit		
BCM	BCM	BCM	BCM/SEC
DLC	Data link connector	—	—
ECM	ECM	ENGINE	ECM
IPDM-E	IPDM E/R	IPDM E/R	IPDM E/R
M&A	Unified meter and A/C amp.	METER/M&A	METER/M&A
STRG	Steering angle sensor	—	STRG
TCM	TCM	A/T	TCM

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS004PP

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS0053P

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Trouble Diagnosis

NKS004PR

CAUTION:

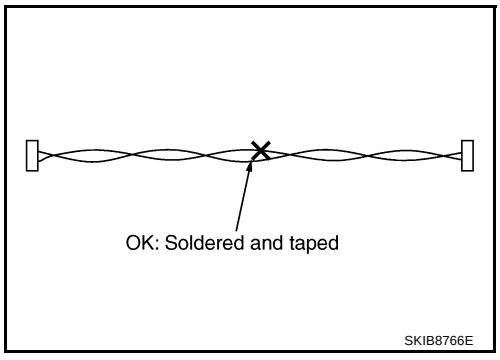
- **Never apply 7.0 V or more to the measurement terminal.**
- **Use a tester with open terminal voltage of 7.0 V or less.**
- **Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.**

Precautions for Harness Repair

NKS004PS

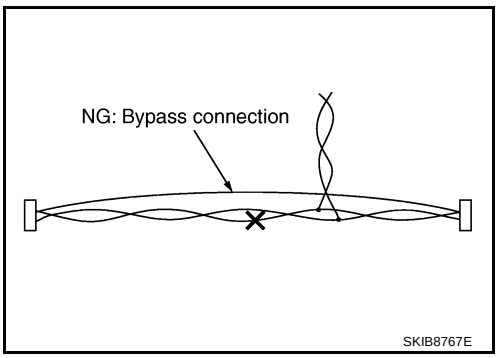
- Solder the repaired area and wrap tape around the soldered area.

  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.

  NOTE:
  Bypass connection may cause CAN communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



- Replace the applicable harness as an assembly if error is detected on the shield lines of CAN communication line.

TROUBLE DIAGNOSIS

PFP:00004

CAN Diagnostic Support Monitor

NKS004PT

Use “CAN DIAG SUPPORT MNTR” for detecting the root cause.

MONITOR ITEM LIST (CONSULT-III)

ECM

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal		Error	
			PRSNT	PAST	PRSNT	PAST
ECM	TRANSMIT DIAG	Signal transmission status	OK	OK or 1 – 39*	UNKWN	0
	VDC/TCS/ABS	With VDC: Signal receiving status from the VDC/TCS/ABS control unit				
		With TCS: Signal receiving status from the ABS actuator and electric unit (control unit)				
		With ABS: Not used even though indicated				
	METER/M&A	Signal receiving status from the unified meter and A/C amp.	OK	OK or 1 – 39*	UNKWN	0
	BCM/SEC	Signal receiving status from the BCM				
	ICC	Not used even though indicated				
	HVAC					
	TCM	Signal receiving status from the TCM	OK	OK or 1 – 39*	UNKWN	0
	EPS	Not used even though indicated				
	IPDM E/R	Signal receiving status from the IPDM E/R	OK	OK or 1 – 39*	UNKWN	0
	e4WD	Not used even though indicated				
	AWD/4WD					

*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

VDC/TCS/ABS Control Unit

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
ABS	INITIAL DIAG	Status of CAN controller	OK	NG[Caution]
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		
	TCM	Signal receiving status from the TCM		
	METER/M&A	Signal receiving status from the unified meter and A/C amp.		
	STRG	Signal receiving status from the steering angle sensor		

CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

TCM

NOTE:
Replace the unit when “NG” is indicated on the “INITIAL DIAG”.

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
TCM	INITIAL DIAG	Status of CAN controller	OK	NG
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		
	VDC/TCS/ABS	With VDC: Signal receiving status from the VDC/TCS/ABS control unit		
		Without VDC: Signal receiving status from the ABS actuator and electric unit (control unit)		
	METER/M&A	Signal receiving status from the unified meter and A/C amp.		
	ICC/e4WD	Not used even though indicated		
	AWD/4WD			

BCM

NOTE:
Replace the unit when “NG” is indicated on the “INITIAL DIAG”.

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
BCM	INITIAL DIAG	Status of CAN controller	OK	NG
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		
	IPDM E/R	Signal receiving status from the IPDM E/R		
	METER/M&A	Signal receiving status from the unified meter and A/C amp.		
	I-KEY	Not used even though indicated		

Unified Meter and A/C Amp.

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal		Error	
			PRSNT	PAST	PRSNT	PAST
M&A	TRANSMIT DIAG	Signal transmission status	OK	OK or 1 – 39*	UNKWN	0
	ECM	Signal receiving status from the ECM				
	TCM	Signal receiving status from the TCM				
	BCM/SEC	Signal receiving status from the BCM				
	VDC/TCS/ABS	With VDC: Signal receiving status from the VDC/TCS/ABS control unit				
		Without VDC: Signal receiving status from the ABS actuator and electric unit (control unit)				
	IPDM E/R	Not used even though indicated				
	DISPLAY					
	I-KEY					
	EPS					
	AWD/4WD					
	e4WD					
	ICC					
	LANE KEEP					
	TIRE-P					

*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

ABS Actuator and Electric Unit (Control Unit)

Models with ABS

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
ABS	INITIAL DIAG	Status of CAN controller	OK	NG[Caution]
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		

CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

Models with TCS

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal	Error
			PRSNT	
ABS	INITIAL DIAG	Status of CAN controller	OK	NG[Caution]
	TRANSMIT DIAG	Signal transmission status		UNKWN
	ECM	Signal receiving status from the ECM		
	TCM	Signal receiving status from the TCM		

CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

IPDM E/R

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

ITEM	CAN DIAG SUPPORT MNTR	Description	Normal		Error	
			PRSNT	PAST	PRSNT	PAST
IPDM-E	TRANSMIT DIAG	Signal transmission status	OK	OK or 1 – 39*	UNKWN	0
	ECM	Signal receiving status from the ECM				
	BCM/SEC	Signal receiving status from the BCM				

*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

CAN System Specification Chart

NKS004PU

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

NOTE:

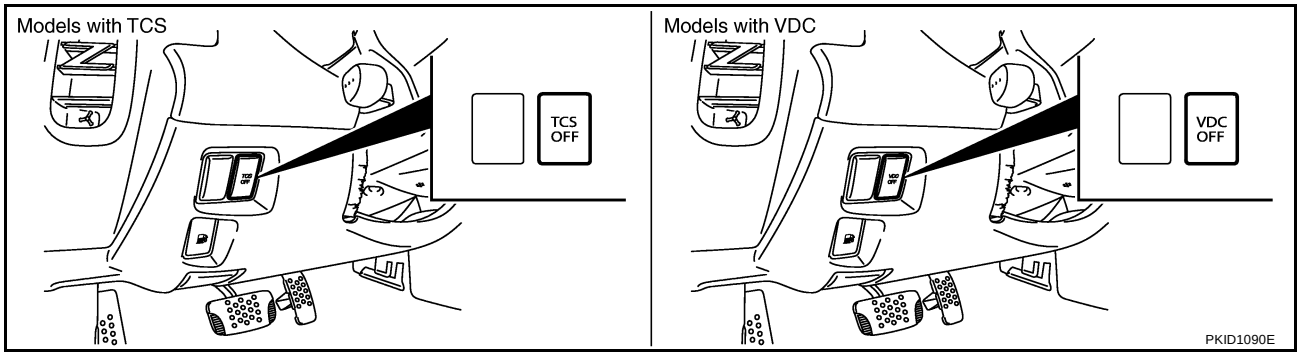
Refer to LAN-19, "CHECK OF CAN SYSTEM TYPE (HOW TO USE CAN SYSTEM TYPE SPECIFICATION CHART)" for how to use CAN system specification chart.

Body type	Coupe/Roadster				
Axle	2WD				
Engine	VQ35HR				
Transmission	M/T		A/T	M/T	A/T
Brake control	ABS	TCS		VDC	
CAN system type	1	2	3	4	5
Diagnosis sheet	LAN-59	LAN-60	LAN-61	LAN-62	LAN-63
CAN communication signal chart	LAN-49, "TYPE 1"	LAN-50, "TYPE 2/TYPE 3"		LAN-51, "TYPE 4/TYPE 5"	

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

NOTE:

Check CAN system type from the vehicle shape and equipment.



CAN Communication Signal Chart

NKS004PV

Refer to LAN-15, "How to Use CAN Communication Signal Chart" for how to use CAN communication signal chart.

TYPE 1

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	BCM	M&A	ABS	IPDM-E
A/C compressor feedback signal	T		R		
A/C compressor request signal	T				R
Accelerator pedal position signal	T			R	
ASCD CRUISE lamp signal	T		R		
ASCD SET lamp signal	T		R		
Cooling fan speed request signal	T				R
Engine coolant temperature signal	T		R		
Engine speed signal	T		R	R	
Fuel consumption monitor signal	T		R		
Malfunction indicator lamp signal	T		R		
A/C switch signal	R	T			
Blower fan motor switch signal	R	T			
Buzzer output signal		T	R		
Day time running light request signal		T			R
Door switch signal		T	R		R
Front wiper request signal		T			R
High beam request signal		T	R		R
Horn chirp signal		T			R
Ignition switch signal		T			R
Low beam request signal		T			R
Position lights request signal		T	R		R
Rear window defogger switch signal		T			R
Sleep request 1 signal		T	R		
Sleep request 2 signal		T			R
Theft warning horn request signal		T			R
Tire pressure signal		T	R		
Turn indicator signal		T	R		
Wake up request 1 signal		T	R		
Fuel level sensor signal	R		T		
Seat belt buckle switch signal		R	T		
Vehicle speed signal	R	R	T		
			R	T	
ABS warning lamp signal			R	T	
Brake warning lamp signal			R	T	
Front wiper stop position signal		R			T
High beam status signal	R				T
Hood switch signal		R			T

Signal name/Connecting unit	ECM	BCM	M&A	ABS	IPDM-E
Low beam status signal	R				T
Rear window defogger control signal	R				T

NOTE:
CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

TYPE 2/TYPE 3

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	TCM	BCM	M&A	ABS	IPDM-E
A/C compressor feedback signal	T			R		
A/C compressor request signal	T					R
Accelerator pedal position signal	T	R			R	
ASCD CRUISE lamp signal	T			R		
ASCD OD cancel request signal	T	R				
ASCD operation signal	T	R				
ASCD SET lamp signal	T			R		
Battery voltage signal	T	R				
Closed throttle position signal	T	R				
Cooling fan speed request signal	T					R
Engine coolant temperature signal	T			R		
Engine speed signal	T	R		R	R	
Fuel consumption monitor signal	T			R		
Malfunction indicator lamp signal	T			R		
Wide open throttle position signal	T	R				
A/T CHECK indicator lamp signal		T		R		
A/T position indicator signal		T		R	R	
A/T self-diagnosis signal	R	T				
Manual mode gear position signal		T		R		
Manual mode indicator signal		T		R		
Output shaft revolution signal	R	T				
Turbine revolution signal	R	T				
A/C switch signal	R		T			
Blower fan motor switch signal	R		T			
Buzzer output signal			T	R		
Day time running light request signal			T			R
Door switch signal			T	R		R
Front wiper request signal			T			R
High beam request signal			T	R		R
Horn chirp signal			T			R
Ignition switch signal			T			R
Low beam request signal			T			R
Position lights request signal			T	R		R

Signal name/Connecting unit	ECM	TCM	BCM	M&A	ABS	IPDM-E
Rear window defogger switch signal			T			R
Sleep request 1 signal			T	R		
Sleep request 2 signal			T			R
Theft warning horn request signal			T			R
Tire pressure signal			T	R		
Turn indicator signal			T	R		
Wake up request 1 signal			T	R		
Fuel level sensor signal	R			T		
Manual mode shift down signal		R		T		
Manual mode shift up signal		R		T		
Manual mode signal		R		T		
Not manual mode signal		R		T		
Seat belt buckle switch signal			R	T		
Stop lamp switch signal		R		T		
Vehicle speed signal	R	R	R	T		
				R	T	
A/T shift schedule change demand signal		R			T	
ABS operation signal		R			T	
ABS warning lamp signal				R	T	
Brake warning lamp signal				R	T	
SLIP indicator lamp signal				R	T	
TCS OFF indicator lamp signal				R	T	
Front wiper stop position signal			R			T
High beam status signal	R					T
Hood switch signal			R			T
Low beam status signal	R					T
Rear window defogger control signal	R					T

NOTE:
CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

TYPE 4/TYPE 5

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
A/C compressor feedback signal	T				R		
A/C compressor request signal	T						R
Accelerator pedal position signal	T	R	R				
ASCD CRUISE lamp signal	T				R		
ASCD OD cancel request signal	T		R				
ASCD operation signal	T		R				
ASCD SET lamp signal	T				R		
Battery voltage signal	T		R				

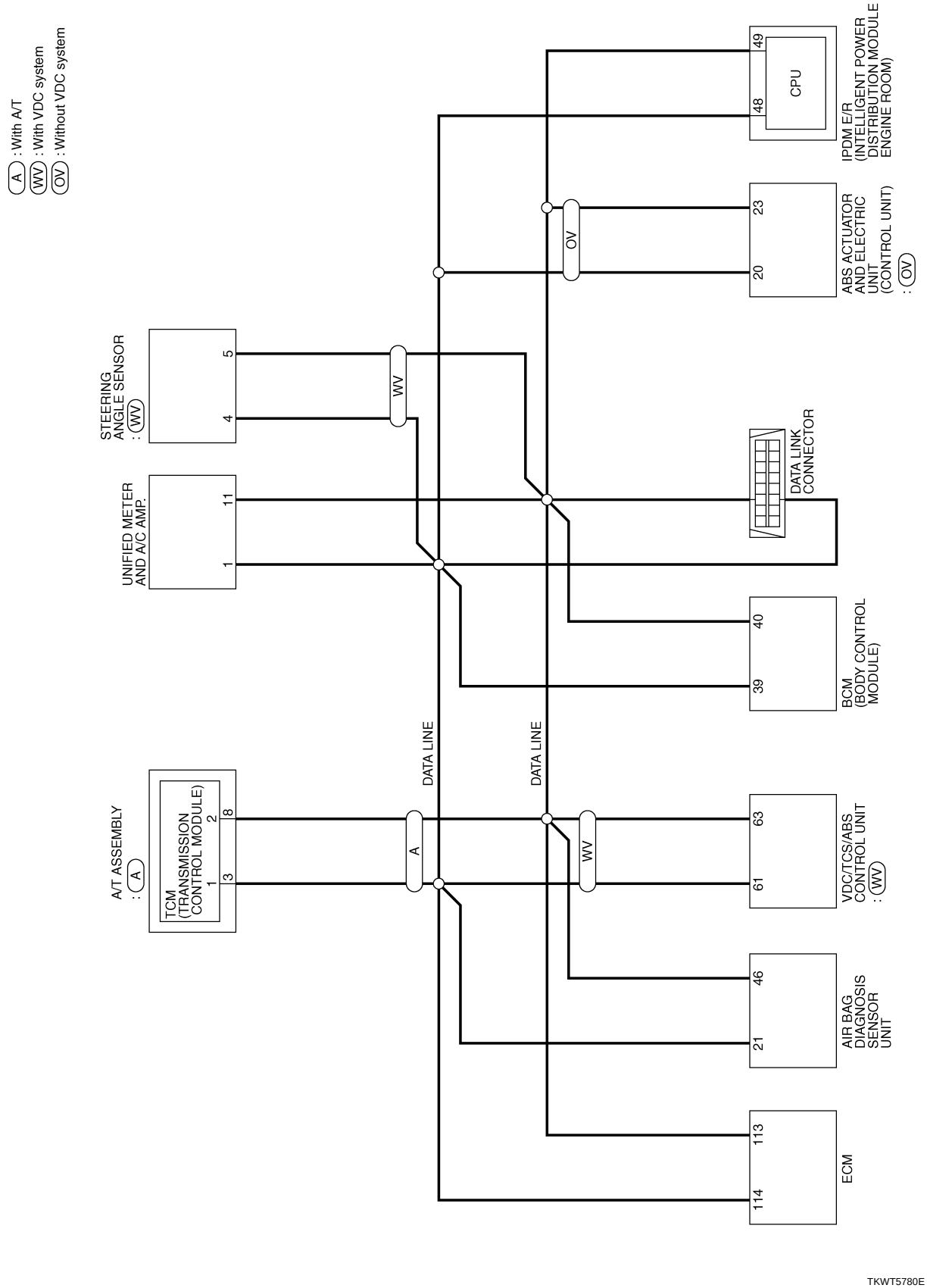
Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
Closed throttle position signal	T		R				
Cooling fan speed request signal	T						R
Engine coolant temperature signal	T				R		
Engine speed signal	T	R	R		R		
Fuel consumption monitor signal	T				R		
Malfunction indicator lamp signal	T				R		
Wide open throttle position signal	T		R				
A/T shift schedule change demand signal		T	R				
ABS operation signal		T	R				
ABS warning lamp signal		T			R		
Brake warning lamp signal		T			R		
SLIP indicator lamp signal		T			R		
VDC OFF indicator lamp signal		T			R		
Vehicle speed signal		T			R		
	R		R	R	T		
A/T CHECK indicator lamp signal			T		R		
A/T position indicator signal		R	T		R		
A/T self-diagnosis signal	R		T				
Manual mode gear position signal			T		R		
Manual mode indicator signal			T		R		
Output shaft revolution signal	R		T				
Turbine revolution signal	R		T				
A/C switch signal	R			T			
Blower fan motor switch signal	R			T			
Buzzer output signal				T	R		
Day time running light request signal				T			R
Door switch signal				T	R		R
Front wiper request signal				T			R
High beam request signal				T	R		R
Horn chirp signal				T			R
Ignition switch signal				T			R
Low beam request signal				T			R
Position lights request signal				T	R		R
Rear window defogger switch signal				T			R
Sleep request 1 signal				T	R		
Sleep request 2 signal				T			R
Theft warning horn request signal				T			R
Tire pressure signal				T	R		
Turn indicator signal				T	R		
Wake up request 1 signal				T	R		
Fuel level sensor signal	R				T		
Manual mode shift down signal			R		T		
Manual mode shift up signal			R		T		

Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
Manual mode signal			R		T		
Not manual mode signal			R		T		
Seat belt buckle switch signal				R	T		
Stop lamp switch signal			R		T		
Steering angle sensor signal		R				T	
Front wiper stop position signal				R			T
High beam status signal	R						T
Hood switch signal				R			T
Low beam status signal	R						T
Rear window defogger control signal	R						T

NOTE:
CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

Schematic

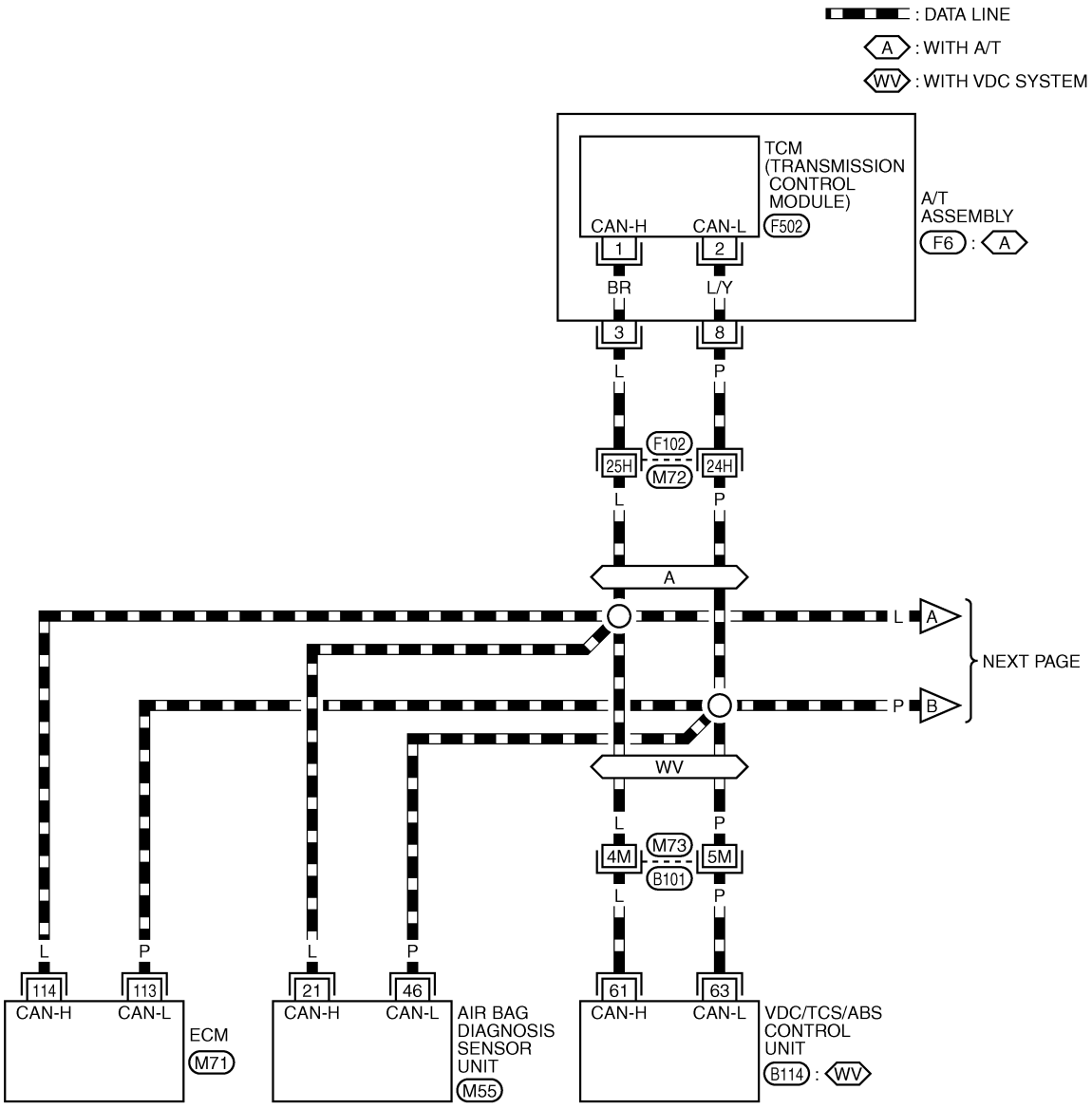
NKS004PW

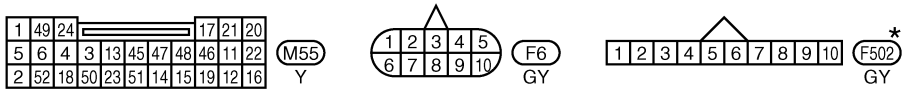


Wiring Diagram — CAN —

NKS004PX

LAN-CAN-01





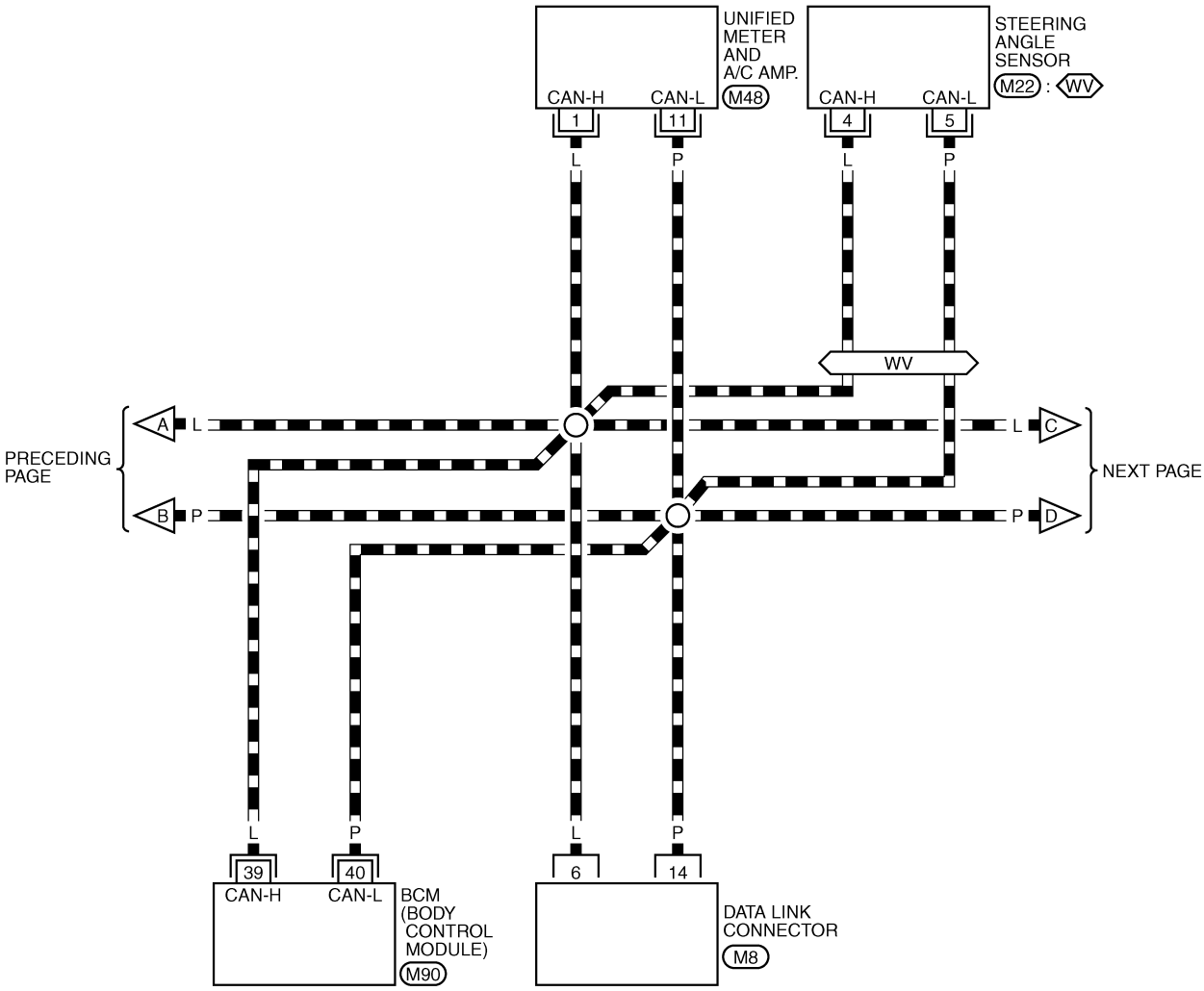
∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

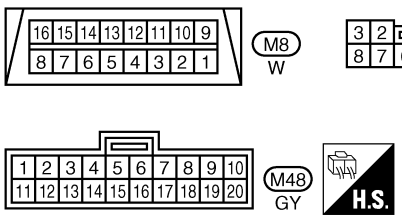
REFER TO THE FOLLOWING.
F102 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M71 , B114 -ELECTRICAL UNITS

TKWT5781E

LAN-CAN-02

: DATA LINE
WV : WITH VDC SYSTEM

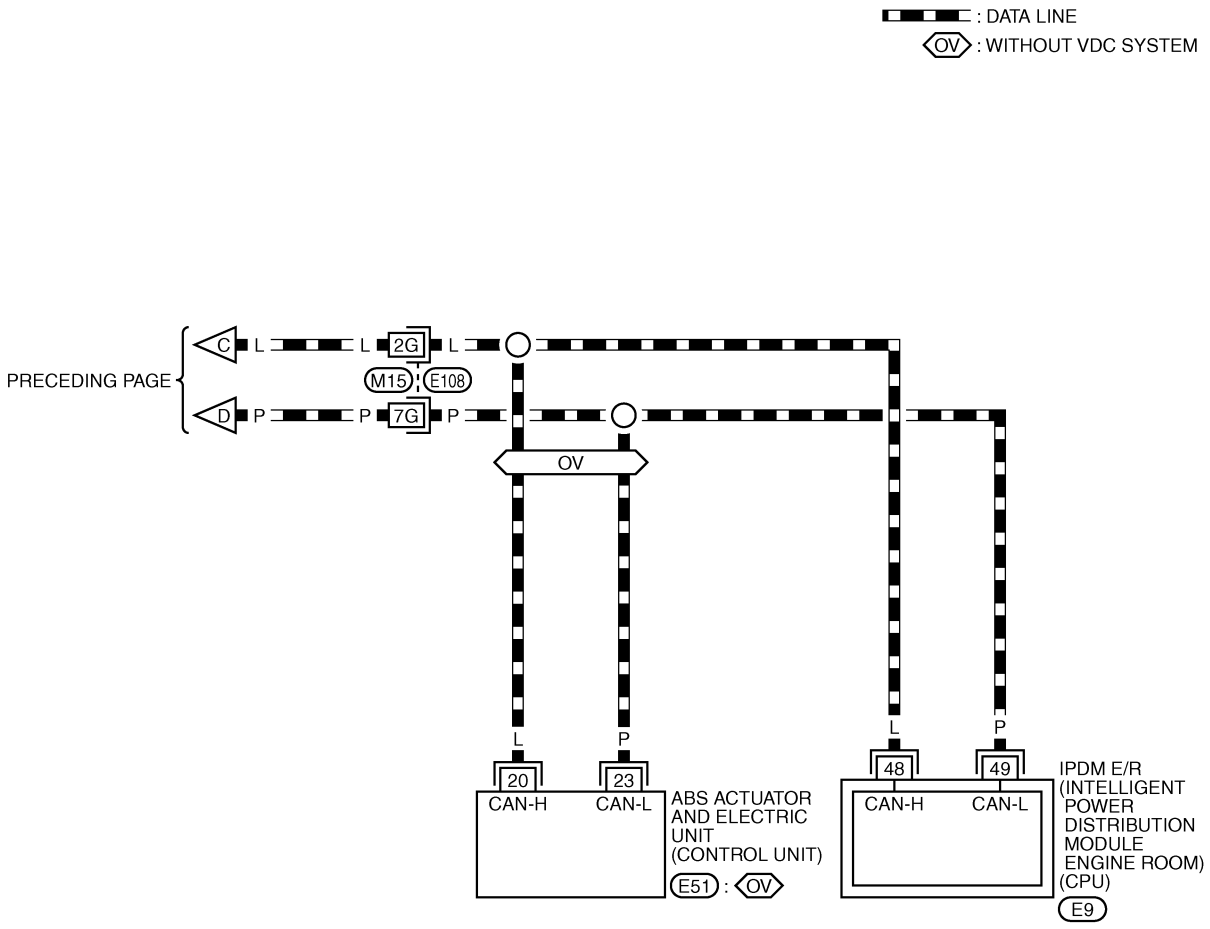


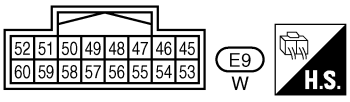


REFER TO THE FOLLOWING.
M90 -ELECTRICAL UNITS

TKWT5782E

LAN-CAN-03





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E51 -ELECTRICAL UNITS

TKWB4321E

Interview Sheet

NKS004PY

CAN Communication System Diagnosis Interview Sheet

Date received:

Type: VIN No.:

Model:

First registration: Mileage:

CAN system type:

Symptom (Results from interview with customer)

Condition at inspection

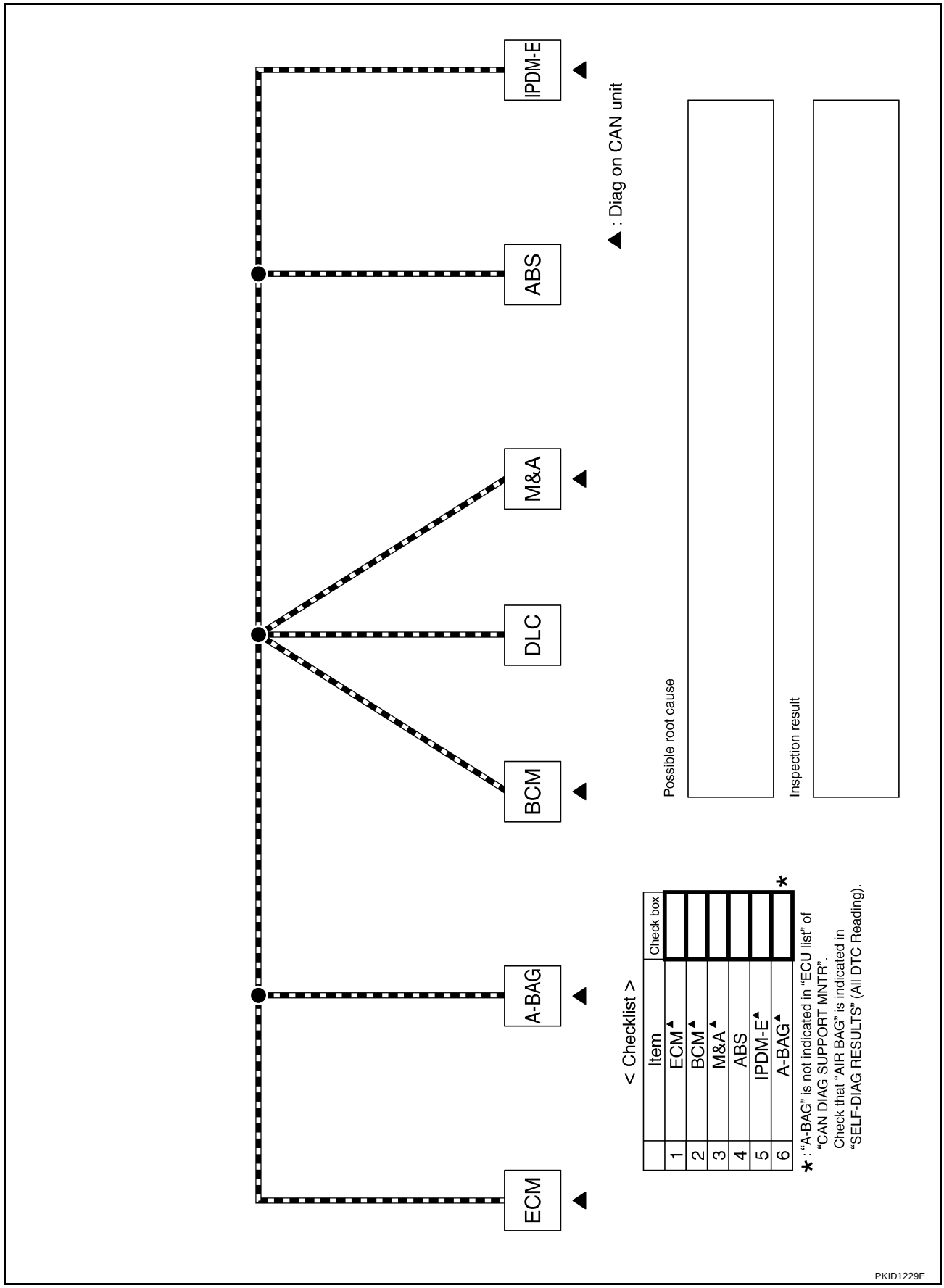
Error symptom : Present / Past

SKIB8898E

CAN System (Type 1)

NKS004Q0

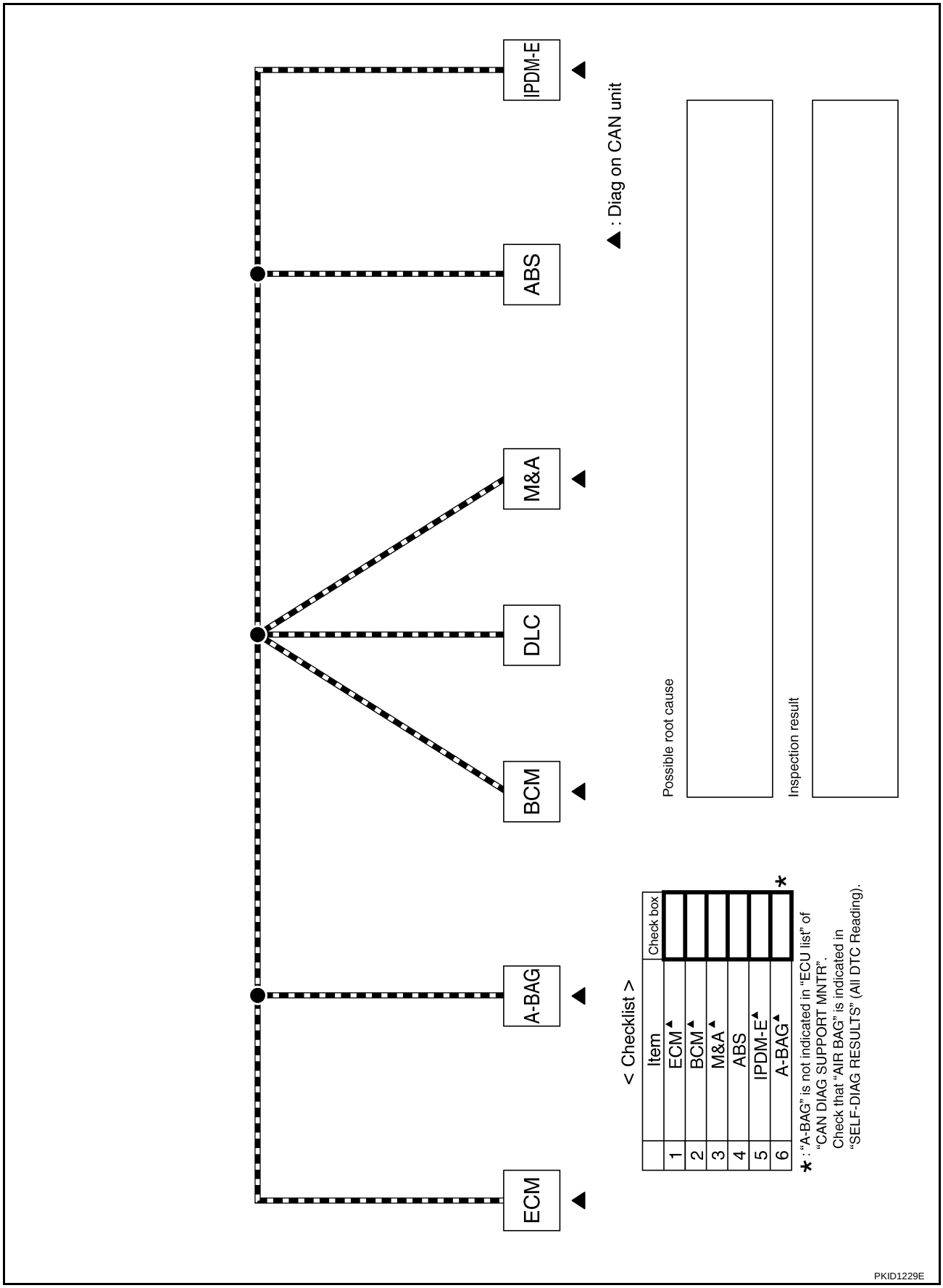
DIAGNOSIS SHEET



CAN System (Type 2)

NKS004Q1

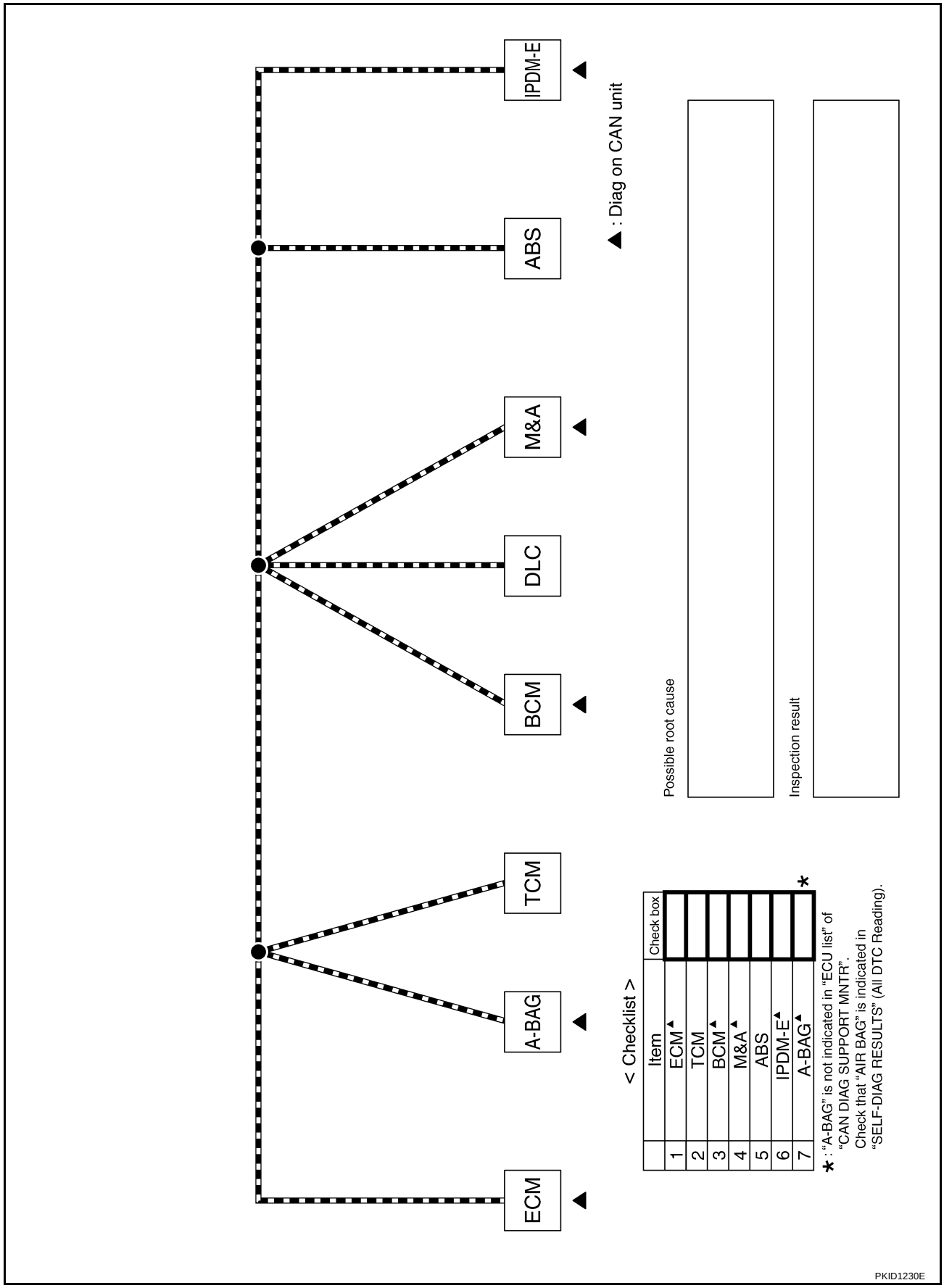
DIAGNOSIS SHEET



CAN System (Type 3)

NKS004S1

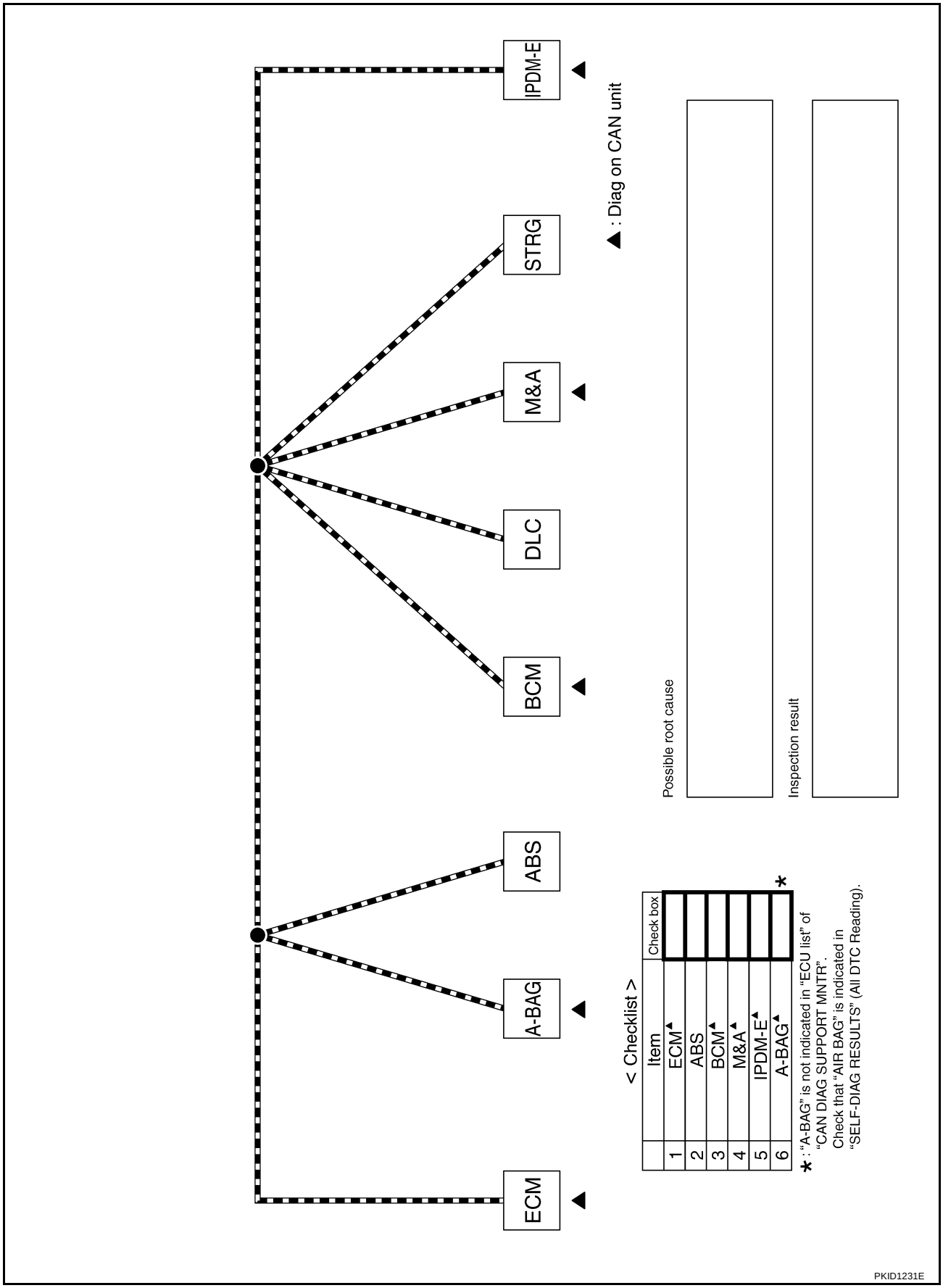
DIAGNOSIS SHEET



CAN System (Type 4)

NKS004Q3

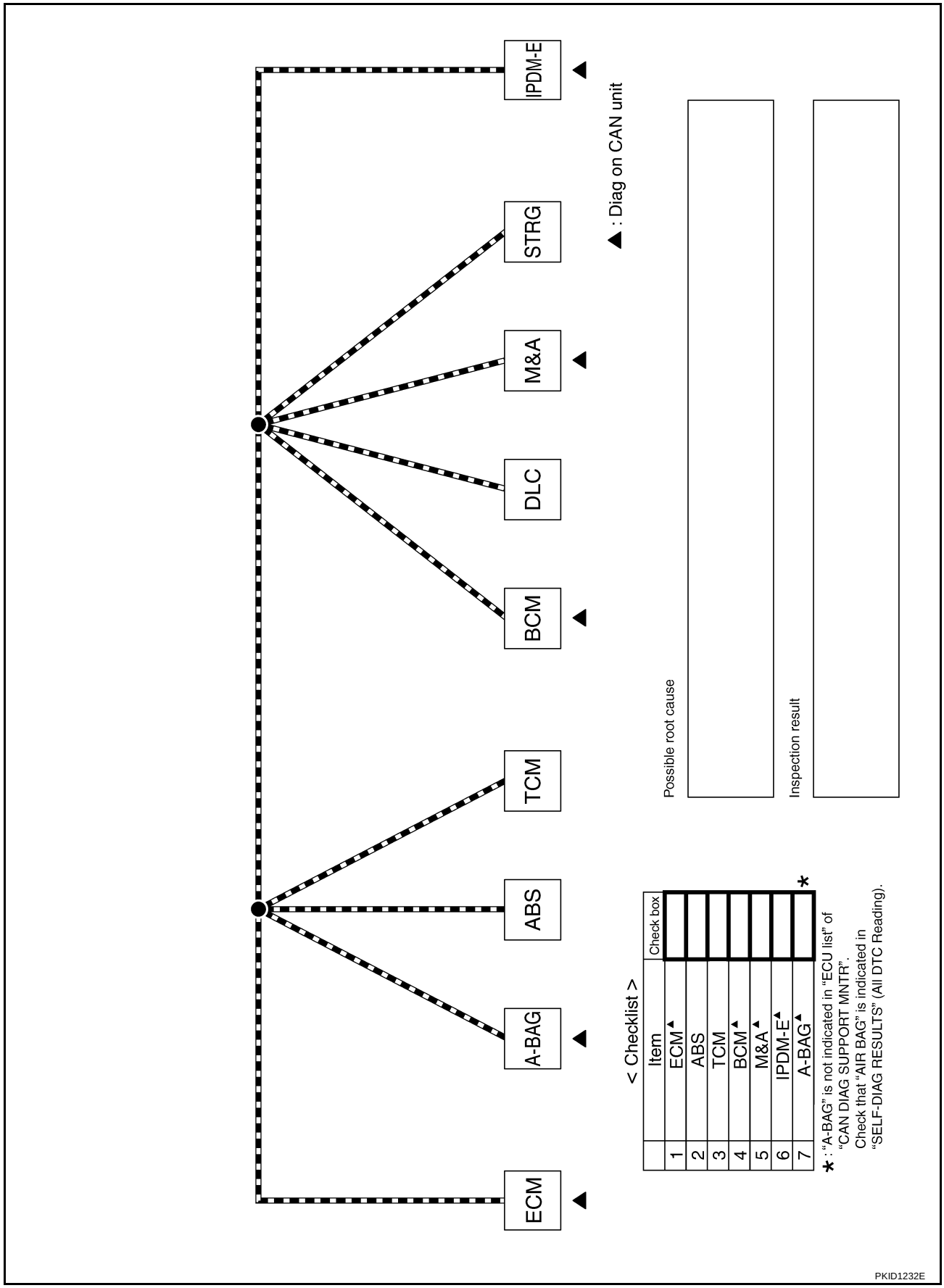
DIAGNOSIS SHEET



CAN System (Type 5)

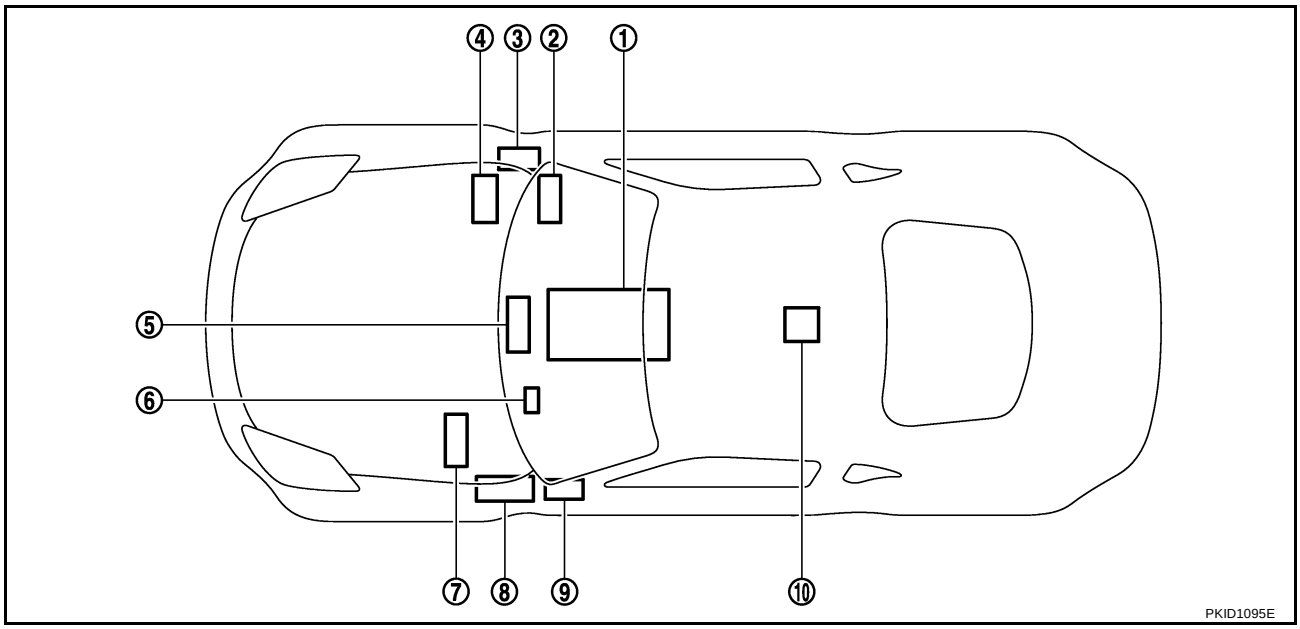
NKS004Q4

DIAGNOSIS SHEET



Component Parts Location

NKS004RJ



1. A/T assembly F6
2. ECM M71
3. VDC/TCS/ABS control unit B114
4. IPDM E/R E9
5. Unified meter and A/C amp. M48
6. Steering angle sensor M22
7. ABS actuator and electric unit (control unit) E51
8. BCM M90
9. Data link connector M8
10. Air bag diagnosis sensor unit M55

Harness Layout

NKS004RK

Refer to PG-41, "Harness Layout" .

Malfunction Area Chart

NKS004RL

MAIN LINE

Malfunction Area	Reference
Main line between VDC/TCS/ABS control unit and data link connector	LAN-66, "Main Line Between VDC/TCS/ABS Control Unit and Data Link Connector"
Main line between TCM and data link connector	LAN-66, "Main Line Between TCM and Data Link Connector"
Main line between data link connector and ABS actuator and electric unit (control unit)	LAN-67, "Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit)"

BRANCH LINE

Malfunction Area	Reference
ECM branch line circuit	LAN-68, "ECM Branch Line Circuit"
Air bag diagnosis sensor unit branch line circuit	LAN-68, "Air Bag Diagnosis Sensor Unit Branch Line Circuit"
VDC/TCS/ABS control unit branch line circuit	LAN-69, "VDC/TCS/ABS Control Unit Branch Line Circuit"
TCM branch line circuit	LAN-69, "TCM Branch Line Circuit"
BCM branch line circuit	LAN-70, "BCM Branch Line Circuit"
Data link connector branch line circuit	LAN-71, "Data Link Connector Branch Line Circuit"
Unified meter and A/C amp. branch line circuit	LAN-71, "Unified Meter and A/C Amp. Branch Line Circuit"
Steering angle sensor branch line circuit	LAN-72, "Steering Angle Sensor Branch Line Circuit"
ABS actuator and electric unit (control unit) branch line circuit	LAN-72, "ABS Actuator and Electric Unit (Control Unit) Branch Line Circuit"
IPDM E/R branch line circuit	LAN-73, "IPDM E/R Branch Line Circuit"

SHORT CIRCUIT

Malfunction Area	Reference
CAN communication circuit	LAN-74, "CAN Communication Circuit"

Main Line Between VDC/TCS/ABS Control Unit and Data Link Connector

NKS0054K

INSPECTION PROCEDURE

1. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the following harness connectors.
- ECM harness connector
- Harness connectors B101 and M73
4. Check the continuity between the Harness connector M73 and the data link connector.

Harness connector		Data link connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
M73	4M	M8	6	Yes
	5M		14	Yes

OK or NG

OK >> ● Present error: Check the following items again.
- Decision of CAN system type.
- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
- Procedure for detecting root cause.

● Past error: Error was detected in the main line between the VDC/TCS/ABS control unit and the data link connector.

NG >> Repair the main line between the harness connector M73 and the data link connector.

Main Line Between TCM and Data Link Connector

NKS0054L

INSPECTION PROCEDURE

1. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the following harness connectors.
- ECM harness connector
- Harness connectors F102 and M72
4. Check the continuity between the Harness connector M72 and the data link connector.

Harness connector		Data link connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
M72	25H	M8	6	Yes
	24H		14	Yes

OK or NG

OK >> ● Present error: Check the following items again.
- Decision of CAN system type.
- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
- Procedure for detecting root cause.

● Past error: Error was detected in the main line between the TCM and the data link connector.

NG >> Repair the main line between the harness connector M72 and the data link connector.

Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit)

NKS0054M

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (connector side and harness side).

- Harness connector M15
- Harness connector E108

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the harness connectors M15 and E108.
2. Check the continuity between the data link connector and the harness connector.

Data link connector		Harness connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
M8	6	M15	2G	Yes
	14		7G	Yes

OK or NG

OK >> GO TO 3.
NG >> Repair the main line between the data link connector and the harness connector M15.

3. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the connector of ABS actuator and electric unit (control unit).
2. Check the continuity between the harness connector and the ABS actuator and electric unit (control unit) harness connector.

Harness connector		ABS actuator and electric unit (control unit) harness connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
E108	2G	E51	20	Yes
	7G		23	Yes

OK or NG

OK >> ● Present error: Check the following items again.
- Decision of CAN system type.
- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
- Procedure for detecting root cause.

● Past error: Error was detected in the main line between the data link connector and the ABS actuator and electric unit (control unit).

NG >> Replace the main line between the harness connector E108 and the ABS actuator and electric unit (control unit).

ECM Branch Line Circuit

NKS0054N

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the ECM for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of ECM.
2. Check the resistance between the ECM harness connector terminals.

ECM harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M71	114	113	Approx. 108 – 132

OK or NG

OK >> GO TO 3.
NG >> Repair the ECM branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the ECM. Refer to EC-142, "POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> ● Present error: Replace the ECM. Refer to EC-76, "Procedure After Replacing ECM" .
● Past error: Error was detected in the ECM branch line.
NG >> Repair the power supply and the ground circuit.

Air Bag Diagnosis Sensor Unit Branch Line Circuit

NKS0054O

INSPECTION PROCEDURE

1. CHECK AIR BAG DIAGNOSIS SENSOR UNIT

Check the air bag diagnosis sensor unit. Refer to SRS-9, "TROUBLE DIAGNOSIS" .

OK or NG

OK >> Replace the main harness.
NG >> Replace parts whose air bag system has a malfunction.

VDC/TCS/ABS Control Unit Branch Line Circuit

NKS0054P

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).

- VDC/TCS/ABS control unit connector
- Harness connector B101
- Harness connector M73

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of VDC/TCS/ABS control unit.
2. Check the resistance between the VDC/TCS/ABS control unit harness connector terminals.

VDC/TCS/ABS control unit harness connector			Resistance (Ω)
Connector No.	Terminal No.		
B114	61	63	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the VDC/TCS/ABS control unit branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the VDC/TCS/ABS control unit. Refer to BRC-87, "Wiring Diagram — VDC —" .

OK or NG

OK >> ● Present error: Replace the VDC/TCS/ABS control unit. Refer to BRC-129, "Removal and Installation" .
● Past error: Error was detected in the VDC/TCS/ABS control unit branch line.
NG >> Repair the power supply and the ground circuit.

TCM Branch Line Circuit

NKS0054Q

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).

- A/T assembly connector
- Harness connector F102
- Harness connector M72

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of A/T assembly.
2. Check the resistance between the A/T assembly harness connector terminals.

A/T assembly harness connector			Resistance (Ω)
Connector No.	Terminal No.		
F6	3	8	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the TCM branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the TCM. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >>
- Present error: Replace the control valve with TCM. Refer to AT-242, "Removal and Installation" .
- Past error: Error was detected in the TCM branch line.

NG >> Repair the power supply and the ground circuit.

BCM Branch Line Circuit

NKS0054R

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the BCM for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of BCM.
2. Check the resistance between the BCM harness connector terminals.

BCM harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M90	39	40	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the BCM branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the BCM. Refer to BCS-11, "Schematic" .

OK or NG

OK >>
- Present error: Replace the BCM. Refer to BCS-17, "Removal and Installation of BCM" .
- Past error: Error was detected in the BCM branch line.

NG >> Repair the power supply and the ground circuit.

Data Link Connector Branch Line Circuit

NKS0054S

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the data link connector for damage, bend and loose connection (connector side and harness side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

Check the resistance between the data link connector terminals.

Data link connector			Resistance (Ω)
Connector No.	Terminal No.		
M8	6	14	Approx. 54 – 66

OK or NG

OK >>
- Present error: Check the following items again.
  - Decision of CAN system type.
  - Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
  - Procedure for detecting root cause.
- Past error: Error was detected in the data link connector branch line circuit.

NG >> Repair the data link connector branch line.

Unified Meter and A/C Amp. Branch Line Circuit

NKS0054T

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the unified meter and A/C amp. for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of unified meter and A/C amp.
2. Check the resistance between the unified meter and A/C amp. harness connector terminals.

Unified meter and A/C amp. harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M48	1	11	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the unified meter and A/C amp. branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the unified meter and A/C amp. Refer to DI-49, "Power Supply and Ground Circuit Inspection" .

OK or NG

OK >> ● Present error: Replace the unified meter and A/C amp. Refer to DI-55, "Removal and Installation of Unified Meter and A/C Amp." .
● Past error: Error was detected in the unified meter and A/C amp. branch line.

NG >> Repair the power supply and the ground circuit.

Steering Angle Sensor Branch Line Circuit

NKS0054U

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the steering angle sensor for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of steering angle sensor.
2. Check the resistance between the steering angle sensor harness connector terminals.

Steering angle sensor harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M22	4	5	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the steering angle sensor branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the steering angle sensor. Refer to BRC-86, "Schematic" .

OK or NG

OK >> ● Present error: Replace the steering angle sensor. Refer to BRC-133, "Removal and Installation" .
● Past error: Error was detected in the steering angle sensor branch line.

NG >> Repair the power supply and the ground circuit.

ABS Actuator and Electric Unit (Control Unit) Branch Line Circuit

NKS0054V

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the ABS actuator and electric unit (control unit) for damage, bend and loose connection (unit side and connector side).

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of ABS actuator and electric unit (control unit).
2. Check the resistance between the ABS actuator and electric unit (control unit) harness connector terminals.

ABS actuator and electric unit (control unit) harness connector			Resistance (Ω)
Connector No.	Terminal No.		
E51	20	23	Approx. 54 – 66

OK or NG

OK >> GO TO 3.
NG >> Repair the ABS actuator and electric unit (control unit) branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the ABS actuator and electric unit (control unit). Refer to BRC-13, "Schematic" .

OK or NG

OK >>
- Present error: Replace the ABS actuator and electric unit (control unit). Refer to BRC-36, "Removal and Installation" .
- Past error: Error was detected in the ABS actuator and electric unit (control unit) branch line.

NG >> Repair the power supply and the ground circuit.

IPDM E/R Branch Line Circuit

NKS0054W

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).

- IPDM E/R connector
- Harness connector E108 (Models with VDC)
- Harness connector M15 (Models with VDC)

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of IPDM E/R.
2. Check the resistance between the IPDM E/R harness connector terminals.

IPDM E/R harness connector			Resistance (Ω)
Connector No.	Terminal No.		
E9	48	49	Approx. 108 – 132

OK or NG

OK >> GO TO 3.
NG >> Repair the IPDM E/R branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the IPDM E/R. Refer to PG-24, "IPDM E/R Power/Ground Circuit Inspection" .

OK or NG

OK >> ● Present error: Replace the IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
● Past error: Error was detected in the IPDM E/R branch line.

NG >> Repair the power supply and the ground circuit.

CAN Communication Circuit

NKS0054X

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect all the unit connectors on CAN communication system.
4. Check terminals and connectors for damage, bend and loose connection.

OK or NG

OK >> GO TO 2.
NG >> Repair the terminal and connector.

2. CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

Check the continuity between the data link connector terminals.

Data link connector			Continuity
Connector No.	Terminal No.		
M8	6	14	No

OK or NG

OK >> GO TO 3.
NG >> Check the harness and repair the root cause.

3. CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

Check the continuity between the data link connector and the ground.

Data link connector		Ground	Continuity
Connector No.	Terminal No.		
M8	6		No
	14		No

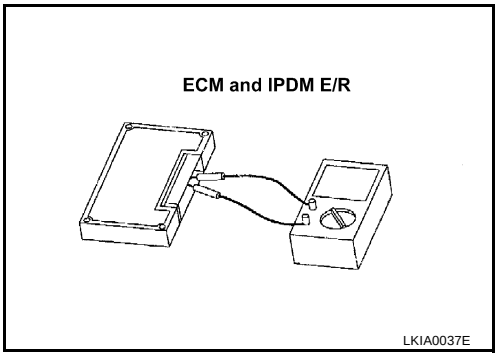
OK or NG

OK >> GO TO 4.
NG >> Check the harness and repair the root cause.

4. CHECK ECM AND IPDM E/R TERMINATION CIRCUIT

1. Remove the ECM and the IPDM E/R.
2. Check the resistance between the ECM terminals.

ECM		Resistance (Ω)
Terminal No.		
114	113	Approx. 108 – 132



3. Check the resistance between the IPDM E/R terminals.

IPDM E/R		Resistance (Ω)
Terminal No.		
48	49	Approx. 108 – 132

OK or NG

OK >> GO TO 5.
NG >> Replace the ECM and/or the IPDM E/R.

5. CHECK SYMPTOM

Connect all the connectors. Check if the symptoms described in the “Symptom (Results from interview with customer)” are reproduced.

Inspection result

Reproduced>>GO TO 6.
Non-reproduced>>Start the diagnosis again. Follow the trouble diagnosis procedure when past error is detected.

6. CHECK UNIT REPRODUCTION

Perform the reproduction test as per the following procedure for each unit.

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect one of the unit connectors of CAN communication system.

   NOTE:
   ECM and IPDM E/R have a termination circuit. Check other units first.
4. Connect the battery cable to the negative terminal. Check if the symptoms described in the “Symptom (Results from interview with customer)” are reproduced.

   NOTE:
   Although unit-related error symptoms occur, do not confuse them with other symptoms.

Inspection result

Reproduced>>Connect the connector. Check other units as per the above procedure.
Non-reproduced>>Replace the unit whose connector was disconnected.

SECTION LT
LIGHTING SYSTEM

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PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS00541

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS00542

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

General Precautions for Service Operations

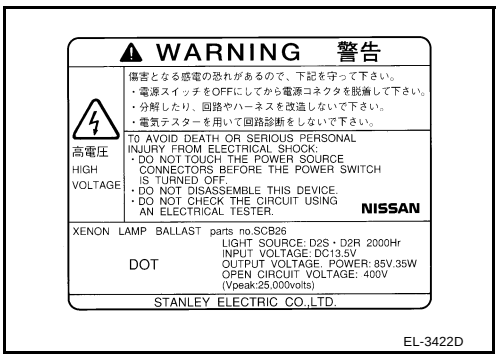
NKS00543

- Never work with wet hands.
- Xenon headlamp includes high voltage generating part. Be sure to disconnect battery negative cable (negative terminal) or power fuse before removing, installing, or touching the xenon headlamp (including lamp bulb).
- Turn the lighting switch OFF before disconnecting and connecting the connector.
- When turning the xenon headlamp on and while it is illuminated, never touch the harness, bulb, and socket of the headlamp.
- When checking the headlamp on/off operation, check it on vehicle and with the power connected to the vehicle-side connector.



PKIB7344E

- Do not touch the headlamp bulb glass surface with bare hands or allow oil or grease to get on it. Do not touch the headlamp bulb just after the headlamp is turned off, because it is very hot.
- Install the xenon headlamp bulb socket correctly. If it is installed improperly, high-voltage leak or corona discharge may occur that can melt the bulb, connector, and housing. Do not illuminate the xenon headlamp bulb out of the headlamp housing. Doing so can cause fire and harm your eyes.
- When the bulb has burned out, wrap it in a thick vinyl bag and discard. Do not break the bulb.
- Leaving the bulb removed from the headlamp housing for a long period of time can deteriorate the performance of the lens and reflector (dirt, clouding). Always prepare a new bulb and have it on hand when replacing the bulb.



EL-3422D

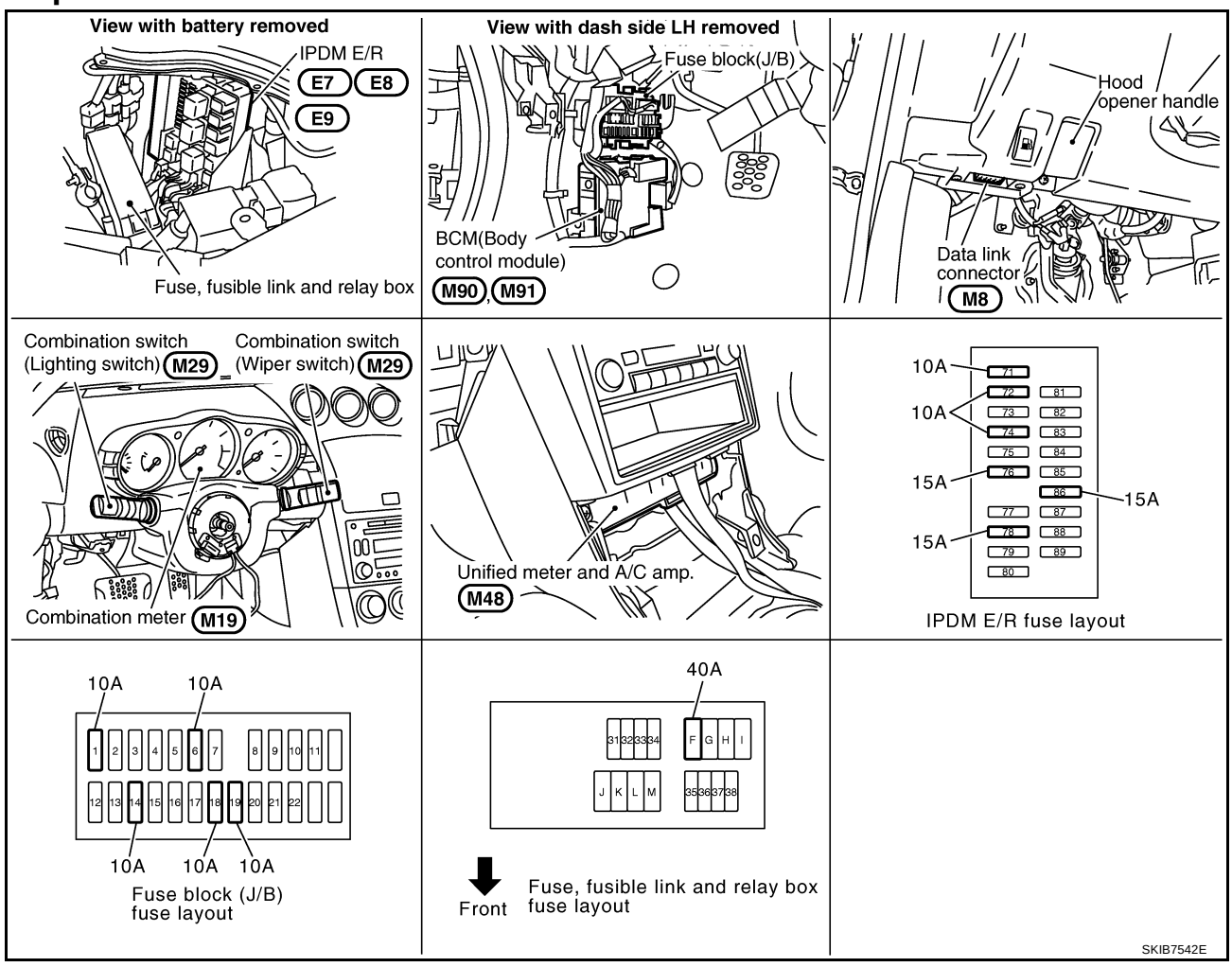
- When adjusting the headlamp aiming, turn the aiming adjustment screw only in the tightening direction. (If it is necessary to loosen the screw, first fully loosen the screw, and then turn it in the tightening direction.)
- Do not use organic solvent (paint thinner or gasoline) to clean lamps and to remove old sealant.

HEADLAMP (FOR USA)

PFP:26010

Component Parts and Harness Connector Location

NKS004WM



System Description

NKS004WN

Control of the headlamp system operation is dependent upon the position of the combination switch (lighting switch). When the lighting switch is placed in the 2ND position, the BCM (body control module) receives input signal requesting the headlamps (and tail lamps) illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) through the CAN communication lines. The CPU (central processing unit) of the IPDM E/R controls the headlamp high and headlamp low relay coils. These relays, when energized, direct power to the respective headlamps, which then illuminate.

OUTLINE

Power is supplied at all times

- to headlamp high relay, located in IPDM E/R and
- to headlamp low relay, located in IPDM E/R, from battery directly,
- through 40A fusible link [letter F, located in fuse, fusible link and relay box]
- to BCM terminal 55,
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM terminal 42,
- through 15A fuse [No.78 located in IPDM E/R]
- to CPU located in IPDM E/R,
- through 10A fuse [No.71,located in IPDM E/R]
- to CPU located in IPDM E/R,
- through 10A fuse [No.19, located in fuse block (J/B)]

- to combination meter terminal 24.

With ignition switch in ON or START position, power is supplied

- to CPU located in IPDM E/R,
- through 10A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

HEADLAMP OPERATION

Low Beam Operation

With the lighting switch in 2ND position, the BCM receives input signal from combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION") the headlamp to illuminate. This input signal is communicated to the IPDM E/R through the CAN communication lines. The CPU located in the IPDM E/R controls the headlamp low relay coil, which when energized, supplies power,

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7.

Ground is supplied

- to front combination lamp RH terminal 4, and
- to front combination lamp LH terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With power and ground supplied, low beam headlamps illuminate.

High Beam Operation/Flash-to-Pass Operation

With the lighting switch in 2ND position and placed in HIGH or PASS position, the BCM receives input signal requesting headlamp high beams to illuminate. High beam request signal and low beam request signal is communicated to the IPDM E/R through CAN communication. The CPU located in the IPDM E/R controls headlamp high relay and headlamp low relay turned ON, which when energized, supplies power,

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7,
- through 10A fuse [No. 72, located in IPDM E/R]
- through IPDM E/R terminal 27

- to front combination lamp RH terminal 3,
- through 10A fuse [No. 74, located in IPDM E/R]
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 3.

Ground is supplied

- to front combination lamp RH terminals 4, and
- to front combination lamp LH terminals 4,
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With the power and ground supplied, headlamp bulbs illuminate. High beam solenoids move the bulb shades in the front combination lamps, and the bulb shades change to high beam position.
Unified meter and A/C amp. receives signal from BCM through CAN communication lines, and then combination meter indicator illuminates high beam.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (ON), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.
Under this condition, the headlamps remain illuminated for 5 minutes, then the headlamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

REMOTE KEYLESS ENTRY SYSTEM OPERATION

Refer to BL-59, "REMOTE KEYLESS ENTRY SYSTEM" .

VEHICLE SECURITY SYSTEM

The vehicle security system will flash the high beams if the system is triggered. Refer to BL-125, "VEHICLE SECURITY (THEFT WARNING) SYSTEM" .

XENON HEADLAMP

Xenon type lamps are used for headlamps. Xenon bulbs do not use a filament. Instead, they produce light when a high voltage current is passed between two tungsten electrodes through a mixture of xenon (an inert gas) and certain other metal halides. In addition to strong lighting power, electronic control of the power supply gives the headlamps stable quality and tone color.
Followings are some advantages of the xenon type headlamp.

- The light produced by the headlamps is white color similar to sunlight that is easy to the eyes.
- Light output is nearly double that of halogen headlamps, affording increased area of illumination.
- Counter-reflected luminance increases and the contrast enhances on the wet road in the rain. That makes visibility go up more than the increase of the light volume.
- Power consumption is approximately 25 percent less than halogen headlamps, reducing battery load.

CAN Communication System Description

NKS004WO

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

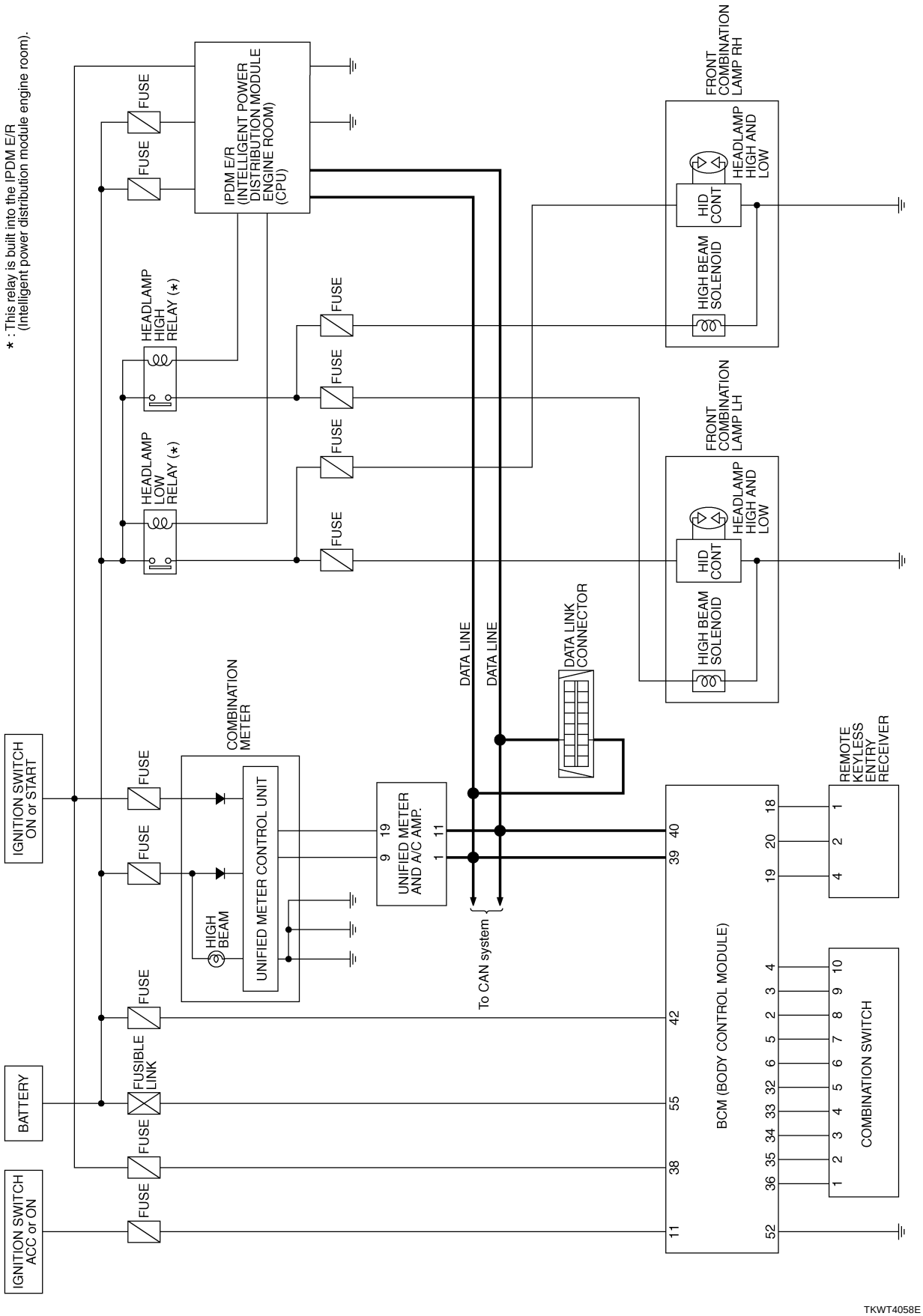
CAN Communication Unit

NKS004WP

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

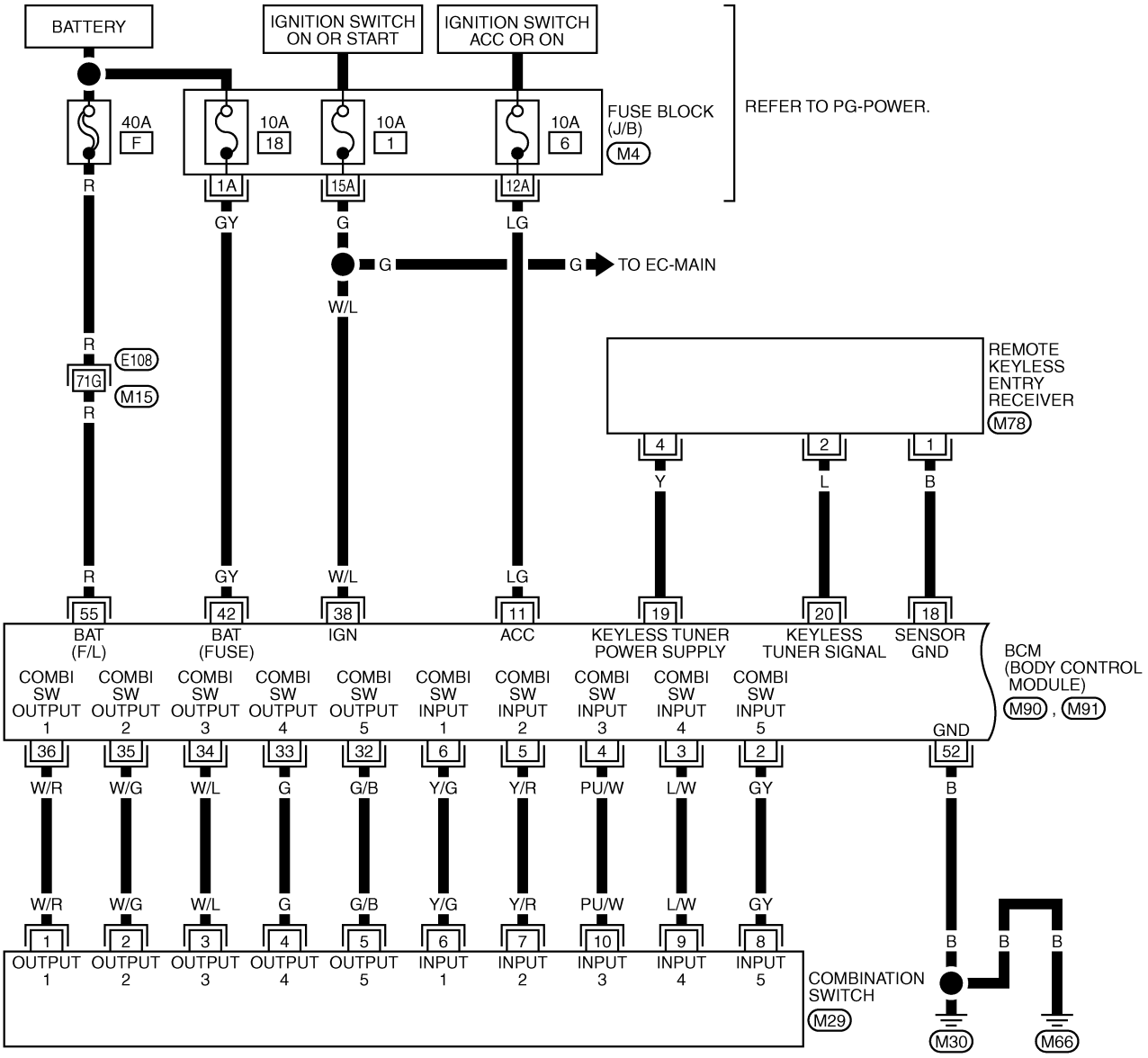
NKS004WQ

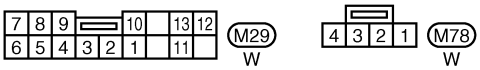


Wiring Diagram — H/LAMP —

NKS004WR

LT-H/LAMP-01





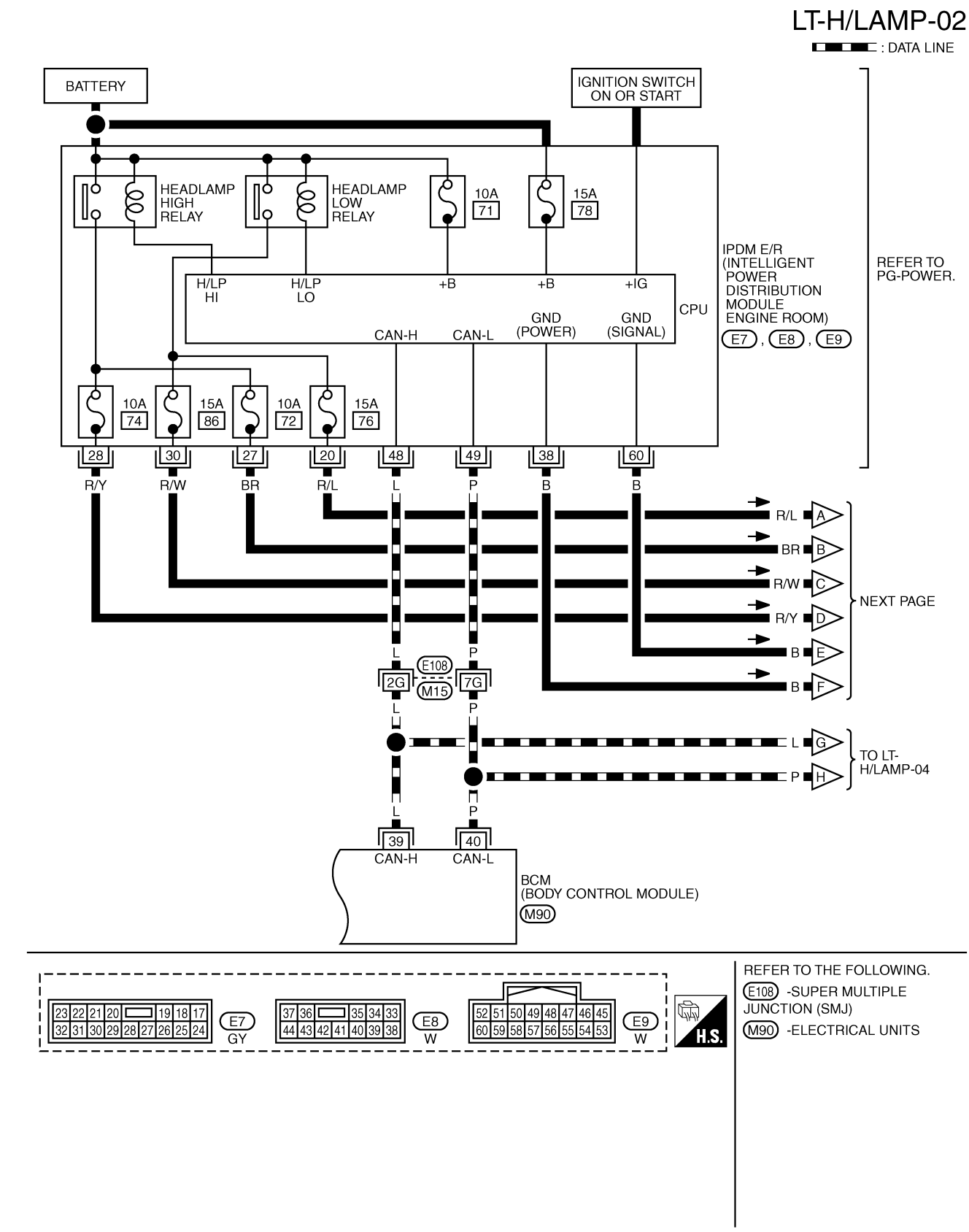
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

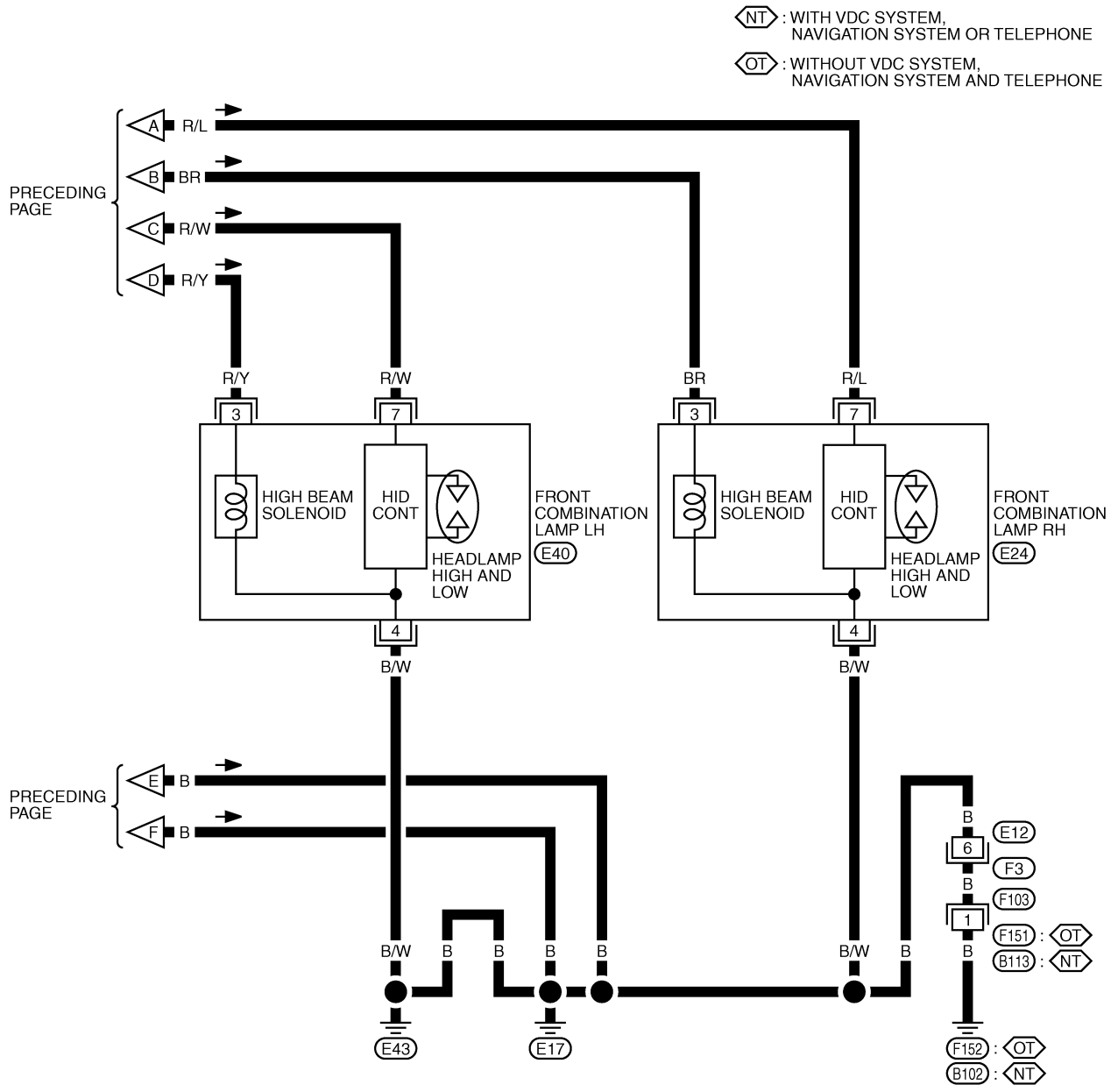
M90 , M91 -ELECTRICAL UNITS

TKWT5744E


LT-H/LAMP-02
: DATA LINE
BATTERY
IGNITION SWITCH ON OR START
HEADLAMP HIGH RELAY
HEADLAMP LOW RELAY
10A 71
15A 78
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E7 , E8 , E9
REFER TO PG-POWER.
H/LP HI
H/LP LO
+B
+B
+IG
CPU
GND (POWER)
GND (SIGNAL)
CAN-H
CAN-L
10A 74
15A 86
10A 72
15A 76
28
30
27
20
48
49
38
60
R/Y
R/W
BR
R/L
L
P
B
B
R/L A
BR B
R/W C
R/Y D
B E
B F
NEXT PAGE
E108
2G
M15
7G
L G
P H
TO LT-H/LAMP-04
39
40
CAN-H
CAN-L
BCM (BODY CONTROL MODULE)
M90
23 22 21 20 19 18 17
32 31 30 29 28 27 26 25 24
E7
GY
37 36 35 34 33
44 43 42 41 40 39 38
E8
W
52 51 50 49 48 47 46 45
60 59 58 57 56 55 54 53
E9
W
H.S.
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M90 -ELECTRICAL UNITS

TKWT5745E

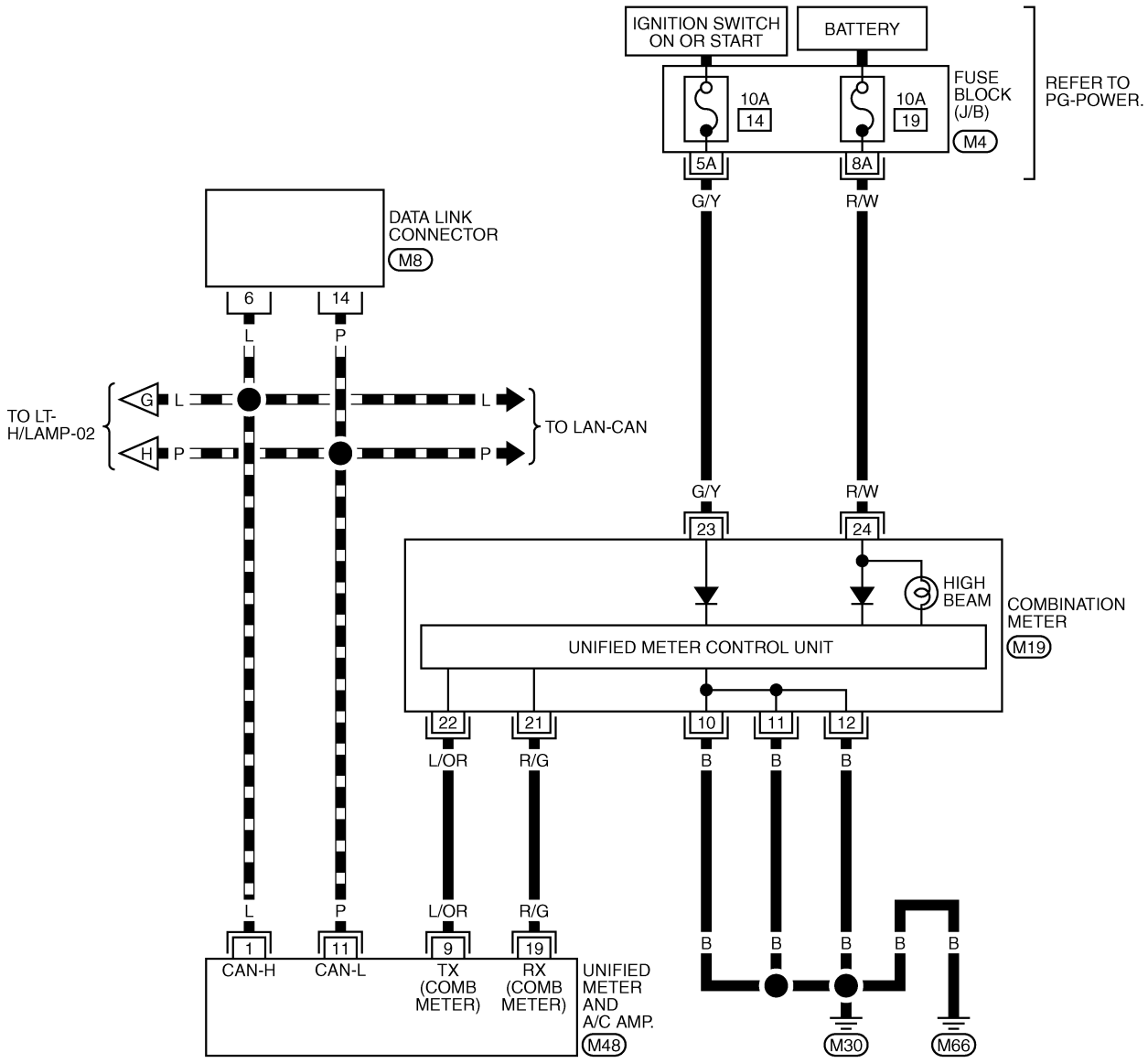
LT-H/LAMP-03

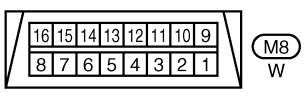


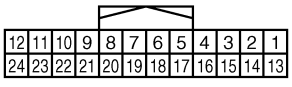
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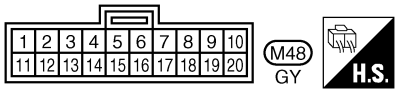
LT-H/LAMP-04

: DATA LINE









REFER TO THE FOLLOWING.

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

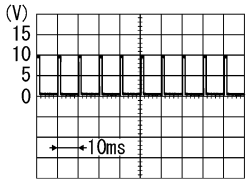
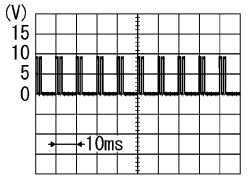
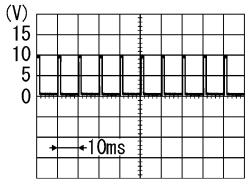
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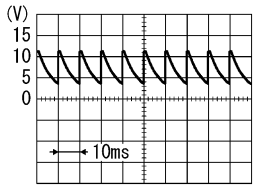
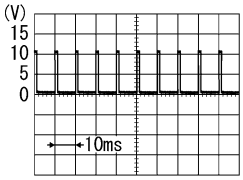
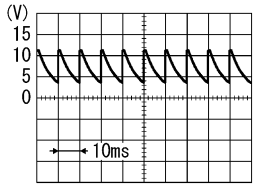
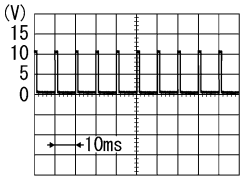
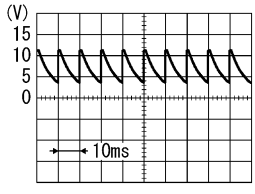
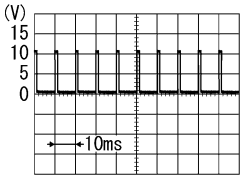
Terminals and Reference Values for BCM

NKS004WS

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch)	 PKIB4959J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4959J Approx. 1.0 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Lighting switch 1ST (The same result with lighting switch 2ND)	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch)	 PKIB4958J Approx. 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
39	L	CAN – H	—	—	—
40	P	CAN – L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0 V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

NKS004WT

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R/L	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0 V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0 V
					ON	Battery voltage
30	R/W	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
48	L	CAN – H	—	—		—
49	P	CAN – L	—	—		—
60	B	Ground	ON	—		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS004WU

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-5, "System Description" .
3. Perform the preliminary check. Refer to LT-15, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does headlamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004WV

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6

Unit	Power source	Fuse and fusible link No.
IPDM E/R	Battery	72
		74
		76
		86

Refer to LT-9, "Wiring Diagram — H/LAMP —" .

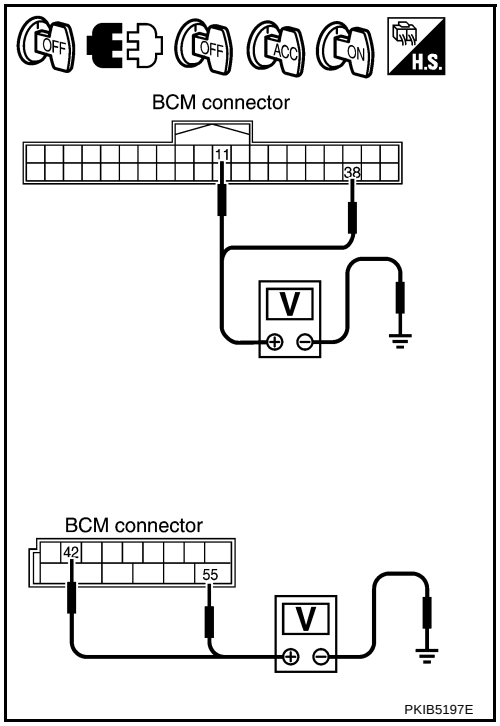
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
BCM connector	Terminal				
M90	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage



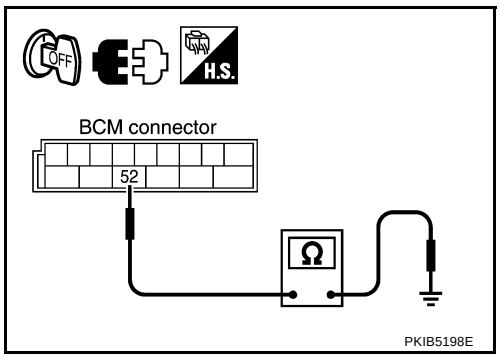
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Function (BCM)

NKS004WW

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
HEADLAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
BCM	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT
Display Item List

Item	Description	CONSULT-III	Factory setting
BATTERY SAVER SET	Exterior lamp battery saver control mode can be changed in this mode. Selects exterior lamp battery saver control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR
Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“ON/OFF”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 1: ON/Others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1 ST	“ON/OFF”	Displays status (lighting switch 1ST or 2ND position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW NOTE	“ON/OFF”	—
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays status of passenger door as judged from passenger door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - RR NOTE	“OFF”	—
DOOR SW - RL NOTE	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
TURN SIGNAL R	“ON/OFF”	Displays status (Turn right: ON/Others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays status (Turn left: ON/Others: OFF) as judged from lighting switch signal.
CARGO LAMP SW NOTE	“OFF”	—

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST
Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON–OFF.
HEAD LAMP	Allows headlamp relay to operate by switching ON–OFF.
FR FOG LAMP NOTE	—
CORNERING LAMP NOTE	—

NOTE:
This item is displayed, but cannot be tested.

CONSULT-III Function (IPDM E/R)

NKS004WX

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Check Item, Diagnosis Mode	Description
SELF-DIAGNOSTIC RESULTS	Refer to PG-18, "SELF-DIAG RESULTS" .
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

DATA MONITOR
All Signals, Main Signals, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL & CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST
Display Item List

Test item	CONSULT-III screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON–OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON–OFF every 1 second).

Headlamp Does Not Change To High Beam (Both Sides)

NKS004WY

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select “HI BEAM SW” of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is HIGH BEAM : HI BEAM SW ON

CHECK THE COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "LAMPS" of IPDM E/R active test item.
2. With operating the test item, check the headlamp high beam operation.

Headlamp high beam should operate.
(Headlamp high beam repeats ON-OFF every 1 second).

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

CONSULT-III DATA MONITOR

1. Select "HL LO REQ" and "HL HI REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status

When lighting switch is HIGH BEAM : HL LO REQ ON : HL HI REQ ON

OK or NG

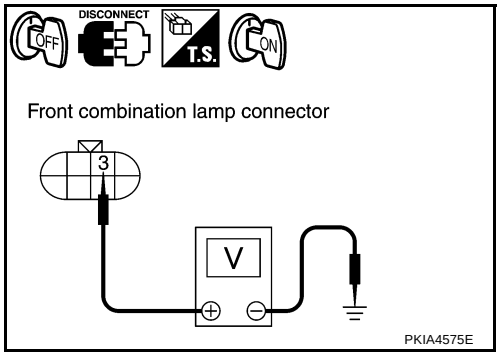
OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select "LAMPS" of IPDM E/R active test item
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

NOTE:
Headlamp high beam repeats ON–OFF every 1 second.



Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

NOTE:
Headlamp high beam repeats ON–OFF every 1 second.

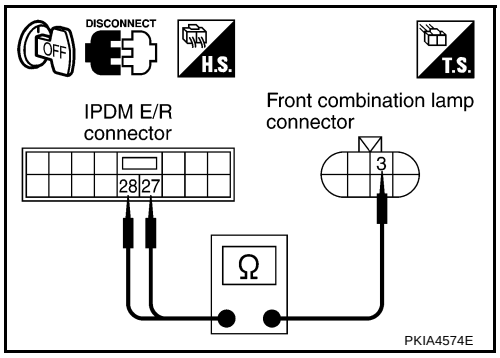
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp (RH and LH) harness connector.



Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	27	E24	3	Yes
LH		28	E40	3	

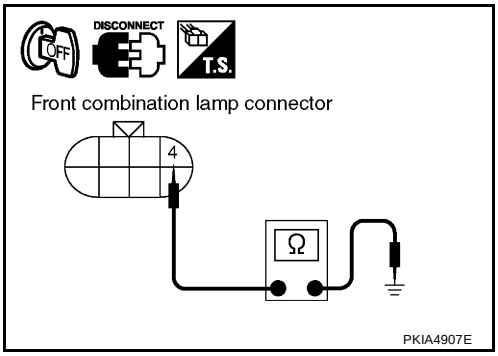
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

6. CHECK HEADLAMP GROUND

Check continuity between front combination lamp (RH and LH) harness connector and ground.

Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		



OK or NG

OK >> Check headlamp harness, connector and bulb.
NG >> Repair harness or connector.

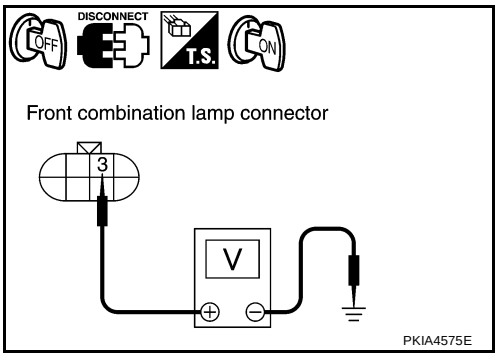
Headlamp Does Not Change To High Beam (One Side)

NKS004WZ

1. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned HIGH BEAM position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.

Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		



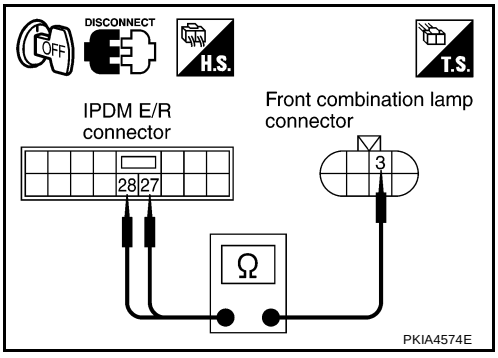
OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp RH or LH harness connector.

Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	27	E24	3	Yes
LH		28	E40	3	



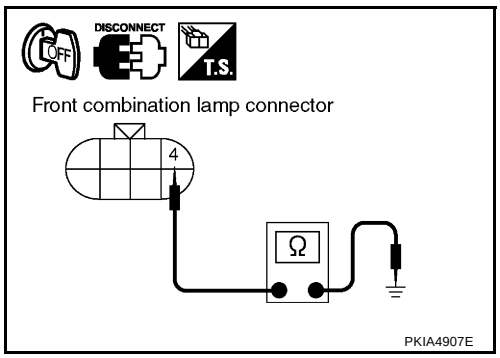
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

3. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH or LH harness connector and ground.

Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		



OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

High Beam Indicator Lamp Does Not Illuminate

NKS004X0

1. CHECK BULB

Check bulb of high beam indicator lamp.

OK or NG

OK >> Replace combination meter. Refer to DI-24, "Removal and Installation for Combination Meter" .
NG >> Replace indicator bulb.

Headlamp Low Beam Does Not Illuminate (Both Sides)

NKS004X1

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP SW1" and "HEAD LAMP SW2" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND position : HEAD LAMP SW1 ON
: HEAD LAMP SW2 ON

CHECK THE COMBINATION SWITCH
Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "LAMPS" of IPDM E/R active test item.
2. With operating the test item, check the headlamp low beam operation.

Headlamp low beam should operate.

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the headlamp low beam operation.

Headlamp low beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

CONSULT-III DATA MONITOR

1. Select "HL LO REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND position : HL LO REQ ON

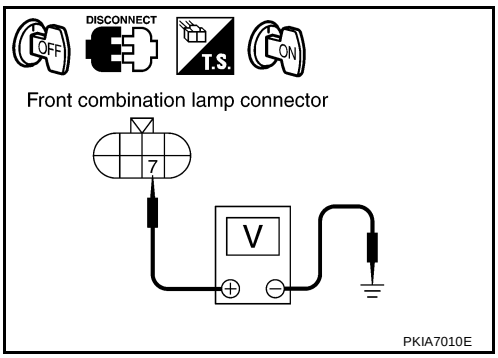
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select "LAMPS" of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(-)	
Front combination lamp connector	Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

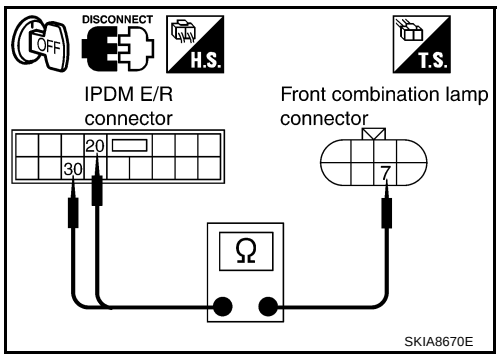
Terminals			Voltage (Approx.)
(+)		(-)	
Front combination lamp connector	Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp (RH and LH) harness connector.



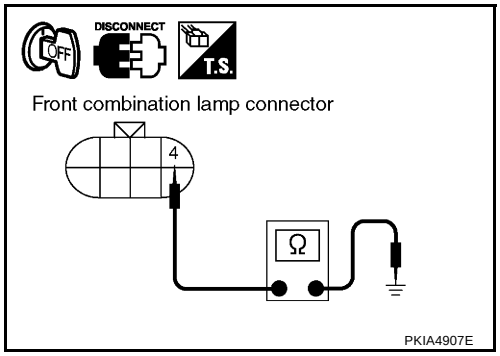
Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	20	E24	7	Yes
LH		30	E40	7	

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

6. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp (RH and LH) harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		

OK or NG

OK >> Check headlamp harness and connectors, ballasts (HID control unit), and xenon bulbs. Refer to LT-27, "Xenon Headlamp Trouble Diagnosis" .
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

NKS004X2

1. CHECK BULB

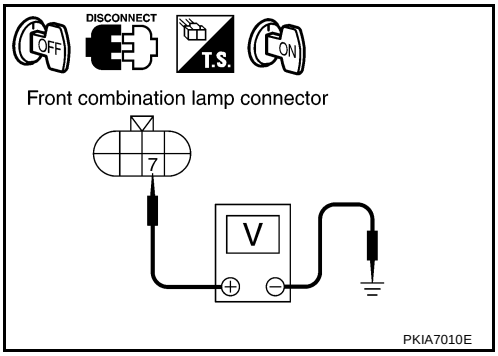
Check ballast (HID control unit) and xenon bulb of lamp which does not illuminate. Refer to LT-27, "Xenon Headlamp Trouble Diagnosis" .

OK or NG

OK >> GO TO 2.
NG >> Replace malfunctioning part.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned 2ND position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.



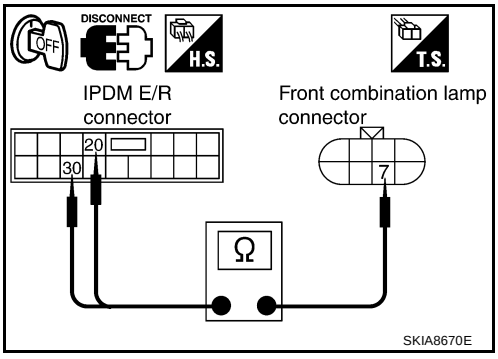
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp RH or LH harness connector.



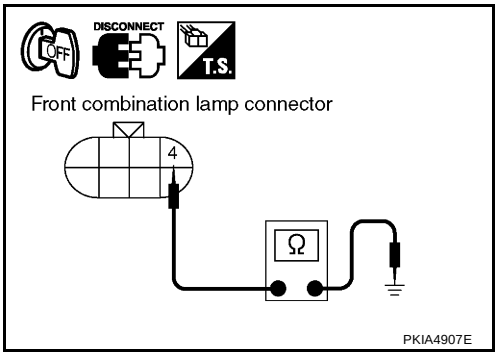
Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	20	E24	7	Yes
LH		30	E40	7	

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

4. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH or LH harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		

OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

Headlamps Does Not Turn OFF

NKS004X3

1. CHECK HEADLAMP TURN OFF

Make sure that lighting switch is OFF. And check if headlamp turns off when ignition switch is turned OFF.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP1" and "HEAD LAMP2" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is OFF : HEAD LAMP SW1 OFF
: HEAD LAMP SW2 OFF

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

3. CHECKING CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

Perform self-diagnosis for “BCM” with CONSULT-III.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
CAN COMM CIRCUIT>> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

General Information for Xenon Headlamp Trouble Diagnosis

NKS004X4

In most cases, malfunction of xenon headlamp - “does not illuminate”, “flickers” or “dark” - is caused by a malfunctioning xenon bulb. A malfunctioning HID control unit or lamp housing, however, may be a cause. Be sure to perform trouble diagnosis following the steps described below.

Caution:

NKS004X5

- Installation or removal of connector must be done with lighting switch OFF.
- Disconnect the battery cable from the negative terminal or remove power fuse.

  CAUTION:
  After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
- When the lamp is illuminated (when lighting switch is ON), never touch harness, HID control unit, inside of lamp, or lamp metal parts.
- To check illumination, temporarily install lamp in vehicle. Be sure to connect power at vehicle side connector.
- If error can be traced directly to electrical system, first check for items such as blown fuses and fusible links, broken wires or loose connectors, dislocated terminals, and improper connections.
- Never work with wet hands.
- Using a tester for HID control unit circuit trouble diagnosis is prohibited.
- Disassembling HID control unit or harnesses (bulb socket harness, ECM harness) is prohibited.
- Immediately after illumination, light intensity and color will fluctuate, but there is nothing wrong.
- When bulb has come to end of its life, brightness will drop significantly, it will flash repeatedly, or light color will turn reddish.

Xenon Headlamp Trouble Diagnosis

NKS004X6

1. CHECK 1: XENON HEADLAMP LIGHTING

Install normal xenon bulb to corresponding xenon bulb headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon bulb.
NG >> GO TO 2.

2. CHECK 2: XENON HEADLAMP LIGHTING

Install normal HID control unit to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace HID control unit.
NG >> GO TO 3.

3. CHECK 3: XENON HEADLAMP LIGHTING

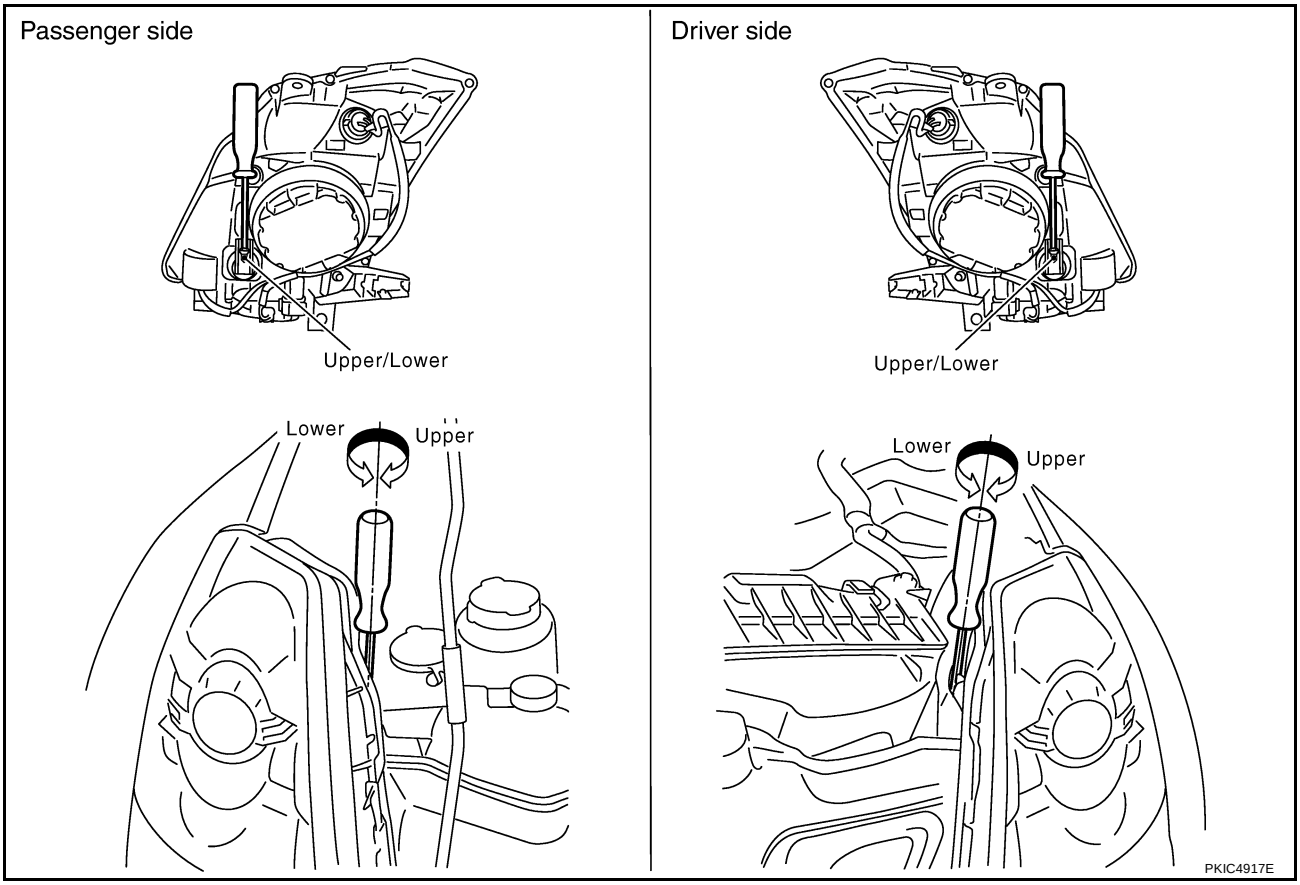
Install normal xenon lamp housing assembly to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon headlamp housing assembly. [Malfunction in starter (boosting circuit) in xenon headlamp housing]
NG >> INSPECTION END

Aiming Adjustment

NKS004X7



PREPARATION BEFORE ADJUSTING

For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

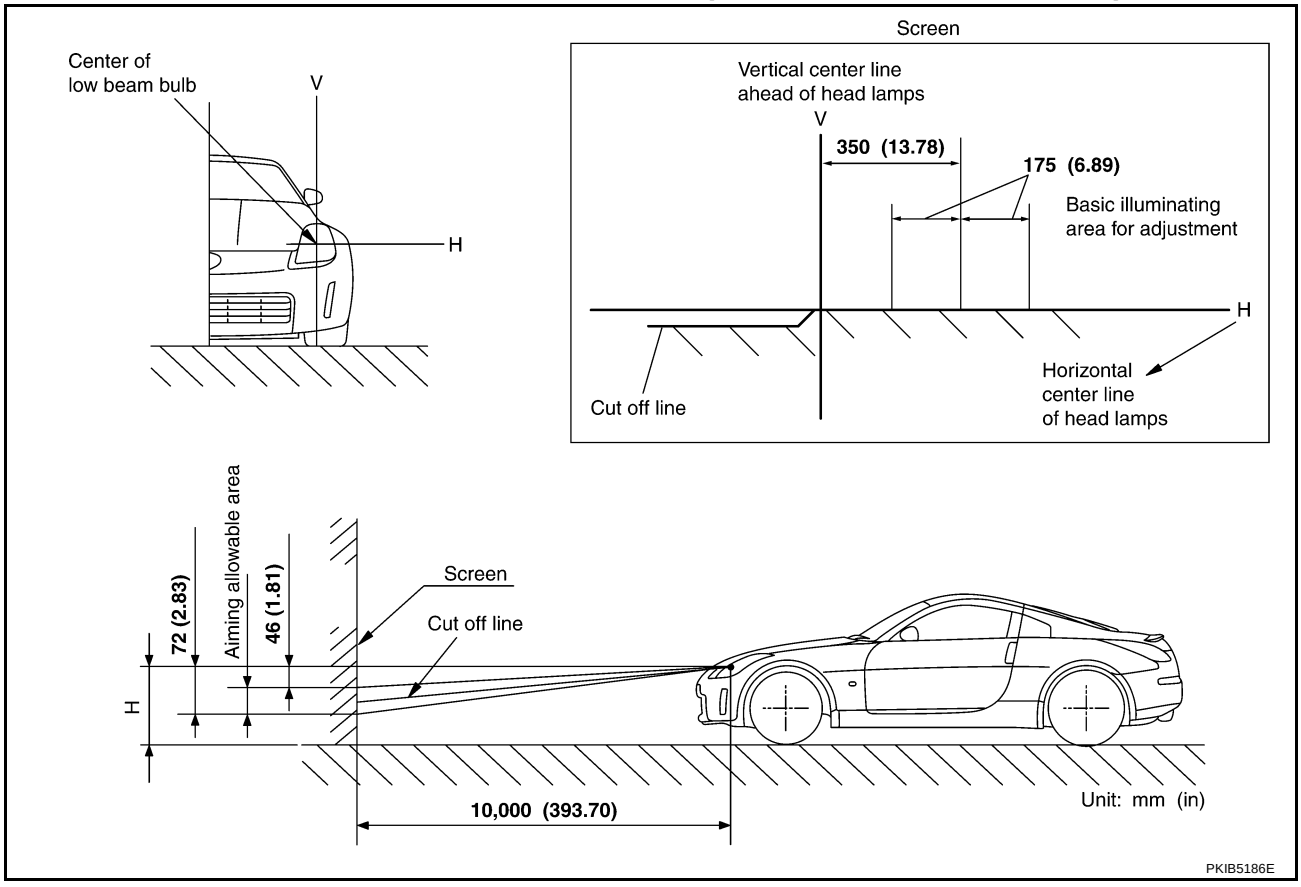
1. Keep all tires inflated to correct pressures.
2. Place vehicle on level surface.

3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam ON.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

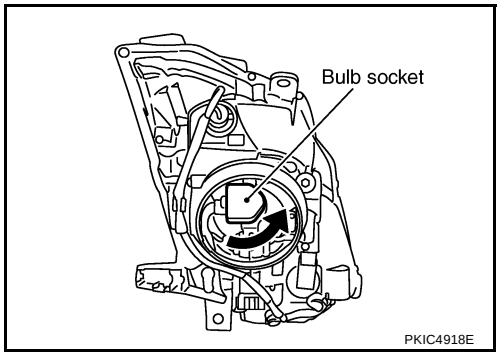
Bulb Replacement

NKS004X8

HEADLAMP HIGH/LOW BEAM

1. Turn lighting switch OFF.
2. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal or remove power fuse.

   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove headlamp. Refer to LT-29, "Removal and Installation" .
4. Turn plastic cap counterclockwise and unlock it.
5. Turn bulb socket counterclockwise and unlock it.
6. Unlock retaining spring and remove bulb from headlamp.
7. Installation is reverse order of removal.



NOTE:
After installation, perform aiming adjustment. Refer to LT-27, "Aiming Adjustment" .

Headlamp high/low beam (Xenon) : 12V - 35W (D2R)

PARKING LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" .
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Installation is reverse order of removal.

Parking lamp : 12V - 5W

FRONT TURN SIGNAL LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" .
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Installation is reverse order of removal.

Front turn signal lamp/— : 12V - 28/8W (amber)

FRONT SIDE MARKER LAMP

1. Remove headlamp. Refer to LT-29, "Removal and Installation" .
2. Replacement integral with headlamp housing assembly.
3. Installation is reverse order of removal.

Front side marker lamp : LED

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

Removal and Installation

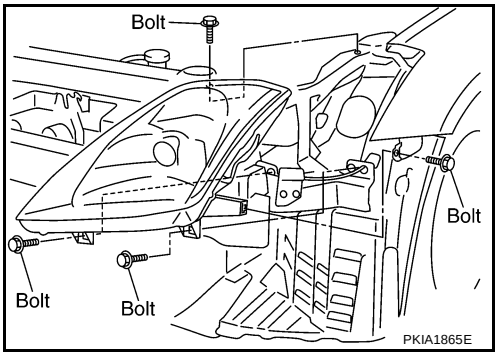
NKS004X9

REMOVAL

1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal or remove power fuse.

   CAUTION:
   After battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

2. Remove front bumper fascia. Refer to EI-14, "FRONT BUMPER" .
3. Remove headlamp mounting bolts.
4. Pull head lamp toward vehicle front, disconnect connector, and remove headlamp.



INSTALLATION

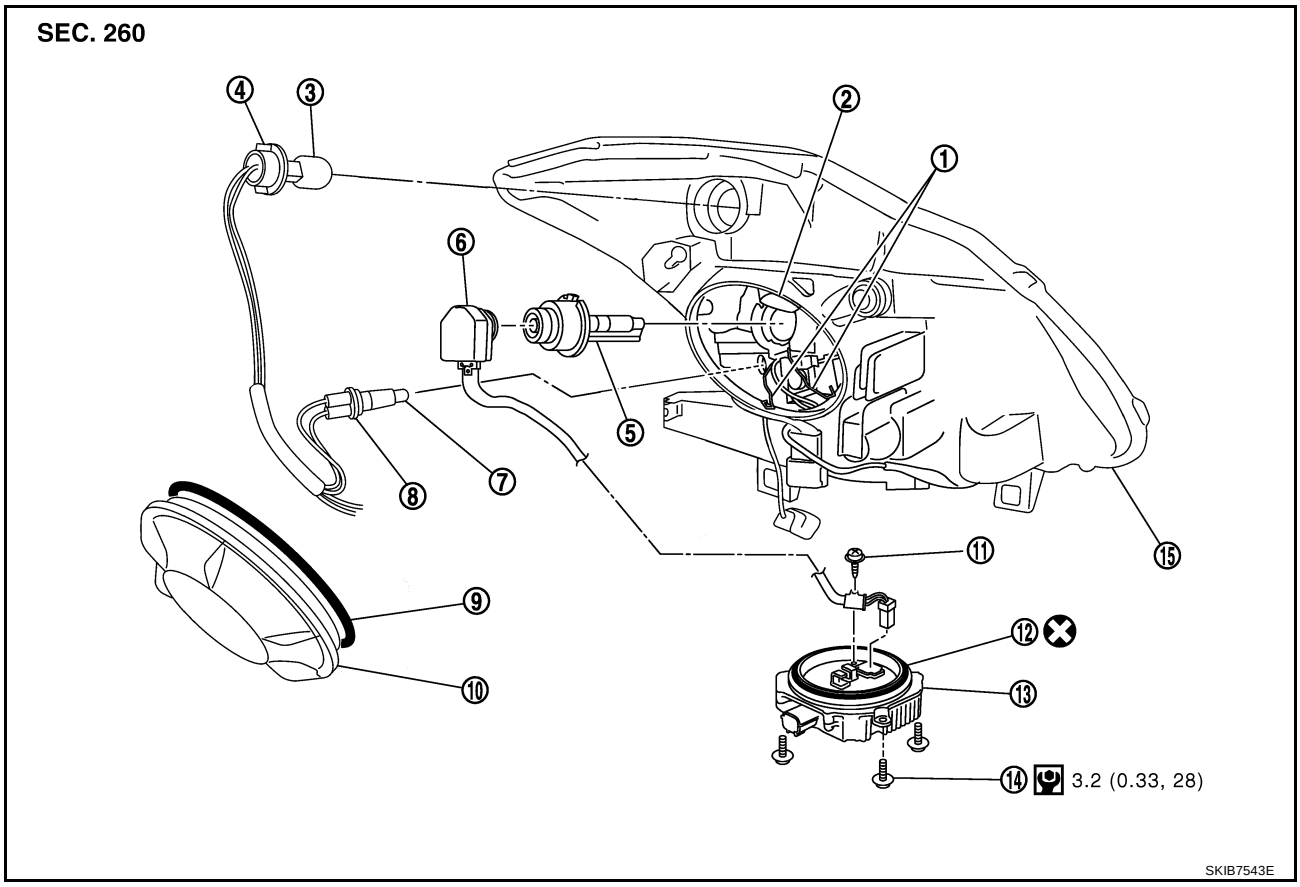
Installation is the reverse order of removal.

Headlamp mounting bolt : 6.1 N·m (0.62 kg-m, 54 in-lb)

NOTE:
After installation, perform aiming adjustment. Refer to LT-27, "Aiming Adjustment" .

Disassembly and Assembly

NKS004XA



1. Retaining spring
2. Xenon bulb socket ground
3. Front turn signal lamp bulb
4. Front turn signal lamp bulb socket
5. Xenon bulb
6. Xenon bulb socket
7. Parking lamp bulb
8. Parking lamp bulb socket
9. Seal packing
10. Plastic cap
11. Ground screw
12. Seal packing
13. HID control unit
14. HID control unit mounting screw
15. Headlamp housing assembly

:N·m (kg-m, in-lb)

: Always replace after every disassembly.

DISASSEMBLY

1. Turn plastic cap counterclockwise, and unlock it.
2. Turn xenon bulb socket counterclockwise, and unlock it.
3. Unlock retaining spring, and remove xenon bulb.
4. Disconnect xenon bulb socket ground.
5. Remove HID control unit mounting screws.
6. Remove ground screw from HID control unit.
7. Disconnect connectors from HID control unit.
8. Pull out xenon bulb socket from head lamp housing assembly.
9. Turn parking lamp bulb socket counterclockwise and unlock it.
10. Remove parking lamp bulb from its socket.
11. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
12. Remove front turn signal lamp bulb from its socket.

ASSEMBLY

Assembly is the reverse order of disassembly.

HID control unit mounting screw : 3.2 N·m (0.33 kg-m, 28 in-lb)

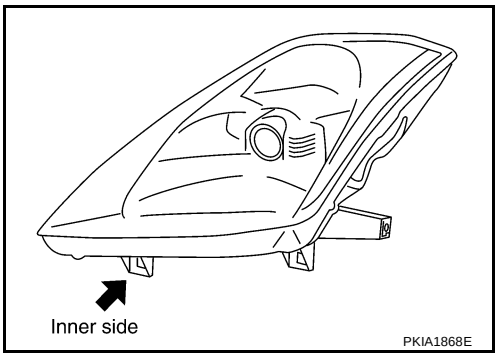
CAUTION:

- **When HID control unit is removed, reinstall it securely and avoid any looseness.**
- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness**

Servicing to Replace Headlamps When Damaged

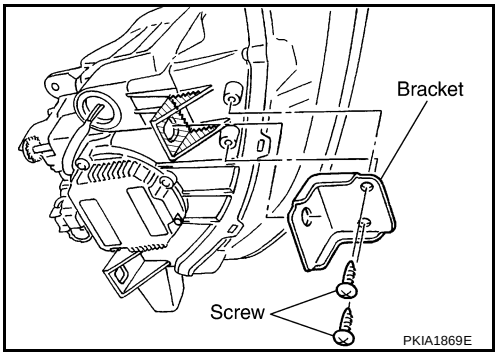
NKS004XB

If only installation part as shown in the figure is damaged, and headlamp housing itself is not damaged, repair can be completed easily by installing correction brackets.



INSTALLATION OF HEADLAMP BRACKET

1. Remove headlamps. Refer to LT-29, "Removal and Installation" .
2. Cut damaged section of installation part, then shape with sandpaper.
3. Attach each correction bracket to headlamp housing boss with 2 screws.

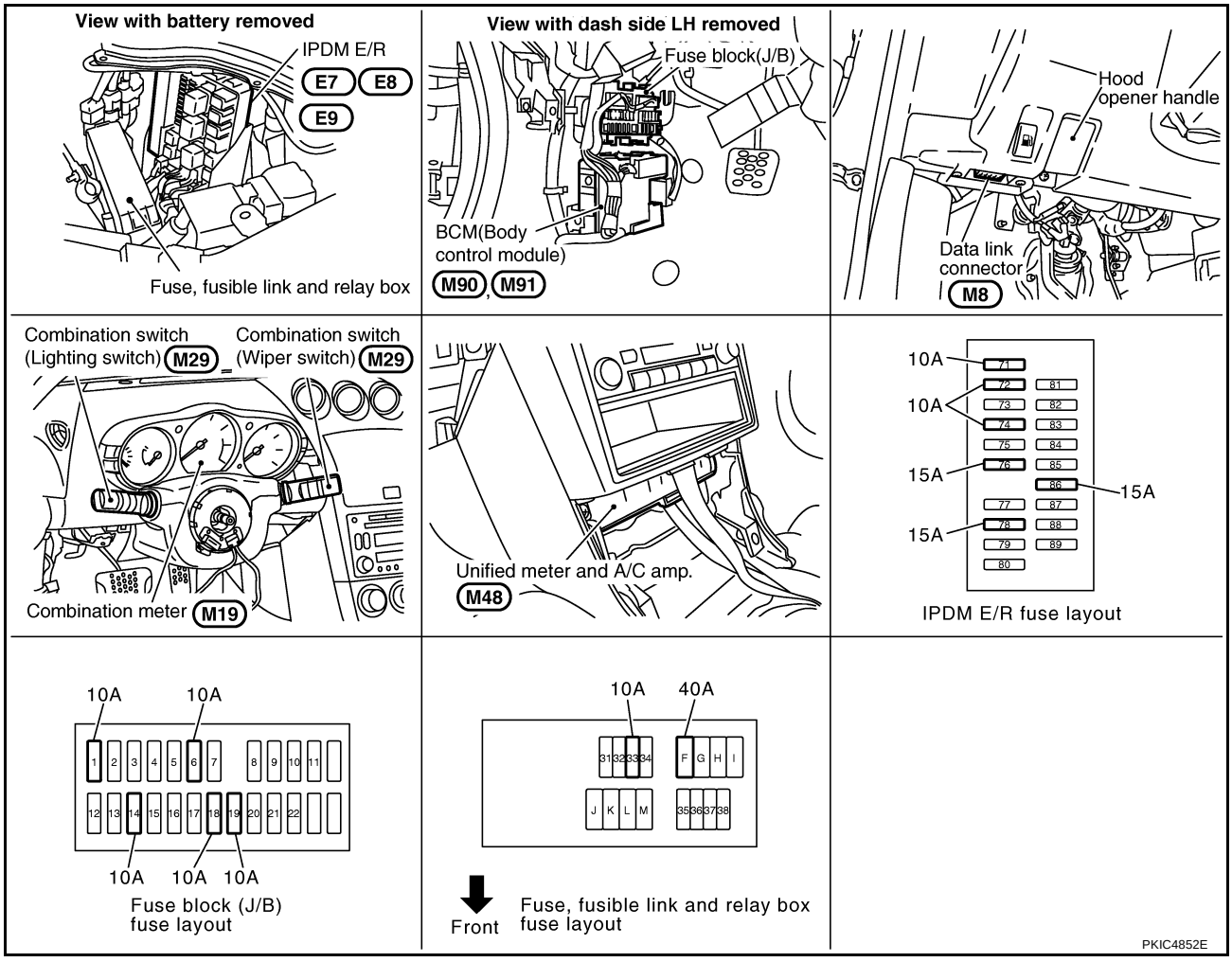


HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -

PFP:26010

Component Parts and Harness Connector Location

NKS004XC



System Description

NKS004XD

- BCM (Body Control Module) controls headlamps low beam, high beam and daytime light operation.
- Daytime light system operates parking, license plate, side marker, tail lamps and headlamp low beam according to signals from unified meter and A/C amp. (receive parking brake switch signal through CAN communication), ECM (receive engine status signal through CAN communication), lighting switch, and ignition switch.
- IPDM E/R (Intelligent Power Distribution Module Engine Room) operates parking, license plate, side marker, tail lamps, headlamp bulbs and high beam solenoids according to CAN communication signals from BCM.
- Unified meter and A/C amp. operates high beam indicator lamp according to CAN communication signals from BCM.

OUTLINE

Power is supplied at all times

- to headlamp high relay, located in IPDM E/R and
- to headlamp low relay, located in IPDM E/R, from battery directly,
- through 15A fuse [No. 78, located in IPDM E/R]
- to CPU (central processing unit) located in IPDM E/R,
- through 40A fusible link [letter F, located in the fuse, fusible link and relay box]
- to BCM terminal 55,
- through 10A fuse [No.18, located in fuse block (J/B)]

- to BCM terminal 42,
- through 10A fuse [No. 71, located in IPDM E/R]
- to CPU located in IPDM E/R,
- through 10A fuse [No.19, located in fuse block (J/B)]
- to combination meter terminal 24,
- through 10A fuse [No.33, located in the fuse, fusible link and relay box]
- to daytime light relay terminals 1 and 3.

With ignition switch in ON or START position, power is supplied

- to CPU located in IPDM E/R,
- through 10A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to BCM terminal 52
- through grounds M30 and M66,
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

HEADLAMP OPERATION

Low Beam Operation

With the lighting switch in 2ND position, the BCM receives input signal requesting the headlamps to illuminate. This input signal is communicated to the IPDM E/R through CAN communication. The CPU located in the IPDM E/R controls the headlamp low relay turned ON, which when energized, supplies power,

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,
- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7.

Ground is supplied

- to front combination lamp RH terminal 4, and
- to front combination lamp LH terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With power and ground supplied, headlamp bulbs illuminate.

High Beam Operation /Flash-to-Pass Operation

With the lighting switch in 2ND position and placed in HIGH or PASS position, the BCM receives input signal requesting headlamp high beams to illuminate. High beam request signal and low beam request signal is communicated to the IPDM E/R through CAN communication. The CPU located in the IPDM E/R controls headlamp high relay and headlamp low relay turned ON, which when energized, supplies power,

- through 15A fuse [No. 76, located in IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,

- through 15A fuse [No. 86, located in IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7,
- through 10A fuse [No.72, located in IPDM E/R]
- through IPDM E/R terminal 27
- to front combination lamp RH terminal 3,
- through 10A fuse [No.74, located in IPDM E/R]
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 3.

Ground is supplied

- to front combination lamp RH terminal 4, and
- to front combination lamp LH terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With the power and ground supplied, headlamp bulbs illuminate. High beam solenoids move the bulb shades in the front combination lamps, and the bulb shades change to high beam position.
Unified meter and A/C amp. receives signal from BCM through CAN communication, and then combination meter indicator illuminates high beam,

DAYTIME LIGHT OPERATION

Once the parking brake is turned OFF after ignition switch ON, if the lighting switch is turned OFF while engine is running, the BCM outputs the signal requesting parking, license plate, side marker, tail lamps and headlamp low beam to illuminate. This output signal is communicated to the IPDM E/R through CAN communication. The CPU located in the IPDM E/R controls headlamp low relay and daytime light relay turned ON, which when energized, supplies power,

- through 15A fuse [No.76, located in the IPDM E/R]
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 7,
- through 15A fuse [No.86, located in the IPDM E/R]
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 7,
- through 10A fuse [No.33, located in the fuse, fusible link and relay box]
- through daytime light relay terminal 2
- to IPDM E/R terminal 55,
- through daytime light relay terminal 5
- to front combination lamp RH terminal 6
- to front combination lamp LH terminal 6
- to rear combination lamp RH terminal 2
- to rear combination lamp LH terminal 2
- to license plate lamp RH terminal 2
- to license plate lamp LH terminal 2.

Ground is supplied

- to front combination lamp RH terminal 4
- to front combination lamp LH terminal 4
- to front combination lamp RH terminal 8
- to front combination lamp LH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp RH terminal 3
- to rear combination lamp LH terminal 3
- to license plate lamp RH terminal 1

- to license plate lamp LH terminal 1
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

With power and ground supplied, the headlamp low, parking, license plate and tail lamps illuminate.

OPERATION

Engine		With engine stopped									With engine running								
Lighting switch		OFF			1ST			2ND			OFF			1ST			2ND		
		OFF	Hi	P	T	Hi	P	Lo	Hi	P	OFF	Hi	P	T	Hi	P	Lo	Hi	P
Headlamp	High beams	–	–	–	–	–	×	–	×	×	–	–	×	–	–	×	–	×	×
	Low beams	–	–	–	–	–	–	×	–	–	×*	×*	–	×*	×*	–	×	–	–
Parking, license plate, side marker and tail lamps		–	–	–	×	–	×	×	×	×	×*	×*	–	×	×	×	×	×	×
Illumination		–	–	–	×	–	×	×	×	×	–	–	–	×	×	×	×	×	×

- T: “TAIL LAMP” position
- Hi: “HIGH BEAM” position
- Lo: “LOW BEAM” position
- P: “FLASH TO PASS” position
- ×: Lamp “ON”
- –: Lamp “OFF”
- *: Once the parking brake is turned OFF after ignition switch ON, parking, license plate, side marker, tail lamps and headlamp low are turned ON.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (ON), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.
Under this condition, the headlamps remain illuminated for 5 minutes, then the headlamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

INTERLOCKED OPERATION WITH REMOTE KEYLESS ENTRY SYSTEM

Refer to BL-59, "REMOTE KEYLESS ENTRY SYSTEM" .

INTERLOCKED OPERATION WITH VEHICLE SECURITY SYSTEM

Refer to BL-125, "VEHICLE SECURITY (THEFT WARNING) SYSTEM" .

XENON HEADLAMP

Xenon type lamps are used for headlamps. Xenon bulbs do not use a filament. Instead, they produce light when a high voltage current is passed between two tungsten electrodes through a mixture of xenon (an inert gas) and certain other metal halides. In addition to strong lighting power, electronic control of the power supply gives the headlamps stable quality and tone color.
Followings are some advantages of the xenon type headlamp.

- The light produced by the headlamps is white color similar to sunlight that is easy to the eyes.
- Light output is nearly double that of halogen headlamps, affording increased area of illumination.
- Counter-reflected luminance increases and the contrast enhances on the wet road in the rain. That makes visibility go up more than the increase of the light volume.
- Power consumption is approximately 25 percent less than halogen headlamps, reducing battery load.

CAN Communication System Description

NKS004XE

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

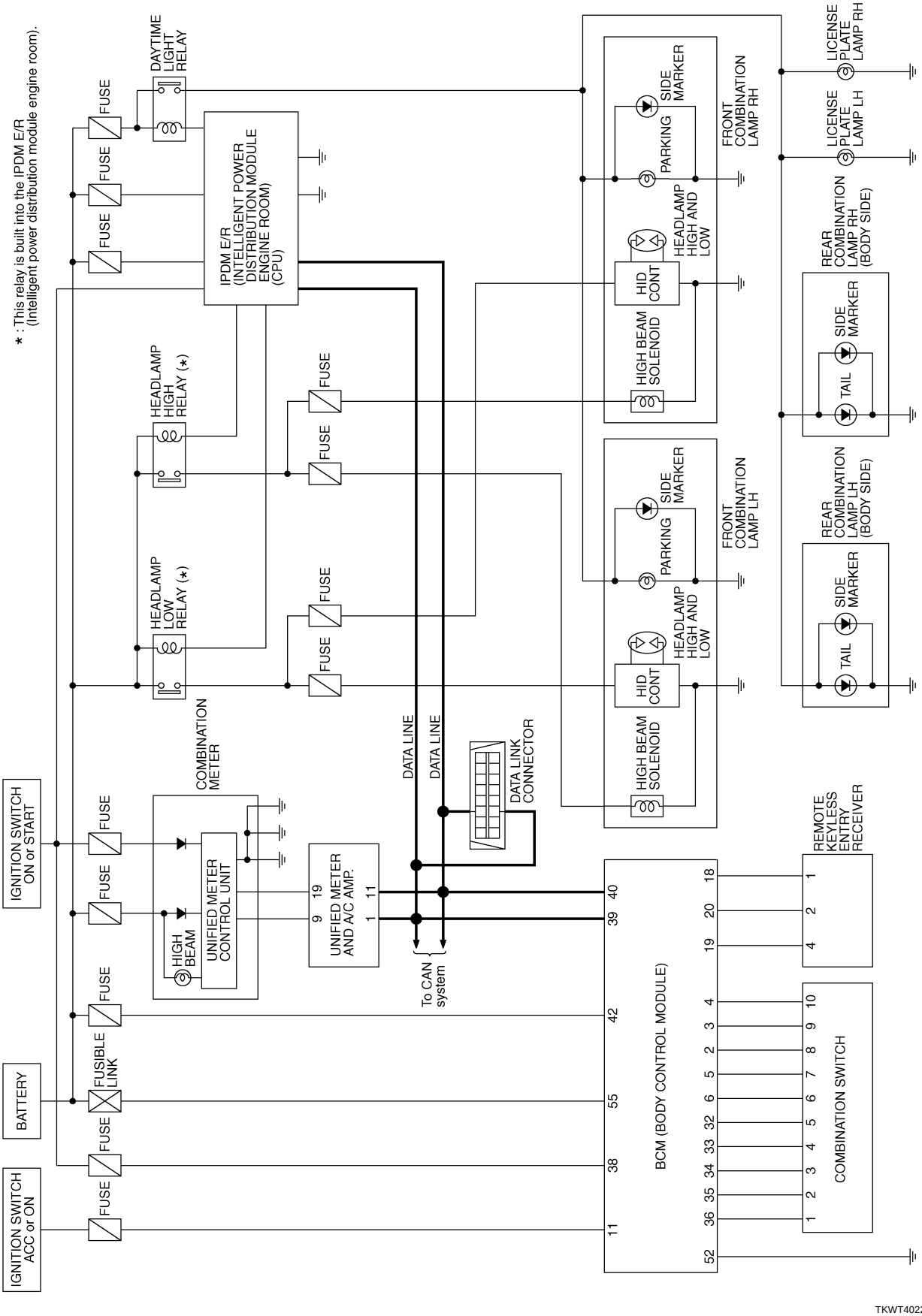
CAN Communication Unit

NKS004XF

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

NKS004XG

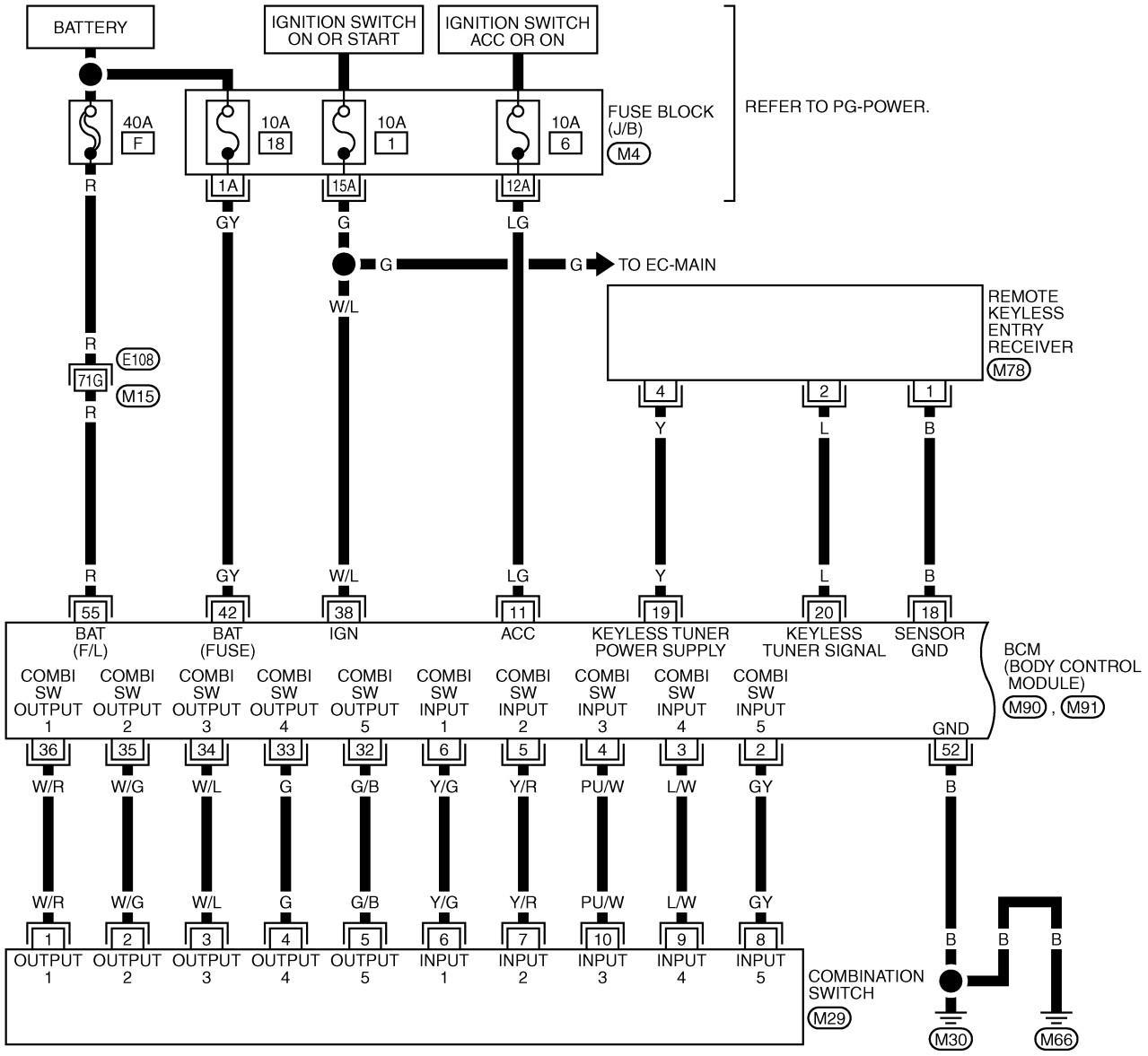


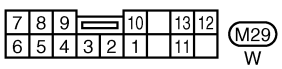
TKWT4022E

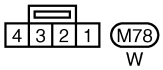
Wiring Diagram — DTRL —

NKS004XH

LT-DTRL-01







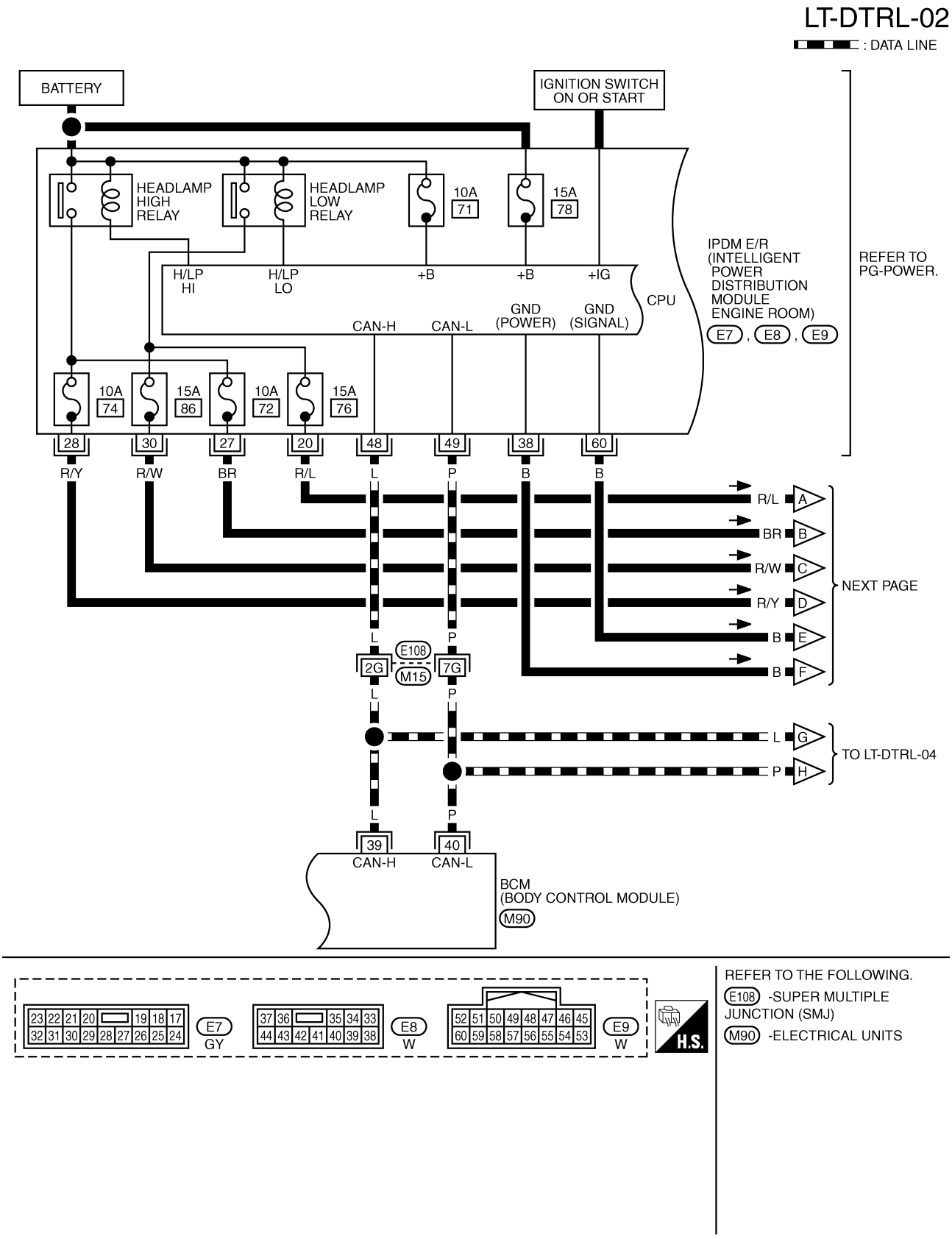
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

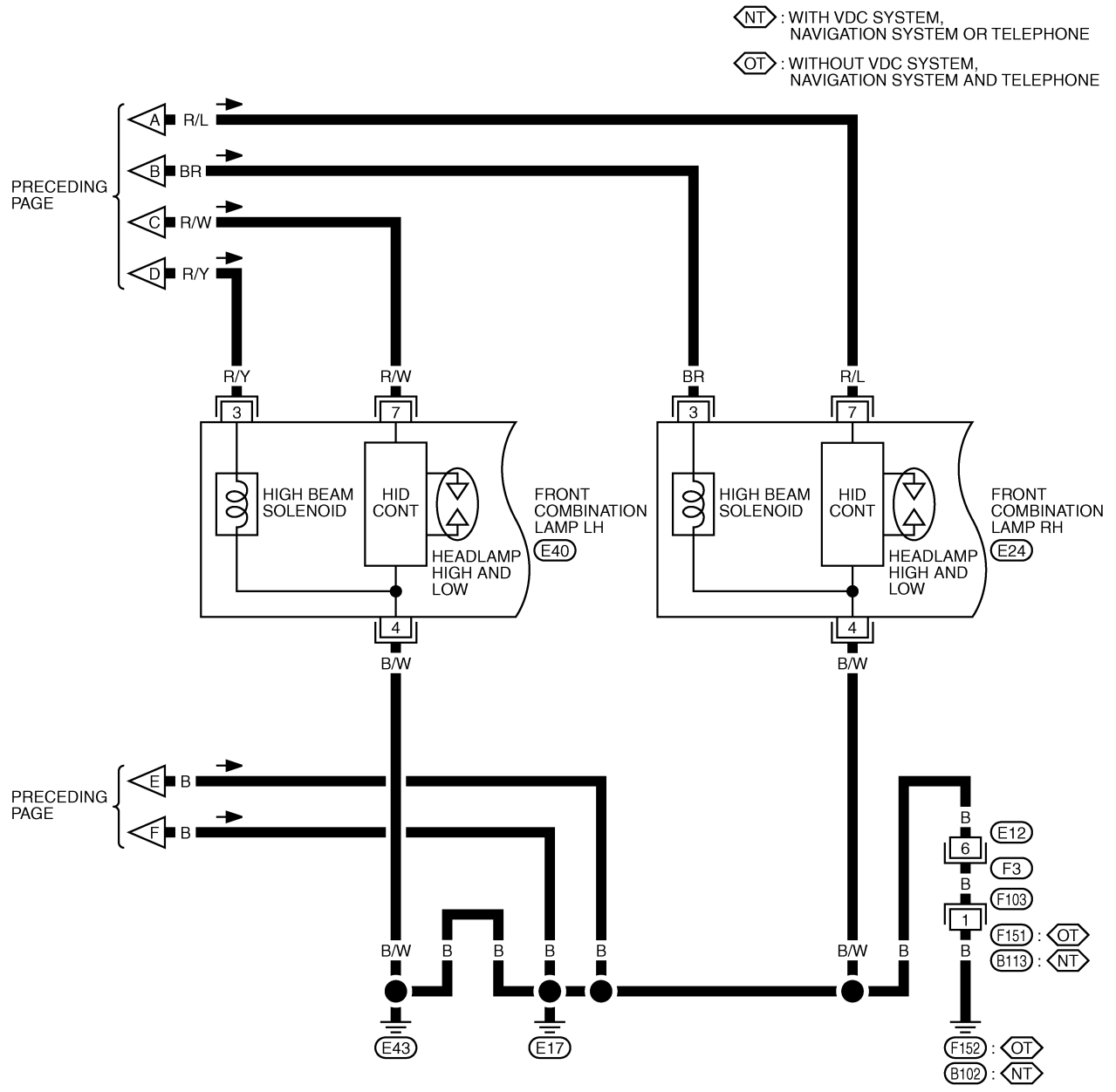
M90 , M91 -ELECTRICAL UNITS

TKWT5747E


LT-DTRL-02
: DATA LINE
BATTERY
IGNITION SWITCH ON OR START
HEADLAMP HIGH RELAY
HEADLAMP LOW RELAY
10A 71
15A 78
H/LP HI
H/LP LO
+B
+B
+IG
CPU
GND (POWER)
GND (SIGNAL)
CAN-H
CAN-L
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E7 , E8 , E9
REFER TO PG-POWER.
10A 74
15A 86
10A 72
15A 76
28
30
27
20
48
49
38
60
R/Y
R/W
BR
R/L
L
P
B
B
R/L A
BR B
R/W C
R/Y D
B E
B F
NEXT PAGE
E108
2G
M15
7G
L G
P H
TO LT-DTRL-04
39
40
CAN-H
CAN-L
BCM (BODY CONTROL MODULE)
M90
23 22 21 20 19 18 17
32 31 30 29 28 27 26 25 24
E7
GY
37 36 35 34 33
44 43 42 41 40 39 38
E8
W
52 51 50 49 48 47 46 45
60 59 58 57 56 55 54 53
E9
W
H.S.
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M90 -ELECTRICAL UNITS

TKWT5748E

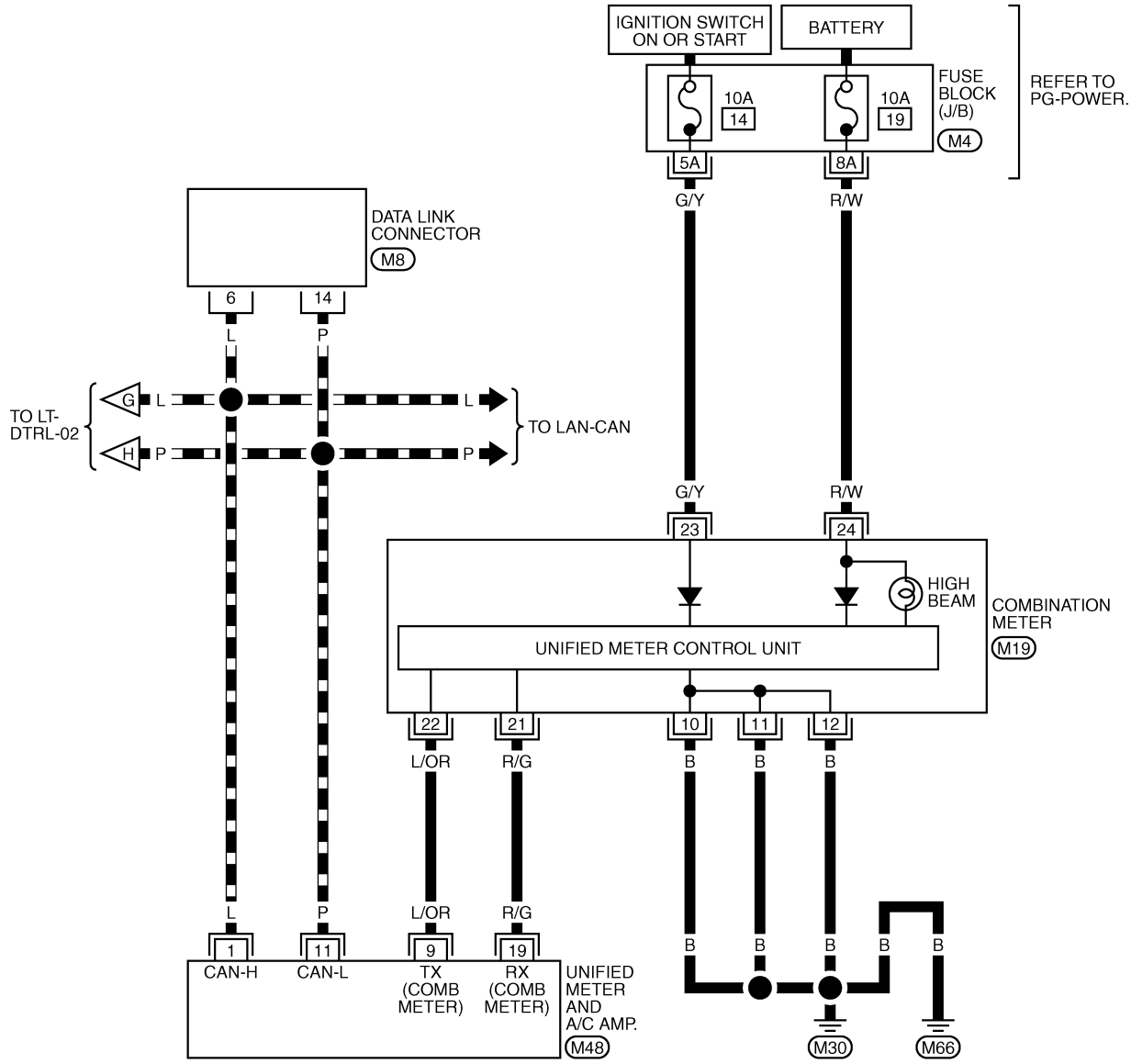
LT-DTRL-03

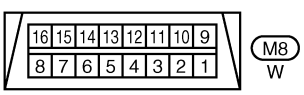


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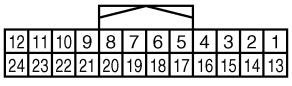
LT-DTRL-04

: DATA LINE

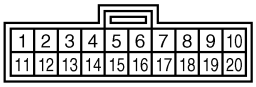




M8
W



M19
W

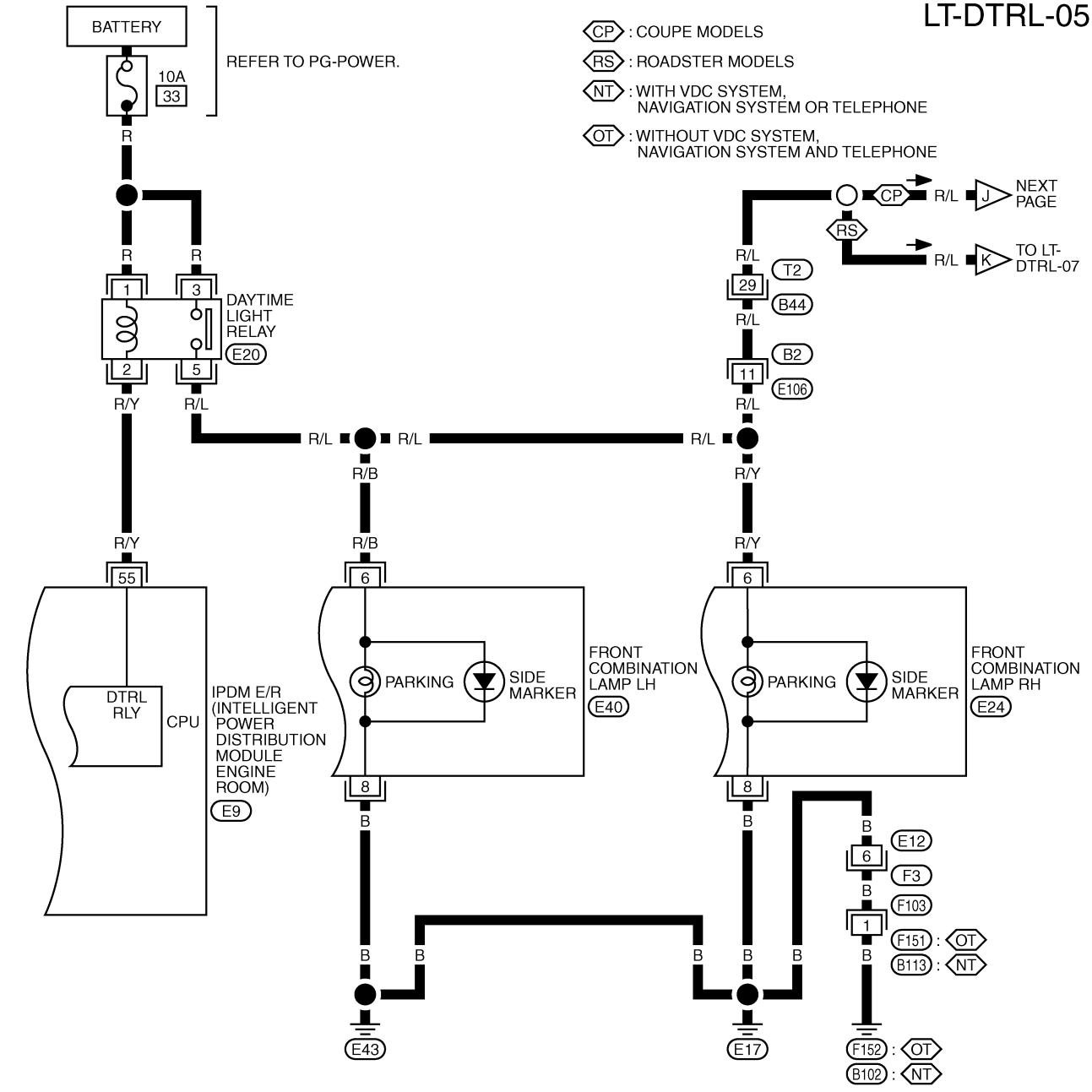


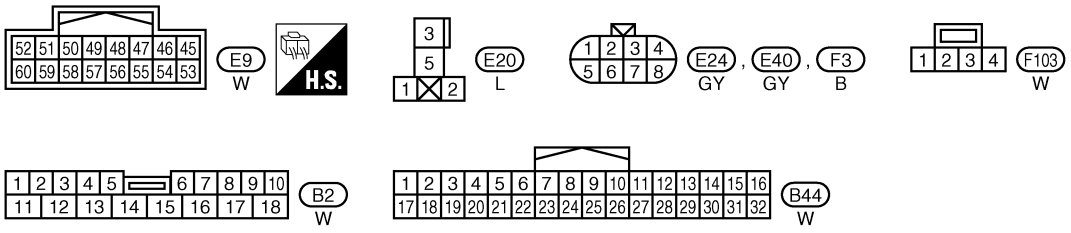
M48
GY

H.S.

REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

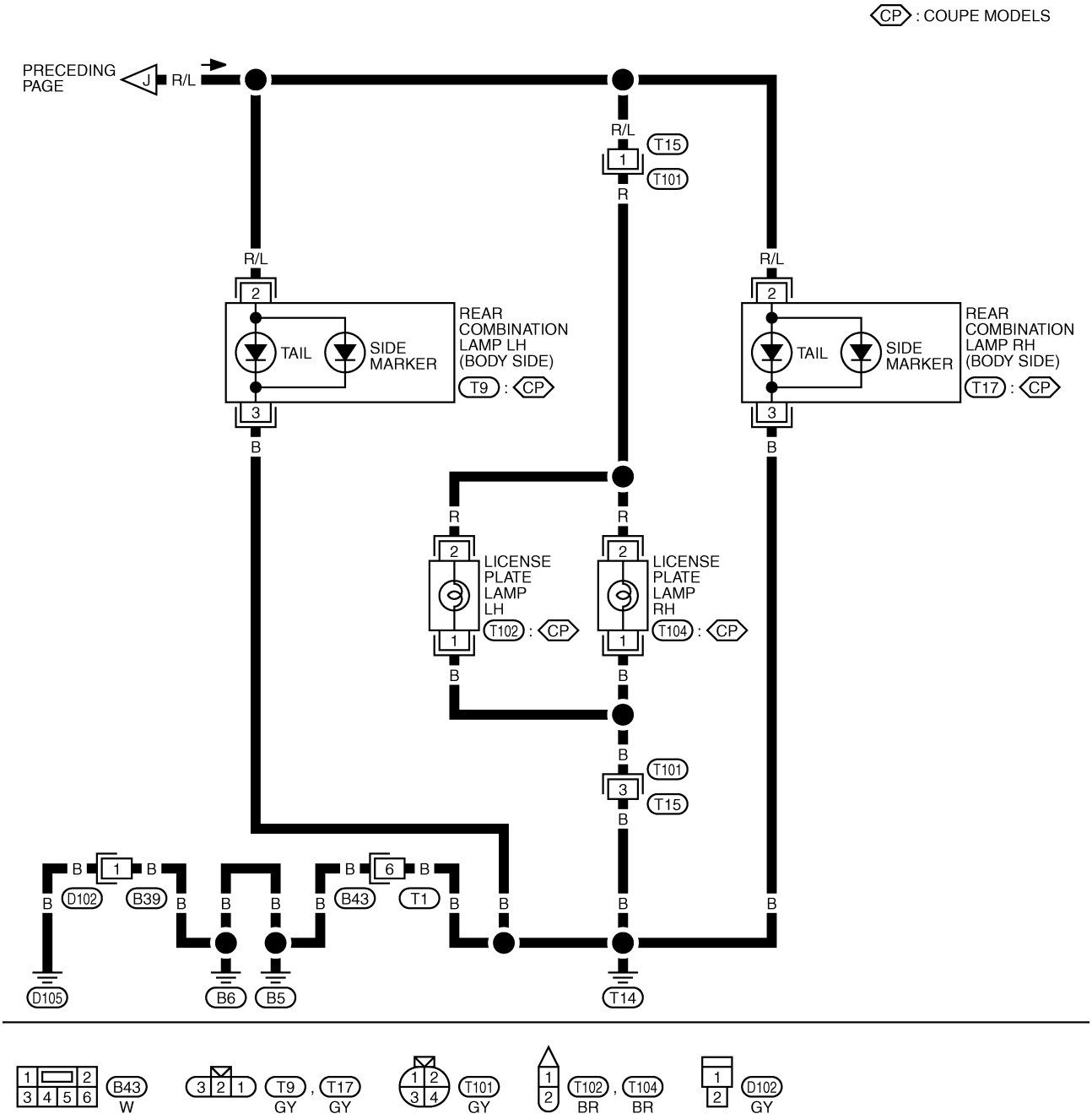
TKWT4026E


LT-DTRL-05
BATTERY
10A
33
REFER TO PG-POWER.
CP : COUPE MODELS
RS : ROADSTER MODELS
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
CP R/L J NEXT PAGE
RS R/L K TO LT-DTRL-07
DAYTIME LIGHT RELAY
E20
T2
B44
B2
E106
DTRL RLY
CPU
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E9
PARKING
SIDE MARKER
FRONT COMBINATION LAMP LH
E40
FRONT COMBINATION LAMP RH
E24
E12
F3
F103
F151 : OT
B113 : NT
F152 : OT
B102 : NT
E43
E17


E9 W
H.S.
E20 L
E24 , E40 , F3 GY GY B
F103 W
B2 W
B44 W

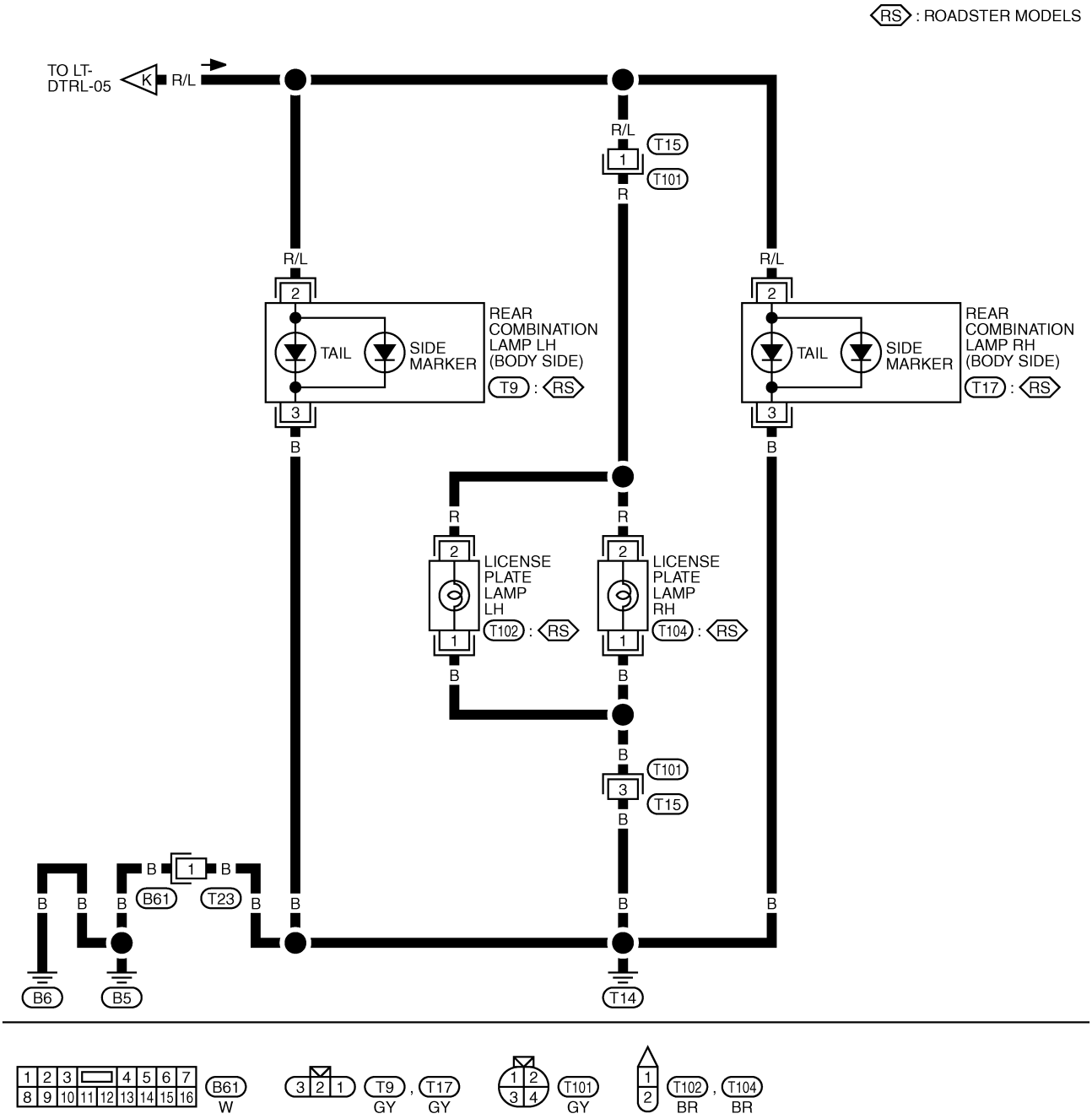
TKWT5750E

LT-DTRL-06



TKWT4028E

LT-DTRL-07



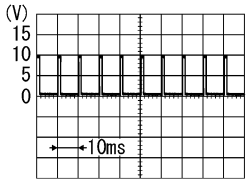
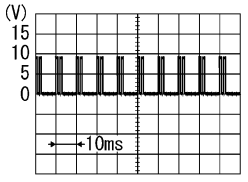
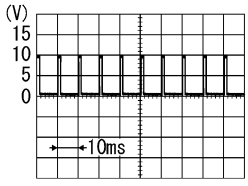
TKWT4029E

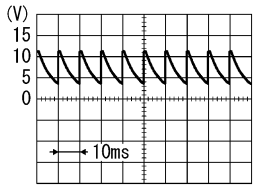
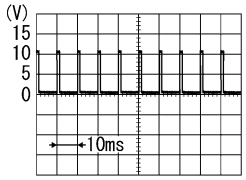
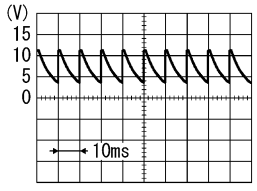
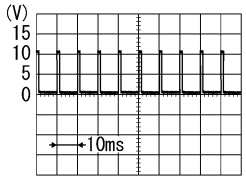
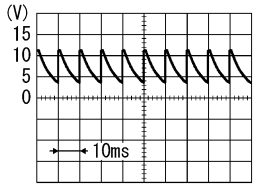
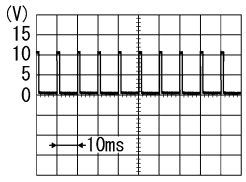
Terminals and Reference Values for BCM

NKS004XI

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch)	 PKIB4959J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4959J Approx. 1.0 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Lighting switch 1ST (The same result with lighting switch 2ND)	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch)	 PKIB4958J Approx. 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
39	L	CAN – H	—	—	—
40	P	CAN – L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0 V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

NKS004XJ

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R/L	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0 V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASS position	OFF	Approx. 0 V
					ON	Battery voltage
30	R/W	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
48	L	CAN – H	—	—		—
49	P	CAN – L	—	—		—
55	R/Y	Daytime light relay signal	ON	Lighting switch 1ST position	OFF	Approx. 0 V
					ON	Battery voltage
60	B	Ground	ON	—		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS004XK

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-32, "System Description" .
3. Perform the preliminary check. Refer to LT-47, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does headlamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004XL

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

UNIT	POWER SOURCE	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6

UNIT	POWER SOURCE	Fuse and fusible link No.
IPDM E/R	Battery	33
		72
		74
		76
		86

Refer to LT-38, "Wiring Diagram — DTRL —" .

OK or NG

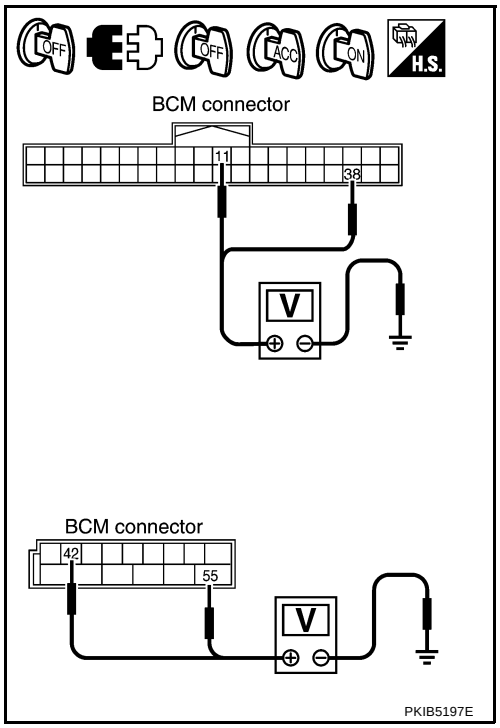
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.

Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
BCM connector	Terminal				
M90	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage



OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

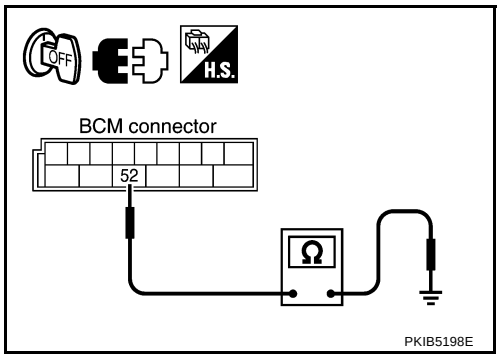
Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.



CONSULT-III Function (BCM)

NKS004XM

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
HEADLAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
BCM	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT
Display Item List

Item	Description	CONSULT-III	Factory setting
BATTERY SAVER SET	Exterior lamp battery saver control mode can be changed in this mode. Select exterior lamp battery saver control mode between two ON/OFF.	ON	×
		OFF	—

DATA MONITOR
Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“ON/OFF”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 1: ON/Others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1 ST	“ON/OFF”	Displays status (lighting switch 1ST or 2ND position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW NOTE	“ON/OFF”	—
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/ Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays status of passenger door as judged from passenger door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - RR NOTE	“OFF”	—
DOOR SW - RL NOTE	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
TURN SIGNAL R	“ON/OFF”	Displays status (Turn right: ON/Others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays status (Turn left: ON/Others: OFF) as judged from lighting switch signal.
ENGINE RUN	“ON/OFF”	Displays status (engine running: ON/ engine stopped: OFF) of engine judged from engine run signal.
PKB SW	“ON/OFF”	Displays status (parking brake released: ON/ parking brake applied: OFF) of parking brake switch judged from parking brake switch signal.
CARGO LAMP SW NOTE	“OFF”	—

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST
Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON–OFF.
HEAD LAMP	Allows headlamp relay to operate by switching ON–OFF.
FR FOG LAMP NOTE	—
CORNERING LAMP NOTE	—
DAYTIME RUNNING LIGHT	Allows headlamp low relay and daytime light relay to operate switching ON–OFF.

NOTE:
This item is displayed, but cannot be tested.

CONSULT-III Function (IPDM E/R)

NKS004XN

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Check Item, Diagnosis Mode	Description
SELF-DIAG RESULTS	Refer to PG-18, "SELF-DIAG RESULTS" .
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

DATA MONITOR
All Signals, Main Signals, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	Monitor item selection			Description
			ALL SIG-NALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL&CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM
Daytime running light request	DTRL REQ	ON/OFF	×		×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST
Display Item List

Test item	CONSULT-III screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON–OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON–OFF every 1 second).

Daytime Light Control Does Not Operate

NKS004XO

NOTE:
Check if parking, license plate, side marker, tail lamps and head lamps low operates normally.

1. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "DAYTIME RUNNING LIGHT" of BCM active test item.
2. With operating the test item, check the headlamp low beam, parking, license plate and tail lamps operate.

Headlamp low beam, parking, license plate and tail lamps should operate.

OK or NG

OK >> GO TO 2.
NG >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

2. CHECK INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP" of BCM data monitor item.
2. With the engine running or stop, check the monitor status.

Engine running	**: ENGINE RUN ON**
Engine stop	**: ENGINE RUN OFF**

3. With operating the parking brake, check the monitor status.

Parking brake ON	**: PKB SW ON**
Parking brake OFF	**: PKB SW OFF**

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

Headlamp Does Not Change To High Beam (Both Sides)

NKS004XP

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is HIGH BEAM	**: HI BEAM SW ON**

Without CONSULT-III
Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "LAMPS" of IPDM E/R active test item.
2. With operating the test item, check the headlamp high beam operation.

Headlamp high beam should operate.
(Headlamp high beam repeats ON-OFF every 1 second).

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select "HL LO REQ" and "HL HI REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status

When lighting switch is	**: HL LO REQ ON**
HIGH BEAM	**: HL HI REQ ON**

OK or NG

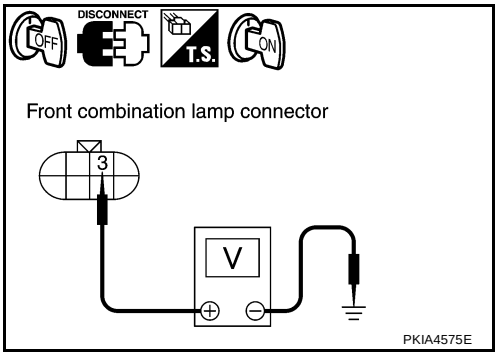
OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select "LAMPS" of IPDM E/R active test item
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

NOTE:
Headlamp high beam repeats ON–OFF every 1 second.



Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

NOTE:
Headlamp high beam repeats ON–OFF every 1 second.

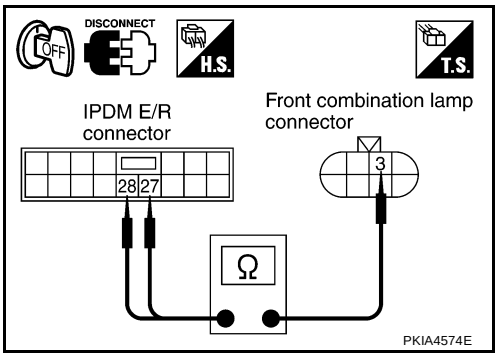
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp (RH and LH) harness connector.



Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	27	E24	3	Yes
LH		28	E40	3	

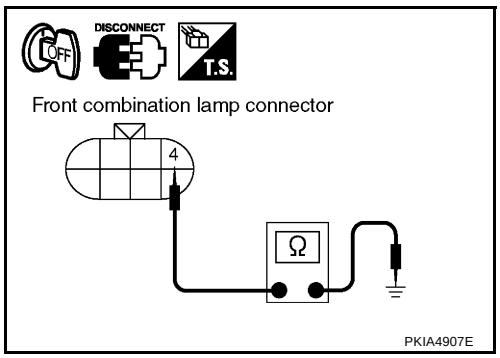
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

6. CHECK HEADLAMP GROUND

Check continuity between front combination lamp (RH and LH) harness connector and ground.

Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		



OK or NG

OK >> Check headlamp harness, connector and bulb.
NG >> Repair harness or connector.

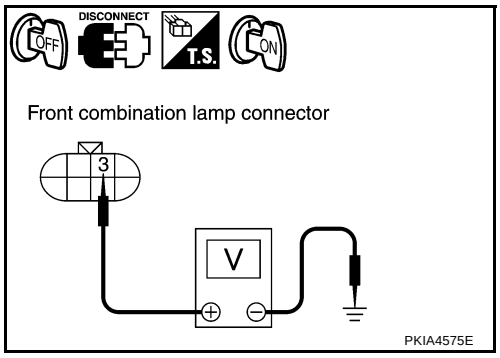
Headlamp Does Not Change To High Beam (One Side)

NKS004XQ

1. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned HIGH BEAM position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.

Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	3	Ground	Battery voltage
LH	E40	3		



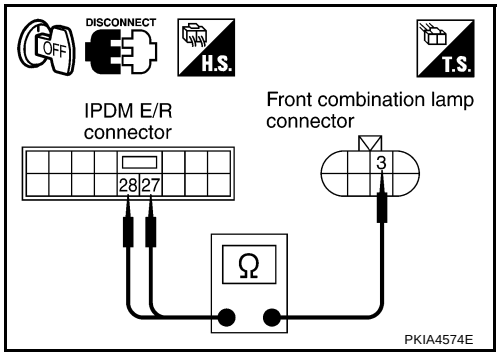
OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp RH or LH harness connector.

Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	27	E24	3	Yes
LH		28	E40	3	



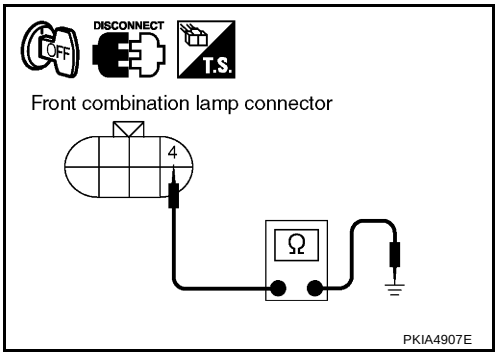
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

3. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH or LH harness connector and ground.

Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		



OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

High Beam Indicator Lamp Does Not Illuminate

NKS004XR

1. CHECK BULB

Check bulb of high beam indicator lamp.

OK or NG

OK >> Replace combination meter. Refer to DI-24, "Removal and Installation for Combination Meter" .
NG >> Replace indicator bulb.

Headlamp Low Beam Does Not Illuminate (Both Sides)

NKS004XS

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP SW1" and "HEAD LAMP SW2" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND : HEAD LAMP SW 1 ON
: HEAD LAMP SW 2 ON

CHECK COMBINATION SWITCH
Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "LAMPS" of IPDM E/R active test item.
2. With operating the test item, check the headlamp low beam operation.

Headlamp low beam should operate.

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the headlamp low beam operation.

Headlamp low beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select "HL LO REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND position : HL LO REQ ON

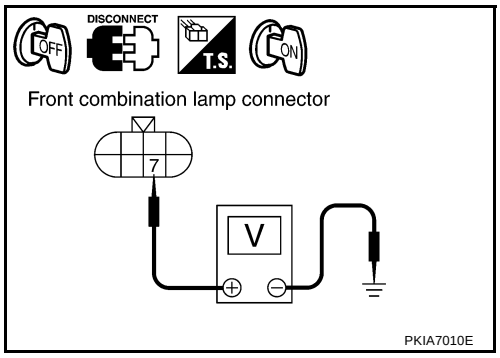
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select "LAMPS" of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.



Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.

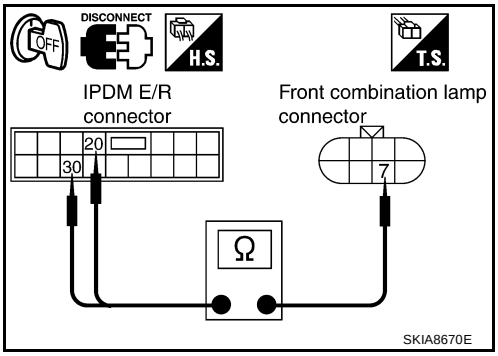
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp (RH and LH) harness connector.



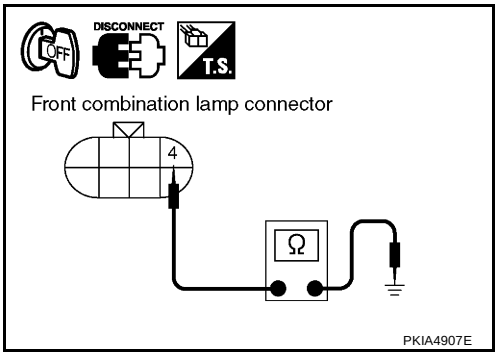
Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	20	E24	7	Yes
LH		30	E40	7	

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

6. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp (RH and LH) harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		

OK or NG

OK >> Check headlamp harness and connectors, ballasts (HID control unit), and xenon bulbs. Refer to LT-60, "Xenon Headlamp Trouble Diagnosis" .
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

NKS004XT

1. CHECK BULB

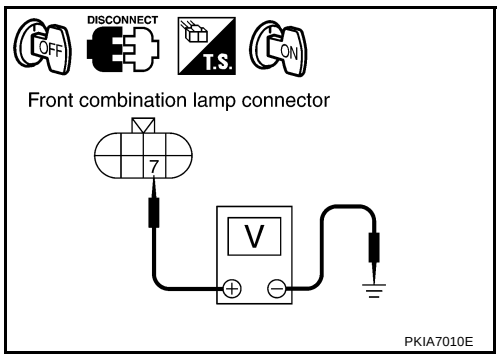
Check ballast (HID control unit) and xenon bulb of lamp which does not illuminate. Refer to LT-60, "Xenon Headlamp Trouble Diagnosis" .

OK or NG

OK >> GO TO 2.
NG >> Replace malfunctioning part.

2. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned 2ND position.
5. Check voltage between front combination lamp RH or LH harness connector and ground.



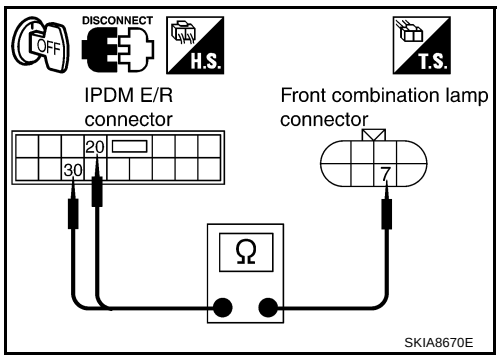
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	7	Ground	Battery voltage
LH	E40	7		

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp RH or LH harness connector.



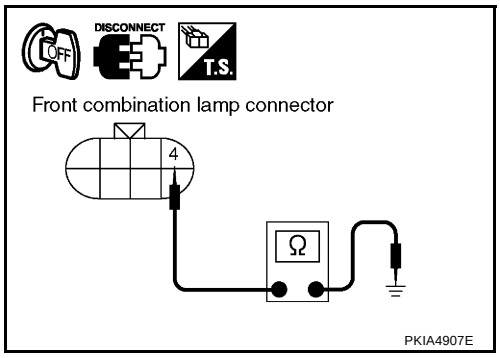
Terminals					Continuity
IPDM E/R			Front combination lamp		
Connector		Terminal	Connector	Terminal	
RH	E7	20	E24	7	Yes
LH		30	E40	7	

OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

4. CHECK HEADLAMP GROUND

Check continuity between front combination lamp RH or LH harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	4		Yes
LH	E40	4		

OK or NG

OK >> Check headlamp harness and connector.
NG >> Repair harness or connector.

Headlamps Does Not Turn OFF

NKS004XU

1. CHECK HEADLAMP TURN OFF

Make sure that lighting switch is OFF. And check if headlamp turns off when ignition switch is turned OFF.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "HEAD LAMP1" and "HEAD LAMP2" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is OFF : HEAD LAMP SW1 OFF
: HEAD LAMP SW2 OFF

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

3. CHECKING CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

Perform self-diagnosis for “BCM” with CONSULT-III.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
CAN COMM CIRCUIT>> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

General Information for Xenon Headlamp Trouble Diagnosis

NKS004XV

In most cases, malfunction of xenon headlamp - “does not illuminate”, “flickers” or “dark” - is caused by a malfunctioning xenon bulb. A malfunctioning HID control unit or lamp housing, however, may be a cause. Be sure to perform trouble diagnosis following the steps described below.

Caution:

NKS004XW

- Installation or removal of connector must be done with lighting switch OFF.
- Disconnect the battery cable from the negative terminal or remove power fuse.

  CAUTION:
  After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
- When the lamp is illuminated (when lighting switch is ON), never touch harness, HID control unit, inside of lamp, or lamp metal parts.
- To check illumination, temporarily install lamp in vehicle. Be sure to connect power at vehicle side connector.
- If error can be traced directly to electrical system, first check for items such as blown fuses and fusible links, broken wires or loose connectors, dislocated terminals, and improper connections.
- Never work with wet hands.
- Using a tester for HID control unit circuit trouble diagnosis is prohibited.
- Disassembling HID control unit or harnesses (bulb socket harness, ECM harness) is prohibited.
- Immediately after illumination, light intensity and color will fluctuate, but there is nothing wrong.
- When bulb has come to end of its life, brightness will drop significantly, it will flash repeatedly, or light color will turn reddish.

Xenon Headlamp Trouble Diagnosis

NKS004XX

1. CHECK 1: XENON HEADLAMP LIGHTING

Install normal xenon bulb to corresponding xenon bulb headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon bulb.
NG >> GO TO 2.

2. CHECK 2: XENON HEADLAMP LIGHTING

Install normal HID control unit to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace HID control unit.
NG >> GO TO 3.

3. CHECK 3: XENON HEADLAMP LIGHTING

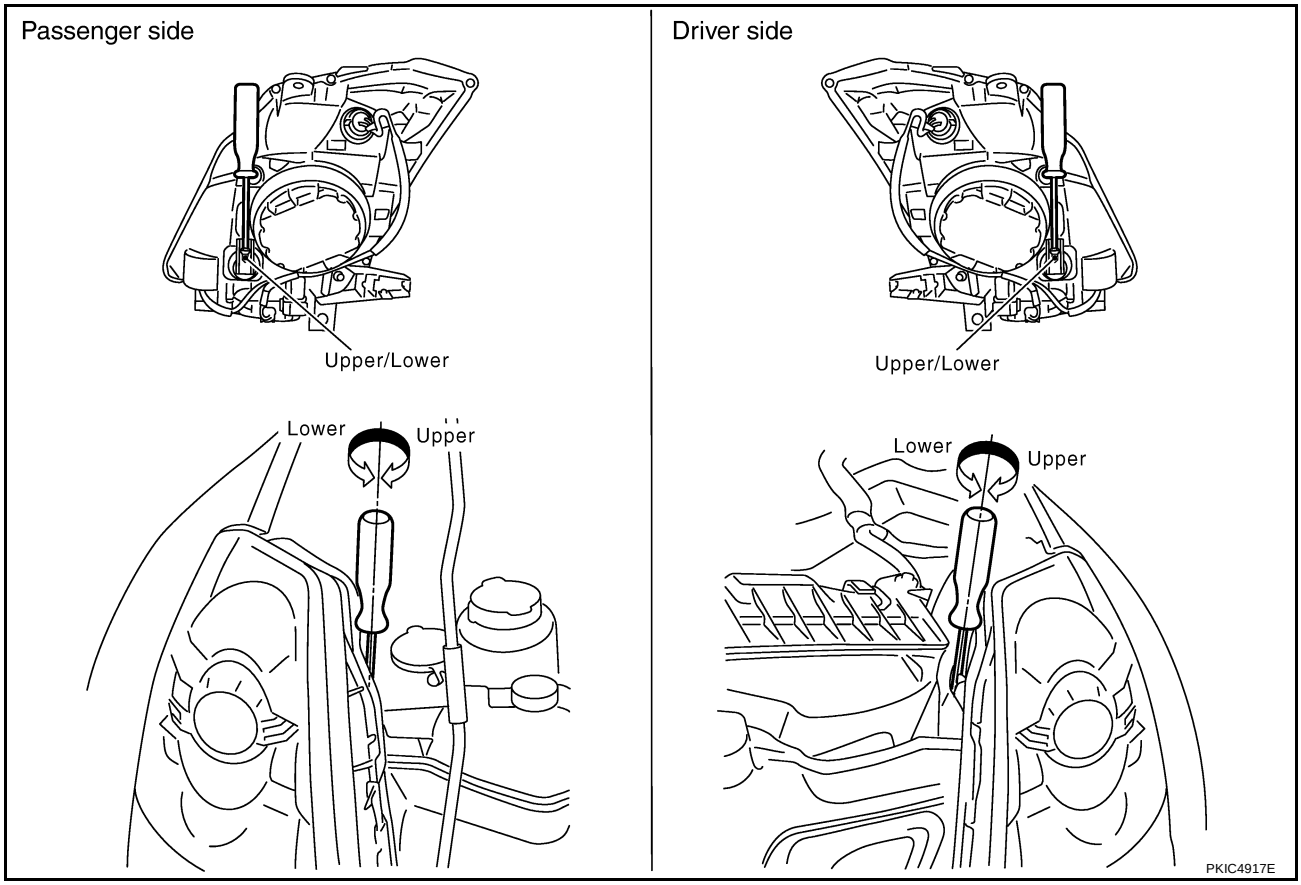
Install normal xenon lamp housing assembly to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon headlamp housing assembly. [Malfunction in starter (boosting circuit) in xenon headlamp housing]
NG >> INSPECTION END

Aiming Adjustment

NKS004XY



PREPARATION BEFORE ADJUSTING

For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

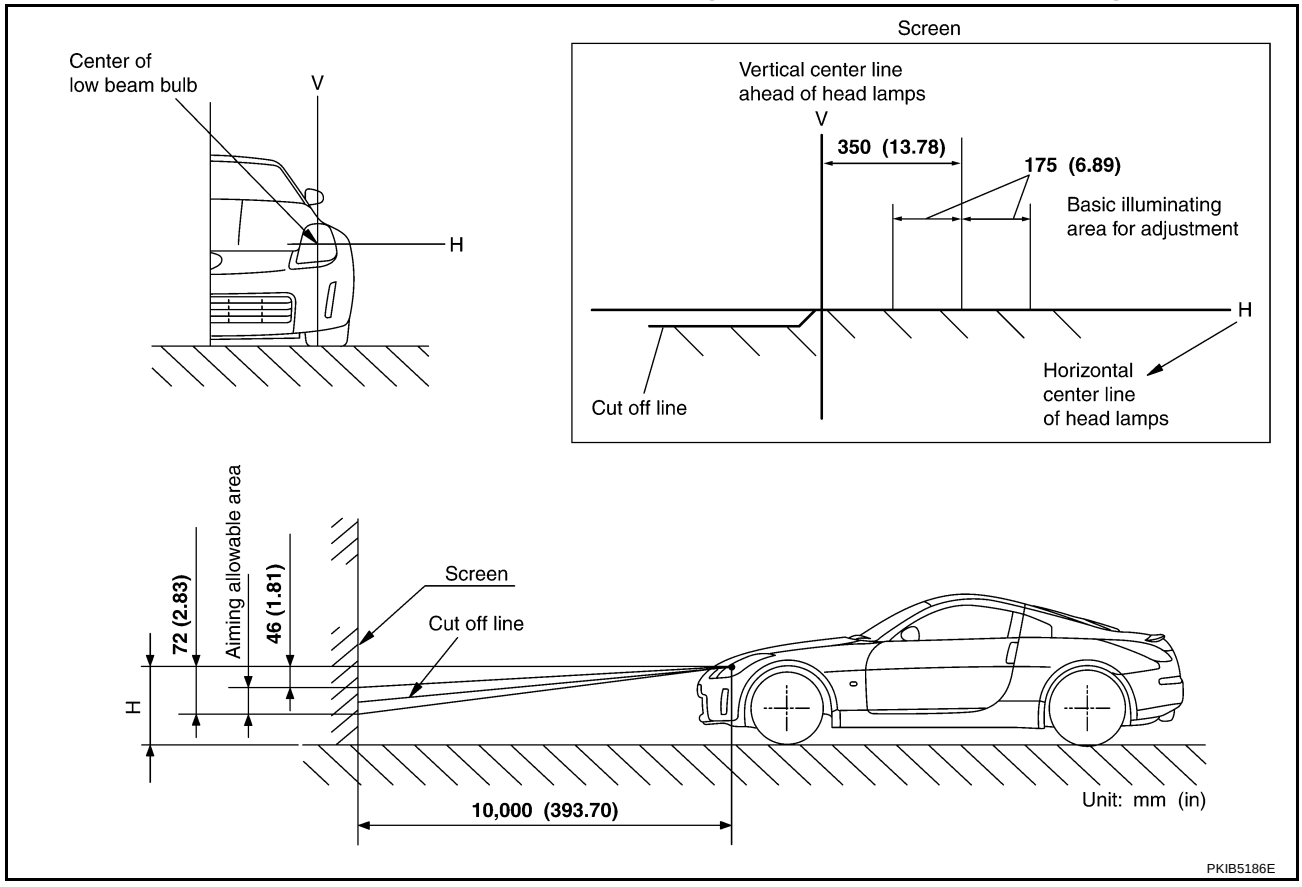
1. Keep all tires inflated to correct pressures.
2. Place vehicle on level surface.

3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam ON.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

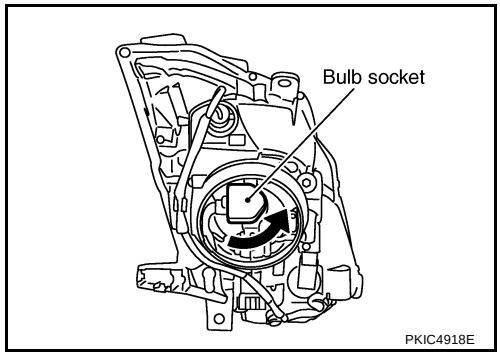
Bulb Replacement

NKS004XZ

HEADLAMP HIGH/LOW BEAM

1. Turn lighting switch OFF.
2. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal or remove power fuse.

   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove headlamp. Refer to LT-62, "Removal and Installation" .
4. Turn plastic cap counterclockwise and unlock it.
5. Turn bulb socket counterclockwise and unlock it.
6. Unlock retaining spring and remove bulb from headlamp.
7. Installation is the reverse order of removal.



NOTE:
After installation, perform aiming adjustment. Refer to LT-60, "Aiming Adjustment" .

Headlamp high/low beam (Xenon) : 12V - 35W (D2R)

PARKING LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" .
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Installation is the reverse order of removal.

Parking lamp : 12V - 5W

FRONT TURN SIGNAL LAMP

1. Turn lighting switch OFF.
2. Remove fender protector (front). Refer to EI-21, "FENDER PROTECTOR" .
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.
5. Installation is the reverse order of removal.

Front turn signal lamp/— : 12V - 28/8W (amber)

FRONT SIDE MARKER LAMP

1. Remove headlamp. Refer to LT-62, "Removal and Installation" .
2. Replacement integral with headlamp housing assembly.
3. Installation is reverse order of removal.

Front side marker lamp : LED

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

Removal and Installation

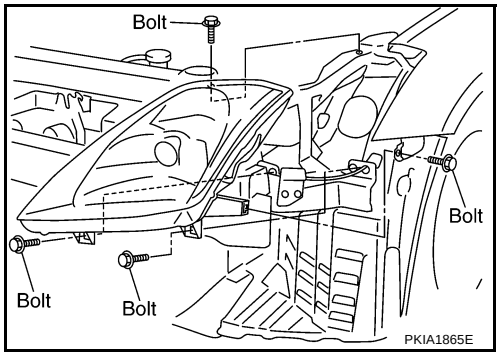
NKS004Y0

REMOVAL

1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal or remove power fuse.

   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.

2. Remove front bumper fascia. Refer to EI-14, "FRONT BUMPER" .
3. Remove headlamp mounting bolts.
4. Pull head lamp toward vehicle front, disconnect connector, and remove headlamp.



INSTALLATION

Installation is the reverse order of removal.

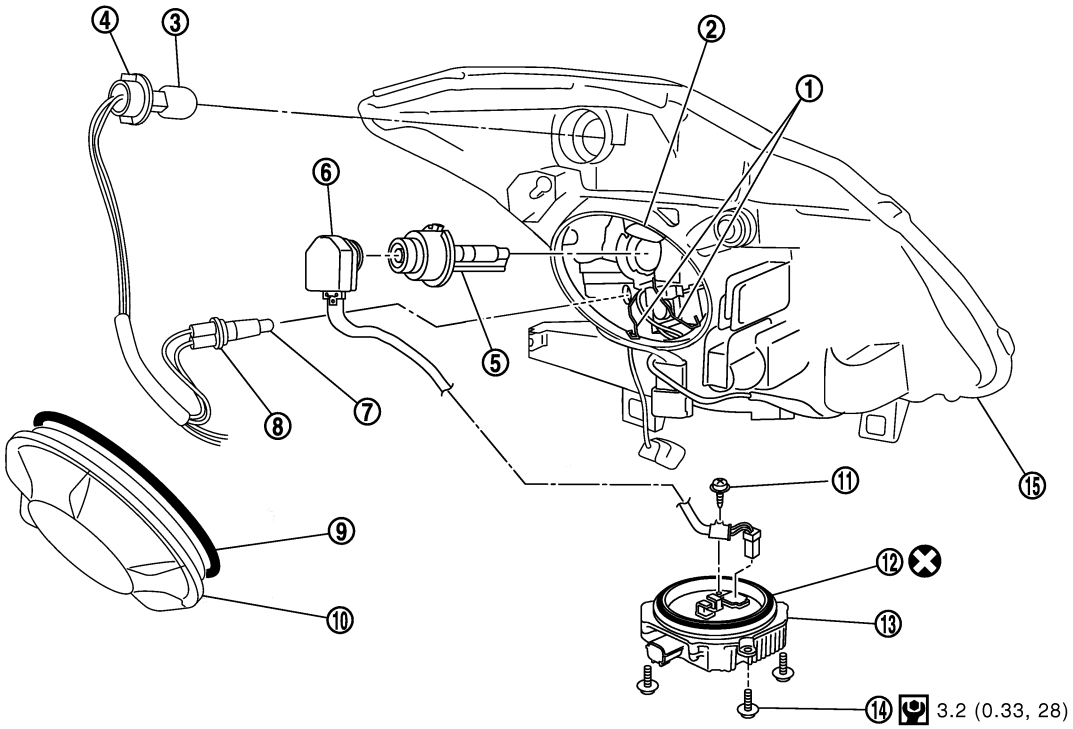
Headlamp mounting bolt : 6.1N·m (0.62 kg-m, 54 in lb)

NOTE:
After installation, perform aiming adjustment. Refer to LT-60, "Aiming Adjustment" .

Disassembly and Assembly

NKS004Y1

SEC. 260



1. Retaining spring	2. Xenon bulb socket ground	3. Front turn signal lamp bulb
4. Front turn signal lamp bulb socket	5. Xenon bulb	6. Xenon bulb socket
7. Parking lamp bulb	8. Parking lamp bulb socket	9. Seal packing
10. Plastic cap	11. Ground screw	12. Seal packing
13. HID control unit	14. HID control unit mounting screw	15. Headlamp housing assembly

:N·m (kg-m, in-lb)

: Always replace after every disassembly.

DISASSEMBLY

1. Turn plastic cap counterclockwise, and unlock it.
2. Turn xenon bulb socket counterclockwise, and unlock it.
3. Unlock retaining spring, and remove xenon bulb.
4. Disconnect xenon bulb socket ground.
5. Remove HID control unit mounting screws.
6. Remove ground screw from HID control unit.
7. Disconnect connectors from HID control unit.
8. Pull out xenon bulb socket from head lamp housing assembly.
9. Turn parking lamp bulb socket counterclockwise and unlock it.
10. Remove parking lamp bulb from its socket.
11. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
12. Remove front turn signal lamp bulb from its socket.

ASSEMBLY

Assembly is the reverse order of disassembly.

HID control unit mounting screw : 3.2 N·m (0.33 kg-m, 28 in-lb)

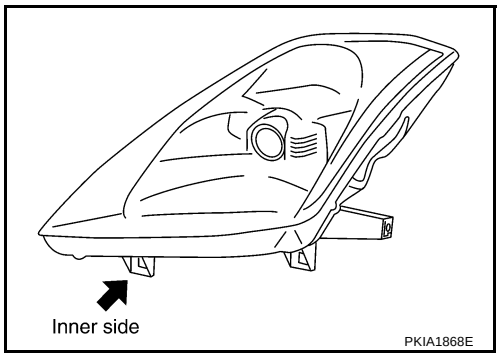
CAUTION:

- **When HID control unit is removed, reinstall it securely and avoid any looseness.**
- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness**

Serving to Replace Headlamps When Damaged

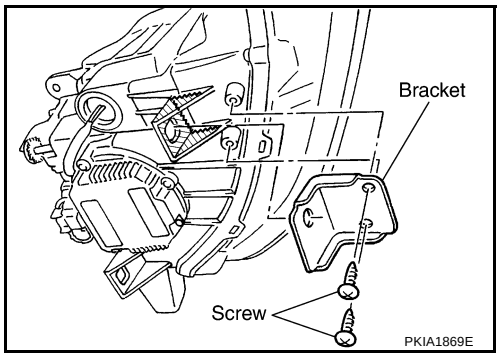
NKS004Y2

If only installation part as shown in the figure is damaged, and headlamp housing itself is not damaged, repair can be completed easily by installing correction brackets.



INSTALLATION OF HEADLAMP BRACKET

1. Remove headlamps. Refer to LT-62, "Removal and Installation" .
2. Cut damaged section of installation part, then shape with sandpaper.
3. Attach each correction bracket to headlamp housing boss with 2 screws.

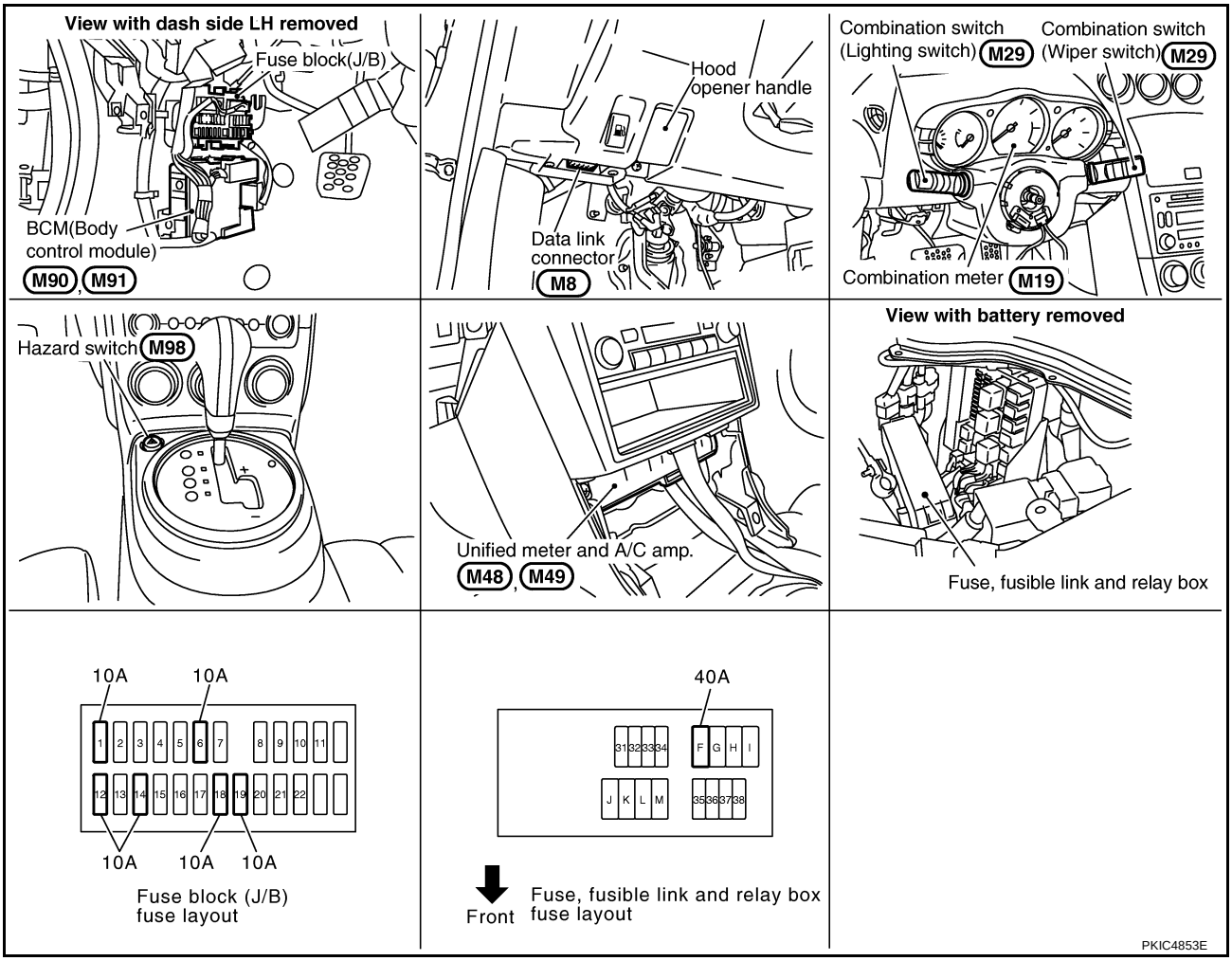


TURN SIGNAL AND HAZARD WARNING LAMPS

PFP:26120

Component Parts and Harness Connector Location

NKS004Y3



System Description

NKS004Y4

TURN SIGNAL OPERATION

When the ignition switch is in ON or START position, power is supplied

- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38,
- through 10A fuse [No.12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 22,
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

Ground is supplied

- to BCM terminal 52
- to unified meter and A/C amp. terminals 29 and 30, and
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

LH Turn Signal Lamp

When the turn signal switch is moved to the left position, the BCM receives left turn signal by combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION"). Power is supplied

- through BCM terminal 45
- to front combination lamp LH terminal 2

- to rear combination lamp LH terminal 2.

Ground is supplied

- to front combination lamp LH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp LH terminal 4
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

The BCM also supplies ground to unified meter and A/C amp. terminals 1and 11 through the CAN communication lines. This input signal is processed by the unified meter control unit in the combination meter through unified meter and A/C amp., which in turn supplies ground to left turn signal indicator lamp.
With the power and ground supplied, BCM controls the flashing of LH turn signal lamps.

RH Turn Signal Lamp

When the turn signal switch is moved to the right position, the BCM receives right turn signal by combination switch reading function (Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION"). Power is supplied

- through BCM terminal 46
- to front combination lamp RH terminal 2
- to rear combination lamp RH terminal 2.

Ground is supplied

- to front combination lamp RH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp RH terminal 4
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

The BCM also supplies ground to unified meter and A/C amp. terminals 1 and 11 through CAN communication lines. This input signal is processed by unified meter control unit in combination meter through unified meter and A/C amp., which in turn supplies ground to the right turn signal indicator lamp.
With power and ground supplied, BCM controls the flashing of RH turn signal lamps.

HAZARD WARNING LAMP OPERATION

Power is supplied at all times

- through 40A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55,
- through 10A fuse [No. 18, located in fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No. 19, located in fuse block (J/B)]
- to combination meter terminal 24, and
- to unified meter and A/C amp. terminal 21.

Ground is supplied

- to BCM terminals 52
- to unified meter and A/C amp. terminals 29 and 30, and
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66.

When the hazard switch is depressed, power is supplied

- through BCM terminal 29
- to hazard lamp switch terminal 2.

Ground is supplied

- through hazard lamp switch terminal 1
- to grounds M30 and M66.

The BCM then supplies power

- through BCM terminal 45
- to front combination lamp LH terminal 2
- to rear combination lamp LH terminal 2,
- through BCM terminal 46
- to front combination lamp RH terminal 2
- to rear combination lamp RH terminal 2.

Ground is supplied

- to front combination lamp LH terminal 8, and
- to front combination lamp RH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp LH terminal 4, and
- to rear combination lamp RH terminal 4
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

The BCM also supplies input to unified meter and A/C amp. terminals 1 and 11 through the CAN communication lines. This input signal is processed by the unified meter control unit in the combination meter through the unified meter and A/C amp., which in turn supplies ground to the left and right turn signal indicator lamps. With the power and ground supplied, BCM controls the flashing of hazard warning lamps.

REMOTE KEYLESS ENTRY SYSTEM OPERATION

Refer to BL-59, "REMOTE KEYLESS ENTRY SYSTEM" .

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

CAN Communication System Description

NKS004Y5

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

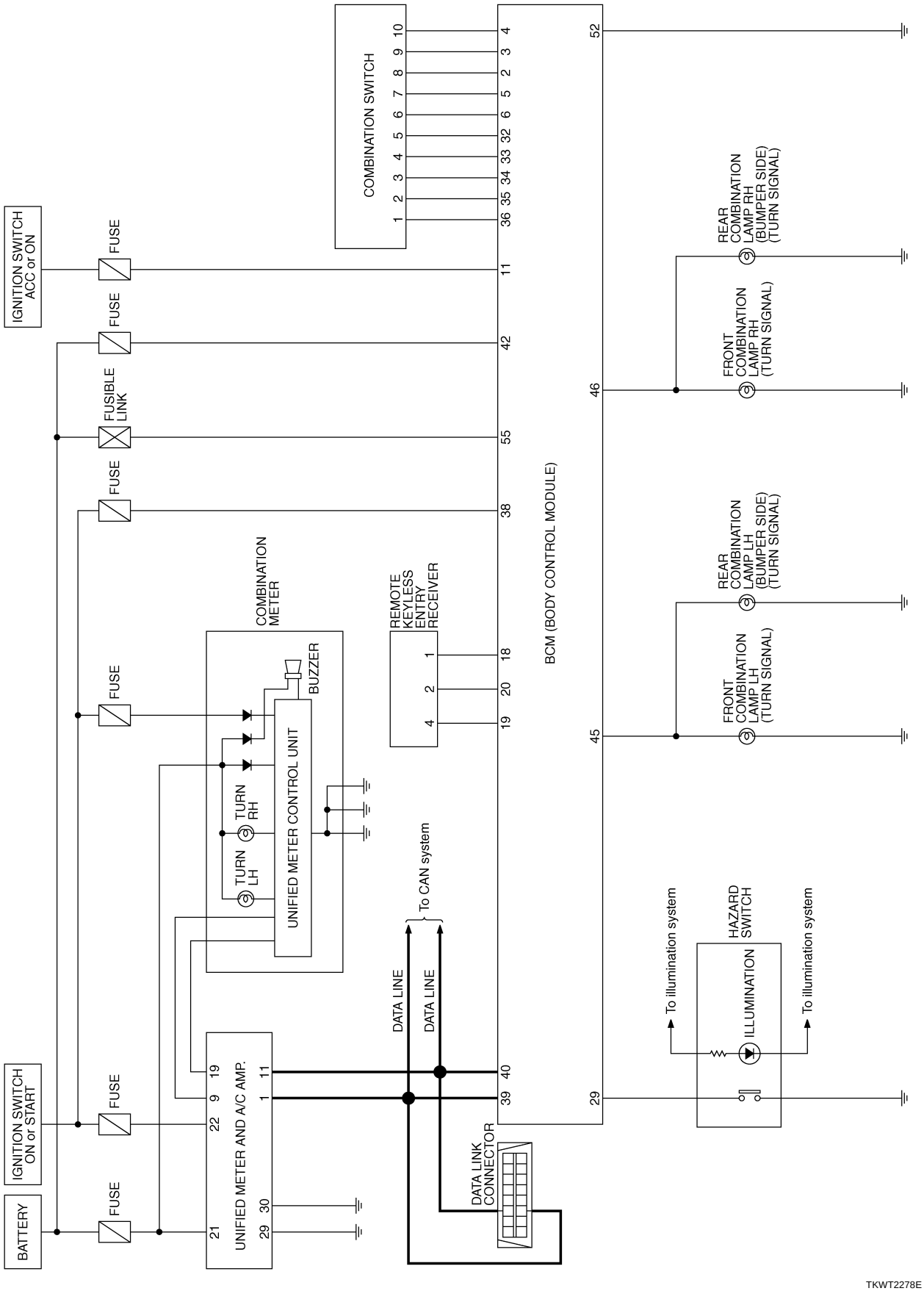
CAN Communication Unit

NKS004Y6

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

NKS004Y7

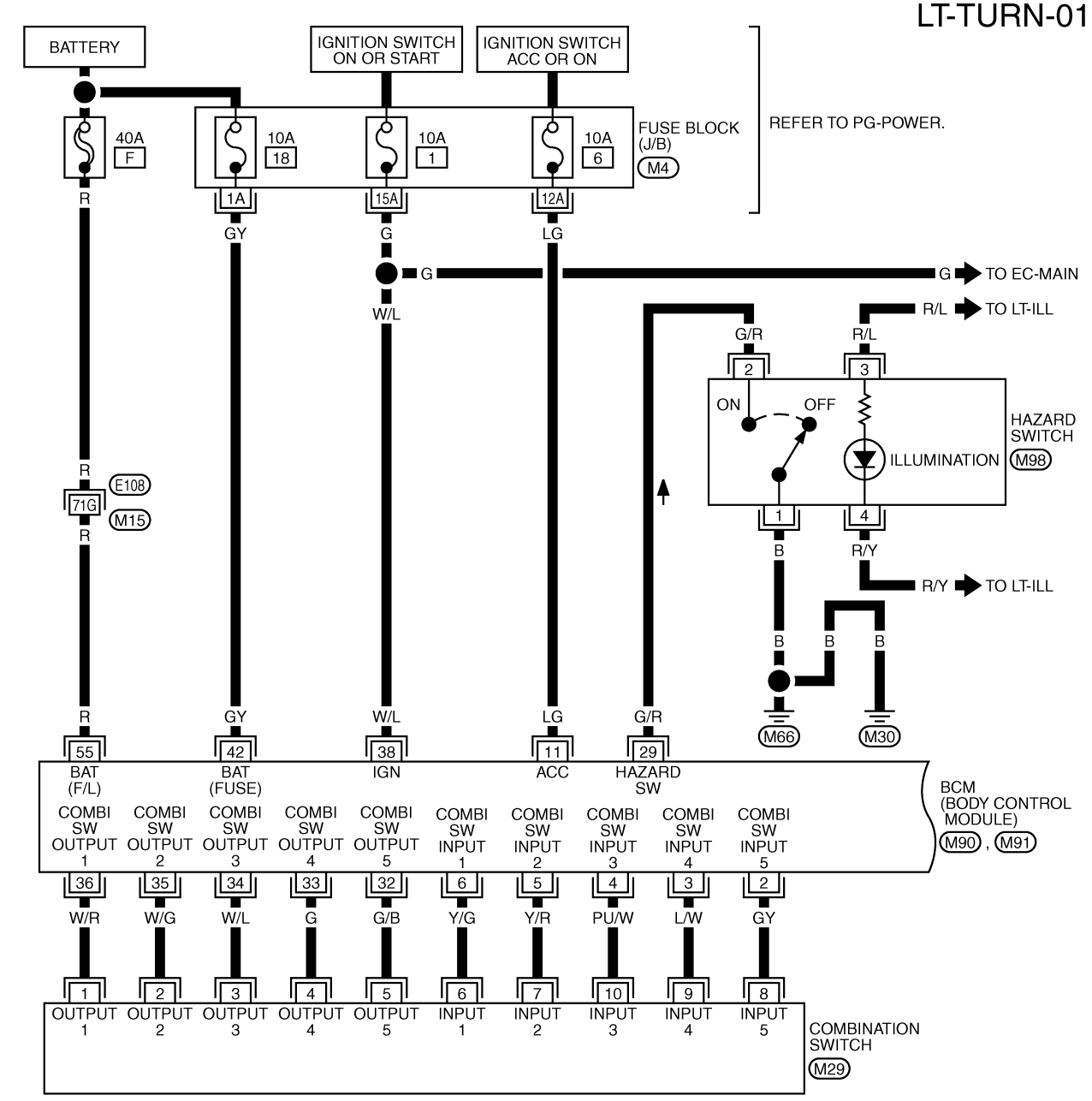


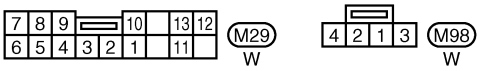
Wiring Diagram — TURN —

NKS004Y8

COUPE MODELS

LT-TURN-01





REFER TO THE FOLLOWING.

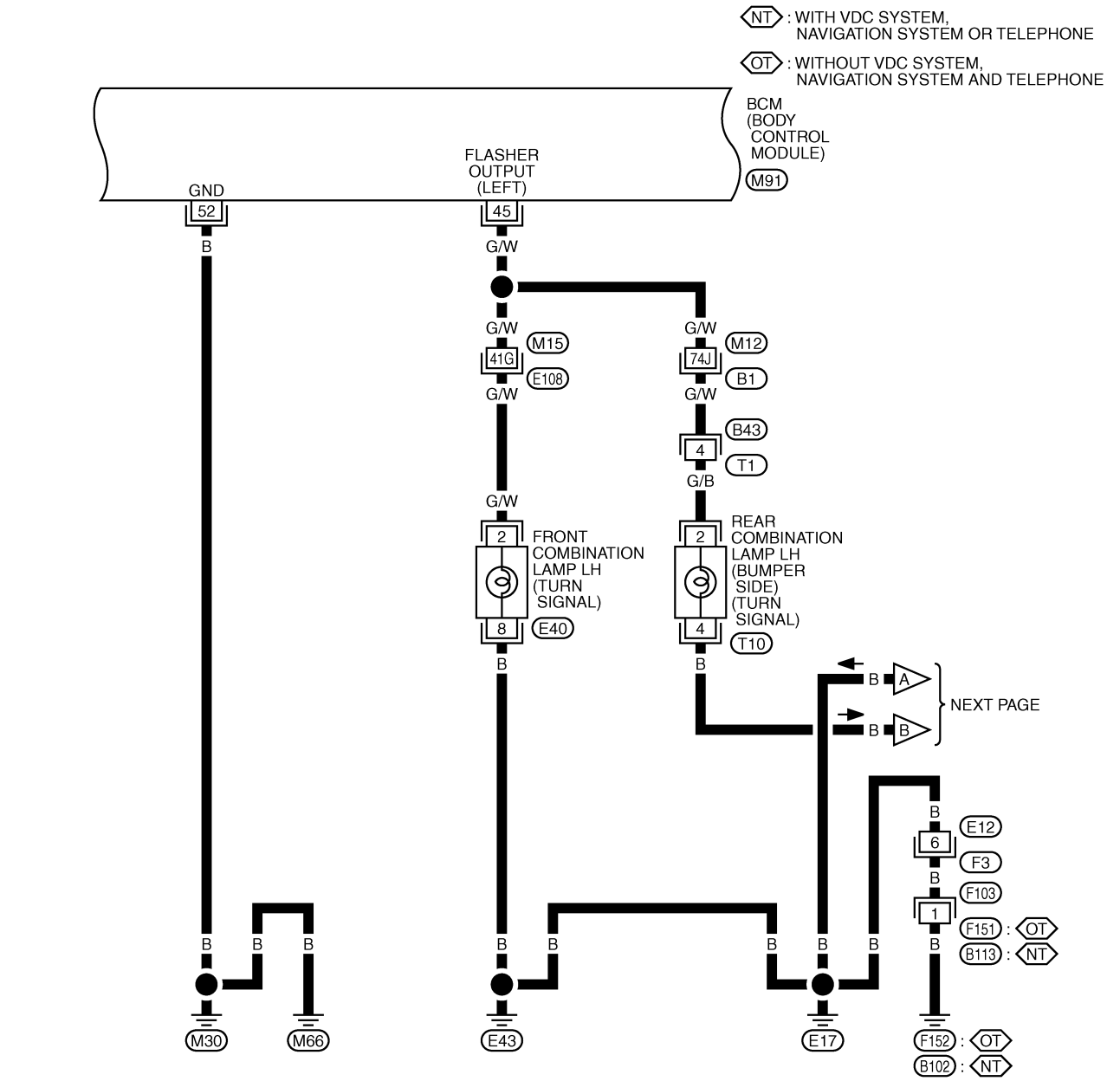
E108 -SUPER MULTIPLE JUNCTION (SMJ)

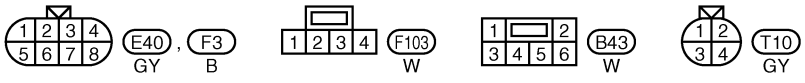
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TKWT5751E

LT-TURN-02





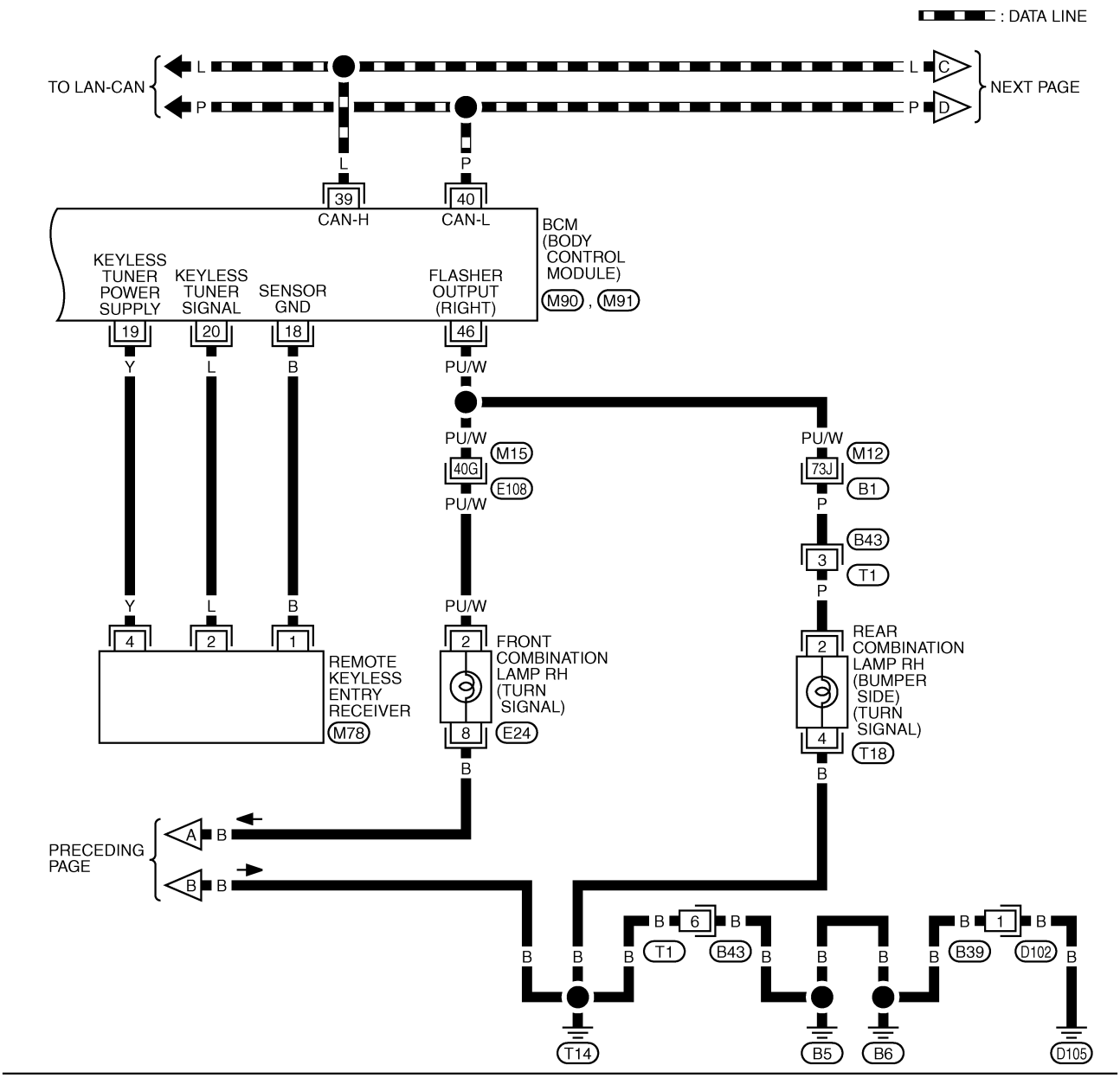
REFER TO THE FOLLOWING.

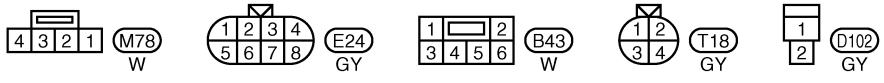
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M91 -ELECTRICAL UNITS

TKWT5752E

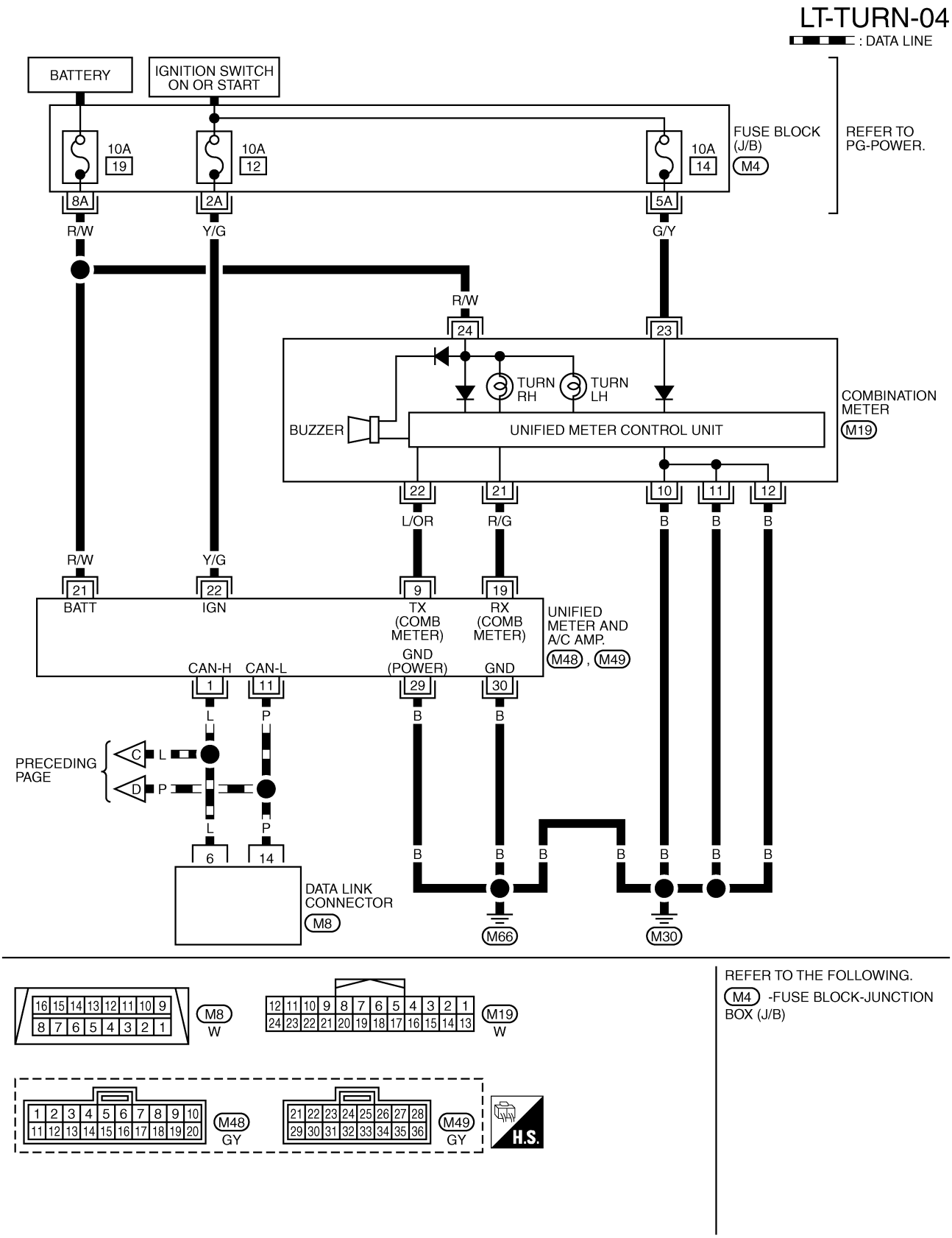
LT-TURN-03





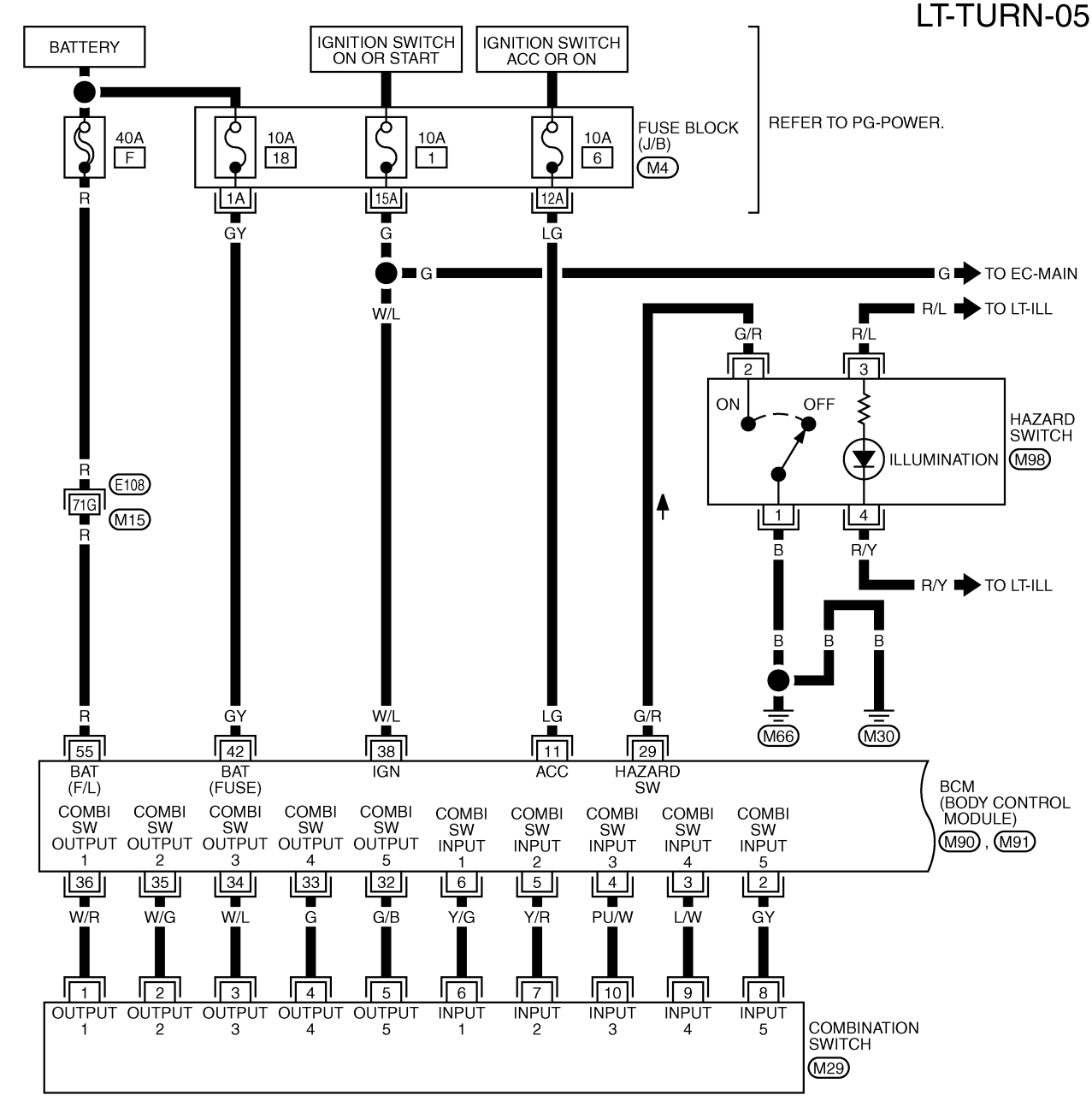
REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 -ELECTRICAL UNITS

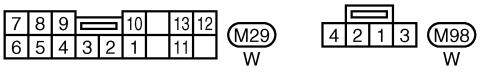
TKWT4032E


LT-TURN-04
: DATA LINE
BATTERY
IGNITION SWITCH ON OR START
10A 19
10A 12
10A 14
FUSE BLOCK (J/B) M4
REFER TO PG-POWER.
8A
2A
5A
R/W
Y/G
G/Y
R/W
24
23
TURN RH
TURN LH
BUZZER
UNIFIED METER CONTROL UNIT
COMBINATION METER M19
22
21
10
11
12
L/OR
R/G
B
B
B
R/W
Y/G
21
22
9
19
BATT
IGN
TX (COMB METER)
RX (COMB METER)
UNIFIED METER AND A/C AMP. M48, M49
CAN-H
CAN-L
GND (POWER)
GND
1
11
29
30
L
P
B
B
PRECEDING PAGE
C
D
L
P
6
14
DATA LINK CONNECTOR M8
M66
M30
M8 W
M19 W
M48 GY
M49 GY
H.S.
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
TKWT2281E

ROADSTER MODELS

LT-TURN-05





REFER TO THE FOLLOWING.

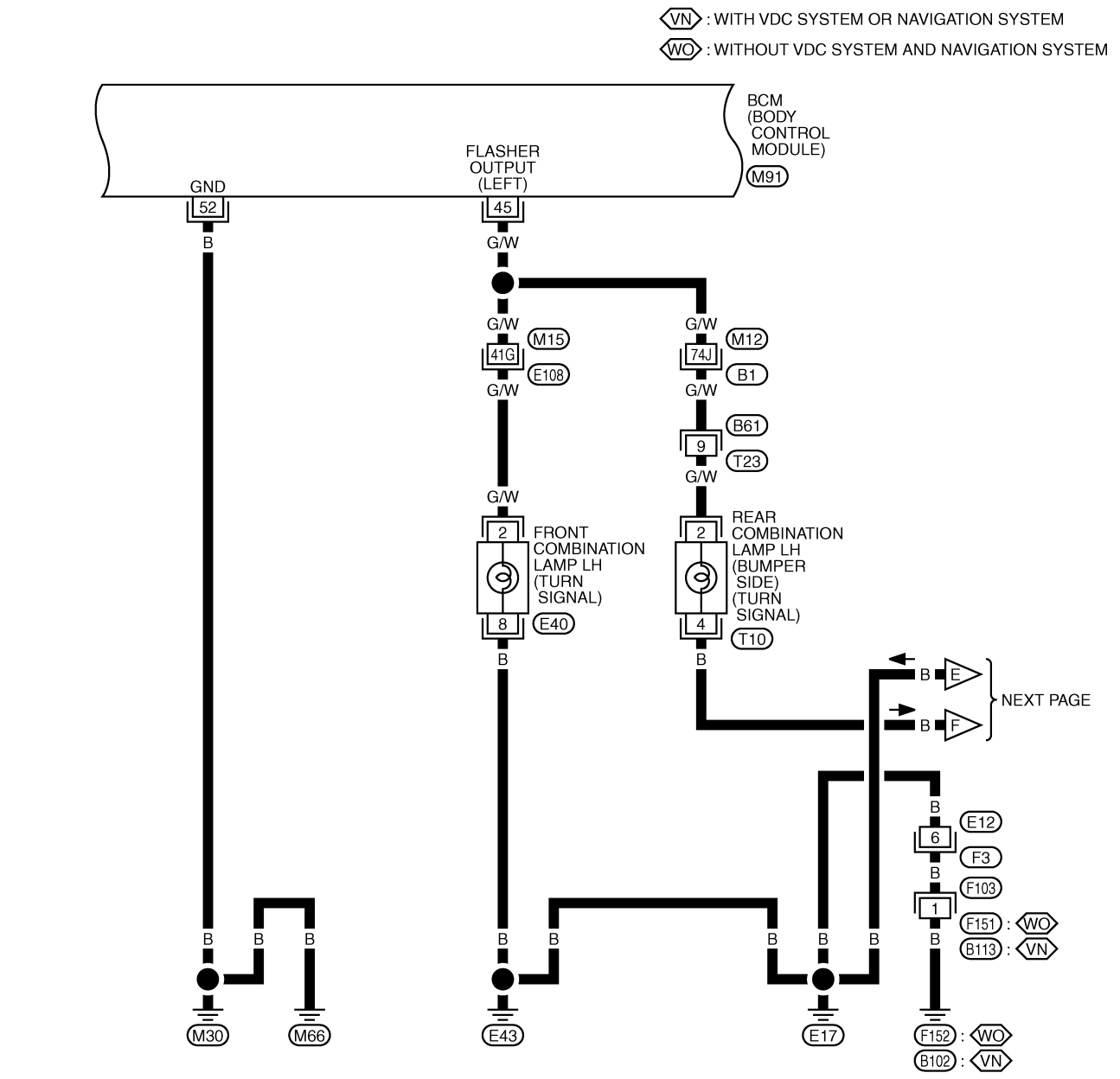
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90, M91 -ELECTRICAL UNITS

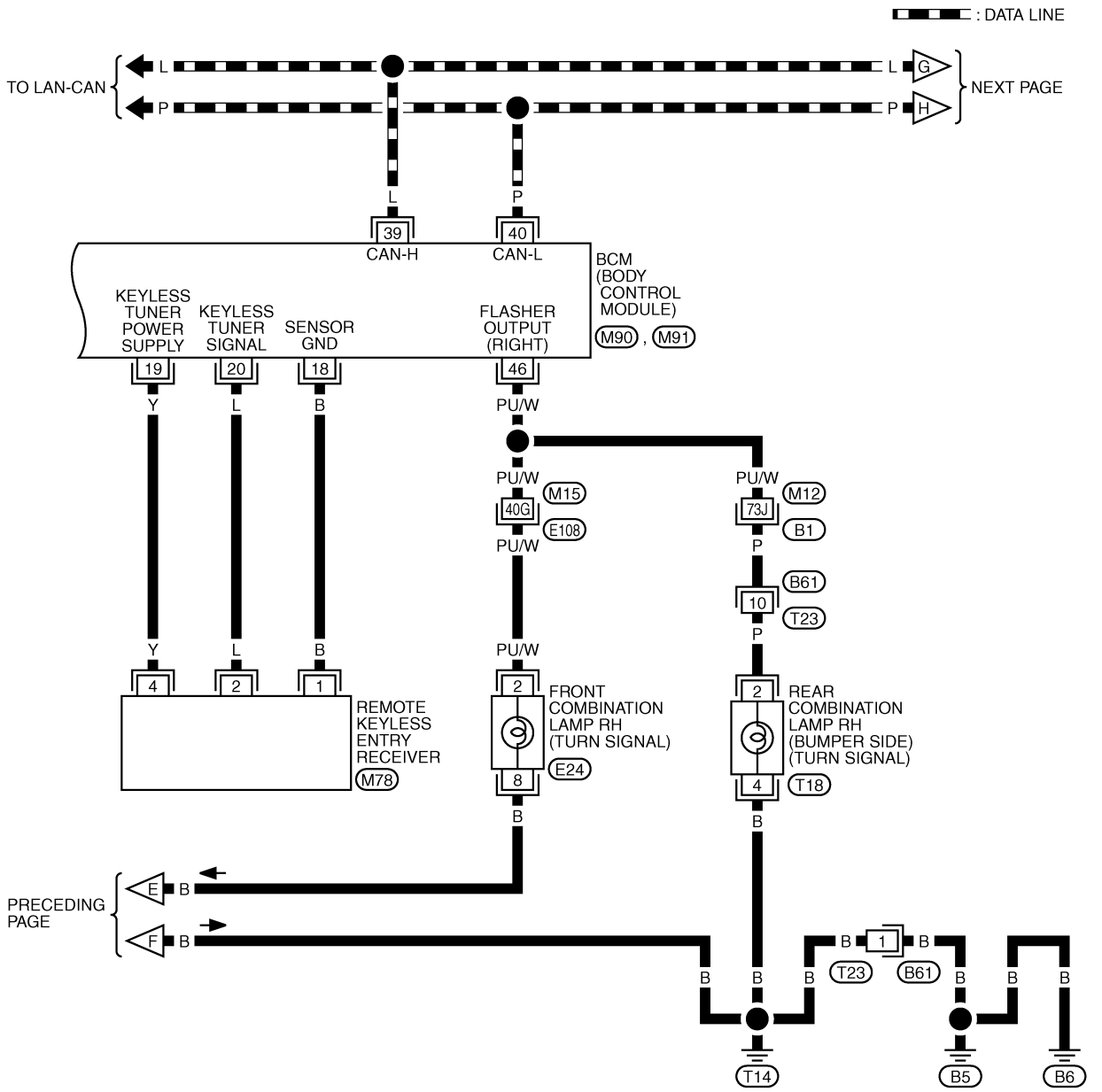
TKWT5753E

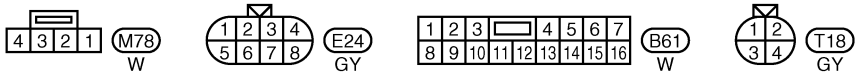
LT-TURN-06



TKWT5583E

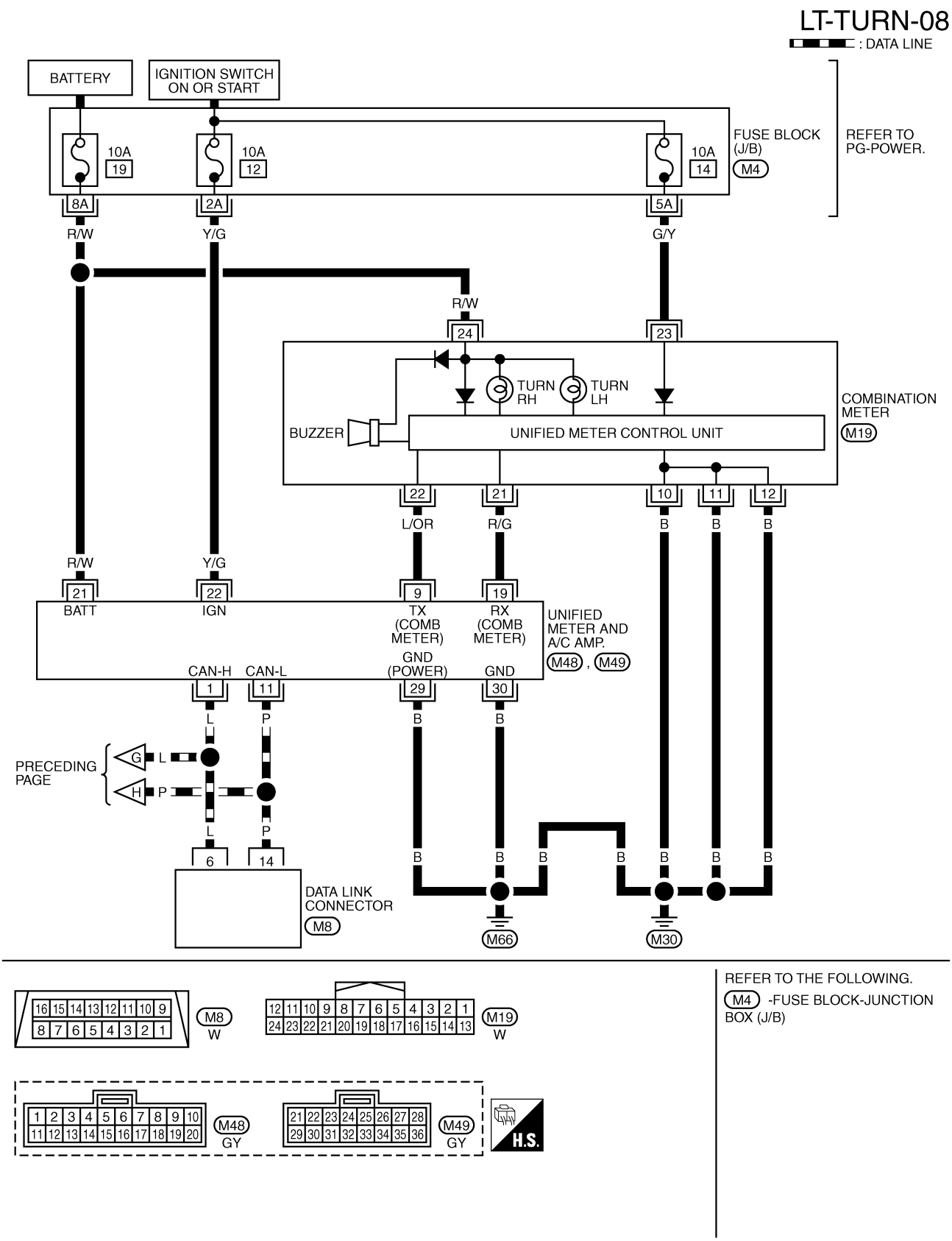
LT-TURN-07





REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , M91 -ELECTRICAL UNITS

TKWT4035E

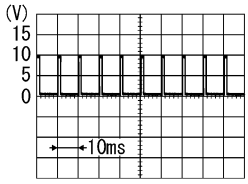
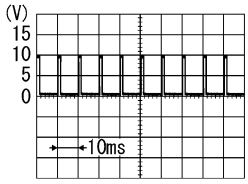
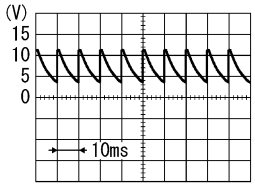
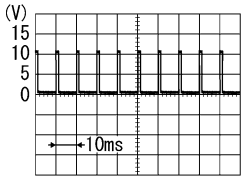

LT-TURN-08
: DATA LINE
BATTERY
IGNITION SWITCH ON OR START
10A 19
10A 12
10A 14
FUSE BLOCK (J/B) M4
REFER TO PG-POWER.
8A
2A
5A
R/W
Y/G
G/Y
R/W
24
23
TURN RH
TURN LH
BUZZER
UNIFIED METER CONTROL UNIT
COMBINATION METER M19
22
21
10
11
12
L/OR
R/G
B
B
B
R/W
Y/G
21
22
9
19
BATT
IGN
TX (COMB METER)
RX (COMB METER)
UNIFIED METER AND A/C AMP. M48 , M49
CAN-H
CAN-L
GND (POWER)
GND
1
11
29
30
L
P
B
B
PRECEDING PAGE
G
H
L
P
6
14
DATA LINK CONNECTOR M8
M66
M30
M8 W
M19 W
M48 GY
M49 GY
H.S.
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
TKWT2284E

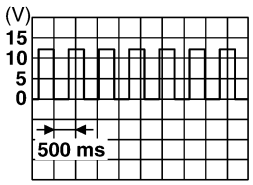
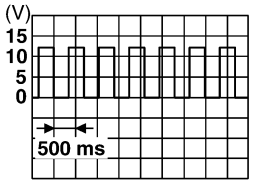
Terminals and Reference Values for BCM

NKS004Y9

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Turn signal switch to right	 PKIB4959J Approx. 1.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Turn signal switch to left	 PKIB4959J Approx. 1.0 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage
29	G/R	Hazard signal	OFF	Hazard switch	OFF	Battery voltage
					ON	Approx. 0 V
36	W/R	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Turn signal switch to right ● Turn signal switch to left	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
42	GY	Battery power supply	OFF	—		Battery voltage
45	G/W	Turn signal (left)	ON	Combination switch	Turn left ON	 SKIA3009J
46	PU/W	Turn signal (right)	ON	Combination switch	Turn right ON	 SKIA3009J
52	B	Ground	ON	—		Approx. 0V
55	R	Battery power supply	OFF	—		Battery voltage

How to Proceed With Trouble Diagnosis

NKS004YA

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-65, "System Description" .
3. Perform preliminary check. Refer to LT-79, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Do turn signal and hazard warning lamps operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004YB

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

UNIT	POWER SOURCE	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6

Refer to LT-69, "Wiring Diagram — TURN —" .

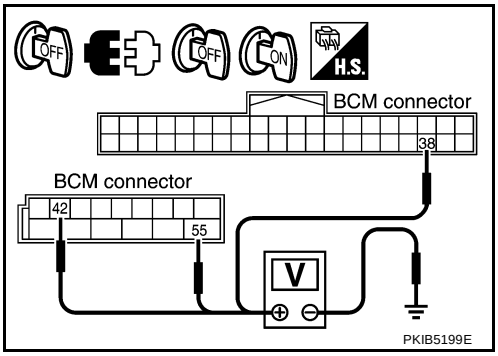
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connectors.
3. Check voltage between BCM harness connector terminals and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M90	38	Ground	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

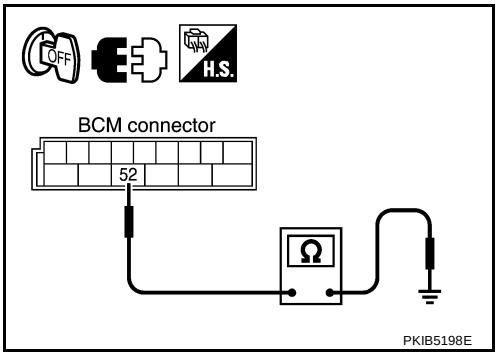
OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector terminal and ground.



BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.

CONSULT-III Function (BCM)

NKS004YC

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
FLASHER	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from ignition switch signal.
HAZARD SW	“ON/OFF”	Displays “Hazard ON (ON)/Hazard OFF (OFF)” status, determined from hazard switch signal.
TURN SIGNAL R	“ON/OFF”	Displays “Turn right (ON)/Other (OFF)” status, determined from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays “Turn left (ON)/Other (OFF)” status, determined from lighting switch signal.
BRAKE SW NOTE	“OFF”	—

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
FLASHER	With a certain operation (OFF, RH, LH), turn signal lamp can be operated.

Turn Signal Lamp Does Not Operate

NKS004YD

1. CHECK BULB

Check bulb standard of each turn signal lamp is correct.

OK or NG

OK >> GO TO 2.
NG >> Replace turn signal lamp bulb.

2. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "TURN SIGNAL R" and "TURN SIGNAL L" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is TURN RH position : TURN SIGNAL R ON

When lighting switch is TURN LH position : TURN SIGNAL L ON

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 3.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

3. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "FLASHER" of BCM active test item.
2. With operating the test item, check the turn signal lamp operation.

Turn signal lamp should operate.

GO TO 4

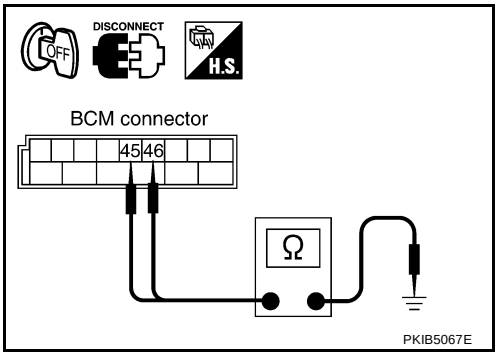
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 4.

4. CHECK SHORT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and all turn signal lamp connectors.
3. Check continuity (short circuit) between BCM harness connector and ground.

BCM connector		Terminal	Ground	Continuity
RH	M91	46		No
LH		45		



OK or NG

OK >> Replace BCM if turn signal lamps does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

Hazard Warning Lamp Does Not Operate But Turn Signal Lamp Operate

NKS004YE

1. CHECK BULB

Make sure bulb standard of each turn signal lamp is correct.

OK or NG

OK >> GO TO 2.
NG >> Replace bulb.

2. CHECK HAZARD SWITCH INPUT SIGNAL

With CONSULT-III

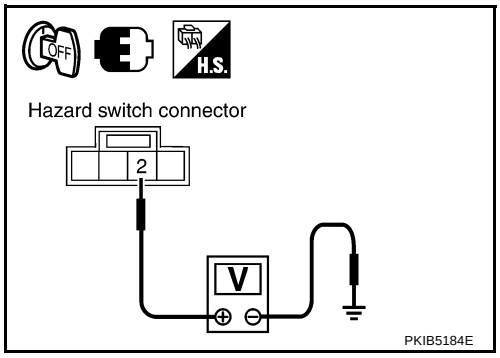
1. Select "HAZARD SW" of BCM data monitor item.
2. With operating the hazard switch, check the monitor status.

When hazard switch is ON position : HAZARD SW ON

Without CONSULT-III

Check voltage between hazard switch harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(-)		
Hazard switch connector	Terminal			
M98	2	Ground	Hazard switch is ON	0V
			Hazard switch is OFF	5V



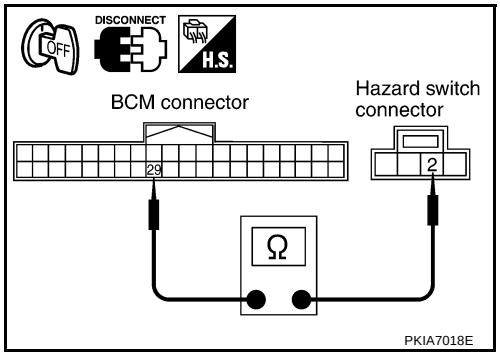
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 3.

3. CHECK HAZARD SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and hazard switch connector.
3. Check continuity BCM harness connector and hazard switch harness connector.

Terminals				Continuity
BCM		Hazard switch		
Connector	Terminal	Connector	Terminal	
M90	29	M98	2	Yes



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

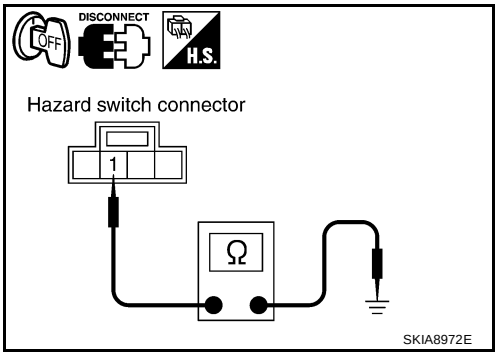
4. CHECK GROUND

Check continuity hazard switch harness connector and ground.

Hazard switch connector	Terminal	Ground	Continuity
M98	1		Yes

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.



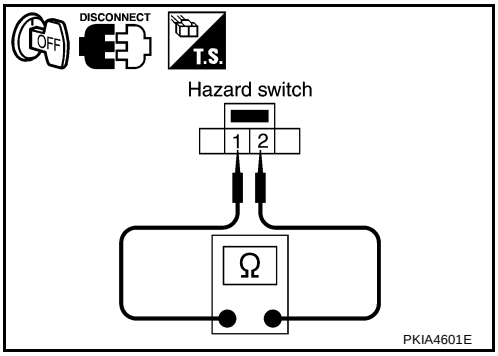
5. CHECK HAZARD SWITCH

Check continuity hazard switch.

Terminal		Condition	Continuity
Hazard switch			
1	2	Hazard switch is ON.	Yes
		Hazard switch is OFF.	No

OK or NG

OK >> Replace BCM if turn signal lamps does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace hazard switch.



Turn Signal Indicator Lamp Does Not Operate

NKS004YF

1. CHECK BULB

Check bulb of turn signal indicator lamp in combination meter.

OK or NG

OK >> Replace combination meter.
NG >> Replace indicator bulb.

Bulb Replacement (Front Turn Signal Lamp)

NKS004YG

Refer to LT-28, "Bulb Replacement" .

Bulb Replacement (Rear Turn Signal Lamp)

NKS004YH

Refer to LT-126, "Bulb Replacement" .

Removal and Installation of Front Turn Signal Lamp

NKS004YI

Refer to LT-29, "Removal and Installation" .

Removal and Installation of Rear Turn Signal Lamp

NKS004YJ

Refer to LT-127, "Removal and Installation" .

LIGHTING AND TURN SIGNAL SWITCH

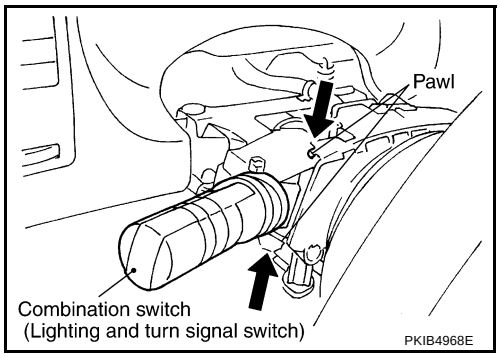
PFP:25540

Removal and Installation

NKS004YK

REMOVAL

1. Remove steering column lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove column upper cover and combination meter assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. While pressing pawls in direction as shown in the figure, pull lighting and turn signal switch toward driver door and disconnect from the base.



INSTALLATION

Installation is the reverse order of removal.

HAZARD SWITCH

PFP:25290

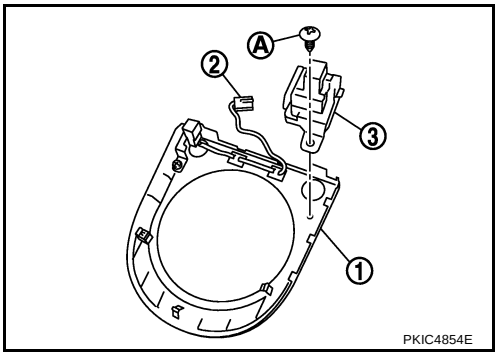
Removal and Installation

NKS004YL

HAZARD SWITCH (A/T MODELS)

Removal

1. Remove console finisher (1). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect hazard switch connector (2).
3. Remove screw (A), and remove hazard switch (3).



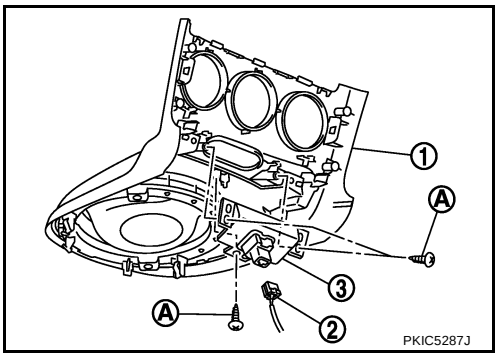
Installation

Installation is the reverse order of removal.

HAZARD SWITCH (M/T MODELS)

Removal

1. Removal console boot (1). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect hazard switch connector (2).
3. Remove screw (A), and remove hazard switch (3).



Installation

Installation is the reverse order of removal.

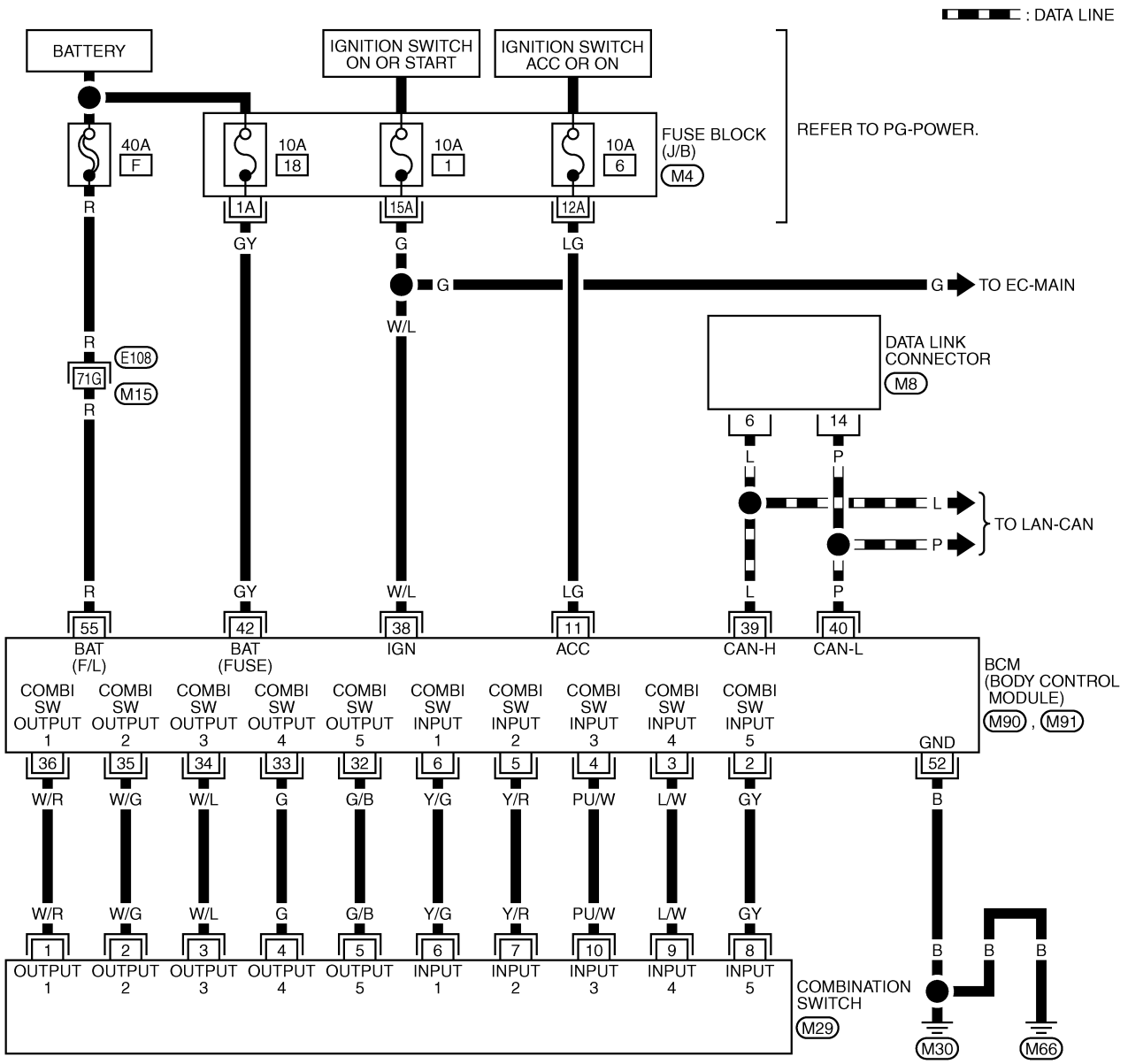
COMBINATION SWITCH

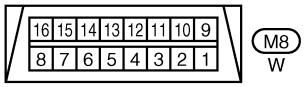
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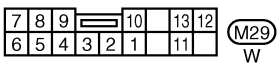
Wiring Diagram —COMBSW—

NKS004YM

LT-COMBSW-01







REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TKWT5754E

Combination Switch Reading Function

NKS004YN

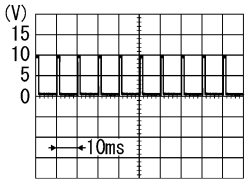
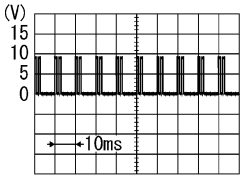
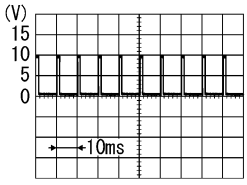
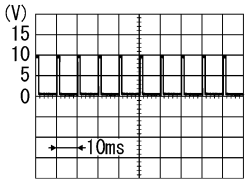
Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

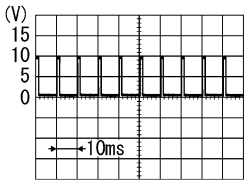
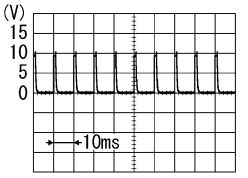
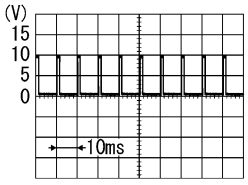
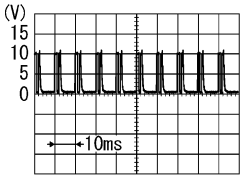
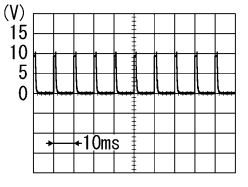
Terminals and Reference Values for BCM

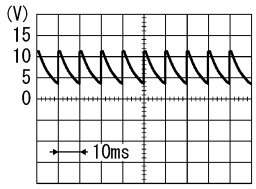
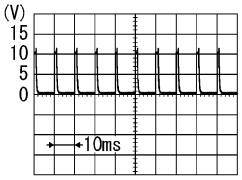
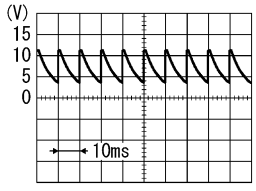
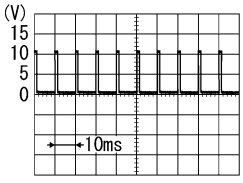
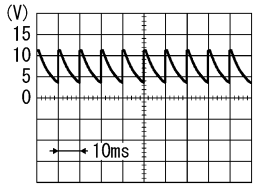
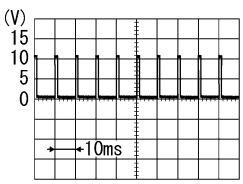
NKS004YO

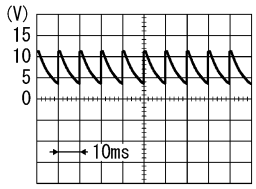
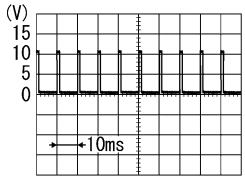
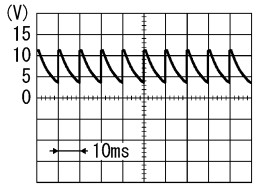
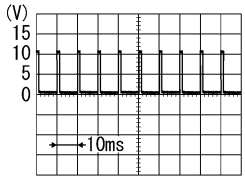
CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch) ● Turn signal switch to right	 PKIB4959J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch) ● Turn signal switch to left	 PKIB4959J Approx. 1.0 V
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Front wiper switch MIST ● Front wiper switch INT ● Front wiper switch LO	 PKIB4959J Approx. 1.0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	Approx. 0 V
					Any of the conditions below ● Front washer switch ● Rear washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4959J Approx. 1.0 V
					Rear wiper switch ON (Wiper intermittent dial position 4)	 PKIB4955J Approx. 0.8 v
6	Y/G	Combination switch input 1	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	Approx. 0 V
					Any of the conditions below ● Front wiper switch HI ● Rear wiper switch INT ● Wiper intermittent dial position 3	 PKIB4959J Approx. 1.0 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2	 PKIB4952J Approx. 1.7 V
					Any of the conditions below ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4955J Approx. 0.8 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4956J Approx. 1.0 V
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 1ST (The same result with lighting switch 2ND) ● Rear wiper switch INT ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch) ● Rear washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 3	 PKIB4958J Approx. 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch) ● Front wiper switch INT ● Front wiper switch HI	 PKIB4958J Approx. 1.2 V
36	W/R	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Turn signal switch to right ● Turn signal switch to left ● Front wiper switch MIST ● Front wiper switch LO ● Front washer switch	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	GY	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0V
55	R	Battery power supply	OFF	—		Battery voltage

CONSULT-III Function (BCM)

NKS004YP

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
COMB SW	DATA MONITOR	Displays BCM input data in real time.

DATA MONITOR
Display Item List

Monitor item name “OPERATION OR UNIT”		Contents
TURN SIGNAL R	“ON/OFF”	Displays “Turn Right (ON)/Other (OFF)” status, determined from lighting switch signal.
TURN SIGNAL L	“ON/OFF”	Displays “Turn Left (ON)/Other (OFF)” status, determined from lighting switch signal.
HI BEAM SW	“ON/OFF”	Displays status (high beam switch: ON/Others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“ON/OFF”	Displays status (headlamp switch 2: ON/Others: OFF) of headlamp switch 2 judged from lighting switch signal.
LIGHT SW 1ST	“ON/OFF”	Displays status (lighting switch 1ST or 2ND position: ON/Others: OFF) of lighting switch judged from lighting switch signal.
PASSING SW	“ON/OFF”	Displays status (flash-to-pass switch: ON/Others: OFF) of flash-to-pass switch judged from lighting switch signal.
FR FOG SW NOTE	“ON/OFF”	—
FR WIPER HI	“ON/OFF”	Displays “Front Wiper HI (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WIPER LOW	“ON/OFF”	Displays “Front Wiper LOW (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WIPER INT	“ON/OFF”	Displays “Front Wiper INT (ON)/Other (OFF)” status, determined from wiper switch signal.
FR WASHER SW	“ON/OFF”	Displays “Front Washer Switch (ON)/Other (OFF)” status, determined from wiper switch signal.
INT VOLUME	[1 - 7]	Displays intermittent operation knob setting (1 - 7), determined from wiper switch signal.
RR WIPER ON	“ON/OFF”	Displays “rear Wiper (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT	“ON/OFF”	Displays “rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW	“ON/OFF”	Displays “rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.

NOTE:
This item is displayed, but cannot be monitored.

Combination Switch Inspection

NKS004YQ

1. SYSTEM CHECK

Referring to table below, check which system malfunctioning switch belongs to.

System 1	System 2	System 3	System 4	System 5
—	FR WASHER	FR WIPER LO	TURN LH	TURN RH
FR WIPER HI	—	FR WIPER INT	PASSING	HEAD LAMP 1
INT VOLUME 1	RR WASHER	—	HEAD LAMP 2	HI BEAM
RR WIPER INT	INT VOLUME 3	—	—	LIGHT SW 1ST
INT VOLUME 2	RR WIPER ON	—	—	—

>> Check the system to which malfunctioning switch belongs, and GO TO 2.

2. SYSTEM CHECK

With CONSULT-III

1. Select "COMBI SW" of BCM data monitor item.
2. Confirm that other switches in malfunctioning system operate normally.
   Example: When the HI BEAM switch is malfunctioning, confirm that “TURN RH”, “HEAD LAMP 1” and “LIGHT SW 1 ST” in System 5, to which the HI BEAM switch belongs, turn ON-OFF normally.

Without CONSULT-III

Operating combination switch, and confirm that other switches in malfunctioning system operate normally.
Example: When the HI BEAM switch is malfunctioning, confirm that “TURN RH”, “HEAD LAMP 1” and “LIGHT SW 1 ST” in System 5, to which HI BEAM switch belongs, turn ON-OFF normally.

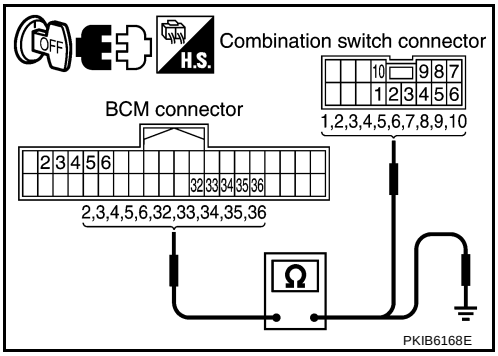
Check results

Other switches in malfunctioning system operate normally.>>Replace lighting switch or wiper switch.
Other switches in malfunctioning system do not operate normally.>>GO TO 3.

3. HARNESS INSPECTION

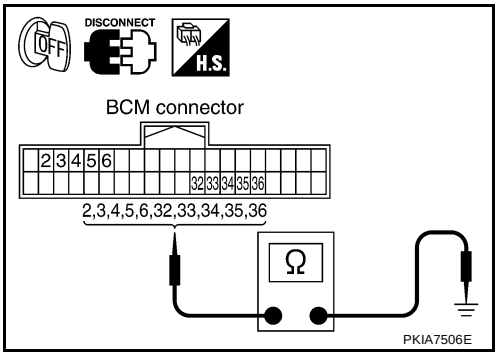
1. Turn ignition switch OFF.
2. Disconnect BCM and combination switch connectors.
3. Check for continuity between BCM harness connector of the suspect system and the corresponding combination switch harness connector.

Suspect system	BCM			Combination switch		Continuity
	Connector	Terminal		Connector	Terminal	
1	M90	Input 1	6	M29	6	Yes
		Output 1	36		1	
2		Input 2	5		7	
		Output 2	35		2	
3		Input 3	4		10	
		Output 3	34		3	
4		Input 4	3		9	
		Output 4	33		4	
5		Input 5	2		8	
		Output 5	32		5	



4. Check for continuity between BCM harness connector in suspect malfunctioning system and ground.

Suspect system	BCM				Continuity
	Connector	Terminal			
1	M90	Input 1	6	Ground	No
		Output 1	36		
2		Input 2	5		
		Output 2	35		
3		Input 3	4		
		Output 3	34		
4		Input 4	3		
		Output 4	33		
5		Input 5	2		
		Output 5	32		

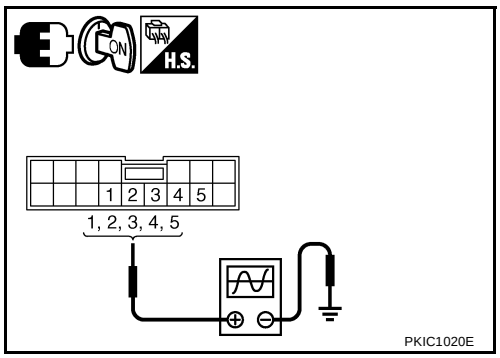


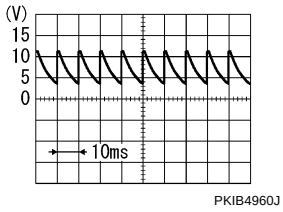
OK or NG

OK >> GO TO 4.
NG >> Check harness between BCM and combination switch for open or short circuit.

4. BCM OUTPUT TERMINAL INSPECTION

1. Connect BCM and combination switch connectors.
2. Set wiper intermittent dial position 4.
3. Turn ignition switch ON.
4. Check BCM output terminal voltage waveform of suspect malfunctioning system.



Suspect system	Terminals (+) Combination switch connector	Terminals (+) Terminal	Terminals (-)	Reference value (Approx.)
1	M29	1	Ground	 PKIB4960J 7.2 V
2		2		
3		3		
4		4		
5		5		

OK or NG

OK >> Open circuit in combination switch, GO TO 5.
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

5. COMBINATION SWITCH INSPECTION

Referring to table below, perform combination switch inspection.

Procedure										
1	2		3	4		5	6		7	
Replace lighting switch	Confirm check results	OK	INSPECTION END	Confirm check results	OK	INSPECTION END	Confirm check results	OK	INSPECTION END	
		NG	Replace wiper switch		NG	Replace switch base		NG	Confirm symptom again	

>> INSPECTION END

Removal and Installation

NKS004YR

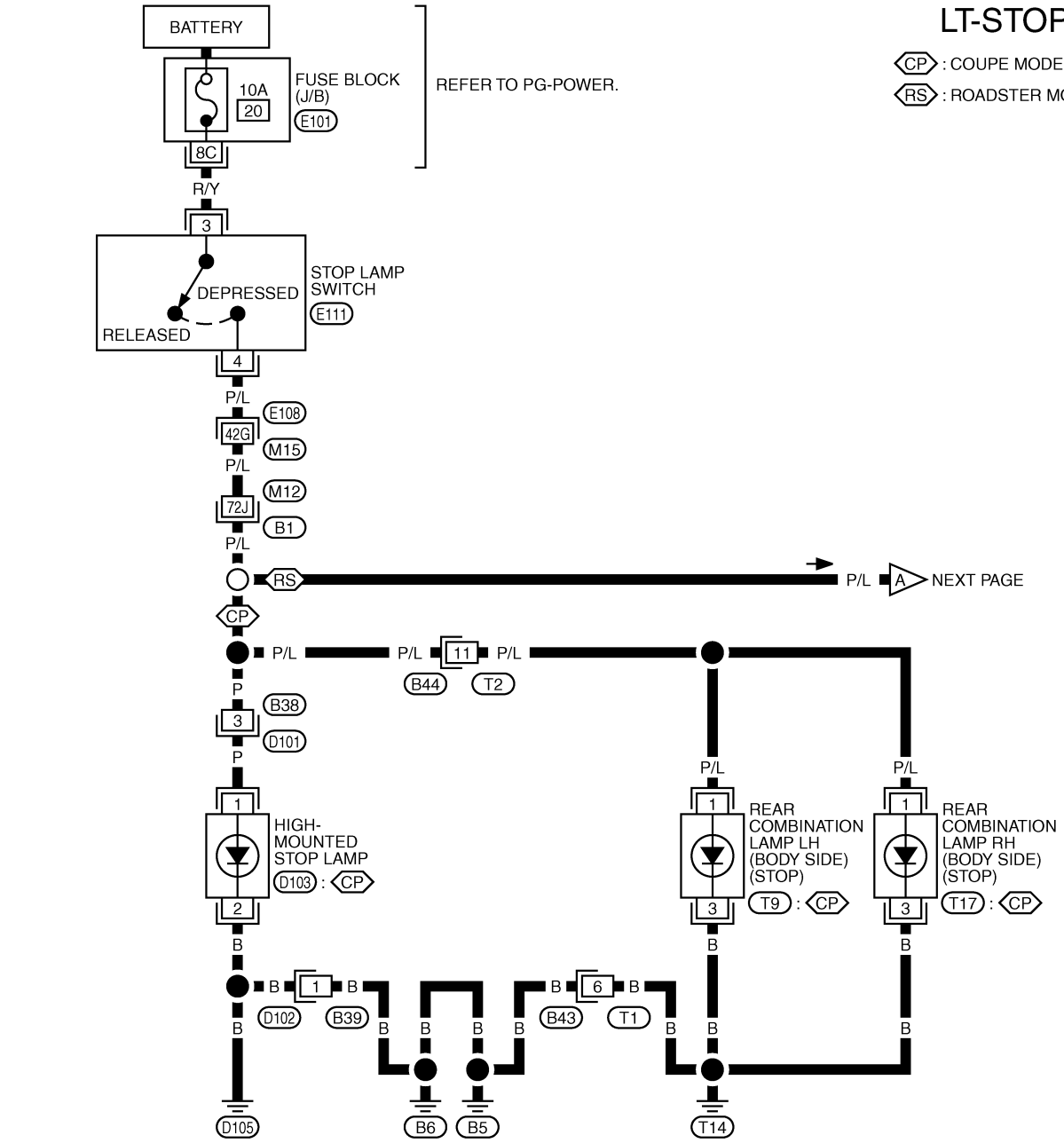
Refer to LT-84, "LIGHTING AND TURN SIGNAL SWITCH" .

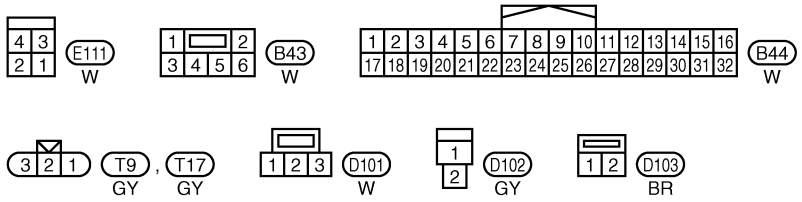
STOP LAMP

PFP:26550

Wiring Diagram — STOP/L —

NKS004YS



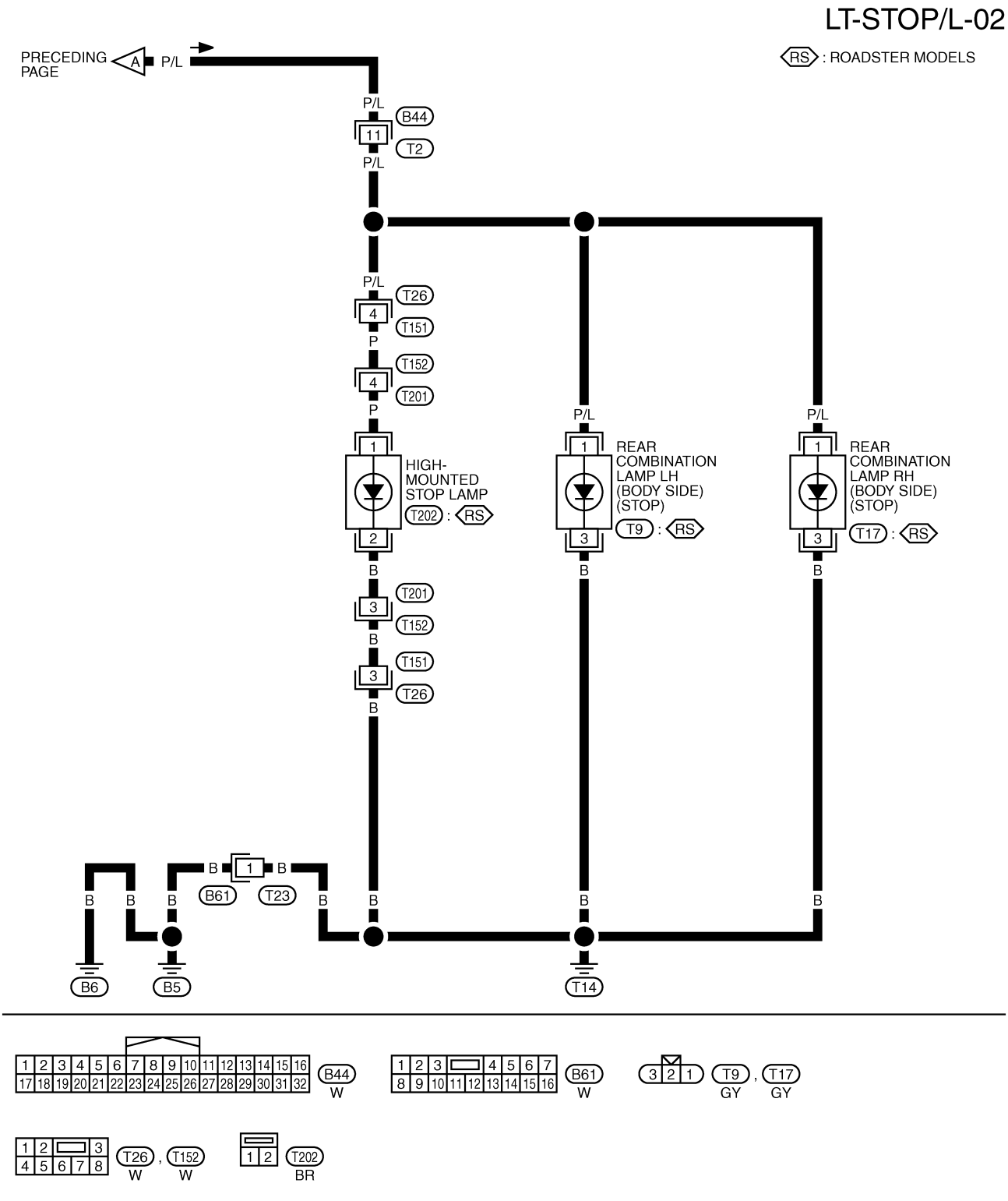


REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5755E

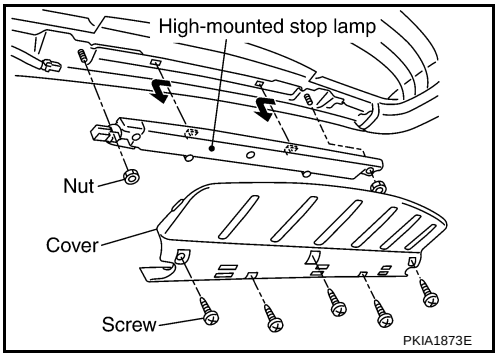

LT-STOP/L-02
RS : ROADSTER MODELS
PRECEDING PAGE
A
P/L
B44
11
T2
T26
4
T151
T152
T201
HIGH-MOUNTED STOP LAMP
T202 : RS
REAR COMBINATION LAMP LH (BODY SIDE) (STOP)
T9 : RS
REAR COMBINATION LAMP RH (BODY SIDE) (STOP)
T17 : RS
3
B61
T23
B6
B5
T14
W
GY
BR
TKWT4038E

High-Mounted Stop Lamp (Coupe Models)

NKS004YT

BULB REPLACEMENT, REMOVAL AND INSTALLATION

1. Remove back door finisher upper. Refer to EI-48, "BACK DOOR FINISHER" .
2. Disconnect high-mounted stop lamp connector.
3. Remove nuts and remove high-mounted stop lamp with cover from back door. Be sure to pull toward the arrow in the figure.
4. Remove screws and remove high-mounted stop lamp assembly from cover.
5. Installation is the reverse order of removal.



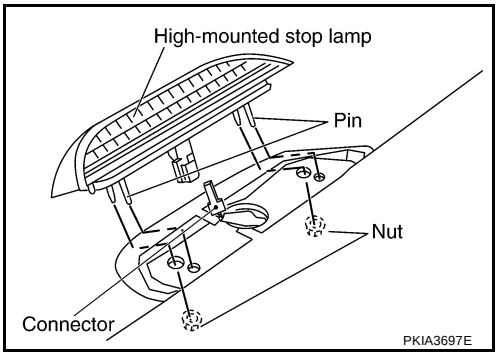
High-mounted stop lamp : LED

High-Mounted Stop Lamp (Roadster Models)

NKS004YU

BULB REPLACEMENT, REMOVAL AND INSTALLATION

1. Turn ignition switch ON, and turn soft-top OPEN/CLOSE switch ON.
2. When the storage lid is fully opened, soft-top OPEN/CLOSE switch to OFF.
3. Remove battery negative cable.
4. Disconnect high-mounted stop lamp connector.
5. Remove high-mounted stop lamp.
6. Remove high-mounted stop lamp assembly from storage lid.
7. Installation is the reverse order of removal.



High-mounted stop lamp : LED

Stop Lamp

NKS004YV

BULB REPLACEMENT

Refer to LT-126, "Bulb Replacement" .

REMOVAL AND INSTALLATION

Refer to LT-127, "Removal and Installation" .

BACK-UP LAMP

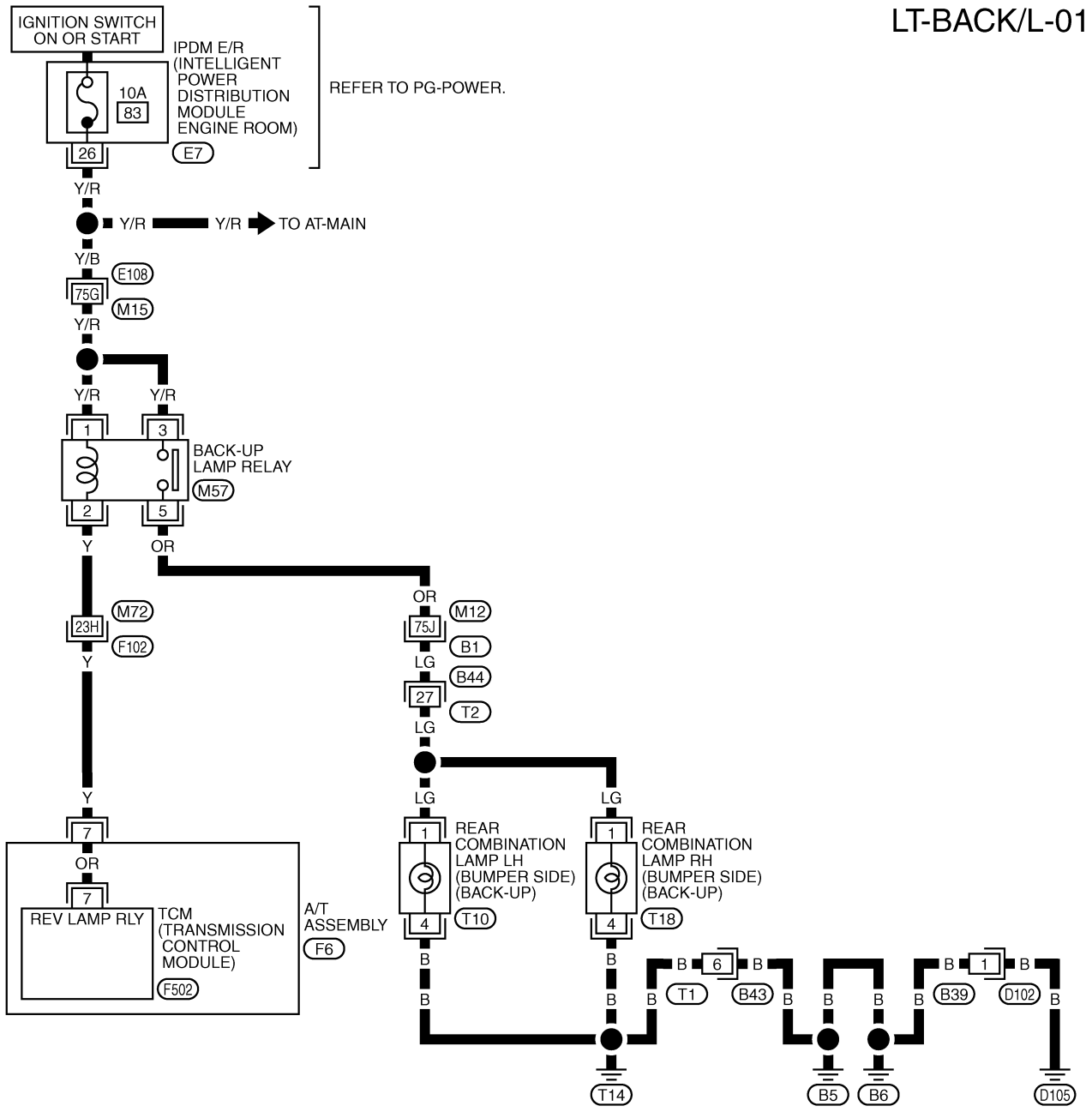
PFP:26550

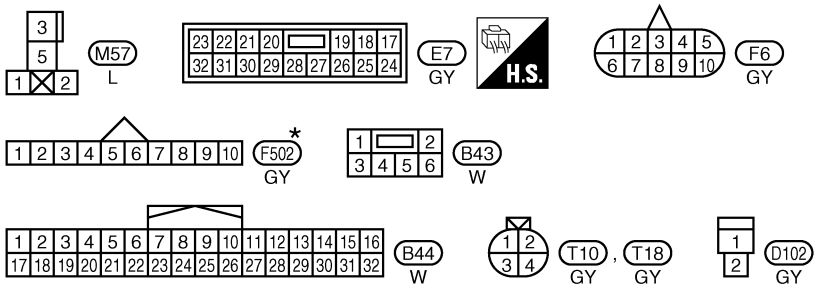
Wiring Diagram — BACK/L —

NKS004YW

COUPE MODELS (A/T)

LT-BACK/L-01





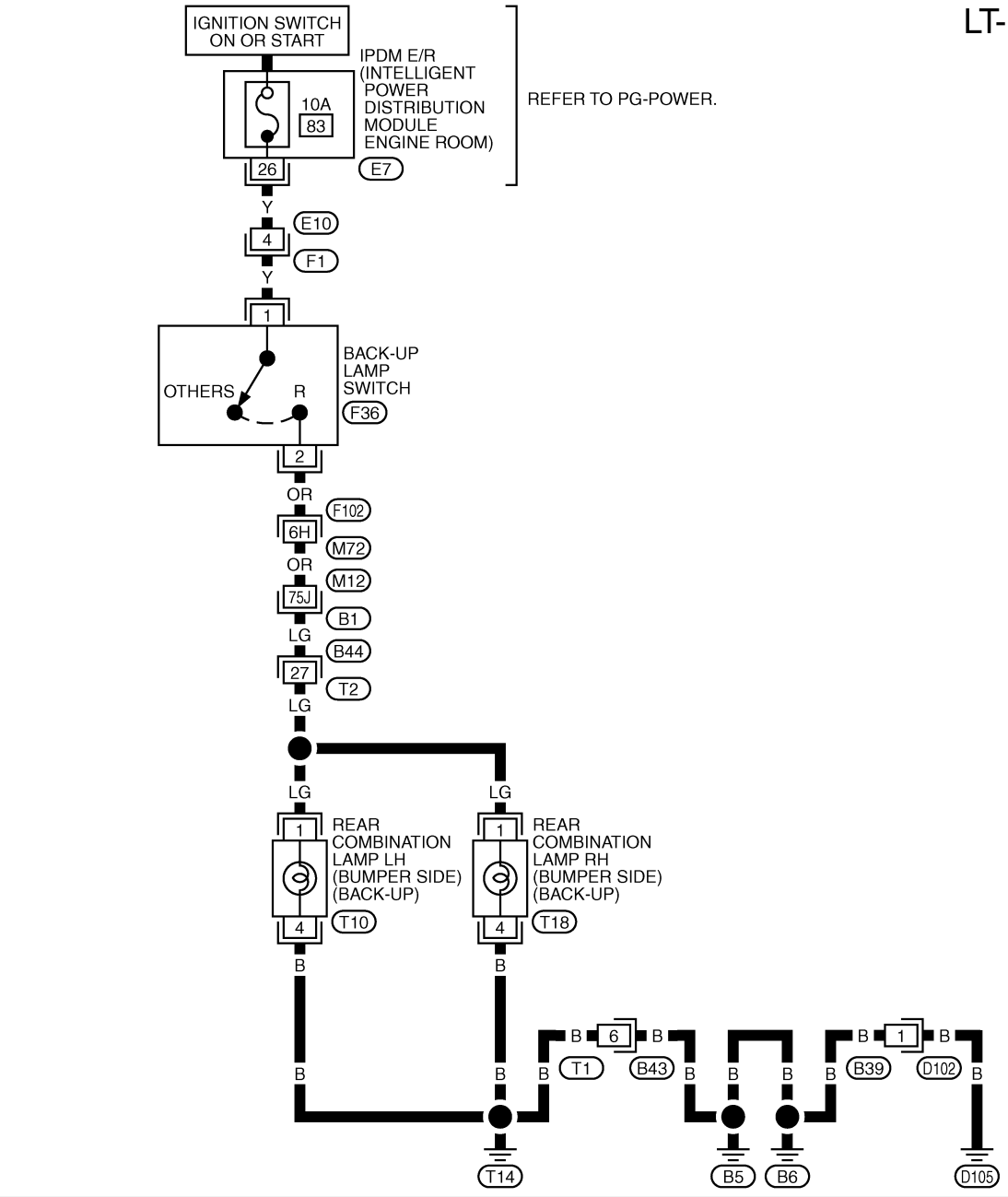
REFER TO THE FOLLOWING.
E108 , F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

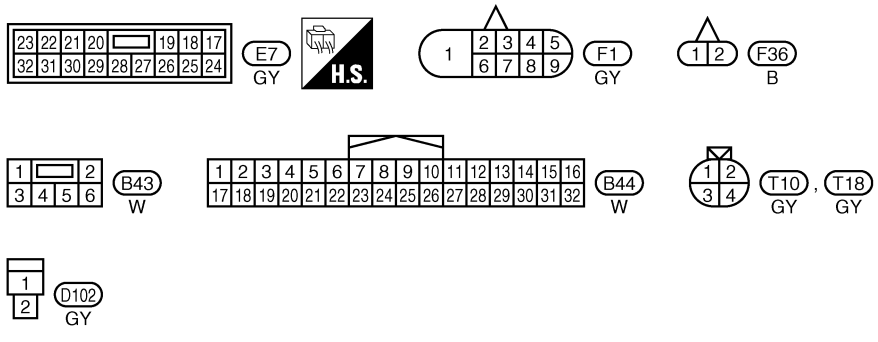
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5756E

COUPE MODELS (M/T)

LT-BACK/L-02



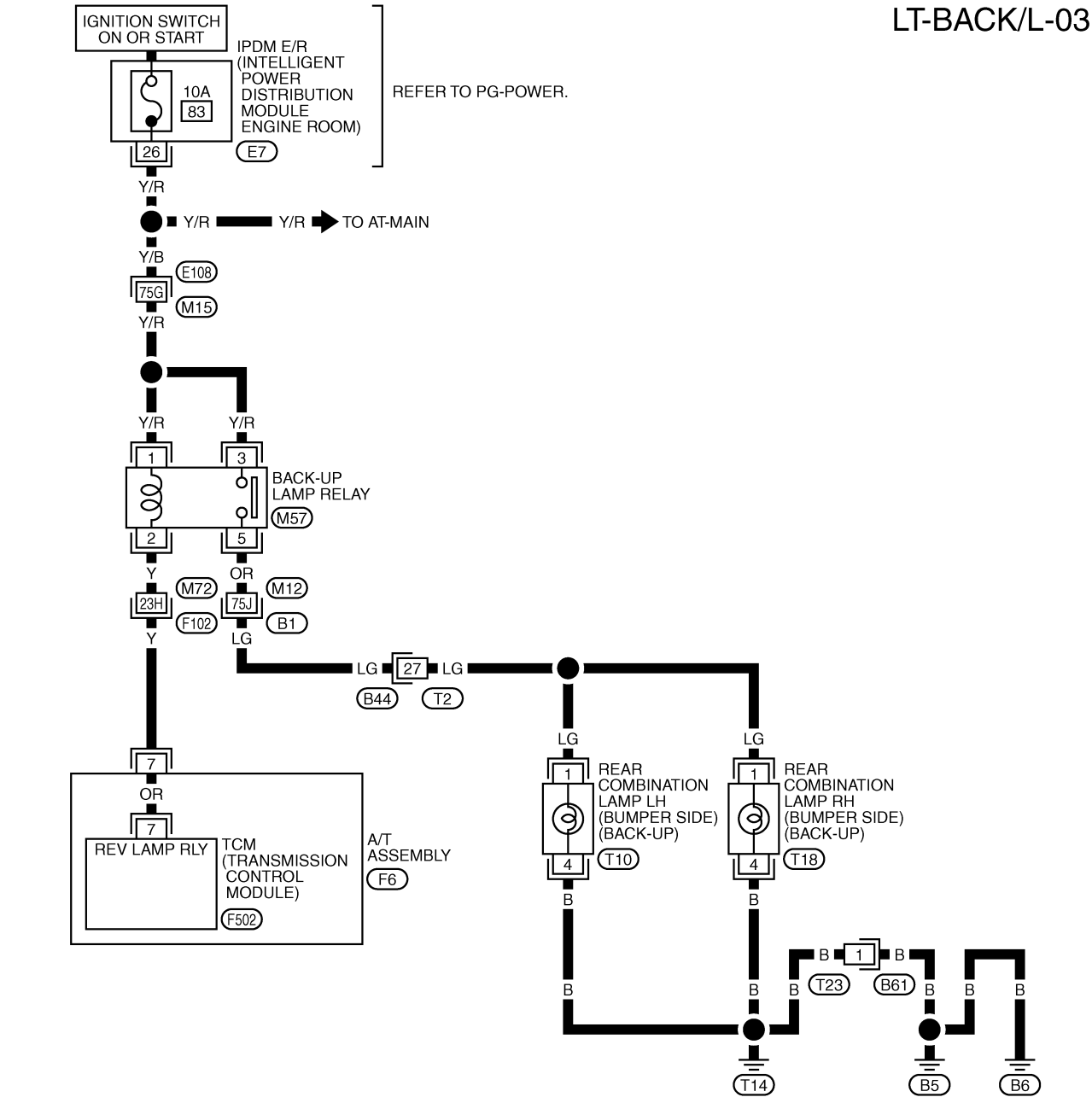


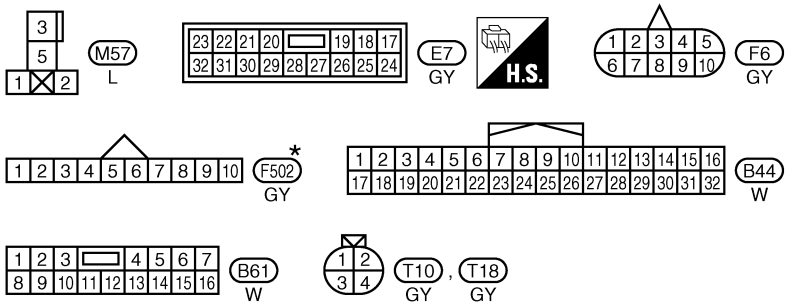
REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5757E

ROADSTER MODELS (A/T)

LT-BACK/L-03





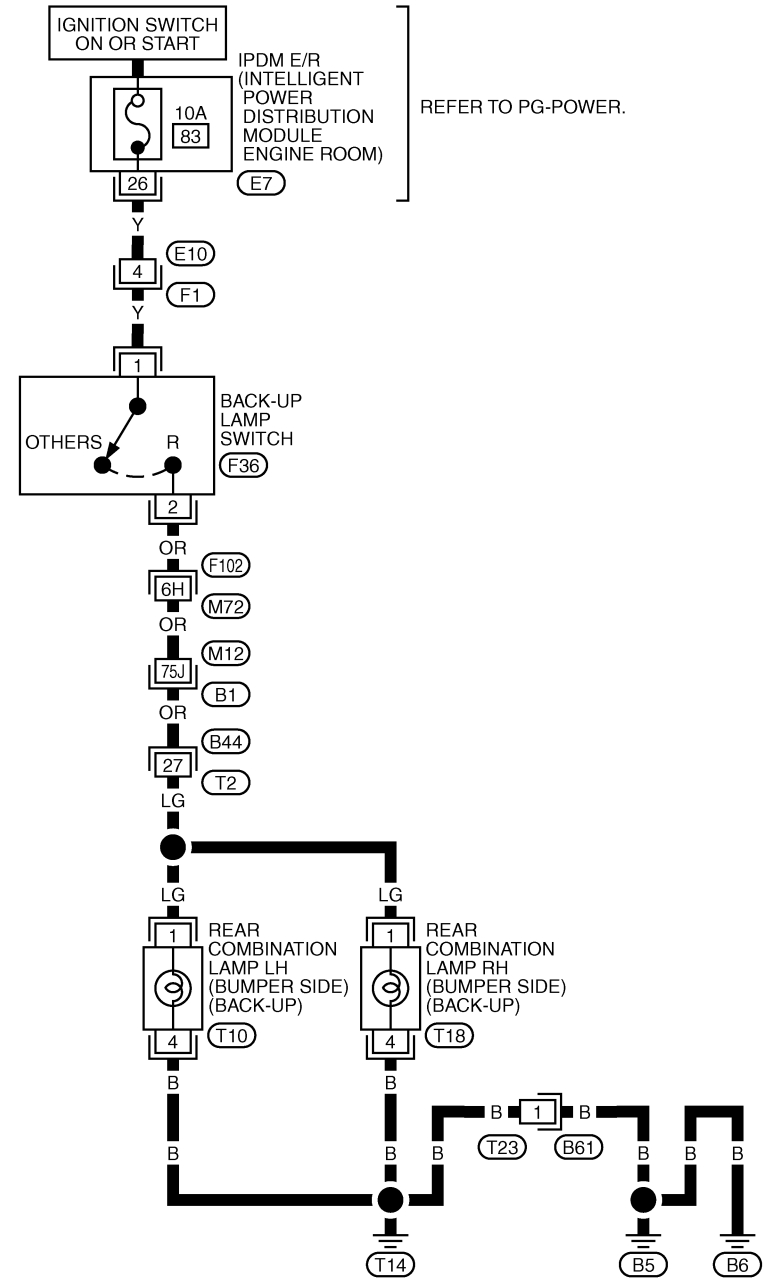
REFER TO THE FOLLOWING.
E108 , F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

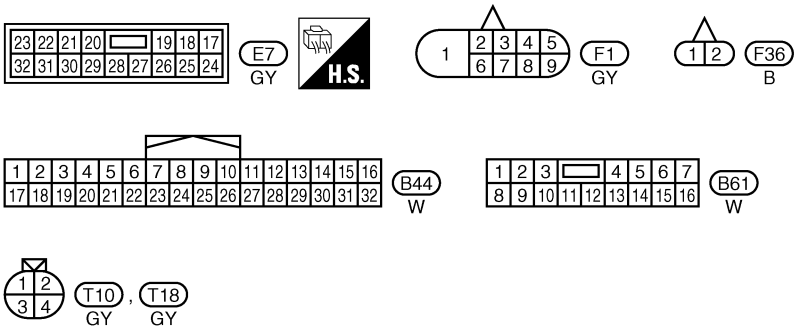
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5758E

ROADSTER MODELS (M/T)

LT-BACK/L-04





REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5759E

Bulb Replacement

NKS004YX

Refer to LT-126, "Bulb Replacement" .

Removal and Installation

NKS004YY

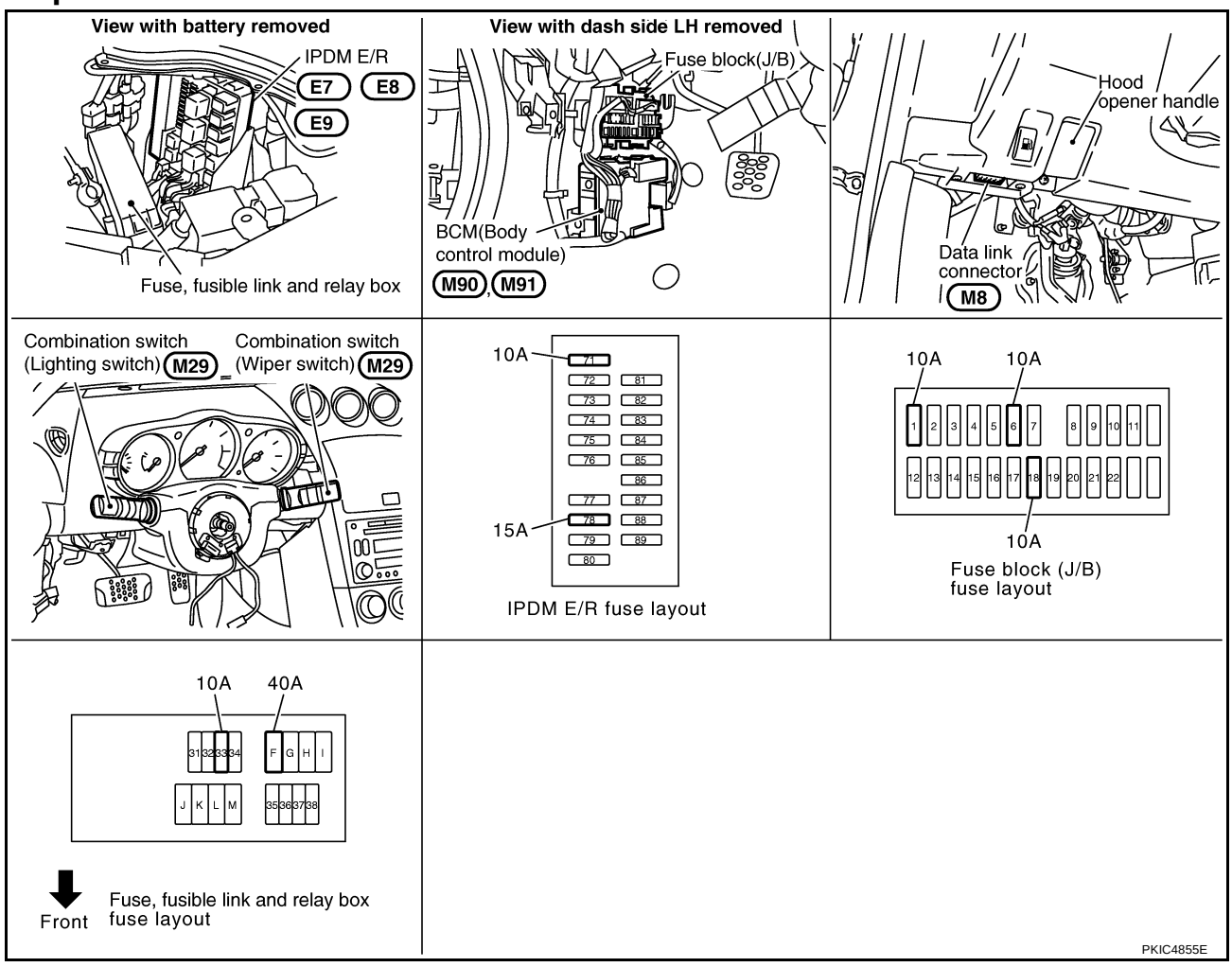
Refer to LT-127, "Removal and Installation" .

PARKING, LICENSE PLATE AND TAIL LAMPS

PFP:26550

Component Parts and Harness Connector Location

NKS004YZ



System Description

NKS004Z0

Control of parking, license plate, side maker and tail lamps operation is dependent upon the position of lighting switch (combination switch). When the lighting switch is in the 1ST position, the BCM (body control module) receives input signal requesting the parking, license plate, side marker and tail lamps to illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) through CAN communication. The CPU (central processing unit) located in the IPDM E/R controls the tail lamp relay coil and daytime light relay* coil. These relay, when energized, directs power to parking, license plate, side marker and tail lamps, which then illuminate.

NOTE:
Daytime light relay*: Canada models

OUTLINE

Power is supplied at all times

- through 10A fuse (No.71, located in IPDM E/R)
- to tail lamp relay, located in IPDM E/R, and
- to CPU located in IPDM E/R,
- through 15A fuse (No.78, located in IPDM E/R)
- to CPU located in IPDM E/R,
- through 40A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in fuse block (J/B)]

- to BCM terminal 42.

With ignition switch in ON or START position, power is supplied

- to CPU located in IPDM E/R,
- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM terminal 38.

With ignition switch in ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

OPERATION BY LIGHTING SWITCH

With the lighting switch in the 1ST or 2ND position, the BCM receives input signal requesting the parking, license plate, side marker and tail lamps to illuminate. This input is communicated to the IPDM E/R through the CAN communication lines. The CPU located in the IPDM E/R controls the tail lamp relay coil and daytime light relay* coil. These relay, when energized, directs power to parking, license plate, side marker and tail lamps, which when energized, directs power

- through IPDM E/R terminal 22 (USA models)
- through daytime light relay terminal 5 (Canada models)
- to front combination lamp LH terminals 6
- to front combination lamp RH terminals 6
- to rear combination lamp LH terminals 2
- to rear combination lamp RH terminals 2
- to license plate lamp LH terminal 2, and
- to license plate lamp RH terminal 2.

Ground is supplied at all times

- to front combination lamp LH terminal 8, and
- to front combination lamp RH terminal 8
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to rear combination lamp LH terminals 3
- to rear combination lamp RH terminals 3
- to license plate lamp LH terminal 1, and
- to license plate lamp RH terminal 1
- through grounds B5, B6, D105 and T14 (Coupe models)
- through grounds B5, B6 and T14 (Roadster models).

With power and ground supplied, parking, license plate side marker and tail lamps illuminate.

NOTE:
Daytime light relay*: Canada models

COMBINATION SWITCH READING FUNCTION

Refer to BCS-3, "COMBINATION SWITCH READING FUNCTION" .

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (ON), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.
Under this condition, the parking, license, side marker and tail lamps remain illuminated for 5 minutes, then the headlamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

CAN Communication System Description

NKS004Z1

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

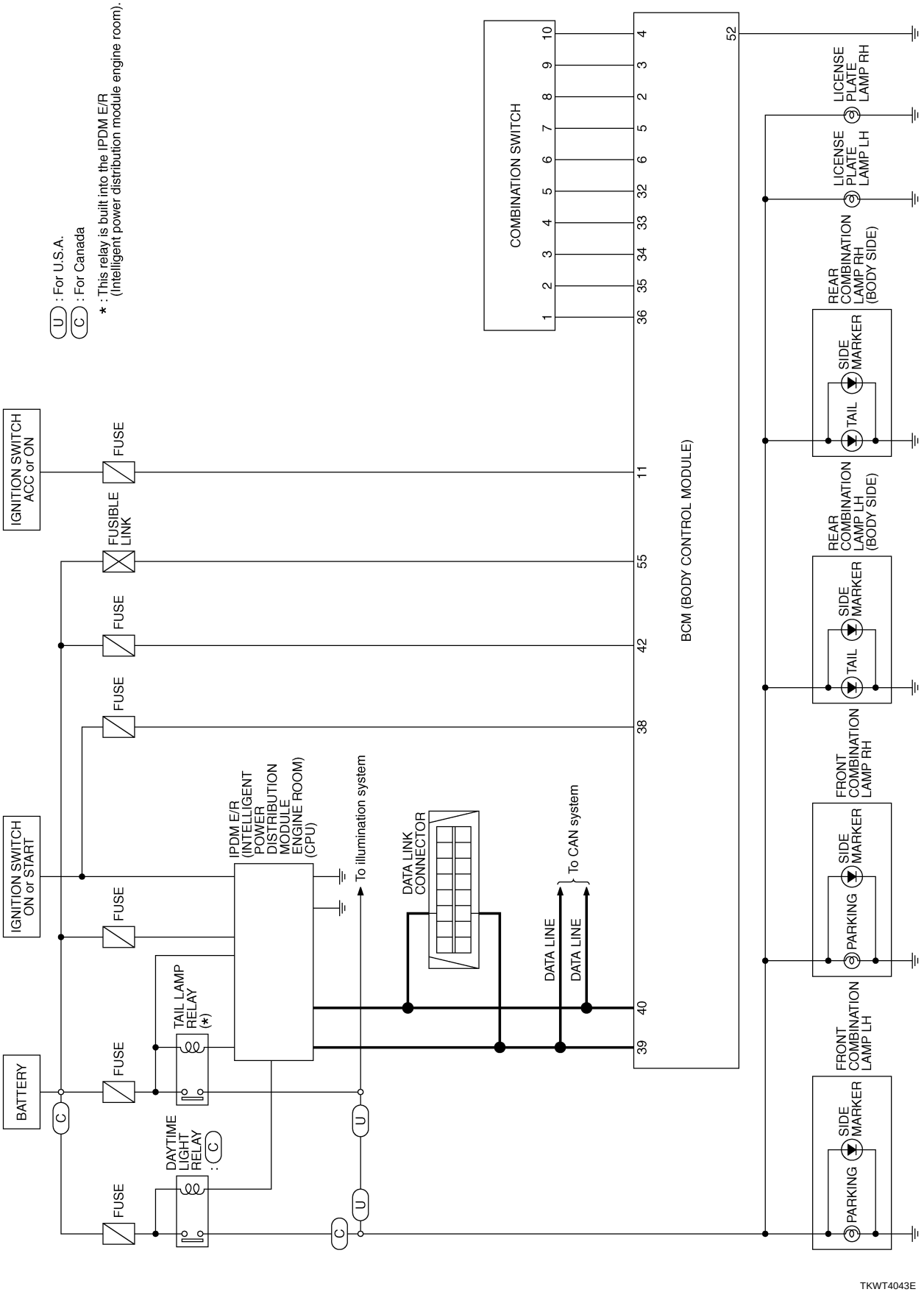
CAN Communication Unit

NKS004Z2

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

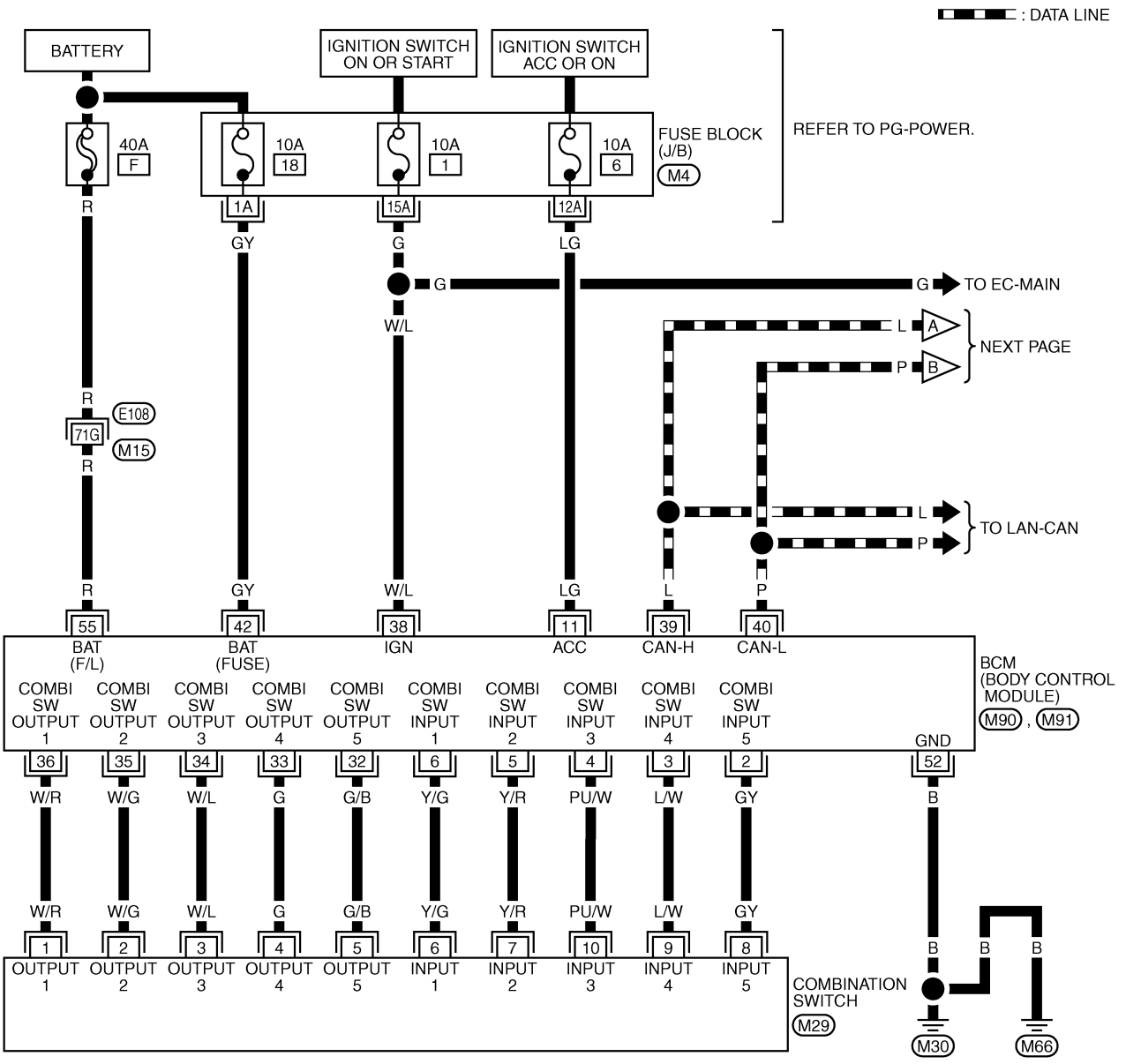
NKS004Z3

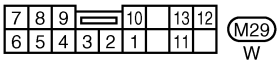


Wiring Diagram — TAIL/L —

NKS004Z4

LT-TAIL/L-01





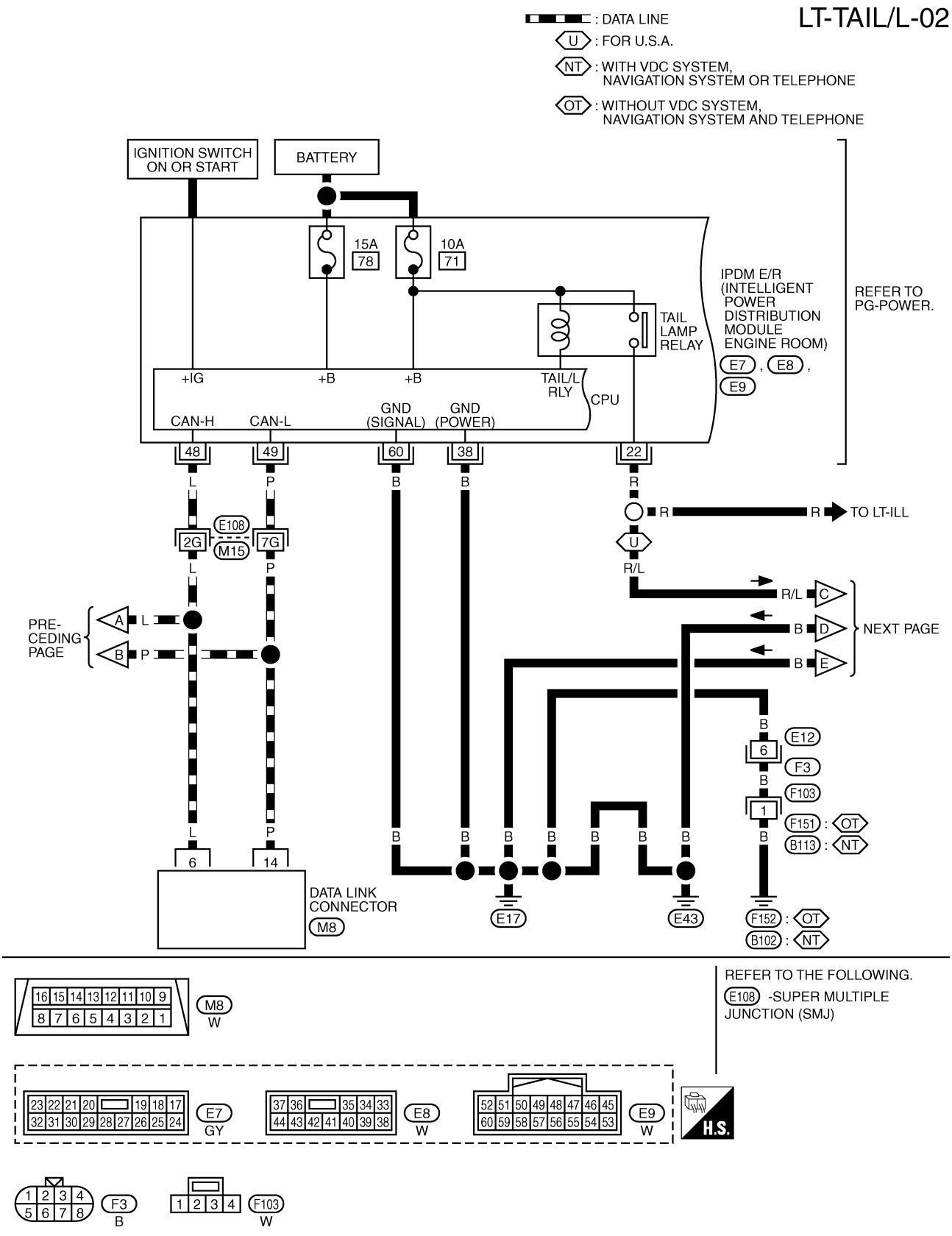
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

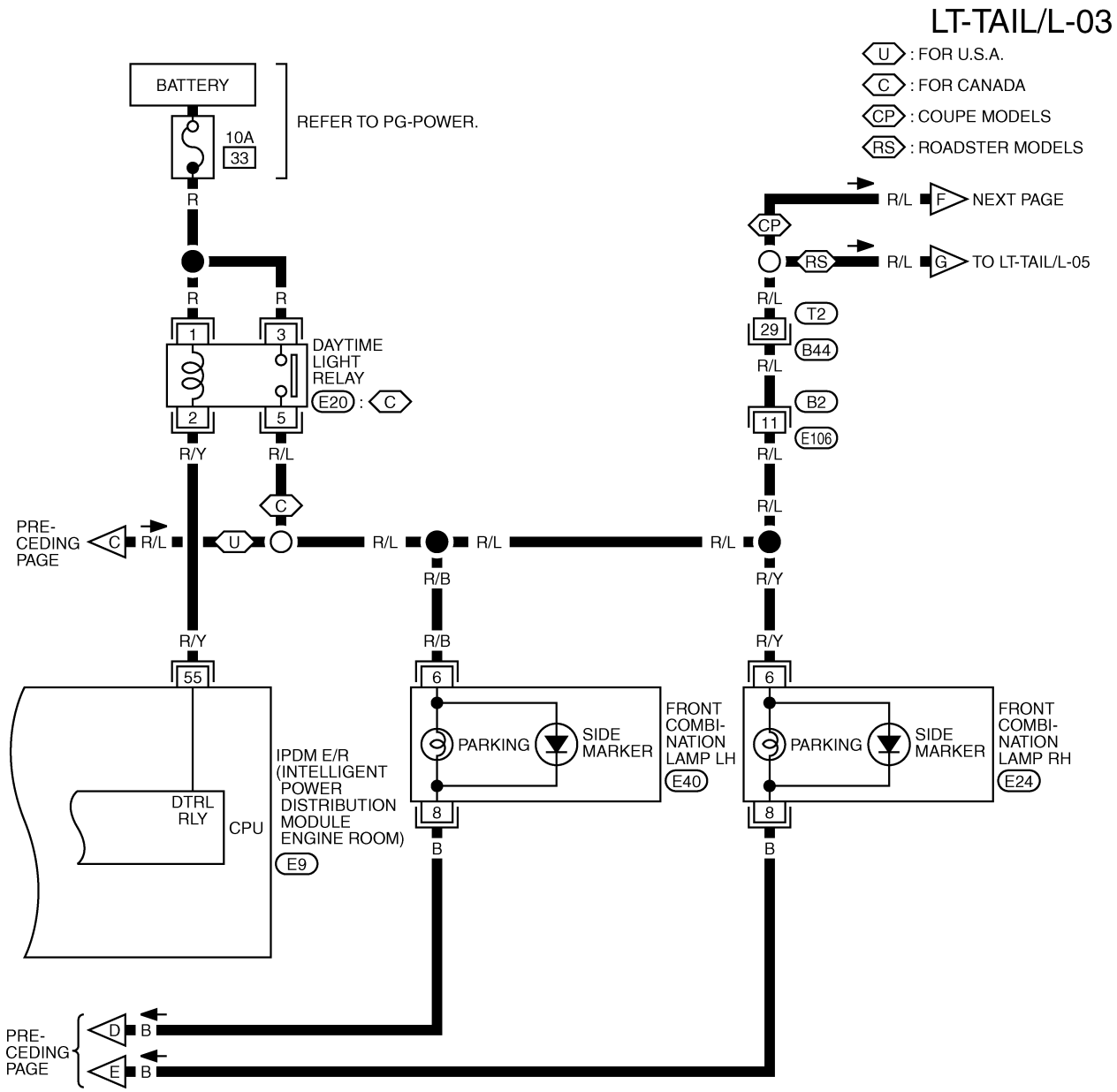
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M90 , M91 -ELECTRICAL UNITS

TKWT5760E


LT-TAIL/L-02
: DATA LINE
U : FOR U.S.A.
NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE
IGNITION SWITCH ON OR START
BATTERY
15A 78
10A 71
TAIL LAMP RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E7, E8, E9
REFER TO PG-POWER.
+IG
+B
+B
TAIL/L RLY
CPU
CAN-H
CAN-L
GND (SIGNAL)
GND (POWER)
48
49
60
38
22
L
P
B
B
R
E108
2G
M15
7G
R
R
TO LT-ILL
U
R/L
R/L C
B D
B E
NEXT PAGE
PRE-CEDING PAGE
A L
B P
B E12
6
F3
B
F103
1
F151 : OT
B113 : NT
6
14
DATA LINK CONNECTOR M8
E17
E43
F152 : OT
B102 : NT
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M8 W
E7 GY
E8 W
E9 W
H.S.
F3 B
F103 W

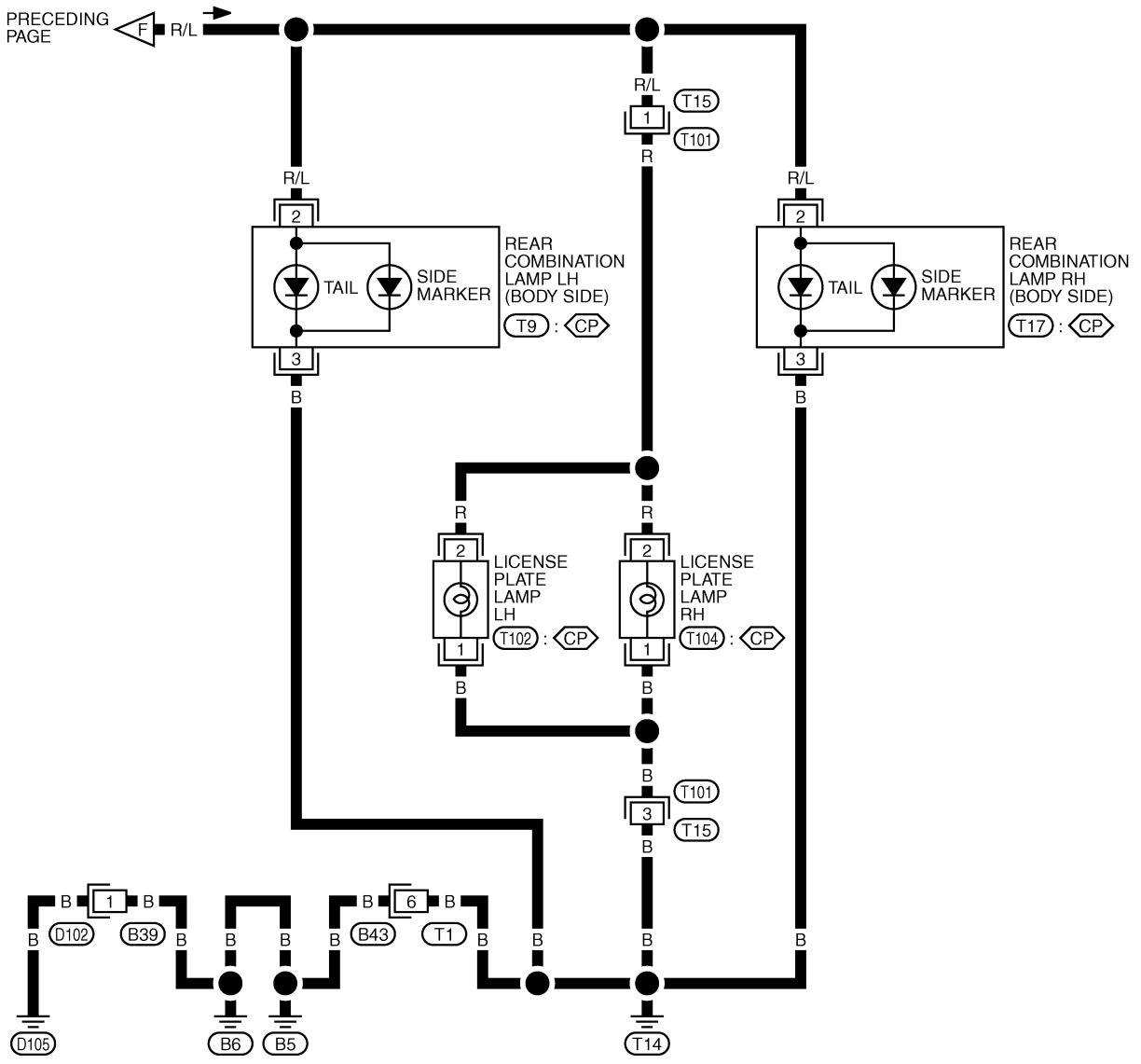
TKWT5761E

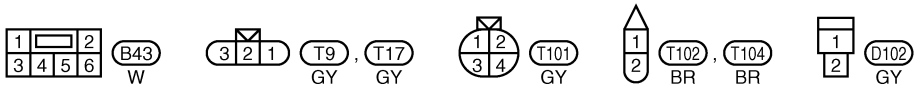

LT-TAIL/L-03
U : FOR U.S.A.
C : FOR CANADA
CP : COUPE MODELS
RS : ROADSTER MODELS
BATTERY
REFER TO PG-POWER.
10A
33
R
R/L
F
NEXT PAGE
CP
RS
R/L
G
TO LT-TAIL/L-05
R
R
R/L
T2
29
B44
R/L
B2
11
E106
R/L
1
3
DAYTIME
LIGHT
RELAY
E20 : C
2
5
R/Y
R/L
C
R/L
PRE-
CEDING
PAGE
C
R/L
U
R/L
R/L
R/L
R/B
R/Y
R/Y
R/B
R/Y
55
6
6
DTRL
RLY
CPU
IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE ROOM)
E9
PARKING
SIDE
MARKER
FRONT
COMBI-
NATION
LAMP LH
E40
PARKING
SIDE
MARKER
FRONT
COMBI-
NATION
LAMP RH
E24
8
8
B
B
PRE-
CEDING
PAGE
D
B
E
B
52 51 50 49 48 47 46 45
60 59 58 57 56 55 54 53
E9
W
H.S.
3
5
1 2
E20
L
1 2 3 4
5 6 7 8
E24 , E40
GY GY
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18
B2
W
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
B44
W

TKWT5762E

LT-TAIL/L-04

CP : COUPE MODELS

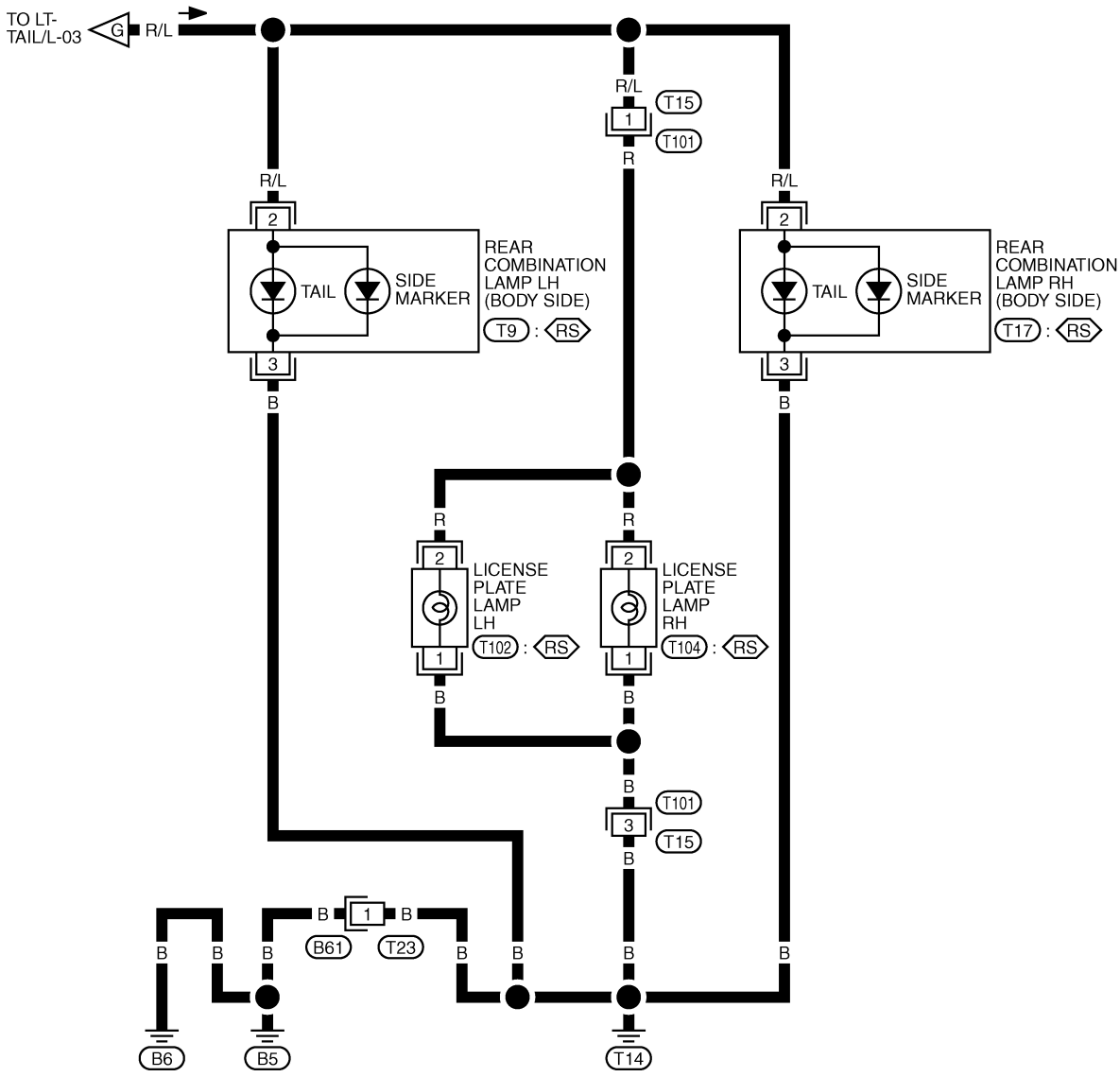


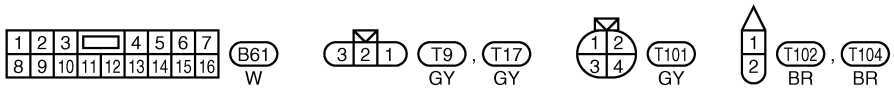


TKWT4047E

LT-TAIL/L-05

RS : ROADSTER MODELS





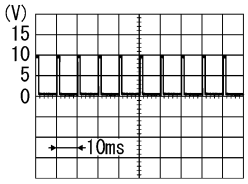
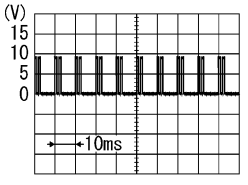
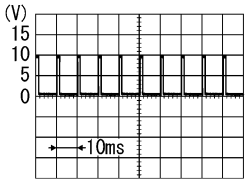
TKWT4048E

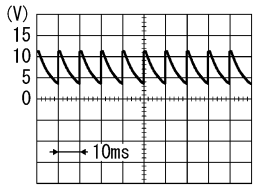
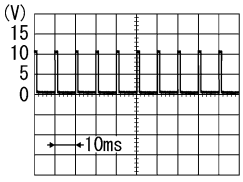
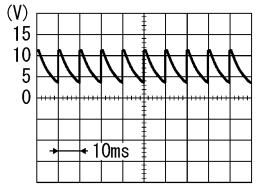
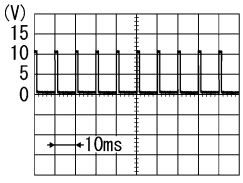
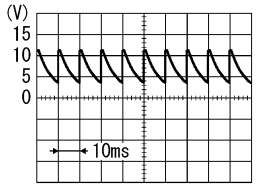
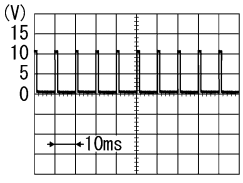
Terminals and Reference Values for BCM

NKS004Z5

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-91, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	GY	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 1ST ● Lighting switch HIGH beam (Operates only HIGH beam switch)	 PKIB4959J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
3	L/W	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4959J Approx. 1.0 V
11	LG	Ignition switch (ACC)	ACC	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Lighting switch 1ST (The same result with lighting switch 2ND)	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch HI beam (Operates only HI beam switch)	 PKIB4958J Approx. 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Lighting switch 2ND ● Lighting switch PASSING (Operates only PASSING switch)	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
39	L	CAN – H	—	—	—
40	P	CAN – L	—	—	—
42	GY	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0 V
55	R	Battery power supply	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

NKS004Z6

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
22	R	Parking, license plate, side marker and tail lamp	ON	Lighting switch 1ST position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
48	L	CAN – H	—	—		—
49	P	CAN – L	—	—		—
60	B	Ground	ON	—		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS004Z7

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-103, "System Description" .
3. Carry out preliminary check. Refer to LT-114, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Do parking, license plate, side marker and tail lamps operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004Z8

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	71

Refer to LT-107, "Wiring Diagram — TAIL/L —" .

OK or NG

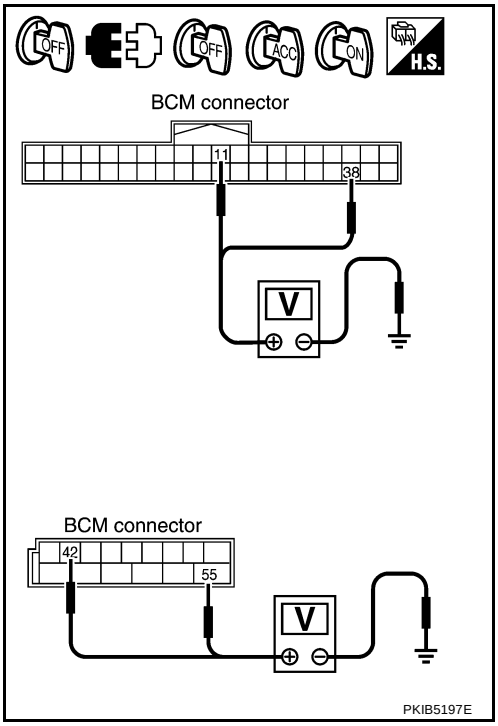
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector terminals and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
BCM connector	Terminal				
M90	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage



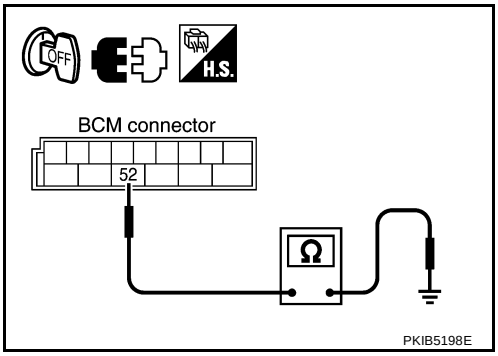
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector terminal and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Function (BCM)

NKS004Z9

Refer to LT-17, "CONSULT-III Function (BCM)" in HEADLAMP (FOR USA).
Refer to LT-49, "CONSULT-III Function (BCM)" in HEADLAMP (FOR CANADA).

CONSULT-III Function (IPDM E/R)

NKS004ZA

Refer to LT-18, "CONSULT-III Function (IPDM E/R)" in HEADLAMP (FOR USA).
Refer to LT-50, "CONSULT-III Function (IPDM E/R)" in HEADLAMP (FOR CANADA).

Parking, License Plate, Side Marker and Tail Lamps Do Not Illuminate (for USA)

NKS004ZB

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "LIGHT SW 1ST" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : LIGHT SW 1ST ON

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "TAIL LAMP" of IPDM E/R active test item.
2. With operating the test item, check the parking, license plate, side marker and tail lamps operation.

Parking, license plate, side marker and tail lamps should operate.

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. Check that the parking, license plate, side marker and tail lamps operation.

Parking, license plate, side marker and tail lamps should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select "TAIL&CLR REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : TAIL&CLR REQ ON

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK IPDM E/R

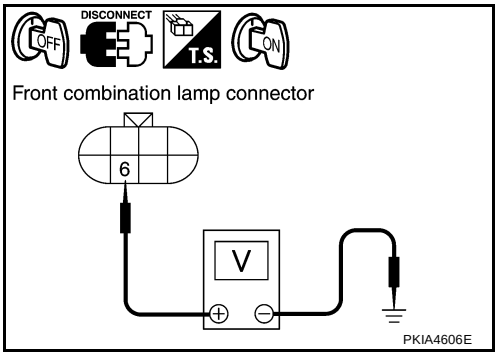
CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connectors.
3. Select "TAIL LAMP" of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

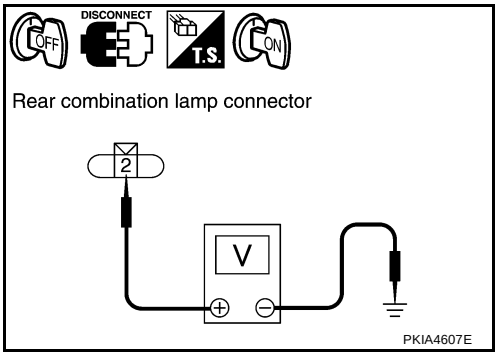
IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

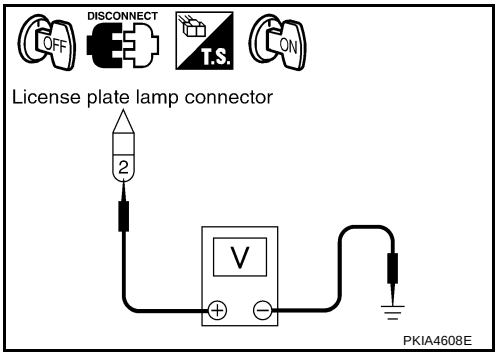
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	6	Ground	Battery voltage
LH	E40			



Terminals				Voltage (Approx.)
(+)			(-)	
Rear combination lamp connector		Terminal		
RH	T17	2	Ground	Battery voltage
LH	T9			



Terminals				Voltage (Approx.)
(+)			(-)	
License plate lamp connector		Terminal		
RH	T104	2	Ground	Battery voltage
LH	T102			



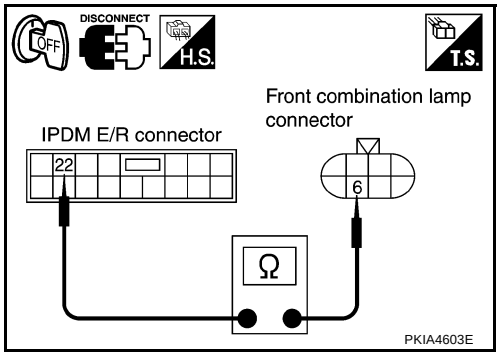
OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

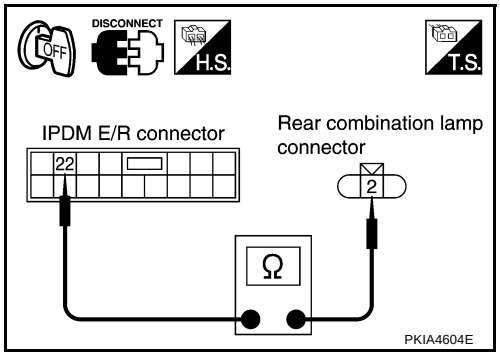
5. CHECK CIRCUIT BETWEEN IPDM E/R AND PARKING, LICENSE PLATE, SIDE MARKER AND TAIL LAMPS

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp, rear combination lamp and license plate lamp harness connector.

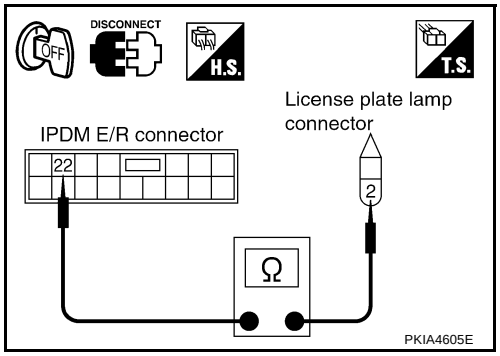
Terminals					Continuity
IPDM E/R		Front combination lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	E24	6	Yes
		LH	E40	6	



Terminals					Continuity
IPDM E/R		Rear combination lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	T17	2	Yes
		LH	T9	2	



Terminals					Continuity
IPDM E/R		Licence plat lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	T104	2	Yes
		LH	T102	2	



OK or NG

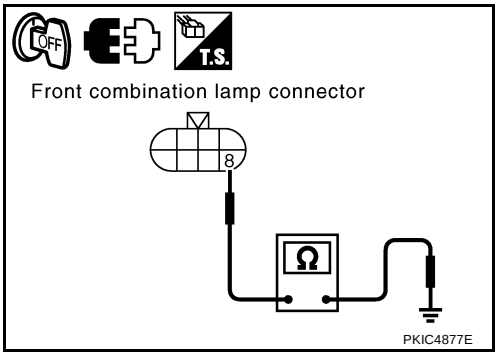
OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

NG >> Repair harness or connector.

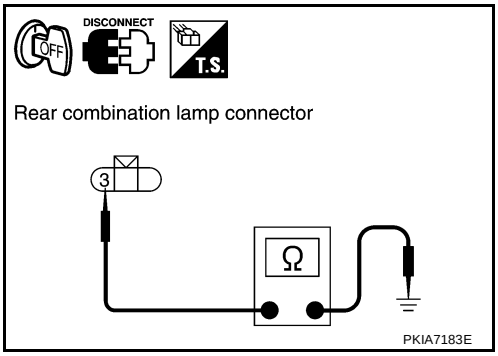
6. CHECK GROUND

1. Check continuity between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

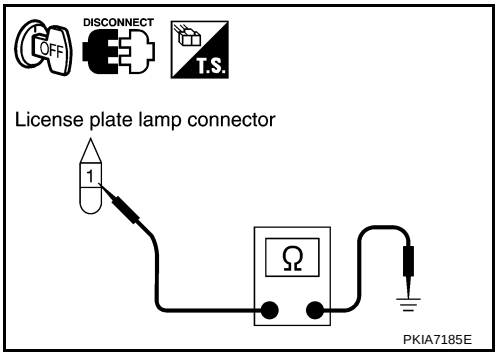
Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	8		Yes
LH	E40			



Rear combination lamp connector		Terminal	Ground	Continuity
RH	T17	3		Yes
LH	T9			



License plate lamp connector		Terminal	Ground	Continuity
RH	T104	1		Yes
LH	T102			



OK or NG

OK >> Check bulb.
NG >> Repair harness or connector.

Parking, License Plate, Side Marker, and Tail Lamps Do Not Illuminate (for Canada)

NKS004ZC

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select "LIGHT SW 1ST" of BCM data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : LIGHT SW 1ST ON

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-92, "Combination Switch Inspection" .

2. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "TAIL LAMP" of IPDM E/R active test item.
2. With operating the test item, check the parking, license plate, side marker and tail lamps operation.

Parking, license plate, side marker and tail lamps should operate.

IPDM E/R AUTO ACTIVE TEST

1. Start auto active test. Refer to PG-20, "Auto Active Test" .
2. With operating the test item, check the parking, license plate, side marker and tail lamps operation.

Parking, license plate, side marker and tail lamps should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

1. Select "TAIL&CLR REQ" of IPDM E/R data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : TAIL&CLR REQ ON

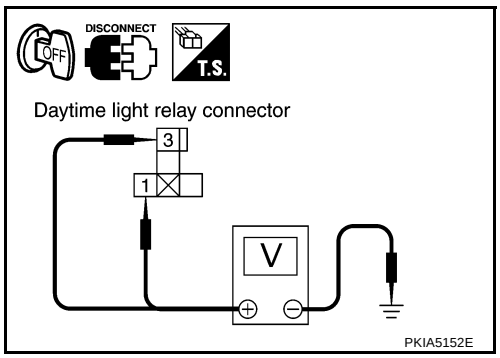
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

4. CHECK POWER SUPPLY CIRCUIT TO DAYTIME LIGHT RELAY

1. Turn ignition OFF.
2. Disconnect daytime light relay.
3. Check voltage between daytime light relay harness connector and ground.

Terminal			
(+)		(–)	voltage (Approx.)
Daytime light relay connector	Terminal		
E20	1	Ground	Battery voltage
	3		



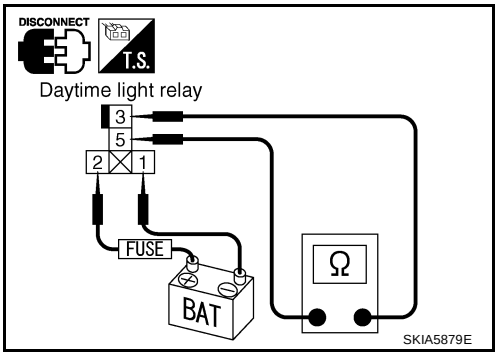
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK DAYTIME LIGHT RELAY

Apply battery voltage to between daytime light relay E20 terminal 1, 2 and check continuity between terminal 3 and 5.

3 – 5 : Continuity should exist.



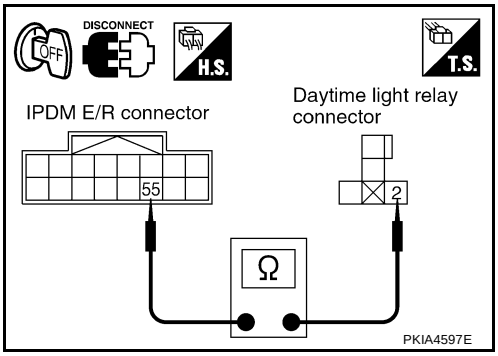
OK or NG

OK >> GO TO 6.
NG >> Replace daytime light relay.

6. CHECK DAYTIME LIGHT RELAY CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector and daytime light relay harness connector.

Terminals				Continuity
IPDM E/R		Daytime light relay		
Connector	Terminal	Connector	Terminal	
E9	55	E20	2	Yes



OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK IPDM E/R

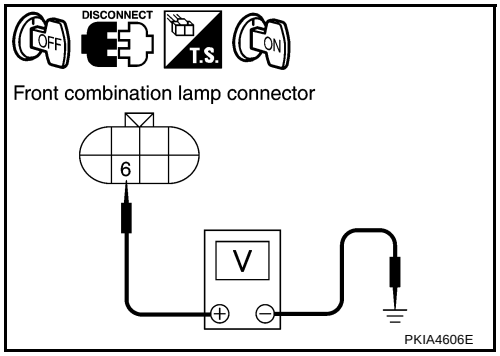
CONSULT-III ACTIVE TEST

1. Connect daytime light relay and IPDM E/R connector.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connectors.
3. Select "TAIL LAMP" of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

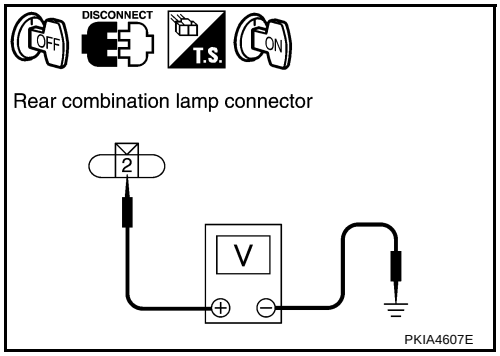
IPDM E/R AUTO ACTIVE TEST

1. Connect daytime light relay and IPDM E/R connector.
2. Disconnect front combination lamp, rear combination lamp and license plate lamp connector.
3. Start auto active test. Refer to PG-20, "Auto Active Test" .
4. With operating the test item, check voltage between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

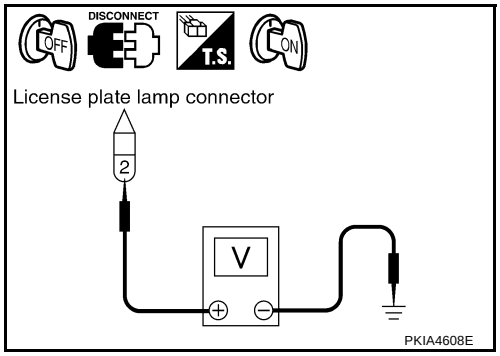
Terminals				Voltage (Approx.)
(+)			(-)	
Front combination lamp connector		Terminal		
RH	E24	6	Ground	Battery voltage
LH	E40			



Terminals				Voltage (Approx.)
(+)			(-)	
Rear combination lamp connector		Terminal		
RH	T17	2	Ground	Battery voltage
LH	T9			



Terminals				Voltage (Approx.)
(+)			(-)	
License plate lamp connector		Terminal		
RH	T104	2	Ground	Battery voltage
LH	T102			



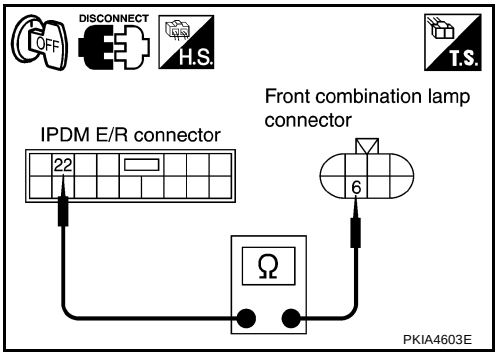
OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

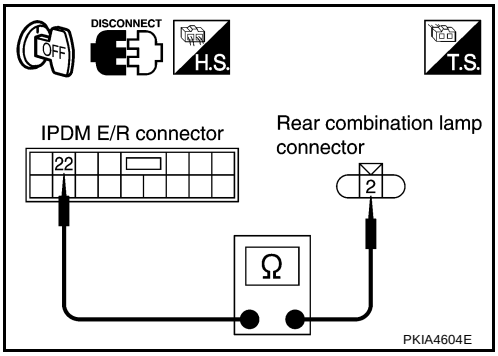
8. CHECK CIRCUIT BETWEEN IPDM E/R AND PARKING, LICENSE PLATE, SIDE MARKER AND TAIL LAMPS

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front combination lamp, rear combination lamp and license plate lamp harness connector.

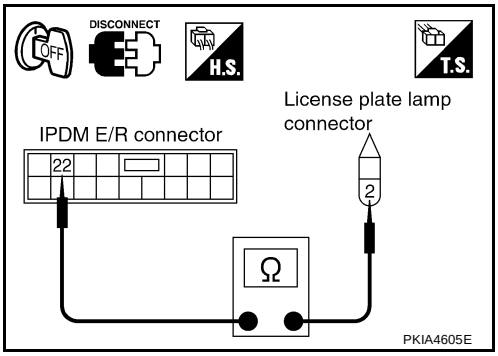
Terminals					Continuity
IPDM E/R		Front combination lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	E24	6	Yes
		LH	E40	6	



Terminals					Continuity
IPDM E/R		Rear combination lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	T17	2	Yes
		LH	T9	2	



Terminals					Continuity
IPDM E/R		Licence plat lamp			
Connector	Terminal	Connector		Terminal	
E7	22	RH	T104	2	Yes
		LH	T102	2	



OK or NG

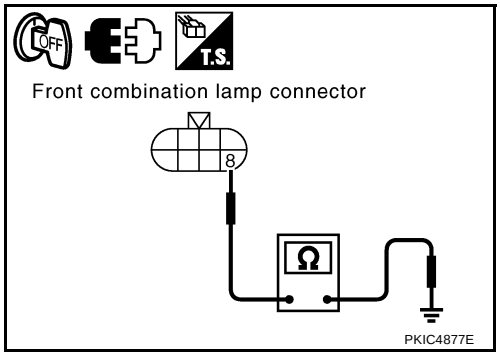
OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

NG >> Repair harness or connector.

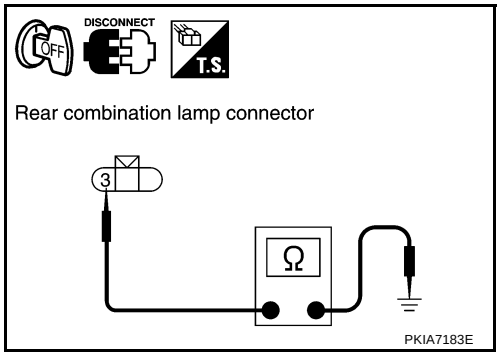
9. CHECK GROUND

1. Check continuity between front combination lamp, rear combination lamp and license plate lamp harness connector and ground.

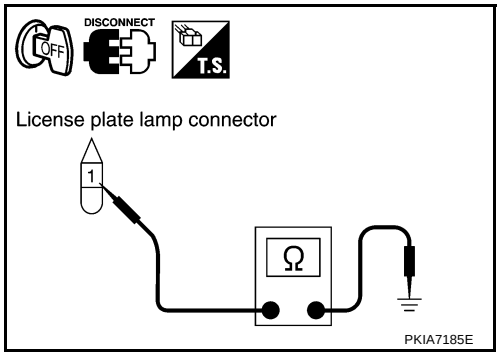
Front combination lamp connector		Terminal	Ground	Continuity
RH	E24	8		Yes
LH	E40			



Rear combination lamp connector		Terminal	Ground	Continuity
RH	T17	3		Yes
LH	T9			



License plate lamp connector		Terminal	Ground	Continuity
RH	T104	1		Yes
LH	T102			



OK or NG

OK >> Check bulb.
NG >> Repair harness or connector.

Parking, Side Marker, License Plate and Tail Lamps Do Not Turn OFF (After Approx. 10 Minutes)

NKS004ZD

1. CHECK IPDM E/R

1. Turn ignition switch ON. Place combination switch (lighting switch) in the ON position. Turn ignition switch OFF.
2. Make sure parking, license plate, and tail lamps turn OFF after approximately 10 minutes.

OK or NG

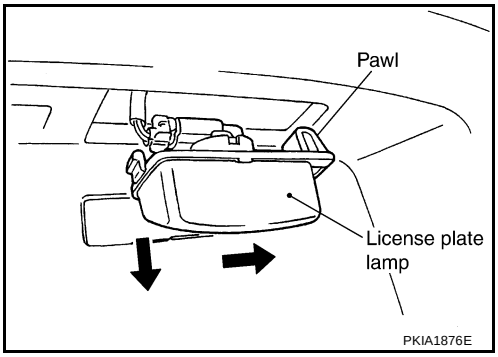
OK >> INSPECTION END.
NG >> Ignition relay malfunction. Refer to PG-17, "Function of Detecting Ignition Relay Malfunction" .

License Plate Lamp

NKS004ZE

BULB REPLACEMENT, REMOVAL AND INSTALLATION

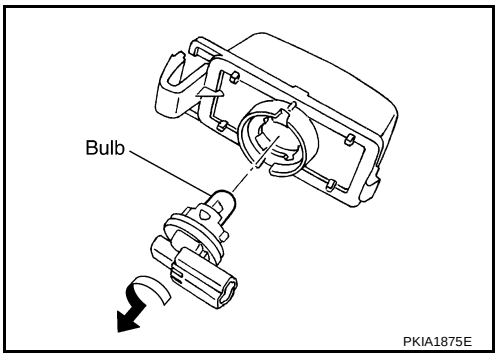
1. While pressing license plate lamp to rightward, pull left side of it and remove.
2. Disconnect license plate lamp connector.



3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from it's socket.

License plate lamp : 12V - 5W

5. Installation is the reverse order of removal.



Front Parking Lamp

NKS004ZF

BULB REPLACEMENT

Refer to LT-28, "Bulb Replacement" .

REMOVAL AND INSTALLATION

Refer to LT-29, "Removal and Installation" .

Tail Lamp

NKS004ZG

BULB REPLACEMENT

Refer to LT-126, "Bulb Replacement" .

REMOVAL AND INSTALLATION

Refer to LT-127, "Removal and Installation" .

REAR COMBINATION LAMP

PFP:26554

Bulb Replacement

NKS004ZH

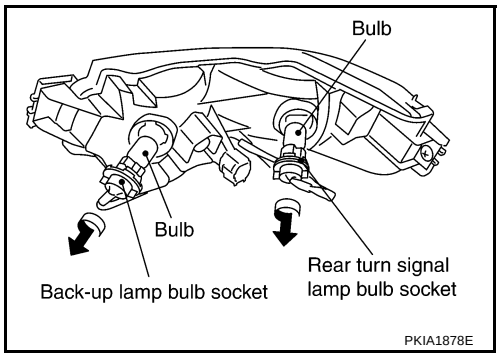
REAR FENDER SIDE (STOP & TAIL LAMP, REAR SIDE MARKER LAMP)

1. Remove rear combination lamp. Refer to LT-127, "Removal and Installation" .
2. Replacement integral with rear combination lamp (rear fender side).

Stop/tail lamp	**: LED**
Rear side marker lamp	**: LED**

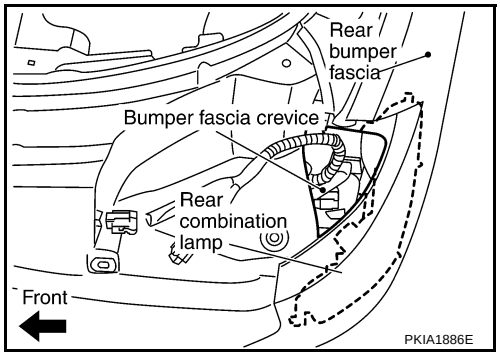
REAR BUMPER SIDE (BACK-UP LAMP BULB, REAR TURN SIGNAL LAMP BULB)

1. Remove rear combination lamp. Refer to LT-127, "Removal and Installation"
2. Turn bulb socket counterclockwise and unlock it through bumper fascia crevice.



3. Remove bulb.
4. Installation is the reverse order of removal.

Rear turn signal lamp (rear bumper side)	**: 12 V - 21 W (amber)**
Back-up lamp (rear bumper side)	**: 12 V - 21 W**



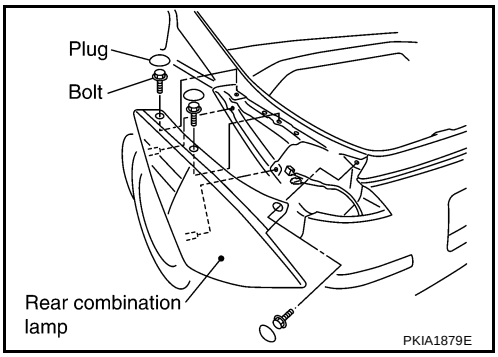
Removal and Installation

NKS004ZI

REMOVAL

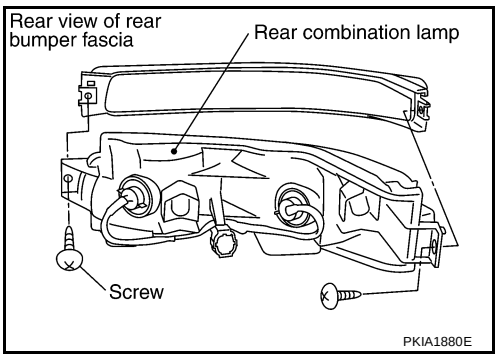
Rear Fender Side

1. Remove plugs and remove rear combination lamp mounting bolts.
2. Pull rear combination lamp toward side of the vehicle and remove from the vehicle.
3. Disconnect rear combination lamp connector.



Rear Bumper Side

1. Remove rear bumper fascia. Refer to EI-17, "REAR BUMPER" .
2. Disconnect rear combination lamp connector.
3. Remove rear combination lamp mounting screws.
4. Remove rear combination lamp from rear bumper fascia.



INSTALLATION

Installation is the reverse order of removal. Be careful of the following:

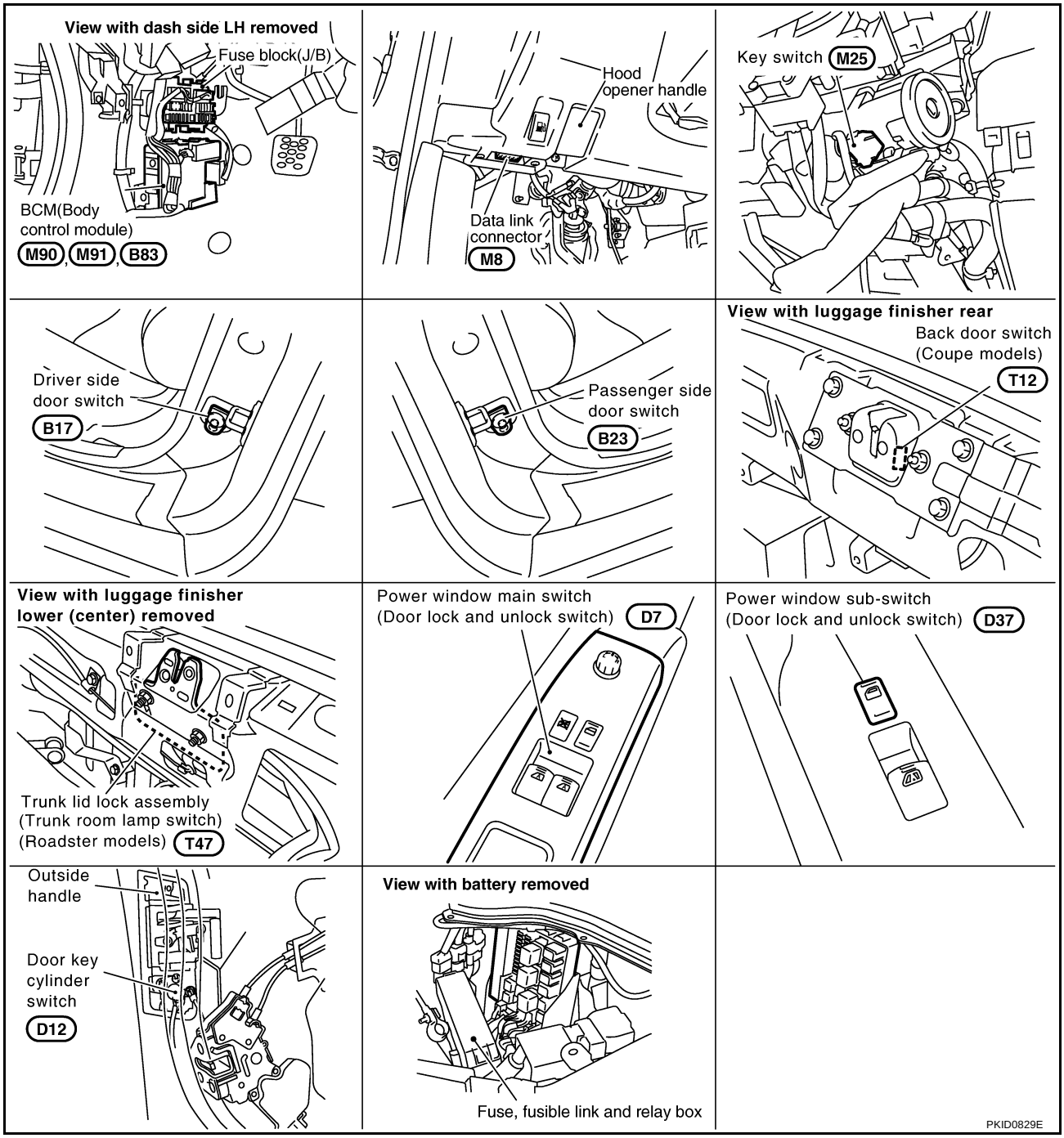
Rear combination lamp (Rear fender side) mounting bolt : 5.5 N·m (0.56 kg-m, 49 in-lb)

INTERIOR ROOM LAMP

PFP:26410

Component Parts and Harness Connector Location

NKS004ZJ



System Description

NKS004ZK

When the map lamp switch is in the DOOR position, map lamp ON/OFF is controlled by timer according to signals from switches including key switch, door switch driver side and assist side, unlock and lock signal from key fob, door lock and unlock switch, key cylinder lock and unlock switch, ignition switch.
When the map lamp turns ON, there is a gradual brightening over 1 second. When map lamp turns OFF, there is a gradual dimming over 1 second.
Map lamp timer is controlled by BCM (body control module).
Map lamp timer control settings can be changed with CONSULT-III.
Ignition key hole illumination turns ON at time when driver door is opened (door switch ON) or removed key fob from key cylinder. Illumination turns OFF when driver door is closed (door switch OFF).

POWER SUPPLY AND GROUND

Power is supplied at all times

- through 10A fuse [No.21, located in fuse block (J/B)]
- to key switch terminal 2,
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM terminal 42,
- through 40A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55.

When key is removed from ignition key cylinder, power is interrupted

- through key switch terminal 1
- to BCM terminal 37.

With ignition switch in ON or START position, power is supplied

- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM terminal 38.

When map lamp and vanity mirror lamp power is supplied at times

- through BCM terminal 41
- to ignition key hole illumination terminal1
- to map lamp terminal 3 (Coupe models)
- to map lamp terminal 2 (Roadster models)
- to luggage room lamp terminal 1 (Coupe models)
- to trunk room lamp terminal 1 (Roadster models) and
- to vanity mirror lamp LH and RH terminals 1.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66.

When driver side door is opened, ground is supplied

- through case ground of driver side door switch
- to BCM terminal 62.

When passenger side door is opened, ground is supplied

- through case ground of passenger side door switch
- to BCM terminal 12.

When back door is opened, ground is supplied (Coupe models)

- through grounds B5, B6, D105 and T14
- to back door switch terminal 3
- through back door switch terminal 1
- to BCM terminal 58.

When trunk lid is opened, ground is supplied (Roadster models)

- through grounds B5, B6 and T14
- to trunk lid lock assembly (trunk room lamp switch) terminal 1
- through trunk lid lock assembly (trunk room lamp switch) terminal 3
- to BCM terminal 57.

When the driver side door or passenger side door is unlocked by door lock and unlock switch, The BCM receives unlock signal with power window serial link

- through grounds M30 and M66
- to power window main switch (door lock and unlock switch) terminal 15 or power window sub switch (door lock and unlock switch) terminal 11
- through power window main switch (door lock and unlock switch) terminal 12 and power window sub switch (door lock and unlock switch) terminal 16
- to BCM terminal 22.

When the driver side door is unlocked by door key cylinder switch, The BCM receives information by communicating with power window main switch

- through grounds M30 and M66
- to door key cylinder switch terminal 2
- through door key cylinder switch terminal 1
- to power window main (door lock and unlock switch) switch terminal 7
- through power window main switch (door lock and unlock switch) terminal 12
- to BCM terminal 22.

When a signal, or combination of signals is received by BCM, ground is supplied

- through BCM terminal 48
- to map lamp terminal 2 (Coupe models)
- to map lamp terminal 3 (Roadster models).

With power and ground are supplied, map lamp illuminates.

SWITCH OPERATION

When map lamp switch is ON, ground is supplied

- to map lamp terminal 1 (Coupe models)
- to map lamp terminal 1 (Roadster models)
- through grounds M30 and M66.

And power is supplied

- through BCM terminal 41
- to ignition key hole illumination terminal 1
- to map lamp terminal 3 (Coupe models)
- to map lamp terminal 2 (Roadster models).

When vanity mirror lamp LH and RH is ON, ground is supplied

- to vanity mirror lamp LH and RH terminals 2
- through grounds M30 and M66.

And power is supplied

- through BCM terminal 41
- to vanity mirror lamp terminal 1.

MAP LAMP TIMER OPERATION

When the map lamp switch is in the DOOR position, and when all conditions below are met, BCM performs timer control (maximum 30 seconds) for map lamp ON/OFF.
In addition, when map lamp turns ON or OFF there is gradual brightening or dimming over 1 second.
Power is supplied at all times

- to 10A fuse [No. 21 located in fuse block (J/B)]
- through key switch terminal 2.

When all doors are closed (all door switches OFF) and key is removed from key cylinder (key switch OFF), power will not be supplied to BCM terminal 37.
Ground is supplied

- through BCM terminal 22
- to power window main switch (door lock and unlock switch) terminal 12.

At this time, BCM detects that driver door is unlocked. It determines that map lamp timer operation conditions are met, and turns map lamp ON for 30 seconds.
When all doors are closed (all door switches OFF) and key is in key cylinder (key switch ON),
Power is supplied

- through key switch terminal 1
- to BCM terminal 37.

When the key is removed from key switch (key switch OFF), power supply to BCM terminal 37 is terminated. BCM detects that key has been removed. It determines that map lamp timer conditions are met, and turns map lamp ON for 30 seconds.

When driver door opens → closes, and key is not inserted in key switch (key switch OFF), BCM terminal 62 changes between 0V (door open) → 5V (door closed). BCM determines that conditions for spot lamp operation are met and turns interior lamp ON for 30 seconds.
Timer control is canceled under the following conditions.

- Driver door is locked (When locked key fob or power window main switch (door lock and unlock switch, door key cylinder switch).
- Driver door is opened (driver door switch turns ON).
- Ignition switch ON.

INTERIOR LAMP BATTERY SAVER CONTROL

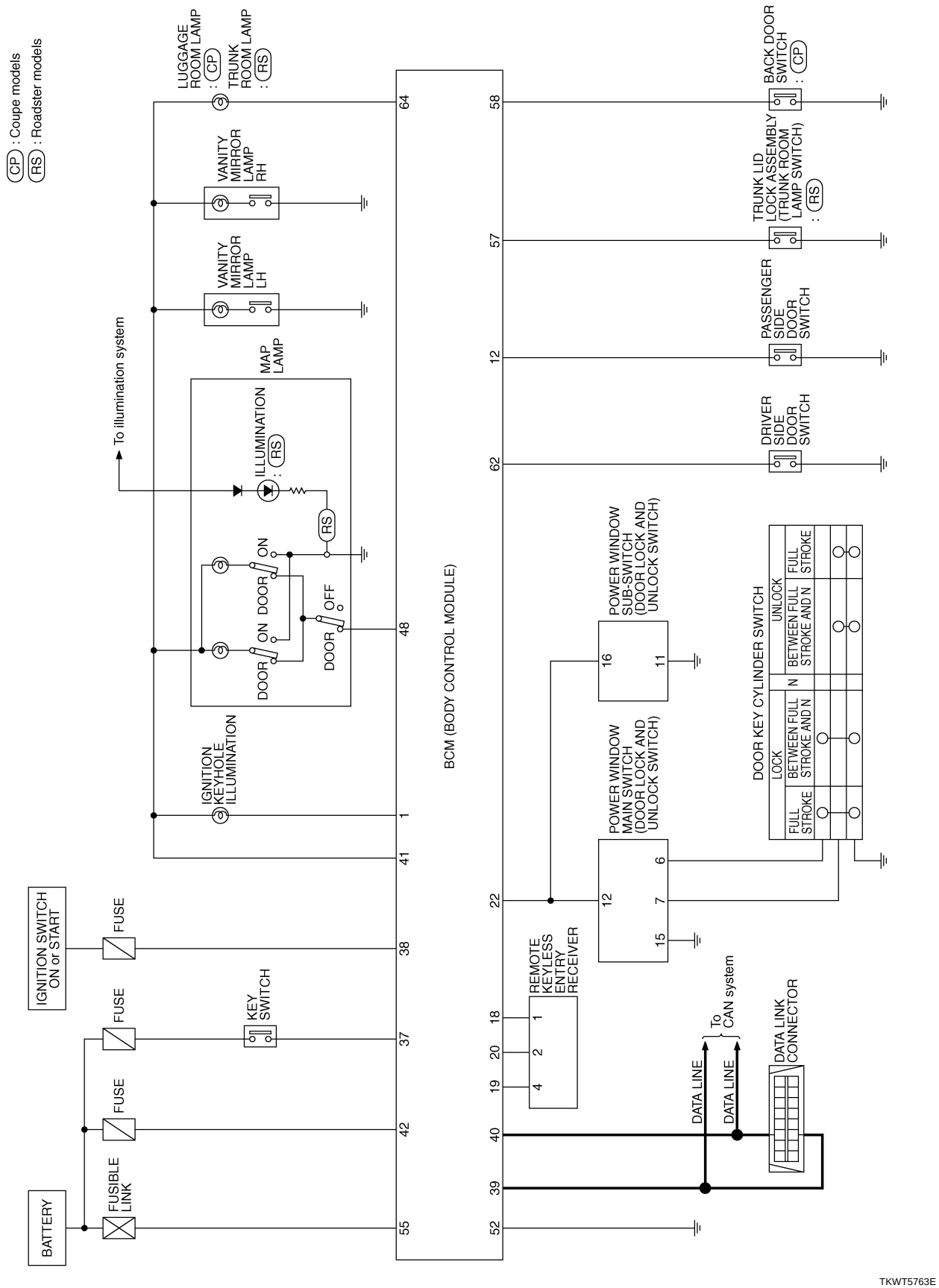
If the room lamp remains illuminated by door switch open signal, or if room lamp switch is in the ON position for more than 30 minutes after the ignition switch is turned to the OFF position, BCM will automatically turn off map lamp, luggage room lamp (Coupe models), trunk room lamp (Roadster models) and vanity mirror lamp.
After lamps turn OFF by battery saver system, the lamps illuminate again when

- signal from key fob, door lock and unlock switch, or key cylinder is locked or unlocked,
- door is opened or closed,
- key is removed from ignition key cylinder or inserted in ignition key cylinder.

Interior lamp battery saver control period can be changed by the function setting of CONSULT-III.

Schematic

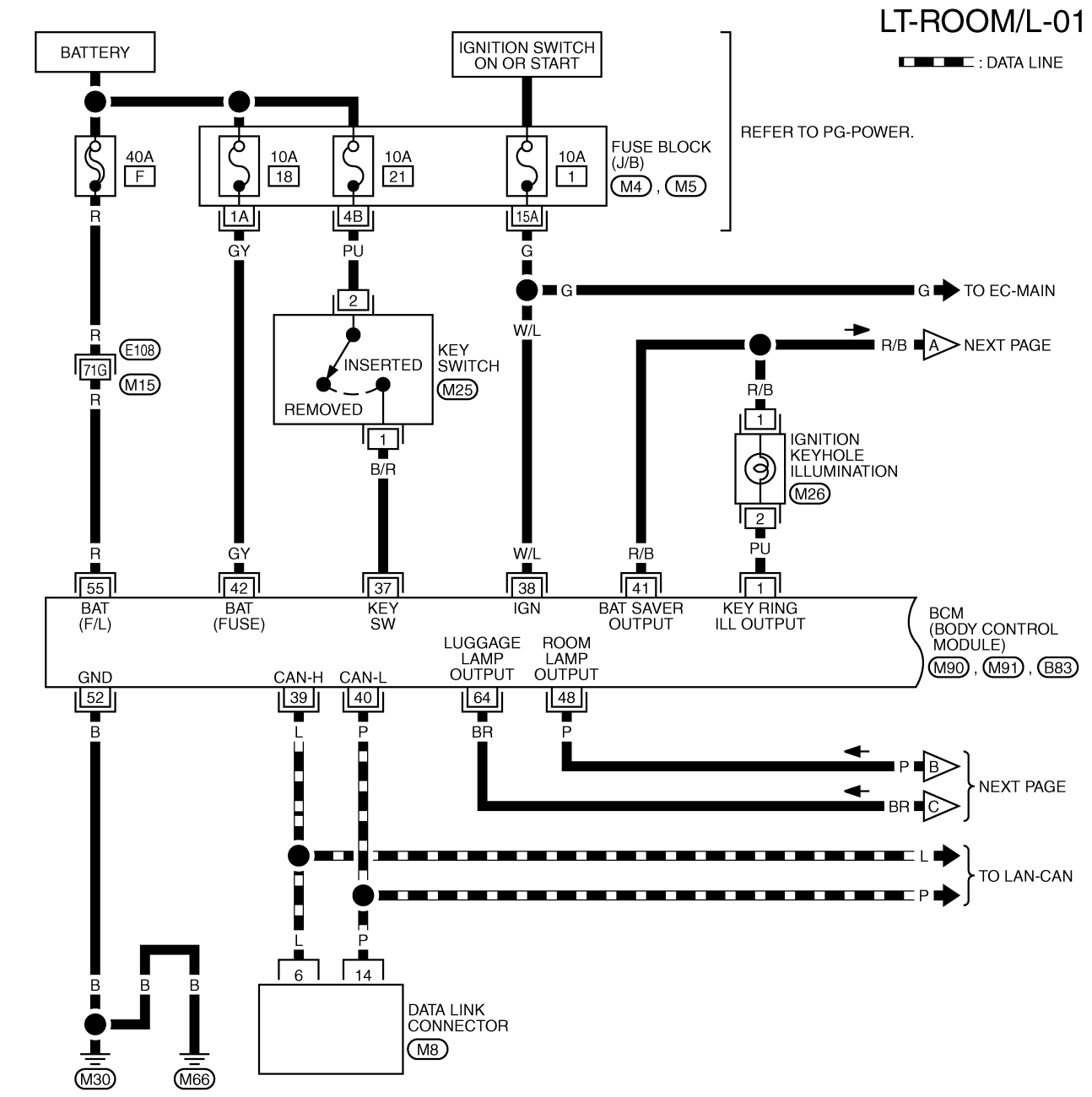
NKS004ZL

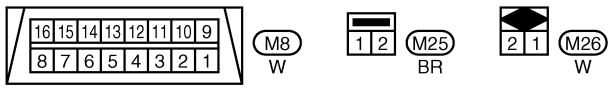


Wiring Diagram — ROOM/L —

NKS004ZM

COUPE MODELS

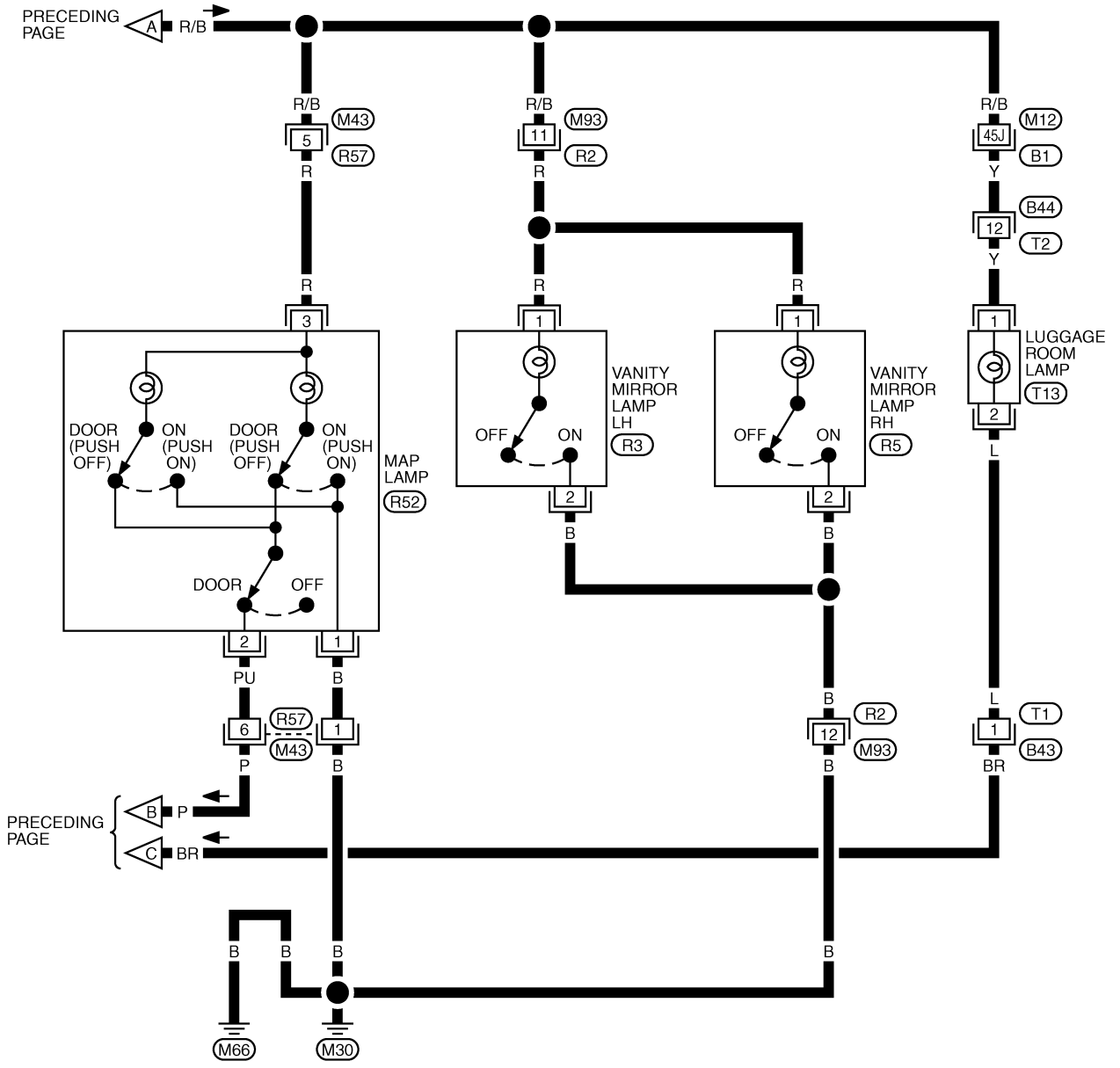


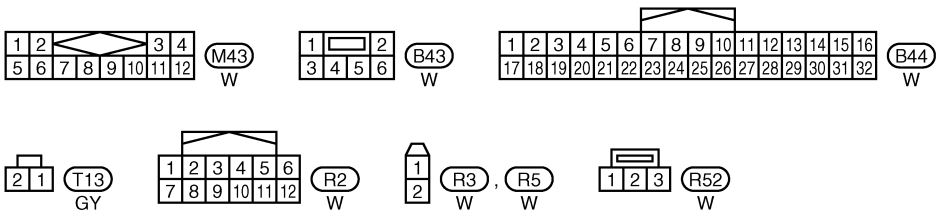


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

TKWT5764E

LT-ROOM/L-02



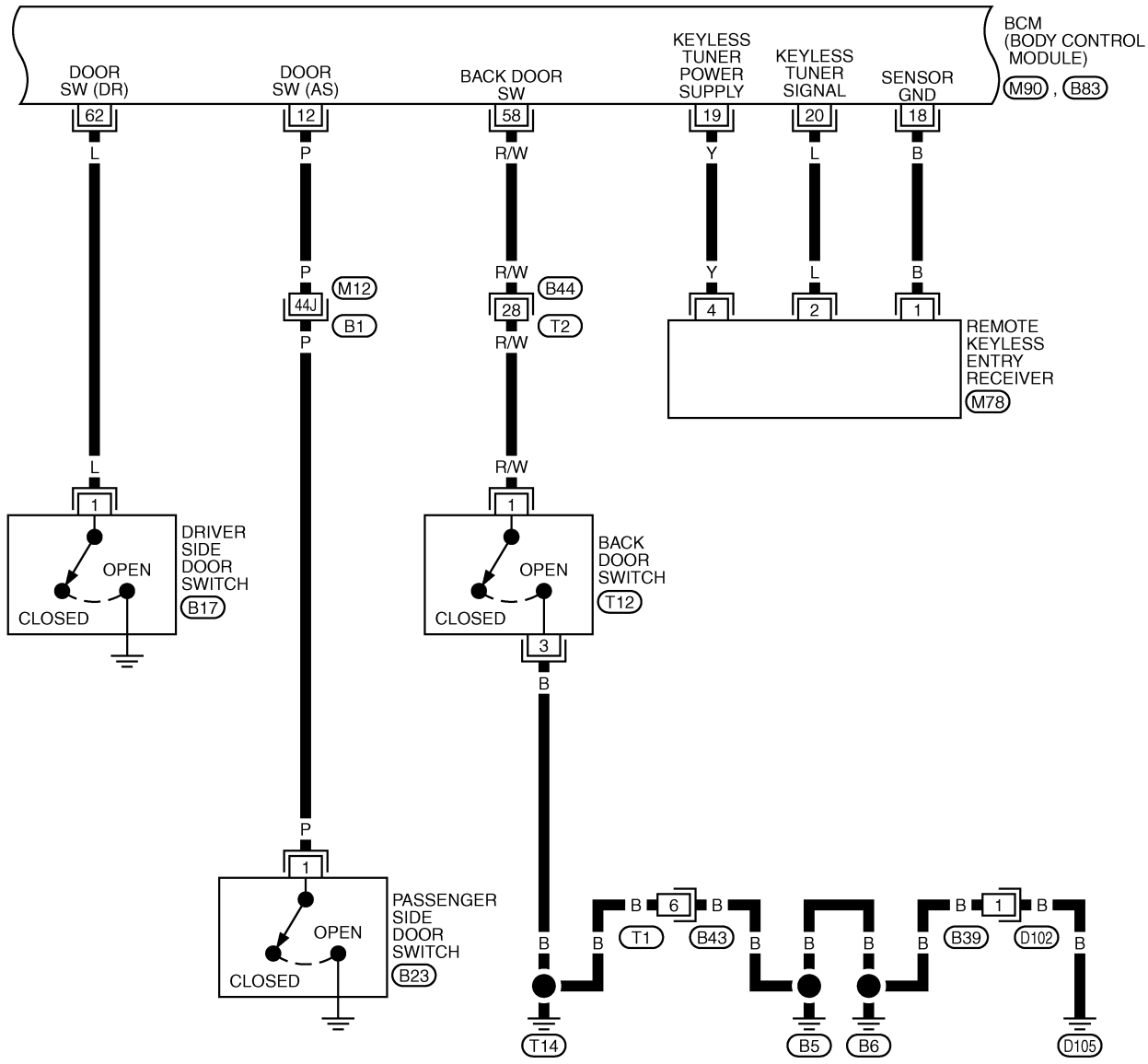


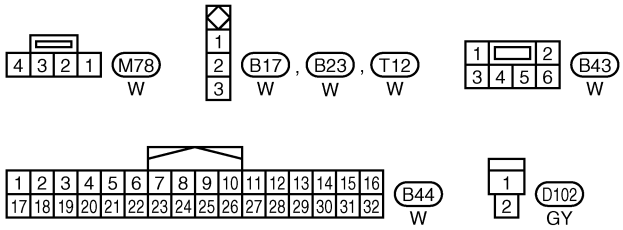
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT5589E

LT-ROOM/L-03

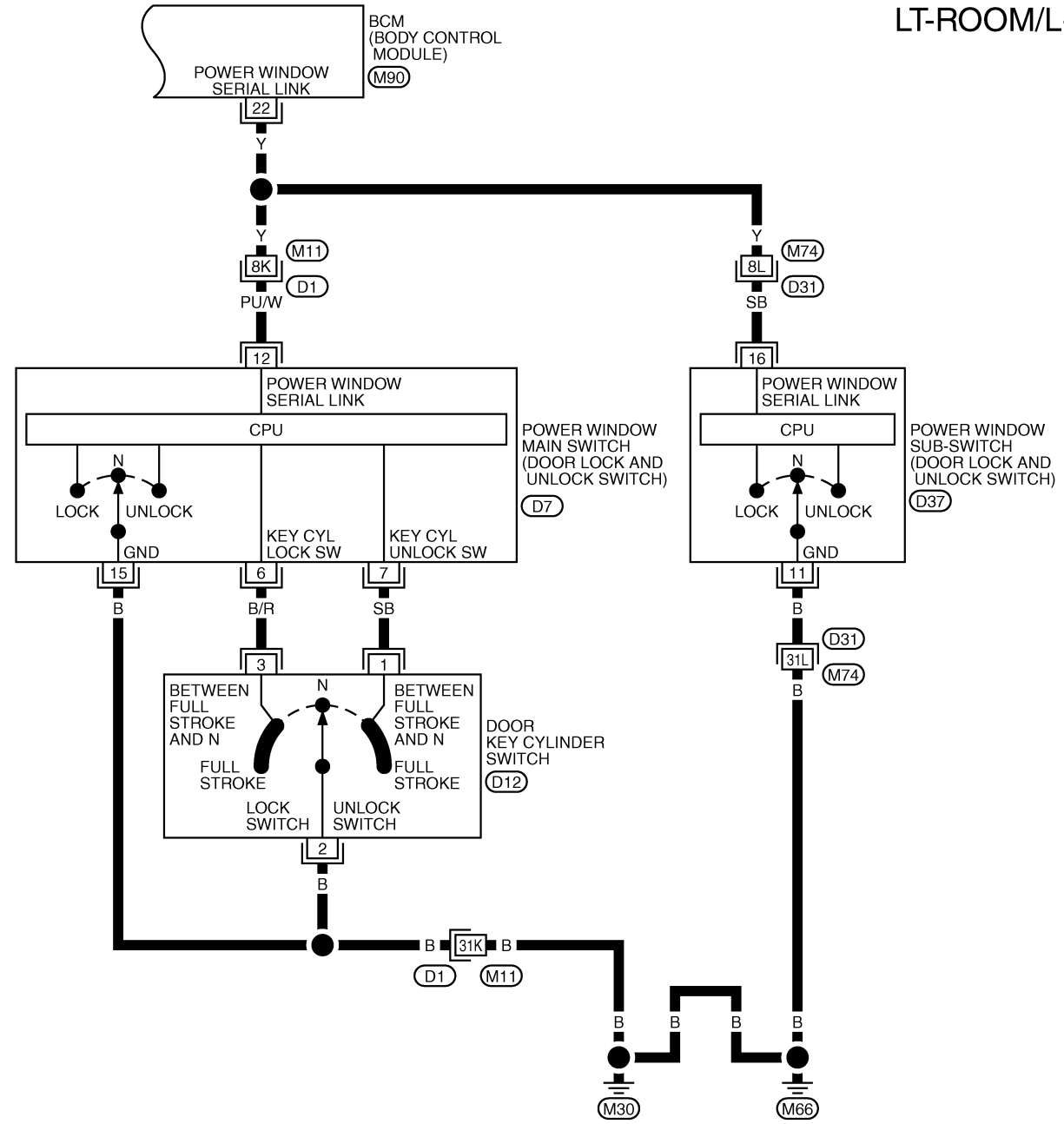


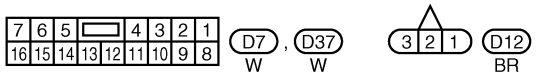


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

TKWT4052E

LT-ROOM/L-04





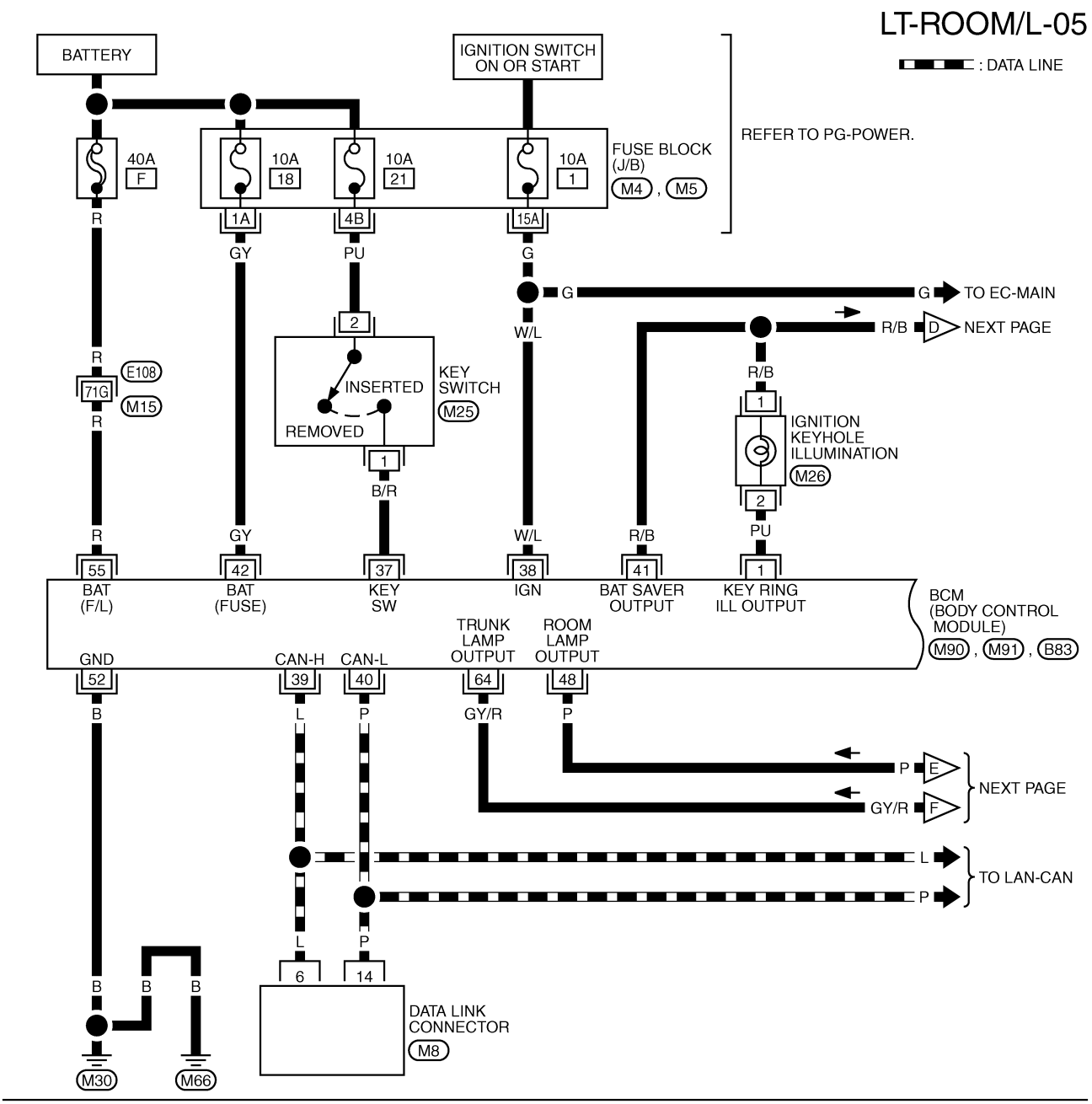
REFER TO THE FOLLOWING.

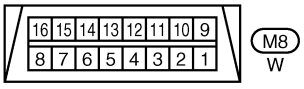
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

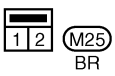
M90 -ELECTRICAL UNITS

TKWT4053E

ROADSTER MODELS





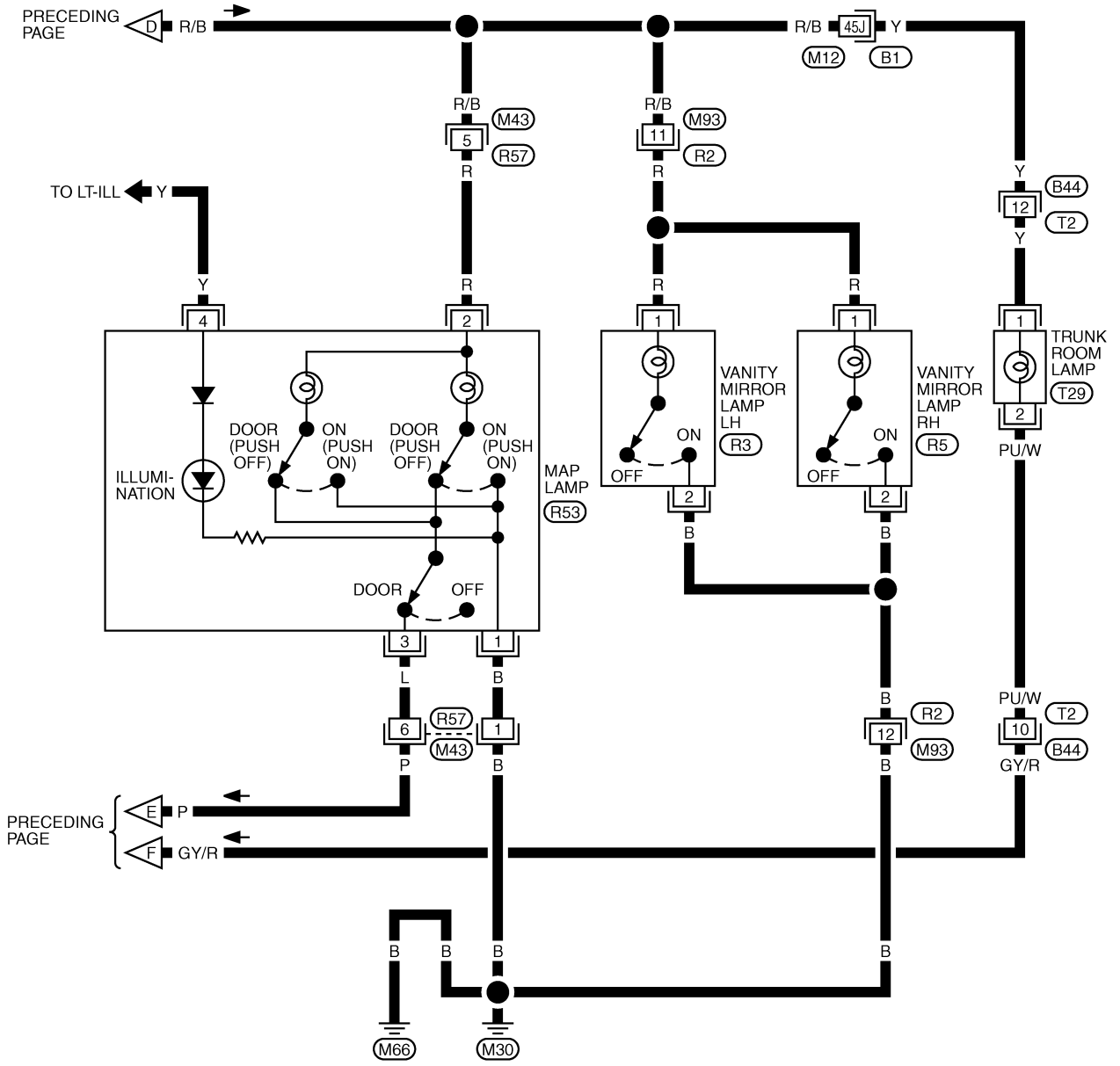




REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M90 , M91 , B83 -ELECTRICAL UNITS

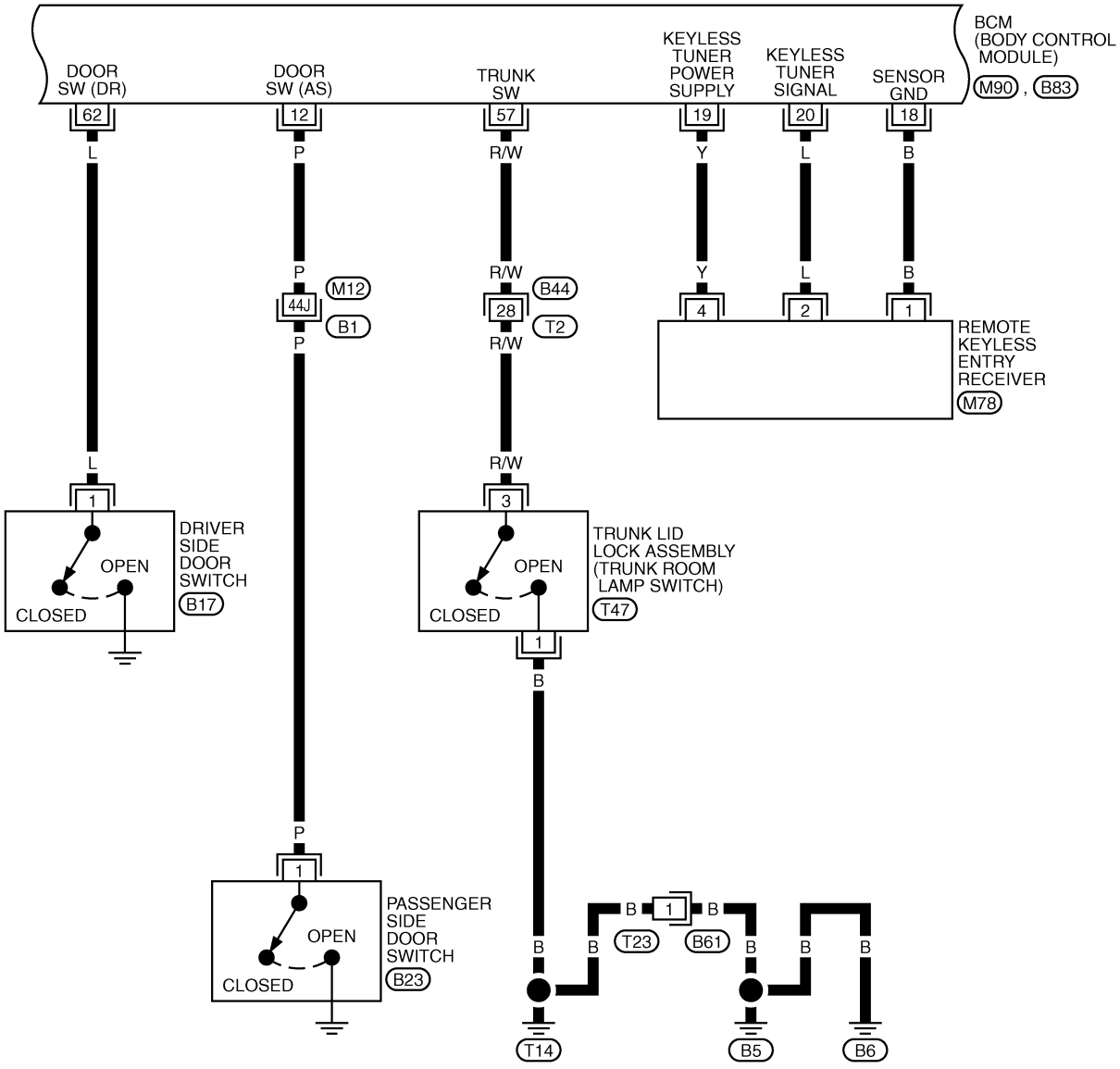
TKWT5765E

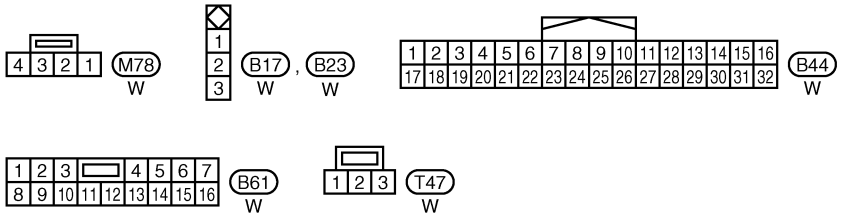
LT-ROOM/L-06



TKWT5766E

LT-ROOM/L-07

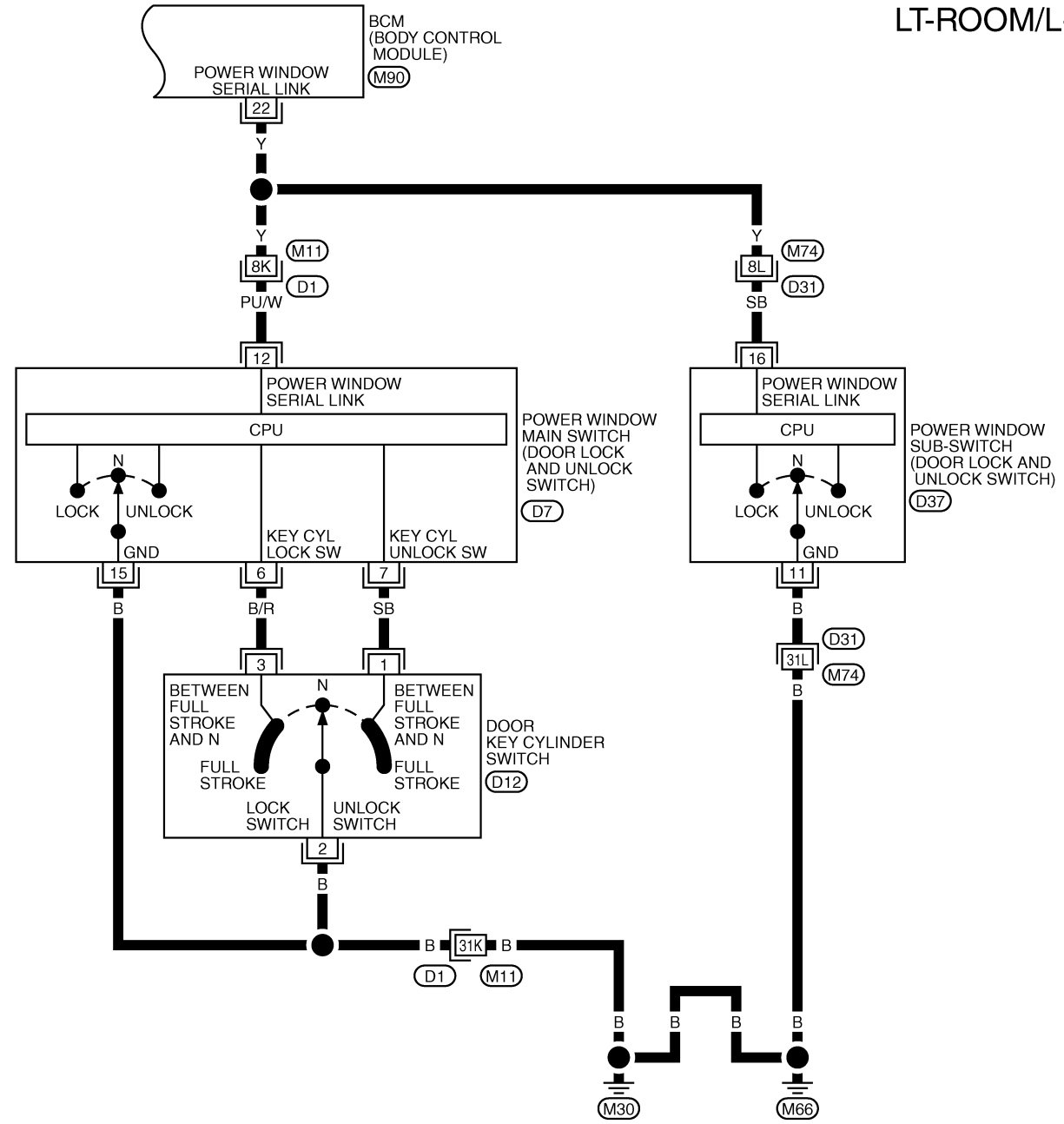


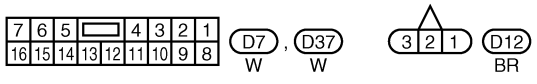


REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M90 , B83 -ELECTRICAL UNITS

TKWT5592E

LT-ROOM/L-08





REFER TO THE FOLLOWING.

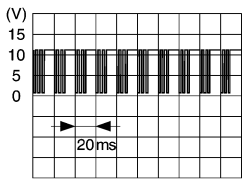
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

M90 -ELECTRICAL UNITS

TKWT4057E

Terminals and Reference Values for BCM

NKS004ZN

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
1	PU	Ignition keyhole illumination signal	OFF	Door is locked. (SW OFF)		Battery voltage
				Door is unlocked. (SW ON)		Approx. 0 V
12	P	Front door switch AS signal	OFF	Front door switch AS	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage
22	Y	Power window switch serial link	ON	—		 PKIA7023E
37	B/R	Key-in detection switch signal	OFF	Vehicle key is removed.		Approx. 0 V
				Vehicle key is inserted.		Battery voltage
38	W/L	Ignition power supply	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
41	R/B	Battery saver output signal	OFF	30 minutes after ignition switch is turned to OFF.		Approx. 0 V
			ON	—		Battery voltage
42	GY	Battery power supply	OFF	—		Battery voltage
48	P	Map lamp output signal	OFF	Map lamp door switch: DOOR position	Any door switch: ON (open)	Approx. 0 V
					Any door switch: OFF (closed)	Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	R	Battery power supply	OFF	—		Battery voltage
57*1	R/W	Trunk room lamp switch signal	OFF	Trunk room lamp switch	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage
58*2	R/W	Back door switch signal	OFF	Luggage room lamp switch	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage
62	L	Front door switch DR signal	OFF	Front door switch DR	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage
64	GY/R*1 BR*2	Trunk room lamp*1 or luggage lamp*2 switch signal	OFF	Trunk room lamp*1 or back door*2 switch	ON (open)	Approx. 0 V
					OFF (closed)	Battery voltage

*1: Roadster models, *2: Coupe models

How to Proceed with Trouble Diagnosis

NKS004ZO

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-128, "System Description" .
3. Perform preliminary check. Refer to LT-142, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does interior room lamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS004ZP

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		18
		21
	Ignition switch ON or START position	1

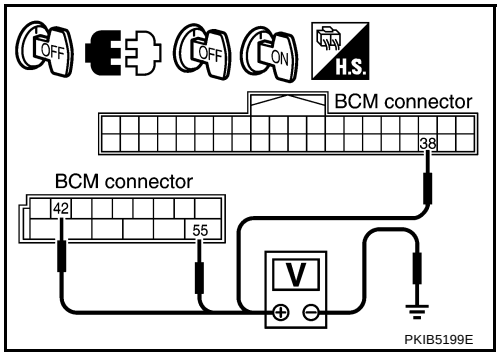
Refer to LT-133, "Wiring Diagram — ROOM/L —" .

OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M90	38	Ground	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

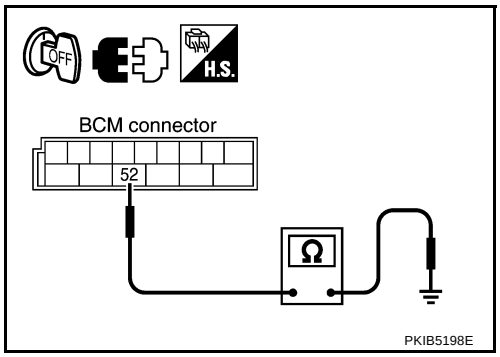
3. CHECK GROUND CIRCUIT

Check continuity between BCM and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.



CONSULT-III Function (BCM)

NKS004ZQ

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis part	Diagnosis mode	Description
INT LAMP	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

WORK SUPPORT
Display Item List

Item	Description	CONSULT-III
SET I/L D–UNLCK INTCON	The 30 seconds glowing function interior room lamps and ignition keyhole illumination can be selected when driver door is released (unlocked).	ON/OFF
ROOM LAMP ON TIME SET	The time in order to escalate illumination can be adjusted when interior room lamps and ignition keyhole illumination is turned on.	MODE 1 – 7
ROOM LAMP OFF TIME SET	The time in order to diminish illumination can be adjusted when interior room lamps and ignition keyhole illumination is turned off.	MODE 1 – 7

Reference between “MODE” and “TIME” for “TURN ON/OFF”

MODE	1	2	3	4	5	6	7
Time (sec.)	0.5	1	2	3	4	5	0

DATA MONITOR
Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from ignition switch signal.
KEY ON SW	“ON/OFF”	Displays “Key inserted (ON)/key removed (OFF)” status judged from key switch signal.
DOOR SW - DR	“ON/OFF”	Displays status of driver door as judged from driver door switch signal. (Door is open: ON/Door is closed: OFF)
DOOR SW - AS	“ON/OFF”	Displays “Door open (ON)/Door closed (OFF)” status, determined from passenger door switch signal.
DOOR SW - RR NOTE	“OFF”	—
DOOR SW - RL NOTE	“OFF”	—
BACK DOOR SW	“ON/OFF”	● Displays status of back door as judged from back door switch signal. (Coupe models) ● Displays status of rear trunk hood as judged from trunk lamp switch signal. (Roadster models)
KEY CYL LK - SW	“ON/OFF”	Displays “Door locked (ON) status, determined from key cylinder lock switch in driver door.
KEY CYL UN - SW	“ON/OFF”	Displays “Door unlocked (OFF) status, determined from key cylinder lock switch in driver door.
CDL LOCK SW	“ON/OFF”	Displays “Door locked (ON)/Door unlocked (OFF) status, determined from locking detection switch in driver door.
CDL UNLOCK SW	“ON/OFF”	Displays “Door unlocked (OFF)” status, determined from locking detection switch in passenger door.
KEYLESS LOCK	“ON/OFF”	Displays “Locked (ON)/Other (OFF)” status, determined from lock signal.
KEYLESS UNLOCK	“ON/OFF”	Displays “Unlocked (ON)/Other (OFF)” status, determined from unlock signal.

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
INT LAMP	Map lamp can be operated by any ON–OFF operations.
IGN ILLUM NOTE	—
STEM LAMP TEST NOTE	—
LUGGAGE LAMP TEST	● Luggage room lamp can be operated by any ON–OFF operations. (Coupe models) ● Trunk room lamp can be operated by any ON–OFF operations. (Roadster models)

NOTE:
This item is displayed, but cannot be tested.

Map Lamp Control Does Not Operate (Coupe models)

NKS004ZR

1. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "INT LAMP" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

OK or NG

OK >> GO TO 2.
NG >> Inspect malfunctioning switch system.

2. CHECK BETWEEN BCM AND MAP LAMP

1. Select "INT LAMP" of BCM active test item.
2. With operating the test item, check the map lamp operation (When map lamp switch is in DOOR position).

Map lamp should operate.

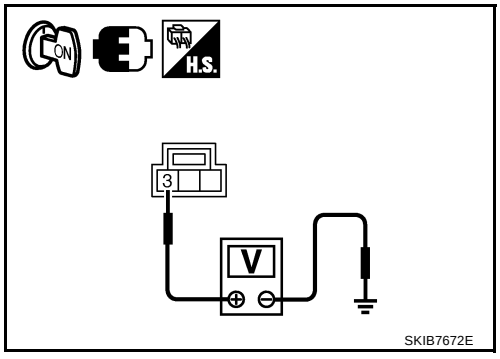
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 3.

3. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between map lamp harness connector and ground.

Terminal			Voltage (Approx.)
(+)		(-)	
Map lamp connector	Terminal		
R52	3	Ground	Battery voltage

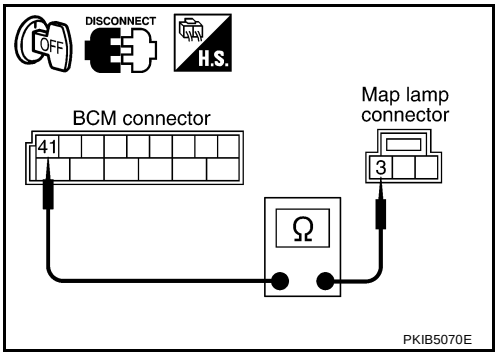


OK or NG

OK >> GO TO 6.
NG >> GO TO 4.

4. CHECK MAP LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and map lamp connector.
3. Check continuity between BCM harness connector and map lamp harness connector.



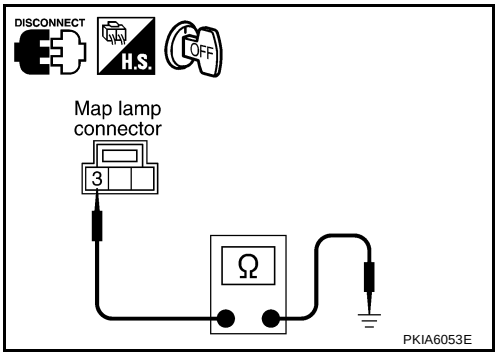
Terminals				Continuity
BCM		Map lamp		
Connector	Terminal	Connector	Terminal	
M91	41	R52	3	Yes

OK or NO

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK SHORT CIRCUIT

Check continuity between map lamp harness connector and ground.



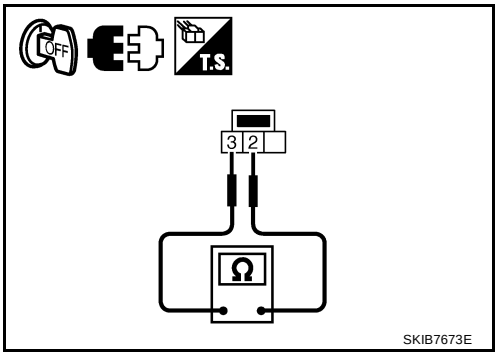
Map lamp connector	Terminal	Ground	Continuity
R52	3		No

OK or NG

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

6. CHECK MAP LAMP

1. Turn ignition switch OFF.
2. Disconnect map lamp connector.
3. Check continuity between map lamp.



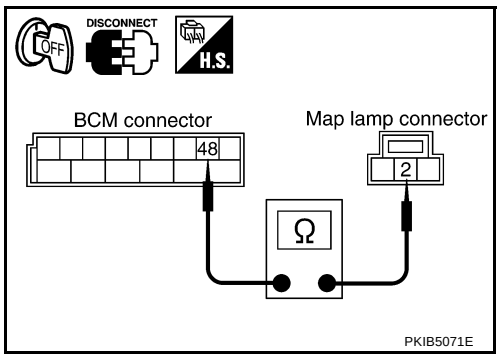
Terminal		Condition	Continuity
Map lamp			
3	2	Map lamp switch is DOOR.	Yes
		Map lamp switch is OFF.	No

OK or NG

OK >> GO TO 7.
NG >> Replace map lamp.

7. CHECK MAP LAMP CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector and map lamp harness connector.



Terminals				Continuity
BCM		Map lamp		
Connector	Terminal	Connector	Terminal	
M91	48	R52	2	Yes

OK or NO

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Map Lamp Control Does Not Operate (Roadster models)

NKS004ZS

1. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "INT LAMP" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

OK or NG

OK >> GO TO 2.

NG >> Inspect malfunctioning switch system.

2. CHECK BETWEEN BCM AND MAP LAMP

1. Select "INT LAMP" of BCM active test item.
2. With operating the test item, check the map lamp operation (When map lamp switch is in DOOR position).

Map lamp should operate.

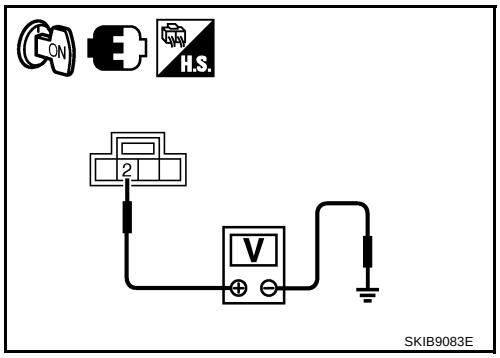
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 3.

3. CHECK BETWEEN BCM AND MAP LAMP

1. Turn ignition switch ON.
2. Check voltage between map lamp harness connector and ground.



Terminal			Voltage (Approx.)
(+)		(-)	
Map lamp connector	Terminal		
R53	2	Ground	Battery voltage

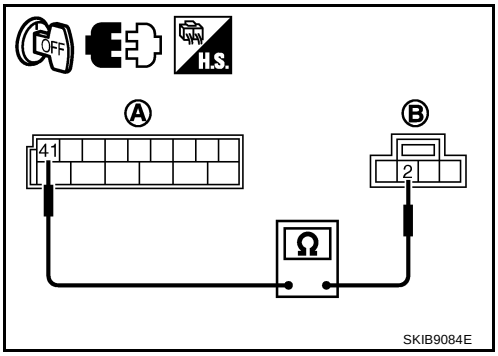
OK or NG

OK >> GO TO 6.

NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and map lamp connector.
3. Check continuity between BCM harness connector (A) and map lamp harness connector (B).



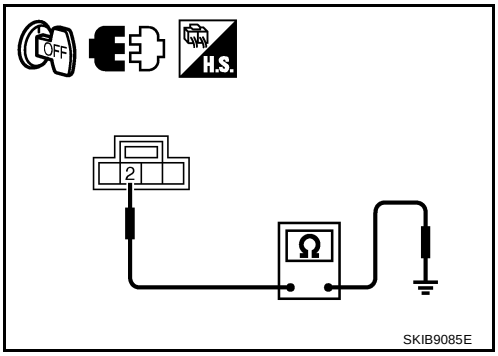
Terminals				Continuity
A		B		
Connector	Terminal	Connector	Terminal	
M91	41	R53	2	Yes

OK or NO

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK SHORT CIRCUIT

Check continuity between map lamp harness connector and ground.



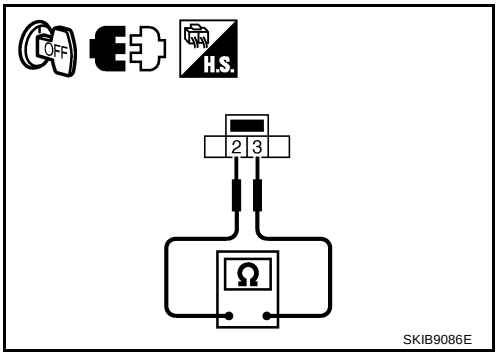
Map lamp connector	Terminal	Ground	Continuity
R53	2		No

OK or NG

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

6. CHECK MAP LAMP

1. Turn ignition switch OFF.
2. Disconnect map lamp connector.
3. Check continuity between map lamp.



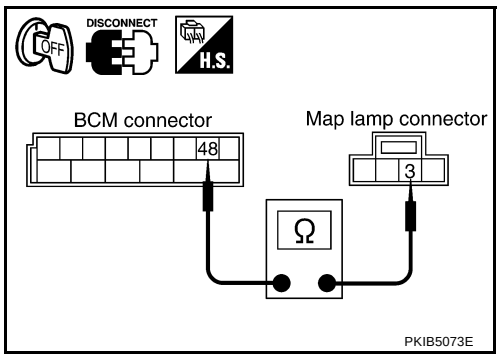
Terminal		Condition	Continuity
Map lamp			
3	2	Map lamp switch is DOOR.	Yes
		Map lamp switch is OFF.	No

OK or NG

OK >> GO TO 7.
NG >> Replace map lamp.

7. CHECK MAP LAMP CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector and map lamp harness connector.



Terminals				Continuity
BCM		Map lamp		
Connector	Terminal	Connector	Terminal	
M91	48	R53	3	Yes

OK or NO

OK >> Replace BCM if map lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Ignition Key Hole Illumination Does Not Illuminate

NKS004ZT

1. CHECK BULB

Check bulb of lamp which does not operate.

OK or NG

OK >> GO TO 2.

NG >> Replace bulb.

2. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "INT LAMP" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

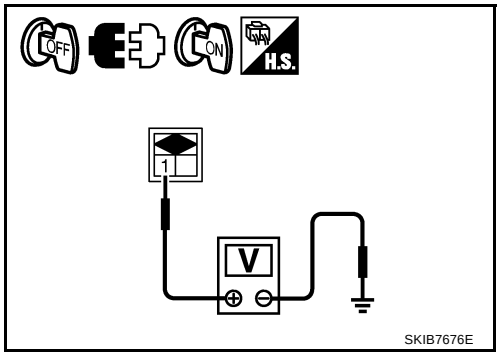
OK or NG

OK >> GO TO 3.

NG >> Inspect malfunctioning switch system.

3. CHECK POWER SUPPLY TO IGNITION KEY HOLE ILLUMINATION

1. Turn ignition switch OFF.
2. Disconnect ignition key hole illumination connector.
3. Turn ignition switch ON.
4. Check voltage between ignition key hole illumination harness connector and ground.



Terminal			Voltage (Approx.)
(+)		(-)	
Ignition key hole illumination connector	Terminal		
M26	1	Ground	Battery voltage

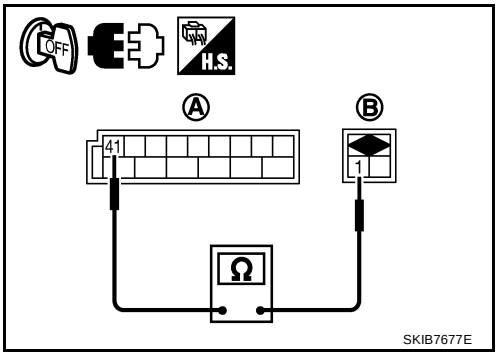
OK or NG

OK >> GO TO 5.

NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT FOR IGNITION KEY HOLE ILLUMINATION

1. Turn ignition switch OFF.
2. Disconnect BCM connector and key hole illumination connector.
3. Check continuity between BCM harness connector (A) and ignition key hole illumination harness connector (B).



Terminals				Continuity
A		B		
Connector	Terminal	Connector	Terminal	
M91	41	M26	1	Yes

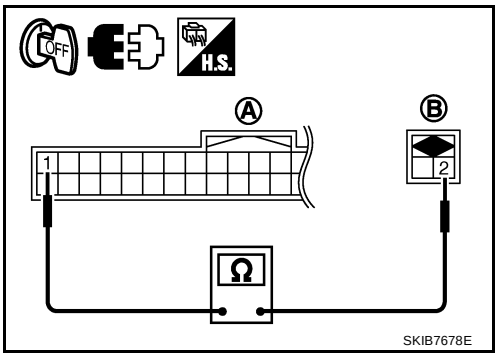
OK or NG

OK >> Replace BCM if ignition key hole illumination does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

5. CHECK GROUND CIRCUIT FOR IGNITION KEY HOLE ILLUMINATION

1. Turn ignition switch OFF.
2. Disconnect BCM connector and key hole illumination connector.
3. Check continuity between BCM harness connector (A) and ignition key hole illumination harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M90	1	M26	2	Yes

OK or NG

OK >> Replace BCM if ignition key hole illumination does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Luggage Room Lamp Does Not Illuminate (Coupe Models)

NKS004ZU

1. CHECK BULB

Inspect bulb of luggage room lamp.

OK or NG

OK >> GO TO 2.

NG >> Replace bulb of luggage room lamp.

2. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "LUGGAGE LAMP TEST" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

OK or NG

OK >> GO TO 3.

NG >> Inspect malfunctioning switch system.

3. CHECK BETWEEN BCM AND LUGGAGE ROOM LAMP

1. Select "LUGGAGE LAMP TEST" of BCM active test item.
2. With operating the test item, check the luggage room lamp operation.

Luggage room lamp should operate.

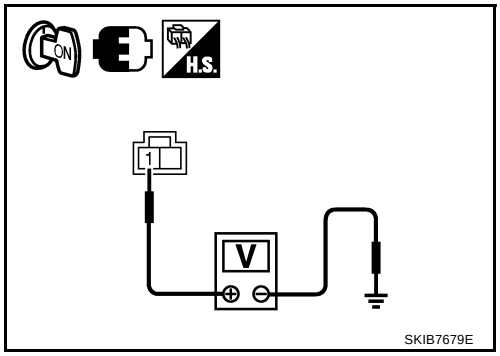
OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between luggage room lamp harness connector and ground.

Terminal			Voltage (Approx.)
(+)		(-)	
Luggage room lamp connector	Terminal		
T13	1	Ground	Battery voltage



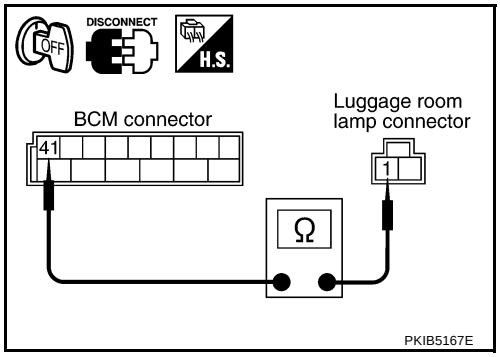
OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. CHECK LUGGAGE ROOM LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and luggage room lamp connector.
3. Check continuity between BCM harness connector and luggage room lamp harness connector.

Terminals				Continuity
BCM		Luggage room lamp		
Connector	Terminal	Connector	Terminal	
M91	41	T13	1	Yes



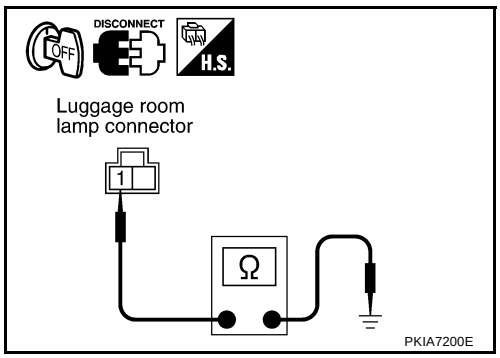
OK or NO

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK SHORT CIRCUIT

Check continuity between luggage room lamp harness connector and ground.

Luggage room lamp connector	Terminal	Ground	Continuity
T13	1		No

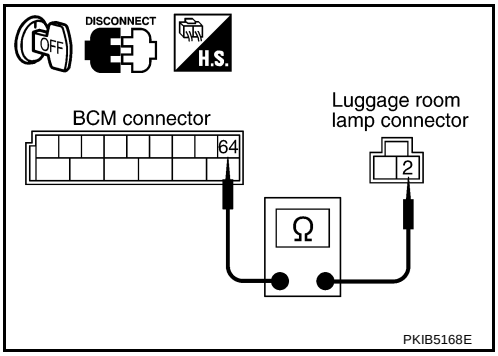


OK or NG

OK >> Replace BCM if luggage room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

7. CHECK LUGGAGE ROOM LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM harness connector and luggage room lamp harness connector.



Terminals				Continuity
BCM		Luggage room lamp		
Connector	Terminal	Connector	Terminal	
B83	64	T13	2	Yes

OK or NO

OK >> Replace BCM if luggage room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Trunk Room Lamp Does Not Illuminate (Roadster Models)

NKS004ZV

1. CHECK BULB

Inspect bulb of trunk room lamp.

OK or NG

OK >> GO TO 2.

NG >> Replace map lamp.

2. CHECK BETWEEN EACH SWITCH AND BCM

1. Select "LUGGAGE LAMP TEST" of BCM data monitor item.
2. Make sure switches listed in display item list turn ON-OFF linked with switch operation. Refer to LT-143, "Display Item List" for switches and their functions.

OK or NG

OK >> GO TO 3.

NG >> Inspect malfunctioning switch system.

3. CHECK BETWEEN BCM AND TRUNK ROOM LAMP

1. Select “BCM” on CONSULT-III. Select “LUGGAGE LAMP TEST” active test.
2. With operating the test item, check the trunk room lamp operation.

Trunk room lamp should operate.

OK or NG

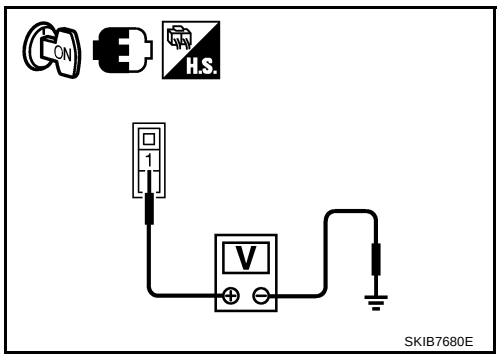
OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> GO TO 4.

4. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between trunk room lamp harness connector and ground.

Terminal			Voltage (Approx.)
(+)		(-)	
Trunk room lamp connector	Terminal		
T29	1	Ground	Battery voltage



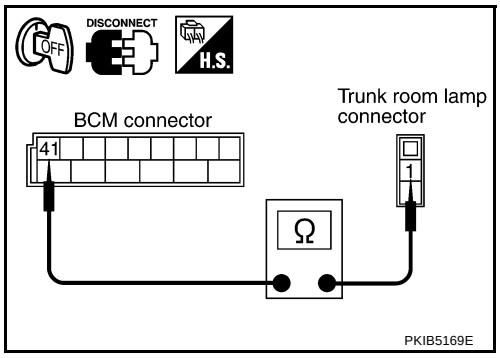
OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. CHECK TRUNK ROOM LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and trunk room lamp connector.
3. Check continuity between BCM harness connector and trunk room lamp harness connector.

Terminals				Continuity
BCM		Trunk room lamp		
Connector	Terminal	Connector	Terminal	
M91	41	T29	1	Yes



OK or NO

OK >> GO TO 6.
NG >> Repair harness or connector.

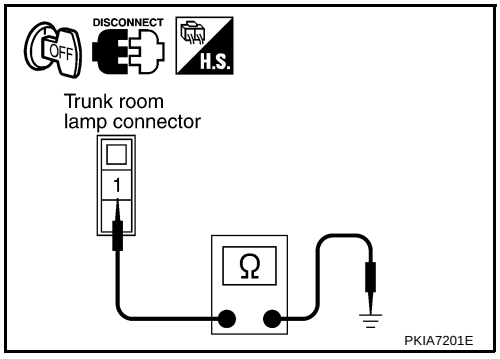
6. CHECK SHORT CIRCUIT

Check continuity between trunk room lamp harness connector and ground.

Trunk room lamp connector	Terminal	Ground	Continuity
T29	1		No

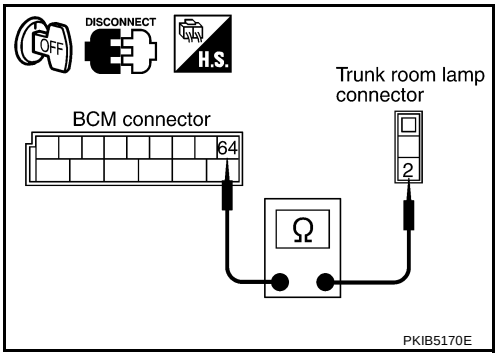
OK or NG

OK >> Replace BCM if trunk room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.



7. CHECK TRUNK ROOM LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM harness connector and trunk room lamp harness connector.



Terminals				Continuity
BCM		Trunk room lamp		
Connector	Terminal	Connector	Terminal	
B83	64	T29	2	Yes

OK or NO

OK >> Replace BCM if trunk room lamp does not work after setting the connector again. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Bulb Replacement

NKS004ZW

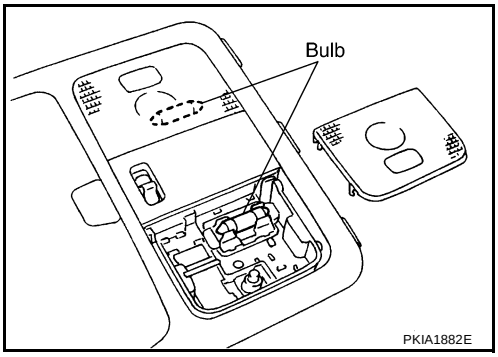
MAP LAMP

Coupe Models

1. Open driver and passenger window, and then disconnect battery cable from the negative terminal.

   CAUTION:
   After battery cables are disconnected, never open/close driver and/or passenger door with the window in the full up position. Automatic window adjusting function will not work and side roof panel may be damaged.
2. Remove lens using clip driver or suitable tool.
3. Remove bulb.

   Map lamp : 12V - 8W
4. Installation is the reverse order of removal.

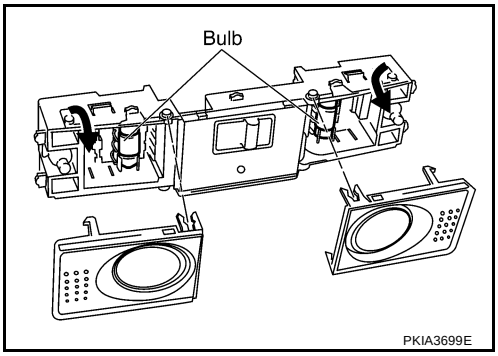


Roadster Models

1. Open driver and passenger window, and then disconnect battery cable from the negative terminal.

   CAUTION:
   After battery cables are disconnected, never open/close driver and/or passenger door with the window in the full up position. Automatic window adjusting function will not work and side roof panel may be damaged.
2. Remove lens using clip driver or suitable tool.
3. Remove bulb.

   Map lamp : 12V - 8W
4. Installation is the reverse order of removal.

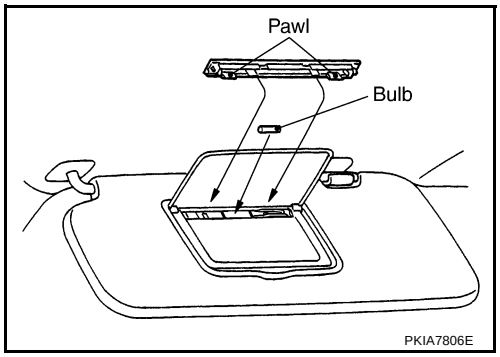


VANITY MIRROR LAMP

1. Insert a thin screwdriver in the lens end and remove lens.
2. Remove bulb.

Vanity mirror lamp : 12V - 1.32W

3. Installation is the reverse order of removal.



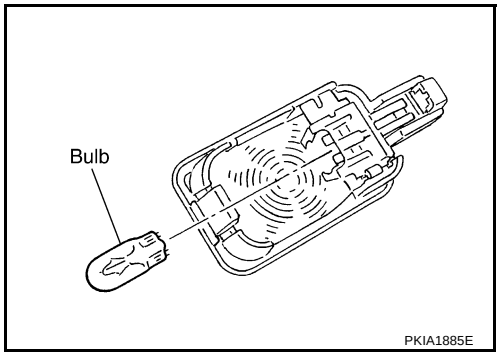
LUGGAGE ROOM LAMP & TRUNK ROOM LAMP

Luggage Room Lamp (Coupe Models)

1. Remove luggage room lamp. Refer to LT-155, "Removal and Installation" .
2. Remove bulb.

Luggage room lamp : 12V - 5W

3. Installation is the reverse order of removal.

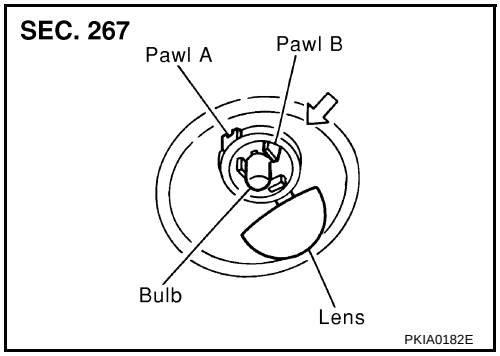


Trunk Room Lamp (Roadster Models)

1. Unfold pawl A and remove lens.
2. Remove trunk room lamp while pressing pawl B in the direction of the arrow.
3. Disconnect trunk room lamp connector.

Trunk room lamp : 12V - 3.4W

4. Installation is the reverse order of removal.

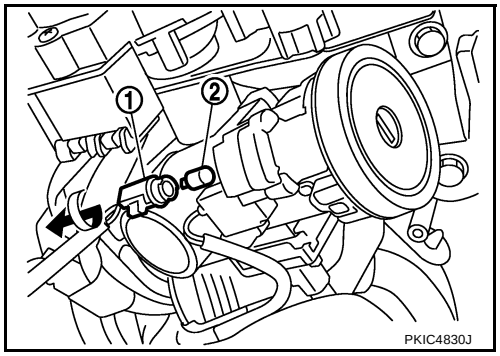


IGNITION KEY HOLE ILLUMINATION

1. Remove instrument lower driver panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Turn bulb socket to left to release lock and remove bulb socket (1).
3. Remove ignition key illumination bulb (2) from its socket.

Ignition key hole illumination : 12V - 1.4W

4. Installation is the reverse order of removal.



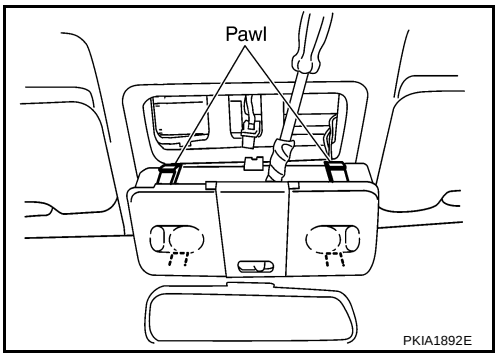
Removal and Installation

NKS004ZX

MAP LAMP

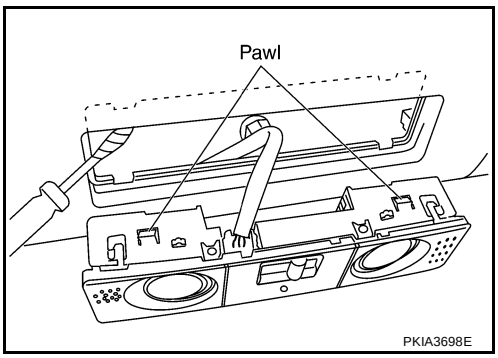
Coupe Models

1. Insert a clip driver or suitable tool and disengage pawl fittings of map lamp.
2. Disconnect map lamp connector and remove map lamp.
3. Installation is the reverse order of removal.



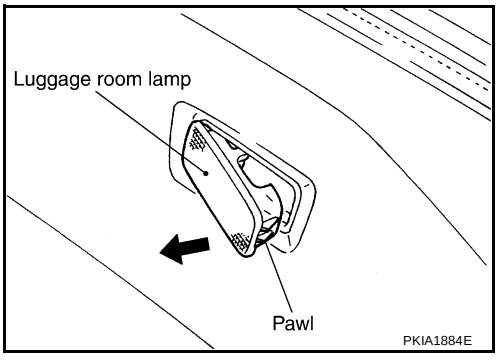
Roadster Models

1. Insert a clip driver or suitable tool and disengage pawl fittings of map lamp.
2. Disconnect map lamp connector and remove map lamp.
3. Installation is the reverse order of removal.



LUGGAGE ROOM LAMP

1. Pull out luggage room lamp in direction shown by the arrow in the figure.
2. Disconnect luggage room lamp connector.
3. Installation is the reverse order of removal.



ILLUMINATION

PFP:27545

System Description

NKS004ZY

Control of the illumination lamp operation is dependent upon the position of the lighting switch (combination switch). When the lighting switch is placed in the 1ST or 2ND position, the BCM (body control module) receives input signal requesting illumination lamps to illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) through the CAN communication lines. The CPU (central processing unit) located in the IPDM E/R controls tail lamp relay coil. This relay, when energized, directs power to illumination lamps, which then illuminate.

OUT LINE

Power is supplied at all times

- through 10A fuse (No.71, located in IPDM E/R)
- to tail lamp relay, located in IPDM E/R, and
- to CPU located in IPDM E/R,
- through 15A fuse (No.78, located in IPDM E/R)
- to CPU located in IPDM E/R.

Power is also supplied at all times

- through 40A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55,
- through 10A fuse [No.18, located in fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No.19, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 21,
- through 10A fuse [No.19, located in fuse block (J/B)]
- to combination meter terminal 24.

With ignition switch in the ON or START position, power is supplied

- to CPU located in IPDM E/R,
- through 10A fuse [No.1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No.12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 22, and
- to NAVI control unit terminal 63 (With navigation system),
- through 10A fuse [No.14, located in fuse block (J/B)]
- to combination meter terminal 23.

With ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No.6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone)
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to unified meter and A/C amp. terminals 29 and 30
- through grounds M30 and M66,
- to combination meter terminals 10, 11 and 12
- through grounds M30 and M66,
- to NAVI control unit terminal 1 (With navigation system)
- through ground B115 (With navigation system).

ILLUMINATION OPERATION BY LIGHTING SWITCH

With the lighting switch in the 1ST or 2ND position, the BCM receives input signal requesting illumination lamps to illuminate. This input signal is communicated to the IPDM E/R through the CAN communication lines. CPU located in the IPDM E/R controls tail lamp relay coil, which, when energized, directs power

- through terminal 22 of IPDM E/R
- to NAVI control unit terminal 61 (With navigation system)
- to NAVI switch terminal 2 (With navigation system)
- to audio unit terminal 8.
- to combination switch (spiral cable) terminal 26 (with steering switch)
- to soft top switch (illumination) terminal 5 (Roadster model)
- to A/T device (A/T illumination) terminal 3 (With A/T)
- to VDC off switch (illumination) terminal 3 (With VDC)
- to TCS off switch (illumination) terminal 3 (With TCS)
- to map lamp (illumination) terminal 4 (Roadster models)
- to hazard switch (illumination) terminal 3
- to heated seat switch (driver side) (illumination) terminal 5 (With hated seat)
- to heated seat switch (passenger side) (illumination) terminal 5 (With heated seat)
- to bottle holder illumination (driver side) terminal 1
- to bottle holder illumination (passenger side) terminal 1
- to cup holder illumination terminal 1
- to luggage floor box lamp terminal 1.

Ground is supplied at all times

- to NAVI control unit terminal 1 (with navigation system)
- through ground B115,
- to NAVI switch terminal 3 (With navigation system)
- to audio unit terminal 7
- to combination switch (spiral cable) terminal 27 (with steering switch)
- to soft top switch (illumination) terminal 6 (Roadster models)
- to A/T device (A/T illumination) terminal 5 (With A/T)
- to VDC off switch (illumination) terminal 4 (With VDC)
- to TCS off switch (illumination) terminal 4 (With TCS)
- to hazard switch (illumination) terminal 4
- to heated seat switch (driver side) (illumination) terminal 6 (With heated seat)
- to heated seat switch (passenger side) (illumination) terminal 6 (With heated seat)
- to bottle holder illumination (driver side) terminal 2, and
- to bottle holder illumination (passenger side) terminal 2
- through combination meter terminal 18,
- to map lamp (illumination) terminal 1 (Roadster models)
- to cup holder illumination terminal 2
- through grounds M30 and M66,
- to luggage floor box lamp terminal 2
- through grounds B5, B6, D105 and T14 (Coupe model)
- through grounds B5, B6 and T14 (Roadster model).

With power and ground supplied, illumination lamps illuminate.

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 1ST or 2ND position, and the ignition switch is turned from ON or ACC to OFF, battery saver control function is activated.
Under this condition, the illumination lamps remain illuminated for 5 minutes, then illumination lamps are turned off.
When the lighting switch is turned from OFF to 1ST or 2ND position after illumination lamps are turned off by battery saver control, and illumination lamps illuminate again.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

CAN Communication System Description

NKS004ZZ

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

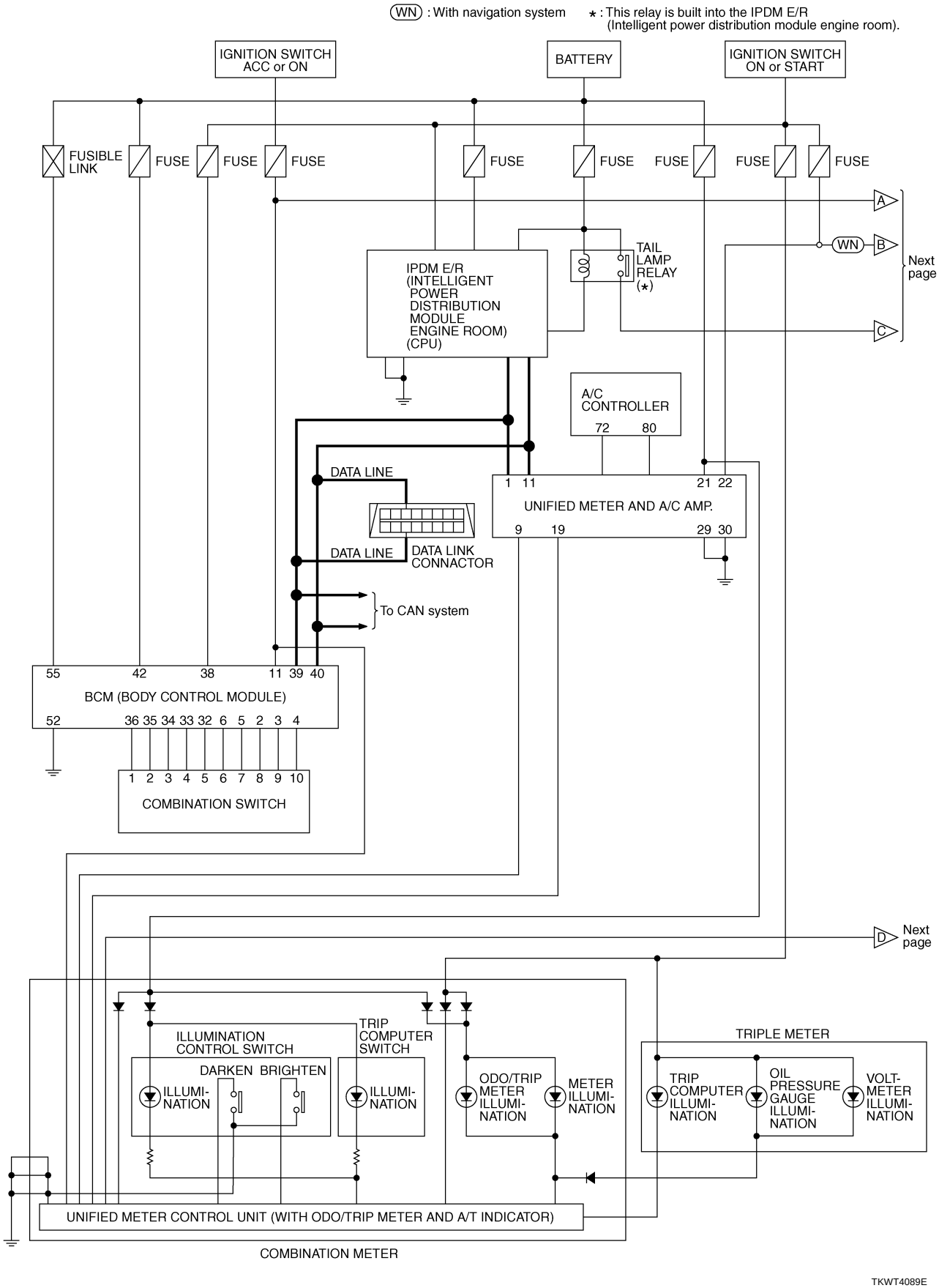
CAN Communication Unit

NKS00500

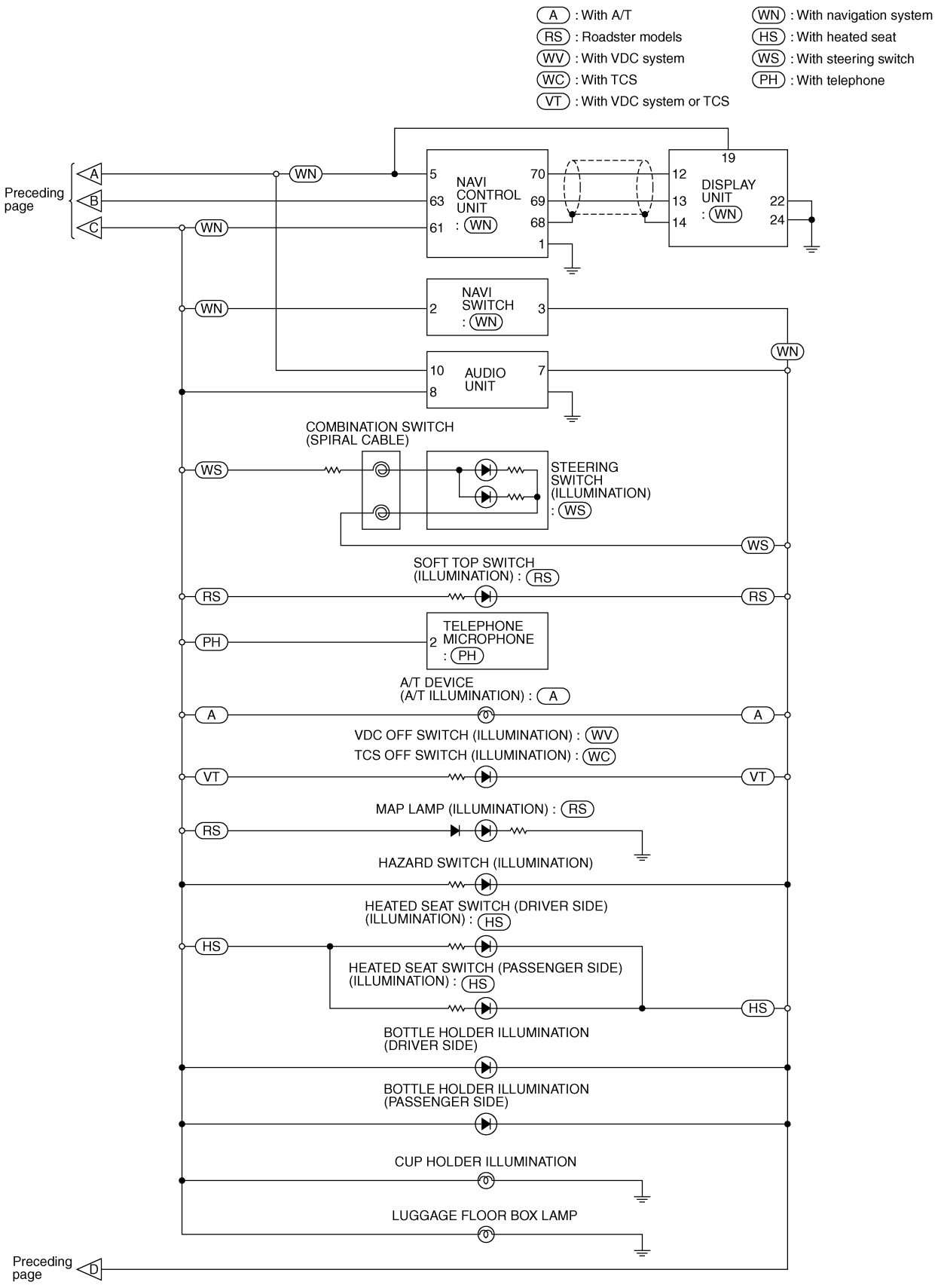
Refer to LAN-48, "CAN System Specification Chart" .

Schematic

NKS00501



TKWT4089E

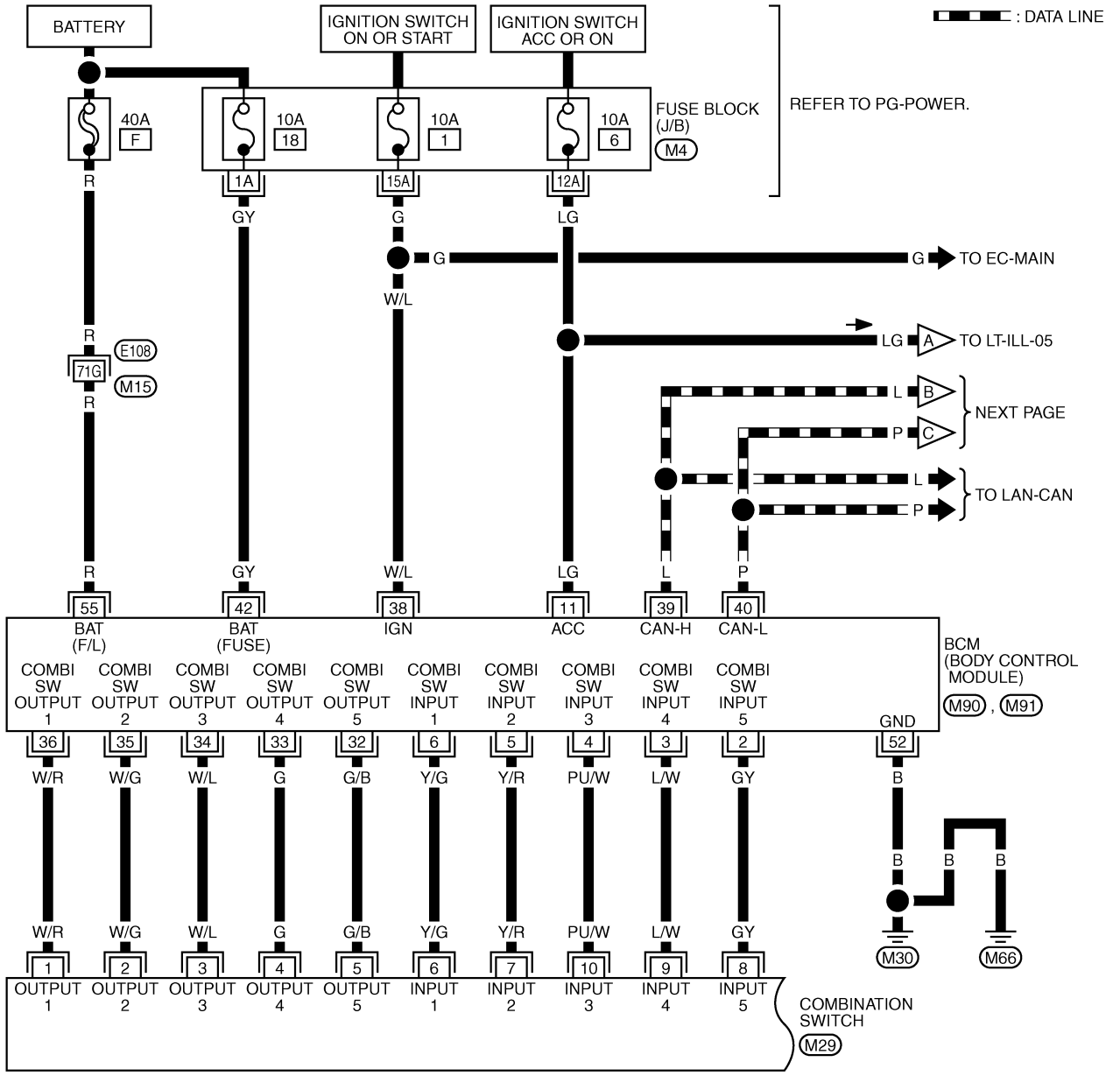

(A) : With A/T
(RS) : Roadster models
(WV) : With VDC system
(WC) : With TCS
(VT) : With VDC system or TCS
(WN) : With navigation system
(HS) : With heated seat
(WS) : With steering switch
(PH) : With telephone
Preceding page
A
B
C
WN
NAVI CONTROL UNIT : WN
5
63
61
70
69
68
1
19
DISPLAY UNIT : WN
12
13
14
22
24
NAVI SWITCH : WN
2
3
AUDIO UNIT
10
8
7
COMBINATION SWITCH (SPIRAL CABLE)
WS
STEERING SWITCH (ILLUMINATION) : WS
SOFT TOP SWITCH (ILLUMINATION) : RS
RS
TELEPHONE MICROPHONE : PH
PH
2
A/T DEVICE (A/T ILLUMINATION) : A
A
VDC OFF SWITCH (ILLUMINATION) : WV
TCS OFF SWITCH (ILLUMINATION) : WC
VT
MAP LAMP (ILLUMINATION) : RS
HAZARD SWITCH (ILLUMINATION)
HEATED SEAT SWITCH (DRIVER SIDE) (ILLUMINATION) : HS
HS
HEATED SEAT SWITCH (PASSENGER SIDE) (ILLUMINATION) : HS
BOTTLE HOLDER ILLUMINATION (DRIVER SIDE)
BOTTLE HOLDER ILLUMINATION (PASSENGER SIDE)
CUP HOLDER ILLUMINATION
LUGGAGE FLOOR BOX LAMP
Preceding page
D

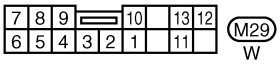
TKWT5767E

Wiring Diagram — ILL —

NKS00502

LT-ILL-01





REFER TO THE FOLLOWING.

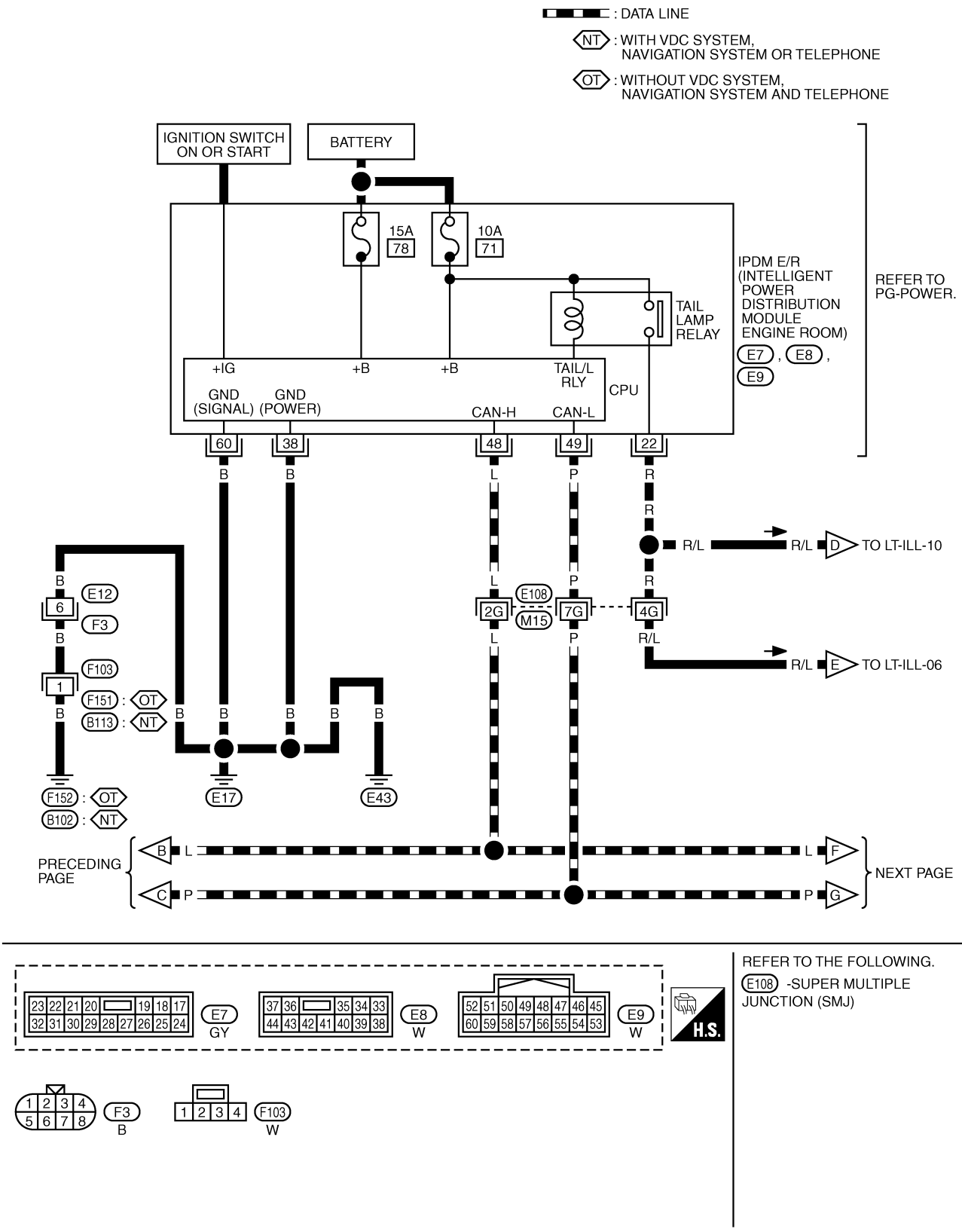
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

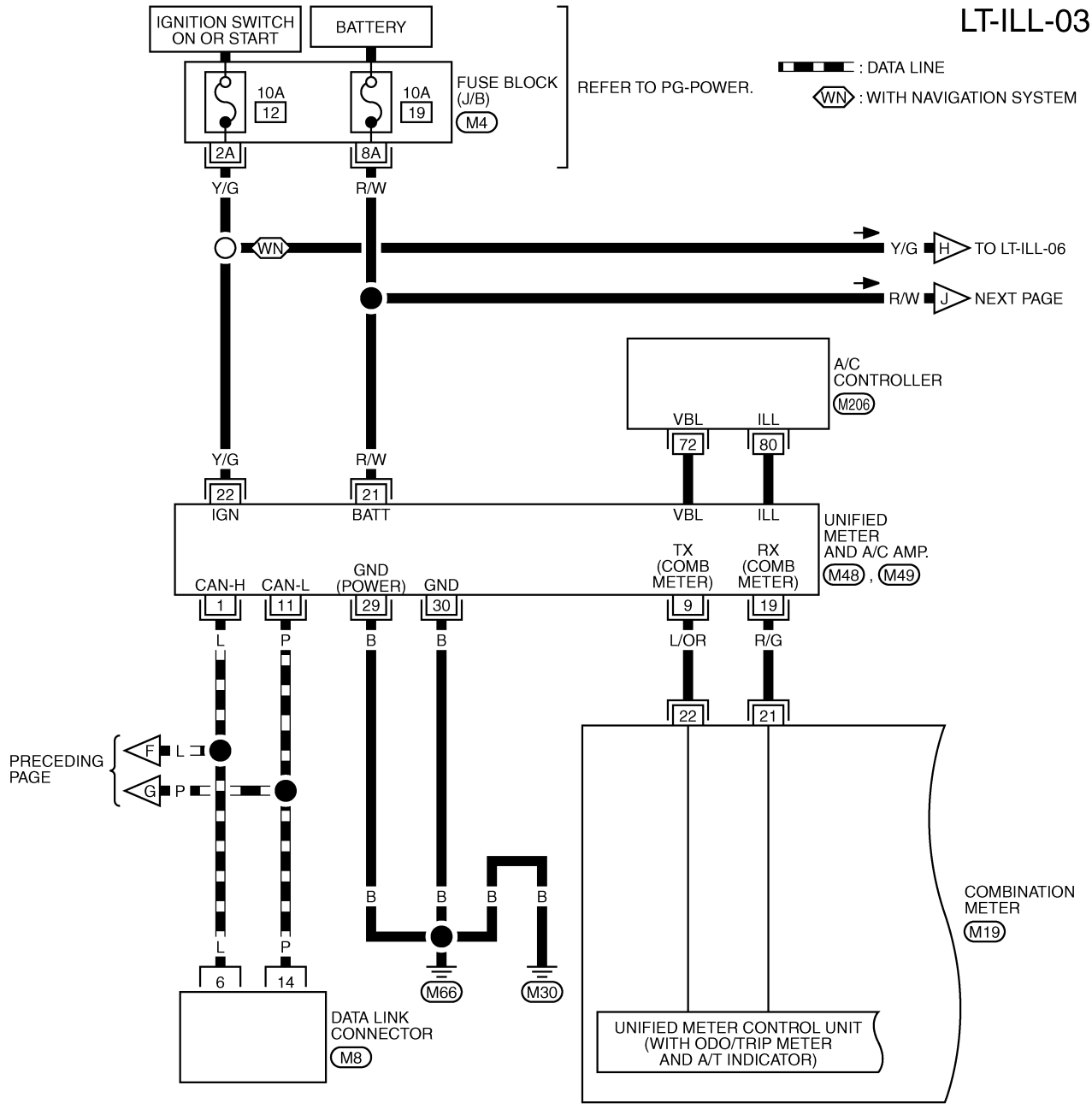
M90 , M91 -ELECTRICAL UNITS

TKWT5768E

LT-ILL-02

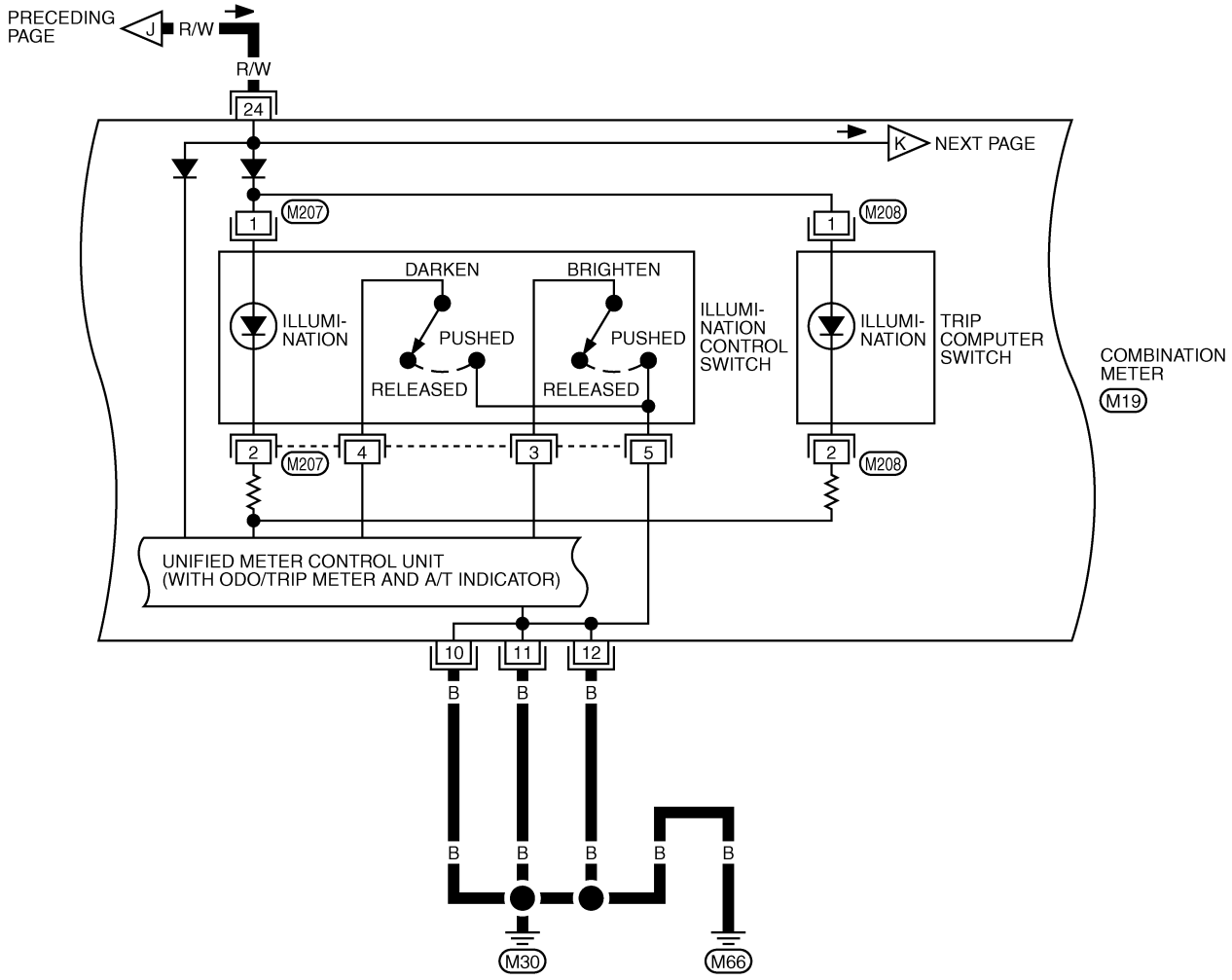


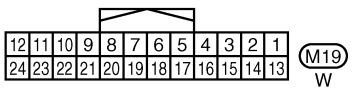
TKWT5769E

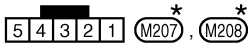

LT-ILL-03
IGNITION SWITCH ON OR START
BATTERY
FUSE BLOCK (J/B) M4
10A 12
10A 19
2A
8A
REFER TO PG-POWER.
: DATA LINE
WN : WITH NAVIGATION SYSTEM
Y/G
R/W
WN
Y/G H TO LT-ILL-06
R/W J NEXT PAGE
A/C CONTROLLER M206
VBL
ILL
72
80
22
IGN
21
BATT
UNIFIED METER AND A/C AMP. M48, M49
CAN-H
CAN-L
GND (POWER)
GND
TX (COMB METER)
RX (COMB METER)
1
11
29
30
9
19
L
P
B
L/OR
R/G
PRECEDING PAGE
F L
G P
6
14
DATA LINK CONNECTOR M8
M66
M30
COMBINATION METER M19
UNIFIED METER CONTROL UNIT (WITH ODO/TRIP METER AND A/T INDICATOR)
M8 W
M19 W
M48 GY
M49 GY
H.S.
M206
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT2296E

LT-ILL-04



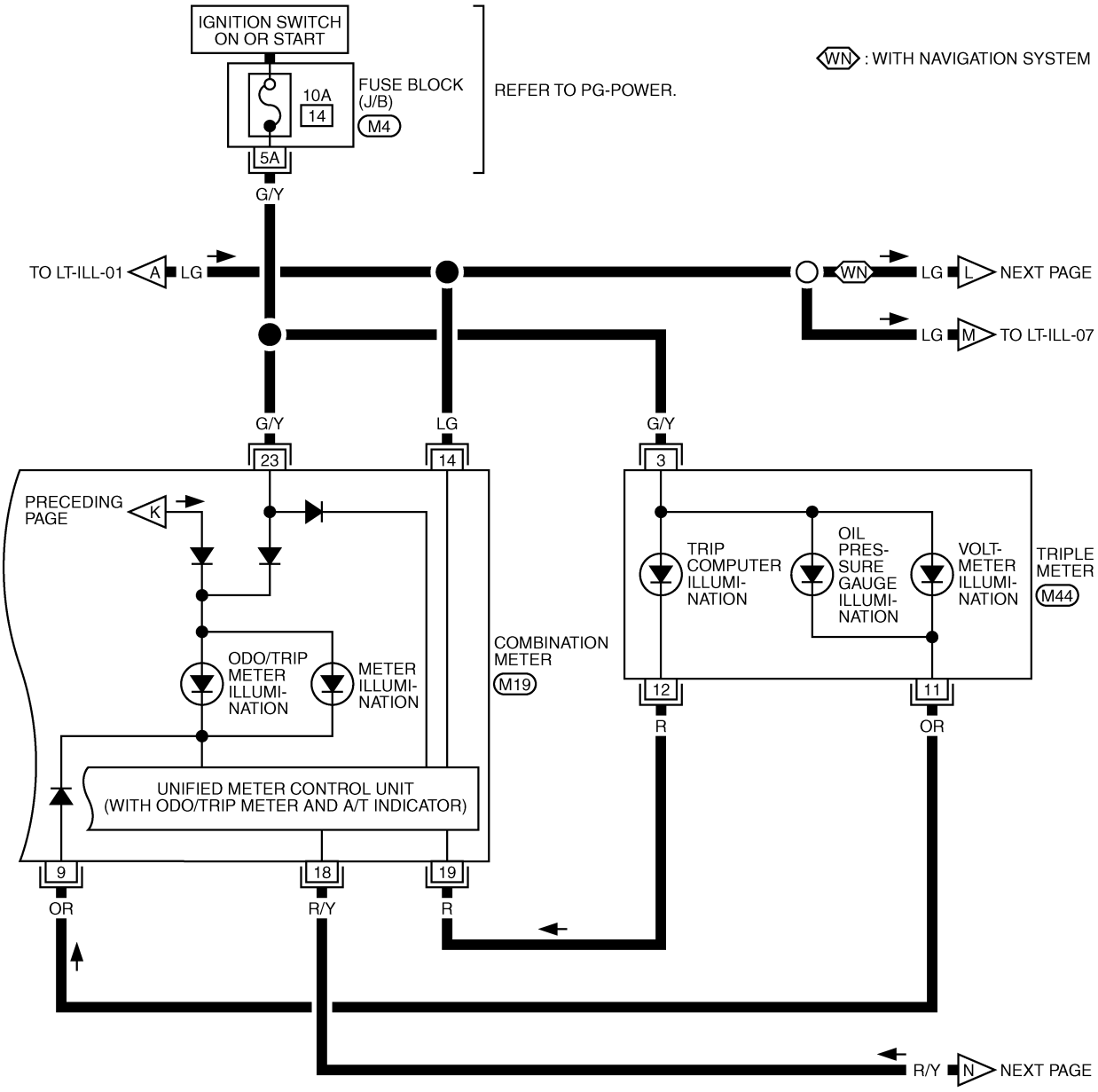


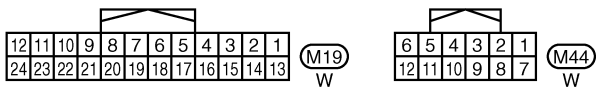


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT4093E

LT-ILL-05

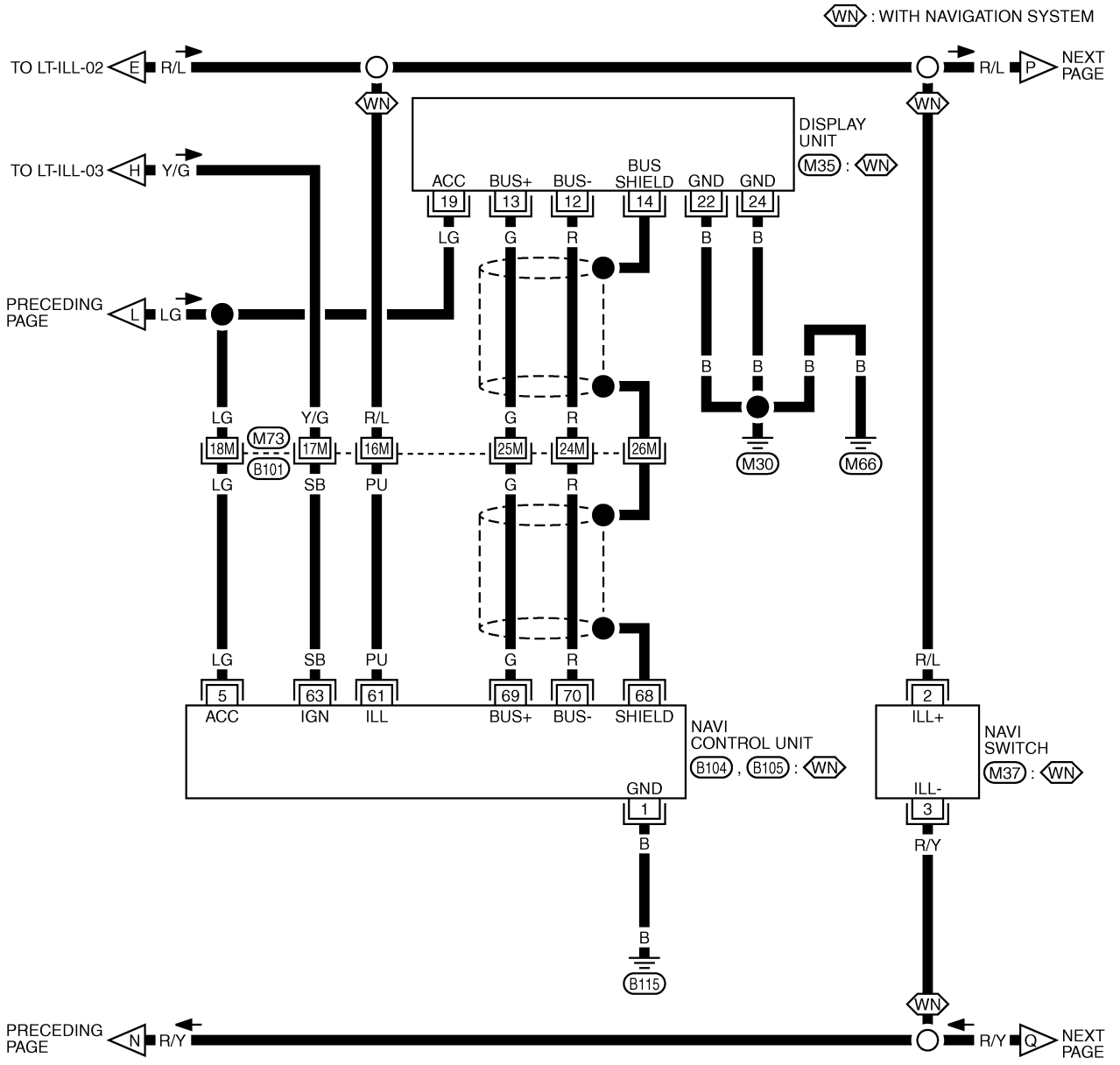


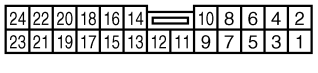


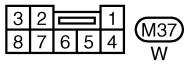
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT1830E

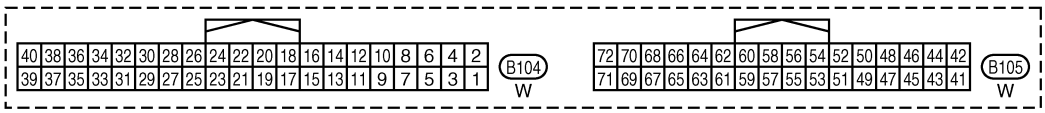
LT-ILL-06





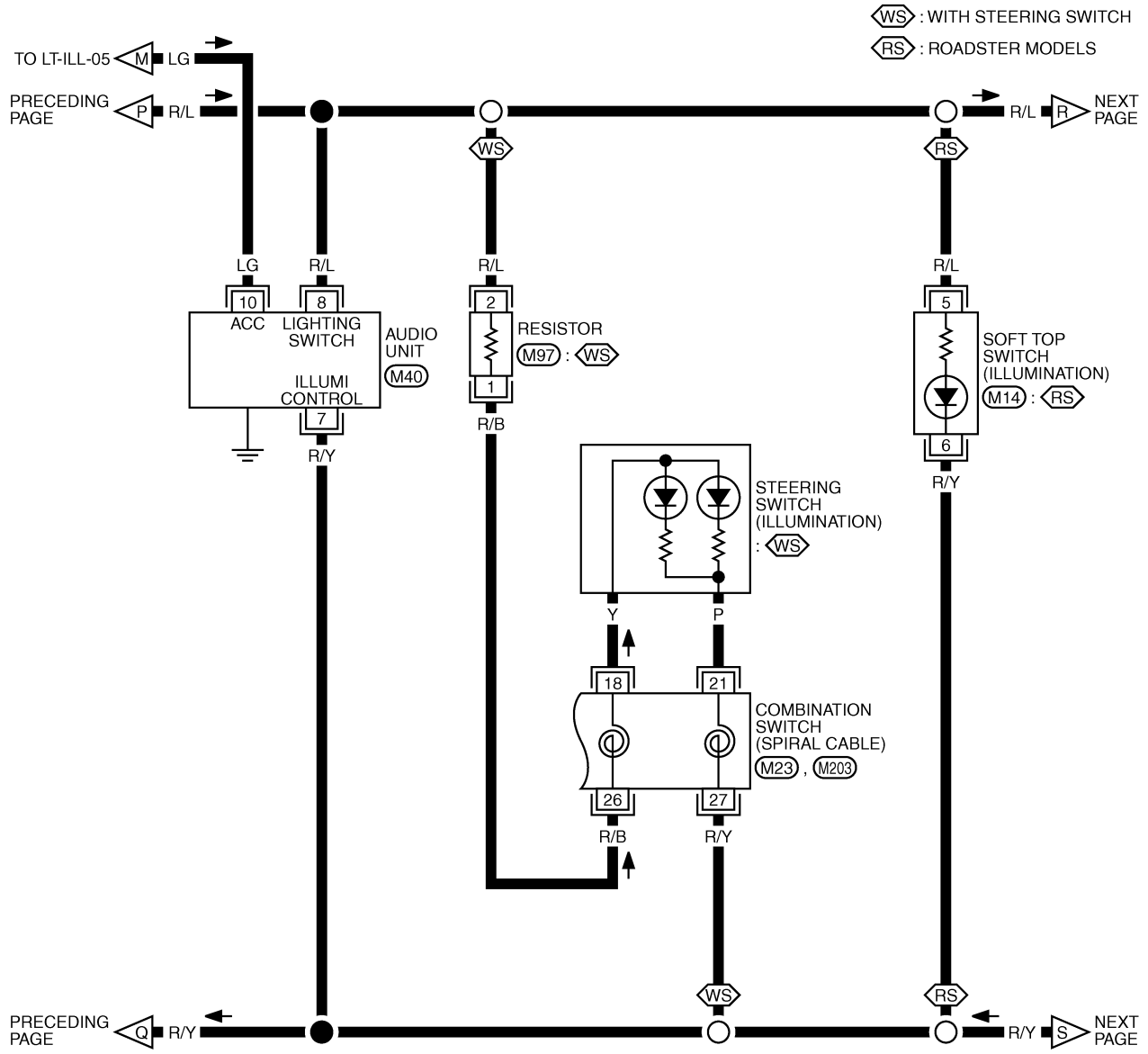


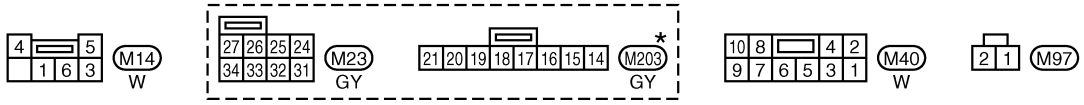
REFER TO THE FOLLOWING.
B101 -SUPER MULTIPLE JUNCTION (SMJ)



TKWT5596E

LT-ILL-07

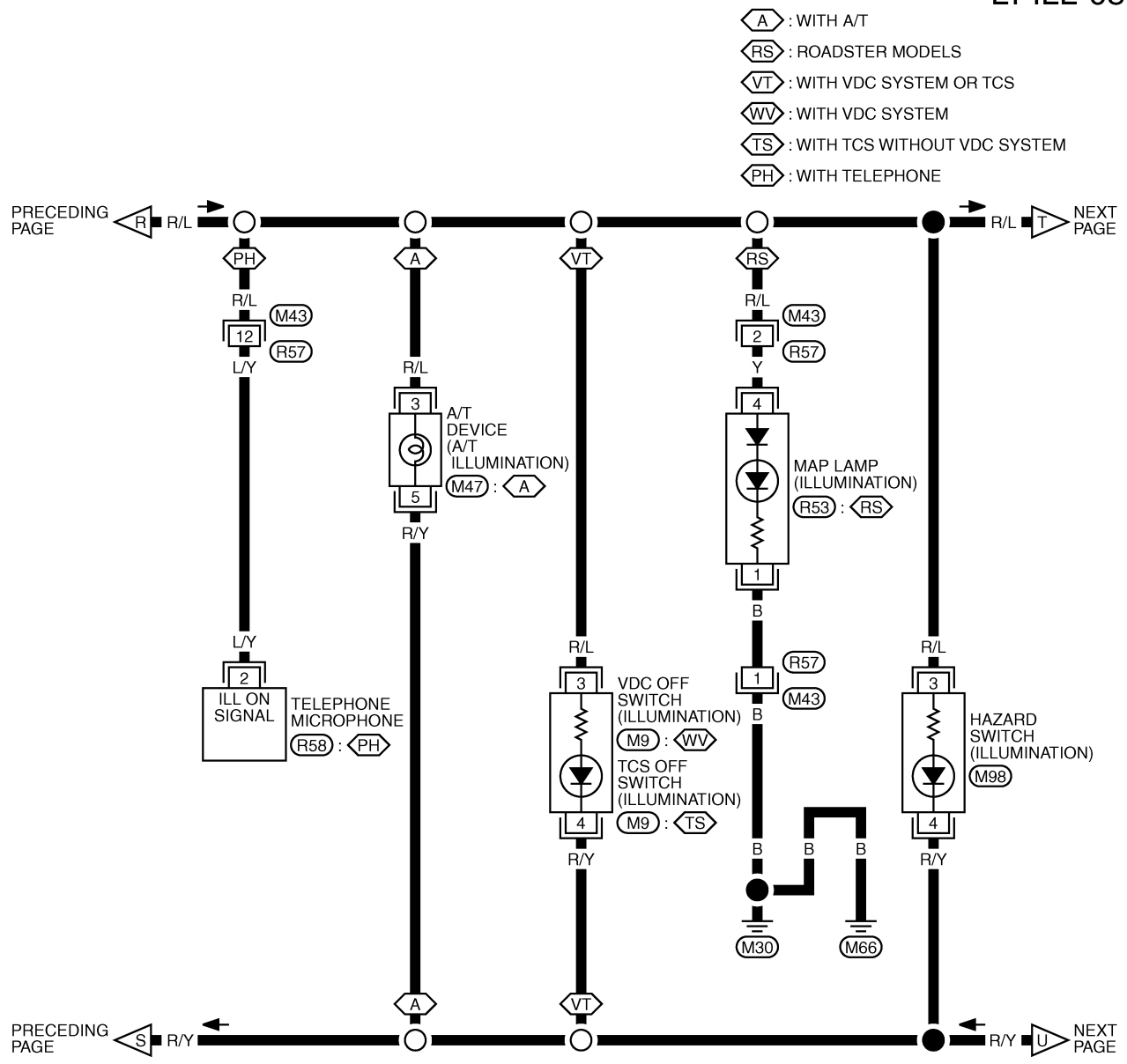


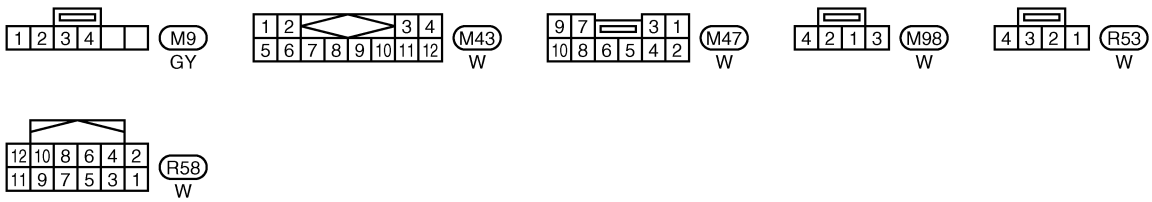


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT4095E

LT-ILL-08

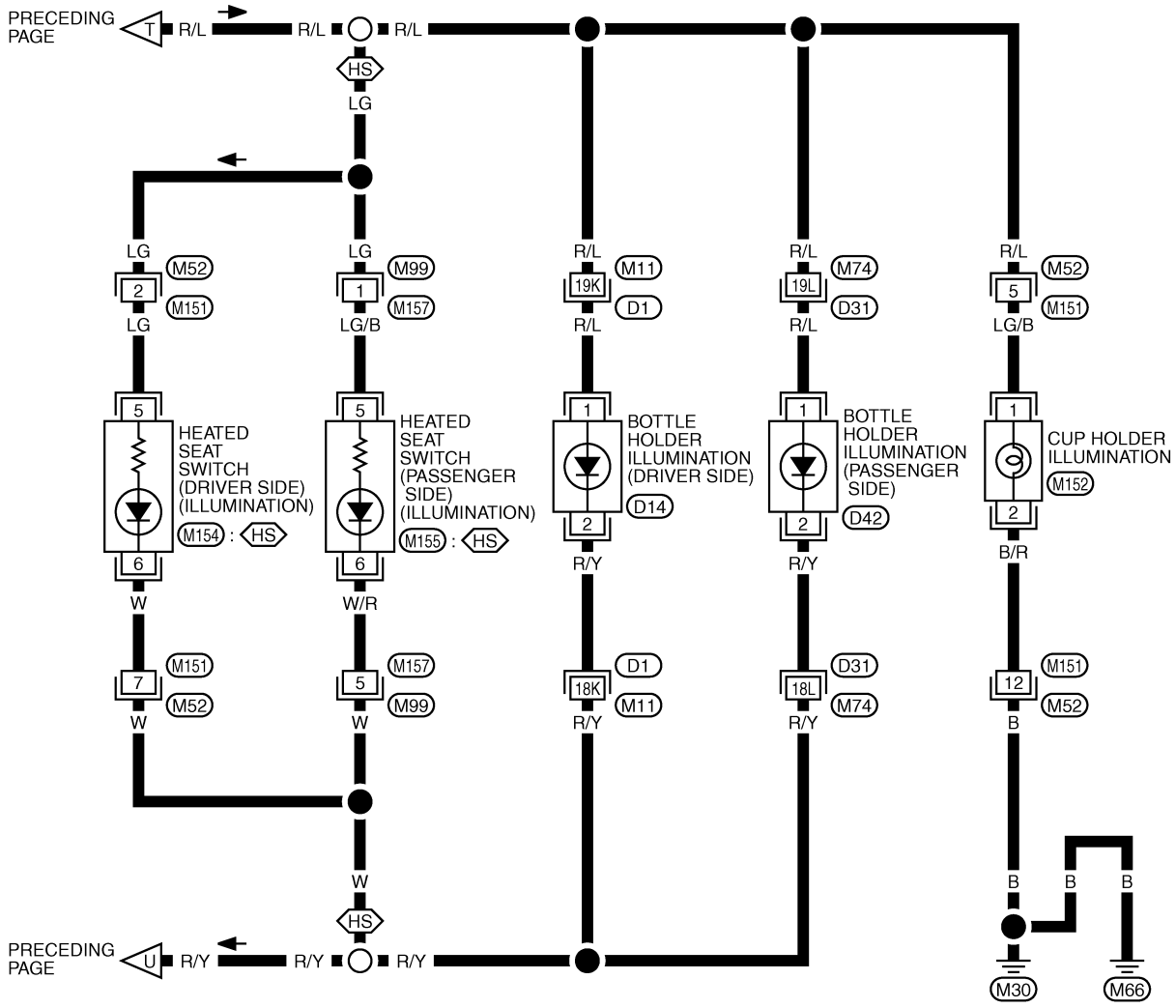




TKWT5771E

LT-ILL-09

HS : WITH HEATED SEAT



M52 W

M99 W

M152 W

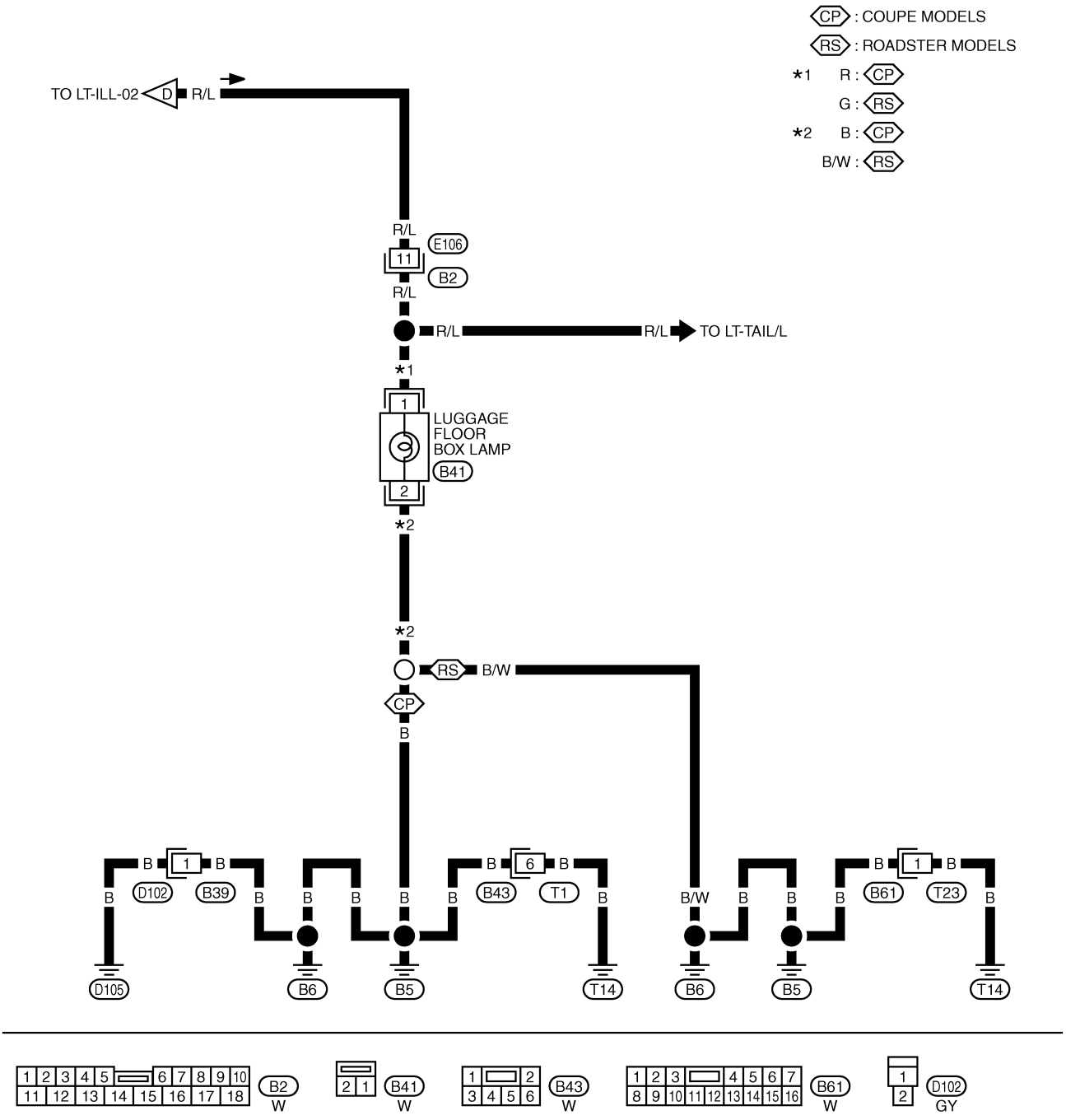
M154 , M155 W BR

D14 , D42 GY GY

REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT4097E

LT-ILL-10



TKWT5772E

Bulb Replacement

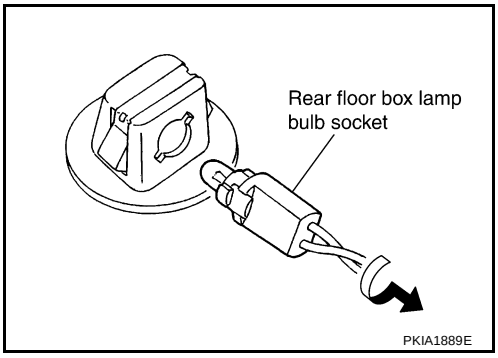
NKS00503

LUGGAGE FLOOR BOX LAMP

1. Remove luggage floor box lamp. Refer to
2. Turn bulb socket counterclockwise to release lock and remove it.

Luggage floor box lamp : 12 V - 1.4W

3. Installation is the reverse order of removal.

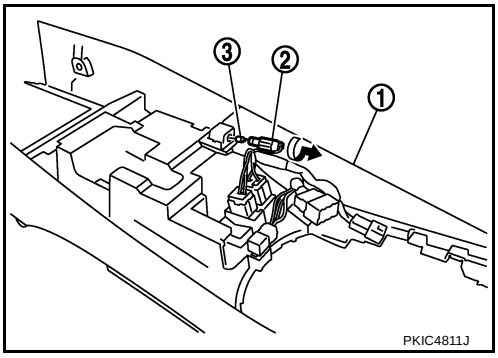


CUP HOLDER ILLUMINATION

1. Remove center console assembly (1). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Turn bulb socket counterclockwise to release lock and remove bulb socket (2).
3. Remove cup holder illumination bulb (3) from its socket.

Cup holder illumination : 12V - 1.1W

4. Installation is the reverse order of removal.

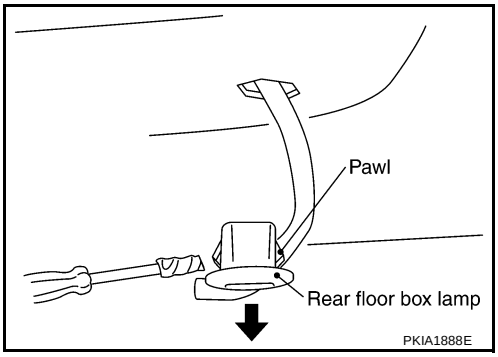


Removal and Installation

NKS00504

LUGGAGE FLOOR BOX LAMP

1. Pull out rear floor box lamp using screwdriver or similar tool.
2. Installation is the reverse order of removal.



BULB SPECIFICATIONS

PFP:26297

Headlamp

NKS00505

Item	Wattage (W)
High / Low	35 (D2R)

Exterior Lamp

NKS00506

Item		Wattage (W)
Front combination lamp	Front turn signal lamp/—	28/8 (amber)
	Parking lamp	5
	Front side marker lamp	LED
Rear combination lamp	Stop/Tail lamp	LED
	Rear turn signal lamp	21 (amber)
	Back-up lamp	21
	Rear side marker lamp	LED
License plate lamp		5
High-mounted stop lamp		LED

Interior Lamp/Illumination

NKS00507

Item	Wattage (W)
Luggage floor box lamp	1.4
Cup holder illumination lamp	1.1
Bottle holder illumination lamp	LED
Map lamp	8
Luggage room lamp	5
Trunk room lamp	3.4
Vanity mirror lamp	1.32
Ignition key hole illumination lamp	1.4

SECTION LU

ENGINE LUBRICATION SYSTEM

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Precautions for Liquid Gasket 2
LIQUID GASKET APPLICATION PROCEDURE 2
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OIL CAPACITY (APPROXIMATE) 13
OIL PUMP 13
REGULATOR VALVE 13

PRECAUTIONS

PFP:00001

Precautions for Battery Service

NBS00018

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Liquid Gasket

NBS00019

LIQUID GASKET APPLICATION PROCEDURE

1. Removal old liquid gasket adhering to the liquid gasket application surface and the mating surface.
   - Remove liquid gasket completely from the liquid gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
3. Apply liquid gasket to the liquid gasket application surface.
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten mounting bolts or nuts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.

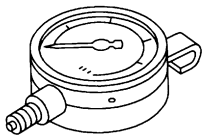
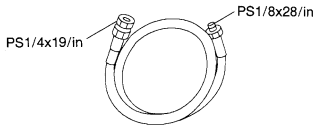
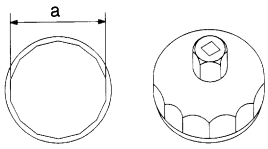
PREPARATION

PFP:00002

Special Service Tools

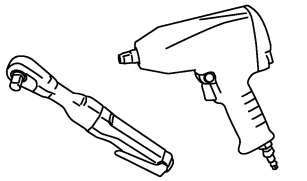
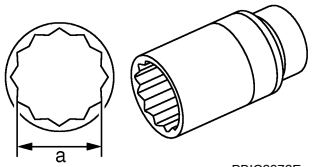
NBS0001A

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST25051001 (J25695-1) Oil pressure gauge  NT050	Measuring oil pressure **Maximum measuring range: 2,452 kPa (25 kg/cm^2 , 356 psi)**
ST25052000 (J25695-2) Hose  S-NT559	Adapting oil pressure gauge to oil pan (upper)
KV10115801 (J38956) Oil filter wrench  S-NT375	Removing oil filter **a: 64.3 mm (2.531 in)**

Commercial Service Tools

NBS0001B

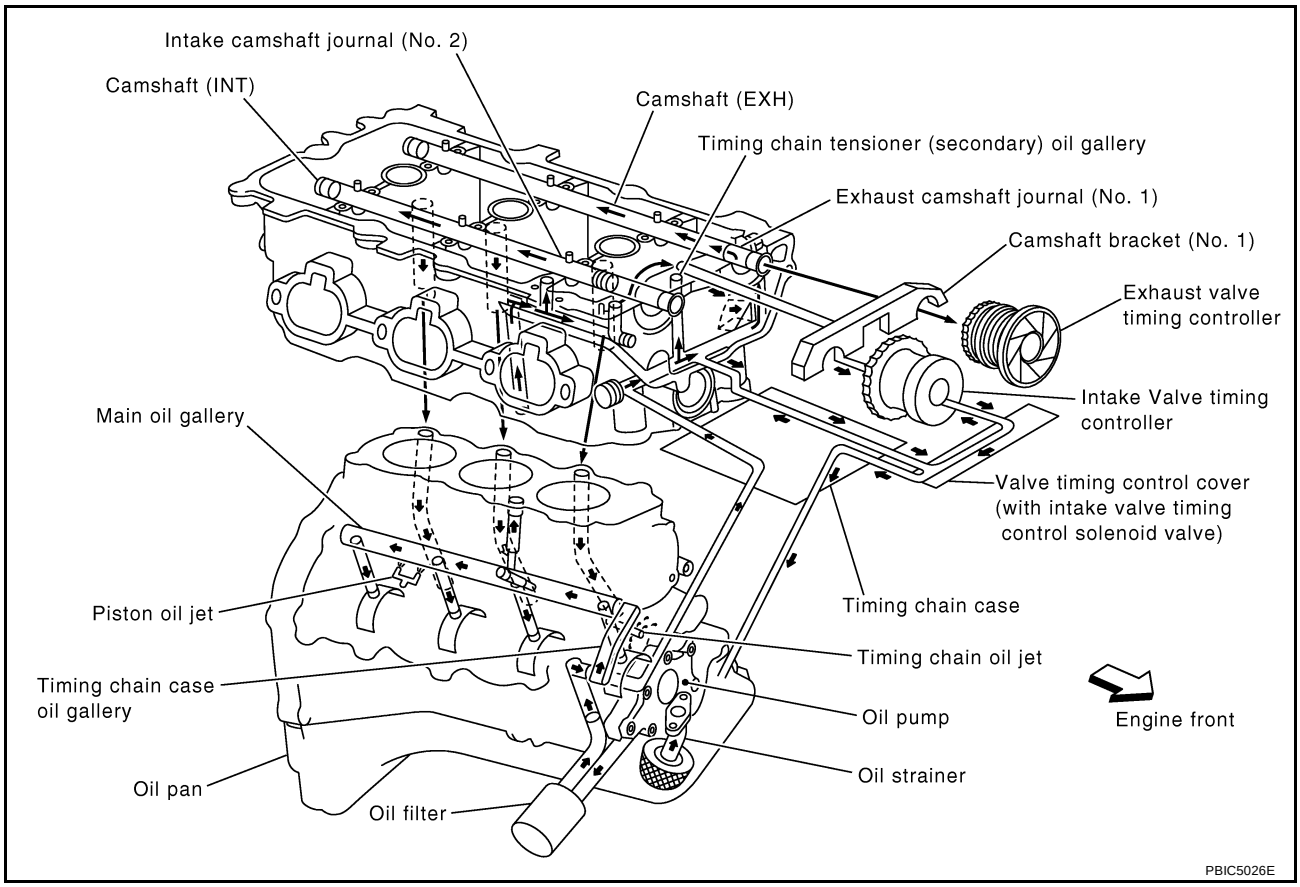
Tool name	Description
Power tool  PBIC0190E	Loosening nuts and bolts
Deep socket  PBIC2072E	Removing and installing oil pressure sensor **a: 24 mm (0.94 in)**

LUBRICATION SYSTEM

PFP:15010

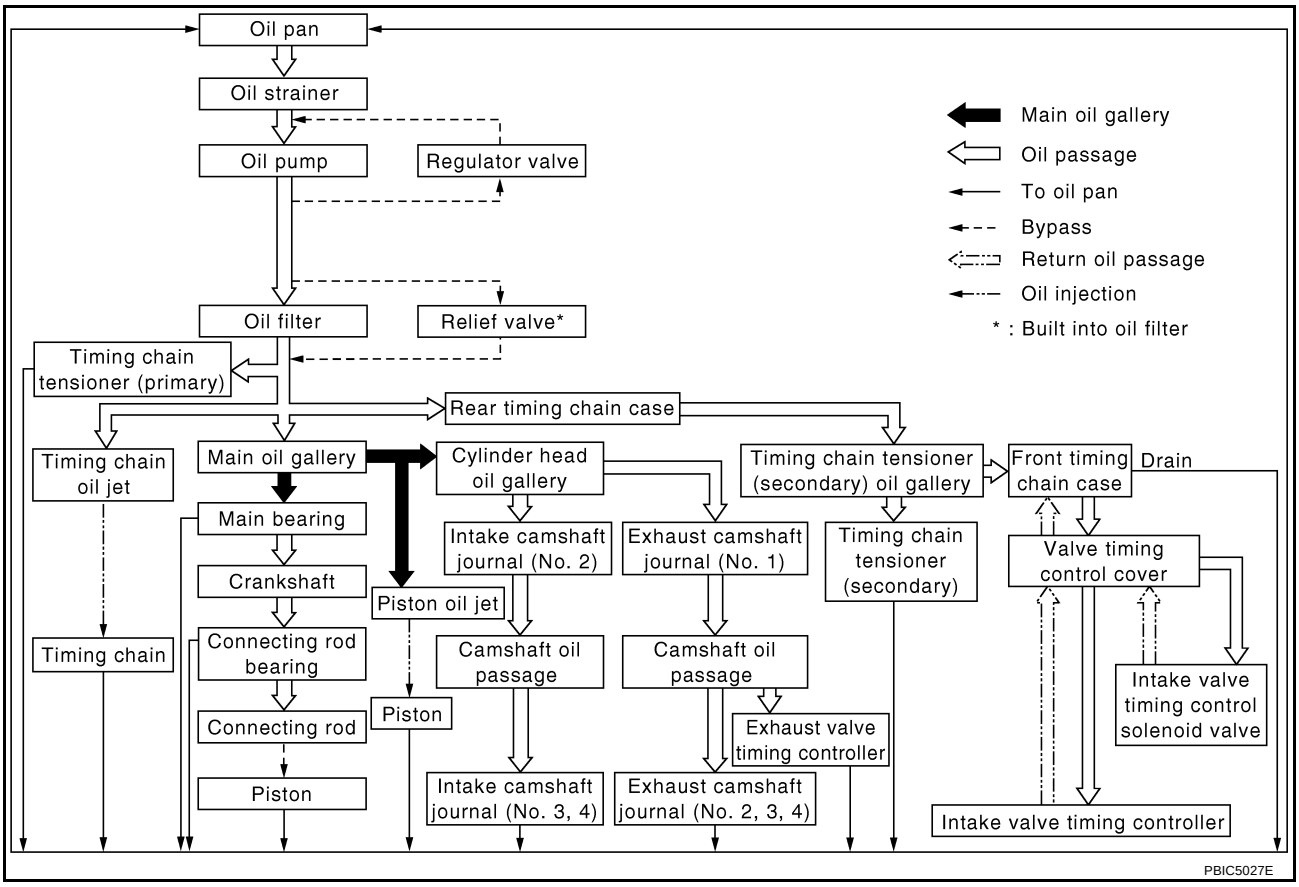
Lubrication Circuit

NBS0001C



System Chart

NBS0001D



ENGINE OIL

PFP:KLA92

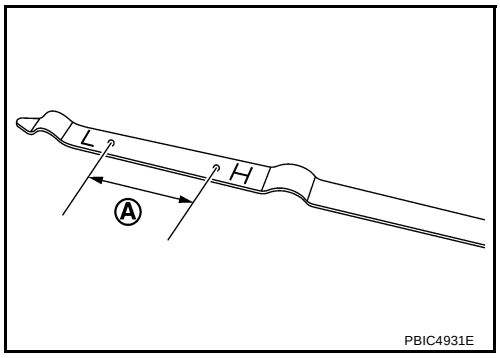
Inspection

NBS0001E

ENGINE OIL LEVEL

NOTE:
Before starting engine, put vehicle horizontally and check the engine oil level. If engine is already started, stop it and allow 10 minutes before checking.

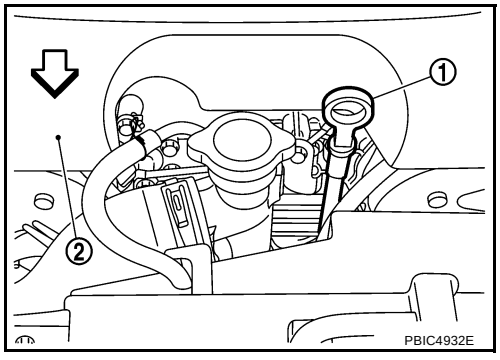
1. Pull out oil level gauge and wipe it clean.
2. Insert oil level gauge and make sure the engine oil level is within the range (A) shown in the figure.
3. If it is out of range, adjust it.



NOTE:
When checking oil level, insert oil level gauge (1) with its tip aligned with oil level gauge guide on cylinder head.

2 : Engine cover

⇦ : Engine front



ENGINE OIL APPEARANCE

- Check engine oil for white turbidity or heavy contamination.
- If engine oil becomes turbid and white, it is highly probable that it is contaminated with engine coolant. Repair or replace damaged parts.

ENGINE OIL LEAKAGE

Check for oil leakage around the following areas:

- Oil pans (lower and upper)
- Oil pan drain plug
- Oil pressure sensor
- Oil filter
- Valve timing control cover
- Mating surface between cylinder head and rocker cover
- Mating surface between front timing chain case and rear timing chain case
- Mating surface between rear timing chain case and cylinder head
- Mating surface between rear timing chain case and cylinder block
- Mating surface between rear timing chain case and oil pan (upper)
- Mating surface between cylinder block and cylinder head
- Mating surface between lower cylinder block and cylinder block
- Crankshaft oil seals (front and rear)
- Camshaft position sensor and exhaust valve timing control position sensor.

OIL PRESSURE CHECK

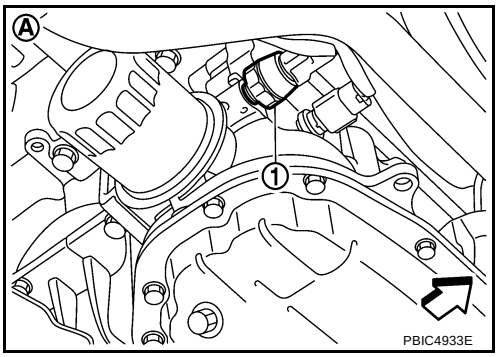
WARNING:

- **Be careful not to burn yourself, as engine oil may be hot.**
- **Oil pressure check should be done in “Neutral position” (M/T models) or “Parking position” (A/T models).**

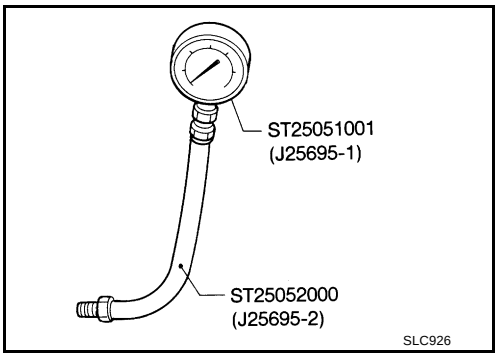
1. Check the engine oil level. Refer to LU-6, "ENGINE OIL LEVEL" .
2. Remove undercover with power tool.
3. Disconnect harness connector at oil pressure sensor, and remove oil pressure sensor using deep socket (commercial service tool).

   CAUTION:
   Do not drop or shock oil pressure sensor.

   1 : Oil pressure switch
   A : 2WD
   ⇦ : Engine front



4. Install the oil pressure gauge (SST) and hose (SST).



5. Start the engine and warm it up to normal operating temperature.
6. Check the engine oil pressure with engine running under no-load.

   NOTE:
   When the engine oil temperature is low, the engine oil pressure becomes high.

   Engine oil pressure [Engine oil temperature at 80 °C (176 °F)]

kPa (kg/cm^2 , psi)

Engine speed	Approximate discharge pressure
Idle speed	More than 98 (1.0, 14)
2,000 rpm	More than 294 (3.0, 43)

   If difference is extreme, check engine oil passage and oil pump for engine oil leaks.
7. After the inspections, install oil pressure sensor as follows:

a. Remove old liquid gasket adhering to oil presser sensor and the mating surface.
b. Apply liquid gasket and tighten oil pressure sensor to the specification.
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

   : 14.7 N·m (1.5 kg-m, 11 ft-lb)

c. After warming up engine, make sure there is no leakage of engine oil with running engine.

Changing Engine Oil

NBS0001F

WARNING:

- **Be careful not to burn yourself, as engine oil may be hot.**

- **Prolonged and repeated contact with used engine oil may cause skin cancer. Try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.**

1. Warm up engine, put vehicle horizontally and check for oil leakage from engine components. Refer to LU-6, "ENGINE OIL LEAKAGE" .
2. Stop the engine and wait for 10 minutes.
3. Loosen oil filler cap and then remove drain plug.
4. Drain engine oil.
5. Install drain plug with new washer. Refer to EM-26, "OIL PAN AND OIL STRAINER" .

   CAUTION:
   Be sure to clean drain plug and install with new washer.

   Oil pan drain plug:

   : 34.3 N·m (3.5 kg-m, 25 ft-lb)

6. Refill with new engine oil.
   Engine oil specification and viscosity:
   Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .

   Engine oil capacity (Approximate):

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.9 (5-1/8, 4-1/4)
	Without oil filter change	4.6 (4-7/8, 4)
Dry engine (Overhaul)		5.5 (5-3/4, 4-7/8)

CAUTION:
- **When filling engine oil, do not pull out oil level gauge.**
- **The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.**
- **Always use oil level gauge to determine the proper amount of engine oil in the engine.**

7. Warm up engine and check area around drain plug and oil filter for oil leakage.
8. Stop engine and wait for 10 minutes.
9. Check the engine oil level. Refer to LU-6, "ENGINE OIL LEVEL" .

OIL FILTER

PFP:15208

Removal and Installation

NBS0001G

REMOVAL

WARNING:

Be careful not to get burned when engine and engine oil may be hot.

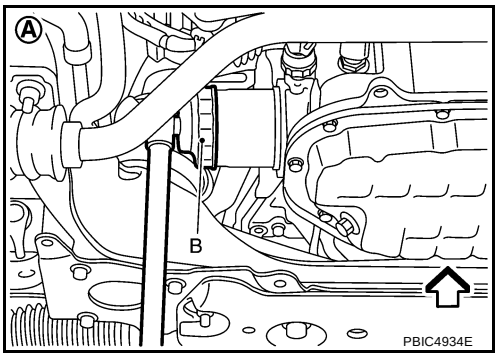
CAUTION:

- **Oil filter is provided with relief valve. Use Genuine NISSAN Oil Filter or equivalent.**
- **When removing, prepare a shop cloth to absorb any engine oil leakage or spillage.**
- **Do not allow engine oil to adhere to drive belts.**
- **Completely wipe off any engine oil that adheres to engine and vehicle.**

1. Remove undercover with power tool.
2. Using oil filter wrench [SST: KV10115801(J38956)] (B), remove oil filter.

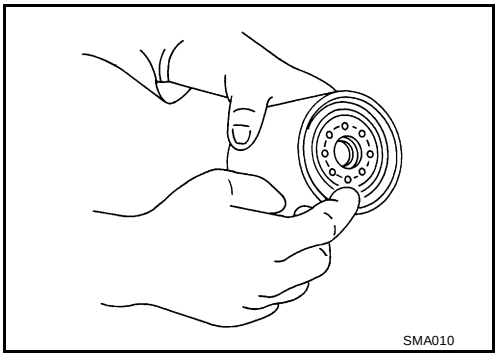
A : 2WD

⇦ : Engine front



INSTALLATION

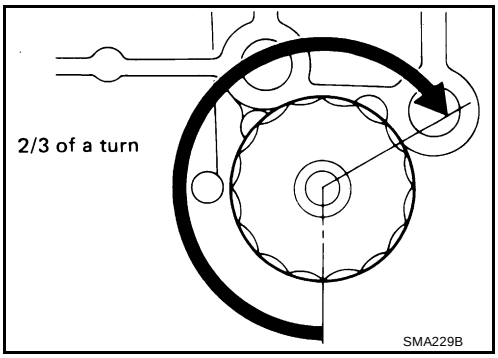
1. Remove foreign materials adhering to oil filter installation surface.
2. Apply engine oil to the oil seal contact surface of new oil filter.



3. Screw oil filter manually until it touches the installation surface, then tighten it by 2/3 turn. Or tighten to specification.

Oil filter:

: 17.7 N·m (1.8 kg-m, 13 ft-lb)



INSPECTION AFTER INSTALLATION

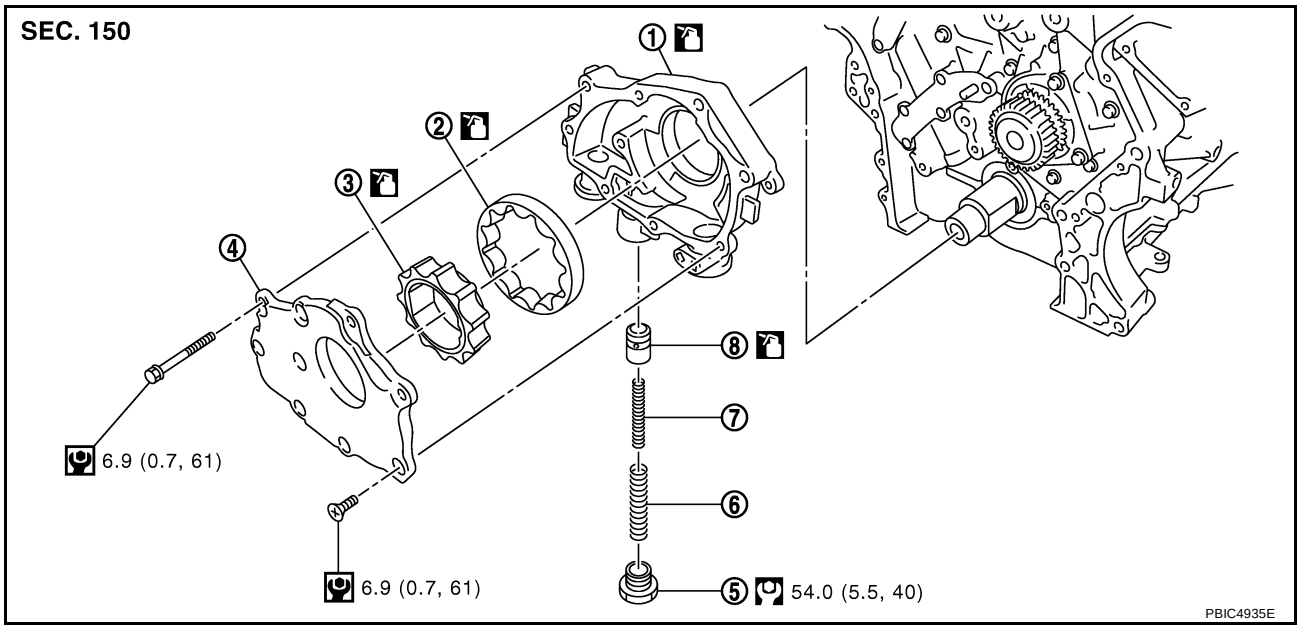
1. Check the engine oil level. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leaks of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and adjust engine oil. Refer to LU-6, "ENGINE OIL" .

OIL PUMP

PFP:15010

Removal and Installation

NBS0001I



1. Oil pump body
2. Oil pump outer rotor
3. Oil pump inner rotor
4. Oil pump cover
5. Regulator valve plug
6. Regulator valve spring
7. Regulator valve spring
8. Regulator valve

- Refer to GI-11, "Components" for symbol marks in the figure.

REMOVAL

1. Remove oil pan (lower) and oil strainer. Refer to EM-26, "OIL PAN AND OIL STRAINER" .
2. Remove front timing chain case and timing chain (primary). Refer to EM-53, "TIMING CHAIN" .
3. Remove oil pump assembly.

INSTALLATION

CAUTION:

Before installation, apply new engine oil to the parts as instructed in the figure.

Note the following, and install in the reverse order of removal.

- When installing, align crankshaft flat faces with inner rotor flat faces.

INSPECTION AFTER INSTALLATION

1. Check the engine oil level. Refer to LU-6, "ENGINE OIL" .
2. Start engine, and check there is no leaks of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and adjust engine oil. Refer to LU-6, "ENGINE OIL" .

Disassembly and Assembly

NBS0001J

DISASSEMBLY

1. Remove oil pump cover.
2. Remove oil pump inner rotor and oil pump outer rotor from oil pump body.
3. After removing regulator valve plug, remove regulator valve spring and regulator valve.

INSPECTION AFTER DISASSEMBLY

Oil Pump Clearance

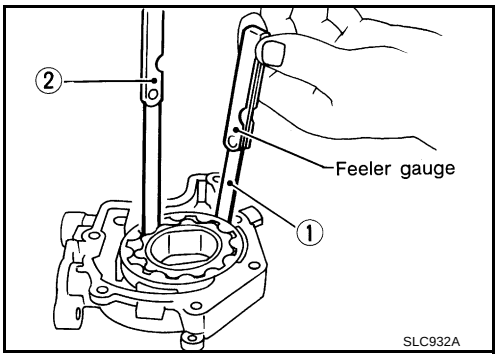
- Measure the clearance with feeler gauge.

– Clearance between oil pump outer rotor and oil pump body (Position “1”)

Standard : 0.114 - 0.260 mm (0.0045 - 0.0102 in)

– Tip clearance between oil pump inner rotor and oil pump outer rotor (Position “2”)

Standard : Below 0.180 mm (0.0071 in)



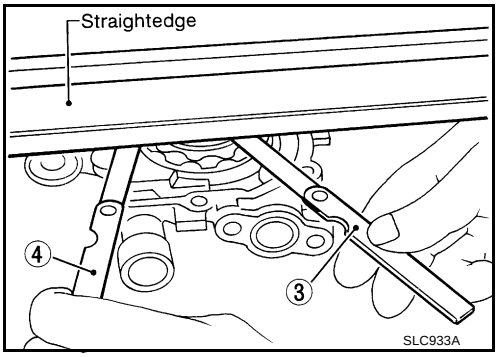
- Measure the clearance with feeler gauge and straightedge.

– Side clearance between oil pump inner rotor and oil pump body (Position “3”)

Standard : 0.030 - 0.070 mm (0.0012 - 0.0028 in)

– Side clearance between oil pump outer rotor and oil pump body (Position “4”)

Standard : 0.030 - 0.090 mm (0.0012 - 0.0035 in)



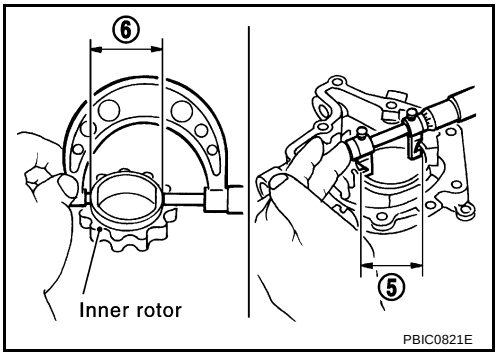
- Calculate the clearance between oil pump inner rotor and oil pump body as follows:

OIL PUMP BODY INNER DIAMETER

– Measure the inner diameter of oil pump body with inside micrometer. (Position “5”)

OIL PUMP INNER ROTOR OUTER DIAMETER

– Measure the outer diameter of protruded portion of oil pump inner rotor with micrometer. (Position “6”)



OIL PUMP INNER ROTOR TO OIL PUMP BODY CLEARANCE

– (Clearance) = (Oil pump body inner diameter) – (Oil pump inner rotor outer diameter)

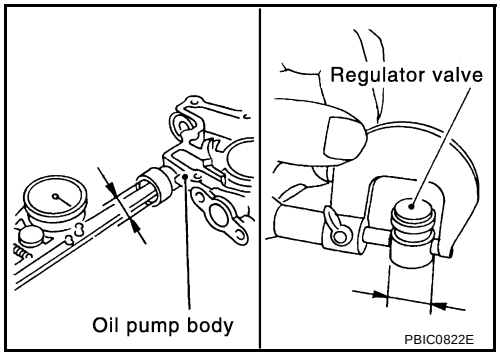
Standard : 0.045 - 0.091 mm (0.0018 - 0.0036 in)

- If measured/calculated values are out of the standard, replace oil pump assembly.

Regulator Valve Clearance

(Clearance) = (Valve hole diameter) – (Regulator valve outer diameter)

Standard : 0.040 - 0.097 mm (0.0016 - 0.0038 in)



- If the calculated value is out of the standard, replace oil pump assembly.

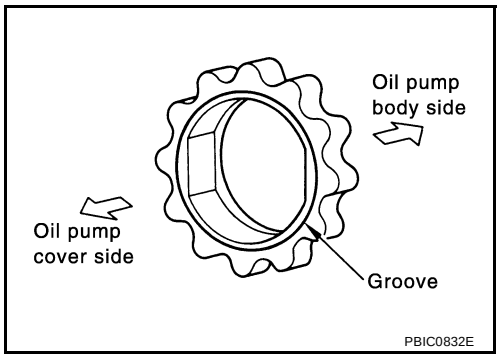
CAUTION:

- **Coat regulator valve with engine oil.**
- **Make sure that it falls smoothly into valve hole by its own weight.**

ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

- Install oil pump inner rotor with the groove faced to oil pump cover side.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

NBS0001K

OIL PRESSURE

kPa (kg/cm^2 , psi)

Engine speed	Approximate discharge pressure*
Idle speed	More than 98 (1.0, 14)
2,000 rpm	More than 294 (3.0, 43)

*: Engine oil temperature at 80°C (176°F)

OIL CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.9 (5-1/8, 4-1/4)
	Without oil filter change	4.6 (4-7/8, 4)
Dry engine (Overhaul)		5.5 (5-3/4, 4-7/8)

OIL PUMP

Unit: mm (in)

Oil pump body to oil pump outer rotor radial clearance	0.114 - 0.260 (0.0045 - 0.0102)
Oil pump inner rotor to oil pump outer rotor tip clearance	Below 0.180 (0.0071)
Oil pump body to oil pump inner rotor side clearance	0.030 - 0.070 (0.0012 - 0.0028)
Oil pump body to oil pump outer rotor side clearance	0.030 - 0.090 (0.0012 - 0.0035)
Oil pump inner rotor to oil pump body clearance	0.045 - 0.091 (0.0018 - 0.0036)

REGULATOR VALVE

Unit: mm (in)

Regulator valve to oil pump body clearance	0.040 - 0.097 (0.0016 - 0.0038)

SECTION MA
MAINTENANCE

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

NLS00001

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

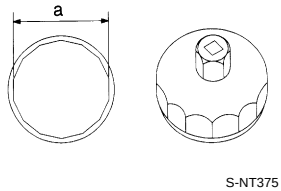
PREPARATION

PFP:00002

Special Service Tools

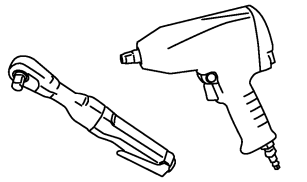
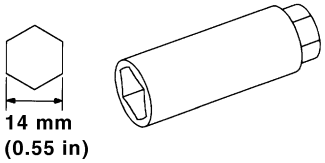
NLS00002

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV10115801 (J38956) Oil filter wrench  S-NT375	Removing and installing oil filter **a: 64.3 mm (2.531 in)**

Commercial Service Tools

NLS00003

(Kent-Moore No.) Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
Spark plug wrench  PBIC3874E	Removing and installing spark plug

GENERAL MAINTENANCE

PFP:00000

Explanation of General Maintenance

NLS00004

General maintenance includes those items which should be checked during the normal day-to-day operation of the vehicle. They are essential if the vehicle is to continue operating properly. The owners can perform checks and inspections themselves or have their NISSAN dealers do them.

OUTSIDE THE VEHICLE

The maintenance items listed here should be performed from time to time, unless otherwise specified.

Item		Reference page
Tires	Check the pressure with a gauge, including the spare, at least once a month and always prior to a long distance trips. Adjust to the specified pressure if necessary. Check carefully for damage, cuts or excessive wear.	—
Wheel nuts	When checking the tires, make sure no nuts are missing, and check for any loose nuts. Tighten if necessary.	—
Windshield	Clean the windshield on a regular basis. Check the windshield at least every six months for cracks or other damage. Repair as necessary.	—
Tire rotation	Tires cannot be rotated in this vehicle, as front tires are different size from rear tires and the direction of wheel rotation is fixed in each tire.	MA-25
Transmitter components in tire pressure monitoring system (TPMS)	Replace grommet seal, valve core and cap of the transmitter in TPMS every tire replacement by reaching wear limit of tire.	WT-10
Wheel alignment and balance	If the vehicle pulls to either side while driving on a straight and level road, or if you detect uneven or abnormal tire wear, there may be a need for wheel alignment. If the steering wheel or seat vibrates at normal highway speeds, wheel balancing may be needed.	MA-23, FSU-6
Windshield wiper blades	Check for cracks or wear if they do not wipe properly.	—
Doors and engine hood	Check that all doors and the engine hood operate smoothly as well as the trunk lid and back hatch. Also make sure that all latches lock securely. Lubricate if necessary. Make sure that the secondary latch keeps the hood from opening when the primary latch is released. When driving in areas using road salt or other corrosive materials, check lubrication frequently.	MA-28
Lamps	Make sure that the headlamps, stop lamps, tail lamps, turn signal lamps, and other lamps are all operating properly and installed securely. Also check headlamp aim. Clean the headlamps on a regular basis.	—

INSIDE THE VEHICLE

The maintenance items listed here should be checked on a regular basis, such as when performing periodic maintenance, cleaning the vehicle, etc.

Item		Reference page
Warning lamps and chimes	Make sure that all warning lamps and chimes are operating properly.	—
Windshield wiper and washer	Check that the wipers and washer operate properly and that the wipers do not streak.	—
Windshield defroster	Check that the air comes out of the defroster outlets properly and in sufficient quantity when operating the heater or air conditioner.	—
Steering wheel	Check that it has the specified play. Be sure to check for changes in the steering condition, such as excessive play, hard steering or strange noises. **Free play: Less than 35 mm (1.38 in)**	—
Seats	Check seat position controls such as seat adjusters, seatback recliner, etc. to make sure they operate smoothly and that all latches lock securely in every position. Check that the head restrains move up and down smoothly and that the locks (if equipped) hold securely in all latched positions. Check that the latches lock securely for folding-down rear seatbacks.	—

Item		Reference page
Seat belts	Check that all parts of the seat belt system (e.g. buckles, anchors, adjusters and retractors) operate properly and smoothly, and are installed securely. Check the belt webbing for cuts, fraying, wear or damage.	MA-29
Accelerator pedal	Check the pedal for smooth operation and make sure the pedal does not catch or require uneven effort. Keep the floor mats away from the pedal.	—
Clutch Pedal	Make sure the pedal operates smoothly and check it has the proper free play.	—
Brakes	Check that the brake does not pull the vehicle to one side when applied.	—
Brake pedal and booster	Check the pedal for smooth operation and make sure it has the proper distance under it when depressed fully. Check the brake booster function. Be sure to keep the floor mats away from the pedal.	BR-7, BR-23
Parking brake	Check that the lever has the proper travel and make sure that the vehicle is held securely on a fairly steep hill when only the parking brake is applied.	PB-3
Automatic transmission "Park" mechanism	Check that the lock release button on the selector lever operates properly and smoothly. On a fairly steep hill check that the vehicle is held securely with the selector lever in the "P" position without applying any brakes.	—

UNDER THE HOOD AND VEHICLE

The maintenance items listed here should be checked periodically (e.g. each time you check the engine oil or refuel).

Item		Reference page
Windshield washer fluid	Check that there is adequate fluid in the tank.	—
Engine coolant level	Check the coolant level when the engine is cold.	MA-13
Radiator and hoses	Check the front of the radiator and clean off any dirt, insects, leaves, etc., that may have accumulated. Make sure the hoses have no cracks, deformation, deterioration or loose connections.	—
Brake and clutch fluid levels	Make sure that the brake and clutch fluid levels are between the "MAX" and "MIN" lines on the reservoirs.	MA-25, MA-20
Battery	Check the fluid level in each cell. It should be between the "MAX" and "MIN" lines. Vehicles operated in high temperatures or under severe conditions require frequent checks of the battery fluid level.	—
Engine drive belts	Make sure that no belt is frayed, worn, cracked or oily.	MA-13
Engine oil level	Check the level on oil level gauge after parking the vehicle on a level spot and turning off the engine.	MA-16
Power steering fluid level and lines	Check the level on the dipstick with the engine off. Check the lines for improper attachment, leaks, cracks, etc.	MA-27
Exhaust system	Make sure there are no loose supports, cracks or holes. If the sound of the exhaust seems unusual or there is a smell of exhaust fumes, immediately locate the trouble and correct it.	MA-20
Underbody	The underbody is frequently exposed to corrosive substances such as those used on icy roads or to control dust. It is very important to remove these substances, otherwise rust will form on the floor pan, frame, fuel lines and around the exhaust system. At the end of winter, the underbody should be thoroughly flushed with plain water, being careful to clean those areas where mud and dirt can easily accumulate.	—
Fluid leaks	Check under the vehicle for fuel, oil, water or other fluid leaks after the vehicle has been parked for a while. Water dripping from the air conditioner after use is normal. If you should notice any leaks or gasoline fumes are evident, check for the cause and correct it immediately.	—

PERIODIC MAINTENANCE

PFP:00026

Introduction of Periodic Maintenance

NLS00005

Two different maintenance schedules are provided, and should be used, depending upon the conditions in which the vehicle is mainly operated. **After 60,000 miles (96,000 km) or 48 months, continue the periodic maintenance at the same mileage/time intervals.**

Schedule 1	Follow Periodic Maintenance Schedule 1 if the driving habits frequently include one or more of the following driving conditions: ● Repeated short trips of less than 5 miles (8 km). ● Repeated short trips of less than 10 miles (16 km) with outside temperatures remaining below freezing. ● Operating in hot weather in stop-and-go “rush hour” traffic. ● Extensive idling and/or low speed driving for long distances, such as police, taxi or door-to-door delivery use. ● Driving in dusty conditions. ● Driving on rough, muddy, or salt spread roads. ● Towing a trailer, using a camper or a car-top carrier.	Emission Control System Maintenance	MA-8
		Chassis and Body Maintenance	MA-9
Schedule 2	Follow Periodic Maintenance Schedule 2 if none of driving conditions shown in Schedule 1 apply to the driving habits.	Emission Control System Maintenance	MA-10
		Chassis and Body Maintenance	MA-10

Schedule 1

NLS00006

EMISSION CONTROL SYSTEM MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary. [ ]: At the mileage intervals only

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	3.75 (6) 3	7.50 (12) 6	11.25 (18) 9	15 (24) 12	18.75 (30) 15	22.5 (36) 18	26.25 (42) 21	30 (48) 24	
Drive belts	NOTE (1)									MA-13
Air cleaner filter	NOTE (2)								[R]	MA-16
EVAP vapor lines									I*	MA-19
Fuel lines									I*	MA-16
Fuel filter	NOTE (3)									-
Engine coolant	NOTE (4)									MA-13
Engine oil		R	R	R	R	R	R	R	R	MA-16
Engine oil filter (Use part No. 15208 65F01 or equivalent.)		R	R	R	R	R	R	R	R	MA-17
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (169,000 km).								MA-18
Intake & exhaust valve clearance*	NOTE (5)									EM-80

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	33.75 (54) 27	37.5 (60) 30	41.25 (66) 33	45 (72) 36	48.75 (78) 39	52.5 (84) 42	56.25 (90) 45	60 (96) 48	
Drive belts	NOTE (1)								I*	MA-13
Air cleaner filter	NOTE (2)								[R]	MA-16
EVAP vapor lines									I*	MA-19
Fuel lines									I*	MA-16
Fuel filter	NOTE (3)									-
Engine coolant	NOTE (4)								R*	MA-13
Engine oil		R	R	R	R	R	R	R	R	MA-16
Engine oil filter (Use part No. 15208 65F01 or equivalent.)		R	R	R	R	R	R	R	R	MA-17
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (169,000 km).								MA-18
Intake & exhaust valve clearance*	NOTE (5)									EM-80

NOTE:

(1) After 60,000 miles (96,000 km) or 48 months, inspect every 15,000 miles (24,000 km) or 12 months. Replace the drive belts if found damaged or if auto belt tensioner reading reaches maximum limit.

(2) If operating mainly in dusty conditions, more frequent maintenance may be required.

(3) Maintenance-free item. For service procedures, refer to FL section.

(4) After 60,000 miles (96,000 km) or 48 months, replace every 30,000 miles (48,000 km) or 24 months.

(5) If valve noise increases, inspect valve clearance.

* Maintenance items and intervals with “*” are recommended by NISSAN for reliable vehicle operation. The owner need not perform such maintenance in order to maintain the emission warranty or manufacturer recall liability. Other maintenance items and intervals are required.

CHASSIS AND BODY MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	3.75 (6) 3	7.50 (12) 6	11.25 (18) 9	15 (24) 12	18.75 (30) 15	22.5 (36) 18	26.25 (42) 21	30 (48) 24	
Brake lines & cables					I				I	MA-25
Brake pads & rotors			I		I		I		I	MA-25
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)				I				I	MA-20, MA-22 , MA-20 , MA-23
Steering gear & linkage, axle & suspension parts			I		I		I		I	MA-26, RSU-5 , MA-27
Tire rotation	NOTE (2)									MA-5, MA-25
Exhaust system			I		I		I		I	MA-20

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	33.75 (54) 27	37.5 (60) 30	41.25 (66) 33	45 (72) 36	48.75 (78) 39	52.5 (84) 42	56.25 (90) 45	60 (96) 48	
Brake lines & cables					I				I	MA-25
Brake pads & rotors			I		I		I		I	MA-25
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)				I				I	MA-20, MA-22 , MA-20 , MA-23
Steering gear & linkage, axle & suspension parts			I		I		I		I	MA-26, RSU-5 , MA-27
Tire rotation	NOTE (2)									MA-5, MA-25
Exhaust system			I		I		I		I	MA-20

NOTE:

(1) If towing a trailer, using a camper or a car-top carrier, or driving on rough or muddy roads, change (not just inspect) oil at every 30,000 miles (48,000 km) or 24 months. **Using automatic transmission fluid other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.**

(2) Tires cannot be rotated in this vehicle. Refer to “Tire rotation” under the “GENERAL MAINTENANCE” heading earlier in this section.

Schedule 2

NLS00007

EMISSION CONTROL SYSTEM MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary. [ ]: At the mileage intervals only

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	7.5 (12) 6	15 (24) 12	22.5 (36) 18	30 (48) 24	37.5 (60) 30	45 (72) 36	52.5 (84) 42	60 (96) 48	
Drive belts	NOTE (1)								I*	MA-13
Air cleaner filter					[R]				[R]	MA-16
EVAP vapor lines					I*				I*	MA-19
Fuel lines					I*				I*	MA-16
Fuel filter	NOTE (2)									-
Engine coolant	NOTE (3)								R*	MA-13
Engine oil		R	R	R	R	R	R	R	R	MA-16
Engine oil filter (Use part No. 15208 65F01 or equivalent.)		R	R	R	R	R	R	R	R	MA-17
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (169,000 km).								MA-18
Intake & exhaust valve clearance*	NOTE (4)									EM-80

NOTE:

(1) After 60,000 miles (96,000 km) or 48 months, inspect every 15,000 miles (24,000 km) or 12 months. Replace the drive belts if found damaged or if auto belt tensioner reading reaches maximum limit.

(2) Maintenance-free item. For service procedures, refer to FL section.

(3) After 60,000 miles (96,000 km) or 48 months, replace every 30,000 miles (48,000 km) or 24 months.

(4) If valve noise increases, inspect valve clearance.

* Maintenance items and intervals with "*" are recommended by NISSAN for reliable vehicle operation. The owner need not perform such maintenance in order to maintain the emission warranty or manufacturer recall liability. Other maintenance items and intervals are required

CHASSIS AND BODY MAINTENANCE

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								Reference Section - Page or - Content Title
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	7.5 (12) 6	15 (24) 12	22.5 (36) 18	30 (48) 24	37.5 (60) 30	45 (72) 36	52.5 (84) 42	60 (96) 48	
Brake lines & cables			I		I		I		I	MA-25
Brake pads & rotors			I		I		I		I	MA-25
Automatic transmission fluid, manual transmission & differential gear oil	NOTE (1)		I		I		I		I	MA-20, MA-20 , MA-23
Steering gear & linkage, axle & suspension parts					I				I	MA-26, RSU-5, MA-27
Tire rotation	NOTE (2)									MA-5, MA-25
Exhaust system					I				I	MA-20

NOTE:

(1) Using automatic transmission fluid other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.

(2) Tires cannot be rotated in this vehicle. Refer to "Tire rotation" under the "GENERAL MAINTENANCE" heading earlier in this section.

RECOMMENDED FLUIDS AND LUBRICANTS

PFP:00000

Fluids and Lubricants

NLS00008

		Capacity (Approximate)			Recommended Fluids/Lubricants
		US measure	Imp measure	Liter	
Engine oil Drain and refill	With oil filter change	5-1/8 qt	4-1/4 qt	4.9	● Engine oil with API Certification Mark*1 ● Viscosity SAE 5W-30
	Without oil filter change	4-7/8 qt	4 qt	4.6	
Dry engine (Overhaul)		5-3/4 qt	4-7/8 qt	5.5	
Cooling system	With reservoir tank	9-1/2 qt	7-7/8 qt	9.0	Genuine NISSAN Long Life Antifreeze/ Coolant or equivalent
	Reservoir tank	7/8 qt	3/4 qt	0.8	
Automatic transmission fluid		10-7/8 qt	9-1/8 qt	10.3	Genuine NISSAN Matic J ATF*2
Manual transmission gear oil		6-1/4 pt	5-1/8 pt	2.93	Genuine NISSAN Manual Transmission Fluid (MTF) HQ Multi 75W-85 or API GL-4,Viscosity SAE 75W-85 or 75W-90
Power steering fluid (PSF)		1-1/8 qt	7/8 qt	1.0	Genuine NISSAN PSF or equivalent*3
Brake and clutch fluid		—	—	—	Genuine NISSAN Super Heavy Duty Brake Fluid*4 or equivalent DOT 3 (US FMVSS No. 116)
Differential gear oil		3 pt	2-1/2 pt	1.4	API GL-5, Viscosity SAE 80W-90*5
Multi-purpose grease		—	—	—	NLGI No. 2 (Lithium soap base)
Windshield washer fluid		—	—	—	Genuine NISSAN Windshield Washer Concentrate Cleaner & Antifreeze or equivalent
Fuel recommendation		—	—	—	Refer toGI-5, "Precautions for Fuel (Unleaded Premium Gasoline Required)" .

*1: For further details, see “Engine Oil Recommendation”.

*2: **Using automatic transmission fluid other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty** .

*3: For Canada, NISSAN Automatic Transmission Fluid (ATF), DEXRON™ III/ MERCON™ or equivalent ATF may also be used.

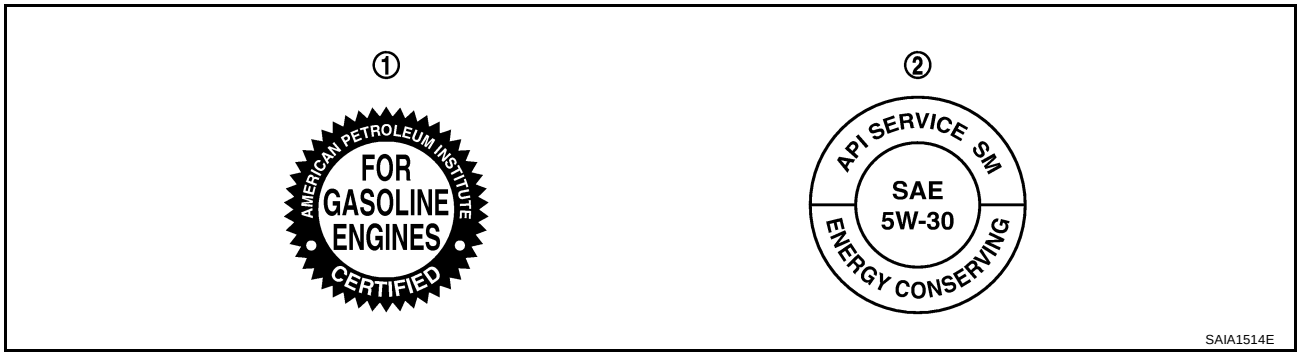
*4: Available in mainland U.S.A. through your NISSAN dealer.

*5: For hot climates, viscosity SAE 90 is suitable for ambient temperatures above 0°C(32°F).

Engine Oil Recommendation

NLS0009U

NISSAN recommends the use of an energy conserving oil in order to improve fuel economy.
Select only engine oils that meet the American Petroleum Institute (API) certification and International Lubricant Standardization and Approval Committee (ILSAC) certification and SAE viscosity standard. These oils have the API certification mark on the front of the container. Oils which do not have the specified quality label should not be used as they could cause engine damage.



1. API certification mark
2. API service symbol

ANTI-FREEZE COOLANT MIXTURE RATIO

The engine cooling system is filled at the factory with a high-quality, year-round, anti-freeze coolant solution. The anti-freeze solution contains rust and corrosion inhibitors. Therefore, additional cooling system additives are not necessary.

CAUTION:
When adding or replacing coolant, be sure to use only Genuine NISSAN Long Life Antifreeze/ Coolant or equivalent with the proper mixture ratio of 50% anti-freeze and 50% demineralized water/distilled water.
Other types of coolant solutions may damage your cooling system.

Outside temperature down to		Anti-freeze	Demineralized water or distilled water
°C	°F		
–35	–30	50%	50%

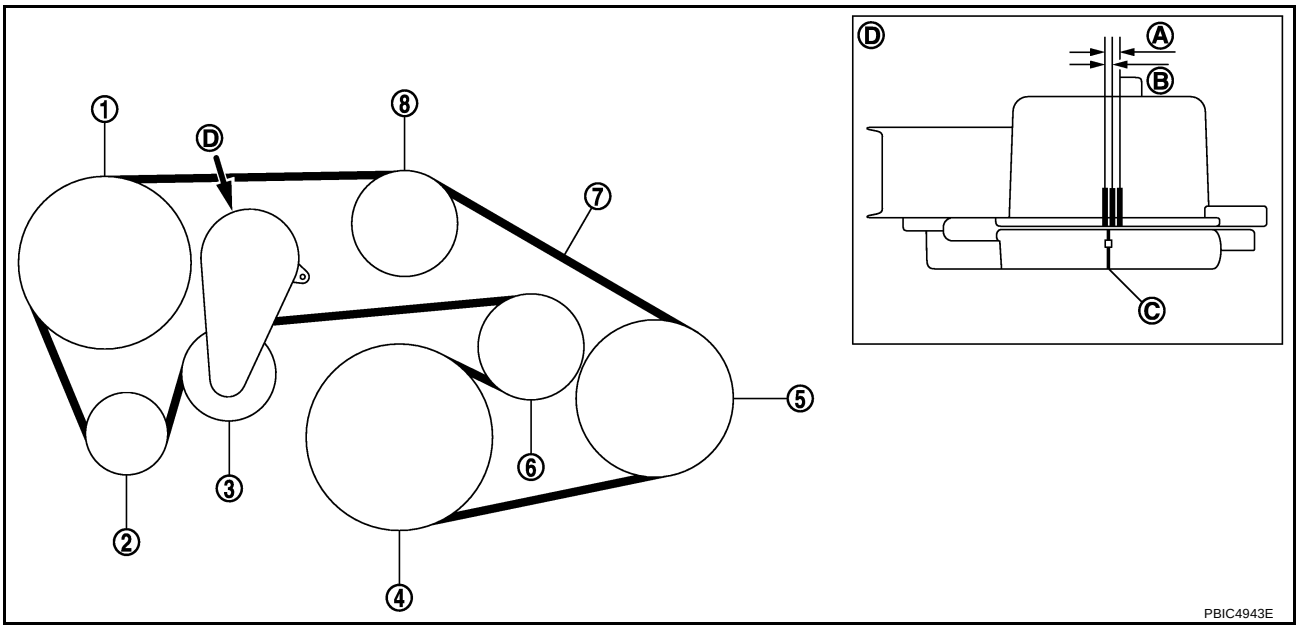
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ENGINE MAINTENANCE

PFP:00000

Checking Drive Belts

NLS0009V



1.	Power steering oil pump	2.	Alternator	3.	Drive belt auto-tensioner
4.	Crankshaft pulley	5.	A/C compressor	6.	Idler pulley
7.	Drive belt	8.	Idler pulley		
A.	Possible use range	B.	Range when new drive belt is installed	C.	Indicator
D.	View D				

WARNING:

Be sure to perform this step when engine is stopped.

- Make sure that the indicator (C) (notch on fixed side) of drive belt auto-tensioner is within the possible use range (A).

  NOTE:
  Check the drive belt auto-tensioner indication when the engine is cold.
- When new drive belt is installed, the indicator (C) (notch on fixed side) should be within the range (B) in the figure.
- Visually check entire drive belt for wear, damage or cracks.
- If the indicator (C) (notch on fixed side) is out of the possible use range or belts is damaged, replace drive belt.

Tension Adjustment

NLS0009W

Belt tension is not necessary, as it is automatically adjusted by drive belt auto-tensioner.

Changing Engine Coolant

NLS0000C

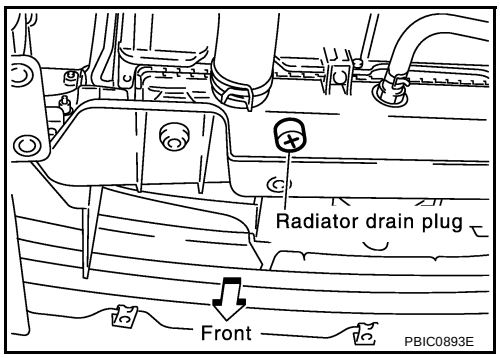
WARNING:

- **To avoid being scalded, do not change engine coolant when engine is hot.**
- **Wrap a thick cloth around cap and carefully remove cap. First, turn cap a quarter of a turn to release built-up pressure. Then turn cap all the way.**
- **Be careful not to allow engine coolant to contact drive belts.**

DRAINING ENGINE COOLANT

1. Remove undercover with power tool.

2. Open radiator drain plug at the bottom of radiator, and then remove radiator cap.



When drain all of engine coolant in the system, open water drain plugs on engine cylinder block. Refer to EM-108, "DISASSEMBLY" .

3. Remove reservoir tank as necessary, and drain engine coolant and clean reservoir tank before installing.
4. Check drained engine coolant for contaminants such as rust, corrosion or discoloration.
   If contaminated, flush the engine cooling system. Refer to MA-15, "FLUSHING COOLING SYSTEM" .

REFILLING ENGINE COOLANT

1. Install reservoir tank, and radiator drain plug.

   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

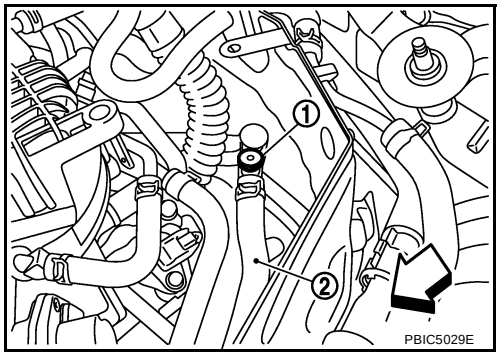
   Radiator drain plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-111, "ASSEMBLY" .

2. Make sure that each hose clamp has been firmly tightened.
3. Remove air relief plug (1) on heater hose (2).

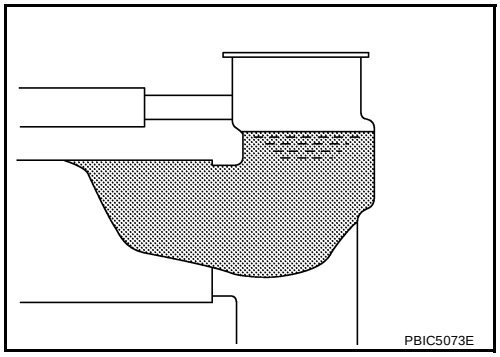
   ⇦ **: Vehicle front**



4. Fill radiator and reservoir tank to specified level.
   - **Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (2-1/8 US qt, 1-3/4 Imp qt) a minute to allow air in system to escape.**
   - **Use Genuine NISSAN Long Life Antifreeze/Coolant or equivalent mixed with water (distilled or demineralized). Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS".**

   Engine coolant capacity
   (with reservoir tank at "MAX" level)

   : Approx. 9.0 ℓ (9-1/2 US qt, 7-7/8 Imp qt)



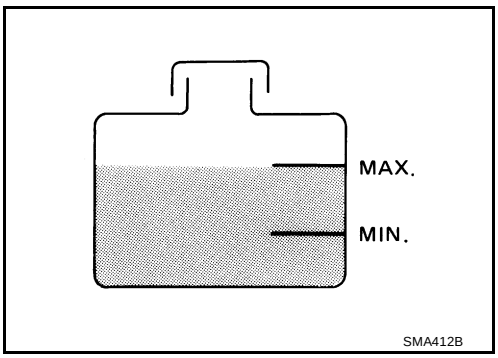
Reservoir tank capacity (at "MAX" level)

: 0.8 ℓ (7/8 US qt, 3/4 Imp qt)

- When engine coolant overflows air relief hole on heater hose, install air relief plug with new O-ring.

Air relief plug:

: 1.2 N·m (0.12 kg-m, 11 in-lb)



5. Install radiator cap.
6. Warm up until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
   - Make sure thermostat condition by touching radiator hose (lower) to see flow of warm water.

   CAUTION:
   Watch water temperature gauge so as not to overheat engine.
7. Stop engine and cool down to less than approximately 50°C (122°F).
   - Cool down using fan to reduce the time.
   - If necessary, refill radiator up to filler neck with engine coolant.
8. Refill reservoir tank to "MAX" level line with engine coolant.
9. Repeat steps 4 through 7 two or more times with radiator cap installed until engine coolant level no longer drops.
10. Check cooling system for leaks with engine running.
11. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between "COOL" and "WARM".
    - Sound may be noticeable at heater unit.
12. Repeat step 11 three times.
13. If sound is heard, bleed air from cooling system by repeating step 4 through 7 until engine coolant level no longer drops.
    - **Clean excess engine coolant from engine.**

FLUSHING COOLING SYSTEM

1. Install reservoir tank, and radiator drain plug.

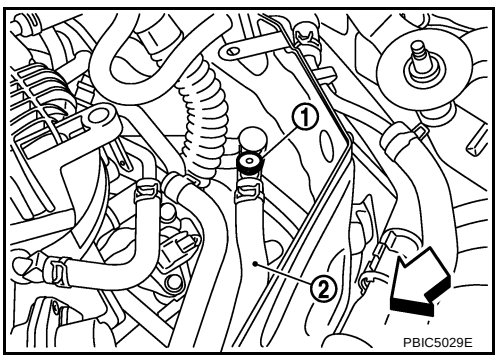
   CAUTION:
   Be sure to clean drain plug and install with new O-ring.

   Radiator drain plug:

   : 1.2 N·m (0.12 kg-m, 11 in-lb)

   If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM-111, "ASSEMBLY" .
2. Remove air relief plug (1) on heater hose (2).

   ⇦ **: Vehicle front**



3. Fill radiator with water until water spills from the air relief hole, then close air relief plug. Fill radiator and reservoir tank with water and reinstall radiator cap.

Air relief plug:

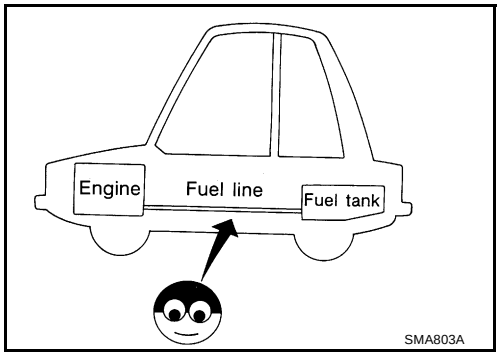
: 1.2 N·m (0.12 kg-m, 11 in-lb)

4. Run engine and warm it up to normal operating temperature.
5. Rev engine two or three times under no-load.
6. Stop engine and wait until it cools down.
7. Drain water from the system. Refer to MA-13, "DRAINING ENGINE COOLANT" .
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.

Checking Fuel Lines

NLS0000D

Inspect fuel lines, fuel filler cap and fuel tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.

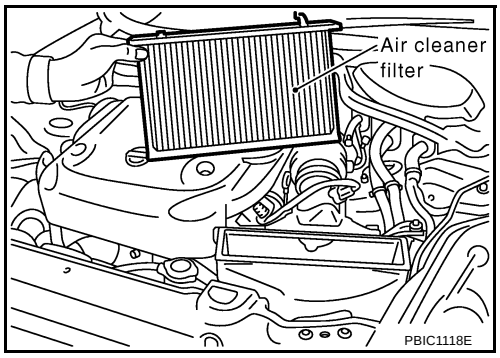


Changing Air Cleaner Filter

NLS0000E

VISCOUS PAPER TYPE

The viscous paper type filter does not need cleaning between replacement intervals. Refer to MA-7, "PERIODIC MAINTENANCE" .



Changing Engine Oil

NLS0000F

WARNING:

- **Be careful not to burn yourself, as engine oil may be hot.**
- **Prolonged and repeated contact with used engine oil may cause skin cancer. Try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.**

1. Warm up engine, put vehicle horizontally and check for oil leakage from engine components. Refer to LU-6, "ENGINE OIL LEAKAGE" .
2. Stop engine and wait for 10 minutes.
3. Loosen oil filler cap and then remove drain plug.
4. Drain engine oil.
5. Install drain plug with new washer. Refer to EM-26, "OIL PAN AND OIL STRAINER" .

   CAUTION:
   Be sure to clean drain plug and install with new washer.

   Oil pan drain plug:

   : 34.3 N·m (3.5 kg-m, 25 ft-lb)

6. Refill with new engine oil.
   Engine oil specification and viscosity:
   Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Engine oil capacity (Approximate):

Unit: ℓ (US qt, Imp qt)

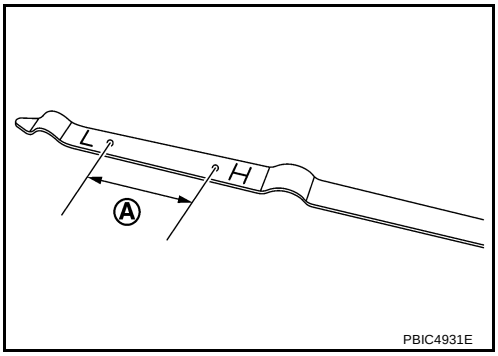
Drain and refill	With oil filter change	4.9 (5-1/8, 4-1/4)
	Without oil filter change	4.6 (4-7/8, 4)
Dry engine (Overhaul)		5.5 (5-3/4, 4-7/8)

CAUTION:

- **When filling engine oil, do not pull out oil level gauge.**
- **The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.**
- **Always use oil level gauge to determine the proper amount of engine oil in the engine.**

7. Warm up engine and check area around drain plug and oil filter for oil leakage.
8. Stop engine and wait for 10 minutes.
9. Check the engine oil level.

A : Make sure that the oil level is between "L" and "H"



Changing Oil Filter

NLS0000G

REMOVAL

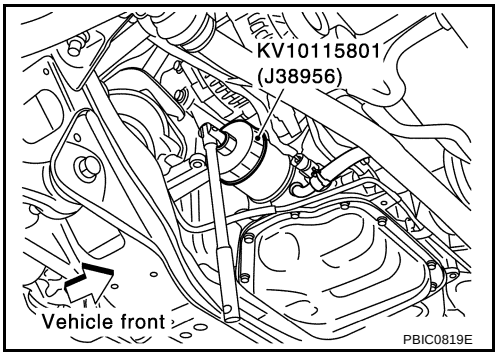
WARNING:

Be careful not to get burned when engine and engine oil may be hot.

1. Remove undercover with power tool.
2. Using oil filter wrench [SST], remove oil filter.

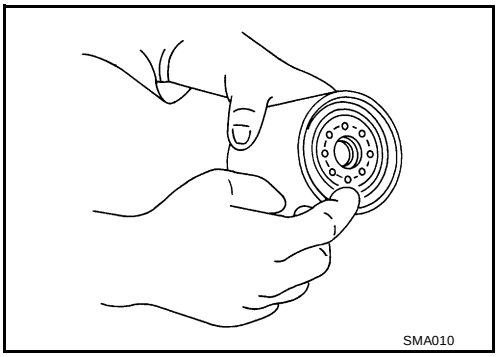
CAUTION:

- **Oil filter is provided with relief valve. Use Genuine NISSAN Oil Filter or equivalent.**
- **When removing, prepare a shop cloth to absorb any engine oil leakage or spillage.**
- **Do not allow engine oil to adhere to drive belts.**
- **Completely wipe off any engine oil that adheres to engine and vehicle.**



INSTALLATION

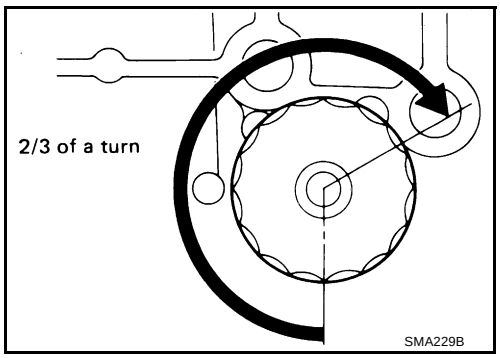
1. Remove foreign materials adhering to oil filter installation surface.
2. Apply engine oil to the oil seal contact surface of new oil filter.



3. Screw oil filter manually until it touches the installation surface, then tighten it by 2/3 turn. Or tighten to specification.

Oil filter:

: 17.7 N·m (1.8 kg-m, 13 ft-lb)



INSPECTION AFTER INSTALLATION

1. Check the engine oil level. Refer to MA-16, "Changing Engine Oil" .
2. Start engine, and check there is no leak of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level and adjust engine oil. Refer to MA-16, "Changing Engine Oil" .

Changing Spark Plugs (Iridium-Tipped Type)

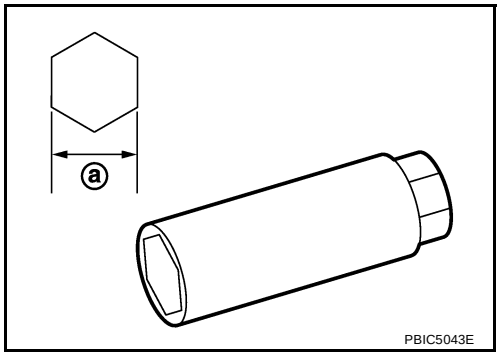
NLS0000H

REMOVAL

1. Remove engine cover with power tool. Refer to EM-17, "INTAKE MANIFOLD COLLECTOR" .
2. Remove ignition coil. Refer to EM-31, "IGNITION COIL" .
3. Remove spark plug using spark plug wrench (commercial service tool).

CAUTION:
Do not drop or shock it.

a : 14 mm (0.55 in)



INSPECTION AFTER REMOVAL

Make	DENSO
Standard type	FXE22HR-11

Gap (Nominal) : 1.1 mm (0.043 in)

CAUTION:

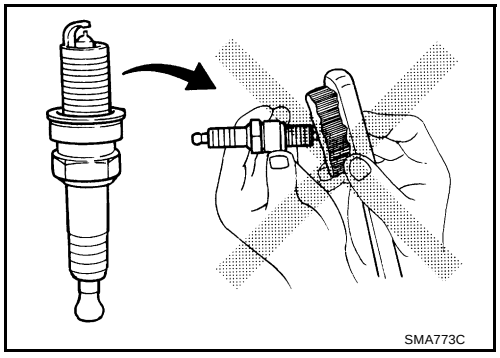
- **Do not drop or shock spark plug.**
- **Do not use wire brush for cleaning.**
- **If plug tip is covered with carbon, spark plug cleaner may be used.**

Cleaner air pressure:

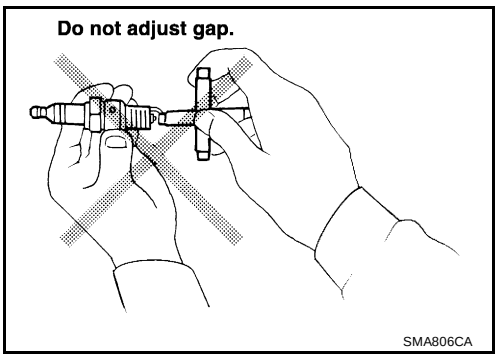
Less than 588 kPa (6 kg/cm^2 , 85 psi)

Cleaning time:

Less than 20 seconds



- **Checking and adjusting plug gap is not required between change intervals.**



INSTALLATION

Installation is the reverse order of removal.

Spark plug:

: 19.6 N·m (2.0 kg-m, 14 ft-lb)

Checking EVAP Vapor Lines

NLS0000I

1. Visually inspect EVAP vapor lines for improper attachment and for cracks, damage, loose connections, chafing and deterioration.
2. Inspect fuel tank filler cap vacuum relief valve for clogging, sticking, etc.
   Refer to EC-33, "EVAPORATIVE EMISSION SYSTEM" .

CHASSIS AND BODY MAINTENANCE

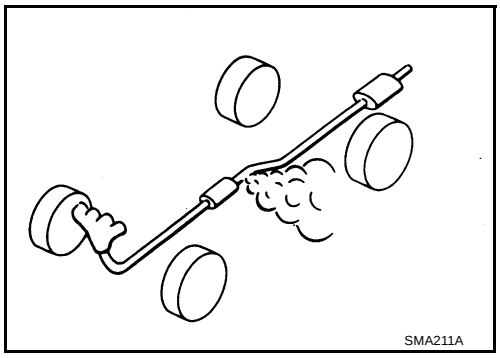
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Checking Exhaust System

NLS0000J

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage, chafing or deterioration.

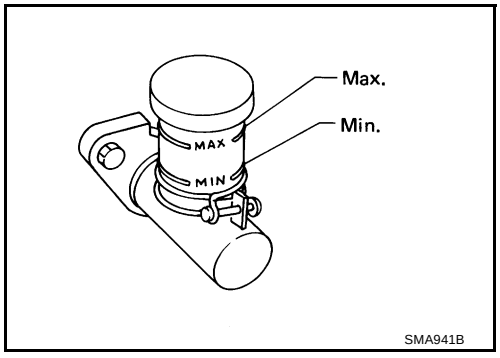
- If anything is found, repair or replace damaged parts.



Checking Clutch Fluid Level and Leaks

NLS0000K

If fluid level is extremely low, check clutch system for leaks.



Checking M/T Oil

NLS0000L

Check for oil leakage.

Changing M/T Oil

NLS0000M

1. Drain oil from drain plug and refill with new gear oil.
2. Check oil level.

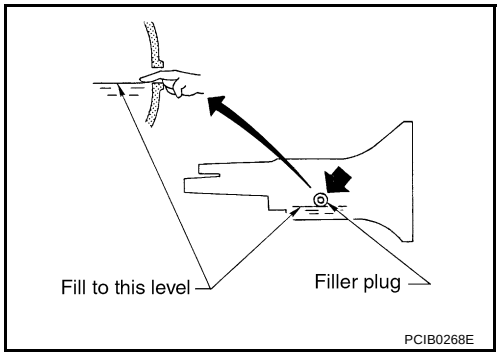
Oil grade and viscosity: **Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .**

Oil capacity: **Approx. 2.9 ℓ (3-1/8 US qt, 2-1/2 Imp qt)**

Filler plug and drain plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)

CAUTION:
Do not reuse gasket.

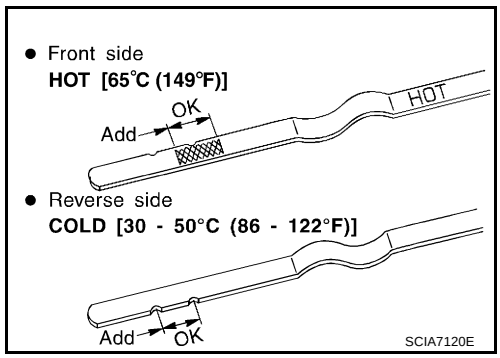


Checking A/T Fluid

NLS0000N

1. Warm up engine.
2. Check for A/T fluid leakage.
3. Loosen the level gauge bolt.

4. Before driving, A/T fluid level can be checked at A/T fluid temperatures of 30 to 50°C (86 to 122°F) using “COLD” range on A/T fluid level gauge as follows.



a. Park vehicle on level surface and set parking brake.

b. Start engine and move selector lever through each gear position. Leave selector lever in “P” position.

c. Check A/T fluid level with engine idling.

d. Remove A/T fluid level gauge and wipe clean with lint-free paper.

CAUTION:
When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.

e. Re-insert A/T fluid level gauge into A/T fluid charging pipe as far as it will go.

CAUTION:
To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions.

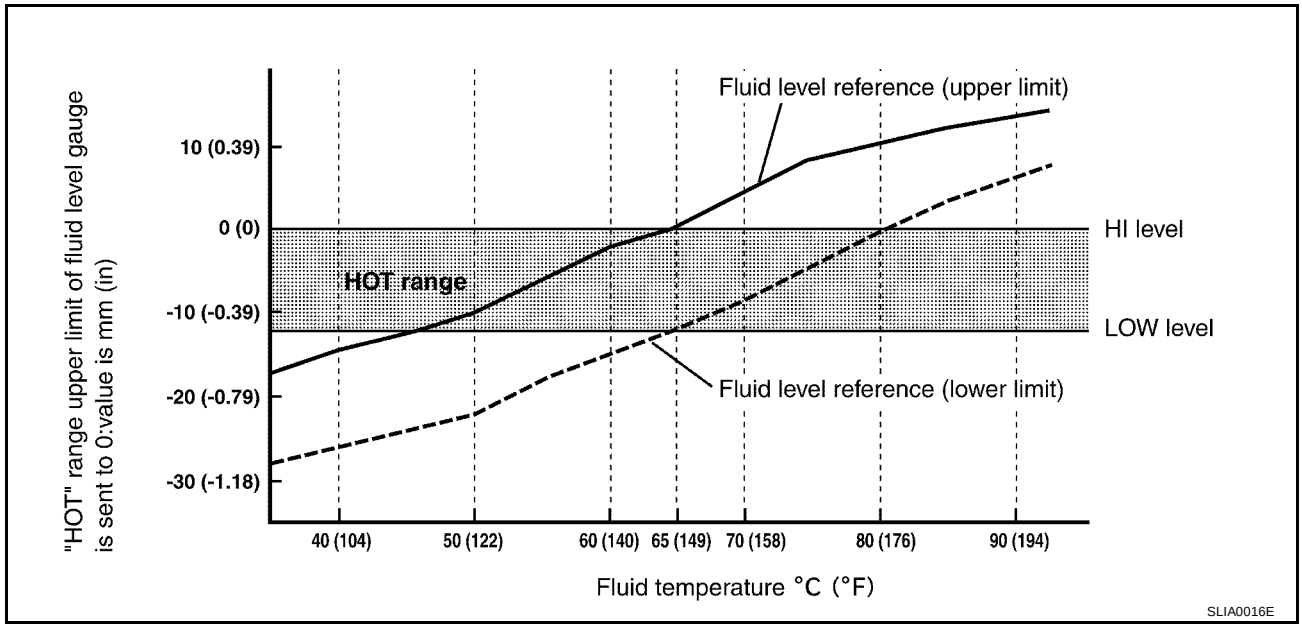
f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add ATF to the A/T fluid charging pipe.

CAUTION:
Do not overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.

6. Make the A/T fluid temperature approximately 65°C (149°F).

NOTE:
A/T fluid level will be greatly affected by temperature as shown in figure. Therefore, be certain to perform operation while checking data with CONSULT-II.



a. Connect CONSULT-II to data link connector.

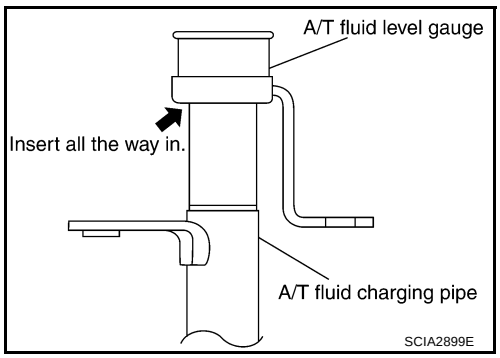
b. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.

c. Read out the value of “ATF TEMP 1”.

7. Re-check A/T fluid level at A/T fluid temperatures of approximately 65°C (149°F) using “HOT” range on A/T fluid level gauge.

CAUTION:
- **When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.**

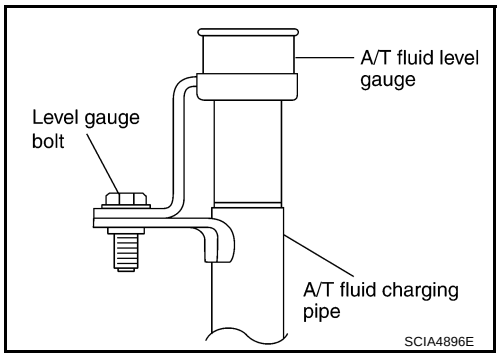
- **To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the gauge reversed from the normal attachment conditions as shown.**



8. Check A/T fluid condition.
   - If ATF is very dark or smells burned, check operation of A/T. Flush cooling system after repair of A/T.
   - If ATF contains frictional material (clutches, bands, etc.), replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to CO-13, "RADIATOR" and AT-14, "A/T Fluid Cooler Cleaning" .
9. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
10. Tighten the level gauge bolt.

Level gauge bolt:

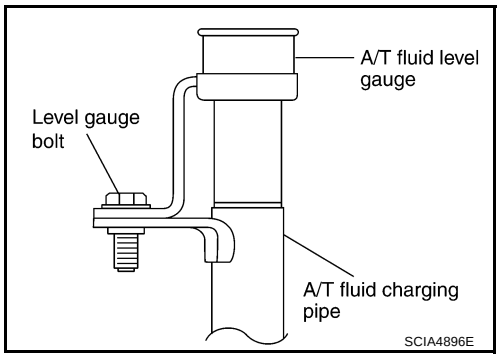
: 5.1N·m (0.52 kg-m, 45 in-lb)



Changing A/T Fluid

NLS0000O

1. Warm up ATF.
2. Stop engine.
3. Loosen the level gauge bolt.
4. Drain ATF from drain plug and refill with new ATF. Always refill same volume with drained ATF.
   - To replace the ATF, pour in new ATF at the A/T charging pipe with the engine idling and at the same time drain the old ATF from the radiator cooler hose return side.
   - When the color of the ATF coming out is about the same as the color of the new ATF, the replacement is complete. The amount of new ATF to use should be 30 to 50% increase of the stipulated amount.



ATF: Genuine NISSAN Matic J ATF

Fluid capacity: 10.3 ℓ (10-7/8 US qt, 9-1/8 Imp qt)

CAUTION:

- **Use only Genuine NISSAN Matic J ATF. Do not mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the NISSAN new vehicle limited warranty.**
- **When filling ATF, take care not to scatter heat generating parts such as exhaust.**
- **Do not reuse drain plug gasket.**

Drain plug:

: 34 N·m (3.5 kg-m, 25 ft-lb)

5. Run engine at idle speed for 5 minutes.
6. Check A/T fluid level and condition. Refer to MA-20, "Checking A/T Fluid" . If ATF is still dirty, repeat step 2. through 5.
7. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
8. Tighten the level gauge bolt.

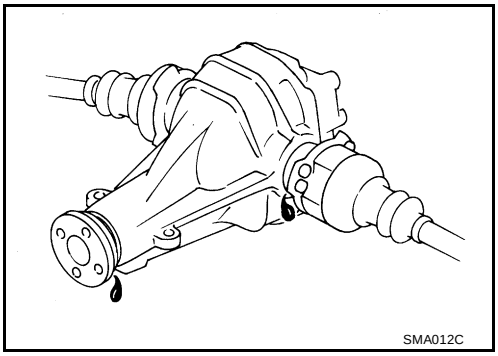
Level gauge bolt:

: 5.1 N·m (0.52 kg-m, 45 in-lb)

Checking Differential Gear Oil

NLS0000P

Check for oil leakage.



Changing Differential Gear Oil

NLS0000Q

1. Drain oil from drain plug and refill with new gear oil.
2. Check oil level.

Oil grade and Viscosity:

Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Capacity:

R200, R200V

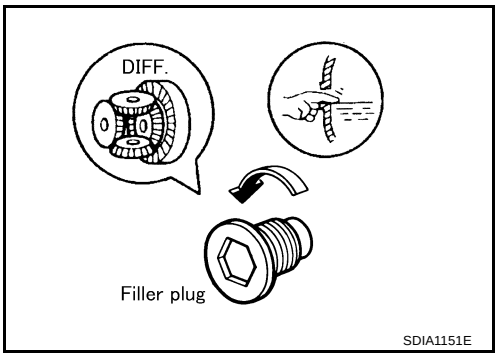
1.4 ℓ (3 US pt, 2 - 1/2 Imp pt)

Drain plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)

Filler plug:

: 34.5 N·m (3.5 kg-m, 25 ft-lb)



CAUTION:

Gaskets are not reusable. Never reuse them.

Balancing Wheels (Bonding Weight Type)

NLS0000R

REMOVAL

1. Remove inner and outer balance weights from the road wheel.

CAUTION:

Be careful not to scratch the road wheel during removal.

2. Using releasing agent, remove double-faced adhesive tape from the road wheel.

CAUTION:

- **Be careful not to scratch the road wheel during removal.**
- **After removing double-faced adhesive tape, wipe clean traces of releasing agent from the road wheel.**

WHEEL BALANCE ADJUSTMENT

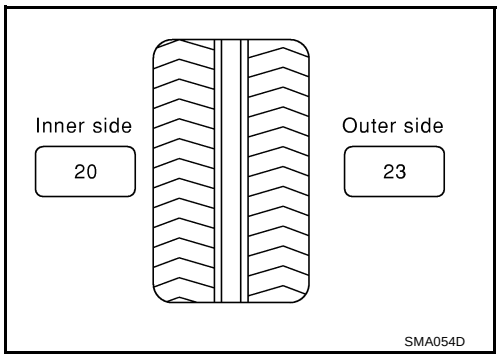
- If a tire balance machine has adhesion balance weight mode settings and drive-in weight mode setting, select and adjust a drive-in weight mode suitable for road wheels.

1. Set road wheel on tire balance machine using the center hole as a guide. Start the tire balance machine.
2. When inner and outer unbalance values are shown on the tire balance machine indicator, multiply outer unbalance value by 5/3 to determine balance weight that should be used. Select the outer balance weight with a value closest to the calculated value above and install it to the designated outer position of, or at the designated angle in relation to the road wheel.

CAUTION:

- **Do not install the inner balance weight before installing the outer balance weight.**
- **Before installing the balance weight, be sure to clean the mating surface of the road wheel.**

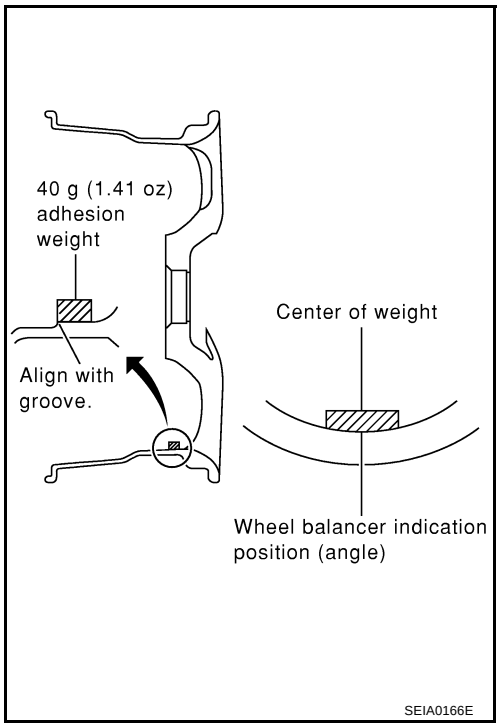
Indicated unbalance value × 5/3 = balance weight to be installed
Calculation example:
23 g (0.81 oz) × 5/3 = 38.33 g (1.35 oz) = 40 g (1.41 oz) balance weight (closer to calculated balance weight value)
Note that balance weight value must be closer to the calculated balance weight value.
Example:
37.4 = 35 g (1.23 oz)
37.5 = 40 g (1.41 oz)



a. Install balance weight in the position shown in the figure at right.
b. When installing balance weight to road wheels, set it into the grooved area on the inner wall of the road wheel as shown in the figure so that the balance weight center is aligned with the tire balance machine indication position (angle).

CAUTION:

- **Always use genuine NISSAN adhesion balance weights.**
- **Balance weights are unreusable; always replace with new ones.**
- **Do not install more than three sheets of balance weight.**

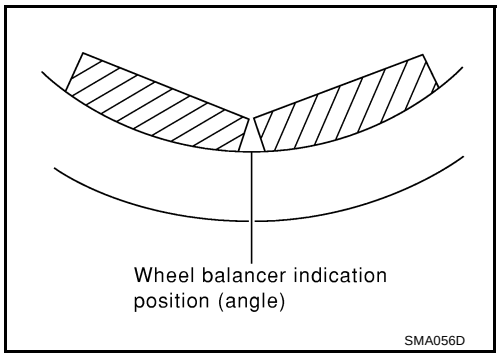


c. If calculated balance weight value exceeds 50 g (1.76 oz), install two balance weight sheets in line with each other (as shown in the figure).

CAUTION:
Do not install one balance weight sheet on top of another.

3. Start tire balance machine again.
4. Install drive-in balance weight on inner side of road wheel in the tire balance machine indication position (angle).

CAUTION:
Do not install more than two balance weights.



5. Start tire balance machine. Make sure that inner and outer residual unbalance values are 5 g (0.17 oz) each or below.
   - If either residual unbalance value exceeds 5 g (0.17 oz), repeat installation procedures.

Wheel balance (Maximum allowable unbalance):

Maximum allowable unbalance	Dynamic (At rim flange)	Less than 5 g (0.17 oz) (one side)
	Static (At rim flange)	Less than 10 g (0.35 oz)

Tire Rotation

NLS0000S

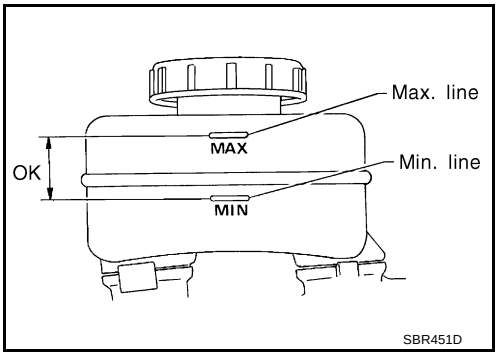
CAUTION:
Do not include the T-type spare tire when rotating the tires.
Use NISSAN genuine wheel nuts for aluminum wheels.

NOTE:
Tire cannot be rotated in vehicle, as front tire are different size from rear tire and the direction of wheel rotation is fixed in each tire.

Checking Brake Fluid Level and Leaks

NLS0000T

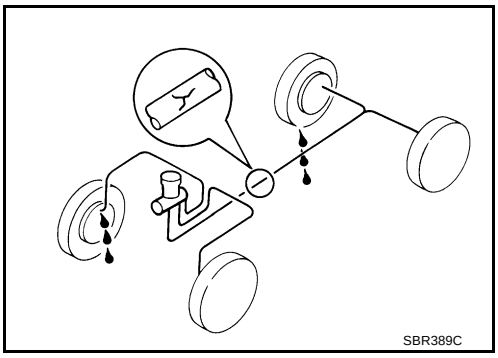
- If fluid level is extremely low, check brake system for leaks.



Checking Brake Lines and Cables

NLS0000U

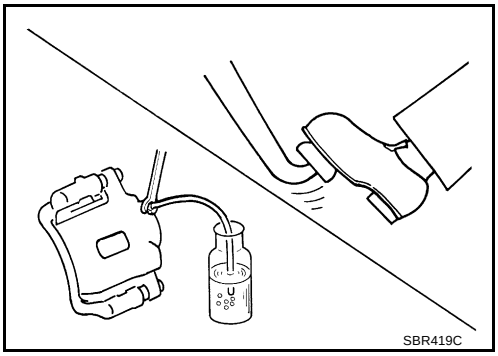
- Check brake fluid lines and parking brake cables for improper attachment, leaks, chafing, abrasions, deterioration, etc.



Changing Brake Fluid

NLS0000V

1. Drain brake fluid from each bleed valve.
2. Refill until new brake fluid comes out from each bleed valve.
   Use same procedure as in bleeding hydraulic system to refill brake fluid.
   Refer to BR-10, "BRAKE FLUID" .
   - Refill with recommended Genuine Brake Fluid or equivalent DOT 3 (US FMVSS No. 116).
     Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS" .
   - Never reuse drained brake fluid.
   - Be careful not to splash brake fluid on painted areas.



Checking Disc Brake

NLS0000W

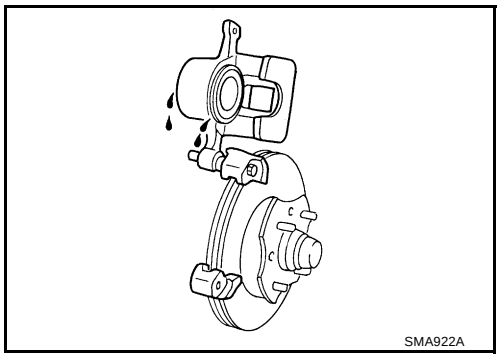
ROTOR

Check condition, wear, and damage.

	Front		Rear	
Brake model	Other than brembo	With brembo	Other than brembo	With brembo
Standard thickness (new)	28.0 mm (1.102 in)	30.0 mm (1.181 in)	16.0 mm (0.630 in)	22.0 mm (0.866 in)
Runout limit (with it attached to the vehicle)	0.035 mm (0.0014 in)	0.040 mm (0.0016 in)	0.055 mm (0.0022 in)	0.07 mm (0.0028 in)
Repair limit thickness	26.0 mm (1.024 in)	28.4 mm (1.118 in)	14.0 mm (0.551 in)	20.2 mm (0.795 in)

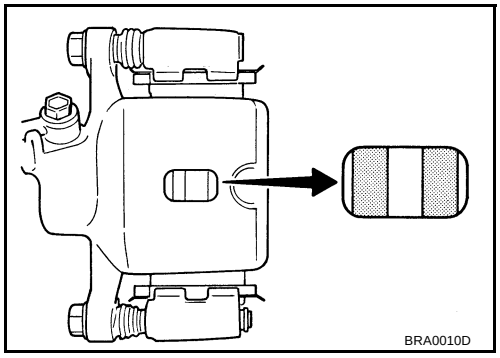
CALIPER

- Check for leakage.



PAD

- Check for wear or damage.



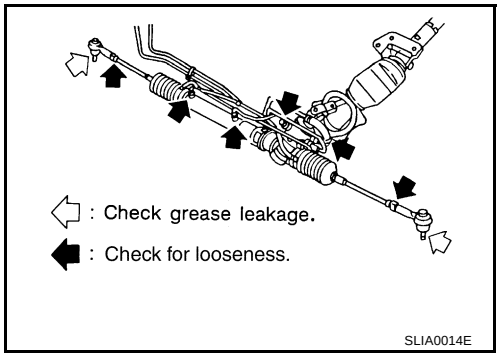
	Front		Rear	
Brake model	Other than brembo	With brembo	Other than brembo	With brembo
Standard thickness (new)	11.0 mm (0.433 in)	9.3 mm (0.366 in)	8.5 mm (0.335 in)	9.1 mm (0.358 in)
Repair limit thickness	2.0 mm (0.079 in)	2.0 mm (0.079 in)	2.0 mm (0.079 in)	2.0 mm (0.079 in)

Checking Steering Gear and Linkage

NLS0000X

STEERING GEAR

- Check gear housing and boots for looseness, damage and grease leakage.
- Check connection with steering column for looseness.



STEERING LINKAGE

Check ball joint, dust cover and other component parts for looseness, wear, damage and grease leakage.

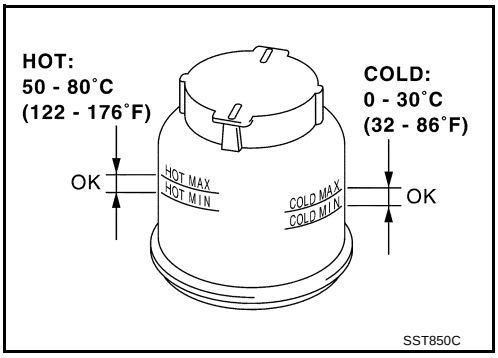
Checking Power Steering Fluid and Lines

NLS0000Y

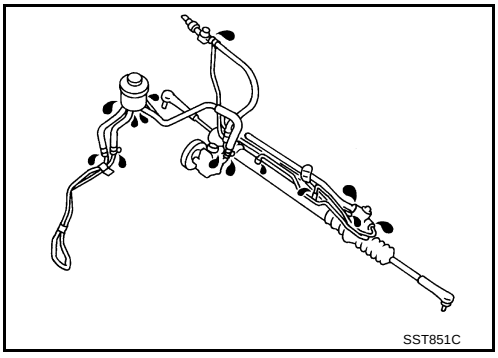
Check fluid level in reservoir tank with engine off.
Use “HOT” range at fluid temperatures of 50 to 80°C (122 to 176°F) or “COLD” range at fluid temperatures of 0 to 30°C (32 to 86°F).

CAUTION:

- **Do not overfill.**
- **Recommended fluid is Genuine NISSAN PSF or equivalent. Refer to** **MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS"**



- **Check lines for improper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.**
- **Check rack boots for accumulation of power steering fluid.**

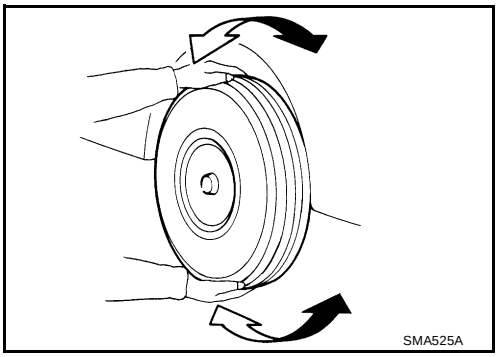


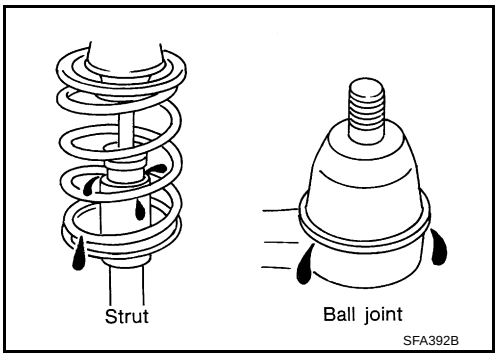
Axle and Suspension Parts

NLS0000Z

Check front and rear axle and suspension parts for excessive play, cracks, wear or other damage.

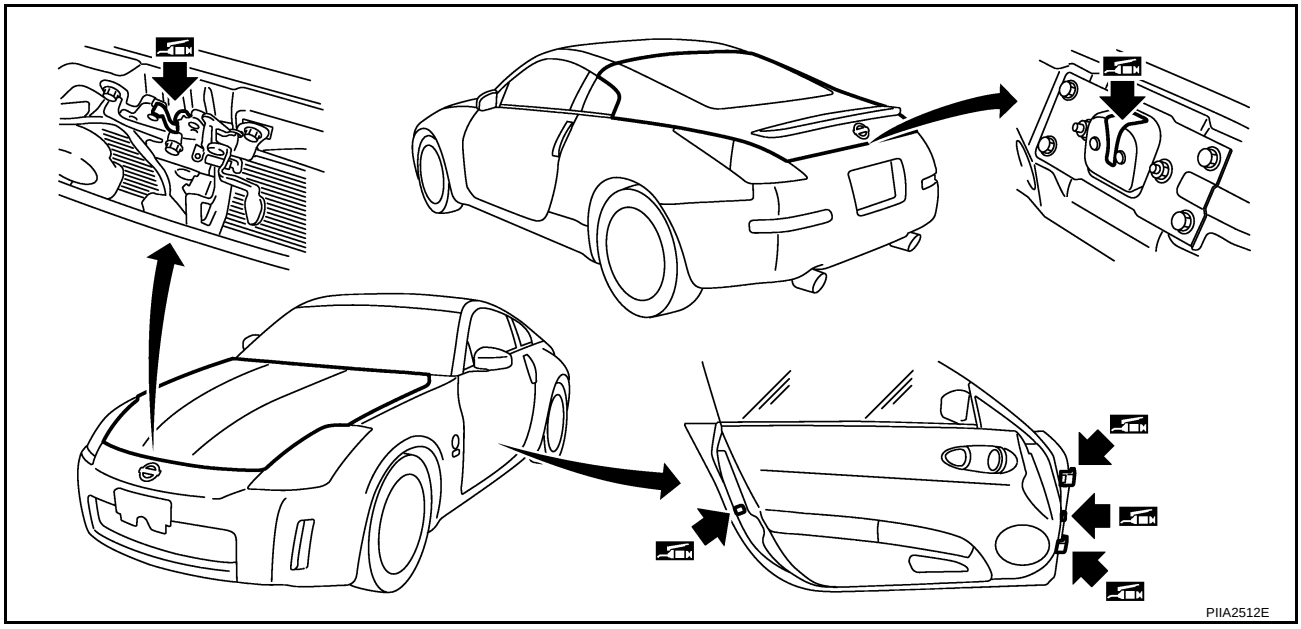
- Shake each wheel to check for excessive play.
- Check wheel bearings for smooth operation.
- Check axle and suspension nuts and bolts for looseness.
- Check strut (shock absorber) for oil leakage or other damage.
- Check suspension ball joint for grease leakage and ball joint dust cover for cracks or other damage.





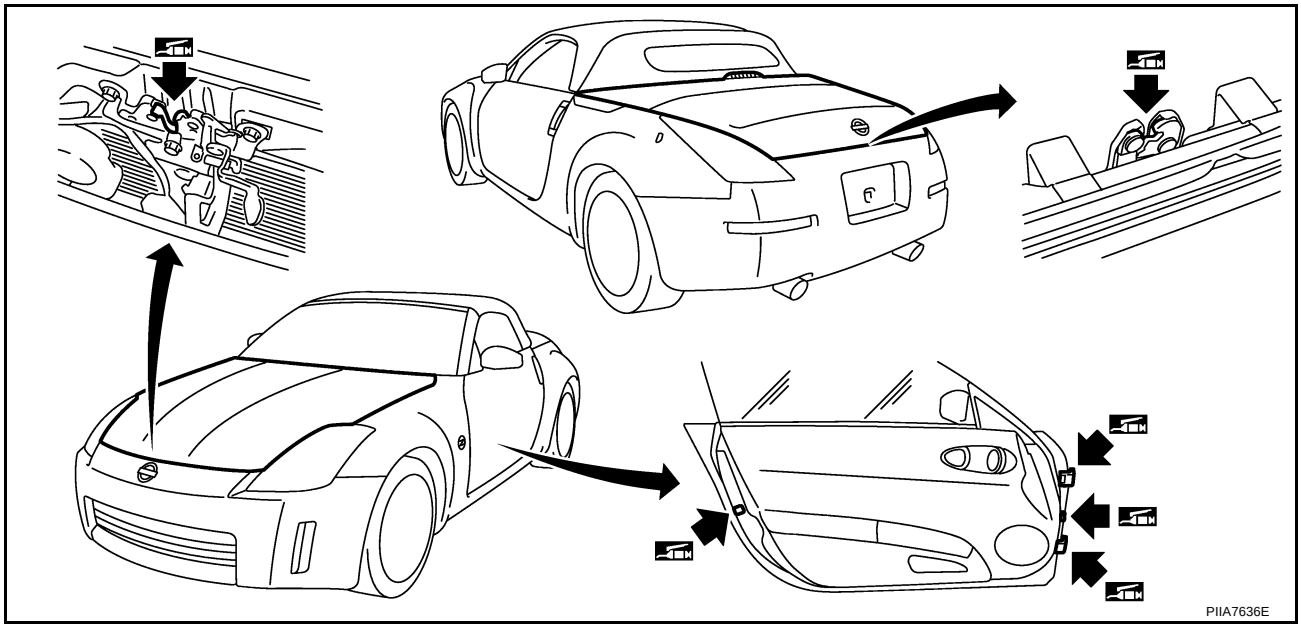
Lubricating Locks, Hinges and Hood Latch (Coupe)

NLS00010



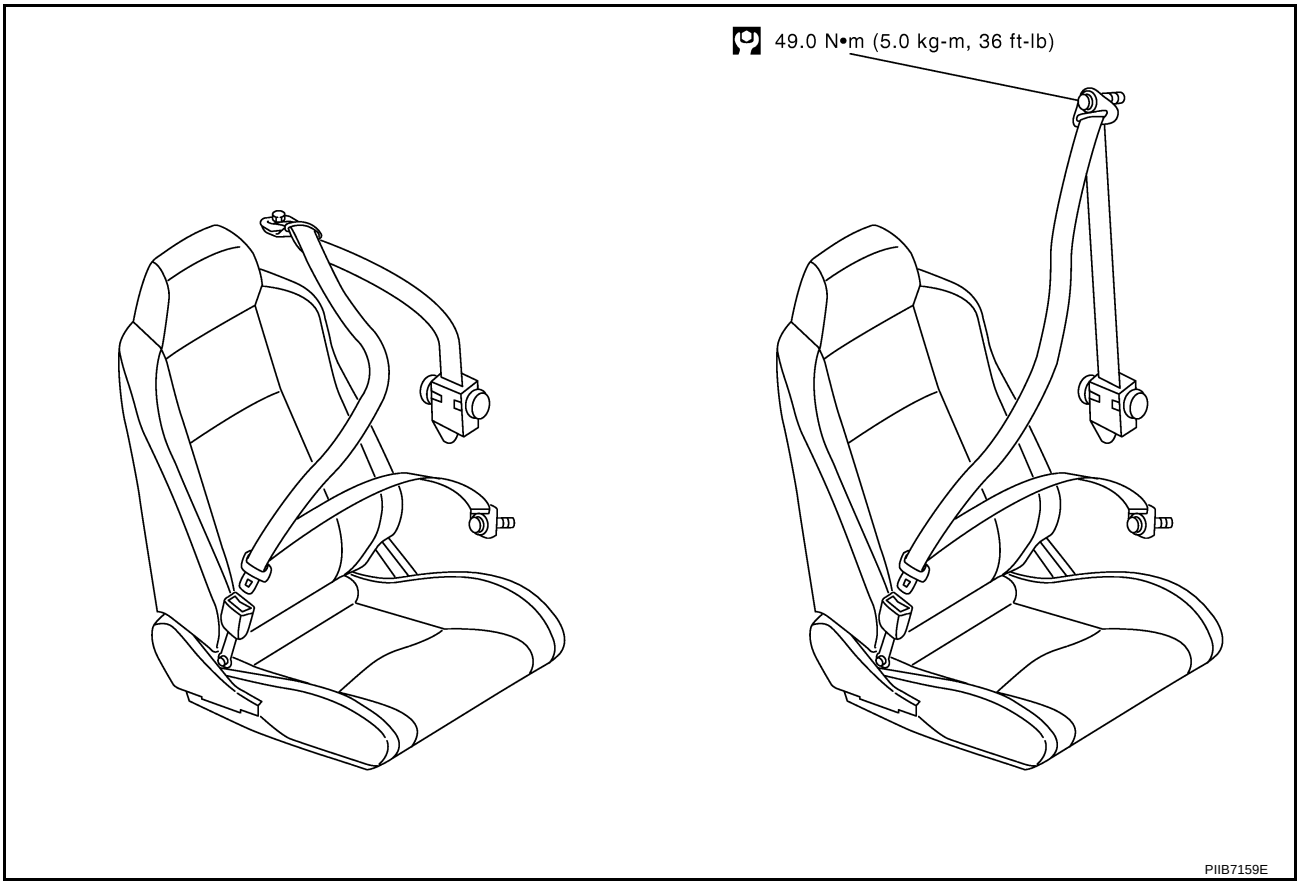
Lubricating Locks, Hinges and Hood Latch (Roadster)

NLS00011



Checking Seat Belt, Buckles, Retractors, Anchors and Adjusters

NLS0005L



CAUTION:

- **After any collision, inspect all seat belt assemblies, including retractors and other attached hardwares (I.e. anchor bolt, guide rail set). Nissan recommends to replace all seat belt assemblies in use during a collision, unless not damaged and properly operating after minor collision.**
  Also inspect seat belt assemblies not in use during a collision, and replace if damaged or improperly operating.
  Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision where the driver and passenger air bags are deployed.
- **If any component of seat belt assembly is questionable, do not repair.**
  Replace as seat belt assembly.
- **If webbing is cut, frayed, or damaged, replace belt assembly.**
- **Never oil tongue and buckle.**
- **Use a genuine NISSAN seat belt assembly.**

For details, refer to Refer to Service Manual in SB section.

- Check anchors for loose mounting
- Check belts for damage
- Check retractor for smooth operation
- Check function of buckles and tongues when buckled and released

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

NLS00014

BELT DEFLECTION AND TENSION

Tension of drive belts	Auto adjustment by auto tensioner

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at “MAX” level)	9.0 (9-1/2, 7-7/8)
Reservoir tank engine coolant capacity (at MAX level)	0.8 (7/8, 3/4)

ENGINE OIL CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.9 (5-1/8, 4-1/4)
	Without oil filter change	4.6 (4-7/8, 4)
Dry engine (Overhaul)		5.5 (5-3/4, 4-7/8)

SPARK PLUG (IRIDIUM-TIPPED TYPE)

Make	DENSO
Standard type	FXE22HR-11
Gap (Nominal)	1.1 mm (0.043 in)

WHEEL BALANCE

Maximum allowable unbalance	Dynamic (At rim flange)	Less than 5 g (0.17 oz) (one side)
	Static (At rim flange)	Less than 10 g (0.35 oz)

Tightening Torque

NLS00015

Unit: N·m (kg-m, ft-lb),
Unit: N·m (kg-m, in-lb)*

Radiator drain plug	1.2 (0.12, 11)*
Air relief plug	1.2 (0.12, 11)*
Oil pan drain plug	34.3 (3.5, 25)
Oil filter	17.7 (1.8, 13)
Spark plug	19.6 (2.0, 14)

SECTION MT
MANUAL TRANSMISSION

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

NCS0000N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Service Notice or Precautions

NCS0000O

- If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube . Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.
- Do not reuse transmission oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transmission clear of dust or dirt.
- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Be careful not to damage sliding surfaces and mating surfaces.
- Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.

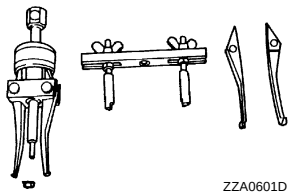
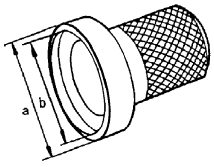
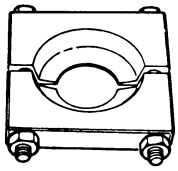
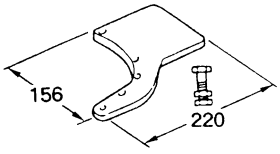
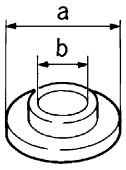
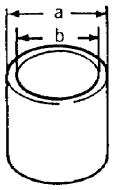
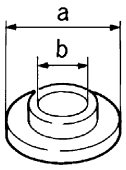
PREPARATION

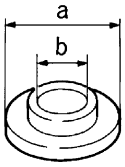
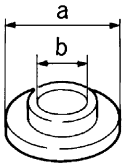
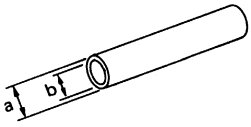
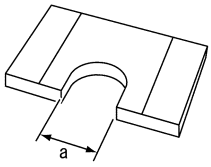
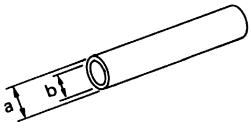
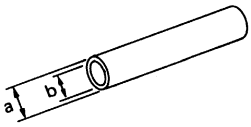
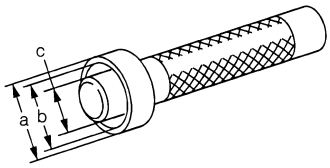
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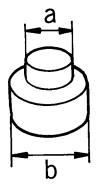
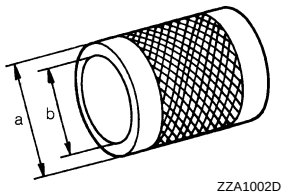
Special Service Tools

NCS0000P

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

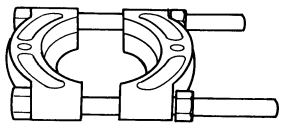
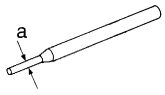
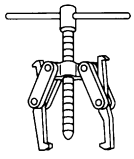
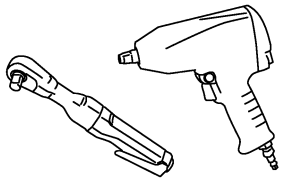
Tool number (Kent-Moore No.) Tool name		Description
KV381054S0 (J-34286) Oil seal puller	 ZZA0601D	Removing rear oil seal
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.	 ZZA0814D	Installing rear oil seal
ST30031000 (J-22912-01) Puller	 ZZA0537D	Measuring wear of inner baulk ring
ST22490000 (—) Adapter setting plate	 156 220 ZZC0465D	Holding a adapter plate
ST30911000 (—) Inserter a: 98 mm (3.86 in) dia. b: 40.5 mm (1.594 in) dia.	 a b ZZA0920D	● Installing main shaft bearing ● Installing 5th-6th synchronizer assembly ● Installing reverse main gear bushing ● Installing 3rd gear bushing ● Installing 3rd-4th synchronizer assembly
ST27861000 (—) Support ring a: 62 mm (2.44 in) dia. b: 52 mm (2.05 in) dia.	 a b ZZA0832D	● Installing 1st-2nd synchronizer assembly ● Installing 1st gear bushing
ST30022000 (—) Inserter a: 110 mm (4.33 in) dia. b: 46 mm (1.81 in) dia.	 a b ZZA0920D	● Installing 3rd main gear ● Installing 4th main gear

Tool number (Kent-Moore No.) Tool name	Description
KV40100630 (J-26092) Inserter a: 67.5 mm (2.657 in) dia. b: 38.5 mm (1.516 in) dia.  ZZA0920D	Installing 4th counter gear thrust washer
ST30032000 (J-26010-01) Inserter a: 80 mm (3.15 in) dia. b: 31 mm (1.22 in) dia.  ZZA0920D	Installing counter rear bearing inner race
KV32102700 (—) Drift a: 48.6 mm (1.913 in) dia. b: 41.6 mm (1.638 in) dia.  ZZA0534D	Installing main drive gear bearing
KV32103300 (J-46529) Press plate a: 73 mm (2.87 in) dia.  PCIB0165J	Installing reverse synchronizer assembly
ST01530000 (—) Drift a: 50 mm (1.97 in) dia. b: 41 mm (1.61 in) dia.  ZZA0534D	Installing reverse synchronizer assembly
ST23860000 (—) Drift a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia.  ZZA0534D	Installing reverse counter gear
KV38102100 (J-25803-01) Drift a: 44 mm (1.73 in) dia. b: 36 mm (1.42 in) dia. c: 24.5 mm (0.965 in) dia.  ZZA1046D	Installing front cover oil seal

Tool number (Kent-Moore No.) Tool name	Description
ST33061000 (J-8107-2) Drift a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.  ZZA1023D	Installing striking rod oil seal
ST33200000 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.  ZZA1002D	Installing counter rear bearing

Commercial Service Tools

NCS0000Q

Tool name	Description
Puller  ZZB0823D	Removing each bearing, gear and bushing
Pin punch a: 6.0 mm (0.24 in) dia.  NT410	Removing and installing each retaining pin
Puller  NT077	● Removing reverse synchronizer assembly ● Removing reverse counter gear ● Removing reverse main gear
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NCS0000R

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

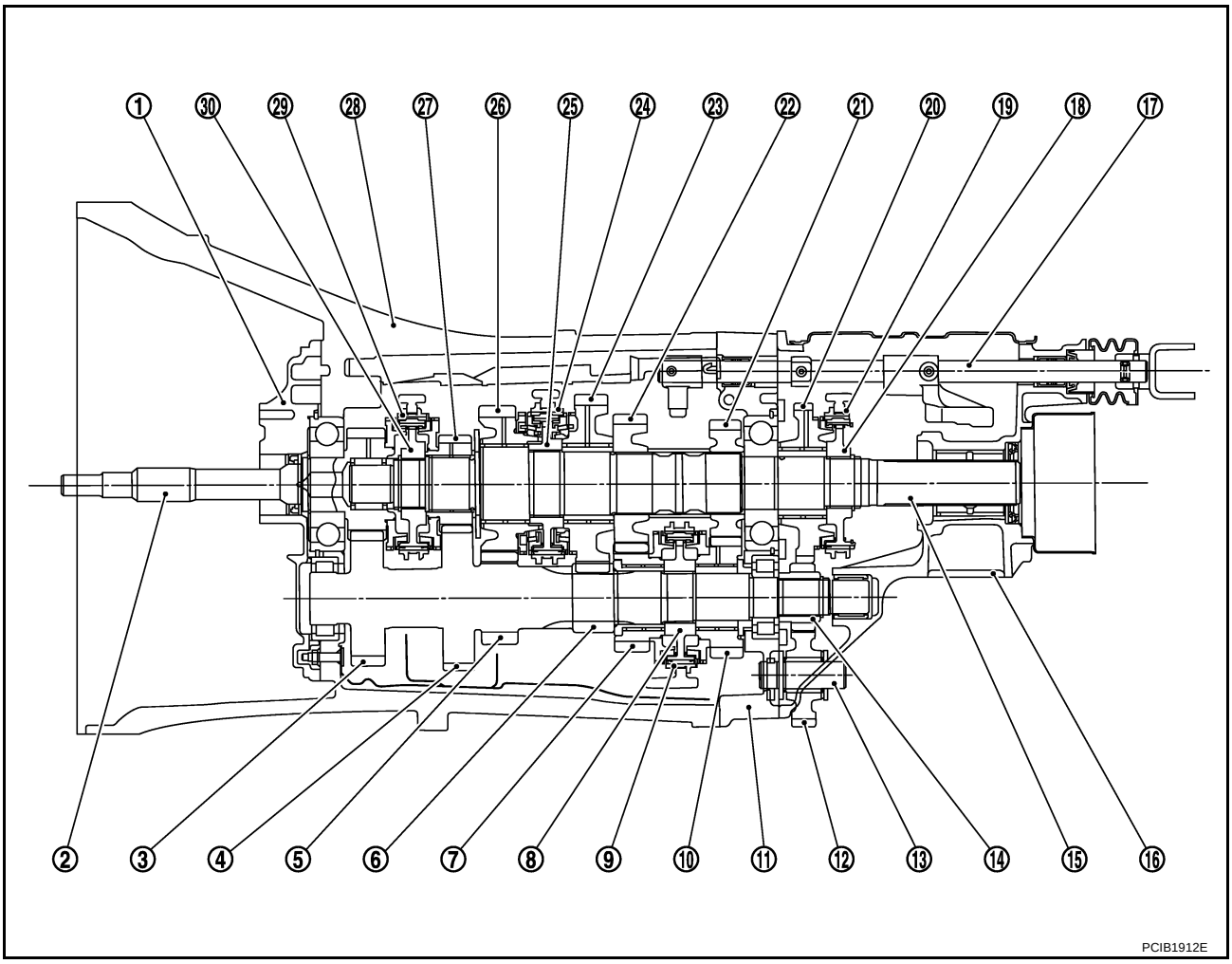
Reference page		MT-9	MT-9	MT-9	MT-22	MT-22	MT-12	MT-26	MT-26	MT-24	MT-24	MT-24	MT-24
SUSPECTED PARTS (Possible cause)		OIL (Oil level is low.)	OIL (Wrong oil.)	OIL (Oil level is high.)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	SHIFT CONTROL LINKAGE (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptoms	Noise	1	2							3	3		
	Oil leakage		3	1	2	2							
	Hard to shift or will not shift		1	1			2					2	2
	Jumps out of gear						1	1	2	2			

DESCRIPTION

PFP:00000

Cross-Sectional View

NCS0000S



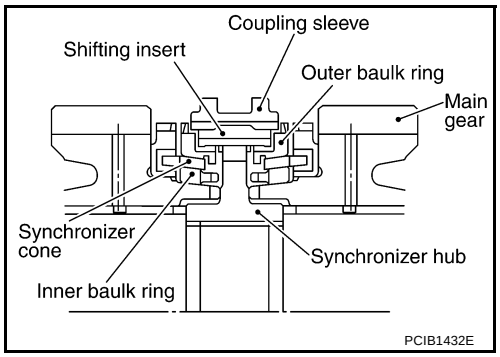
1. Front cover
2. Main drive gear
3. Counter shaft
4. 6th counter gear
5. 2nd counter gear
6. 1st counter gear
7. 3rd counter gear
8. 3rd-4th synchronizer hub
9. 3rd-4th coupling sleeve
10. 4th counter gear
11. Adapter plate
12. Reverse idler gear
13. Reverse idler shaft
14. Reverse counter gear
15. Main shaft
16. Rear extension
17. Striking rod
18. Reverse synchronizer hub
19. Reverse coupling sleeve
20. Reverse main gear
21. 4th main gear
22. 3rd main gear
23. 1st main gear
24. 1st-2nd coupling sleeve
25. 1st-2nd synchronizer hub
26. 2nd main gear
27. 6th main gear
28. Transmission case
29. 5th-6th coupling sleeve
30. 5th-6th synchronizer hub

DOUBLE-CONE SYNCHRONIZER

The 4th gear is equipped with a double-cone synchronizer to reduce the operating force of the shift lever.

TRIPLE-CONE SYNCHRONIZER

The 1st, 2nd and 3rd gears are equipped with a triple-cone synchronizer to reduce the operating force of the shift lever.



M/T OIL

PFP:KLD20

Changing M/T Oil

NCS0000T

DRAINING

1. Start the engine and warm up the transmission unit sufficiently.
2. After stopping engine, remove filler plug and drain plug to drain oil.
3. Replace gasket on drain plug with new one. Screw drain plug into transmission case, and tighten to the specified torque. Refer to MT-22, "Case Components" .

   CAUTION:
   Do not reuse gasket.

FILLING

1. Fill new oil into the transmission to the level of the filler plug mounting hole.

   Oil grade and viscosity : Refer to MA-11, "Fluids and Lubricants" .
   Oil capacity : Approx. 2.93 ℓ (6-1/4 US pt, 5-1/8 Imp pt)

2. Replace gasket on filler plug with new one. Screw filler plug into transmission case, and tighten to the specified torque. Refer to MT-22, "Case Components" .

   CAUTION:
   Do not reuse gasket.

Checking M/T Oil

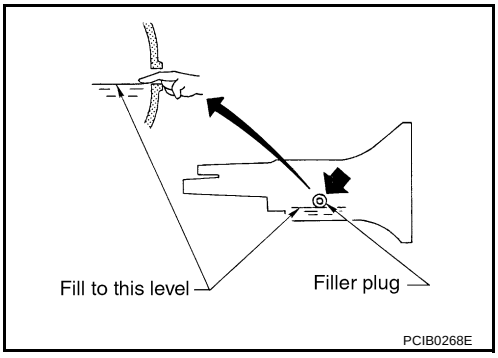
NCS0000U

OIL LEAKAGE AND OIL LEVEL

- Check if oil is leaking from transmission or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

  CAUTION:
  Never start engine while checking oil level.
- When screwing in filler plug with a new gasket, first screw into the transmission by hand, then tighten to the specified torque. Refer to MT-22, "Case Components" .

  CAUTION:
  Do not reuse gasket.



REAR OIL SEAL

PFP:33140

Removal and Installation

NCS0000V

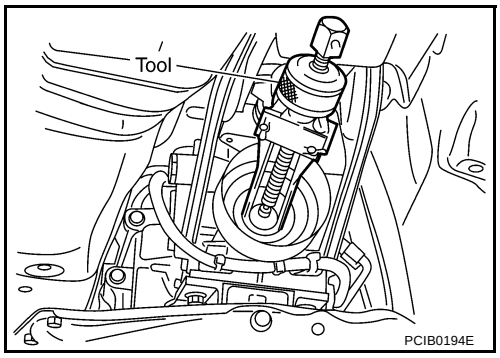
REMOVAL

1. Remove propeller shaft. Refer to PR-6, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.

2. Remove rear oil seal using oil seal puller.

   Tool number : KV381054S0 (J-34286)

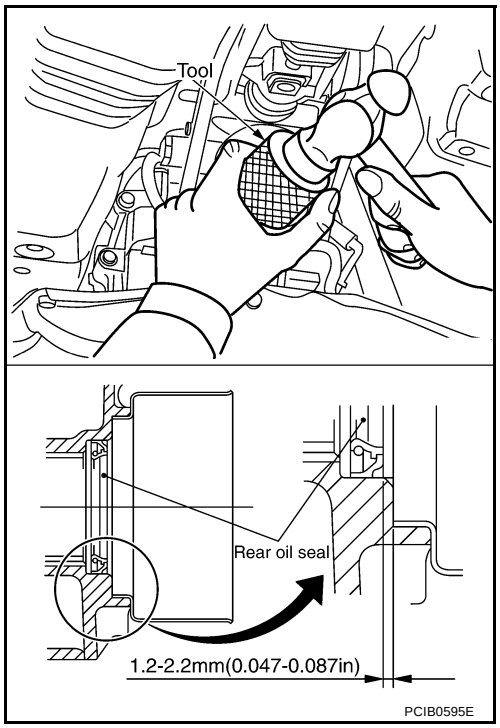


INSTALLATION

1. Apply multi-purpose grease to rear oil seal lip. Drive in rear oil seal until the edge is approximately 1.2 - 2.2 mm (0.047 - 0.087 in) above the boss edge using drift.

   Tool number : ST33400001 (J-26082)

   CAUTION:
   - **Do not reuse rear oil seal.**
   - **When installing, do not incline the rear oil seal.**



2. Install propeller shaft. Refer to PR-6, "Removal and Installation" .

   CAUTION:
   - **Do not impact or damage propeller shaft tube.**
   - **If lubricant leak has occurred, after finishing work, check oil level. Refer to MT-9, "Checking M/T Oil" .**

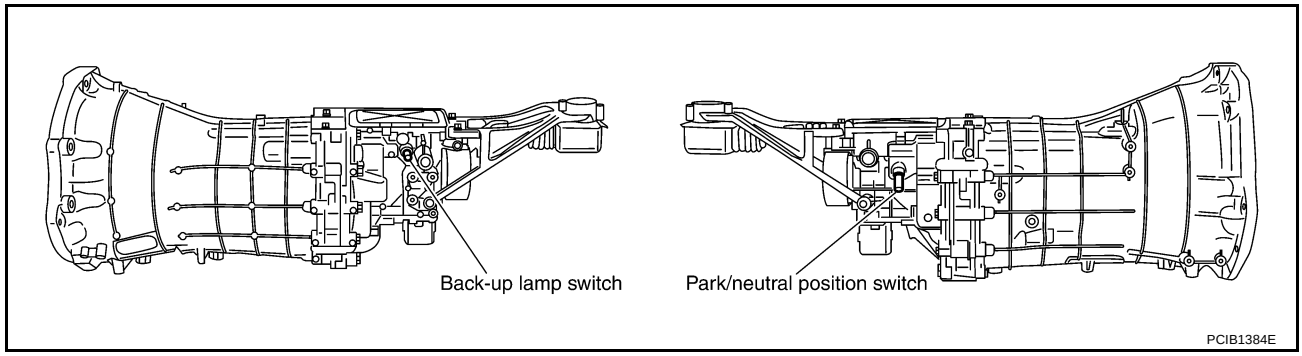
POSITION SWITCH

PFP:32005

Checking

NCS0000W

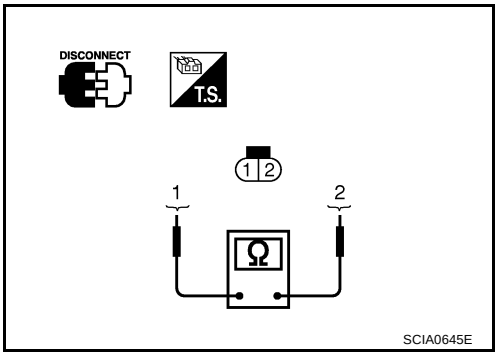
COMPONENT LOCATION



BACK-UP LAMP SWITCH

- Check continuity.

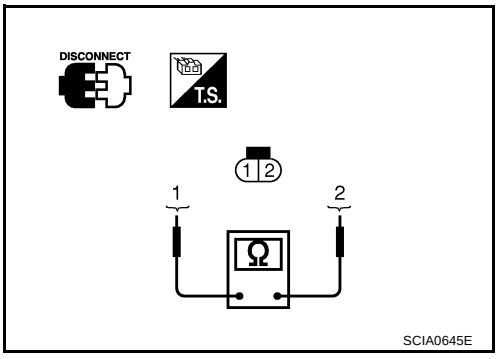
Gear position	Continuity
Reverse	Yes
Except reverse	No



PARK/NEUTRAL POSITION SWITCH

- Check continuity.

Gear position	Continuity
Neutral	Yes
Except neutral	No



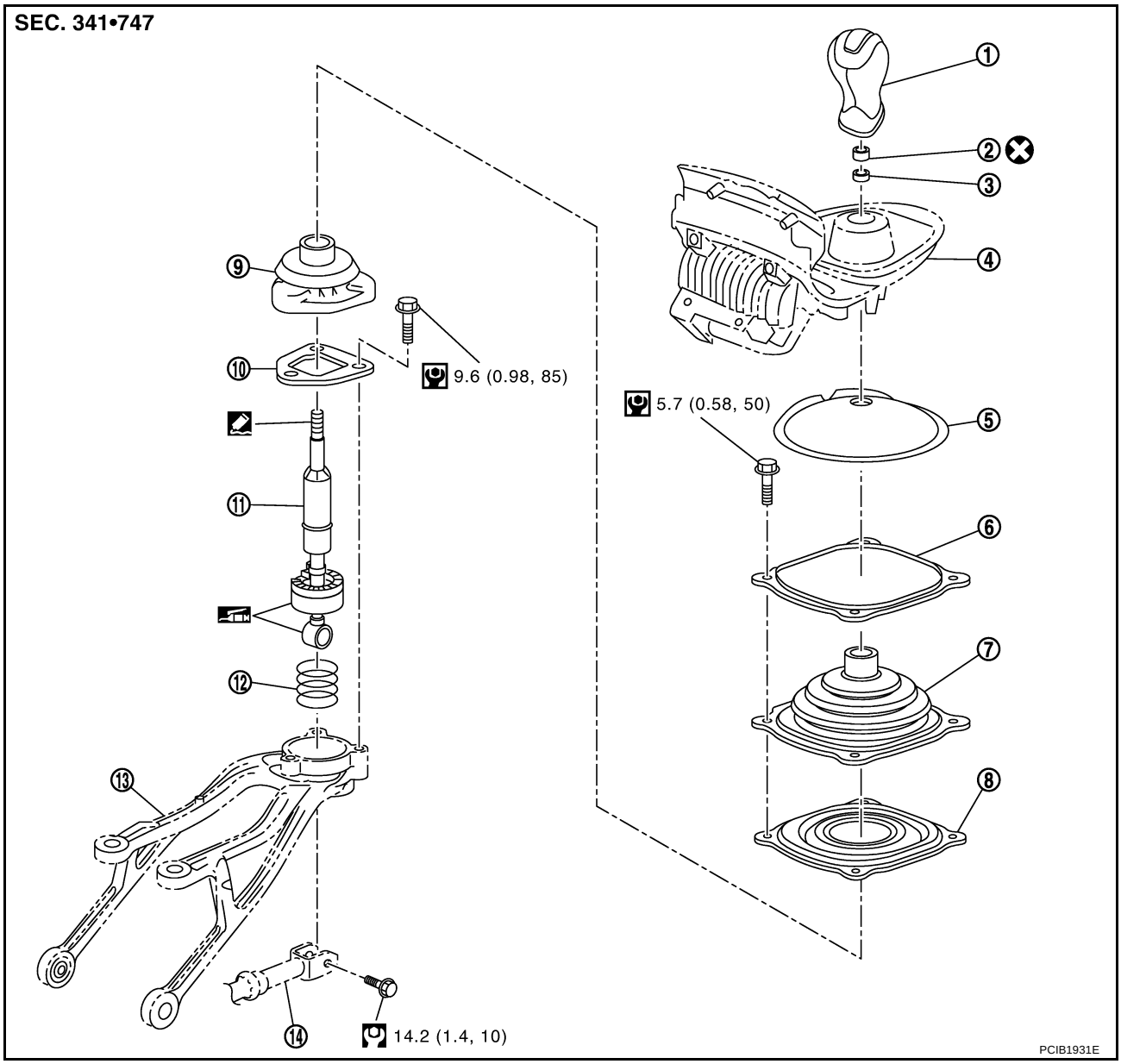
SHIFT CONTROL

PFP:34103

Removal and Installation

NCS0000X

COMPONENTS



1. Shift knob	2. Insulator	3. Seat
4. Console boot	5. Felt	6. Hole cover
7. Control lever boot B	8. Hole insulator	9. Control lever boot A
10. Guide plate	11. Control lever assembly	12. Control lever spring
13. Control lever housing	14. Control rod	

Refer to GI-11, "Components" and the followings for the symbols in the figure.

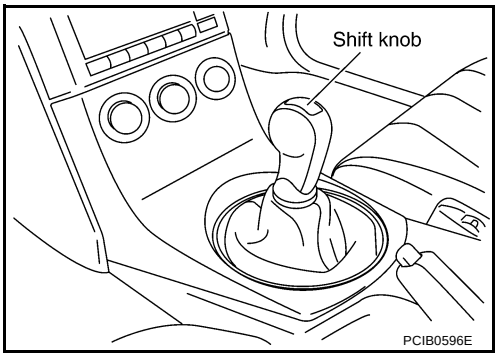
: Apply multi-purpose grease.

: Apply Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

REMOVAL

1. Remove the shift knob with the following procedure.

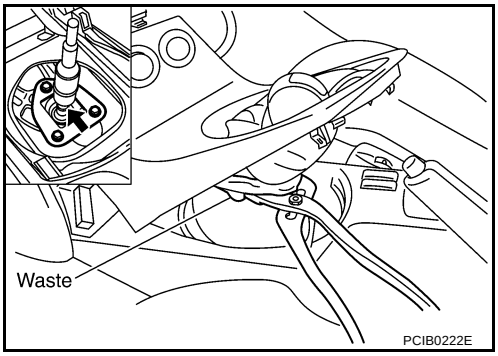
a. Release metal clips on console boot from center console. Refer to IP-11, "Removal and Installation" .



b. Lift console boot, and push down control lever boot B and control lever boot A. Set water pump pliers and others to control lever assembly.

CAUTION:

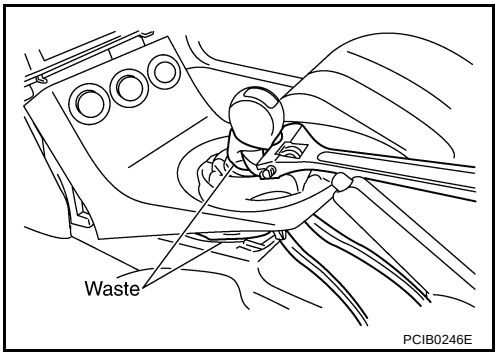
Put waste cloth between water pump pliers and control lever assembly to avoid damaging control lever assembly.



c. Set monkey wrench to shift knob.

CAUTION:

Put waste cloth between shift knob and monkey wrench to avoid damaging shift knob.



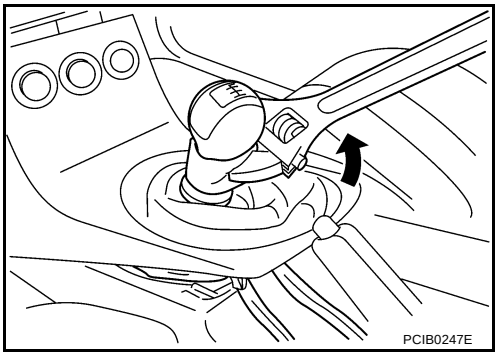
d. Keeping control lever assembly in place with water pump pliers, turn monkey wrench counterclockwise to loosen shift knob.

NOTE:

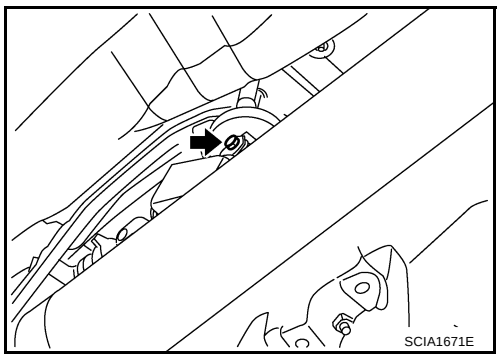
Remove shift knob from control lever assembly keeping water pump pliers in place because a certain power to turn shift knob is still necessary even after adhesive is peeled.

e. Remove shift knob from control lever assembly.

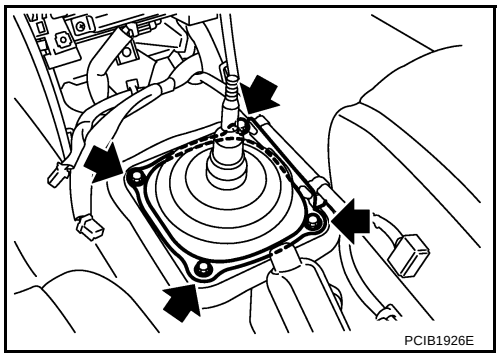
2. Remove insulator and seat from control lever assembly.
3. Remove console boot.
4. Remove center console assembly. Refer to IP-11, "Removal and Installation" .
5. Remove felt.



6. Release the boot, remove control rod mounting bolt, and separate control lever and control rod.

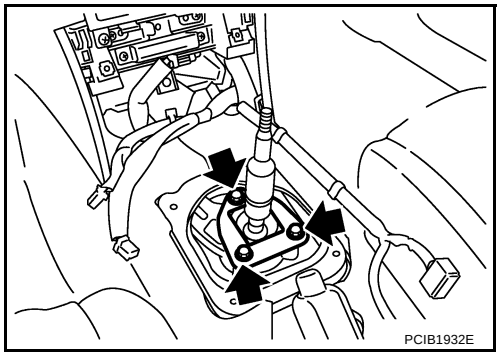


7. Remove the hole cover mounting bolts and then remove the hole cover.
8. Remove the control lever boot B and the hole insulator.
9. Remove the control lever boot A.



10. Remove guide plate mounting bolts, and then remove control lever assembly and control lever spring from control lever housing.

CAUTION:
Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.



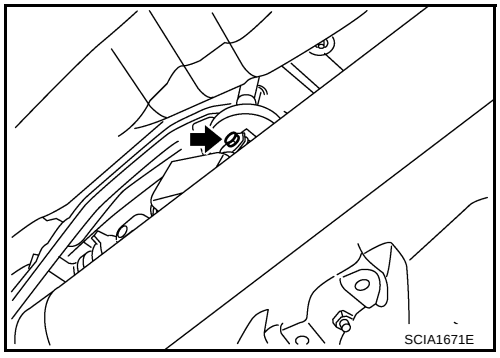
INSTALLATION

1. Set control lever spring, control lever assembly, and guide plate to control lever housing and then temporarily tightening guide plate mounting bolts.

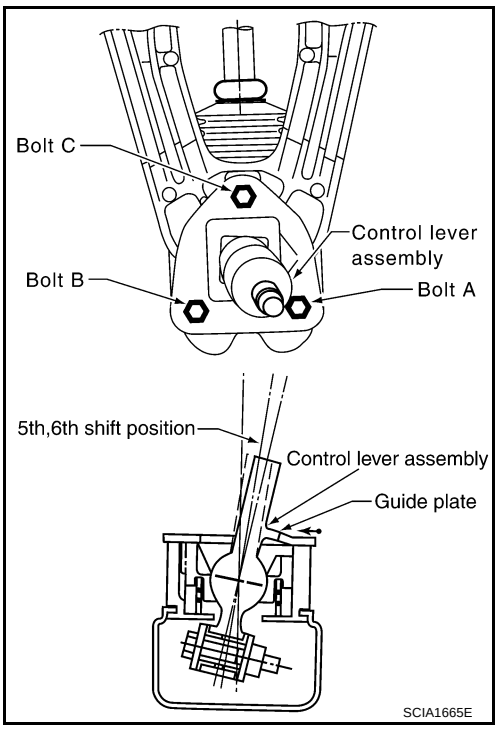
CAUTION:
Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.

2. Install control lever assembly to control rod and then tighten bolt to the specified torque. Refer to MT-12, "COMPONENTS" .
3. Install boot to control lever housing.

CAUTION:
Fit the boot to the groove on the control lever housing.

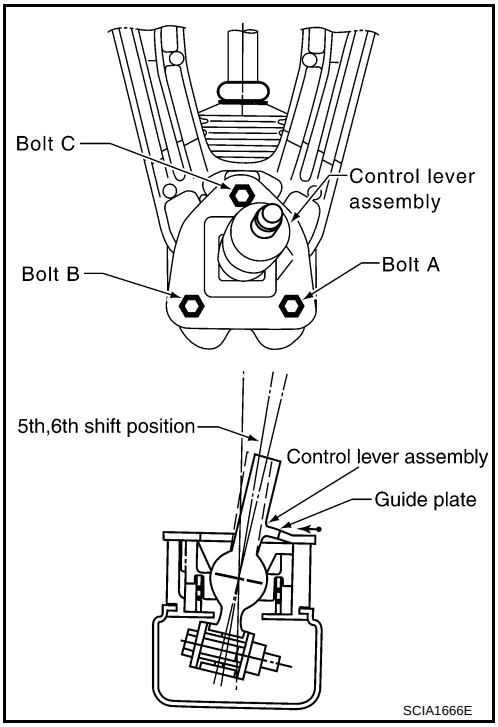


4. After shifting control lever assembly into 6th gear, push it toward reverse gear (to the right) until it comes to a stop.
5. At the point where the control lever assembly stops, bring the guide plate closer until guide plate stopper contacts control lever assembly claw, and then loosely tighten mounting bolt A.



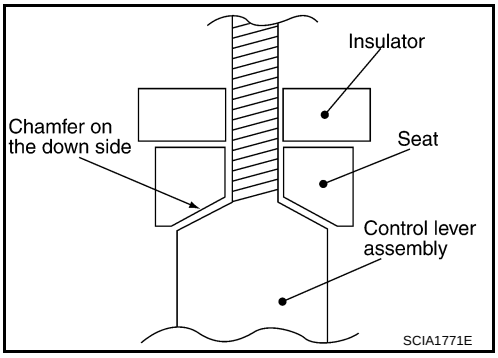
6. After shifting control lever assembly into 5th gear, push it toward reverse gear (to the right) until it comes to a stop.
7. At the point where control lever assembly stops, bring guide plate closer until the guide plate stopper contacts control lever assembly claw, and then tighten mounting bolt C to the specified torque. Refer to MT-12, "COMPONENTS" .
8. Tighten guide plate bolts A and B to the specified torque. Refer to MT-12, "COMPONENTS" .
9. Install control lever boot A.

   CAUTION:
   Fit the control lever boot A to the groove on the control lever housing.
10. Install hole insulator and control lever boot B.
11. Install hole cover and tighten bolts to the specified torque. Refer to MT-12, "COMPONENTS" .
12. Install felt.
13. Install center console assembly. Refer to IP-11, "Removal and Installation" .
14. Install console boot to center console assembly. Refer to IP-11, "Removal and Installation" .



15. As shown in the figure, assemble seat and insulator to control lever assembly.

    CAUTION:
    - **Do not reuse insulator.**
    - **Be careful with the orientation of seat.**
16. Apply locking sealant to control lever assembly threads, install shift knob.
    - **Use Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**



CAUTION:
Remove the remaining adhesive on control lever and shift knob threads.

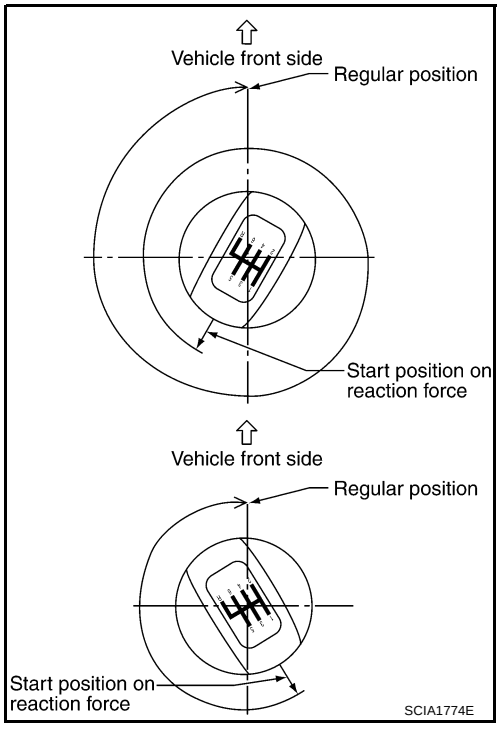
17. Put the shift knob in the correct position as the following indicates.

a. When tightening shift knob, if shift knob comes to the proper position within 1/2 turn from the position at which resistance begins to be felt, tighten it 1 more turn to set it in the proper position.

b. If it takes more than 1/2 turn from the position at which resistance begins to be felt, tighten it to set it in the proper position.

CAUTION:

- **Do not adjust the knob with loosing.**
- **After adjusting to the regular position, until 30 minutes pass, do not operate the shift intensely such as screwing or turning the shift knob to opposite direction since a locking sealant because stiff.**



INSPECTION AFTER INSTALLATION

After installing, confirm the following items:

- When control lever assembly is shifted to each position, make sure there is no binding or disconnection in each boot.
- When shifted to each position, make sure there is no noise, binding, and backlash. Especially when control lever assembly is shifted to 5th, 6th without pressing downward, check for binding.
- When control lever assembly is shifted to 1st, 2nd side and 5th, 6th side, confirm control lever assembly returns to neutral position smoothly.
- In any position other than reverse, confirm that control lever assembly can be pressed downward.
- With control lever assembly pressed downward, confirm that it can be shifted to reverse.
- When shifted from reverse to neutral position, confirm control lever assembly returns to neutral position smoothly with spring power.
- Without control lever assembly pressed downward, confirm that it cannot be shifted to reverse.

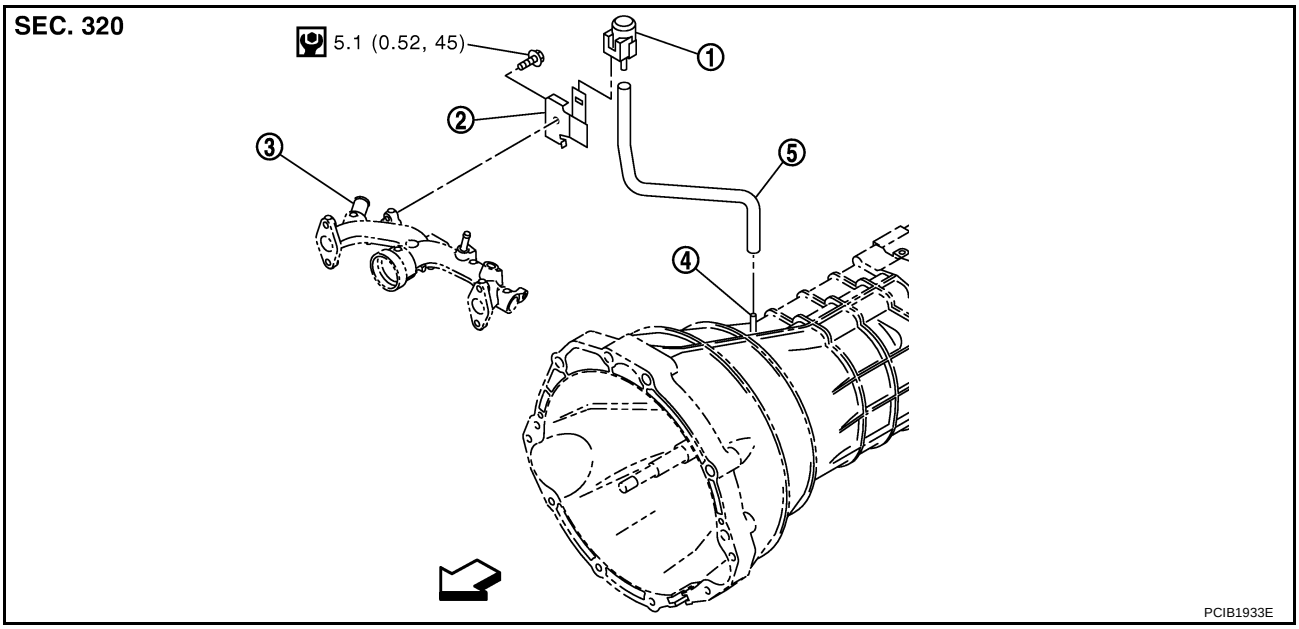
AIR BREATHER HOSE

PFP:31098

Removal and Installation

NCS0000Y

Refer to the figure for air breather hose removal and installation information.



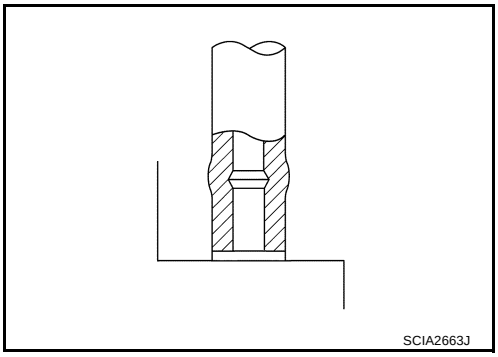
1. Breather
2. Bracket
3. Water outlet (rear)
4. Breather tube
5. Air breather hose

⇦ : Vehicle front

Refer to GI-11, "Components" ,for the symbols in the figure.

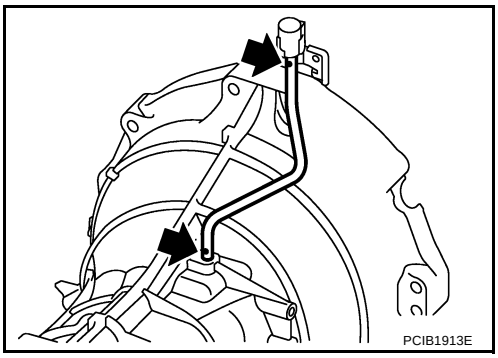
CAUTION:

- **Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.**
- **Be sure to insert air breather hose into breather tube until hose end reaches the tube's base.**
- **Be sure to insert air breather hose into breather until hose end reaches the breather's base.**



- **Set air breather hose with painted mark facing backward.**

⇦ : Painted mark



TRANSMISSION ASSEMBLY

PFP:32010

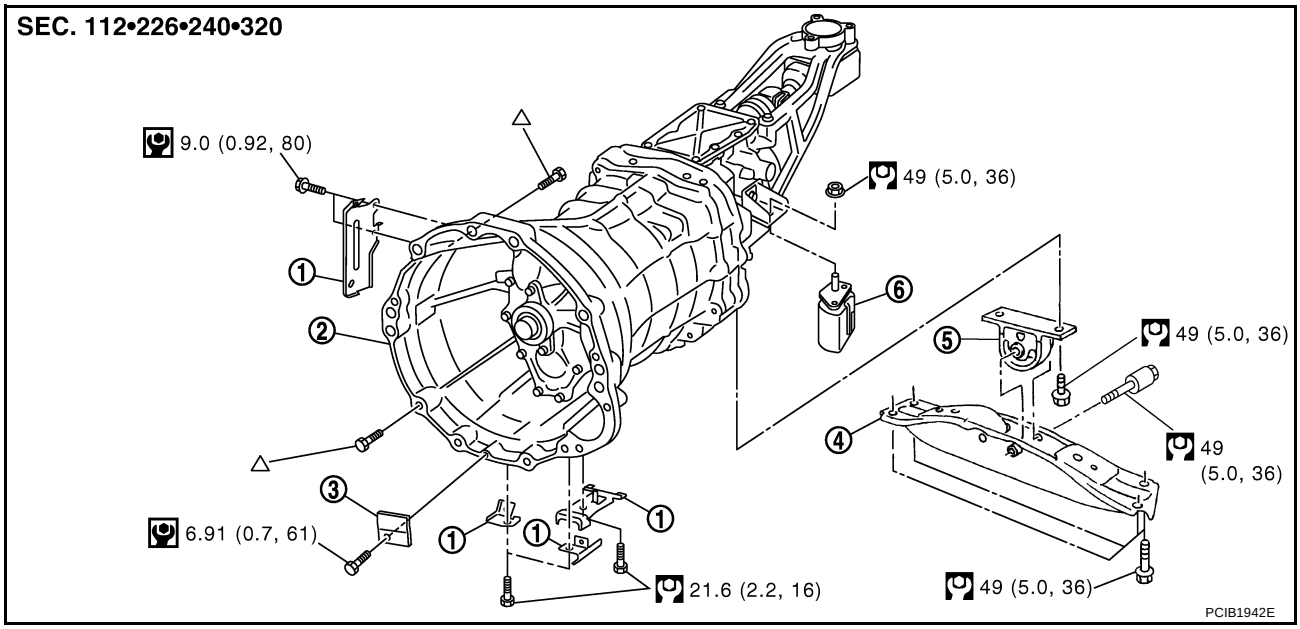
Removal and Installation

NCS0000Z

CAUTION:

If transmission assembly is removed from the Vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.

COMPONENTS



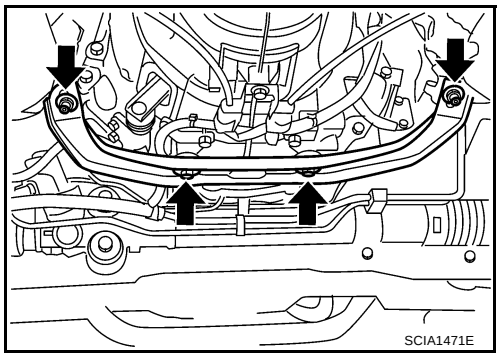
1. Harness bracket
2. Transmission assembly
3. Rear plate cover
4. Rear engine mounting member
5. Engine mounting insulator (rear)
6. Dynamic damper (For coupe)

Refer to GI-11, "Components" and the following for the symbols in the figure.

△: For the bolt tightening torque, refer to MT-20, "INSTALLATION" .

REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove tower bar. Refer to FSU-20, "Removal and Installation" .
3. Remove front cross bar with power tool. Refer to FSU-9, "REMOVAL" .
4. Remove exhaust mounting bracket. Refer to EX-3, "Removal and Installation" .

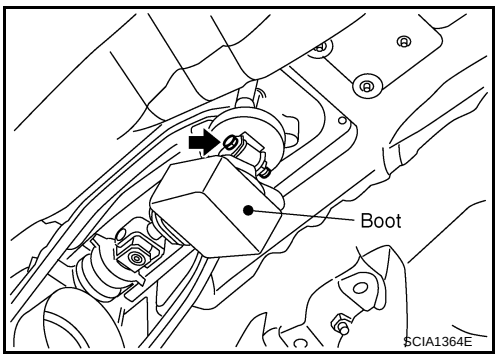


5. Remove nut connecting catalytic converter to exhaust manifold, and then remove three way catalyst and exhaust front tube as one unit. Refer to EX-3, "Removal and Installation" and EM-22, "Removal and Installation" .
6. Remove propeller shaft. Refer to PR-6, "Removal and Installation" .

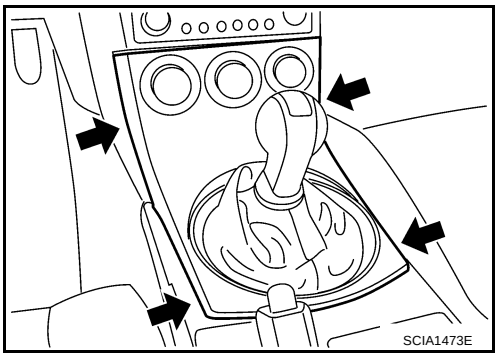
   CAUTION:

   Do not impact or damage propeller shaft tube.

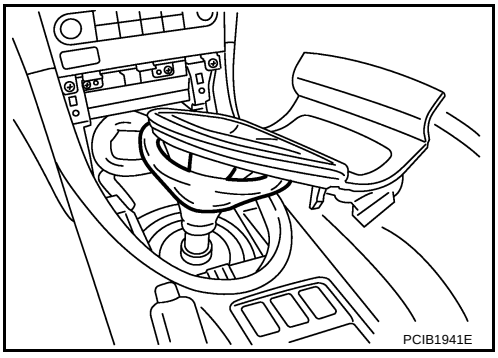
7. Remove control rod mounting bolt and then separate control lever assembly from the control rod.



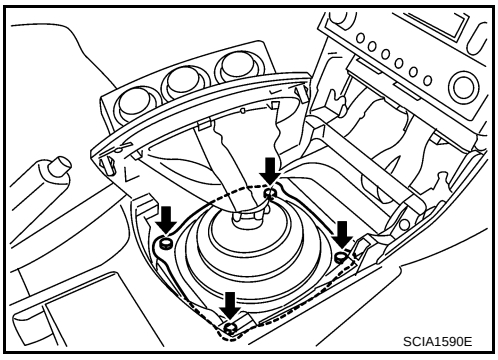
8. Using a suitable tool, release claws and separate console boot from center console. Refer to IP-11, "Removal and Installation" .



9. Remove felt as shown in the figure.
10. Slide center console assembly to remove hole cover mounting bolts.

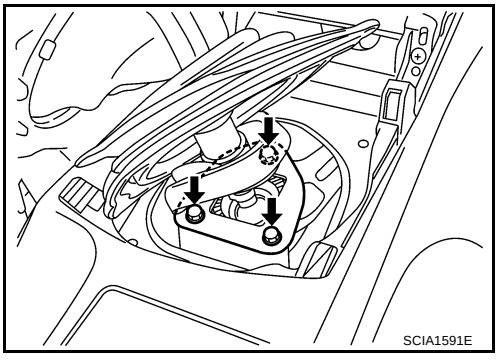


11. Remove hole cover.
12. Remove control lever boot B, hole insulator, and control lever boot A.

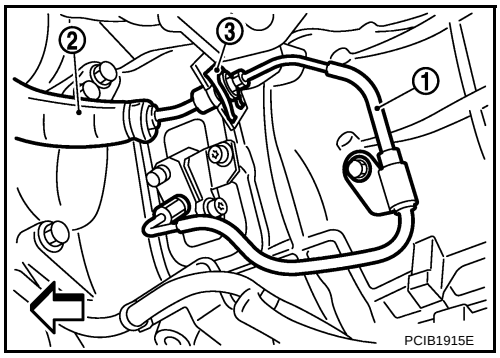


13. Remove guide plate mounting bolts and then separate control lever assembly from the control lever housing.

CAUTION:
Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.



14. Remove clutch tube (1), clutch hose (2), and lock plate (3). Refer to CL-15, "Removal and Installation" .



⇦ : Vehicle front

CAUTION:
- **Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.**
- **Do not depress clutch pedal during removal procedure.**

NOTE:
Insert a suitable plug into clutch hose and CSC (Concentric Slave Cylinder) tube after removing clutch tube.

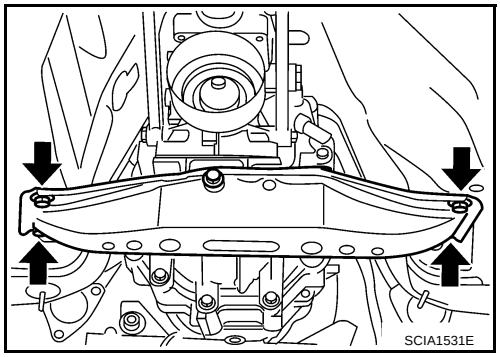
15. Remove crankshaft position sensor (POS). Refer to EM-107, "Disassembly and Assembly" .

CAUTION:
- **Do not subject it to impact by dropping or hitting.**
- **Do not disassemble.**
- **Do not allow iron dust, etc., to get on the sensor's front edge magnetic area.**
- **Do not place in an area affected by magnetism.**

16. Remove starter motor. Refer to SC-17, "Removal and Installation" .
17. Remove rear plate cover. Refer to EM-26, "Removal and Installation" .
18. Disconnect Park/Neutral position (PNP) switch harness connector.
19. Remove harness brackets.
20. Separate heated oxygen sensor 2 wire harness, back-up lamp switch wire harness and Park/Neutral position (PNP) switch wire harness from the transmission.
21. Set transmission jack to the transmission assembly.

CAUTION:
When setting transmission jack, be careful not to contact with the switch.

22. Remove rear engine mounting member. Refer to EM-101, "Removal and Installation" .



23. Remove engine and transmission mounting bolts with power tool.
24. Lower a suitable jack to the position where the back-up lamp switch harness connector can be disconnect. Then disconnect back-up lamp switch harness connector.
25. Remove transmission assembly from the vehicle.

CAUTION:
- **Secure transmission assembly to a suitable jack while removing it.**
- **The transmission assembly must not interfere with the wire harnesses and clutch hose.**
- **Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.**

26. Remove dynamic damper.
27. Remove CSC (Concentric Slave Cylinder) body and tube. Refer to CL-11, "COMPONENTS" .

CAUTION:
If transmission assembly is removed from the vehicle, always replace CSC (Concentric Slave Cylinder) body and CSC tube. Return CSC body insert to original position to remove transmission assembly. Dust on clutch disc sliding parts may damage seal of CSC body and may cause clutch fluid leakage.

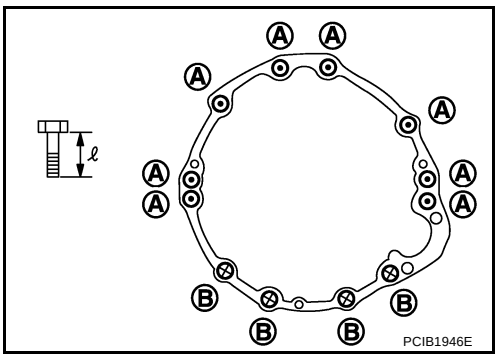
INSTALLATION

Note the following, and install in the reverse order of removal.

- Tighten transmission assembly mounting bolts to the specified torque. The figure is the view from the vehicle forward.

  : Transmission to engine

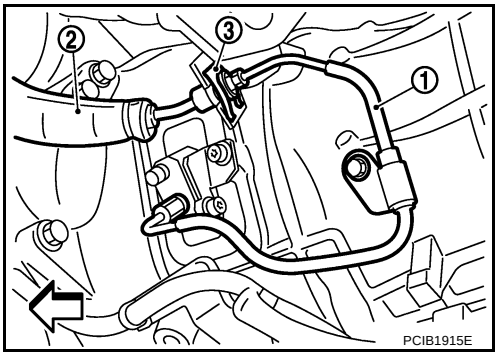
  : Engine to transmission



Bolt symbol	A	B
Quantity	8	4
" ℓ " mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7,55)	46.6 (4.8,34)

- Install clutch tube (1), clutch hose (2), and lock plate (3) and then tighten clutch tube flare nut to the specified torque. Refer to CL-15, "Removal and Installation" .

  : Vehicle front



Clutch tube mounting bolt tightening torque

: 8.1 N·m (0.83 kg-m, 72 in-lb)

CAUTION:

- **The transmission assembly must not interfere with the wire harnesses and clutch hose.**
- **When installing, be careful to avoid interference between transmission main drive gear and clutch cover.**
- **If flywheel is removed, align dowel pin with the smallest hole of flywheel. Refer to EM-111, "ASSEMBLY" .**
- **Do not impact or damage propeller shaft tube.**
- **Refer to MT-14, "INSTALLATION" and MT-16, "INSPECTION AFTER INSTALLATION" for control lever installation information.**
- **After installation, check oil level, and oil leaks and loose mechanisms. Refer to MT-9, "Checking M/T Oil" .**
- **Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.**

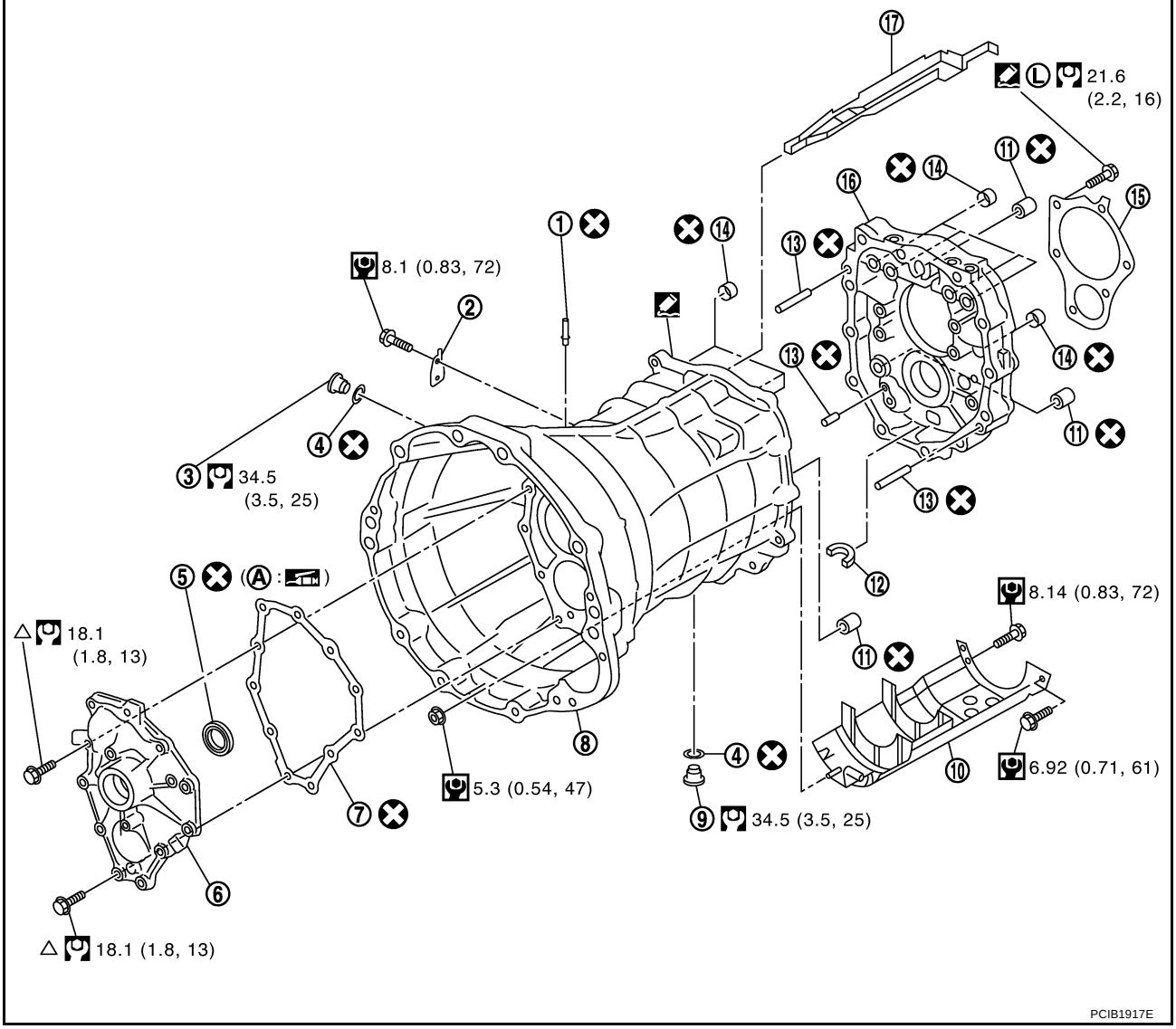
Disassembly and Assembly

NCS00011

COMPONENTS

Case Components

SEC. 321



1. Breather tube	2. Bracket	3. Filler plug
4. Gasket	5. Front cover oil seal	6. Front cover
7. Front cover gasket	8. Transmission case	9. Drain plug
10. Baffle plate	11. Sliding ball bearing	12. Magnet
13. Dowel pin	14. Bushing	15. Main shaft bearing retainer
16. Adapter plate	17. Oil gutter	
A. Seal lip		

Refer to GI-11, "Components" and the followings for the symbols in the figure.

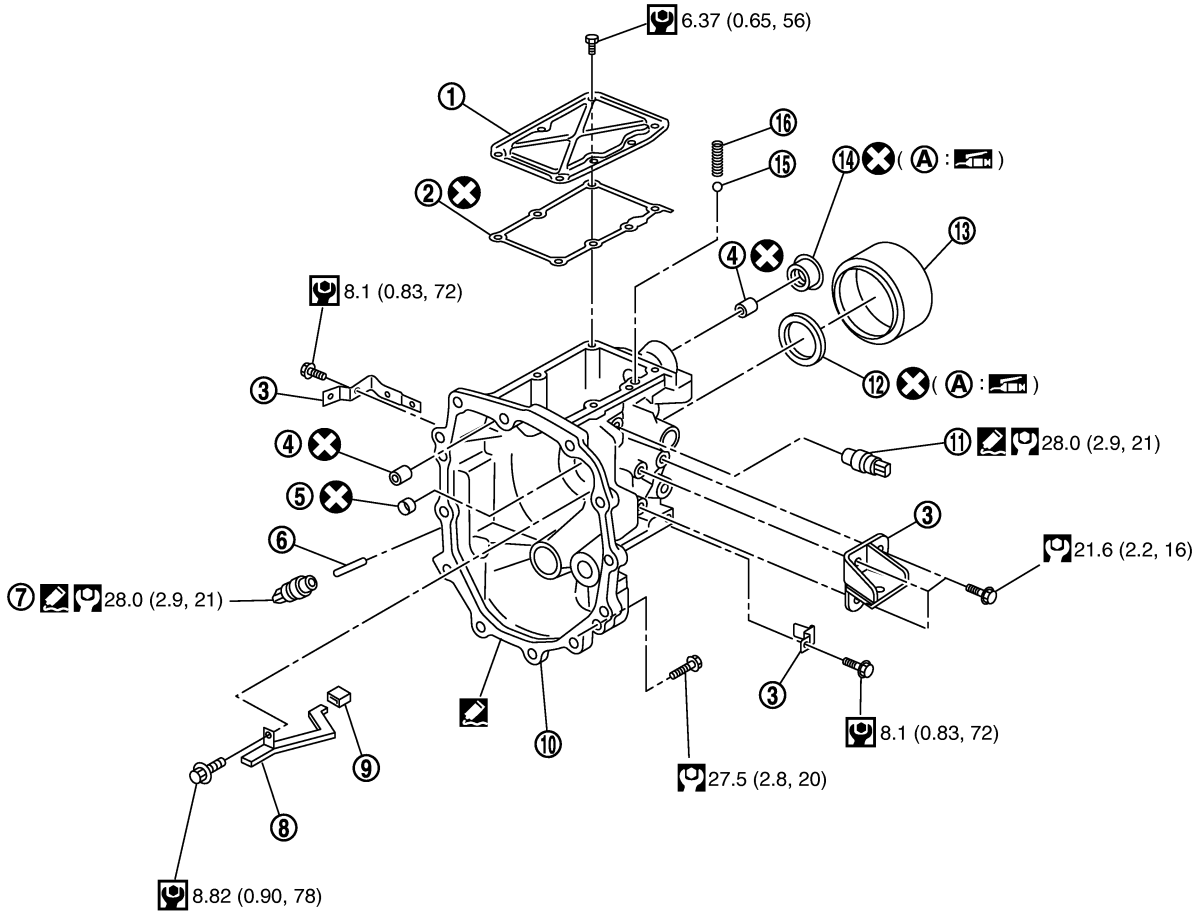
: Apply multi-purpose grease.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

: Apply Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

△ : For the bolt mounting positions, Refer to MT-56, "Case Components" .

SEC. 321



1. Rear extension upper cover	2. Rear extension upper cover gasket	3. Bracket
4. Sliding ball bearing	5. Bushing	6. Plunger
7. Park/Neutral position (PNP) switch	8. Rear extension oil gutter	9. Cap
10. Rear extension	11. Back-up lamp switch	12. Rear oil seal
13. Rear extension dust cover	14. Striking rod oil seal	15. Check ball
16. Check select spring		
A. Seal lip		

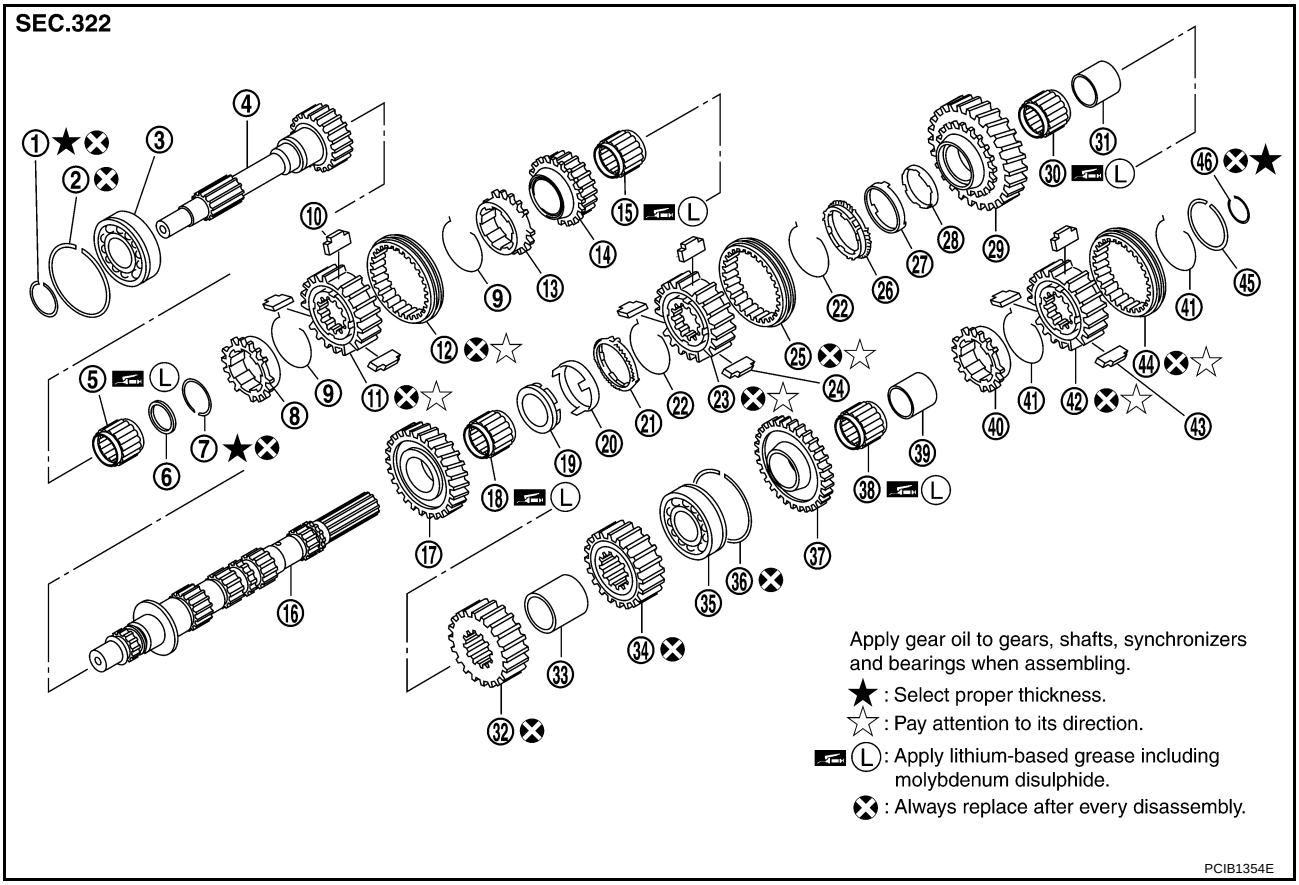
Refer to GI-11, "Components" and the followings for the symbols in the figure.

: Apply multi-purpose grease.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

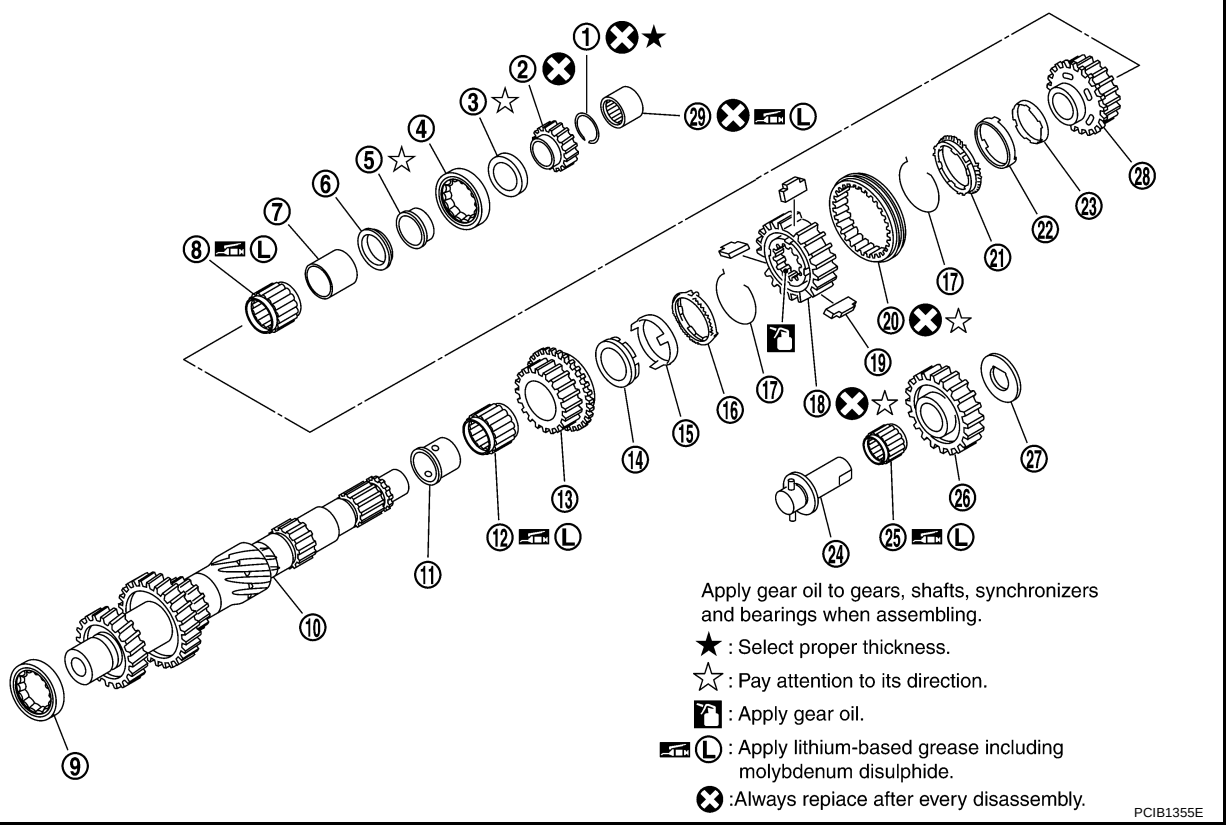
Gear Components

SEC.322



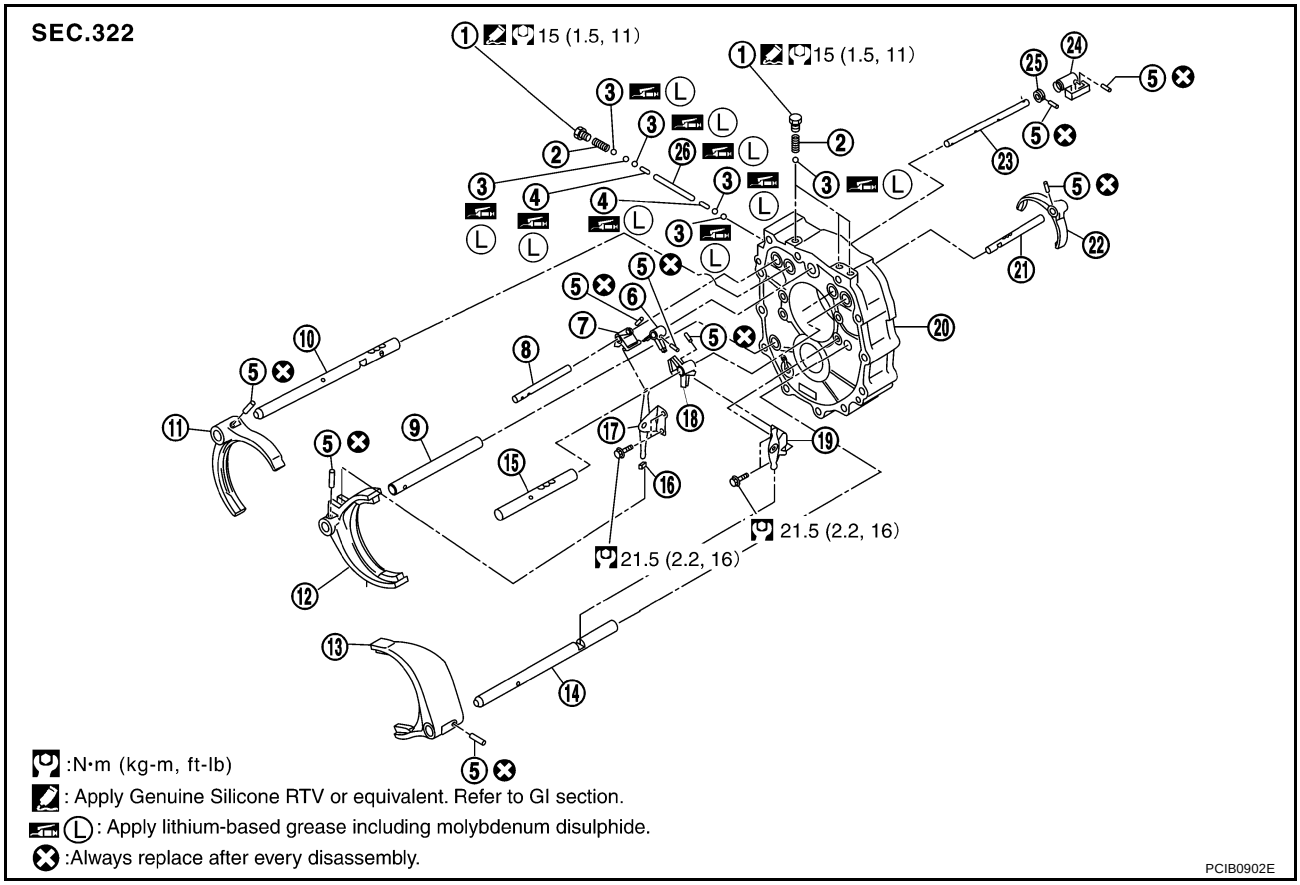
1. Snap ring
2. Snap ring
3. Main drive gear bearing
4. Main drive gear
5. Main pilot bearing
6. Pilot bearing spacer
7. Snap ring
8. 5th baulk ring
9. 5th-6th spread spring
10. 5th-6th shifting insert
11. 5th-6th synchronizer hub
12. 5th-6th coupling sleeve
13. 6th baulk ring
14. 6th main gear
15. 6th needle bearing
16. Main shaft
17. 2nd main gear
18. 2nd needle bearing
19. 2nd inner baulk ring
20. 2nd synchronizer cone
21. 2nd outer baulk ring
22. 1st-2nd spread spring
23. 1st-2nd synchronizer hub
24. 1st-2nd shifting insert
25. 1st-2nd coupling sleeve
26. 1st outer baulk ring
27. 1st synchronizer cone
28. 1st inner baulk ring
29. 1st main gear
30. 1st needle bearing
31. 1st gear bushing
32. 3rd main gear
33. 3rd-4th main spacer
34. 4th main gear
35. Main shaft bearing
36. Snap ring
37. Reverse main gear
38. Reverse main needle bearing
39. Reverse main gear bushing
40. Reverse baulk ring
41. Reverse spread spring
42. Reverse synchronizer hub
43. Reverse shifting insert
44. Reverse coupling sleeve
45. Snap ring
46. Snap ring

SEC.322



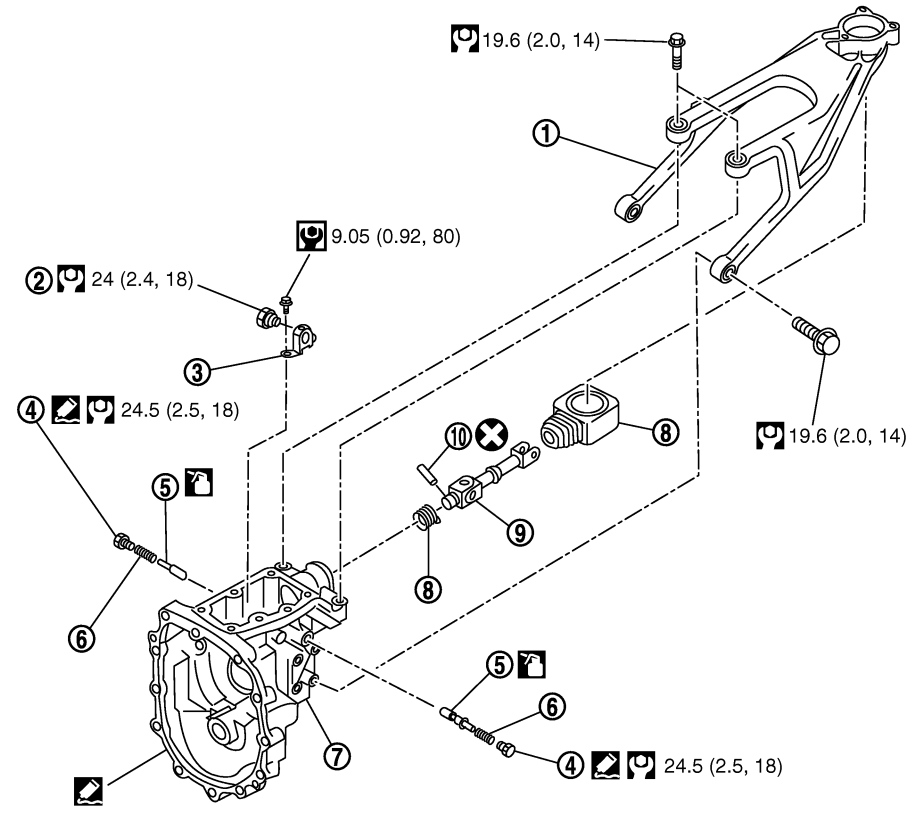
1. Snap ring
2. Reverse counter gear
3. Counter rear bearing spacer
4. Counter rear bearing
5. Counter rear bearing inner race
6. 4th counter gear thrust washer
7. 4th gear bushing
8. 4th needle bearing
9. Counter front bearing
10. Counter shaft
11. 3rd gear bushing
12. 3rd needle bearing
13. 3rd counter gear
14. 3rd inner baulk ring
15. 3rd synchronizer cone
16. 3rd outer baulk ring
17. 3rd-4th spread spring
18. 3rd-4th synchronizer hub
19. 3rd-4th shifting insert
20. 3rd-4th coupling sleeve
21. 4th outer baulk ring
22. 4th synchronizer cone
23. 4th inner baulk ring
24. Reverse idler shaft
25. Reverse idler needle bearing
26. Reverse idler gear
27. Reverse idler thrust washer
28. 4th counter gear
29. Counter end bearing

Shift Control Components



1. Check ball plug
2. Check ball spring
3. Check ball
4. Interlock pin
5. Retaining pin
6. Striking lever
7. 3rd-4th fork rod bracket
8. 3rd-4th fork rod
9. 3rd-4th fork rod (reversal side)
10. 1st-2nd fork rod
11. 1st-2nd shift fork
12. 3rd-4th shift fork
13. 5th-6th shift fork
14. 5th-6th fork rod (reversal side)
15. 5th-6th fork rod
16. Shiftier cap
17. 3rd-4th control lever
18. 5th-6th fork rod bracket
19. 5th-6th control lever
20. Adapter plate
21. Reverse fork rod
22. Reverse shift fork
23. Striking rod
24. Low/high control lever
25. Stopper ring
26. Interlock plunger

SEC. 321



1. Control lever housing
2. Check shift pin
3. Control bracket
4. Return spring plug
5. Return spring plunger
6. Return spring
7. Rear extension
8. Boot
9. Control rod
10. Retaining pin

Refer to GI-11, "Components" and the followings for the symbols in the figure.

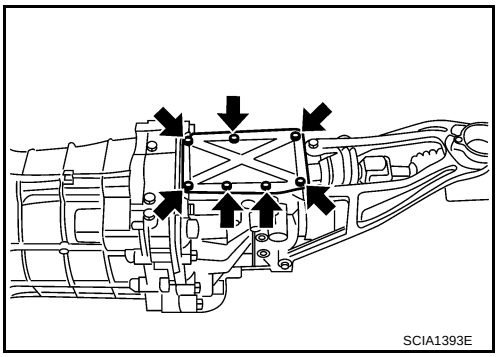
: Apply gear oil.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

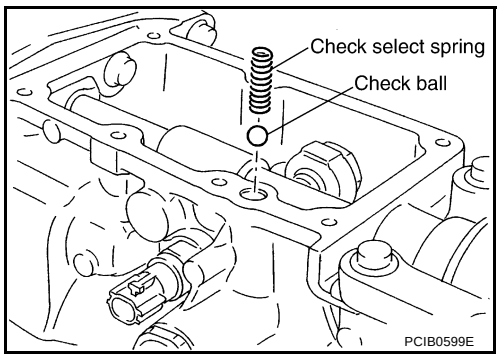
DISASSEMBLY

Case Components

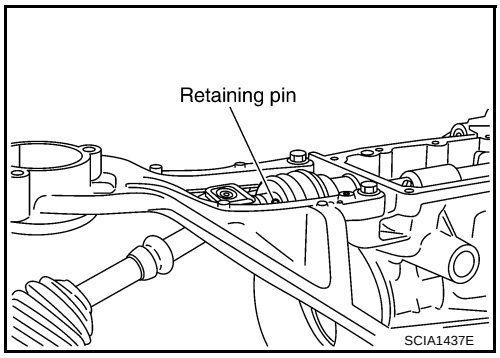
1. Remove rear extension upper cover mounting bolts.
2. Remove rear extension upper cover and rear extension upper cover gasket from the rear extension.



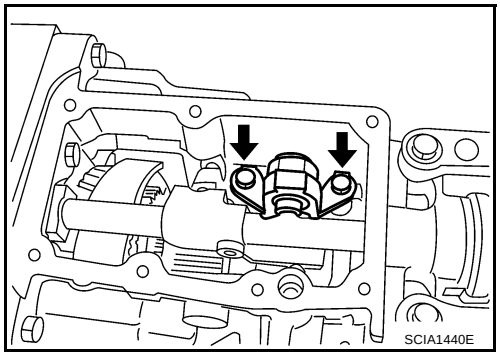
3. Remove check select spring and check ball from the rear extension.



4. Remove retaining pin using a pin punch, and remove control rod.
5. Remove Park/Neutral position (PNP) switch, plunger and back-up lamp switch from the rear extension.



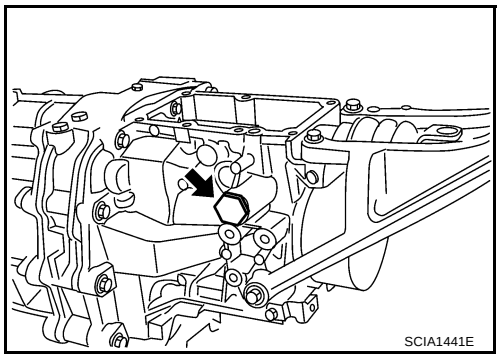
6. Remove control bracket mounting bolts. Then remove check shift pin and control bracket as one unit from the rear extension.



7. Remove right and left return spring plugs. Then remove return springs and return spring plungers from the rear extension.

CAUTION:
Return spring and return spring plunger have different lengths for right and left sides. Identify right and left side and then store.

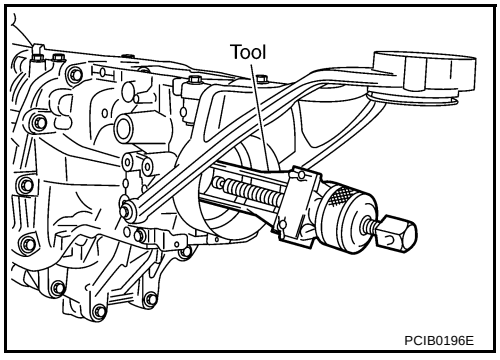
8. Remove bracket mounting bolts. Then remove brackets from the rear extension.



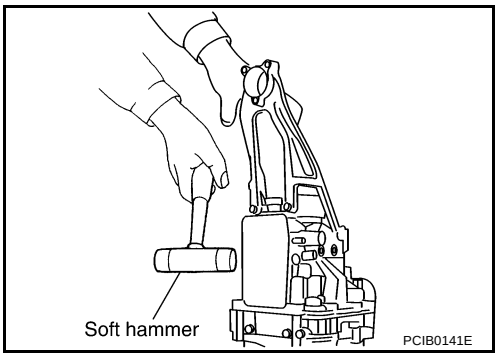
9. Remove rear oil seal from the rear extension using an oil seal puller.

Tool number : KV381054S0 (J-34286)

CAUTION:
Be careful not to damage rear extension.



10. Remove rear extension mounting bolts. Using a soft hammer, tap rear extension assembly to remove.

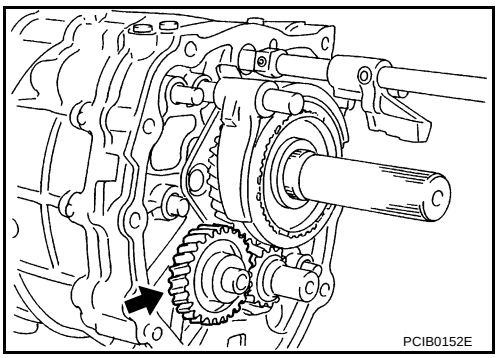


CAUTION:
Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.

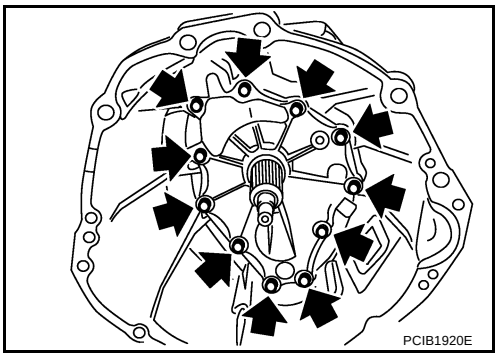
11. Remove control lever housing mounting bolts, and remove control lever housing from the rear extension.
12. Remove striking rod oil seal from the rear extension. Refer to MT-22, "Case Components" .

CAUTION:
Be careful not to damage rear extension.

13. Remove rear extension oil gutter and cap from the rear extension. Refer to MT-22, "Case Components" .
14. Remove reverse idler thrust washer, revers idler gear, and reverse idler needle bearing from the reverse idler shaft.
15. Remove reverse idler shaft from the adapter plate.

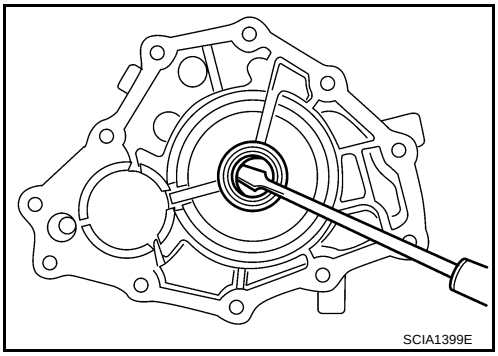


16. Remove front cover mounting bolts, then remove front cover and front cover gasket from the transmission case.

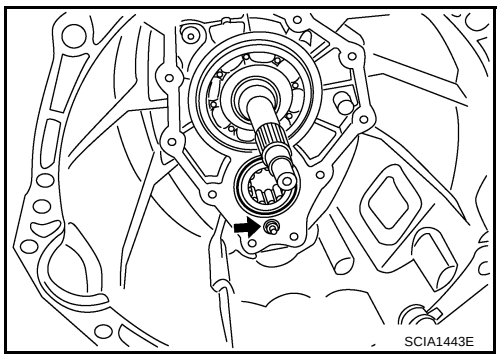


17. Remove front cover oil seal from the front cover, using a flat-bladed screwdriver.

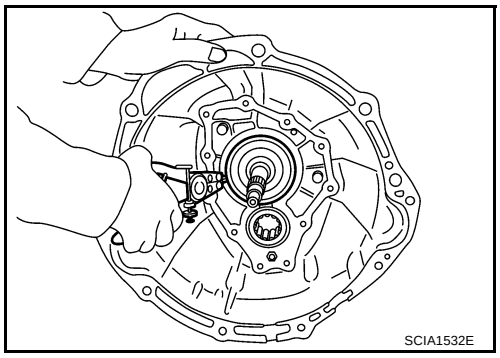
CAUTION:
Be careful not to damage front cover mating surface.



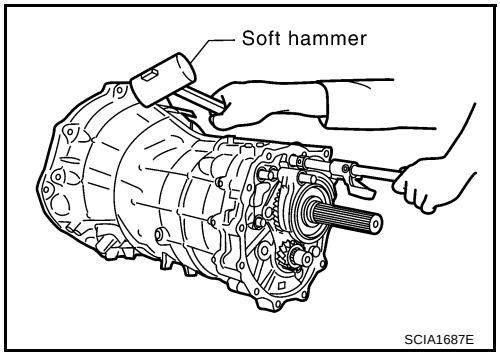
18. Remove baffle plate mounting nut from the transmission case.



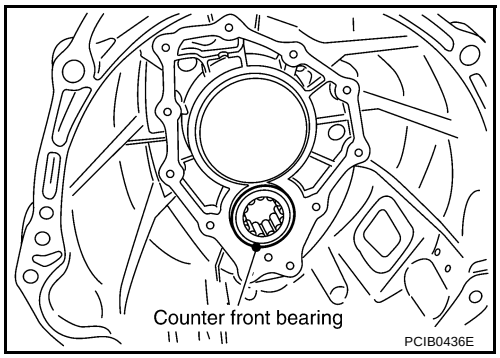
19. Remove snap ring from the main drive gear bearing, using snap ring pliers.



20. Using a soft hammer to carefully tap main shaft and counter shaft from the transmission case side, and then separate adapter plate and transmission case.



21. Remove counter front bearing from the transmission case.
22. Remove oil gutter and breather tube from the transmission case.
23. Remove filler plug, drain plug, and gaskets from transmission case.
24. Remove bracket mounting bolt and then remove bracket from transmission case.

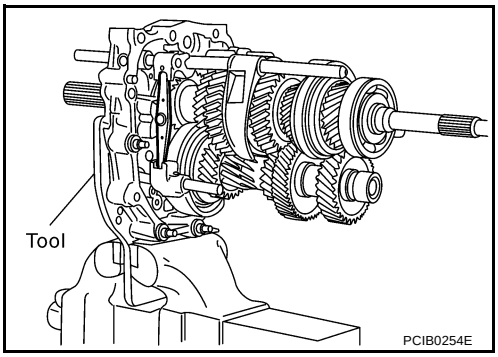


Shift Control Components

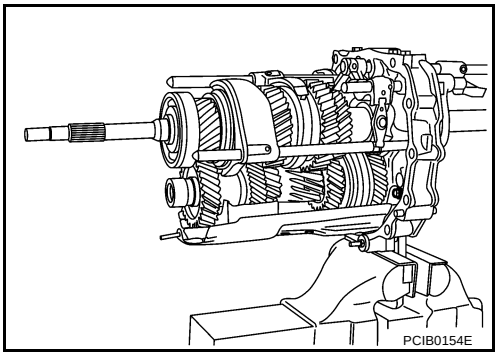
1. Install adapter setting plate to the adapter plate and then fixing in adapter setting plate using a vise.

   Tool number : ST22490000 (—)

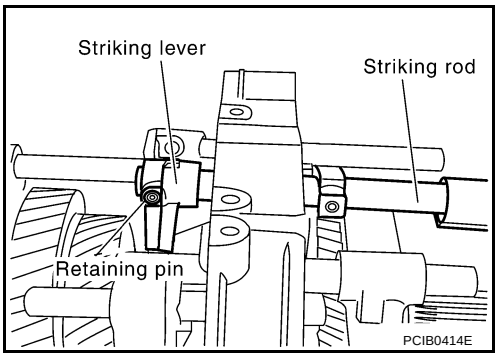
   CAUTION:
   Do not directly secure the surface in a vise.



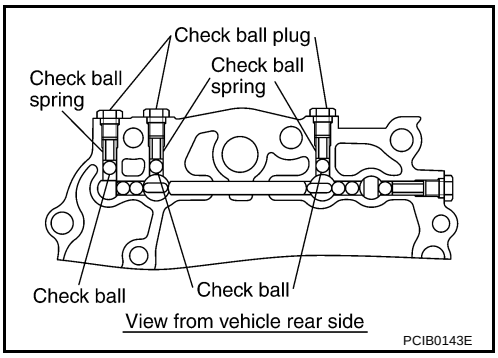
2. Remove baffle plate mounting bolts, and remove baffle plate from the adapter plate.



3. Remove retaining pin using a pin punch, and remove striking lever and striking rod.

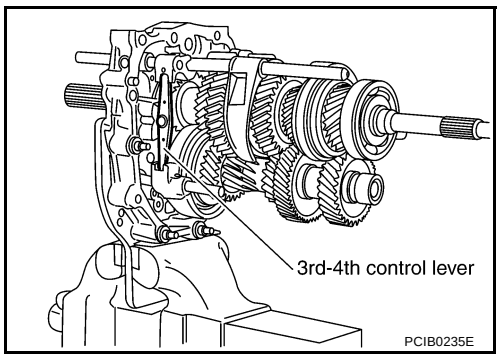


4. Remove check ball plugs and then remove check ball springs and check balls from the adapter plate.

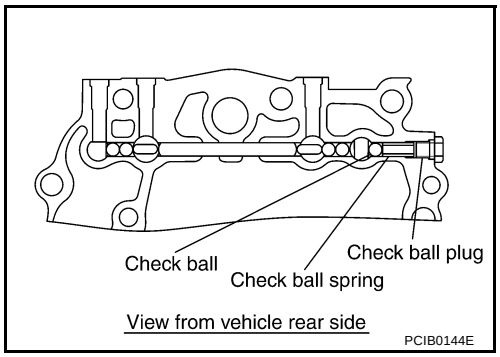


5. Remove 3rd-4th control lever mounting bolts and then remove 3rd-4th control lever and shifter cap.

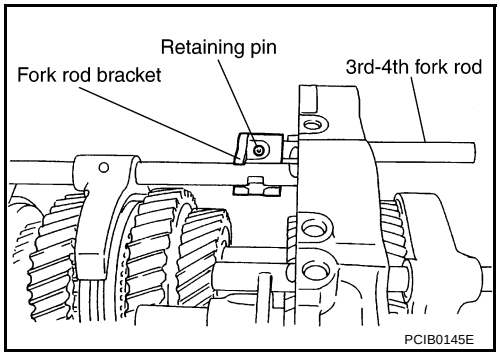
CAUTION:
Be careful not to lose shifter cap.



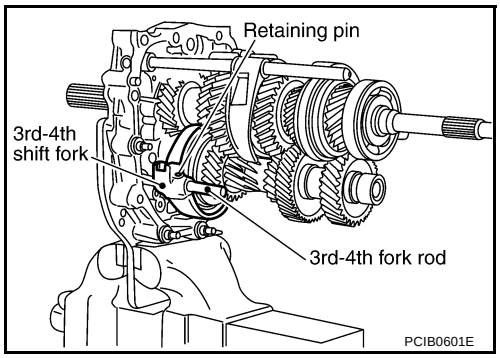
6. Remove check ball plug and then remove check ball spring and check ball from the adapter plate.



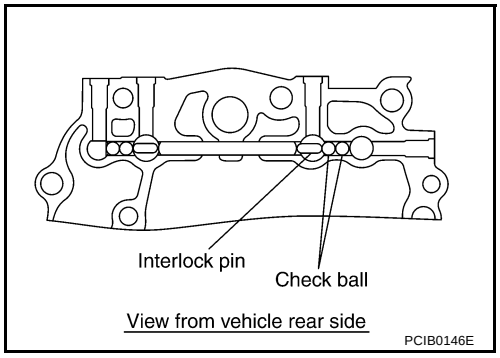
7. Using a pin punch to knock out retaining pin, and then remove 3rd-4th fork rod bracket and 3rd-4th fork rod.



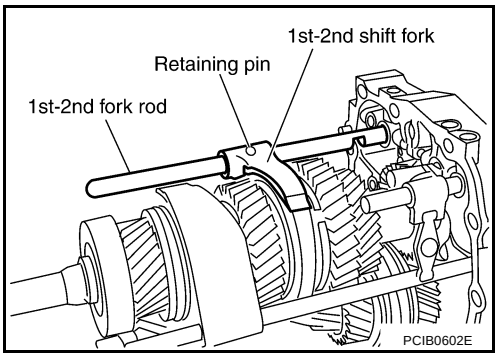
8. Using a pin punch to knock out retaining pin, and then remove 3rd-4th shift fork and 3rd-4th fork rod (reversal side).



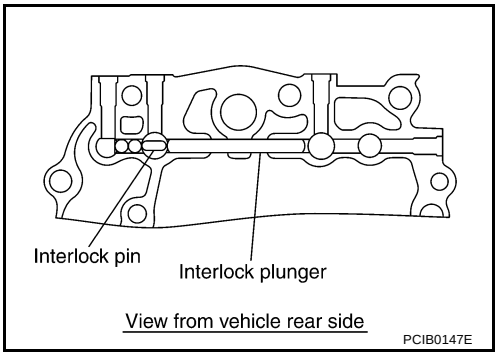
9. Remove check balls and interlock pin from the adapter plate.



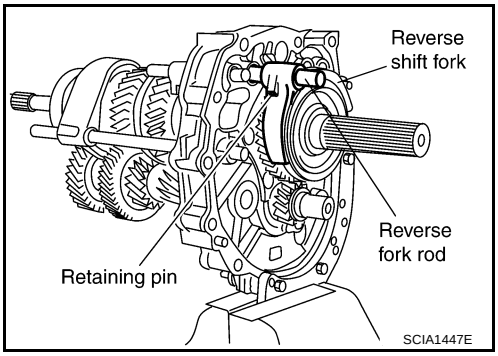
10. Using a pin punch to knock out retaining pin, and then remove 1st-2nd shift fork and 1st-2nd fork rod.



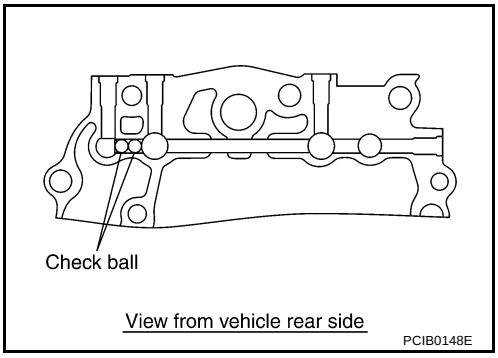
11. Remove interlock plunger and interlock pin from the adapter plate.



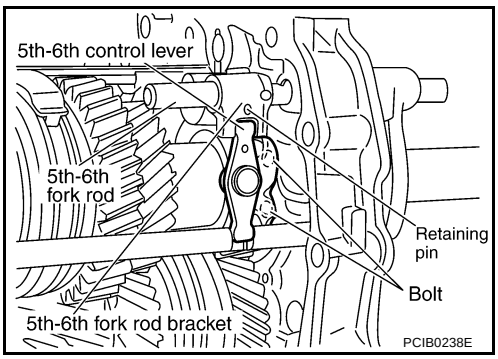
12. Using a pin punch to knock out retaining pin, and then remove reverse shift fork and reverse fork rod.



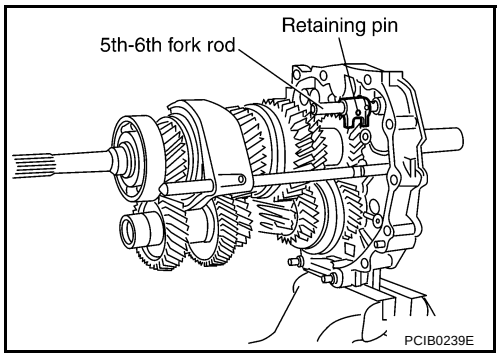
13. Remove check balls from the adapter plate.



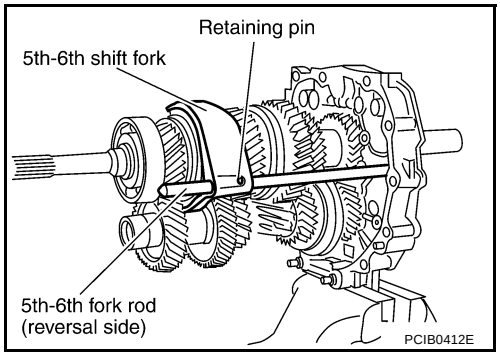
14. Remove 5th-6th control lever mounting bolts and then remove 5th-6th control lever from the adapter plate.



15. Using a pin punch to knock out retaining pin, and then remove 5th-6th fork rod bracket and 5th-6th fork rod.



16. Using a pin punch to knock out retaining pin, and then remove 5th-6th fork rod (reversal side) and 5th-6th shift fork.

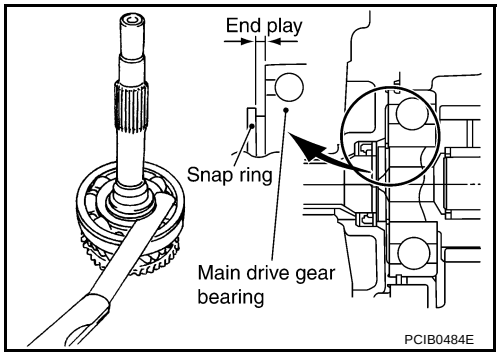


Gear Components

- Before disassembly, measure end play for each position. If the end play is outside the standards, disassemble and inspect.

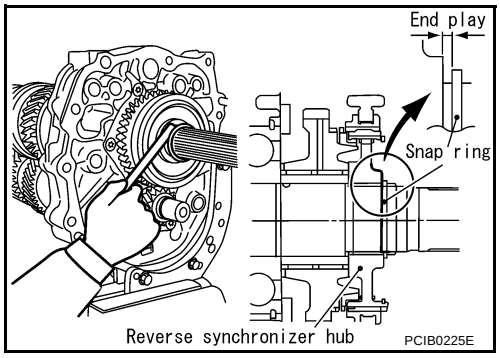
– Main drive gear

End play : 0 - 0.10 mm (0 - 0.004 in)



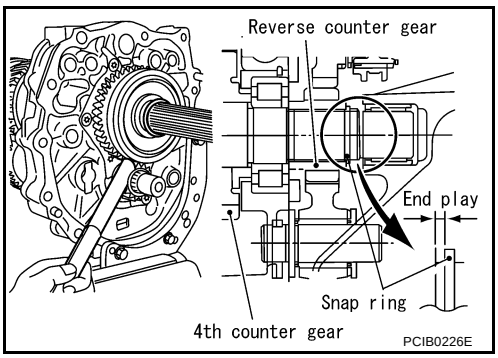
– Main shaft

End play : 0 - 0.10 mm (0 - 0.004 in)

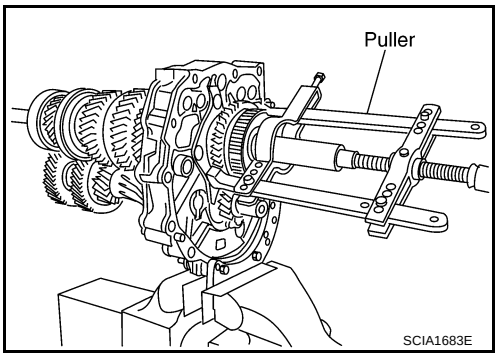


– Counter shaft

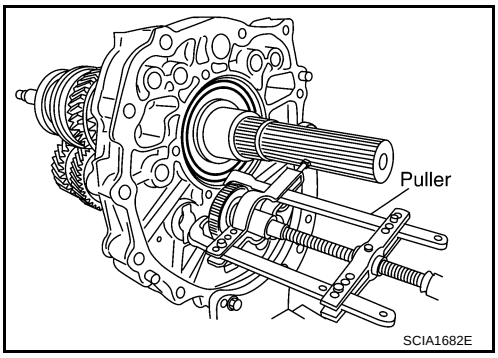
End play : 0 - 0.10 mm (0 - 0.004 in)



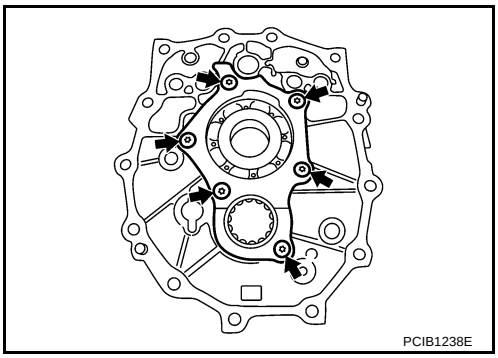
1. After removing snap ring and reverse coupling snap ring, using a puller to remove reverse main gear and reverse synchronizer assembly.
2. Remove reverse main needle bearing.



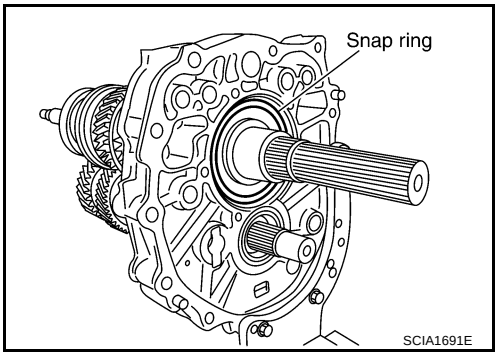
3. After removing snap ring, using the puller to remove reverse counter gear and counter rear bearing spacer.



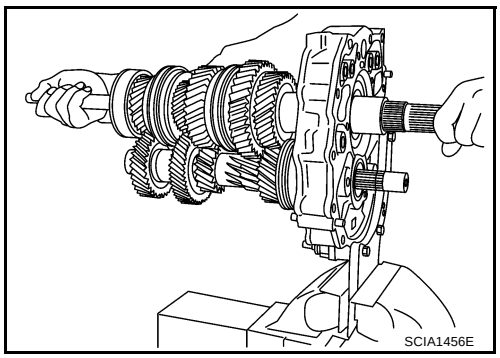
4. Remove main shaft bearing retainer mounting bolts and then remove main shaft bearing retainer.



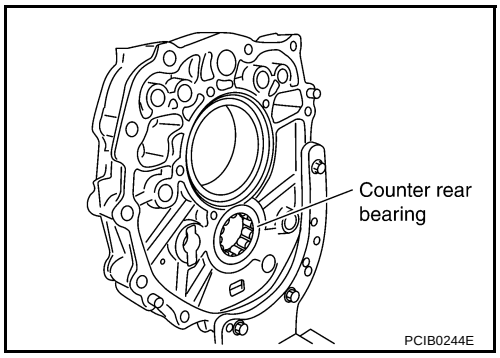
5. Remove snap ring from the main shaft bearing.



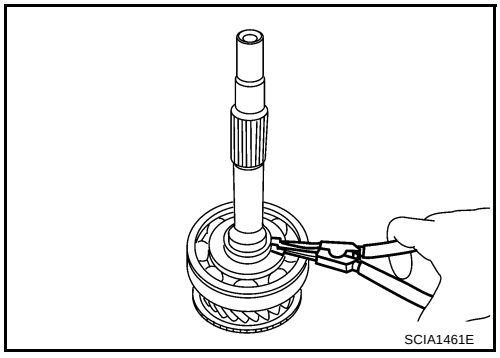
6. Carefully tap main shaft with a plastic hammer and then remove main shaft, main drive gear, and counter shaft from adapter plate.
7. Remove main pilot bearing, pilot bearing spacer and 5th baulk ring.



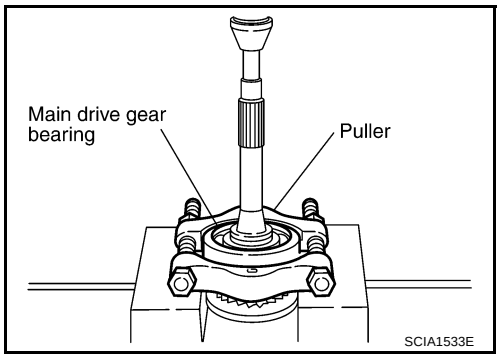
8. Remove counter rear bearing from the adapter plate.
9. Remove magnet from adapter plate.



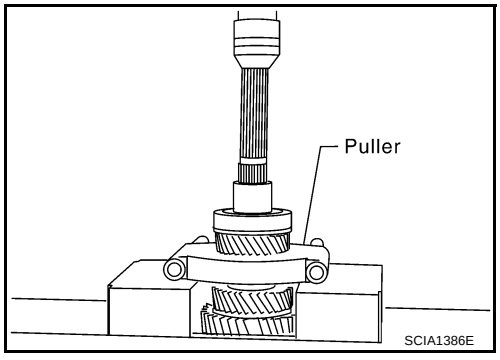
10. Remove snap ring from the main drive gear using snap ring pliers.



11. Set the suitable puller on the main drive gear and then using a press to remove main drive gear bearing from the main drive gear.



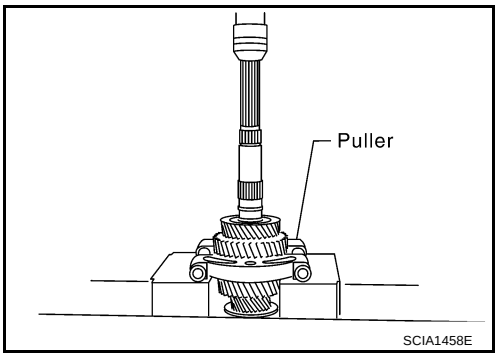
12. Using a press to remove the reverse main gear bushing, main shaft bearing and 4th main gear.
13. Remove 3rd-4th main spacer.



14. Using a press to remove 1st main gear and 3rd main gear.

CAUTION:
Be careful not to damage the baulk ring.

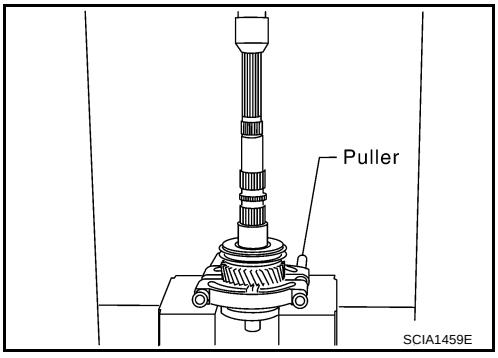
15. Remove 1st needle bearing.



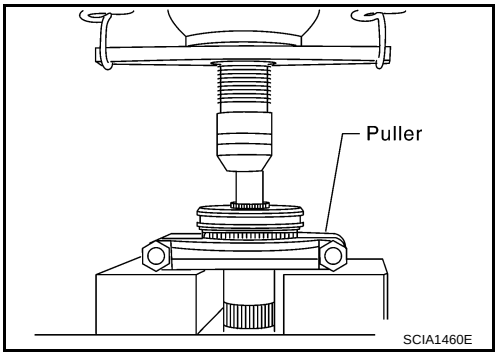
16. Using a press to remove 1st gear bushing, 1st-2nd synchronizer assembly, and 2nd main gear.

CAUTION:
Be aware that when using the press, if the main shaft gear positioner catches on the V-block, etc., the main shaft could be damaged.

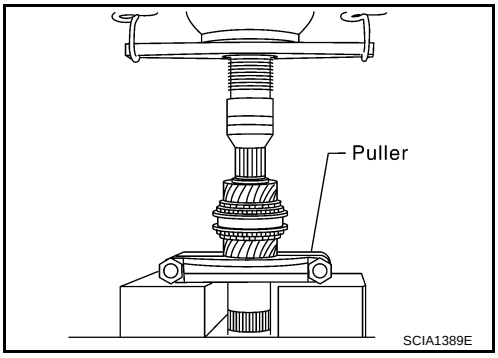
17. Remove 2nd needle bearing.



18. After removing snap ring, using a press to remove 6th main gear and 5th-6th synchronizer assembly.
19. Remove 6th needle bearing.

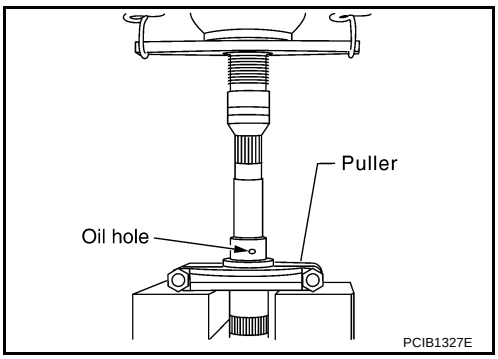


20. Using a press to remove the 3rd counter gear, 3rd-4th synchronizer assembly, 4th counter gear, 4th needle bearing, 4th gear bushing, 4th counter gear thrust washer, and counter rear bearing inner race.
21. Remove 3rd needle bearing.



22. Using a press to remove the 3rd gear bushing.

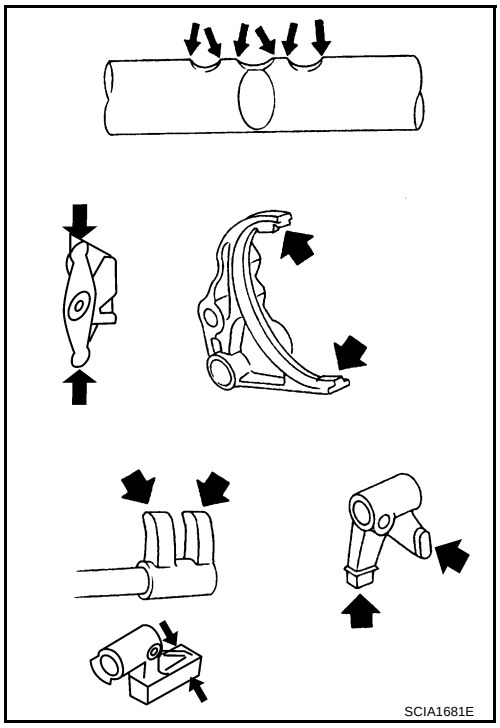
CAUTION:
Do not use oil hole of 3rd gear bushing when press out.



INSPECTION AFTER DISASSEMBLY

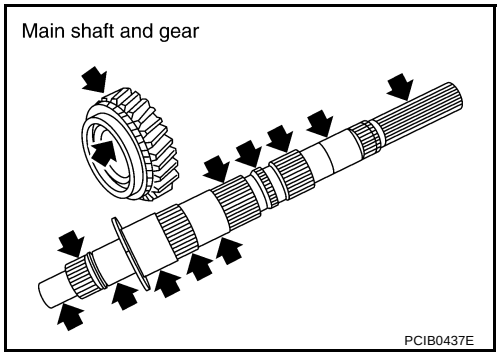
Shift Control

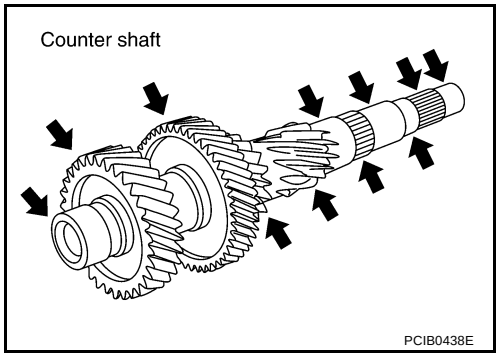
If the contact surface on striking lever, fork rod, shift fork, etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



Gear and Shaft

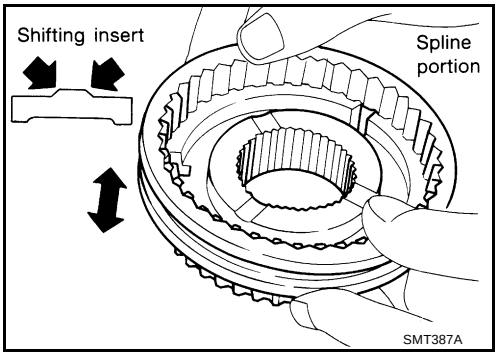
If the contact surface on each gear, main shaft, main drive gear, and counter shaft, etc. has damage, peeling, abrasion, dent, bent, or any other damage, replace the components.



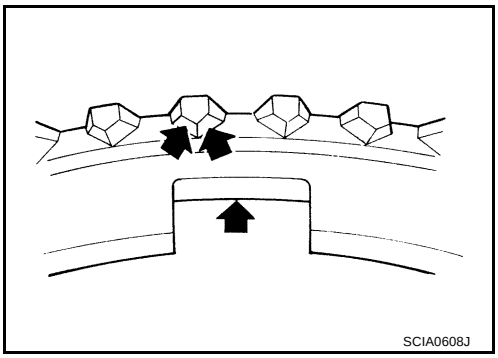


Synchronizer

- If the contact surface on coupling sleeve, synchronizer hub, and shifting insert has damage or abrasion, replace the components.
- Coupling sleeve and synchronizer hub shall move smoothly.



- If the cam surface on baulk ring or contact surface on insert has damage or excessive wear, replace with a new one.
- If spread spring is damaged, replace with a new one.



Baulk Ring Clearance

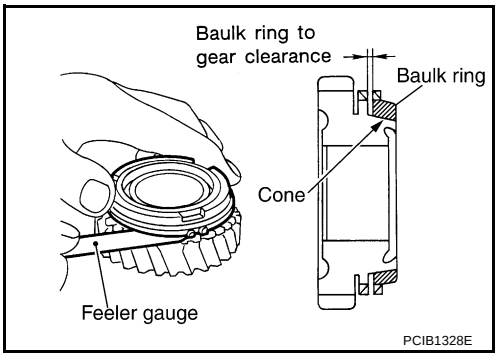
- **Single cone synchronizer (5th and 6th)**

– Push baulk ring on the cone and measure baulk ring back surface clearance at two locations or more on opposite sides, find the average value, and replace it if it is outside the limit value.

Clearance

Standard value : 0.70 - 1.35 mm (0.028 - 0.053 in)

Limit value : 0.5 mm (0.020 in) or less

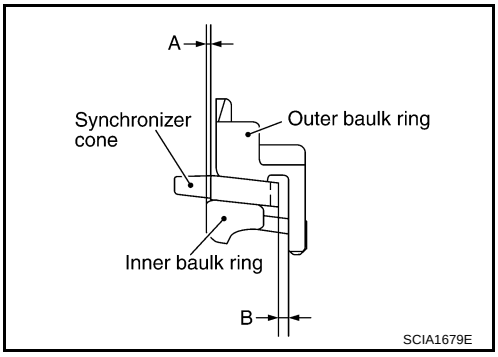


- **Double cone synchronizer (4th)**

Follow the instructions below and inspect the clearance of the outer baulk ring, synchronizer cone, inner baulk ring.

CAUTION:

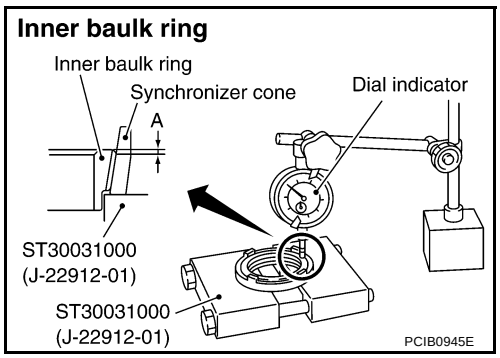
Clearances “A” and “B” of the outer baulk ring, synchronizer cone, and inner baulk ring are controlled as a set, so if the clearance is outside the limit value, replace the synchronizer assembly.



1. Using a dial indicator, measure clearance A at 2 or more points diagonally opposite, and calculate mean value.

Clearance A

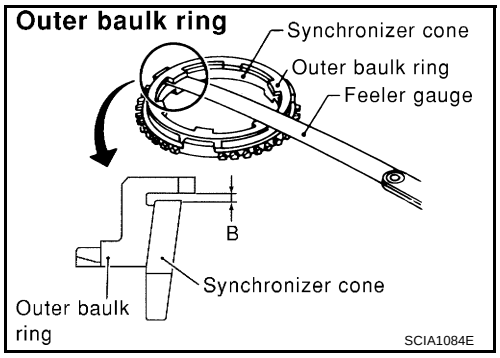
Standard value	**: 0.50 - 0.70 mm (0.020 - 0.028 in)**
Limit value	**: 0.3 mm (0.012 in) or less**



2. Using a feeler gauge, measure clearance B at 2 or more points diagonally opposite, and calculate mean value.

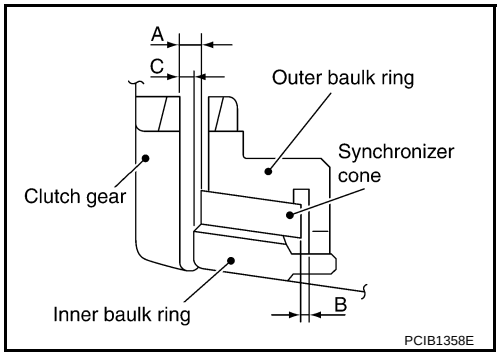
Clearance B

Standard value	**: 0.85 - 1.35 mm (0.033 - 0.053 in)**
Limit value	**: 0.7 mm (0.028 in) or less**



- **Triple cone synchronizer (1st, 2nd and 3rd)**
  Check clearance for outer baulk ring, synchronizer cone and inner baulk ring of triple cone synchronizer following the direction.

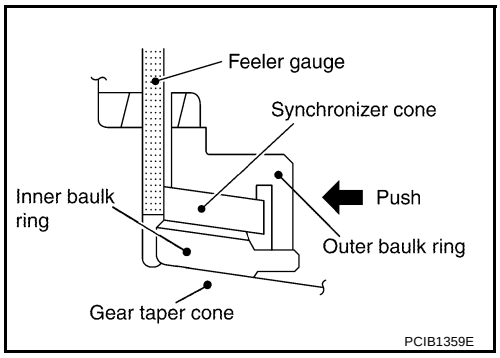
  NOTE:
  Outer baulk ring, synchronize cone and inner baulk ring, three control “clearance A, B and C” as a three-piece suite. If the value exceeds the limit value, replace them as a three-piece suite.



1. Using feeler gauge put and press baulk ring on gear taper cone, and then measure “clearance A” at more then 2 diagonal points, and calculate the average.

Clearance A

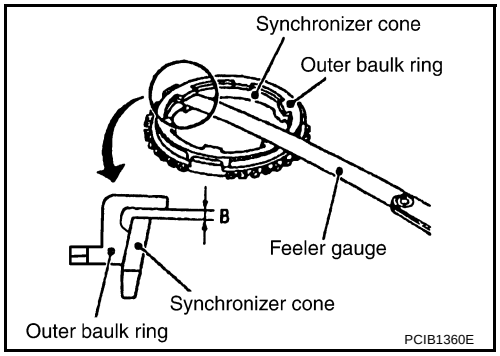
Standard value (1st)	**: 0.65 - 1.25 mm (0.026 - 0.049 in)**
Standard value (2nd, 3rd)	**: 0.60 - 1.30 mm (0.024 - 0.051 in)**
Limit value	**: 0.3 mm (0.012 in) or less**



2. Using feeler gauge measure “clearance B” at more than 2 diagonal positions, and calculate the average.

Clearance B

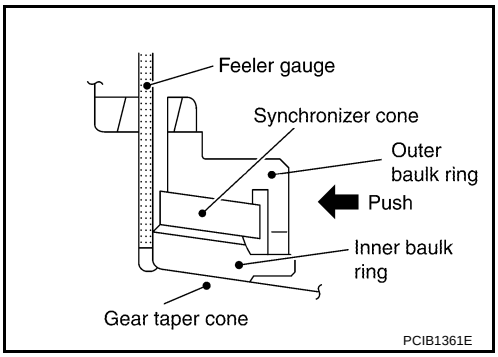
Standard value	**: 0.85 - 1.35 mm (0.033 - 0.053 in)**
Limit value	**: 0.7 mm (0.028 in) or less**



3. Using feeler gauge put and press baulk ring on gear taper cone, and then measure “clearance C” at more then 2 diagonal points, and calculate the average.

Clearance C

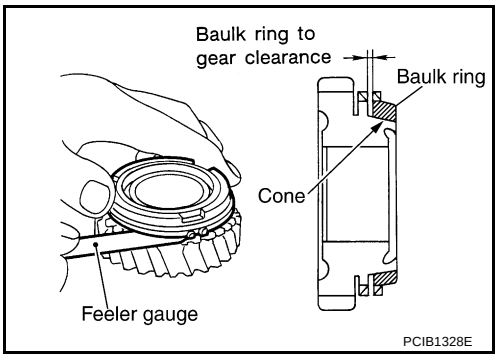
Standard value (1st)	**: 0.80 - 1.2 mm (0.031 - 0.047 in)**
Standard value (2nd, 3rd)	**: 0.75 - 1.25 mm (0.030 - 0.049 in)**
Limit value	**: 0.3 mm (0.012 in) or less**



- **Reverse synchronizer**
  Push baulk ring on the cone and measure baulk ring back surface clearance at two locations or more on opposite sides, find the average value, and replace if it is outside the limit value.

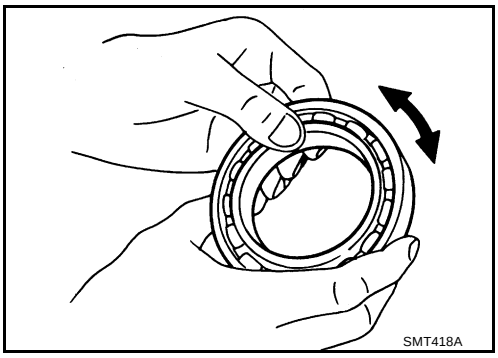
Clearance

Standard value	**: 0.75 - 1.20 mm (0.030 - 0.047 in)**
Limit value	**: 0.5 mm (0.020 in) or less**



Bearing

If the bearing does not rotate smoothly or the contact surface on ball or race is damaged or peeled, replace with new ones.



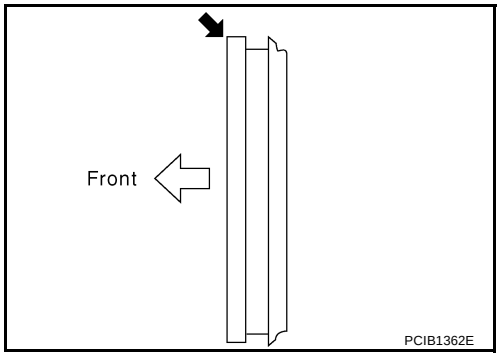
ASSEMBLY

Gear Components

1. Install 5th-6th coupling sleeve and 5th-6th shifting inserts in the 5th-6th synchronizer hub.

CAUTION:

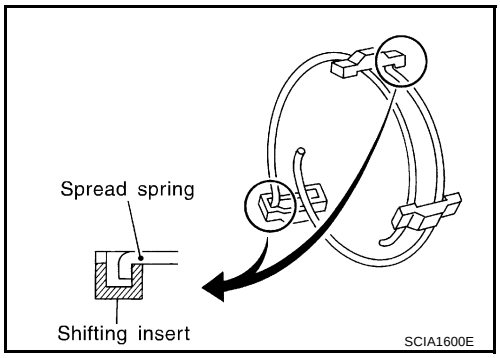
- **Do not reuse 5th-6th coupling sleeve and 5th-6th synchronizer hub.**
- **Replace 5th-6th coupling sleeve and 5th-6th synchronizer hub as a set.**
- **Install 5th-6th coupling sleeve with the large chamfer on the rear side.**



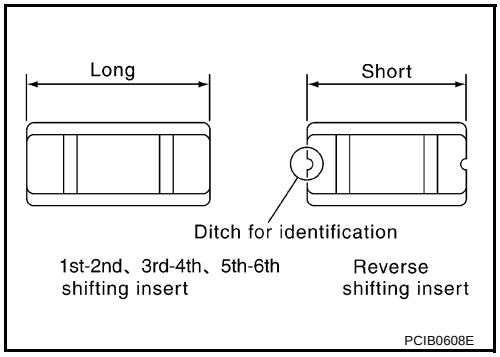
2. Install 5th-6th spread springs in the 5th-6th shifting inserts.

CAUTION:

- **Do not install 5th-6th spread spring hook onto the same 5th-6th shifting insert.**

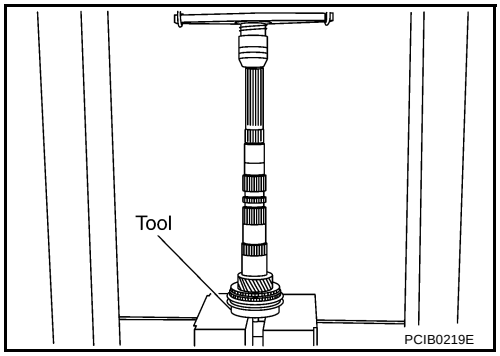


- **Be careful with the shape of reverse shifting insert to avoid misassembly.**

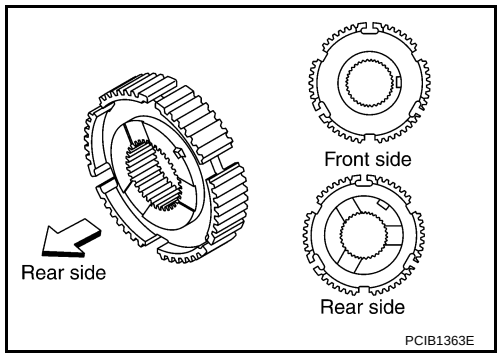


3. Apply recommended grease to 6th needle bearing.
4. Install 6th needle bearing, 6th main gear and 6th baulk ring on the main shaft and then using an inserter and a press to press fit the 5th-6th synchronizer assembly.

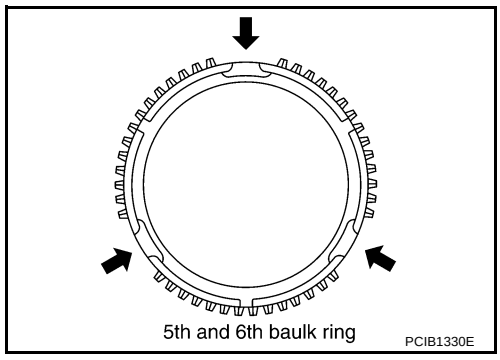
Tool number : ST30911000 (—)



CAUTION:
When press fitting, install with the side having the three boss edge oil grooves facing the rear side.



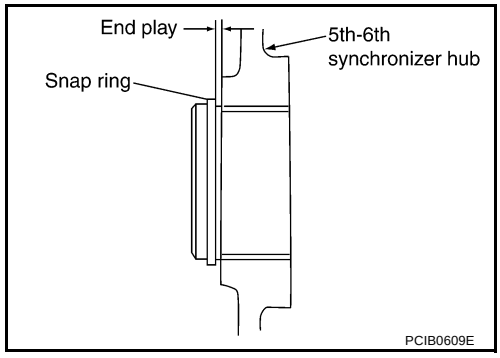
NOTE:
5th and 6th baulk rings have three spaces that four gear teeth are missing as shown in the figure.



5. Select and install a snap ring so that the end play comes within the standard value.

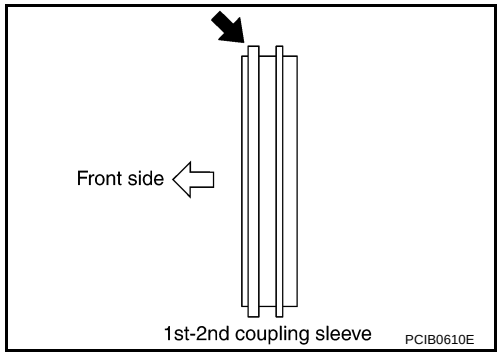
End play : 0 - 0.10 mm (0 - 0.004 in)

CAUTION:
Do not reuse snap ring.



6. Install 1st-2nd coupling sleeve and 1st-2nd shifting inserts into the 1st-2nd synchronizer hub.

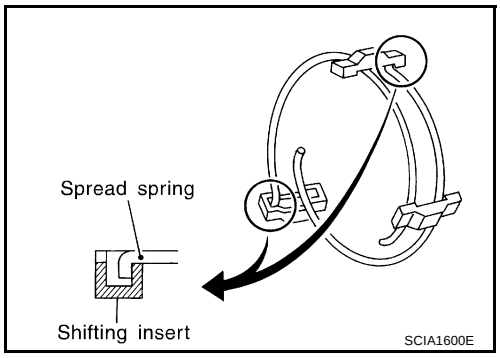
CAUTION:
- **Do not reuse 1st-2nd coupling sleeve and 1st-2nd synchronizer hub.**
- **Replace 1st-2nd coupling sleeve and 1st-2nd synchronizer hub as a set.**
- **Install 1st-2nd coupling sleeve with the thicker flange faced the front side.**



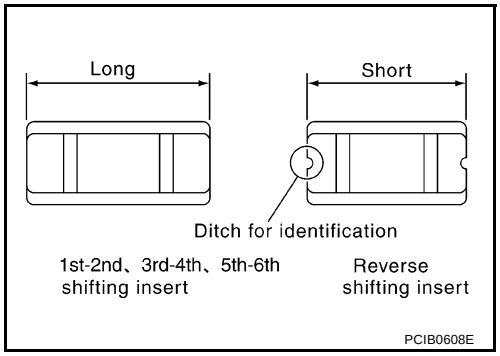
7. Install 1st-2nd spread springs in the 1st-2nd shifting inserts.

CAUTION:

- **Do not install 1st-2nd spread spring hook onto the same 1st-2nd shifting insert.**



- **Be careful with the shape of reverse shifting insert to avoid misassembly.**

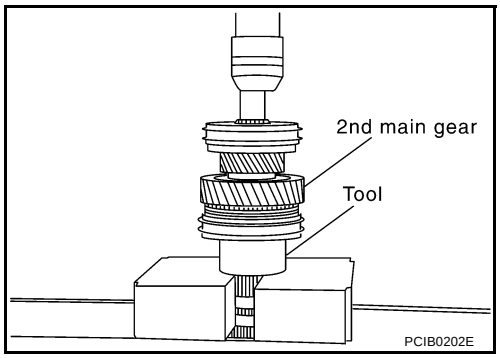


8. Apply recommended grease to 2nd needle bearing.
9. Install 2nd main gear, 2nd needle bearing, 2nd inner baulk ring, 2nd synchronizer cone and 2nd outer baulk ring on the main shaft and then using a support ring and a press to press fit the 1st-2nd synchronizer assembly.

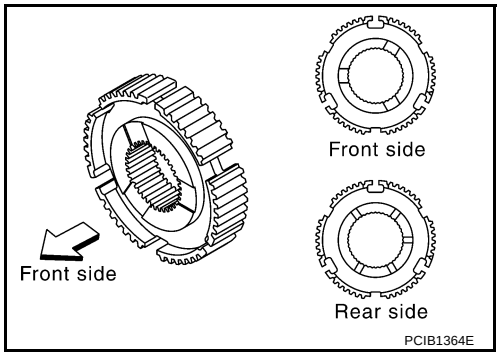
Tool number : ST27861000 (—)

CAUTION:

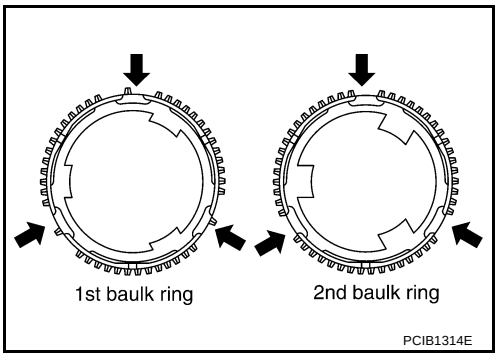
- **Replace 2nd inner baulk ring, 2nd synchronizer cone and 2nd outer baulk ring as a set.**



- **When press fitting, install with the side having the three boss edge oil grooves facing the front side.**

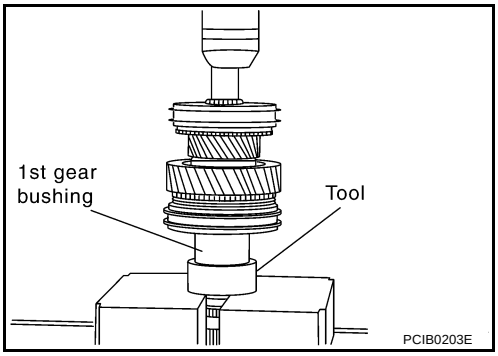


NOTE:
1st baulk ring has three spaces that four gear tooth is missing and 2nd baulk ring has three spaces that two gear teeth are missing.



10. Using a support ring and a press to press fit the 1st gear bushing.

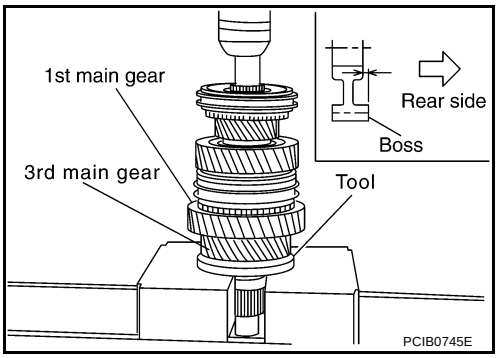
    Tool number : ST27861000 (—)



11. Apply recommended grease to 1st needle bearing.
12. Install 1st outer baulk ring, 1st synchronizer cone, 1st inner baulk ring, 1st needle bearing and 1st main gear on the main shaft and then using the inserter and a press to press fit the 3rd main gear.

    Tool number : ST30022000 (—)

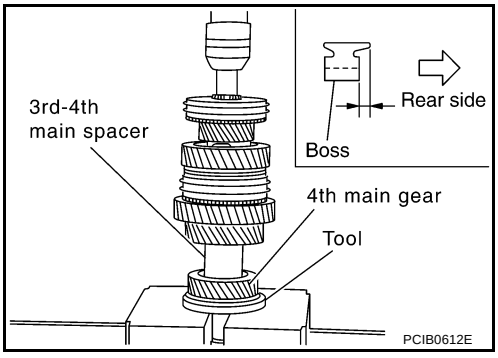
    CAUTION:
    - **Do not reuse 3rd main gear.**
    - **Replace 1st outer baulk ring, 1st synchronizer cone and 1st inner baulk ring as a set.**



13. Install 3rd-4th main spacer on the main shaft and then using the inserter and a press to press fit the 4th main gear.

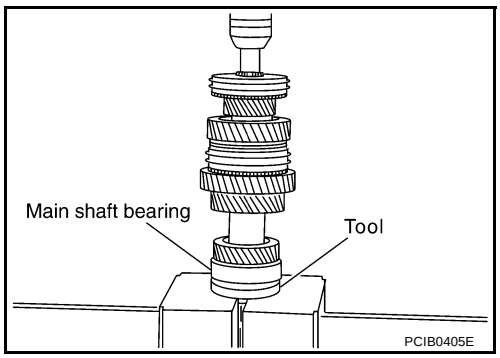
    Tool number : ST30022000 (—)

    CAUTION:
    - **Do not reuse 4th main gear.**
    - **When installing, set boss to rear side.**



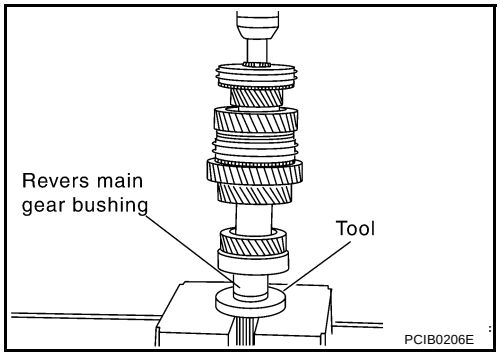
14. Using the inserter and a press to press fit the main shaft bearing onto the main shaft.

Tool number : ST30911000 (—)



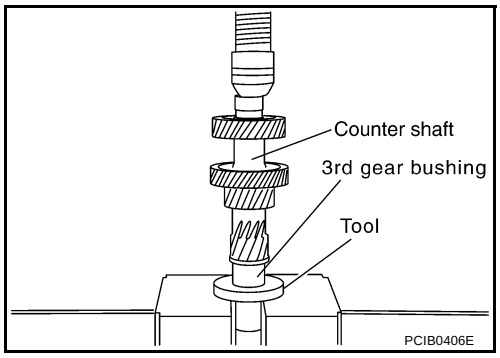
15. Using the inserter and a press to press fit the reverse main gear bushing onto the main shaft.

Tool number : ST30911000 (—)



16. Using the inserter and a press to press fit the 3rd gear bushing onto the counter shaft.

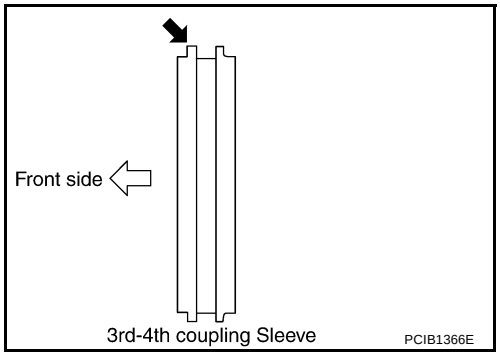
Tool number : ST30911000 (—)



17. Install 3rd-4th coupling sleeve and 3rd-4th shifting inserts into the 3rd-4th synchronizer hub.

CAUTION:

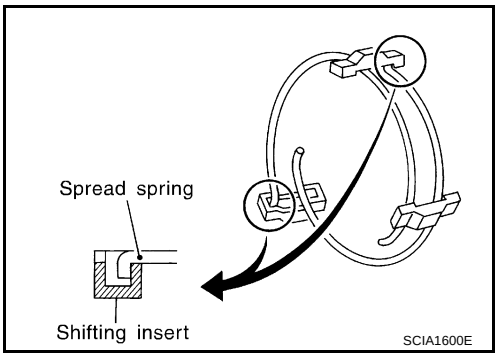
- **Do not reuse 3rd-4th coupling sleeve and 3rd-4th synchronizer hub.**
- **Replace 3rd-4th coupling sleeve and 3rd-4th synchronizer hub as a set.**
- **Install 3rd-4th coupling sleeve with the thicker flange faced the front side.**



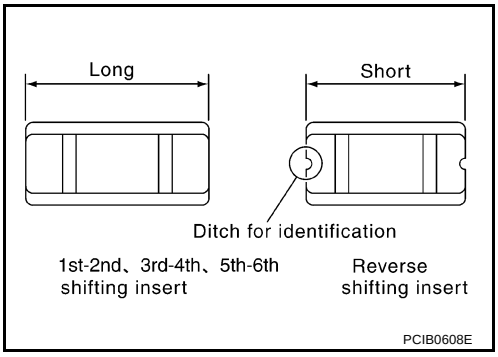
18. Install 3rd-4th spread springs in the 3rd-4th shifting inserts.

CAUTION:

- **Do not install 3rd-4th spread spring hook onto the same 3rd-4th shifting insert.**

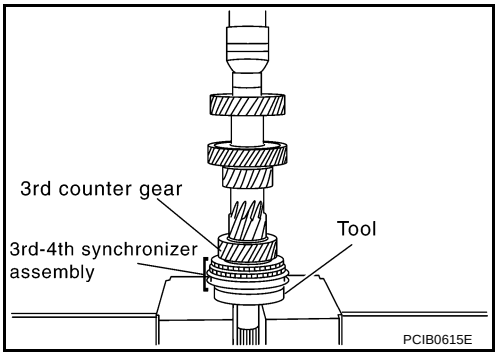


- **Be careful with the shape of reverse shifting insert to avoid misassembly.**



19. Apply recommended grease to 3rd needle bearing.
20. Apply gear oil to the hole spline press fitting side of 3rd-4th synchronizer hub.
21. Install 3rd needle bearing, 3rd counter gear, 3rd inner baulk ring, 3rd synchronizer cone and 3rd outer baulk ring on the counter shaft and then using the inserter and a press to press fit the 3rd-4th synchronizer assembly.

Tool number : ST30911000 (—)

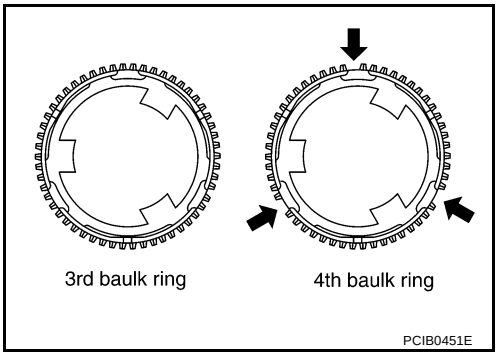


CAUTION:

Replace 3rd inner baulk ring, 3rd synchronizer cone and outer baulk ring as a set.

NOTE:

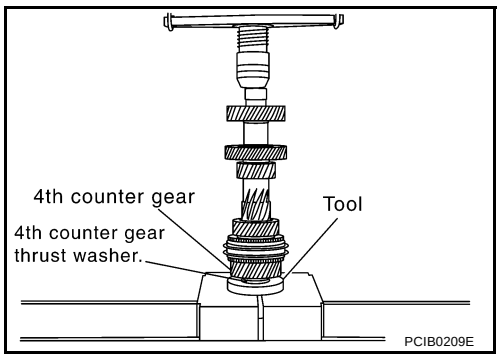
4th baulk ring has three spaces that one gear tooth is missing but 3rd baulk ring doesn't.



22. Apply recommended grease to 4th needle bearing.
23. Install 4th outer baulk ring, 4th synchronizer cone, 4th inner baulk ring, 4th needle bearing and 4th counter gear onto the counter shaft and then using the inserter and a press to press fit the 4th gear bushing and 4th counter gear thrust washer.

    Tool number : KV40100630 (J-26092)

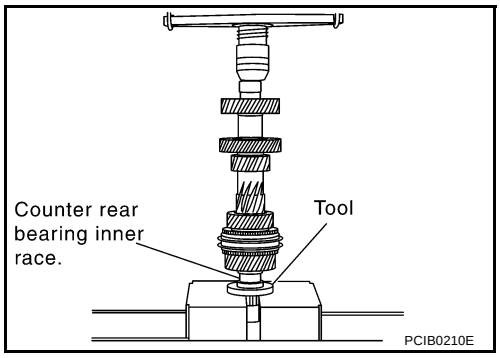
    CAUTION:
    Replace 4th outer baulk ring, 4th synchronizer cone and 4th inner baulk ring as a set.



24. Using the inserter and a press to press fit the counter rear bearing inner race onto the counter shaft.

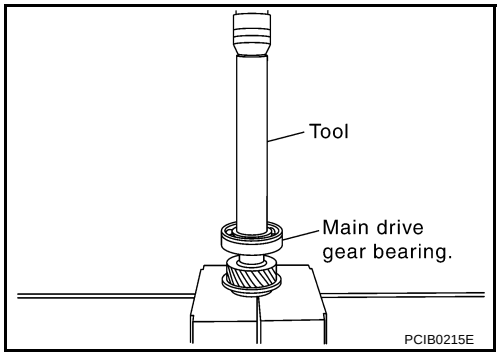
    Tool number : ST30032000 (J-26010-01)

    CAUTION:
    Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.



25. Using the drift and a press to press fit the main drive gear bearing onto the main drive gear.

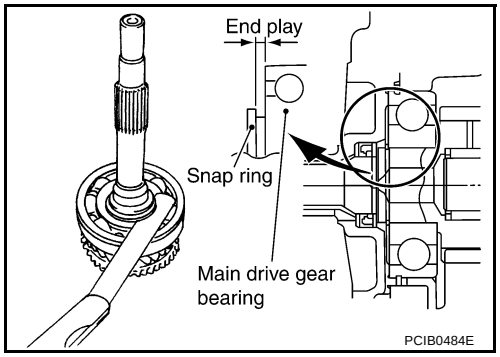
    Tool number : KV32102700 (—)



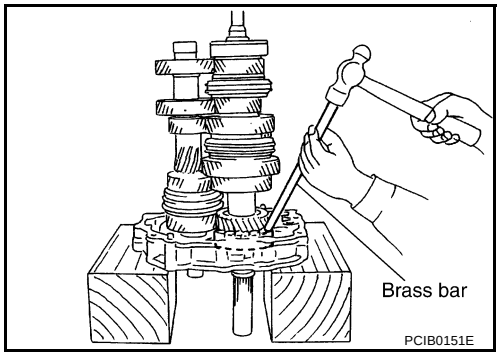
26. Select and install a snap ring to the main drive gear bearing so that the end play comes within the standard value.

    End play : 0 - 0.10 mm (0 - 0.004 in)

    CAUTION:
    Do not reuse snap ring.
27. Apply recommended grease to main pilot bearing.
28. Install main pilot bearing, pilot bearing spacer and 5th baulk ring to main drive gear.



29. Install main drive gear assembly, main shaft assembly, and counter shaft assembly combined in one unit to adapter plate using brass bar.

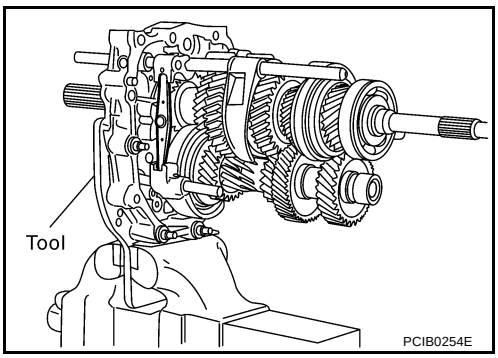


30. Install the adapter setting plate to adapter plate and then fixing in adapter setting plate using a vise.

    Tool number : ST22490000 (—)

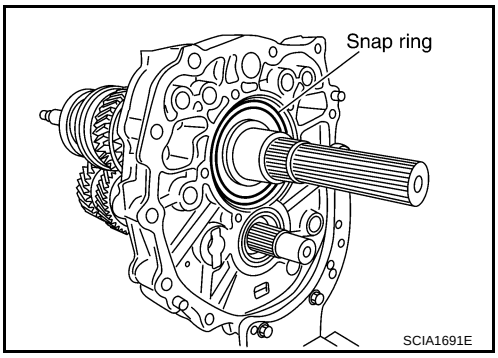
    CAUTION:
    Do not directly secure the surface in a vise.

31. Install magnet to adapter plate.



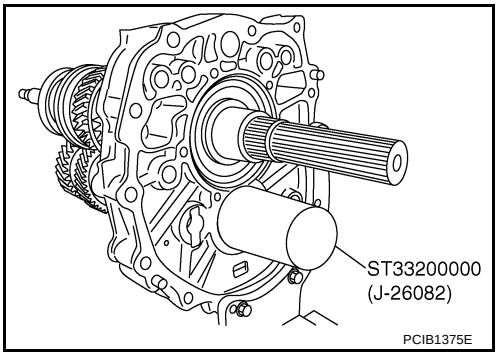
32. Install snap ring to mainshaft bearing.

    CAUTION:
    Do not reuse snap ring.



33. Install counter rear bearing onto the adapter plate using the drift.

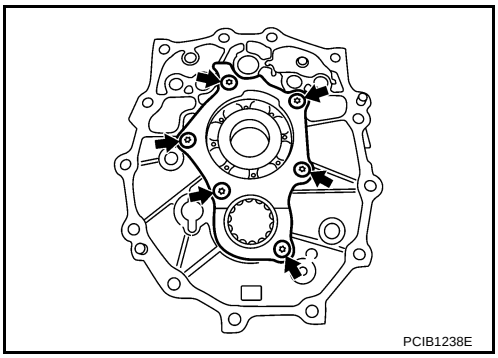
    CAUTION:
    Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.



34. Apply recommended thread locking sealant to the end of the bolts (first 3 to 4 threads), screw the bolts into the main shaft bearing retainer, and tighten it to the specified torque. Refer to MT-22, "Case Components" .

    - **Use Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

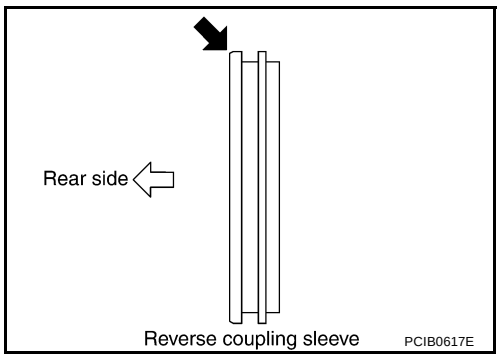
      CAUTION:
      Remove old sealant and oil adhering to threads.



35. Install reverse coupling sleeve and reverse shifting inserts into the reverse synchronizer hub.

    CAUTION:
    - **Do not reuse reverse coupling sleeve and reverse synchronizer hub.**
    - **Replace reverse coupling sleeve and reverse synchronizer hub as a set.**

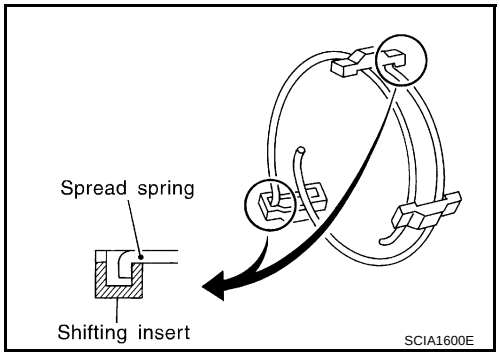
- **Install reverse coupling sleeve with the flat flange on the rear side.**



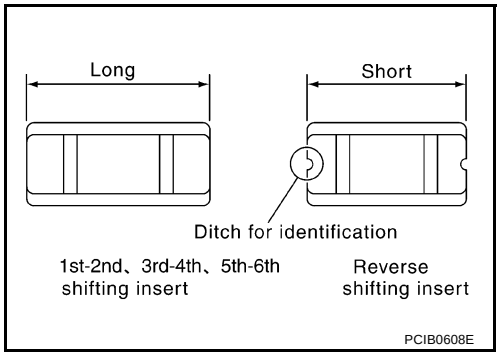
36. Install reverse spread springs in the reverse shifting inserts.

CAUTION:

- **Do not install reverse spread spring hook onto the same reverse shifting insert.**



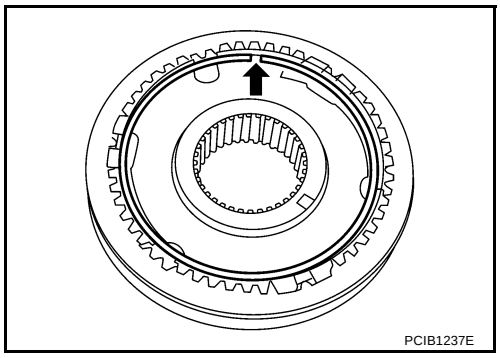
- **Be careful with the shape of 1st-2nd, 3rd-4th and 5th-6th shifting insert to avoid misassembly.**



37. Install snap ring to reverse synchronizer hub.

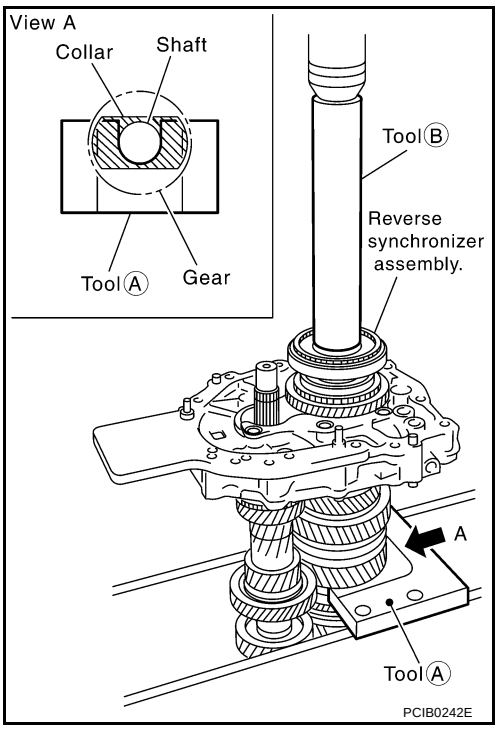
CAUTION:

- **Do not reuse snap ring.**
- **Do not align the snap ring notch with synchronizer hub groove when assembling.**

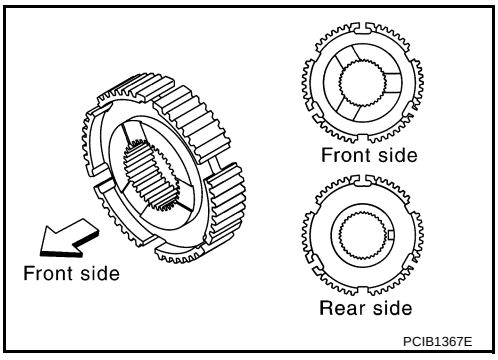


38. Apply recommended grease to reverse main needle bearing.
39. After installing reverse main gear bushing, reverse main needle bearing, reverse main gear and reverse baulk ring onto the main shaft, using the drift and press plate and a press to press fit the reverse synchronizer assembly.

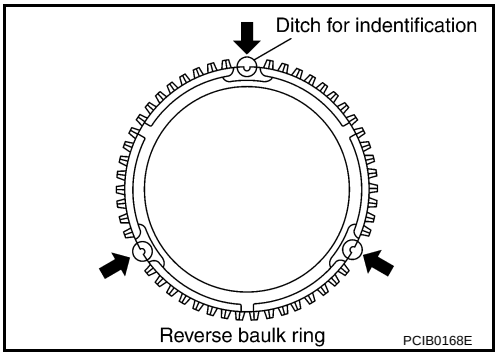
Tool number A: KV32103300 (J-46529)
Tool number B: ST01530000 (—)



CAUTION:
When installing, face the side with three ditches to the front side.



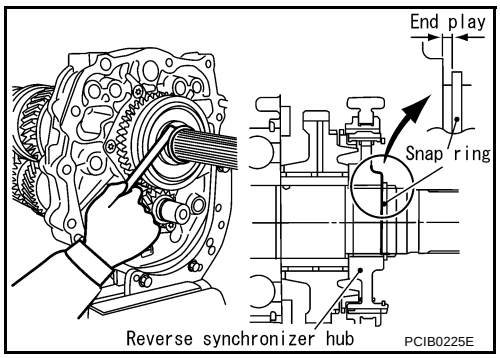
NOTE:
Reverse baulk ring has three spaces that two gear teeth are missing, and each space has small ditch for identification as shown in the figure.



40. Select and install a snap ring so that the end play comes within the standard value.

End play : 0 - 0.10 mm (0 - 0.004 in)

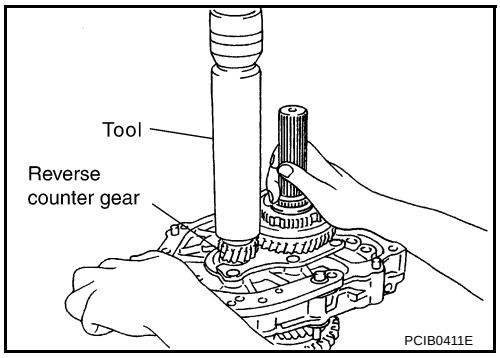
CAUTION:
Do not reuse snap ring.



41. After installing counter rear bearing spacer, press and fit reverse counter gear onto counter shaft with drift and press.

Tool number : ST23860000 (—)

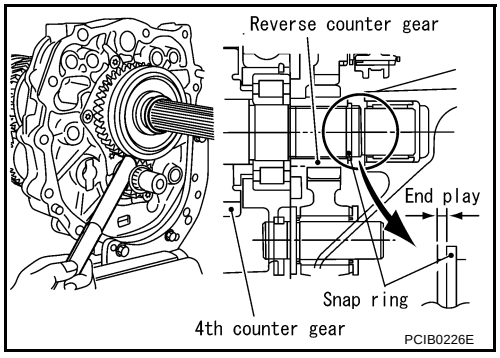
CAUTION:
- **Do not reuse reverse counter gear.**
- **When installing counter rear bearing spacer, identification ditch should face to the rear side.**
- **Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.**



42. Select and install a snap ring so that the end play comes within the standard value.

End play : 0 - 0.10 mm (0 - 0.004 in)

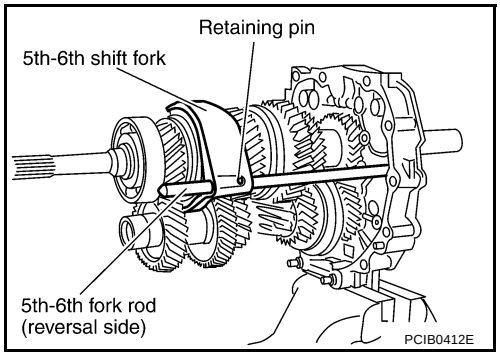
CAUTION:
Do not reuse snap ring.



Shift Control Components

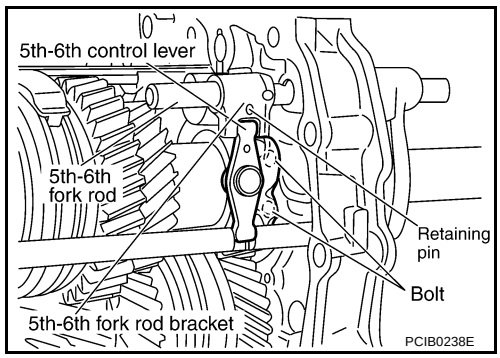
1. Install 5th-6th shift fork to the 5th-6th coupling sleeve.
2. Install 5th-6th fork rod (reversal side) to the 5th-6th shift fork.
3. Using a pin punch to tap the retaining pin into the 5th-6th shift fork.

CAUTION:
Do not reuse retaining pin.



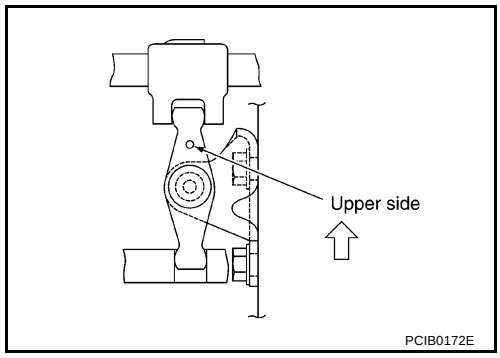
4. Install 5th-6th fork rod to the adapter plate.
5. Install 5th-6th fork rod bracket to the 5th-6th fork rod.
6. Using a pin punch to tap the retaining pin into the 5th-6th fork rod bracket.

CAUTION:
Do not reuse retaining pin.

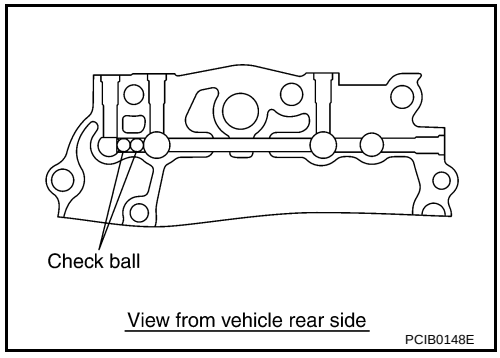


7. Install 5th-6th control lever to the adapter plate and then tighten mounting bolts to the specified torque. Refer to MT-26, "Shift Control Components" .

CAUTION:
Set the projection upward.

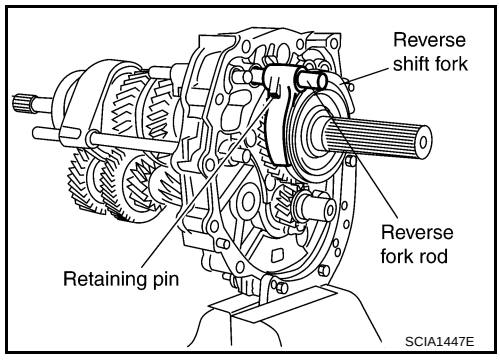


8. Apply recommended grease check balls and then install check balls to the adapter plate.

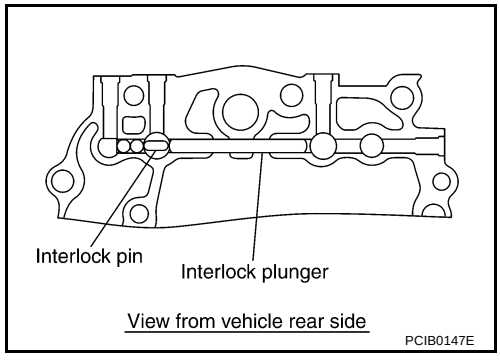


9. Install reverse shift fork to the reverse coupling sleeve.
10. Install reverse fork rod to the reverse shift fork.
11. Using a pin punch to tap the retaining pin into the reverse shift fork.

CAUTION:
Do not reuse retaining pin.

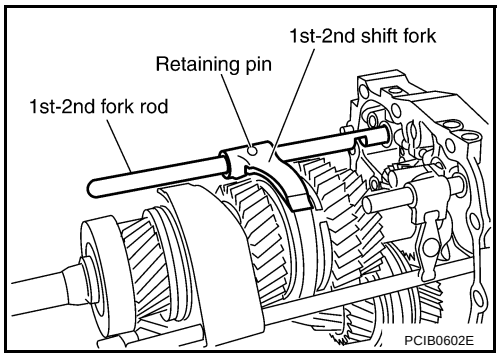


12. Apply recommended grease to interlock pin and interlock plunger.
13. Install interlock pin and interlock plunger to the adapter plate.



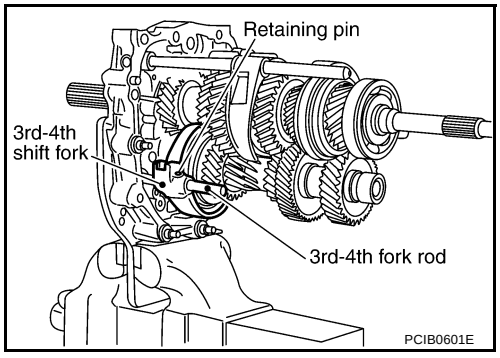
14. Install 1st-2nd shift fork to the 1st-2nd coupling sleeve.
15. Install 1st-2nd fork rod to the 1st-2nd shift fork.
16. Using a pin punch to tap the retaining pin into the 1st-2nd shift fork.

CAUTION:
Do not reuse retaining pin.

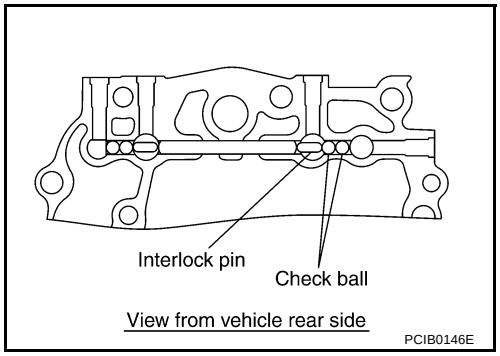


17. Install 3rd-4th shift fork to the 3rd-4th coupling sleeve.
18. Install 3rd-4th fork rod (reversal side) to the 3rd-4th shift fork.
19. Using a pin punch to tap the retaining pin into the 3rd-4th shift fork (reversal side).

CAUTION:
Do not reuse retaining pin.

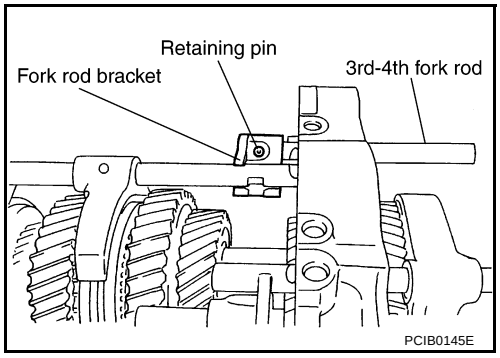


20. Apply recommended grease to interlock pin and check balls.
21. Install interlock pin and check balls to the adapter plate.



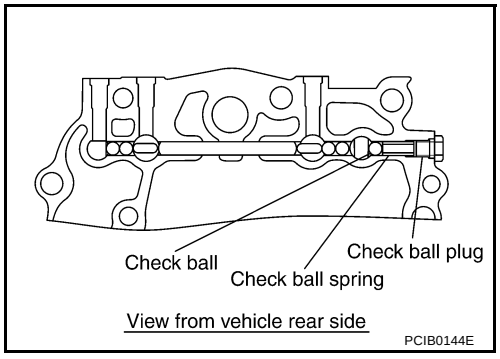
22. Install 3rd-4th fork rod to the adapter plate.
23. Install 3rd-4th fork rod bracket to the 3rd-4th fork rod.
24. Using a pin punch to tap the retaining pin into the 3rd-4th fork rod bracket.

CAUTION:
Do not reuse retaining pin.



25. Apply recommended grease to check ball and then install check ball and check ball spring into adapter plate.
26. Apply recommended sealant to threads of check ball plugs, and tighten check ball plugs to the specified torque. Refer to MT-26, "Shift Control Components" .
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

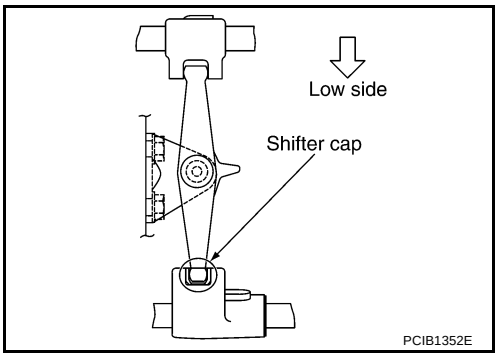
CAUTION:
Remove old sealant and oil adhering to threads.



27. Install 3rd-4th control lever to the adapter plate, and then tighten mounting bolts to the specified torque. Refer to MT-26, "Shift Control Components" .

CAUTION:

- **Make sure the top and bottom are oriented correctly.**
- **Do not drop shifter cap.**

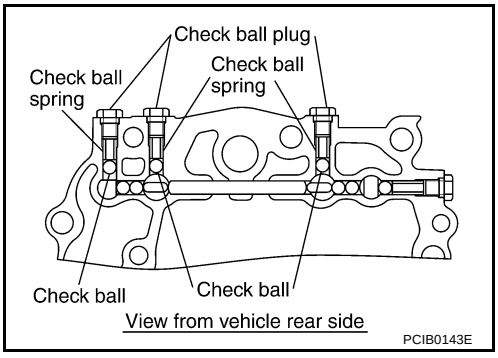


28. Apply recommended grease to check ball and then install check balls and check ball springs into adapter plate.
29. Apply recommended sealant to threads of check ball plugs, and tighten check ball plugs to the specified torque. Refer to MT-26, "Shift Control Components" .

- **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

CAUTION:

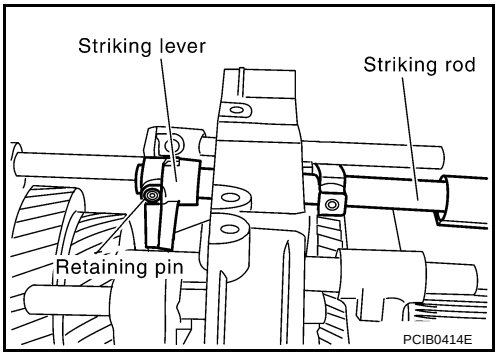
Remove old sealant and oil adhering to threads.



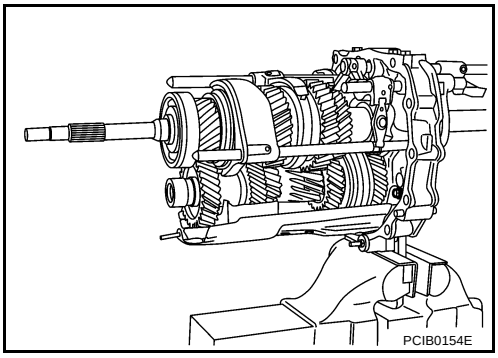
30. Install striking rod to the adapter plate.
31. Install striking lever to the striking rod.
32. Using a pin punch to tap the retaining pin into the striking lever.

CAUTION:

Do not reuse retaining pin.



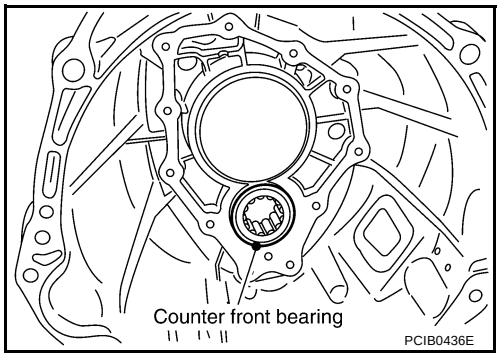
33. Install baffle plate to the adapter plate, and then tighten mounting bolts to the specified torque.



Case Components

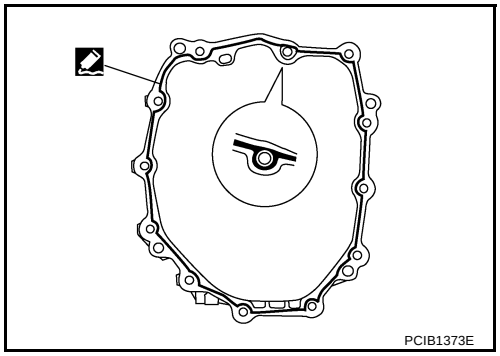
1. Install counter front bearing to the transmission case.
2. Install oil gutter to transmission case.
3. Install breather tube to transmission case.

CAUTION:
Do not reuse breather tube.

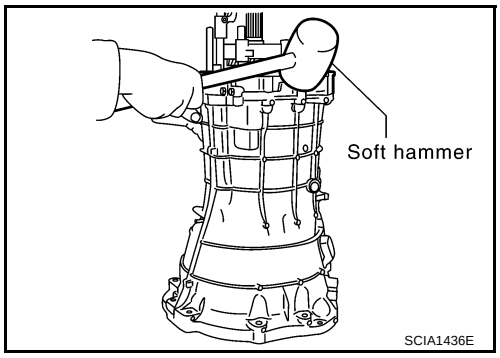


4. Apply recommended sealant to the transmission case adapter plate mounting surface as shown in the figure.
   - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

CAUTION:
Remove old sealant adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to both mounting surfaces.

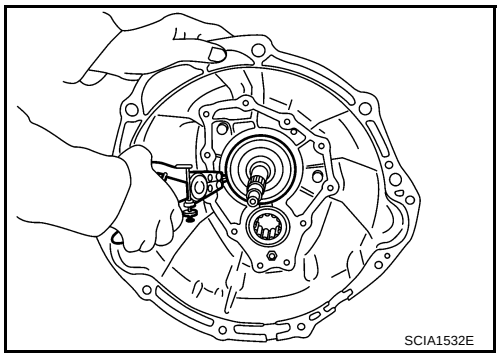


5. Place the adapter plate in the transmission case, using soft hammer to tap the adapter plate to install it into the transmission case.

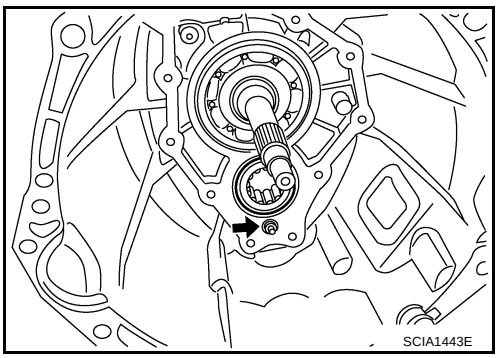


6. Install snap ring to main drive gear bearing, using snap ring pliers.

CAUTION:
Do not reuse snap ring.



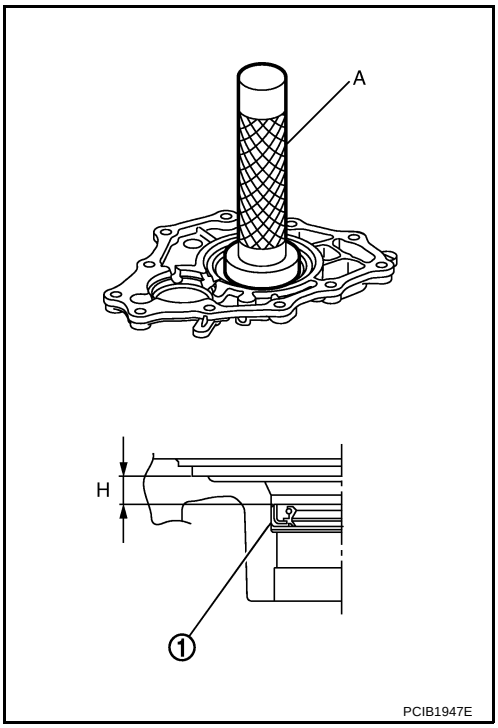
7. Tighten baffle plate mounting nut to the specified torque. Refer to MT-22, "Case Components" .



8. Apply multi-purpose grease to the lip of the front cover oil seal (1). Using a drift (A), to install oil seal approx. 8.55-9.55 mm (0.336-0.376 in) above from the front cover edge surface.

Tool number : KV38102100 (J-25803-01)

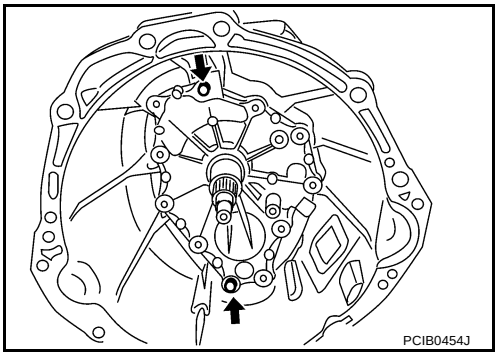
CAUTION:
- **Do not reuse front cover oil seal.**
- **When installing, do not incline the front cover oil seal.**



9. Install front cover gasket and front cover to the transmission case.

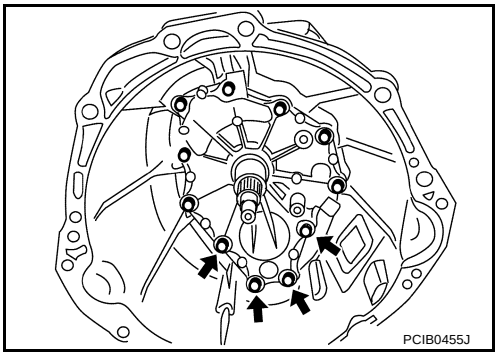
CAUTION:
- **Do not reuse front cover gasket.**
- **Do not damage front cover oil seal.**

10. Temporary tightening 2 bolts in the positions shown in the figure.

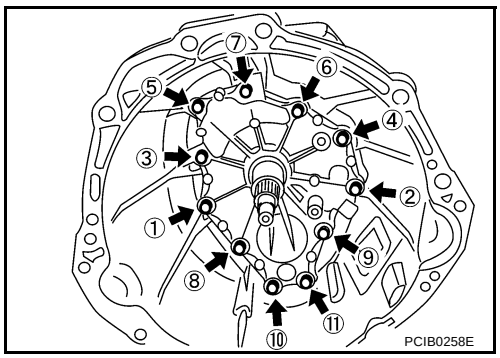


11. Temporary tightening remaining 9 bolts.

CAUTION:
Four bolts pointed by arrows in the figure are not reusable.



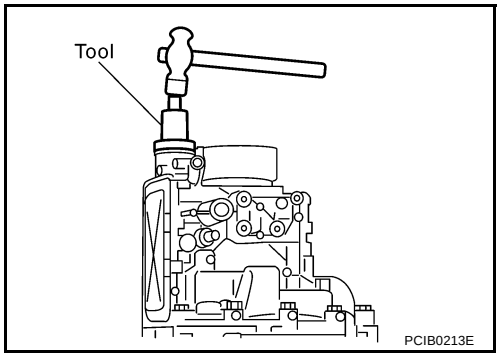
12. Tighten bolts to the specified torque in order as shown in the figure. Refer to MT-22, "Case Components"



13. Install rear extension oil gutter and cap to rear extension and then tighten mounting bolt to the specified torque. Refer to MT-22, "Case Components" .
14. Install bracket to transmission case and then tighten mounting bolt to the specified torque. Refer to MT-22, "Case Components" .
15. Apply recommended grease to reverse idler needle bearing.
16. Install reverse idler shaft, reverse idler needle bearing, reverse idler gear, and reverse idler thrust washer to the adapter plate.
17. Apply multi-purpose grease to the striking rod oil seal lip, and then using the drift to install striking rod oil seal.

    Tool number : ST33061000 (J-8107-2)

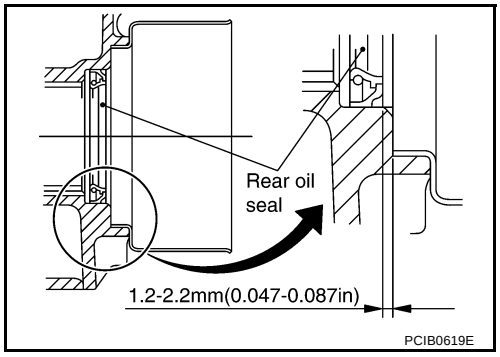
    CAUTION:
    - **Do not reuse striking rod oil seal.**
    - **When installing, do not incline the striking rod oil seal.**



18. Apply multi-purpose grease to the lip of the rear oil seal. Using a drift to install rear oil seal. 1.2 - 2.2 mm (0.047 - 0.087 in) above from the rear extension edge surface.

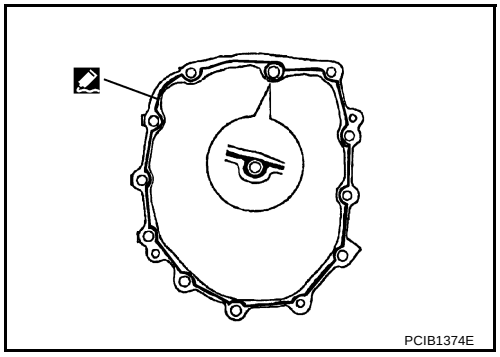
    Tool number : ST33400001 (J-26082)

    CAUTION:
    - **Do not reuse rear oil seal.**
    - **When installing, do not incline the rear oil seal.**



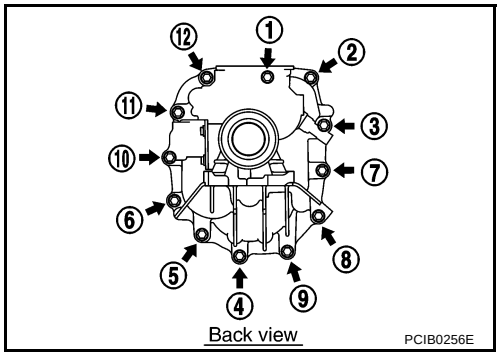
19. Apply recommended sealant to the adapter plate rear extension mounting surface as shown in the figure.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

    CAUTION:
    Remove old sealant adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to both mounting surfaces.



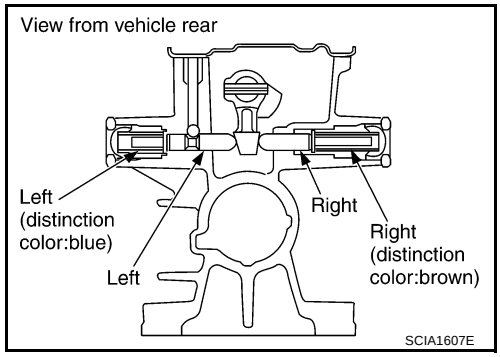
20. Install rear extension to the adapter plate and then tighten mounting bolts to the specified torque in order as shown on the figure. Refer to MT-22, "Case Components" .

    CAUTION:
    Do not damage rear oil seal and striking rod oil seal.
21. Install control lever housing to the rear extension and then tighten mounting bolts to the specified torque. Refer to MT-26, "Shift Control Components" .



CAUTION:
Do not hold control lever housing to prevent bushing of control lever housing from deformation when moving transmission assembly.

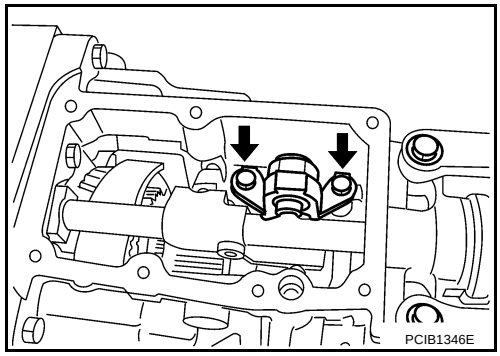
22. Apply gear oil to return spring plungers.
23. Install return spring plungers and return springs into the rear extension, apply recommended sealant to threads of return spring plugs, and then tighten return spring plugs to the specified torque. Refer to MT-26, "Shift Control Components" .
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**



Region	Return spring identification mark	Plunger groove
RH	Brown	No
LH	Blue	Yes

CAUTION:
- **The right and left return springs and return spring plungers are different, so make sure they are installed correctly.**
- **Remove old sealant and oil adhering to threads.**

24. Install shift check pin as a one unit with the control bracket to rear extension and then tighten mounting bolts to the specified torque. Refer to MT-26, "Shift Control Components" .
25. Install plunger to the rear extension, and then screwing Park/Neutral position (PNP) switch and back-up lamp switch to the rear extension with 1-2 pitches. Apply recommended sealant to threads of switches, and tighten switches to the specified torque. Refer to MT-22, "Case Components" .
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**



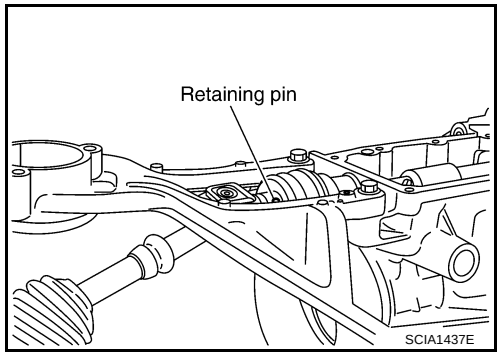
CAUTION:
Remove old sealant and oil adhering to threads.

26. Install brackets to rear extension and then tighten bracket mounting bolts to the specified torque. Refer tp MT-22, "Case Components" .
27. Install boot and control rod to striking rod.
28. Install retaining pin into the control rod, using a pin punch.

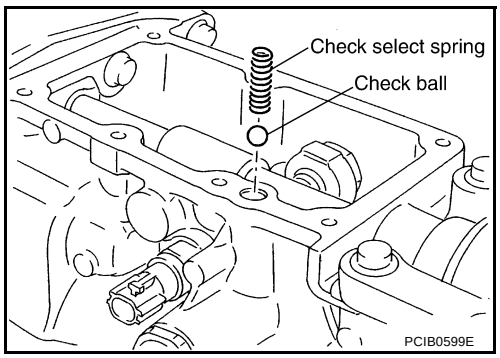
CAUTION:
Do not reuse retaining pin.

29. Install boot to control rod.

CAUTION:
Fit the boot to the groove on the control rod.



30. Install check ball and check select spring into the rear extension.

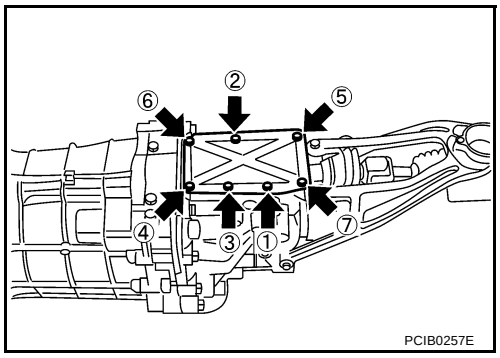


31. Install rear extension upper cover gasket and rear extension upper cover to rear extension.

CAUTION:

- **Do not reuse rear extension upper cover gasket.**
- **Avoid tangling check select spring.**

32. Tighten rear extension upper cover bolts to the specified torque in order as shown in the figure. Refer to MT-22, "Case Components" .



33. Install gasket to drain plug and then install it to transmission case. Tighten drain plug to the specified torque. Refer to MT-22, "Case Components" .

CAUTION:

Do not reuse gasket.

34. Install gasket to filler plug and then install it to transmission case. Tighten filler plug to the specified torque. Refer to MT-22, "Case Components" .

CAUTION:

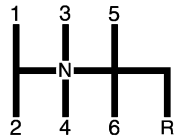
- **Do not reuse gasket.**
- **After oil is filled, tighten filler plug to specified torque.**

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NCS00012

Transmission model		FS6R31A
Number of speed		6
Shift pattern		 SCIA0955E
Synchromesh type		Warner
Gear ratio	1st	3.794
	2nd	2.324
	3rd	1.624
	4th	1.271
	5th	1.000
	6th	0.794
	Reverse	3.446
Main gear (Number of teeth)	Drive	26
	1st	37
	2nd	34
	3rd	33
	4th	31
	6th	31
	Reverse	42
Counter gear (Number of teeth)	Drive	32
	1st	12
	2nd	18
	3rd	25
	4th	30
	6th	48
	Reverse	15
Reverse idler gear (Number of teeth)		26
Oil capacity (Approx.)	ℓ (US pt, Imp pt)	2.93 (6-1/4, 5-1/8)
Remarks	Reverse synchronizer	Installed
	Double cone synchronizer	4th
	Triple cone synchronizer	1st, 2nd and 3rd

End Play

NCS00013

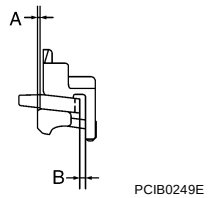
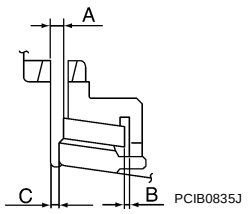
Unit: mm (in)

Item	Standard value
Counter shaft	0 - 0.10 (0 - 0.004)
Main drive gear	0 - 0.10 (0 - 0.004)
Main shaft	0 - 0.10 (0 - 0.004)

Baulk Ring Clearance

NCS00016

Unit: mm (in)

Measurement point		Standard value	Limit value
4th (Double-cone synchronizer)	Clearance between synchronizer cone and inner baulk ring end face “A”	0.50 - 0.70 (0.020 - 0.028)	0.3 (0.012)
 PCIB0249E	Clearance between outer baulk ring pawl and synchronizer cone “B”	0.85 - 1.35 (0.033 -0.053)	0.7 (0.028)
1st, 2nd and 3rd (Triple-cone synchronizer)	Clearance between synchronizer cone and clutch gear end face “A”	1st: 0.65 - 1.25 (0.026 - 0.049) 2nd: 0.60 - 1.30 (0.024 - 0.051) 3rd: 0.60 - 1.30 (0.024 - 0.051)	0.3 (0.012) 0.3 (0.012) 0.3 (0.012)
 PCIB0835J	Clearance between outer baulk ring pawl and synchronizer cone “B”	0.85 - 1.35 (0.033 - 0.053)	0.7 (0.028)
	Clearance between inner baulk ring and clutch gear end face “C”	1st: 0.8 - 1.2 (0.031 - 0.047) 2nd: 0.75 - 1.25 (0.030 - 0.049) 3rd: 0.75 - 1.25 (0.030 - 0.049)	0.3 (0.012) 0.3 (0.012) 0.3 (0.012)
5th and 6th		0.70 - 1.35 (0.028 - 0.053)	0.5 (0.020)
Reverse		0.75 - 1.20 (0.030 - 0.047)	0.5 (0.020)

SECTION PB
PARKING BRAKE SYSTEM

CONTENTS

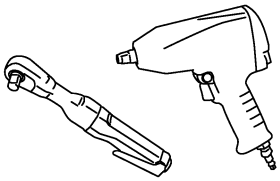
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PREPARATION

PFP:00002

Commercial Service Tools

NFS000TF

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

PARKING BRAKE SYSTEM

PFP:36010

On-Vehicle Service

NFS0001F

LEVER STROKE

- When parking brake lever is operated with a force of 196 N (20 kg, 44 lb), check that the stroke is within the specified number of notches. (Check it by listening and counting the ratchet clicks.)

Lever stroke : 6 to 7 notches

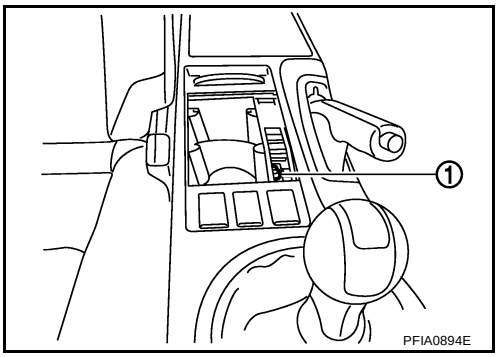
INSPECT COMPONENTS

- Make sure the components are attached properly (check for looseness, backlash, etc.).
- Check parking lever assembly for bend, damage and cracks, and replace if necessary.
- Check that there is no wear or damage to the cable, and replace if there is.
- Inspecting parking brake warning lamp switch is inspected and exchange if there is a faulty.

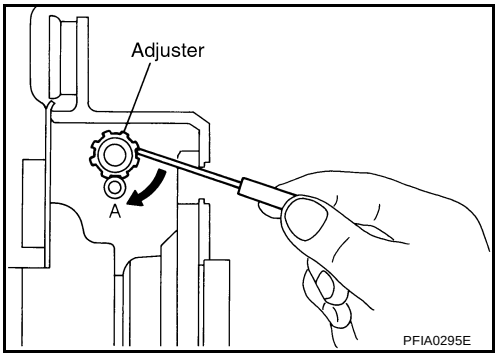
ADJUSTMENT

- To perform adjustment operations, remove tire from the vehicle with power tool.

1. Remove the coin pocket. Insert a deep socket wrench to rotate adjusting nut (1) and loosen the cable sufficiently. Then, return the lever.
2. Using wheel nuts, fix the disc rotor to the hub and prevent it from tilting.



3. Remove adjusting hole plug installed on the disc. Using a flat-bladed screwdriver, turn the disc in direction “A” as shown in the figure until the disc is locked. After locking, turn the adjuster in the opposite direction by 5 or 6 notches.
4. Rotate the disc to make sure there is no drag. Install the adjusting hole plug.
5. Adjust cable as follows:



a. Operate lever 10 or more times with a force of 294 N (30 kg, 66 lb).
b. Rotate adjusting nut with deep socket to adjust lever stroke.

CAUTION:
Do not reuse the adjusting nut after removing it.

c. When parking brake lever is operated with a force of 196 N (20 kg, 44 lb), check that the stroke is within the specified number of notches. (Check it by listening and counting the ratchet clicks.)

Lever stroke : 6 to 7 notches

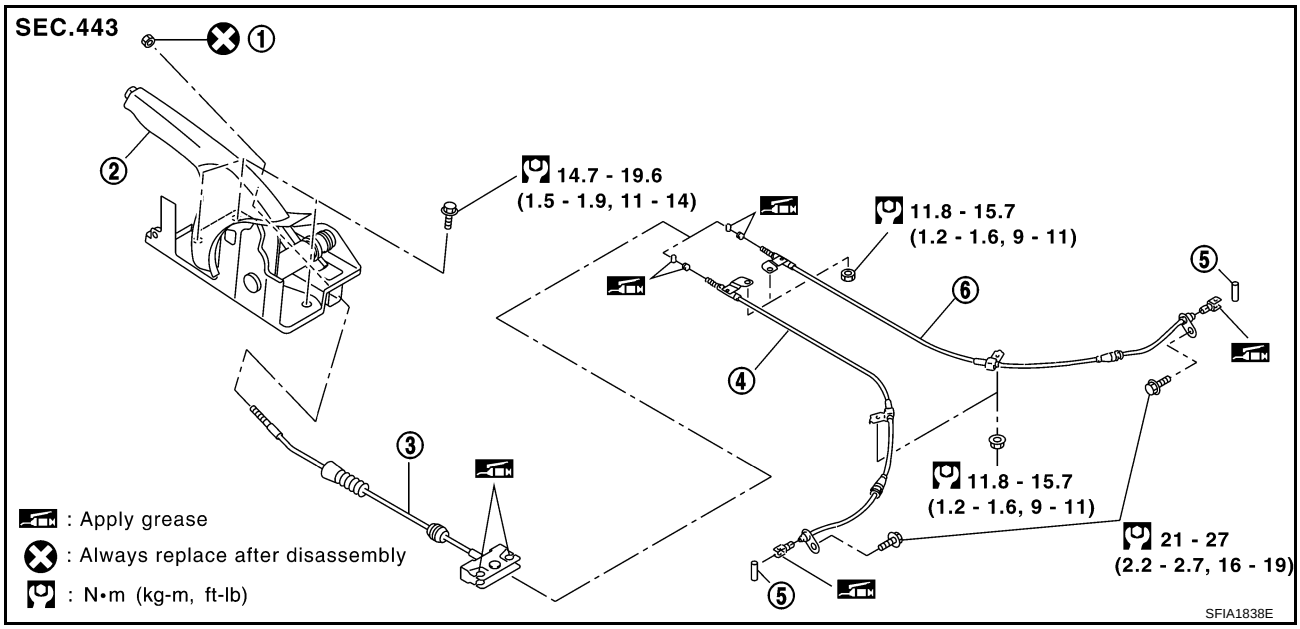
d. With the lever completely returned, make sure there is no drag on the rear brake.

PARKING BRAKE CONTROL

PFP:36010

Components

NFS0001G



1. Adjusting nut
2. Device assembly
3. Front cable
4. Rear left cable
5. Pin
6. Rear right cable

Removal and Installation

NFS0001H

REMOVAL

1. Remove center console. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove adjusting nut from device assembly.
3. Remove exhaust center muffler. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
5. Remove rear disc caliper and disc rotors. Refer to BR-44, "Removal and Installation of Brake Caliper Assembly (Other than Brembo Calipers)" or BR-45, "Removal and Installation of Brake Caliper Assembly (With Brembo Calipers)" .
6. Remove parking brake shoe, and remove rear cable from toggle lever. Refer to PB-5, "Components" .
7. Remove cable mounting nuts and bolts.
8. Remove right and left rear cables.
9. Remove front cable.
10. Remove device assembly mounting bolts and remove device assembly from vehicle.

INSTALLATION

1. Refer to “Component Parts Location” for tightening torque. Install in the reverse order of removal.

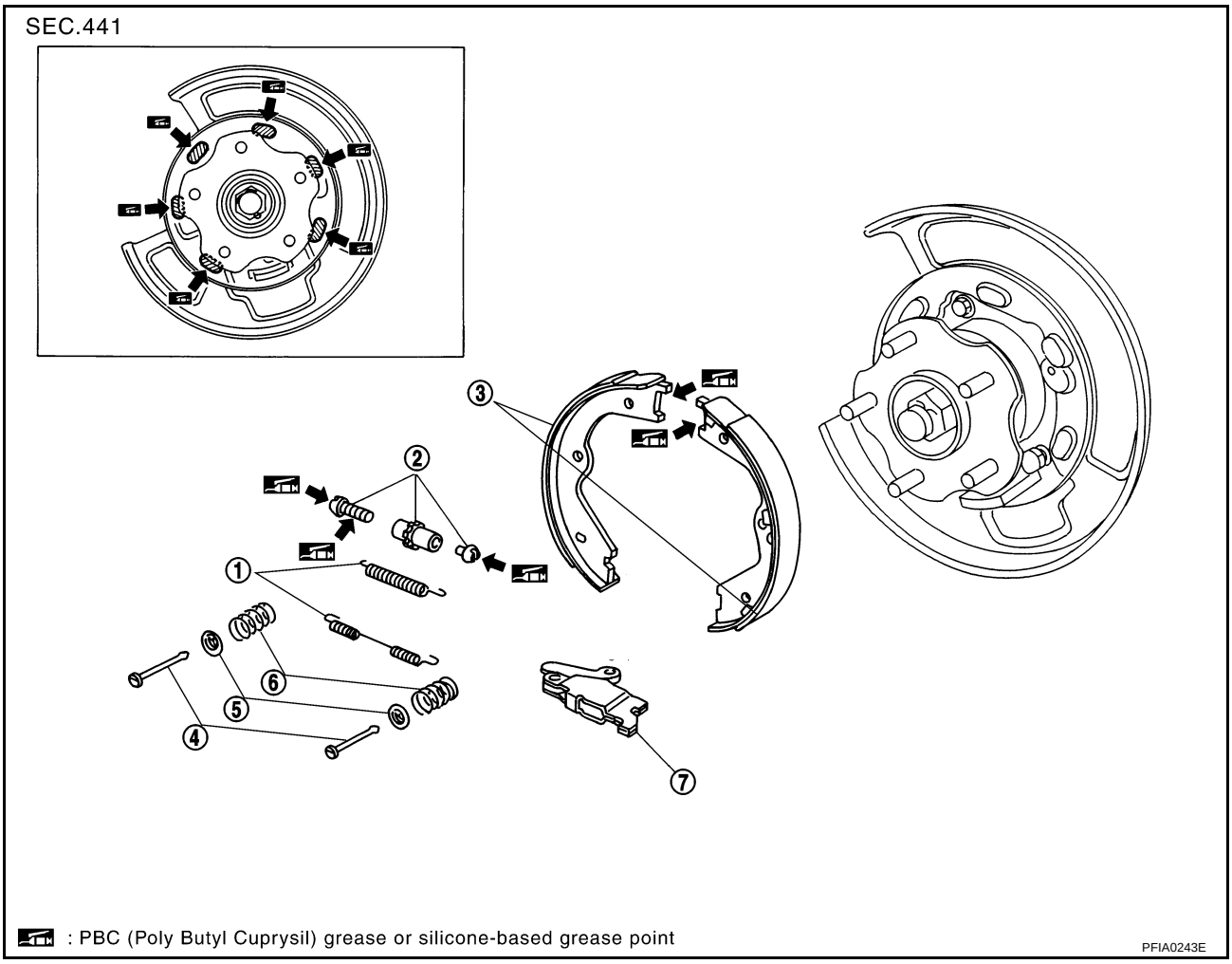
   CAUTION:
   Since the adjusting nut is not a reusable part, do not reuse it.
2. Adjust parking brake. Refer to PB-3, "ADJUSTMENT" .

PARKING BRAKE SHOE

PFP:44060

Components

NFS0001I



1. Return spring
2. Adjuster assembly
3. Shoe
4. Anti-rattle pin
5. Retainer
6. Anti-rattle spring
7. Toggle lever

Removal and Installation

NFS0001J

REMOVAL

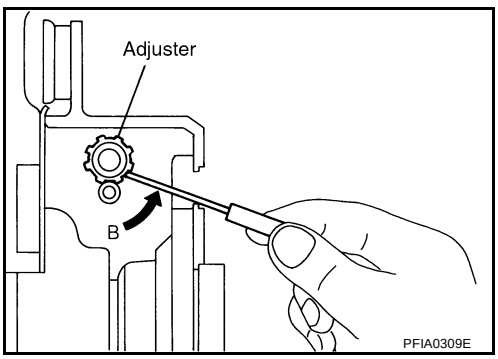
WARNING:

Clean brakes with a vacuum dust collector to minimize the hazard of air borne particles or other materials.

Be careful of the following:

- Remove the disc rotor only with the parking brake lever completely in the returned position.
- If disc rotor cannot be removed, remove as follows:

1. Fix the disc rotor in place with wheel nuts and remove disc rotor plug. Using a flat-bladed screwdriver, rotate star wheel on the adjuster assembly in direction “B” to retract and loosen brake shoes.



INSPECTION AFTER REMOVAL

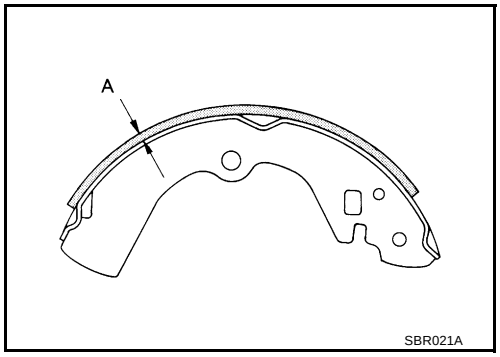
Lining Thickness Inspection

- Check the thickness of the lining.

Standard

Standard thickness “A” : 3.2 mm (0.126 in)

Wear limit thickness “A” : 1.5 mm (0.059 in)



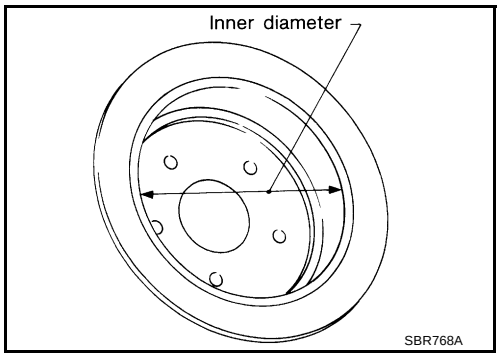
Drum Inner Diameter Inspection

- Check the inner diameter of the drum.

Standard

Standard inner diameter : 172 mm (6.77 in) dia.

Wear limit of inner diameter : 173 mm (6.81 in) dia.



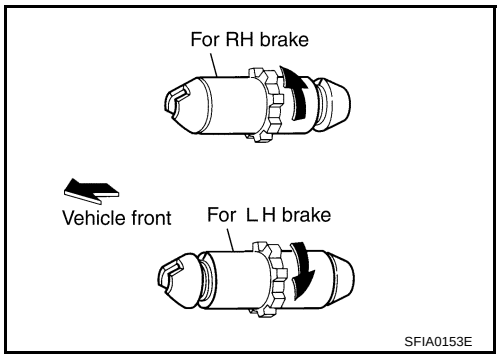
Other Inspections

- Check shoe sliding surface for excessive wear and damage.
- Check anti-rattle pin for excessive wear and corrosion.
- Check return spring for sagging.
- Does the adjustor move smoothly?
- Check either visually or with a vernier caliper to see if there is any excessive wear, cracks, or damage inside the drum.

INSTALLATION

Be careful of the following:

- Refer to “Component Parts Location” and apply brake grease to the specified points during assembly.
- Orientation of the adjuster is different from left to right. Assemble the adjuster so that threaded part expands when rotating it in the direction shown by the arrow.
- Collapse the adjuster to assemble
- When disassembling the adjuster, apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the threads.
- After replacing brake shoes or disc rotors, or if brakes do not function well, perform break-in operation as follows.



1. Adjust the parking brake lever stroke to the specified stroke.
2. Perform parking brake break-in (drag run) operation by driving the vehicle under the following conditions:

Drive forward

- **Perform the following.**
- **Vehicle speed approx. 30 ± 5 km/h (19 ± 3 MPH) set (forward)**
- **Parking brake operating force approx. 294 ± 49 N (30 ± 5 kg, 67 ± 11 lb) set**
- **Time (other than brembo): Approx. 30 sec.**
- **Time (made by brembo): Approx. 60 sec.**

3. After break-in operation, check lever stroke of the parking brake. Readjust if it is no longer at the specified stroke.
   - To prevent the lining from getting too hot, allow a cool off period of approximately 5 minutes after every break-in operation.
   - Do not perform excessive break-in operations, because it may cause uneven or early wear of the lining.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Parking Drum Brake

NFS0001K

Brake lining	Standard thickness (new)	3.2 mm (0.126 in)
	Wear limit thickness	1.5 mm (0.059 in)
Drum (disc)	Standard inner diameter (new)	172 mm (6.77 in) dia.
	Wear limit of inner diameter	173 mm (6.81 in) dia.

Parking Brake Control

NFS0001L

Control type	Center lever
Number of notches [under force of 196 N (20 kg,44 lb)]	6 – 7 notches
Number of notches when warning lamp comes on	1 notch

SECTION PG

POWER SUPPLY, GROUND & CIRCUIT ELEMENTS

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PRECAUTIONS

PFP:00001

Precautions for Battery Service

NKS0054E

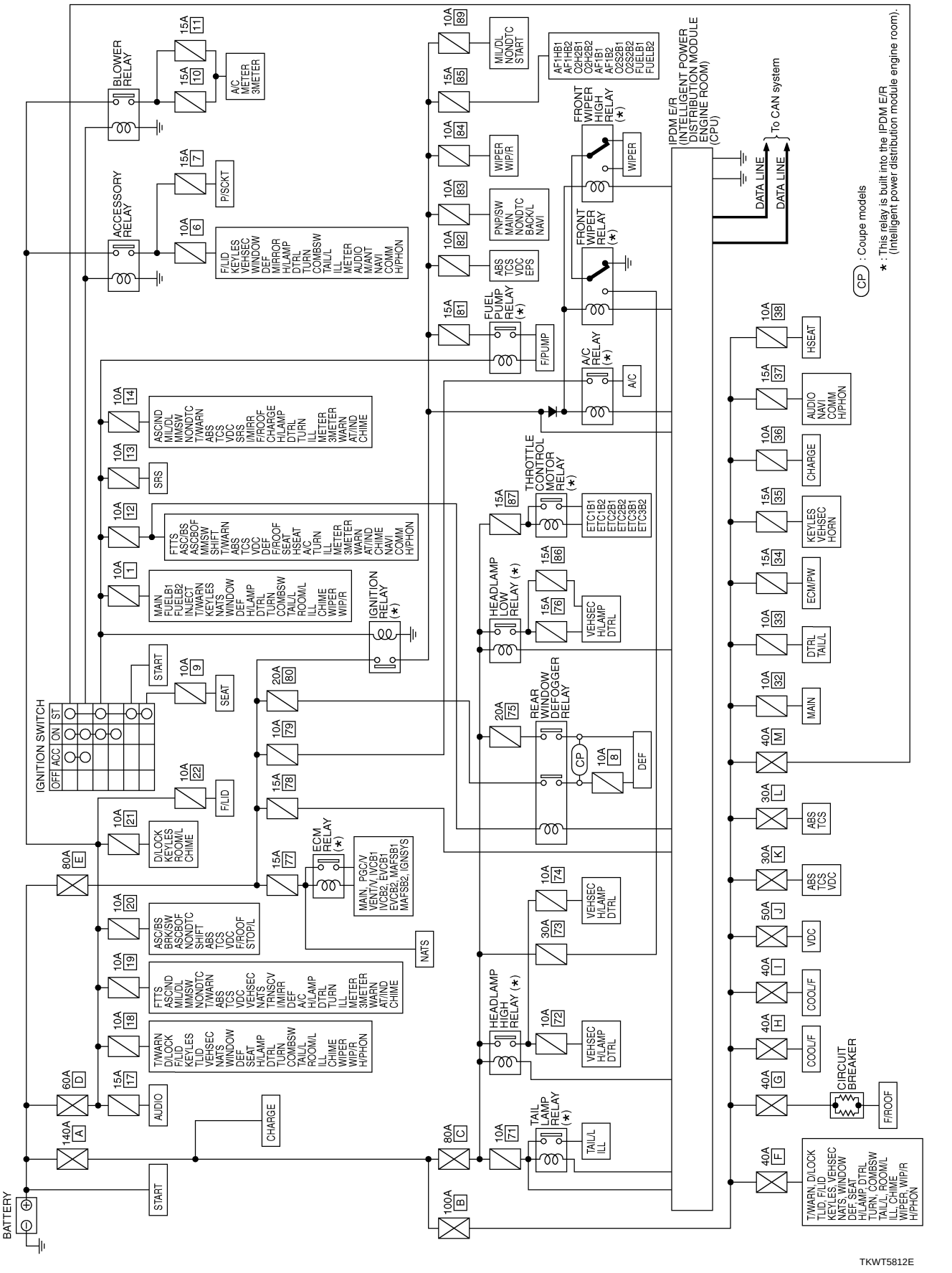
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

POWER SUPPLY ROUTING CIRCUIT

PFP:24110

Schematic

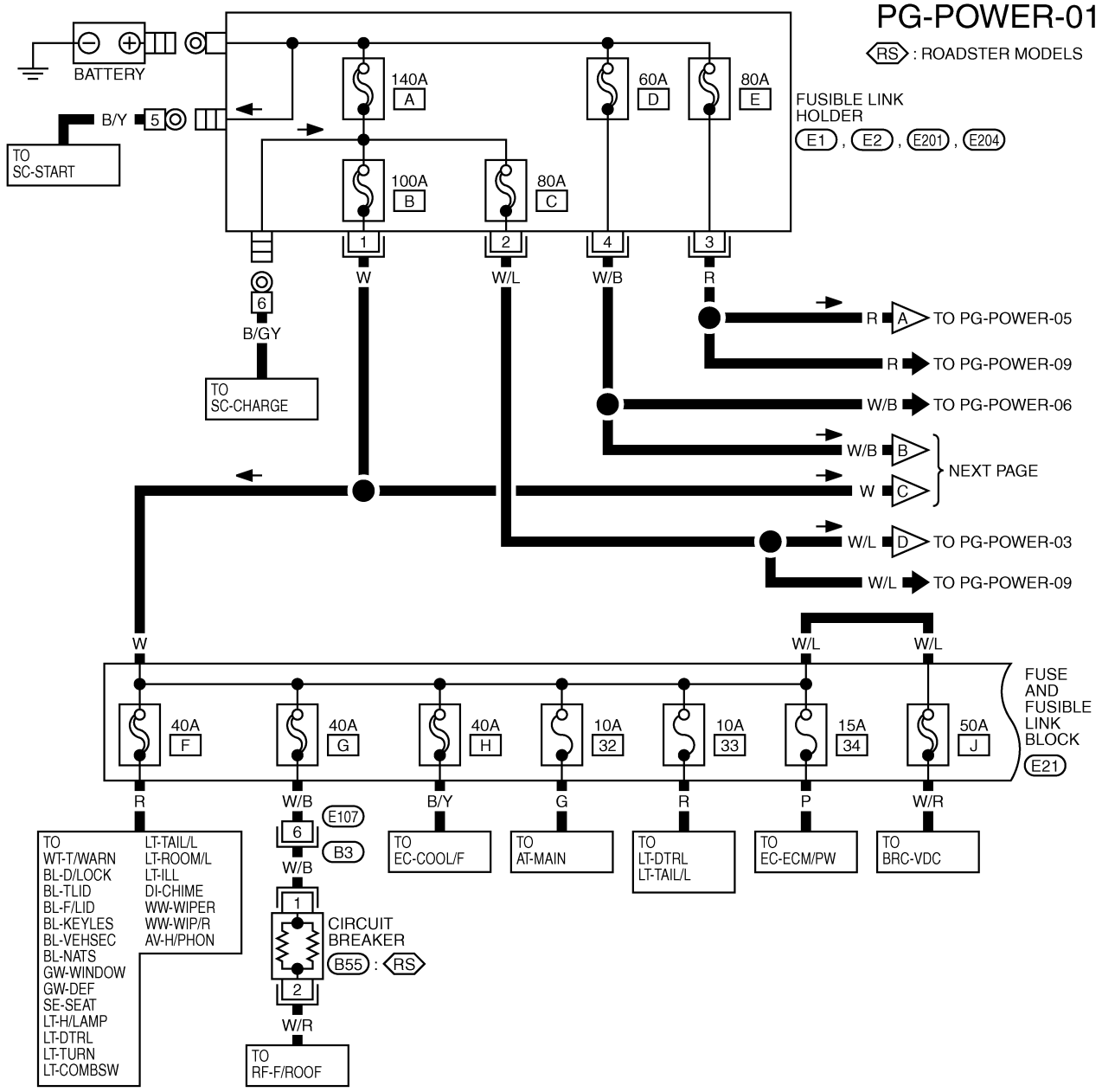
NKS004SX

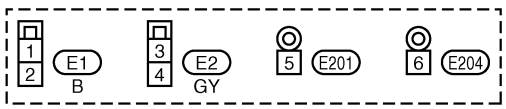


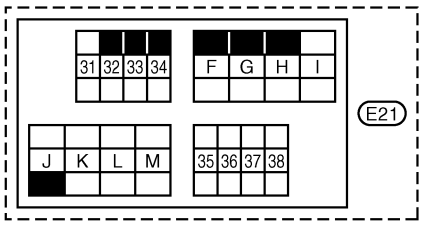
Wiring Diagram — POWER —

NKS004SY

BATTERY POWER SUPPLY — IGNITION SW. IN ANY POSITION



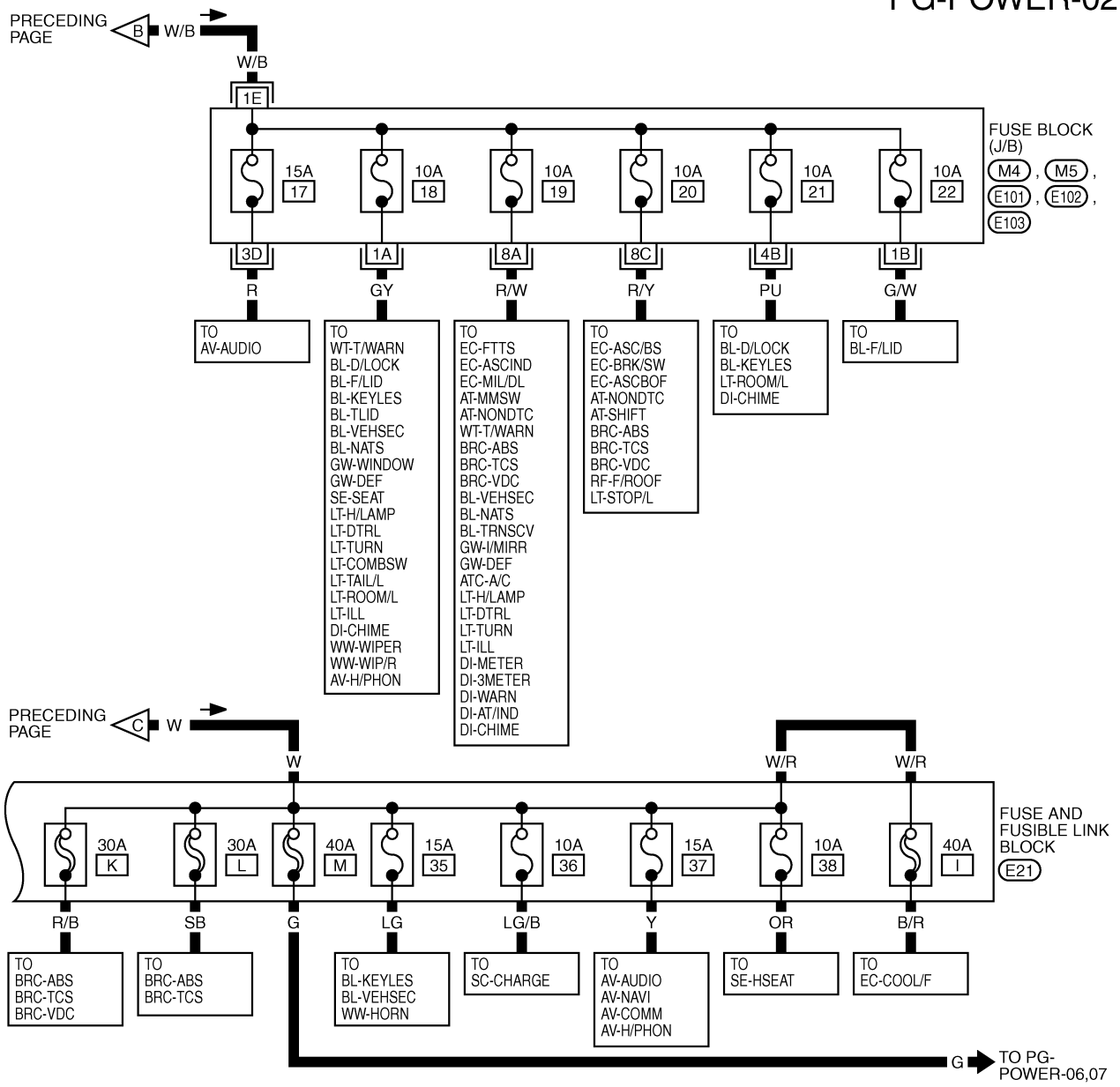


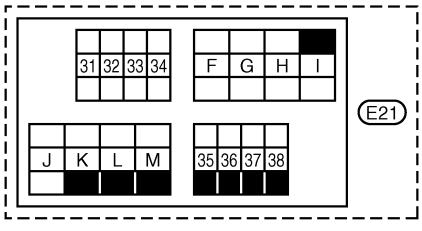




TKWT5813E

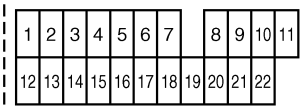
PG-POWER-02





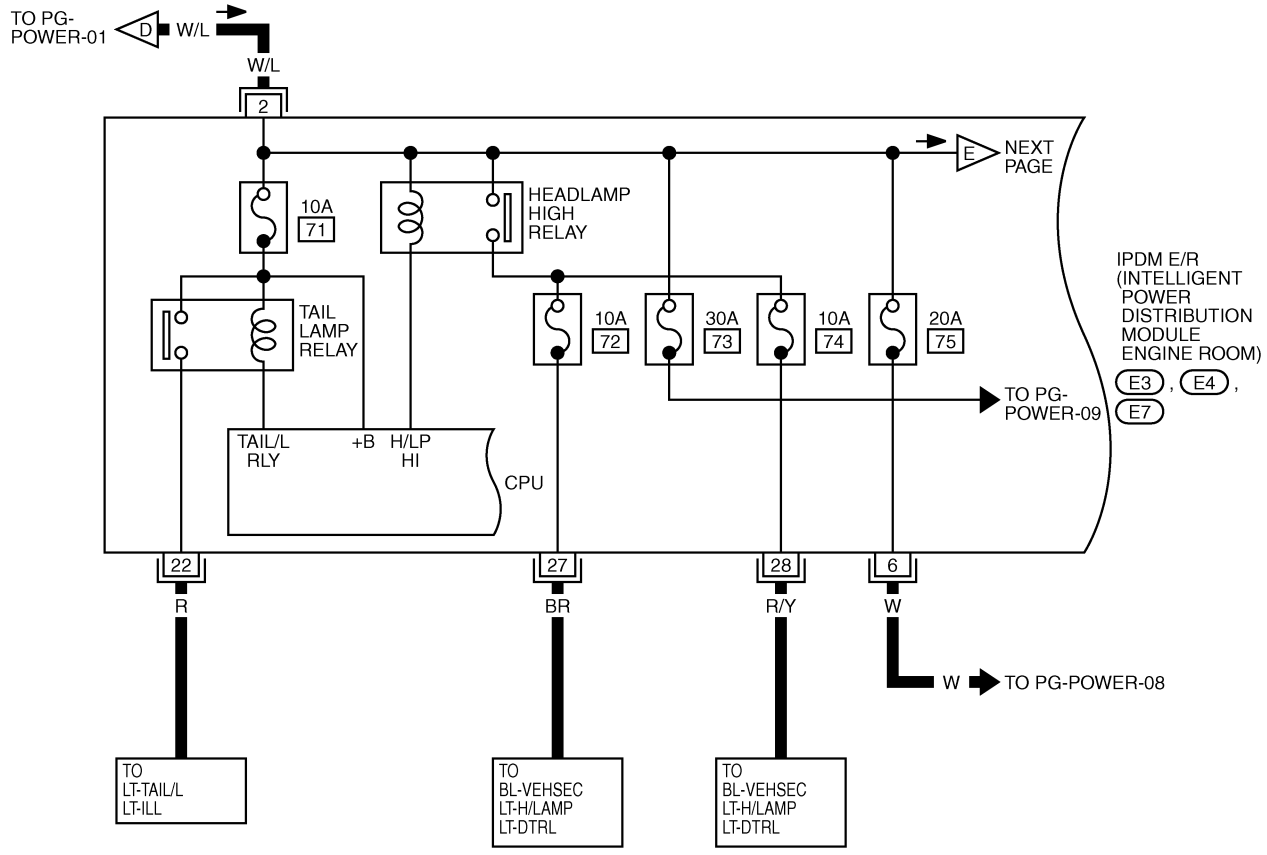
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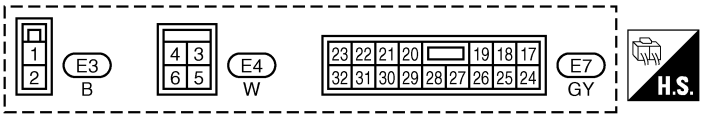
M4, M5, E101, E102, E103 -FUSE BLOCK-JUNCTION BOX (J/B)



TKWT5814E

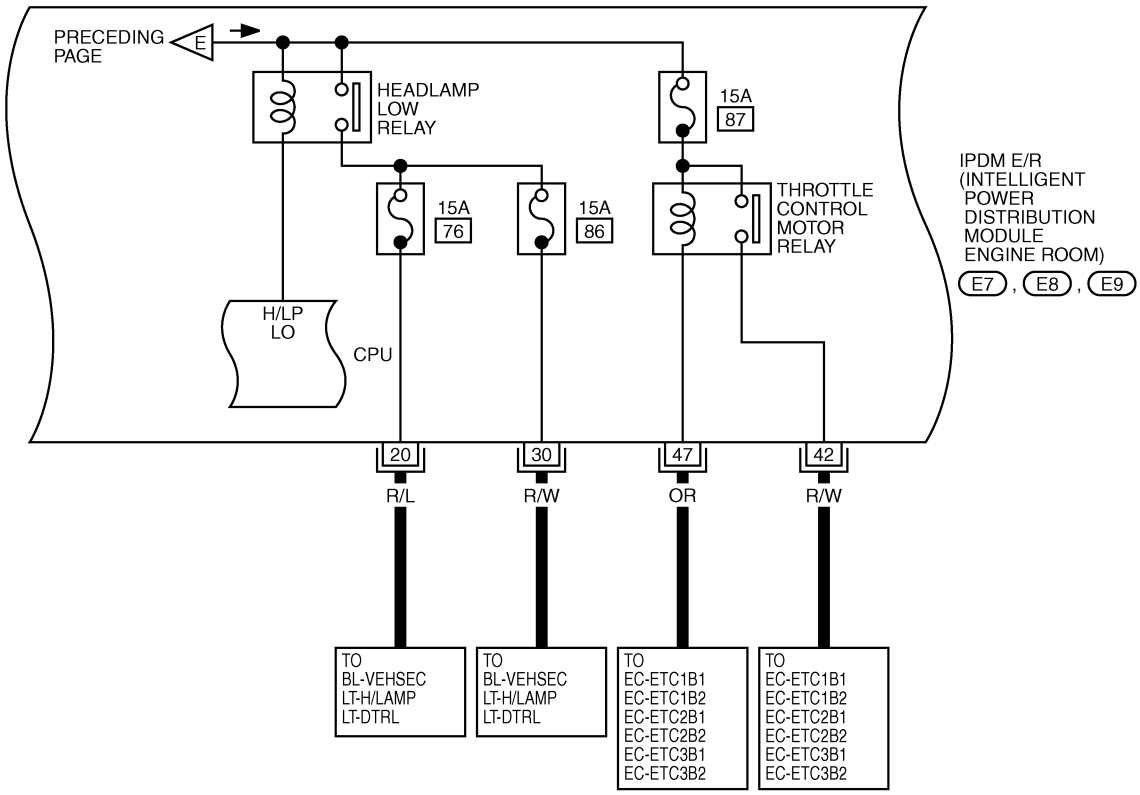
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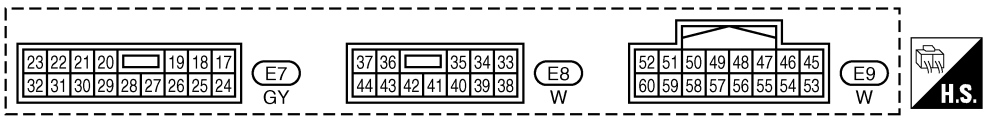




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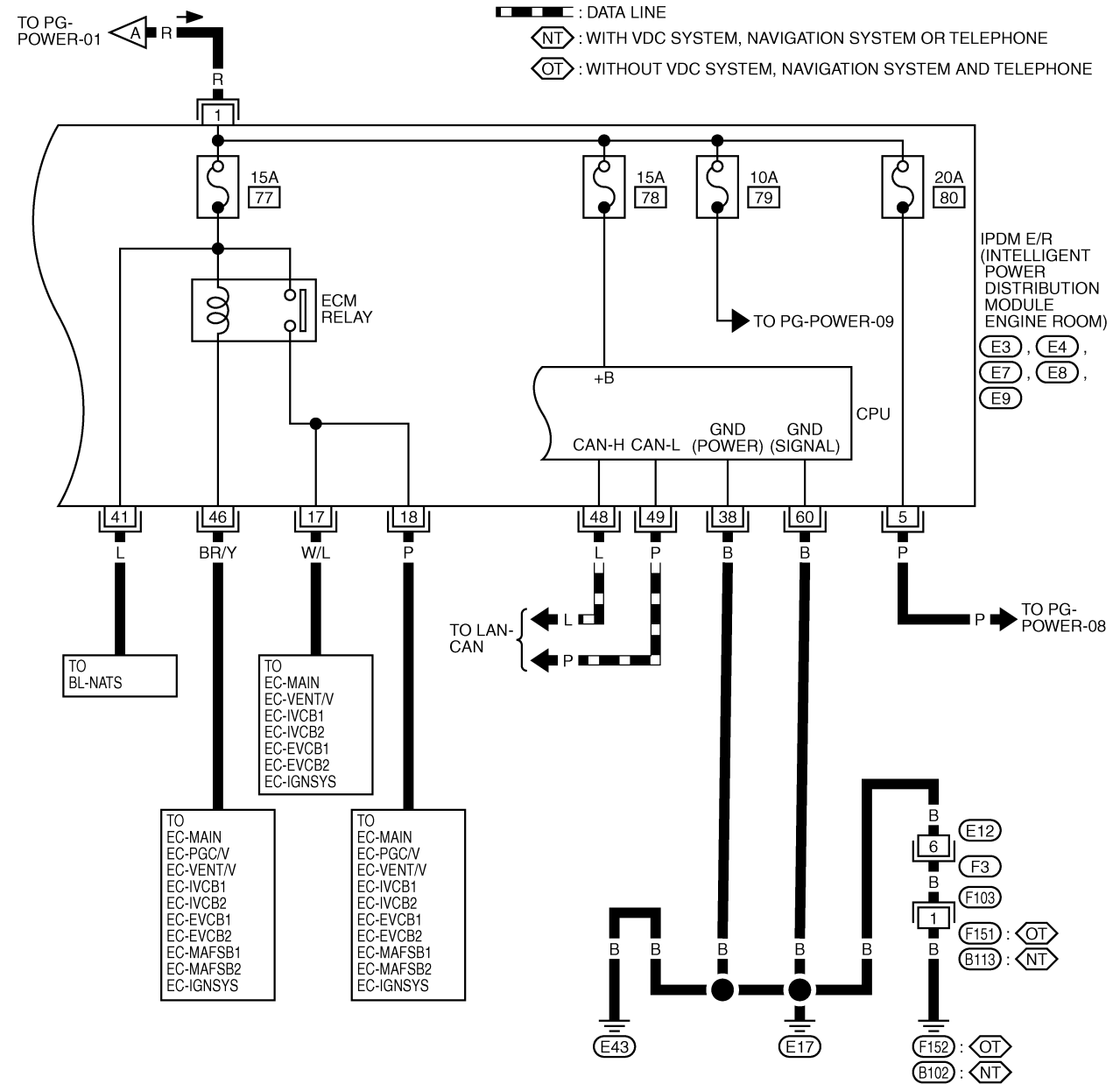
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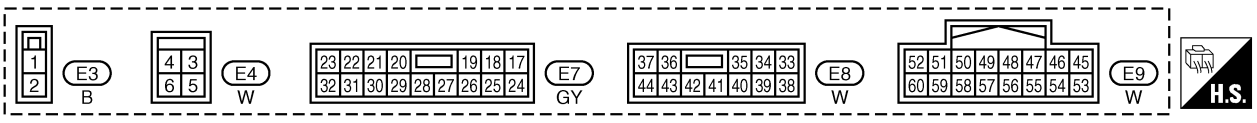


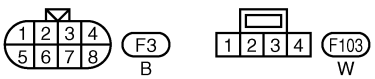


TKWT5816E

PG-POWER-05



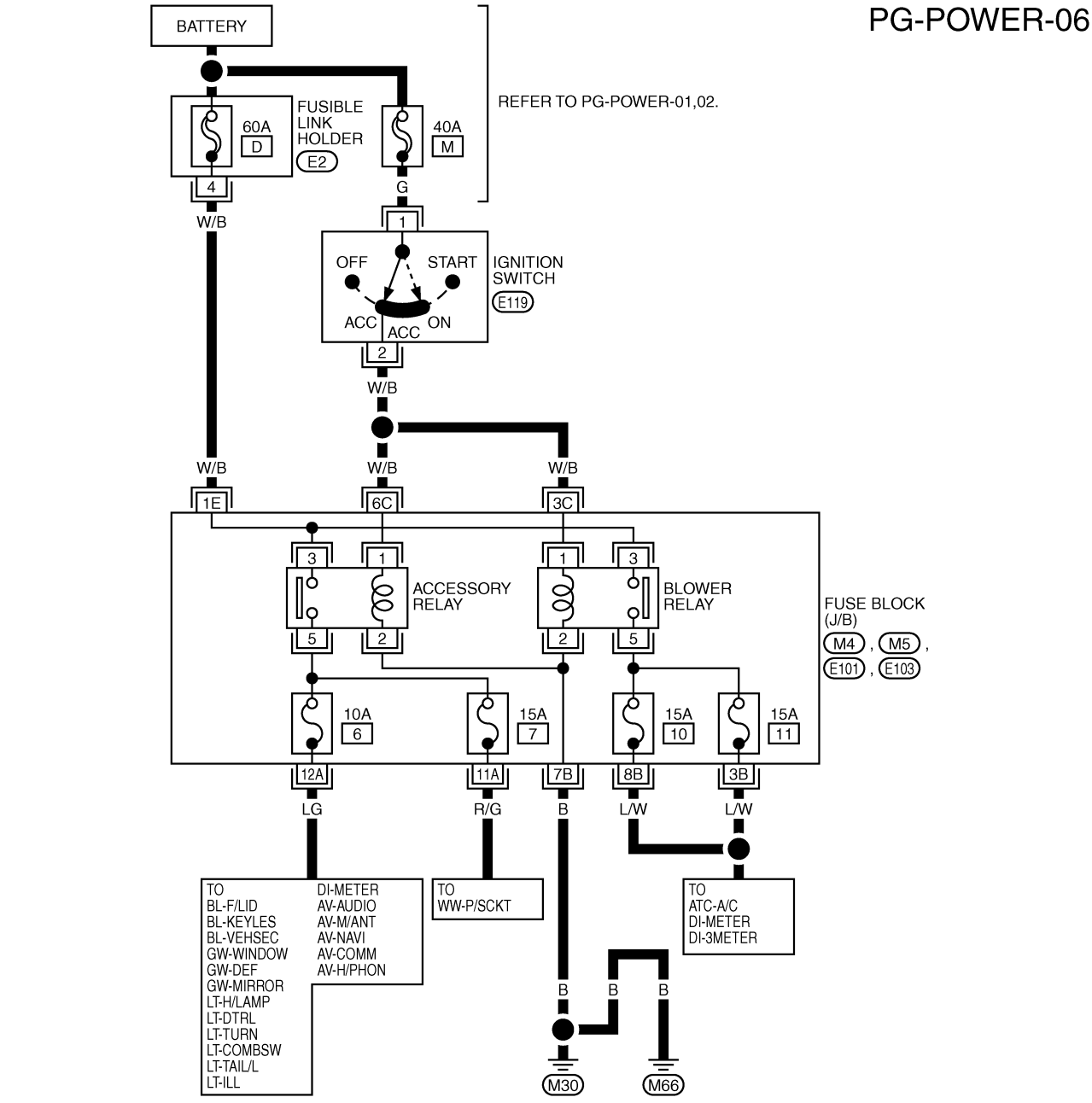


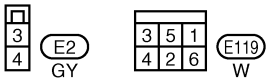


TKWT5817E

ACCESSORY POWER SUPPLY — IGNITION SW. IN “ACC” OR “ON”

PG-POWER-06





REFER TO THE FOLLOWING.

M4 , M5 , E101 , E103

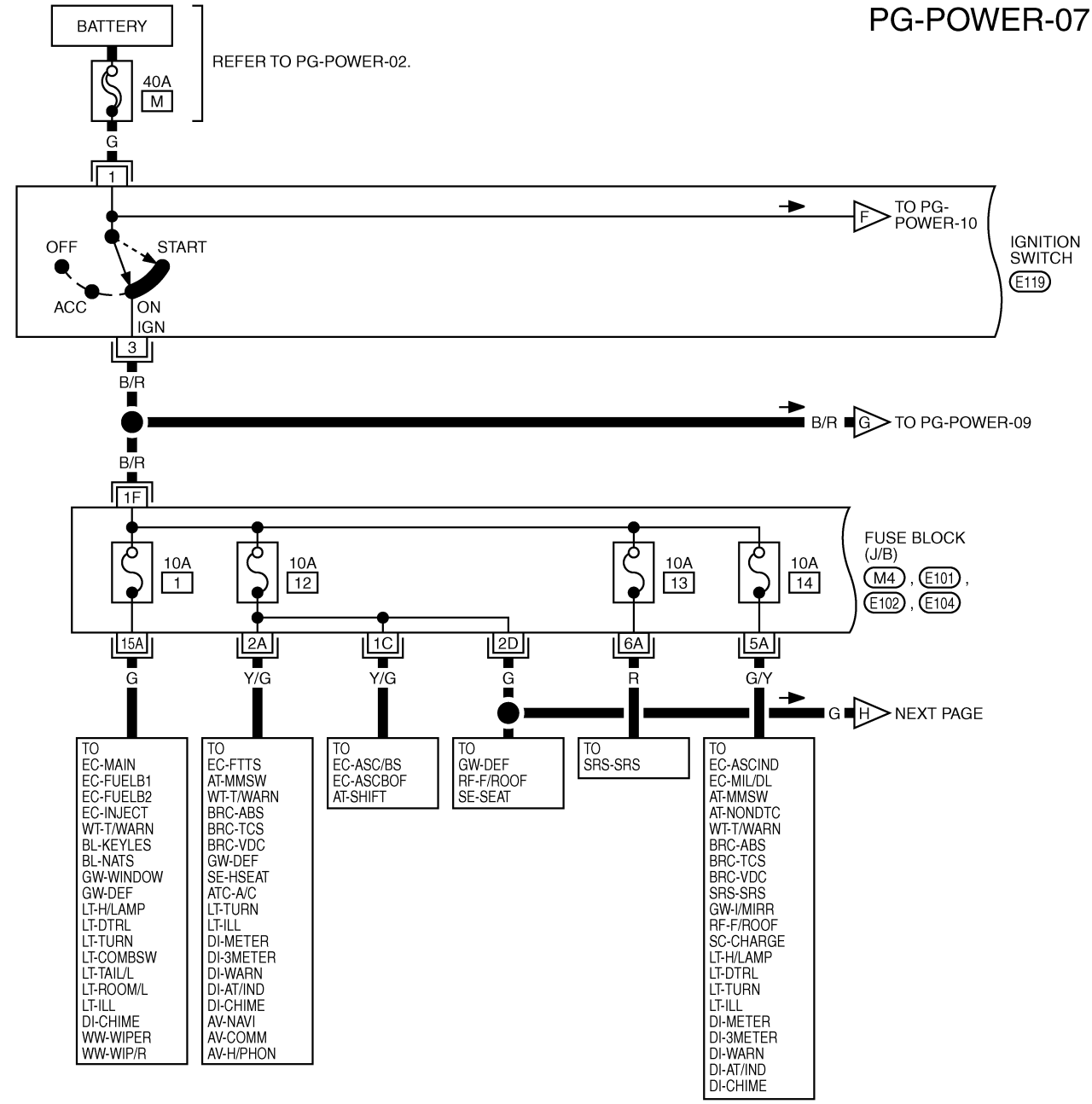
-FUSE BLOCK-JUNCTION BOX (J/B)

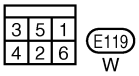
1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22

TKWT5818E

IGNITION POWER SUPPLY — IGNITION SW. IN “ON” AND/OR “START”

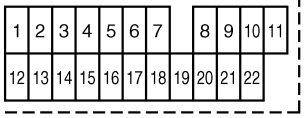
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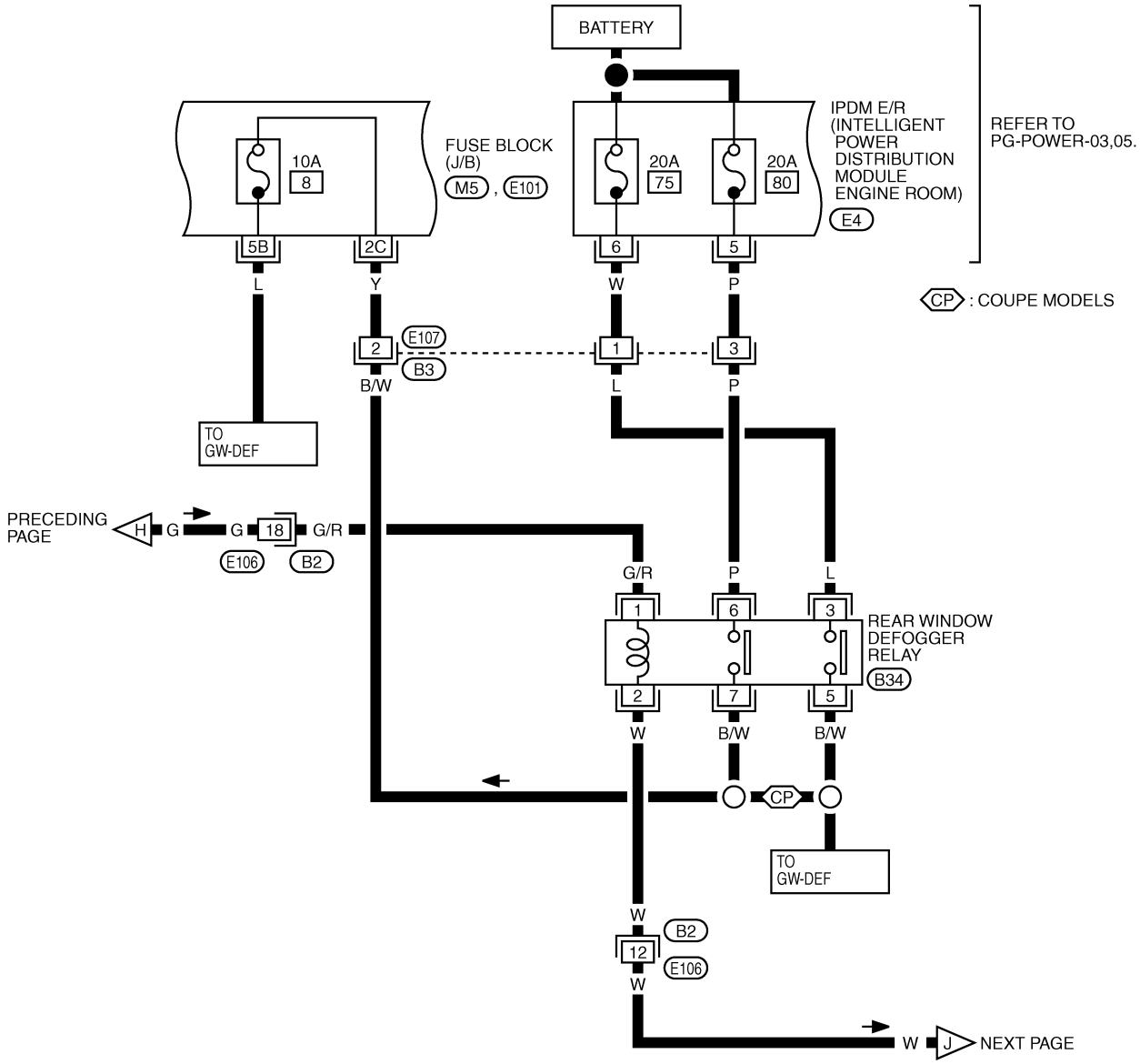
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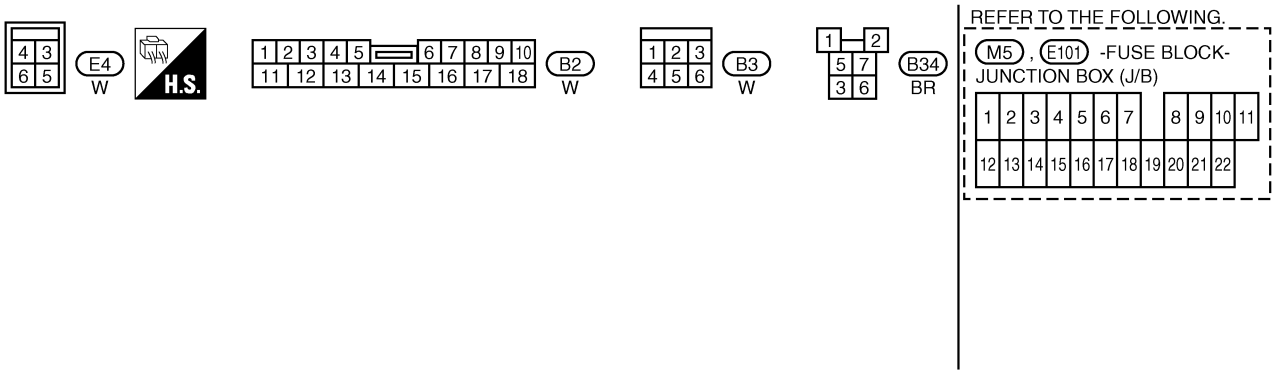
M4 , E101 , E102 , E104
-FUSE BLOCK-JUNCTION BOX (J/B)



TKWT5819E

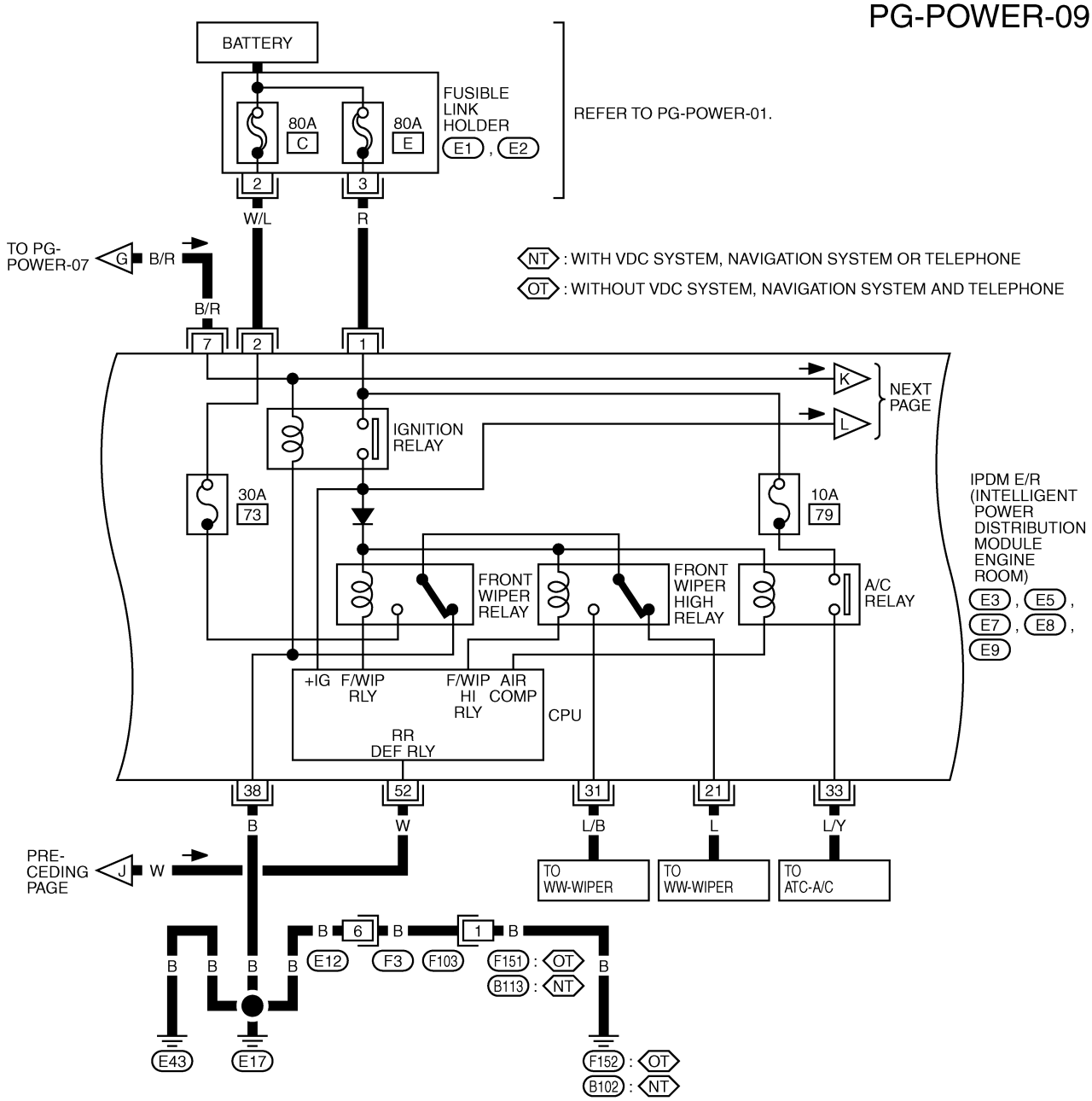
PG-POWER-08

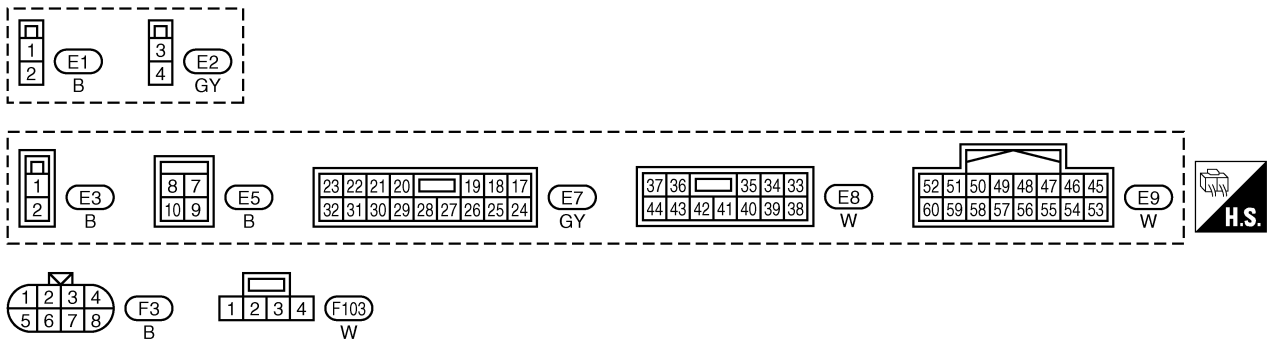




TKWT5820E

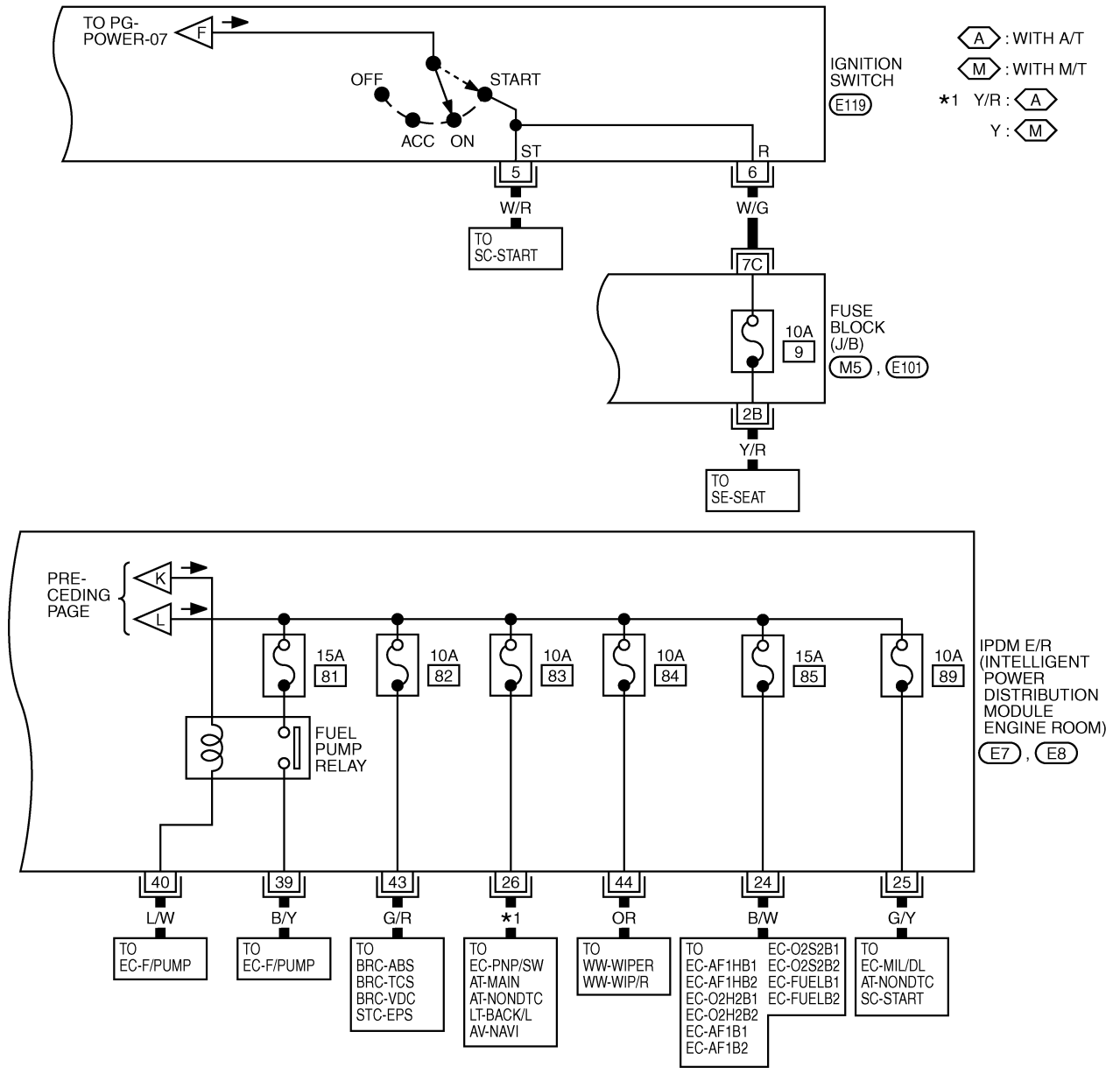
PG-POWER-09





TKWT5821E

PG-POWER-10

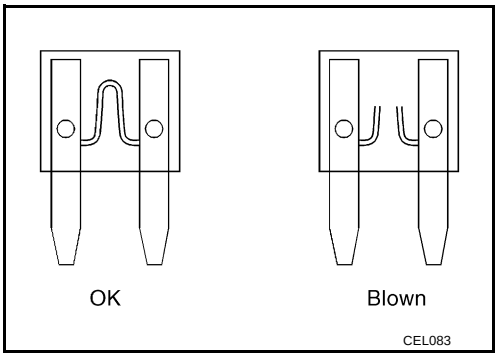


TKWT5822E

Fuse

NKS000E1

- If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse.
- Use fuse of specified rating. Never use fuse of more than specified rating.
- Do not partially install fuse; always insert it into fuse holder properly.
- Remove fuse for “ELECTRICAL PARTS (BAT)” if vehicle is not used for a long period of time.



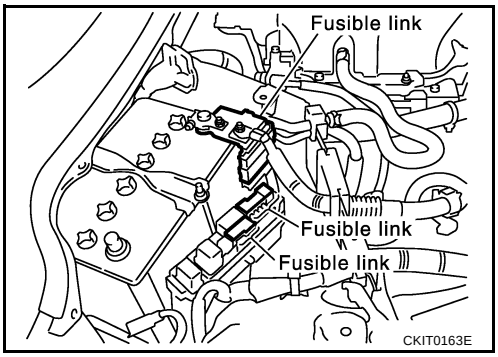
Fusible Link

NKS000E2

A melted fusible link can be detected either by visual inspection or by feeling with finger tip. If its condition is questionable, use circuit tester or test lamp.

CAUTION:

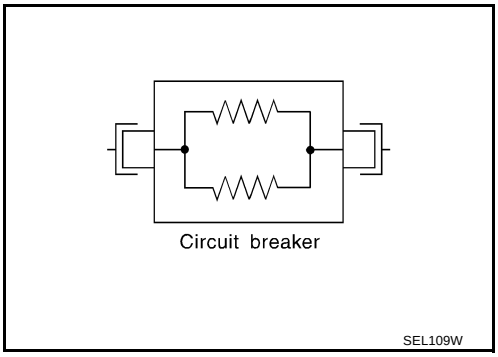
- **If fusible link should melt, it is possible that critical circuit (power supply or large current carrying circuit) is shorted. In such a case, carefully check and eliminate cause of malfunction.**
- **Never wrap outside of fusible link with vinyl tape. Important: Never let fusible link touch any other wiring harness, vinyl or rubber parts.**



Circuit Breaker

NKS000E3

The PTC thermistor generates heat in response to current flow. The temperature (and resistance) of the thermistor element varies with current flow. Excessive current flow will cause the element's temperature to rise. When the temperature reaches a specified level, the electrical resistance will rise sharply to control the circuit current. Reduced current flow will cause the element to cool. Resistance falls accordingly and normal circuit current flow is allowed to resume.



IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

PFP:284B7

System Description

NKS000E4

- IPDM E/R (Intelligent Power Distribution Module Engine Room) integrates relays and fuse blocks which were originally placed in engine room. It controls integrated relays via IPDM E/R control circuit.
- IPDM E/R integrated control unit performs ON-OFF operation of relay, hood switch signal reception, etc.
- It controls operation of each electrical part via ECM, BCM and CAN communication lines.

CAUTION:

None of the IPDM E/R-integrated relays can be removed.

SYSTEMS CONTROLLED BY IPDM E/R

IPDM E/R receives a request signal from each control unit with CAN communication. It controls each system.

Control system	Transmit control unit	Control part
Lamp control	BCM	● Head lamps (HI, LO) ● Parking lamps, license plate lamps and tail lamps
Wiper control	BCM	Front wipers
Rear window defogger control	BCM	Rear window defogger
A/C compressor control	ECM	A/C compressor (magnet clutch)
Cooling fan control	ECM	Cooling fan

CAN COMMUNICATION LINE CONTROL

With CAN communication, by connecting each control unit using two communication lines (CAN L line, CAN H line), it is possible to transmit maximum amount of information with minimum wiring. Each control unit can transmit and receive data, and reads necessary information only.

1. Fail-safe control
   - When CAN communication with other control units is impossible, IPDM E/R performs fail-safe control. After CAN communication recovers normally, it also returns to normal control.
   - Operation of control parts by IPDM E/R during fail-safe mode is as follows:

Controlled system	Fail-safe mode
Headlamp	● With the ignition switch ON, the headlamp (low) is ON. ● With the ignition switch OFF, the headlamp (low) is OFF.
Parking, license plate and tail lamps	● With the ignition switch ON, the parking, license plate and tail lamps are ON. ● With the ignition switch OFF, the parking, license plate and tail lamps are OFF.
Cooling fan	● With the ignition switch ON, the cooling fan HI operates. ● With the ignition switch OFF, the cooling fan stops.
Front wiper	Until the ignition switch is turned OFF, the front wiper LO and HI remains in the same status it was in just before fail–safe control was initiated.
Rear window defogger	Rear window defogger relay OFF
A/C compressor	A/C compressor OFF

IPDM E/R STATUS CONTROL

In order to save power, IPDM E/R switches status by itself based on each operating condition.

1. CAN communication status
   - CAN communication is normally performed with other control units.
   - Individual unit control by IPDM E/R is normally performed.
   - When sleep request signal is received from BCM, mode is switched to sleep waiting status.
2. Sleep waiting status
   - Process to stop CAN communication is activated.
   - All systems controlled by IPDM E/R are stopped. When 3 seconds have elapsed after CAN communication with other control units is stopped, mode switches to sleep status.
3. Sleep status
   - IPDM E/R operates in low power mode.
   - CAN communication is stopped.
   - When a change in CAN communication line is detected, mode switches to CAN communication status.
   - When a change in hood switch or ignition switch signal is detected, mode switches to CAN communication status.

CAN Communication System Description

NKS000E5

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicles are equipped with many electronic control units and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

NKS000E6

Refer to LAN-48, "CAN System Specification Chart" .

Function of Detecting Ignition Relay Malfunction

NKS000E7

- When contact point of integrated ignition relay is stuck and cannot be turned OFF, IPDM E/R turns ON parking lamp, license plate lamp and tail lamp for 10 minutes to indicate ignition relay malfunction.
- When a state of ignition relay having built-in does not agree with a state of Ignition switch signal input by a CAN communication from BCM, IPDM E/R lets tail lamp relay operate.

Ignition switch signal	Ignition relay status	Tail lamp relay and daytime light relay*1
ON	ON	—
OFF	OFF	—
ON	OFF	—
OFF	ON	ON (10 minutes)

NOTE:

- When the ignition switch is turned ON, tail lamp relay and daytime light relay are OFF.
- *1: Canada model only

CONSULT-III Function (IPDM E/R)

NKS000E8

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Inspection Item, Diagnosis Mode	Description
SELF-DIAG RESULTS	The IPDM E/R performs diagnosis of the CAN communication and self-diagnosis.
DATA MONITOR	The input/output data of the IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	The IPDM E/R sends a drive signal to electronic components to check their operation.

SELF-DIAG RESULTS

Display Item List

Display Items	CONSULT-III display code	Malfunction detecting condition	TIME		Possible causes
			CRNT	PAST	
NO DTC IS DETECTED.FURTHER TESTING MAY BE REQUIRED.	-	-	-	-	-
CAN COMM CIRC	U1000	● If CAN communication reception/transmission data has a malfunction, or if any of the control units malfunction, data reception/ transmission cannot be confirmed. ● When the data in CAN communication is not received before the specified time	×	×	Any of or several items below have errors. ● TRANSMIT DIAG ● ECM ● BCM

NOTE:

The details for display of the period are as follows:

- CRNT: Error currently detected with IPDM E/R.
- PAST: Error detected in the past and memorized with IPDM E/R.

DATA MONITOR

All Items, Main Items, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	SELECT MONITOR ITEM			Description
			ALL SIG-NALS	MAIN SIG-NALS	SELEC-TION FROM MENU	
Motor fan request	MOTOR FAN REQ	1/2/3/4	×	×	×	Signal status input from ECM
Compressor request	AC COMP REQ	ON/OFF	×	×	×	Signal status input from ECM
Parking request	TAIL&CLR REQ	ON/OFF	×	×	×	Signal status input from BCM
H/L LO request	HL LO REQ	ON/OFF	×	×	×	Signal status input from BCM
H/L HI request	HL HI REQ	ON/OFF	×	×	×	Signal status input from BCM
Front fog request	FR FOG REQ*1	ON/OFF	×	×	×	—
Head lamp washer request	HL WASHER REQ*1	ON/OFF	×		×	—
Front wiper request	FR WIP REQ	STOP/1LOW/ LOW/HI	×	×	×	Signal status input from BCM
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	×	×	×	Output status of IPDM E/R
Wiper protection	WIP PROT	OFF/Block	×	×	×	Control status of IPDM E/R
Starter request	ST RLY REQ*2	ON/OFF	×		×	Status of input signal
Ignition relay status	IGN RLY	ON/OFF	×	×	×	Ignition relay status monitored with IPDM E/R
Rear window defogger request	RR DEF REQ	ON/OFF	×	×	×	Signal status input from BCM

Item name	CONSULT-III screen display	Display or unit	SELECT MONITOR ITEM			Description
			ALL SIG-NALS	MAIN SIG-NALS	SELEC-TION FROM MENU	
Oil pressure switch	OIL P SW *1	OPEN/CLOSE	×		×	—
Day time light request	DTRL REQ *3	ON/OFF	×		×	Signal status input from BCM
Hood switch	HOOD SW*1	ON/OFF	×		×	—
Theft warning horn request	THFT HRN REQ	ON/OFF	×		×	Signal status input from BCM
Horn chirp	HORN CHIRP	ON/OFF	×		×	Output status of IPDM E/R

NOTE:

- Perform monitoring of IPDM E/R data with the ignition switch ON. When the ignition switch is at ACC, the display may not be correct.
- *1: This items is displayed, but does not function.
- *2: The vehicle without intelligent key system displays only ON without change.
- *3: Only the vehicle with daytime light system operates.

ACTIVE TEST

Display Item List

Test item	CONSULT-III screen display	Description
Tail lamp operation	TAIL LAMP	With a certain ON-OFF operation, the tail lamp relay can be operated.
Rear window defogger operation	REAR DEFOGGER	With a certain ON-OFF operation, the rear window defogger relay can be operated.
Front wiper (HI, LO) operation	FRONT WIPER	With a certain operation (OFF, HI ON, LO ON), the front wiper relay (Lo, Hi) can be operated.
Cooling fan operation	MOTOR FAN	With a certain operation (1,2,3,4), the cooling fan can be operated.
Headlamp washer NOTE 1	HEAD LAMP WASHER	—
Lamp (HI, LO, FOG NOTE 2) operation	LAMPS	With a certain operation (OFF, HI ON, LO ON, FOG ON NOTE), the lamp relay (Lo, Hi, Fog NOTE) can be operated.
Horn operation	HORN	Push “ON” button, horn relay operates 20 ms.

NOTE:

1. Headlamp washer item is displayed, but it cannot be tested.
2. Fog lamp item is displayed, but it cannot be tested.

Auto Active Test

NKS000E9

DESCRIPTION

In auto active test mode, operation inspection can be performed when IPDM E/R sends a drive signal to the following systems:

- Rear window defogger
- Front wipers
- Parking lamp, license plate lamp and tail lamp
- Headlamps (Hi, Lo)
- A/C compressor (magnetic clutch)
- Cooling fan

OPERATION PROCEDURE

1. Close hood and front door (passenger side), and then lift wiper arms away from windshield (to prevent glass damage by wiper operation).

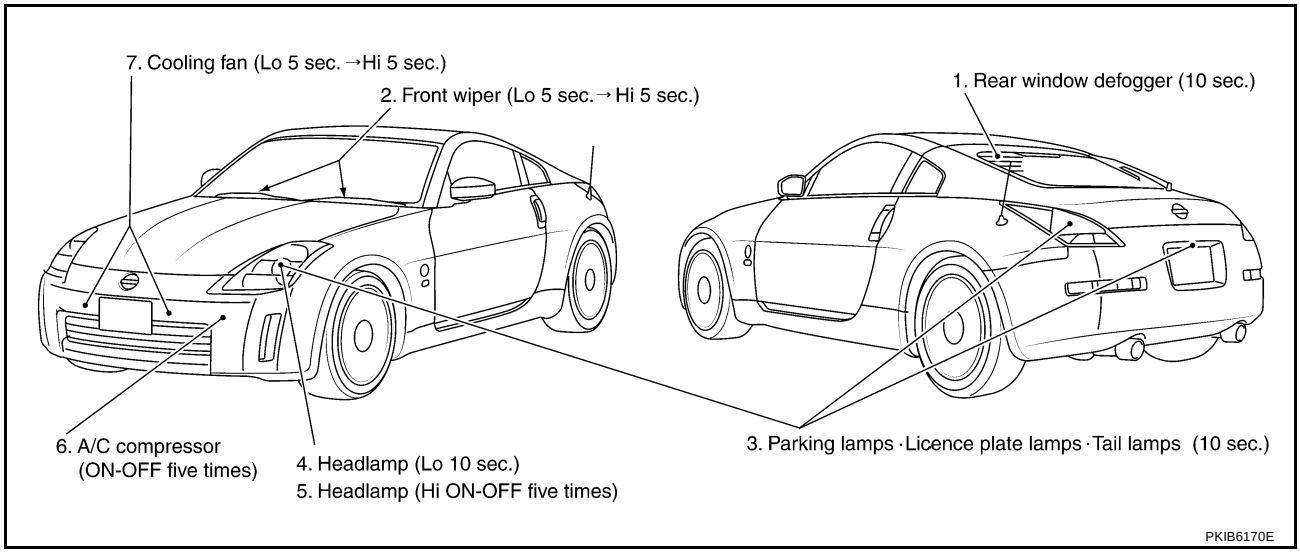
   NOTE:
   When auto active test is performed with hood opened, sprinkle water on windshield beforehand.
2. Turn ignition switch OFF.
3. Turn ignition switch ON, and, within 20 seconds, press driver's front door switch 10 times (close other door). Then turn ignition switch OFF.
4. Turn ignition switch ON within 10 seconds after ignition switch OFF.
5. When auto active test mode is actuated, horn chirps once. Oil pressure warning lamp starts blinking.
6. After a series of operations is repeated three times, auto active test is completed.

   NOTE:
   When auto active test mode has to be cancelled halfway, turn ignition switch OFF.

   CAUTION:
   Be sure to inspect BL-38, "Check Door Switch" when the auto active test cannot be performed.

INSPECTION IN AUTO ACTIVE TEST MODE

When auto active test mode is actuated, the following eight steps are repeated three times.



NOTE:
It takes 10 seconds from 3 to 4.

Concept of Auto Active Test

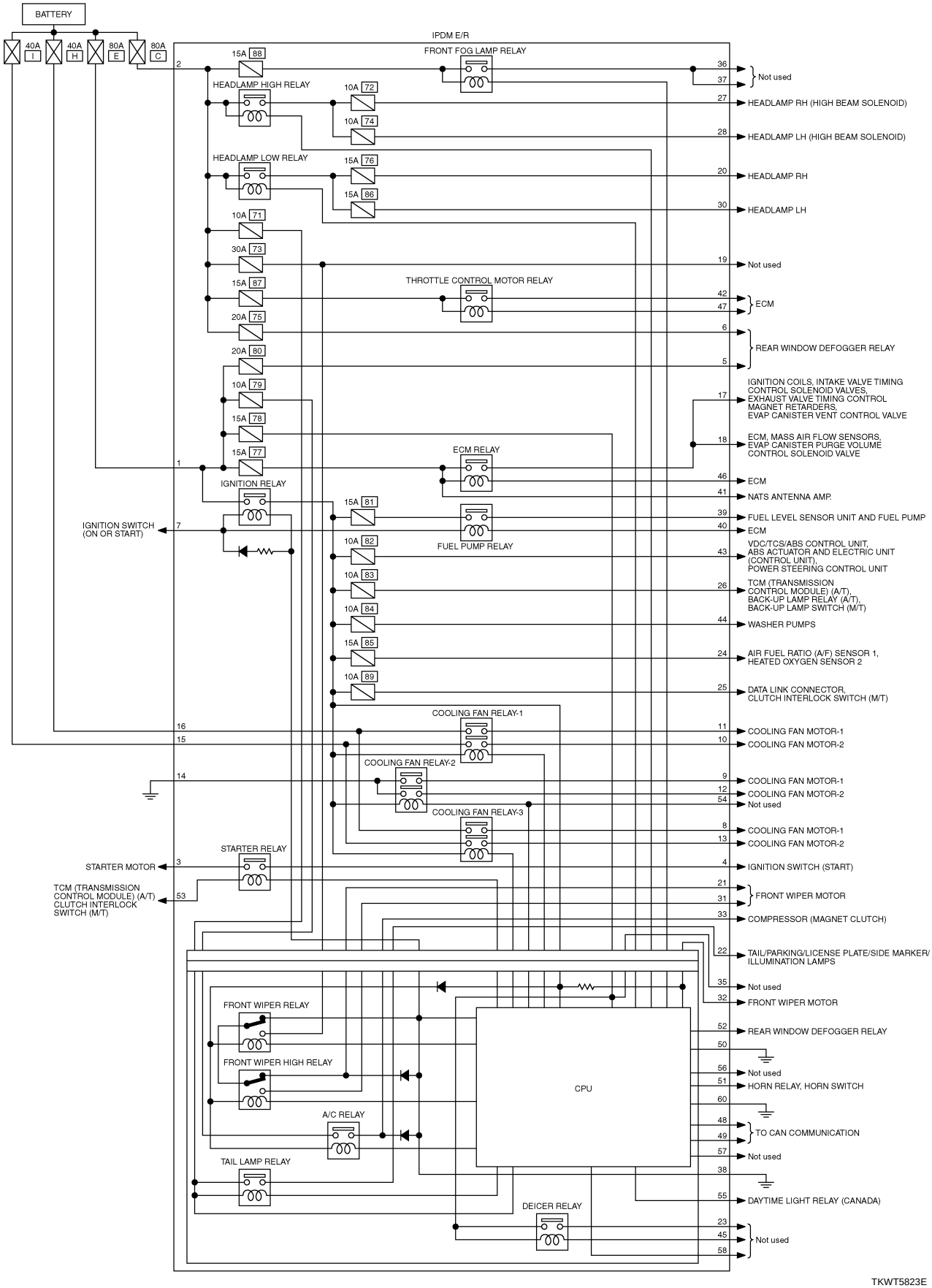
- IPDM E/R actuates auto active test mode when it receives door switch signal from BCM via CAN communication line. Therefore, when auto active test mode is activated successfully, CAN communication between IPDM E/R and BCM is normal.
- If any of systems controlled by IPDM E/R cannot be operated, possible cause can be easily diagnosed using auto active test.

Diagnosis chart in auto active test mode

Symptom	Inspection contents		Possible cause
Rear window defogger does not operate.	Perform auto active test. Does rear window defogger operate?	YES	● BCM signal input circuit
		NO	● Rear window defogger relay circuit ● Open circuit of rear window defogger ● IPDM E/R malfunction
Any of front wipers, tail and parking lamps, front fog lamps, and head lamps (Hi, Lo) do not operate.	Perform auto active test. Does system in question operate?	YES	● BCM signal input system
		NO	● Lamp/wiper motor malfunction ● Lamp/wiper motor ground circuit malfunction ● Harness/connector malfunction between IPDM E/R and system in question ● IPDM E/R (integrated relay) malfunction
A/C compressor does not operate.	Perform auto active test. Does magnetic clutch operate?	YES	● BCM signal input circuit ● CAN communication signal between BCM and ECM. ● CAN communication signal between ECM and IPDM E/R
		NO	● Magnetic clutch malfunction ● Harness/connector malfunction between IPDM E/R and magnetic clutch ● IPDM E/R (integrated relay) malfunction
Cooling fan does not operate.	Perform auto active test. Does cooling fan operate?	YES	● ECM signal input circuit ● CAN communication signal between ECM and IPDM E/R
		NO	● Cooling fan motor malfunction ● Harness/connector malfunction between IPDM E/R and cooling fan motor ● IPDM E/R (integrated relay) malfunction

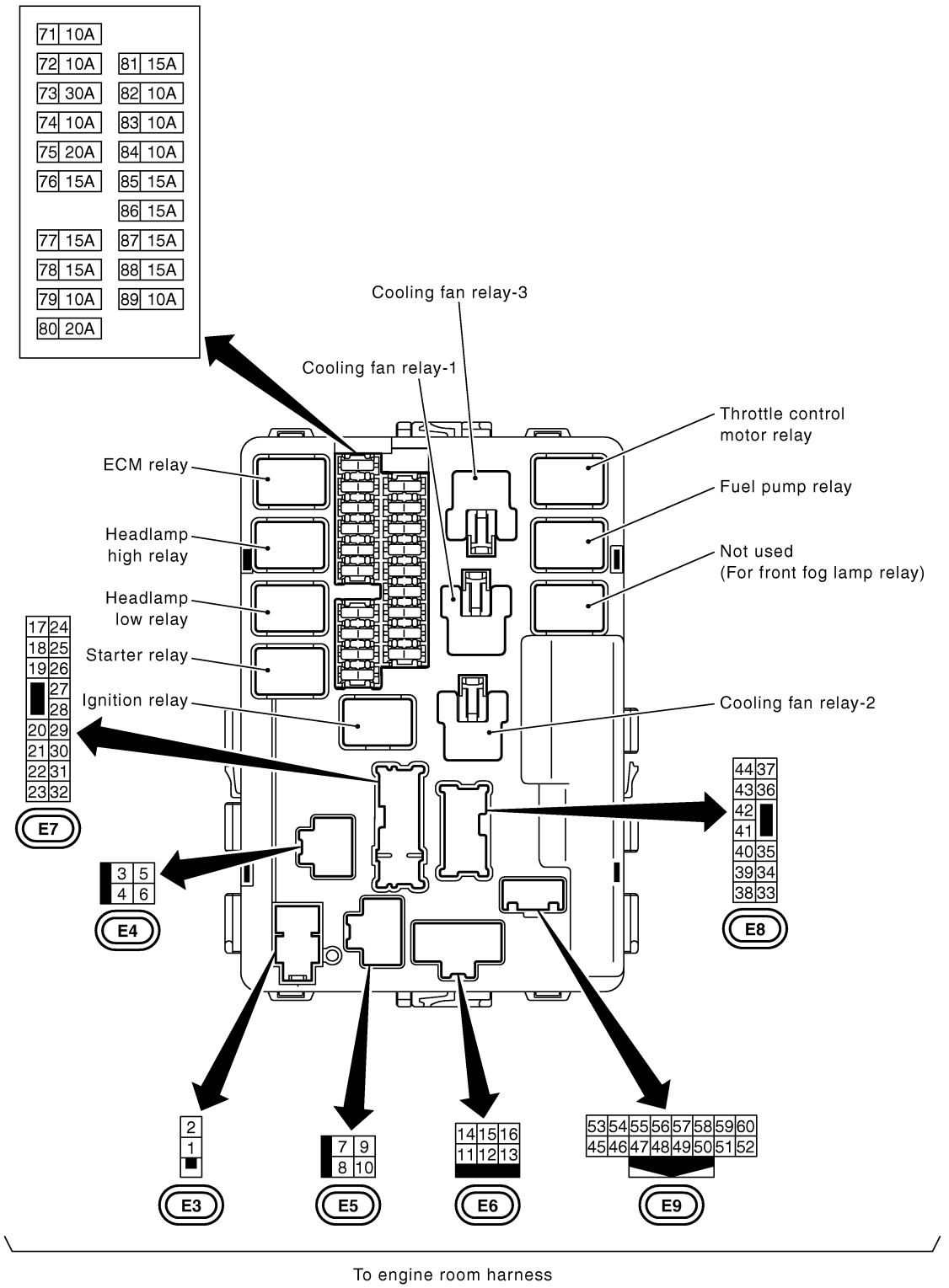
Schematic

NKS0054B



IPDM E/R Terminal Arrangement

NKS0054C



CKIT0850E

IPDM E/R Power/Ground Circuit Inspection

NKS000EC

1. CHECK FUSE AND FUSIBLE LINK

Make sure the following fusible links or IPDM E/R fuses are not blown.

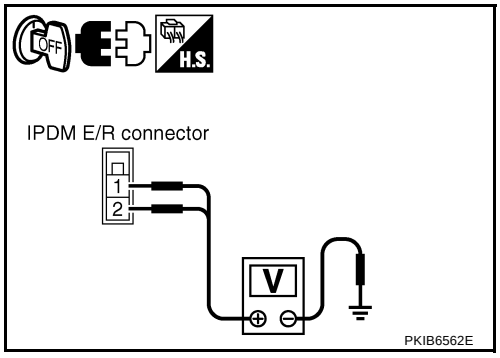
Terminal No.	Signal name	Fuse and fusible link No.
1	Battery power	E
2		C
—		71
		78

OK or NG

OK >> GO TO 2.
NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link.

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check voltage between IPDM E/R harness connector and ground.



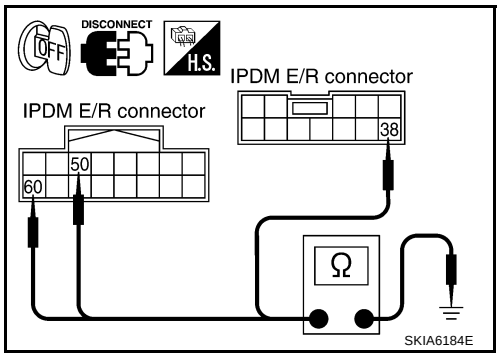
Terminal			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal		
E3	1	Ground	Battery voltage
	2		

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

1. Disconnect IPDM E/R harness connectors.
2. Check continuity between IPDM E/R harness connectors and ground.



IPDM E/R connector	Terminal		Continuity
E8	38	Ground	Yes
E9	50		
	60		

OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

Inspection With CONSULT-III (Self-Diagnosis)

NKS000ED

1. CHECK SELF DIAGNOSTIC RESULT

CONSULT-III display	CONSULT-III display code	TIME		Details of diagnosis result
		CRNT	PAST	
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	—	—	—	No malfunction
CAN COMM CIRC	U1000	×	×	Any of or several items below have errors. ● TRANSMIT DIAG ● ECM ● BCM

NOTE:

The details for display of the period are as follows:

- CRNT: Error currently detected with IPDM E/R.
- PAST: Error detected in the past and memorized with IPDM E/R.

Contents displayed

NO DTC IS DETECTED.FURTHER TESTING MAY BE REQUIRED.>>INSPECTION END

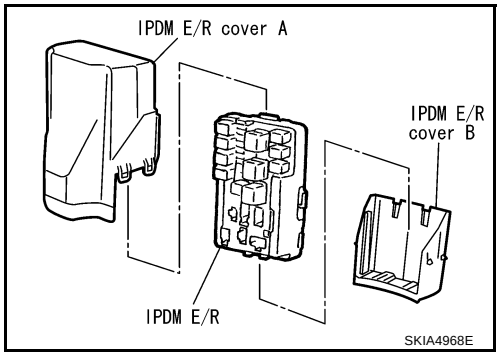
CAN COMM CIRC>>After print-out of the monitor items, refer to LAN-49, "CAN Communication Signal Chart" .

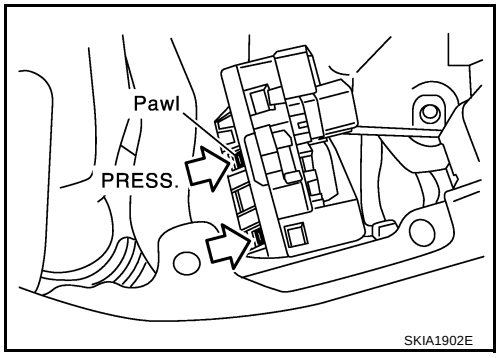
Removal and Installation of IPDM E/R

NKS000EE

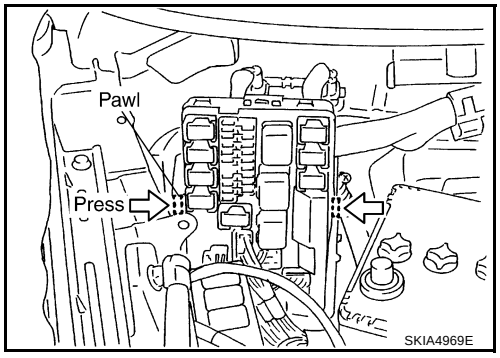
REMOVAL

1. Remove battery. Refer to SC-7, "Removal and Installation" .
2. Remove IPDM E/R cover A. While pressing pawl on backside of IPDM E/R cover B toward vehicle front to unlock, lift up IPDM E/R.





3. While pressing pawls on right and left side of IPDM E/R, remove IPDM E/R cover B from IPDM E/R.
4. Remove harness connector from IPDM E/R.



INSTALLATION

Installation is the reverse order of removal.

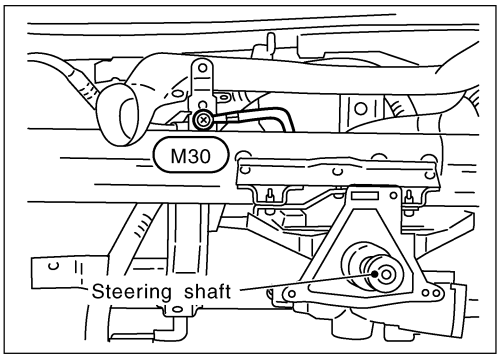
GROUND

PFP:00011

Ground Distribution

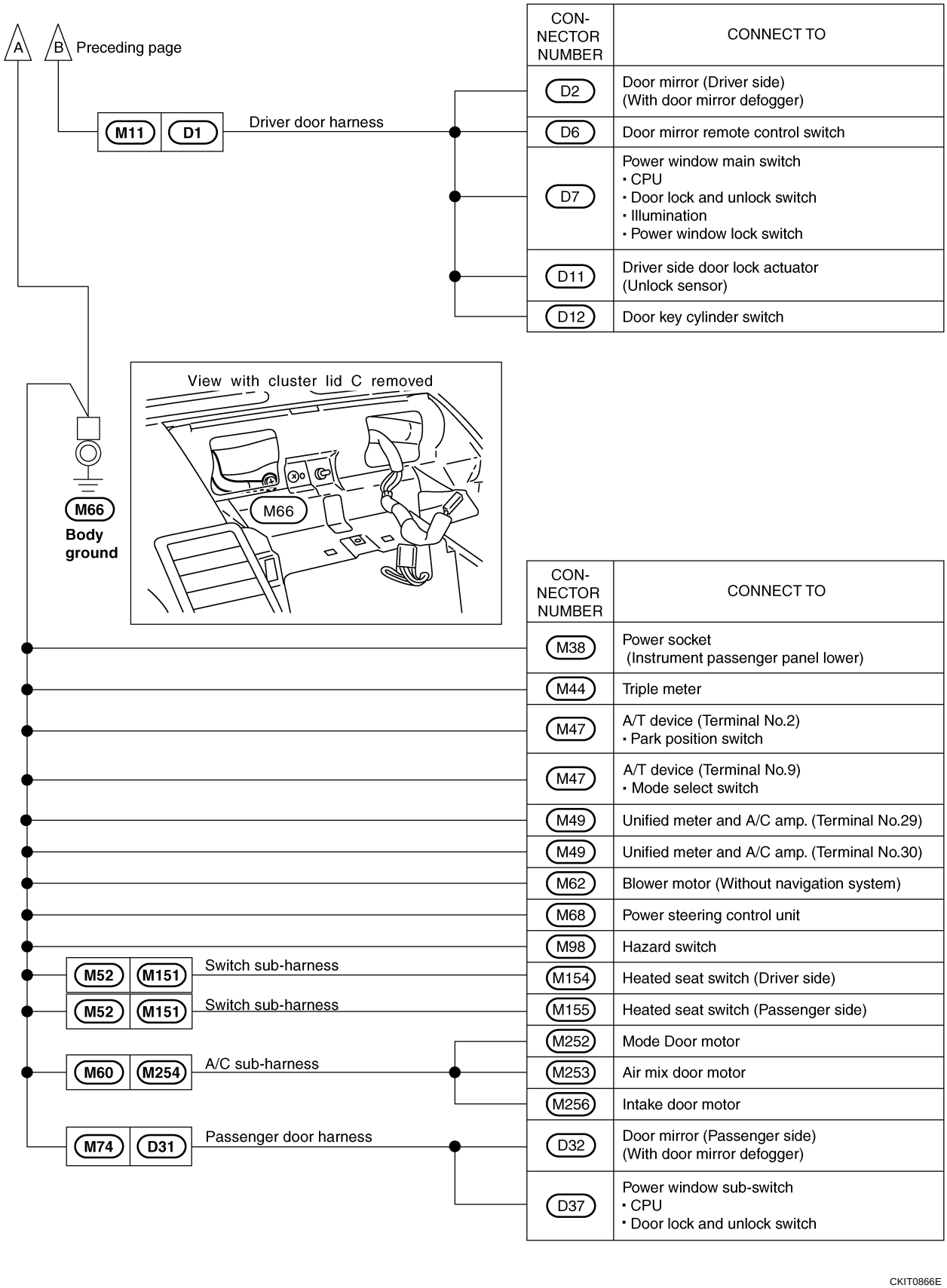
NKS000EF

MAIN HARNESS



CONNECTOR NUMBER	CONNECT TO
M5	Fuse block (J/B) (Terminal No.7B) • Accessory relay • Blower relay
M8	Data link connector (Terminal No.4)
M8	Data link connector (Terminal No.5)
M9	TCS off switch (With TCS Without VDC system)
M9	VDC off switch (With VDC system)
M13	Fuel lid opener switch
M14	Soft top switch
M19	Combination meter (Terminal No.10)
M19	Combination meter (Terminal No.11)
M19	Combination meter (Terminal No.12)
M22	Steering angle sensor
M28	NATS antenna amp.
M29	Combination switch
M35	Display unit (Terminal No.22)
M35	Display unit (Terminal No.24)
M37	NAVI switch
M55	Air bag diagnosis sensor unit
M91	BCM (Body control module)
M152	Cup holder illumination
R3	Vanity mirror lamp LH
R4	Auto anti-dazzling inside mirror
R5	Vanity mirror lamp RH
R8	Soft top front lock switch
R52	Map lamp (Coupe models)
R53	Map lamp (Roadster models) • Map lamp switches • Illumination
R58	Front passenger air bag off indicator

CKIT0865E

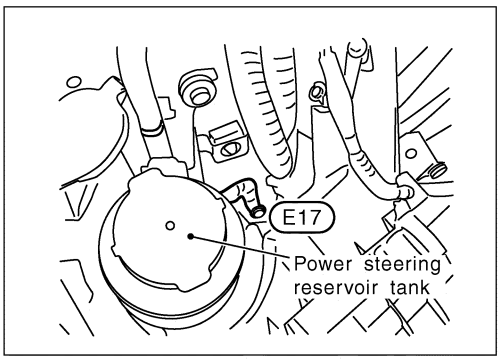


CON-NECTOR NUMBER	CONNECT TO
D2	Door mirror (Driver side) (With door mirror defogger)
D6	Door mirror remote control switch
D7	Power window main switch • CPU • Door lock and unlock switch • Illumination • Power window lock switch
D11	Driver side door lock actuator (Unlock sensor)
D12	Door key cylinder switch

CON-NECTOR NUMBER	CONNECT TO
M38	Power socket (Instrument passenger panel lower)
M44	Triple meter
M47	A/T device (Terminal No.2) • Park position switch
M47	A/T device (Terminal No.9) • Mode select switch
M49	Unified meter and A/C amp. (Terminal No.29)
M49	Unified meter and A/C amp. (Terminal No.30)
M62	Blower motor (Without navigation system)
M68	Power steering control unit
M98	Hazard switch
M154	Heated seat switch (Driver side)
M155	Heated seat switch (Passenger side)
M252	Mode Door motor
M253	Air mix door motor
M256	Intake door motor
D32	Door mirror (Passenger side) (With door mirror defogger)
D37	Power window sub-switch • CPU • Door lock and unlock switch

CKIT0866E

ENGINE ROOM HARNESS



E17
Body ground

CONNECTOR NUMBER	CONNECT TO
E8	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.38)
E9	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.50)
E9	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.60)
E24	Front combination lamp RH (Terminal No.4) ▪ Headlamp ▪ High beam solenoid
E24	Front combination lamp RH (Terminal No.8) ▪ Parking ▪ Side marker ▪ Turn signal
E38	Cooling fan motor-1
E39	Cooling fan motor-2
E52	Front wiper motor

E12 F3 Engine control harness

F103 F151 Engine control earth sub-harness

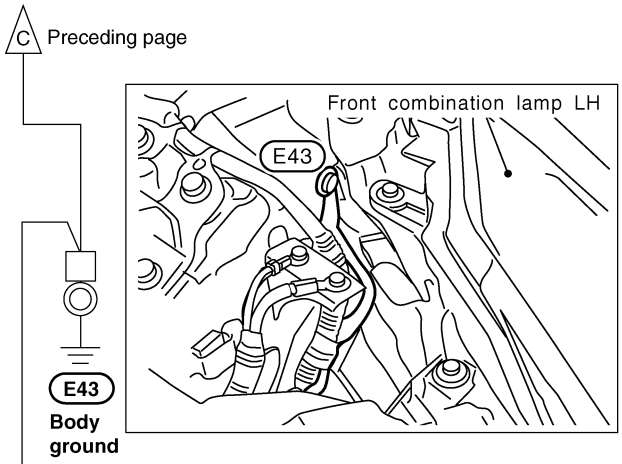
F103 B113 Body No.2 harness

D To engine control earth sub-harness (Without VDC system, navigation system and telephone)

J To body No.2 harness (With VDC system, navigation system or telephone)

C Next page

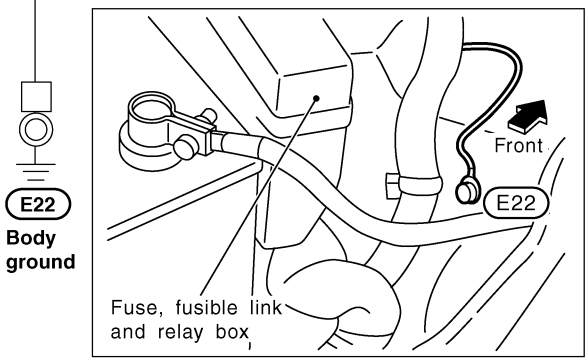
CKIT0867E



CON-NECTOR NUMBER	CONNECT TO
E6	IPDM E/R (Intelligent power distribution module engine room) (Terminal No.14)
E19	Shift lock relay
E30	Washer level sensor
E33	Horn (Low)
E36	Horn (High)
E40	Front combination lamp LH (Terminal No. 4) ▪ Headlamp ▪ High beam solenoid
E40	Front combination lamp LH (Terminal No. 8) ▪ Parking ▪ Side marker ▪ Turn signal
E44	Brake fluid level switch
E51	ABS actuator and electric unit (Terminal No. 16)
E51	ABS actuator and electric unit (Terminal No. 30)

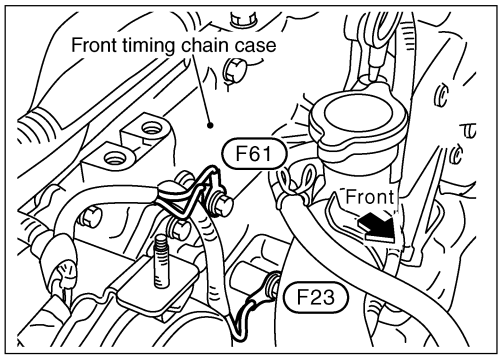
CKIT0868E

CON-NECTOR NUMBER	CONNECT TO
E37	Shield wire (Crash zone sensor)



CKIT0869E

ENGINE CONTROL HARNESS



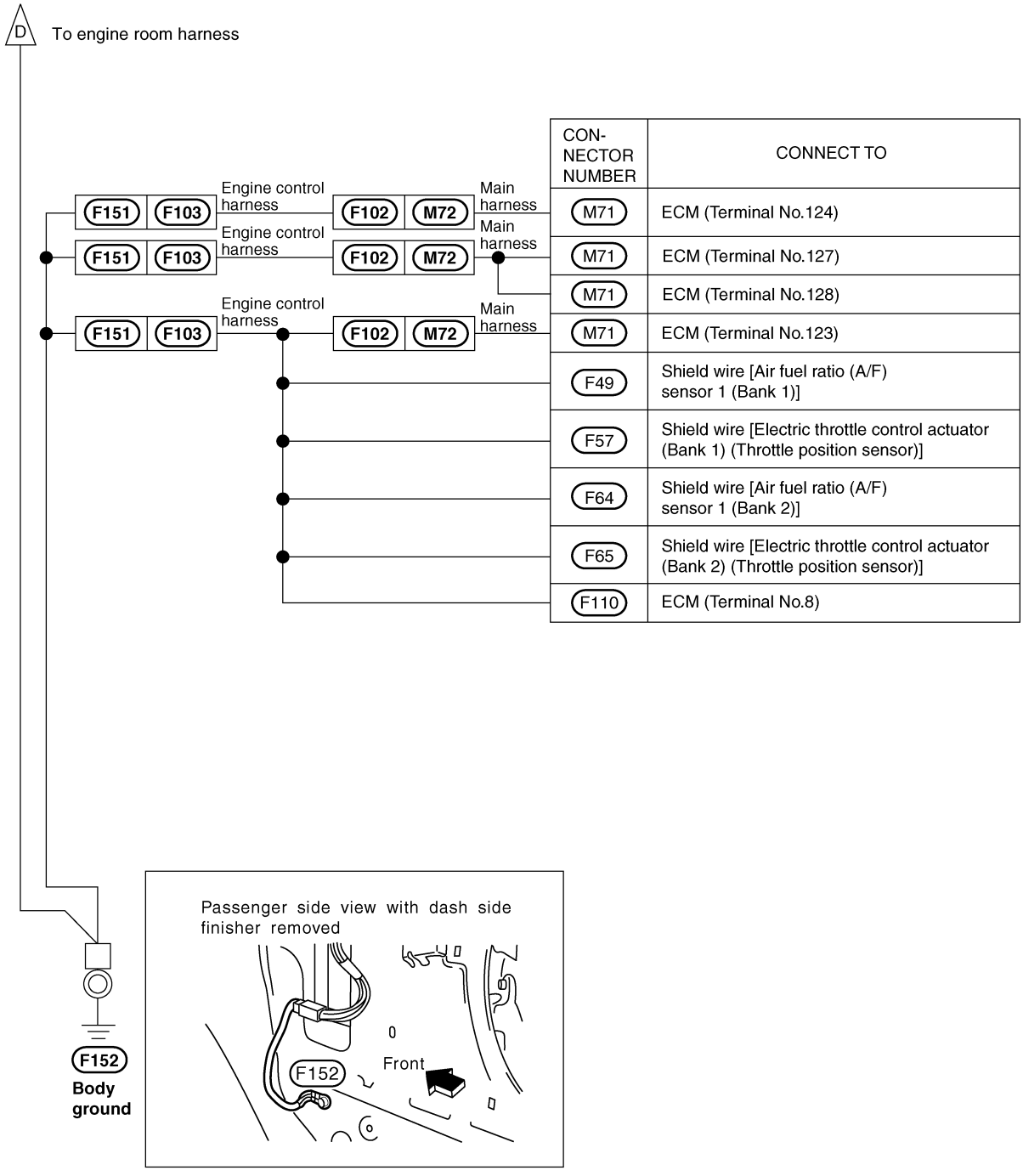
CON-NECTOR NUMBER	CONNECT TO
F6	A/T assembly (Terminal No.5)
F6	A/T assembly (Terminal No.10)

F23
Engine ground

CON-NECTOR NUMBER	CONNECT TO
F15	Ignition coil No.5 (With power transistor)
F16	Condenser
F27	Ignition coil No.2 (With power transistor)
F28	Ignition coil No.4 (With power transistor)
F29	Ignition coil No.6 (With power transistor)
F55	Ignition coil No.1 (With power transistor)
F56	Ignition coil No.3 (With power transistor)

F61
Engine ground

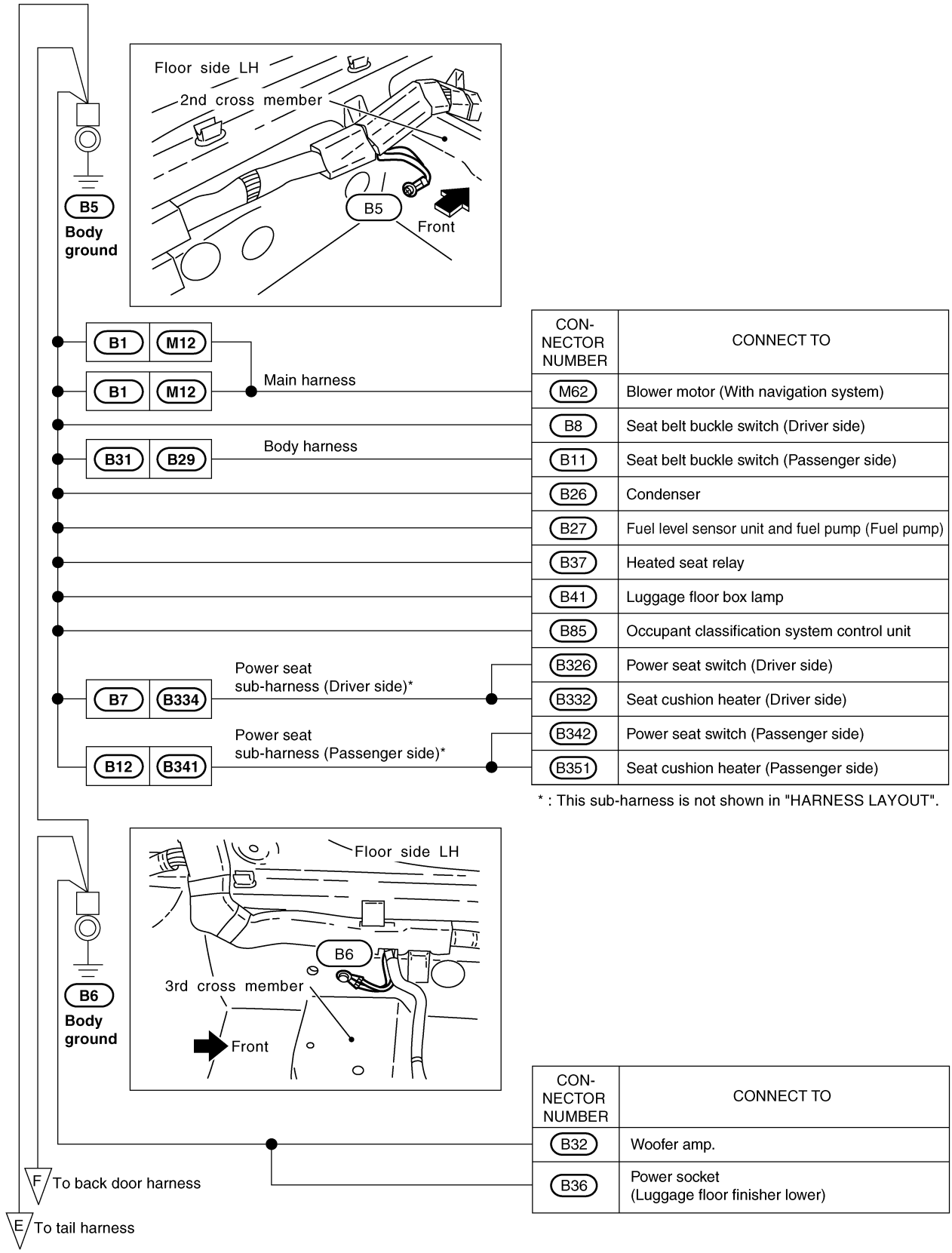
CKIT0870E



CON-NECTOR NUMBER	CONNECT TO
M71	ECM (Terminal No.124)
M71	ECM (Terminal No.127)
M71	ECM (Terminal No.128)
M71	ECM (Terminal No.123)
F49	Shield wire [Air fuel ratio (A/F) sensor 1 (Bank 1)]
F57	Shield wire [Electric throttle control actuator (Bank 1) (Throttle position sensor)]
F64	Shield wire [Air fuel ratio (A/F) sensor 1 (Bank 2)]
F65	Shield wire [Electric throttle control actuator (Bank 2) (Throttle position sensor)]
F110	ECM (Terminal No.8)

CKIT0871E

BODY HARNESS
Coupe Models



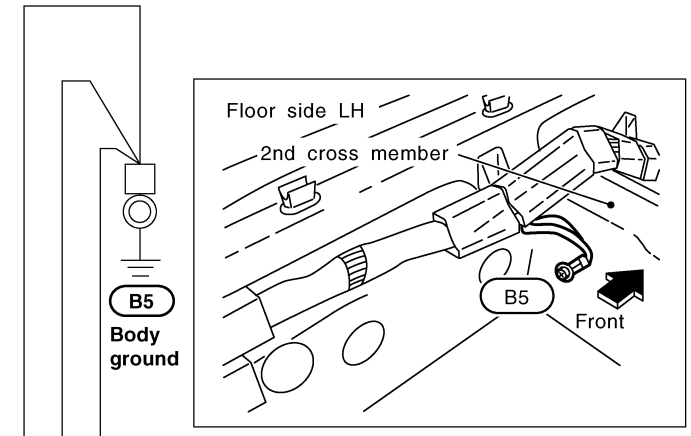
CONNECTOR NUMBER	CONNECT TO
M62	Blower motor (With navigation system)
B8	Seat belt buckle switch (Driver side)
B11	Seat belt buckle switch (Passenger side)
B26	Condenser
B27	Fuel level sensor unit and fuel pump (Fuel pump)
B37	Heated seat relay
B41	Luggage floor box lamp
B85	Occupant classification system control unit
B326	Power seat switch (Driver side)
B332	Seat cushion heater (Driver side)
B342	Power seat switch (Passenger side)
B351	Seat cushion heater (Passenger side)

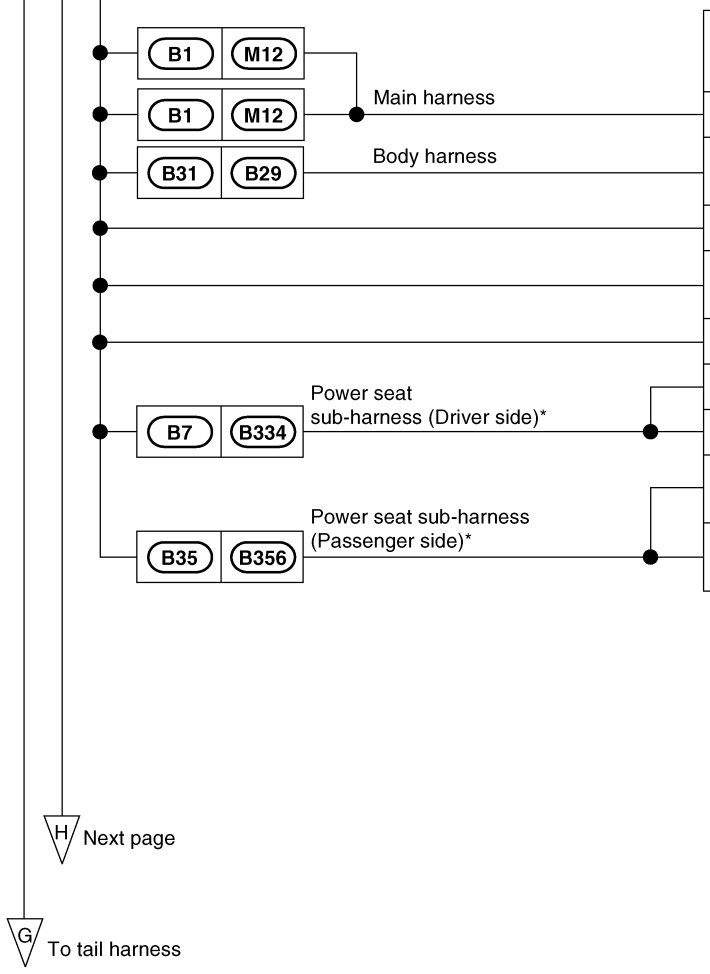
* : This sub-harness is not shown in "HARNESS LAYOUT".

CONNECTOR NUMBER	CONNECT TO
B32	Woofer amp.
B36	Power socket (Luggage floor finisher lower)

CKIT0856E

Roadster Models

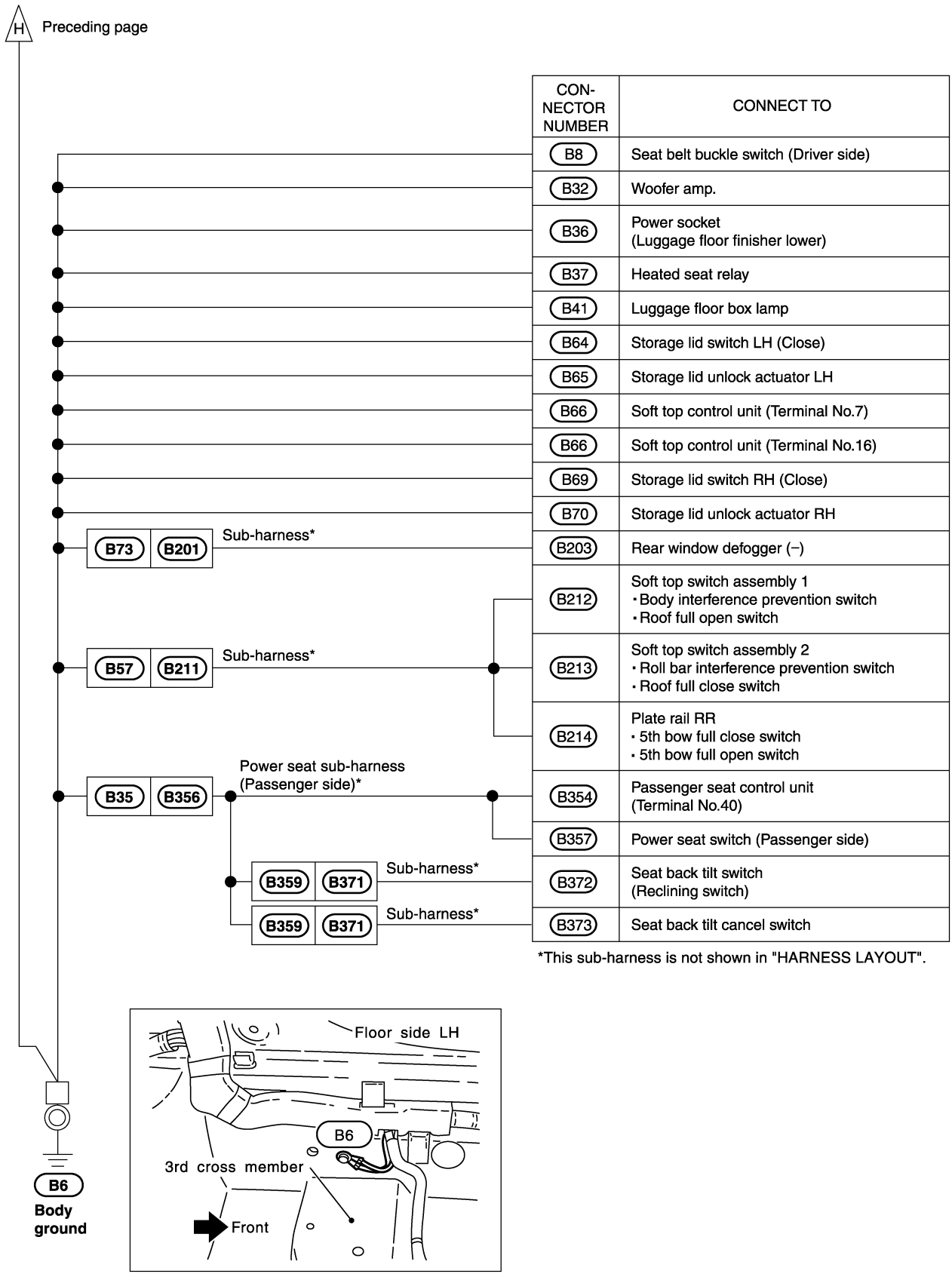




CON-NECTOR NUMBER	CONNECT TO
M62	Blower motor (With navigation system)
B11	Seat belt buckle switch (Passenger side)
B26	Condenser
B27	Fuel level sensor unit and fuel pump (Fuel pump)
B85	Occupant classification system control unit
B326	Power seat switch (Driver side)
B332	Seat cushion heater (Driver side)
B351	Seat cushion heater (Passenger side)
B354	Passenger seat control unit (Terminal No.48)

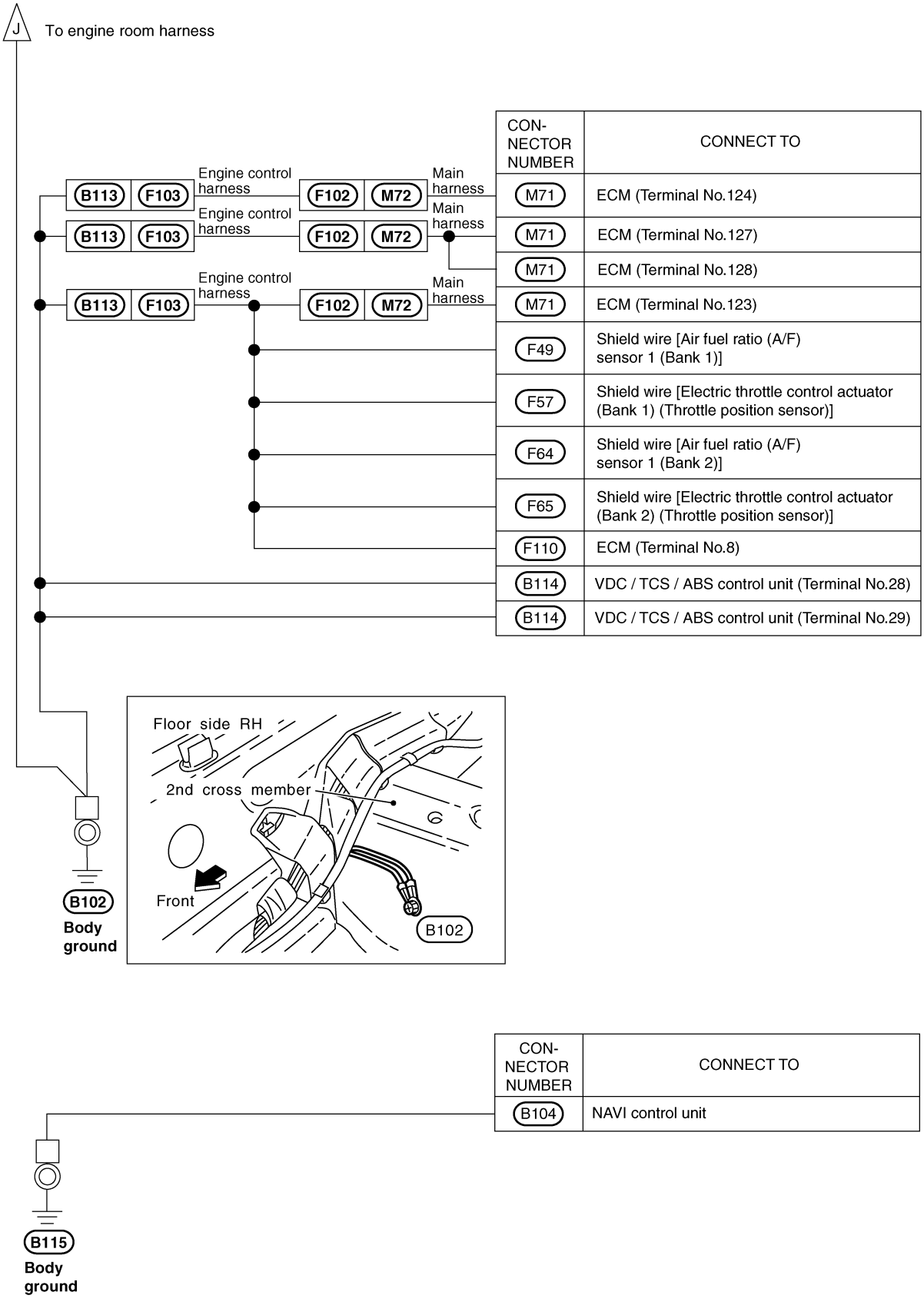
* : This sub-harness is not shown in "HARNESS LAYOUT".

CKIT0857E


H
Preceding page
CON-NECTOR NUMBER
CONNECT TO
B8
Seat belt buckle switch (Driver side)
B32
Woofer amp.
B36
Power socket (Luggage floor finisher lower)
B37
Heated seat relay
B41
Luggage floor box lamp
B64
Storage lid switch LH (Close)
B65
Storage lid unlock actuator LH
B66
Soft top control unit (Terminal No.7)
B66
Soft top control unit (Terminal No.16)
B69
Storage lid switch RH (Close)
B70
Storage lid unlock actuator RH
B73
B201
Sub-harness*
B203
Rear window defogger (−)
B212
Soft top switch assembly 1
• Body interference prevention switch
• Roof full open switch
B57
B211
Sub-harness*
B213
Soft top switch assembly 2
• Roll bar interference prevention switch
• Roof full close switch
B214
Plate rail RR
• 5th bow full close switch
• 5th bow full open switch
B35
B356
Power seat sub-harness (Passenger side)*
B354
Passenger seat control unit (Terminal No.40)
B357
Power seat switch (Passenger side)
B359
B371
Sub-harness*
B372
Seat back tilt switch (Reclining switch)
B359
B371
Sub-harness*
B373
Seat back tilt cancel switch
*This sub-harness is not shown in "HARNESS LAYOUT".
B6
Body ground
Floor side LH
B6
3rd cross member
Front

CKIT0735E

BODY NO. 2 HARNESS

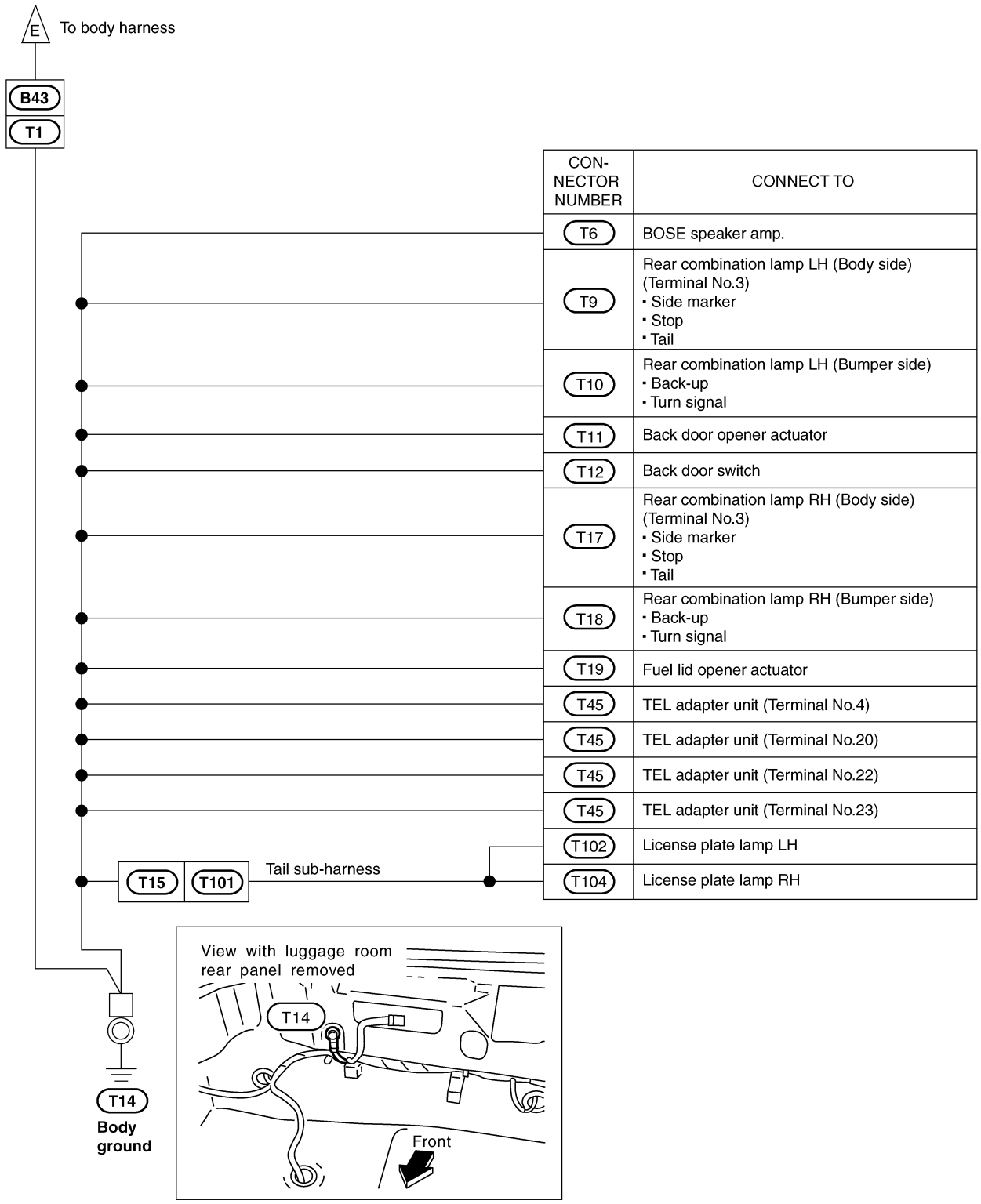


CON-NECTOR NUMBER	CONNECT TO
M71	ECM (Terminal No.124)
M71	ECM (Terminal No.127)
M71	ECM (Terminal No.128)
M71	ECM (Terminal No.123)
F49	Shield wire [Air fuel ratio (A/F) sensor 1 (Bank 1)]
F57	Shield wire [Electric throttle control actuator (Bank 1) (Throttle position sensor)]
F64	Shield wire [Air fuel ratio (A/F) sensor 1 (Bank 2)]
F65	Shield wire [Electric throttle control actuator (Bank 2) (Throttle position sensor)]
F110	ECM (Terminal No.8)
B114	VDC / TCS / ABS control unit (Terminal No.28)
B114	VDC / TCS / ABS control unit (Terminal No.29)

CON-NECTOR NUMBER	CONNECT TO
B104	NAVI control unit

CKIT0872E

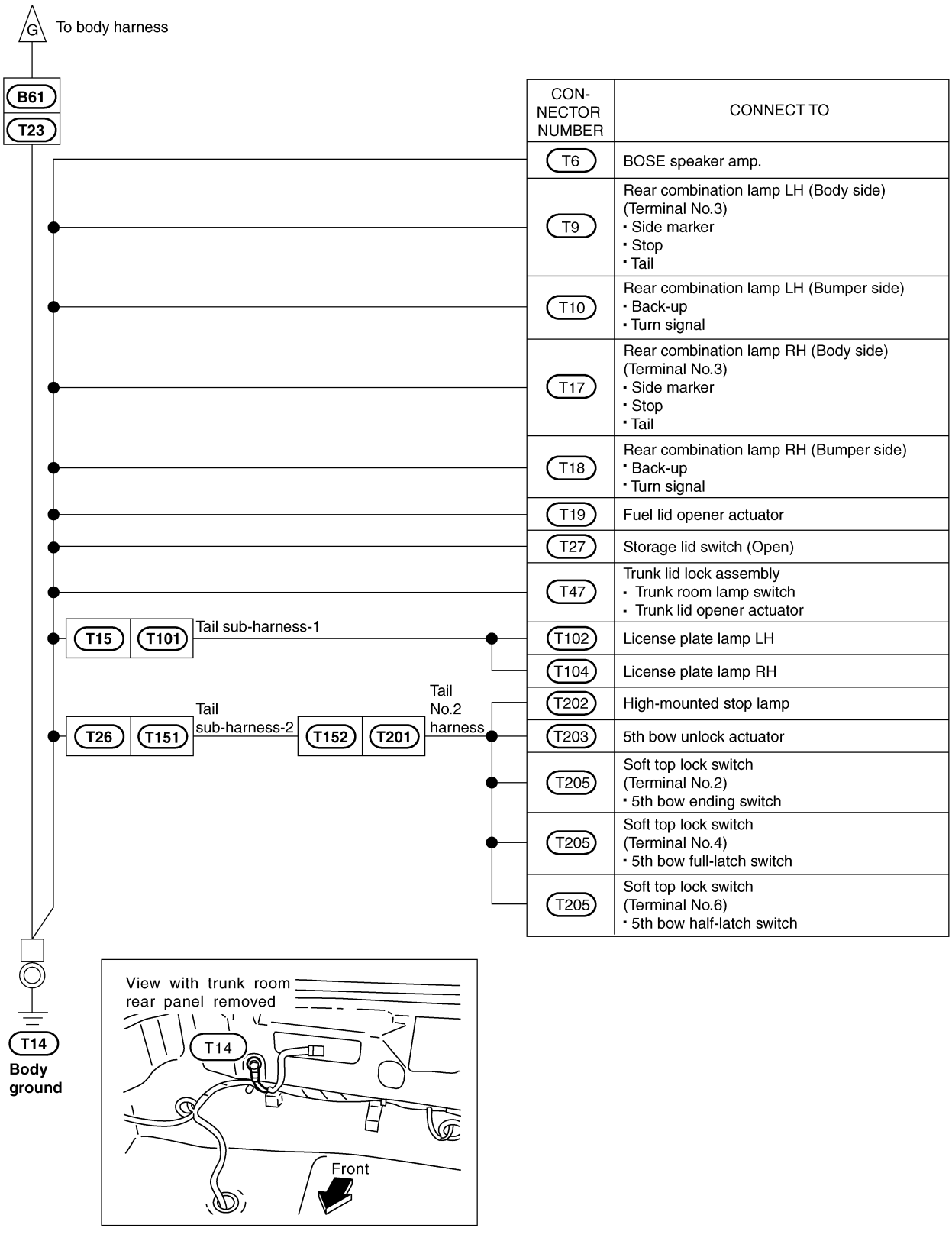
TAIL HARNESS
Coupe Models



CON-NECTOR NUMBER	CONNECT TO
T6	BOSE speaker amp.
T9	Rear combination lamp LH (Body side) (Terminal No.3) ▪ Side marker ▪ Stop ▪ Tail
T10	Rear combination lamp LH (Bumper side) ▪ Back-up ▪ Turn signal
T11	Back door opener actuator
T12	Back door switch
T17	Rear combination lamp RH (Body side) (Terminal No.3) ▪ Side marker ▪ Stop ▪ Tail
T18	Rear combination lamp RH (Bumper side) ▪ Back-up ▪ Turn signal
T19	Fuel lid opener actuator
T45	TEL adapter unit (Terminal No.4)
T45	TEL adapter unit (Terminal No.20)
T45	TEL adapter unit (Terminal No.22)
T45	TEL adapter unit (Terminal No.23)
T102	License plate lamp LH
T104	License plate lamp RH

CKIT0873E

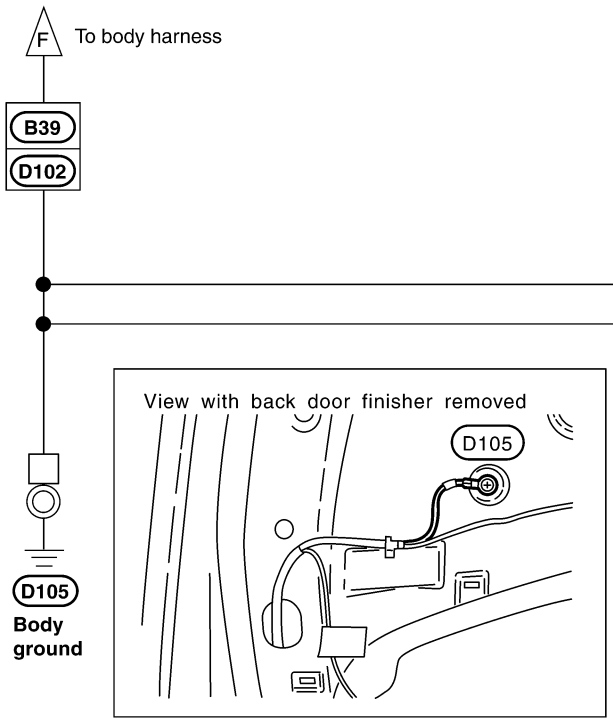
Roadster Models



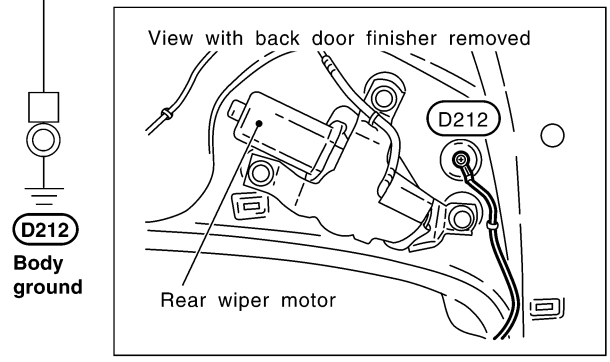
CONNECTOR NUMBER	CONNECT TO
T6	BOSE speaker amp.
T9	Rear combination lamp LH (Body side) (Terminal No.3) ▪ Side marker ▪ Stop ▪ Tail
T10	Rear combination lamp LH (Bumper side) ▪ Back-up ▪ Turn signal
T17	Rear combination lamp RH (Body side) (Terminal No.3) ▪ Side marker ▪ Stop ▪ Tail
T18	Rear combination lamp RH (Bumper side) ▪ Back-up ▪ Turn signal
T19	Fuel lid opener actuator
T27	Storage lid switch (Open)
T47	Trunk lid lock assembly ▪ Trunk room lamp switch ▪ Trunk lid opener actuator
T102	License plate lamp LH
T104	License plate lamp RH
T202	High-mounted stop lamp
T203	5th bow unlock actuator
T205	Soft top lock switch (Terminal No.2) ▪ 5th bow ending switch
T205	Soft top lock switch (Terminal No.4) ▪ 5th bow full-latch switch
T205	Soft top lock switch (Terminal No.6) ▪ 5th bow half-latch switch

CKIT0859E

BACK DOOR HARNESS



CON-NECTOR NUMBER	CONNECT TO
D103	High-mounted stop lamp
D106	Rear wiper motor



CON-NECTOR NUMBER	CONNECT TO
D211	Rear window defogger (-)

CKIT0464E

HARNESS

PFP:00011

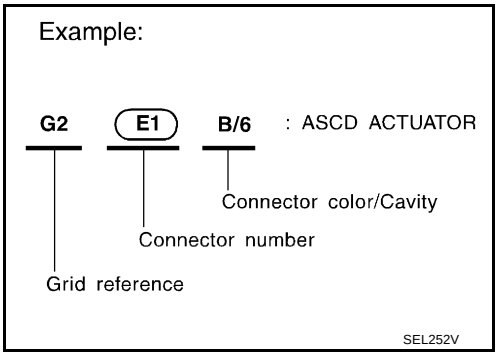
Harness Layout

NKS000EG

HOW TO READ HARNESS LAYOUT

The following Harness Layouts use a map style grid to help locate connectors on the figures:

- Main Harness
- Engine Room Harness (Engine Compartment)
- Engine Control Harness (Engine Compartment)
- Body Harness



To Use the Grid Reference

1. Find the desired connector number on the connector list.
2. Find the grid reference.
3. On the figure, find the crossing of the grid reference letter column and number row.
4. Find the connector number in the crossing zone.
5. Follow the line (if used) to the connector.

CONNECTOR SYMBOL

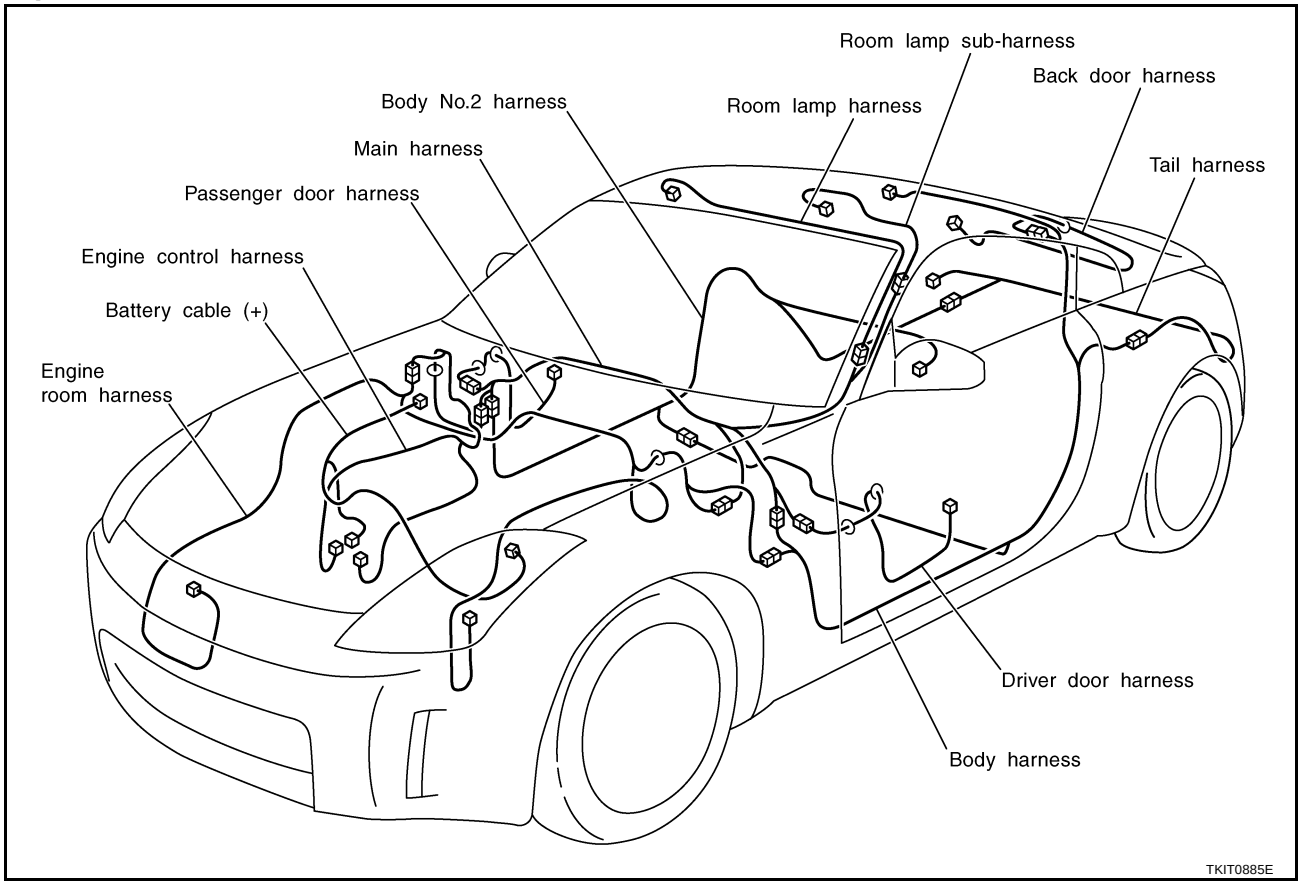
Main symbols of connector (in Harness Layout) are indicated in the below.

Connector type	Water proof type		Standard type	
	Male	Female	Male	Female
• Cavity: Less than 4 • Relay connector				
• Cavity: From 5 to 8				
• Cavity: More than 9				
• Ground terminal etc.	—			

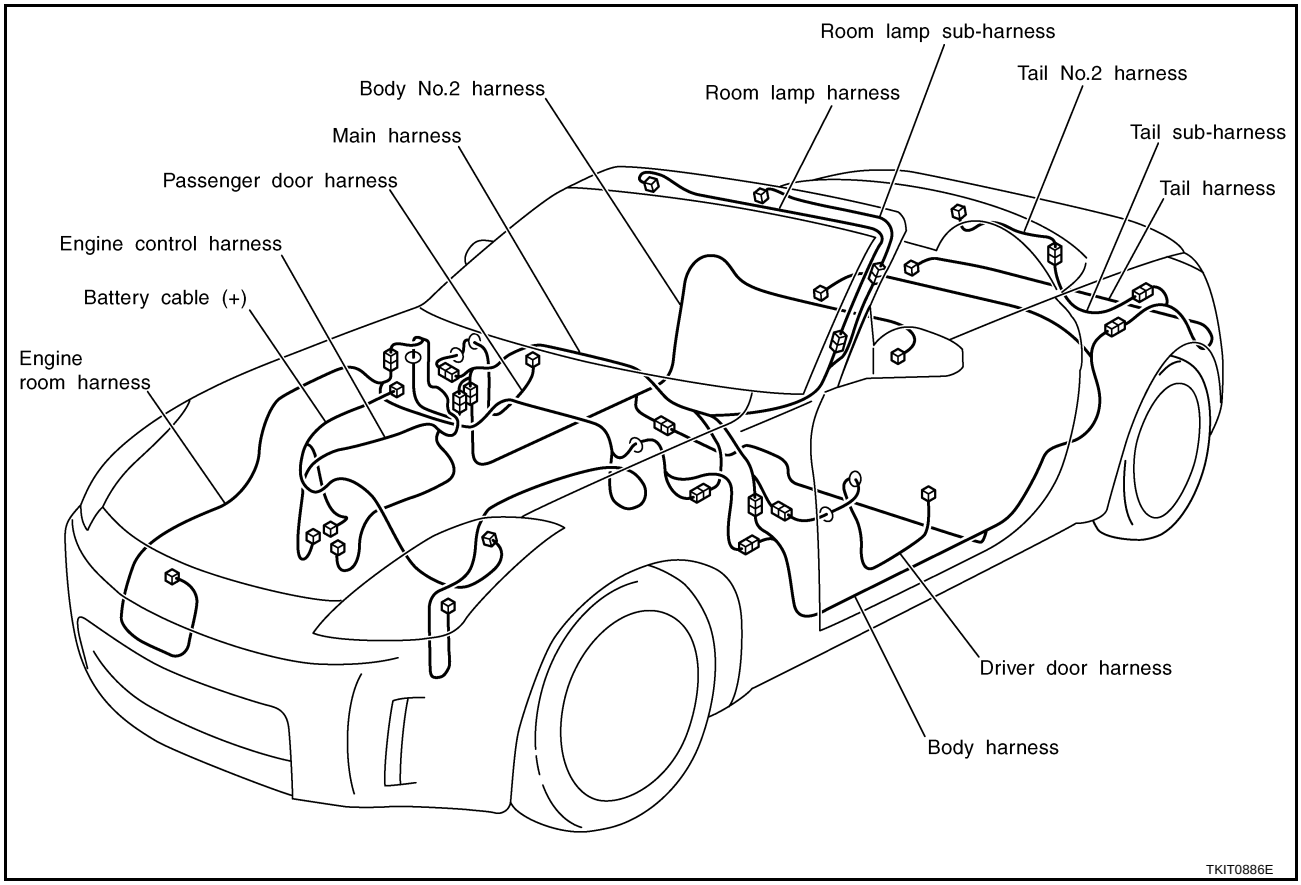
CKIT0108E

OUTLINE

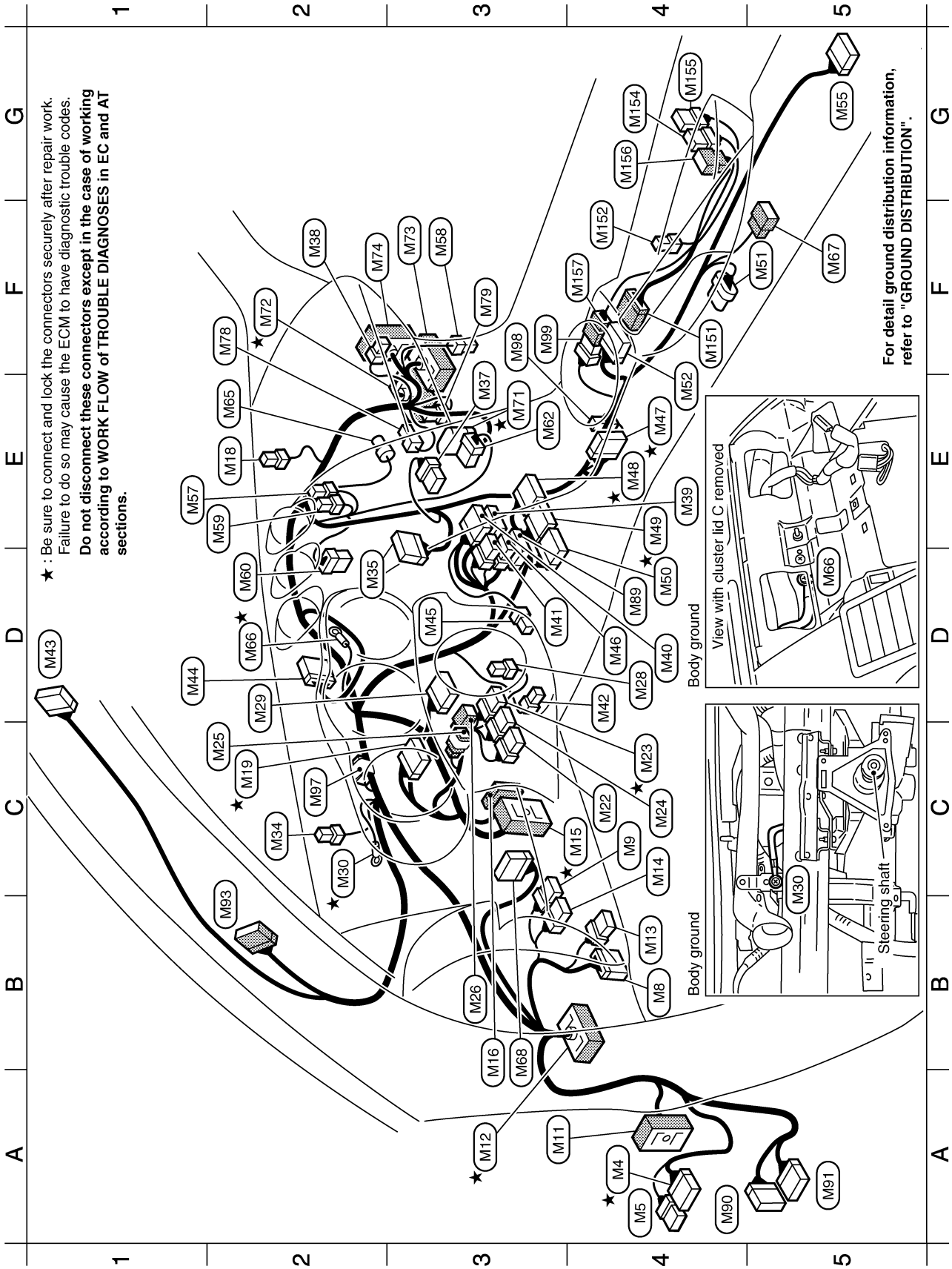
Coupe Models



Roadster Models



MAIN HARNESS



TKIT0887E

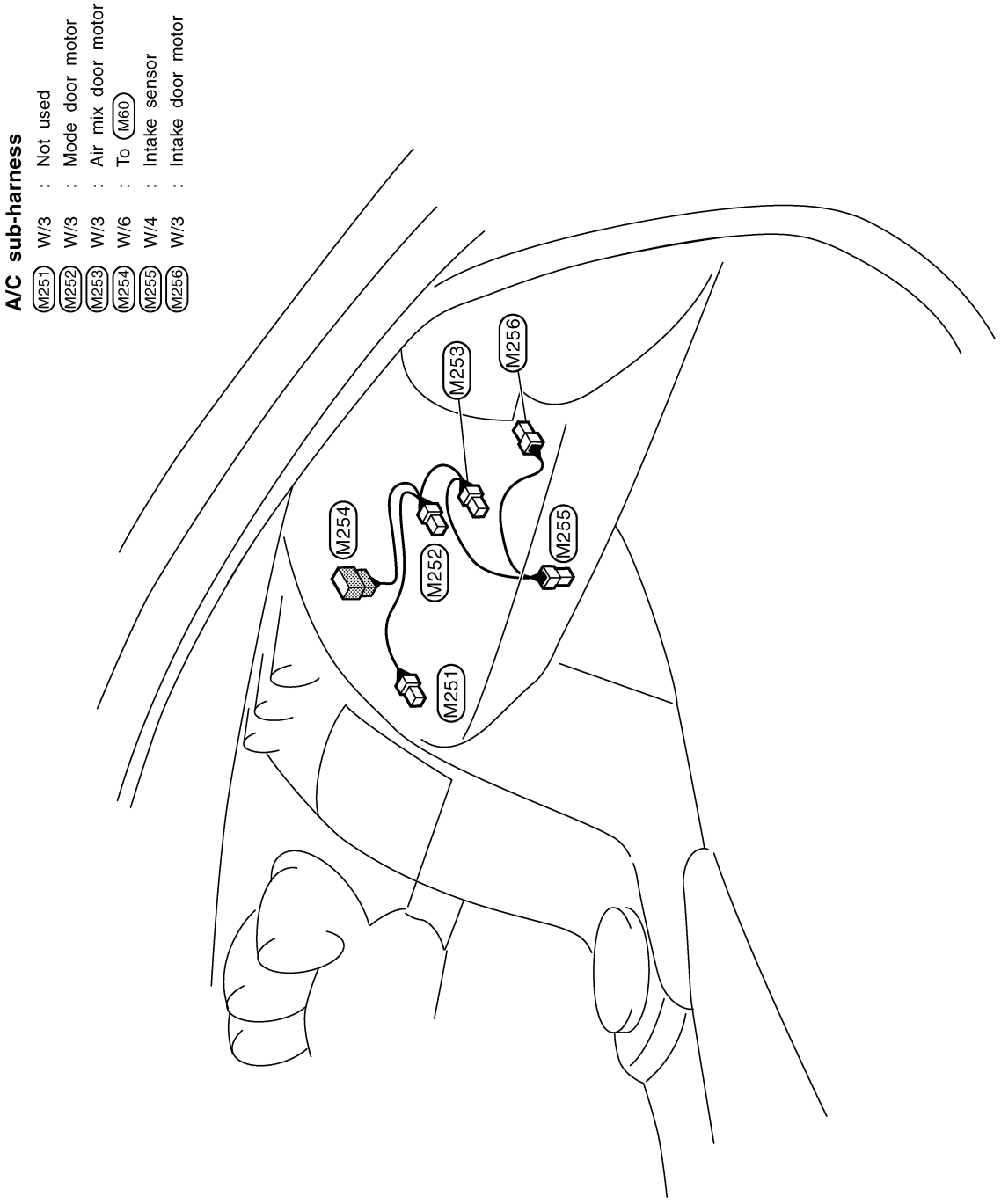
A4 ★	M4	W/16	:	Fuse block (J/B)
A4	M5	W/8	:	Fuse block (J/B)
B4	M8	W/16	:	Data link connector
C4	M9	GY/6	:	VDC off switch (With VDC system)
		GY/6	:	TCS off switch (Without VDC system)
A3	M11	SMJ	:	To D1
A3 ★	M12	SMJ	:	To B1
B4	M13	GY/6	:	Fuel lid opener switch
C4	M14	W/6	:	Soft top switch (For Roadster models)
C4 ★	M15	SMJ	:	To E108
B3	M16	W/16	:	To E109 (With VDC system)
E2	M18	B/2	:	Sunload sensor
C2 ★	M19	W/24	:	Combination meter
C4	M22	W/8	:	Steering angle sensor (With VDC system)
C4 ★	M23	GY/8	:	Combination switch (Spiral cable)
C4	M24	Y/6	:	Combination switch (Spiral cable)
C2	M25	BR/2	:	Key switch
B3	M26	W/2	:	Ignition Keyhole illumination
D4	M28	W/4	:	NATS antenna amp.
D2	M29	W/16	:	Combination switch
C2 ★	M30	—	:	Body ground
C2	M34	BR/2	:	Security indicator lamp
D2	M35	GY/24	:	Display unit (With navigation system)
E3	M37	W/8	:	NAVI switch (With navigation system)
F2	M38	B/2	:	Power socket
E4	M39	W/16	:	Audio unit [With A/T or with M/T (With VDC system, BOSE system or navigation system)]
D4	M40	W/10	:	Audio unit
D3	M41	W/6	:	Audio unit
D4	M42	W/2	:	In-vehicle sensor
D1	M43	W/12	:	To R57
D1	M44	W/12	:	Triple meter
D3	M45	BR/2	:	Antenna amp. (Via sub-harness)
D4	M46	BR/8	:	Audio unit (With navigation system or without telephone)
E4 ★	M47	W/10	:	A/T device (For A/T)
E4 ★	M48	GY/20	:	Unified meter and A/C amp.
E4 ★	M49	GY/16	:	Unified meter and A/C amp.
D4	M50	W/24	:	Unified meter and A/C amp.
F5	M51	B/6	:	Yaw rate / side G sensor (With VDC system)
E4	M52	W/12	:	To M151
G5	M55	Y/28	:	Air bag diagnosis sensor unit
E1	M57	L/4	:	Back-up lamp relay (For A/T)
F3	M58	W/4	:	To B112 (With VDC system)
E2	M59	L/4	:	Fuel lid opener relay (For Coupe models)
D2	M60	W/6	:	To M254
E3	M62	W/6	:	Blower motor
E2	M65	Y/4	:	Front passenger air bag module
D2 ★	M66	—	:	Body ground
F5	M67	W/8	:	To B86 (With navigation system)
B3	M68	W/12	:	Power steering control unit
E3 ★	M71	GY/32	:	ECM
F2 ★	M72	SMJ	:	To F102
F3	M73	SMJ	:	To B101 (With navigation system, VDC system or telephone)
F2	M74	SMJ	:	To D31
F2	M78	W/4	:	Remote keyless entry receiver
F3	M79	W/2	:	Tire pressure warning check connector
D4	M89	W/12	:	Audio unit (With BOSE system)
A4	M90	W/40	:	BCM (Body control module)
A5	M91	B/15	:	BCM (Body control module)
B2	M93	W/12	:	To R2
C2	M97	—/2	:	Resistor
F3	M98	W/4	:	Hazard switch
F3	M99	W/8	:	To M157 (For heated seat)

Switch sub-harness

F4	M151	W/12	:	To M52
F3	M152	W/2	:	Cup holder illumination
G4	M154	W/6	:	Heated seat switch (Driver side) (With heated seat)
G4	M155	BR/6	:	Heated seat switch (Passenger side) (With heated seat)
G4	M156	W/6	:	Not used
F4	M157	W/8	:	To M99 (For heated seat)

★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

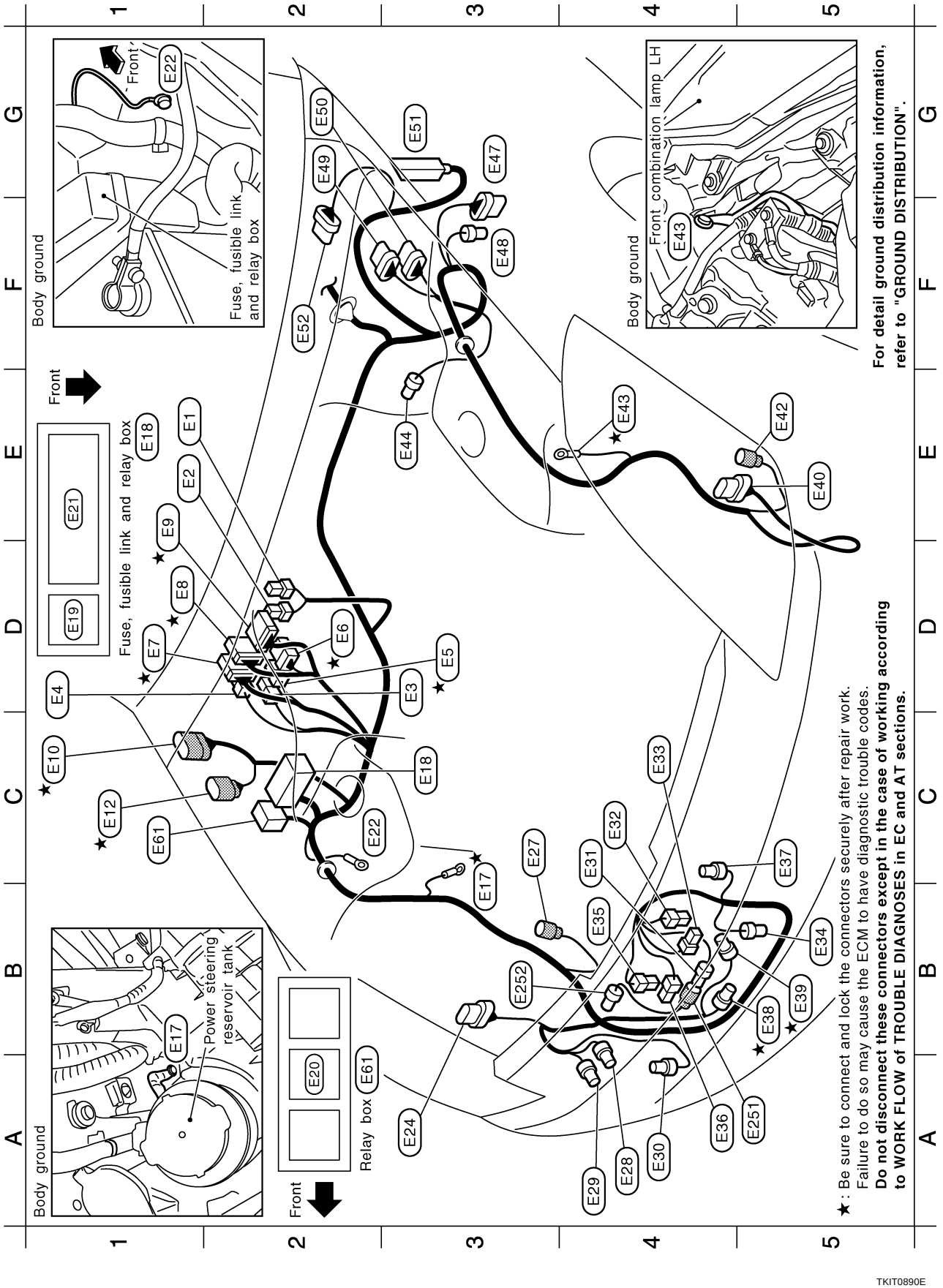
TKIT0888E


A/C sub-harness
M251 W/3 : Not used
M252 W/3 : Mode door motor
M253 W/3 : Air mix door motor
M254 W/6 : To M60
M255 W/4 : Intake sensor
M256 W/3 : Intake door motor
M253
M256
M254
M252
M255
M251

TKIT0889E

ENGINE ROOM HARNESS

Engine Compartment



TKIT0890E

E1	E1	B/2	:	Fusible link holder
E1	E2	GY/2	:	Fusible link holder
D3	E3	B/2	:	IPDM E/R (Intelligent power distribution module engine room)
D1	E4	W/4	:	IPDM E/R (Intelligent power distribution module engine room)
D3 ★	E5	B/4	:	IPDM E/R (Intelligent power distribution module engine room)
D2 ★	E6	W/6	:	IPDM E/R (Intelligent power distribution module engine room)
D1 ★	E7	GY/16	:	IPDM E/R (Intelligent power distribution module engine room)
D1 ★	E8	W/12	:	IPDM E/R (Intelligent power distribution module engine room)
E1 ★	E9	W/16	:	IPDM E/R (Intelligent power distribution module engine room)
C1 ★	E10	GY/9	:	To F1
C1 ★	E12	B/8	:	To F3
B3 ★	E17	—	:	Body ground
C3	E18	—	:	Fuse,fusible link and relay box
D1	E19	L/4	:	Shift lock relay (With A/T)
A2	E20	L/4	:	Daytime light relay (For Canada)
E1	E21	—	:	Fuse and fusible link block
C2	E22	—	:	Body ground
A3	E24	GY/8	:	Front combination lamp RH
C3	E27	GY/2	:	Front wheel sensor RH
A4	E28	GY/2	:	Rear washer pump
A4	E29	GY/2	:	Front washer pump
A4	E30	BR/2	:	Washer level sensor
C4	E31	B/3	:	To E251
C4	E32	B/1	:	Horn (Low)
C4	E33	B/1	:	Horn (Low)
B5	E34	B/2	:	Ambient sensor
B4	E35	B/1	:	Horn (High)
A4	E36	B/1	:	Horn (High)
C5	E37	Y/2	:	Crash zone sensor
B5 ★	E38	GY/4	:	Cooling fan motor-1 (Via sub-harness)
B5 ★	E39	GY/4	:	Cooling fan motor-2 (Via sub-harness)
E5	E40	GY/8	:	Front combination lamp LH
E5	E42	B/2	:	Front wheel sensor LH
E4 ★	E43	—	:	Body ground
E3	E44	GY/2	:	Brake fluid level switch
G3	E47	B/8	:	VDC relay box (With VDC system)
F3	E48	B/2	:	VDC relay box (With VDC system)
G2	E49	GY/8	:	VDC actuator (With VDC system)
G2	E50	B/8	:	VDC actuator (With VDC system)
G3	E51	SMJ	:	ABS actuator and electric unit (Without VDC system)
F2	E52	GY/5	:	Front wiper motor
C1	E61	—	:	Relay box (For Canada)

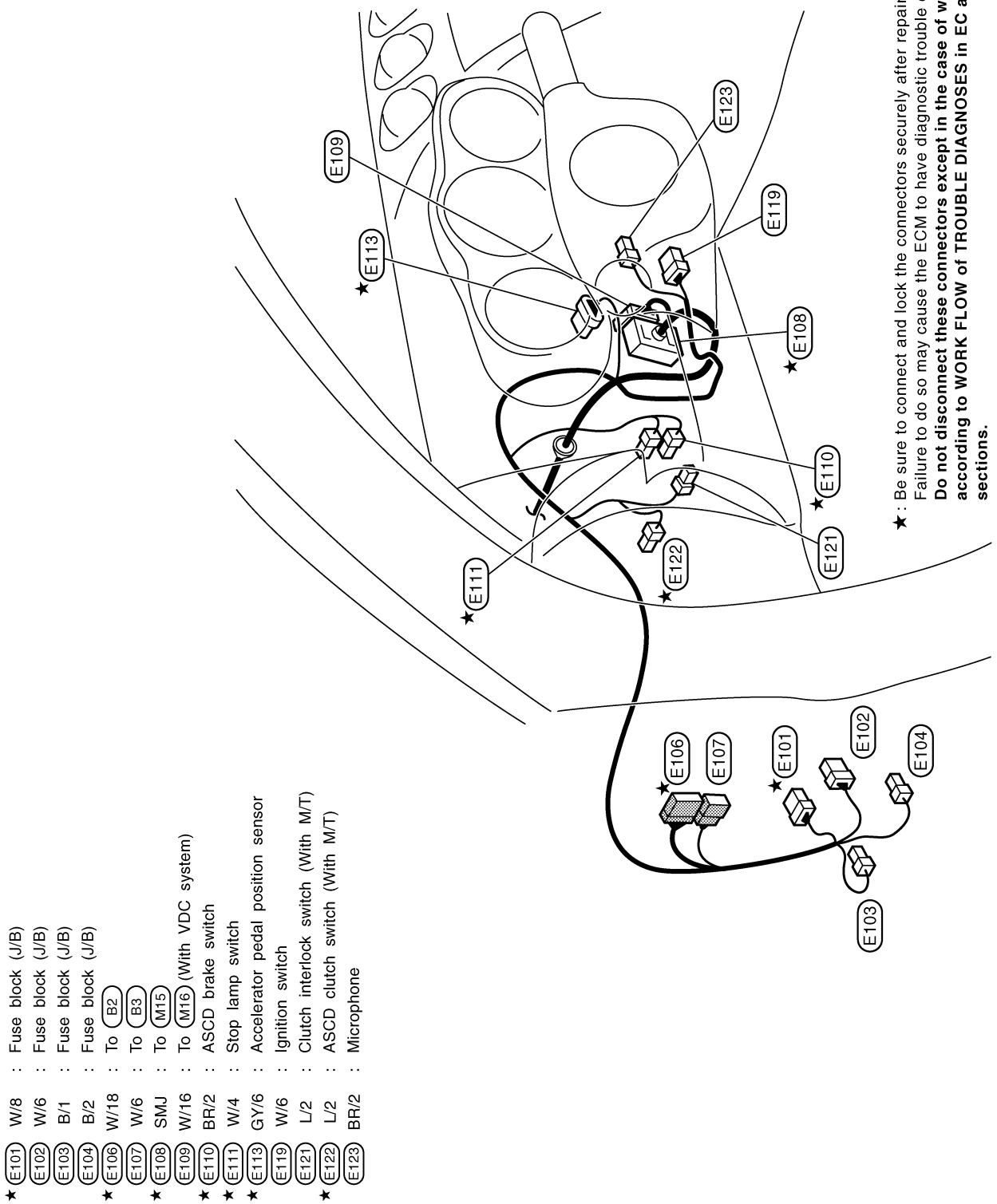
Sub-harness

A5	E251	B/3	:	To E31
B3	E252	B/3	:	Refrigerant pressure sensor

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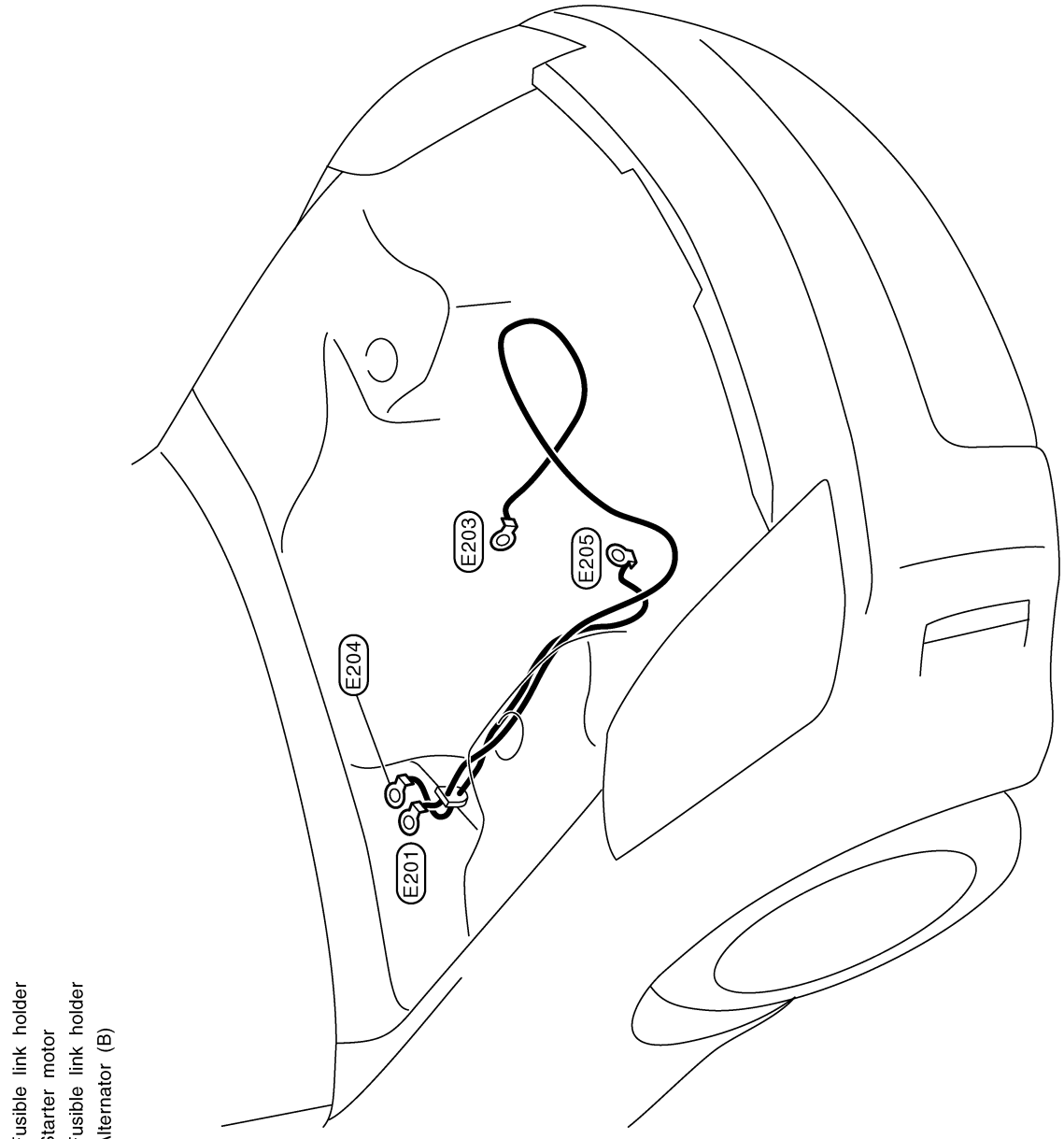
TKIT0891E

Passenger Compartment



TKIT0899E

Battery Cable

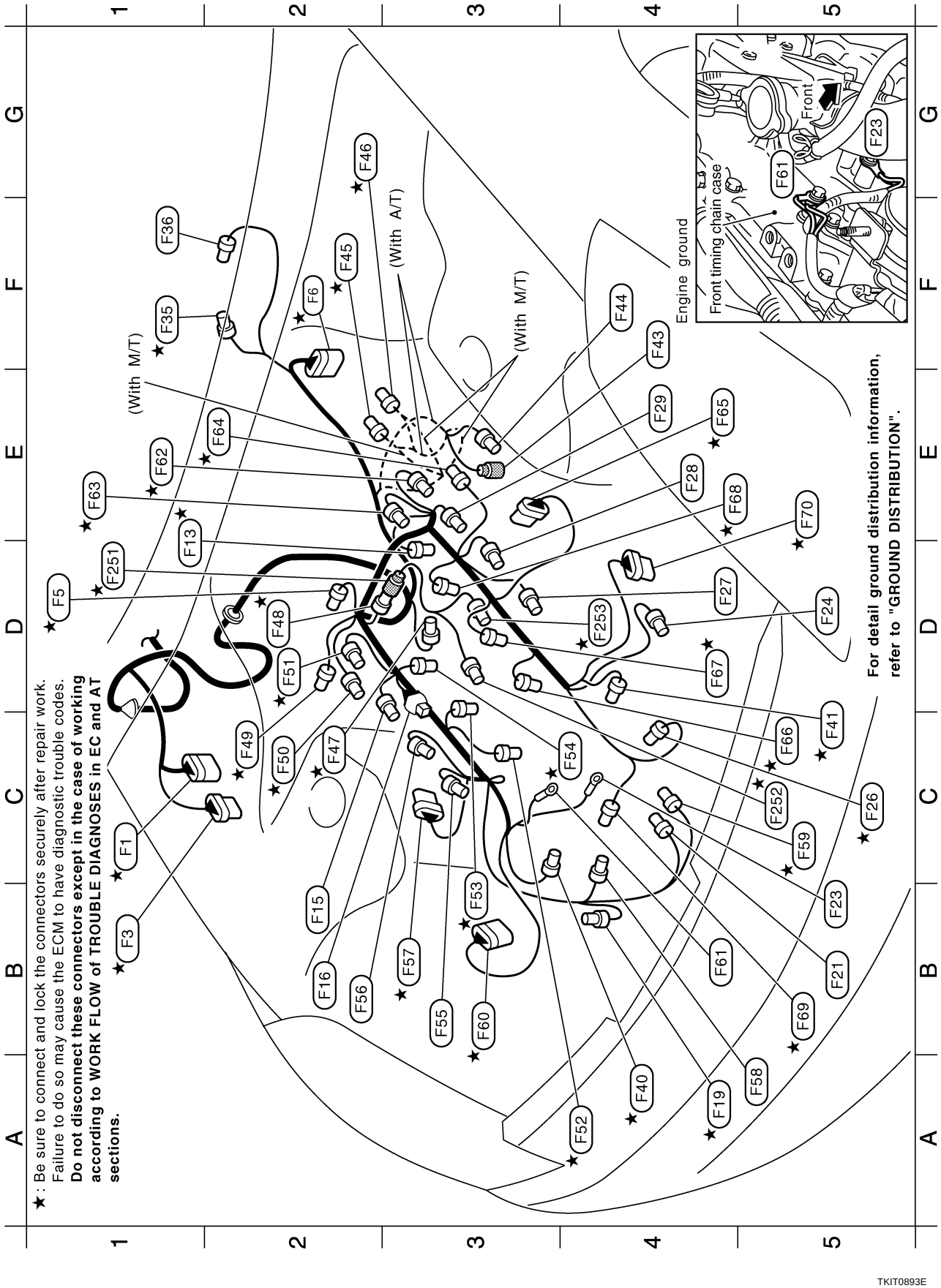


E201 : Fusible link holder
E203 : Starter motor
E204 : Fusible link holder
E205 : Alternator (B)

TKIT0892E

ENGINE CONTROL HARNESS

Engine Compartment



TKIT0893E

C1 ★ F1 GY/9 : To E10
B1 ★ F3 B/8 : To E12
D1 ★ F5 GY/2 : EVAP canister purge volume control solenoid valve
F2 ★ F6 GY/10 : A/T assembly (With A/T)
D1 ★ F13 GY/2 : Engine coolant temperature sensor
B2 F15 GY/3 : Ignition coil No.5 (With power transistor)
B2 F16 W/2 : Condenser
A4 ★ F19 B/3 : Power steering pressure sensor
B5 F21 B/3 : Oil pressure sensor
B5 F23 — : Engine ground
D5 F24 B/1 : Compressor
C5 ★ F26 GY/2 : Intake valve timing control solenoid valve (Bank 2)
D4 F27 GY/3 : Ignition coil No.2 (With power transistor)
E4 F28 GY/3 : Ignition coil No.4 (With power transistor)
E4 F29 GY/3 : Ignition coil No.6 (With power transistor)
F1 ★ F35 B/2 : Park/Neutral position switch (With M/T)
F1 F36 B/2 : Back-up lamp switch (With M/T)
A4 ★ F40 B/4 : Exhaust valve timing control magnet retarder (Bank 1)
C5 ★ F41 B/4 : Exhaust valve timing control magnet retarder (Bank 2)
F4 F43 GY/2 : Power steering solenoid valve
F4 F44 GY/1 : Starter motor
F2 ★ F45 B/4 : Heated oxygen sensor 2 (Bank 1)
G2 ★ F46 B/4 : Heated oxygen sensor 2 (Bank 2)
C2 ★ F47 B/3 : Crankshaft position sensor (POS)
D2 ★ F48 B/4 : To F251
C2 ★ F49 GY/4 : Air fuel ratio (A/F) sensor 1 (Bank 1)
C2 ★ F50 B/3 : Exhaust valve timing control position sensor (Bank 1)
D2 ★ F51 B/3 : Camshaft position sensor (PHASE) (Bank 1)
A4 ★ F52 GY/2 : Fuel injector No.1
B3 ★ F53 GY/2 : Fuel injector No.3
C4 ★ F54 GY/2 : Fuel injector No.5
B3 F55 GY/3 : Ignition coil No.1 (With power transistor)
B2 F56 GY/3 : Ignition coil No.3 (With power transistor)
B3 ★ F57 B/6 : Electric throttle control actuator (Bank 1)
A5 F58 B/3 : Alternator (S, L)
C5 ★ F59 GY/2 : Engine oil temperature sensor
B3 ★ F60 B/6 : Mass air flow sensor (Bank 1)
B4 F61 — : Engine ground
E1 ★ F62 B/3 : Exhaust valve timing control position sensor (Bank 2)
E1 ★ F63 B/3 : Camshaft position sensor (PHASE) (Bank 2)

TKIT0894E

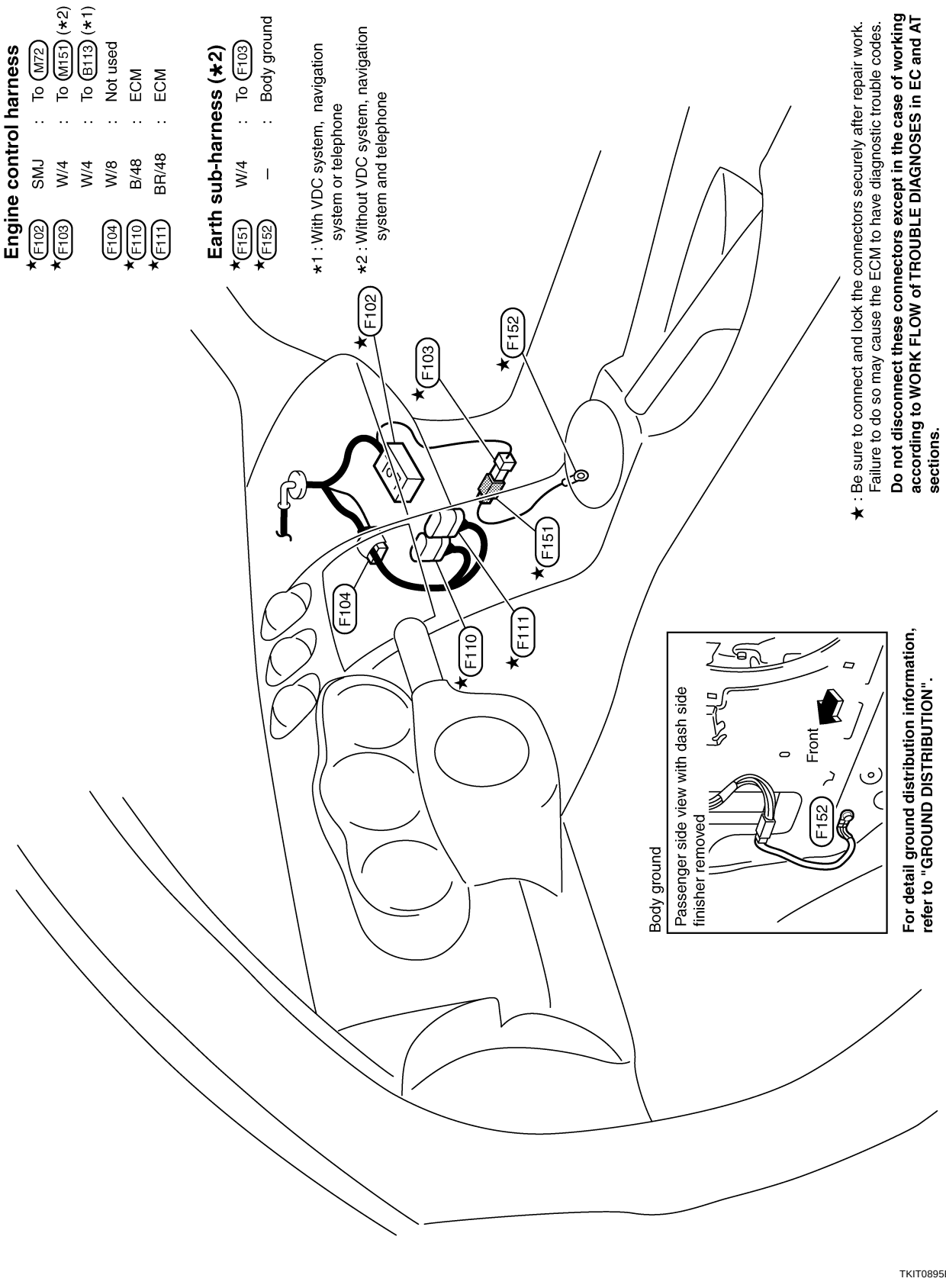
E2 ★ F64 GY/4 : Air fuel ratio (A/F) sensor 1 (Bank 2)
E4 ★ F65 B/6 : Electric throttle control actuator (Bank 2)
C5 ★ F66 GY/2 : Fuel injector No.2
D4 ★ F67 GY/2 : Fuel injector No.4
E4 ★ F68 GY/2 : Fuel injector No.6
B5 ★ F69 GY/2 : Intake valve timing control solenoid valve (Bank 1)
E5 ★ F70 B/6 : Mass air flow sensor (Bank 2)

Engine control sub-harness

D1 ★ F251 B/4 : To F48
C5 ★ F252 —/2 : Knock sensor (Bank 1)
D4 ★ F253 —/2 : Knock sensor (Bank 2)

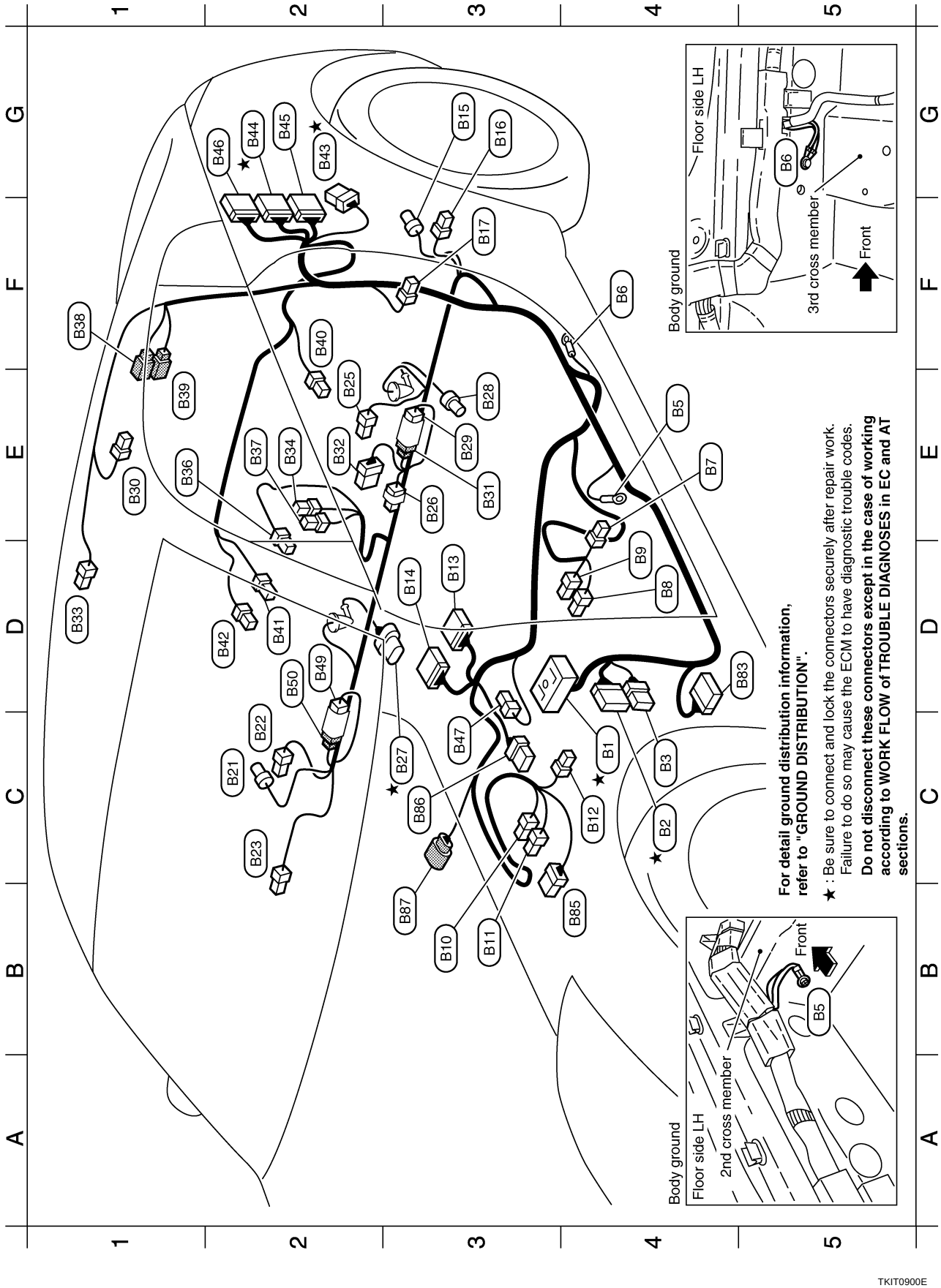
★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

Passenger Compartment



TKIT0895E

BODY HARNESS
Coupe Models



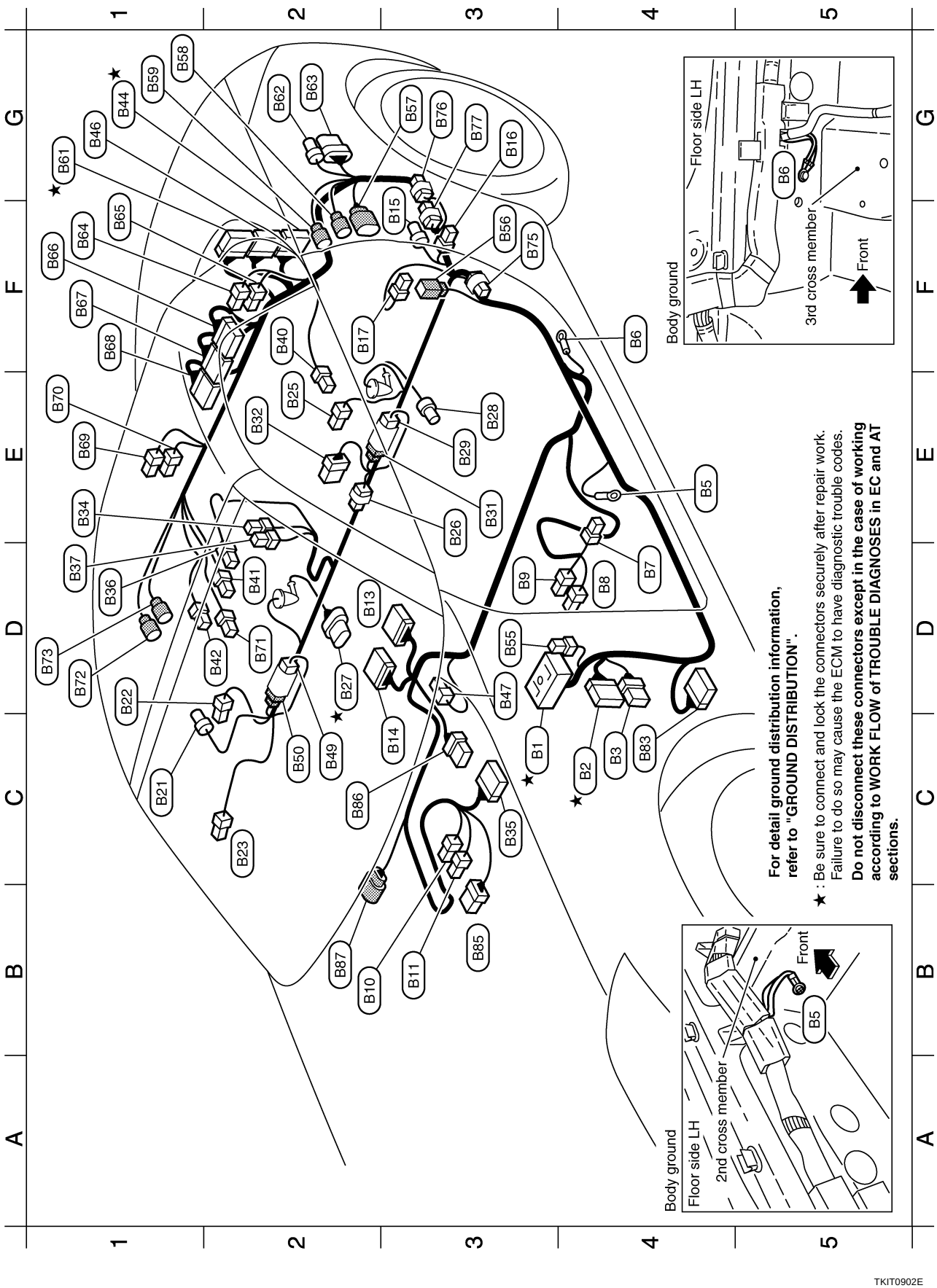
TKIT0900E

C4	★B1	SMJ	:	To M12
C4	★B2	W/18	:	To E106
C4	B3	W/6	:	To E107
E4	B5	—	:	Body ground
F4	B6	—	:	Body ground
E4	B7	W/4	:	Driver side seat (With heated seat or side air bag)
D4	B8	W/3	:	Seat belt buckle switch (Driver side)
D4	B9	Y/2	:	LH side air bag module (With side air bag)
B3	B10	Y/2	:	RH side air bag module (With side air bag)
B3	B11	W/3	:	Seat belt buckle switch (Passenger side)
C4	B12	W/4	:	Passenger side seat (With heated seat or side air bag)
D3	B13	Y/12	:	Air bag diagnosis sensor unit
D3	B14	Y/12	:	Air bag diagnosis sensor unit
G3	B15	Y/2	:	LH side air bag (satellite) sensor (With side air bag)
G3	B16	Y/2	:	Seat belt pre-tensioner LH
F3	B17	W/3	:	Driver side door switch
C2	B21	Y/2	:	RH side air bag (satellite) sensor (With side air bag)
C2	B22	Y/2	:	Seat belt pre-tensioner RH
C2	B23	W/3	:	Passenger side door switch
E2	B25	W/2	:	Woofer (With BOSE system)
E3	B26	W/2	:	Condenser
C3	★B27	GY/5	:	Fuel level sensor unit and fuel pump
E3	B28	GY/2	:	Fuel level sensor unit (Sub)
E3	B29	W/2	:	To B31
E1	B30	Y/2	:	LH side curtain air bag module (With side air bag)
E3	B31	W/2	:	To B29
E2	B32	BR/8	:	Woofer amp. (With BOSE system)
D1	B33	Y/2	:	RH side curtain air bag module (With side air bag)
E2	B34	BR/6	:	Rear window defogger relay
E1	B36	B/2	:	Power socket
E2	B37	L/4	:	Heated seat relay (With heated seat or side air bag)
F1	B38	W/3	:	To D101
E1	B39	GY/2	:	To D102
F2	B40	BR/2	:	Rear speaker LH
D2	B41	W/2	:	Luggage floor box lamp
D2	B42	BR/2	:	Rear speaker RH
G2	★B43	W/6	:	To T1
G2	★B44	W/32	:	To T2
G2	B45	W/10	:	To T3 (With BOSE system)
G2	B46	W/24	:	To T4 (With BOSE system)
C3	B47	B/1	:	Parking brake switch
D2	B49	BR/2	:	To B50
D2	B50	BR/2	:	To B49
D5	B83	W/15	:	BCM (Body control module)
B4	B85	W/8	:	Passenger side seat
C3	B86	W/8	:	To M67
B3	B87	GY/8	:	To B116

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TKIT0901E

Roadster Models

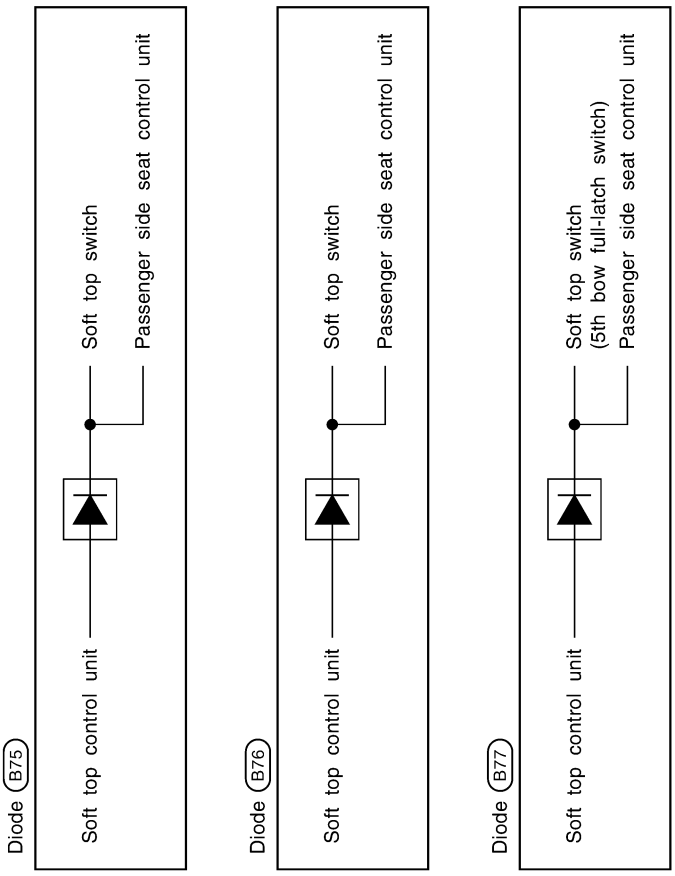


C3	★B1	SMJ	:	To M12
C4	★B2	W/18	:	To E106
C4	B3	W/6	:	To E107
E4	B5	—	:	Body ground
F4	B6	—	:	Body ground
D4	B7	W/4	:	Driver side seat
D4	B8	W/3	:	Seat belt buckle switch (Driver side)
D3	B9	Y/2	:	LH side air bag module (With side air bag)
B2	B10	Y/2	:	RH side air bag module (With side air bag)
B3	B11	W/3	:	Seat belt buckle switch (Passenger side)
D2	B13	Y/12	:	Air bag diagnosis sensor unit
C3	B14	Y/12	:	Air bag diagnosis sensor unit
F3	B15	Y/2	:	LH side air bag (satellite) sensor (With side air bag)
G3	B16	Y/2	:	Seat belt pre-tensioner LH
F2	B17	W/3	:	Driver side door switch
C1	B21	Y/2	:	RH side air bag (satellite) sensor (With side air bag)
D1	B22	Y/2	:	Seat belt pre-tensioner RH
C2	B23	W/3	:	Passenger side door switch
E2	B25	W/2	:	Woofer (With BOSE system)
E3	B26	W/2	:	Condenser
D2	★B27	GY/5	:	Fuel level sensor unit and fuel pump
E3	B28	GY/2	:	Fuel level sensor unit (Sub)
E3	B29	W/2	:	To B31
E3	B31	W/2	:	To B29
E2	B32	BR/8	:	Woofer amp. (With BOSE system)
E1	B34	BR/6	:	Rear window defogger relay
C3	B35	W/18	:	Passenger side seat
D1	B36	B/2	:	Power socket
D1	B37	L/4	:	Heated seat relay (With heated seat or side air bag)
F2	B40	BR/2	:	Rear speaker LH
D2	B41	W/2	:	Luggage floor box lamp
D2	B42	BR/2	:	Rear speaker RH
G1	★B44	W/32	:	To T2
G1	B46	W/24	:	To T4 (With BOSE system)
D3	B47	B/1	:	Parking brake switch
C2	B49	BR/2	:	To B50
C2	B50	BR/2	:	To B49
D3	B55	W/2	:	Circuit breaker
F3	B56	W/2	:	Short connector
G3	B57	GY/8	:	Soft top assembly
G1	B58	B/2	:	Soft top assembly
G1	B59	GY/2	:	Roof actuator LH
G1	★B61	W/16	:	To T23
G2	B62	GY/4	:	To T24 (With BOSE system)
G2	B63	B/6	:	To T25 (With BOSE system)
F1	B64	W/2	:	Storage lid switch LH (Close)
F1	B65	B/2	:	Storage lid unlock actuator LH
F1	B66	W/16	:	Soft top control unit
F1	B67	W/20	:	Soft top control unit
F1	B68	W/12	:	Soft top control unit
E1	B69	W/2	:	Storage lid switch RH (Close)
E1	B70	B/2	:	Storage lid unlock actuator RH
D2	B71	W/2	:	Trunk opener cancel switch
D1	B72	GY/2	:	Roof actuator RH
D1	B73	B/2	:	Rear window defogger (Via sub-harness)
F3	B75	W/2	:	Diode
G3	B76	W/2	:	Diode
G3	B77	W/2	:	Diode
C4	B83	W/15	:	BCM (Body control module)
B3	B85	W/8	:	Passenger side seat
C2	B86	W/8	:	To M67
B2	B87	GY/8	:	To B116

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Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.

TKIT0903E


Diode B75
Soft top control unit
Soft top switch
Passenger side seat control unit
Diode B76
Soft top control unit
Soft top switch
Passenger side seat control unit
Diode B77
Soft top control unit
Soft top switch
(5th bow full-latch switch)
Passenger side seat control unit

TKIT0117E

BODY NO. 2 HARNESS

TAIL HARNESS
Coupe Models

★ (T1) W/6 : To (B43)
★ (T2) W/32 : To (B44)
(T3) W/10 : To (B45) (With BOSE system)
(T4) W/24 : To (B46) (With BOSE system)
(T5) GY/4 : Rear wheel sensor
(T6) GY/8 : BOSE speaker amp. (With BOSE system)
(T7) B/24 : BOSE speaker amp. (With BOSE system)
(T9) GY/3 : Rear combination lamp LH (Body side)
(T10) GY/4 : Rear combination lamp LH (Bumper side)
(T11) W/4 : Back door opener actuator
(T12) W/3 : Back door switch
(T13) GY/2 : Luggage room lamp
(T14) — : Body ground
(T15) GY/4 : To (T101)
(T17) GY/3 : Rear combination lamp RH (Body side)
(T18) GY/4 : Rear combination lamp RH (Bumper side)
(T19) W/4 : Fuel lid opener actuator
★ (T20) B/2 : EVAP canister vent control valve
★ (T21) GY/3 : EVAP control system pressure sensor
(T42) W/16 : Satellite radio tuner (With BOSE system)
(T45) W/32 : TEL adapter unit (with telephone)
(T46) W/24 : To (B111) (With telephone)

Tail sub-harness-1

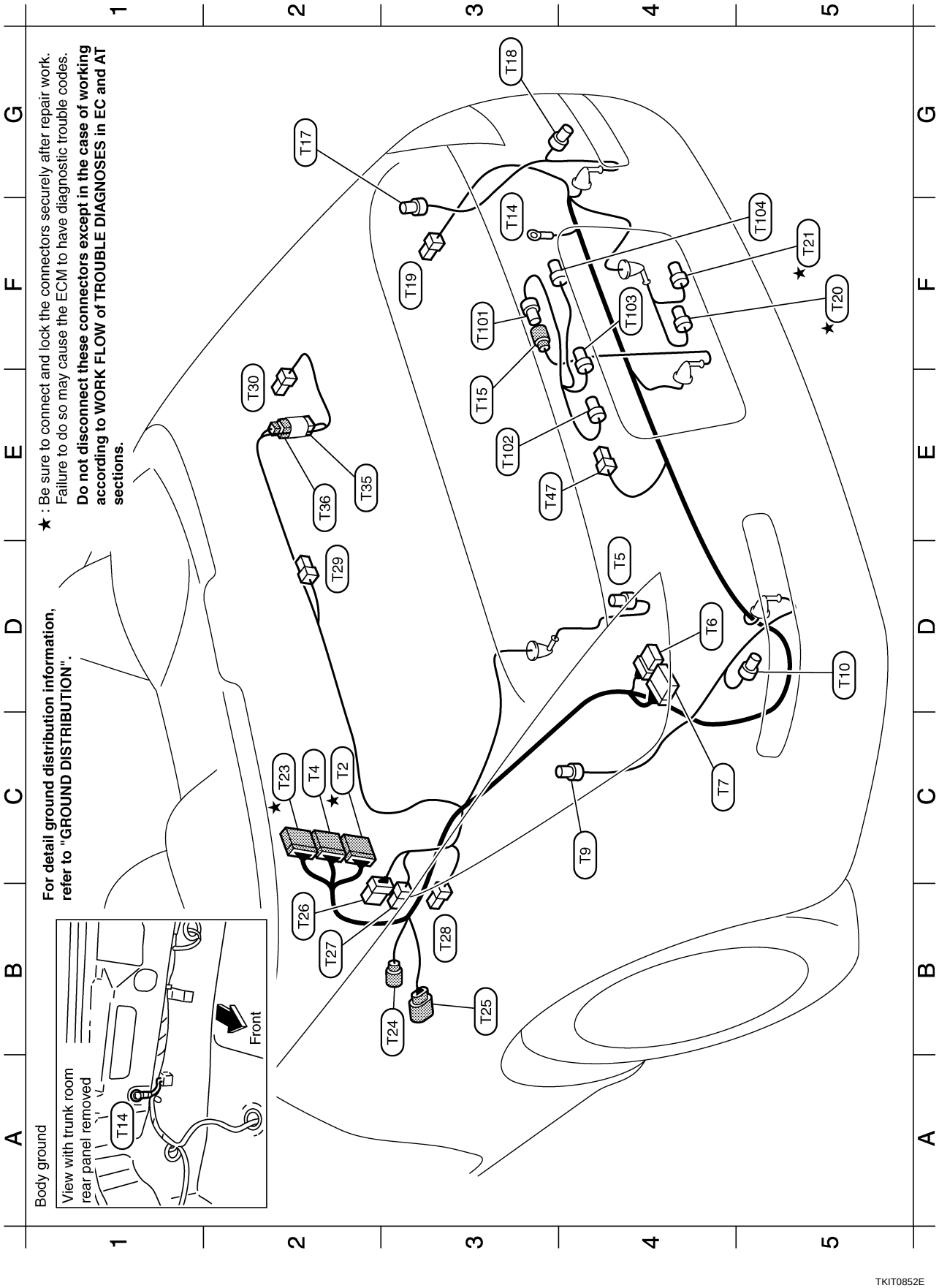
(T101) GY/4 : To (T15)
(T102) BR/2 : License plate lamp LH
(T103) GY/2 : Back door opener switch
(T104) BR/2 : License plate lamp RH

★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

For detail ground distribution information, refer to "GROUND DISTRIBUTION".

TKIT0897E

Roadster Models



TKIT0852E

C2	★T2	W/32	:	To B44
C2	T4	W/24	:	To B46 (With BOSE system)
D4	T5	GY/4	:	Rear wheel sensor
D4	T6	GY/8	:	BOSE speaker amp. (With BOSE system)
C4	T7	B/24	:	BOSE speaker amp. (With BOSE system)
C4	T9	GY/3	:	Rear combination lamp LH (Body side)
D5	T10	GY/4	:	Rear combination lamp LH (Bumper side)
F3	T14	—	:	Body ground
E3	T15	GY/4	:	To T101
G2	T17	GY/3	:	Rear combination lamp RH (Body side)
G3	T18	GY/4	:	Rear combination lamp RH (Bumper side)
F3	T19	W/4	:	Fuel lid opener actuator
F5	★T20	B/2	:	EVAP canister vent control valve
F5	★T21	GY/3	:	EVAP control system pressure sensor
C2	★T23	W/16	:	To B61
B3	T24	GY/4	:	To B62 (With BOSE system)
B3	T25	B/6	:	To B63 (With BOSE system)
B2	T26	W/8	:	To T151
B2	T27	B/2	:	Storage lid switch (Open)
B3	T28	W/2	:	Storage lid actuator LH
D2	T29	W/2	:	Trunk room lamp
E2	T30	W/2	:	Storage lid actuator RH
E2	T35	W/2	:	To T36
E2	T36	W/2	:	To T35
E3	T47	W/3	:	Trunk lid lock assembly

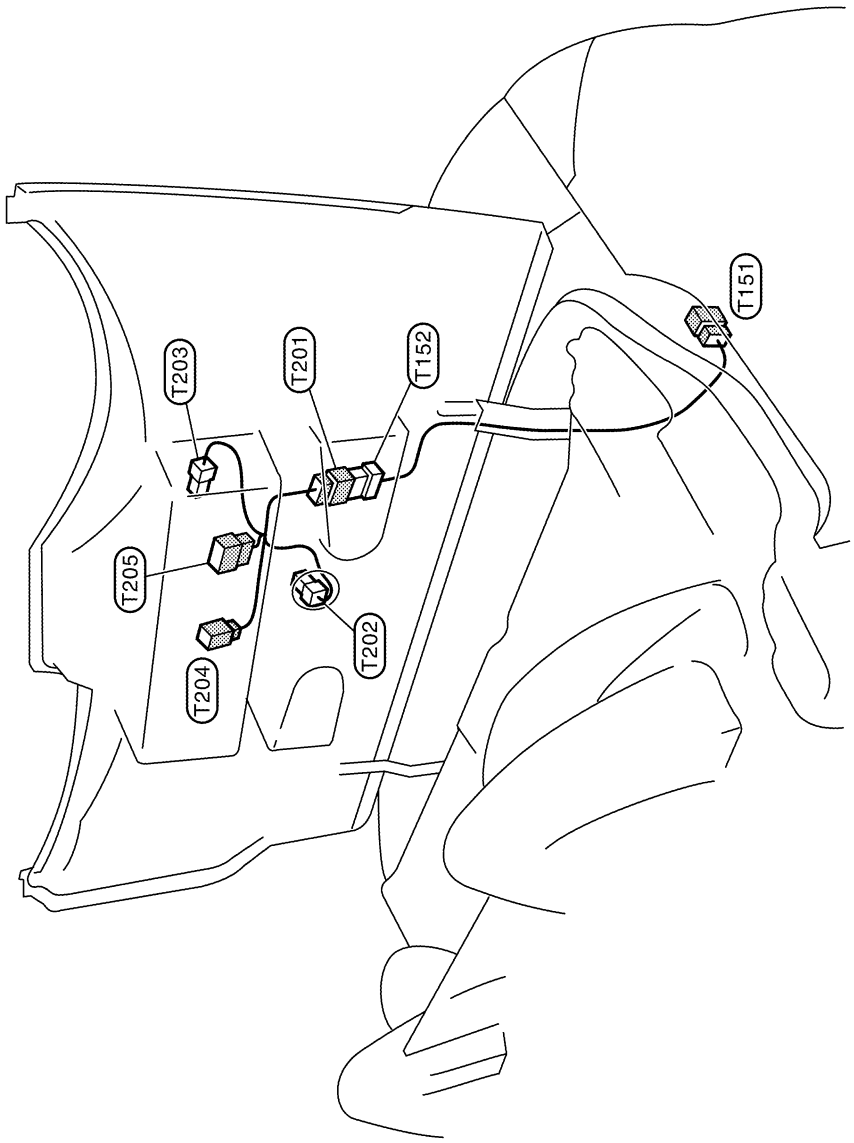
Tail sub-harness-1

F3	T101	GY/4	:	To T15
E3	T102	BR/2	:	License plate lamp LH
F4	T103	GY/2	:	Trunk lid opener switch
F5	T104	BR/2	:	License plate lamp RH

★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.**

TKIT0853E

TAIL NO. 2 HARNESS
Roadster Models



Tail No.2 harness

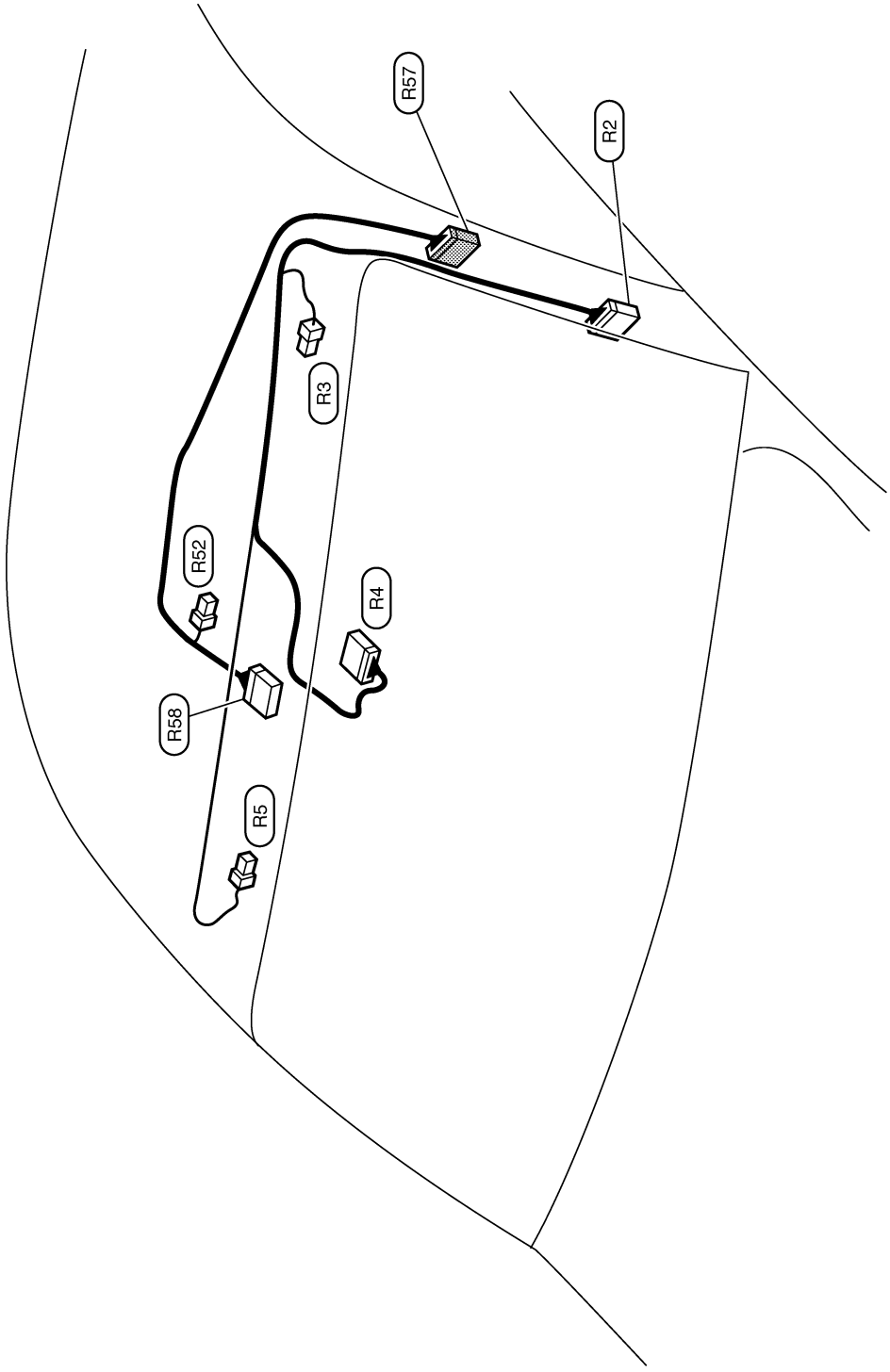
- T201 W/8 : To T152
- T202 BR/2 : High-mounted stop lamp
- T203 W/4 : 5th bow unlock actuator
- T204 B/2 : 5th bow closure motor
- T205 W/6 : Soft top lock switch

Tail sub-harness-2

- T151 W/8 : To T26
- T152 W/8 : To T201

TKIT0113E

ROOM LAMP HARNESS
Coupe Models



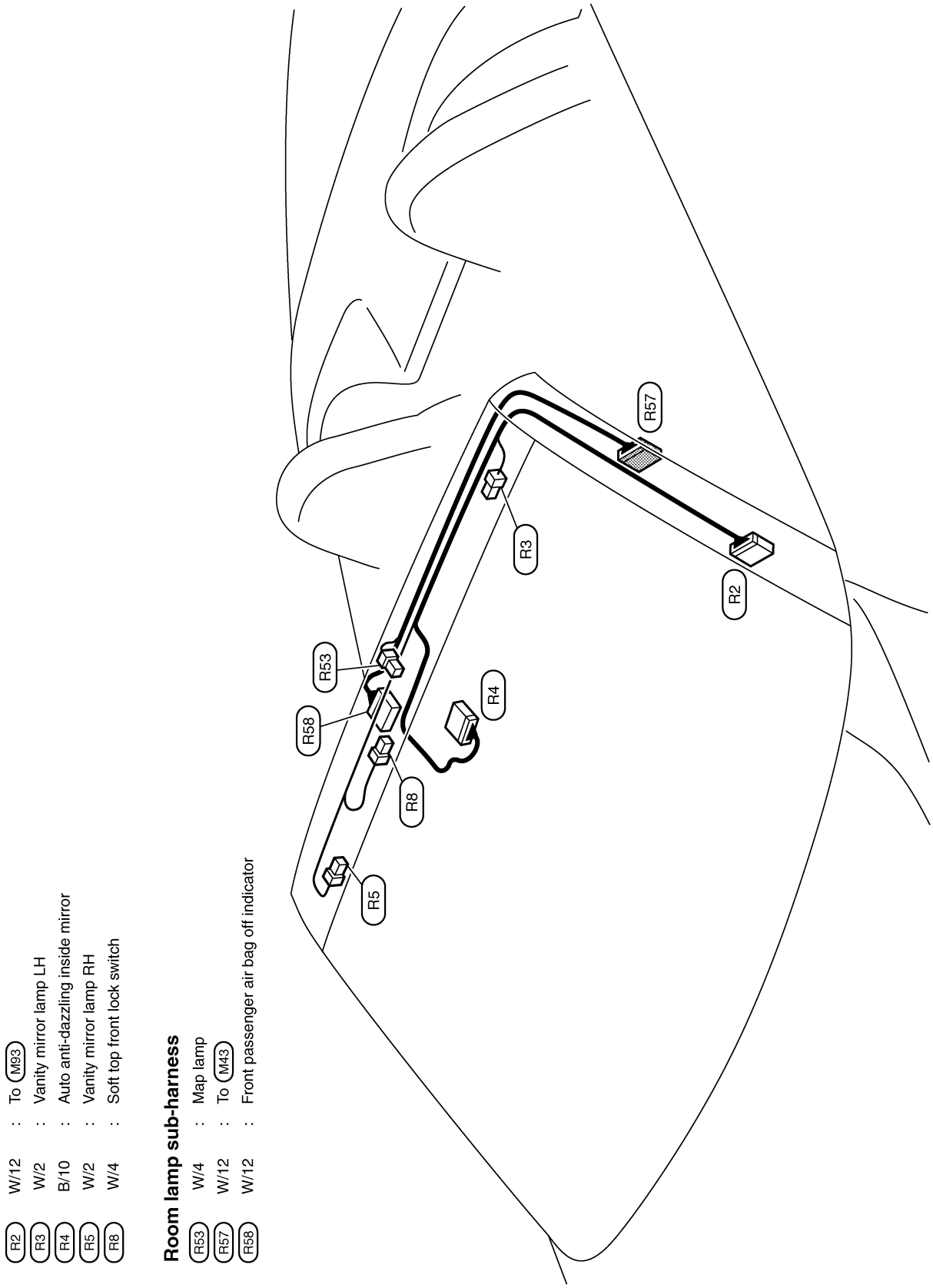
Room lamp sub-harness

R52	W/3	:	Map lamp
R57	W/12	:	To (M43)
R58	W/12	:	Front passenger air bag off indicator • Telephone microphone

R2	W/12	:	To (M93)
R3	W/2	:	Vanity mirror lamp LH
R4	B/10	:	Auto anti-dazzling inside mirror
R5	W/2	:	Vanity mirror lamp RH

TKIT0898E

Roadster Models

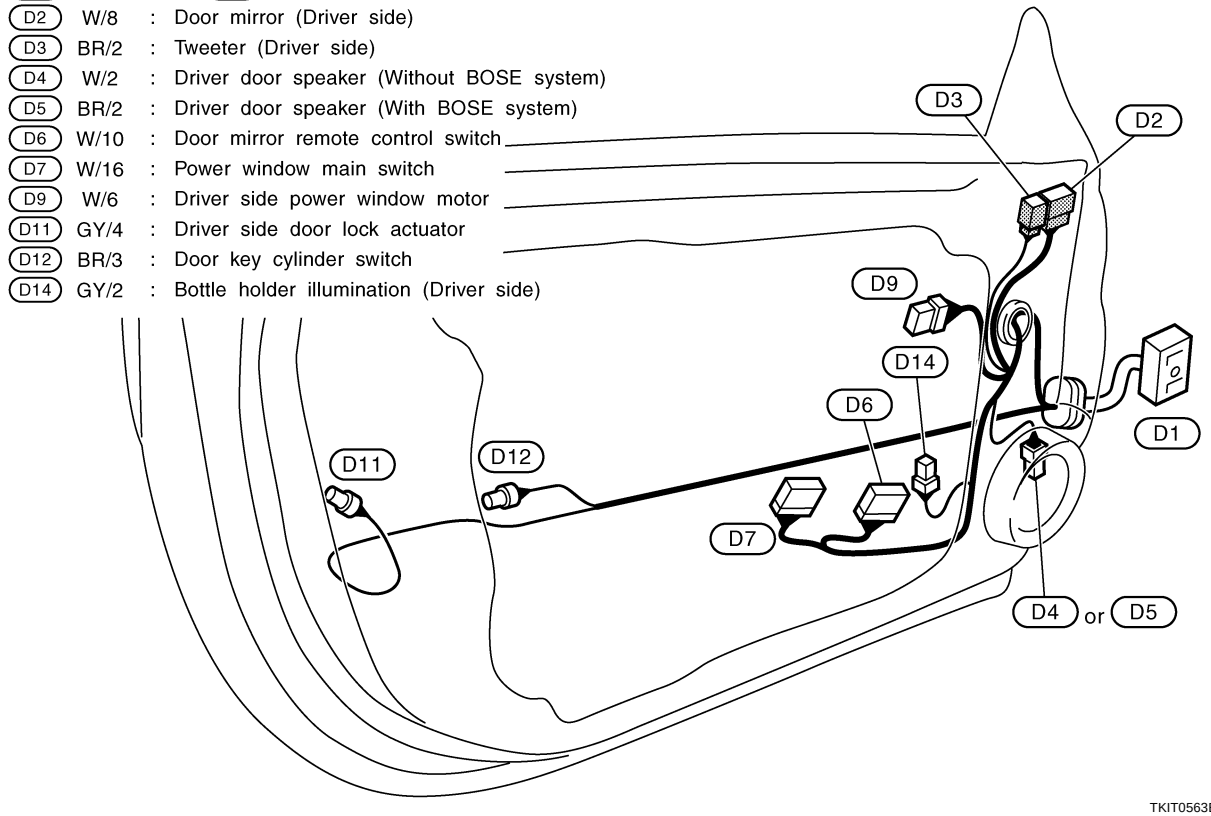


TKIT0855E

DOOR HARNESS

Driver Side Door

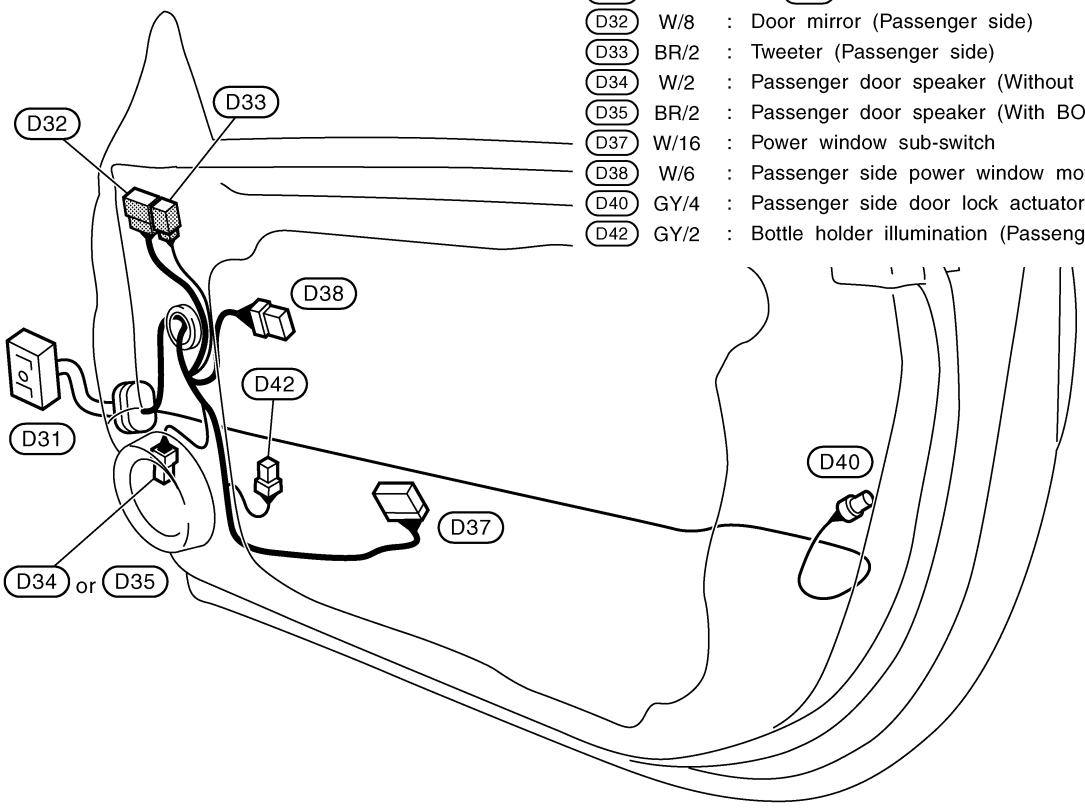
D1	SMJ	:	To M11
D2	W/8	:	Door mirror (Driver side)
D3	BR/2	:	Tweeter (Driver side)
D4	W/2	:	Driver door speaker (Without BOSE system)
D5	BR/2	:	Driver door speaker (With BOSE system)
D6	W/10	:	Door mirror remote control switch
D7	W/16	:	Power window main switch
D9	W/6	:	Driver side power window motor
D11	GY/4	:	Driver side door lock actuator
D12	BR/3	:	Door key cylinder switch
D14	GY/2	:	Bottle holder illumination (Driver side)



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Passenger Side Door

D31	SMJ	:	To M74
D32	W/8	:	Door mirror (Passenger side)
D33	BR/2	:	Tweeter (Passenger side)
D34	W/2	:	Passenger door speaker (Without BOSE system)
D35	BR/2	:	Passenger door speaker (With BOSE system)
D37	W/16	:	Power window sub-switch
D38	W/6	:	Passenger side power window motor
D40	GY/4	:	Passenger side door lock actuator
D42	GY/2	:	Bottle holder illumination (Passenger side)



TKIT0564E

Back Door

Defogger harness (-)
D211 B/1 : Rear window defogger (-)
D212 — : Body ground
D101 W/3 : To B38
D102 GY/2 : To B39
D103 BR/2 : High-mounted stop lamp
D104 B/1 : Rear window defogger
D105 — : Body ground
D106 W/4 : Rear wiper motor
D212
D106
D211
D105
D104
D103
D101
D102
Body ground
View with back door finisher removed
D105
Body ground
View with back door finisher removed
D212
Rear wiper motor
For detail ground distribution information, refer to "GROUND DISTRIBUTION".
TKIT0068E

Wiring Diagram Codes (Cell Codes)

NKS000EH

Use the chart below to find out what each wiring diagram code stands for.
Refer to the wiring diagram code in the alphabetical index to find the location (page number) of each wiring diagram.

Code	Section	Wiring Diagram Name
3METER	DI	Triple Meter
ABS	BRC	Anti-Lock Braking System
A/C	ATC	Air Conditioner
AF1B1	EC	Air Fuel Ratio Sensor 1 (Bank 1)
AF1B2	EC	Air Fuel Ratio Sensor 1 (Bank 2)
AF1HB1	EC	Air Fuel Ratio Sensor 1 Heater (Bank 1)
AF1HB2	EC	Air Fuel Ratio Sensor 1 Heater (Bank 2)
APPS1	EC	Accelerator Pedal Position Sensor
APPS2	EC	Accelerator Pedal Position Sensor
APPS3	EC	Accelerator Pedal Position Sensor
ASC/BS	EC	Automatic Speed Control Device (ASCD) Brake Switch
ASC/SW	EC	Automatic Speed Control Device (ASCD) Steering Switch
ASCBOF	EC	Automatic Speed Control Device (ASCD) Brake Switch
ASCIND	EC	Automatic Speed Control Device (ASCD) Indicator
AT/IND	DI	A/T Indicator Lamp
AUDIO	AV	Audio
BACK/L	LT	Back-Up Lamp
BRK/SW	EC	Brake Switch
CAN	AT	CAN Communication Line
CAN	EC	CAN Communication Line
CAN	LAN	CAN System
CHARGE	SC	Charging System
CHIME	DI	Warning Chime
COMBSW	LT	Combination Switch
COMM	AV	Audio Visual Communication Line
COOL/F	EC	Cooling Fan Control
DEF	GW	Rear Window Defogger
D/LOCK	BL	Power Door Lock
DTRL	LT	Headlamp - With Daytime Light System
ECM/PW	EC	ECM Power Supply for Back-Up
ECTS	EC	Engine Coolant Temperature Sensor
EOTS	EC	Engine Oil Temperature Sensor
EPS	STC	Electric Controlled Power Steering System
ETC1B1	EC	Electric Throttle Control Function (Bank 1)
ETC1B2	EC	Electric Throttle Control Function (Bank 2)
ETC2B1	EC	Electric Throttle Control Motor Relay (Bank 1)
ETC2B2	EC	Electric Throttle Control Motor Relay (Bank 2)
ETC3B1	EC	Electric Throttle Control Motor (Bank 1)
ETC3B2	EC	Electric Throttle Control Motor (Bank 2)
EVCB1	EC	Exhaust Valve Timing Control Magnet Retarder (Bank 1)
EVCB2	EC	Exhaust Valve Timing Control Magnet Retarder (Bank 2)

Code	Section	Wiring Diagram Name
EVCSB1	EC	Exhaust Valve Timing Control Position Sensor (Bank 1)
EVCSB2	EC	Exhaust Valve Timing Control Position Sensor (Bank 2)
F/LID	BL	Fuel Lid Opener
F/PUMP	EC	Fuel Pump
F/ROOF	RF	Soft Top
FTS	AT	A/T Fluid Temperature Sensor Circuit
FTTS	EC	Fuel Tank Temperature Sensor
FUELB1	EC	Fuel Injection System Function (Bank 1)
FUELB2	EC	Fuel Injection System Function (Bank 2)
H/LAMP	LT	Headlamp
H/PHON	AV	Handsfree Telephone System
HORN	WW	Horn
HSEAT	SE	Heated Seat
IATSB1	EC	Intake Air Temperature Sensor (Bank 1)
IGNSYS	EC	Ignition System
ILL	LT	Illumination
I/MIRR	GW	Inside Mirror (Auto Anti-Dazzling Mirror)
INJECT	EC	Injector
IVCB1	EC	Intake Valve Timing Control Solenoid Valve (Bank 1)
IVCB2	EC	Intake Valve Timing Control Solenoid Valve (Bank 2)
KEYLES	BL	Remote Keyless Entry System
KSB1	EC	Knock Sensor (Bank 1)
KSB2	EC	Knock Sensor (Bank 2)
MAFSB1	EC	Mass Air Flow Sensor (Bank 1)
MAFSB2	EC	Mass Air Flow Sensor (Bank 2)
MAIN	AT	Main Power Supply and Ground Circuit
MAIN	EC	Main Power Supply and Ground Circuit
M/ANT	AV	Manual Antenna
METER	DI	Speedometer, Tachometer, Temp. and Fuel Gauges
MIL/DL	EC	MIL & Data Link Connector
MIRROR	GW	Power Door Mirror
MMSW	AT	Manual Mode Switch
NATS	BL	Nissan Anti-Theft System
NAVI	AV	Navigation System
NONDTC	AT	Non-Detective Items
O2H2B1	EC	Heated Oxygen Sensor 2 Heater (Bank 1)
O2H2B2	EC	Heated Oxygen Sensor 2 Heater (Bank 2)
O2S2B1	EC	Heated Oxygen Sensor 2 (Bank 1)
O2S2B2	EC	Heated Oxygen Sensor 2 (Bank 2)
PGC/V	EC	EVAP Canister Purge Volume Control Solenoid Valve
PHSB1	EC	Camshaft Position Sensor (PHASE) (Bank 1)
PHSB2	EC	Camshaft Position Sensor (PHASE) (Bank 2)
PNP/SW	AT	Park/Neutral Position Switch
PNP/SW	EC	Park/Neutral Position Switch

Code	Section	Wiring Diagram Name
POS	EC	Crankshaft Position Sensor (CKPS) (POS)
POWER	PG	Power Supply Routing
PRE/SE	EC	EVAP Control System Pressure Sensor
P/SCKT	WW	Power Socket
PS/SEN	EC	Power Steering Pressure Sensor
ROOM/L	LT	Interior Room Lamp
RP/SEN	EC	Refrigerant Pressure Sensor
SEAT	SE	Power Seat
SEN/PW	EC	Sensor Power Supply
SHIFT	AT	A/T Shift Lock System
SRS	SRS	Supplemental Restraint System
START	SC	Starting System
STOP/L	LT	Stop Lamp
STSIG	AT	Start Signal Circuit
TAIL/L	LT	Parking, License and Tail Lamps
TCS	BRC	Traction Control System
TLID	BL	Trunk Lid Opener
TPS1B1	EC	Throttle Position Sensor (Sensor 1) (Bank 1)
TPS1B2	EC	Throttle Position Sensor (Sensor 1) (Bank 2)
TPS2B1	EC	Throttle Position Sensor (Sensor 2) (Bank 1)
TPS2B2	EC	Throttle Position Sensor (Sensor 2) (Bank 2)
TPS3B1	EC	Throttle Position Sensor (Bank 1)
TPS3B2	EC	Throttle Position Sensor (Bank 2)
TRNSCV	BL	Homelink Universal Transceiver
TURN	LT	Turn Signal and Hazard Warning Lamp
T/WARN	WT	Low Tire Pressure Warning System
VDC	BRC	Vehicle Dynamics Control System
VEHSEC	BL	Vehicle Security System
VENT/V	EC	EVAP Canister Vent Control Valve
VSSA/T	AT	Vehicle Speed Sensor A/T (Revolution Sensor)
WARN	DI	Warning Lamps
WINDOW	GW	Power Window
WIPER	WW	Front Wiper and Washer
WIP/R	WW	Rear Wiper and Washer

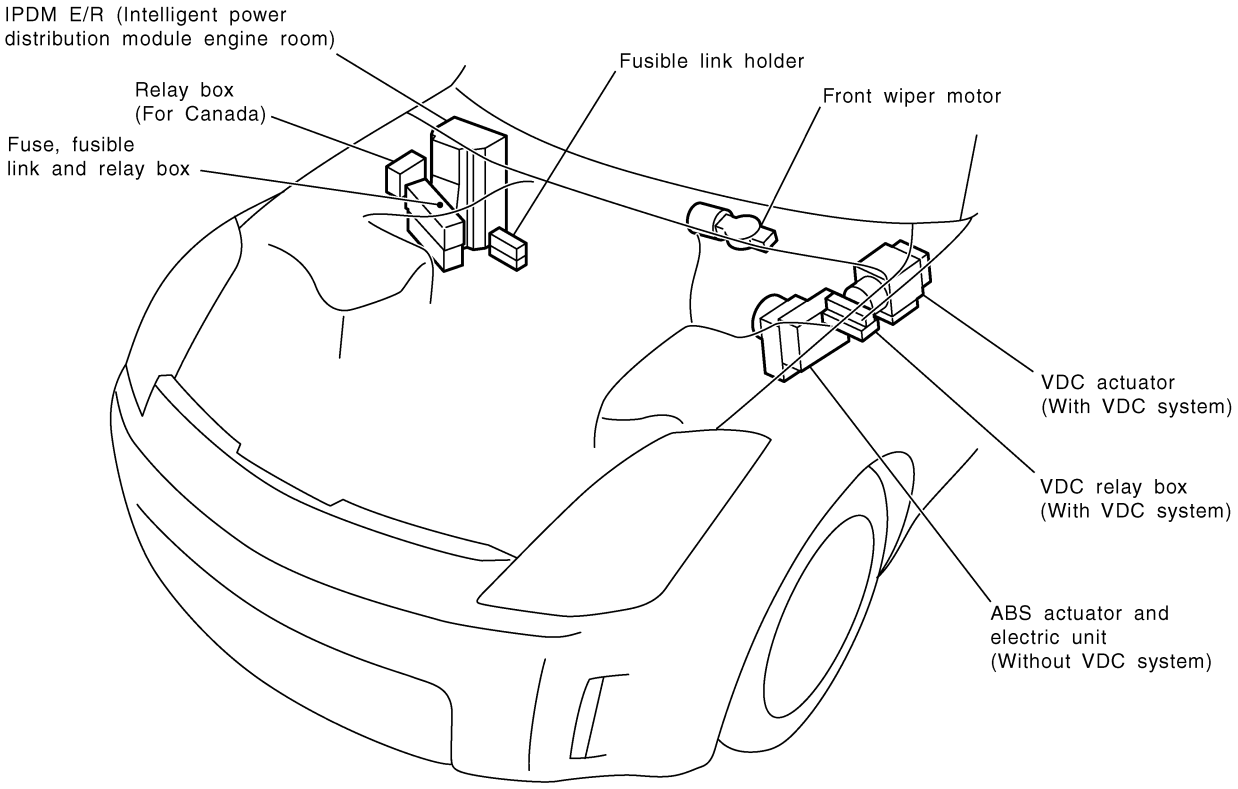
ELECTRICAL UNITS LOCATION

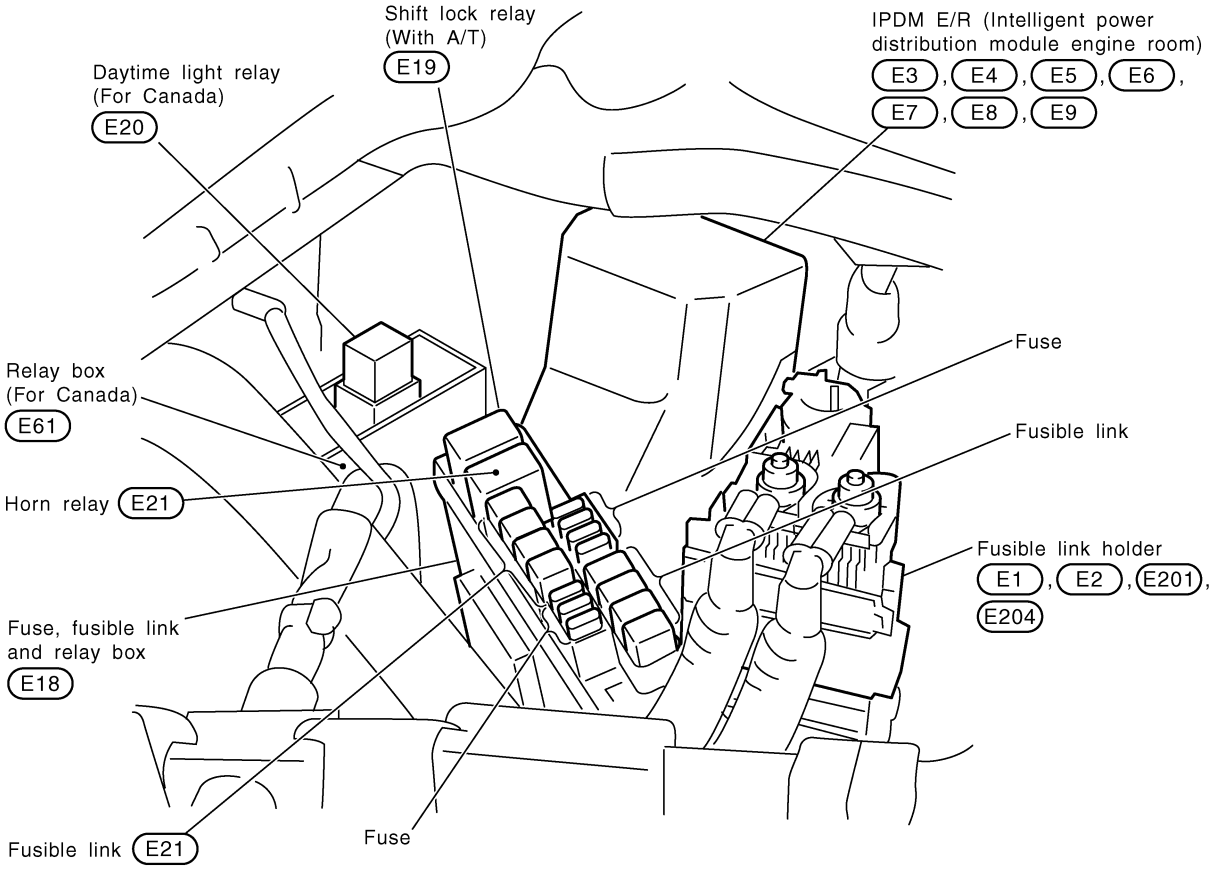
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Electrical Units Location

NKS000EI

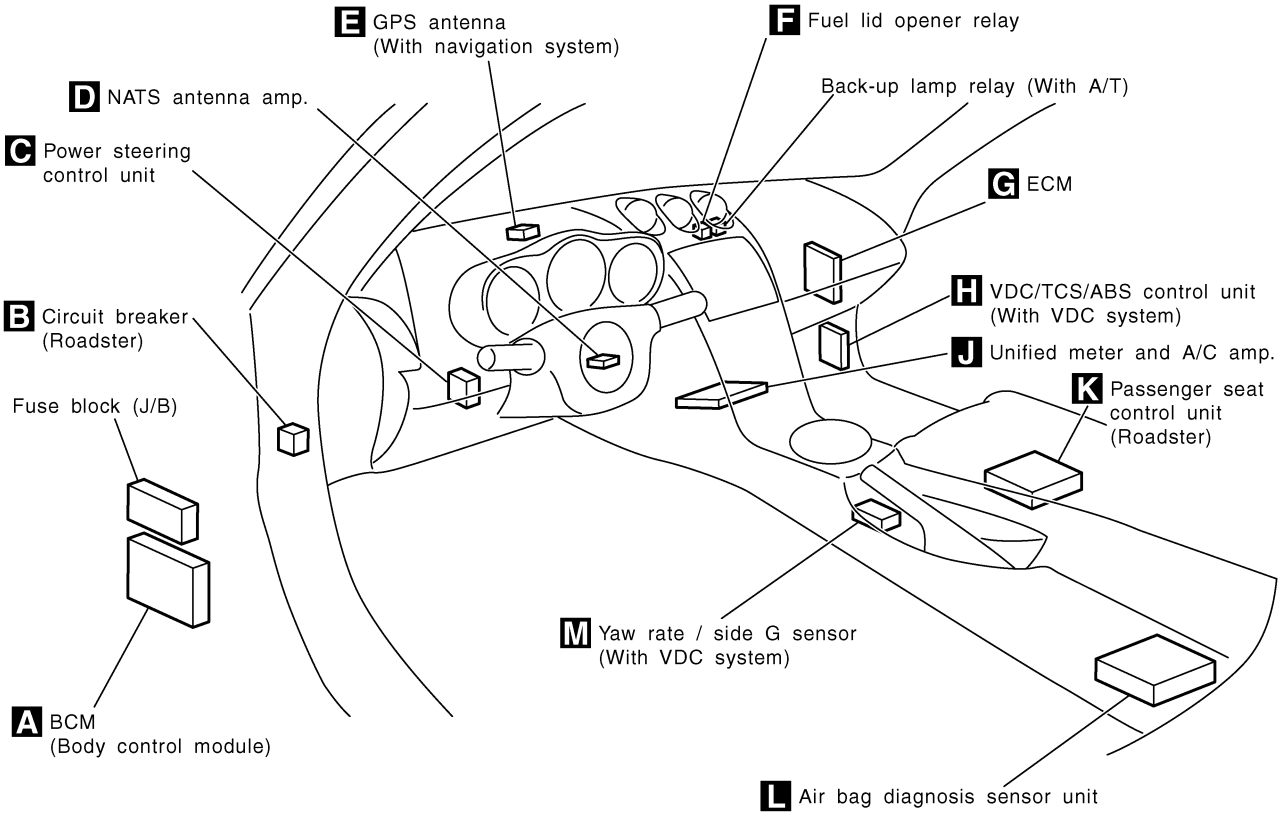
ENGINE COMPARTMENT



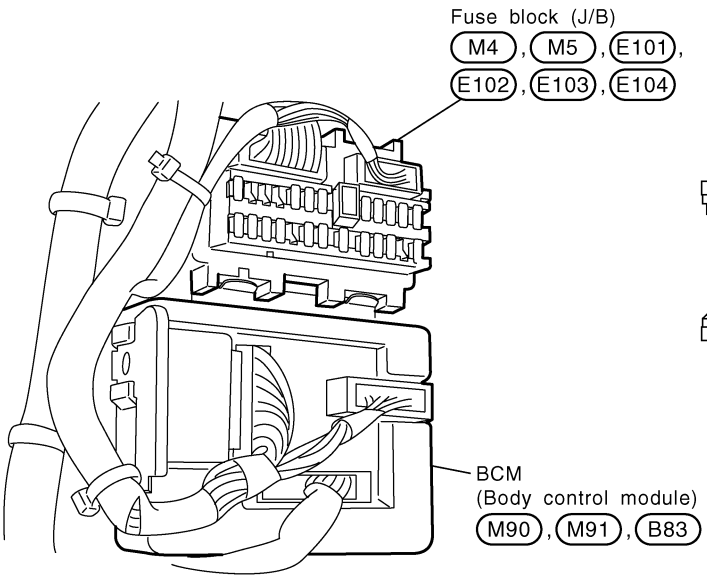


CKIT0874E

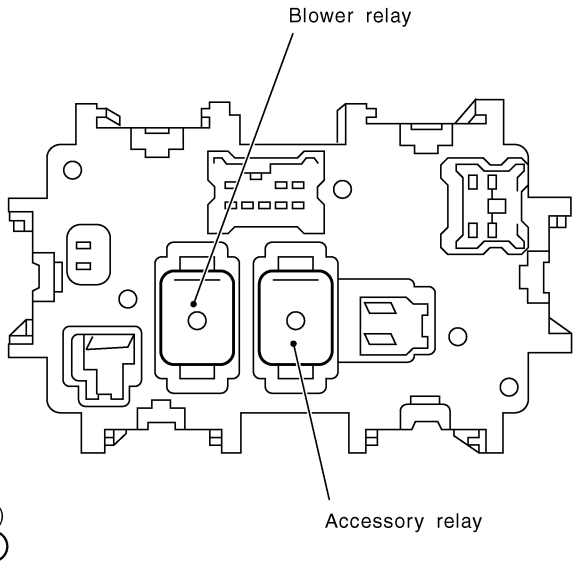
PASSENGER COMPARTMENT



A Behind dash side lower LH finisher

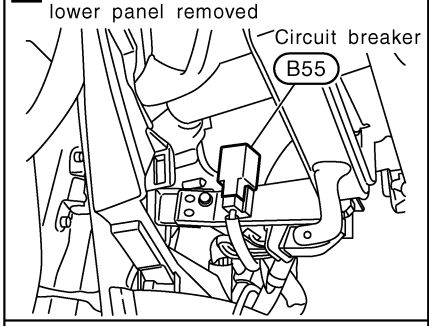


Fuse block (J/B) rear view

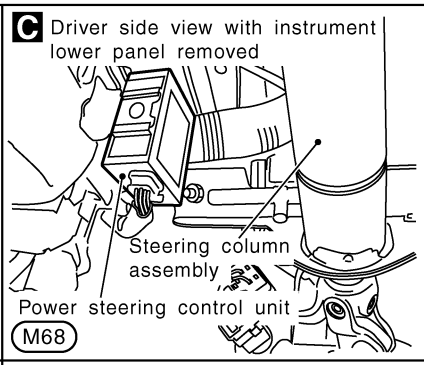


CKIT0860E

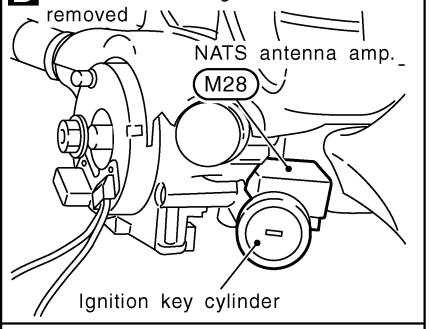
B Driver side view with instrument lower panel removed



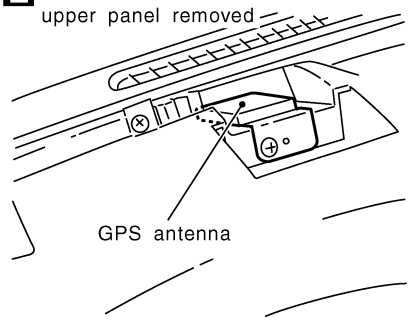
C Driver side view with instrument lower panel removed



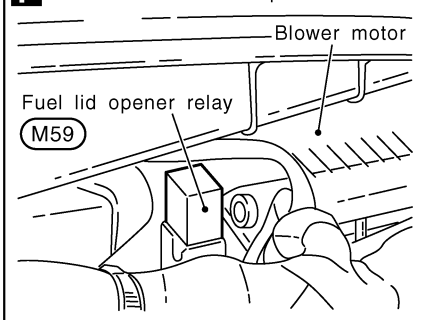
D View with steering column cover removed



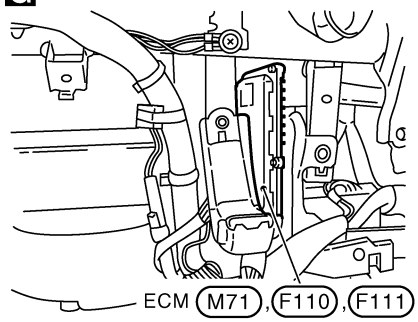
E Driver side view with instrument upper panel removed



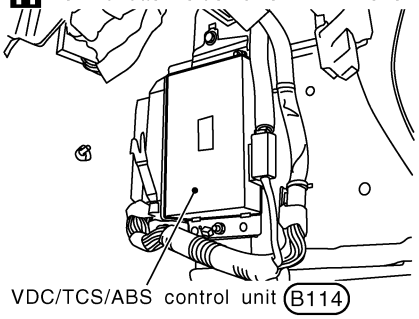
F View with instrument panel removed



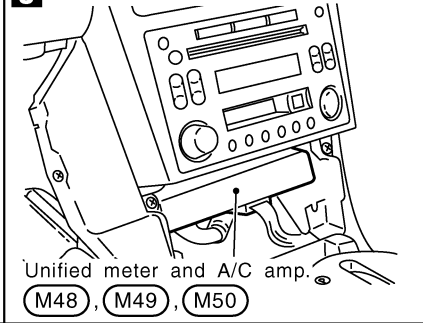
G Blower motor RH side



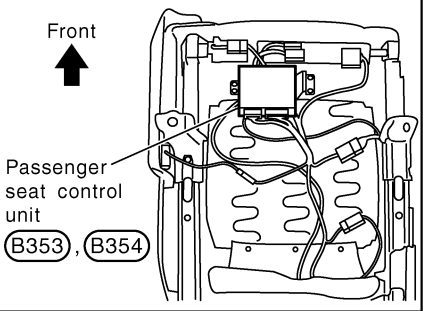
H Behind dash side lower RH finisher



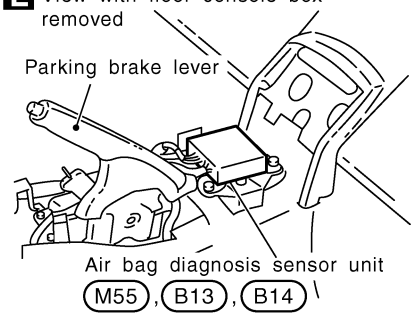
J View with console finisher removed



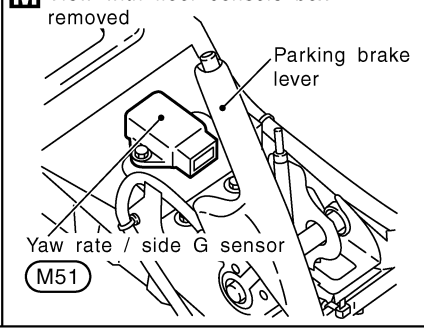
K Under passenger seat



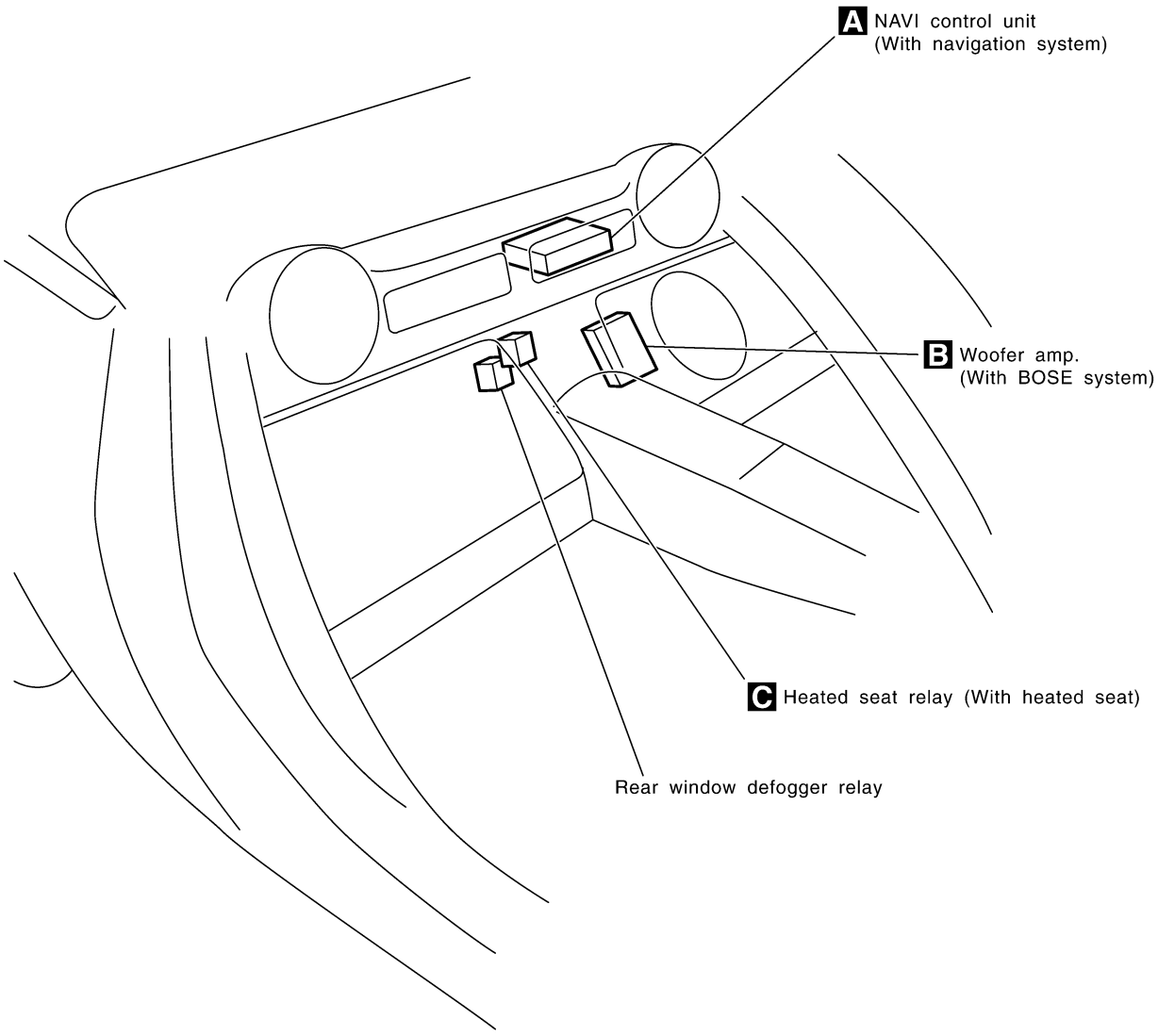
L View with floor console box removed

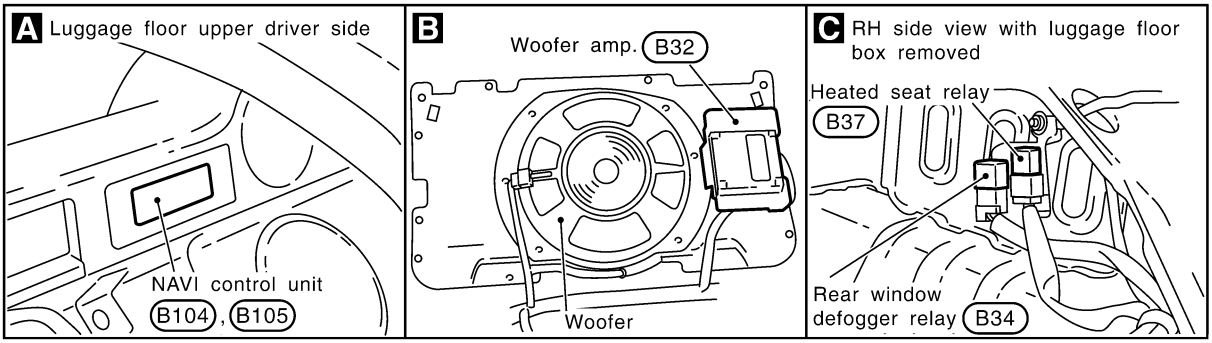


M View with floor console box removed



CKIT0875E

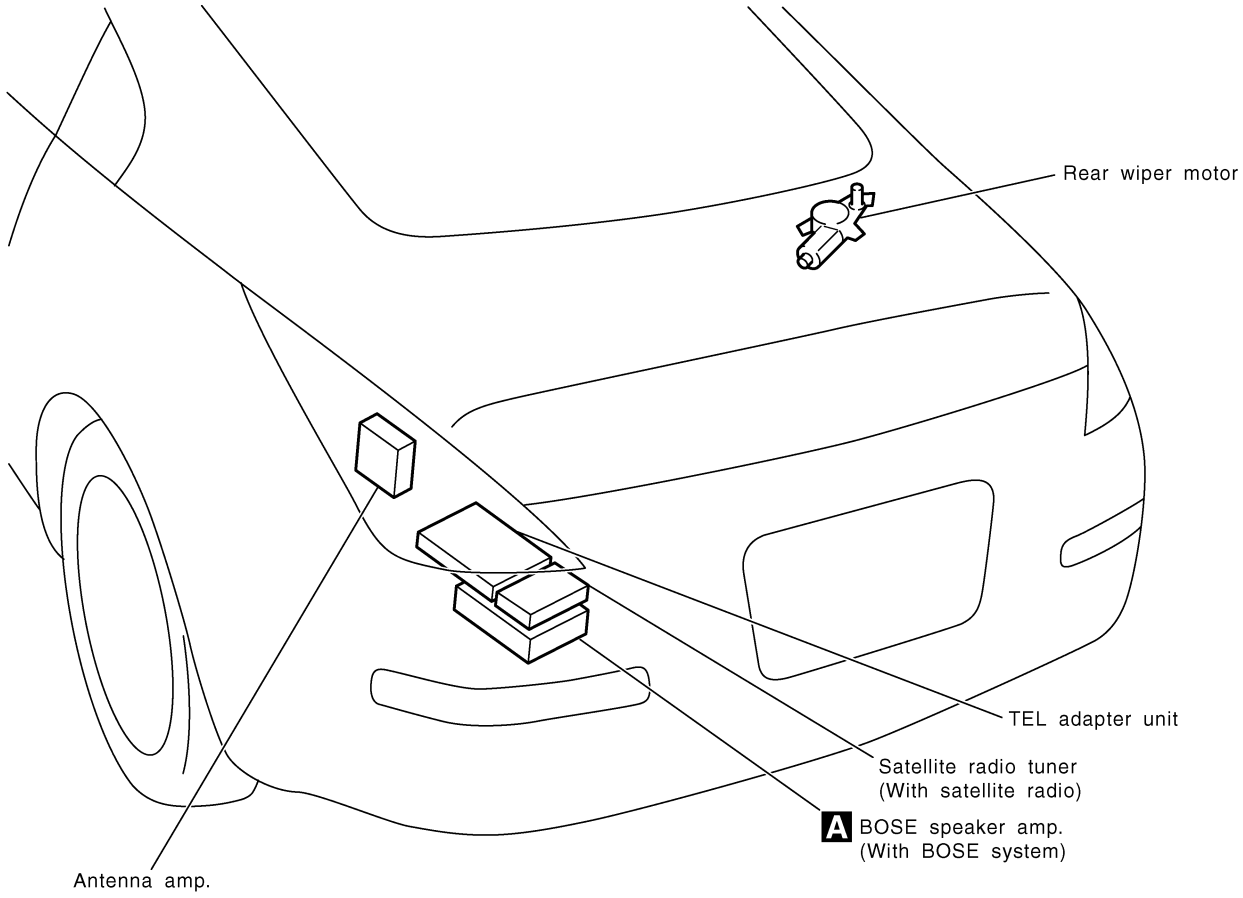

A NAVI control unit
(With navigation system)
B Woofer amp.
(With BOSE system)
C Heated seat relay (With heated seat)
Rear window defogger relay

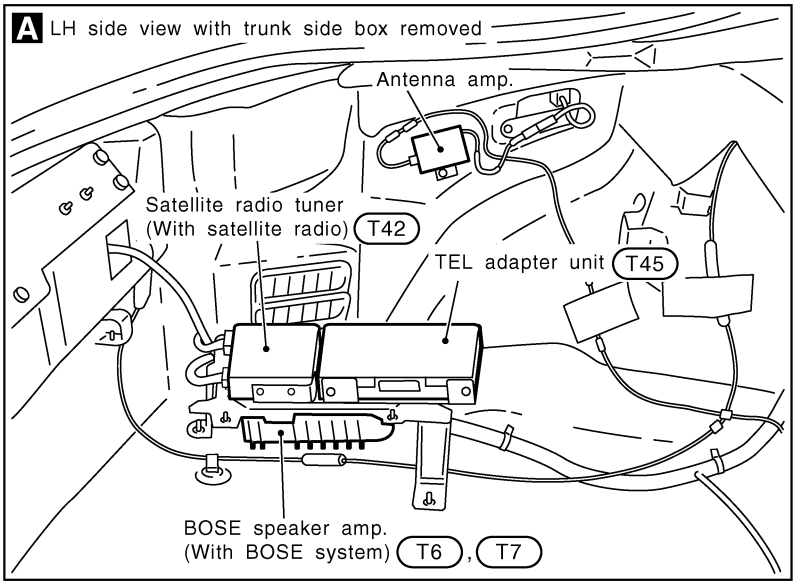

A Luggage floor upper driver side
NAVI control unit
B104, B105
B
Woofer amp. B32
Woofer
C RH side view with luggage floor box removed
Heated seat relay
B37
Rear window defogger relay B34

CKIT0349E

LUGGAGE COMPARTMENT

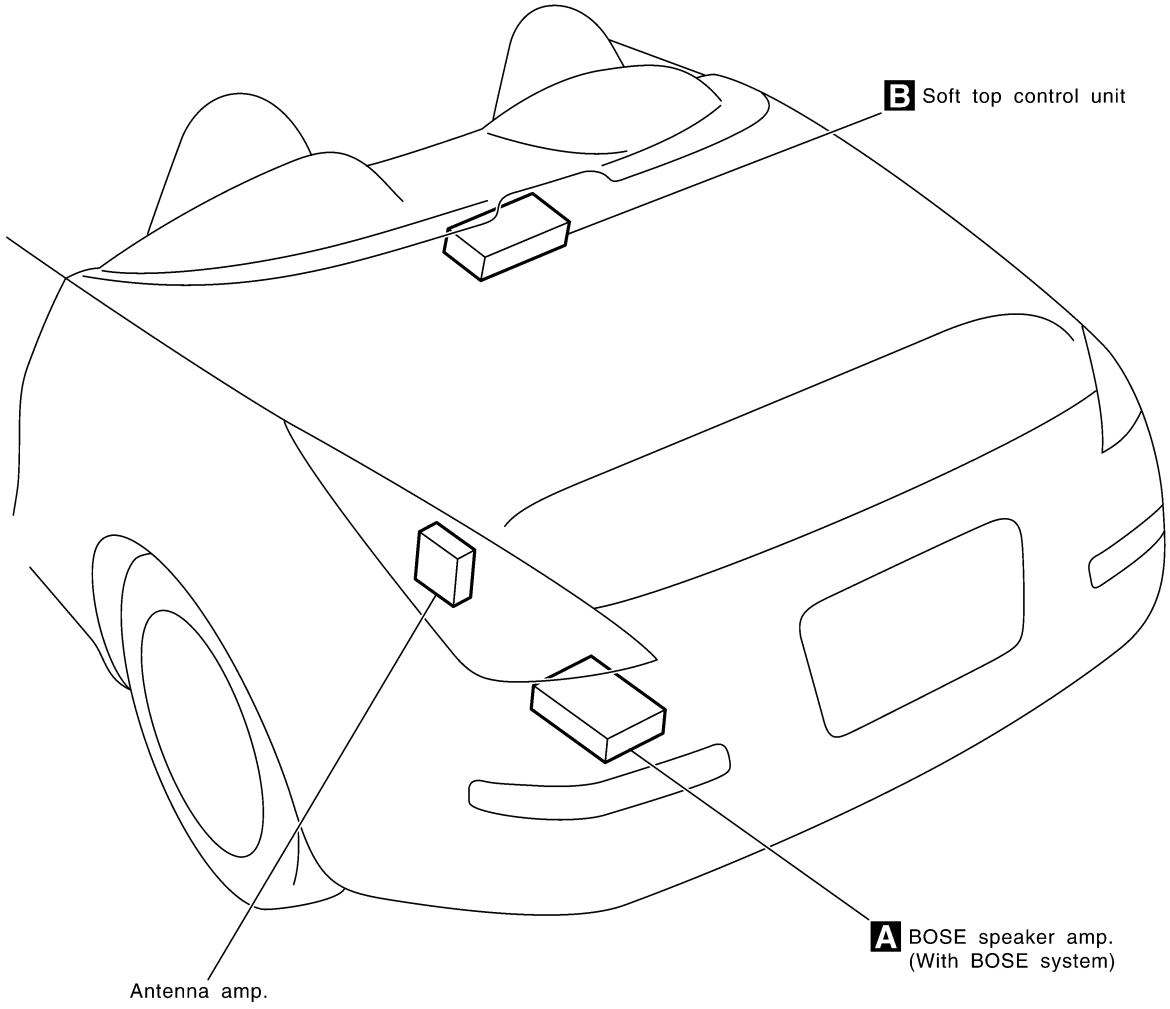
Coupe Models

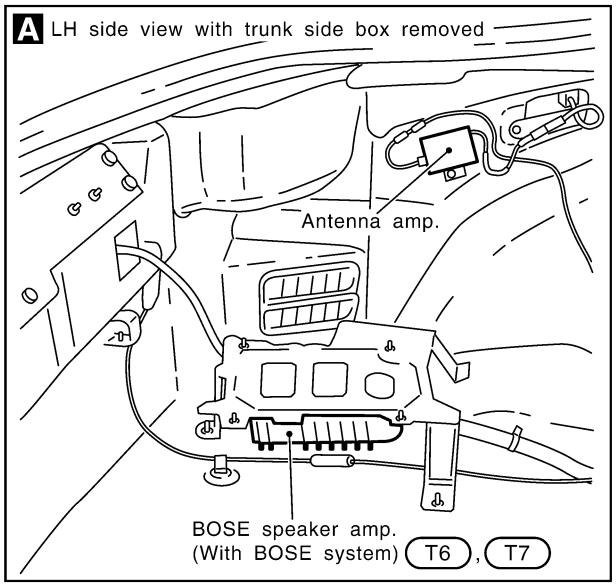


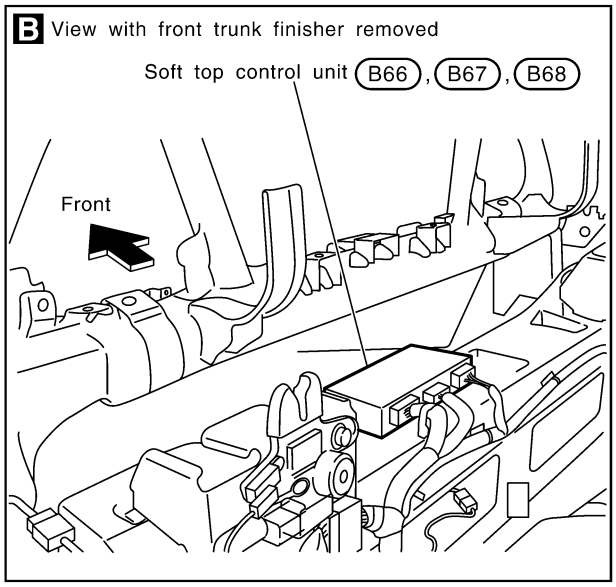


CKIT0878E

Roadster Models







CKIT0350E

HARNESS CONNECTOR

PFP:00011

Description

NKS004SA

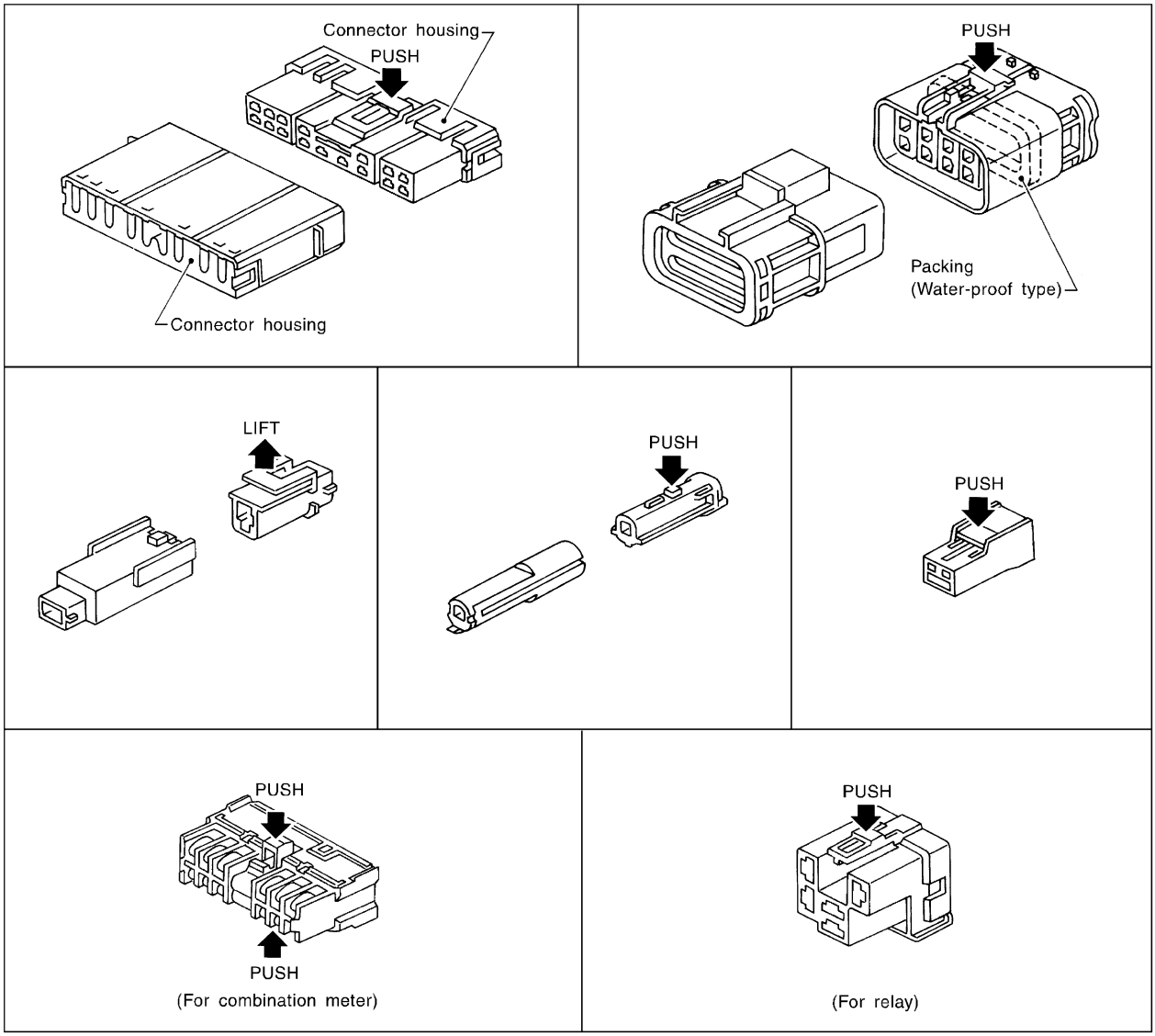
HARNESS CONNECTOR (TAB-LOCKING TYPE)

- The tab-locking type connectors help prevent accidental looseness or disconnection.
- The tab-locking type connectors are disconnected by pushing or lifting the locking tab(s). Refer to the figure below.

CAUTION:

Never pull the harness or wires when disconnecting the connector.

[Example]



SEL769DA

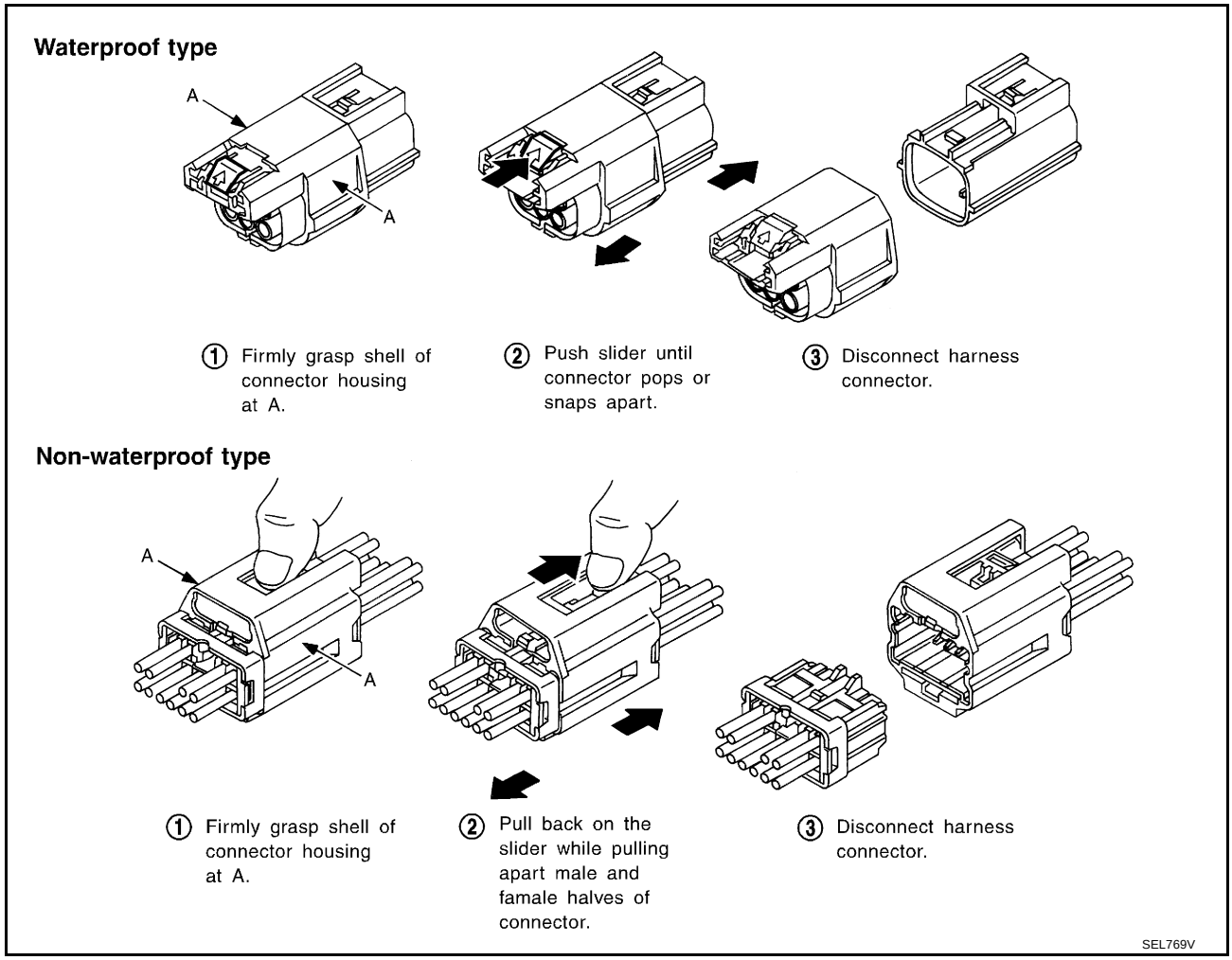
HARNESS CONNECTOR (SLIDE-LOCKING TYPE)

- A new style slide-locking type connector is used on certain systems and components, especially those related to OBD.
- The slide-locking type connectors help prevent incomplete locking and accidental looseness or disconnection.
- The slide-locking type connectors are disconnected by pushing or pulling the slider. Refer to the figure below.

CAUTION:

- **Never pull the harness or wires when disconnecting the connector.**
- **Be careful not to damage the connector support bracket when disconnecting the connector.**

[Example]

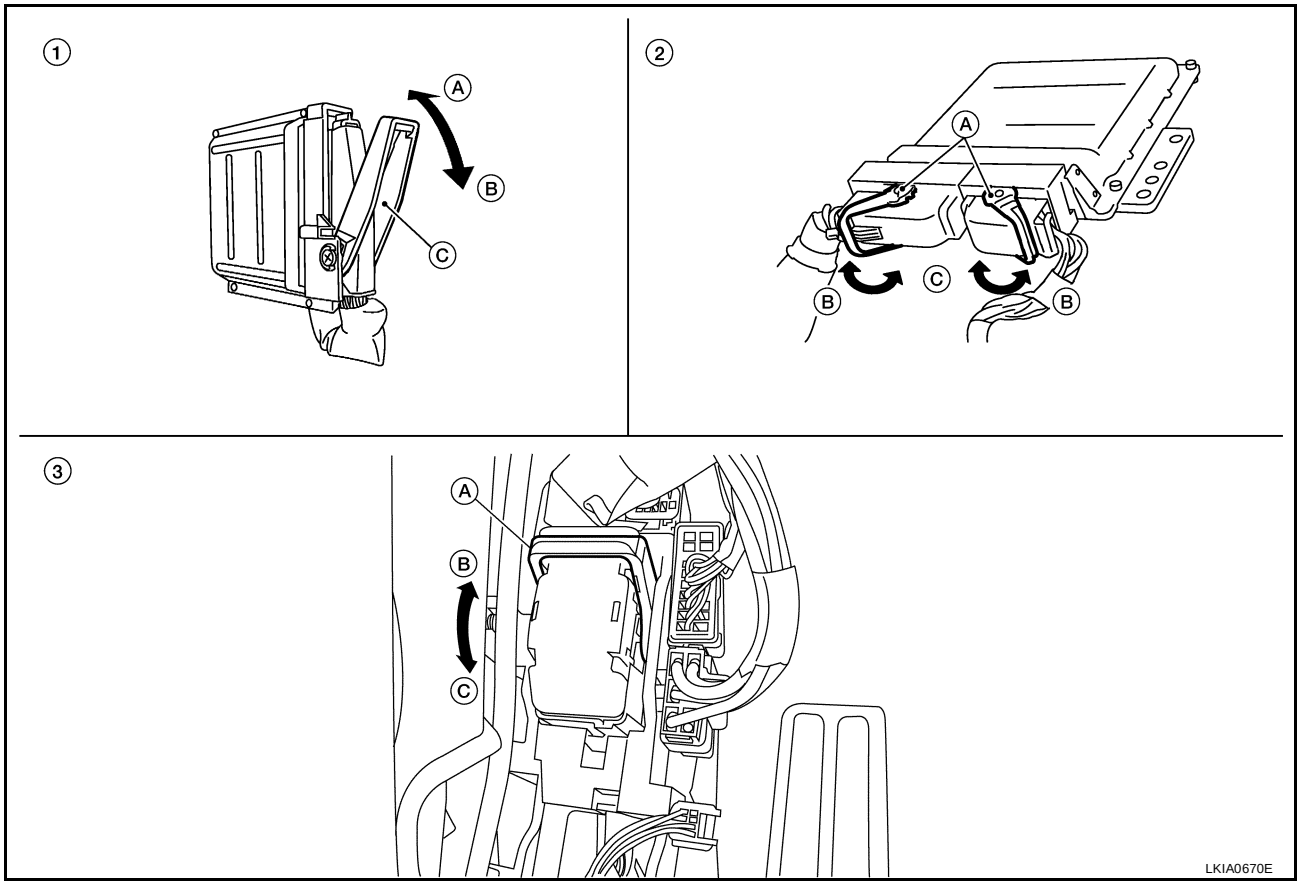


HARNESS CONNECTOR (LEVER LOCKING TYPE)

- Lever locking type harness connectors are used on certain control units and control modules such as ECM, ABS actuator and electric unit (control unit), etc.
- Lever locking type harness connectors are also used on super multiple junction (SMJ) connectors.
- Always confirm the lever is fully locked in place by moving the lever as far as it will go to ensure full connection.

CAUTION:

Always confirm the lever is fully released (loosened) before attempting to disconnect or connect these connectors to avoid damage to the connector housing or terminals.



1. Control unit with single lever
   A. Fasten
   B. Loosen
   C. Lever
2. Control unit with dual levers
   A. Levers
   B. Fasten
   C. Loosen
3. SMJ connector
   A. Lever
   B. Fasten
   C. Loosen

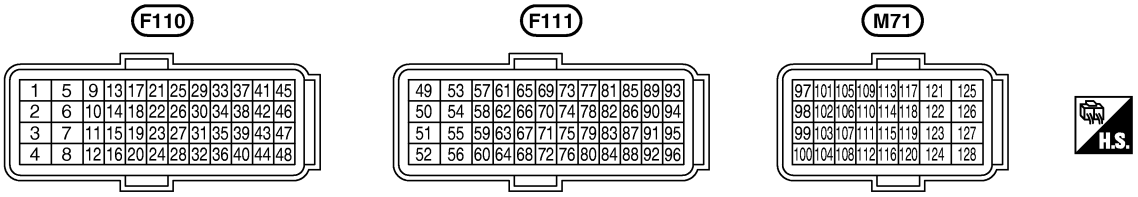
ELECTRICAL UNITS

PFP:00011

Terminal Arrangement

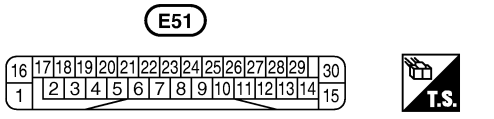
NKS004SB

ECM



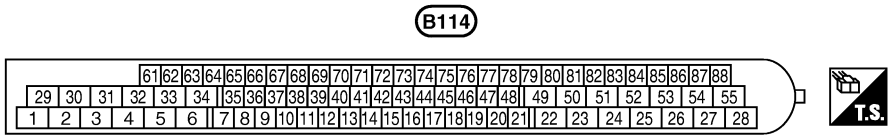
(Black) (Brown) (Gray)

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)



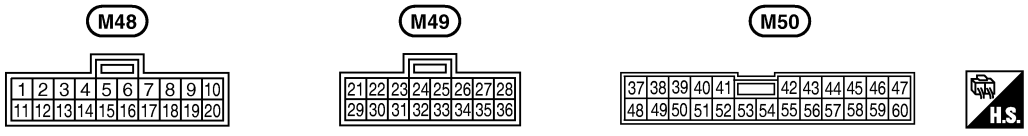
(Gray)

VDC/TCS/ABS CONTROL UNIT



(Black)

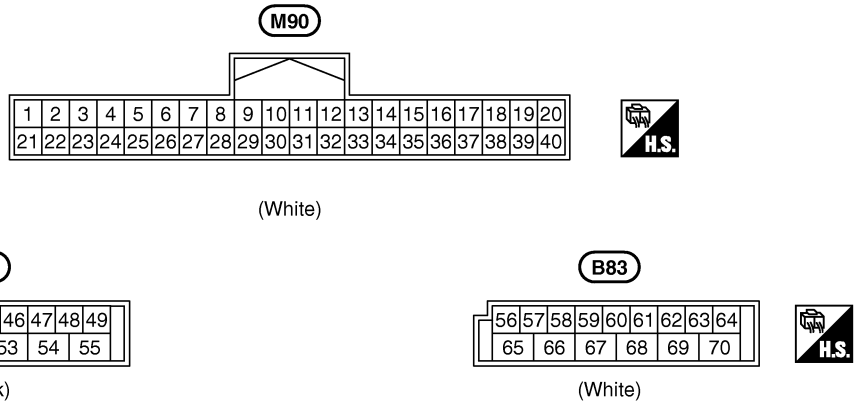
UNIFIED METER AND A/C AMP.



(Gray) (Gray) (White)

CKIT0876E

BCM (BODY CONTROL MODULE)



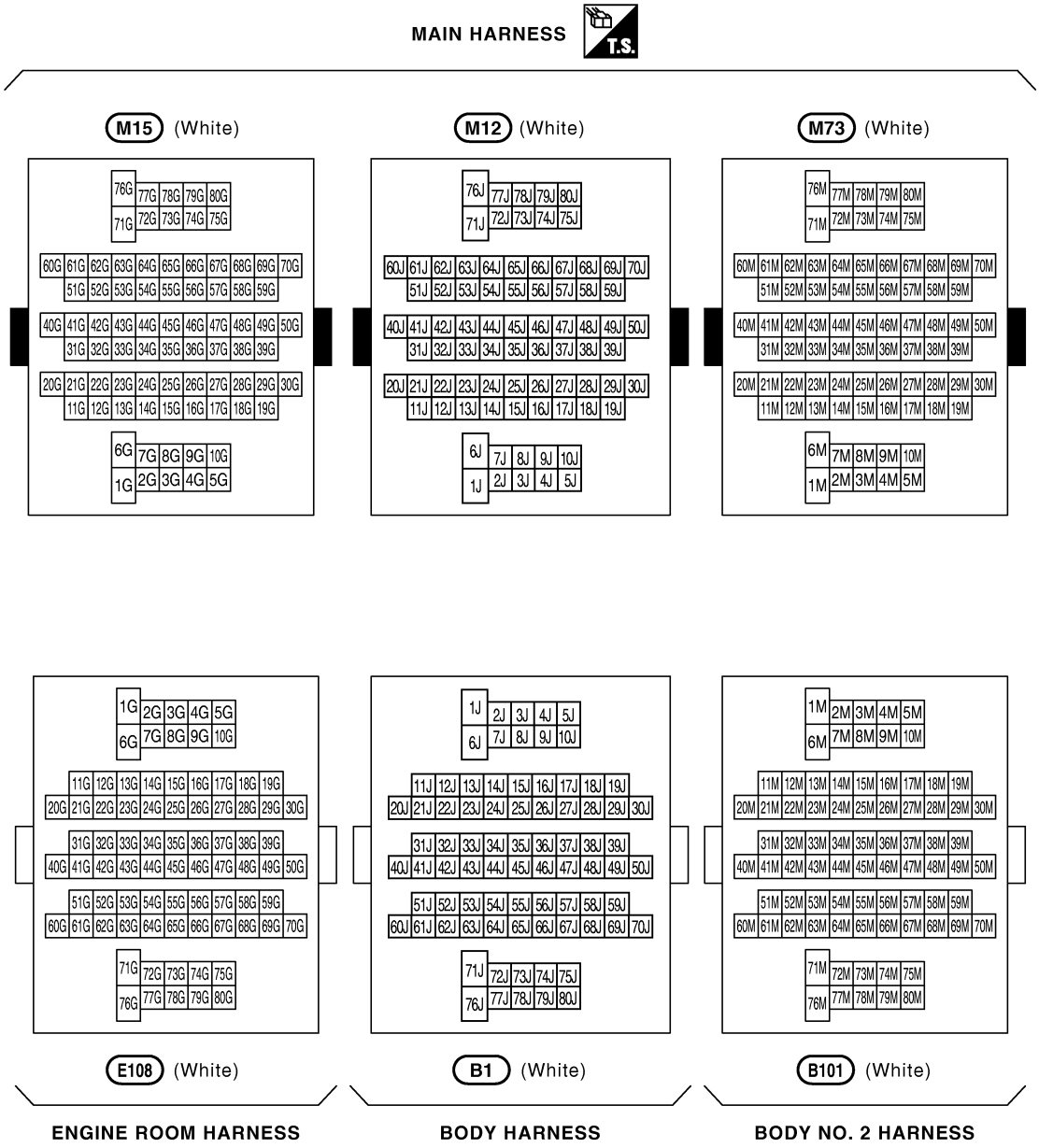
CKIT0647E

SMJ (SUPER MULTIPLE JUNCTION)

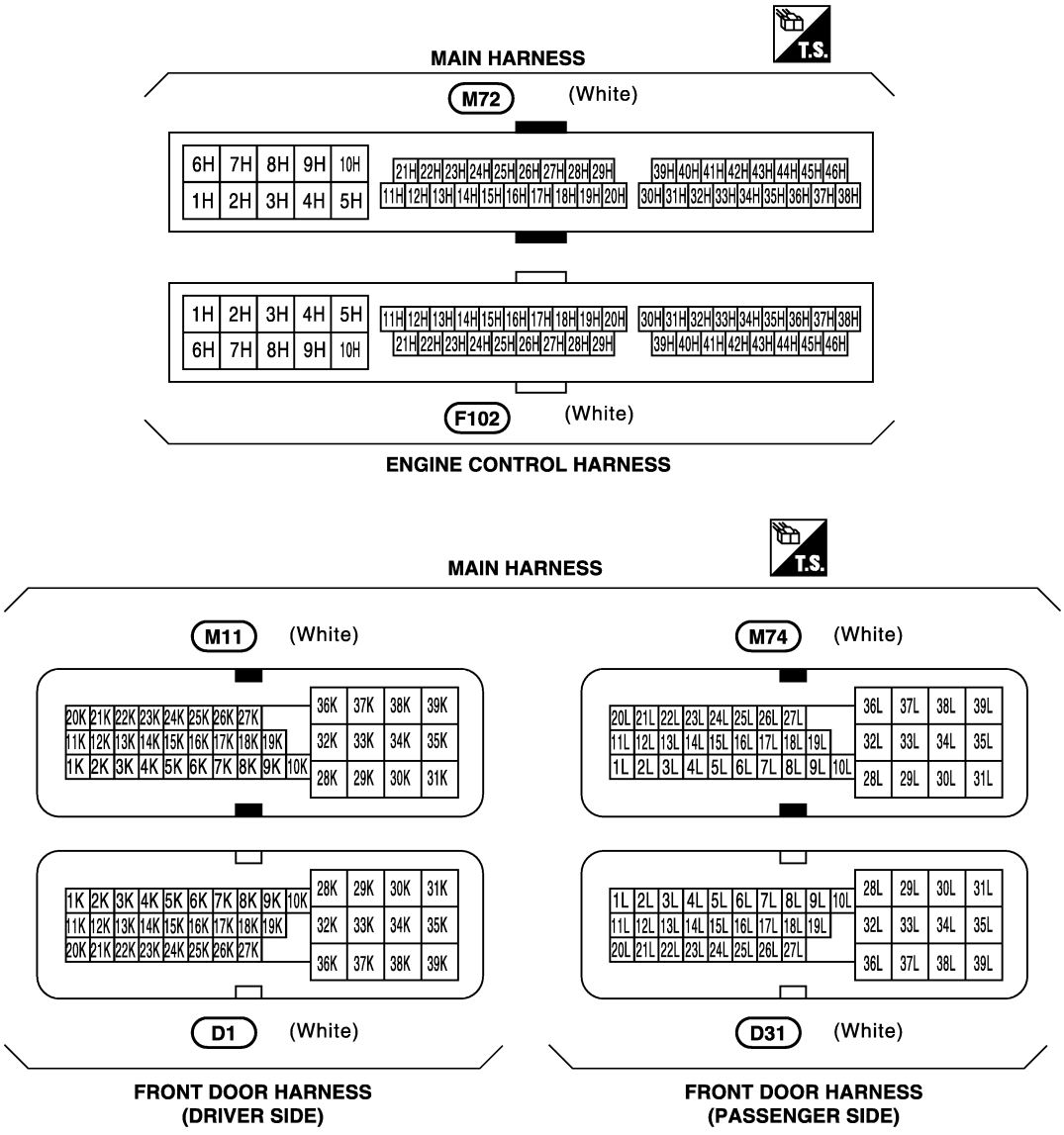
PFP:B4341

Terminal Arrangement

NKS000EL



CKIT0743E


MAIN HARNESS
T.S.
M72
(White)
6H 7H 8H 9H 10H
1H 2H 3H 4H 5H
21H 22H 23H 24H 25H 26H 27H 28H 29H
11H 12H 13H 14H 15H 16H 17H 18H 19H 20H
39H 40H 41H 42H 43H 44H 45H 46H
30H 31H 32H 33H 34H 35H 36H 37H 38H
1H 2H 3H 4H 5H
6H 7H 8H 9H 10H
11H 12H 13H 14H 15H 16H 17H 18H 19H 20H
21H 22H 23H 24H 25H 26H 27H 28H 29H
30H 31H 32H 33H 34H 35H 36H 37H 38H
39H 40H 41H 42H 43H 44H 45H 46H
F102
(White)
ENGINE CONTROL HARNESS
MAIN HARNESS
T.S.
M11
(White)
20K 21K 22K 23K 24K 25K 26K 27K
11K 12K 13K 14K 15K 16K 17K 18K 19K
1K 2K 3K 4K 5K 6K 7K 8K 9K 10K
36K 37K 38K 39K
32K 33K 34K 35K
28K 29K 30K 31K
M74
(White)
20L 21L 22L 23L 24L 25L 26L 27L
11L 12L 13L 14L 15L 16L 17L 18L 19L
1L 2L 3L 4L 5L 6L 7L 8L 9L 10L
36L 37L 38L 39L
32L 33L 34L 35L
28L 29L 30L 31L
1K 2K 3K 4K 5K 6K 7K 8K 9K 10K
11K 12K 13K 14K 15K 16K 17K 18K 19K
20K 21K 22K 23K 24K 25K 26K 27K
28K 29K 30K 31K
32K 33K 34K 35K
36K 37K 38K 39K
D1
(White)
1L 2L 3L 4L 5L 6L 7L 8L 9L 10L
11L 12L 13L 14L 15L 16L 17L 18L 19L
20L 21L 22L 23L 24L 25L 26L 27L
28L 29L 30L 31L
32L 33L 34L 35L
36L 37L 38L 39L
D31
(White)
FRONT DOOR HARNESS
(DRIVER SIDE)
FRONT DOOR HARNESS
(PASSENGER SIDE)

CKIT0158E

STANDARDIZED RELAY

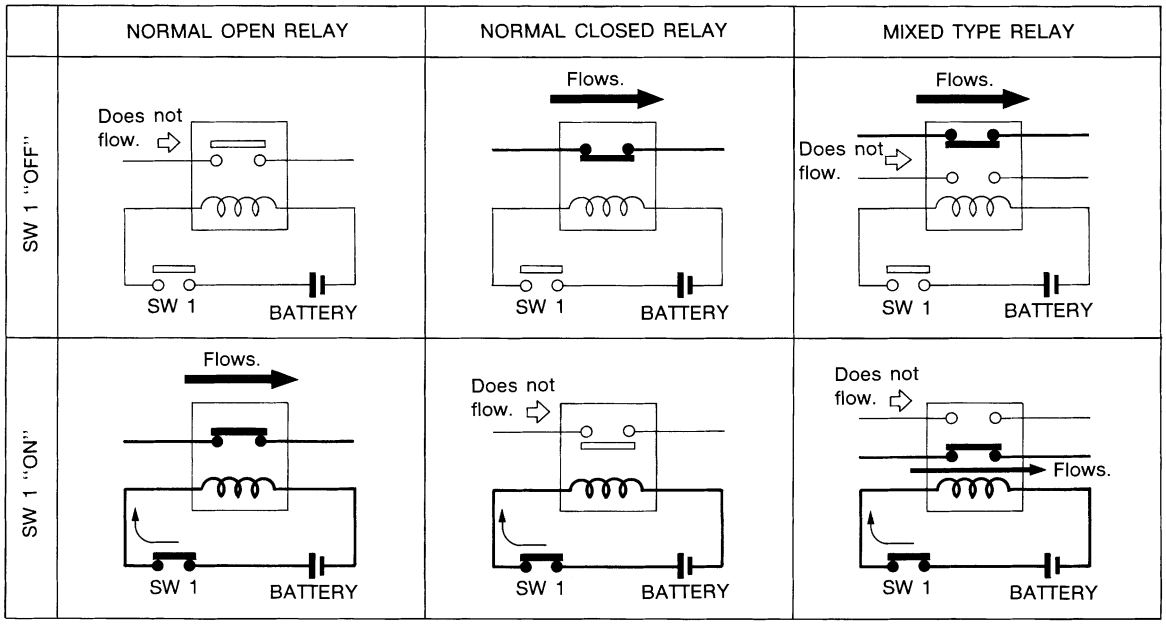
PFP:00011

Description

NKS000EM

NORMAL OPEN, NORMAL CLOSED AND MIXED TYPE RELAYS

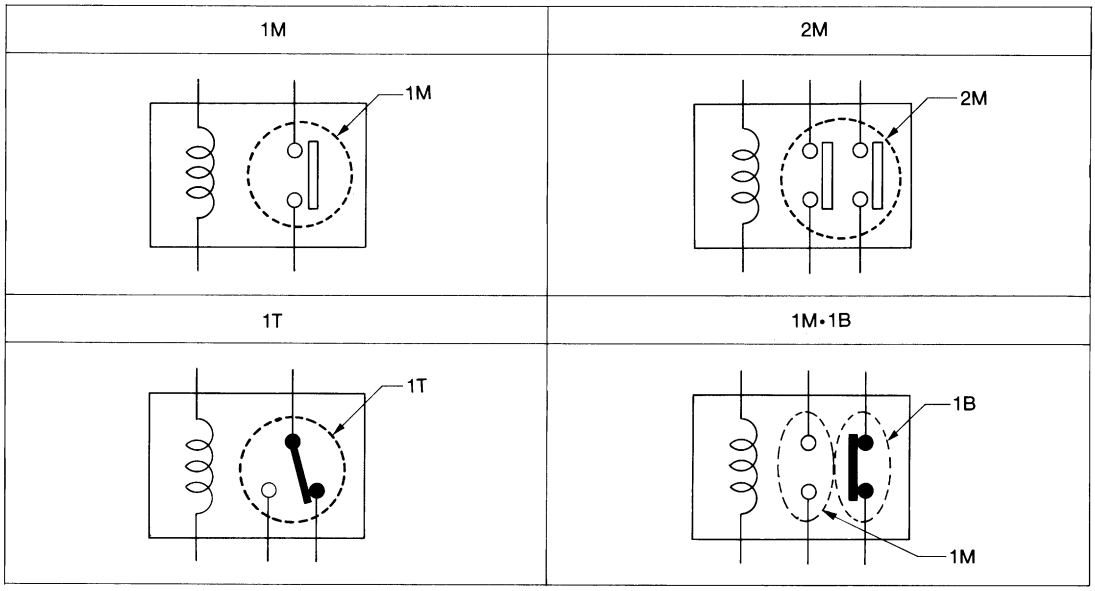
Relays can mainly be divided into three types: normal open, normal closed and mixed type relays.



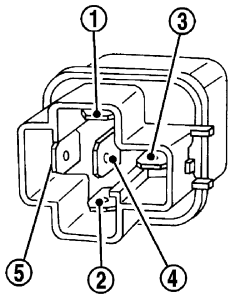
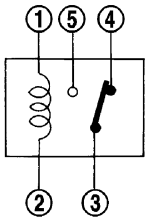
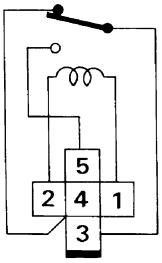
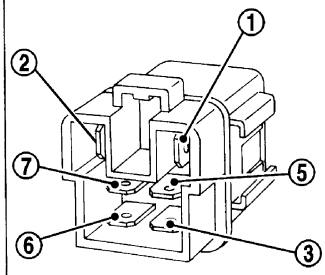
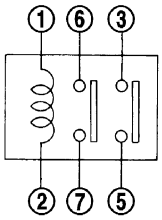
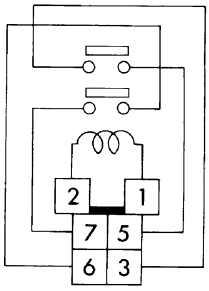
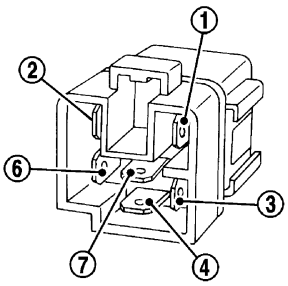
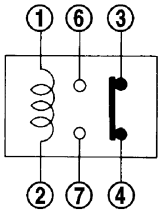
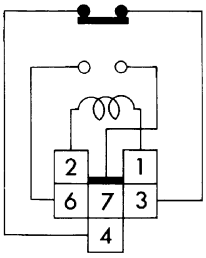
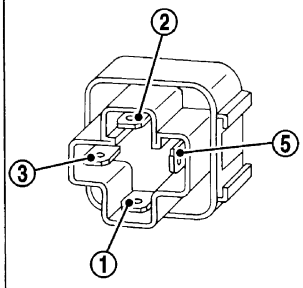
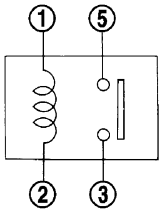
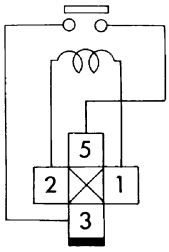
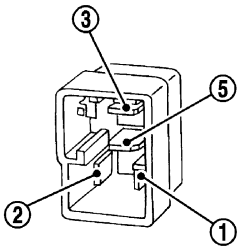
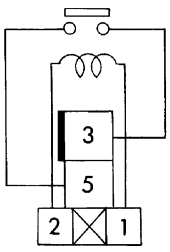
SEL881H

TYPE OF STANDARDIZED RELAYS

1M ..... 1 Make
2M ..... 2 Make
1T ..... 1 Transfer
1M·1B ..... 1 Make 1 Break



SEL882H

Type	Outer view	Circuit	Connector symbol and connection	Case color
1T				BLACK
2M				BROWN
1M•1B				GRAY
1M				BLUE
				

The arrangement of terminal numbers on the actual relays may differ from those shown above.

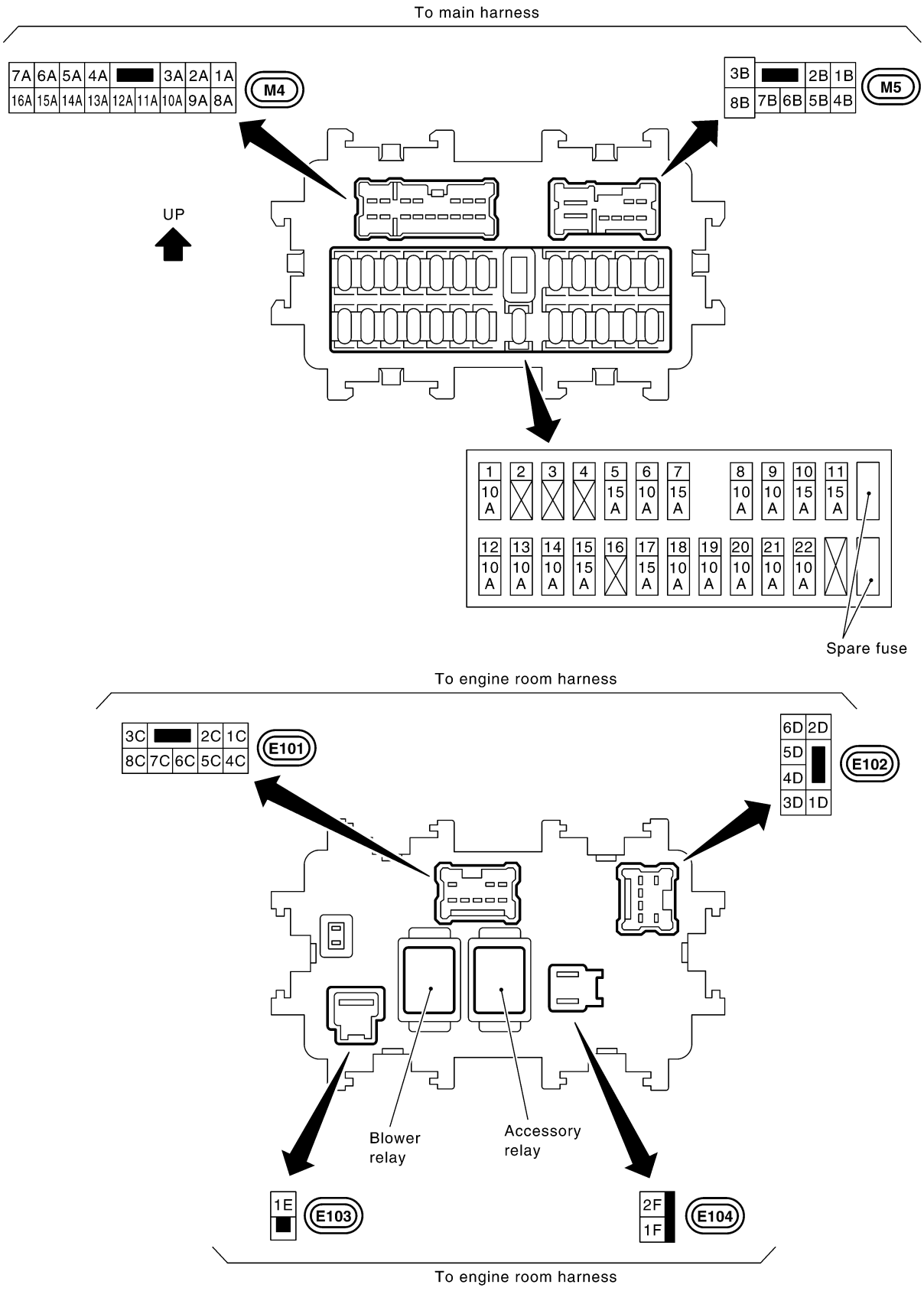
SEL188W

FUSE BLOCK - JUNCTION BOX (J/B)

PFP:24350

Terminal Arrangement

NKS000EN



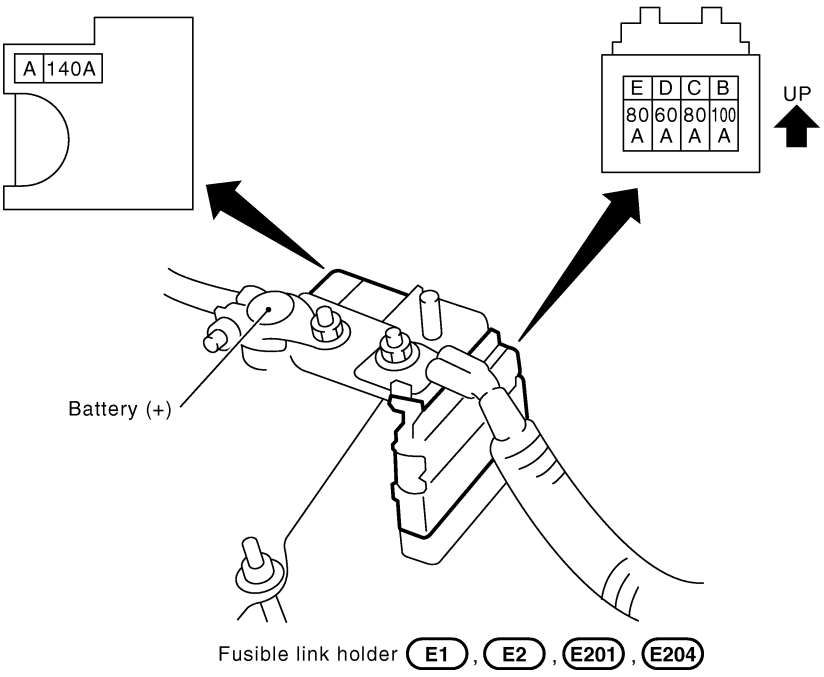
CKIT0363E

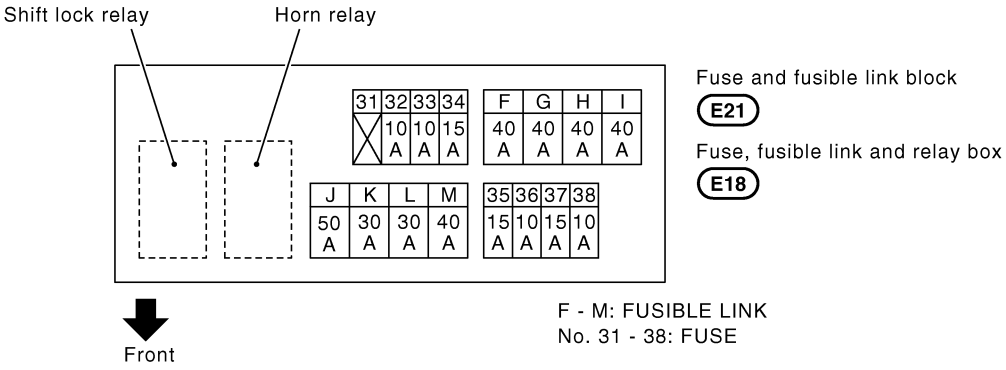
FUSE, FUSIBLE LINK AND RELAY BOX

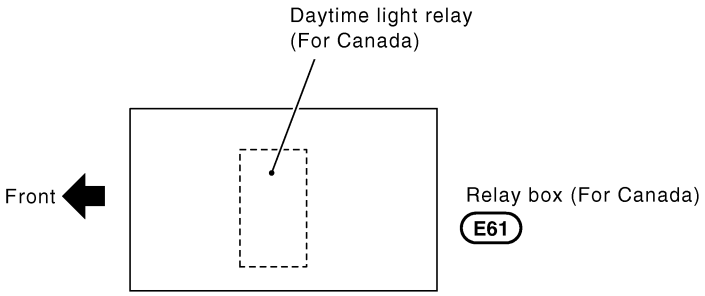
PFP:24382

Terminal Arrangement

NKS000EO







CKIT0877E

SECTION PR
PROPELLER SHAFT

CONTENTS

PRECAUTIONS 2
Precautions for Propeller Shaft 2
PREPARATION 3
Special Service Tools 3
NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 4
NVH Troubleshooting Chart 4
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APPEARANCE AND NOISE INSPECTION 5
PROPELLER SHAFT VIBRATION 5
Components 6
Removal and Installation 6
REMOVAL 6
INSPECTION 7
INSTALLATION 8
SERVICE DATA AND SPECIFICATIONS (SDS) 10
General Specifications 10
Propeller Shaft Runout Limit 10

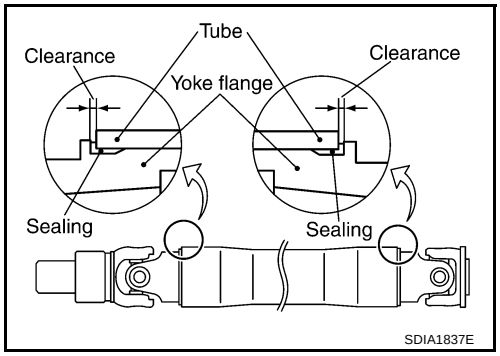
PRECAUTIONS

PFP:00001

Precautions for Propeller Shaft

NDS00001

- If propeller shaft is dropped, replace propeller shaft with new one.
- Do not hit, impact, or damage tube.
- If damage such as cracks or peeling off in sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- If there is chipping or bend in tube, replace propeller shaft with new one.
- Check that the clearance is between tube and yoke flange. If there is no clearance, replace propeller shaft.
- Protect propeller shaft with protector (special service tool) during work.



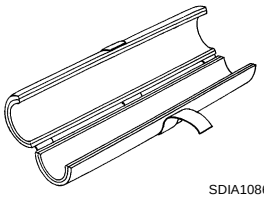
PREPARATION

PFP:00002

Special Service Tools

NDS00002

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
— (J-46208) Propeller shaft protector  SDIA1086E	Removing and installing propeller shaft

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NDS00003

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

		Reference page	PR-5	—	—	—	—	PR-5	PR-7	NVH in RFD section	NVH in FAX, RAX, FSU, and RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in BR section	NVH in PS section
		Possible cause and SUSPECTED PARTS	Uneven rotating torque	Center bearing improper installation	Excessive center bearing axial end play	Center bearing mounting (insulator) cracks, damage or deterioration	Excessive joint angle	Rotation imbalance	Excessive runout	DIFFERENTIAL	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	Noise		×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Shake			×			×				×	×	×	×	×	×
	Vibration		×	×	×	×	×	×	×		×	×		×		×

×: Applicable

REAR PROPELLER SHAFT

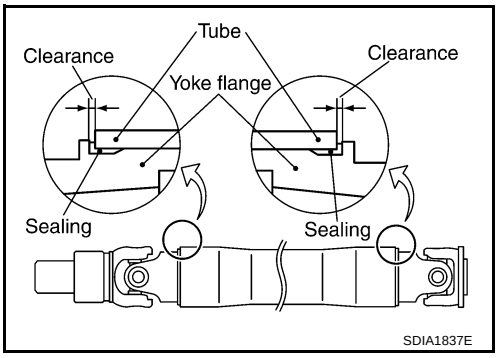
PFP:37000

On-Vehicle Inspection

NDS00004

APPEARANCE AND NOISE INSPECTION

- Check the propeller shaft tube surface for dents or cracks. If damaged, replace propeller shaft assembly.
- If damage such as cracks or peeling off sealing (joint between yoke and tube) is found, replace propeller shaft with new one.
- Check that the gap is between tube and yoke flange. If there is no gap, replace propeller shaft.

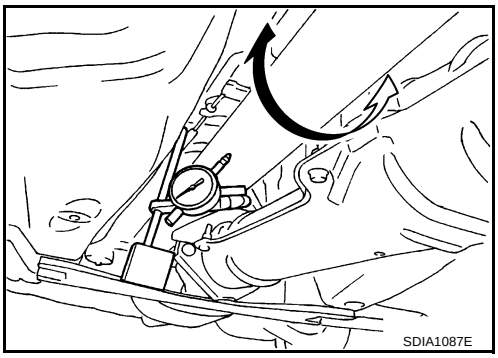


PROPELLER SHAFT VIBRATION

If vibration is present at high speed, inspect propeller shaft runout first.

1. Measure propeller shaft runout at runout measuring points by rotating final drive companion flange with hands.

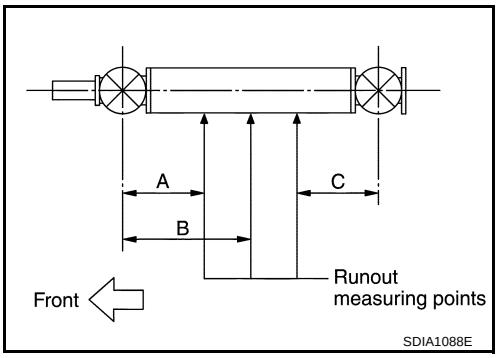
Propeller shaft runout limit : 1.5 mm (0.059 in) or less



Propeller shaft runout measuring points

Dimension for M/T models
A: 340 mm (13.39 in)
B: 660.5 mm (26.00 in)
C: 340 mm (13.39 in)

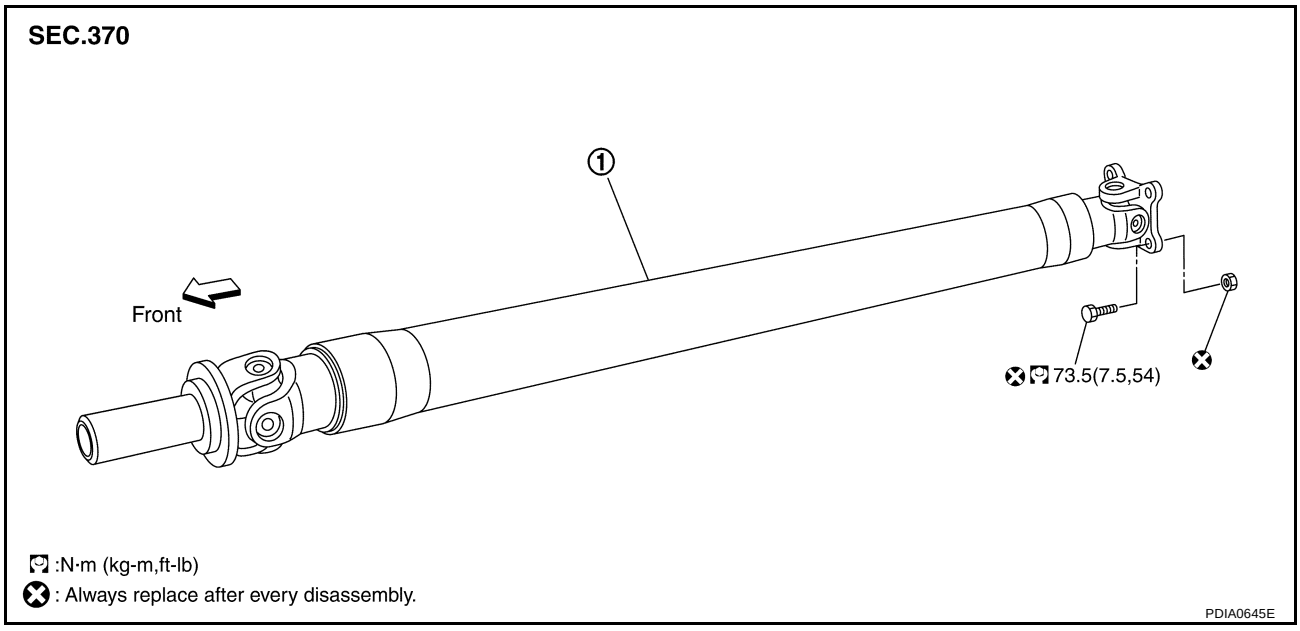
Dimension for A/T models
A: 340 mm (13.39 in)
B: 641.5 mm (25.26 in)
C: 340 mm (13.39 in)



2. If runout still exceeds specifications, separate propeller shaft at final drive companion flange; then rotate companion flange 90, 180, 270 degrees and install propeller shaft.
3. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
4. Check the vibration by driving vehicle.

Components

NDS00005



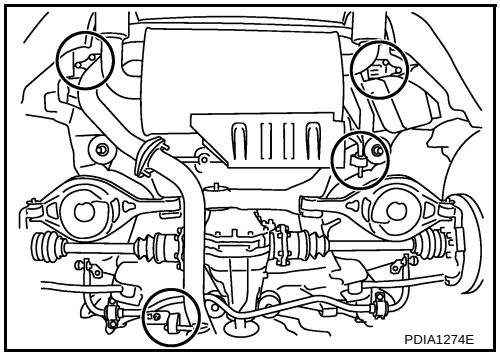
1. Propeller shaft

Removal and Installation

NDS00006

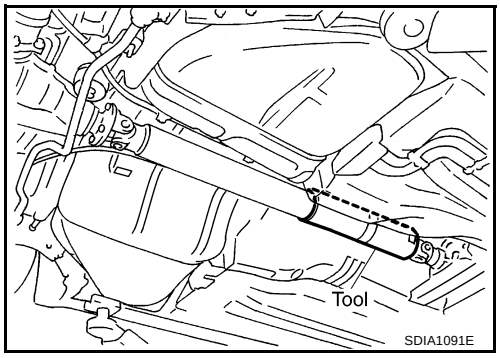
REMOVAL

1. Set transmission to neutral position.
2. Release parking brake.
3. To keep space for removing propeller shaft, first detach rear-side mounts (4 locations) of exhaust tube and main muffler. Then lower exhaust tube and main muffler, and support them with jack or equivalent. (See the figure.)



4. Attach protector (special service tool) to propeller shaft. (When reused.)

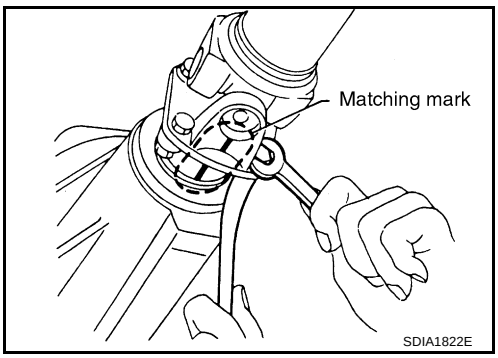
Tool number : — (J-46208)



5. Put matching marks on flange yoke with final drive companion flange. (When reused.)

CAUTION:
For matching mark, use paint. Do not damage flange yoke and companion flange.

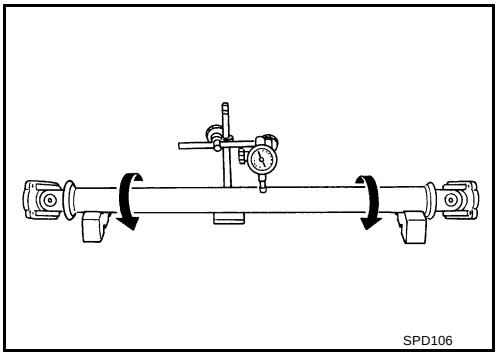
6. Remove propeller shaft fixing bolts and nuts. Then propeller shaft.



INSPECTION

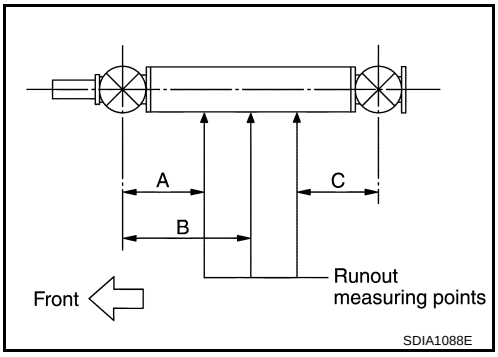
- Inspect propeller shaft runout at measuring points. If runout exceeds specifications, replace propeller shaft assembly.

Propeller shaft runout limit : 1.5 mm (0.059 in) or less



Propeller shaft runout measuring points

Dimension for M/T models	**A: 340 mm (13.39 in)**
	B: 660.5 mm (26.00 in)
	C: 340 mm (13.39 in)
Dimension for A/T models	**A: 340 mm (13.39 in)**
	B: 641.5 mm (25.26 in)
	C: 340 mm (13.39 in)

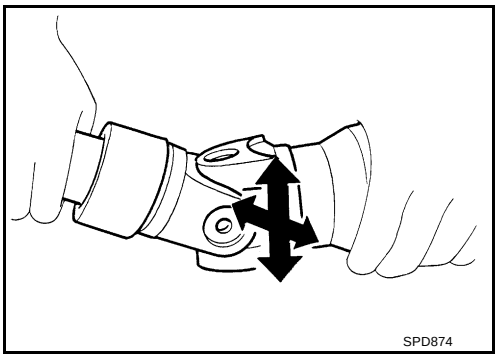


- Inspect journal axial play. If the play exceeds specifications, replace propeller shaft assembly.

Journal axial play : 0 mm (0 in)

- Check propeller shaft for bend and damage. If damage is detected, replace propeller shaft assembly.

CAUTION:
Do not disassemble joints.



INSTALLATION

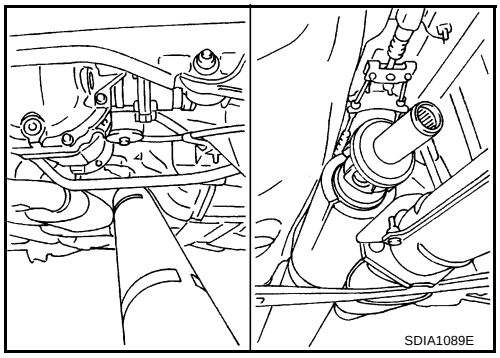
When Installing New Propeller Shaft

CAUTION:

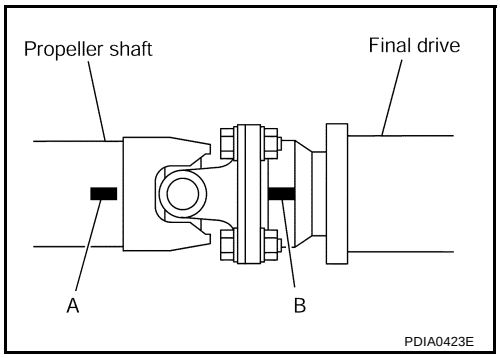
- **When installing propeller shaft, handle it carefully.**
- **Propeller shaft must be installed with packing material attached (delivered condition). Do not install propeller shaft with packing material removed.**

1. Insert propeller shaft with packing material between floor reinforcement and floor panel.

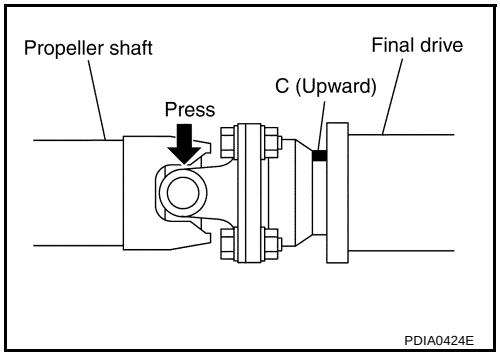
   CAUTION:
   After insertion, check that shift control boot does not come off (M/T models).



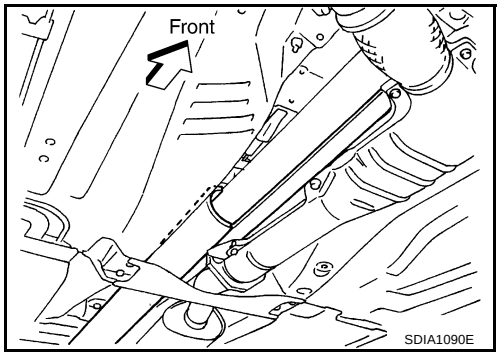
2. Install propeller shaft while aligning its matching mark A with the matching mark B on the joint as close as possible.
3. Temporarily tighten bolts and nuts.



4. Press down propeller shaft with matching mark C facing upward. Then tighten fixing bolts and nuts to the specified torque. Refer to PR-6, "Components" .



5. Remove packing material from propeller shaft.
6. Return exhaust system to its original position. For tightening torque, EX-3, "EXHAUST SYSTEM" .
7. After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive. Reinstall companion flange after rotating it by 90, 180, 270 degrees. Then perform driving test and check propeller shaft vibration again at each point.



When Installing Reused Propeller Shaft

CAUTION:

When installing propeller shaft, handle it carefully.

1. With protector (special service tool) attached, align matching marks to install propeller shaft to final drive companion flange, and then tighten to specified torque. Refer to PR-6, "Components" .
2. Remove protector (special service tool) from propeller shaft.
3. Return exhaust system to its original position. For tightening torque, EX-3, "EXHAUST SYSTEM" .
4. After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive. Reinstall companion flange after rotating it by 90, 180, 270 degrees. Then perform driving test and check propeller shaft vibration again at each point.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NDS00007

Applied model	VQ35DE	
	M/T	A/T
Propeller shaft model	2S80A CFRP	
Number of joints	2	
Coupling method with transmission	Sleeve type	
Type of journal bearings	Shell type (Non-disassembly type)	
Distance between yokes	95 mm (3.74 in)	
Shaft length (Spider to spider)	1321 mm (52.007 in)	1283 mm (50.512 in)
Shaft outer diameter	85.0 mm (3.346 in)	

Propeller Shaft Runout Limit

NDS00008

Model	2S80A CFRP
Propeller shaft runout limit	1.5 mm (0.059 in) or less

SECTION PS
POWER STEERING SYSTEM

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NGS000FR

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NGS000FS

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Steering System

NGS00003

- Before disassembly, thoroughly clean the outside of the unit.
- Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- For easier and proper assembly, place disassembled parts in order on a parts rack.
- Use nylon cloth or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.
- Before inspection or reassembly, carefully clan all parts in order on a parts rack.
- Before assembly, apply a coat of recommended power steering fluid to hydraulic parts. Petroleum jelly may be applied to O-rings and seals. Do not use any grease.
- Replace all gaskets, seals and O-rings. Avoid damaging O-rings, seals and gaskets during installation. Perform functional tests whenever designated.

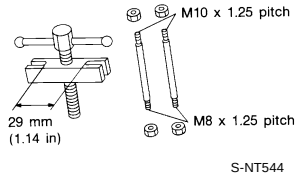
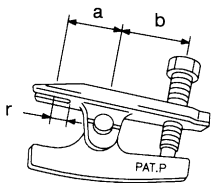
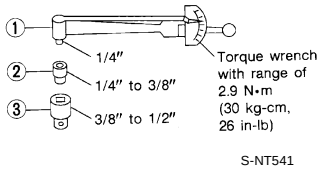
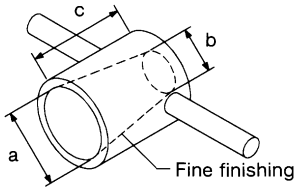
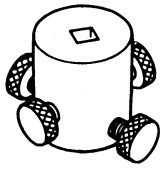
PREPARATION

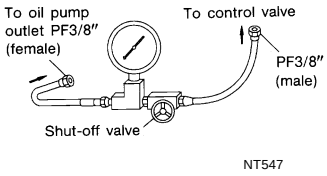
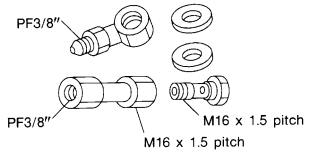
PFP:00002

Special Service Tools

NGS00004

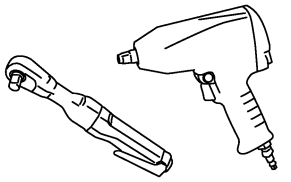
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST27180001 (J-25726-A) Steering wheel puller		Removing steering wheel
HT72520000 (J-25730-A) Ball joint remover a: 33 mm (1.30 in) b: 50 mm (1.97 in) r: 11.5 mm (0.453 in)		Removing outer socket ball joint
ST3127S000 (See J-25765-A) Preload gauge 1. GG9103000 (J-25765-A) Torque wrench 2. HT62940000 (–) Socket adapter 3. HT62900000 (–) Socket adapter		Inspecting of rotating torque
KV48104400 (–) Teflon ring installation tool a: 50 mm (1.97 in) dia. b: 36 mm (1.42 in) dia. c: 100 mm (3.94 in)		Installing of rack Teflon ring
KV48103400 (–) Torque adapter		Inspecting rotating torque

Tool number (Kent-Moore No.) Tool name	Description
KV48103500 (J-26357) Pressure gauge  NT547	Measuring oil pump relief pressure
KV48102500 (J-33914) Pressure gauge adapter  NT542	Measuring oil pump relief pressure

Commercial Service Tools

NGS00005

Tool name	Description
Power tool  PBIC0190E	Removing oil pump and wheel nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NGS00006

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		PS-6	PS-6	PS-21	PS-21	PS-21	PS-6	PS-7	PS-21	EM-12	PS-7	PS-15	PS-17	PS-10	PS-10	PS-17	NVH in PR section	NVH in RFD section	NVH in FAX, RAX, FSU, RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in BR section
Possible cause and suspected parts		Fluid level	Air in hydraulic system	Outer socket ball joint swinging force	Outer socket ball joint sliding torque	Outer socket ball joint end play	Steering fluid leakage	Steering wheel play	Steering gear rack sliding force	Drive belt looseness	Improper steering wheel	Improper installation or looseness of tilt lock lever	Mounting rubber deterioration	Steering column deformation or damage	Improper installation or looseness of steering column	Steering linkage looseness	PROPELLER SHAFT	DIFFERENTIAL	AXLE and SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES
Symptom	Noise	×	×	×	×	×	×	×	×	×							×	×	×	×	×	×	×
	Shake										×	×	×				×		×	×	×	×	×
	Vibration										×	×	×	×	×		×		×	×		×	
	Shimmy										×	×	×			×			×	×	×		×
	Judder												×			×			×	×	×		×

×: Applicable

POWER STEERING FLUID

PFP:KLF20

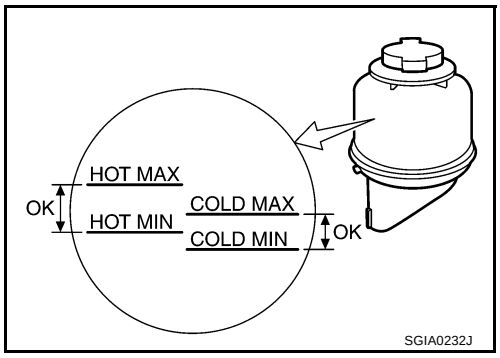
Checking Fluid Level

NGS00007

- Stop engine before performing a fluid level check.
- Ensure that fluid level is between the MAX range and MIN level.
- Because fluid level differs within the HOT range and the COLD range, check it carefully.

HOT : Fluid temperatures from 50 to 80 °C (122 to 176°F)

COLD : Fluid temperatures from 0 to 30°C (32 to 86°F)



CAUTION:

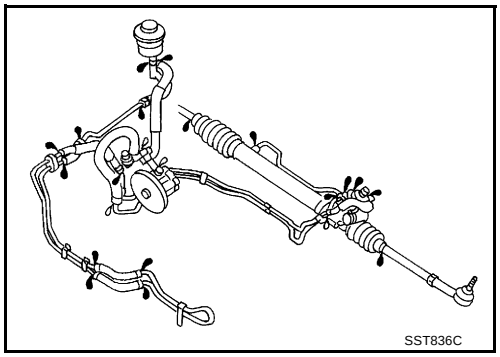
- **Do not overfill the MAX level.**
- **Do not reuse any used power steering fluid.**

Checking Fluid Leakage

NGS00008

Check that hydraulic piping lines for improper attachment and for leaks, cracks, damage, loose connections, chafing or deterioration.

1. Run engine until fluid temperature reaches 50 to 80° C (122 to 176°F) in reservoir tank. Keep engine speed idle.
2. Turn steering wheel right-to-left several times.
3. Hold steering wheel at each “lock” position for five seconds to check fluid leakage.



CAUTION:

Do not hold steering wheel in a locked position for more than 10 seconds. (There is the possibility that oil pump may be damaged.)

4. If fluid leakage at connections is noticed, then loosen flare nut and then retighten. Do not over tighten connector as this can damage O-ring, washer and connector.
5. If fluid leakage at the connectors is noticed, then loosen the flare nut and retighten it.
6. Check steering gear boots for accumulation of fluid indicating a from steering gear.

Air Bleeding Hydraulic System

NGS00009

Incomplete air bleeding causes the following. When this happens, bleed air again.

- Generation of air bubbles in reservoir tank
- Generation of clicking noise in oil pump
- Excessive buzzing in oil pump

NOTE:

When vehicle is stationary or while steering wheel is being turned slowly, some noise may be heard from oil pump or gear. This noise is normal and does not affect any system.

1. Stop engine, and then turn steering wheel fully to right and left several times.

CAUTION:

Do not allow steering fluid reservoir tank to go below the low-level line. Check tank frequenter and add fluid as needed.

2. Run engine at idle speed. Turn steering wheel fully to the right and then fully to the left, and keep for about three seconds. Then check whether a fluid leakage has occurred.
3. Repeat the 2nd procedure several times at about three seconds intervals.

CAUTION:

Do not hold steering wheel in the locked position more than 10 seconds. (There is the possibility that oil pump may be damaged.)

4. Check generation of air bubbles and cloud in fluid.
5. If air bubbles and the cloud don't fade, stop engine, hold air bleeding until air bubbles and the cloud fade. Perform the 2nd and the 3rd procedures again.
6. Stop engine, check fluid level.

STEERING WHEEL

PFP:48430

On-Vehicle Inspection and Service

NGS0000A

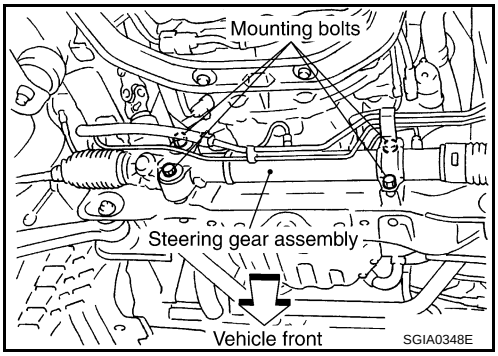
CHECKING CONDITION OF INSTALLATION

- Check installation condition of steering gear assembly, front suspension, axle and steering column.
- Check if movement exists when steering wheel is moved up and down, to the left and right and to the axial direction.

End play of the axle direction for steering wheel:

0 mm (0 in)

- Check if the mounting bolts for steering gear assembly are loose or not. Refer to PS-17, "POWER STEERING GEAR AND LINKAGE" .



CHECKING STEERING WHEEL PLAY

1. Set tires to the straight ahead, start engine, then turn steering wheel to the left and right lightly, and measure steering wheel movement on the outer circumference when steering wheel is turned up to the point where tires start moving.

Steering wheel play on the outer circumference : 0 - 35 mm (0 - 1.38 in)

CHECKING NEUTRAL POSITION ON STEERING WHEEL

- Check neutral position on steering wheel after confirming that front wheel alignment is correct. Refer to PS-35, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

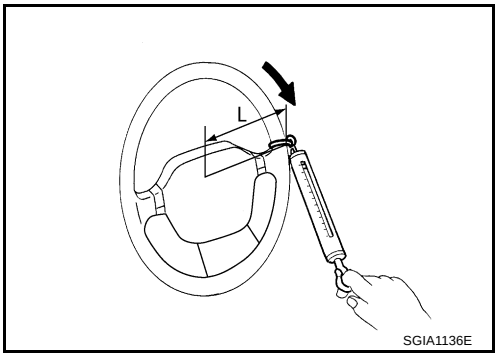
1. Set the vehicle to the straight ahead-direction, check if steering wheel is in the neutral position.
2. If it is not in the neutral position, remove steering wheel and reinstall it correctly.
3. If the neutral position cannot adjust in the two teeth of steering gear assembly, loosen tie-rod lock nuts of steering outer sockets, then adjust tie-rods by the same amount in the opposite direction.

CHECKING STEERING WHEEL TURNING FORCE

1. Park vehicle on a level and dry surface, set parking brake.
2. Start engine.
3. Bring power steering fluid up to adequate operating temperature. [Make sure temperature of fluid is approximately 50 to 80°C (122 to 176°F).]
4. Check steering wheel turning force when steering wheel has been turned 540° from neutral position.

Steering wheel turning force : 7.45 N·m (0.76 kg-m, 66 in-lb)

NOTE:
Multiply the distance (L) from the hook of spring scale to the center of steering wheel by the measurement value with a spring scale.



5. If steering wheel turning force is out of the specification, check rack sliding force and relief hydraulic pressure of oil pump. Regarding relief hydraulic pressure of oil pump, refer to PS-28, "CHECKING RELIEF OIL PRESSURE" .

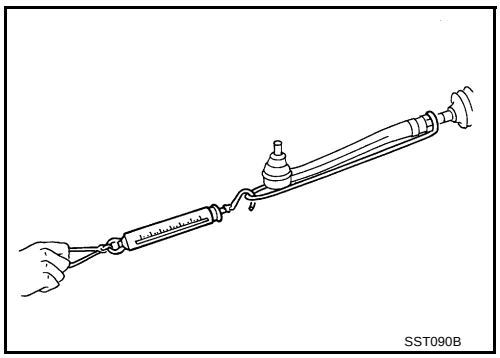
a. Disconnect lower joint and steering knuckle from steering gear assembly. Refer to PS-17, "Removal and Installation" , FAX-4, "Removal and Installation" .

b. Start and run engine at idle to make sure steering fluid has reached normal operating temperature.

c. While pulling outer socket slowly in ± 11.5 mm (± 0.453 in) range from neutral position, make sure rack sliding force is within specification.

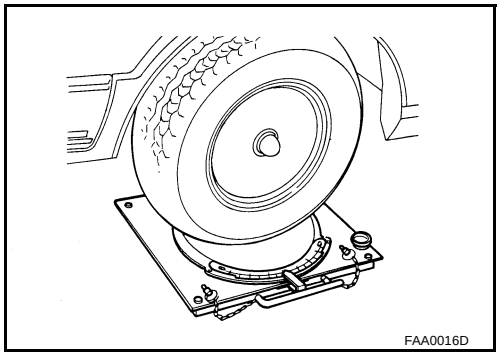
Rack sliding force: 171 - 234 N (17.4 - 23.9 kg, 38 - 53 lb)

d. If rack sliding force is not within specification, overhaul steering gear assembly.



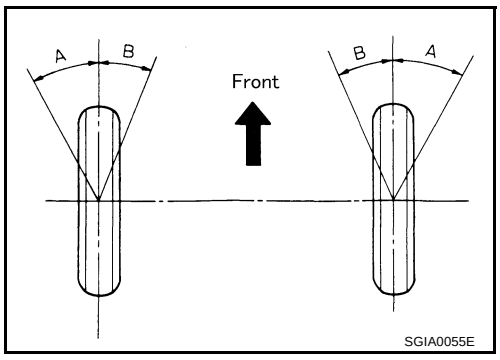
CHECKING FRONT WHEEL TURNING ANGLE

- Check front wheel turning angle after the toe-in inspection. Place front wheels on turning radius gauges and rear wheels on stands so that vehicle can be level. Check the maximum inner and outer wheel turning angles for LH and RH road wheels.



- Start engine and run at idle, turn steering wheel all the way right and left, measure the turning angle.

Inner wheel (Angle: A)	Minimum	35° 55' (35.9°)
	Nominal	38° 55' (38.9°)
	Maximum	39° 55' (39.9°)
Outer wheel (Angle: B)	Nominal	30° 40' (30.7°)

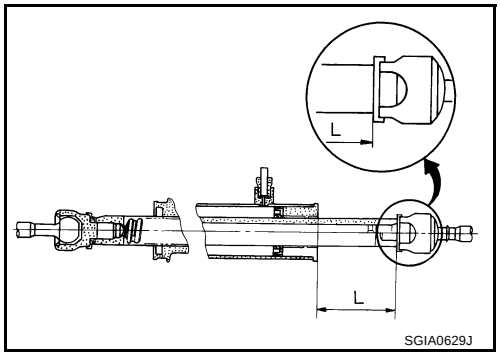


- If it is not within specification, measure rack strokes.

Rack stroke "L" : 64.5 mm (2.539 in)

- If rack stroke is out of specification, disassemble steering gear assembly to check rack stroke.
- Any turning angles are not adjustable. If any of steering angles are out of the specification, check if the following parts are wear or damaged.
  - Steering gear
  - Steering column
  - Front suspension components

  If found that they are worn or damaged, replace them with new ones respectively.



Removal and Installation

NGS0000B

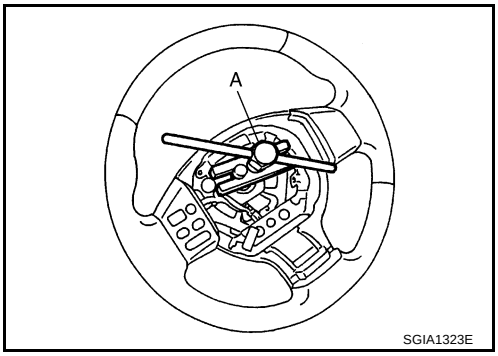
REMOVAL

NOTE:

When reconnecting spiral cable, fix cable with a tape so that fixing case and rotating part keep aligned. This will omit neutral position alignment procedure during spiral cable installation.

1. Set vehicle to the straight-ahead position.
2. Remove driver air bag module. Refer to SRS-40, "Removal and Installation" .
3. Remove steering wheel lock nut after steering is locked.
4. Remove steering wheel with the steering wheel puller A.

Tool number A: ST27180001 (J-25726-A)



INSTALLATION

Installation is the reverse order of removal. For tightening torque, refer to PS-10, "Removal and Installation" .

NOTE:

Check the spiral cable neutral position after replacing or rotating spiral cable. Refer to SRS-42, "Removal and Installation" .

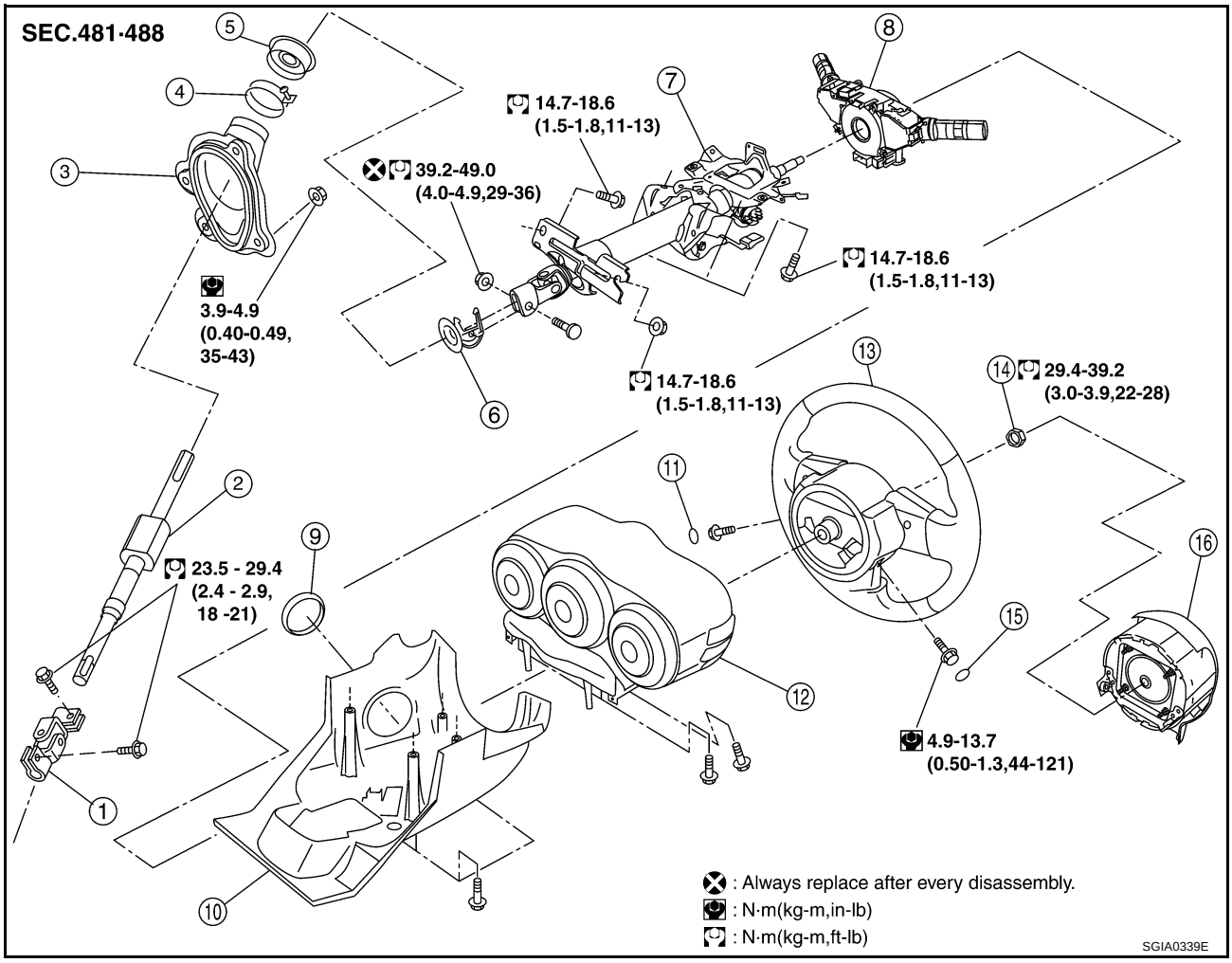
STEERING COLUMN

PFP:48810

Removal and Installation

NGS0000C

COMPONENTS



1.	Lower joint	2.	Lower shaft	3.	Hole cover
4.	Clamp	5.	Hole cover seal	6.	Collar
7.	Steering column assembly	8.	Combination switch & spiral cable	9.	Escutcheon
10.	Column lower cover	11.	Right lid	12.	Combination meter & column upper cover
13.	Steering wheel	14.	Steering wheel lock nut	15.	Left lid
16.	Driver air bag module				

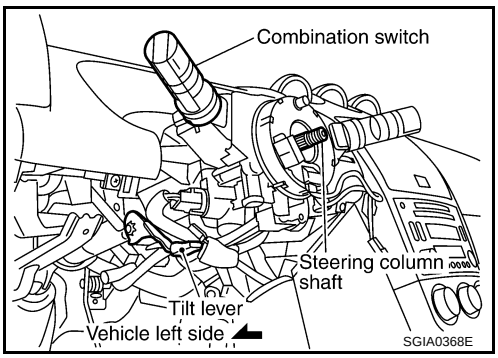
CAUTION:

- **Care must be taken not to give axial impact to steering column assembly during removal and installation.**
- **Care must be taken not to move steering gear during removal of steering column assembly.**

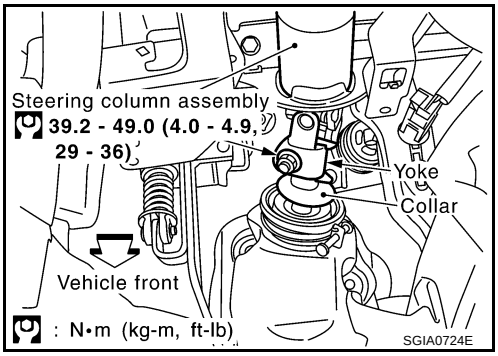
REMOVAL

1. Set vehicle to the straight ahead-direction.
2. Remove driver air bag module from steering wheel. Refer to SRS-40, "DRIVER AIR BAG MODULE" .
3. Disconnect steering switch connector, remove steering wheel lock nut, then remove steering wheel. Refer to PS-7, "STEERING WHEEL" .
4. Remove dash side finisher (LH). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Remove instrument driver panel lower. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
6. Remove column lower cover and combination meter (which is connected with steering column upper cover) from steering column assembly. Refer to DI-24, "Removal and Installation for Combination Meter" .

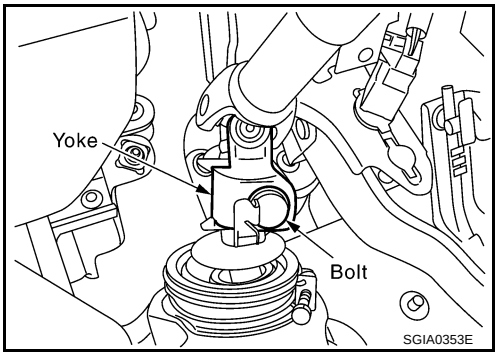
7. Remove combination switch & spiral cable from steering column assembly. Refer to SRS-42, "Removal and Installation" .
8. Disconnect the following connector from steering column assembly.
   - Steering lock harness connector
   - Ignition switch harness connector
   - Key switch harness connector
9. Remove control unit with VDC/TCS/ABS control unit. Refer to BRC-129, "VDC/TCS/ABS CONTROL UNIT" .
10. Disconnect brake switch harness connector.
11. Remove steering column shaft from lower shaft in the following procedure.



a. Remove lock nut from yoke.

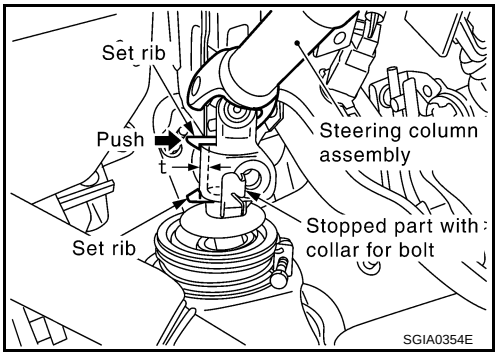


b. Turn steering wheel to the right to appear the head of bolt.
c. Remove the fixed part of collar for bolt to the outside of its head, remove bolt.

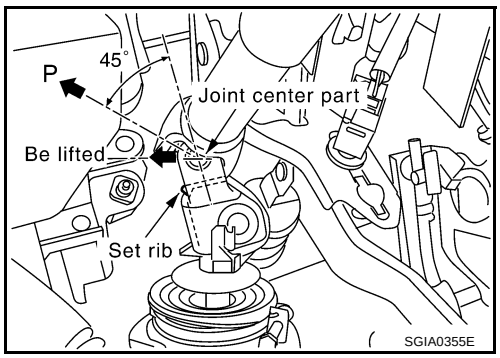


d. Remove the set lib of steering column assembly side from yoke, push it equal to the thick part of yoke.

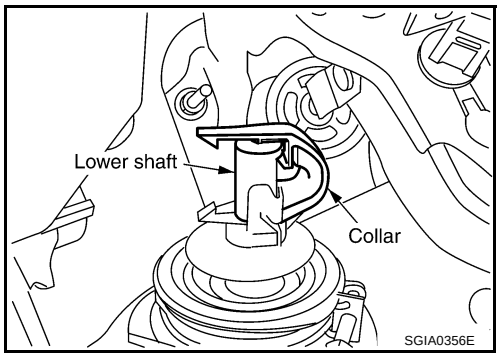
NOTE:
Because collar is set in lower shaft, if the set lib is pushed (action), joint center will be lifted in the opposite direction (reaction), and then the set lib will be in squeezed to the thick part of yoke.



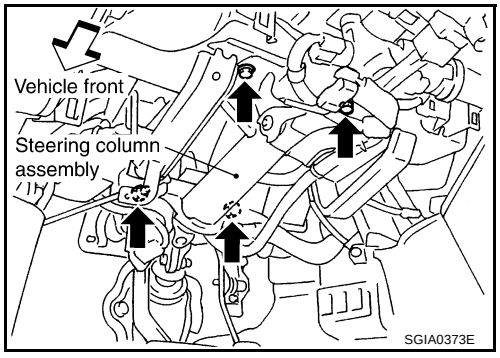
e. Yoke will be removed from collar, when steering column assembly is lifted about 45° oblique upward.



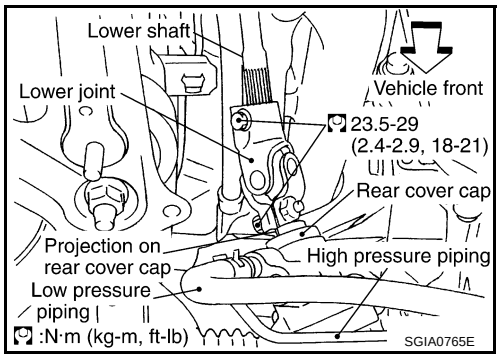
f. Collar remains on lower shaft.



12. Remove bolts and nut from steering member, remove steering column assembly from steering member.
13. Remove collar from lower shaft.
14. Remove hole cover seal from lower shaft.
15. Remove mounting bolts, then remove hole cover from panel.

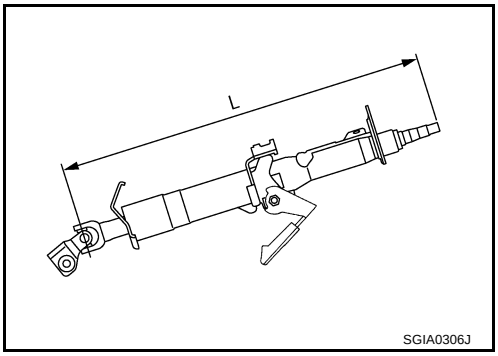


16. Raise vehicle, then loosen bolt for lower yoke of lower joint and remove joint together with lower shaft.



INSPECTION AFTER REMOVAL

- Check if there is something wrong with jacket tube of steering column assembly and collar etc. And then if they are damaged, replace with new one.
- If vehicle has a collision light shocked, check column length “L” as shown in the figure. Then if it is out of the specified value, replace with new one.



Specified value

Steering column length “L”: 548 mm (21.57 in)

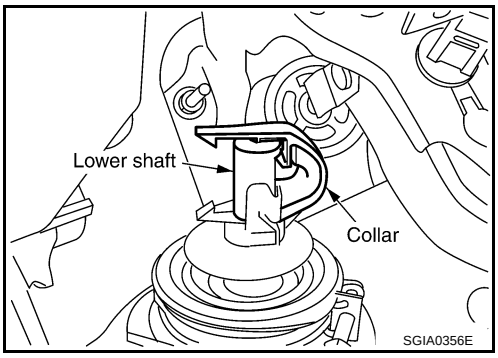
- Check the turning torque of steering column with preload gauge (SST: ST3127S000 [J-25765-A]). If it is out of the specified value, repair it or replace with new one.

Specified value

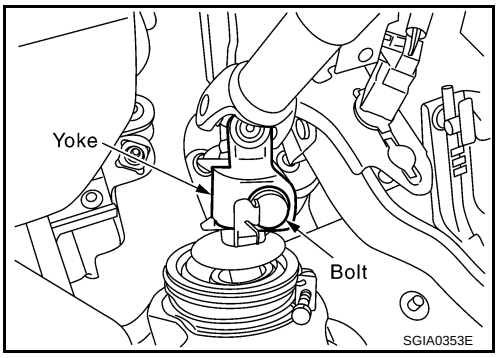
Turning torque : 0 - 0.2 N·m (0 - 0.02 kg-m, 0 - 2 in-lb)

INSTALLATION

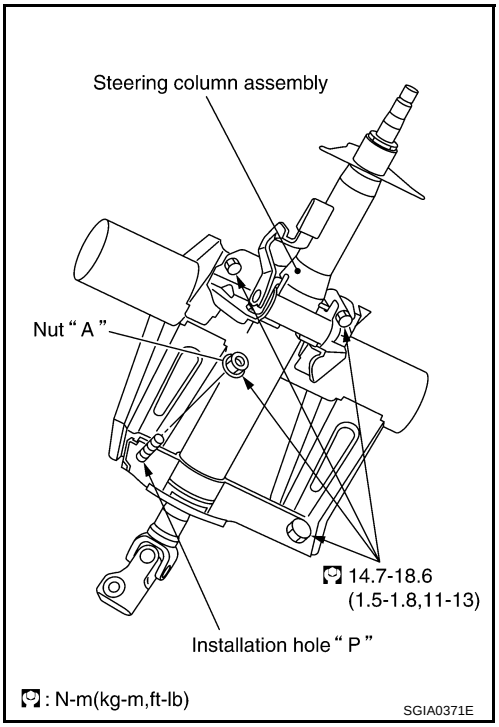
1. Install collar to lower shaft.



2. Install yoke of column shaft to collar, tack bolt and nut.



3. Put steering column assembly (installation hole “P”) on bolt for steering member side and install nut “A” then tighten it together with the other bolts at the specified torque.
4. Connect yoke and collar with bolt, tighten nut at the specified torque.



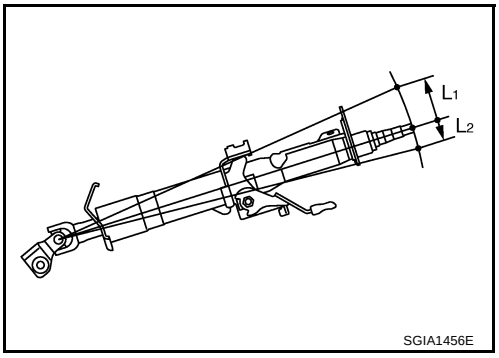
INSPECTION AFTER INSTALLATION

- After installing steering column to vehicle, check tilt device and its operation range “L_1” , “L_2” .

Tilt operating range “L_1 ” : 28 - 32 mm (1.10 - 1.26 in)

“L_2 ” : 13 - 17 mm (0.51 - 0.67 in)

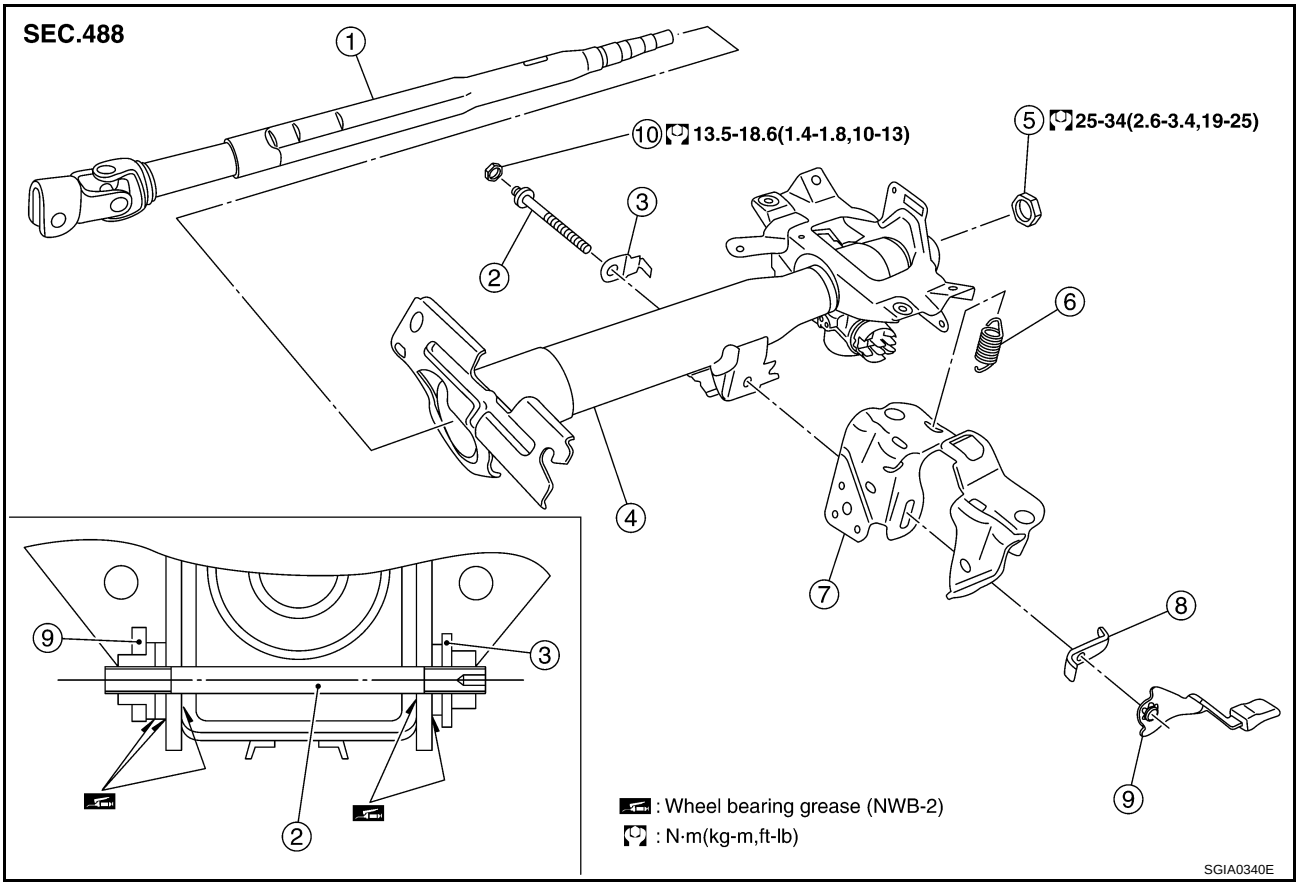
- Check if steering operation can turn to the end of the left and right smoothly.



Disassembly and Assembly

NGS0000D

COMPONENTS

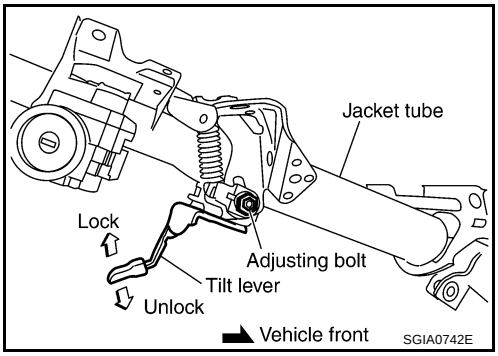


1. Steering column shaft
2. Adjusting bolt
3. Adjusting stopper
4. Jacket tube
5. Steering column shaft lock nut
6. Spring
7. Column mounting bracket
8. Tilt lever stopper
9. Tilt lever
10. Lock nut

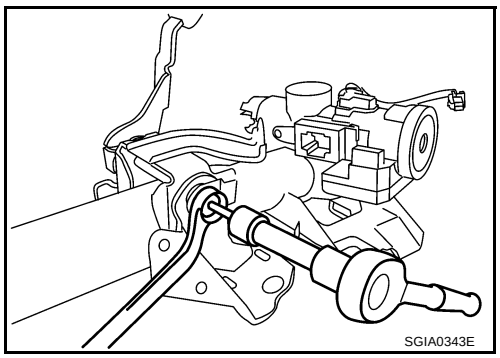
DISASSEMBLY

1. Remove steering column shaft lock nut, then remove steering column shaft from front side of jacket tube.
2. Remove tilt device from jacket tube.
3. Remove lock nut and adjusting stopper according to the following procedure.

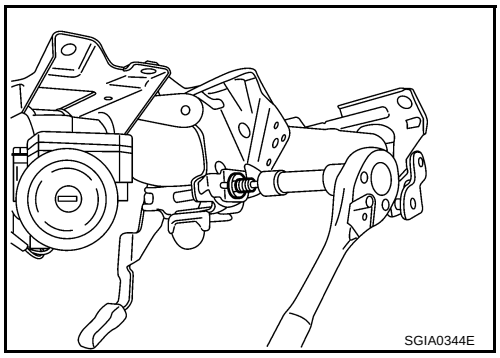
a. Turn tilt lever to the unlock side.
b. Remove spring from column mounting bracket.



c. Lock adjusting bolt, then remove lock nut.



d. Remove adjusting bolt, adjusting stopper, column mounting bracket, tilt lever stopper and tilt lever from jacket tube.



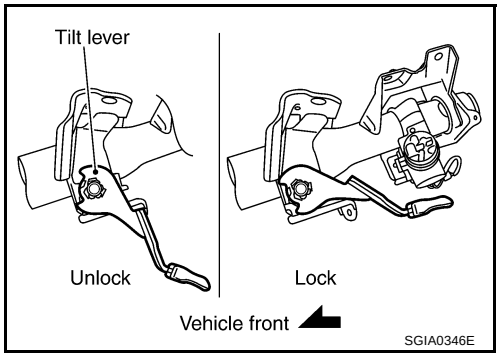
INSPECTION AFTER DISASSEMBLY

- Check if there is something wrong with steering column shaft and bearing. And then if they are damaged, replace with new one.
- Check if there is something wrong with the component of tilt device. And then if it is damaged, replace with new one.

ASSEMBLY

1. Install tilt device to jacket tube. Refer to PS-15, "Disassembly and Assembly" .

   NOTE:
   - Turn tilt lever to unlock side while at work to make it easier.
   - That can avoid column shaft's sudden descent when tilt lever is operated on vehicle.



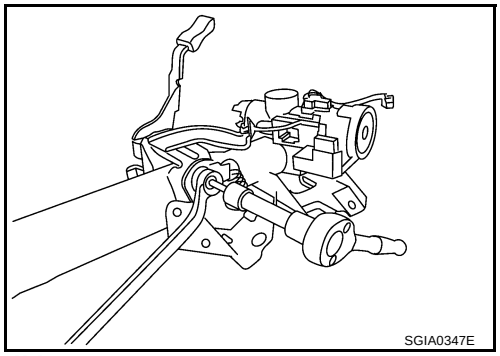
2. When tilt lever is in the locked position (operation range is about 40°), tighten lock nut at the specified torque to make tilt lever locked.

   Tightening torque:

   13.5 - 18.6 N·m (1.4 - 1.8 kg-m, 10 - 13 ft-lb)

3. Apply grease to the part shown in the figure of component. Refer to PS-15, "Disassembly and Assembly" .
4. Install steering column shaft to jacket tube, tighten steering column shaft lock nut at the specified torque.

   Tightening torque : 25 - 34 N·m (2.6 - 3.4 kg-m, 19 - 25 ft-lb)



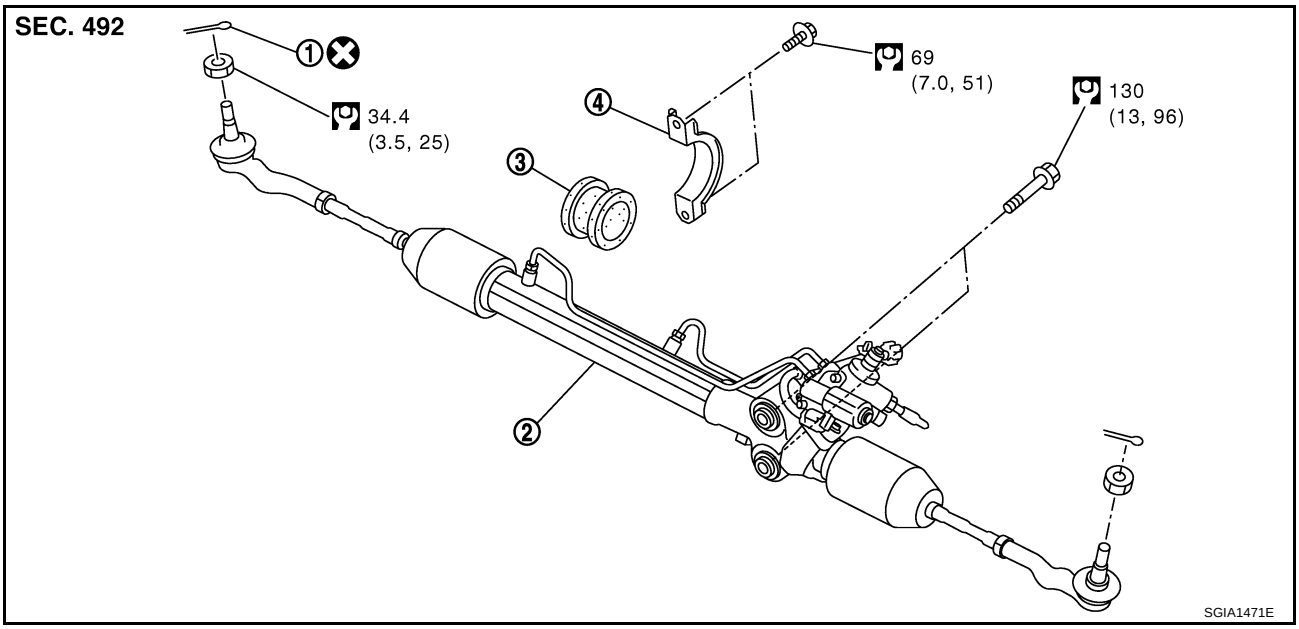
POWER STEERING GEAR AND LINKAGE

PFP:49001

Removal and Installation

NGS0000E

COMPONENTS



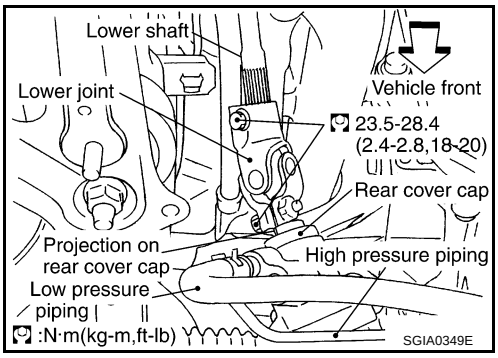
1. Cotter pin
2. Steering gear assembly
3. Rack mounting insulator
4. Rack mounting bracket

Refer to GI-11, "Components" , for the symbols in the figure.

CAUTION:
Spiral cable may snap due to steering operation if steering column is separated from steering gear assembly. Therefore fix steering wheel with a string to avoid turns.

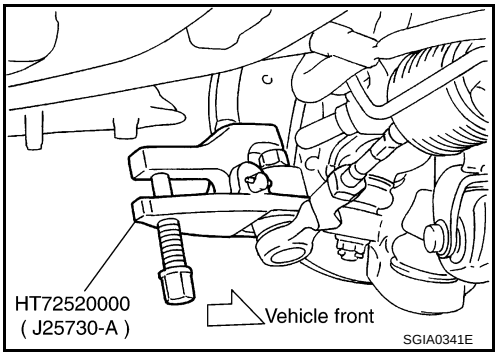
REMOVAL

1. Set wheels in the straight-ahead position.
2. Remove undercover and tires from vehicle with power tool.
3. Remove front crossbar. Refer to FSU-8, "Components" .
4. Confirm slit of lower joints fits with the projection on rear cover cap, furthermore marking position on steering gear assembly nearly fits with the projection on rear cover cap.
5. Remove cotter pin at steering outer socket, then loosen mounting nut.

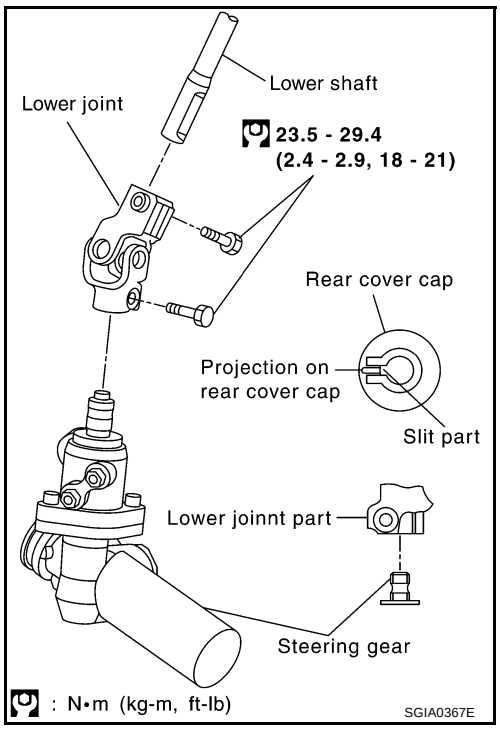


6. Use a ball joint remover (SST) to remove steering outer socket from steering knuckle. Be careful not to damage ball joint boot.

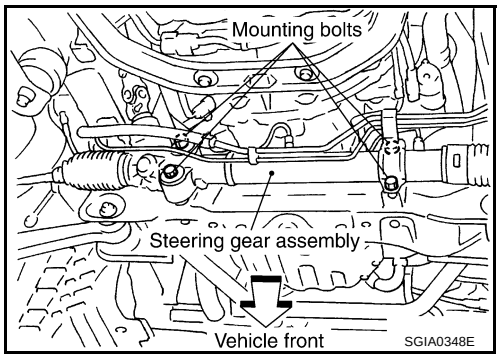
   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (SST) from coming off.
7. Remove oil pipings (high pressure side and low pressure side) from steering gear assembly, then drain fluid from pipings.



8. Loosen bolt on upper yoke of lower joint and remove bolt on lower yoke of joint, then slide lower joint into lower shaft. Separate steering gear assembly from lower shaft.
9. Tack bolt on upper yoke of lower joint, fix lower joint to lower shaft.



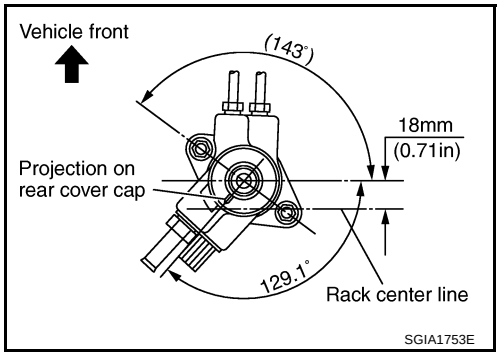
10. Remove the fixing bolt and remove steering gear assembly, rack mounting bracket and insulator from vehicle.



INSTALLATION

- Refer to PS-17, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- After removing/installing or replacing steering components, check wheel alignment. Refer to FSU-6, "Wheel Alignment Inspection" .
- When steering wheel is set in the straight ahead direction, confirm slit of lower joint fits with the projection on rear cover cap, furthermore marking position on steering gear assembly nearly fits with the projection on rear cover cap.
- After installation, bleed air from piping. Refer to PS-6, "Air Bleeding Hydraulic System" .



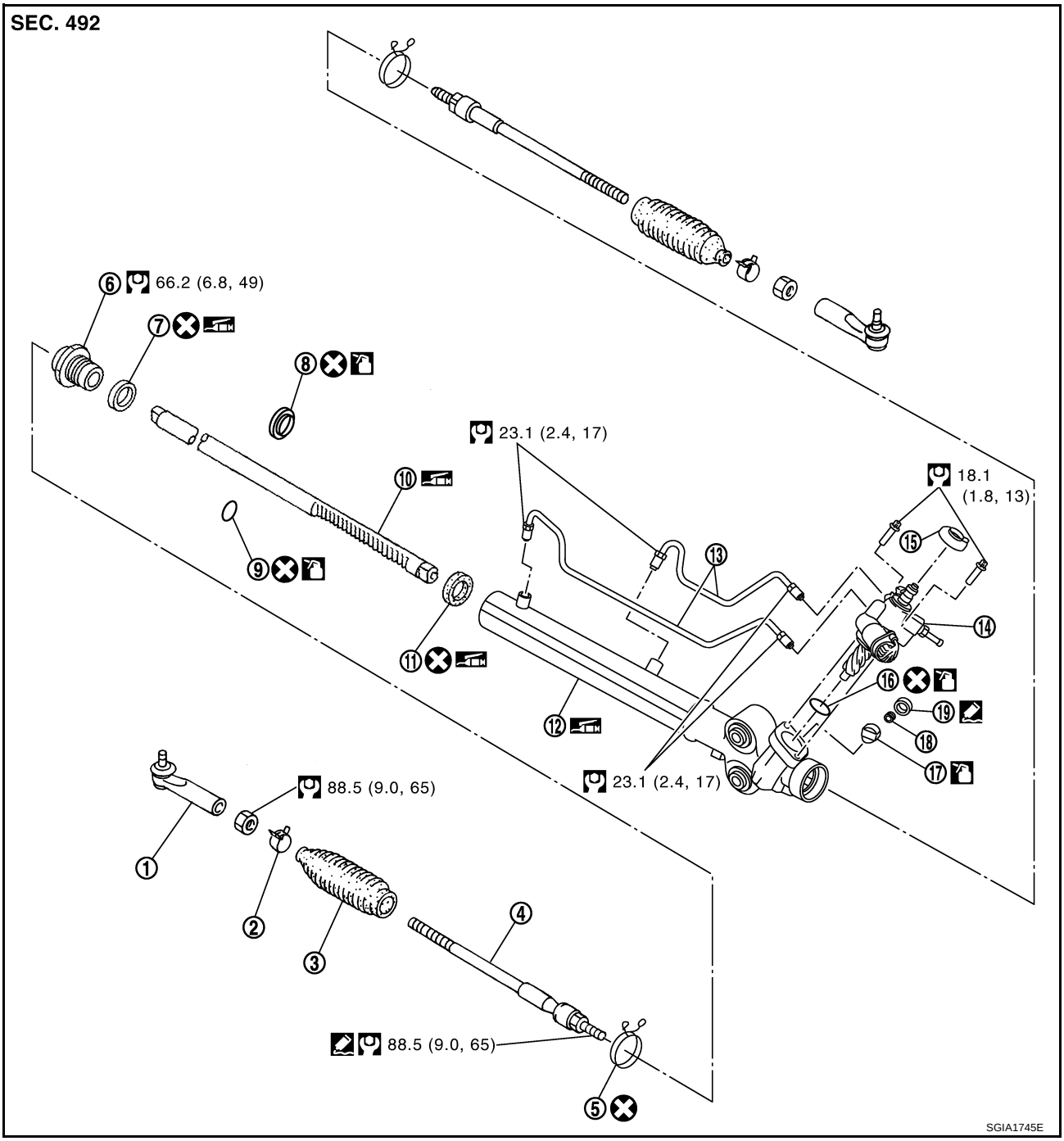
POWER STEERING GEAR

PFP:49001

Disassembly and Assembly

NGS000B1

COMPONENTS



1.	Outer socket	2.	Boot clamp	3.	Boot
4.	Inner socket	5.	Boot clamp	6.	End cover assembly
7.	Rack oil seal	8.	Rack Teflon ring	9.	O-ring A
10.	Rack assembly	11.	Rack oil seal	12.	Gear housing assembly
13.	Cylinder tube	14.	Gear-sub assembly	15.	Rear cover cap
16.	O-ring B	17.	Retainer	18.	Spring
19.	Adjusting screw				

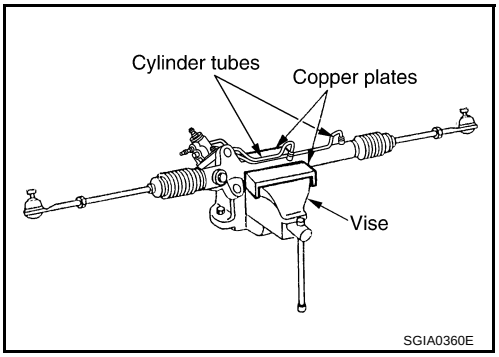
Refer to GI-11, "Components" , and the followings for the symbols in the figure.

: Apply Genuine Thread Locking Sealant, Three Bound 1111B or equivalent.

: Apply multi-purpose grease.
: Apply Genuine NISSAN PSF or equivalent.

CAUTION:

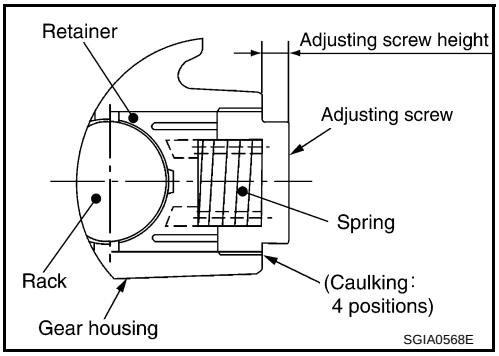
- **Secure steering gear assembly with a vise, using copper plates or something similar to prevent it from being damaged. Do not grip cylinder with a vise.**
- **Before performing disassembly, clean steering gear assembly with kerosene. Be careful not to bring any kerosene into contact with the discharge and return port connectors.**



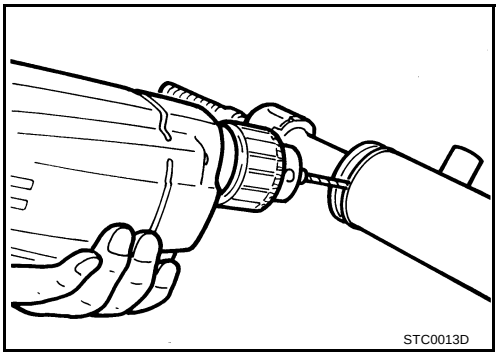
DISASSEMBLY

1. Remove cylinder tubes from gear housing assembly.
2. Remove rear cover cap from gear-sub assembly.
3. Measure adjusting screw height from gear housing assembly, then loosen adjusting screw.

   CAUTION:
   - **Do not turn adjusting screw more than twice.**
   - **Replace steering gear assembly when adjusting screw is removed or more than twice.**
4. Remove fixing bolts of gear-sub assembly, and then remove gear-sub assembly from gear housing assembly.
5. Remove O-ring B from gear housing assembly.
6. Loosen lock nut of outer socket, and remove outer socket.
7. Remove boot clamps of the small diameter side and the large diameter side, then remove boots.



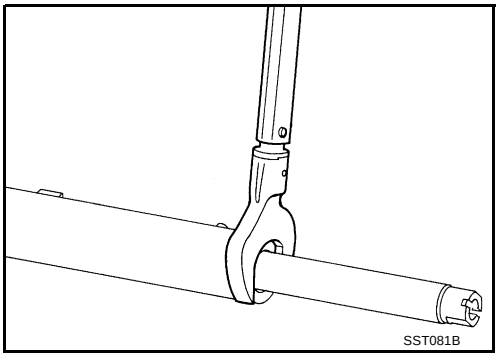
   CAUTION:
   On removing boots, be careful not to damage the inner socket and the gear housing assembly. If they are is damaged, change them to avoid oil leaks.
8. Drill out the clinching part of cylinder outer rim with a 3 mm (0.12 in) drill in 1.5 mm (0.059 in) depth.



9. Remove end cover assembly with a 42 mm (1.65 in) open head (suitable tool).

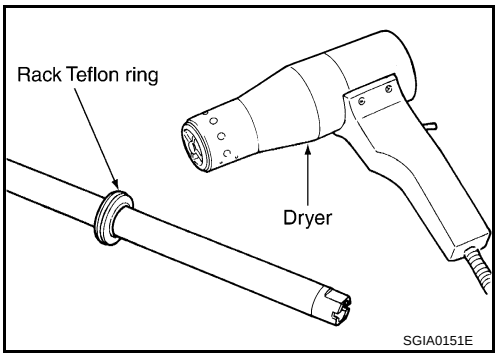
   CAUTION:
   Be careful not to damage rack. If it is damaged, replace rack. Otherwise, oil leaks may result.
10. Pull rack with rack oil seal out of gear housing assembly.

    CAUTION:
    Be careful not to damage cylinder. If it is damaged, replace gear housing assembly. Otherwise, oil leaks may result.



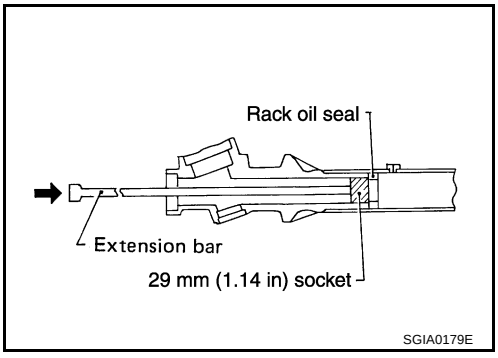
11. Heat rack Teflon ring to approximately 40°C (104°F) with a dryer, then remove it and O-ring A from rack assembly.

CAUTION:
Be careful not to damage rack. If it is damaged, change to a new one to avoid oil leaks.



12. Use a taped 29 mm (1.14 in) socket and an extension bar. Remove rack oil seal from gear housing assembly.

CAUTION:
Be careful not to damage gear housing assembly and cylinder inner wall. If it is damaged, gear housing assembly must be replaced. Otherwise, oil leaks will result.



INSPECTION AFTER DISASSEMBLY

Boot

Check boot for cracks and deformation. Replace it, if necessary.

Rack Assembly

Check rack for damage and wear. Replace it, if necessary.

Gear-sub Assembly

- Check pinion gear for damage or wear. Replace if necessary.
- Rotate pinion and check for torque variation or rattle. Replace if necessary.

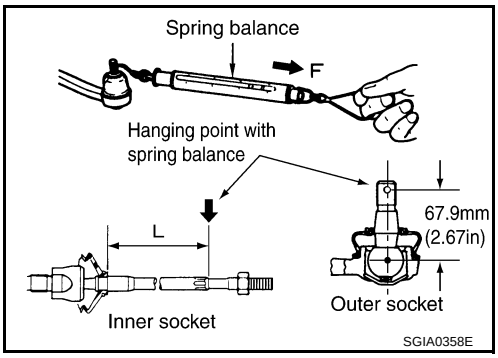
Gear Housing Assembly

Check gear housing assembly for damage and scratches (inner wall). Replace it, if necessary.

Outer Socket and Inner Socket

Swing Torque

- Hook a spring balance at the point shown in the figure. Confirm if the reading is within the specification. When ball stud and inner socket start moving the measured value must be within the specification. If the reading is outside the specification, replace socket.



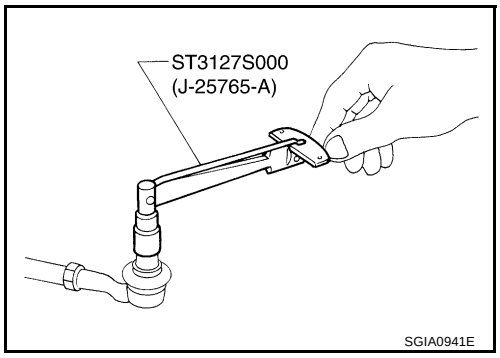
Specified value

Item	Outer socket	Inner socket
Measuring point	Cotter-pin hole of stud	shown as L: 48.5 mm (1.909 in)
Swing torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)	1.0 - 7.8 N·m (0.11 - 0.79 kg-m, 9 - 69 in-lb)
Measuring value	4.42 - 42.7 N (0.5 - 4.4 kg, 1 - 10 lb)	10 - 78 N (1 - 8 kg, 2 - 18 lb)

Rotating Torque

- Using a preload gauge (SST), check if reading is within the value specified below. If the value is outside the standard, replace outer sockets.

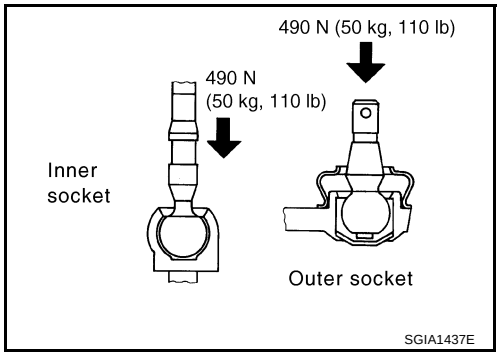
Rotating torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)



Axial End Play

- Apply load of 490 N (50 kg,110 lb) to ball stud axially. Use a dial-gauge to measure the amount of the movement that the stud makes. Check if the reading is within the specified below. If the value is outside the standard, replace outer and inner sockets.

Outer socket	0.5 mm (0.020 in) or less
Inner socket	0.2 mm (0.008 in) or less



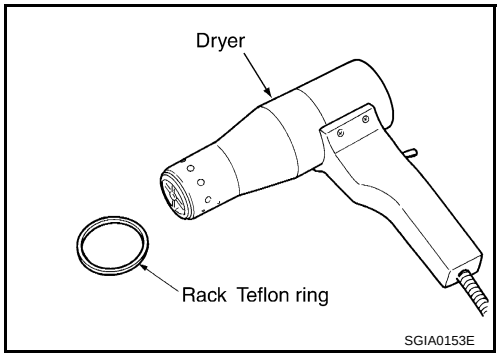
ASSEMBLY

1. Apply recommended fluid to O-ring A. Put an O-ring A into rack Teflon ring.

   NOTE:
   Do not reuse O-ring A.

2. Heat rack Teflon ring to approximately 40°C (104°F) with a dryer. Assemble it to mounting groove of rack.

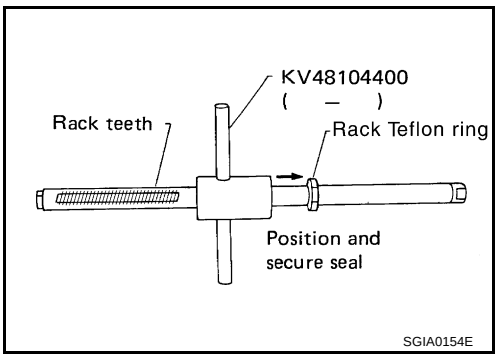
   NOTE:
   Do not reuse rack Teflon ring.

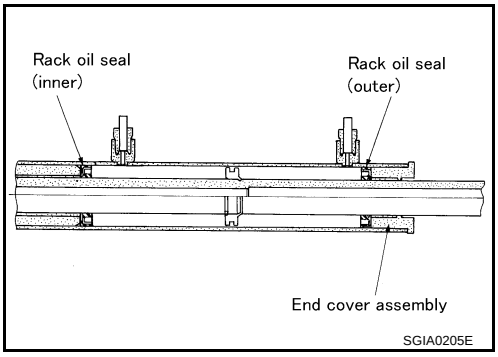


3. To fit rack Teflon ring on rack, use rack Teflon ring installation tool (SST) from tooth side. Compress rim of ring with the tool.
4. Apply Multi-purpose grease or equivalent to rack oil seal. Insert rack oil seal, then insert rack to gear housing assembly.

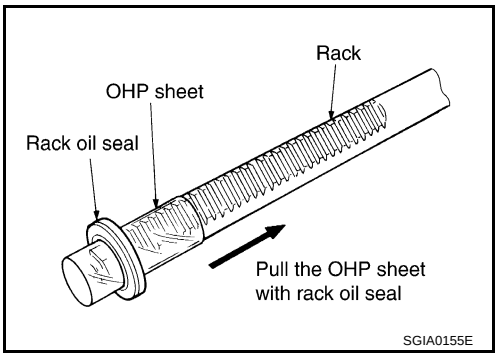
NOTE:
Do not reuse rack oil seal.

CAUTION:
- **When inserting rack, do not damage retainer sliding part. If it is damaged, replace gear housing assembly.**
- **When unstring rack, do not damage cylinder inner wall. If it is damaged, It may cause oil leaks. Replace gear housing assembly.**
- **Attach rack oil seal. Both inner lip and outer lip should face each other.**

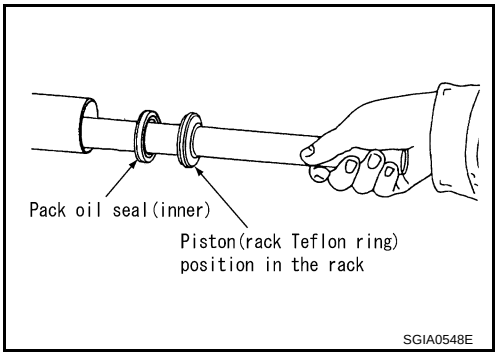




a. To avoid damaging inner rack oil seal, wrap an OHP sheet [approximately. 70 mm (2.76 in) × 100 mm (3.94 in)] around rack tooth. Place oil seal on sheet. Then, pull oil seal along with OHP sheet until they pass the toothed section of rack, then remove it.

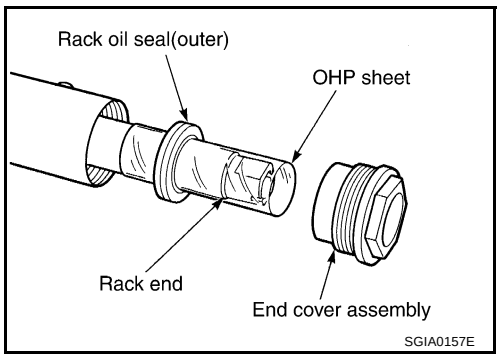


b. Insert rack oil seal (inner) to piston (rack Teflon ring) position and push retainer to adjust screw side with fingers lightly, and then make rack move in gear housing assembly, install rack oil seal (inner) to fit in with gear housing assembly.



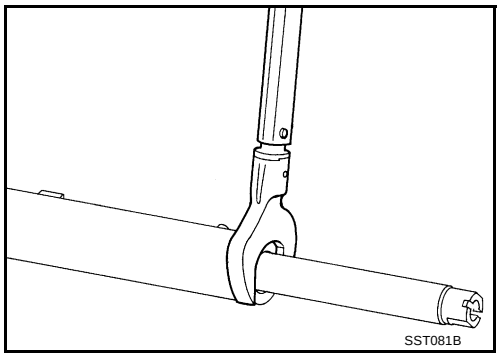
c. When installing outer rack oil seal, cover the end of rack with an OHP sheet [70 mm (2.76 in) × 100 mm (3.94 in)]. It will avoid damaging rack oil seal. Then place oil seal on sheet. Pull rack oil seal along with OHP sheet until they pass rack end. Then remove OHP sheet.

d. Install end cover assembly to rack, move it to gear housing assembly.



5. Using a 42 mm (1.65 in) open head (suitable tool), tighten end cover assembly at the specified torque.

CAUTION:
Do not damage rack surface. If it is damaged, it may cause oil leaks. Replace rack assembly.

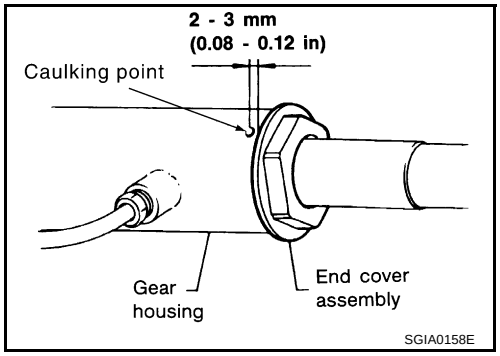


6. After tightening end cover assembly, caulk cylinder at one point as shown in the figure using a punch. This will prevent end cover from getting loose.

7. Apply recommended fluid to O-ring B. Install O-ring B to gear housing assembly.

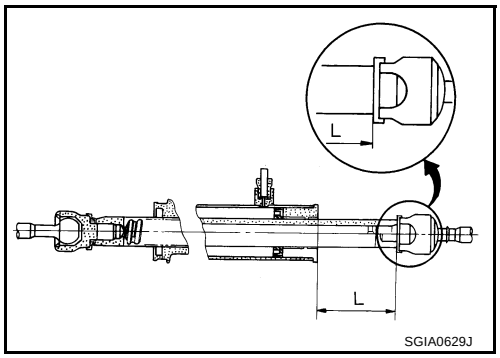
NOTE:
Do not reuse O-ring B.

8. Install gear-sub assembly to gear housing assembly.

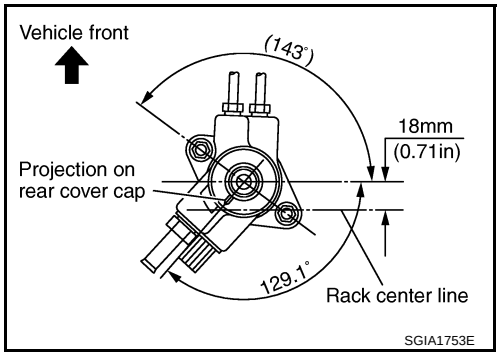


9. Decide neutral position of rack.

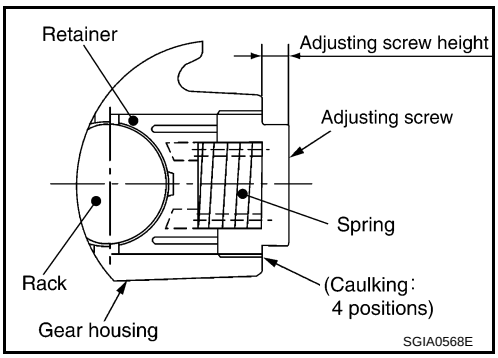
Rack stroke “L” : 64.5 mm (2.539 in)



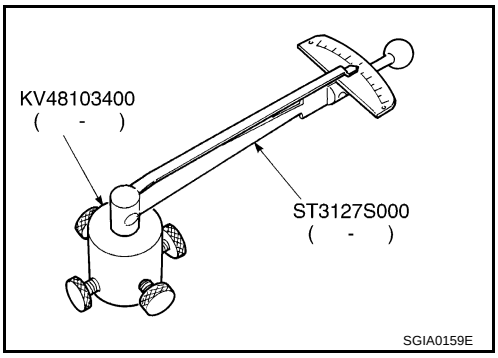
10. Install the projection part (Tip) of rear cover cap to gear-sub assembly as shown in the figure.



11. Apply thread locking adhesive (Three Bond 1111B or equivalent) to the thread of adjusting screw to the adjusting screw height from gear housing assembly. The adjusting screw height is the same as it was measured in the overhaul in advance.
12. Rotate pinion ten times whole range of rack so that parts get to fit with each other.



13. Measure pinion rotating torque within from –180° to + 180° make preload gauge (SST) and torque adapter (SST) in rack neutral position, then hold preload gauge (SST) at maximum torque.
14. After loosening adjusting screw once, tighten it again with torque of 4.9 - 5.9 N·m (0.50 - 0.60 kg-m, 44 - 52 in-lb). After that loosen it within from 20° to 40°.



15. Measure pinion rotating torque with torque adapter (SST) and preload gauge (SST), then confirm whether its reading is within the specified value. If the reading is not within the specified value, readjust screw angle with adjusting screw. Change gear assembly to new one, if the reading is still not within the specified value or the rotating torque of adjusting screw is less than 5 N·m (0.51kg-m, 44 in-lb)

Pinion rotation torque:

Around neutral position (within ±100°)

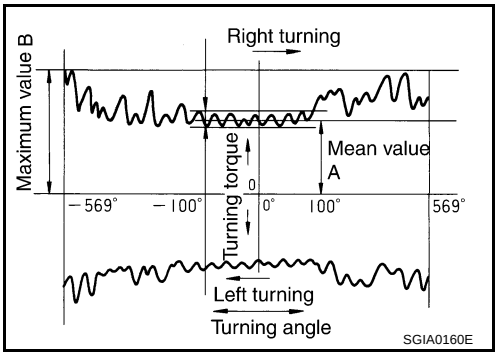
Average "A":

1.71 - 2.34 N·m (0.18 - 0.23 kg-m, 16 - 20 in-lb)

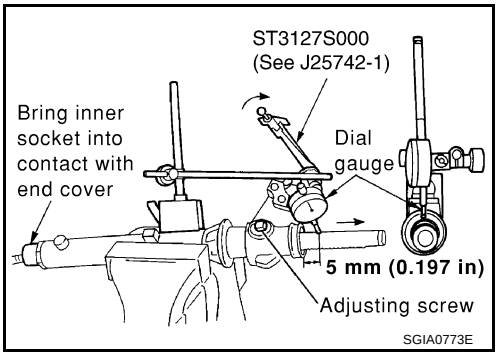
Other than above (more than ±100°)

Maximum variation "B":

2.3 N·m (0.23 kg-m, 20 in-lb)



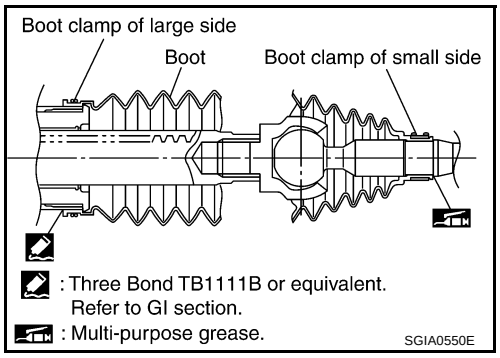
16. Turn pinion fully to the end of the left with tie-rods to rack.
17. Set dial gauge to rack as shown in the figure. Measure vertical movement of rack when pinion is turned counterclockwise with torque of 19.6 N·m (2.0 kg-m, 14 ft-lb). Check reading is within the specified value. If reading is outside of the specification, readjust screw angle with adjusting screw. If reading is still outside of specification, or if the rotating torque of adjusting screw is less than 5 N·m (0.51 kg-m, 44 in-lb), replace steering gear assembly.



Specified value		
Amount of vertical movement with rack	Less than 0.265 mm (0.0104 in)	
Measuring point	Axial direction of rack	5 mm (0.20 in) away from end of gear housing
	Radius direction of rack	Shaft direction of adjusting screw

18. Install large-diameter side of boot to gear housing assembly.
19. Install small-diameter side of boot to the mounting groove of inner socket boot.
20. Install boot clamp to the small-diameter side of boot.
21. Install boot clamp to the large-diameter side of boot.

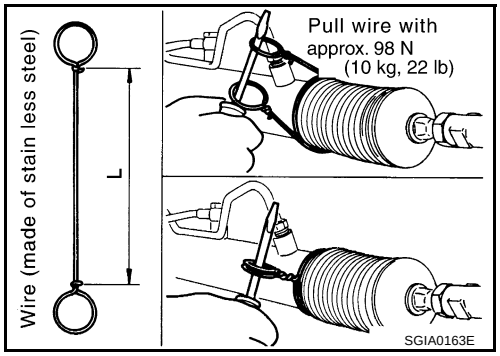
NOTE:
Do not reuse boot clamp.



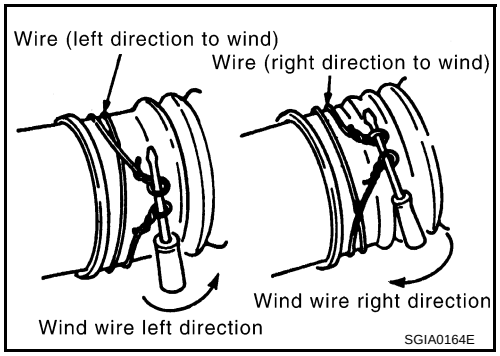
a. Tighten large-diameter side of RH/LH boot with boot clamp (stainless wire).

Wire length "L" : 370 mm (14.57 in)

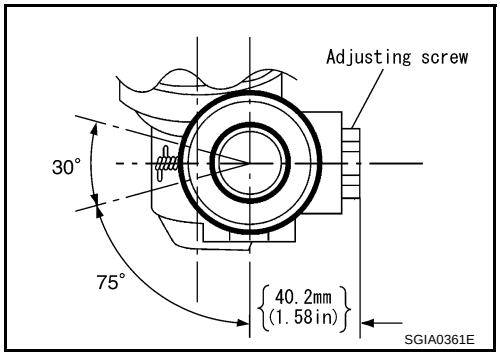
b. After wrapping clamp around boot groove for two turns, insert screwdriver in loop on both ends of wire. Twist 4 to 4.5 turns while pulling with a force of approx. 98 N (10 kg, 22 lb).



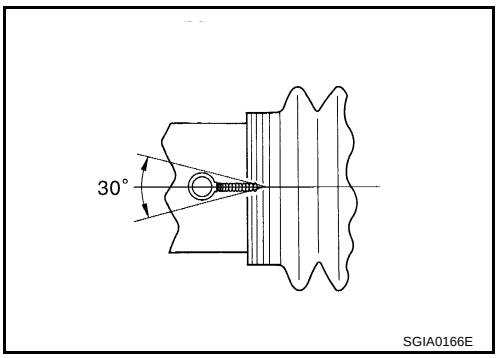
c. Twist boot clamp as shown in the figure, pay attention to relationship between winding and twisting directions.



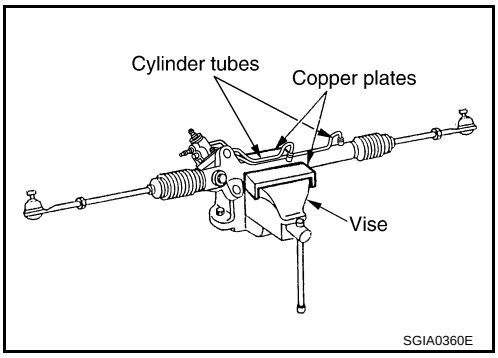
d. Confirm the twisted point with clamp faces in the opposite direction to adjusting screw within 30° as shown in the figure.



e. After twisting wire 4 to 4.5 turns, bend cut end of wire. Cut end of wire should not touch boot. Be sure wire end is at least 5 mm (0.20 in) away from clearance for tube.



22. Install cylinder tubes to gear housing assembly.

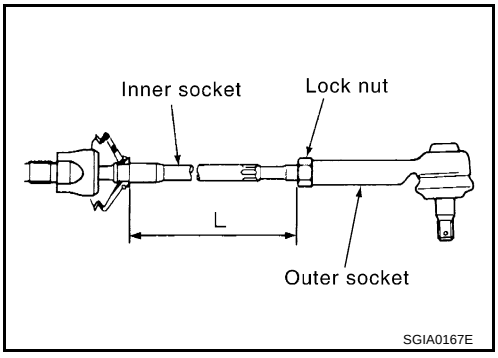


23. Tighten lightly inner socket in specified length “L”, then tighten lock nut at specified torque. Refer to PS-19, "COMPONENTS" . Reconfirm if inner socket length is within limit of specified length “L”.

Inner socket length “L” : 106.3 mm (4.19 in)

CAUTION:

Perform toe-in adjustment after this procedure. Length achieved after toe-in adjustment is not necessarily value given here.



POWER STEERING OIL PUMP

PFP:49110

On-Vehicle Inspection and Service

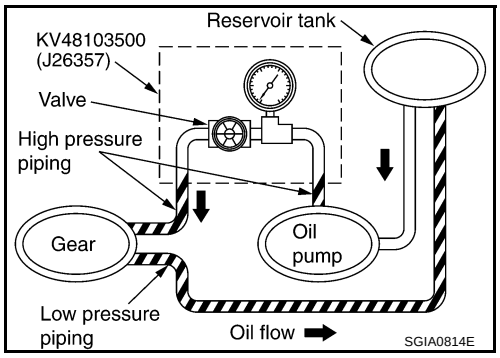
NGS0000H

CHECKING RELIEF OIL PRESSURE

CAUTION:

Before starting work, confirm belt tension is proper.

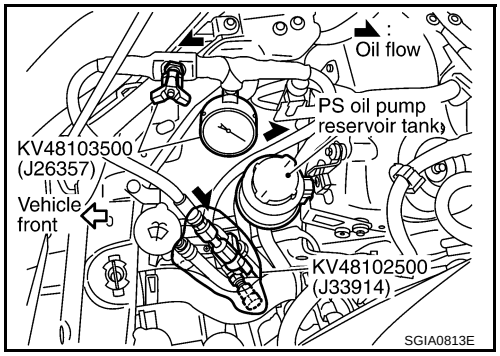
1. Connect oil pressure gauge (SST) and oil pressure gauge adapter (SST) between oil pump discharge connector and high pressure hose and then bleed air from the hydraulic circuit.



2. Start engine. Allow engine to run until tank temperature reaches 50 to 80°C (122 to 176°F).

   CAUTION:

   - **Warm up engine with shut-off valve fully opened. If engine is started with shut-off valve closed, fluid pressure in power steering pump increases to maximum. This will raise fluid temperature excessively.**
   - **Be careful not to contact hose with belt when engine is started.**



3. With engine at idle, close shut-off valve and read the relief oil pressure.

   Relief oil pressure:

   9,600 - 10,200 kPa (97.9 - 104 kg/cm^2 , 1,392 - 1,479 psi)

   CAUTION:

   Do not close shut-off valve of pressure gauge for more than 10 seconds.

4. After measurement, open shut-off valve slowly.
   - If relief oil pressure is outside the specification, disassemble and repair oil pump. Refer to PS-29, "Disassembly and Assembly" .
5. After inspection, disconnect oil pressure gauge (SST) and oil pressure gauge adapter (SST) from hydraulic circuit, connect oil pump discharge connector and high pressure hose. Add fluid and bleed air from hydraulic circuit thoroughly. Refer to PS-6, "Air Bleeding Hydraulic System" .

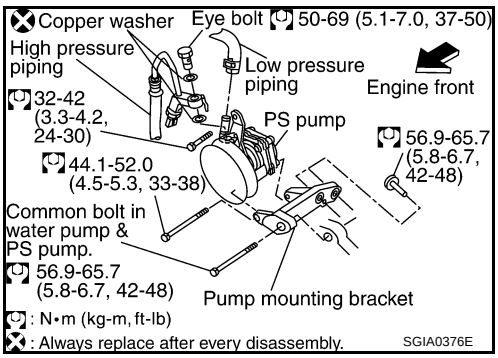
Removal and Installation

NGS0000I

REMOVAL

1. Remove engine cover.
2. Remove air cleaner box.
3. Drain water from radiator upper tank, then remove radiator upper hose.
4. Remove radiator fan shroud. Refer to CO-13, "Removal and Installation" .

5. Loosen idler pulley, then remove belt.
6. Drain power steering fluid from reservoir tank.
7. Remove piping of high pressure and low pressure (drain fluid from their pipings)
8. Remove bolt common to water pump and power steering pump.
9. Remove bolt then remove power steering pump.



INSTALLATION

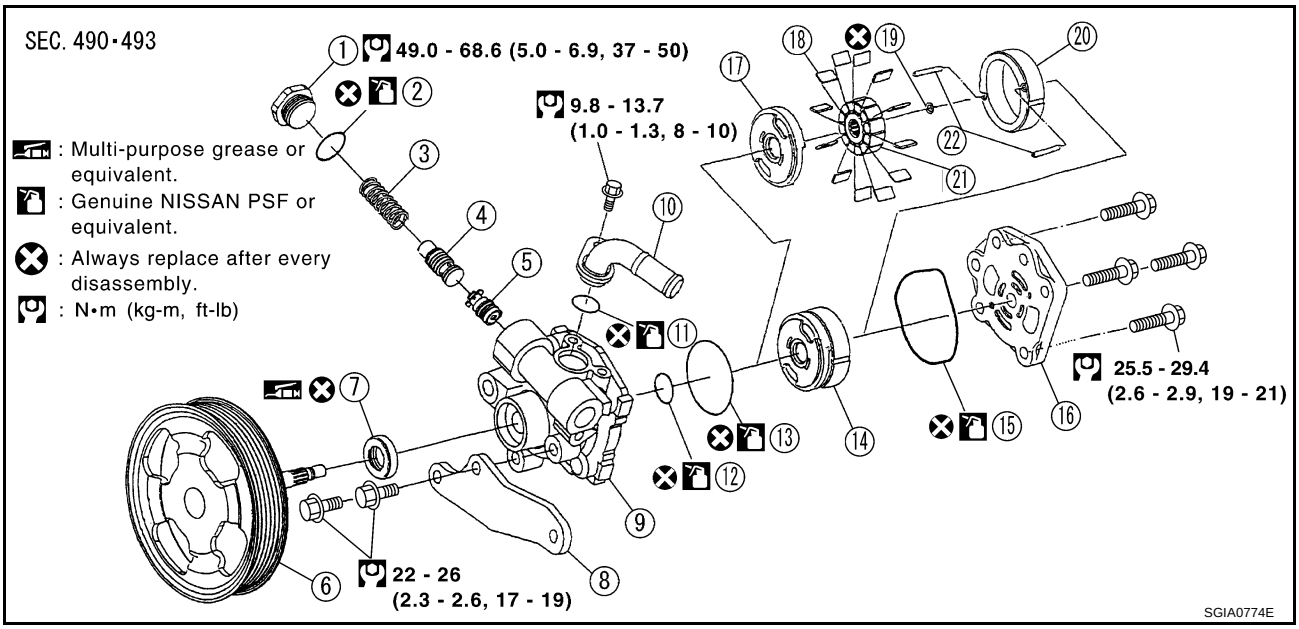
Refer to PS-33, "HYDRAULIC LINE" for tightening torque. Install in the reverse order of removal.

- After installation, adjust belt tension. Refer to EM-12, "DRIVE BELTS" .
- After installation, bleed air. Refer to PS-6, "Air Bleeding Hydraulic System" .

Disassembly and Assembly

NGS0000J

COMPONENTS

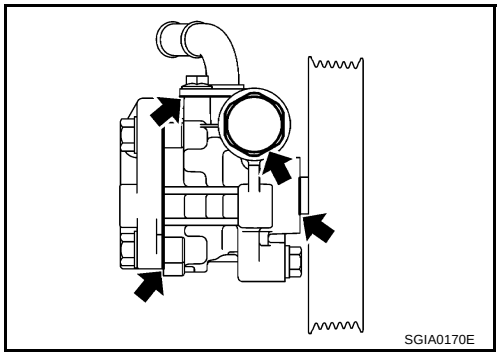


1. Plug
2. O-ring D
3. Flow control valve spring
4. Relief valve assembly
5. Flow control valve assembly
6. Shaft kit
7. Oil seal
8. Bracket
9. Body assembly
10. Suction connector assembly
11. O-ring E
12. O-ring C
13. O-ring B
14. Cartridge assembly
15. O-ring A
16. Cover assembly
17. Side plate
18. Vane
19. Rotor snap ring
20. Cam ring
21. Rotor
22. Dowel pin

INSPECTION BEFORE DISASSEMBLY

Disassemble power steering oil pump only if the following items are found.

- Oil leakage from oil pump
- Deformed or damaged pulley
- Poor performance



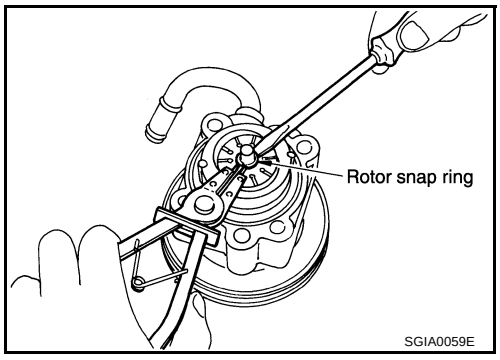
DISASSEMBLY

NOTE:
Fix oil pump in vise as the occasion demands.

CAUTION:
When retaining drive shaft in a vise, always use copper or aluminium plates between vise and shaft.

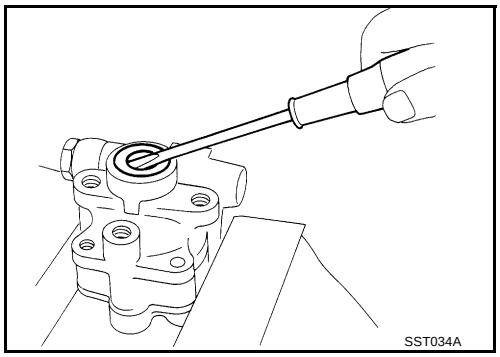
1. Unscrew two front bracket bolts and remove bracket from body assembly.
2. Unscrew four cover assembly bolts and remove cover assembly from body assembly.
3. Remove O-ring A from body assembly.
4. Remove rotor snap ring with snap ring pliers, and remove shaft kit from body assembly.

   CAUTION:
   When removing rotor snap ring, be careful not to damage pulley shaft of shaft kit.



5. Using a screwdriver, remove oil seal for body assembly.
6. Remove cam ring, rotor, vane, side plate, O-ring B and O-ring C from body assembly.
7. Remove plug, then remove O-ring D, flow control valve spring, relief valve assembly and flow control value assembly from body assembly.

   CAUTION:
   Be careful not to drop and deform relief valve assembly and flow control valve assembly.
8. Remove fixing bolt of suction connector assembly, then remove suction connector assembly and O-ring E from body assembly.



INSPECTION AFTER DISASSEMBLY

Body Assembly and Cover Assembly Inspection

- Check body assembly and cover assembly for damage. If any damage is found, replace with new part for cover assembly, and replace with new power steering pump assembly for body assembly.

Cartridge Assembly Inspection

- Check cam ring, side plate, rotor and vane for damage. If any damage is found, replace cartridge assembly with new one.

Relief Valve Assembly Inspection

- Check relief valve assembly for damage. If any damage is found, replace it with new one.

Flow Control Valve Assembly Inspection

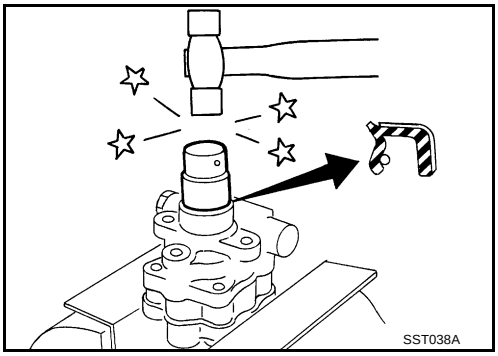
- Check flow control valve assembly for damage. If any damage is found, replace it with new one.

ASSEMBLY

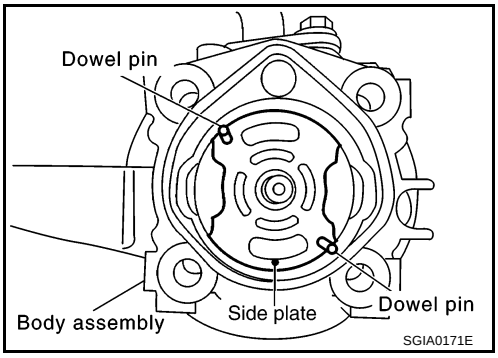
NOTE:
Fix oil pump in vise as occasion demands.

CAUTION:
When retaining drive shaft in a vise, always use copper or aluminium plates between vise and shaft.

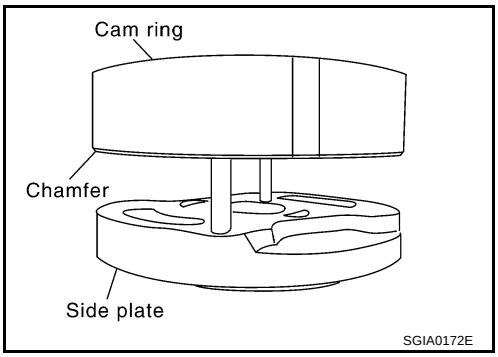
1. Apply a coat of Multi-purpose grease or equivalent to oil seal lip and to the circumference of oil seal. Using proper tool such as hand press machine, install it to the body assembly.
   NOTE:
   Do not reuse oil seal.
2. Install shaft kit to body assembly.
3. Apply recommended fluid to O-ring B and O-ring C, then install O-ring B and O-ring C to body assembly.
   NOTE:
   Do not reuse O-ring B and O-ring C.

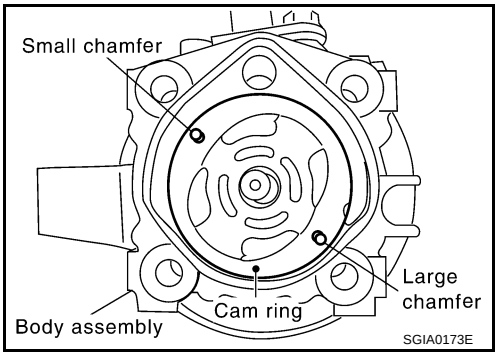


4. Set dowel pin at the illustration position (The position is the same regardless of right or left direction), and install side plate to body assembly.



5. Install cam ring on side plate as follows;
   - Turn chamfered edge side of cam ring to side plate as shown in the figure.
   - Position large chamfered side of cam ring as shown in the figure.

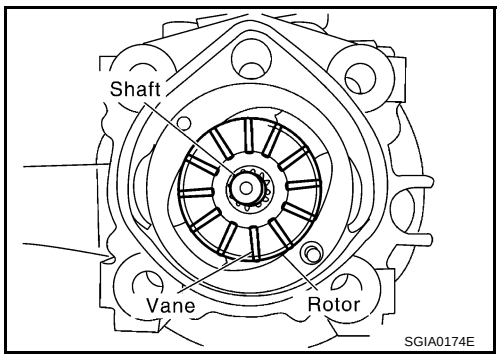




6. Install rotor to shaft of shaft kit (rotor direction is the same regardless of the front and back).
7. Install vane to rotor (vane direction is the same regardless of inside and outside).
8. Install rotor snap ring to shaft of shaft kit.

   NOTE:
   - Do not reuse rotor snap ring.

   CAUTION:
   Be careful not to damage rotor and pulley shaft.



9. Apply recommended fluid to O-ring A, then install O-ring A to body assembly.

   NOTE:
   Do not reuse O-ring A.
10. Attach cover assembly to body assembly and tighten fixing bolts diagonally at the specified torque.
11. Install flow control valve assembly, relief valve assembly and flow control valve spring to body assembly.
12. Apply recommended fluid to O-ring D and install to plug, then tighten plug at the specified torque.

    NOTE:
    Do not reuse O-ring D.
13. Apply recommended fluid to O-ring E and install to suction connector assembly, then install suction connector to body assembly.

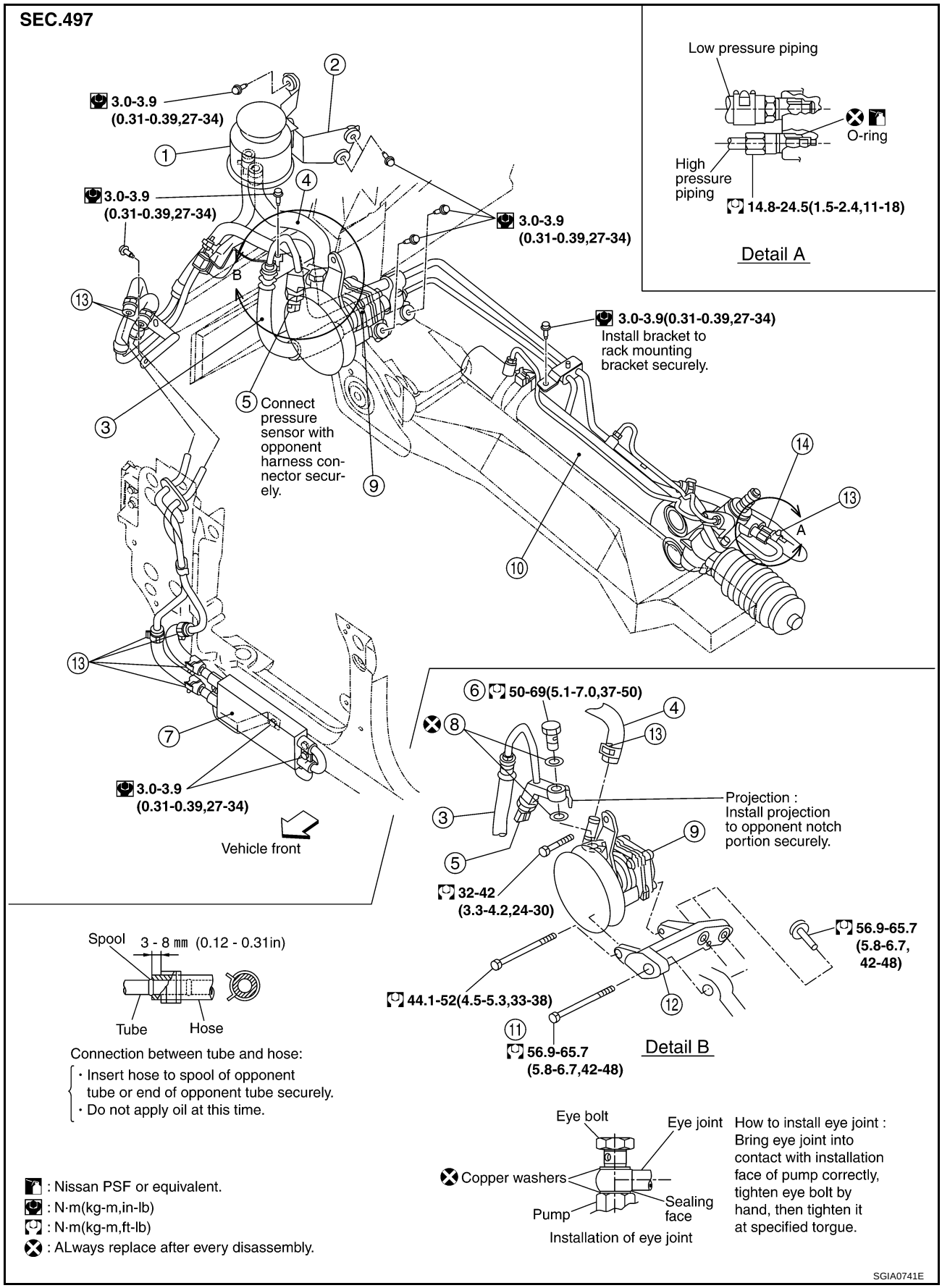
    NOTE:
    Do not reuse O-ring E.
14. Install bracket to body assembly, and tighten mounting bolts at the specified torque.

HYDRAULIC LINE

PFP:49721

Removal and Installation

NGS0000K



1. Reservoir tank
2. Reservoir tank bracket
3. Hose & tube assembly
4. Suction hose
5. Oil pressure sensor
6. Eye bolt
7. Oil cooler
8. Copper washer
9. Power steering oil pump
10. Steering gear assembly
11. Common bolt
12. Oil pump bracket
13. Clip

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Steering Wheel

NGS0000L

End play of the axle direction for steering wheel	0 mm (0 in)
Steering wheel play on the outer circumference	0 - 35 mm (0 - 1.38 in) or less

Steering Angle

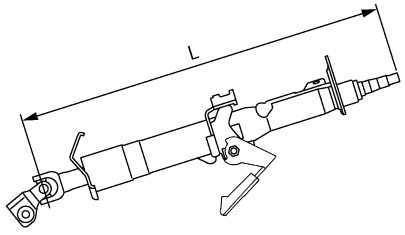
NGS0000M

Inner wheel Degree minute (Decimal degree)	Minimum	35° 55' (35.9°)
	Nominal	38° 55' (38.9°)
	Maximum	39° 55' (39.9°)
Outer wheel Degree minute (Decimal degree)	Nominal	30° 40' (30.7°)

Steering Column

NGS0000N

Steering column length “L”	548 mm (21.57 in)

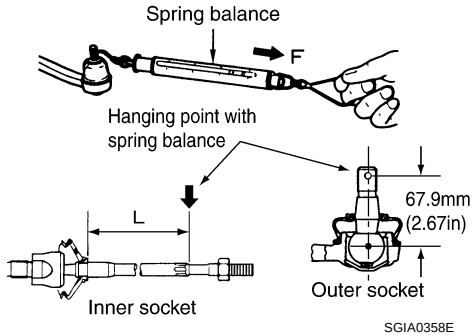


SGIA0306J

Steering Outer Socket and Inner Socket

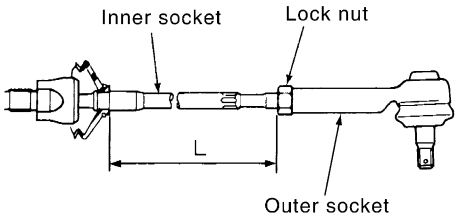
NGS0000O

Steering gear type		PR26AF
Outer socket ball joint outer socket	Swinging torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)
	Measurement on spring balance ● Measuring point: stud cotter pin hole	4.42 - 42.7 N (0.5 - 4.4 kg, 1 - 10 lb)
	Rotating torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)
	Axial end play	0.5 mm (0.020 in) or less
Inner socket ball joint inner socket	Swinging torque	1.0 - 7.8 N·m (0.11 - 0.79 kg-m, 9 - 69 in-lb)
	Measurement on spring balance ● Measuring point: L mark see below, L=48.5 mm (1.91 in).	10 - 78 N (1 - 8 kg, 2 - 18 lb)
	Axial end play	0.2 mm (0.008 in) or less



SGIA0358E

Inner socket length “L”	106.3 mm (4.19 in)

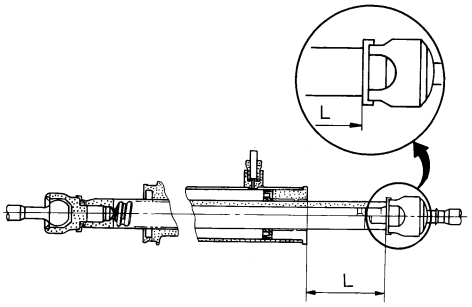


SGIA0167E

Steering Gear

NGS0000P

Steering gear model	PR26AF
Rack neutral position, dimension “L” (rack stroke)	64.5 mm (2.539 in)



SGIA0629J

Oil Pump

NGS0000Q

Oil pump relief hydraulic pressure	9,600 - 10,200 kPa (97.9 - 104 kg/cm^2 , 1,392 - 1,479 psi)

Steering Fluid

NGS0000R

Fluid capacity	Approx. 1.0 ℓ (1-1/8 US qt, 7/8 Imp qt)

SECTION RAX
REAR AXLE

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PRECAUTIONS

PFP:00001

Caution

NDS0000T

Observe the following precautions when disassembling and servicing drive shaft.

- Joint sub-assembly does not disassemble because it is non- overhaul parts.
- Perform work in a location which is as dust-free as possible.
- Before disassembling and servicing, clean the outside of parts.
- Prevention of the entry of foreign objects must be taken into account during disassembly of the service location.
- Disassembled parts must be carefully reassembled in the correct order. If work is interrupted, a clean cover must be placed over parts.
- Paper shop cloths must be used. Fabric shop cloths must not be used because of the danger of lint adhering to parts.
- Disassembled parts (except for rubber parts) should be cleaned with kerosene which shall be removed by blowing with air or wiping with paper shop cloths.

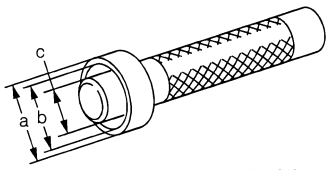
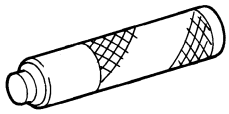
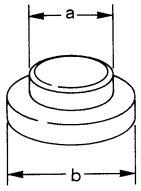
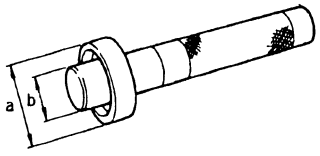
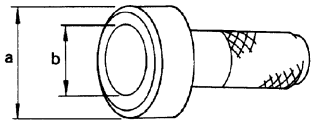
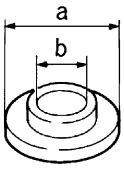
PREPARATION

PFP:00002

Special Service Tools

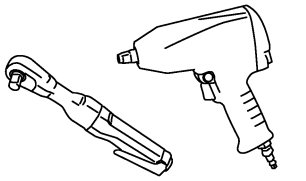
NDS0000U

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST33220000 (—) Drift a: 37 mm (1.46 in) dia. b: 31 mm (1.22 in) dia. c: 22 mm (0.87 in) dia.	 ZZA1046D	● Removing wheel hub ● Removing wheel bearing outer side inner race ● Inspection of wheel bearing rotating torque
ST33251000 (—)	 ZZA0982D	Installing wheel hub
ST35300000 (—) Drift a: 45 mm (1.77 in) dia. b: 59 mm (2.32 in) dia.	 ZZA0881D	● Installing wheel hub ● Inspection of wheel bearing rotating torque
KV40100900 (—) Drift a: 52 mm (2.05 in) dia. b: —	 ZZA0539D	Wheel bearing rotating torque inspection
KV38100500 (—) Drift a: 80 mm (3.15 in) dia. b: 60 mm (2.36 in) dia.	 ZZA0701D	Installing drive shaft plug
KV38102200 (—) Drift a: 90 mm (3.54 in) dia. b: 31 mm (1.22 in) dia.	 ZZA0920D	Installing drive shaft plug

Commercial Service Tools

NDS0000V

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NDS0000W

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			—	RAX-12	—	RAX-6	—	NVH in PR section.	NVH in RFD section.	NVH in RAX and RSU sections.	Refer to REAR AXLE in this chart.	NVH in WT section.	NVH in WT section.	Refer to DRIVE SHAFT in this chart.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Excessive joint angle	Joint sliding resistance	Imbalance	Improper installation, looseness	Parts interference	PROPELLER SHAFT	DIFFERENTIAL	REAR AXLE AND REAR SUSPENSION	REAR AXLE	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	DRIVE SHAFT	Noise	×	×				×	×	×	×	×	×		×	×
		Shake	×		×			×		×	×	×	×		×	×
	REAR AXLE	Noise				×	×	×	×	×		×	×	×	×	×
		Shake				×	×	×		×		×	×	×	×	×
		Vibration				×	×	×		×		×		×		×
		Shimmy				×	×			×		×	×		×	×
		Judder				×				×		×	×		×	×
		Poor quality ride or handling				×	×			×		×	×			

×: Applicable

WHEEL HUB

PFP:43202

On-Vehicle Inspection

NDS0000X

Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

WHEEL BEARING INSPECTION

- Move wheel hub in the axial direction by hand. Make sure there is no looseness of wheel bearing.

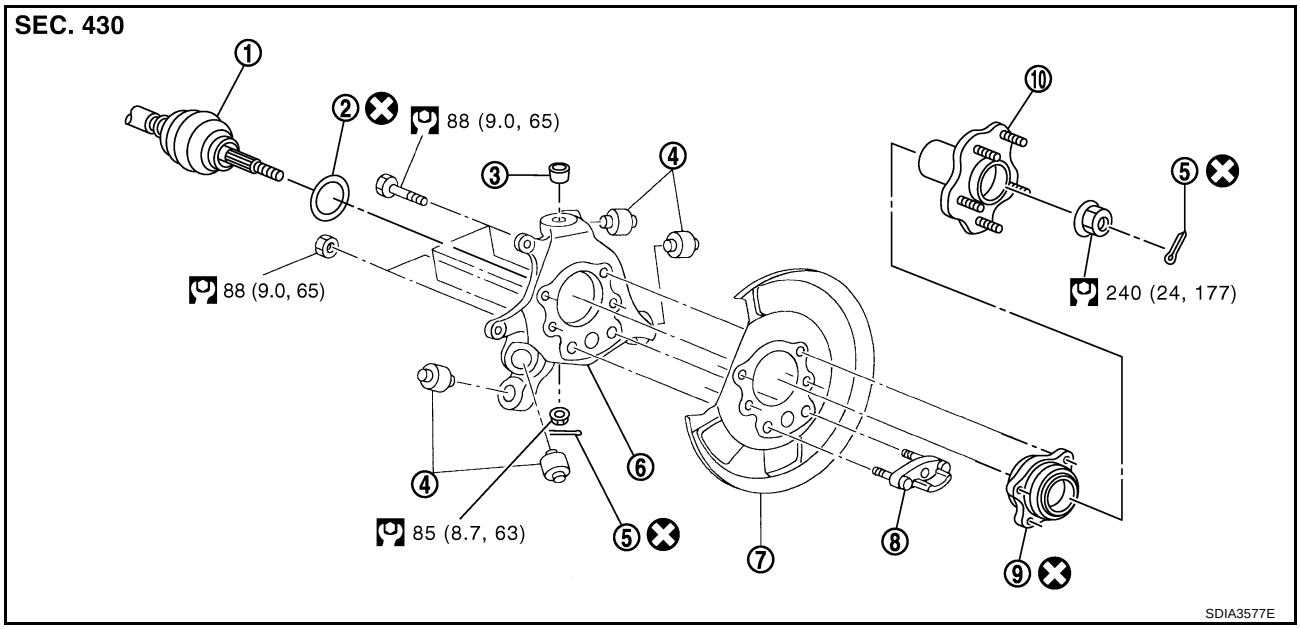
  Axial end play : 0.05 mm (0.002 in) or less

- Rotate wheel hub and make sure there is no unusual noise or other irregular conditions. If there are any irregular conditions, replace wheel bearings.

Removal and Installation

NDS0000Y

COMPONENT



1. Drive shaft
2. Dust shield
3. Ball seat
4. Bushing
5. Cotter pin
6. Axle housing
7. Back plate
8. Anchor block
9. Wheel bearing
10. Wheel hub

Refer to GI-11, "Components" , for the symbols in the figure.

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove cotter pin. Then remove lock nut from drive shaft.
3. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-39, "REAR DISC BRAKE" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
4. Remove disc rotor and remove parking cable and parking brake shoe from back plate. Refer to PB-4, "PARKING BRAKE CONTROL" , PB-5, "PARKING BRAKE SHOE" .
5. Remove fixing bolts and nuts in axle side of radius rod, front lower link with power tool.
6. Remove fixing bolt and nut in axle side of rear lower link with power tool. Then remove coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
7. Remove fixing bolt and nut in axle side of shock absorber with power tool.
8. Using a puller (suitable tool), remove axle from drive shaft.

   CAUTION:
   - **When removing axle, do not apply an excessive angle to drive shaft joint. Also be careful not to excessively extend slide joint.**

- **Do not allow drive shaft to hang down without support for counter shaft, wheel joints, and other parts.**

9. Remove suspension arm and cotter pin at axle, then loosen mounting nut.
10. Use a ball joint remover (suitable tool) to remove suspension arm from axle. Be careful not to damage ball joint boot.

CAUTION:
Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.

INSPECTION AFTER REMOVAL

Ball Joint Inspection

- Check for boot breakage, axial looseness, and torque of suspension arm ball joint. Refer to RSU-11, "SUSPENSION ARM" .

INSTALLATION

- Refer to RAX-6, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

Disassembly and Assembly

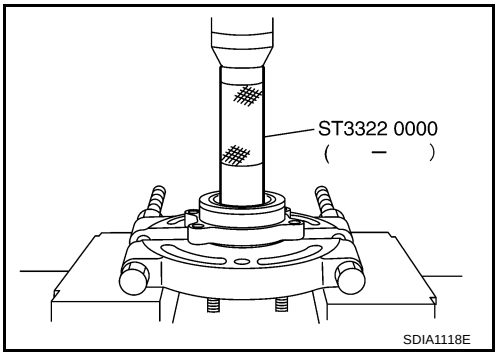
NDS0000Z

DISASSEMBLY

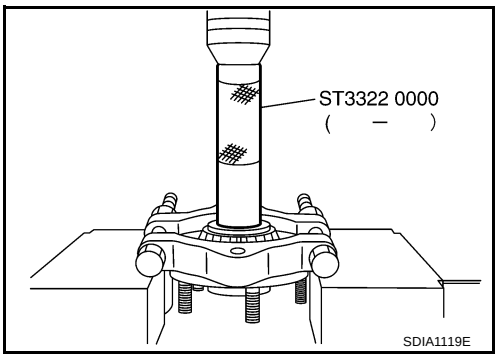
Wheel Bearing

CAUTION:
Do not disassemble if wheel bearing has no trouble.

1. Remove wheel bearing fixing bolts and anchor block fixing nuts, and remove wheel hub and bearing assembly, back plate and anchor block from axle.
2. Using a drift (SST) and a puller (suitable tool), press wheel hub out to remove from wheel bearing.

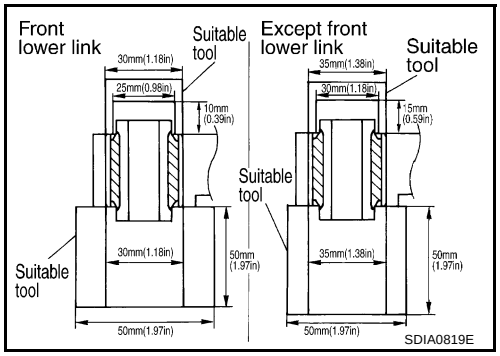


3. Using a drift (SST) and a puller (suitable tool), press wheel bearing outer side inner race out to remove from wheel hub.



Bushing

- Using a suitable drift, remove each bushing from axle.



INSPECTION AFTER DISASSEMBLY

Check for deformity, cracks and damage of each parts, replace if necessary.

Wheel Hub

- Inspect wheel hub for deformation, cracks, and other damage. If any irregular conditions are found, replace wheel hub.

Axle

- Inspect axle for deformation, cracks, and other damage. If any irregular conditions are found, replace axle.

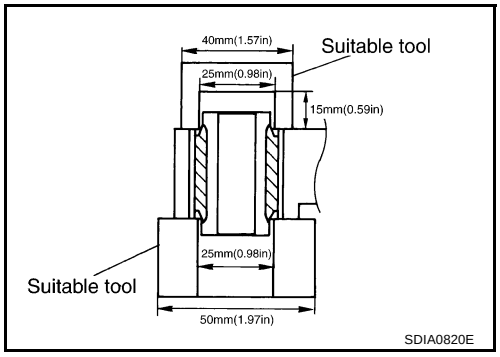
Back Plate

- Inspect back plate for deformation, cracks, and other damage. If any irregular conditions are found, replace back plate.

ASSEMBLY

Bushing

- Using a suitable drift to install each bushing onto axle.



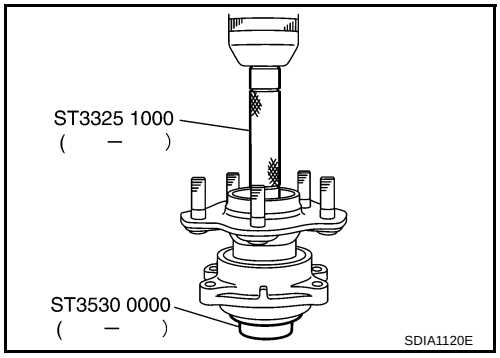
Wheel Bearing

1. Press fit a wheel hub into wheel bearing with a drift (SST).

   CAUTION:

   - **Press fit a drift (SST) while holding it against wheel bearing inner side inner race.**
   - **Wheel bearing cannot be reused. Do not attempt to reuse it.**

   NOTE:
   Final press load guideline 49,033 N (5,000 kg, 11,000 lb)
2. Install back plate and wheel hub and bearing assembly.
3. Install anchor block onto axle.



INSPECTION AFTER ASSEMBLY

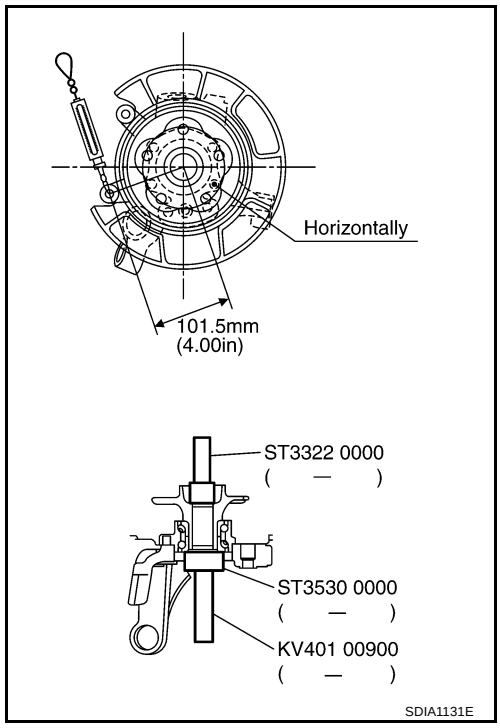
1. With wheel bearing pressed into axle housing, apply 49,033 N (5,000 kg, 11,000 lb) to wheel hub and rotate both clockwise and counterclockwise 10 times to minimize resistance.
2. Attach spring balance in the position shown in illustration and pull at a rate of 10 ± 2 rpm to measure rotating torque.

Rotating torque:

Less than 1.88 N·m (0.19 kg-m, 17 in-lb)

Spring balance reading:

Less than 18.5 N (1.89 kg, 4.16 lb)



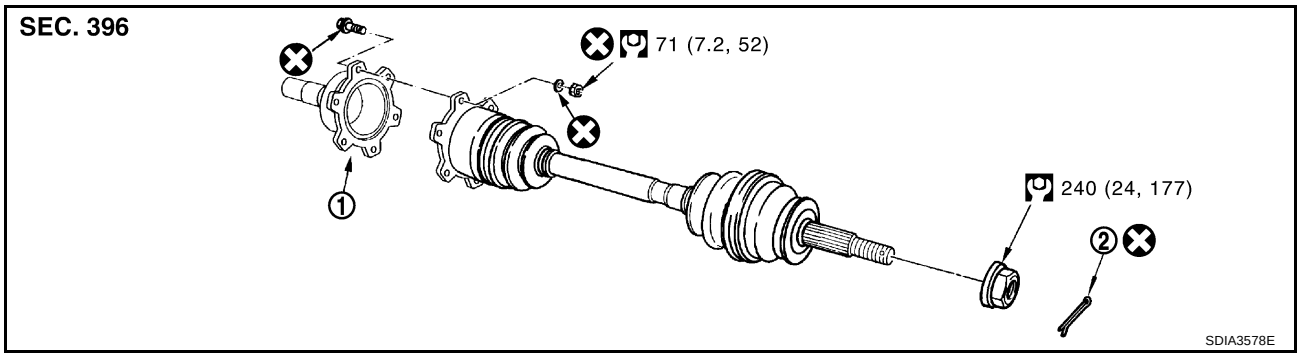
REAR DRIVE SHAFT

PFP:39600

Removal and Installation

NDS00010

COMPONENTS



1. Side flange
2. Cotter pin

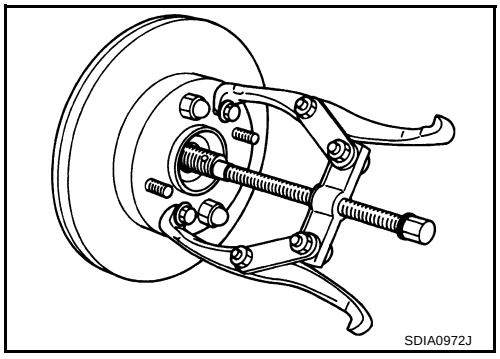
Refer to GI-11, "Components" , for the symbols in the figure.

REMOVAL

1. Remove tires from vehicle with power tool.
2. Remove cotter pin. Then remove lock nut from drive shaft.
3. Remove stabilizer connecting rod mounting bracket bolt and free stabilizer connecting rod.
4. Remove fixing nuts and bolts between side flange and drive shaft with power tool.
5. Using a puller (suitable tool), remove drive shaft from axle.

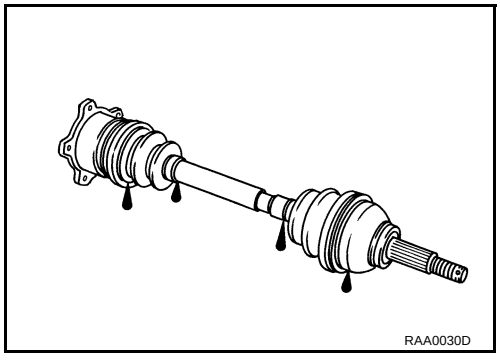
CAUTION:

- **When removing drive shaft, do not apply an excessive angle to drive shaft joint. Also be careful not to excessively extend slide joint.**



INSPECTION AFTER REMOVAL

- Move joint up/down, left/right, and in the axial direction. Check for any rough movement or significant looseness.
- Check boot for cracks or other damage, and also for grease leakage.
- If a trouble is found, disassemble drive shaft, and then replace with new one.



INSTALLATION

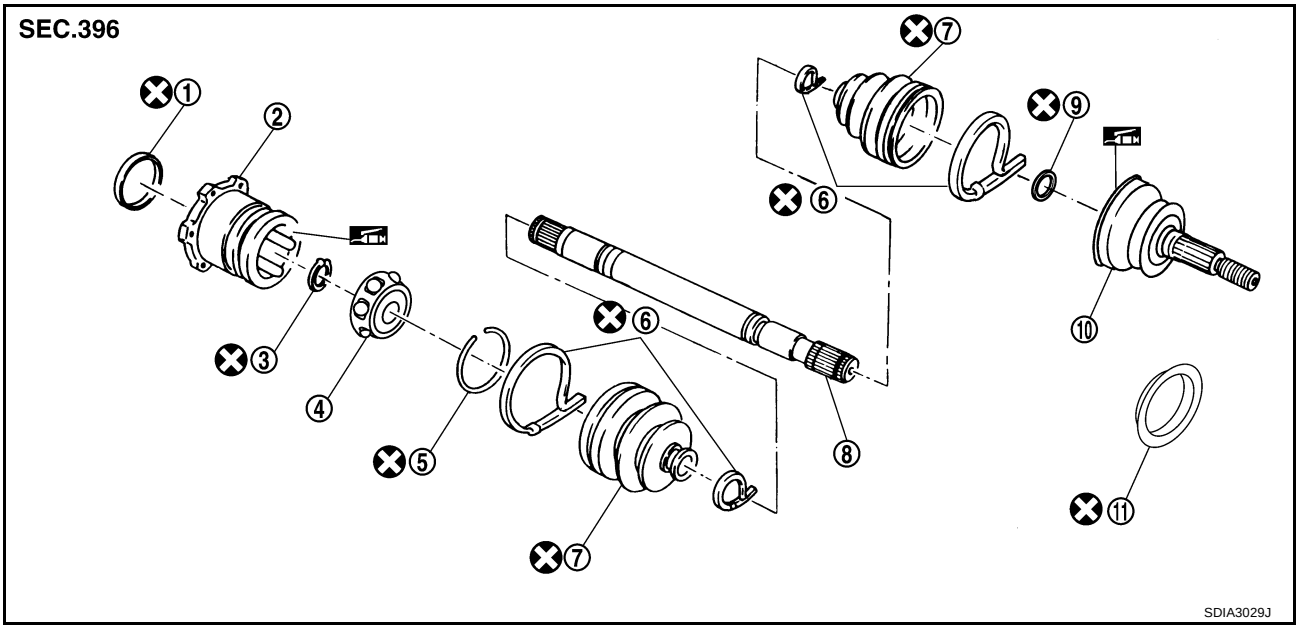
- Refer to RAX-10, "Removal and Installation" for tightening torque. Install in the reverse order of removal.

NOTE:
Refer to component parts location and do not reuse non-reusable parts.

Disassembly and Assembly

NDS00011

COMPONENTS



1. Plug	2. Housing	3. Snap ring
4. Ball cage/Steel ball/Inner race assembly	5. Stopper ring	6. Boot band
7. Boot	8. Shaft	9. Circular clip
10. Joint sub-assembly	11. Dust shield	

Refer to GI-11, "Components" and the followings for the symbols in the figure.

: Fill NISSAN genuine grease or equivalent.

DISASSEMBLY

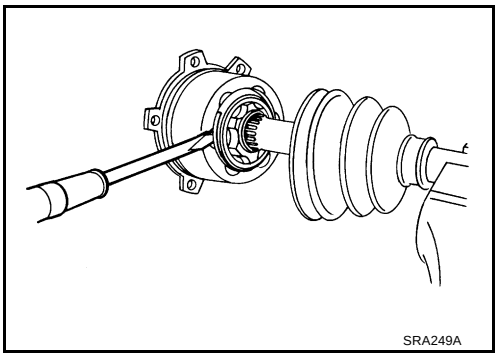
Final Drive Side

1. Press shaft in a vice.

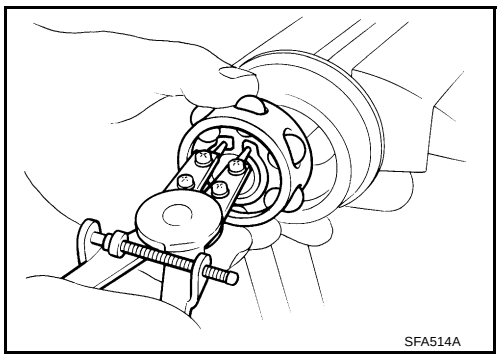
   CAUTION:

   When retaining drive shaft in a vice, always use copper or aluminum plates between vise and shaft.

2. Remove boot bands.
3. If plug needs to be removed, move boot to wheel side, and drive it out with a plastic hammer.
4. Remove stopper ring with a flat-bladed screwdriver, and pull out housing.



5. Remove snap ring, then remove ball cage/steel ball/inner race assembly from shaft.
6. Remove boot from shaft.
7. Remove old grease on housing with paper towels.

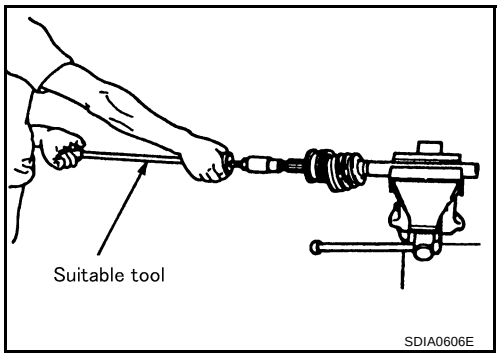

SFA514A

Wheel Side

1. Place shaft in a vice.

   CAUTION:
   When retaining drive shaft in a vice, always use copper or aluminum plates between vise and shaft.
2. Remove boot bands. Then remove boot from joint sub-assembly.
3. Screw a drive shaft puller 30 mm (1.18 in) or more into threaded part of joint sub-assembly. Pull joint sub-assembly out of shaft.

   CAUTION:
   - **If joint sub-assembly cannot be removed after five or more unsuccessful attempts, replace shaft and joint sub assembly as a set.**
   - **Align sliding hammer and drive shaft and remove them by pulling directly.**
4. Remove boot from shaft.
5. Remove circular clip from shaft.
6. While rotating ball cage, remove old grease on joint sub-assembly with paper towels.



SDIA0606E

INSPECTION AFTER DISASSEMBLY

Shaft

- Replace shaft if there is any runout, cracking, or other damage.

Joint sub-assembly (Wheel Side)

- Make sure there is no rough rotation or unusual axial looseness.
- Make sure there is no foreign material inside joint.
- Check joint sub-assembly for compression scars, cracks, fractures.

  CAUTION:
  If there are any irregular conditions of joint sub-assembly components, replace the entire joint sub-assembly.

Housing (Final Drive Side)

- Make sure there are compression scars, cracks, factures or unusual wear of ball rolling surface.
- Make sure there is no damage to shaft screws.
- Make sure there is no deformation of boot installation parts.

Ball Cage

- Make sure there are compression scars, cracks, factures of sliding surface.

Steel Ball

- Make sure there are compression scars, cracks, factures or unusual wear.

Inner Race

- Check ball sliding surface for compression scars, cracks or fractures.
- Make sure there is no damage to serrated part.

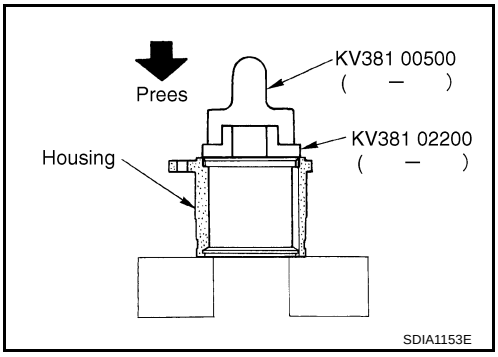
CAUTION:
If there are any irregular conditions in the component, replace with a new set of housing, ball cage, steel ball and inner race.

ASSEMBLY

Final Drive Side

1. If plug has been removed, use a drift (SST) to press in a new one.

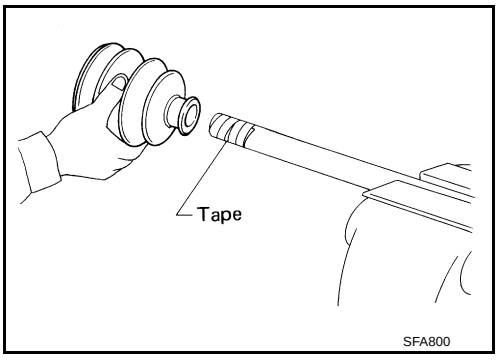
   NOTE:
   Discard old plug; replace with new one.



2. Wind serrated part of shaft with tape. Install boot band and boot to shaft. Be careful not to damage boot.

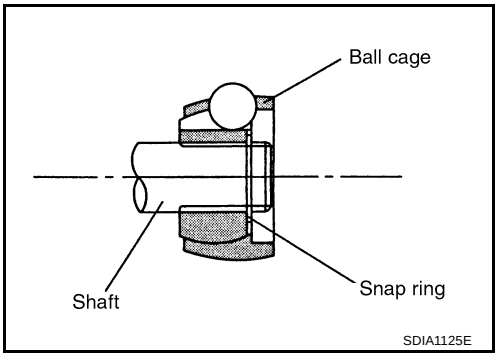
   NOTE:
   Discard old boot band and boot; replace with new one.

3. Remove protective tape wound around serrated part of shaft.



4. Install ball cage/steel ball/inner race assembly to shaft, and secure them tightly with a snap ring.

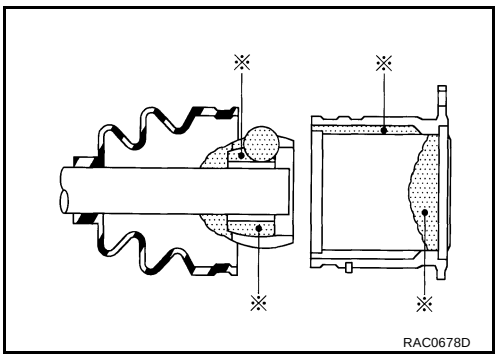
   NOTE:
   Discard old snap ring; replace with new one.



5. Insert the amount grease (NISSAN genuine grease or equivalent) onto housing (* point) to the quantity mentioned below, and install it to shaft.

   Grease amount : 124 – 134 g (4.37 – 4.73 oz)

6. Install stopper ring to housing.
7. After installed, pull shaft to check engagement between joint sub-assembly and stopper ring.

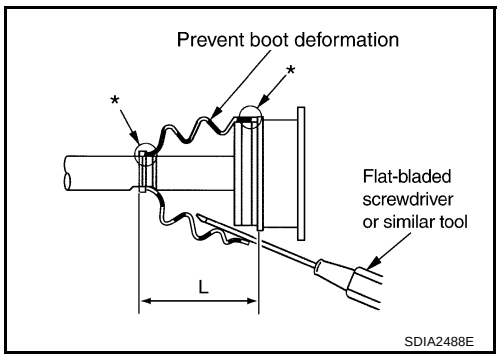


8. Install boot securely into grooves (indicated by * marks) shown in the figure.

   CAUTION:
   If there is grease on boot mounting surfaces (indicated by* marks) of shaft and housing, boot may come off. Remove all grease from surfaces.

9. Make sure boot installation length “L” is the length indicated below. Insert a flat-bladed screwdriver or similar tool into smaller side of boot. Bleed air from boot to prevent boot deformation.

   Boot installation Length “L ” : 93.9 mm (3.697 in)



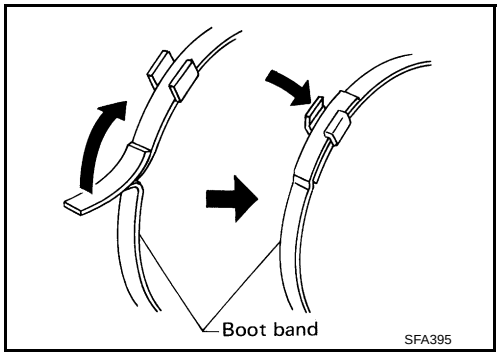
CAUTION:

- **Boot may break if boot installation length is less than standard value.**
- **Take care not to touch the tip of screwdriver to inside of boot.**

10. Secure big and small ends of boot with new boot bands as shown in the figure.

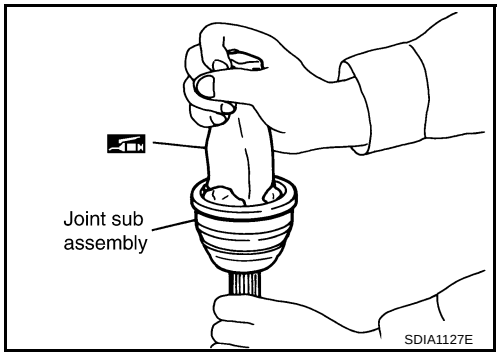
    NOTE:
    Discard old boot bands; replace with new ones.

11. After installing housing and shaft, rotate boot to check whether or not the actual position is correct. If boot position is not correct, secure boot with new boot band again.



Wheel Side

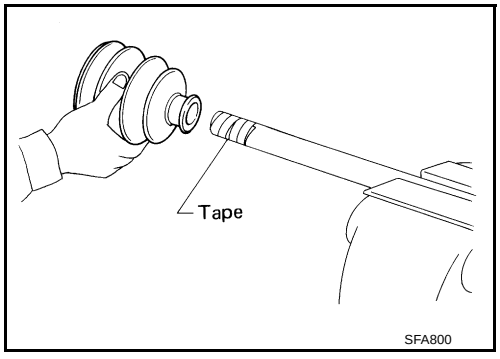
1. Insert the amount grease (NISSAN genuine grease or equivalent) into joint sub-assembly serration hole until grease begins to ooze from ball groove and serration hole. After insert grease, use a shop cloth to wipe off old grease that has oozed out.



2. Wind serrated part of shaft with tape. Install boot band and boot to shaft. Be careful not to damage boot.

   NOTE:
   Discard old boot band and boot; replace with each new one.

3. Remove protective tape wound around serrated part of shaft.

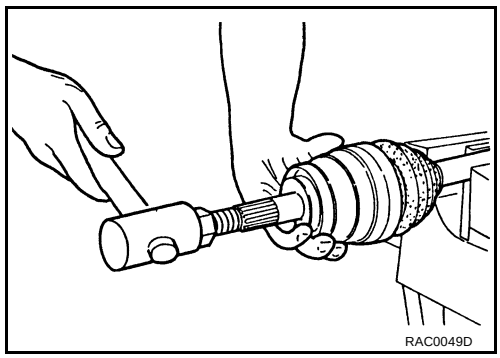


4. Attach circular clip to shaft. At this time, circular clip must fit securely into shaft groove. Attach nut to joint sub-assembly. Use a wooden hammer to press-fit.

   NOTE:
   Discard old circular clip; replace with new one.

5. Insert the amount grease (NISSAN genuine grease or equivalent) listed below into housing from large end of boot.

   Grease amount : 86 – 96 g (3.03 – 3.39 oz)

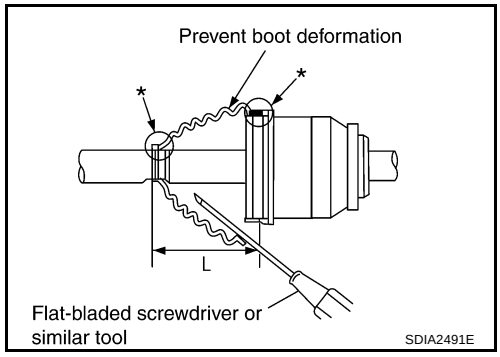


6. Install boot securely into grooves (indicated by * marks) shown in the figure.

   CAUTION:
   If there is grease on boot mounting surfaces (indicated by* marks) of shaft and housing, boot may come off. Remove all grease from surfaces.

7. Make sure boot installation length “L” is the length indicated below. Insert a flat-bladed screwdriver or similar tool into smaller side of boot. Bleed air from boot to prevent boot deformation.

   Boot installation length “L” : 97.0 mm (3.819 in)

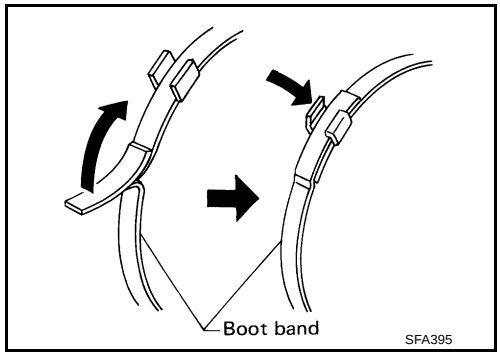


   CAUTION:
   - **Boot may brake if boot installation length is less than standard value.**
   - **Be careful that screwdriver tip does not contact inside surface of boot.**

8. Secure big and small ends of boot with new boot bands as shown in the figure.

   NOTE:
   Discard old boot bands; replace with new ones.

9. After installing joint sub-assembly and shaft, rotate boot to check whether or not the actual position is correct. If boot position is not correct, secure boot with new boot bands again.

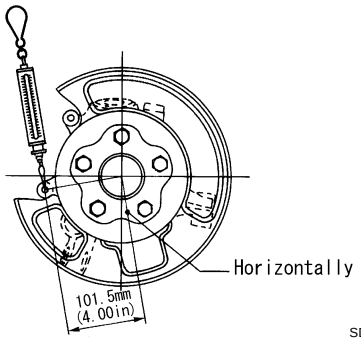


SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Bearing

NDS00012

Axial end play	0.05 mm (0.002 in) or less
Rotating torque	At a load of 49,033 N (5,000 kg, 11,000 lb) Less than 1.88 N·m (0.19 kg-m, 17 in-lb)
Measurement of spring balance	Less than 18.5 N (1.89 kg, 4.16 lb)
Measuring point (Brake caliper installation points)	 SDIA0801E

Drive Shaft

NDS00013

Joint	Wheel side	Final drive side
Grease quantity	86 – 96 g (3.03 – 3.39 oz)	124 – 134 g (4.37 – 4.73 oz)
Boots installed length	97.0 mm (3.819 in)	93.9 mm (3.697 in)

SECTION RF
ROOF

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS00063

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NIS00064

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions

NIS00065

- Disconnect both battery cables in advance.
- Never tamper with or force air bag lid open, as this may adversely affect air bag performance.
- Be careful not to scratch pad and other parts.
- When removing or disassembling any part, be careful not to damage or deform it. Protect parts, which may get in the way with cloth.
- When removing parts with a screwdriver or other tool, protect parts by wrapping them with vinyl or tape.
- Keep removed parts protected with cloth.
- If a clip is deformed or damaged, replace it.
- If an unreusable part is removed, replace it with a new one.
- Tighten bolts and nuts firmly to the specified torque.
- After re-assembly has been completed, make sure each part functions correctly.
- Remove stains in the following way.

Water-soluble stains:
Dip a soft cloth in warm water, and then squeeze it tightly. After wiping the stain, wipe with a soft dry cloth.
Oil stain:
Dissolve a synthetic detergent in warm water (density of 2 to 3% or less), dip the cloth, then clean off the stain with the cloth. Next, dip the cloth in fresh water and squeeze it tightly. Then clean off the detergent completely. Then wipe the area with a soft dry cloth.
Do not use any organic solvent, such as thinner or benzine.

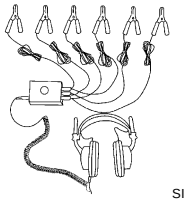
PREPARATION

PFP:00002

Special Service Tools

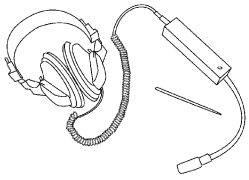
NIS00066

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS00067

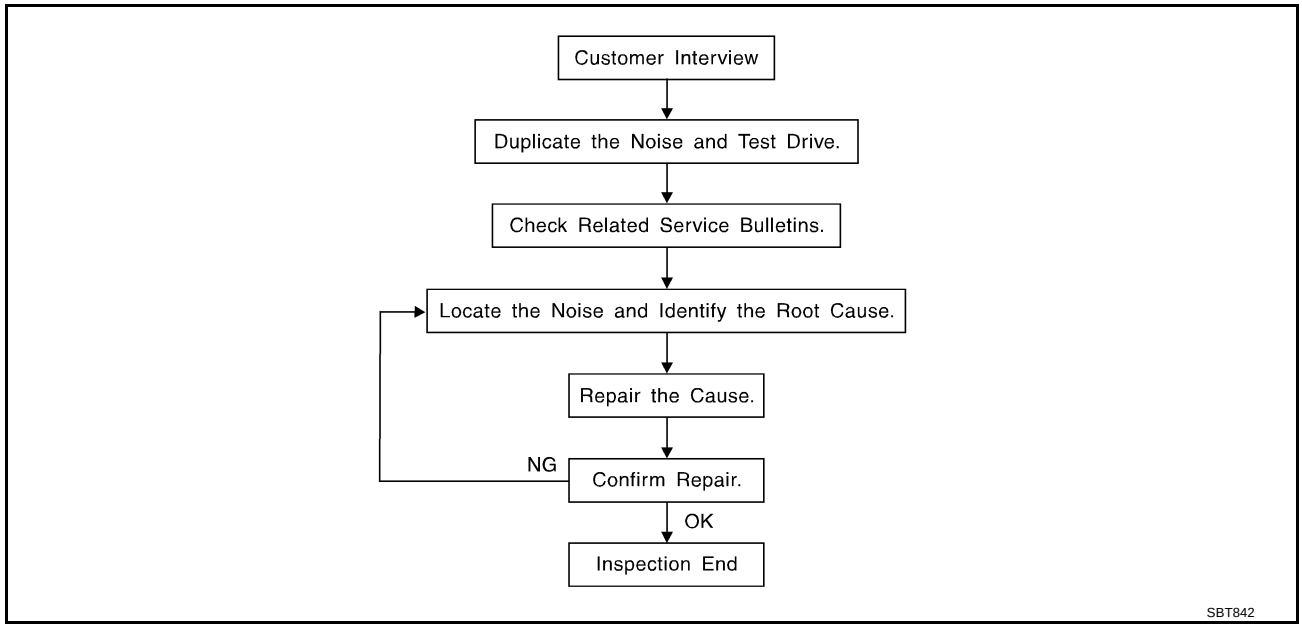
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS00298



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to RF-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to RF-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS00299

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint
   These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

   CAUTION:
   Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

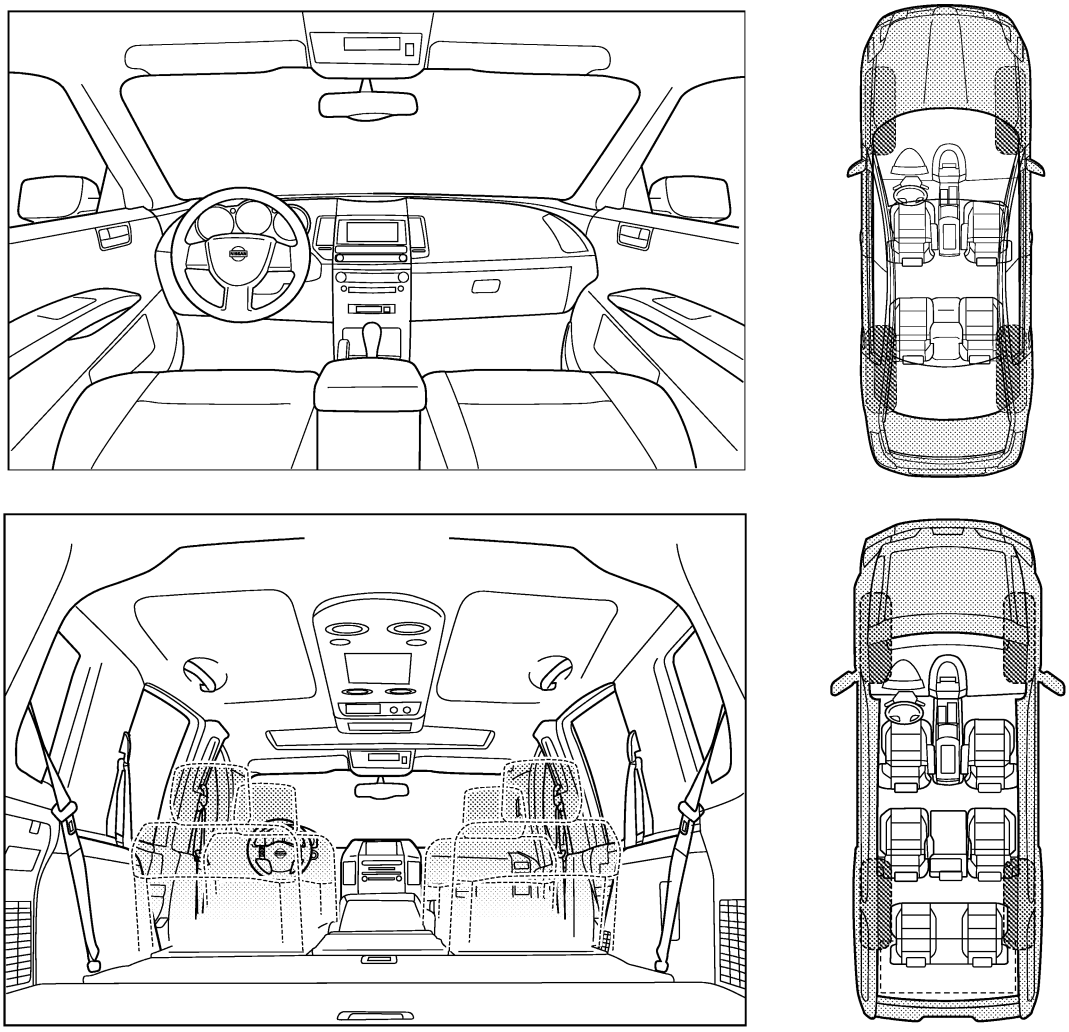
Diagnostic Worksheet

NIS0029A

SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

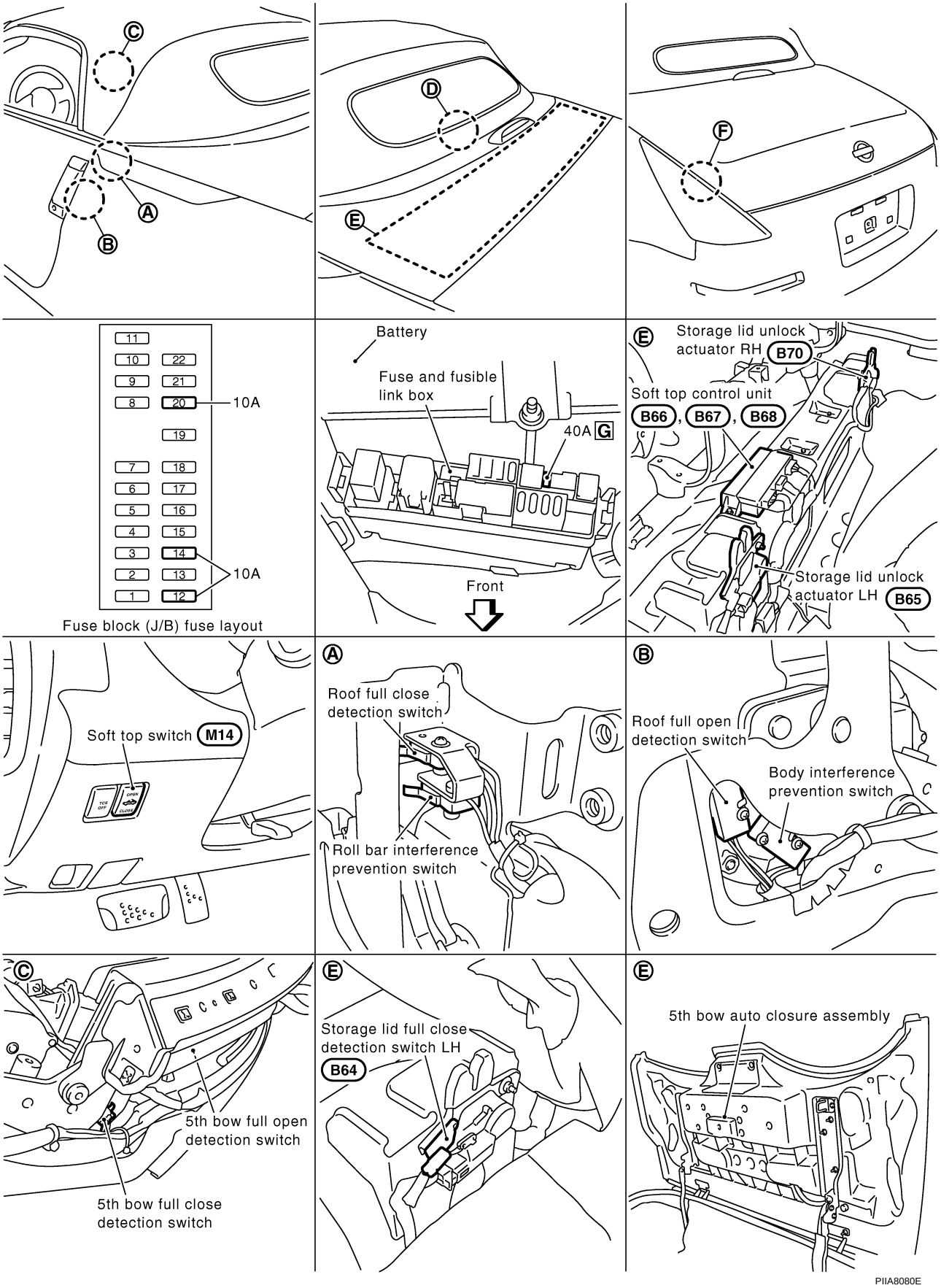
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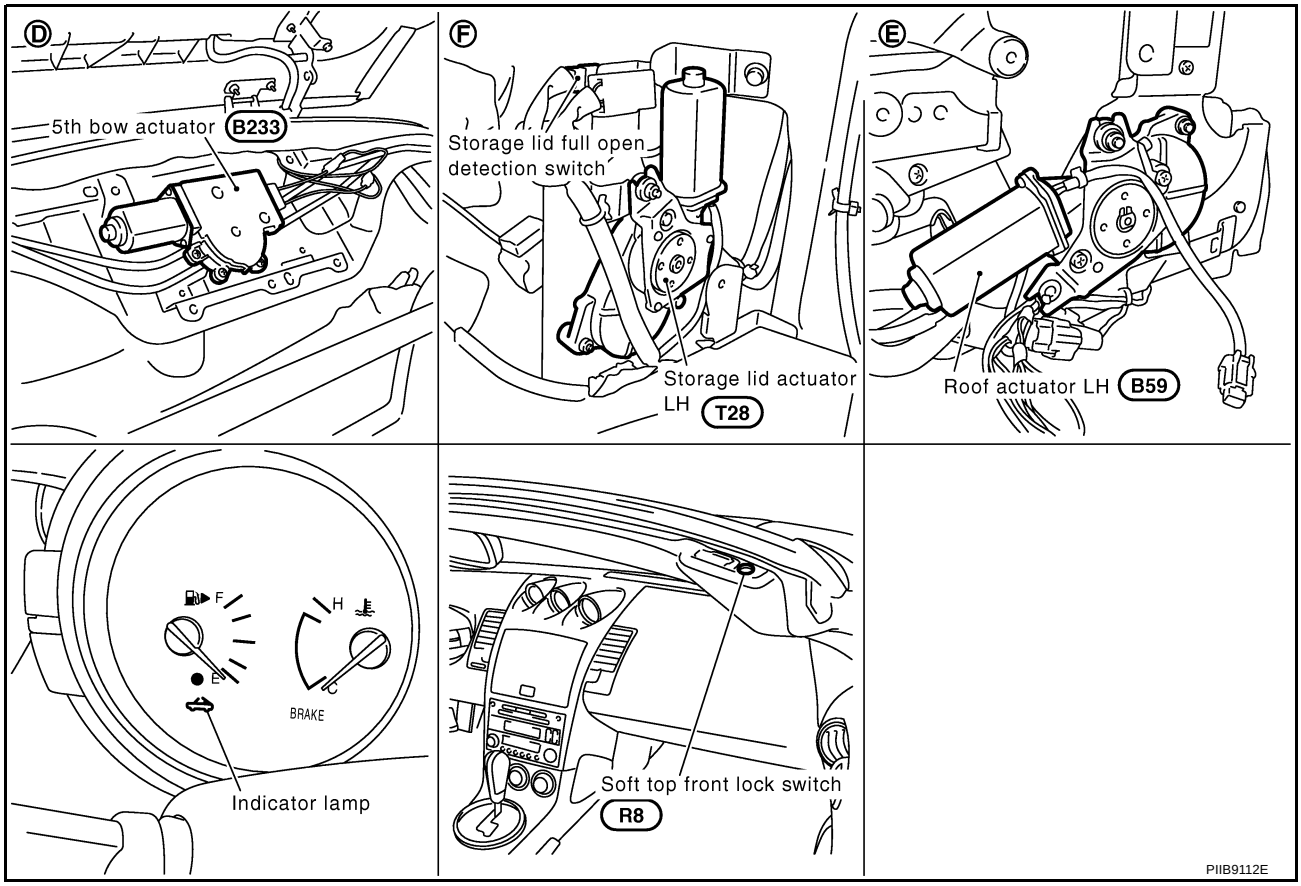
SOFT TOP

PFP:97002

Component Parts and Harness Connector Location

NIS0006B





Following Parts Are Built Into 5th Bow Auto Closure Assembly.

- 5th bow half-latch switch built in 5th bow lock assembly in storage lid.
- 5th bow full-latch switch built in 5th bow lock assembly in storage lid.
- 5th bow ending switch built in 5th bow lock assembly in storage lid.
- 5th bow unlock actuator.
- 5th bow closure motor.

NOTE:
Always replace following switches as a 5th bow lock assembly.

- 5th bow half-latch switch
- 5th bow full-latch switch
- 5th bow ending switch.

5th bow full open detection switch and 5th bow full close detection switch are built into 5th bow switch assembly located at plate rail RR. Replace above switches as a plate rail RR.

System Description

NIS0006C

An electronic soft top open/close system has been adopted that allows the soft top to be opened or closed using the soft top switch.
The following parts operate, linked with the operation of the soft top.

- When the soft top begins to operate, the passenger seat tilts forward. When operation is completed, it returns to its original position.
  (It does not move when the seat cancel switch is ON.)
- When the soft top begins to operate, both power windows activate to the fully-open position.
  (They do not activate to the fully-closed position after operation is completed.)
  Moreover, power window cannot be operated while soft top is operating.

When the soft top switch is released, soft top operation stops.

CONDITIONS FOR OPERATION

Operation is avairable when all of the conditions below are satisfied.

- Ignition switch is ON.
- The brake pedal is ON.
- Vehicle speed is 4 km/h (2 MPH) or less.
- Battery voltage is approximately 10 V or more.

CAUTION:
Run the engine when operating or inspecting the soft top to prevent battery dies.

CONDITIONS FOR STOPPING OPERATION

Operation of the soft top stops when the conditions below are satisfied while the soft top is operating.

- Any of the above operation conditions is no longer satisfied.
- The passenger side power seat is operated. (It does not move when seat cancel switch is ON.)

OUTLINE OF OPERATION

Refer to the illustrations for the positions of the soft top, and the conditions of switch and actuator operation.

OPERATION: FULL CLOSE → FULL OPEN

Refer to RF-19, "State Chart" .

- CONDITION: FULL CLOSE

Item	Condition
5th bow half-latch switch	: OFF
5th bow full-latch switch	: OFF
5th bow ending switch	: OFF
5th bow full open detection switch	: OFF
5th bow full close detection switch	: OFF
Storage lid full open detection switch	: OFF
Storage lid full close detection switch LH	: OFF
Storage lid full close detection switch RH	: OFF
Roof full open detection switch	: OFF
Roof full close detection switch	: OFF
Body interference prevention switch	: OFF
Roll bar interference prevention switch	: OFF

- CONDITION: OP 1
  When the soft top switch is pushed to OPEN, the indicator lamp illuminates, windows activate to the fully-open position and the passenger seat tilts forward by approximately 6 degrees by power window down request signal. When passenger seat tilts forward by approximately 6 degrees, seat back position signal is turned ON.

Item	Condition
Soft top switch	: OPEN (Until the operation ends)
Indicator lamp	: ON
Power window down request signal	: ON
Seat back position signal	: OFF → ON

- CONDITION: OP 2
  The 5th bow unlock actuator operates, releasing the 5th bow lock.

Item	Condition
5th bow unlock actuator	: ON

- CONDITION: OP 3
  The 5th bow actuator moves the 5th bow up.

Item	Condition
5th bow half-latch switch	: OFF → ON
5th bow actuator	: UP
5th bow unlock actuator	: ON → OFF

- CONDITION: OP 4
  The 5th bow is rising.

Item	Condition
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON
5th bow closure motor	: OPEN → STOP
5th bow full-latch switch	: OFF → ON
5th bow ending switch	: OFF → ON

- CONDITION: OP 5
  The 5th bow stops in the fully-open position. The storage lid unlock actuator operates, releasing the storage lid lock.

Item	Condition
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Storage lid unlock actuator (LH and RH)	: OFF→ON
Storage lid full close detection switch (RH)	: OFF → ON

- CONDITION: OP 6
  The storage lid actuator operates, raising the storage lid.

Item	Condition
Storage lid full close detection switch (LH)	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN
Storage lid unlock actuator (LH and RH)	: ON → OFF

- CONDITION: OP 7
  The storage lid stops in the fully-open position. The 5th bow actuator moves the 5th bow down.

Item	Condition
Storage lid full open detection switch	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN → STOP
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITION: OP 8
  The 5th bow actuator stops in the fully-closed position. The roof actuator operates (OPEN operation), opening the roof.

Item	Condition
5th bow full close detection switch	: ON → OFF
5th bow actuator	: DOWN → STOP
Roof actuator (LH and RH)	: OPEN
Roof full close detection switch	: OFF → ON

- CONDITION: OP 9
  While the roof is opening, the 5th bow actuator moves the 5th bow up.

Item	Condition
Roof actuator (LH and RH)	: OPEN
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON
Roll bar interference prevention switch	: OFF → ON

- CONDITION: OP 10
  While the roof is opening, the 5th bow stops in the fully-open position.

Item	Condition
Roof actuator (LH and RH)	: OPEN
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Body interference prevention switch	: OFF → ON

- CONDITION: OP 11
  The roof is stored and stops motion. The storage lid actuator operates (DOWN operation) to lower the storage lid.
  The passenger seat also returns to its original position.

Item	Condition
Roof full open detection switch	: OFF → ON
Roof actuator (LH and RH)	: OPEN → STOP
Storage lid actuator (LH and RH)	: CLOSE
Storage lid full open detection switch	: ON → OFF
Storage lid full close detection switch (LH)	: ON → OFF
Power window request signal	: OFF

- CONDITION: OP 12
  At the fully-closed position, the storage lid inverts and stops. The passenger seat tilts back. Opening operation is completed, and the indicator lamp turns OFF.

Item	Condition
Storage lid full close detection switch (RH)	: ON → OFF
Storage lid actuator (LH and RH)	: CLOSE → OPEN → STOP
Indicator lamp	: ON → OFF

OPERATION: FULL OPEN → FULL CLOSE

Refer to RF-21, "State Chart" .

- CONDITION: FULL OPEN

Item	Condition
5th bow half-latch switch	: ON
5th bow full-latch switch	: ON
5th bow ending switch	: ON
5th bow full open detection switch	: ON
5th bow full close detection switch	: ON
Storage lid full open detection switch	: OFF
Storage lid full close detection switch LH	: OFF
Storage lid full close detection switch RH	: OFF
Roof full open detection switch	: ON
Roof full close detection switch	: ON
Body interference prevention switch	: ON
Roll bar interference prevention switch	: ON

- CONDITION: CL 1
  When the soft top switch is pressed to the CLOSE side, the indicator lamp illuminates, storage lid unlock actuator also operates, releasing the storage lid lock.

Item	Condition
Soft top switch	: OLOSE (Until the operation ends)
Indicator lamp	: ON
Storage lid unlock actuator	: ON
Storage lid full close detection switch (RH)	: OFF → ON

- CONDITION: CL 2
  Windows activate to the fully-open position and the passenger seat tilts forward by approximately 6 degrees by power window down request signal. Storage lid actuator operates to raise the storage lid. When passenger seat tilts forward by approximately 6 degrees, seat back position signal is turned ON.

Item	Condition
Storage lid full close detection switch (LH)	: OFF → ON
Storage lid actuator (LH and RH)	: UP
Power window down request signal	: ON
Storage lid unlock actuator	: ON → OFF
Seat back position signal	: OFF → ON

- CONDITION: CL 3
  The storage lid stops at the fully-open position. The roof actuator operates (CLOSE operation) to close the roof.

Item	Condition
Storage lid full open detection switch	: OFF → ON
Storage lid actuator (LH and RH)	: OPEN → STOP
Roof actuator (LH and RH)	: CLOSE
Roof full open detection switch	: ON → OFF
Body interference prevention switch	: ON → OFF

- CONDITION: CL 4
  While the roof is closing, the 5th bow actuator operates (DOWN operation) to lower the 5th bow.

Item	Condition
Roof actuator (LH and RH)	: CLOSE
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITOIN: CL 5
  The roof is closing, and 5th bow is lowering.

Item	Condition
Roof actuator (LH and RH)	: CLOSE
5th bow full close detection switch	: ON → OFF
5th bow actuator	: DOWN → STOP
Roll bar interference prevention switch	: ON → OFF

- CONDITION: CL 6
  The roof stops at the fully-closed position. The 5th bow actuator inverts, raising the 5th bow.

Item	Condition
Roof full close detection switch	: ON → OFF
Roof actuator (LH and RH)	: CLOSE → STOP
5th bow actuator	: UP
5th bow full close detection switch	: OFF → ON

- CONDITON: CL 7
  The 5th bow stops in the fully-open position. The storage lid actuator operates (DOWN operation) lower the storage lid.

Item	Condition
5th bow full open detection switch	: OFF → ON
5th bow actuator	: UP → STOP
Storage lid actuator (LH and RH)	: CLOSE
Storage lid full open detection switch	: ON → OFF
Storage lid full close detection switch (LH)	: ON → OFF

- CONDITION: CL 8
  The storage lid inverts and stops at the fully-closed position. The 5th bow actuator operates (DOWN operation) to lower the 5th bow.

Item	Condition
Storage lid full close detection switch (RH)	: ON → OFF
Storage lid actuator	: CLOSE → OPEN → STOP
5th bow actuator	: DOWN
5th bow full open detection switch	: ON → OFF

- CONDITION: CL 9
  The 5th bow is lowering.

Item	Condition
5th bow actuator	: DOWN
5th bow full close detection switch	: ON → OFF

- CONDITION: CL 10
  5th bow auto closure operates. The passenger seat tilts back. Closing operation is completed, soft top front lock is locked, and the indicator lamp turns OFF. The passenger seat also returns to its original position.

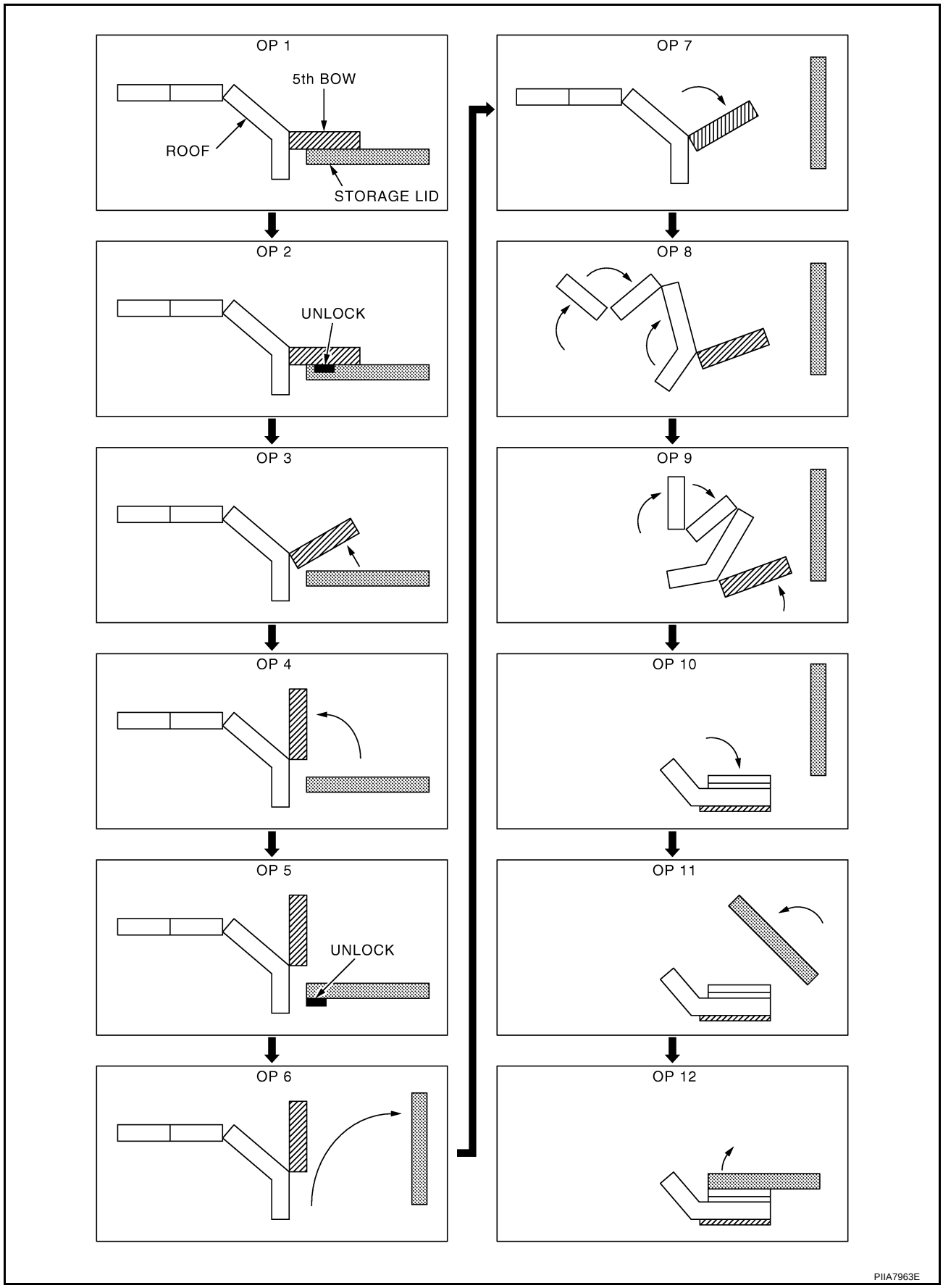
Item	Condition
5th bow actuator	: DOWN → STOP
5th bow half-latch switch	: ON → OFF
5th bow full-latch switch	: ON → OFF
5th bow ending switch	: ON → OFF
5th bow closure motor	: CLOSE → STOP
Power window request signal	: OFF
Indicator lamp	: ON → OFF

Operation Chart

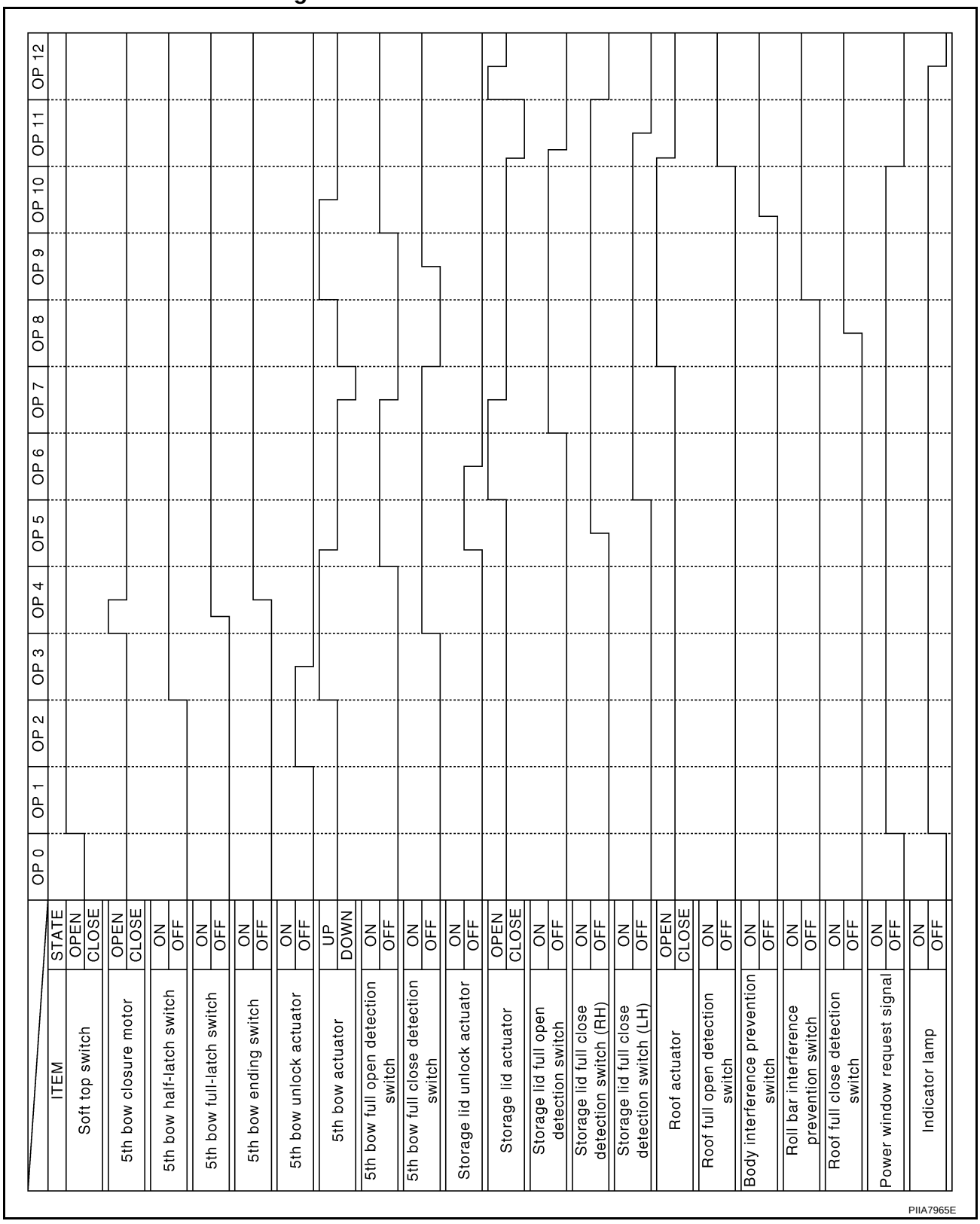
NIS0006D

CLOSE → OPEN

State Chart

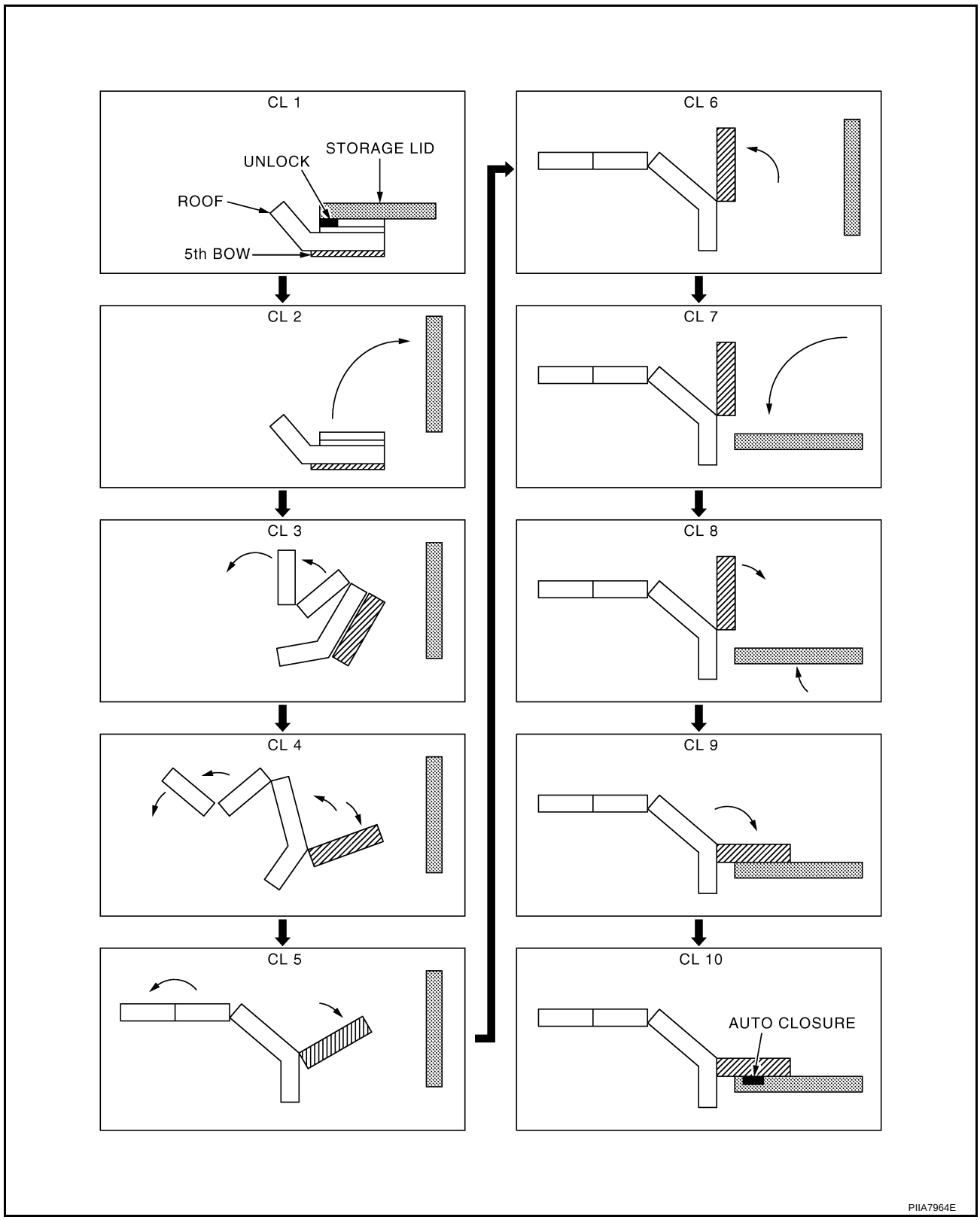


Each Switch and Actuator Signal Chart

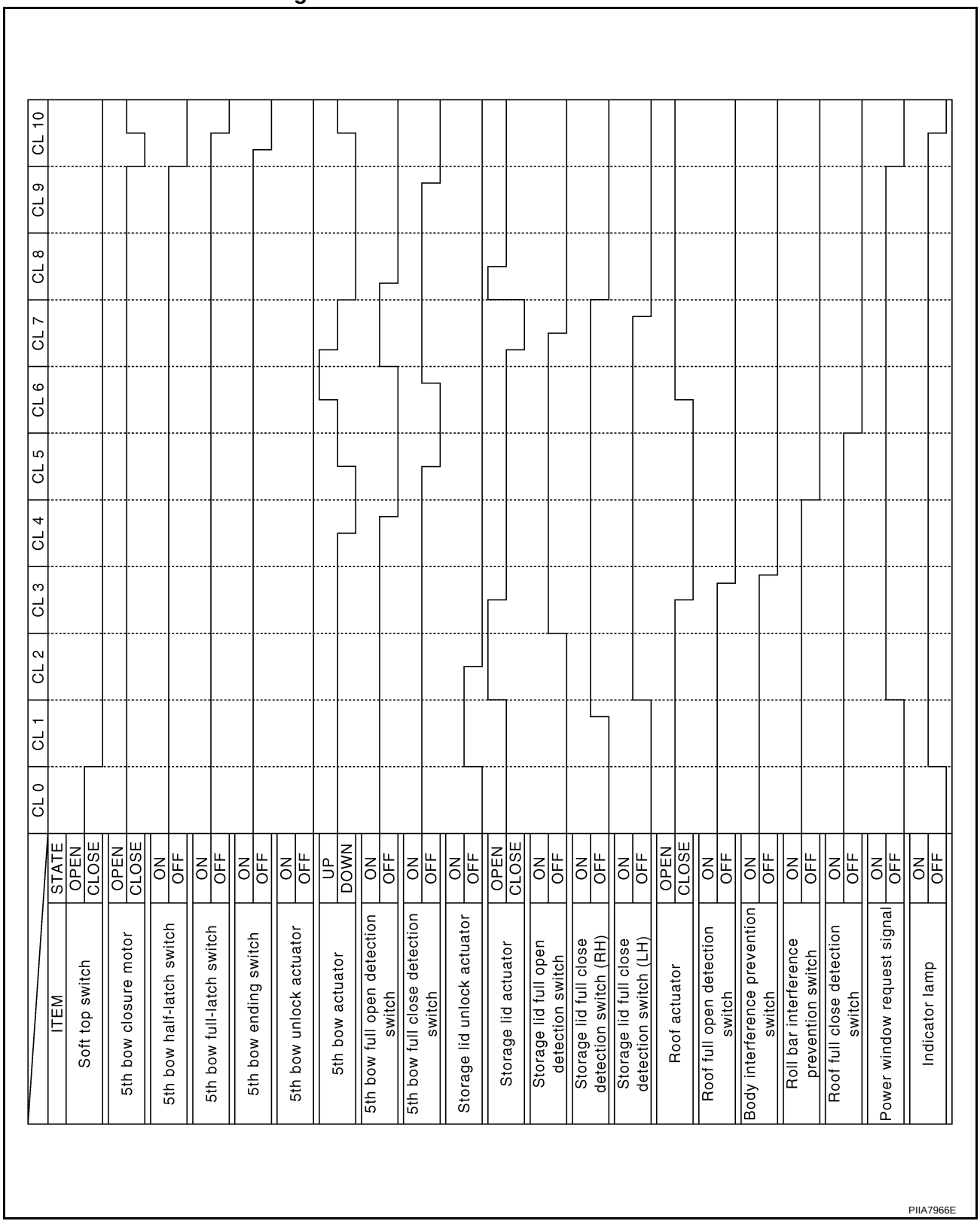


OPEN → CLOSE

State Chart



Each Switch and Actuator Signal Chart



Indicator Lamp

NIS0006E

The indicator lights, turns off or blinks according to the operating state.

Turns OFF : The open / close operation stops or completes or any switch is malfunctioning

Lights : The soft top is operating or the operation stops on the way

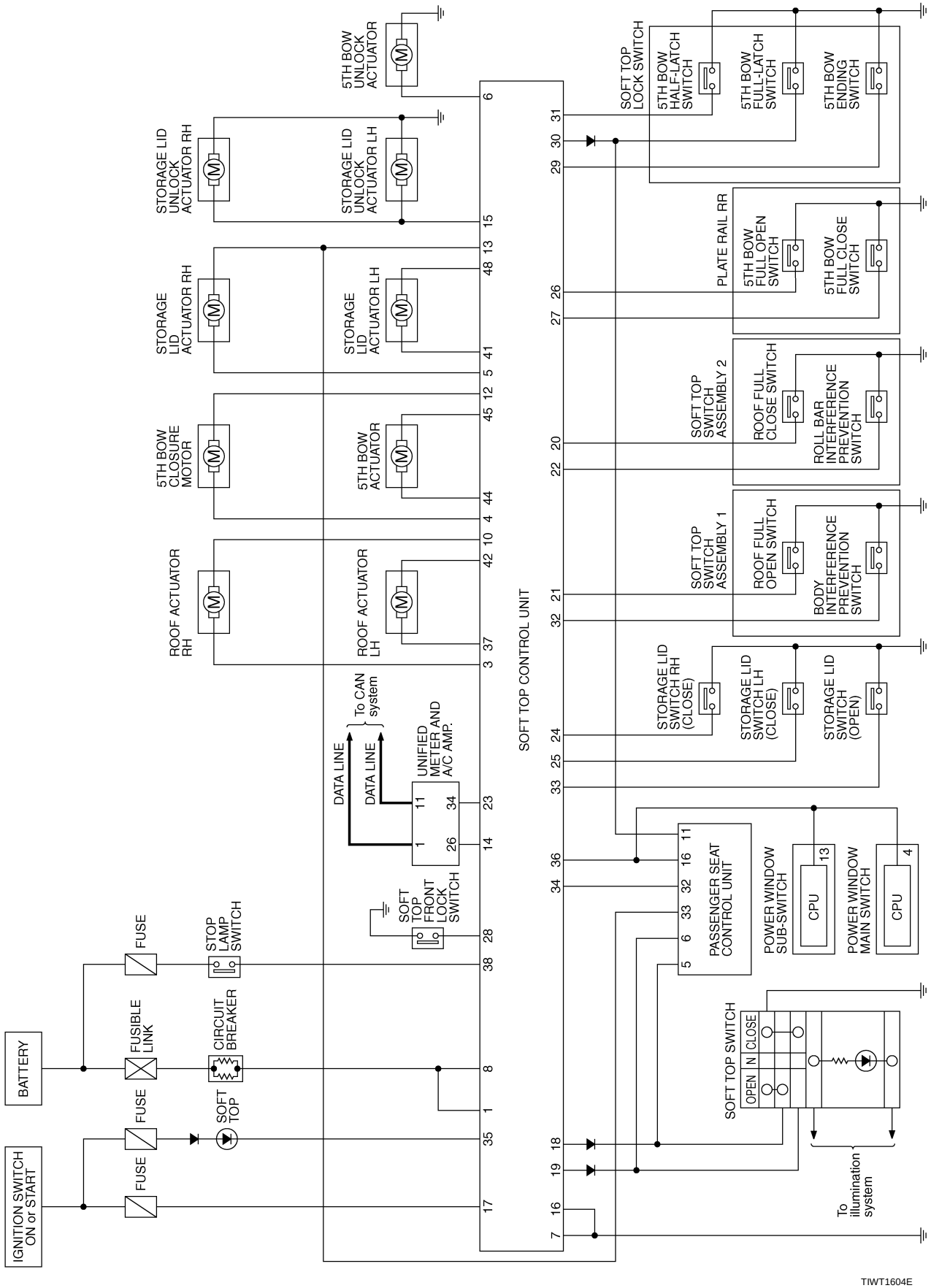
Blinks : The soft top cannot be operated, do not response or front lock is unlocked at the fully closed position

State of roof		The operation stops when the soft top is,		Operation
		full open or full close	in position on the way	
Operational condition		Turning off	Lighting	Lighting
Out of operational condition	When battery voltage decreases remarkably	Turning off	Lighting	Lighting
	Brake pedal is not depressed	Turning off	Lighting	Lighting
	Vehicle speed is 5 km/h (3 MPH) or more	Turning off	Lighting	Lighting
	Ignition switch: OFF	Turning off	Turning off*	Turning off*
Malfunction of	any switch of the system	Turning off	Lighting	Blinking
	soft top control unit	Blinking	Blinking	Blinking
	vehicle speed signal	Blinking	Blinking	Blinking

*: The soft top operates for approximately 30 seconds after turn ignition switch OFF.

Schematic

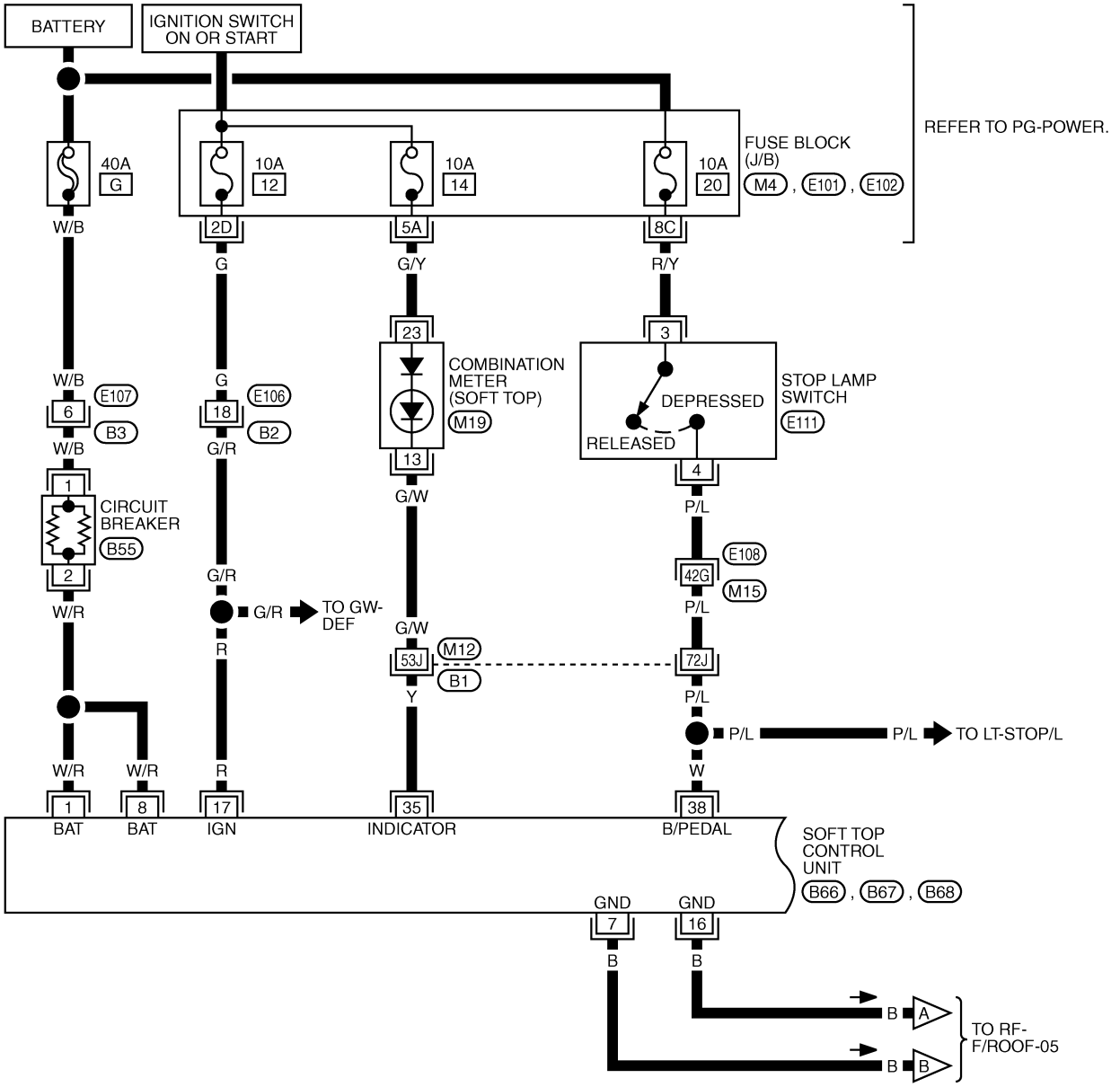
NIS0006F

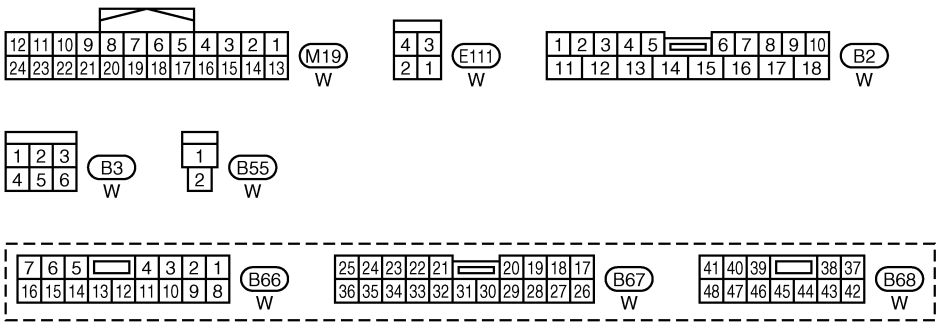


Wiring Diagram — F/ROOF —

NIS0006G

RF-F/ROOF-01

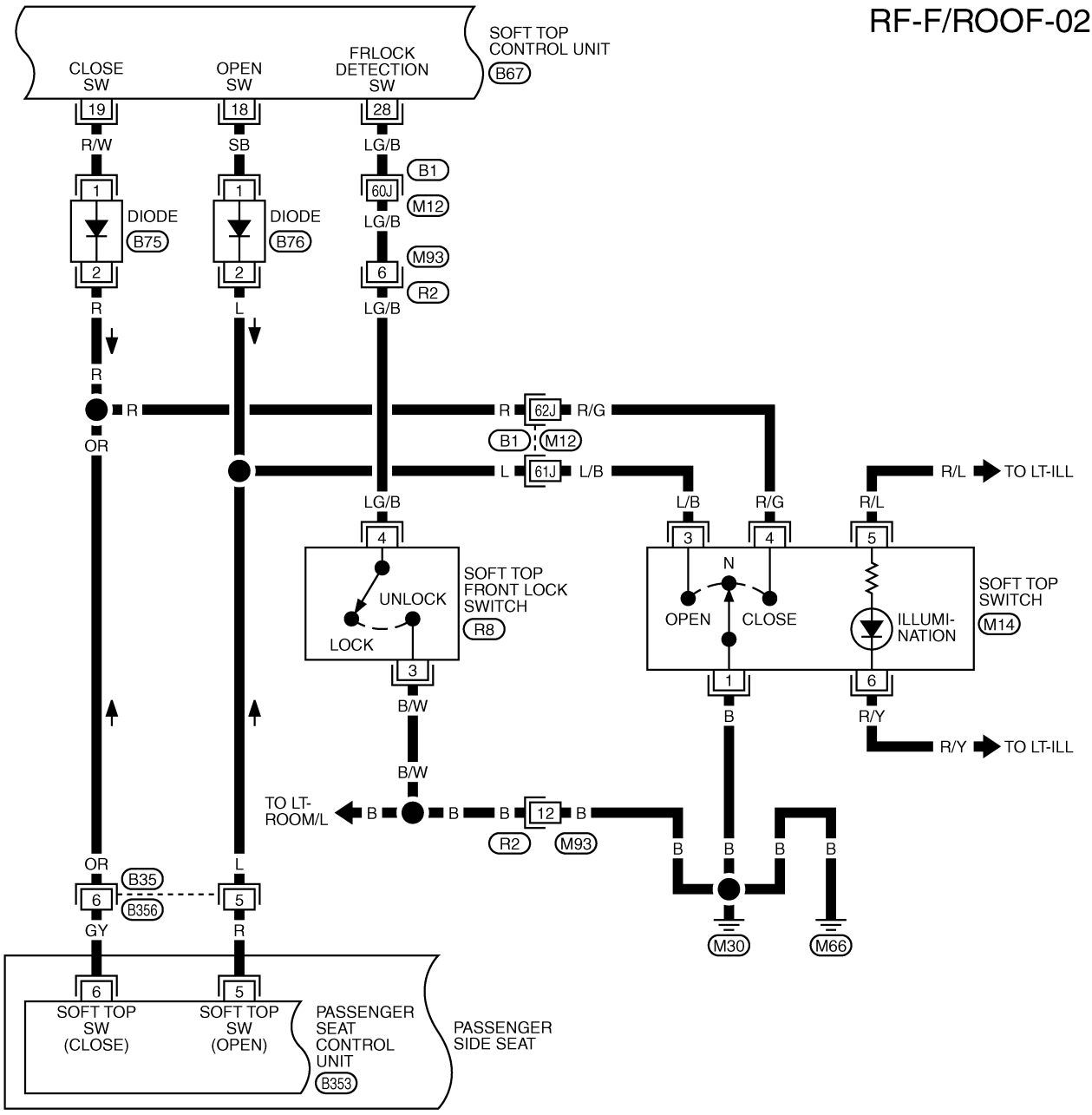


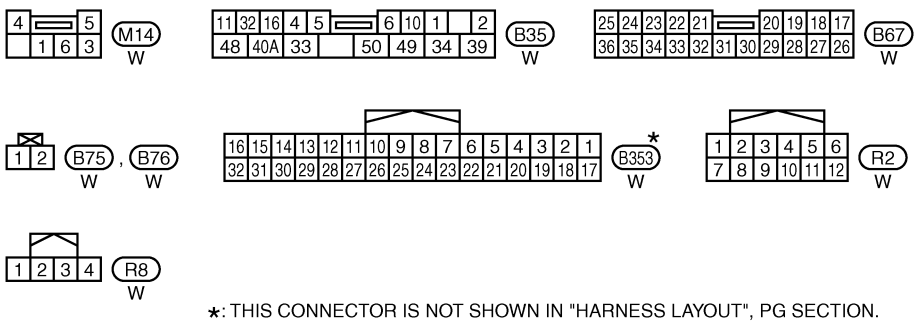


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E101 , E102 -FUSE BLOCK- JUNCTION BOX (J/B)

TIWT2281E

RF-F/ROOF-02





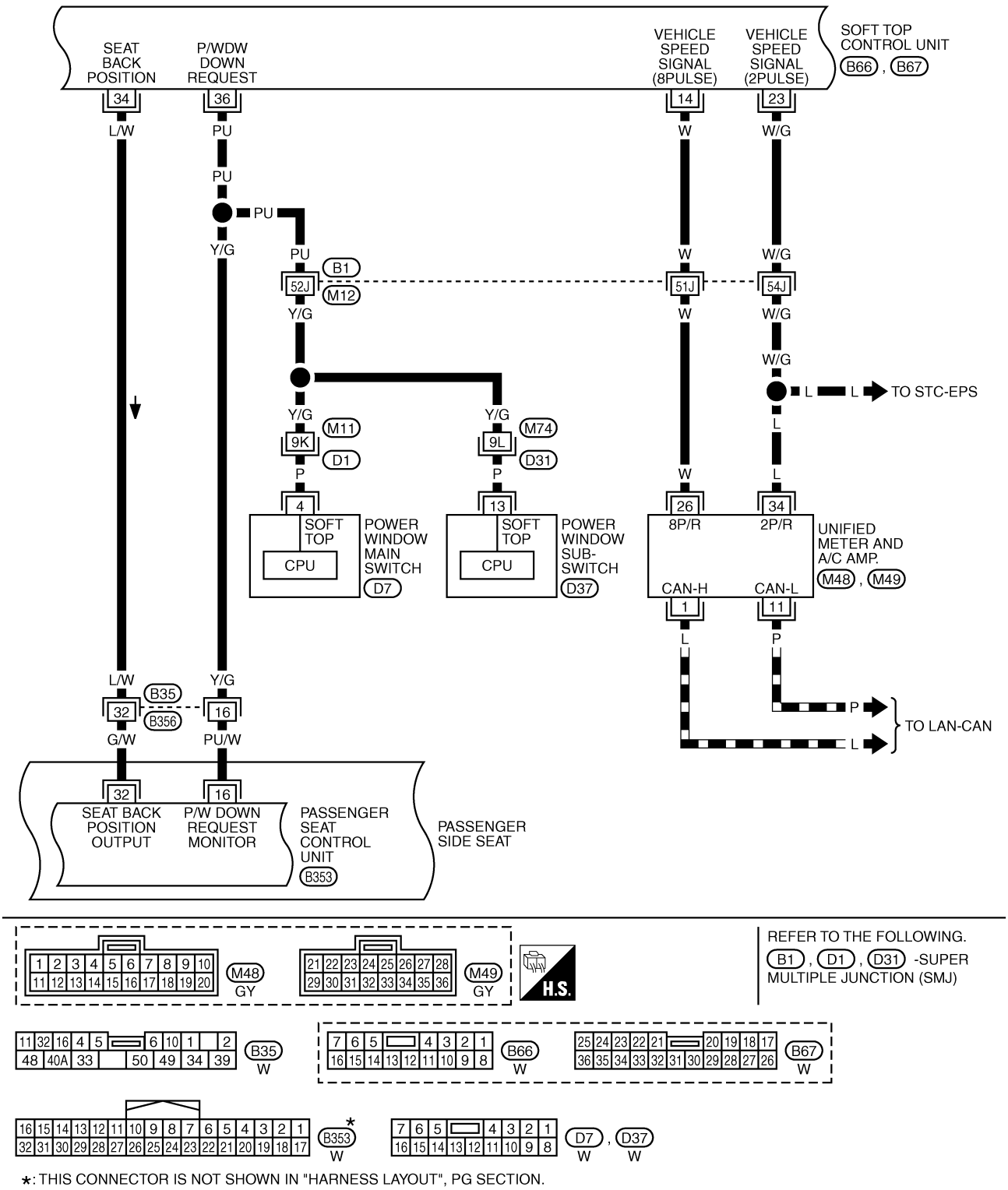
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT2282E

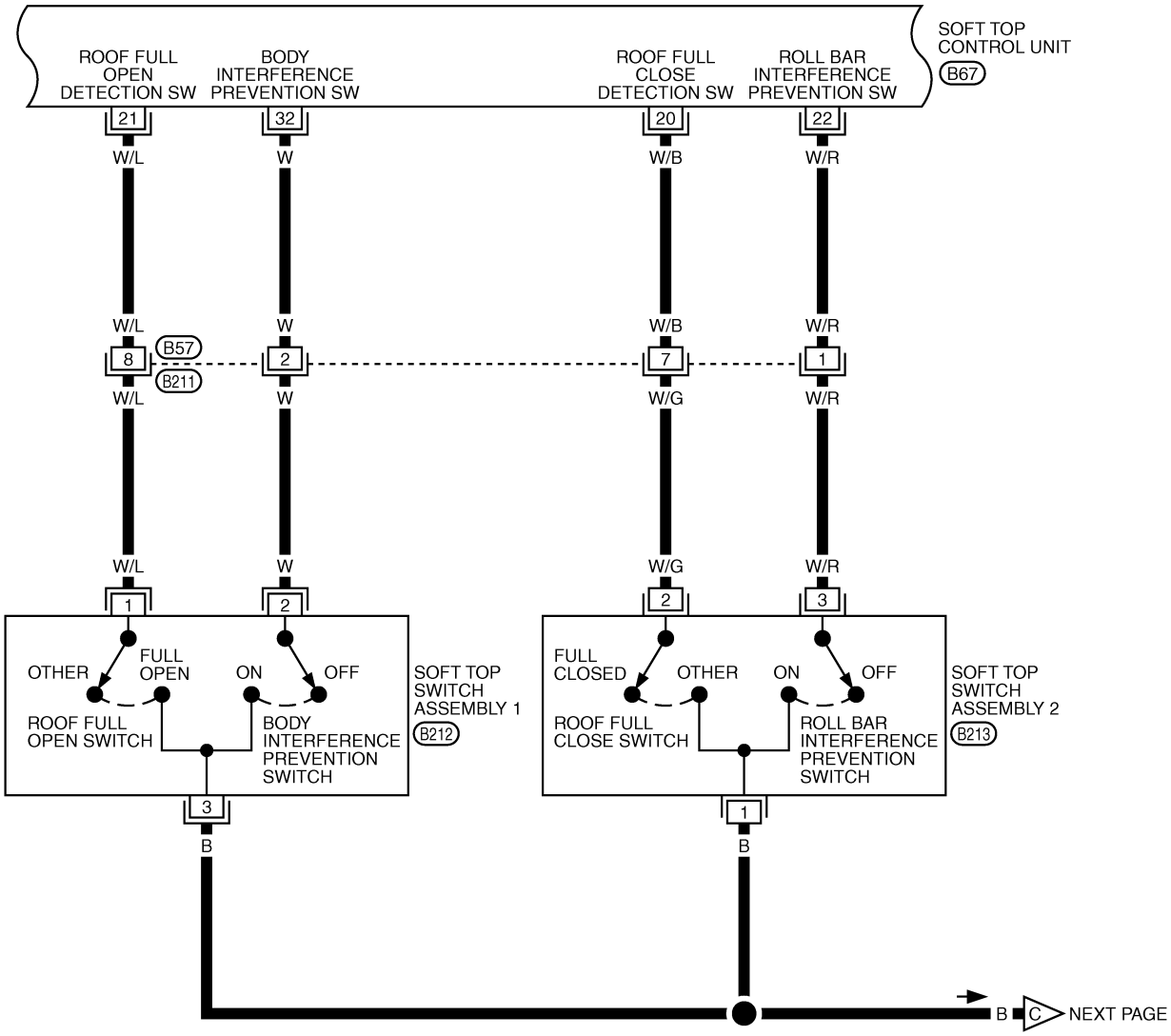
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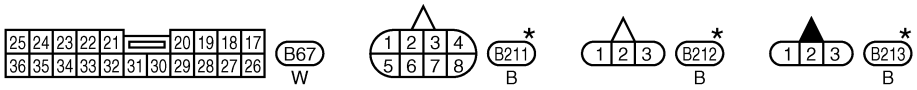
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TIWT1607E

RF-F/ROOF-04

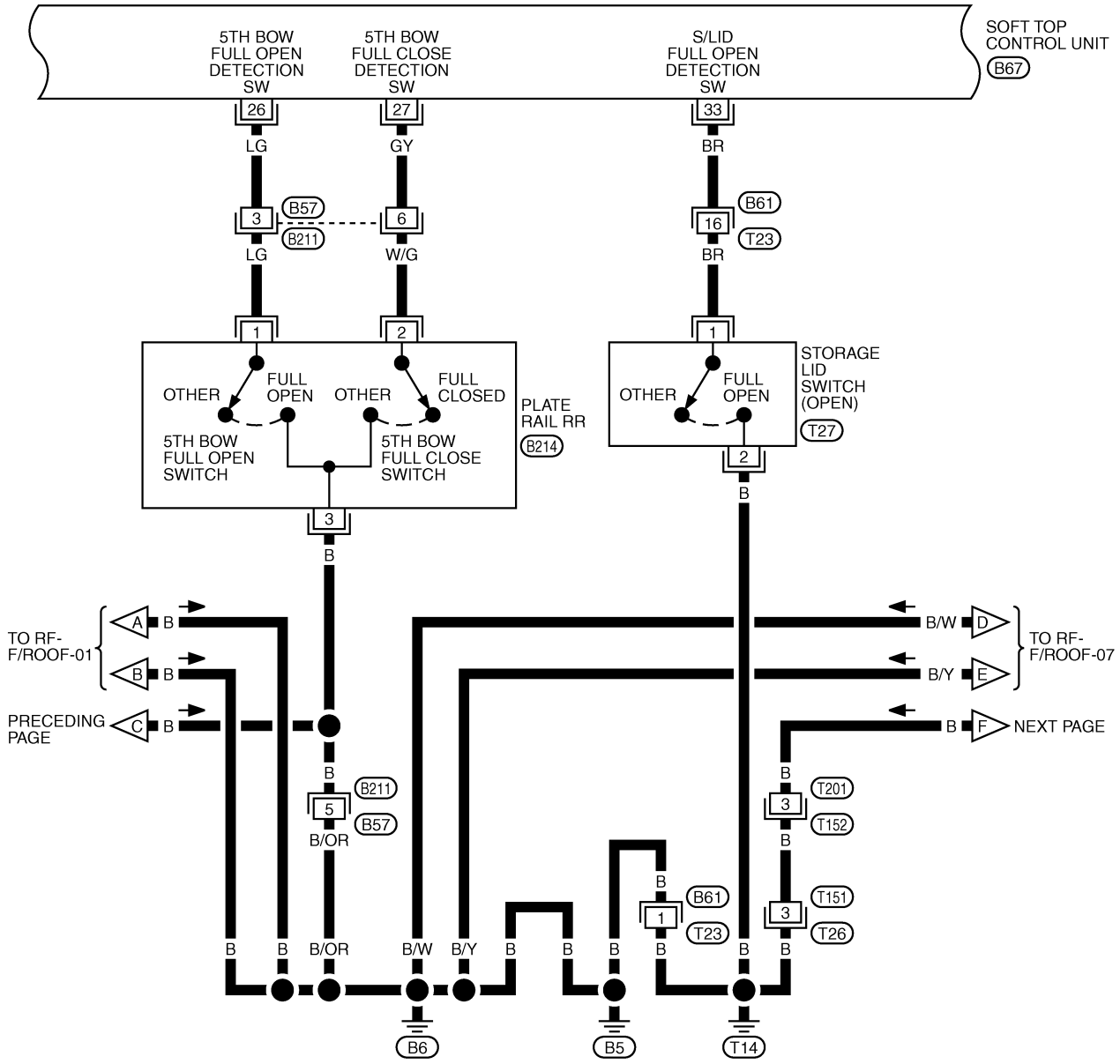


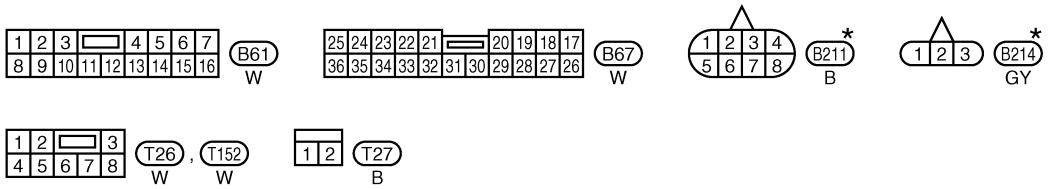


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0766E

RF-F/ROOF-05

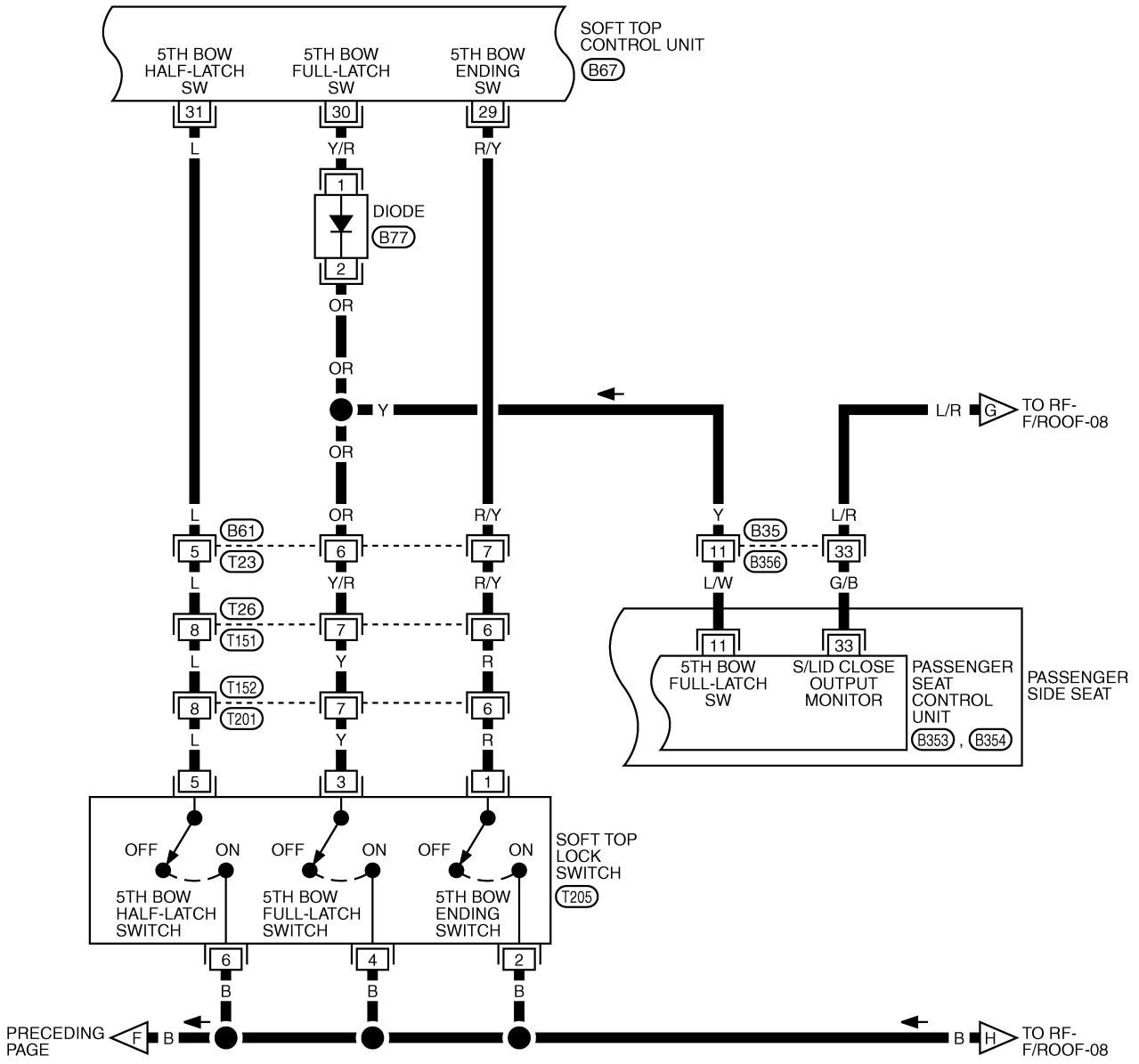


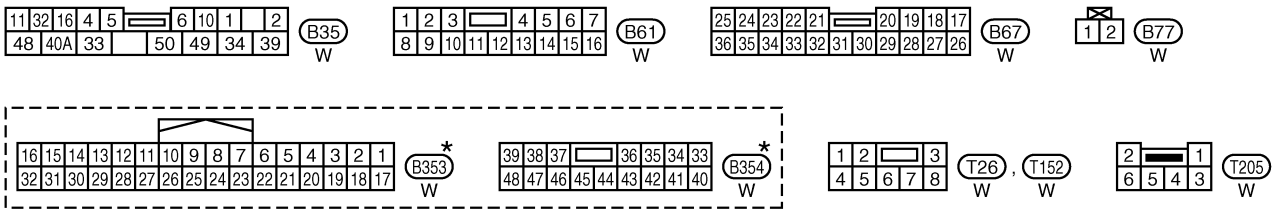


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT2283E

RF-F/ROOF-06

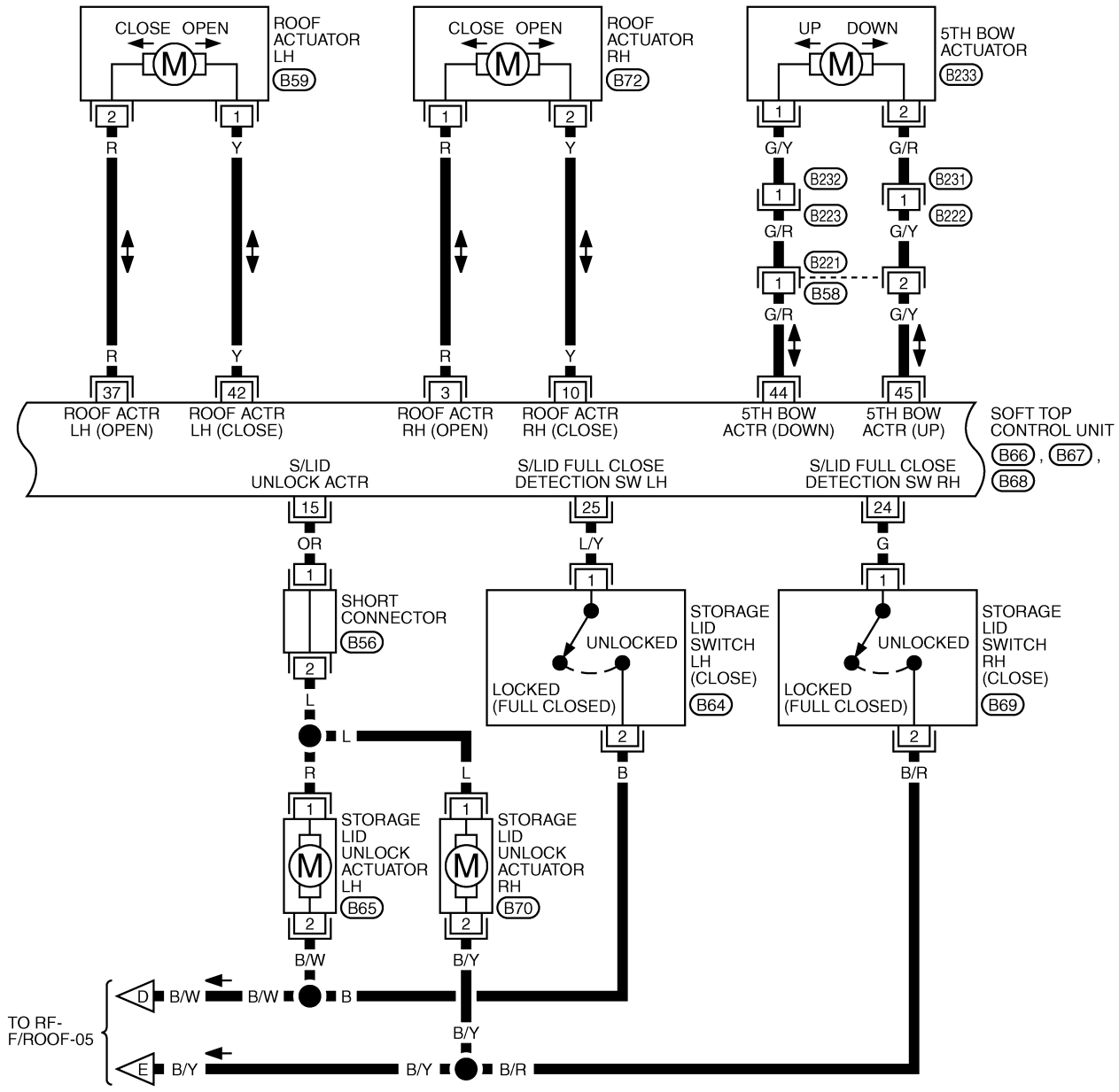


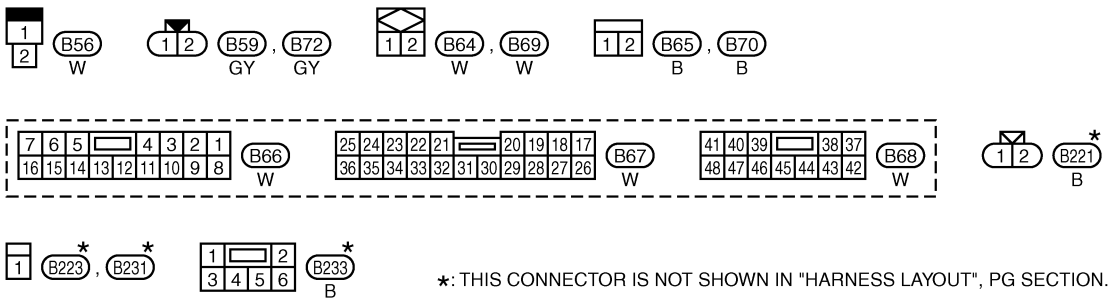


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT1791E

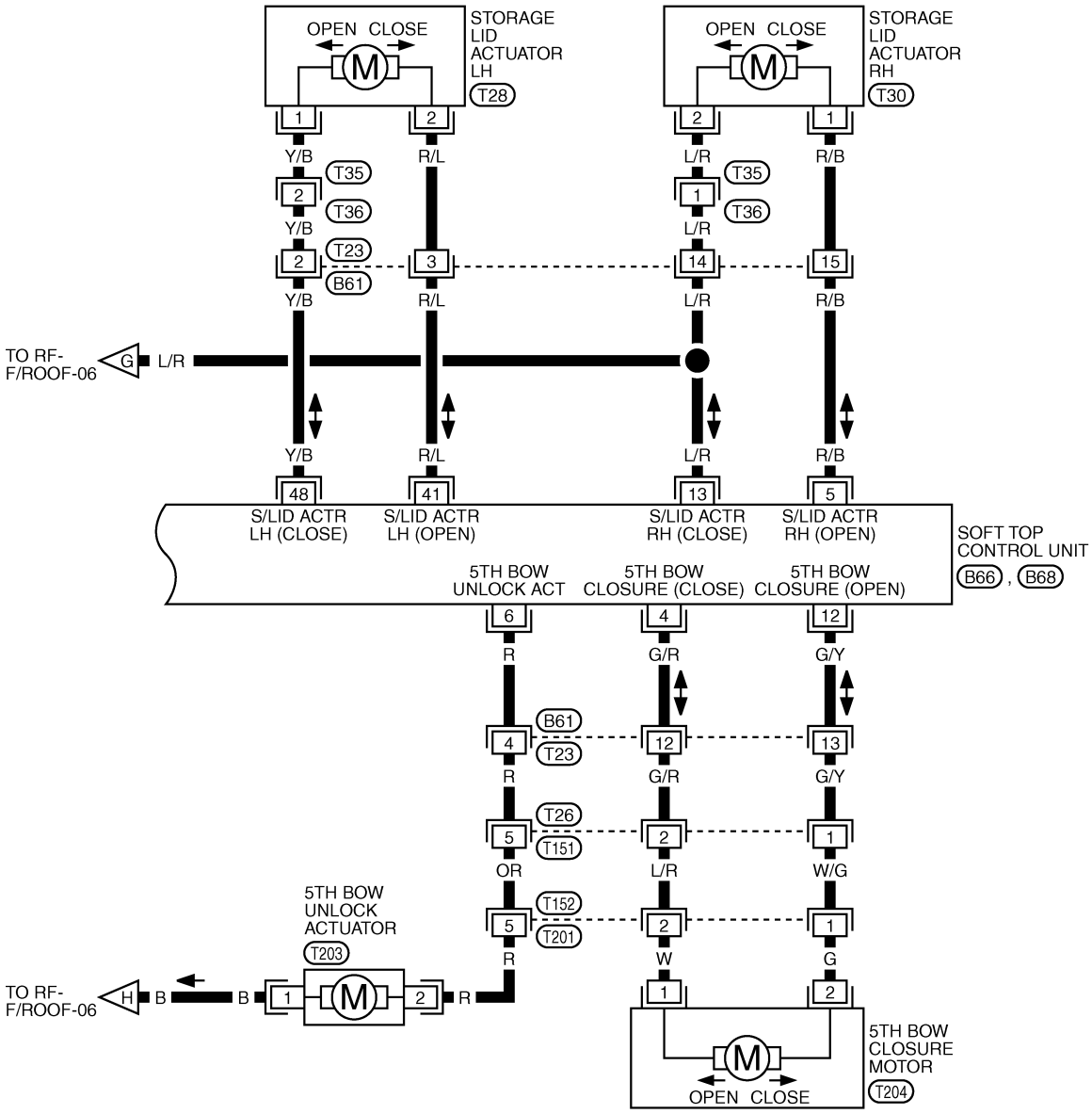
RF-F/ROOF-07

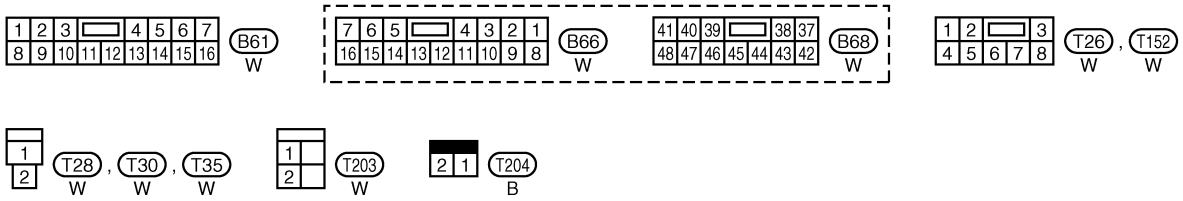




TIWT2284E

RF-F/ROOF-08





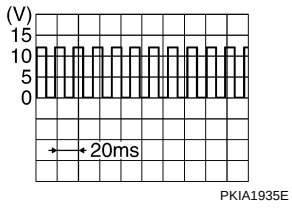
TIWT1608E

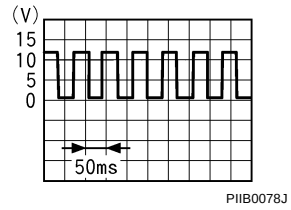
Terminal and Reference Value of Soft Top Control Unit

NIS0006H

CLOSE → OPEN OPERATION

The operation chart for roof position. Refer to RF-19, "State Chart" .

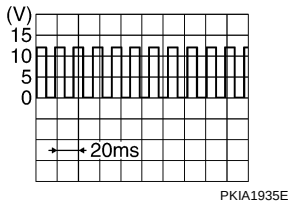
Terminal No.	Wire color	Description		Condition (Roof position: OP)	Value (V) (Approx.)
		Signal name	Input/ Output		
1	W/R	Battery power supply	Input	—	Battery voltage
3	R	Roof actuator RH (OPEN) signal	Output	OP8 → OP11	0 → Battery voltage → 0
				Other than above	0
4	G/R	5th bow closure motor (CLOSE) signal	Output	—	0
5	R/B	Storage lid actuator RH (OPEN) signal	Output	OP6 → OP7	0 → Battery voltage → 0
				OP12	
				Other than above	0
6	R	5th bow unlock actuator signal	Output	OP2 → OP3	0 → Battery voltage → 0
				Other than above	0
7	B	Ground	—	—	0
8	W/R	Battery power supply	Input	—	Battery voltage
10	Y	Roof actuator RH (CLOSE) signal	Output	—	0
12	G/Y	5th bow closure motor (OPEN) signal	Output	OP4	0 → Battery voltage → 0
				Other than above	0
13	L/R	Storage lid actuator RH (CLOSE) signal	Output	OP11 → OP12	0 → Battery voltage → 0
				Other than above	0
14	W	Speed signal (8 pulse)	Input/ Output	Speed meter operate [When vehicle speed is Approx. 40km/h (25 MPH)]	 PKIA1935E
15	OR	Storage lid unlock actuator LH and RH signal	Output	OP5 → OP6	0 → Battery voltage → 0
				Other than above	0
16	B	Ground	—	—	0
17	R	Ignition switch (ON or START)	Input	Ignition switch (ON or START position)	Battery voltage
18	SB	Soft top switch (OPEN) signal	Input	Soft top switch open operate	0
				Other than above	5
19	R/W	Soft top switch (CLOSE) signal	Input	Soft top switch close operate	0
				Other than above	5
20	W/B	Roof full close detection switch signal	Input	OP8	5 → 0
21	W/L	Roof full open detection switch signal	Input	OP11	5 → 0
22	W/R	Roll bar interference prevention switch signal	Input	OP9	5 → 0

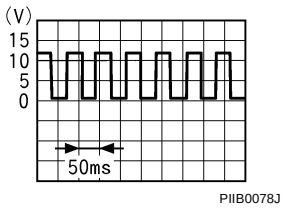
Terminal No.	Wire color	Description		Condition (Roof position: OP)		Value (V) (Approx.)
		Signal name	Input/ Output			
23	W/G	Speed signal (2 pulse)	Input/ Output	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]		 PIIB0078J
24	G	Storage lid full close detection switch (RH) signal	Input	OP5 → OP12		5 → 0 → 5
25	L/Y	Storage lid full close detection switch (LH) signal	Input	OP6 → OP11		5 → 0 → 5
26	LG	5th bow full open detection switch signal	Input	OP5 → OP7		5 → 0 → 5
				OP10		5 → 0
27	GY	5th bow full close detection switch signal	Input	OP4 → OP8		5 → 0 → 5
				OP9		5 → 0
28	LG/B	Soft top front lock detection switch signal	Input	Front lock	: Lock	5
					: Unlock	0
29	R/Y	5th bow ending switch signal	Input	OP4		5 → 0
30	Y/R	5th bow full-latch switch signal	Input	OP4		5 → 0
31	L	5th bow half-latch switch signal	Input	OP3		5 → 0
32	W	Body interference prevention switch signal	Input	OP10		5 → 0
33	BR	Storage lid full open detection switch signal	Input	OP7 → OP11		5 → 0 → 5
34	L/W	Seat back position signal	Input	When passenger seat inclines forward		0
				Other than above		5
35	Y	Indicator lamp signal	Input	OP1 → OP12		0
				Other than above		Battery voltage
36	PU	Power window down signal	Output	OP1→OP11		0
				Other than above		5
37	R	Roof actuator LH (OPEN) signal	Output	OP8 → OP11		0 → Battery voltage → 0
				Other than above		0
38	W	Brake pedal signal	Input	Brake pedal	: Depressed	Battery voltage
					: Released	0
41	R/L	Storage lid actuator LH (OPEN) signal	Output	OP6 → OP7		0 → Battery voltage → 0
				OP12		
				Other than above		0
42	Y	Roof actuator LH (CLOSE) signal	Output	—		0
44	G/R	5th bow actuator (DOWN) signal	Output	OP7 → OP8		0 → Battery voltage → 0
				Other than above		0
45	G/Y	5th bow actuator (UP) signal	Output	OP3 → OP5		0 → Battery voltage → 0
				OP9 → OP10		
				Other than above		0

Terminal No.	Wire color	Description: Signal name	Description: Input/Output	Condition (Roof position: OP)	Value (V) (Approx.)
48	Y/B	Storage lid actuator LH (CLOSE) signal	Output	OP11 → OP12	0 → Battery voltage → 0
				Other than above	0

OPEN → CLOSE OPERATION

The operation chart for roof position. Refer to RF-21, "State Chart" .

Terminal No.	Wire color	Description: Signal name	Description: Input/Output	Condition (Roof position: CL)	Value (V) (Approx.)
1	W/R	Battery power supply	Input	—	Battery voltage
3	R	Roof actuator RH (OPEN) signal	Output	—	0
4	G/R	5th bow closure motor (CLOSE) signal	Output	CL10	0 → Battery voltage → 0
				Other than above	0
5	R/B	Storage lid actuator RH (OPEN) signal	Output	CL2 → CL3	0 → Battery voltage → 0
				CL8	
				Other than above	0
6	R	5th bow unlock actuator signal	Output	—	0
7	B	Ground	—	—	0
8	W/R	Battery power supply	Input	—	Battery voltage
10	Y	Roof actuator RH (CLOSE) signal	Output	CL3 → CL6	0 → Battery voltage → 0
				Other than above	0
12	G/Y	5th bow closure motor (OPEN) signal	Output	—	0
13	L/R	Storage lid actuator RH (CLOSE) signal	Output	CL7 → CL8	0 → Battery voltage → 0
				Other than above	0
14	W	Speed signal (8 pulse)	Input/Output	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]	 PKIA1935E
15	OR	Storage lid unlock actuator LH and RH signal	Output	CL1 → CL2	0 → Battery voltage → 0
				Other than above	0
16	B	Ground	—	—	0
17	R	Ignition switch (ON or START)	Input	Ignition switch (ON or START position)	Battery voltage
18	SB	Soft top switch (OPEN) signal	Input	Soft top switch open operate	0
				Other than above	5
19	R/W	Soft top switch (CLOSE) signal	Input	Soft top switch close operate	0
				Other than above	5
20	W/B	Roof full close detection switch signal	Input	CL6	0 → 5
21	W/L	Roof full open detection switch signal	Input	CL3	0 → 5

Terminal No.	Wire color	Description		Condition (Roof position: CL)		Value (V) (Approx.)
		Signal name	Input/ Output			
22	W/R	Roll bar interference prevention switch signal	Input	CL5		0 → 5
23	W/G	Speed signal (2 pulse)	Input/ Output	Speed meter operate [When vehicle speed is Approx. 40 km/h (25 MPH)]		 PIIB0078J
24	G	Storage lid full close detection switch (RH) signal	Input	CL1 → CL8		5 → 0 → 5
25	L/Y	Storage lid full close detection switch (LH) signal	Input	CL2 → CL7		5 → 0 → 5
26	LG	5th bow full open detection switch signal	Input	CL4		0 → 5
				CL7		5 → 0
				CL8		0 → 5
27	GY	5th bow full close detection switch signal	Input	CL5 → CL6		0 → 5 → 0
				CL9		0 → 5
28	LG/B	Soft top front lock detection switch signal	Input	Front lock	: Lock	5
					: Unlock	0
29	R/Y	5th bow ending switch signal	Input	CL10		0 → 5
30	Y/R	5th bow full-latch switch signal	Input	CL10		0 → 5
31	L	5th bow half-latch switch signal	Input	CL9 → CL10		0 → 5
32	W	Body interference prevention switch signal	Input	CL3		0 → 5
33	BR	Storage lid full open detection switch signal	Input	CL3 → CL7		5 → 0 → 5
34	L/W	Seat back position signal	Input	When passenger seat inclines forward		0
				Other than above		5
35	Y	Indicator lamp signal	Input	CL1 → CL10		0
				Other than above		Battery voltage
36	PU	Power window down signal	Output	CL1 → CL10		0
				Other than above		5
37	R	Roof actuator LH (OPEN) signal	Output	—		0
38	W	Brake pedal signal	Input	Brake pedal	: Depressed	Battery voltage
					: Released	0
41	R/L	Storage lid actuator LH (OPEN) signal	Output	CL2 → CL3		0 → Battery voltage → 0
				CL8		
				Other than above		0
42	Y	Roof actuator LH (CLOSE) signal	Output	CL3 → CL6		0 → Battery voltage → 0
44	G/R	5th bow actuator (DOWN) signal	Output	CL4 → CL5		0 → Battery voltage → 0
				CL8 → CL10		
45	G/Y	5th bow actuator (UP) signal	Output	CL6 → CL7		0 → Battery voltage → 0

Terminal No.	Wire color	Description		Condition (Roof position: CL)	Value (V) (Approx.)
		Signal name	Input/ Output		
48	Y/B	Storage lid actuator LH (CLOSE) signal	Output	CL7 → CL8	0 → Battery voltage → 0
				Other than above	0

Work Flow

NIS0006I

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to RF-12, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to RF-37, "Trouble Diagnosis Chart by Symptom" .
4. Does soft top system operate normally? If Yes, GO TO 5. If No, GO TO 3.
5. INSPECTION END.

Trouble Diagnosis Chart by Symptom (CLOSE → OPEN)

NIS0006J

The operation chart for roof position. Refer to RF-19, "State Chart" .

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Roof does not operate	1. Check soft top control unit power supply	OP1	RF-40
	2. Check soft top switch (Open)	OP1	RF-40
	3. Check operation permission condition	OP1	RF-78
	4. Check each switch condition (Open operate)	Full close	RF-80
	5. Check seat back position signal	OP1	RF-83
	6. Check 5th bow unlock actuator (Open operate)	OP2	RF-44
	7. Check 5th bow half-latch switch (Open operate)	OP2	RF-44
	8. Check 5th bow actuator (Open operate)	OP3	RF-46
5th bow operation stops at full open position	1. Check 5th bow full close detection switch (Open operate)	OP4	RF-46
	2. Check 5th bow full open detection switch (Open operate)	OP5	RF-48
	3. Check storage lid unlock actuator (Open operate)	OP5	RF-49
	4. Check storage lid full close detection switch (LH and RH) (Open operate)	OP5.6	RF-50
	5. Check storage lid actuator (Open operate)	OP6	RF-52
Storage lid operation stops at full open position	Check storage lid full open detection switch (Open operate)	OP7	RF-53
Roof does not operate	Check roof actuator (Open operate)	OP8	RF-55
Roof stops on the way	Check roll bar interference prevention switch (Open operate)	OP8	RF-56
Storage lid operation stops at full open position after the roof is stored.	1. Check body interference prevention switch (Open operate)	OP10	RF-57
	2. Check roof full open detection switch	OP10	RF-58
Passenger side seat back does not operate.	1. Check passenger side seat cancel switch	OP1	SE-52
	2. Check passenger side seat operate signal 1	OP1	RF-82
Passenger side seat bock does not return to former state	Check passenger side seat operate signal 2	OP10	RF-83
Power window down does not operate.	Check power window harness	OP1	RF-82

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Both power window down and passenger seat are not operated.	Check power window down request signal	OP1	RF-81
Indicator lamp does not light. (soft top operates properly)	Check indicator lamp circuit	—	RF-85
Indicator lamp blinks when IGN SW: OFF → ON is done.	Replace soft top control unit	—	RF-86
Indicator lamp blinks when beginning to run.	Check speed signal	—	RF-84

(OPEN → CLOSE)

The operation chart for roof position. Refer to RF-21, "State Chart" .

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Roof does not operate	1. Check soft top control unit power supply	CL1	RF-40
	2. Check soft top switch (Close)	CL1	RF-42
	3. Check operation permission condition	CL1	RF-78
	4. Check each switch condition (Close operate)	Full open	RF-81
	5. Check seat back position signal	CL1	RF-83
	6. Check storage lid unlock actuator (Close operate)	CL1	RF-59
	7. Check storage lid full close detection switch (LH and RH) (Close operate)	CL1.2	RF-60
	8. Check storage lid actuator (Close operate)	CL2	RF-62
Storage lid operation stops at full open position	1. Check roof actuator (Close operate)	CL2	RF-66
	2. Check body interference prevention switch (Close operate)	CL3	RF-65
Roof stops on the way	1. Check storage lid full open detection switch (Close operate)	CL3	RF-63
	2. Check roof full close detection switch (Close operate)	CL5	RF-67
	3. Check 5th bow actuator (Close operate)	CL5	RF-69
Operation stops after 5th bow operates down	Check 5th bow full close detection switch (Close operate)	CL5	RF-69
Operation stops after 5th bow operates up	Check 5th bow full open detection switch (Close operate)	CL6	RF-71
Auto closure of 5th bow does not operate.	1. Check 5th bow half-latch switch	CL10	RF-72
	2. Check 5th bow full-latch switch	CL10	RF-73
	3. Check 5th bow ending switch	CL10	RF-75
	4. Check 5th bow closure motor	CL10	RF-76
Passenger side seat back does not operate.	1. Check passenger side seat cancel switch	CL1	SE-52
	2. Check passenger side seat operate signal 1	CL1	RF-82
Passenger side seat back does not return to former state	Check passenger side seat operate signal 3	CL10	RF-83
Power window down does not operate.	Check power window harness	CL1	RF-82
Both power window down and passenger seat are not operated.	Check power window down request signal	CL1	RF-81
Indicator lamp does not light. (soft top operates properly)	Check indicator lamp circuit	—	RF-85

Symptom	Diagnostic procedure and repair order	Roof position	Refer to page
Indicator lamp blinks when IGN SW: OFF → ON is done.	Replace soft top control unit	—	RF-86
Indicator lamp blinks when beginning to run.	Check speed signal	—	RF-84
Indicator lamp blinks when soft top front lock is unlock at the fully closed position.	Check soft top front lock switch	Full close	RF-78

Check Soft Top Control Unit Power Supply (OP, CL)

NIS0006K

1. CHECK FUSE

- Check 10A fuse [No.12, located in the fuse block (J/B)]
- Check 40A fusible link (letter **G** located in the fuse and fusible link box.)

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

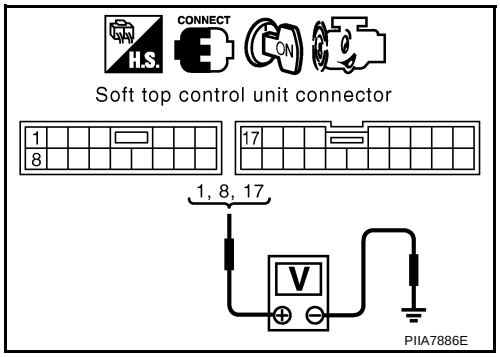
OK or NG

OK >> GO TO 2.
NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Start engine.
2. Check voltage between soft top control unit connector B66, 67 terminal 1, 8, 17 and ground.

1 (W/R) - Ground : Battery voltage
8 (W/R) - Ground : Battery voltage
17 (R) - Ground : Battery voltage



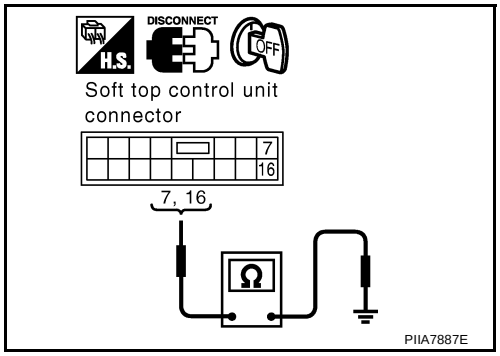
OK or NG

OK >> GO TO 3.
NG >> Check soft top control unit power supply circuit for open or short.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check continuity between soft top control unit connector B66 terminal 7, 16 and ground.

7 (B) - Ground : Continuity should exist.
16 (B) - Ground : Continuity should exist.



OK or NG

OK >> Power supply and ground circuit are OK.
NG >> Check soft top control unit ground circuit for open or short.

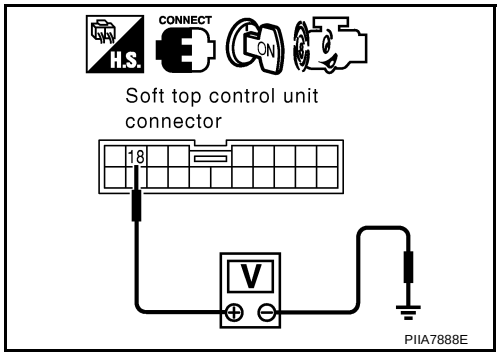
Check Soft Top Switch (OPEN)

NIS0006L

1. CHECK SOFT TOP OPEN SWITCH SIGNAL

1. Start engine.
2. Check soft top control unit connector and ground.

Connector	Terminal (Wire color)		Soft top switch Condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	18 (SB)	Ground	OPEN	0
			Other than above	5



OK or NG

OK >> Soft top switch (OPEN) is OK.
NG >> GO TO 2.

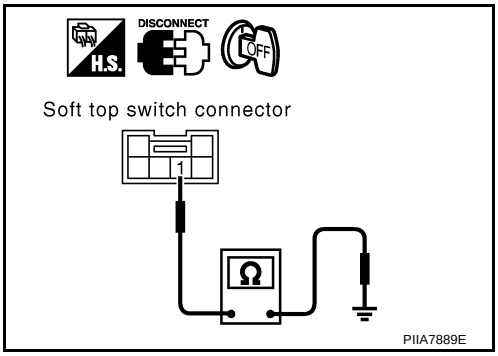
2. CHECK SOFT TOP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top switch connector.
3. Check continuity between soft top switch connector M14 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.



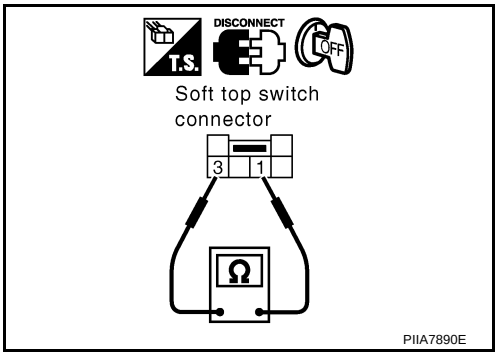
3. CHECK SOFT TOP SWITCH

Soft top switch operate, check continuity between soft top switch connector M14 terminal 1 and 3.

Connector	Terminal		Soft top switch Condition	Continuity
M14	1	3	OPEN	Yes
			Other than above	No

OK or NG

OK >> GO TO 4.
NG >> Replace soft top switch.



4. CHECK SOFT TOP SWITCH CIRCUIT

1. Check continuity between soft top control unit connector B67 terminal 18 and soft top switch connector M14 terminal 3.

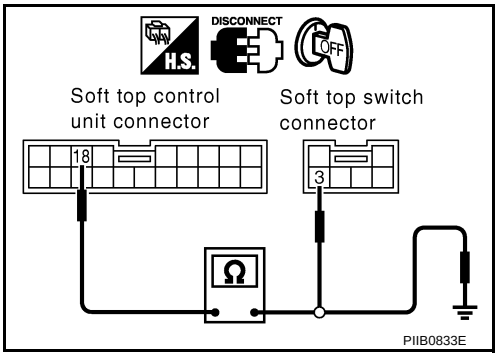
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	Continuity
	(+)		(-)	
B67	18 (SB)	M14	3 (L/B)	No
M14	3 (L/B)	B67	18 (SB)	Yes

2. Check continuity between soft top control unit connector B67 terminal 18 and ground.

18 (SB) - Ground : Continuity should not exist.

OK or NG

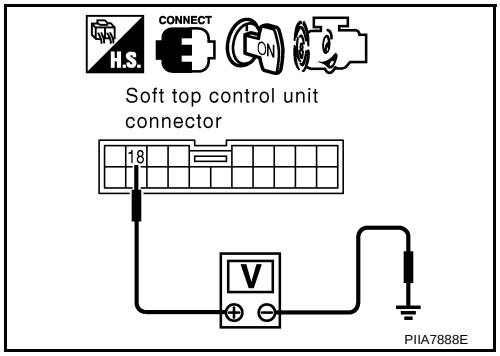
OK >> GO TO 5.
NG >> Repair or replace harness.



5. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 18 and ground.

18 (SB) - Ground : Approx. 5V



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace soft top control unit.

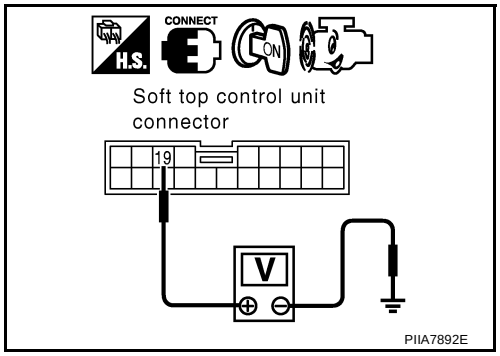
Check Soft Top Switch (CLOSE)

NIS0006M

1. CHECK SOFT TOP CLOSE SWITCH SIGNAL

1. Start engine.
2. Check soft top control unit connector and ground.

Connector	Terminal (Wire color)		Soft top switch Condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	19 (R/W)	Ground	CLOSE	0
			Other than above	5



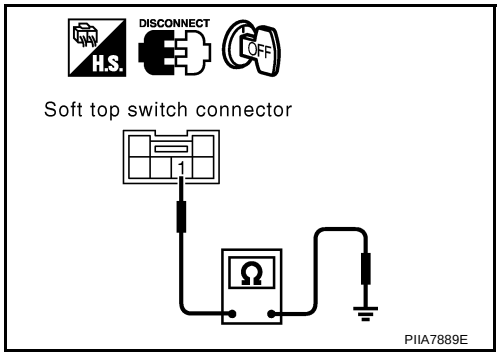
OK or NG

OK >> Soft top switch (CLOSE) is OK.
NG >> GO TO 2.

2. CHECK SOFT TOP SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top switch connector.
3. Check continuity between soft top switch connector M14 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



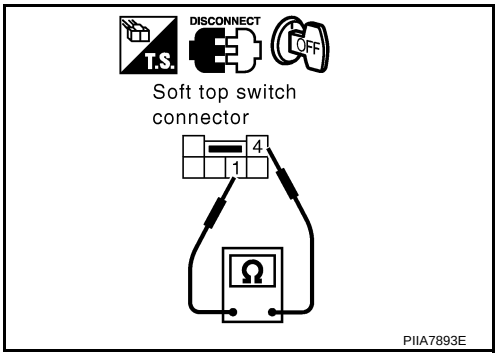
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP SWITCH

Soft top switch operate, check continuity between soft top switch connector M14 terminal 1 and 4.

Connector	Terminal		Soft top switch Condition	Continuity
M14	1	4	CLOSE	Yes
			Other than above	No



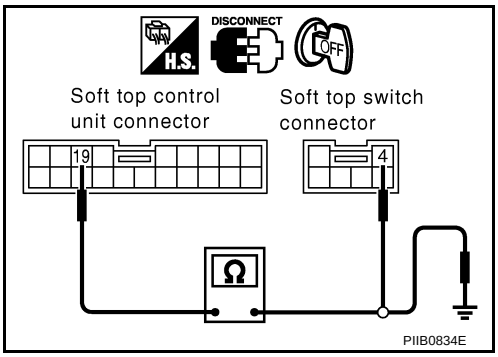
OK or NG

OK >> GO TO 4.
NG >> Replace soft top switch.

4. CHECK SOFT TOP SWITCH CIRCUIT

1. Check continuity between soft top control unit connector B67 terminal 19 and soft top switch connector M14 terminal 4.

Connector	Terminal (Wire color) (+)	Connector	Terminal (Wire color) (-)	Continuity
B67	19 (R/W)	M14	4 (R/G)	No
M14	4 (R/G)	B67	19 (R/W)	Yes



2. Check continuity between soft top control unit connector B67 terminal 19 and ground.

19 (R/W) - Ground : Continuity should not exist.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness.

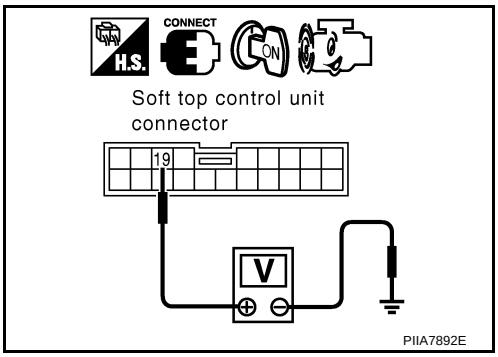
5. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 19 and ground.

19 (R/W) - Ground : Approx. 5V

OK or NG

OK >> Check condition of harness and connector.
NG >> Replace soft top control unit.



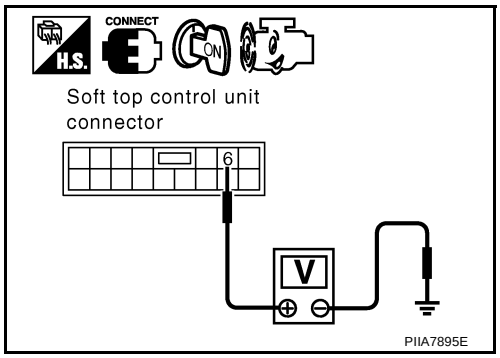
Check 5th Bow Unlock Actuator (Open Operate)

NIS0006N

1. CHECK 5TH BOW UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof Condition	Voltage (V) (Approx.)
	(+)	(-)		
B66	6 (R)	Ground	OP1 → OP2	0 → Battery voltage



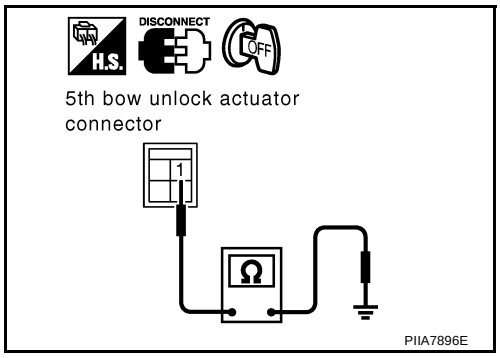
OK or NG

OK >> GO TO 2.
NG >> Replace soft top control unit.

2. CHECK 5TH BOW UNLOCK ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect 5th bow unlock actuator connector.
3. Check continuity between 5th bow unlock actuator connector T203 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



OK or NG

OK >> Replace 5th bow unlock actuator.
NG >> Repair or replace harness.

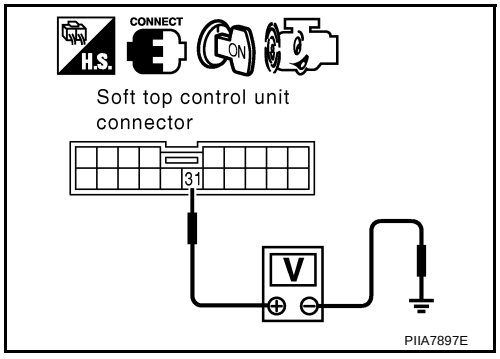
Check 5th Bow Half-Latch Switch (Open Operate)

NIS0006O

1. CHECK 5TH BOW HALF-LATCH SWITCH SIGNAL CHECK

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	31 (L)	Ground	OP2 → OP3	5 → 0



OK or NG

OK >> Soft top lock switch (5th bow half-latch switch) is OK.
NG >> GO TO 2.

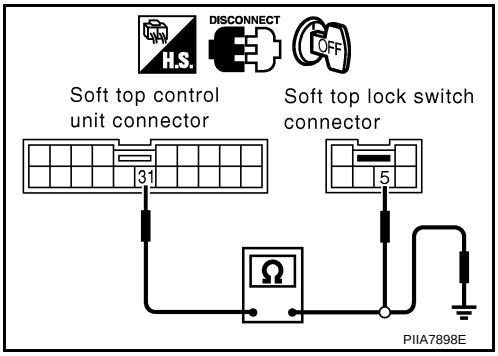
2. CHECK 5TH BOW HALF-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 31 and soft top lock switch connector T205 terminal 5.

31 (L) - 5 (L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Continuity should not exist.



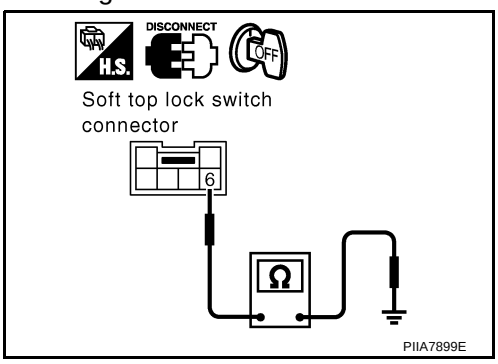
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 6 and ground.

6 (B) - Ground : Continuity should exist.



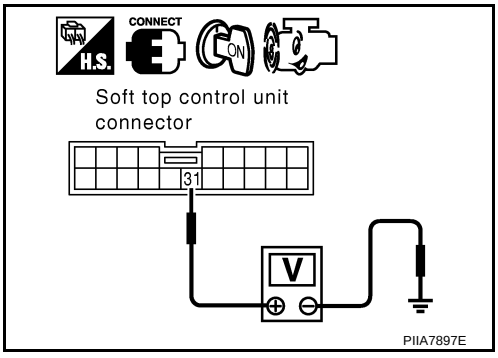
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Approx. 5V



OK or NG

OK >> Replace Soft top lock switch (5th bow lock assembly in storage lid).
NG >> Replace soft top control unit.

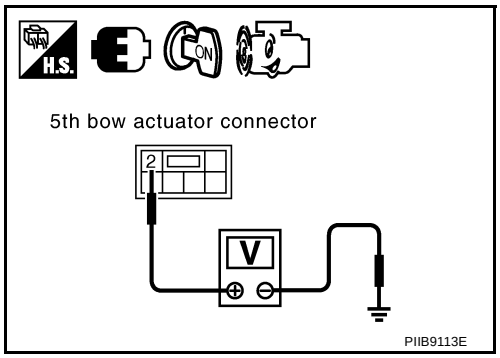
Check 5th Bow Actuator (Open Operate)

NIS0006P

1. CHECK 5TH BOW ACTUATOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between 5th bow actuator connector and ground.

Con-nector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B233	2 (G/R)	Ground	OP2 → OP3	0 → Battery voltage



OK or NG

OK >> Replace 5th bow actuator.
NG >> GO TO 2.

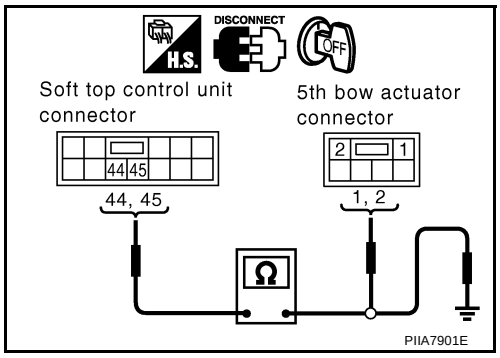
2. CHECK 5TH BOW ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow actuator connector.
3. Check continuity between soft top control unit connector B68 terminal 44, 45 and 5ht bow actuator connector B233 terminal 1, 2.

44 (G/R) - 1 (G/Y) : Continuity should exist.
45 (G/Y) - 2 (G/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B68 terminal 44, 45 and ground.

44 (G/R) - Ground : Continuity should not exist.
45 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

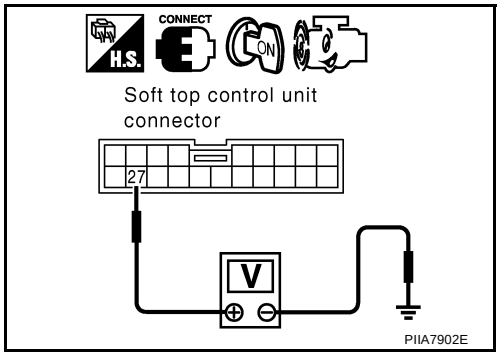
Check 5th Bow Full Close Detection Switch (Open Operate)

NIS0006Q

1. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	27 (GY)	Ground	OP3 → OP4	5 → 0



OK or NG

OK >> Plate rail RR (5th bow full close switch) is OK.
NG >> GO TO 2.

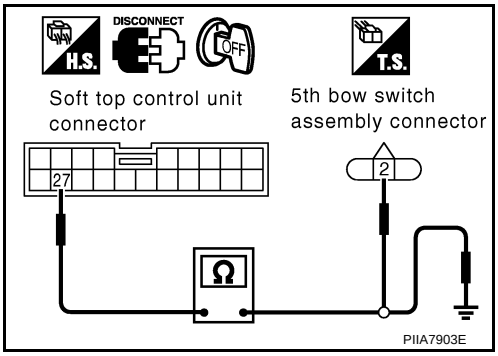
2. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 27 and 5th bow switch assembly connector B214 terminal 2.

27 (GY) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 27 and ground.

27 (GY) - Ground : Continuity should not exist.



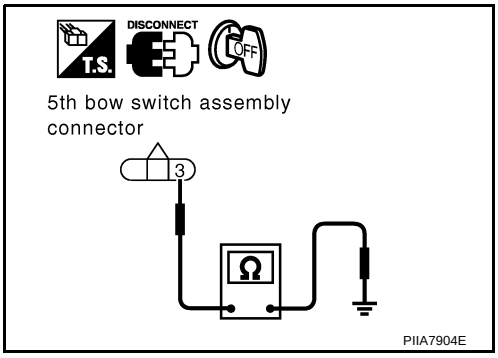
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



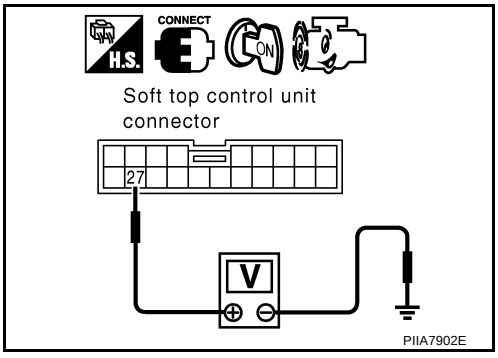
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 27 and ground.

27 (GY) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

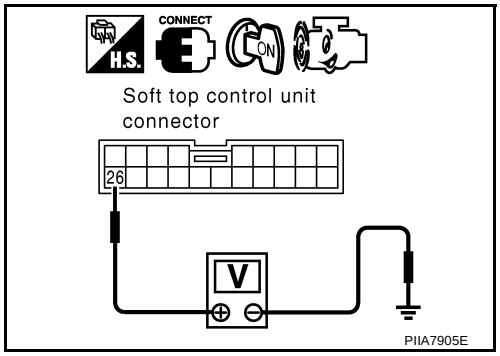
Check 5th Bow Full Open Detection Switch (Open Operate)

NIS0006R

1. CHECK 5TH BOW FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	26 (LG)	Ground	OP4 → OP5	5 → 0



OK or NG

OK >> Plate rail RR (5th bow full open switch) is OK.
NG >> GO TO 2.

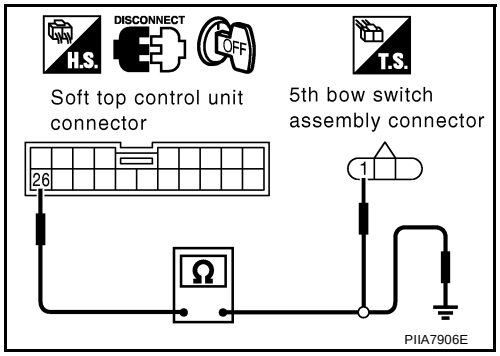
2. CHECK 5TH BOW FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 26 and 5th bow switch assembly connector B214 terminal 1.

26 (LG) - 1 (LG) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Continuity should not exist.



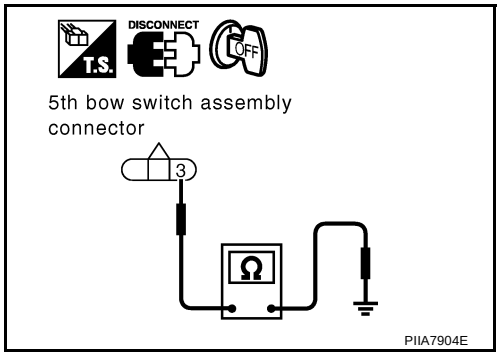
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



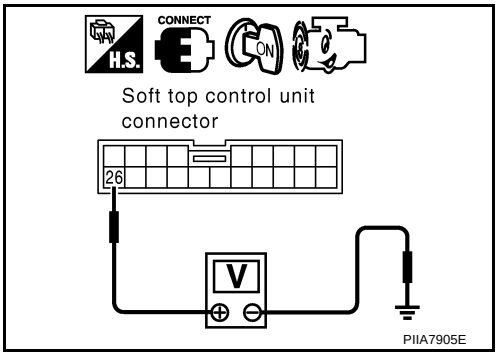
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

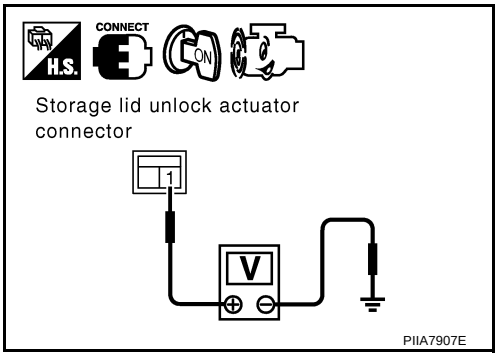
Check Storage Lid Unlock Actuator (Open Operate)

NIS0006S

1. CHECK STORAGE LID UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between storage lid unlock actuator (LH or RH) connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B65 (LH)	1 (R)	Ground	OP5 → OP6	0 → Battery voltage → 0
B70 (RH)	1 (L)			



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK STORAGE LID UNLOCK ACTUATOR CIRCUIT

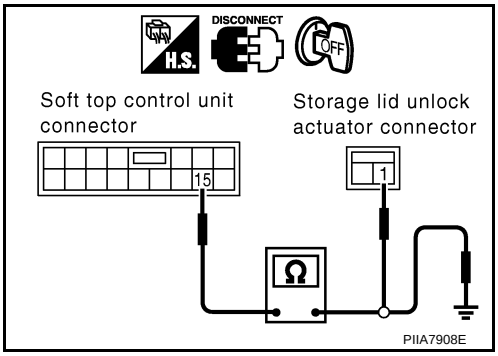
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid unlock actuator connector.
3. Check continuity between soft top control unit connector B66 terminal 15 and storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 1.

B65 (LH) 15 (OR) - 1 (R) : Continuity should exist.

B70 (RH) 15 (OR) - 1 (L) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 15 and ground.

15 (OR) - Ground : Continuity should not exist.



OK or NG

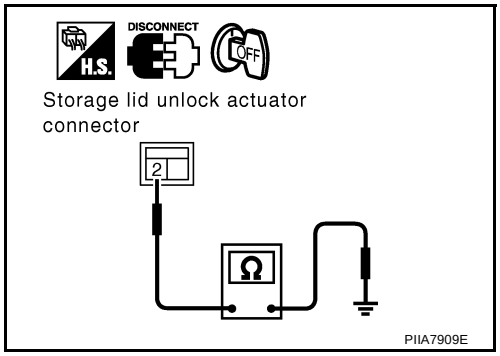
OK >> Replace soft top control unit.
NG >> Repair or replace harness.

3. CHECK STORAGE LID UNLOCK ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect storage lid unlock actuator connector.
3. Check continuity between storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 2 and ground.

B65 (LH) 2 (B/W) - Ground : Continuity should exist.

B70 (RH) 2 (B/Y) - Ground : Continuity should exist.



OK or NG

OK >> Replace malfunction storage lid unlock actuator (LH or RH).
NG >> Repair or replace harness.

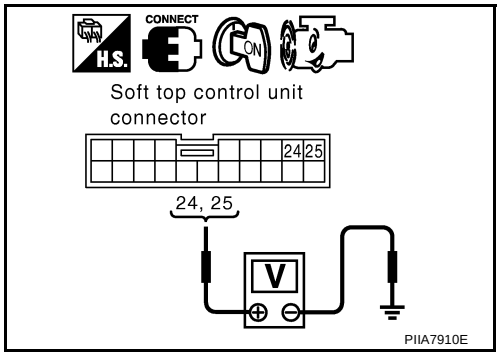
Check Storage Lid Full Close Detection Switch (Open Operate)

NIS0006T

1. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector		Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
		(+)	(-)		
B67	RH	24 (G)	Ground	OP5	5 → 0
	LH	25 (L/Y)		OP6	



OK or NG

OK >> Storage lid switch (LH & RH) (CLOSE) is OK.
NG >> GO TO 2.

2. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH CIRCUIT

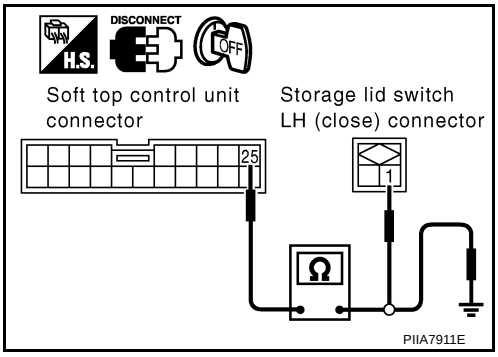
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (close) connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 25 and storage lid switch LH (close) connector B64 terminal 1.

25 (L/Y) - 1 (L/Y) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 25 and ground.

25 (L/Y) - Ground : Continuity should not exist.



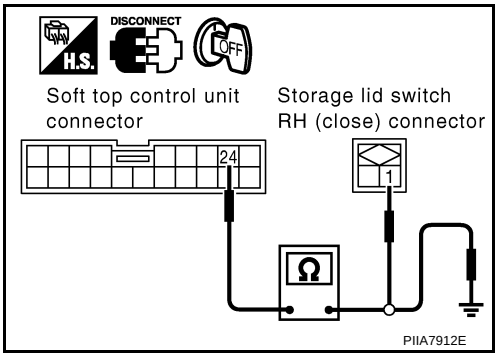
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 24 and storage lid switch RH (close) connector B69 terminal 1.

24 (G) - 1 (G) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 24 and ground.

24 (G) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

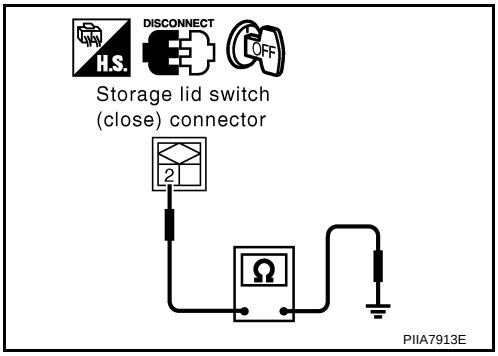
Check continuity between storage lid switch (close) connector B64 (LH), B69 (RH) terminal 2 and ground.

B64 (LH) 2 (B) - Ground : Continuity should exist.

B69 (RH) 2 (B/R) - Ground : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

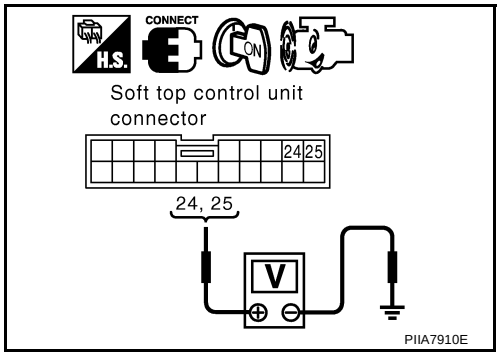


4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 24 (RH), 25 (LH) and ground.

24 (G) - Ground : Approx. 5V

25 (L/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace malfunction storage lid switch (LH or RH) (CLOSE).

NG >> Replace soft top control unit.

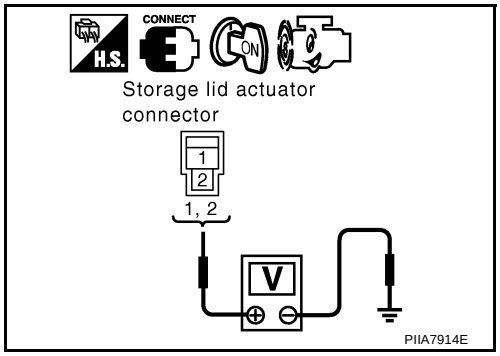
Check Storage Lid Actuator (Open Operate)

NIS0006U

1. CHECK STORAGE LID ACTUATOR (OPEN) SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between storage lid actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T28 (LH)	2 (R/L)	Ground	OP6 → OP7	0 → Battery voltage → 0
T30 (RH)	1 (R/B)			



OK or NG

OK >> Replace storage lid actuator (LH or RH).

NG >> GO TO 2.

2. CHECK STORAGE LID ACTUATOR CIRCUIT

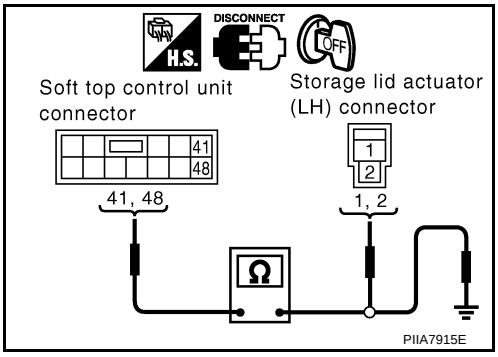
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid actuator connector.
3. Check the following.

- Continuity between soft top control unit connector B68 terminal 41, 48 and storage lid actuator (LH) connector T28 terminal 1, 2.

41 (R/L) - 2 (R/L) : Continuity should exist.
48 (Y/B) - 1 (Y/B) : Continuity should exist.

- Continuity between soft top control unit connector B68 terminal 41, 48 and ground.

41 (R/L) - Ground : Continuity should not exist.
48 (Y/B) - Ground : Continuity should not exist.



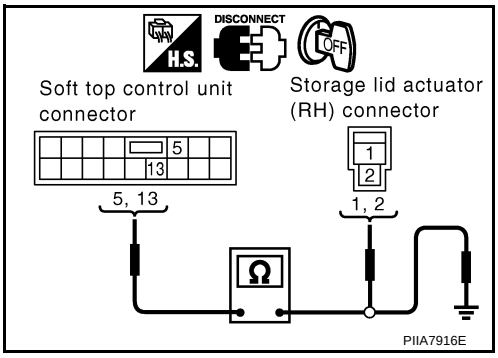
4. Check the following.

- Continuity between soft top control unit connector B66 terminal 5, 13 and storage lid actuator (RH) connector T30 terminal 1, 2.

5 (R/B) - 1 (R/B) : Continuity should exist.
13 (L/R) - 2 (L/R) : Continuity should exist.

- Continuity between soft top control unit connector B66 terminal 5, 13 and ground.

5 (R/B) - Ground : Continuity should not exist.
13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

Check Storage Lid Full Open Detection Switch (Open Operate)

NIS0006V

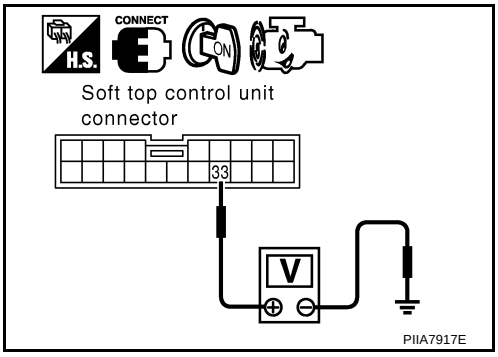
1. CHECK STORAGE LID FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	33 (BR)	Ground	OP6 → OP7	5 → 0

OK or NG

OK >> Storage lid switch (OPEN) is OK.
NG >> GO TO 2.



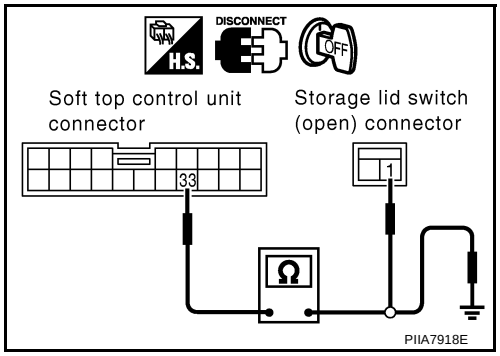
2. CHECK SOTORAGE LID FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (open) connector.
3. Check continuity between soft top control unit connector B67 terminal 33 and storage lid switch (open) connector T27 terminal 1.

33 (BR) - 1 (BR) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 33 and ground.

33 (BR) - Ground : Continuity should not exist.



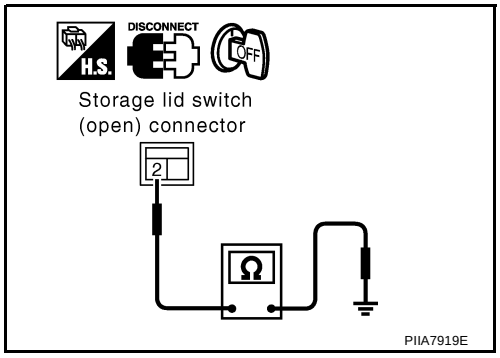
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (open) connector T27 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



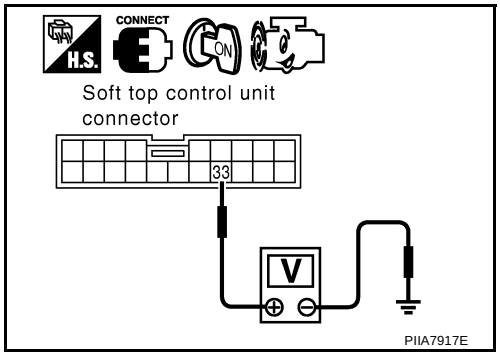
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 33 and ground.

33 (BR) - Ground : Approx. 5V



OK or NG

OK >> Replace storage lid switch (open).
NG >> Replace soft top control unit.

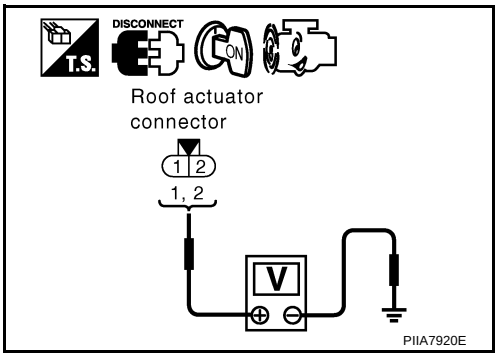
Check Roof Actuator (Open Operate)

NIS0006W

1. CHECK ROOF ACTUATOR (OPEN) SIGNAL

1. Turn ignition switch OFF.
2. Disconnect roof actuator connector.
3. Start engine.
4. Operate soft top switch (OPEN), check voltage between roof actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B59 (LH)	2 (R)	Ground	OP8 → OP11	0 → Battery voltage → 0
B72 (RH)	1 (R)			



OK or NG

OK >> Replace roof actuator (LH or RH).
NG >> GO TO 2.

2. CHECK ROOF ACTUATOR CIRCUIT

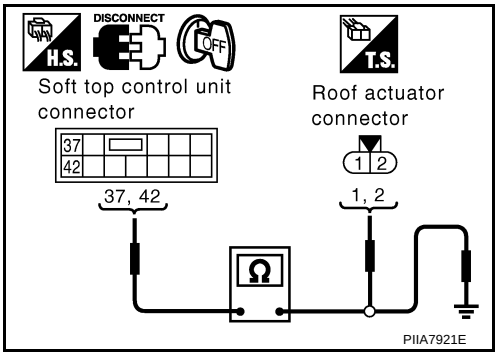
1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 37, 42 and roof actuator (LH) connector B59 terminal 1, 2.

37 (R) - 2 (R) : Continuity should exist.
42 (Y) - 1 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 37, 42 and ground.

37 (R) - Ground : Continuity should not exist.
42 (Y) - Ground : Continuity should not exist.



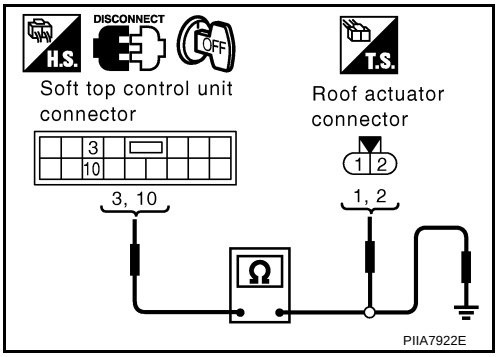
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 3, 10 and roof actuator (RH) connector B72 terminal 1, 2.

3 (R) - 1 (R) : Continuity should exist.
10 (Y) - 2 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 3, 10 and ground.

3 (R) - Ground : Continuity should not exist.
10 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

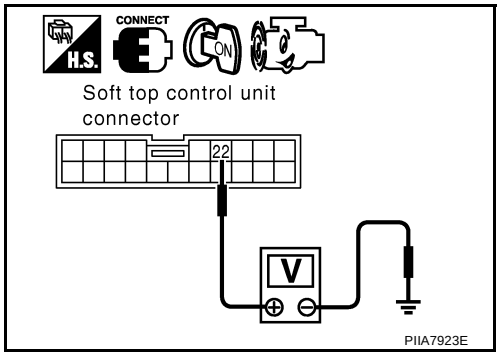
Check Roll Bar Interference Prevention Switch (Open Operate)

NIS0006X

1. CHECK ROLL BAR INTERFERENCE PREVENTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	22 (W/R)	Ground	OP8 → OP9	5 → 0



OK or NG

OK >> Soft top switch assembly 2 is OK.
NG >> GO TO 2.

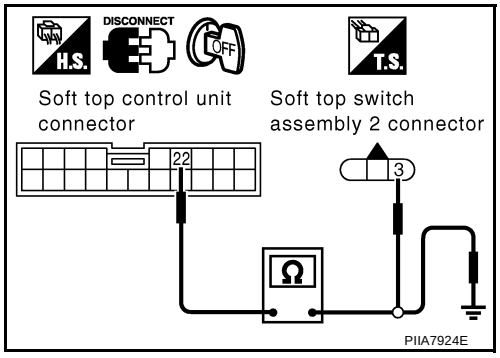
2. CHECK ROLL BAR INTERFERENCE PREVENTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 2 (roll bar interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 22 and soft top switch assembly 2 connector B213 terminal 3.

22 (W/R) - 3 (W/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 22 and ground.

22 (W/R) - Ground : Continuity should not exist.



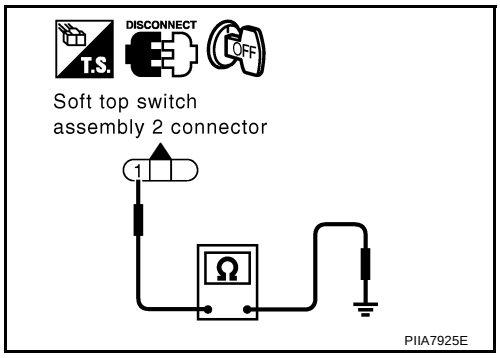
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK ROLL BAR INTERFERENCE PREVENTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 2 connector B213 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



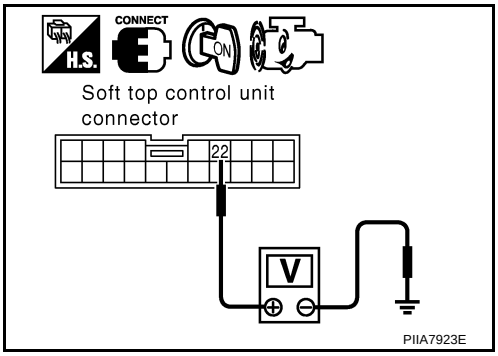
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 22 and ground.

22 (W/R) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 2.
NG >> Replace soft top control unit.

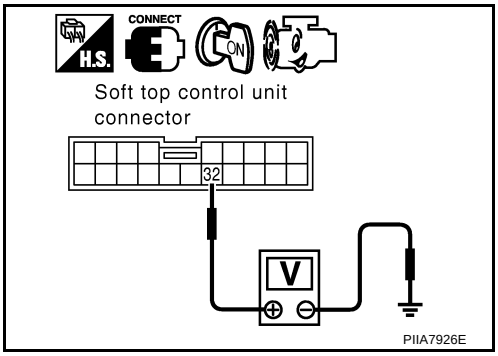
Check Body Interference Prevention Switch (Open Operate)

NIS0006Y

1. CHECK BODY INTERFERENCE PREVENTION SWITCH

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	32 (W)	Ground	OP10	5 → 0



OK or NG

OK >> Soft top switch assembly 1 is OK.
NG >> GO TO 2.

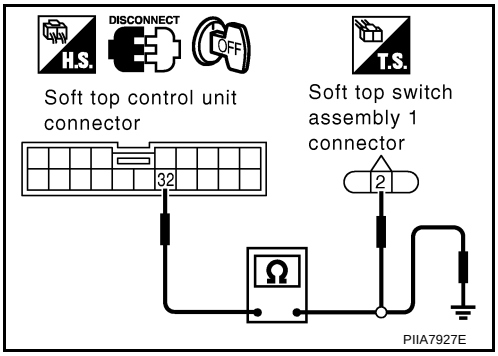
2. CHECK BODY INTERFERENCE PREVENTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 1 (body interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 32 and soft top switch assembly 1 connector B212 terminal 2.

32 (W) - 2 (W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Continuity should not exist.



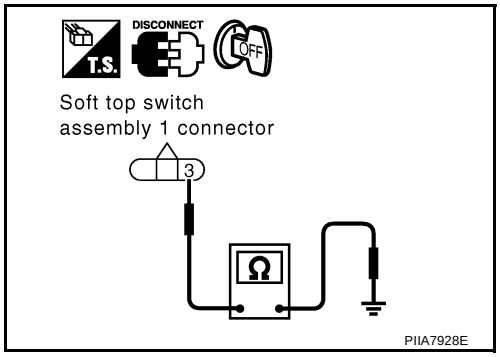
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK BODY INTERFERENCE PREVENTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 1 connector B212 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



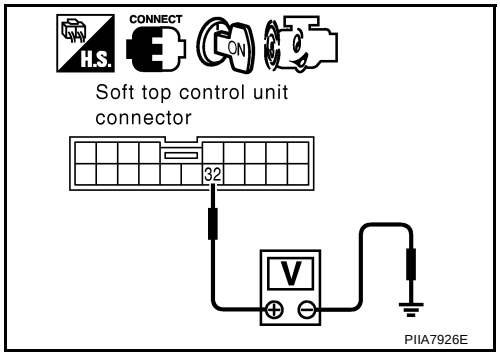
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
NG >> Replace soft top control unit.

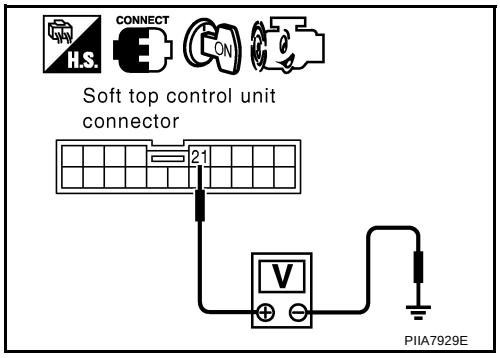
Check Roof Full Open Detection Switch (Open Operate)

NIS0006Z

1. CHECK ROOF FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch OPEN, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	21 (W/L)	Ground	OP10 → OP11	5 → 0



OK or NG

OK >> Soft top switch assembly 1 (roof full open detection switch) is OK.
NG >> GO TO 2.

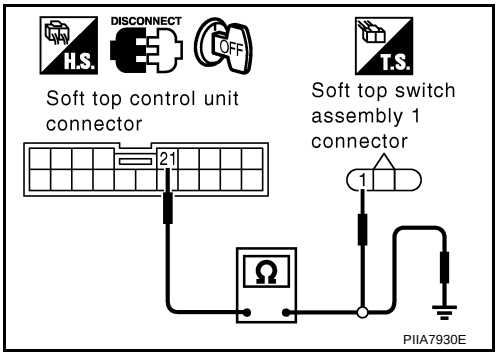
2. CHECK ROOF OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 1 connector.
3. Check continuity between soft top control unit connector B67 terminal 21 and soft top switch assembly 1 connector B212 terminal 1.

   21 (W/L) - 1 (W/L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 21 and ground.

   21 (W/L) - Ground : Continuity should not exist.



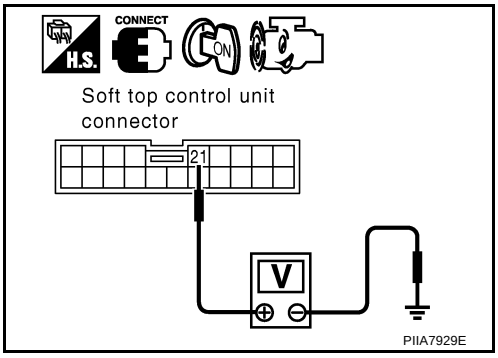
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 21 and ground.

   21 (W/L) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
>> Replace soft top control unit.

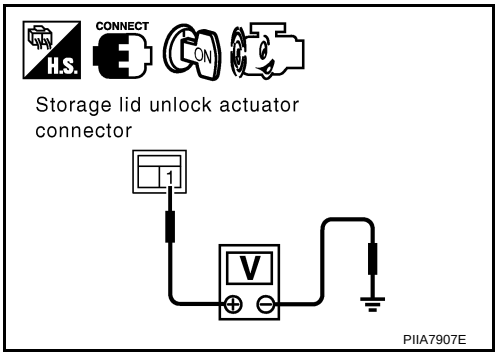
Check Storage Lid Unlock Actuator (Close Operate)

NIS00070

1. CHECK STORAGE LID UNLOCK ACTUATOR SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between storage lid unlock actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B65 (LH)	1 (R)	Ground	CL1 → CL2	0 → Battery voltage → 0
B70 (RH)	1 (L)			



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

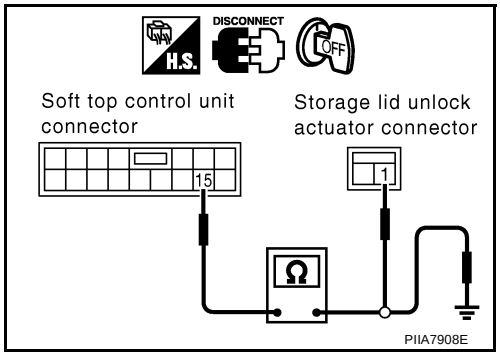
2. CHECK STORAGE LID UNLOCK ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid unlock actuator connector.
3. Check continuity between soft top control unit connector B66 terminal 15 and storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 1.

   B65 (LH) 15 (OR) - 1 (R) : Continuity should exist.

   B70 (RH) 15 (OR) - 1 (L) : Continuity should exist.
4. Check continuity between soft top control unit connector B66 terminal 15 and ground.

   15 (OR) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

3. CHECK STORAGE LID UNLOCK ACTUATOR GROUND CIRCUIT

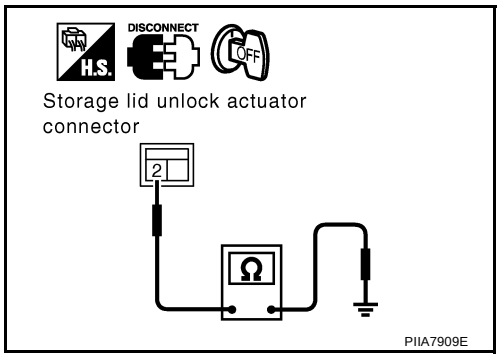
1. Turn ignition switch OFF.
2. Disconnect storage lid unlock actuator connector.
3. Check continuity between storage lid unlock actuator connector B65 (LH), B70 (RH) terminal 2 and ground.

   B65 (LH) 2 (B) - Ground : Continuity should exist.

   B70 (RH) 2 (B/Y) - Ground : Continuity should exist.

OK or NG

OK >> Replace malfunction storage lid unlock actuator (LH or RH).
NG >> Repair or replace harness.



Check Storage Lid Full Close Detection Switch (Close Operate)

NIS00071

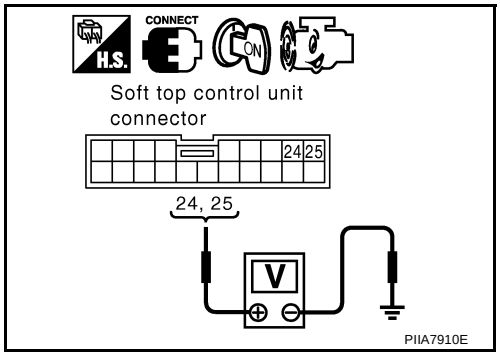
1. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	24 (G) for switch RH	Ground	CL1	5 → 0
	25 (L/Y) for switch LH		CL1 → CL2	

OK or NG

OK >> Storage lid switch (LH & RH) (CLOSE) is OK.
NG >> GO TO 2.



2. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH CIRCUIT

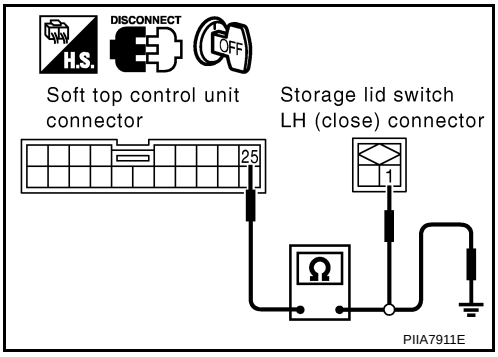
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (close) connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 25 and storage lid switch LH (close) connector B64 terminal 1.

25 (L/Y) - 1 (L/Y) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 25 and ground.

25 (L/Y) - Ground : Continuity should not exist.



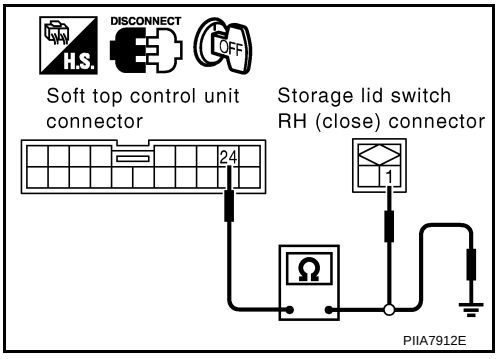
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 24 and storage lid switch RH (close) connector B69 terminal 1.

24 (G) - 1 (G) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 24 and ground.

24 (G) - Ground : Continuity should not exist.



OK or NG

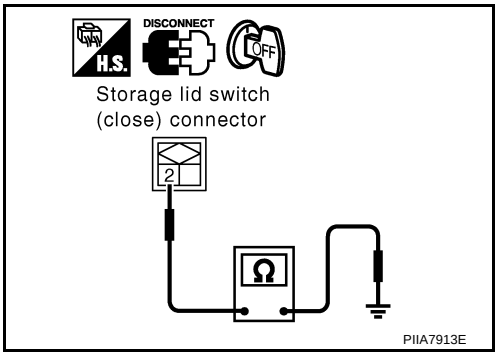
OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (close) connector B64 (LH), B69 (RH) terminal 2 and ground.

B64 (LH) 2 (B) - Ground : Continuity should exist.

B69 (RH) 2 (B/R) - Ground : Continuity should exist.



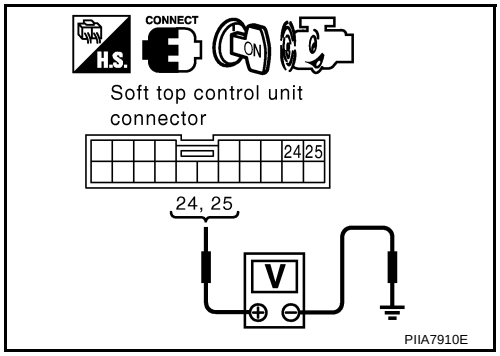
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP ROOF CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 24, 25 and ground.

24 (G) - Ground : Approx. 5V
25 (L/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace malfunction storage lid switch (LH or RH).
NG >> Replace soft top control unit.

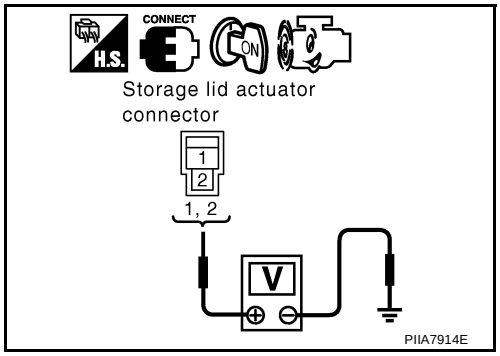
Check Storage Lid Actuator (Close Operate)

NIS00072

1. CHECK STORAGE LID ACTUATOR (CLOSE) SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between storage lid actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T28 (LH)	1 (Y/B)	Ground	CL2 → CL3	0 → Battery voltage → 0
T30 (RH)	2 (L/R)			



OK or NG

OK >> Replace storage lid actuator (LH or RH).
NG >> GO TO 2.

2. CHECK STORAGE LID ACTUATOR CIRCUIT

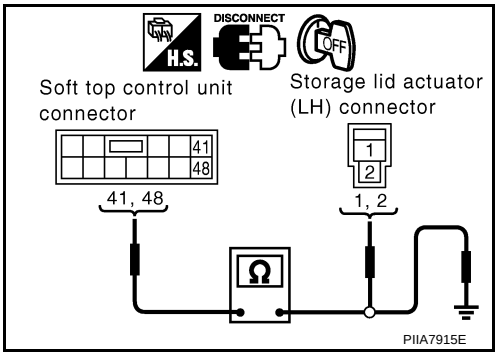
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid actuator connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 41, 48 and storage lid actuator (LH) connector T28 terminal 1, 2.

41 (R/L) - 2 (R/L) : Continuity should exist.
48 (Y/B) - 1 (Y/B) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 41, 48 and ground.

41 (R/L) - Ground : Continuity should not exist.
48 (Y/B) - Ground : Continuity should not exist.



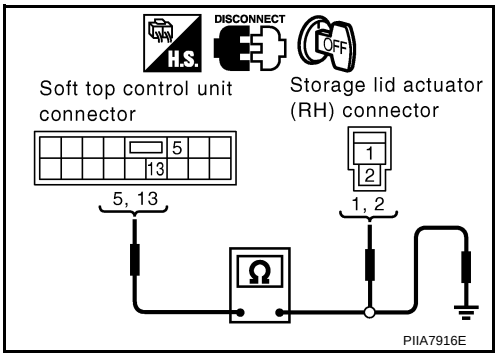
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 5, 13 and storage lid actuator (RH) connector T30 terminal 1, 2.

5 (R/B) - 1 (R/B) : Continuity should exist.
13 (L/R) - 2 (L/R) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 5, 13 and ground.

5 (R/B) - Ground : Continuity should not exist.
13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

Check Storage Lid Full Open Detection Switch (Close Operate)

NIS00073

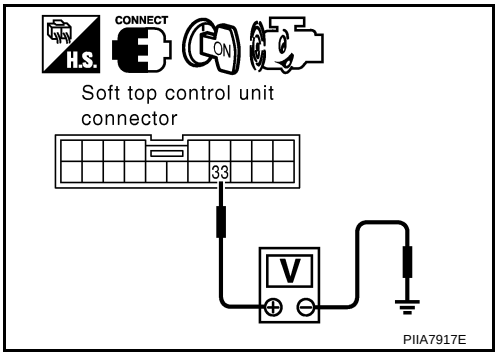
1. CHECK STORAGE LID FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	33 (BR)	Ground	CL2 → CL3	5 → 0

OK or NG

OK >> Storage lid switch (OPEN) (storage lid full open detection switch) is OK.
NG >> GO TO 2.



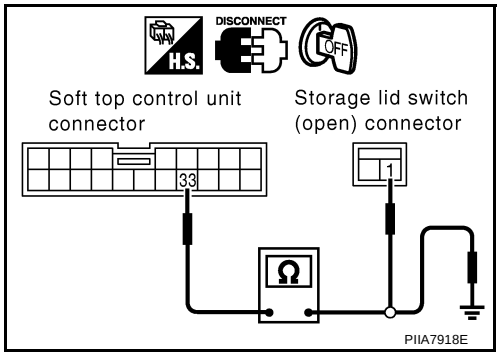
2. CHECK SOTORAGE LID FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid switch (open) connector.
3. Check continuity between soft top control unit connector B67 terminal 33 and storage lid switch (open) connector T27 terminal 1.

33 (BR) - 1 (BR) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 33 and ground.

33 (BR) - Ground : Continuity should not exist.



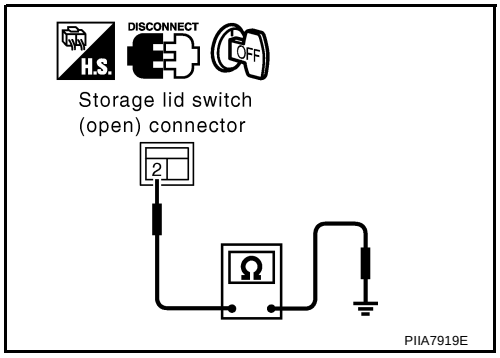
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK STORAGE LID FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between storage lid switch (open) connector T27 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



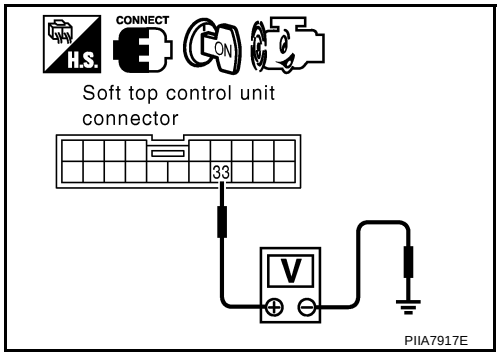
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 33 and ground.

33 (BR) - Ground : Approx. 5V



OK or NG

OK >> Replace storage lid switch (open).
NG >> Replace soft top control unit.

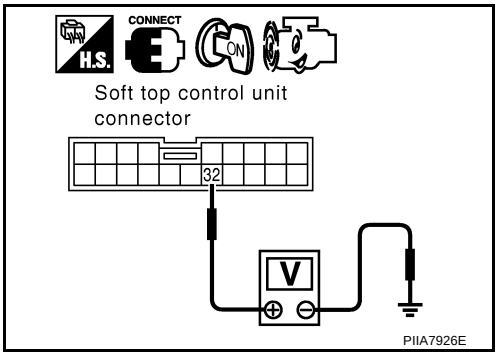
Check Body Interference Prevention Switch (Close Operate)

NIS00074

1. CHECK BODY INTERFERENCE PREVENTION SWITCH

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	32 (W)	Ground	CL3	0 → 5



OK or NG

OK >> Soft top switch assembly 1 (body interference prevention switch) is OK.
NG >> GO TO 2.

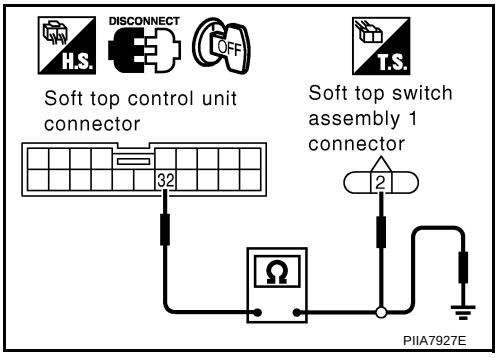
2. CHECK BODY INTERFERENCE PREVENTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 1 (body interference prevention switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 32 and soft top switch assembly 1 connector B212 terminal 2.

32 (W) - 2 (W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Continuity should not exist.



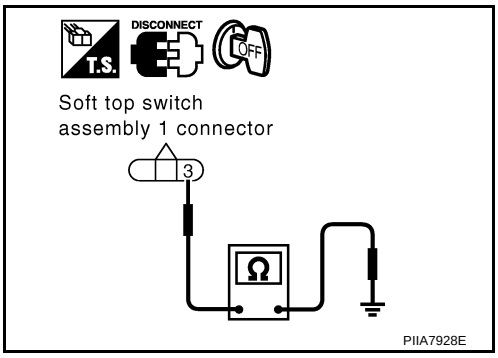
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK BODY INTERFERENCE PREVENTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 1 connector B212 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



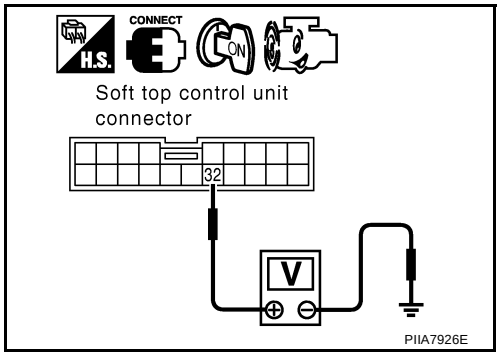
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 32 and ground.

32 (W) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 1.
NG >> Replace soft top control unit.

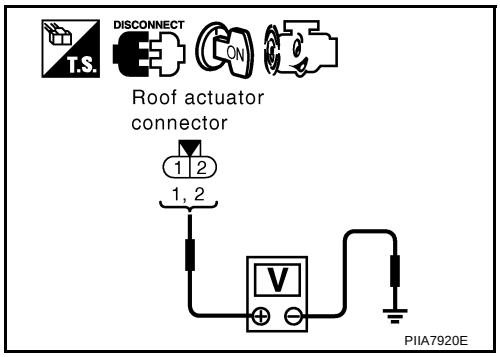
Check Roof Actuator (Close Operate)

NIS00075

1. CHECK ROOF ACTUATOR (CLOSE) SIGNAL

1. Turn ignition switch OFF.
2. Disconnect roof actuator connector.
3. Start engine.
4. Operate soft top switch (CLOSE), check voltage between roof actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B59 (LH)	1 (Y)	Ground	CL3 → CL6	0 → Battery voltage → 0
B72 (RH)	2 (Y)			



OK or NG

OK >> Replace roof actuator (LH or RH).
NG >> GO TO 2.

2. CHECK ROOF ACTUATOR CIRCUIT

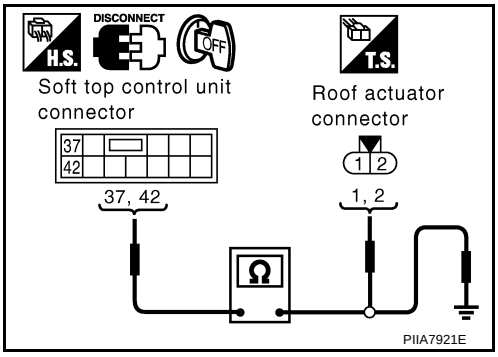
1. Turn ignition switch OFF.
2. Disconnect soft top control unit connector.
3. Check the following.

– Continuity between soft top control unit connector B68 terminal 37, 42 and roof actuator (LH) connector B59 terminal 1, 2.

37 (R) - 2 (R) : Continuity should exist.
42 (Y) - 1 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B68 terminal 37, 42 and ground.

37 (R) - Ground : Continuity should not exist.
42 (Y) - Ground : Continuity should not exist.



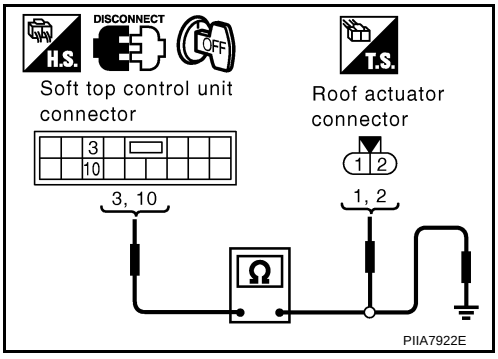
4. Check the following.

– Continuity between soft top control unit connector B66 terminal 3, 10 and roof actuator (RH) connector B72 terminal 1, 2.

3 (R) - 1 (R) : Continuity should exist.
10 (Y) - 2 (Y) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 3, 10 and ground.

3 (R) - Ground : Continuity should not exist.
10 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

Check Roof Full Close Detection Switch

NIS00076

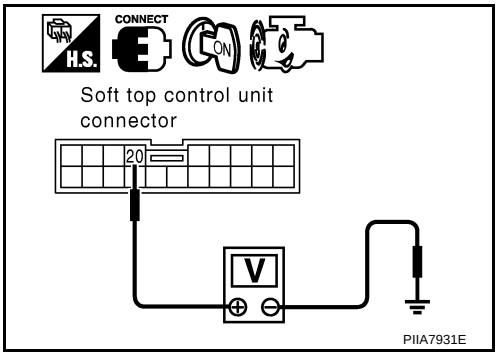
1. CHECK ROOF FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	CL5 → CL6	0 → 5

OK or NG

OK >> Soft top switch assembly 2 (roof full close detection switch) is OK.
NG >> GO TO 2.



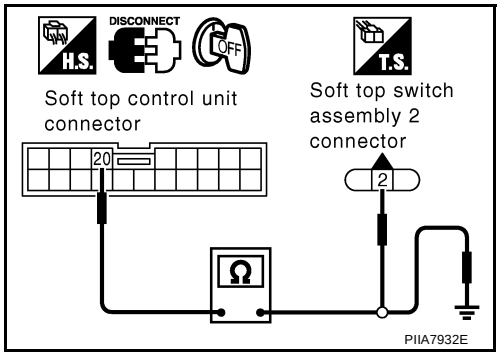
2. CHECK ROOF FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top switch assembly 2 (roof full close detection switch) connector.
3. Check continuity between soft top control unit connector B67 terminal 20 and soft top switch assembly 2 connector B213 terminal 2.

20 (W/B) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 20 and ground.

20 (W/B) - Ground : Continuity should not exist.



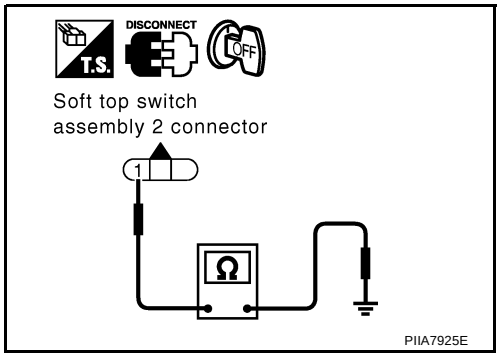
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK ROOF FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between soft top switch assembly 2 connector B213 terminal 1 and ground.

1 (B) - Ground : Continuity should exist.



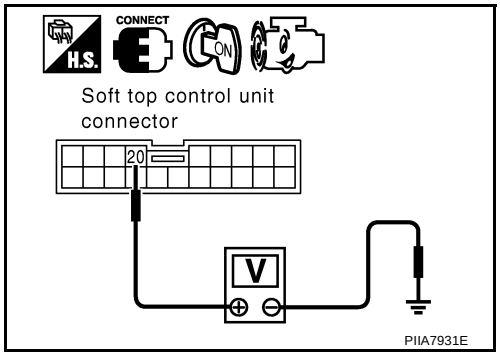
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 20 and ground.

20 (W/B) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top switch assembly 2.
NG >> Replace soft top control unit.

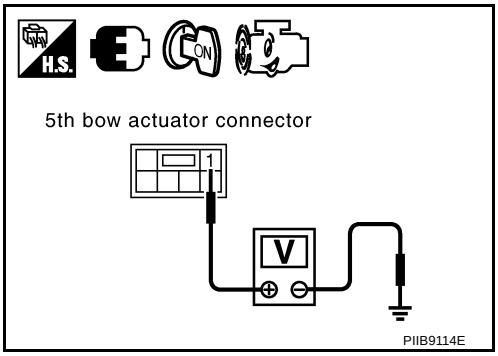
Check 5th Bow Actuator (Close Operate)

NIS00077

1. CHECK 5TH BOW ACTUATOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between 5th bow actuator connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B233	1 (G/Y)	Ground	CL4 → CL5	0 → Battery voltage → 0



OK or NG

OK >> Replace 5th bow actuator.
NG >> GO TO 2.

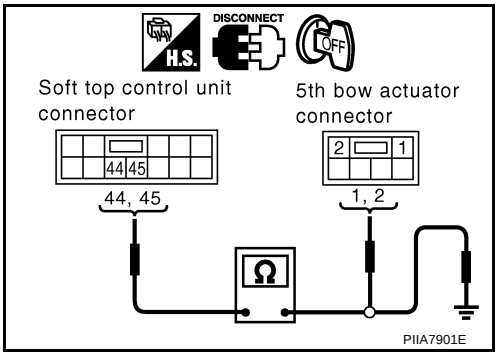
2. CHECK 5TH BOW ACTUATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow actuator connector.
3. Check continuity between soft top control unit connector B68 terminal 44, 45 and 5ht bow actuator connector B233 terminal 1, 2.

44 (G/R) - 1 (G/Y) : Continuity should exist.
45 (G/Y) - 2 (G/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B68 terminal 44, 45 and ground.

44 (G/R) - Ground : Continuity should not exist.
45 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

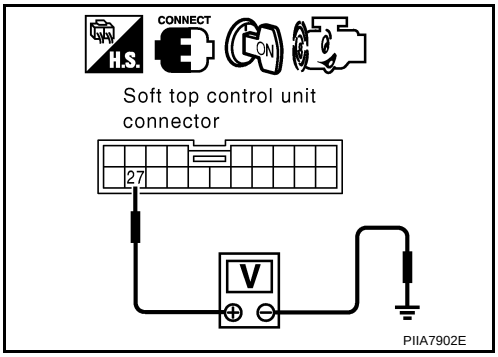
Check 5th Bow Full Close Detection Switch (Close Operate)

NIS00078

1. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	27 (GY)	Ground	CL5 → CL6	0 → 5 → 0



OK or NG

OK >> Plate rail RR (5th bow full close switch) is OK.
NG >> GO TO 2.

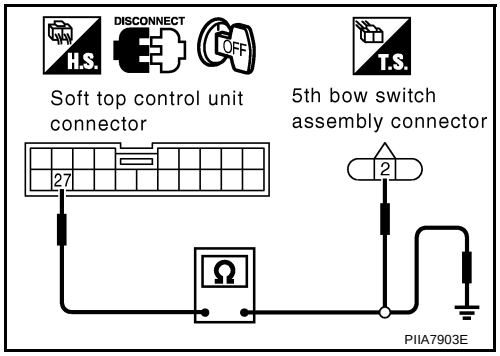
2. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly (at plate rail RR) connector.
3. Check continuity between soft top control unit connector B67 terminal 27 and 5th bow switch assembly connector B214 terminal 2.

27 (GY) - 2 (W/G) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 27 and ground.

27 (GY) - Ground : Continuity should not exist.



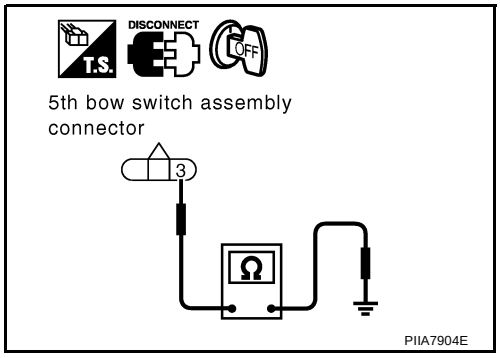
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL CLOSE DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



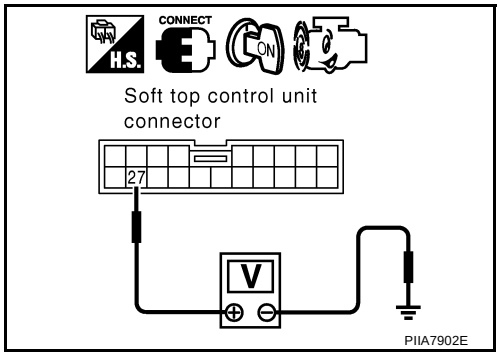
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 27 and ground.

27 (GY) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

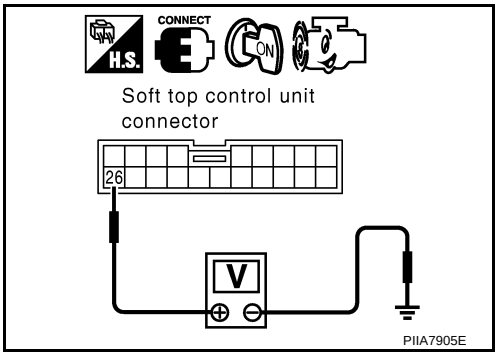
Check 5th Bow Full Open Detection Switch (Close Operate)

NIS00079

1. CHECK 5TH BOW FULL OPEN DETECTION SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	26 (LG)	Ground	CL6 → CL7	5 → 0



OK or NG

OK >> Plate rail RR (5th bow full open switch) is OK.
NG >> GO TO 2.

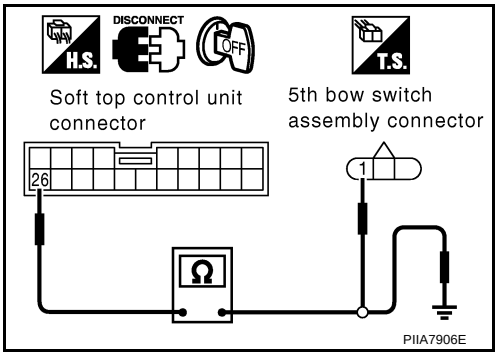
2. CHECK 5TH BOW FULL OPEN DETECTION SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow switch assembly connector.
3. Check continuity between soft top control unit connector B67 terminal 26 and 5th bow switch assembly connector B214 terminal 1.

26 (LG) - 1 (LG) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Continuity should not exist.



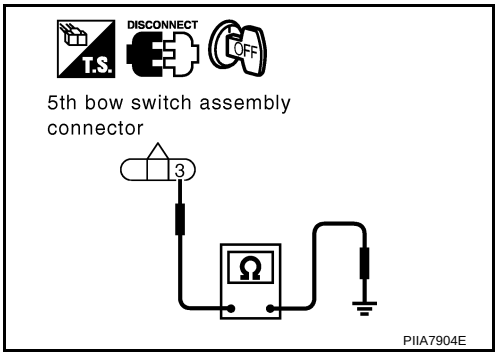
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW FULL OPEN DETECTION SWITCH GROUND CIRCUIT

Check continuity between 5th bow switch assembly connector B214 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.



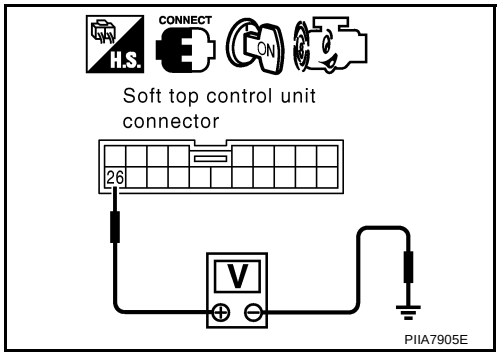
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTORL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 26 and ground.

26 (LG) - Ground : Approx. 5V



OK or NG

OK >> Replace plate rail RR.
NG >> Replace soft top control unit.

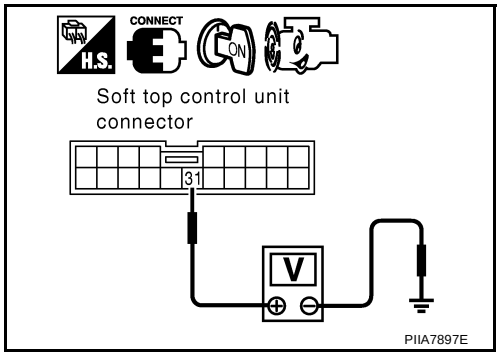
Check 5th Bow Half-Latch Switch (Close Operate)

NIS0007A

1. CHECK 5TH BOW HALF-LATCH SWITCH SIGNAL CHECK

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	31 (L)	Ground	CL9 → CL10	0 → 5



OK or NG

OK >> Soft top lock switch (5th bow half-latch switch) is OK.
NG >> GO TO 2.

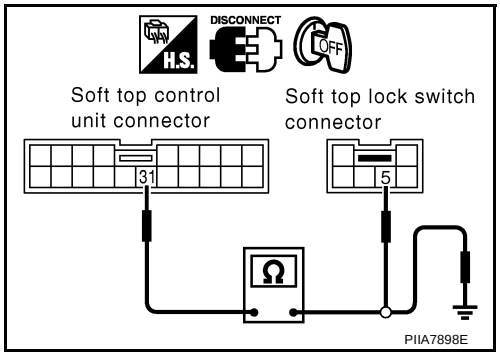
2. CHECK 5TH BOW HALF-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 31 and soft top lock switch connector T205 terminal 5.

31 (L) - 5 (L) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Continuity should not exist.



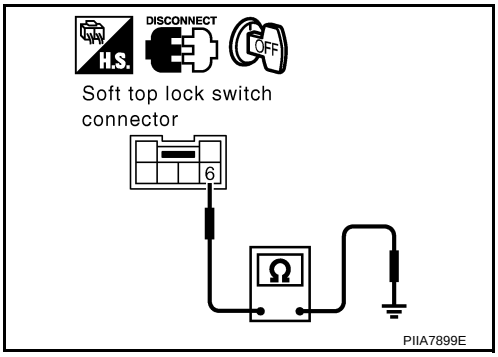
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 6 and ground.

6 (B) - Ground : Continuity should exist.



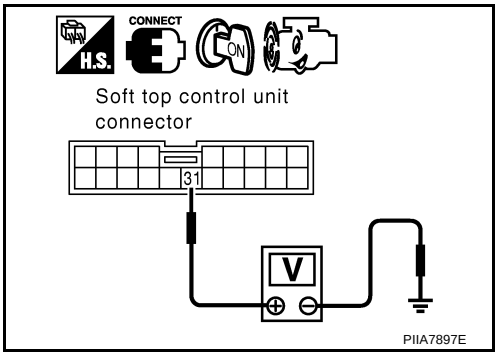
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 31 and ground.

31 (L) - Ground : Approx. 5V



OK or NG

OK >> Replace 5th bow lock assembly in storage lid.
NG >> Replace soft top control unit.

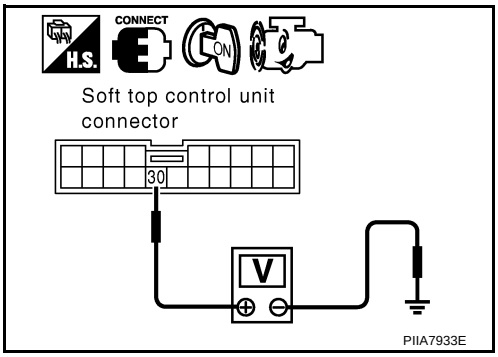
NIS0007B

Check 5th Bow Full-Latch Switch

1. CHECK 5TH BOW FULL-LATCH SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	30 (Y/R)	Ground	CL10	0 → 5



OK or NG

OK >> Soft top lock switch (5th bow full-latch switch) is OK.
NG >> GO TO 2.

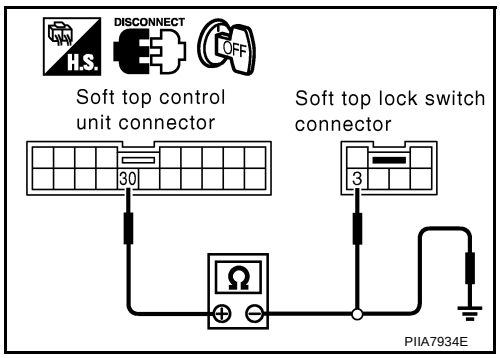
2. CHECK 5TH BOW FULL-LATCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 30 and soft top lock switch connector T205 terminal 3.

30 (Y/R) - 3 (Y) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 30 and ground.

30 (Y/R) - Ground : Continuity should not exist.



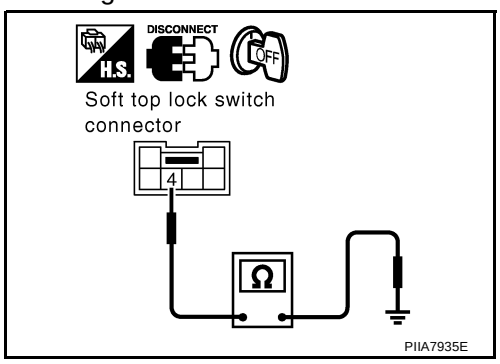
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW HALF-LATCH SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 4 and ground.

4 (B) - Ground : Continuity should exist.



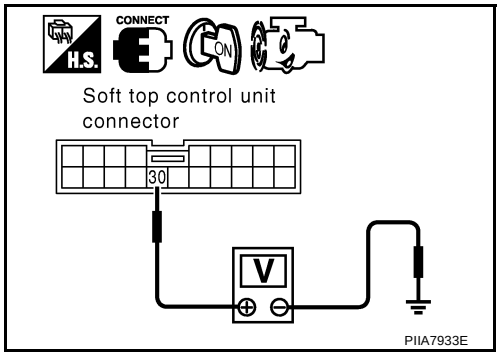
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 30 and ground.

30 (Y/R) - Ground : Approx. 5V



OK or NG

OK >> Replace 5th bow assembly in storage lid.
NG >> Replace soft top control unit.

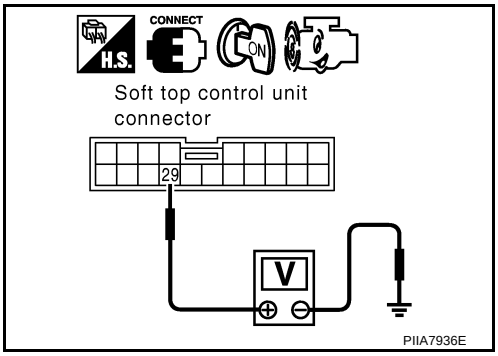
Check 5th Bow Ending Switch

NIS0007C

1. CHECK 5TH BOW ENDING SWITCH SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	29 (R/Y)	Ground	CL10	0 → 5



OK or NG

OK >> Soft top lock switch (5th bow ending switch) is OK.
NG >> GO TO 2.

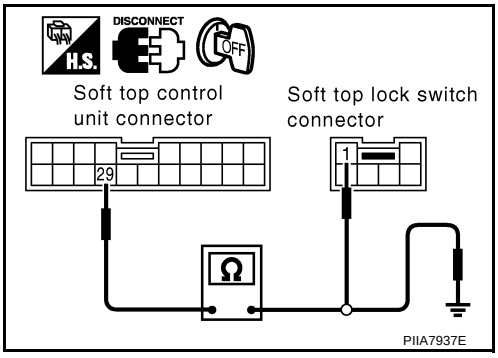
2. CHECK 5TH BOW ENDING CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top lock switch (at 5th bow lock assembly in storage lid) connector.
3. Check continuity between soft top control unit connector B67 terminal 29 and soft top lock switch connector T205 terminal 1.

29 (R/Y) - 1 (R) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 29 and ground.

29 (R/Y) - Ground : Continuity should not exist.



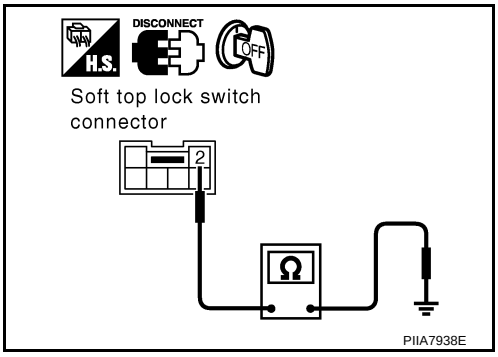
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK 5TH BOW ENDING SWITCH GROUND CIRCUIT

Check continuity between soft top lock switch connector T205 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



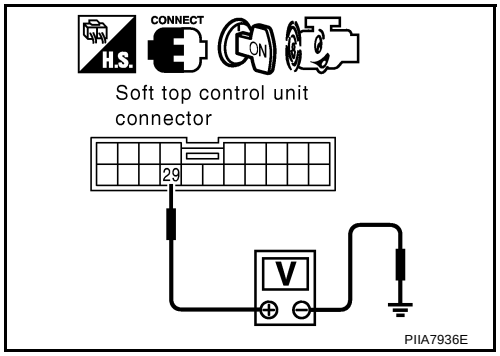
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 29 and ground.

29 (R/Y) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top lock switch (5th bow lock assembly in storage lid).
NG >> Replace soft top control unit.

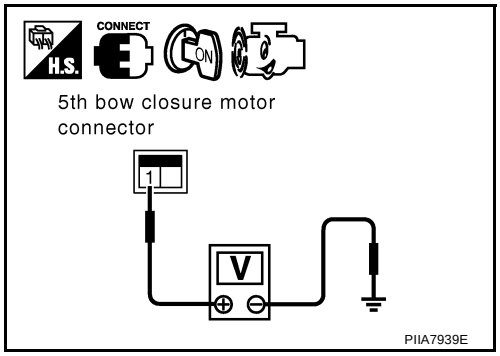
Check 5th Bow Closure Motor

NIS0007D

1. 5TH BOW CLOSURE MOTOR INPUT SIGNAL

1. Start engine.
2. Operate soft top switch CLOSE, check voltage between 5th bow closure motor connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
T204	1 (W)	Ground	CL9 → CL10	0 → Battery voltage → 0



OK or NG

OK >> Replace 5th bow closure motor.
NG >> GO TO 2.

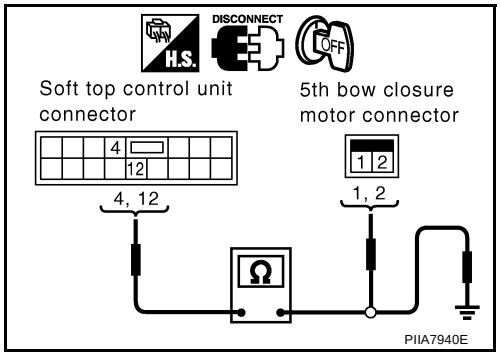
2. CHECK 5TH BOW CLOSURE MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and 5th bow closure motor connector.
3. Check continuity between soft top control unit connector B66 terminal 4, 12 and 5th bow closure motor connector T204 terminal 1, 2.

4 (G/R) - 1 (W) : Continuity should exist.
12 (G/Y) - 2 (G) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 4, 12 and ground.

4 (G/R) - Ground : Continuity should not exist.
12 (G/Y) - Ground : Continuity should not exist.



OK or NG

OK >> Replace soft top control unit.
NG >> Repair or replace harness.

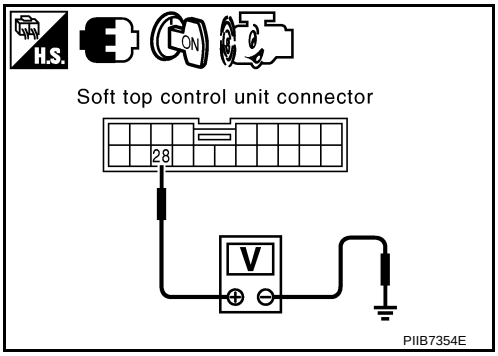
Check Soft Top Front Lock Switch

NIS001L7

1. SOFT TOP FRONT LOCK SWITCH SIGNAL

1. Start engine.
2. Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(-)			
B67	28 (LG/B)	Ground	Front lock	Lock	5
				Unlock	0



OK or NG

OK >> Soft top front lock switch is OK.
NG >> GO TO 2.

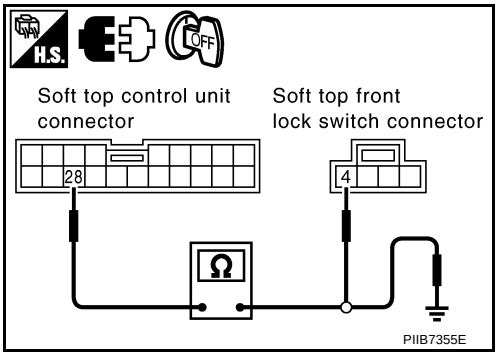
2. CHECK 5TH BOW ENDING CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and soft top front lock switch connector.
3. Check continuity between soft top control unit connector B67 terminal 28 and soft top front lock switch connector R8 terminal 4.

28 (LG/B) - 4 (LG/B) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 28 and ground.

28 (LG/B) - Ground : Continuity should not exist.



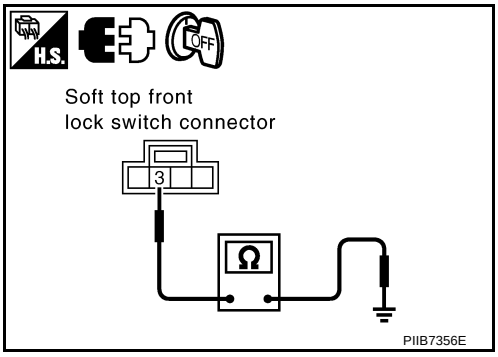
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

3. CHECK SOFT TOP FRONT LOCK SWITCH GROUND CIRCUIT

Check continuity between soft top front lock switch connector R8 terminal 3 and ground.

3 (B/W) - Ground : Continuity should exist.



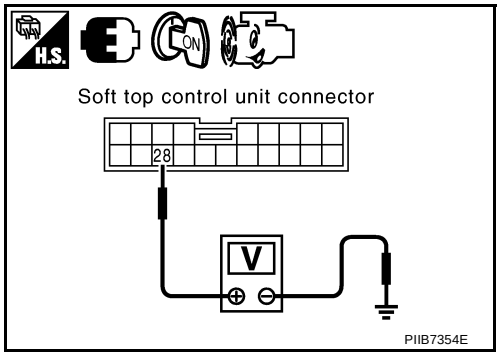
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK SOFT TOP CONTROL UNIT OUTPUT SIGNAL

1. Connect soft top control unit connector.
2. Start engine.
3. Check voltage between soft top control unit connector B67 terminal 28 and ground.

28 (LG/B) - Ground : Approx. 5V



OK or NG

OK >> Replace soft top front lock switch (front lock striker RH).
NG >> Replace soft top control unit.

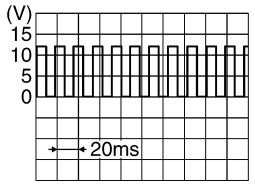
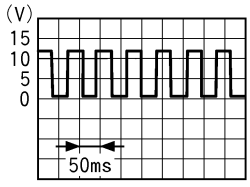
Check Operation Permission Condition

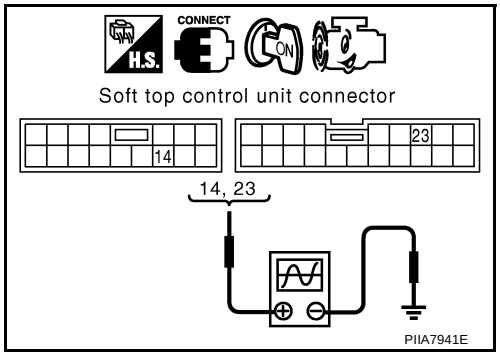
NIS0007E

First perform the “SELF-DIAG RESULT” in “BCM” with CONSULT-II, then perform the each trouble diagnosis of malfunction system indicated “SELF-DIAG RESULT” of “BCM”. Refer to BCS-15, "CONSULT-III Function (BCM)" .

1. CHECK VEHICLE SPEED SIGNAL

1. Start engine.
2. Check the signal between soft top control unit connector and ground with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value.)
B66	14 (W)	Ground	Speedometer operated [When vehicle speed is Approx. 40km/h (25MPH)]	 PKIA1935E
B67	23 (W/G)			 PIIB0078J



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK VEHICLE SPEED SIGNAL CIRCUIT

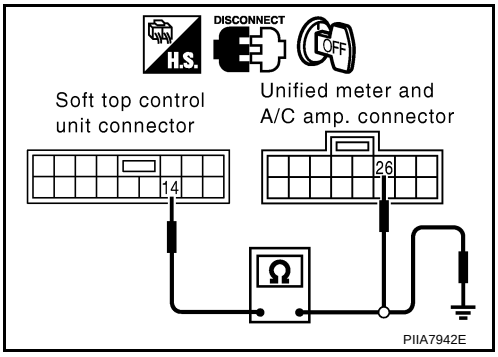
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and unified meter and A/C amp connector.
3. Check the following.

– Continuity between soft top control unit connector B66 terminal 14 and unified meter and A/C amp connector M49 terminal 26.

14 (W) - 26 (W) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 14 and ground.

14 (W) - Ground : Continuity should not exist.



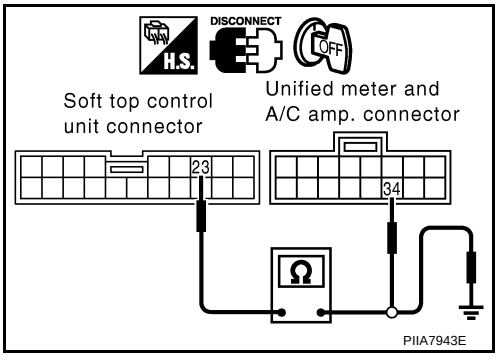
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 23 and unified meter and A/C amp connector M49 terminal 34.

23 (W/G) - 34 (L) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 23 and ground.

23 (W/G) - Ground : Continuity should not exist.



OK or NG

OK >> Check unified meter and A/C amp. Refer to DI-44, "System Description" .

NG >> Repair or replace harness.

3. CHECK FUSE

- Check 10A fuse [No.20, located in fuse block (J/B)].

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

OK or NG

OK >> GO TO 4.

NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

4. CHECK BRAKE PEDAL SIGNAL

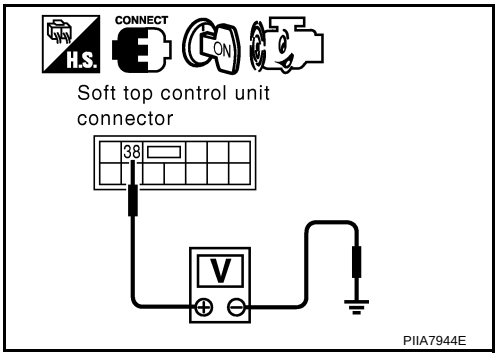
Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Brake pedal condition	Voltage (V) (Approx.)
	(+)	(-)		
B68	38 (W)	Ground	Depressed	Battery voltage
			Released	0

OK or NG

OK >> Stop lamp switch is OK.

NG >> GO TO 5.



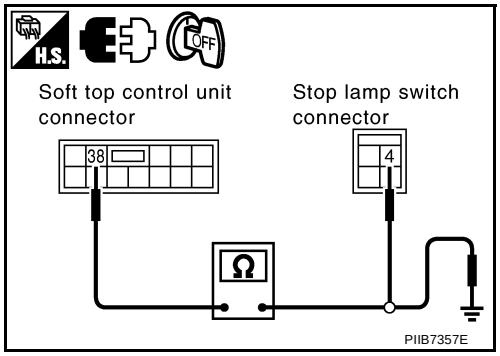
5. CHECK BRAKE PEDAL SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and stop lamp switch connector.
3. Continuity between soft top control unit connector B68 terminal 38 and stop lamp switch connector E111 terminal 4.

38 (W) - 4 (P/L) : Continuity should exist.

4. Continuity between soft top control unit connector B68 terminal 38 and ground.

38 (W) - Ground : Continuity should not exist.



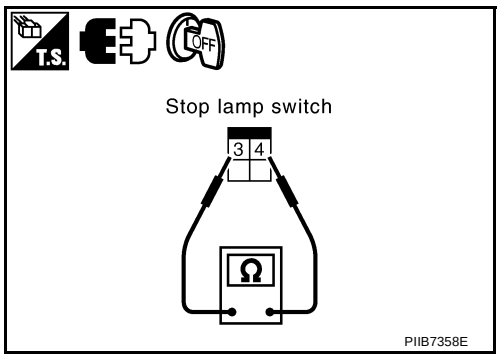
OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness.

6. CHECK STOP LAMP SWITCH

Continuity between stop lamp switch connector E111 terminal 3 and 4.

Connector	Terminal		Brake pedal condition	Continuity
E111	3	4	Depressed	Yes
			Released	No



OK or NG

OK >> Check condition of harness and connector.
NG >> Replace stop lamp switch.

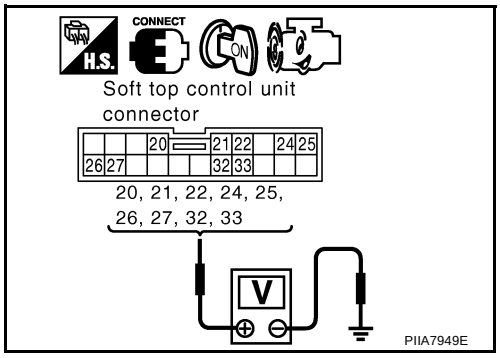
Check Each Switch Condition (Open Operate)

NIS0007F

1. CHECK EACH SWITCH SIGNAL

1. Start engine.
2. Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	Full closed	5
	21 (W/L)			
	22 (W/R)			
	24 (G)			
	25 (L/Y)			
	26 (LG)			
	27 (GY)			
	32 (W)			
	33 (BR)			



OK or NG

OK >> Each switch condition is OK.
NG >> Check malfunction switch.

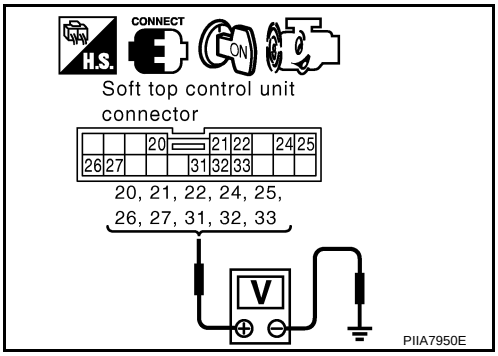
Check Each Switch Condition (Close Operate)

NIS0007G

1. CHECK EACH SWITCH SIGNAL

1. Start engine.
2. Check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	20 (W/B)	Ground	Full opened	0
	21 (W/L)			
	22 (W/R)			
	24 (G)			5
	25 (L/Y)			
	26 (LG)			0
	27 (GY)			
	31 (L)			
	32 (W)			
	33 (P)			5



OK or NG

OK >> Each switch condition is OK.
NG >> Check malfunction switch.

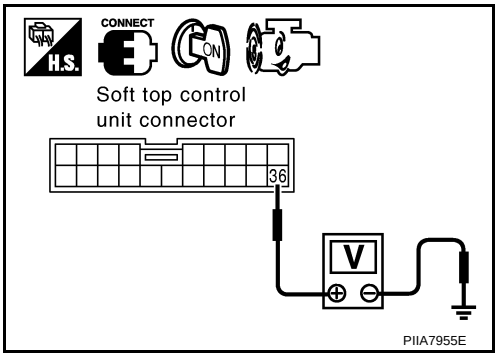
Check Power Window Down Request Signal

NIS0007H

1. CHECK POWER WINDOW REQUEST SIGNAL

1. Start engine.
2. Soft top switch operate, check voltage between soft top control unit connector and ground.

Con-nector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	36 (PU)	Ground	OP1 → OP11 (open operation)	5 → 0 → 5
			CL1 → CL10 (close operation)	



OK or NG

OK >> Check the condition of harness and connector.
NG >> Replace soft top control unit.

Check Power Window Harness

NIS0007I

1. CHECK POWER WINDOW CIRCUIT

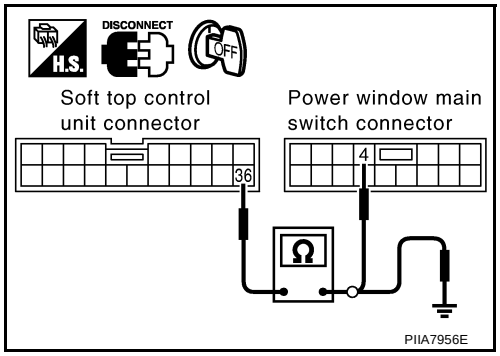
1. Turn ignition switch OFF.
2. Disconnect soft top control unit, power window main switch and power window sub-switch connector.
3. Check the following.

– Continuity between soft top control unit connector B67 terminal 36 and power window main switch connector D7 terminal 4.

36 (PU) - 4 (P) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 36 and ground.

36 (PU) - Ground : Continuity should not exist.



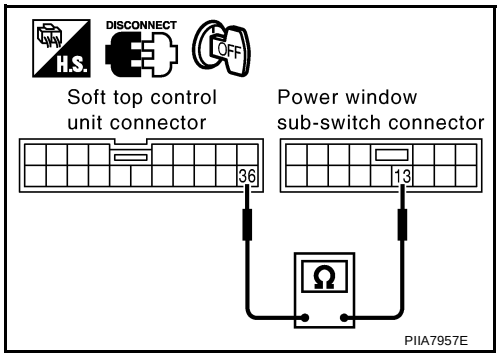
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 36 and power window sub-switch connector D37 terminal 13.

36 (PU) - 13 (P) : Continuity should exist.

OK or NG

OK >> Replace malfunction power window switch.
NG >> Repair or replace harness.



Check Passenger Side Seat Operate Signal 1

NIS0007J

1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and passenger side seat control unit connector.
3. Check continuity between soft top control unit connector B67 terminal 36 and passenger seat control unit connector B353 terminal 16.

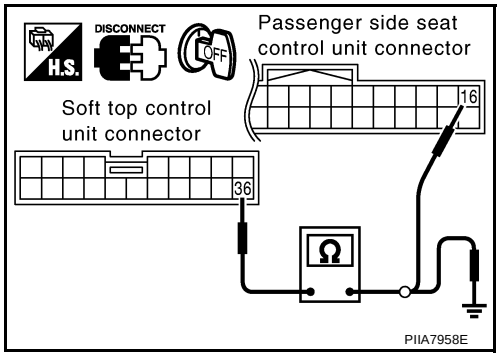
36 (PU) - 16 (PU/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 36 and ground.

36 (PU) - Ground : Continuity should not exist.

OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace harness.



Check Passenger Side Seat Operate Signal 2

NIS0007K

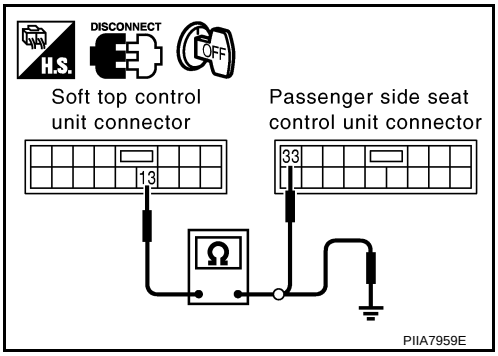
1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit, storage lid actuator RH and passenger seat control unit connector.
3. Check continuity between soft top control unit connector B66 terminal 13 and passenger seat control unit connector B354 terminal 33.

13 (L/R) - 33 (G/B) : Continuity should exist.

4. Check continuity between soft top control unit connector B66 terminal 13 and ground.

13 (L/R) - Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace harness.

Check Passenger Side Seat Operate Signal 3

NIS0007L

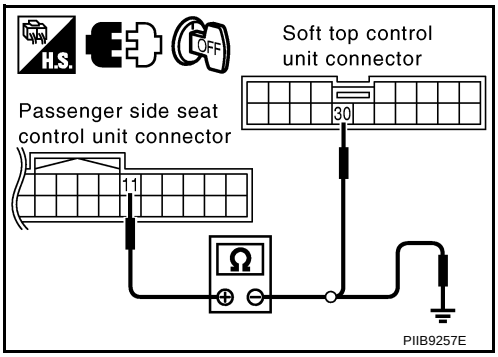
1. CHECK PASSENGER SIDE SEAT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit, passenger seat control unit and soft top lock switch connector.
3. Check continuity between passenger seat control unit connector B353 terminal 11 and soft top control unit connector B67 terminal 30.

11 (L/W) - 30 (Y/R) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 30 and ground.

11 (L/W) - Ground : Continuity should not exist.



OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace harness.

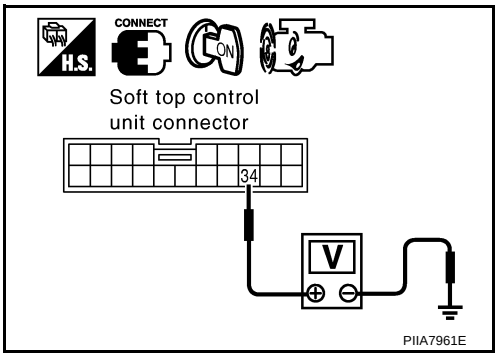
Check Seat Back Position Signal

NIS0007M

1. CHECK SEAT BACK POSITION SIGNAL

1. Start engine.
2. The thing whose seat cancel switch is OFF is confirmed.
3. Soft top switch operate, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Seat condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	34 (L/W)	Ground	When passenger seat inclines forward	5
			Other than above	0



OK or NG

OK >> Replace soft top control unit.
NG >> GO TO 2.

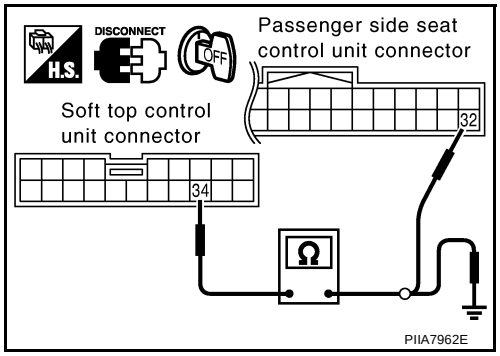
2. CHECK SEAT BACK POSITION SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and passenger seat control unit connector.
3. Check continuity between soft top control unit connector B67 terminal 34 and passenger seat control unit connector B353 terminal 32.

34 (L/W) - 32 (G/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 34 and ground.

34 (L/W) - Ground : Continuity should not exist.



OK or NG

OK >> Check passenger side seat. Refer to SE-37, "Trouble Diagnosis Symptom Chart" .

NG >> Repair or replace harness.

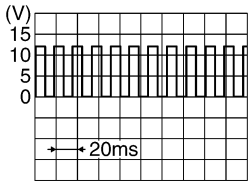
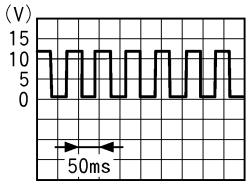
Check Speed Signal Circuit

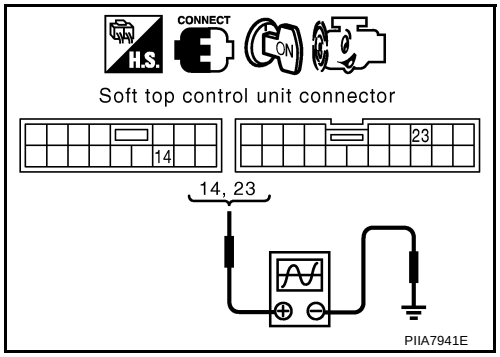
NIS0007N

First perform the “SELF-DIAG RESULT” in “BCM” with CONSULT-II, then perform the each trouble diagnosis of malfunction system indicated “SELF-DIAG RESULT” of “BCM”. Refer to BCS-15, "CONSULT-III Function (BCM)" .

1. CHECK VEHICLE SPEED SIGNAL

1. Start engine.
2. Check the signal between soft top control unit connector and ground with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value.)
B66	14 (W)	Ground	Speedometer operated [When vehicle speed is Approx. 40km/h (25MPH)]	 PKIA1935E
B67	23 (W/G)			 PIIB0078J



OK or NG

OK >> Replace soft top control unit.

NG >> GO TO 2.

2. CHECK VEHICLE SPEED SIGNAL CIRCUIT

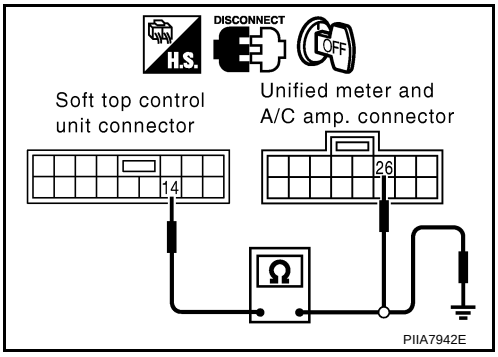
1. Turn ignition switch OFF.
2. Disconnect soft top control unit and unified meter and A/C amp connector.
3. Check the following.

– Continuity between soft top control unit connector B66 terminal 14 and unified meter and A/C amp connector M49 terminal 26.

14 (W) - 26 (W) : Continuity should exist.

– Continuity between soft top control unit connector B66 terminal 14 and ground.

14 (W) - Ground : Continuity should not exist.



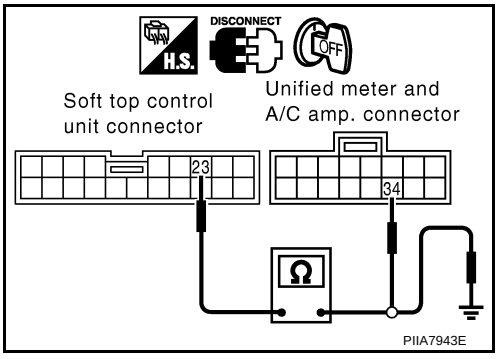
4. Check the following.

– Continuity between soft top control unit connector B67 terminal 23 and unified meter and A/C amp connector M49 terminal 34.

23 (W/G) - 34 (L) : Continuity should exist.

– Continuity between soft top control unit connector B67 terminal 23 and ground.

23 (W/G) - Ground : Continuity should not exist.



OK or NG

OK >> Check unified meter and A/C amp. Refer to DI-44, "System Description" .

NG >> Repair or replace harness.

Check Indicator Lamp Circuit

NIS0007O

1. CHECK FUSE

- Check 10A fuse [No.14, located in fuse block (J/B)]

NOTE:
Refer to RF-11, "Component Parts and Harness Connector Location" .

OK or NG

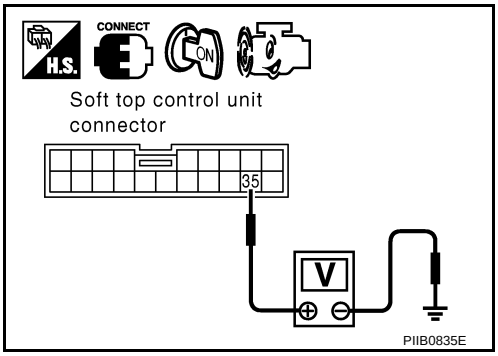
OK >> GO TO 2.

NG >> If fuse blown out, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK INDICATOR LAMP SIGNAL

1. Start engine.
2. Soft top switch operate, check voltage between soft top control unit connector and ground.

Connector	Terminal (Wire color)		Roof condition	Voltage (V) (Approx.)
	(+)	(-)		
B67	35 (Y)	Ground	Full open or full close	Battery voltage
			Other than above	0



OK or NG

OK >> Check the condition of the harness and the connector.

NG - 1 >> If battery voltage: Replace soft top control unit.

NG - 2 >> If 0V: GO TO 3.

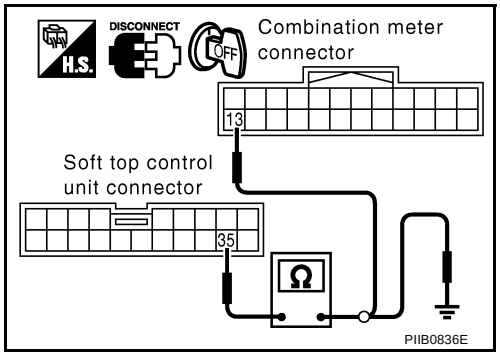
3. CHECK INDICATOR LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and combination meter connector.
3. Check continuity between soft top control unit connector B67 terminal 35 and combination meter connector M19 terminal 13.

35 (Y) – 13 (G/W) : Continuity should exist.

4. Check continuity between soft top control unit connector B67 terminal 35 and ground.

35 (Y) – Ground : Continuity should not exist.



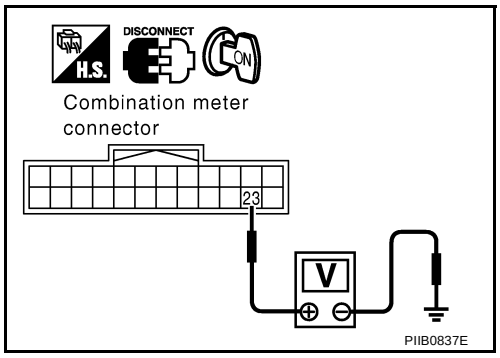
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.

4. CHECK INDICATOR LAMP POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between combination meter connector M19 terminal 23 and ground.

23 (G/Y) – Ground : Battery voltage



OK or NG

OK >> Check the Condition of the Harness and the Connector.
- If OK: Replace combination meter.
- If NG: Repair or replace harness.

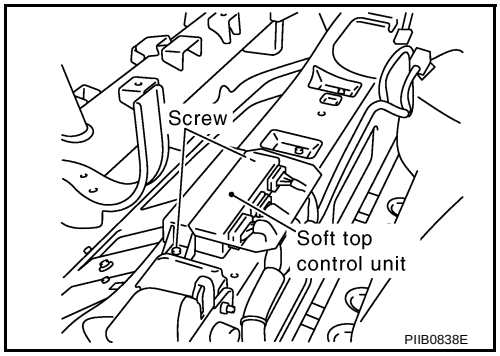
NG >> Repair or replace harness.

Removal and Installation of Soft Top Control Unit

NIS0007P

REMOVAL

1. Push the soft top switch on the close side to clear the soft top storage room, and release the buttom before strage lid starts closing.
2. Remove trim parts and turn the front side of storage room finisher. RF-126, "Removal and Installation of Storage Room Finisher"
3. Disconnect soft top control unit connector, remove the screw and soft top control unit.



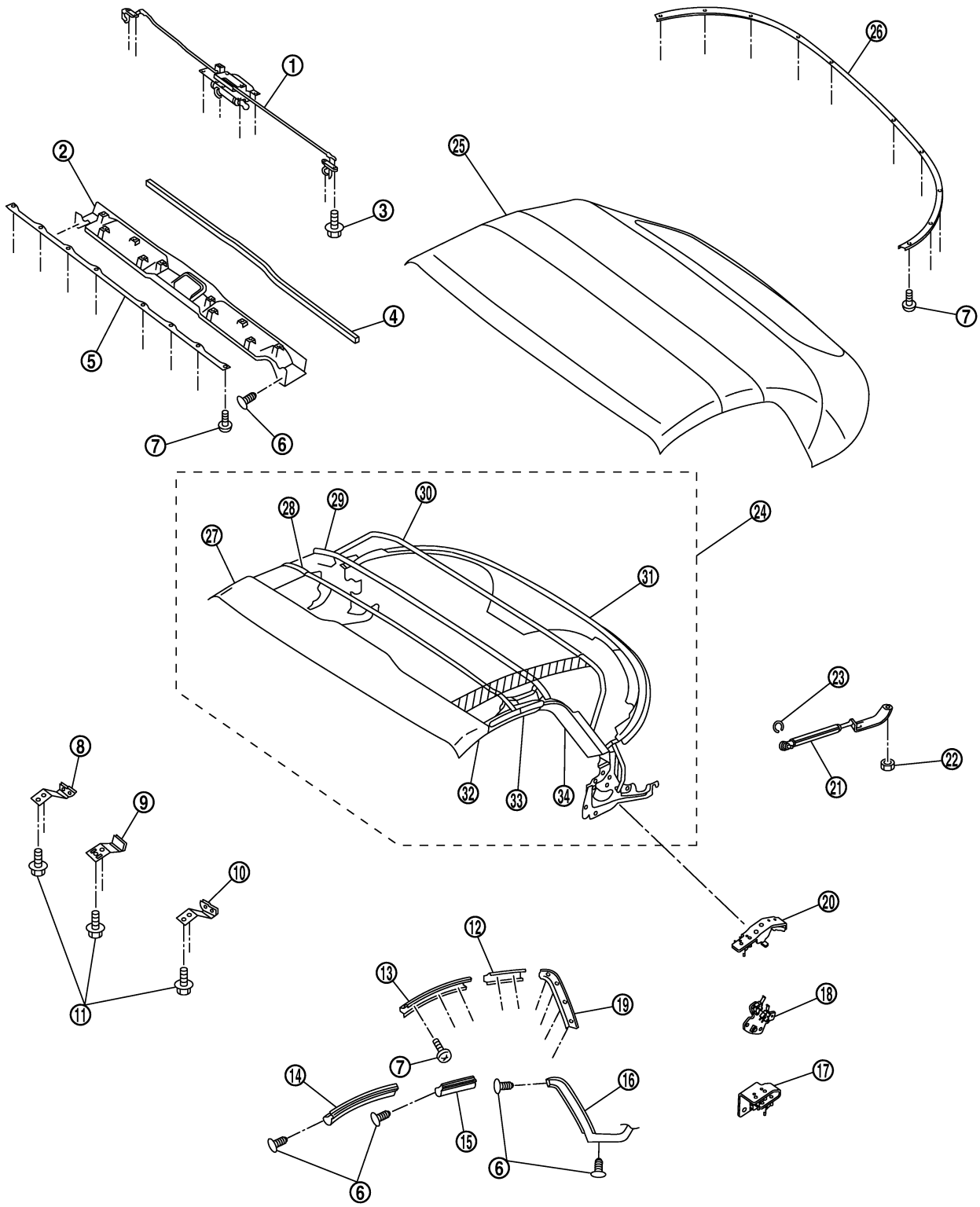
INSTALLATION

Installation in the reverse order of removal.

Component Parts Drawing

NIS0007Q

SEC. 737



PIIB1399E

1. Front lock
2. Front lock finisher
3. TORX bolt (T30)
4. Welt
5. Front center retainer
6. Clip
7. Screw
8. Front lock striker, RH
9. Front lock striker, center
10. Front lock striker, LH
11. Bolt
12. B link retainer
13. A link retainer
14. A link weather strip
15. B link weather-strip
16. C link and 5th bow weather strip
17. Soft top switch bracket 1
18. Soft top switch bracket 2
19. C link retainer
20. Plate rail RR bracket
21. 5th bow operating strut rod
22. Nut
23. Holder
24. Soft top frame
25. Soft top cover
26. 5th bow retainer
27. 1st bow
28. 2nd bow
29. 3rd bow
30. 4th bow
31. 5th bow
32. A link
33. B link
34. C link

Removal and Installation of Soft Top Assembly

NIS0007R

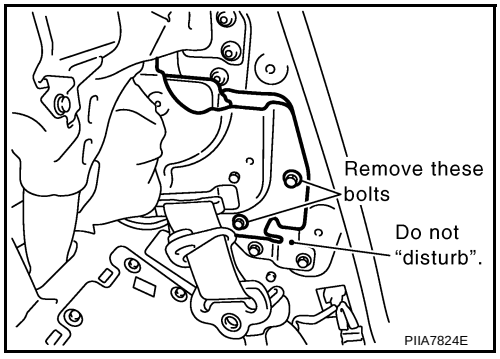
CAUTION:
Install fender cover to protect rear fender.

REMOVAL

1. Fully open storage lid with soft top retracting.
2. Remove seat belt sholder bolt. Refer to SB-6, "REMOVAL OF SEAT BELT RETRACTOR" .
3. Remove rear side finisher. Refer to EI-37, "REAR SIDE FINISHER" .
4. Remove back panel finisher. Refer to EI-42, "BACK PANEL FINISHER" .
5. Loosen bolts at soft top mounting bracket (front).

   CAUTION:
   Do not remove soft top mounting bracket (front) (body side).

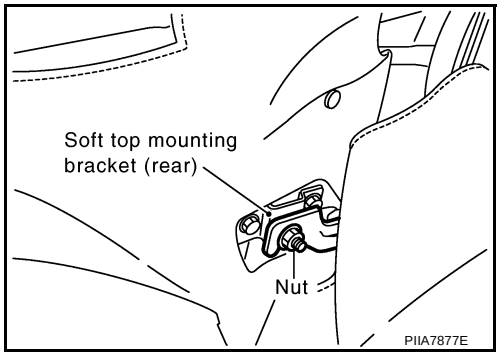
   Nut: 28.0 N·m (2.9 kg-m, 21 ft-lb)



6. Close soft top until 5th bow are raised and folded with C-link. Loosen nut at soft top mounting bracket (rear). Then fold (open) soft top assembly completely.

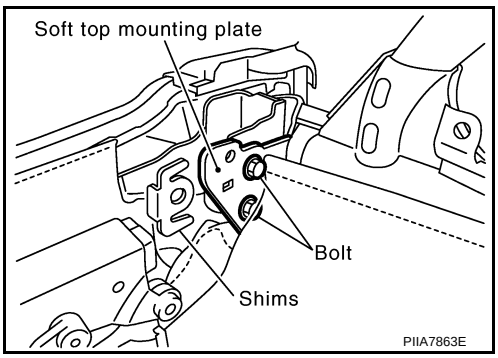
   CAUTION:
   Do not remove soft top mounting bracket (rear) (body side).

   Bolt: 28.0 N·m (2.9 kg-m, 21 ft-lb)



7. Remove back panel bracket.

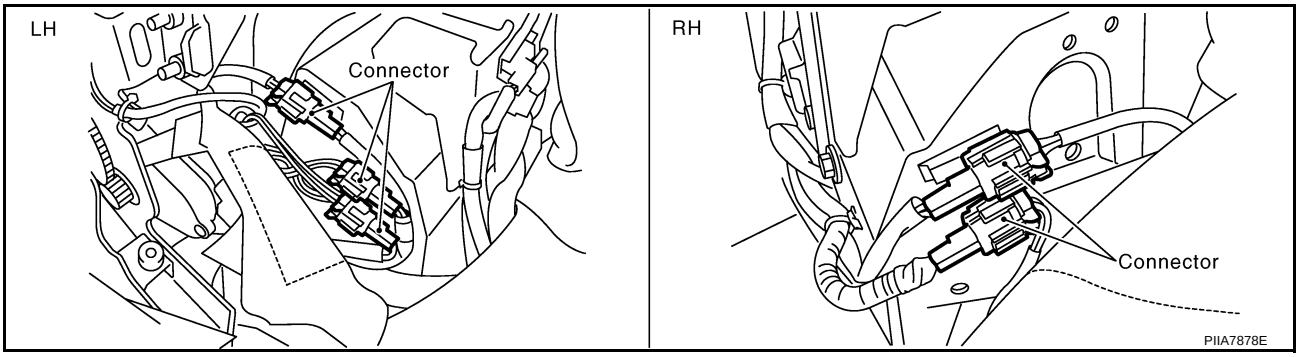
8. Remove bolts, at the soft top mounting plate and shims.



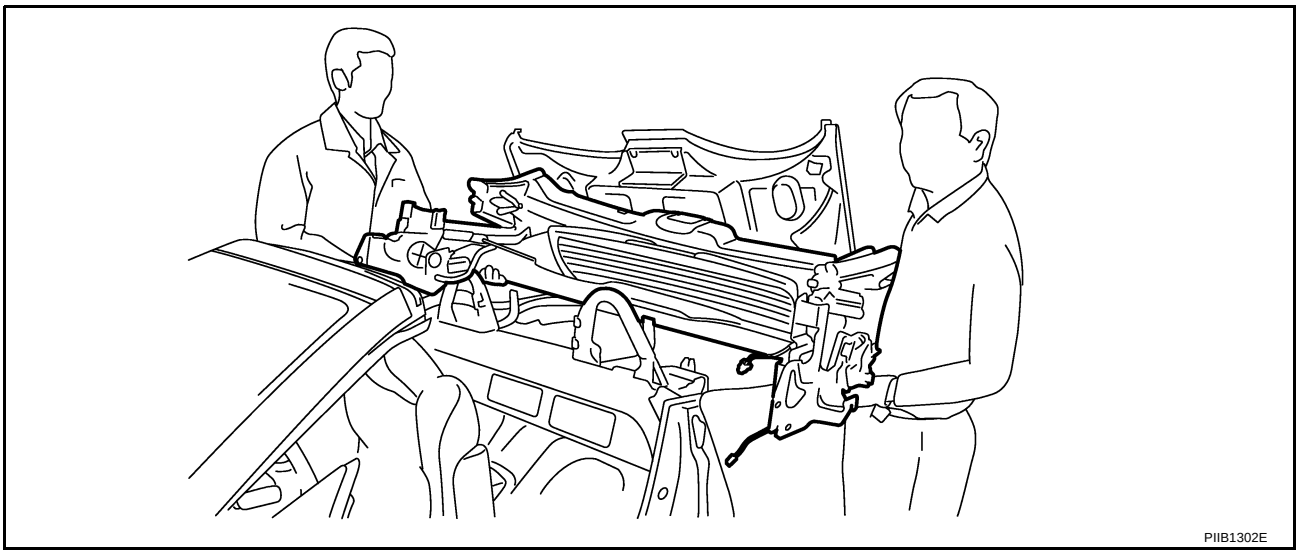
CAUTION:
Do not replace left and right shims with each one with different thickness.

Bolt: 28.0 N·m (2.9 kg-m, 21 ft-lb)

9. Disconnect harness connector.



10. Lift up soft top assembly from left and right, and then remove soft top assembly.



CAUTION:
2 workers are required for the heavy load of approximately 40 kg (89 lb).

INSTALLATION

Install in the reverse order of removal except the order of tightening bolts and nuts. (See note below.)

NOTE:
Before tighten soft top fixing bolts and nuts, make sure that soft top is sat on each pins from soft top mounting brackets without any gaps.
To sit soft top correctly, follow this order.

1. Push soft top assembly down when nuts at soft top mounting bracket (rear) is tighten.
2. Close soft top until the angle of A-link becomes vertical against ground, then tighten bolts at soft top mounting bracket (front).
3. Tighten bolts at soft top mounting plate with shims, then attach back panel bracket with bolts.

Removal and Installation of Soft Top Cover

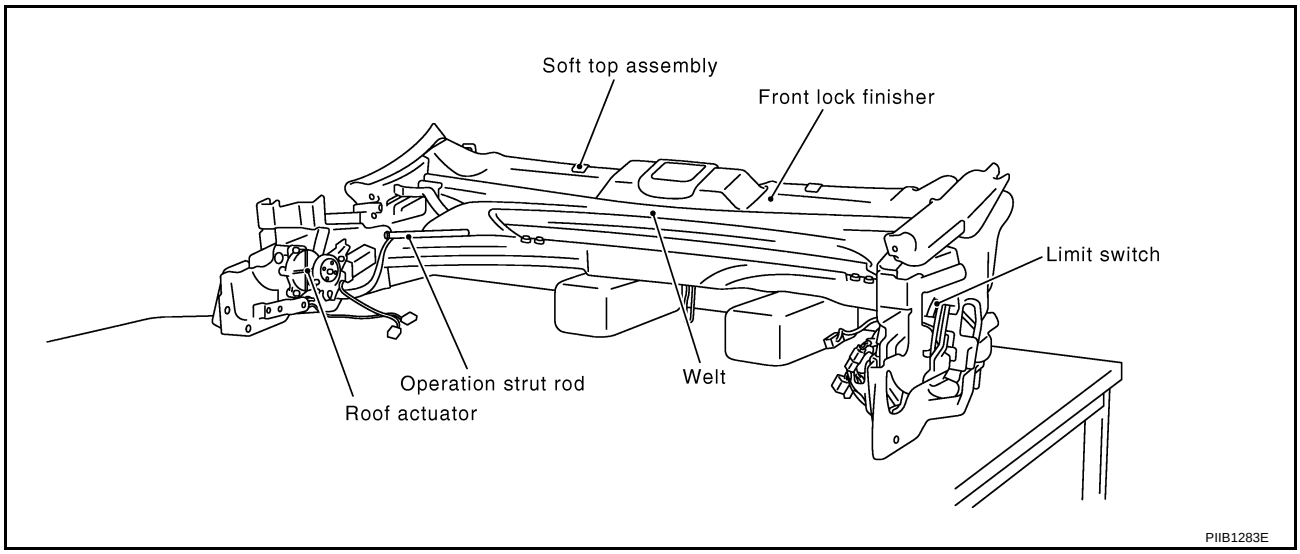
NIS0007S

REMOVAL

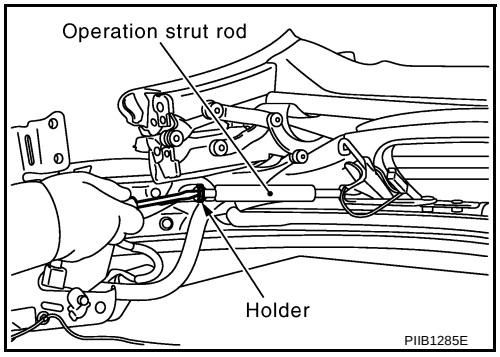
CAUTION:

- **Do not reuse used double-faced adhesive tape, nonwoven fabric, EPT seal, pad, etc.**
- **Be careful not to damage soft top assembly during removal. Do not place it upside-down so as to prevent cover from compression scars.**

1. Remove soft top assembly from the vehicle. Refer to RF-88, "Removal and Installation of Soft Top Assembly" .
2. Set up the soft top assembly on the table.



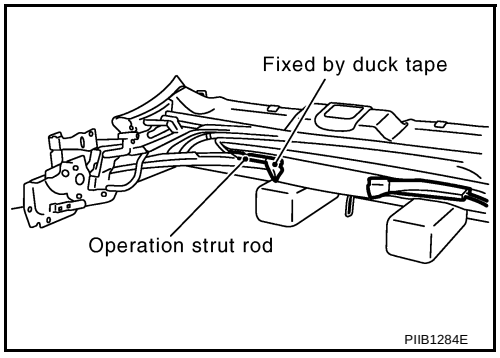
3. Remove roof actuator (RH/LH). Refer to RF-108, "Removal and Installation of Roof Actuator" .
4. Remove holder of 5th bow operation strut rods, and then remove 5th bow operation strut rods.



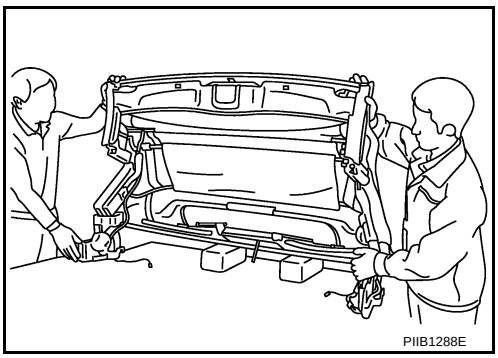
CAUTION:

- **When 5th bow operating strut rods are removed, 5th bow drops suddenly.**
  Perform operation while holding 5th bow.

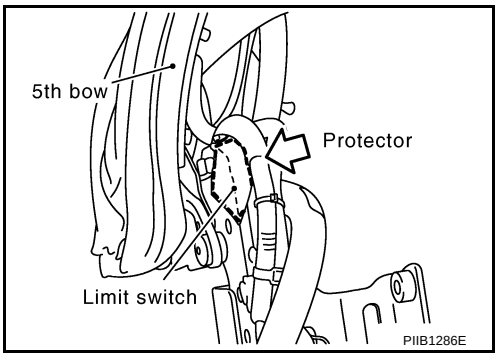
- **Temporarily fix 5th bow operating strut rods on 5th bow finisher after removal.**



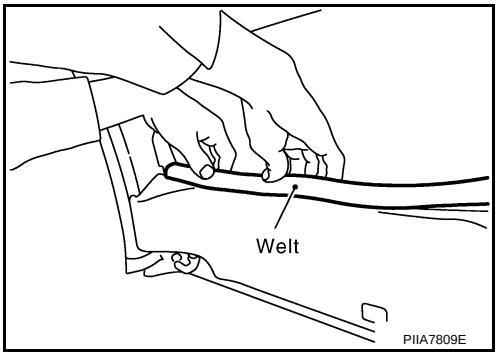
5. Open soft top assembly.



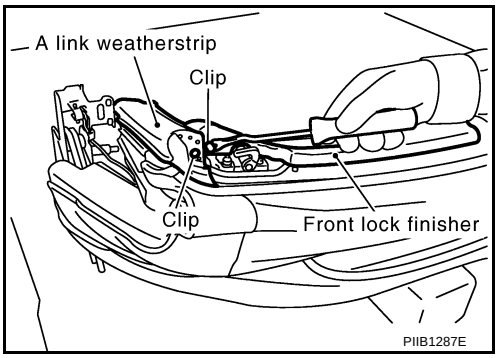
6. Protect the limit switch contact around the rotation axis of the 5th bow on the left side of soft top with tape.



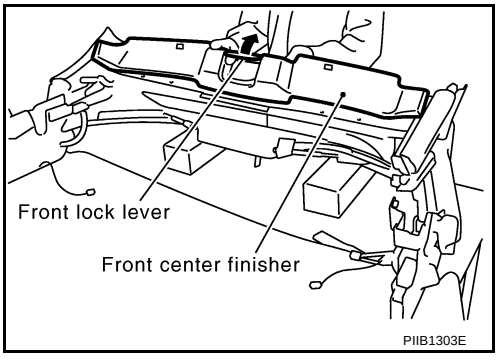
7. Remove welt on the rear end of front lock finisher.



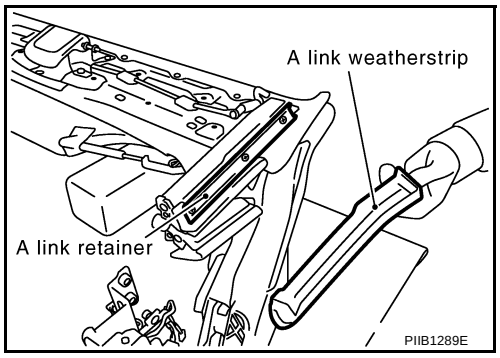
8. Remove left/right clips on the front end of front lock finisher.



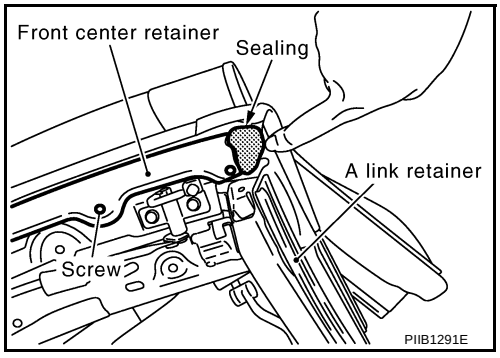
9. Pull up front lock lever, and then disengage clips to remove front lock finisher.



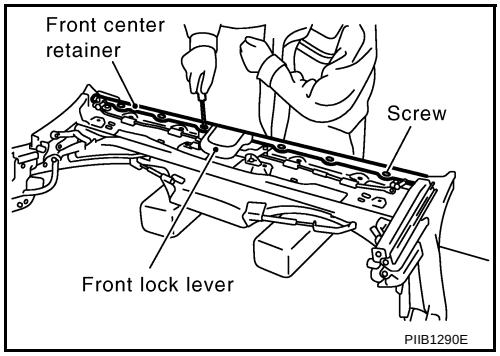
10. Remove clip, and then A link weather strip.



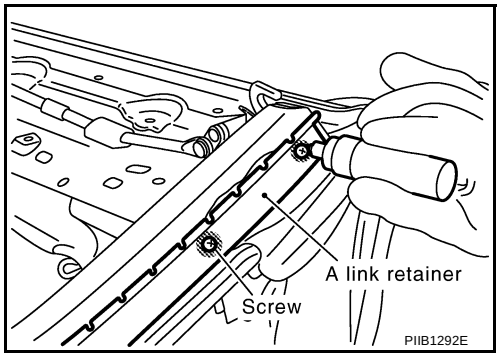
11. Peel a link sealing out.



12. Remove screws, and then remove front center retainer.

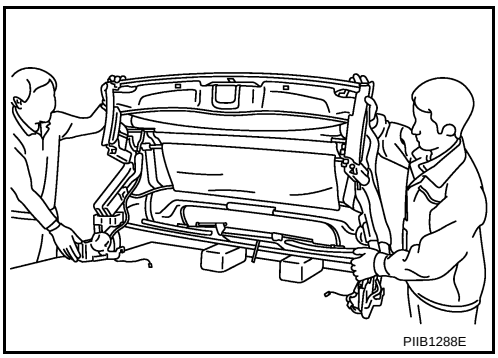


13. Put matching marks to installation position of A link retainer.

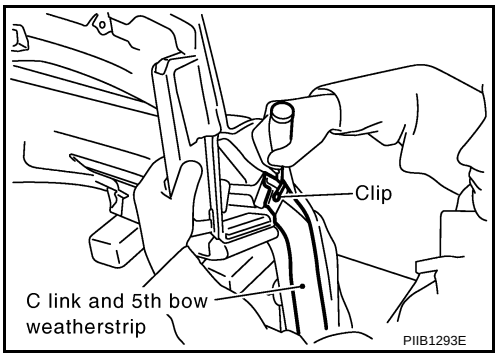


14. Remove screws, and then remove A link retainer.

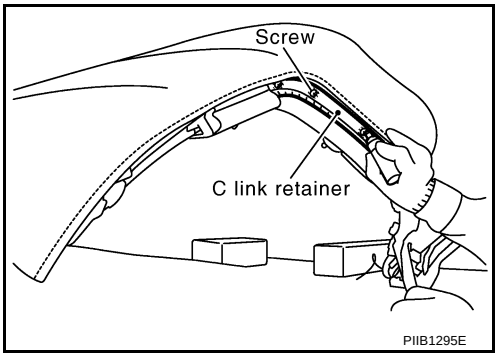
15. Open soft top about 90 degrees.



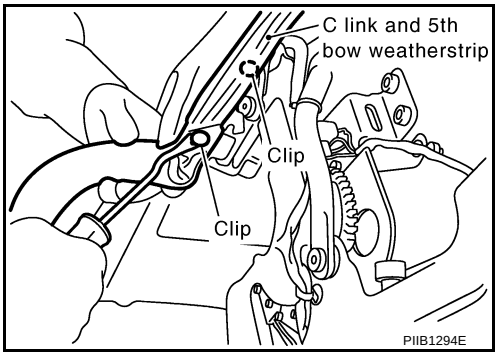
16. Remove clips on the top of C link and 5th bow weather strip.



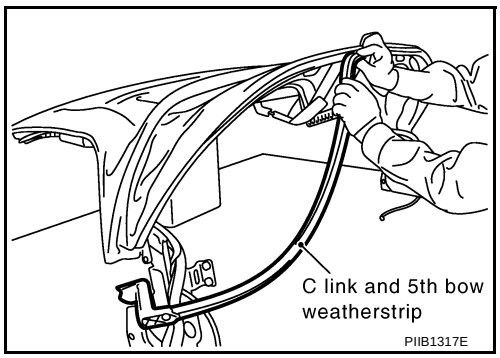
17. Fully open soft top.
18. Put matching marks to installation position on C link retainer.
19. Remove screws, and then remove C link retainer.



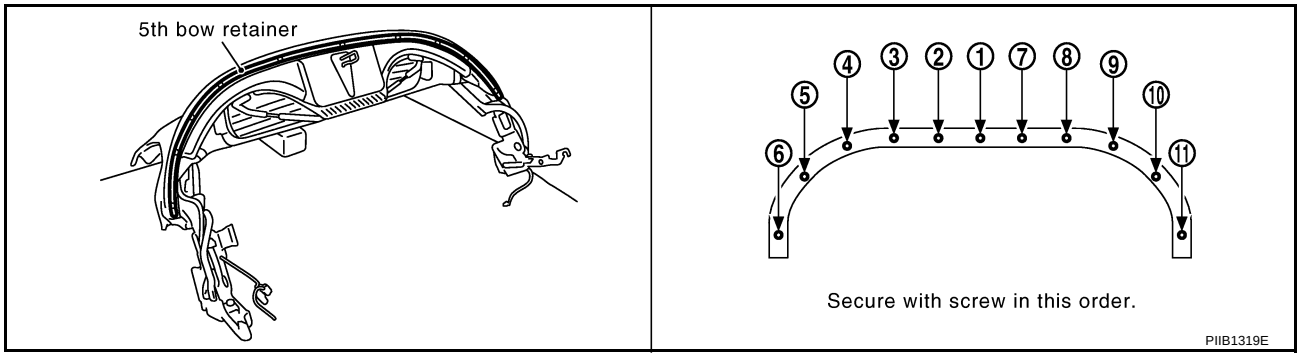
20. Remove clips on the bottom edge of C link and 5th bow weatherstrip.



21. Remove C link and 5th bow weather strip from 5th bow.



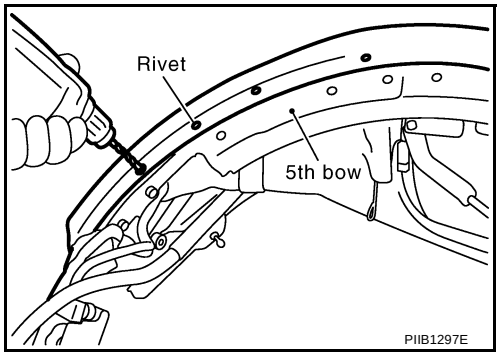
22. Remove screws, and then remove 5th bow retainer.

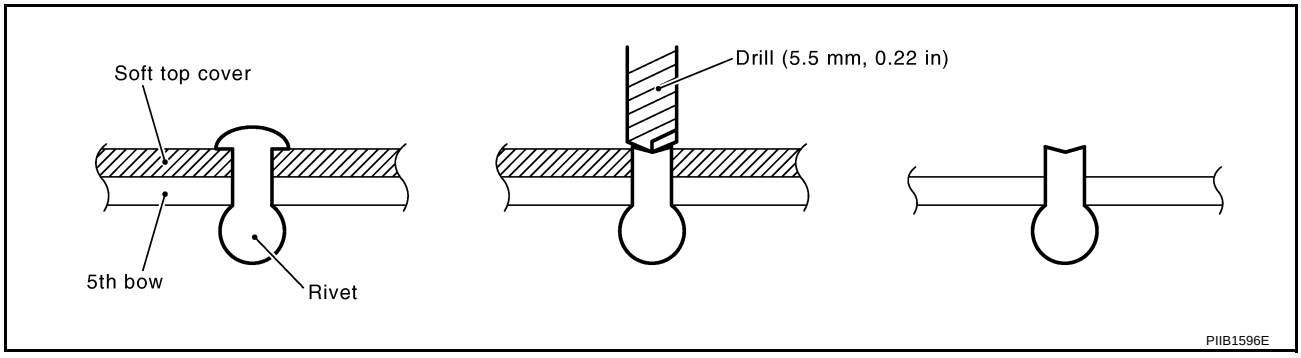


23. Shave rivets head of soft top cover 5th bow by using a drill.
[Drill bit diameter: 5.5 mm (0.22 in)]

CAUTION:

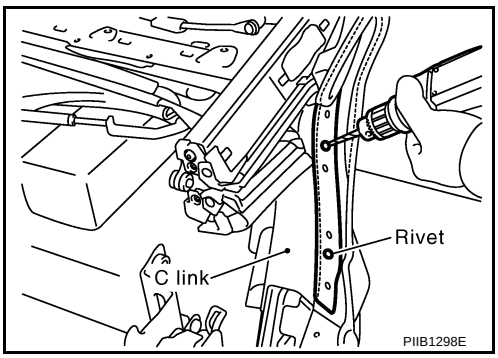
Do not attempt to remove rivets completely.





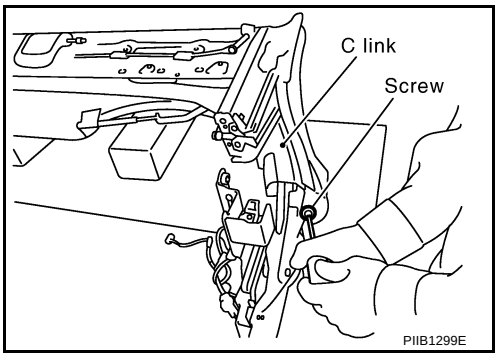
24. Close soft top, and then Shave rivets head and of C link by using a drill.
[Drill bit diameter: 5.5 mm (0.22 in)]

CAUTION:
Do not attempt to remove rivets completely.



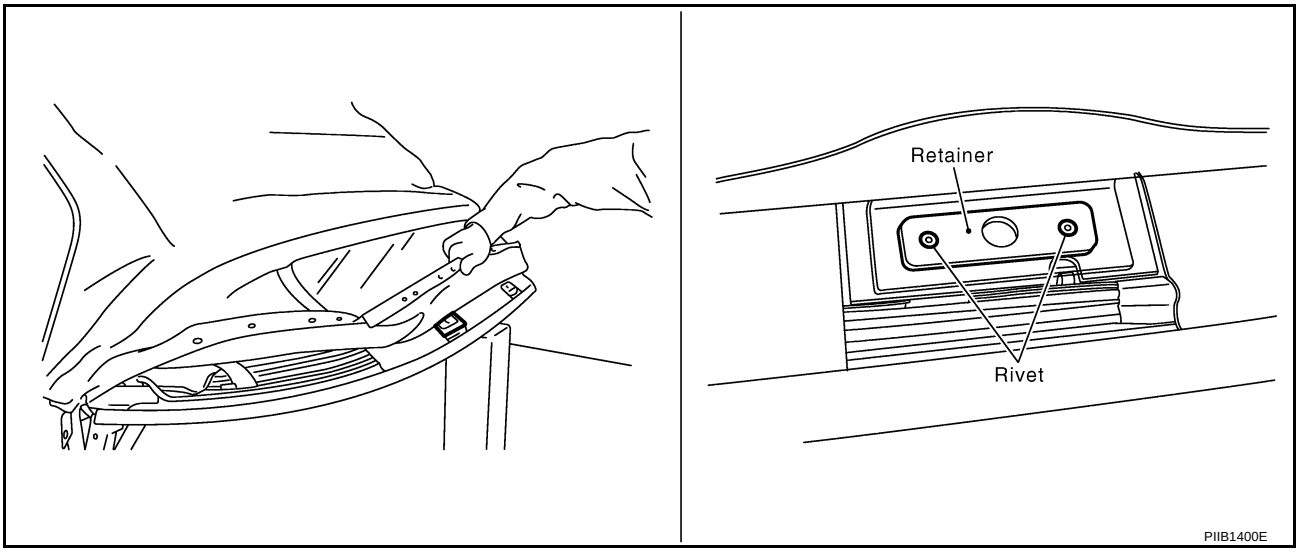
25. Cut EPT seal and remove screws on the bottom of C link.

NOTE:
Check the position when cutting EPT seal.

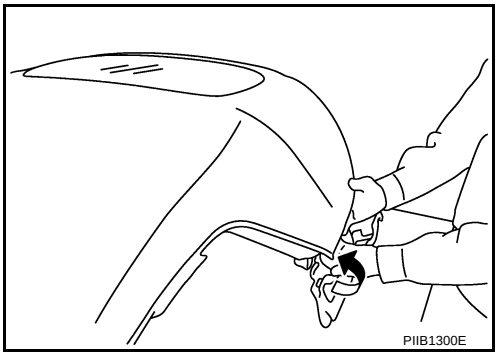


26. Pull up soft top cover from 5th bow finisher.
27. Shave rivets head of 5th bow finisher upper surface, and then remove rivets head and remove retainer.
[Drill bit diameter: 5.5 mm (0.22 in)]

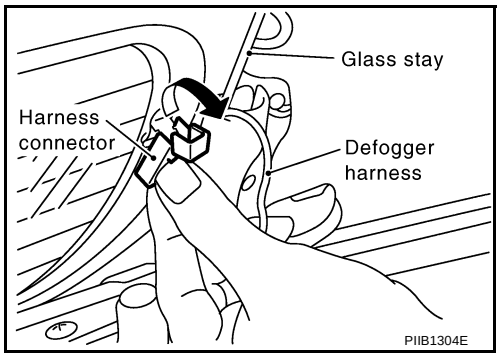
CAUTION:
- **Do not attempt to remove rivets completely.**
- **Be careful not to damage soft top when using a drill.**



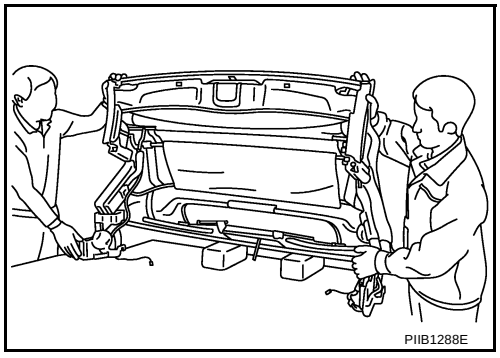
28. Pull up cover from the bottom of C link.



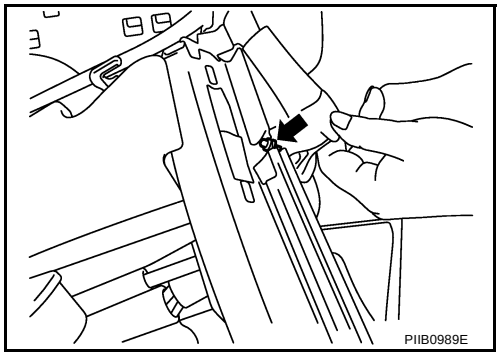
29. Open harness connector cover, and then disconnect defogger harness connector from terminal.



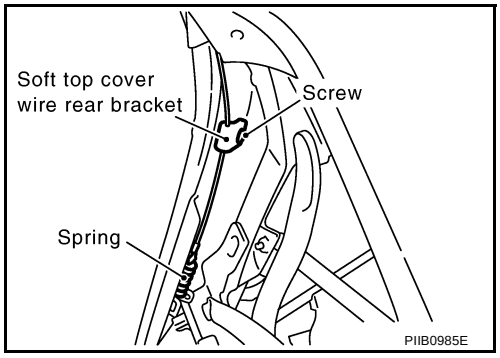
30. Open soft top about 90 degrees.



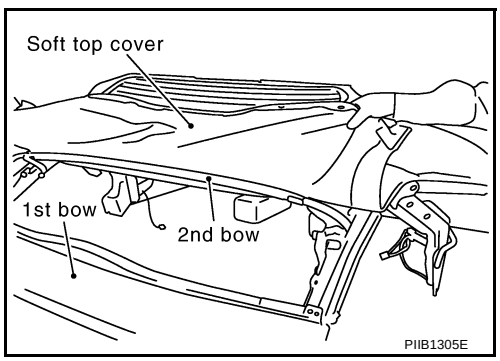
31. Remove soft top wire from A link.



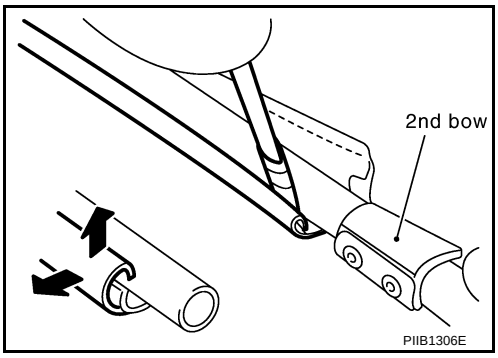
32. Remove soft top cover wire rear bracket from C link.
33. Remove spring from C link.



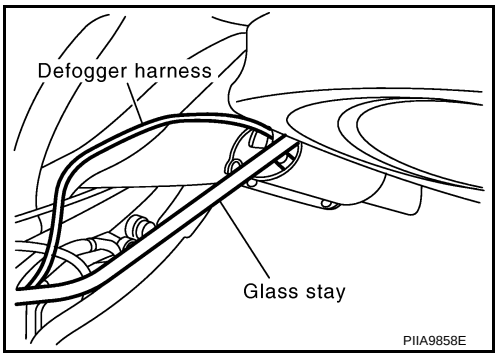
34. Pull out soft top cover frontward from 1st bow.



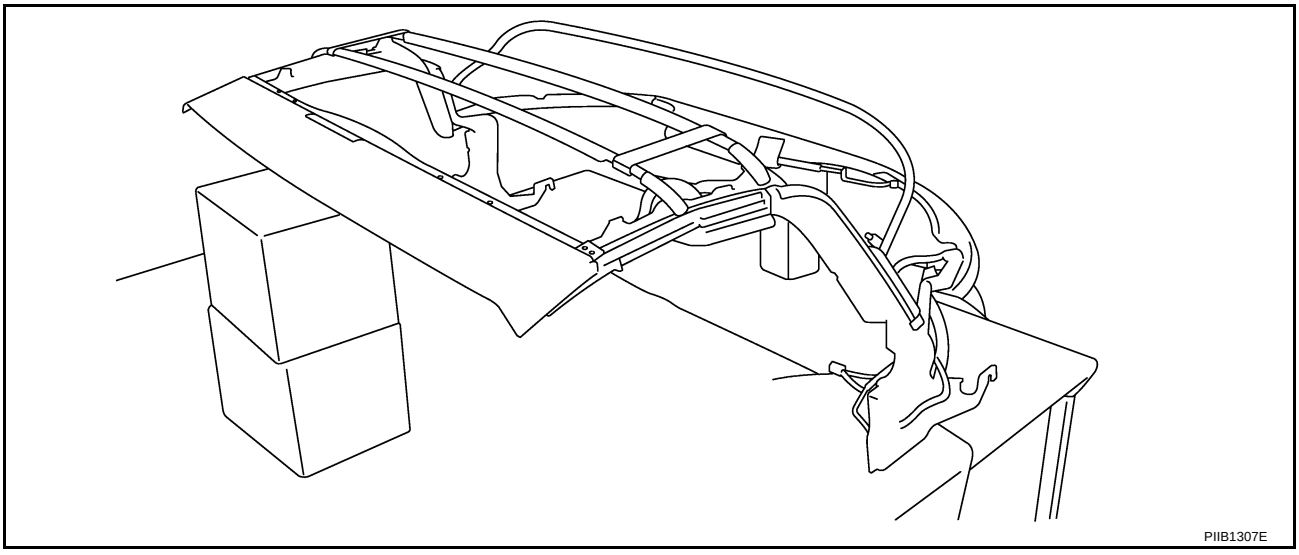
35. Pull up 2nd bow retainer by using a screwdriver, and then remove soft top cover from 2nd bow.



36. Pull up 3rd bow retainer by using a screwdriver, and then remove soft top cover from 3rd bow.
37. Pull out glass stay and defogger harness from sleeve on rear window glass side.



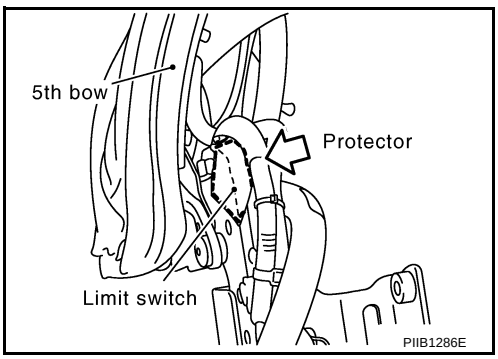
38. Pull out soft top cover from 4th bow and remove soft top cover completely from frame.



INSTALLATION

CAUTION:

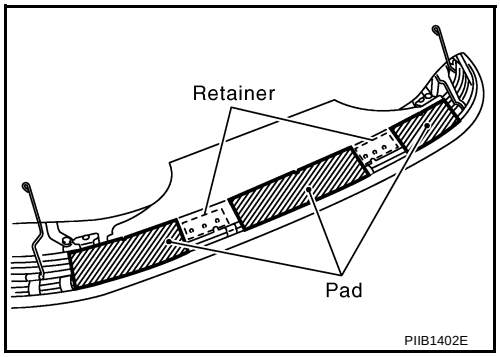
Make sure that the limit switch contact around the rotation axis of the 5th bow on the left side of soft top is protected with tape.



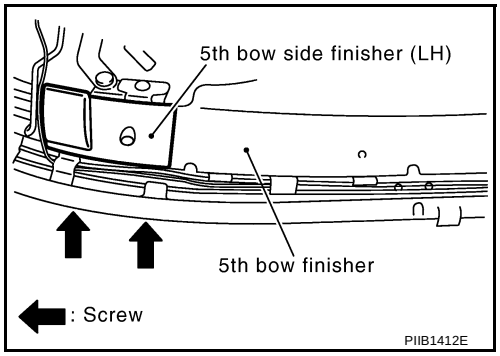
Preparation Work

1. Remove 5th bow finisher pads.

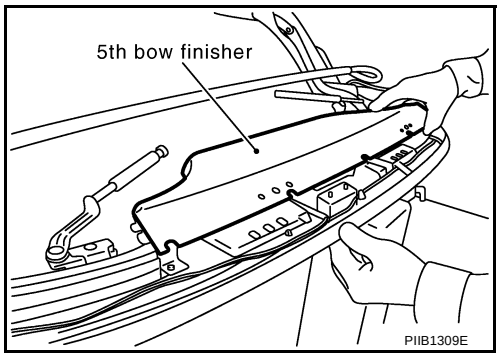
   NOTE:
   Put matching marks so as to check the position when installing.



2. Remove screws, and then remove 5th bow side finisher (RH/LH).

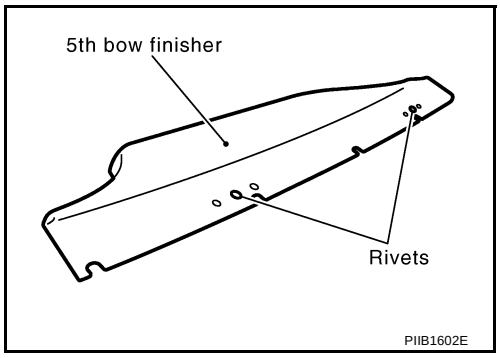


3. Remove clips, and then remove 5th bow finisher.



4. Remove rivets head of 5th bow finisher retainer.

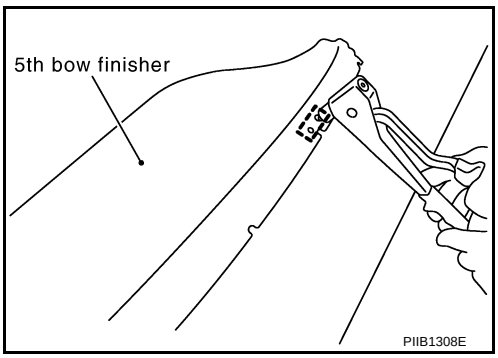
   CAUTION:
   Do not attempt to remove rivets completely.



5. Replace retainers under 5th bow finisher with a new part.

NOTE:

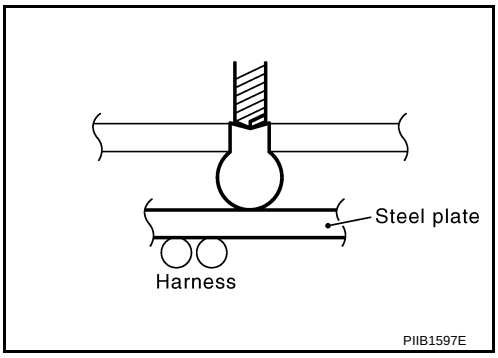
- Put new retainers under 5th bow finisher with rivet.
- Apply nonwoven fabric to retainer lower edge.



6. Remove remains of soft top cover mounting rivet from 5th bow and C link.

NOTE:

Put a steel plate between a rivet and harnesses on 5th bow for harness protection, when removing the remaining rivets by drill.

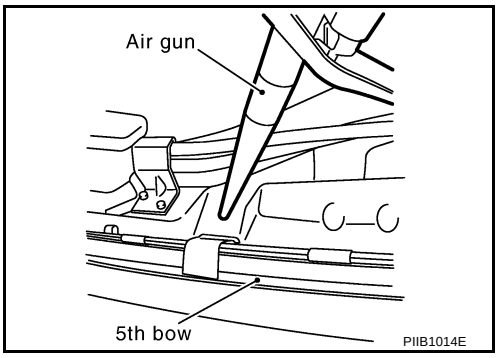


CAUTION:

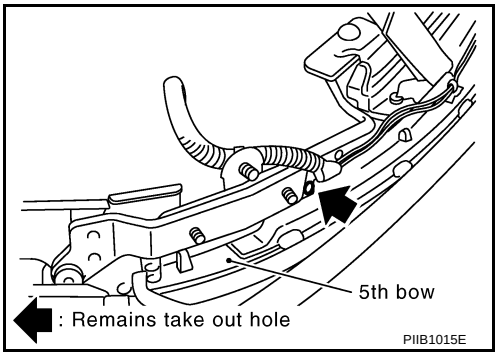
Take out the remains of rivets completely from 5th bow, other wise the remains cause noise.

NOTE:

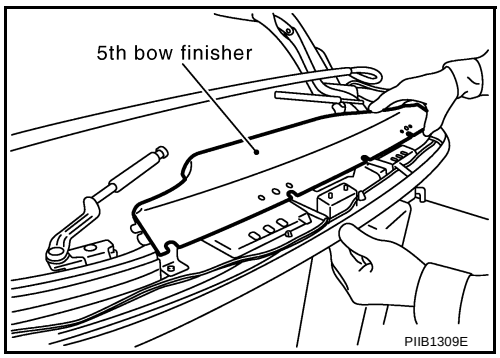
- Blow remains of rivet toward both ends of 5th bow with compressed air if they are in 5th bow.



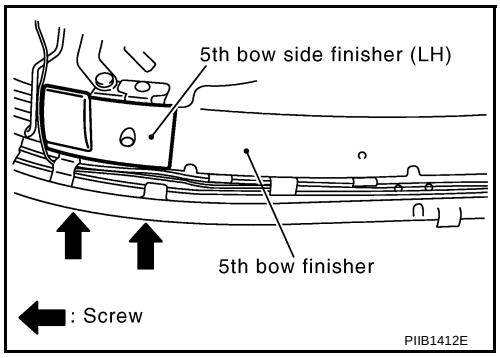
- Remove the remains drawn to both ends by the air blow from the gap.



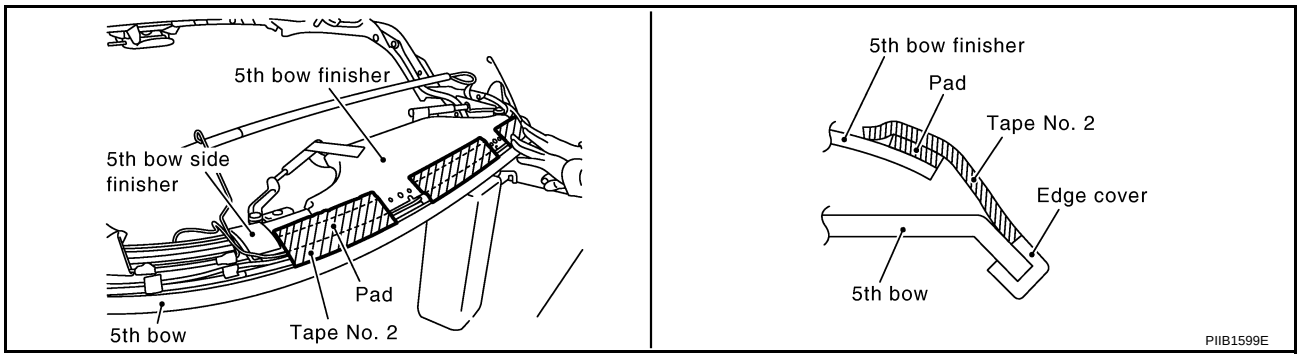
7. Install 5th bow finisher to 5th bow.



8. Install 5th bow side finisher (RH/LH) to 5th bow.



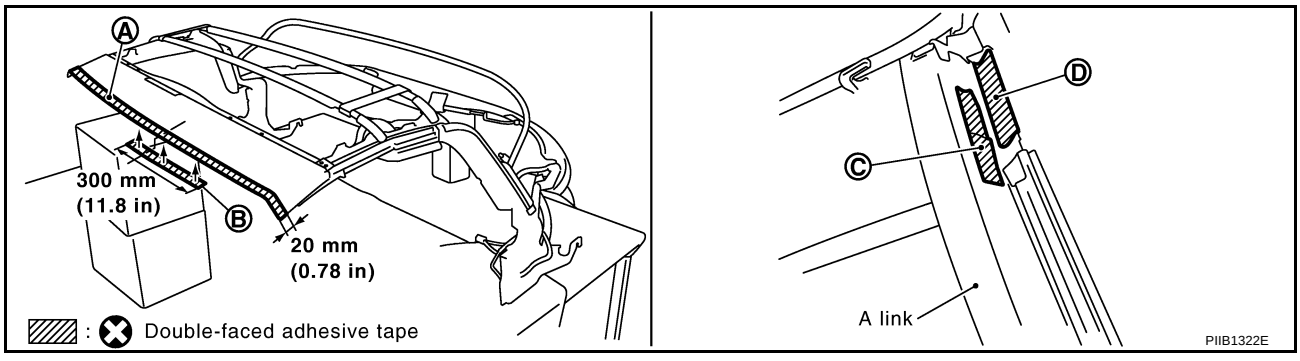
9. Install new pads and fabric tapes.



10. Secure 5th bow finisher harness with new nonwoven fabric if necessary.

Installation

1. Apply double faced adhesive tape for frame.



A: Upper side of 1st bow
B: Under side of 1st bow
C: Outer side of A link (between grommets)
D: Outer and under side of 1st bow edge

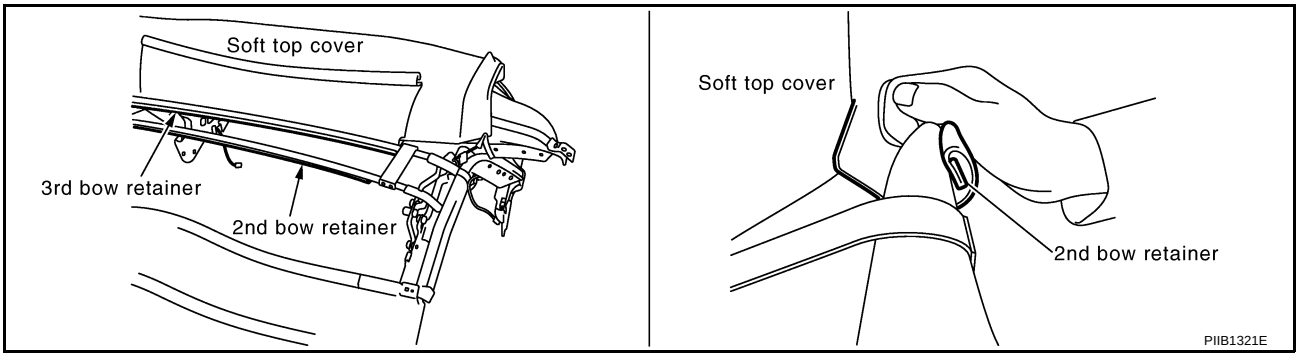
2. Put soft top cover on frame.

3. Put glass stays and defogger harnesses into sleeves on both side of rear window.

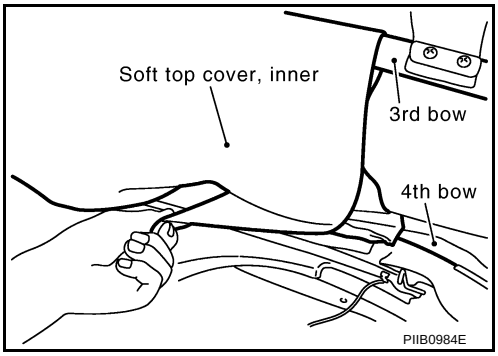
NOTE:

- Out side bag is for glass stay.
- Inside bag is for harness.

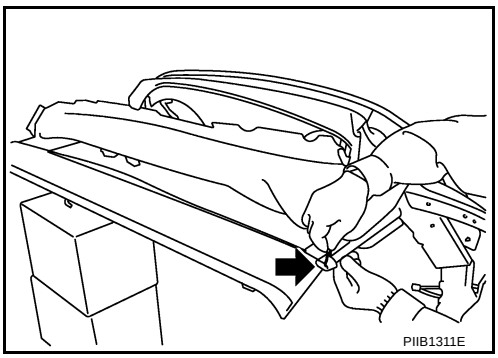
4. Hook soft top cover inner fabric edge to 3rd bow retainer and press retainer to hold securely.



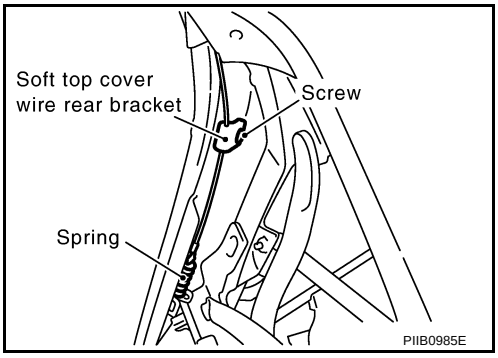
5. Hook soft top cover inner fabric edge to 2nd bow retainer and press retainer to hold securely.
6. Wrap soft top cover around 4th bow and fix soft top cover by velcro fastener.



7. Insert soft top cover wire to A link.

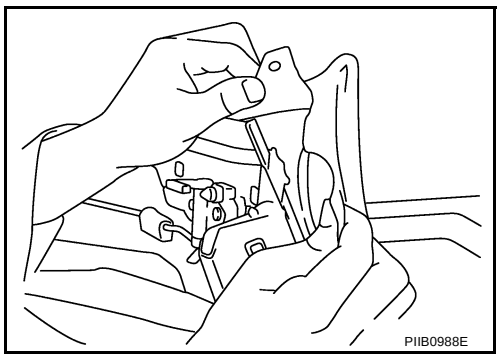


8. Tighten soft top cover wire rear bracket to C link with screw. (Face tension wire outside.)



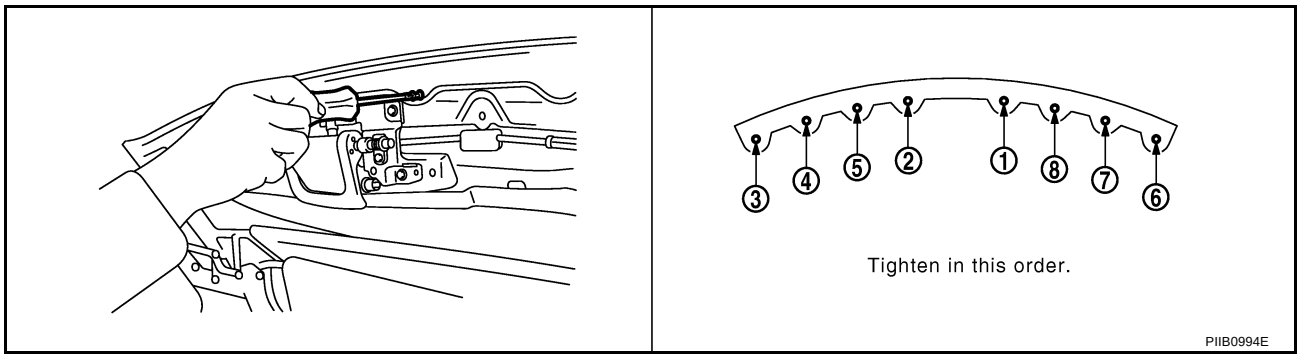
9. Hook soft top cover wire spring on C link and bend the hook of wire spring to prevent unhooking the hook.

10. Put soft top cover on 1st bow.



11. Align soft top cover hole and grommet hole at the 1st bow.

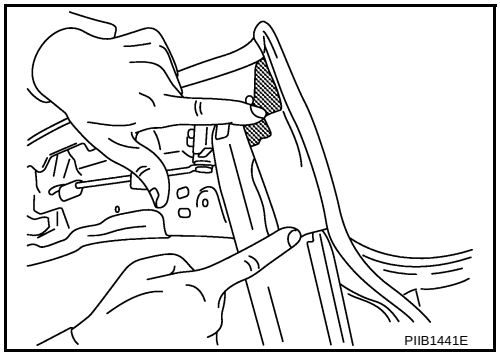
12. Tighten screws on 1st bow with front center retainer.



13. Apply EPT seal to A link installation position.

CAUTION:

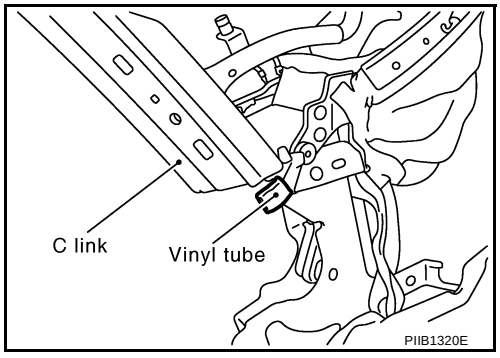
Install EPT seal to the original position.



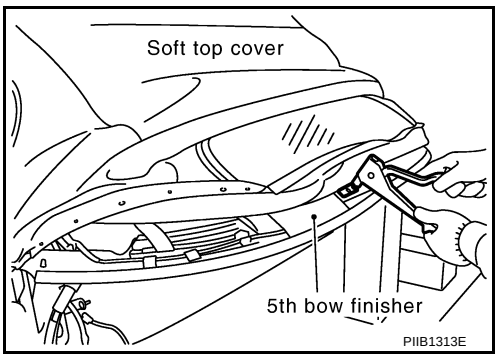
14. Put soft top cover on C link lower.

NOTE:

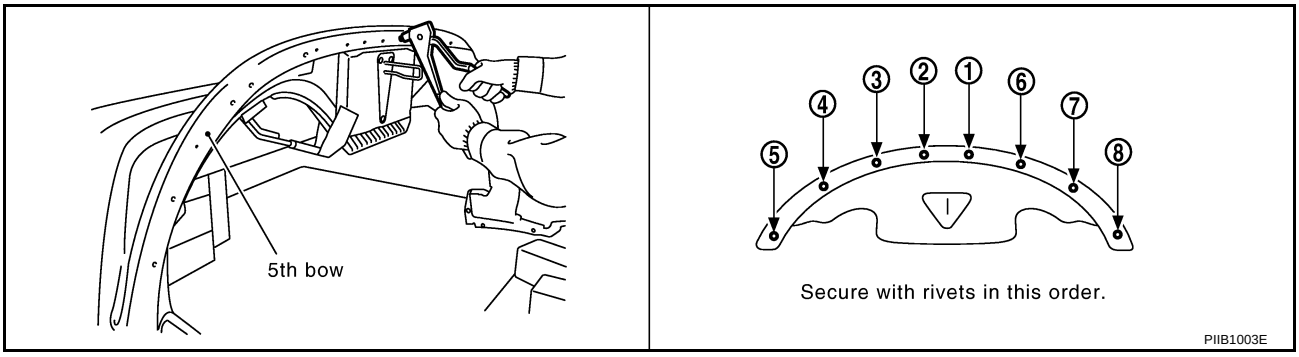
- Make sure that vinyl tube is on C link bottom end bracket.
- Be careful not to pull soft top cover with too much tension.



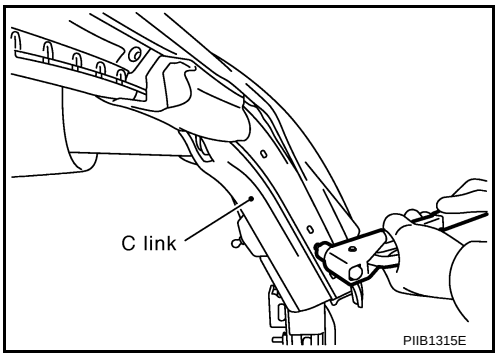
15. Open 5th bow then secure soft top cover to 5th bow finisher upper surface with rivet.



16. Close 5th bow then wrap soft top cover around 5th bow.
17. Secure soft top cover to 5th bow with rivet.



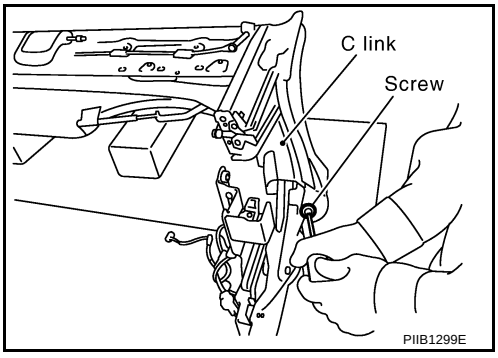
18. Secure soft top cover to C link with rivet.



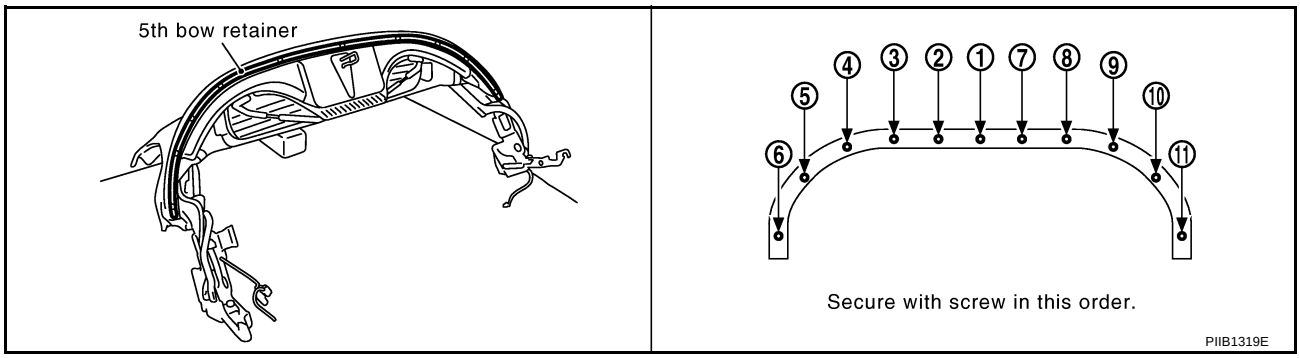
19. Align screw hole on soft top cover and the bottom of C link, and then tighten with screw.

NOTE:

- During tighten up the screw, insert a thin metal rod such as a nail [diameter: 4mm (0.16in)] to a clip hole near the screw to align holes of soft top cloth and its backing plastic plate, and C link frame.
- Tighten screw while holding soft top at certain angle for easy screw installation.



20. Close 5th bow then install 5th bow retainer with screws.

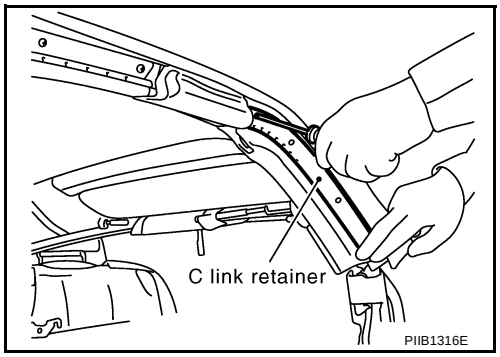


CAUTION:
Apply it to the original position.

NOTE:
During tighten up the screw, insert a thin metal rod such as a nail [diameter: 4mm (0.16in)] to a clip hole near the each end of 5th bow retainer to align holes of the retainer, soft top cloth and its backing plastic plate, and 5th bow.

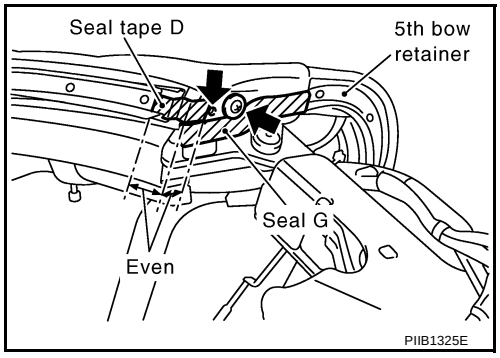
21. Install C link retainer with screws.

NOTE:
Align matching marks on the retainer to screw heads, when installing the retainer.



22. Apply seal to C link lower installation position.

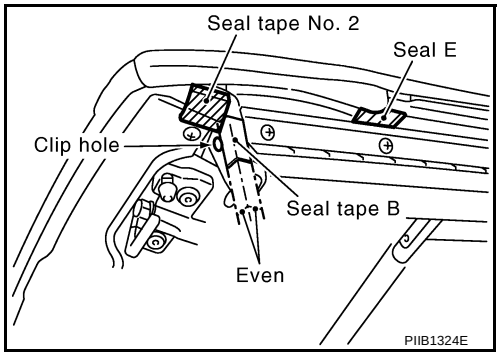
CAUTION:
Make sure not to cover clip hole and screw head.



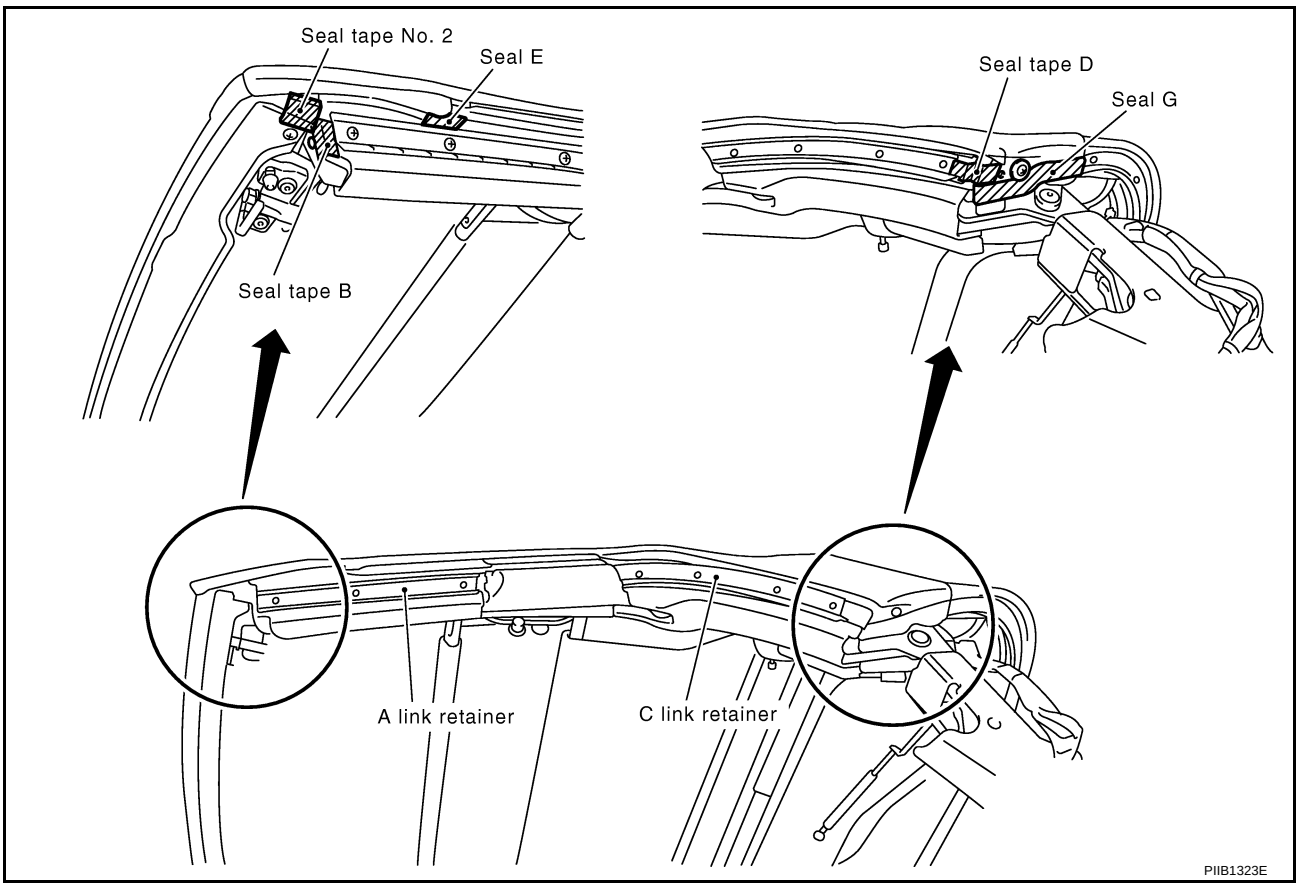
23. Install A link retainer with screws.

NOTE:
Align matching marks on the retainer to screw heads, when installing the retainer.

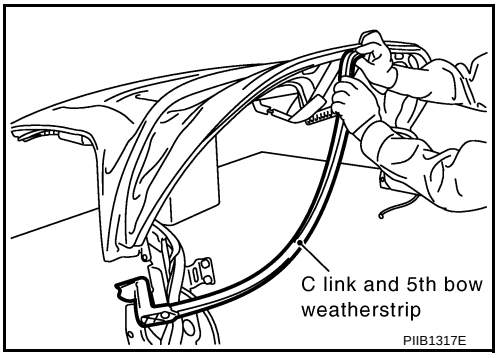
24. Apply seal E to A link installation position.



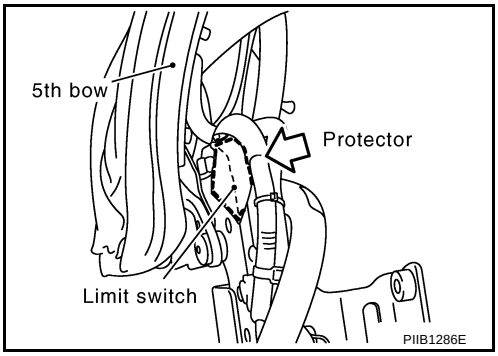
25. Recheck seals for A link and C link.



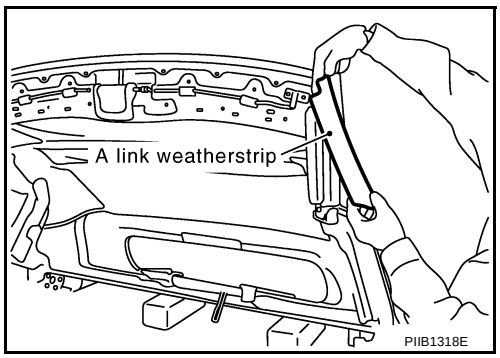
26. Install C link and 5th bow weather strip to 5th bow and C link.



27. Remove protection tape on the limit switch.



28. Install A link weather strip.



29. Install front lock finisher and welt after closing soft top.
30. Connect defogger harnesses at rear window.
31. Install 5th bow operating strut rods (RH/LH).
32. Install roof actuator (RH/LH). Refer to RF-108, "Removal and Installation of Roof Actuator" .
33. Install soft top assembly to vehicle. Refer to RF-88, "Removal and Installation of Soft Top Assembly" .
34. Check soft top open/close operation.
35. Check door glass contact. Refer to GW-53, "FITTING INSPECTION" .
36. Check for water leakage. Refer to RF-116, "Repairing Method for Water Leakage Around Doors" .

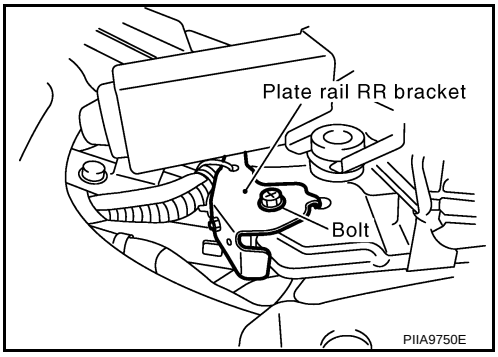
NOTE:
If there are wrinkles on the soft top cover, use a hair dryer to warm up the wrinkled area. Apply warm air from the hair dryer keeping the distance by 150 - 200 mm (5.9 - 7.8 in) and move the dryer to gently warm up soft top cover, for about 5 - 10 minutes until the wrinkle seems to be gone. Not to heat up soft top cover to much.

Removal and Installation of Switches

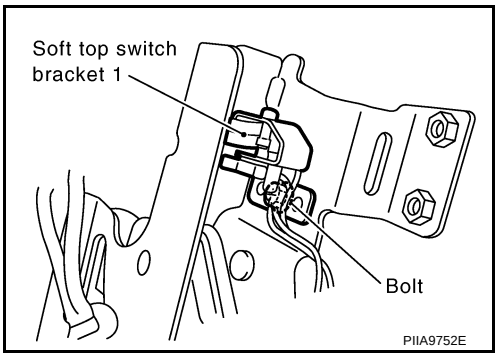
NIS0007T

REMOVAL

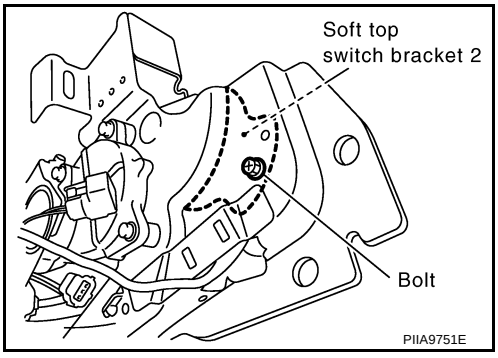
1. Uninstall soft top assembly from the vehicle. Remove roof actuator (RH/LH) from the soft top.
2. Remove harness tie wrap band at the left side of the soft top.
3. Remove limit switches with plate rail RR bracket by removing bolt.



4. Remove limit switches with soft top switch bracket1 by removing bolt.



5. Remove limit switches with soft top switch bracket 2 by removing bolt.



INSTALLATION

Install in the reverse order of removal.

NOTE:

Wire harnesses correctly to avoid following situation.

- Pinching harnesses by frame.
- Tangling harnesses by frame and links.
- Pulling harnesses between fixing point by harness clips.

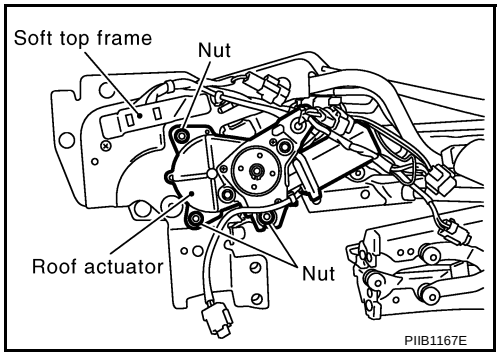
Removal and Installation of Roof Actuator

NIS0007U

REMOVAL

1. Remove soft top assembly. Refer to RF-88, "Removal and Installation of Soft Top Assembly" .
2. Remove nuts and then remove roof actuator (RH/LH).

   NOTE:
   If removal is difficult, rotate motor axis to remove them.



3. Disconnect soft top actuator harness connector.

INSTALLATION

Install in the reverse order of removal.

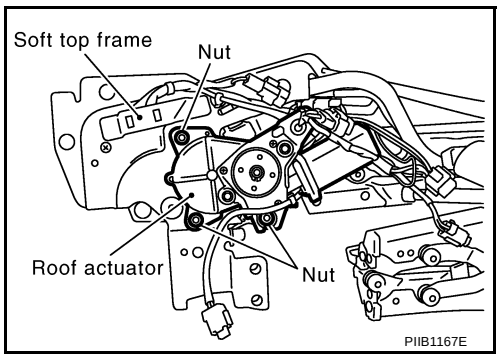
Removal and Installation of 5th Bow Drive Unit

NIS0007V

REMOVAL

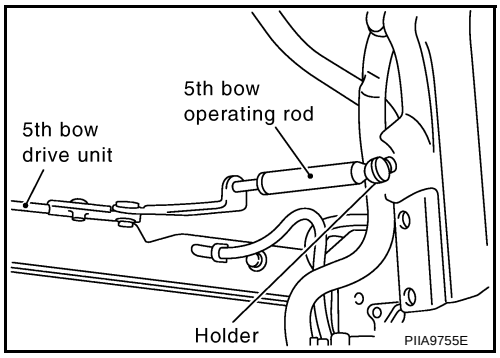
1. Uninstall soft top assembly from the vehicle.
2. Remove roof actuator (RH/LH) from the soft top.

   NOTE:
   If removal is difficult, rotate motor axis to remove them.



3. Disconnect 5th bow operating rod (RH/LH) at the frame side by pulling out the holder.

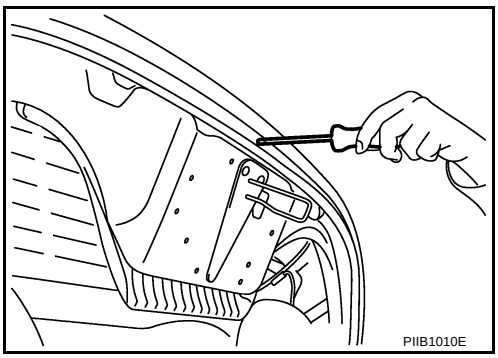
   NOTE:
   This step will make the 5th bow up and down motion easier.



4. Make sure that the limit switch contact around the rotation axis of the 5th bow on the left side of soft top is protected with tape.
5. Open the soft top manually, and put a stand under the 1st bow. Then fix the soft top not to move during this procedure.

   NOTE:
   Put a waste cloth between the front lock and the stand not to make any scratches to the soft top.
6. Remove the C link and 5th bow weather strip.

7. Remove the soft top cover retainer (5th bow retainer) from 5th bow by taking out screws.

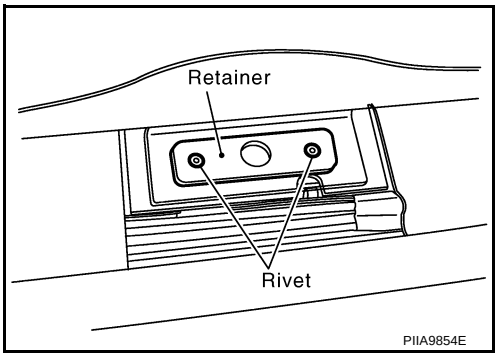


8. Drilling rivets attaching the soft top cover to 5th bow, then pull up the soft top cover bottom edge.

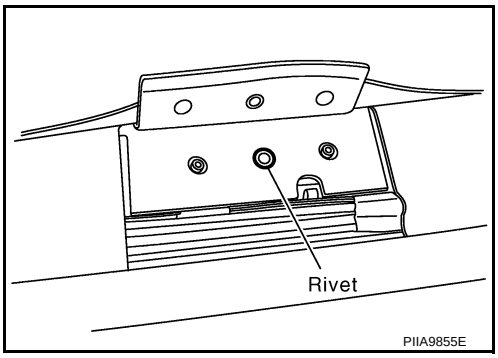
NOTE:
Use 4 mm (0.16 in) diameter drill bit to remove the rivet head. When drilling rivets, be careful not to damage the soft top cover.

9. Drilling rivets with retainers attaching with tags from the soft top cover, 5th bow finisher and the 5th bow.

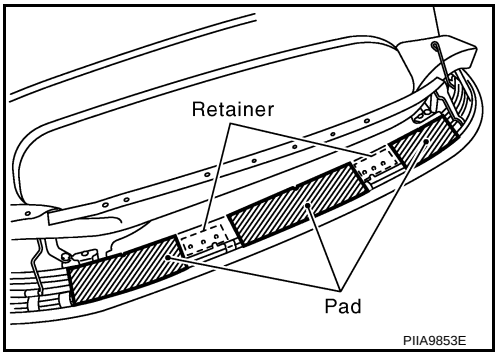
NOTE:
Use 4 mm (0.16 in) diameter drill bit to remove the rivet head. The soft top cover is separated from 5th bow.



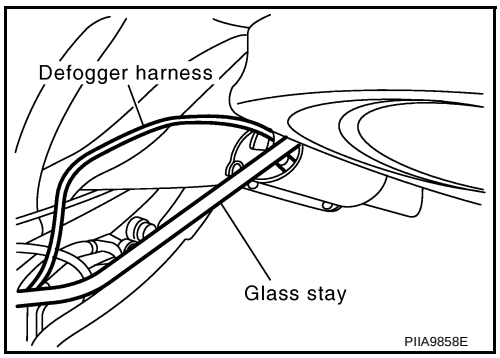
10. Drilling rivets under retainers by using 4 mm (0.16 in) diameter drill bit.



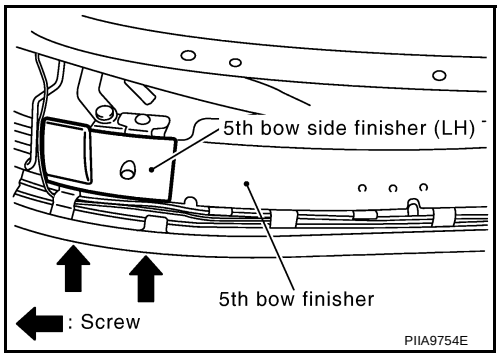
11. Remove pads from 5th bow finisher.



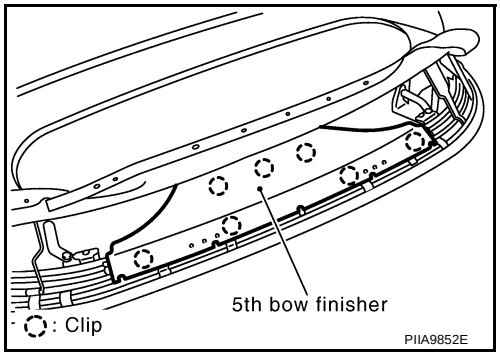
12. Roll the soft top cover bottom edge up, and disconnect defogger harness connector from the rear window glass.
13. Pull out glass stays from sleeves on each side of the rear window glass.



14. Remove 5th bow side finisher (RH/LH) by removing screws.

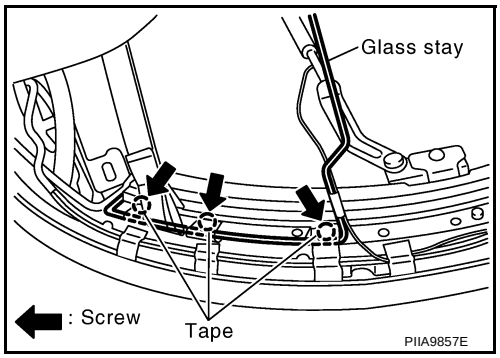


15. Remove 5th bow finisher by pulling the finisher up.

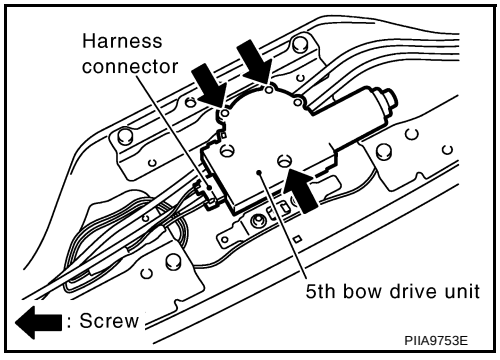


16. Remove glass stays from 5th bow by removing screws from the bottom of the 5th bow.

    NOTE:
    - When removing glass stays, support 5th bow to avoid a bend of glass stay. This bend may happen by the weight of the 5th bow and the tensile force of the tether from the soft top cover.
    - Be careful not to damage the 5th bow nor to be hurt by the falling 5th bow, because the 5th bow is heavy and moves freely after removing glass stays.



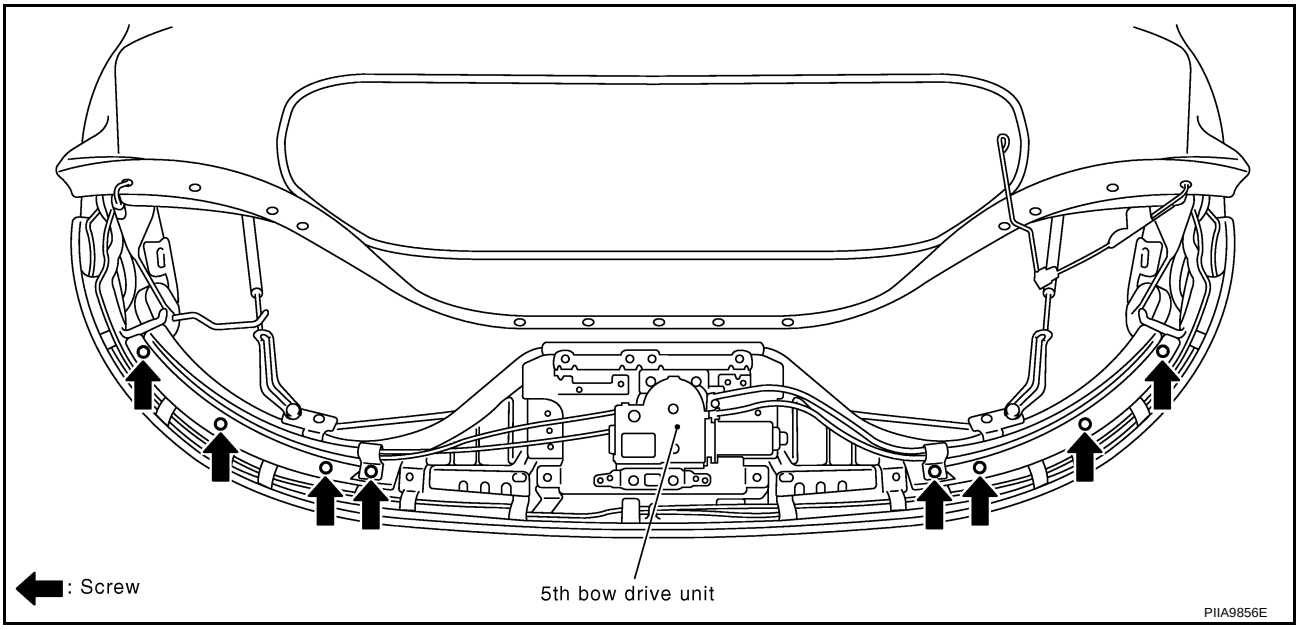
17. Disconnect 5th bow drive unit harness connector.



18. Remove 5th bow drive unit and rails together from 5th bow by removing screws.

NOTE:

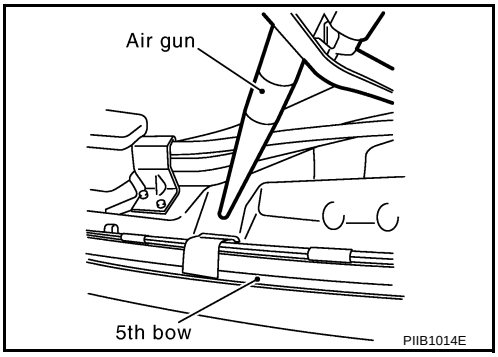
- After removing drive unit and rails, not to pull rails. Otherwise, the wire in the rail may be damaged.
- The screws are not reusable.



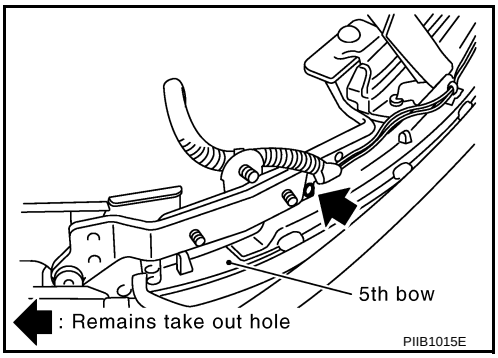
INSTALLATION

Preparation Work

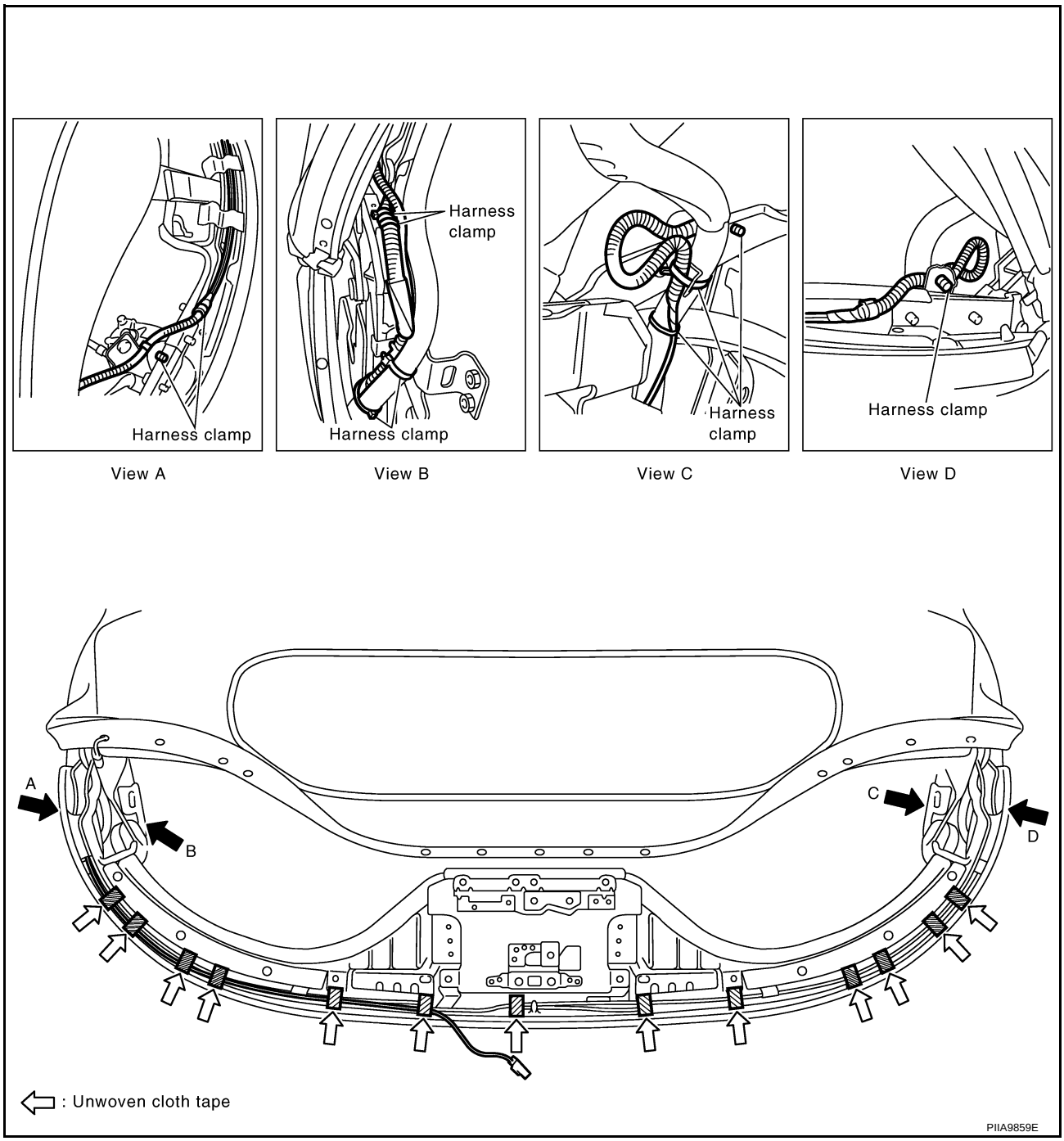
1. Blow remains of rivet toward both ends of 5th bow with compressed air if they are entering into 5th bow.

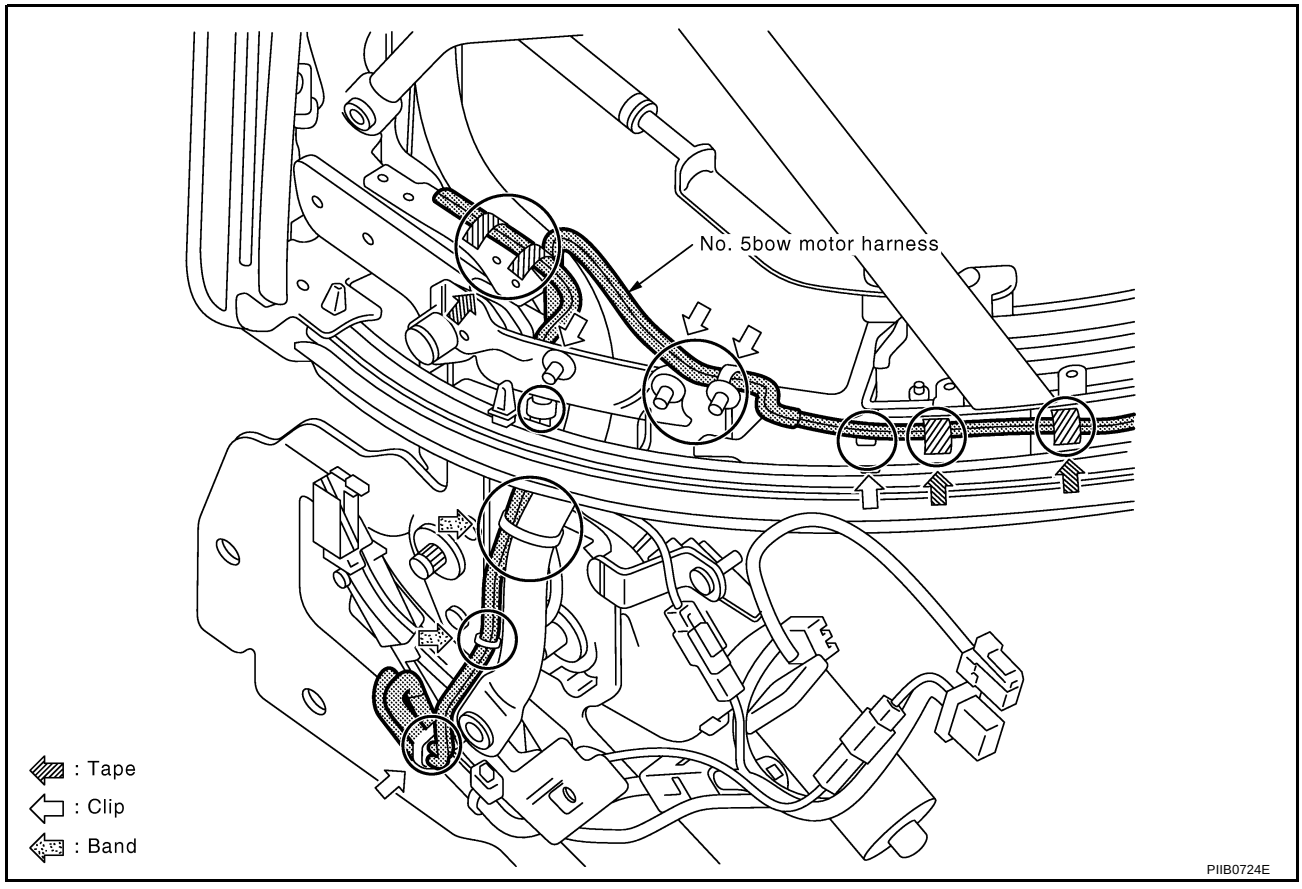


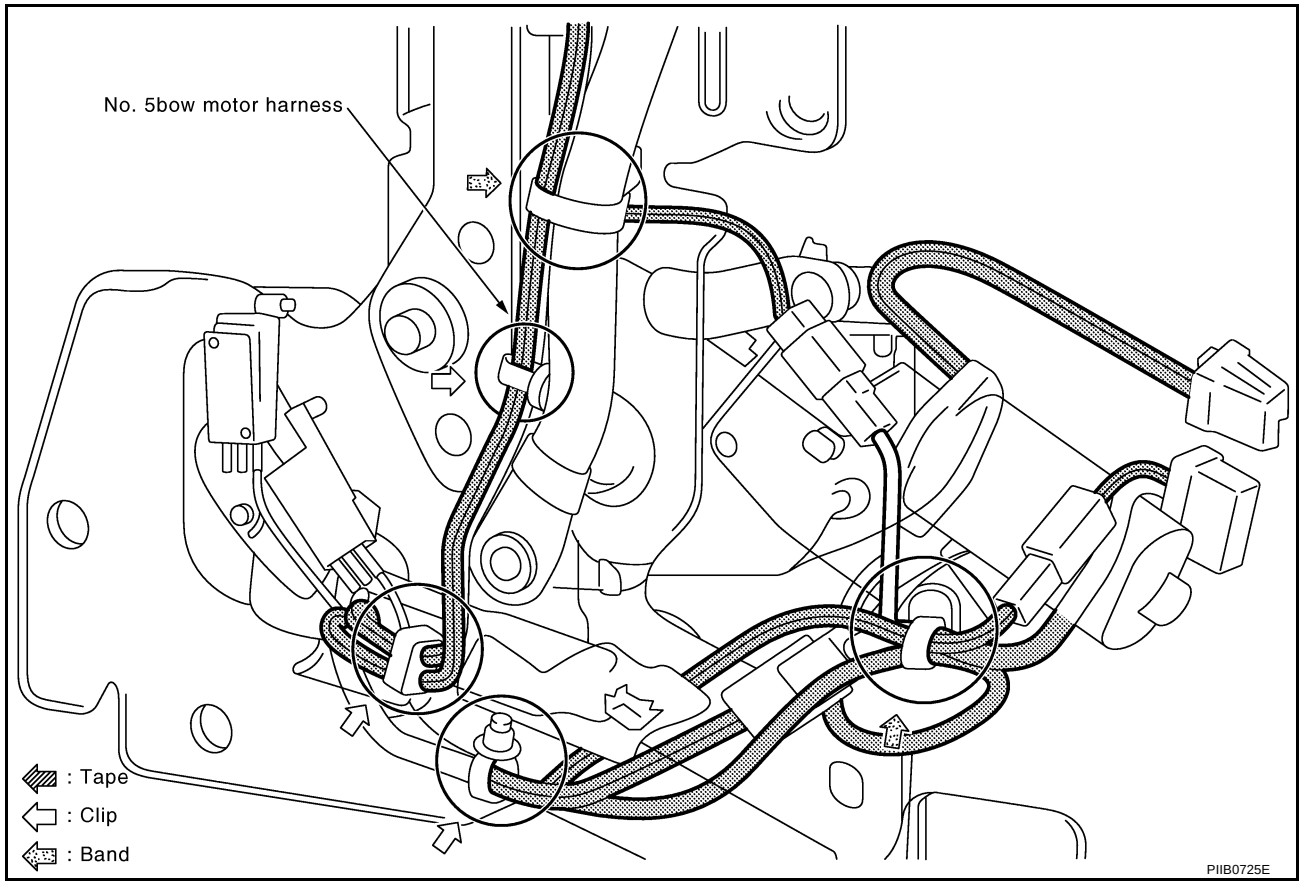
2. Remove the remains drawn to both ends by the air blow from the gap.

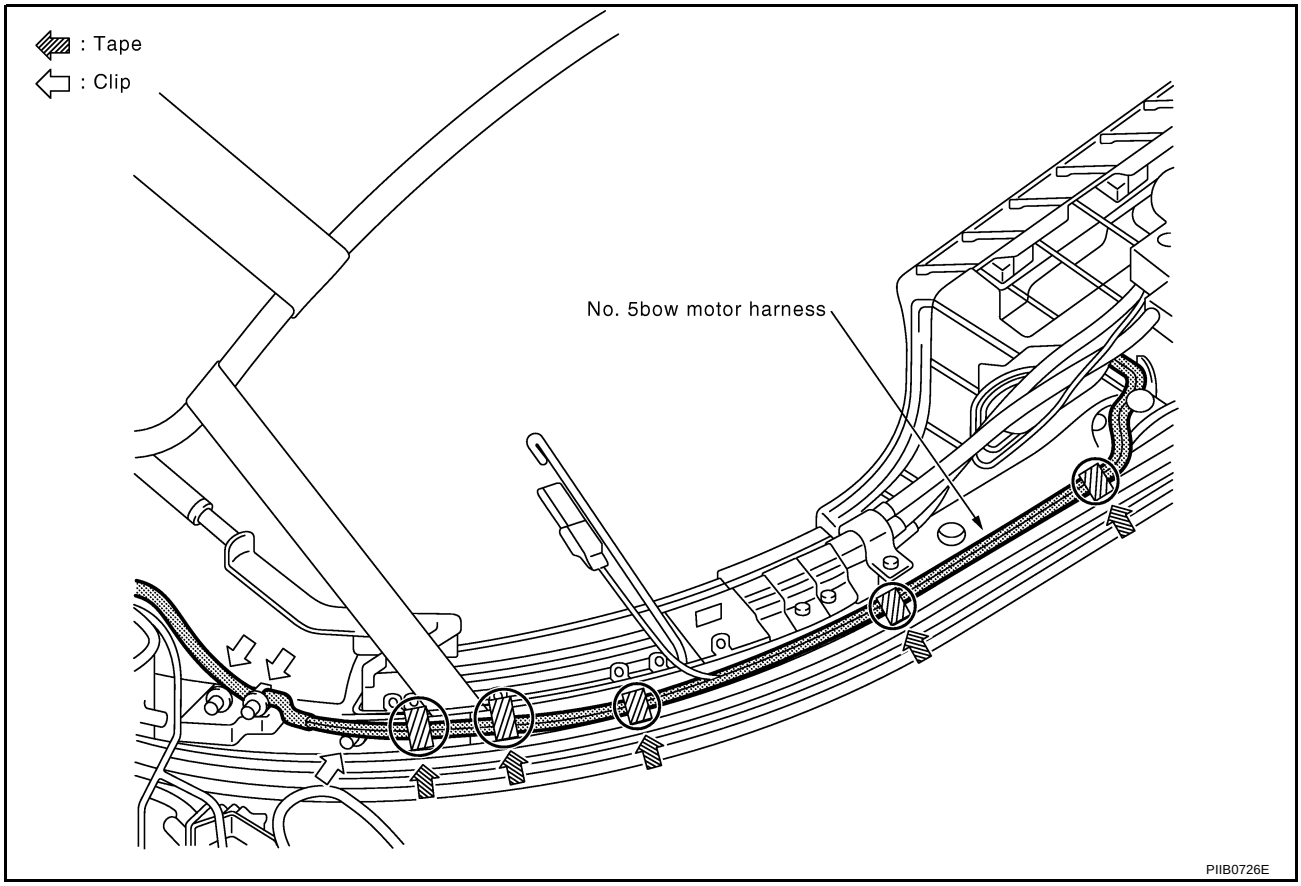


3. For fixing harness to 5th bow and Soft top frame, see next figure.



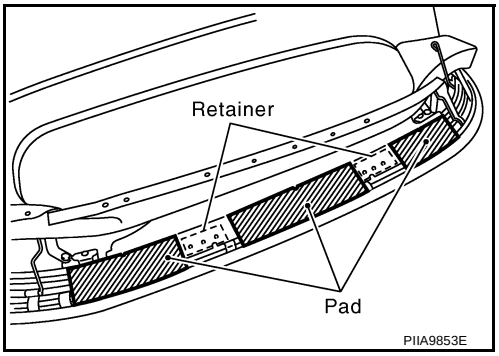

No. 5bow motor harness
: Tape
: Clip
: Band
PIIB0724E


No. 5bow motor harness
: Tape
: Clip
: Band
PIIB0725E



4. Replace rivet retainer on back of 5th bow finisher with a new one.
5. Secure 5th bow finisher with rivet, and then apply nonwoven fabric.
6. Install 5th bow finisher and 5th bow finisher (RH/LH).
7. Apply pad on 5th bow finisher.

   NOTE:
   Apply pad to the original position.



Installation

Install in the reverse order of removal.

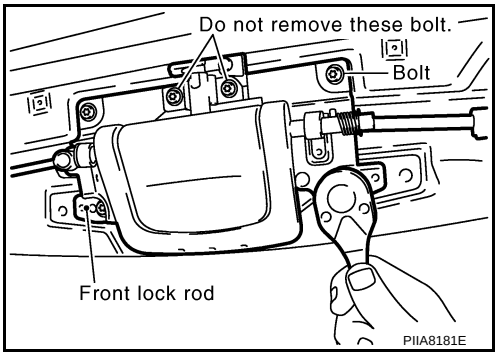
Removal and Installation of Front Lock

NIS0007W

REMOVAL

1. Remove welt and front finisher.
2. Remove bolts, and then remove front lock rod.

   CAUTION:
   Do not remove front lock hook, center bolts.



3. Remove bolts, and then remove front lock striker, LH, center, and RH.

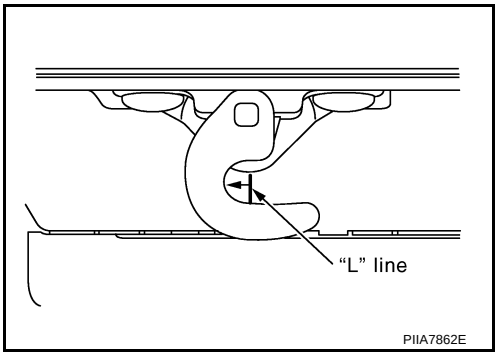
   NOTE:
   Paint matching marks for front lock assembly to check location for installation.

INSTALLATION

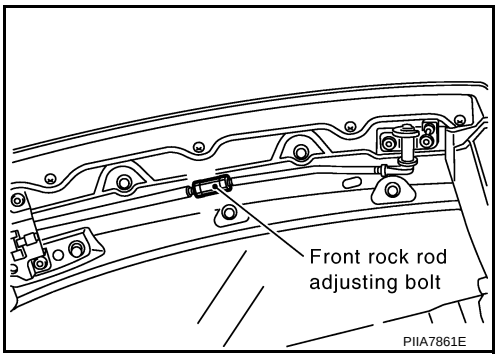
Install in the reverse order of removal.
Always adjust before installation. Refer to RF-115, "INSPECTION AND ADJUSTMENT" .

INSPECTION AND ADJUSTMENT

1. Apply super-check spray on a contact surface of 3 hooks which may touch with rods on the body. Fully close soft top, and then engage front lock.
2. Open soft top, and then make sure that the part, from which iron material is visible by peeling off super-check mark, exceeds “L” line.



3. Adjust hook contact length by adjusting front lock rod length using front lock rod adjust bolt if “L” line is not exceeded in front lock hook, RH and LH.

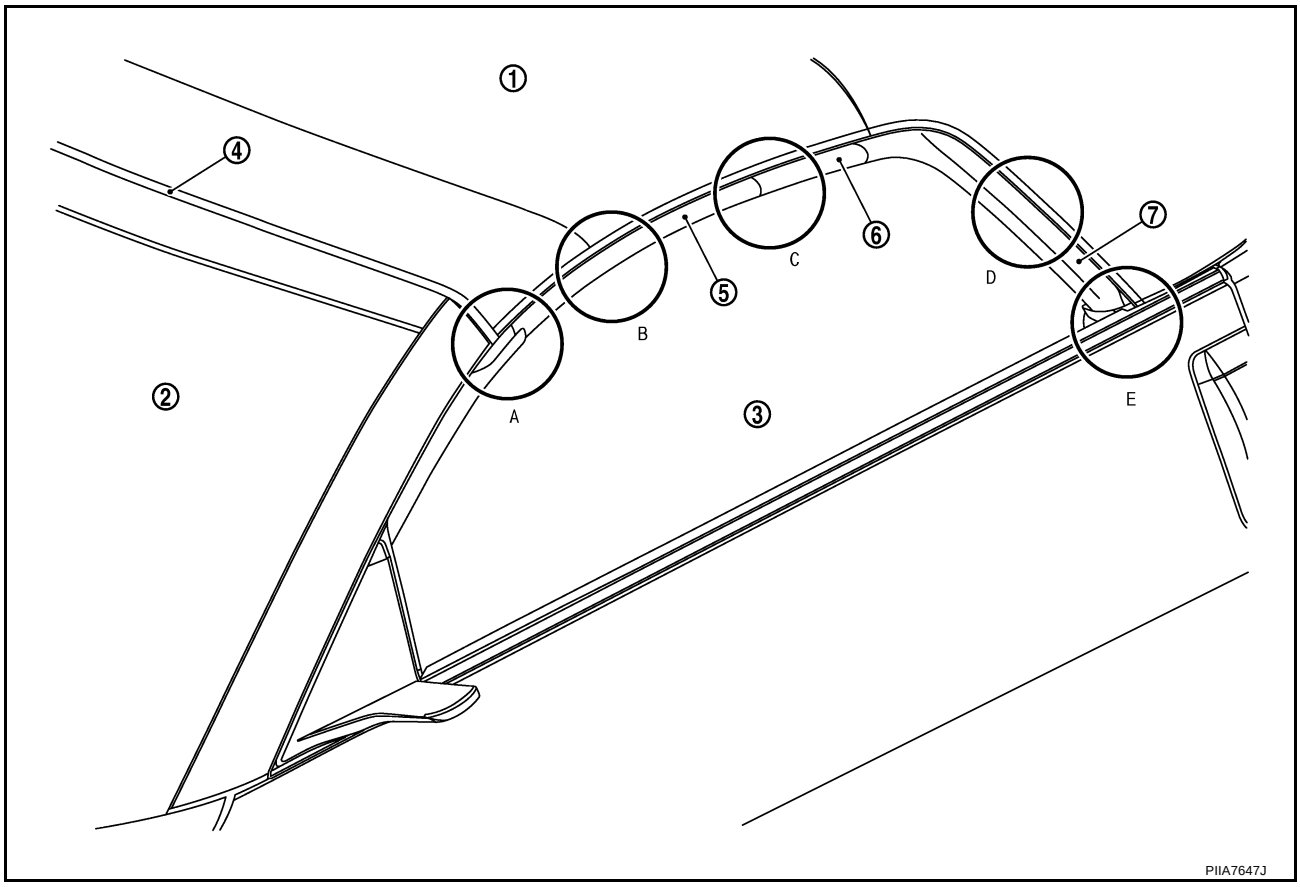


4. There is a part malfunction, if “L” line is not exceeded in front lock center hook. Replace front lock assembly.
5. Make sure that the super check mark exceeds the “L” line, and then measure the fully closed operating force while contacting push-pull gauge to the handle. Make sure that the operating force is 68.6 N (7 kg, 15.4 lb) or less, and then install it.

   NOTE:
   - Replace front lock assembly if the operating force is over the specified value.
   - Make sure that operating force when replacing front weather strip, center weather strip, and rear weather strip is 107.8 N (11 kg, 24.2 lb) or less.

Repairing Method for Water Leakage Around Doors

NIS0007X



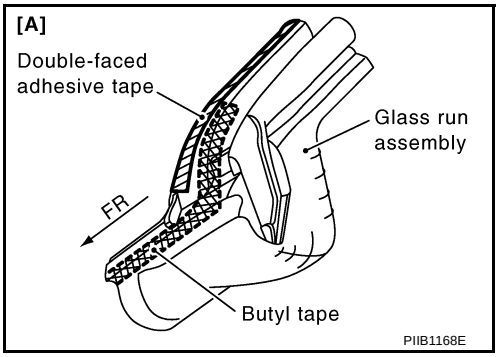
1. Soft top assembly
2. Windshield glass
3. Door glass
4. Glass run assembly
5. A link weather strip
6. B link weather strip
7. C link and 5th bow weather strip

WATER LEAKAGE FROM A

Water may be entering passenger room through back of front pillar.
Cause: Butyl tape on back of glass run assembly may be separating from roof panel.

Repair Procedure 1

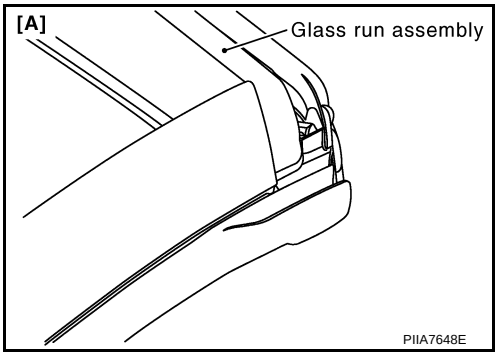
Apply butyl tape on back of glass run assembly again, and correct installing position.



Water may be entering through connection between front pillar and front edge of soft top.
Cause: There may be a gap between glass run assembly and weather strip of soft top.

Repair Procedure 2

Replace glass run assembly with a new one to eliminate the gap between glass run assembly and weather strip.



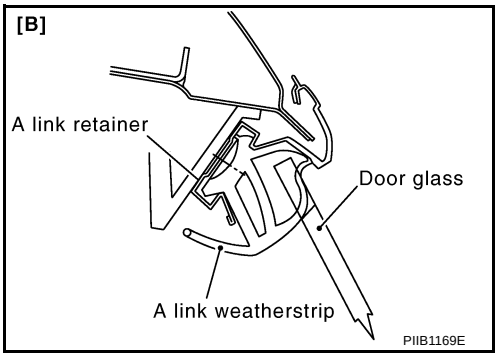
WATER LEAKAGE FROM B

Water may be entering through door glass upper inside edge.
Cause: There may be poor contact between A link weather strip of soft top and door glass.

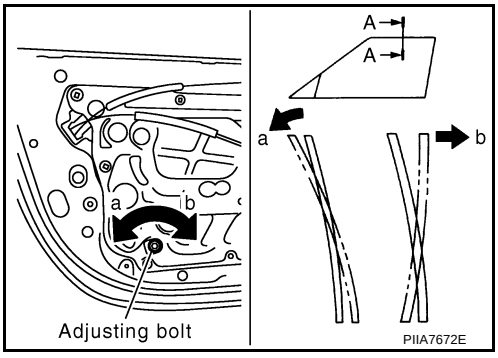
Repair Procedure 3

- Adjust door glass position frontward/backward or upward/downward against soft top assembly.
- Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

CAUTION:
Soft top assembly position may be incorrect when glass upper position is low even if door glass adjustment is performed. Perform soft top assembly adjustment, if necessary. Refer to GW-51, "FRONT DOOR GLASS AND REGULATOR" .



Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

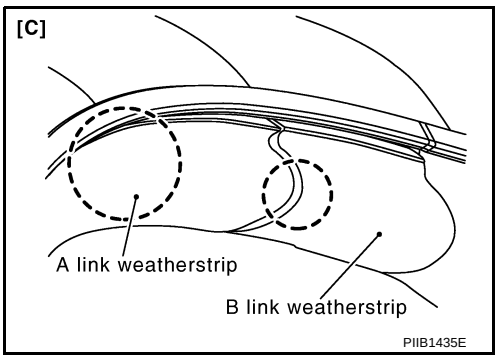


WATER LEAKAGE FROM C

Water may be entering through a joint between soft top weather strips.
Cause: There may be a step or a gap at the weather strips joint.

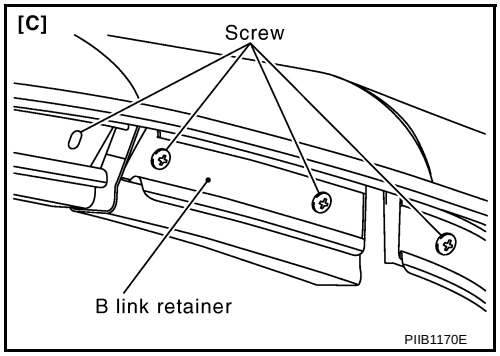
Repair Procedure 4

- Replace weather strip with a new one.
- If the step or the gap is not eliminated after replacing weather strip, then perform the following procedure.

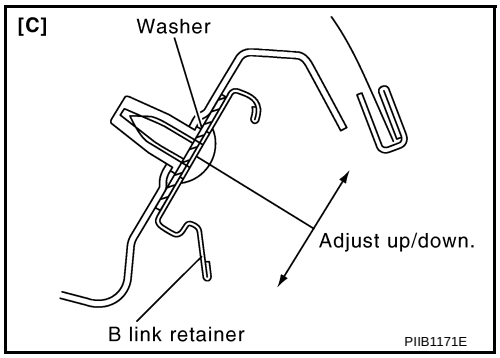


Repair Procedure 5

- Loosen retainer screws.
- Make fine upward/downward position adjustments to the B link retainer.
  (Move the B link retainer of a protruded weather strip downward for the adjustment.)



- Insert approximately 0.5 mm (0.02 in) washer into the back of the subsiding weather strip retainer, if the step is not eliminated after adjustment.



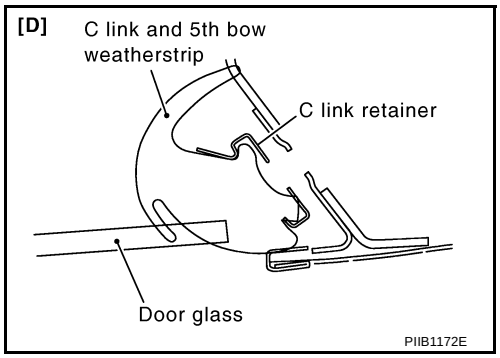
WATER LEAKAGE FROM D

Water may be entering through inside door glass rear.
Cause: There may be poor contact between Clink and 5th bow weather strip of soft top and door glass.

Repair Procedure 6

- Adjust door glass position frontward/backward or upward/downward against soft top.
- Adjust door glass tilt contact by rotating adjusting bolt on regulator lower edge.

CAUTION:
Soft top assembly position may be incorrect in the case of glass upper position is low even if door glass adjustment is performed. Perform soft top assembly adjustment if necessary. Refer to GW-51, "FRONT DOOR GLASS AND REGULATOR" .

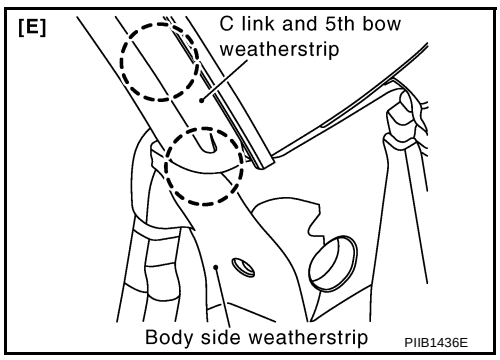


WATER LEAKAGE FROM E

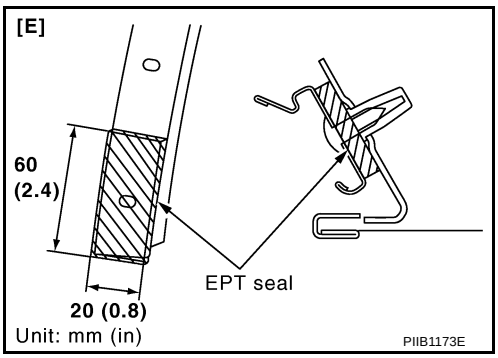
Water may be entering passenger room through weather strip joint.
Cause: There may be a step or a gap between C link and 5th bow weather strip side and body side of weatherstrip.

Repair Procedure 7

- Remove C link weather strip.
- Remove C link retainer.



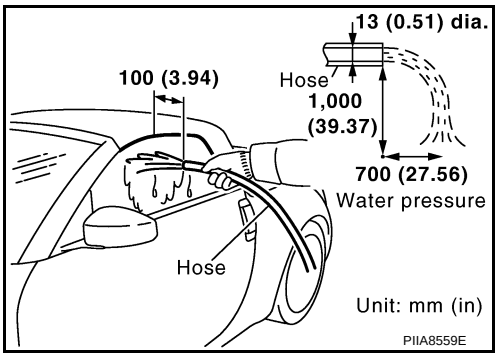
- Apply approximately 5 mm (0.2 in) thick EPT seal to retainer back surface.



WATER LEAKAGE TEST

Visually check for water leakage after repairing.

1. 2 workers are required. One worker checks inside the vehicle, and the other one washes with water.
2. Use 13 mm (0.51 in) diameter hose. Adjust water pressure by following method.
   Hold the hose horizontally, and release water at 1000 mm (39.37 in) height from ground. Adjust the distance, between the ground point just below the hose and the water dropping point, to reach 700 mm (27.56 in). (See the figure.)
3. Keeping the distance between the hose and the testing area by 100 mm (3.94 in), apply water along the area 3 times. During applying water, move the hose by 100 mm (3.94 in)/sec speed.



4. Visually check for water leakage.

Correspondence in Emergency

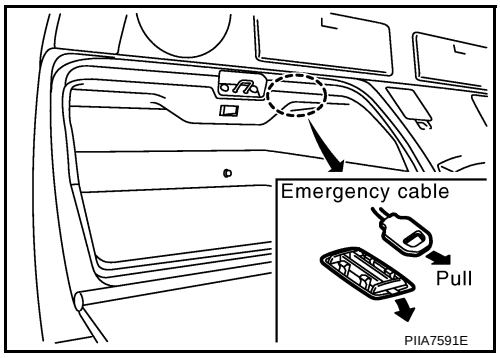
NIS0007Y

If the soft top cannot be operated electrically in the event of a discharged battery or any other system malfunction, the soft top needs to be closed manually or opened manually according to the following procedures.

MANUAL OPERATION (SOFT TOP FULLY OPEN ⇒ FULLY CLOSE)

1. Open The Trunk Lid

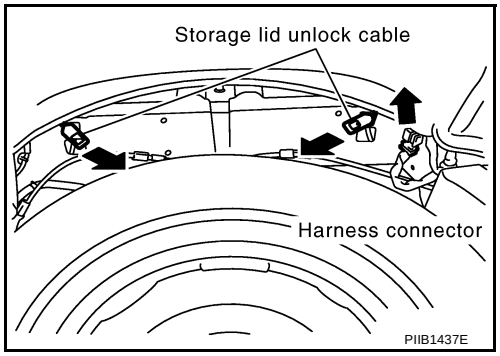
- Open the lid behind the passenger's seat (rear floor box).
- Remove cap of the emergency cable.
- Pull the emergency cable upper surface in the box.
- Open trunk lid.



2. Open The Storage Lid

- Remove floorboard inside of the trunk.
- Disconnect the storage lid motor harness connector upperward, which is located at the right hand side of the trunk.
- Pull down the storage lid lock release cable (right and left sides in the trunk).
- Confirm a clicking sound of lock release.
- Pull up the storage lid from the right and left sides of vehicle (two people are required).

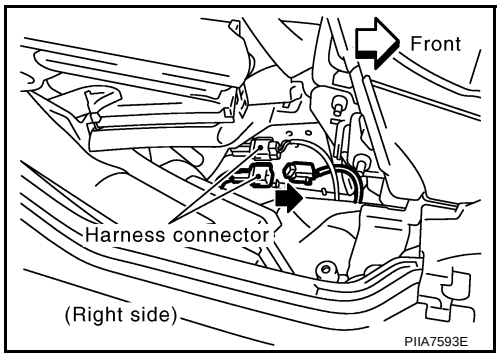
  CAUTION:
  The storage lid is extremely heavy. Pulling it up should be done by two people. Use Hex-wrench to rotate the axis of the gear, when the lid does not move.



3. Close The Soft Top

- Disconnect roof actuator harness connector right and left sides.

  CAUTION:
  2nd disconnect top of roof actuator harness connector right and first disconnect top of roof actuator harness connectors left sides.
- Pull up the soft top right and left sides of the vehicle slowly by hand (two people are required).
- Lock soft top front lock.



4. Close The Storage Lid

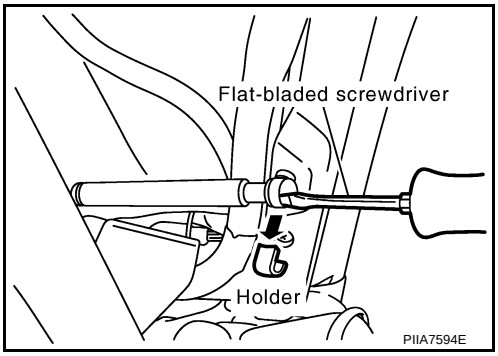
Push down soft top to body panel.

5. Lower The Soft Top 5th Bow

- Remove both operating rod of soft top 5th bow.

CAUTION:
Remove a holder of operating rod end.
Simultaneously hold soft top 5th bow by hand when removing the holder.

- Push in 5th bow to storage lid (do half lock).



CAUTION:
After closing the soft top manually according to the above procedures, have the soft top operation system checked and/or repaired by a NISSAN dealer as soon as possible.
Avoid leaving the vehicle outside for long periods or driving at high speed. As the rear of the soft top is not locked completely, this may allow wind and rain get into the vehicle.

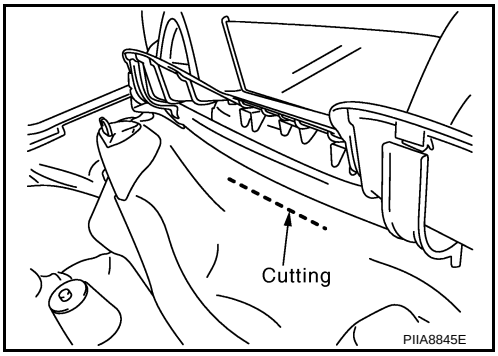
MANUAL OPERATION (SOFT TOP FULLY CLOSE ⇒ FULLY OPEN)

1. Remove The Luggage Floor Trim

Remove the rear floor box and luggage floor finisher upper. Refer to EI-41, "Removal and Installation (for Roadster Models)" .

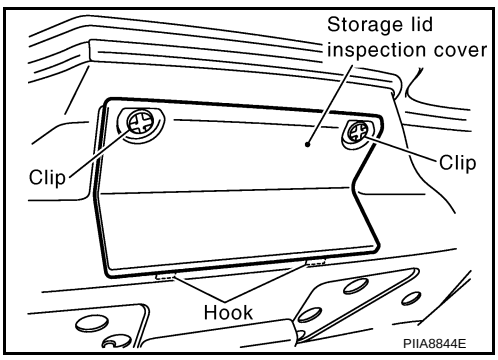
2. Cutting Storage Room Finisher

Cut storage room finisher from seat side.

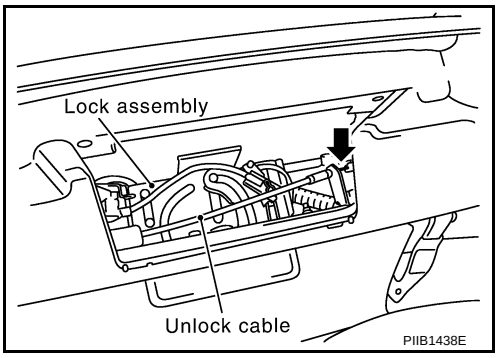


3. Unlock The Storage Lid

- Remove clip of inspection cover.



- Remove the storage lid inspection cover.
- Pull the unlock wire then unlock the soft top 5th bow.



4. Open The Soft Top 5th Bow

- Remove both shock absorber of soft top 5th bow.
- Open the soft top 5th bow (approximate 90 degrees)

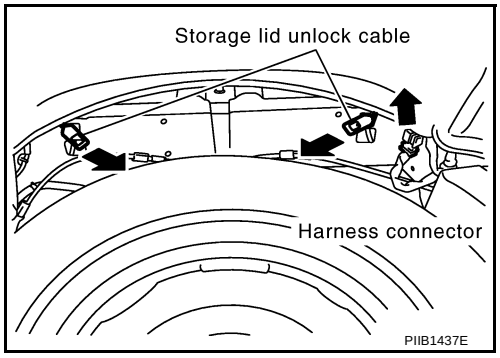
5. Open The Trunk Lid

- Pull the emergency cable.
- Open the trunk lid.

6. Open The Storage Lid

- Remove floorboard inside of the trunk.
- Disconnect the storage lid motor harness connector downward which is in the right hand side of the trunk.
- Pull down the storage lid lock release cable (right and left side of the trunk).
- Confirm a clicking sound of lock release.
- Pull up the storage lid from the right and left sides of vehicle (two people are required).

  CAUTION:
  The storage lid is extremely heavy. Pulling it up should be done by two people. Use Hex-wrench to rotate the axis of the gear, when storage lid does not move.



- Disconnect roof actuator harness connector right and left side (disconnect top of roof actuator harness connector right and left side).

7. Open The Soft Top

- Lower the soft top 5th bow.
- Unlock the front lock.
- Open the soft top right and left side of the vehicle slowly by hand (two person job).

8. Close The Storage Lid

NOTE:
If necessary.

9. Close The Trunk Lid

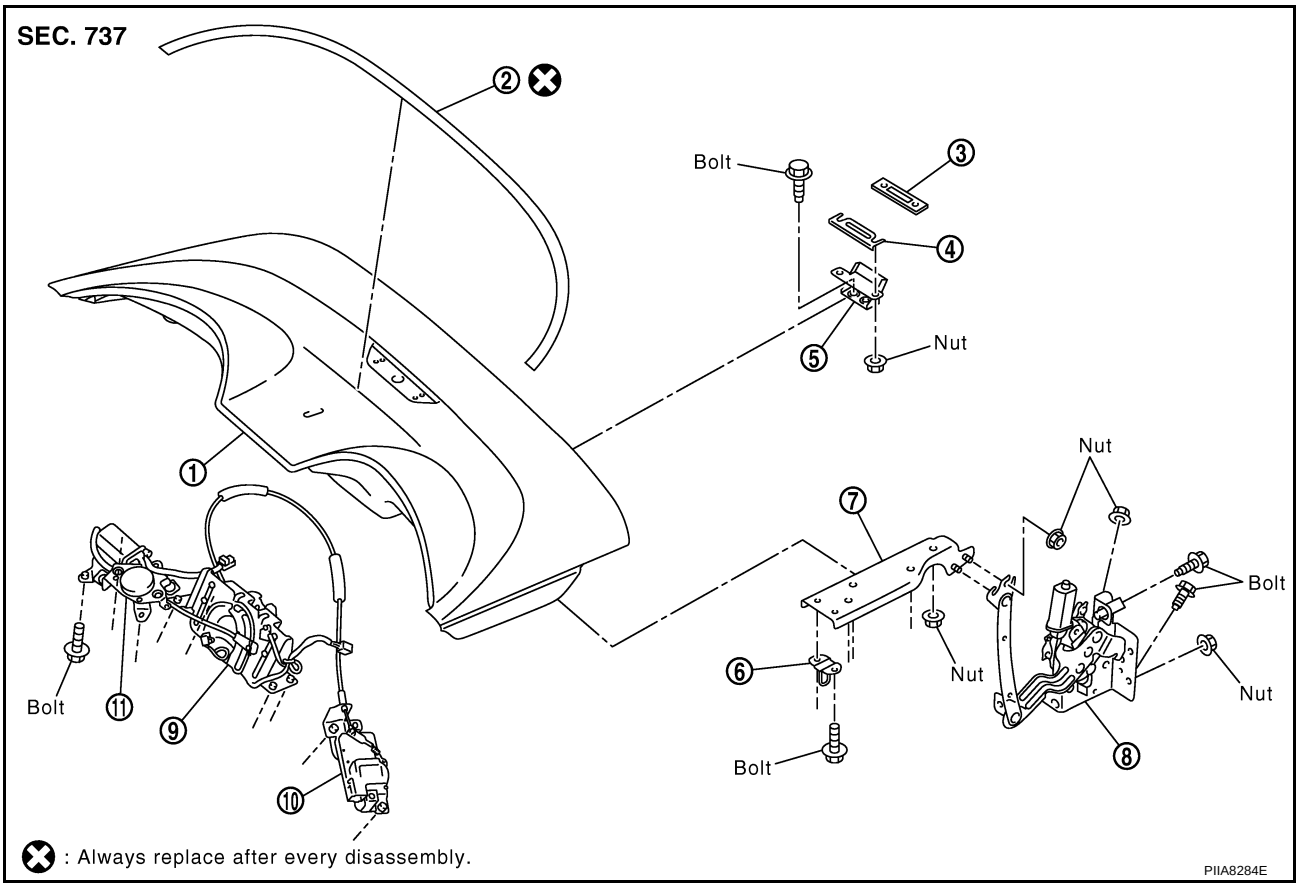
NOTE:
If necessary.

STORAGE LID

PFP:97002

Removal and Installation of Storage Lid Assembly

NIS0007Z



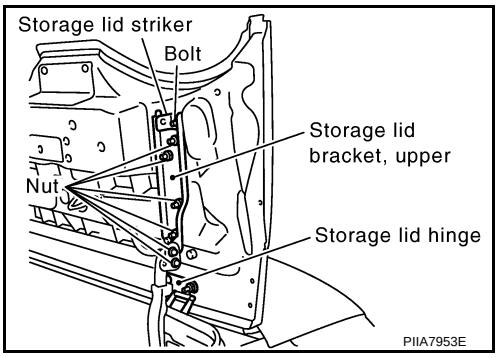
1. Storage lid	2. Storage outer protector	3. Spacer
4. Shim	5. Storage lid hinge	6. Storage lid striker
7. Storage lid upper bracket	8. Storage lid lower bracket	9. 5th bow lock
10. 5th bow unlock actuator	11. 5th bow closure motor	

REMOVAL

1. Disconnect storage lid actuator connector.
2. Remove bolts, and then remove storage lid striker.

   NOTE:
   - 2 or more workers are required.
   - Paint matching marks to check location for installation.
3. Remove nuts which is connecting the storage lid upper bracket and the storage lid lower bracket.

   NOTE:
   Paint matching marks to check location for installation.
4. Remove nuts of storage lid hinge, and then remove storage lid, spacers and shims.

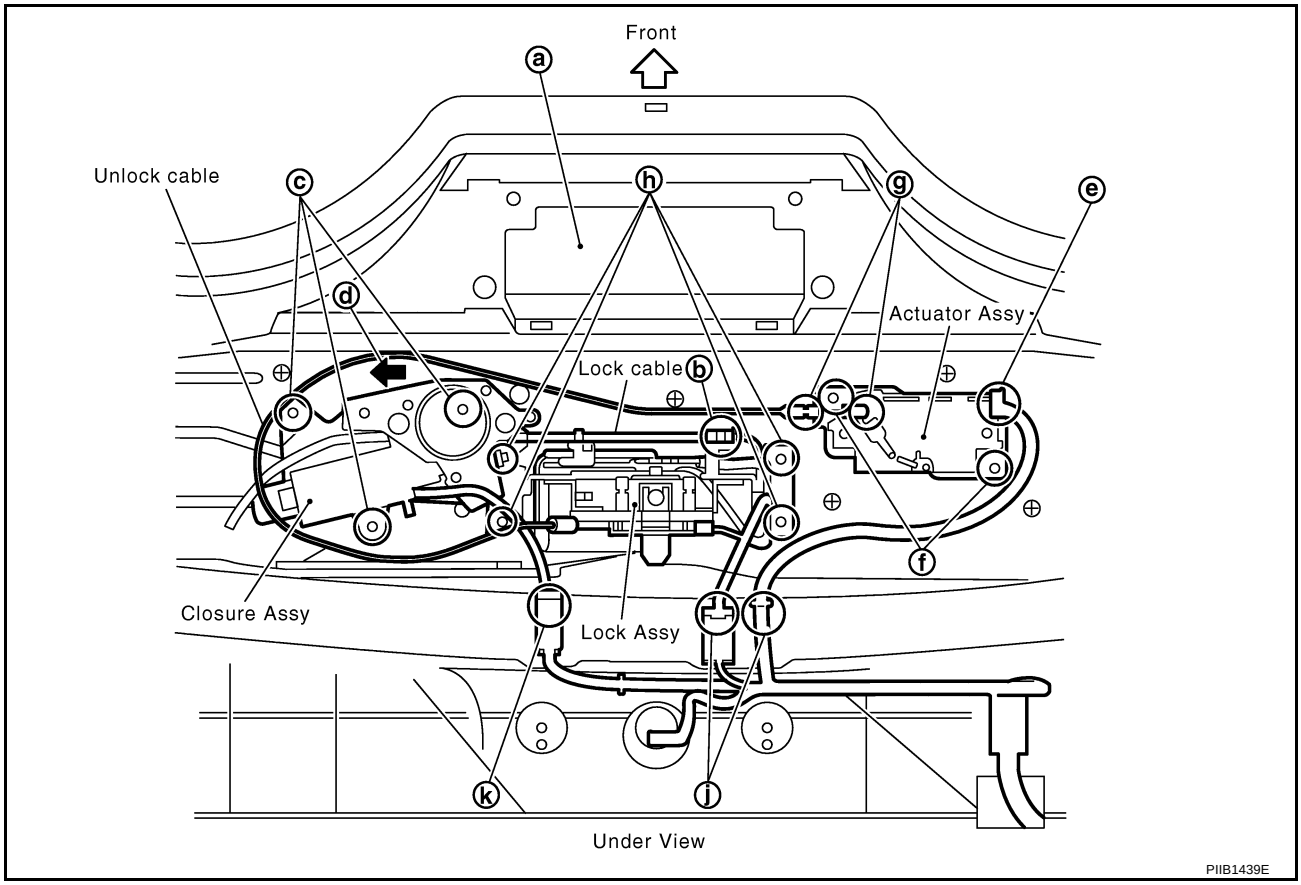


INSTALLATION

1. Install in the reverse order of removal.
2. Install storage lid, and then adjust fitting of lid.

Removal and Installation of Storage Lid Inside Unit

NIS00080



REMOVAL

NOTE:

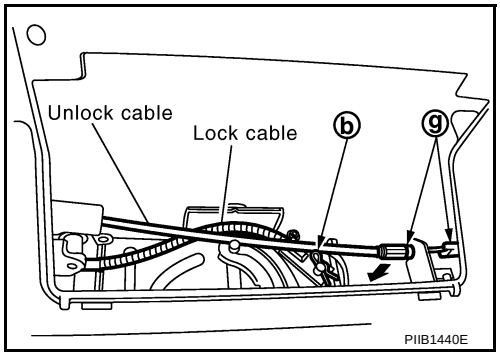
After installing Storage lid on the vehicle, an adjustment of Storage lid position is required in both closed and opened condition.

Put the removed storage lid on the floor or a work bench covered by waste clothes to prevent any scratches.

1. Remove storage lid inspection cover on the front side of Storage lid. (a in the figure)
2. Disconnect a wire from a lock assembly by pulling out a connection pin. (b in the figure)

   NOTE:

   The pin should be taken off by a small pliers not to fell into Storage lid. If the pin fell into Storage lid, then it is very difficult to take the pin out from the lid. And if the pin is left inside the lid, it may make an uncomfortable noise.



3. Remove closure mounting bolt from back of storage lid. (c in the figure)
4. Move closure toward outside of vehicle (because it interferes with unlock). (d in the figure)
5. Disconnect unlock actuator connector. (e in the figure)
6. Disconnect actuator side of unlock cable. (g in the figure)
7. Remove unlock actuator mounting bolt from back of storage lid, and then remove unlock actuator from inspection cover. (f in the figure)
8. Remove lock mounting bolt from back of storage lid, and then move entire lock toward rear of storage lid. (h in the figure)

9. Disconnect lock harness connector, and then remove lock from inspection cover. (j in the figure)
   NOTE:
   Turn lock catcher counterclockwise, and then face it to storage lid inspection hole side to remove because it interferes with storage lid when removing.
10. Disconnect closure harness connector, and then remove closure from inspection cover. (k in the figure)
11. Disconnect unlock actuator, lock, and closure harness connectors from inspection cover.
    (Push in harness connector clip tabs from back of storage lid using a screwdriver so as to remove.)

INSTALLATION

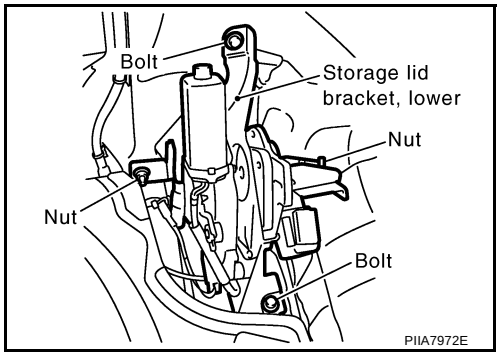
Install in the reverse order of removal.

Removal and Installation of Storage Lid Actuator

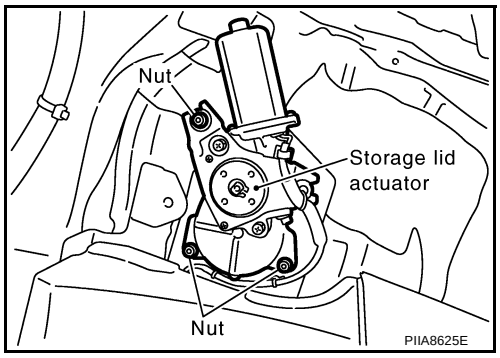
NIS00081

REMOVAL

1. Remove trank room trim.
2. Remove nuts and bolts, and then remove storage lid lower bracket.



3. Disconnect storage lid actuator harness connector.
4. Remove nuts and remove storage lid actuator from storage lid bracket, lower.

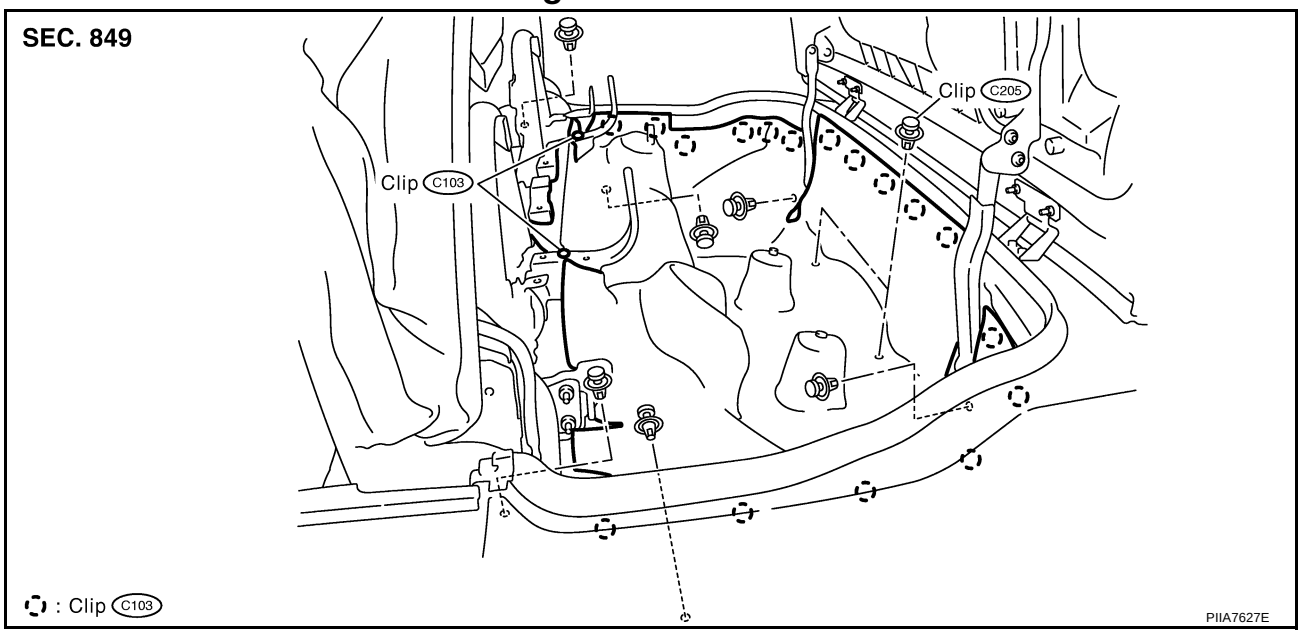


INSTALLATION

Install in the reverse order of removal.

Removal and Installation of Storage Room Finisher

NIS00082



REMOVAL

1. Remove rear side finisher. Refer to EI-37, "REAR SIDE FINISHER" .
2. Remove bolts, and then soft top mounting bracket (front).
3. Remove bolts, and then soft top mounting bracket (rear).
4. Lift up soft top mounting bracket using a lever, and then remove storage room finisher clips.
5. Remove storage room finisher clips, and then remove rear side of storage room finisher.

6. Lift up back panel finisher clips using remover tools, and then remove front side of storage room finisher.

INSTALLATION

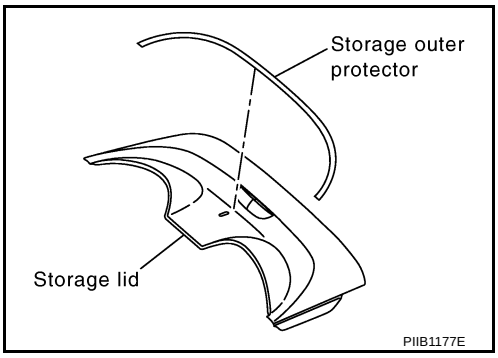
Install in the reverse order of removal.

Removal and Installation of Storage Outer Protector

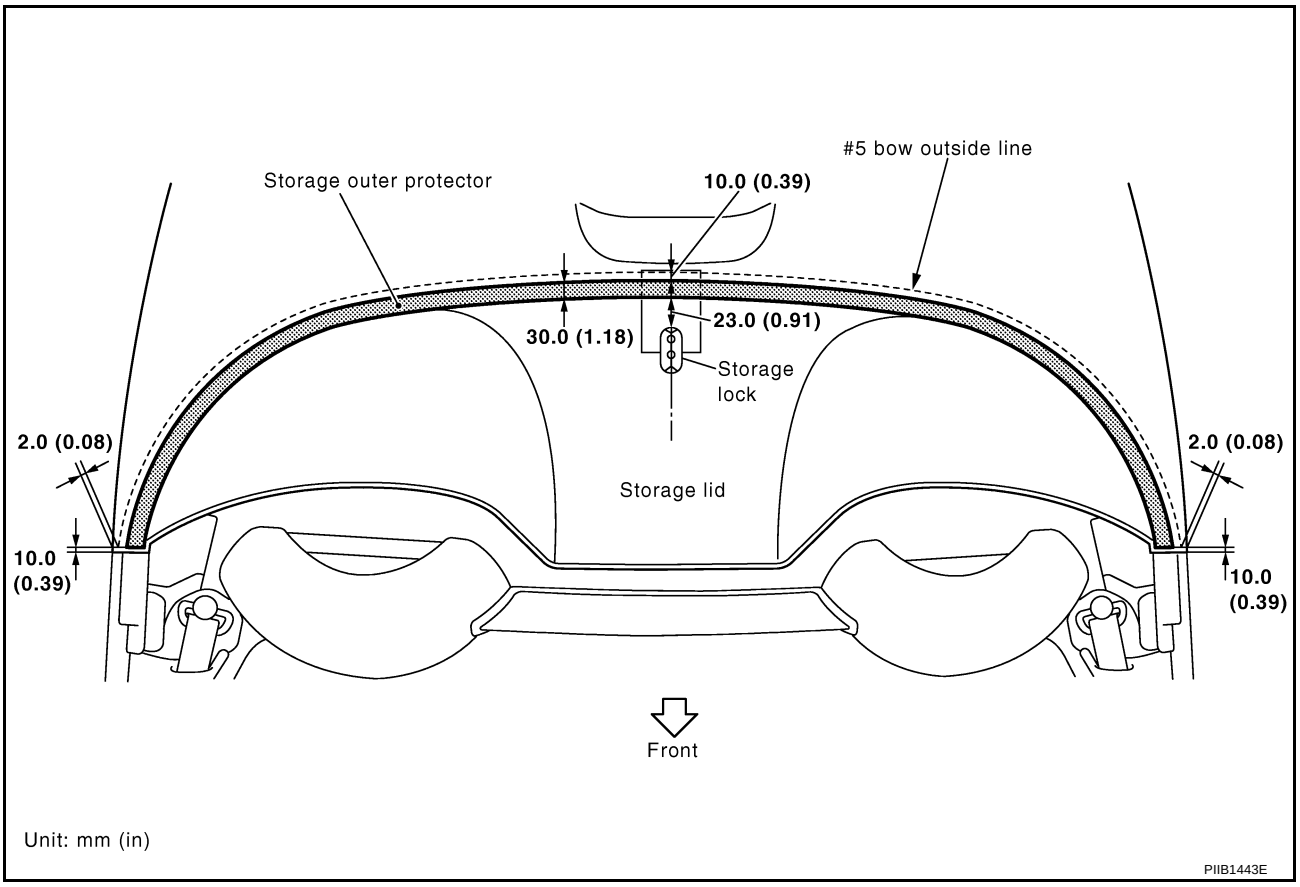
NIS00083

Note the following, and install in the reverse order of removal.

1. Heat the bonded area using a hair dryer, and then remove storage outer protector.
   NOTE:
   Do not reuse storage outer protector after removing.



2. Remove storage room finisher.



3. Clean Storage lid surface.
4. Close Soft top, and draw a line on a storage lid just behind the 5th bow out side edge by a water base marker pen.
5. Apply IPA solution (isopropyl alcohol : water = 1 : 1) on the lid, and set the storage outer protector position from one side. And do the same procedure to another side.
6. Apply left side storage lid outer aligning with left storage lid scribed line.
7. Apply right side storage lid outer aligning with right storage lid scribed line.

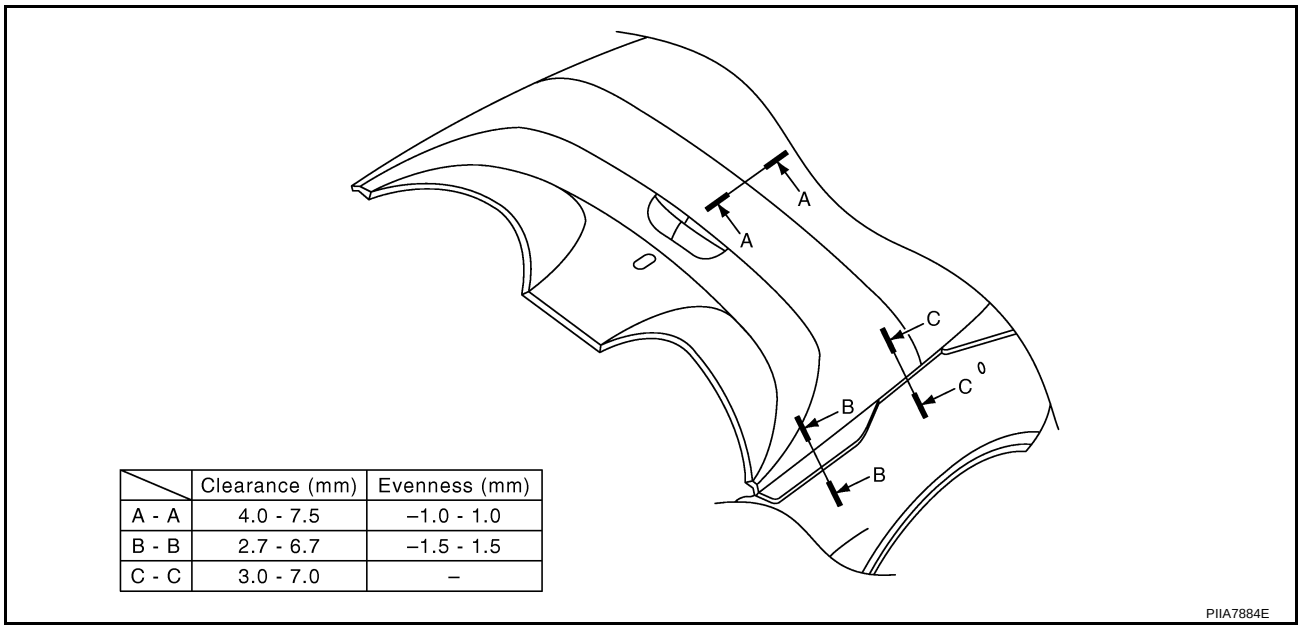
NOTE:
Not to put air or dust under the tape.
After applying the tape on the lid, peal off the protection film on the storage outer protector.

- Secure left, right, and front end of storage room finisher with remaining part when removing using double-faced adhesive tape.

Adjustment of Storage Lid

NIS00084

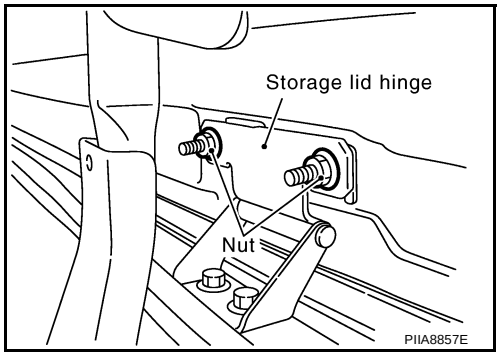
ADJUSTMENT IN FULLY CLOSED POSITION



	Clearance (mm)	Evenness (mm)
A - A	4.0 - 7.5	–1.0 - 1.0
B - B	2.7 - 6.7	–1.5 - 1.5
C - C	3.0 - 7.0	–

A-A Clearance Adjustment

Loosen nuts of storage lid hinge. Adjust storage lid until the clearance is within the specification.

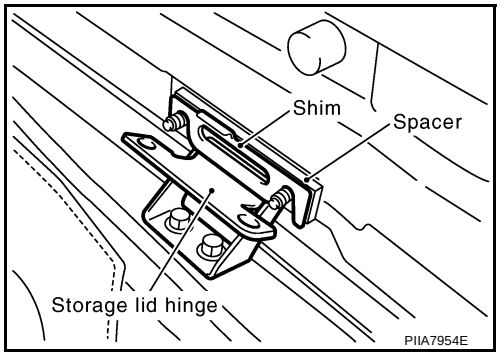


B-B Clearance Adjustment

Loosen nut of storage lid striker lock, and adjust it until the clearance is within the specification.

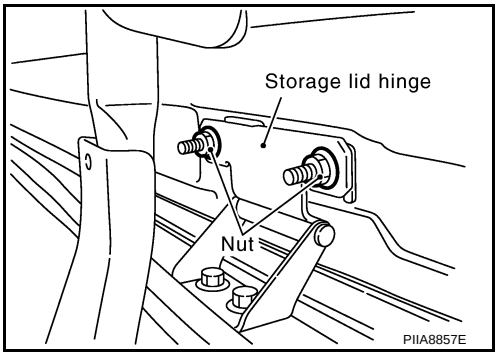
C-C Clearance Adjustment, A-A Evenness Adjustment

Loosen nuts of storage lid hinge. Adjust storage lid height by exchanging or adding shim until the evenness is within the specification.



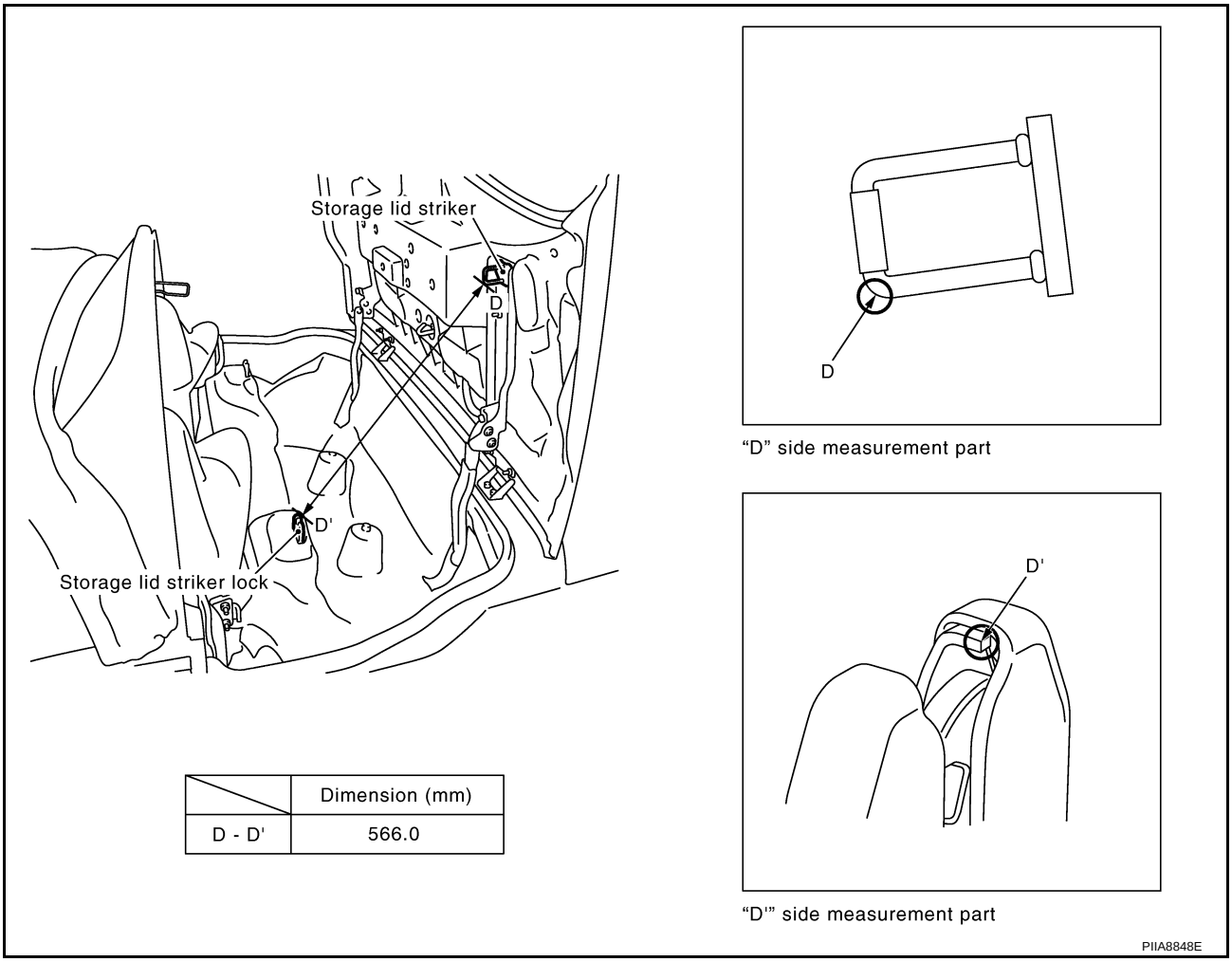
B-B Evenness Adjustment

Loosen nuts of storage lid hinge. Adjust the lid until the evenness is within the specification.



ADJUSTMENT IN FULLY OPENED POSITION

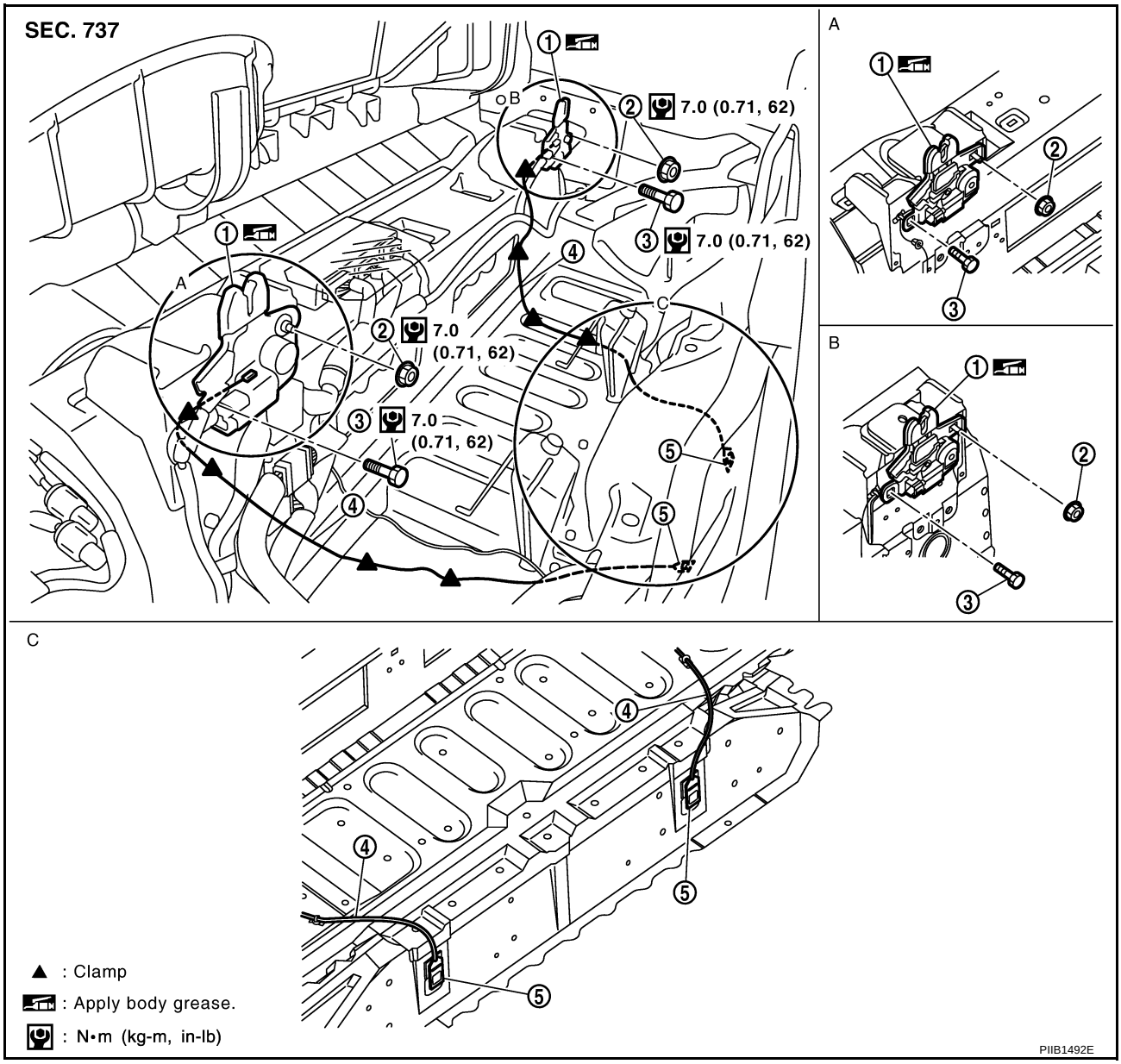
Adjust linkage position of storage lid striker and storage lid striker lock to specified dimension, by loosening nuts fixing storage lid bracket, upper and lower.



	Dimension (mm)
D - D'	566.0

Removal and Installation of Storage Lid Striker Lock & Storage Lid Emergency Opener Cable

NIS00085



1. Storage lid striker lock assembly
2. Nut
3. Bolt
4. Storage lid emergency opener cable
5. Storage lid emergency opener hook

REMOVAL

1. Remove storage room finisher. Refer to RF-126, "Removal and Installation of Storage Room Finisher" .
2. Remove trunk front finisher. Refer to EI-49, "TRUNK ROOM TRIM & TRUNK LID FINISHER" .
3. Disconnect each clamp of storage lid emergency opener cable.
4. Disconnect each harness connector of storage lid lock assembly.
5. Remove storage lid lock mounting bolts, and then remove storage lid lock assembly.

INSTALLATION

Install in the reverse order of removal.

SECTION RFD
REAR FINAL DRIVE

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PRECAUTIONS

PFP:00001

Service Notice or Precautions

NDS00009

- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts when applied.
- Overhaul should be done in a clean work area, it is preferable to work in dustproof area.
- Before disassembly, using steam or white gasoline, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with a new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time when the unit is disassembled.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Clean and flush the parts sufficiently and blow-dry them.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mounting surface; then remove any moisture, oil, and foreign materials from the application and mounting surfaces.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or shop rags to prevent entering of lint.
- During assembly, observe the specified tightening torque, and apply new gear oil, petroleum jelly, or multi-purpose grease as specified for each vehicle, if necessary.

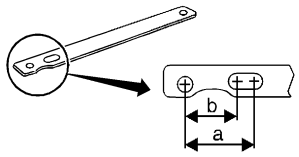
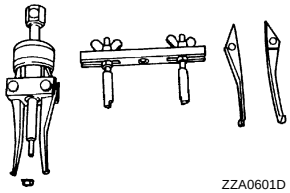
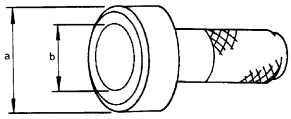
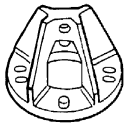
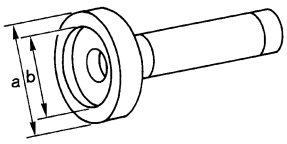
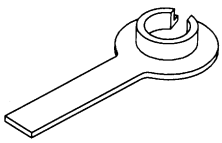
PREPARATION

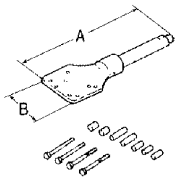
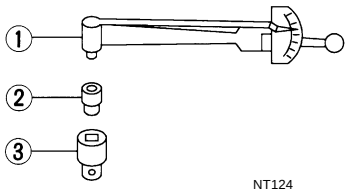
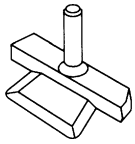
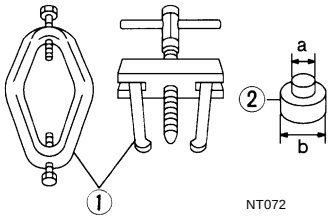
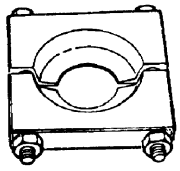
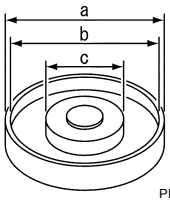
PFP:00002

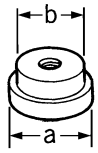
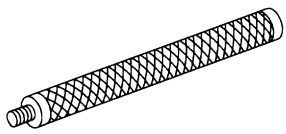
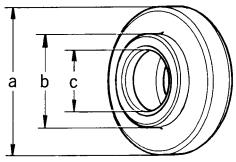
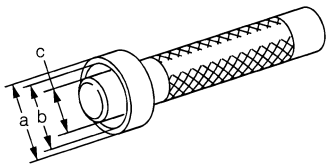
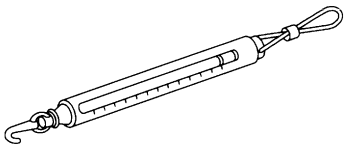
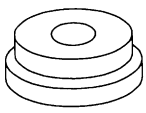
Special Service Tools

NDS0000A

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

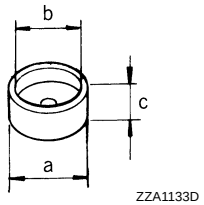
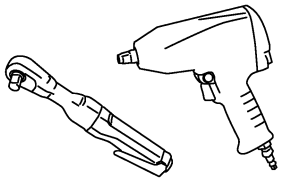
Tool number (Kent-Moore No.) Tool name		Description
KV40104000 (—) Flange wrench a: 85 mm (3.35 in) dia. b: 65 mm (2.56 in) dia.	 NT659	Removing and installing drive pinion lock nut
KV381054S0 (J-34286) Puller	 ZZA0601D	Removing front oil seal
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0811D	● Installing front oil seal ● Installing pinion rear bearing outer race
KV40104100 (—) Attachment	 ZZA0804D	Removing side flange
ST36230000 (J-25840-A) Sliding hammer	 ZZA0803D	Removing side flange
KV38100200 (J-26233) Drift a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.	 ZZA1143D	Installing side oil seal
KV38107900 (J-39352) Protector	 S-NT129	Installing side flange

Tool number (Kent-Moore No.) Tool name	Description
KV38100800 (J-25604-01) Attachment a: 541 mm (21.30 in) b: 200 mm (7.87 in)  SDIA0267E	Fixing unit assembly
ST3127S000 (J-25765-A) Preload gauge 1: GG91030000 (J-25765) Torque wrench 2: HT62940000 (—) Socket adapter (1/2″) 3: HT62900000 (—) Socket adapter (3/8″)  NT124	Measuring pinion bearing preload and total preload
KV10111100 (J-37228) Seal cutter  S-NT046	Removing rear cover
ST3306S001 (J-22888-D) Differential side bearing puller set 1: ST33051001 (J-22888-20) Puller 2: ST33061000 (J-8107-2) Base a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.  NT072	Removing and installing side bearing inner race
ST30031000 (J-22912-01) Replacer  ZZA0700D	Removing pinion rear bearing inner race
KV40105230 (—) Drift a: 92 mm (3.62 in) dia. b: 86 mm (3.39 in) dia. c: 45 mm (1.77 in) dia.  PDIA0591E	Installing pinion rear bearing outer race

Tool number (Kent-Moore No.) Tool name	Description
ST30613000 (J-25742-3) Drift a: 72 mm (2.83 in) dia. b: 48 mm (1.89 in) dia.  ZZA1000D	Installing pinion front bearing outer race
ST30611000 (J-25742-1) Drift bar  S-NT090	Installing pinion front bearing outer race (Use with ST30613000)
ST30901000 (J-26010-01) Drift a: 79 mm (3.11 in) dia. b: 45 mm (1.77 in) dia. c: 35.2 mm (1.386 in) dia.  ZZA0978D	Installing pinion rear bearing inner race
KV38100300 (J-25523) Drift a: 54 mm (2.13 in) dia. b: 46 mm (1.81 in) dia. c: 32 mm (1.26 in) dia.  ZZA1046D	Installing side bearing inner race
(J-8129) Spring gauge  NT127	Measuring turning torque
(J-34309) Differential shim selector tool  NT134	Adjusting bearing preload and pinion gear height
(J-25269-4) Side bearing disc (2 Req'd)  NT136	Selecting pinion height adjusting washer

Commercial Service Tools

NDS0000B

Tool name	Description
Spacer a: 60 mm (2.36 in) dia. b: 36 mm (1.42 in) dia. c: 30 mm (1.18 in)  ZZA1133D	Installing pinion front bearing inner race
Power tool  PBIC0190E	Loosening nuts and bolts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NDS0000C

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		Refer to RFD-28 (R200 2-pinion), RFD-48 (R200V LSD).	Refer to RFD-21 (R200 2-pinion), RFD-41 (R200V LSD).	Refer to RFD-28 (R200 2-pinion), RFD-48 (R200V LSD).	Refer to RFD-22 (R200 2-pinion), RFD-42 (R200V LSD).	Refer to RFD-23 (R200 2-pinion), RFD-43 (R200V LSD).	Refer to RFD-9 .	NVH in PR section	NVH in FAX, RAX, FSU and RSU sections	NVH in WT section	NVH in WT section	NVH in RAX section	NVH in BR section	NVH in PS section
Possible cause and SUSPECTED PARTS		Gear tooth rough	Gear contact improper	Tooth surfaces worn	Backlash incorrect	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×

×: Applicable

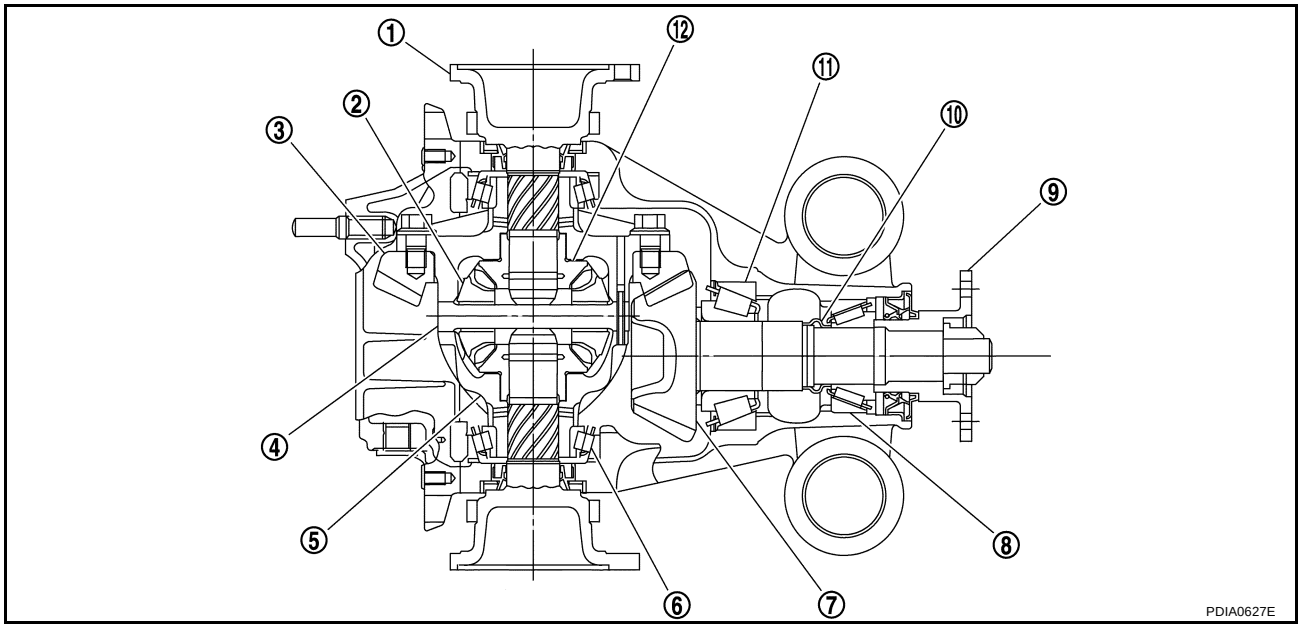
DESCRIPTION

PFP:00000

Cross-Sectional View

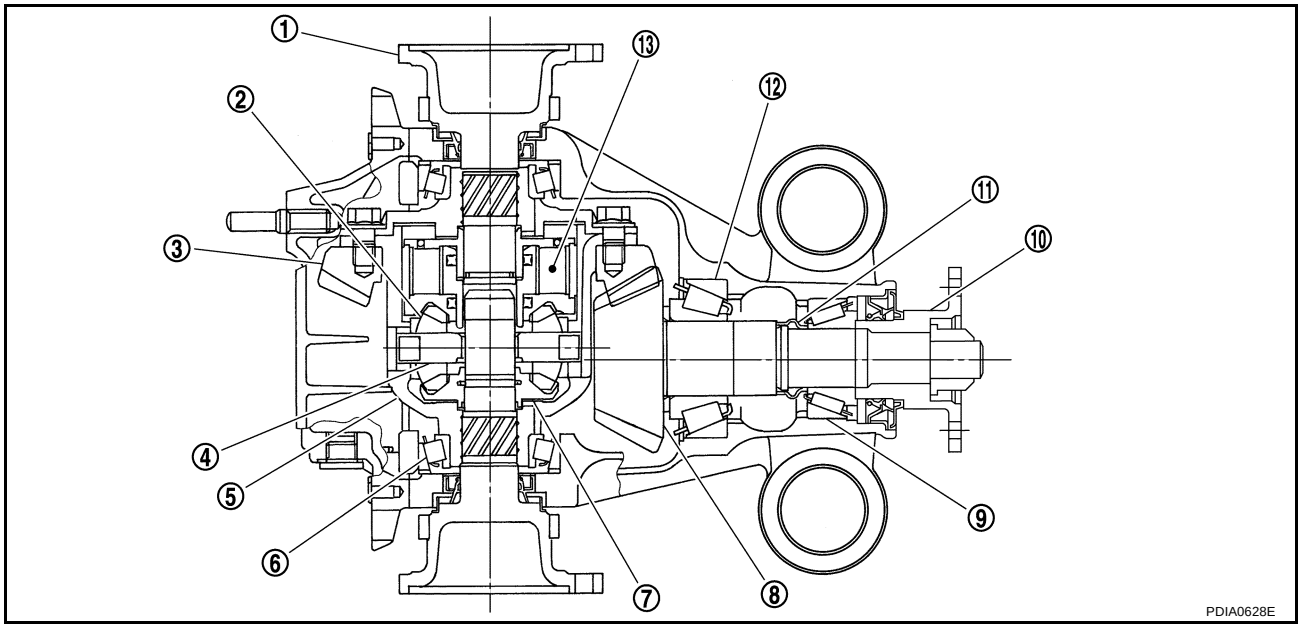
NDS0000D

R200 (2-pinion)



1. Side flange
2. Pinion mate gear
3. Drive gear
4. Pinion mate shaft
5. Differential case
6. Side bearing
7. Drive pinion
8. Pinion front bearing
9. Companion flange
10. Collapsible spacer
11. Pinion rear bearing
12. Side gear

R200V (LSD)



1. Side flange
2. Pinion mate gear
3. Drive gear
4. Pinion mate shaft
5. Differential case
6. Side bearing
7. Side gear
8. Drive pinion
9. Pinion front bearing
10. Companion flange
11. Collapsible spacer
12. Pinion rear bearing
13. Viscous coupling

DIFFERENTIAL GEAR OIL

PFP:KLD30

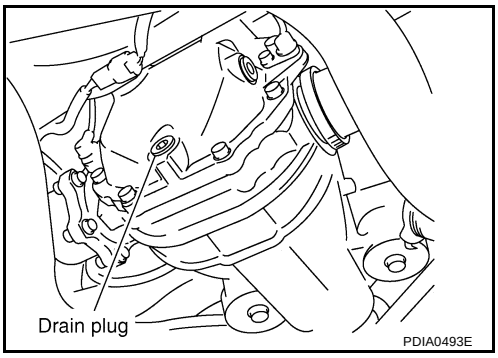
Changing Differential Gear Oil

NDS0000E

DRAINING

1. Stop engine.
2. Remove drain plug and drain gear oil.
3. Set a gasket on drain plug and install it to final drive assembly and tighten to the specified torque. Refer to RFD-19, "COMPONENTS" (R200 2-pinion) or RFD-39, "COMPONENTS" (R200V LSD).

   CAUTION:
   Do not reuse gasket.



FILLING

1. Remove filler plug. Fill with new gear oil until oil level reaches the specified level near filler plug mounting hole.

   Oil grade and Viscosity:

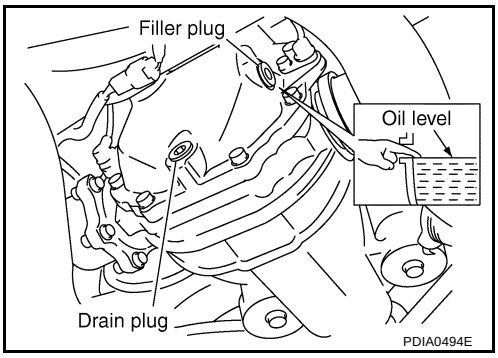
   Refer to MA-11, "Fluids and Lubricants" .

   Oil capacity:

   Approx. 1.4 ℓ (3 US pt, 2-1/2 Imp pt)

2. After refilling oil, check oil level. Set a gasket to filler plug, then install it to final drive assembly. Refer to RFD-19, "COMPONENTS" (R200 2-pinion) or RFD-39, "COMPONENTS" (R200V LSD).

   CAUTION:
   Do not reuse gasket.



Checking Differential Gear Oil

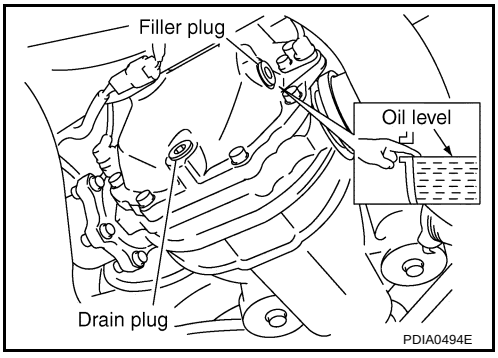
NDS0000F

OIL LEAKAGE AND OIL LEVEL

- Make sure that oil is not leaking from final drive assembly or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

  CAUTION:
  Do not start engine while checking oil level.
- Set a gasket on filler plug and install it on final drive assembly. Refer to RFD-19, "COMPONENTS" (R200 2-pinion) or RFD-39, "COMPONENTS" (R200V LSD).

  CAUTION:
  Do not reuse gasket.



FRONT OIL SEAL

PFP:38189

Removal and Installation

NDS0000G

CAUTION:

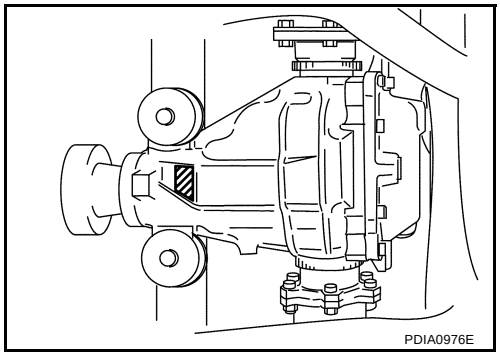
Verify identification stamp of replacement frequency put in the lower part of gear carrier to determine replacement for collapsible spacer when replacing front oil seal. Refer to RFD-10, "IDENTIFICATION STAMP OF REPLACEMENT FREQUENCY OF FRONT OIL SEAL" . If necessary collapsible spacer replacement, remove final drive assembly and disassemble it to replace front oil seal and collapsible spacer. Refer to RFD-17, "Removal and Installation" , RFD-19, "Disassembly and Assembly (R200 2-pinion)" and/or RFD-39, "Disassembly and Assembly (R200V LSD)" .

NOTE:

The reuse of collapsible spacer is prohibited in principle. However, it is reusable on a one-time basis only in cases when replacing front oil seal.

IDENTIFICATION STAMP OF REPLACEMENT FREQUENCY OF FRONT OIL SEAL

- The diagonally shaded area in the figure shows stamping point for replacement frequency of front oil seal.
- The following table shows if collapsible spacer replacement is needed before replacing front oil seal.
  When collapsible spacer replacement is required, disassemble final drive assembly to replace collapsible spacer and front oil seal. Refer to RFD-19, "Disassembly and Assembly (R200 2-pinion)" or RFD-39, "Disassembly and Assembly (R200V LSD)" .



Stamp	collapsible spacer replacement
No stamp	Not required
“0” or “0” on the far right of stamp	Required
“01” or “1” on the far right of stamp	Not required

CAUTION:

Be sure to make a stamping after replacing front oil seal.

- After replacing front oil seal, make a stamping on the stamping point in accordance with the table below in order to identify replacement frequency.

CAUTION:

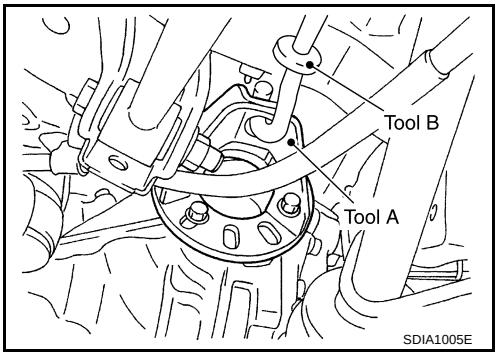
Stamping shall be made from left to right.

Stamp before stamping	Stamping on the far right	Stamping
No stamp	0	0
“0” (Front oil seal was replaced once.)	1	01
“01” (Collapsible spacer and front oil seal were replaced last time.)	0	010
“0” is on the far right. (Only front oil seal was replaced last time.)	1	...01
“1” is on the far right. (Collapsible spacer and front oil seal were replaced last time.)	0	...010

REMOVAL

1. Drain gear oil. Refer to RFD-9, "DRAINING" .
2. Make a judgment if a collapsible spacer replacement is required. Refer to RFD-10, "IDENTIFICATION STAMP OF REPLACEMENT FREQUENCY OF FRONT OIL SEAL" .
3. Remove rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).
4. Remove drive shaft from final drive. Then suspend it by wire etc. Refer to RAX-10, "Removal and Installation" .
5. Install attachment to side flange, and then pull out the side flange with the sliding hammer.

   Tool number **A: KV40104100 (—)**
   B: ST36230000 (J-25840-A)



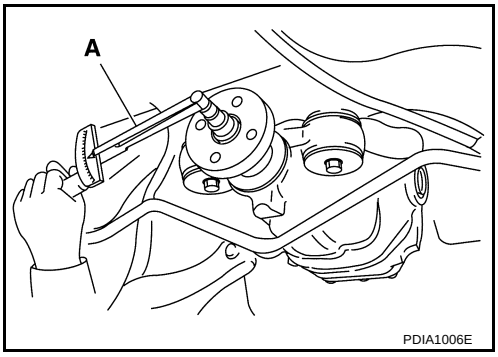
NOTE:

Model	Circular clip installation position	
	Right side	Left side
R200 (2-pinion)	Final drive side	
R200V (LSD)	Final drive side	Side flange side

6. Remove propeller shaft. Refer to PR-6, "Removal and Installation" .
7. Measure the total preload with the preload gauge.

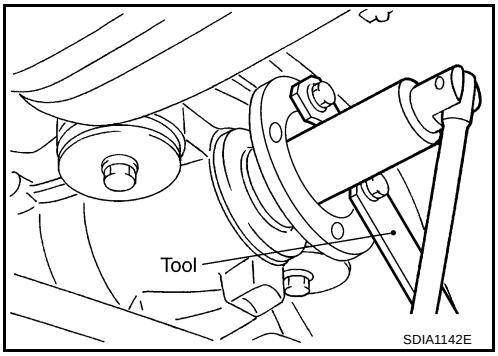
   Tool number **A: ST3127S000 (J-25765-A)**

   NOTE:
   Record the preload measurement.



8. Remove drive pinion lock nut using the flange wrench.

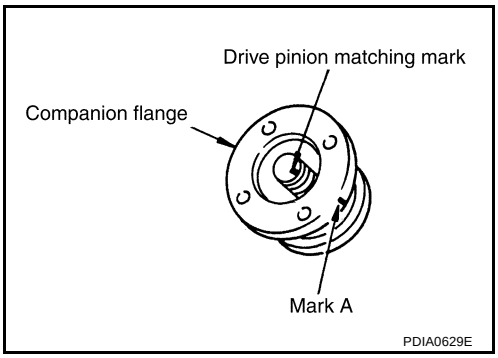
   Tool number **: KV40104000 (—)**



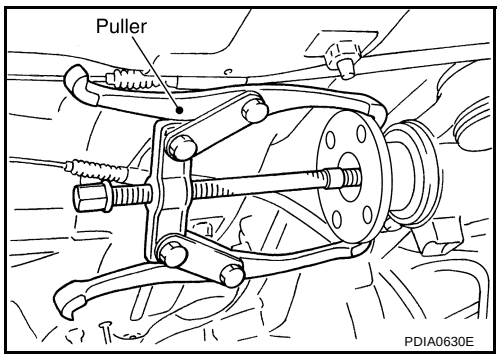
9. Put matching mark on the end of the drive pinion. The matching mark should be in line with the matching mark A on companion flange.

   CAUTION:
   For matching mark, use paint. Do not damage drive pinion.

   NOTE:
   The matching mark A on the final drive companion flange indicates the maximum vertical runout position.

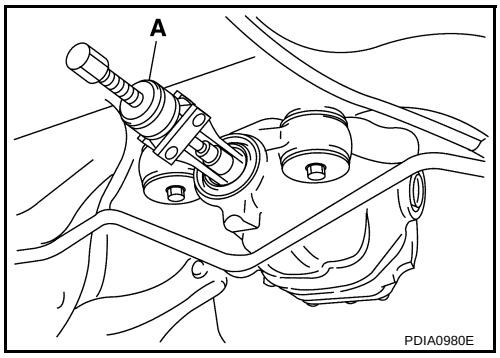


10. Remove companion flange using a puller.



11. Remove front oil seal using the puller.

Tool number A: KV381054S0 (J-34286)



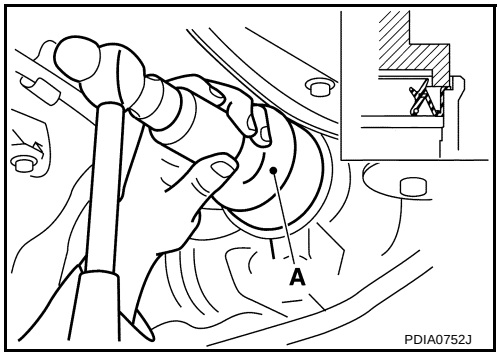
INSTALLATION

1. Apply multi-purpose grease to front oil seal lips.
2. Install front oil seal using the drift as shown in the figure.

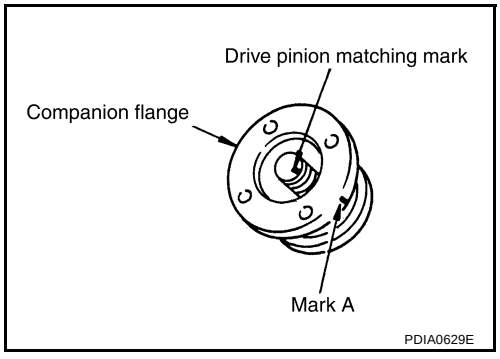
Tool number A: ST30720000 (J-25405)

CAUTION:

- **Do not reuse oil seal.**
- **Do not incline oil seal when installing.**



3. Align the matching mark of drive pinion with the matching mark of companion flange, and then install the companion flange.



4. Apply anti-corrosion oil to the thread and seat of new drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.

CAUTION:
Do not reuse drive pinion lock nut.

5. Tighten to drive pinion lock nut, while adjust total preload torque.

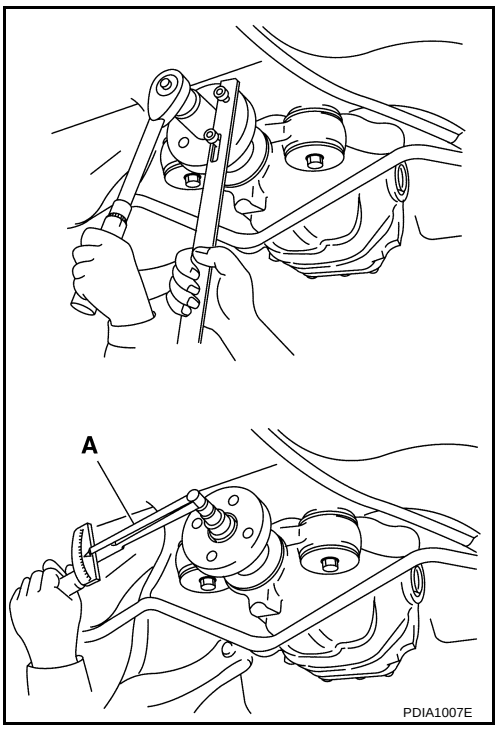
Tool number A: ST3127S000 (J-25765-A)

Drive pinion lock nut tightening torque:

147 – 323 N·m (15 – 32 kg-m, 109 – 238 ft-lb)

Total preload torque:

Total preload torque should equal the measurement taken during removal plus an additional 0.1 – 0.4 N·m (0.01 – 0.04 kg-m, 1 – 3 in-lb).



CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the preload torque.**

6. Make a stamping for identification of front oil seal replacement frequency. Refer to RFD-10, "IDENTIFICATION STAMP OF REPLACEMENT FREQUENCY OF FRONT OIL SEAL" .

CAUTION:
Be sure to make a stamping after replacing front oil seal.

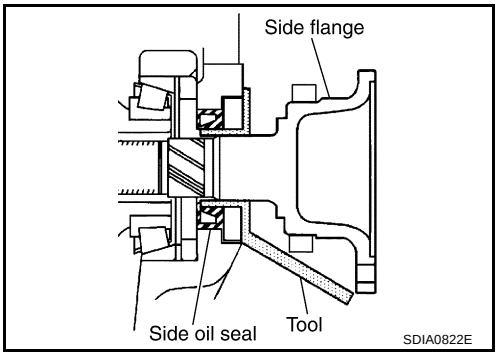
7. Install propeller shaft. Refer to PR-6, "Removal and Installation" .
8. Install side flange with the following procedure.

NOTE:
Install the RH side flange, then install the LH side flange. If LH side flange is installed first, the RH side flange comes out sometimes from the shock of installing the RH side flange. [For R200V (with LSD)]

a. Attach the protector to side oil seal.

Tool number : KV38107900 (J-39352)

b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.



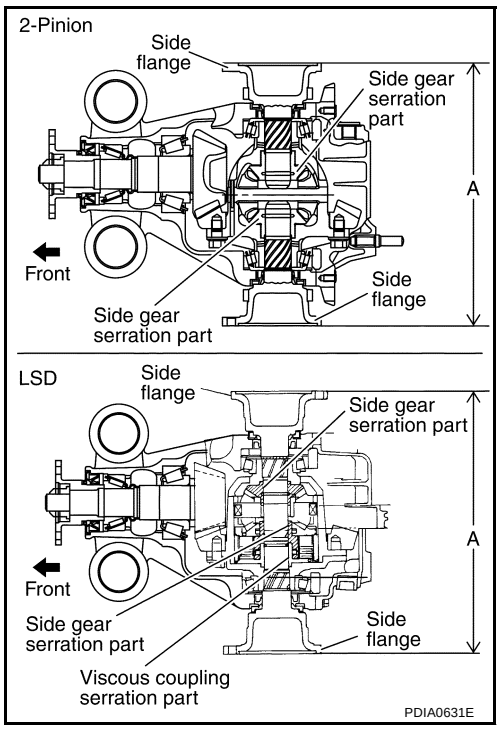
c. Put a suitable drift on the center of side flange, then drive it until sound changes.

NOTE:
When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

d. Confirm that the dimension of the side flange installation (Measurement A) in the figure comes into the following.

Measurement A: 326 – 328 mm (12.83 – 12.91 in)

9. Install drive shaft. Refer to RAX-10, "Removal and Installation" .
10. Install rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).
11. Refill gear oil to the final drive and check oil level. Refer to RFD-9, "FILLING" .
12. Check the final drive for oil leakage. Refer to RFD-9, "OIL LEAKAGE AND OIL LEVEL" .



SIDE OIL SEAL

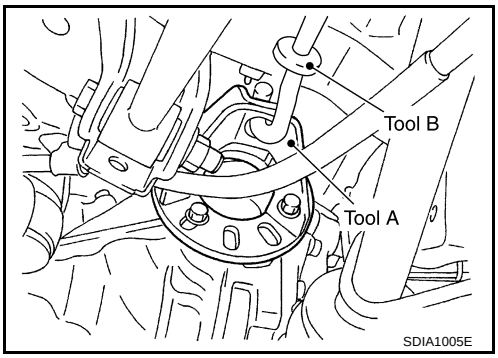
PFP:33142

Removal and Installation

NDS0000H

REMOVAL

1. Remove rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).
2. Remove drive shaft from final drive. Then suspend it by wire etc. Refer to RAX-10, "Removal and Installation" .
3. Install attachment to side flange, and then pull out the side flange with the sliding hammer.

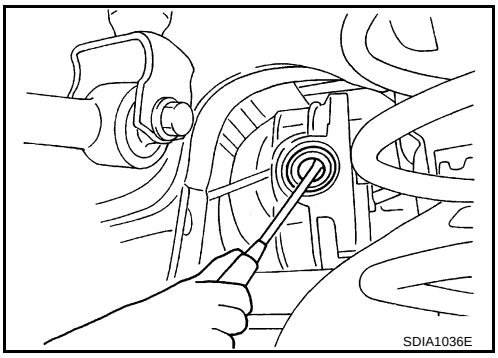


Tool number **A: KV40104100 (—)**
B: ST36230000 (J-25840-A)

NOTE:

Model	Circular clip installation position	
	Right side	Left side
R200 (2-pinion)	Final drive side	
R200V (LSD)	Final drive side	Side flange side

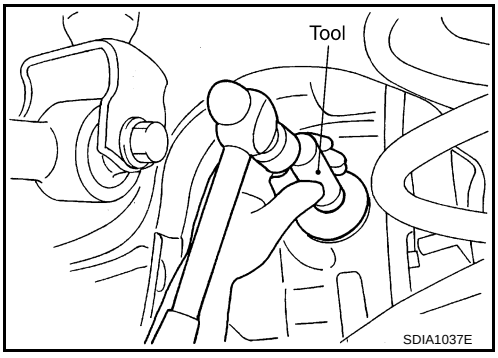
4. Remove side oil seal, using a flat-bladed screwdriver.



CAUTION:
Be careful not to damage gear carrier.

INSTALLATION

1. Apply multi-purpose grease to side oil seal lips.
2. Install side oil seal until it becomes flush with the case end, using the drift.



Tool number **: KV38100200 (J-26233)**

CAUTION:
- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**

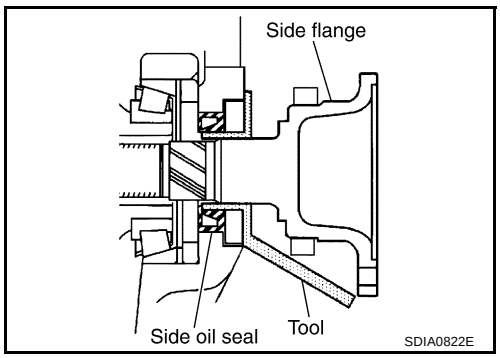
3. Install side flange with the following procedure.

NOTE:
Install the RH side flange, then install the LH side flange. If LH side flange is installed first, the RH side flange comes out sometimes from the shock of installing the RH side flange. [For R200V (with LSD)]

a. Attach the protector to side oil seal.

Tool number : KV38107900 (J-39352)

b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.

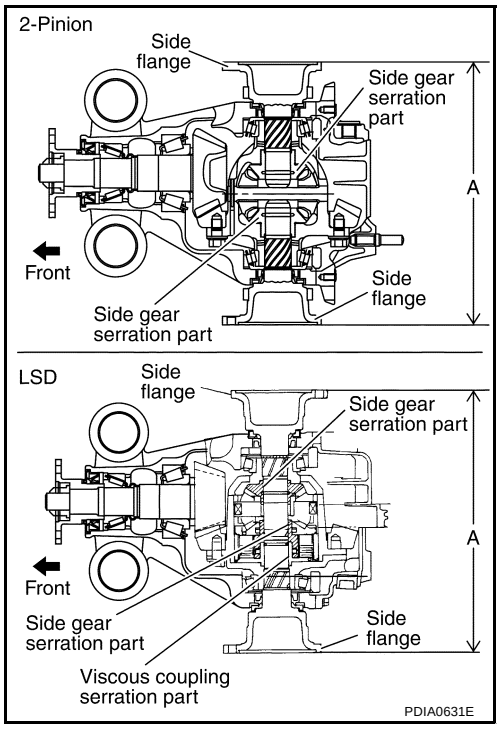


c. Put a suitable drift on the center of side flange, then drive it until sound changes.

NOTE:
When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

d. Confirm that the dimension of the side flange installation (Measurement A) in the figure comes into the following.

Measurement A: 326 - 328 mm (12.83 - 12.91 in)



4. Install drive shaft. Refer to RAX-10, "Removal and Installation" .
5. Install rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).

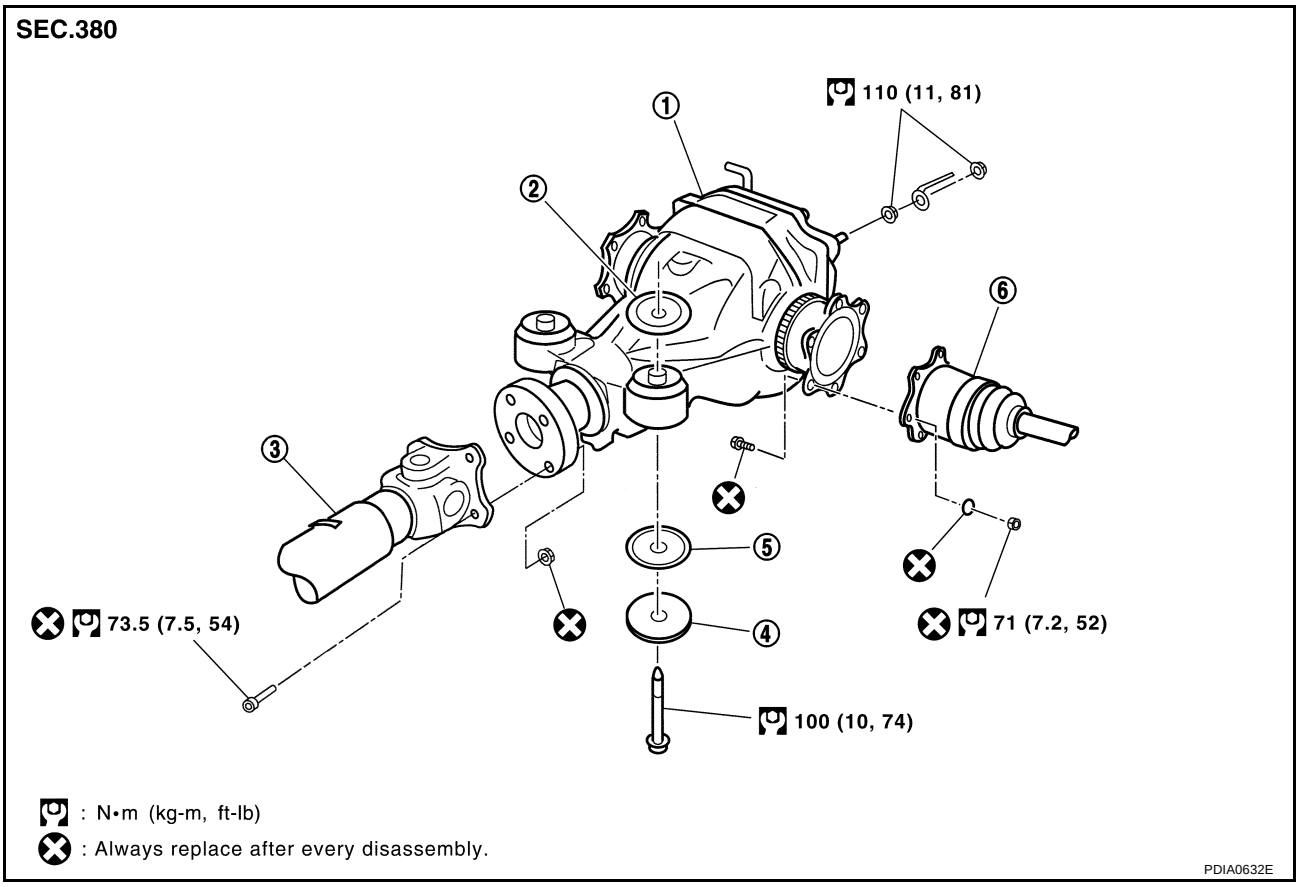
REAR FINAL DRIVE ASSEMBLY

PFP:38300

Removal and Installation

NDS0000I

COMPONENTS

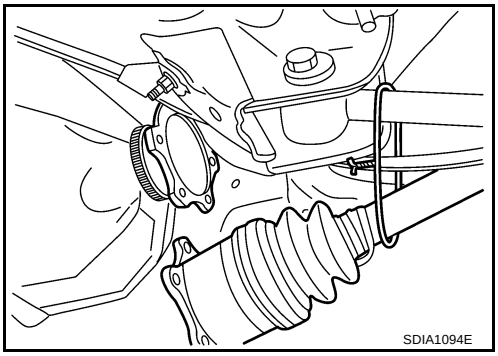


1. Rear final drive assembly
2. Upper stopper
3. Propeller shaft
4. Washer
5. Lower stopper
6. Drive shaft

REMOVAL

1. Remove propeller shaft from the final drive. Refer to PR-6, "Removal and Installation" .

   CAUTION:
   Do not impact or damage propeller shaft tube.
2. Remove rear stabilizer bar with a power tool. Refer to FSU-18, "STABILIZER BAR" .
3. Remove drive shaft from final drive. Then suspend it by wire etc. Refer to RAX-10, "REAR DRIVE SHAFT" .
4. Remove breather hose from the final drive.
5. Remove rear wheel sensor. Refer to BRC-34, "WHEEL SENSORS" (ABS), BRC-73, "WHEEL SENSORS" (TCS/ABS) or BRC-128, "WHEEL SENSORS" (VDC/TCS/ABS).

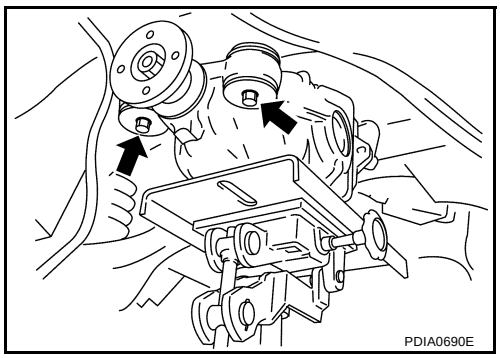


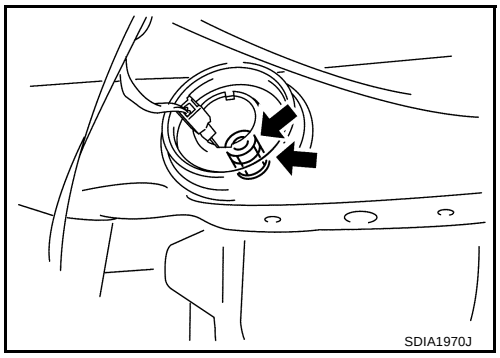
6. Set a suitable jack to rear final drive assembly.

CAUTION:
Do not place a suitable jack on the rear cover (aluminum case).

7. Remove the mounting bolts and nuts connecting to the suspension member, and remove rear final drive assembly.

CAUTION:
Secure rear final drive assembly to a suitable jack while removing it.





INSTALLATION

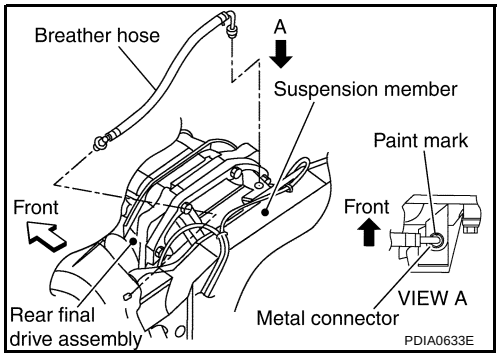
Note the following, and installation is in the reverse order of removal.

- Refer to RFD-19, "COMPONENTS" (R200 2-pinion) or RFD-39, "COMPONENTS" (R200V LSD) about each tightening torque.
- When installing breather hoses, refer to the figure.

CAUTION:
Make sure there are no pinched or restricted areas on the breather hose caused by bending or winding when installing it.

- For installation, the vehicle side end shall be inserted to suspension member. Install metal connector side of this hose to rear cover by inserting it with aiming painted marking to the front of vehicle.

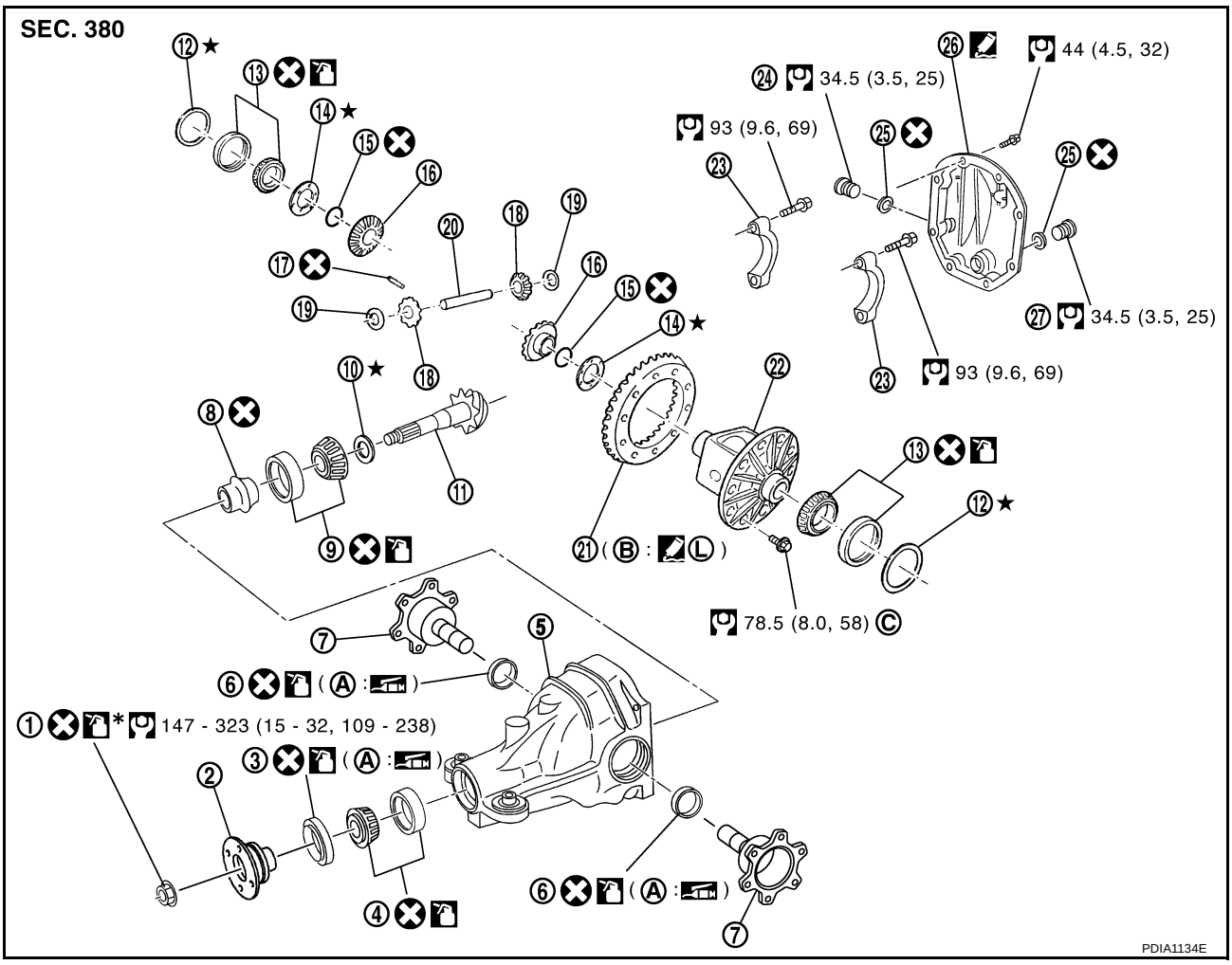
- When oil leaks while removing final drive assembly, check oil level after the installation. Refer to RFD-9, "Checking Differential Gear Oil" .



Disassembly and Assembly (R200 2-pinion)

NDS0000J

COMPONENTS



1.	Drive pinion lock nut	2.	Companion flange	3.	Front oil seal
4.	Pinion front bearing	5.	Gear carrier	6.	Side oil seal
7.	Side flange	8.	Collapsible spacer	9.	Pinion rear bearing
10.	Pinion height adjusting washer	11.	Drive pinion	12.	Side bearing adjusting washer
13.	Side bearing	14.	Side gear thrust washer	15.	Circular clip
16.	Side gear	17.	Lock pin	18.	Pinion mate gear
19.	Pinion mate thrust washer	20.	Pinion mate shaft	21.	Drive gear
22.	Differential case	23.	Bearing cap	24.	Filler plug
25.	Gasket	26.	Rear cover	27.	Drain plug

A: Oil seal lip

B: Screw hole

C: After tightening the bolts to the specified torque, tighten the bolts additionally by turning the bolts 31 to 36 degrees.

Refer to GI-11, "Components" and the followings for the symbols in the figure.

: Apply gear oil.

: Apply anti-corrosion oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

ASSEMBLY INSPECTION AND ADJUSTMENT

- Before inspection and adjustment, drain gear oil.

Total Preload Torque

1. Secure final drive assembly onto an attachment.

Tool number : KV38100800 (J-25604-01)

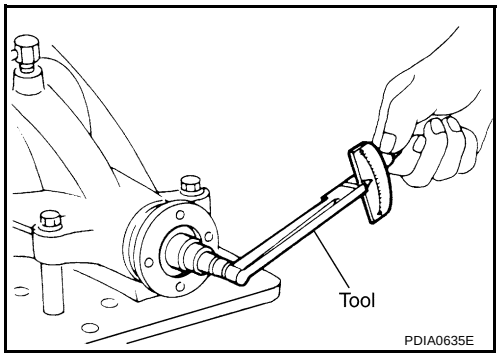
2. Remove side flanges.
3. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
4. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
5. Measure total preload with the preload gauge.

Tool number : ST3127S000 (J-25765-A)

Total preload torque:

2.85 – 3.75 N·m (0.29 – 0.38 kg-m, 26 – 33 in-lb)

NOTE:
Total preload torque = Pinion bearing preload torque + Side bearing preload torque



- If measured value is out of the specification, disassemble it to check and adjust each part. Adjust the pinion bearing preload and side bearing preload. Adjust the pinion bearing preload first, then adjust the side bearing preload.

When the preload torque is large

On pinion bearings: **Replace the collapsible spacer.**

On side bearings: **Use thinner side bearing adjusting washers by the same amount to each side. Refer to RFD-60, "Side Bearing Adjusting Washer" .**

When the preload is small

On pinion bearings: **Tighten the drive pinion lock nut.**

On side bearings: **Use thicker side bearing adjusting washers by the same amount to each side. Refer to RFD-60, "Side Bearing Adjusting Washer" .**

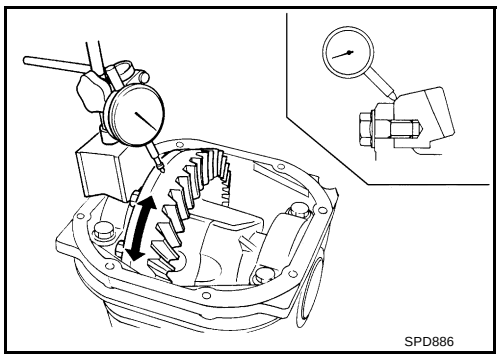
Drive Gear Runout

1. Remove rear cover. Refer to RFD-24, "Differential Assembly" .
2. Fit a dial indicator to the drive gear back face.
3. Rotate the drive gear to measure runout.

Runout limit: 0.05 mm (0.0020 in) or less

- If the runout is outside of the repair limit, check drive gear assembly condition; foreign material may be caught between drive gear and differential case, or differential case or drive gear may be deformed, etc.

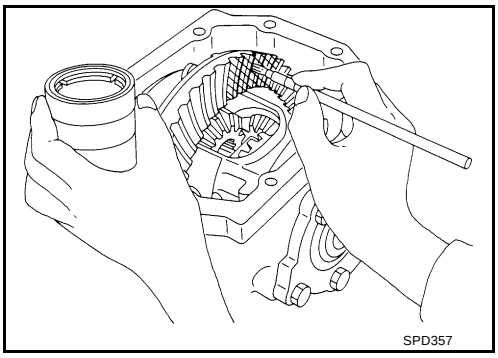
CAUTION:
Replace drive gear and drive pinion gear as a set.



Tooth Contact

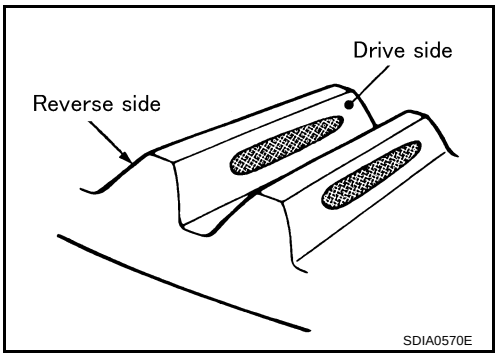
1. Remove rear cover. Refer to RFD-24, "Differential Assembly" .
2. Apply red lead to drive gear.

CAUTION:
Apply red lead to both the faces of 3 to 4 gears at 4 locations evenly spaced on drive gear.



3. Rotate drive gear back and forth several times, check drive pinion gear to drive gear tooth contact.

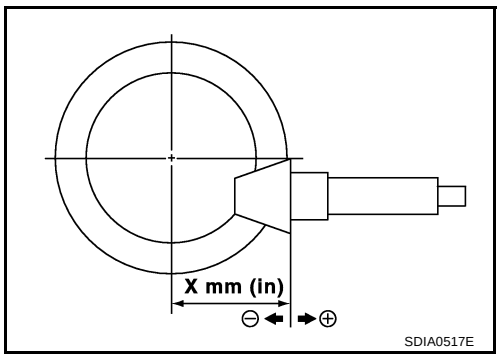
CAUTION:
Check tooth contact on drive side and reverse side.



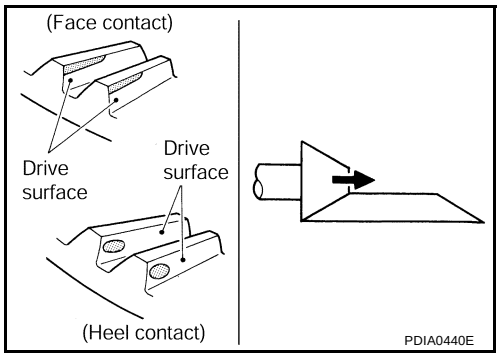
Tooth contact condition		Pinion height adjusting washer selection valve [mm (in)]		Adjustment (Yes/No)	Possible cause
Drive side	Back side				
Heel side Toe side	Toe side Heel side	Thicker ↑	+0.09 (+0.0035)	Yes	Occurrence of noise and scoring sound in all speed ranges.
			+0.06 (+0.0024)		Occurrence of noise when accelerating.
			+0.03 (+0.0012)	No	–
			0		
		Thinner ↓	-0.03 (-0.0012)		
			-0.06 (-0.0024)	Yes	Occurrence of noise at constant speed and decreasing speed.
			-0.09 (-0.0035)		Occurrence of noise and scoring sound in all speed ranges.

SDIA0207E

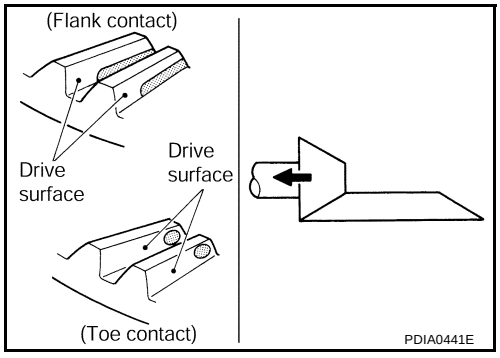
4. If tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).



- If the tooth contact is near the face (face contact), or near the heel (heel contact), thicken pinion height adjusting washers to move drive pinion closer to drive gear.
  Refer to RFD-60, "Pinion Height Adjusting Washer" .



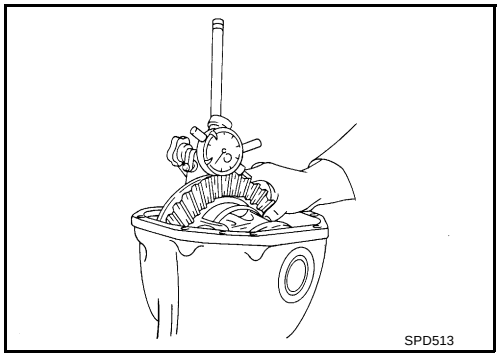
- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), thin pinion height adjusting washers to move drive pinion farther from drive gear.
  Refer to RFD-60, "Pinion Height Adjusting Washer" .



Backlash

1. Remove rear cover. Refer to RFD-24, "Differential Assembly" .
2. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash: 0.10 – 0.15 mm (0.0039 – 0.0059 in)



- If the backlash is outside of the specified value, change the thickness of side bearing adjusting washer.

When the backlash is large:

Make drive gear back side adjusting washer thicker, and drive gear tooth side adjusting washer thinner by the same amount. Refer to RFD-60, "Side Bearing Adjusting Washer" .

When the backlash is small:

Make drive gear back side adjusting washer thinner, and drive gear tooth side adjusting washer thicker by the same amount. Refer to RFD-60, "Side Bearing Adjusting Washer" .

CAUTION:

Do not change the total amount of washers as it will change the bearing preload.

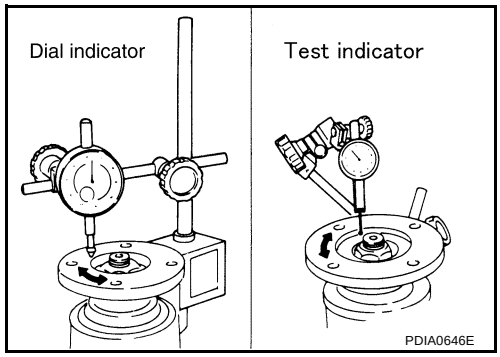
Companion Flange Runout

1. Fit a dial indicator onto the companion flange face (inner side of the propeller shaft mounting bolt holes).
2. Rotate the companion flange to check for runout.

Runout limit : 0.08 mm (0.0031 in)

3. Fit a test indicator to the inner side of the companion flange (socket diameter).
4. Rotate the companion flange to check for runout.

Runout limit : 0.08 mm (0.0031 in)



5. If the runout value is outside the repair limit, follow the procedure below to adjust.

a. Check for runout while changing the phase between companion flange and drive pinion gear by 90° step, and search for the position where the runout is the minimum.

b. If the runout value is still outside of the limit after the phase has been changed, possible cause will be an assembly malfunction of drive pinion and pinion bearing and malfunction of pinion bearing. Check for these items and repair if necessary.

c. If the runout value is still outside of the limit after the check and repair, replace companion flange.

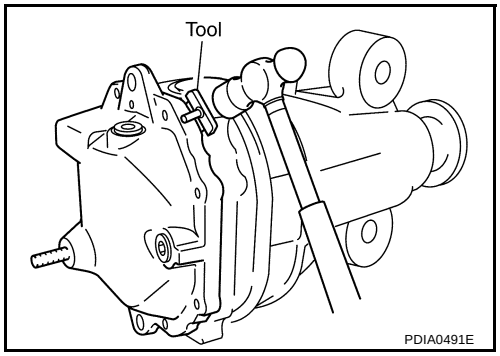
DISASSEMBLY

Differential Assembly

1. Drain gear oil, if necessary.
2. Remove side flange.
3. Remove rear cover mounting bolts.
4. Remove rear cover to insert the seal cutter between gear carrier and rear cover.

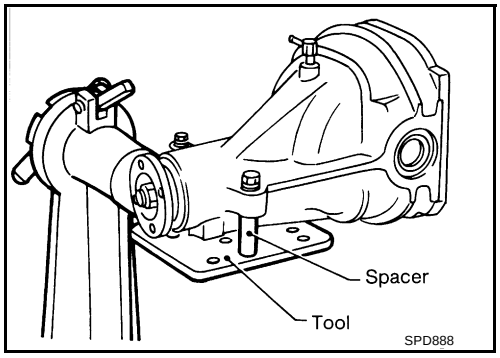
   Tool number : KV10111100 (J-37228)

   CAUTION:
   - **Be careful not to damage the mating surface.**
   - **Do not insert flat-bladed screwdriver, this way damage the mating surface.**



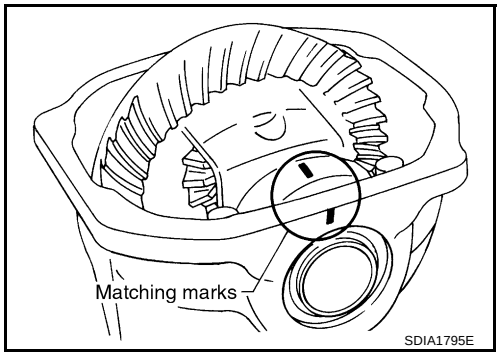
5. Using two 45 mm (1.77 in) spacers, mount carrier on the attachment.

   Tool number : KV38100800 (J-25604-01)

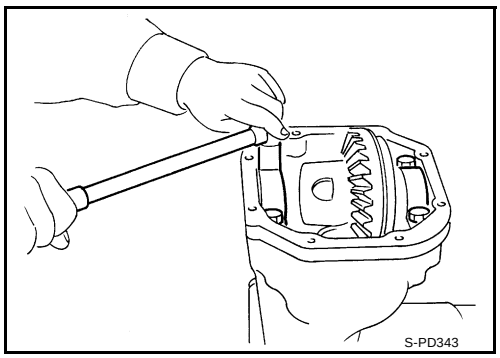


6. For proper reinstallation, paint matching marks on one side of the bearing cap.

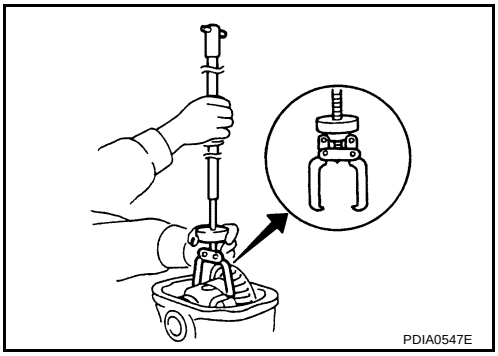
   CAUTION:
   - **For matching marks, use paint. Do not damage bearing caps and gear carrier.**
   - **Bearing caps are line-board during manufacture. The matching marks are used to reinstall them in their original positions.**



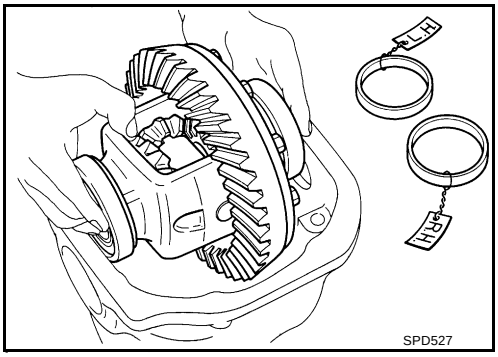
7. Remove bearing caps.



8. Lift differential case assembly out with a suitable tool.



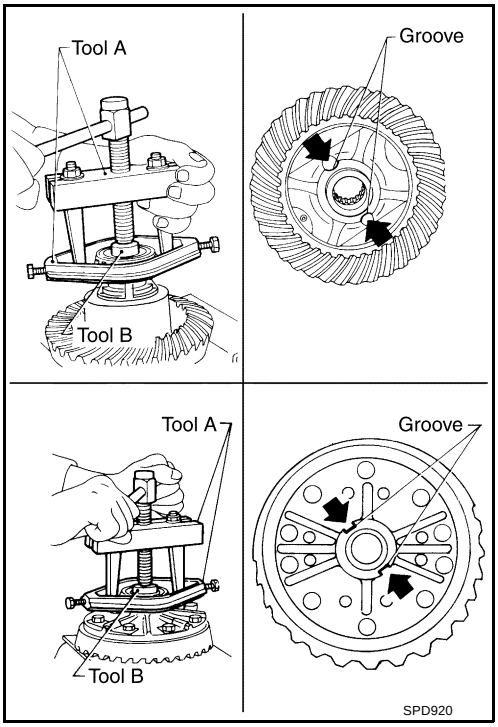
- Keep side bearing outer races together with inner race. Do not mix them up.
  Also, keep side bearing adjusting washers together with bearings.



9. Remove side bearing inner race.
   To prevent damage to bearing, engage puller jaws in groove.

   Tool number **A: ST33051001 (J-22888-20)**
   B: ST33061000 (J-8107-2)

   CAUTION:
   - **To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.**
   - **It is not necessary to remove side bearing inner race except it is replaced.**

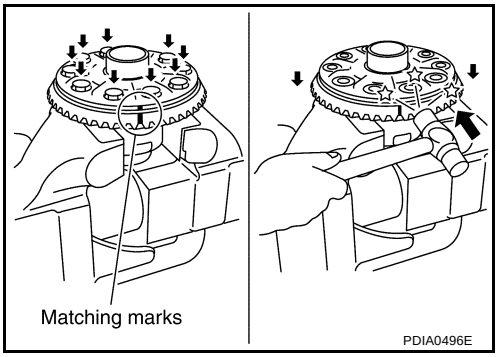


10. For proper reinstallation, paint matching marks on one differential case assembly.

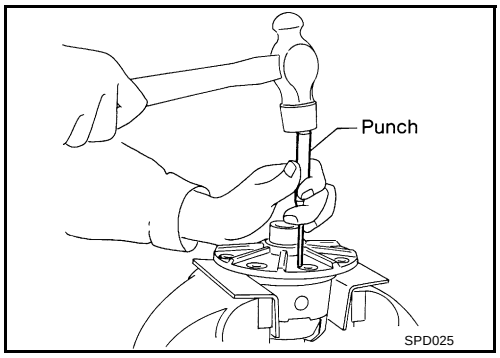
    CAUTION:
    For matching marks, use paint. Do not damage differential case and drive gear.

11. Remove drive gear mounting bolts.
12. Tap drive gear off differential case assembly with a soft hammer.

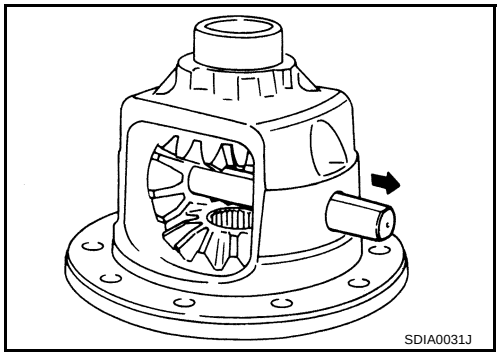
    CAUTION:
    Tap evenly all around to keep drive gear from bending.



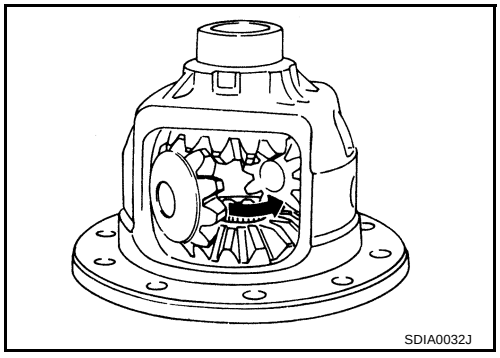
13. Remove lock pin of pinion mate shaft with a punch from drive gear side.



14. Remove pinion mate shaft.



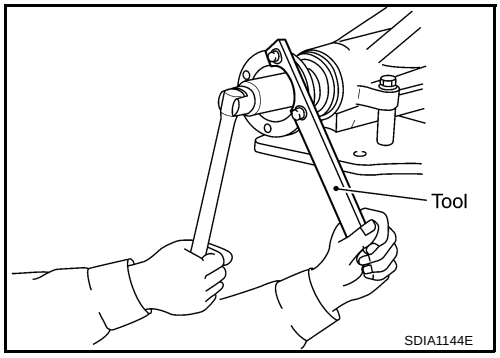
15. Turn pinion mate gear, then remove pinion mate gear, pinion mate thrust washer, side gear and side gear thrust washer from differential case.



Drive Pinion Assembly

1. Remove differential assembly. Refer to RFD-24, "Differential Assembly" .
2. Remove drive pinion lock nut with the flange wrench.

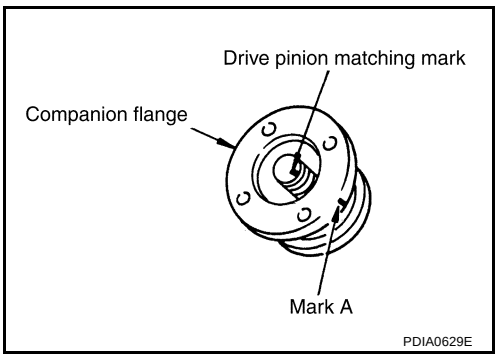
Tool number : KV40104000 (—)



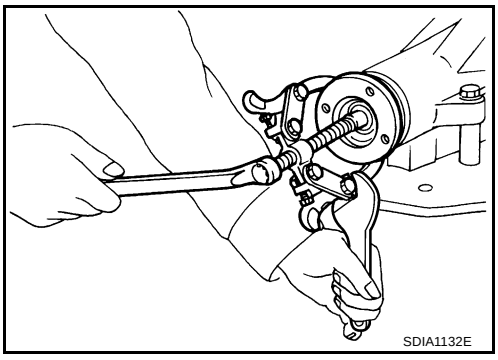
3. Put matching mark on the end of drive pinion. The matching mark should be in line with the matching mark A on companion flange.

CAUTION:
For matching mark, use paint. Do not damage companion flange and drive pinion.

NOTE:
The matching mark A on the final drive companion flange indicates the maximum vertical runout position.
When replacing companion flange, matching mark is not necessary.



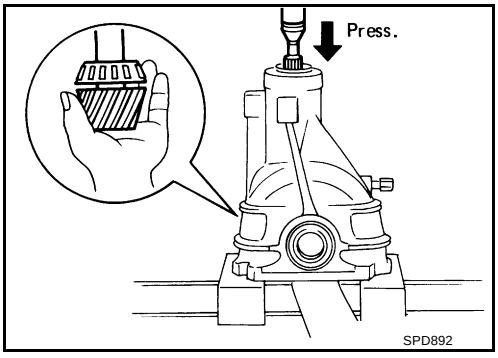
4. Remove companion flange using the suitable puller.



5. Press drive pinion assembly out of gear carrier.

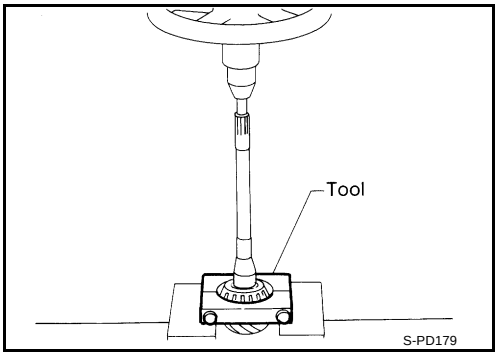
CAUTION:
Do not drop drive pinion assembly.

6. Remove front oil seal.
7. Remove side oil seal.
8. Remove pinion front bearing inner race.
9. Remove collapsible spacer.



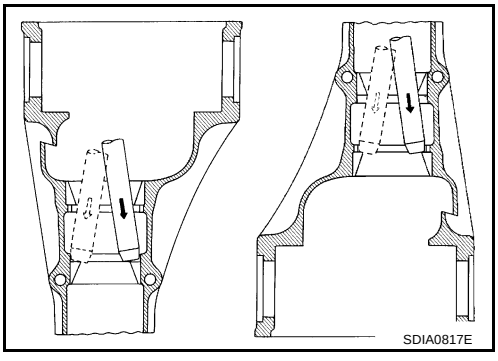
10. Remove pinion rear bearing inner race and drive pinion height adjusting washer with the replacer.

Tool number : ST30031000 (J-22912-01)



11. Tap pinion front/rear bearing outer races uniformly a brass rod or equivalent to removed.

CAUTION:
Be careful not to damage gear carrier.



INSPECTION AFTER DISASSEMBLY

Clean up the disassembled parts. Then, inspect if the parts are worn or damaged. If so, follow the measures below.

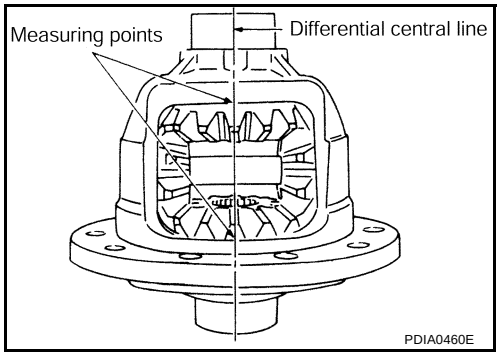
Content	Conditions and Measures
Hypoid gear	● If the gear teeth do not mesh or line-up correctly, determine the cause and adjust or replace as necessary. ● If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.
Bearing	● If any chipped (by friction), pitted, worn, rusted or scratched mark, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).
Side gear and Pinion mate gear	● If any cracks or damage on the surface of the tooth is found, replace. ● If any worn or chipped mark on the contact sides of the thrust washer is found, replace.
Side gear thrust washer and pinion mate thrust washer	● If it is chipped (by friction), damaged, or unusually worn, replace.
Oil seal	● Whenever disassembled, replace. ● If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.
Differential case	● If any wear or crack on the contact sides of the differential case is found, replace.
Companion flange	● If any chipped mark (about 0.1 mm, 0.004 in) or other damage on the contact sides of the lips of the companion flange is found, replace.

ADJUSTMENT AND SELECTION OF ADJUSTING WASHERS

Differential Side Gear Clearance

- Assemble the differential parts if they are disassembled. Refer to RFD-24, "Differential Assembly" .

1. Place differential case straight up so that side gear to be measured comes upward.



2. Using feeler gauge, measure the clearance between side gear back and differential case at 3 different points, while rotating side gear. Average the 3 readings, and then measure the clearance of the other side as well.

Side gear back clearance specification:

0.2 mm (0.008 in) or less.
(Each gear should rotate smoothly without excessive resistance during differential motion.)

CAUTION:
To prevent side gear from tilting, insert feeler gauges with the same thickness from both sides.

3. If the back clearance is outside the specification, use a thicker/thinner side gear thrust washer to adjust. Refer to RFD-60, "Side Gear Thrust Washer" .

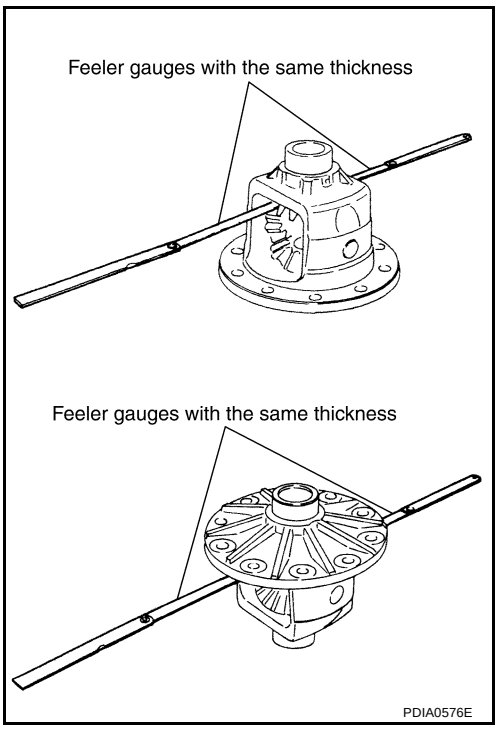
When the back clearance is large:

Use a thicker thrust washer.

When the back clearance is small:

Use a thinner thrust washer.

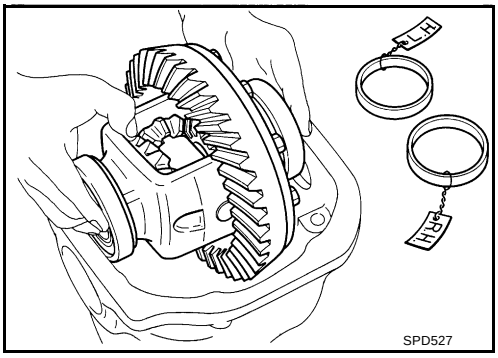
CAUTION:
Select a side gear thrust washer for right and left individually.



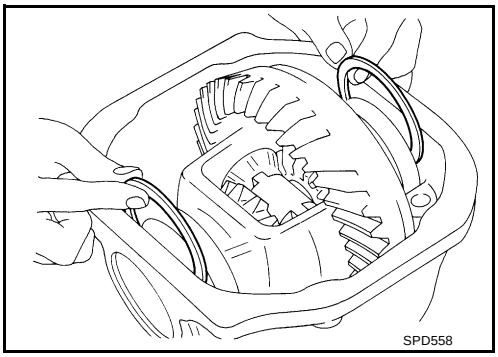
Side Bearing Preload

- Selecting carrier side bearing adjusting washers is required for successful completion of this procedure.

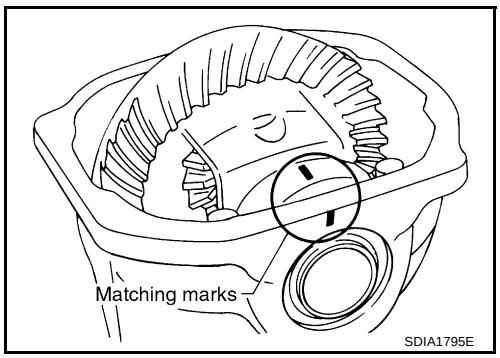
1. Make sure all parts are clean. Also, make sure the bearings are well lubricated with gear oil.
2. Place the differential case, with side bearings and bearing races installed, into gear carrier.



3. Insert left and right original side bearing adjusting washers in place between side bearings and gear carrier.



4. Install bearing caps in their correct locations and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-19, "COMPONENTS" .
5. Turn the carrier several times to seat the bearings.

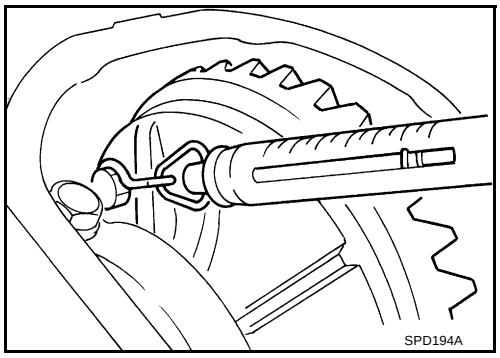


6. Measure the turning torque of the carrier at the drive gear mounting bolts with a spring gauge.

Tool number : — (J-8129)

Specification:

34.2 – 39.2 N (3.5 – 4.0 kg, 7.7 – 8.8 lb) of pulling force at the drive gear bolt



7. If the turning torque is outside the specification, use a thicker/ thinner side bearing adjusting washer to adjust. Refer to RFD-60, "Side Gear Thrust Washer" .

If the turning torque is less than the specified range:

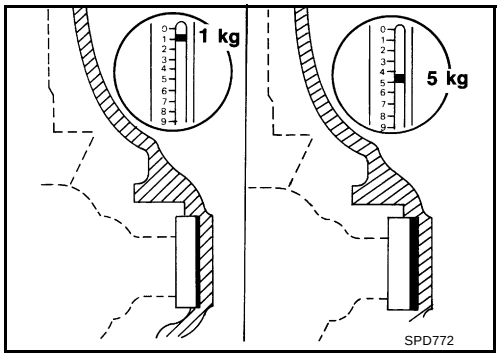
Use a thicker thrust washer.

If the turning torque is greater than the specification:

Use a thinner thrust washer.

CAUTION:

Select a side bearing adjusting washer for right and left individually.

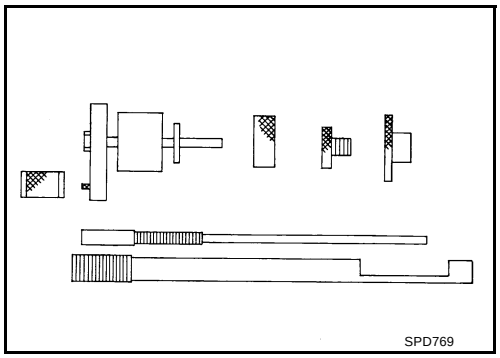


8. Record the total amount of washer thickness required for the correct carrier side bearing preload.

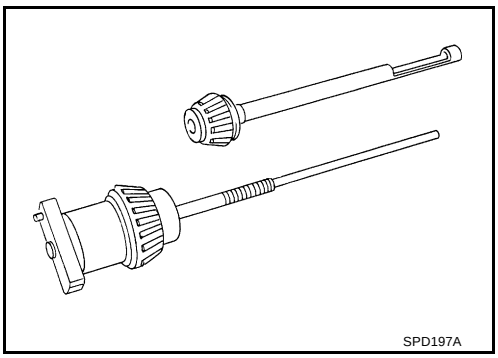
Pinion Gear Height

1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the differential shim selector tool.

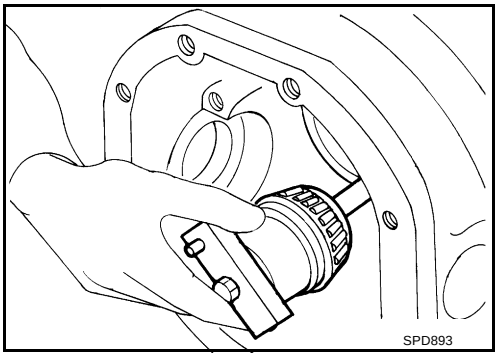
Tool number : — (J-34309)



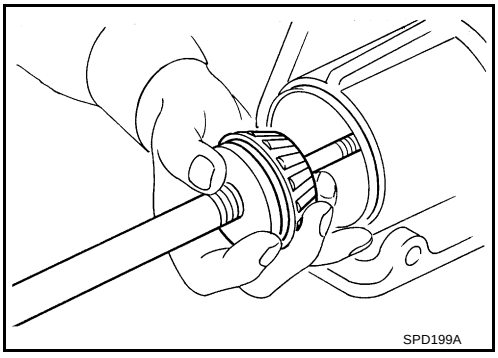
- **Pinion front bearing;** make sure the J-34309-3 pinion front bearing seat is secured tightly against the J-34309-2 gauge anvil. Then turn the pinion front bearing pilot, J-34309-5, to secure the bearing in its proper position.
- **Pinion rear bearing;** the pinion rear bearing pilot, J-34309-8, is used to center the pinion rear bearing only. The pinion rear bearing locking seat, J-34309-4, is used to lock the bearing to the assembly.
- **Installation of J-34309-9 and J-34309-16;** place a suitable 2.5 mm (0.098 in) thick plain washer between J-34309-9 and J-34309-16. Both surfaces of J-34309-9 and J-34309-16 must be parallel with a clearance of 2.5 mm (0.098 in).


SPD197A

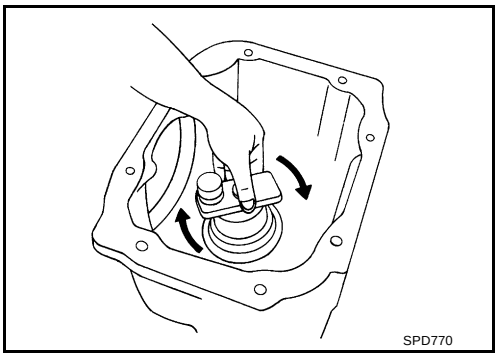
3. Install the pinion rear bearing inner race into gear carrier. Then place the pinion preload shim selector tool, J-34309-1, gauge screw assembly.


SPD893

4. Assemble the pinion front bearing inner race and the J-34309-2 gauge anvil. Assemble them together with the J-34309-1 gauge screw in gear carrier. Make sure that the pinion height gauge plate, J-34309-16, will turn a full 360 degrees. Tighten the two sections together by hand.


SPD199A

5. Turn the assembly several times to seat the bearings.

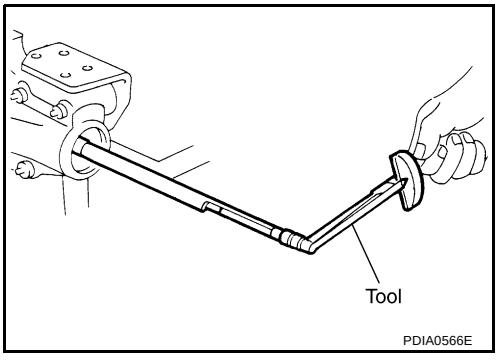

SPD770

6. Measure the turning torque at the end of the J-34309-2 gauge anvil using preload gauge.

Tool number : ST3127S000 (J-25765- A)

Turning torque specification:

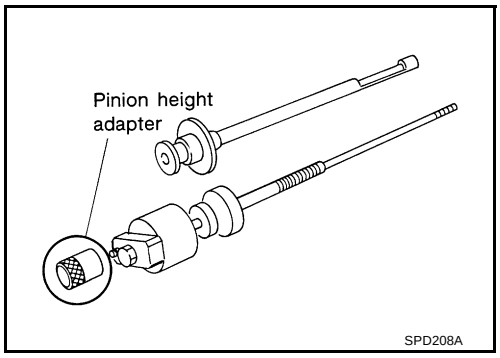
1.0 – 1.3 N·m (0.11 – 0.13 kg-m, 9 – 11 in-lb)



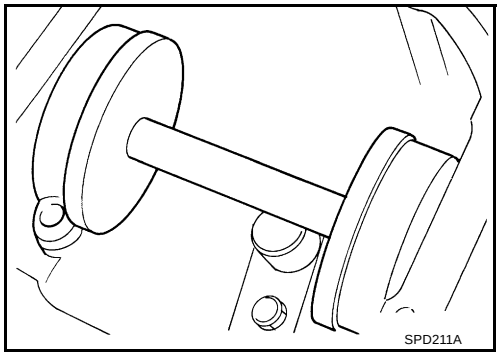
PDIA0566E

7. Place the J-34309-11 “R200A” pinion height adapter onto the gauge plate and tighten it by hand.

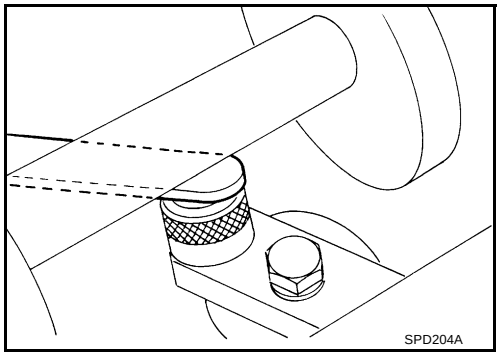
   CAUTION:
   Make sure all machined surfaces are clean.



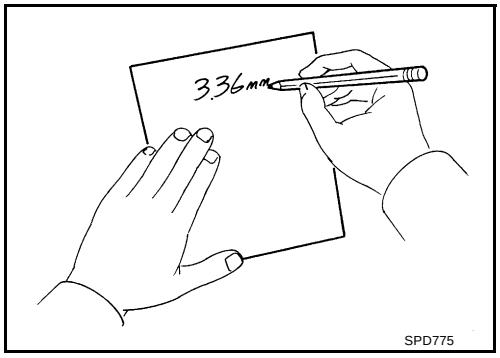
8. Position the side bearing discs, J-25269-4, and arbor firmly into the side bearing bores. Install the bearing caps and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-19, "COMPONENTS" .



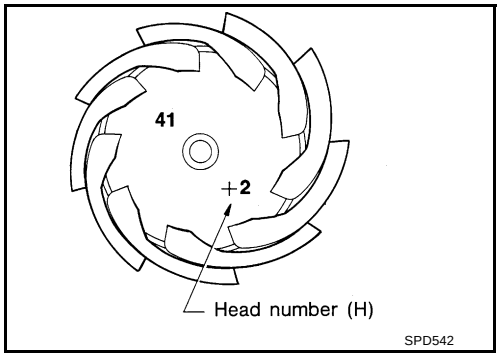
9. Select the correct standard pinion height adjusting washer thickness. Select by using a standard gauge of 3 mm (0.12 in) and your J-34309-101 feeler gauge. Measure the distance between the J-34309-11 pinion height adapter including the standard gauge and the arbor.



10. Write down exact measurement (the value of feeler gauge).

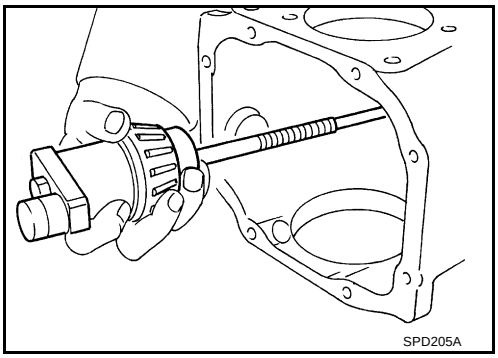


11. Correct the pinion height washer size by referring to the “pinion head number”.
    There are two numbers painted on the drive pinion. The first one refers to the drive pinion and drive gear as a matched set. This number should be the same as the number on the drive gear. The second number is the “pinion head height number”. It refers to the ideal pinion height from standard for quietest operation. Use the following chart to determine the correct pinion height washer.



Pinion head height number	Add or remove from the standard pinion height adjusting washer thickness measurement
- 6	Add 0.06 mm (0.0024 in)
- 5	Add 0.05 mm (0.0020 in)
- 4	Add 0.04 mm (0.0016 in)
- 3	Add 0.03 mm (0.0012 in)
- 2	Add 0.02 mm (0.0008 in)
- 1	Add 0.01 mm (0.0004 in)
0	Use the selected washer thickness
+1	Subtract 0.01 mm (0.0004 in)
+2	Subtract 0.02 mm (0.0008 in)
+3	Subtract 0.03 mm (0.0012 in)
+4	Subtract 0.04 mm (0.0016 in)
+5	Subtract 0.05 mm (0.0020 in)
+6	Subtract 0.06 mm (0.0024 in)

12. Select the correct pinion height adjusting washer. Refer to RFD-60, "Pinion Height Adjusting Washer" .
13. Remove the J-34309 differential shim selector tool from the final drive housing. Then disassemble to retrieve the pinion bearings.



ASSEMBLY

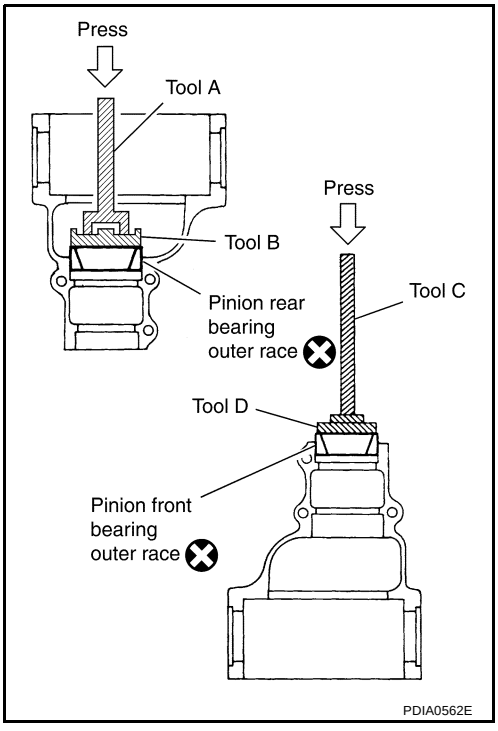
Drive Pinion Assembly

1. Install front and rear bearing outer races using drifts.

Tool number **A: ST30720000 (J-25405)**
B: KV40105230 (—)
C: ST30611000 (J-25742-1)
D: ST30613000 (J-25742-3)

CAUTION:
- **At first, using a hammer, tap bearing outer race until it becomes flat to gear carrier.**
- **Do not reuse pinion front and rear bearing outer race.**

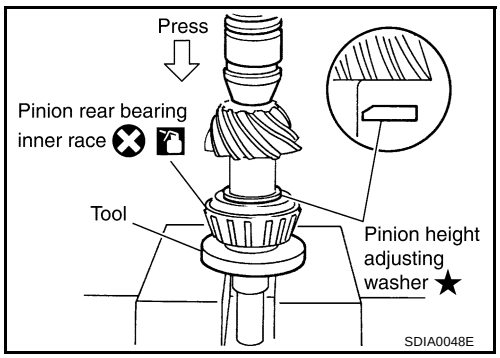
2. Select drive pinion height adjusting washer. Refer to RFD-60, "Pinion Height Adjusting Washer" .



3. Install selected drive pinion height adjusting washer to drive pinion. Press pinion rear bearing inner race to it, using drift.

   Tool number : ST30901000 (J-26010-01)

   CAUTION:
   - **Pay attention to the direction of pinion height adjusting washer. (Assemble as shown in the figure.)**
   - **Do not reuse pinion rear bearing inner race.**

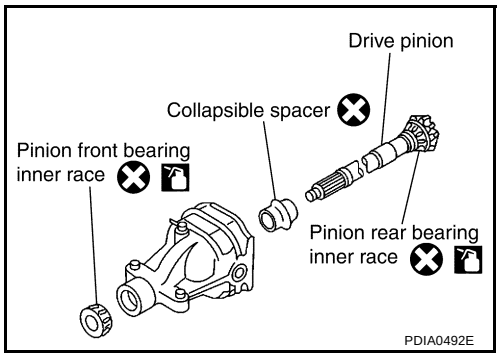


4. Assemble collapsible spacer to drive pinion.

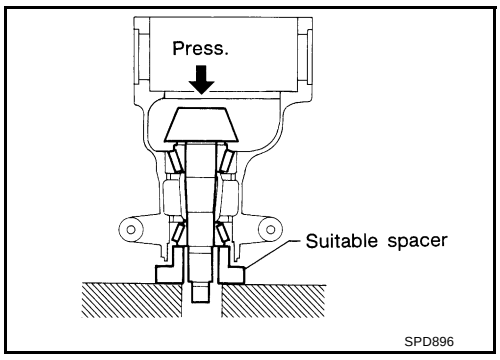
   CAUTION:
   Do not reuse collapsible spacer.

5. Apply gear oil to pinion rear bearing, and assemble drive pinion into gear carrier.
6. Apply gear oil to pinion front bearing, and assemble pinion front bearing inner race to drive pinion assembly.

   CAUTION:
   Do not reuse pinion front bearing inner race.



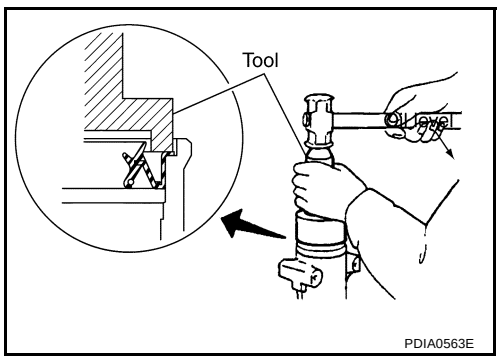
7. Using suitable spacer, press the pinion front bearing inner race to drive pinion as far as drive pinion nut can be tightened.



8. Using the drift, install front oil seal as shown in the figure.

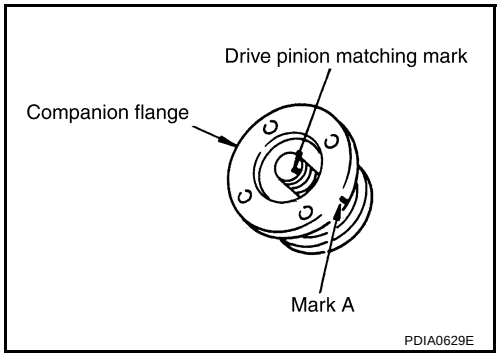
   Tool number : ST30720000 (J-25405)

   CAUTION:
   - **Do not reuse oil seal.**
   - **When installing, do not incline oil seal.**
   - **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**



9. Install companion flange.

   NOTE:
   When reusing drive pinion, align the matching mark of drive pinion with the matching mark A of companion flange, then install companion flange.



10. Apply anti-corrosion oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.

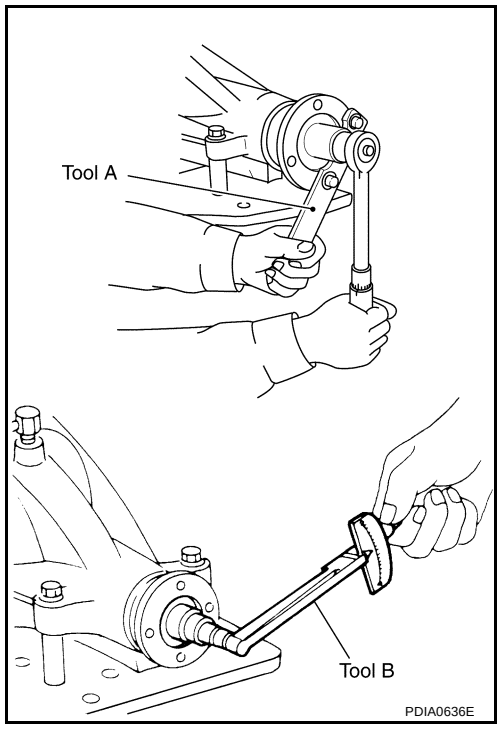
CAUTION:
Do not reuse drive pinion lock nut.

11. Adjust to the drive pinion lock nut tightening torque and pinion bearing preload torque.

Tool number **A: KV40104000 (—)**
B: ST3127S000 (J-25765-A)

Drive pinion lock nut tightening torque:
147 – 323 N·m (15 – 32 kg-m, 109 – 238 ft-lb)

Drive pinion bearing preload:
2.65 – 3.23 N·m (0.27 – 0.32 kg-m, 24 – 28 in-lb)



CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the preload torque.**
- **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.**

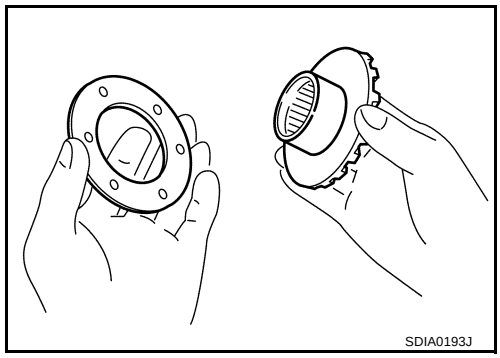
12. Install differential case assembly. Refer to RFD-35, "Differential Assembly" .

CAUTION:
Do not install rear cover yet.

13. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and companion flange runout. Refer to RFD-20, "Drive Gear Runout" , RFD-21, "Tooth Contact" , RFD-22, "Backlash" and RFD-23, "Companion Flange Runout" .
Recheck above items. Readjust the above description, if necessary.
14. Check total preload torque. Refer to RFD-20, "Total Preload Torque" .
15. Install rear cover. Refer to RFD-35, "Differential Assembly" .

Differential Assembly

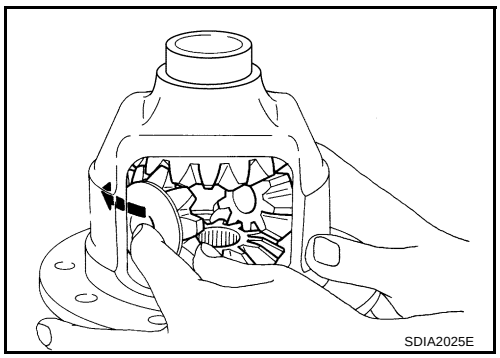
1. Install side gear thrust washers with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the side gears.



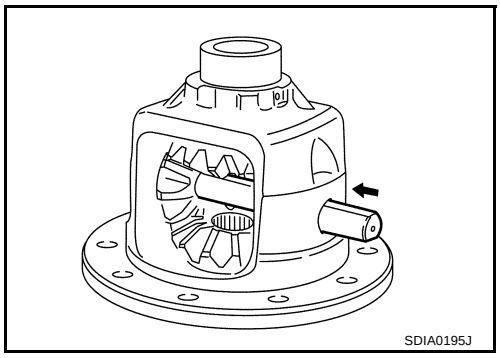
2. Install side gears and thrust washers into differential case.

CAUTION:
Make sure that the circular clip is installed to side gears.

3. Align 2 pinion mate gears in diagonally opposite positions, then rotate and install them into differential case after installing thrust washer to pinion mate gear.

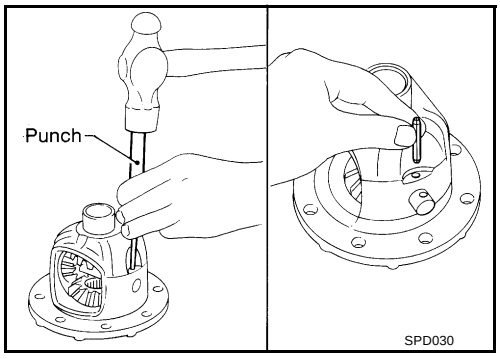


4. Align the lock pin holes on differential case with shaft, and install pinion mate shaft.
5. Measure side gear end play. If necessary, select the appropriate side gear thrust washers. Refer to RFD-59, "DIFFERENTIAL SIDE GEAR CLEARANCE" .

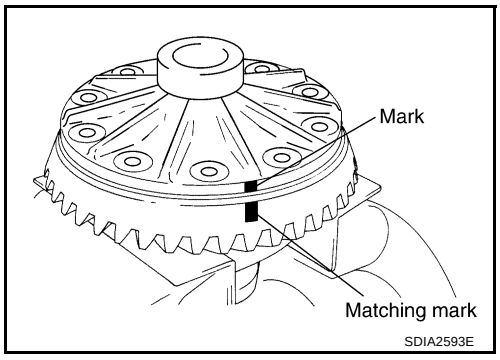


6. Drive a lock pin into pinion mate shaft, using a punch. Make sure lock pin is flush with differential case.

CAUTION:
Do not reuse lock pin.

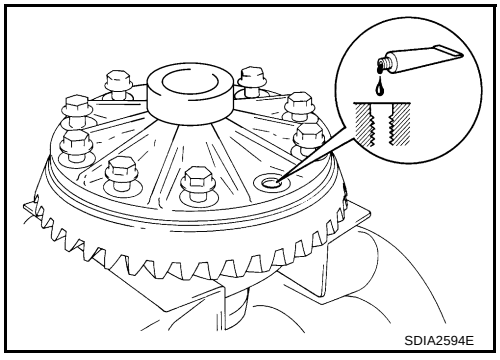


7. Align the matching mark of differential case with the mark of drive gear, then place drive gear.



8. Apply thread locking sealant into the thread hole of drive gear.
   - **Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

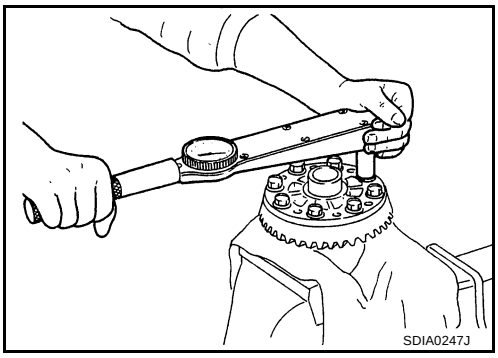
CAUTION:
Drive gear back and threaded holes shall be cleaned and degreased sufficiently.



9. Install drive gear on the mounting bolts, and then tighten to the specified torque. Refer to RFD-19, "COMPONENTS" .

CAUTION:

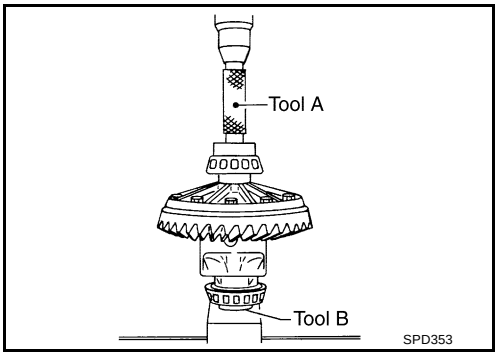
- **Tighten bolts in a crisscross fashion.**
- **After tightening the bolts to the specified torque, tighten the bolts additionally by turning the bolts 31 to 36 degrees.**



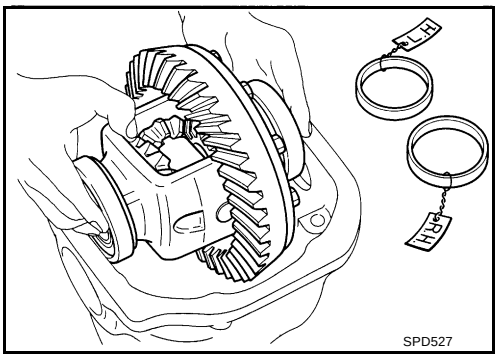
10. Press side bearing inner races to differential case, using the drift and the base.

Tool number **A: KV38100300 (J-25523)**
B: ST33061000 (J-8107-2)

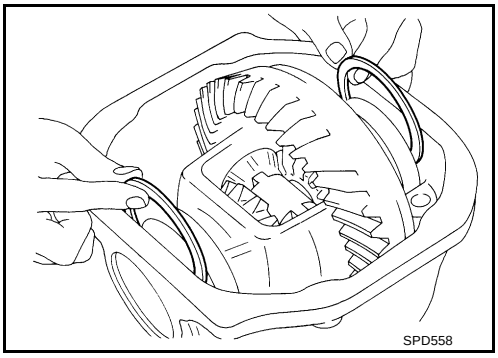
CAUTION:
Do not reuse side bearing inner race.



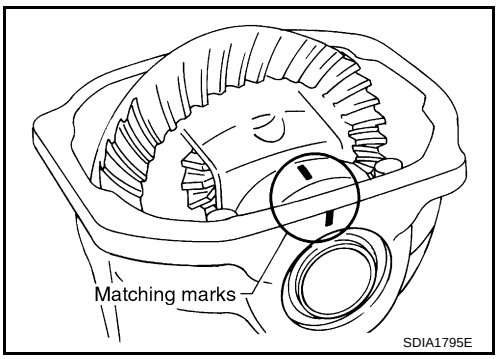
11. Install differential case assembly with side bearing outer races into gear carrier.
12. Measure side bearing preload. If necessary, select the appropriate side bearing adjusting washers. Refer to RFD-29, "Side Bearing Preload" .



13. Insert selected left and right side bearing adjusting washers in place between side bearings and gear carrier.

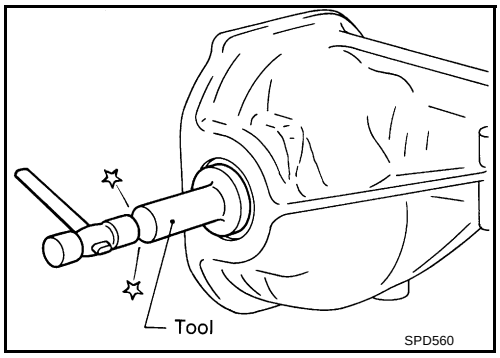


14. Align matching marks on bearing cap with that on gear carrier.
15. Install bearing caps and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-19, "COMPONENTS" .



16. Using the drift, drive side oil seals until it becomes flush with the case end.

Tool number : KV38100200 (J-26233)



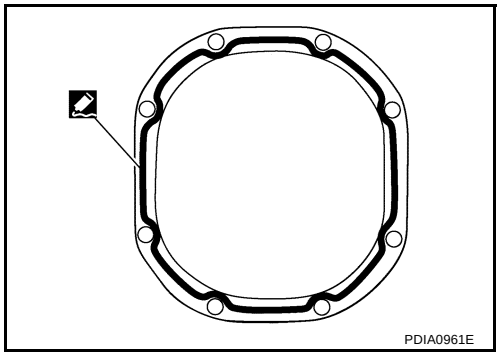
CAUTION:

- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**

17. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and total preload torque. Refer to RFD-20, "Drive Gear Runout" , RFD-21, "Tooth Contact" , RFD-22, "Backlash" and RFD-20, "Total Preload Torque" .
Recheck above items. Readjust the above description, if necessary.

18. Apply sealant to mating surface of rear cover.

- **Use Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**



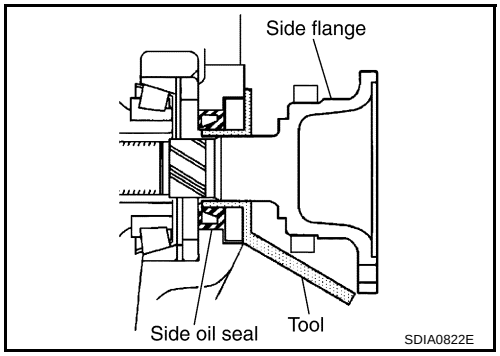
CAUTION:
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.

19. Install rear cover on gear carrier and tighten mounting bolts with the specified torque. Refer to RFD-19, "COMPONENTS" .

20. Install side flange with the following procedure.

a. Attach the protector to side oil seal.

Tool number : KV38107900 (J-39352)



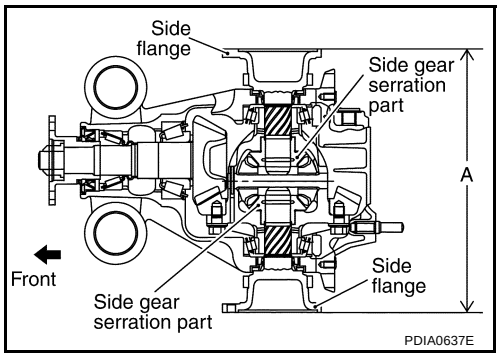
b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.

c. Put a suitable drift on the center of side flange, then drive it until sound changes.

NOTE:
When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

d. Confirm that the dimension of the side flange installation (Measurement A) in the figure comes into the following.

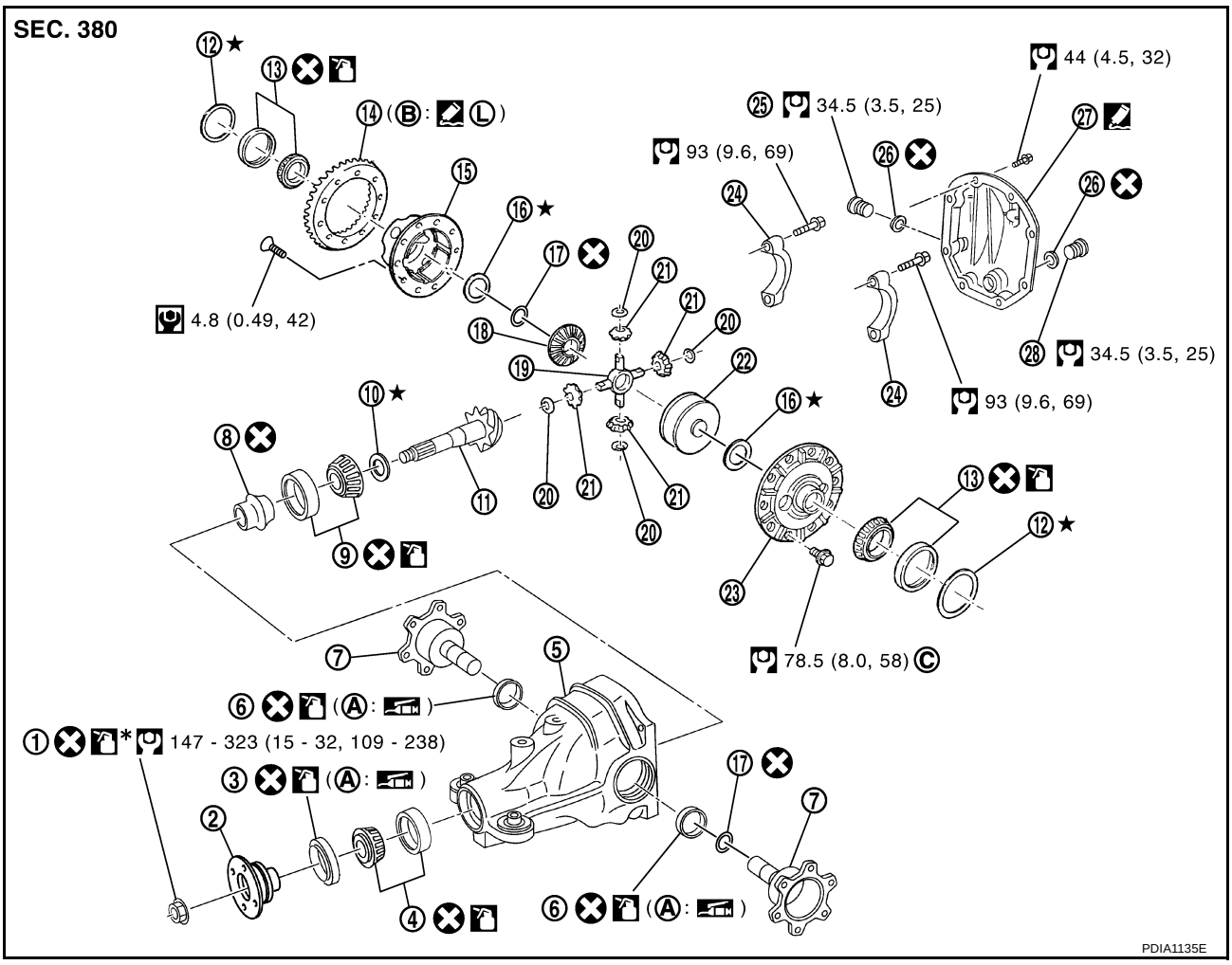
Measurement A: 326 – 328 mm (12.83 – 12.91 in)



Disassembly and Assembly (R200V LSD)

NDS0000K

COMPONENTS



1. Drive pinion lock nut
2. Companion flange
3. Front oil seal
4. Pinion front bearing
5. Gear carrier
6. Side oil seal
7. Side flange
8. Collapsible spacer
9. Pinion rear bearing
10. Pinion height adjusting washer
11. Drive pinion
12. Side bearing adjusting washer
13. Side bearing
14. Drive gear
15. Differential case B
16. Side gear thrust washer
17. Circular clip
18. Side gear
19. Pinion mate shaft
20. Pinion mate thrust washer
21. Pinion mate gear
22. Viscous coupling
23. Differential case A
24. Bearing cap
25. Filler plug
26. Gasket
27. Rear cover
28. Drain plug

A: Oil seal lip

B: Screw hole

C: After tightening the bolts to the specified torque, tighten the bolts additionally by turning the bolts 31 to 36 degrees.

Refer to GI-11, "Components" and the followings for the symbols in the figure.

: Apply gear oil.

*: Apply anti-corrosion oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

L: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .

ASSEMBLY INSPECTION AND ADJUSTMENT

- Before inspection and adjustment, drain gear oil.

Total Preload Torque

1. Secure final drive assembly onto an attachment.

Tool number : KV38100800 (J-25604-01)

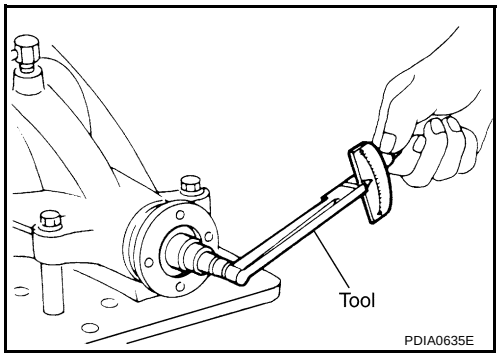
2. Remove side flanges.
3. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
4. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
5. Measure total preload with the preload gauge.

Tool number : ST3127S000 (J-25765-A)

Total preload torque:

2.85 – 3.75 N·m (0.29 – 0.38 kg-m, 26 – 33 in-lb)

NOTE:
Total preload torque = Pinion bearing preload torque + Side bearing preload torque



- If measured value is out of the specification, disassemble it to check and adjust each part. Adjust the pinion bearing preload and side bearing preload. Adjust the pinion bearing preload first, then adjust the side bearing preload.

When the preload torque is large

On pinion bearings: **Replace the collapsible spacer.**

On side bearings: **Use thinner side bearing adjusting washers by the same amount to each side. Refer to RFD-60, "Side Bearing Adjusting Washer" .**

When the preload is small

On pinion bearings: **Tighten the drive pinion lock nut.**

On side bearings: **Use thicker side bearing adjusting washers by the same amount to each side. Refer to RFD-60, "Side Bearing Adjusting Washer" .**

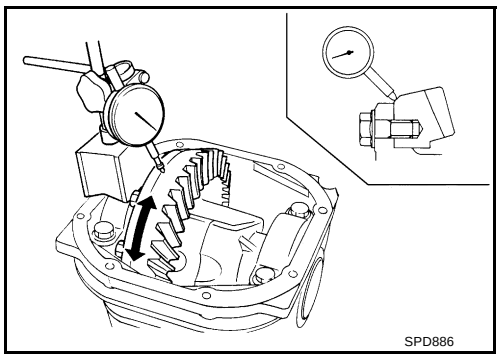
Drive Gear Runout

1. Remove rear cover. Refer to RFD-44, "Differential Assembly" .
2. Fit a dial indicator to the drive gear back face.
3. Rotate the drive gear to measure runout.

Runout limit: 0.05 mm (0.0020 in) or less

- If the runout is outside of the repair limit, check drive gear assembly condition; foreign material may be caught between drive gear and differential case, or differential case or drive gear may be deformed, etc.

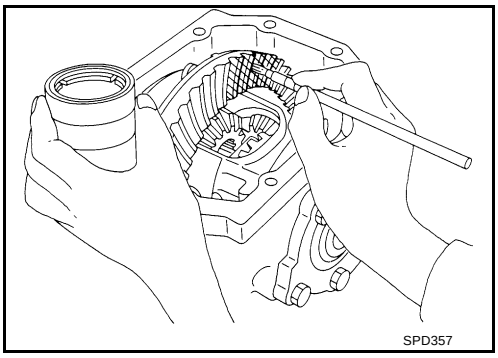
CAUTION:
Replace drive gear and drive pinion gear as a set.



Tooth Contact

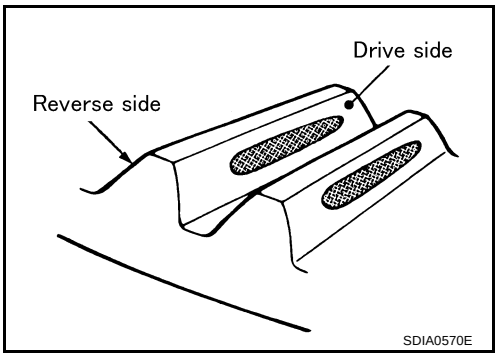
1. Remove rear cover. Refer to RFD-44, "Differential Assembly" .
2. Apply red lead to drive gear.

CAUTION:
Apply red lead to both the faces of 3 to 4 gears at 4 locations evenly spaced on drive gear.



3. Rotate drive gear back and forth several times, check drive pinion gear to drive gear tooth contact.

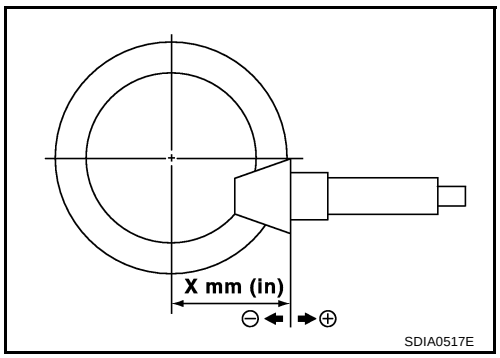
CAUTION:
Check tooth contact on drive side and reverse side.



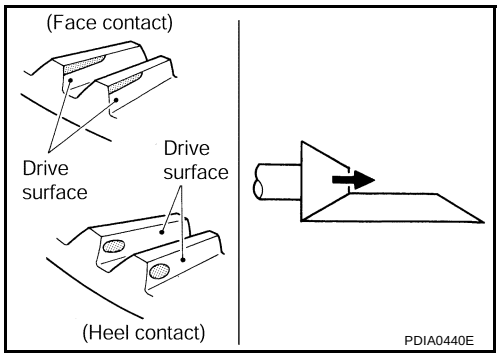
Tooth contact condition		Pinion height adjusting washer selection valve [mm (in)]		Adjustment (Yes/No)	Possible cause
Drive side	Back side				
Heel side Toe side	Toe side Heel side	Thicker ↑	+0.09 (+0.0035)	Yes	Occurrence of noise and scoring sound in all speed ranges.
			+0.06 (+0.0024)		Occurrence of noise when accelerating.
			+0.03 (+0.0012)	No	–
			0		
		Thinner ↓	-0.03 (-0.0012)		
			-0.06 (-0.0024)	Yes	Occurrence of noise at constant speed and decreasing speed.
			-0.09 (-0.0035)		Occurrence of noise and scoring sound in all speed ranges.

SDIA0207E

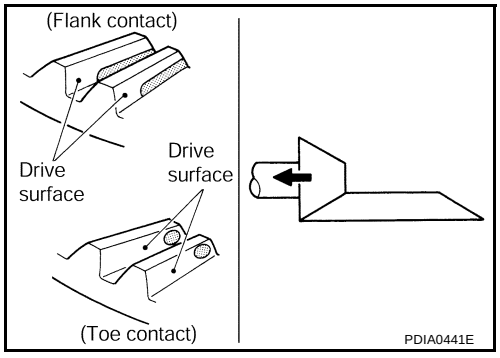
4. If tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).



- If the tooth contact is near the face (face contact), or near the heel (heel contact), thicken pinion height adjusting washers to move drive pinion closer to drive gear.
  Refer to RFD-60, "Pinion Height Adjusting Washer" .



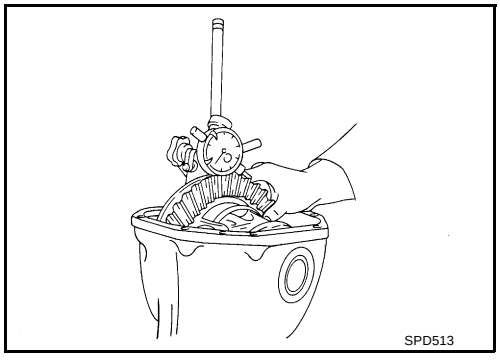
- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), thin pinion height adjusting washers to move drive pinion farther from drive gear.
  Refer to RFD-60, "Pinion Height Adjusting Washer" .



Backlash

1. Remove rear cover. Refer to RFD-44, "Differential Assembly" .
2. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash: 0.10 – 0.15 mm (0.0039 – 0.0059 in)



- If the backlash is outside of the specified value, change the thickness of side bearing adjusting washer.

When the backlash is large:

Make drive gear back side adjusting washer thicker, and drive gear tooth side adjusting washer thinner by the same amount. Refer to RFD-60, "Side Bearing Adjusting Washer" .

When the backlash is small:

Make drive gear back side adjusting washer thinner, and drive gear tooth side adjusting washer thicker by the same amount. Refer to RFD-60, "Side Bearing Adjusting Washer" .

CAUTION:

Do not change the total amount of washers as it will change the bearing preload.

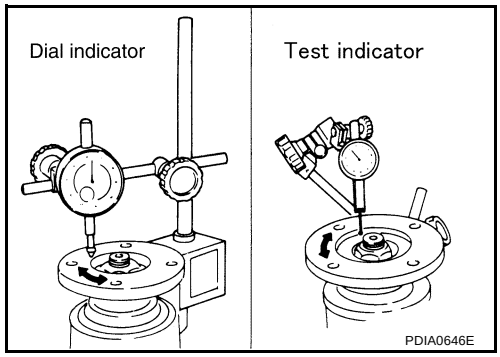
Companion Flange Runout

1. Fit a dial indicator onto the companion flange face (inner side of the propeller shaft mounting bolt holes).
2. Rotate the companion flange to check for runout.

Runout limit : 0.08 mm (0.0031 in)

3. Fit a test indicator to the inner side of the companion flange (socket diameter).
4. Rotate the companion flange to check for runout.

Runout limit : 0.08 mm (0.0031 in)



5. If the runout value is outside the repair limit, follow the procedure below to adjust.

a. Check for runout while changing the phase between companion flange and drive pinion gear by 90° step, and search for the position where the runout is the minimum.

b. If the runout value is still outside of the limit after the phase has been changed, possible cause will be an assembly malfunction of drive pinion and pinion bearing and malfunction of pinion bearing. Check for these items and repair if necessary.

c. If the runout value is still outside of the limit after the check and repair, replace companion flange.

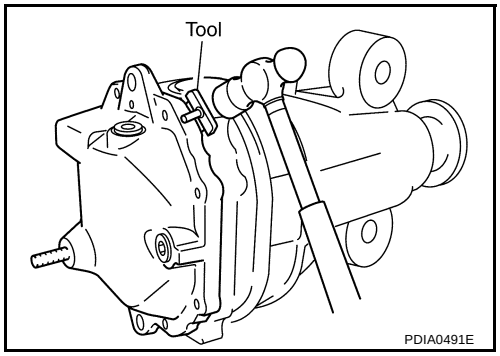
DISASSEMBLY

Differential Assembly

1. Drain gear oil, if necessary.
2. Remove side flange.
3. Remove rear cover mounting bolts.
4. Remove rear cover to insert the seal cutter between gear carrier and rear cover.

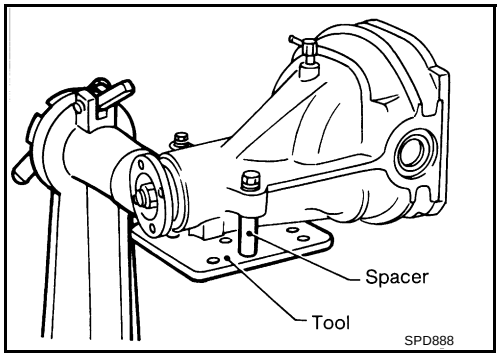
   Tool number : KV10111100 (J-37228)

   CAUTION:
   - **Be careful not to damage the mating surface.**
   - **Do not insert flat-bladed screwdriver, this way damage the mating surface.**



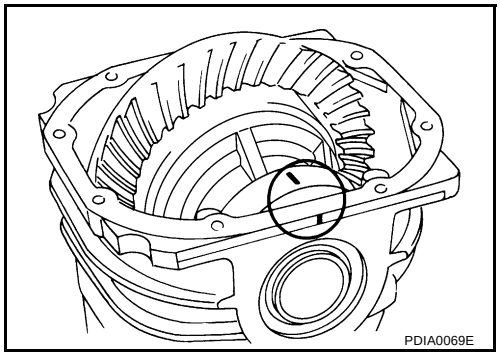
5. Using two 45 mm (1.77 in) spacers, mount carrier on the attachment.

   Tool number : KV38100800 (J-25604-01)

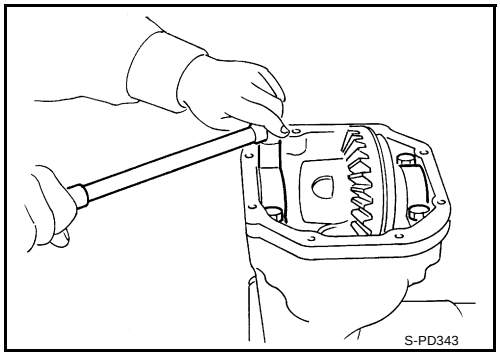


6. For proper reinstallation, paint matching marks on one side of the bearing cap.

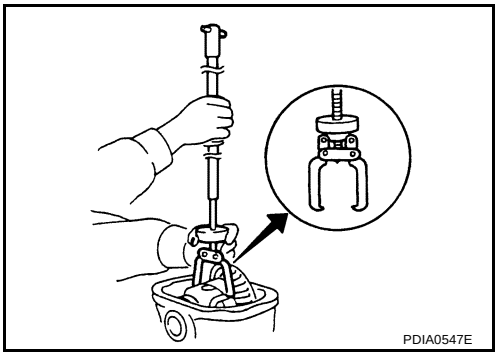
   CAUTION:
   - **For matching marks, use paint. Do not damage bearing caps and gear carrier.**
   - **Bearing caps are line-board during manufacture. The matching marks are used to reinstall them in their original positions.**



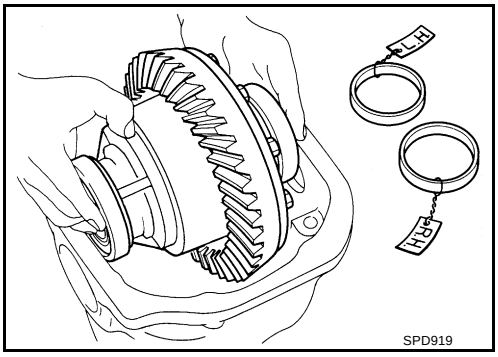
7. Remove bearing caps.



8. Lift differential case assembly out with a suitable tool.



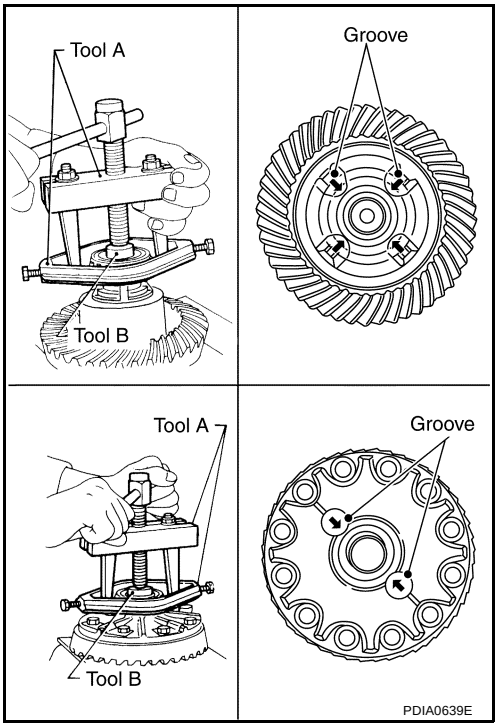
- Keep side bearing outer races together with inner race. Do not mix them up.
  Also, keep side bearing adjusting washers together with bearings.



9. Remove side bearing inner race.
   To prevent damage to bearing, engage puller jaws in groove.

   Tool number **A: ST33051001 (J-22888-20)**
   B: ST33061000 (J-8107-2)

   CAUTION:
   - **To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.**
   - **It is not necessary to remove side bearing inner race except it is replaced.**

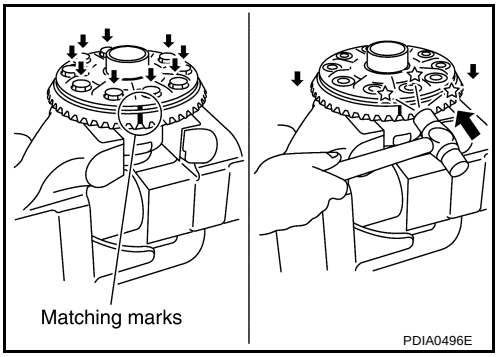


10. For proper reinstallation, paint matching marks on one differential case assembly.

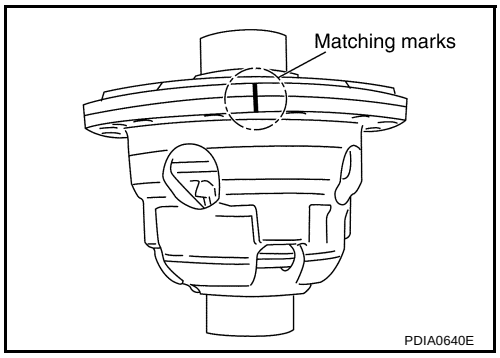
    CAUTION:
    For matching marks, use paint. Do not damage differential case and drive gear.

11. Remove drive gear mounting bolts.
12. Tap drive gear off differential case assembly with a soft hammer.

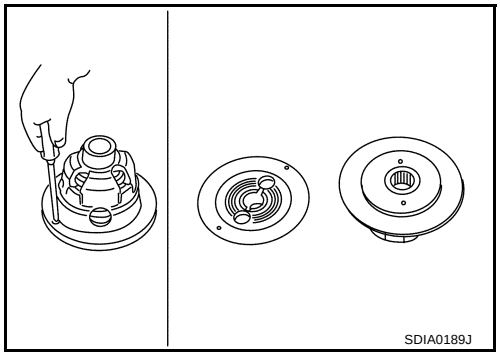
    CAUTION:
    Tap evenly all around to keep drive gear from bending.



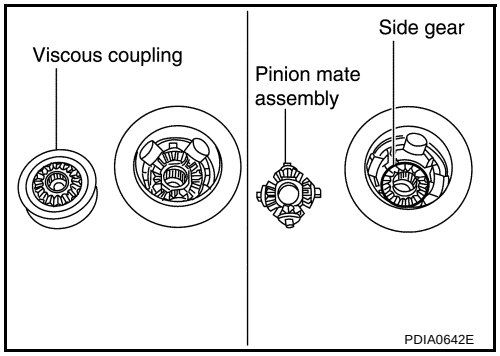
13. Put matching marks with paint.



14. Loosen screws on differential cases A and B.



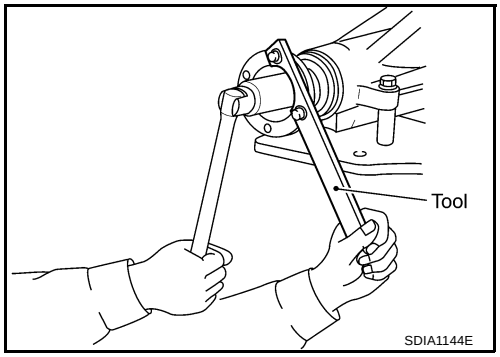
15. Separate differential case A and B, then remove viscous coupling, pinion mate gear, pinion mate thrust washer, side gear and side gear thrust washer from differential cases.



Drive Pinion Assembly

1. Remove differential assembly. Refer to RFD-44, "Differential Assembly" .
2. Remove drive pinion lock nut with the flange wrench.

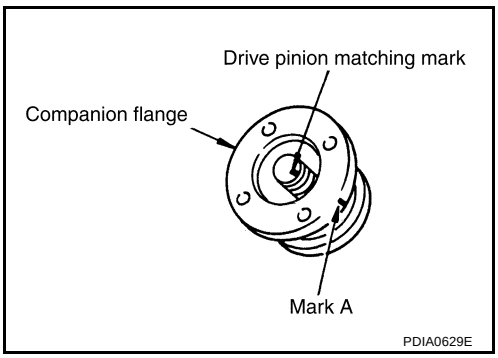
Tool number : KV40104000 (—)



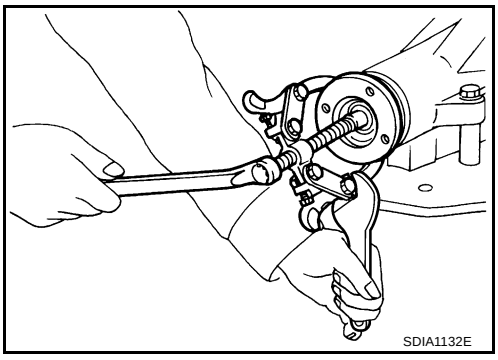
3. Put matching mark on the end of drive pinion. The matching mark should be in line with the matching mark A on companion flange.

CAUTION:
For matching mark, use paint. Do not damage companion flange and drive pinion.

NOTE:
The matching mark A on the final drive companion flange indicates the maximum vertical runout position.
When replacing companion flange, matching mark is not necessary.



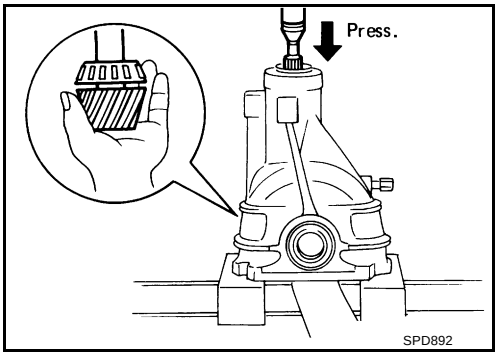
4. Remove companion flange using the suitable puller.



5. Press drive pinion assembly out of gear carrier.

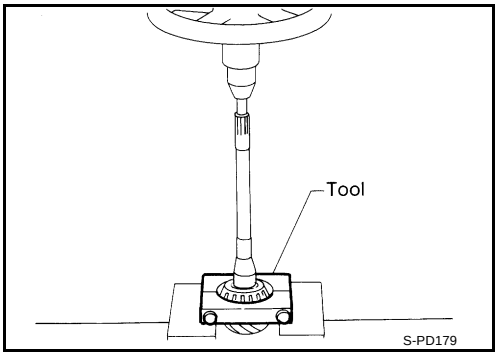
CAUTION:
Do not drop drive pinion assembly.

6. Remove front oil seal.
7. Remove side oil seal.
8. Remove pinion front bearing inner race.
9. Remove collapsible spacer.



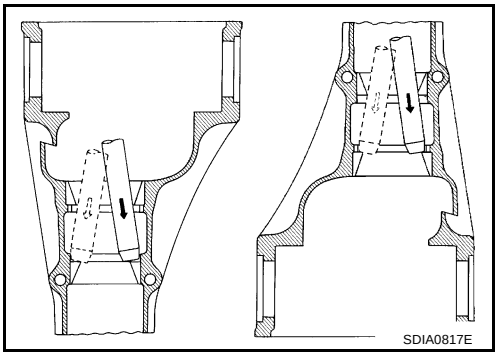
10. Remove pinion rear bearing inner race and drive pinion height adjusting washer with the replacer.

Tool number : ST30031000 (J-22912-01)



11. Tap pinion front/rear bearing outer races uniformly a brass rod or equivalent to removed.

CAUTION:
Be careful not to damage gear carrier.



INSPECTION AFTER DISASSEMBLY

Clean up the disassembled parts. Then, inspect if the parts are worn or damaged. If so, follow the measures below.

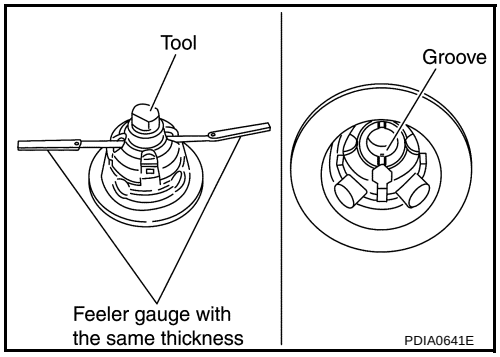
Content	Conditions and Measures
Hypoid gear	● If the gear teeth do not mesh or line-up correctly, determine the cause and adjust or replace as necessary. ● If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.
Bearing	● If any chipped (by friction), pitted, worn, rusted or scratched mark, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).
Side gear and Pinion mate gear	● If any cracks or damage on the surface of the tooth is found, replace. ● If any worn or chipped mark on the contact sides of the thrust washer is found, replace.
Side gear thrust washer and pinion mate thrust washer	● If it is chipped (by friction), damaged, or unusually worn, replace.
Oil seal	● Whenever disassembled, replace. ● If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.
Differential case	● If any wear or crack on the contact sides of the differential case is found, replace.
Companion flange	● If any chipped mark (about 0.1 mm, 0.004 in) or other damage on the contact sides of the lips of the companion flange is found, replace.

ADJUSTMENT AND SELECTION OF ADJUSTING WASHERS

Differential Side Gear Clearance

- Assemble the differential parts if they are disassembled. Refer to RFD-44, "Differential Assembly" .

1. Place differential assembly so that right side gear is on the upper side.
2. Measure the clearance between right side gear back and differential case using feeler gauge, while rotating right side gear with a suitable tool attached to splines.



Side gear back clearance specification:

0.15 mm (0.0059 in) or less.
(Each gear should rotate smoothly without excessive resistance during differential motion.)

CAUTION:

- **Do not place feeler gauge at groove side of differential case.**
- **To prevent side gear from tilting, insert feeler gauges with the same thickness from both sides.**

3. If the back clearance is outside the specification, use a thicker/thinner side gear thrust washer to adjust. Refer to RFD-60, "Side Gear Thrust Washer" .

When the back clearance is large:

Use a thicker thrust washer.

When the back clearance is small:

Use a thinner thrust washer.

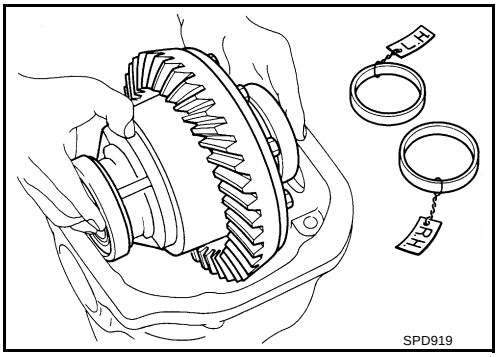
CAUTION:

- **Adjust the clearance with the left side gear thrust washer only.**
- **Only one side gear thrust washer can be selected.**

Side Bearing Preload

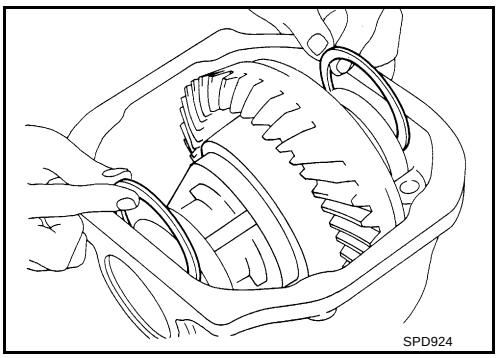
- Selecting carrier side bearing adjusting washers is required for successful completion of this procedure.

1. Make sure all parts are clean. Also, make sure the bearings are well lubricated with gear oil.
2. Place the differential case, with side bearings and bearing races installed, into gear carrier.

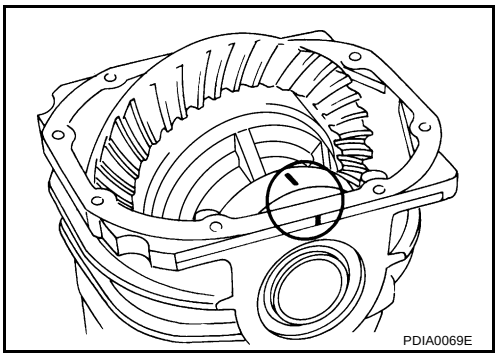


SPD919

3. Insert left and right original side bearing adjusting washers in place between side bearings and gear carrier.


SPD924

4. Install bearing caps in their correct locations and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-55, "Differential Assembly" .
5. Turn the carrier several times to seat the bearings.

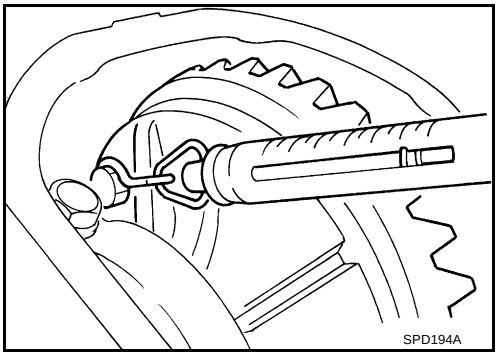

PDIA0069E

6. Measure the turning torque of the carrier at the drive gear mounting bolts with a spring gauge.

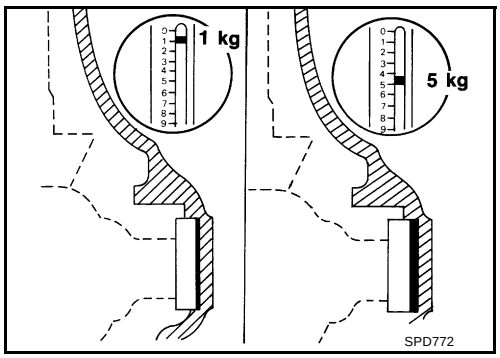
Tool number : — (J-8129)

Specification:

34.2 – 39.2 N (3.5 – 4.0 kg, 7.7 – 8.8 lb) of pulling force at the drive gear bolt


SPD194A

7. If the turning torque is outside the specification, use a thicker/ thinner side bearing adjusting washer to adjust. Refer to RFD-60, "Side Bearing Adjusting Washer" .



If the turning torque is less than the specified range:

Use a thicker thrust washer.

If the turning torque is greater than the specification:

Use a thinner thrust washer.

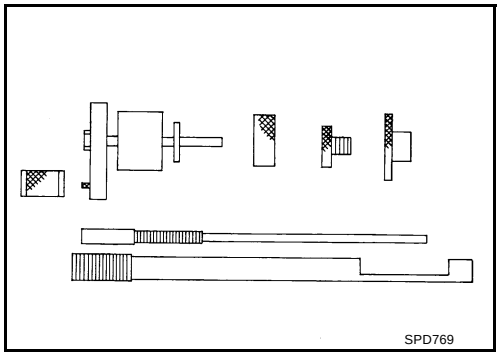
CAUTION:

Select a side bearing adjusting washer for right and left individually.

8. Record the total amount of washer thickness required for the correct carrier side bearing preload.

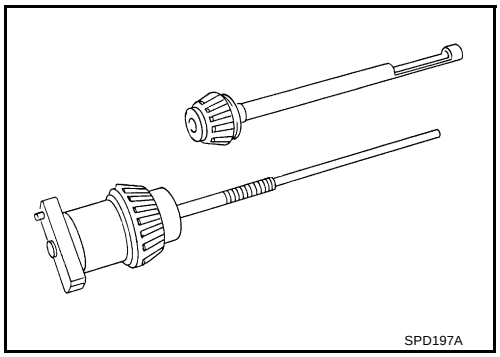
Pinion Gear Height

1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the differential shim selector tool.

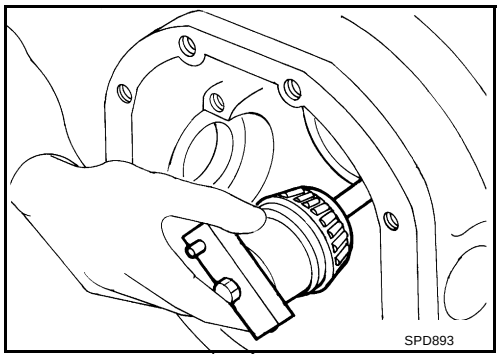


Tool number : — (J-34309)

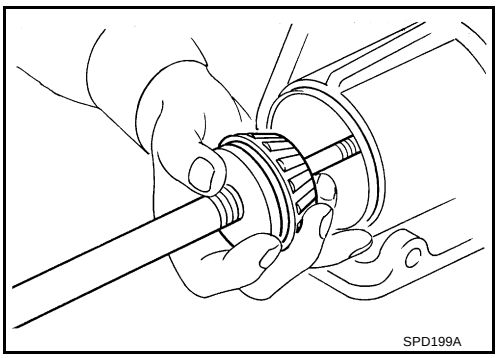
- **Pinion front bearing;** make sure the J-34309-3 pinion front bearing seat is secured tightly against the J-34309-2 gauge anvil. Then turn the pinion front bearing pilot, J-34309-5, to secure the bearing in its proper position.
- **Pinion rear bearing;** the pinion rear bearing pilot, J-34309-8, is used to center the pinion rear bearing only. The pinion rear bearing locking seat, J-34309-4, is used to lock the bearing to the assembly.
- **Installation of J-34309-9 and J-34309-16;** place a suitable 2.5 mm (0.098 in) thick plain washer between J-34309-9 and J-34309-16. Both surfaces of J-34309-9 and J-34309-16 must be parallel with a clearance of 2.5 mm (0.098 in).



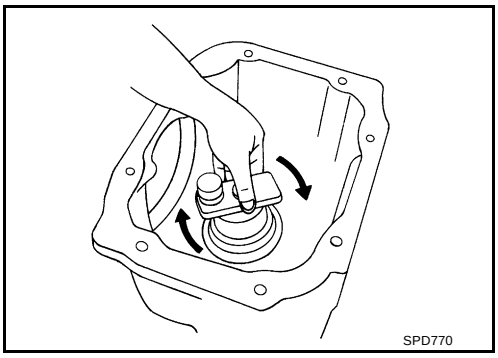
3. Install the pinion rear bearing inner race into gear carrier. Then place the pinion preload shim selector tool, J-34309-1, gauge screw assembly.



4. Assemble the pinion front bearing inner race and the J-34309-2 gauge anvil. Assemble them together with the J-34309-1 gauge screw in gear carrier. Make sure that the pinion height gauge plate, J-34309-16, will turn a full 360 degrees. Tighten the two sections together by hand.


SPD199A

5. Turn the assembly several times to seat the bearings.

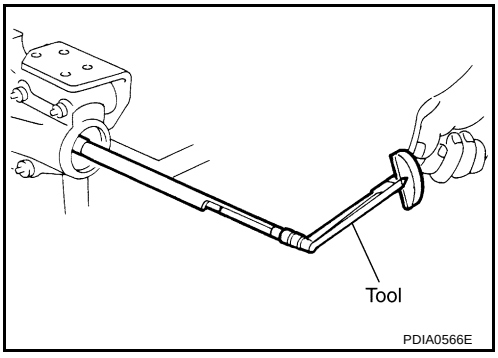

SPD770

6. Measure the turning torque at the end of the J-34309-2 gauge anvil using preload gauge.

Tool number : ST3127S000 (J-25765- A)

Turning torque specification:

1.0 – 1.3 N·m (0.11 – 0.13 kg-m, 9 – 11 in-lb)

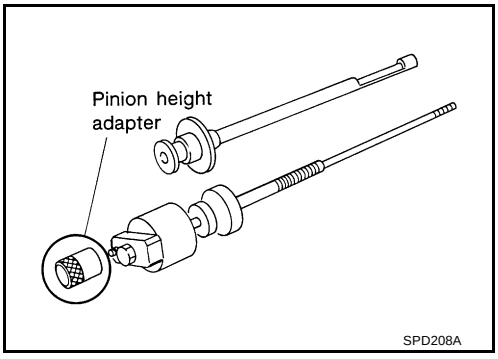


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7. Place the J-34309-11 “R200A” pinion height adapter onto the gauge plate and tighten it by hand.

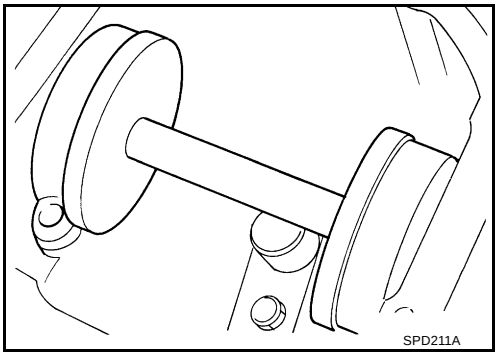
CAUTION:

Make sure all machined surfaces are clean.

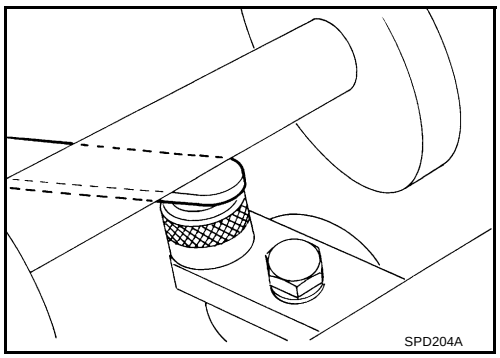


SPD208A

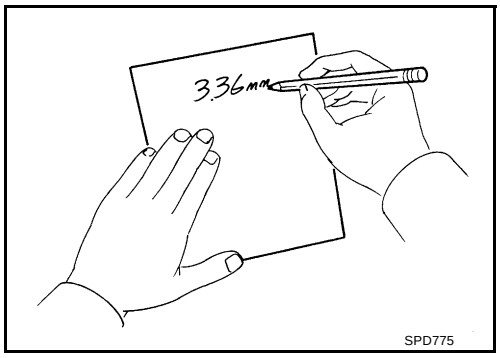
8. Position the side bearing discs, J-25269-4, and arbor firmly into the side bearing bores. Install the bearing caps and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-39, "COMPONENTS" .


SPD211A

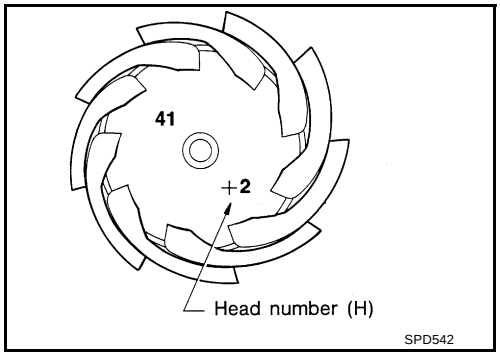
9. Select the correct standard pinion height adjusting washer thickness. Select by using a standard gauge of 3 mm (0.12 in) and your J-34309-101 feeler gauge. Measure the distance between the J-34309-11 pinion height adapter including the standard gauge and the arbor.



10. Write down exact measurement (the value of feeler gauge).



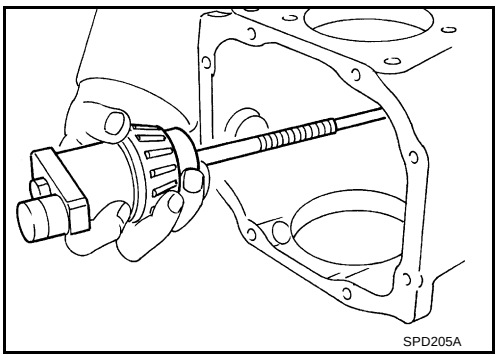
11. Correct the pinion height washer size by referring to the “pinion head number”.
There are two numbers painted on the drive pinion. The first one refers to the drive pinion and drive gear as a matched set. This number should be the same as the number on the drive gear. The second number is the “pinion head height number”. It refers to the ideal pinion height from standard for quietest operation. Use the following chart to determine the correct pinion height washer.



Pinion head height number	Add or remove from the standard pinion height adjusting washer thickness measurement
- 6	Add 0.06 mm (0.0024 in)
- 5	Add 0.05 mm (0.0020 in)
- 4	Add 0.04 mm (0.0016 in)
- 3	Add 0.03 mm (0.0012 in)
- 2	Add 0.02 mm (0.0008 in)
- 1	Add 0.01 mm (0.0004 in)
0	Use the selected washer thickness
+1	Subtract 0.01 mm (0.0004 in)
+2	Subtract 0.02 mm (0.0008 in)
+3	Subtract 0.03 mm (0.0012 in)
+4	Subtract 0.04 mm (0.0016 in)
+5	Subtract 0.05 mm (0.0020 in)
+6	Subtract 0.06 mm (0.0024 in)

12. Select the correct pinion height adjusting washer. Refer to RFD-60, "Pinion Height Adjusting Washer" .

13. Remove the J-34309 differential shim selector tool from the final drive housing. Then disassemble to retrieve the pinion bearings.



ASSEMBLY

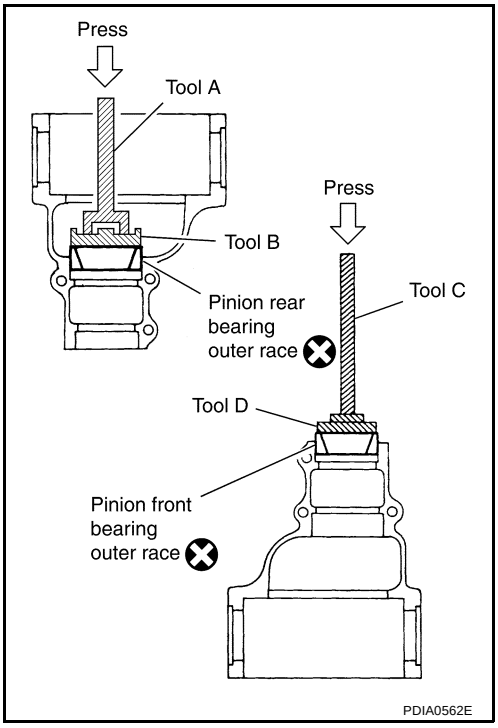
Drive Pinion Assembly

1. Install front and rear bearing outer races using drifts.

Tool number **A: ST30720000 (J-25405)**
B: KV40105230 (—)
C: ST30611000 (J-25742-1)
D: ST30613000 (J-25742-3)

CAUTION:
- **At first, using a hammer, tap bearing outer race until it becomes flat to gear carrier.**
- **Do not reuse pinion front and rear bearing outer race.**

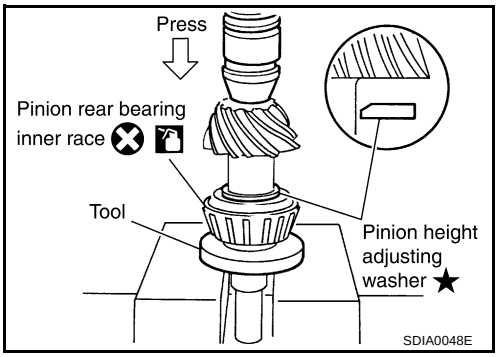
2. Select drive pinion height adjusting washer. Refer to RFD-50, "Pinion Gear Height" .



3. Install selected drive pinion height adjusting washer to drive pinion. Press pinion rear bearing inner race to it, using drift.

Tool number **: ST30901000 (J-26010-01)**

CAUTION:
- **Pay attention to the direction of pinion height adjusting washer. (Assemble as shown in the figure.)**
- **Do not reuse pinion rear bearing inner race.**

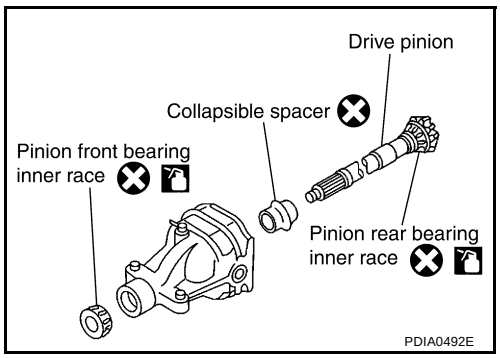


4. Assemble collapsible spacer to drive pinion.

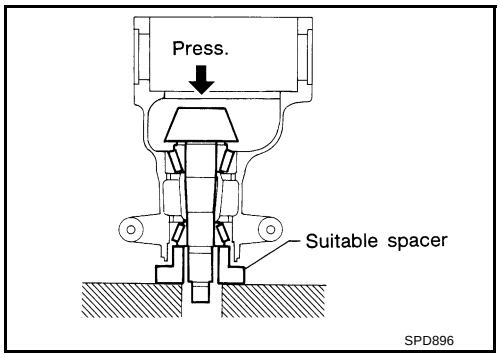
CAUTION:
Do not reuse collapsible spacer.

5. Apply gear oil to pinion rear bearing, and assemble drive pinion into gear carrier.
6. Apply gear oil to pinion front bearing, and assemble pinion front bearing inner race to drive pinion assembly.

CAUTION:
Do not reuse pinion front bearing inner race.



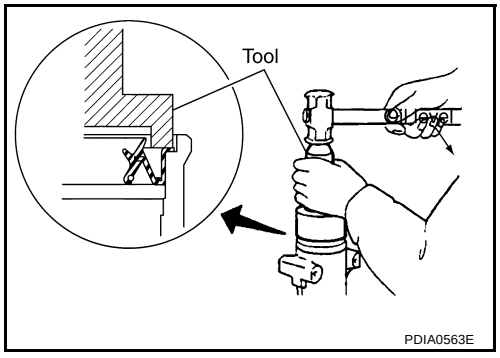
7. Using suitable spacer, press the pinion front bearing inner race to drive pinion as far as drive pinion nut can be tightened.



8. Using the drift, install front oil seal as shown in the figure.

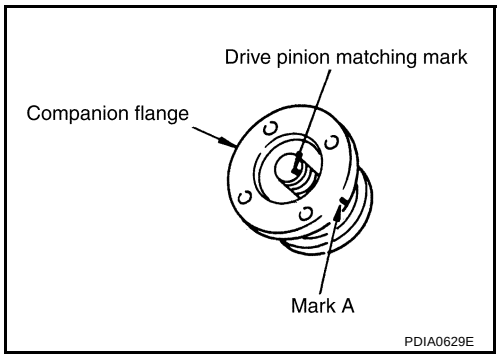
Tool number : ST30720000 (J-25405)

CAUTION:
- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**



9. Install companion flange.

NOTE:
When reusing drive pinion, align the matching mark of drive pinion with the matching mark A of companion flange, then install companion flange.



10. Apply anti-corrosion oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.

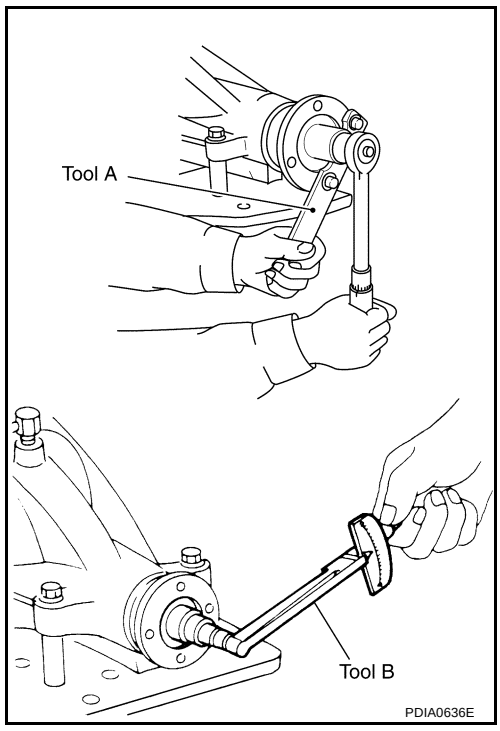
CAUTION:
Do not reuse drive pinion lock nut.

11. Adjust to the drive pinion lock nut tightening torque and pinion bearing preload torque.

Tool number **A: KV40104000 (—)**
B: ST3127S000 (J-25765-A)

Drive pinion lock nut tightening torque:
147 – 323 N·m (15 – 32 kg-m, 109 – 238 ft-lb)

Drive pinion bearing preload:
2.65 – 3.23 N·m (0.27 – 0.32 kg-m, 24 – 28 in-lb)



CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the preload torque.**
- **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.**

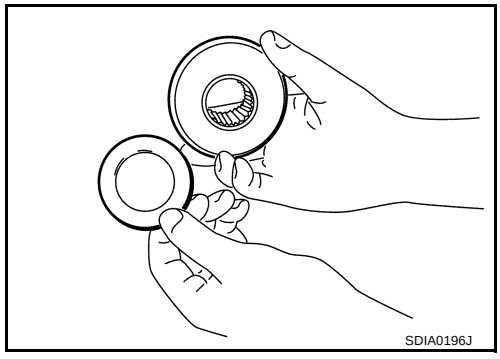
12. Install differential case assembly. Refer to RFD-44, "Differential Assembly" .

CAUTION:
Do not install rear cover yet.

13. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and companion flange runout. Refer to RFD-40, "Drive Gear Runout" , RFD-41, "Tooth Contact" , RFD-42, "Backlash" and RFD-43, "Companion Flange Runout" .
Recheck above items. Readjust the above description, if necessary.
14. Check total preload torque. Refer to RFD-40, "Total Preload Torque" .
15. Install rear cover. Refer toRFD-44, "Differential Assembly" .

Differential Assembly

1. Install side gear thrust washer with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the side gear.

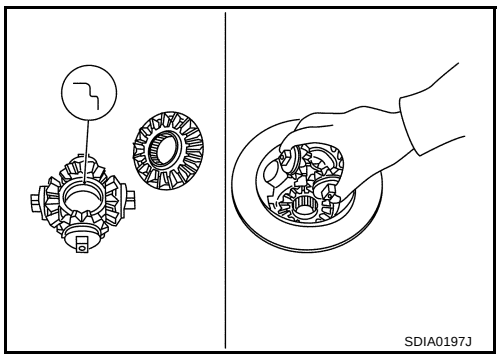


2. Install side gear and thrust washer into differential case B.

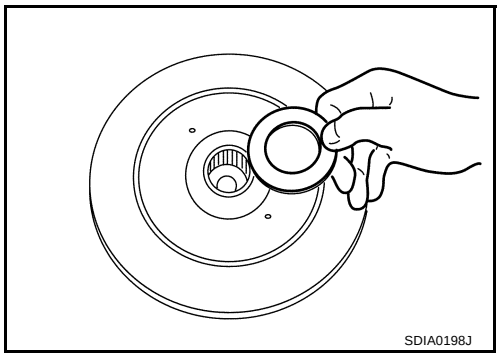
CAUTION:
Make sure that the circular clip is installed to side gear.

3. Install pinion mate assembly (pinion mate shaft, pinion mate gears and pinion mate thrust washers) into differential case B.

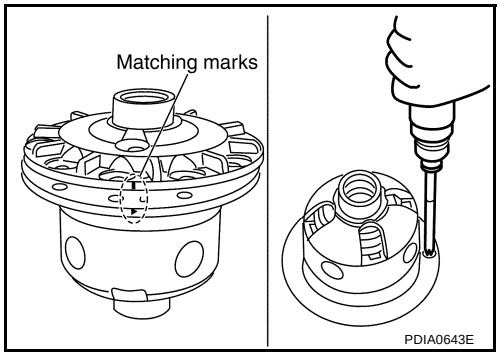
CAUTION:
The pinion mate shaft groove side shall be installed to side gear.


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4. Install viscous coupling into differential case B.
5. Install side gear thrust washer with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the viscous coupling.

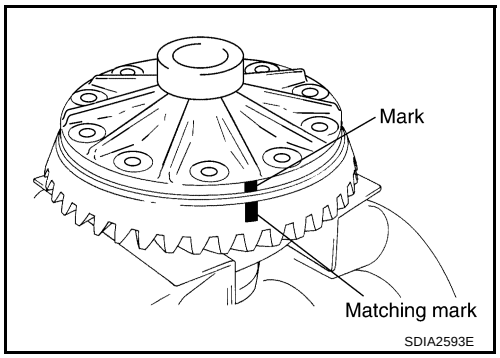

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6. Align the matching marks and install differential case A into differential case B.
7. Measure side gear end play. If necessary, select the appropriate side gear thrust washer. Refer to RFD-48, "Differential Side Gear Clearance" .



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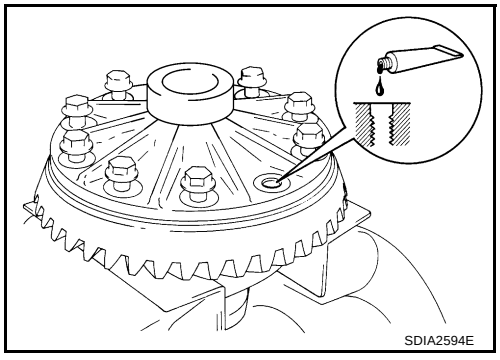
8. Align the matching mark of differential case with the mark of drive gear, then place drive gear.



SDIA2593E

9. Apply thread locking sealant into the thread hole of drive gear.
   - **Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

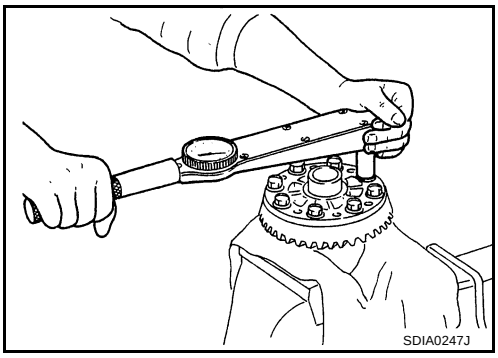
CAUTION:
Drive gear back and threaded holes shall be cleaned and degreased sufficiently.


SDIA2594E

10. Install drive gear on the mounting bolts, and then tighten to the specified torque. Refer to RFD-39, "COMPONENTS" .

CAUTION:

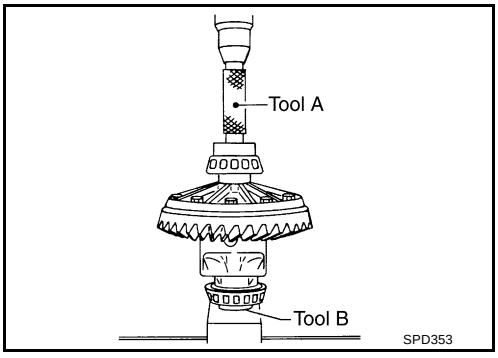
- **Tighten bolts in a crisscross fashion.**
- **After tightening the bolts to the specified torque, tighten the bolts additionally by turning the bolts 31 to 36 degrees.**



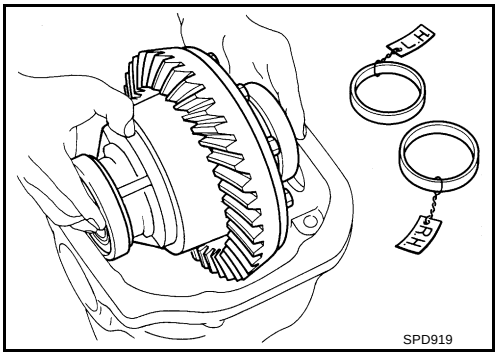
11. Press side bearing inner races to differential case, using the drift and the base.

Tool number **A: KV38100300 (J-25523)**
B: ST33061000 (J-8107-2)

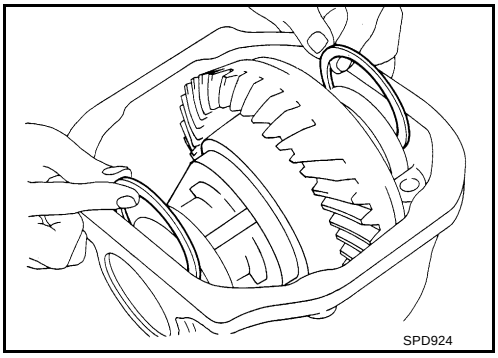
CAUTION:
Do not reuse side bearing inner race.



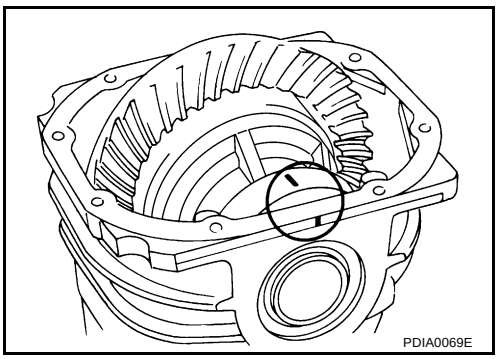
12. Install differential case assembly with side bearing outer races into gear carrier.
13. Measure side bearing preload. If necessary, select the appropriate side bearing adjusting washers. Refer to RFD-49, "Side Bearing Preload" .



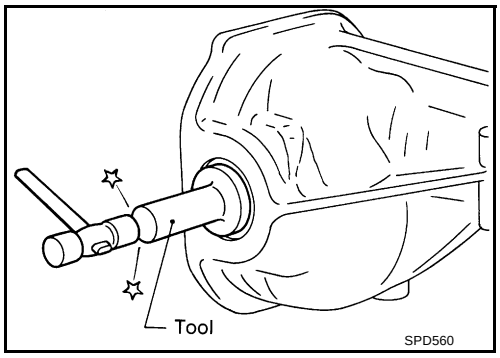
14. Insert selected left and right side bearing adjusting washers in place between side bearings and gear carrier.



15. Align matching marks on bearing cap with that on gear carrier.
16. Install bearing caps and tighten bearing cap mounting bolts to the specified torque. Refer to RFD-39, "COMPONENTS" .



17. Using the drift, drive side oil seals until it becomes flush with the case end.



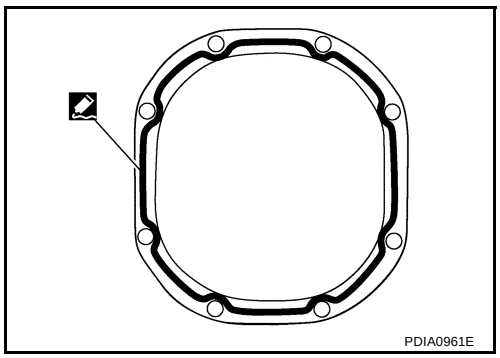
Tool number : KV38100200 (J-26233)

CAUTION:

- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**

18. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and total preload torque. Refer to RFD-40, "Drive Gear Runout" , RFD-41, "Tooth Contact" , RFD-42, "Backlash" and RFD-40, "Total Preload Torque" .
Recheck above items. Readjust the above description, if necessary.

19. Apply sealant to mating surface of rear cover.



- **Use Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

CAUTION:

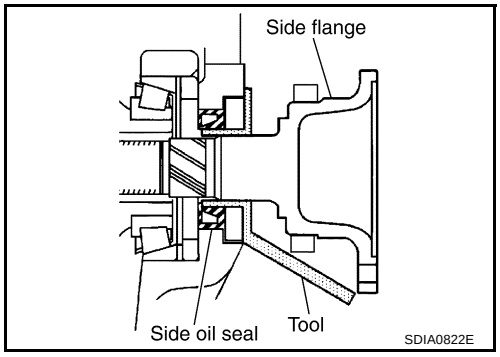
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.

20. Install rear cover on gear carrier and tighten mounting bolts with the specified torque. Refer to RFD-39, "COMPONENTS" .
21. Install side flange with the following procedure.

NOTE:

Install the RH side flange, then install the LH side flange. If LH side flange is installed first, the RH side flange comes out sometimes from the shock of installing the RH side flange.

a. Attach the protector to side oil seal.



Tool number : KV38107900 (J-39352)

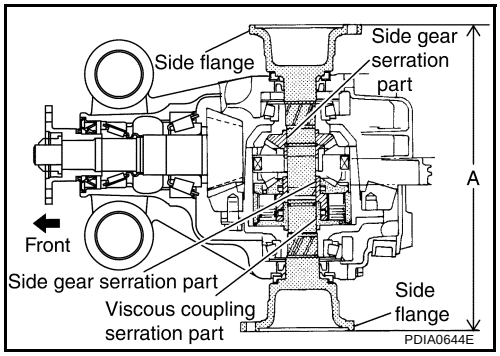
b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.

c. Put a suitable drift on the center of side flange, then drive it until sound changes.

NOTE:

When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.

d. Confirm that the dimension of the side flange installation (Measurement A) in the figure comes into the following.



Measurement A: 326 – 328 mm (12.83 – 12.91 in)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

NDS0000L

Applied model	VQ35DE	
	M/T	A/T
Final drive model	R200	R200V (With LSD)
Gear ratio	3.538	3.357
Number of teeth (Drive gear/Drive pinion)	46/13	47/14
Oil capacity (Approx.) ℓ (US pt, Imp pt)	1.4 (3, 2-1/2)	
Number of pinion gears	2	4
Drive pinion adjustment spacer type	Collapsible	

Inspection and Adjustment

NDS0000M

DRIVE GEAR RUNOUT

Item	Runout limit
Drive gear back face	0.05 mm (0.0020 in) or less

DIFFERENTIAL SIDE GEAR CLEARANCE

Item	Specification	
	R200	R200V (With LSD)
Side gear backlash (Clearance between side gear and differential case)	0.2 mm (0.008 in) or less (Each gear should rotate smoothly without excessive resistance during differential motion.)	0.15 mm (0.0059 in) or less (Each gear should rotate smoothly without excessive resistance during differential motion.)

PRELOAD TORQUE

Item	Specification
Pinion bearing (P_1)	2.65 – 3.23 N·m (0.27 – 0.32 kg-m, 24 – 28 in-lb)
Side bearing (P_2)	0.20 – 0.52 N·m(0.02 – 0.05 kg-m, 2 – 4 in-lb)
Side bearing to pinion bearing (Total preload) (Total preload = P_1 + P_2)	2.85 – 3.75 N·m(0.29 – 0.38 kg-m, 26 – 33 in-lb)

BACKLASH

Item	Specification
Drive gear to drive pinion gear	0.10 – 0.15 mm (0.0039 – 0.0059 in)

COMPANION FLANGE RUNOUT

Item	Runout limit
Companion flange face	0.08 mm (0.0031 in) or less
Inner side of the companion flange	0.08 mm (0.0031 in) or less

SELECTIVE PARTS

Side Gear Thrust Washer

Unit: mm (in)

R200		R200V			
Thickness	Part number*	Thickness	Part number*	Thickness	Part number*
0.75 (0.0295)	38424 EC000	0.80 (0.0315)	38424 40F60	1.16 (0.0457)	38424 40F72
0.78 (0.0307)	38424 EC001	0.83 (0.0327)	38424 40F61	1.19 (0.0469)	38424 40F73
0.81 (0.0319)	38424 EC002	0.86 (0.0339)	38424 40F62	1.22 (0.0480)	38424 40F74
0.84 (0.0331)	38424 EC003	0.89 (0.0350)	38424 40F63	1.25 (0.0492)	38424 40F75
0.87 (0.0343)	38424 EC004	0.92 (0.0362)	38424 40F64	1.28 (0.0504)	38424 40F76
0.90 (0.0350)	38424 EC005	0.95 (0.0374)	38424 40F65	1.31 (0.0516)	38424 40F77
0.93 (0.0366)	38424 EC006	0.98 (0.0386)	38424 40F66	1.34 (0.0528)	38424 40F78
		1.01 (0.0398)	38424 40F67	1.37 (0.0539)	38424 40F79
		1.04 (0.0409)	38424 40F68	1.40 (0.0551)	38424 40F80
		1.07 (0.0421)	38424 40F69	1.43 (0.0563)	38424 40F81
		1.10 (0.0433)	38424 40F70	1.46 (0.0575)	38424 40F82
		1.13 (0.0445)	38424 40F71	1.49 (0.0587)	38424 40F83

*: Always check with the Parts Department for the latest parts information.

Pinion Height Adjusting Washer

Unit: mm (in)

R200, R200V			
Thickness	Part number*	Thickness	Part number*
3.05 (0.1201)	38154 0C000	3.29 (0.1295)	38154 0C008
3.08 (0.1213)	38154 0C001	3.32 (0.1307)	38154 0C009
3.11 (0.1224)	38154 0C002	3.35 (0.1319)	38154 0C010
3.14 (0.1236)	38154 0C003	3.38 (0.1331)	38154 0C011
3.17 (0.1248)	38154 0C004	3.41 (0.1343)	38154 0C012
3.20 (0.1260)	38154 0C005	3.44 (0.1354)	38154 0C013
3.23 (0.1272)	38154 0C006	3.47 (0.1366)	38154 0C014
3.26 (0.1283)	38154 0C007	3.50(0.1378)	38154 0C015

*: Always check with the Parts Department for the latest parts information.

Side Bearing Adjusting Washer

Unit: mm (in)

R200, R200V			
Thickness	Part number*	Thickness	Part number*
2.00 (0.0787)	38453 N3100	2.35 (0.0925)	38453 N3107
2.05 (0.0807)	38453 N3101	2.40 (0.0945)	38453 N3108
2.10 (0.0827)	38453 N3102	2.45 (0.0965)	38453 N3109
2.15 (0.0846)	38453 N3103	2.50 (0.0984)	38453 N3110
2.20 (0.0866)	38453 N3104	2.55 (0.1004)	38453 N3111
2.25 (0.0886)	38453 N3105	2.60 (0.1024)	38453 N3112
2.30 (0.0906)	38453 N3106	2.65 (0.1043)	38453 N3113

*: Always check with the Parts Department for the latest parts information.

SECTION RSU
REAR SUSPENSION

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PRECAUTIONS

PFP:00001

Cautions

NES0000K

- When installing rubber bushings, final tightening must be carried out under unladen conditions with tires on ground. Oil will shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Caulking nuts are not reusable. Always use new ones when installing. Since new caulking nuts are pre-oiled, tighten as they are.

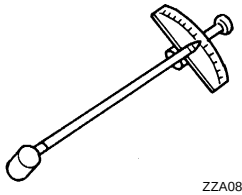
PREPARATION

PFP:00002

Special Service Tools

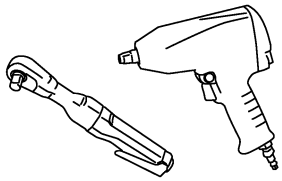
NES0000L

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST3127S000 (J-25765-A) Preload gauge  ZZA0806D	Measuring rotating torque of ball joint

Commercial Service Tools

NES0000M

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NES0000N

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			RSU-7	RSU-9	—	—	—	RSU-7	RSU-5	RSU-16	NVH in PR section.	NVH in RFD section.	NVH in RAX and RSU sections.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	REAR AXLE AND REAR SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	REAR SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×	×	×	×
		Shake	×	×	×	×		×			×		×	×	×	×	×	×
		Vibration	×	×	×	×	×				×		×	×		×		×
		Shimmy	×	×	×	×			×				×	×	×		×	×
		Judder	×	×	×								×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×			

×: Applicable

REAR SUSPENSION ASSEMBLY

PFP:55020

On-Vehicle Inspection

NES0000O

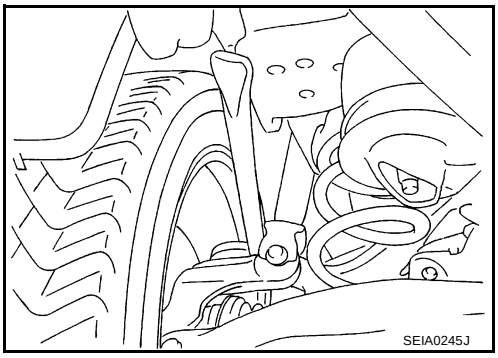
Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

INSPECTION OF SUSPENSION ARM BALL JOINT END PLAY

- Measure axial end play by installing and moving up/down with an iron pry bar or something similar between suspension arm and axle.

  Axial end play : 0 mm (0 in)

  CAUTION:
  Be careful not to damage ball joint boot.


SEIA0245J

SHOCK ABSORBER INSPECTION

- Check shock absorber for oil leakage, damage and replace if necessary.

Wheel Alignment Inspection

NES0000P

DESCRIPTION

- Measure wheel alignment under unladen conditions. “Unladen conditions” means that fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats in designated positions.

PRELIMINARY INSPECTION

- Check tires for improper air pressure and wear.
- Check road wheels for runout.
- Check wheel bearing axial end play.
- Check ball joint axial end play of suspension arm.
- Check shock absorber operation.
- Check each mounting point of axle and suspension for looseness and deformation.
- Check each link, arm and member for cracks, deformation, and other damage.
- Check vehicle posture.

GENERAL INFORMATION AND RECOMMENDATIONS

- A four-wheel thrust alignment should be performed.
  - This type of alignment is recommended for any NISSAN/INFINITI vehicle.
  - The four-wheel “thrust” process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
  - The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
  - The rack should be checked to ensure that it is level.
- Make sure the machine is properly calibrated.
  - Your alignment equipment should be regularly calibrated in order to give correct information.
  - Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

THE ALIGNMENT PROCESS

IMPORTANT:

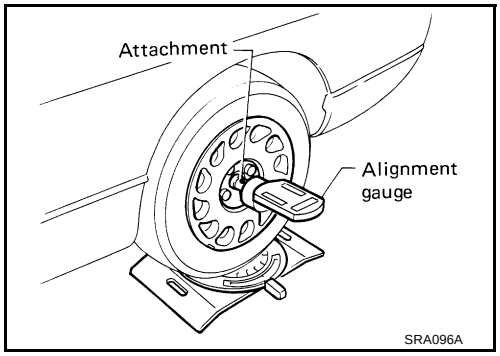
Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Do NOT use these indicators.**
  - The alignment specifications programmed into your machine that operate these indicators may not be correct.
  - This may result in an ERROR.
- Some newer alignment machines are equipped with an optional “Rolling Compensation” method to “compensate” the sensors (alignment targets or head units). **DO NOT use this “Rolling Compensation” method.**
  - Use the “Jacking Compensation Method”. After installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.
  - See Instructions in the alignment machine you're using for more information on this.

CAMBER INSPECTION

- Measure camber of both right and left wheels with a suitable alignment gauge and adjust in accordance with the following procedures.

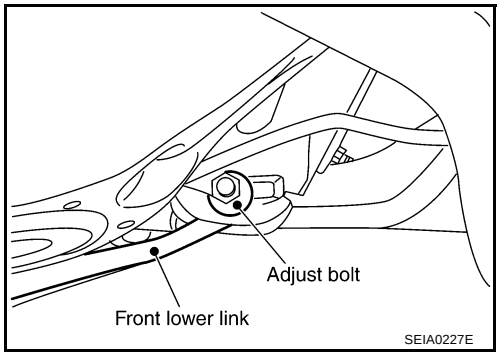
Camber **: Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .**



If outside the standard value, adjust with adjusting bolt in front lower link.

NOTE:

After adjusting camber, be sure to check toe-in.



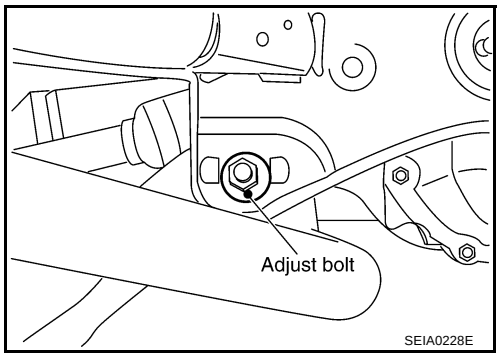
TOE-IN

If toe-in is not within the specification, adjust with adjusting bolt in rear lower link.

CAUTION:

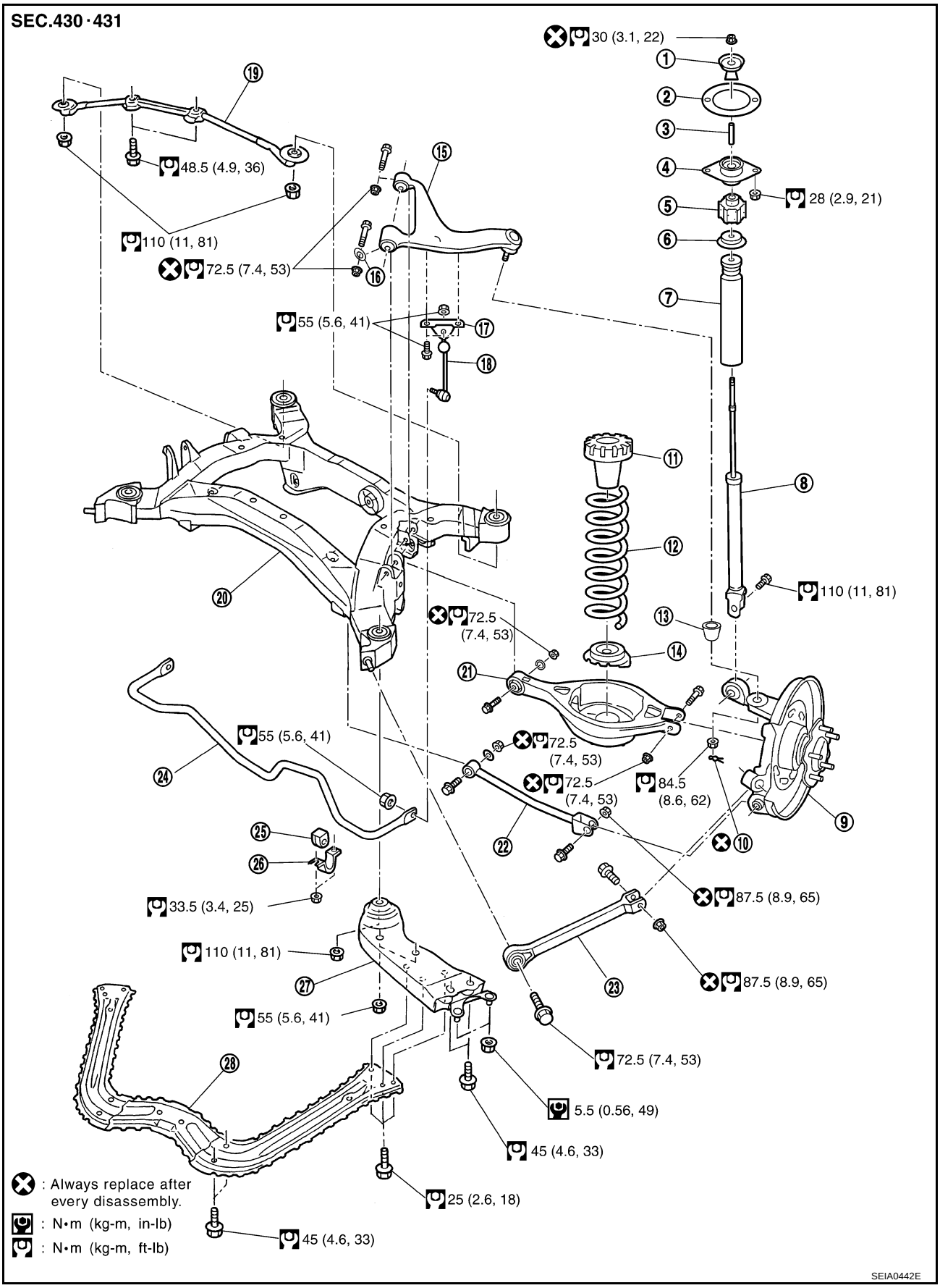
Be sure to adjust equally on RH and LH side with adjusting bolt.

If toe-in is not still within the specification, inspect and replace any damaged or worn rear suspension parts.



Components

NES0000Q



1. Bushing
2. Mounting seal
3. Distance tube
4. Mounting seal bracket
5. Bushing
6. Bound bumper cover
7. Bound bumper
8. Shock absorber
9. Axle
10. Cotter pin
11. Upper seat
12. Coil spring
13. Ball seat
14. Rubber seat
15. Suspension arm
16. Stopper rubber
17. Stabilizer connecting rod mounting bracket
18. Stabilizer connecting rod
19. Rear pin stay
20. Rear suspension member
21. Rear lower link
22. Front lower link
23. Radius rod
24. Stabilizer bar
25. Stabilizer bushing
26. Stabilizer clamp
27. Member stay
28. Tunnel stay

Removal and Installation

NES0000R

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-39, "REAR DISC BRAKE" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove stabilizer bar. Refer to RSU-16, "STABILIZER BAR" .
4. Remove rear exhaust tube. Refer to EX-3, "EXHAUST SYSTEM" .
5. Remove rear propeller shaft. Refer to PR-5, "REAR PROPELLER SHAFT" .
6. Separate attachment bolts between parking brake cable and vehicle and rear suspension member. Refer to PB-4, "PARKING BRAKE CONTROL" .
7. Remove wheel sensor from rear final drive.
8. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
9. Remove fixing bolt in upper side of mounting seal bracket. Refer to RSU-9, "SHOCK ABSORBER" .
10. Set jack under rear final drive.
11. Remove tunnel stay and member stay from vehicle.
12. Remove fixing bolts and nuts of rear pin stay and then remove rear pin stay from vehicle.
13. Gradually lowering jack, remove rear suspension assembly.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of installation position of links (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

SHOCK ABSORBER

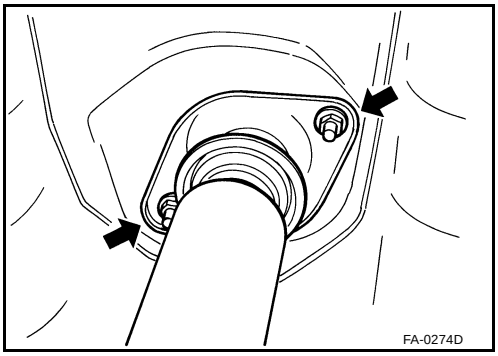
PFP:56210

Removal and Installation

NES0000S

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Remove fixing bolt in lower side of shock absorber assembly with power tool.
4. Remove mounting seal bracket fixing nuts of shock absorber upper side with power tool and remove shock absorber from vehicle.



INSPECTION AFTER REMOVAL

- Check shock absorber assembly for deformation, cracks, damage, and replace if necessary.
- Check piston rod for damage, uneven wear or distortion, and replace if necessary.
- Check welded and sealed areas for oil leakage, and replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of shock absorber assembly lower side (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

Disassembly and Assembly

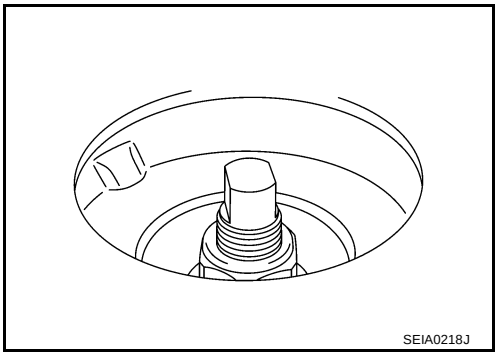
NES0000T

DISASSEMBLY

CAUTION:
Make sure piston rod on shock absorber is not damaged when removing components from shock absorber.

1. Remove mounting seal from mounting seal bracket.
2. Wrap a shop cloth around lower side of shock absorber and fix it in a vise.

   CAUTION:
   Do not set the cylindrical part of shock absorber in vise.
3. Secure piston rod tip so that piston rod does not turn, and remove piston rod lock nut.
4. Remove bushing (Upper side), distance tube, mounting seal bracket, bushing (Lower side), bound bumper cover and bound bumper from shock absorber.



INSPECTION AFTER DISASSEMBLY

Bound Bumper and Bushing

- Check bound bumper and bushing for cracks, deformation or other damage. Replace if necessary.

ASSEMBLY

- Refer to RSU-7, "Components" for tightening torque. Assembly in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

  CAUTION:
  Make sure piston rod on shock absorber is not damaged when attaching components to shock absorber.

SUSPENSION ARM

PFP:55501

Removal and Installation

NES0000U

REMOVAL

1. Remove tire with power tool.
2. Remove drive shaft. Refer to RAX-10, "REAR DRIVE SHAFT" .
3. Remove fixing nuts and bolts between suspension arm and rear suspension member.
4. Remove cotter pin of suspension arm ball joint, and loosen nut.
5. Use a ball joint remover (suitable tool) to remove suspension arm from axle. Be careful not to damage ball joint boot.

   CAUTION:
   Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.
6. Remove suspension arm and stopper rubber from vehicle.

INSPECTION AFTER REMOVAL

Visual Inspection

- Check suspension arm and bushing for deformation, cracks or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks or damage, and also for grease leakage.

Ball Joint Inspection

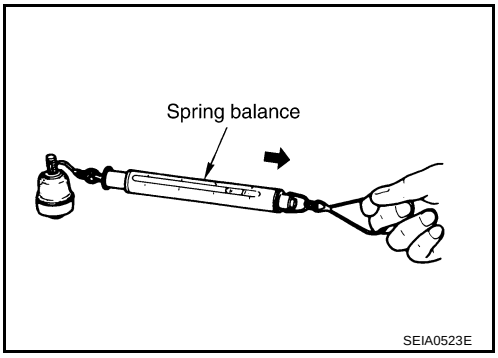
- Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:
Before measuring, move ball joint at least ten times by hand to check for smooth movement.

- Hook spring balance at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.

  Swing torque:
  0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)
  Measured value of spring balance:
  8.06 - 54.8 N (0.83 - 5.5 kg, 1.81 - 12.32 lb)

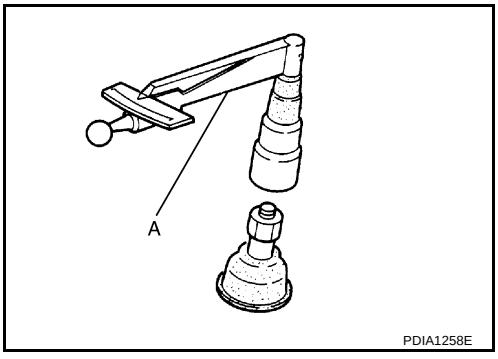


- If it is outside the specified range, replace suspension arm assembly.

Rotating Torque Inspection

- Attach mounting nut to ball stud. Make sure that sliding torque is within the specifications with a preload gauge.

  Tool number A: ST3127S000 (J-25765-A)
  Rotating torque:
  0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)



- If it is outside the specified range, replace suspension arm assembly.

Axial End Play Inspection

- Move tip of ball joint in axial direction to check for looseness.

  Axial end play : 0 mm (0 in)
- If it is outside the specified range, replace suspension arm assembly.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of rear suspension member installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

RADIUS ROD

PFP:55110

Removal and Installation

NES0000V

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-39, "REAR DISC BRAKE" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove fixing bolt and nut in axle side of radius rod with power tool.
4. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
5. Remove fixing bolt in lower side of shock absorber with power tool.
6. Remove fixing bolt and nut in axle side of front lower link with power tool.
7. Remove fixing bolt in rear suspension member side of radius rod with power tool, then remove radius rod from vehicle.

INSPECTION AFTER REMOVAL

- Check radius rod and bushing for any deformation, cracks, or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

FRONT LOWER LINK

PFP:55110

Removal and Installation

NES0000W

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Remove fixing nut and bolt between front lower link and rear suspension member with power tool.
4. Remove fixing nut and bolt between front lower link and axle with power tool.
5. Remove front lower link from vehicle.

INSPECTION AFTER REMOVAL

- Check front lower link and bushing for any deformation, cracks, or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-7, "Components" .

REAR LOWER LINK & COIL SPRING

PFP:551B0

Removal and Installation

NES0000X

REMOVAL

1. Remove tire with power tool.
2. Set jack under rear lower link.
3. Loosen fixing bolt and nut of rear lower link in side of suspension member, and then remove fixing bolt and nut in side of axle with power tool.
4. Slowly lower jack, then remove upper seat, coil spring and rubber sheet from rear lower link.
5. Remove fixing bolt and nut in side of rear suspension member to remove rear lower link with power tool.

INSPECTION AFTER REMOVAL

- Check rear lower link, bushing and coil spring for deformation, cracks, and damage. Replace rear lower link and coil spring if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

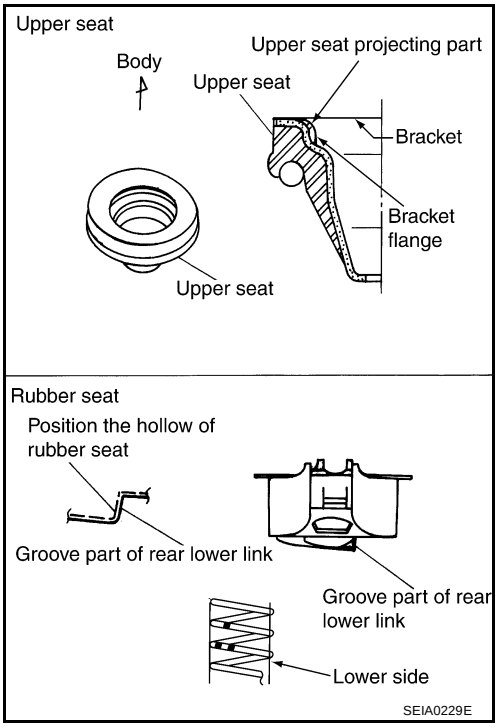
- Check that upper seat is attached as shown in the figure.

  NOTE:
  Insert bracket tabs (3) and the inside protrusion on upper seat into each other beforehand as shown in the figure.

- Match up rubber seat indentions and rear lower link grooves and attach.

  NOTE:
  Make sure spring is not up side down. The top and bottom are indicated by paint color.

- Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .



STABILIZER BAR

PFP:56230

Removal and Installation

NES0000Y

REMOVAL

1. Remove fixing bolts and remove stabilizer connecting rod mount bracket from suspension arm.
2. Remove lower side fixing nut on stabilizer connecting rod and remove stabilizer connecting rod from stabilizer bar with power tool.
3. Remove fixing nut on stabilizer clamp and remove stabilizer from vehicle with power tool.

INSPECTION AFTER REMOVAL

- Check stabilizer bar, stabilizer bushings, stabilizer clamp, stabilizer connecting rod, stabilizer connecting rod mounting bracket for any deformation, crack or damage. Replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.

REAR SUSPENSION MEMBER

PFP:55501

Removal and Installation

NES0000Z

REMOVAL

1. Remove tire with power tool.
2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-39, "REAR DISC BRAKE" .

   NOTE:
   Avoid depressing brake pedal while brake caliper is removed.
3. Remove rear exhaust tube. Refer to EX-3, "EXHAUST SYSTEM" .
4. Remove stabilizer bar. Refer to RSU-16, "STABILIZER BAR" .
5. Remove drive shaft. Refer toRAX-10, "REAR DRIVE SHAFT" .
6. Remove final drive. Refer to RFD-17, "REAR FINAL DRIVE ASSEMBLY" .
7. Separate the attachment between parking brake cable and vehicle and rear suspension member. Refer to PB-4, "PARKING BRAKE CONTROL" .
8. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
9. Remove fixing bolt in lower side of shock absorber.
10. Set jack under rear suspension member.
11. Remove fixing bolts and nuts tunnel stay and member stay from vehicle.
12. Remove fixing bolts and nuts of rear pin stay and then remove rear pin stay from vehicle.
13. Slowly lowering jack, then remove rear suspension member, suspension arm, radius rod, front lower link and axle from vehicle as a unit.
14. Remove fixing bolts and nuts, then remove suspension arm, front lower link, radius rod from rear suspension member.

INSPECTION AFTER REMOVAL

- Check rear suspension member for deformation, cracks, and other damage and replace if necessary.

INSTALLATION

- Refer to RSU-7, "Components" , for tightening torque. Install in the reverse order of removal.

  NOTE:
  Refer to component parts location and do not reuse non-reusable parts.
- Perform final tightening of installation position of links (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Wheel Alignment (Unladen*)

NES00010

Camber Degree minute (Decimal degree)		Minimum	–2° 05′ (–2.08°)
		Nominal	–1° 35′ (–1.58°)
		Maximum	–1° 05′ (–1.08°)
Total toe-in	Distance	Minimum	1.1 mm (0.043 in)
		Nominal	1.9 mm (0.075 in)
		Maximum	2.7 mm (0.106 in)
	Angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0° 02′ 54″ (0.05°)
		Nominal	0° 04′ 54″ (0.08°)
		Maximum	0° 06′ 54″ (0.12°)

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

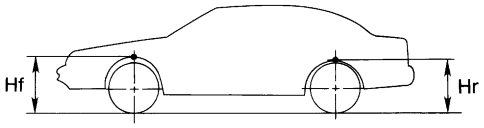
Ball Joint

NES00011

Axial end play	0 mm (0 in)
Swing torque	0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)
Measurement on spring balance (cotter pinhole position)	8.06 - 54.8 N (0.83 - 5.5 kg, 1.81 - 12.32 lb)
Rotating torque	0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)

Wheelarch Height (Unladen*)

NES00012



SFA818A

Applied model	225/45R18 (Front) 245/45R18 (Rear)		245/40R18 (Front) 265/35R19 (Rear)
	Coupe	Roadster	Coupe
Front (Hf)	683 mm (26.89 in)		683 mm (26.89 in)
Rear (Hr)	706 mm (27.80 in)	705 mm (27.76 in)	703 mm (27.68 in)

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

SECTION SB
SEAT BELTS

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NHS00001

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precaution for Seat Belt Service

NHS00002

CAUTION:

- **Before removing the seat belt pre-tensioner assembly, turn the ignition switch off, disconnect the both battery cables and wait at least 3 minutes.**
- **Do not use electrical test equipment for seat belt pre-tensioner connector.**
- **After replacing or reinstalling seat belt pre-tensioner assembly, or reconnecting front seat belt pre-tensioner connector, check the system function. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**
- **Do not use disassemble buckle or seat belt assembly.**
- **Replace anchor bolts if they are deformed or worn out.**
- **Never oil tongue and buckle.**
- **If any component of seat belt assembly is questionable, do not repair. Replace the whole seat belt assembly.**
- **If webbing is cut, frayed, or damaged, replace seat belt assembly.**
- **When replacing seat belt assembly, use a genuine NISSAN seat belt assembly.**

AFTER A COLLISION

WARNING:

Inspect all seat belt assemblies including retractors and attaching hardware after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.

Replace any seat belt assembly (including anchor bolts) if:

- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident. (i.e. torn webbing, bent retractor or guide).
- The seat belt attaching point was damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair as necessary before installing a new seat belt assembly.
- Anchor bolts are deformed or worn out.
- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

Precautions for Battery Service

NHS00003

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

SEAT BELTS

PFP:86884

System Description

NHS00004

SEAT BELT WARNING CHIME

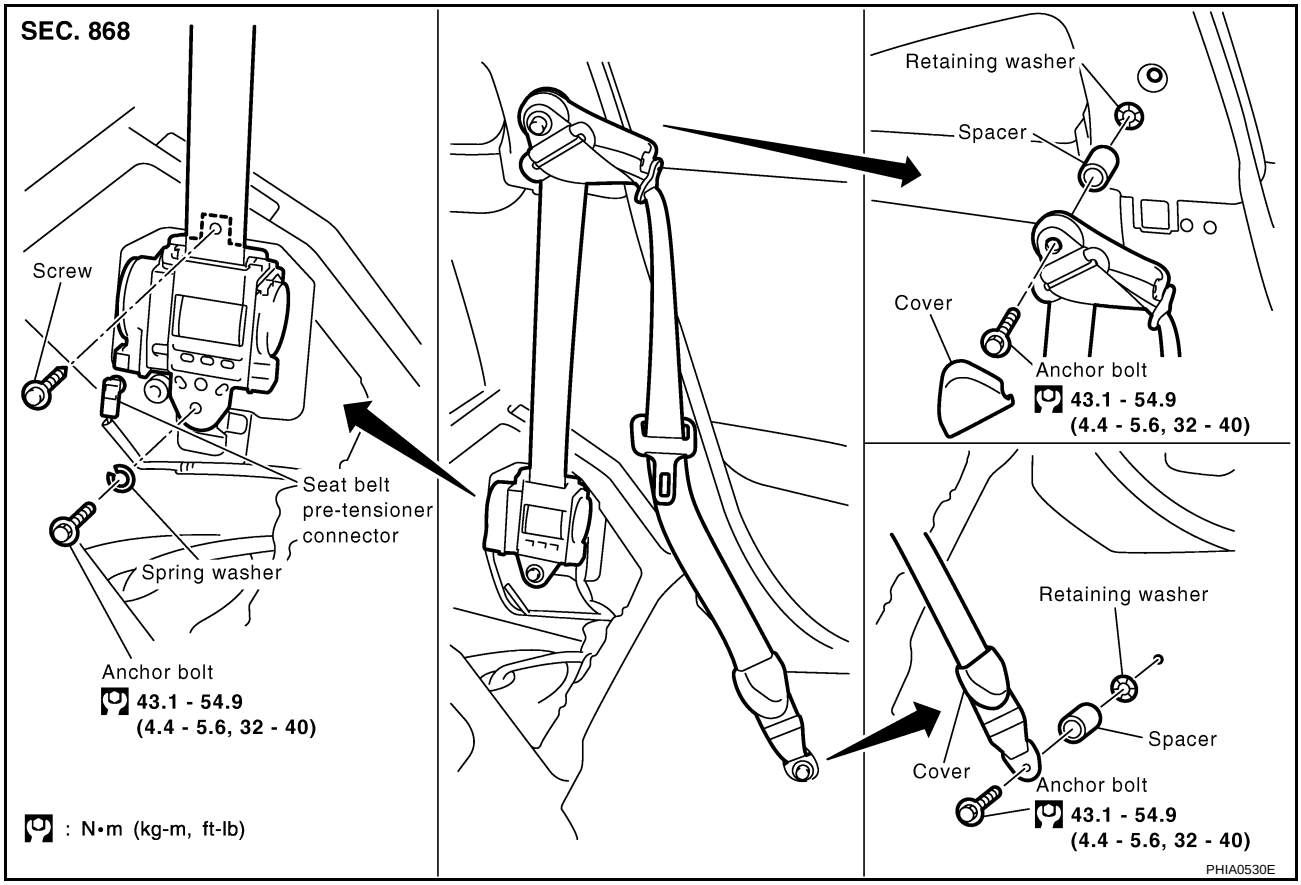
- With ignition switch turned ON and seat belt unfastened (seat belt switch ON), warning chime will sound for approximately 6 seconds.
- If warning chime does not sound. Refer to DI-88, "Seat Belt Buckle Switch (Driver Side) Signal Inspection" .

SEAT BELT WARNING LAMP

- Fasten driver's seat belt.
- The seat belt warning lamp should go out.
- If the seat belt warning lamp does not go out. Refer to DI-58, "Wiring Diagram — WARN —" .

Removal and Installation of Seat Belt (Coupe)

NHS00005



CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

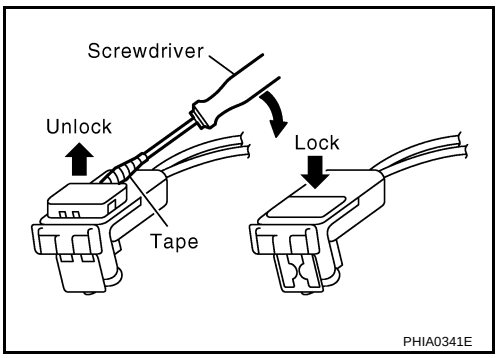
REMOVAL OF SEAT BELT RETRACTOR

1. Remove the shoulder anchor cover on the seat belt anchor.
2. Remove the anchor bolt.
3. Slide up outer anchor cover, and remove the anchor bolt.
4. Remove the rear side finisher and rear pillar finisher. Refer to EI-35, "Removal and Installation (for Coupe Models)" .
5. Remove the center console. Refer to IP-10, "Component Parts Drawing" .
6. Remove the luggage floor finisher lower. Refer to EI-39, "Removal and Installation (for Coupe Models)" .
7. Remove the woofer and woofer amp. (BOSE system) bracket mounting bolts. Refer to AV-49, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" .
8. Remove the rear floor box. Refer to EI-39, "Removal and Installation (for Coupe Models)" .

9. Disconnect the seat belt pre-tensioner connector.

CAUTION:

- **For installing/removing pre-tensioner seat belt connector, insert screwdriver wrapped in tape into notch, lift lock and remove connector.**
- **Install connector with lock raised, and push lock into connector.**



10. Remove the seat belt pre-tensioner retractor fixing screw and anchor bolt, and then remove the seat belt retractor.

INSTALLATION OF SEAT BELT RETRACTOR

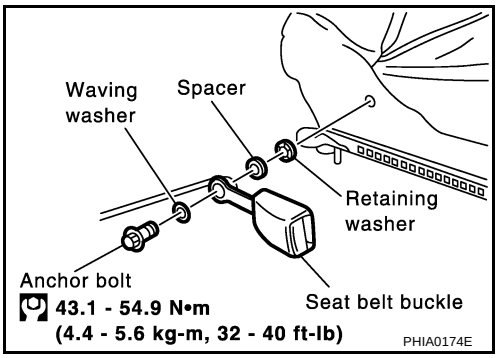
CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

Install in the reverse order of removal.

REMOVAL OF SEAT BELT BUCKLE

1. Remove the seat. Refer to SE-73, "REMOVAL" .
2. Remove the screws, and remove the seat cushion inner finisher.
3. Remove the anchor bolt, and remove the buckle.

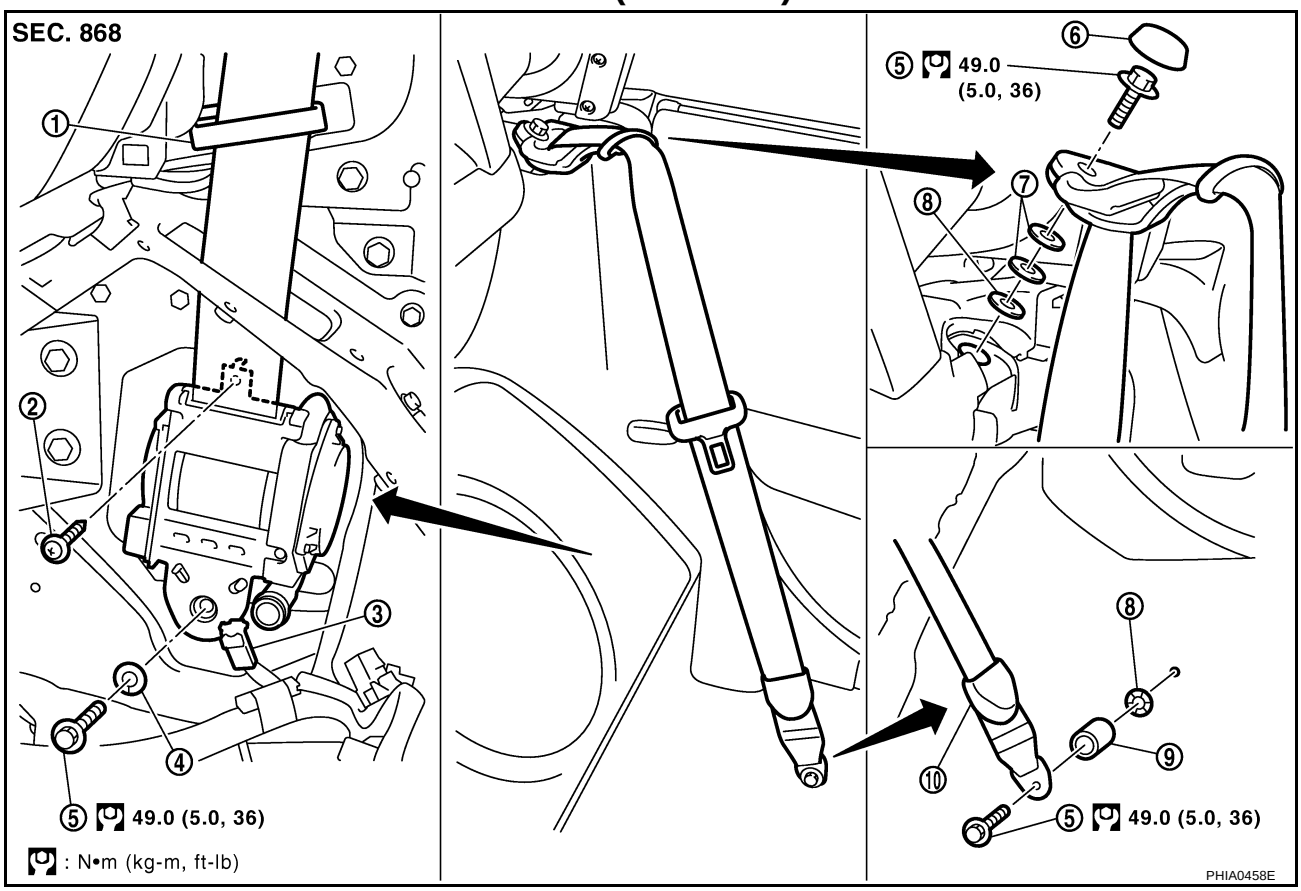


INSTALLATION OF SEAT BELT BUCKLE

Install in the reverse order of removal.

Removal and Installation of Seat Belt (Roadster)

NHS00006



1. Sash guide
2. Screw
3. Seat belt pre-tensioner connector
4. Spring washer
5. Anchor bolt
6. Shoulder anchor cover
7. Spacer
8. Retaining washer
9. Spacer
10. Outer anchor cover

CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

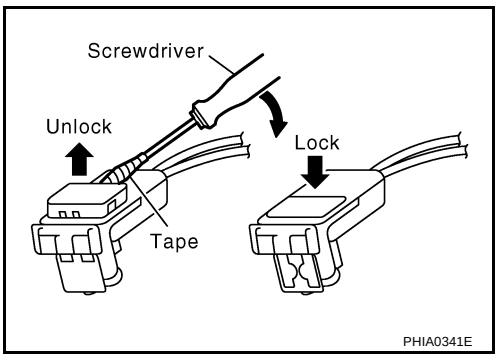
REMOVAL OF SEAT BELT RETRACTOR

1. Remove the shoulder anchor cover on the seat belt anchor.
2. Remove the anchor bolt.
3. Slide up outer anchor cover, and remove the anchor bolt.
4. Remove the rear side finisher. Refer to EI-37, "Removal and Installation (for Roadster Models)" .
5. Remove the center console. Refer to IP-10, "Component Parts Drawing" .
6. Remove the luggage floor finisher lower. Refer to EI-41, "Removal and Installation (for Roadster Models)" .
7. Remove the woofer and woofer amp. (BOSE system) bracket mounting bolts. Refer to AV-49, "Removal and Installation of Woofer and Woofer Amp. (BOSE System)" .
8. Remove the rear floor box. Refer to EI-41, "Removal and Installation (for Roadster Models)" .

9. Disconnect the seat belt pre-tensioner connector.

CAUTION:

- **For installing/removing pre-tensioner seat belt connector, insert screwdriver wrapped in tape into notch, lift lock and remove connector.**
- **Install connector with lock raised, and push lock into connector.**



10. Remove the seat belt pre-tensioner retractor fixing screw and anchor bolt, and then remove the seat belt retractor.
11. Remove the sash guide and then remove the seat belt assembly.

INSTALLATION OF SEAT BELT RETRACTOR

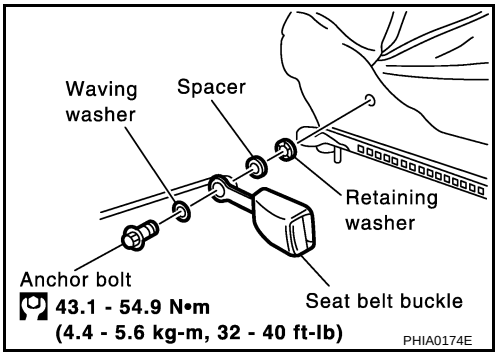
CAUTION:

Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.

Install in the reverse order of removal.

REMOVAL OF SEAT BELT BUCKLE

1. Remove the seat. Refer to SE-73, "REMOVAL" .
2. Remove the screws, and remove the seat cushion inner finisher.
3. Remove the anchor bolt, and remove the buckle.



INSTALLATION OF SEAT BELT BUCKLE

Install in the reverse order of removal.

Seat Belt Inspection

NHS00007

AFTER A COLLISION

WARNING:

Inspect all seat belt assemblies including retractors and attached hardware after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.

Replace any seat belt assembly (including anchor bolts) if:

- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident. (i.e. torn webbing, bent retractor or guide).
- The seat belt attaching point was damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair as necessary before installing a new seat belt assembly.
- Anchor bolts are deformed or worn out.
- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

PRELIMINARY CHECKS

1. Check the seat belt warning lamp/chime for proper operation as follows:

a. Switch ignition ON. The seat belt warning lamp should illuminate. Also, the seat belt warning chime should sound for about 6 seconds.

b. Fasten driver's seat belt. The seat belt warning lamp should go out and the chime (if sounding) should stop.

2. If the air bag warning lamp is blinking, conduct self-diagnosis using CONSULT-II, and confirm with air bag warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" .

3. Make sure that the seat belt retractor, seat belt anchor and buckle bolts are securely attached.

4. Check the shoulder seat belt guide for seats. Ensure guide swivels freely and that webbing lays flat and does not bind in guide. Ensure height adjuster operates properly and holds securely.

5. Check retractor operation:

a. Fully extend the seat belt webbing and check for twists, tears or other damage.

b. Allow the seat belt to retract. Ensure that webbing returns smoothly and completely into the retractor. If the seat belt does not return smoothly, wipe the inside of the loops with a clean paper cloth, because dirt built up in the loops of the upper anchors can cause the seat belts to retract slowly.

c. Fasten the seat belt. Check the seat belt returns smoothly and completely to the retractor. If the webbing does not return smoothly, the cause may be an accumulation of dust or dirt. Use the “SEAT BELT TAPE SET” and perform the following steps.

   Inspect the seat belt through-anchor:

   1. Pull the seat belt out to a length of 500 mm (19.69 in) or more.
   2. Use a clip or other device to the fix the seat belt at the rear side finisher webbing opening.
   3. Pass a thin wire through the through-anchor webbing opening. Hold both ends of the wire and pull taut while moving it up and down several times along the webbing opening surface to remove dirt.
   4. Any dirt that cannot be removed with the wire can be removed by cleaning the opening with a clean cloth.
   5. Apply tape at the point where the webbing contacts the through-anchor webbing opening.

      NOTE:
      Apply the tape so that there is no looseness or wrinkling.

   6. Remove the clip fixing the seat belt and make sure that the webbing returns smoothly.
   7. Repeat steps above as necessary to check the other seat belts.

SEAT BELT RETRACTOR ON-VEHICLE CHECK

Emergency Locking Retractors (ELR)

NOTE:
All seat belt retractors are of the Emergency Locking Retractors (ELR) type. In an emergency (sudden stop) the retractor will lock and prevent the webbing from extending any further.
Check the seat belt retractors using the following test(s) to determine if a retractor assembly is operating properly.

ELR Function Stationary Check

Grasp the shoulder webbing and pull forward quickly. The retractor should lock and prevent the belt from extending further.

ELR Function Moving Check

WARNING:
Perform the following test in a safe, open area clear of other vehicles and obstructions (for example, a large, empty parking lot). Road surface must be paved and dry. Do Not perform the following test on wet or gravel roads or on public streets and highways. This could result in an accident and serious personal injury. The driver and passenger must be prepared to brace themselves in the event the retractor does not lock.

1. Fasten driver's seat belt. Buckle a passenger into the seat for the belt that is to be tested.
2. Proceed to the designated safe area.
3. Drive the vehicle at approximately 16 km/h (10 MPH). Notify any passengers of a pending sudden stop. The driver and passenger must be prepared to brace themselves in the event the retractor does not lock. Apply brakes firmly and make a very hard stop.

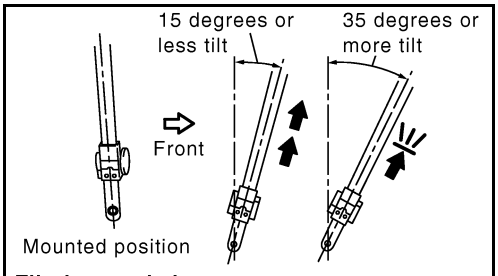
While stopping, seat belts should lock and not be extended. If the seat belt retractor assembly does not lock, perform the retractor off-vehicle check.

SEAT BELT RETRACTOR OFF-VEHICLE CHECK

1. Remove the seat belt retractor assembly.
2. Slowly pull out webbing while tilting the retractor assembly forward from the mounted position without twisting the retractor assembly as shown in the figure.

   15 degrees or less tilt : Webbing can be pulled out.
   35 degrees or more tilt : Webbing locks and cannot be pulled out.

   If NG, replace the retractor assembly.



Tilt the seat belt retractor forward from the mounted position without twisting the retractor.
PHIA0175E

SECTION SC
STARTING & CHARGING SYSTEM

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PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS00001

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NKS00002

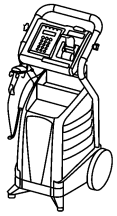
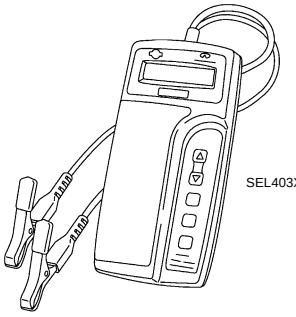
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

PREPARATION

PFP:00002

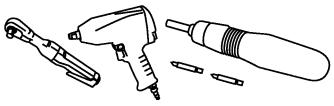
Special Service Tools

NKS00004

Tool number (Kent-Moore No.) Tool name	Description
— (J-48087) Battery Service Center  WKIA5280E	Tests battery. For operating instructions, refer to Technical Service Bulletin and Battery Service Center User Guide.
— (J-44373 Model MCR620) Starting/Charging System Tester  SEL403X	Tests starting and charging system. For operating instructions, refer to Technical Service Bulletin.

Commercial Service Tools

NKS0054Y

Tool name	Description
Power tool  PIIB1407E	Loosening bolts, nuts and screws

BATTERY

PFP:AYBGL

How to Handle Battery

NKS00006

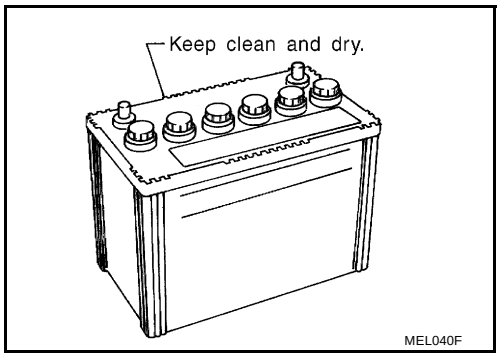
CAUTION:

- **If it becomes necessary to start the engine with a booster battery and jumper cables, use a 12-volt booster battery.**
- **After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.**

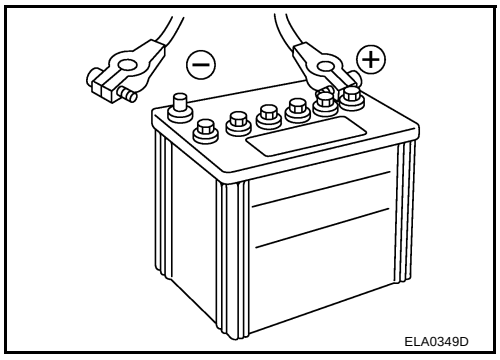
METHODS OF PREVENTING OVER-DISCHARGE

The following precautions must be taken to prevent over-discharging a battery.

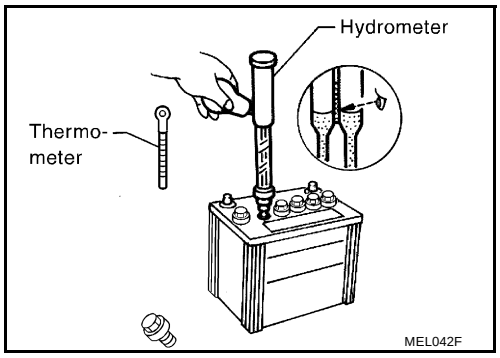
- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance, check the electrolyte level.
  This also applies to batteries designated as “low maintenance” and “maintenance-free”.



- When the vehicle is not going to be used over a long period of time, disconnect the battery cable from the negative terminal.



- Check the charge condition of the battery.
  Periodically check the specific gravity of the electrolyte. Keep a close check on charge condition to prevent over-discharge.

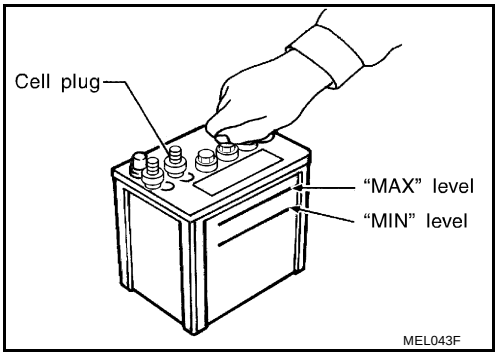


CHECKING ELECTROLYTE LEVEL

WARNING:

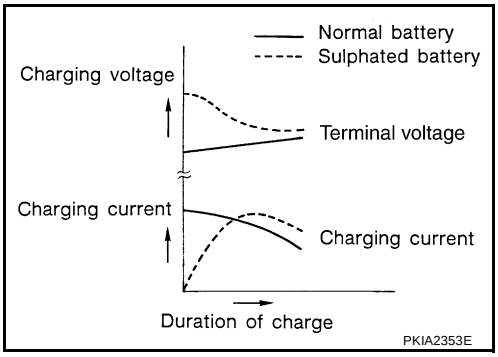
Never allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, never touch or rub your eyes until you have thoroughly washed your hands. If acid contacts eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.

- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.



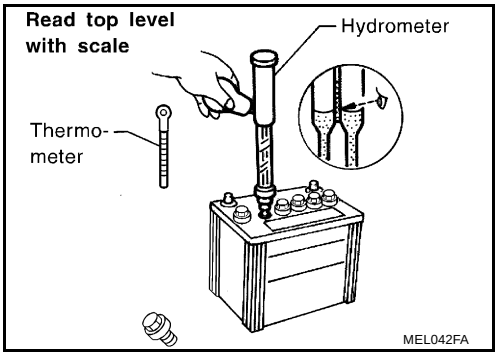
Sulphation

A battery will be completely discharged if it is left unattended for a long time and the specific gravity will become less than 1.100. This may result in sulphation on the cell plates.
To determine if a battery has been "sulphated", note its voltage and current when charging it. As shown in the figure, less current and higher voltage are observed in the initial stage of charging sulphated batteries.
A sulphated battery may sometimes be brought back into service by means of a long, slow charge, 12 hours or more, followed by a battery capacity test.



SPECIFIC GRAVITY CHECK

1. Read hydrometer and thermometer indications at eye level.
2. Use the chart below to correct your hydrometer reading according to electrolyte temperature.



Hydrometer Temperature Correction

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
71 (160)	0.032
66 (150)	0.028
60 (140)	0.024
54 (130)	0.020
49 (120)	0.016
43 (110)	0.012
38 (100)	0.008
32 (90)	0.004
27 (80)	0
21 (70)	–0.004

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
16 (60)	–0.008
10 (50)	–0.012
4 (40)	–0.016
–1 (30)	–0.020
–7 (20)	–0.024
–12 (10)	–0.028
–18 (0)	–0.032

Corrected specific gravity	Approximate charge condition
1.260 - 1.280	Fully charged
1.230 - 1.250	3/4 charged
1.200 - 1.220	1/2 charged
1.170 - 1.190	1/4 charged
1.140 - 1.160	Almost discharged
1.110 - 1.130	Completely discharged

CHARGING THE BATTERY

CAUTION:

- **Never “quick charge” a fully discharged battery.**
- **Keep the battery away from open flame while it is being charged.**
- **When connecting the charger, connect the leads first, then turn on the charger. Never turn on the charger first, as this may cause a spark.**
- **If battery electrolyte temperature rises above 55 °C (131 °F), stop charging. Always charge battery at a temperature below 55 °C (131 °F).**

Charging Rates

Amps	Time
50	1 hour
25	2 hours
10	5 hours
5	10 hours

Never charge at more than 50 ampere rate.

NOTE:

The ammeter reading on your battery charger will automatically decrease as the battery charges. This indicates that the voltage of the battery is increasing normally as the state of charge improves. The charging amps indicated above refer to initial charge rate.

- If, after charging, the specific gravity of any two cells varies more than 0.050, the battery should be replaced.

Trouble Diagnoses with Battery Service Center

NKS00007

For battery testing, use Battery Service Center (J-48087). For details and operating instructions, refer to Technical Service Bulletin and/or Battery Service Center User Guide.

Removal and Installation

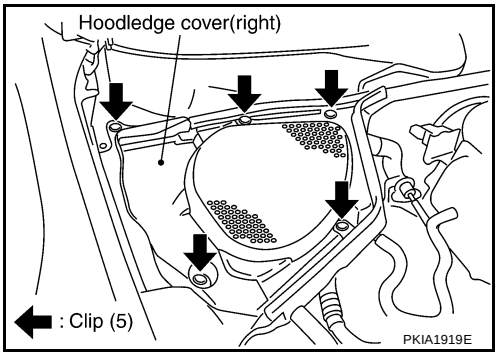
NKS00008

REMOVAL

CAUTION:

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

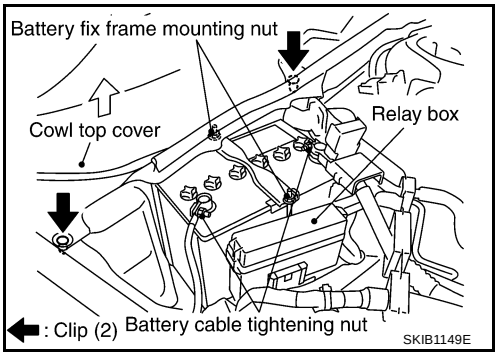
1. Remove hoodledge cover (right).



2. Disconnect both battery cables from terminals.

   CAUTION:

   When disconnecting, disconnect the battery cable from the negative terminal first.
3. Remove clips of cowl top cover (right) and it raises to the up side.
4. Remove battery fix frame mounting nuts and battery fix frame.
5. Remove relay box from bracket.
6. Remove battery.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

When connecting, connect the battery cable to positive terminal first.

Battery fix frame mounting nut

: 3.9 N·m (0.40 kg-m, 35 in-lb)

Battery cable tightening nut

: 5.4 N·m (0.55 kg-m, 48 in-lb)

STARTING SYSTEM

PFP:23300

System Description

NKS00009

M/T MODELS

Power is supplied at all times:

- through 40A fusible link (letter **M** , located in the fuse and fusible link block)
- to ignition switch terminal 1,
- through 10A fuse (No. 71, located in the IPDM E/R)
- to CPU of IPDM E/R,
- through 15A fuse (No. 78, located in the IPDM E/R)
- to CPU of IPDM E/R.

With the ignition switch in the ON or START position, power is supplied:

- to CPU of IPDM E/R, from battery direct
- through 10A fuse (No. 89, located in the IPDM E/R) and IPDM E/R terminal 25
- to clutch interlock switch terminal 1.

When the clutch pedal is depressed, power is supplied:

- through clutch interlock switch terminal 2
- to IPDM E/R terminal 53.

Ground is supplied:

- to IPDM E/R terminals 38, 50 and 60
- from grounds E17, E43 and B102 (with VDC, navigation system or telephone).
- from grounds E17, E43 and F152 (without VDC, navigation system and telephone).

Then starter relay is turn ON.
With the ignition switch in the START position, IPDM E/R is energized and power is supplied:

- from ignition switch terminal 5
- to IPDM E/R terminal 4 and
- through IPDM E/R terminal 3
- to starter motor terminal 1.

The starter motor plunger closes and provides a closed circuit between the battery and starter motor. The starter motor is grounded to the engine block. With power and ground supplied, cranking occurs and the engine starts.

A/T MODELS

Power is supplied at all times:

- through 40A fusible link (letter **M** , located in the fuse and fusible link block)
- to ignition switch terminal 1,
- through 10A fuse (No. 71, located in the IPDM E/R)
- to CPU of IPDM E/R,
- through 15A fuse (No. 78, located in the IPDM E/R)
- to CPU of IPDM E/R.

With the ignition switch in the ON or START position, power is supplied:

- to CPU of IPDM E/R, from battery direct.

When the selector lever in the “P” or “N” position, power is supplied:

- from A/T assembly (TCM) terminal 9
- to IPDM E/R terminal 53.

Ground is supplied:

- to IPDM E/R terminals 38, 50 and 60
- from grounds E17, E43 and B102 (with VDC, navigation system or telephone).
- from grounds E17, E43 and F152 (without VDC, navigation system and telephone).

Then starter relay is turn ON.
With the ignition switch in the START position, IPDM E/R is energized and power is supplied:

- from ignition switch terminal 5
- to IPDM E/R terminal 4 and
- through IPDM E/R terminal 3
- to starter motor terminal 1.

The starter motor plunger closes and provides a closed circuit between the battery and starter motor. The starter motor is grounded to the engine block. With power and ground supplied, cranking occurs and the engine starts.

Wiring Diagram — START —

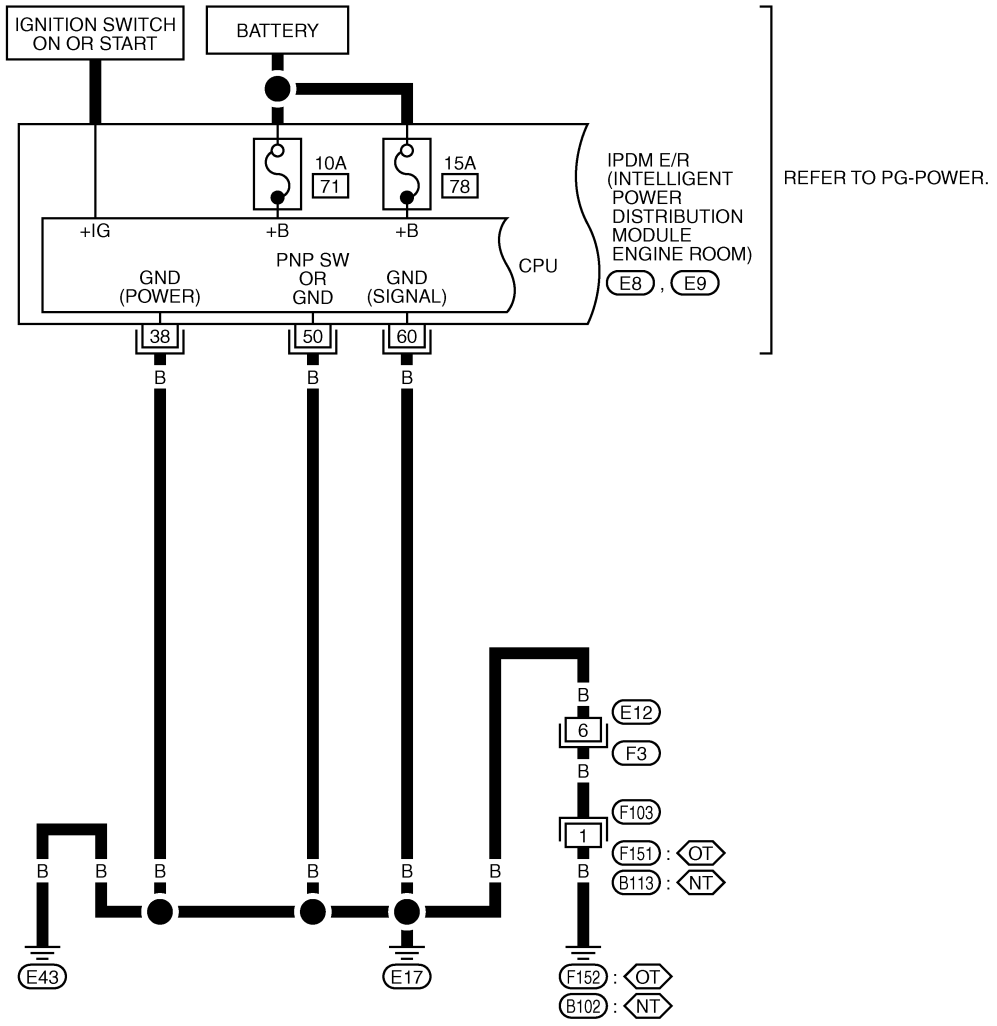
NKS0000A

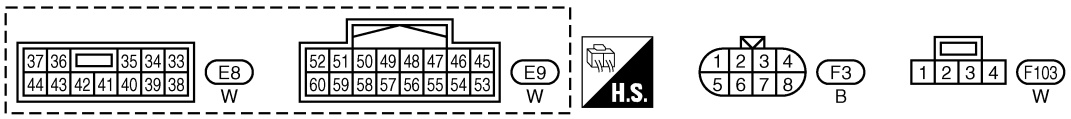
M/T MODELS

SC-START-01

NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE

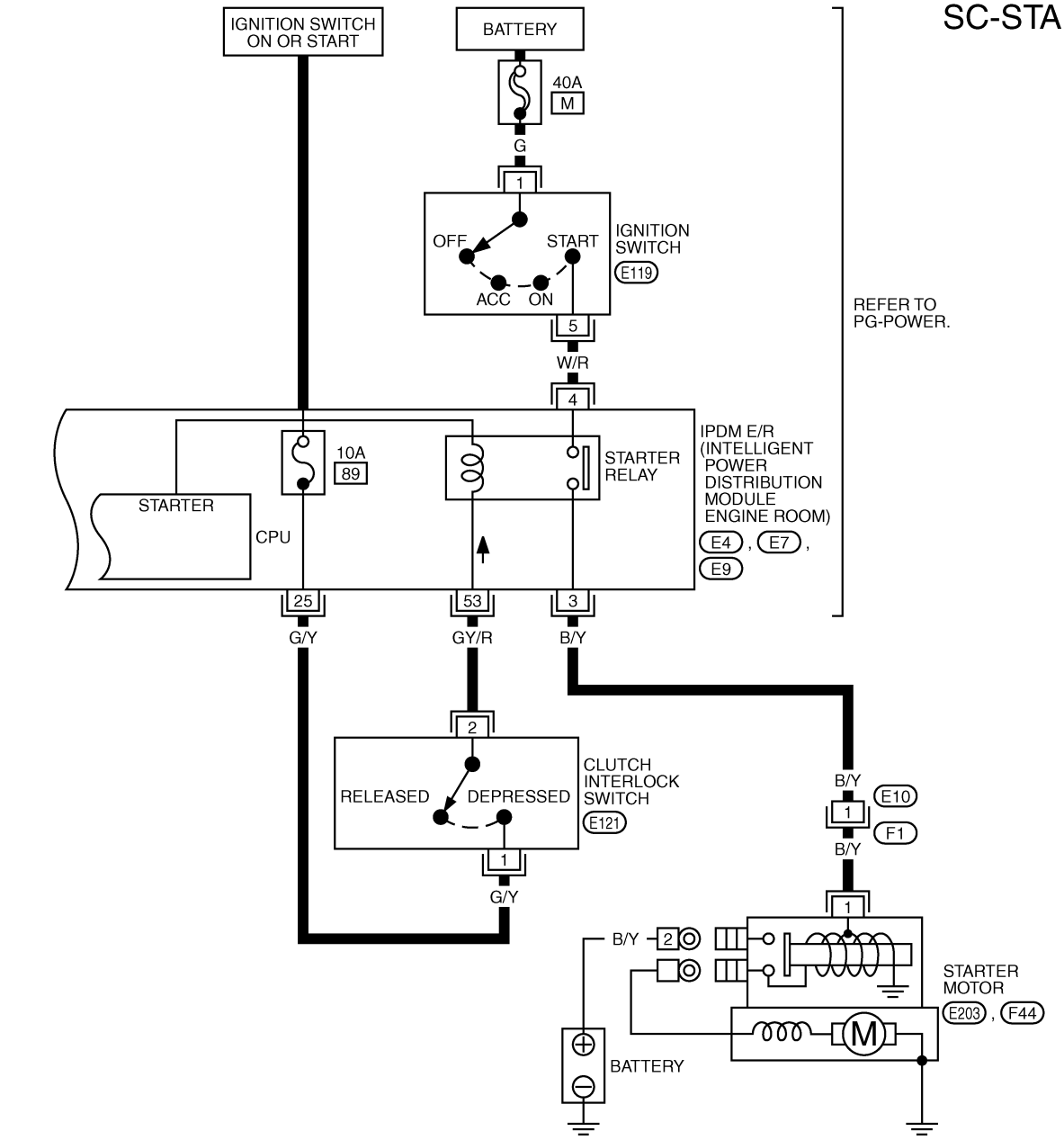
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE

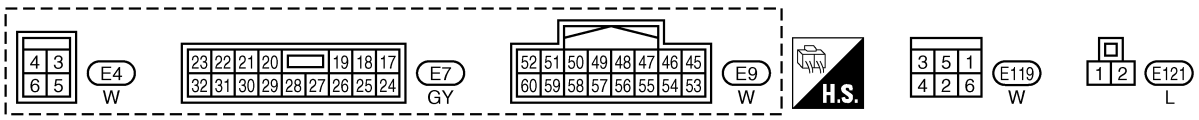


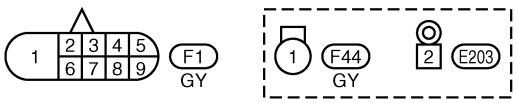


TKWT5715E

SC-START-02

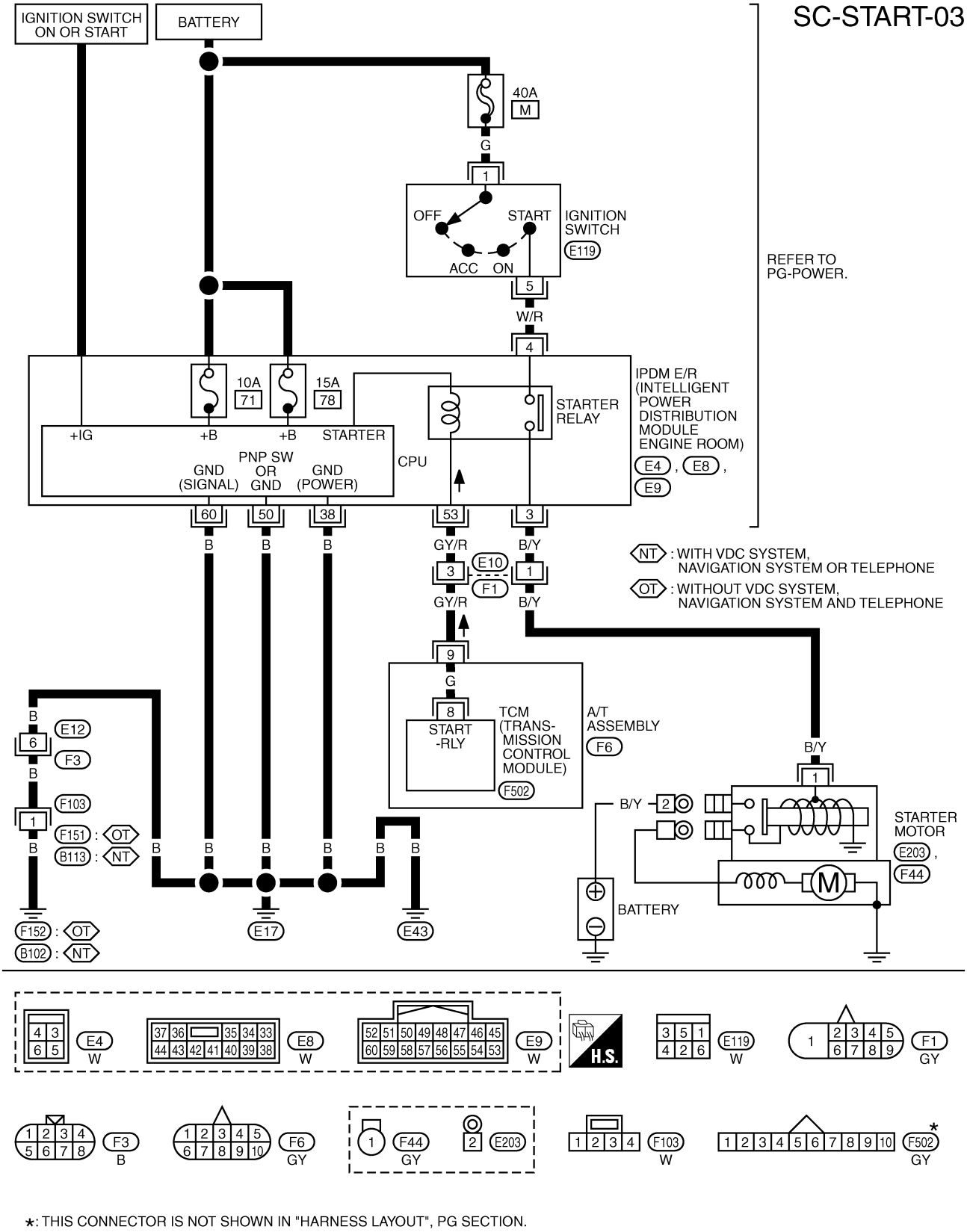






TKWT5716E

A/T MODELS



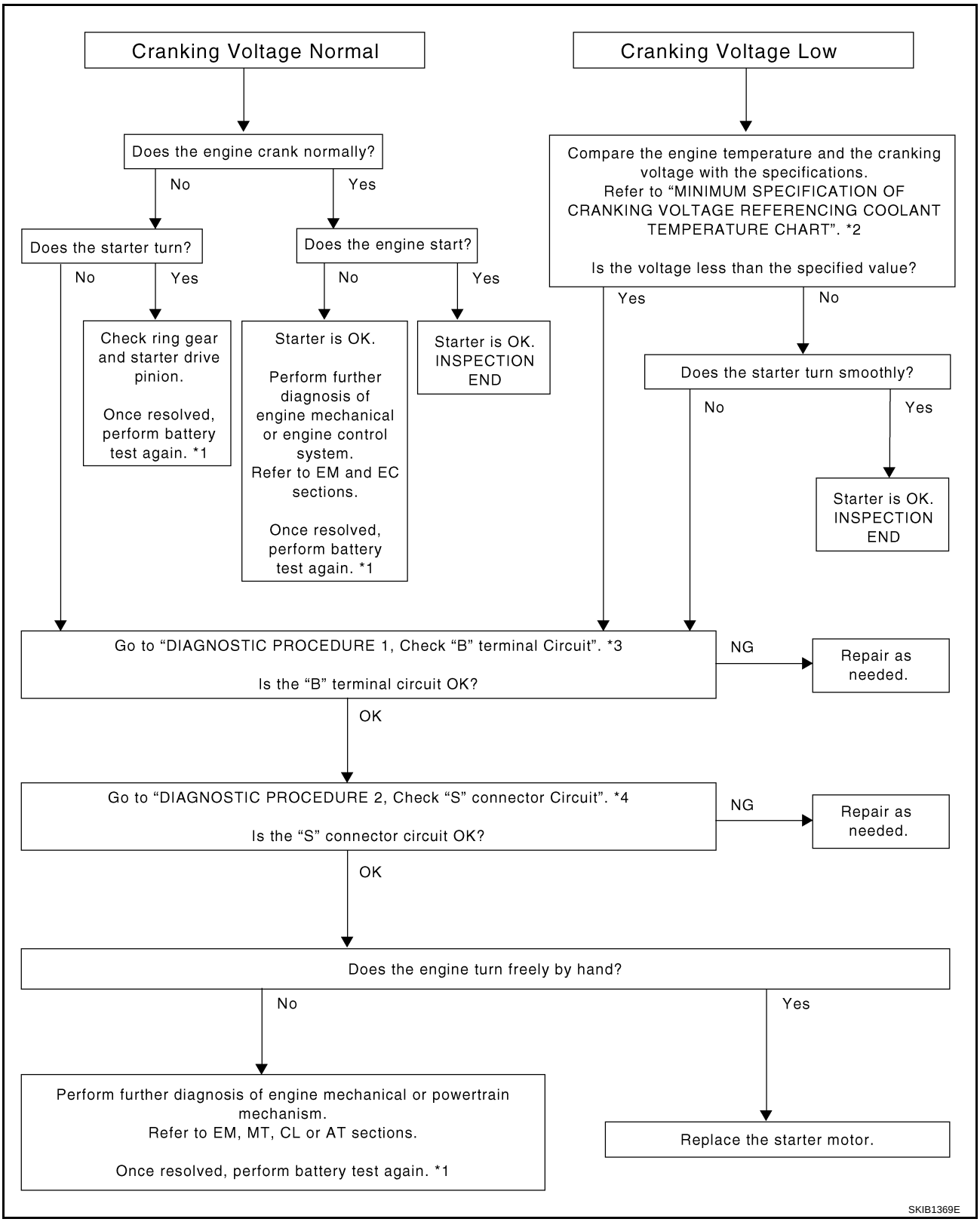
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5717E

Trouble Diagnoses with Starting/Charging System Tester (Starting)

NKS0000B

For starting system testing, use Starting/Charging System Tester (J-44373). For details and operating instructions, refer to Technical Service Bulletin.



*1 For battery testing, use Battery Service Center (J-48087). For details and operating instructions, refer to Technical Service Bulletin and/or Battery Service Center User Guide.

*2 SC-16, "MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE"

*3 SC-14, "Check “B” Terminal Circuit"

*4 SC-15, "Check “S” Connector Circuit"

DIAGNOSTIC PROCEDURE 1
Check “B” Terminal Circuit

CAUTION:

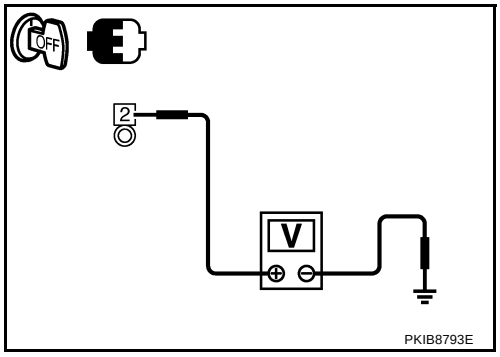
Perform diagnosis under the condition that engine cannot start by the following procedure.

1. **Remove fuel pump fuse.**
2. **Crank or start the engine (where possible) until the fuel pressure is released.**

1. CHECK “B” TERMINAL CIRCUIT

1. Turn ignition switch OFF.
2. Make sure that starter motor “B” terminal connection is clean and tight.
3. Check voltage between starter motor “B” terminal and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Starter motor “B” terminal	Terminal		
E203	2	Ground	Battery voltage



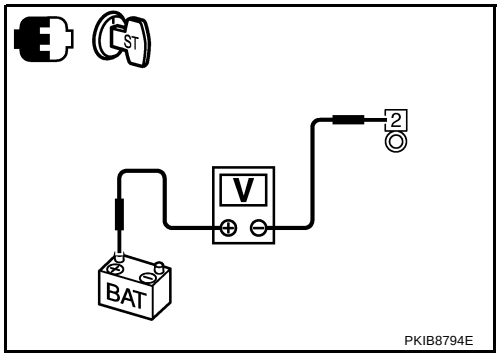
OK or NG

OK >> GO TO 2.
NG >> Check harness between battery and starter motor for open circuit.

2. CHECK BATTERY CABLE CONNECTION STATUS (VOLTAGE DROP TEST)

1. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
2. Check voltage between starter motor “B” terminal and battery positive terminal.

Terminals			Condition	Voltage (Approx.)
(+)	(–)			
	Starter motor “B” terminal	Terminal		
Battery positive terminal	E203	2	When the ignition switch is in START position	Less than 0.5 V

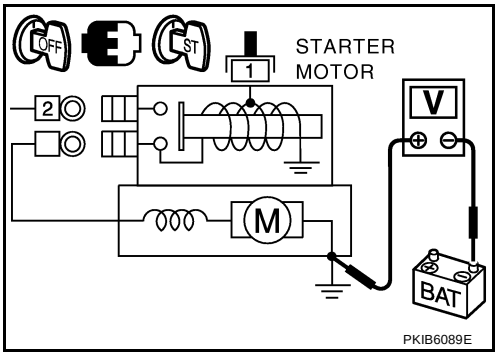


OK or NG

OK >> GO TO 3.
NG >> Check harness between the battery and the starter motor for poor continuity.

3. CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

1. Turn ignition switch OFF.
2. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
3. Check voltage between starter motor case and battery negative terminal.



Terminals		Condition	Voltage (Approx.)
(+)	(–)		
Starter motor case	Battery negative terminal	When the ignition switch is in START position	Less than 0.2 V

OK or NG

OK >> “B” terminal circuit is OK. Further inspection necessary. Refer to SC-13, "Trouble Diagnoses with Starting/Charging System Tester (Starting)" .

NG >> Check the starter motor case and ground for poor continuity.

DIAGNOSTIC PROCEDURE 2

Check “S” Connector Circuit

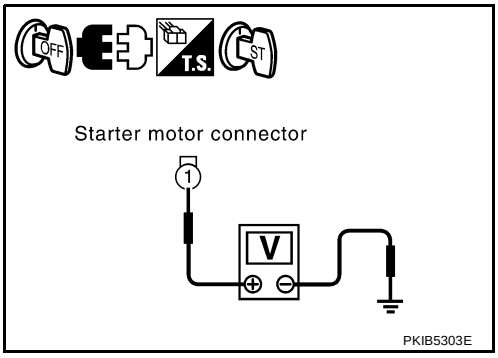
CAUTION:

Perform diagnosis under the condition that engine cannot start by the following procedure.

1. **Remove fuel pump fuse.**
2. **Crank or start the engine (where possible) until the fuel pressure is released.**

1. CHECK “S” CONNECTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector.
3. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
4. Check voltage between starter motor harness connector and ground.



Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Starter motor connector	Terminal			
F44	1	Ground	When the ignition switch is in START position	Battery voltage

OK or NG

OK >> “S” connector circuit is OK. Further inspection necessary. Refer to SC-13, "Trouble Diagnoses with Starting/Charging System Tester (Starting)" .

NG >> Check the following.

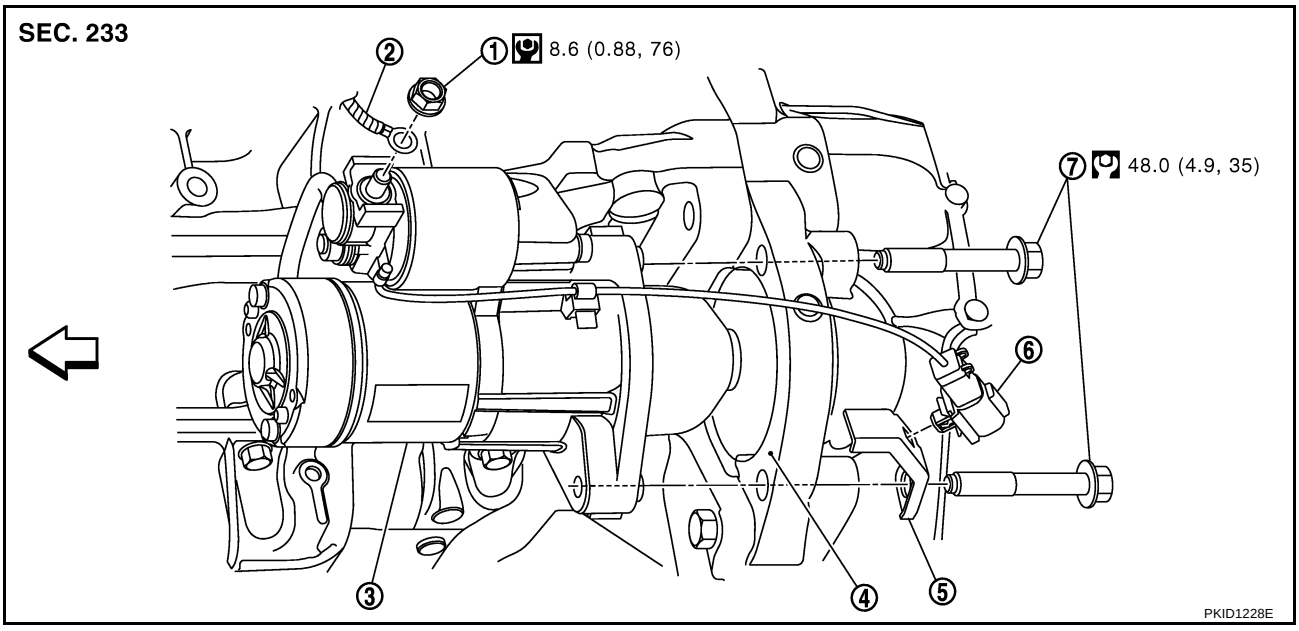
- 40A fusible link (letter **M** , located in fuse and fusible link block)
- Ignition switch
- Starter relay (within the IPDM E/R)
- Harness for open or short

MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE

Engine coolant temperature	Voltage [V]
–30 °C to –20 °C (–22 °F to –4 °F)	8.6
–19 °C to –10 °C (–2 °F to 14°F)	9.1
–9 °C to 0 °C (16 °F to 32 °F)	9.5
More than 1 °C (More than 34 °F)	9.9

Removal and Installation

NKS0000C



1. "B" terminal mounting nut
2. "B" terminal harness
3. Starter motor
4. Transmission case (M/T models) Converter housing (A/T models)
5. Harness clip bracket
6. "S" terminal connector
7. Starter motor mounting bolt

⇦: Vehicle front

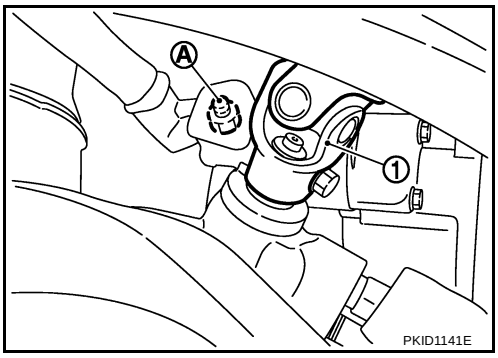
Refer to GI-11, "Components" for symbols not described on the above.

REMOVAL

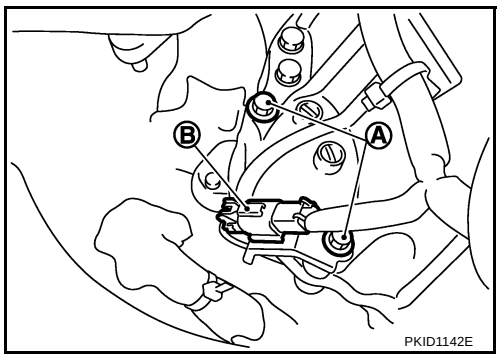
1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.

   CAUTION:

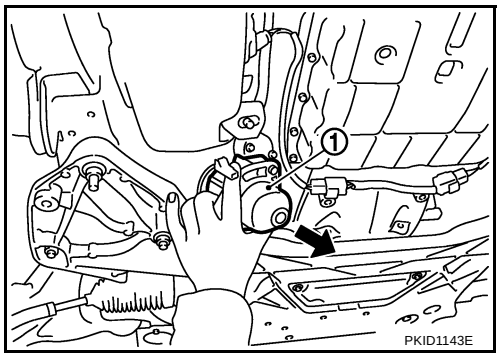
   Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.
2. Remove engine undercover, using power tools.
3. Disconnect steering lower joint (1), then remove it. Refer to PS-17, "REMOVAL" .
4. Remove "B" terminal mounting nut (A).



5. Disconnect “S” connector (B).
6. Remove starter motor mounting bolts (A) and harness connector clip bracket, using power tools.



7. Remove starter motor (1) downward from the vehicle.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

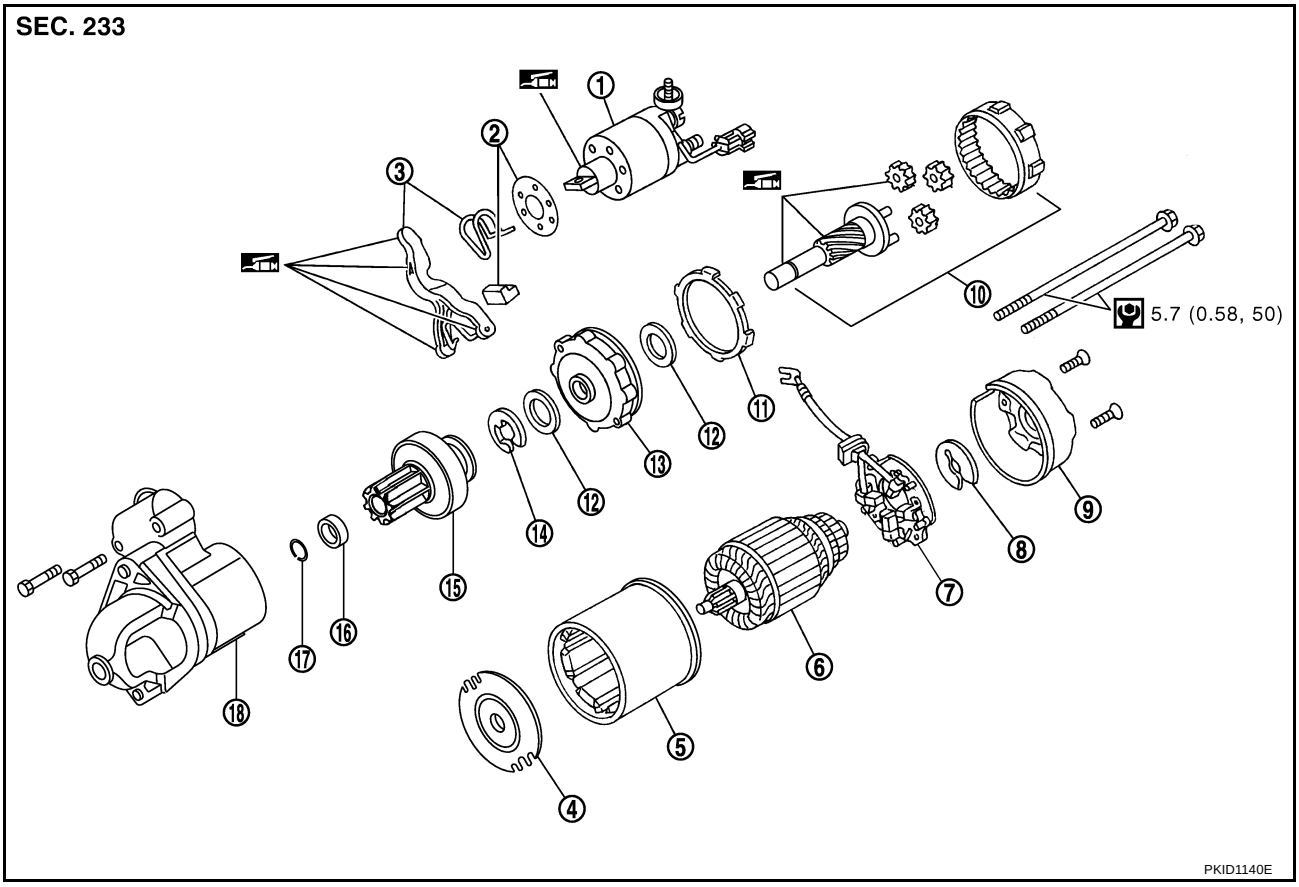
Be sure to tighten “B” terminal nut carefully.

Disassembly and Assembly

NKS0000D

TYPE: S114-928

SEC. 233



1. Magnetic switch assembly	2. Dust cover kit	3. Shift lever set
4. Center bracket (A)	5. Yoke assembly	6. Armature assembly
7. Brush holder assembly	8. Thrust washer	9. Rear cover assembly
10. Shaft gear assembly	11. Packing	12. Thrust washer
13. Center bracket (P)	14. E-ring	15. Pinion assembly
16. Pinion stopper	17. Pinion stopper clip	18. Gear case assembly

: High-temperature grease point

Refer to GI-11, "Components" for symbols not described on the above.

INSPECTION AFTER DISASSEMBLY

Pinion/Clutch Check

1. Inspect pinion teeth.
   - Replace pinion if teeth are worn or damaged. (Also check condition of ring gear teeth.)
2. Inspect reduction gear teeth.
   - Replace reduction gear if teeth are worn or damaged. (Also check condition of armature shaft gear teeth.)
3. Check to see if pinion locks in one direction and rotates smoothly in the opposite direction.
   - If it locks or rotates in both directions, or unusual resistance is evident, replace.

CHARGING SYSTEM

PFP:23100

System Description

NKS0000E

The alternator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC regulator.
Power is supplied at all times

- through 10A fuse (No. 36, located in the fuse and fusible link block)
- to alternator terminal 4 (“S” terminal).

“B” terminal supplies power to charge the battery and operate the vehicle's electrical system. Output voltage is controlled by the IC regulator at terminal 4 (“S” terminal) detecting the input voltage.
The charging circuit is protected by the 140A fusible link (letter **A** , located in the fusible link holder).
The alternator is grounded to the engine block.
With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminal 23 for the charge warning lamp.

Ground is supplied with power and ground supplied

- to terminal 17 of combination meter
- through alternator terminal 3 (“L” terminal)
- through case ground.

The charge warning lamp will illuminate. When the alternator is providing sufficient voltage with the engine running, the ground is opened and the charge warning lamp will go off.
If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

MALFUNCTION INDICATOR

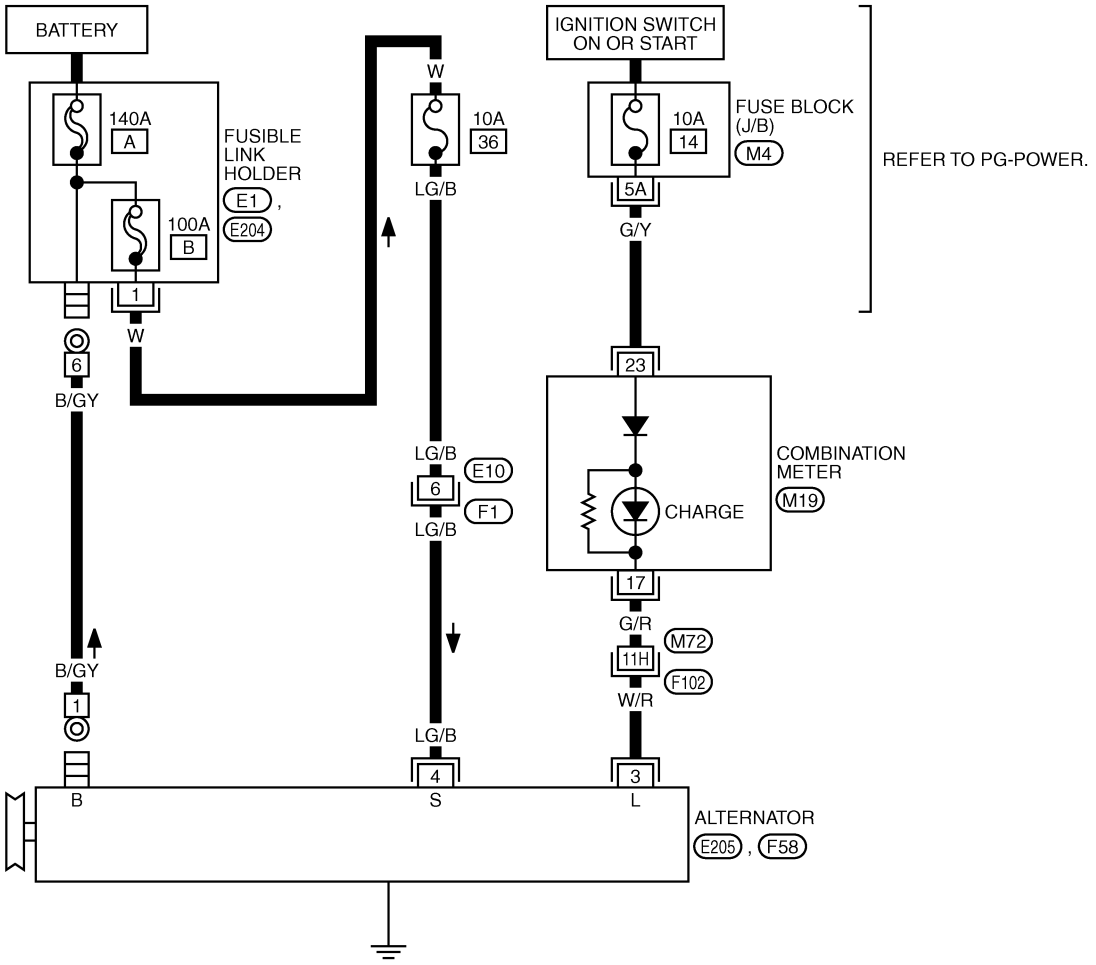
The IC regulator warning function activates to illuminate charge warning lamp, if any of the following symptoms occur while alternator is operating:

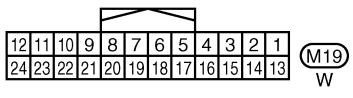
- Excessive voltage is produced.
- No voltage is produced.

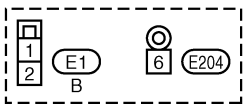
Wiring Diagram — CHARGE —

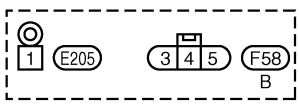
NKS0000F

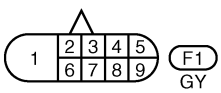
SC-CHARGE-01











REFER TO THE FOLLOWING.

F102 -SUPER MULTIPLE JUNCTION (SMJ)

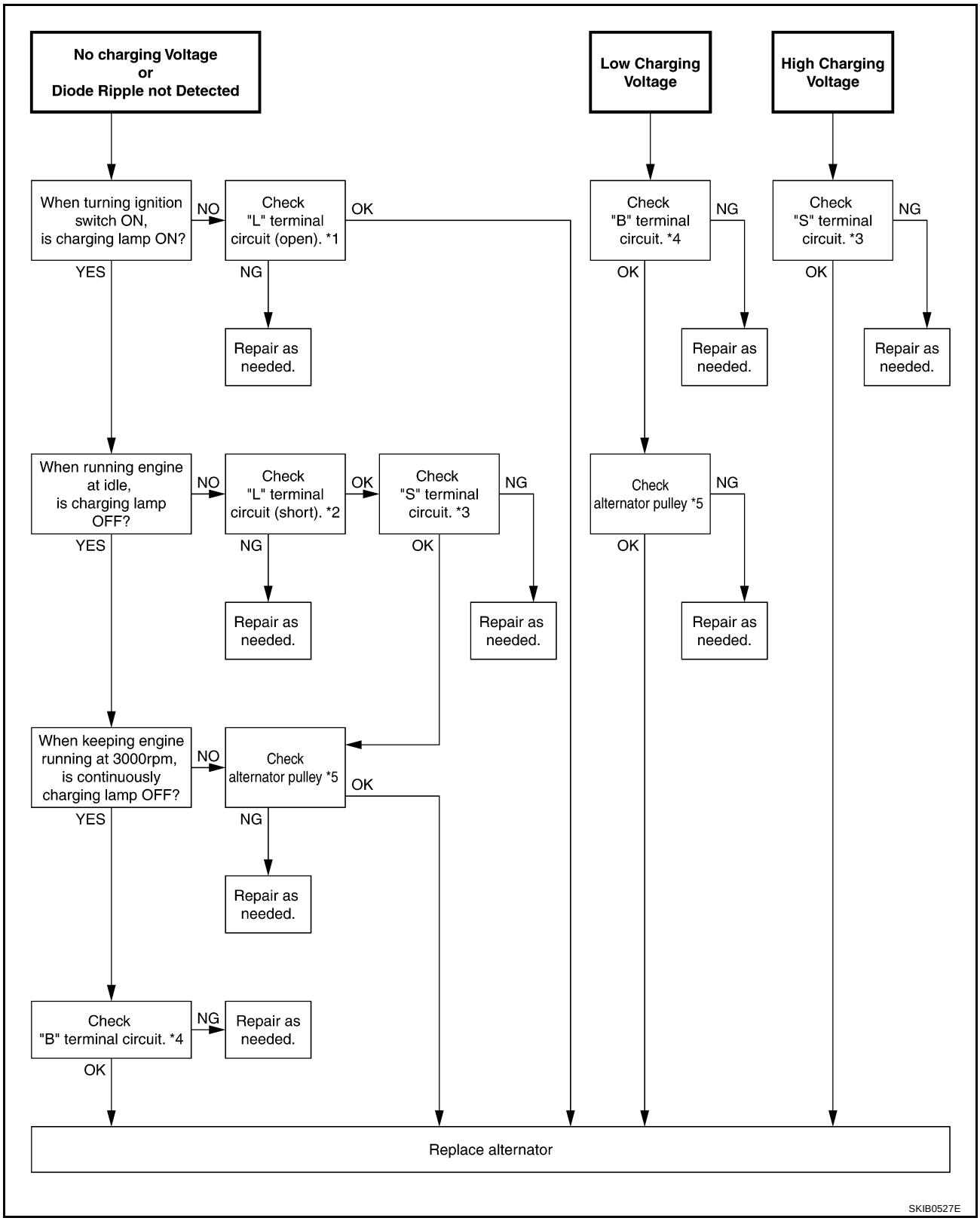
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5718E

Trouble Diagnoses with Starting/Charging System Tester (Charging)

NKS0000G

For charging system testing, use Starting/Charging System Tester (J-44373). For details and operating instructions, refer to Technical Service Bulletin.



*1 SC-23, "Check “L” Terminal Circuit (Open)"
*2 SC-24, "Check “L” Terminal Circuit (Short)"
*3 SC-24, "Check “S” Terminal Circuit"
*4 SC-24, "Check “B” Terminal Circuit"
*5 SC-27, "ALTERNATOR PULLEY INSPECTION"

PRELIMINARY INSPECTION

1. CHECK BATTERY TERMINALS CONNECTION

Check if battery terminals are clean and tight.

OK or NG

OK >> GO TO 2.
NG >> Repair battery terminals connection.

2. CHECK FUSE AND FUSIBLE LINK

Check for blown alternator and combination meter fuses and fusible links.

Unit	Power source (Power supply terminals)	Fuse and fusible link No.
Alternator	Battery (“S” terminal)	36, letter B, letter A
Combination meter	Ignition switch ON (“L” terminal)	14

OK or NG

OK >> GO TO 3.
NG >> Be sure eliminate cause of malfunction before installing new fuse and fusible link.

3. CHECK ALTERNATOR DRIVE BELT TENSION

Check alternator drive belt tension. Refer to EM-12, "Checking Drive Belts" .

OK or NG

OK >> INSPECTION END
NG >> Repair as needed.

DIAGNOSTIC PROCEDURE 1
Check “L” Terminal Circuit (Open)

1. CHECK “L” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check if “L” terminal is clean and tight.

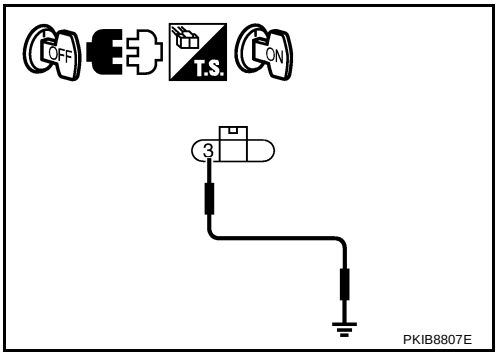
OK or NG

OK >> GO TO 2.
NG >> Repair “L” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2. CHECK “L” TERMINAL CIRCUIT (OPEN)

1. Disconnect alternator connector.
2. Apply ground to alternator harness connector terminal.
3. Check condition the charge warning lamp with the ignition switch in the ON position.

Alternator connector	Terminal	Ground	Condition	
			Ignition switch position	Charge warning lamp
F58	3		ON	illuminate



OK or NG

OK >> Go to SC-22, "Trouble Diagnoses with Starting/Charging System Tester (Charging)" .
NG >> Check the following.

- Harness for open between combination meter and alternator
- Harness for open between combination meter and fuse
- Charge warning lamp (Combination meter)

DIAGNOSTIC PROCEDURE 2
Check “L” Terminal Circuit (Short)

1. CHECK “L” TERMINAL CIRCUIT (SHORT)

1. Turn ignition switch OFF.
2. Disconnect alternator connector.
3. Turn ignition switch ON.

Charge warning lamp should light up?

YES >> Check the following.
- Harness for short between combination meter and alternator
- Charge warning lamp (Combination meter)

NO >> Go to SC-22, "Trouble Diagnoses with Starting/Charging System Tester (Charging)" .

DIAGNOSTIC PROCEDURE 3
Check “S” Terminal Circuit

1. CHECK “S” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check if “S” terminal is clean and tight.

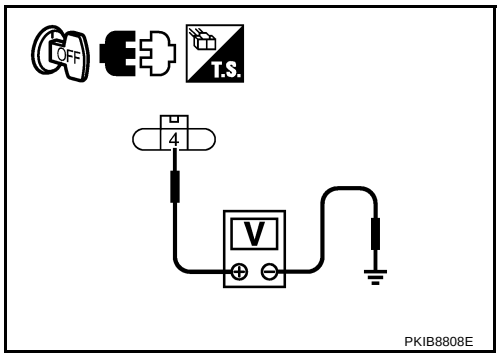
OK or NG

OK >> GO TO 2.
NG >> Repair “S” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2. CHECK “S” TERMINAL CIRCUIT

1. Disconnect alternator connector.
2. Check voltage between alternator harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator connector	Terminal		
F58	4	Ground	Battery voltage



OK or NG

OK >> Go to SC-22, "Trouble Diagnoses with Starting/Charging System Tester (Charging)" .
NG >> Harness for open between alternator and fuse.

DIAGNOSTIC PROCEDURE 4
Check “B” Terminal Circuit

1. CHECK “B” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check if “B” terminal is clean and tight.

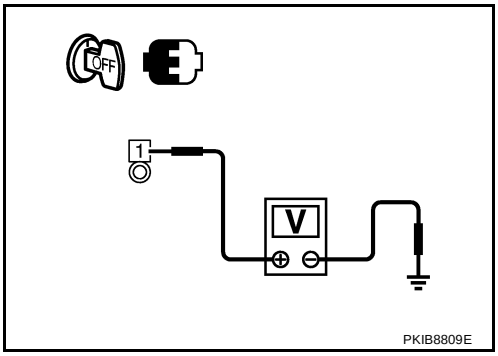
OK or NG

OK >> GO TO 2.
NG >> Repair “B” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2. CHECK “B” TERMINAL CIRCUIT

Check voltage between alternator “B” terminal and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator “B” terminal	Terminal		
E205	1	Ground	Battery voltage



OK or NG

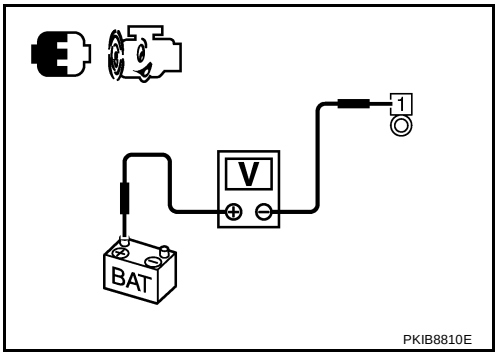
OK >> GO TO 3.

NG >> Check harness for open between alternator and fusible link.

3. CHECK “B” TERMINAL CONNECTION (VOLTAGE DROP TEST)

1. Start engine, then engine running at idle and warm.
2. Check voltage between battery positive terminal and alternator “B” terminal.

Terminals			Voltage (Approx.)
(+)	(–)		
	Alternator “B” terminal	Terminal	
Battery positive terminal	E205	1	Less than 0.2 V



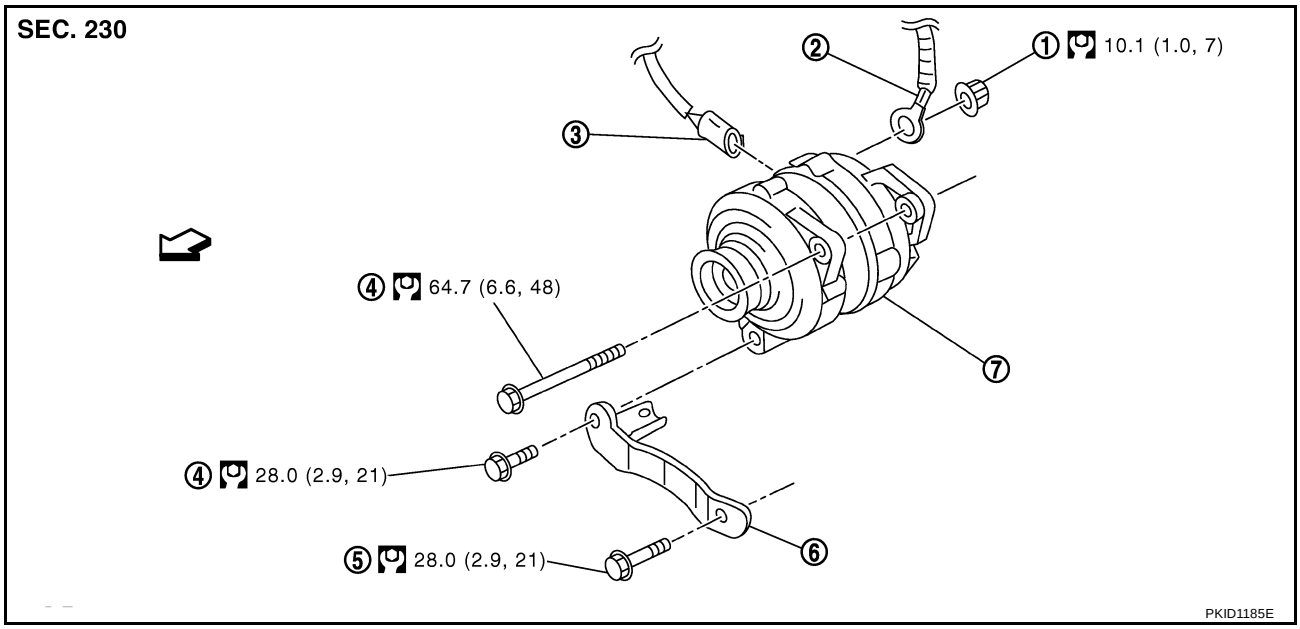
OK or NG

OK >> Go to SC-22, "Trouble Diagnoses with Starting/Charging System Tester (Charging)" .

NG >> Check harness between battery and alternator for poor continuity.

Removal and Installation

NKS0000H



1. "B" terminal mounting nut
2. "B" terminal harness
3. Alternator connector
4. Alternator mounting bolt
5. Alternator stay mounting bolt
6. Alternator stay
7. Alternator

⇦ :Vehicle front

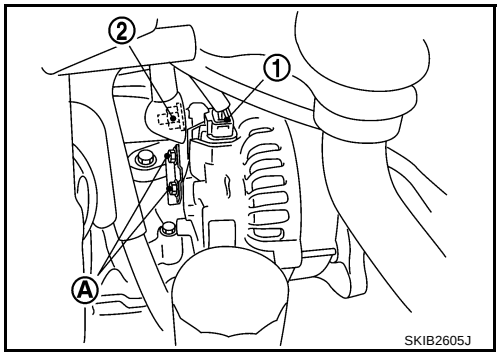
Refer to GI-11, "Components" for symbols not described on the above.

REMOVAL

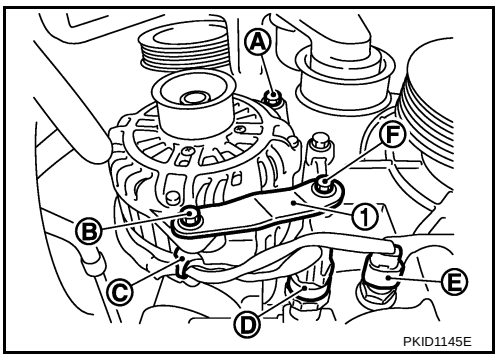
1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.

   CAUTION:

   Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.
2. Remove engine undercover, using power tools.
3. Remove air cleaner assembly and harness clip. Refer to EM-15, "AIR CLEANER AND AIR DUCT" .
4. Remove radiator cooling fan assembly. Refer to CO-21, "COOLING FAN" .
5. Remove alternator and power steering oil pump belt. Refer to EM-12, "Removal and Installation" .
6. Disconnect alternator connector (1).
7. Remove "B" terminal mounting nut (2).
8. Remove the harness bracket bolts (A).



9. Remove oil pressure switch harness clip (C) from alternator stay (1).
10. Disconnect oil pressure switch connector (D) and oil temperature sensor connector (E).
11. Remove alternator mounting bolt (B) and alternator stay mounting bolt (F) using power tools, then remove alternator stay.
12. Remove alternator mounting bolt (A), using power tools.



13. Remove alternator assembly downward from the vehicle.

ALTERNATOR PULLEY INSPECTION

Perform the following.

- Make sure that alternator pulley does not rattle.
- Make sure that alternator pulley nut is tight.

Alternator pulley nut:

: 118 N·m (12.0 kg-m, 87 ft-lb)

INSTALLATION

Installation is the reverse order of removal.

- Install alternator, and check tension of belt. Refer to EM-12, "Checking Drive Belts" .

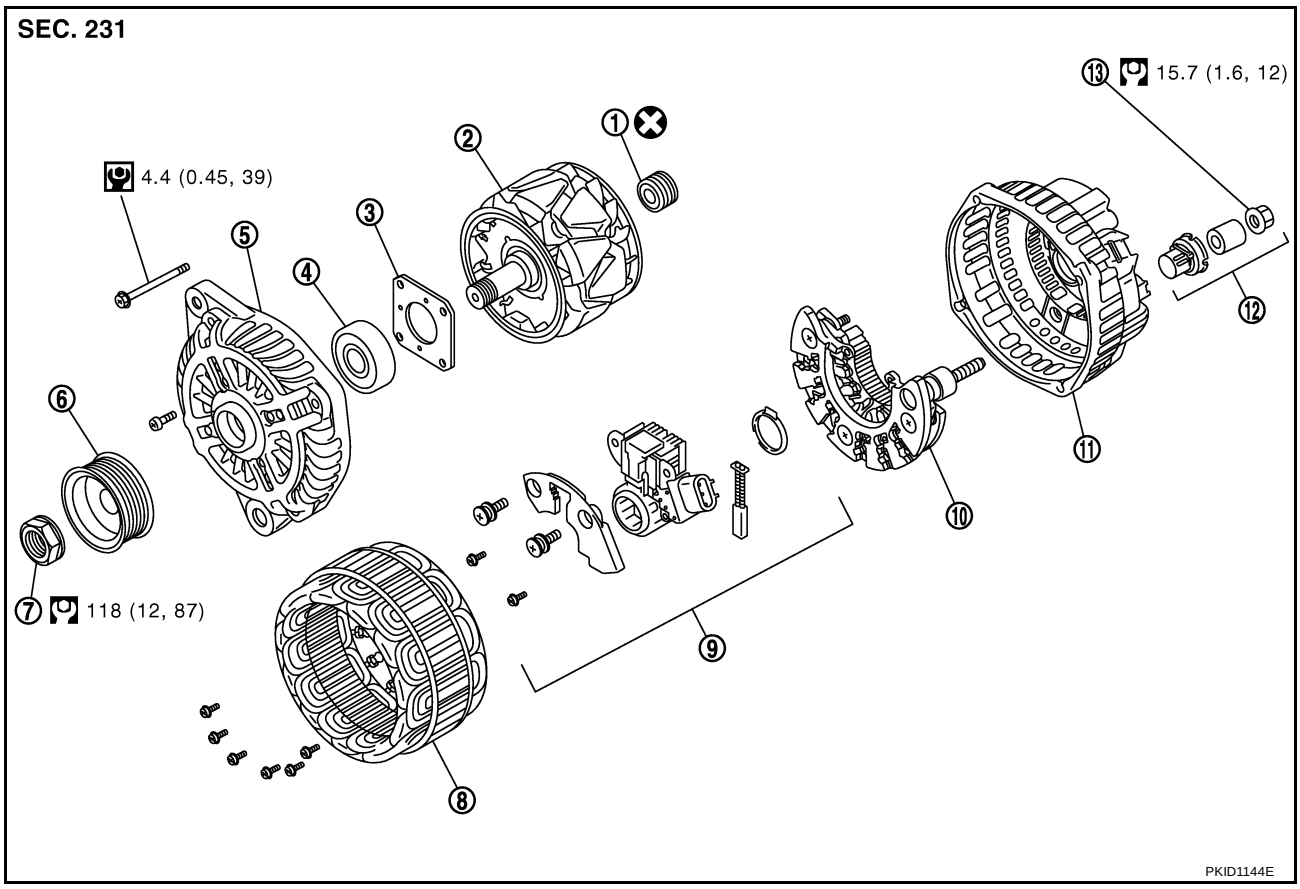
CAUTION:

Be sure to tighten “B” terminal nut carefully.

Disassembly and Assembly

NKS0000I

TYPE: A3TJ1991



1. Rear bearing
2. Rotor assembly
3. Retainer
4. Front bearing
5. Front bracket assembly
6. Pulley
7. Pulley nut
8. Stator assembly
9. IC voltage regulator assembly
10. Diode assembly
11. Rear bracket assembly
12. Terminal set
13. “B” terminal nut

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Battery

NKS0054Z

Type		80D23L
20 hour rate capacity	[V - Ah]	12 - 62
Cold cranking current (For reference value)	[A]	589

Starter

NKS00550

Type			S114-928
			HITACHI make
			Reduction gear type
System voltage		[V]	12
No-load	Terminal voltage	[V]	11
	Current	[A]	Less than 110
	Revolution	[rpm]	More than 2,700
Minimum diameter of commutator		[mm (in)]	28.0 (1.102)
Minimum length of brush		[mm (in)]	10.5 (0.413)
Brush spring tension		[N (kg, lb)]	16.2 (1.65, 3.6)
Clearance between bearing metal and armature shaft		[mm (in)]	Less than 0.2 (0.008)
Clearance between pinion front edge and pinion stopper		[mm (in)]	0.3 - 2.5 (0.012 - 0.098)

Alternator

NKS00551

Type		A3TJ1991
		MITSUBISHI make
Nominal rating	[V - A]	12 - 150
Ground polarity		Negative
Minimum revolution under no-load (When 13.5 V is applied)	[rpm]	Less than 1,300
Hot output current (When 13.5 V is applied)	[A/rpm]	More than 31/1,300 More than 122/2,500 More than 144/5,000
Regulated output voltage	[V]	14.1 - 14.7
Minimum length of brush	[mm (in)]	More than 5.00 (0.1969)
Brush spring pressure	[N (g, oz)]	4.1 - 5.3 (418 - 540, 14.8 - 19.1)
Slip ring minimum outer diameter	[mm (in)]	More than 22.1 (0.870)
Rotor (Field coil) resistance	[Ω]	1.7 - 2.0

SECTION SE
SEAT

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NIS0009B

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Service Notice

NIS0009C

- When removing or installing various parts, place a cloth or padding onto the vehicle body to prevent scratches.
- Handle trim, molding, instruments, grille, etc. carefully during removing or installing. Be careful not to oil or damage them.
- Apply sealing compound where necessary when installing parts.
- When applying sealing compound, be careful that the sealing compound does not protrude from parts.
- When replacing any metal parts (for example body outer panel, members, etc.), be sure to take rust prevention measures.

Precautions for Battery Service

NIS0009D

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Work

NIS0009E

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and keep them.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After re-installation is completed, be sure to check that each part works normally.
- Follow the steps below to clean components.

– Water soluble foul: Dip a soft cloth into lukewarm water, and wring the water out of the cloth to wipe the fouled area.
Then rub with a soft and dry cloth.

– Oily foul: Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%), and wipe the fouled area.
Then dip a cloth into fresh water, and wring the water out of the cloth to wipe the detergent off. Then rub with a soft and dry cloth.

- Do not use organic solvent such as thinner, benzene, alcohol, and gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

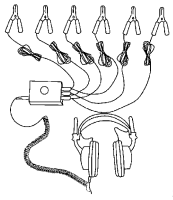
PREPARATION

PFP:00002

Special Service Tools

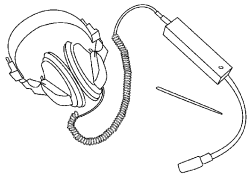
NIS0009F

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J39570) Chassis ear  SIIA0993E	Locating the noise
(J43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tools

NIS0009G

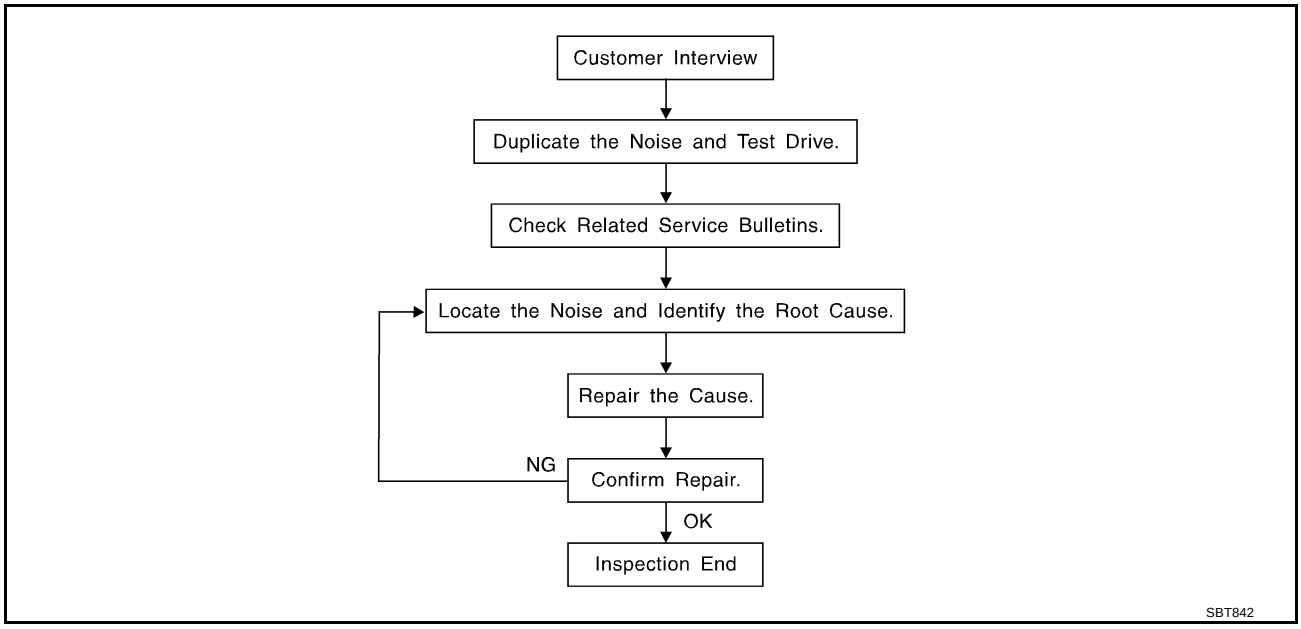
Tool name	Description
Engine ear  SIIA0995E	Locating the noise

SQUEAK AND RATTLE TROUBLE DIAGNOSES

PFP:00000

Work Flow

NIS0029B



CUSTOMER INTERVIEW

Interview the customer if possible, to determine the conditions that exist when the noise occurs. Use the Diagnostic Worksheet during the interview to document the facts and conditions when the noise occurs and any customer's comments; refer to RF-9, "Diagnostic Worksheet" . This information is necessary to duplicate the conditions that exist when the noise occurs.

- The customer may not be able to provide a detailed description or the location of the noise. Attempt to obtain all the facts and conditions that exist when the noise occurs (or does not occur).
- If there is more than one noise in the vehicle, be sure to diagnose and repair the noise that the customer is concerned about. This can be accomplished by test driving the vehicle with the customer.
- After identifying the type of noise, isolate the noise in terms of its characteristics. The noise characteristics are provided so the customer, service adviser and technician are all speaking the same language when defining the noise.
- Squeak —(Like tennis shoes on a clean floor)
  Squeak characteristics include the light contact/fast movement/brought on by road conditions/hard surfaces=higher pitch noise/softer surfaces=lower pitch noises/edge to surface=chirping
- Creak—(Like walking on an old wooden floor)
  Creak characteristics include firm contact/slow movement/twisting with a rotational movement/pitch dependent on materials/often brought on by activity.
- Rattle—(Like shaking a baby rattle)
  Rattle characteristics include the fast repeated contact/vibration or similar movement/loose parts/missing clip or fastener/incorrect clearance.
- Knock —(Like a knock on a door)
  Knock characteristics include hollow sounding/sometimes repeating/often brought on by driver action.
- Tick—(Like a clock second hand)
  Tick characteristics include gentle contacting of light materials/loose components/can be caused by driver action or road conditions.
- Thump—(Heavy, muffled knock noise)
  Thump characteristics include softer knock/dead sound often brought on by activity.
- Buzz—(Like a bumble bee)
  Buzz characteristics include high frequency rattle/firm contact.
- Often the degree of acceptable noise level will vary depending upon the person. A noise that you may judge as acceptable may be very irritating to the customer.
- Weather conditions, especially humidity and temperature, may have a great effect on noise level.

DUPLICATE THE NOISE AND TEST DRIVE

If possible, drive the vehicle with the customer until the noise is duplicated. Note any additional information on the Diagnostic Worksheet regarding the conditions or location of the noise. This information can be used to duplicate the same conditions when you confirm the repair.
If the noise can be duplicated easily during the test drive, to help identify the source of the noise, try to duplicate the noise with the vehicle stopped by doing one or all of the following:

1) Close a door.
2) Tap or push/pull around the area where the noise appears to be coming from.
3) Rev the engine.
4) Use a floor jack to recreate vehicle “twist”.
5) At idle, apply engine load (electrical load, half-clutch on M/T models, drive position on A/T models).
6) Raise the vehicle on a hoist and hit a tire with a rubber hammer.

- Drive the vehicle and attempt to duplicate the conditions the customer states exist when the noise occurs.
- If it is difficult to duplicate the noise, drive the vehicle slowly on an undulating or rough road to stress the vehicle body.

CHECK RELATED SERVICE BULLETINS

After verifying the customer concern or symptom, check ASIST for Technical Service Bulletins (TSBs) related to that concern or symptom.
If a TSB relates to the symptom, follow the procedure to repair the noise.

LOCATE THE NOISE AND IDENTIFY THE ROOT CAUSE

1. Narrow down the noise to a general area. To help pinpoint the source of the noise, use a listening tool (Chassis Ear: J-39570, Engine Ear and mechanics stethoscope).
2. Narrow down the noise to a more specific area and identify the cause of the noise by:

- removing the components in the area that you suspect the noise is coming from.
  Do not use too much force when removing clips and fasteners, otherwise clips and fastener can be broken or lost during the repair, resulting in the creation of new noise.
- tapping or pushing/pulling the component that you suspect is causing the noise.
  Do not tap or push/pull the component with excessive force, otherwise the noise will be eliminated only temporarily.
- feeling for a vibration with your hand by touching the component(s) that you suspect is (are) causing the noise.
- placing a piece of paper between components that you suspect are causing the noise.
- looking for loose components and contact marks.
  Refer to RF-7, "Generic Squeak and Rattle Troubleshooting" .

REPAIR THE CAUSE

- If the cause is a loose component, tighten the component securely.
- If the cause is insufficient clearance between components:
  - separate components by repositioning or loosening and retightening the component, if possible.
  - insulate components with a suitable insulator such as urethane pads, foam blocks, felt cloth tape or urethane tape. A Nissan Squeak and Rattle Kit (J-43980) is available through your authorized Nissan Parts Department.

CAUTION:
Do not use excessive force as many components are constructed of plastic and may be damaged.

NOTE:
Always check with the Parts Department for the latest parts information.
The following materials are contained in the Nissan Squeak and Rattle Kit (J-43980). Each item can be ordered separately as needed.
URETHANE PADS [1.5 mm (0.059 in) thick]
Insulates connectors, harness, etc.
76268-9E005: 100 × 135 mm (3.94 × 5.31 in)/76884-71L01: 60 × 85 mm (2.36 × 3.35 in)/76884-71L02: 15 × 25 mm (0.59 × 0.98 in)
INSULATOR (Foam blocks)
Insulates components from contact. Can be used to fill space behind a panel.
73982-9E000: 45 mm (1.77 in) thick, 50 × 50 mm (1.97 × 1.97 in)/73982-50Y00: 10 mm (0.39 in) thick, 50 × 50 mm (1.97 × 1.97 in)

INSULATOR (Light foam block)
80845-71L00: 30 mm (1.18 in) thick, 30 × 50 mm (1.18 × 1.97 in)
FELT CLOTHTAPE
Used to insulate where movement does not occur. Ideal for instrument panel applications.
68370-4B000: 15 × 25 mm (0.59 × 0.98 in) pad/68239-13E00: 5 mm (0.20 in) wide tape roll
The following materials, not found in the kit, can also be used to repair squeaks and rattles.
UHMW (TEFLON) TAPE
Insulates where slight movement is present. Ideal for instrument panel applications.
SILICONE GREASE
Used in place of UHMW tape that will be visible or not fit. Will only last a few months.
SILICONE SPRAY
Use when grease cannot be applied.
DUCT TAPE
Use to eliminate movement.

CONFIRM THE REPAIR

Confirm that the cause of a noise is repaired by test driving the vehicle. Operate the vehicle under the same conditions as when the noise originally occurred. Refer to the notes on the Diagnostic Worksheet.

Generic Squeak and Rattle Troubleshooting

NIS0029C

Refer to Table of Contents for specific component removal and installation information.

INSTRUMENT PANEL

Most incidents are caused by contact and movement between:

1. The cluster lid A and instrument panel
2. Acrylic lens and combination meter housing
3. Instrument panel to front pillar garnish
4. Instrument panel to windshield
5. Instrument panel mounting pins
6. Wiring harnesses behind the combination meter
7. A/C defroster duct and duct joint
   These incidents can usually be located by tapping or moving the components to duplicate the noise or by pressing on the components while driving to stop the noise. Most of these incidents can be repaired by applying felt cloth tape or silicon spray (in hard to reach areas). Urethane pads can be used to insulate wiring harness.

   CAUTION:
   Do not use silicone spray to isolate a squeak or rattle. If you saturate the area with silicone, you will not be able to recheck the repair.

CENTER CONSOLE

Components to pay attention to include:

1. Shifter assembly cover to finisher
2. A/C control unit and cluster lid C
3. Wiring harnesses behind audio and A/C control unit

The instrument panel repair and isolation procedures also apply to the center console.

DOORS

Pay attention to the:

1. Finisher and inner panel making a slapping noise
2. Inside handle escutcheon to door finisher
3. Wiring harnesses tapping
4. Door striker out of alignment causing a popping noise on starts and stops

Tapping or moving the components or pressing on them while driving to duplicate the conditions can isolate many of these incidents. You can usually insulate the areas with felt cloth tape or insulator foam blocks from the Nissan Squeak and Rattle Kit (J-43980) to repair the noise.

TRUNK

Trunk noises are often caused by a loose jack or loose items put into the trunk by the owner.
In addition look for:

1. Trunk lid dumpers out of adjustment
2. Trunk lid striker out of adjustment
3. The trunk lid torsion bars knocking together
4. A loose license plate or bracket

Most of these incidents can be repaired by adjusting, securing or insulating the item(s) or component(s) causing the noise.

SUNROOF/HEADLINING

Noises in the sunroof/headlining area can often be traced to one of the following:

1. Sunroof lid, rail, linkage or seals making a rattle or light knocking noise
2. Sunvisor shaft shaking in the holder
3. Front or rear windshield touching headlining and squeaking

Again, pressing on the components to stop the noise while duplicating the conditions can isolate most of these incidents. Repairs usually consist of insulating with felt cloth tape.

SEATS

When isolating seat noise it's important to note the position the seat is in and the load placed on the seat when the noise is present. These conditions should be duplicated when verifying and isolating the cause of the noise.
Cause of seat noise include:

1. Headrest rods and holder
2. A squeak between the seat pad cushion and frame
3. The rear seatback lock and bracket

These noises can be isolated by moving or pressing on the suspected components while duplicating the conditions under which the noise occurs. Most of these incidents can be repaired by repositioning the component or applying urethane tape to the contact area.

UNDERHOOD

Some interior noise may be caused by components under the hood or on the engine wall. The noise is then transmitted into the passenger compartment.
Causes of transmitted underhood noise include:

1. Any component mounted to the engine wall
2. Components that pass through the engine wall
3. Engine wall mounts and connectors
4. Loose radiator mounting pins
5. Hood bumpers out of adjustment
6. Hood striker out of adjustment

These noises can be difficult to isolate since they cannot be reached from the interior of the vehicle. The best method is to secure, move or insulate one component at a time and test drive the vehicle. Also, engine RPM or load can be changed to isolate the noise. Repairs can usually be made by moving, adjusting, securing, or insulating the component causing the noise.

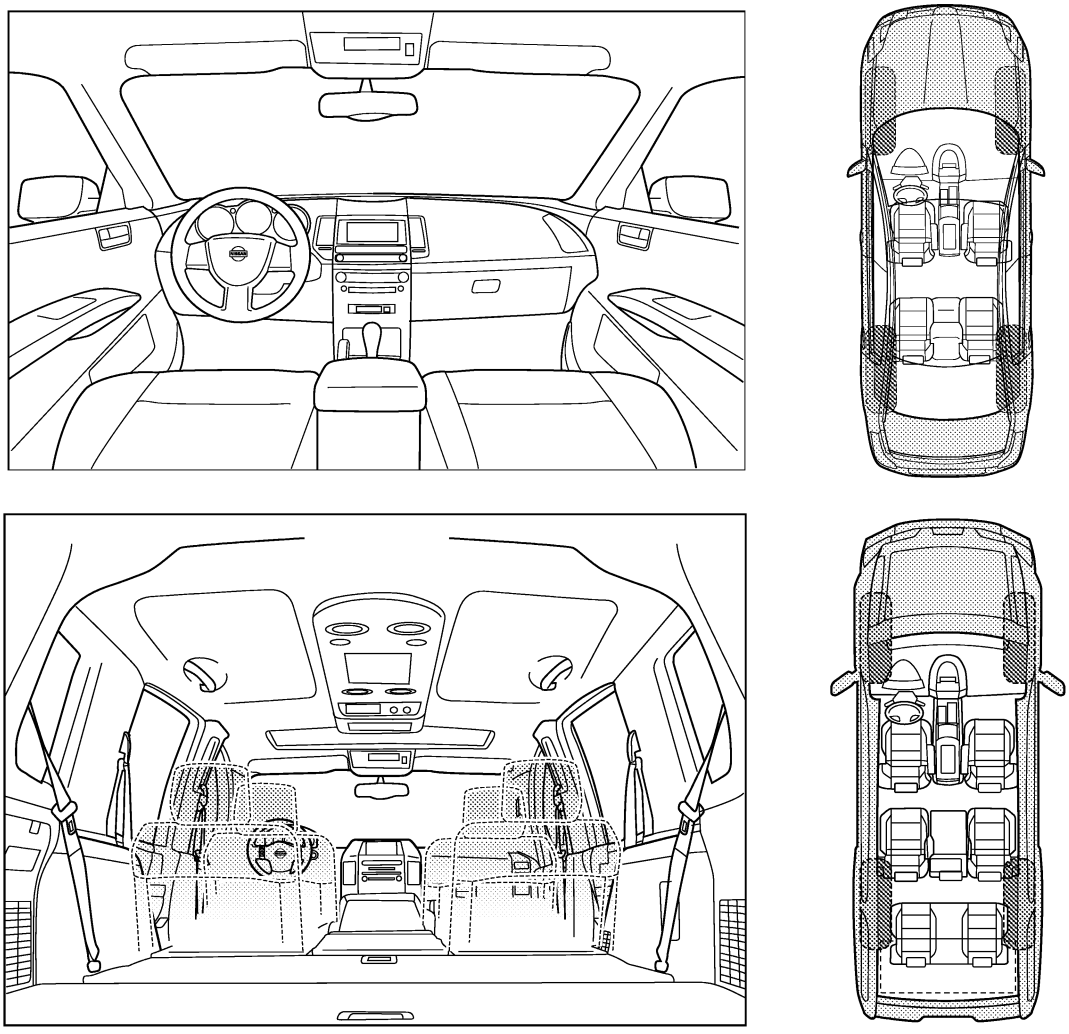
Diagnostic Worksheet

NIS0029D

SQUEAK & RATTLE
DIAGNOSTIC WORKSHEET

Dear Nissan Customer:
We are concerned about your satisfaction with your Nissan vehicle. Repairing a squeak or rattle sometimes can be very difficult. To help us fix your Nissan right the first time, please take a moment to note the area of the vehicle where the squeak or rattle occurs and under what conditions. You may be asked to take a test drive with a service advisor or technician to ensure we confirm the noise you are hearing.

I. WHERE DOES THE NOISE COME FROM? (circle the area of the vehicle)
The illustrations are for reference only, and may not reflect the actual configuration of your vehicle.



Continue to page 2 of the worksheet and briefly describe the location of the noise or rattle. In addition, please indicate the conditions which are present when the noise occurs.

PIIB8740E

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ anytime
- ☐ 1st time in the morning
- ☐ only when it is cold outside
- ☐ only when it is hot outside
- ☐ after sitting out in the rain
- ☐ when it is raining or wet
- ☐ dry or dusty conditions
- ☐ other:

III. WHEN DRIVING:

- ☐ through driveways
- ☐ over rough roads
- ☐ over speed bumps
- ☐ only about ____ mph
- ☐ on acceleration
- ☐ coming to a stop
- ☐ on turns: left, right or either (circle)
- ☐ with passengers or cargo
- ☐ other: _____
- ☐ after driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ squeak (like tennis shoes on a clean floor)
- ☐ creak (like walking on an old wooden floor)
- ☐ rattle (like shaking a baby rattle)
- ☐ knock (like a knock at the door)
- ☐ tick (like a clock second hand)
- ☐ thump (heavy, muffled knock noise)
- ☐ buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name: _____

W.O.# _____ Date: _____

This form must be attached to Work Order

PIIB8742E

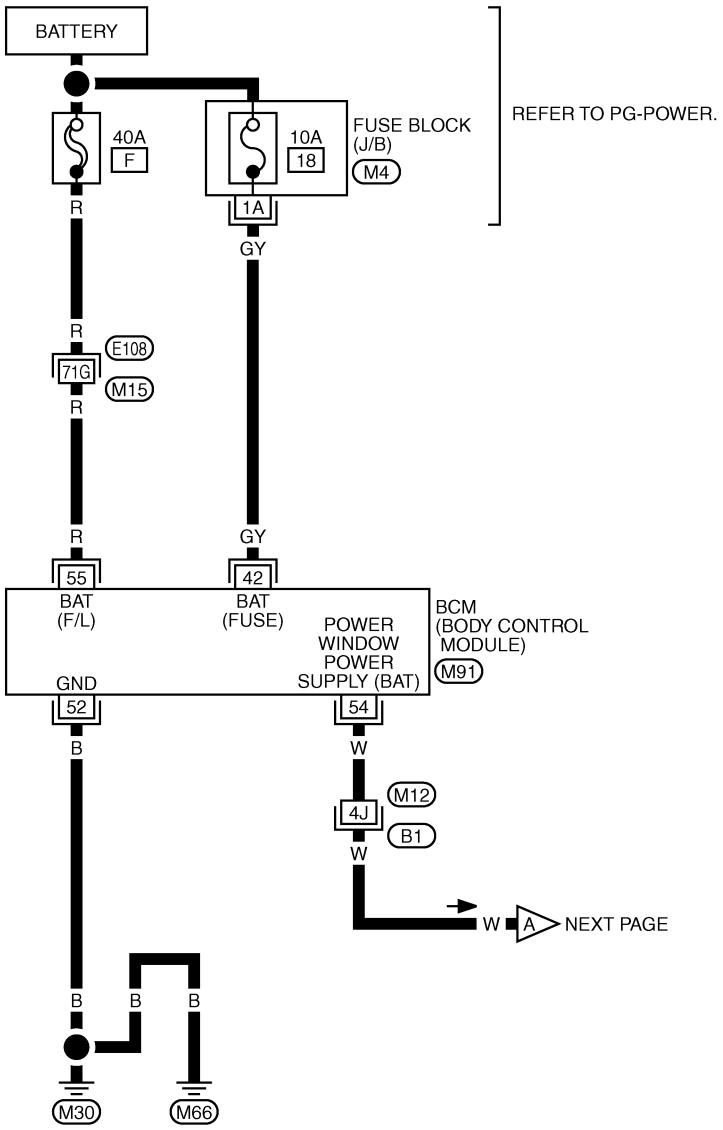
POWER SEAT/FOR COUPE

PFP:87016

Wiring Diagram–SEAT– /For Driver Seat

NIS0009K

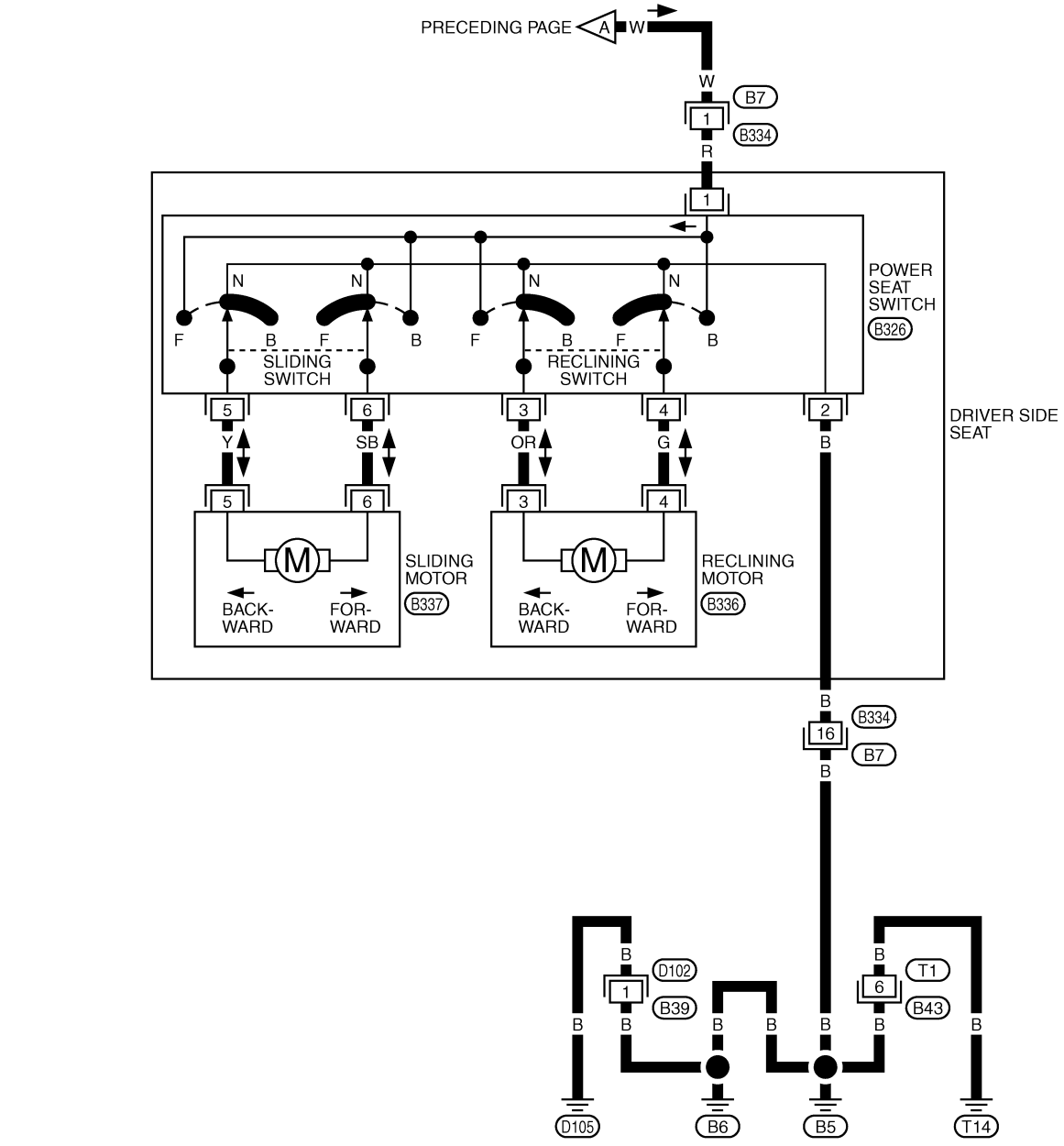
SE-SEAT-01

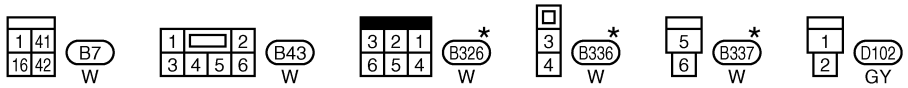


REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M91 -ELECTRICAL UNITS

TIWT1611E

SE-SEAT-02



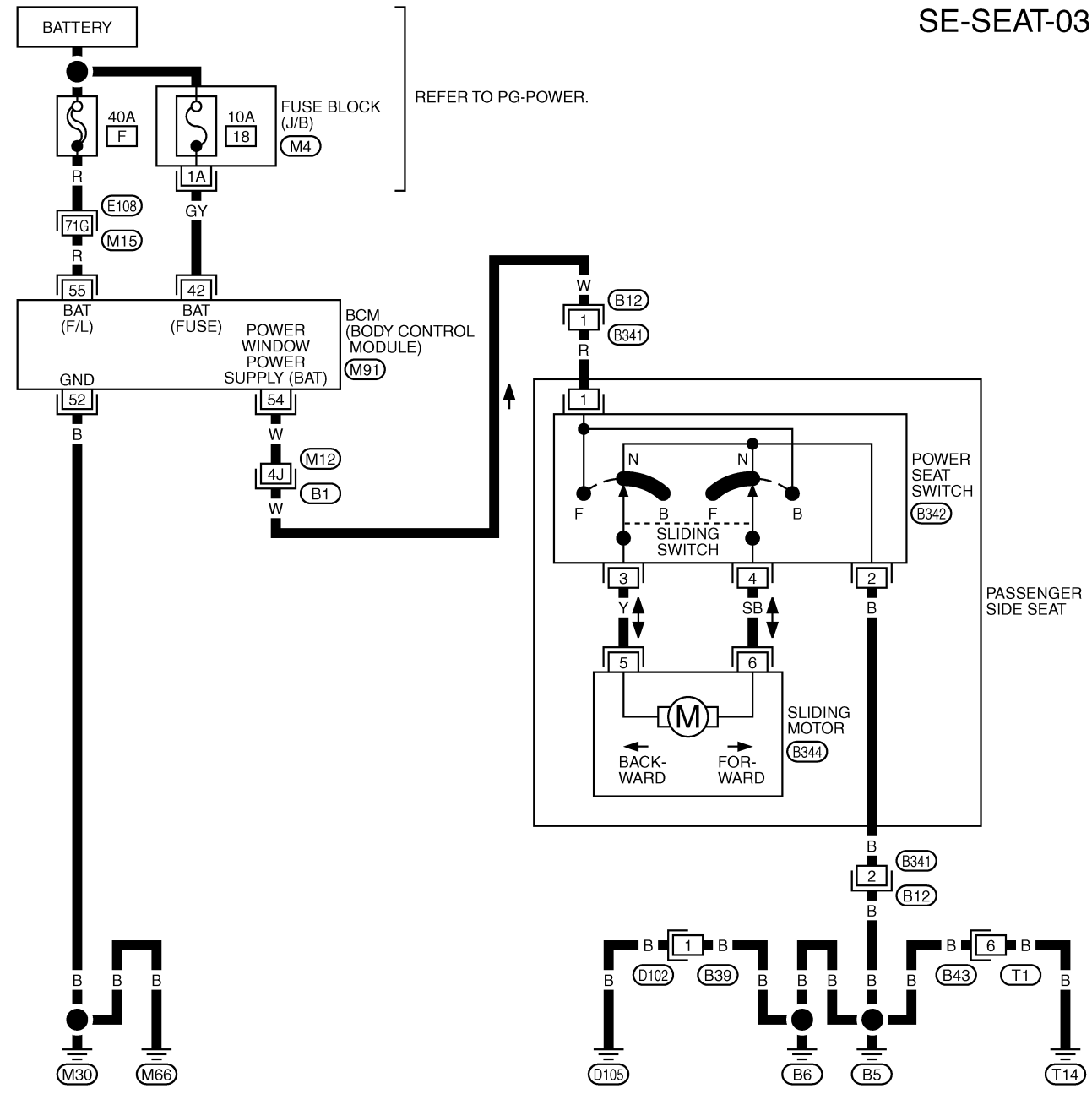


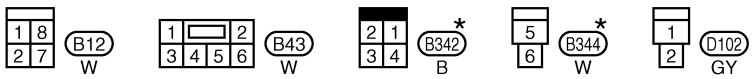
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0723E

Wiring Diagram–SEAT– /For Passenger Seat

NIS0009L





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.

E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

M91 -ELECTRICAL UNITS

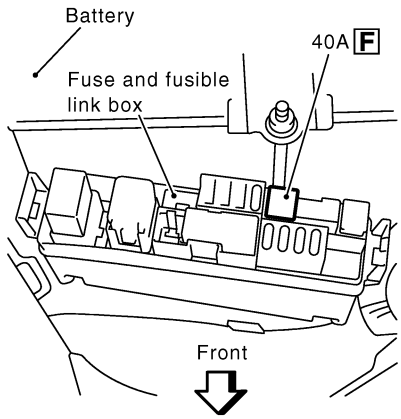
TIWT1612E

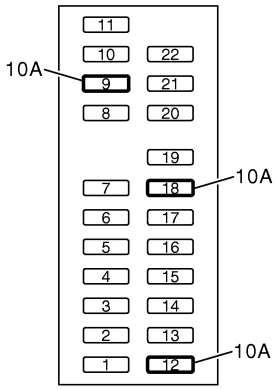
POWER SEAT/FOR ROADSTER

PFP:25565

Component Parts and Harness Connector Location

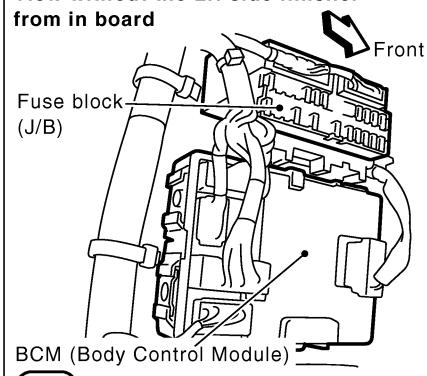
NIS0009M

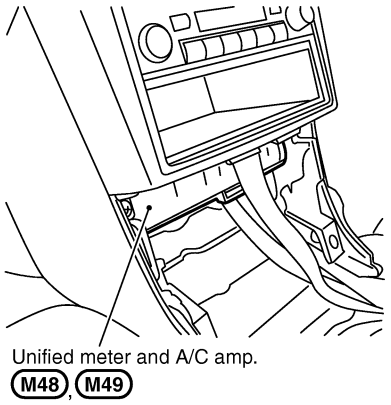


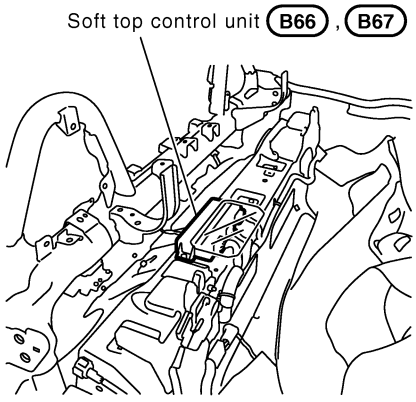


Fuse block (J/B) fuse layout

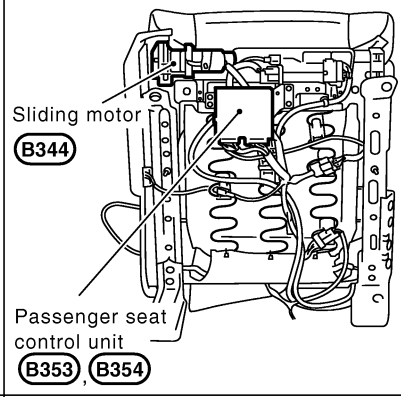
View without the LH side finisher from in board



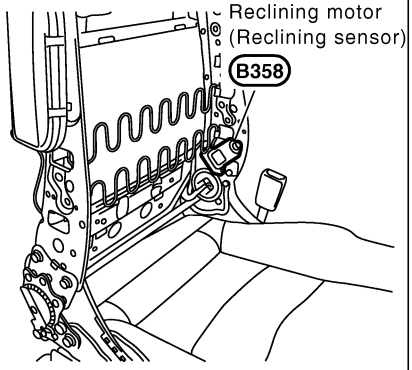


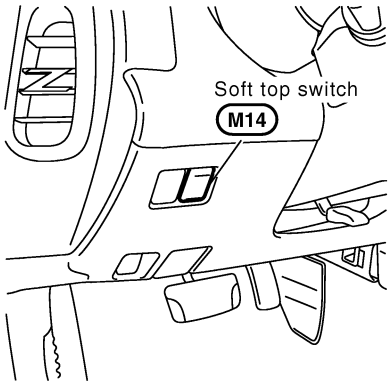


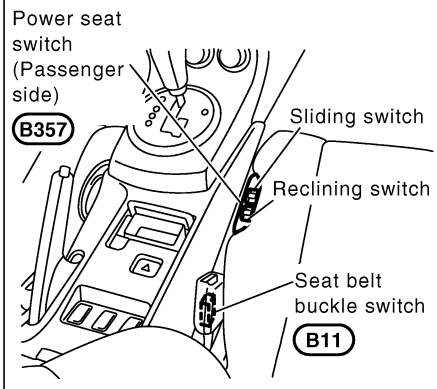
Bottom view of passenger seat



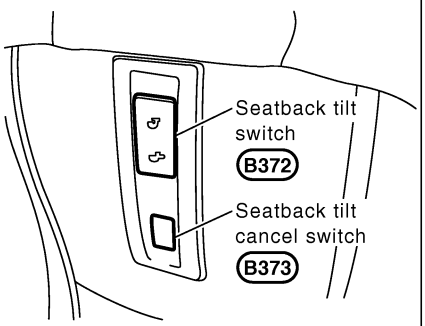
Front view of passenger side seatback without pad and trim removed



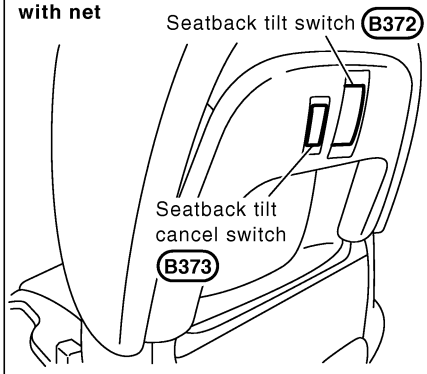


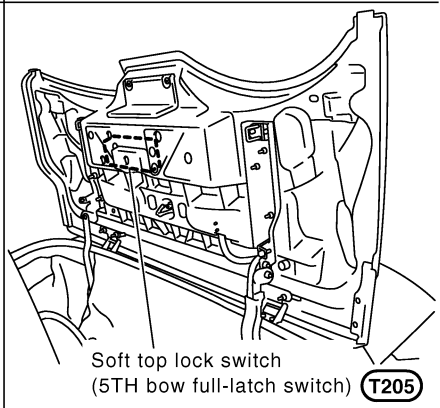


Rear view of passenger side seatback without net

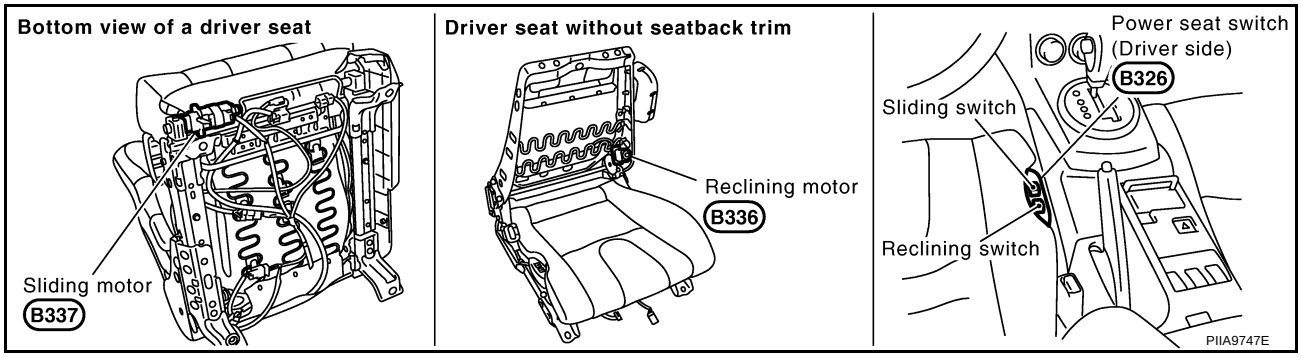


Rear view of passenger side seatback with net





PIIB7413E



System Description

NIS0009N

Power is supplied at all times,

- through 40A fusible link (letter **F** , located in the fusible link)
- to BCM terminal 55,
- through 10A fuse [No.18, located in the fuse block (J/B)]
- to BCM terminal 42,
- through BCM terminal 41,
- to passenger seat control unit terminal 34,
- through BCM terminal 54
- to driver side power seat switch terminal 1 and passenger seat control unit terminal 39.

When ignition switch in ON or START position,
power is supplied

- thought 10A fuse [No. 12, located in the fuse block (J/B)]
- to passenger seat control unit terminal 2.

When ignition switch in START position,
power is supplied

- thought 10A fuse [No. 9, located in the fuse block (J/B)]
- to passenger seat control unit terminal 1.

ground supplied

- to BCM terminal 52
- through body grounds M30 and M66,
- to passenger side seat control unit terminals 40, 48
- through body grounds B5, B6 and T14.

DRIVER SIDE SEAT OPERATION

When a driver side seat sliding switch is operated forward,
power is supplied

- through power seat switch terminal 5
- to sliding motor terminal 5.

Then ground is supplied

- to sliding motor terminal 6
- through power seat switch terminal 6
- through power seat switch terminal 2

The driver side seat moves forward.
When a driver side seat sliding switch is operated backward,
power is supplied

- through power seat switch terminal 6
- to sliding motor terminal 6.

Then ground is supplied

- to sliding motor terminal 5
- through power seat switch terminal 5

- through power seat switch terminal 2

The driver side seat moves backward.
When a driver side seat reclining switch is operated forward, power is supplied

- through power seat switch terminal 3
- to reclining motor terminal 3.

Then ground is supplied

- to reclining motor terminal 4
- through power seat switch terminal 4
- through power seat switch terminal 2

The driver side seat folds forward.
When a driver side seat reclining switch is operated backward, power is supplied

- through power seat switch terminal 4
- to reclining motor terminal 4.

Then ground is supplied

- to reclining motor terminal 3
- through power seat switch terminal 3
- through power seat switch terminal 2

The driver side seat reclines backward.

PASSENGER SIDE SEAT MANUAL OPERATION

When a passenger side seat sliding switch is operated forward, ground is supplied

- to passenger seat control unit terminal 14
- through power seat switch terminal 14
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 45
- to sliding motor terminal 45

Then ground is supplied

- to sliding motor terminal 37
- through passenger seat control unit terminal 37

The passenger side seat moves forward.
When a passenger side seat sliding switch is operated backward, ground is supplied

- to passenger seat control unit terminal 15
- through power seat switch terminal 15
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the backward signal, power is supplied simultaneously

- through passenger seat control unit terminal 37
- to sliding motor terminal 37

Then ground is supplied.

- to sliding motor terminal 45
- through passenger seat control unit terminal 45

The passenger side seat moves backward.
When a passenger side seat reclining switch is operated forward, ground is supplied

- to passenger seat control unit terminal 12
- through power seat switch terminal 12
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

The passenger side seat folds forward.
When a passenger side seat reclining switch is operated backward, ground is supplied

- to passenger seat control unit terminal 13
- through power seat switch terminal 13
- through power seat switch terminal 40B
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the backward signal, power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42

The passenger side seat reclines backward.

PASSENGER SEATBACK TILT FORWARD/BACKWARD OPERATION

When a passenger side seatback tilt switch is operated forward, ground is supplied

- to passenger seat control unit terminal 8
- through seatback tilt switch terminal 8
- through seatback tilt switch terminal 40
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the forward signal, power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds front most forward.
When a passenger side seatback tilt switch is operated backward, ground is supplied

- to passenger seat control unit terminal 9
- through seatback tilt switch terminal 9
- through seatback tilt switch terminal 40
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the backward signal, power is supplied simultaneously

- through passenger seat control unit terminal 35

- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

INTERLOCKING OPERATION OF THE PASSENGER SEAT WITH THE SOFT TOP

NOTE:
Refer to RF-12, "System Description" for detailed operation.

CLOSE → OPEN

When a soft top switch is operated to OPEN,
ground is supplied

- to passenger seat control unit terminal 5
- through soft top switch terminal 3
- through soft top switch terminal 1
- through body ground M30 and M66.

Then passenger seat control unit recognizes the soft top OPEN signal,
Soft top control unit transmits power window down signal to passenger seat control unit,

- through soft top control unit terminal 36
- to passenger seat control unit terminal 16.

When passenger seat control unit receives power window down signal and soft top OPEN signal,
power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds 6° forward.
When storage lid closed, soft top control unit transmits a storage lid close signal to passenger seat control unit,

- through soft top control unit terminal 13
- to passenger seat control unit terminal 33.

When passenger seat control unit receives storage lid close signal,
power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

OPEN → CLOSE

When a soft top switch is operated to CLOSE,
ground is supplied

- to passenger seat control unit terminal 6
- through soft top switch terminal 4
- through soft top switch terminal 1
- through body ground M30 and M66.

Then passenger seat control unit recognizes the soft top CLOSE signal,
soft top control unit transmits power window down signal to passenger seat control unit,

- through soft top control unit terminal 36
- to passenger seat control unit terminal 16.

When passenger seat control unit receives power window down signal and soft top CLOSE signal,

power is supplied simultaneously

- through passenger seat control unit terminal 42
- to reclining motor terminal 42

Then ground is supplied

- to reclining motor terminal 35
- through passenger seat control unit terminal 35

Then, a seat folds 6° forward.
When soft top lock switch (5th bow full latch switch) is turned ON, soft top control unit transmits a soft top lock signal to passenger seat control unit,
ground is supplied

- to passenger seat control unit terminal 11
- through soft top lock switch (5th bow full latch switch) terminal 3
- through soft top lock switch (5th bow full latch switch) terminal 4
- through body ground B5, B6 and T14.

When passenger seat control unit receives soft top lock switch ON signal,
power is supplied simultaneously

- through passenger seat control unit terminal 35
- to reclining motor terminal 35

Then ground is supplied

- to reclining motor terminal 42
- through passenger seat control unit terminal 42.

The passenger side seat returns to former position.

PASSENGER SIDE RECLINING MOTOR OPERATION

When a passenger side seat reclining motor is operated,
signal is transmitted

- to passenger seat control unit terminal 3
- through reclining motor terminal 3
- through reclining motor terminal 41
- through passenger seat control unit terminal 41.

Then passenger seat control unit judges seatback angle by receiving reclining sensor signal.

SEATBACK TILT CANCEL SWITCH OPERATION

When a passenger side seatback tilt cancel switch is operated to CANCEL,
ground is supplied

- to passenger seat control unit terminal 7
- through seatback tilt cancel switch terminal 7
- through seatback tilt cancel switch terminal 40C
- through body ground B5, B6 and T14.

Then passenger seat control unit recognizes the CANCEL signal.
When a “seatback tilt cancel switch” is operated to CANCEL, the automatic operation of a passenger seat is not performed.

MANUAL OPERATION

The seat positions can be adjusted by operating the sliding switch and reclining switch located on the side of both driver and passenger seat cushions.

AUTOMATIC OPERATION

Passenger Seatback Tilting Function

- When the seatback tilt switch on the rear side of the passenger seatback is operated to tilt forward, the seatback tilts forward to the front most position.
- To tilt the seatback backward or restore its position, push the seatback tilt switch on the tilt-backward direction. The seatback will be tilting backwards while the switch is operated. It can be moved backwards until it reaches to its start position.

Conditions For the Operation

When the following conditions are satisfied, the seatback tilts forward or backward by operating the seatback tilt switch.

Conditions	● Power seat switches (sliding and reclining) are OFF. ● The seat belt is not fastened. ● The vehicle speed is approximately 6 km/h or less. ● The soft top is not currently in operation.*1 ● The ignition switch is not in the START position. ● The seatback tilt cancel switch is in AUTO.

*1: The operation will be stopped only while the reclining motor is operating.

Conditions for Stopping the Operation

- Seatback tilting operation stops when any one of the conditions below is satisfied.

Conditions	● A power seat switch (sliding or reclining) is operated. ● The seat belt is fastened. ● The vehicle speed is approximately 7 km/h or more. ● The soft top is in operation. (Stops only tilt-forward operation.)*2 ● The seatback tilting switch is operated while the seatback is in operation. ● The ignition switch is turned to the START position. ● Reclining motor lock is detected.

*2: Operation will be stopped only while the reclining motor is operating.

NOTE:

If operation stops as a result of the conditions below, use the reclining switch to tilt the seat backward.

- A power seat switch (sliding or reclining) is operated.
- The seat belt is fastened.
- The seatback tilt cancel switch is turned to “CANCEL”.

Soft Top Interlocking Operation Function

- The seatback tilts forward by approximately 6° (tilt froward operation) when the soft top opens or closes.
- When open/close operation is completed, the seatback returns to the tilt start position (return operation).

Conditions for the Operation

When the soft top switch is pushed to OPEN or CLOSE, and all of the conditions below are satisfied, then the seatback operates, linked with the operation of the soft top.

Conditions	● The power seat switches (sliding and reclining) are OFF. ● The seatback tilt switch is OFF. ● The vehicle speed is 6 km/h or less. ● The ignition switch is ON. ● The seatback tilt cancel switch is turned to AUTO.

Conditions for the Pausing/Stopping Operation

Operation is paused or stopped if any of the conditions below are satisfied during soft top operation.

Stop conditions	● A power seat switch (sliding or reclining) is operated. ● Reclining motor lock is detected (return operation only). ● The seatback tilt switch is operated while the seatback is operating. ● The seatback tilt cancel switch is turned to CANCEL.
Pause condition	● The ignition switch is turned to the START position.

Seat Status Output Signal

- Depending on the seat status, the “passenger seat control unit” sends the seat status output signal to the “soft top control unit”.
- The “soft top control unit” controls the soft top open/close operation based on whether the seat status signal is ON or OFF. For details about soft top control, refer to RF-19, "Operation Chart" .

Seat status signal OFF→ ON condition	● When a seatback tilt forward motion has been completed. (as a process during a soft top interlocking operation) ● When a seatback tilt forward motion has been completed. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and a tilt forward / backward operation is under going, and if the seatback is tilted more than 6 degree from the start position of the tilt forward / backward operation. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and a tilt forward operation was under going, but the operation was stopped under some conditions, (See below *4.) and if the seatback is tilted more than 6 degree from the start position of the tilt forward operation. (after an automatic operation by using a seatback tilt switch) ● When a seatback tilt forward permission condition is satisfied for a soft top interlocking operation, and also the seatback tilt cancel switch is in “Cancel” position. ● When the ignition switch has been turned from “START” to “ON” position. (during a soft top interlocking operation. After an engine start operation, the soft top interlocking operation is accepted.)
Seat status signal ON→ OFF condition	● When a seatback tilt backward motion has been started. (as a process during a soft top interlocking operation) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, after a tilt forward operation has been finished. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, and a tilt forward / backward operation is under going, and if the seatback is tilted more than 6 degree from the start position of the tilt forward / backward operation. (during a automatic operation by using a seatback tilt switch) ● When a seatback tilt backward permission condition is satisfied for a soft top interlocking operation, and a tilt forward operation was under going, but the operation was stopped under some conditions, (See below *4.) and if the seatback is still tilted more than 6 degree from the start position of the tilt forward operation. (after an automatic operation by using a seatback tilt switch.) ● When the ignition switch has been turned from “ON” to “START” position. (during a soft top interlocking operation. During an engine start operation, the soft top interlocking operation is paused.) ● When a seatback tilt forward motion has been started by the seatback tilt switch, just after the seatback tilt forward motion has been finished for a soft top interlocking operation. (for the seatback tilt switch operation during a soft top interlocking operation) ● When a seatback tilt forward motion has been started by the passenger seat reclining switch, just after the seatback tilt forward motion has been finished for a soft top interlocking operation. (for the seat reclining switch operation during a soft top interlocking operation)

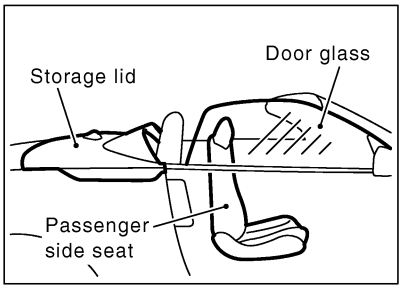
*3: After that, seat condition signal stays ON if cancel switch turns to AUTO.
The seat status signal turns ON only when power window DOWN signal input is ON.

*4: If tilt forward/backward operation stops as a result of the conditions below, the tilt start position does not change.

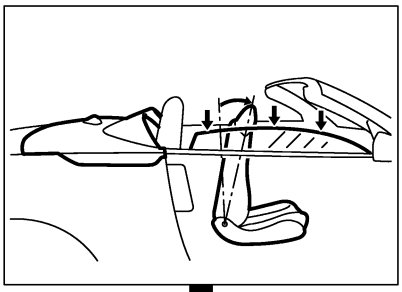
- The vehicle speed is approximately 7 km/h or more.
- The seatback tilt switch is operated while the seatback is operating.
- The ignition switch is turned to the START position.

Operation of the Passenger Seat Linked with the Soft Top

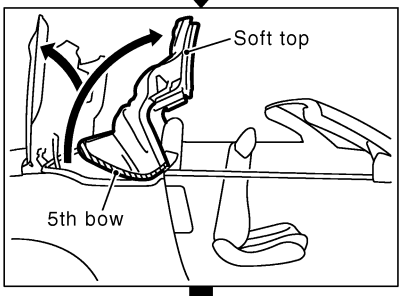
Passenger seat operation during soft top CLOSE operation



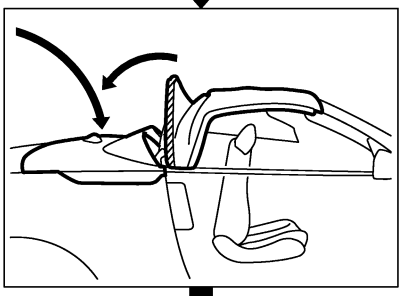
1. Passenger seatback tilts forward by approximately 6˚ as soon as windows go down, when soft top switch has been pushed on CLOSE.



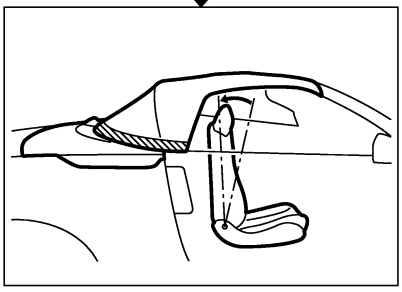
2. Soft top CLOSE operation starts as soon as the passenger seatback tilt forward operation completes.



3. Soft top continues the operation.

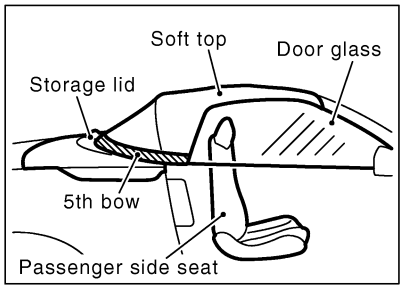


4. Passenger seatback goes back to the original position when 5th bow is closed.

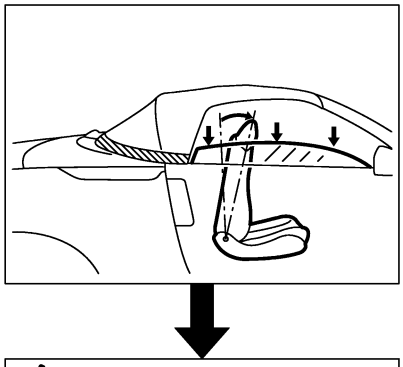


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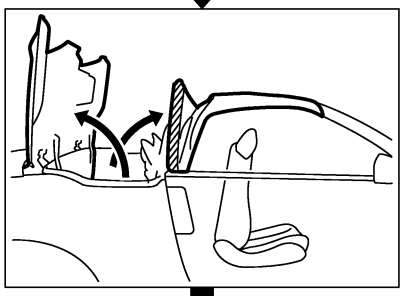
Passenger seat operation during soft top OPEN operation



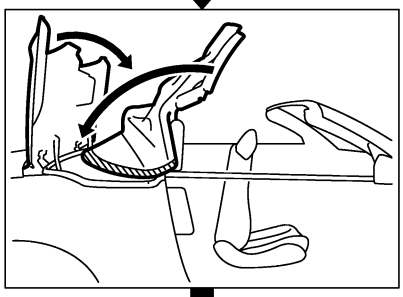
1. Passenger seatback tilts forward by approximately 6° as soon as windows go down, when soft top switch has been pushed on OPEN.



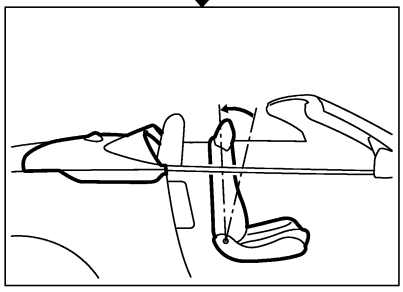
2. Soft top OPEN operation starts as soon as the passenger seatback tilt forward operation completes.



3. Soft top continues the operation.



4. Passenger seatback goes back to the original position when storage lid is closed.



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CANCEL FUNCTION

The seatback tilt cancel switch can be used to set following functions ON or OFF.

- The seatback tilt forward/backward function
- The soft top interlocking operation function

CAUTION:

- **If a child seat is installed, turn the seat tilt cancel switch OFF to disable the seatback tilt forward/backward function and the soft top interlock operation function.**

FAIL-SAFE MODE

If the power seat switch is not operated, nor the seat back tilt switch is not operated, nor the soft top interlocking operation is not under operation, and if the passenger seat control unit detects a motor operation power from the soft top control unit, the passenger seat control unit stops the motor by switching the motor power line to ground.

Operation location	● Sliding motor ● Reclining motor

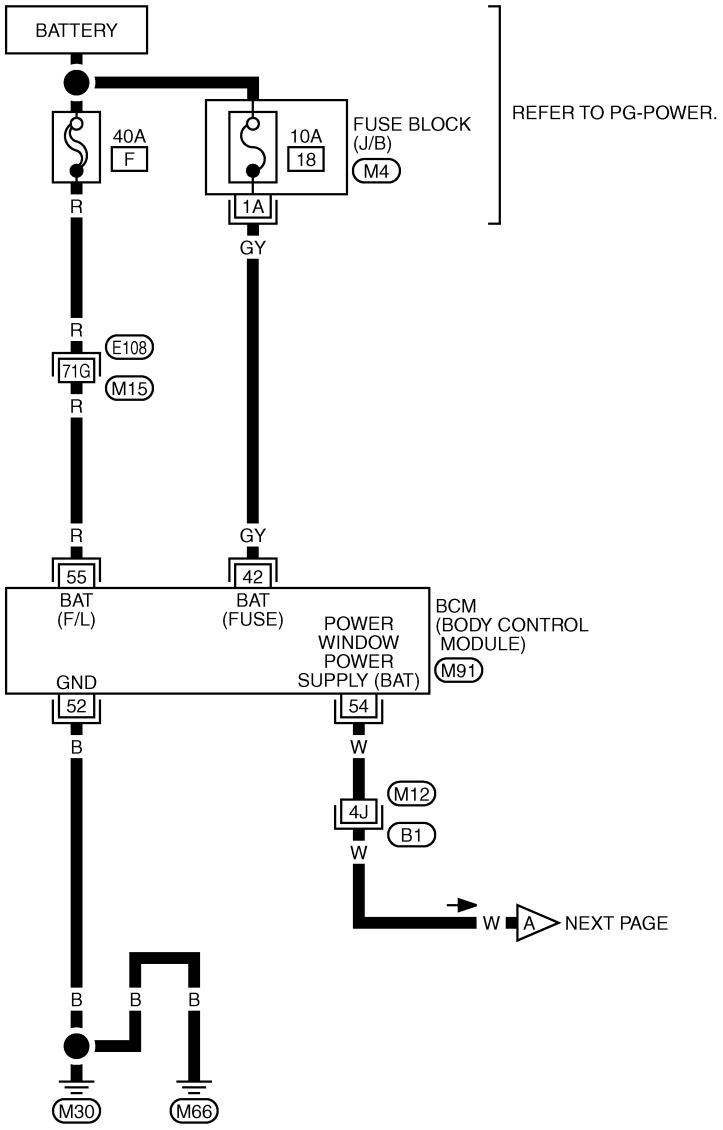
Canceling Fail-Safe Mode

- Disconnect and reconnect the battery terminal.
- Disconnect and reconnect the passenger seat control unit connector.

Wiring Diagram–SEAT– / For Driver Seat

NIS0009O

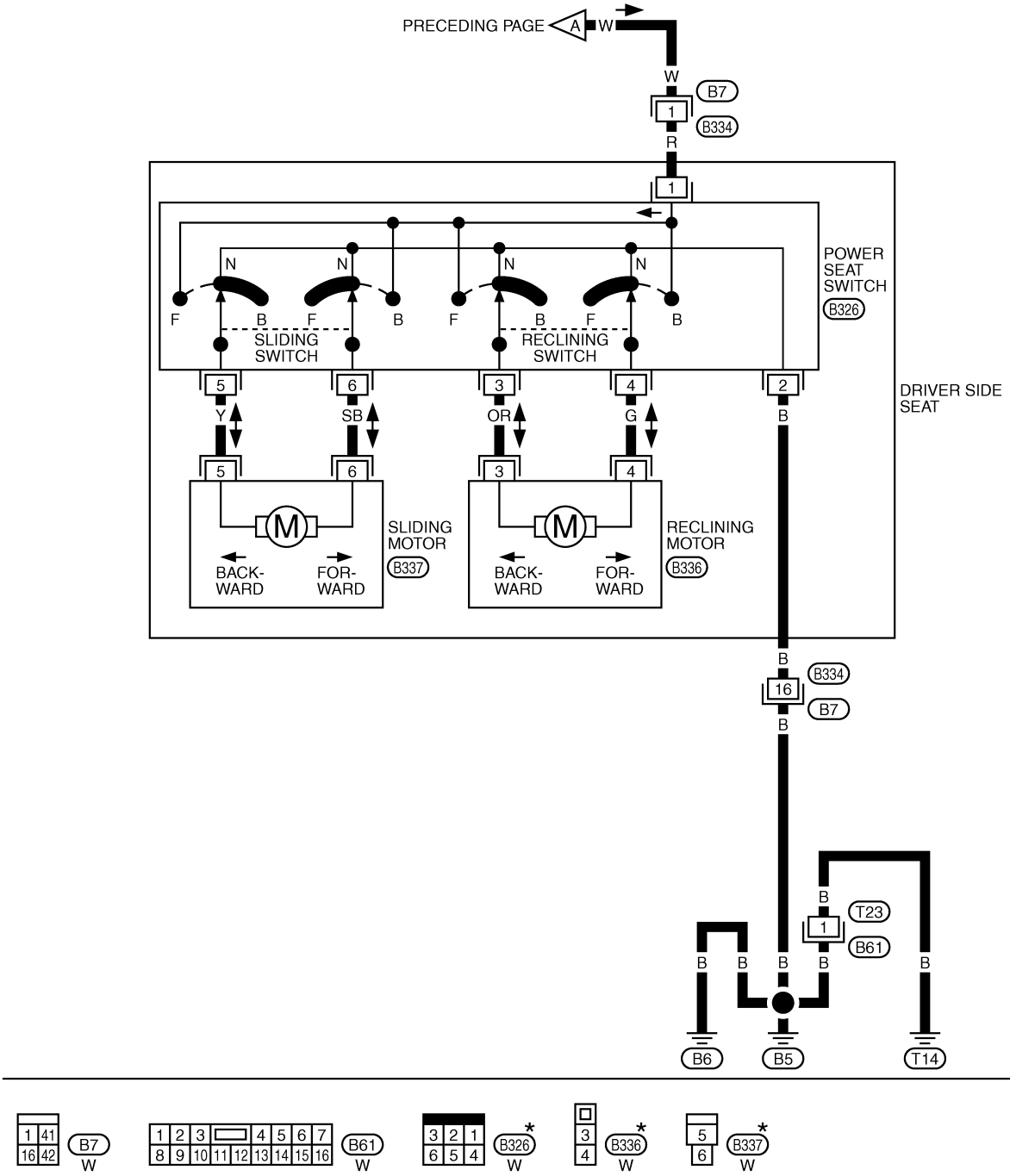
SE-SEAT-04



REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M91 -ELECTRICAL UNITS

TIWT1613E

SE-SEAT-05

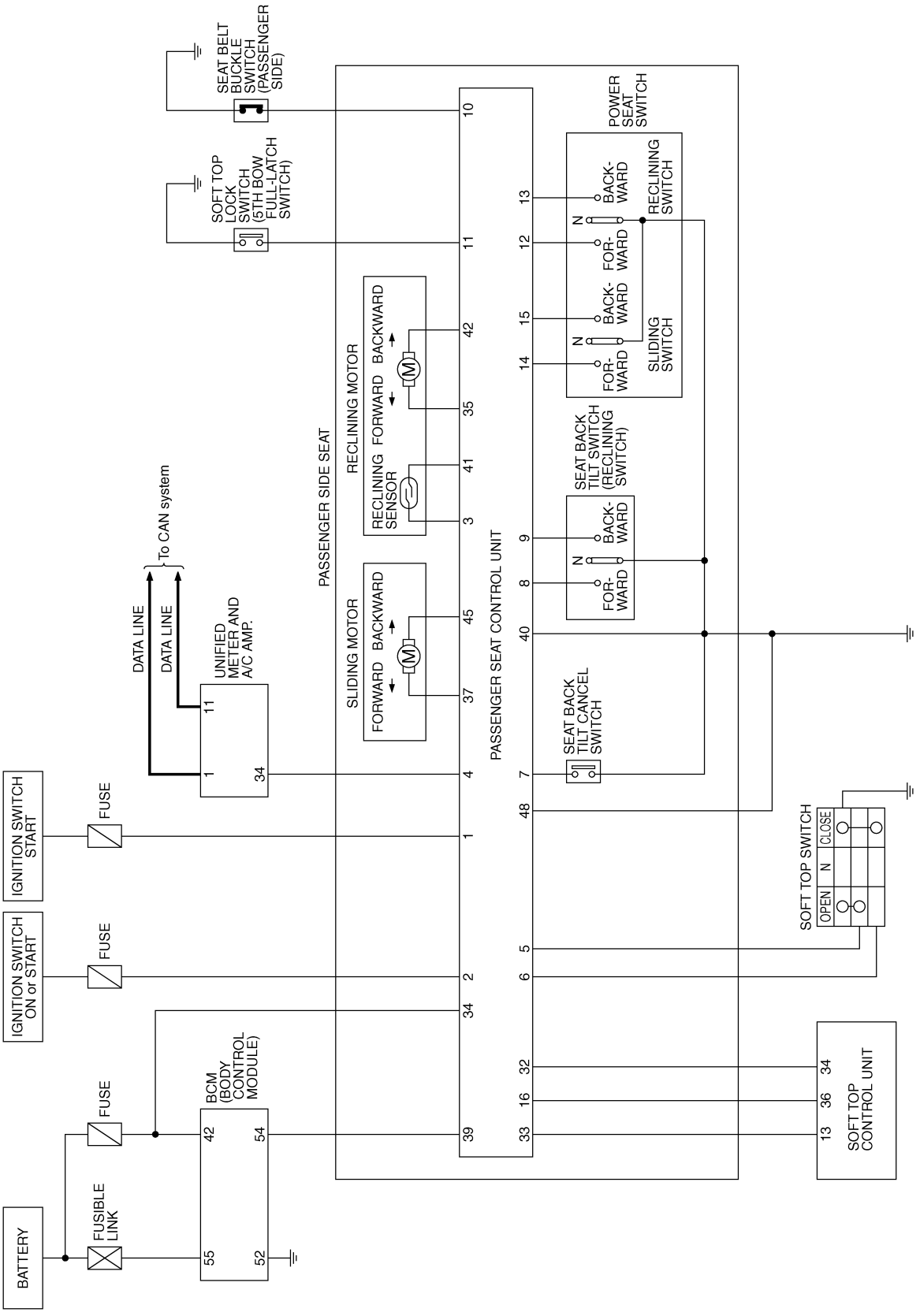


∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0774E

Schematic / For Passenger Seat

NIS0009P

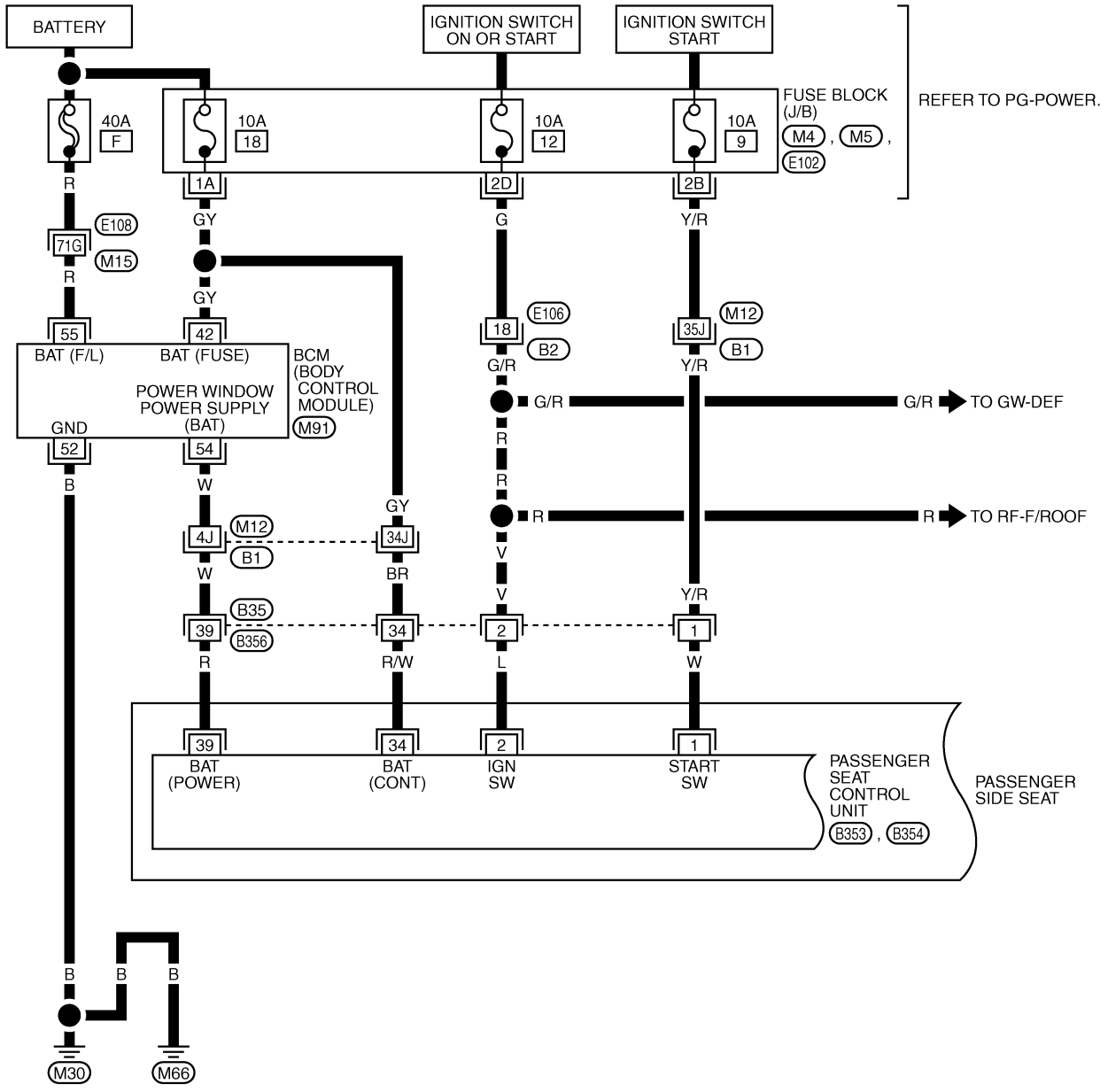


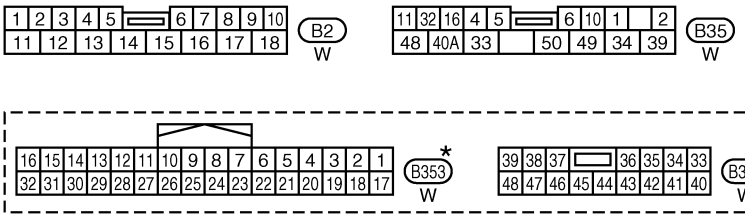
TIWT2287E

Wiring Diagram–SEAT– / For Passenger Seat

NIS0009Q

SE-SEAT-06





∗ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

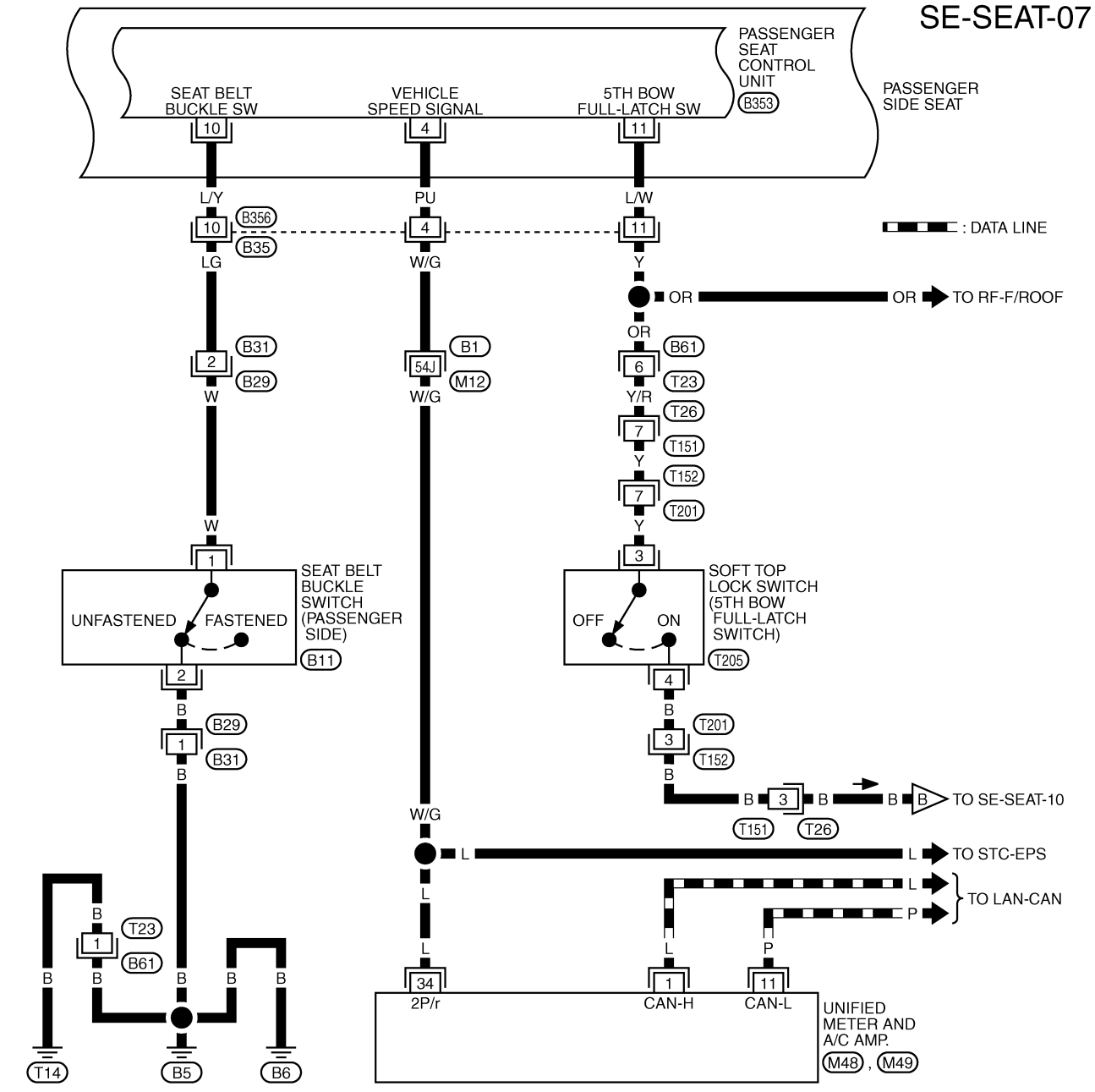
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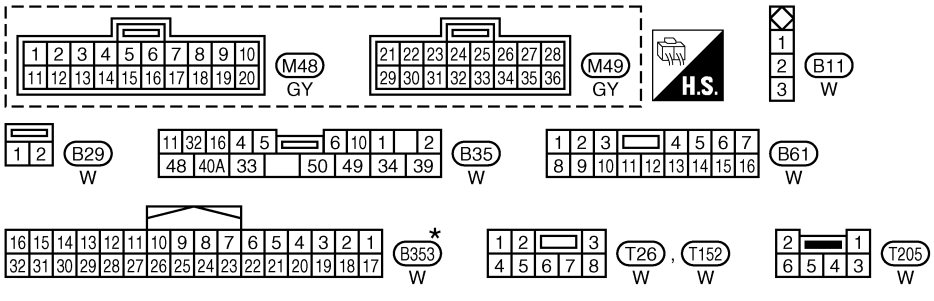
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , M5 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

M91 -ELECTRICAL UNITS

TIWT2288E



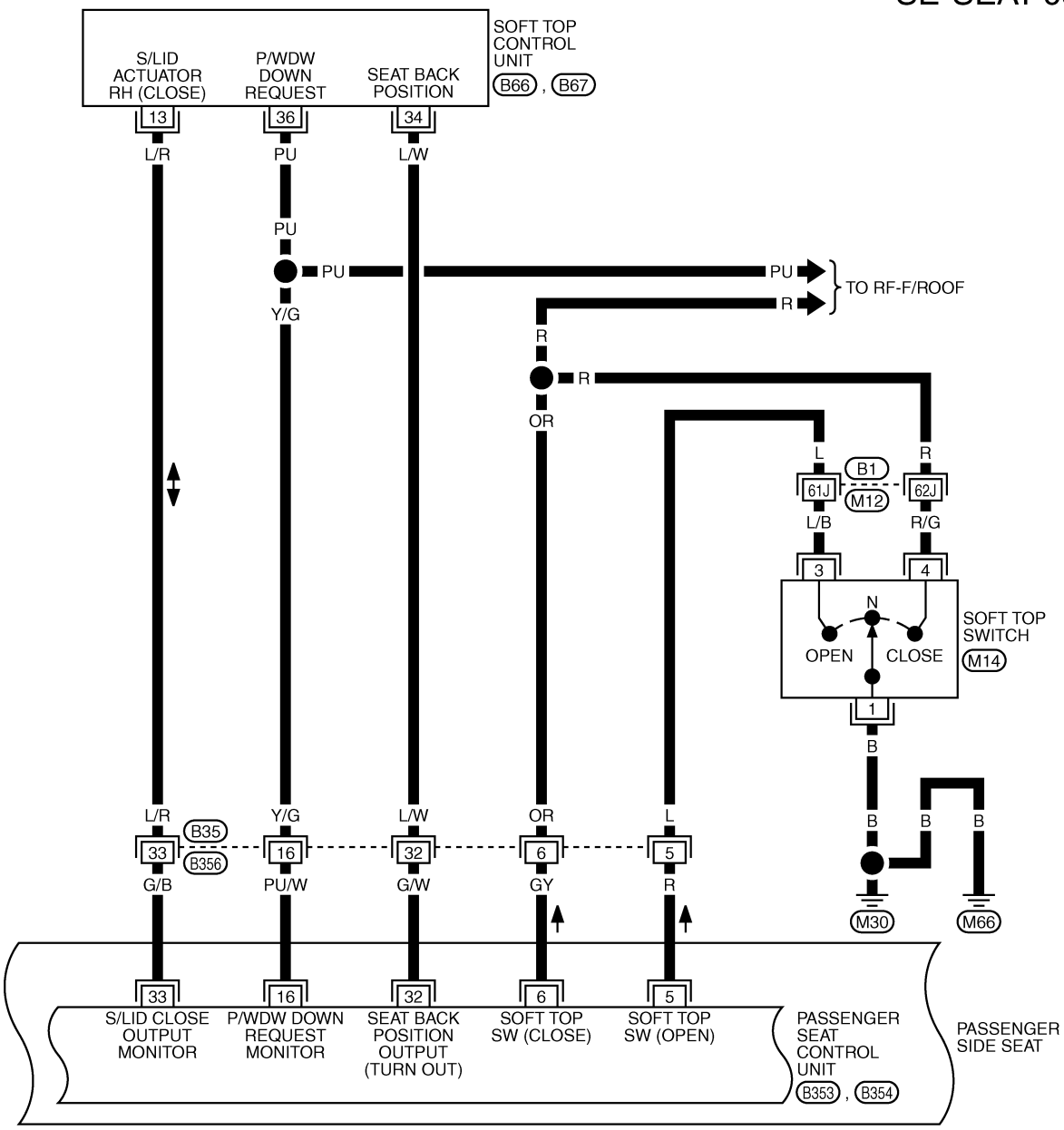


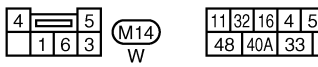
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

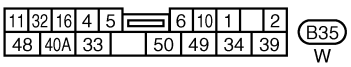
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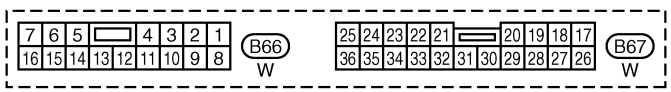
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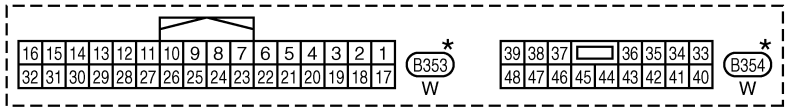
SE-SEAT-08









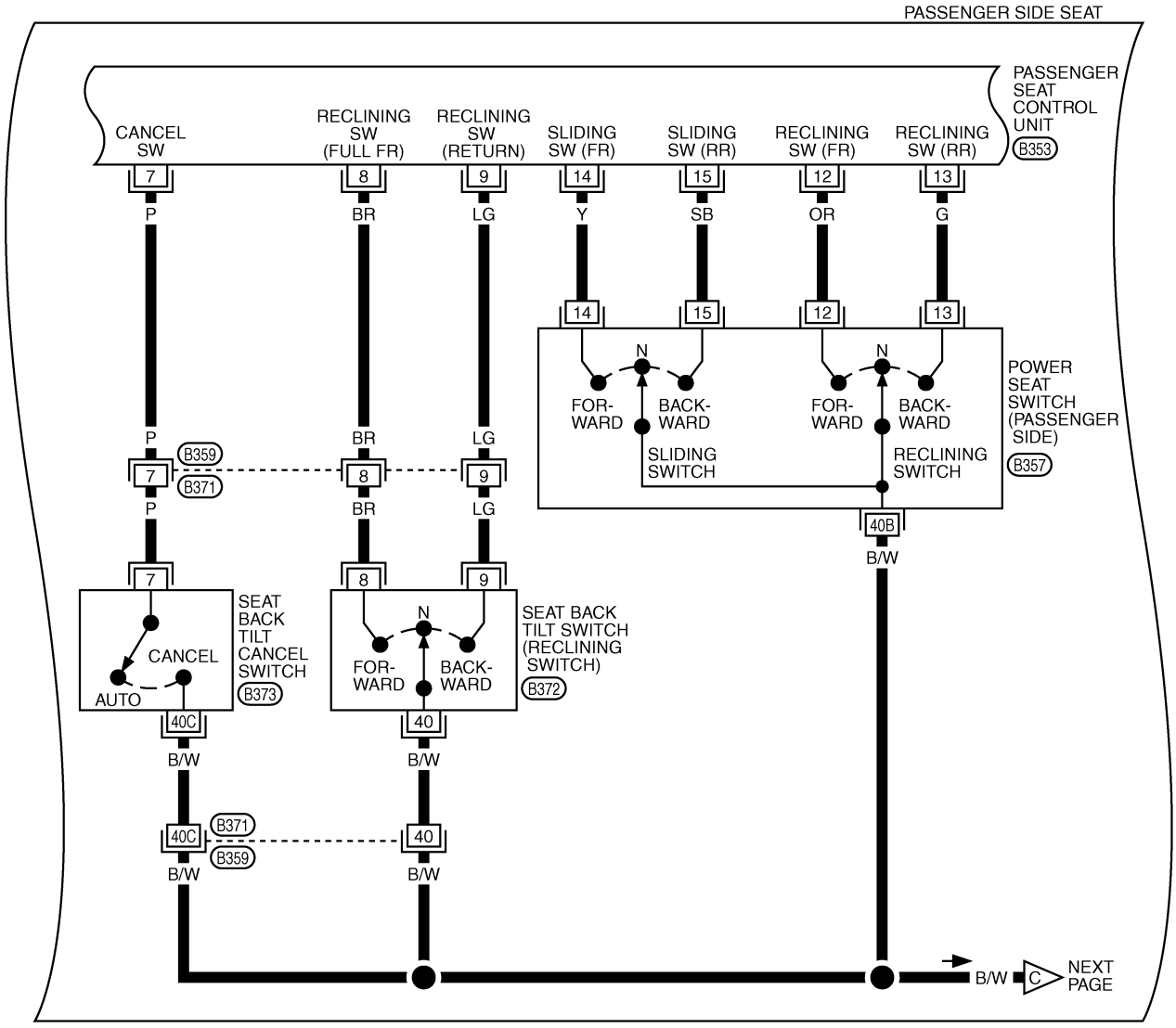


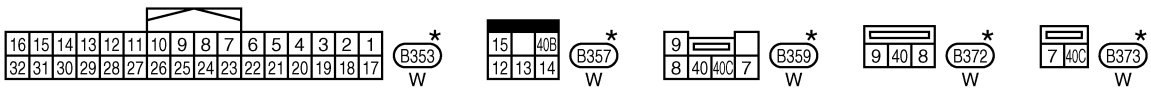
★ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT2289E

SE-SEAT-09

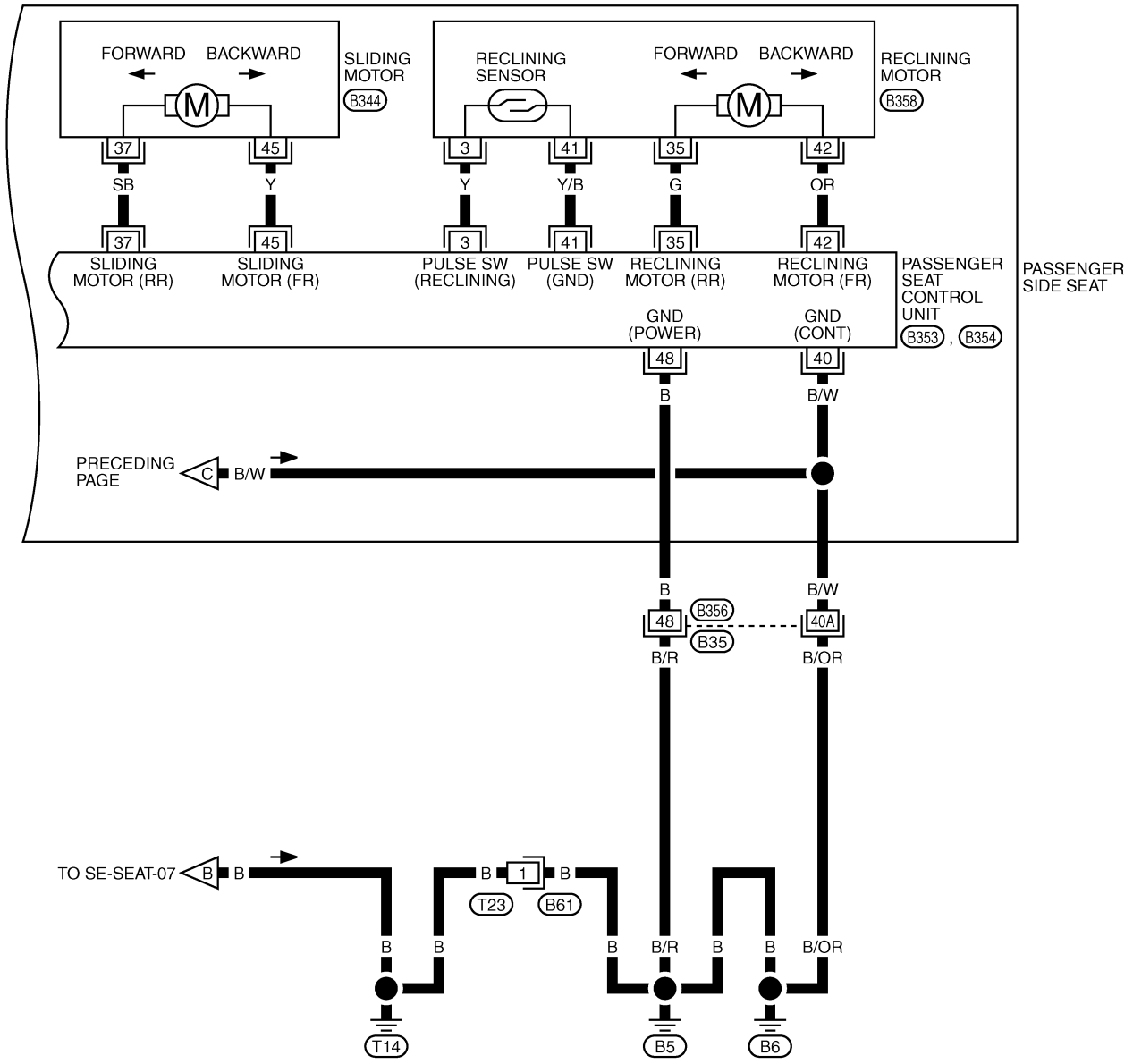


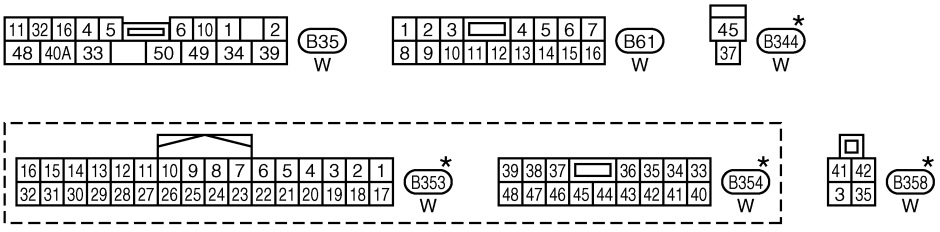


* : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT0729E

SE-SEAT-10



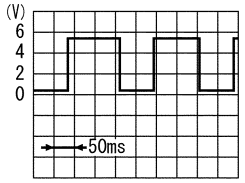
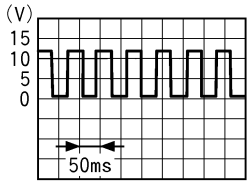


∗ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT2290E

Terminals and Reference Values of Passenger Seat Control Unit

NIS0009R

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
1	W	Ignition switch START power supply	Input	Ignition switch (START position)	Battery voltage
2	L	Ignition switch ON power supply	Input	Ignition switch (ON or START position)	Battery voltage
3	Y	Reclining sensor input signal	Input	When reclining motor is operated	 SIIA0692J
				Other than above	0 or 5
4	PU	Vehicle speed signal (2puls)	Input	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	 PIIB0078J
5	R	Soft top switch OPEN signal	Input	When soft top switch is turned to OPEN	0
				Other than above	Battery voltage
6	GY	Soft top switch CLOSE signal	Input	When soft top switch is turned to CLOSE	0
				Other than above	Battery voltage
7	P	Seatback tilt cancel switch signal	Input	When seatback tilt cancel switch is turned to AUTO	5
				When seatback tilt cancel switch is turned to CANCEL	0
8	BR	Seatback tilt switch FORWARD signal	Input	When seatback tilt switch is turned to FORWARD	0
				Other than above	Battery voltage
9	LG	Seatback tilt switch BACKWARD signal	Input	When seatback tilt switch is turned to BACKWARD	0
				Other than above	Battery voltage
10	L/Y	Seat belt buckle switch signal	Input	When seat belt is fastened (OFF)	5
				When seat belt is unfastened (ON)	0
11	L/W	Soft top lock switch (5th bow full latch switch) signal	Input	5th bow full latch switch: ON	0
				5th bow full latch switch: OFF	5
12	OR	Reclining switch FORWARD signal	Input	When power seat reclining switch is turned to FORWARD	0
				Other than above	Battery voltage

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
13	G	Reclining switch BACKWARD signal	Input	When power seat reclining switch is turned to BACKWARD	0
				Other than above	Battery voltage
14	Y	Sliding switch FORWARD signal	Input	When power seat sliding switch is turned to FORWARD	0
				Other than above	Battery voltage
15	SB	Sliding switch BACKWARD signal	Input	When power seat sliding switch is turned to BACKWARD	0
				Other than above	Battery voltage
16	PU/W	Power window down signal	Input	When soft top switch is turned to ON	0
				Other than above	5
32	G/W	Seatback position signal	Input	When the seatback is tilted by the interlocking operation with soft top	0
				Other than above	5
33	G/B	Storage lid actuator RH CLOSE signal	Input	When storage lid actuator is in a closed operation	Battery voltage
				Other than above	0
34	R/W	Battery power supply (control unit)	Input	—	Battery voltage
35	G	Reclining motor BACKWARD output	Output	Reclining switch backward operation (Motor operated)	Battery voltage
				Other than above	0
37	SB	Sliding motor BACKWARD output	Output	Sliding switch backward operation (Motor operated)	Battery voltage
				Other than above	0
39	R	Battery power supply (power)	Output	—	Battery voltage
40	B/W	Ground (control unit)	—	—	0
41	Y/B	Ground (sensor)	—	—	0
42	OR	Reclining motor FORWARD output	Output	Reclining switch forward operation (Motor operated)	Battery voltage
				Other than above	0
45	Y	Sliding motor FORWARD output	Output	Sliding switch forward operation (Motor operated)	Battery voltage
				Other than above	0
48	B	Ground (power)	—	—	0

Terminals and Reference Values of BCM

NIS0009S

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
42	GY	Battery power supply (Fuse)	Input	—	Battery voltage
52	B	Ground	—	—	0

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
54	W	Power window power supply output (driver side power seat switch and passenger seat control unit power supply)	Output	—	Battery voltage
55	R	Battery power supply (Fusible link)	Input	—	Battery voltage

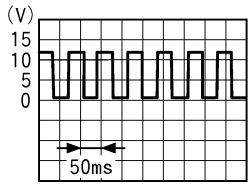
Terminals and Reference Values of Soft Top Control Unit

NIS0009T

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
13	L/R	Storage lid actuator RH CLOSE signal	Input	When storage lid actuator is in a closing operation	Battery voltage
				Other than above	0
34	L/W	Seatback position signal	Input	When the seatback is tilted by the interlocking operation with soft top	0
				Other than above	5
36	PU	Power window down signal	Input	When soft top switch is turned to ON	0
				Other than above	5

Terminals and Reference Values of Unified Meter and A/C Amp.

NIS0009U

Terminal	Wire Color	Item	Signal Input/ Output	Condition	Voltage (V) (Approx)
1	L	CAN-H	Input/ Output	—	—
11	P	CAN-L	Input/ Output	—	—
34	L	Speed signal (2puls)	Input	Speedometer is in operation [When vehicle speed is approx. 40 km/h (25 MPH)]	 PIIB0078J

Work Flow

NIS0009V

1. Check the symptom and customer's requests.
2. Understand the outline of system. Refer to SE-16, "System Description" .
3. According to the trouble diagnosis chart, repair or replace the cause of the malfunction. Refer to SE-37, "Trouble Diagnosis Symptom Chart" .
4. Does power seat system operate normally? If Yes, GO TO 5, If No, GO TO 3.
5. INSPECTION END.

Trouble Diagnosis Symptom Chart

NIS0009W

Always check the “WORK FLOW” before troubleshooting. Refer to SE-37, "Work Flow" .

Symptom	Diagnosis / service procedure		Refer to page
Power seat systems do not operate (Neither driver side seat nor passenger side seat operation can be performed).	Check BCM power supply and ground circuit		SE-38
Functions of a driver side power seat do not operate.	Check driver side power seat power supply and ground		SE-40
A part of driver side power seat system does not operate.	1.	Check driver side seat sliding motor circuit	SE-41
	2.	Check driver side seat reclining motor circuit	SE-42
All the passenger side power seat systems do not operate.	Check passenger seat control unit power supply and ground		SE-44
A passenger seat does not a sliding operation.	Check passenger side seat sliding motor circuit		SE-45

Symptom	Diagnosis / service procedure		Refer to page
A passenger seat does not carry out a reclining operation (Neither manual operation nor an automatic operation can be performed).	Check passenger side seat reclining motor circuit		SE-46
The automatic operation of a passenger seat can not be performed (a manual operation can be performed).	1.	Check passenger side seat reclining sensor circuit	SE-47
	2.	Check seatback tilt cancel switch circuit	SE-52
	3.	If the above systems are normal, replace passenger seat control unit.	SE-15
A passenger seat operates automatically when the vehicle is running.	Check vehicle speed signal		SE-57
Passenger seatback does not return during a soft top CLOSE operation.	Check soft top lock switch circuit		SE-55
Passenger seatback does not tilt forward and return during a soft top OPEN operation.	Check storage lid close signal circuit		SE-55
Passenger seatback does not tilt forward during a soft top CLOSE operation or OPEN operation.	1.	Check power window down request signal circuit	SE-54
	2.	Check soft top switch circuit	SE-53
	3.	If the above systems are normal, replace passenger seat control unit.	SE-15
Seat does not tilt when passenger seatback tilt switch is pushed (other functions operate normally).	1.	Check seatback tilt switch circuit	SE-51
	2.	Check seat belt buckle switch circuit	SE-56
	3.	If the above systems are normal, replace passenger seat control unit	SE-15
A part of passenger seat system does not operate (only manual).	1.	Check passenger side seat sliding switch circuit	SE-48
	2.	Check passenger side seat reclining switch circuit	SE-49
Passenger seatback dose not go back to the original position during a soft top CLOSE or OPEN operation.	Check passenger seat control unit ignition signal circuit		SE-44
The manual operation of a passenger seat cannot be performed (a automatic operation can be performed).	Check passenger side power seat ground circuit		SE-50

Check BCM Power Supply and Ground

NIS0009X

1. CHECK FUSE

- Check 40A fusible link (letter **F** located in the fuse and fusible link box).
- Check 10A fuse [No.18, located in the fuse block (J/B)]

NOTE:
Refer to SE-15, "Component Parts and Harness Connector Location" .

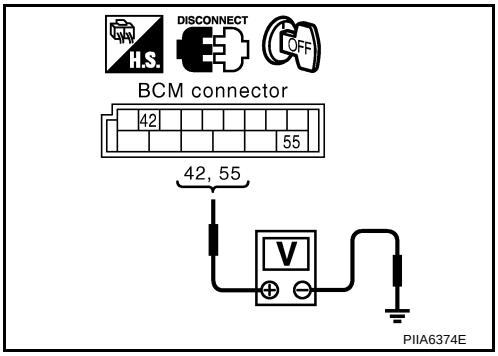
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK BCM POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector M91 terminal 42, 55 and ground.

42 (GY) - Ground : Battery voltage
55 (R) - Ground : Battery voltage



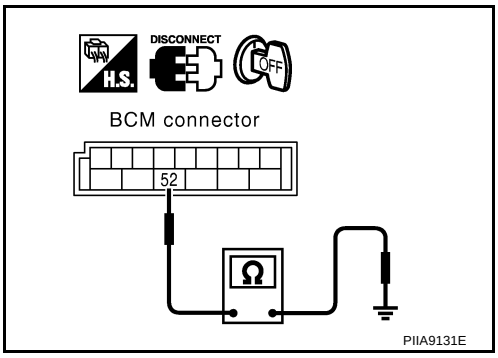
OK or NG

OK >> GO TO 3.
NG >> Repair or replace the harness between BCM and fusible link.

3. CHECK BCM GROUND CIRCUIT

Check continuity between BCM connector M91 terminal 52 and ground.

52 (B) - Ground : Continuity should exist.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace the harness between BCM and ground.

4. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Disconnect power seat switch and passenger seat control unit connector.
2. Check continuity between BCM connector M91 terminal 54 and power seat switch connector B326 terminal 1.

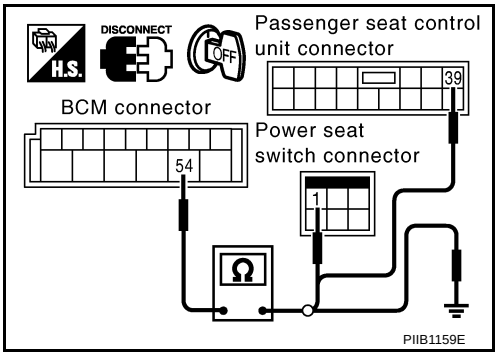
54 (W) - 1 (R) : Continuity should exist.

3. Check continuity between BCM connector M91 terminal 54 and passenger seat control unit connector B354 terminal 39.

54 (W) - 39 (R) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.



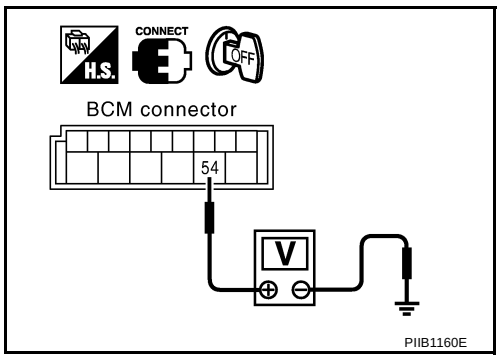
OK or NG

OK >> GO TO 5.
NG >> Replace harness between BCM and power seat switch or passenger seat control unit.

5. CHECK BCM OUTPUT POWER SUPPLY

1. Connect BCM connector.
2. Check voltage between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Battery voltage



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace BCM.

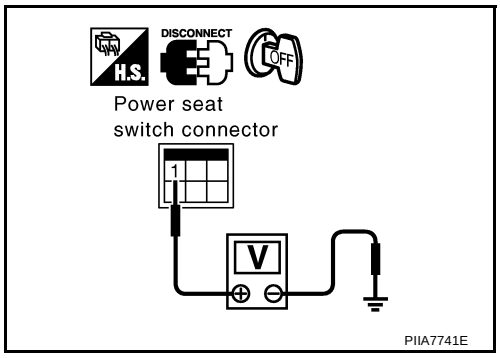
Check Driver Side Seat Power Supply and Ground

NIS0009Y

1. CHECK POWER SEAT SWITCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect power seat switch connector.
3. Check voltage between power seat switch connector B326 terminal 1 and ground.

1 (R) - Ground : Battery voltage



OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

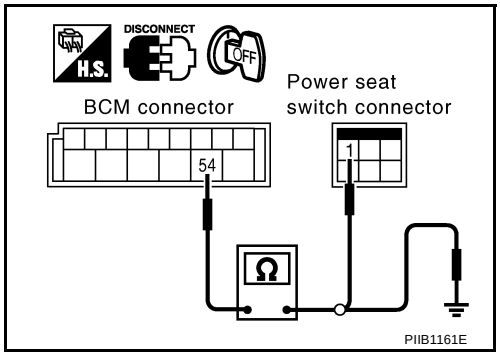
2. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Disconnect passenger seat control unit connector.
2. Check continuity between BCM connector M91 terminal 54 and power seat switch connector B326 terminal 1.

54 (W) - 1 (R) : Continuity should exist.

3. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.



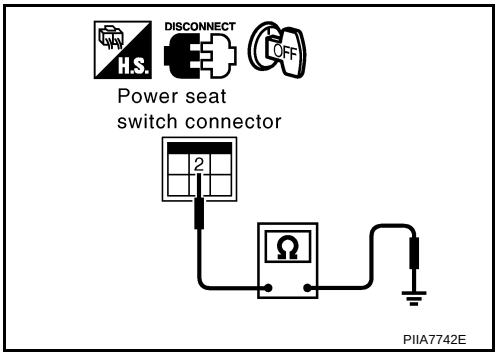
OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace harness between BCM and power seat switch.

3. CHECK POWER SEAT SWITCH GROUND CIRCUIT

Check continuity between power seat switch connector B326 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between power seat switch and ground.

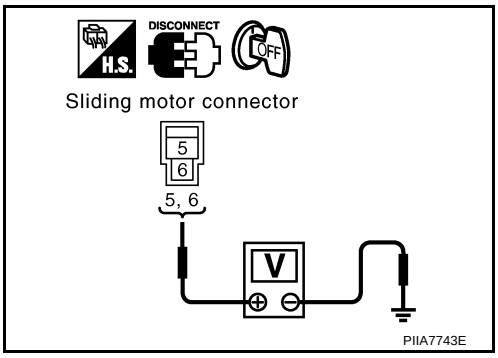
Check Driver Side Seat Sliding Motor Circuit

NIS0009Z

1. CHECK SLIDING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect sliding motor connector.
3. Sliding switch operate, check voltage between sliding motor connector and ground.

Connector	Terminal (Wire color)		Sliding switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B337	5 (Y)	Ground	FORWARD	Battery voltage
			Other than above	0
	6 (SB)		BACKWARD	Battery voltage
			Other than above	0



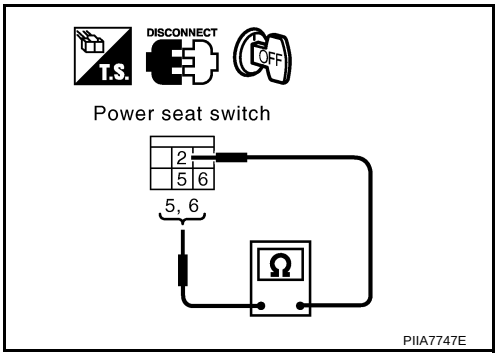
OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. CHECK POWER SEAT SWITCH 1

1. Disconnect power seat switch connector.
2. Sliding switch operate, check continuity between power seat switch terminal 5, 6 and 2.

Terminals		Sliding switch condition	Continuity
5	2	BACKWARD	Yes
		Other than above	No
6		FORWARD	Yes
		Other than above	No



OK or NG

OK >> Replace sliding motor.
NG >> Replace power seat switch.

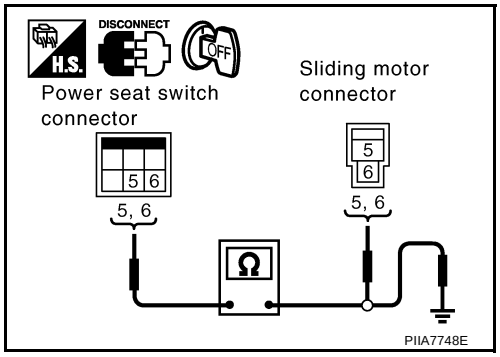
3. CHECK SLIDING MOTOR CIRCUIT HARNESS

1. Disconnect power seat switch connector.
2. Check continuity between power seat switch connector B326 terminal 5, 6 and sliding motor connector B337 terminal 5, 6.

5 (Y) - 5 (Y) : Continuity should exist.
6 (SB) - 6 (SB) : Continuity should exist.

3. Check continuity between power seat switch connector B326 terminal 5, 6 and ground.

5 (Y) - Ground : Continuity should not exist.
6 (SB) - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between power seat switch and sliding motor.

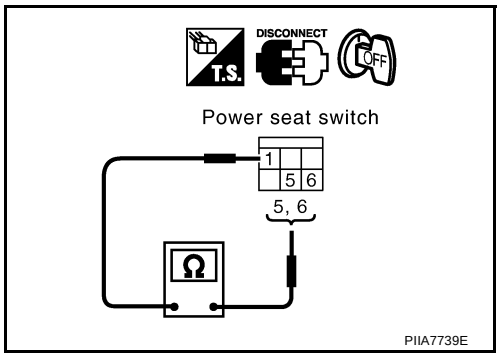
4. CHECK POWER SEAT SWITCH 2

Check continuity between power seat switch as follows.

Terminals		Sliding switch condition	Continuity
5	1	FORWARD	Yes
		Other than above	No
6		BACKWARD	Yes
		Other than above	No

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.



Check Driver Side Seat Reclining Motor Circuit

NIS000A0

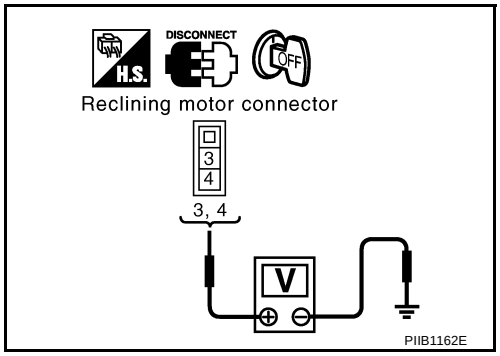
1. CHECK RECLINING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect reclining motor connector.
3. Reclining switch operate, check voltage between reclining motor connector and ground.

Connector	Terminal (Wire color)		Reclining switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B336	3 (OR)	Ground	FORWARD	Battery voltage
			Other than above	0
	4 (G)		BACKWARD	Battery voltage
			Other than above	0

OK or NG

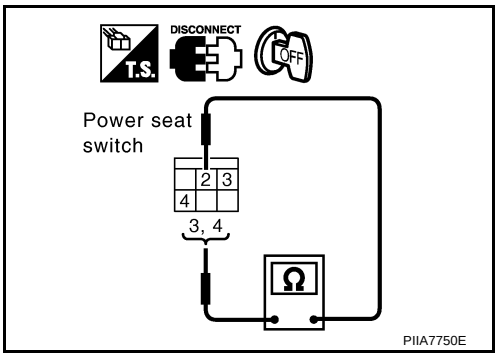
OK >> GO TO 2.
NG >> GO TO 3.



2. CHECK POWER SEAT SWITCH 1

1. Disconnect power seat switch connector.
2. Reclining switch operate, check continuity between power seat switch terminal 3, 4 and 2.

Terminals		Reclining switch condition	Continuity
3	2	FORWARD	Yes
		Other than above	No
4		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Replace reclining motor.
NG >> Replace power seat switch.

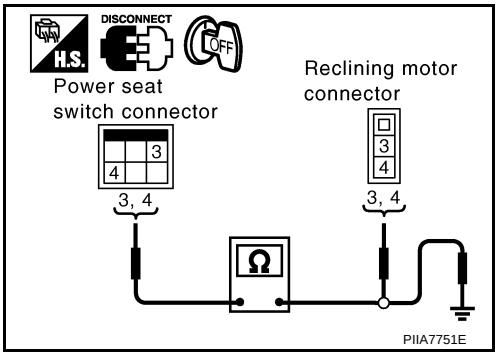
3. CHECK RECLINING MOTOR CIRCUIT HARNESS

1. Disconnect power seat switch connector.
2. Check continuity between power seat switch connector B326 terminal 3, 4 and reclining motor connector B336 terminal 3, 4.

3 (OR) - 3 (OR) : Continuity should exist.
4 (G) - 4 (G) : Continuity should exist.

3. Check continuity between power seat switch connector B326 terminal 3, 4 and ground.

3 (OR) - Ground : Continuity should not exist.
4 (G) - Ground : Continuity should not exist.



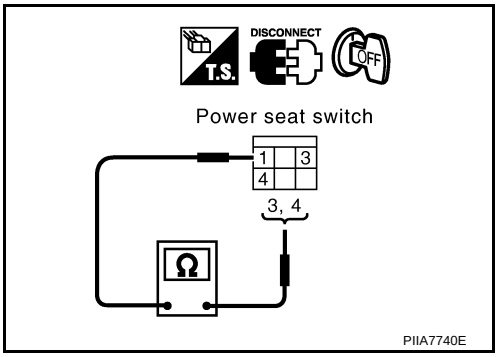
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between power seat switch and reclining motor.

4. CHECK POWER SEAT SWITCH 2

Reclining switch operate, check continuity between power seat switch as follows.

Terminals		Reclining switch condition	Continuity
3	1	FORWARD	Yes
		Other than above	No
4		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.

Check Passenger Seat Control Unit Power Supply and Ground

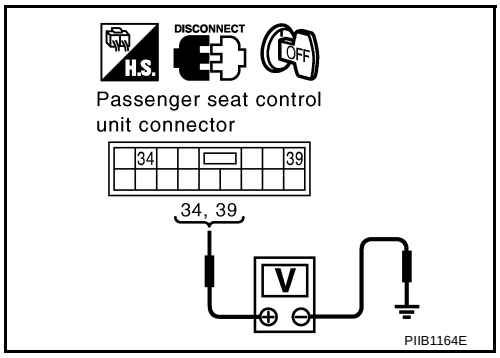
NIS000A1

1. CHECK PASSENGER SEAT CONTROL UNIT POWER SUPPLY

Check voltage between passenger seat control unit connector B354 terminal 34, 39 and ground.

34 (R/W) - Ground : Battery voltage.

39 (R) - Ground : Battery voltage.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> GO TO 2.

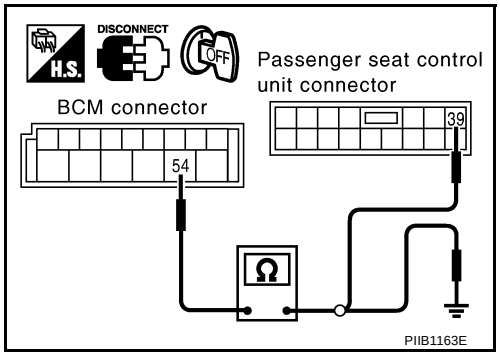
2. CHECK BCM OUTPUT POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and passenger seat control unit connector.
3. Check continuity between BCM connector M91 terminal 54 and passenger seat control unit connector B354 terminal 39.

54 (W) - 39 (R) : Continuity should exist.

4. Check continuity between BCM connector M91 terminal 54 and ground.

54 (W) - Ground : Continuity should not exist.



OK or NG

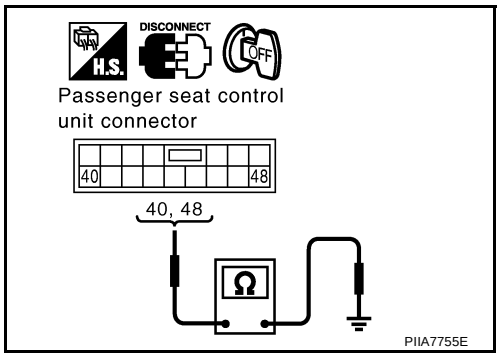
OK >> GO TO 3.
NG >> Repair or replace the harness between BCM and passenger seat control unit.

3. CHECK PASSENGER SEAT CONTROL UNIT GROUND CIRCUIT

Check continuity between passenger seat control unit connector B354 terminal 40, 48 and ground.

40 (B/W) - Ground : Continuity should exist.

48 (B) - Ground : Continuity should exist.



OK or NG

OK >> Check the harness between power seat control unit and fuse block and the 10A fuse (#18).
NG >> Repair or replace the harness between passenger seat control unit and ground.

Check Passenger Seat Control Unit Ignition Signal Circuit

NIS000A2

1. CHECK FUSE

- Check 10A fuse [No.9, located in the fuse block (J/B)].
- Check 10A fuse [No.12, located in the fuse block (J/B)].

NOTE:
Refer to SE-15, "Component Parts and Harness Connector Location" .

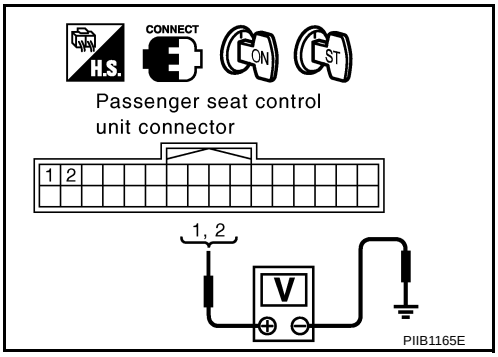
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK PASSENGER SEAT CONTROL UNIT POWER SUPPLY

Check voltage between passenger seat control unit and ground.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition		Voltage (V) (Approx.)
B353	1 (W)	Ground	Ignition switch	: START	Battery voltage
	2 (L)			: ON	



OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace the harness between passenger seat control unit and fuse block (J/B).

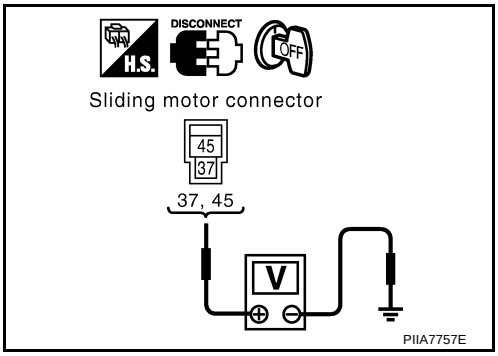
Check Passenger Side Seat Sliding Motor Circuit

NIS000A3

1. CHECK SLIDING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect sliding motor connector.
3. Sliding switch operated, check voltage between sliding motor connector and ground.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Sliding switch condition	Voltage (V) (Approx.)
B344	37 (SB)	Ground	BACKWARD	Battery voltage
			Other than above	0
	45 (Y)		FORWARD	Battery voltage
			Other than above	0



OK or NG

OK >> Replace sliding motor.
NG >> GO TO 2.

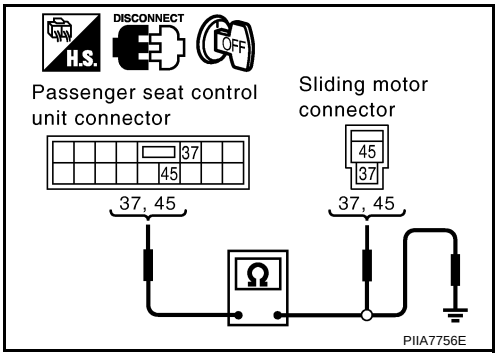
2. CHECK SLIDING MOTOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 37, 45 and sliding motor connector B344 terminal 37, 45.

37 (SB) - 37 (SB) : Continuity should exist.
45 (Y) - 45 (Y) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B354 terminal 37, 45 and ground.

37 (SB) - Ground : Continuity should not exist.
45 (Y) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and sliding motor.

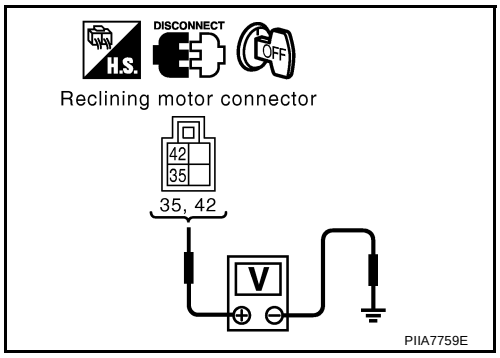
Check Passenger Side Seat Reclining Motor Circuit

NIS000A4

1. CHECK RECLINING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect reclining motor connector.
3. Reclining switch operated, check voltage between reclining motor and ground.

Connector	Terminal (Wire color)		Reclining switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B358	35 (G)	Ground	BACKWARD	Battery voltage
			Other than above	0
	42 (OR)		FORWARD	Battery voltage
			Other than above	0



OK or NG

OK >> Replace reclining motor.
NG >> GO TO 2.

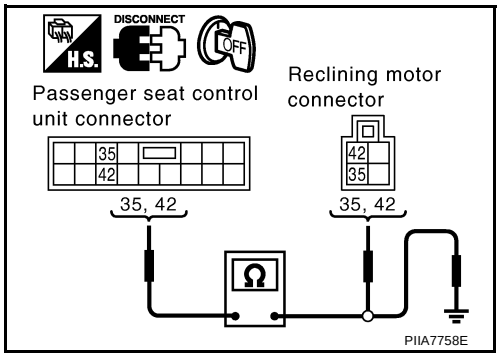
2. CHECK RECLINING MOTOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 35, 42 and reclining motor connector B358 terminal 35, 42.

35 (G) - 35 (G) : Continuity should exist.
42 (OR) - 42 (OR) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B354 terminal 35, 42 and ground.

35 (G) - Ground : Continuity should not exist.
42 (OR) - Ground : Continuity should not exist.



OK or NG

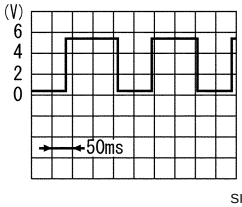
OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.

Check Passenger Side Seat Reclining Sensor Circuit

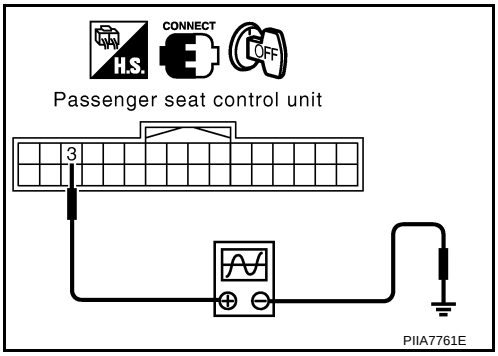
NIS000A5

1. CHECK RECLINING SENSOR OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Check signal between passenger seat control unit connector and ground, with oscilloscope.

Connector	Terminal (Wire color) (+)	Terminal (Wire color) (-)	Condition	Signal (Reference value)
B353	3 (Y)	Ground	When reclining motor is operated.	

SIIA0692J



PIIA7761E

OK or NG

OK >> Passenger side seat reclining motor circuit is OK.
NG1 >> When voltage waveform dose not appear with a constant voltage (approx. 5V), GO TO 3.
NG2 >> When voltage waveform dose not appear with a constant voltage (approx. 0V), GO TO 2.

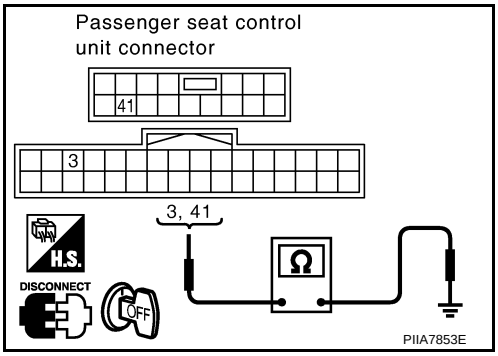
2. CHECK RECLINING SENSOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 3, 41 and ground.

3 (Y) - Ground : Continuity should not exist.
41 (Y/B) - Ground : Continuity should not exist.

OK or NG

OK >> Replace passenger seat control unit.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.



PIIA7853E

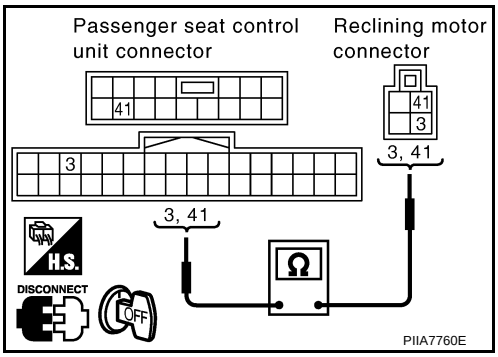
3. CHECK RECLINING SENSOR CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 3, 41 and reclining motor connector B358 terminal 3, 41.

3 (Y) - 3 (Y) : Continuity should exist.
41 (Y/B) - 41 (Y/B) : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness between passenger seat control unit and reclining motor.

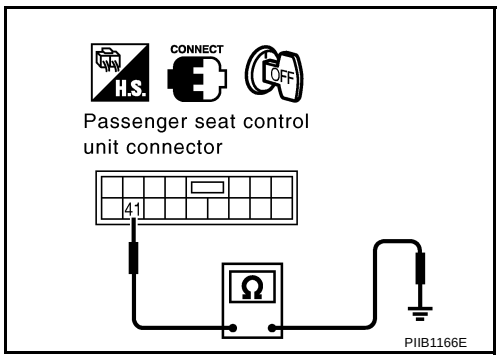


PIIA7760E

4. CHECK RECLINING SENSOR GROUND CIRCUIT

1. Connect passenger seat control unit connector.
2. Check continuity between passenger seat control unit connector B354 terminal 41and ground.

41 (Y/B) - Ground : Continuity should exist.



OK or NG

OK >> Replace reclining motor.
NG >> Replace passenger seat control unit.

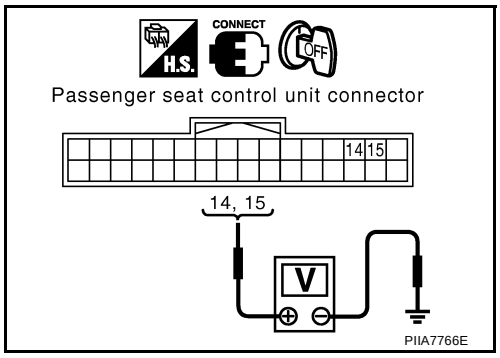
Check Passenger Side Seat Sliding Switch Circuit

NIS000A6

1. CHECK SLIDING SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Sliding switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Sliding switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	14 (Y)	Ground	FORWARD	0
			Other than above	Battery voltage
	15 (SB)		BACKWARD	0
			Other than above	Battery voltage



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

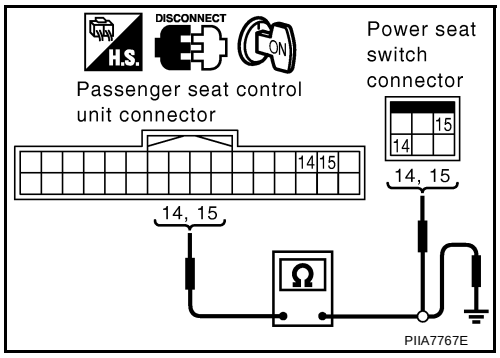
2. CHECK SLIDING SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and power seat switch connector.
2. Check continuity between passenger seat control unit connector B353 terminal 14, 15 and power seat switch connector B357 terminal 14, 15.

14 (Y) - 14 (Y) : Continuity should exist.
15 (SB) - 15 (SB) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 14, 15 and ground.

14 (Y) - Ground : Continuity should not exist.
15 (SB) - Ground : Continuity should not exist.



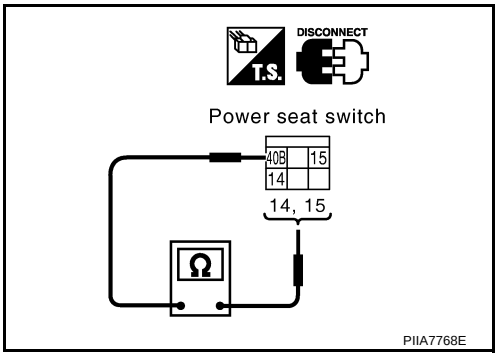
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and power seat switch.

3. CHECK POWER SEAT SWITCH

Sliding switch operated, check continuity between power seat switch terminal 14, 15 and 40B.

Terminals		Sliding switch condition	Continuity
14	40B	FORWARD	Yes
		Other than above	No
15		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.

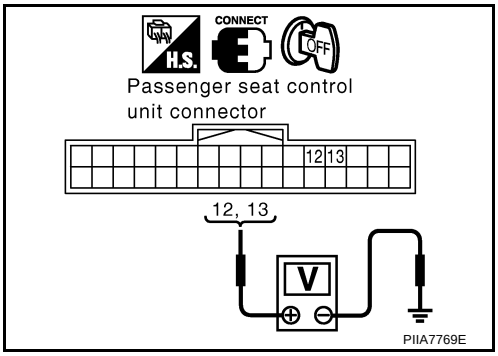
Check Passenger Side Seat Reclining Switch Circuit

NIS000A7

1. CHECK RECLINING SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Reclining switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Reclining switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	12 (OR)	Ground	FORWARD	0
			Other than above	Battery voltage
	13 (G)		BACKWARD	0
			Other than above	Battery voltage



OK or NG

OK >> Passenger side seat reclining switch circuit is OK.
NG >> GO TO 2.

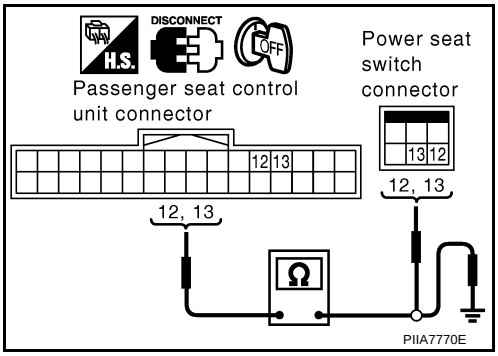
2. CHECK RECLINING SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and power seat switch connector.
2. Check continuity between passenger seat control unit connector B353 terminal 12, 13 and power seat switch connector B357 terminal 12, 13.

12 (OR) - 12 (OR) : Continuity should exist.
13 (G) - 13 (G) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 12, 13 and ground.

12 (OR) - Ground : Continuity should not exist.
13 (G) - Ground : Continuity should not exist.



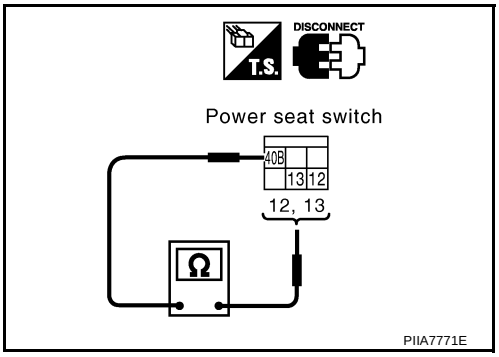
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and power seat switch.

3. CHECK POWER SEAT SWITCH

Reclining switch operated, check continuity between power seat switch terminal 12, 13 and 40B.

Terminals		Reclining switch condition	Continuity
12	40B	FORWARD	Yes
		Other than above	No
13		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Replace power seat switch.

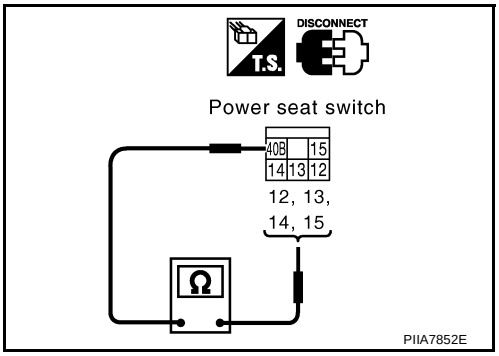
Check Passenger Side Power Seat Switch Ground Circuit

NIS000A8

1. CHECK POWER SEAT SWITCH

1. Turn ignition switch OFF.
2. Disconnect power seat switch connector.
3. Check continuity between power seat switch terminal 12, 13, 14, 15 and 40B.

Terminals		Condition	Continuity
12	40B	When reclining switch is turned to forward	Yes
		Other than above	No
13		When reclining switch is turned to backward	Yes
		Other than above	No
14		When sliding switch is turned to forward	Yes
		Other than above	No
15		When sliding switch is turned to backward	Yes
		Other than above	No



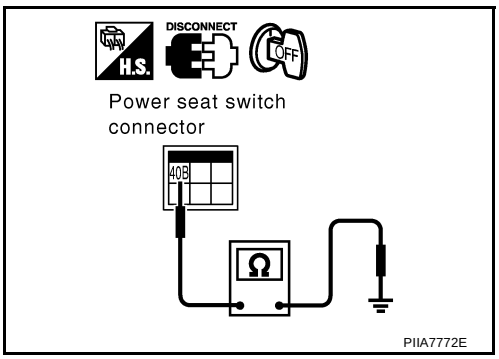
OK or NG

OK >> GO TO 2.
NG >> Replace power seat switch.

2. CHECK POWER SEAT SWITCH GROUND CIRCUIT

Check continuity between power seat switch connector B357 terminal 40B and ground.

40B (B/W) - Ground : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between power seat switch and ground.

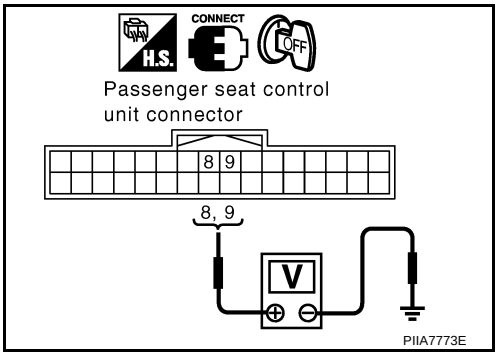
Check Seatback Tilt Switch Circuit

NIS000A9

1. CHECK SEATBACK TILT SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Seatback tilt switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Seatback tilt switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	8 (BR)	Ground	FORWARD	0
			Other than above.	Battery voltage
	9 (LG)		BACKWARD	0
			Other than above.	Battery voltage



OK or NG

OK >> Seatback tilt switch circuit is OK.
NG >> GO TO 2.

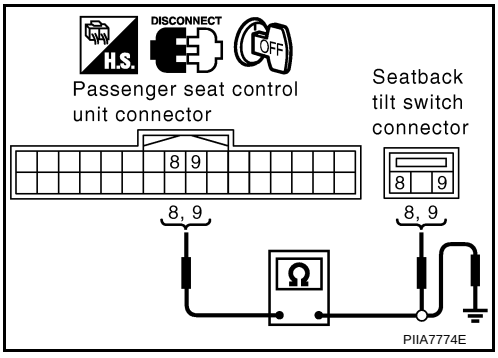
2. CHECK SEATBACK TILT SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and seatback tilt switch.
2. Check continuity between passenger seat control unit connector B353 terminal 8, 9 and seatback tilt switch connector B372 terminal 8, 9.

8 (BR) - 8 (BR) : Continuity should exist.
9 (LG) - 9 (LG) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 8, 9 and ground.

8 (BR) - Ground : Continuity should not exist.
9 (LG) - Ground : Continuity should not exist.



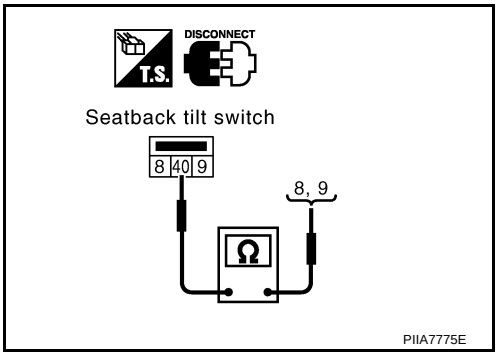
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seatback tilt switch.

3. CHECK SEATBACK TILT SWITCH

Seatback switch operated, check continuity between seatback tilt switch terminal 8, 9 and 40.

Terminals		Seatback switch condition	Continuity
8	40	FORWARD	Yes
		Other than above	No
9		BACKWARD	Yes
		Other than above	No



OK or NG

OK >> GO TO 4.
NG >> Replace seatback tilt switch.

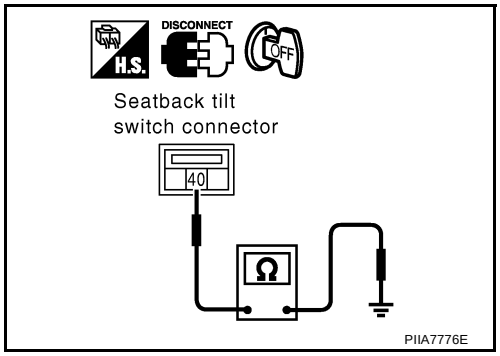
4. CHECK SEATBACK TILT SWITCH GROUND CIRCUIT

Check continuity between seatback tilt switch connector B372 terminal 40 and ground.

40 (B/W) - Ground : Continuity should exist.

OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seatback tilt switch and ground.



Check Seatback Tilt Cancel Switch Circuit

NIS000AA

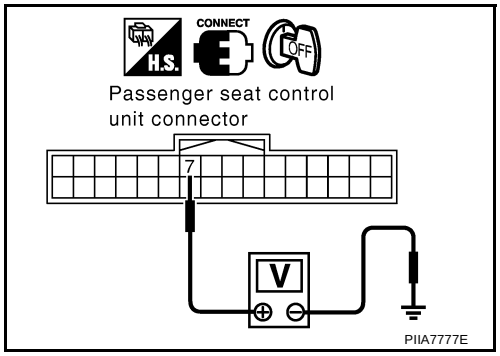
1. CHECK SEATBACK TILT CANCEL SWITCH OUTPUT SIGNAL

1. Turn ignition switch OFF.
2. Seatback tilt cancel switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Seatback tilt cancel switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	7 (P)	Ground	CANCEL	0
			AUTO	5

OK or NG

OK >> Passenger seatback tilt cancel switch circuit is OK.
NG >> GO TO 2.



2. CHECK SEATBACK TILT CANCEL SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and seatback tilt cancel switch.
2. Check continuity between passenger seat control unit connector B353 terminal 7 and seatback tilt cancel switch connector B373 terminal 7.

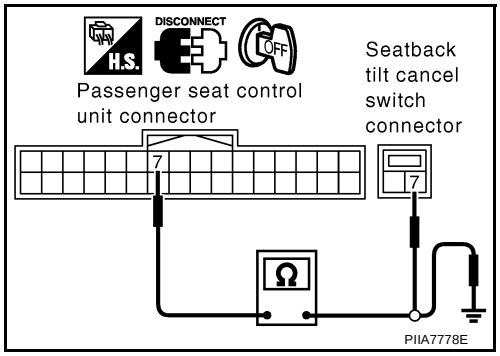
7 (P) - 7 (P) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 7 and ground.

7 (P) - Ground : Continuity should not exist.

OK or NG

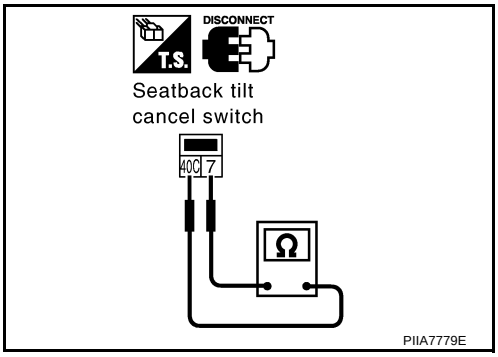
OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seatback tilt cancel switch.



3. CHECK SEATBACK TILT CANCEL SWITCH

Seatback tilt cancel switch operated, check continuity between seatback tilt cancel switch terminal 7 and 40C.

Terminals		Seatback tilt cancel switch condition	Continuity
7	40C	CANCEL	Yes
		AUTO	No



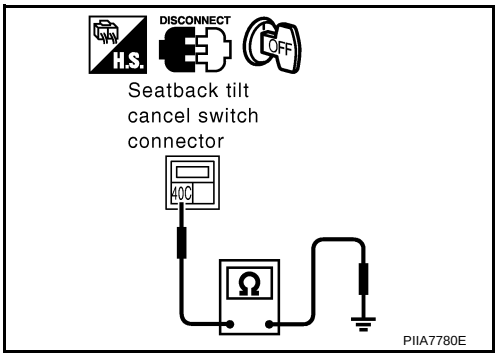
OK or NG

OK >> GO TO 4.
NG >> Replace seatback tilt cancel switch.

4. CHECK SEATBACK TILT CANCEL SWITCH GROUND CIRCUIT

Check continuity between seatback tilt cancel switch connector B373 terminal 40C and ground.

40C (B/W) - Ground : Continuity should exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seatback tilt cancel switch and ground.

Check Soft Top Switch Circuit

NIS000AB

1. CHECK SOFT TOP SYSTEM

Soft top is operated.

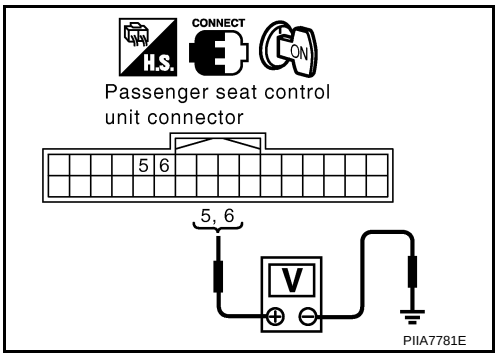
Operate normally?

Yes >> GO TO 2.
No >> Further inspection necessary. Refer to

2. CHECK SOFT TOP SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Soft top switch operated, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Soft top switch condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	5 (R)	Ground	OPEN*	0
			Other than above	Battery voltage
	6 (GY)		CLOSE*	0
			Other than above	Battery voltage



*: Turn ignition switch ON and depress brake pedal when soft top switch operates.

OK or NG

OK >> Soft top switch circuit is OK.
NG >> GO TO 3.

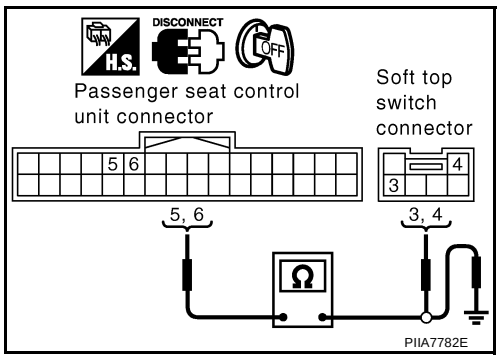
3. CHECK SOFT TOP SWITCH CIRCUIT HARNESS

1. Disconnect passenger seat control unit connector and soft top switch.
2. Check continuity between passenger seat control unit connector B353 terminal 5, 6 and soft top switch connector M14 terminal 3, 4.

5 (R) - 3 (L/B) : Continuity should exist.
6 (GY) - 4 (R/G) : Continuity should exist.

3. Check continuity between passenger seat control unit connector B353 terminal 5, 6 and ground.

5 (R) - Ground : Continuity should not exist.
6 (GY) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness between passenger seat control unit and soft top switch.

Check Power Window Down Request Signal Circuit

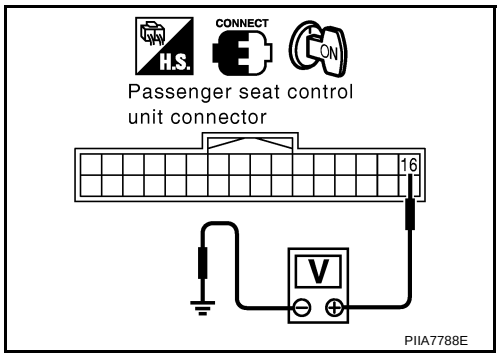
NIS000AC

1. CHECK POWER WINDOW DOWN REQUEST SUGNAL INPUT

1. Turn ignition switch ON.
2. Check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	16 (PU/W)	Ground	When soft top switch is turned to OPEN or CLOSE.*	0
			Other than above.	5

*: Turn ignition switch ON and depress brake pedal when soft top switch operates.



OK or NG

OK >> Power window down request signal circuit is OK.
NG >> GO TO 2.

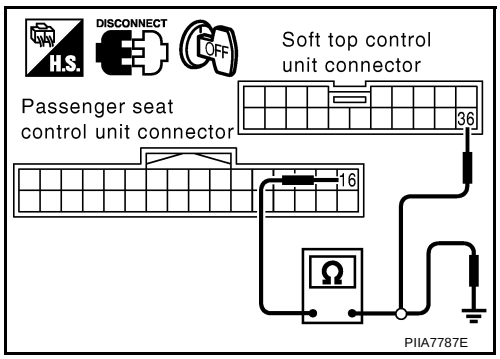
2. CHECK POWER WINDOW DOWN REQUEST SUGNAL CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and passenger seat control unit connector.
3. Check continuity between passenger seat control unit connector B353 terminal 16 and soft top control unit connector B67 terminal 36.

16 (PU/W) - 36 (PU) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 16 and ground.

16 (PU/W) - Ground : Continuity should not exist.



OK or NG

OK >> Power window down request signal circuit is OK. Further inspection is necessary. Refer to RF-81, "Check Power Window Down Request Signal" .
NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

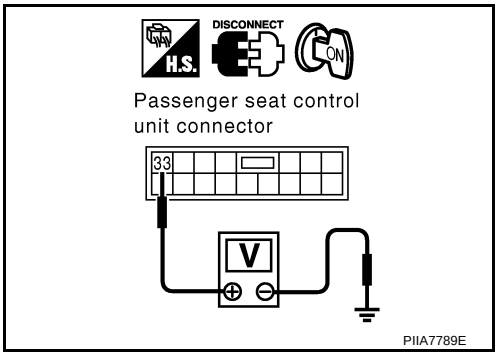
Check Storage Lid Close Signal Circuit

NIS000AD

1. CHECK STORAGE LID CLOSE SIGNAL

1. Turn ignition switch ON.
2. Soft top operates in OPEN, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	33 (G/B)	Ground	When storage lid is in a closing operation	Battery voltage
			Other than above.	0



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

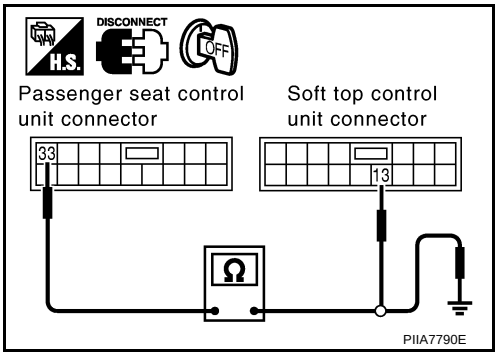
2. CHECK STORAGE LID CLOSE SIGNAL CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect soft top control unit and storage lid actuator and passenger seat control unit connector.
3. Check continuity between passenger seat control unit connector B353 terminal 33 and soft top control unit connector B66 terminal 13.

33 (G/B) - 13 (L/R) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 33 and ground.

33 (G/B) - Ground : Continuity should not exist.



OK or NG

OK >> Storage lid close signal circuit is OK. Further inspection is necessary. Refer to RF-62, "Check Storage Lid Actuator (Close Operate)" .
NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

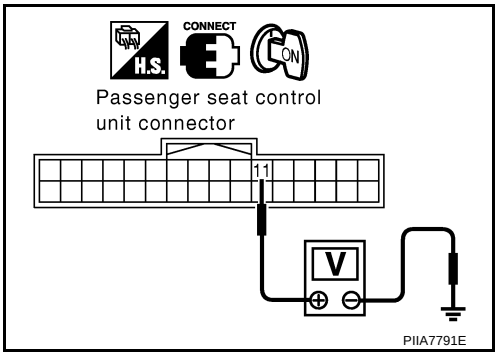
Check Soft Top Lock Switch Circuit

NIS000AE

1. CHECK SOFT TOP LOCK SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Soft top operates in CLOSE, check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition	Voltage (V) (Approx.)
	(+)	(-)		
B353	11 (L/W)	Ground	5th bow full latch switch is turned to ON	0
			Other than above	5



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

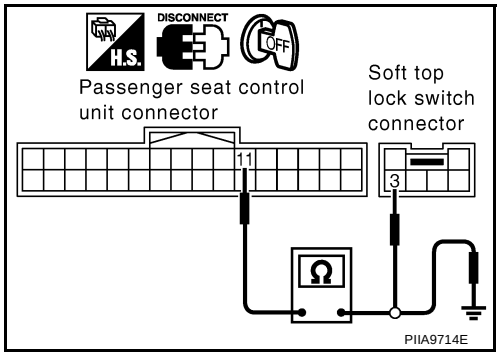
2. CHECK SOFT TOP LOCK SWITCH CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect passenger seat control unit and soft top lock switch connector.
3. Check continuity between passenger seat control unit connector B353 terminal 11 and soft top lock switch connector T205 terminal 3.

11 (L/W) - 3 (Y) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 11 and ground.

11 (L/W) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and connector.
NG >> Repair or replace harness between passenger seat control unit and soft top control unit.

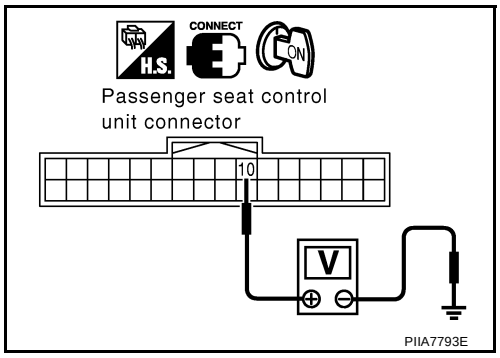
Check Seat Belt Buckle Switch Circuit

NIS000AF

1. CHECK SEAT BELT BUCKLE SWITCH OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between passenger seat control unit connector and ground.

Connector	Terminal (Wire color)		Condition		Voltage (V) (Approx.)
	(+)	(-)			
B353	10 (L/Y)	Ground	Seat belt.	: Fastened	5
				: Unfastened	0



OK or NG

OK >> Seat belt buckle switch circuit is OK.
NG >> GO TO 2.

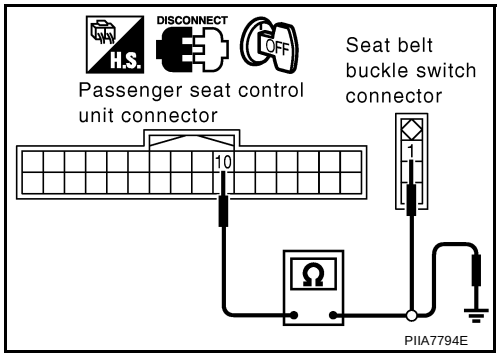
2. CHECK SEAT BELT BUCKLE SWITCH CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect passenger seat control unit connector and seat belt buckle switch connector.
3. Check continuity between passenger seat control unit connector B353 terminal 10 and seat belt buckle switch connector B11 terminal 1.

10 (L/Y) - 1 (W) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 10 and ground.

10 (L/Y) - Ground : Continuity should not exist.



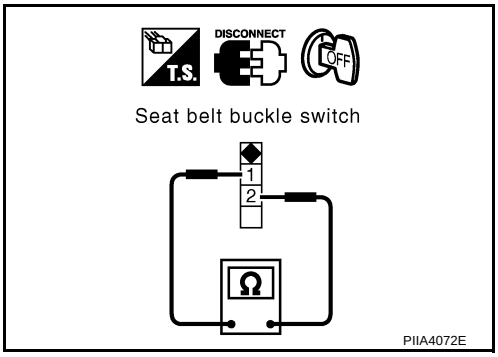
OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness between passenger seat control unit and seat belt buckle switch.

3. CHECK SEAT BELT BUCKLE SWITCH

Check continuity between seat belt buckle switch terminal 1 and 2.

Terminals		Condition		Continuity
1	2	Seat belt	: Fastened	No
			: Unfastened	Yes



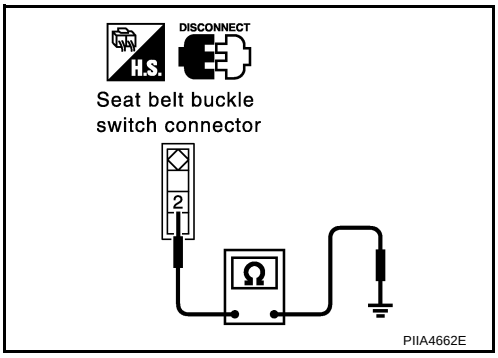
OK or NG

OK >> GO TO 4.
NG >> Replace seat belt buckle switch.

4. CHECK SEAT BELT BUCKLE SWITCH GROUND CIRCUIT

Check continuity between seat belt buckle switch connector B11 terminal 2 and ground.

2 (B) - Ground : Continuity should exist.



OK or NG

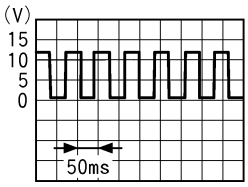
OK >> Check the condition of the harness and connector.
NG >> Repair or replace the harness between seat belt buckle switch and ground.

NIS000AG

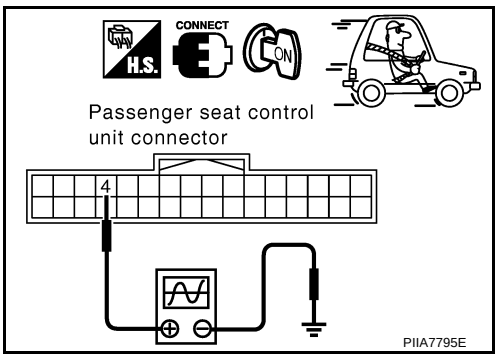
Check Vehicle Speed Signal

1. CHECK VEHICLE SPEED SIGNAL

1. Turn ignition switch ON.
2. Check signal between passenger seat control unit connector and body ground with oscilloscope.

Connector	Terminal (Wire color)		Condition	Signal (Reference value)
	(+)	(-)		
B353	4 (PU)	Ground	When vehicle speed is approx. 40 km/h (25 MPH)	

PIIB0078J



OK or NG

OK >> Replace passenger seat control unit.
NG >> GO TO 2.

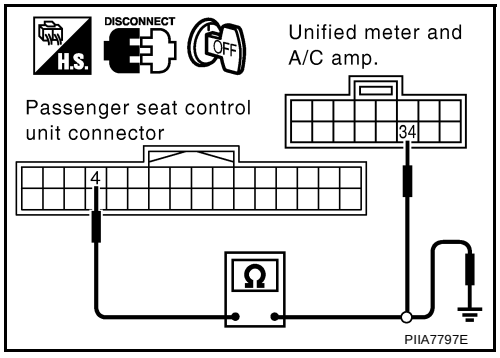
2. CHECK VEHICLE SPEED SIGNAL CIRCUIT HARNESS

1. Turn ignition switch OFF.
2. Disconnect passenger seat control unit connector and unified meter and A/C amp.
3. Check continuity between passenger seat control unit connector B353 terminal 4 and unified meter and A/C amp. connector M49 terminal 34.

4 (PU) - 34 (L) : Continuity should exist.

4. Check continuity between passenger seat control unit connector B353 terminal 4 and ground.

4 (PU) - Ground : Continuity should not exist.



OK or NG

OK >> Vehicle speed signal circuit is OK. Further inspection is necessary. Refer to DI-18, "Vehicle Speed Signal Inspection" .

NG >> Repair or replace harness between passenger seat control unit and unified meter and A/C amp.

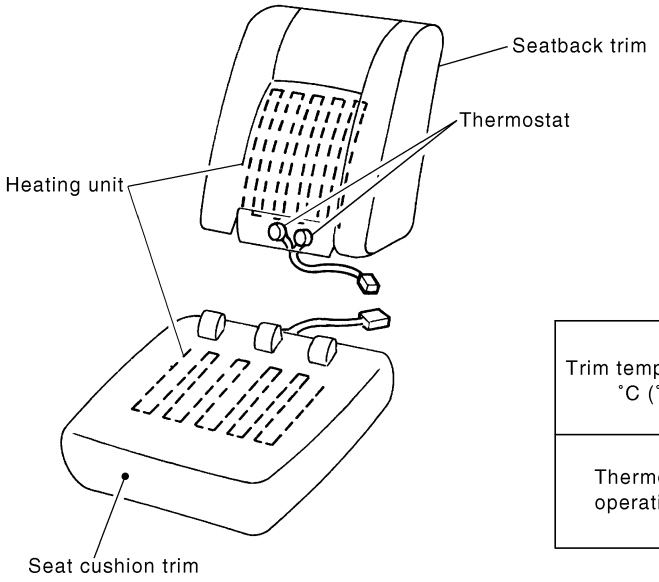
HEATED SEAT

PFP:87335

Description

NIS000AH

- When handling seat, be extremely careful not to scratch heating unit.
- To replace heating unit, seat trim and pad should be separated.
- Do not use any organic solvent, such as thinner, benzene, alcohol, etc. to clean trims.

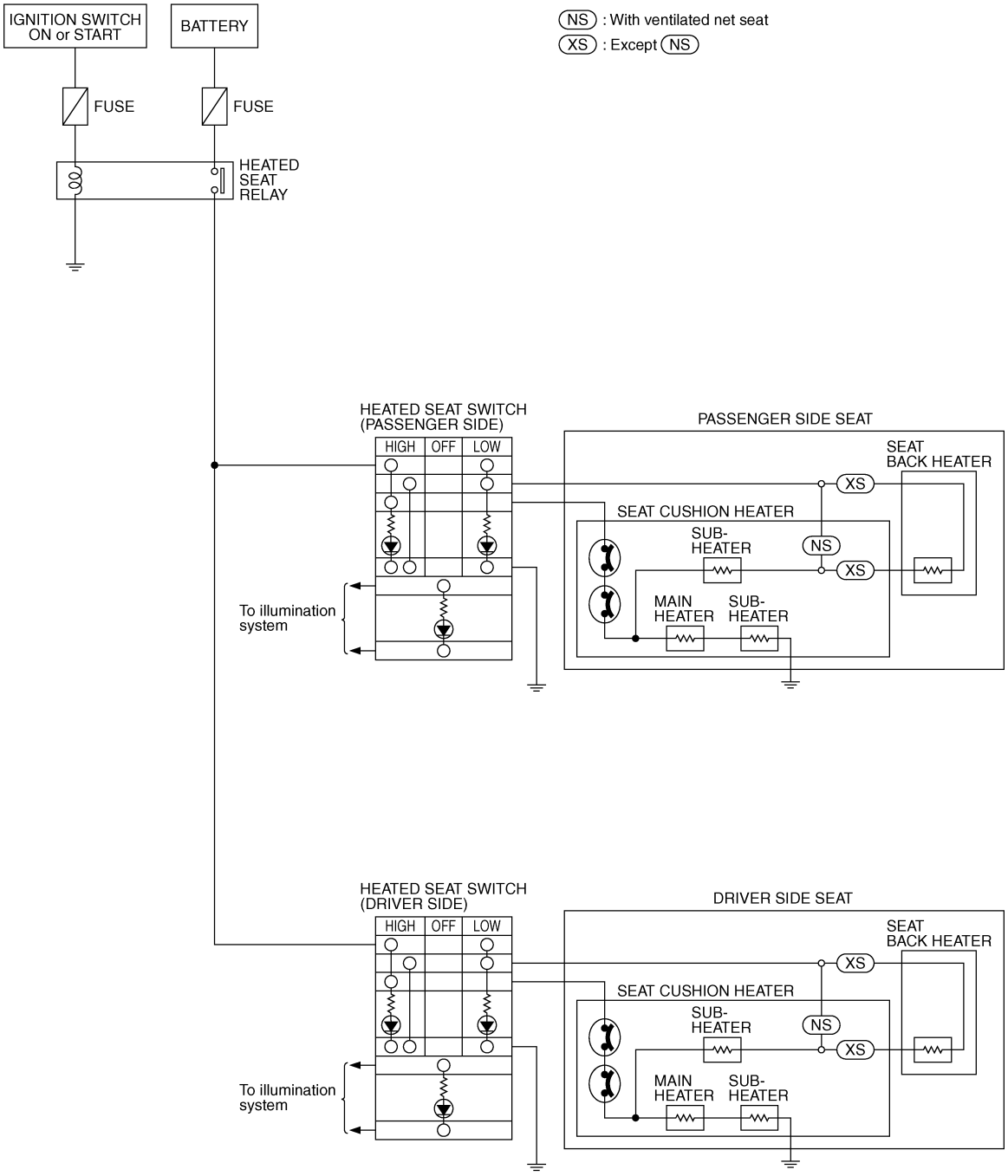


Trim temperature °C (°F)	Heating up to 35 - 45 (95 - 113)	Cooling down to 25 - 35 (77 - 95)
Thermostat operation	OFF	ON

PIIA9035E

Schematic

NIS000AI

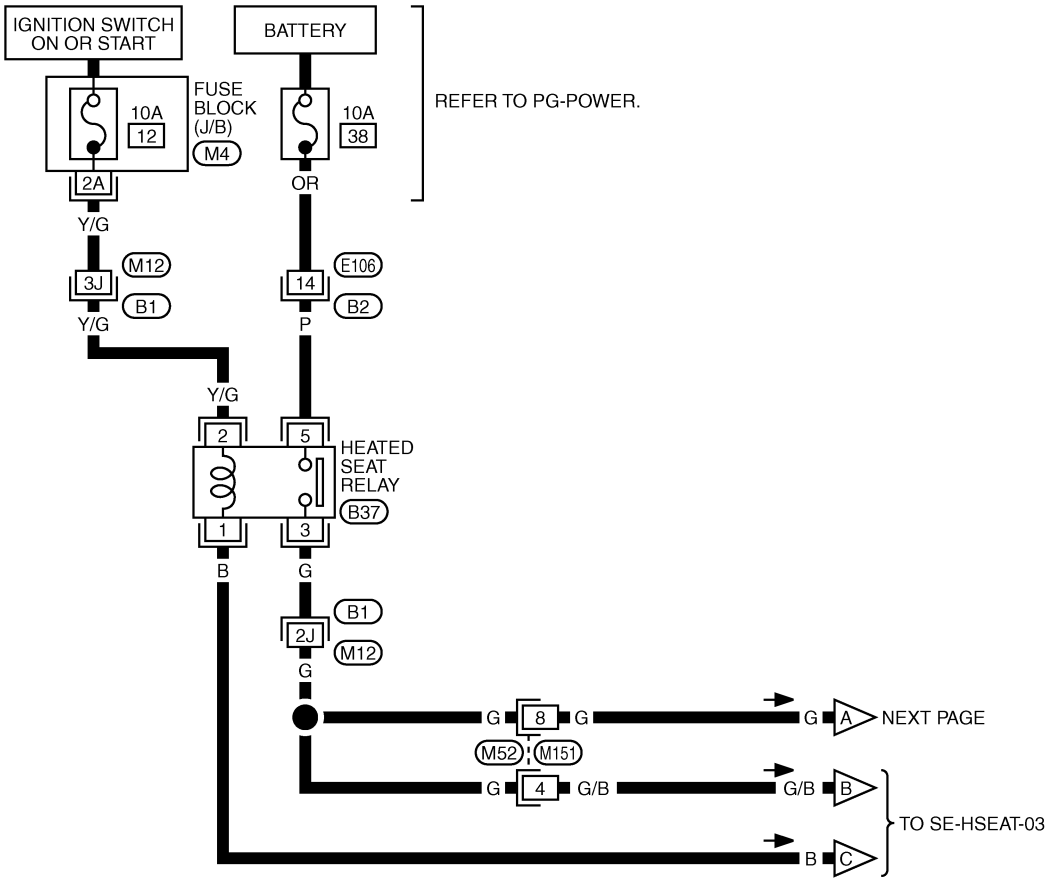


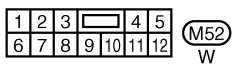
TIWT0517E

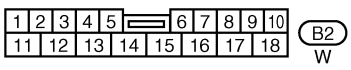
Wiring Diagram–HSEAT–/For Coupe

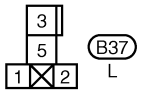
NIS000AJ

SE-HSEAT-01









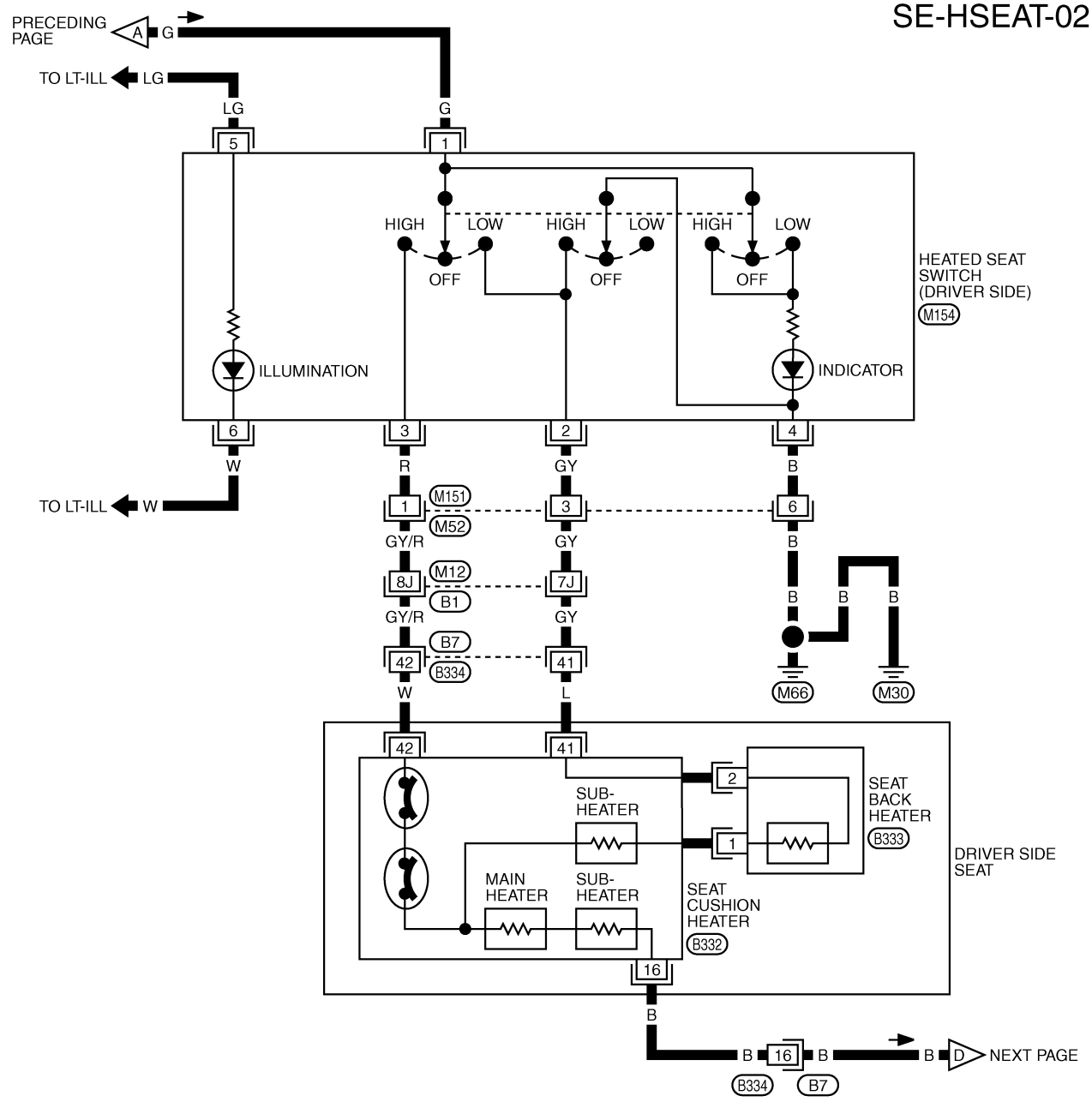
REFER TO THE FOLLOWING.

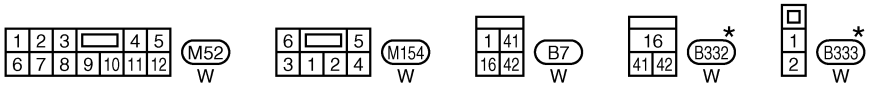
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT2291E

SE-HSEAT-02



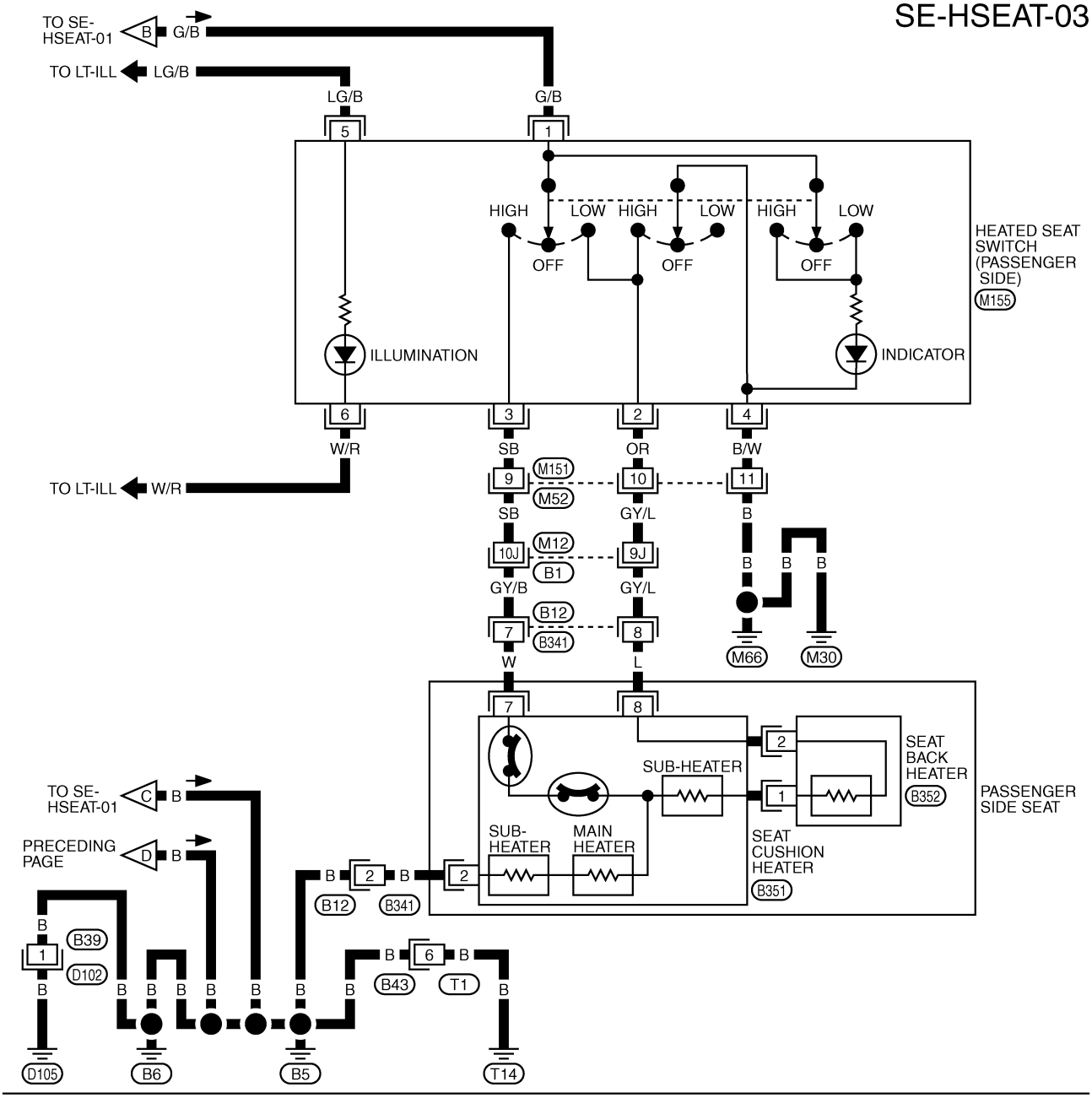


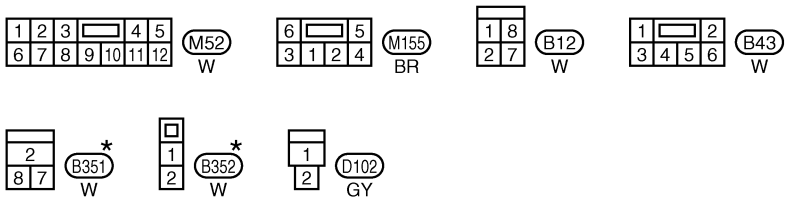
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TIWT1619E

SE-HSEAT-03





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

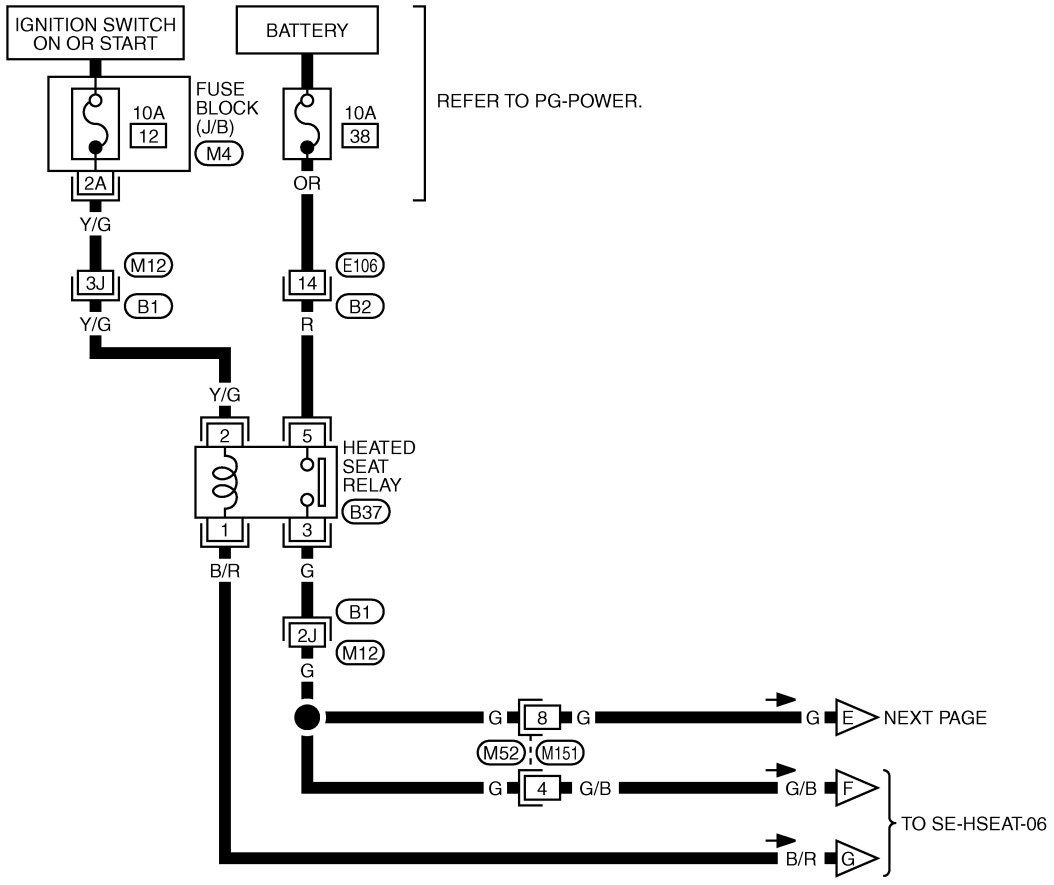
REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

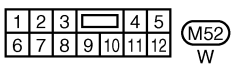
TIWT1620E

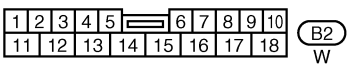
Wiring Diagram–HSEAT–/For Roadster–

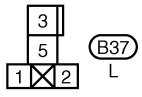
NIS000AK

SE-HSEAT-04









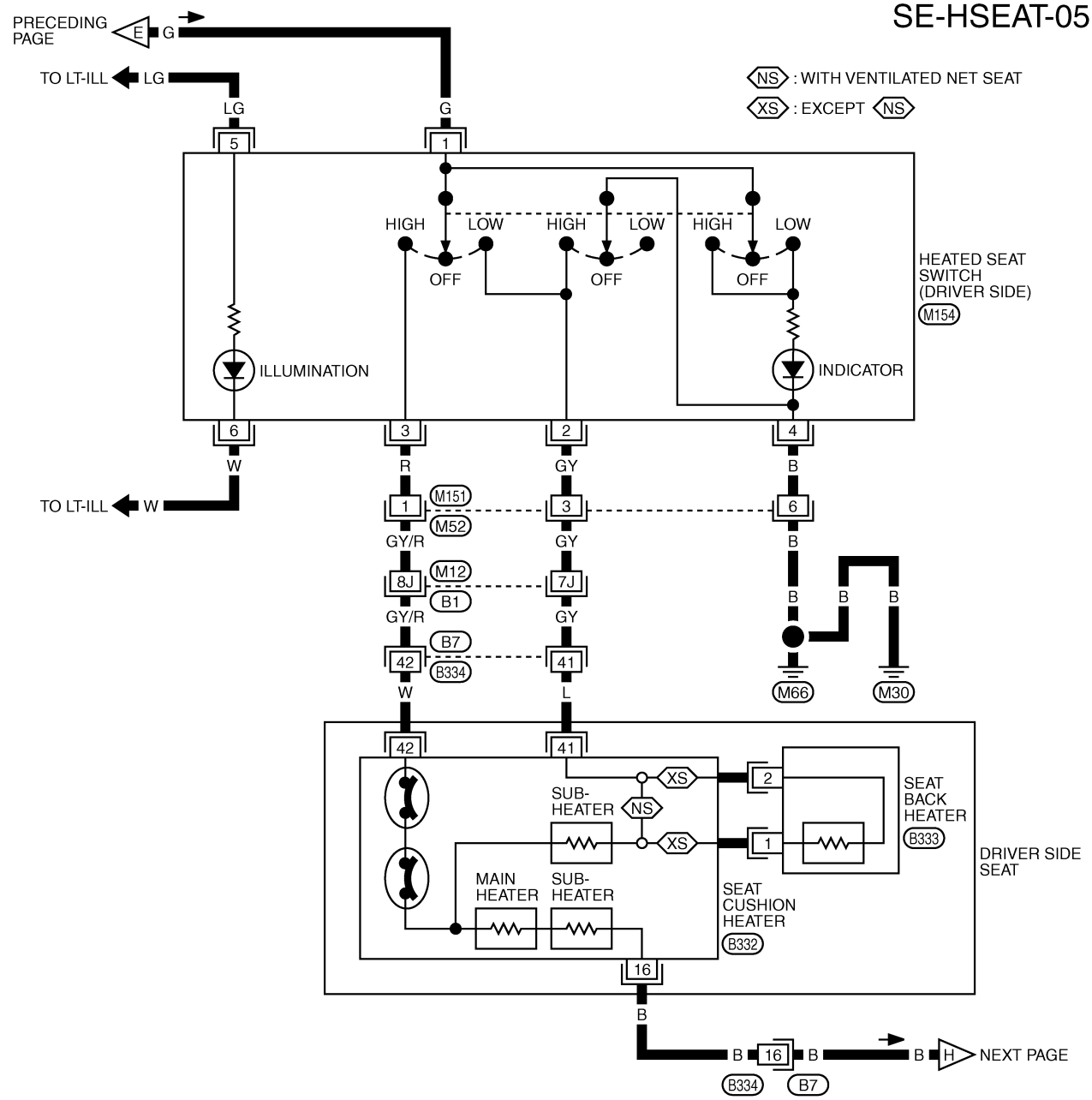
REFER TO THE FOLLOWING.

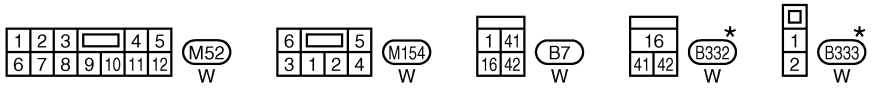
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TIWT2292E

SE-HSEAT-05



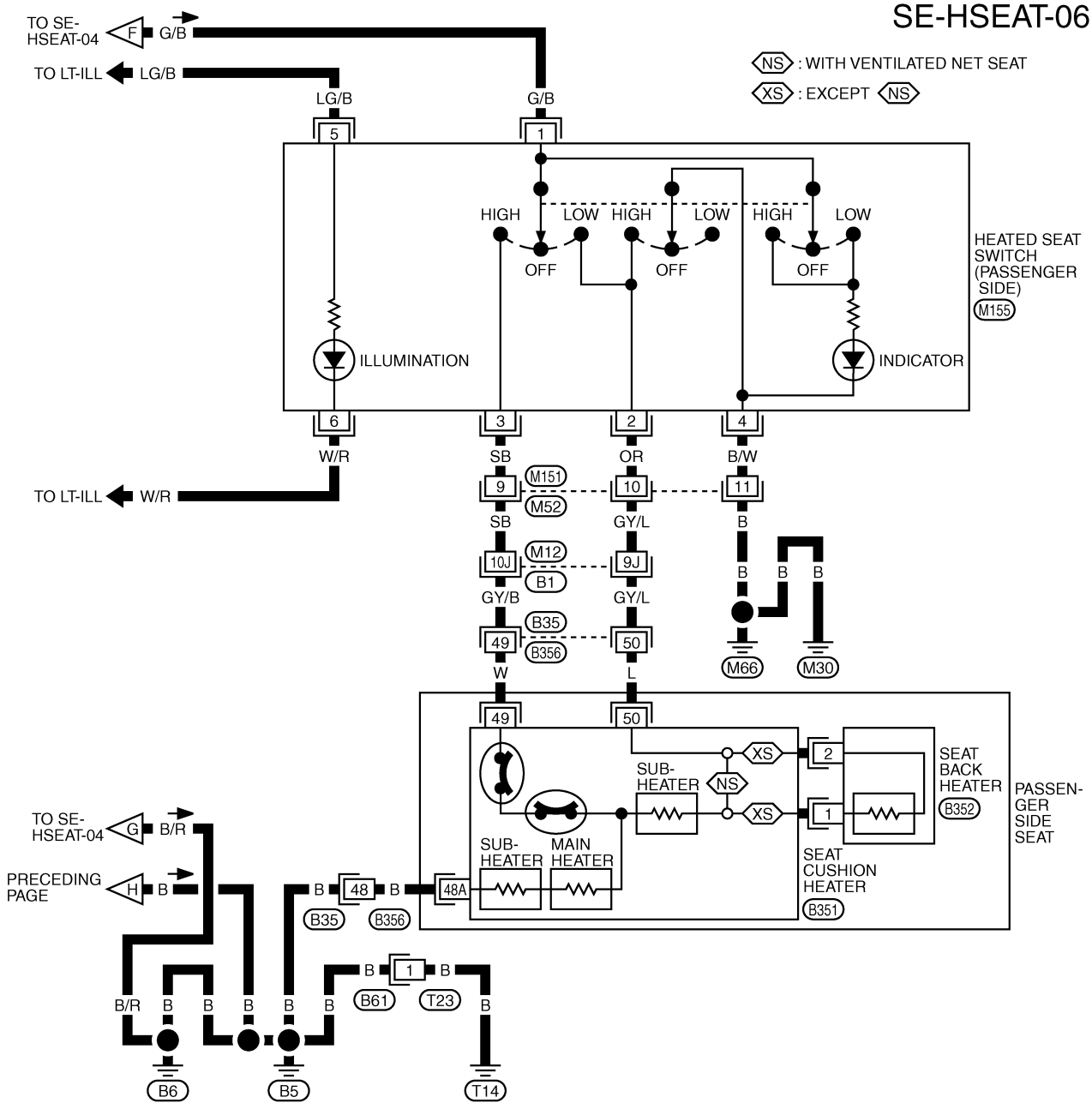


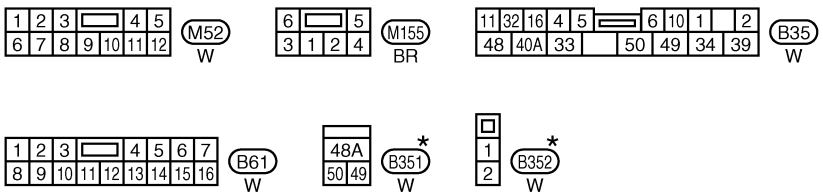
∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT1622E

SE-HSEAT-06





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

TIWT2293E

SEAT

PFP:87000

Removal and Installation

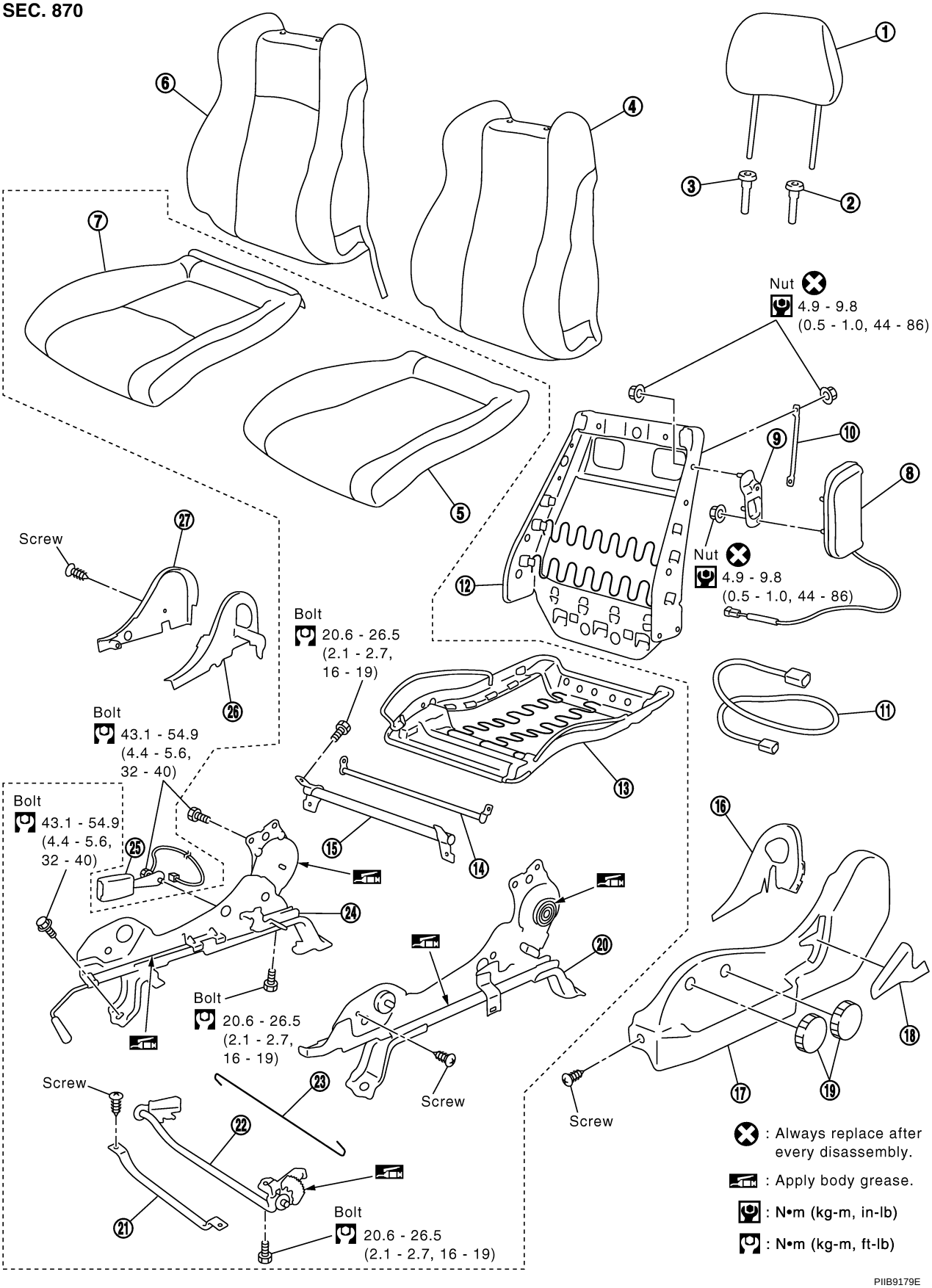
NIS000AL

CAUTION:

Do not disassembly the component parts of only front passenger seat in the dotted lines shown in the figure below.

MANUAL SEAT (COUPE)

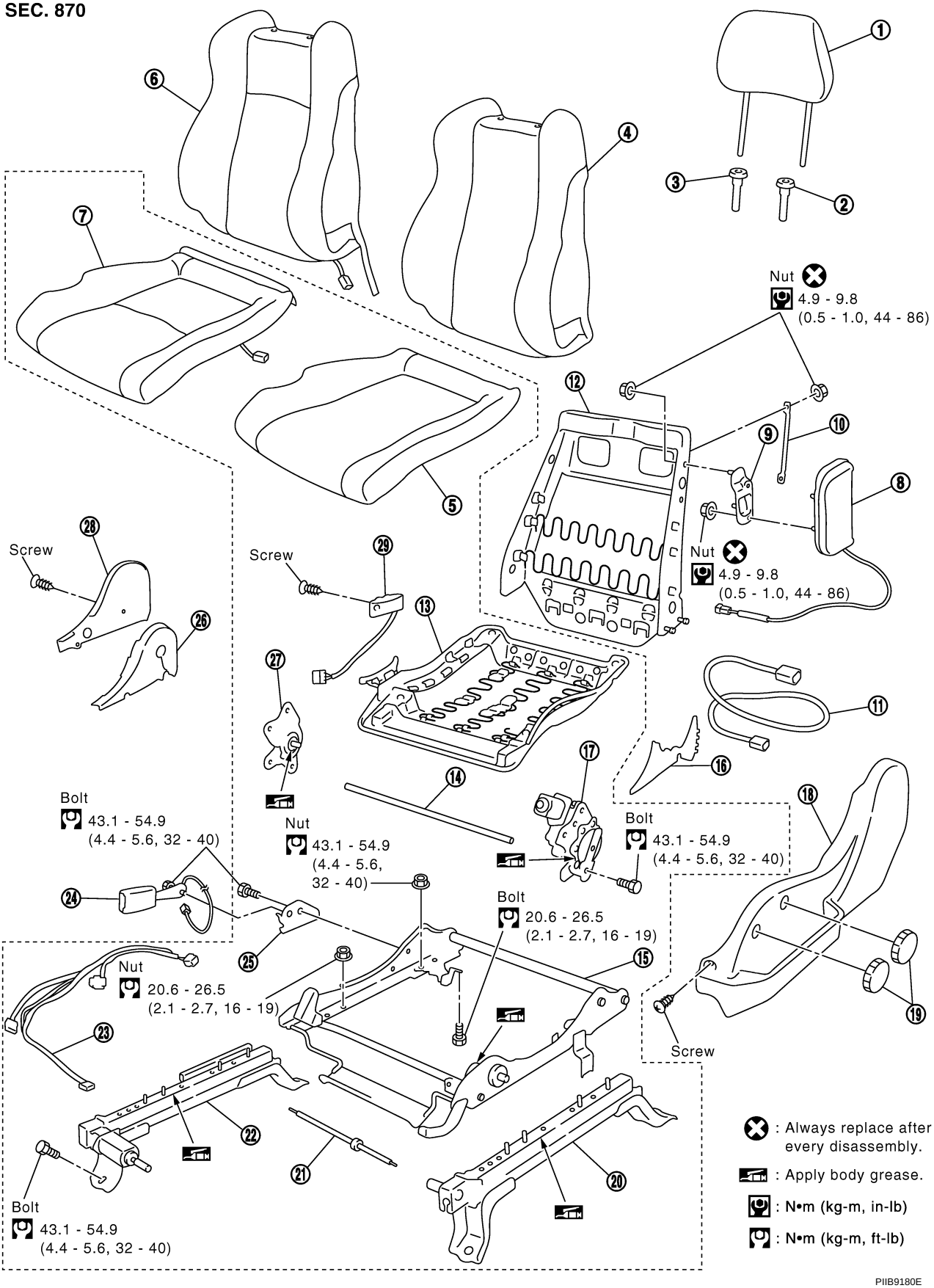
SEC. 870



1. Headrest
2. Headrest holder (locked)
3. Headrest holder (free)
4. Seatback pad
5. Seat cushion pad
6. Seatback trim
7. Seat cushion trim
8. Side air bag module
9. Side air bag module bracket
10. Inner cloth stay
11. Side air bag module harness
12. Seatback frame
13. Seat cushion frame
14. Connector rod
15. Rear gusset
16. Inner cover outer device
17. Seat cushion outer finisher
18. Reclining lever knob
19. Lifter dial
20. Sliding and reclining device outer
21. Front gusset
22. Seat thigh support adjuster
23. Wire pull
24. Sliding and reclining device inner
25. Seat belt buckle
26. Inner cover inner device
27. Seat cushion inner finisher

POWER SEAT

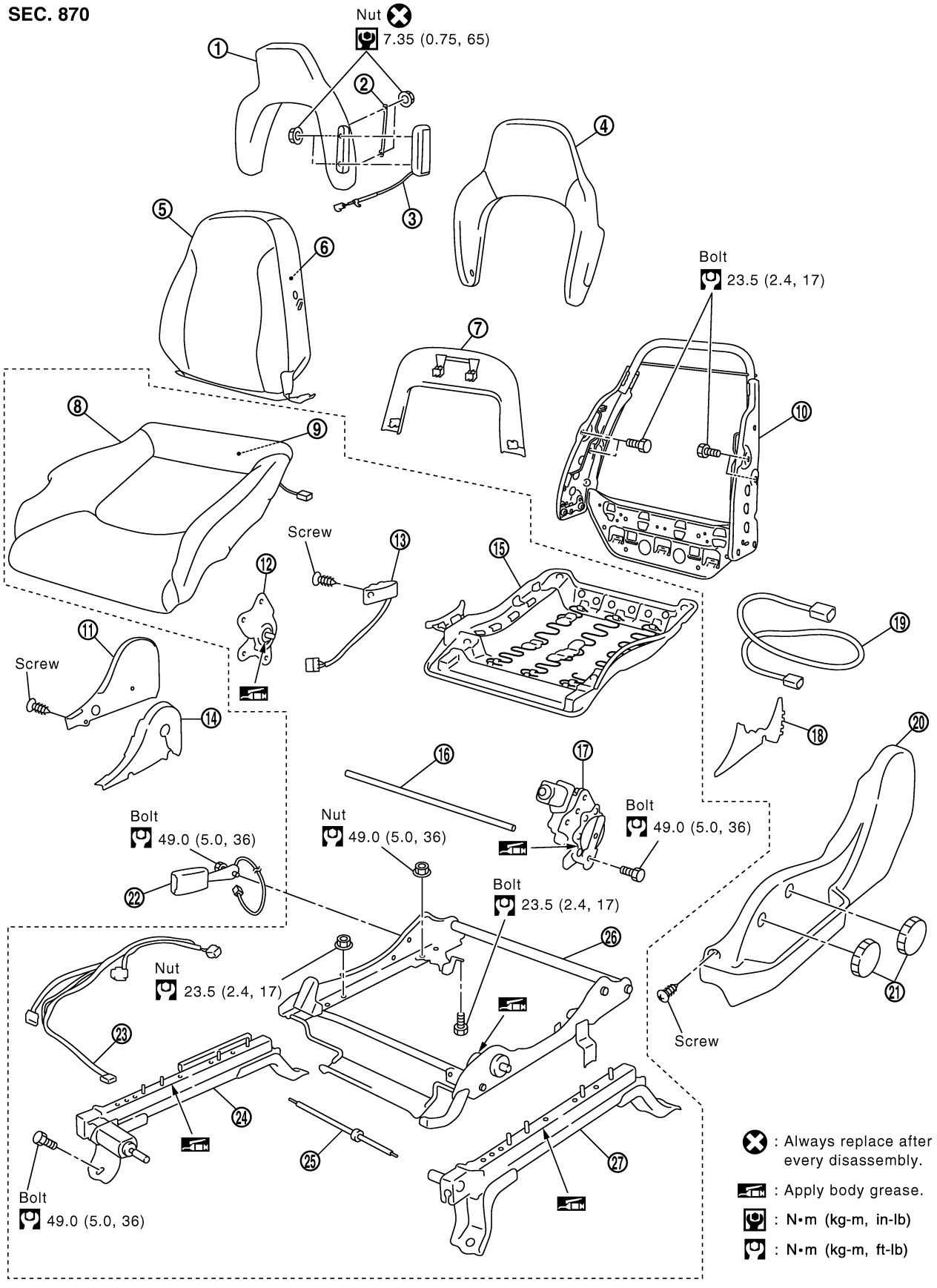
SEC. 870



1. Headrest
2. Headrest holder (locked)
3. Headrest holder (free)
4. Seatback pad
5. Seat cushion pad
6. Seatback trim
7. Seat cushion trim
8. Side air bag module
9. Side air bag module bracket
10. Inner cloth stay
11. Side air bag module harness
12. Seatback frame
13. Seat cushion frame
14. Reclining device rod
15. Seat thigh support adjuster assembly
16. Inner cover outer device
17. Reclining device outer
18. Seat cushion outer finisher
19. Lifter dial
20. Sliding outer assembly
21. Flexible wire
22. Sliding inner assembly
23. Power seat harness
24. Seat belt buckle
25. Seat belt buckle bracket
26. Inner cover inner device
27. Reclining device inner
28. Seat cushion inner finisher
29. Power seat switch

NET SEAT (ROADSTER)

SEC. 870



1. Seatback frame and pad upper
2. Inner cloth stay
3. Side air bag module
4. Seatback trim upper
5. Seatback trim lower
6. Seatback pad lower

7. Seatback garnish
8. Seat cushion trim
9. Seat cushion pad
10. Seatback frame
11. Seat cushion inner finisher
12. Reclining inner device
13. Power seat switch
14. Inner cover inner device
15. Seat cushion frame
16. Reclining device rod
17. Reclining outer device
18. Inner cover outer device
19. Side air bag module harness
20. Seat cushion outer finisher
21. Lifter dial
22. Seat belt buckle
23. Power seat harness
24. Sliding inner assembly
25. Flexible wire
26. Seat thigh support adjuster assembly
27. Sliding outer assembly

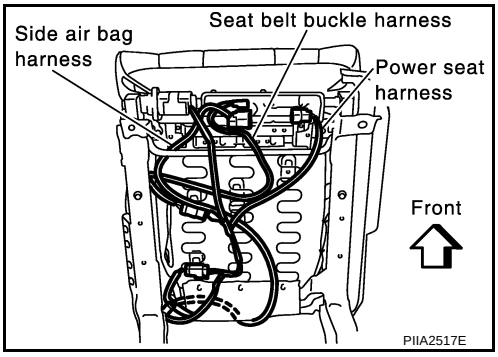
REMOVAL

When removing or installing the seat trim, carefully handle it to keep dirt out and avoid damage.

CAUTION:

- **Before removing the seat, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **When checking the power seat circuit for continuity using a circuit tester, do not confuse its connector with the side air bag module connector. Such an error may cause the air bag to deploy.**
- **Do not drop, tilt, or bump the side air bag module installing in the seat. Always handle it with care.**

1. Remove the front leg cover and rear leg cover (LH/RH).
2. Slide the seat until the body mounting bolts are visible and a tool can be inserted.
3. Remove mounting bolts from vehicle.
4. Disconnect both battery cables.
5. Disconnect harness connector from under seat cushion.
6. Remove fastening clips under seat cushion, and remove seats from vehicle.



INSTALLATION

Install in the reverse order of removal.

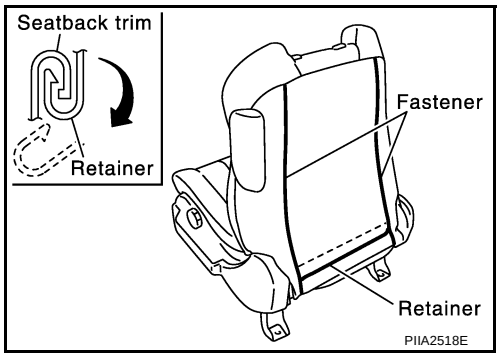
Disassembly and Assembly

NIS000AM

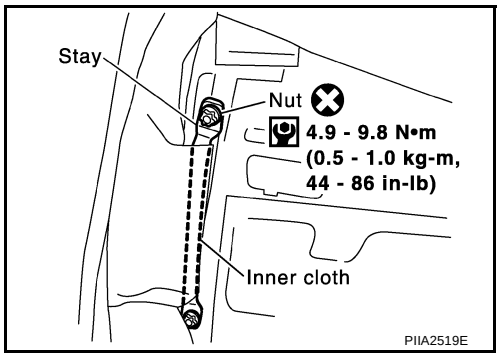
SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)

Disassembly

1. Open fastener on back of seatback, and remove retainer from seatback trim.

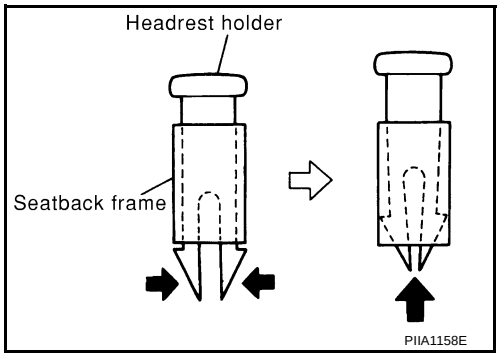


2. Remove the stay securing the inner cloth.



3. Squeeze and pull up headrest holder tabs to remove from seatback frame.

   NOTE:
   Before installing the headrest holder, check its orientation (front/rear and right/left).



4. Remove the seat heater harness connector. After removing the seatback trim and pad, remove the hog ring to separate the trim and pad.

   NOTE:
   Seatback heater unit is stitched into seatback trim. It cannot be separated (for heated seat models only).

Assembly

Assemble in the reverse order of disassembly.

REMOVAL OF SEATBACK ASSEMBLY

1. After completing the steps 1 of “SEATBACK TRIM AND PAD”, remove the harness connectors for the reclining motor (driver seat only).
2. Pull out the harness connector for the side air bag from the seat cushion.
3. Remove the reclining device mounting bolts on the seatback frame, and remove the seatback assembly.

   NOTE:
   When assembling the seatback frame, make sure that the reclining device are locked on both sides, and be sure to temporarily tighten the bolts, then tighten them finally.

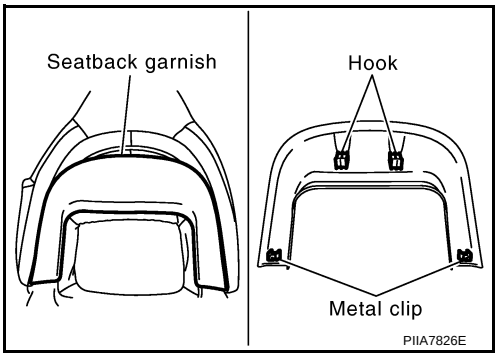
INSTALLATION OF SEATBACK ASSEMBLY

Install in the reverse order of removal.

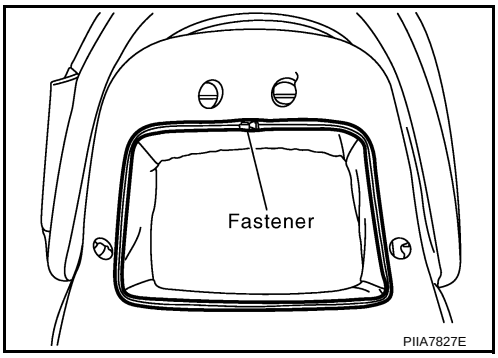
SEATBACK TRIM AND PAD (NET SEAT FOR ROADSTER)

Disassembly

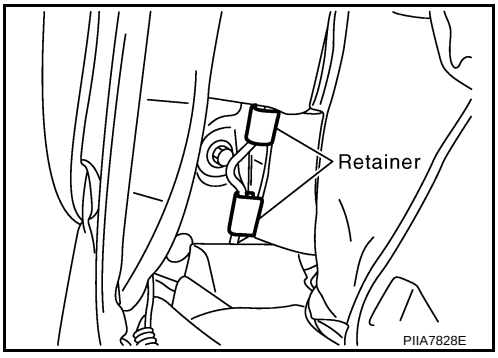
1. Remove the seatback garnish.



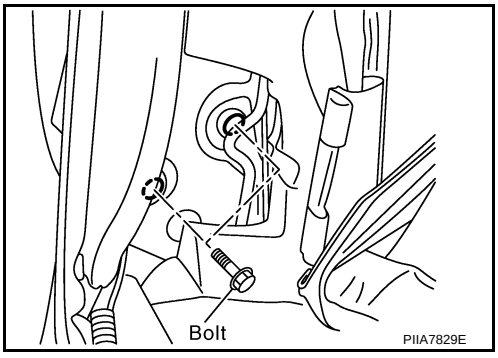
2. Open fastener on seatback lower.



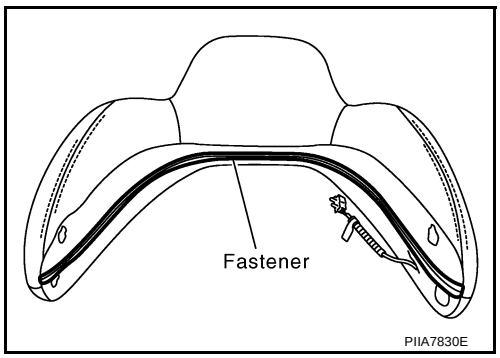
3. Remove the retainer.



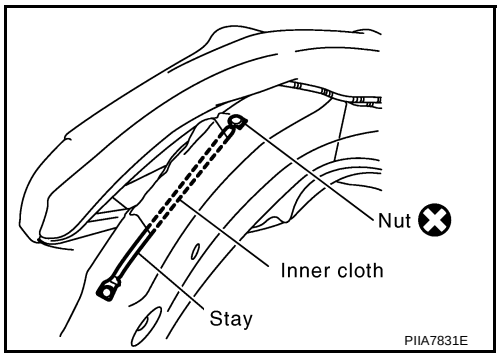
4. Disconnect side air bag connector.
5. Remove the seatback upper mounting bolts.



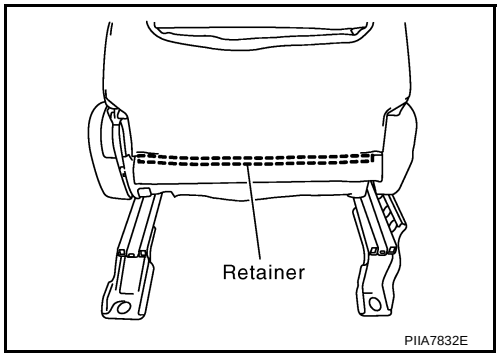
6. Open fastener on seatback upper.



7. Remove the stay securing the inner cloth.



8. Separate the seatback frame and pad upper and seatback trim upper.
9. Remove the retainer.



10. After removing the seatback trim and pad, remove the hog rings to separate the trim and pad.

Assembly

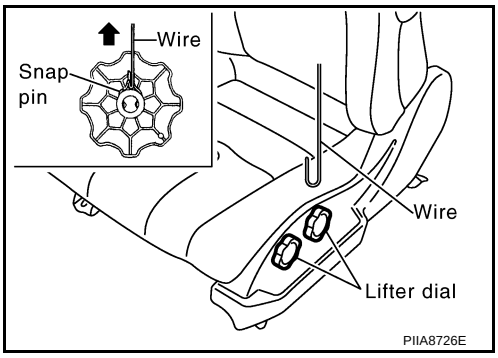
Assemble in the reverse order of disassembly.

SEAT CUSHION TRIM AND PAD (POWER SEAT AND NET SEAT)

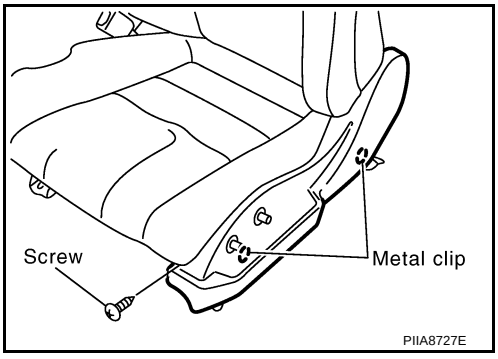
CAUTION:
Do not disassemble front passenger seat cushion assembly.
Always replace as an assembly.
For front passenger seat service parts, refer to the service part catalogue.

Disassembly

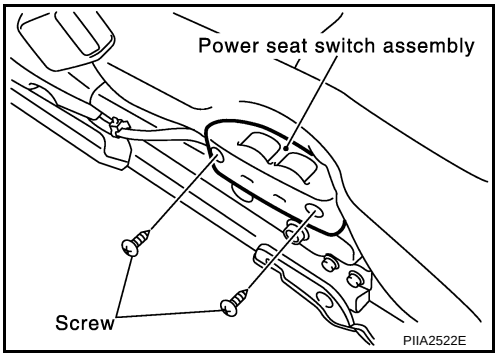
1. Hang snap ring on wire, and pull it up to remove. Remove Lifter dial.



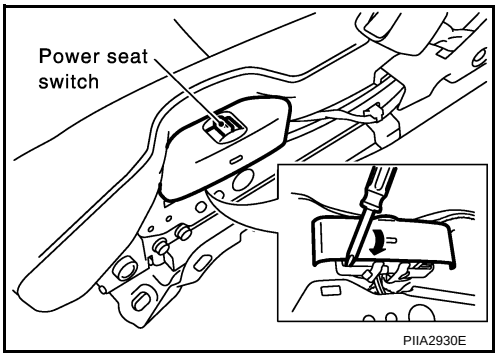
2. Unfasten the screw and metal clip and remove the seat cushion outer finisher.



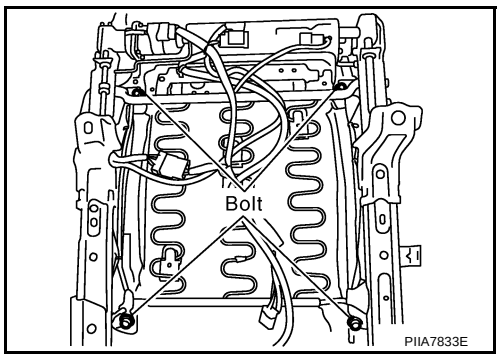
3. Unfasten screws and remove the power seat switch assembly.



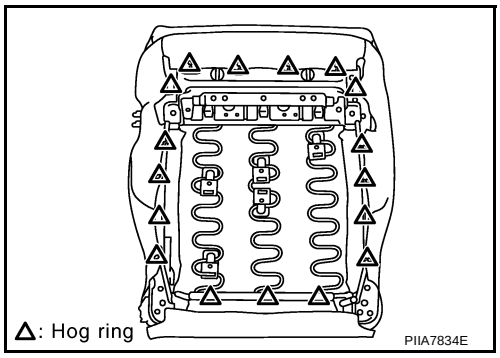
Insert a screwdriver in lower side of power seat switch and remove it (passenger seat for coupe).



4. Remove bolts on the under side of seat cushion.



5. Remove hog rings from under seat cushion frame.



6. Disconnect harness connector from seat cushion heater unit.
7. After removing the seat cushion trim and pad, remove the hog rings to separate the trim and pad.

NOTE:
Seat cushion heater unit is stitched into seat cushion trim. It cannot be separated.

Assembly

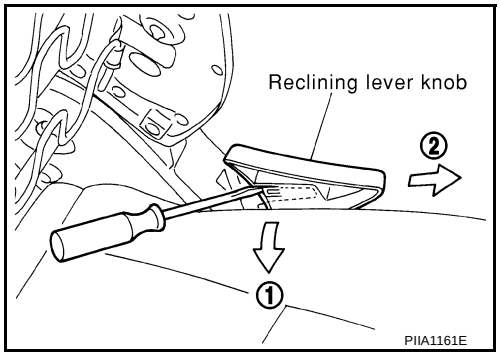
Assemble in the reverse order of disassembly.

SEAT CUSHION TRIM AND PAD (MANUAL SEAT FOR COUPE)

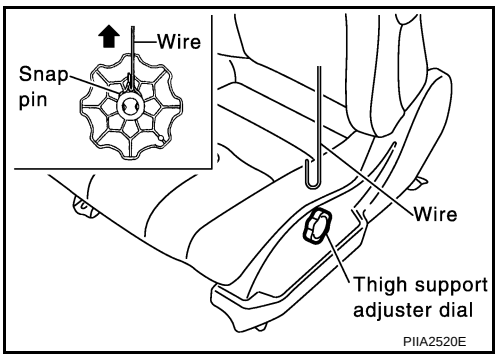
CAUTION:
Do not disassemble front passenger seat cushion assembly.
Always replace as an assembly.
For front passenger seat service parts, refer to the service part catalogue.

Disassembly

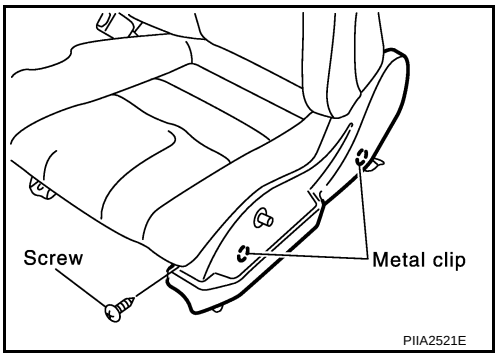
1. Pull up tabs of reclining lever from inside. Slide knob forward to remove.



2. Hang snap ring on wire, and pull it up to remove. Remove thigh support adjuster dial.



3. Unfasten the screw and metal clip and remove the seat cushion outer finisher.



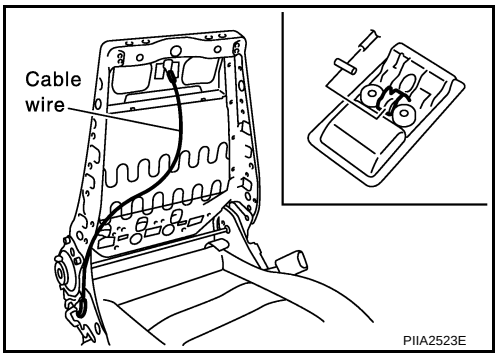
4. Remove bolts on the under side of seat cushion.
5. Remove hog rings from under seat cushion frame.
6. After removing the seat cushion trim and pad, remove the hog rings to separate the trim and pad.

Assembly

Assemble in the reverse order of disassembly.

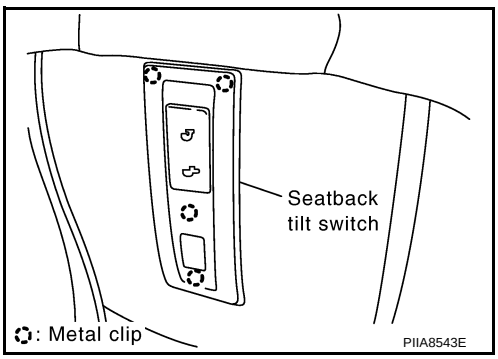
PASSENGER SIDE SEATBACK FORWARD RECLINING (COUPE)

1. Remove passenger side seatback trim and pad. Refer to SE-74, "SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)" .
2. Remove screw and fixing clip, then disconnect cable wire.



PASSENGER SIDE SEATBACK FORWARD RECLINING (ROADSTER)

1. Remove the seatback tilt switch.



2. Disconnect seatback tilt switch harness connector.

3. Remove passenger side seatback trim and pad. Refer to SE-74, "SEATBACK TRIM AND PAD (MANUAL SEAT AND POWER SEAT)" .

SECTION SRS

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NHS00008

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for SRS “AIR BAG” and “SEAT BELT PRE-TENSIONER” Service

NHS00009

- Do not use electrical test equipment to check SRS circuits unless instructed in this Service Manual.
- Before servicing the SRS, turn ignition switch OFF, and disconnect both battery cables. Then wait at least 3 minutes.
  For approximately 3 minutes after the cables are removed, it is still possible for the air bag and seat belt pre-tensioner to deploy. Therefore, do not work on any SRS connectors or wires until at least 3 minutes have passed.
- Diagnosis sensor unit must always be installed with their arrow marks “⇐” pointing towards the front of the vehicle for proper operation. Also check diagnosis sensor unit for cracks, deformations or rust before installation and replace if required.
- The spiral cable must be set to the neutral position since its rotations are limited. Do not attempt to turn steering wheel or column, if steering gear was disconnected from the column shaft.
- Handle air bag module carefully. Always put a driver air bag module with the pad side facing upward.
- Conduct self-diagnosis to check entire SRS for proper function after replacing any components.
- After an air bag deployemented, the front instrument panel assembly should be replaced if damaged.
- Always replace instrument panel pad following front passenger air bag deployment.

Precautions for Battery Service

NHS0000A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Occupant Classification System Precaution

NHS000A0

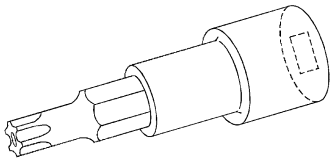
Replace occupant classification system control unit and passenger front seat cushion as an assembly.

PREPARATION

PFP:00002

Commercial Service Tools

NHS0000C

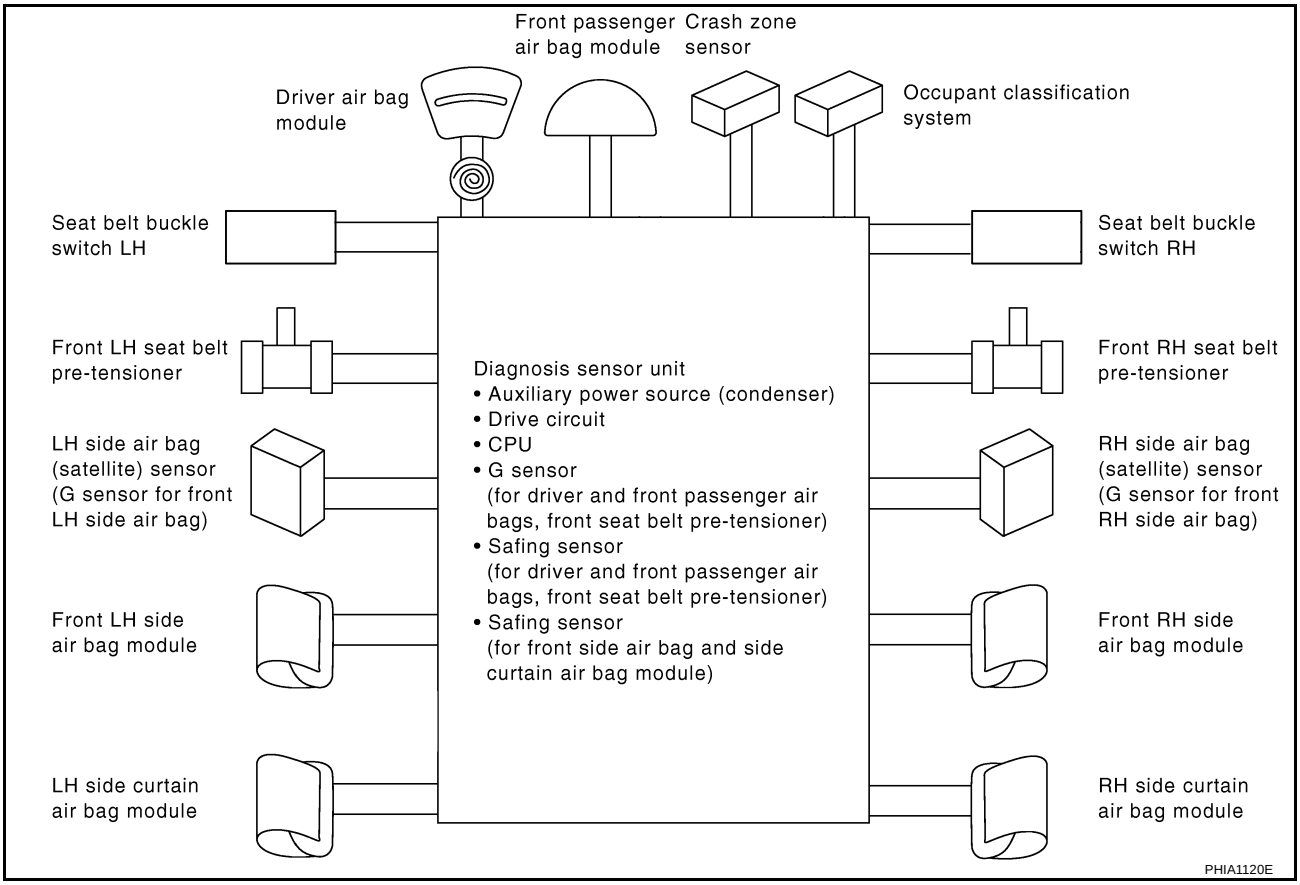
Tool name	Description
Tamper resistant TORX bit  S-NT757	Size: T30

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

PFP:28556

SRS Configuration

NHS0000D



The air bag deploys if the diagnosis sensor unit activates while the ignition switch is in the ON or START position.
The collision modes for which supplemental restraint systems are activated are different among the SRS systems. For example, the driver air bag module and front passenger air bag module are activated in a frontal collision but not in a side collision.
SRS configurations which are activated for some collision modes are as follows;

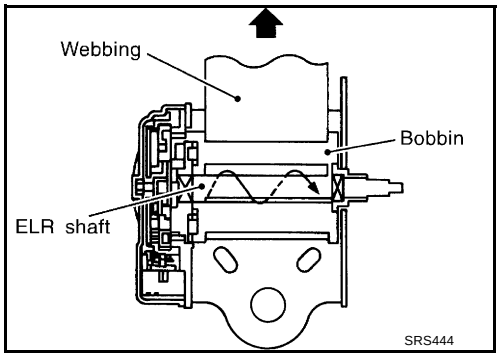
SRS configuration	Frontal collision	Left side collision	Right side collision
Driver air bag module	×	—	—
Front passenger air bag module	×	—	—
Front LH seat belt pre-tensioner	×	—	—
Front RH seat belt pre-tensioner	×	—	—
Front LH side air bag module	—	×	—
Front RH side air bag module	—	—	×
LH side curtain air bag module*	—	×	—
RH side curtain air bag module*	—	—	×

*: For Coupe

Front Seat Belt Pre-tensioner with Load Limiter

NHS0000E

The seat belt pre-tensioner system with load limiter is installed for both the driver's seat and the front passenger seat. It operates simultaneously with the SRS air bag system in the event of a frontal collision with an impact exceeding a specified level.
When the frontal collision with an impact exceeding a specified level occurs, seat belt slack resulting from clothing or other factors is immediately taken up by the pre-tensioner. Vehicle passengers are securely restrained.
When passengers in a vehicle are thrown forward in a collision and the restraining force of the seat belt exceeds a specified level, the load limiter permits the specified extension of the seat belt by the twisting of the ELR shaft, and a relaxation of the chest-area seat belt web tension while maintaining force.



Front Side Air Bag

NHS0000F

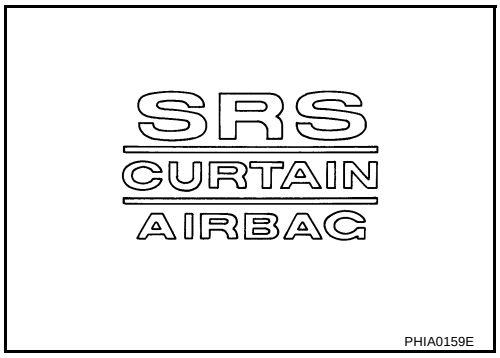
Front side air bag is built-in type.
The front seatbacks with built-in type side air bag have the labels as shown.



Side Curtain Air Bag/for Coupe

NHS0000G

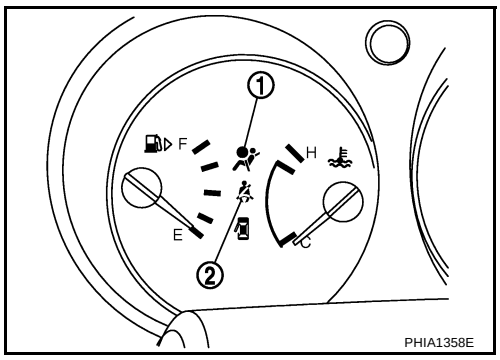
The side curtain air bags have the labels as shown.



Warning Lamp

NHS000A6

Air bag warning lamp : (1)
Seat belt warning lamp: (2)



Occupant Classification System (OCS)

NHS000A1

The occupant classification system identifies different size occupants, out of position occupants, and detects if child seat is present in the front passenger seat. The occupant classification system receives inputs from the occupant classification sensor (located inside the passenger seat cushion assembly) and belt tension sensor (part of the passenger front seat belt assembly and located at the belt anchor location). Depending on classification of passenger, the occupant classification system sends a signal to the diagnosis sensor unit. The diagnosis sensor unit uses this signal to determine full, partial, or non deployment of passenger front air bag in the event of a collision. Depending on the signal received, the diagnosis sensor unit can disable the passenger front air bag completely.

NOTE:
In case of customer concern, CONSULT-ll can be used to confirm the passenger air bag status (readiness).

Passenger Air Bag Status Condition

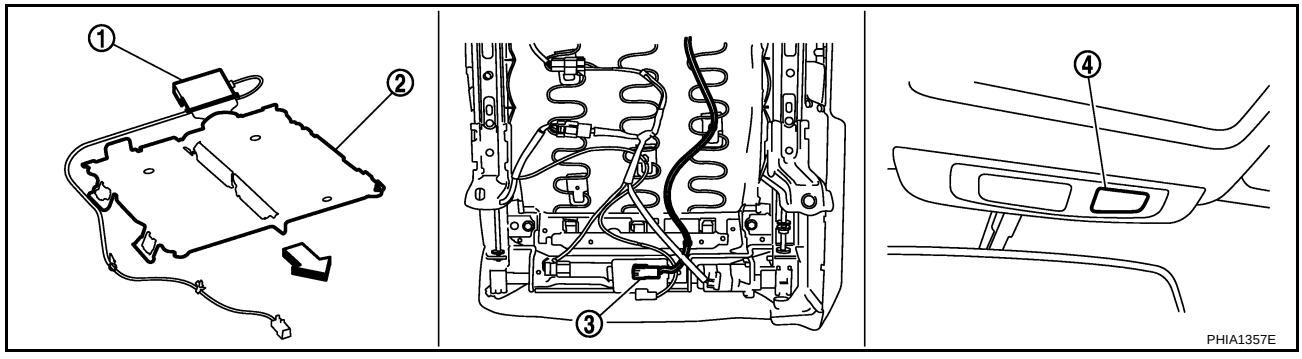
NHS000A2

Front Passenger Seat (Condition)	PASS AIR BAG OFF Indicator (Status)	Passenger Air Bag Status (Readiness)	CONSULT-lll Display
Seat occupied	OFF	Active (enabled)	ON
seat occupiedNOTE	ON	Deactivated (disabled)	OFF
Seat empty	OFF	Deactivated (disabled)	OFF

NOTE:
Passenger does not meet Ocuupant classification System specifications for passenger air bag activation.

Component Parts of Occupant Classification System

NHS000A3



1. Occupant classification system control unit
2. Seat sensor mat
3. Occupant classification system connector
4. Passenger air bag OFF Indicator (cut-off telltaile)

Passenger Seat belt Warning System

NHS000A4

SYSTEM DESCRIPTION
This system warns when passenger seat belt is not fasten.

This system is composed of the following items.

- Seat belt warning lamp.
- Seat belt buckle switch (passenger side).
- Air bag diagnosis sensor unit.
- Occupant classification system.

Seat belt warning lamp is used for both driver seat belt warning and passenger seat belt warning.
Seat belt warning lamp turns ON when all conditions below are met.

- Driver seat belt is fastened.
- Occupant is on passenger seat.
- Passenger seat belt is not fasten.

TROUBLE DIAGNOSIS

PFP:00004

Trouble Diagnosis Introduction

NHS0000H

CAUTION:

- **Do not use electrical test equipment on any circuit related to the SRS unless instructed in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**
- **Do not repair, splice or modify the SRS wiring harness. If the harness is damaged, replace it with a new one.**
- **Keep ground portion clean.**

DIAGNOSIS FUNCTION

The SRS self-diagnostic results can be read by using “AIR BAG” warning lamp and/or CONSULT-lll.
The User mode is exclusively prepared for the customer (driver). This mode warns the driver of a system malfunction through the operation of the “AIR BAG” warning lamp.
The Diagnosis mode allows the technician to locate and inspect the malfunctioning part.
The mode applications for the “AIR BAG” warning lamp and CONSULT-lll are as follows:

	User mode	Diagnosis mode	Display type
“AIR BAG” warning lamp	X	X	ON-OFF operation
CONSULT-III	—	X	Monitoring

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a malfunction. It is important to fully understand the symptoms or conditions for a customer complaint.

Information from Customer

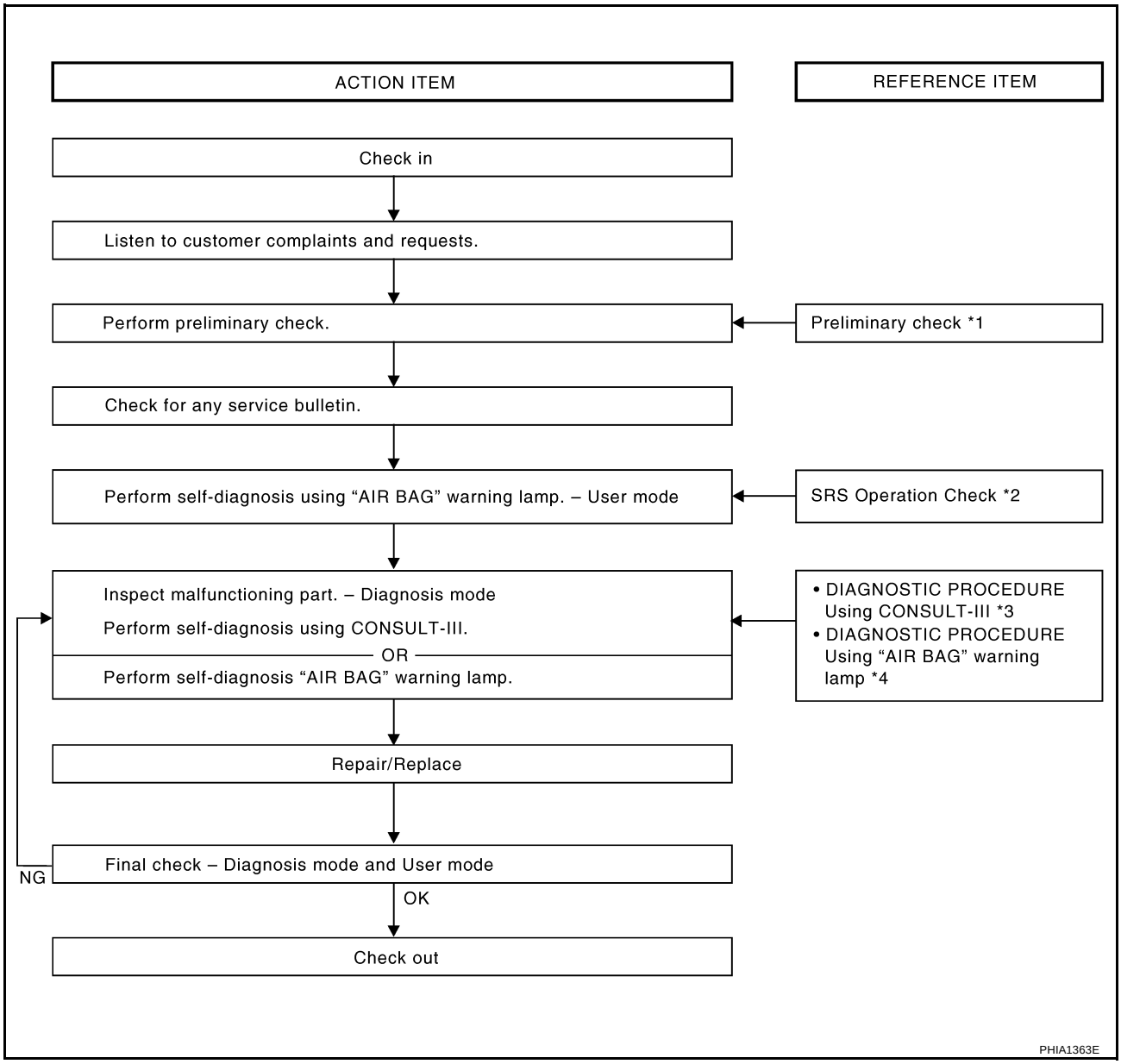
WHAT..... Vehicle model
WHEN..... Date, Frequencies
WHERE..... Road conditions
HOW..... Operating conditions, Symptoms

Preliminary Check

Make sure that the following parts are in good order.

- Battery (Refer to SC-4, "How to Handle Battery" .)
- Fuse (Refer to SRS-13, "Wiring Diagram — SRS —/For Coupe" or SRS-19, "Wiring Diagram — SRS —/For Roadster" .)
- System component-to-harness connections

WORK FLOW



*1: SRS-9, "Preliminary Check".

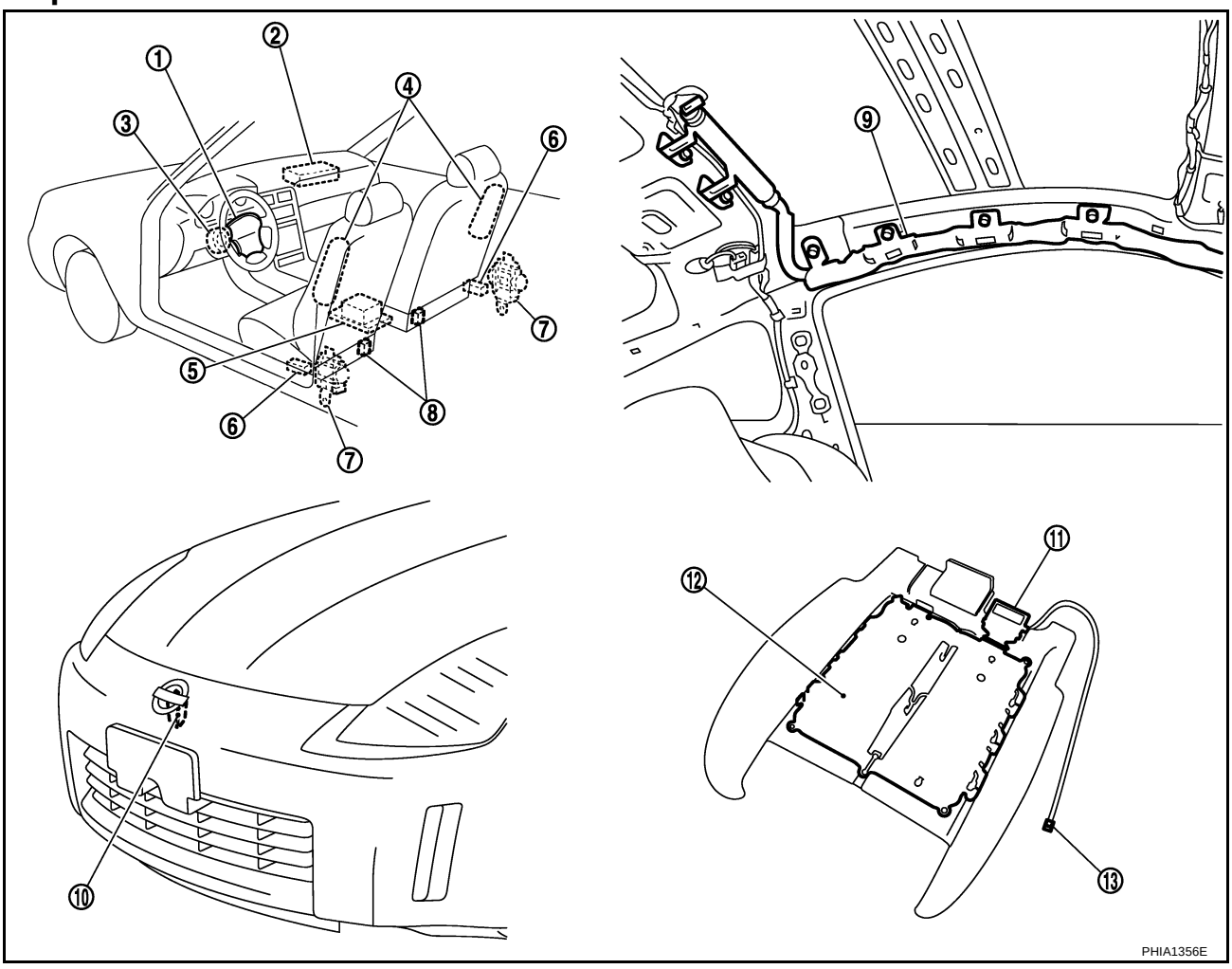
*2: SRS-27, "SRS Operation Check (USER MODE)".

*3: SRS-29, "Trouble Diagnosis with CONSULT-III".

*4: SRS-33, "Trouble Diagnosis without CONSULT-III".

Component Parts Location

NHS0000I

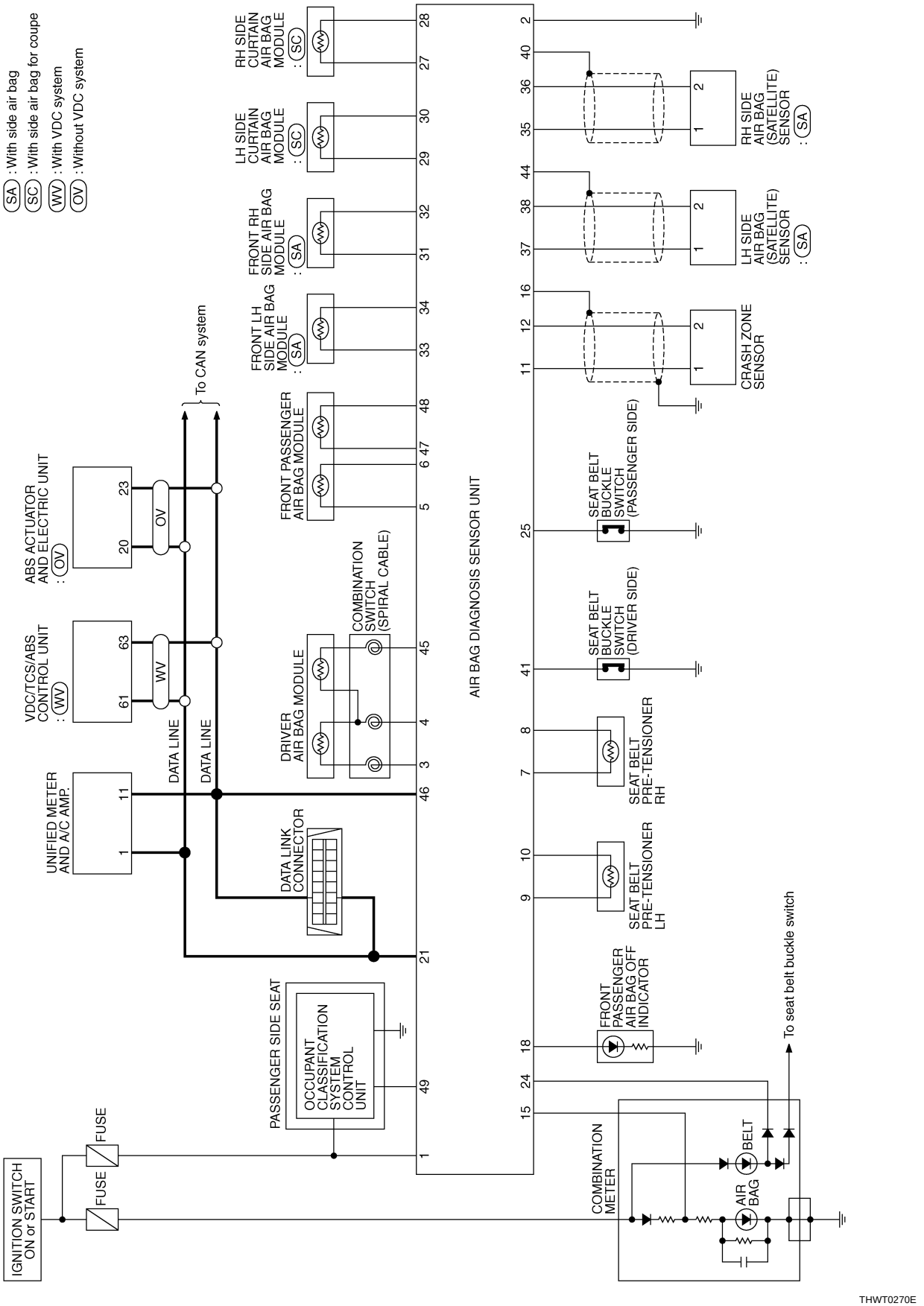


1.	Driver air bag module	2.	Front passenger air bag module	3.	Spiral cable
4.	Front side air bag module (LH/RH)	5.	Diagnosis sensor unit	6.	Side air bag (Satellite) sensor (LH/ RH)
7.	Seat belt pre-tensioner (LH/RH)	8.	Seat belt buckle switch (LH/ RH)	9.	Side curtain air bag module*
10.	Crash zone sensor	11.	Occupant classification system control unit	12.	Seat sensor mat
13.	Occupant classification system connector				

*: For Coupe

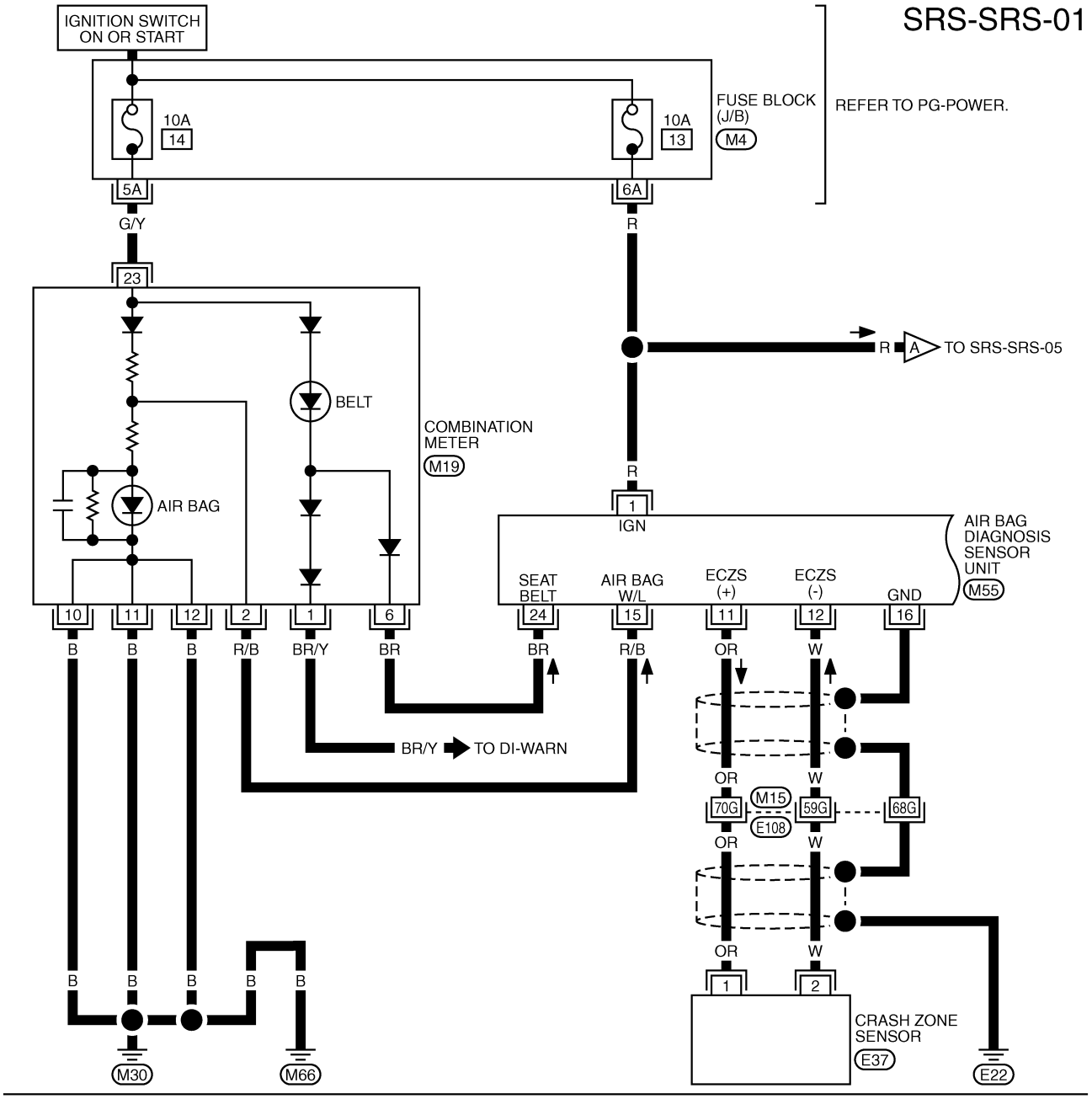
Schematic

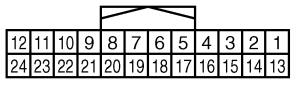
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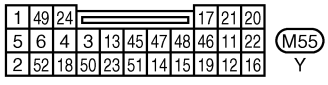


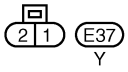
Wiring Diagram — SRS —/For Coupe

NHS0000K









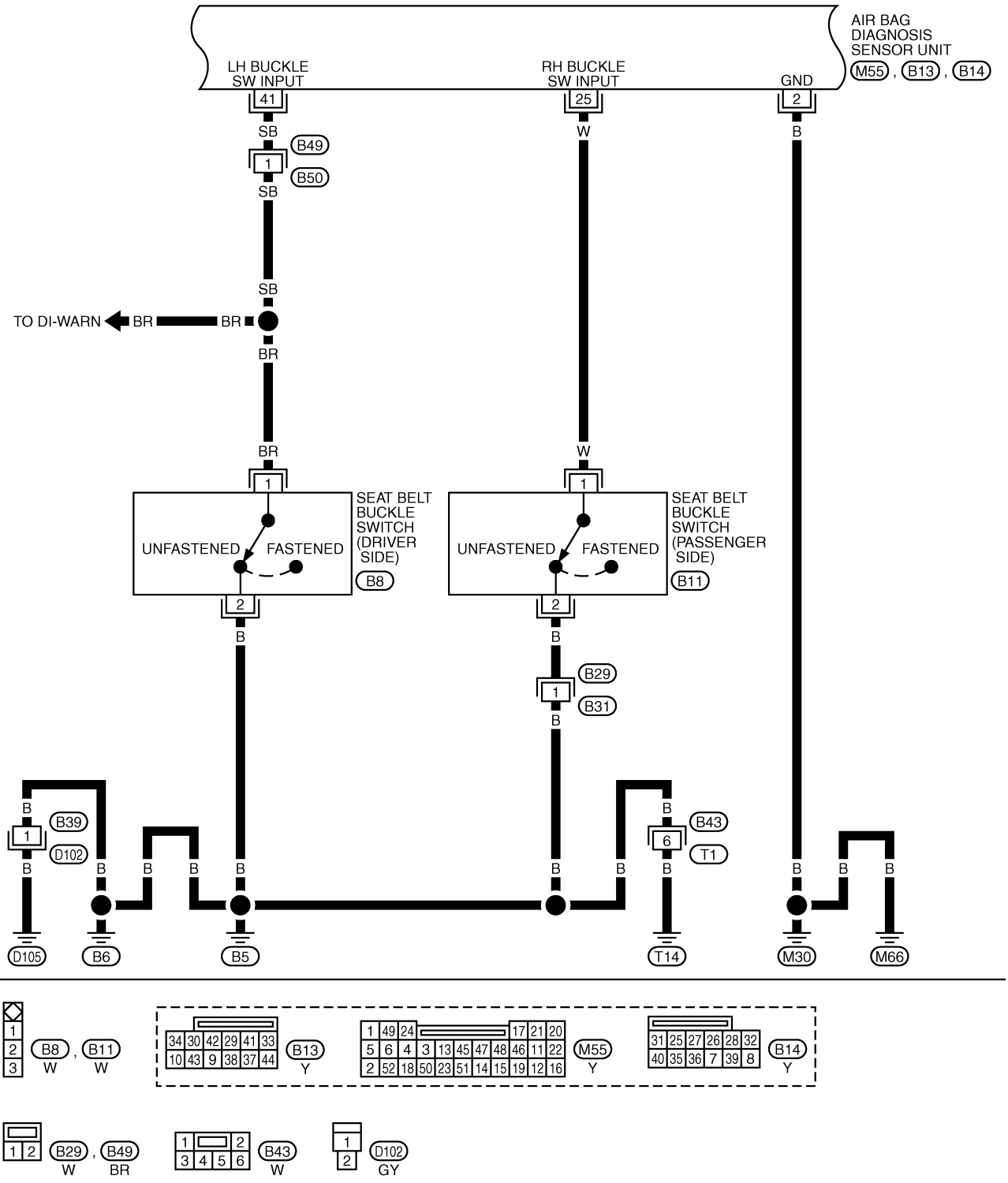
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

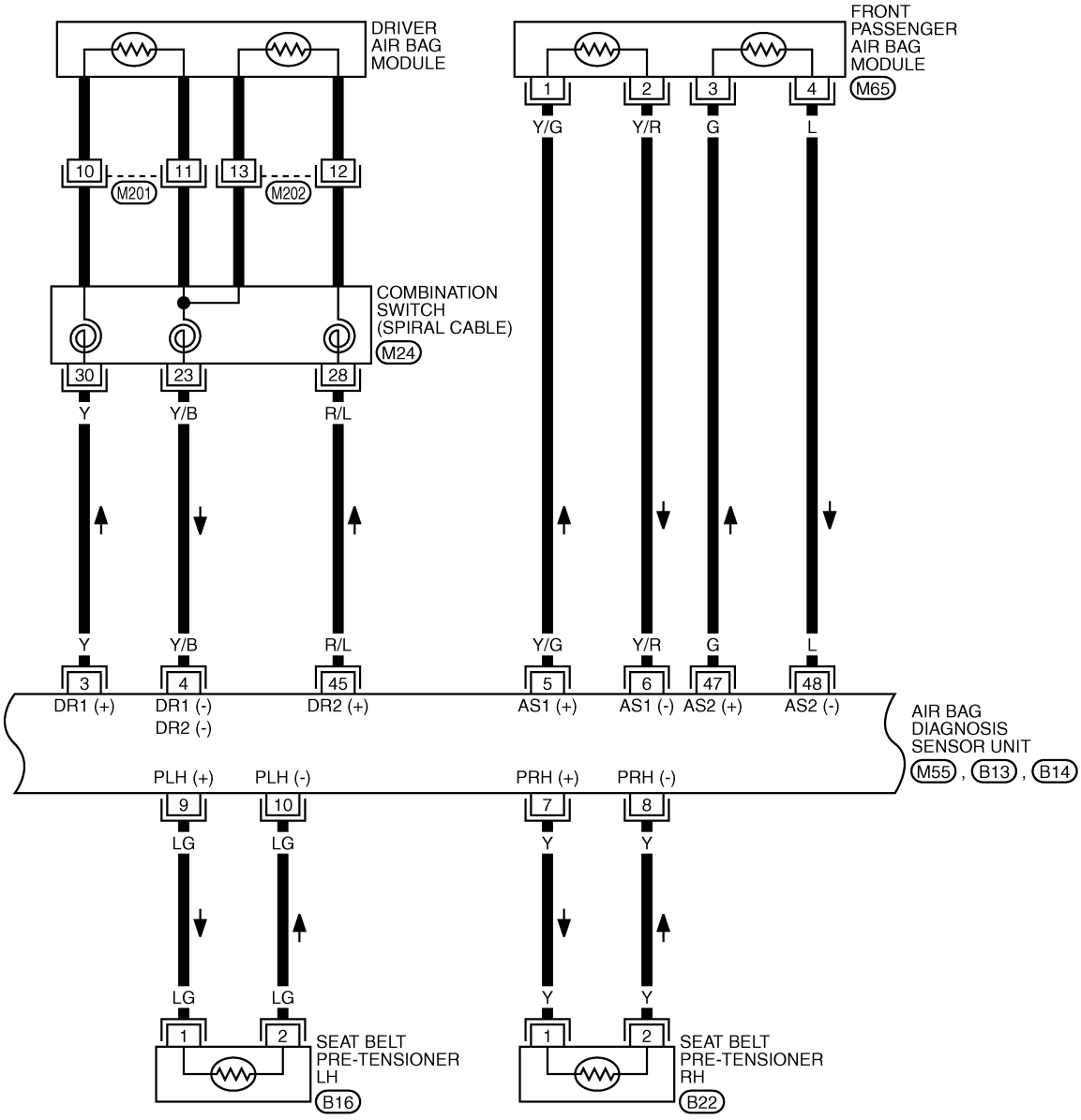
THWT0271E

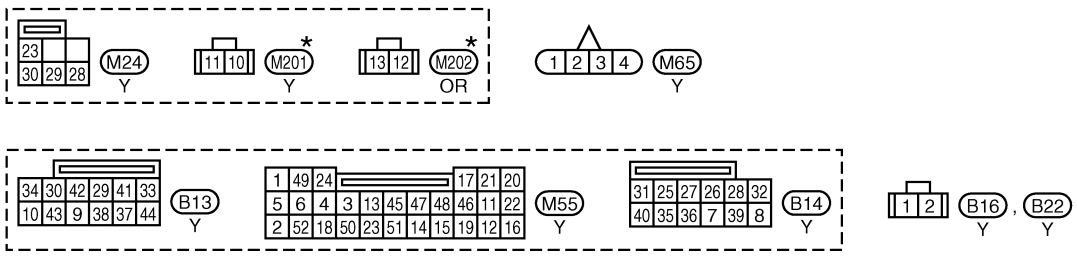
SRS-SRS-02



THWT0258E

SRS-SRS-03



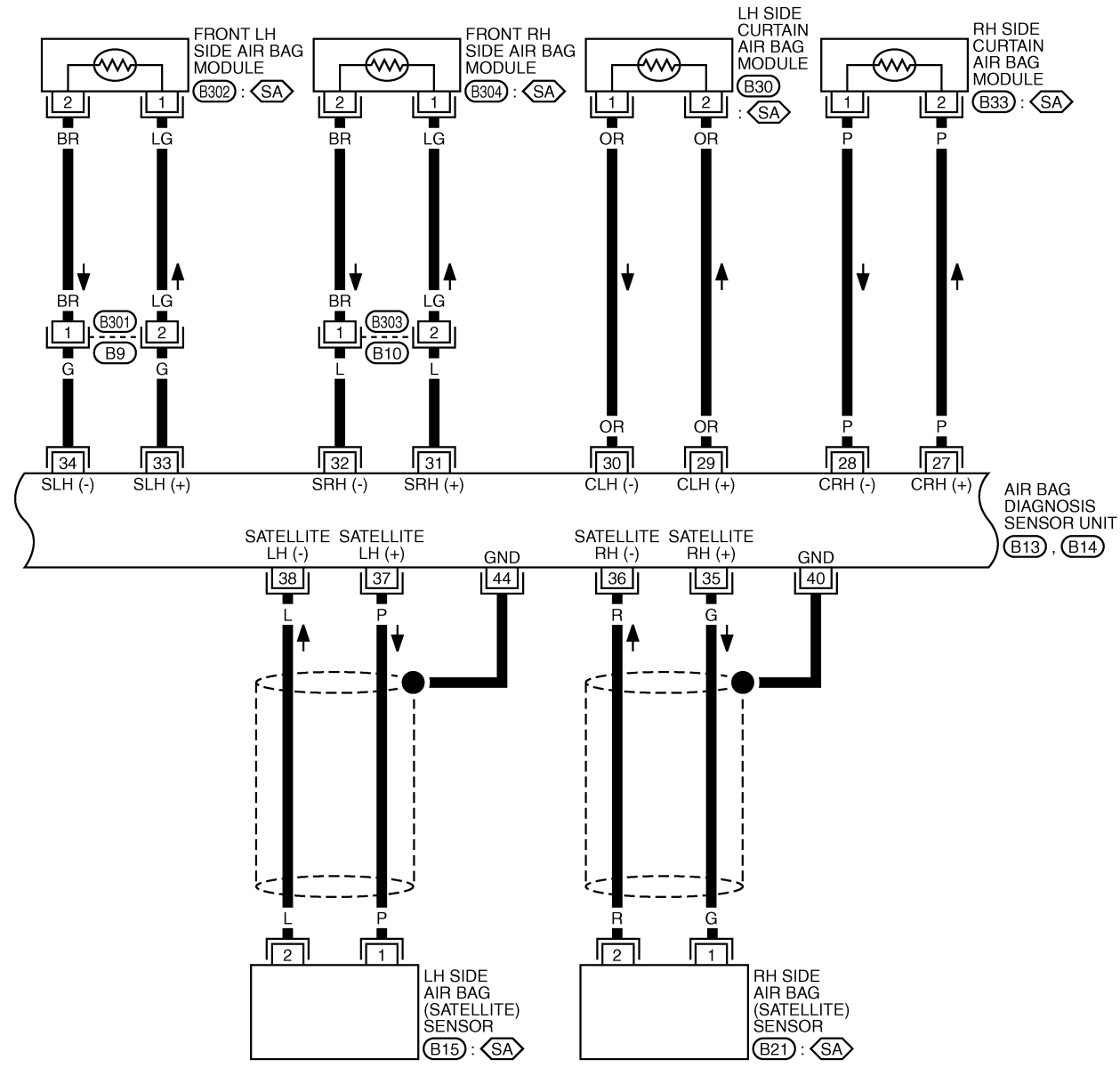


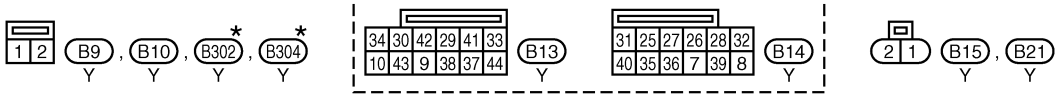
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

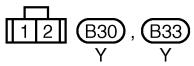
THWT0165E

SRS-SRS-04

SA : WITH SIDE AIR BAG



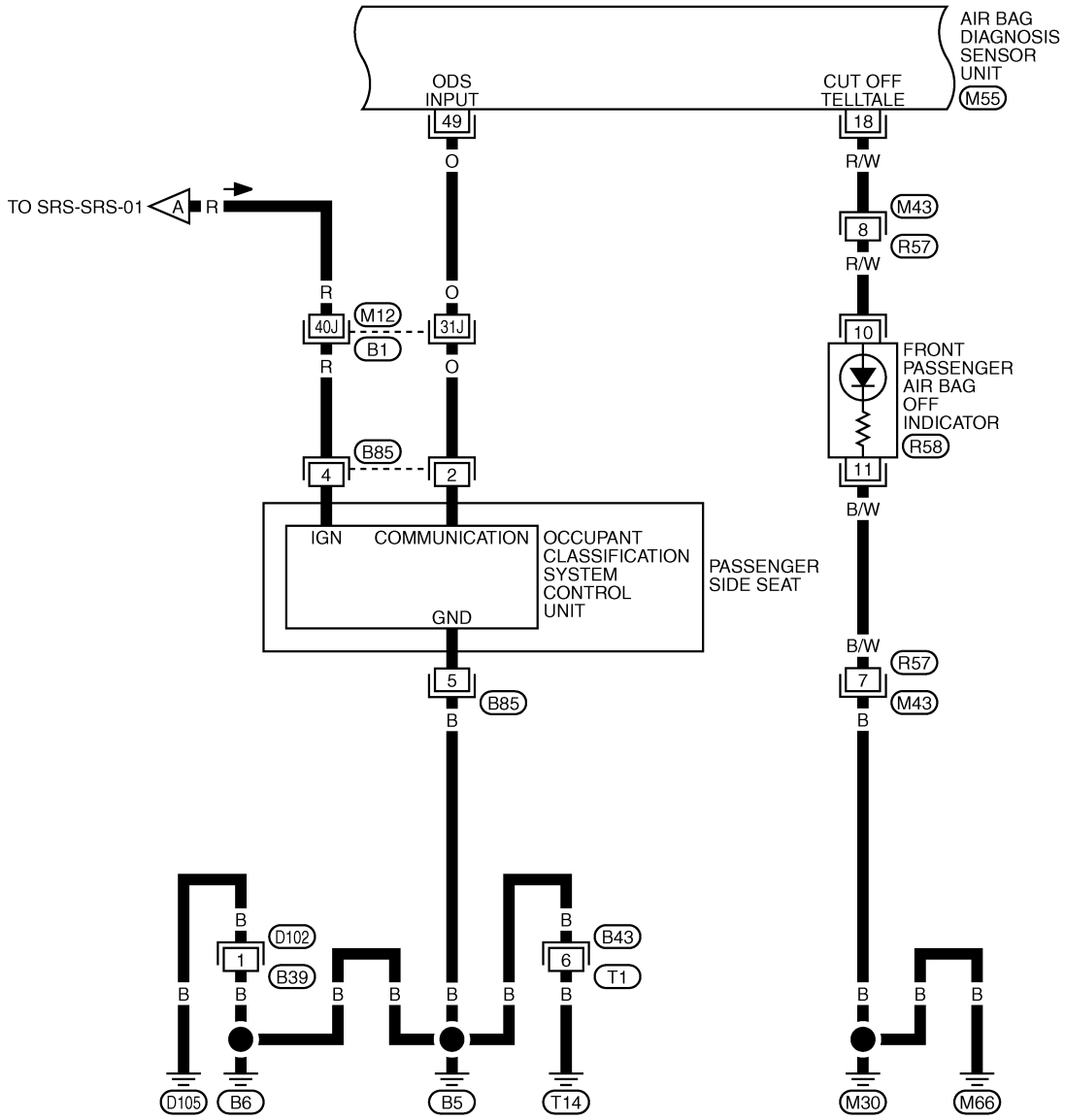


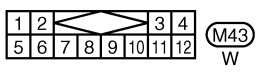


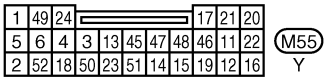
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

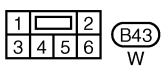
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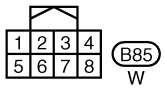
SRS-SRS-05

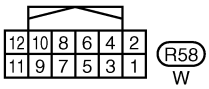


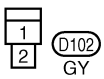










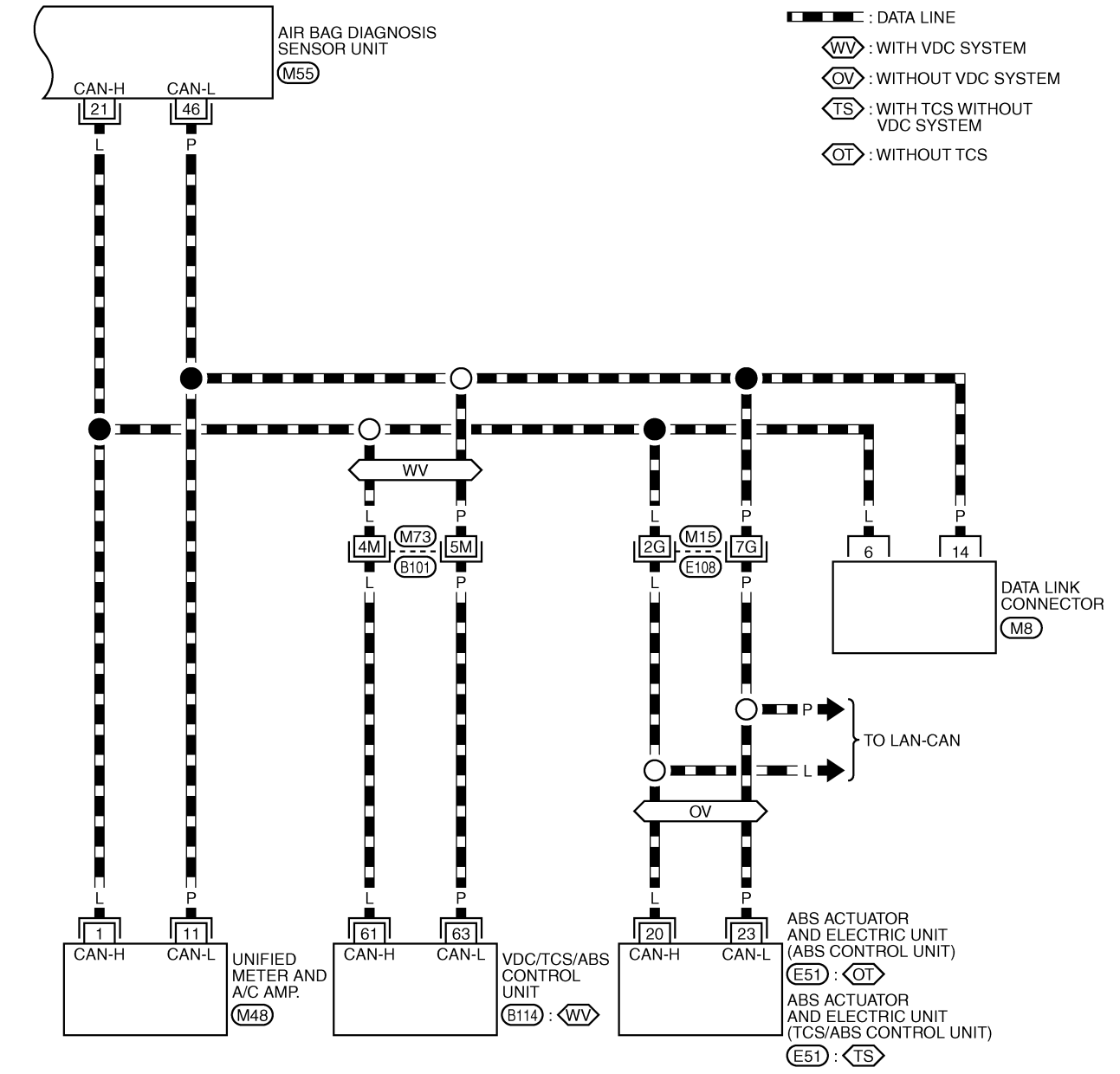


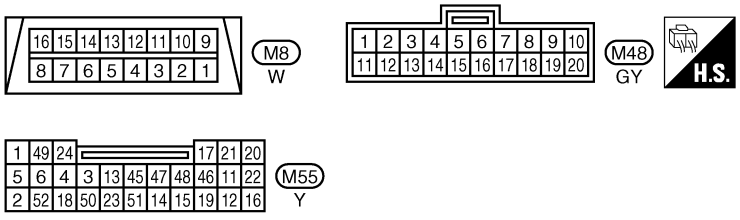
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

THWT0272E

SRS-SRS-06



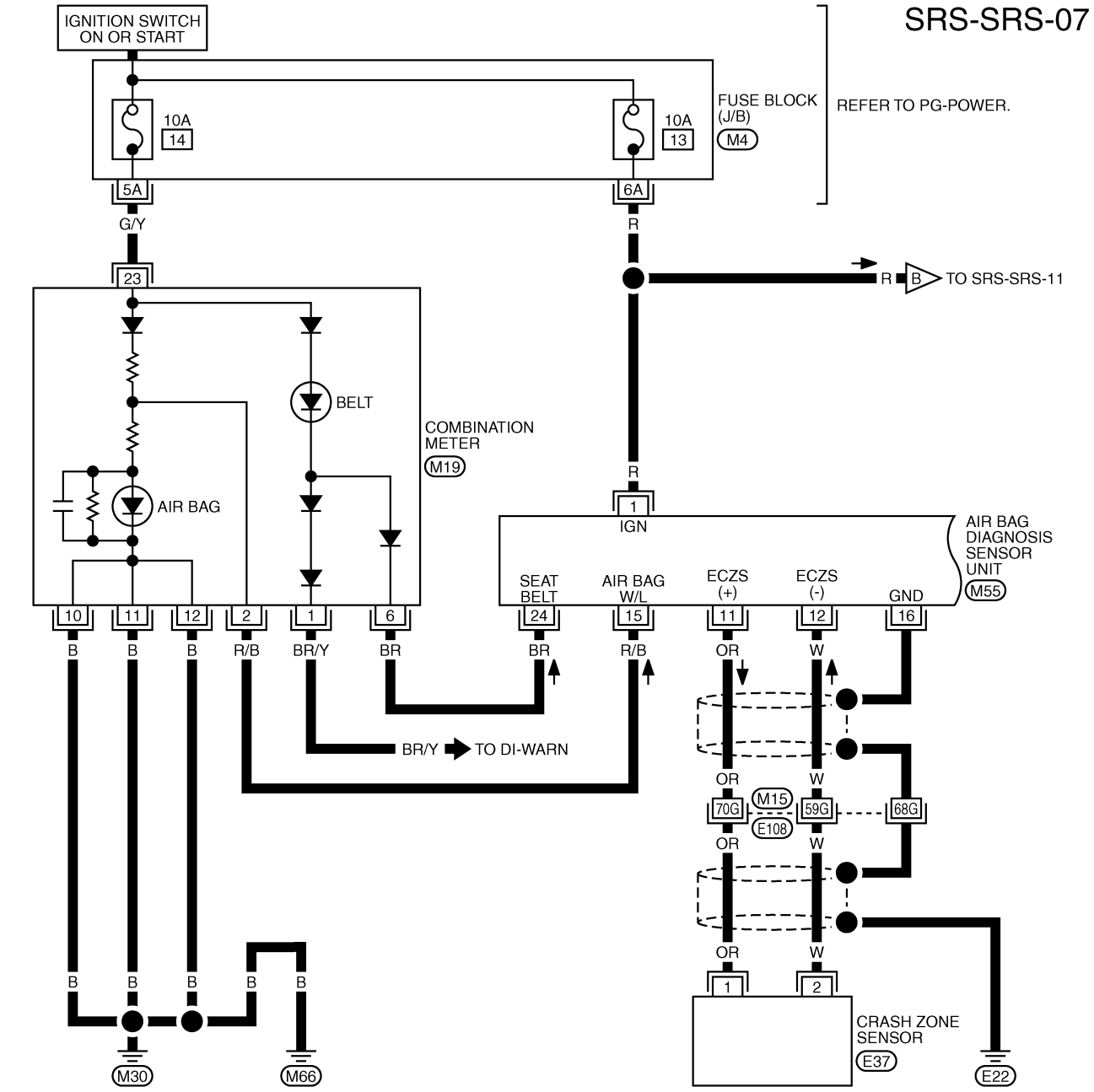


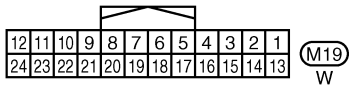
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E51 , B114 -ELECTRICAL UNITS

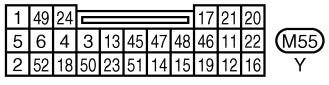
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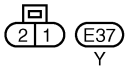
Wiring Diagram — SRS —/For Roadster

NHS0000L









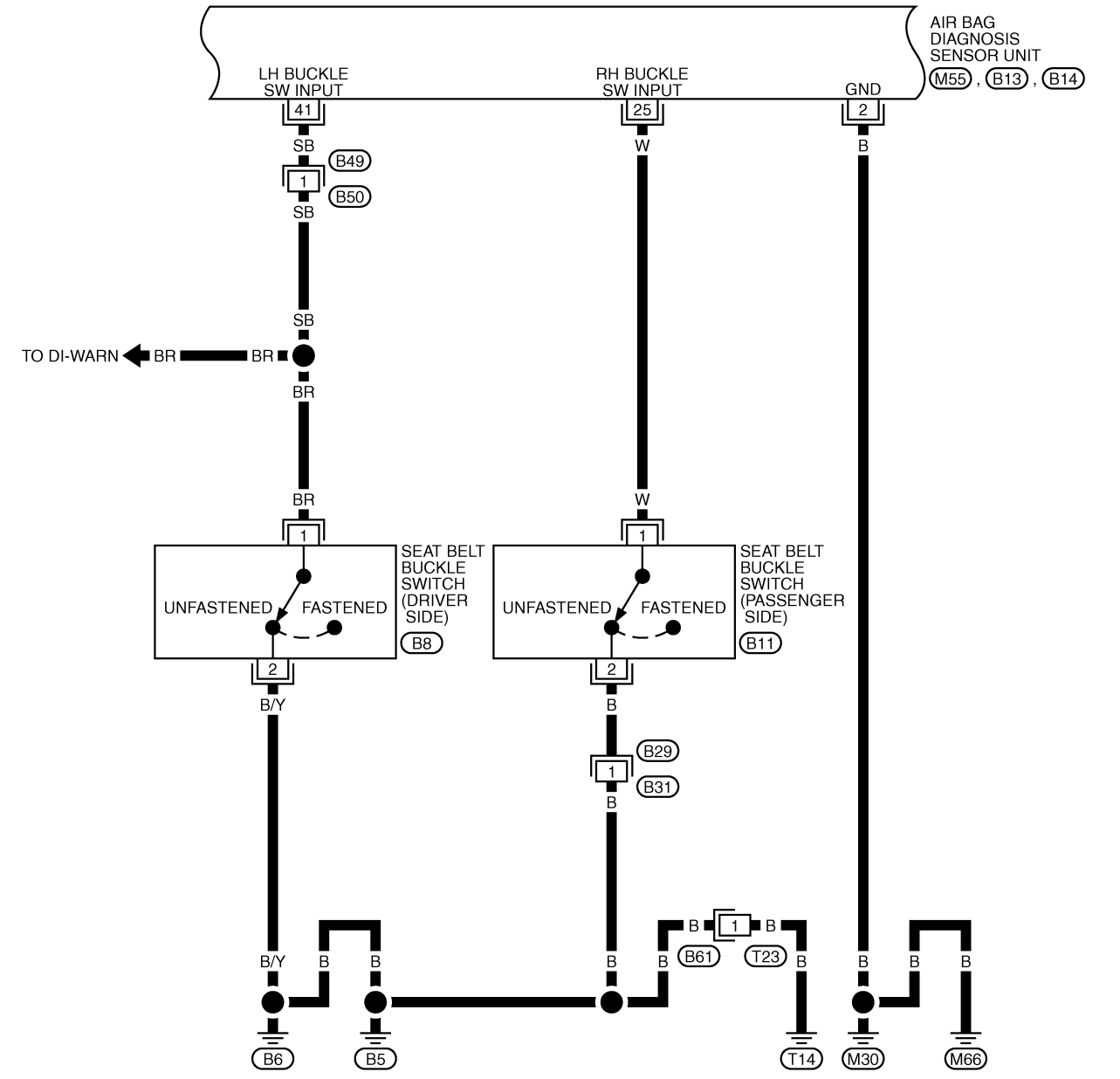
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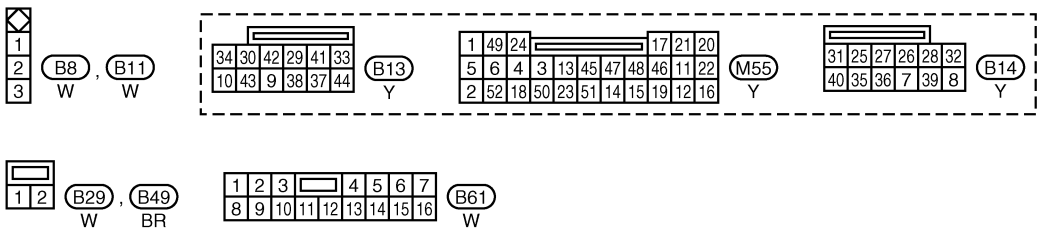
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

THWT0274E

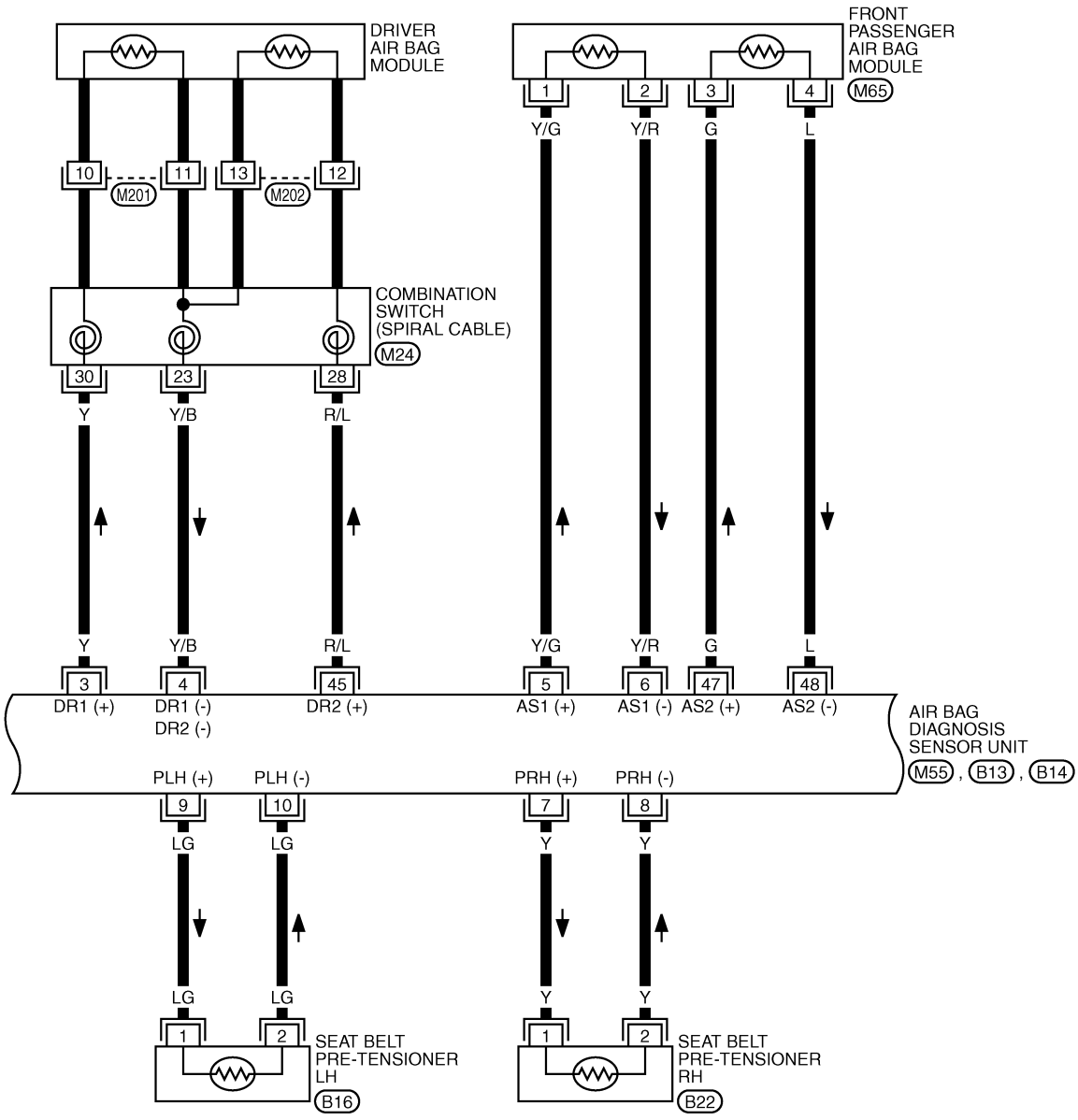
SRS-SRS-08

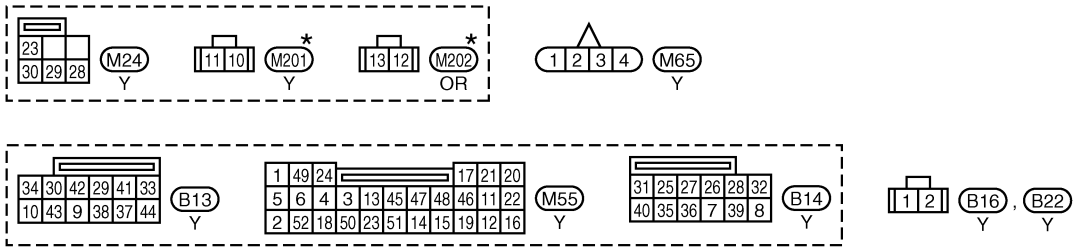




THWT0275E

SRS-SRS-09

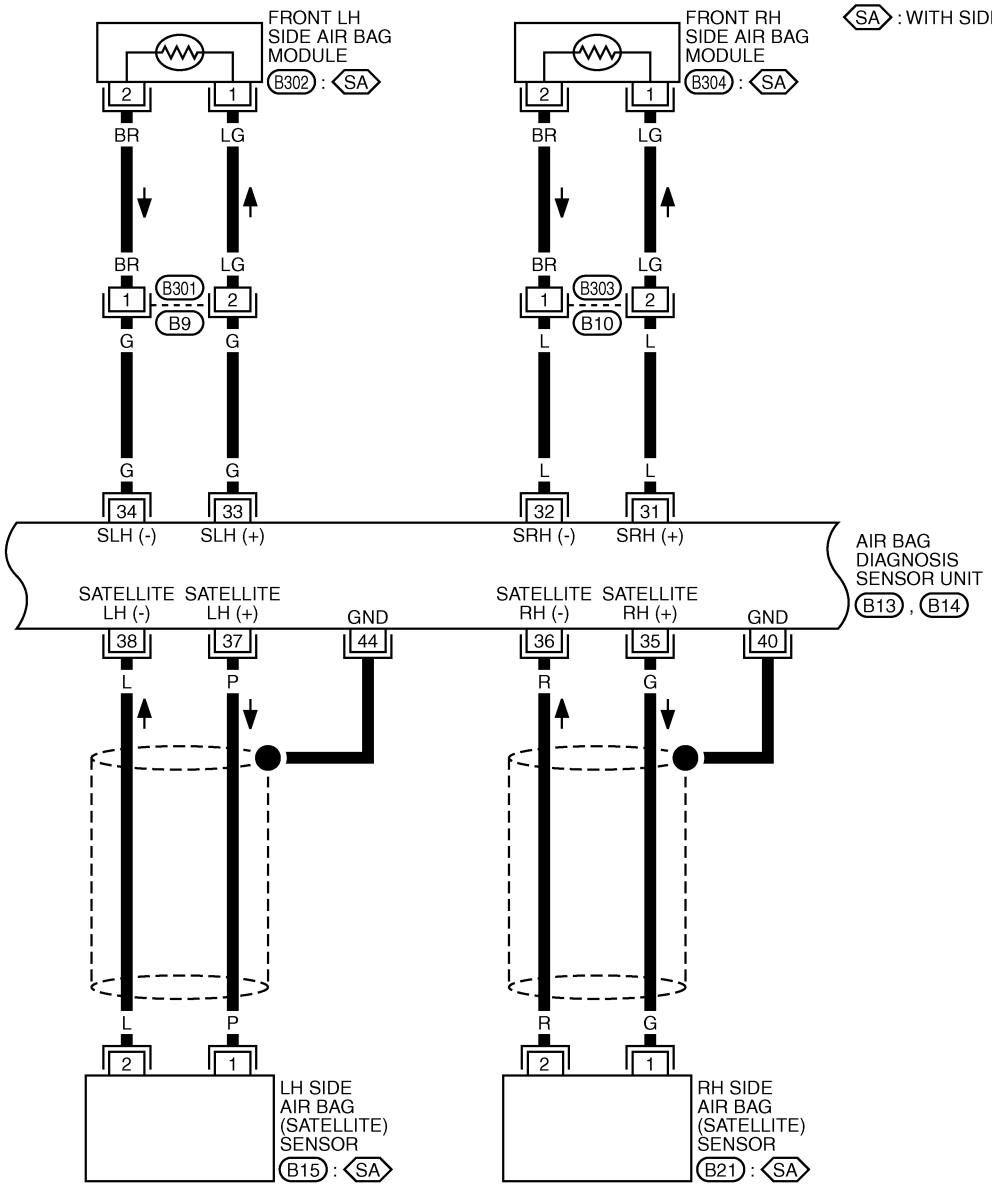


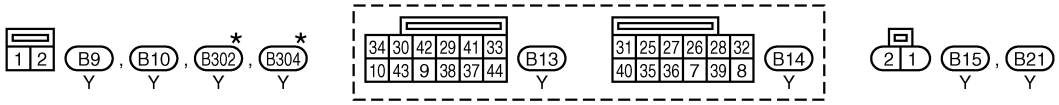


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

THWT0276E

SRS-SRS-10

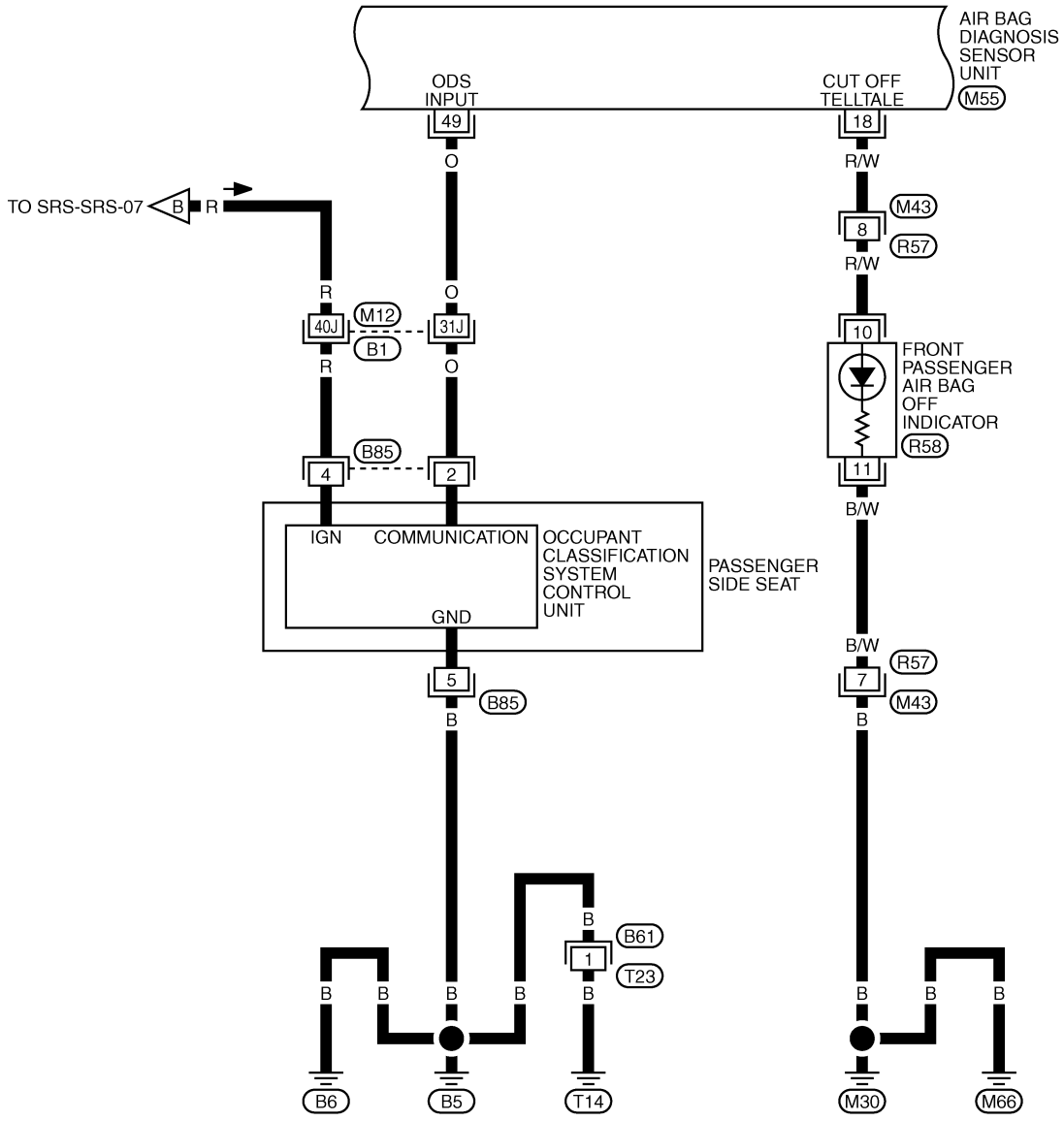


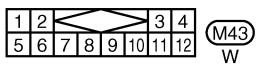


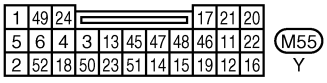
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

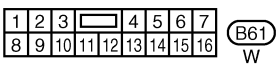
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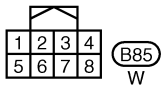
SRS-SRS-11

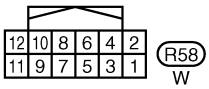










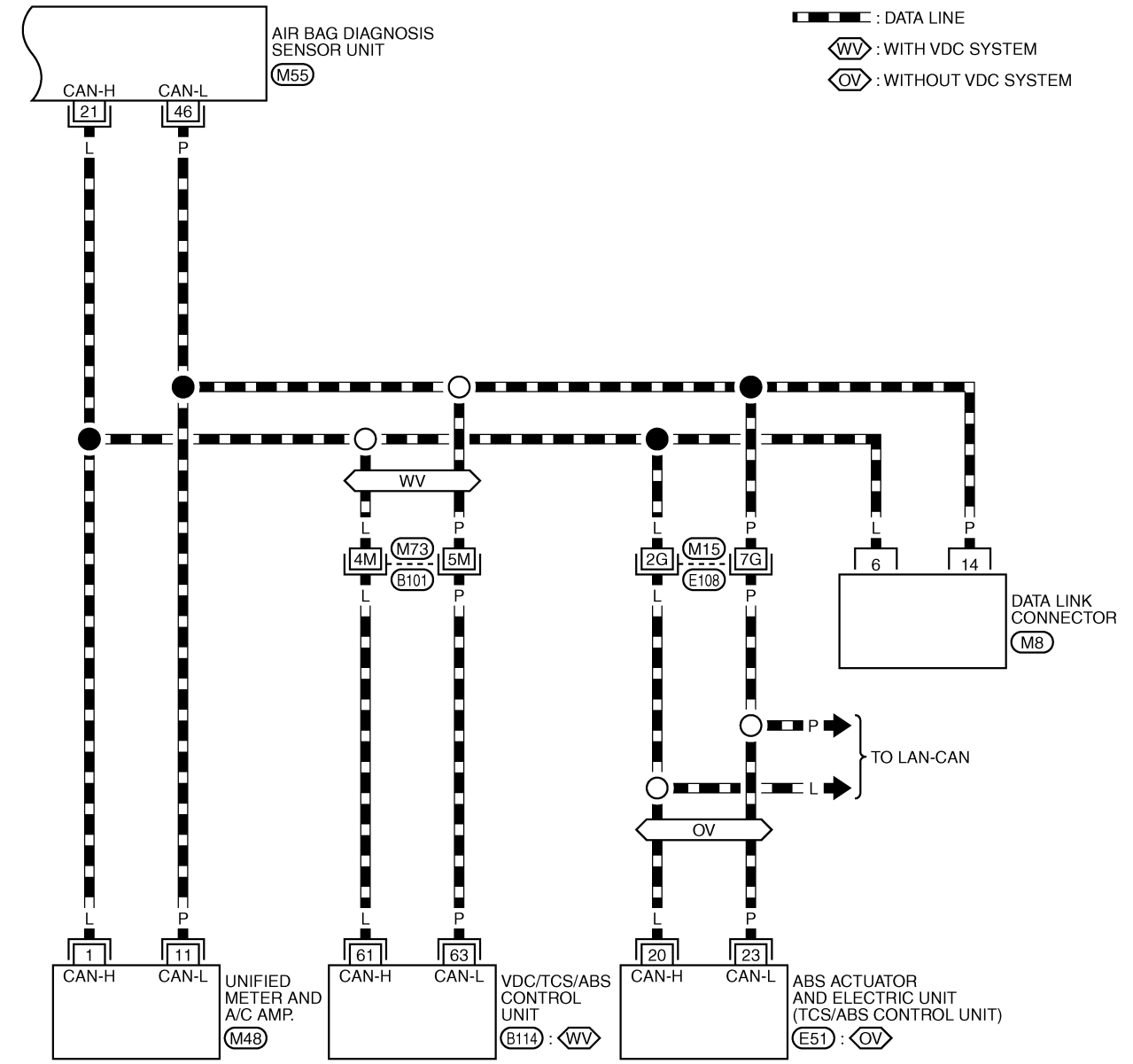


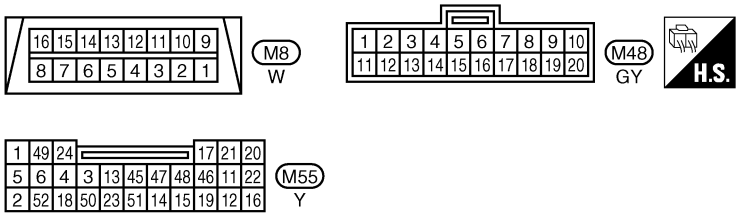
REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

THWT0278E

SRS-SRS-12





REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E51 , B114 -ELECTRICAL UNITS

THWT0279E

CONSULT-lll Function

NHS0000M

DIAGNOSIS MODE FOR CONSULT-LLL

- “SELF-DIAG [CURRENT]”
  A current self-diagnostic results (also indicated by the number of warning lamp flashes in the Diagnosis mode) is displayed on the CONSULT-lll screen in real time. This refers to a malfunctioning part requiring repairs.
- “SELF-DIAG [PAST]”
  Self-diagnostic results previously stored in the memory are displayed on the CONSULT-lll screen. The stored results are not erased until memory erasing is performed.
- “TROUBLE DIAG RECORD”
  With TROUBLE DIAG RECORD, diagnostic results previously erased by a reset operation can be displayed on the CONSULT-lll screen.
- “ECU DISCRIMINATED NO.”
  The diagnosis sensor unit for each vehicle model is assigned with its own, individual classification number. This number will be displayed on the CONSULT-lll screen, as shown. When replacing the diagnosis sensor unit, refer to the part number for the compatibility. After installation, replacement with a correct unit can be checked by confirming this classification number on the CONSULT-lll screen.
  After repair, make sure the discriminated number of diagnosis sensor unit installed to vehicle are same. Refer to SRS-51, "ECU DISCRIMINATED NO." .

HOW TO CHANGE SELF-DIAGNOSIS MODE WITH CONSULT-LII

From User Mode to Diagnosis Mode

After selecting “AIR BAG” on the “SELECT SYSTEM” screen, User mode automatically changes to Diagnosis mode.

From Diagnosis Mode to User Mode

To return to User mode from Diagnosis mode, touch “BACK” key of CONSULT-lll until “SELECT SYSTEM” appears, then diagnosis mode automatically changes to User mode.

HOW TO ERASE SELF-DIAGNOSTIC RESULTS

- “SELF-DIAG [CURRENT]”
  A current self-diagnostic result is displayed on the CONSULT-lll screen in real time.
  After the malfunction is repaired completely, no malfunction is detected on “SELF-DIAG [CURRENT]”.
- “SELF-DIAG [PAST]”
  Return to the “SELF-DIAG [CURRENT]” CONSULT-lll screen by touching “BACK” key of CONSULT-lll and select “SELF-DIAG [CURRENT]” in SELECT DIAG MODE. Touch “ERASE” in “SELF-DIAG [CURRENT]” mode.

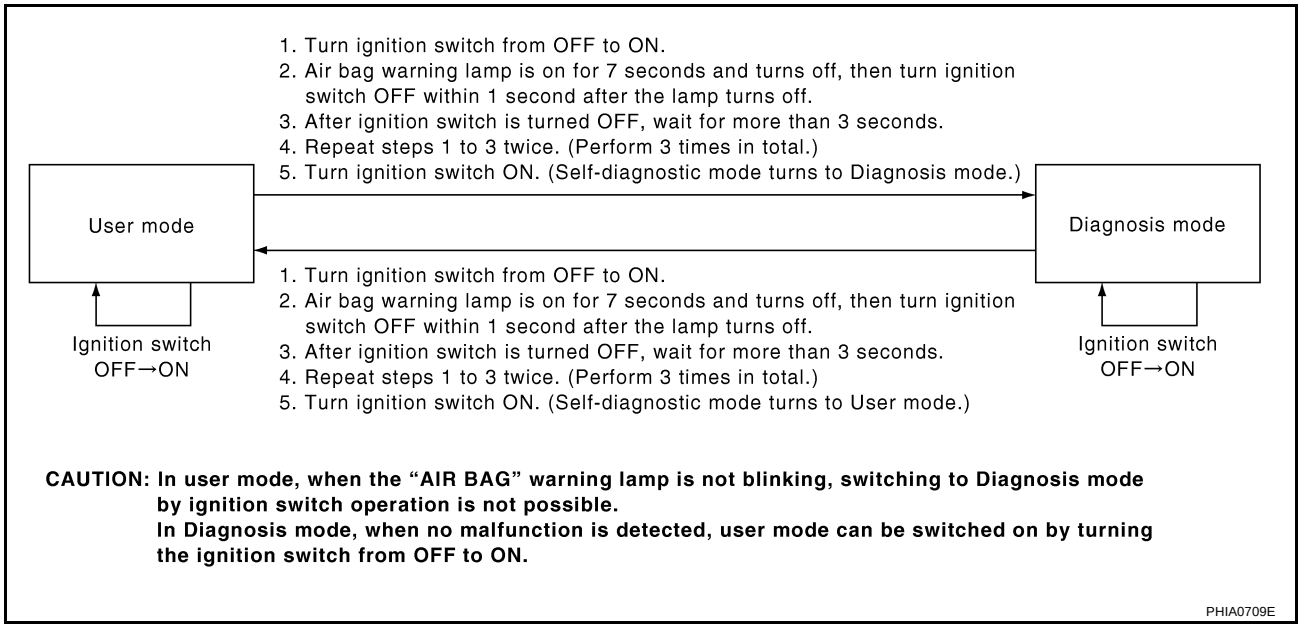
  NOTE:
  If the memory of the malfunction in “SELF-DIAG [PAST]” is not erased, the User mode shows the system malfunction by the operation of the warning lamp even if the malfunction is repaired completely.
- “TROUBLE DIAG RECORD”
  The memory of “TROUBLE DIAG RECORD” cannot be erased.

Self-Diagnosis Function (Without CONSULT-lll)

NHS0000N

- The reading of these results is accomplished “User mode” and “Diagnosis mode”.
- After a malfunction is repaired, turn ignition switch ON. Diagnosis mode returns to the User mode. At that time, the self-diagnostic result is cleared.

HOW TO CHANGE SELF-DIAGNOSTIC MODE WITHOUT CONSULT-LLL



HOW TO ERASE SELF-DIAGNOSTIC RESULTS

After a malfunction is repaired, turn the ignition switch OFF for at least one second, then back ON. Diagnosis mode returns to the User mode. At that time, the self-diagnostic results are cleared.

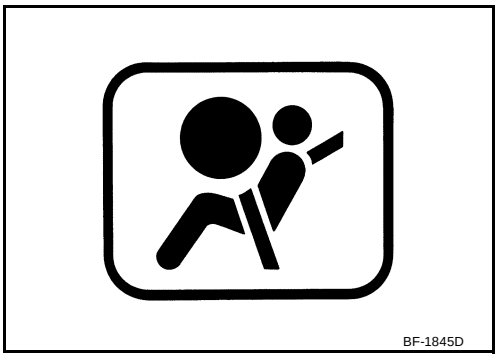
SRS Operation Check (USER MODE)

NHS0000O

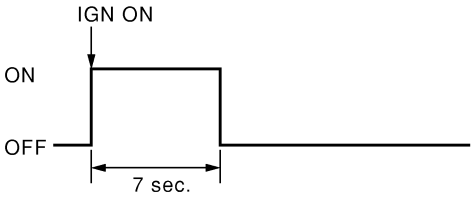
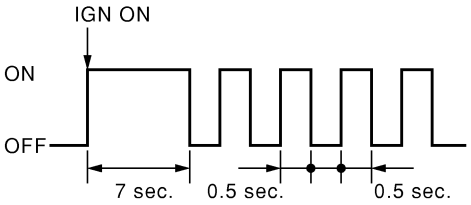
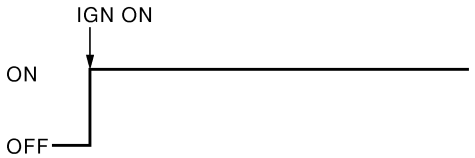
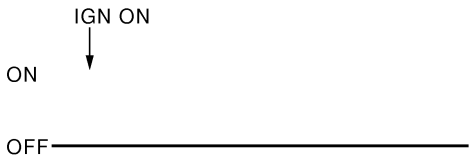
DIAGNOSTIC PROCEDURE

Checking Air Bag Operation by Using “AIR BAG” Warning Lamp—User Mode

1. Turn ignition switch from OFF to ON, and make sure that the air bag warning lamp blinks.
2. Compare the SRS air bag warning lamp blinking pattern with the examples.



Warning lamp examples

“AIR BAG” warning lamp operation-User mode-	SRS condition	Reference item
 SHIA0011E	● No malfunction is detected. ● No further action is necessary.	—
 SHIA0012E	● The system is malfunctioning and needs to be repaired as indicated.	Go to SRS-33, "WARNING LAMP FLASH CODE CHART" or SRS-29, "DTC No. Index (“SELF-DIAG [CURRENT]” “SELF-DIAG [PAST]” or TROUBLE DIAG RECORD)" .
 SHIA0013E	● Air bag is deployed. ● Seat belt pre-tensioner is deployed.	Go to SRS-53, "COLLISION DIAGNOSIS" .
	● Diagnosis sensor unit is malfunctioning. ● Air bag power supply circuit is malfunctioning. ● SRS air bag warning lamp circuit is malfunctioning.	Go to SRS-37, "Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn OFF" .
 SHIA0014E	● Diagnosis sensor unit is malfunctioning. ● Air bag warning lamp circuit is malfunctioning.	Go to SRS-38, "Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn ON" .

Trouble Diagnosis with CONSULT-III

NHS0000P

DIAGNOSTIC PROCEDURE

Diagnositic mode	Description
SELF-DIAG RESULT	The self-diagnosis result is displayed. (SELF-DIAG [CURRENT], [PAST], [RECORRD]). Refer to SRS-29, "DTC No. Index (“SELF-DIAG [CURRENT]” “SELF-DIAG [PAST]” or TROUBLE DIAG RECORD)" .
ECU DISCRIMINATED No.	The parts number of diagnosis sensor unit is displayed.

DTC No. Index (“SELF-DIAG [CURRENT]” “SELF-DIAG [PAST]” or TROUBLE DIAG RECORD)

Diagnostic item	Explanation		Repair order “Recheck SRS at each replacement”
NO DTC IS DETECTED.	When malfunction is indicated by the “AIR BAG” warning lamp in User mode.	● Low battery voltage (Less than 9V)	—
		● Self-diagnostic results “SELF-DIAG [PAST]” (previously stored in the memory) might not be erased after repair. ● Intermittent malfunction has been detected in the past.	● Go to SRS-25, "DIAGNOSIS MODE FOR CONSULT-III" .
	● No malfunction is detected.		—
DRIVER AIRBAG MODULE [OPEN] [B1054]	● Driver air bag module circuit is open (including the spiral cable).		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace driver air bag module. 4. Replace the spiral cable. 5. Replace the diagnosis sensor unit.
DRIVER AIRBAG MODULE [VB-SHORT] [B1055]	● Driver air bag module circuit is shorted to a power supply circuit (including the spiral cable).		
DRIVER AIRBAG MODULE [GND-SHORT] [B1056]	● Driver air bag module circuit is shorted to ground (including the spiral cable).		
DRIVER AIRBAG MODULE [SHORT] [B1057]	● Driver air bag module circuit is shorted between lines.		
ASSIST A/B MODULE [VB-SHORT] [B1070]	● Front passenger air bag module circuit is shorted to a power supply circuit.		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger air bag module. 4. Replace the diagnosis sensor unit.
ASSIST A/B MODULE [OPEN] [B1071]	● Front passenger air bag module circuit is open.		
ASSIST A/B MODULE [GND-SHORT] [B1072]	● Front passenger air bag module circuit is shorted to ground.		
ASSIST A/B MODULE [SHORT] [B1073]	● Front passenger air bag module circuit is shorted between lines.		
CRASH ZONE SEN [UNIT FAIL] [B1033] [B1034] CRASH ZONE SEN [COMM FAIL] [B1035] CRASH ZONE SEN [UNMATCH] [B1036]	● Crash zone sensor		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the crash zone sensor. 4. Replace the diagnosis sensor unit.

Diagnostic item	Explanation	Repair order "Recheck SRS at each replacement"
SIDE MODULE LH [OPEN] [B1134]	● Front LH side air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front LH setback assembly (front LH side air bag module). 4. Replace the diagnosis sensor unit.
SIDE MODULE LH [VB-SHORT] [B1135]	● Front LH side air bag module circuit is shorted to a power supply circuit.	
SIDE MODULE LH [GND-SHORT] [B1136]	● Front LH side air bag module circuit is shorted to ground.	
SIDE MODULE LH [SHORT] [B1137]	● Front LH side air bag module circuit is shorted between lines.	
SIDE MODULE RH [OPEN] [B1129]	● Front RH side air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front RH setback assembly (front RH side air bag module). 4. Replace the diagnosis sensor unit.
SIDE MODULE RH [VB-SHORT] [B1130]	● Front RH side air bag module circuit is shorted to some power supply circuit.	
SIDE MODULE RH [GND-SHORT] [B1131]	● Front RH side air bag module circuit is shorted to ground.	
SIDE MODULE RH [SHORT] [B1132]	● Front RH side air bag module circuit is shorted between lines.	
SATELLITE SENS LH [UNIT FAIL] [B1118] [B1119] SATELLITE SENS LH [COMM FAIL] [B1120] SATELLITE SENS LH [UNMATCH] [B1121]	● LH side air bag (Satellite) sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the LH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit.
SATELLITE SENS RH [UNIT FAIL] [B1113] [B1114] SATELLITE SENS RH [COMM FAIL] [B1115] SATELLITE SENS RH [UNMATCH] [B1116]	● RH side air bag (Satellite) sensor	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the RH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit.
PRE-TEN FRONT LH [OPEN] [B1086]	● Front LH pre-tensioner circuit is open.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front LH seat belt. 4. Replace the diagnosis sensor unit.
PRE-TEN FRONT LH [VB-SHORT] [B1087]	● Front LH pre-tensioner circuit is shorted to a power supply circuit.	
PRE-TEN FRONT LH [GND-SHORT] [B1088]	● Front LH pre-tensioner circuit is shorted to ground.	
PRE-TEN FRONT LH [SHORT] [B1089]	● Front LH pre-tensioner circuit is shorted between lines.	

Diagnostic item	Explanation	Repair order "Recheck SRS at each replacement"
PRE-TEN FRONT RH [OPEN] [B1081]	● Front RH pre-tensioner circuit is shorted to a power supply circuit.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front RH seat belt. 4. Replace the diagnosis sensor unit.
PRE-TEN FRONT RH [VB-SHORT] [B1082]	● Front RH pre-tensioner is shorted to a power supply circuit.	
PRE-TEN FRONT RH [GND-SHORT] [B1083]	● Front RH pre-tensioner circuit is shorted to ground.	
PRE-TEN FRONT RH [SHORT] [B1084]	● Front RH pre-tensioner circuit is shorted between lines.	
CURTAIN MODULE LH* [OPEN] [B1150]	● LH side curtain air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace LH side curtain air bag module. 4. Replace the diagnosis sensor unit.
CURTAIN MODULE LH* [VB-SHORT] [B1151]	● LH side curtain air bag module circuit is shorted to some power supply circuits.	
CURTAIN MODULE LH* [GND-SHORT] [B1152]	● LH side curtain air bag module circuit is shorted to ground.	
CURTAIN MODULE LH* [SHORT] [B1153]	● LH side curtain air bag module circuit is shorted between lines.	
CURTAIN MODULE RH* [OPEN] [B1145]	● RH side curtain air bag module circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace RH side curtain air bag module. 4. Replace the diagnosis sensor unit.
CURTAIN MODULE RH* [VB-SHORT] [B1146]	● RH side curtain air bag module circuit is shorted to a power supply circuit.	
CURTAIN MODULE RH* [GND-SHORT] [B1147]	● RH side curtain air bag module circuit is shorted to ground.	
CURTAIN MODULE RH* [SHORT] [B1148]	● RH side curtain air bag module circuit is shorted between lines.	
CONTROL UNIT [B1001-B1015] [B1026-B1031] [B1042-B1047] [B1058-B1063] [B1074-B1079] [B1106-B1111] [B1122-B1127] [B1138-B1143] [B1202-B1207]	● Diagnosis sensor unit is malfunctioning.	● Replace the diagnosis sensor unit.
PASS A/B INDCTR CKT [B1023]	● Cutoff telltale circuit is open or shorted to grand or the circuits are shorted each other.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace cutoff telltale. 4. Replace the diagnosis sensor unit.

Diagnostic item	Explanation	Repair order “Recheck SRS at each replacement”
OCCUPANT SENS C/U [UNIT FAIL] [B1017] [B1020] [B1021]	● Trouble occurs in Occupant Classification System-CU.	● Replace passenger side seat cushion assembly.
OCCUPANT SENS C/U [COMM FAIL] [B1022]	● Trouble occurs in Occupant Classification System-CU, circuit of Occupant Classification System-CU—Diagnosis Sensor Unit or Diagnosis Sensor Unit.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace passenger side seat cushion assembly. 4. Replace the diagnosis sensor unit.
OCCUPANT SENS [UNIT FAIL] [B1018]	● Trouble occurs in Occupant Classification System-SENS.	● Replace passenger side seat cushion assembly.
FRONTAL COLLISION DETECTION [B1209]	● Seat belt pre-tensioner and front air bag are deployed.	● Go to SRS-53, "For Frontal Collision" .
SIDE COLLISION DETECTION [B1210]	● Side and curtain air bag is deployed.	● Go to SRS-55, "For Side Collision" .

*: For coupe

NOTE:
Follow the procedures in numerical order when repairing malfunctioning parts. Confirm whether malfunction is eliminated using air bag warning lamp or CONSULT-III each time repair is finished. If malfunction is still observed, proceed to the next step. When malfunction is eliminated, further repair work is not required.

Trouble Diagnosis without CONSULT-III

NHS0000Q

DIAGNOSTIC PROCEDURE

Inspecting SRS Malfunctioning Parts by Using “AIR BAG” Warning Lamp — Diagnosis Mode

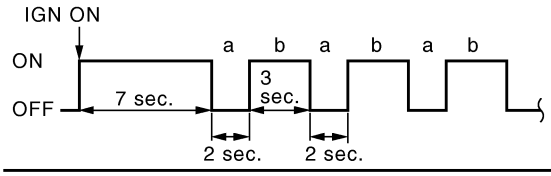
NOTE:
SRS will not enter Diagnosis mode if no malfunction is detected in User mode.

1. Turn ignition switch ON.
2. After “AIR BAG” warning lamp lights for 7 seconds, turn ignition switch OFF within 1 second.
3. Wait more than 3 seconds.
4. Repeat the steps 1 to 3 two times.
5. Turn ignition switch ON.

SRS is now in Diagnosis mode.
“AIR BAG” warning lamp operates in Diagnosis mode as follows:

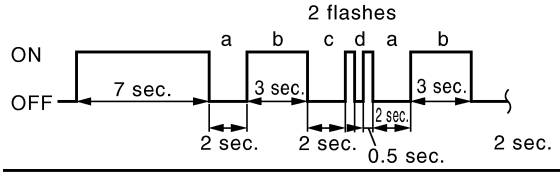
WARNING LAMP FLASH CODE CHART

<Diagnosis results (previously stored in the memory) might not be erased after repair or intermittent malfunctions have been detected in the past.>

Flash pattern	Repair order
a through b are repeated. 	1. Erase memory. (Once key switch is turned from OFF to ON, TROUBLE DIAG RECORD will be erased.)

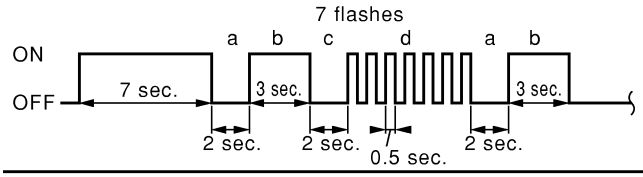
PHIA0532E

<Driver air bag module>

Flash pattern	Repair order
a through d are repeated. d: Two flashes indicate malfunctioning driver air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the spiral cable. 4. Replace the related harness.

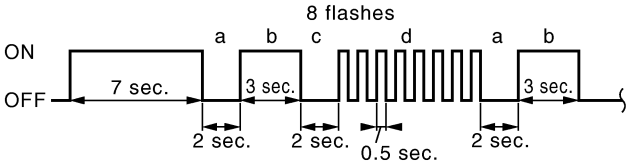
PHIA1233E

<Diagnosis sensor unit>

Flash pattern	Repair order
a through d are repeated. d: Seven flashes indicate malfunctioning diagnosis sensor unit circuit. 	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace the diagnosis sensor unit. 4. Replace the related harness.

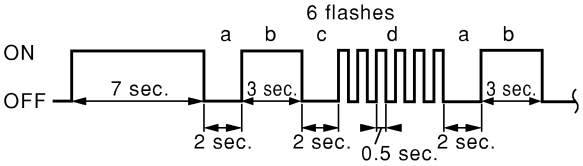
SHIA0028E

<Front passenger air bag module>

Flash pattern	Repair order
a through d are repeated. d: Eight flashes indicate malfunctioning front passenger air bag module circuit.  	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

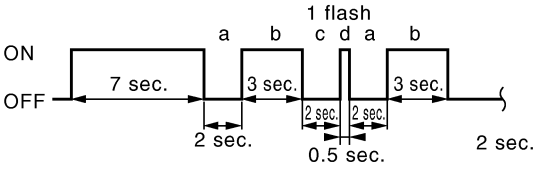
PHIA1234E

<Crash zone sensor>

Flash pattern	Repair order
a through d are repeated. d: Six flashes indicate malfunctioning crash zone sensor circuit.  	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the crash zone sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

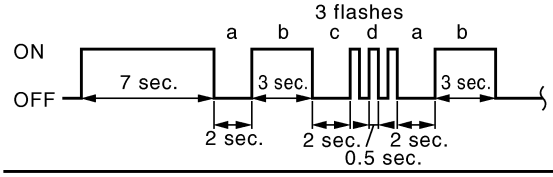
SHIA0083E

<Front RH seat belt pre-tensioner>

Flash pattern	Repair order
a through d are repeated. d: One flash indicates malfunctioning front RH seat belt pre-tensioner circuit.  	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

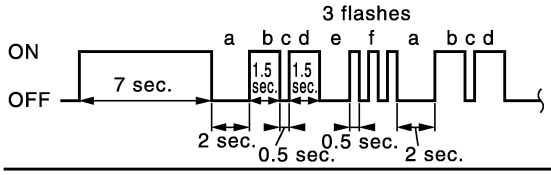
PHIA1235E

<Front LH seat belt pre-tensioner>

Flash pattern	Repair order
a through d are repeated. d: Three flashes indicate malfunctioning front LH seat belt pre-tensioner circuit.  	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

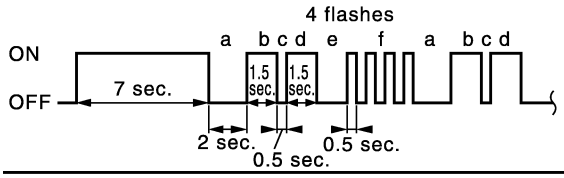
PHIA1236E

<RH side air bag (Satellite) sensor>

Flash pattern	Repair order
a through f are repeated. f: Three flashes indicate malfunctioning RH side air bag (Satellite) sensor circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the RH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

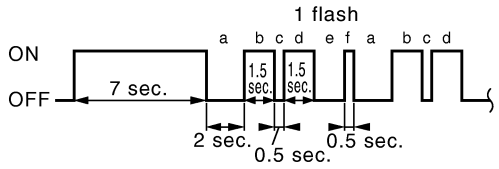
SHIA0032E

<LH side air bag (Satellite) sensor>

Flash pattern	Repair order
a through f are repeated. f: Four flashes indicate malfunctioning LH side air bag (Satellite) sensor. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the LH side air bag (Satellite) sensor. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

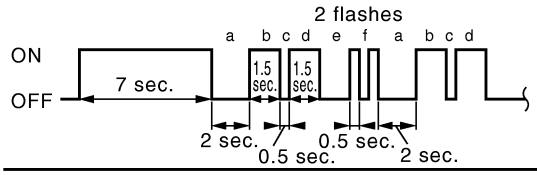
SHIA0033E

<Front RH side air bag module>

Flash pattern	Repair order
a through f are repeated. f: One flash indicates malfunctioning front RH side air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

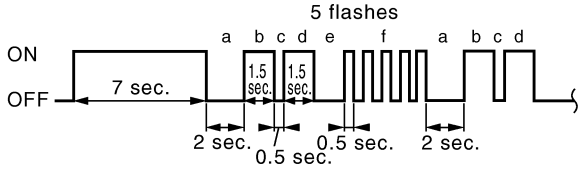
PHIA1237E

<Front LH side air bag module>

Flash pattern	Repair order
a through f are repeated. f: Two flashes indicate malfunctioning front LH side air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

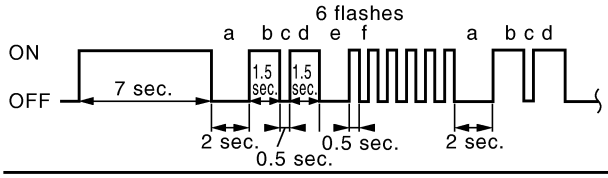
PHIA1238E

<RH side curtain air bag module>

Flash pattern	Repair order
a through f are repeated. f: Five flashes indicate malfunctioning RH side curtain air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

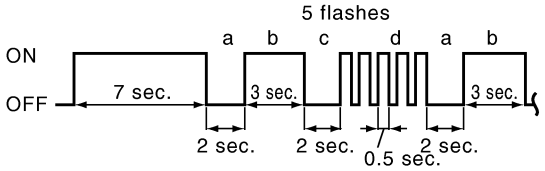
PHIA1240E

<LH side curtain air bag module>

Flash pattern	Repair order
a through f are repeated. f: Six flashes indicate malfunctioning LH side curtain air bag module circuit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the related harness.

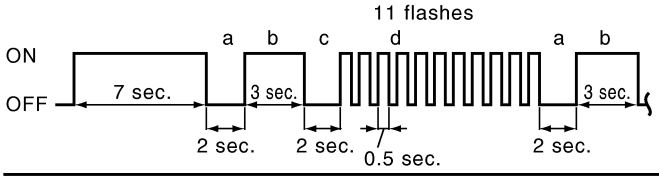
PHIA1241E

<Occupant classification system>

Flash pattern	Repair order
a through d are repeated. d: Five flashes indicate malfunctioning OCS control unit. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger seat cushion and occupant classification system control unit as an assembly. 4. Replace the diagnosis sensor unit.

PHIA1242E

<Front passenger air bag off indicator>

Flash pattern	Repair order
a through d are repeated. d: Eleven flashes indicate malfunctioning front passenger air bag off indicator. 	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger air bag off indicator unit. 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

PHIA1243E

Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn OFF

NHS0000R

DIAGNOSTIC PROCEDURE

1. CHECK THE DEPLOYMENT OF AIR BAG MODULE

Is air bag module deployed?

YES or NO

YES >> Refer to SRS-53, "COLLISION DIAGNOSIS" .
NO >> GO TO 2.

2. CHECK THE AIR BAG FUSE

Check 10A fuse [No.13, located in fuse block (J/B)].
Refer to PG-15, "Fuse" .

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK AIR BAG FUSE AGAIN

Replace “AIR BAG” fuse and turn ignition switch ON.

Does the “AIR BAG” fuse blow again?

YES >> Repair or replace main harness.
NO >> **INSPECTION END**

4. CHECK DIAGNOSIS SENSOR UNIT

With CONSULT-III

Is “AIR BAG” displayed on CONSULT-III?

YES or NO

YES >> GO TO 5.
NO >> Visually check the wiring harness connection of diagnosis sensor unit. If the harness connection check result is OK, replace diagnosis sensor unit.

5. CHECK HARNESS CONNECTION

Is harness connection between warning lamp and diagnosis sensor unit OK?

OK or NG

OK >> Replace diagnosis sensor unit.
NG >> Connect “AIR BAG” warning lamp and diagnosis sensor unit connector properly. If “AIR BAG” warning lamp still does not go off, replace harness.

Trouble Diagnosis: “AIR BAG” Warning Lamp Does Not Turn ON

NHS0000S

DIAGNOSTIC PROCEDURE

1. CHECK “METER” FUSE

Check 10A fuse [No.14, located in fuse block (J/B)].
Refer to PG-15, "Fuse" .

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK “METER” FUSE AGAIN

Replace 10A fuse [No.14, located in fuse block (J/B)] and turn ignition switch ON.

Does the meter fuse blow again?

YES >> Repair or replace the related harness.
NO >> **INSPECTION END**

3. CHECK HARNESS CONNECTION BETWEEN DIAGNOSIS SENSOR UNIT AND COMBINATION METER

Disconnect diagnosis sensor unit connector and turn ignition switch ON.
Does “AIR BAG” warning lamp turn ON?

YES or NO

YES >> Replace diagnosis sensor unit.
NO >> Replace combination meter assembly.

Trouble Diagnosis: Passenger Seat belt Warning System

NHS000A5

1. HECK THE SYSTEM 1

Check seat belt warning lamp function.

Seat belt warning lamp turns ON in the following conditions.

- Driver seat belt is fastened.
- Occupant is on passenger seat.
- Passenger seat belt is not fasten.

OK or NG

OK >> GO TO 2.
NG >> Check the followings.
- Harness between air bag diagnosis sensor unit and combination meter.
- Seat belt buckle switch (passenger side) circuit.
- Seat belt buckle switch (passenger side).
  If these are OK, replace air bag diagnosis sensor unit.

2. CHECK THE SYSTEM 2

Check seat belt warning lamp function.

Seat belt warning lamp turns OFF in the following conditions.

- Driver seat belt is fastened.
- Occupant is on passenger seat.
- Passenger seat belt is fastened.

OK or NG

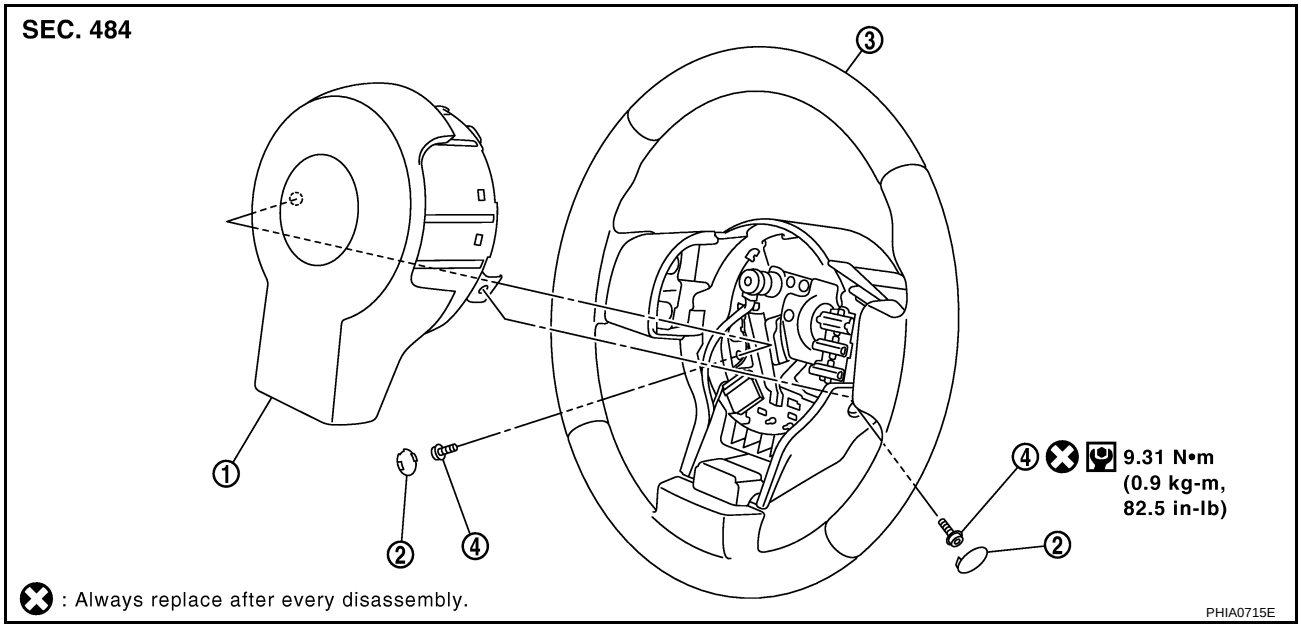
OK >> System is OK.
NG >> Check the followings.
- Sea tbelt buckle switch (passenger side) circuit.
- Seat belt buckle switch (passenger side).
  If these are OK, replace air bag diagnosis sensor unit.

DRIVER AIR BAG MODULE

PFP:K8510

Removal and Installation

NHS0000T



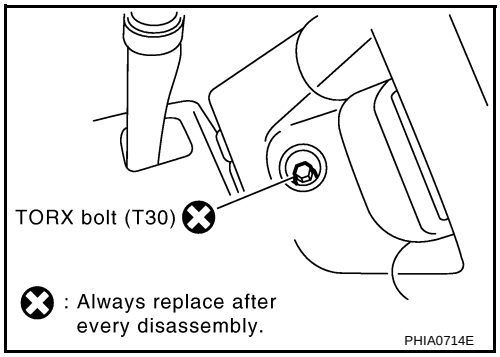
1. Driver air bag module
2. Side lid (RH/LH)
3. Steering wheel
4. TORX bolt (T30)

REMOVAL

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the side of driver air bag module.**
- **Do not use air tools or electric tools for servicing.**

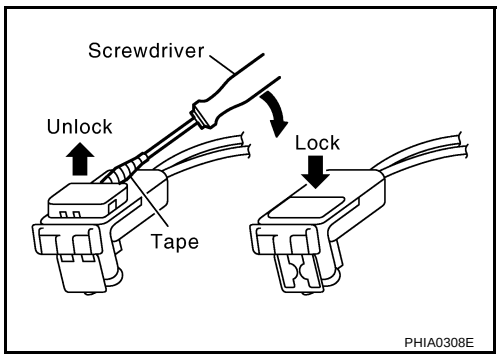
1. Remove the side lids (RH/LH).
2. Using Tamper resistant TORX bit (T30), remove the TORX bolts (T30) at right and left.



3. Disconnect the steering wheel switch sub-harness connector.
4. Disconnect the air bag harness connector, and remove the driver air bag module.

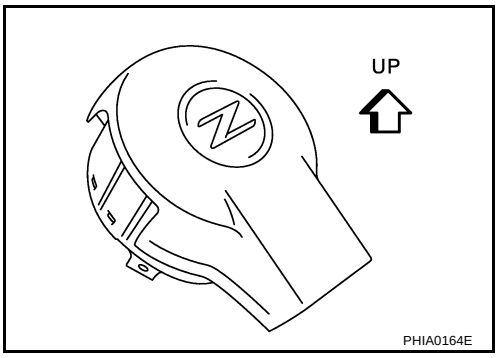
   CAUTION:

   - **For installing / removing driver air bag module connector, insert thin screwdriver wrapped in tape into notch, lift lock and remove connector.**
   - **Install connector with lock raised, and push lock into connector.**
   - **After installing the connector, make sure that the lock is pushed securely into it.**

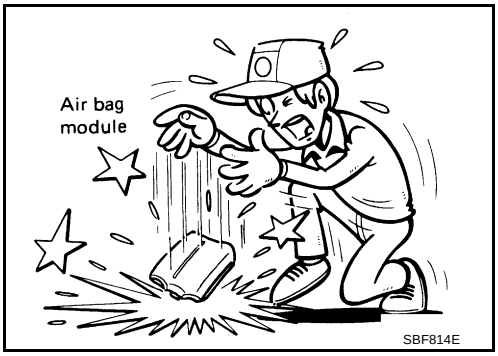


CAUTION:

- **Always work from the side of driver air bag module.**
- **Always place driver air bag module with pad side facing upward.**
- **Do not insert any foreign objects (screwdriver, etc.) into driver air bag module.**
- **Do not disassemble driver air bag module.**
- **Do not use old bolts after removal; replace with new bolts.**
- **Do not expose the driver air bag module to temperatures exceeding 90°C (194°F).**



- **Replace driver air bag module if it has been dropped or sustained an impact.**
- **Do not allow oil, grease or water to come in contact with the front passenger air bag module.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

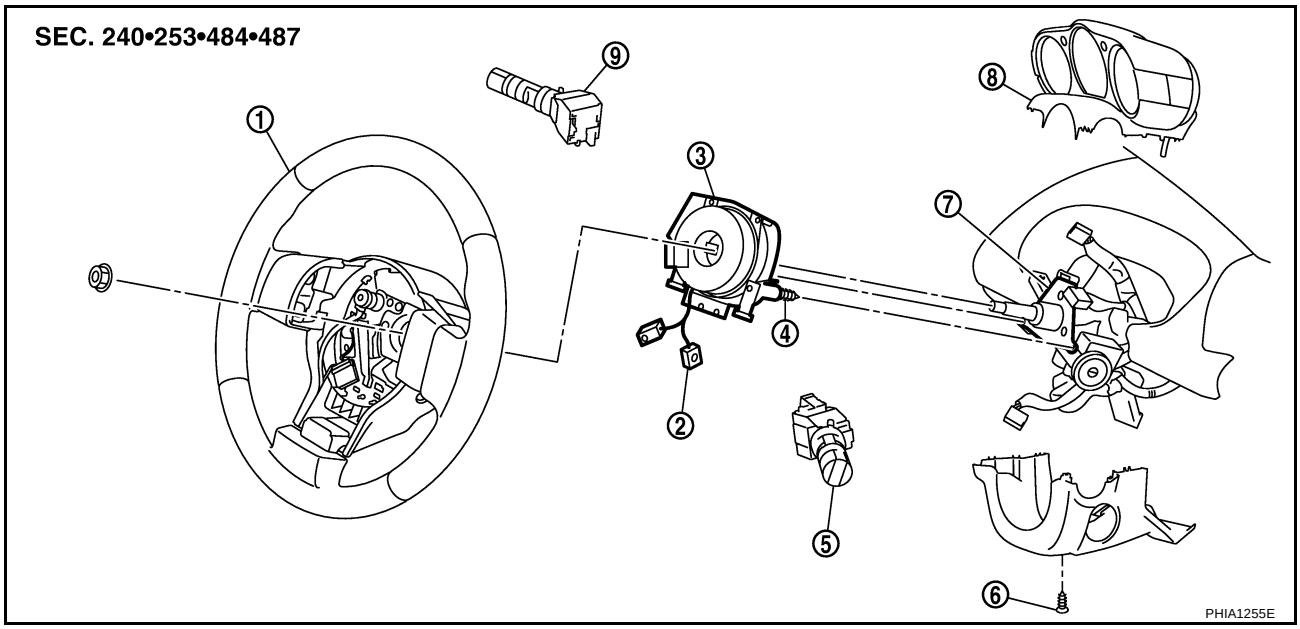
- **For installing the air bag module, tighten the TORX bolts (T30).**
- **After the work is completed, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

SPIRAL CABLE

PFP:25554

Removal and Installation

NHS0000U



1. Steering wheel	2. Driver air bag module connector	3. Spiral cable
4. Screw (Do not remove)	5. Wiper and washer switch	6. Screw
7. Sreering column assembly	8. Combination meter	9. Lighting and turn signal switch

REMOVAL

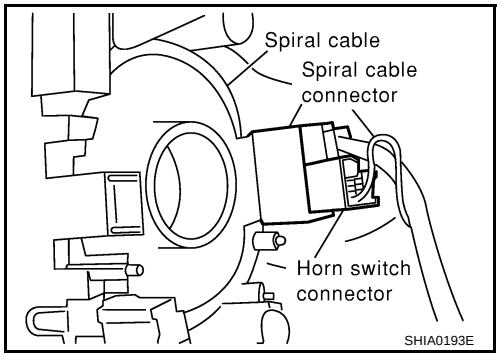
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

1. Remove driver air bag module. Refer to SRS-40, "Removal and Installation" .
2. Disconnect horn switch connector.
3. Set the steering wheel in the neutral position.
4. Remove steering wheel. Refer to PS-7, "STEERING WHEEL" .
5. Remove combination meter assembly. Refer to DI-24, "Removal and Installation for Combination Meter" .
6. Loosen the spiral cable fixing screws, and then remove the spiral cable.

   CAUTION:
   - **Do not disassemble spiral cable.**
   - **Do not apply lubricant to the spiral cable.**
7. Remove the horn switch connector and then remove spiral cable connector.

   CAUTION:
   Also, with the steering linkage disconnected the cable may snap by turning the steering wheel beyond the limited number of turns.

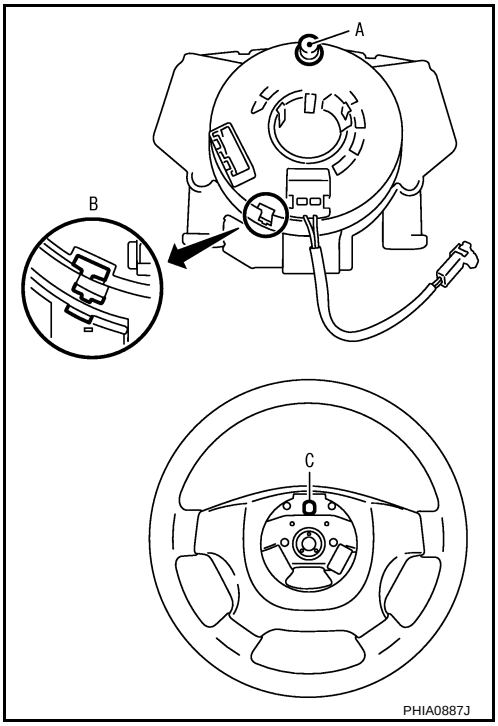


INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **The spiral cable may snap by steering operation if the cable is installed in an improper position.**
- **The neutral position is set as follows.**
  Turn quietly the spiral cable clockwise to the end position. Then turn it counterclockwise (about 2 and harf turns) and stop turning at the point on which the stopper insertion holes are in the same position.
  The service part is installed in the neutral position by the stopper and can be set without adjusting after the stopper is removed.
- **Do not turn the spiral cable rashly and also beyond the limit number of turns. (These will cause cable snap.)**
- **Adjust the spiral cable locating pin (showed as A inthe figure) to the steering wheel locating pin hole (showed as C in the figuer).**
- **Secure the air bag harness with the harness fixing hook.**
- **After the work is completed, make sure no system malfunction is detected by air bag warning lamp.**
- **In case that malfunction is detected by the air bag warning lamp, reset by the self-diagnosis function and delete the memory by CONSULT–III.**
- **In case that malfunction is still detected after the above operation, perform self-diagnosis to repair malfunctions. Refer to Refer to SRS-27, "SRS Operation Check (USER MODE)" .**



FRONT PASSENGER AIR BAG MODULE

PFP:K8515

Removal and Installation

NHS0000V

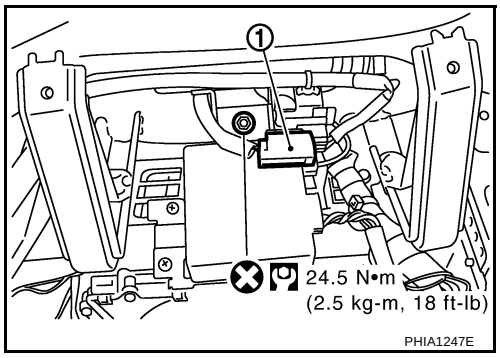
REMOVAL

CAUTION:

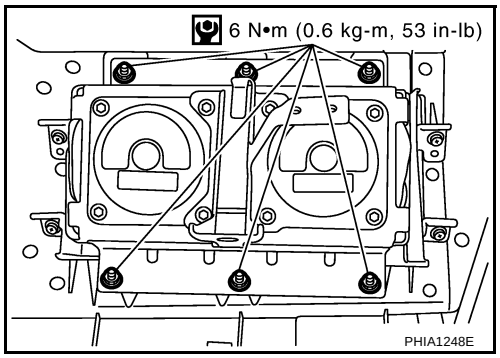
- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the side of or under front passenger air bag module.**
- **Do not use air tools or electric tools for servicing.**

1. Remove cluster lid C. Refer to IP-14, "(Q) Cluster Lid C" .
2. Remove instrument passenger panel lower and knee protector (RH). Refer to IP-13, "(L) Instrument Passenger Panel Lower" .
3. Disconnect passenger air bag module connector.

   Passenger air bag module connector : (1)

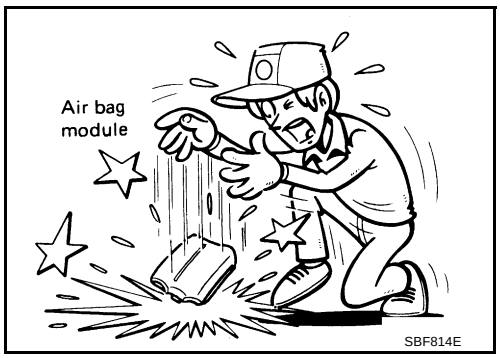


4. Remove hexagon bolt, and then remove instrument passenger panel upper assembly.
5. Remove fixing nuts, and then remove front passenger air bag module.



CAUTION:

- **Always place front passenger air bag module with caution label side facing upward.**
- **Do not insert any foreign objects (screwdriver, etc.) into front passenger air bag module.**
- **Do not disassemble front passenger air bag module.**
- **Do not use old bolts after removal; replace with new bolts.**
- **Replace front passenger air bag module if it has been dropped or sustained an impact.**
- **Do not expose the front passenger air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the front passenger air bag module.**
- **After front passenger air bag module inflates, the instrument panel assembly should be replaced.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

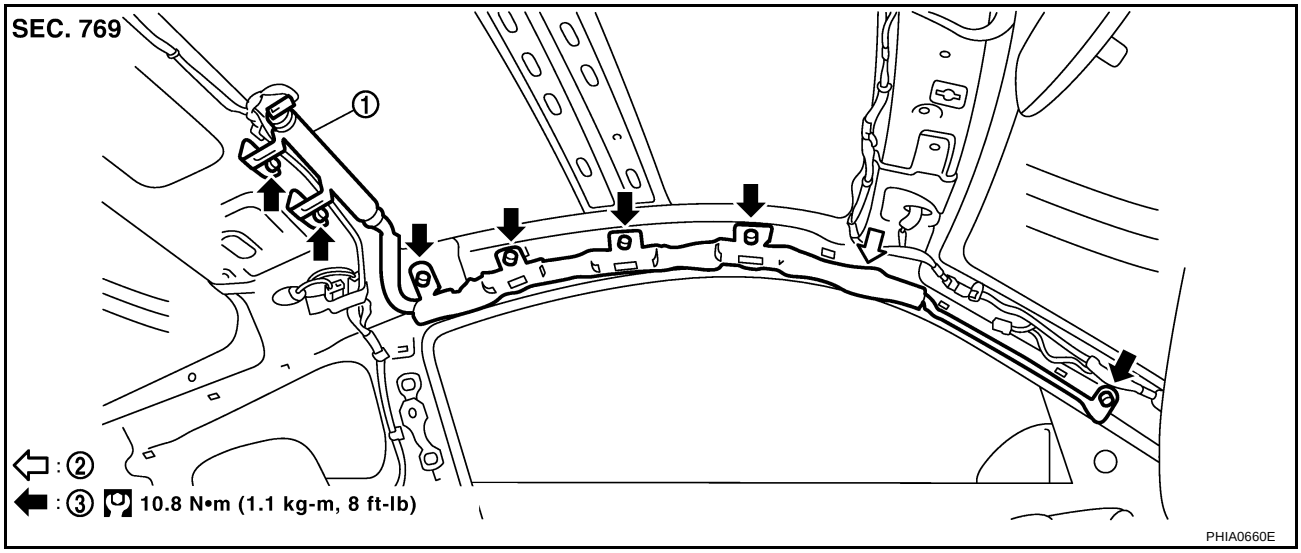
- **Always work from the side of or under front passenger air bag module.**
- **After the work is completed, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

SIDE CURTAIN AIR BAG MODULE (FOR COUPE)

PFP:985P0

Removal and Installation

NHS0000W



1. Side curtain air bag module
2. Clip
3. Bolt

REMOVAL

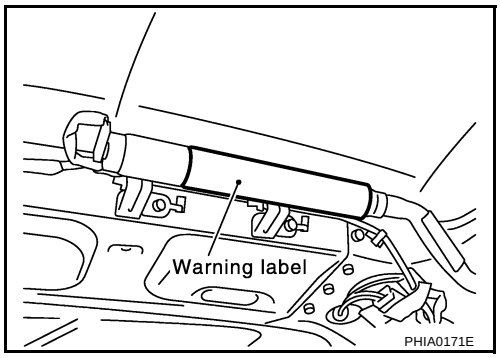
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

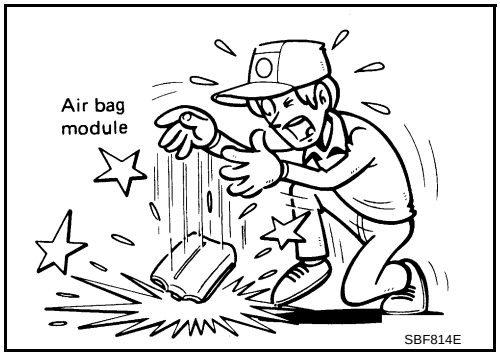
1. Remove headlining. Refer to EI-44, "Removal and Installation (for Coupe Models)" .
2. Disconnect side curtain air bag connector.
3. Remove side curtain air bag module fixing bolts and clip.
4. Remove the side curtain air bag module.

CAUTION:

- **Always place the side curtain air bag module with the warning label facing upward.**
- **Do not disassemble side curtain air bag module.**
- **Do not insert any foreign objects (screwdriver, etc.) into air bag module connector.**



- **Replace side curtain air bag module if it has been dropped or sustained an impact.**
- **Do not expose the air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the side curtain air bag module.**



INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Always work from the side of the side curtain air bag module.**
- **After replacement of side curtain air bag module, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

CRASH ZONE SENSOR

PFP:98531

Removal and Installation

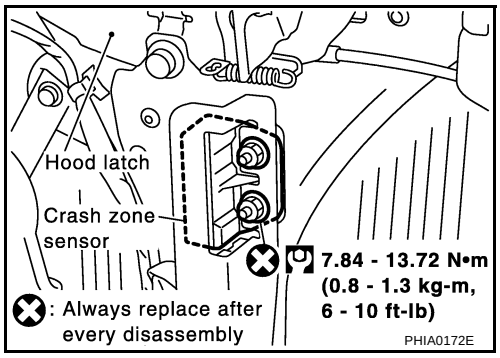
NHS0000X

REMOVAL

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

1. Remove crash zone sensor connector.
2. Remove crash zone sensor fixing nuts.



CAUTION:

- **Replace crash zone sensor if it has been dropped or sustained an impact.**
- **Do not disassemble crash zone sensor.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check crash zone sensor for proper installation.**
- **After the work is complete, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

SIDE AIR BAG (SATELLITE) SENSOR

PFP:98830

Removal and Installation

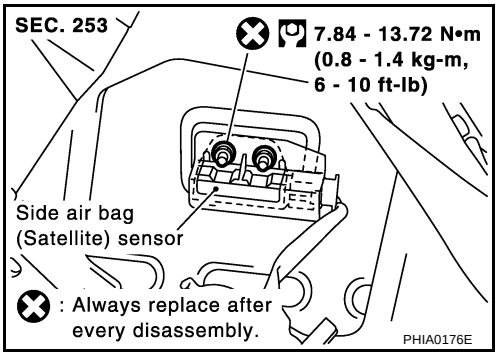
NHS0000Y

REMOVAL

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

1. Remove seat belt pre-tensioner. Refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" or SB-6, "Removal and Installation of Seat Belt (Roadster)" .
2. Remove side air bag (Satellite) sensor fixing nuts.
3. Remove the side air bag (Satellite) sensor connector.



CAUTION:

- **Do not use old nuts; replace with new ones.**
- **Check side air bag (Satellite) sensor to ensure it is free of deformities, dents, cracks or rust. If it shows any visible signs of damage, replace it with new one.**
- **Do not attempt to disassemble side air bag (Satellite) sensor.**
- **Replace side air bag (Satellite) sensor if it has been dropped or sustained an impact.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check side air bag (Satellite) sensor for proper installation.**
- **After replacement of side air bag (Satellite) sensor, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

FRONT SEAT BELT PRE-TENSIONER

PFP:86884

Removal and Installation

NHS0000Z

For removal and installation procedures, refer to SB-4, "Removal and Installation of Seat Belt (Coupe)" or SB-6, "Removal and Installation of Seat Belt (Roadster)" .

DIAGNOSIS SENSOR UNIT

PFP:28556

Removal and Installation

NHS00010

REMOVAL

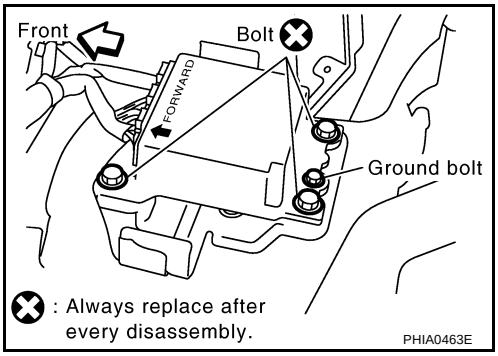
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use air tools or electric tools for servicing.**

1. Disconnect each harness connector for the air bag module and seat belt pre-tensioner.
2. Remove center console. Refer to IP-11, "Removal and Installation" .
3. Disconnect diagnosis sensor unit connector.
4. Remove fixing bolts from the diagnosis sensor unit.

Hex bolt: 24.5 N·m (2.5 kg-m, 18 ft-lb)

Ground bolt: 6.9 N·m (0.7 kg-m, 61 in-lb)



CAUTION:

- **Do not use old bolts. Replace with new ones.**
- **Check diagnosis sensor unit bracket to ensure it is free of deformities, dents, cracks or rust. If it shows any visible signs of damage, replace with new one.**
- **Replace diagnosis sensor unit if it has been dropped or sustained an impact.**

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Check the diagnosis sensor unit for proper installation.**
- **After replacement of diagnosis sensor unit, perform self-diagnosis to make sure that no malfunction is detected. Refer to SRS-27, "SRS Operation Check (USER MODE)" .**

ECU DISCRIMINATED NO.

After replacing the diagnosis sensor unit, make sure that the diagnosis sensor unit identification is correct for the vehicle as equipped.

Model	Specification	ECU DISCRIMINATED No.
Coupe	Models with driver and passenger air bags and seat belt pre-tensioner	FAE6
	Models with driver and passenger air bags, seat belt pre-tensioner, side air bags and curtain air bags	FAE4
Roadster	Models with driver and passenger air bags and seat belt pre-tensioner	FAE7
	Models with driver and passenger air bags, seat belt pre-tensioner and side air bags	FAE5

OCCUPANT CLASSIFICATION SYSTEM CONTROL UNIT

PFP:98852

Removal and Installation

NHS000A7

The occupant classification system control unit, seat pressure sensor, and bladder are an integral part of the front passenger seat cushion and are replaced as an assembly. Refer to SE-67, "Removal and Installation" .

COLLISION DIAGNOSIS

PFP:00015

For Frontal Collision

NHS00011

To repair the SRS, perform the following steps.

When SRS (except the front side air bag and side curtain air bag modules) is activated in a collision:

1. Replace the diagnosis sensor unit.
2. Remove the air bag modules (except the front side air bag modules and side curtain air bag modules), crash zone sensor assembly, bracket and seat belt pre-tensioner assemblies.
3. Check the SRS components using the table below:

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

4. Install new air bag modules (except the front side air bag modules and side curtain air bag modules) crash zone sensor assembly, bracket and seat belt pre-tensioner assemblies.
5. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" for details. Ensure entire SRS operates properly.

When SRS is not activated in a collision:

1. Check the SRS components using the table below:

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

2. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" for details. Ensure entire SRS operates properly.

When only one front air bag module is activated in a collision:

1. Replace the following components:

– Diagnosis sensor unit

– Crash zone sensor

– Activated front air bag and seat belt pre-tensioner.

2. Check the other SRS components using the table below. (Refer to “SRS is NOT activated”.)

– Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

3. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" for details. Ensure entire SRS operates properly.

Only one front air bag may inflate a crash, depending on the crash severity and whether the front occupants are belted or unbelted. This does not indicate improper performance of the system. Perform self-diagnosis to make sure the entire SRS operates properly.

SRS INSPECTION (FOR FRONTAL COLLISION)

Part	SRS is activated	SRS is NOT activated
Driver airbag module	If the Driver airbag has deployed: REPLACE. Install with new fasteners.	If the Driver air bag has NOT been activated: [same text as in current manual]
Passenger front airbag module	If the Passenger front airbag has deployed: REPLACE. Install with new fasteners.	If the Passenger front air bag has NOT been activated: [same text as in current manual]
Crash zone sensor	If any of the front airbags or seat belt pre-tensionsers have been activated: REPLACE the crash zone sensor and bracket with new fasteners.	If the front airbags or seat belt pre-tensionsers have NOT been activated: [same text as in current manual]
Seat belt pre-tensioner assemblies	If the driver or passenger Seat belt pre-tensioner has been activated: REPLACE the seat belt pre-tensioner assemblies with new fasteners.	If the pre-tensioners have NOT been activated: [same text as in current manual]
Diagnosis sensor unit	If any of the SRS components have been activated: REPLACE the Diagnosis sensor unit. Install with new fasteners.	If none of the SRS components have been activated: [same text as in current manual]

Part	SRS is activated	SRS is NOT activated
Steering wheel	[same text as in current manual]	
Spiral cable	If the Driver airbag has deployed: REPLACE the spiral cable.	If the Driver airbag has not deployed: [same text as in current manual]
Harness and connectors	1. Check connectors for poor connection, damage, and terminals for deformities. 2. Check harness for binding, chafing, cuts, or deformities. 3. If no damage is found, reinstall the harness and connectors. 4. If damaged—REPLACE damaged section of harness. Do not repair, splice or modify any SRS harness.	
Instrument panel	1. Visually check instrument panel for damage. 2. If no damage is found, reinstall the instrument panel. 3. If damaged—REPLACE the instrument panel with bolts.	

For Side Collision

NHS00012

WHEN THE SIDE AIR BAG IS ACTIVATED IN THE SIDE COLLISION:

1. Replace the following components:
- All parts of front seatback (including front seatback frame) with front side air bag module (on the side on which front side air bag is activated)
- Curtain air bag module (on the side on which side curtain air bag is activated)
- Diagnosis sensor unit
- Satellite sensor (on the side on which side air bag and side curtain air bag is activated)
2. Check the SRS components and the related parts using the following table.
- Replace any SRS components and the related parts showing visible signs of damage (dents, cracks, deformation).
3. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" . Ensure entire SRS operates properly.

WHEN SRS IS NOT ACTIVATED IN THE SIDE COLLISION:

1. Check the SRS components and the related parts using the following table.
- Replace any SRS components and the related parts showing visible signs of damage (dents, cracks, deformation).
2. Perform self-diagnosis using CONSULT-III or “AIR BAG” warning lamp. Refer to SRS-27, "SRS Operation Check (USER MODE)" . Ensure entire SRS operates properly.

SRS INSPECTION (FOR SIDE COLLISION)

Part	Front side air bag and side curtain air bag is activated	Front side air bag and side curtain air bag is NOT activated
(LH or RH) side curtain air bag module*	REPLACE the side curtain air bag module. (Repair the center pillar inner, etc. before installing new one if damaged.)	1. Check for visible signs of damage (dents, tears, deformation) of the center pillar on the collision side. 2. If damaged— Remove the side curtain air bag module. 3. Check for visible signs of damaged (tears etc.) of the side curtain air bag module. 4. Check harness and connectors for damage, and terminals for deformities. 5. If no damage is found, reinstall the side curtain air bag module with new bolts. 6. If damaged—REPLACE the side curtain air bag module with new bolts.
Front (LH or RH) side air bag module	REPLACE all parts of seatback with deployed front side air bag module.	1. Check for visible signs of damage (dents, tears, deformation) of the seat back on the collision side. 2. Check harness and connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall the front seatback assembly. 4. If damaged—REPLACE the front seatback assembly.
(LH or RH) side air bag (Satellite) sensor	REPLACE the side air bag (Satellite) sensor on the collision side with new nuts. (Repair the center pillar inner, etc. before installing new one if damaged.)	1. Remove the side air bag (Satellite) sensor on the collision side. Check harness connectors for damage, terminals for deformities, and harness for binding. 2. Check for visible signs of damage (dents, cracks, deformation) of the side air bag (Satellite) sensor. 3. Install the side air bag (Satellite) sensor to check fit. 4. If no damage is found, reinstall the side sir bag (Satellite) sensor with new nuts. 5. If damaged—REPLACE the side air bag (Satellite) sensor with new nuts.
Diagnosis sensor unit	REPLACE the diagnosis sensor unit with the new bolts.	1. Check case and bracket for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall the diagnosis sensor unit with new bolts and ground bolt. 4. If damaged—REPLACE the diagnosis sensor unit with new bolts and ground bolt.

Part	Front side air bag and side curtain air bag is activated	Front side air bag and side curtain air bag is NOT activated
Seat belt pre-tensioner assembly	1. Check if the seat belt can be extended smoothly. If the seat belt cannot be extended smoothly, – Check for deformities of the center pillar inner. – If the center pillar inner has no damage, REPLACE the seat belt pre-tensioner assembly. 2. Remove the seat belt pre-tensioner assembly on the collision side. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 3. Check for visible signs of damage (dents, cracks, deformation) of the seat belt pre-tensioner assembly. 4. Check seat belt adjuster for damage. 5. If no damage is found, reinstall the seat belt pre-tensioner assembly. 6. If damaged—REPLACE the seat belt pre-tensioner assembly with new bolts.	
Seat with front side air bag	REPLACE all parts of front seatback (including front seatback frame)	1. Visually check the seat on the collision side. 2. Remove the seat on the collision side and check the following for damage and deformities. – Harness, connectors and terminals – Frame and recliner (for front and rear seat), and also adjuster and slides (for front seat) 3. If no damage is found, reinstall the seat. 4. If damaged—REPLACE the damaged seat parts using new bolts.
Center inner pillar	1. Check the center inner pillar on the collision side for damage (dents, cracks, deformation). 2. If damaged—REPAIR the center inner pillar.	
Trim/headlining*	1. Check for visible signs of damage (dents, cracks, deformation) of the interior trim on the collision side. 2. If damaged—REPLACE the damaged trim parts.	

*: For coupe

SECTION WT
ROAD WHEELS & TIRES

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DIAGNOSTIC PROCEDURE 33
Warning Lamp Blinks When Ignition Switch Is

Turned On 35
DIAGNOSTIC PROCEDURE 35
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PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NES000LO

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Battery Service

NES000LP

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Service Notice or Precautions

NES000LQ

- Low tire pressure warning lamp flashes 1min., then turns ON when occurring any malfunction except low tire pressure.
  Delete the memory with CONSULT-III, or register the ID to turn low tire pressure warning lamp OFF. Refer to WT-21, "ID Registration Procedure" .
- ID registration is required when replacing or rotating wheels. replacing transmitter or BCM. Refer to WT-21, "ID Registration Procedure" .
- Replace grommet seal, valve core and cap of the transmitter in TPMS every tire replacement by reaching wear limit of tire.

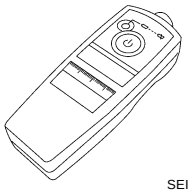
PREPARATION

PFP:00002

Special Service Tools

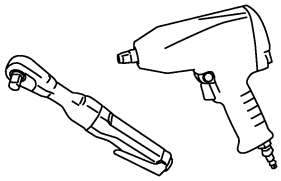
NES00014

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
(J-45295) Transmitter activation tool  SEIA0462E	ID registration

Commercial Service Tools

NES00015

Tool name	Description
Power tool  PBIC0190E	Removing wheel nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

NES00016

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

			Reference page	FAX-4,FSU-5	WT-6	—	—	—	—	—	—	NVH in PR section.	NVH in RFD section.	NVH in FAX and FSU sections.	NVH in RAX and RSU sections.	Refer to TIRES in this chart.	Refer to ROAD WHEEL in this chart.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
			Possible cause and SUSPECTED PARTS	Improper installation, looseness	Out-of-round	Imbalance	Incorrect tire pressure	Uneven tire wear	Deformation or damage	Non-uniformity	Incorrect tire size	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	REAR AXLE AND REAR SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	TIRES	Noise		×	×	×	×	×	×	×		×	×	×	×		×	×	×	×
		Shake		×	×	×	×	×	×		×	×		×	×		×	×	×	×
		Vibration					×				×	×		×	×			×		×
		Shimmy		×	×	×	×	×	×	×	×			×	×		×		×	×
		Judder		×	×	×	×	×	×		×			×	×		×		×	×
		Poor quality ride or handling		×	×	×	×	×	×		×			×	×		×			
	ROAD WHEEL	Noise		×	×	×			×			×	×	×	×	×		×	×	×
		Shake		×	×	×			×			×		×	×	×		×	×	×
		Shimmy, judder		×	×	×			×					×	×	×			×	×
		Poor quality ride or handling		×	×	×			×					×	×	×				

×: Applicable

ROAD WHEEL

PFP:40300

Inspection

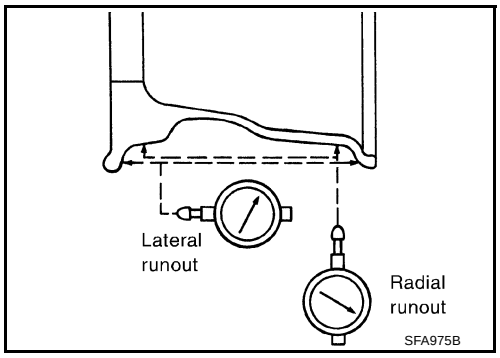
NES00017

ALUMINUM WHEEL

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.

a. Remove tire from aluminum wheel and mount on a tire balance machine.

b. Set dial indicator as shown in the figure.



Wheel runout (Dial indicator value):

Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

STEEL WHEEL

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.

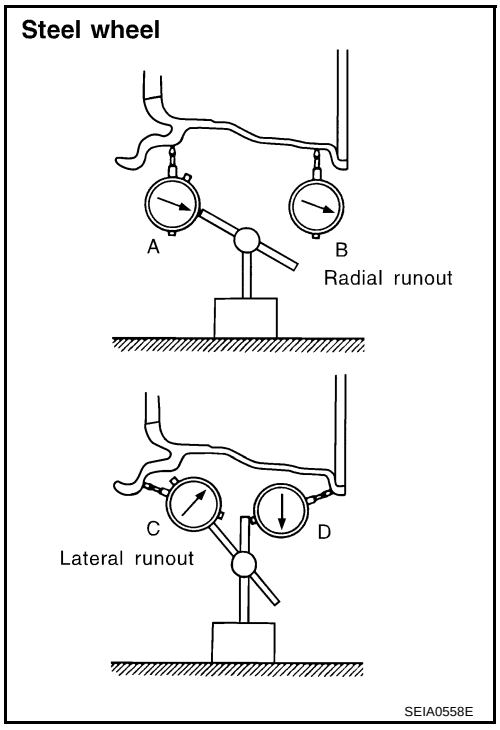
a. Remove tire from steel wheel and mount wheel on a tire balance machine.

b. Set two dial indicators as shown in the figure.

c. Set each dial indicator to 0.

d. Rotate wheel and check dial indicators at several points around the circumference of the wheel.

e. Calculate runout at each point as shown below.



Radial runout = (A+B)/2

Lateral runout = (C+D)/2

f. Select maximum positive runout value and the maximum negative value.
Add the two values to determine total runout.
In case a positive or negative value is not available, use the maximum value (negative or positive) for total runout.
If the total runout value exceeds the limit, replace steel wheel.

Wheel runout:

Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

ROAD WHEEL TIRE ASSEMBLY

PFP:40300

Balancing Wheels (Bonding Weight Type)

NES00018

REMOVAL

1. Remove inner and outer balance weights from the road wheel.

   CAUTION:
   Be careful not to scratch the road wheel during removal.

2. Using releasing agent, remove double-faced adhesive tape from the road wheel.

   CAUTION:
   - **Be careful not to scratch the road wheel during removal.**
   - **After removing double-faced adhesive tape, wipe clean traces of releasing agent from the road wheel.**

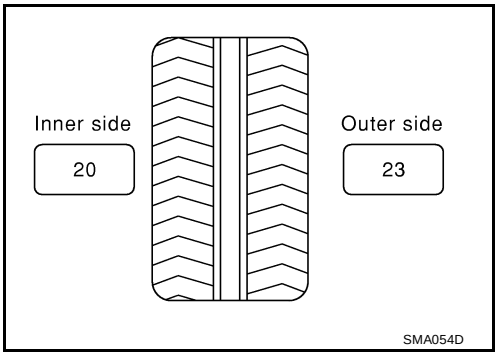
WHEEL BALANCE ADJUSTMENT

- If a tire balance machine has adhesion balance weight mode settings and drive-in weight mode setting, select and adjust a drive-in weight mode suitable for road wheels.

1. Set road wheel on wheel balancer using the center hole as a guide. Start the tire balance machine.
2. When inner and outer unbalance values are shown on the wheel balancer indicator, multiply outer unbalance value by 5/3 to determine balance weight that should be used. Select the outer balance weight with a value closest to the calculated value above and install it to the designated outer position of, or at the designated angle in relation to the road wheel.

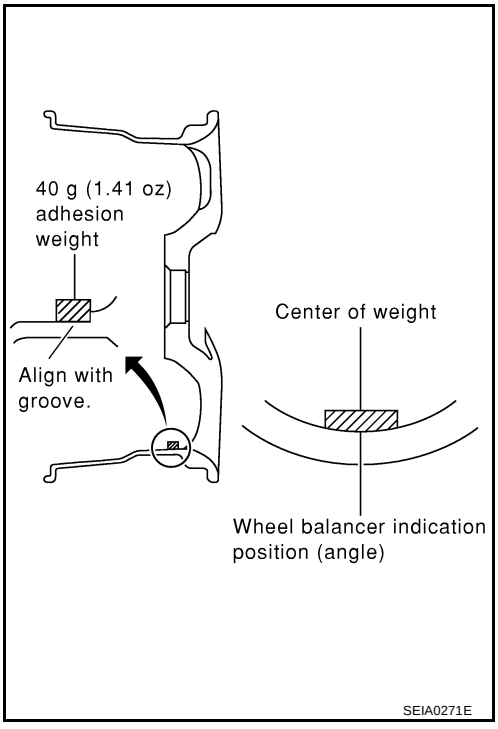
   CAUTION:
   - **Do not install the inner balance weight before installing the outer balance weight.**
   - **Before installing the balance weight, be sure to clean the mating surface of the road wheel.**

   Indicated unbalance value × 5/3 = balance weight to be installed
   Calculation example:
   23 g (0.81 oz) × 5/3 = 38.33 g (1.35 oz) = 40 g (1.41 oz) balance weight (closer to calculated balance weight value)
   Note that balance weight value must be closer to the calculated balance weight value.
   Example:
   37.4 = 35 g (1.23 oz)
   37.5 = 40 g (1.41 oz)



   a. Install balance weight in the position shown in the figure.
   b. When installing balance weight to road wheels, set it into the grooved area on the inner wall of the road wheel as shown in the figure so that the balance weight center is aligned with the tire balance machine indication position (angle).

   CAUTION:
   - **Always use genuine NISSAN adhesion balance weights.**
   - **Balance weights are unreusable; always replace with new ones.**
   - **Do not install more than three sheets of balance weight.**



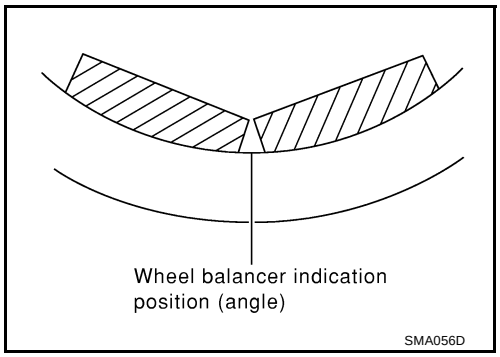
c. If calculated balance weight value exceeds 50 g (1.76 oz), install two balance weight sheets in line with each other (as shown in the figure).

CAUTION:
Do not install one balance weight sheet on top of another.

3. Start tire balance machine again.
4. Install drive-in balance weight on inner side of road wheel in the tire balance machine indication position (angle).

CAUTION:
Do not install more than two balance weights.

5. Start tire balance machine. Make sure that inner and outer residual unbalance values are 5 g (0.17 oz) each or below.
   - If either residual unbalance value exceeds 5 g (0.17 oz), repeat installation procedures.



Wheel balance (Maximum allowable unbalance):

Maximum allowable unbalance	Dynamic (At rim flange)	5 g (0.17 oz) (one side)
	Static (At rim flange)	10 g (0.35 oz)

Tire Rotation

NES00019

CAUTION:
- **Do not include the T-type spare tire when rotating the tires.**
- **Use NISSAN genuine wheel nuts for aluminum wheels.**

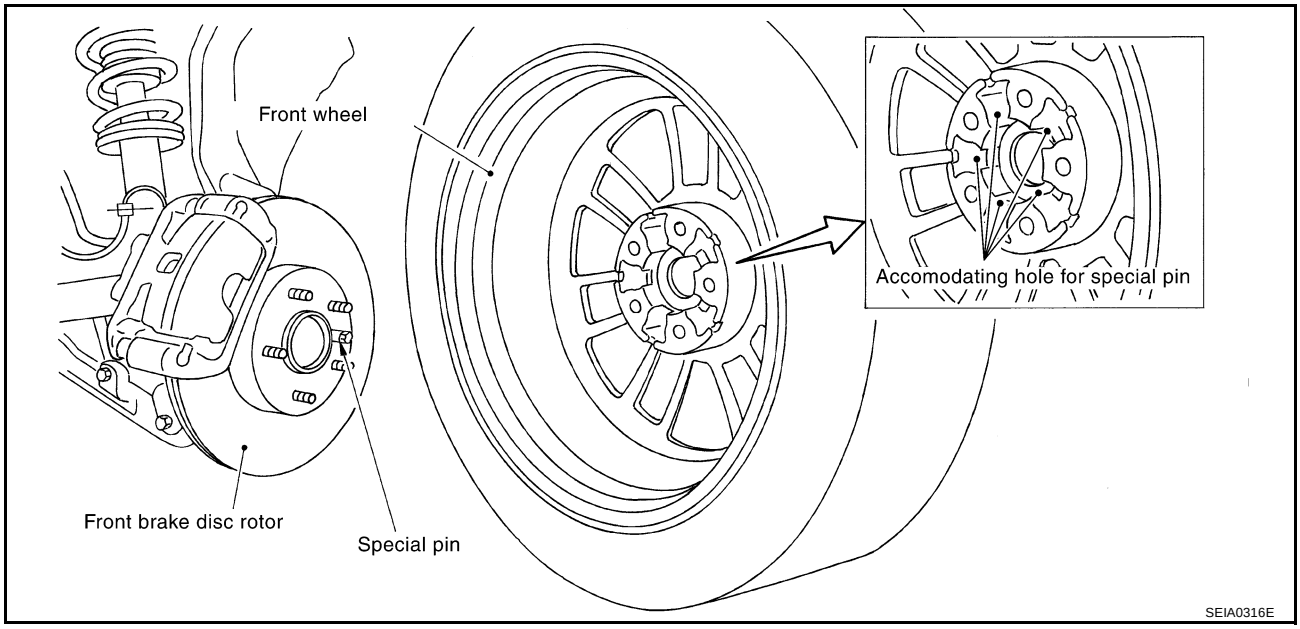
NOTE:
Tire cannot be rotated in vehicle, as front tire are different size from rear tire and the direction of wheel rotation is fixed in each tire.

DESCRIPTION

Safety Device Preventing from Being Incorrectly Installed

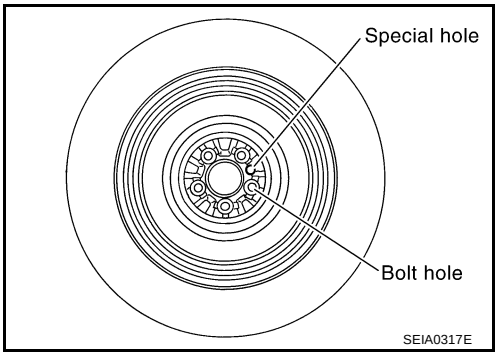
Front brake disc rotor and front wheel

- Front and rear wheel size for this model differs, therefore a special pin has been installed on the front brake disc rotor. To accommodate this pin a hole has been provided on the front wheel (the rear wheel does not have this hole.) and in some case the rear wheel is being mistakenly installed on the front.



T-type spare tire wheel

- T-type spare tire wheel for this model has a special hole designed to avoid the pin on front disc rotor.

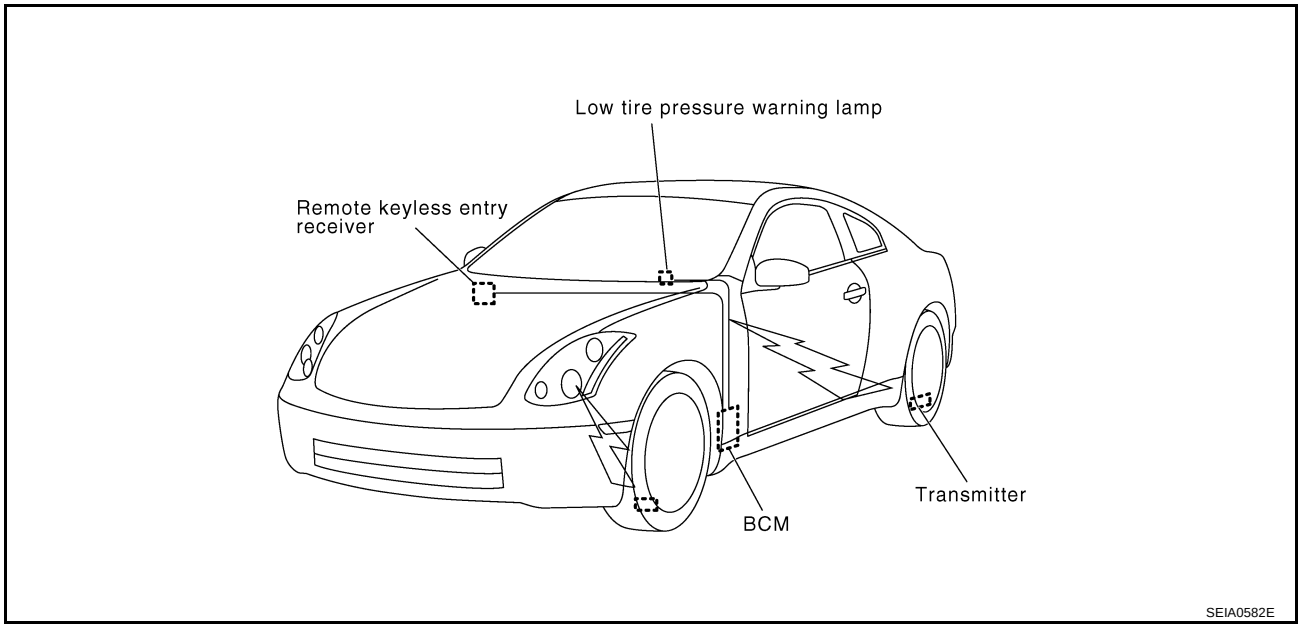


TIRE PRESSURE MONITORING SYSTEM

PFP:40300

System Components

NES0001A



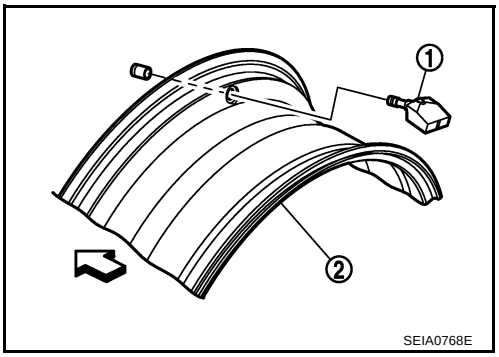
System Description

NES0001B

TRANSMITTER

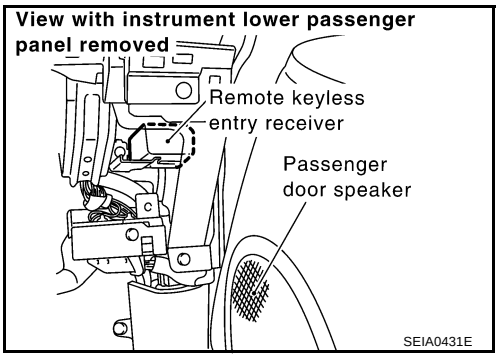
A sensor-transmitter (1) integrated with a valve is installed on a wheel (2), and transmits a detected air pressure signal in the form of a radio wave.

⇦ : Outside



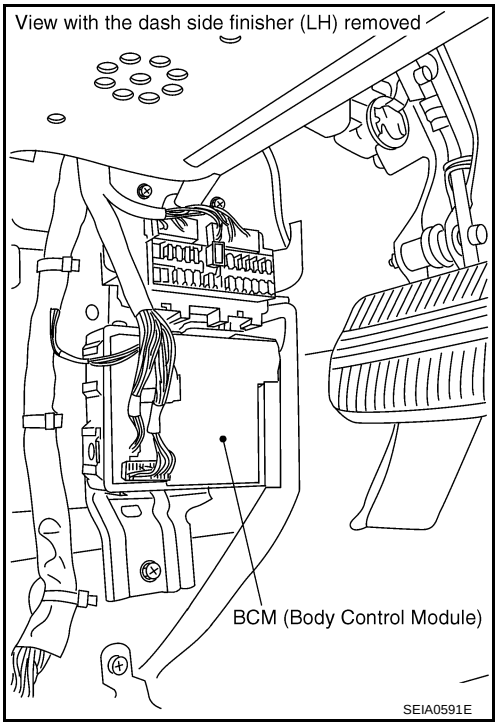
REMOTE KEYLESS ENTRY RECEIVER

The remote keyless entry receiver receives the air pressure signal transmitted by the transmitter in each wheel.



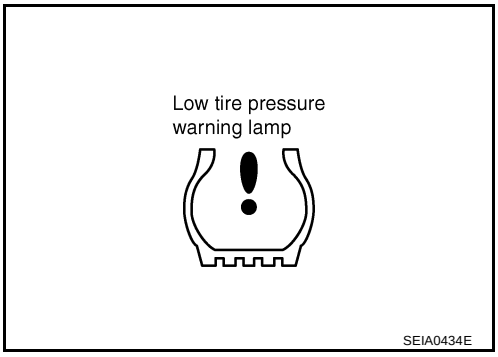
BCM (BODY CONTROL MODULE)

The BCM reads the air pressure signal received by the remote keyless entry receiver, and controls the low tire pressure warning lamp operations. It also has a judgement function to detect a system malfunction.



LOW TIRE PRESSURE WARNING LAMP

The combination meter receives tire pressure status from the BCM using CAN communication. When a low tire pressure condition is sensed by the BCM, the combination meter low tire pressure warning lamp are activated.



Low tire pressure warning lamp indication

Condition	Low tire pressure warning lamp
Less than 190 kPa (1.90 kg/cm^2 , 28 psi) [Note]	ON
Low tire pressure warning system malfunction [Other diagnostic item]	Warning lamp flashes 1 min, then turns ON.

NOTE:

Standard air pressure is for 240 kpa (2.4 kg/cm^2 , 35 psi) vehicles.

Can Communication

NES000A0

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-49, "CAN Communication Signal Chart" .

TROUBLE DIAGNOSIS

PFP:00004

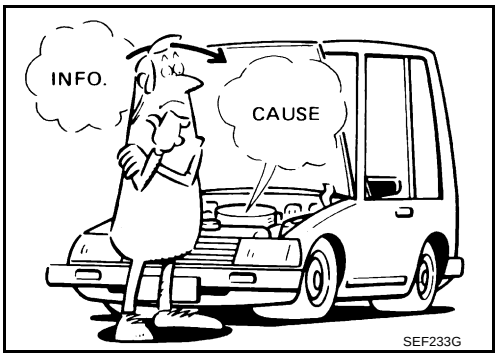
How to Perform Trouble Diagnosis

NES000AF

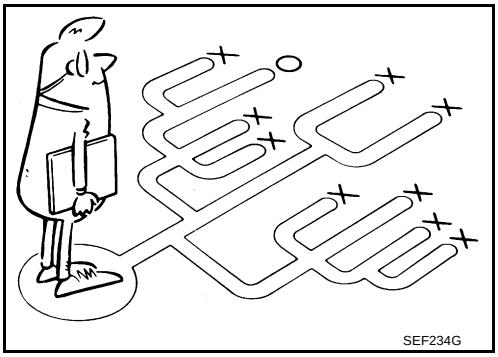
BASIC CONCEPT

- To perform trouble diagnosis, it is the most important to have understanding about vehicle systems (control and mechanism) thoroughly.
- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptoms, and understand them fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptoms by driving vehicle with customer.

  CAUTION:
  Customers are not professional. It is dangerous to make an easy guess like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.



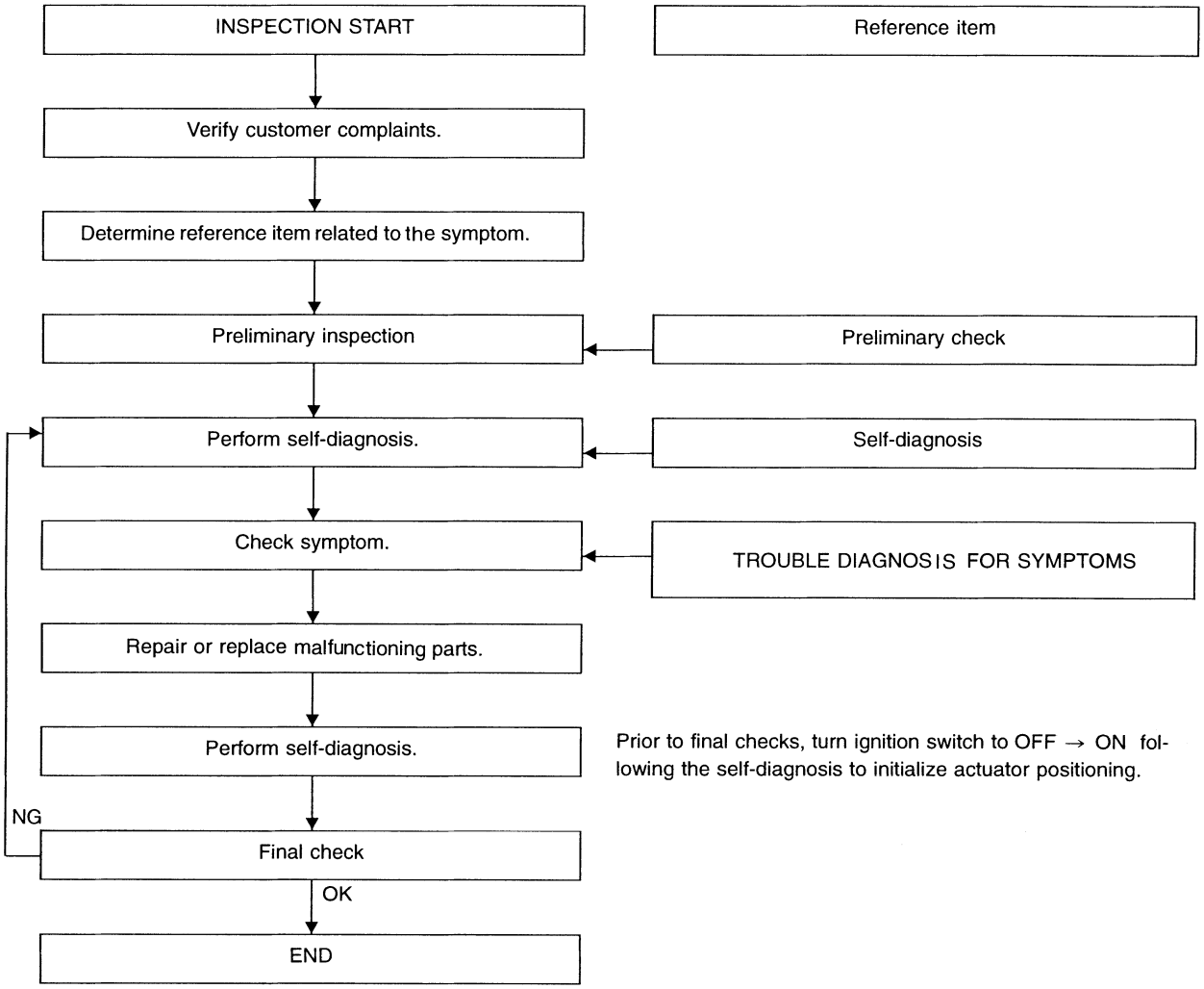
- It is essential to check symptoms right from the beginning in order to repair malfunctions completely.
  For intermittent malfunctions, reproduce symptoms based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairing without any symptom diagnosis, you cannot judge if malfunctions have actually been eliminated.
- After completing diagnosis, always erase diagnostic memory.
- For intermittent malfunctions, move harness or harness connector by hand. Then check for poor contact or reproduced open circuit.



INTRODUCTION

- Before troubleshooting, verify customer complaints.
- If a vehicle malfunction is difficult to reproduce, harnesses, harness connectors or terminals may be malfunctioning. Hold and shake these parts to make sure they are securely connected.
- When using a circuit tester to measure voltage or resistance of each circuit, be careful not to damage or deform connector terminals.

WORK FLOW

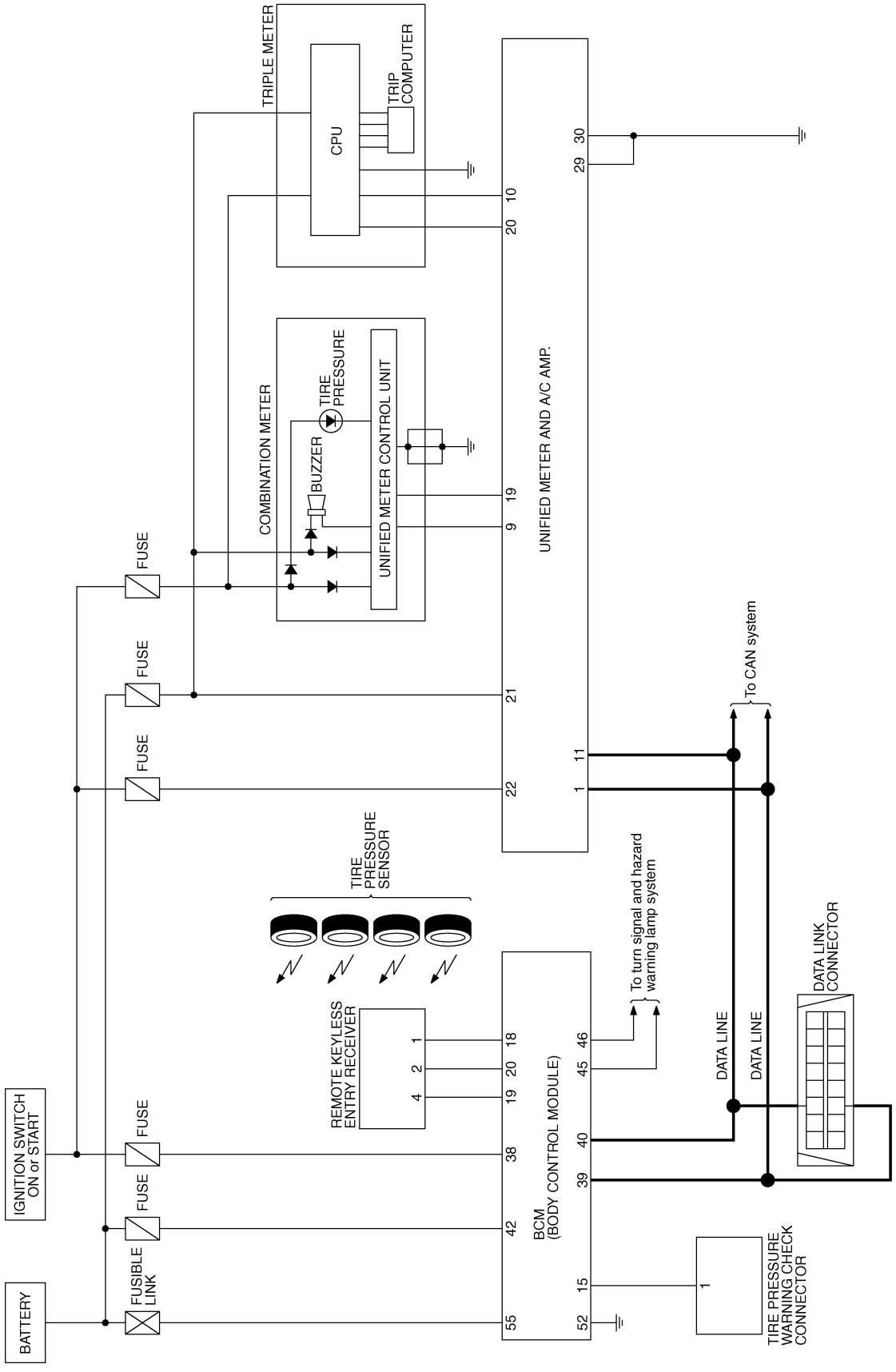


SEIA0100E

Preliminary check: WT-29 Self-diagnosis: WT-23 Trouble diagnosis for symptoms: WT-33

Schematic

NES0001D

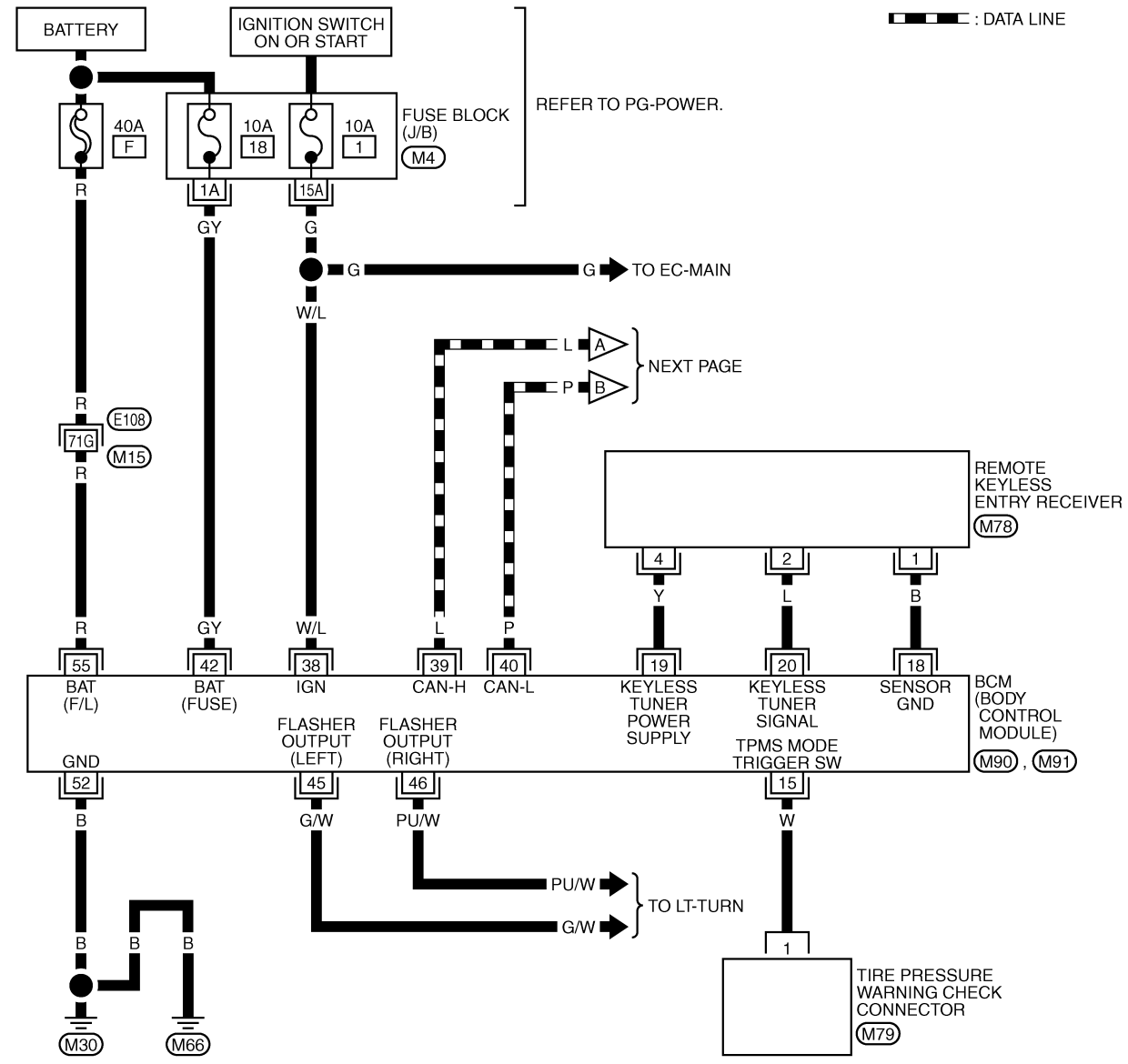


TEWT0020E

Wiring Diagram — T/WARN —

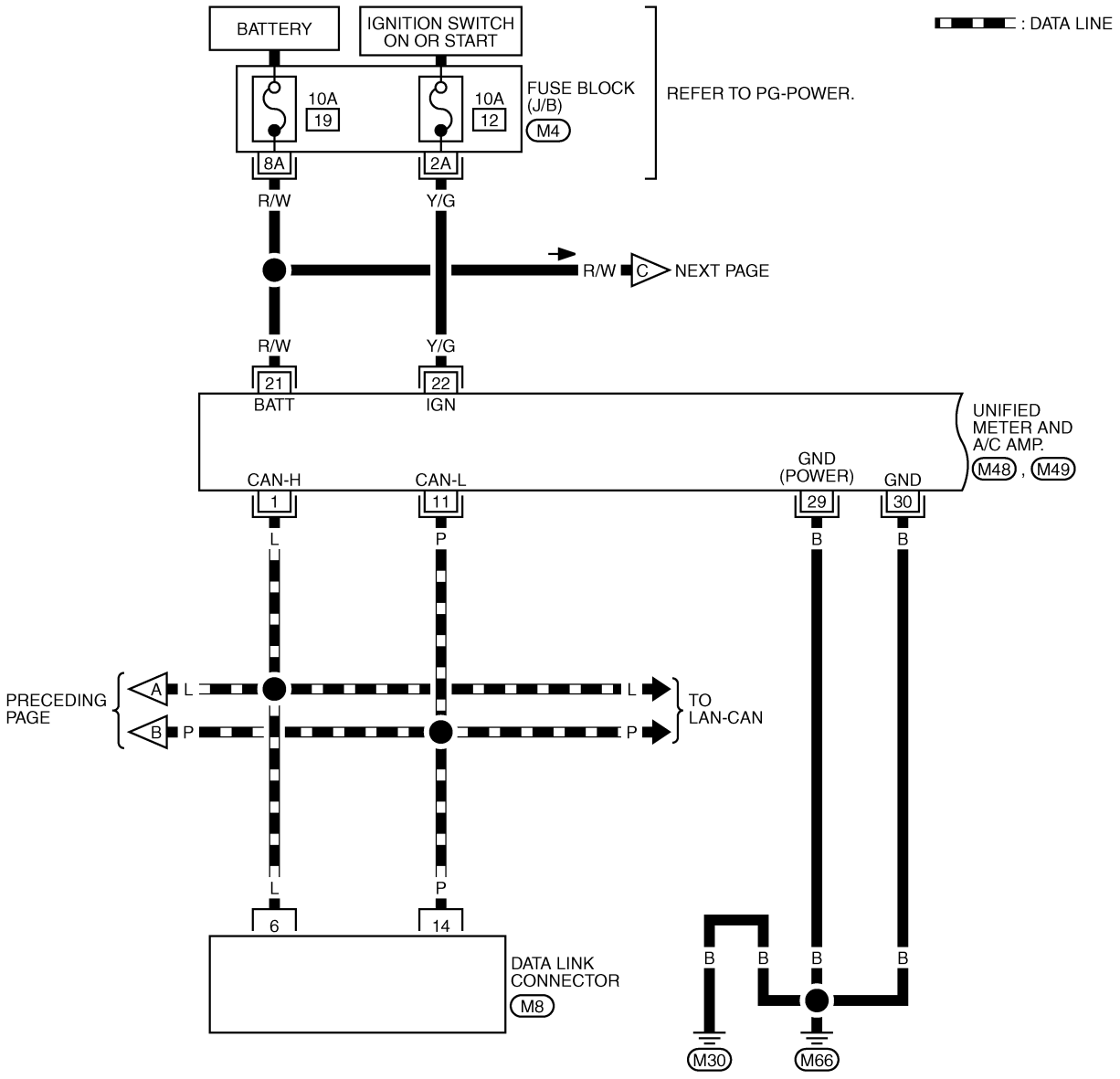
NES0001E

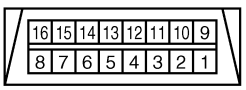
WT-T/WARN-01

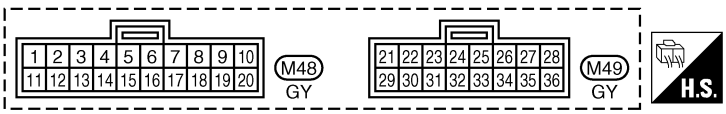


TEWT0056E

WT-T/WARN-02



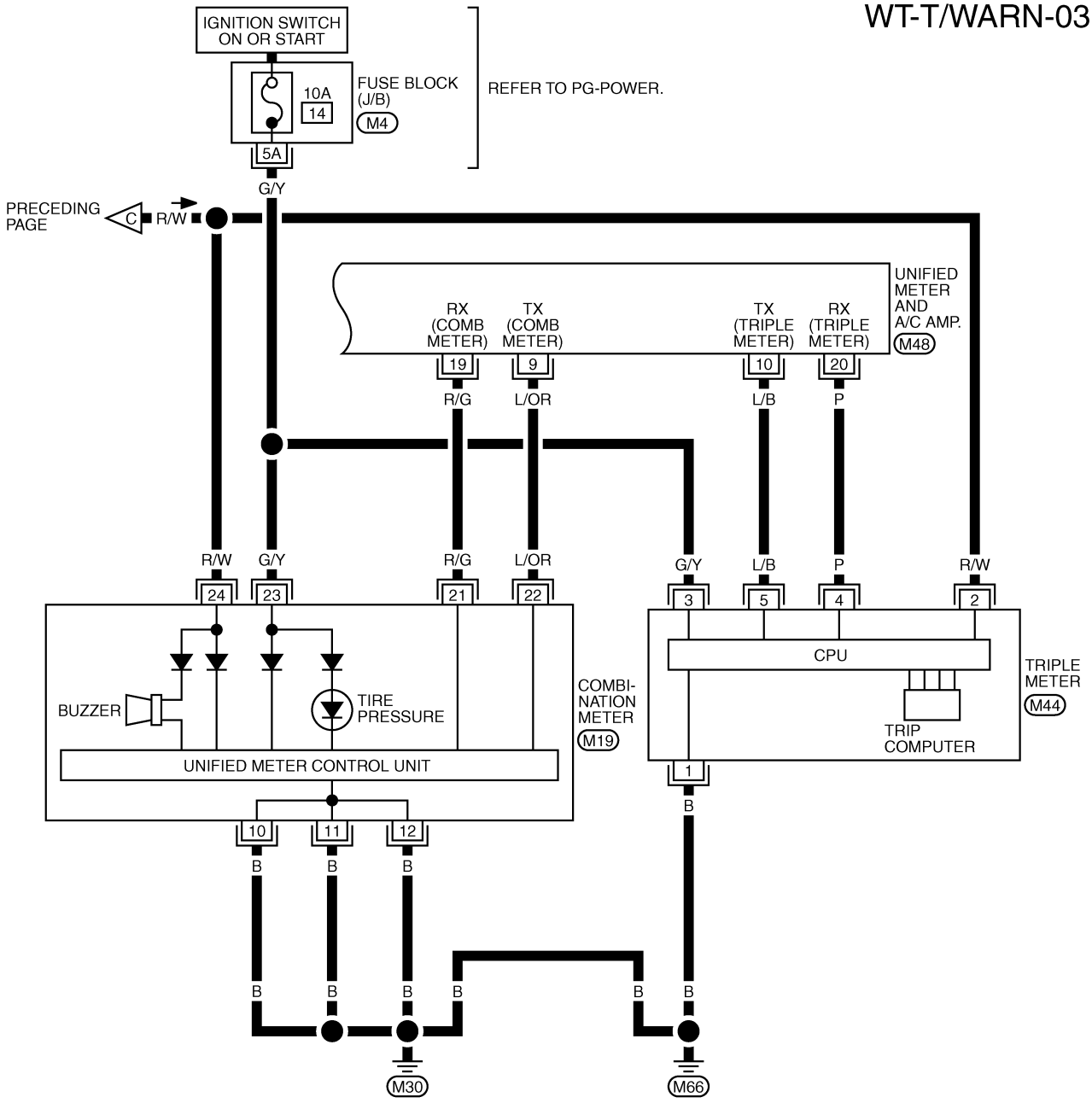


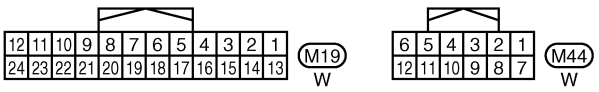


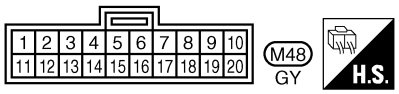
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TEWT0022E

WT-T/WARN-03







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TEWT0023E

Trouble Diagnosis Chart for Symptoms

NES000A1

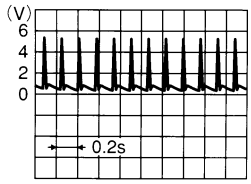
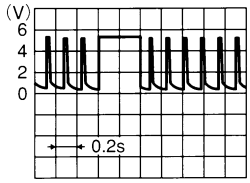
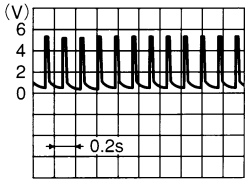
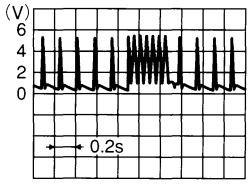
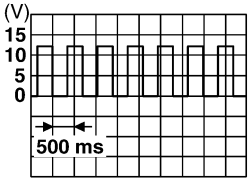
If low tire pressure warning lamp turns ON, perform self-diagnosis. Refer to WT-23, "SELF-DIAG RESULTS MODE" .

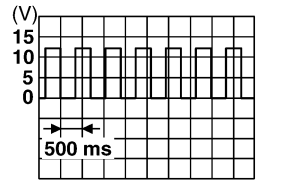
Symptom	Check item	Reference page
Warning lamp does not come on when ignition switch is turned on.	CAN communication line	WT-33
	Combination meter	
	BCM	
Warning lamp stays on when ignition switch is turned on.	ID registration	WT-33
	BCM connector or circuit	
	BCM	
Warning lamp blinks when ignition switch is turned on.	BCM connector or circuit	WT-35
	BCM	
Turn signal lamp blinks when ignition switch is turned on.	BCM connector or circuit	WT-36
	BCM	
ID registration can not be operated.	Transmitter	WT-36
	Remote keyless entry receiver connector or circuit	
	Remote keyless entry receiver	
	BCM connector or circuit	
	BCM	

Control Unit Input/Output Signal Standard

NES0001F

Standards using a circuit tester and oscilloscope

Terminal (Wire color)	Item	Condition	Voltage (V) Approx. value
15 (W)	Tire pressure warning check connector	Always	5V
18 (B)	Remote keyless entry receiver (Ground)	—	0V
19 (Y)	Remote keyless entry receiver (Power supply)	Stand-by	 OCC3879D
		Press any of the keyfob switches	 OCC3882D
20 (L)	Remote keyless entry receiver (Signal)	Stand-by	 OCC3881D
		Press any of the keyfob switches	 OCC3880D
38 (W/L)	Ignition switch	Ignition switch ON or START	Battery voltage (12V)
39 (L)	Data line (CAN H)	—	—
40 (P)	Data line (CAN L)	—	—
42 (GY)	Battery power supply (Fuse)	Always	Battery voltage (12V)
45 (G/W)	Turn signal (left)	● Ignition switch ON ● Combination switch is turn left ON	 SKIA3009J

Terminal (Wire color)	Item	Condition	Voltage (V) Approx. value
46 (PU/W)	Turn signal (right)	● Ignition switch ON ● Combination switch is turn right ON	 SKIA3009J
52 (B)	GND	—	0V
55 (R)	Battery power supply (F/L)	Always	Battery voltage (12V)

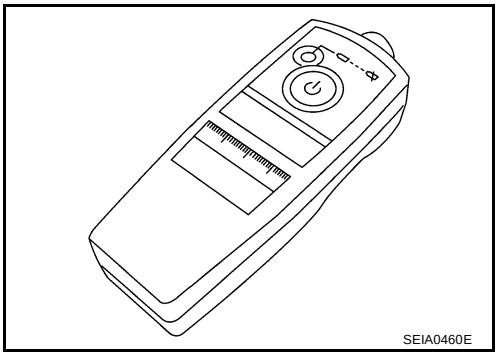
ID Registration Procedure

NES0001G

ID REGISTRATION WITH ACTIVATION TOOL

This procedure must be done after replacing or rotating wheels, replacing transmitter or BCM.

1. Select “AIR PRESSURE MONITOR” on “SELECT WORK ITEM”.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen, and select “ID REGIST”.
3. With the activation tool (J-45295) pushed against the front-left transmitter position of the tire air valve, press the button then keep 5 seconds.
4. Register the IDs in order from FR LH, FR RH, RR RH to RR LH. When ID registration of each wheel has been completed, a buzzer sounds and turn signal lamp (LH/ RH) blinks.


SEIA0460E

Activation tire position		Buzzer	Turn signal lamp	CONSULT-III
1	Front LH	Once	2 times flashing	“Red” ↓ “Green”
2	Front RH	2 times		
3	Rear RH	3 times		
4	Rear LH	4 times		

5. After completing all ID registrations, press “END” to complete the procedure.

NOTE:
Be sure to register the IDs in order from FR LH, FR RH, RR RH, to RR LH, or the self-diagnostic results display will not function properly.

ID REGISTRATION WITHOUT ACTIVATION TOOL

This procedure must be done after replacing or rotating wheels, replacing transmitter or BCM.

1. Select “AIR PRESSURE MONITOR” on “SELECT WORK ITEM”.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen, and select “ID REGIST”.
3. Adjust the tire pressure to the values shown in the table below for ID registration, and drive the vehicle at 40 km/h (25 MPH) or more for a few minutes.

Tire position	Tire pressure kPa (kg/cm^2 , psi)
Front – Left	240 (2.4, 34)
Front – Right	220 (2.2, 31)
Rear – Right	200 (2.0, 29)
Rear – Left	180 (1.8, 26)

4. After completing all ID registrations, press “END” to complete the procedure.

Activation tire position	CONSULT-III
Front LH	“Red” ↓ “Green”
Front RH	
Rear RH	
Rear LH	

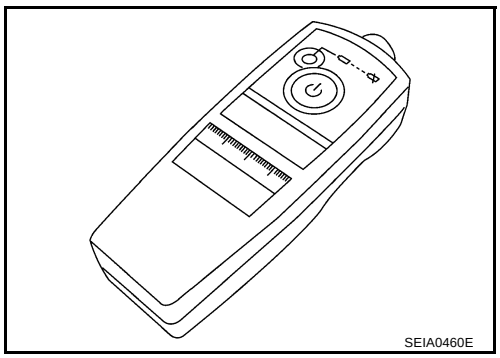
5. Inflate all tires to proper pressure. Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

Transmitter Wake Up Operation

NES0001H

WITH ACTIVATION TOOL

1. With the activation tool (J-45295) pushed against the front-left transmitter, press the button for 5 seconds.
   - When ignition switch ON, as the low tire pressure warning lamp blinks per the follow diagram, the respective transmitter then must be woken up.



Warning lamp blinking timing	Need to activation tire position
ON / OFF: a, b — a : 0.3sec, b : 1.3sec	Front LH
ON / OFF: a, a, a, b — a : 0.3sec, b : 1.3sec	Front RH
ON / OFF: a, a, a, a, b — a : 0.3sec, b : 1.3sec	Rear RH
ON / OFF: a, a, a, a, a, b — a : 0.3sec, b : 1.3sec	Rear LH
ON / OFF: a, b — a : 2sec, b : 0.2sec	All tire

SEIA0378E

2. Register the ID of wheel that warning lamp flashes. When wake up of registered wheel has been completed, turn signal lamp flashes two times.
3. After completing wake up of all transmitters, make sure low tire pressure warning lamp goes out.

CONSULT-III Function (BCM)

NES000DL

CONSULT-III MAIN FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnosis part	Mode	Function
Air pressure monitor	Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
	Self-diagnostic results	Self-diagnostic results can be read and erased quickly.
	Data monitor	Input/Output data in the control unit can be read.
	Active test	Diagnostic Test Mode in with CONSULT-III drives some actuators apart from the control unit (BCM) and also shifts some parameters in a specified range.

WORK SUPPORT MODE

ID Read

The registered ID number is displayed.

ID Regist

Refer to WT-21, "ID Registration Procedure" .

SELF-DIAG RESULTS MODE

Display Item List

DTC	Diagnostic item	Diagnostic item is detected when …	Check items
C1704	FLAT_TIRE_FL	Front-left tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	—
C1705	FLAT_TIRE_FR	Front-right tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
C1706	FLAT_TIRE_RR	Rear-right tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
C1707	FLAT_TIRE_RL	Rear-left tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
C1708	[NO_DATA]_FL	Data from front-left transmitter cannot be received.	WT-30
C1709	[NO_DATA]_FR	Data from front-right transmitter cannot be received.	
C1710	[NO_DATA]_RR	Data from rear-right transmitter cannot be received.	
C1711	[NO_DATA]_RL	Data from rear-left transmitter cannot be received.	
C1712	[CHECKSUM_ERR]_FL	Checksum data from front-left transmitter is malfunctioning.	WT-30
C1713	[CHECKSUM_ERR]_FR	Checksum data from front-right transmitter is malfunctioning.	
C1714	[CHECKSUM_ERR]_RR	Checksum data from rear-right transmitter is malfunctioning.	
C1715	[CHECKSUM_ERR]_RL	Checksum data from rear-left transmitter is malfunctioning.	
C1716	[PRESSDATA_ERR]_FL	Air pressure data from front-left transmitter is malfunctioning.	WT-31
C1717	[PRESSDATA_ERR]_FR	Air pressure data from front-right transmitter is malfunctioning.	
C1718	[PRESSDATA_ERR]_RR	Air pressure data from rear-right transmitter is malfunctioning.	
C1719	[PRESSDATA_ERR]_RL	Air pressure data from rear-left transmitter is malfunctioning.	
C1720	[CODE_ERROR]_FL	Function code data from front-left transmitter is malfunctioning.	WT-30
C1721	[CODE_ERROR]_FR	Function code data from front-right transmitter is malfunctioning.	
C1722	[CODE_ERROR]_RR	Function code data from rear-right transmitter is malfunctioning.	
C1723	[CODE_ERROR]_RL	Function code data from rear-left transmitter is malfunctioning.	
C1724	[BATT_VOLT_LOW]_FL	Battery voltage of front-left transmitter drops.	WT-30
C1725	[BATT_VOLT_LOW]_FR	Battery voltage of front-right transmitter drops.	
C1726	[BATT_VOLT_LOW]_RR	Battery voltage of rear-right transmitter drops.	
C1727	[BATT_VOLT_LOW]_RL	Battery voltage of rear-left transmitter drops.	
C1729	VHCL_SPEED_SIG_ERR	Vehicle speed signal is error.	WT-32

NOTE:
Before performing the self-diagnosis, be sure to register the ID, or else the actual malfunction location may be different from that displayed on CONSULT-III.

DATA MONITOR MODE

Display Item List

Monitor item (Unit)	Remarks
VEHICLE SPEED [km/h] or [mph]	Vehicle speed is displayed.
AIR PRESS FL [kpa] or [psi]	Tire pressure is displayed.
AIR PRESS FR [kPa] or [psi]	Tire pressure is displayed.
AIR PRESS RR [kpa] or [psi]	Tire pressure is displayed.
AIR PRESS RL [kpa] or [psi]	Tire pressure is displayed.
ID REGST FL 1 [DONE/YET]	Registration ID is displayed.
ID REGST FR 1 [DONE/YET]	Registration ID is displayed.
ID REGST RR 1 [DONE/YET]	Registration ID is displayed.
ID REGST RL 1 [DONE/YET]	Registration ID is displayed.
WARNING LAMP [ON/OFF]	Control status of low tire pressure warning lamp is displayed.
BUZZER [ON/OFF]	Buzzer in combination meter is displayed.

ACTIVE TEST MODE

NOTE:

Before performing the self-diagnosis, be sure to register the ID, or else the actual malfunction location may be different from that displayed on CONSULT-III.

TEST ITEM LIST

Test item	Content
FLASHER	This test is able to check to make sure that each turn signal lamp turns on.
HORN	This test is able to check to make sure that the horn sounds.
WARNING LAMP	This test is able to check to make sure that the warning lamp turns on.
ID REGIST WARNING	This test is able to check to make sure that the buzzer sounds or the warning lamp turns on.
FLAT TIRE WARNING	This test is able to check to make sure that the buzzer sounds or the warning lamp turns on.

Diagnosis Procedure with Warning Lamp Function (Without CONSULT-III)

NES000A4

DESCRIPTION

During driving, the low tire pressure warning system receives the signal transmitted from the transmitter installed in each wheel. The control unit (BCM) of this system has pressure judgement and trouble diagnosis functions.

FUNCTION

When the low tire pressure warning system detects low inflation pressure or another unusual symptom, the warning lamps in the combination meter comes on. To start the self-diagnostic results mode, ground terminal of the tire pressure warning check connector. The malfunction location is indicated by the warning lamp flashing. Refer to PG-41, "HARNESS" .

MALFUNCTION CODE CHART

Code (warning lamp blinks)	Diagnosis item	Reference
15	Front-left tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	—
16	Front-right tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
17	Rear-right tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
18	Rear-left tire pressure drops to 190 kPa (1.90 kg/cm^2 , 28 psi) or less.	
21	Transmitter no data (front - left)	WT-30
22	Transmitter no data (front - right)	
23	Transmitter no data (rear - right)	
24	Transmitter no data (rear - left)	
31	Transmitter checksum error (front - left)	WT-30
32	Transmitter checksum error (front - right)	
33	Transmitter checksum error (rear - right)	
34	Transmitter checksum error (rear - left)	
35	Transmitter pressure data error (front - left)	WT-31
36	Transmitter pressure data error (front - right)	
37	Transmitter pressure data error (rear - right)	
38	Transmitter pressure data error (rear - left)	
41	Transmitter function code error (front - left)	WT-30
42	Transmitter function code error (front - right)	
43	Transmitter function code error (rear - right)	
44	Transmitter function code error (rear - left)	
45	Transmitter battery voltage low (front - left)	WT-30
46	Transmitter battery voltage low (front - right)	
47	Transmitter battery voltage low (rear - right)	
48	Transmitter battery voltage low (rear - left)	
52	Vehicle speed signal	WT-32

LOW TIRE PRESSURE WARNING LAMP SYMPTOM CHART

Diagnosis Item	Symptom (Ignition switch ON)	Low tire pressure warning lamp	Cause	Action
Low tire pressure warning lamp	Warning light comes on immediately and turns off after 1 second.	 ON 1 sec > stays OFF SEIA0592E	All wheel transmitters are “activated” (working).	None (system OK)
	Warning light blinks on for 2 seconds, then turns off for 0.2 seconds-repeats.	 Blinks: ON 2 sec > OFF 0.2 sec SEIA0593E	All wheel transmitters are not activated.	Activate all wheel transmitters. Refer to WT-22, "Transmitter Wake Up Operation" .
	Warning light blinks 1 time.	 Blinks 1 time ON 0.3 sec > OFF 1.0 sec PEIA0073E	Front LH wheel transmitter is not activated.	Activate front LH wheel transmitter. Refer to WT-22, "Transmitter Wake Up Operation" .
	Warning light blinks 2 times.	 Blinks 2 times ON 0.3 sec > OFF 0.3 sec SEIA0595E	Front RH wheel transmitter is not activated.	Activate front RH wheel transmitter. Refer to WT-22, "Transmitter Wake Up Operation" .
	Warning light blinks 3 times.	 Blinks 3 times ON 0.3 sec > OFF 0.3 sec SEIA0596E	Rear RH wheel transmitter is not activated.	Activate rear RH wheel transmitter. Refer to WT-22, "Transmitter Wake Up Operation" .

Diagnosis Item	Symptom (Ignition switch ON)	Low tire pressure warning lamp	Cause	Action
Low tire pressure warning lamp	Warning light blinks 4 times.	 Blinks 4 times ON 0.3 sec > OFF 0.3 sec SEIA0597E	Rear LH wheel transmitter is not activated.	Activate rear LH wheel transmitter. Refer to WT-22, "Transmitter Wake Up Operation" .
	Warning light comes on and does not turn off.	 Comes ON and stays ON SEIA0598E	Tire pressure is low.	Check tire pressure with CONSULT-III. Refer to WT-24, "DATA MONITOR MODE" .
			The fuse for combination meter from battery is pulled out.	Check the fuse for combination meter from battery. Install or replace (if needed).
			BCM connector pulled out.	Check BCM connector. Reconnect if needed.
			Low tire pressure or tire pressure monitoring system malfunction.	● Perform CONSULT-III Self- Diagnosis. Refer to WT-23, "SELF-DIAG RESULTS MODE" . – Perform ID Registration if needed. Refer to WT-21, "ID Registration Procedure" .
Turn signal lamp	Turn signal lamp does not flash 2 times or horn does not sound after transmitter activation.	—	1. Tool J-45295 (special service tool) battery low. 2. Ignition OFF during activation. 3. Tool J-45295 (special service tool) not positioned correctly. 4. Transmitters already activated.	1. Install new battery. 2. Make sure ignition is ON during activation. 3. Position tool correctly during activation. 4. None

NOTE:
If more than one wheel transmitter is NOT activated, the warning light blinking patterns for those wheels will combine. (Example: one blink/OFF/three blinks = Rear LH and Rear RH transmitters are not activated.)

Preliminary Check

NES0001K

BASIC INSPECTION

1. CHECK ALL TIRE PRESSURES

- Check all tire pressures. Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

OK or NG

OK >> GO TO 2.
NG >> Adjust tire pressure to specified value.

2. CHECK LOW TIRE PRESSURE WARNING LAMP ACTIVATION

- Check low tire pressure warning lamp activation.

Dose low tire pressure warning lamp activate for 1 second when ignition switch is turned “ON”?

YES >> GO TO 3.
NO >> Check fuse and combination meter.

3. CHECK CONNECTOR

1. Disconnect BCM harness connectors M90 and M91.
2. Check terminals for damage or loose connection.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK ACTIVATION TOOL

- Check activation tool battery.

OK or NG

OK >> Perform self-diagnosis.
NG >> Replace activation tool battery.

TROUBLE DIAGNOSIS FOR SELF-DIAGNOSTIC ITEMS

PFP:00000

Transmitter or Control Unit (BCM)

NES0001M

MALFUNCTION CODE NO. 21, 22, 23 OR 24

1. CHECK CONTROL UNIT

- Drive for several minutes. Check all tire pressures with CONSULT-III “DATA MONITOR”.

Are all tire pressures displayed 0 kPa?

YES >> GO TO 2.
NO >> GO TO 3.

2. CHECK REMOTE KEYLESS ENTRY RECEIVER CONNECTOR

1. Disconnect remote keyless entry receiver harness connector M78.
2. Check terminals for damage or loose connection.
3. Reconnect harness connector.

OK or NG

OK >> Replace BCM refer to BCS-17, "Removal and Installation of BCM" , then GO TO 3.
NG >> Repair or replace remote keyless entry receiver harness connector.

3. ID REGISTRATION

- Perform ID registration of all transmitters.

Is there any tire that ID cannot be registered to?

YES >> Replace transmitter of the tire, then GO TO 5.
NO >> GO TO 4.

4. VEHICLE DRIVING

- Drive at a speed of 40 km/h (25 MPH) or more for several minutes without stopping.
  Check all tire pressures with CONSULT-III “DATA MONITOR” within 15 minutes after vehicle speed becomes 17 km/h (11 MPH).

Does “DATA MONITOR” display tire pressure as normal without any warning lamp?

YES >> INSPECTION END
NO >> GO TO 5.

5. ID REGISTRATION AND VEHICLE DRIVING

1. Perform ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tire pressures with CONSULT-III “DATA MONITOR” within 5 minutes.

Does “DATA MONITOR” display tire pressure as normal without any warning lamp?

YES >> INSPECTION END
NO >> GO TO the inspection applicable to DTC.

Transmitter - 1

NES0001N

MALFUNCTION CODE NO. 31, 32, 33, 34, 41, 42, 43, 44, 45, 46, 47 OR 48

1. ID REGISTRATION (CORRECTION OF TRANSMITTER LOCATION)

1. Perform ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes.

>> GO TO 2.

2. REPLACE TRANSMITTER

1. Check low tire pressure warning condition again, and replace malfunctioning transmitter.
2. Perform ID registration of all transmitters.

Can ID registration of all transmitters be completed?

YES >> GO TO 3.
NO >> GO TO the inspection 1. Refer to WT-30, "Transmitter or Control Unit (BCM)" .

3. VEHICLE DRIVING

- Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tire pressures with CONSULT-III “DATA MONITOR” within 5 minutes.

Does “DATA MONITOR” display tire pressure as normal without any warning lamp?

YES >> INSPECTION END
NO >> Replace malfunctioning transmitter, and perform “Step 3” again.

Transmitter - 2

NES0001O

MALFUNCTION CODE NO. 35, 36, 37 OR 38

1. CHECK ALL TIRE PRESSURE

- Check all tire pressures. Refer to WT-39, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

Are there any tires whose pressure is “64 psi” or more?

YES >> Adjust tire pressure to specified value.
NO >> GO TO 2.

2. VEHICLE DRIVING

1. Perform ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for several minutes without stopping.
   Check all tire pressures with CONSULT-III “DATA MONITOR” within 15 minutes after vehicle speed becomes 17 km/h (11 MPH).

>> Replace transmitter with new one if “DATA MONITOR” displays 64 psi or more. Then GO TO 3.

3. ID REGISTRATION AND VEHICLE DRIVING

1. Perform ID registration of all transmitters.
2. Drive at a speed of 40 km/h (25 MPH) or more for 3 minutes, and then drive the vehicle at any speed for 10 minutes. Then check all tire pressures with CONSULT-III “DATA MONITOR” within 5 minutes.

Does “DATA MONITOR” display tire pressure as normal without any warning lamp?

YES >> INSPECTION END
NO >> GO TO the inspection applicable to DTC.

Vehicle Speed Signal

NES0001P

MALFUNCTION CODE NO. 52

1. CHECK SELF-DIAGNOSTIC RESULTS

1. Perform “CONSULT-III Start procedure”.
2. Touch “BCM” on “SELECT SYSTEM” screen.
3. Touch “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
4. Check display contents in self-diagnostic results.

Is the “CAN COMM CIRCUIT” displayed in the self-diagnosis display?

YES >> Perform trouble diagnosis for CAN communication system.
NO >> Check combination meter. Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Warning Lamp Does Not Come On When Ignition Switch Is Turned On

NES0001Q

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

1. Perform “CONSULT-III Start Procedure”.
2. Touch “BCM” on “SELECT SYSTEM” screen.
3. Touch “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
4. Check display contents in self-diagnostic results.

Is the “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Perform trouble diagnosis for CAN communication system.
NO >> GO TO 2.

2. CHECK COMBINATION METER

Check combination meter function.

OK or NG

OK >> GO TO 3.
NG >> Check combination meter. Refer to DI-47, "SELF-DIAGNOSTIC RESULTS" .

3. CHECK LOW TIRE PRESSURE WARNING LAMP

1. Turn ignition switch OFF.
2. Disconnect BCM harness connectors M90 and M91.

Does the warning lamp activate?

YES >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NO >> Check combination meter and repair or replace.

Warning Lamp Stays On When Ignition Switch Is Turned On

NES0001R

DIAGNOSTIC PROCEDURE

1. PERFORM SELF-DIAGNOSIS

1. Turn ignition switch ON. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “AIR PRESSURE MONITOR” with CONSULT-III.
3. Touch “ERASE”.
4. Turn ignition switch OFF.
5. Start engine.

Does low tire pressure warning lamp turn OFF?

YES >> INSPECTION END
NO >> GO TO 2.

2. PERFORM ID REGISTRATION

Perform ID registration all transmitters. Refer to WT-21, "ID Registration Procedure" .

Does low tire pressure warning lamp turn OFF?

YES >> INSPECTION END
NO >> GO TO 3.

3. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect BCM harness connectors M90 and M91.
3. Check terminals for damage or loose connections.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

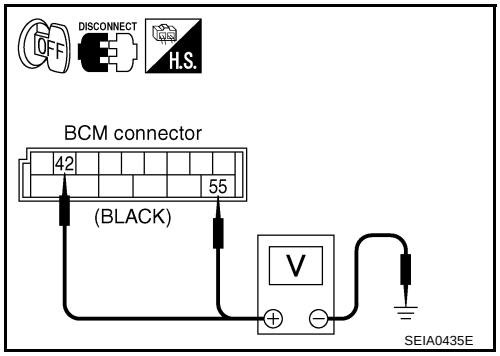
4. CHECK POWER SUPPLY CIRCUIT (BATTERY)

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Check voltage between BCM harness connector M91 terminals 42, 55 and ground.

Connector	Terminal	Voltage (Approx.)
M91	42 - Ground	Battery voltage
	55 - Ground	

OK or NG

OK >> GO TO 5.
NG >> Check BCM power supply circuit for open or short.



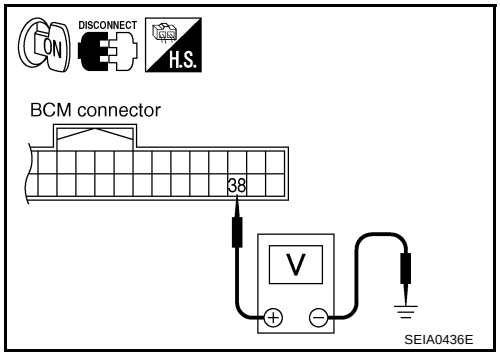
5. CHECK POWER SUPPLY CIRCUIT (IGN)

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Turn ignition switch ON.
4. Check voltage between BCM harness connector M90 terminal 38 and ground.

Connector	Terminal	Voltage (Approx.)
M90	38 - Ground	Battery voltage

OK or NG

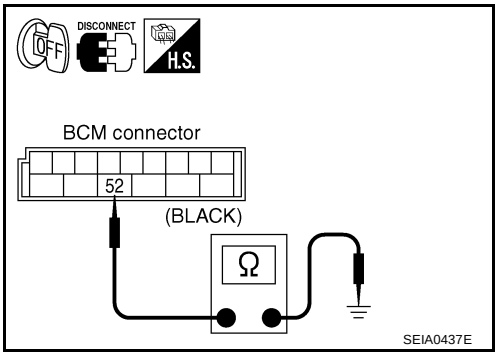
OK >> GO TO 6.
NG >> Check BCM power supply circuit for open or short.



6. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Check continuity between BCM harness connector M91 terminal 52 and ground.

Continuity should exist.



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair or replace BCM ground circuit.

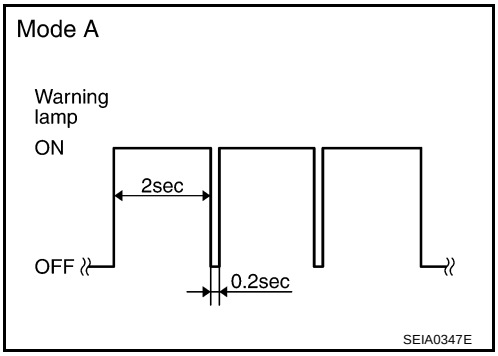
Warning Lamp Blinks When Ignition Switch Is Turned On

NES0001S

NOTE:
If warning lamp blinks below, the system is normal.

Blink Mode A

- This mode shows transmitter status is OFF-mode.
  Perform transmitter wake up operation. Refer to WT-22, "Transmitter Wake Up Operation" .



DIAGNOSTIC PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector M90.
3. Check terminals for damage or loose connections.

OK or NG

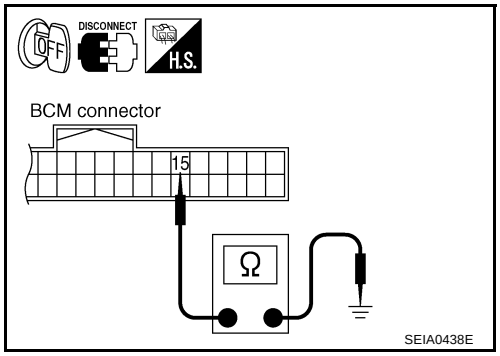
OK >> GO TO 2.

NG >> Repair or replace damaged parts.

2. CHECK TIRE PRESSURE WARNING CHECK SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Check continuity between BCM harness connector M90 terminal 15 and ground.

Continuity should exist.



OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .

NG >> Repair or replace harness connector.

Turn Signal Lamp Blinks When Ignition Switch Is Turned On

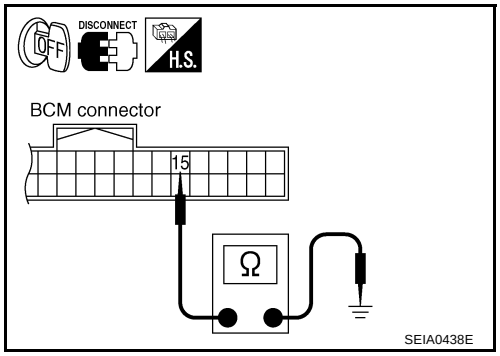
NES0001T

DIAGNOSTIC PROCEDURE

1. CHECK TIRE PRESSURE WARNING CHECK SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM harness connector.
3. Check continuity between BCM harness connector M90 terminal 15 and ground.

Continuity should exist.



OK or NG

OK >> Check turn signal lamp operation. Refer to LT-65, "TURN SIGNAL AND HAZARD WARNING LAMPS" .

NG >> Repair or replace harness connector.

ID Registration Can Not Be Completed

NES0001U

DIAGNOSTIC PROCEDURE

1. ID REGISTRATION (ALL)

- Perform ID registration of all transmitters.

Can ID registration of all transmitters be completed?

YES >> INSPECTION END

NO >> GO TO WT-30, "TROUBLE DIAGNOSIS FOR SELF-DIAGNOSTIC ITEMS" .

REMOVAL AND INSTALLATION

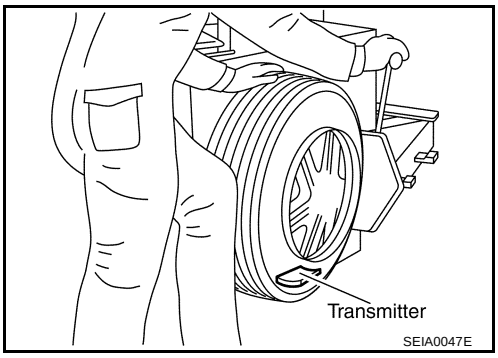
PFP:00000

Transmitter

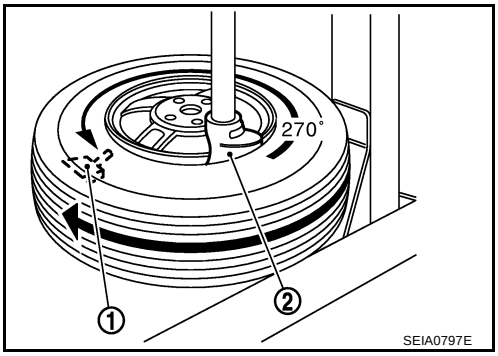
NES0001V

REMOVAL

1. Deflate tire. Unscrew transmitter retaining nut and allow transmitter to fall into tire.
2. Gently bounce tire so that transmitter falls to bottom of tire. Place on tire changing machine and break both tire beads ensuring that the transmitter remains at the bottom of the tire.

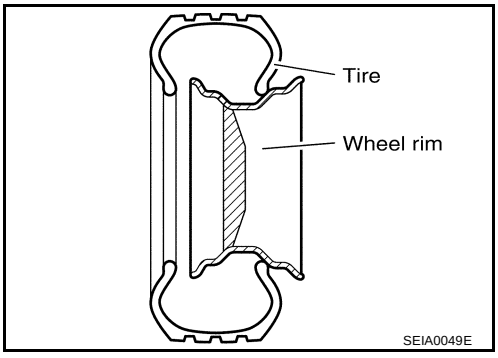


3. Turn tire so that valve hole is at bottom and bounce so that transmitter (1) is near valve hole. Carefully lift tire onto turntable and position valve hole (and transmitter) 270 degree from mounting/dismounting head (2).
4. Lubricate tire well and remove first side of the tire. Reach inside the tire and remove the transmitter.



INSTALLATION

1. Put first side of tire onto rim.

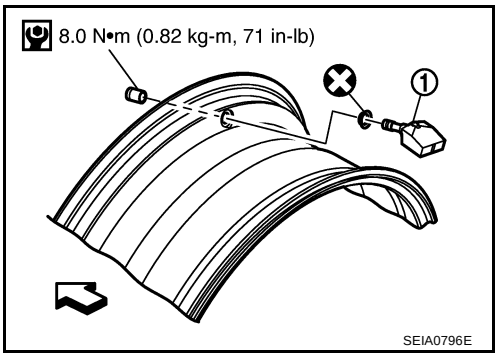


2. Mount transmitter (1) on rim and tighten nut.

CAUTION:

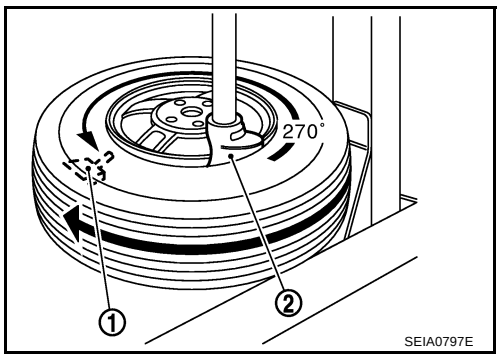
Speed for tightening nut should be less than 10 rpm.

⇦ : Outside



3. Place wheel on turntable of tire machine. Ensure that transmitter (1) is 270 degree from mounting head (2) when second side of tire is fitted.

   NOTE:
   Do not touch transmitter at mounting head.



4. Lubricate tire well and fit second side of tire as normal. Ensure that tire does not rotate relative to rim.
5. Inflate tire and fit to appropriate wheel position.

REMOTE KEYLESS ENTRY RECEIVER

Removal

1. Remove the front kicking plate LH. Refer to EI-35, "BODY SIDE TRIM" .
2. Remove the dash side finisher LH. Refer to EI-35, "BODY SIDE TRIM" .
3. Remove the instrument lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove the glove box assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Disconnect keyless entry receiver connector.

Installation

Install in the reverse order of removal.

BCM (BODY CONTROL MODULE)

Removal

Remove the BCM. Refer to BCS-17, "Removal and Installation of BCM" .

Installation

Install in the reverse order of removal.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Road Wheel

NES0001W

Kind of wheel		Aluminum	Steel (for tenporary tire)
Maximum radial runout limit	Lateral deflection	Less than 0.3 mm (0.012 in)	Less than 1.5 mm (0.059 in)
	Vertical deflection		
Maximum Allowable unbalance	Dynamic (At rim flange)	Less than 5g (0.14 oz) (one side)	
	Static (At rim flange)	Less than 10g (0.35 oz)	

Unit: mm (in)

Wheel size	Offset
18 × 8JJ	30 (1.18)
18 × 8 1/2JJ	33 (1.30)
18 × 9JJ	30 (1.18)
19 × 10JJ	30 (1.18)
17 × 4T	30 (1.18)

Tire

NES0001X

Unit: kPa (kg/cm^2 , psi)

Tire size	Air pressure			
	Front		Rear	
	Coupe	Roadster	Coupe	Roadster
225/45R18 91W	240 (2.4, 35)		—	
245/40R18 93W			—	
245/45R18 96W	—		240 (2.4, 35)	
265/35R19 94W	—			
T145/80 D17	420 (4.2, 60)			

Tightening Torque

NES0001Y

Wheel nut	108 N·m (11 kg-m, 80 ft-lb)

SECTION WW
WIPER, WASHER & HORN

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PRECAUTION

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NKS00544

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

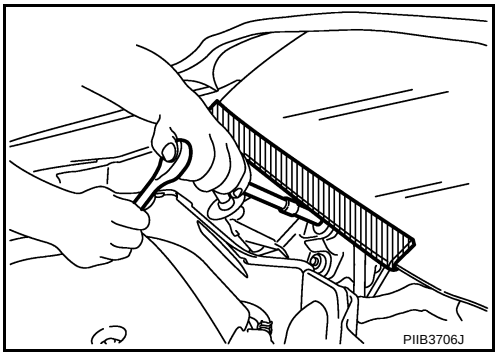
WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Procedures without Cowl Top Cover

NKS00545

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Battery Service

NKS00546

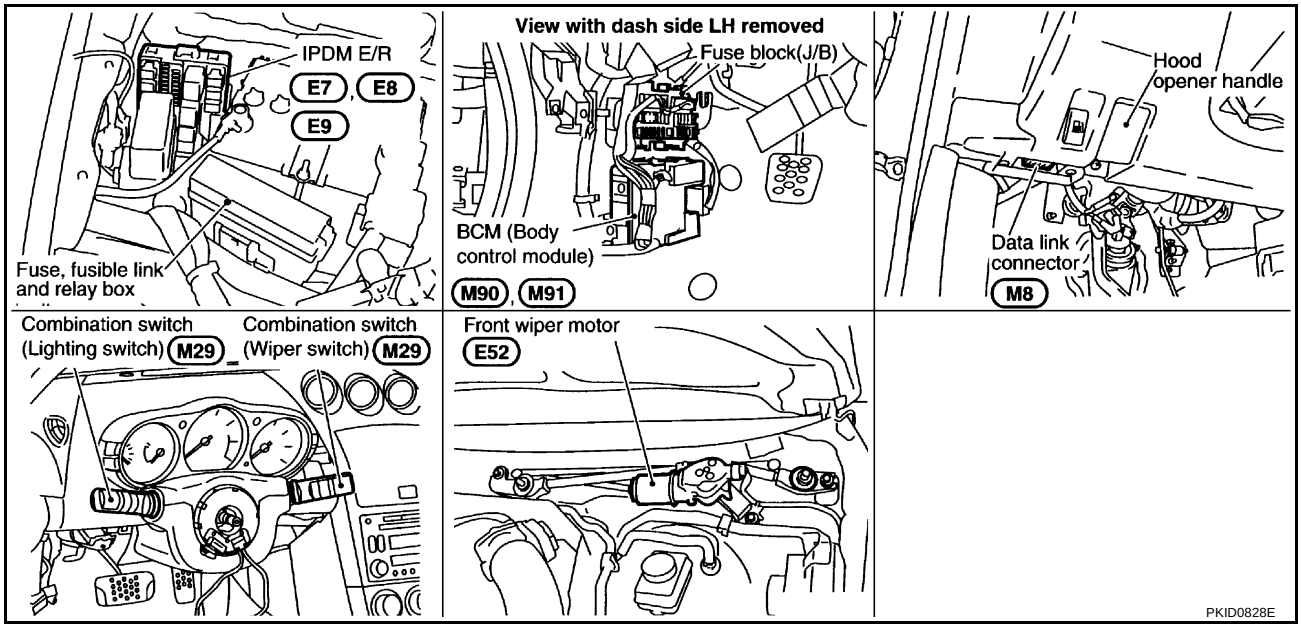
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

FRONT WIPER AND WASHER SYSTEM

PFP:28810

Components Parts and Harness Connector Location

NKS0051Z



System Description

NKS00520

- All front wiper relays (HI, LO) are included in IPDM E/R (intelligent power distribution module engine room).
- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM (body control module) when switch is turned ON.
- BCM controls front wiper LO, HI, and INT (intermittent) operation.
- IPDM E/R operates wiper motor according to CAN communication signals from BCM.

OUT LINE

Power is supplied at all times

- to ignition relay, located in IPDM E/R, from battery direct
- through 40 A fusible link [letter F, located in fuse, fusible link and relay box]
- to BCM terminal 55,
- through 10 A fuse [No.18 located in fuse block (J/B)]
- to BCM terminal 42,
- through 30 A fuse [No.73 located in IPDM E/R]
- to front wiper relay, located in IPDM E/R,
- through 15 A fuse [No.78 located in IPDM E/R]
- to CPU (central processing unit) located in IPDM E/R,
- through 10 A fuse [No.71 located in IPDM E/R]
- to CPU located in IPDM E/R.

When ignition switch is in ON or START position, power is supplied

- to ignition relay, located in IPDM E/R,
- through 10 A fuse [No.1 located in fuse block (J/B)]
- to BCM terminal 38,
- through ignition relay, located in IPDM E/R
- to front wiper relay, located in IPDM E/R
- to front wiper high relay, located in IPDM E/R
- to CPU located in IPDM E/R,
- through 10 A fuse [No.84 located in IPDM E/R]
- through IPDM E/R terminal 44

- to front washer pump terminal 2.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,
- to IPDM E/R terminals 38 and 60
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone),
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone),
- to combination switch terminal 12
- through grounds M30 and M66.

LOW SPEED WIPER OPERATION

When the front wiper switch is in low position, BCM detects low speed wiper ON signal by BCM wiper switch reading function.
BCM sends front wiper request signal (LOW) with CAN communication line

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When the IPDM E/R receives front wiper request signal (LOW), it turns ON front wiper relay, located in the IPDM E/R, power is supplied

- to front wiper motor terminal 3
- through IPDM E/R terminal 21 and front wiper high relay and front wiper relay.

Ground is supplied

- to front wiper motor terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone),
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With power and ground is supplied, front wiper motor operates at low speed.

HIGH SPEED WIPER OPERATION

When the front wiper switch is in high position, BCM detects high speed wiper ON signal by BCM wiper switch reading function.
BCM sends front wiper request signal (HI) with CAN communication line

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When the IPDM E/R receives front wiper request signal (HI), it turns ON front wiper relay, located in IPDM E/R, power is supplied

- to front wiper motor terminal 2
- through IPDM E/R terminal 31 and front wiper high relay and front wiper relay.

Ground is supplied

- to front wiper motor terminal 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone),
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

With power and ground is supplied, front wiper motor operates at high speed.

INTERMITTENT OPERATION

Front wiper intermittent operation delay interval is determined from a combination of 3 switches (intermittent operation dial position 1, 2, and 3) and vehicle speed signal.
After each intermittent operation delay interval, BCM sends front wiper request signal to IPDM E/R.

Wiper Dial Position Setting

Wiper dial position	Intermittent operation interval	Combination switch		
		Intermittent operation dial position 1	Intermittent operation dial position 2	Intermittent operation dial position 3
1	Short	ON	ON	ON
2		ON	ON	OFF
3		ON	OFF	OFF
4	↑ ↓	OFF	OFF	OFF
5		OFF	OFF	ON
6		OFF	ON	ON
7	Long	OFF	ON	OFF

Example: For wiper dial position 1
Using combination switch reading function, BCM detects ON/OFF status of intermittent operation dial positions 1, 2, and 3.
When combination switch status is as listed below, BCM determines that it is wiper dial position 1.

- Intermittent operation dial position 1: ON (Continuity exists between combination switch output 3 and input 1.)
- Intermittent operation dial position 2: ON (Continuity exists between combination switch output 5 and input 1.)
- Intermittent operation dial position 3: ON (Continuity exists between combination switch output 4 and input 2.)

BCM determines front wiper intermittent operation delay interval from wiper dial position 1 and vehicle speed, and sends wiper request signal (INT) to IPDM E/R.

AUTO STOP OPERATION

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach windshield base.
When the wiper arms are not located at base of windshield with wiper switch OFF, ground is provided

- from IPDM E/R terminal 21
- to front wiper motor terminal 3, in order to continue wiper motor operation at low speed

When the wiper arms reach base of windshield, front wiper motor terminals 1 and 4 are connected, and ground is supplied

- to IPDM E/R terminal 32
- through front wiper motor terminals 1 and 4
- through grounds E17, E43 and B102 (with VDC system, navigation system or telephone),
- through grounds E17, E43 and F152 (without VDC system, navigation system and telephone).

Then the IPDM E/R sends auto stop operation signal to BCM with CAN communication.
When the BCM receives auto stop operation signal, BCM sends wiper stop signal to IPDM E/R with CAN communication line. IPDM E/R stops wiper motor. Wiper motor will then stop wiper arms at the STOP position.

WASHER OPERATION

When the wiper switch is in front wiper washer position, BCM detect front wiper washer signal by BCM wiper switch reading function (Refer to WW-7, "COMBINATION SWITCH READING FUNCTION").
Combination switch ground is supplied

- to front washer pump terminal 1
- through combination switch terminal 11
- to combination switch terminal 12
- through grounds M30 and M66.

With ground is supplied, front washer pump is operated.
When the BCM detects that front washer pump has operated for 0.4 seconds or longer, BCM operates front wiper motor for low speed.
When the BCM detects washer switch is OFF, low speed operation cycles approximately 2 times and stops.

MIST OPERATION

When the wiper switch is turned to the mist position, wiper low speed operation cycles once and then stops.
For additional information about wiper operation under this condition, refer to WW-5, "LOW SPEED WIPER OPERATION" .
If switch is held in mist position, low speed operation continues.

FAIL-SAFE FUNCTION

If an abnormality occurs in CAN communications, IPDM E/R holds the condition just before fail-safe status is initiated until ignition switch is turned off. (If wipers were operating in LO just before the initiation of fail-safe status, they continue to operate in LO until ignition switch is turned OFF)

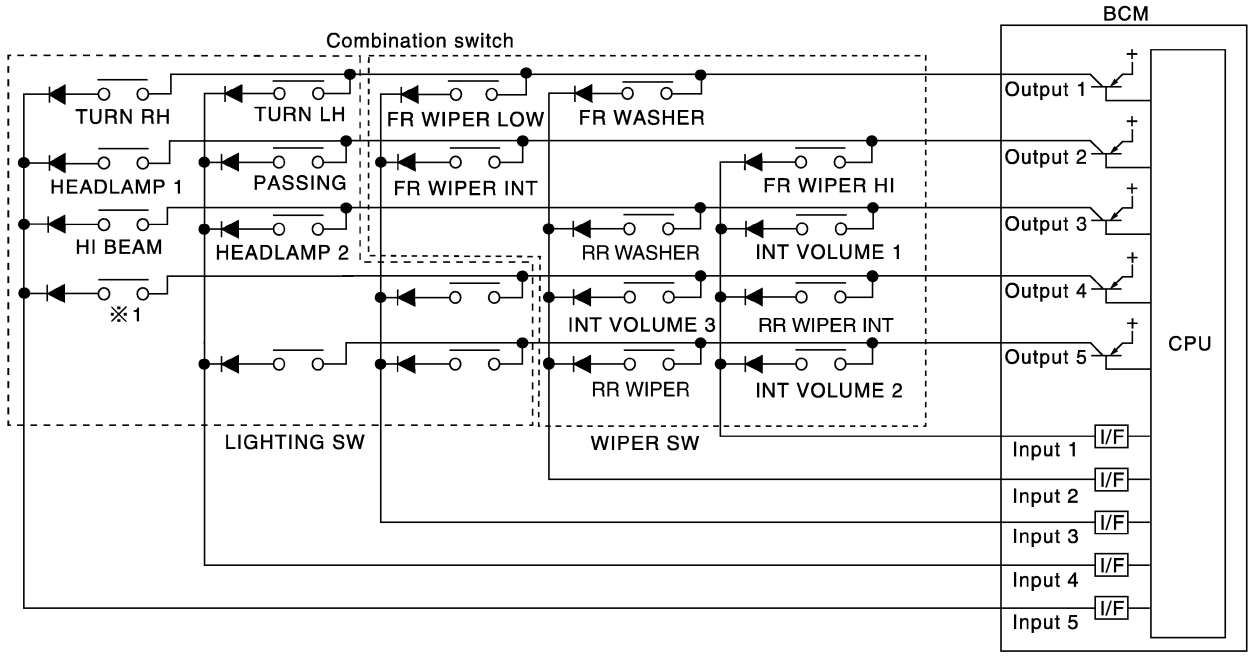
COMBINATION SWITCH READING FUNCTION

Description

- BCM reads combination switch (wiper) status, and controls related systems such as headlamps and wipers, according to the results.
- BCM reads information of a maximum of 20 switches by combining five output terminals (OUTPUT 1 - 5) and five input terminals (INPUT 1 - 5).

Operation Description

- BCM activates transistors of output terminals (OUTPUT 1 - 5) periodically, and allows current to flow in turn.
- If any (1 or more) switches are turned ON, circuit of output terminals (OUTPUT 1 - 5) and input terminals (INPUT 1 - 5) becomes active.
- At this time, transistors of output terminals (OUTPUT 1 - 5) are activated to allow current to flow. When voltage of input terminals (INPUT 1 - 5) corresponding to that switch changes, interface in BCM detects voltage change, and BCM determines that switch is ON.



※1 : LIGHTING SWITCH 1ST POSITION

PKIC4861E

BCM - Operation Table of Combination Switches

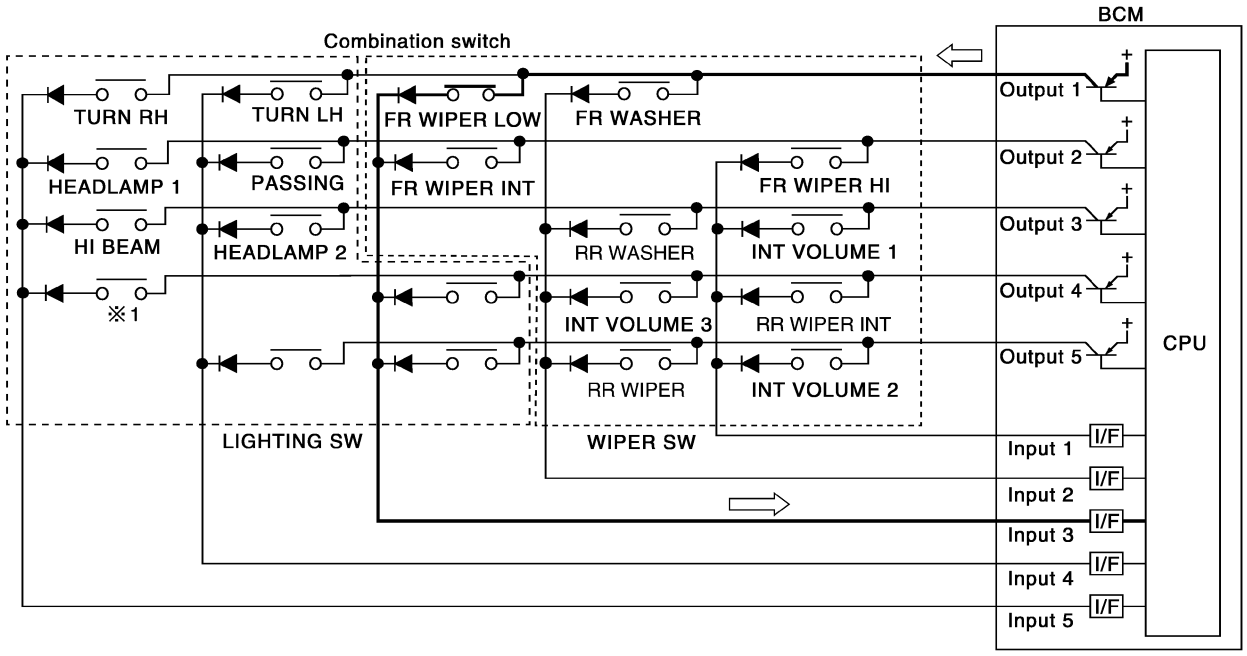
BCM reads operation status of combination switch using combinations shown in table below.

	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	—	—	FR WIPER HI ON	FR WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	RR WIPER INT ON	RR WIPER INT OFF	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	—	—	RR WASHER ON	RR WASHER OFF	INT VOLUME 3 ON	INT VOLUME 3 OFF	RR WIPER ON	RR WIPER OFF
COMB SW INPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	—	—	—	—	—	—
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	—	—	—	—
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1st) ON	LIGHTING SW (1st) OFF	—	—

PKIC4963E

Sample Operation: (When Wiper Switch Turned to LOW Position)

- When wiper switch is turned to LOW position, front wiper LOW contact in combination switch turns ON. At this time if OUTPUT 1 transistor is activated, BCM detects that voltage changes in INPUT 3.
- When BCM detects that voltage changes in INPUT 3 while OUTPUT 1 transistor is ON, it judges that front wiper switch is in LOW position. Then BCM sends front wiper request signal (LO) to IPDM E/R using CAN communication.
- If BCM detects that voltage changes in INPUT 3 when OUTPUT 1 transistor is activated again, it recognizes that wiper switch is still in LOW position.



※1 : LIGHTING SWITCH 1ST POSITION

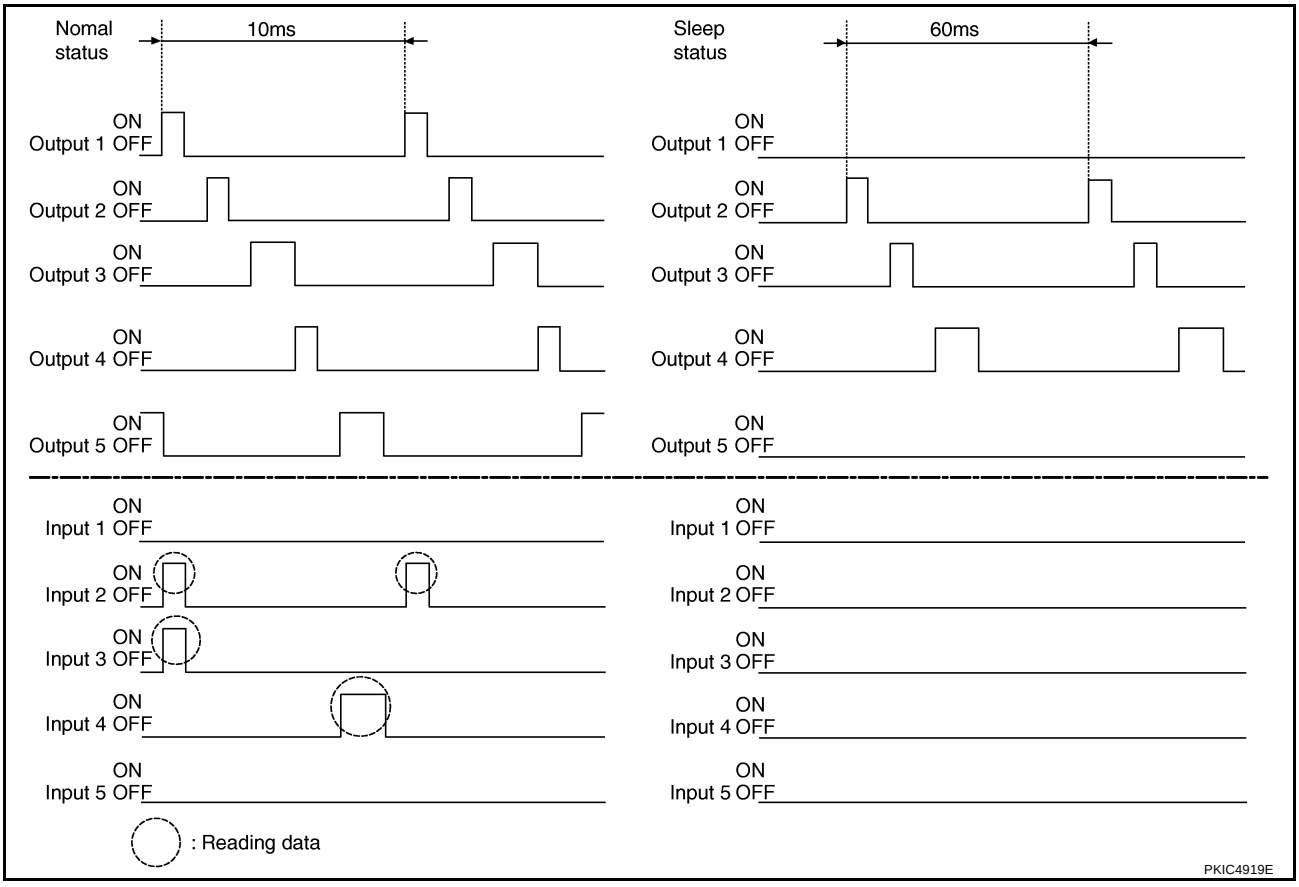
PKIC4862E

NOTE:
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore after switch is turned ON, electrical loads are activated with time delay. But this time delay is so short that it cannot be detected by human senses.

Operation Mode

The combination switch reading function has the operation modes shown below.

1. Normal status
- When BCM is not in sleep status, OUTPUT terminals (1 - 5) each turn ON-OFF every 10 ms.
2. Sleep status
- When BCM is in sleep status BCM enters low power mode. OUTPUT (1 - 5) turn ON-OFF every 60 ms, and only input from light switch system is accepted.



CAN Communication System Description

NKS00521

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

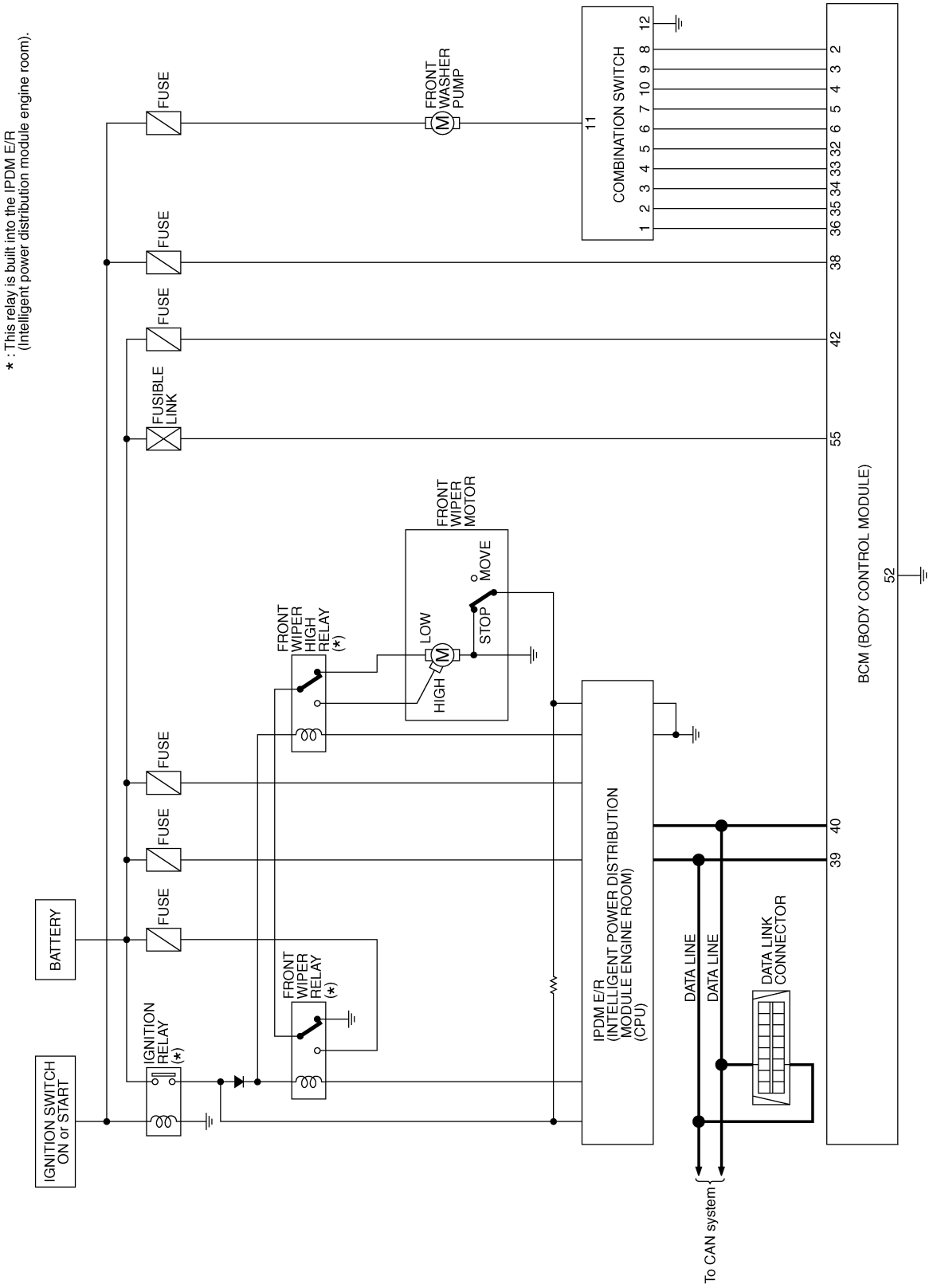
CAN Communication Unit

NKS00522

Refer to LAN-48, "CAN System Specification Chart" .

Schematic

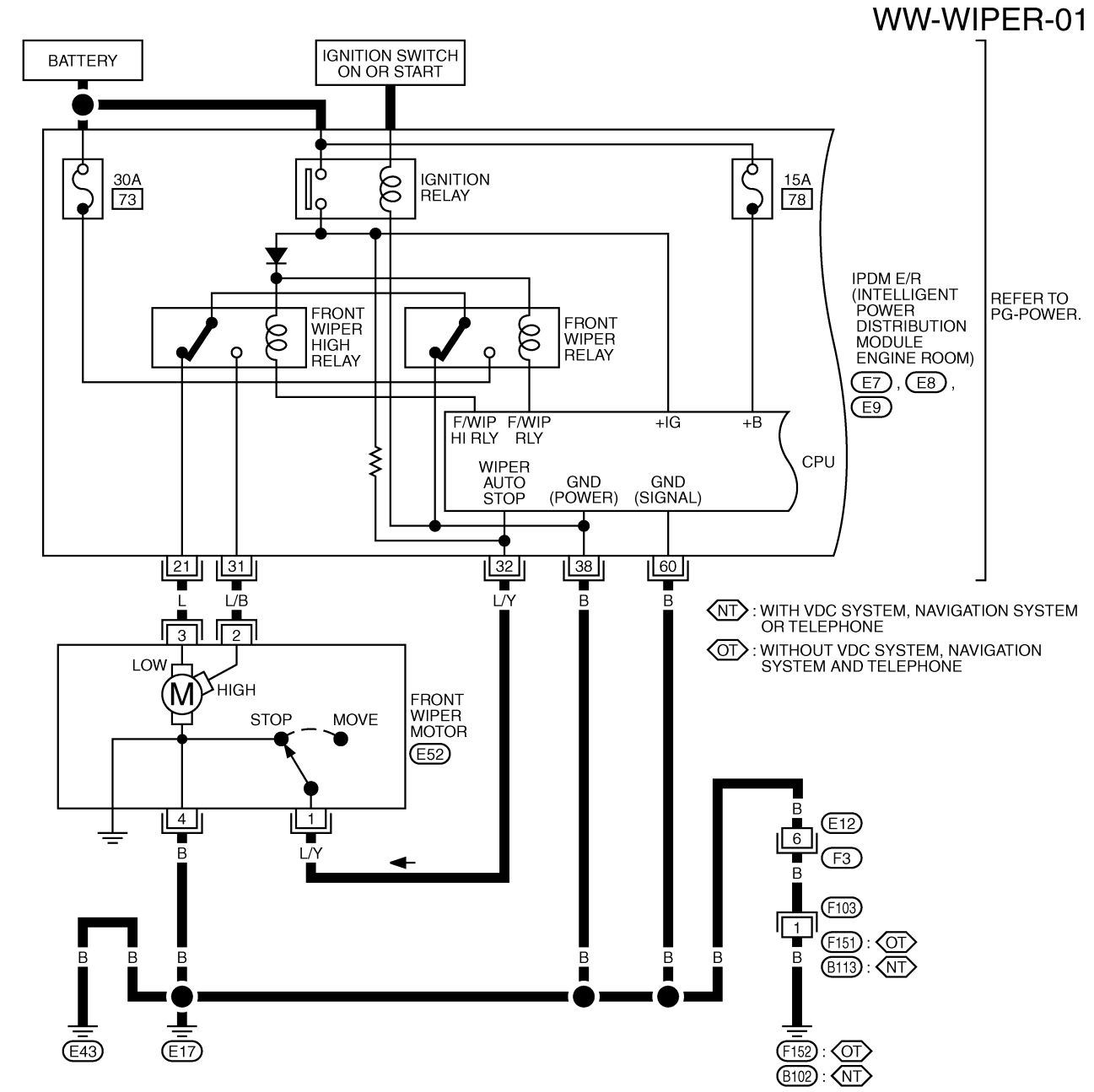
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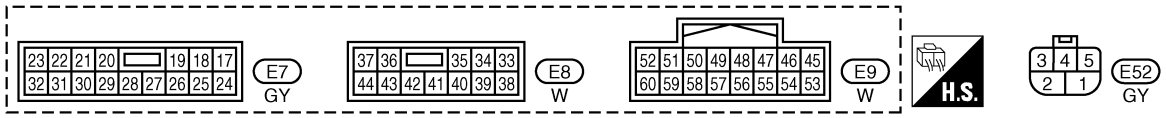


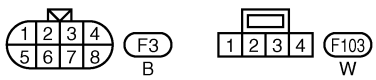
TKWT4003E

Wiring Diagram — WIPER —

NKS00524

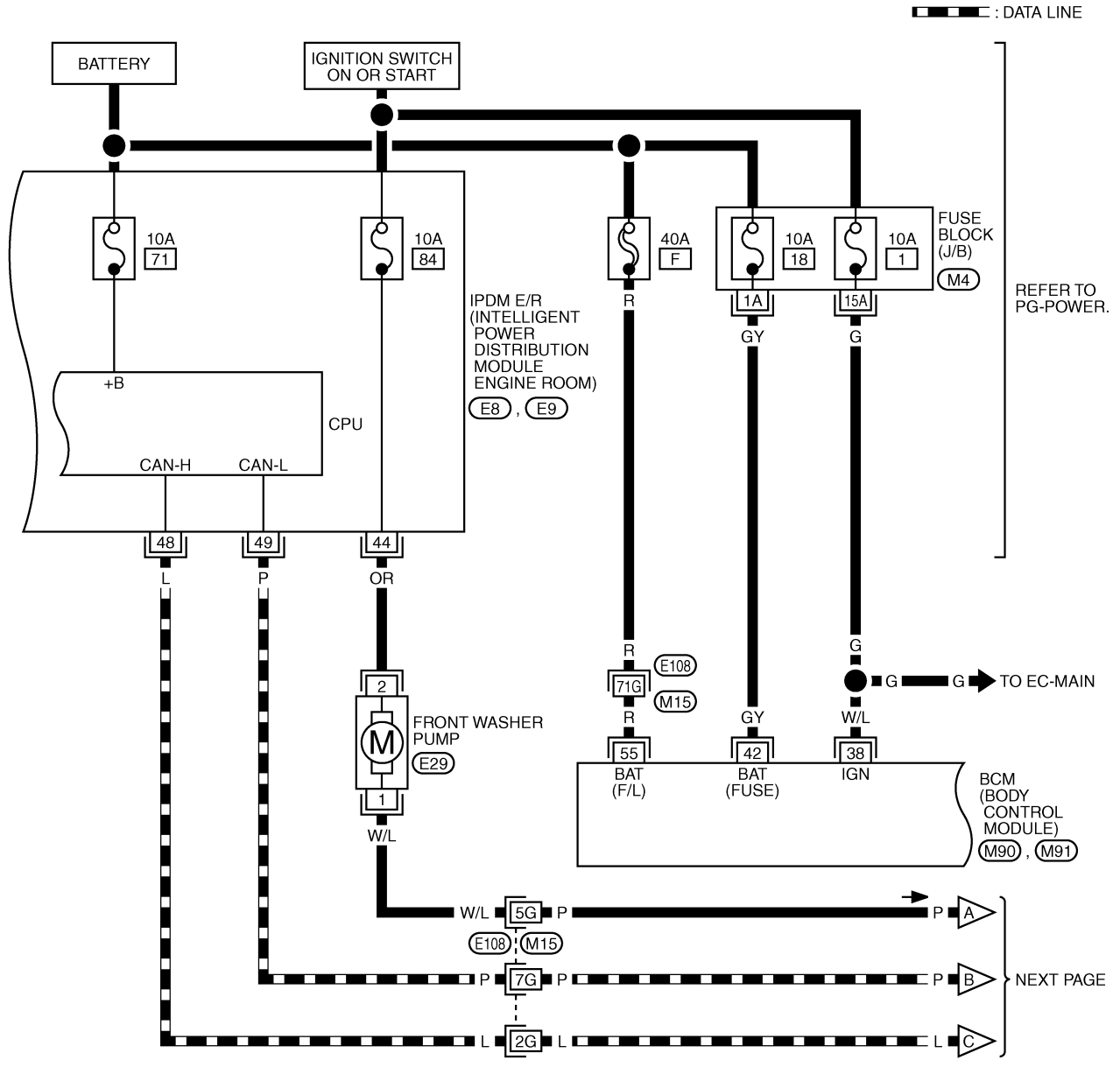


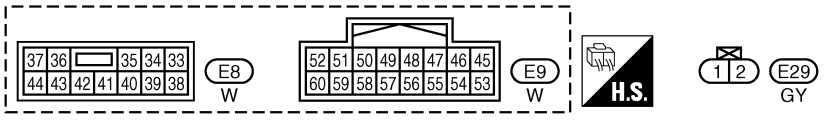




TKWT5737E

WW-WIPER-02





REFER TO THE FOLLOWING.

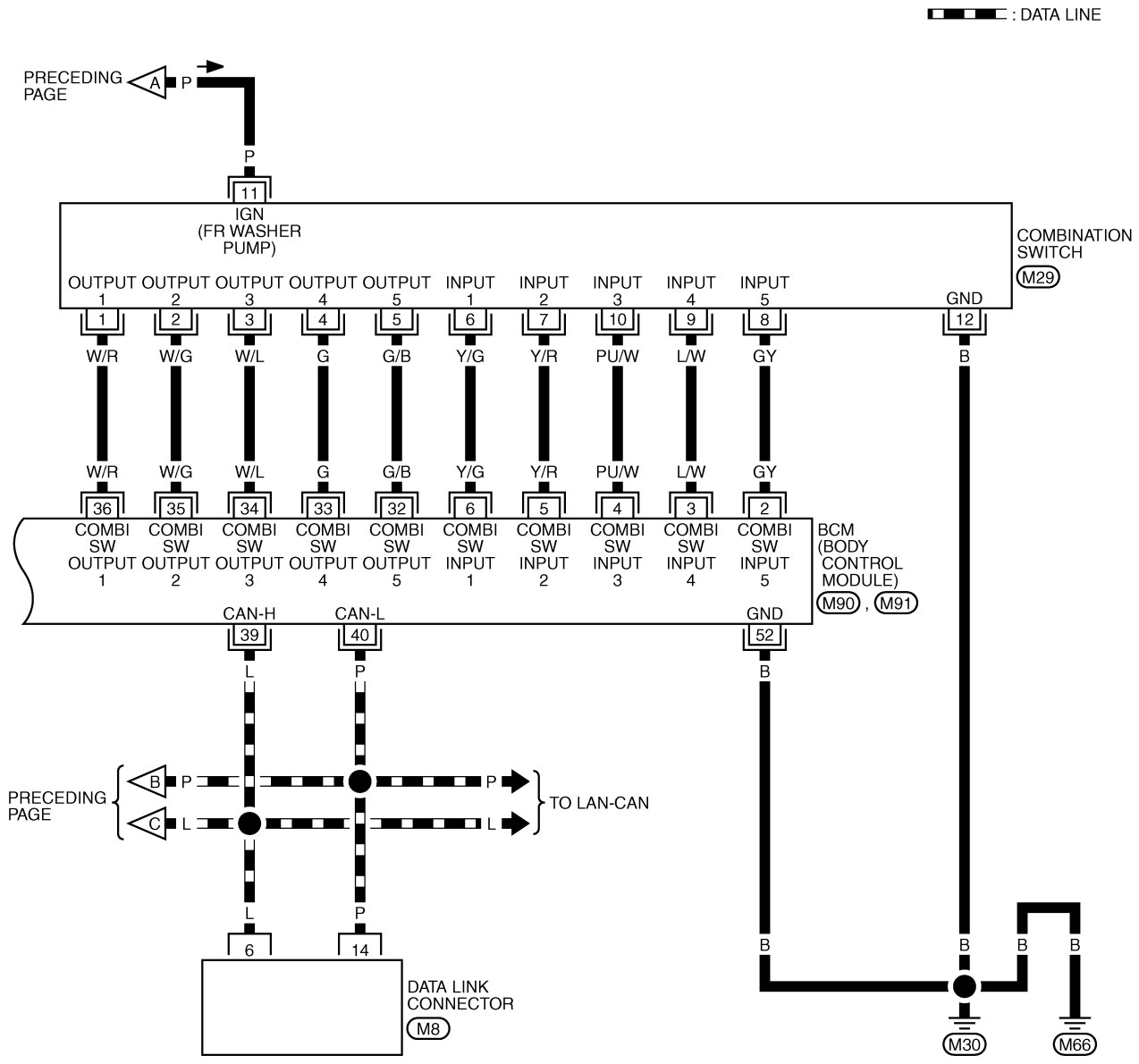
E108 -SUPER MULTIPLE JUNCTION (SMJ)

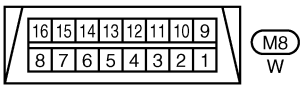
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

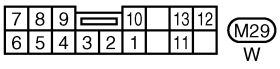
M90 , M91 -ELECTRICAL UNITS

TKWT5738E

WW-WIPER-03







REFER TO THE FOLLOWING.
M90 , M91 -ELECTRICAL UNITS

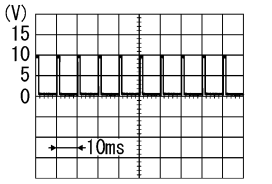
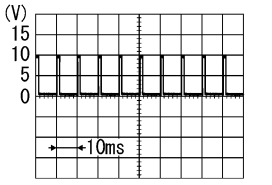
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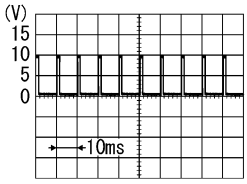
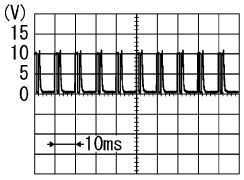
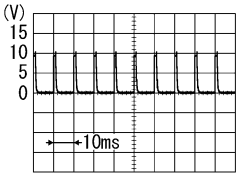
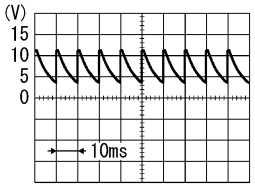
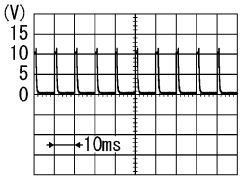
Terminals and Reference Values for BCM

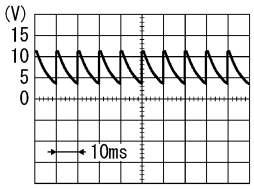
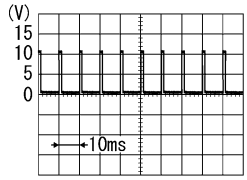
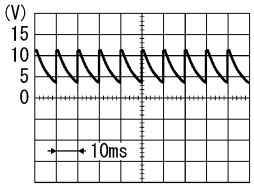
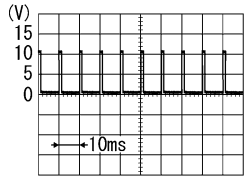
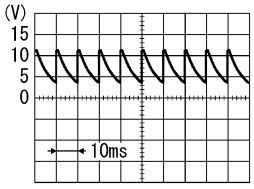
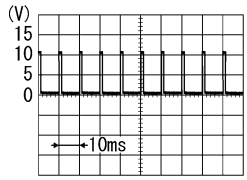
NKS00525

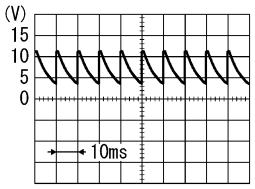
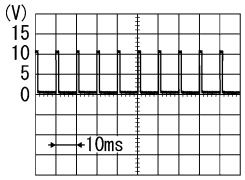
CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to WW-19, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
4	PU/W	Combination switch input 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Any of the conditions below ● Front wiper switch MIST ● Front wiper switch INT ● Front wiper switch LO	 PKIB4959J Approx. 1.0 V
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	Approx. 0 V
					Any of the conditions below ● Front washer switch ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4959J Approx. 1.0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
6	Y/G	Combination switch input 1	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	Approx. 0 V
					Any of the conditions below ● Front wiper switch HI ● Wiper intermittent dial position 3	 PKIB4959J Approx. 1.0 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2	 PKIB4952J Approx. 1.7 V
					Any of the conditions below ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4955J Approx. 0.8 V
32	G/B	Combination switch output 5	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 6 ● Wiper intermittent dial position 7	 PKIB4956J Approx. 1.0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 5 ● Wiper intermittent dial position 6	 PKIB4958J Approx. 1.2 V
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch	OFF (Wiper intermittent dial position 4)	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Wiper intermittent dial position 1 ● Wiper intermittent dial position 2 ● Wiper intermittent dial position 3	 PKIB4958J Approx. 1.2 V
35	W/G	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Front wiper switch INT ● Front wiper switch HI	 PKIB4958J Approx. 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
36	W/R	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Any of the conditions below ● Front wiper switch MIST ● Front wiper switch LO ● Front washer switch	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	GY	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	R	Battery power supply	OFF	—		Battery voltage

Terminals and Reference Values for IPDM E/R

NKS00526

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
21	L	Low speed signal	ON	Wiper switch	OFF	Approx. 0 V
					LOW	Battery voltage
31	L/B	High speed signal	ON	Wiper switch	OFF	Approx. 0 V
					HI	Battery voltage
32	L/Y	Wiper auto stop signal	ON	Wiper operating		Battery voltage
				Wiper stopped		Approx. 0 V
38	B	Ground	ON	—		Approx. 0 V
44	OR	Washer pump power supply	ON	—		Battery voltage
48	L	CAN – H	—	—		—
49	P	CAN – L	—	—		—
60	B	Ground	ON	—		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS00527

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-4, "System Description" .
3. Perform preliminary check. Refer to WW-18, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does the front wiper and washer operate normally? If YES, GO TO 6. If NO, GO TO 4.

6. INSPECTION END

Preliminary Check

NKS00528

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
Front washer pump	Ignition switch ON or START	84
Front wiper motor, front wiper relay, front wiper HI relay	Battery	73
BCM	Battery	F
		18
	Ignition switch ON or START	1

Refer to WW-11, "Wiring Diagram — WIPER —" .

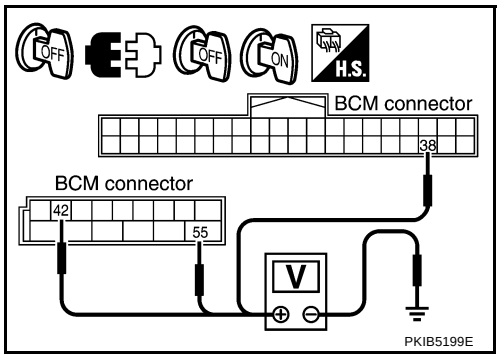
OK or NG

OK >> GO TO 2

NG >> If fuse is blown, be sure to eliminate the cause of malfunction before installing new fuse, Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector terminal and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M90	38	Ground	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

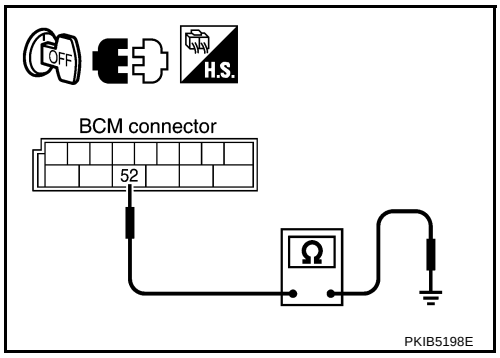
Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.



CONSULT-III Function (BCM)

NKS00529

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis position	Diagnosis mode	Description
WIPER	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Device operation can be checked by applying a drive signal to device.
BCM	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT

Display Item List

Item	Description	CONSULT-III	Factory setting
WIPER SPEED SETTING	Vehicle speed sousing type wiper control mode can be changed in this mode. Vehicle speed sousing type wiper control mode between two ON/OFF.	ON	—
		OFF	×

NOTE:
Regarding wiper speed setting, if the BCM set value is initialized by the use of CONSULT-III work support, then set it individually to OFF after the initialization because it is automatically set to ON by initializing CONSULT-III.

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from ignition switch signal.
IGN SW CAN	“ON/OFF”	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from CAN communication signal.
FR WIPER HI	“ON/OFF”	Displays “FRONT WIPER HI (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER LOW	“ON/OFF”	Displays “FRONT WIPER LOW (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER INT	“ON/OFF”	Displays “FRONT WIPER INT (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WASHER SW	“ON/OFF”	Displays “FRONT WASHER Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
INT VOLUME	“1 - 7”	Displays intermittent operation dial position setting (1 - 7) as judged from wiper switch signal.
FR WIPER STOP	“ON/OFF”	Displays “Stopped (ON)/Operating (OFF)” status as judged from auto-stop signal.
VEHICLE SPEED	“km/h”	Displays vehicle speed status as judged from vehicle speed signal.
RR WIPER ON NOTE 1	“ON/OFF”	Displays “Rear Wiper ON (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT NOTE 1	“ON/OFF”	Displays “Rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW NOTE 1	“ON/OFF”	Displays “Rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER STOP NOTE 1	“ON/OFF”	Displays “Rear Wiper Stop (ON)/Other (OFF)” status, as judged from wiper switch signal.
RR WIPER STP2 NOTE 2	“OFF”	—

NOTE:
1. Coupe models
2. This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Display on CONSULT-III screen	Description
Front wiper output	FR WIPER	With a certain operation (OFF, HI, LO, INT), front wiper can be operated.
Rear wiper output NOTE	RR WIPER	Rear wiper can be operated by ON–OFF operation.

NOTE:
Coupe models

CONSULT-III Function (IPDM E/R)

NKS0052A

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis Mode	Description
SELF–DIAG RESULTS	Refer to PG-18, "SELF-DIAG RESULTS" .
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

DATA MONITOR

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR wiper request	FR WIP REQ	STOP/LOW/HI	×	×	×	Signal status input from BCM
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	×	×	×	Output status of IPDM E/R
Wiper protection	WIP PROT	OFF/Block	×	×	×	Control status of IPDM E/R

NOTE:
Perform monitoring of IPDM E/R data with ignition switch ON. When ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Display Item List

Test item	CONSULT-III screen display	Description
Front wiper (HI, LO) output	FR WIPER	With a certain operation (OFF, HI ON, LO ON), front wiper relay (and/or front wiper high relay) can be operated.

Front Wiper Does Not Operate

NKS0052B

CAUTION:

During IPDM E/R fail-safe control, front wipers may not operate. Refer to PG-16, "CAN COMMUNICATION LINE CONTROL" in "PG IPDM E/R" to make sure that it is not in fail-safe status.

1. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper LO and HI operation.

IPDM E/R AUTO ACTIVE TEST

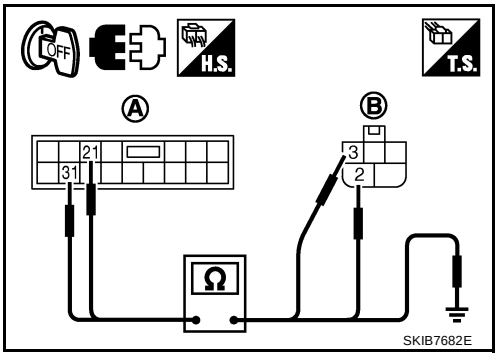
1. Start up auto active test. Refer to PG-20, "Auto Active Test" .
2. With operating the test item, check that front wiper LO and HI operation.

Does front wiper operate normally?

YES >> GO TO 5.
NO >> GO TO 2.

2. CHECK FRONT WIPER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	21	E52	3	Yes
	31		2	

4. Check continuity between IPDM E/R harness connector (A) and Ground.

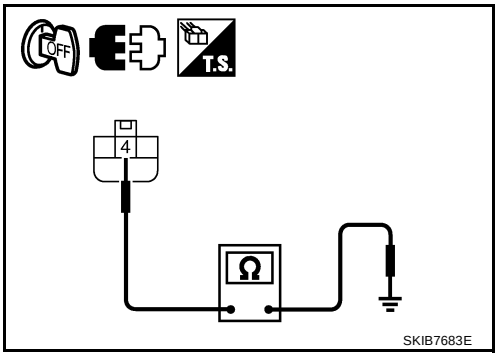
A		Ground	Continuity
Connector	Terminal		
E7	21		No
	31		

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between front wiper motor harness connector and ground.



Front wiper motor connector	Terminal	Ground	Continuity
E52	4		Yes

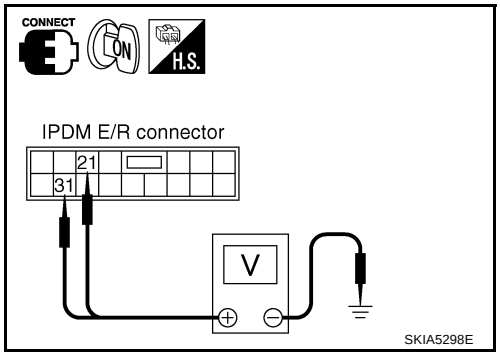
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK IPDM E/R

CONSULT-III ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select "FRONT WIPER" of IPDM E/R active test item.
3. With operating the test item, check voltage between IPDM E/R harness connector and ground.



Terminals			Condition	Voltage (Approx.)
(+)		(-)		
IPDM E/R connector	Terminal			
E7	21	Ground	Stopped	0 V
			LO operation	Battery voltage
	31		Stopped	0 V
			HI operation	Battery voltage

IPDM E/R AUTO ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-20, "Auto Active Test" .
3. With operating the test item, check voltage between IPDM E/R harness connector and ground.

Terminals			Condition	Voltage (Approx.)
(+)		(-)		
IPDM E/R connector	Terminal			
E7	21	Ground	Stopped	0 V
			LO operation	Battery voltage
	31		Stopped	0 V
			HI operation	Battery voltage

OK or NG

OK >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .
NG >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

5. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select “FR WIPER INT”, “FR WIPER LOW”, and “FR WIPER HI” of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

6. CHECKING CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

Perform self-diagnosis for “BCM” with CONSULT-III.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
CAN COMM CIRCUIT>> Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

Front Wiper Does Not Return to Stop Position

NKS0052C

1. CHECK FRONT WIPER STOP SIGNAL

With CONSULT-III

1. Select "WIP AUTO STOP" of IPDM E/R data monitor item.
2. Make sure that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper operation.

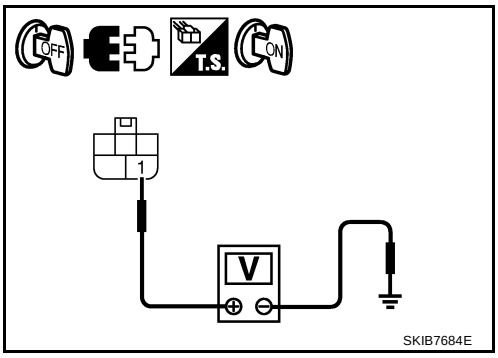
GO TO 2

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> GO TO 2.

2. CHECK IPDM E/R

1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Turn ignition switch ON.
4. Check voltage between front wiper motor harness connector and ground.



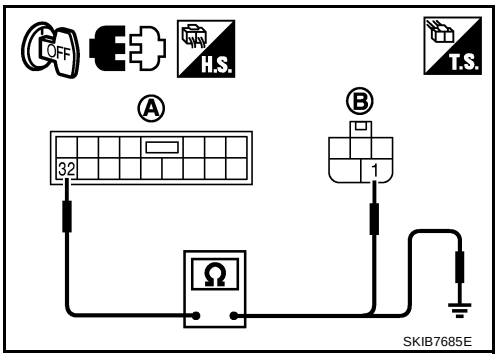
Terminals			Voltage (Approx.)
(+)		(-)	
Front wiper motor connector	Terminal	Ground	
E52	1		Battery voltage

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3. CHECK FRONT WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	32	E52	1	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

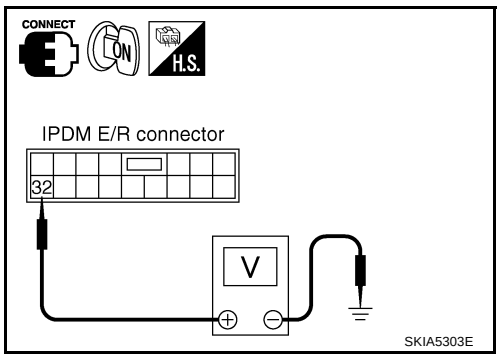
A		Ground	Continuity
Connector	Terminal		
E7	32		Yes

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.

4. CHECK IPDM E/R

1. Connect IPDM E/R connector and front wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R harness connector and ground while front wiper motor is stopped and while it is operating.



Terminal			Condition	Voltage (Approx.)
(+)		(-)		
IPDM E/R connector	Terminal			
E7	32	Ground	Wiper stopped	0 V
			Wiper operating	Battery voltage

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .

Only Front Wiper Low Does Not Operate

NKS0052D

1. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper LO operation.

IPDM E/R AUTO ACTIVE TEST

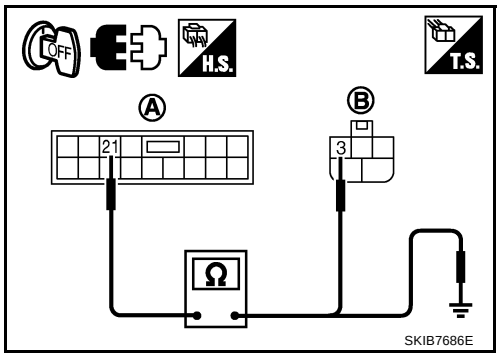
1. Start up auto active test. Refer to PG-20, "Auto Active Test" .
2. With operating the test item, check that front wiper LO operation.

Does front wiper operate normally?

YES >> Refer to LT-92, "Combination Switch Inspection" .
NO >> GO TO 2.

2. CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	21	E52	3	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
E7	21		No

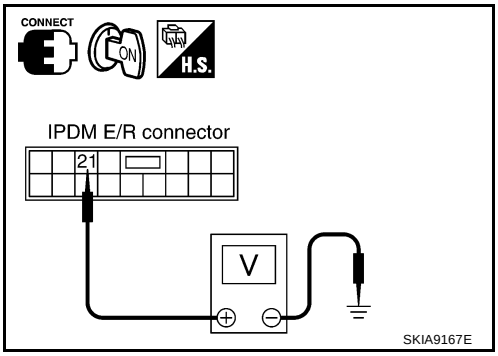
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IPDM E/R

CONSULT-III ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select "FRONT WIPER" of IPDM E/R active test item.
3. With operating the test item, check that front wiper LO operation.



Terminals			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal	Ground	
E7	21		Battery voltage

IPDM E/R AUTO ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-20, "Auto Active Test" .
3. With operating the test item, check that front wiper LO operation.

Terminals			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal	Ground	
E7	21		Battery voltage

OK or NG

OK >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .

NG >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

Only Front Wiper Hi Does Not Operate

NKS0052E

1. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper HI operation.

IPDM E/R AUTO ACTIVE TEST

1. Start up auto active test. Refer to PG-20, "Auto Active Test"
2. With operating the test item, check that front wiper HI operation.

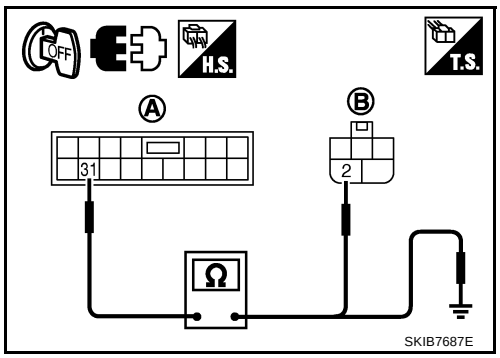
Does front wiper operate normally?

YES >> Refer to LT-92, "Combination Switch Inspection" .

NO >> GO TO 2.

2. CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	31	E52	2	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
E7	31		No

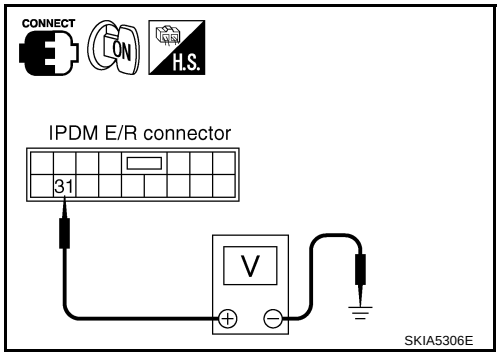
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IPDM E/R

CONSULT-III ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select "FRONT WIPER" of IPDM E/R active test item.
3. With operating the test item, check voltage between IPDM E/R harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal	Ground	
E7	31		Battery voltage

IPDM E/R AUTO ACTIVE TEST

1. Connect IPDM E/R connector and front wiper motor connector.
2. Start up auto active test. Refer to PG-20, "Auto Active Test" .
3. With operating the test item, check voltage between IPDM E/R harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(-)	
IPDM E/R connector	Terminal	Ground	
E7	31		Battery voltage

OK or NG

OK >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .
NG >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .

Only Front Wiper Intermittent Does Not Operate

NKS0052F

1. CHECK COMBINATION SWITCH

CONSULT-III DATA MONITOR

1. Select "FR WIPER INT" of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check combination switch (wiper switch) Refer to LT-92, "Combination Switch Inspection" .

Front Wiper Interval Time Is Not Controlled by Vehicle Speed

NKS0052G

1. CHECK FUNCTION OF COMBINATION METER

Confirm that speedometer operates normally.

Does front wiper operate normally?

YES >> GO TO 2.
NO >> Combination meter vehicle speed system malfunction. Refer to DI-18, "Vehicle Speed Signal Inspection" .

2. CHECK CAN COMMUNICATION BETWEEN BCM AND COMBINATION METER

Perform self-diagnosis for “BCM” with CONSULT-III.

Displayed self-diagnosis results

NO DTC>>Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
CAN COMM CIRCUIT>>Check CAN communication line of BCM. Refer to BCS-16, "CAN Communication Inspection Using CONSULT-III (Self-Diagnosis)" .

Front Wiper Intermittent Operation Switch Position Cannot Be Adjusted

NKS0052H

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select "INT VOLUME" of BCM data monitor item.
2. Make sure that “INT VOLUME”, changes in order form 1 to 7 according to wiper switch operation.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

Wiper Does Not Wipe When Front Washer Operates

NKS0052I

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select "FR WASHER SW" of BCM data monitor item.
2. Make sure that “FR WASHER SW” turn ON-OFF according to front wiper switch operation.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check front wiper switch. Refer to LT-92, "Combination Switch Inspection" .

After Front Wiper Operate for 10 Seconds, They Stop for 20 Seconds, and After Repeating the Operations Five Times, They Become Inoperative

NKS0052J

CAUTION:

- **When auto-stop signal has not varied for 10 seconds or longer while IPDM E/R is operating front wipers, IPDM E/R considers that front wipers are locked, and stops wiper output. That causes this symptom.**
- **This status can be checked by “DATA MONITOR” of “IPDM E/R” on which “WIPER PROTECTION” item shows “BLOCK”.**

1. CHECK WIPER MOTOR SIGNAL

CONSULT-III DATA MONITOR

1. Select "WIP AUTO STOP" of BCM data monitor item.
2. make sure that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper operation.

GO TO 2

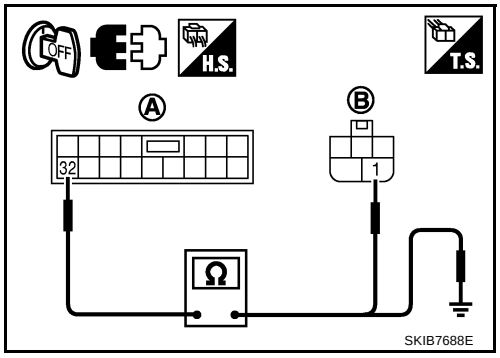
OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> GO TO 2.

2. CHECK WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	32	E52	1	Yes



4. Check continuity between IPDM E/R harness connector (A) and ground.

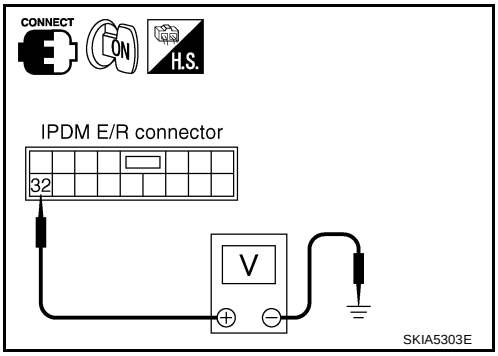
A		Ground	Continuity
Connector	Terminal		
E7	32		No

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK FRONT WIPER MOTOR

1. Connect IPDM E/R connector and front wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between IPDM E/R harness connector and ground while front wiper motor is stopped and while it is operating.



Terminal			Condition	Voltage (Approx.)
(+)		(-)		
IPDM E/R connector	Terminal			
E7	32	Ground	Wiper stopped	0 V
			Wiper operating	Battery voltage

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Replace front wiper motor. Refer to WW-31, "Disassembly and Assembly Front Wiper Motor and Linkage" .

Front Wiper Does Not Stop

NKS0052K

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select “FR WIPER INT”, “FR WIPER LOW”, “FR WIPER HI”, and “FR WASHER SW” of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location

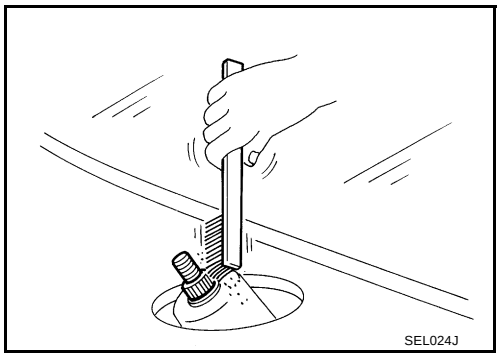
NKS0052L

REMOVAL

1. Turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).
2. Remove washer tube from washer tube joint.
3. Open hood, remove front wiper arm caps, and remove front wiper arm nuts.
4. Raise front wiper arms, and remove front wiper arms from vehicle.

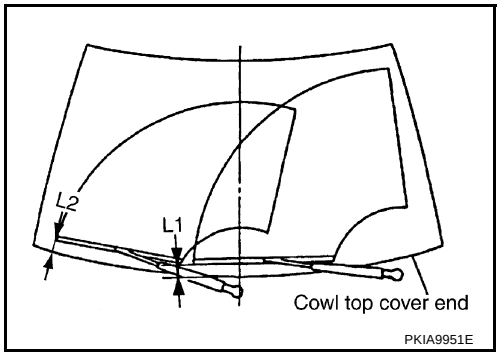
INSTALLATION

1. Clean up the pivot area as shown in the figure. This will reduce possibility of front wiper arm looseness.
2. Prior to front wiper arms installation, turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).



3. Lift the blade up and then set it down onto windshield glass surface to set the blade center to clearance “L1” & “L2” immediately.
4. Tighten front wiper arm nuts to specified torque.

Front wiper arm nuts : 23.6 N·m (2.4 kg-m, 18 ft-lb)



5. Install washer tube from washer tube joint.
6. Spray washer fluid. Turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).
7. Make sure that wiper blades stop within clearance “L1” & “L2”.

Clearance “L1” : 63.9 ± 7.5 mm (2.516 ± 0.295 in)
Clearance “L2” : 32.0 ± 6.5 mm (1.260 ± 0.256 in)

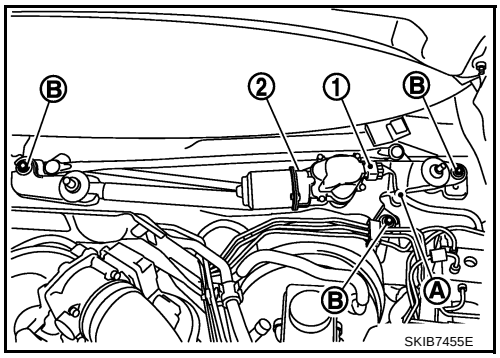
8. Install front wiper arm caps.

Removal and Installation of Front Wiper Drive Assembly

NKS0052M

REMOVAL

1. Remove front wiper arms. Refer to WW-30, "REMOVAL" .
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
3. Disconnect wiper motor connector (1) and remove connector clip (A).
4. Remove front wiper drive assembly mounting bolts (B), and remove front wiper drive assembly (2) from the vehicle.



INSTALLATION

1. Install front wiper drive assembly to the vehicle.

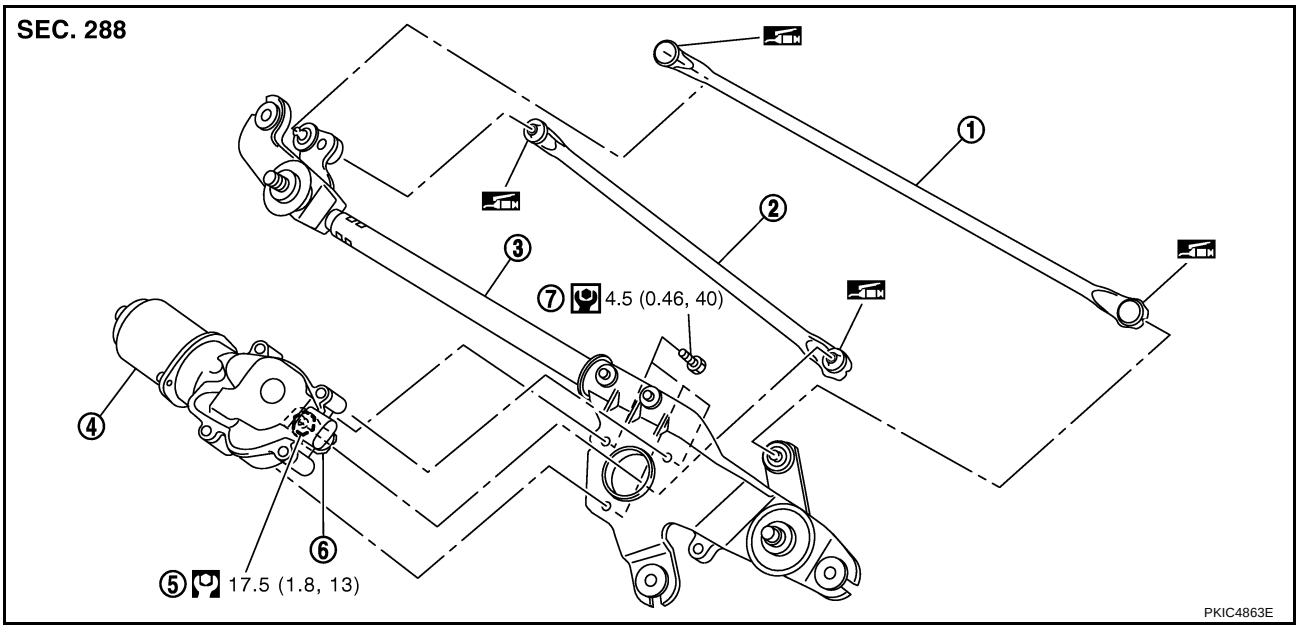
Front wiper drive assembly mounting bolts : 4.5 N·m (0.46 kg-m, 40 in-lb)

2. Connect wiper motor connector. Turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).
3. Install connector clips to the wiper frame, and install cowl top cover. Refer to EI-20, "COWL TOP" .

4. Install front wiper arms and arm caps. Refer to WW-30, "INSTALLATION" .

Disassembly and Assembly Front Wiper Motor and Linkage

NKS0052N



1. Wiper linkage 1
2. Wiper linkage 2
3. Motor frame
4. Wiper motor
5. Motor arm nut
6. Motor arm
7. Wiper motor mounting bolt

:N·m (kg-m, in-lb)

:N·m (kg-m, ft-lb)

:Should be lubricated with grease

DISASSEMBLY

1. Remove wiper linkages from wiper motor and motor frame.
2. Remove wiper motor mounting bolts, and remove wiper motor from wiper frame.

CAUTION:

Be careful not to bend wiper linkages nor to damage the resin part of ball joint when removing wiper linkages.

ASSEMBLY

1. Connect wiper motor connector. Turn front wiper switch ON to operate wiper motor, and then turn front wiper switch OFF (auto stop).
2. Disconnect wiper motor connector.
3. Install wiper motor to wiper frame.

Wiper motor mounting bolts : 4.5 N·m (0.46 kg-m, 40 in-lb)

4. Install wiper linkages to wiper frame and wiper motor.

CAUTION:

- **Never drop the wiper motor nor cause it to interfere with other parts.**
- **Check joint of motor arm and wiper linkages (at retainer) for grease conditions. Apply grease if necessary.**

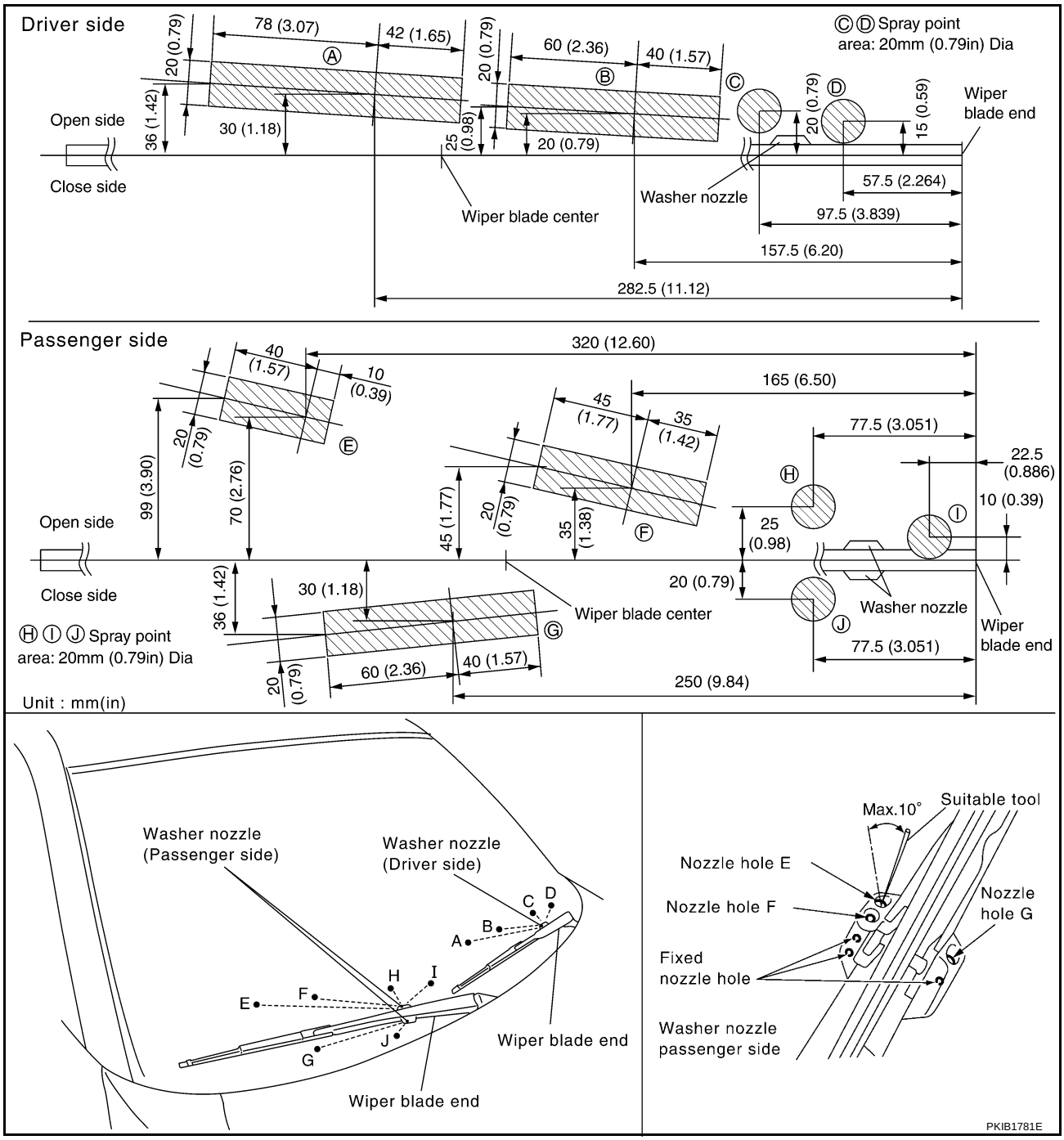
Washer Nozzle Adjustment

NKS0052O

1. When wiper blade position is in auto stop condition, remove front wiper motor connector to ensure front wiper arms do not move.
2. Adjust each nozzle position (A, B, E, F, and G) so that spray positions are in the range of shaded parts.

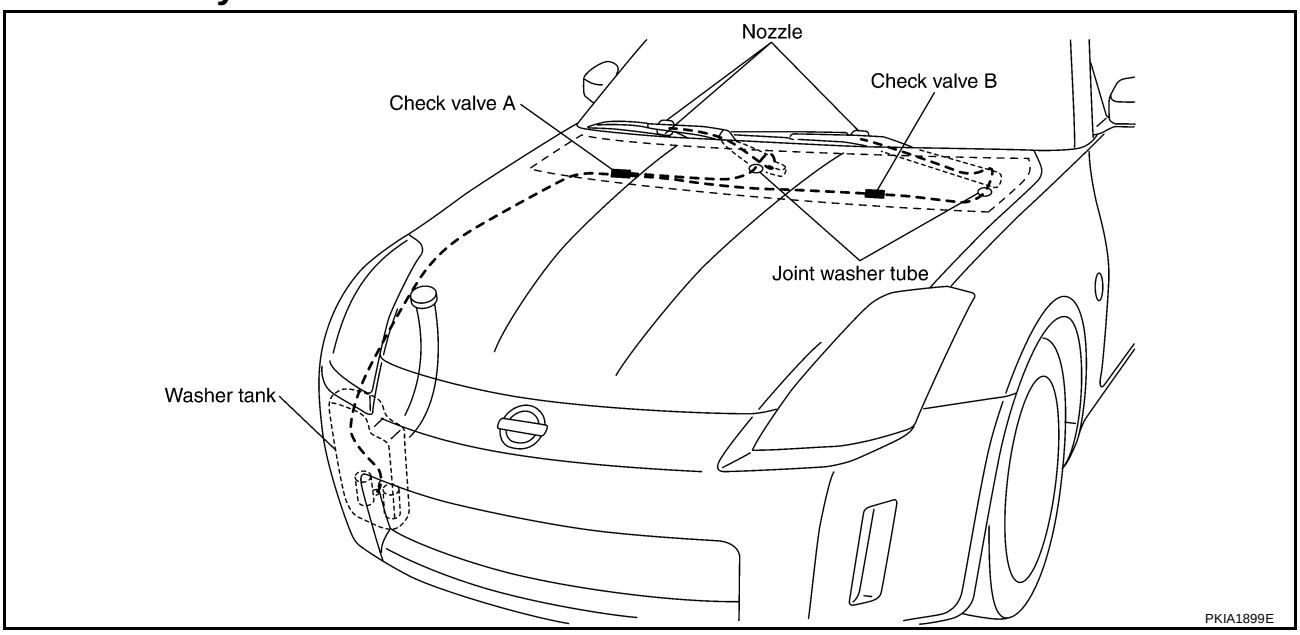
CAUTION:

Only washer nozzles (A, B, E, F, and G) can be adjusted. Washer nozzles (C, D, H, I, and J) cannot be adjusted because of fixed nozzles.



Washer Tube Layout

NKS0052P



Removal and Installation of Front Washer Nozzle

NKS0052Q

Replace wiper arm assembly. Refer to WW-30, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location" .

CAUTION:

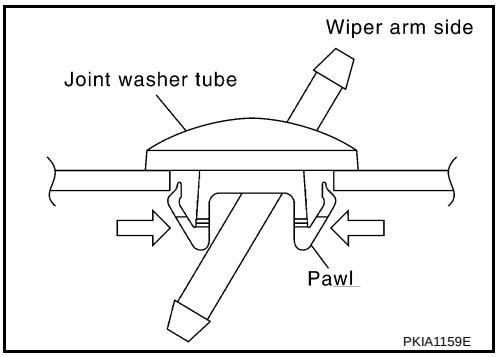
Never remove/install washer nozzle from wiper arm assembly.

Removal and Installation of Front Washer Tube Joint

NKS0052R

REMOVAL

1. Remove upwards while pressing pawls on reverse side.
2. Remove washer tube.



INSTALLATION

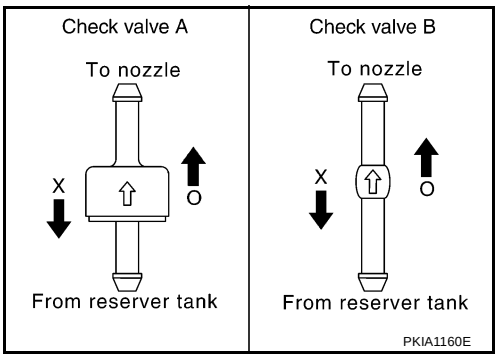
Installation is the reverse order of removal.

Inspection for Washer Nozzle

NKS0052S

CHECK VALVE INSPECTION

Blow air in the injection direction, and check that air flows only one way. Make sure that the reverse direction (inhale) is not possible.



Inspection of Front Wiper and Washer Switch Circuit

NKS0052T

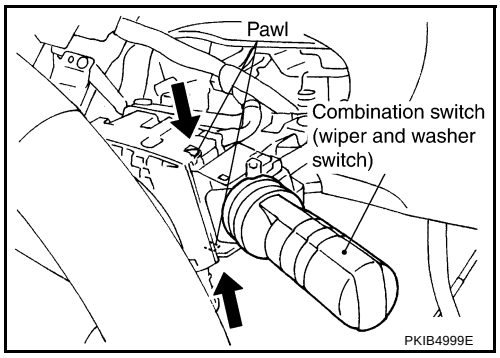
Refer to LT-92, "Combination Switch Inspection" .

Removal and Installation of Front Wiper and Washer Switch

NKS0052U

REMOVAL

1. Remove steering column lower cover and combination meter. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect wiper and washer switch connector.
3. Pull wiper and washer switch toward the passenger door while pressing pawls in direction shown by the arrow (⬅) in the figure, and remove it from the base.



INSTALLATION

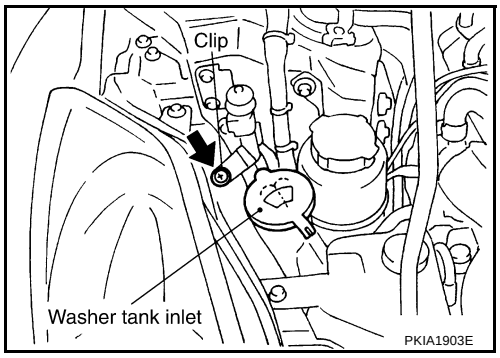
Installation is the reverse order of removal.

Removal and Installation of Washer Tank

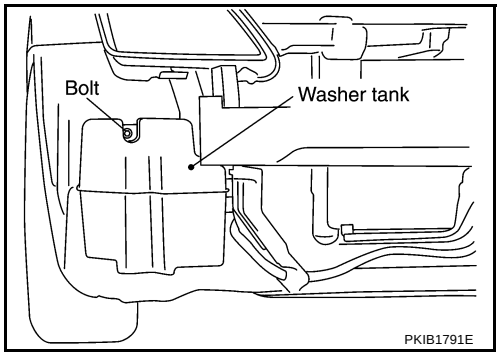
NKS0052V

REMOVAL

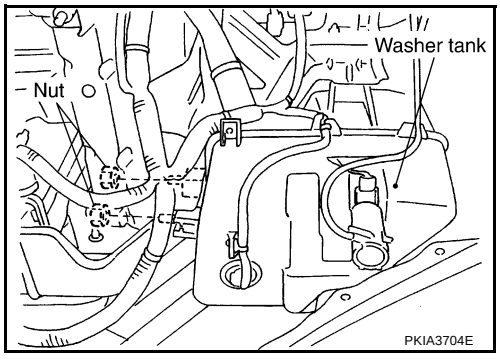
1. Remove clip and pull out washer tank inlet.



2. Remove under cover.
3. Remove fender protector. Refer to EI-21, "FENDER PROTECTOR" .
4. Remove front bumper fascia. Refer to EI-14, "FRONT BUMPER" .
5. Disconnect washer pump connector.
6. Remove washer tank mounting bolt and nuts.



7. Remove washer tube, and remove washer tank from the vehicle.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

After installation, add water up to the upper level of washer tank inlet, and check for water leaks.

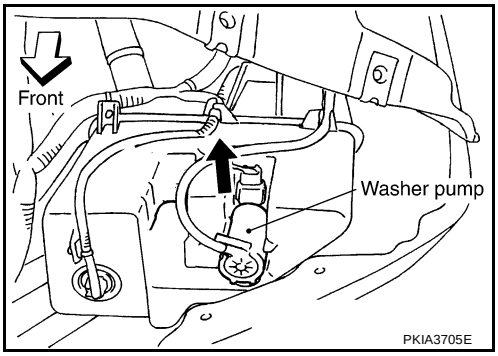
Washer tank mounting bolt and nuts : 5.7 N·m (0.58 kg-m, 50 in-lb)

Removal and Installation of Washer Pump

NKS0052W

REMOVAL

1. Remove fender protector. Refer to EI-21, "FENDER PROTECTOR" .
2. Disconnect washer pump connector and remove washer tube.
3. Pull out washer pump in direction shown by the arrow (⬅) in the figure. Remove washer pump from washer tank.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

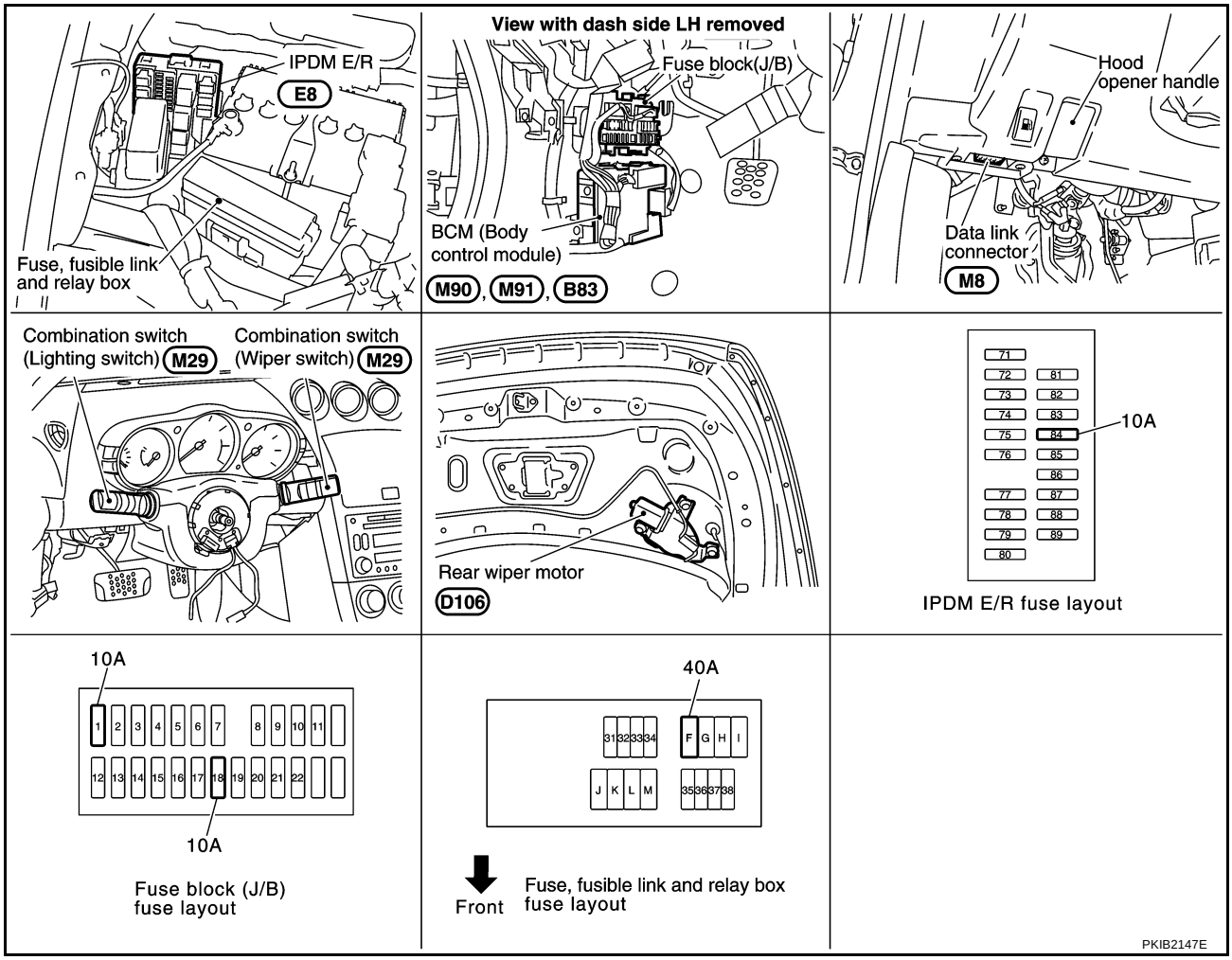
When installing washer pump, there should be no packing twists, etc.

REAR WIPER AND WASHER SYSTEM

PFP:28710

Components Parts and Harness Connector Location

NKS0052X



System Description

NKS0052Y

- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM when switch is turned ON.
- BCM (body control module) controls rear wiper ON and INT (intermittent) operation.

OUT LINE

Power is supplied at all times

- through 40 A fusible link (letter F, located in fuse, fusible link and relay box)
- to BCM terminal 55,
- through 10 A fuse [No. 18, located in fuse block (J/B)]
- to BCM terminal 42.

When ignition switch is in ON or START position, power is supplied

- through 10 A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10 A fuse (No. 84, located in IPDM E/R)
- through IPDM E/R terminal 44
- to rear washer pump terminal 2.

Ground is supplied

- to BCM terminal 52
- through grounds M30 and M66,

- to combination switch terminal 12
- through grounds M30 and M66.

Rear Wiper Operation

When wiper switch is in rear wiper ON position, BCM detect rear wiper ON signal by BCM wiper switch reading function.
BCM operate rear wiper motor, power is supplied

- through BCM terminal 70
- to rear wiper motor 4.

Ground is supplied

- to rear wiper motor terminal 1
- through grounds B5, B6, D105 and T14.

With power and ground is supplied, rear wiper operates.

Intermittent Operation

The rear wiper motor operates wiper arms at low speed approximately every 7 seconds.
When wiper switch is in rear wiper INT position, BCM detect rear wiper INT signal by BCM wiper switch reading function. (Refer to WW-7, "COMBINATION SWITCH READING FUNCTION")
BCM operate rear wiper motor, power is supplied

- through BCM terminal 70
- to rear wiper motor 4.

Ground is supplied

- to rear wiper motor terminal 1
- through grounds B5, B6, D105 and T14.

With power and ground is supplied, rear wiper operates at intermittent.

Auto Stop Operation

With rear wiper switch turned OFF, rear wiper motor will continue to operate until wiper arm reaches rear wiper stopper.
Then wiper motor turns the other way and wiper arm moves once until wiper arm reaches stopper.

Washer Operation

When wiper switch is in rear wiper washer position, BCM detect rear wiper washer signal by BCM wiper switch reading function (Refer to WW-7, "COMBINATION SWITCH READING FUNCTION"), and combination switch (wiper switch) ground is supplied

- to rear washer pump terminal 1
- through combination switch terminal 13
- to combination switch terminal 12
- through grounds M30 and M66.

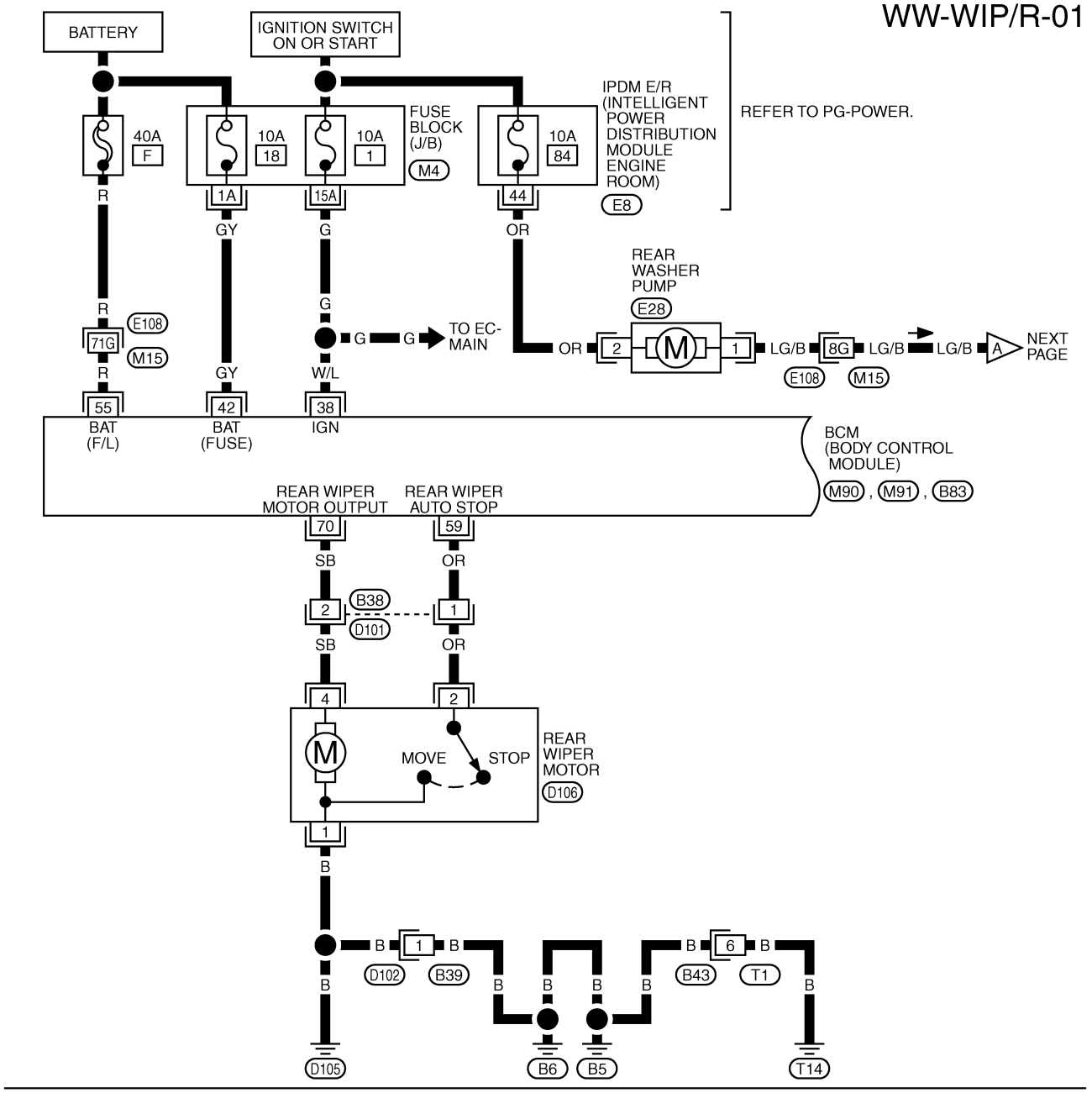
With ground is supplied, rear washer pump is operated.
When BCM detects that rear washer pump has operated for 0.4 seconds or longer, BCM operates rear wiper motor low speed.
When BCM detects washer switch is OFF, low speed operation cycles approximately 3 times and then stops.

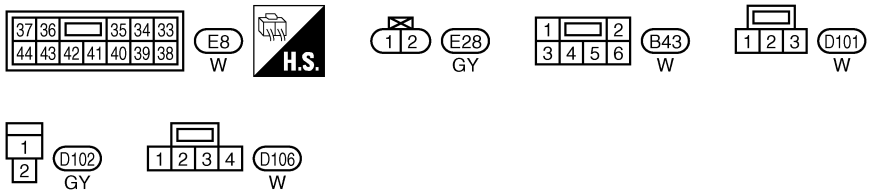
BCM WIPER SWITCH READING FUNCTION

Refer to WW-7, "COMBINATION SWITCH READING FUNCTION" .

Wiring Diagram — WIP/ R —

NKS0052Z





REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

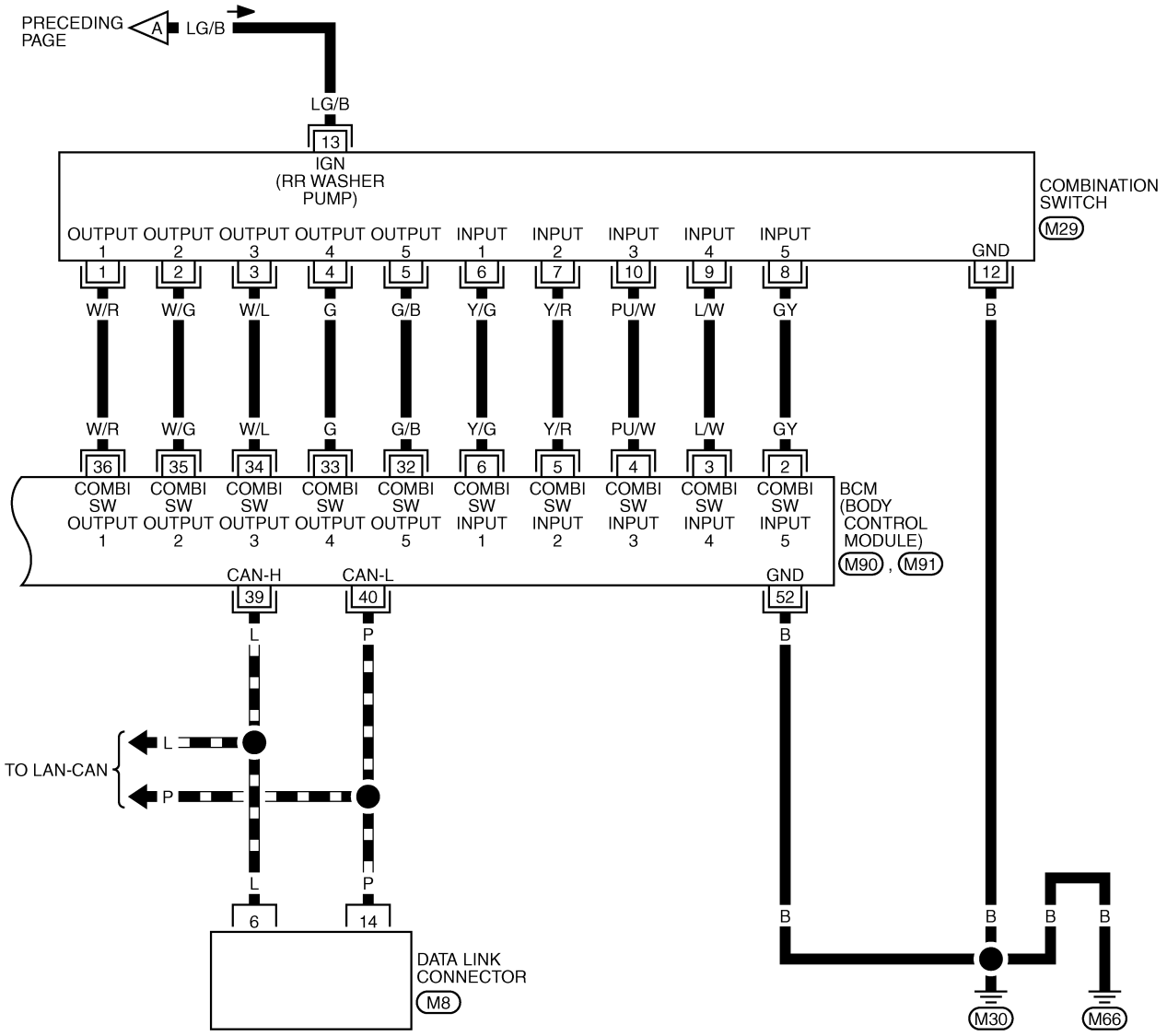
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

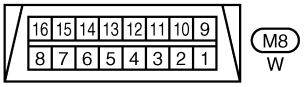
M90 , M91 , B83 -ELECTRICAL UNITS

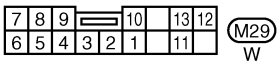
TKWT5739E

WW-WIP/R-02

: DATA LINE







REFER TO THE FOLLOWING.
M90 , M91 -ELECTRICAL UNITS

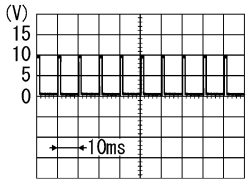
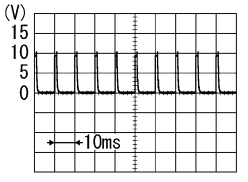
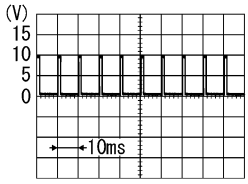
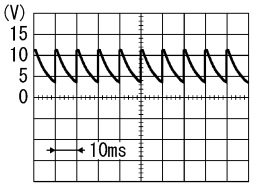
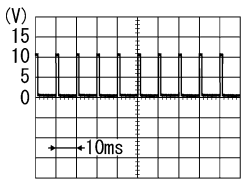
TKWT4008E

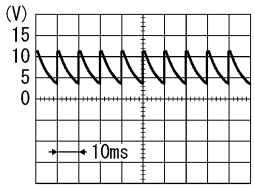
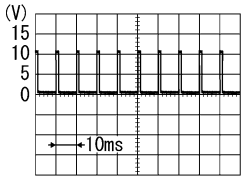
Terminals and Reference Values for BCM

NKS00530

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to WW-43, "DATA MONITOR" .**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
5	Y/R	Combination switch input 2	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Rear washer switch	 PKIB4959J Approx. 1.0 V
					Rear wiper switch ON	 PKIB4955J Approx. 0.8 v
6	Y/G	Combination switch input 1	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	Approx. 0 V
					Rear wiper switch INT	 PKIB4959J Approx. 1.0 V
33	G	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Rear wiper switch INT	 PKIB4958J Approx. 1.2 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
34	W/L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper intermittent dial position 4)	OFF	 PKIB4960J Approx. 7.2 V
					Rear washer switch	 PKIB4958J Approx. 1.2 V
38	W/L	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	GY	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	R	Battery power supply	OFF	—		Battery voltage
59	OR	Rear wiper auto stop signal	ON	Rear wiper operates		Approx. 0 V
				Rear wiper does not operate		Battery voltage
70	SB	Rear wiper motor output signal	ON	Rear wiper operates		Battery voltage
				Rear wiper does not operate		Approx. 0 V

How to Proceed With Trouble Diagnosis

NKS00531

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-36, "System Description" .
3. Perform preliminary check. Refer to WW-42, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does rear wiper and washer operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

NKS00532

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
Rear washer pump	Ignition ON or START	84
BCM	Ignition ON or START	1
	Battery	F
		18

Refer to WW-38, "Wiring Diagram — WIP/ R —" .

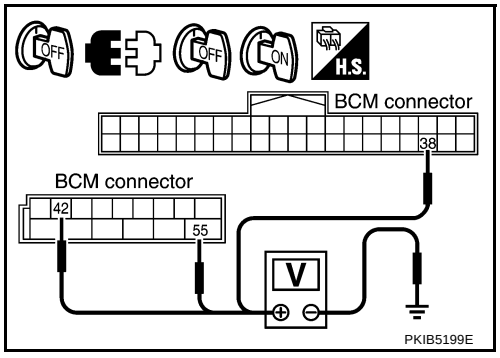
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM connector and ground.



Terminals			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M90	38	Ground	Approx. 0 V	Battery voltage
M91	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

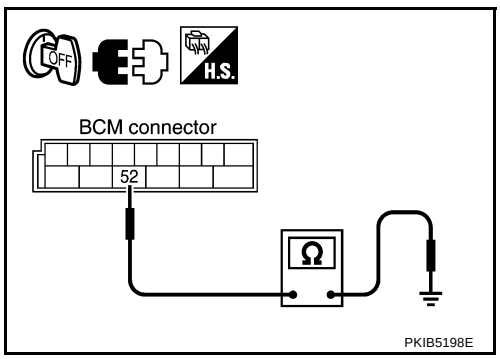
OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM and ground.



BCM connector	Terminal	Ground	Continuity
M91	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.

CONSULT-III Function (BCM)

NKS00533

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

BCM diagnosis position	Diagnosis mode	Description
WIPER	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Device operation can be checked by applying a drive signal to device.

DATA MONITOR
Display Item List

Monitor item		Contents
IGN ON SW	“ON/OFF”	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from ignition switch signal.
IGN SW CAN	“ON/OFF”	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from CAN communication signal.
FR WIPER HI	“ON/OFF”	Displays “FRONT WIPER HI (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER LOW	“ON/OFF”	Displays “FRONT WIPER LOW (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WIPER INT	“ON/OFF”	Displays “FRONT WIPER INT (ON)/Other (OFF)” status as judged from wiper switch signal.
FR WASHER SW	“ON/OFF”	Displays “FRONT WASHER Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
INT VOLUME	“1 - 7”	Displays intermittent operation dial position setting (1 - 7) as judged from wiper switch signal.
FR WIPER STOP	“ON/OFF”	Displays “Stopped (ON)/Operating (OFF)” status as judged from auto-stop signal.
VEHICLE SPEED	“km/h”	Displays vehicle speed status as judged from vehicle speed signal.
RR WIPER ON NOTE 1	“ON/OFF”	Displays “Rear Wiper ON (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER INT NOTE 1	“ON/OFF”	Displays “Rear Wiper INT (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WASHER SW NOTE 1	“ON/OFF”	Displays “Rear Washer Switch (ON)/Other (OFF)” status as judged from wiper switch signal.
RR WIPER STOP NOTE 1	“ON/OFF”	Displays “Rear Wiper Stop (ON)/Other (OFF)” status, as judged from wiper switch signal.
RR WIPER STP2 NOTE 2	“OFF”	—

NOTE:
1. Coupe models
2. This item is displayed, but cannot be monitored.

ACTIVE TEST
Display Item List

Test item	Display on CONSULTIII screen	Description
Front wiper output	FR WIPER	With a certain operation (OFF, HI, LO, INT), front wiper can be operated.
Rear wiper output NOTE	RR WIPER	Rear wiper can be operated by any ON–OFF operation

NOTE:
Coupe models

Rear Wiper Does Not Operate

NKS00534

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR

1. Select "RR WIPER ON" of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

CHECK COMBINATION SWITCH

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

2. ACTIVE TEST

CONSULT-III ACTIVE TEST

1. Select "REAR WIPER" of BCM active test item.
2. With operating the test item, check that rear wiper operation.

GO TO 3

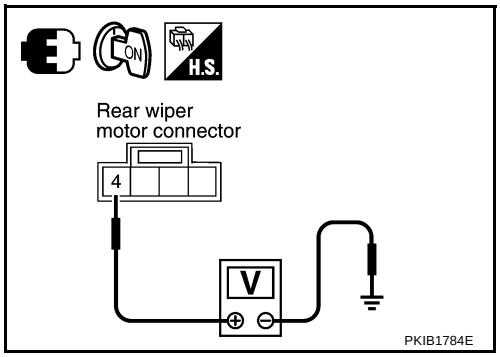
Does rear wiper operate normally?

YES >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NO >> GO TO 3.

3. CHECK BCM

With rear wiper switch ON, check voltage between rear wiper motor harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(-)	
Rear wiper motor connector	Terminal	Ground	
D106	4		Battery voltage



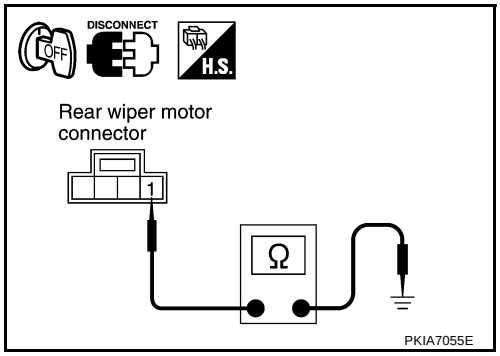
OK or NG

OK >> GO TO 4.
NG >> GO TO 5.

4. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect rear wiper motor connector.
3. Check continuity between rear wiper motor harness connector and ground.

Rear wiper motor connector	Terminal	Ground	Continuity
D106	1		Yes

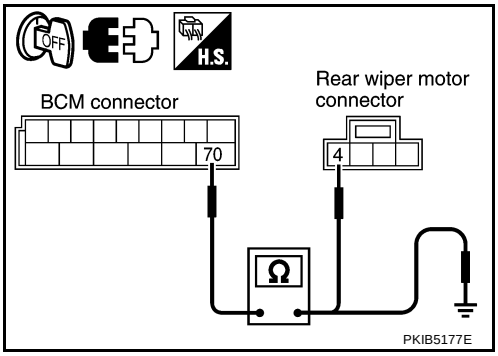


OK or NG

OK >> Replace rear wiper motor. Refer to WW-47, "Removal and Installation of Rear Wiper Motor" .
NG >> Repair harness or connector.

5. CHECK REAR WIPER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and rear wiper motor connector.
3. Check continuity between BCM harness connector and rear wiper motor harness connector.



BCM		Rear wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
B83	70	D106	4	Yes

4. Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
B83	70		No

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Repair harness or connector.

Rear Wiper Does Not Return to Stop Position

NKS00535

1. CHECK REAR WIPER MOTOR CIRCUIT

With CONSULT-III

1. Select "RR WIPER STOP" of BCM data monitor item.
2. Make sure that “RR WIPER STOP”, turn ON-OFF linked with rear wiper switch operation.

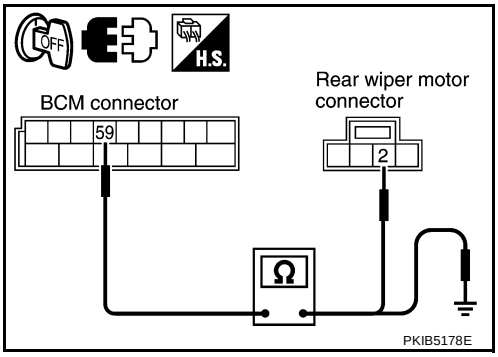
GO TO 2

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> GO TO 2.

2. CHECK REAR WIPER AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and rear wiper motor connector.
3. Check continuity between BCM harness connector and rear wiper motor harness connector.

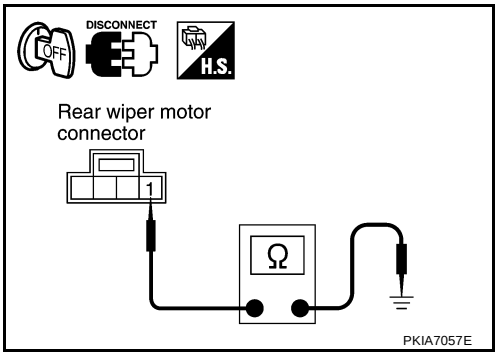


BCM		Rear wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
B83	59	D106	2	Yes

4. Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
B83	59		No

5. Check continuity between rear wiper motor harness connector and ground.



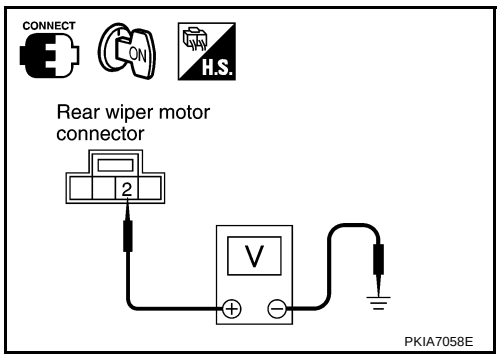
Rear wiper motor connector	Terminal	Ground	Continuity
D106	1		Yes

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK REAR WIPER MOTOR SIGNAL

1. Connect BCM connector and rear wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between rear wiper motor harness connector terminal and ground while rear wiper motor is stopped and while it is operating.



Terminals			Condition	Voltage (Approx.)
(+)		(-)		
Rear wiper motor connector	Terminal			
D106	2	Ground	Wiper stopped	Battery voltage
			Wiper operating	0 V

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Replace rear wiper motor. Refer to BCS-17, "Removal and Installation of BCM" .

Only Rear Wiper ON Does Not Operate

NKS00536

Refer to LT-92, "Combination Switch Inspection" .

Only Rear Wiper INT Does Not Operate

NKS00537

Refer to LT-92, "Combination Switch Inspection" .

Wiper Does Not Wipe When Rear Washer Operates

NKS00538

Refer to LT-92, "Combination Switch Inspection" .

Rear Wiper Does Not Stop

NKS00539

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

With CONSULT-III

1. Select “BCM” on CONSULT-III, and select “WIPER” on “SELECT TEST ITEM” screen.
2. Select “DATA MONITOR” on “SELECT DIAG MODE” screen. Make sure that “RR WIPER INT”, “RR WIPER ON”, and “RR WASHER SW” turn ON-OFF according to wiper switch operation.

Without CONSULT-III

Refer to LT-92, "Combination Switch Inspection" .

OK or NG

OK >> Replace BCM. Refer to BCS-17, "Removal and Installation of BCM" .
NG >> Check combination switch (wiper switch). Refer to LT-92, "Combination Switch Inspection" .

Removal and Installation of Rear Wiper Arm, Adjustment of Wiper Arms Stop Location

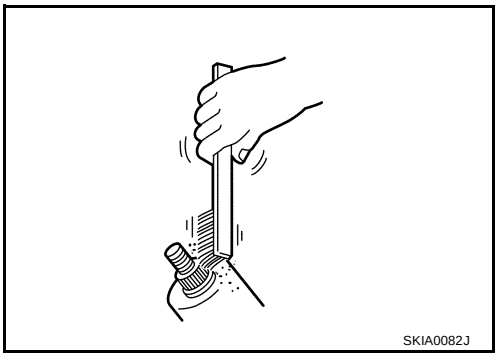
NKS0053A

REMOVAL

1. Turn rear wiper switch ON to operate wiper motor, and then turn rear wiper switch OFF (auto stop).
2. Remove rear wiper arm cap, and remove rear wiper arm nut.
3. Raise rear wiper arm, and remove rear wiper arm from the vehicle.

INSTALLATION

1. Clean up the pivot area as shown in the figure. This will reduce possibility of rear wiper arm nut looseness.
2. Prior to rear wiper arm installation, turn rear wiper switch ON to operate wiper motor, and then turn rear wiper switch OFF (auto stop).



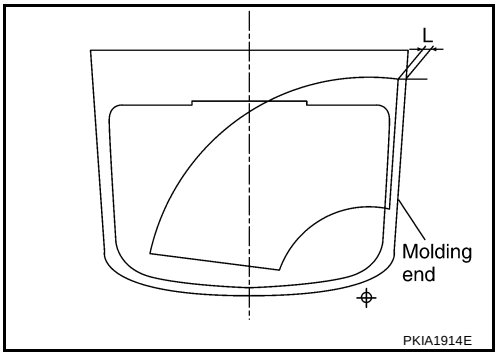
3. Lift the blade up and then set it down onto windshield glass surface to set the blade center to clearance “L” immediately.
4. Tighten wiper arm nuts to specified torque.

Rear wiper arm nut : 15.2 N·m (1.6 kg-m, 11 ft-lb)

5. Spray washer fluid. Turn rear wiper switch ON to operate wiper motor, and then turn rear wiper switch OFF (auto stop).
6. Make sure that wiper blade stop within clearance “L”.

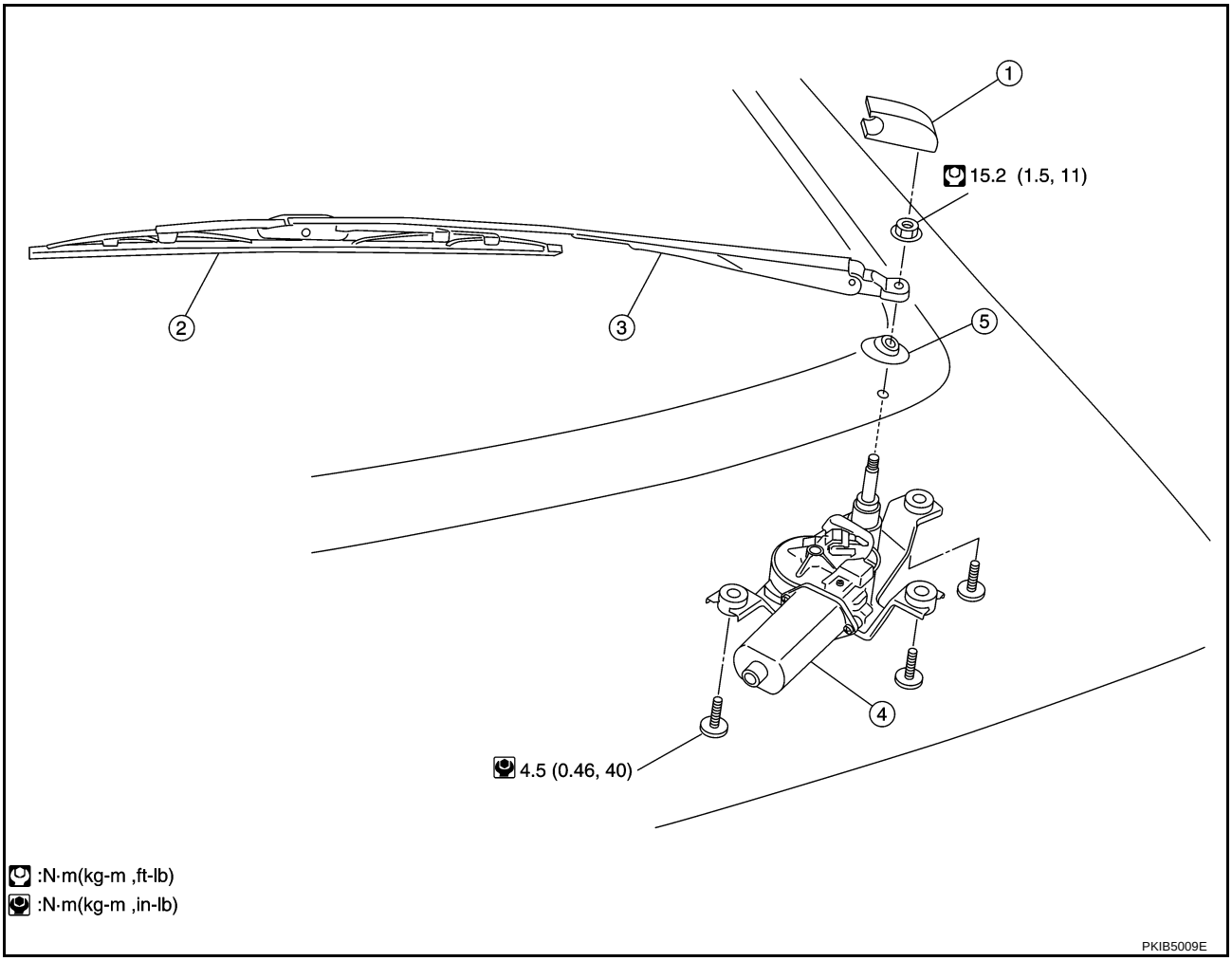
Clearance “L” : 30 ± 7.5 mm (1.181 ± 0.295 in)

7. Install rear wiper arm caps.



Removal and Installation of Rear Wiper Motor

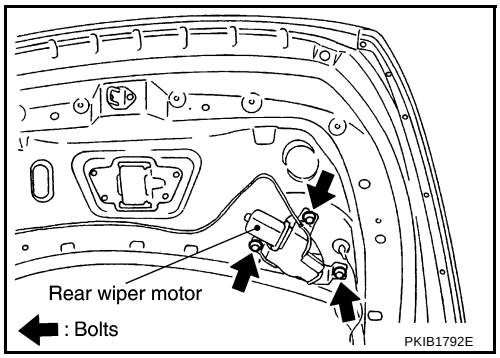
NKS0053B



1. Cover wiper arm
2. Wiper blade
3. Wiper arm
4. Rear wiper motor
5. Pivot cap

REMOVAL

1. Remove rear wiper arm. Refer to WW-46, "REMOVAL" .
2. Remove pivot cap.
3. Remove back door finisher lower. Refer to EI-48, "BACK DOOR FINISHER" .
4. Disconnect rear wiper motor connector.
5. Remove rear wiper motor mounting bolts and remove rear wiper motor from the vehicle.



INSTALLATION

1. Install rear wiper motor to the vehicle.

Rear wiper motor mounting bolts : 4.5 N·m (0.46 kg-m, 40 in-lb)

2. Install pivot cap.
3. Connect rear wiper motor connector. Turn rear wiper switch ON to operate wiper motor, and then turn rear wiper switch OFF (auto stop).
4. Install back door finisher lower. Refer to EI-48, "BACK DOOR FINISHER" .
5. Install rear wiper arm and arm cap. Refer to WW-47, "INSTALLATION" .

CAUTION:

Never drop the rear wiper motor nor cause it to interfere with other parts.

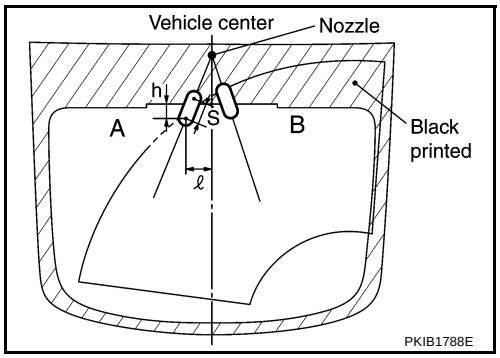
Washer Nozzle Adjustment

NKS0053C

Adjust spray position as shown in the figure.

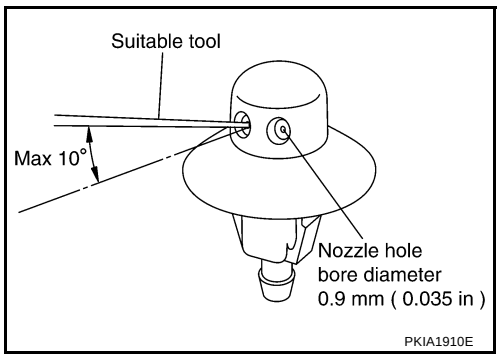
Unit: mm (in)

Spray position	h (height)	ℓ (width)	S	Diameter (spray position range)
A	30 (1.18)	73 (2.87)	50 (1.97)	30
B	12 (0.47)	50 (1.97)	50 (1.97)	30



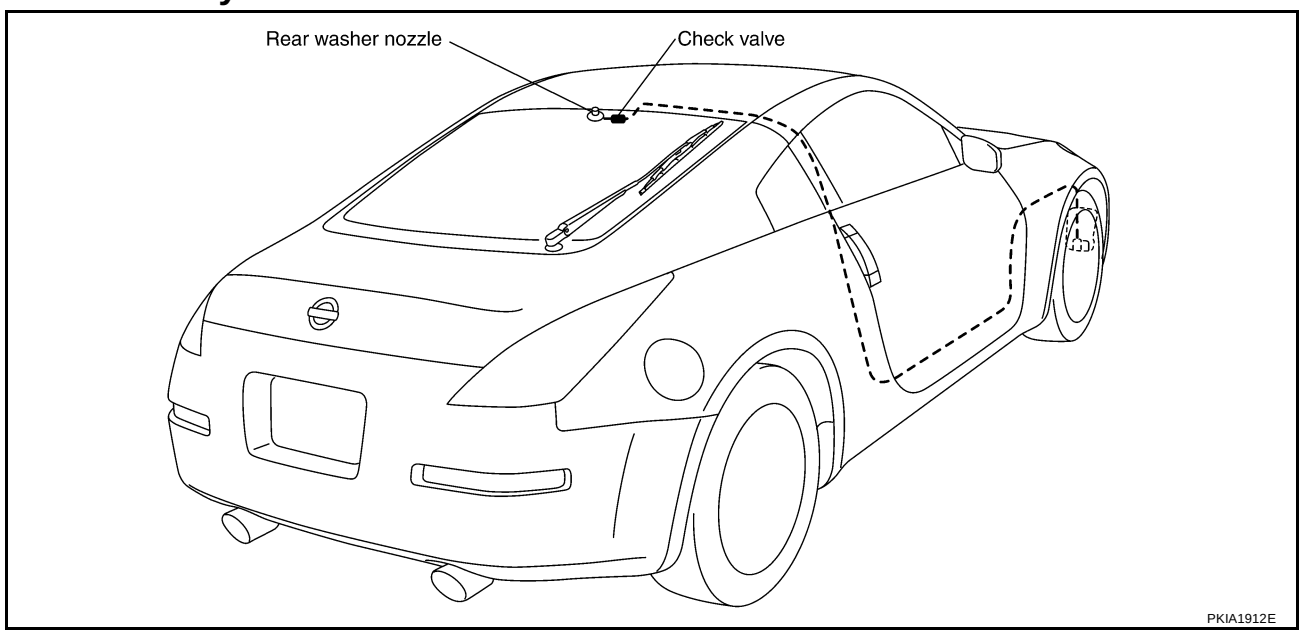
Adjust washer nozzle with suitable tool as shown in the figure.

Adjustable range : ±10° (In any direction)



Washer Tube Layout

NKS0053D

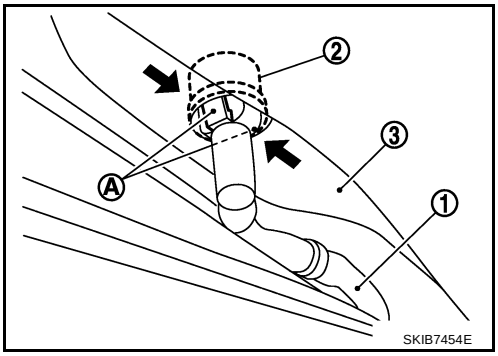


Removal and Installation of Rear Washer Nozzle

NKS0053E

REMOVAL

1. Remove washer tube(1).
2. While pressing pawl (A) on the reverse side of rear washer nozzle (2), remove rear washer nozzle (2) from back door (3).



INSTALLATION

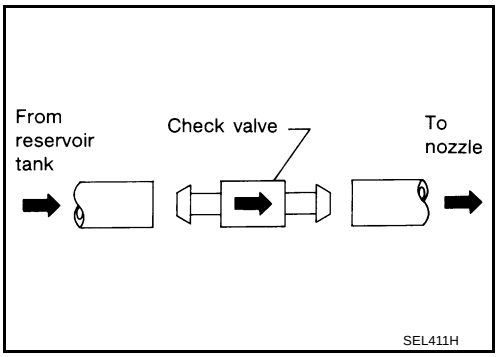
Installation is the reverse order of removal. Adjust nozzle spray location. Refer to WW-48, "Washer Nozzle Adjustment" .

Inspection for Washer Nozzle

NKS0053F

CHECK VALVE INSPECTION

A check valve is provided in washer fluid line. Be careful not to connect check valve to washer tube in the wrong direction.



Inspection of Rear Wiper and Washer Switch Circuit

NKS0053G

Refer to WW-34, "Removal and Installation of Front Wiper and Washer Switch" .

Removal and Installation of Rear Wiper and Washer Switch

NKS0053H

Refer to WW-34, "Removal and Installation of Front Wiper and Washer Switch" .

Removal and Installation of Washer Tank

NKS0053I

Refer to WW-34, "Removal and Installation of Washer Tank" .

Removal and Installation of Washer Pump

NKS0053J

Refer to WW-35, "Removal and Installation of Washer Pump" .

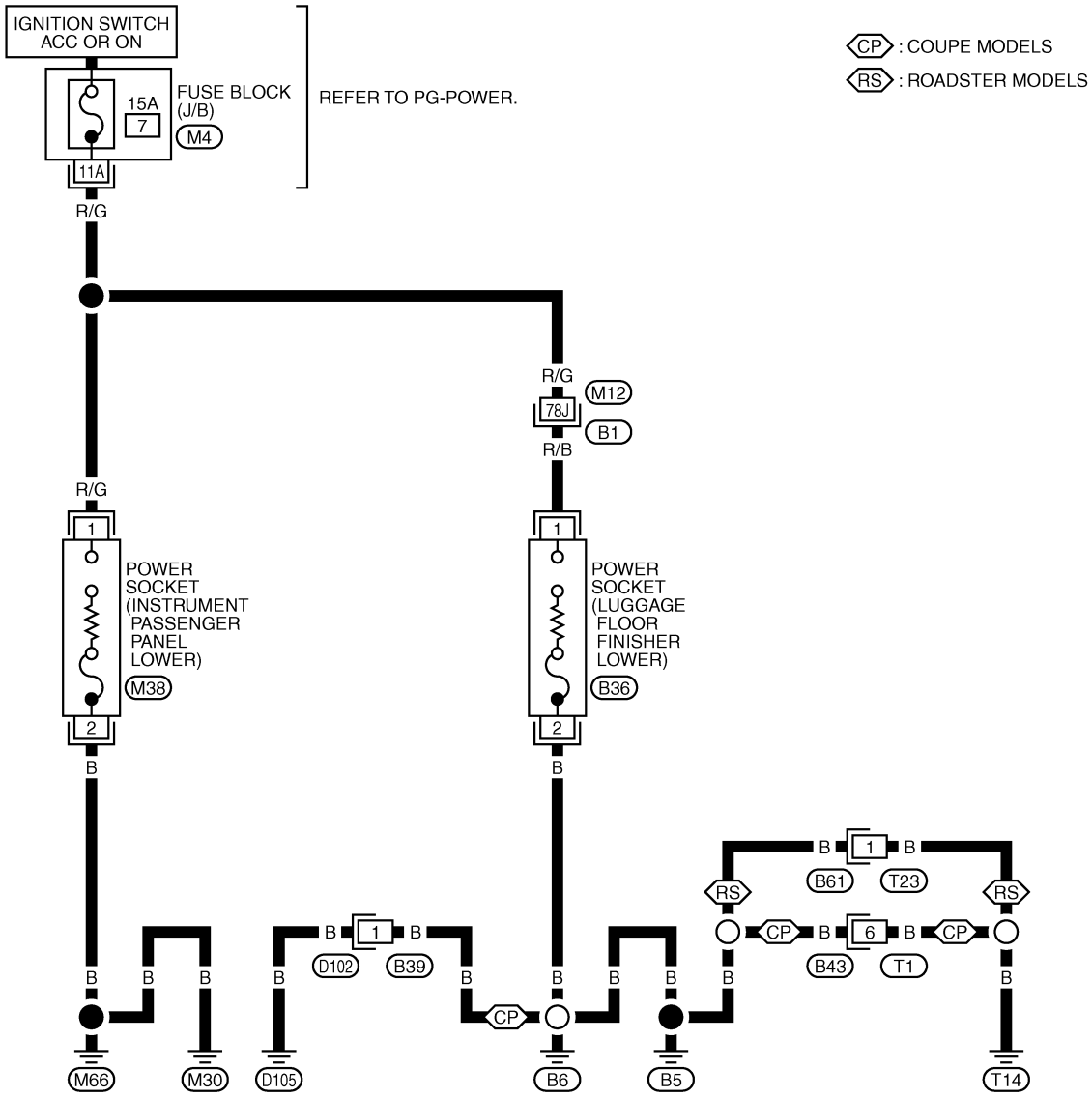
POWER SOCKET

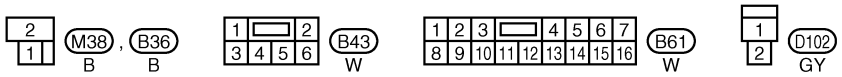
PFP:253A2

Wiring Diagram — P/SCKT —

NKS0053K

WW-P/SCKT-01





REFER TO THE FOLLOWING.
B1 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

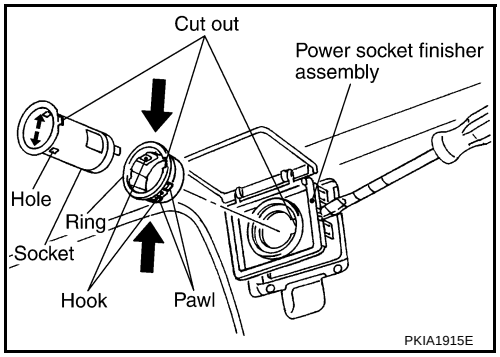
TKWT5740E

Removal and Installation (Luggage Floor Finisher Lower)

NKS0053L

REMOVAL

1. Remove power socket finisher assembly using a clip driver or a suitable tool.
2. Disconnect power socket connector.
3. Remove inner socket from ring. While pressing hook on ring out from square hole.
4. Remove ring from power socket finisher while pressing pawls.



INSTALLATION

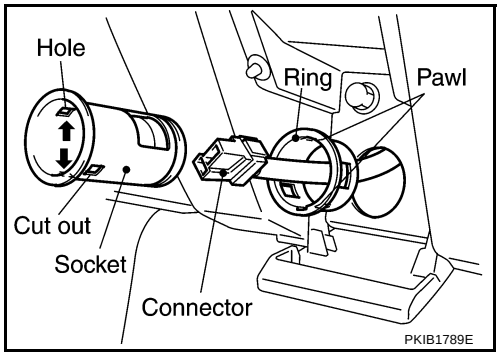
Installation is the reverse order of removal.

Removal and Installation (Instrument Passenger Panel Lower)

NKS0053M

REMOVAL

1. Remove socket using a clip driver or a suitable tool that pressing pawls in socket hole.
2. Disconnect power socket connector.
3. Remove ring from instrument passenger panel lower.



INSTALLATION

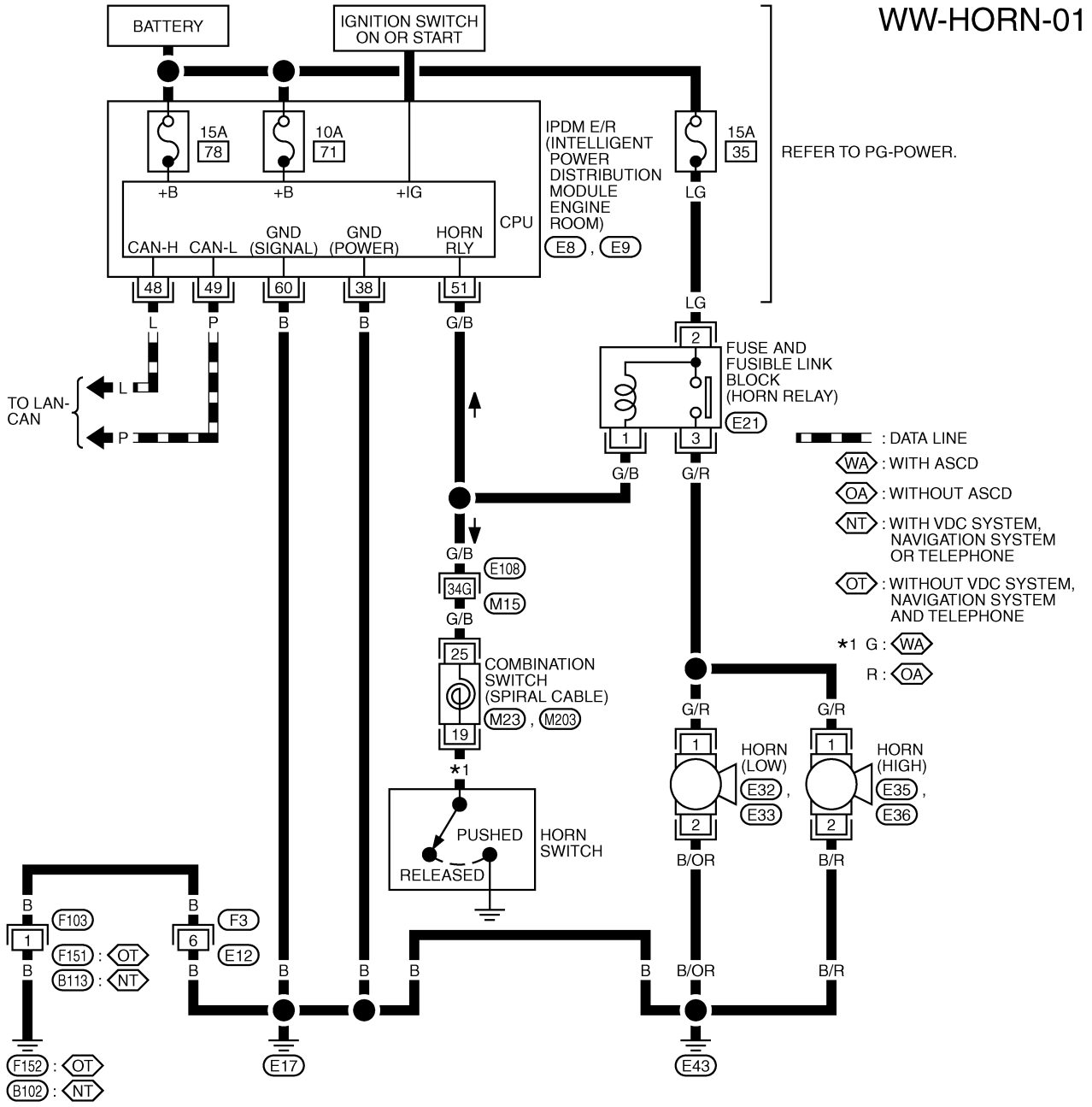
Installation is the reverse order of removal.

HORN

PFP:25610

Wiring Diagram — HORN —

NKS0053N



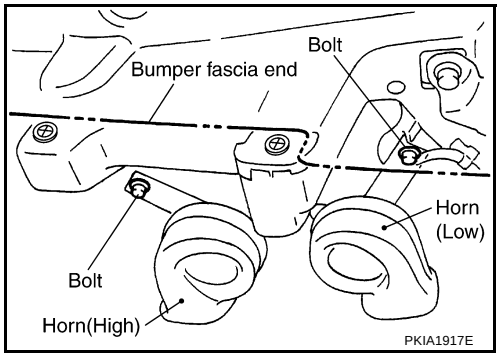
TKWT5741E

Removal and Installation

NKS0053O

REMOVAL

1. Disconnect all horn connectors.
2. Remove horn mounting bolt and remove horn from vehicle.



INSTALLATION

Tighten horn bolt to specified torque.

Horn mounting bolt : 5.7 N·m (0.58 kg-m, 50 in-lb)